CKD

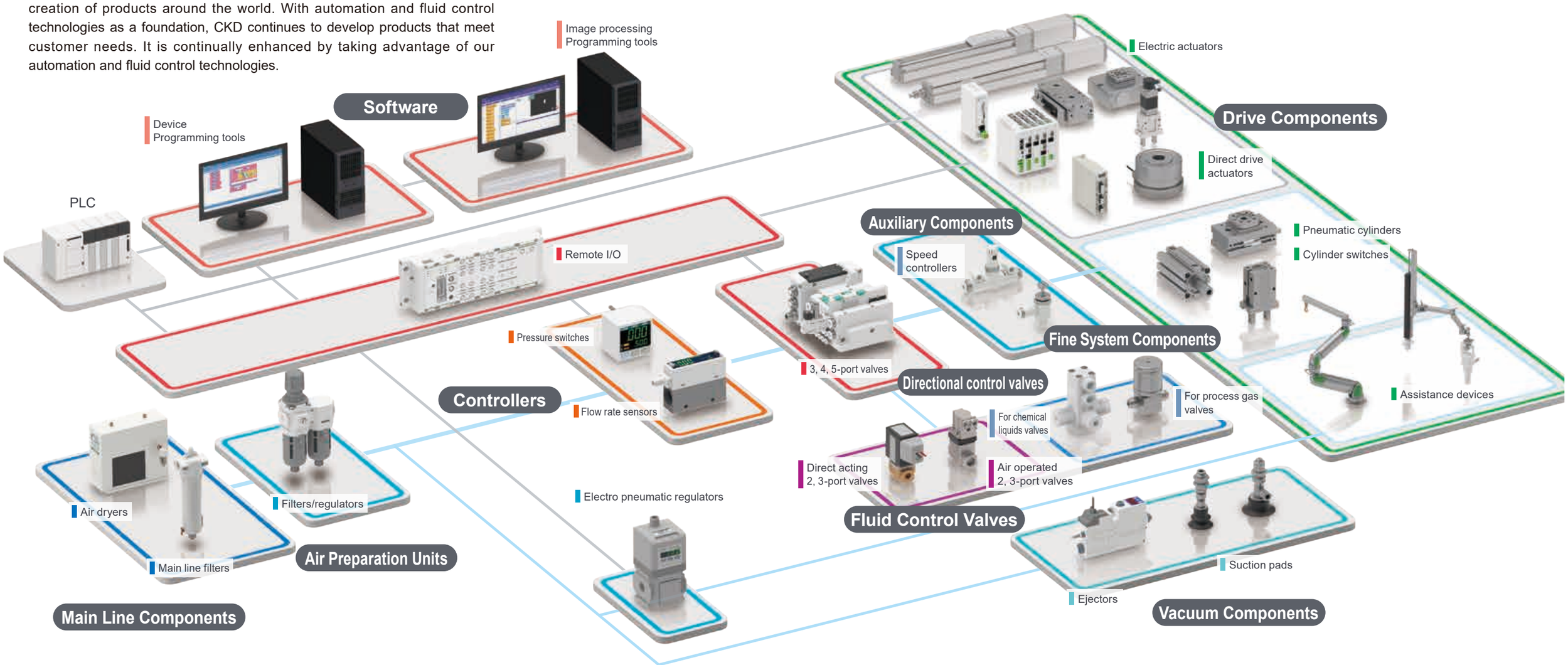
Pneumatic Cylinders ④

- Rodless
- With Brake
- Clamp
- Swivel / Rotary

CKD products seen from their configuration images

Both Air and Electric. From software to I/O units

CKD's product lineup has been expanding steadily, contributing to the creation of products around the world. With automation and fluid control technologies as a foundation, CKD continues to develop products that meet customer needs. It is continually enhanced by taking advantage of our automation and fluid control technologies.



CKD products by application

High Durability Components
HP Series

Long Service Life
Environmental Resistance

HP
HIGH PRODUCTIVITY

CC-1421A

For Food Manufacturing Processes
FP Series

FP Food Process™

CC-1271A

For Outdoor Use WP Series

WEATHER PROOF

CC-1276AA

Rechargeable Battery Manufacturing Process P4 Series

Material
restrictions
1/5 or less dust
generation

CC-1226AA

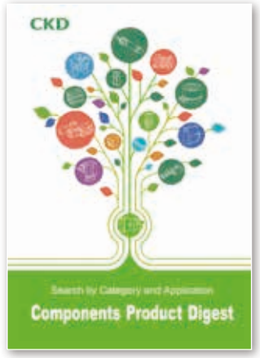
For Clean Components
P5/P7 Series

Low particle
generation
exhaust port

CB-033SA

Guide to the CKD catalog

Learn more about each product category in the booklet catalog



RJ-001AA

The Digest Catalog allows you to search for components you are looking for by overview

Detailed specifications are available in the respective Booklet and WEB catalogs.

Main Line Component Products
Gas Generators

Air Dryers | Main Line Filters | Condensate Drains | Nitrogen gas extraction units

RJ-009AA

Refining and Pressure Adjusting Components
Auxiliary Components

Filters | Regulators | Pressure gauges | Speed controllers | Silencers | Fittings | Tubes

RJ-007AA

Sensors/Controllers

Pressure switches | Flow rate sensors | Flow rate controllers | Air sensors

RJ-008AA

Precision / Vacuum Components

Air bearings | Ejector systems | Vacuum pump systems | Suction Pads

RJ-010AA

Fluid Control Valves

Solenoid valves | Air operated valves | Ball valves

RJ-013AA

Wet Fine System/High Purity Chemical Liquid System

CB-031AA

Dry Fine System/High Purity Gas Control System Components

CB-035A

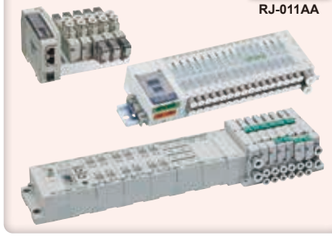
Learn more on the WEB

https://www.ckd.co.jp/kiki/en/

Directional Control Valves (1)

Plug-in Block Manifolds | 3, 4, 5-port valves | Remote I/O

RJ-011AA



Directional Control Valves (2)

2, 3, 5-port valves | Explosion-proof | Air operated valves | Manual selector valves

RJ-012AA

Pneumatic Cylinders (1)

Standard

RJ-002AA

Pneumatic Cylinders (2)

Space saving structures

RJ-003AA

Pneumatic Cylinders (3)

With linear guide | With guide

RJ-004AA

Pneumatic Cylinders (4)

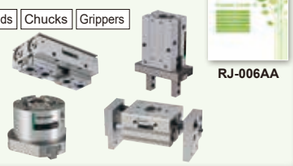
Rodless | With brake | Clamps | Oscillating / Rotating

RJ-005AA

Pneumatic Cylinders (5)

Hands | Chucks | Grippers

RJ-006AA



Visual Programming Tool for Image Processing

Facilea
CC-1548AA

Facilea AI
CC-1623AA

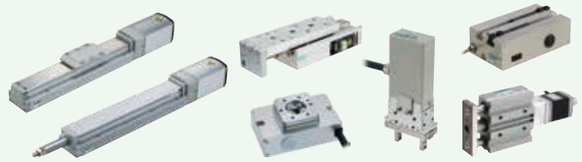
Device Visual Programming Tool

ExiaStudio
CC-1579AA

Electric Actuators

ROBODEX Pulse

RJ-014AA



Electric Actuators

ROBODEX Std.
CB-055AA

Electric Actuators

ROBODEX Servo
CC-1275AA CC-1436AA

ABSODEX

ABSODEX
CC-1614AA

I N D E X

Search by Product Name / Model No.
Product Name — Intro 1
Model No. Alphabetical Index — Ending 42

Search by Product System List — Intro 3
You can select by appearance and product overview of each series.

Guide to Using CAD Data — Intro 17
Website Guide — Intro 19
Model Selection System Guide — Intro 20

⚠ Precautions for Use
● Pneumatic Components Precautions — Intro 39
● General Notes for Pneumatic Cylinders — Intro 41
* For precautions of each product, be sure to read the individual precautions for each model series in the main text.

Technical Data — Intro 22
About Flow Characteristics Display Method — Intro 35
About Protection Structure — Intro 37
About CE Marking — Ending 30
About CKD RoHS Compliance — Ending 32
About ISO9001 / ISO14001 Certification — Ending 34
Index (Alphabetical Index) — Ending 42

About International System of Units (SI Units)
List of Circuit Symbols
Posted on the CKD website.
https://www.ckd.co.jp/kiki/en/

Rodless Cylinders >>> P. 1
Cylinders with Brake / with Lock >>> P. 289
Lock Unit >>> P. 613
Cylinders with Valve >>> P. 651
Clamp Cylinders >>> P. 733
Special Cylinders >>> P. 901
High Speed Cylinders >>> P. 1177
Swing/Rotary Cylinders >>> P. 1223
Related Components >>> P. 1377
Cylinder Switches >>> P. 1457

Product Group	Product Name	Page
Rodless Cylinders >>> P. 1	Super Rodless Cylinder SRL3	5
	Super Rodless Cylinder with High-Precision Guide SRG3	111
	Super Rodless Cylinder with High-Precision Guide SRM3	143
	Super Rodless Cylinder with Brake SRT3	175
	Magnet Type Super Rodless Cylinder MRL2	205
	Magnet Type Super Rodless Cylinder High-Precision Guide Type MRG2	239
	Shuttle Mover SM-25	261
Cylinders with Brake / with Lock >>> P. 289	Celtop Cylinder ULK*	293
	Celtop Cylinder (Small Bore) JSK2	319
	Celtop Cylinder (Small Bore) JSM2	319
	Tie Rod Cylinder with Brake JSG	371
	Celtop Cylinder JSC3	415
	Celtop Cylinder JSC4	415
	Super Compact Cylinder with Fall Prevention USSD	509
	Flat Cylinder with Free Position Fall Prevention UFCD	563
	Selex Cylinder with Free Position Fall Prevention USC	585
Lock Units >>> P. 613	Lock Unit UB	617
	Brake Unit JSB3	625
	Linear Guide Lock LMB	633
	Linear Guide Lock LML	641
Cylinders with Valve >>> P. 651	Compact Cell Cylinder CKV2	653
	Cylinder with valve CAV2/COVR,N2	685
Clamp Cylinders >>> P. 733	Clamp Cylinder CAC4	739
	Clamp Cylinder with Fall Prevention UCAC2	769
	Lightweight Clamp Cylinder CAC-N	789
	Lightweight Clamp Cylinder with Fall Prevention UCAC-N	789
	Rotary Clamp Cylinder RCS2	811
	Rotary Clamp Cylinder RCC2	845
	Pin Clamp Cylinder PCC	875
Special Cylinders >>> P. 901	Compact Cylinder with Vacuum Pad MVC	903
	Stopper Cylinder STK	919
	Mechanical Power Cylinder MCP	991
	Guideless Cylinder GLC	1013
	Balancer Unit BBS	1033
	New Handling System NHS	1071
	Hybri-Robo HR	1117
	Cylinder / Gripper with Linear Norm Sensor LN	1135
High Speed Cylinders >>> P. 1177	High Energy Absorption Cylinder HCM	1183
	High Speed Cylinder HCA	1203
Oscillating / Rotating Cylinders >>> P. 1223	Selex Rotary RRC	1225
	Table Type Rotary Actuator GRC	1243
	Selex Rotary Vane Type RV3*	1283
Related Components >>> P. 1377	Shock Absorber SKL	1383
	Shock Absorber NCK	1391
	Shock Absorber SCK	1403
	Shock Absorber FCK	1411
	Free Joint FJ	1439
	Simple Flow Controller FK	1451
Cylinder Switches >>> P. 1457	M Series, R Series, T Series, K Series F Series, H Series, V Series, E Series	1457

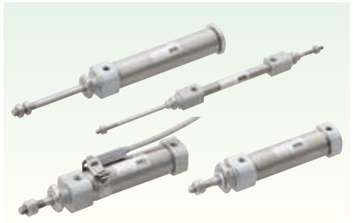
Search by Product System List

Products can be selected by series appearance and product overview.

General-type >>> Pneumatic Cylinder Catalog ① Catalog No.RJ-002AA

Standard, small Bore Size cylinders **(ø2.5 to ø16)**

Pencil type compact cylinder



Pencil Shaped Cylinders

SCP□3

Series	Also known as...	Bore Size (ø)
SCPD3	Single Rod Type	6, 10, 16
SCPS	Single Acting, Push Type	2.5, 4
SCPS3	Single Acting, Push Type	6, 10, 16
SCPH3	Single Acting, Retracting Type	
SCPD3-T	Heat resistant type	6, 10, 16
SCPD3-□C	With Rubber Air Cushion	
SCPD3-F	Low speed type	
SCPD3-O	Low Speed Type	
SCPD3-D	Double rod type	
SCPD3-Z	With Speed Controller	10, 16
SCP□3-M	Non-Rotating Type	
SCPD3-K	High Load Type	6, 10, 16
SCP□3-V	With Valve	10, 16

Standard, medium Bore Size cylinders **(ø20 to ø40)**

Stainless Steel tube for high corrosion resistance

Small Bore Size Cylinders

CMK2

Series	Also known as...	Bore Size (ø)
CMK2	Single Rod Type	20, 25, 32, 40
CMK2-S	Single Acting, Push Type	
CMK2-SR	Single Acting, Retracting Type	
CMK2-P	Stroke Adjustable Type (Push)	
CMK2-R	Stroke Adjustable Type (Pull)	
CMK2-T	Heat resistant type	
CMK2-□C	With Rubber Air Cushion	
CMK2-C	Air Cushion Type	
CMK2-Q	Drop prevention type	
CMK2-F	Low speed type	
CMK2-D	Double rod type	
CMK2-B	Back-to-Back Type	
CMK2-M	Non-Rotating Type	
CMK2-Z	Built-in Speed Controller Type	
CMK2-H	Low Hydraulic Pressure Type	
CMK2-G2/G3	Cutting Oil Resistant Type	
CMK2-JG2/JG3	Stainless Steel Type	

Standard, medium Bore Size cylinders **(ø20 to ø40)**

Serviceable type for maintenance

Small Bore Size Cylinders

CMA2

Series	Also known as...	Bore Size (ø)
CMA2	Single Rod Type	20, 30, 40
CMA2-E	Direct Type	

General Type/Medium Bore Cylinder **(ø20 to ø100)**

Smart type with abundant Bore Sizes and options

Round Shaped Cylinders

SCM

Series	Also known as...	Bore Size (ø)
SCM	Single Rod Type	20 to 100
SCM-X	Single Acting, Push Type	20 to 40
SCM-Y	Single Acting, Retracting Type	
SCM-P	Stroke Adjustable Type (Push)	20 to 63
SCM-R	Stroke Adjustable Type (Pull)	
SCM-T	Heat resistant type	20 to 100
SCM-Q	Drop prevention type	
SCM-F	Low speed type	20 to 40
SCM-O	Low Speed Type	20 to 100
SCM-U	Low Friction Type	
SCM-D	Double rod type	
SCM-B	Back-to-Back Type	20 to 63
SCM-W	Two-Stage Type	
SCM-W4	Tandem Type	
SCM-M	Non-Rotating Type	
SCM-LD	Direct Foot Type	

General Type/Medium Bore Cylinder **(ø32 to ø100)**

Environmentally friendly tie-rod cylinder

Tie Rod Cylinders

SCG

Series	Also known as...	Bore Size (ø)
SCG	Single Rod Type	32 to 100
SCG-Q	Drop prevention type	
SCG-O	Low Speed Type	
SCG-U	Low Friction Type	
SCG-D	Double rod type	
SCG-M	Non-Rotating Type	32 to 63
SCG-G	Heavy-Duty Scraper Type	32 to 100
SCG-G2/G3	Cutting Oil Resistant Type	40 to 100
SCG-G4	Sputter adhesion prevention type	32 to 100

General Type/Medium Bore Cylinder **(ø40 to ø100)**

Robust type with No. 1 reliability

Medium Bore Size Cylinder

SCA2

Series	Also known as...	Bore Size (ø)
SCA2	Single Rod Type	40, 50, 63, 80, 100
SCA2-P	Stroke Adjustable Type (Push)	
SCA2-R	Stroke Adjustable Type (Pull)	
SCA2-T	Heat resistant type	
SCA2-Q2	Drop prevention type	
SCA2-O	Low Friction Type	
SCA2-U	Low Friction Type	
SCA2-D	Double rod type	
SCA2-B	Back-to-Back Type	
SCA2-W	Two-Stage Type	
SCA2-K	Steel Tube Type	
SCA2-H	Low Hydraulic Pressure Type	
SCA2-G	Scraper Type	
SCA2-G2/G3	Cutting Oil Resistant Type	
SCA2-G1/G4	Sputter adhesion prevention type	
SCA2-V	With Valve	

Space-Saving Type >>> Pneumatic Cylinder ② Catalog No.RJ-003AA

General Type/Large Bore Cylinder **(ø125 to ø250)**

Rich variations and high rigidity

Large Bore Size Cylinders

SCS2

Series	Also known as...	Bore Size (ø)
SCS2	Lubricated Type	125, 140, 160, 180, 200, 250
SCS2-N	Non-Lube Type	
SCS2-P	Stroke Adjustable Type (Push)	
SCS2-T	Heat resistant type	
SCS2-D	Double Rod Type/Lubricated Type	
SCS2-ND	Double Rod Type/Non-Lube Type	
SCS2-B	Back-to-Back Type	
SCS2-W	Two-Stage Type	
SCS2-H	Low Hydraulic Pressure Type	
SCS2-G	Heavy-Duty Scraper Type	

Space-Saving/Super Compact **(ø12 to ø200)**

Abundant variations, compact type with switch mounting on 4 sides

Compact Cylinders

SSD2

Series	Also known as...	Bore Size (ø)
SSD2	Single Rod Type	12 to 200
SSD2-K	High Load Type	12 to 100
SSD2-L	Long stroke	
SSD2-X	Push Type	12 to 50
SSD2-Y	Retracting Type	
SSD2-T1	Heat resistant type	12 to 100
SSD2-T1L	With Heat Resistant Cylinder Switch	16 to 63
SSC2-K-□C	High Load Type/With Rubber Air Cushion	20 to 100
SSD2-Q	Drop prevention type	
SSD2-F/SSD2-KF	Fine Speed Type/High Load/Fine Speed Type	12 to 100
SSD2-O	Low Speed Type	
SSD2-KU	High Load/Low Friction Type	20 to 100
SSD2-D	Double rod type	12 to 200
SSD2-B	Back-to-Back Type	12 to 100
SSD2-W	Two-Stage Type	
SSD2-M	Non-Rotating Type	12 to 63
SSD2-DM	Double Rod/ Non-Rotating Type	
SSD2-G	Heavy-Duty Scraper Type	20 to 100
SSD2-G2/G3	Cutting Oil Resistant Type	16 to 100
SSD2-KG2/KG3	High Load/Cutting Oil Resistant Type	
SSD2-G1	Coil Scraper Type	25 to 100
SSD2-G4	Sputter adhesion prevention type	
SSD2-KG1	High Load/Coil Scraper Type	
SSD2-KG4	High Load/Spatter Adhesion Prevention Type	
SSD2-DG1	Double Rod/Coil Scraper Type	
SSD2-DG4	Double Rod/Spatter Adhesion Prevention Type	
SSD2-G5	Environment Resistant Scraper Type	20 to 100
SSD2-KG5	High Load/ Environment Resistant Scraper Type	
SSD2-L4	With Strong Magnetic Field Resistant Switch	40 to 100
SSD2-G1L4	With Strong Magnetic Field Resistant Switch/ With Coil Scraper	
SSD2-KL4	High Load/With Strong Magnetic Field Resistant Switch	
SSD2-KG1L4	High Load/With Strong Magnetic Field Resistant Switch/With Coil Scraper	

Space-Saving/Guided/Super Compact **(ø12 to ø100)**

SSD2 Series equipped with guide rod

Guided Compact Cylinders

SSG

Series	Also known as...	Bore Size (ø)
SSG	Single Rod Type	12 to 100

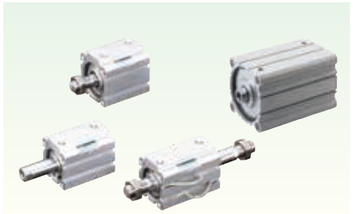
Search by Product System List

Products can be selected by series appearance and product overview.

Space-Saving Type >>> Pneumatic Cylinders ② Catalog No. RJ-003AA

Space-Saving/Super Compact **(ø12 to ø160)**

Compact type with abundant Bore Sizes and options



Compact Cylinders

SSD

Series	Also known as...	Bore Size (ø)
SSD	Single Rod Type	12 to 160
SSD-K	Single Rod High Load Type	12 to 100
SSD-X	Single Acting, Push Type	12, 16, 20, 25, 32, 40, 50
SSD-Y	Single Acting, Retracting Type	
SSD-T	Heat resistant type	12 to 100
SSD-T1L	With Heat Resistant Cylinder Switch	16 to 63
SSD-K-□C	High Load Type/With Rubber Air Cushion	32 to 100
SSD-Q	Drop prevention type	16 to 100
SSD-F	Low speed type	12 to 100
SSD-KF	High Load Type/ Fine Speed Type	
SSD-O	Low Speed Type	
SSD-KU	High Load/Low Friction Type	20 to 100
SSD-D	Double rod type	12 to 160
SSD-B	Back-to-Back Type	12 to 100
SSD-W	Two-Stage Type	
SSD-M	Non-Rotating Type	12 to 63
SSD-G2/G3	Cutting Oil Resistant Type	16 to 100
SSD-K G2/G3	High Load, Cutting Oil Resistant Type	
SSD-G1/G4	Sputter adhesion prevention type	25 to 100
SSD-K G1/G4	High Load, Spatter Adhesion Prevention Type	
SSD-D G1/G4	Double Rod, Spatter Adhesion Prevention Type	
SSD-G5	Environment Resistant Scraper Type	20 to 100
SSD-KG5	High Load/Environment Resistant Scraper Type	20 to 100
SSD-L4	With Strong Magnetic Field Resistant Switch	40 to 100
SSD-G1L4	With Strong Magnetic Field Resistant Switch/ With Coil Scraper	
SSD-KL4	High Load Type With Strong Magnetic Field Resistant Switch	
SSD-KG1L4	High Load Type With Strong Magnetic Field Resistant Switch/With Coil Scraper	

Space-Saving/Compact Single Acting Type **(ø6 to ø15)**

Thumb-sized with fully threaded outer diameter

Cartridge Cylinders

CAT

Series	Also known as...	Bore Size (ø)
CAT	Single Acting, Push Type	6, 10, 15

Space-Saving/Multi-Surface Mount Type **(ø6 to ø32)**

More compact than conventional products, direct mount

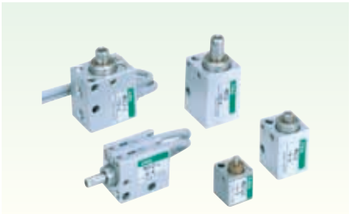
Compact Cylinders

SMG

Series	Also known as...	Bore Size (ø)
SMG	Single Rod Type	6 to 32
SMG-X	Push Type	
SMG-Y	Retracting Type	
SMG-F	Low speed type	
SMG-M	Non-rotating Type	

Space-Saving/Direct Mount Type **(ø4 to ø10)**

Direct mounting possible from 4 directions



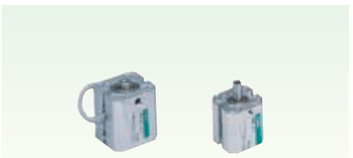
Compact Direct Cylinders

MDC2

Series	Also known as...	Bore Size (ø)
MDC2	Single Rod Type	4, 6, 8, 10
MDC2-X	Push Type	
MDC2-Y	Retracting Type	
MDC2-F	Low Speed Type	

Space-Saving/Compact Cylinder **(ø6 to ø16)**

SSD small bore series. With high-precision guide also available



Compact Cylinders

MSD

Series	Also known as...	Bore Size (ø)
MSD	Single Rod Type	6, 8
MSD-X	Single Acting, Push Type	
MSD-Y	Single Acting, Retracting Type	
MSD-K	High Load Type	6, 8, 12, 16
MSD-F	Low speed type	6, 8
MSD-KF	High Load Type/Fine Speed Type	6, 8, 12, 16

Space-Saving/Flat Type **(ø25 to ø63)**

Mountable even in narrow spaces. With rotation stop function

Flat Cylinder Compact Demi

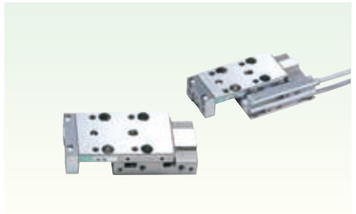
FC□

Series	Also known as...	Bore Size (ø)
FCS	Single Acting, Push Type	25, 32, 40, 50, 63 equivalent
FCH	Single Acting, Retracting Type	
FCD	Single Rod Type	
FCD-D	Double rod type	
FCD-K	With Cushion	

With Linear Guide >>> Pneumatic Cylinders ③ Catalog No. RJ-004AA

With High-Precision Guide **(ø4.5 to ø8)**

High precision and rigidity in a compact size



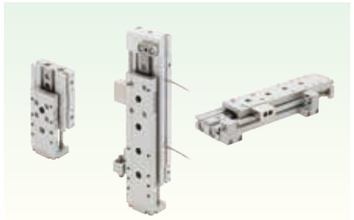
Linear Slide Cylinders

LCM

Series	Also known as...	Bore Size (ø)
LCM	Single rod type	4.5 to 8
LCM-P	Stroke Adjustable Type (Push)	
LCM-R	Stroke Adjustable Type (Push/ Retract)	
LCM-A	Side Mount Type	

With High-Precision Guide **(ø6 to ø25)**

Thorough weight reduction, increased rigidity



Linear Slide Cylinders

LCR

Series	Also known as...	Bore Size (ø)
LCR	Basic type	6 to 25
LCR-Q	Drop prevention type	8 to 25
LCR-F	Ultra Low Speed Type	12, 16, 20, 25

With High-Precision Guide **(ø6 to ø25)**

Emphasis on high precision and high rigidity. Easier to use

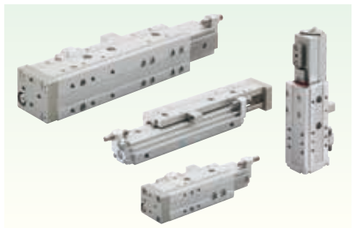
Linear Slide Cylinders

LCG

Series	Also known as...	Bore Size (ø)
LCG	Single rod type	6 to 25
LCG-Q	Drop prevention type	8 to 25

With High-Precision Guide **(ø12 to ø20)**

Standardly equipped with specs frequently used by customers



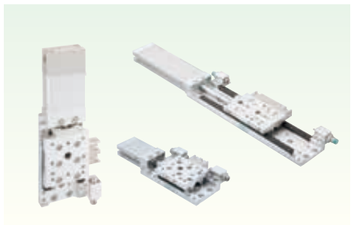
Linear Slide Cylinders

LCW

Series	Also known as...	Bore Size (ø)
LCW	Single rod type	12 to 20
LCW-Q	Drop prevention type	

With High-Precision Guide **(ø25, ø32)**

Ideal for space-saving applications due to thorough thinning



Low Profile Linear Slide Cylinders

LCX

Series	Also known as...	Bore Size (ø)
LCX	Single rod type	25, 32
LCX-Q	Drop prevention type	
LCX-□L	Long stroke	
LCX-Q-□L	Fall Prevention Type / Long Stroke	

Guided Compact Cylinder **(ø6 to ø16)**

SSD small bore series. With high-precision guide also available

Compact Linear Guided Compact Cylinders

MSDG

Series	Also known as...	Bore Size (ø)
MSDG-L	Guided Type	6, 8, 12, 16
MSDG-LF	Guided Type/Fine Speed Type	12, 16

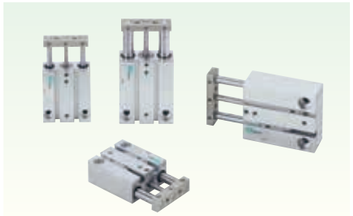
Search by Product System List

Products can be selected by series appearance and product overview.

Guided >>> Pneumatic Cylinders ③ Catalog No. RJ-004AA

Guided Cylinder **(ø6, ø10)**

Extremely small guided space-saving type



Compact Guided Cylinders

STM

Series	Also known as...	Bore Size (ø)
STM-M/B	Single rod type	6, 10

Guided Cylinder **(ø12 to ø100)**

Environmentally friendly product. Improved load resistance

Guided Cylinders

STG

Series	Also known as...	Bore Size (ø)
STG-M/B	Single rod type	12 to 100
STG-M/B-□C	Rubber Air Cushion Type	32 to 63
STG-M/B C	Air Cushion Type	16 to 63
STG-M/B Q	Drop prevention type	20 to 63
STG-M/B G	Heavy-Duty Scraper Type	
STG-M/B G1	Coil Scraper Type	
STG-MG2/MG3	Cutting Oil Resistant Type	
STG-M/B G4	Sputter adhesion prevention type	40 to 63
STG-MG5	Environment Resistant Scraper Type	20 to 100
STG-K	Heavy-Duty Guide Rod Type	32, 50

Guided Cylinder **(ø8 to ø100)**

Abundant Bore Sizes and variations

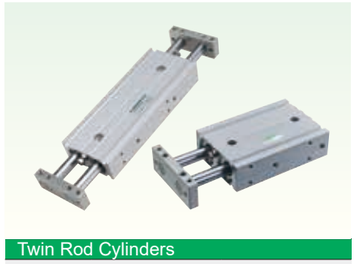
Guided Cylinders

STS/STL

Series	Also known as...	Bore Size (ø)
ST S/L-M/B	Single Rod Type	8 to 100
ST S/L-M/B P	Stroke Adjustable Type (Push)	8 to 80
ST S/L-M/B T	Heat resistant type	12 to 80
ST S/L-M/B T2	Packing Material: Fluoro Rubber	
ST S/L-M/B-□C	Rubber Air Cushion Type	32 to 80
ST S/L-M/B C	Air Cushion Type	25 to 80
ST S/L-M/B Q	Drop prevention type	20 to 80
ST S/L-M/B F	Low speed type	8 to 80
ST S/L-M/B O	Low Speed Type	
ST S/L-M/B G	Heavy-Duty Scraper Type/	20 to 80
ST S/L-M/B G1	Coil Scraper Type	
ST S/L-M/B G 2/3	Cutting Oil Resistant Type	
ST S/L-M/B G4	Sputter adhesion prevention type	40 to 80
ST S/L-M/B V	Valve Mounted Type	20 to 63

Twin Rod Cylinder **(ø6 to ø32)**

High non-rotating accuracy with twin rods. For P&P applications



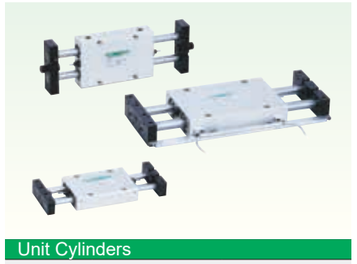
Twin Rod Cylinders

STR2

Series	Also known as...	Bore Size (ø)
STR2-M/B	Standard type	6, 10, 16, 20, 25, 32
STR2-M/B Q	Drop prevention type	16, 20, 25, 32
STR2-M/B O	Low Speed Type	6, 10, 16, 20, 25, 32
STR2-M/B F	Low speed type	10, 16, 20, 25, 32
STR2-M/B D	Double rod type	6, 10, 16, 20, 25, 32

Unit Cylinder **(ø10 to ø32)**

Stable positioning accuracy with double/double rod structure



Unit Cylinders

UCA2

Series	Also known as...	Bore Size (ø)
UCA2	Sleeve Bearing Type	10, 16, 25, 32
UCA2-B	Rolling Bearing Type	

Rodless Type >>> Pneumatic Cylinders ④ P. 1

Rodless Type/Basic Type **(ø12 to ø100)**

Abundant Bore Sizes and variations

Listed Page From P. 5

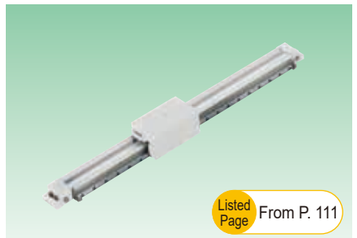
Super Rodless Cylinders

SRL3

Series	Also known as...	Bore Size (ø)	Page
SRL3	Standard type	12, 16, 20, 25, 32, 40, 50, 63, 80, 100 equivalent	10
SRL3-J	Full Cowl Type		70
SRL3-G	With Resin Guide		28
SRL3-Q	With Fall Prevention Function		42
SRL3-GQ	With Resin Guide / With Fall Preven-tion Function		58

Rodless Type/With High-Precision Guide **(ø12 to ø25)**

Integrated High Precision LM Guide



Listed Page From P. 111

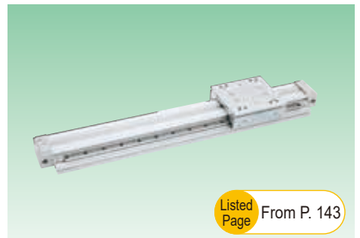
Super Rodless Cylinder with High Precision Guide

SRG3

Series	Also known as...	Bore Size (ø)	Page
SRG3	Standard Type	12, 16, 20, 25 equivalent	116

Rodless Type/With High-Precision Guide **(ø25 to ø63)**

High Precision LM Guide adopted on 2 axes. Increased rigidity



Listed Page From P. 143

Super Rodless Cylinder with High Precision Guide

SRM3

Series	Also known as...	Bore Size (ø)	Page
SRM3	Double Acting Type	25, 32, 40, 63 equivalent	146
SRM3-Q	Double Acting Type / Fall Prevention Type		146

Magnet Type With High-Precision Guide **(ø10 to ø25)**

High-precision LM guide integrated into MRL2

Listed Page From P. 239

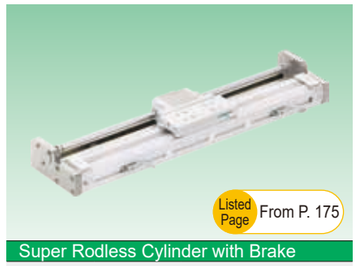
Magnet Type Super Rodless Cylinder High Precision Guide

MRG2

Series	Also known as...	Bore Size (ø)	Page
MRG2	Double Acting Type	10, 16, 25	242

Rodless Type/With Brake **(ø12 to ø63)**

Type with high-reliability brake



Listed Page From P. 175

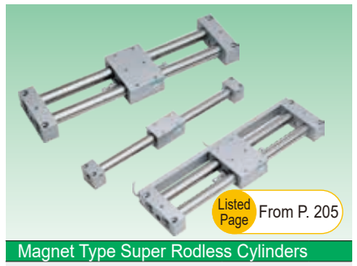
Super Rodless Cylinder with Brake

SRT3

Series	Also known as...	Bore Size (ø)	Page
SRT3	Double Acting Type	12, 16, 20, 25, 32, 42, 50, 63 equivalent	178

Rodless Type/Magnet Type **(ø6 to ø32)**

Rodless, further space-saving



Listed Page From P. 205

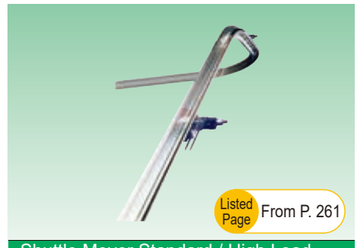
Magnet Type Super Rodless Cylinders

MRL2

Series	Also known as...	Bore Size (ø)	Page
MRL2	Basic type	6, 10, 16, 20, 25, 32	212
MRL2-G	Simple Guide Type / 1 Piston		212
MRL2-W	Simple Guide Type / 2 Piston		212
MRL2-F	Low speed type		212

Rodless Type/Shuttle Mover **(ø25)**

Rodless with a curve. Flexible layout possible



Listed Page From P. 261

Shuttle Mover Standard / High Load

SM-25

Series	Also known as...	Bore Size (ø)	Page
SM-25	Standard Type	25	264
	High Load Type		

Search by Product System List

Products can be selected by series appearance and product overview.

With Brake/With Lock >>> Pneumatic Cylinders ④ P. 289

Small/Medium Bore with Brake **(ø16 to ø40)**

High-performance compact brake for pencil type, etc.

Cell Top Cylinders (Small/Medium Bore)

ULK

Series	Also known as...	Bore Size (ø)	Page
ULK	Single Rod Type	20, 25, 32, 40	296
ULK-V	With Valve	20, 25, 32, 40	296

Small/Medium Bore with Brake **(ø20 to ø40)**

Reliable brake equipped on CMK2/CMA2

Cell Top Cylinders (Small/Medium Bore)

JSK2/JSM2

Series	Also known as...	Bore Size (ø)	Page
Crimped Type			
JSK2	Single Rod Type	20, 25, 32, 40	324
JSK2-V	With Valve		324
Disassembly Type			
JSM2	Single Rod Type	20, 30, 40	344
JSM2-V	With Valve		344

Medium Bore with Brake **(ø40 to ø100)**

Reliable brake mechanism equipped on SCG

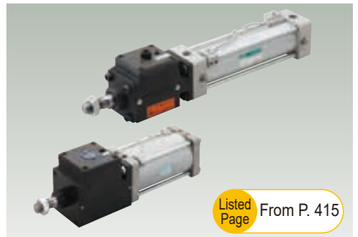
Tie Rod Cylinders with Brake

JSG

Series	Also known as...	Bore Size (ø)	Page
JSG	Single Rod Type	40, 50, 63, 80, 100	376
JSG-V	With Brake Release Valve		376

Medium/Large Bore with Brake **(ø40 to ø180)**

Brake equipped on reliable robust cylinder



Cell Top Cylinders (Medium/Large Bore)

JSC3/JSC4

Series	Also known as...	Bore Size (ø)	Page
JSC3	Single Rod Type	40 to 100	422
JSC4	Single Rod Type	125 to 180	422
JSC3-V	With Valve for Brake	40 to 100	460
JSC3-H	Low Hydraulic Pressure Type	40 to 100	470
JSC4-H	Low Hydraulic Pressure Type	125 to 180	470
JSC3-T	Heat resistant type	40 to 100	486
JSC4-T	Heat resistant type	125 to 180	486

With Fall Prevention **(ø20 to ø100)**

Fall prevention function equipped on compact SSD

Super Compact Cylinders with Fall Prevention

USSD

Series	Also known as...	Bore Size (ø)	Page
USSD	Single Rod Type	20, 25, 32, 40, 50, 63, 80, 100	514
USSD-K	High Load Type		514

With Fall Prevention **(ø25 to ø63)**

Fall prevention function equipped on Flat Cylinder FCD Series

Flat Cylinders with Free Position and Fall Prevention

UFCD

Series	Also known as...	Bore Size (ø)	Page
UFCD-KL	Single Rod Type/ With Cushion	25 to 63	566

With Fall Prevention **(ø40 to ø100)**

Fall prevention possible at any position

Selex Cylinders with Free Position and Fall Prevention

USC

Series	Also known as...	Bore Size (ø)	Page
USC	Single Rod Type	40 to 100	588
USC-G1	With Coil Scraper		588

Lock Unit >>> Pneumatic Cylinders ④ P. 613

Light. Slim lock unit

Fixing, "Improved safety", "Drop prevention" possible

Lock Units

UB

Series	Applicable Shaft Diameter	Page
UB	8, 16	620

Brake Unit

Only the brake part of the Brake Cylinder is unitized

Brake Units

JSB3

Series	Rod Diameter	Page
JSB3	16, 20, 25, 30, 35, 40, 45	628

Brake for LM Guide

Reliable brake mounted on LM Guide

Linear Guide Locks

LMB

Series	Page
LMB	636

Lock unit

Linear guide, compact and high holding force

Linear Guide Locks

LML

Series	Page
LML	643

With Valve >>> Pneumatic Cylinders ④ P. 651

With Valve/Medium Bore Cylinder **(ø20 to ø40)**

High performance solenoid valve mounted on CMK2 Series

Compact Cell Cylinders

CKV2

Series	Also known as...	Bore Size (ø)	Page
CKV2	Single Rod Type	20, 25, 32, 40	660
CKV2-M	Non-Rotating Type		670

With Valve **(ø50, 75, 100)**

Boasting long-standing reliability

Cell Cylinders

CAV2/COV$^{P}_{N}$2

Series	Also known as...	Bore Size (ø)	Page
CAV2	Double Solenoid/ Lubricated Type	50, 75, 100	694
COVP2	Single Solenoid / Push on Energization Type / Lubricated Type		694
COVN2	Single Solenoid / Retract on Energization Type / Lubricated Type		694
CAV2-N	Double Solenoid / Non-lube Type		694
COVP2-N	Single Solenoid / Push on Energization Type / Non-lube Type		694
COVN2-N	Single Solenoid / Retract on Energization Type / Non-lube Type		694

Other with valve

In addition, there is a lineup of "Cylinders with Valves" below.

Product Name	Series	Bore Size (ø)	Catalog No.
Pencil Shaped Cylinder	SCPS3-V SCPD3-V	10, 16	RJ-002AA
Medium Bore Size Cylinder	SCA2-V	40, 50, 63, 80, 100	RJ-002AA
Guided Cylinder	ST S/L-M/B V	20 to 63	RJ-004AA
Brake Cylinder	ULK-V	20, 25, 32, 40	P. 296
	JSK2-V	20, 25, 32, 40	P. 324
	JSM2-V	20, 25, 32, 40	P. 344
	JSG-V	40, 50, 63, 80, 100	P. 376
	JSC3-V	40, 50, 63, 80, 100	P. 460
Selex Rotary	RV3S V/W RV3D V/W	0.98 to 66.6 (Torque Size)	P. 1304

Search by Product System List

Products can be selected by series appearance and product overview.

Clamp >>> Pneumatic Cylinders ④ P. 733

Clamp Cylinder **(ø40 to ø80)**

Cylinder exclusively for clamping

Clamp Cylinders

CAC4

Series	Also known as...	Bore Size (ø)	Page
CAC4	Single Rod Type	40, 50, 63, 80	742
CAC4-G4	Sputter adhesion prevention type	40, 50, 63, 80	756

Clamp Cylinder with Fall Prevention **(ø50, ø63)**

Drop prevention function equipped on clamp cylinder

Clamp Cylinders with Fall Prevention

UCAC2

Series	Also known as...	Bore Size (ø)	Page
UCAC2	Single Rod Type	50, 63	772

Clamp Cylinder **(ø32, ø40)**

Dedicated for clamping, contributes to weight reduction of welding jigs

Lightweight Clamp Cylinders

CAC-N

Series	Also known as...	Bore Size (ø)	Page
CAC-N	Single Rod Type	32, 40	792

Clamp Cylinder with Fall Prevention **(ø32, ø40)**

Equipped with free position fall prevention function

Lightweight Clamp Cylinders with Fall Prevention

UCAC-N

Series	Also known as...	Bore Size (ø)	Page
UCAC-N	With Fall Prevention	32, 40	798

Rotary Clamp **(ø12 to ø63)**

Simple design for compact clamping

Rotary Clamp Cylinders

RCS2

Series	Also known as...	Bore Size (ø)	Page
RCS2	Single Rod Type	12 to 63	816
RCS2-T2	Seal material Fluororubber		826
RCS2-G4	Sputter adhesion prevention type	32 to 63	832

Rotary Clamp **(ø16 to ø63)**

Ideal for clamping in limited spaces

Rotary Clamp Cylinders

RCC2

Series	Also known as...	Bore Size (ø)	Page
RCC2	Single Rod Type	16 to 63	846
RCC2-G4	Sputter adhesion prevention type	20 to 63	860

Pin Clamp Cylinder

Workpiece positioning and clamping possible with one unit

Pin Clamp Cylinders

PCC

Series	Also known as...	Bore Size (ø)	Page
PCC	Single Rod Type	50	878
PCC-Q	Drop prevention type		878

Special >>> Pneumatic Cylinders ④ P. 901

Space-Saving/Compact With Vacuum Pad **(ø6, ø10)**

Suction pad equipped on Rod End

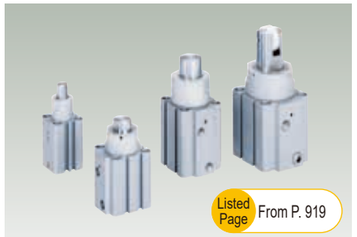
Compact Cylinders with Vacuum Suction

MVC

Series	Also known as...	Bore Size (ø)	Page
MVC	Single Rod Type	6, 10	908

Stopper Cylinder **(ø20 to ø50)**

Space saving type with excellent lateral load resistance



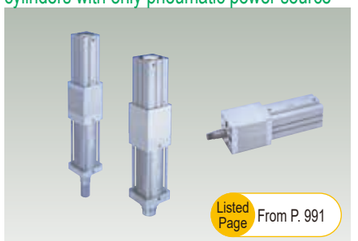
Stopper Cylinders

STK

Series	Also known as...	Bore Size (ø)	Page
STK	Rod End/Shape: Round Bar Type	20, 32, 40, 50	924
STK-Y	Single Acting / Retract Type / Rod End Round Bar Shape		932
STK-Y1	Spring Type / Rod End Round Bar Shape		940
STK-M	Rod End Chamfered Shape		948
STK-MY	Single Acting / Retract Type / Rod End Chamfered Shape		956
STK-MY1	Spring Type / Rod End Chamfered Shape		964
STK-JY	Single Acting / Retract Type / Rod End Roller Shape		972
STK-JY1	Spring Type / Rod End Roller Shape		978

Mechanical Power Cylinder

Achieves high thrust comparable to hydraulic cylinders with only pneumatic power source



Mechanical Power Cylinders

MCP

Series	Also known as...	Bore Size (ø)	Page
MCP-W	Fast Forward + Intensification	For 2t / For 5t	996
MCP-S	Intensification Part Only		996

Guideless Cylinder **(ø40 to ø100)**

Non-rotating without guide, excellent lateral load resistance

Guideless Cylinders

GLC

Series	Also known as...	Bore Size (ø)	Page
GLC	Single Rod Type	40 to 100	1018

Balancer Unit **(ø50 to ø100)**

Lightly supports heavy objects with only air source

Balancer Units

BBS

Series	Also known as...	Bore Size (ø)	Page
BBS-A	Automatic Pressure Adjustment Type	50 to 100	1038
BBS-O	Fixed Pressure Adjustment Type		1054

Unit Equipment XZ Axis Composite Unit

Selectable X axis (payload), selectable Z axis.

New Handling System

NHS

Series	Also known as...	Page
NSR	X Axis Module	1076
NHS-H	Z Axis Module (HRL)	1088
NHS-S	Z Axis Module (STL-B)	1100

Search by Product System List

Products can be selected by series appearance and product overview.

Special >>> Pneumatic Cylinders ④ P. 901

Guided Single Axis Unit

Low profile and high rigidity

Hybri-Robo

HRL

Series	Also known as...	Page
HRL-1	Guided Single Axis Unit	1120

With Length Measurement Function/Cylinder/Gripper

Compact cylinder/gripper equipped with length measuring function

Cylinder/Gripper with Linear Norm Sensor

LN

Series	Also known as...	Bore Size (ø)	Page
SSD-LN SSD-O-LN	Cylinder with Sensor Super Compact Type	12 to 50	1144
BHA-LN	Cross Roller Parallel Gripper with Sensor	12, 16, 20, 25	1150
BHG-LN	Cross Roller Parallel Gripper with Rubber Cover and Sensor	12, 16, 20, 25	1150
BHE-LN	Centering Gripper with Sensor	12, 16, 20, 25	1150

High Speed Type >>> Pneumatic Cylinders ④ P. 1177

High Speed Type/High Speed Cylinder **(ø20 to ø63)**

High speed operation at 2000 mm/s. High cushion capacity

High Energy Absorption Cylinders

HCM

Series	Also known as...	Bore Size (ø)	Page
HCM	Single Rod Type	20 to 63	1186

High Speed Type/High Speed Cylinder **(ø20 to ø100)**

High-speed operation at 3000 mm/s. High cushion capacity

High Speed Cylinders

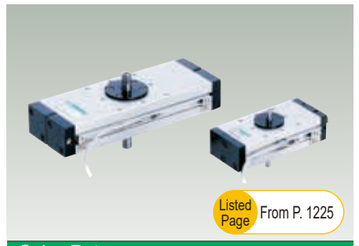
HCA

Series	Also known as...	Bore Size (ø)	Page
HCA	Single Rod	20, 25, 32, 40, 50, 63, 80, 100	1206

Swinging/Rotating Type >>> Pneumatic Cylinders ④ P. 1223

Swing/Rotary Type 0.7 to 5.6 N·m

Rack & pinion type, compact swinging type



Selex Rotary

RRC

Series	Also known as...	Torque Size	Page
RRC	Rack & Pinion Type	0.7 to 5.6	1230

*Torque size (N·m, at 0.5 MPa)

Swinging/Rotating Type 0.5 to 8.0 N·m

Table type actuator. High precision type also available

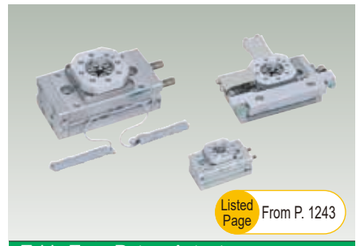


Table Type Rotary Actuators

GRC

Series	Also known as...	Torque Size	Page
GRC	Basic type	0.5 to 8.1	1248
GRC-K	High-Precision Type	1.0 to 8.1	1248
GRC-F	Low speed type	0.5 to 8.1	1262
GRC-KF	High-Precision Type/Low Speed Type	1.0 to 8.1	1262

*Torque size (N·m, at 0.5 MPa)

Swinging/Rotating Type 0.12 to 0.66 N·m

Vane type. Abundant torque sizes.

Selex Rotary Vane Type

RV3□

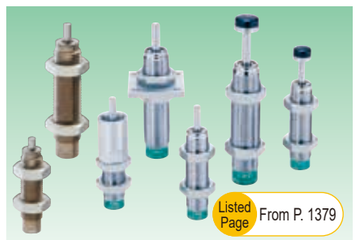
Series	Also known as...	Torque Size	Page
Compact			
RV3S	Single Vane Type	0.12 to 3.19	1288
RV3D	Double Vane Type	0.28 to 7.70	1288
RV3S V/W	Single Vane Type/With Valve	0.98 to 3.19	1304
RV3D V/W	Double Vane Type/With Valve	2.11 to 7.70	1304
RV3S	Angle Adjustable Single Vane Type	0.31 to 3.19	1312
RV3DA	Angle Adjustable Double Vane Type	0.71 to 7.70	1312
Large			
RV3S (Large)	Single Vane Type	4.7 to 102	1324
RV3D (Large)	Double Vane Type	10.1 to 206	1324
RV3S V/W	Single Vane Type with Valve	4.7 to 27.9	1334
RV3D V/W	Double Vane Type with Valve	10.1 to 66.6	1334
RV3SH	Single Vane Type Low Hydraulic Pressure Type	4.7 to 102	1344
RV3DH	Double Vane Type Low Hydraulic Pressure Type	10.1 to 206	1344
RVC	Shock absorber		1350

*Torque size (N·m, at 0.5 MPa)

Related Components >>> Pneumatic Cylinders ④ P. 1377

Shock Absorber **(Absorption Capacity 1 to 720 J)**

3 models available to suit application



Shock absorbers

SKL, NCK, SCK, FCK

Series	Also known as...	Absorption Energy	Page
Fixed Type			
SKL	–	0.2 to 3.6	1386
NCK	–	1 to 200	1392
Adjustable Type			
SCK	–	0.049 to 588	1404
FCK-L	Low Speed Type	1.5 to 79.3	1414
FCK-M	Medium Speed Type	1.8 to 720	1414
FCK-H	High Speed Type		

Absorption Energy: J

Free Joint **(Size M3 to M45)**

For preventing misalignment when mounting cylinder. 3 types available

Free Joints

FJ

Series	Page
FJ	1442

Simple Type Floating Connector

For preventing misalignment when mounting cylinder. Simple type.

Simple Floating Joint

FK

Series	Page
FK	1452

Cylinder Switch

>>> Pneumatic Cylinders ④ P. 1457

Abundant types available

Cylinder Switches

Series	Page
2-Color Indicator Solid State Cylinder Switch	1464
Strong Magnetic Field Resistant Cylinder Switch	1465
M Series	1468
R Series	1470
T Series	1472
Water Resistant Cylinder Switch	1476
Magnetic Environment Cylinder Switch	1478
K Series	1480
F Series	1482
H Series	1484
V Series	1485
E Series	1486

Search by Product System List

Products can be selected by series appearance and product overview.

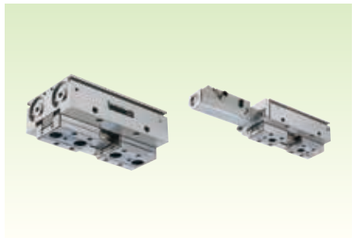
Hands (Grippers) >>> Pneumatic Cylinders ⑤ Catalog No. RJ-006AA

Wide variety including thin, lightweight, and wide types available

Parallel Grippers

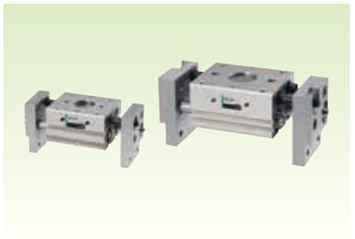
Series	Also known as...	Bore Size (ø)
LSH-HP1 LSHL-HP1	Linear Slide Gripper (HP Series)	6 to 32
LSHM-HP2	Linear Slide Gripper with Length Measurement Function (HP Series)	10 to 25
LSH	Linear Slide Gripper (Standard Type)	10 to 25
FH100	Feather Gripper (Mini Parallel Gripper)	10 to 25
BSA2	Ultra Compact Cross Roller Parallel Gripper	6
BHA	Compact Cross Roller Parallel Gripper	12 to 25
BHG	Compact Cross Roller Parallel Gripper with Rubber Cover	12 to 25

Series	Also known as...	Bore Size (ø)
BHE	Centering Gripper	12 to 32
LHA	Linear Guide Gripper	6 to 32
LHAG	Linear Guide Gripper with Rubber Cover	12 to 32
HAP-1C	Parallel Gripper	15
HAP	Parallel Gripper	20 to 40
HKP	Cross Roller Parallel Gripper	32 to 80
HCP	Horizontal Parallel Gripper	12 to 32
HGP	Long Stroke Parallel Gripper	25



Low Profile Parallel Grippers

Series	Also known as...	Bore Size (ø)
LST-HP1	Low Profile Long Stroke Gripper	8x2 to 20x2
LSTM-HP2	Low Profile Long Stroke Gripper with Length Measurement Function	12x2 to 20x2
HLF2	Long Stroke Thin Gripper	8x2 to 20x2
HLA/HLB	Low Profile Parallel Gripper	12 to 20
HLAG/ HLBG	Low Profile Parallel Gripper with Rubber Cover	12 to 20
HLC	Low Profile Long Stroke Parallel Gripper	8x2 to 30x2
HLD	Ultra Thin Parallel Gripper	8×4 to 20×4



Wide Parallel Grippers

Series	Also known as...	Bore Size (ø)
HMC-HP1	Wide Parallel Gripper	10x2 to 40x2
HMF	Compact Wide Parallel Gripper	12x2 to 40x2
HMF-G	Cutting Oil Resistant Specification Compact Wide Parallel Gripper	16x2 to 25x2
HMFB	Large Wide Parallel Gripper with Linear Guide	25x2 to 40x2
HFP	Wide Parallel Gripper	16×2 to 40×2

Fulcrum Grippers

Series	Also known as...	Bore Size (ø)
FH500	Feather Gripper (Mini Pivot Gripper)	10 to 20
HBL	Pivot Gripper	15 to 40
HJL	Toggle Gripper	32 to 63
HMD	180-degree Opening/Closing Thin Wide Angle Gripper	12 to 25
HDL	180-degree Opening/Closing Wide Angle Gripper	25 to 40
HJD	180-degree Opening/Closing High Gripping Force Wide Angle Gripper	32 to 63

Mechanical Grippers

Series	Also known as...	Cylinder Bore (ø)
BHA-FC	Mechanical Gripper	12 to 32

Chucks >>> Pneumatic Cylinders ⑤ Catalog No. RJ-006AA

Compact and powerful. Abundant types available

3-Jaw Chucks

Series	Also known as...	Bore Size (ø)
CKW-HP1	3-Jaw Chuck	16 to 50
CKWL-HP1	3-Jaw Long Stroke Chuck	16 to 40
CKL2	Powerful Chuck	16 to 100
CKLG2	Powerful Chuck with Rubber Cover	20 to 100
CKL2-HC	Drop Prevention Type Powerful Chuck	32 to 80
CKH2	High Gripping Force Powerful Chuck	50 to 100
CKLB2	2-Direction Powerful Chuck (Parallel Gripper)	20 to 100
CKG	3-Jaw Bearing Chuck	16 to 50
CK	3-Jaw Long Stroke Chuck	25 to 44
CKA	3-Direction Thin Chuck	16 to 100
CKS	Low Profile Chuck	8x3 to 32x3
CKS-F	Low Profile Chuck (Hollow Type)	16x3 to 50x3
CKF	Hollow Chuck	30 to 80
CKJ	Ultra Long Stroke Chuck	12×6 to 50×6

Mechanical Chucks

Series	Also known as...	Cylinder Bore (ø)
CKL2-FC	Mechanical Chuck	20 to 40

Robot Peripheral Components

>>> Pneumatic Cylinder ⑤ Catalog No. RJ-006AA

Auto Gripper Changers

Series	Also known as...
CHC	Auto Gripper Changer

Grippers for Collaborative Robots

>>> Pneumatic Cylinders ⑤ Catalog No. RJ-006AA

Compact and lightweight yet high gripping force due to air drive

Grippers for Collaborative Robots

Series	Also known as...	Bore Size (ø)
RLSH/RHLF/ RCKL-UR	UNIVERSAL ROBOTS Official Certified Gripper	RLSH: ø20 RHLF: ø16x2 RCKL: ø40
RLSH/RHLF/ RCKL-TM	OMRON ROBOT Official Certified Gripper	
RLSH/RHLF/ RCKL-TM	TECHMAN ROBOT Official Certified Gripper	
RLSH/RHLF/ RCKL-FN	FANUC Robot Gripper compatible with CRX Series	
RLSH/RHLF/ RCKL-YS	YASKAWA MOTOMAN Robot Gripper compatible with HC10DTP Series	
RLSH/RHLF/ RCKL-JK	JAKA Robot Gripper compatible with Zu Series	
RLSH/RHLF/ RCKL-KW	Kawasaki Robot duAro Series K-AddOn Registered Gripper	

CKD How to use CAD data

Free download!

This is what makes CKD's CAD great!

Comprehensive list of CKD's leading products

Japanese, English, Chinese (Simplified and Traditional), and Korean are supported.

Simultaneous with new product launch

NEW Model No. AX1R

ABSODEX

Supports various data formats

More than 25 types of 2D and more than 35 types of 3D

Supports PDF and JPEG formats!

*To use 3D CAD, you must register as a CKD plus member.

CKD plus How to register as a member

STEP 1

From the CKD Components Product top page, click "New member registration"

STEP 2.

Enter your name, company name, contact information, and email address

Easy registration in 2 STEPS

Registration complete!

How to download CAD

STEP 1

Click on "3D CAD" from the product detail page

STEP 2.

Select model No.

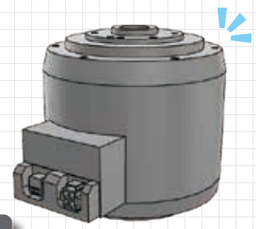
STEP 3

❶ Specify CAD format

❷ Generate CAD data

Download CAD

Download complete!

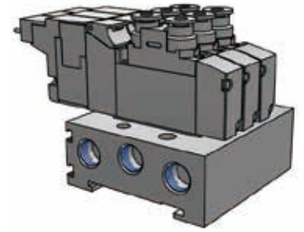


Pneumatic valve manifold specifications and CAD data are easily available on the Web.

Specifications are available

Manifold specifications for pneumatic valves can be prepared and shipped assembled to the customer.

Get CAD data

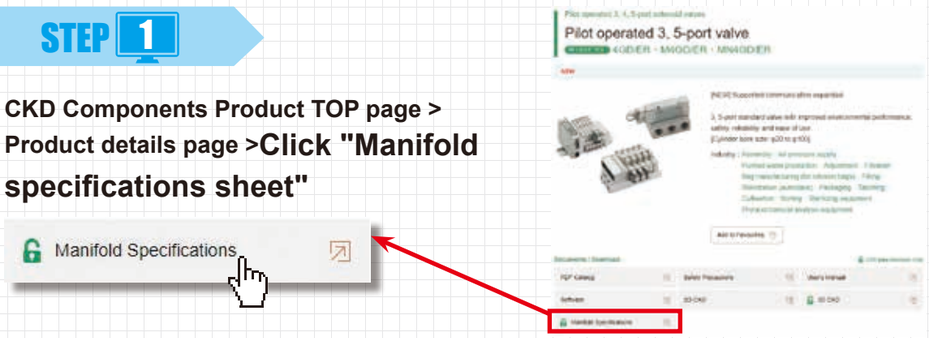


2D and 3D CAD data available for pneumatic valve manifold assemblies

Specifications and download method of CAD data

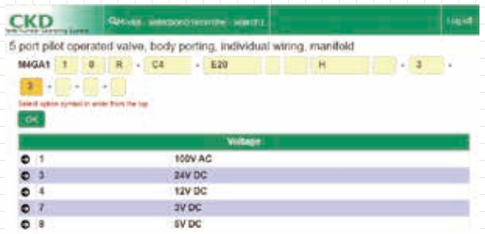
STEP 1

CKD Components Product TOP page > Product details page >Click "Manifold specifications sheet"



STEP 2.

Select model No.



STEP 3

Create specifications sheet

STEP 4

●For specifications output, Specification output Click

●If downloading CAD data 2D/3D CAD Click

Download complete!

Significantly reduces work time

For details, please contact our nearest sales office. © 2025. CKD Corporation All Rights Reserved.

Website Guide

Various information is provided on our website.
Please make use of it.

Catalogs	CAD	Instruction Manuals
Maintenance Parts	Software	Model Selection
FAQ	Technical Information	Standard Compliant Product Information
Columns	Event Information	Seminars

You can find the information you need here.

You can search for desired products.

You can find suitable products by application.

You can check the latest news.

Each product page provides various information.

Various information is published by product axis and application.

Model Selection System Guide

About Using the Model Selection System

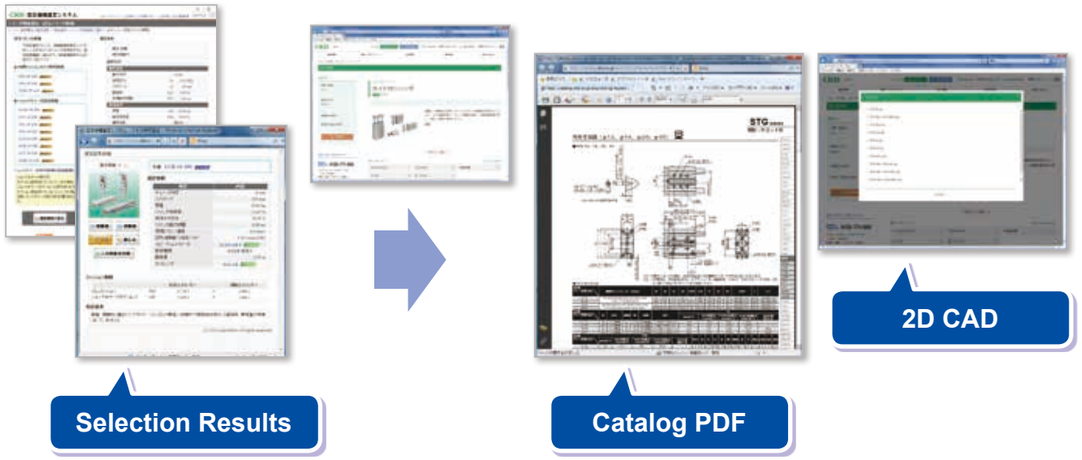
We provide a system that supports the selection of the following items. Please use it when selecting models and designing.

Published on our website

This system is for selecting products according to your application and operating conditions.

*Downloadable software may not be able to be downloaded due to your company's security policy. In that case, please contact us.

Link from selection results to catalog PDFs and CAD data!



No registration required, available anytime!

We offer various services for CKD products, including catalogs, PDFs, CAD data, and model selection. Please take a look.

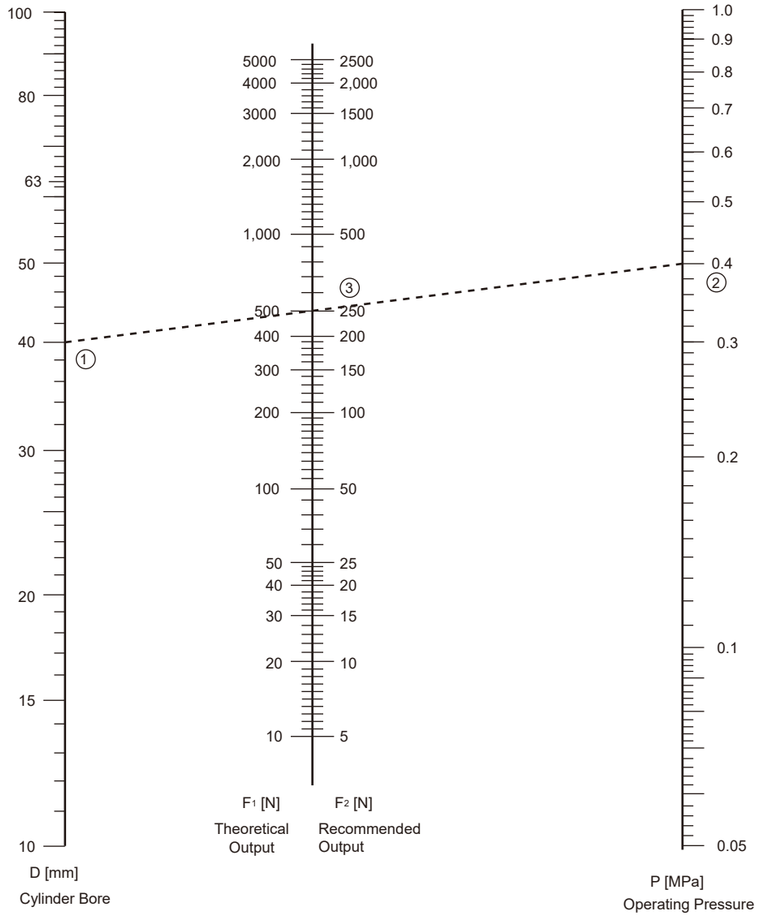
https://www.ckd.co.jp/en/

Technical Data

	Page
Cylinder Bore Selection Nomogram (1, 2)	Intro 23
Required Flow Rate during Cylinder Operation (3, 4)	Intro 25
Allowable Absorption Energy Value (5, 6)	Intro 27
Relationship values between dimensions by mounting type and maximum stroke (L) (7, 8)	Intro 29
How to Determine Cylinder Mounting Type (9)	Intro 31
Air Compressor, Air Tank Selection (10)	Intro 32
Dimensional Tolerances for Commonly Used Fits (11)	Intro 33

Cylinder Bore Selection Nomogram

● For bore 10 mm to 100 mm, rod push direction



This nomogram was created using the following formula.

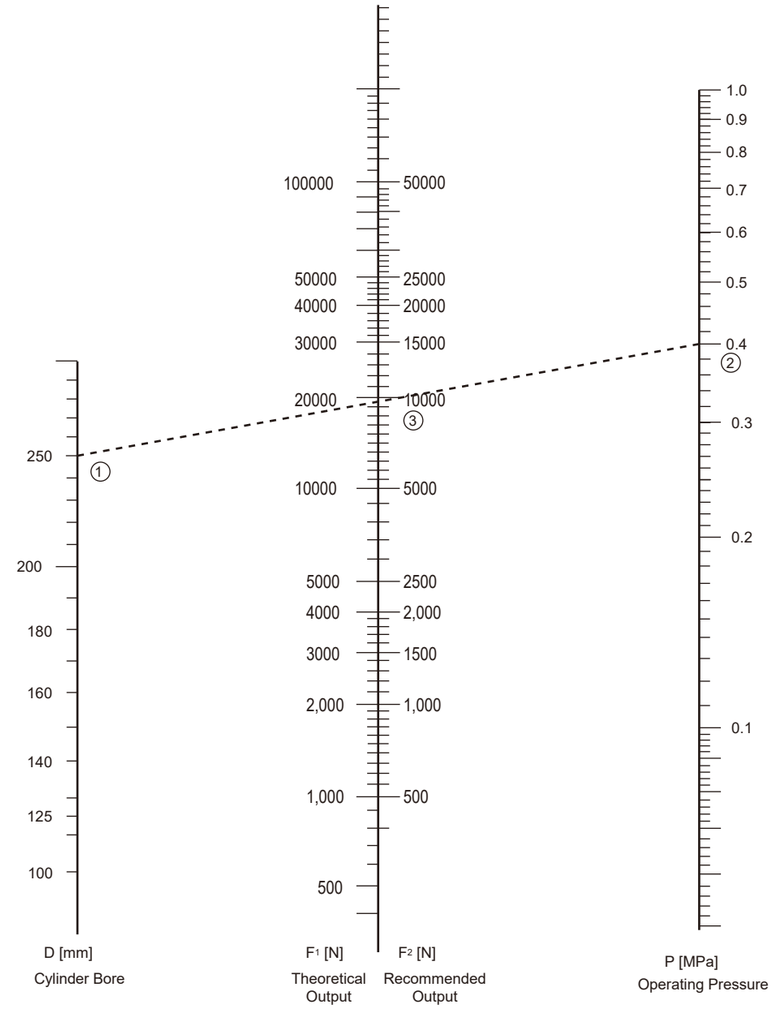
$$F1 = \frac{\pi}{4} \times D^2 \cdot P$$

However, F_1: Theoretical output [N]
F_2: Recommended output (at 50% efficiency) [N]
D: Cylinder bore [mm]
P: Operating Pressure [MPa]

(Example) What is the theoretical output when operating a ø40 bore cylinder at an air pressure of 0.4 MPa?
(Answer) Connect D and P to find the point on F, and obtain a theoretical output F ≈ 500 N.

Cylinder Bore Selection Nomogram

●For bore 100 mm to 250 mm, rod push direction



This nomogram was created using the following formula.

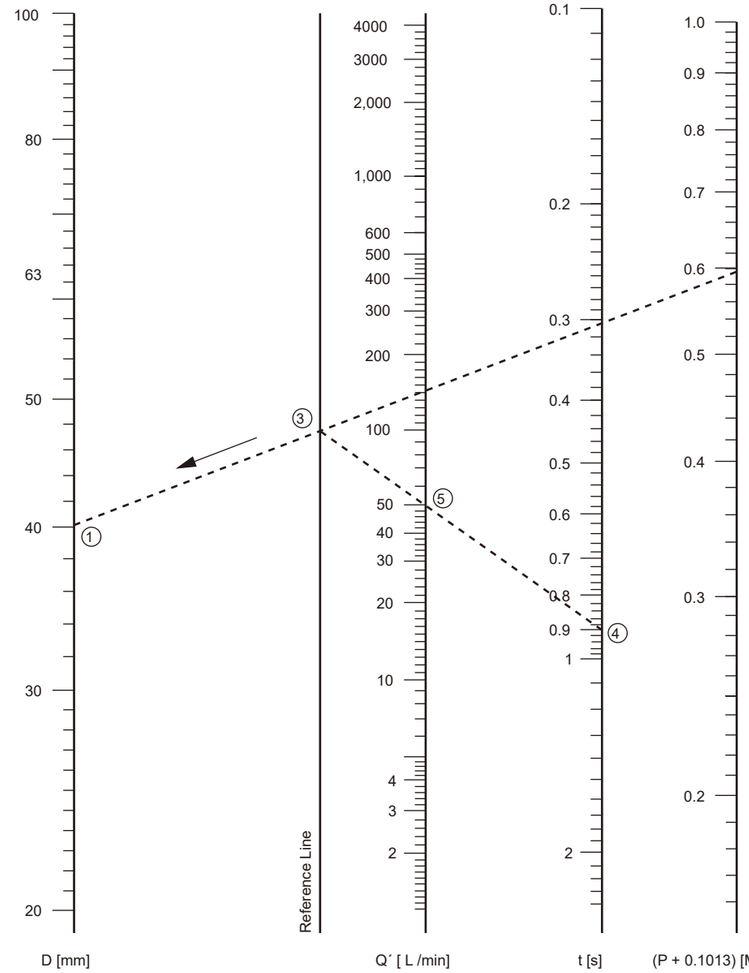
$$F1 = \frac{\pi}{4} \times D^2 \cdot P$$

However, F_1: Theoretical output [N]
F_2: Recommended output (at 50% efficiency) [N]
D: Cylinder bore [mm]
P: Operating Pressure [MPa]

(Example) What is the theoretical output when operating a ø250 bore cylinder at an air pressure of 0.4 MPa?
(Answer) Connect D and P to find the point on F, and obtain a theoretical output F ≈ 19000 N.

Required Flow Rate During Cylinder Operation (Bore Size Within 100 mm)

●Q: Required flow rate per 100 mm stroke L/min



1. Calculation Formula for Required Flow Rate during Cylinder Operation

The required flow rate is the instantaneous flow rate when the cylinder is operating. This is different from the cylinder's air consumption, so please do not confuse them.

$$Q = \frac{\pi}{4} \cdot D^2 \frac{L}{t} \cdot \frac{P+0.1013}{0.1013} \times 10^{-6} \times 60$$

Q: Flow rate [ℓ /min] (ANR)
D: Cylinder bore [mm]
L: Stroke [mm]
t: Stroke travel time [s]
P: Operating Pressure (MPa)

(Ex. 1, figure above) What is the required flow rate when operating a ø40 bore cylinder at an air pressure of 0.5 MPa with a stroke of 100 mm per 0.9 s?

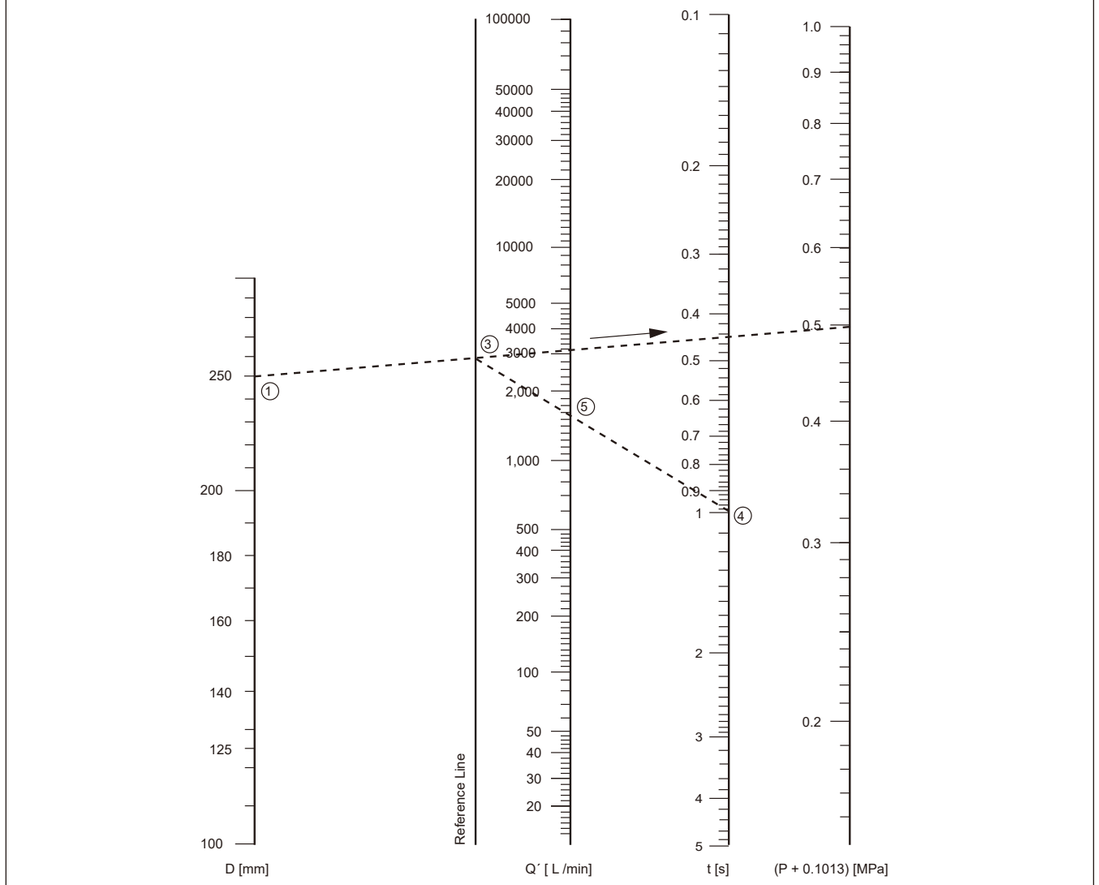
(Answer) Find the point on the relationship line from D and (P+0.1013), and obtain Q' = 50 (L/min) from the point on the relationship line and t.

(Ex. 2, figure right) What is the required air volume when operating a ø250 bore cylinder at an air pressure of 0.4 MPa with a stroke of 100 mm per 1 s?

(Answer) Find the point on the relationship line from D and (P+0.1013), and obtain Q' = 1450 (L/min) from the point on the relationship line and t.

Required Flow Rate During Cylinder Operation (Bore Size 100 to 250 mm)

●Q: Required flow rate per 100 mm stroke L/min



2. Cylinder Air Consumption Calculation Formula (per hour)

Air consumption per time is the air consumption caused by the cylinder operating within a certain period, which is the air volume consumed in the cylinder and in the piping between the cylinder and the switching valve. Regardless of the cylinder speed, it is different from the required air flow rate during operation.

$Q_T=(Q_1+Q_2+(2\times Q_3))\times n$ [For Double Acting cylinder]

Q_T : Air consumption per minute [L/min] (ANR)
n : Number of cylinder operations per minute [cycles/min]
Q_1 : Air consumption during push stroke [L] (ANR)
Q_2 : Air consumption during pull stroke [L] (ANR)
Q_3 : Piping volume from directional control valve to each port of the cylinder [L] (ANR)

$$Q1 = \frac{\pi}{4} \cdot D^2 \times L \times 10^{-6} \times \left(\frac{P+0.1013}{0.1013}\right)$$

$$Q2 = \frac{\pi}{4} \cdot (D^2 - d^2) \times L \times 10^{-6} \times \left(\frac{P+0.1013}{0.1013}\right)$$

$$Q_3 = \frac{\pi}{4} \cdot d_3^2 \times L_3 \times 10^{-6} \times \left(\frac{P}{0.1013}\right)$$

D: Cylinder bore [mm]
d: Piston Rod outer diameter [mm]
L: Cylinder Stroke [mm]
L_3 : Piping length from directional control valve to cylinder port [mm]
d_3 : Piping inner diameter from directional control valve to cylinder port [mm]
P: Working Pressure [MPa] (Gauge Pressure)
(Note: 1 L = 1 dm^3 .)

(Example) Cylinder bore 100 mm, Rod diameter 30 mm, Stroke 800 mm, Operating Pressure 0.5 MPa, 5 operations per minute
Piping tube inner diameter 7 mm, Piping tube length 2000 mm

$$Q_1 = \frac{\pi}{4} \times 100^2 \times 800 \times 10^{-6} \times \left(\frac{0.5+0.1013}{0.1013}\right) = 37.3$$

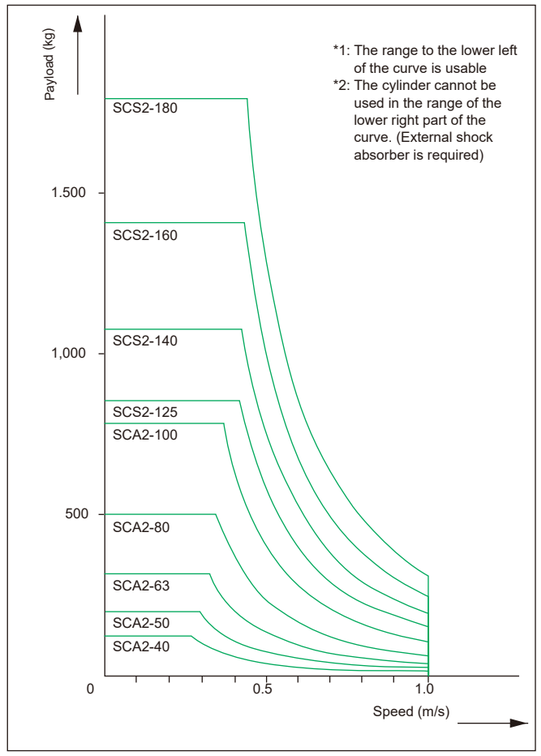
$$Q2 = \frac{\pi}{4} \times (100^2 - 30^2) \times 800 \times 10^{-6} \times \left(\frac{0.5+0.1013}{0.1013}\right) = 33.9$$

$$Q_3 = \frac{\pi}{4} \times 7^2 \times 2000 \times 10^{-6} \times \left(\frac{0.5}{0.1013}\right) = 0.4$$

Q_T = (37.3+33.9+(2×0.4))×5 = 360 [L/min] (ANR)

Allowable absorption energy value: With Cushion

Allowable Absorption Energy Value Graph with Cushion



●Cushion

The purpose of the cushion is to utilize the compressibility of air to absorb the kinetic energy held by the piston and prevent the piston from impacting the cover at the stroke end. Therefore, the cushion is not intended to operate the piston at low speed near the stroke end. The table below shows the kinetic energy that can be absorbed by the cushion. If the kinetic energy exceeds this value or if you want to avoid bouncing due to air compressibility, please consider a separate shock absorber.

$$\text{Kinetic energy (J)} = \frac{1}{2} \times \text{Payload (kg)} \times [\text{Speed (m/s)}]^2$$

Absorption Energy Value with Cushion

1.SCA2, JSC3

Bore Size (mm)	Effective Cushion Length (mm)	Allowable Absorption Energy (J)
ø40	14.6	4.29
ø50	16.6	8.37
ø63	16.6	15.8
ø80	20.6	27.9
ø100	23.6	49.8

2.SCG, SCM, JSG

Bore Size (mm)	Effective Cushion Length (mm)	Allowable Absorption Energy (J)	Remarks
ø20	8.1	0.8	SCM
ø25	8.1	1.2	only
ø32	8.6	2.5	
ø40	8.6	3.7	
ø50	13.4	8.0	
ø63	13.4	14.4	
ø80	15.4	25.4	
ø100	15.4	45.6	

3.SCS2, JSC4

Tube I.D. (mm)	Effective Cushion Length (mm)	Allowable Absorption Energy (J)
ø125	21.6	63.5
ø140	21.6	91.5
ø160	21.6	116
ø180	21.6	152
ø200	26.6	233
ø250	26.6	362

(Note)

About how to calculate kinetic energy

The average speed of the cylinder is calculated by $ua = \frac{L}{T}$.

ua : Average speed (m/s)
L : Cylinder stroke (m)
T : Operating Time (s)

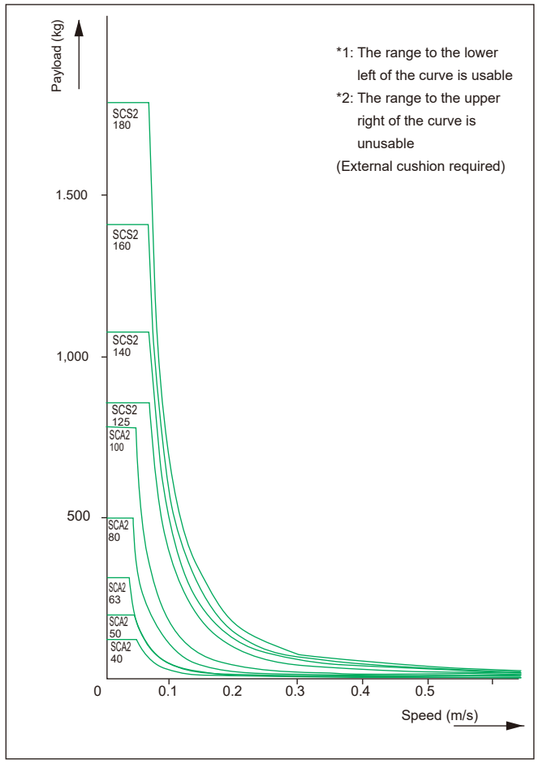
In contrast, the cylinder speed just before entering the cushion can be found with the following simple formula.

$um : = \frac{L}{T} \times (1+1.5 \times w)$

um : Speed just before entering the cushion (m/s)
w : Decimal value of cylinder load factor (0.3 for 30%, 0.5 for 50%)

When calculating kinetic energy or using a graph, use this value of um as the speed.

Allowable absorption energy value: Without Cushion



1. Allowable absorption energy without cushion
   The allowable absorption energy for each model is as shown in the table below.

Allowable absorption energy without cushion

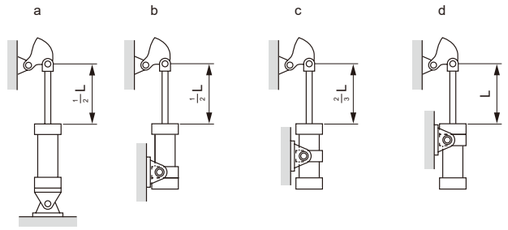
Unit: J

Code / Bore Size (mm)	SCM *1	SCA2	SCS2	CAV2/COV2
ø40	–	0.067	–	–
ø50	0.057	0.079	–	0.072
ø63	0.057	0.079	–	–
ø75	–	–	–	0.154
ø80	0.112	0.201	–	–
ø100	0.153	0.301	–	0.154
ø125	–	–	0.371	–
ø140	–	–	0.386	–
ø160	–	–	0.386	–
ø180	–	–	0.958	–
ø200	–	–	1.08	–
ø250	–	–	2.32	–

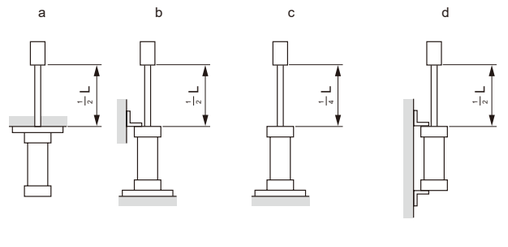
*1: This is the absorption energy without cushion for cushion codes "R" and "H".

Relationship between Dimensions by Mounting Type and Max Stroke (L)

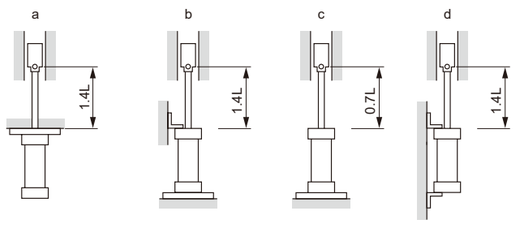
1 For double end pin joint



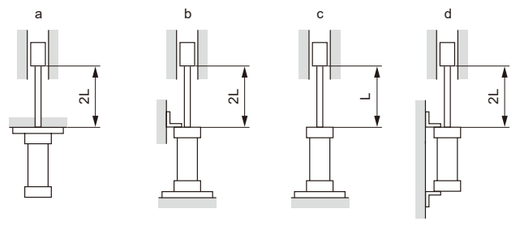
2 Rod End free



3 Rod End guided (pin joint)



4 Cylinder fixed, Rod End guided



Max Stroke

Pencil Shaped Cylinder SCP□3 Series			
D (mm) / F0 (N)	ø6	ø10	ø16
5	570		
10	405	720	
30	230	415	650
50		320	500
100			355

CMA2/CMK2/JSM2 Series			
D (mm) / F0 (N)	ø20	ø25, ø30, ø32	ø40
50	2020		
100	1440	2040	
200	1,000	1440	2,000
400		1,000	1500
600			1160
800			980

SCG/SCA2/JSG/JSC3					
D (mm) / F0 (N)	ø40	ø50	ø63	ø80	ø100
200	2600	4100			
400	1810	2900	2900		
600	1500	2400	2400	3600	
800	1280	2,000	2,000	3140	4500
1,000		1820	1820	2800	4000
1500			1480	2300	3300
2,000				1980	2840
2500				1760	2560
3000				1600	2300
3500					2140
4000					2,000
5000					1800

SCS2						
D (mm) / F0 (N)	ø125	ø140	ø160	ø180	ø200	ø250
1500	3700	3700				
2,000	3200	3200				
2500	2900	2900	4600			
3000	2600	2600	4100	5300		
3500	2400	2400	3800	5000	5900	
4000	2300	2300	3600	4600	5600	
5000	2,000	2,000	3200	4100	5000	7400
6000	1900	1900	2900	3800	4600	6800
7000	1700	1700	2700	3500	4200	6200
8000		1600	2500	3300	3900	5800
9000		1500	2400	3100	3700	5500
10000			2300	2900	3500	5200
15000				2400	2900	4200
20000					2500	3600
25000						3300
30000						3000

JSC4				
D (mm) / F0 (N)	ø125	ø140	ø160	ø180
1500	4600			
2,000	3900	3900		
2500	3500	3500	4600	
3000	3200	3200	4100	5300
3500	3000	3000	3800	5000
4000	2800	2800	3600	4600
5000	2500	2500	3200	4100
6000	2300	2300	2900	3800
7000	2100	2100	2700	3500
8000		2,000	2500	3300
9000		1880	2400	3100
10000			2300	2900
15000				2400

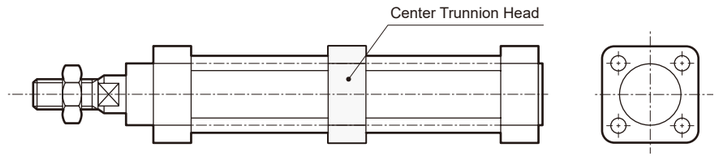
D: Cylinder bore [mm]
F0: Load [N]
L: Max Stroke [mm]

Request
The values in the table are calculated values. If the stroke exceeds the max stroke stated in the specifications section for each model, please consult us.

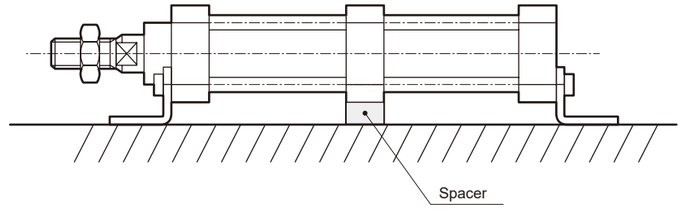
Precautions for Exceeding Max Stroke

⚠ Caution: If exceeding the Max stroke described on the "Specifications" page for each model, note the following points.

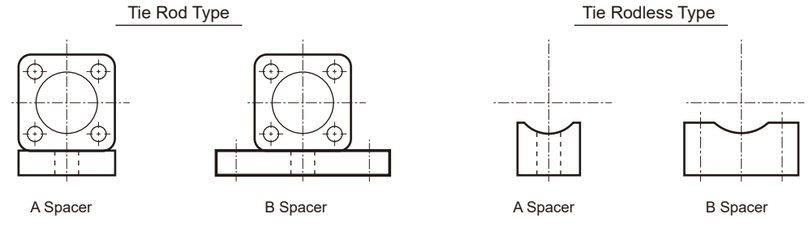
1. Min Operating Pressure
   Starting pressure increases due to deflection of the Piston Rod inside the cylinder.
2. Piston Rod Buckling
   Buckling risk increases unless the piston contacts the cylinder cover via the internal stopper. When stopping the piston with an external stopper, please refer to the technical data "Relationship between dimensions according to mounting type and maximum stroke (L) (Intro 29)".
3. Reinforcement of Tie Rods
   A center trunnion head is inserted to prevent the tie rod from deflecting and touching the cylinder tube.



4. Cylinder Tube Deflection Prevention
   When mounted horizontally, tube deflection prevention is necessary. Consider deflection prevention using the center trunnion head inserted for tie rod reinforcement.



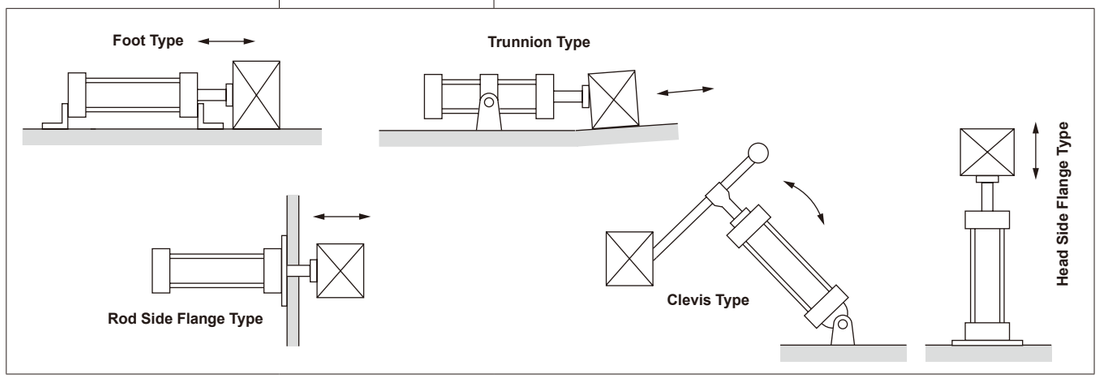
*The spacer in the diagram below is made to order.



How to Determine Cylinder Mounting Type

Since the piston of a cylinder moves in only one direction, select the cylinder mounting type according to the direction of load movement as shown below.

Direction of Load Movement	Mounting type	Precautions
During operation, the load moves linearly.	Foot Type Flange Type	Fix the Cylinder Body so that the direction of load movement and the direction of piston movement are parallel.
	Trunnion Type Clevis Type	Adopt the mounting type on the left if the stroke is long or if the direction of load movement and the direction of piston movement are not parallel and in the same direction. However, be careful not to apply lateral load to the Piston Rod or bushing.
During operation, the load swings within one plane.	Trunnion Type Clevis Type	Align the swinging direction of the clevis or trunnion supporting the cylinder with the swinging direction of the load. Also, align the swinging direction of the Rod End fitting. When a lateral load acts on the bushing, the value of the lateral load should be within 1/20 of the cylinder output.
During operation, the load swings in all directions.	Trunnion Type Clevis Type	Use a knuckle for the connecting fitting between the rod and the load. When a lateral load acts on the bushing, the value of the lateral load should be within 1/20 of the cylinder output.



Bellows Max Operating Temperature

Code	Bellows Material	Max Ambient Temperature	Instantaneous Max Temperature
J	Nylon Tarpaulin	60°C	100°C
	Polyolefin Elastomer	100°C	200°C
K	Neoprene Sheet	100°C	200°C
L	Silicone Rubber Glass Cloth	250°C	400°C

Instantaneous max temperature is the temperature when sparks, chips, etc. instantaneously hit the bellows.

Selection of Air Compressor and Air Tank

Air Compressor, Air Tank Selection

For compressors and tanks, it is necessary to select a model that accounts for 10 to 20% leakage loss in piping and switching valves in addition to the actual air consumption. Generally, the piston displacement described in compressor manufacturer catalogs is a theoretical value, so about 70% based on volumetric efficiency is the effective value. Therefore, select a compressor model with a piston displacement twice the air consumption.

Selection of Air Compressor for Intermittent Use (Operation)

For intermittent use, installing an air tank allows a small air compressor to perform a large amount of work. In other words, it is sufficient to install an air tank with a capacity that does not drop below the maximum cylinder operating pressure even if a pressure drop occurs due to high air consumption while cylinders, etc. are operating, and a compressor that can replenish compressed air by the time the cylinder performs its next operation.

Air Tank Capacity

$$Vt = \frac{Vs}{(Pt-Ps)\times 10.2}$$

Vt : Tank capacity (ℓ)
Vs : Air consumption per cycle (ℓ) (ANR)
Pt : Tank pressure (MPa)
Ps : Maximum cylinder Operating Pressure

Inspection of Type 2 pressure vessels

Based on the Ministry of Labour Ordinance, cylinders falling under the following must undergo inspection by the Japan Boiler Association.

① Cylinders with a rated pressure exceeding 0.2 MPa and an internal volume exceeding 0.04 m^3

② Cylinders with a rated pressure exceeding 0.2 MPa, a cylinder tube inner diameter of 200 mm or more, and a body length (cylinder tube length) of 1000 mm or more

$$V=\frac{D^2 \times S \times 3.14}{4\times 10^9}$$

V: Cylinder internal volume (m^3)
D: Tube inner diameter (mm)
S: Body Length (Cylinder Tube Length) (mm)

Japan Boiler Association Website Address
http://www.jbanet.or.jp/

[Technical Reference Data] Dimensional Tolerances for Commonly Used Fits, Excerpted from JIS B 0401:1998

MEMO

Tolerance used for shafts

Classification of Basic Dimensions (mm)		Shaft Tolerance Class Unit: μm								
Over	Up to and including	d9	e8	e11	f7	f8	h6	h7	h8	h9	p6
-	3	-20 -45	-14 -28	-14 -74	-6 -16	-6 -20	0 -6	0 -10	0 -14	0 -25	+12 +6
3	6	-30 -60	-20 -38	-20 -95	-10 -22	-10 -28	0 -8	0 -12	0 -18	0 -30	+20 +12
6	10	-40 -76	-25 -47	-25 -115	-13 -28	-13 -35	0 -9	0 -15	0 -22	0 -36	+24 +15
10	14	-50 -93	-32 -59	-32 -142	-16 -34	-16 -43	0 -11	0 -18	0 -27	0 -43	+29 +18
14	18										
18	24	-65 -117	-40 -73	-40 -170	-20 -41	-20 -53	0 -13	0 -21	0 -33	0 -52	+35 +22
24	30										
30	40	-80 -142	-50 -89	-50 -210	-25 -50	-25 -64	0 -16	0 -25	0 -39	0 -62	+42 +26
40	50										
50	65	-100 -174	-60 -106	-60 -250	-30 -60	-30 -76	0 -19	0 -30	0 -46	0 -74	+51 +32
65	80										
80	100	-120 -207	-72 -126	-72 -292	-36 -71	-36 -90	0 -22	0 -35	0 -54	0 -87	+59 +37

Tolerance used for holes

Classification of Basic Dimensions (mm)		Shaft Tolerance Class Unit: μm					
Over	Up to and including	F7	H6	H7	H8	H9	H10
-	3	+16 +6	+6 0	+10 0	+14 0	+25 0	+40 0
3	6	+22 +10	+8 0	+12 0	+18 0	+30 0	+48 0
6	10	+28 +13	+9 0	+15 0	+22 0	+36 0	+58 0
10	14	+34 +16	+11 0	+18 0	+27 0	+43 0	+70 0
14	18						
18	24	+41 +20	+13 0	+21 0	+33 0	+52 0	+84 0
24	30						
30	40	+50 +25	+16 0	+25 0	+39 0	+62 0	+100 0
40	50						
50	65	+60 +30	+19 0	+30 0	+46 0	+74 0	+120 0
65	80						
80	100	+71 +36	+22 0	+35 0	+54 0	+87 0	+140 0

Regarding Notation Method for Flow Characteristics

1. Display of Flow Characteristics

The flow rate display in the specifications section of the catalog is shown as follows.

Target Components	Display	Unit	Standard
Pneumatic Components	Display compliant with New JIS	C, b	ISO 6358:1989 "Pneumatics - Components for compressible fluids - Methods for testing flow-rate characteristics" JIS B 8390:2000 (ISO 6358 translation)
	Conventional Display	S	JIS B 8373:1993 'Pneumatic 2-port solenoid valves' JIS B 8374:1993 "Pneumatic 3-port solenoid valves" JIS B 8375:1993 "Pneumatic 4, 5-port solenoid valves" JIS B 8379:1995 "Pneumatic silencers"
		Cv	ANSI(NFPA)T3. 21. 3:1990

2. Explanation

The flow rate characteristics of solenoid valves were conventionally displayed using effective area S, but JIS was revised (JIS B 8390: 2000), and they are now displayed by a pair of sonic conductance C and critical pressure ratio b.

- Sonic Conductance C: Value obtained by dividing the weight flow rate passing through equipment in a choked flow state by the product of the upper limit absolute pressure and the density in the standard state. (sonic conductance) S ≈ 5.0 C (Conventional sizing is possible using C.)
- Critical Pressure Ratio b: Pressure ratio at which choked flow occurs if smaller than this value (downstream pressure / upstream pressure) (critical pressure ratio)
- Effective cross-sectional area S (mm^2): The cross-sectional area value of an ideal orifice without friction or contraction, derived by calculation from the pressure change within an air tank when air is released in a choked flow state from equipment included with the air tank.

*Choked flow: Flow where the upstream pressure is higher than the downstream pressure and the velocity reaches the speed of sound in some parts of the component. The weight flow rate of gas is proportional to the upstream pressure and does not depend on the downstream pressure. (Choked flow)

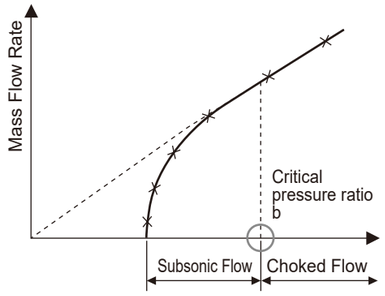


Fig. 1 Weight flow rate characteristics versus upstream pressure

Flow rate calculation formula

It is expressed as follows by practical units.

$\frac{P_2+0.1}{P_1+0.1}$ When ≤ b, Choked Flow

$$Q=600\times C\,(P_1+0.1)\sqrt{\frac{293}{273+t}} \quad \text{.....(1)}$$

$\frac{P_2+0.1}{P_1+0.1}$ When > b, Subsonic Flow

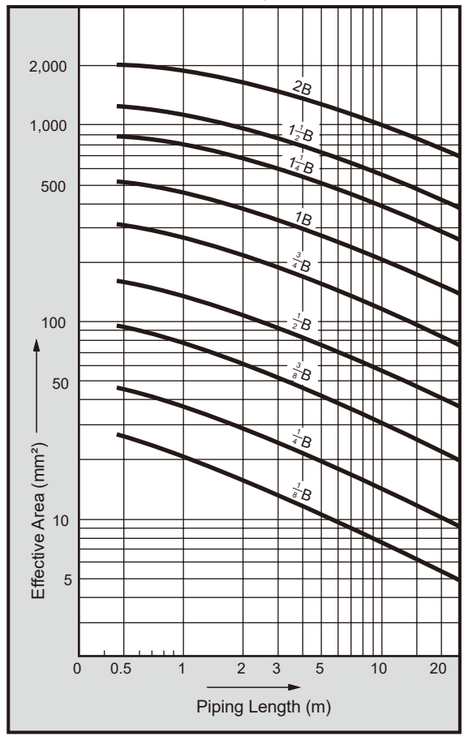
$$Q=600\times C\,(P_1+0.1)\sqrt{1-\left[\frac{\frac{P_2+0.1}{P_1+0.1}-b}{1-b}\right]^2}\sqrt{\frac{293}{273+t}} \quad \text{.....(2)}$$

Q : Air Flow Rate [dm^3/min(ANR)]: The SI unit dm^3 (cubic decimeter) may also be expressed as L (liter). $1dm^3 = 1$ L
C : Sonic conductance [$dm^3/(s\cdot bar)$]
b : Critical pressure ratio [−]
P_1 : Upstream pressure [MPa]
P_2 : Downstream pressure [MPa]
t : Temperature [°C]

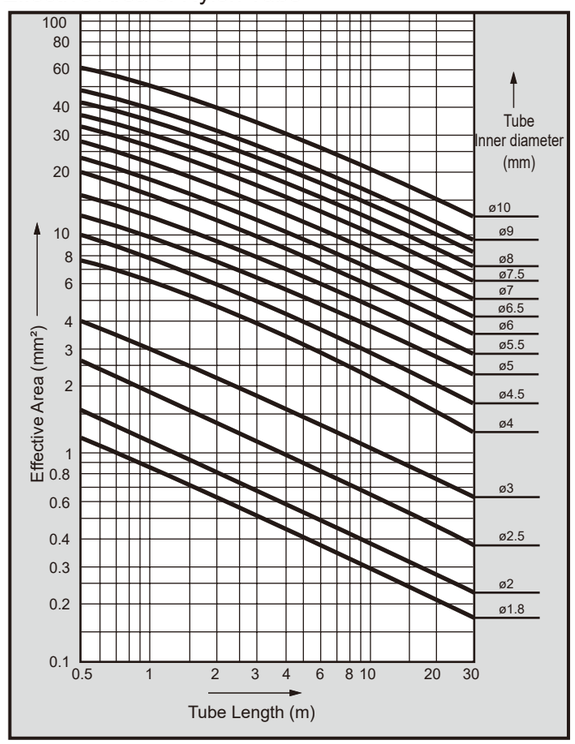
When calculating with effective cross-sectional area S, calculate C = S / 5 and substitute the value C into the above formula. For subsonic flow, substitute b = 0.5 into equation (2).

Effective Area of Steel Pipe/Nylon Tube and Recommended Maximum Flow Rate Table for Gas Pipe

Effective Area of Steel Pipe



Effective Area of Nylon Tube



Recommended Maximum Flow Rate Table for Gas Pipe

Nominal Size	1/8B	1/4B	3/8B	1/2B	3/4B	1B	1 1/4B	1 1/2B
Pressure Drop MPa(*1)	0.124	0.0707	0.0576	0.0425	0.0276	0.0209	0.0133	0.0105
Inlet Pressure MPa	Recommended Maximum Flow Rate (L/min)							
0.05	127	244	518	838	1,465	2,460	3,870	5,150
0.1	146	282	598	965	1,690	2,828	4,460	5,950
0.15	163	314	668	1,076	1,885	3,150	4,960	6,630
0.2	179	344	730	1,180	2,060	3,450	5,430	7,280
0.3	206	395	840	1,360	2,375	3,900	6,300	8,400
0.4	230	442	940	1,520	2,660	4,450	7,000	9,360
0.5	252	485	1,030	1,660	2,920	4,875	7,700	10,250
0.6	272	523	1,110	1,800	3,140	5,250	8,300	11,050
0.7	292	558	1,185	1,920	3,350	5,620	8,870	11,800
0.8	308	592	1,260	2,035	3,560	5,970	9,430	12,570
0.9	324	623	1,325	2,140	3,745	6,290	9,900	13,220
1.0	340	654	1,395	2,250	3,930	6,600	10,400	13,880
1.2	370	717	1,510	2,450	4,280	7,150	11,250	15,040
1.4	398	763	1,625	2,624	4,590	7,700	12,100	16,200
1.5	410	790	1,680	2,710	4,740	7,930	12,550	16,780

(*1: Inlet Pressure = 0.5 MPa
Gas Pipe Length: 10 m)

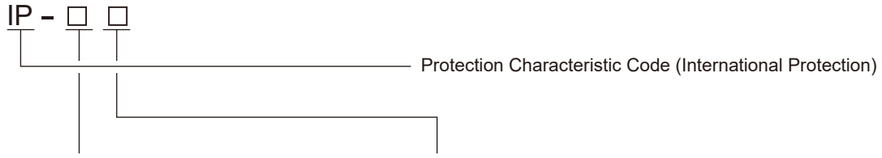
(Remarks)
For main lines where the piping distance is long, it is necessary to consider the degree of pressure drop that occurs at the end of the main line when air flows. Recommended maximum flow rate means the maximum flow rate that can be recommended within a range where the pressure drop relative to the piping length is acceptable, judged from practical use. Therefore, it does not mean that no more flow can pass, but that flowing more will result in a larger pressure drop.

About Protection Structure

● Protection Structure

■ IEC (International Electrotechnical Commission: International Electrotechnical Commission) Standard (IEC60529)

■ JIS C 0920 : 2003



First Characteristic Numeral (Protection class against ingress of foreign solid objects)

First Characteristic Numeral	Degree of Protection	
0	No protection	
1	ø50 mm	Solid objects with a diameter of 50 mm or more do not ingress.
2	ø12.5 mm	Solid objects with a diameter of 12.5 mm or more do not ingress.
3	2.5 mm	Solid objects with a diameter of 2.5 mm or more do not ingress.
4	1 mm	Solid objects with a diameter of 1.0 mm or more do not ingress.
5	Dust-protected type	Dust does not ingress in a quantity sufficient to interfere with the normal operation and safety of the equipment.
6	Dust-tight type	Dust does not enter the interior.

Second Characteristic Numeral (Degree of protection against ingress of water)

Second Characteristic Numeral	Degree of Protection	
0	No protection	
1	Protection against vertically falling water drops	No harmful effects from vertically falling water drops.
2	Protection against vertically dripping water when tilted up to 15 degrees	No harmful effects from water drops falling at an inclination of up to 15 degrees from vertical on either side.
3	Protection against spraying water	No harmful effects from water sprayed at an angle of up to 60 degrees from vertical on either side.
4	Protection against splashing water	No harmful effects from splashing water from any direction.
5	Protection against water jets	No harmful effects from water jets from a nozzle from any direction.
6	Protection against powerful water jets	No harmful effects from strong direct jets of water from any direction.
7	Protection against immersion in water	Water does not ingress when immersed in water under defined conditions.
8	Protection from continuous immersion in water	Can be used when continuously immersed in water.

MEMO

Safety Precautions

Be sure to read this section before use.

When designing and manufacturing equipment using CKD products, the manufacturer is obligated to ensure that the safety of the mechanism, pneumatic control circuit and/or water control circuit and the system that runs the electrical controls are secured. It is important to select, use, handle and maintain CKD products appropriately to ensure their safe usage. Observe warnings and precautions to ensure device safety. Check that device safety is ensured, and manufacture a safe device.

WARNING

1 This product is designed and manufactured as a general industrial machine part.
It must be handled by an operator having sufficient knowledge and experience.

2 Use this product in accordance with specifications.

This product must be used within its stated specifications. In addition, never modify or additionally machine this product.
This product is intended for use in general industrial machinery equipment or parts. It is not intended for use outdoors (except for products with outdoor specifications) or for use under the following conditions or environments.
(Note that this product can be used when CKD is consulted prior to its usage and the customer consents to CKD product specifications. The customer should provide safety measures to avoid danger in the event of problems.)

❶ Use for applications requiring safety, including nuclear energy, railways, aircraft, marine vessels, vehicles, medical devices, devices or applications in contact with beverages or foodstuffs, amusement devices, emergency cutoff circuits, press machines, brake circuits, or safety devices or applications.
❷ Use for applications where life or assets could be significantly affected, and special safety measures are required.

3 Observe organization standards and regulations, etc., related to the safety of the device design and control, etc.

ISO4414,JIS B 8370(Pneumatic fluid power - General rules and safety requirements for systems and their components)
JFPS2008(Principles for pneumatic cylinder selection and use)
Including the High Pressure Gas Safety Act, Industrial Safety and Health Act, other safety rules, organization standards and regulations, etc.

4 Do not handle, pipe, or remove devices before confirming safety.

❶ Inspect and service the machine and devices after confirming safety of the entire system related to this product.
❷ Note that there may be hot or charged sections even after operation is stopped.
❸ When inspecting or servicing the device, turn OFF the energy source (air supply or water supply), and turn OFF power to the facility. Discharge any compressed air from the system, and pay enough attention to possible water leakage and leakage of electricity.
❹ When starting or restarting a machine or device that incorporates pneumatic components, make sure to secure system safety, such as pop-out prevention measures.

5 Observe the warnings and cautions on the following pages to prevent accidents.

■ Precautions are ranked as “DANGER”, “WARNING”, and “CAUTION” in this section.

DANGER:	In the case where the product operation is mishandled and/or when the urgency of a dangerous situation is high, it may lead to fatalities or serious injuries.
WARNING:	A dangerous situation may occur if handling is mistaken, leading to fatal or serious injuries.
CAUTION:	A dangerous situation may occur if handling is mistaken, leading to minor injuries or property damage.

Note that some items indicated with “CAUTION” may lead to serious results depending on the conditions.
All items contain important information and must be observed.

Warranty

1 Warranty period

The product specified herein is warranted for one (1) year from the date of delivery to the location specified by the customer.

2 Warranty coverage

If the product specified herein fails for reasons attributable to CKD within the warranty period specified above, CKD will promptly provide a replacement for the faulty product or a part thereof or repair the faulty product at one of CKD’s facilities free of charge. However, following failures are excluded from this warranty:

1) Failure caused by handling or use of the product under conditions and in environments not conforming to those stated in the catalog, the Specifications, or the Instruction Manual.
2) Failure caused by use of the product exceeding its durability (cycles, distance, time, etc.) or caused by consumable parts.
3) Failure not caused by the product.
4) Failure caused by use not intended for the product.
5) Failure caused by modifications/alterations or repairs not carried out by CKD.
6) Failure caused by reasons unforeseen at the level of technology available at the time of delivery.
7) Failure caused by acts of nature and disasters beyond control of CKD.

The warranty stated herein covers only the delivered product itself. Any loss or damage induced by failure of the delivered product is excluded from this warranty.
Note: For details on the durability and consumable parts, contact your nearest CKD sales office.

3 Compatibility check

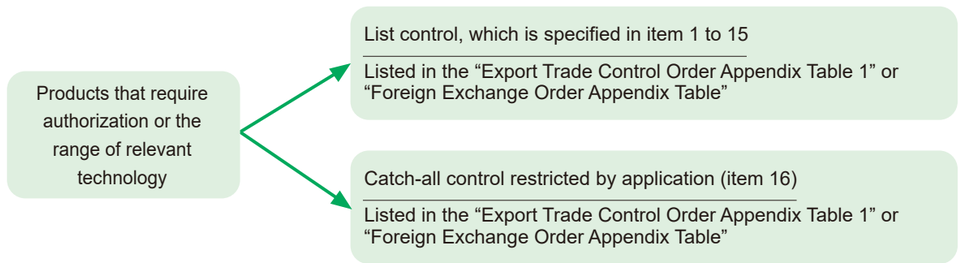
The customer is responsible for confirming the compatibility of CKD products with the customer’s systems, machines and equipment.

Precautions for export

1 Security Trade Control

The products in this catalog and their related technologies may require approval before export or provision. For the sake of maintaining world peace and safety, there may be cases in which approval under the Foreign Exchange and Foreign Trade Control Law is required in advance, depending on the country to where the product or related technology is being exported or provided. The scope of products and related technologies requiring approval are listed in the Export Trade Control Order Appendix Table 1 or Foreign Exchange Order Appendix Table. The Export Trade Control Order Appendix Table 1 and Foreign Exchange Order Appendix Table contain the following two types of information.

· “List controls” specified for items 1 to 15
· “Catch-all controls” that do not indicate specifications by item, but restriction by application (Section 16)



An application for approval is received by the Security Export Licensing Division of the Ministry of Economy, Trade and Industry or local bureaus of the Ministry of Economy, Trade and Industry.

2 Products and related technologies in this catalog

The products and related technologies in this catalog are subject to the catch-all control of the Foreign Exchange and Foreign Trade Control Law. When exporting or providing the products or related technologies in this catalog, ensure that they are not used for arms or weapons.

3 Contact

Contact your local CKD Sales Office for information on the Security Trade Control of products and related technologies in this catalog.

*For cylinder switches, please check P. 1512.

Design / Selection

1. Confirmation of Specifications

Warning

■Use within the product's specified operating range.
The products described in this catalog are designed to be used only in compressed air systems. Do not use outside the specified pressure or temperature range as it may cause damage or malfunction. (See specifications). If using fluids other than compressed air and low hydraulic pressure, please consult us.

■If product dimensional accuracy is required, please consult us separately.
The dimensional tolerance of pneumatic cylinders is set based on JIS B8368. If accuracy is required, please inquire in advance.

2. Design for Safety

Warning

■If the force changes due to twisting of the sliding parts of the machine, there is a danger that the cylinder's Piston rod may extend suddenly.
In such cases, there is a risk of injury to the human body, such as getting hands or feet caught, and damage to the machine, so make adjustments so that the machine moves smoothly and design it so that it does not cause injury to the human body.

■If there is a risk of danger to the human body, install a protective cover.
If the drive part of the cylinder poses a risk of danger to personnel, install a protective cover. Design the structure so that personnel cannot enter the cylinder's operating range or directly touch that area.

■Consider the possibility of circuit pressure drop due to power outages, etc.
When using a cylinder for a clamping mechanism, if the circuit pressure drops due to a power outage, etc., the clamping force will decrease and there is a risk that the workpiece may come off. Therefore, incorporate a safety device to prevent injury or damage to personnel or machinery. Lifting devices and lifts also require consideration for fall prevention.

■Consider the possibility of power source failure.
For equipment controlled by power sources such as pneumatic, hydraulic, or electric, take measures to prevent injury or damage to personnel or equipment even if these power sources fail.

■Design a circuit to prevent sudden projection.
When driving a cylinder with an exhaust center type directional control valve, or when starting after exhausting the residual pressure of the circuit, if pressure is applied to one side of the piston from a state where the air in the cylinder is exhausted, the driven object pops out at high speed. In such cases, there is a risk of causing injury to the human body such as pinching hands or feet, or causing damage to the machine, so please design a pop-out prevention circuit.

■Consider the operating state during an emergency stop.
Design so that injury to the human body and damage to equipment/devices due to cylinder operation do not occur when the safety device operates and the machine stops during system abnormalities such as emergency stop or power failure.

■Consider the operating state when restarting after an emergency stop or abnormal stop.
Design the system so that restarting does not cause harm to personnel or damage to equipment. Also, if it is necessary to reset the cylinder to the starting position, design a safe control device.

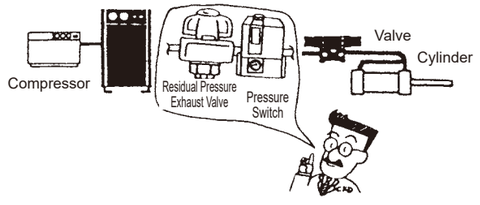
■Take necessary measures in advance to prevent adverse effects on people or things if this product malfunctions.

CAUTION

■Use within a range where the piston does not collide and break at the stroke end.
When a piston with inertial force collides with the cover at the stroke end and stops, use within the allowable absorption energy range.

■Install a speed controller on the cylinder.
Use within the operating piston speed range of each cylinder.

■Install a "pressure switch" and "residual pressure exhaust valve" on the compressed air supply side of the equipment.
● The pressure switch prevents operation if the set pressure is not reached. The residual pressure exhaust valve discharges the compressed air remaining in the pneumatic circuit and prevents accidents due to the operation of pneumatic equipment due to residual pressure.



■The load factor for fall prevention cylinders should be 50% or less.

3. Application Specific Design

Warning

■When a deceleration circuit or shock absorber is necessary.
If the speed of the driven object is high or its mass is large, it will be difficult to absorb the impact with only the cylinder's cushion. Therefore, provide a circuit to decelerate before entering the cushion, or use an external shock absorber to mitigate the impact. In this case, sufficiently consider the rigidity of the machinery.

■When inertia, vibration, etc. occur
When mounting the cylinder on a moving object (X-axis module, pallet, etc.), design considering the inertia, vibration, etc. generated when the moving object stops.

■About Intermediate Stop
When performing an intermediate stop of the cylinder piston with a 3-position closed center type directional control valve, accurate and precise positioning like low hydraulic pressure is difficult due to the compressibility of air. Also, since valves and cylinders do not guarantee zero air leakage, it may not be possible to hold the stop position for a long time. If long-term stop position holding is required, please consult us.

4. Operating Environment

Warning

■Install the product avoiding rain, water, direct sunlight, and high humidity.

■Do not use the product in an atmosphere where there is a risk of corrosion.
Use in such environments can cause damage and malfunction. Also, even for plated materials used for Piston Rods, tie rods, etc. in cylinders, plating is not applied to machined parts (thread width, cut surface). Rust can occur even in a general environment, so take necessary measures.

■In dusty places or places exposed to water droplets, oil droplets, cutting oil, or coolant, install a cover, etc.
If there is a lot of dust, please use the type with a powerful scraper. If liquid splashes, please use the coolant resistant type.

■If the Ambient Temperature is 5°C or less, moisture in the circuit may freeze, causing malfunctions such as operational defects. Therefore, remove moisture and prevent freezing.

CAUTION

■When using a cylinder with a valve with AC voltage, humming noise may occur depending on the operating conditions. If humming noise is a problem depending on the operating environment, select DC voltage.

■Some models use oil-impregnated bearings, and oil may be discharged to the outside of the cylinder. Be careful when using in locations where oil discharge is undesirable.

5. Durability

Warning

■Durability varies depending on usage conditions and model characteristics.

CAUTION

■Bellows are consumable parts.
Replace as necessary.

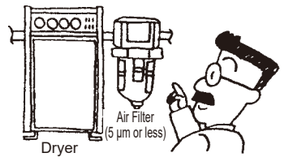
6. Pneumatic Source

Warning

■Use clean, dry compressed air.
Do not use compressed air containing chemicals, synthetic oil containing organic solvents, salt, corrosive gas, etc. as it may cause damage or malfunction.

CAUTION

■Use dry compressed air that does not generate drain in the piping.



● Drain occurs if there is a temperature drop inside pneumatic piping or pneumatic equipment.
● If the piping volume is larger than the cylinder volume (atmospheric pressure equivalent volume), condensed water droplets will accumulate as drain without the compressed air in the cylinder being completely discharged at each switching of the solenoid valve.
● Drain enters the air passages inside pneumatic equipment, momentarily blocking the passages and causing malfunction.
●Rust generated by drain will cause pneumatic equipment failure.
●Drain washes away lubricating oil, causing poor lubrication.

■Use of ultra-dry air is unsuitable for standard pneumatic equipment. Use equipment compatible with ultra-dry air.
● Ultra-dry compressed air shortens the life of pneumatic components.
● Use a solenoid valve for DC voltage drive.

■Use compressed air free from oxidized oil, tar, carbon, etc., from the air compressor.
● Oxidized oil, tar, carbon, etc., entering and adhering inside pneumatic equipment increases the resistance of sliding parts, causing malfunction.
● Lubricating oil mixed with oxidized oil, tar, carbon, etc., will wear down the sliding parts of pneumatic equipment.

■Use compressed air that does not contain solid foreign matter.
● Solid contaminants in the compressed air can enter pneumatic equipment, causing wear on sliding parts or sticking phenomena; 5 µm or less.
● Perform regular maintenance inspections of the compressor.

7. Usage Method

CAUTION

■It is initially lubricated, so it can be used without lubrication. If lubricating, use Turbine Oil Class 1 (additive-free) ISO-VG32. Also, if lubrication is stopped midway, malfunction will occur due to the loss of the initial lubricant, so be sure to continue lubrication. It is necessary to decide whether to adopt a non-lubricated or lubricated specification for pneumatic equipment and ensure that the chosen method is reliably managed.

■Provide intermediate support for long-stroke cylinders.
For long stroke cylinders, provide intermediate support to prevent rod sag, tube deflection, and rod damage due to vibration or external load.

■Use within the Max stroke of the mounting style.
Refer to Intro 30.

■Cylinders with air cushion experience a speed change at the beginning of movement.

For cylinders with air cushion, speed changes occur when the cushion ring comes off the cushion packing at the beginning of movement. Depending on conditions such as speed controller placement and adjustment, piping diameter, air pressure, and cushion needle opening, the change may become large. If it is necessary to prevent this, please consult us.

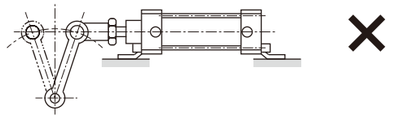
■Avoid using multiple cylinders in synchronization as much as possible.

Synchronization cannot be achieved, causing twisting of the Piston Rod and leading to malfunction. If synchronous operation is necessary, be sure to provide a separate guide device with rigidity.

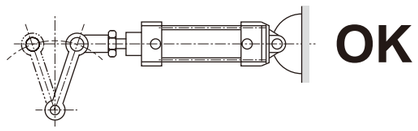
■When installing clevises and trunnions, confirm that they can rotate freely without interference during the full stroke operation of the cylinder before use.

■If the direction of load movement changes with operation, use a swinging type cylinder (clevis type, trunnion type) where the cylinder itself can rotate by a certain angle. Also, install the connecting fitting at the Rod End so that it moves in the same direction as the Cylinder Body's movement.

■Do not connect a fixed type cylinder to an arm that performs circular motion. In this case, connect it to an oscillating type cylinder.



×

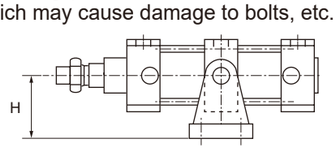


OK

■To prevent breakage of the Piston Rod End screw, wear of the bushing, seizure, etc., connect the Piston Rod End and the load with a free joint or simple flow controller, etc., so that there is no twisting at any position of the stroke.

■If the clearance between the clevis or trunnion and the mating bearing is large, a bending action will occur on the pin or shaft. Therefore, do not make this gap too large. (Recommended fit H10/e8)

■In the figure below, if the height H from the mounting surface of the bearing bracket to the bearing position is large, a large force will be generated on the mounting part of the bracket by the cylinder force, which may cause damage to bolts, etc.



■Cylinders may have slight oil seepage from sliding parts, packings, and gaskets. Be careful when using in locations where oil seepage is undesirable.

■Precautions for Using Relief Port
Exhaust treatment type (P72) cannot be used with vacuum scavenging. And vice versa. This will cause particle scattering or defects, so absolutely do not do it.

8. Securing Space

⚠CAUTION

■Ensure space around the cylinder for mounting, removal, wiring, and piping work.

9. Specification in Instruction Manual

⚠CAUTION

■Clearly state the maintenance conditions in the equipment's instruction manual.

● Product functionality may significantly decrease, and safety may not be ensured depending on usage status, operating environment, and maintenance. Proper maintenance allows the product to fully demonstrate its functions.

Installation / Mounting / Adjustment

1. Mounting

⚠Warning

■When mounting the cylinder, protect the load from falling or tipping over.

⚠Caution

■Do not remove the cylinder packaging bag or the dust-proof port seal for the piping port until just before performing piping.

● If the dust-proof port seal for the piping port is removed before piping connection work, foreign matter may enter the cylinder from the piping port, causing failure, malfunction, etc.

■If the cylinder weight is 15 kg or more, use lifting equipment.

■Do not hit or grip objects with the cylinder tube and Piston Rod sliding parts, causing scratches or dents.

The bore is manufactured with precise tolerances, so even slight deformation can cause a malfunction. Scratches or dents on the Piston Rod sliding part will damage packings and cause air leakage.

■If the direction of load movement is not parallel to the Piston Rod axis, twisting may occur in the Piston Rod and main body (tube), posing a risk of the Piston Rod flying out. Twisting also causes seizure, breakage, etc. Be sure to align the Piston Rod axis with the direction of load movement.

■Prevent seizure of rotating parts.

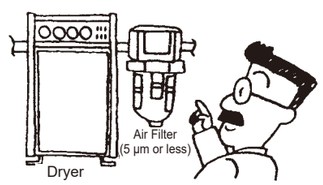
Apply grease to rotating parts (pins, etc.) to prevent seizure.

2. Pneumatic Source

⚠CAUTION

■Install a pneumatic filter immediately before the circuit using the pneumatic equipment.

● Install an air dryer and filter to remove moisture in the piping. Also, install a filter near the directional control valve (primary side) to remove rust, foreign matter, and drain.



■When supplying compressed air after completing pipe connections, supply it so that high pressure is not applied suddenly.

● Piping connections may come off, and piping tubes may spring out, causing accidents.

● If compressed air is supplied too slowly, sealing pressure may not be generated depending on the solenoid valve's internal seal mechanism, potentially causing air leakage.

●The cylinder may operate suddenly.

3. Piping

⚠CAUTION

■When piping, refer to the instruction manual and ensure connection ports, etc., are not mistaken.

● This will cause a malfunction.

■When connecting piping, wrap sealing tape clockwise from a position 2 threads or more inward from the tip of the pipe thread.

● If sealant tape protrudes beyond the threaded part of the piping, it will be cut by screwing in, and the cut piece will enter the interior, causing failure.

■Ensure that piping connected to the cylinder does not detach due to vibration, loosening, or pulling phenomena.

● If the exhaust side piping of the pneumatic circuit detaches, cylinder speed control will become impossible.

● In the case of a chuck holding mechanism, the chuck will release, creating a dangerous situation.

■When using nylon tubes or urethane tubes, pay attention to the following.

● In atmospheres where spatter scatters, use flame-resistant tubes or metal pipes.

■Use corrosion-resistant piping materials such as galvanized pipes, Stainless Steel pipes, nylon tubes, rubber hoses, etc.

■ Tighten with the appropriate torque during piping connection.

● The purpose is to prevent air leaks and screw damage.

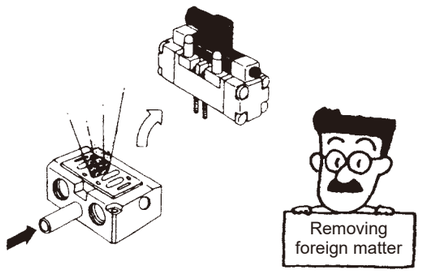
● To avoid damaging the threads, first tighten by hand, then use a tool.

[Reference Value] Please refer to the instruction manual.

Connection Thread	Tightening Torque (N·m)
M3	0.3 to 0.6
M5	1 to 1.5
Rc 1/8	3 to 5
Rc 1/4	6 to 8
Rc 3/8	13 to 15
Rc 1/2	16 to 18
Rc 3/4	19 to 40
Rc 1	41 to 70

■ When piping, be sure to perform flushing immediately before connecting to pneumatic equipment.

● It is necessary that foreign matter that entered during piping does not enter the pneumatic components.



4. Confirmation Before Operation

⚠ Warning

■ Before operating, confirm that there is no looseness or abnormality in the load or cylinder mounting fasteners.

■ Do not use until it is confirmed that the equipment operates properly.

After installation, repair, or modification, connect compressed air or electricity, perform appropriate functional tests and leak tests, and confirm that installation is normal.

■ Confirm that there is no mechanical interference or abnormality in the operating system.

■ Gradually increase and set the pressure while confirming that there is no abnormality in the operation of the equipment.

■ Starting with the exhaust side at atmospheric pressure is dangerous as the rod may extend suddenly. When starting, always apply pressure to the exhaust side cylinder chamber.

⚠ CAUTION

■ When piping connection is complete and compressed air is supplied, be sure to confirm that there are no air leaks in all parts of the piping connection.

● Apply leak detection fluid with a brush to the piping connection parts to confirm there are no air leaks.

■ Be sure to read the instruction manual.

Read carefully and understand the contents before using the product. Also, keep it so that you can check it at any time.

5. Adjustment

⚠ Warning

■ When adjusting speed with a speed controller, adjust by gradually opening the needle from the closed state. Starting speed adjustment in the open state is dangerous as the rod may extend suddenly.

■ The effect of the cushion with air cushion is adjusted at the time of shipment. However, re-adjust the cushion needle for use in accordance with the size of the load and piston speed.

Gradually open the needle from the closed state to adjust the cushioning effect. Note that if the cushion needle is loosened too much, there will be no cushioning effect, and it may fall off. After adjustment, tighten and fix the needle nut (Hexagon Nut). Use within the allowable kinetic energy value. If used exceeding the allowable value, the product may be damaged.

■ When the cylinder is in operation, do not enter or put your hand in its operating range.

Use / Maintenance

1. Maintenance and Inspection

⚠ Warning

■ Perform maintenance inspections carefully according to the instruction manual.

Mishandling will cause damage or malfunction of equipment or devices.

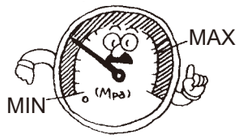
⚠ CAUTION

■ Implement daily and periodic inspections systematically so that maintenance management is performed correctly.

● Insufficient maintenance management will significantly impair product functionality, leading to reduced lifespan, damage, malfunction, and other defects or accidents.

1) Pressure management of supply compressed air

● Is the set pressure being supplied?
Does the pressure gauge indication during equipment operation show the set pressure?



2) Management of pneumatic filter

● Is drain being discharged normally?
Is the contamination status of the bowl and element normal?

3) Compressed air leakage management at piping connection parts

● Is the condition of the connection parts of moving parts, in particular, normal?

4) Solenoid Valve Operating Status Management

● Is there any delay in operation, and is the exhaust state normal?

5) Pneumatic Actuator Operating Status Management

● Is operation smooth?
Is the end-of-stroke stop status normal?
Is the connection with the load normal?

6) Management of lubricator

● Is oil level adjustment normal?

7) Lubricating Oil Management

● Is the supplied lubricating oil the correct type?

■ If air leakage increases or equipment does not operate normally, do not use.

● After repair or modification, connect compressed air or electricity, perform appropriate functional inspections and leak tests, and confirm normal operation.

■ After a long period of disuse, confirm normal operation when restarting.

■ Replace consumable parts that have exceeded their rated life with new ones during periodic inspections.

Do not use consumable parts that have been stored for 5 years or more.

■ Store consumable parts in a cool, dark place away from direct sunlight.

■ If lubrication of sliding surfaces deteriorates or they become dry, periodically apply lithium grease (general type) or fluorine grease (heat-resistant, low-speed, low-friction, P7 type, etc.). Also, be sure to remove foreign matter from the sliding surface before applying grease. If the type of grease used is unknown, please contact us.

2. Influence of Fluorine Grease

⚠ Warning

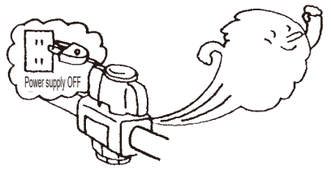
■ If you smoke cigarettes, etc., with hands that have fluorine grease from cylinders using fluorine grease (heat-resistant, low-speed, low-friction, P7, etc.), harmful gases will be generated, which may harm the human body, so please be careful.

3. Removal

⚠ Warning

■ Removal of Equipment and Supply/Exhaust of Compressed Air

When removing equipment, confirm that measures to prevent the driven object from falling or running away have been taken, then shut off the supply air and connected power, and exhaust the compressed air in the system before proceeding. When restarting, confirm that projection prevention measures have been taken, then proceed with caution.



■ When removing the load from a double-rod cylinder, be sure to do so with the Piston Rod width across flats on the load side fixed. Note that if you perform it without fixing the Piston Rod on the load side, the fastening part (screwed part) of the Piston Rod may loosen.

■ Perform cylinder removal work after taking measures to prevent the load from falling or tipping over.

4. Disassembly / Assembly

⚠ Warning

■ Disassemble the cylinder after removing it from the equipment.

■ When performing disassembly and assembly, ensure it is done by a worker who has acquired specialized knowledge.

After disassembly and reassembly, perform leak and operation tests before reassembling onto the equipment.

■When disassembling a single-acting cylinder, be very careful as parts may be ejected due to the spring.

■Install and remove the rod metal using appropriate pliers (C-type Retaining Ring installation tool).

■Even when using appropriate pliers (C-type Retaining Ring installation tool), the Retaining Ring may detach from the tip of the pliers, fly off, and cause damage to personnel and surrounding equipment, so be careful.
Also, when installing, confirm that it is securely in the Retaining Ring groove before supplying air.

⚠CAUTION

■When performing maintenance such as replacing consumable parts, disassemble and reassemble on a test bench, etc., in a clean atmosphere free of dust, and perform a functional inspection to ensure the equipment operates normally.

MEMO

Rodless Cylinder

	Listed Page
Rodless Cylinder System List	4
Rodless Cylinder **SRL3** Series	5
Rodless Cylinder with High Precision Guide **SRG3** Series (Single guide)	111
Rodless Cylinder with High Precision Guide **SRM3** Series (Double guide)	143
Rodless Cylinder with Brake **SRT3** Series	175
Magnet Type Rodless Cylinder **MRL2** Series	205
Magnet Type Rodless Cylinder High Precision Guide Type **MRG2** Series	239
Shuttle Mover **SM-25** Series	261

Rodless Cylinder

Uses flat piston with many merits. Realizes high-speed conveyance in a space-saving design.

Standard Type

SRL3 Series

Full Cowl Type

SRL3-J Series

With dustproof cover resistant to bad environments

With 1-axis Linear Guide

SRG3 Series

With High Precision 1-axis Linear Guide

With 2-axis Linear Guide

SRM3 Series

With High Precision 2-axis Linear Guide

With Brake

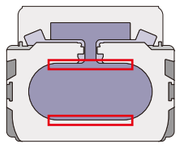
SRT3 Series

Intermediate stop possible anywhere with long-life brake

Features of the Rodless Cylinder

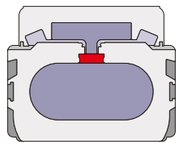
High lateral load resistance

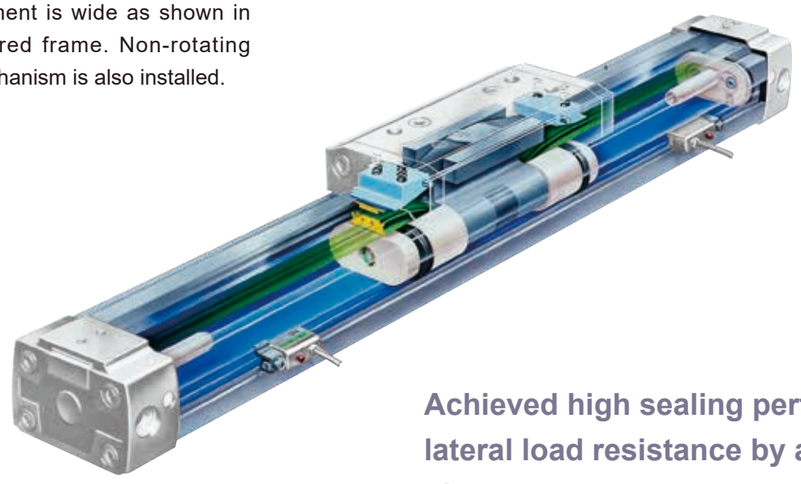
Adopted a structure where the piston is flat and can receive the load. The structure is strong against lateral bending moment because the part receiving the lateral bending moment is wide as shown in the red frame. Non-rotating mechanism is also installed.



High sealing performance

Since the part where the seal belt (red part) contacts is a flat structure, it has higher sealing performance than a round piston.





Achieved high sealing performance and lateral load resistance by adopting flat piston

High speed of up to 2000 mm/sec

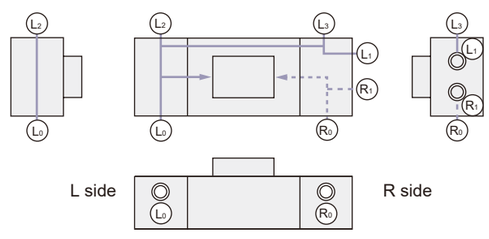
Adopted Piston Packing that withstands high speed (maximum 2000 mm/s).

Long stroke

Long stroke up to 5000 mm is supported.
(Excluding some models)

High installability

Depending on the installation location of the cylinder, centralized port (one-way piping) and standard port (both sides piping) can be selected.



ø12 to 20 or equiv.

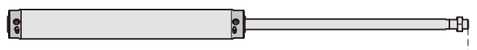
Lock mechanism mountable

It is possible to install a lock mechanism at the stroke end. (Q type of SRL3/SRM3)

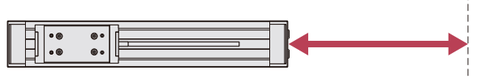
Space-saving

It is space-saving in the stroke direction compared to general cylinders.

General Type Cylinder



SRL3



Up to 39% space saving

System Chart

Rodless Cylinder SR□3 Series

Variation / Model No.	Bore Size (Equivalent)										Listed Page
	ø12	ø16	ø20	ø25	ø32	ø40	ø50	ø63	ø80	ø100	
Basic type **SRL3 Series** Space-saving Basic Type	●	●	●	●	●	●	●	●	●	●	10
Resin Guide Type **SRL3-G Series** With Simple Resin Guide	●	●	●	●	●	●	●	●	●	●	28
Standard / Fall Prevention Type **SRL3-Q Series** Basic Type with Fall Prevention Function	●	●	●	●	●	●	●	●	●	●	42
Resin Guide / Fall Prevention Type **SRL3-GQ Series** With Simple Resin Guide and Fall Prevention Function	●	●	●	●	●	●	●	●	●	●	58
Full Cowl Type **SRL3-J Series** With Dustproof Cover				●	●	●	●	●			70
High Precision Guide Type (With 1-axis Linear Guide) **SRG3 Series** With High Precision Guide	●	●	●	●							116
High Precision Guide Type (With 2-axis Linear Guide) **SRM3 Series** With High Precision Guide				●	●	●		●			146
High Precision Guide / Fall Prevention Type (With 2-axis Linear Guide) **SRM3-Q Series** High Precision Guide with Fall Prevention Function				●	●	●	●	●			146
With Brake Type **SRT3 Series** With Brake	●	●	●	●	●	●	●	●			178

CKD

Rodless Type

SRL3

Rodless Cylinder

ø12, ø16, ø20, ø25, ø32, ø40, ø50, ø63, ø80, ø100 or equiv.

Overview

High load capacity and long service life. A rodless cylinder capable of high-speed drive. The series ranges from ø12 to ø100 equivalent, with abundant variations.

Features

Flat Cylinder
Adopted a structure where the piston is flat and can receive the load. Excellent load resistance, and also equipped with a rotation stop mechanism.

Seal Belt
Since the seal part is made straight, sealing performance has been further improved.

Magnet Standard Equipment
Switch can be mounted directly on the standard type.

Adopted High Speed Packing
Adopted Piston Packing that can withstand high speeds.

Centralized Port
Depending on the installation location of the cylinder, centralized port (one-way piping) and standard port (both sides piping) can be freely selected. Equipment can be made compact.

CONTENTS

Product Introduction	2
Series variation	6
Variation/Option Combination Availability Table	8
● Double Acting Type (SRL3)	10
● Double Acting, resin guide type (SRL3-G)	28
● Double Acting, drop prevention type (SRL3-Q)	42
● Double Acting, resin guide, drop prevention type (SRL3-GQ)	58
External dimensions with options	20
● Double Acting, full cowl type (SRL3-J)	70
External dimensions with options	80
Parts composition table	88
Weight list of various kits	92
Outer Dimensions Diagram with Switch	86
Model Selection Guide	96
⚠Precautions for Use	106

CKD

System Chart

Rodless Cylinder
SRL3 Series

●: Standard, ◎: Option, ○: Custom-made, ▩: Cannot be manufactured

Variation	Model No. / Circuit Diagram Code	Bore Size (mm)	Standard Stroke (mm)									Min Stroke (mm)	Max Stroke (mm)		Intermediate stroke (per mm)	Mounting Type				Cushion				Option									Switch	Page
			200	300	400	500	600	700	800	900	1000					Basic type	Axial Foot Type	Axial Foot Type	Axial Foot Type	With Cushion on Both Sides	With R Side Cushion	With L Side Cushion	Without Cushion	Full Stroke Adjustment with Shock Absorber on Both Sides	With full stroke adjustment R side shock suppressor	With full stroke adjustment L side shock suppressor	Full Stroke Adjustment Bracket Retrofit	Floating Joint	Thin Floating Joint	Intermediate support bracket for 00LB	Intermediate Support Bracket (for LB1)	Table Mounting Screw Size Up	Height Adjustment Plate		
																00	LB	LB1	LJ	B	R	L	N	A	A1	A2	A3	Y	Y1	L*	N*	H	U		
Double Acting / Standard Type	SRL3	ø12, ø16, ø20 equivalent	●	●	●	●	●	●	●	●	●	1	5000		1	●	●	●		●	●	●	●	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	10
		ø25 equivalent	●	●	●	●	●	●	●	●	●		5000			●	●	●		●	●	●	●	◎	◎	◎	◎	◎	◎	◎	◎		◎		
		ø32 equivalent	●	●	●	●	●	●	●	●	●		5000			●	●	●		●	●	●	●	◎	◎	◎		◎	◎	◎	◎		◎		
		ø40, ø50, ø63 equivalent	●	●	●	●	●	●	●	●	●		5000			●	●			●	●	●	●	◎	◎	◎		◎	◎	◎			◎		
		ø80, ø100 equivalent	●	●	●	●	●	●	●	●	●		5000			●	●			●	●	●	●	◎	◎	◎		◎		◎			◎		
Double Acting / Resin Guide Type	SRL3-G	ø12, ø16, ø20 equivalent	●	●	●	●	●	●	●	●	●	1	5000		1	●	●	●		●	●	●	●	◎	◎	◎	◎			◎	◎	◎	◎	◎	28
		ø25 equivalent	●	●	●	●	●	●	●	●	●		5000			●	●	●		●	●	●	●	◎	◎	◎	◎			◎	◎		◎		
		ø32 equivalent	●	●	●	●	●	●	●	●	●		5000			●	●	●		●	●	●	●	◎	◎	◎				◎	◎		◎	◎	
		ø40, ø50, ø63 equivalent	●	●	●	●	●	●	●	●	●		5000			●	●			●	●	●	●	◎	◎	◎				◎			◎		
		ø80, ø100 equivalent	●	●	●	●	●	●	●	●	●		5000			●	●			●	●	●	●	◎	◎	◎				◎			◎		
Double Acting / Fall Prevention Type	SRL3-Q	ø12, ø16, ø20 equivalent	●	●	●	●	●	●	●	●	●	5	5000		1	●	●	●		●	●	●	●	◎	◎	◎	◎	◎	○	◎	◎	◎	◎	◎	42
		ø25 equivalent	●	●	●	●	●	●	●	●	●		5000			●	●	●		●	●	●	●	◎	◎	◎	◎	◎	○	◎	◎		◎		
		ø32 equivalent	●	●	●	●	●	●	●	●	●		5000			●	●	●		●	●	●	●	◎	◎	◎		◎		◎	◎		◎	◎	
		ø40, ø50, ø63 equivalent	●	●	●	●	●	●	●	●	●		5000			●	●			●	●	●	●	◎	◎	◎		◎		◎			◎		
		ø80, ø100 equivalent	●	●	●	●	●	●	●	●	●		5000			●	●			●	●	●	●	◎	◎	◎		◎		◎			◎		
Double Acting / Fall Prevention Type Resin Guide Type	SRL3-GQ	ø12, ø16, ø20 equivalent	●	●	●	●	●	●	●	●	●	5	5000		1	●	●	●		●	●	●	●	◎	◎	◎	◎			◎	◎	◎	◎	◎	58
		ø25 equivalent	●	●	●	●	●	●	●	●	●		5000			●	●	●		●	●	●	●	◎	◎	◎	◎			◎	◎		◎		
		ø32 equivalent	●	●	●	●	●	●	●	●	●		5000			●	●	●		●	●	●	●	◎	◎	◎				◎	◎		◎	◎	
		ø40, ø50, ø63 equivalent	●	●	●	●	●	●	●	●	●		5000			●	●			●	●	●	●	◎	◎	◎				◎			◎		
		ø80, ø100 equivalent	●	●	●	●	●	●	●	●	●		5000			●	●			●	●	●	●	◎	◎	◎				◎			◎		
Double Acting / Full Cowl Type	SRL3-J	ø25 equivalent	●	●	●	●	●	●	●	●	●	1	3000		1	●			●	●	●	●	●	◎	◎	◎	◎	◎		◎	◎			◎	70
		ø32 equivalent	●	●	●	●	●	●	●	●	●		3000			●			●	●	●	●	●	◎	◎	◎		◎		◎	◎			◎	
		ø40, ø50, ø63 equivalent	●	●	●	●	●	●	●	●	●		3000			●			●	●	●	●	●	◎	◎	◎		◎		◎					

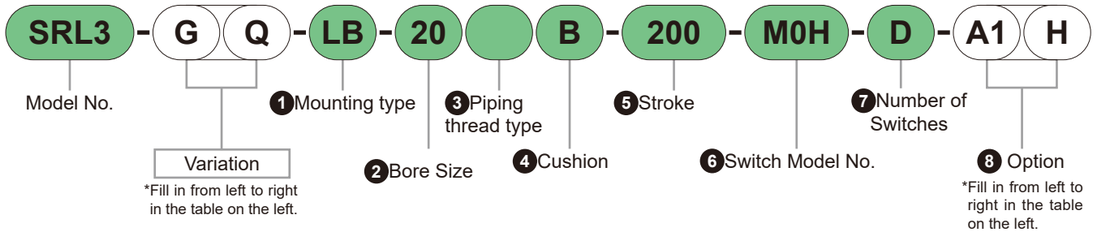
Variation and Option Item Combination Availability Table

●Mark: Standard
◎Mark: Option
○Mark: Custom-made
△Mark: Manufacturable depending on conditions (please consult)
× Mark: Cannot be manufactured

Category		Category	Variation				Piping thread		Option										
			Double Acting Basic Type	Resin Guide Type	Drop prevention type	Full Cowl Type	NPT	G	Stroke Adjustment Both Sides	Stroke Adjustment R Side	Stroke Adjustment L Side	For Stroke Adjustment Bracket Retrofit	Table Mounting Screw Size Up	Port/Cushion Needle Position Specification	Port/Cushion Needle Position Specification	Port/Cushion Needle Position Specification	Port/Cushion Needle Position Specification	Port/Cushion Needle Position Specification	Port/Cushion Needle Position Specification
		Code	None	G	Q	J	N	G	A	A1	A2	A3	H	R	B	T	D	S	X
Variation	Double Acting Basic Type	Blank					○	○	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
	Resin Guide Type	G			◎	×	○	○	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
	Drop prevention type	Q				×	○	○	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
	Full Cowl Type	J					○	○	◎	◎	◎	◎	×	◎	◎	◎	◎	◎	×
Piping thread	NPT	N						×	○	○	○	○	○	○	○	○	○	○	○
	G	G							○	○	○	○	○	○	○	○	○	○	○
Option	Stroke Adjustment Both Sides	A								×	×	×	◎	◎	◎	◎	◎	◎	◎
	Stroke Adjustment R Side	A1									×	×	◎	◎	◎	◎	◎	◎	◎
	Stroke Adjustment L Side	A2										×	◎	◎	◎	◎	◎	◎	◎
	For Stroke Adjustment Bracket Retrofit	A3											◎	◎	◎	◎	◎	◎	◎
	Table Mounting Screw Size Up	H												◎	◎	◎	◎	◎	◎
	Port/Cushion Needle Position Specification	R													×	×	×	×	×
	Port/Cushion Needle Position Specification	B														×	×	×	×
	Port/Cushion Needle Position Specification	T															×	×	×
	Port/Cushion Needle Position Specification	D																×	×
	Port/Cushion Needle Position Specification	S																	×
	Port/Cushion Needle Position Specification	X																	
Accessories	Cylinder Switch		◎	◎	◎	◎	○	○	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
	Floating Joint	Y	◎	×	◎	◎	○	○	◎	◎	◎	◎	△	◎	◎	◎	◎	◎	◎
	Low Profile Floating Joint	Y1	◎	×	*1	×	○	○	○	○	○	○	△	◎	◎	◎	◎	◎	◎
	Intermediate Support Bracket (for 00, LB)	L	◎	◎	◎	◎	○	○	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
	Intermediate Support Bracket (for LB1)	N	◎	◎	◎	◎	○	○	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
	With Height Adjustment Plate	U	◎	◎	◎	×	○	○	◎	◎	◎	◎	△	◎	◎	◎	◎	◎	◎

*1: ø25 equivalent or less can be manufactured with "○" (custom-made).

[Model No. Example]



Model No.: Rodless Cylinder
● Variation: Resin Guide Type, Fall Prevention Type
❶ Mounting style : Axial Foot Type
❷ Bore Size : ø20 or equivalent
❸ Port thread : Rc Thread
❹ Cushion : With Cushion on Both Sides
❺ Stroke : 200 mm
❻ Switch model No. : Reed MOH switch, lead wire 1 m
❼ Switch quantity : With 2 pcs.
❽ Option : R side only full stroke adjustable, with shock absorber, larger table mounting thread

Rodless Cylinder Double Acting Type

SRL3 Series

● Bore Size: ø12, ø16, ø20, ø25, ø32, ø40, ø50, ø63, ø80, ø100 or equivalent

Circuit Diagram Code

RoHS

Model No. Notation

Without Switch
(Built-in magnet for switch)

SRL3 - 00 - 12 [ ] B - 200 ——— B

Model No. ❶ ❷ ❸ ❹ ❺ ❽

With Switch
(Built-in magnet for switch)

SRL3 - 00 - 12 [ ] B - 200 - M0H - R - B

Model No. ❷Bore Size ❹Cushion ❻Switch Model No. ❽Option

❶Mounting type ❸Piping thread type ❺Stroke ❼Number of Switches

❶Mounting type

Mounting brackets are pre-assembled on the product and shipped.

Code	Content	
00	Basic type	
LB	Axial Foot Type	
LB1	Axial Foot Type (ø12 to ø32 equivalent only)	

Note: When the Bore Size of ^a is equivalent to ø12, 16, 20, 25, or 32, and the option code 8 is "R" or "T", the mounting style is "00" or "LB1". (❽Option Code "R" and "T" with mounting type "LB" cannot be manufactured because piping is not possible.)

❷Bore Size (mm)

Code	Content
12	ø12 equivalent
16	ø16 equivalent
20	ø20 equivalent
25	ø25 equivalent
32	ø32 equivalent
40	ø40 equivalent
50	ø50 equivalent
63	ø63 equivalent
80	ø80 equivalent
100	ø100 equivalent

❸Piping thread type

Code	Content
Blank	M5 (ø12, ø16 equivalent) Rc Thread (ø20 to ø100 equivalent)
N	NPT Thread (ø20 equivalent or larger) (Custom-made)
G	G Thread (ø20 equivalent or larger) (Custom-made)

❹Cushion

Code	Content
B	With Cushion on Both Sides
R	With R Side Cushion
L	With L Side Cushion
N	Without Cushion

❺Stroke (mm)

Bore Size	Stroke	Intermediate Stroke
ø12 to ø100 equivalent	1 to 5000	Every 1 mm

Note: For the minimum stroke with switch, please refer to P. 14.

❻Switch Model No.

For switch details, please refer to P. 1457. Switches are included with the product and shipped.

Contact	Indicator LED Special Function	Wiring (Output)	Load Voltage (V) AC	Load Voltage (V) DC	Load Current (mA) AC	Load Current (mA) DC	Lead wire *1 Straight	Lead wire *1 L-shape	
Solid State	1-Color	2-wire	-	10 to 30	-	5 to 30	M2H□	M2V□	
	2-Color		-	10 to 30	-	5 to 30	-	M2WV□	
	1-Color	3-wire (NPN)	-	30 or less	-	100 or less	M3H□	M3V□	
	2-Color		-	30 or less	-	100 or less	-	M3WV□	
	1-Color (Custom order)	3-wire (PNP)	-	30 or less	-	100 or less	M3PH□	M3PV□	
	2-Color	2-wire	-	24 ± 10%	-	5 to 20	T2WH□	T2WV□	
		3-wire (NPN)	-	30 or less	-	50 or less	T3WH□	T3WV□	
	2-Color Improved Water Resistance	2-wire	-	24 ± 10%	-	5 to 20	T2WLH□	T2WLV□	*2
	2-Color for AC Magnetic Field		-	24 ± 10%	-		T2YD□	-	
			-		-		T2YDT□	-	
Reed	1-Color	2-wire	110	12/24	7 to 20	5 to 50	M0H□	M0V□	
	No Indicator LED		110	5/12/24	20 or less	50 or less	M5H□	M5V□	

*4

*Lead wire length, connector specification

Code	Content
Blank	1 m (Standard)
3	3 m (Option)
5	5 m (Option)
W	M8 Connector, 1PIN (+), 4PIN (−) Lead Wire 0.3 m

*4: T2WLH and T2WLV only can be selected.

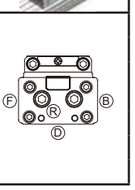
Ex) Lead wire length
1 m M0V
3 m M0V3
5 m M0V3

*1: Insert the Code selected in the "Lead wire length, connector specifications" table into "□" of the switch model number.
*2: It does not guarantee the water resistance performance of the cylinder.
*3: Switches other than the above switch model numbers are also available. (Custom Product) For details, see P. 1457.

❼Number of Switches

Code	Content
R	With 1 pc on R side
L	With 1 pc on L side
D	With 2 pcs
T	With 3 pcs
4	With 4 pcs (If 4 or more, enter the number of switches)

❽Option

	Code	Description	Bore Size (ø) equivalent 12	16	20	25	32	40	50	63	80	100	
	A	Full stroke adjustment both sides, with shock absorber	●	●	●	●	●	●	●	●	●	●	
	A1	Full stroke adjustment R side only, with shock absorber	●	●	●	●	●	●	●	●	●	●	
	A2	Full stroke adjustment L side only, with shock absorber	●	●	●	●	●	●	●	●	●	●	
	A3	Full Stroke Adjustment Bracket Retrofit Type	●	●	●	●							
	Y	Floating Joint	●	●	●	●	●	●	●	●	●	●	
	Y1	Low Profile Type Floating Joint	●	●	●	●	●	●	●	●			
*1	L*	Intermediate Support Bracket (for 00, LB)	●	●	●	●	●	●	●	●	●	●	
*1	N*	With Intermediate Support Bracket (for LB1)	●	●	●	●	●						
*4	H	Table Mounting Screw Size Up	●	●	●								
	U	Height Adjustment Plate	●	●	●	●	●	●	●	●	●	●	
	Blank	Port Position: F (Standard) / Cushion Needle Position: F (Standard)	●	●	●	●	●	●	●	●	●	●	
	R	Port Position: R (Centralized Port) / Cushion Needle Position: F	●	●	●	●	●	●	●	●	●	●	
	B	Port Position: F / Cushion Needle Position: B	●	●	●	●	●	●	●	●	●	●	
	T	Port Position: R (Centralized Port) / Cushion Needle Position: B	●	●	●	●	●	●	●	●	●	●	
	D	Port Position: D / Cushion Needle Position: F				●	●	●	●	●	●	●	
	S	Port Position: D / Cushion Needle Position: D					●	●	●	●	●	●	
	X	Port Position: F (Centralized Port) / Cushion Needle Position: F									●	●	

*1: The Code "□" in L□, N□ indicates the number of sets. If 2 sets are required, enter "L2" (for LB) or "N2" (for LB1). 2 pcs / 1 set
*2: For port and cushion needle position display symbols, please refer to the external dimensions diagrams on pages 16 to 19.
*3: For standard types ø12 to ø25 equivalent, it is necessary to remove the cover, assemble the plate nut, and retrofit the full stroke adjustment bracket. A3 is an option with a mounting plate nut assembled for retrofitting the full stroke adjustment bracket without removing the cover.
*4: "H" means screw size is "M4" for ø12, ø16 equivalent and "M5" for ø20 equivalent.
*5: Be sure to check the combination of options in the "Option Combination Table" on the next page.
*6: If ❶mounting method "LB1" is selected, options "D" or "S" cannot be selected.

Rechargeable Battery Compatible Specification (Catalog No. CC-1226AA)

●Design compatible with rechargeable battery manufacturing process

SRL3- ···· - P4*

*Please contact us for details.

Food Manufacturing Process Compatible Specification (Catalog No. CC-1271AA)

●Uses food grade grease that can be used in food manufacturing processes

SRL3- ···· - FP1

Option Combination Table

●: Combinable　□: Not Combinable

		Option																
		Full stroke adjustment both sides, with shock absorber	Full stroke adjustment R side only, with shock absorber	Full stroke adjustment L side only, with shock absorber	Full Stroke Adjustment Bracket Retrofit Type	Floating Joint	Low Profile Floating Joint	Intermediate support bracket for 00LB	Intermediate Support Bracket (for LB1)	Table Mounting Screw Size Up	Height Adjustment Plate	Port position F, Cushion needle position F (Standard)	Port position R, Cushion needle position F (Centralized port)	Port position F, Cushion needle position B	Port position R, Cushion needle position B(Centralized port)	Port position D, Cushion needle position F	Port position D, Cushion needle position D	Port position F, Cushion needle position F(Centralized port)
	Code	A	A1	A2	A3	Y	Y1	L*	N*	H	U	Blank	R	B	T	D	S	X
Option	A	\	□	□	□	●	●	●	●	●	●	●	●	●	●	●	●	●
	A1		\	□	□	●	●	●	●	●	●	●	●	●	●	●	●	●
	A2			\	□	●	●	●	●	●	●	●	●	●	●	●	●	●
	A3				\	●	●	●	●	●	●	●	●	●	●	●	●	□
	Y					\	□	●	●	□	□	●	●	●	●	●	●	●
	Y1						\	●	●	□	□	●	●	●	●	●	●	□
	L*							\	□	●	●	●	●	●	●	●	●	●
	N*								\	●	●	●	●	●	●	●	●	□
	H									\	□	●	●	●	●	●	●	□
	U										\	●	●	●	●	●	●	●
	Blank											\	□	□	□	□	□	□
	R												\	□	□	□	□	□
	B													\	□	□	□	□
	T														\	□	□	□
	D															\	□	□
	S																\	□
	X																	\

***1: Depending on the Bore Size, some combinations may not be possible, so be sure to check the option column in the "Model Number Notation Method" ❽ on the previous page.**

*2: If ❶mounting method "LB1" is selected, ❽options “D” or “S” cannot be selected.

Switch Individual Model No. Notation **(For parts composition, please refer to Pages 88 to 90.)**

●Switch body+Mounting bracket set (*1)

SRL3 - M0H

❻Switch Model No.

●Switch body only

SW - M0H

❻Switch Model No.

●Mounting bracket complete set (*2)

• M Type Switch

SRL3 - M

• T Type Switch

SRL3 - T

● Lead wire holder (*3)

SRL3 - MH

*1: The switch body + mounting bracket set does not include a lead wire holder.
If a lead wire holder is required, please order it separately.
*2: The mounting bracket is different for M type switch and T type switch.
*3: Lead wire holder is 10 pcs/1 set.

● How to order discrete shock absorber

(1 Shock absorber, 1 Hexagon Nut for fixing shock absorber)

SRL3 - 40 - NCK

❷Bore Size

Note: The Hexagon Nut for fixing SRL3-40 Shock Absorbers only differs from the NCK standard nut.

Applicable Shock Absorber Model No.

Model	Shock Absorber Model No.
SRL3-12	NCK-00-0.3-C
SRL3-16	NCK-00-0.3-C
SRL3-20	NCK-00-0.7-C
SRL3-25	NCK-00-1.2
SRL3-32	NCK-00-2.6
SRL3-40	NCK-00-7
SRL3-50	NCK-00-12
SRL3-63	NCK-00-12
SRL3-80	NCK-00-20
SRL3-100	NCK-00-20

●Floating Joint Set Model No. Notation

(Mount, Mount Base, Pin, Flat Washer, Pan Head Screw with Spring Washer, 4 Mounting Bolts)

SRL3 - 40 - Y

❷Bore Size

● How to order discrete intermediate support bracket

For 00, LB

SRL3 - 40 - L　(2 pcs / 1 set)

❷Bore Size

For LB1

SRL3 - 32 - N　(2 pcs / 1 set)

❷Bore Size

● How to order full stroke adjusting bracket kit

SRL3 - 40 - A1　(1 Set)

❷Bore Size

(For parts composition, please refer to the full stroke adjustment bracket kit on P. 89.)

●Mounting Bracket Model No. Notation

(2 Brackets, 4 Mounting Bolts)

SRL3 - LB - 40

❶Mounting type　❷Bore Size

● How to order height adjustment plate set

(Plate, 4 Mounting Bolts)

SRL3 - 40 - U

❷Bore Size

Specifications

Item		SRL3								
Bore Size	mm	ø12 equivalent	ø16 equivalent	ø20 equivalent	ø25 equivalent	ø32 equivalent	ø40 equivalent	ø50 equivalent	ø63 equivalent	ø80 equivalent	ø100 equivalent
Operation Method		Double Acting Type									
Operating Fluid		Compressed Air									
Max Operating Pressure	MPa	0.7									
Min Operating Pressure	MPa	0.2			0.1				0.05		
Proof Pressure	MPa	1.05									
Ambient Temperature	°C	5 to 60									
Port Size		M5		Rc 1/8		Rc 1/4		Rc 3/8		Rc 1/2	
Stroke tolerance	mm	v(To 1000), $^{+2.5}_{0}$ (To 3000), $^{+3.0}_{0}$ (To 5000)									
Operating Piston Speed	mm/s	50 to 2000 (Standard Port Piping) *1									
Cushion		Air Cushion									
Lubrication		Not required (If lubricating, use Turbine Oil Class 1 ISO VG32. Note that once lubrication is started, it must be continued.)									

*1: The operating piston speed for centralized port piping varies depending on the stroke, so please consult us separately.

Allowable Absorption Energy

Bore Size (mm)	With Cushion		Without Cushion	With Shock Absorber (Initial Setting)	
	Allowable Absorption Energy (J)	Cushion Stroke (mm)	Allowable Absorption Energy (J)	Absorption Energy (J)	Effective Stroke (mm)
ø12 equivalent	0.03	14.5	0.003	2.4	5.5
ø16 equivalent	0.22	19.2	0.007	2.4	5.5
ø20 equivalent	0.59	22.2	0.010	5.7	7
ø25 equivalent	1.40	20.9	0.015	10	9
ø32 equivalent	2.57	23.5	0.030	18	13
ø40 equivalent	4.27	23.9	0.050	50	16.5
ø50 equivalent	9.13	24.9	0.072	86	21
ø63 equivalent	17.4	29.6	0.138	86	21
ø80 equivalent	40	45.8	0.393	143	25
ø100 equivalent	67	45.8	0.622	143	25

Stroke

Bore Size (mm)	Standard Stroke (mm)	Max Stroke (mm)	Min Stroke (mm)
ø12 equivalent ø16 equivalent ø20 equivalent ø25 equivalent ø32 equivalent ø40 equivalent ø50 equivalent ø63 equivalent ø80 equivalent ø100 equivalent	200, 300 400, 500 600, 700 800, 900 1000	5000	1

Note: Intermediate strokes can be manufactured in 1 mm increments.

M Type Switch Mounting Quantity and Minimum Stroke (mm)

Switch Qty	1		2	
Switch Model No. / Bore Size (mm)	M□V	M□H	M□V	M□H
ø12 equivalent	10	10	30	45 (70)
ø16 equivalent	10	10	30	45 (70)
ø20 equivalent	10	10	30	45 (70)
ø25 equivalent	10	10	30	45 (70)
ø32 equivalent	10	10	30	45
ø40 equivalent	10	10	30	45
ø50 equivalent	15	15	30	45
ø63 equivalent	15	15	30	45
ø80 equivalent	25		50	
ø100 equivalent	25		50	

Note: In the case of full stroke adjustment, the minimum stroke with switch is shown in ( ).

T Type Switch Mounting Quantity and Minimum Stroke (mm)

Switch Qty	1				2			
Switch Model No. / Bore Size (mm)	T□V	T2WLV	T□H	T2WLH	T□V	T2WLV	T□H	T2WLH
ø12 equivalent	5	5	5	5 (11)	45	35	50 (70)	56 (82)
ø16 equivalent	5	5	5	5 (11)	45	35	50 (70)	56 (82)
ø20 equivalent	5	5	5	5 (11)	45	35	50 (70)	56 (82)
ø25 equivalent	10	10	10	10 (16)	45	35	50 (70)	56 (82)
ø32 equivalent	10	10	10	10	45	35	50	56
ø40 equivalent	10	10	10	10	45	35	50	56
ø50 equivalent	10	10	10	10	45	35	50	56
ø63 equivalent	10	10	10	10	45	35	50	56
ø80 equivalent	15	15	15	15	45	35	50	56
ø100 equivalent	15	15	15	15	45	35	50	56

Note: In the case of full stroke adjustment, the minimum stroke with switch is shown in ( ).

Cylinder Weight

Unit: kg

Bore Size (mm)	Weight at 0 mm Stroke				Switch Mounting bracket Weight		Additional Weight per 100 mm Stroke
	Basic type (00)	Foot type		Switch Weight	T Type	M Type	
		(LB)	(LB1)				
ø12 equivalent	0.24	0.25	0.26	Refer to the mass described in the switch specifications on P. 1457.	0.005	0.001	0.10
ø16 equivalent	0.32	0.33	0.35				0.13
ø20 equivalent	0.52	0.54	0.58				0.18
ø25 equivalent	1.0	1.1	1.1				0.28
ø32 equivalent	1.5	1.6	1.7				0.36
ø40 equivalent	2.4	2.5	-				0.53
ø50 equivalent	3.5	3.6	-				0.75
ø63 equivalent	6.1	6.4	-				1.11
ø80 equivalent	18.4	19.0	-				2.32
ø100 equivalent	26.2	27.2	-				3.38

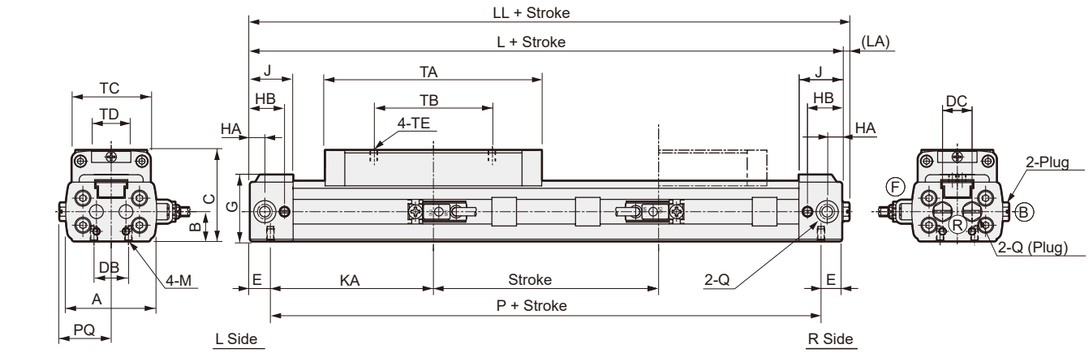
Theoretical Thrust Table

(Unit: N)

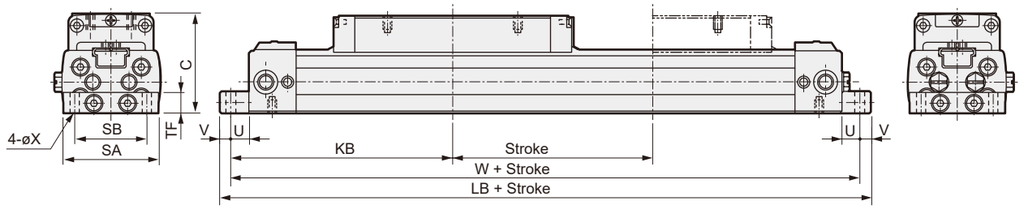
Bore Size (mm)	Operating Direction	Operating Pressure MPa							
		0.05	0.1	0.2	0.3	0.4	0.5	0.6	0.7
ø12 equivalent	Push/Pull	-	-	27.7	41.5	55.3	69.1	83.0	96.8
ø16 equivalent	Push/Pull	-	-	43.2	64.8	86.4	1.08×10^{2}	1.30×10^{2}	1.51×10^{2}
ø20 equivalent	Push/Pull	-	-	62.9	94.4	1.26×10^{2}	1.57×10^{2}	1.89×10^{2}	2.20×10^{2}
ø25 equivalent	Push/Pull	-	54.2	1.08×10^{2}	1.63×10^{2}	2.17×10^{2}	2.71×10^{2}	3.25×10^{2}	3.80×10^{2}
ø32 equivalent	Push/Pull	-	81.4	1.63×10^{2}	2.44×10^{2}	3.26×10^{2}	4.07×10^{2}	4.88×10^{2}	5.70×10^{2}
ø40 equivalent	Push/Pull	-	1.27×10^{2}	2.53×10^{2}	3.80×10^{2}	5.06×10^{2}	6.33×10^{2}	7.60×10^{2}	8.86×10^{2}
ø50 equivalent	Push/Pull	-	1.99×10^{2}	3.98×10^{2}	5.96×10^{2}	7.95×10^{2}	9.94×10^{2}	1.19×10^{3}	1.39×10^{3}
ø63 equivalent	Push/Pull	1.57×10^{2}	3.14×10^{2}	6.27×10^{2}	9.41×10^{2}	1.25×10^{3}	1.57×10^{3}	1.88×10^{3}	2.20×10^{3}
ø80 equivalent	Push/Pull	2.53×10^{2}	5.06×10^{2}	1.01×10^{3}	1.52×10^{3}	2.03×10^{3}	2.53×10^{3}	3.04×10^{3}	3.54×10^{3}
ø100 equivalent	Push/Pull	3.96×10^{2}	7.91×10^{2}	1.58×10^{3}	2.37×10^{3}	3.16×10^{3}	3.95×10^{3}	4.74×10^{3}	5.53×10^{3}

External Dimensions (Bore Size: ø12 to ø20 equivalent)

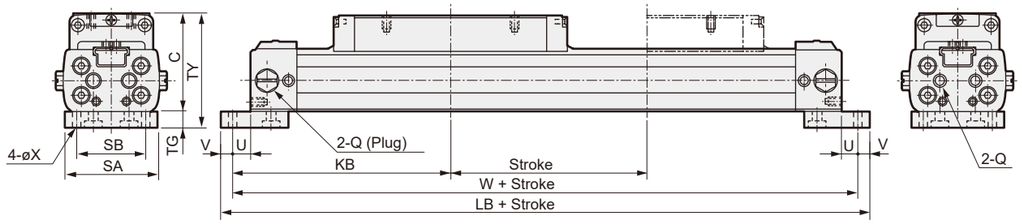
● SRL3-12 to 20



● With Foot Bracket SRL3-LB-12 to 20



● With Foot Bracket SRL3-LB1-12 to 20



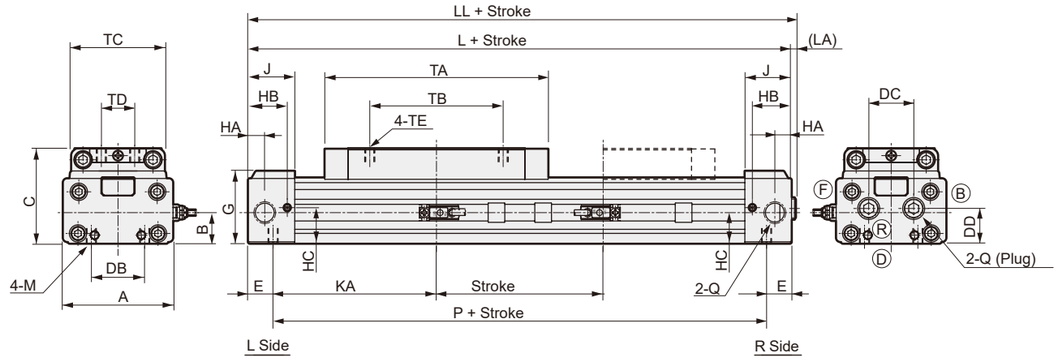
Code / Bore Size (mm)	A	B	C	DB	DC	E	G	HA	HB	J	KA	L	LL	LA	M	P	PQ	Q	TA	TB	TC	TD	TE
ø12 equivalent	33	10.5	33	10	11	8.5	24	6	14	17.5	59.5	136	139	3	M3 Depth 5	119	19	M5	81	42	29	13	M3 Depth 5
ø16 equivalent	37	12	37	14	12	8.5	27	6	14	17.5	66	149	152	3	M3 Depth 5	132	21	M5	88	48	32	15	M3 Depth 5
ø20 equivalent	44	14	42	16	16	10.5	31	8.5	18.5	22	74	169	171.5	2.5	M4 Depth 6.5	148	24.5	Rc 1/8	100	60	38	18	M4 Depth 6

Code	With Foot Bracket (LB)									With Foot Bracket (LB1)									
Bore Size (mm)	KB	LB	SA	SB	TF	U	V	W	X	KB	LB	SA	SB	TG	TY	U	V	W	X
ø12 equivalent	74	156	32	24	8	6	4	148	3.4	74	156	32	24	6	39	6	4	148	3.4
ø16 equivalent	80.5	169	35	26	8	6	4	161	3.4	80.5	169	35	26	6	43	6	4	161	3.4
ø20 equivalent	90.5	193	43	33	10	6	6	181	4.5	90.5	193	43	33	8	50	6	6	181	4.5

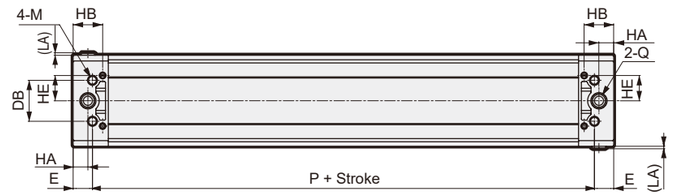
Note: For external dimensions diagrams with options and with each switch, please refer to P. 20 to 23 and 86.

External Dimensions (Bore Size: ø25 to ø63 equivalent)

● SRL3-25 to 63



● Bottom piping (option code: D/S)



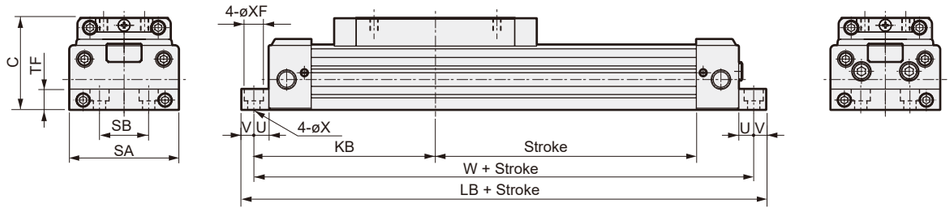
Code / Bore Size (mm)	A	B	C	DB	DC	DD	E	G	HA	HB	HC	HE	J	KA
ø25 equivalent	53	17	53	20	26	19	14	40.5	7.5	20	18.9	-	24	81
ø32 equivalent	66	18.5	57	32	27	21	15	43.5	10	23.5	21.5	17	28	98
ø40 equivalent	80	22	67	36	35	28	17	51.5	13	26	27	22.3	31	105
ø50 equivalent	96	28	82	45	35	35	23	61	15	33	35.3	11	39	106
ø63 equivalent	118	35	95	50	39	42	19	74	15	32	43	31	39	129

Code / Bore Size (mm)	L	LL	LA	M	P	Q	TA	TB	TC	TD	TE
ø25 equivalent	190	192	2	M6 Depth 9	162	Rc 1/8	122	70	48	20	M5 Depth 6
ø32 equivalent	226	228.5	2.5	M6 Depth 9	196	Rc 1/4	134	80	56	20	M6 Depth 7.5
ø40 equivalent	244	246.5	2.5	M8 Depth 12	210	Rc 1/4	148	90	68	30	M6 Depth 9
ø50 equivalent	258	260.5	2.5	M8 Depth 12	212	Rc 3/8	152	100	80	30	M8 Depth 10.5
ø63 equivalent	296	298.5	2.5	M10 Depth 15	258	Rc 3/8	168	110	102	40	M8 Depth 11.5

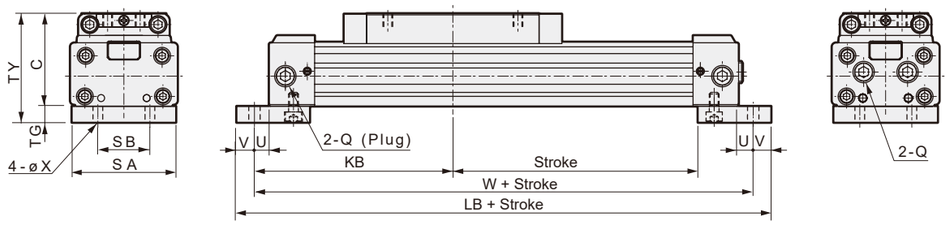
***1: Refer to P. 20 to 23, and 86 for dimensions with options and with switches.**
*2: For ø25 equivalent, option: S is not available.

External Dimensions (Bore Size: ø25 to ø63 equivalent)

● With Foot Bracket SRL3-LB-25 to 63



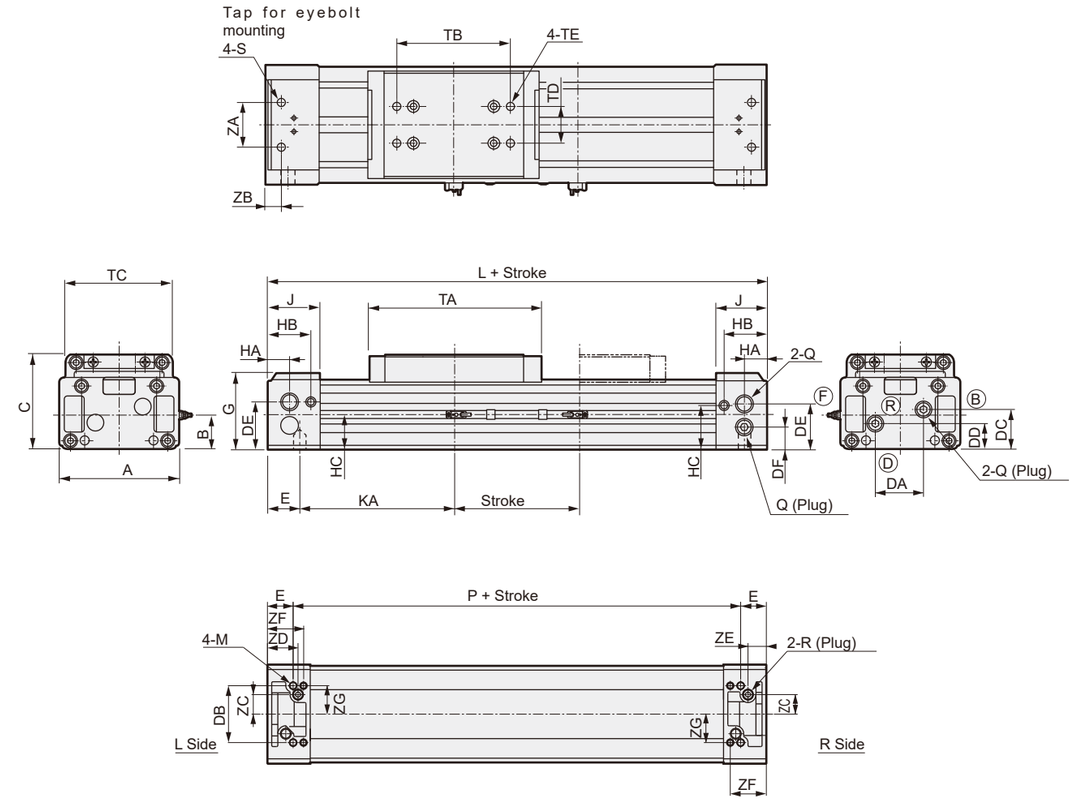
● With Foot Bracket SRL3-LB1-25, 32 (Supports ø40 to ø63 or equiv. mounting: there is no LB1)



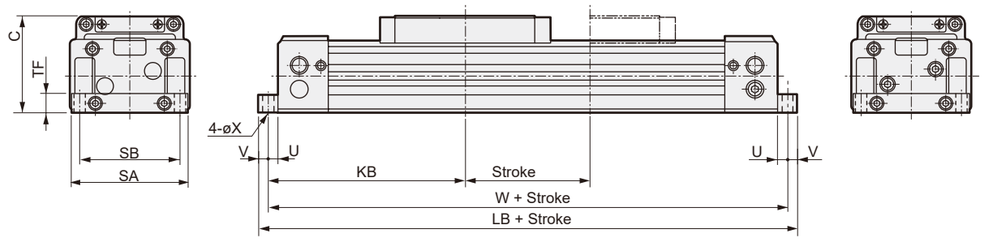
Code	With Foot Bracket (LB)										With Foot Bracket (LB1)									
Bore Size (mm)	KB	LB	SA	SB	TF	U	V	W	X	XF	KB	LB	SA	SB	TG	TY	U	V	W	X
ø25 equivalent	104	230	52	20	12	9	11	208	7	-	104	230	50	20	10	63	9	11	208	7
ø32 equivalent	122	266	64	32	12	9	11	244	7	-	122	266	64	32	10	67	9	11	244	7
ø40 equivalent	133	284	80	36	15	11	9	266	9	14 Counterbore Depth 8.6	-	-	-	-	-	-	-	-	-	-
ø50 equivalent	140	298	94	45	20	11	9	280	9	14 Counterbore Depth 8.6	-	-	-	-	-	-	-	-	-	-
ø63 equivalent	161	346	116	50	25	13	12	322	11	17.5 Counterbore Depth 10.8	-	-	-	-	-	-	-	-	-	-

External Dimensions (Bore Size: ø80 to ø100 equivalent)

● SRL3-80 to 100



● With Foot Bracket SRL3-LB-□□-□□□



Code	A	B	C	DA	DB	DC	DD	DE	DF	E	G	HA	HB	HC	J	KA	L	M	P	Q	R	S
Bore Size (mm)																						
ø80 equivalent	162	49	130	64	93	58	38	65	33	42	106	30	59	64.5	70	208	500	M12 Depth 18	416	Rc 1/2	Rc 3/8	M12 Depth 23
ø100 equivalent	198	61.5	150	73	108	71.5	47.5	81.5	41.5	43	125	30	69	76.5	80	222	530	M12 Depth 18	444	Rc 1/2	Rc 1/2	M12 Depth 23

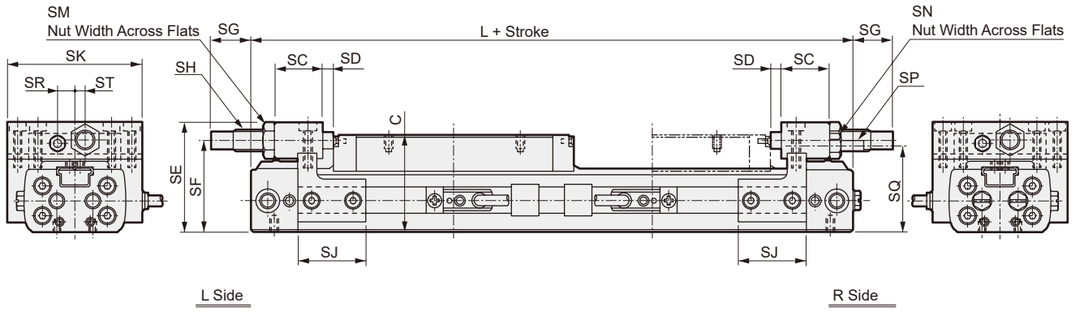
Code	TA	TB	TC	TD	TE	ZA	ZB	ZC	ZD	ZE	ZF	ZG	With Foot Bracket (LB)								
Bore Size (mm)													KB	LB	SA	SB	TF	U	V	W	X
ø80 equivalent	228	150	146	50	M12 Depth 15	60	21	32	50	30	59	46.5	263	550	162	134	25	13	12	526	14
ø100 equivalent	238	160	170	60	M12 Depth 15	60	21	36.5	55	30	69	54	280	590	198	160	30	15	15	560	14

Note: For external dimensions diagrams with options and with each switch, please refer to P. 20 to 23, and 86.

External Dimensions with Options

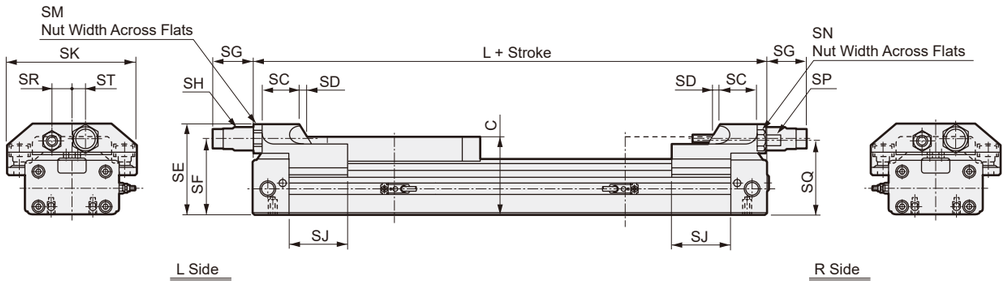
● With full stroke adjusting Shock Absorbers (SRL3)

· Equivalent to ø12 to ø25



Code / Bore Size (mm)	SC	SD	SE	SF	SG			SH		SJ	SK	SM	SN	SP	SQ	SR	ST	C	L
					At MAX	At MIN	Adjustment Range	Thread Diameter	Max Absorption Energy J										
ø12 equivalent	19.5	2.5	40	32	17.5	7.5	10	M8×0.75	3	25	45	12	5.5	M3	30.5	6	3	33	136
ø16 equivalent	18	4	42	35	14.5	4.5	10	M8×0.75	3	25	49	12	5.5	M3	34	6	4	37	149
ø20 equivalent	22.5	3.5	48	40	14.5	4.5	10	M10×1.0	7	39	57	14	7	M4	38	8	5	42	169
ø25 equivalent	20	2.5	62.5	51.5	14.5	4.5	10	M12×1.0	12	50	77	17	10	M6	50	12	10	53	190

• ø32 to ø63 equivalent

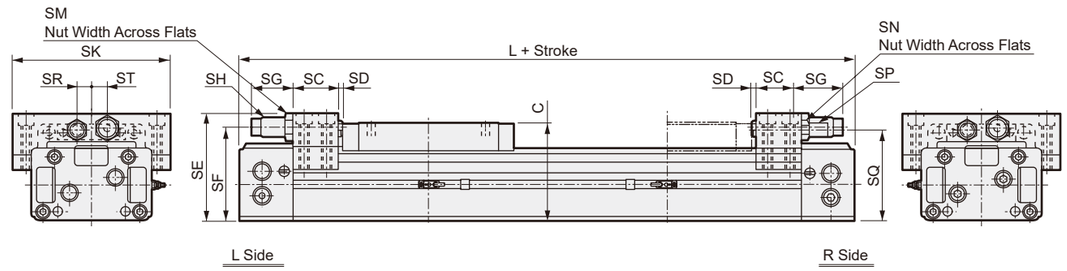


Code / Bore Size (mm)	SC	SD	SE	SF	SG			SH		SJ	SK	SM	SN	SP	SQ	SR	ST	C	L
					At MAX	At MIN	Adjustment Range	Thread Diameter	Max Absorption Energy J										
ø32 equivalent	22	7	66.5	55.5	27	17	10	M14×1.5	26	46	98	19	13	M8	53.5	14	12	57	226
ø40 equivalent	32	7	78.5	65.5	34	24	10	M20×1.5	70	51	112	24	17	M10	63.5	17	12	67	244
ø50 equivalent	38	8	99	80	55	45	10	M25×1.5	120	53	136	32	19	M12	77.5	22	17	82	258
ø63 equivalent	38	8	112	93.5	44	34	10	M25×1.5	120	64	158	32	24	M16	89	25	20	95	296

External Dimensions with Options

● Full stroke adjustable with shock absorber

· Equivalent to ø80, ø100

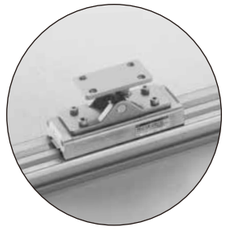


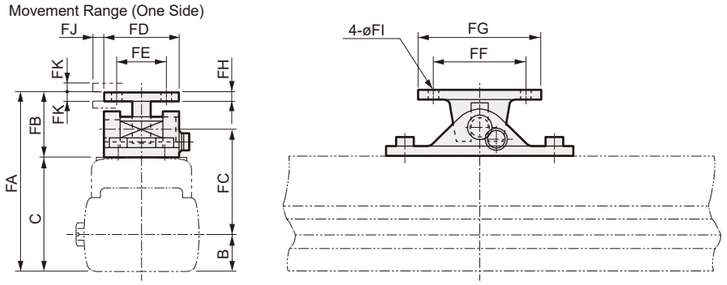
Code / Bore Size (mm)	SC	SD	SE	SF	SG			SH		SK	SM	SN	SP	SQ	SR	ST	C	L
					At MAX	At MIN	Adjustment Range	Thread Diameter	Max Absorption Energy J									
ø80 equivalent	60	6	145	125.5	50	40	10	M27×1.5	200	214	32	27	M20	123	20	20	130	500
ø100 equivalent	60	6	164	144.5	50	40	10	M27×1.5	200	250	32	27	M20	142	20	20	150	530

External Dimensions with Options

● Floating fitting (Y)

Material: Steel
Zinc Chromate

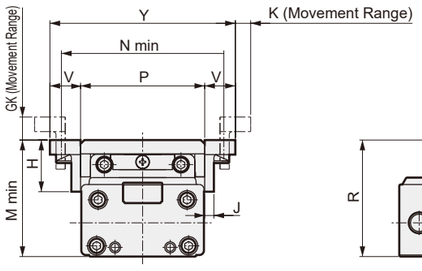




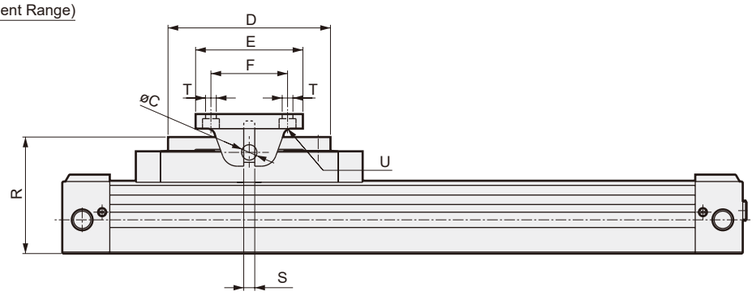
Code / Bore Size (mm)	FA	FB	FC	FD	FE	FF	FG	FH	FI	FJ	FK	B	C
ø12 equivalent	54	21	31.5	24	16	30	40	3	3.4	3	3	10.5	33
ø16 equivalent	58	21	34	24	16	30	40	3	3.4	3	3	12	37
ø20 equivalent	67	25	39	30	20	40	56	4	4.5	3	3	14	42
ø25 equivalent	78	25	47	30	20	40	56	4	6	3	3	17	53
ø32 equivalent	95	38	55.5	45	30	50	70	6	7	5	5	18.5	57

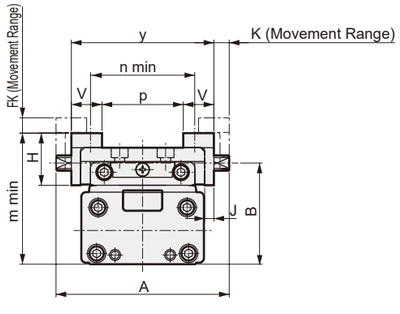
Code / Bore Size (mm)	FA	FB	FC	FD	FE	FF	FG	FH	FI	FJ	FK	B	C
ø40 equivalent	105	38	62	45	30	50	70	6	7	5	5	22	67
ø50 equivalent	126	44	73	60	40	70	90	8	9	5	5	28	82
ø63 equivalent	139	44	79	60	40	70	90	8	9	5	5	35	95
ø80 equivalent	188	58	107	80	50	90	120	11	14	10	5	49	130
ø100 equivalent	220	70	120.5	90	60	110	140	13	14	10	5	61.5	150

● Thin floating fitting (Y1) ø12 to ø63 or equiv.

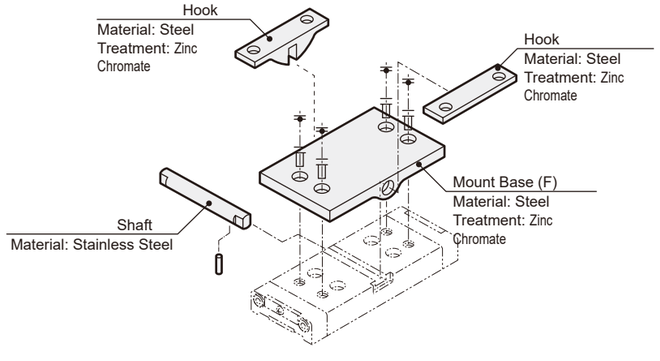


[Hook Outward Mounting]





[Hook Inward Mounting]



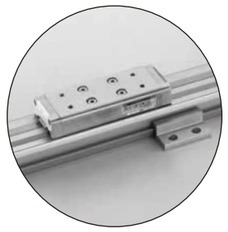
Code / Bore Size	A	B	C	D	E	F	H	J	K	FK	GK	M min	m min	N min	n min	P	p	R	S	V	Y	y	T	U
ø12 equivalent	52	32	5	60	40	30	20	3	6	6	9	38	43	47.5	26.5	34	16	38	3.5	12	58	40	ø3.4	ø6.5 Counterbore Depth 3.3
ø16 equivalent	56	36.5	5	60	40	30	20	3	6	6	9	42	47	51.5	30.5	38	20	42	3.5	12	62	44	ø3.4	ø6.5 Counterbore Depth 3.3
ø20 equivalent	64	41	6	84	56	40	24.5	4	6	6	9	48.5	56.5	62	34	44	22	48.5	4	15	74	52	ø4.5	ø8 Counterbore Depth 4.4
ø25 equivalent	74	53	6	84	56	40	24.5	4	6	6	9	60.5	68.5	72	44	54	32	60.5	4	15	84	62	ø5.5	ø9.5 Counterbore Depth 5.4
ø32 equivalent	99	56.5	8	106	70	50	34	6	10	10	15	66	75.5	92	54	67	39	66	5.5	20	107	79	ø6.6	ø11 Counterbore Depth 6.5
ø40 equivalent	113	66	10	116	70	50	34	6	10	10	15	76	85.5	106	68	81	53	76	7	20	121	93	ø6.6	ø11 Counterbore Depth 6.5
ø50 equivalent	133	81	12	120	90	70	43	8	10	10	15	93	106	129	81	97	63	93	8.5	25	147	113	ø9	ø14 Counterbore Depth 8.6
ø63 equivalent	155	94	14	136	90	70	43	8	10	10	15	108	120	151	103	119	85	107	10	25	169	135	ø9	ø14 Counterbore Depth 8.6

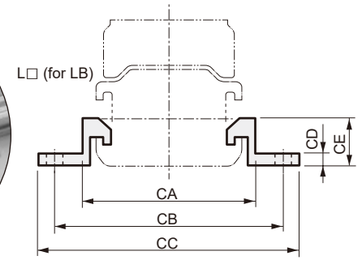
External Dimensions with Options

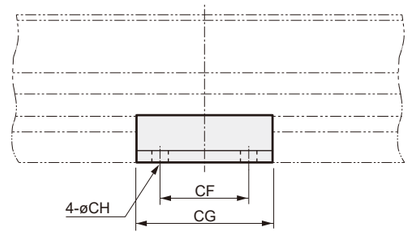
● Intermediate support bracket (L□N□)

(This bracket is an auxiliary bracket for preventing deflection.)

Material: Aluminum Alloy
Alumite



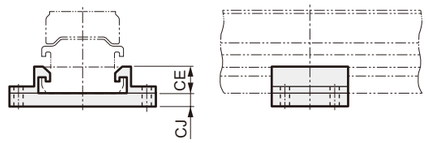




Code / Bore Size (mm)	CA	CB	CC	CD	CE	CF	CG	CH	CJ
ø12 equivalent	38	52	60	3	11	16	30	4	6
ø16 equivalent	42	56	64	3	12	20	35	4	6
ø20 equivalent	49	64	75	4	14	20	38	5	8
ø25 equivalent	60	76	88	6	19.5	20	40	7	10
ø32 equivalent	74	88	100	6	21.5	20	40	7	10
ø40 equivalent	90	108	124	6	24.5	30	60	9	-
ø50 equivalent	106	124	140	8	30.5	30	60	9	-
ø63 equivalent	130	152	172	10	38.5	50	90	11	-
ø80 equivalent	172	210	236	12	32	60	110	14	-
ø100 equivalent	208	246	272	12	32	60	110	14	-

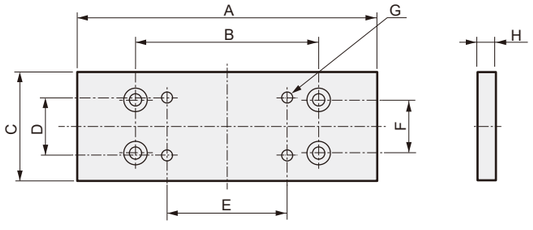
L□ (for 00, LB) N□ (for LB1)

N□ (for LB1)



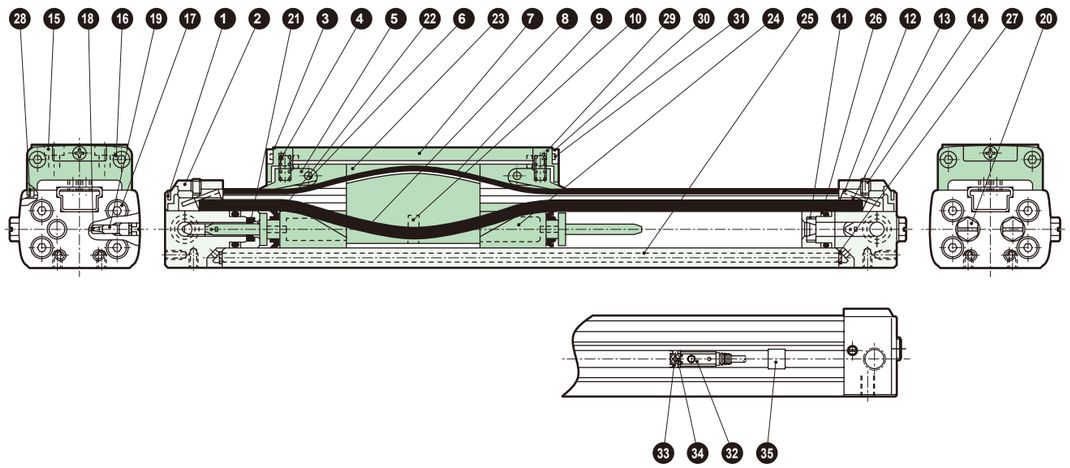
● Height adjustment plate (U)

Material: Aluminum Alloy
Alumite



Code / Bore Size	A	B	C	D	E	F	G	H
ø12 equivalent	80	42	29	16	30	13	4-M3 Through	8
ø16 equivalent	87	48	32	16	30	15	4-M3 Through	6
ø20 equivalent	99	60	38	20	40	18	4-M4 Through	7
ø25 equivalent	121	70	48	20	40	20	4-M5 Through	10.5
ø32 equivalent	134	80	56	30	50	20	4-M6 Through	10.5
ø40 equivalent	147	90	68	30	50	30	4-M6 Through	12.5
ø50 equivalent	151	100	80	40	70	30	4-M8 Through	18
ø63 equivalent	167	110	102	40	70	40	4-M8 Through	18
ø80 equivalent	227	150	146	50	90	50	4-M12 Through	18
ø100 equivalent	237	160	170	60	110	60	4-M12 Through	18

Internal Structure / Material (Bore Size: ø12 to ø40 equivalent)

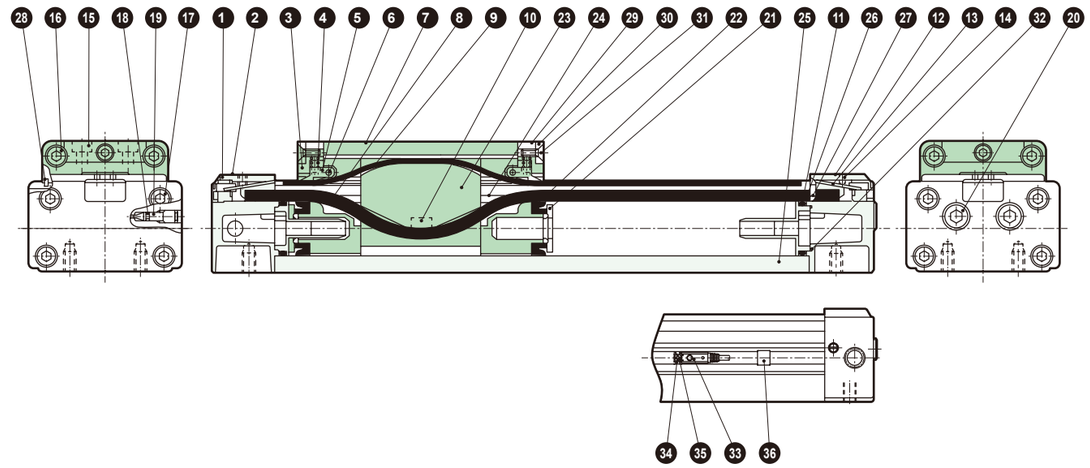


No.	Part Name	Material	Remarks
1	Belt Cover	Polyamide	
2	Cover (L)	Aluminum Alloy	Baked Painting
3	Table Cover	Polyacetal	
4	Spring	Steel	Black Oxide
5	Belt Holder	Polyacetal	
6	Parallel Pin (ø12 to ø20)	Stainless Steel	
	Shaft (ø25 to ø40)	Steel	Zinc Chromate
7	Table	Aluminum Alloy	Alumite
8	Seal Belt	Urethane Rubber	
9	Dustproof Belt	Stainless Steel, Nitrile Rubber	
10	Magnet		
11	Cushion Adapter	Polyacetal	
12	Cover (R)	Aluminum Alloy	Baked Painting
13	Belt Spacer	Steel	Zinc Chromate
14	Hexagon Socket Set Screw	Alloy Steel	Zinc Chromate
15	Hexagon Socket Head Cap Screw	Alloy Steel	Zinc Chromate
16	Hexagon Socket Head Cap Screw	Stainless Steel	
17	Hexagon Socket Head Cap Screw	Alloy Steel	Zinc Chromate
18	Needle Gasket	Nitrile Rubber	
19	Cushion Needle	Steel	Zinc Chromate

Part No.	Part Name	Material	Remarks
20	Plug	ø12, ø16: Copper Alloy ø20 to ø40: Steel	ø12, ø16: Zinc Chromate ø20 to ø40: Nickel Plating
21	Cushion Seal	Urethane Rubber	
22	Piston Packing	Nitrile Rubber	
23	Yoke	Aluminum Alloy	Alumite
24	Piston	Polyacetal	
25	Cylinder Tube	Aluminum Alloy	Alumite
26	Cylinder Gasket	Nitrile Rubber	
27	O-ring for Centralized Port	Nitrile Rubber	
28	Scraper	Polyacetal	
29	Double-sided Tape		
30	Plate	ø12 to ø20: Stainless Steel ø25 to ø40: Alloy Steel	ø25 to ø40: Zinc Chromate
31	Cross-Recessed Tapping Screw	Stainless Steel	
With Switch			
32	Switch		
33	Mounting bracket	Stainless Steel	
34	Cross-Recessed Pan Head Screw	Stainless Steel	
35	Lead Wire Holder	Polyacetal	

For maintenance parts, please visit the CKD Equipment Product Site (https: //www.ckd.co.jp/kiki/en/) → "model No." → Maintenance Parts.

Internal structure diagram / Material (Bore Size: Equivalent to ø50 to ø63)

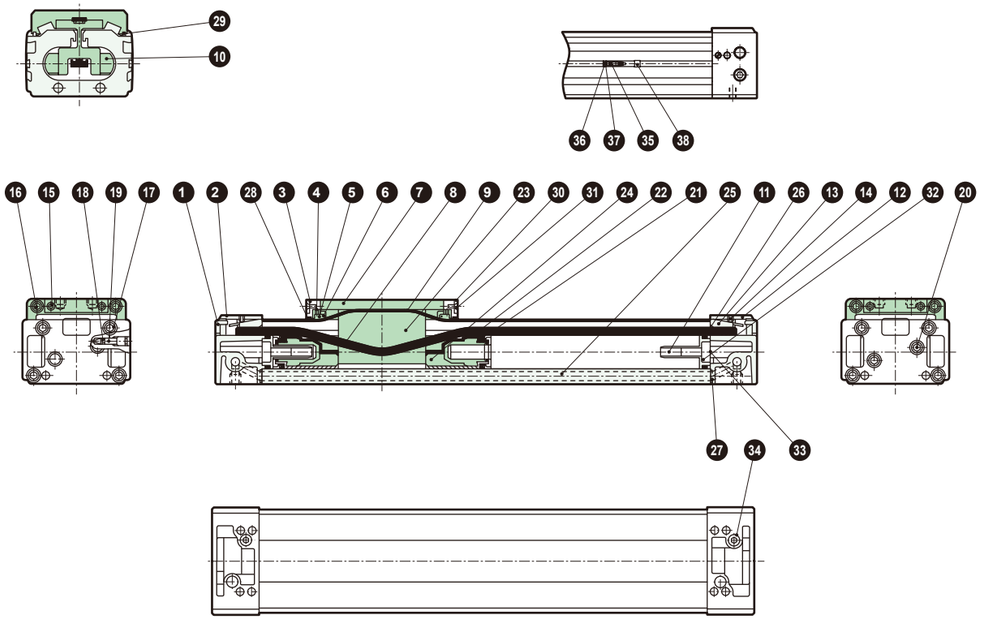


No.	Part Name	Material	Remarks
1	Belt Cover	Polyamide	
2	Cover (L)	Aluminum Alloy	Baked Painting
3	Table Cover	Polyacetal	
4	Spring	Steel	Black Oxide
5	Belt Holder	Polyacetal	
6	Shaft	Steel	Zinc Chromate
7	Table	Aluminum Alloy	Alumite
8	Seal Belt	Urethane Rubber	
9	Dustproof Belt	Stainless Steel, Nitrile Rubber	
10	Magnet		
11	Cushion Ring	Polyacetal	
12	Cover (R)	Aluminum Alloy	Baked Painting
13	Belt Spacer	Steel	Zinc Chromate
14	Hexagon Socket Set Screw	Alloy Steel	Zinc Chromate
15	Hexagon Socket Head Cap Screw	Alloy Steel	Zinc Chromate
16	Hexagon Socket Head Cap Screw	Stainless Steel	
17	Hexagon Socket Head Cap Screw	Alloy Steel	Zinc Chromate
18	Needle Gasket	Nitrile Rubber	
19	Cushion Needle	Steel	Zinc Chromate

Part No.	Part Name	Material	Remarks
20	Plug	Steel	Zinc Chromate
21	Cushion Seal	Urethane Rubber	
22	Piston Packing	Nitrile Rubber	
23	Yoke	Aluminum Alloy	Alumite
24	Piston	Polyacetal	
25	Cylinder Tube	Aluminum Alloy	Alumite
26	Cylinder Gasket	Nitrile Rubber	
27	O-ring for Centralized Port	Nitrile Rubber	
28	Scraper	Polyacetal	
29	Double-sided Tape		
30	Plate	Alloy Steel	Zinc Chromate
31	Cross-Recessed Tapping Screw	Stainless Steel	
32	Cushion Ring Gasket	Nitrile Rubber	
With Switch			
33	Switch		
34	Mounting bracket	Stainless Steel	
35	Cross-Recessed Pan Head Screw	Stainless Steel	
36	Lead Wire Holder	Polyacetal	

For maintenance parts, please visit the CKD Equipment Product Site (https: //www.ckd.co.jp/kiki/en/) → "model No." → Maintenance Parts.

Internal Structure / Material (Bore Size: ø80 to ø100 equivalent)



No.	Part Name	Material	Remarks
1	Belt Cover	Polyamide	
2	Cover (L)	Aluminum Alloy	Baked Painting
3	Table Cover	Polyacetal	
4	Spring	Steel	Black Oxide
5	Belt Holder	Polyacetal	
6	Shaft	Steel	Zinc Chromate
7	Table	Aluminum Alloy	Alumite
8	Seal Belt	Urethane Rubber	
9	Dustproof Belt	Stainless Steel, Nitrile Rubber	
10	Magnet		
11	Cushion Ring	Polyacetal	
12	Cover (R)	Aluminum Alloy	Baked Painting
13	Belt Spacer	Steel	Zinc Chromate
14	Hexagon Socket Set Screw	Alloy Steel	Zinc Chromate
15	Hexagon Socket Head Cap Screw	Alloy Steel	Zinc Chromate
16	Hexagon Socket Head Cap Screw	Stainless Steel	
17	Hexagon Socket Head Cap Screw	Alloy Steel	Zinc Chromate
18	Needle Gasket	Nitrile Rubber	
19	Cushion Needle	Steel	Zinc Chromate
20	Plug	Steel	Zinc Chromate

Part No.	Part Name	Material	Remarks
21	Cushion Seal	Urethane Rubber	
22	Piston Packing	Nitrile Rubber	
23	Yoke	Aluminum Alloy	Alumite
24	Piston	Polyacetal	
25	Cylinder Tube	Aluminum Alloy	Alumite
26	Cylinder Gasket	Nitrile Rubber	
27	O-ring for Centralized Port	Nitrile Rubber	
28	Felt (1)	Wool	
29	Felt (2)	Wool	
30	Plate	Alloy Steel	Zinc Chromate
31	Cross-Recessed Tapping Screw	Stainless Steel	
32	Cushion Ring Gasket (1)	Nitrile Rubber	
33	Cushion Ring Gasket (2)	Nitrile Rubber	
34	Plug	Steel	Zinc Chromate
With Switch			
35	Switch		
36	Mounting bracket	Stainless Steel	
37	Cross-Recessed Pan Head Screw	Stainless Steel	
38	Lead Wire Holder	Polyacetal	

For maintenance parts, please visit the CKD Equipment Product Site (https: //www. ckd.co.jp/kiki/en/) → "model No." → Maintenance Parts.

MEMO

Rodless Type
SRL3
SRG3
SRM3
SRT3
MRL2
MRG2
SM-25
Cylinder Switch
Ending

Rodless Cylinder Resin Guide Type

SRL3-G Series

● Bore Size: ø12, ø16, ø20, ø25, ø32, ø40, ø50, ø63, ø80, ø100 or equivalent

Circuit Diagram Code

RoHS

Model No. Notation

Without Switch
(Built-in magnet for switch)

SRL3-G - 00 - 12 [ ] B - 200 ——— B

Model No. ❶ ❷ ❸ ❹ ❺ ❽

With Switch
(Built-in magnet for switch)

SRL3-G - 00 - 12 [ ] B - 200 - M0H - R - B

Model No. ❷Bore Size ❹Cushion ❻Switch Model No. ❽Option
❶Mounting type ❸Piping thread type ❺Stroke ❼Number of Switches

❶Mounting type

Mounting brackets are pre-assembled on the product and shipped.

Code	Content	
00	Basic type	
LB	Axial Foot Type	
LB1	Axial Foot Type (ø12 to ø32 equivalent only)	

Note: When the Bore Size of ❷ is equivalent to ø12, 16, 20, 25, or 32, and the option code ❽ is "R" or "T", the mounting style is "00" or "LB1". (Mounting style "LB" cannot be manufactured with option code ❽ "R" and "T" because piping is not possible.)

❷Bore Size (mm)

Code	Content
12	ø12 equivalent
16	ø16 equivalent
20	ø20 equivalent
25	ø25 equivalent
32	ø32 equivalent
40	ø40 equivalent
50	ø50 equivalent
63	ø63 equivalent
80	ø80 equivalent
100	ø100 equivalent

❸Piping thread type

Code	Content
Blank	M5 (ø12, ø16 equivalent) Rc Thread (ø20 to ø100 equivalent)
N	NPT Thread (ø20 equivalent or larger) (Custom-made)
G	G Thread (ø20 equivalent or larger) (Custom-made)

❹Cushion

Code	Content
B	With Cushion on Both Sides
R	With R Side Cushion
L	With L Side Cushion
N	Without Cushion

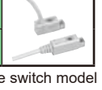
❺Stroke (mm)

Bore Size	Stroke	Intermediate Stroke
ø12 to ø100 equivalent	1 to 5000	Every 1 mm

Note: For the minimum stroke with switch, please refer to P. 32.

❻Switch Model No.

For switch details, please refer to P. 1457. Switches are included with the product and shipped.

Contact	Indicator LED Special Function	Wiring (Output)	Load Voltage (V) AC	Load Voltage (V) DC	Load Current (mA) AC	Load Current (mA) DC	Lead wire *1 Straight	Lead wire *1 L-shape	
Solid State	1-Color	2-wire	-	10 to 30	-	5 to 30	M2H□	M2V□	
	2-Color		-	10 to 30	-	5 to 30	-	M2WV□	
	1-Color	3-wire (NPN)	-	30 or less	-	100 or less	M3H□	M3V□	
	2-Color		-	30 or less	-	100 or less	-	M3WV□	
	1-Color (Custom order)	3-wire (PNP)	-	30 or less	-	100 or less	M3PH□	M3PV□	
	2-Color	2-wire	-	24 ± 10%	-	5 to 20	T2WH□	T2WV□	
		3-wire (NPN)	-	30 or less	-	50 or less	T3WH□	T3WV□	
	2-Color Improved Water Resistance	2-wire	-	24 ± 10%	-	5 to 20	T2WLH□	T2WLV□	*2
	2-Color for AC Magnetic Field		-	24 ± 10%	-		T2YD□	-	
			—		-		T2YDT□	-	
Reed	1-Color	2-wire	110	12/24	7 to 20	5 to 50	M0H□	M0V□	
	No Indicator LED		110	5/12/24	20 or less	50 or less	M5H□	M5V□	

*4

*Lead wire length, connector specification

Code	Content
Blank	1 m (Standard)
3	3 m (Option)
5	5 m (Option)
W	M8 Connector, 1PIN (+), 4PIN (−) Lead Wire 0.3 m

*4: T2WLH and T2WLV only can be selected.

Ex) Lead wire length
1 m M0V
3 m M0V3
5 m M0V5

*1: Insert the Code selected in the "Lead wire length, connector specifications" table into "□" of the switch model number.
*2: It does not guarantee the water resistance performance of the cylinder.
*3: Switches other than the above switch model numbers are also available. (Custom Product) For details, see P. 1457.

❼Number of Switches

Code	Content
R	With 1 pc on R side
L	With 1 pc on L side
D	With 2 pcs
T	With 3 pcs
4	With 4 pcs (If 4 or more, enter the number of switches)

❽Option

	Code	Description	Bore Size (ø) equivalent 12	16	20	25	32	40	50	63	80	100	
	A	Full stroke adjustment both sides, with shock absorber	●	●	●	●	●	●	●	●	●	●	
	A1	Full stroke adjustment R side only, with shock absorber	●	●	●	●	●	●	●	●	●	●	
	A2	Full stroke adjustment L side only, with shock absorber	●	●	●	●	●	●	●	●	●	●	
	A3	Full Stroke Adjustment Bracket Retrofit Type	●	●	●	●							
*1	L□	Intermediate Support Bracket (for 00, LB)	●	●	●	●	●	●	●	●	●	●	
*1	N□	With Intermediate Support Bracket (for LB1)	●	●	●	●	●						
*4	H	Table Mounting Screw Size Up	●	●	●								
	U	Height Adjustment Plate	●	●	●	●	●	●	●	●	●	●	
	Blank	Port Position: F (Standard)	Cushion Needle Position: F (Standard)	●	●	●	●	●	●	●	●	●	●	
	R	Port Position: R (Centralized Port)	Cushion Needle Position: F	●	●	●	●	●	●	●	●	●	●	
	B	Port Position: F	Cushion Needle Position: B	●	●	●	●	●	●	●	●	●	●	
	T	Port Position: R (Centralized Port)	Cushion Needle Position: B	●	●	●	●	●	●	●	●	●	●	
	D	Port Position: D	Cushion Needle Position: F				●	●	●	●	●	●	●	
	S	Port Position: D	Cushion Needle Position: D					●	●	●	●	●	●	
	X	Port Position: F (Centralized Port)	Cushion Needle Position: F									●	●	

*1: The Code "□" in L□, N□ indicates the number of sets. If 2 sets are required, enter "L2" (for LB) or "N2" (for LB1). 2 pcs / 1 set
*2: For port and cushion needle position display codes, please refer to the external dimensions diagrams on P. 34 to 37.
*3: For standard types ø12 to ø25 equivalent, it is necessary to remove the cover, assemble the plate nut, and retrofit the full stroke adjustment bracket. A3 is an option with a mounting plate nut assembled for retrofitting the full stroke adjustment bracket without removing the cover.
*4: "H" means screw size is "M4" for ø12, ø16 equivalent and "M5" for ø20 equivalent.
*5: Be sure to check the combination of options in the "Option Combination Table".
*6: If ❶mounting method "LB1" is selected, options "D" or "S" cannot be selected.

Food Manufacturing Process Compatible Specification (Catalog No. CC-1271AA)

●Uses food grade grease that can be used in food manufacturing processes

SRL3-G -·····- FP1

Option Combination Table

●: Combinable ▨: Not Combinable

		Option														
		Full stroke adjustment both sides, with shock absorber	Full stroke adjustment R side only, with shock absorber	Full stroke adjustment L side only, with shock absorber	Full Stroke Adjustment Bracket Retrofit Type	Intermediate support bracket for 00, LB	Intermediate Support Bracket (for LB1)	Table Mounting Screw Size Up	Height Adjustment Plate	Port position F, Cushion needle position F (Standard)	Port position R, Cushion needle position F (Centralized port)	Port position F, Cushion needle position B	Port position R, Cushion needle position B(Centralized port)	Port position D, Cushion needle position F	Port position D, Cushion needle position D	Port position F, Cushion needle position F(Centralized port)
	Code	A	A1	A2	A3	L□	N□	H	U	Blank	R	B	T	D	S	X
Option	A		▨	▨	▨	●	●	●	●	●	●	●	●	●	●	●
	A1			▨	▨	●	●	●	●	●	●	●	●	●	●	●
	A2				▨	●	●	●	●	●	●	●	●	●	●	●
	A3					●	●	●	●	●	●	●	●	●	●	▨
	L□					▨	▨	●	●	●	●	●	●	●	●	●
	N□							●	●	●	●	●	●	●	●	▨
	H							▨	▨	●	●	●	●	●	●	▨
	U									●	●	●	●	●	●	●
	Blank									▨	▨	▨	▨	▨	▨	▨
	R										▨	▨	▨	▨	▨	▨
	B											▨	▨	▨	▨	▨
	T												▨	▨	▨	▨
	D													▨	▨	▨
	S														▨	▨
	X															▨

***1: Depending on the Bore Size, some combinations may not be possible, so be sure to check the option column in the "Model Number Notation Method"❽ on the previous page.**

*2: If ❶mounting method "LB1" is selected, ❽options “D” or “S” cannot be selected.

Switch Individual Model No. Notation

(For parts composition, please refer to P. 88 to 90.)

●Switch body+Mounting bracket set (*1)

SRL3 - M0H

❻Switch Model No.

●Switch body only

SW - M0H

❻Switch Model No.

●Mounting bracket complete set (*2)

・M Type Switch

SRL3 - M

・T Type Switch

SRL3 - T

● Lead wire holder (*3)

SRL3 - MH

*1: The switch body + mounting bracket set does not include a lead wire holder. If a lead wire holder is required, please order it separately.
*2: The mounting bracket is different for M type switch and T type switch.
*3: Lead wire holder is 10 pcs/1 set.

● How to order discrete shock absorber

(1 Shock absorber, 1 Hexagon Nut for fixing shock absorber)

SRL3 - 40 - NCK

❷Bore Size

Note: The Hexagon Nut for fixing SRL3-40 Shock Absorbers only differs from the NCK standard nut.

Applicable Shock Absorber Model No.

Model	Shock Absorber Model No.
SRL3-12	NCK-00-0.3-C
SRL3-16	NCK-00-0.3-C
SRL3-20	NCK-00-0.7-C
SRL3-25	NCK-00-1.2
SRL3-32	NCK-00-2.6
SRL3-40	NCK-00-7
SRL3-50	NCK-00-12
SRL3-63	NCK-00-12
SRL3-80	NCK-00-20
SRL3-100	NCK-00-20

● How to order discrete intermediate support bracket

For 00, LB

SRL3 - 40 - L (2 pcs / 1 set)

❷Bore Size

For LB1

SRL3 - 32 - N (2 pcs / 1 set)

❷Bore Size

● How to order full stroke adjusting bracket kit

SRL3 - 40 - A1 (1 Set)

❷Bore Size

(For parts composition, please refer to the full stroke adjustment bracket kit on P. 89.)

●Mounting Bracket Model No. Notation

(2 Brackets, 4 Mounting Bolts)

SRL3 - LB - 40

❶Mounting type ❷Bore Size

● How to order height adjustment plate set

(Plate, 4 Mounting Bolts)

SRL3 - 40 - U

❷Bore Size

Specifications

Item		SRL3-G									
Bore Size	mm	ø12 equivalent	ø16 equivalent	ø20 equivalent	ø25 equivalent	ø32 equivalent	ø40 equivalent	ø50 equivalent	ø63 equivalent	ø80 equivalent	ø100 equivalent
Operation Method		Double Acting Type									
Operating Fluid		Compressed Air									
Max Operating Pressure	MPa	0.7									
Min Operating Pressure	MPa	0.25			0.15				0.1		
Proof Pressure	MPa	1.05									
Ambient Temperature	°C	5 to 60									
Port Size		M5		Rc 1/8		Rc 1/4		Rc 3/8		Rc 1/2	
Stroke tolerance	mm	$^{+2.0}_{0}$ (up to 1000), $^{+2.5}_{0}$ (up to 3000), $^{+3.0}_{0}$ (up to 5000)									
Operating Piston Speed	mm/s	50 to 2000 (Standard Port Piping) *1									
Cushion		Air Cushion									
Lubrication		Not required (If lubricating, use Turbine Oil Class 1 ISO VG32. Note that once lubrication is started, it must be continued.)									

*1: The operating piston speed for centralized port piping varies depending on the stroke, so please consult us separately.

Allowable Absorption Energy

Bore Size (mm)	With Cushion		Without Cushion	With Shock Absorber (Initial Setting)	
	Allowable Absorption Energy (J)	Cushion Stroke (mm)	Allowable Absorption Energy (J)	Absorption Energy (J)	Effective Stroke (mm)
ø12 equivalent	0.03	14.5	0.003	2.4	5.5
ø16 equivalent	0.22	19.2	0.007	2.4	5.5
ø20 equivalent	0.59	22.2	0.010	5.7	7
ø25 equivalent	1.40	20.9	0.015	10	9
ø32 equivalent	2.57	23.5	0.030	18	13
ø40 equivalent	4.27	23.9	0.050	50	16.5
ø50 equivalent	9.13	24.9	0.072	86	21
ø63 equivalent	17.4	29.6	0.138	86	21
ø80 equivalent	40	45.8	0.393	143	25
ø100 equivalent	67	45.8	0.622	143	25

Stroke

Bore Size (mm)	Standard Stroke (mm)	Max Stroke (mm)	Min Stroke (mm)
ø12, ø16, ø20, ø25, ø32, ø40, ø50, ø63, ø80, ø100 equivalent	200, 300, 400, 500, 600, 700, 800, 900, 1000	5000	1

Note: Intermediate strokes can be manufactured in 1 mm increments.

M Type Switch Mounting Quantity and Minimum Stroke (mm)

Switch Qty.	1		2	
Switch Model No. / Bore Size (mm)	M□V	M□H	M□V	M□H
ø12 equivalent	10	10	30	45 (70)
ø16 equivalent	10	10	30	45 (70)
ø20 equivalent	10	10	30	45 (70)
ø25 equivalent	10	10	30	45 (70)
ø32 equivalent	10	10	30	45
ø40 equivalent	10	10	30	45
ø50 equivalent	15	15	30	45
ø63 equivalent	15	15	30	45
ø80 equivalent	25		50	
ø100 equivalent	25		50	

Note: In the case of full stroke adjustment, the minimum stroke with switch is shown in ( ).

T Type Switch Mounting Quantity and Minimum Stroke (mm)

Switch Qty.	1				2			
Switch Model No. / Bore Size (mm)	T□V	T2WLV	T□H	T2WLH	T□V	T2WLV	T□H	T2WLH
ø12 equivalent	5	5	5	5 (11)	45	35	50 (70)	56 (82)
ø16 equivalent	5	5	5	5 (11)	45	35	50 (70)	56 (82)
ø20 equivalent	5	5	5	5 (11)	45	35	50 (70)	56 (82)
ø25 equivalent	10	10	10	10 (16)	45	35	50 (70)	56 (82)
ø32 equivalent	10	10	10	10	45	35	50	56
ø40 equivalent	10	10	10	10	45	35	50	56
ø50 equivalent	10	10	10	10	45	35	50	56
ø63 equivalent	10	10	10	10	45	35	50	56
ø80 equivalent	15	15	15	15	45	35	50	56
ø100 equivalent	15	15	15	15	45	35	50	56

Note: In the case of full stroke adjustment, the minimum stroke with switch is shown in ( ).

Cylinder Weight

Unit: kg

Bore Size (mm)	Weight at 0 mm Stroke				Switch Mounting bracket Weight		St=100 mm Additional Weight per
	Basic type (00)	Foot type		Switch Weight	T Type	M Type	
		(LB)	(LB1)				
ø12 equivalent	0.24	0.25	0.26	Refer to the mass described in the switch specifications on P. 1457.	0.005	0.001	0.10
ø16 equivalent	0.32	0.33	0.35				0.13
ø20 equivalent	0.52	0.54	0.58				0.18
ø25 equivalent	1.0	1.1	1.1				0.28
ø32 equivalent	1.5	1.6	1.7				0.36
ø40 equivalent	2.4	2.5	-				0.53
ø50 equivalent	3.5	3.6	-				0.75
ø63 equivalent	6.1	6.4	-				1.11
ø80 equivalent	18.8	19.4	-				2.32
ø100 equivalent	26.6	27.6	-				3.38

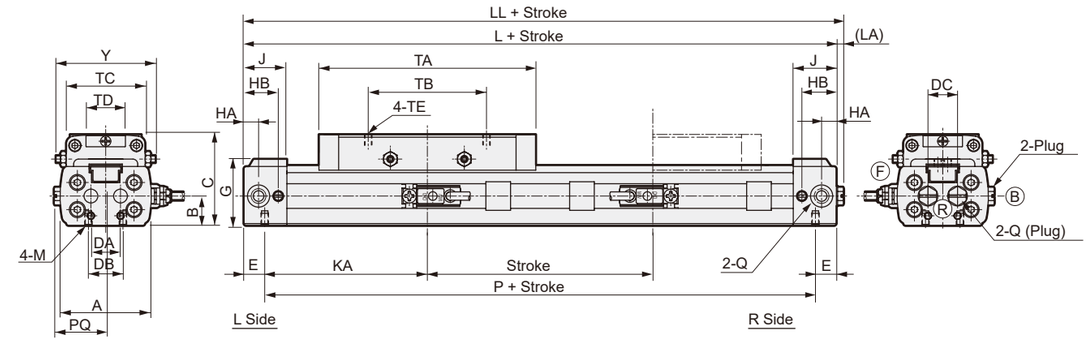
Theoretical Thrust Table

(Unit: N)

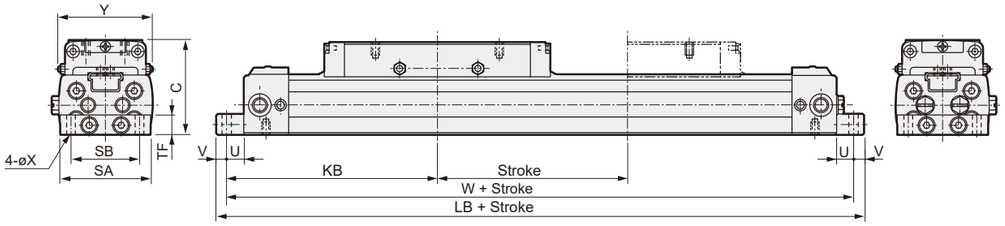
Bore Size (mm)	Operating Direction	Operating Pressure MPa								
		0.1	0.15	0.2	0.25	0.3	0.4	0.5	0.6	0.7
ø12 equivalent	Push/Pull	-	-	-	34.6	41.5	55.3	69.1	83.0	96.8
ø16 equivalent	Push/Pull	-	-	-	54.0	64.8	86.4	1.08×10^2	1.30×10^2	1.51×10^2
ø20 equivalent	Push/Pull	-	-	-	78.6	94.4	1.26×10^2	1.57×10^2	1.89×10^2	2.20×10^2
ø25 equivalent	Push/Pull	-	81.4	1.08×10^2	1.35×10^2	1.63×10^2	2.17×10^2	2.71×10^2	3.25×10^2	3.80×10^2
ø32 equivalent	Push/Pull	-	1.22×10^2	1.63×10^2	2.04×10^2	2.44×10^2	3.26×10^2	4.07×10^2	4.88×10^2	5.70×10^2
ø40 equivalent	Push/Pull	-	1.90×10^2	2.53×10^2	3.16×10^2	3.80×10^2	5.06×10^2	6.33×10^2	7.60×10^2	8.86×10^2
ø50 equivalent	Push/Pull	-	2.98×10^2	3.98×10^2	4.98×10^2	5.96×10^2	7.95×10^2	9.94×10^2	1.19×10^3	1.39×10^3
ø63 equivalent	Push/Pull	3.14×10^2	4.70×10^2	6.27×10^2	7.84×10^2	9.41×10^2	1.25×10^3	1.57×10^3	1.88×10^3	2.20×10^3
ø80 equivalent	Push/Pull	5.06×10^2	7.60×10^2	1.01×10^3	1.26×10^3	1.52×10^3	2.03×10^3	2.53×10^3	3.04×10^3	3.54×10^3
ø100 equivalent	Push/Pull	7.91×10^2	1.19×10^3	1.58×10^3	1.98×10^3	2.37×10^3	3.16×10^3	3.95×10^3	4.74×10^3	5.53×10^3

External Dimensions (Bore Size: ø12 to ø20 equivalent)

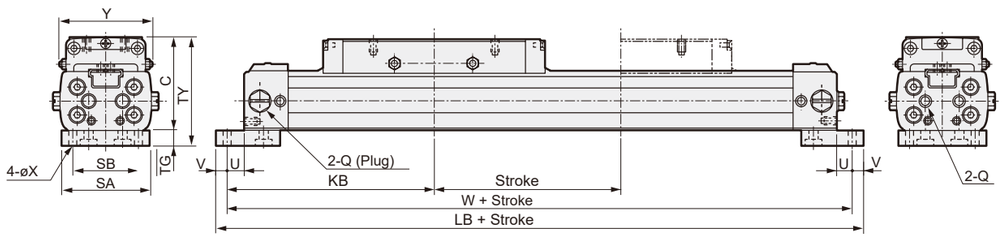
● SRL3-G-12 to 20



● With Foot Bracket SRL3-G-LB-12 to 20



● With Foot Bracket SRL3-G-LB1-12 to 20



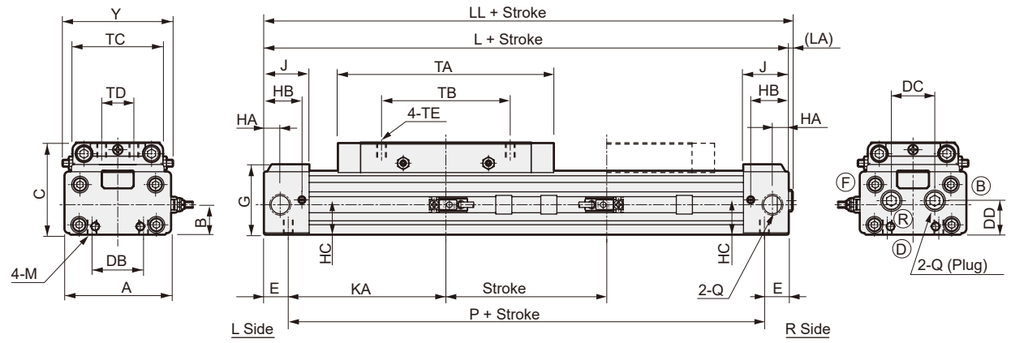
Code / Bore Size (mm)	A	B	C	DA	DB	DC	E	G	HA	HB	J	KA	L	LL	LA	M	P	PQ	Q	TA	TB	TC	TD	TE	Y
ø12 equivalent	33	10.5	33	8	10	11	8.5	24	6	14	17.5	59.5	136	139	3	M3 Depth 5	119	19	M5	81	42	29	13	M3 Depth 5	36 to 38
ø16 equivalent	37	12	37	12	14	12	8.5	27	6	14	17.5	66	149	152	3	M3 Depth 5	132	21	M5	88	48	32	15	M3 Depth 5	39 to 41
ø20 equivalent	44	14	42	16	16	16	10.5	31	8.5	18.5	22	74	169	171.5	2.5	M4 Depth 6.5	148	24.5	Rc 1/8	100	60	38	18	M4 Depth 6	43 to 45

Code / Bore Size (mm)	With Foot Bracket (LB)									With Foot Bracket (LB1)									
	KB	LB	SA	SB	TF	U	V	W	X	KB	LB	SA	SB	TG	TY	U	V	W	X
ø12 equivalent	74	156	32	24	8	6	4	148	3.4	74	156	32	24	6	39	6	4	148	3.4
ø16 equivalent	80.5	169	35	26	8	6	4	161	3.4	80.5	169	35	26	6	43	6	4	161	3.4
ø20 equivalent	90.5	193	43	33	10	6	6	181	4.5	90.5	193	43	33	8	50	6	6	181	4.5

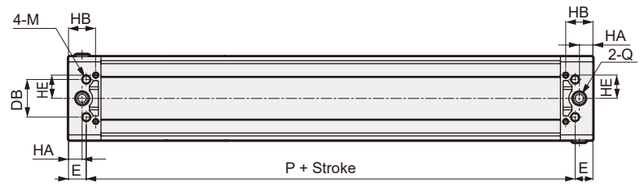
Note: For external dimensions diagrams with options and with each switch, please refer to P. 20 to 23, and 86.

External Dimensions (Bore Size: ø25 to ø63 equivalent)

● SRL3-G-25 to 63



● Bottom piping (option code: D/S)



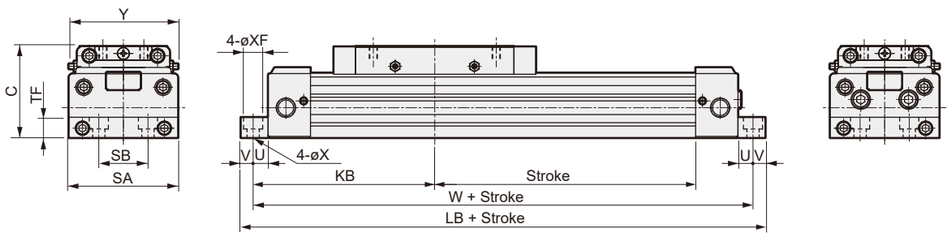
Code / Bore Size (mm)	A	B	C	DB	DC	DD	E	G	HA	HB	HC	HE	J	KA	L
ø25 equivalent	53	17	53	20	26	19	14	40.5	7.5	20	18.9	-	24	81	190
ø32 equivalent	66	18.5	57	32	27	21	15	43.5	10	23.5	21.5	17	28	98	226
ø40 equivalent	80	22	67	36	35	28	17	51.5	13	26	27	22.3	31	105	244
ø50 equivalent	96	28	82	45	35	35	23	61	15	33	35.3	11	39	106	258
ø63 equivalent	118	35	95	50	39	42	19	74	15	32	43	31	39	129	296

Code / Bore Size (mm)	LL	LA	M	P	Q	TA	TB	TC	TD	TE	Y
ø25 equivalent	192	2	M6 Depth 9	162	Rc 1/8	122	70	48	20	M5 Depth 6	58 to 61
ø32 equivalent	228.5	2.5	M6 Depth 9	196	Rc 1/4	134	80	56	20	M6 Depth 7.5	65 to 69
ø40 equivalent	246.5	2.5	M8 Depth 12	210	Rc 1/4	148	90	68	30	M6 Depth 9	77 to 81
ø50 equivalent	260.5	2.5	M8 Depth 12	212	Rc 3/8	152	100	80	30	M8 Depth 10.5	92 to 96
ø63 equivalent	298.5	2.5	M10 Depth 15	258	Rc 3/8	168	110	102	40	M8 Depth 11.5	114 to 118

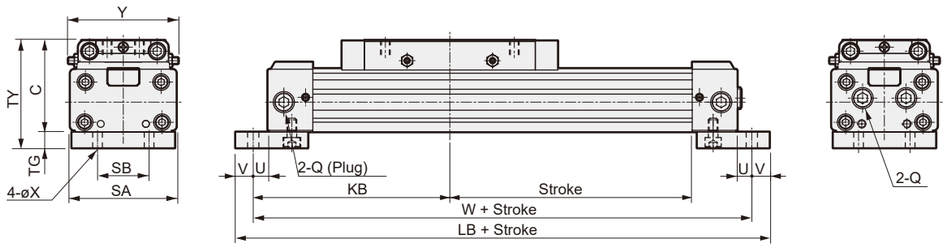
***1: Refer to P. 20 to 23, and 86 for dimensions with options and with switches.**
*2: Bottom porting is not available for ø25 equivalent.

External Dimensions (Bore Size: ø25 to ø63 equivalent)

● With Foot Bracket SRL3-G-LB-25 to 63



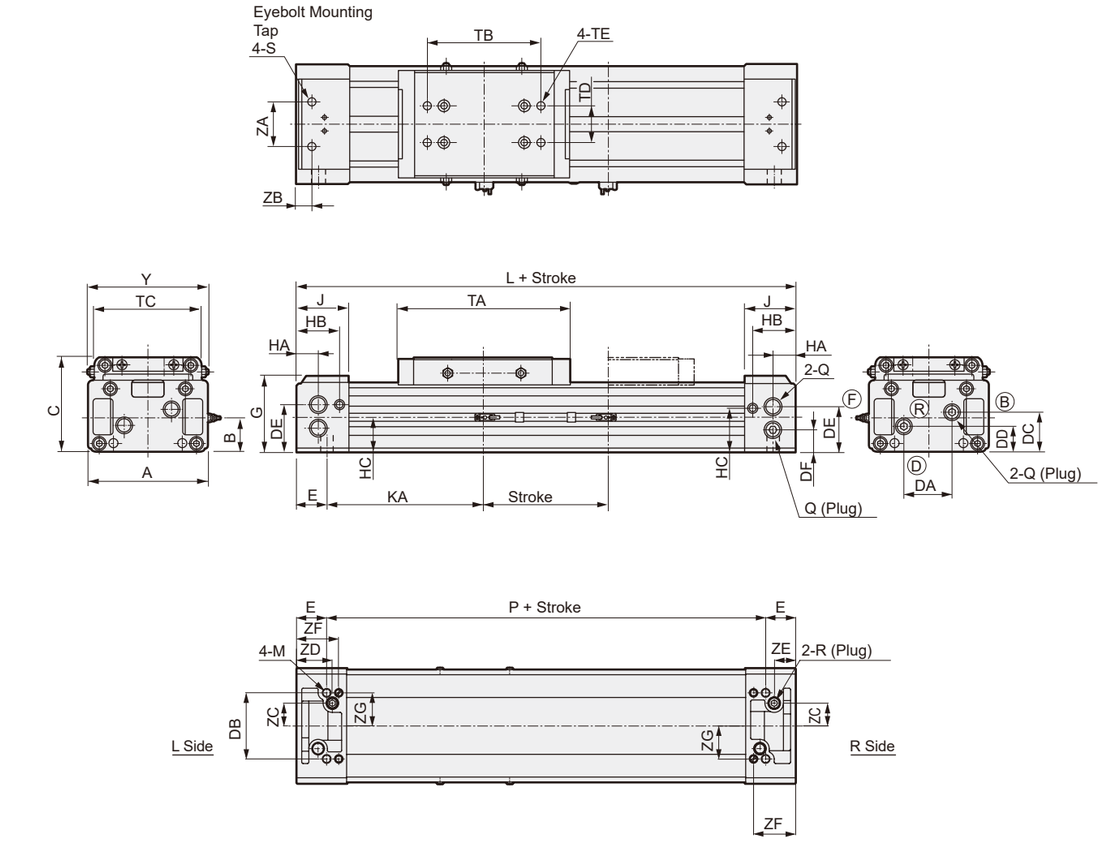
● With Foot Bracket SRL3-G-LB1-25, 32 (Supports ø40 to ø63 or equiv. mounting: there is no LB1)



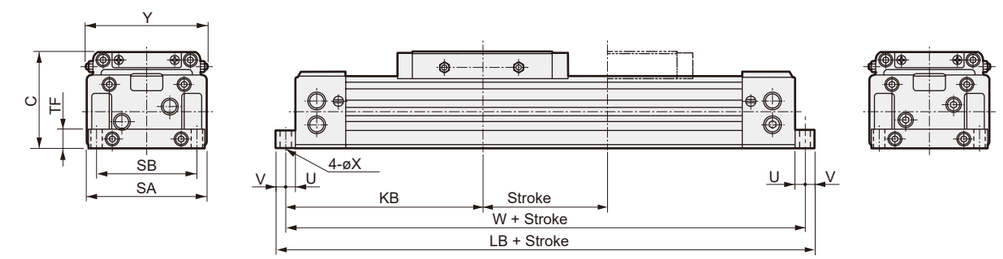
Code	With Foot Bracket (LB)										With Foot Bracket (LB1)									
Bore Size (mm)	KB	LB	SA	SB	TF	U	V	W	X	XF	KB	LB	SA	SB	TG	TY	U	V	W	X
ø25 equivalent	104	230	52	20	12	9	11	208	7	-	104	230	50	20	10	63	9	11	208	7
ø32 equivalent	122	266	64	32	12	9	11	244	7	-	122	266	64	32	10	67	9	11	244	7
ø40 equivalent	133	284	80	36	15	11	9	266	9	14 Counterbore Depth 8.6	-	-	-	-	-	-	-	-	-	-
ø50 equivalent	140	298	94	45	20	11	9	280	9	14 Counterbore Depth 8.6	-	-	-	-	-	-	-	-	-	-
ø63 equivalent	161	346	116	50	25	13	12	322	11	17.5 Counterbore Depth 10.8	-	-	-	-	-	-	-	-	-	-

External Dimensions (Bore Size: ø80 to ø100 equivalent)

● SRL3-G-80 to 100



● With Foot Bracket SRL3-G-LB-□□ -□□□

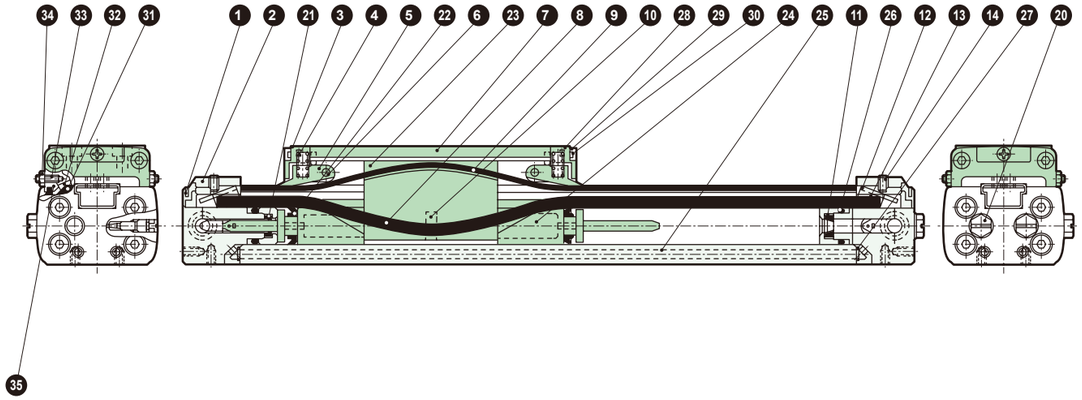


Code	A	B	C	DA	DB	DC	DD	DE	DF	E	G	HA	HB	HC	J	KA	L	M	P	Q	R	S
Bore Size (mm)																						
ø80 equivalent	162	49	130	64	93	58	38	65	33	42	106	30	59	64.5	70	208	500	M12 Depth 18	416	Rc 1/2	Rc 3/8	M12 Depth 23
ø100 equivalent	198	61.5	150	73	108	71.5	47.5	81.5	41.5	43	125	30	69	76.5	80	222	530	M12 Depth 18	444	Rc 1/2	Rc 1/2	M12 Depth 23

Code	TA	TB	TC	TD	TE	Y	ZA	ZB	ZC	ZD	ZE	ZF	ZG	With Foot Bracket LB								
Bore Size (mm)														KB	LB	SA	SB	TF	U	V	W	X
ø80 equivalent	228	150	146	50	M12 Depth 15	157 to 164	60	21	32	50	30	59	46.5	263	550	162	134	25	13	12	526	14
ø100 equivalent	238	160	170	60	M12 Depth 15	183 to 190	60	21	36.5	55	30	69	54	280	590	198	160	30	15	15	560	14

Note: For external dimensions diagrams with options and with each switch, please refer to P. 20 to 23, and 86.

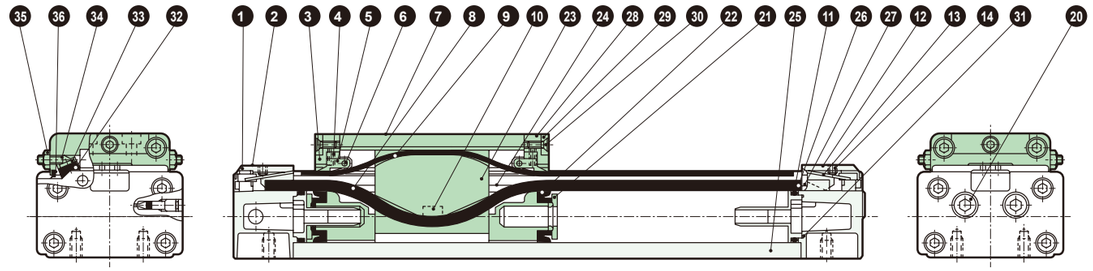
Internal Structure / Material (Bore Size: ø12 to ø40 equivalent)



No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Belt Cover	Polyamide		19	Cushion Needle	Steel	Zinc Chromate
2	Cover (L)	Aluminum Alloy	Baked Painting	20	Plug	ø12, ø16: Copper Alloy	ø12, ø16: Nickel Plating
3	Table Cover	Polyacetal				ø20 to ø40: Steel	ø20 to ø40: Zinc Chromate
4	Spring	Steel	Black Oxide	21	Cushion Seal	Urethane Rubber	
5	Belt Holder	Polyacetal		22	Piston Packing	Nitrile Rubber	
6	Parallel Pin (ø12 to ø20)	Stainless Steel		23	Yoke	Aluminum Alloy	Alumite
	Shaft (ø25 to ø40)	Steel	Zinc Chromate	24	Piston	Polyacetal	
7	Table	Aluminum Alloy	Alumite	25	Cylinder Tube	Aluminum Alloy	Alumite
8	Seal Belt	Urethane Rubber		26	Cylinder Gasket	Nitrile Rubber	
9	Dustproof Belt	Stainless Steel, Nitrile Rubber		27	O-ring for Centralized Port	Nitrile Rubber	
10	Magnet			28	Double-sided Tape		
11	Cushion Adapter	Polyacetal		29	Plate	ø12 to ø20: Stainless Steel	
12	Cover (R)	Aluminum Alloy	Baked Painting			ø25 to ø40: Alloy Steel	ø25 to ø40: Zinc Chromate
13	Belt Spacer	Steel	Zinc Chromate	30	Cross-Recessed Tapping Screw	Stainless Steel	
14	Hexagon Socket Set Screw	Alloy Steel	Zinc Chromate	31	Slider	Polyacetal	
15	Hexagon Socket Head Cap Screw	Alloy Steel	Zinc Chromate	32	Slider Plate	Steel	
16	Hexagon Socket Head Cap Screw	Stainless Steel		33	Adjustment Screw	Alloy Steel	Zinc Chromate
17	Hexagon Socket Head Cap Screw	Alloy Steel	Zinc Chromate	34	Nut	Steel	Zinc Chromate
18	Needle Gasket	Nitrile Rubber		35	Scraper	Polyacetal	

For maintenance parts, please visit the CKD Equipment Product Site
(https: //www.ckd.co.jp/kiki/en/) → "model No." → Maintenance Parts.

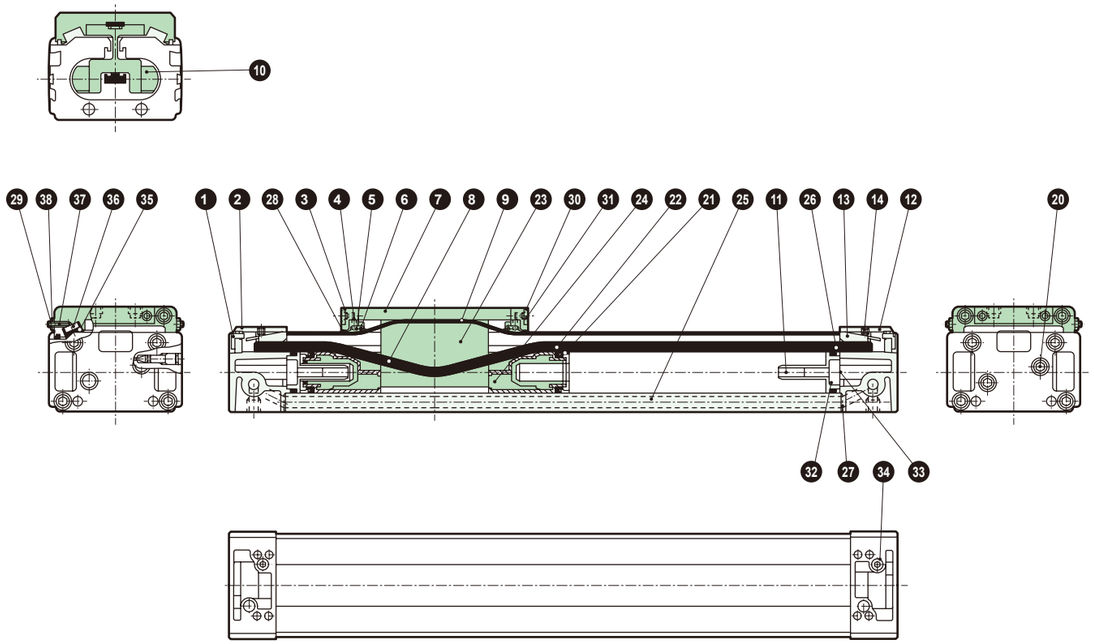
Internal Structure / Material (Bore Size: ø50, ø63 equivalent)



No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Belt Cover	Polyamide		19	Cushion Needle	Steel	Zinc Chromate
2	Cover (L)	Aluminum Alloy	Baked Painting	20	Plug	Steel	Zinc Chromate
3	Table Cover	Polyacetal		21	Cushion Seal	Urethane Rubber	
4	Spring	Steel	Black Oxide	22	Piston Packing	Nitrile Rubber	
5	Belt Holder	Polyacetal		23	Yoke	Aluminum Alloy	Alumite
6	Shaft	Steel	Zinc Chromate	24	Piston	Polyacetal	
7	Table	Aluminum Alloy	Alumite	25	Cylinder Tube	Aluminum Alloy	Alumite
8	Seal Belt	Urethane Rubber		26	Cylinder Gasket	Nitrile Rubber	
9	Dustproof Belt	Stainless Steel, Nitrile Rubber		27	O-ring for Centralized Port	Nitrile Rubber	
10	Magnet			28	Double-sided Tape		
11	Cushion Ring	Polyacetal		29	Plate	Alloy Steel	Zinc Chromate
12	Cover (R)	Aluminum Alloy	Baked Painting	30	Cross-Recessed Tapping Screw	Stainless Steel	
13	Belt Spacer	Steel	Zinc Chromate	31	Cushion Ring Gasket	Nitrile Rubber	
14	Hexagon Socket Set Screw	Alloy Steel	Zinc Chromate	32	Slider	Polyacetal	
15	Hexagon Socket Head Cap Screw	Alloy Steel	Zinc Chromate	33	Slider Plate	Steel	Zinc Chromate
16	Hexagon Socket Head Cap Screw	Stainless Steel		34	Adjustment Screw	Alloy Steel	Zinc Chromate
17	Hexagon Socket Head Cap Screw	Alloy Steel	Zinc Chromate	35	Nut	Steel	Zinc Chromate
18	Needle Gasket	Nitrile Rubber		36	Scraper	Polyacetal	

For maintenance parts, please visit the CKD Equipment Product Site
(https: //www.ckd.co.jp/kiki/en/) → "model No." → Maintenance Parts.

Internal Structure / Material (Bore Size: ø80, ø100 equivalent)

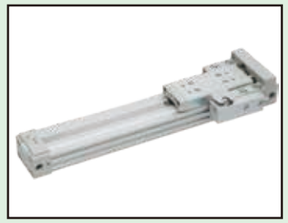


No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Belt Cover	Polyamide		20	Plug	Steel	Zinc Chromate
2	Cover (L)	Aluminum Alloy	Baked Painting	21	Cushion Seal	Urethane Rubber	
3	Table Cover	Polyacetal		22	Piston Packing	Nitrile Rubber	
4	Spring	Steel	Black Oxide	23	Yoke	Aluminum Alloy	Alumite
5	Belt Holder	Polyacetal		24	Piston	Polyacetal	
6	Shaft	Steel	Zinc Chromate	25	Cylinder Tube	Aluminum Alloy	Alumite
7	Table	Aluminum Alloy	Alumite	26	Cylinder Gasket	Nitrile Rubber	
8	Seal Belt	Urethane Rubber		27	O-ring for Centralized Port	Nitrile Rubber	
9	Dustproof Belt	Stainless Steel, Nitrile Rubber		28	Felt (1)	Wool	
10	Magnet			29	Felt (2)	Wool	
11	Cushion Ring	Polyacetal		30	Plate	Alloy Steel	Zinc Chromate
12	Cover (R)	Aluminum Alloy	Baked Painting	31	Cross-Recessed Tapping Screw	Stainless Steel	
13	Belt Spacer	Steel	Zinc Chromate	32	Cushion Ring Gasket (1)	Nitrile Rubber	
14	Hexagon Socket Set Screw	Alloy Steel	Zinc Chromate	33	Cushion Ring Gasket (2)	Nitrile Rubber	
15	Hexagon Socket Head Cap Screw	Alloy Steel	Zinc Chromate	34	Plug	Steel	Zinc Chromate
16	Hexagon Socket Head Cap Screw	Stainless Steel		35	Slider	Polyacetal	
17	Hexagon Socket Head Cap Screw	Alloy Steel	Zinc Chromate	36	Slider Plate	Steel	Zinc Chromate
18	Needle Gasket	Nitrile Rubber		37	Adjustment Screw	Alloy Steel	Zinc Chromate
19	Cushion Needle	Steel	Zinc Chromate	38	Nut	Steel	Zinc Chromate

For maintenance parts, please visit the CKD Equipment Product Site (https: //www.ckd.co.jp/kiki/en/) → "model No." → Maintenance Parts.

MEMO

Rodless Type
SRL3
SRG3
SRM3
SRT3
MRL2
MRG2
SM-25
Cylinder Switch
Ending



Rodless Cylinder Double Acting / Fall Prevention Type

SRL3-Q Series

● Bore Size: ø12, ø16, ø20, ø25, ø32, ø40, ø50, ø63, ø80, ø100 or equiv.

Circuit Diagram Code

RoHS

Model No. Notation

Without Switch
(Built-in magnet for switch)

SRL3-Q - 00 - 12 [ ] B - 200 ——— B

Model No. ❶ ❷ ❸ ❹ ❺ ❽

With Switch
(Built-in magnet for switch)

SRL3-Q - 00 - 12 [ ] B - 200 - M0H - R - B

Model No. ❷Bore Size ❹Cushion ❻Switch Model No. ❽Option
❶Mounting type ❸Piping thread type ❺Stroke ❼Number of Switches

❶Mounting type

Mounting brackets are pre-assembled on the product and shipped.

Code	Content	
00	Basic type	
LB	Axial Foot Type	
LB1	Axial Foot Type (ø12 to ø32 equivalent only)	

Note: ❷Have Bore Sizes equivalent to ø12, ø16, ø20, ø25, and ø32 ❽For option codes "R" and "T", the mounting style will be "00" or "LB1".
(❽Option Code "R" and "T" with mounting type "LB" cannot be manufactured because piping is not possible.)

❷Bore Size (mm)

Code	Content
12	ø12 equivalent
16	ø16 equivalent
20	ø20 equivalent
25	ø25 equivalent
32	ø32 equivalent
40	ø40 equivalent
50	ø50 equivalent
63	ø63 equivalent
80	ø80 equivalent
100	ø100 equivalent

❸Piping thread type

Code	Content
Blank	M5 (ø12, ø16 equivalent) Rc Thread (ø20 to ø100 equivalent)
N	NPT Thread (ø20 equivalent or larger) (Custom-made)
G	G Thread (ø20 equivalent or larger) (Custom-made)

❹Cushion

Code	Content
B	With Cushion on Both Sides
R	With R Side Cushion
L	With L Side Cushion
N	Without Cushion

❺Stroke (mm)

Bore Size	Stroke	Intermediate Stroke
ø12 to ø100 equivalent	5 to 5000	Every 1 mm

Note: For the minimum stroke with switch, please refer to P. 46.

❻Switch Model No.

For switch details, please refer to P. 1457. Switches are included with the product and shipped.

	Indicator LED Special Function	Wiring (Output)	Load Voltage (V) AC	Load Voltage (V) DC	Load Current (mA) AC	Load Current (mA) DC	Lead wire *1 Straight	Lead wire *1 L-shape	
Solid State	1-Color	2-wire	-	10 to 30	-	5 to 30	M2H□	M2V□	
	2-Color		-	10 to 30	-	5 to 30	-	M2WV□	
	1-Color	3-wire (NPN)	-	30 or less	-	100 or less	M3H□	M3V□	
	2-Color		-	30 or less	-	100 or less	-	M3WV□	
	1-Color (Custom order)	3-wire (PNP)	-	30 or less	-	100 or less	M3PH□	M3PV□	
	2-Color	2-wire	-	24 ± 10%	-	5 to 20	T2WH□	T2WV□	
		3-wire (NPN)	-	30 or less	-	50 or less	T3WH□	T3WV□	
	2-Color for AC Magnetic Field	2-wire	-	24 ± 10%	-	5 to 20	T2YD□	-	
			—		-		T2YDT□	-	
Reed	1-Color	2-wire	110	12/24	7 to 20	5 to 50	M0H□	M0V□	
	No Indicator LED		110	5/12/24	20 or less	50 or less	M5H□	M5V□	

*1: For "□" in the switch model number, enter the code selected from the "Lead wire length" table.
*2: Switches other than the model numbers listed above are also available. (Custom Product) For details, see P. 1457.

* Lead wire length

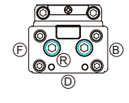
Code	Content
Blank	1 m (Standard)
3	3 m (Option)
5	5 m (Option)

Example) Lead wire length
1 m M0V
3 m M0V3
5 m M0V5

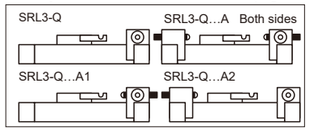
❼Number of Switches

Code	Content
R	With 1 pc on R side
L	With 1 pc on L side
D	With 2 pcs
T	With 3 pcs
4	With 4 pcs (If 4 or more, enter the number of switches)

❽Option

	Code	Description	Bore Size (ø) equivalent 12	16	20	25	32	40	50	63	80	100	
	A	Full stroke adjustment both sides, with shock absorber	●	●	●	●	●	●	●	●	●	●	
	A1	Full stroke adjustment R side only, with shock absorber	●	●	●	●	●	●	●	●	●	●	
	A2	Full stroke adjustment L side only, with shock absorber	●	●	●	●	●	●	●	●	●	●	
	A3	Full Stroke Adjustment Bracket Retrofit Type	●	●	●	●							
	Y	Floating Joint	●	●	●	●	●	●	●	●	●	●	
	Y1	Low Profile Floating Joint	●	●	●	●							
*2	L*	Intermediate Support Bracket (for 00, LB)	●	●	●	●	●	●	●	●	●	●	
*2	N*	With Intermediate Support Bracket (for LB1)	●	●	●	●	●						
*5	H	Table Mounting Screw Size Larger	●	●	●								
	U	Height Adjustment Plate	●	●	●	●	●	●	●	●	●	●	
	Blank	Port Position: F (Standard)	Cushion Needle Position: F (Standard)	●	●	●	●	●	●	●	●	●	●	
	R	Port Position: R (Centralized Port)	Cushion Needle Position: F	●	●	●	●	●	●	●	●	●	●	
	B	Port Position: F	Cushion Needle Position: B	●	●	●	●	●	●	●	●	●	●	
	T	Port Position: R (Centralized Port)	Cushion Needle Position: B	●	●	●	●	●	●	●	●	●	●	
	D	Port Position: D	Cushion Needle Position: F				●	●	●	●	●	●	●	
	S	Port Position: D	Cushion Needle Position: D					●	●	●	●	●	●	
	X	Port Position: F (Centralized Port)	Cushion Needle Position: F									●	●	

*1: Since the full stroke adjustment bracket on the R side is a standard part for fall prevention, only the shock absorber is added to the R side when A1 is specified. When A is indicated, the R side is equipped with fall prevention, full stroke adjustment, and shock absorber, and the L side is equipped with full stroke adjustment and shock absorber. (Figure below)



*2: The Code "□" in L□, N□ indicates the number of sets. If 2 sets are required, enter "L2" (for LB) or "N2" (for LB1). 2 pcs / 1 set
*3: For port and cushion needle position display symbols, please refer to the external dimensions diagrams on P. 48 to 50.
*4: For standard types ø12 to ø25 equivalent, it is necessary to remove the cover, assemble the plate nut, and retrofit the full stroke adjustment bracket. A3 is an option with a mounting plate nut assembled for retrofitting the full stroke adjustment bracket without removing the cover.
*5: "H" means screw size is "M4" for ø12, ø16 equivalent and "M5" for ø20 equivalent.
*6: Be sure to check the combination of options in the "Option Combination Table" on the next page.
*7: If ❶mounting method "LB1" is selected, options "D" or "S" cannot be selected.

Rechargeable Battery Compatible Specification (Catalog No. CC-1226AA)

●Design compatible with rechargeable battery manufacturing process

SRL3-Q - ···· - P4*

*Please contact us for details.

Option Combination Table

●: Combinable ▒: Not Combinable

	Code	A	A1	A2	A3	Y	Y1	L□	N□	H	U	Blank	R	B	T	D	S	X
		Full stroke adjustment both sides, with shock absorber	Full stroke adjustment R side only, with shock absorber	Full stroke adjustment L side only, with shock absorber	Full Stroke Adjustment Bracket Retrofit Type	Floating Joint	Low Profile Floating Joint	Intermediate support bracket (for 00, LB)	Intermediate Support Bracket (for LB1)	Table Mounting Screw Size Up	Height Adjustment Plate	Port position F, Cushion needle position F (Standard)	Port position R, Cushion needle position F (Centralized port)	Port position F, Cushion needle position B	Port position R, Cushion needle position B(Centralized port)	Port position D, Cushion needle position F	Port position D, Cushion needle position D	Port position F, Cushion needle position F(Centralized port)
Option	A		●	●	▒	●	●	●	●	●	●	●	●	●	●	●	●	●
	A1	●		●	▒	●	●	●	●	●	●	●	●	●	●	●	●	●
	A2	●	●		▒	●	●	●	●	●	●	●	●	●	●	●	●	●
	A3	●	●	●		●	●	●	●	●	●	●	●	●	●	●	●	▒
	Y	●	●	●	●		▒	●	●	▒	▒	●	●	●	●	●	●	●
	Y1	●	●	●	●	▒		●	●	▒	▒	●	●	●	●	●	●	▒
	L□	●	●	●	●	●	●		▒	●	●	●	●	●	●	●	●	●
	N□	●	●	●	●	●	●	▒		●	●	●	●	●	●	●	●	▒
	H	●	●	●	●	●	●	●	●		▒	●	●	●	●	●	●	▒
	U	●	●	●	●	●	●	●	●	▒		●	●	●	●	●	●	●
	Blank	●	●	●	●	●	●	●	●	●	●		▒	▒	▒	▒	▒	▒
	R	●	●	●	●	●	●	●	●	●	●	▒		▒	▒	▒	▒	▒
	B	●	●	●	●	●	●	●	●	●	●	▒	▒		▒	▒	▒	▒
	T	●	●	●	●	●	●	●	●	●	●	▒	▒	▒		▒	▒	▒
	D	●	●	●	●	●	●	●	●	●	●	▒	▒	▒	▒		▒	▒
	S	●	●	●	●	●	●	●	●	●	●	▒	▒	▒	▒	▒		▒
	X	●	●	●	●	●	▒	●	▒	▒	●	▒	▒	▒	▒	▒	▒	

***1: Depending on the Bore Size, some combinations may not be possible, so be sure to check the option column in the "Model Number Notation Method" ❽ on the previous page.**

*2: If ❶mounting method "LB1" is selected, ❽options “D” or “S” cannot be selected.

Switch Individual Model No. Indication **(For parts composition, please refer to Pages 88 to 90.)**

●Switch body+Mounting bracket set (*1)

SRL3 - M0H

❻Switch Model No.

●Switch body only

SW - M0H

❻Switch Model No.

●Mounting bracket complete set (*2)

• M Type Switch

SRL3 - M

• T Type Switch

SRL3 - T

● Lead wire holder (*3)

SRL3 - MH

*1: The switch body + mounting bracket set does not include a lead wire holder. If a lead wire holder is required, please order it separately.
*2: The mounting bracket is different for M type switch and T type switch.
*3: Lead wire holder is 10 pcs/1 set.

● How to order discrete shock absorber

(1 Shock absorber, 1 Hexagon Nut for fixing shock absorber)

SRL3 - 40 - NCK

❷Bore Size

Note: Note that the Hexagon Nut only for Shock Absorbers fixing for SRL3-40 is different from the NCK standard nut.

Applicable Shock Absorber Model No.

Model	Shock Absorber Model No.
SRL3-12	NCK-00-0.3-C
SRL3-16	NCK-00-0.3-C
SRL3-20	NCK-00-0.7-C
SRL3-25	NCK-00-1.2
SRL3-32	NCK-00-2.6
SRL3-40	NCK-00-7
SRL3-50	NCK-00-12
SRL3-63	NCK-00-12
SRL3-80	NCK-00-20
SRL3-100	NCK-00-20

●Floating Joint Set Model No. Notation

(Mount, Mount Base, Pin, Flat Washer, Pan Head Screw with Spring Washer)

SRL3 - 40 - Y

❷Bore Size

● How to order discrete intermediate support bracket

For 00, LB

SRL3 - 40 - L (2 pcs / 1 set)

❷Bore Size

For LB1

SRL3 - 32 - N (2 pcs / 1 set)

❷Bore Size

● How to order full stroke adjusting bracket kit

SRL3 - 40 - A1 (1 Set)

❷Bore Size

(For parts composition, please refer to the full stroke adjustment bracket kit on P. 89.)

●Mounting Bracket Model No. Notation

(2 Brackets, 4 Mounting Bolts)

SRL3 - LB - 40

❶ Mounting type ❷Bore Size

● How to order height adjustment plate set

(Plate, 4 Mounting Bolts)

SRL3 - 40 - U

❷Bore Size

Specifications

Item		SRL3-Q									
Bore Size mm		ø12 Equivalent	ø16 Equivalent	ø20 Equivalent	ø25 Equivalent	ø32 Equivalent	ø40 Equivalent	ø50 Equivalent	ø63 Equivalent	ø80 Equivalent	ø100 Equivalent
Operation Method		Double Acting Type									
Operating Fluid		Compressed Air									
Max Operating Pressure MPa		0.7									
Min Operating Pressure MPa		0.2			0.15			0.1			
Proof Pressure MPa		1.05									
Ambient Temperature °C		5 to 60									
Port Size	Cylinder Part	M5		Rc 1/8		Rc 1/4		Rc 3/8		Rc 1/2	
	Fall Prevention Part	M5		Rc 1/8							
Stroke tolerance mm		$^{+2.0}_{0}$ (to 1000) $^{+2.5}_{0}$ (to 3000) $^{+3.0}_{0}$ (to 5000)									
Operating Piston Speed mm/s		50 to 2000 (Standard Port Piping) *1									
Cushion		Air Cushion									
Lubrication		Not required (If lubricating, use Turbine Oil Class 1 ISO VG32. Note that once lubrication is started, it must be continued.)									
Fall Prevention Mechanism		Installed on Cover R Side									
Holding Force N		Maximum Thrust × 0.7									

*1: ①When the piston moves at 500 to 2000 mm/s, reduce the speed when entering the position locking mechanism to 500 mm/s or less. For common port piping, the working piston speed varies depending on the stroke. Contact CKD.
②As a deceleration method, please use an external shock absorber or a deceleration circuit.
③Apply grease periodically to the sliding part of the lock lever.

Allowable Absorption Energy

Bore Size (mm)	With Cushion		Without Cushion	With Shock Absorber (Initial Setting)	
	Allowable Absorption Energy (J)	Cushion Stroke (mm)	Allowable Absorption Energy (J)	Absorption Energy (J)	Effective Stroke (mm)
ø12 equivalent	0.03	14.5	0.003	2.4	5.5
ø16 equivalent	0.22	19.2	0.007	2.4	5.5
ø20 equivalent	0.59	22.2	0.010	5.7	7
ø25 equivalent	1.40	20.9	0.015	10	9
ø32 equivalent	2.57	23.5	0.030	18	13
ø40 equivalent	4.27	23.9	0.050	50	16.5
ø50 equivalent	9.13	24.9	0.072	86	21
ø63 equivalent	17.4	29.6	0.138	86	21
ø80 equivalent	40	45.8	0.393	143	25
ø100 equivalent	67	45.8	0.622	143	25

Stroke

Bore Size (mm)	Standard Stroke (mm)	Max Stroke (mm)	Min Stroke (mm)
ø12, ø16, ø20, ø25, ø32, ø40, ø50, ø63, ø80, ø100 equivalent	200, 300, 400, 500, 600, 700, 800, 900, 1000	5000	5

Note: Intermediate strokes can be manufactured in 1 mm increments.

M Type Switch Mounting Quantity and Minimum Stroke (mm)

Switch Qty.	1		2	
Switch Model No. / Bore Size (mm)	M□V	M□H	M□V	M□H
ø12 equivalent	10	10	30	70
ø16 equivalent	10	10	30	70
ø20 equivalent	10	10	30	70
ø25 equivalent	10	10	30	70
ø32 equivalent	10	10	30	45
ø40 equivalent	10	10	30	45
ø50 equivalent	15	15	30	45
ø63 equivalent	15	15	30	45
ø80 equivalent	25		50	
ø100 equivalent	25		50	

T Type Switch Mounting Quantity and Minimum Stroke (mm)

Switch Qty.	1		2	
Switch Model No. / Bore Size (mm)	T□V	T□H	T□V	T□H
ø12 equivalent	5	5	45	70
ø16 equivalent	5	5	45	70
ø20 equivalent	5	5	45	70
ø25 equivalent	10	10	45	70
ø32 equivalent	10	10	45	50
ø40 equivalent	10	10	45	50
ø50 equivalent	10	10	45	50
ø63 equivalent	10	10	45	50
ø80 equivalent	15	15	45	50
ø100 equivalent	15	15	45	50

Before use, be sure to read the precautions for use for Drop prevention type on P. 106 to 109.

Cylinder Weight

Unit: kg

Bore Size (mm)	Weight at 0 mm Stroke				Switch Mounting Bracket Weight		St=Additional weight per 100 mm stroke
	Basic type (00)	Foot type		Switch Weight	T Type	M Type	
		(LB)	(LB1)				
ø12 equivalent	0.38	0.39	0.40	Refer to the mass described in the switch specifications on P. 1457.	0.005	0.001	0.10
ø16 equivalent	0.47	0.48	0.50				0.13
ø20 equivalent	0.74	0.76	0.80				0.18
ø25 equivalent	1.5	1.6	1.6				0.28
ø32 equivalent	2.4	2.5	2.6				0.36
ø40 equivalent	3.6	3.7	-				0.53
ø50 equivalent	6.0	6.1	-				0.75
ø63 equivalent	8.8	9.1	-				1.11
ø80 equivalent	22.4	23.0	-				2.32
ø100 equivalent	30.5	31.5	-				3.38

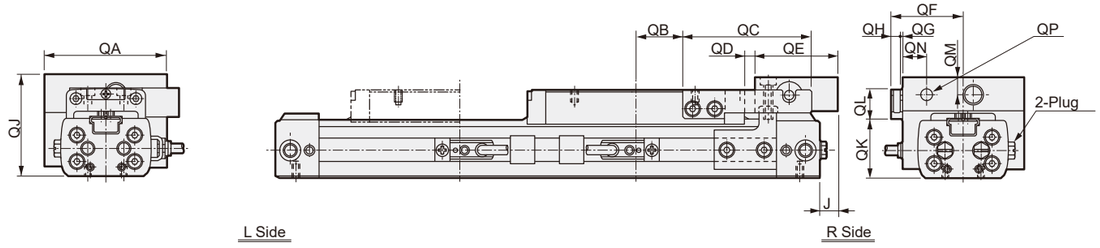
Theoretical Thrust Table

(Unit: N)

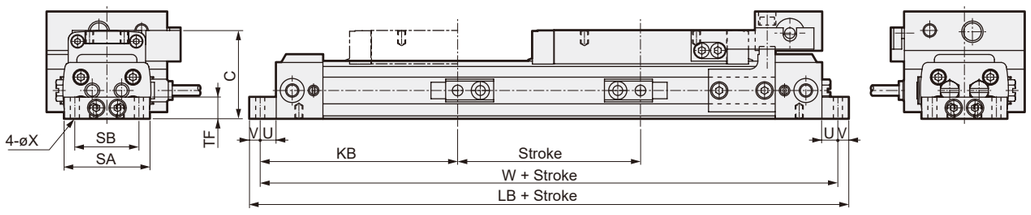
Bore Size (mm)	Operating Direction	Operating Pressure MPa							
		0.1	0.15	0.2	0.3	0.4	0.5	0.6	0.7
ø12 equivalent	Push/Pull	-	-	27.7	41.5	55.3	69.1	83.0	96.8
ø16 equivalent	Push/Pull	-	-	43.2	64.8	86.4	1.08×10^{2}	1.30×10^{2}	1.51×10^{2}
ø20 equivalent	Push/Pull	-	-	62.9	94.4	1.26×10^{2}	1.57×10^{2}	1.89×10^{2}	2.20×10^{2}
ø25 equivalent	Push/Pull	-	81.4	1.08×10^{2}	1.63×10^{2}	2.17×10^{2}	2.71×10^{2}	3.25×10^{2}	3.80×10^{2}
ø32 equivalent	Push/Pull	-	1.22×10^{2}	1.63×10^{2}	2.44×10^{2}	3.26×10^{2}	4.07×10^{2}	4.88×10^{2}	5.70×10^{2}
ø40 equivalent	Push/Pull	-	1.90×10^{2}	2.53×10^{2}	3.80×10^{2}	5.06×10^{2}	6.33×10^{2}	7.60×10^{2}	8.86×10^{2}
ø50 equivalent	Push/Pull	-	2.98×10^{2}	3.98×10^{2}	5.96×10^{2}	7.95×10^{2}	9.94×10^{2}	1.19×10^{3}	1.39×10^{3}
ø63 equivalent	Push/Pull	3.14×10^{2}	4.70×10^{2}	6.27×10^{2}	9.41×10^{2}	1.25×10^{3}	1.57×10^{3}	1.88×10^{3}	2.20×10^{3}
ø80 equivalent	Push/Pull	5.06×10^{2}	7.60×10^{2}	1.01×10^{3}	1.52×10^{3}	2.03×10^{3}	2.53×10^{3}	3.04×10^{3}	3.54×10^{3}
ø100 equivalent	Push/Pull	7.91×10^{2}	1.19×10^{3}	1.58×10^{3}	2.37×10^{3}	3.16×10^{3}	3.95×10^{3}	4.74×10^{3}	5.53×10^{3}

External Dimensions (Bore Size: ø12 to ø25 equivalent)

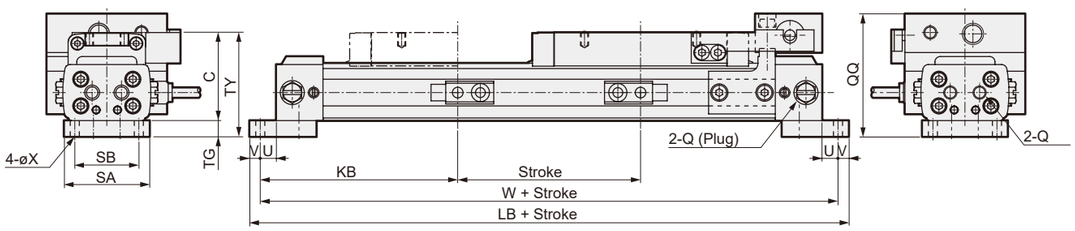
● SRL3-Q



●With Foot Bracket (LB)



●With Foot Bracket (LB1)



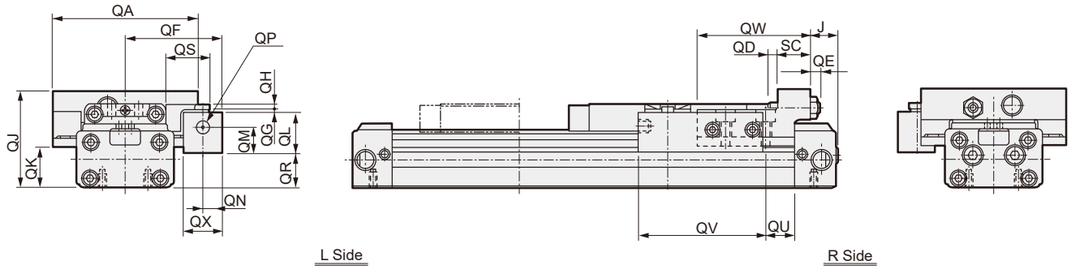
Code / Bore Size (mm)	J	QA	QB	QC	QD	QE	QF	QG	QH	QJ	QK	QL	QM	QN	QP	QQ
ø12 equivalent	0	45	19	46	2.5	25	27.5	1	4	40	21.5	12.5	7	9.5	M5	46
ø16 equivalent	0	49	19	52	2.5	28	29.5	1	4	42	25	12	7	9.5	M5	48
ø20 equivalent	-1	57	24	53	2.5	31	33.5	1	4	48	29	13	8	10.5	Rc 1/8	56
ø25 equivalent	5.5	77	26	67.5	2.5	37	43.5	1	4	62.5	36	17	8	10.5	Rc 1/8	72.5

Code	With Foot Bracket (LB)										With Foot Bracket (LB1)												
Bore Size (mm)	C	KB	LB	SA	SB	TF	U	V	W	X	C	KB	LB	Q	QQ	SA	SB	TG	TY	U	V	W	X
ø12 equivalent	33	74	156	32	24	8	6	4	148	3.4	33	74	156	M5	46	32	24	6	39	6	4	148	3.4
ø16 equivalent	37	80.5	169	35	26	8	6	4	161	3.4	37	80.5	169	M5	48	35	26	6	43	6	4	161	3.4
ø20 equivalent	42	90.5	193	43	33	10	6	6	181	4.5	42	90.5	193	Rc 1/8	56	43	33	8	50	6	6	181	4.5
ø25 equivalent	53	104	230	52	20	12	9	11	208	7	53	104	230	Rc 1/8	72.5	50	20	10	63	9	11	208	7

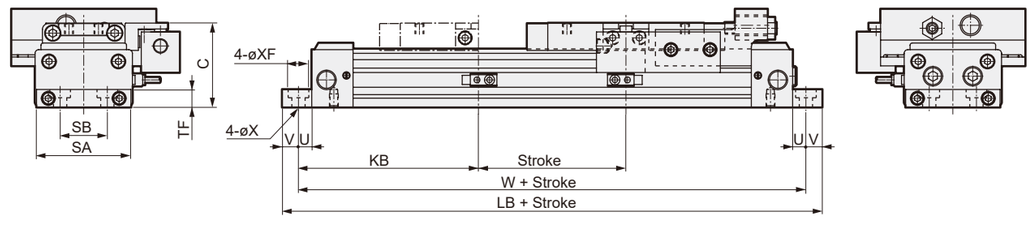
***1: For dimensions other than those listed above, please refer to P. 16 to 19, and 86.**
***2: vRefer to P. 22, 23, 51 and 52 for dimensions diagrams, and dimensions diagrams with options and accessories.**

External Dimensions (Bore Size: ø32 to ø63 equivalent)

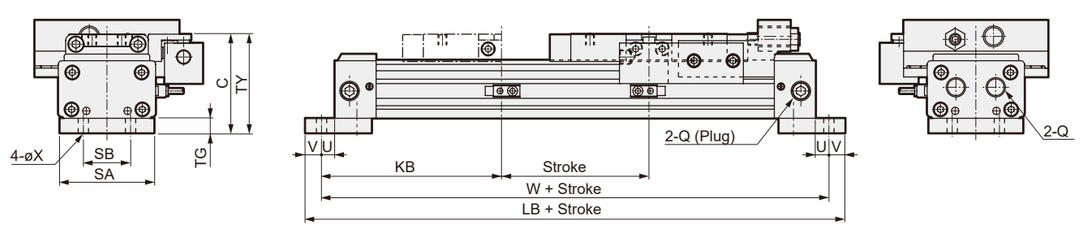
● SRL-Q



● With Foot Bracket (LB)



●With Foot Bracket (LB1)



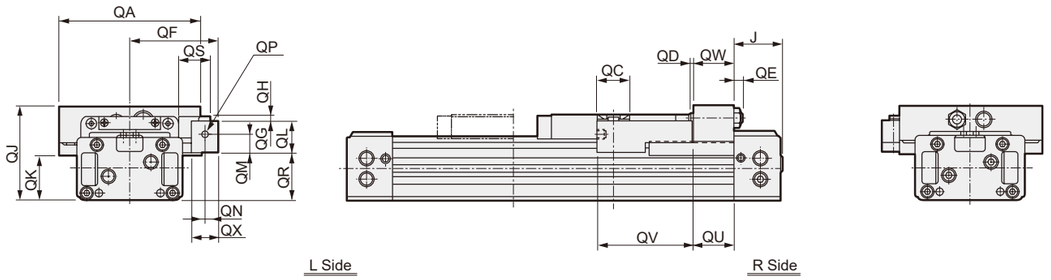
Code / Bore Size (mm)	J	QA	QD	QE	QF	QG	QH	QJ	QK	QL	QM	QN	QP	QQ	QR	QS	QU	QV	QW	QX	SC
ø32 equivalent	19.5	98	7	6	65	2	4	66.5	28	27.5	18	13	Rc 1/8	88.5	23.5	29	21	84	76	26	22
ø40 equivalent	11.5	112	7	11	72	2	4	78.5	34	27.5	18	13	Rc 1/8	-	31.5	29	27	84	87	26	32
ø50 equivalent	9.5	136	8	9	84	2	5	99	40	33	21.5	15	Rc 1/8	-	42	36	12.5	100	102	30	38
ø63 equivalent	20.5	158	8	14	95	2	5	112	50	33	21.5	15	Rc 1/8	-	55	36	31.5	100	91	30	38

Code	With Foot Bracket (LB)											With Foot Bracket (LB1)												
Bore Size (mm)	C	KB	LB	SA	SB	TF	U	V	W	X	XF	C	KB	LB	Q	QQ	SA	SB	TG	TY	U	V	W	X
ø32 equivalent	57	122	266	64	32	12	9	11	244	7	-	57	122	266	Rc 1/4	88.5	64	32	10	67	9	11	244	7
ø40 equivalent	67	133	284	80	36	15	11	9	266	9	14 Counterbore Depth 8.6	-	-	-	-	-	-	-	-	-	-	-	-	-
ø50 equivalent	82	140	298	94	45	20	11	9	280	9	14 Counterbore Depth 8.6	-	-	-	-	-	-	-	-	-	-	-	-	-
ø63 equivalent	95	161	346	116	50	25	13	12	322	11	17.5 Counterbore Depth 10.8	-	-	-	-	-	-	-	-	-	-	-	-	-

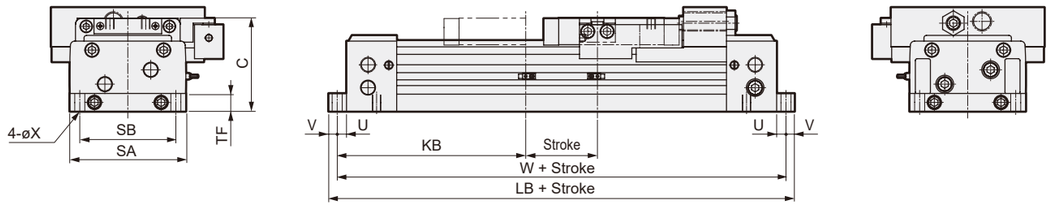
***1: For dimensions other than those listed above, please refer to P. 16 to 19 and 86.**
***2: Refer to P. 22, 23, 51 and 52 for dimensions diagram, and dimensions diagrams with options and switches.**

External Dimensions (Bore Size: ø80, ø100 equivalent)

● SRL3-Q



●With Foot Bracket (LB)



Code / Bore Size (mm)	J	QA	QC	QD	QE	QF	QG	QH	QJ	QK	QL	QM	QN	QP	QR	QS	QU	QV	QW	QX
ø80 equivalent	70	214	50	6	14	133	2	7	145	69	47.5	29	20	Rc 1/8	73.5	48	62	143	60	40
ø100 equivalent	80	250	50	6	14	145	2	7	164	88	47.5	29	20	Rc 1/8	92.5	48	62	148	60	40

Code / Bore Size (mm)	With Foot Bracket (LB)									
	C	KB	LB	SA	SB	TF	U	V	W	X
ø80 equivalent	130	263	550	162	134	25	13	12	526	14
ø100 equivalent	150	280	590	198	160	30	15	15	560	14

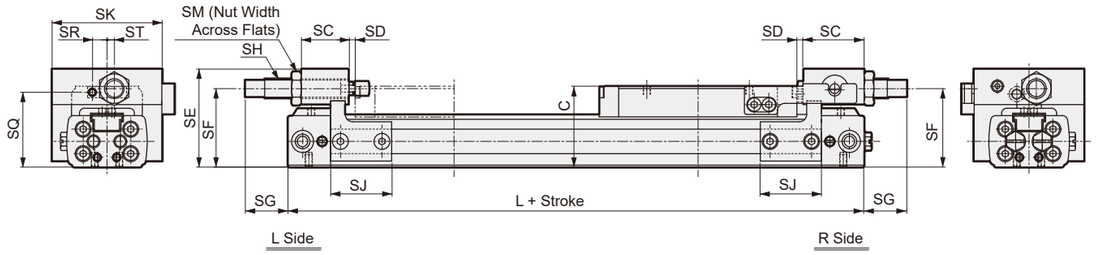
***1: For dimensions other than those listed above, please refer to P. 16 to 19 and 86.**
***2: Refer to P. 22, 23, 51 and 52 for dimensions diagram, and dimensions diagrams with options and switches.**

External Dimensions with Options

● **Full stroke adjustable with shock absorber**

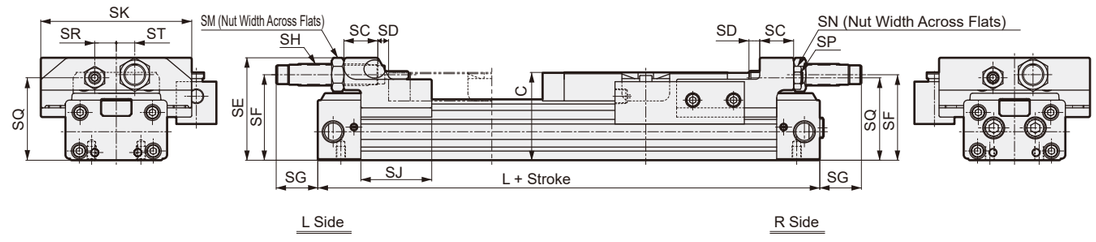
Note: Option: In case of A or A1, adjust the stroke with the entire unit on the fall prevention side, and do not perform fine adjustment with the shock absorber and Hexagon Socket Set Screw. If fine adjustment is performed with the shock absorber and Hexagon Socket Set Screw on the fall prevention side, the positional relationship between the lock lever and the fall prevention body will shift, and reliable locking will not be possible.

• ø12 to ø25 equivalent



Code / Bore Size (mm)	SC	SD	SE	SF	SG			SH		SJ	SK	SM	SN	SP	SQ	SR	ST	C	L
					At MAX	At MIN	Adjustment Range	Thread Diameter	Max Absorption Energy J										
ø12 equivalent	19.5	2.5	40	32	17.5	7.5	10	M8×0.75	3	25	45	12	5.5	M3	30.5	6	3	33	136
ø16 equivalent	18	4	42	35	14.5	4.5	10	M8×0.75	3	25	49	12	5.5	M3	34	6	4	37	149
ø20 equivalent	22.5	3.5	48	40	14.5	4.5	10	M10×1.0	7	39	57	14	7	M4	38	8	5	42	169
ø25 equivalent	20	2.5	62.5	51.5	14.5	4.5	10	M12×1.0	12	50	77	17	10	M6	50	12	10	53	190

• ø32 to ø63 equivalent



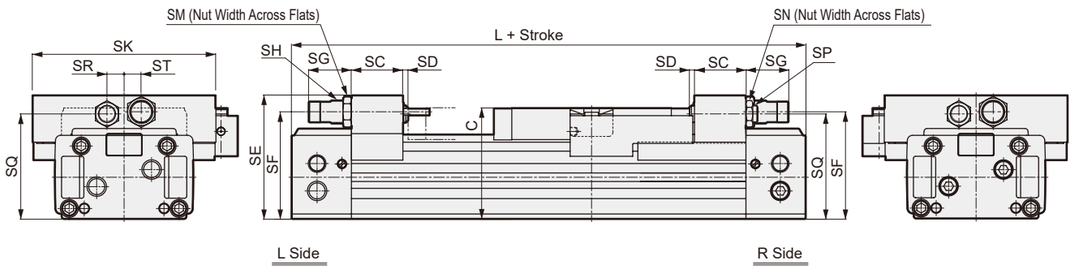
Code / Bore Size (mm)	SC	SD	SE	SF	SG			SH		SJ	SK	SM	SN	SP	SQ	SR	ST	C	L
					At MAX	At MIN	Adjustment Range	Thread Diameter	Max Absorption Energy J										
ø32 equivalent	22	7	66.5	55.5	27	17	10	M14×1.5	26	46	98	19	13	M8	53.5	14	12	57	226
ø40 equivalent	32	7	78.5	65.5	34	24	10	M20×1.5	70	51	112	24	17	M10	63.5	17	12	67	244
ø50 equivalent	38	8	99	80	55	45	10	M25×1.5	120	53	136	32	19	M12	77.5	22	17	82	258
ø63 equivalent	38	8	112	93.5	44	34	10	M25×1.5	120	64	158	32	24	M16	89	25	20	95	296

External Dimensions with Options

● Full stroke adjustable with shock absorber

Note: Option: In case of A or A1, adjust the stroke with the entire unit on the fall prevention side, and do not perform fine adjustment with the shock absorber and Hexagon Socket Set Screw. If fine adjustment is performed with the shock absorber and Hexagon Socket Set Screw on the fall prevention side, the positional relationship between the lock lever and the fall prevention body will shift, and reliable locking will not be possible.

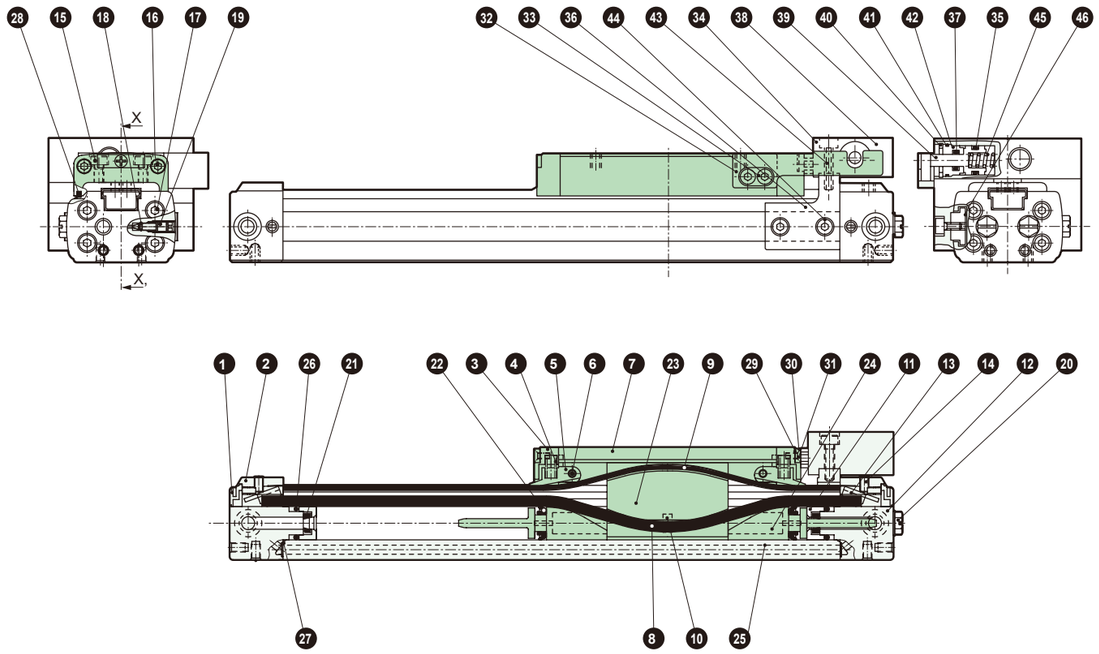
・ø80 to ø100 equivalent



Code / Bore Size (mm)	SC	SD	SE	SF	SG			SH		SK	SM	SN	SP	SQ	SR	ST	C	L
					At MAX	At MIN	Adjustment Range	Thread Diameter	Max Absorption Energy J									
ø80 equivalent	60	6	145	125.5	50	40	10	M27×1.5	200	214	32	27	M20	123	20	20	130	500
ø100 equivalent	60	6	164	144.5	50	40	10	M27×1.5	200	250	32	27	M20	142	20	20	150	530

MEMO

Internal Structure / Material (Bore Size: ø12 to ø25 equivalent)

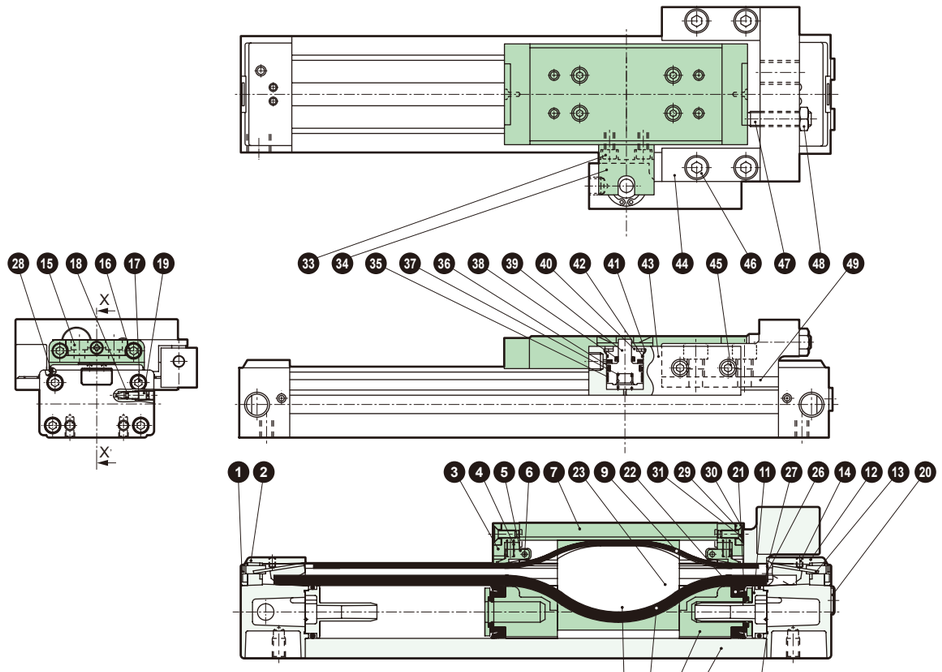


X-X, Cross-sectional view

Part No.	Part Name	Material	Remarks
1	Belt Cover	Polyamide	
2	Cover (L)	Aluminum Alloy	Baked Painting
3	Table Cover	Polyacetal	
4	Spring	Steel	Black Oxide
5	Belt Holder	Polyacetal	
6	Parallel Pin (ø12 to ø20) Shaft (ø25)	Stainless Steel Steel	 Zinc Chromate
7	Table	Aluminum Alloy	Alumite
8	Seal Belt	Urethane Rubber	
9	Dustproof Belt	Stainless Steel, Nitrile Rubber	
10	Magnet		
11	Cushion Adapter	Polyacetal	
12	Cover (R)	Aluminum Alloy	Baked Painting
13	Belt Spacer	Steel	Zinc Chromate
14	Hexagon Socket Set Screw	Alloy Steel	Zinc Chromate
15	Hexagon Socket Head Cap Screw	Alloy Steel	Zinc Chromate
16	Hexagon Socket Head Cap Screw	Stainless Steel	
17	Hexagon Socket Head Cap Screw	Alloy Steel	Zinc Chromate
18	Needle Gasket	Nitrile Rubber	
19	Cushion Needle	Steel	Zinc Chromate
20	Plug	ø12, ø16: Copper Alloy ø20 to ø25: Steel	ø12, ø16: Nickel Plating ø20 to ø25: Zinc Chromate
21	Cushion Seal	Urethane Rubber	
22	Piston Packing	Nitrile Rubber	
23	Yoke	Aluminum Alloy	Alumite
24	Piston	Polyacetal	
25	Cylinder Tube	Aluminum Alloy	Alumite
26	Cylinder Gasket	Nitrile Rubber	
27	O-ring for Centralized Port	Nitrile Rubber	
28	Scraper	Polyacetal	
29	Double-sided Tape		
30	Plate	ø12 to ø20: Stainless Steel ø25: Alloy Steel	 ø25: Zinc Chromate
31	Cross-Recessed Tapping Screw	Stainless Steel	
32	Lock Lever	Alloy Steel	Chrome Plating
33	Hexagon Socket Head Cap Screw	Alloy Steel	Zinc Chromate
34	Stopper	Steel	Black Oxide
35	Piston Packing	Nitrile Rubber	
36	Adapter	Steel	Zinc Chromate
37	Rod Seal	Nitrile Rubber	
38	Fall Prevention Body	Aluminum Alloy	Alumite
39	Lock Pin (Stopper Piston)	Alloy Steel	Chrome Plating
40	C-Type Retaining Ring for Holes	Steel	
41	Gasket	Nitrile Rubber	
42	Rod Cover	Aluminum Alloy	Alumite
43	Hexagon Socket Head Cap Screw	Alloy Steel	Zinc Chromate
44	Hexagon Socket Head Cap Screw	Alloy Steel	Zinc Chromate
45	Spring	Steel	Electrodeposition Coating
46	Plate Nut	Alloy Steel	Black Oxide

For maintenance parts, please visit the CKD Equipment Product Site (https: //www.ckd.co.jp/kiki/en/) → "model No." → Maintenance Parts.

Internal Structure / Material (Bore Size: ø32 to ø63 equivalent)

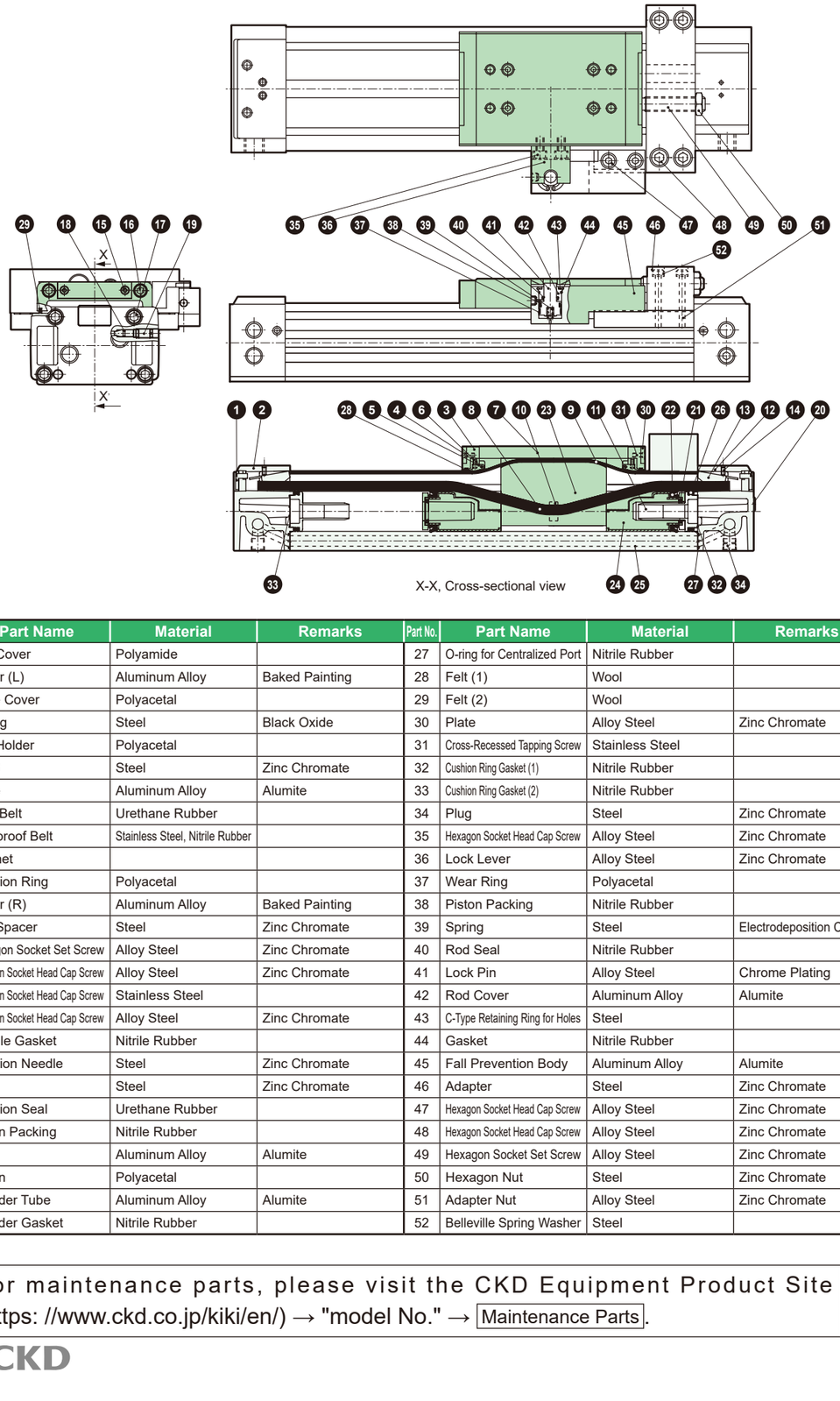


X-X, Cross-sectional view

Part No.	Part Name	Material	Remarks
1	Belt Cover	Polyamide	
2	Cover (L)	Aluminum Alloy	Baked Painting
3	Table Cover	Polyacetal	
4	Spring	Steel	Black Oxide
5	Belt Holder	Polyacetal	
6	Shaft	Steel	Zinc Chromate
7	Table	Aluminum Alloy	Alumite
8	Seal Belt	Urethane Rubber	
9	Dustproof Belt	Stainless Steel, Nitrile Rubber	
10	Magnet		
11	Cushion Ring	Polyacetal	
12	Cover (R)	Aluminum Alloy	Baked Painting
13	Belt Spacer	Steel	Zinc Chromate
14	Hexagon Socket Set Screw	Alloy Steel	Zinc Chromate
15	Hexagon Socket Head Cap Screw	Alloy Steel	Zinc Chromate
16	Hexagon Socket Head Cap Screw	Stainless Steel	
17	Hexagon Socket Head Cap Screw	Alloy Steel	Zinc Chromate
18	Needle Gasket	Nitrile Rubber	
19	Cushion Needle	Steel	Zinc Chromate
20	Plug	Steel	Zinc Chromate
21	Cushion Seal	Urethane Rubber	
22	Piston Packing	Nitrile Rubber	
23	Yoke	Aluminum Alloy	Alumite
24	Piston	Polyacetal	
25	Cylinder Tube	Aluminum Alloy	Alumite
26	Cylinder Gasket	Nitrile Rubber	
27	O-ring for Centralized Port	Nitrile Rubber	
28	Scraper	Polyacetal	
29	Double-sided Tape		
30	Plate	Alloy Steel	Zinc Chromate
31	Cross-Recessed Tapping Screw	Stainless Steel	
32	Cushion Ring Gasket	Nitrile Rubber	ø50, ø63 only
33	Hexagon Socket Head Cap Screw	Alloy Steel	Zinc Chromate
34	Lock Lever	Alloy Steel	Zinc Chromate
35	Wear Ring	Polyacetal	
36	Piston Packing	Nitrile Rubber	
37	Spring	Steel	Electrodeposition Coating
38	Rod Seal	Nitrile Rubber	
39	Lock Pin	Alloy Steel	Chrome Plating
40	Rod Cover	Aluminum Alloy	Alumite
41	C-Type Retaining Ring for Holes	Steel	
42	Gasket	Nitrile Rubber	
43	Fall Prevention Body	Aluminum Alloy	Alumite
44	Adapter	Steel	Zinc Chromate
45	Hexagon Socket Head Cap Screw	Alloy Steel	Zinc Chromate
46	Hexagon Socket Head Cap Screw	Alloy Steel	Zinc Chromate
47	Hexagon Socket Set Screw	Alloy Steel	Zinc Chromate
48	Hexagon Nut	Steel	Zinc Chromate
49	Adapter Nut	Alloy Steel	Zinc Chromate

For maintenance parts, please visit the CKD Equipment Product Site (https: //www.ckd.co.jp/kiki/en/) → "model No." → Maintenance Parts.

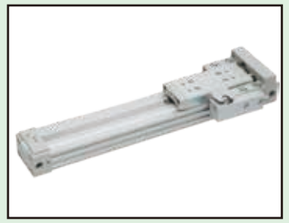
Internal Structure / Material (Bore Size: ø80, ø100 equivalent)



Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Belt Cover	Polyamide		27	O-ring for Centralized Port	Nitrile Rubber	
2	Cover (L)	Aluminum Alloy	Baked Painting	28	Felt (1)	Wool	
3	Table Cover	Polyacetal		29	Felt (2)	Wool	
4	Spring	Steel	Black Oxide	30	Plate	Alloy Steel	Zinc Chromate
5	Belt Holder	Polyacetal		31	Cross-Recessed Tapping Screw	Stainless Steel	
6	Shaft	Steel	Zinc Chromate	32	Cushion Ring Gasket (1)	Nitrile Rubber	
7	Table	Aluminum Alloy	Alumite	33	Cushion Ring Gasket (2)	Nitrile Rubber	
8	Seal Belt	Urethane Rubber		34	Plug	Steel	Zinc Chromate
9	Dustproof Belt	Stainless Steel, Nitrile Rubber		35	Hexagon Socket Head Cap Screw	Alloy Steel	Zinc Chromate
10	Magnet			36	Lock Lever	Alloy Steel	Zinc Chromate
11	Cushion Ring	Polyacetal		37	Wear Ring	Polyacetal	
12	Cover (R)	Aluminum Alloy	Baked Painting	38	Piston Packing	Nitrile Rubber	
13	Belt Spacer	Steel	Zinc Chromate	39	Spring	Steel	Electrodeposition Coating
14	Hexagon Socket Set Screw	Alloy Steel	Zinc Chromate	40	Rod Seal	Nitrile Rubber	
15	Hexagon Socket Head Cap Screw	Alloy Steel	Zinc Chromate	41	Lock Pin	Alloy Steel	Chrome Plating
16	Hexagon Socket Head Cap Screw	Stainless Steel		42	Rod Cover	Aluminum Alloy	Alumite
17	Hexagon Socket Head Cap Screw	Alloy Steel	Zinc Chromate	43	C-Type Retaining Ring for Holes	Steel	
18	Needle Gasket	Nitrile Rubber		44	Gasket	Nitrile Rubber	
19	Cushion Needle	Steel	Zinc Chromate	45	Fall Prevention Body	Aluminum Alloy	Alumite
20	Plug	Steel	Zinc Chromate	46	Adapter	Steel	Zinc Chromate
21	Cushion Seal	Urethane Rubber		47	Hexagon Socket Head Cap Screw	Alloy Steel	Zinc Chromate
22	Piston Packing	Nitrile Rubber		48	Hexagon Socket Head Cap Screw	Alloy Steel	Zinc Chromate
23	Yoke	Aluminum Alloy	Alumite	49	Hexagon Socket Set Screw	Alloy Steel	Zinc Chromate
24	Piston	Polyacetal		50	Hexagon Nut	Steel	Zinc Chromate
25	Cylinder Tube	Aluminum Alloy	Alumite	51	Adapter Nut	Alloy Steel	Zinc Chromate
26	Cylinder Gasket	Nitrile Rubber		52	Belleville Spring Washer	Steel	

For maintenance parts, please visit the CKD Equipment Product Site (https: //www.ckd.co.jp/kiki/en/) → "model No." → Maintenance Parts.

MEMO



Rodless Cylinder Double Acting, Resin guide, Drop prevention type

SRL3-GQ Series

● Bore Size: ø12, ø16, ø20, ø25, ø32, ø40, ø50, ø63, ø80, ø100 or equivalent

Circuit Diagram Code

RoHS

Model No. Notation

Without Switch
(Built-in magnet for switch)

SRL3-GQ - 00 - 12 [ ] B - 200 ——— B

Model No. ❶ ❷ ❸ ❹ ❺ ❽

With Switch
(Built-in magnet for switch)

SRL3-GQ - 00 - 12 [ ] B - 200 - M0H - R - B

Model No. ❶Mounting type ❷Bore Size ❸Piping thread type ❹Cushion ❺Stroke ❻Switch Model No. ❼Number of Switches ❽Option

❶Mounting type

Mounting brackets are pre-assembled on the product and shipped.

Code	Content	
00	Basic type	
LB	Axial Foot Type	
LB1	Axial Foot Type (ø12 to ø32 equivalent only)	

Note: When the Bore Size of ❷ is equivalent to ø12, 16, 20, 25, or 32, and the option code ❽ is "R" or "T", the mounting style is "00" or "LB1". (Mounting style "LB" cannot be manufactured with option code ❽ "R" and "T" because piping is not possible.)

❷Bore Size (mm)

Code	Content
12	ø12 equivalent
16	ø16 equivalent
20	ø20 equivalent
25	ø25 equivalent
32	ø32 equivalent
40	ø40 equivalent
50	ø50 equivalent
63	ø63 equivalent
80	ø80 equivalent
100	ø100 equivalent

❸Piping thread type

Code	Content
Blank	M5 (ø12, ø16 equivalent) Rc Thread (ø20 to ø100 equivalent)
N	NPT Thread (ø20 equivalent or larger) (Custom-made)
G	G Thread (ø20 equivalent or larger) (Custom-made)

❹Cushion

Code	Content
B	With Cushion on Both Sides
R	With R Side Cushion
L	With L Side Cushion
N	Without Cushion

❺Stroke (mm)

Bore Size	Stroke	Intermediate Stroke
ø12 to ø100 equivalent	5 to 5000	Every 1 mm

Note: For the minimum stroke with switch, please refer to P. 62.

❻Switch Model No.

For switch details, please refer to P. 1457. Switches are included with the product and shipped.

	Indicator LED Special Function	Wiring (Output)	Load Voltage (V) AC	Load Voltage (V) DC	Load Current (mA) AC	Load Current (mA) DC	Lead wire *1 Straight	Lead wire *1 L-shape	
Solid State	1-Color	2-wire	-	10 to 30	-	5 to 30	M2H□	M2V□	
	2-Color		-	10 to 30	-	5 to 30	-	M2WV□	
	1-Color	3-wire (NPN)	-	30 or less	-	100 or less	M3H□	M3V□	
	2-Color		-	30 or less	-	100 or less	-	M3WV□	
	1-Color (Custom order)	3-wire (PNP)	-	30 or less	-	100 or less	M3PH□	M3PV□	
	2-Color	2-wire	-	24 ± 10%	-	5 to 20	T2WH□	T2WV□	
		3-wire (NPN)	-	30 or less	-	50 or less	T3WH□	T3WV□	
	2-Color for AC Magnetic Field	2-wire	-	24 ± 10%	-	5 to 20	T2YD□	-	
			-		-		T2YDT□	-	
Reed	1-Color	2-wire	110	12/24	-	5 to 50	M0H□	M0V□	
	No Indicator LED		110	5/12/24	-	50 or less	M5H□	M5V□	

*1: For "□" in the switch model number, enter the code selected from the "Lead wire length" table.
*2: Switches other than the model numbers listed above are also available. (Custom Product) For details, see P. 1457.

* Lead wire length

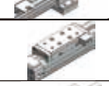
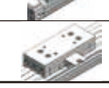
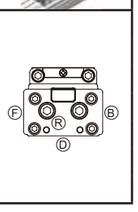
Code	Content
Blank	1 m (Standard)
3	3 m (Option)
5	5 m (Option)

Example) Lead wire length
1 m M0V
3 m M0V3
5 m M0V5

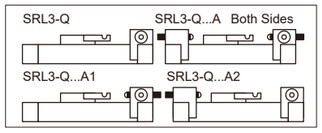
❼Number of Switches

Code	Content
R	With 1 pc on R side
L	With 1 pc on L side
D	With 2 pcs
T	With 3 pcs
4	With 4 pcs (If 4 or more, enter the number of switches)

❽ Option

	Code	Description	Bore Size (ø) equivalent 12	16	20	25	32	40	50	63	80	100	
	A	Full stroke adjustment both sides, with shock absorber	●	●	●	●	●	●	●	●	●	●	
	A1	Full stroke adjustment R side only, with shock absorber	●	●	●	●	●	●	●	●	●	●	
	A2	Full stroke adjustment L side only, with shock absorber	●	●	●	●	●	●	●	●	●	●	
	A3	Full Stroke Adjustment Bracket Retrofit Type	●	●	●	●							
*2	L*	Intermediate Support Bracket (for 00, LB)	●	●	●	●	●	●	●	●	●	●	
*2	N*	With Intermediate Support Bracket (for LB1)	●	●	●	●	●						
*5	H	Table Mounting Screw Size Up	●	●	●								
	U	Height Adjustment Plate	●	●	●	●	●	●	●	●	●	●	
	Blank	Port Position: F (Standard) / Cushion Needle Position: F (Standard)	●	●	●	●	●	●	●	●	●	●	
	R	Port Position: R (Centralized Port) / Cushion Needle Position: F	●	●	●	●	●	●	●	●	●	●	
	B	Port Position: F / Cushion Needle Position: B	●	●	●	●	●	●	●	●	●	●	
	T	Port Position: R (Centralized port) / Cushion Needle Position: B	●	●	●	●	●	●	●	●	●	●	
	D	Port Position: D / Cushion Needle Position: F				●	●	●	●	●	●	●	
	S	Port Position: D / Cushion Needle Position: D					●	●	●	●	●	●	
	X	Port Position: F (Centralized Port) / Cushion Needle Position: F									●	●	

*1: Since the full stroke adjustment bracket on the R side is standard equipment for the drop prevention type, only the shock absorber is added to the R side when A1 is specified. When A is indicated, the R side is equipped with fall prevention, full stroke adjustment, and shock absorber, and the L side is equipped with full stroke adjustment and shock absorber. (Figure below)



2: The "" in L* and N* indicates the number of sets. If 2 sets are required, enter "L2" (for LB) or "N2" (for LB1). 2 pcs./set
*3: For port and cushion needle position display symbols, please refer to the external dimensions diagrams on P. 64 to 66.
*4: In the case of the standard with ø12 to ø25, remove the cover, attach a flat nut and install the full stroke adjusting bracket. A3 is an option with a mounting plate nut assembled for retrofitting the full stroke adjustment bracket without removing the cover.
*5:In "H", the thread size for ø12 and ø16 is "M4" and the thread size for ø20 is "M5".
*6: Be sure to check the combination of options in the "Option Combination Table" on the next page.
*7: If ❶mounting method "LB1" is selected, options "D" or "S" cannot be selected.

Option Combination Table

●: Combinable ⬜: Not Combinable

		Option														
		Full Stroke Adjustment Both Sides, Shock Absorber	Full stroke adjustment R side only, with shock absorber	Full stroke adjustment L side only, with shock absorber	Full Stroke Adjustment Bracket Retrofit Type	Intermediate support bracket (for 00, LB)	Intermediate Support Bracket (for LB1)	Table Mounting Screw Size Up	Height Adjustment Plate	Port position F, Cushion needle position F (Standard)	Port position R, Cushion needle position F (Centralized port)	Port position F, Cushion needle position B	Port position R, Cushion needle position B (Centralized port)	Port position D, Cushion needle position F	Port position D, Cushion needle position D	Port position F, Cushion needle position F (Centralized port)
	Code	A	A1	A2	A3	L□	N□	H	U	Blank	R	B	T	D	S	X
Option	A	＼				●	●	●	●	●	●	●	●	●	●	●
	A1		＼			●	●	●	●	●	●	●	●	●	●	●
	A2			＼		●	●	●	●	●	●	●	●	●	●	●
	A3				＼	●	●	●	●	●	●	●	●	●	●	
	L□					＼		●	●	●	●	●	●	●	●	●
	N□						＼	●	●	●	●	●	●	●	●	
	H							＼		●	●	●	●	●	●	
	U								＼	●	●	●	●	●	●	●
	Blank									＼						
	R										＼					
	B											＼				
	T												＼			
	D													＼		
	S														＼	
	X															＼

***1: Depending on the Bore Size, some combinations may not be possible, so be sure to check the ❽option column in the "Model Number Notation Method" on the previous page.**

*2: If ❶mounting method "LB1" is selected, ❽options “D” or “S” cannot be selected.

Switch Individual Model No. Notation **(For parts composition, please refer to P. 88 to 90.)**

●Switch body+Mounting bracket set (*1)

SRL3 - M0H

❻Switch Model No.

●Switch body only

SW - M0H

❻Switch Model No.

●Mounting bracket complete set (*2)

• M Type Switch

SRL3 - M

• T Type Switch

SRL3 - T

Note: The mounting bracket differs between M type switch and T type switch.

● Lead wire holder (*3)

SRL3 - MH

*1: The switch body + mounting bracket set does not include a lead wire holder. If a lead wire holder is required, please order it separately.
*2: The mounting bracket is different for M type switch and T type switch.
*3: Lead wire holder is 10 pcs./set.

● How to order discrete shock absorber

SRL3 - 40 - NCK

❷Bore Size

(1 Shock absorber, 1 Hexagon Nut for fixing shock absorber)

Note: Note that the Hexagon Nut only for Shock Absorbers fixing for SRL3-40 is different from the NCK standard nut.

Applicable Shock Absorber Model No.

Model	Shock Absorber Model No.
SRL3-12	NCK-00-0.3-C
SRL3-16	NCK-00-0.3-C
SRL3-20	NCK-00-0.7-C
SRL3-25	NCK-00-1.2
SRL3-32	NCK-00-2.6
SRL3-40	NCK-00-7
SRL3-50	NCK-00-12
SRL3-63	NCK-00-12
SRL3-80	NCK-00-20
SRL3-100	NCK-00-20

● How to order discrete intermediate support bracket

For 00, LB

SRL3 - 40 - L (2 pcs / 1 set)

❷Bore Size

For LB1

SRL3 - 32 - N (2 pcs / 1 set)

❷Bore Size

●Mounting Bracket Model No. Notation

SRL3 - LB - 40

❶ Mounting type ❷Bore Size

(2 Brackets, 4 Mounting Bolts)

● How to order height adjustment plate set

SRL3 - 40 - U

❷Bore Size

(Plate, 4 Mounting Bolts)

● How to order full stroke adjusting bracket kit

SRL3 - 40 - A1 (1 Set)

❷Bore Size

(For parts composition, please refer to the full stroke adjustment bracket kit on P. 89.)

Specifications

Item		SRL3-GQ									
Bore Size	mm	ø12 equivalent	ø16 equivalent	ø20 equivalent	ø25 equivalent	ø32 equivalent	ø40 equivalent	ø50 equivalent	ø63 equivalent	ø80 equivalent	ø100 equivalent
Operation Method		Double Acting Type									
Operating Fluid		Compressed Air									
Max Operating Pressure	MPa	0.7									
Min Operating Pressure	MPa	0.25			0.15			0.1			
Proof Pressure	MPa	1.05									
Ambient Temperature	°C	5 to 60									
Port Size	Cylinder Part	M5		Rc 1/8		Rc 1/4		Rc 3/8		Rc 1/2	
	Fall Prevention Part	M5		Rc 1/8							
Stroke tolerance	mm	$^{+2.0}_{0}$ (up to 1000), $^{+2.5}_{0}$ (up to 3000), $^{+3.0}_{0}$ (up to 5000)									
Operating Piston Speed	mm/s	50 to 2000 (Standard Port Piping) *1									
Cushion		Air Cushion									
Lubrication		Not required (If lubricating, use Turbine Oil Class 1 ISO VG32. Note that once lubrication is started, it must be continued.)									
Fall Prevention Mechanism		Installed on Cover R Side									
Holding Force	N	Maximum Thrust × 0.7									

*1: ①When the piston moves at 500 to 2000 mm/s, reduce the speed when entering the position locking mechanism to 500 mm/s or less. Also, the operating piston speed for centralized port piping varies depending on the stroke, so please consult us separately.
②As a deceleration method, please use an external shock absorber or a deceleration circuit.
③Apply grease periodically to the sliding part of the lock lever.

Allowable Absorption Energy

Bore Size (mm)	With Cushion		Without Cushion	With Shock Absorber (Initial Setting)	
	Allowable Absorption Energy (J)	Cushion Stroke (mm)	Allowable Absorption Energy (J)	Absorption Energy (J)	Effective Stroke (mm)
ø12 equivalent	0.03	14.5	0.003	2.4	5.5
ø16 equivalent	0.22	19.2	0.007	2.4	5.5
ø20 equivalent	0.59	22.2	0.010	5.7	7
ø25 equivalent	1.40	20.9	0.015	10	9
ø32 equivalent	2.57	23.5	0.030	18	13
ø40 equivalent	4.27	23.9	0.050	50	16.5
ø50 equivalent	9.13	24.9	0.072	86	21
ø63 equivalent	17.4	29.6	0.138	86	21
ø80 equivalent	40	45.8	0.393	143	25
ø100 equivalent	67	45.8	0.622	143	25

Stroke

Bore Size (mm)	Standard Stroke (mm)	Max Stroke (mm)	Min Stroke (mm)
ø12, ø16, ø20, ø25, ø32, ø40, ø50, ø63, ø80, ø100 equivalent	200, 300, 400, 500, 600, 700, 800, 900, 1000	5000	5

Note: Intermediate strokes can be manufactured in 1 mm increments.

M Type Switch Mounting Quantity and Min Stroke (mm)

Switch Qty.	1		2	
Switch Model No. / Bore Size (mm)	M□V	M□H	M□V	M□H
ø12 equivalent	10	10	30	70
ø16 equivalent	10	10	30	70
ø20 equivalent	10	10	30	70
ø25 equivalent	10	10	30	70
ø32 equivalent	10	10	30	45
ø40 equivalent	10	10	30	45
ø50 equivalent	15	15	30	45
ø63 equivalent	15	15	30	45
ø80 equivalent	25		50	
ø100 equivalent	25		50	

T Type Switch Mounting Quantity and Min Stroke (mm)

Switch Qty.	1		2	
Switch Model No. / Bore Size (mm)	T□V	T□H	T□V	T□H
ø12 equivalent	5	5	45	70
ø16 equivalent	5	5	45	70
ø20 equivalent	5	5	45	70
ø25 equivalent	10	10	45	70
ø32 equivalent	10	10	45	50
ø40 equivalent	10	10	45	50
ø50 equivalent	10	10	45	50
ø63 equivalent	10	10	45	50
ø80 equivalent	15	15	45	50
ø100 equivalent	15	15	45	50

Be sure to read the Safety precautions for Drop prevention type on P. 106 to 109 before use.

Cylinder Weight

Unit: kg

Bore Size (mm)	Weight at 0 mm Stroke			Switch Weight	Switch Mounting Bracket Weight		St=Additional weight per 100 mm stroke
	Basic type (00)	Foot type			T Type	M Type	
		(LB)	(LB1)				
ø12 equivalent	0.38	0.39	0.40	Refer to the mass described in the switch specifications on P. 1457.	0.005	0.001	0.10
ø16 equivalent	0.47	0.48	0.50				0.13
ø20 equivalent	0.74	0.76	0.80				0.18
ø25 equivalent	1.5	1.6	1.6				0.28
ø32 equivalent	2.4	2.5	2.6				0.36
ø40 equivalent	3.6	3.7	-				0.53
ø50 equivalent	6.0	6.1	-				0.75
ø63 equivalent	8.8	9.1	-				1.11
ø80 equivalent	22.4	23.0	-				2.32
ø100 equivalent	30.5	31.5	-				3.38

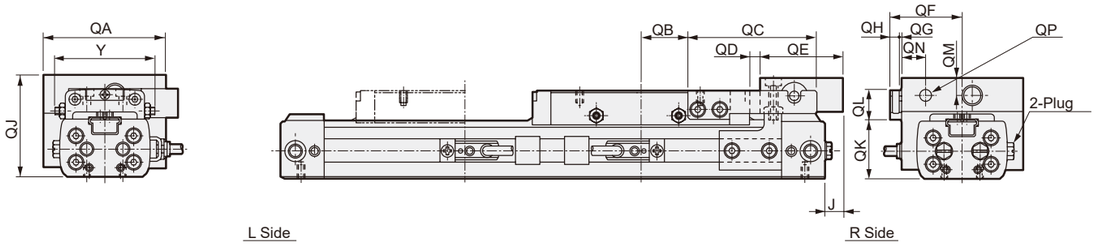
Theoretical Thrust Table

(Unit: N)

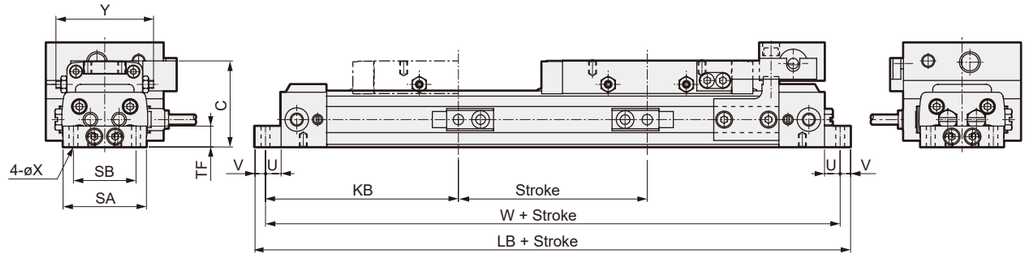
Bore Size (mm)	Operating Direction	Operating Pressure MPa								
		0.1	0.15	0.2	0.25	0.3	0.4	0.5	0.6	0.7
ø12 equivalent	Push/Pull	-	-	-	34.6	41.5	55.3	69.1	83.0	96.8
ø16 equivalent	Push/Pull	-	-	-	54.0	64.8	86.4	1.08×10^2	1.30×10^2	1.51×10^2
ø20 equivalent	Push/Pull	-	-	-	78.6	94.4	1.26×10^2	1.57×10^2	1.89×10^2	2.20×10^2
ø25 equivalent	Push/Pull	-	81.4	1.08×10^2	1.35×10^2	1.63×10^2	2.17×10^2	2.71×10^2	3.25×10^2	3.80×10^2
ø32 equivalent	Push/Pull	-	1.22×10^2	1.63×10^2	2.04×10^2	2.44×10^2	3.26×10^2	4.07×10^2	4.88×10^2	5.70×10^2
ø40 equivalent	Push/Pull	-	1.90×10^2	2.53×10^2	3.16×10^2	3.80×10^2	5.06×10^2	6.33×10^2	7.60×10^2	8.86×10^2
ø50 equivalent	Push/Pull	-	2.98×10^2	3.98×10^2	4.94×10^2	5.96×10^2	7.95×10^2	9.94×10^2	1.19×10^3	1.39×10^3
ø63 equivalent	Push/Pull	3.14×10^2	4.70×10^2	6.27×10^2	7.84×10^2	9.41×10^2	1.25×10^3	1.57×10^3	1.88×10^3	2.20×10^3
ø80 equivalent	Push/Pull	5.06×10^2	7.60×10^2	1.01×10^3	1.26×10^3	1.52×10^3	2.03×10^3	2.53×10^3	3.04×10^3	3.54×10^3
ø100 equivalent	Push/Pull	7.91×10^2	1.19×10^3	1.58×10^3	1.98×10^3	2.37×10^3	3.16×10^3	3.95×10^3	4.74×10^3	5.53×10^3

External dimensions diagram (Bore Size: Equivalent to ø12 to ø25)

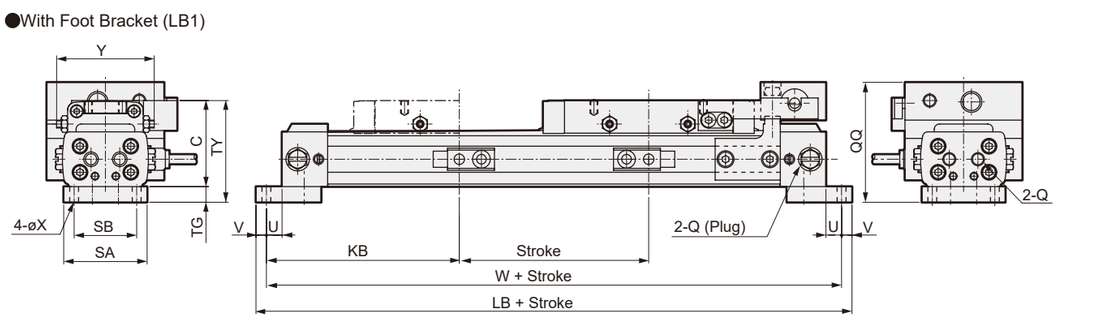
● SRL3-GQ



●With Foot Bracket (LB)



●With Foot Bracket (LB1)



Code / Bore Size (mm)	A	B	C	DA	DB	DC	DD	E	G	HA	HB	HC	J	JJ	KA	L	LL	LA	M	P	PQ	Q
ø12 equivalent	33	10.5	33	8	10	11	-	8.5	24	6	14	-	17.5	0	59.5	136	139	3	M3 Depth 5	119	19	M5
ø16 equivalent	37	12	37	12	14	12	-	8.5	27	6	14	-	17.5	0	66	149	152	3	M3 Depth 5	132	21	M5
ø20 equivalent	44	14	42	16	16	16	-	10.5	31	8.5	18.5	-	22	-1	74	169	171.5	2.5	M4 Depth 6.5	148	24.5	Rc 1/8
ø25 equivalent	53	17	53	-	20	26	19	14	40.5	7.5	20	18.9	24	5.5	81	190	192	2	M6 Depth 9	162	-	Rc 1/8

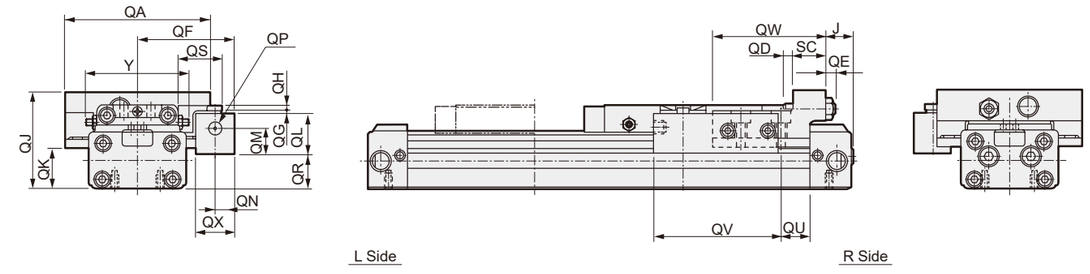
Code / Bore Size (mm)	QA	QB	QC	QD	QE	QF	QG	QH	QJ	QK	QL	QM	QN	QP	TA	TB	TC	TD	TE	Y
ø12 equivalent	45	19	46	2.5	25	27.5	1	4	40	21.5	12.5	12.5	9.5	M5	81	42	29	13	M3 Depth 5	36 to 38
ø16 equivalent	49	19	52	2.5	28	29.5	1	4	42	25	25	12	9.5	N5	88	48	32	15	M3 Depth 5	39 to 41
ø20 equivalent	57	24	53	2.5	31	33.5	1	4	48	29	29	13	10.5	Rc 1/8	100	60	38	18	M4 Depth 6	43 to 45
ø25 equivalent	77	26	67.5	2.5	37	43.5	1	4	62.5	36	36	17	10.5	Rc 1/8	122	70	48	20	M5 Depth 6	58 to 61

Code	With Foot Bracket (LB)											With Foot Bracket (LB1)											
Bore Size (mm)	C	KB	LB	SA	SB	TF	U	V	W	X	Y	C	KB	LB	Q	QQ	SA	SB	TG	TY	U	V	W	X	Y
ø12 equivalent	33	74	156	32	24	8	6	4	148	3.4	36 to 38	33	74	156	M5	46	32	24	6	39	6	4	148	3.4	36 to 38
ø16 equivalent	37	80.5	169	35	26	8	6	4	161	3.4	39 to 41	37	80.5	169	M5	48	35	26	6	43	6	4	161	3.4	39 to 41
ø20 equivalent	42	90.5	193	43	33	10	6	6	181	4.5	43 to 45	42	90.5	193	Rc 1/8	56	43	33	8	50	6	6	181	4.5	43 to 45
ø25 equivalent	53	104	230	52	20	12	9	11	208	7	58 to 61	53	104	230	Rc 1/8	72.5	52	20	10	63	9	11	208	7	58 to 61

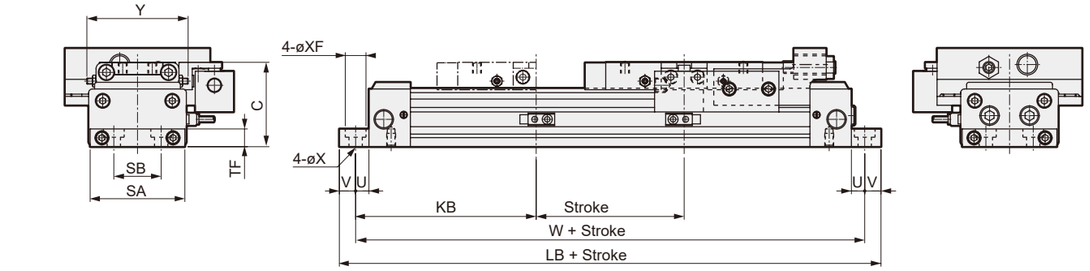
***1: For dimensions other than those listed above, please refer to P. 16 to 19 and 86.**
***2: Refer to P. 22, 23, 51 and 52 for dimensions diagram, and dimensions diagrams with options and switches.**

External dimensions diagram (Bore Size: Equivalent to ø32 to ø63)

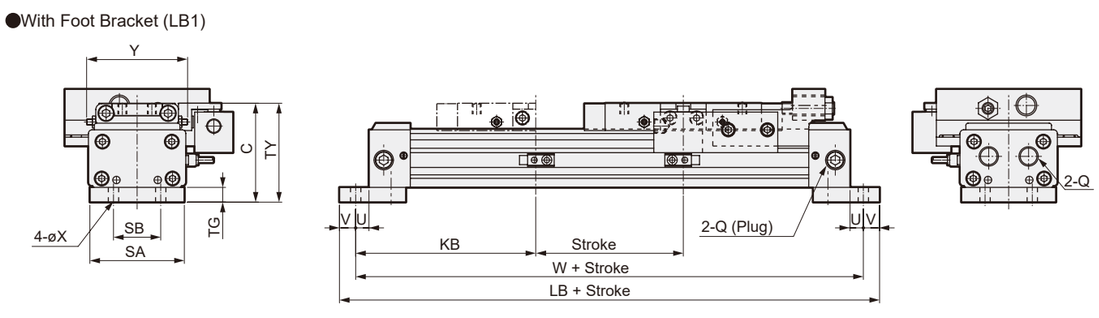
● SRL3-GQ



●With Foot Bracket (LB1)



●With Foot Bracket (LB1)



Code / Bore Size (mm)	A	B	C	DB	DC	DD	E	G	HA	HB	HC	HE	J	JJ	KA	L	LL	LA	M	P
ø32 equivalent	66	18.5	57	32	27	21	15	43.5	10	23.5	21.5	17	28	19.5	98	226	228.5	2.5	M6 Depth 9	196
ø40 equivalent	80	22	67	36	35	28	17	51.5	13	26	27	22.3	31	11.5	105	244	246.5	2.5	M8 Depth 12	210
ø50 equivalent	96	28	82	45	35	35	23	61	15	33	35.3	11	39	9.5	106	258	260.5	2.5	M8 Depth 12	212
ø63 equivalent	118	35	95	50	39	42	19	74	15	32	43	31	39	20.5	129	296	298.5	2.5	M10 Depth 15	258

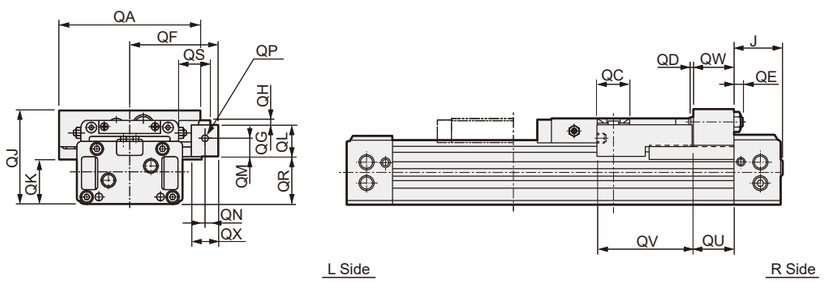
Code / Bore Size (mm)	Q	QA	QD	QE	QF	QG	QH	QJ	QK	QL	QM	QN	QP	TA	TB	TC	TD	TE	Y
ø32 equivalent	Rc 1/4	98	7	6	65	2	4	66.5	28	27.5	18	13	Rc 1/8	134	80	56	20	M6 Depth 7.5	65 to 69
ø40 equivalent	Rc 1/4	112	7	11	72	2	4	78.5	34	27.5	18	13	Rc 1/8	148	90	68	30	M6 Depth 9	77 to 81
ø50 equivalent	Rc 3/8	136	8	9	84	2	5	99	40	33	21.5	15	Rc 1/8	152	100	80	30	M8 Depth 10.5	92 to 96
ø63 equivalent	Rc 3/8	158	8	14	95	2	5	112	50	33	21.5	15	Rc 1/8	168	110	102	40	M8 Depth 11.5	114 to 118

Code	With Foot Bracket (LB)												With Foot Bracket (LB1)													
Bore Size (mm)	C	KB	LB	SA	SB	TF	U	V	W	X	XF	Y	C	KB	LB	Q	QQ	SA	SB	TG	TY	U	V	W	X	XF	Y
ø32 equivalent	57	122	266	64	32	12	9	11	244	7	-	65 to 69	57	122	266	Rc 1/4	88.5	64	32	10	67	9	11	244	7	-	65 to 69
ø40 equivalent	67	133	284	80	36	15	11	9	266	9	14 Counterbore Depth 8.6	77 to 81	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ø50 equivalent	82	140	298	94	45	20	11	9	280	9	14 Counterbore Depth 8.6	92 to 96	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ø63 equivalent	95	161	346	116	50	25	13	12	322	11	17.5 Counterbore Depth 10.8	114 to 118	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

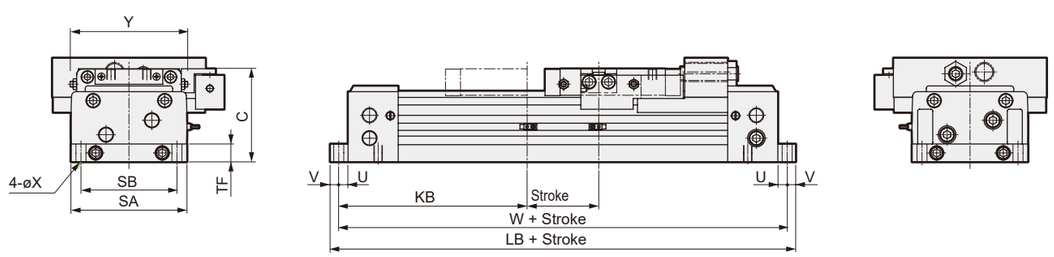
***1: For dimensions other than those listed above, please refer to P. 16 to 19 and 86.**
***2: Refer to P. 22, 23, 51 and 52 for dimensions diagram, and dimensions diagrams with options and switches.**

External dimensions diagram (Bore Size: Equivalent to ø80, ø100)

● SRL3-GQ



●With Foot Bracket (LB)



Code / Bore Size (mm)	A	B	C	DA	DB	DC	DD	DE	DF	E	G	HA	HB	HC	J	KA	L	M	P	Q	QA
ø80 equivalent	162	49	130	64	93	58	38	65	33	42	106	30	59	64.5	70	208	500	M12 Depth 18	416	Rc 1/2	214
ø100 equivalent	198	61.5	150	73	108	71.5	47.5	81.5	41.5	43	125	30	69	76.5	80	222	530	M12 Depth 18	444	Rc 1/2	250

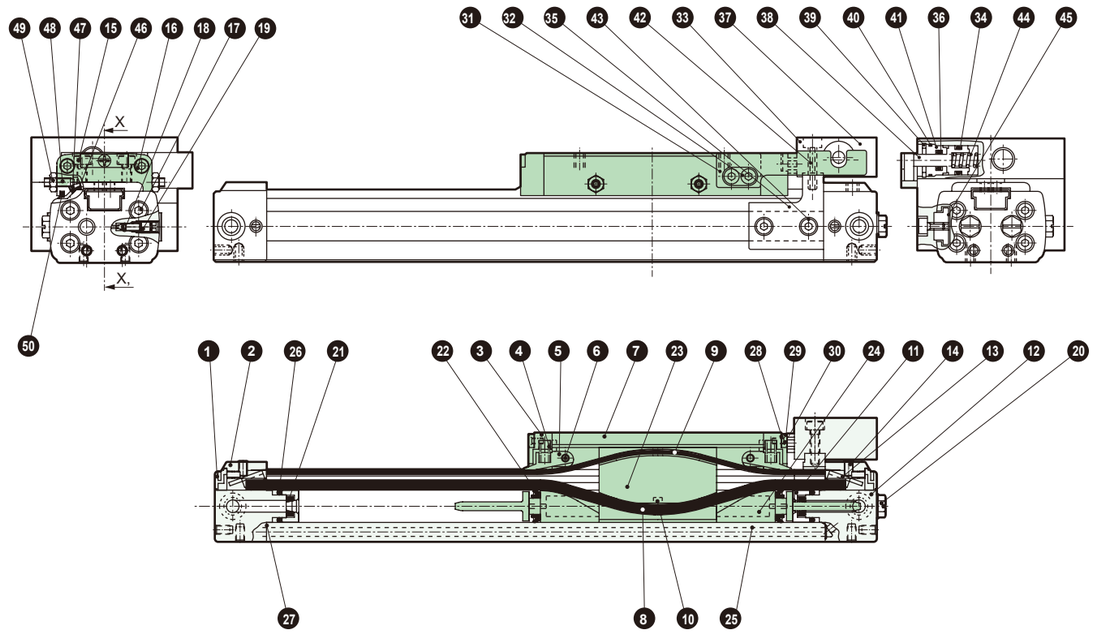
Code / Bore Size (mm)	QC	QD	QE	QF	QG	QH	QJ	QK	QL	QM	QN	QP	QR	QS	QU	QV	QW	QX	R	S	TA	TB
ø80 equivalent	50	6	14	133	2	7	145	69	47.5	29	20	Rc 1/8	73.5	48	62	143	60	40	Rc 3/8	M12 Depth 23	228	150
ø100 equivalent	50	6	14	145	2	7	164	88	47.5	29	20	Rc 1/8	92.5	48	62	148	60	40	Rc 1/2	M12 Depth 23	238	160

Code / Bore Size (mm)	TC	TD	TE	Y	ZA	ZB	ZC	ZD	ZE	ZF	ZG
ø80 equivalent	146	50	M12 Depth 15	157 to 164	60	21	32	50	30	59	46.5
ø100 equivalent	170	60	M12 Depth 15	183 to 190	60	21	36.5	55	30	69	54

Code	With Foot Bracket (LB)										
Bore Size (mm)	C	KB	LB	SA	SB	TF	U	V	W	X	Y
ø80 equivalent	130	263	550	162	134	25	13	12	526	14	157 to 164
ø100 equivalent	150	280	590	198	160	30	15	15	560	14	183 to 190

***1: For dimensions other than those listed above, please refer to P. 16 to 19 and 86.**
***2: Refer to P. 22, 23, 51 and 52 for dimensions diagram, and dimensions diagrams with options and switches.**

Internal Structure / Material (Bore Size: ø12 to ø25 equivalent)

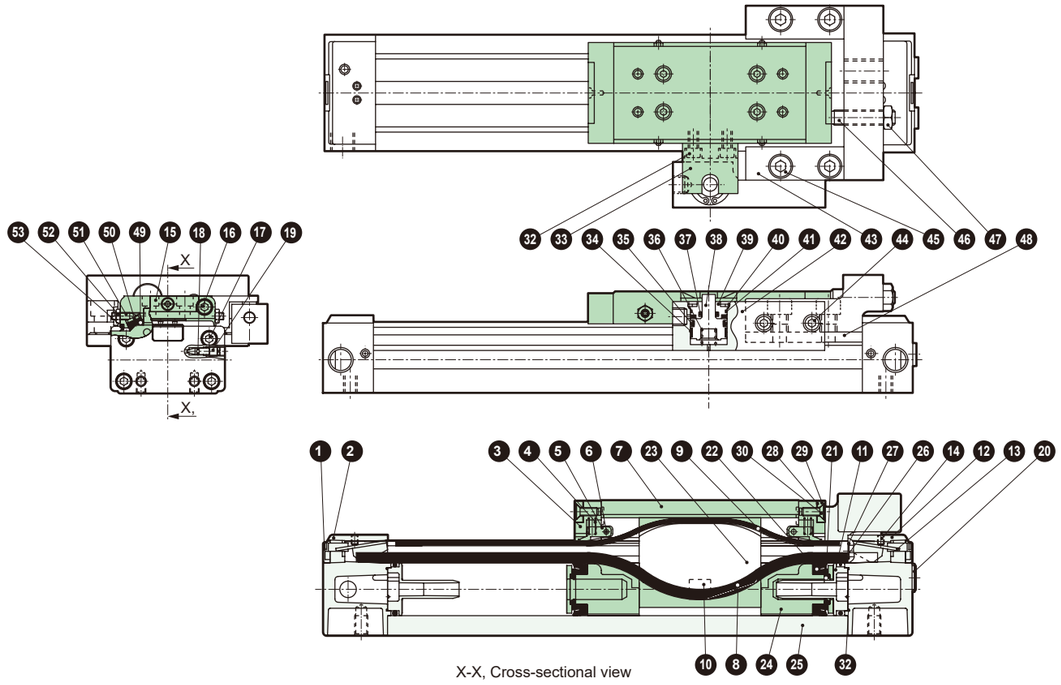


X-X, Cross-sectional view

Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Belt Cover	Polyamide		26	Cylinder Gasket	Nitrile Rubber	
2	Cover (L)	Aluminum Alloy	Baked Painting	27	O-ring for Centralized Port	Nitrile Rubber	
3	Table Cover	Polyacetal		28	Double-sided Tape		
4	Spring	Steel	Black Oxide	29	Plate	ø12 to ø20: Stainless Steel ø25: Alloy Steel	ø25: Zinc Chromate
5	Belt Holder	Polyacetal					
6	Parallel Pin (ø12 to ø20)	Stainless Steel		30	Cross-Recessed Tapping Screw	Stainless Steel	
	Shaft (ø25)	Steel	Zinc Chromate	31	Lock Lever	Alloy Steel	Chrome Plating
7	Table	Aluminum Alloy	Alumite	32	Hexagon Socket Head Cap Screw	Alloy Steel	Zinc Chromate
8	Seal Belt	Urethane Rubber		33	Stopper	Steel	Black Oxide
9	Dustproof Belt	Stainless Steel, Nitrile Rubber		34	Piston Packing	Nitrile Rubber	
10	Magnet			35	Adapter	Steel	Zinc Chromate
11	Cushion Adapter	Polyacetal		36	Rod Seal	Nitrile Rubber	
12	Cover (R)	Aluminum Alloy	Baked Painting	37	Fall Prevention Body	Aluminum Alloy	Alumite
13	Belt Spacer	Steel	Zinc Chromate	38	Lock Pin (Stopper Piston)	Alloy Steel	Chrome Plating
14	Hexagon Socket Set Screw	Alloy Steel	Zinc Chromate	39	C-Type Retaining Ring for Holes	Steel	
15	Hexagon Socket Head Cap Screw	Alloy Steel	Zinc Chromate	40	Gasket	Nitrile Rubber	
16	Hexagon Socket Head Cap Screw	Stainless Steel		41	Rod Cover	Aluminum Alloy	Alumite
17	Hexagon Socket Head Cap Screw	Alloy Steel	Zinc Chromate	42	Hexagon Socket Head Cap Screw	Alloy Steel	Zinc Chromate
18	Needle Gasket	Nitrile Rubber		43	Hexagon Socket Head Cap Screw	Alloy Steel	Zinc Chromate
19	Cushion Needle	Steel	Zinc Chromate	44	Spring	Steel	Electrodeposition Coating
20	Plug	ø12, ø16: Copper Alloy ø20 to ø25: Steel	ø12, ø16: Nickel Plating ø20 to ø25: Zinc Chromate	45	Plate Nut	Alloy Steel	Black Oxide
				46	Slider	Polyacetal	
21	Cushion Seal	Urethane Rubber		47	Slider Plate	Steel	
22	Piston Packing	Nitrile Rubber		48	Adjustment Screw	Alloy Steel	Zinc Chromate
23	Yoke	Aluminum Alloy	Alumite	49	Nut	Steel	Zinc Chromate
24	Piston	Polyacetal		50	Scraper	Polyacetal	
25	Cylinder Tube	Aluminum Alloy	Alumite				

For maintenance parts, please visit the CKD Equipment Product Site (https: //www.ckd.co.jp/kiki/en/) → "model No." → Maintenance Parts.

Internal Structure / Material (Bore Size: ø32 to ø63 equivalent)

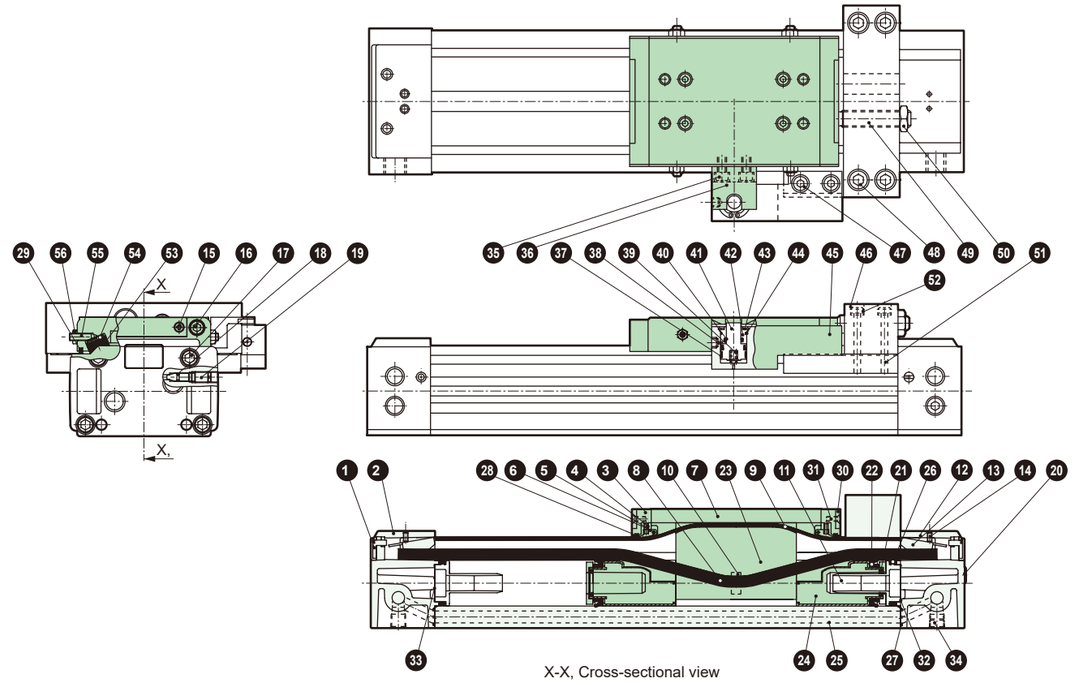


X-X, Cross-sectional view

Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Belt Cover	Polyamide		28	Double-sided Tape		
2	Cover (L)	Aluminum Alloy	Baked Painting	29	Plate	Alloy Steel	Zinc Chromate
3	Table Cover	Polyacetal		30	Cross-Recessed Tapping Screw	Stainless Steel	
4	Spring	Steel	Black Oxide	31	Cushion Ring Gasket	Nitrile Rubber	ø50, ø63 only
5	Belt Holder	Polyacetal		32	Hexagon Socket Head Cap Screw	Alloy Steel	Zinc Chromate
6	Shaft	Steel	Zinc Chromate	33	Lock Lever	Alloy Steel	Zinc Chromate
7	Table	Aluminum Alloy	Alumite	34	Wear Ring	Polyacetal	
8	Seal Belt	Urethane Rubber		35	Piston Packing	Nitrile Rubber	
9	Dustproof Belt	Stainless Steel, Nitrile Rubber		36	Spring	Steel	Electrodeposition Coating
10	Magnet			37	Rod Seal	Nitrile Rubber	
11	Cushion Ring	Polyacetal		38	Lock Pin	Alloy Steel	Chrome Plating
12	Cover (R)	Aluminum Alloy	Baked Painting	39	Rod Cover	Aluminum Alloy	Alumite
13	Belt Spacer	Steel	Zinc Chromate	40	C-Type Retaining Ring for Holes	Steel	
14	Hexagon Socket Set Screw	Alloy Steel	Zinc Chromate	41	Gasket	Nitrile Rubber	
15	Hexagon Socket Head Cap Screw	Alloy Steel	Zinc Chromate	42	Fall Prevention Body	Aluminum Alloy	Alumite
16	Hexagon Socket Head Cap Screw	Stainless Steel		43	Adapter	Steel	Zinc Chromate
17	Hexagon Socket Head Cap Screw	Alloy Steel	Zinc Chromate	44	Hexagon Socket Head Cap Screw	Alloy Steel	Zinc Chromate
18	Needle Gasket	Nitrile Rubber		45	Hexagon Socket Head Cap Screw	Alloy Steel	Zinc Chromate
19	Cushion Needle	Steel	Zinc Chromate	46	Hexagon Socket Set Screw	Alloy Steel	Zinc Chromate
20	Plug	Steel	Zinc Chromate	47	Hexagon Nut	Steel	Zinc Chromate
21	Cushion Seal	Urethane Rubber		48	Adapter Nut	Alloy Steel	Zinc Chromate
22	Piston Packing	Nitrile Rubber		49	Slider	Polyacetal	
23	Yoke	Aluminum Alloy	Alumite	50	Slider Plate	Steel	Zinc Chromate
24	Piston	Polyacetal		51	Adjustment Screw	Alloy Steel	Zinc Chromate
25	Cylinder Tube	Aluminum Alloy	Alumite	52	Nut	Steel	Zinc Chromate
26	Cylinder Gasket	Nitrile Rubber		53	Scraper	Polyacetal	
27	O-ring for Centralized Port	Nitrile Rubber					

For maintenance parts, please visit the CKD Equipment Product Site
(https: //www.ckd.co.jp/kiki/en/) → "model No." → Maintenance Parts.

Internal Structure / Material (Bore Size: ø80, ø100 equivalent)



X-X, Cross-sectional view

Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Belt Cover	Polyamide		29	Felt (2)	Wool	
2	Cover (L)	Aluminum Alloy	Baked Painting	30	Plate	Alloy Steel	Zinc Chromate
3	Table Cover	Polyacetal		31	Cross-Recessed Tapping Screw	Stainless Steel	
4	Spring	Steel	Black Oxide	32	Cushion Ring Gasket (1)	Nitrile Rubber	
5	Belt Holder	Polyacetal		33	Cushion Ring Gasket (2)	Nitrile Rubber	
6	Shaft	Steel	Zinc Chromate	34	Plug	Steel	Zinc Chromate
7	Table	Aluminum Alloy	Alumite	35	Hexagon Socket Head Cap Screw	Alloy Steel	Zinc Chromate
8	Seal Belt	Urethane Rubber		36	Lock Lever	Alloy Steel	Zinc Chromate
9	Dustproof Belt	Stainless Steel, Nitrile Rubber		37	Wear Ring	Polyacetal	
10	Magnet			38	Piston Packing	Nitrile Rubber	
11	Cushion Ring	Polyacetal		39	Spring	Steel	Electrodeposition Coating
12	Cover (R)	Aluminum Alloy	Baked Painting	40	Rod Seal	Nitrile Rubber	
13	Belt Spacer	Steel	Zinc Chromate	41	Lock Pin	Alloy Steel	Chrome Plating
14	Hexagon Socket Set Screw	Alloy Steel	Zinc Chromate	42	Rod Cover	Aluminum Alloy	Alumite
15	Hexagon Socket Head Cap Screw	Alloy Steel	Zinc Chromate	43	C-Type Retaining Ring for Holes	Steel	
16	Hexagon Socket Head Cap Screw	Stainless Steel		44	Gasket	Nitrile Rubber	
17	Hexagon Socket Head Cap Screw	Alloy Steel	Zinc Chromate	45	Fall Prevention Body	Aluminum Alloy	Alumite
18	Needle Gasket	Nitrile Rubber		46	Adapter	Steel	Zinc Chromate
19	Cushion Needle	Steel	Zinc Chromate	47	Hexagon Socket Head Cap Screw	Alloy Steel	Zinc Chromate
20	Plug	Steel	Zinc Chromate	48	Hexagon Socket Head Cap Screw	Alloy Steel	Zinc Chromate
21	Cushion Seal	Urethane Rubber		49	Hexagon Socket Set Screw	Alloy Steel	Zinc Chromate
22	Piston Packing	Nitrile Rubber		50	Hexagon Nut	Steel	Zinc Chromate
23	Yoke	Aluminum Alloy	Alumite	51	Adapter Nut	Alloy Steel	Zinc Chromate
24	Piston	Polyacetal		52	Belleville Spring Washer	Steel	
25	Cylinder Tube	Aluminum Alloy	Alumite	53	Slider	Polyacetal	
26	Cylinder Gasket	Nitrile Rubber		54	Slider Plate	Steel	Zinc Chromate
27	O-ring for Centralized Port	Nitrile Rubber		55	Adjustment Screw	Alloy Steel	Zinc Chromate
28	Felt (1)	Wool		56	Nut	Steel	Zinc Chromate

For maintenance parts, please visit the CKD Equipment Product Site
(https: //www.ckd.co.jp/kiki/en/) → "model No." → Maintenance Parts.

Rodless Cylinder Double Acting / Full Cowl Type

SRL3-J Series

● Bore Size: ø25, ø32, ø40, ø50, ø63 or equiv.

Circuit Diagram Code

RoHS

Model No. Notation

Without Switch
(Built-in magnet for switch)

SRL3-J - 00 - 25 [ ] B - 200 ——— B

Model No. ❶ ❷ ❸ ❹ ❺ ❽

With Switch
(Built-in magnet for switch)

SRL3-J - 00 - 25 [ ] B - 200 - M0H - R - B

Model No. ❷Bore Size ❹Cushion ❻Switch Model No. ❽Option
❶Mounting type ❸Piping thread type ❺Stroke ❼Number of Switches

❶Mounting type

Mounting brackets are pre-assembled on the product and shipped.

Code	Content	
00	Basic type	
LJ	Axial Foot Type (For Centralized Piping) (ø25, ø32 equivalent)	

❷Bore Size (mm)

Code	Content
25	ø25 equivalent
32	ø32 equivalent
40	ø40 equivalent
50	ø50 equivalent
63	ø63 equivalent

❸Piping thread type

Code	Content
Blank	M5 (ø12, ø16 equivalent) Rc Thread (ø20 to ø100 equivalent)
N	NPT Thread (ø20 equivalent or larger) (Custom-made)
G	G Thread (ø20 equivalent or larger) (Custom-made)

❹Cushion

Code	Content
B	With Cushion on Both Sides
R	With R Side Cushion
L	With L Side Cushion
N	Without Cushion

❺Stroke (mm)

Bore Size	Stroke	Intermediate Stroke
ø25 to ø63 equivalent	1 to 3000	Every 1 mm

Note: For the minimum stroke with switch, please refer to P. 74.

❻Switch Model No.

For switch details, please refer to P. 1457. Switches are included with the product and shipped.

Contact	Indicator LED Special Function	Wiring (Output)	Load Voltage (V) AC	Load Voltage (V) DC	Load Current (mA) AC	Load Current (mA) DC	Lead wire *1 Straight	Lead wire *1 L-shape	
Solid State	1-Color	2-wire	-	10 to 30	-	5 to 30	M2H□	M2V□	
	2-Color		-	10 to 30	-	5 to 30	-	M2WV□	
	1-Color	3-wire (NPN)	-	30 or less	-	100 or less	M3H□	M3V□	
	2-Color		-	30 or less	-	100 or less	-	M3WV□	
	1-Color (Custom order)	3-wire (PNP)	-	30 or less	-	100 or less	M3PH□	M3PV□	
	2-Color	2-wire	-	24 ± 10%	-	5 to 20	T2WH□	T2WV□	
		3-wire (NPN)	-	30 or less	-	50 or less	T3WH□	T3WV□	
	2-Color Improved Water Resistance	2-wire	-	24 ± 10%	-	5 to 20	T2WLH□	T2WLV□	*2
	2-Color for AC Magnetic Field		-	24 ± 10%	-		T2YD□	-	
			—		-		T2YDT□	-	
	2-Color		-	10 to 30	-		T2YLH□	T2YLV□	
	2-Color	3-wire (NPN)	-	10 to 28	-	50 or less	T3YLH□	T3YLV□	
Reed	1-Color	2-wire	110	12/24	-	5 to 50	M0H□	M0V□	
	No Indicator LED		110	5/12/24	-	50 or less	M5H□	M5V□	

*4

*Lead wire length, connector specification

Code	Content
Blank	1 m (Standard)
3	3 m (Option)
5	5 m (Option)
W	M8 Connector, 1PIN (+), 4PIN (−) Lead Wire 0.3 m

*4: Only T2WLH and T2WLV can be selected.

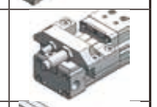
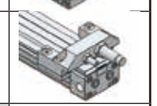
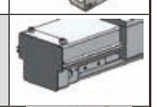
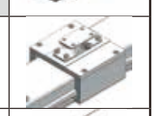
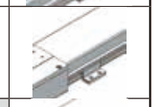
Example) Lead wire length
1 m M0V
3 m M0V3
5 m M0V5

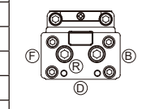
*1: For "□" in the switch model number, enter the code selected from the "Lead wire length, connector specification" table.
*2: This does not guarantee the water resistance of the cylinder.
*3: Switches other than the model numbers listed above are also available. (Custom Product) For details, see P. 1457.

❼Number of Switches

Code	Content
R	With 1 pc on R side
L	With 1 pc on L side
D	With 2 pcs
T	With 3 pcs
4	With 4 pcs (If 4 or more, enter the number of switches)

❽Option

Code	Description	Bore Size (ø) equivalent 25	32	40	50	63	
A	Full stroke adjustment both sides, With shock absorber	●	●	●	●	●	
A1	Full stroke adjustment R side only, With shock absorber	●	●	●	●	●	
A2	Full stroke adjustment L side only, With shock absorber	●	●	●	●	●	
A3	Full Stroke Adjustment Bracket Retrofit Type	●					
Y	Floating Joint	●	●	●	●	●	
3 L	Intermediate Support Bracket (for 00)	●	●	●	●	●	
3 N	With Intermediate Support Bracket (for LJ)	●	●				

Code	Port Position	Cushion Needle Position	25	32	40	50	63	
Blank	F (Standard)	F (Standard)	●	●	●	●	●	
R	R (Centralized Port)	F	●	●	●	●	●	
B	F	B	●	●	●	●	●	
T	R (Centralized Port)	B *6, *7	●	●	●	●	●	
D	D	F	●	●	●	●	●	
S	D	D		●	●	●	●	

*1: The diagrams for A, A1, and A2 show the inside of the dust-proof cover.
*2: In the case of the standard with ø25, reM0Ve the cover, attach a flat nut and install the full stroke adjusting bracket. "A3" is an option with a mounting plate nut assembled for retrofitting without reM0Ving the cover.
3: The "" in L* and N* indicates the number of sets. If 2 sets are required, enter "L2" (for 00) or "N2" (for LJ). 2 pcs / 1 set.
*4: For port and cushion needle position display symbols, please refer to the external dimensions diagrams on P. 76 to 79.
*5: When installing piping fittings or speed controllers, it is recommended to use the attached extension fittings.
*6: When using centralized piping ports (R side ports), reM0Ve the side cover before use.
*7: Common piping port (port position R) of ø25 and ø32 is ❶ available only for mounting bracket LJ. "00" cannot be selected for ❶mounting type.

Switch Individual Model No. Notation

(For component parts, please refer to P. 91.)

●Switch body+Mounting bracket set (*1)

SRL3 - M0H

●Switch body only

SW - M0H

6 Switch Model No.

●Mounting bracket complete set (*2)

・M Type Switch

SRL3 - M

・T Type Switch

SRL3 - T

● Lead wire holder (*3)

SRL3 - MH

*1: The switch body + mounting bracket set does not include a lead wire holder. If a lead wire holder is required, please order it separately.
*2: The mounting bracket is different for M type switch and T type switch.
*3: Lead wire holder is 10 pcs/1 set.

● How to order discrete shock absorber

(1 Shock absorber, 1 Hexagon Nut for fixing shock absorber)

SRL3 - 40 - NCK

2 Bore Size

Note: Note that the Hexagon Nut only for Shock Absorbers fixing for SRL3-40 is different from the NCK standard nut.

Applicable Shock Absorber Model No.

Model No.	Applicable Shock Absorber
SRL3-J-25	NCK-00-1.2
SRL3-J-32	NCK-00-2.6
SRL3-J-40	NCK-00-7
SRL3-J-50/63	NCK-00-12

●Floating Joint Set Model No. Notation

(Mount, Mount Base, Pin, Flat Washer, Pan Head Screw with Spring Washer, 4 Mounting Bolts)

SRL3 - 40 - Y

2 Bore Size

● How to order discrete intermediate support bracket

For 00

SRL3 - 40 - L (2 pcs./set)

2 Bore Size

For LJ

SRL3 - 32 - N (2 pcs./set)

2 Bore Size

● How to order cover kit

SRL3-J - 40 - 200 - COVER-KIT

2 Bore Size　5 Stroke

● How to order adaptor kit

SRL3-J - 40 - ADAPTOR-KIT

2 Bore Size

● How to order full stroke adjusting bracket kit

SRL3-J - 40 - A1 (1 Set)

2 Bore Size

For component parts, please refer to P. 94.

●Mounting Bracket Model No. Notation

(2 Brackets, 4 Mounting Bolts)

SRL3-J - LJ - 32

2 Bore Size

MEMO

Rodless Type
SRL3
SRG3
SRM3
SRT3
MRL2
MRG2
SM-25
Cylinder Switch
Ending

Specifications

Item	SRL3-J				
Bore Size	ø25 equivalent	ø32 equivalent	ø40 equivalent	ø50 equivalent	ø63 equivalent
Operation Method	Double Acting Type				
Operating Fluid	Compressed Air				
Max Operating Pressure MPa	0.7				
Min Operating Pressure MPa	0.1				0.05
Proof Pressure MPa	1.05				
Ambient Temperature °C	5 to 60				
Port Size	Rc1/8	Rc1/4		Rc3/8	
Stroke tolerance mm	$^{+2.0}_{0}$ (to 1000), $^{+2.5}_{0}$(to 3000)				
Operating Piston Speed mm/s	50 to 2000 (Standard Port Piping) *1				
Cushion	Air Cushion				
Lubrication	Not required (If lubricating, use Turbine Oil Class 1 ISO VG 32. Note that once lubrication is started, it must be continued.)				

*1: The operating piston speed for centralized port piping varies depending on the stroke, so please consult us separately.

Allowable Absorption Energy

Bore Size (mm)	With Cushion		Without Cushion	With Shock Absorber (Initial Setting)	
	Allowable Absorption Energy (J)	Cushion Stroke (mm)	Allowable Absorption Energy (J)	Absorption Energy (J)	Effective Stroke (mm)
ø25 equivalent	1.40	20.9	0.015	10	9
ø32 equivalent	2.57	23.5	0.030	18	13
ø40 equivalent	4.27	23.9	0.050	50	16.5
ø50 equivalent	9.13	24.9	0.072	86	21
ø63 equivalent	17.4	29.6	0.138	86	21

Stroke

Equiv. Bore Size	Standard Stroke (mm)	Max Stroke (mm)	Minimum Stroke (mm)
ø25, ø32, ø40, ø50, ø63 equivalent	200, 300, 400, 500, 600, 700, 800, 900, 1000	3000	1

Note: Intermediate strokes can be manufactured in 1 mm increments.

M Type Switch Mounting Quantity and Min Stroke (mm)

Switch Qty.	1		2	
Switch Model No. / Bore Size (mm)	M□V	M□H	M□V	M□H
ø25 equivalent	10	10	30	45 (70)
ø32 equivalent	10	10	30	45
ø40 equivalent	10	10	30	45
ø50 equivalent	15	15	30	45
ø63 equivalent	15	15	30	45

Note: In the case of full stroke adjustment, the minimum stroke with switch is shown in ( ).

T Type Switch Mounting Quantity and Min Stroke (mm)

Switch Qty.	1				2			
Switch Model No. / Bore Size (mm)	T□V	T2WLV	T□H	T2WLH	T□V	T2WLV	T□H	T2WLH
ø25 equivalent	10	10	10	10 (16)	45	35	50 (70)	56 (82)
ø32 equivalent	10	10	10	10	45	35	50	56
ø40 equivalent	10	10	10	10	45	35	50	56
ø50 equivalent	10	10	10	10	45	35	50	56
ø63 equivalent	10	10	10	10	45	35	50	56

Note: In the case of full stroke adjustment, the minimum stroke with switch is shown in ( ).

Cylinder Weight

(kg)

Item / Equiv. Bore Size	Weight at 0 mm Stroke: Basic type	Weight at 0 mm Stroke: Switch Weight	Switch Mounting Bracket Weight: T Type	Switch Mounting Bracket Weight: M Type	Added weight per stroke = 100 mm
ø25 equivalent	2.37	Refer to the mass described in the switch specifications on P. 1457.	0.005	0.001	0.37
ø32 equivalent	3.34				0.46
ø40 equivalent	4.78				0.65
ø50 equivalent	7.27				0.90
ø63 equivalent	11.23				1.28

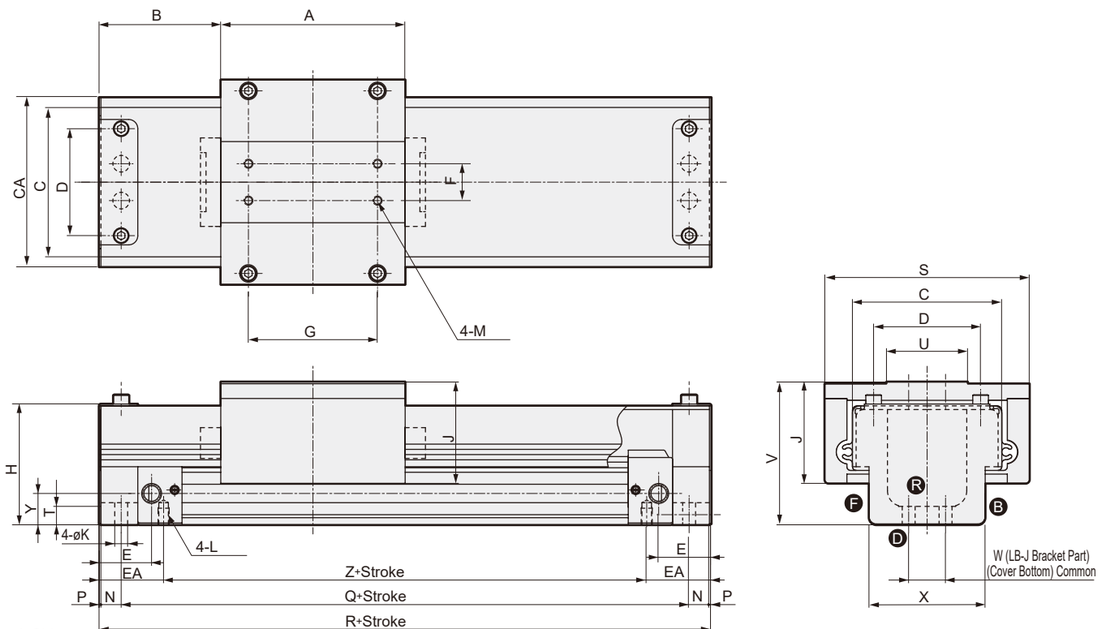
Theoretical Thrust Table

(Unit: N)

Bore Size (mm)	Operating Direction	Operating Pressure MPa: 0.05	0.1	0.2	0.3	0.4	0.5	0.6	0.7
ø25 equivalent	Push/Pull	-	54.2	1.08×10^{2}	1.63×10^{2}	2.17×10^{2}	2.71×10^{2}	3.25×10^{2}	3.80×10^{2}
ø32 equivalent	Push/Pull	-	81.4	1.63×10^{2}	2.44×10^{2}	3.26×10^{2}	4.07×10^{2}	4.88×10^{2}	5.70×10^{2}
ø40 equivalent	Push/Pull	-	1.27×10^{2}	2.53×10^{2}	3.80×10^{2}	5.06×10^{2}	6.33×10^{2}	7.60×10^{2}	8.86×10^{2}
ø50 equivalent	Push/Pull	-	1.99×10^{2}	3.98×10^{2}	5.96×10^{2}	7.95×10^{2}	9.94×10^{2}	1.19×10^{3}	1.39×10^{3}
ø63 equivalent	Push/Pull	1.57×10^{2}	3.14×10^{2}	6.27×10^{2}	9.41×10^{2}	1.25×10^{3}	1.57×10^{3}	1.88×10^{3}	2.20×10^{3}

External Dimensions (Bore Size: ø25 equivalent)

●ø25 equivalent



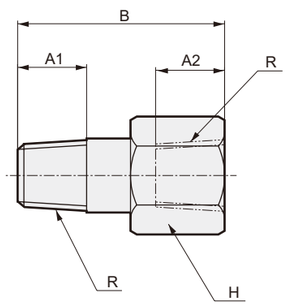
Code / Bore Size (mm)	A	B	C	CA	D	E	EA	F	G	H	J	K	L	M
ø25 equivalent	100	66	81	91.9	58	28.5	35	20	70	65.5	55	7	M6 Depth 9	M5 Through

Code / Bore Size (mm)	N	P	Q	R	S	T	U	V	W	X	Y	Z
ø25 equivalent	11	1	208	232	111	10	44	77.5	20	63	17	162

*1: SRL3-J has the same mounting dimensions as SRL3-LB (P. 18).
*2: Extension joints (2 pcs) are attached and shipped. When mounting piping joints or speed controllers, we recommend using extension joints.
*3: For external dimensions diagrams with each switch, please refer to P. 87.

Accessory External Dimensions

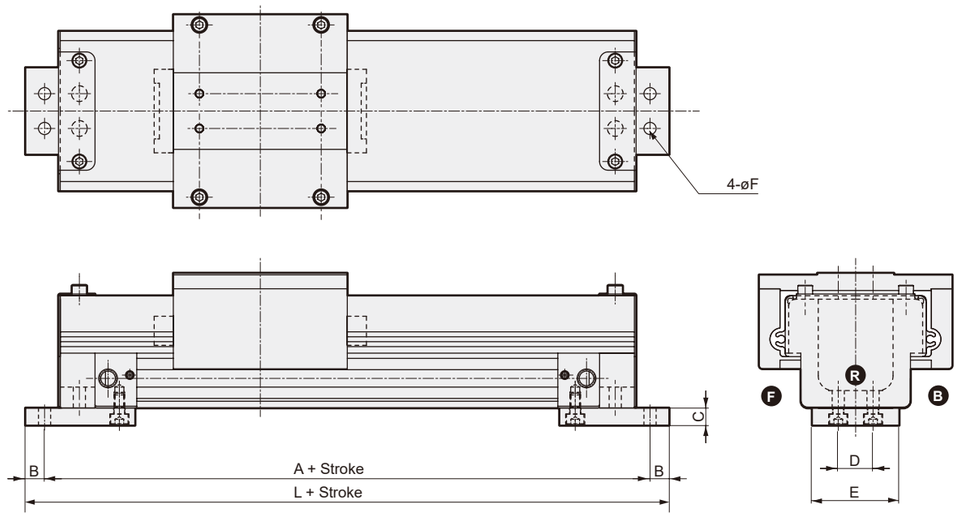
●Extension Joint



Code	A1	A2	B	R	H
SRL3-J-PF01	8	8	28.5	Rc 1/8	14
SRL3-J-PF02	11	11	33	Rc 1/4	17
SRL3-J-PF03	12	12	37	Rc 3/8	21

External Dimensions (Bore Size: ø25 equivalent)

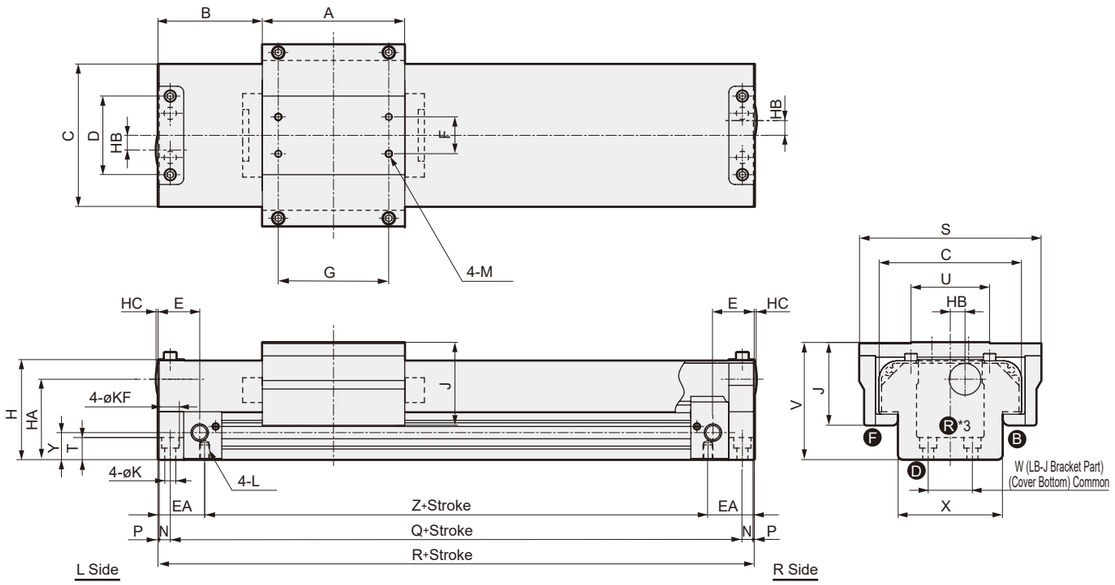
● Axial foot (for common piping) (LJ)



Code / Bore Size (mm)	A	B	C	D	E	F	L
ø25 equivalent	248	11	10	20	50	7	270

*1: The dimensions are the same for full stroke adjustment with shock absorber (A□).
*2: For external dimensions diagrams with each switch, please refer to P. 87.

External Dimensions (Bore Size: ø32 to ø63 equivalent)



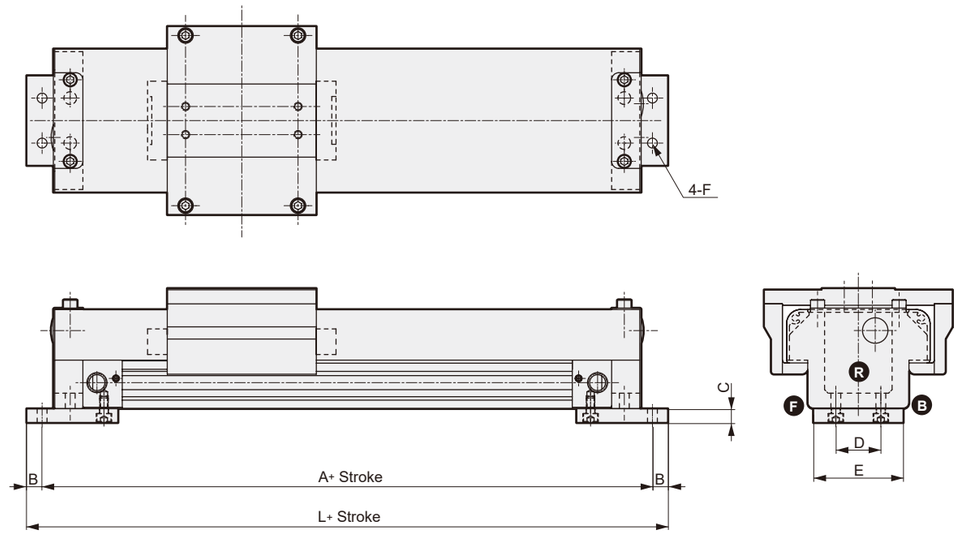
Code / Bore Size (mm)	A	B	C	D	E	EA	F	G	H	HA	HB	HC	J	K	KF
ø32 equivalent	106	81	102	58	31	36	20	80	71.5	55.5	12	2	61	7	-
ø40 equivalent	116	85	116	64	34	38	30	90	81.5	65.5	12	2	67.5	9	14 Counterbore Depth 8.6
ø50 equivalent	120	90	140	84	36	44	30	100	102	80	17	2	85	9	14 Counterbore Depth 8.6
ø63 equivalent	136	106	162	95	41	45	40	110	115	93.5	20	2	91	11	17.5 Counterbore Depth 10.8

Code / Bore Size (mm)	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
ø32 equivalent	M6 Depth 9	M6 Through	11	1	244	268	134	11	52	85.5	32	72	18.5	196
ø40 equivalent	M8 Depth 12	M6 Through	9	1	266	286	148	18	64	95.5	36	85	22	210
ø50 equivalent	M8 Depth 12	M8 Through	9	1	280	300	178	22.5	74	119	45	109	28	212
ø63 equivalent	M10 Depth 15	M8 Through	12	1	322	348	200	28	96	132	50	129	35	258

*1: SRL3-J has the same mounting dimensions as SRL3-LB (P. 18).
*2: Extension joints (2 pcs) are attached and shipped.
*3: R port position cannot be selected for ø32 with mounting type "00".
*4: For external dimensions diagrams with each switch, please refer to P. 87.

External Dimensions (Bore Size: ø32 equivalent)

● Axial foot (for common piping) (LJ)

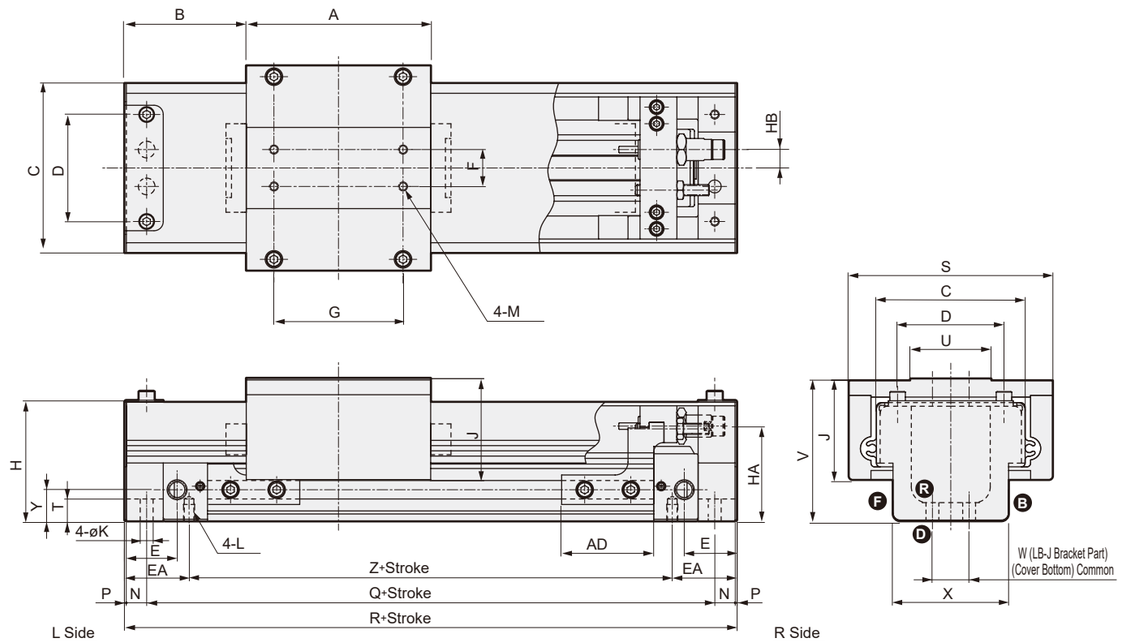


Code / Bore Size (mm)	A	B	C	D	E	F	L
ø32 equivalent	284	11	10	32	64	7	306

*1: The dimensions are the same for full stroke adjustment with shock absorber (A□).
*2: For external dimensions diagrams with each switch, please refer to P. 87.

External Dimensions with Options (Bore Size: ø25 equivalent)

● Full stroke adjustable with shock absorber



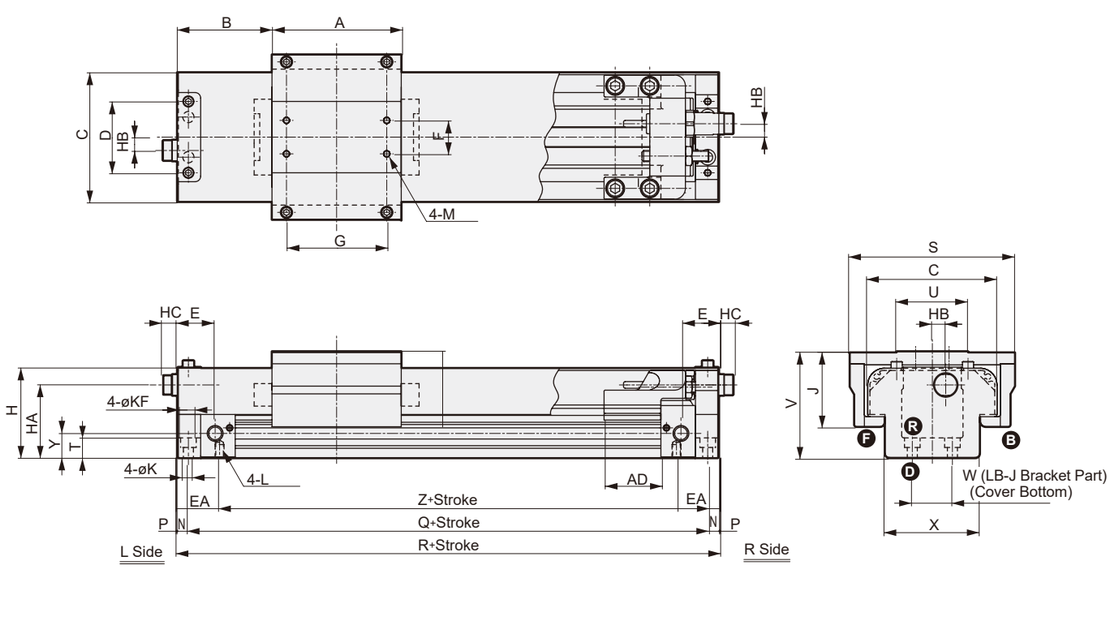
Code / Bore Size (mm)	A	AD	B	C	D	E	EA	F	G	H	HA	HB	J	K
ø25 equivalent	100	50	66	81	58	28.5	35	20	70	65.5	51.5	10	55	7

Code / Bore Size (mm)	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
ø25 equivalent	M6 Depth 9	M5 Through	11	1	208	232	111	10	44	77.5	20	63	17	162

*1: SRL3-J has the same mounting dimensions as SRL3-LB (P. 18).
*2: Extension joints (2 pcs) are attached and shipped.

External Dimensions with Options (Bore Size: ø32 to ø63 equivalent)

● Full stroke adjustable with shock absorber



Code / Bore Size (mm)	A	AD	B	C	D	E	EA	F	G	H	HA	HB	HC MAX	J	K	KF	L	M
ø32 equivalent	106	46	81	102	58	31	36	20	80	70.5	55.5	12	6	61	7	-	M16 Depth 9	M6 Through
ø40 equivalent	116	51	85	116	64	34	38	30	90	80.5	65.5	12	13	67.5	9	14 Counterbore Depth 8.6	M8 Depth 12	M6 Through
ø50 equivalent	120	53	90	140	84	36	44	30	100	101	80	17	34	85	9	14 Counterbore Depth 8.6	M8 Depth 12	M8 Through
ø63 equivalent	136	64	106	162	95	41	45	40	110	114	93.5	20	18	91	11	17.5 Counterbore Depth 10.8	M10 Depth 15	M8 Through

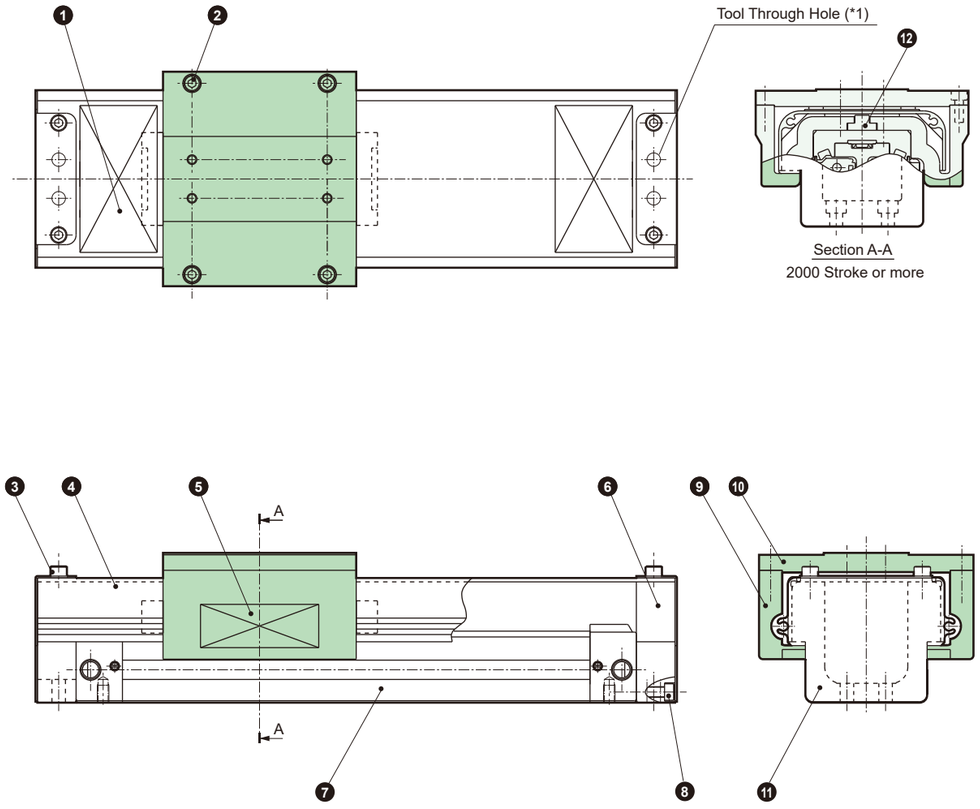
Code / Bore Size (mm)	N	P	Q	R	S	T	U	V	W	X	Y	Z
ø32 equivalent	11	1	244	268	134	11	52	85.5	32	72	18.5	196
ø40 equivalent	9	1	266	286	148	18	64	95.5	36	85	22	210
ø50 equivalent	9	1	280	300	178	22.5	74	119	45	109	28	212
ø63 equivalent	12	1	322	348	200	28	96	132	50	129	35	258

*1: SRL3-J has the same mounting dimensions as SRL3-LB (P. 18).
*2: Extension joints (2 pcs) are attached and shipped.

Internal Structure / Material

For the internal structure of the main body, it is the same as the standard type SRL3 series, so please refer to P. 24.

●ø25 equivalent



Item	Part Name	Material	Remarks	Item	Part Name	Material	Remarks
1	Caution nameplate (Beware of tripping)	Polypropylene		7	Rodless Cylinder		SRL3 (CKD)
2	Hexagon Socket Head Cap Screw	Stainless Steel		8	Hexagon Socket Head Cap Screw	Alloy Steel	
3	Hexagon Socket Head Cap Screw	Stainless Steel		9	Table Adapter	Aluminum Alloy	Alumite
4	Cover	Aluminum Alloy	Alumite	10	Table Plate	Aluminum Alloy	Alumite
5	Caution nameplate (Beware of pinching)	Polypropylene		11	Side Cover	Aluminum Alloy	Alumite
6	LB-J Bracket	Aluminum Alloy	Alumite	12	Table Spacer	Polyacetal	

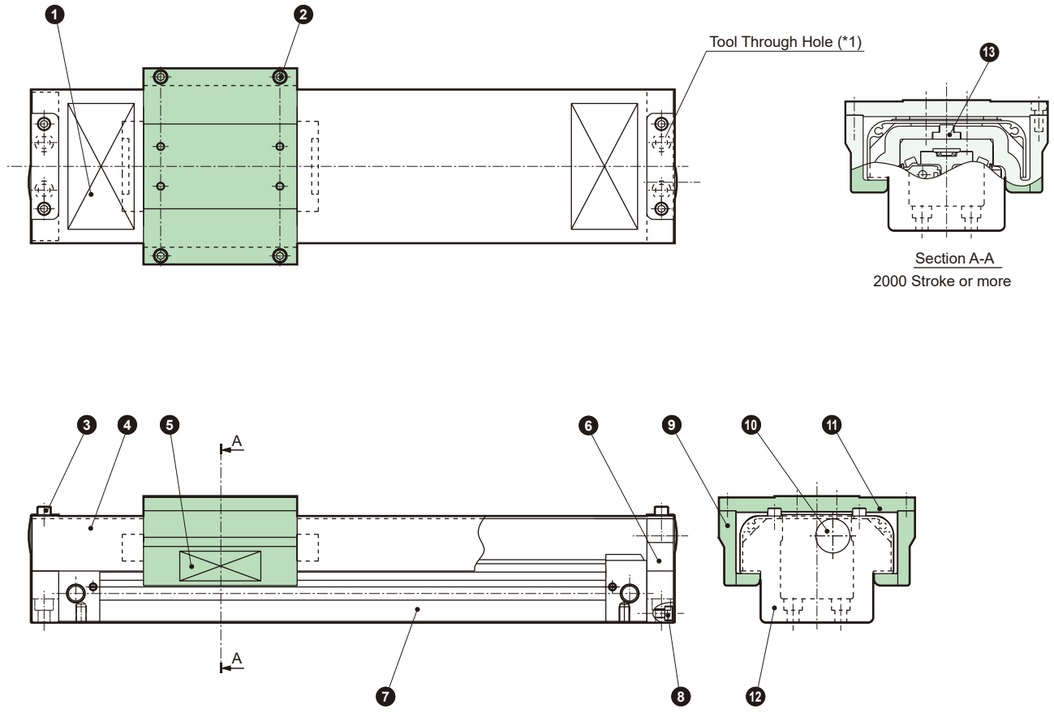
*1: When installing the product, reM0Ve the side cover and tighten with a hexagonal wrench using this hole.
*2: Extension joints (2 pcs) are attached and shipped.

For maintenance parts, please visit the CKD Equipment Product Site (https: //www.ckd.co.jp/kiki/en/) → "model No." → Maintenance Parts.

Internal Structure / Material

For the internal structure of the main body, it is the same as the standard type SRL3 series, so please refer to P. 24, 25.

● ø32 to ø63 or equiv.



Item	Part Name	Material	Remarks	Item	Part Name	Material	Remarks
1	Caution nameplate (Beware of tripping)	Polypropylene		8	Hexagon Socket Head Cap Screw	Alloy Steel	Zinc Plating
2	Hexagon Socket Head Cap Screw	Stainless Steel		9	Table Adapter	Aluminum Alloy	Alumite
3	Hexagon Socket Head Cap Screw	Stainless Steel		10	Hole Plug	Polyamide	
4	Cover	Aluminum Alloy	Alumite	11	Table Plate	Aluminum Alloy	Alumite
5	Caution nameplate (Beware of pinching)	Polypropylene		12	Side Cover	Aluminum Alloy	Alumite
6	LB-J Bracket	Aluminum Alloy	Alumite	13	Table Spacer	Polyacetal	
7	Rodless Cylinder		SRL3 (CKD)				

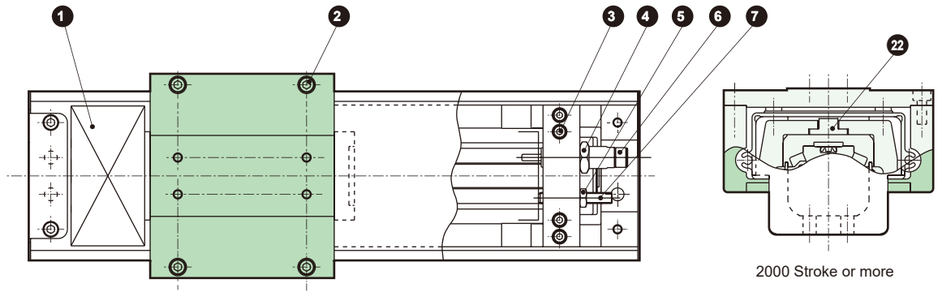
*1: When installing the product, reM0Ve the side cover and tighten with a hexagonal wrench using this hole.
*2: Extension joints (2 pcs) are attached and shipped.

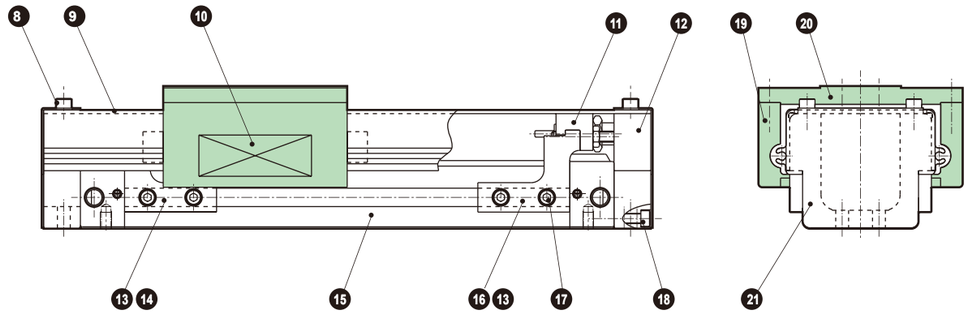
For maintenance parts, please visit the CKD Equipment Product Site (https: //www.ckd.co.jp/kiki/en/) → "model No." → Maintenance Parts.

Internal Structure / Material

For the internal structure of the main body, it is the same as the standard type SRL3 series, so please refer to P. 24.

● Full stroke adjustable with Shock Absorbers (ø25 or equivalent)





Item	Part Name	Material	Remarks	Item	Part Name	Material	Remarks
1	Caution nameplate (Beware of tripping)	Polypropylene		12	LB-J Bracket	Aluminum Alloy	Alumite
2	Hexagon Socket Head Cap Screw	Stainless Steel		13	Plate Nut	Alloy Steel	Black Oxide
3	Hexagon Socket Head Cap Screw	Alloy Steel	Zinc Plating	14	Adapter (R)	Steel	Zinc Plating
4	Hexagon Nut	Steel	Zinc Plating	15	Rodless Cylinder		SRL3 (CKD)
5	Hexagon Nut	Steel	Zinc Plating	16	Adapter (L)	Steel	Zinc Plating
6	Shock absorber			17	Hexagon Socket Head Cap Screw	Alloy Steel	Zinc Plating
7	Hexagon Socket Set Screw	Alloy Steel	Zinc Plating	18	Hexagon Socket Head Cap Screw	Alloy Steel	Zinc Plating
8	Hexagon Socket Head Cap Screw	Stainless Steel		19	Table Adapter	Aluminum Alloy	Alumite
9	Cover	Aluminum Alloy	Alumite	20	Table Plate	Aluminum Alloy	Alumite
10	Caution nameplate (Beware of pinching)	Polypropylene		21	Side Cover	Aluminum Alloy	Alumite
11	Plate	Aluminum Alloy	Alumite	22	Table Spacer	Polyacetal	

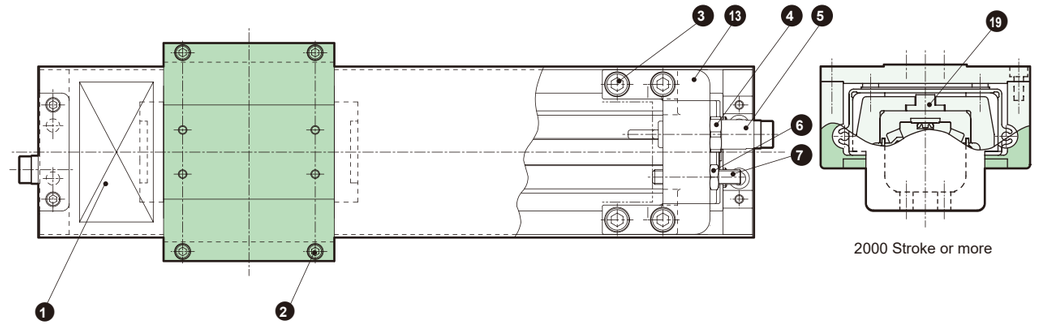
Note: Extension fittings (2 pcs.) are included with the shipment.

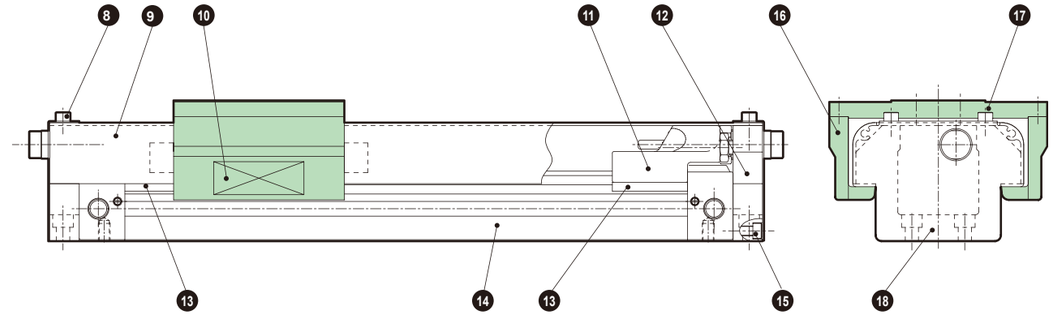
For maintenance parts, please visit the CKD Equipment Product Site (https: //www.ckd.co.jp/kiki/en/) → "model No." → Maintenance Parts.

Internal Structure / Material

For the internal structure of the main body, it is the same as the standard type SRL3 series, so please refer to P. 24, 25.

● Full stroke adjustable with Shock Absorbers (ø32 to ø63 or equivalent)





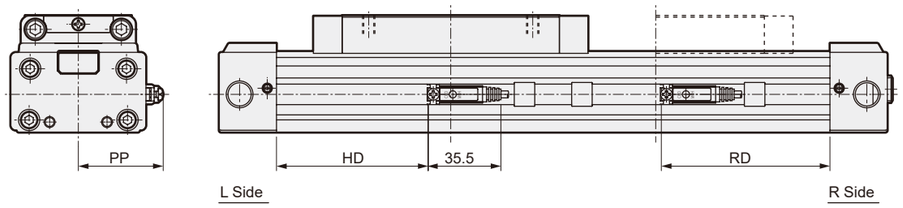
Item	Part Name	Material	Remarks	Item	Part Name	Material	Remarks
1	Caution nameplate (Beware of tripping)	Polypropylene		11	Adapter	Steel	Zinc Plating
2	Hexagon Socket Head Cap Screw	Stainless Steel		12	LB-J Bracket	Aluminum Alloy	Alumite
3	Hexagon Socket Head Cap Screw	Alloy Steel	Zinc Plating	13	Adapter Nut	Steel	Zinc Plating
4	Hexagon Nut	Steel	Zinc Plating	14	Rodless Cylinder		SRL3 (CKD)
5	Shock absorber			15	Hexagon Socket Head Cap Screw	Alloy Steel	Zinc Plating
6	Hexagon Nut	Steel	Zinc Plating	16	Table Adapter	Aluminum Alloy	Alumite
7	Hexagon Socket Set Screw	Alloy Steel	Zinc Plating	17	Table Plate	Aluminum Alloy	Alumite
8	Hexagon Socket Head Cap Screw	Stainless Steel		18	Side Cover	Aluminum Alloy	Alumite
9	Cover	Aluminum Alloy	Alumite	19	Table Spacer	Polyacetal	
10	Caution nameplate (Beware of pinching)	Polypropylene					

Note: Extension fittings (2 pcs.) are included with the shipment.

For maintenance parts, please visit the CKD Equipment Product Site (https: //www.ckd.co.jp/kiki/en/) → "model No." → Maintenance Parts.

SRL3 Series External Dimensions with Switch

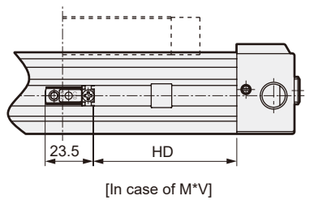
●M0H/V, M5H/V, M2H/V, M2WV, M3H/V, M3WV, M3PH/V
・SRL3-Standard, G, Q, GQ



Code / Bore Size (mm)	PP	HD	RD
ø12 equivalent	24.5	40.5	60.5
ø16 equivalent	26.5	47	67
ø20 equivalent	29.5	52.5	72.5
ø25 equivalent	34.5	60	82
ø32 equivalent	41.5	74	96

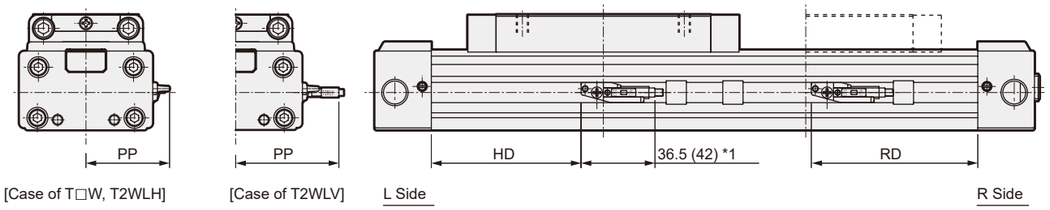
Code / Bore Size (mm)	PP	HD	RD
ø40 equivalent	48.5	80	102
ø50 equivalent	56.5	79	101
ø63 equivalent	67.5	98	120
ø80 equivalent	87.5	170	190
ø100 equivalent	105.5	175	195

Note: For switch mountability, refer to the model number display method for each variation.



[In case of M*V]

●T2WH/V, T3WH/V, T2WLH/V
・SRL3-Standard, G, Q, GQ

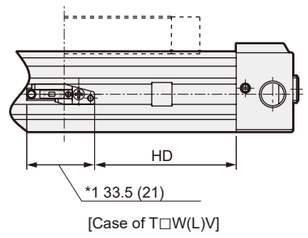


[Case of T□W, T2WLH] [Case of T2WLV] L Side R Side

Code / Bore Size (mm)	PP T□W, T2WLH	PP T2WLV	HD	RD
ø12 equivalent	24.3	34	32	69
ø16 equivalent	26.3	36	38	76
ø20 equivalent	29.3	39	44	81
ø25 equivalent	34.3	44	52	90
ø32 equivalent	41.3	51	66	104

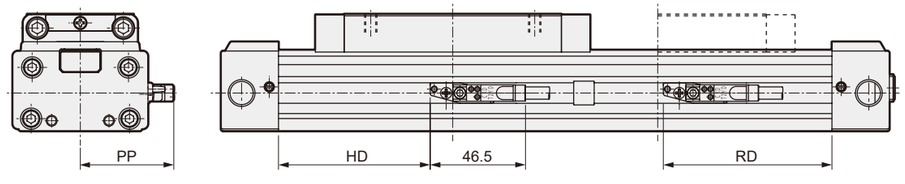
Code / Bore Size (mm)	PP T□W, T2WLH	PP T2WLV	HD	RD
ø40 equivalent	48.3	58	72	110
ø50 equivalent	56.3	66	71	109
ø63 equivalent	67.3	77	90	128
ø80 equivalent	87.3	97	161	199
ø100 equivalent	105.3	115	166	204

*1: For T2WLH/V, dimensions are in ( ).
*2: For switch mountability, refer to the model number display method for each variation.



[Case of T□W(L)V]

●T2YD, T2YDT
・SRL3-Standard, G, Q, GQ



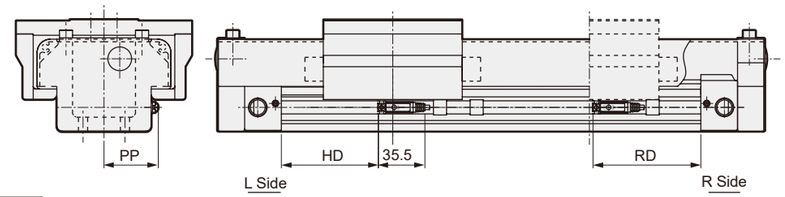
Code / Bore Size (mm)	PP	HD	RD
ø12 equivalent	28.4	36	65
ø16 equivalent	30.4	42	72
ø20 equivalent	33.4	48	77
ø25 equivalent	38.4	56	86
ø32 equivalent	45.4	70	100

Code / Bore Size (mm)	PP	HD	RD
ø40 equivalent	52.4	76	106
ø50 equivalent	60.4	75	105
ø63 equivalent	71.4	94	124
ø80 equivalent	91.4	165	195
ø100 equivalent	109.4	170	200

Note: For switch mountability, refer to the model number display method for each variation.

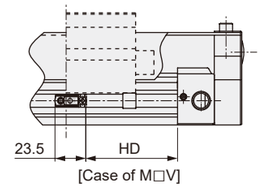
SRL3 Series External Dimensions with Switch

●M0H/V, M5H/V, M2H/V, M2WV, M3H/V, M3WV, M3PH/V
・SRL3-J



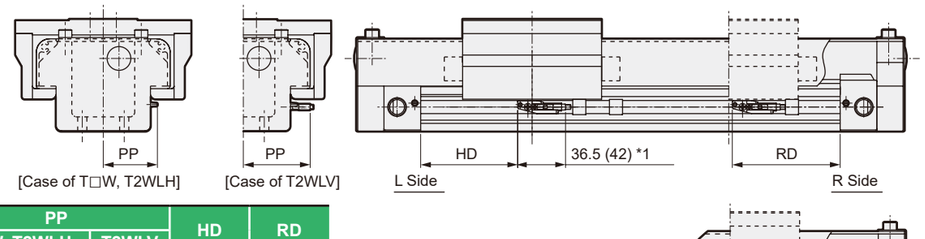
Code / Bore Size (mm)	PP	HD	RD
ø25 equivalent	34.5	60	82
ø32 equivalent	41.5	74	96
ø40 equivalent	48.5	80	102
ø50 equivalent	56.5	79	101
ø63 equivalent	67.5	98	120

Note: For switch mountability, refer to the model number display method for each variation.



[Case of M□V]

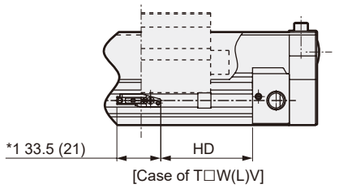
●T2WH/V, T3WH/V, T2WLH/V
・SRL3-J



[Case of T□W, T2WLH] [Case of T2WLV]

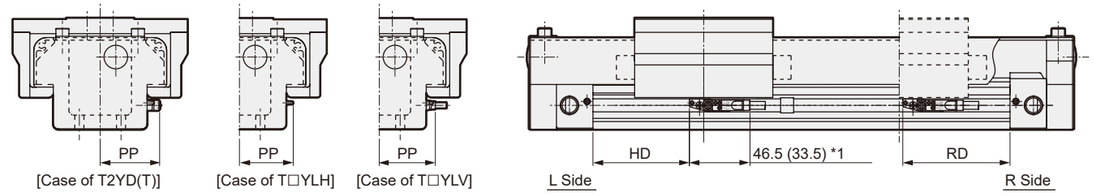
Code / Bore Size (mm)	PP T□W, T2WLH	PP T2WLV	HD	RD
ø25 equivalent	34.3	44	52	90
ø32 equivalent	41.3	51	66	104
ø40 equivalent	48.3	58	72	110
ø50 equivalent	56.3	66	71	109
ø63 equivalent	67.3	77	90	128

*1: For T2WLH/V, dimensions are in ( ).
*2: For switch mountability, refer to the model number display method for each variation.



[Case of T□W(L)V]

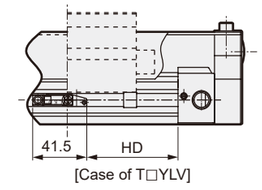
●T2YD, T2YDT, T2YLH/V, T3YLH/V
・SRL3-J



[Case of T2YD(T)] [Case of T□YLH] [Case of T□YLV]

Code / Bore Size (mm)	PP T2YD(T)	PP T□YLH	PP T□YLV	HD	RD
ø25 equivalent	38.4	34.5	36	56	86
ø32 equivalent	45.4	41.5	43	70	100
ø40 equivalent	52.4	48.5	50	76	106
ø50 equivalent	60.4	56.5	58	75	105
ø63 equivalent	71.4	67.5	69	94	124

*1: In the case of T□YLH, the dimensions in ( ) apply.
*2: For switch mountability, refer to the model number display method for each variation.



[Case of T□YLV]

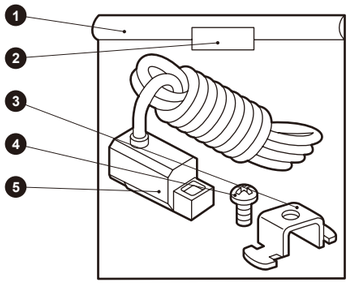
Component Parts List

Switch

●Switch body+Mounting bracket set (*1)

SRL3 - M0H

6 Switch Model No.

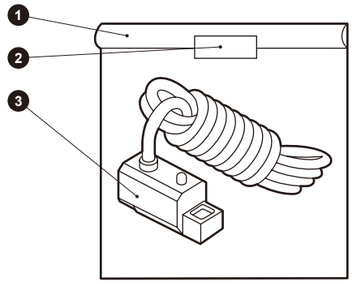


Part No.	Part Name	Quantity
1	Plastic Bag	1
2	Label	1
3	Switch Mounting Bracket	1
4	Cross-Recessed Pan Head Screw	1
5	Switch	1

●Switch body only

SW - M0H

6 Switch Model No.

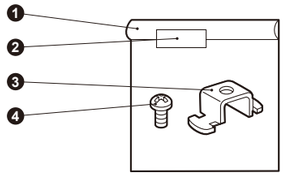


Part No.	Part Name	Quantity
1	Plastic Bag	1
2	Label	1
3	Switch	1

Switch

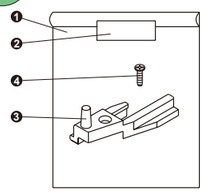
● Mounting bracket only

SRL3 - M



● Mounting bracket only

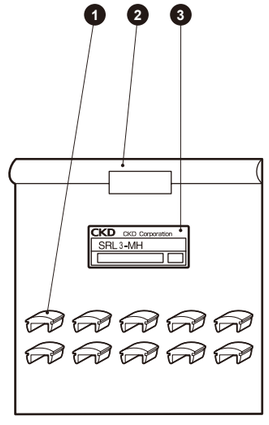
SRL3 - T



Part No.	Part Name	Quantity
1	Plastic Bag	1
2	Label	1
3	Switch Mounting Bracket	1
4	Cross-Recessed Pan Head Screw	1

●Lead Wire Holder

SRL3 - MH



Part No.	Part Name	Quantity
1	Lead Wire Holder	10
2	Plastic Bag	1
3	Package Label (S)	1

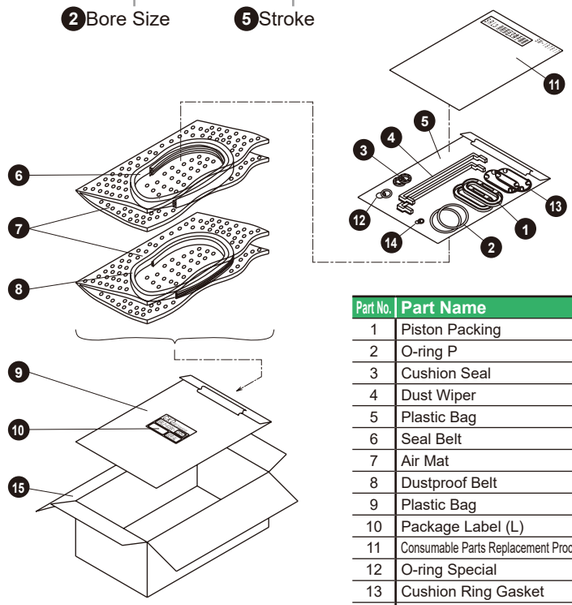
Note: Packaging style may vary slightly depending on size.

Consumable Parts

SRL3 - 40 K - 200

2 Bore Size

5 Stroke



Part No.	Part Name	Quantity
1	Piston Packing	2
2	O-ring P	2
3	Cushion Seal	2
4	Dust Wiper	2
5	Plastic Bag	1
6	Seal Belt	1
7	Air Mat	1
8	Dustproof Belt	1
9	Plastic Bag	1
10	Package Label (L)	1
11	Consumable Parts Replacement Procedure Manual	1
12	O-ring Special	2
13	Cushion Ring Gasket	2
14	Needle Gasket	2
15	Cardboard Box	1

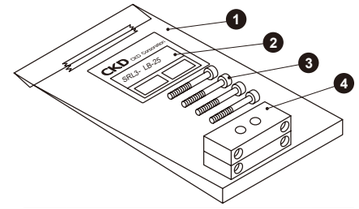
*1: Cushion ring gaskets are not included for ø12 to ø40.
*2: Four gaskets are added for ø80 to ø100.

Mounting bracket

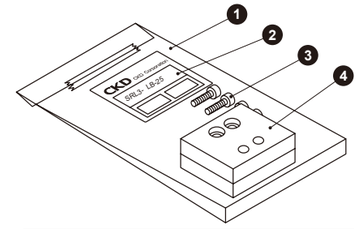
SRL3 - LB - 40

1 Mounting type 2 Bore Size

2 Brackets + 4 Mounting Bolts



Part No.	Part Name	Quantity
1	Plastic Bag	1
2	Package Label (S)	1
3	Hexagon Socket Head Cap Screw	4
4	Foot Bracket (A)	2



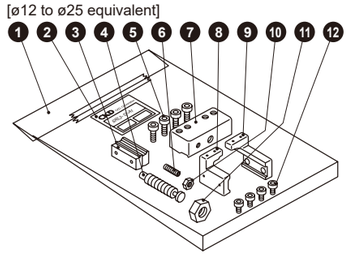
Part No.	Part Name	Quantity
1	Plastic Bag	1
2	Package Label (S)	1
3	Hexagon Socket Head Cap Screw	4
4	Foot Bracket (B)	2

Full Stroke Adjustment Bracket Kit

SRL3 - 40 - A1 1 Set

2 Bore Size

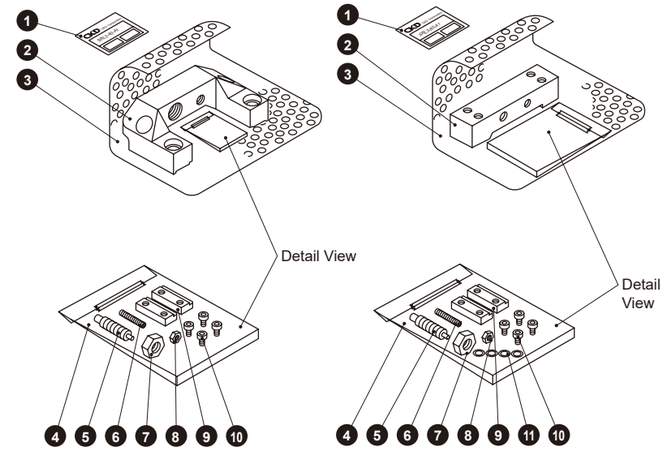
[ø12 to ø25 equivalent]



Part No.	Part Name	Quantity
1	Plastic Bag	1
2	Package Label (S)	1
3	Plate Nut	2
4	Shock absorber	1
5	Hexagon Socket Head Cap Screw	4
6	Hexagon Socket Set Screw	1
7	Plate	1
8	Adapter (R)	1
9	Adapter (L)	1
10	Nut for Fixing Stopper Bolt	1
11	Nut for Fixing Shock Absorber	1
12	Hexagon Socket Head Cap Screw	4

[ø32 to ø63 equivalent]

[ø80, ø100 equivalent]



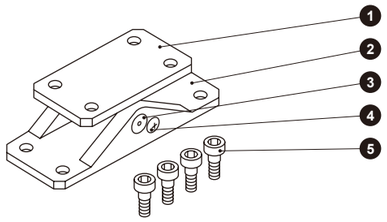
Part No.	Product Name	Quantity	Part No.	Product Name	Quantity
1	Package Label (S)	1	7	Hexagon Nut	1
2	Adapter	1	8	Hexagon Nut	1
3	Air Mat		9	Adapter Nut	2
4	Plastic Bag	1	10	Hexagon Socket Head Cap Screw	4
5	Shock absorber	1	11	Belleville Spring	4
6	Hexagon Socket Set Screw	1			

Note: Packaging style may vary slightly depending on size.

Floating Joint Set

SRL3 - 40 - Y

② Bore Size



Part No.	Part Name	Quantity
1	Mount	1
2	Mount Base	1
3	Pin	1
4	Pan Head Screw with Spring Washer	1
5	Mounting Bolt	4

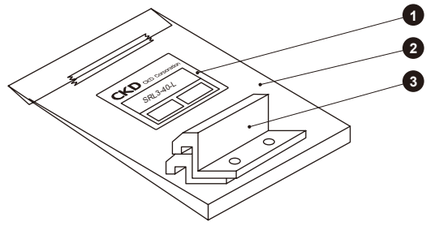
Note: Packaging style may vary slightly depending on size.

Intermediate Support Bracket

For 00, LB

SRL3 - 40 - Y 2 pcs./ set

② Bore Size

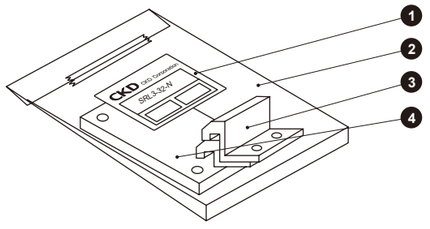


Part No.	Part Name	Quantity
1	Package Label (S)	1
2	Plastic Bag	1
3	Intermediate Support Bracket	2

●For LB1

SRL3 - 32 - N 2 pcs./ set

② Bore Size



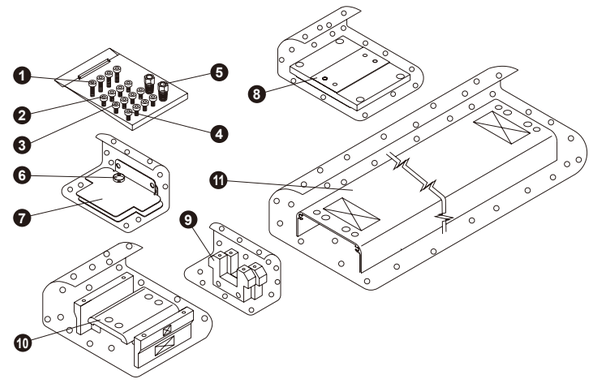
Part No.	Part Name	Quantity
1	Package Label (S)	1
2	Plastic Bag	1
3	Intermediate Support Bracket	2
4	Plate	1

Component Parts List

Cover Kit

SRL3-J - 40 - 200 - COVER-KIT

② Bore Size ⑤ Stroke



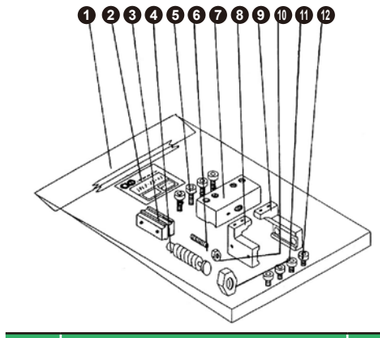
Part No.	Parts List	Quantity
1	Hexagon Socket Head Cap Screw	4
2	Hexagon Socket Head Cap Screw	4
3	Hexagon Socket Head Cap Screw	4
4	Hexagon Socket Head Cap Screw	4
5	Extension Joint	2
6	Hole Plug	2
7	Side Cover	2
8	Table Plate	1
9	LB-J Bracket	2
10	Table Adapter	1
11	Cover	1

Full Stroke Adjustment Bracket Kit

● Full Stroke Adjustment Bracket Kit

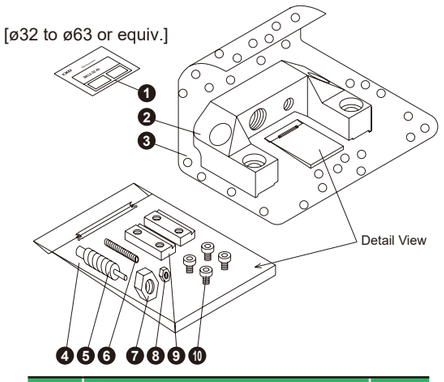
SRL3-J - 40 - A1 1 Set

[ø25 equivalent] ② Bore Size



Part No.	Parts List	Quantity
1	Plastic Bag	1
2	Package Label (S)	1
3	Plate Nut	2
4	Shock absorber	1
5	Hexagon Socket Head Cap Screw	4
6	Hexagon Socket Set Screw	1
7	Plate	1
8	Adapter (R)	1
9	Adapter (L)	1
10	Nut for Fixing Stopper Bolt	1
11	Nut for Fixing Shock Absorber	1
12	Hexagon Socket Head Cap Screw	4

[ø32 to ø63 or equiv.]



Part No.	Parts List	Quantity
1	Package Label (S)	1
2	Adapter	1
3	Air Mat	
4	Plastic Bag	1
5	Shock absorber	1
6	Hexagon Socket Set Screw	1
7	Hexagon Nut	1
8	Hexagon Nut	1
9	Adapter Nut	2
10	Hexagon Socket Head Cap Screw	4

Weight List of Various Kits

Floating Joint

Kit Number	Weight (g)
SRL3-12-Y	86
SRL3-16-Y	86
SRL3-20-Y	189
SRL3-25-Y	188
SRL3-32-Y	572
SRL3-40-Y	571
SRL3-50-Y	1194
SRL3-63-Y	1188
SRL3-80-Y	2638
SRL3-100-Y	4115

Low Profile Floating Joint

Kit Number	Weight (g)
SRL3-12-Y1	139
SRL3-16-Y1	157
SRL3-20-Y1	291
SRL3-25-Y1	403
SRL3-32-Y1	732
SRL3-40-Y1	879
SRL3-50-Y1	1590
SRL3-63-Y1	2057

Intermediate Support Bracket

● For 00, LB

Kit Number	Weight (g)
SRL3-12-L	12
SRL3-16-L	14
SRL3-20-L	21
SRL3-25-L	35
SRL3-32-L	35
SRL3-40-L	70
SRL3-50-L	87
SRL3-63-L	199
SRL3-80-L	337
SRL3-100-L	337

●For LB1

Kit Number	Weight (g)
SRL3-12-N	40
SRL3-16-N	49
SRL3-20-N	81
SRL3-25-N	123
SRL3-32-N	136

Support Bracket

● For LB

Kit Number	Weight (g)
SRL3-LB-12	13
SRL3-LB-16	15
SRL3-LB-20	28
SRL3-LB-25	88
SRL3-LB-32	103
SRL3-LB-40	152
SRL3-LB-50	272
SRL3-LB-63	448
SRL3-LB-80	610
SRL3-LB-100	1014

●For LB1

Kit Number	Weight (g)
SRL3-LB1-12	25
SRL3-LB1-16	27
SRL3-LB1-20	58
SRL3-LB1-25	123
SRL3-LB1-32	161

Shock Absorber Only

Kit Number	Weight (g)
SRL3-12-NCK	14
SRL3-16-NCK	14
SRL3-20-NCK	23
SRL3-25-NCK	45
SRL3-32-NCK	77
SRL3-40-NCK	212
SRL3-50-NCK	330
SRL3-63-NCK	330
SRL3-80-NCK	475
SRL3-100-NCK	475

Height Adjustment Plate

Kit Number	Weight (g)
SRL3-12-U	52
SRL3-16-U	47
SRL3-20-U	75
SRL3-25-U	173
SRL3-32-U	225
SRL3-40-U	352
SRL3-50-U	620
SRL3-63-U	873
SRL3-80-U	1396
SRL3-100-U	2070

Weight List of Various Kits

Related to Switch

● Mounting bracket only

Kit Number	Weight (g)
SRL3-M	1
SRL3-T	5

Note: In the case of the mounting bracket + switch, add the switch weight.

●Lead Wire Holder

Kit Number	Weight (g)
SRL3-MH	3

Consumable Parts

●SRL3 Series

Kit Number	Weight (g)
SRL3-12K-□	7+5×Stroke/100
SRL3-16K-□	8+5×Stroke/100
SRL3-20K-□	10+5×Stroke/100
SRL3-25K-□	24+10×Stroke/100
SRL3-32K-□	31+10×Stroke/100
SRL3-40K-□	54+18×Stroke/100
SRL3-50K-□	66+18×Stroke/100
SRL3-63K-□	91+18×Stroke/100
SRL3-80K-□	248+42×Stroke/100
SRL3-100K-□	268+42×Stroke/100

●SRL3-G Series

Kit Number	Weight (g)
SRL3-G-12K-□	7+5×Stroke/100
SRL3-G-16K-□	9+5×Stroke/100
SRL3-G-20K-□	11+5×Stroke/100
SRL3-G-25K-□	28+10×Stroke/100
SRL3-G-32K-□	36+10×Stroke/100
SRL3-G-40K-□	59+18×Stroke/100
SRL3-G-50K-□	78+18×Stroke/100
SRL3-G-63K-□	104+18×Stroke/100
SRL3-G-80K-□	296+42×Stroke/100
SRL3-G-100K-□	319+42×Stroke/100

●SRL3-Q Series

Kit Number	Weight (g)
SRL3-Q-12K-□	7+5×Stroke/100
SRL3-Q-16K-□	8+5×Stroke/100
SRL3-Q-20K-□	10+5×Stroke/100
SRL3-Q-25K-□	25+10×Stroke/100
SRL3-Q-32K-□	31+10×Stroke/100
SRL3-Q-40K-□	54+18×Stroke/100
SRL3-Q-50K-□	68+18×Stroke/100
SRL3-Q-63K-□	92+18×Stroke/100
SRL3-Q-80K-□	250+42×Stroke/100
SRL3-Q-100K-□	270+42×Stroke/100

●SRL3-GQ Series

Kit Number	Weight (g)
SRL3-GQ-12K-□	8+5×Stroke/100
SRL3-GQ-16K-□	9+5×Stroke/100
SRL3-GQ-20K-□	11+5×Stroke/100
SRL3-GQ-25K-□	29+10×Stroke/100
SRL3-GQ-32K-□	37+10×Stroke/100
SRL3-GQ-40K-□	60+18×Stroke/100
SRL3-GQ-50K-□	80+18×Stroke/100
SRL3-GQ-63K-□	105+18×Stroke/100
SRL3-GQ-80K-□	298+42×Stroke/100
SRL3-GQ-100K-□	322+42×Stroke/100

Full Stroke Adjustment Kit

Kit Number	Weight (g)
SRL3-12-A1	110
SRL3-16-A1	114
SRL3-20-A1	187
SRL3-25-A1	375
SRL3-32-A1	644
SRL3-40-A1	1032
SRL3-50-A1	2128
SRL3-63-A1	2454
SRL3-80-A1	3108
SRL3-100-A1	3422

Rodless Type
SRL3
SRG3
SRM3
SRT3
MRL2
MRG2
SM-25
Cylinder Switch
Ending

Weight List of Various Kits

Mounting Bracket Kit

Kit Number	Weight (g)
SRL3-J-LJ-25	176
SRL3-J-LJ-32	230

Adapter Kit

Kit Number	Weight (g)
SRL3-J-25-ADAPTOR-KIT	266
SRL3-J-32-ADAPTOR-KIT	504
SRL3-J-40-ADAPTOR-KIT	753
SRL3-J-50-ADAPTOR-KIT	1598
SRL3-J-63-ADAPTOR-KIT	1861

Extension Joint Kit

Kit Number	Weight (g)
SRL3-J-PF01	34
SRL3-J-PF02	63
SRL3-J-PF03	104

Cover Kit

Kit Number	Weight (g)
[Less than 2000st]	
SRL3-J-25-□-COVER-KIT	1382+89×Stroke/100
SRL3-J-32-□-COVER-KIT	1802+101×Stroke/100
SRL3-J-40-□-COVER-KIT	2221+117×Stroke/100
SRL3-J-50-□-COVER-KIT	3626+147×Stroke/100
SRL3-J-63-□-COVER-KIT	4892+166×Stroke/100
[2000st or more]	
SRL3-J-25-□-COVER-KIT	1379+89×Stroke/100
SRL3-J-32-□-COVER-KIT	1799+101×Stroke/100
SRL3-J-40-□-COVER-KIT	2218+117×Stroke/100
SRL3-J-50-□-COVER-KIT	3621+147×Stroke/100
SRL3-J-63-□-COVER-KIT	4887+166×Stroke/100

Full Stroke Adjustment Kit

Kit Number	Weight (g)
SRL3-J-25-A1	375
SRL3-J-32-A1	644
SRL3-J-40-A1	1032
SRL3-J-50-A1	2128
SRL3-J-63-A1	2454

MEMO

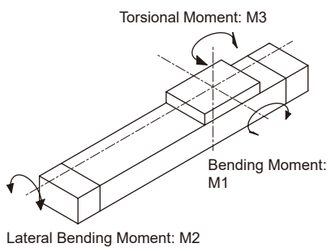
Rodless Type
SRL3
SRG3
SRM3
SRT3
MRL2
MRG2
SM-25
Cylinder Switch
Ending

Rodless Cylinder Model Selection Guide

[STEP1]

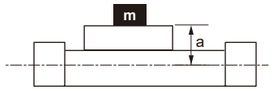
Moment acts depending on the cylinder mounting direction and the center of gravity of the load.

● Types of moment caused by load



[Table 1] Value of a

Bore Size	a (m)
	SRL3, SRL3-G, SRL3-Q, SRL3-GQ
ø12 equivalent	0.023
ø16 equivalent	0.025
ø20 equivalent	0.028
ø25 equivalent	0.036
ø32 equivalent	0.039
ø40 equivalent	0.045
ø50 equivalent	0.054
ø63 equivalent	0.060
ø80 equivalent	0.081
ø100 equivalent	0.089



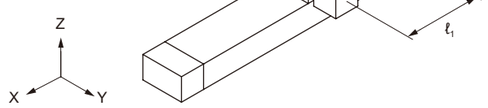
1 Calculate static moment.

Unit: N·m

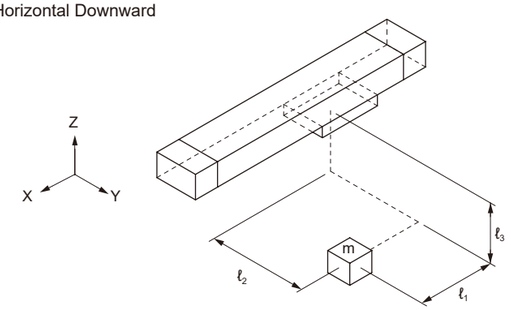
Mounting Direction		Horizontal Upward	Horizontal Downward	Horizontal Lateral	Vertical
Vertical load W		m × 9.8			-
Static Moment	M1	W×ℓ_1	W×ℓ_1	-	W x (ℓ_3 +a)
	M2	W×ℓ_2	W×ℓ_2	W x (ℓ_3 +a)	-
	M3	-	-	W×ℓ_1	W×ℓ_2

m : Load weight (kg)
ℓ_1 : Stroke distance from the center of table to the center of gravity of load [m]
ℓ_2 : Length in the width direction from the center of table to the center of gravity of load [m]
ℓ_3 : Length in the vertical direction from the center of table to the center of gravity of load [m]

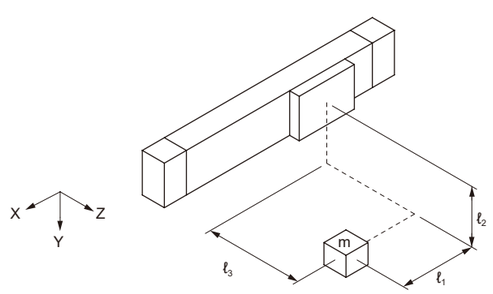
Horizontal Upward



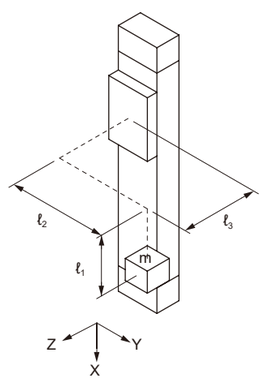
Horizontal Downward



Horizontal Lateral



Vertical



2 Calculate the dynamic moment generated by the inertia force of the load at the stroke end.

Unit: N·m

Mounting Direction		Horizontal Upward	Horizontal Downward	Vertical	Horizontal Lateral
Dynamic Moment	M1i	W x (ℓ_3 +a)xG			
	M2i	Dynamic moment M2i does not occur			
	M3i	W×ℓ_2 xG			

The dynamic moment calculation is as above regardless of the mounting direction.

The approximate value of G coefficient is obtained from Table 2.

[Table 2] $Va(\text{Average Speed}) = \frac{\text{Travel Distance}}{\text{Travel Time}}$ (m/s)

Va(Average Speed) (m/s)	Vm(Stroke End Speed) (m/s)	G Coefficient
0.3	to 0.65	9
0.6	to 1.00	15
0.9	to 1.30	23
1.2	to 2.00	40

G Coefficient= ▢

3 Select approximate Bore Size.

Select approximate Bore Size.

M1+M1i = ▢ (N·m) → (ø)
M2 = ▢ (N·m) → (ø)
M3+M3i = ▢ (N·m) → (ø)
W = ▢ (N) → (ø)
$E_0 = \frac{1}{2} \times m \times \mathbf{Vm^2}$ = ▢ (J) → (ø)

Tentatively select the maximum Bore Size.

ø ▢

[Table 3] Allowable Value

Item / Bore Size (mm)		W max (N)	M1 max (N·m)	M2 max (N·m)	M3 max (N·m)
SRL3	ø12 equivalent	30	1.5	0.6	0.6
	ø16 equivalent	140	5	1	1
	ø20 equivalent	200	10	1.5	3
	ø25 equivalent	360	17	5	10
	ø32 equivalent	620	36	10	21
	ø40 equivalent	970	77	23	26
	ø50 equivalent	1470	154	32	42
	ø63 equivalent	2320	275	52	76
	ø80 equivalent	3500	460	70	100
	ø100 equivalent	5000	750	95	130
SRL3-G	ø12 equivalent	30	1.5	0.6	0.4
	ø16 equivalent	140	5	1	0.6
	ø20 equivalent	200	10	1.5	1
	ø25 equivalent	360	17	5	2
	ø32 equivalent	620	36	10	4
	ø40 equivalent	810	41	18	5
	ø50 equivalent	1440	76	32	9
	ø63 equivalent	1630	98	51	12
	ø80 equivalent	3500	351	70	37
	ø100 equivalent	4130	386	95	42

[Table 4] Allowable Absorption Energy of SRL3 (E_0)

Bore Size (mm)	Built-in Air Cushion (J)	Shock absorber (J)	Model No.
ø12 equivalent	0.03	2.4	NCK-00-0.3-C
ø16 equivalent	0.22	2.4	NCK-00-0.3-C
ø20 equivalent	0.59	5.7	NCK-00-0.7-C
ø25 equivalent	1.40	10.0	NCK-00-1.2
ø32 equivalent	2.57	18.0	NCK-00-2.6
ø40 equivalent	4.27	50.0	NCK-00-7
ø50 equivalent	9.13	86.0	NCK-00-12
ø63 equivalent	17.4	86.0	NCK-00-12
ø80 equivalent	33.0	143.0	NCK-00-20
ø100 equivalent	57.0	143.0	NCK-00-20

4 Determine the combined stroke end moment (M_T).
(Confirm that the following formula is satisfied for the Bore Size selected in **3**.)

$$M_T = \frac{M1+M1_i}{M1max} + \frac{M2}{M2max} + \frac{M3 + M3i}{M3max} + \frac{W}{Wmax} < 1$$

M : Resultant moment (Condition is to be smaller than 1.)
Wmax : Maximum allowable value of W (from Table 3)
M1 max : M1 maximum allowable value (from Table 3)
M2 max : M2 maximum allowable value (from Table 3)
M3 max : M3 maximum allowable value (from Table 3)

· If M_T significantly exceeds 1, change the selection conditions.
· If M_T slightly exceeds 1, it may become 1 or less by improving accuracy in STEP2. Please proceed to STEP 2 and subsequent steps to confirm.

[STEP2]

Next, increase the accuracy of load factor, effective thrust, stroke end speed, and resultant moment value.

● Determine the load factor.

$$\alpha = \frac{F_0}{F} \times 100[\%]$$

α : Load Factor
F_0 : Force required to move the workpiece (N)
F : Effective thrust of the cylinder (N) (Fig. 1 to 4)

Horizontal Operation	Vertical Operation
$F_0=F_W+F_1+F_2+F_3+F_L$	$F_0=W+F_1+F_2+F_3+F_L$
Fw : W×0.2 (N)	F_1 : $M_1 \times C_1$ Note (N)
F2 : $M_2 \times C_2$ Note (N)	F_3 : $M_3 \times C_3$ Note (N)
F_L : Other kinds of resistance (e.g., guide resistance) (N)	W : Load (N)

Note: Coefficient to correct the increase in friction force generated when a moment is applied

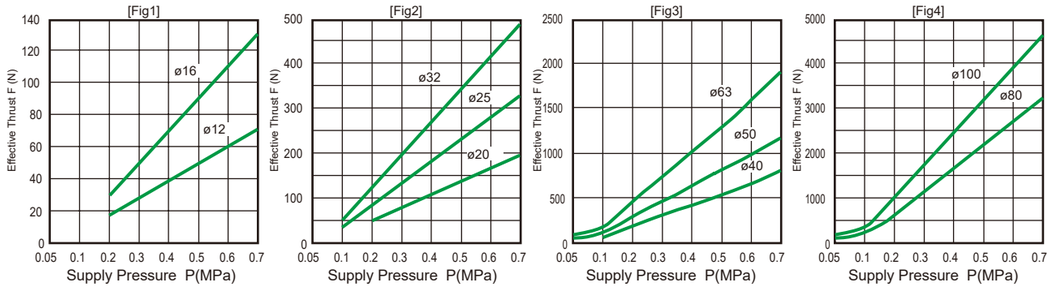
[Table 5] Friction Coefficient by Each Moment 1/m

Bore Size (mm)	C_1	C_2	C_3
ø12 equivalent	8	27	8
ø16 equivalent	7	24	7
ø20 equivalent	6	21	6
ø25 equivalent	5	16	5
ø32 equivalent	4	13	4
ø40 equivalent	4	11	4
ø50 equivalent	4	9	4
ø63 equivalent	3	8	3
ø80 equivalent	3	7	3
ø100 equivalent	3	6	3

[Table 6] Guideline for Load Factor

Operating Pressure (MPa)	Load Factor (%)
0.2 to 0.3	α ≤ 40
0.3 to 0.6	α ≤ 50
0.6 to 0.7	α ≤ 60

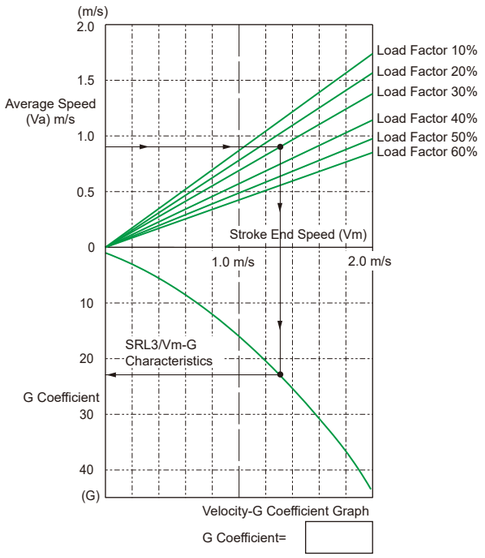
● Graph for obtaining effective thrust



[STEP3]

Determine the stroke end velocity (Vm) from [Fig. 1] based on the average velocity (Va) and the load factor obtained in STEP 2, and further determine the G coefficient.

● Speed-G Coefficient Graph[Fig. 1]



●The arrow (→) in the figure indicates
┌ Average speed : 0.9 m/s
└ Load factor : 30%
at
┌ Stroke end speed : 1.3 m/s
└ G coefficient : 22.5
Shows an example of finding.

[STEP4]

● Calculate the resultant moment (M_T) using the G coefficient obtained in STEP 3.

M1+M1i = ☐ (N·m)
M2' = ☐ (N·m)
M3+M3i = ☐ (N·m)
W' = ☐ (N)

$$M_T = \frac{M1+M1_i}{M1max} + \frac{M2}{M2max} + \frac{M3 + M3i}{M3max} + \frac{W}{Wmax}$$

$M_T \leq 1$
↓
Determine Cylinder Bore Size (*Refer to [Table 3] in STEP 1)
↓
Check Cushion Capacity

Unit: N·m

Mounting Direction		Horizontal Upward	Horizontal Downward	Vertical	Horizontal Lateral
Dynamic Moment	M1i	W x (ℓ_3 +a)xG			
	M2i	Dynamic moment M2i does not occur			
	M3i	W×ℓ_2 xG			

It is the same calculation formula as STEP 1, but this time, calculate using the G coefficient value obtained in STEP 3.

[STEP5]

Confirmation of Cushion Capacity

● When using the built-in air cushion

・Confirm that $E \leq E_0$ from Table 7.

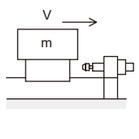
$$E = \frac{1}{2} \times m \times V_m^2$$

E : Kinetic energy at the final end of workpiece (J)
m : Load weight (kg)
Vm : Piston cushion entry speed (m/s)

● When using the product with Shock Absorbers

・Calculate the collision energy E and equivalent mass of impact object Me using the formulas in the table below, and confirm that Me is within the allowable value in Fig. 2. Also, confirm that it is within the allowable value from Table 7. Please note that the allowable values for equivalent mass of impact object Me and collision energy E differ depending on the magnitude of the collision speed.

・Since the allowable absorption energy varies depending on the collision speed, ensure that it does not exceed 1/3 of the allowable absorption energy in Table 7 when the collision speed is 2000 mm/s, and 1/2 when the collision speed is 1000 mm/s.

	Horizontal Movement	Vertical Descent	Vertical Ascent
Usage Example			
Equivalent Impact Object Weight Me (kg)	$Me = \frac{2 \times E}{V^2}$	$Me = \frac{2 \times E}{V^2}$	$Me = \frac{2 \times E}{V^2}$
Energy E (J)	$E = \frac{mV^2}{2} + F \cdot St$	$E = \frac{mV^2}{2} + (F+mg) \cdot St$	$E = \frac{mV^2}{2} + (F-mg) \cdot St$

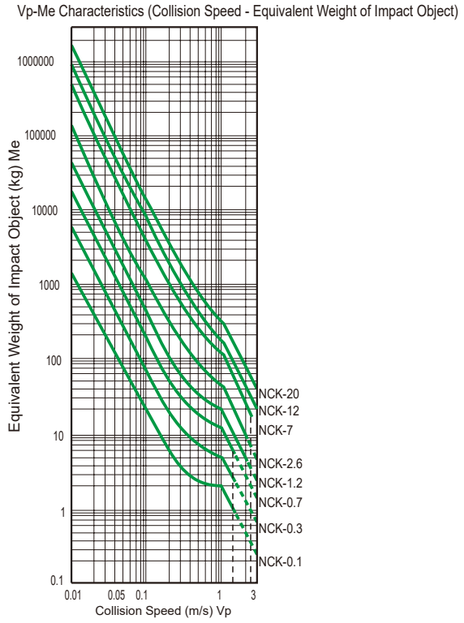
Code

E : Colliding energy J
Me : Colliding object equivalent weight kg
m : Workpiece weight kg
F : Cylinder thrust N
V : Collision speed (m/s)
St : Stroke of shock absorber (m)
g : Gravity acceleration 9.8 (m/s²)

[Table 7] Allowable Absorption Energy of SRL3 (E_0)

Bore Size (mm)	Built-in Air Cushion (J)	Shock absorber (J)	Model No.
ø12 equivalent	0.03	2.4	NCK-00-0.3-C
ø16 equivalent	0.22	2.4	NCK-00-0.3-C
ø20 equivalent	0.59	5.7	NCK-00-0.7-C
ø25 equivalent	1.40	10.0	NCK-00-1.2
ø32 equivalent	2.57	18.0	NCK-00-2.6
ø40 equivalent	4.27	50.0	NCK-00-7
ø50 equivalent	9.13	86.0	NCK-00-12
ø63 equivalent	17.4	86.0	NCK-00-12
ø80 equivalent	33.0	143.0	NCK-00-20
ø100 equivalent	57.0	143.0	NCK-00-20

[Fig. 2] Allowable Value of Equivalent Weight of Impact Object



[STEP6]

● The Bore Size determined from the cushion performance is øA. (Bore Size determined from STEP5)

● The Bore Size determined from the load conditions is øB. (Bore Size determined from STEP4)

øA ≥ øB → øA Select.

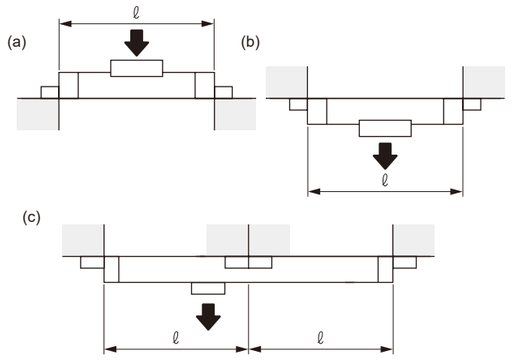
Or

→ øB Can be handled by using in combination with an external damper.

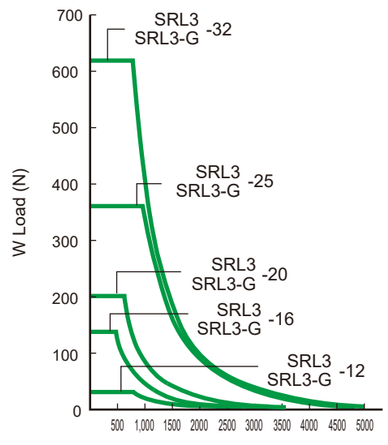
øA < øB → øB Select.

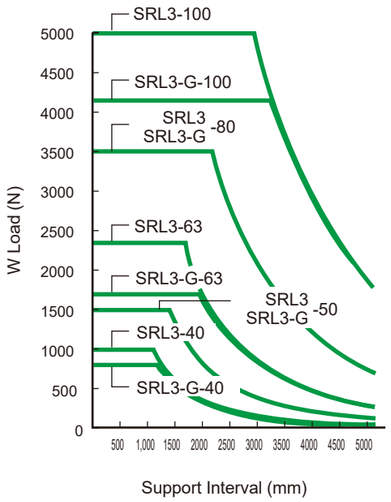
1 Vertical Load Limitation

● If the stroke is long, the cylinder tube sags with its self-weight and load. In such cases, ensure that the support interval shown in the figure below: ℓSupport with an intermediate support bracket so that it is less than or equal to the graph value. (The intermediate support bracket is an auxiliary bracket for reducing deflection and is not a fixing bracket.)

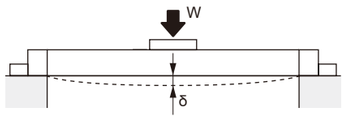


● Allowable load for the supporting methods (a), (b) and (c) above

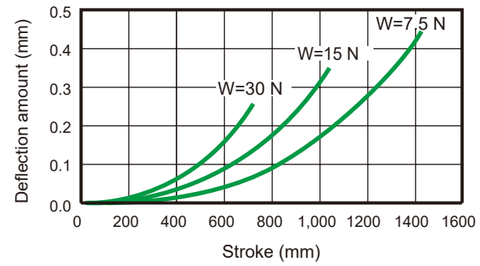




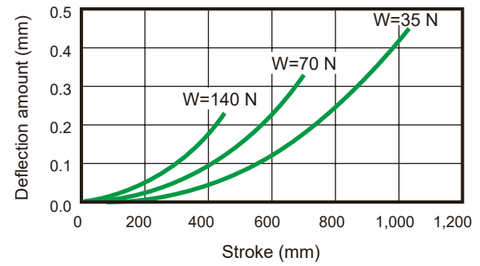
2 Deflection amount of cylinder tube δ



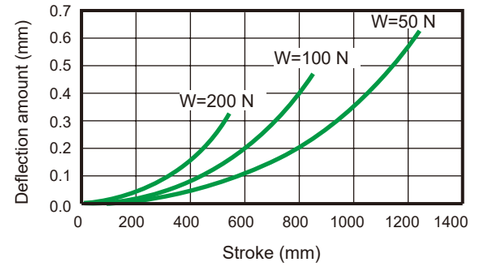
● SRL3-12, SRL3-G-12 (ø12 or equiv.)



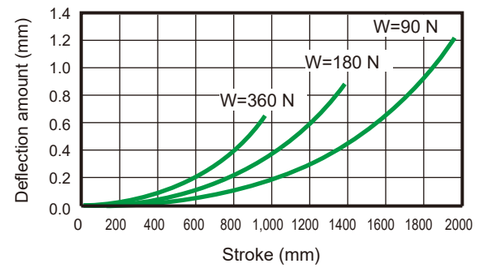
● SRL3-16, SRL3-G-16 (ø16 or equiv.)



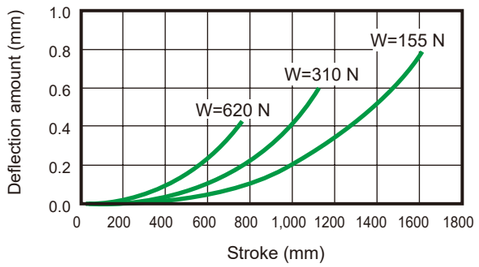
● SRL3-20, SRL3-G-20 (ø20 or equiv.)



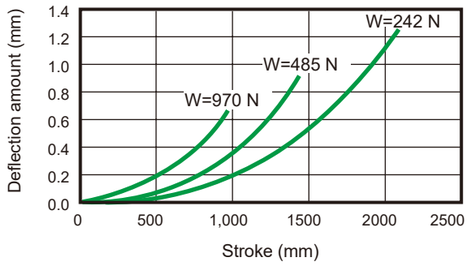
● SRL3-25, SRL3-G-25 (ø25 or equiv.)



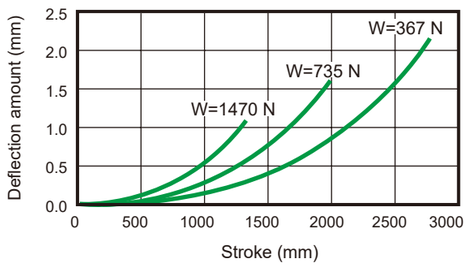
● SRL3-32, SRL3-G-32 (ø32 or equiv.)



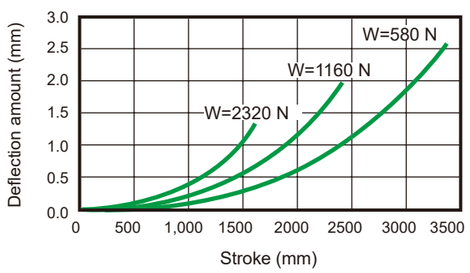
● SRL3-40, SRL3-G-40 (ø40 or equiv.)



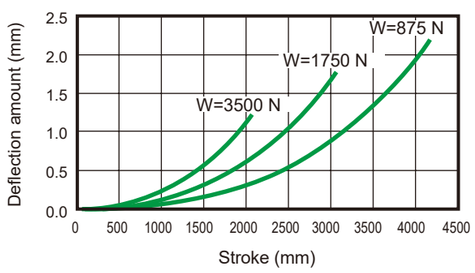
● SRL3-50, SRL3-G-50 (ø50 or equiv.)



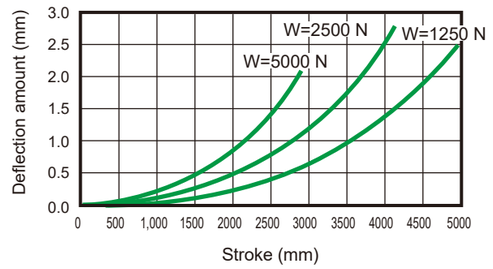
● SRL3-63, SRL3-G-63 (ø63 or equiv.)



● SRL3-80, SRL3-G-80 (ø80 or equiv.)



● SRL3-100, SRL3-G-100 (ø100 or equiv.)

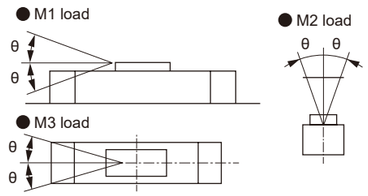


3 Table Tilt Angle θ

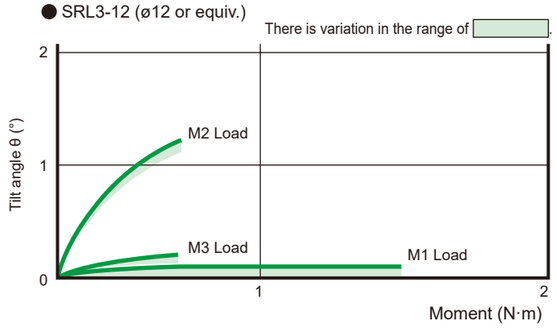
● M1 load

● M2 load

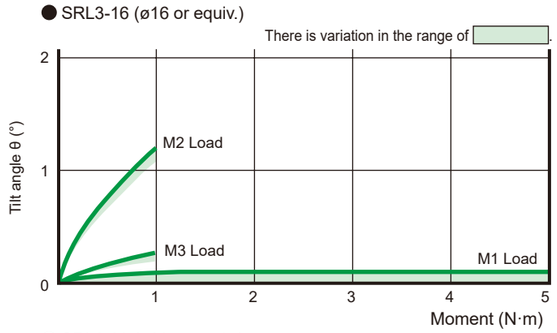
● M3 load



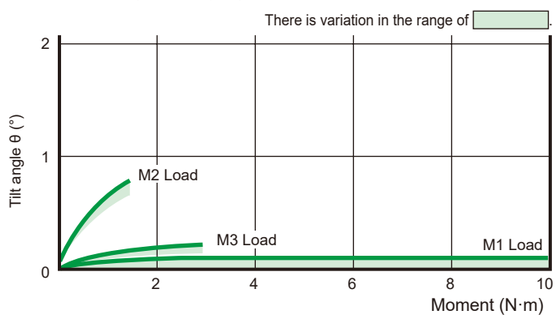
● SRL3-12 (ø12 or equiv.)



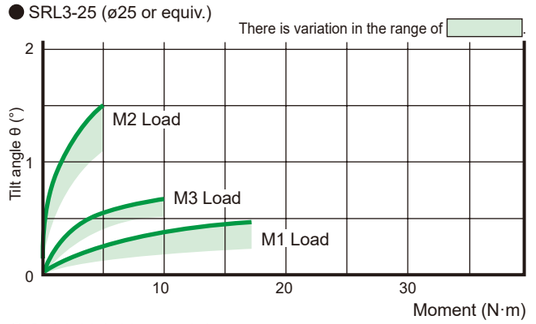
● SRL3-16 (ø16 or equiv.)



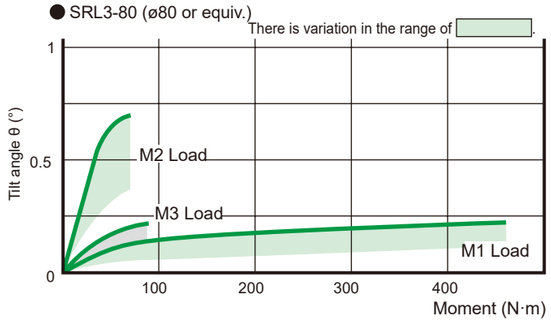
● SRL3-20 (ø20 or equiv.)



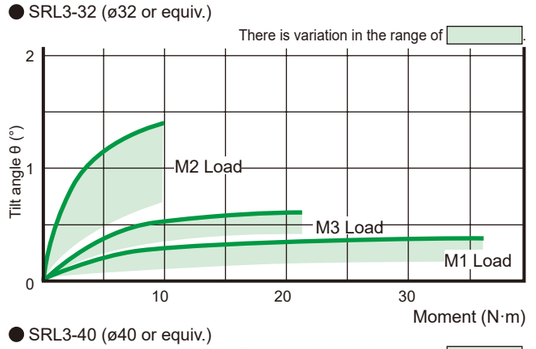
● SRL3-25 (ø25 or equiv.)



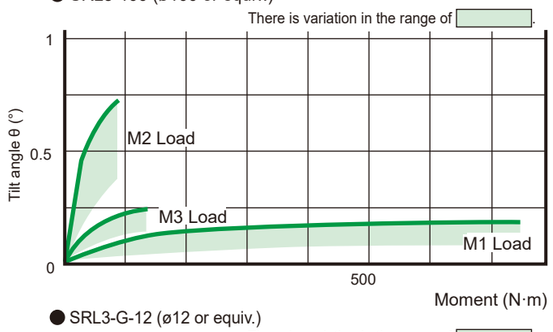
● SRL3-80 (ø80 or equiv.)



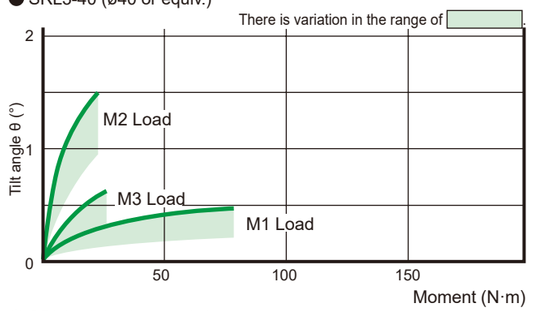
● SRL3-32 (ø32 or equiv.)



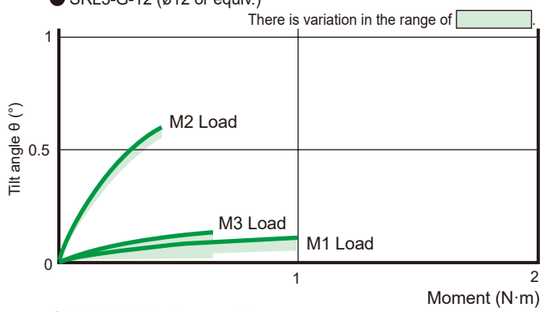
● SRL3-100 (ø100 or equiv.)



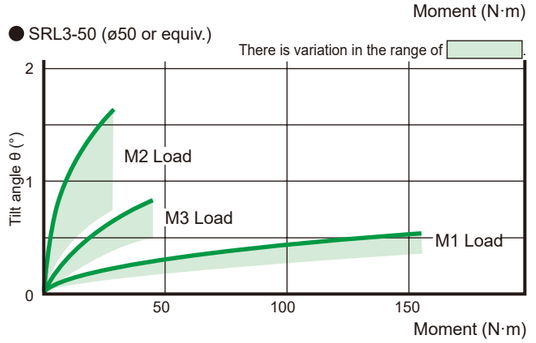
● SRL3-40 (ø40 or equiv.)



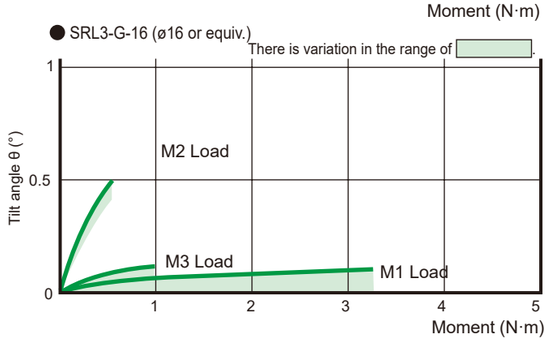
● SRL3-G-12 (ø12 or equiv.)



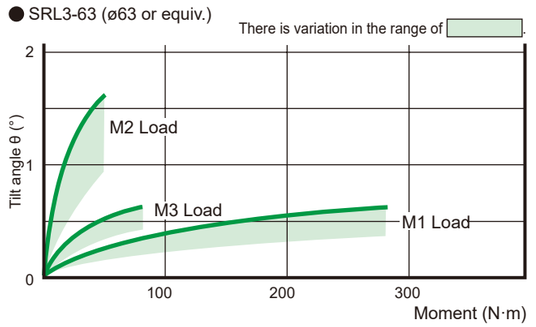
● SRL3-50 (ø50 or equiv.)



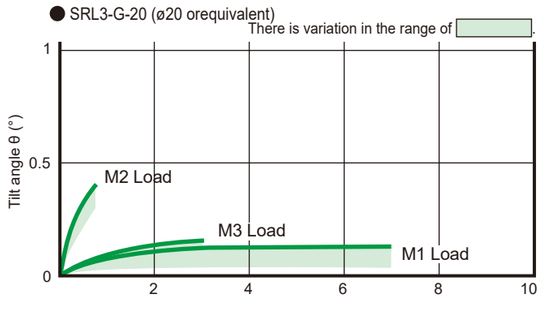
● SRL3-G-16 (ø16 or equiv.)



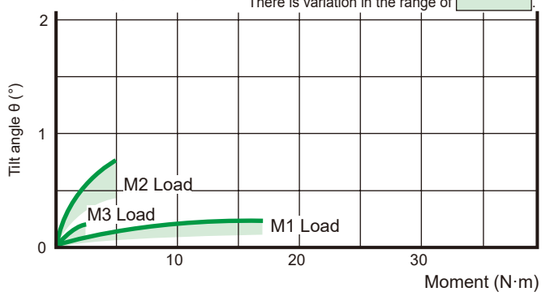
● SRL3-63 (ø63 or equiv.)



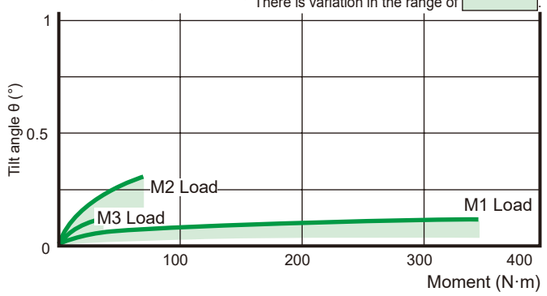
● SRL3-G-20 (ø20 orequivalent)



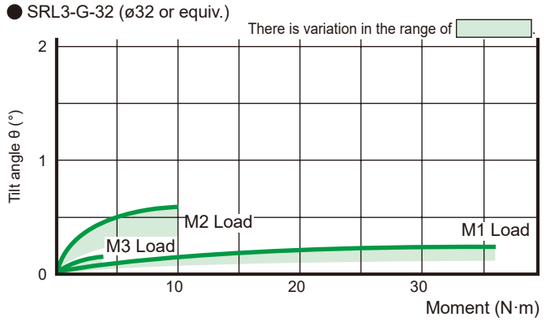
● SRL3-G-25 (ø25 or equivalent)



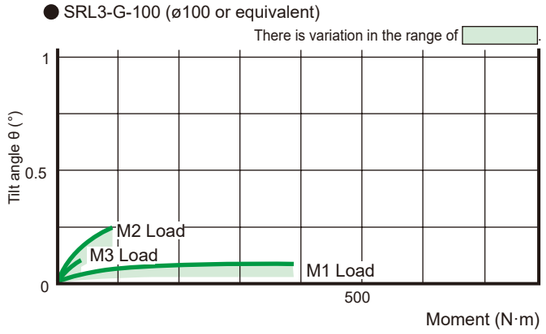
● SRL3-G-80 (ø80 or equiv.)



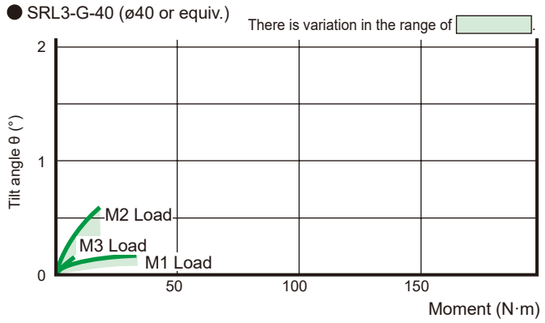
● SRL3-G-32 (ø32 or equiv.)



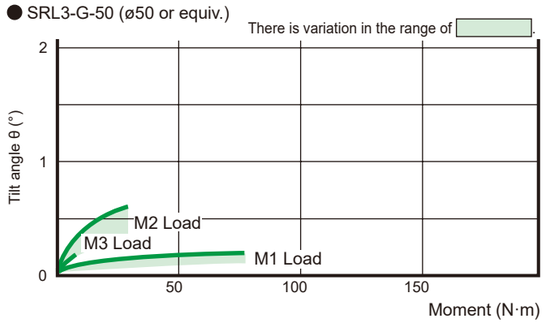
● SRL3-G-100 (ø100 or equivalent)



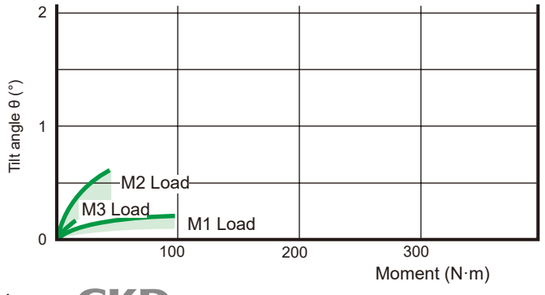
● SRL3-G-40 (ø40 or equiv.)



● SRL3-G-50 (ø50 or equiv.)



● SRL3-G-63 (ø63 or equiv.)



MEMO

To Use This Product Safely

Be sure to read this before use. For general cylinder information, see Intro 41, and for cylinder switches, see P. 1512.

Individual Precautions: Rodless Cylinder SRL3 Series

Design / Selection

1. Common

⚠ CAUTION

■ Pay attention when designing the brake control circuit.

Slit type rodless cylinders represented by SRL3 have slight external air leakage structurally, so intermediate stop control by an all-port block 3-position valve will cause a failure to maintain the table stop position. Therefore, please use a both-side pressurization control circuit using a PAB connection 3-position valve. However, please note that if air is pressurized in a de-energized state when restarting after a pressure drop, the table may move and deviate from the origin. Do not use intermediate stop by control with ABR connection because air on both sides escapes, there is a danger of popping out when restarting, and speed control becomes difficult.

■ Basic Circuit Diagram

● Horizontal load

Piping as shown in Figure 1 will apply equal pressure to both sides of the piston when stopped, preventing the table from flying out during restart.

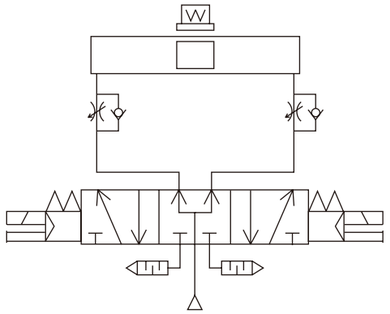


Fig. 1

● In case of vertical load

● If a vertical load is applied as shown in Fig. 2, the table will move in the Load Direction. Therefore, install a pressure reducing valve with check valve on the upper side, reduce the thrust in the Load Direction, and balance the load.

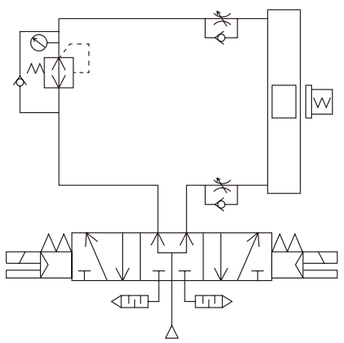


Fig. 2

■ Although the structure of SRL3 and other slit rodless cylinders has a slight amount of external air leakage, it does not affect the speed control performance.

■ Prevent negative pressure from occurring inside the cylinder tube. If used as an air balancer or in an all-port blocked state, if the table is driven by external force, inertia force, etc., negative pressure may be generated in the cylinder, causing the seal belt to detach and air leakage to occur. Be careful not to create negative pressure in the cylinder by driving it with external force, inertial force, etc.

2. Fall Prevention Type SRL3-Q

⚠ CAUTION

■ Keep the cylinder load factor at 50% or less. If the load factor is high, the lock may not be released, or it may lead to damage to the lock part.

■ To operate the cylinder at 500 mm/s and over, reduce the speed when entering the position locking mechanism to 500 mm/s or less. As a deceleration method, consider installing an external shock suppressor, installing a deceleration circuit, etc.

During Use

1. Common

⚠ Warning

■ Shock Absorber Adjustment

Since the gap between the shock suppressor and the stopper bolt is narrow, it is recommended to remove the adapter (stroke adjustment plate) for adjustment.

■ Precautions for use of stroke adjustment unit

Be sure to adjust so that the table stops at the stopper bolt. Settings where cylinder thrust continues to be applied to the shock suppressor even at the cylinder stroke end may cause the shock suppressor to break.

Table 1
Full stroke adjustment shock suppressor specifications (Initial setting value)

Model	Absorption Energy (J)	Effective Stroke (mm)
For SRL3-12/16	2.4	5.5
For SRL3-20	5.7	7
For SRL3-25	10	9
For SRL3-32	18	13
For SRL3-40	50	16.5
For SRL3-50/63	86	21
For SRL3-80/100	143	25

⚠ CAUTION

■ Do not perform electric welding after installing the rodless cylinder.

Current flows through the cylinder and a spark occurs between the dustproof belt and the cylinder tube, damaging the dustproof belt.

■ The Cylinder Body may be damaged or may malfunction if a unit with excessive inertia, etc., is actuated. Use within the allowable range.

■ Do not apply strong impact or excessive moment to the table.

■ Carefully match the centers when connecting a load with an external guide mechanism.

● Displacement of the shaft center increases as the stroke becomes longer. Carefully decide the connection method (floating) so that the displacement can be absorbed.

■ Keep the moment, including inertia force caused by load transfer or stop, within the allowable load. Exceeding this value will cause damage.

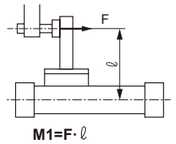
(When overhang is large)

● When the overhang load is large and the cylinder is stopped at both ends by the piston, load inertia causes bending moment even if the energy is within the allowable absorbed energy of the internal cushion. If the kinetic energy is large and an external cushion is used, try to hit the center of gravity of the workpiece as much as possible.

(When using external stopper)

● When using an external stopper, make a selection considering bending moment due to the cylinder thrust.

● Moment that operates when the cylinder stops with an external stopper



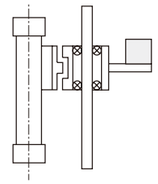
F : Cylinder Thrust
ℓ : From cylinder center Distanace to stopper

M1=F·ℓ

(When using external guide)

● If the centers are not coincident when an external guide is attached, movement will not be smooth and resistance due to interference will operate as moment. Design the connection part so that it can accept non-coincidence of the centers.

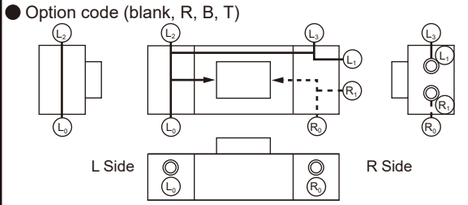
● Example of guide use



■ Piping port position and operating direction

Equivalent to Bore Size ø12 to ø20

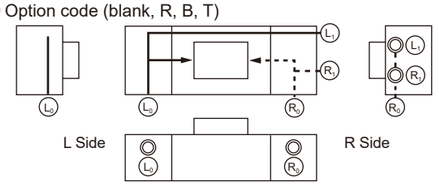
● Option code (blank, R, B, T)



Ⓡ indicates R side pressurization port, and Ⓛ indicates L side pressurization port. At the time of factory shipment, Ⓡ Ⓛ ports other than 1 location each are sealed with plugs. Piping to other ports is possible by removing the plugs. Option codes (D, S) cannot be manufactured.

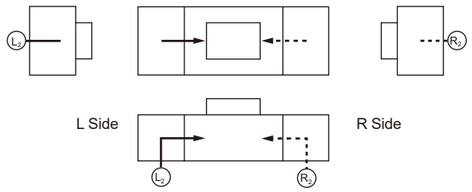
Equivalent to Bore Size ø25 to ø63

● Option code (blank, R, B, T)



Ⓡ indicates R side pressurization port, and Ⓛ indicates L side pressurization port. At the time of factory shipment, Ⓡ Ⓛ ports other than 1 location each are sealed with plugs. Piping to other ports is possible by removing the plugs. However, bottom piping is not possible. If bottom piping is required, please select option (D, S).

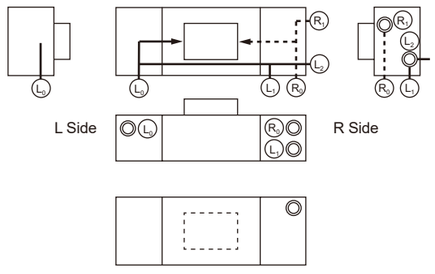
● Option code (D, S) (bottom piping)



Ⓡ indicates R side pressurization port, and Ⓛ indicates L side pressurization port. At the time of factory shipment, Ⓡ Ⓛ ports other than 1 location each are sealed with plugs. Piping to other ports is possible by removing the plugs.

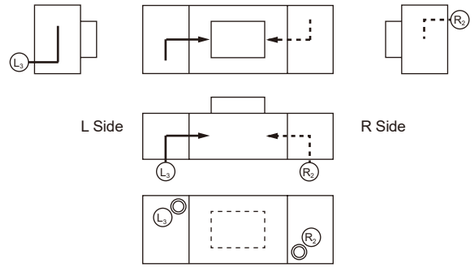
Equivalent to Bore Size ø80, ø100

● Option code (blank, R, B, T)



Ⓡ indicates R side pressurization port, and Ⓛ indicates L side pressurization port. At the time of factory shipment, ⓇⓁ ports other than each 1 location are sealed with plugs. Piping to other ports is possible by removing the plug.

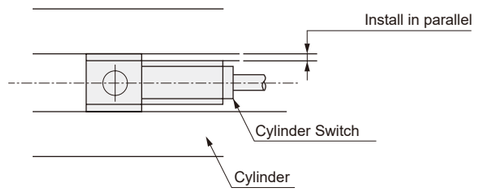
● Option code (D, S) (bottom piping)



Since there are no ports other than Ⓡ Ⓛ, piping is not possible.

■Treat our shock suppressors as consumable parts. Replace it if a decrease in energy absorption capacity is observed or if operation is no longer smooth.

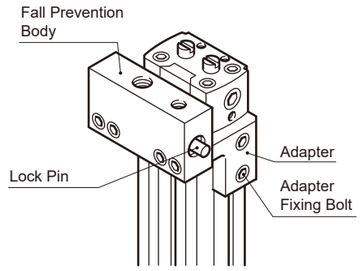
■Install the switch in parallel with the mounting groove and do not apply force to the lead wire.



2. Fall Prevention Type SRL3-Q

⚠Warning

■How to adjust the stroke adjustment unit

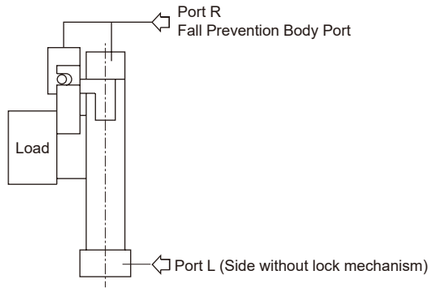


- Loosen the adaptor fixing bolt to move the position locking mechanism. In this case, please use with shock absorber (A, A1). Also, if the stroke is finely adjusted with a shock suppressor, the fall prevention position will be misaligned and it will not be possible to lock securely, so perform fine adjustment with the adapter fixing bolt.
- After moving it to the desired position, tighten the adaptor fixing bolt with the value in the table below. If tightened below the values in the table, the fall prevention main body may shift, so please be sure to observe this.
- When setting the load, be sure to confirm that the lock mechanism is working before installing.

Model	Adapter Fixing Bolt Tightening Torque (N·m)
SRL3-Q-12/16	1 to 1.2
SRL3-Q-20	2.5 to 2.8
SRL3-Q-25	5.2 to 5.6
SRL3-Q-32	22 to 24
SRL3-Q-40	44 to 48
SRL3-Q-50/63	77 to 83
SRL3-Q-80/100	100 to 110

■About Piping

- Piping to the position locking mechanism is necessary.

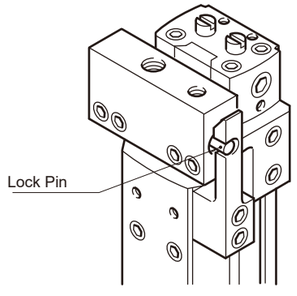


- Divide the piping to R side of the rodless cylinder using a tee fitting, etc., and with the same kind of pipe, connect the piping to the position locking mechanism.
- When the piping to the position locking mechanism is long and thin, or when the speed controller is far away from the cylinder port, note that it takes time to engage the lock. Also, clogging of the silencer attached to the valve's EXH. port will lead to similar results.

■Supply pressure equal to or higher than the Min Operating Pressure to the position locking mechanism port.

■Manual release

- Push in the lock pin of position locking mechanism using a stick. In this case, be sure to supply pressure to port L and release the lock after ensuring that no load is applied to the lock mechanism. If both ports R and L are exhausted and pressure is supplied to port R while the piston is locked, the lock will be released and the table may fly out, which is very dangerous.



■Valves

- Keeping the cylinder with pressure applied to the lock mechanism may cause the lock pin to come off, which is very dangerous. Do not use 3-position closed center and 3-position P/A/B connection valves.
- If back pressure is applied to the locking mechanism, the lock may be released. Use a discrete valve, or use an individual exhaust manifold.
- For usage where the drop speed is increased by the Quick Exhaust Valves, the lock may not release normally because the Cylinder Body starts operating before the lock pin. Do not use a quick exhaust valve with a drop prevention type cylinder.

■For safety purposes, prevent the load from falling under its own weight during maintenance.

■In the case of the cylinder with air cushion, if the air cushion needle at the lock mechanism side is tightened excessively, the piston bounds at the stroke end, the lock lever contacts the lock pin violently and the lock mechanism may be damaged. Also, if the air cushion needle is opened too much, the piston will bounce back at the stroke end, similarly leading to damage. Adjust the needle so that the air cushion does not bounce. When stopping with external cushioning equipment (shock absorber, etc.), adjust similarly so that there is no bounce. Also, please perform periodic inspections once or twice a year to check for damage to the holding part due to this phenomenon.

⚠CAUTION

■After the lock mechanism is manually operated, make sure to confirm manual operation and return the mechanism to the original state before use. Also, do not perform manual operations other than during adjustment, as it is dangerous.

■Release the lock when installing or adjusting the cylinder. Performing installation work, etc. while the lock is engaged may damage the lock part.

■Do not use multiple cylinders synchronized. Do not use two or more fall prevention cylinders synchronized to move one workpiece. The lock of one of the cylinders may become unremovable.

■Use the speed controller with meter-out control. Lock may not be released with meter-in control.

■On the side with the lock, be sure to use the cylinder to the stroke end. If the cylinder piston has not reached the stroke end, the lock may not engage, or it may not be possible to release the lock.

■Apply grease regularly to the sliding part of the lock lever.

For precautions regarding mounting, installation, adjustment, use, and maintenance, please see "Precautions for Use" in this catalog and the CKD Components Product website (https://www.ckd.co.jp/kiki/en/) -> "Model No." -> Instruction Manual.

Rodless Type

SRG3

Rodless Cylinder with High Precision Guide

ø12, ø16, ø20, ø25 or equiv.

Overview

This is a rodless cylinder with a high-precision guide, where a single-axis high-precision linear guide is integrally included with the inner diameter size equivalent to ø12 to ø25 of the Rodless Cylinder. Ideal for high-precision conveyance of small parts.

Features

Achieves high precision compactly

By attaching and integrating a single-axis high-precision guide to the side of the Rodless Cylinder (SRL3), miniaturization as a guided rodless cylinder is achieved. Realizes miniaturization of equipment.

Low profile design similar to SRL3 is possible

Due to our original flat rodless cylinder structure, the table position is extremely low, enabling thin design of equipment. Also, since it is based on SRL3, the interface dimensions for Stroke are compatible, and design changes can be made easily.

Centralized Port

Depending on the installation location of the cylinder, centralized port (one-way piping) and standard port (both sides piping) can be freely selected. Equipment can be made compact.

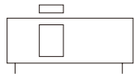
CONTENTS

Product Introduction	2
Series variation	112
Variation/Option Combination Availability Table	114
● Double Acting Type (SRG3)	116
Outer Dimensions Diagram with Switch	126
Model Selection Guide	130
Technical Data	135
⚠Precautions for Use	138

System Chart

Rodless Cylinder with High Precision Guide SRG3 Series

●: Standard, ◎: Option, : Not manufacturable

Variation	Model No. Circuit Diagram Code	Bore Size (mm)	Standard Stroke (mm)									Min Stroke (mm)		Max Stroke (mm)	Intermediate Stroke (per mm)	Mounting Type			Cushion				Option						Switch	Page
			200	300	400	500	600	700	800	900	1000					Basic type	Axial Foot Type	Axial Foot Type	Without Cushion	With Cushion on Both Sides	With R Side Cushion	With L Side Cushion	Full Stroke Adjustment with Shock Absorber on Both Sides	With full stroke adjustment R side shock absorber	With full stroke adjustment L side shock absorber	Full Stroke Adjustment Bracket Retrofit Type	Table Mounting Screw Size Up			
																00	LB	LB1	N	B	R	L	A	A1	A2	A3	H			
Double Acting Type	SRG3 	ø12 equivalent	●	●	●							1		450	1	●	●	●	●	●	●	●	◎	◎	◎	◎	◎		◎	116
		ø16 or equiv., ø20 or equiv.	●	●	●	●	●	●	●					800		●	●	●	●	●	●	●	◎	◎	◎	◎	◎			
		ø25 equivalent	●	●	●	●	●	●	●	●	●			1000		●	●	●	●	●	●	●	◎	◎	◎	◎				

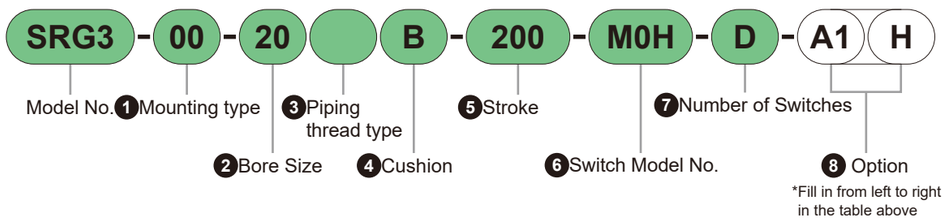
Rodless Type
SRL3
SRG3
SRM3
SRT3
MRL2
MRG2
SM-25
Cylinder Switch
Ending

Variation and Option Item Combination Availability Table

◎ Mark: Option
○ Mark: Custom-made
△ Mark: Manufacturable depending on conditions (please consult)
× Mark: Cannot be manufactured

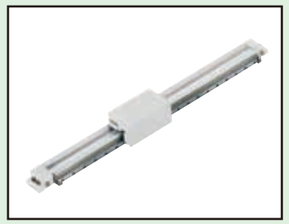
Category		Category	Variation	Piping thread		Option										
			Double Acting Basic Type	NPT	G	Stroke Adjustment Both Sides	Stroke adjustment R side	Stroke Adjustment L Side	For Stroke Adjustment Bracket Retrofit	Table Mounting Screw Size Up	Port/Cushion Needle Position Specification	Port/Cushion Needle Position Specification	Port/Cushion Needle Position Specification	Port/Cushion Needle Position Specification	Port/Cushion Needle Position Specification
		Code	None	N	G	A	A1	A2	A3	H	R	B	T	D	S
Variation	Double Acting Basic Type	Blank		○	○	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
Piping thread	NPT	N			×	○	○	○	○	○	○	○	○	○	○
	G	G				○	○	○	○	○	○	○	○	○	○
Option	Stroke Adjustment Both Sides	A					×	×	×	◎	◎	◎	◎	◎	◎
	Stroke adjustment R side	A1						×	×	◎	◎	◎	◎	◎	◎
	Stroke Adjustment L Side	A2							×	◎	◎	◎	◎	◎	◎
	For Stroke Adjustment Bracket Retrofit	A3								◎	◎	◎	◎	◎	◎
	Table Mounting Screw Size Up	H									◎	◎	◎	◎	◎
	Port/Cushion Needle Position Specification	R										×	×	×	×
	Port/Cushion Needle Position Specification	B											×	×	×
	Port/Cushion Needle Position Specification	T												×	×
	Port/Cushion Needle Position Specification	D													×
	Port/Cushion Needle Position Specification	S													
Accessories	Cylinder Switch	Separately Shown	◎	○	○	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

[Model No. Example]



Model No.: Rodless Cylinder with High Precision Guide
1 Mounting Style : Basic type
2 Bore Size : ø20 or equivalent
3 Port Thread Type : Rc Thread
4 Cushion : With Cushion on Both Sides
5 Stroke : 200 mm
6 Switch Model No. : Reed MOH switch, lead wire 1 m
7 Number of Switches : With 2 pcs.
8 Option : R side full stroke adjustable, with shock absorber, larger table mounting thread

MEMO



Rodless Cylinder with High-Precision Guide

SRG3 Series

● Bore Size: ø12, ø16, ø20, ø25 or equiv.

Circuit Diagram Code

RoHS

Model No. Notation

Without Switch
(Built-in magnet for switch)

SRG3 - 00 - 25 - B - 200 ——— A

Model No. ❶ ❷ ❸ ❹ ❺ ❽

With Switch
(Built-in magnet for switch)

SRG3 - 00 - 25 - B - 200 - M0H - R - A

Model No. ❷Bore Size ❹Cushion ❻Switch Model No. ❽Option

❶Mounting type ❸Piping thread type ❺Stroke ❼Number of Switches

❶Mounting type

Mounting brackets are included with the product and shipped.

Code	Content	
00	Basic type	
LB	Axial Foot Type	
LB1	Axial Foot Type	

❷Bore Size (mm)

Code	Content
12	ø12 equivalent
16	ø16 equivalent
20	ø20 equivalent
25	ø25 equivalent

❸Piping thread type

Code	Content
Blank	M5 (ø12, ø16 equivalent)
	Rc thread (Equivalent to ø20, ø25)
N	NPT Thread (ø20 equivalent or larger) (Custom-made)
G	G Thread (ø20 equivalent or larger) (Custom-made)

❹Cushion

Code	Content
B	With Cushion on Both Sides
R	With R Side Cushion
L	With L Side Cushion
N	Without Cushion

❺Stroke (mm)

Bore Size	Stroke	Intermediate Stroke
ø12 equivalent	1 to 450	Every 1 mm
ø16 equivalent	1 to 800	
ø20 equivalent	1 to 800	
ø25 equivalent	1 to 1000	

Note: For the minimum stroke with switch, please refer to P. 118.

❻Switch Model No.

For switch details, please refer to P. 1457. Switches are included with the product and shipped.

Contact	Indicator LED Special Function	Wiring (Output)	Load Voltage (V) AC	Load Voltage (V) DC	Load Current (mA) AC	Load Current (mA) DC	Lead wire *1 Straight	Lead wire *1 L-shape	
Solid State	1-Color	2-wire	-	10 to 30	-	5 to 30	M2H□	M2V□	
	2-Color	2-wire	-	10 to 30	-	5 to 30	-	M2WV□	
	1-Color	3-wire (NPN)	-	30 or less	-	100 or less	M3H□	M3V□	
	2-Color	3-wire (NPN)	-	30 or less	-	100 or less	-	M3WV□	
	1-Color (Custom order)	3-wire (PNP)	-	30 or less	-	100 or less	M3PH□	M3PV□	
	2-Color	2-wire	-	24 ± 10%	-	5 to 20	T2WH□	T2WV□	
		3-wire (NPN)	-	30 or less	-	50 or less	T3WH□	T3WV□	
	2-Color Improved Water Resistance	2-wire	-	24 ± 10%	-	5 to 20	T2WLH□	T2WLV□	*2
	2-Color for AC Magnetic Field		-	24 ± 10%	-		T2YD□	-	
			-		-		T2YDT□	-	
	1-Color Flexible Lead Wire Type		—	10 to 30	—	5 to 20 *2	T2HR3	T2VR3	
Reed	1-Color	2-wire	110	12/24	7 to 20	5 to 50	M0H□	M0V□	
	No Indicator LED		110	5/12/24	20 or less	50 or less	M5H□	M5V□	

*4

*1: Insert the Code selected in the "Lead wire length, connector specifications" table into "□" of the switch model number.
*2: It does not guarantee the water resistance performance of the cylinder.
*3: Switches other than the above switch model numbers are also available. (Custom Product) For details, see P. 1457.

*Lead wire length, connector specification

Code	Content
Blank	1 m (Standard)
3	3 m (Option)
5	5 m (Option)
W	M8 Connector, 1PIN (+), 4PIN (−) Lead Wire 0.3 m

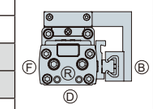
*4: T2WLH and T2WLV only can be selected.

Ex) Lead wire length
1 m M0H
3 m M0H3
5 m M0H5

❼Number of Switches

Code	Content
R	With 1 pc on R side
L	With 1 pc on L side
D	With 2 pcs
T	With 3 pcs
4	With 4 pcs (For 4 or more pieces, enter the number of switches.)

❽ Option

	Code	Description	Bore Size (ø) Equivalent to 12	Equivalent to 16	Equivalent to 20	Equivalent to 25	
	A	Full stroke adjustment both sides, with shock absorber	●	●	●	●	
	A1	Full stroke adjustment R side only, with shock absorber	●	●	●	●	
	A2	Full stroke adjustment L side only, with shock absorber	●	●	●	●	
*3	A3	Full Stroke Adjustment Bracket Retrofit Type	●	●	●	●	
*4	H	Table Mounting Screw Size Up	●	●	●		
	Blank	Port Position: F (Standard) / Cushion Needle Position: F (Standard)	●	●	●	●	
*2	R	Port Position: R (Centralized Port) / Cushion Needle Position: F	●	●	●	●	
	B	Port Position: F / Cushion Needle Position: B	●	●	●		
*2	T	Port Position: R (Centralized Port) / Cushion Needle Position: B	●	●	●		
*5	D	Port Position: D / Cushion Needle Position: F				●	

*1 : For port and cushion needle position indication codes, please refer to the external dimensions diagram.
*2 : In the case of option codes "R" and "T", the ❶mounting type will be "00" or "LB1". (Option Codes "R" and "T" with ❶mounting type "LB" cannot be manufactured because piping is not possible.)
*3 : Option Code "A3" is an option where a mounting plate nut is assembled to allow retrofitting of the full stroke adjustment bracket.
*4: The thread size of option code "H" is M4 for ø12 and ø16 or equivalent, and M5 for ø20 or equivalent.
*5 : If the port position is "D", ❶mounting type "LB1" cannot be used. (ø25 equivalent)

Switch Individual Model No. Notation

(Common with SRL3.)

●Switch body+Mounting bracket set

SRL3 - M0H

❻Switch Model No.

●Switch body only

SW - M0H

❻Switch Model No.

*1: The switch body + mounting bracket set does not include a lead wire holder. If a lead wire holder is required, please order it separately.
*2: The mounting brackets for M-type switches and T-type switches are different.
*3: Lead wire holders are 10 pieces/1 set.

●Mounting bracket complete set (*2)
M-type switch

SRL3 - M

T type switch

SRL3 - T

● Lead wire holder (*3)

SRL3 - MH

Shock absorber single item model number display method

SRL3 - 20 - NCK

❷Bore Size

(1 Shock absorber, 1 Hexagon Nut for fixing shock absorber)

Applicable Shock Absorber Model No.

Model No. Notation	Applicable Model
NCK-00-0.3-C	SRG3-12 / 16
NCK-00-0.7-C	SRG3-20
NCK-00-1.2	SRG3-25

Mounting Bracket Model No. Display Method

SRL3 - LB - 20 (2 Brackets, 4 Mounting Bolts)

❶Mounting type ❷Bore Size

Full stroke adjustment bracket kit model number display method

(Applies to option code A3.)

SRG3 - 20

❷Bore Size

- A (With full stroke adjustment bracket kit on both sides)
- A1 (With full stroke adjustment bracket kit on R side)
- A2 (With full stroke adjustment bracket kit on L side)

(For parts composition, please refer to **P. 127)**

Specifications

Item	SRG3 (Standard/with switch)			
Bore Size	ø12 equivalent	ø16 equivalent	ø20 equivalent	ø25 equivalent
Operation Method	Double Acting Type			
Operating Fluid	Compressed Air			
Max Operating Pressure MPa	0.7			
Min Operating Pressure MPa	0.2			0.1
Proof Pressure MPa	1.05			
Ambient Temperature °C	5 to 60			
Port Size	M5		Rc 1/8	
Stroke tolerance mm	$^{+2.0}_{0}$			
Operating Piston Speed mm/s	50 to 1000 *1			
Repeat stopping accuracy mm	±0.05 (In case of with shock absorber)			
Cushion	Air Cushion			
Lubrication	Not Required	When lubricating, use turbine oil Class 1 ISO VG32. In addition, after starting lubrication, continue to lubricate.		

*1: The operating piston speed for centralized port piping varies depending on the stroke, so please consult us separately.

Allowable Absorption Energy

Bore Size (mm)	With Cushion		Without Cushion	With Shock Absorber (Initial Setting)	
	Allowable Absorption Energy (J)	Cushion Stroke (mm)	Allowable Absorption Energy (J)	Absorption Energy (J)	Effective Stroke (mm)
ø12 equivalent	0.03	14.5	0.003	2.4	5.5
ø16 equivalent	0.22	19.2	0.007	2.4	5.5
ø20 equivalent	0.59	22.2	0.010	5.7	7
ø25 equivalent	1.40	20.9	0.015	10	9

Stroke

Bore Size (mm)	Standard Stroke (mm)	Max Stroke (mm)	Min Stroke (mm)
ø12 equivalent	200, 300, 400	450	1
ø16 equivalent ø20 equivalent	200, 300, 400, 500 600, 700, 800	800	
ø25 equivalent	200, 300, 400 500, 600, 700 800, 900, 1000	1000	

Note: Intermediate strokes can be manufactured in 1 mm increments.

M Type Switch Mounting Quantity and Min Stroke (mm)

Switch Qty.	1		2	
Switch Model No. / Bore Size (mm)	M□V	M□H	M□V	M□H
ø12 equivalent	10	10	30	45 (70)
ø16 equivalent	10	10	30	45 (70)
ø20 equivalent	10	10	30	45 (70)
ø25 equivalent	10	10	30	45 (70)

Note: In the case of full stroke adjustment, the minimum stroke with switch is shown in ( ).

T Type Switch Mounting Quantity and Min Stroke (mm)

Switch Qty.	1				2			
Switch Model No. / Bore Size (mm)	T□V	T2WLV	T□H	T2WLH	T□V	T2WLV	T□H	T2WLH
ø12 equivalent	5	5	5	5 (11)	45	35	50 (70)	56 (82)
ø16 equivalent	5	5	5	5 (11)	45	35	50 (70)	56 (82)
ø20 equivalent	5	5	5	5 (11)	45	35	50 (70)	56 (82)
ø25 equivalent	10	10	10	10 (16)	45	35	50 (70)	56 (82)

Note: In the case of full stroke adjustment, the minimum stroke with switch is shown in ( ).

Cylinder Weight

Unit: kg

Bore Size (mm)	Weight at 0 mm Stroke				Weight of mounting bracket		Added weight per stroke=100 mm
	Basic type (00)	Foot type (LB)	Foot type (LB1)	Switch Weight	T Type	M Type	
ø12 equivalent	0.46	0.47	0.48	P. 1457Refer to the weight in the switch specifications.	0.005	0.001	0.23
ø16 equivalent	0.61	0.62	0.64				0.28
ø20 equivalent	0.96	0.98	1.02				0.33
ø25 equivalent	1.73	1.83	1.83				0.52

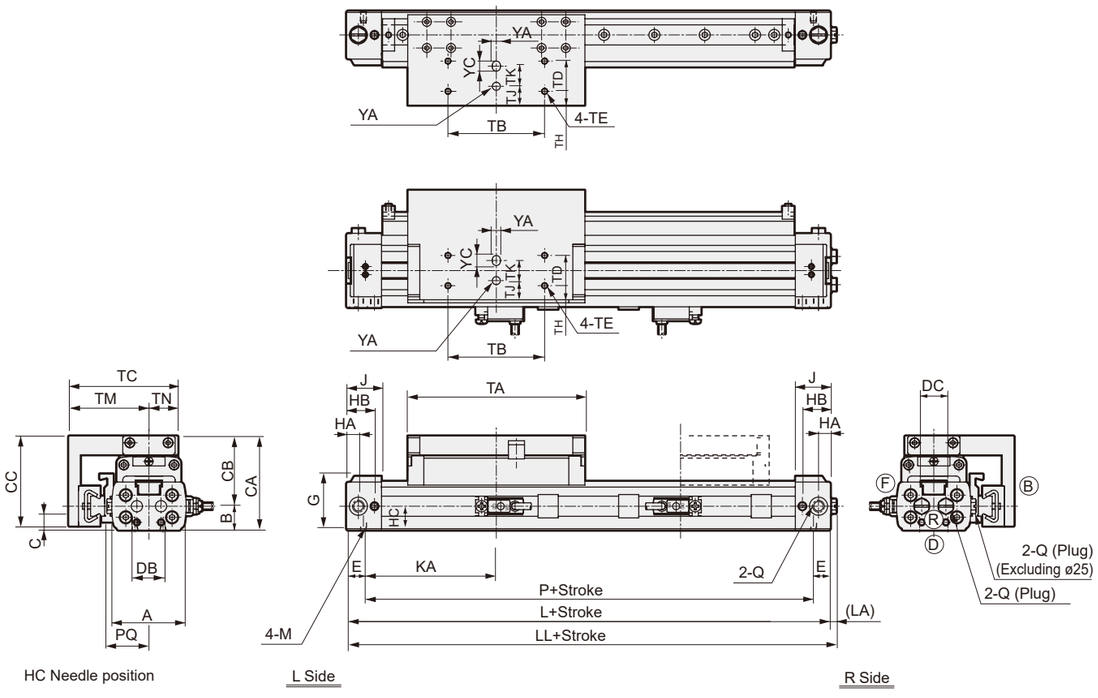
Theoretical Thrust Table

(Unit: N)

Bore Size (mm)	Operating Direction	Operating Pressure MPa						
		0.1	0.2	0.3	0.4	0.5	0.6	0.7
ø12 equivalent	Push/Pull	-	27.7	41.5	55.3	69.1	83.0	96.8
ø16 equivalent	Push/Pull	-	43.2	64.8	86.4	1.08×10^{2}	1.30×10^{2}	1.51×10^{2}
ø20 equivalent	Push/Pull	-	62.9	94.4	1.26×10^{2}	1.57×10^{2}	1.89×10^{2}	2.20×10^{2}
ø25 equivalent	Push/Pull	54.2	1.08×10^{2}	1.63×10^{2}	2.17×10^{2}	2.71×10^{2}	3.25×10^{2}	3.80×10^{2}

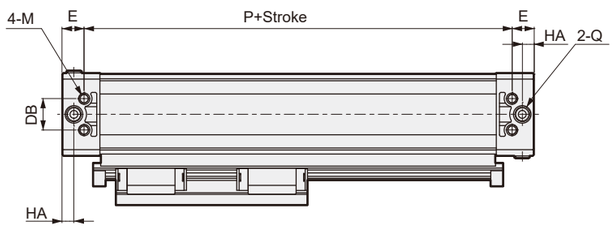
Outline Dimension Drawing

● SRG3



● Bottom piping (option code: D)

Bottom piping is only for equivalent to ø25.



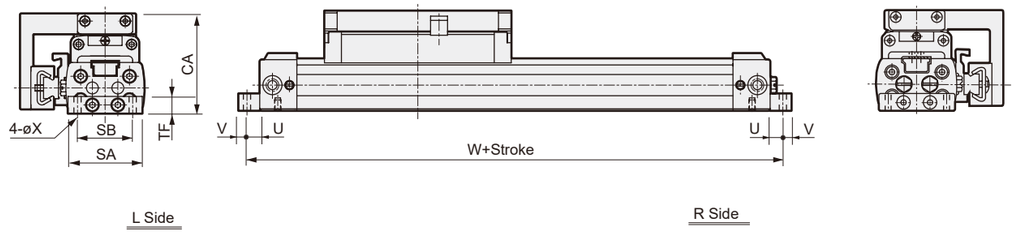
Code / Bore Size (mm)	A	B	CA	CB	CC	DB	DC	E	G	HA	HB	HC	J	KA	L	LL	LA	M
ø12 equivalent	33	10.5	43	32.5	40.5	10	11	8.5	24	6	14	10.5	17.5	59.5	136	139	3	M3 Depth 5
ø16 equivalent	37	12	47	35	45	14	12	8.5	27	6	14	12	17.5	66	149	152	3	M3 Depth 5
ø20 equivalent	44	14	54	40	50	16	16	10.5	31	8.5	18.5	14	22	74	169	171.5	2.5	M4 Depth 6.5
ø25 equivalent	53	17	67	50	63.5	20	26	14	40.5	7.5	20	18.9	24	81	190	192	2	M6 Depth 9

Code / Bore Size (mm)	P	PQ	Q	TA	TB	TC	TD	TE	TH	TJ	TK	TM	TN	YA	YC
ø12 equivalent	119	19	M5	81	42	49	13	M3 Depth 5	6.5	8	10	36	13	$4^{+0.07}_{+0.02}$ Depth 4	5
ø16 equivalent	132	21	M5	88	48	54.5	15	M3 Depth 6	7	9.5	10	40	14.5	$4^{+0.07}_{+0.02}$ Depth 4	5
ø20 equivalent	148	24.5	Rc 1/8	100	60	61.5	18	M4 Depth 6	8.5	10	15	44	17.5	$6^{+0.07}_{+0.02}$ Depth 6	7
ø25 equivalent	162	-	Rc 1/8	122	70	80	20	M5 Depth 8	12	14.5	15	58	22	$6^{+0.07}_{+0.02}$ Depth 6	7

Note: For dimensions with each switch, please refer to P. 126.

Outline Dimension Drawing

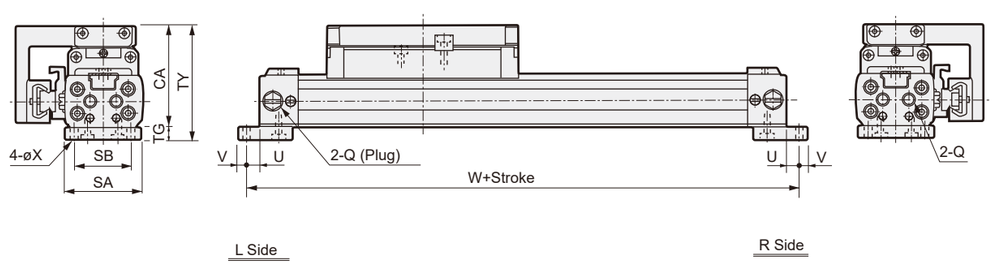
● With Foot Bracket SRG3-LB-□□-□□□



Code / Bore Size (mm)	With Foot Bracket (LB) SA	SB	TF	U	V	W	X
ø12 equivalent	32	24	8	6	4	148	3.4
ø16 equivalent	35	26	8	6	4	161	3.4
ø20 equivalent	43	33	10	6	6	181	4.5
ø25 equivalent	52	20	12	9	11	208	7

Note: For dimensions with each switch, please refer to **P. 126.**

● With Foot Bracket SRG3-LB1-□□-□□□

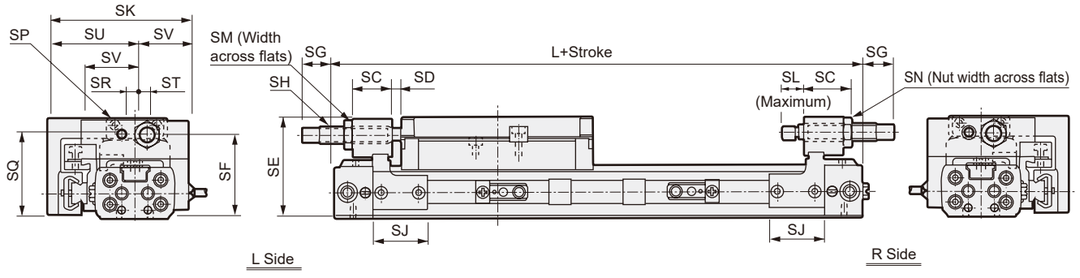


Code / Bore Size (mm)	With Foot Bracket (LB1) Q	SA	SB	TG	TY	CA	U	V	W	X
ø12 equivalent	M5	32	24	6	49	43	6	4	148	3.4
ø16 equivalent	M5	35	26	6	53	47	6	4	161	3.4
ø20 equivalent	Rc 1/8	43	33	8	62	54	6	6	181	4.5
ø25 equivalent	Rc 1/8	50	20	10	77	67	9	11	208	7

Note: For dimensions with each switch, please refer to P. 126.

External Dimensions with Options

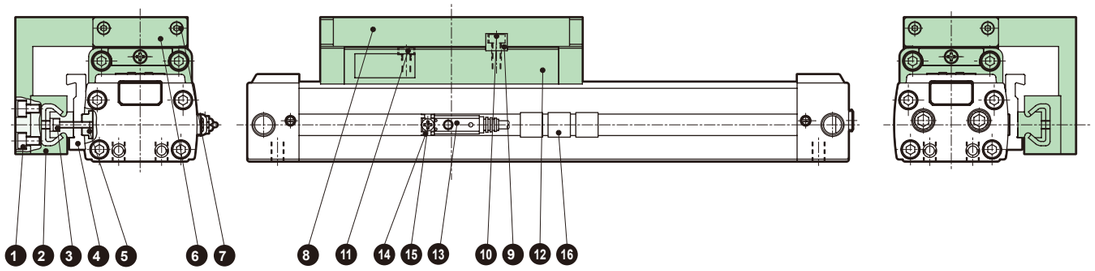
● With full Stroke adjusting Shock Absorbers (SRG3)



Code / Bore Size (mm)	SC	SD	SE	SF	SG			SH		SJ	SK	SL	SM	SN	SP	SQ	SR	ST	SU	SV
					At MAX	At MIN	Adjustment range	Outer diameter thread	Maximum absorption energy (J)											
ø12 equivalent	19.5	2.5	42	35	17.5	7.5	10	M8×0.75	3	25	58.5	8.5	12	7	M4	35.5	6	3	36	22.5
ø16 equivalent	18	4	46	39	14.5	4.5	10	M8×0.75	3	25	64.5	10	12	7	M4	40	6	4	40	24.5
ø20 equivalent	22.5	3.5	53	45	14.5	4.5	10	M10×1.0	7	39	72.5	11.5	14	8	M5	48	8	5	44	28.5
ø25 equivalent	20	2.5	65.5	54.5	14.5	4.5	10	M12×1.0	12	50	96.5	11.5	17	10	M6	56	12	10	58	38.5

MEMO

Internal Structure / Material



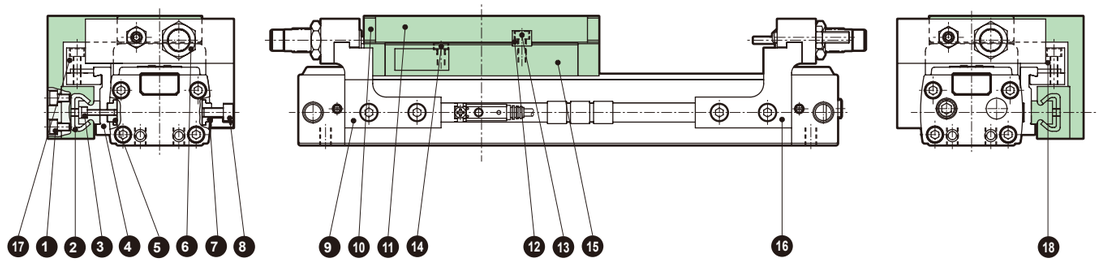
Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide	10	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide
2	High-precision guide	Stainless Steel		11	Hexagon Socket Head Cap Screw	Alloy Steel	Zinc Chromate
3	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide	12	Table	Aluminum Alloy	Alumite
4	Guide holder	Aluminum Alloy	Alumite	With Switch			
5	Plate nut (B)	Steel	Black Oxide	13	Switch		
6	Stopper plate	Steel	Zinc Chromate	14	Mounting bracket	Stainless Steel	
7	Hexagon Socket Head Cap Screw	Alloy Steel	Zinc Chromate	15	Cross-Recessed Pan Head Screw	Stainless Steel	
8	Connection plate	Aluminum Alloy	Alumite	16	Lead Wire Holder	Polyacetal	
9	Key	Steel	Black Oxide				

Note: The internal structure of the cylinder part is the same as the Rodless Cylinder SRL3 series.P. 24.

For maintenance parts, please visit the CKD Equipment Product Site
(https: //www.ckd.co.jp/kiki/en/) → "model No." → Maintenance Parts.

Internal structure diagram/materials (Option)

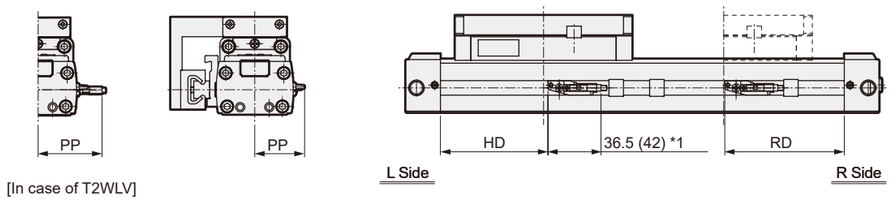
● Full stroke adjustable with shock absorber



Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide	10	Stopper plate	Steel	Zinc Chromate
2	High-precision guide	Stainless Steel		11	Connection plate	Aluminum Alloy	Alumite
3	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide	12	Key	Steel	Black Oxide
4	Guide holder	Aluminum Alloy	Alumite	13	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide
5	Plate nut (B)	Steel	Black Oxide	14	Hexagon Socket Head Cap Screw	Alloy Steel	Zinc Chromate
6	Hexagon Nut	Steel	Zinc Chromate	15	Table	Aluminum Alloy	Alumite
7	Plate Nut	Alloy Steel	Black Oxide	16	Adapter (L)	Steel	Zinc Chromate
8	Hexagon Socket Head Cap Screw	Alloy Steel	Zinc Chromate	17	Adapter (LG)	Steel	Zinc Chromate
9	Adapter (R)	Steel	Zinc Chromate	18	Adapter (RG)	Steel	Zinc Chromate

SRG3 Series Switch External Dimensions Diagram

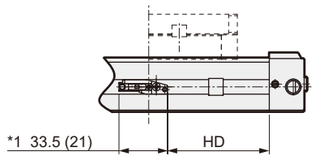
●T2WH/V, T3WH/V, T2WLH/V



[In case of T2WLV]

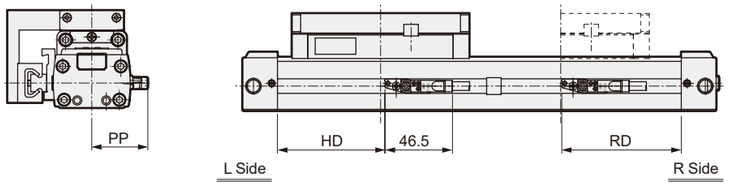
SRG3				
Code	PP		HD	RD
Bore Size (mm)	T□W, T2WLH	T2WLV		
ø12 equivalent	24.3	34	32	69
ø16 equivalent	26.3	36	38	76
ø20 equivalent	29.3	39	44	81
ø25 equivalent	34.3	44	52	90

Note: In the case of T2WLH/V, it will be the dimension in ( ).



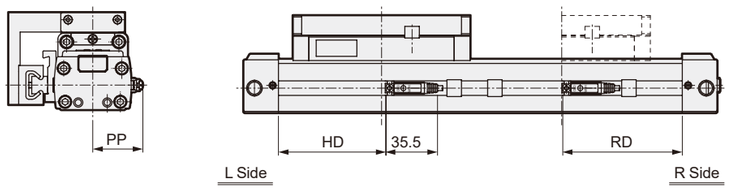
[In case of T□W(L)V]

●T2YD, T2YDT

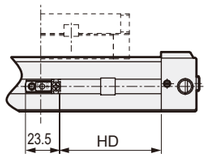


SRG3			
Code	PP	HD	RD
Bore Size (mm)			
ø12 equivalent	28.4	36	65
ø16 equivalent	30.4	42	72
ø20 equivalent	33.4	48	77
ø25 equivalent	38.4	56	86

●M0H/V, M5H/V, M2H/V, M2WV, M3H/V, M3WV, M3PH/V



SRG3			
Code	PP	HD	RD
Bore Size (mm)			
ø12 equivalent	24.5	40.5	60.5
ø16 equivalent	26.5	47	67
ø20 equivalent	29.5	52.5	72.5
ø25 equivalent	34.5	60	82



[In case of M*V]

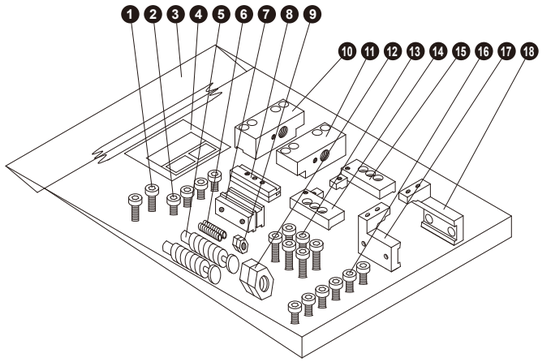
Full Stroke Adjustment Bracket Kit

●(With full stroke adjustment bracket kit on both sides)

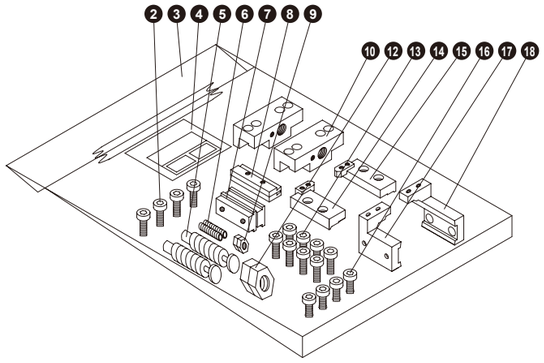
SRG3 - 25 - A

❷Bore Size

[Equivalent to ø12 to ø20]



[ø25 equivalent]



Part No.	Part Name	Quantity
1	Hexagon Socket Head Cap Screw	Equivalent to ø12 to ø20: 2 ø25 or equiv.: -
2	Hexagon Socket Head Cap Screw	4
3	Plastic Bag	1
4	Package label	1
5	Shock absorber	2
6	Hexagon Socket Set Screw	2
7	Plate Nut	2
8	Adapter Nut	2
9	Hexagon Nut	2
10	Equivalent to ø12 to ø20 Plate (R) ø25 equivalent Plate	ø12 to ø20 or equiv.: 1 ø25 or equiv.: 2
11	Plate (L)	ø12 to ø20 or equiv.: 1 ø25 or equiv.: -
12	Hexagon Nut	2
13	Hexagon Socket Head Cap Screw	ø12 to ø20 or equiv.: 6 ø25 or equiv.: 8
14	Adapter (RG)	1
15	Adapter (LG)	1
16	Hexagon Socket Head Cap Screw	ø12 to ø20 or equiv.: 6 ø25 or equiv.: 4
17	Adapter (R)	1
18	Adapter (L)	1

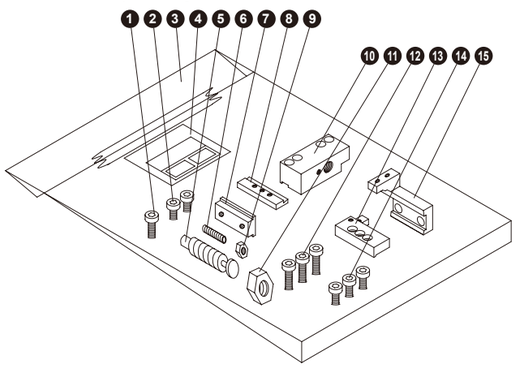
Full Stroke Adjustment Bracket Kit

●With full stroke adjustment bracket kit on R side

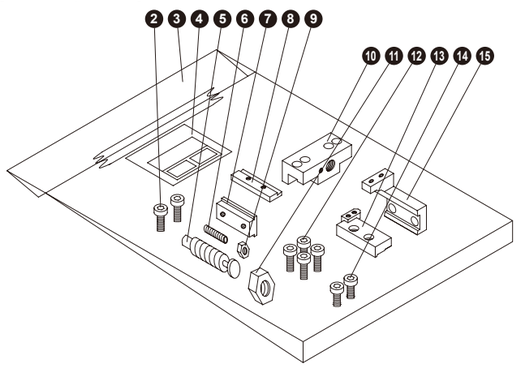
SRG3 - 25 - A1

② Bore Size

[ø12 to ø20 or equivalent]



[ø25 or equivalent]



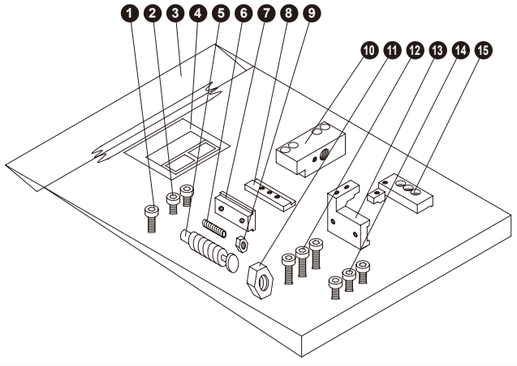
Part No.	Part Name	Quantity	Part No.	Part Name	Quantity
1	Hexagon Socket Head Cap Screw	Equivalent to ø12 to ø20: 1 ø25 equivalent: -	9	Hexagon Nut	1
2	Hexagon Socket Head Cap Screw	2	10	ø12 to ø20 or equivalent: Plate (R) ø25 or equivalent: Plate	1
3	Plastic Bag	1	11	Hexagon Nut	1
4	Package label	1	12	Hexagon Socket Head Cap Screw	ø12 to ø20 or equivalent: 3 ø25 or equiv.: 4
5	Shock absorber	1	13	Adapter (RG)	1
6	Hexagon Socket Set Screw	1	14	Hexagon Socket Head Cap Screw	ø12 to ø20 or equivalent: 3 ø25 or equiv.: 2
7	Plate Nut	1	15	Adapter (L)	1
8	Adapter Nut	1			

● With full stroke adjustment bracket kit on L side

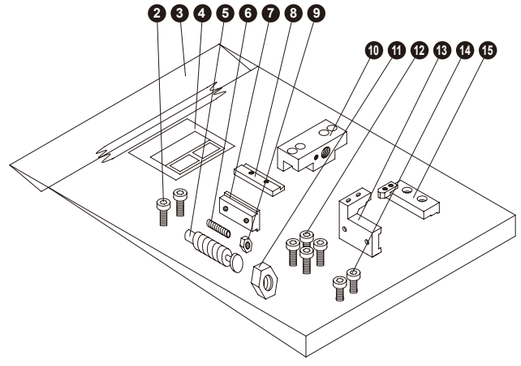
SRG3 - 25 - A2

② Bore Size

[ø12 to ø20 or equivalent]



[ø25 or equivalent]



Part No.	Part Name	Quantity	Part No.	Part Name	Quantity
1	Hexagon Socket Head Cap Screw	ø12 to ø20 or equiv.: 1 ø25 or equivalent: -	9	Hexagon Nut	1
2	Hexagon Socket Head Cap Screw	2	10	ø12 to ø20 or equiv.: Plate (L) ø25 or equivalent: Plate	1
3	Plastic Bag	1	11	Hexagon Nut	1
4	Package label	1	12	Hexagon Socket Head Cap Screw	Equivalent to ø12 to ø20 3 ø25 or equiv.: 4
5	Shock absorber	1	13	Adapter (LG)	1
6	Hexagon Socket Set Screw	1	14	Hexagon Socket Head Cap Screw	Equivalent to ø12 to ø20 3 ø25 or equiv.: 2
7	Plate Nut	1	15	Adapter (R)	1
8	Adapter Nut	1			

Parts kit weight table

Full Stroke Adjustment Kit

●With full stroke adjustment bracket kit on both sides

Kit Number	Kit weight (g)
SRG3-12-A	244
SRG3-16-A	261
SRG3-20-A	405
SRG3-25-A	813

●With full stroke adjustment bracket kit on R side

Kit Number	Kit weight (g)
SRG3-12-A1	122
SRG3-16-A1	131
SRG3-20-A1	202
SRG3-25-A1	406

●With full stroke adjustment bracket kit on L side

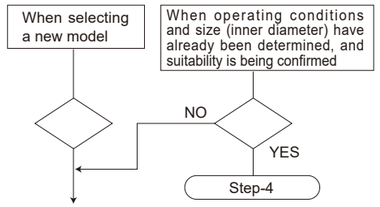
Kit Number	Kit weight (g)
SRG3-12-A2	122
SRG3-16-A2	130
SRG3-20-A2	403
SRG3-25-A2	407

Other parts kits are common with the SRL3 Series. Please refer to SRL3 Series P. 92 and 93.

SRG3 Series Model Selection Guide

Since the selection conditions are different from general air cylinders, please check the suitability using the selection guide.

1 Step 1:



2 Step 2: Confirmation of operating conditions

1. Operating Pressure (P) (MPa)
2. Load weight (M) (kg)
3. Applied load (F_L) (N)
4. Mounting direction
5. stroke (L) (mm)
6. Travel time: t (s)
7. Operation speed (V) (m/s)

Calculation formula for average operating speed V of cylinder

$$V=\frac{L}{t}\times\frac{1}{1000}\ (m/s)$$

[Payload]

This is the value of (transported substance weight+jig weight).

[Mounting direction]

Operating direction: Horizontal, Vertical

Mounting direction Table upward, Table downward

3 Step 3: Selection of approximate cylinder size

●Cylinder size (I.D.) calculation formula

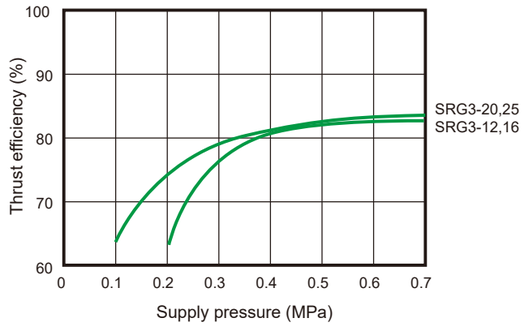
$$F=\frac{\pi}{4}\times D^2\times P\times\frac{a}{100}\ (N)$$

$$\therefore D=\sqrt{\frac{4F}{\pi\cdot P\cdot a}}\ (mm)$$

D: Cylinder inner diameter (mm)
P: Operating Pressure (MPa)
(a) Thrust efficiency (%) (refer to Fig. 1.)
F: Cylinder theoretical thrust (N)

D= ø

Figure 1 Trend of SRG3 thrust efficiency



● When calculating from the theoretical thrust value in Table 1, indicate the approximate required thrust ≥ applied load ×2 (x2 of Load x 2 is when the load factor is about 50% as a safety factor)

(Example) Operating Pressure 0.5 MPa
Load 5N
*Required thrust is 5 Nx2=10 N

From Table 1, if you select a Bore Size with a theoretical thrust of 10 N or more at an Operating Pressure of 0.5 MPa, it will be ø12.

D= ø12

[Cylinder theoretical thrust]

Table 1 Cylinder theoretical thrust values Unit: N

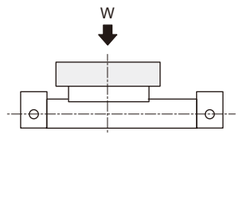
Bore Size (mm)	Pressure receiving area (mm²)	Operating Pressure MPa						
		0.1	0.2	0.3	0.4	0.5	0.6	0.7
ø12 or equivalent	138	-	28	41	55	69	83	97
ø16 equivalent	216	-	43	65	86	108	130	151
ø20 equivalent	315	-	63	94	126	157	189	220
ø25 equivalent	542	54	108	163	217	271	325	380

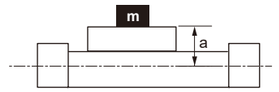
Note: Values in Table 1 do not include thrust efficiency.

4 Step 4: Calculation of load (W) and each moment value

Vertical load and static moment act depending on the cylinder mounting direction and the load's center of gravity position.

[Vertical load]



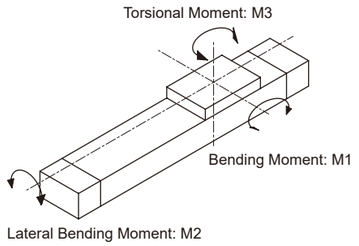


Value of a

Bore Size	a (m)
ø25 equivalent	0.033
ø32 or equivalent	0.035
ø40 equivalent	0.040
ø63 or equivalent	0.050

[Static moment]

● Types of moment caused by load

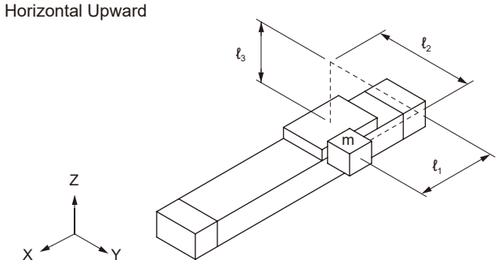


Unit: N·m

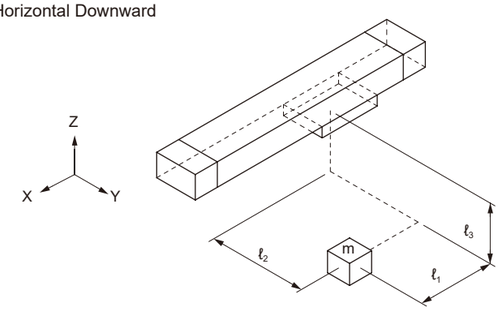
Mounting Direction		Horizontal Upward	Horizontal Downward	Horizontal Lateral	Vertical
Vertical load W		m × 9.8			-
Static Moment	M1	W×ℓ_1	W×ℓ_1	-	W x (ℓ_3 +a)
	M2	W×ℓ_2	W×ℓ_2	W x (ℓ_3+a)	-
	M3	-	-	W×ℓ_1	W×ℓ_2

m : Load weight (kg)
ℓ_1 : Stroke distance from the center of table to the center of gravity of load [m]
ℓ_2 : Length in the width direction from the center of table to the center of gravity of load [m]
ℓ_3 : Length in the vertical direction from the center of table to the center of gravity of load [m]

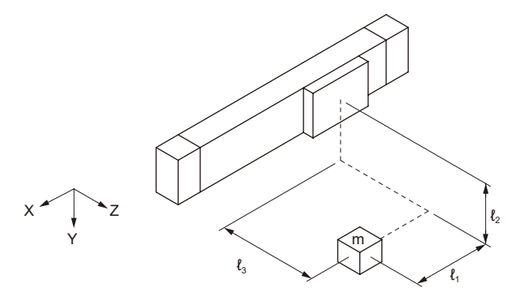
Horizontal Upward



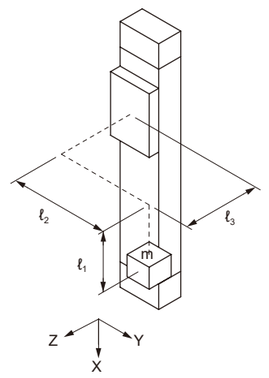
Horizontal Downward



Horizontal Lateral



Vertical



5 Step 5: Confirmation of Combined Load and Moment Values

● Divide each load by the value shown in Table 2 to find load/moment ratio, and confirm that the total value is 1.0 or less.

●Calculation formula

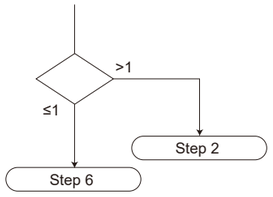
$$\frac{W}{Wmax}+\frac{M1}{M1\ max}+\frac{M2}{M2\ max}+\frac{M3}{M3\ max}\leq 1.0$$

Table 2 Allowable values for load and moment

Item / Bore Size (mm)	Vertical load W (N)	Bending moment M1 (N·m)	Lateral bending moment M2 (N·m)	Torsional moment M3 (N·m)
ø12 or equivalent	20	1	0.5	3
ø16 equivalent	40	2.5	1	5.5
ø20 equivalent	40	2.5	1	5.5
ø25 equivalent	90	6.5	2.5	17

●If the total value is greater than 1.0

1. Reconsider load
2. Implement reviews such as increasing the cylinder's inner diameter.



6 Step 6: Calculation of Required Thrust

● Calculate the required cylinder thrust (F_N) that satisfies the conditions of the moments.

1. During horizontal operation

$F_N=F_W+F_{M1}+F_{M2}+F_{M3}+F_L$ (N)

F_W = W×0.2 (N)

F_{M1} = M1×C1 (N)

F_{M2} = M2×C2 (N)

F_{M3} = M3×C3 (N)

F_L : Applied load (N)

C1: Friction force coefficient due to moment M1 (Table 3)

C2: Friction force coefficient due to moment M2 (Table 3)

C3: Friction force coefficient due to moment M3 (Table 3)

2. During vertical operation

$F_N=W+F_{M1}+F_{M3}+F_L$ (N)

$F_N=$ ☐ (N)

[Friction force coefficient due to each moment]

● The friction differs depending on the moment. Calculate the friction of each moment from Table 3.

Table 3 Friction force coefficient due to each moment 1/m

Bore Size (mm)	C1	C2	C3
ø12 or equivalent	8	27	8
ø16 equivalent	7	24	7
ø20 equivalent	6	21	6
ø25 equivalent	5	16	5

7 Step 7: Confirmation of Load Factor

● Determine the load factor by taking into account the status of utilization such as stability, margin and service life of the cylinder.

● Formula of load factor (α)

$$\alpha=\frac{\text{Required thrust }(F_N)}{\text{Cylinder thrust }(F)}\times 100\ \%$$

$$F=\frac{\pi}{4}xD^2xPx\frac{\mu}{100}\ (N)$$

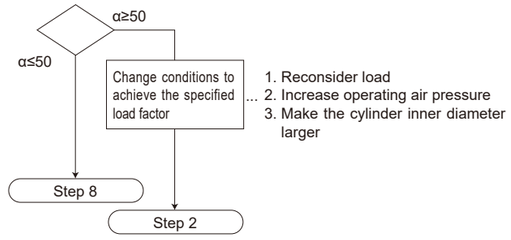
D: Cylinder Bore Size (mm)

$\frac{\pi}{4}\times D^2$ = Pressurized area (mm^2)

● $\frac{\pi}{4}xD^2xP$ The cylinder theoretical thrust value in Table 1 can be used as the value.

P : Operating Pressure MPa

μ : Thrust efficiency (Use the values in Figure 1.)



[Appropriate range of load factor]

● The piston speed differs depending on the load factor. In normal use, the values in Table 4 are recommended.

Table 4 (Appropriate range of load factor - Reference value)

Operating Pressure MPa	Load factor (%)
0.2 to 0.3	α ≤ 40
0.3 to 0.6	α ≤ 50
0.6 to 0.7	α ≤ 60

[Example] Cylinder size to be used: Equivalent to ø12

Required thrust 1.78 (N)

In case of Operating Pressure 0.5 (MPa)

$$\alpha=\frac{1.78}{138x0.5x\frac{82}{100}}\times 100$$

= 3.1%

Since α≤50%, it is OK.

8 Step 8: Confirmation of Cushioning Capacity

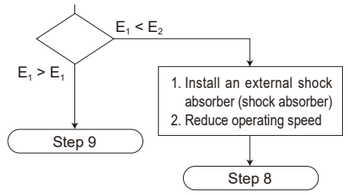
Check if the kinetic energy due to the movement of the actual load can be absorbed by the cushion capacity of the cylinder itself.

[Cylinder's Allowable Absorbed Energy] E_1]

●The value of kinetic energy absorption capacity by the cylinder cushion mechanism varies depending on the cylinder inner diameter. SRG3 is the value in Table 5.

Table 5 SRG3 Allowable absorption energy (E_1)

Bore Size (mm)	Allowable Absorption Energy (J)
ø12 or equivalent	0.03
ø16 equivalent	0.22
ø20 equivalent	0.59
ø25 equivalent	1.40



[Piston Kinetic Energy: E_2]

● Formula for calculating the piston kinetic energy

$$E_2=\frac{1}{2}xMxVa^2\ (J)$$

M: Applied load weight (kg)

Va: Piston impact speed into cushion (m/s)

$$Va=\frac{L}{t}x\left(1+1.5x\frac{\alpha}{100}\right)$$

L : Stroke (m)

t : Operating Time (s)

α : Load factor (%)

9 Step 9: Confirmation of Inertial Load

● Check whether the inertia force of the load caused by the piston operation is within the allowable range of the cylinder.

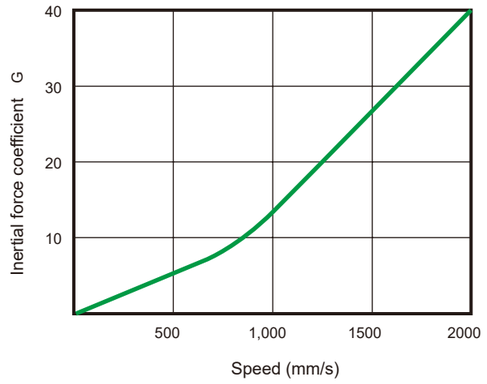
(1) Determine the G coefficient from the impact speed into the cushion part (Va) and the trend of the SRG3 inertial force coefficient in Fig. 2. The entry speed into the cushion part (Va) is the value calculated in Step 8.

Va: Piston impact speed into cushion (m/s)

$$Va = \frac{L}{t} \times \left(1 + 1.5 \times \frac{\alpha}{100}\right)$$

L : Stroke (mm)
t : Operating Time (s)
α : Load Factor (%)

Figure 2 Trend of SRG3 inertial force coefficient



(2) Determine the bending moment (M1i) and torsional moment (M3i) due to inertial force.

Unit: N·m

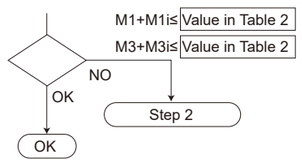
Mounting Direction		Horizontal Upward	Horizontal Downward	Vertical	Horizontal Lateral
Dynamic Moment	M1i	W x (ℓ_3 +a) xG			
	M2i	Dynamic moment M2i does not occur			
	M3i	W x ℓ_2 xG			

The moment due to inertial force is calculated as above regardless of the mounting direction.

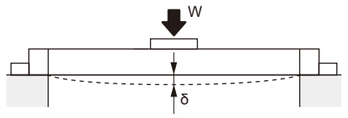
Add moments of static load (M1 and M3) and moments of inertia force (M1i and M3i) and check that the resulting values are within the values in Table 2.

M1+M1i≤M1 max
M3+M3i≤M3 max

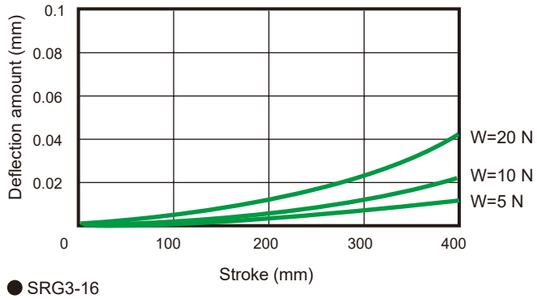
M1 max and M3 max are the values in Table 2



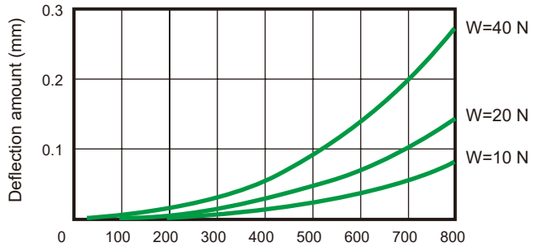
1 Deflection amount of cylinder tube δ



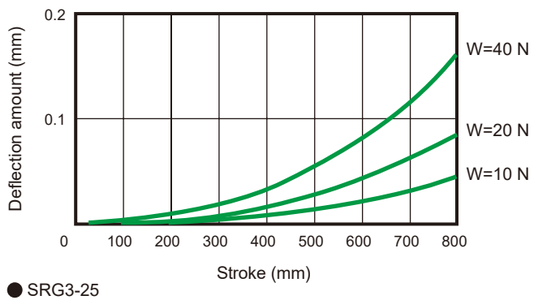
● SRG3-12



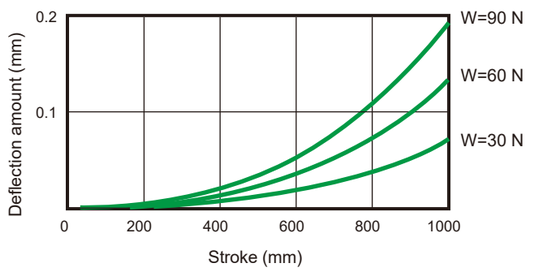
● SRG3-16



● SRG3-20



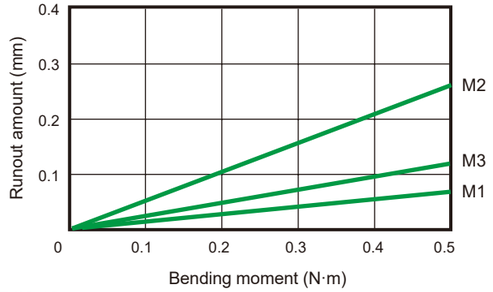
● SRG3-25



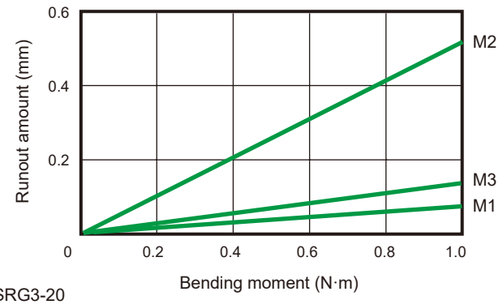
2 Table runout

(Runout at a position 70 mm from the cylinder center)

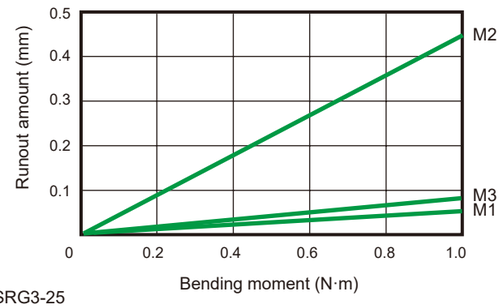
● SRG3-12



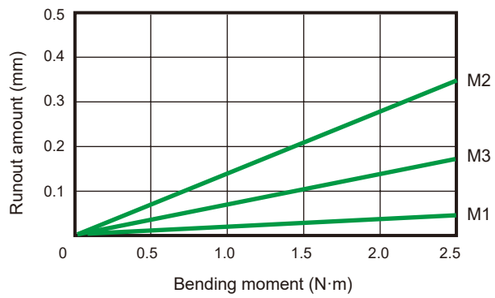
● SRG3-16



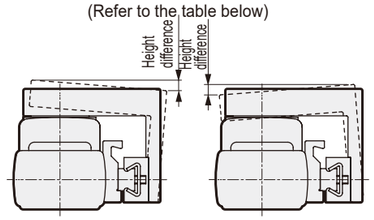
● SRG3-20



● SRG3-25



Note: This product has a height difference tilt in the table in a no-load state, separately from the table displacement mentioned above. (Refer to the table below)



Height difference (Reference value)

Tube I.D.	Height difference (MAX)
ø12 or equivalent	0.9 mm
ø16 equivalent	1.0 mm
ø20 equivalent	1.1 mm
ø25 equivalent	1.5 mm

3 Confirmation method for full stroke adjustment unit

(1) Confirmation of allowable collision energy of shock absorber

Calculate the equivalent collision weight Me and collision energy E using the formulas in the table below, and confirm that Me and E are less than or equal to the allowable values in Figure 3. Also, confirm that specifications such as repetition frequency and collision speed are less than or equal to the allowable values according to Table 6. Note that the allowable values for equivalent weight of impact object Me and impact energy E vary depending on the magnitude of the impact speed.

● Code
E : Colliding energy (J)
Me : Colliding object equivalent weight (kg)
m : Workpiece weight (kg)
F : Cylinder thrust (N)
V : Collision speed (m/s)
St : Stroke of shock absorber (m)
g : Gravity acceleration 9.8 (m/s^2)

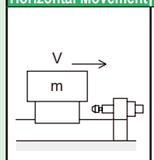
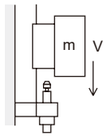
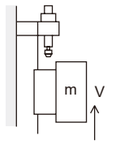
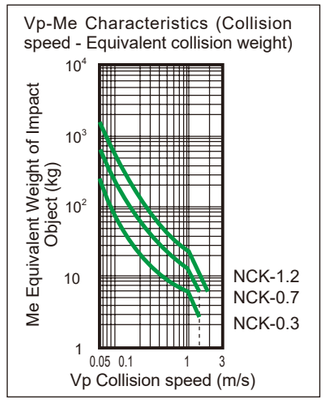
	Horizontal Movement	Vertical Descent	Vertical Ascent
Usage Example			
Equivalent Weight of Impact Object Me (kg)	$Me=m+\frac{2F\cdot St}{V^2}$	$Me=m+\frac{2\cdot St\,(F+mg)}{V^2}$	$Me=m+\frac{2\cdot St\,(F-mg)}{V^2}$
Energy E (J)	$E=\frac{mV^2}{2}+F\cdot St$	$E=\frac{mV^2}{2}+(F+mg)\cdot St$	$E=\frac{mV^2}{2}+(F-mg)\cdot St$

Figure 3 Allowable value of equivalent collision weight



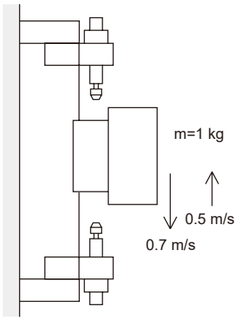
(2) Shock absorber

Table 6 Specifications

Model		For SRG3-12 / 16	For SRG3-20	For SRG3-25
Shock Absorber Model No. / Item		NCK-00-0.3-C	NCK-00-0.7-C	NCK-00-1.2
Model / Classification		Without adjuster Spring return type		
Maximum Absorption Energy	J	3	7	12
Stroke	mm	6	8	10
Per hour Max Absorption Energy	kJ/hour	6.3	12.6	21.6
Max Impact Speed	m/s	1.5		2.0
Max Repetition Frequency	times/min	35	30	
Ambient Temperature	°C	-10 to 80		
Required mounting strength	N	3540	6150	8400
Return Time	S	0.3 or less		
Product weight	kg	0.012	0.02	0.04
Return Spring force	At Extension N	2.9	2.0	2.9
	At Compression N	4.5	4.3	5.9

(3) Calculation example (In case of SRG3-20)

● Example of calculation (1)
Rising and lowering
Operating Conditions
● Applied load M 1 (kg)
● Collision speed
Ascending 0.5 (m/s)
Descending 0.7 (m/s)
● Operating Pressure 0.5 (MPa)
(157 N)



①Kinetic energy during ascent (E_1)

$E_1=\frac{1\times0.5^2}{2}+(157-1x9.8)x0.008$

=1.30 (J)

Less than 1/2 of the maximum absorption energy in Table 6, and kinetic energy (E_1) can be absorbed

$Me=1+\frac{2x0.008\ (157-1x9.8)}{0.5^2}$

=10.42 (kg)

The Me of the shock absorber used for SRG3-20 is 18 (kg) when V=0.5 (m/s) from Figure 3, and can be absorbed

②Kinetic energy during descent (E_1)

$E_1=\frac{1\times0.7^2}{2}+(157+1\times9.8)\times0.008$

=1.58 (J)

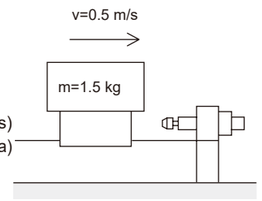
Less than 1/2 of the maximum absorption energy in Table 6, and kinetic energy (E_1) can be absorbed

$Me=1+\frac{2x0.008\ (157+1x9.8)}{0.7^2}$

=6.45 (kg)

The Me of the shock absorber used for SRG3-20 is 16 kg when V=0.7 m/s from Figure 3, and can be absorbed

● Example of calculation (2)
Horizontal
Operating Conditions
Payload M 1.5 (kg)
Collision speed
Horizontal direction 0.5 (m/s)
Operating Pressure 0.3 (MPa)
(94 N)



Kinetic energy in horizontal direction (E_1)

$E_1=\frac{1.5\times0.5^2}{2}+94\times0.008$

=0.94 (J)

Less than 1/2 of the maximum absorption energy in Table 6, and kinetic energy (E_1) can be absorbed

$Me=1.5+\frac{2x94x0.008}{0.5^2}$

=7.52 (kg)

From Figure 3, the Me value of the shock absorber for SRG3-20 when V=0.5 (m/s) is 18 kg, and since 7.52<18, it can be absorbed

Note: Refer to 9 Step 9 (Confirmation of inertia load) and keep the inertia load within the allowable value.

Pneumatic Component

To Use This Product Safely

Be sure to read this before use.
For general cylinder information, see Intro 41, and for cylinder switches, see P. 1512.

Individual Precautions: Rodless Cylinder with High Precision Guide SRG3 Series

During Use

1. Common

CAUTION

■Pay attention when designing the brake control circuit.
Slit type rodless cylinders represented by SRL3 have slight external air leakage structurally, so intermediate stop control by an all-port block 3-position valve will cause a failure to maintain the table stop position. Therefore, please use a both-side pressurization control circuit using a PAB connection 3-position valve. However, please note that if air is pressurized in a de-energized state when restarting after a pressure drop, the table may move and deviate from the origin.

■Basic Circuit Diagram
● Horizontal load
Piping as shown in Figure 1 will apply equal pressure to both sides of the piston when stopped, preventing the table from flying out during restart.

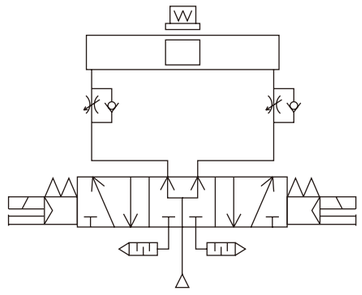


Fig. 1

● In case of vertical load
● If a vertical load is applied as shown in Fig. 2, the table will move in the Load Direction. Therefore, install a pressure reducing valve with check valve on the upper side, reduce the thrust in the Load Direction, and balance the load.

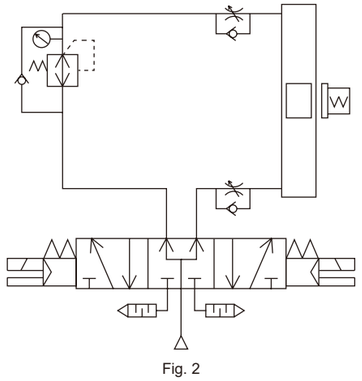


Fig. 2

■Although the structure of SRL3 and other slit rodless cylinders has a slight amount of external air leakage, it does not affect the speed control performance.

■Prevent negative pressure from occurring inside the cylinder tube. If used as an air balancer or in an all-port blocked state, if the table is driven by external force, inertia force, etc., negative pressure may be generated in the cylinder, causing the seal belt to detach and air leakage to occur. Be careful not to create negative pressure in the cylinder by driving it with external force, inertial force, etc.

Warning

■Shock Absorber Adjustment
Since the gap between the shock absorber and the stopper bolt is narrow, it is recommended to remove the stroke adjustment plate for adjustment.

■Precautions for use of stroke adjustment unit
Be sure to adjust so that the table stops at the stopper bolt. Settings where cylinder thrust continues to be applied to the shock absorber even at the cylinder stroke end may cause the shock absorber to break.

Table 1 Full stroke adjustment shock absorber specifications (Initial setting value)

Model	Absorption Energy (J)	Effective Stroke (mm)
For SRG3-12/16	2.4	5.5
For SRG3-20	5.7	7
For SRG3-25	10	8

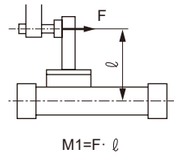
■Do not perform electric welding after installing the rodless cylinder.
Current flows through the cylinder and a spark occurs between the dustproof belt and the cylinder tube, damaging the dustproof belt.

■The Cylinder Body may be damaged or may malfunction if a unit with excessive inertia, etc., is actuated. Use within the allowable range.

■Do not apply strong impact or excessive moment to the table.

■Carefully match the centers when connecting a load with an external guide mechanism.
● Displacement of the shaft center increases as the stroke becomes longer. Carefully decide the connection method (floating) so that the displacement can be absorbed.

■Keep the moment, including inertia force caused by load transfer or stop, within the allowable load. Exceeding this value will cause damage.
(When overhang is large)
● When the overhang load is large and the cylinder is stopped at both ends by the piston, load inertia causes bending moment even if the energy is within the allowable absorbed energy of the internal cushion. If the kinetic energy is large and an external cushion is used, try to hit the center of gravity of the workpiece as much as possible.
(When using external stopper)
● When using an external stopper, make a selection considering bending moment due to the cylinder thrust.



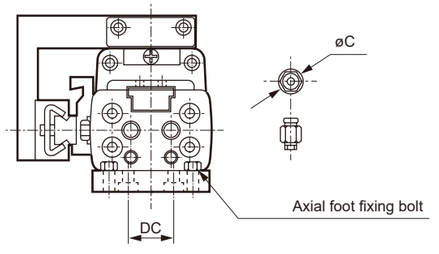
M1=F· ℓ

F: Cylinder Thrust
ℓ: Length from the center of the cylinder to the stopper

■Using common port piping
● Piping used for the common ports (option codes R and T) are limited. Select an appropriate one from Table 2.

Table 2

Mounting Type / Bore Size (mm)	Usable fitting outer diameter øC		
	00	LB	LB1
ø12 or equivalent	11 or less	Centralized port piping not usable	11 or less
ø16 equivalent	12 or less		12 or less
ø20 equivalent	16 or less		16 or less
ø25 equivalent	26 or less		26 or less

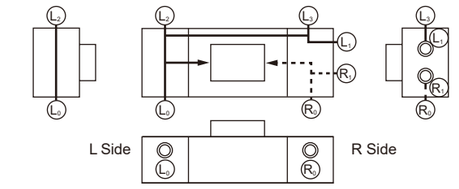


● In the case of the axial foot (LB1) mounting style with option code R or T, the piping tube and the axial foot fixing bolt will interfere with each other. Fix the Cylinder Body (by tightening the axial foot fixing bolt) before attaching the piping tube. (If the piping fitting is assembled first, it will interfere, making it impossible to tighten the axial foot fixing bolt.)

■Piping port position and operating direction

Equivalent to Bore Size ø12 to ø20

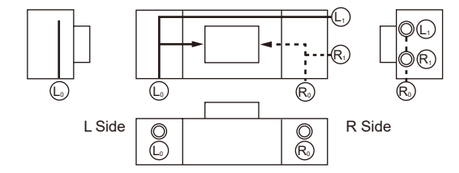
● Option code (blank, R, B, T)



Ⓡindicates the pressurized ports on R side and Ⓛindicates the pressurized ports on L side. When the product is shipped from the factory, ports other than one each of Ro Lo are sealed with plugs. Piping to other ports is possible by removing the plug. Optional code (D) cannot be manufactured.

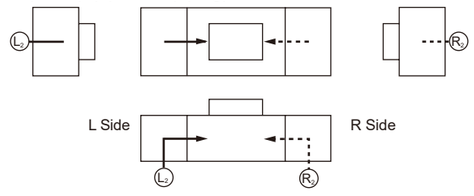
Bore Size ø25

● Option code (blank, R, B, T)



Ⓡindicates the pressurized ports on R side and Ⓛindicates the pressurized ports on L side. When the product is shipped from the factory, ports other than one each of Ro Lo are sealed with plugs. Piping to other ports is possible by removing the plug. However, bottom piping is not possible. If bottom piping is required, select option (D).

● Option (D) (bottom piping)



Ⓡ indicates the pressurized ports on R side, Ⓛ indicates the pressurized port on L side. Except R2 L2, there are no ports for piping.

■Do not damage surface flatness by denting or scratching the body (tube) mounting surface or the end plate surface.

⚠CAUTION

■Pay attention when designing the brake control circuit.

Slit type rodless cylinders represented by SRL3 have slight external air leakage structurally, so intermediate stop control by an all-port block 3-position valve will cause a failure to maintain the table stop position. Therefore, please use a both-side pressurization control circuit using a PAB connection 3-position valve. However, please note that if air is pressurized in a de-energized state when restarting after a pressure drop, the table may move and deviate from the origin.

■Basic Circuit Diagram

● Horizontal load

If piped as shown in Fig. 1, equal pressure is applied to both sides of the piston when stopped, preventing the table from jumping out during restart.

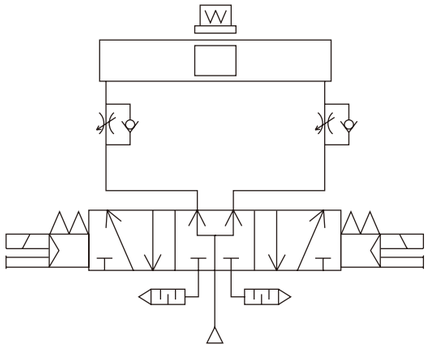


Fig. 1

● In case of vertical load

If a vertical load is applied as shown in Fig. 2, the table will move in the Load Direction. Therefore, install a pressure reducing valve with check valve on the upper side, reduce the thrust in the Load Direction, and balance the load.

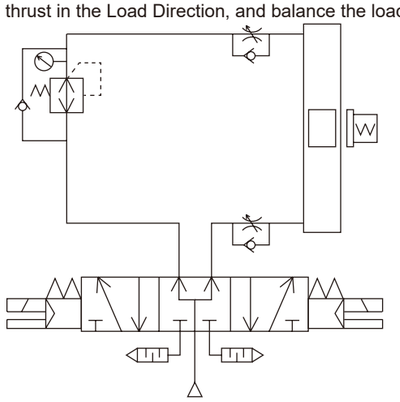


Fig. 2

■Do not use the cylinder in places where it is directly exposed to cutting oil, coolant, oil mist, etc.

If unavoidable due to cylinder installation, be sure to protect the cylinder with a cover, etc.

■Do not use this product where foreign matter such as cutting chips, dust, or spatter, etc., will contact or enter the cylinders.

If unavoidable due to cylinder installation, provide a cover, etc., for protection. Also, if used in such an environment, please be sure to consult us.

■Treat our shock absorbers as consumable parts.

Replace them if a decrease in energy absorption capacity is observed or if operation is no longer smooth.

For precautions regarding mounting, installation, adjustment, use, and maintenance, please see "Precautions for Use" in this catalog and the CKD Components Product website (https://www.ckd.co.jp/kiki/en/) -> "Model No." -> Instruction Manual.

MEMO

Rodless type

SRM3

High precision guided Rodless cylinder

ø25, ø32, ø40, ø63 or equiv.

Overview

This is a high precision guided rodless cylinder with two high precision linear guides integrated into the Rodless Cylinder Bore Size equivalent to ø25 to ø63. It is ideal for high precision transport of components, etc.

Features

Strong against bending moments

Thin profile design

Safety
(Drop prevention unit available as an option)

A drop prevention unit capable of mechanical locking at any position throughout the entire stroke can be installed, improving the safety of mechanical equipment.

The full stroke adjustment unit is securely fixed

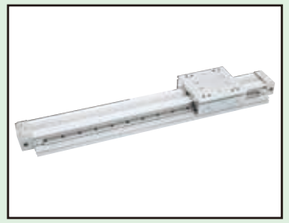
The unit with full stroke adjustment shock absorber is securely fixed with a dedicated plate nut, eliminating the need for a spacer between the covers and preventing misalignment at the stroke end.

CONTENTS

Product Introduction	2
Series System Chart	144
● Double Acting (SRM3)	146
● Double Acting/position locking (SRM3-Q)	146
Switch External Dimensions	157
Model Selection Guide	160
Technical Data	166
⚠Precautions for Use	170

●: Standard, ◎: Option, : Not available

Variations	Model Number / Circuit Diagram Code	Bore Size (mm)	Standard Stroke (mm) 200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	Min Stroke (mm)	Max Stroke (mm)	Intermediate Stroke (Every mm)	Cushion: No cushion N	With both sides cushion B	With R side cushion R	With L side cushion L	Options: With full stroke adjustment both sides shock absorber A	With full stroke adjustment R side shock absorber A1	With full stroke adjustment L side shock absorber A2	Full stroke adjustment bracket retrofit type A3	With full stroke adjustment both sides light load shock absorber E	With full stroke adjustment R side light load shock absorber E1	With full stroke adjustment L side light load shock absorber E2	Switch	Page
Double Acting	SRM3	Equivalent to ø25 / ø32	●	●	●	●	●	●	●	●	●											50	1000	1	●	●	●	●	◎	◎	◎	◎	◎	◎	◎	◎	146
		Equivalent to ø40/ø63	●	●	●	●	●	●	●	●	●	●	●	●	●							80	2000		●	●	●	●	◎	◎	◎	◎	◎	◎	◎		
Double Acting / Drop prevention	SRM3-Q	Equivalent to ø25 / ø32	●	●	●	●	●	●	●	●	●											50	1000	1	●	●	●	●	◎	◎	◎	◎	◎	◎	◎	◎	146
		Equivalent to ø40 / ø63	●	●	●	●	●	●	●	●	●	●	●	●	●							80	2000		●	●	●	●	◎	◎	◎	◎	◎	◎	◎		



Rodless Cylinder with High-Precision Guide

Double Acting Type SRM3 Series

Double Acting/Fall Prevention Type SRM3-Q Series

● Bore Size: ø25, ø32, ø40, ø63 Equivalent

Circuit Diagram Code

RoHS

Model No. Notation

Without Switch
(Built-in Magnet for Switch)

SRM3 - 25 - B - 500 ——— C0 - A

1 2 3 4 7 Built-in Magnet 8

With Switch
(Built-in Magnet for Switch)

SRM3 - 25 - B - 500 - T0H - R ——— A

1 Model Number
3 Cushion
5 Switch Model
8 Option
2 Bore Size
4 Stroke
6 Number of Switches

1 Model Number

Code	Description
SRM3	Standard Type
SRM3-Q	Fall Prevention Type

Note: Square nuts (2 types, 8 pcs each) are included to allow use of T-slots.

2 Bore Size (mm)

Code	Description
25	ø25 Equivalent
32	ø32 Equivalent
40	ø40 Equivalent
63	ø63 Equivalent

3 Cushion

Code	Description
B	Cushion on Both Sides
R	Cushion on R Side
L	Cushion on L Side
N	Without Cushion

4 Stroke (mm)

Bore Size	Stroke	Intermediate Stroke
ø25, ø32 Equivalent	50 to 1000	in 1mm increments
ø40, ø63 Equivalent	80 to 2000	

Note: Refer to P. 148 for the minimum stroke with switch.

5 Switch Model

For switch details, refer to P. 1457. Switches are shipped with the product.

Contact	Indicator Light Special Function	Wiring (Output)	Load Voltage (V) AC	Load Voltage (V) DC	Load Current (mA) AC	Load Current (mA) DC	Lead Wire *1 Straight	Lead Wire *1 L-shaped	
Non-contact	2-color	2-wire	-	24+/-10%	-	5 to 20	T2WH□	T2WV□	
		3-wire (NPN)	-	30 or less	-	50 or less	T3WH□	T3WV□	
	2-color/Improved Water Resistance	2-wire	-	24+/-10%	-	5 to 20	T2WLH□	T2WLV□	*2
	For 2-color AC Magnetic Field		-	24+/-10%	-		T2YD□	-	
			-		-		T2YDT□	-	
Contact	1-color	2-wire	110	12/24	7 to 20	5 to 50	T0H□	T0V□	
	Without Indicator Lamp		110	5/12/24	20 or less	50 or less	T5H□	T5V□	
	1-color		110/220	12/24	7 to 20/ 7 to 10	5 to 50	T8H□	T8V□	

*4

*1: Enter the code selected in the "*Lead wire length, connector specifications" table into "□" of the Switch Model.
*2: It does not guarantee the water resistance of the cylinder.
*3: Switches other than the above models are also available. (Custom Product) For details, see P. 1457.

*Lead wire length, connector specifications

Code	Description
No Code	1m (Standard)
3	3m (Option)
5	5m (Option)
W	M8 connector, 1PIN (+) 4PIN (-) Lead wire 0.3 m

*4: Only T2WLH and T2WLV can be selected.

Example) Lead wire length
1 m T0H
3 m T0H3
5 m T0H5

6 Number of Switches

Code	Description
R	1 pc on R Side
L	1 pc on L Side
D	2 pcs
T	3 pcs
4	4 pcs (Indicate number of switches for 4 pcs or more)

7 Built-in Magnet

Code	Description
C0	Built-in Magnet for Contact Switch
C1	Built-in Magnet for Non-contact Switch

*1: Select only when switch model No. is not selected.
*2: The built-in magnet cannot be changed after shipment.

Rechargeable Battery Compatible Specification
(Catalog No. CC-1226AA)

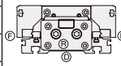
●Structure usable in rechargeable battery manufacturing process

SRM3 - . . . . - P4*

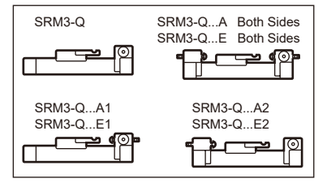
SRM3-Q - . . . . - P4*

*Contact us for details.

8 Option

	Code	Full Stroke Adjustment		Port Position	Cushion Needle Position	
	A		Both Sides, with Shock Absorber			
	A1		R Side Only, with Shock Absorber			
	A2		L Side Only, with Shock Absorber			
*1	A3		Bracket Retrofit Type			
	E		Both Sides, with Light Load Shock Absorber			
	E1		R Side Only, with Light Load Shock Absorber			
	E2		L Side Only, with Light Load Shock Absorber			
	No Code			F (Standard)	F (Standard)	
*3	R			R (Concentrated Port)	F	
	B			F	B	
*3	T			R (Concentrated Port)	B	
	D			D	F	
*4	S			D	D	

*1: To retrofit the full stroke adjustment bracket, it is necessary to remove the cover and assemble the plate nut. "A3" is an option with a mounting plate nut assembled for retrofitting the full stroke adjustment bracket.
*2: When model No. SRM3-Q is selected, the full stroke adjustment bracket on the R side becomes a standard part for drop prevention. When "A1" or "E1" is indicated, only the shock absorber is added to the R side. When "A" is indicated, the R side has fall prevention, full stroke adjustment, and shock absorber, and the L side has full stroke adjustment and shock absorber. (Figure below)



*3: For equivalent to ø63, option "R" or "T" cannot be selected.
*4: For equivalent to ø25, option "S" cannot be selected.

Switch Individual Model No. Notation

● Switch Body Only

SW - T0H

5 Switch Model

Shock Absorber Unit Model No. Notation

Model	Shock Absorber Unit Model	
	Standard Type (-A)	Light Load Type (-E)
SRM3-25	NCK-00-1.2	NCK-00-0.7-C
SRM3-32	NCK-00-2.6	NCK-00-1.2
SRM3-40	NCK-00-7	NCK-00-2.6
SRM3-63	NCK-00-12	NCK-00-7

Replacement Parts Model No. Notation

SRM3 - 40 K - 200

2 Bore Size
4 Stroke

Full Stroke Adjustment Bracket Kit Model No. Notation (Applicable to option symbol A3.)

SRM3 - 40 — A1 (Full Stroke Adjustment Bracket Kit with Shock Absorber)
— E1 (Full Stroke Adjustment Bracket Kit with Light Load Shock Absorber)

2 Bore Size

(Refer to the Full Stroke Adjustment Bracket Kit on P. 158 for the component configuration.)

Specifications

Item		SRM3 Standard Type/With Switch				SRM3-Q Fall Prevention Type/With Switch			
Bore Size	mm	ø25 Equivalent	ø32 Equivalent	ø40 Equivalent	ø63 Equivalent	ø25 Equivalent	ø32 Equivalent	ø40 Equivalent	ø63 Equivalent
Operating Method		Double Acting Type				Double Acting/Fall Prevention Type			
Operating Fluid		Compressed Air							
Max Operating Pressure	MPa	0.7							
Min Operating Pressure	MPa	0.15		0.1		0.15			0.1
Proof Pressure	MPa	1.05							
Ambient Temperature	°C	5 to 60							
Port Size	Cylinder Body Port	Rc1/8	Rc1/4		Rc3/8	Rc1/8	Rc1/4		Rc3/8
	Fall Prevention Port	-				Rc1/8			
Stroke Tolerance	mm	$^{+2.0}_{0}$ (up to 1000) $^{+2.5}_{0}$ (up to 2000)							
Operating Piston Speed	mm/s	50 to 1500 *1, *2							
Cushion		Air Cushion							
Lubrication		Not Required							
Repeatability	mm	±0.03							
Fall Prevention Mechanism		-				Installed on Cover R Side			
Holding Force	N	-				Max Thrust x 0.7			

*1: Piston speed with concentrated port piping varies depending on the stroke, so please consult us separately.
*2: ①When operating at a speed of 500 to 1500 mm/s, please decelerate so that the entry speed into the fall prevention mechanism is 500 mm/s or less.
②As a deceleration method, please use a method such as installing an external shock absorber or a deceleration circuit.
③Apply grease periodically to the sliding part of the lock lever.

Allowable Absorbed Energy

Bore Size (mm)	With Cushion		Without Cushion	With Shock Absorber (Initial Setting Value)	
	Allowable Absorbed Energy (J)	Cushion Stroke (mm)	Allowable Absorbed Energy (J)	Absorbed Energy (J)	Effective Stroke (mm)
ø25 Equivalent	1.40	20.9	0.015	10	9
ø32 Equivalent	2.57	23.5	0.030	18	13
ø40 Equivalent	4.27	23.9	0.050	50	16.5
ø63 Equivalent	17.4	29.6	0.138	86	21

Stroke

Bore Size (mm)	Standard Stroke (mm)	Max Stroke (mm)	Min Stroke (mm)
ø25, ø32 Equivalent	200, 300, 400, 500, 600, 700, 800, 900, 1000	1000	50
ø40, ø63 Equivalent	200, 300, 400, 500, 600, 700, 800, 900, 1000, 1100, 1200, 1300, 1400, 1500, 1600, 1700, 1800, 1900, 2000	2000	80

Note: Intermediate strokes can be manufactured in 1mm increments.

Number of Switches Mounted and Min Stroke (mm)

Number of Switches	1				2			
Switch Model / Bore Size (mm)	T□V	T□H	T2WLV	T2WLH	T□V	T□H	T2WLV	T2WLH
ø25 Equivalent	50	50	50	50	50	50	50	56
ø32 Equivalent	50	50	50	50	50	50	50	56
ø40 Equivalent	80	80	80	80	80	80	80	86
ø63 Equivalent	80	80	80	80	80	80	80	86

Cylinder Weight

Unit: kg

Bore Size (mm)	Weight at 0mm stroke			Additional Weight per 100mm Stroke
	Basic Type (SRM3)	Fall Prevention Type (SRM3-Q)	Switch Weight	
ø25 Equivalent	2.4	2.9	Refer to the Weight listed in the Switch Specifications on P. 1457.	0.59
ø32 Equivalent	3.3	4.2		0.72
ø40 Equivalent	4.8	6.0		1.20
ø63 Equivalent	15.1	17.8		1.99

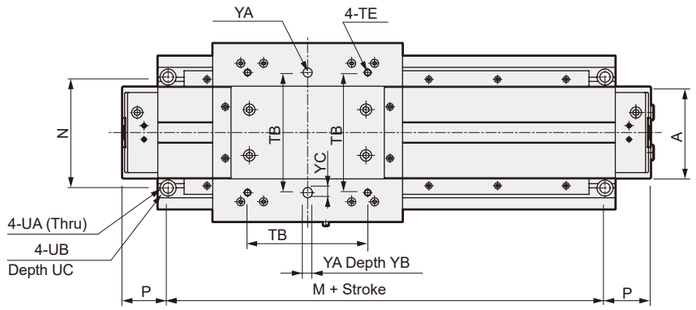
Theoretical Thrust Table

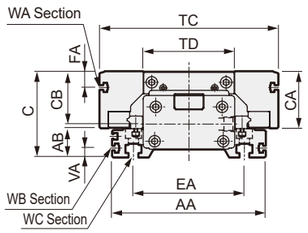
(Unit: N)

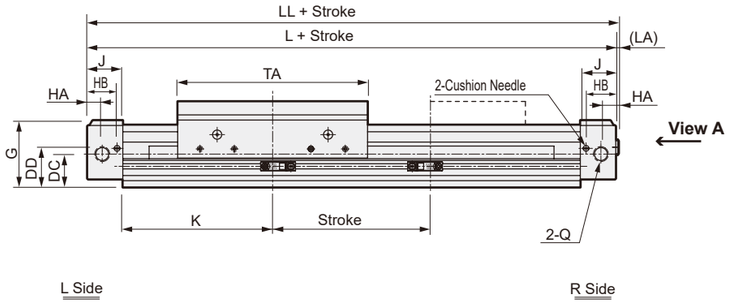
Bore Size (mm)	Operating Direction	Operating Pressure MPa							
		0.1	0.15	0.2	0.3	0.4	0.5	0.6	0.7
ø25 Equivalent	Push/Pull	-	81.4	$1.08x10^2$	$1.63x10^2$	$2.17x10^2$	$2.71x10^2$	$3.25x10^2$	$3.80x10^2$
ø32 Equivalent	Push/Pull	-	$1.21x10^2$	$1.63x10^2$	$2.44x10^2$	$3.26x10^2$	$4.07x10^2$	$4.88x10^2$	$5.70x10^2$
ø40 Equivalent	Push/Pull	-	$1.90x10^2$	$2.53x10^2$	$3.80x10^2$	$5.06x10^2$	$6.33x10^2$	$7.60x10^2$	$8.86x10^2$
ø63 Equivalent	Push/Pull	$3.14x10^2$	$4.70x10^2$	$6.27x10^2$	$9.41x10^2$	$1.25x10^3$	$1.57x10^3$	$1.88x10^3$	$2.20x10^3$

Dimensional Drawings

● Standard Type (SRM3)

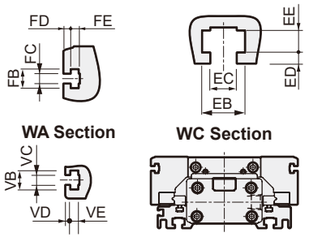






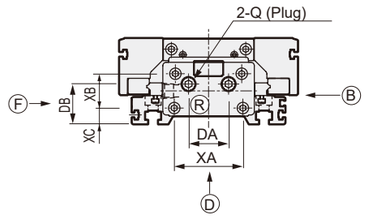
L Side

R Side



Note: SRM3-25 and 32 do not have WB section.

View A



Code / Bore Size (mm)	A	AA	AB	C	CA	CB	DA	DB	DC	DD	EA	EB	EC	ED	EE
ø25 Equivalent	53	102	18	57	39	37	26	22	20	21.9	71	9.5	5.5	2.5	4.5
ø32 Equivalent	66	116	20	62	41.5	39.5	27	25	22.5	25.5	80	11	6.6	2.5	6
ø40 Equivalent	80	134	25	75	49.5	46	35	35	29	34	97	14.5	9	3.5	7.5
ø63 Equivalent	118	188	31.5	100	68	62.5	39	44.5	37.5	45.5	140	18	11	4	9

Code / Bore Size (mm)	FA	FB	FC	FD	FE	G	HA	HB	HE	J	K	L	LA	LL
ø25 Equivalent	10	8.5	4.5	3	3.7	43.5	7.5	20	-	24	98	244	2	246
ø32 Equivalent	10	8.5	4.5	3	3.7	47.5	10	23.5	17	28	106	268	2.5	270.5
ø40 Equivalent	14	8.5	4.5	3	3.7	58.5	13	26	22.3	31	131	324	2.5	326.5
ø63 Equivalent	20	9.5	5.5	3	4.5	76.5	15	32	31	39	187	452	2.5	454.5

*1: Please note that after shipment, the cylinder switch cannot be changed from contact switch to non-contact switch, or from non-contact switch to contact switch.

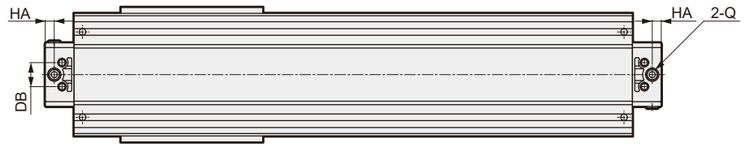
*2: For ø25 equivalent, option: S is not available.

***3: For dimensions with each switch, refer to P. 157.**

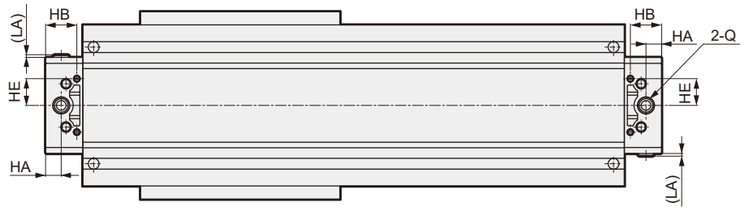
Dimensional Drawings

● Bottom Piping (SRM3-□□-□□□-D/S)

•ø25 Equivalent



•ø32 Equivalent to ø63 Equivalent



Code / Bore Size (mm)	LL	M	N	P	Q	TA	TB	TC	TD	TE	UA	UB
ø25 Equivalent	246	182	71	31	Rc1/8	118	75	112	61	M5 Depth 12	5.5	9.5 Counterbore Depth 6.5
ø32 Equivalent	270.5	196	80	36	Rc1/4	132	85	128	65	M6 Depth 13	6.6	11 Counterbore Depth 6.5
ø40 Equivalent	326.5	244	97	40	Rc1/4	166	105	156	81	M6 Depth 15	9	14 Counterbore Depth 8.5
ø63 Equivalent	454.5	350	140	51	Rc3/8	250	160	224	118	M8 Depth 20	11	17.5 Counterbore Depth 10.5

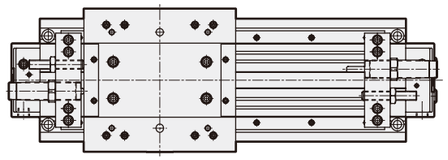
Code / Bore Size (mm)	VA	VB	VC	VD	VE	XA	XB	XC	YA	YC
ø25 Equivalent	-	-	-	-	-	38	23	8.5	$6^{+0.07}_{+0.02}$ Depth 6	7
ø32 Equivalent	-	-	-	-	-	48	25	10	$6^{+0.07}_{+0.02}$ Depth 6	7
ø40 Equivalent	8	8.5	4.5	2	3.7	60	30	14	$8^{+0.07}_{+0.02}$ Depth 8	9
ø63 Equivalent	10	9.5	5.5	2.5	4.5	96	42	16.5	$10^{+0.07}_{+0.02}$ Depth 10	12

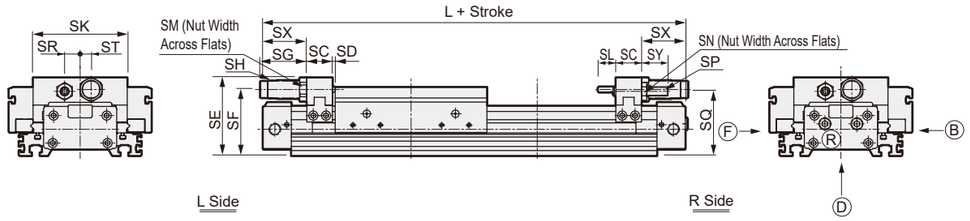
Note: For dimensions with each switch, refer to P. 157.

Dimensional Drawings

● Full Stroke Adjustment, with Standard Shock Absorber (SRM3-□□-□□□-A)]

Note: For SRM3-25-A, the shock absorber is inside the cover.





● Full Stroke Adjustment, with Light Load Shock Absorber (SRM3-□□-□□□-E)

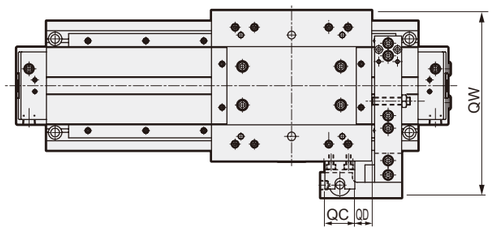
Code / Bore Size (mm)	SC	SD	SE	SF	SG			SH		SK	SL	SM	SN	SP	SQ	SR	ST
					At MAX	At MIN	Adjustment Range	Outer Diameter Thread	Max Absorbed Energy (J)								
ø25 Equivalent	24	2	66	54.5	22.5	12.5	10	M12x1.0	12	78	11	17	10	M6	53	12	10
ø32 Equivalent	24	2	70.5	59.5	47	37	10	M14x1.5	26	86	15	19	13	M8	57.5	14	12
ø40 Equivalent	28	3	85.5	72.5	51	41	10	M20x1.5	70	103	19.5	24	17	M10	70.5	17	12
ø63 Equivalent	36	4	114.5	96	68	58	10	M25x1.5	120	150	25	32	24	M16	91.5	25	20

Code / Bore Size (mm)	SX	SY	NE	NF	NG			NH		NN	NP	NQ	NR	NT	NY	L
					At MAX	At MIN	Adjustment Range	Outer Diameter Thread	Max Absorbed Energy (J)							
ø25 Equivalent	37	14	56.5	50	24	14	10	M10x1.0	7	10	M6	50	11	8	14	244
ø32 Equivalent	42	24	61.5	54	22.5	12.5	10	M12x1.0	12	10	M6	54	12	11	14	268
ø40 Equivalent	48	29	74.5	66	42	32	10	M14x1.5	26	13	M8	66.5	16	13	19	324
ø63 Equivalent	61	40	99.5	87.5	42	32	10	M20x1.5	70	19	M12	88	16	20	30	452

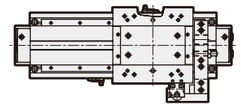
Note: For dimensions with each switch, refer to P. 157.

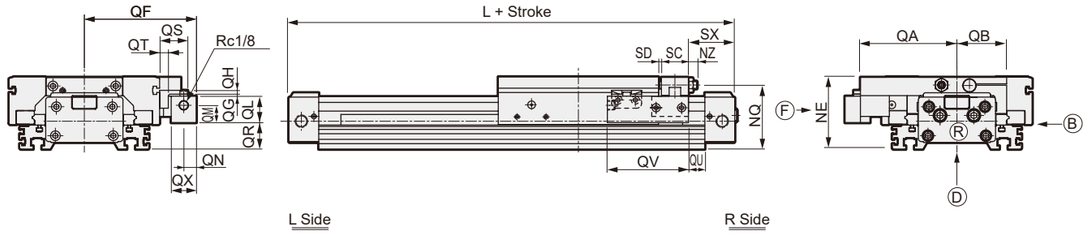
Dimensional Drawings

● Fall Prevention Type (SRM3-Q)



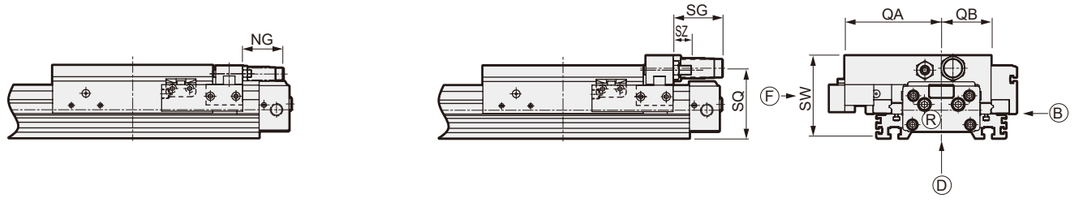
Note:
For SRM3-Q (Fall Prevention Type) -25, 32, 40, a T-type switch is assembled at the position shown in the figure below.





● Fall Prevention/Full Stroke Adjustment, with Light Load Shock Absorber (SRM3-Q-□□-□□□-E1)

● Fall Prevention/Full Stroke Adjustment, with Standard Shock Absorber (SRM3-Q-□□-□□□-A1)

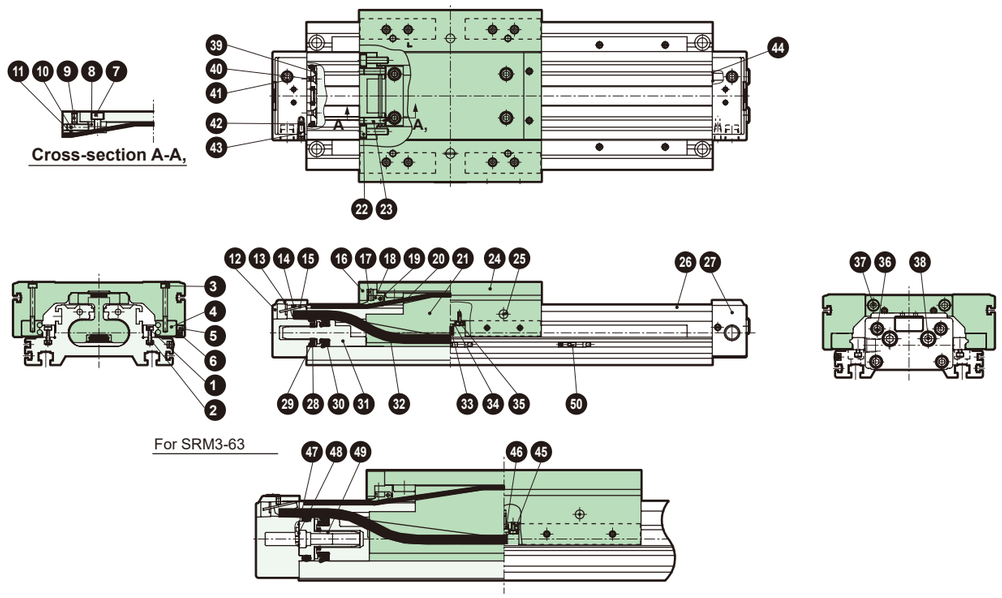


Code / Bore Size (mm)	QA	QB	QC	QD	QF	QG	QH	QL	QM	QN	QR	QS	QT	QV	QU
ø25 Equivalent	78	39	31	26.5	94	2	4	27.5	18	13	13	29	9	84	17
ø32 Equivalent	86	43	31	26.5	102	2	4	27.5	18	13	16.5	29	9	84	18
ø40 Equivalent	100	51.5	31	17.5	116	2	4	27.5	18	13	27.5	29	9	84	17
ø63 Equivalent	140	75	34	20.5	156	2	5	33	21.5	15	41	36	12	100	22

Code / Bore Size (mm)	QX	QW	NE	NG	NQ	NZ	SC	SD	SW	SG	SQ	SX	SZ	L
ø25 Equivalent	26	150	56.5	24	50	4	24	2	66	22.5	53	37	4	244
ø32 Equivalent	26	166	61.5	22.5	54	4	24	2	69.5	47	57.5	42	9	268
ø40 Equivalent	26	194	74.5	42	66.5	9	28	3	85.5	51	70.5	48	19	324
ø63 Equivalent	30	268	99.5	42	88	15	36	4	114.5	68	91.5	61	20	452

Note: For dimensions with each switch, refer to P. 157.

Internal Structure and Materials



No.	Part Name	Material	Remarks	No.	Part Name	Material	Remarks
1	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide	28	Cushion Packing	Urethane Rubber	
2	Nut Rail	Steel	Black Oxide	29	Cylinder Gasket	Nitrile Rubber	
3	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide	30	Piston Packing	Nitrile Rubber	
4	High Precision Guide	Steel		31	Piston	Polyacetal	
5	Hexagon Socket Set Screw	Alloy Steel	Zinc Chromate	32	Seal Belt	Urethane Rubber	
6	Hexagon Socket Set Screw	Alloy Steel	Zinc Chromate	33	Magnet		
7	Hexagon Socket Head Cap Screw	Alloy Steel	Zinc Chromate	34	Magnet Case	Polyamide	
8	Yoke Holder	Steel	Black Oxide	35	Hexagon Socket Head Cap Screw	Stainless Steel	
9	Hexagon Socket Set Screw	Alloy Steel	Zinc Chromate	36	Hexagon Socket Head Cap Screw	Alloy Steel	Zinc Chromate
10	Hexagon Socket Set Screw	Alloy Steel	Zinc Chromate	37	Hexagon Socket Head Cap Screw	Alloy Steel	Zinc Chromate
11	Dust Wiper	Polyacetal		38	Plug	Steel	Zinc Chromate
12	Belt Cover	Polyamide		39	Cushion Adapter	Polyacetal	ø25 to ø40 equivalent only
13	Cover (L)	Aluminum Alloy	Painted	40	Cross-Recessed Countersunk Head Screw	ø25, ø63 equivalent: Steel ø32, ø40 equivalent: Alloy Steel	Zinc Chromate
14	Hexagon Socket Set Screw	Alloy Steel	Zinc Chromate				
15	Belt Spacer	Steel	Zinc Chromate	41	Hexagon Socket Set Screw (ø25, ø32 equivalent)	Alloy Steel	Zinc Chromate
16	Table Cover	Steel	Zinc Chromate		Plug (ø40, ø63 equivalent)	Steel	Zinc Chromate
17	Spring	Steel	Black Oxide	42	Needle Gasket	Nitrile Rubber	
18	Belt Holder	Polyacetal		43	Cushion Needle	Steel	Zinc Chromate
19	Parallel Pin	Steel	Zinc Chromate	44	Concentrated Port O-Ring	Nitrile Rubber	
20	Dust Proof Belt	Stainless Steel, Nitrile Rubber		45	Spacer	Aluminum Alloy	
21	Yoke	Aluminum Alloy	Alumite	46	Hexagon Socket Head Cap Screw	Stainless Steel	
22	Hexagon Socket Head Cap Screw	Alloy Steel	Zinc Chromate	47	Cushion Ring Gasket	Nitrile Rubber	ø63 only
23	Hexagon Socket Set Screw	Alloy Steel	Zinc Chromate	48	O-Ring	Nitrile Rubber	
24	Table	Aluminum Alloy	Alumite	49	Cushion Ring	Polyacetal	
25	Grease Nipple	Copper	Nickel Plating	With Switch			
26	Cylinder Body	Aluminum Alloy	Alumite	50	Switch		
27	Cover (R)	Aluminum Alloy	Painted				

Replacement Parts List

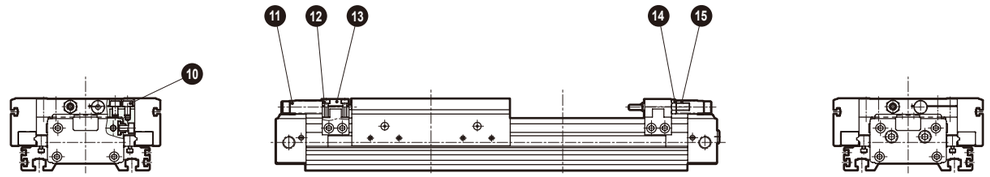
No./Part Name / Bore Size (mm)	Kit Number	Replacement Part Number
ø25 Equivalent	SRM3-25K-□	⑪ ⑳ ㉘ ㉙ ㉚ ㉜ ㊷ ㊹
ø32 Equivalent	SRM3-32K-□	
ø40 Equivalent	SRM3-40K-□	
ø63 Equivalent	SRM3-63K-□	⑪ ⑳ ㉘ ㉙ ㉚ ㉜ ㊷ ㊹ ㊼

Note: Specify the kit number when ordering. Specify the stroke for □.

Internal Structure and Materials: with Shock Absorber

● Full Stroke Adjustment, with Standard Shock Absorber (SRM3-□□-□□□-A)

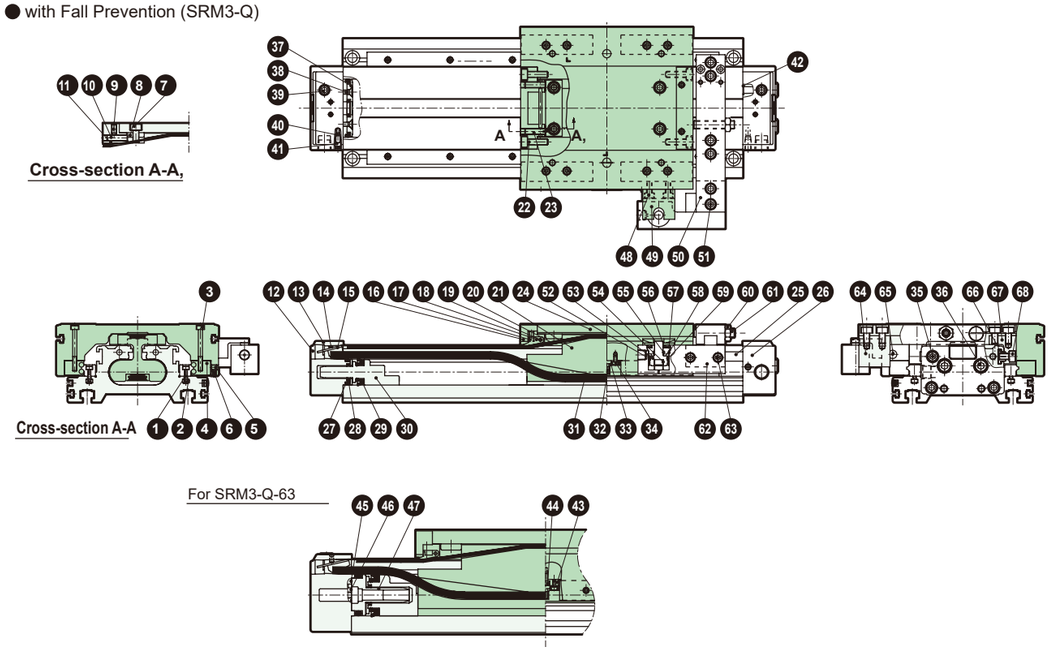
● Full Stroke Adjustment, with Light Load Shock Absorber (SRM3-□□-□□□-E)



No.	Part Name	Material	Remarks	No.	Part Name	Material	Remarks
1	Hexagon Socket Head Cap Screw	Alloy Steel	Zinc Plated	9	Hexagon Socket Set Screw	Alloy Steel	Zinc Plated
2	Adapter Nut	Steel	Black Oxide	10	Hexagon Socket Head Cap Screw	Alloy Steel	Zinc Plated
3	Hexagon Socket Head Cap Screw	Alloy Steel	Zinc Plated	11	Shock Absorber		
4	Shock Absorber			12	Hexagon Socket Head Cap Screw	Alloy Steel	Zinc Plated
5	Hexagon Nut	Steel	Zinc Plated	13	Plate (3)	Aluminum Alloy	Alumite
6	Adapter	Steel	Zinc Plated	14	Hexagon Nut	Steel	Zinc Plated
7	Plate (1)	Aluminum Alloy	Alumite	15	Hexagon Socket Set Screw	Alloy Steel	Zinc Plated
8	Hexagon Nut	Steel	Zinc Plated				

Internal Structure and Materials: with Fall Prevention

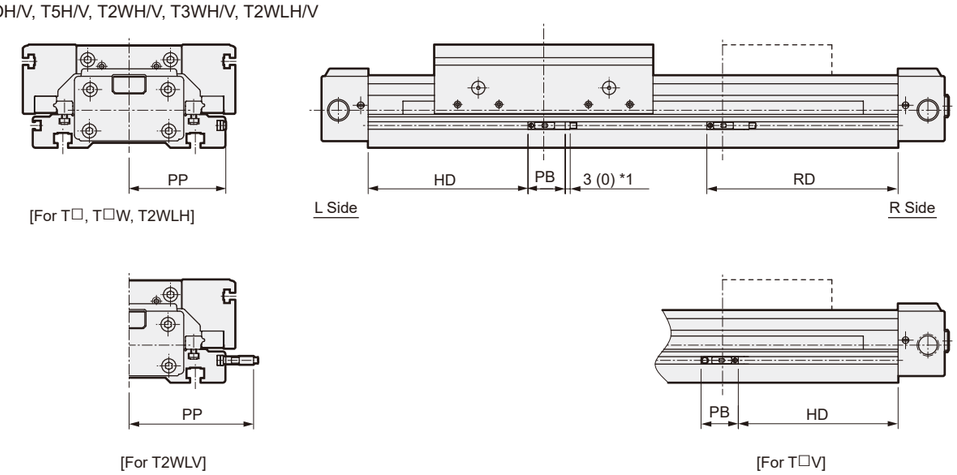
● with Fall Prevention (SRM3-Q)



No.	Part Name	Material	Remarks	No.	Part Name	Material	Remarks
1	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide	36	Plug	Steel	Zinc Chromate
2	Nut Rail	Steel	Black Oxide	37	Cushion Adapter	Polyacetal	ø25 to ø40 equivalent only
3	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide	38	Cross-Recessed Countersunk Head Screw	ø25, ø63 equivalent: Steel ø32, ø40 equivalent: Alloy Steel	Zinc Chromate
4	High Precision Guide	Steel		39	Hexagon Socket Set Screw (ø25, ø32 equivalent)	Alloy Steel	Zinc Chromate
5	Hexagon Socket Set Screw	Alloy Steel	Zinc Chromate		Plug (ø40, ø63 equivalent)	Steel	Zinc Chromate
6	Hexagon Socket Set Screw	Alloy Steel	Zinc Chromate	40	Needle Gasket	Nitrile Rubber	
7	Hexagon Socket Head Cap Screw	Alloy Steel	Zinc Chromate	41	Cushion Needle	Steel	Zinc Chromate
8	Yoke Holder	Steel	Black Oxide	42	Concentrated Port O-Ring	Nitrile Rubber	
9	Hexagon Socket Set Screw	Alloy Steel	Zinc Chromate	43	Spacer	Aluminum Alloy	
10	Hexagon Socket Set Screw	Alloy Steel	Zinc Chromate	44	Hexagon Socket Head Cap Screw	Stainless Steel	
11	Dust Wiper	Polyacetal		45	Cushion Ring Gasket	Nitrile Rubber	ø63 equivalent only
12	Belt Cover	Polyamide		46	O-Ring	Nitrile Rubber	
13	Cover (L)	Aluminum Alloy	Painted	47	Cushion Ring	Polyacetal	
14	Hexagon Socket Set Screw	Alloy Steel	Zinc Chromate	48	Hexagon Socket Head Cap Screw	Alloy Steel	Zinc Plated
15	Belt Spacer	Steel	Zinc Chromate	49	Lock Lever	Steel	Zinc Plated
16	Table Cover	Steel	Zinc Chromate	50	Plate (4)	Aluminum Alloy	Alumite
17	Spring	Steel	Black Oxide	51	Hexagon Socket Head Cap Screw	Alloy Steel	Zinc Plated
18	Belt Holder	Polyacetal		52	Piston Packing	Nitrile Rubber	
19	Parallel Pin	Steel	Zinc Chromate	53	Lock Pin	Alloy Steel	Zinc Chromate
20	Dust Proof Belt	Stainless Steel, Nitrile Rubber		54	Cylindrical Spring	Piano Wire	Electrodeposition Coating
21	Yoke	Aluminum Alloy	Alumite	55	Rod Packing	Nitrile Rubber	
22	Hexagon Socket Head Cap Screw	Alloy Steel	Zinc Chromate	56	Rod Cover	Aluminum Alloy	Hard Alumite
23	Hexagon Socket Set Screw	Alloy Steel	Zinc Chromate	57	C-Ring for Hole	Steel	Black Oxide
24	Table	Aluminum Alloy	Alumite	58	O-Ring	Nitrile Rubber	
25	Cylinder Body	Aluminum Alloy	Alumite	59	Wear Ring	Polyacetal	
26	Cover (R)	Aluminum Alloy	Painted	60	Hexagon Nut	Steel	Zinc Plated
27	Cushion Packing	Urethane Rubber		61	Hexagon Socket Set Screw	Alloy Steel	Zinc Plated
28	Cylinder Gasket	Nitrile Rubber		62	Fall Prevention Body	Aluminum Alloy	Alumite
29	Piston Packing	Nitrile Rubber		63	Hexagon Socket Head Cap Screw	Alloy Steel	Zinc Plated
30	Piston	Polyacetal		64	Mounting Block	Aluminum Alloy	Alumite
31	Seal Belt	Urethane Rubber		65	Grease Nipple	Copper	Nickel Plating (ø32 to 63 equivalent only)
32	Magnet			66	Adapter Nut	Steel	Black Oxide
33	Magnet Case	Polyamide		67	Adapter	Steel	Zinc Plated
34	Hexagon Socket Head Cap Screw	Stainless Steel		68	Hexagon Socket Head Cap Screw	Alloy Steel	Zinc Plated

SRM3 Series Switch External Dimensions Diagram

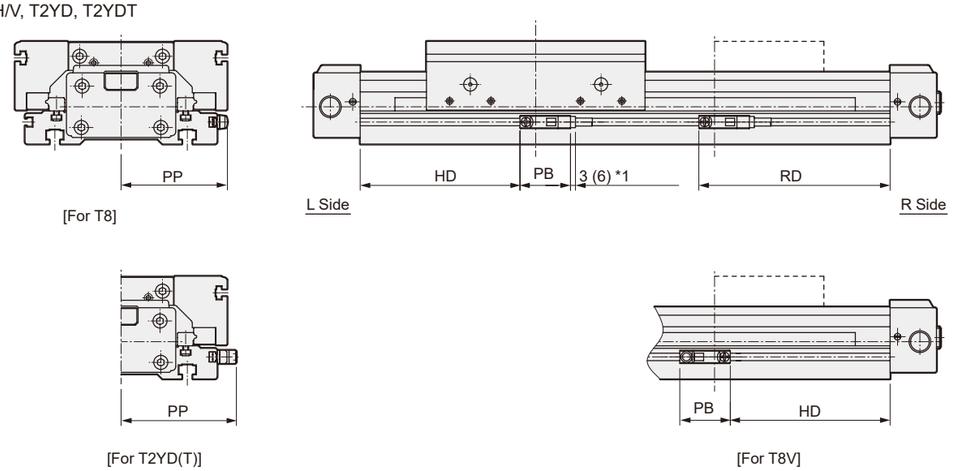
● TOH/V, T5H/V, T2WH/V, T3WH/V, T2WLH/V



Code	SRM3-Standard, Q													
	T0, T5				T2W, T3W				T2WL					
Bore Size (mm)	PB	PP	HD	RD *2	PB	PP	HD	RD *2	PB		PP		HD	RD *2
									Straight	L-shaped	Straight	L-shaped		
ø25 Equivalent	22.5	51.5	88.5	107.5	22.5	51.5	90.5	105.5	31	10	51.5	68.3	90.5	105.5
ø32 Equivalent	22.5	58.5	96.5	115.5	22.5	58.5	98.5	113.5	31	10	51.5	68.3	98.5	113.5
ø40 Equivalent	22.5	67.5	121.5	140.5	22.5	67.5	123.5	138.5	31	10	51.5	68.3	123.5	138.5
ø63 Equivalent	22.5	94.5	177.5	196.5	22.5	94.5	179.5	194.5	31	10	51.5	68.3	179.5	194.5

*1: Values in ( ) are dimensions at T2WLH.
*2: RD dimension does not apply to L-shaped lead wire type.
*3: For switch mounting availability, refer to the Model No. Notation for each variation.

● T8H/V, T2YD, T2YDT



Code	SRM3-Standard, Q							
	T8				T2YD, T2YDT			
Bore Size (mm)	PB	PP	HD	RD *2	PB	PP	HD	RD *2
ø25 Equivalent	30.5	57.3	81.5	102.5	29.5	62.7	87.5	108.5
ø32 Equivalent	30.5	64.3	89.5	110.5	29.5	69.7	95.5	116.5
ø40 Equivalent	30.5	73.3	114.5	135.5	29.5	78.7	120.5	141.5
ø63 Equivalent	30.5	100.3	170.5	191.5	29.5	105.7	176.5	197.5

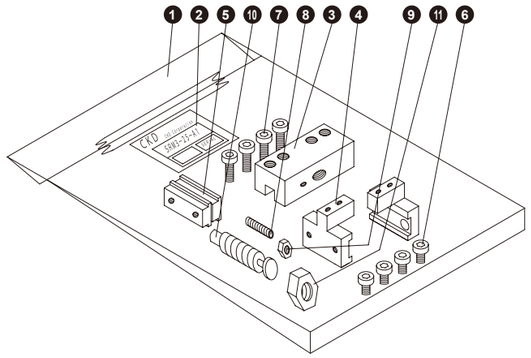
*1: Values in ( ) are dimensions for T2YD and T2YDT.
*2: RD dimension does not apply to L-shaped lead wire type.
*3: For switch mounting availability, refer to the Model No. Notation for each variation.

Full Stroke Adjustment Bracket Kit

● Full Stroke Adjustment Bracket Kit (with Shock Absorber)

SRM3 - 25 - A1

❷ Bore Size
(P. 146)

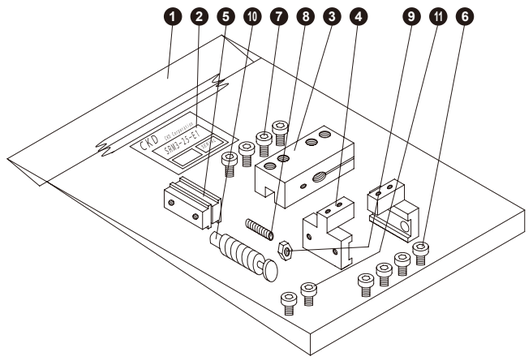


No.	Part Name	Quantity
1	Plastic Bag	1
2	Package Label	1
3	Plate (1)	1
4	Adapter	2
5	Adapter Nut	2
6	Hexagon Socket Head Cap Screw	4
7	Hexagon Socket Head Cap Screw	4
8	Hexagon Socket Set Screw	1
9	Hexagon Nut	1
10	Shock Absorber	1
11	Hexagon Nut	1

● Full Stroke Adjustment Bracket Kit (with Light Load Shock Absorber)

SRM3 - 25 - E1

❷ Bore Size
(P. 146)



No.	Part Name	Quantity
1	Plastic Bag	1
2	Package Label	1
3	Plate (3)	1
4	Adapter	2
5	Adapter Nut	2
6	Hexagon Socket Head Cap Screw	4
7	Hexagon Socket Head Cap Screw	4
8	Hexagon Socket Set Screw	1
9	Hexagon Nut	1
10	Shock Absorber	1
11	Hexagon Nut	1

List of Various Kit Weight

Replacement Parts Kit

Kit Number	Weight (g)
SRM3-25K-□	29+10 x Stroke/100
SRM3-32K-□	33+10 x Stroke/100
SRM3-40K-□	66+18 x Stroke/100
SRM3-63K-□	115+18 x Stroke/100

Full Stroke Adjustment Bracket Kit (with Light Load Shock Absorber)

Kit Number	Weight (g)
SRM3-25-E1	174
SRM3-32-E1	207
SRM3-40-E1	349
SRM3-63-E1	930

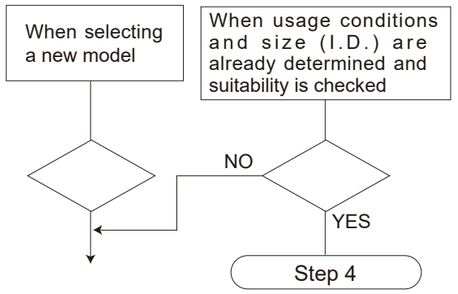
Full Stroke Adjustment Bracket Kit (with Shock Absorber)

Kit Number	Weight (g)
SRM3-25-A1	247
SRM3-32-A1	298
SRM3-40-A1	581
SRM3-63-A1	1316

SRM3 Series Model Selection Guide

The selection conditions differ from general air cylinders, so please check the suitability using the selection guide.

1 Step 1



2 Step 2: Confirmation of operating conditions

1. Operating Pressure (P) (MPa)
2. Load weight (M) (kg)
3. Applied load (F_L) (N)
4. Mounting direction
5. stroke (L) (mm)
6. Travel time: t (s)
7. Operation speed (V) (m/s)

Calculation Formula for Cylinder Average Operating Speed V

$$V = \frac{L}{t} \times \frac{1}{1000} (m/s)$$

[Load Weight]

Value of (Conveyed Object Weight + Jig Weight).

[Mounting Direction]

Operating direction: Horizontal, Vertical

Mounting direction Table facing up, Table facing down

3 Step 3 Selection of Approximate Cylinder Size

● Calculation Formula for Cylinder Size (I.D.)

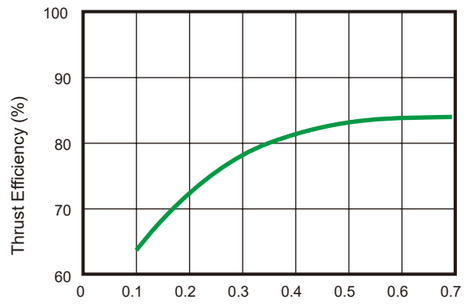
$$F = \frac{\pi}{4} \times D^2 \times P \times \frac{a}{100} (N)$$

$$\therefore D = \sqrt{\frac{4F}{\pi \cdot P \cdot a}} (mm)$$

D : Cylinder I.D. (mm)
P : Operating Pressure (MPa)
a : Thrust Efficiency (%) (Refer to Fig. 1)
F : Cylinder Theoretical Thrust (N)

D= ø

Figure 1 Trend of SRM3 thrust efficiency



● When obtaining from the theoretical thrust values in Table 1, approximate required thrust ≥ Load Weight x 2
(The x 2 in Load Weight x 2 is assuming a load factor of about 50% as a safety factor)

[Example] Operating Pressure 0.5 MPa
Load 20N

*Required thrust is 20 x 2 = 40 N

Selecting a Bore Size with a theoretical thrust of 40 N or more at an Operating Pressure of 0.5 MPa from Table 1 gives ø25.

D= ø25

[Cylinder Theoretical Thrust]

Table 1 Cylinder theoretical thrust values Unit: N

Bore Size (mm)	Pressure Area (mm^2)	Operating Pressure MPa							
		0.1	0.15	0.2	0.3	0.4	0.5	0.6	0.7
ø25 Equivalent	542	-	81.4	108	163	217	271	325	380
ø32 Equivalent	814	-	121	163	244	326	407	488	570
ø40 Equivalent	1266	-	190	253	380	506	633	760	886
ø63 Equivalent	3137	314	470	627	941	1255	1568	1882	2196

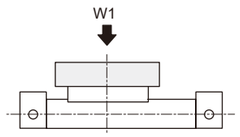
Note: The values in Table 1 do not include thrust efficiency.

4 Step 4 Calculation of Load (W) and Each Moment Value

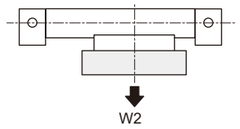
Vertical load and static moment act depending on the cylinder mounting direction and the position of the center of gravity of the load.

[Vertical Load]

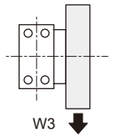
[W1 (Horizontal upward, vertical)]

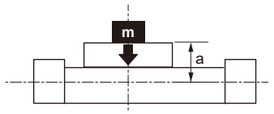


[W2 (Horizontal downward)]



[W3 (Horizontal lateral)]



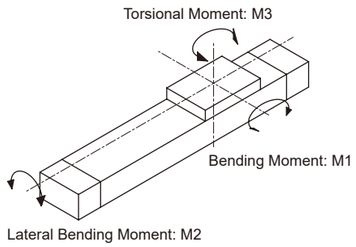


Value of a

Bore Size	a (m)
ø25 Equivalent	0.057
ø32 Equivalent	0.040
ø40 Equivalent	0.046
ø63 Equivalent	0.063

[Static Moment]

● Types of Moment Generated by Load

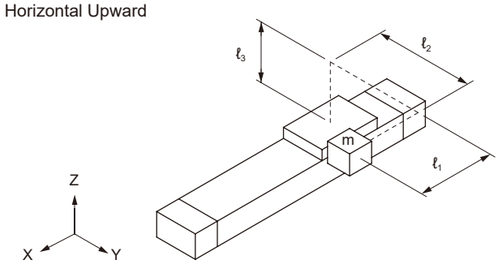


Unit: N·m

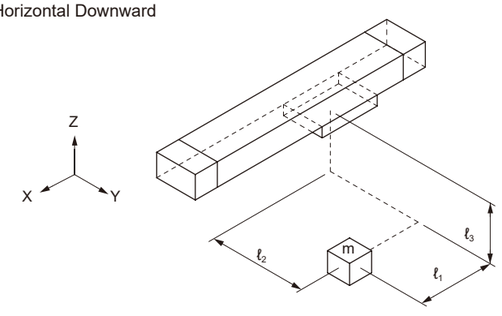
Mounting Direction		Horizontal Upward	Horizontal Downward	Horizontal Lateral	Vertical
Vertical LoadW		m x 9.8			-
Static Moment	M1	W x ℓ_1	W x ℓ_1	-	W x (ℓ_3 + a)
	M2	W x ℓ_2	W x ℓ_2	W x (ℓ_3 + a)	-
	M3	-	-	W x ℓ_1	W x ℓ_2

m : Load weight (kg)
ℓ_1 : Stroke distance from the center of table to the center of gravity of load [m]
ℓ_2 : Length in the width direction from the center of table to the center of gravity of load [m]
ℓ_3 : Length in the vertical direction from the center of table to the center of gravity of load [m]

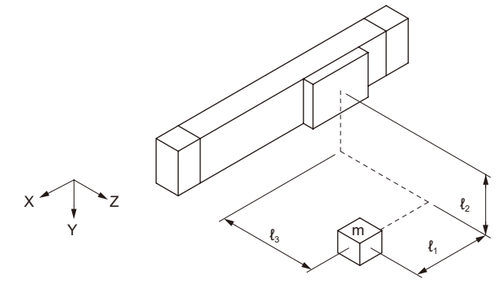
Horizontal Upward



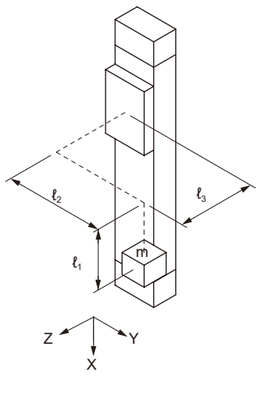
Horizontal Downward



Horizontal Lateral



Vertical



5 Step 5 Confirmation of Combined Value of Load and Moment

● Divide each load by the allowable value read from Fig. 3 to Fig. 8 to obtain the load and moment ratio, and check that the total value is 1.0 or less.

Calculation Formula

$$\frac{W}{Wmax'} + \frac{M1}{M1max'} + \frac{M2}{M2max'} + \frac{M3}{M3max'} \leq 1.0$$

Wmax', M1max', M2max', M3max' are readings from Fig. 2 to Fig. 7

● If the total value is greater than 1.0:

1. Re-examine the load,
2. Review such as selecting a larger cylinder I.D.

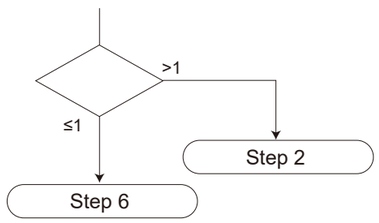


Fig. 2: SRM3-25, 32 Allowable Load for W1, W2, W3

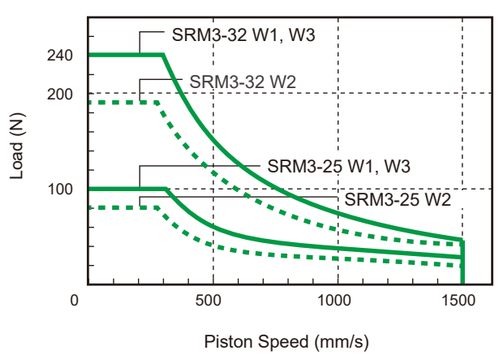


Fig. 3: SRM3-40, 63 Allowable Load for W1, W2, W3

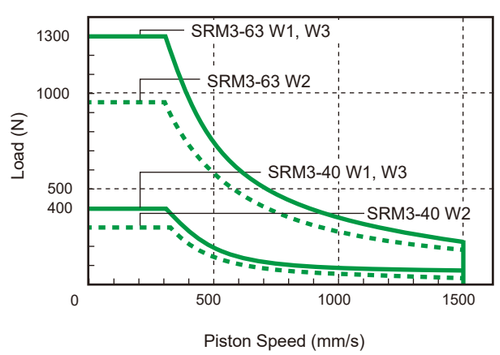


Fig. 4: SRM3-25, 32 Allowable Moment for M1, M3

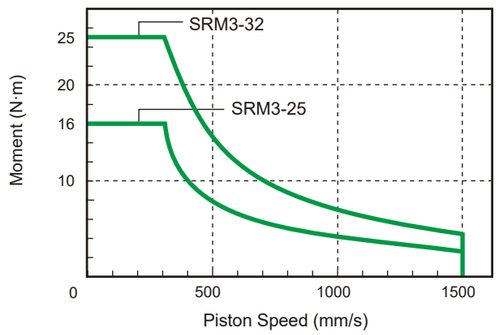


Fig. 5: SRM3-40, 63 Allowable Moment for M1, M3

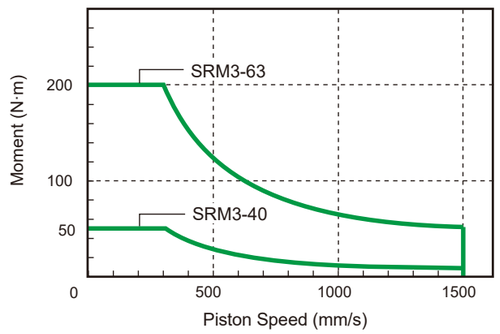


Fig. 6: SRM3-25, 32 Allowable Moment for M2

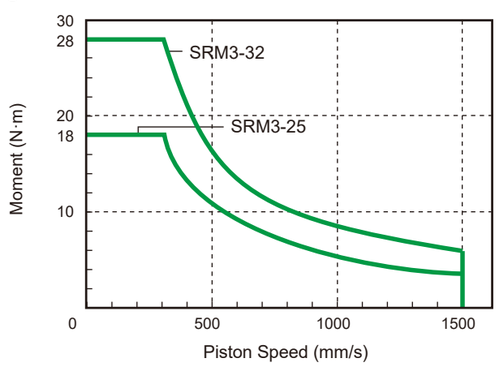
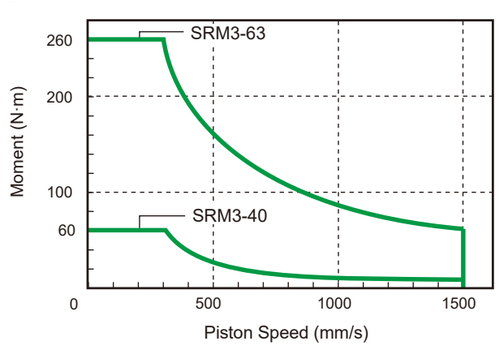


Fig. 7: SRM3-40, 63 Allowable Moment for M2



6 Step 6 Calculation of Required Thrust

Calculate the required cylinder thrust (F_N).

1. During horizontal operation
   F_N=W x 0.2 (N)

2. During vertical operation
   F_N=W (N)

7 Step 7 Confirmation of Load Factor

● The load factor is determined by considering usage conditions such as stability of cylinder operating speed, margin, and service life.

● Calculation Formula for Load Factor (α)

$$\alpha = \frac{\text{Required Thrust } (F_N)}{\text{Cylinder Thrust } (F)} \times 100\ \%$$

$$F = \frac{\pi}{4} \times D^2 \times P \times \eta \frac{\mu}{100}\ (N)$$

D: Cylinder I.D.(mm)

$\frac{\pi}{4} \times D^2$ = Pressurized area (mm^2)

●The theoretical thrust value of the cylinder in Table 4 may be used as the value for $\frac{\pi}{4} \times D^2 \times P$.

P: Operating Pressure MPa

μ: Thrust efficiency (Use the values in Figure 1.)

[Appropriate Range of Load Factor]

● Although piston speed varies depending on load factor, the range in Table 2 below is desirable for general use.

Table 2 (Appropriate Range of Load Factor - Reference Value)

Operating Pressure MPa	Load Factor %
0.2 to 0.3	α≤40
0.3 to 0.6	α≤50
0.6 to 0.7	α≤60

[Example] Cylinder size to be used: Equivalent to ø25,
Required thrust 4N
When Operating Pressure is 0.5 MPa

$$\alpha = \frac{4}{542 \times 0.5 \times \frac{83}{100}} \times 100$$

=2%

OK because α≤50%.

8 Step 8 Confirmation of Cushion Capacity

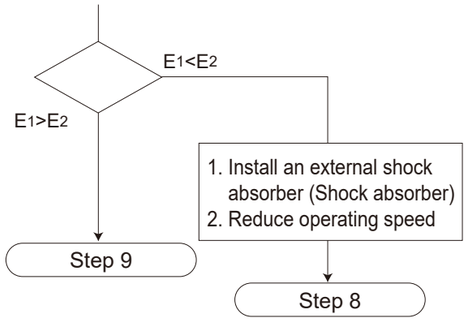
Check whether the kinetic energy due to the motion of the actual load can be absorbed by the cylinder's own cushion capacity.

[Allowable Absorbed Energy of Cylinder]

● The value of kinetic energy absorption capacity by the cylinder's cushion mechanism varies depending on the cylinder I.D. Compare with the values in Table 3 for SRM3.

Table 3 SRM3 Allowable absorption energy (E_1)

Bore Size (mm)	Allowable Absorbed Energy (J)
ø25 Equivalent	1.40
ø32 Equivalent	2.57
ø40 Equivalent	4.27
ø63 Equivalent	17.4



[Piston Kinetic Energy]

● Calculation Formula for Piston Kinetic Energy (E_2)

$$E_2 = \frac{1}{2} \times M \times Va^2 \ (J)$$

M : Applied load weight (kg)

Va : Piston Cushion Entry Speed (m/s)

$$Va = \frac{L}{t} \times (1 + 1.5 \times \frac{\alpha}{100})$$

L : Stroke (m)

t : Operation Time (S)

α : Load Factor (%)

9 Step 9 Confirmation of Inertial Load

● Check if the inertial force acting from the load due to piston operation is within the cylinder's capability range.

(1) Obtain the G coefficient from the entry speed into the cushion part (Va) and the trend of the inertial force coefficient of SRM3 in Fig. 8. The entry speed into the cushion part (Va) is the value calculated in Step 8.

Va: Piston Cushion Entry Speed (m/s)

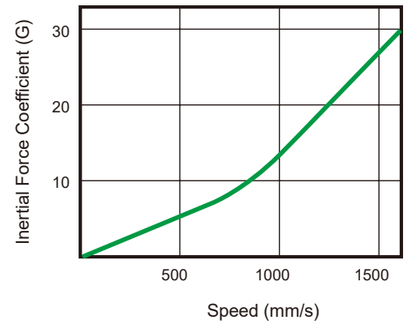
$$Va = \frac{L}{t} \times (1 + 1.5 \times \frac{\alpha}{100})$$

L : Stroke (m)

t : Operation Time (S)

α : Load Factor (%)

Figure 8 Trend of SRM3 inertial force coefficient



(2) Calculate bending moment (M1i) and torsional moment (M3i) due to inertial force.

Unit: N·m

Mounting Direction		Horizontal Upward	Horizontal Downward	Vertical	Horizontal Lateral
Dynamic Moment	M1i	W x (ℓ_3 + a) x G			
	M2i	Dynamic moment M2i does not occur			
	M3i	W x ℓ_2 x G			

Moment due to inertial force is calculated as above regardless of mounting direction.

(3) Add the moment due to static load (M1 and M3) and the moment due to inertial force (M1i and M3i) and confirm that the combined value is less than or equal to the maximum allowable value in Table 4.

$$M1 + M1i \leq M1max$$
$$M3 + M3i \leq M3max$$

M1max, M3max are values in Table 4

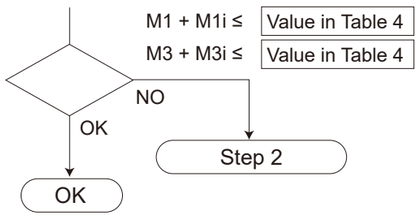


Table 4 Max allowable values of load and moment

Item / Bore Size (mm)	Vertical Load W1max (N)	Vertical Load W2max (N)	Vertical Load W3max (N)
ø25 Equivalent	100	80	100
ø32 Equivalent	240	190	240
ø40 Equivalent	400	320	400
ø63 Equivalent	1300	1000	1300

Item / Bore Size (mm)	Bending Moment M1max (N·m)	Lateral Bending Moment M2max (N·m)	Torsional Moment M3max (N·m)
ø25 Equivalent	16	18	16
ø32 Equivalent	25	28	25
ø40 Equivalent	50	60	50
ø63 Equivalent	200	260	200

Table 4 shows the maximum allowable value. Allowable values depend on operating speed conditions as shown in Fig. 2 to Fig. 7. (The range on the lower left side of the characteristic curves in Fig. 2 to Fig. 7 is usable.)

1 Cushion Characteristics and Kinetic Energy

(1) About Cushion

● Cushion

A cushion utilizes the compressibility of air to absorb the kinetic energy possessed by the piston and prevent the piston and cover from colliding impactfully at the stroke end. Therefore, the cushion is not intended to operate the piston at low speed from near the stroke end. Table 5 shows the kinetic energy that can be absorbed by the cushion. If the kinetic energy exceeds this value or if you want to avoid bouncing due to air compressibility, select a model with shock absorber or consider a separate shock absorber. (Refer to Step 8 above.)

● SRM3 Cushion Characteristic Value

Table 5 Allowable absorbed energy of cushion (E_1)

Bore Size (mm)	Effective Cushion Length (mm)	Allowable Absorbed Energy (J)	
		With Cushion	Without Cushion
ø25 Equivalent	20.9	1.40	0.015
ø32 Equivalent	23.5	2.57	0.030
ø40 Equivalent	23.9	4.27	0.050
ø63 Equivalent	29.6	17.4	0.138

● Calculation Formula for Kinetic Energy (E2)

$E_2 = \frac{1}{2} \times M \times V^2$ (J)

M: Load Weight (kg)

V : Piston Cushion entry speed (m/s)

L : Cylinder Stroke (m)

t : Piston Operation Time (s)

α: Cylinder Load Factor (%)

$\alpha = \frac{\text{Load Weight}}{\text{Cylinder Thrust}} \times 100$

$V = \frac{L}{t} \times (1 + 1.5 \times \frac{\alpha}{100})$

(2) About Shock Absorber

Shock absorbers used with SRM3 with shock absorber are shown in Table 7. Please use within the specification range of the shock absorber shown in Table 6.

Table 6 Specifications

Shock Absorber Model Number / Item		NCK-00-0.7-C	NCK-00-1.2	NCK-00-2.6	NCK-00-7	NCK-00-12
Type/Classification		Without adjuster Spring return type				
Max Absorbed Energy	J	7	12	26	70	120
Stroke	mm	8	10	15	20	25
Per Hour Max Absorbed Energy	KJ/h	12.6	21.6	39.0	84.0	86.4
Max Collision Speed	m/s	1.5	2.0		2.5	3.0
Max Repetition Frequency	cycles/min	30		25	20	12
Ambient Temperature	°C	-10 to 80 (14.0 to 176.0°F)				
Mount Required Strength	N	6150	8400	12100	24400	33500
Return Time	S	0.3 or less			0.4 or less	
Product Weight	kg	0.02	0.04	0.07	0.2	0.3
Return Spring Force	Extended N	2.0	2.9	5.9	9.8	16.3
	Compressed N	4.3	5.9	11.8	21.6	33.3

● The allowable absorbed energy in SRM3 differs depending on the collision speed. When the collision speed is 1000 mm/s to 1500 mm/s, do not exceed 1/2 of the maximum absorbed energy in Table 9.

Table 7 Applicable shock absorber model No.

Model	Shock Absorber Applicable Model Number	
	Standard Type (-A)	Light Load Type (-E)
SRM3-25	NCK-00-1.2	NCK-00-0.7-C
SRM3-32	NCK-00-2.6	NCK-00-1.2
SRM3-40	NCK-00-7	NCK-00-2.6
SRM3-63	NCK-00-12	NCK-00-7

● Confirmation of Allowable Collision Energy of Shock Absorber

Calculate the collision equivalent Weight Me and collision energy E using the formula in the table below, and confirm that Me and E are below the allowable values in Fig. 9. Also, confirm that specifications such as repetition frequency and collision speed are below the allowable values according to the table. Please note that the allowable values for collision equivalent Weight Me and collision energy E differ depending on the magnitude of the collision speed.

● Code

E : Collision Energy (J)
Me : Collision Equivalent Weight (kg)
m : Workpiece Weight (kg)
F : Cylinder Thrust (N)
V : Collision Speed (m/s)
St : Shock Absorber Stroke (m)
g : Gravitational Acceleration 9.8 (m/s^2)

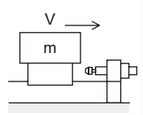
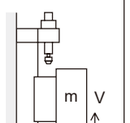
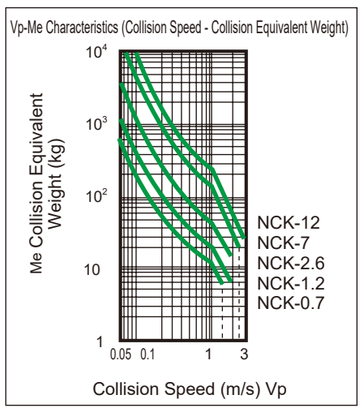
Application Example	Horizontal Movement	Vertical Downward	Vertical Upward
			
Collision Equivalent Weight Me (kg)	$Me=m+\frac{2F \cdot St}{V^2}$	$Me=m+\frac{2 \cdot St\,(F+mg)}{V^2}$	$Me=m+\frac{2 \cdot St\,(F-mg)}{V^2}$
Energy E (J)	$E=\frac{mV^2}{2}+F \cdot St$	$E=\frac{mV^2}{2}+(F+mg) \cdot St$	$E=\frac{mV^2}{2}+(F-mg) \cdot St$

Figure 9 Allowable value of equivalent collision weight

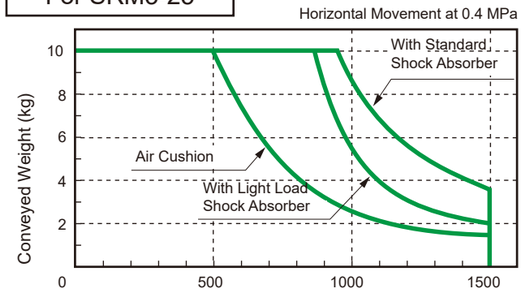


● With cushion/shock absorber Transfer weight - speed characteristics

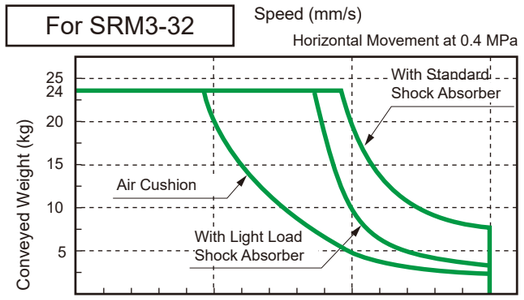
The figure below shows the conveyed Weight - speed characteristics. Since it changes depending on the usage conditions, confirm that it is below the allowable value shown in Table 6.

SRM3 With Cushion/Shock Absorber Conveyed Weight - Speed Characteristics

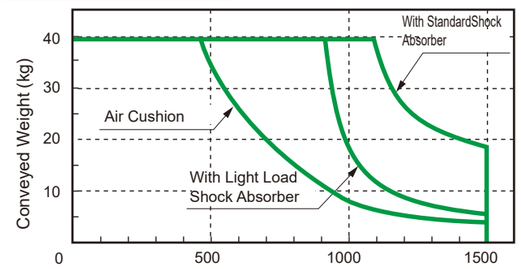
For SRM3-25



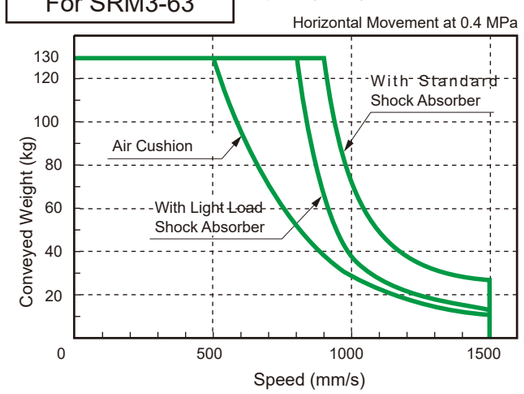
For SRM3-32



For SRM3-40



For SRM3-63

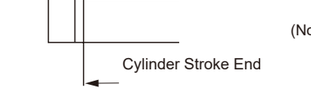


Precautions for Use

The shock absorber absorbs the rated energy with the rated stroke, but the mounting position of the shock absorber at the time of product shipment is set to leave a slight margin in the stroke of the shock absorber at the cylinder stroke end. Therefore, the absorbed energy will be a value smaller than the allowable absorbed energy (Table 11), so if the rated absorbed energy is required, adjust so that the full stroke of the shock absorber can be used.

Table 11 Specification of initial setting value with shock absorber

Model	Standard Type (-A)		Light Load Type (-E)	
	Absorbed Energy (J)	Effective Stroke (mm)	Absorbed Energy (J)	Effective Stroke (mm)
SRM3-25	10	9	5.7	7
SRM3-32	18	13	10	9
SRM3-40	50	16.5	18	13
SRM3-63	86	21	50	16.5



(Note) This is the description of the shock absorber attached to the full stroke adjustment type.

Shock Absorber Adjustment

The absorbed energy of the shock absorber can be adjusted by changing the operating stroke of the shock absorber.

● Calculation Example (For SRM3-25-A)

Shock Absorber Used NCK-00-1.2

● Calculation Example (1) During Ascent, During Descent

Usage Conditions

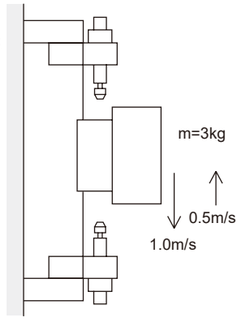
● Load weight m 3 kg

● Collision Speed

Ascending 0.5 m/s

Descending: 1.0 m/s

● Operating Pressure 0.5 MPa (245 N)



①Kinetic Energy During Ascent (E_1)

$$E_1=\frac{3 \times 0.5^2}{2}+(245-3 \times 9.8) \times 0.01$$

=2.5 (J)

It is less than the maximum absorbed energy in Table 6, and kinetic energy (E1) can be absorbed.

$$Me=3+\frac{2 \times 0.01 \times (245-3 \times 9.8)}{0.5^2}$$

=20 (kg)

The Me of the shock absorber used for SRM3-25-A is 32 kg at V=0.5 m/s from Fig. 10, making it absorbable.

②Kinetic Energy During Descent (E_1)

$$E_1=\frac{3 \times 1.0^2}{2}+(245+3 \times 9.8) \times 0.01$$

=4.2 (J)

It is 1/2 or less of the maximum absorbed energy in Table 6, and kinetic energy (E1) can be absorbed.

$$Me=2+\frac{2 \times 147 \times 0.01}{1.5^2}$$

=3.3 (kg)

From Fig. 9, the Me value of the shock absorber for SRM3-25-A at V=1.5 m/s is 10 kg, so 3.4 < 10, making it absorbable.

(Note) Regarding inertial load, refer to Selection Guide 9 Step 9 Confirmation of Inertial Load and ensure it does not exceed the allowable value.

The Me value of the shock absorber used for SRM3-25-A is 24 kg at V=1.0 m/s from Fig. 9, making it absorbable.

● Calculation Example (2)

Horizontal

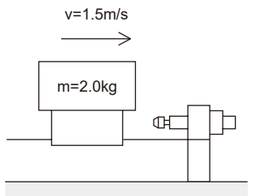
Usage Conditions

Load Weight M = 2 kg

Collision Speed

Horizontal direction: 1.5 m/s

Operating Pressure: 0.3 MPa (147 N)



Horizontal Kinetic Energy (E1)

$$E_1=\frac{2 \times 1.5^2}{2}+147 \times 0.01$$

=3.7 (J)

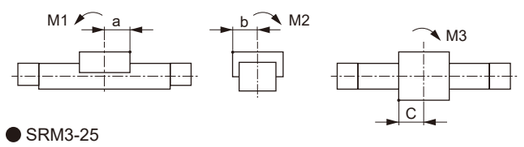
2 Table Deflection (Displacement at Table Edge)

The figure below shows the displacement at the table edge when a moment acts. The table on the right shows the position of the table edge.

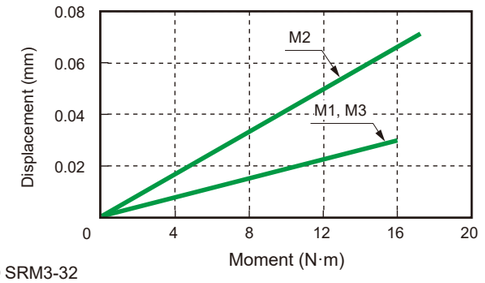
mm

Model	a	b	c
SRM3-25	50	50	50
SRM3-32	55	55	55
SRM3-40	70	70	70
SRM3-63	100	100	100

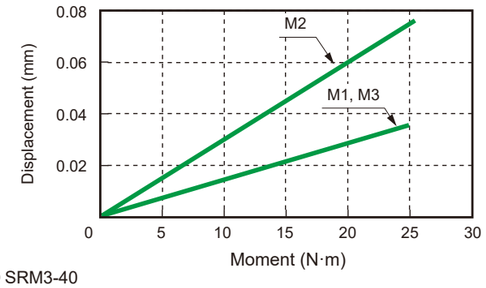
M1 Moment M2 Moment M3 Moment



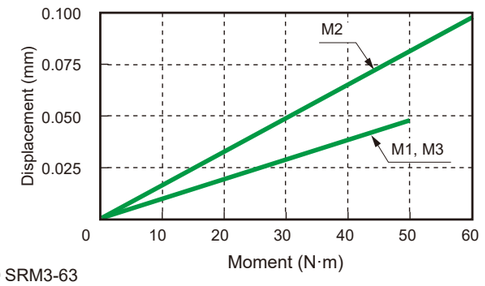
● SRM3-25



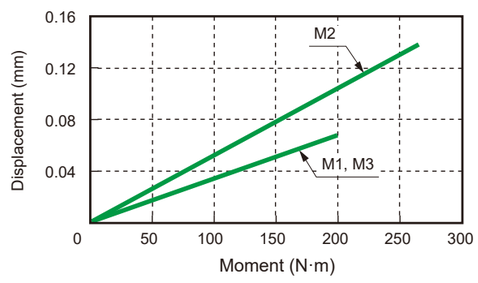
● SRM3-32



● SRM3-40



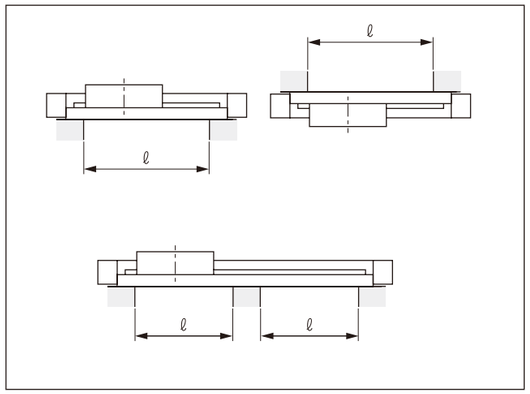
● SRM3-63



3 Support Spacing

If the stroke is long and the load or bending moment is large, the deflection of the tube will be large. Secure the tube using the spacing shown in the table below as a guide.

Model	Recommended Support Spacing (ℓ) mm
SRM3-25	400
SRM3-32	400
SRM3-40	500
SRM3-63	600



For Safe Use of This Product

Please read before use. Check P. 41 at the beginning for general cylinders and P. 1512 for cylinder switches.

Specific Precautions: Rodless Cylinder with High Precision Guide SRM3 Series

Design / Selection

1. Common

⚠ CAUTION

■ Please be careful when designing the intermediate stop control circuit.

Since slit type rodless cylinders represented by SRL3 structurally have slight external air leakage, intermediate stop control using an all-port block 3-position valve will cause a failure where the table stop position cannot be maintained. Therefore, please use a both-side pressurization control circuit using a PAB connection 3-position valve. However, please note that if air is pressurized in a non-energized state during both-start after a pressure drop, the table may move and deviate from the origin.

■ Basic Circuit Diagram

● For Horizontal Load

Piping as shown in Fig. 1 applies equal pressure to both sides of the piston when stopped, preventing the table from shooting out when restarting.

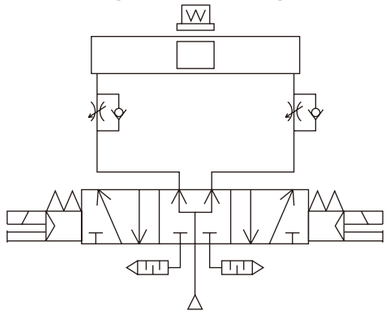


Fig. 1

● For Vertical Load

If a vertical load acts as shown in Fig. 2, the table moves in the Load Direction, so install a pressure reducing valve with check valve on the upper side to reduce the thrust in the Load Direction and balance the load.

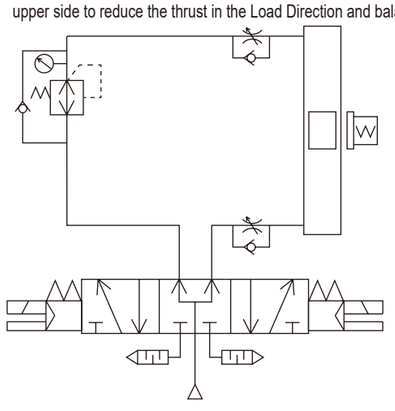
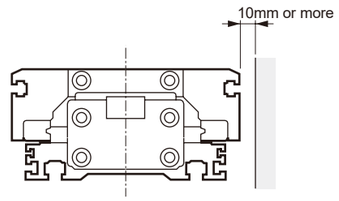


Fig. 2

■ If there is a magnetic material such as an iron plate near the cylinder switch, it may cause a malfunction of the cylinder switch, so keep a distance of 10 mm or more from the side of the table.



■ Cannot be used in places where cutting oil, coolant fluid, oil mist, etc. come directly into contact with the cylinder.

If it is unavoidable due to cylinder installation, be sure to provide a cover etc. to protect the cylinder.

■ Cannot be used in environments where foreign matter such as chips, dust, dirt, spatter, etc., come directly into contact with the cylinder or fly around.

If unavoidable due to cylinder installation, install a cover, etc., to protect it. Also, be sure to consult us when using in such an environment.

■ Be careful not to generate negative pressure inside the cylinder tube. When used as an air balancer or when the table is driven by external force, inertial force, etc. with all ports blocked, negative pressure may be generated in the cylinder, causing the seal belt to detach and air leakage to occur. Be careful not to generate negative pressure in the cylinder by driving with external force, inertial force, etc.

2. Fall Prevention Type SRM3-Q

⚠ CAUTION

■ The cylinder load factor should be 50% or less.

If the load factor is high, the lock may not be released or the lock part may be damaged.

■ When operating the cylinder at a speed of 500 mm/s or more, please decelerate so that the entry speed into the fall prevention mechanism is 500 mm/s or less. As a deceleration method, please use a method such as installing an external shock absorber or a deceleration circuit.

During Use

1. Common

⚠ WARNING

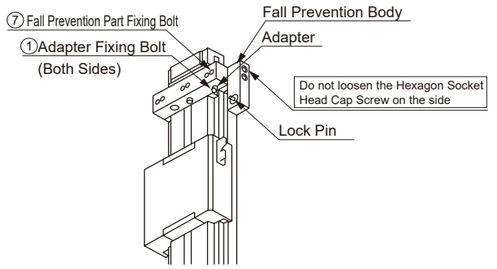
■ Adjustment of Shock Absorber

● Since the gap between the shock absorber and the stopper bolt is narrow, it is recommended to remove the stroke adjustment plate for adjustment.

2. Fall Prevention Type SRM3-Q

⚠ WARNING

■ Adjustment method of stroke adjustment unit



Loosen the ⑦drop prevention part fixing bolt in the figure above to adjust the stroke. Do not loosen the Hexagon Socket Head Cap Screw on the side in the figure above, as the position of the fall prevention part lock pin will shift.

● By loosening the adapter fixing bolt, the fall prevention body can be moved. In this case, use with shock absorber (A, A1, E, E1). Also, if the stroke is finely adjusted with the shock absorber, the fall prevention position will shift and it will not be possible to lock reliably, so please make fine adjustments with the adapter fixing bolt.

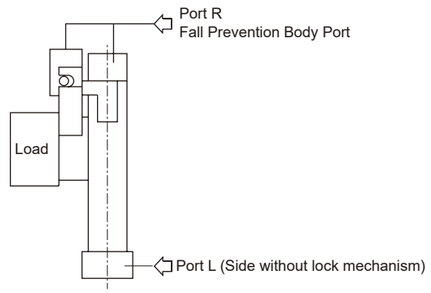
● After moving to an arbitrary position, tighten the adapter fixing bolt with the value in the table below to fix it. If tightened below the value in the table below, the fall prevention body part may shift, so be sure to observe it.

● When setting the load, be sure to confirm that the lock mechanism works before installation.

Model	① Adapter Fixing Bolt ⑦ Fall prevention part fixing bolt Tightening Torque Tightening torque
SRM3-Q-25	6.2 to 7.6
SRM3-Q-32	6.2 to 7.6
SRM3-Q-40	10.4 to 12.8
SRM3-Q-63	19.4 to 23.8

■ About Piping

● Piping to the fall prevention body is required.



● Branch the piping to the R side of the rodless cylinder with a tee etc., and pipe to the fall prevention body with equivalent piping.

● Please note that if the piping to the fall prevention body is thin and long, or if the speed controller is far from the cylinder port, the exhaust speed will be slow and it may take time for the lock to engage. Also, clogging of the silencer attached to the EXH. port of the valve will lead to the same result.

■ Be sure to supply pressure equal to or higher than the minimum Operating Pressure to the fall prevention body port.

■ About Manual Release

● Push in the lock pin for fall prevention with a rod-shaped object to release it. In this case, be sure to supply pressure to port L so that no load is applied to the lock mechanism, and then release the lock.

● It is very dangerous if pressure is supplied to port R while both ports R and L are exhausted and the piston is locked, as the lock may be released and the table may shoot out.

■ About Valve

● If the cylinder is held with pressure applied to the lock mechanism side, the lock pin may come off, which is very dangerous, so do not use 3-position closed center and 3-position PAB connection valves.

● If back pressure is applied during locking, the lock may be released, so use a single valve or an individual exhaust type manifold.

● In a usage method where the descent speed is increased with a quick exhaust valve, the start of movement of the Cylinder Body is faster than the operation of the lock pin, and normal release may not be possible. Do not use a quick exhaust valve for fall prevention type cylinders.

■ During equipment maintenance, for safety, please take separate measures to prevent the load from falling due to its own weight.

■ In the case of a cylinder with air cushion, if the air cushion needle on the lock mechanism side is tightened too much, the piston will bounce at the stroke end, the lock lever and lock pin will contact impactfully, leading to damage of the lock mechanism. Also, if the air cushion needle is opened too much, the piston will rebound at the stroke end, leading to damage as well. Adjust the needle so that the air cushion does not bounce. When stopping with external buffer equipment (shock absorber, etc.), similarly adjust so that there is no bounce. Also, please perform periodic inspection 1 to 2 times/year to check for damage to the holding part due to this phenomenon.

3. Common

⚠CAUTION

■Do not apply strong impact or excessive moment to the table.

■Perform sufficient alignment when connecting to a load that has an external guide mechanism.

● The longer the stroke, the larger the variation in the axis center, so please consider a connection method (floating) that can absorb the displacement amount.

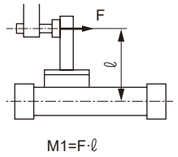
■Ensure that the moment including the inertial force generated during load movement or stopping does not exceed the allowable load. If this value is exceeded, damage will occur.

(When overhang is large)

● When the overhang is large and stopping at both ends with the piston, a bending moment acts due to the inertial force of the load even if it is within the range of the internal cushion's absorbed energy. When kinetic energy is large and an external cushion etc. is used, please hit the workpiece center of gravity as much as possible. (When using an external stopper)

● When an external stopper is used, please select taking into account the bending moment due to cylinder thrust.

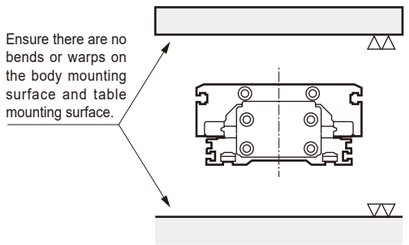
● Moment acting when stopped by an external stopper



M1=F·ℓ

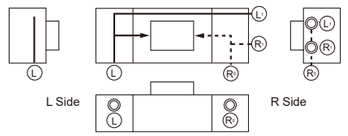
F : Cylinder Thrust
ℓ : Distance from cylinder center to stopper

■Do not make dents or scratches that would impair flatness on the body (tube) mounting surface and table mounting surface.



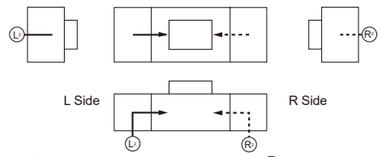
■About Piping Port Position and Operation Direction

● In case of Option Code (No Code, R, B, T)



Ⓡ indicates right side pressurization port, Ⓛ indicates left side pressurization port. At the time of shipment from the factory, ports other than ⓇⓁ(1 location each) are sealed with plugs. Piping to other ports is possible by removing the plugs. However, bottom piping is not possible. If bottom piping is required, please select option (D, S). Ⓛport is for ø25, ø32, ø40 only. ø63 Ⓛ port type is not available.

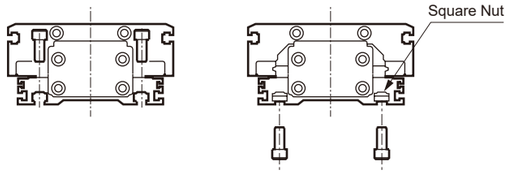
● In case of Option (D, S) (Bottom Piping)

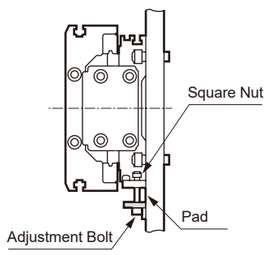


Ⓡ indicates R side pressurization port, Ⓛ indicates L side pressurization port. There are no ports for piping other than Ⓡ and Ⓛ.

■About Body Mounting

SRM3 can be mounted from 2 directions as shown in the figure below. Also, flexible mounting from the side direction is possible using the T-slots. In that case, installation will be easier if level adjustment is possible.





■About T-slots and Square Nuts

SRM3 is provided with T-slots for square nuts as shown in the figure below, and the square nuts in the table below are attached as accessories upon shipment.

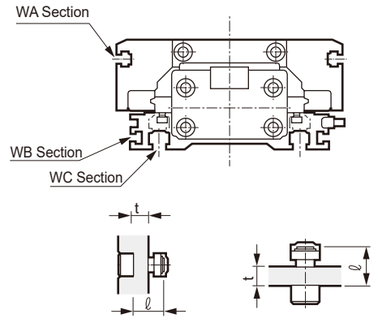
● Accessory square nuts (8 each)

Model	Included Square Nut	
SRM3-25	M4	M5
SRM3-32	M4	M6
SRM3-40	M4	M8
SRM3-63	M5	M10

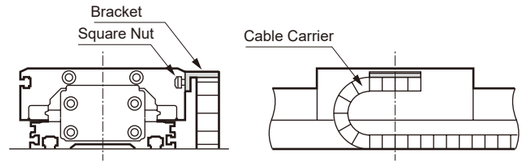
● The following dimensions are recommended for T-slot bolt length R.

mm

Model	WA Section	WB Section	WC Section
SRM3-25	M4 ℓ=t+6	–	M5 ℓ=t+6
SRM3-32	M4 ℓ=t+6	–	M6 ℓ=t+8
SRM3-40	M4 ℓ=t+6	M4 ℓ=t+6	M8 ℓ=t+10
SRM3-63	M5 ℓ=t+7	M5 ℓ=t+7	M10 ℓ=t+12



[Table T-slot Usage Example]

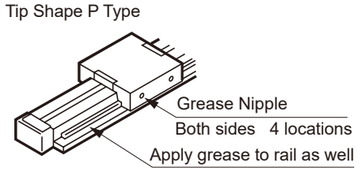


■Please treat our shock absorber as a consumable part.
Replace it when a decrease in energy absorption capacity is observed or when operation is no longer smooth.

■The guide part of the SRM3 series is adjusted for proper pressurization at the time of shipment.
Do not carelessly adjust the pressurization during use.

■For normal use, apply lithium-based grease to the guide of the SRM3 series approximately every 100 km of travel distance (about 6 months in time).
Grease application recommended grease gun
THK: Grease Gun Unit MG70

Tip Shape P Type



4. Fall Prevention Type SRM3-Q

⚠CAUTION

■When the lock mechanism is operated manually, be sure to return it to its original state after manual confirmation before use. Also, do not perform manual operation except during adjustment as it is dangerous.

■Release the lock when mounting or adjusting the cylinder. If mounting work is performed while the lock is engaged, the lock part may be damaged.

■Do not use multiple cylinders in synchronization. Do not use a method where two or more fall prevention type cylinders are synchronized to move one workpiece. The lock of one of the cylinders may not be releasable.

■Use the speed controller with meter-out control. The lock may not be releasable with meter-in control.

■Be sure to use up to the cylinder stroke end on the side with the lock. If the cylinder piston does not reach the stroke end, the lock may not engage or the lock may not be releasable.

■Apply grease periodically to the sliding part of the lock lever.

For precautions during installation, adjustment, use, and maintenance, please refer to "During Use" in this catalog and the Instruction Manual on the CKD Component Product Site (https://www.ckd.co.jp/kiki/en/) -> "Model Number".

Rodless Type

SRT3

Rodless Cylinder with Brake

ø12, ø16, ø20, ø25, ø32,
ø40, ø50, ø63 Equivalent

Overview

This is a rodless cylinder with brake, attaching a compact and highly reliable brake to the ø12 to ø63 equivalent series (SRL3) of rodless cylinders.

Features

Easy Brake Release
The brake can be released simply by returning the tilt of the brake plate to its original position using a flathead screwdriver etc.

Elimination of Piping Trouble
Supply of air pressure to the brake section does not require moving piping (cable carrier, etc.), but only piping to the end flange.

Simple Structure
The number of components in the brake section is extremely small, and the structure is simple.

Space Saving
Due to the low-profile and compact brake mechanism, it saves space.

Repeatability ±1.5 mm (300 mm/s at no load)

Brake Durability High Life

CONTENTS

Product Introduction	176
Series Variation	176
● Double Acting Type (SRT3)	178
Dimensions with Switch	190
Model Selection Guide	192
⚠Precautions for Use	198

Variation

Rodless Cylinder with Brake
SRT3 Series

●: Standard, ◎: Option, : Not Available

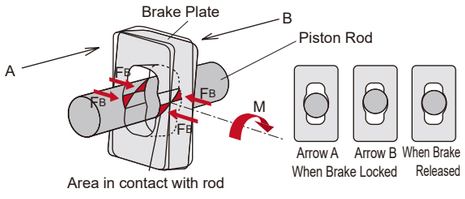
Variation	Model Number	Bore Size (mm)	Stroke (mm)									Min Stroke (mm)	Max Stroke (mm)	Intermediate stroke (per mm)	Mounting Type		Cushion				Option	Switch	Page
			200	300	400	500	600	700	800	900	1000				Basic Type	Axial Foot Type	Cushion on Both Sides	Cushion on R Side	Cushion on L Side	Without Cushion	Floating Joint		
															00	LB	B	R	L	N	Y		
Double Acting Type	SRT3	ø12 Equivalent, ø16 Equivalent, ø20 Equivalent	●	●	●	●	●	●	●	●	●	1	1000	1	●	●	●	●	●	●	◎	◎	178
		ø25 Equivalent, ø32 Equivalent, ø40 Equivalent	●	●	●	●	●	●	●	●	●		1500		●	●	●	●	●	●	◎	◎	
		ø50 Equivalent, ø63 Equivalent	●	●	●	●	●	●	●	●	●		2000		●	●	●	●	●	●	◎	◎	

Note: ◎ only when without switch, not available when with switch.

Product Introduction

● Equipped with New Brake Mechanism

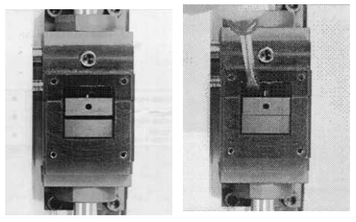
Equipped with a new swash plate type brake mechanism, it features excellent durability and strong holding force (equivalent to cylinder thrust at 0.6 MPa).



By applying rotational force M to the brake plate, force F_B in the axial direction is generated to hold the rod, ensuring excellent durability and strong holding force.

● Easy Brake Release

The brake can be released simply by returning the tilt of the brake plate to its original position using a flathead screwdriver etc.



● Elimination of Piping Trouble

Supply of air pressure to the brake section does not require moving piping (cable carrier, etc.), but only piping to the end flange.

● Simple Structure

The number of components in the brake section is extremely small, and the structure is simple.

● Space Saving

Due to the low-profile and compact brake mechanism, it saves space.

● Switch Mounting Possible

Various cylinder switches such as non-contact and contact types can be mounted.

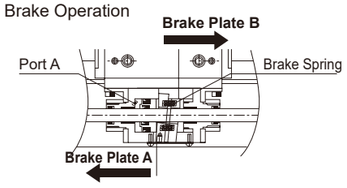
M□V

M□H

- ● Non-contact 2-wire
  M2V/H
- ● Non-contact 3-wire
  M3V/H
- ● Contact 2-wire
  M0V/H, M5V/H
- ● 2-color Display Non-contact 2-wire
  M2WV, T2WV/H
- ● 2-color Display Non-contact 3-wire
  M3WV, T3WV/H
- ● For AC Magnetic Field
  T2YD, T2YDT

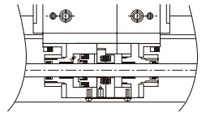
Operational Principle

Brake Operation



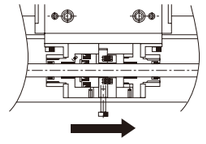
When air is exhausted from port Ⓐ, brake plates Ⓐ and Ⓑ are pushed by spring force, brake plates Ⓐ and Ⓑ tilt in the direction of the arrow using each as a fulcrum, and the braking force is amplified by the cylinder thrust to hold the Piston Rod.

Brake Release



When air is supplied from port Ⓐ, brake plates Ⓐ and Ⓑ are pushed by the release piston, brake plates Ⓐ and Ⓑ become perpendicular to the Piston Rod, clearance is created between them, and the rod becomes free.

Manual Brake Release



Remove the cover, screw a Hexagon Socket Head Cap Screw etc. into the brake plate Ⓐ and tilt it in the direction of the arrow to make the brake plates Ⓐ and Ⓑ parallel, and the Piston Rod becomes free. (The brake can also be released by returning the tilt of the brake plate to its original position using a flathead screwdriver etc.)

Rodless Cylinder with Brake

SRT3 Series

● Bore Size: ø12, ø16, ø20, ø25, ø32, ø40, ø50, ø63 Equivalent

RoHS

Model No. Notation

Without Switch
(Built-in Magnet for Switch)

SRT3 - 00 - 32 - B - 200 ——— Y

Model Number ① ② ③ ④ ⑦

With Switch
(Built-in Magnet for Switch)

SRT3 - 00 - 32 - B - 200 - M0H - R - Y

Model Number
① Mounting Type
② Bore Size
③ Cushion
④ Stroke
⑤ Switch Model
⑥ Number of Switches
⑦ Option

① Mounting Type

Mounting brackets are included with the product before shipment.

Code	Description	
00	Basic Type	
LB	Axial Foot Type	

② Bore Size (mm)

Code	Description
12	ø12 Equivalent
16	ø16 Equivalent
20	ø20 Equivalent
25	ø25 Equivalent
32	ø32 Equivalent
40	ø40 Equivalent
50	ø50 Equivalent
63	ø63 Equivalent

③ Cushion

Code	Description
B	Cushion on Both Sides
R	Cushion on R Side
L	Cushion on L Side
N	Without Cushion

④ Stroke (mm)

Bore Size	Stroke	Intermediate Stroke
ø12 to ø20 Equivalent	1 to 1000	in 1mm increments
ø25 to ø40 Equivalent	1 to 1500	
ø50, ø63 Equivalent	1 to 2000	

Note: Refer to P. 180 for the minimum stroke with switch.

⑤ Switch Model

For switch details, refer to P. 1457. Switches are included with the product before shipment.

Contact	Indicator Light Special Function	Wiring (Output)	Load Voltage (V) AC	Load Voltage (V) DC	Load Current (mA) AC	Load Current (mA) DC	Lead Wire *1 Straight	Lead Wire *1 L-shaped	
Non-contact	1-color	2-wire	-	10 to 30	-	5 to 30	M2H□	M2V□	
	2-color		-	10 to 30	-	5 to 30	-	M2WV□	
	1-color	3-wire (NPN)	-	30 or less	-	100 or less	M3H□	M3V□	
	2-color		-	30 or less	-	100 or less	-	M3WV□	
	1-color (Custom Product)	3-wire (PNP)	-	30 or less	-	100 or less	M3PH□	M3PV□	
	2-color	2-wire	-	24+/-10%	-	5 to 20	T2WH□	T2WV□	
		3-wire (NPN)	-	30 or less	-	50 or less	T3WH□	T3WV□	
	For 2-color AC Magnetic Field	2-wire	-	24+/-10%	-	5 to 20	T2YD□	-	
			-		-		T2YDT□	-	
Contact	1-color	2-wire	110	12/24	7 to 20	5 to 50	M0H□	M0V□	
	Without Indicator Lamp		110	5/12/24	20 or less	50 or less	M5H□	M5V□	

*1: Enter the code selected in the "*Lead wire length" table into "□" of the Switch Model.
*2: Switches other than the above models are also available. (Custom Product) For details, refer to P. 1457.

*Lead Wire Length

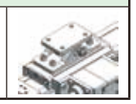
Code	Description
No Code	1 m (Standard)
3	3 m (Option)
5	5 m (Option)

Example) Lead wire length
1 m M0V
3 m M0V3
5 m M0V5

⑥ Number of Switches

Code	Description
R	1 pc on R Side
L	1 pc on L Side
D	2 pcs
T	3 pcs
4	4 pcs (Indicate number of switches for 4 pcs or more.)

⑦ Option

Code	Description	
Y	Floating Joint	

Switch Individual Model No. Notation

●Switch body+Mounting bracket set (*1)

SRL3 - M0H□

⑤ Switch Model

● Switch Body Only

SW - M0H□

⑤ Switch Model

● Mounting bracket complete set (*2)

・M Type Switch

SRL3 - M

・T Type Switch

SRL3 - T

● Lead wire holder (*3)

SRL3 - MH

*1: Lead wire holder is not included in the Switch Body + Mounting Bracket Set. If a lead wire holder is required, please order it separately.
*2: Mounting brackets differ between M type switch and T type switch.
*3: Lead wire holder is 10 pcs/1 set.

Floating Joint Set Model No. Notation

SRL3 - 40 - Y

② Bore Size

(Mount, Mount Base, Pin, Flat Washer, Pan Head Screw with Spring Washer, 4 Mounting Bolts)

Mounting Bracket Model No. Notation

SRT3 - LB - 40

(2 Brackets, 4 Mounting Bolts)

② Bore Size

Specifications

Item			SRT3							
Bore Size		mm	ø12 Equivalent	ø16 Equivalent	ø20 Equivalent	ø25 Equivalent	ø32 Equivalent	ø40 Equivalent	ø50 Equivalent	ø63 Equivalent
Operating Method			Double Acting Type							
Operating Fluid			Compressed Air							
Max Operating Pressure		MPa	0.7							
Min Operating Pressure	Cylinder Part	MPa	0.2			0.15			0.1	
	Brake Part	MPa	0.3 *1							
Proof Pressure		MPa	1.05							
Ambient Temperature		°C	5 to 60							
Port Size	Cylinder Part		M5		Rc1/8		Rc1/4		Rc3/8	
	Brake Part		M5		Rc1/8					
Stroke Tolerance		mm	$^{+2.0}_{0}$(up to 1000) $^{+2.5}_{0}$(up to 2000)							
Operating Piston Speed		mm/s	50 to 1000 (1.97 to 39.4 in/sec)							
Cushion			Air Cushion							
Lubrication			Not required (When lubricating, use turbine oil Class 1 ISO VG32)							
Holding Force		N	66	118	184	288	483	754	1178	1870

*1: The minimum Operating Pressure of the brake part is the value when the load is balanced.

Allowable Absorbed Energy

Bore Size (mm)	With Cushion		Without Cushion
	Allowable Absorbed Energy (J)	Cushion Stroke (mm)	Allowable Absorbed Energy (J)
ø12 Equivalent	0.03	14.5	0.003
ø16 Equivalent	0.22	19.2	0.007
ø20 Equivalent	0.59	22.2	0.010
ø25 Equivalent	1.40	20.9	0.015
ø32 Equivalent	2.57	23.5	0.030
ø40 Equivalent	4.27	23.9	0.050
ø50 Equivalent	9.13	24.9	0.072
ø63 Equivalent	17.4	29.6	0.138

Stroke

Bore Size (mm)	Standard Stroke (mm)	Max Stroke (mm)	Min Stroke (mm)
ø12 Equivalent	200, 300 400, 500 600, 700 800, 900 1000	1000	1
ø16 Equivalent			
ø20 Equivalent			
ø25 Equivalent		1500	
ø32 Equivalent			
ø40 Equivalent			
ø50 Equivalent		2000	
ø63 Equivalent			

Note: Intermediate strokes can be manufactured in 1mm increments.

Number of M Type Switches Mounted and Min Stroke (mm)

Number of Switches	1		2	
Switch Model / Bore Size (mm)	M□V	M□H	M□V	M□H
ø12 Equivalent	10	10	30	45
ø16 Equivalent				
ø20 Equivalent				
ø25 Equivalent				
ø32 Equivalent				
ø40 Equivalent				
ø50 Equivalent	15	15		
ø63 Equivalent				

Number of T Type Switches Mounted and Min Stroke (mm)

Number of Switches	1		2	
Switch Model / Bore Size (mm)	T□V	T□H	T□V	T□H
ø12 Equivalent	5	5	45	50
ø16 Equivalent				
ø20 Equivalent				
ø25 Equivalent	10	10		
ø32 Equivalent				
ø40 Equivalent				
ø50 Equivalent				
ø63 Equivalent				

Cylinder Weight

Unit: kg

Bore Size (mm)	Weight at 0mm Stroke			Mounting Bracket Weight		Additional Weight per 100mm Stroke
	Basic Type (00)	Foot Type (LB)	Switch Weight	T Type	M Type	
ø12 Equivalent	0.83	0.84	Refer to the Weight listed in the Switch Specifications on P. 1457.	0.005	0.001	0.18
ø16 Equivalent	0.95	0.96				0.21
ø20 Equivalent	1.17	1.19				0.26
ø25 Equivalent	2.24	2.34				0.43
ø32 Equivalent	3.8	3.9				0.54
ø40 Equivalent	5.0	5.1				0.71
ø50 Equivalent	7.4	7.5				0.96
ø63 Equivalent	12.4	12.7				1.46

Theoretical Thrust Table

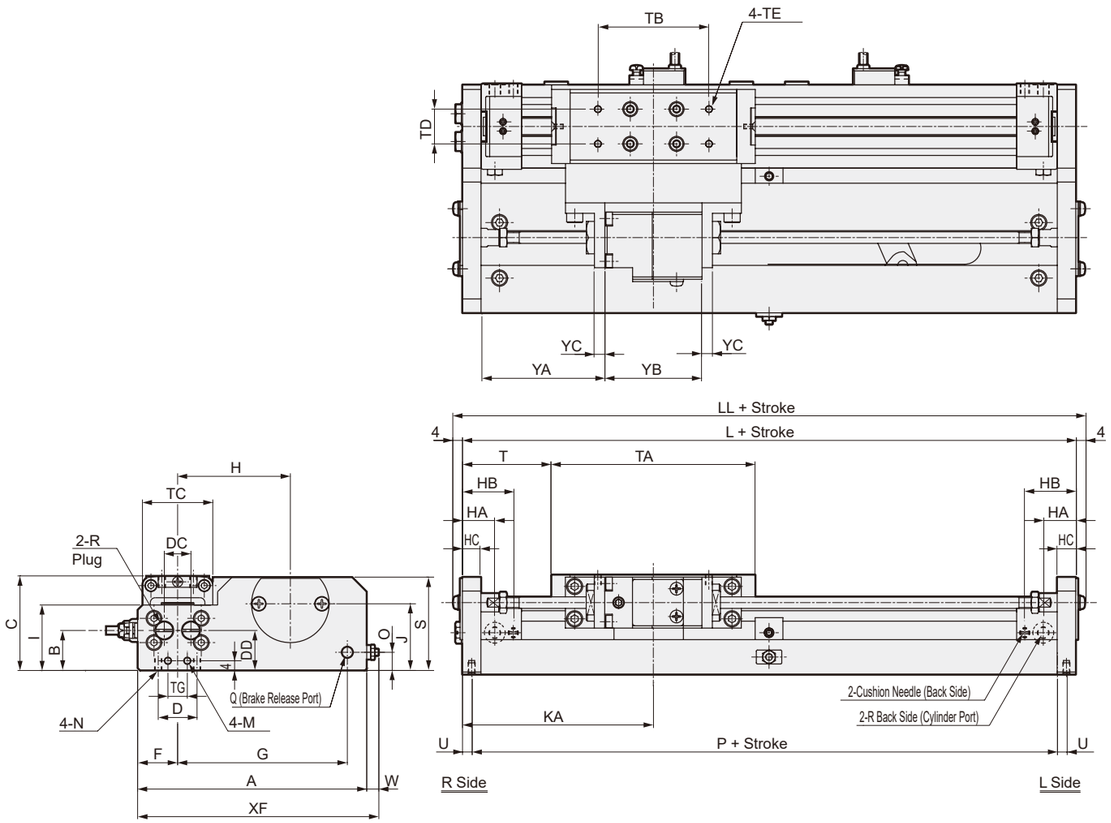
(Unit: N)

Bore Size (mm)	Operating Direction	Operating Pressure MPa							
		0.1	0.15	0.2	0.3	0.4	0.5	0.6	0.7
ø12 Equivalent	Push/Pull	-	-	27.7	41.5	55.3	69.1	83.0	96.8
ø16 Equivalent	Push/Pull	-	-	43.2	64.8	86.4	$1.08x10^2$	$1.30x10^2$	$1.51x10^2$
ø20 Equivalent	Push/Pull	-	-	62.9	94.4	$1.26x10^2$	$1.57x10^2$	$1.89x10^2$	$2.20x10^2$
ø25 Equivalent	Push/Pull	-	81.4	$1.08x10^2$	$1.63x10^2$	$2.17x10^2$	$2.71x10^2$	$3.25x10^2$	$3.80x10^2$
ø32 Equivalent	Push/Pull	-	$1.22x10^2$	$1.63x10^2$	$2.44x10^2$	$3.26x10^2$	$4.07x10^2$	$4.88x10^2$	$5.70x10^2$
ø40 Equivalent	Push/Pull	-	$1.90x10^2$	$2.53x10^2$	$3.80x10^2$	$5.06x10^2$	$6.33x10^2$	$7.60x10^2$	$8.86x10^2$
ø50 Equivalent	Push/Pull	$1.99x10^2$	$2.98x10^2$	$3.98x10^2$	$5.96x10^2$	$7.95x10^2$	$9.94x10^2$	$1.19x10^3$	$1.39x10^3$
ø63 Equivalent	Push/Pull	$3.14x10^2$	$4.70x10^2$	$6.27x10^2$	$9.41x10^2$	$1.25x10^3$	$1.57x10^3$	$1.88x10^3$	$2.20x10^3$

Dimensional Drawings (Bore Size: ø12, ø16 Equivalent)

Basic Type (00)

● SRT3-00-12 to 16



Code / Bore Size (mm)	A	B	C	D	DC	DD	F	G	H	HA	HB	HC	I	J	KA	L	LL	M	N	O	P	Q	R	S
ø12 Equivalent	94.5	16.5	39	16	11	16.5	16.5	70	46	14	22	8	27	27.5	76	152	160	M3 Depth 5	M3 Depth 6	8	144	M5	M5	39
ø16 Equivalent	98.5	18	43	20	12	18	18.5	72	48	14	22	8	30	31	82.5	165	173	M3 Depth 5	M3 Depth 6	8	157	M5	M5	42

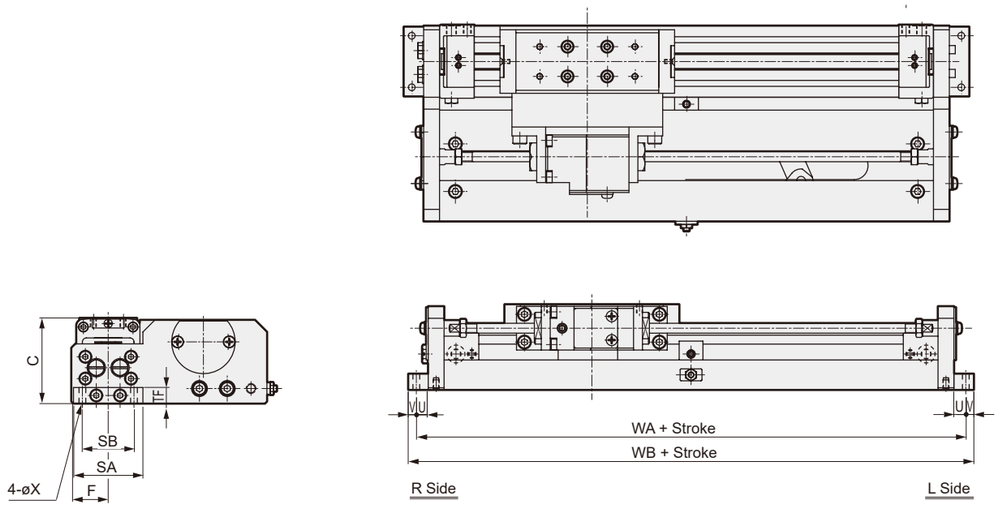
Code / Bore Size (mm)	T	TA	TB	TC	TD	TE	TG	U	W	XF	YA	YB	YC
ø12 Equivalent	35.5	81	42	29	13	M3 Depth 5	8	4	5	99.5	47	42	8
ø16 Equivalent	38.5	88	48	32	15	M3 Depth 5	12	4	5	99.5	53.5	42	8

Note: For dimensions with each switch, refer to P. 190.

Dimensional Drawings (Bore Size: ø12, ø16 Equivalent)

Axial Foot Type (LB)

● SRT3-LB-12 to 16



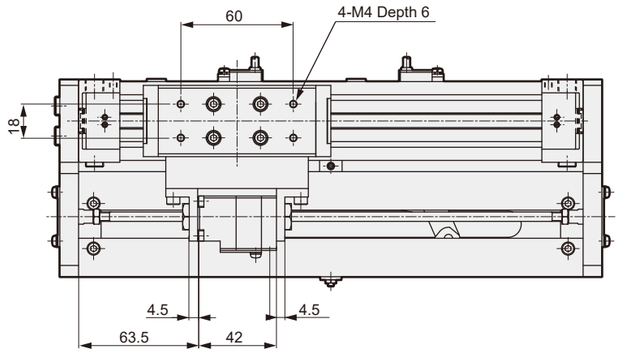
Code / Bore Size (mm)	C	F	Mounting Method SA	SB	TF	U	V	X	WA	WB
ø12 Equivalent	39	16.5	32	24	8	6	4	3.4	164	172
ø16 Equivalent	43	18.5	35	26	8	6	4	3.4	177	185

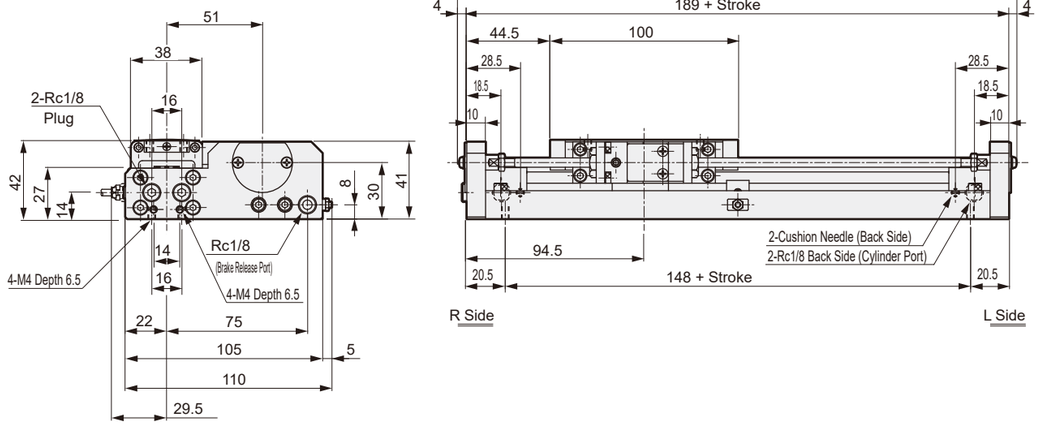
Note: For dimensions with each switch, refer to P. 190.

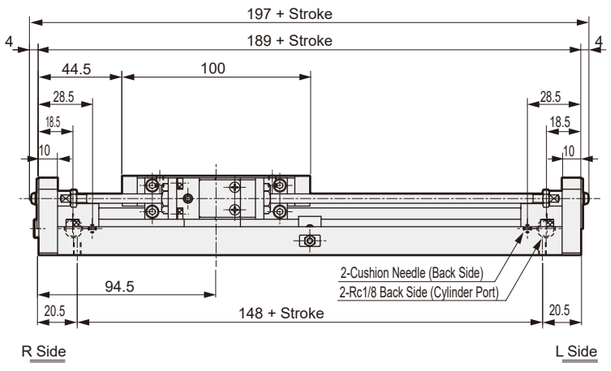
Dimensional Drawings (Bore Size: ø20 Equivalent)

Basic Type (00)

● SRT3-00-20

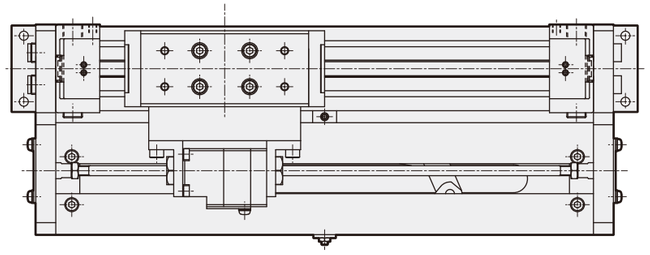


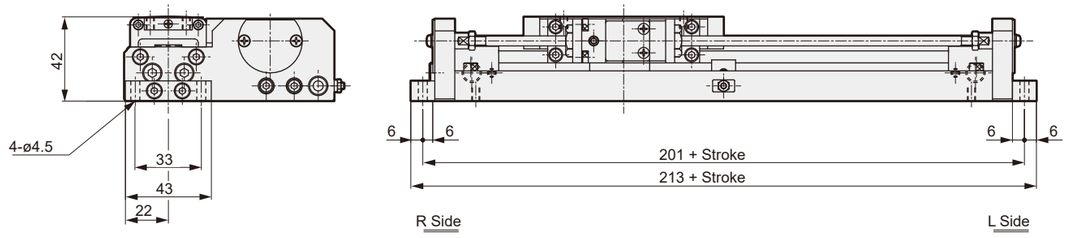




Axial Foot Type (LB)

● SRT3-LB-20

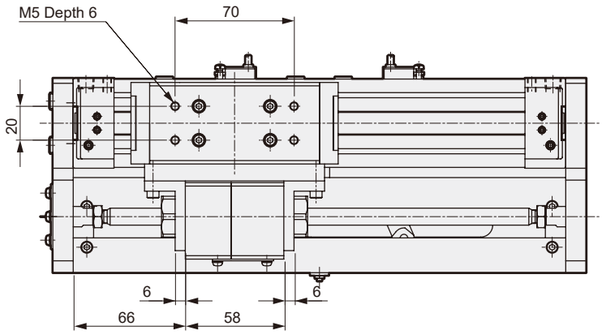


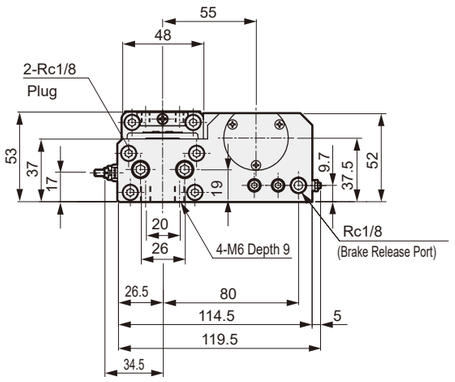


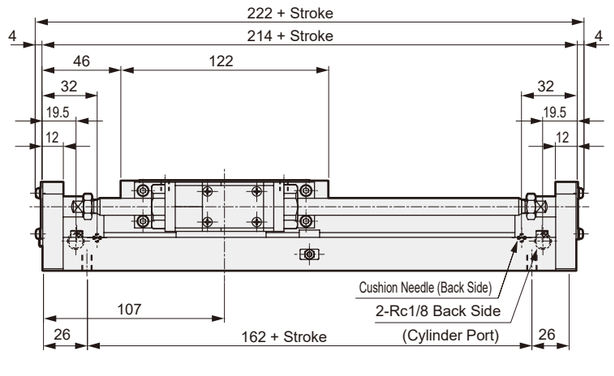
Dimensional Drawings (Bore Size: ø25 Equivalent)

Basic Type (00)

● SRT3-00-25

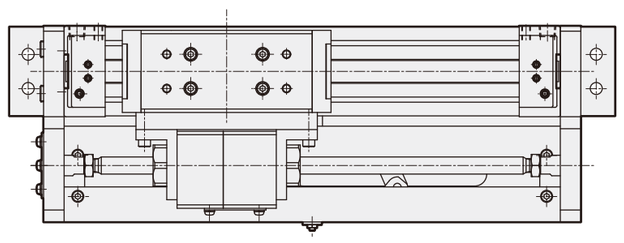


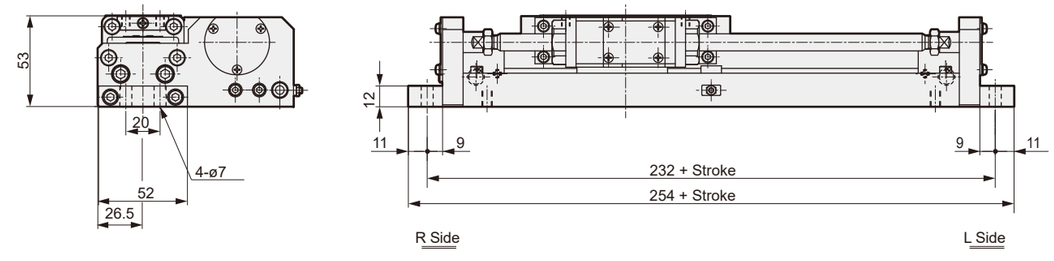




Axial Foot Type (LB)

● SRT3-LB-25

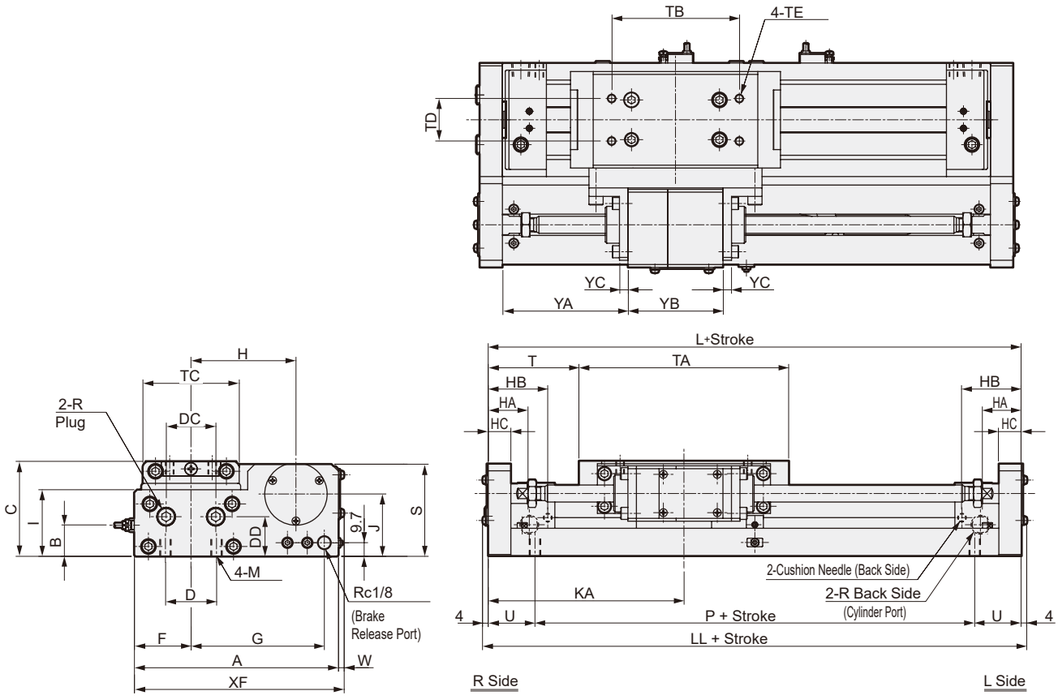




Dimensional Drawings (Bore Size: ø32 to ø63 Equivalent)

Basic Type (00)

● SRT3-00-32 to 63



Code / Bore Size (mm)	A	B	C	D	DC	DD	F	G	H	HA	HB	HC	I	J	KA	L	LL	M	P	R	S	T
ø32 Equivalent	129	18.5	57	32	27	21	33	87	66	24	37.5	14	39	39	127	254	262	M6 Depth 9	196	Rc 1/4	56	60
ø40 Equivalent	144	22	67	36	35	28	40	94	74	29	42	16	47	44	138	276	284	M8 Depth 12	210	Rc 1/4	65	64
ø50 Equivalent	177	28	82	45	35	35	48	102	89	33	51	18	57	52	147	294	302	M8 Depth 12	212	Rc 3/8	77	71
ø63 Equivalent	209	35	95	50	39	42	59	113	105	35	52	20	68	60	168	336	344	M10 Depth 15	258	Rc 3/8	93	84

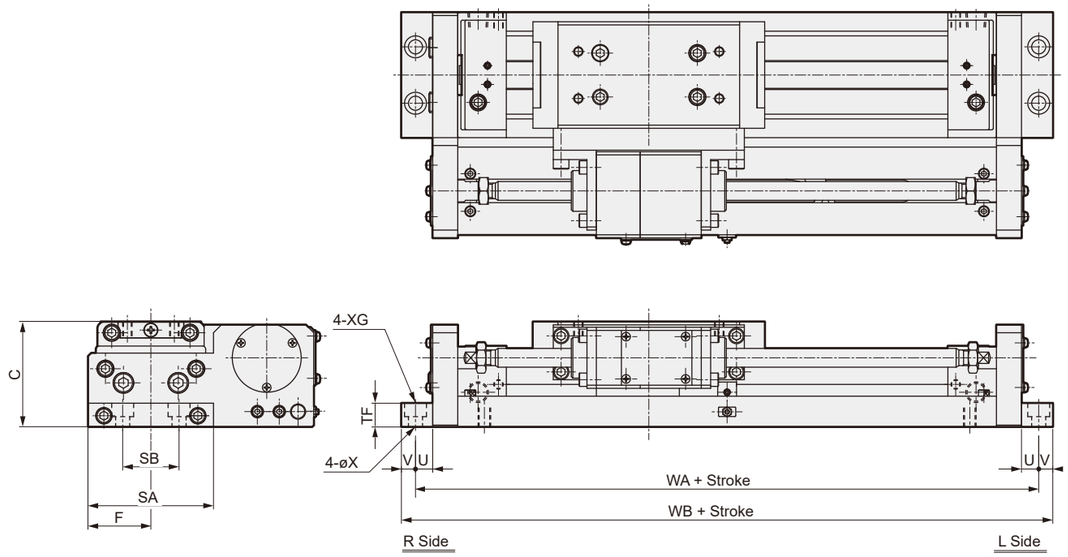
Code / Bore Size (mm)	TA	TB	TC	TD	TE	U	W	XF	YA	YB	YC
ø32 Equivalent	134	80	56	20	M6 Depth 7.5	29	4	133	78.5	69	6
ø40 Equivalent	148	90	68	30	M6 Depth 9	33	4	148	88.5	67	6
ø50 Equivalent	152	100	80	30	M8 Depth 10.5	41	4	181	92.5	73	8
ø63 Equivalent	168	110	102	40	M8 Depth 11.5	39	1	210	98.5	99	9

Note: For dimensions with each switch, refer to P. 190.

Dimensional Drawings (Bore Size: ø32 to ø63 Equivalent)

Axial Foot Type (LB)

● SRT3-LB-32 to 63

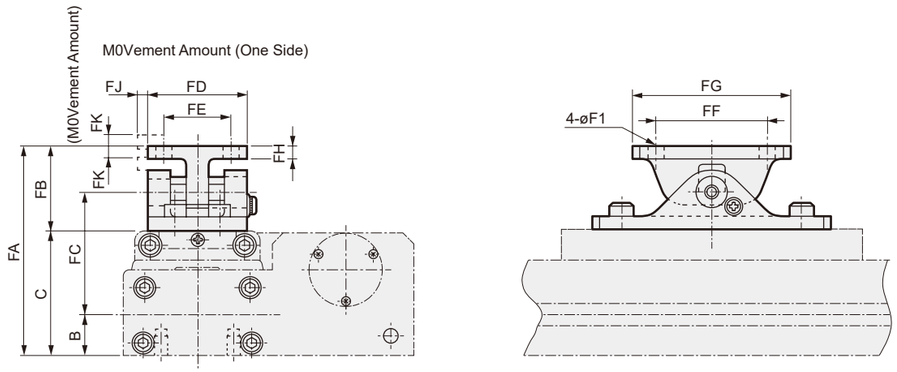


Code / Bore Size (mm)	C	F	Mounting Method SA	SB	TF	U	V	WA	WB	X	XG
ø32 Equivalent	57	33	64	32	12	9	11	272	294	7	-
ø40 Equivalent	67	40	80	36	15	11	9	298	316	9	14 Counterbore Depth 8.6
ø50 Equivalent	82	48	94	45	20	11	9	316	334	9	14 Counterbore Depth 8.6
ø63 Equivalent	95	59	116	50	25	13	12	362	386	11	17.5 Counterbore Depth 10.8

Note: For dimensions with each switch, refer to P. 190.

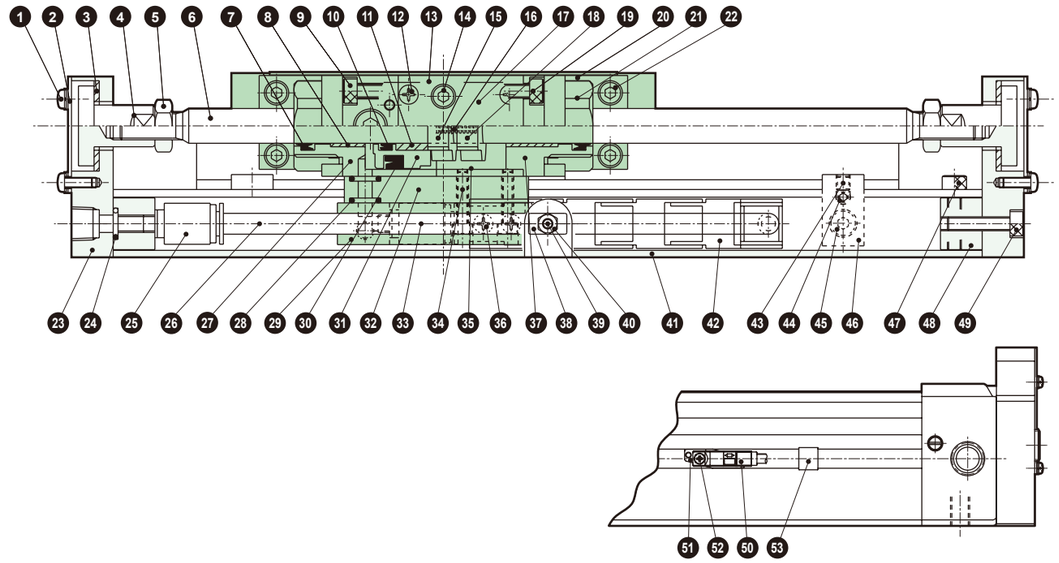
Dimensional Drawings with Option

● Floating Joint



Code / Bore Size (mm)	FA	FB	FC	FD	FE	FF	FG	FH	FI	FJ	FK	B	C
ø12 Equivalent	54	21	31.5	24	16	30	40	3	3.4	3	3	10.5	33
ø16 Equivalent	58	21	34	24	16	30	40	3	3.4	3	3	12	37
ø20 Equivalent	67	25	39	30	20	40	56	4	4.5	3	3	14	42
ø25 Equivalent	78	25	47	30	20	40	56	4	6	3	3	17	53
ø32 Equivalent	95	38	55.5	45	30	50	70	6	7	5	5	18.5	57
ø40 Equivalent	105	38	62	45	30	50	70	6	7	5	5	22	67
ø50 Equivalent	126	44	73	60	40	70	90	8	9	5	5	28	82
ø63 Equivalent	139	44	79	60	40	70	90	8	9	5	5	35	95

Internal Structure and Materials



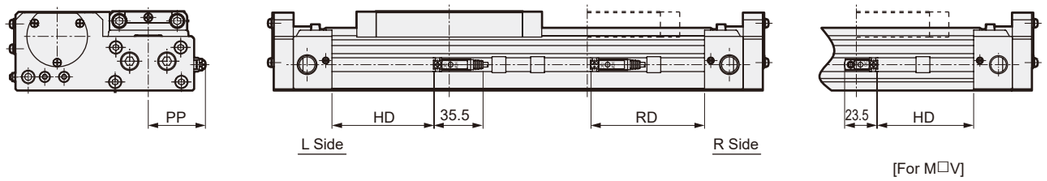
Brake Part Cannot Be Disassembled

No.	Part Name	Material	Remarks	No.	Part Name	Material	Remarks
1	Pan Head Screw	Steel	Zinc Chromate	29	Adapter	Aluminum Alloy	Alumite
2	Joint Cover	Aluminum Alloy	Alumite	30	Piston Packing	Nitrile Rubber	
3	Slide Plate	Bearing Alloy		31	Release Piston	Aluminum Alloy	Alumite
4	Floating Joint	Steel	Manganese Phosphate	32	Spacer	Aluminum Alloy	Alumite
5	Hexagon Nut Type 3	Steel	Zinc Chromate	33	Push-in Fitting		
6	Brake Shaft	Steel	Industrial Chrome Plating	34	Hexagon Socket Head Cap Screw	Steel	Black Oxide
7	Rod Packing	Nitrile Rubber		35	Body B	Aluminum Alloy	Alumite
8	Bearing Bush	Bearing Alloy		36	Pan Head Screw	Steel	Zinc Chromate
9	Hexagon Socket Head Cap Screw	Steel	Black Oxide	37	Brake End Cover	Aluminum Alloy	Alumite
10	Rod Packing	Nitrile Rubber		38	Square Nut	Steel	Zinc Chromate
11	Bearing Bush	Oil Impregnated Bearing Alloy		39	Pan Head Screw	Steel	Zinc Chromate
12	Pan Head Screw	Steel	Zinc Chromate	40	Hexagon Nut Type 3	Steel	Zinc Chromate
13	Brake Mounting Base	Aluminum Alloy	Alumite	41	Cable Holder	Aluminum Alloy	Alumite
14	Hexagon Socket Head Cap Screw	Steel	Black Oxide	42	Cable Carrier	Special Resin	
15	Brake Plate A	Special Steel	Zinc Chromate	43	Hexagon Socket Set Screw	Steel	Black Oxide (ø12 to ø40 equivalent only)
16	Brake Spring	Steel	Black Oxide	44	Hexagon Socket Set Screw (ø12 to ø40 equivalent) Hexagon Socket Button Head Screw (ø50, ø63 equivalent)	Steel	Black Oxide
17	Cover	Aluminum Alloy	Alumite				
18	Brake Plate B	Special Steel	Zinc Chromate	45	Hexagon Socket Button Head Screw	Steel	Black Oxide
19	Hexagon Socket Head Cap Screw	Steel	Black Oxide	46	Rail Stopper Plate	Steel	Zinc Chromate
20	Brake Mounting Foot	Steel	Zinc Chromate	47	Hexagon Socket Head Cap Screw	Steel	Black Oxide
21	Fixing Nut	Steel	Zinc Chromate	48	Cable Holder Stopper	Aluminum Alloy	Alumite
22	Hexagon Socket Head Cap Screw	Steel	Black Oxide	49	Hexagon Socket Head Cap Screw	Steel	Black Oxide
23	End Face Flange	Aluminum Alloy	Alumite	With Switch			
24	Gasket	Nitrile Rubber		50	Switch		
25	Push-in Fitting			51	Mounting Bracket	Stainless Steel	
26	Tube	Polyamide		52	Cross-Recessed Pan Head Screw	Stainless Steel	
27	Body A	Aluminum Alloy	Alumite	53	Lead Wire Holder	Polyacetal	
28	Gasket	Nitrile Rubber					

For maintenance parts, please visit the CKD Equipment Product Site (https: //www.ckd.co.jp/kiki/en/) → "model No." → Maintenance Parts.

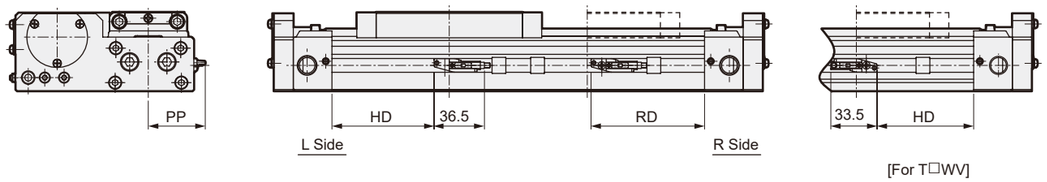
SRT3 Series Switch External Dimensions Diagram

● M0H/V, M5H/V, M2H/V, M2WV, M3H/V, M3WV, M3PH/V



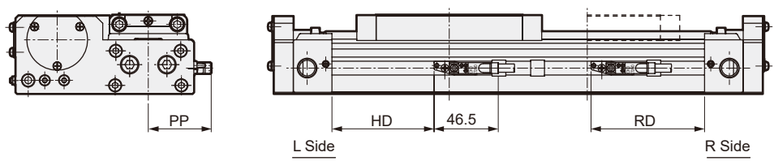
[For M□V]

● T2WH/V, T3WH/V



[For T□WV]

● T2YD, T2YDT



Code	M□			T2W, T3W			T2YD(T)		
Bore Size (mm)	PP	HD	RD	PP	HD	RD	PP	HD	RD
ø12 Equivalent	24.5	40.5	60.5	24.3	32	69	28.4	36	65
ø16 Equivalent	26.5	47	67	26.3	38	76	30.4	42	72
ø20 Equivalent	29.5	52.5	72.5	29.3	44	81	33.4	48	77
ø25 Equivalent	34.5	60	82	34.3	52	90	38.4	56	86
ø32 Equivalent	41.5	74	96	41.3	66	104	45.4	70	100
ø40 Equivalent	48.5	80	102	48.3	72	110	52.4	76	106
ø50 Equivalent	56.5	79	101	56.3	71	109	60.4	75	105
ø63 Equivalent	67.5	98	120	67.3	90	128	71.4	94	124

MEMO

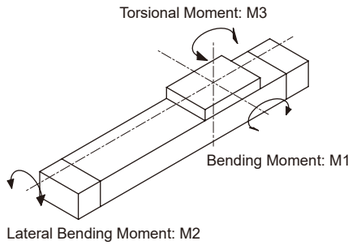
Rodless Type
SRL3
SRG3
SRM3
SRT3
MRL2
MRG2
SM-25
Cylinder Switch
Ending

Rodless Cylinder with Brake (SRT3) Model Selection Guide

[STEP1]

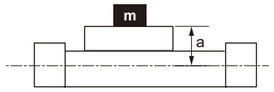
A moment acts depending on the cylinder mounting direction and the position of the center of gravity of the load.

● Types of Moment Generated by Load



[Table 1] Value of a

Bore Size	a (m)
ø12 Equivalent	0.023
ø16 Equivalent	0.025
ø20 Equivalent	0.028
ø25 Equivalent	0.036
ø32 Equivalent	0.039
ø40 Equivalent	0.045
ø50 Equivalent	0.054
ø63 Equivalent	0.060



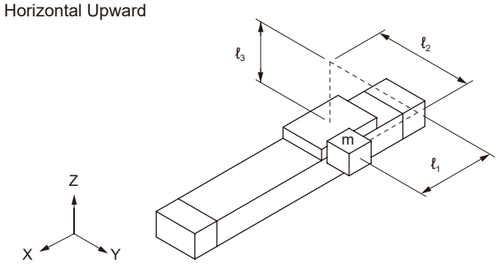
1 Determine the static moment.

Unit: N·m

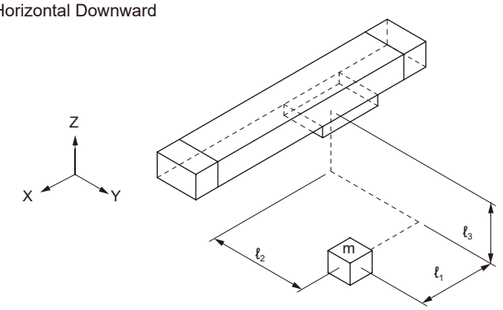
Mounting Direction		Horizontal Upward	Horizontal Downward	Horizontal Lateral	Vertical
Vertical LoadW		m x 9.8			-
Static Moment	M1	W x ℓ_1	W x ℓ_1	–	W x (ℓ_3 + a)
	M2	W x ℓ_2	W x ℓ_2	W x (ℓ_3 + a)	–
	M3	–	–	W x ℓ_1	W x ℓ_2

m : Load weight (kg)
ℓ_1 : Stroke distance from the center of table to the center of gravity of load [m]
ℓ_2 : Length in the width direction from the center of table to the center of gravity of load [m]
ℓ_3 : Length in the vertical direction from the center of table to the center of gravity of load [m]

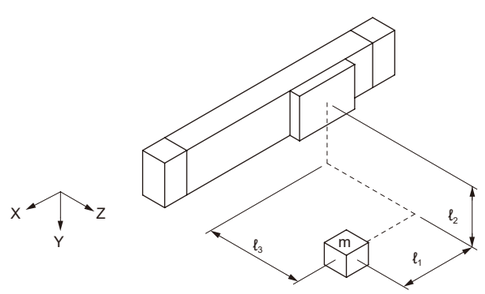
Horizontal Upward



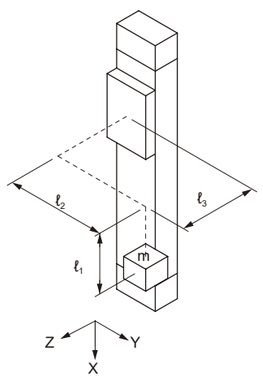
Horizontal Downward



Horizontal Lateral



Vertical



2 Determine the dynamic moment generated by the inertial force of the load at the stroke end.

Unit: N·m

Mounting Direction		Horizontal Upward	Horizontal Downward	Vertical	Horizontal Lateral
Dynamic Moment	M1i	W x (ℓ_3 + a) x G			
	M2i	Dynamic moment M2i does not occur			
	M3i	W x ℓ_2 x G			

Dynamic moment is calculated as above regardless of mounting direction.

The approximate value of G coefficient is obtained from Table 2.

[Table 2] Va (Average Speed)= $\frac{\text{Moving Distance}}{\text{Moving Time}}$ (m/s)

Va (Average Speed) (m/s)	Vm (Stroke End Speed) (m/s)	G Coefficient
0.3	to 0.65	9
0.6	to 1.00	15
0.9	to 1.30	23
1.2	to 2.00	40

G Coefficient = ☐

3 Select the approximate cylinder I.D.

Select the approximate cylinder I.D.

M1+M1i = ☐ (N·m)→(ø)
M2 = ☐ (N·m)→(ø)
M3+M3i = ☐ (N·m)→(ø)
W = ☐ (N) →(ø)
E'=$\frac{1}{2}$ ×m×Vm² = ☐ (J) →(ø)

Temporarily select the maximum Bore Size

ø ☐

[Table 3] Allowable Values

Item / Bore Size (mm)	Wmax (N)	M1max (N·m)	M2max (N·m)	M3max (N·m)
ø12 Equivalent	30	1.5	0.6	0.6
ø16 Equivalent	140	5	1	1
ø20 Equivalent	200	10	1.5	3
ø25 Equivalent	360	17	5	10
ø32 Equivalent	620	36	10	21
ø40 Equivalent	970	77	23	26
ø50 Equivalent	1470	154	32	42
ø63 Equivalent	2320	275	52	76

[Table 4] Allowable Absorbed Energy (E_0)

Bore Size (mm)	Built-in Air Cushion (J)
ø12 Equivalent	0.03
ø16 Equivalent	0.22
ø20 Equivalent	0.59
ø25 Equivalent	1.40
ø32 Equivalent	2.57
ø40 Equivalent	4.27
ø50 Equivalent	9.13
ø63 Equivalent	17.4

Note: Shock absorbers cannot be attached to SRT3. Kinetic Energy due to Load: If E' exceeds the allowable absorbed energy: E_0, install an external buffer device.

4 Determine the combined moment at stroke end (M_T).
(Confirm that the following formula is satisfied for the tube Bore Size selected in 3.)

$$M_T = \frac{M1 + M1_i}{M1max} + \frac{M2}{M2max} + \frac{M3 + M3i}{M3max} + \frac{W}{Wmax} < 1$$

M : Combined Moment (Condition is less than 1.)
Wmax : Max allowable value of W (from Table 3)
M1max : M1 Max allowable value (from Table 3)
M2max : M2 Max allowable value (from Table 3)
M3max : M3 Max allowable value (from Table 3)

·If M_T greatly exceeds 1, change the selection conditions.
·If M_T slightly exceeds 1, it may become 1 or less by improving accuracy in STEP 2. Proceed to STEP 2 and verify.

[STEP2]

Next, improve the accuracy of load factor, effective thrust, stroke end speed, and combined moment value.

● Determine the load factor.

$$\alpha = \frac{F_0}{F} \times 100\ [\%]$$

α : Load Factor
F_0: Force required to move the workpiece (N)
F : Cylinder Effective Thrust (N) (Fig 1 to 3)

Horizontal Operation	Vertical Operation
$F_0 = F_W + F_1 + F_2 + F_3 + F_L$	$F_0 = W + F_1 + F_2 + F_3 + F_L$

F_W: W x 0.2 (N)
F_1: M_1 x C1 Note (N)
F_2 : M2 x C2 Note (N)
F_3: M_3 x C3 Note (N)
F_L : Other resistance (Guide resistance, etc.) (N)
W : Load (N)

Note: Coefficient to correct the increase in friction force generated when moment is applied

[Table 5] Friction Coefficient by Each Moment 1/m

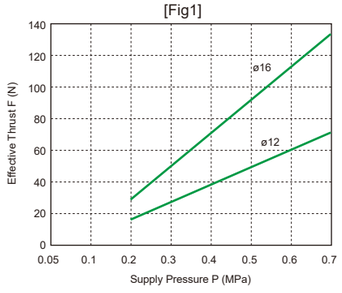
Bore Size (mm)	C1	C2	C3
ø12 Equivalent	8	27	8
ø16 Equivalent	7	24	7
ø20 Equivalent	6	21	6
ø25 Equivalent	5	16	5
ø32 Equivalent	4	13	4
ø40 Equivalent	4	11	4
ø50 Equivalent	4	9	4
ø63 Equivalent	3	8	3

[Table 6] Guideline for Load Factor

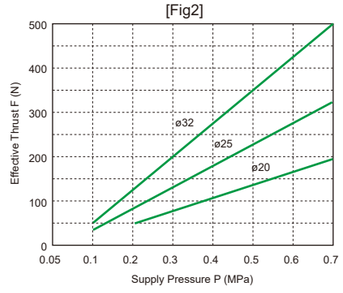
Operating Pressure (MPa)	Load Factor (%)
0.2 to 0.3	α≤40
0.3 to 0.6	α≤50
0.6 to 0.7	α≤60

● Graph for Determining Effective Thrust

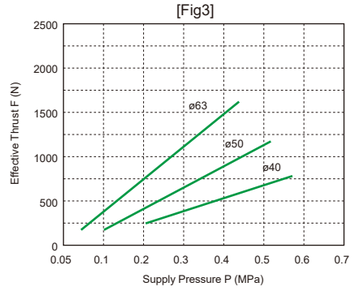
[Fig1]



[Fig2]



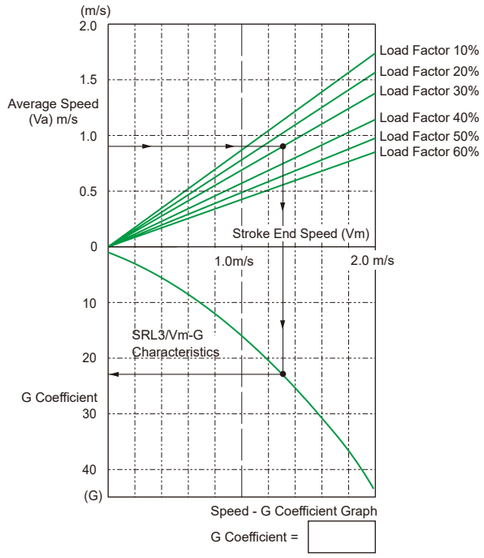
[Fig3]



[STEP3]

Obtain the stroke end speed (Vm) from <Fig. 3> using the average speed (Va) and the load factor obtained in STEP 2, and further obtain the G coefficient.

● Speed - G Coefficient Graph <Fig. 3>



● The arrow (->) in the figure shows an example of obtaining
Average Speed : 0.9 m/s
Load Factor : 30%
at
Stroke End Speed : 1.3 m/s
G Coefficient : 22.5

[STEP4]

● Check the combined moment (M_T) with the G coefficient obtained from STEP 3.

M1 + M1i = (N·m)
M2 = (N·m)
M3 + M3i = (N·m)
W = (N)

$$M_T = \frac{M1 + M1_i}{M1max} + \frac{M2}{M2max} + \frac{M3 + M3i}{M3max} + \frac{W}{Wmax}$$

$M_T \leq 1$
↓
Bore Size Determined (*Refer to [Table 3] in STEP 1)
↓
Check Cushion Capacity

Unit: N·m

Mounting Direction		Horizontal Upward	Horizontal Downward	Vertical	Horizontal Lateral
Dynamic Moment	M1i	W x (ℓ_3 + a) x G			
	M2i	Dynamic moment M2i does not occur			
	M3i	W x ℓ_2 x G			

It is the same formula as STEP 1, but this time calculate using the G coefficient value obtained in STEP 3.

[STEP5]

● Confirmation of Cushion Capacity

$$E = \frac{1}{2} \times m \times V_{m^2}$$

E : Kinetic Energy at Stroke End (J)
m : Load Weight (kg)
Vm: Piston Cushion Entry Speed (m/s)

[Table 7] Allowable Absorbed Energy (E_0)

Bore Size (mm)	Built-in Air Cushion (J)
ø12 Equivalent	0.03
ø16 Equivalent	0.22
ø20 Equivalent	0.59
ø25 Equivalent	1.40
ø32 Equivalent	2.57
ø40 Equivalent	4.27
ø50 Equivalent	9.13
ø63 Equivalent	17.4

Note: Shock absorbers cannot be attached to SRT3. Kinetic Energy at Stroke End: If E exceeds the allowable absorbed energy: E_0, install an external buffer device.

[STEP6]

● Let the Bore Size determined by cushion capacity be [øA] . (Bore Size determined from STEP 5)

● The Bore Size determined from the load conditions is [øB] . (Bore Size determined from STEP 4)

[øA≥øB] → [øA] Select.
or
[øB] can be handled in combination with an external buffer device.

[øA<øB] → [øB] Select.

MEMO

Pneumatic Component

For Safe Use of This Product

Please read before use. Check P. 41 at the beginning for general cylinders and P. 1512 for cylinder switches.

Specific Precautions: Rodless Cylinder with Brake SRT3 Series

Design / Selection

⚠WARNING

■Structure so that the human body does not directly touch the driven object and the moving parts of the cylinder with brake.

Install a protective cover so that the human body cannot touch it directly. Or, if there is a risk of touching, provide a sensor etc. to make a safe structure such as emergency stop before touching or sounding a warning sound to notify danger.

■Use a balance circuit that considers the cylinder shooting out.

If the brake is operated at an arbitrary position during the stroke such as intermediate stop, and air pressure is applied to only one side of the cylinder, the piston will shoot out at high speed when the brake is released. In such a case, there is a risk of causing injury to the human body such as pinching hands and feet, and causing damage to the machine, so use a balance circuit like the recommended pneumatic circuit to prevent shooting out.

■The Rodless cylinder with brake is a lubrication-free specification, so absolutely do not lubricate it. It causes brake malfunction.

■Please note that holding force is the ability to hold a static load without vibration or shock after the brake is activated under no load.

Therefore, please be careful when using near the upper limit of the holding force at all times.

■Do not apply impact load, strong vibration, or rotational force when the brake is operating.

If impact load, strong vibration, or rotational force is applied from the outside, the holding force will decrease and it is dangerous, so please be careful.

■When performing intermediate stop, consider the stopping accuracy and overrun amount.

Because it is a mechanical lock, it does not stop instantly in response to the stop signal, but stops with a time delay. The stroke that slides due to this delay is the overrun amount. And the range between the maximum and minimum overrun amount is the stopping accuracy.

- Place the limit switch in front of the desired stop position by the overrun amount.
- The limit switch requires a detection length (dog length) of the overrun amount + α.
- In the case of our cylinder switch, the operating range is 7 to 16 mm (depending on the switch model). . If the overrun amount exceeds this, perform self-holding of the contact on the switch load side.

■Do not use multiple cylinders with brakes in synchronization. If synchronization is lost, excessive moment load or load concentration may occur on the cylinder where the brake worked first, causing brake release failure, reduced life, damage, etc.

■To further improve stopping accuracy, shorten the time from the stop signal until the brake operates and stops as much as possible.

To do so, use a DC type control electric circuit and valve with good response, and place the valve and cylinder as close as possible.

■Please note that stopping accuracy is affected by changes in piston speed.

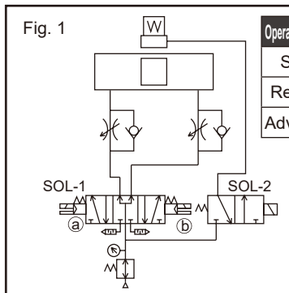
If the piston speed changes due to load fluctuation or disturbance during the reciprocating stroke of the cylinder, the dispersion of the stop position will increase, so consider keeping the piston speed constant immediately before the stop position. Also, during the cushion stroke and while in the acceleration range from the start of operation, the speed change is large, so the dispersion of the stop position becomes large. The stopping accuracy at piston speed 300 mm/s with no load is +/- 1.5 mm (reference value).

■Precautions for Basic Circuit

● For Horizontal Load

Please pipe as shown in Fig. 1 for use. In the case of a rodless cylinder, the cross-sectional areas on both sides of the piston are equal, so a pressure reducing valve for balancing is not necessary.

Fig. 1

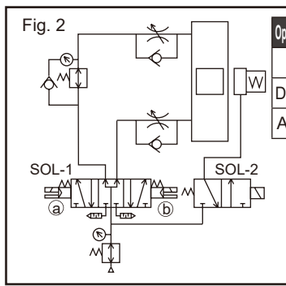


Operating State	ⓐSOL-1ⓑ	SOL-2
Stop	OFF	OFF	OFF
Retract	ON	OFF	ON
Advance	OFF	ON	ON

● For Vertical Load

If the load is downward as shown in Fig. 2, the table will malfunction in the Load Direction when the brake is released, so install a pressure reducing valve with check valve on the upper side to reduce the thrust in the Load Direction and balance the load.

Fig. 2



Operating State	ⓐSOL-1ⓑ	SOL-2
Stop	OFF	OFF	OFF
Descend	ON	OFF	ON
Ascend	OFF	ON	ON

Note: If pressure fluctuation occurs due to other Pneumatic Component, install a dedicated pressure reducing valve to stabilize operation.

■When releasing the brake, make sure to release the brake earlier than the cylinder operation. If the cylinder operation is faster, the brake may not release.

■If back pressure is applied during locking, the lock may be released, so use a single valve or an individual exhaust type manifold for the brake release valve.

■To prevent the piston from shooting out at startup, be sure to use a 3-position PAB connection (both-side pressurization) valve for cylinder drive.

■To balance the thrust including the load, be sure to insert a pressure reducing valve with check valve on the side with larger thrust.

⚠CAUTION

■Cannot be used in environments where welding spatter etc. falls on the cylinder.

■Cannot be used in places where cutting oil, coolant fluid, oil mist, etc. come directly into contact with the cylinder.

If it is unavoidable due to cylinder installation, be sure to provide a cover etc. to protect the cylinder.

■Cannot be used in environments where foreign matter such as chips, dust, dirt, spatter, etc. come directly into contact with the cylinder or fly around.

If it is unavoidable due to cylinder installation, provide a cover etc. so that it can be protected. Also, be sure to consult us when using in such an environment.

■Slit type rodless cylinders represented by SRL3 structurally have external air leakage at a level that does not affect speed control.

■Be careful not to generate negative pressure inside the cylinder tube. When used as an air balancer or when the table is driven by external force, inertial force, etc. with all ports blocked, negative pressure may be generated in the cylinder, causing the seal belt to detach and air leakage to occur. Be careful not to generate negative pressure in the cylinder by driving with external force, inertial force, etc.

■Precautions Regarding Stopping Accuracy

● Stop Pitch and Load Factor

Stopping accuracy varies depending on stop pitch and load factor. The load factors in the table below are recommended to obtain the specified stopping accuracy.

Stop Pitch	Load Factor
50 mm or less	20% of Thrust
50 mm to 100 mm	40% of Thrust
100 mm or more	60% of Thrust

● Selection of Brake Valve

Stopping accuracy and overrun amount vary depending on the response of the brake valve. Also, connect the valve directly to the brake port to improve stopping accuracy.

● When Using PC (Programmable Controller)

If a PC (Programmable Controller) is used for the electric control device of the brake valve, the stopping accuracy will deteriorate due to the scan time (calculation processing time). When using a PC, do not incorporate only the brake valve into the PC circuit.

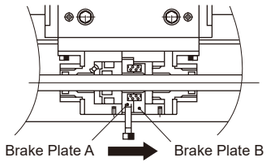
■Do not change the load weight significantly when the brake is stopped. The stop position may change.

■Abrasion powder with the protective tape may be generated when the cable carrier slides. Please consider the usage environment.

During Use

⚠WARNING

■How to release the brake manually



● Remove the cover, screw a Hexagon Socket Head Cap Screw etc. into the brake plate A and tilt it in the direction of the arrow to make the brake plates A and B parallel, and the Piston Rod becomes free. Please note that unless the two brake plates are securely tilted, release will be in one direction only.

■The brake can be released by manual release operation or by pressurizing air to the brake release port. When installing a load, if the brake is released by this operation, the load may fall, so be sure to return the manual release operation to the initial state, or confirm that the brake works with no air in the brake release port before installation.

■Do not apply force exceeding the brake holding force listed in the catalog to the cylinder.

■If the cylinder speed is fast, the length of the detection dog must take into account the response time of the relay. Please note that if the dog length is short, the stop signal will not be output and it will not stop.

■During equipment maintenance, for safety, please take separate measures to prevent the load from falling due to its own weight.

■Never disassemble and inspect the brake part as it is dangerous when reused.

■The required amount of grease is applied to the brake part, so avoid applying more grease and do not wipe off the grease.

■The brake part cannot be replaced.

■Please always use with the dust cover attached except during manual release, as it may cause a malfunction.

⚠CAUTION

■Do not apply strong impact or excessive moment to the table.

■Perform sufficient alignment when connecting to a load that has an external guide mechanism.

● The longer the stroke, the larger the variation in the axis center, so please consider a connection method (floating) that can absorb the displacement amount.

■Adjust the air balance of the cylinder.

With the brake released, attach the load to the cylinder and balance the load by adjusting the air pressure on the rod side and head side of the cylinder. By ensuring this load balance, it is possible to prevent malfunctions such as cylinder shooting out when releasing the brake and brake not releasing normally.

■Adjust the mounting position of the detection part such as the cylinder switch.

When performing intermediate stop, adjust the mounting position of the detection part such as the cylinder switch considering the overrun amount with respect to the desired stop position.

■Load fluctuation during the reciprocating stroke of the cylinder causes changes in piston speed, and changes in piston speed increase the dispersion of the stop position. Adjust the mounting so that there is no load fluctuation during the cylinder reciprocating stroke, especially immediately before stopping.

■During the cushion stroke and while in the acceleration range from the start of operation, the speed change is large, so the dispersion of the stop position becomes large. Therefore, please note that if step operation with a short stroke from the start of operation to the next position is performed, the accuracy in the specification column may not be achieved.

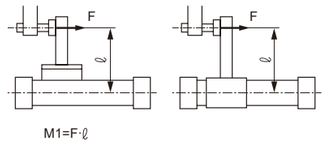
■Abrasion powder with the protective tape may be generated when the cable carrier slides. Please be careful when using in an environment that dislikes dust.

■Ensure that the moment including the inertial force generated during load movement or stopping does not exceed the allowable load. If this value is exceeded, damage will occur.

● When the overhang is large and stopping at both ends with the piston, a bending moment acts due to the inertial force of the load even if it is within the range of the internal cushion's absorbed energy. When kinetic energy is large and an external cushion etc. is used, please hit the workpiece center of gravity as much as possible.

● When an external stopper is used, please select taking into account the bending moment due to cylinder thrust.

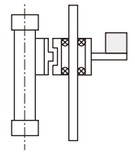
● Moment acting when stopped by an external stopper



M3=F·ℓ
F : Cylinder Thrust
ℓ : From cylinder center
Distance to stopper

● When an external guide is attached, if it is not aligned, the movement will not be smooth, and at the same time, the resistance due to twisting will act as a moment, so structure the connection part to absorb misalignment.

● Example of using guide



■Avoid electric welding after installing the rodless cylinder. Current flows through the cylinder, causing sparks between the dust proof belt and the cylinder tube, damaging the dust proof belt.

■Operating a unit with excessive inertia will cause damage to the Cylinder Body and malfunction, so be sure to use it within the allowable range.

■Do not make scratches, dents, etc. on the Cylinder Body. It causes malfunction.

■Please note that in usage conditions where negative pressure is generated in the cylinder due to external force, inertial force, etc., external air leakage and malfunction may occur due to detachment of the seal belt.

■Please treat our shock absorber as a consumable part. Replace it when a decrease in energy absorption capacity is observed or when operation is no longer smooth.

■If the air supply piping is thin or long, the stopping accuracy will deteriorate, so please consider this sufficiently.

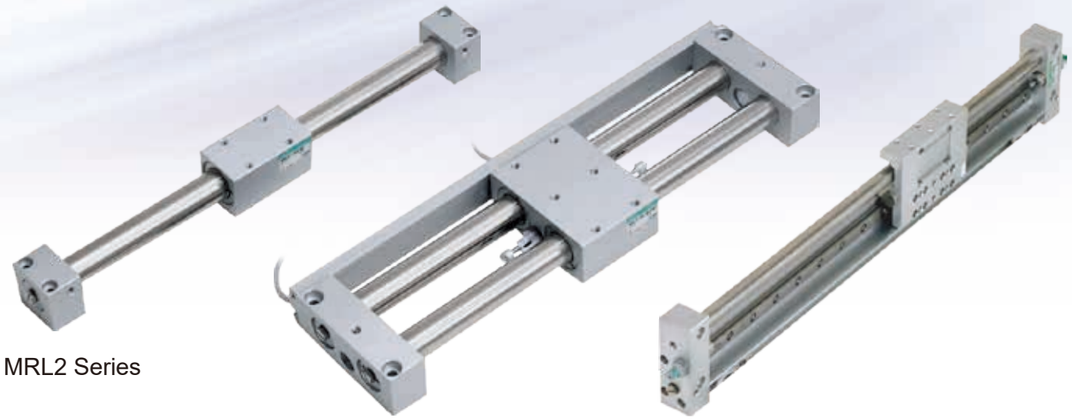
■If the cylinder has been stopped for a long time, such as first thing in the morning or afternoon, the frictional resistance increases and the piston speed changes, so the stopping accuracy may deteriorate. Perform a break-in operation to obtain stable stopping accuracy.

For precautions during installation, adjustment, use, and maintenance, please refer to "During Use" in this catalog and the Instruction Manual on the CKD Component Product Site (https://www.ckd.co.jp/kiki/en/) -> "Model Number".

Magnet Type Rodless Cylinder

Magnet type rodless cylinder with improved lubrication mechanism for long life and stable operation

Compact type with shorter overall length and lower slider height compared to slit type rodless cylinders



MRL2 Series

MRL2-G Series
MRL2-W Series

MRG2 Series

Equipped with Lube-Keeper lubrication mechanism for renewed performance

Fiber aggregate material (Lube-Keeper) impregnated with grease is attached to the sliding parts of the piston and slider. Enables stable lubricant supply over a long period and prevents wear. Achieved a significant improvement in lifespan (more than double compared to conventional products) and stabilization of operation.

Durability Performance
2 times
More (Conventional)

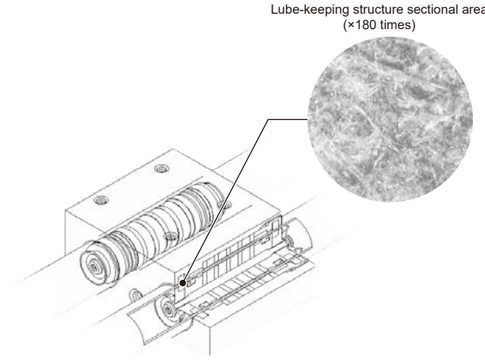
Features of Lube-Keeper

Lubrication supply and absorption function

Due to the capillary action effect, impregnated grease can be applied evenly and stably to the sliding surface, and excess grease is absorbed.

Dust wiper function

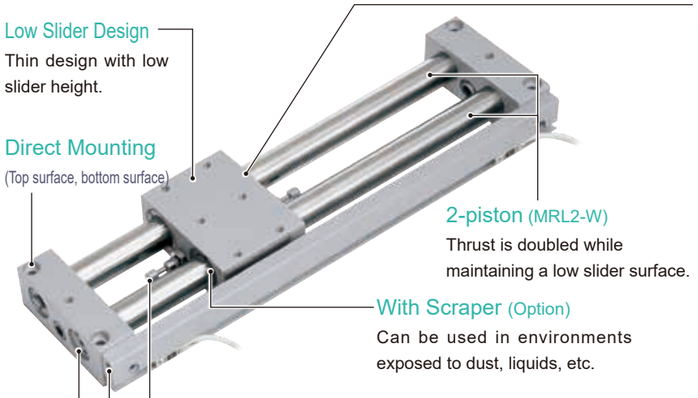
In addition to dust, abrasion powder from packings, etc., is also caught within the fiber aggregate material, reducing contamination of sliding parts.



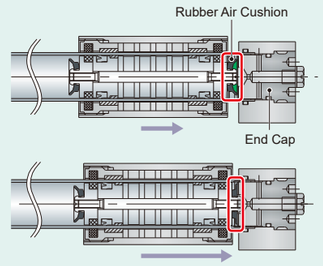
MRL2 Series (ø6 to ø32)

Improved Environmental Performance

Rubber air cushion available as an option. Reduces impact noise at the stroke end and improves the factory environment.



Rubber Air Cushion Mechanism Explanation



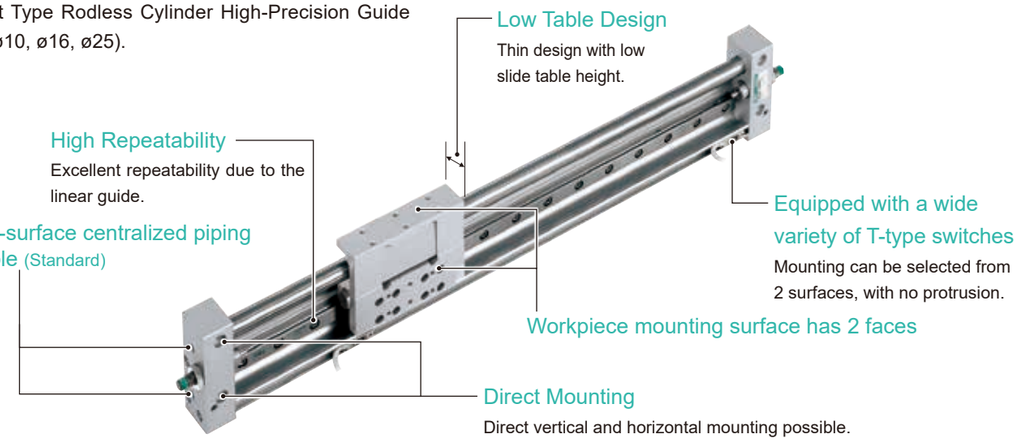
When the piston operates and the rubber air cushion contacts the end cap, a sealed air space is formed in part A. The air in this sealed space is compressed as the piston operates, absorbing energy. At the stroke end, energy absorption due to the compressive strain of the rubber air cushion is also added.

Model Variations	Tube Bore (mm)	Stroke (mm)	Variation
Basic type MRL2 Series Space-saving basic type	ø6 ø10	Max. 1500	With switch Ultra Low Speed Type
Simplified guide (1-piston) MRL2-G Series Simplified guide type with a cylinder and a guide	ø16 ø20		
Simplified guide (2-piston) MRL2-W Series Simplified guide with two cylinders provides twice as much thrust	ø25 ø32		

MRG2 Series (ø10, ø16, ø25)

Equipped with a linear guide for high precision and high rigidity.

Magnet Type Rodless Cylinder High-Precision Guide Type (ø10, ø16, ø25).



MRL2

Magnet Type Rodless Cylinder

ø6, ø10, ø16, ø20, ø25, ø32

CONTENTS

Product Introduction	202
Model Selection Points	206
Series System Chart	208
Variation/Option Combination Availability Table	210
● Basic (MRL2)	212
● Simplified guide 1-piston (MRL2-G)	212
● Simplified guide 2-piston (MRL2-W)	212
Dimensions with Switch	226
Model Selection Guide	228
Technical Data	232
⚠ Precautions for Use	234

Rodless Type
SRL3
SRG3
SRM3
SRT3
MRL2
MRG2
SM-25
Cylinder Switch
Ending

CONTENTS	Page
Series System Chart	208
⚠ Precautions for Use	234
Technical Data	
MRL2-G / MRL2-W Slider Deflection Amount Rubber Air Cushion Data	232

MRL2/MRL2-G/MRL2-W Series

● Model Selection Points

	Model Selection Points	Recommended Model		Features		Page
Basic Type	· When using a guide system separately from the cylinder. · When space is limited. *Use in conjunction with a guide.	**MRL2** ø6, ø10, ø16, ø20, ø25, ø32 		• Long lifespan due to the adoption of Lube-Keeper. • By selecting the rubber air cushion, reduction of impact acceleration & impact noise level at the stroke end is achieved. • Cylinders can be mounted directly.	Model No. Notation	212
					Specifications	214
					Dimensional Drawings	216
					Internal structure and parts list	220
					Selection Guide	228
					Switch Mounting Position Dimension Drawing	226
Simple Guide Type	· When securing the slider's trajectory. · When used for general conveyance. · When the mounted load is large. · When stroke adjustment is necessary. · When absorbing shock at the stroke end with a shock absorber.	**MRL2-GAA** (Simple Guide Type 1-Piston Type) ø6, ø10, ø16, ø20, ø25, ø32 		• Twin-tube type of MRL2 series, no need for a separate guide system. • Thin design with low slide table height, saving space. • Absorbs shock at the stroke end with the shock absorber equipped type. • Single-surface piping is possible with the switch-equipped centralized piping type.	Model No. Notation	212
					Specifications	214
					Dimensional Drawings	217
					Internal structure and parts list	222
					Selection Guide	228
					Switch Mounting Position Dimension Drawing	226
	• When securing the slider's trajectory. • When used for general conveyance. • When the stacked load is large and a double thrust is required. • When stroke adjustment is necessary. • When absorbing shock at the stroke end with a shock absorber.	**MRL2-WAA** (Simple Guide Type 2-Piston Type) ø6, ø10, ø16, ø20, ø25, ø32 		• Twin-tube type of MRL2 series, no need for a separate guide system. • With the twin piston type, the generated thrust is twice that of a single piston model. • Thin design with low slide table height, saving space. • Absorbs shock at the stroke end with the shock absorber equipped type. • Single-surface piping is possible with the switch-equipped centralized piping type.	Model No. Notation	212
					Specifications	214
					Dimensional Drawings	217
					Internal structure and parts list	224
					Selection Guide	228
					Switch Mounting Position Dimension Drawing	226

Magnet Type Rodless Cylinder
MRL2 Series

●: Standard, ◎: Option, : Not available

Variations	Model Number Circuit Diagram Code	Bore Size (mm)	Cushion: Rubber Cushion	Cushion: Rubber Air Cushion	Standard Stroke (mm): 50	100	150	200	250	300	350	400	500	600	700	Min Stroke (mm)	Max Stroke *1 (mm)	Intermediate stroke (per mm)	Options: With Scraper S	Options: Switch Equipped Centralized Piping R	Options: with Shock Absorber C	Page
Basic Type With Switch Low speed type	MRL2 MRL2-L MRL2-F	ø6	●	◎	●	●	●	●								1	300	1	◎			212
		ø10			●	●	●	●	●	●							500		◎			
		ø16				●	●	●	●	●		●	●				1000		◎			
		ø20						●	●	●	●	●	●	●	●		1500		◎			
		ø25						●	●	●	●	●	●	●	●		1500		◎			
		ø32						●	●	●	●	●	●	●	●		1500		◎			
Simple Guide Type 1-Piston Type With Switch Low speed type	MRL2-G MRL2-GL MRL2-GF	ø6	●	◎	●	●	●	●								1	300	1	◎		◎	212
		ø10			●	●	●	●	●	●							500		◎	◎	◎	
		ø16				●	●	●	●	●		●	●				1000		◎	◎	◎	
		ø20						●	●	●	●	●	●	●	●		1500		◎	◎	◎	
		ø25						●	●	●	●	●	●	●	●		1500		◎	◎	◎	
		ø32						●	●	●	●	●	●	●	●		1500		◎	◎	◎	
Simple Guide Type 2-Piston Type With Switch Low speed type	MRL2-W MRL2-WL MRL2-WF	ø6	●	◎	●	●	●	●								1	300	1	◎		◎	212
		ø10			●	●	●	●	●	●							500		◎	◎	◎	
		ø16				●	●	●	●	●		●	●				1000		◎	◎	◎	
		ø20						●	●	●	●	●	●	●	●		1500		◎	◎	◎	
		ø25						●	●	●	●	●	●	●	●		1500		◎	◎	◎	
		ø32						●	●	●	●	●	●	●	●		1500		◎	◎	◎	

*1: • The Max Stroke with switch is: ø6:200 mm, ø10:300 mm, ø16:500 mm, ø20 to ø32:700 mm.
• Max Stroke of the fine speed series is: ø6:300 mm, ø10:500 mm, ø16 to ø25:800 mm, ø32:700 mm
• Max Stroke of the common piping with switch is: ø10:300 mm, ø16:500 mm, ø20 to ø32:700 mm

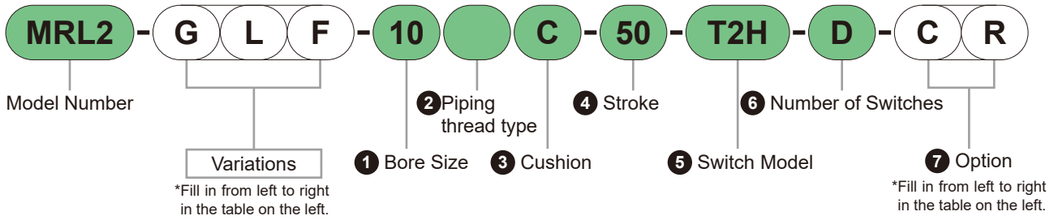
Variation and Option Item Combination Availability Table

●Mark: Standard
◎Mark: Options
○Mark: Custom-made
△Mark: Manufacturable depending on conditions (please consult)
× Mark: Not available

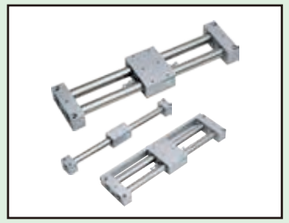
Category		Category	Variation					Piping thread		Cushion sion	Options		
			Double Acting Basic Type	Twin 1 Piston	Twin 2 Piston	With Cylinder Switch	Low speed type	NPT (ø25, ø32)	G (ø25, ø32)	With Rubber Air Cushion	with Shock Absorber	With Scraper	Switch Equipped Centralized Piping
		Code	None	G	W	L	F	N	G	C	C	S	R
Variations	Double Acting Basic Type	No Code						○	○	◎	x	◎	x
	Twin 1 Piston	G			x	◎	◎	○	○	◎	◎	◎	◎
	Twin 2 Piston	W				◎	◎	○	○	◎	◎	◎	◎
	With Cylinder Switch	L					◎	○	○	◎	◎	◎	*2
	Low speed type	F						○	○	◎	*1	x	x
Piping thread	NPT (ø25, ø32)	N							x	○	○	○	○
	G (ø25, ø32)	G								○	○	○	○
Cushion sion	With Rubber Air Cushion	C									◎	◎	◎
Options	with Shock Absorber	C										◎	◎
	With Scraper	S											◎
	Switch Equipped Centralized Piping	R											
Accessories	Cylinder Switch	Separately Shown	◎	◎	◎	◎	◎	○	○	◎	◎	◎	◎

*1: Slow speed performance upon shock absorber impact cannot be guaranteed.
*2: When selecting common piping with an "R" switch, be sure to combine the unit with "L" with switch.

[Model No. Example]



Model No.: Magnet Type Rodless Cylinder
●Variation: Simplified guide 1-piston, with switch, fine speed
1 Bore Size : ø10 mm
2 Port thread : Rc Thread
3 Cushion : Rubber Air Cushion
4 Stroke : 50 mm
5 Switch model No. : Solid State T2H Switch, Lead Wire 1 m
6 Switch quantity : 2 pcs
7 Options : With shock absorber, common piping



Magnet Type Rodless Cylinder
- **Basic MRL2-(F) Series**
- Simplified guide 1-**piston MRL2-G(F) Series**
- Simplified guide 2-**piston MRL2-W(F) Series**

● Bore Size: ø6, ø10, ø16, ø20, ø25, ø32

Circuit Diagram Code

RoHS

Model No. Notation

Without Switch
(Without magnet for switch)

MRL2-W - **6** - **C** - **50** - **C**
(1) (2) (3) (4) (5) (8)

With Switch
(Built-in Magnet for Switch)

MRL2-WL - **6** - **C** - **50** - **T2H** - **R** - **C**

(1) Model No. (2) Bore Size (3) Piping thread type (4) Cushion (5) Stroke (6) Switch Model (7) Number of Switches (8) Option

❶ Model Number

Code		Description
Basic Type	MRL2	Without Switch
	MRL2-L	With Switch
	MRL2-F	Low speed type
	MRL2-LF	Slow speed type, with switch
Simple Guide Type 1-Piston Type	MRL2-G	Without Switch
	MRL2-GL	With Switch
	MRL2-GF	Low speed type
	MRL2-GLF	Slow speed type, with switch
Simple Guide Type 2-Piston Type	MRL2-W	Without Switch
	MRL2-WL	With Switch
	MRL2-WF	Low speed type
	MRL2-WLF	Slow speed type, with switch

❷ Bore Size (mm)

Code	Description
6	ø6
10	ø10
16	ø16
20	ø20
25	ø25
32	ø32

❸ Piping thread type

Code	Content
No Code	M5 (ø6 to ø20)
	Rc thread (ø25, ø32)
*1 N	NPT thread (Custom Product)(ø25, ø32)
*1 G	G thread (Custom Product)(ø25, ø32)

*1: When the cushion is a rubber cushion (blank), the port thread code will be the following.
NPT thread: NN G thread: GN

❹ Cushion

Code	Content
No Code	Rubber Cushion
C	Rubber Air Cushion

Note: In the case of MRL2-G and W with the "C" rubber-air cushion, the stopper protrudes from the end plate by approximately 1 mm at the time of shipment.Also, please fully consider that moving the stopper to adjust the stroke may cause the rubber air cushion to become ineffective.

❺ Stroke (mm)

Bore Size	Stroke	Intermediate Stroke
ø6	1 to 300	in 1mm increments
ø10	1 to 500	
ø16	1 to 1000	
ø20 to ø32	1 to 1500	

Note: For the maximum stroke of the switch-equipped slow speed type, please refer to P. 214.

❻ Switch Model

For switch details, refer to P. 1457. Switches are shipped with the product.

Contact	Indicator LED Special Function	Wiring (Output)	Load Voltage (V) AC	Load Voltage (V) DC	Load Current (mA) AC	Load Current (mA) DC	Lead wire *1 Straight	Lead wire *1 L-shape	
Solid State	1-Color	2-wire	85 to 265	-	5 to 100	-	T1H□	T1V□	
			-	10 to 30	-	5 to 20 *2	T2H□	T2V□	
		3-wire (NPN)	-	30 or less	-	100 or less	T3H□	T3V□	
		3-wire (PNP)	-		-		T3PH□	T3PV□	
	2-color	2-wire	-	24 ± 10%	-	5 to 20	T2WH□	T2WV□	
		3-wire (NPN)	-	30 or less	-	50 or less	T3WH□	T3WV□	
	2-colorImproved Water Resistance	2-wire	-	24 ± 10%	-	5 to 20	T2WLH□	T2WLV□	*3
	1-Color Flexible Lead Wire Type		-	10 to 30	-	5 to 20 *2	T2HR3	T2VR3	

*1: Enter the code selected in the "*Lead wire length, connector specifications" table into "□" of the Switch Model.
*2: The maximum load current of 20 mA mentioned above is at 25°C. If the switch operating Ambient Temperature is higher than 25°C, it will be lower than 20 mA. (It will be 5 to 10 mA at 60°C.)
*3: It does not guarantee the water resistance of the cylinder.
*4: Switches other than the above models are also available. (Custom Product) For details, refer to P. 1457.

***Lead wire length, connector specifications**

Code	Content
Blank	1 m (Standard)
3	3 m (Option)
5	5m (Option)
W	M8 Connector, 1PIN (+), 4PIN (−) Lead wire 0.3 m

*5: T2WLH and T2WLV only can be selected.

Example) Lead wire length
1 m T1H
3 m T1H3
5 m T1H5

❼ Number of Switches

Code	Content
R	With 1 on R side
L	With 1 on L side
D	With 2 pcs
T	With 3 pcs
4	With 4 (For 4 or more, enter the number of switches.)

❽ Option

Code	Description	
C	with Shock Absorber (Basic type cannot be selected.)	
S	With scraper (Slow speed type cannot be selected.)	
R	Switch-equipped centralized piping type (Basic type and ø6 cannot be selected.)	

Note: When selecting common piping with "R" switch, select the ❶model No. with a switch (MRL2-*L).

Clean Specification

(Catalog No. CB-033SAA)

● Dust prevention structure usable in clean rooms

MRL2 - □ - . . . . - P72

MRL2 - □ - . . . . - P52

Rechargeable Battery Compatible Specification

(Catalog No. CC-1226AA)

●Structure usable in rechargeable battery manufacturing process

MRL2 - . . . . - P4*

*Contact us for details.

Switch Individual Model No. Notation

SW - T2H
(6) Switch Model

Note: Contact CKD when using an environment-friendly T-switch.

Shock Absorber Unit Model No. Notation

● Shock Absorbers + mounting nut (Hexagon Nut) each 1

Used when changing from standard type to shock absorber equipped type

MRL2 - W - 25 - C
G
(2) Bore Size

(Reference)
Applicable Shock Absorber Model No.

Model	Shock Absorber Model Number
MRL2-W-6, MRL2-G-6	NCK-00-0.1
MRL2-W-10, MRL2-G-10	NCK-00-0.1-C
MRL2-W-16, MRL2-G-16	NCK-00-0.3-C
MRL2-W-20, MRL2-G-20	NCK-00-0.7-C
MRL2-W-25, MRL2-G-25	NCK-00-1.2-C
MRL2-W-32, MRL2-G-32	NCK-00-1.2-C

Specifications

Item		MRL2(L,F) , MRL2-G(L,F) , MRL2-W(L,F)					
Bore Size	mm	ø6	ø10	ø16	ø20	ø25	ø32
Operating Method		Double Acting Type					
Operating Fluid		Compressed Air					
Max Operating Pressure	MPa	0.7					
Min Operating Pressure	MPa	0.3 *1		0.2			
Proof Pressure	MPa	1.05					
Ambient Temperature	°C	-10 to 60 (fine speed: 5 to 60) (no freezing)					
Port Size		M5				Rc1/8	
Stroke Tolerance	mm	$^{-1.5}_{0}$ (to 1000)			$^{+2.0}_{0}$ (to 1500)		
Operating Piston Speed	mm/s	50 to 500 (fine speed: 1 to 200)					
Cushion		Rubber Cushion					
Lubrication		Not required (When lubricating, use turbine oil ISO VG32) However, not possible for slow speed type					
Magnet Holding Force *2	N	19	63	166	294	350	574
Stroke Adjustment Range (one side) *3	mm	3	4	6	8.5	10	10

*1: The value for MRL2-G-6-C (with shock absorber) is 0.4.
*2: For simple guide type 2-piston type (W), the value is doubled.
*3: Stroke adjustment is not possible for MRL2 (basic type).

Stroke

Bore Size (mm)	Standard Stroke (mm)	Max Stroke (mm)	Max Stroke with switch (mm)	Max Stroke with switch-equipped centralized piping (mm)	Max Stroke for slow speed type (mm)	Min Stroke (mm)
ø6	50, 100, 150, 200	300	200	–	300	1
ø10	50, 100, 150, 200, 250, 300	500	300	300	500	
ø16	100, 150, 200, 250, 300, 400, 500	1000	500	500	800	
ø20	200, 250, 300, 350, 400, 500, 600, 700	1500	700	700	800	
ø25	200, 250, 300, 350, 400, 500, 600, 700	1500	700	700	800	
ø32	200, 250, 300, 350, 400, 500, 600, 700	1500	700	700	700	

Note: About Intermediate Stroke: Manufacturable every 1 mm.

Number of T Type Switches Mounted and Min Stroke (mm)

Switch Model	T2V, T3V		T2H, T3H		T1V		T1H	
Number of Switches / Bore Size (mm)	1	2	1	2	1	2	1	2
ø6 to ø32	5	20	5	50	5	40	5	70

Cylinder Weight

Unit (g)

Model Number	Without Switch		With Switch		Switch-equipped centralized piping type	
	Product weight when stroke = 0 mm	Added weight per S = 100 mm	Product weight when stroke = 0 mm	Added weight per S = 100 mm	Product weight when stroke = 0 mm	Added weight per S = 100 mm
MRL2-6	73	13	103	39	-	-
MRL2-10	143	28	169	48	-	-
MRL2-16	278	43	313	63	-	-
MRL2-20	542	85	587	105	-	-
MRL2-25	954	98	1017	128	-	-
MRL2-32	1230	195	1301	225	-	-
MRL2-G-6	193	28	223	54	-	-
MRL2-G-10	368	53	394	73	411	94
MRL2-G-16	635	85	670	105	691	126
MRL2-G-20	1197	155	1242	175	1269	196
MRL2-G-25	1852	196	1915	226	1997	289
MRL2-G-32	2297	390	2368	420	2455	483
MRL2-W-6	203	28	233	54	-	-
MRL2-W-10	398	53	424	73	441	94
MRL2-W-16	710	85	745	105	766	126
MRL2-W-20	1367	155	1412	175	1439	196
MRL2-W-25	2206	196	2269	226	2351	289
MRL2-W-32	2859	390	2930	420	3017	483

Note: The weight of the switch is not included in the product weight of types with switch and common piping types with switch.

Theoretical Thrust Table

● **MRL2, MRL2-G**

(Unit: N)

Bore Size (mm)	Operating Direction	Operating Pressure MPa					
		0.2	0.3	0.4	0.5	0.6	0.7
ø6	Push/Pull	-	8.48	11.3	14.1	17.0	19.8
ø10	Push/Pull	-	23.6	31.4	39.3	47.1	55.0
ø16	Push/Pull	40.2	60.3	80.4	1.01×10^2	1.21×10^2	1.41×10^2
ø20	Push/Pull	62.8	94.2	1.26×10^2	1.57×10^2	1.88×10^2	2.20×10^2
ø25	Push/Pull	98.2	1.47×10^2	1.96×10^2	2.45×10^2	2.95×10^2	3.44×10^2
ø32	Push/Pull	1.61×10^2	2.41×10^2	3.22×10^2	4.02×10^2	4.83×10^2	5.63×10^2

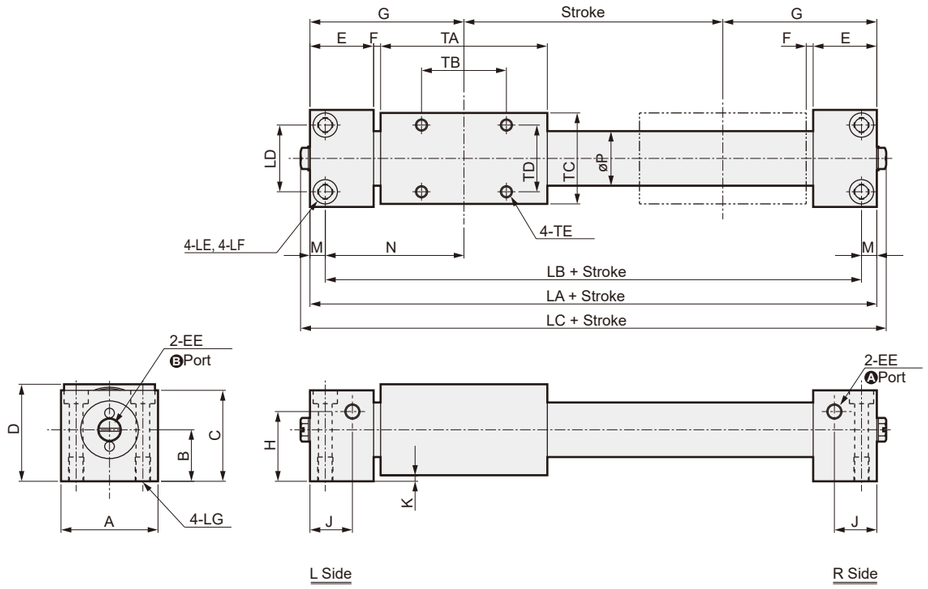
● **MRL2-W**

(Unit: N)

Bore Size (mm)	Operating Direction	Operating Pressure MPa					
		0.2	0.3	0.4	0.5	0.6	0.7
ø6	Push/Pull	-	17.0	22.6	28.3	33.9	39.6
ø10	Push/Pull	-	47.1	62.8	78.5	94.2	1.10×10^2
ø16	Push/Pull	80.4	1.21×10^2	1.61×10^2	2.01×10^2	2.41×10^2	2.81×10^2
ø20	Push/Pull	1.26×10^2	1.88×10^2	2.51×10^2	3.14×10^2	3.77×10^2	4.40×10^2
ø25	Push/Pull	1.96×10^2	2.95×10^2	3.93×10^2	4.91×10^2	5.89×10^2	6.87×10^2
ø32	Push/Pull	3.22×10^2	4.83×10^2	6.43×10^2	8.04×10^2	9.65×10^2	1.13×10^3

Dimensional Drawings: MRL2 (basic)

● MRL2 (basic) without switch



Note: It is possible to select Ⓐ, Ⓑ for air piping port. At the time of shipment, Ⓑ port C will be assembled with a plug.
- ø6 to ø20: Plug (FPL-M5)
- ø25, ø32: Hexagon Socket tapered screw plug

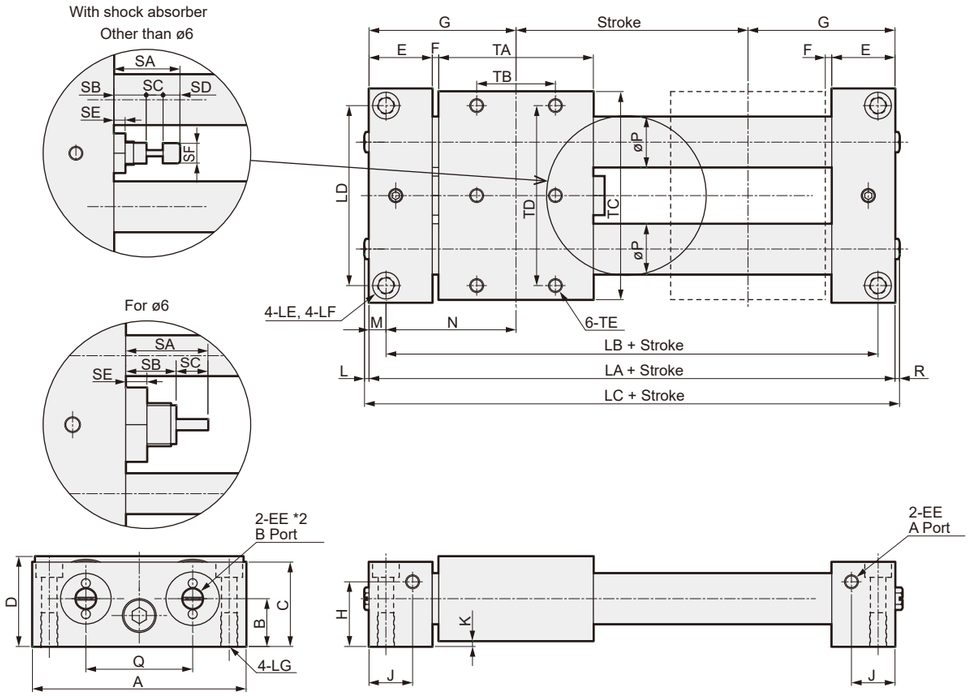
Code	Basic Type (Basic Dimensions)												
Bore Size (mm)	LA	LC	A	C	D	LB	LD	LE	LF	LG	TB	TD	TE
ø6	74	80.2	20	16.5	20	68	14	ø3.5	–	M4 Depth 6	20	12	M3 Depth 4.5
ø10	80	86.2	26	24	26	72	18	ø3.5	ø6.5 Counterbore Depth 3.3	M4 Depth 8	20	18	M3 Depth 4.5
ø16	102	108.2	32	30	32	92	22	ø4.5	ø8 Counterbore Depth 4.4	M5 Depth 8	28	22	M4 Depth 6
ø20	128	134.2	38	36	38	116	26	ø5.5	ø9.5 Counterbore Depth 5.4	M6 Depth 12	44	26	M4 Depth 6
ø25	130	132.2	52	45	48	118	40	ø5.5	ø9.5 Counterbore Depth 5.4	M6 Depth 12	40	30	M6 Depth 6
ø32	138	140.2	60	53	56	124	46	ø6.9	ø11 Counterbore Depth 6.5	M8 Depth 12	40	40	M6 Depth 9

Code													
Bore Size (mm)	B	E	EE	F	G	H	J	K	M	N	P	TA	TC
ø6	11	15	M5 Depth 4	2	37	9	9.5	2	3	34	7.6	40	18
ø10	14	18	M5 Depth 4	2	40	5.5	10	2	4	36	12	40	24
ø16	17	21	M5 Depth 4	2.5	51	23	14	2	5	46	18	55	30
ø20	20	24	M5 Depth 4	3	64	28	15.5	2	6	58	23	74	36
ø25	25.5	27	Rc1/8	3	65	29	17	3	6	59	28	70	45
ø32	29.5	27	Rc1/8	3	69	37	17	3	7	62	35	78	53

Note: For dimensions with each switch, please refer to P. 226, 227.

Dimensional Drawings MRL2-G (simplified guide 1-piston)/MRL2-W (simplified guide 2-piston)

● MRL2-G (simplified guide 1-piston) without switch
● MRL2-W (simplified guide 2-piston) without switch



*1: Air piping port is Ⓐ, Ⓑ can be selected. At shipment, Ⓑ Shipped with the plug assembled onto port.
- ø6 to ø20: Plug (FPL-M5)
- ø25, ø32: Hexagon Socket tapered screw plug

*2: For MRL2-W, it will be "4-EE".

Code	Simple Guide Type (G, W) Mounting Dimensions														
Bore Size (mm)	LA	LC	L	R	A	C	D	LB	LD	LE	LF	LG	TB	TD	TE
ø6	74	80.2	3.1	3.1	46	20	24	68	40	ø3.5	–	M4 Depth 6	20	38	M3 Depth 4.5
ø10	83	87.2	1.6	2.6	64	24	26	74	54	ø4.5	ø8 Counterbore Depth 4.4	M5 Depth 10	20	55	M4 Depth 6
ø16	105	109.2	1.6	2.6	76	30	32	93	64	ø5.5	ø9.5 Counterbore Depth 5.4	M6 Depth 12	28	64	M5 Depth 8
ø20	131	135.2	1.6	2.6	90	36	38	119	77	ø6.9	ø11 Counterbore Depth 6.5	M8 Depth 12	44	78	M5 Depth 8
ø25	136	138	0	2	108	45	48	122	90	ø6.9	ø11 Counterbore Depth 6.5	M8 Depth 12	40	90	M6 Depth 9
ø32	144	146	0	2	126	53	56	130	108	ø6.9	ø11 Counterbore Depth 6.5	M8 Depth 12	40	104	M6 Depth 9

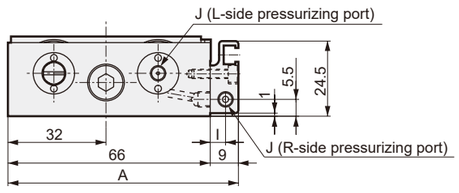
Code																			
Bore Size (mm)	B	E	EE	F	G	H	J	K	M	N	P	Q	SA	SB	SC	SD	SE	SF	TA	TC
ø6	13	15	M5 Depth 4	2	37	9	9.5	2	3	34	7.6	26	15.5	9.5	6	-	4	-	40	44
ø10	14	19.5	M5 Depth 4	2	41.5	5.5	11.5	2	4.5	37	12	34	20.5	9.5	5	6	4	6	40	62
ø16	17	22.5	M5 Depth 4	2.5	52.5	23	15.5	2	6	46.5	18	38	23.5	11.5	6	6	4	7	55	74
ø20	20	25.5	M5 Depth 4	3	65.5	28	17	2	6	59.5	23	46	25.5	10.5	8	7	4	8	74	88
ø25	25.5	30	Rc1/8	3	68	29	20	3	7	61	28	50	30	12.5	10	7.5	5	10	70	101
ø32	29.5	30	Rc1/8	3	72	37	20	3	7	65	35	60	30	12.5	10	7.5	5	10	78	119

Note: For dimensions with each switch, please refer to P. 226, 227.

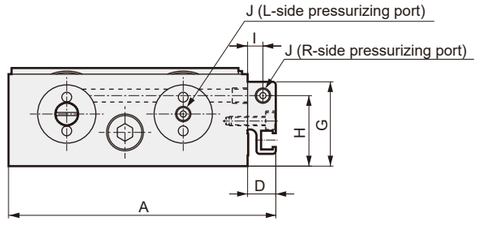
Dimensional Drawings with Option

- MRL2-GL-□-R (simplified guide 1-piston) common piping with switch
- MRL2-WL-□-R (simplified guide 2-piston) with switch common piping

· In case of ø10



· In case of ø16 to ø32

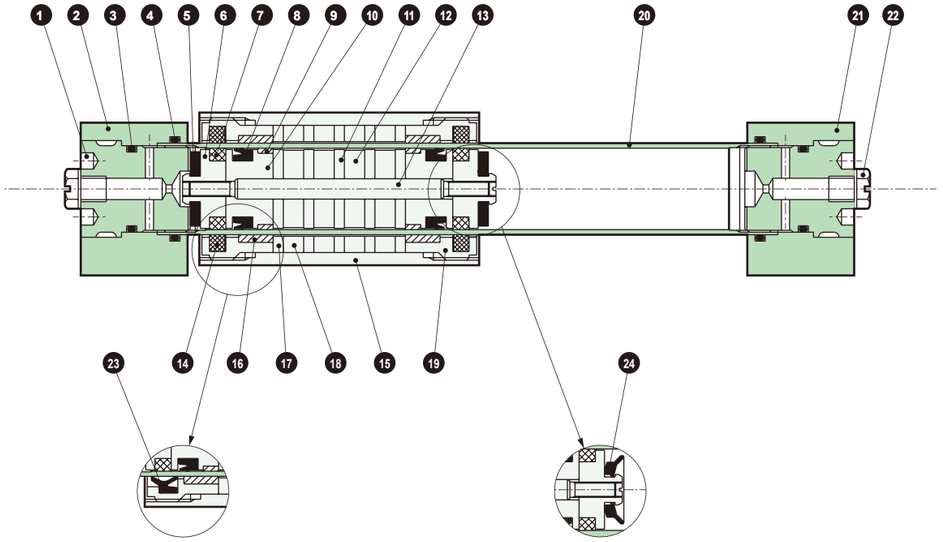


Code / Bore Size (mm)	A	D	G	H	I	J
ø10	75	-	-	-	5	M5 Depth 4
ø16	87	9	27.5	23	5	M5 Depth 4
ø20	101	9	32.5	28	5	M5 Depth 4
ø25	122	14	45	29	7.5	Rc1/8
ø32	140	14	53	37	7.5	Rc1/8

MEMO

Internal Structure and Materials

● MRL2 (basic)



With scraper option
code "S"

Cushion code "C"
Rubber-air cushioned

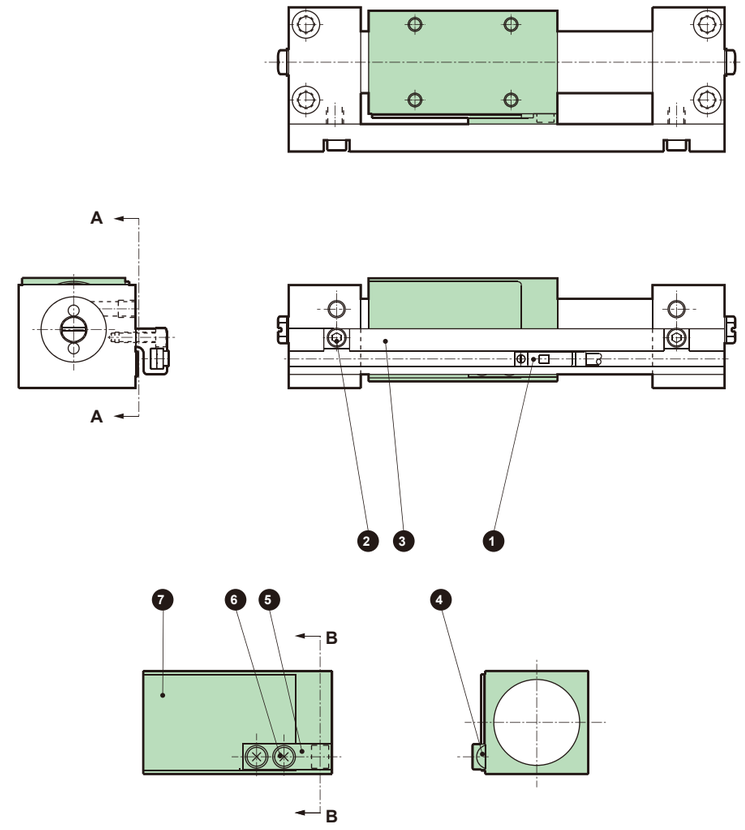
Do not disassemble

No.	Part Name	Material	Remarks	No.	Part Name	Material	Remarks
1	End Cap	Aluminum Alloy	Chromate	14	Lube-Keeper (For slider)	Special rubber	
2	End plate (L)	Aluminum Alloy	Alumite	15	Slider	Aluminum Alloy	Alumite
3	O-ring	Nitrile Rubber		16	Slider wear ring	Polyacetal	
4	O-ring	Nitrile Rubber		17	Slider yoke	Steel	Zinc Chromate
5	Cushion Rubber	Urethane Rubber		18	Magnet	Special alloy	
6	Piston (2)	Aluminum Alloy	Chromate	19	Slider Cover	Aluminum Alloy	Chromate
7	Lube-Keeper (For piston)	Special rubber		20	Cylinder Tube	Stainless Steel	
8	Piston Packing	Nitrile Rubber		21	End plate (R)	Aluminum Alloy	Alumite
9	Piston wear ring	Polyacetal		22	Plug	ø6 to ø20: FPL (CKD) ø25, ø32: Steel	ø25, ø32: Zinc Chromate
10	Piston (1)	Aluminum Alloy	Chromate				
11	Piston yoke	Steel	Zinc Chromate	23	Scraper	Urethane Rubber	
12	Magnet	Special alloy		24	Rubber Air Cushion	Special rubber	
13	Piston Shaft	Stainless Steel					

Note: The magnetic strength of the embedded magnet is powerful. Do not disassemble.

Internal Structure and Materials

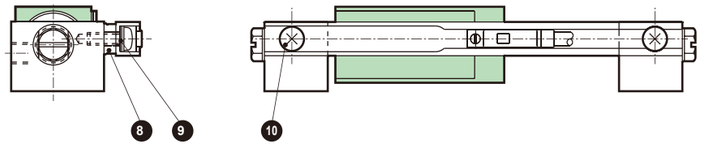
● MRL2-L (with switch)



A-A Arrow View

Section B-B

● MRL2-L-6

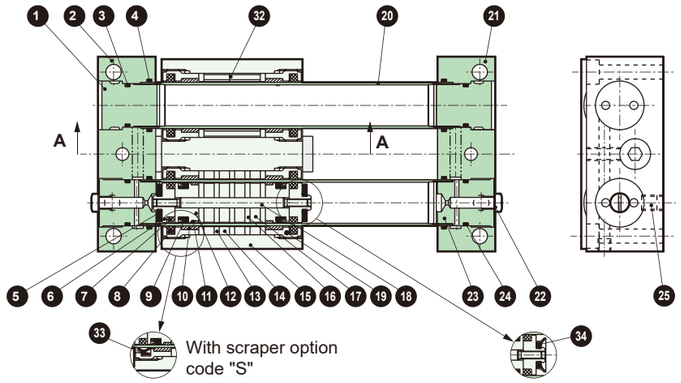


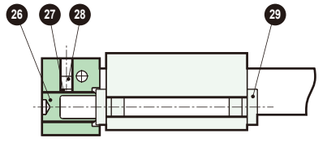
Do not disassemble

No.	Part Name	Material	Remarks	No.	Part Name	Material	Remarks
1	Switch			6	Cross-Recessed Pan Head Screw	Stainless Steel	
2	Hexagon Socket Head Cap Screw	Stainless Steel		7	Shield Plate	Steel	Nickel Plating
3	Switch Rail	Aluminum Alloy	Alumite	8	Spacer	Copper Alloy	Nickel Plating
4	Magnet	Special alloy		9	Plain Washer	Stainless Steel	
5	Magnet Holder	Polyacetal		10	Cross-Recessed Pan Head Screw	Stainless Steel	

Internal Structure and Materials

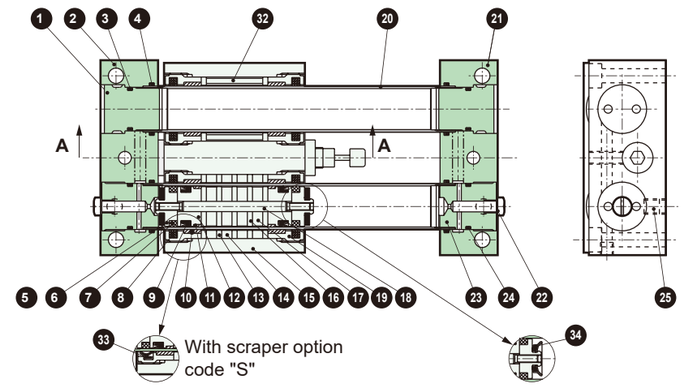
● MRL2-G (simplified guide 1-piston)

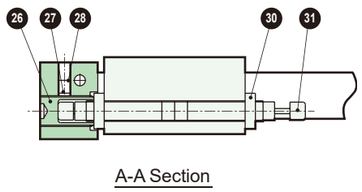




Cushion code "C"
Rubber-air cushioned

● MRL2-G-□-C (with shock absorber)





Cushion code "C"
Rubber-air cushioned

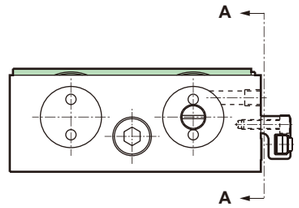
Do not disassemble

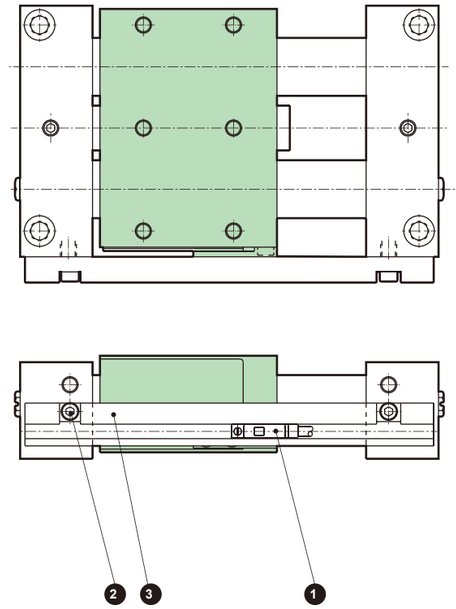
No.	Part Name	Material	Remarks	No.	Part Name	Material	Remarks
1	End Cap	Aluminum Alloy	Chromate	19	Slider Cover	Aluminum Alloy	Chromate
2	End plate (L)	Aluminum Alloy	Alumite	20	Cylinder Tube	Stainless Steel	
3	O-ring	Nitrile Rubber		21	End plate (R)	Aluminum Alloy	Alumite
4	O-ring	Nitrile Rubber		22	Plug	ø6 to ø20: FPL (CKD) ø25, ø32: Steel	ø25, ø32: Zinc Chromate
5	Cushion Rubber	Urethane Rubber		23	End Cap	Aluminum Alloy	Chromate
6	Piston (2)	Aluminum Alloy	Chromate	24	O-ring	Nitrile Rubber	
7	Lube-Keeper (For piston)	Special rubber		25	Hexagon Socket Set Screw	Alloy Steel	
8	Lube-Keeper (For slider)	Special rubber		26	Stopper	Alloy Steel	Nickel Plating
9	Piston Packing	Nitrile Rubber		27	Set shoe	Aluminum Alloy	
10	Slider wear ring	Polyacetal		28	Hexagon Socket Set Screw	Stainless Steel	
11	Piston wear ring	Polyacetal		29	Stopper bolt	Steel	Nickel Plating
12	Piston (1)	Aluminum Alloy	Chromate	30	Hexagon Nut	Steel	
13	Slider yoke	Steel	Zinc Chromate	31	Shock Absorber		
14	Magnet	Special alloy		32	Spacer	Stainless Steel	
15	Slider	Aluminum Alloy	Alumite	33	Scraper	Urethane Rubber	
16	Piston yoke	Steel	Zinc Chromate	34	Rubber Air Cushion	Special rubber	
17	Magnet	Special alloy					
18	Piston Shaft	Stainless Steel					

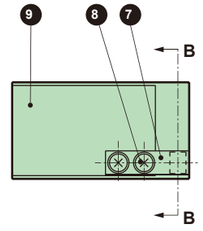
Note: The magnetic strength of the magnet is powerful. Do not disassemble.

Internal Structure and Materials

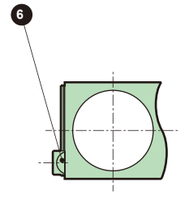
● MRL2-GL (with switch)





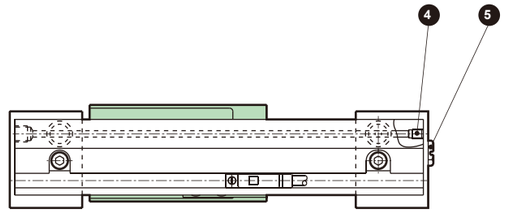


A-A Arrow View



Section B-B

● MRL2-GL-□R (switch common piping)

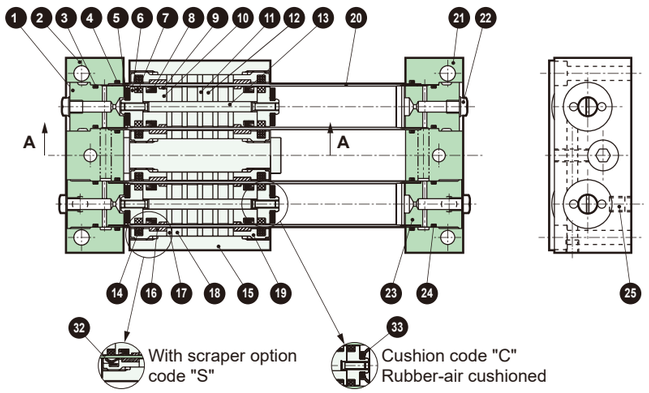


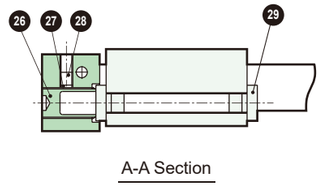
Do not disassemble

No.	Part Name	Material	Remarks	No.	Part Name	Material	Remarks
1	Switch			6	Magnet	Special alloy	
2	Hexagon Socket Head Cap Screw	Stainless Steel		7	Magnet Holder	Polyacetal	
3	Switch Rail	Aluminum Alloy	Alumite	8	Cross-Recessed Pan Head Screw	Stainless Steel	
4	Hexagon Socket Set Screw	Stainless Steel		9	Shield Plate	Steel	Nickel Plating
5	Plug	ø6 to ø20: FPL (CKD) ø25, ø32: Steel	ø25, ø32: Zinc Chromate				

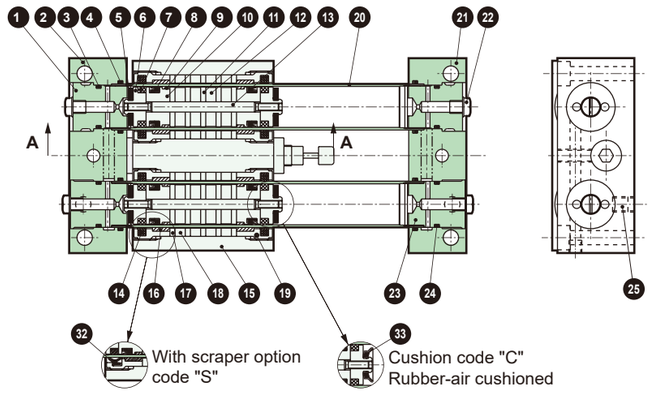
Internal Structure and Materials

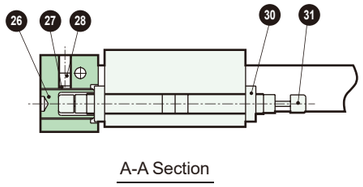
● MRL2-W (simplified guide 2-piston)





● MRL2-W-□-C (with Shock Absorbers)





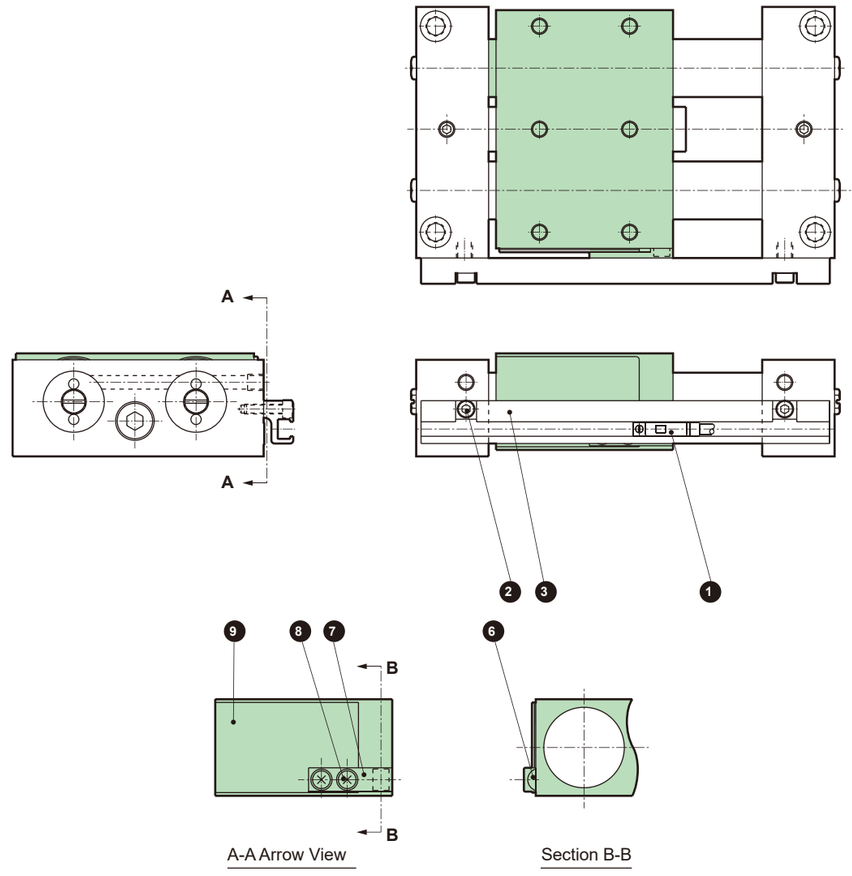
Do not disassemble

No.	Part Name	Material	Remarks	No.	Part Name	Material	Remarks
1	End Cap	Aluminum Alloy	Chromate	18	Magnet	Special alloy	
2	End plate (L)	Aluminum Alloy	Alumite	19	Slider Cover	Aluminum Alloy	Chromate
3	O-ring	Nitrile Rubber		20	Cylinder Tube	Stainless Steel	
4	O-ring	Nitrile Rubber		21	End plate (R)	Aluminum Alloy	Alumite
5	Cushion Rubber	Urethane Rubber		22	Plug	ø6 to ø20: FPL (CKD) ø25, ø32: Steel	ø25, ø32: Zinc Chromate
6	Piston (2)	Aluminum Alloy	Chromate				
7	Lube-Keeper (For piston)	Special rubber		23	End Cap	Aluminum Alloy	Chromate
8	Piston Packing	Nitrile Rubber		24	O-ring	Nitrile Rubber	
9	Piston wear ring	Polyacetal		25	Hexagon Socket Set Screw	Alloy Steel	
10	Piston (1)	Aluminum Alloy	Chromate	26	Stopper	Alloy Steel	Nickel Plating
11	Piston yoke	Steel	Zinc Chromate	27	Set shoe	Aluminum Alloy	
12	Magnet	Special alloy		28	Hexagon Socket Set Screw	Stainless Steel	
13	Piston Shaft	Stainless Steel		29	Stopper bolt	Steel	Nickel Plating
14	Lube-Keeper (For slider)	Special rubber		30	Hexagon Nut	Steel	
15	Slider	Aluminum Alloy	Alumite	31	Shock Absorber		
16	Slider wear ring	Polyacetal		32	Scraper	Urethane Rubber	
17	Slider yoke	Steel	Zinc Chromate	33	Rubber Air Cushion	Special rubber	

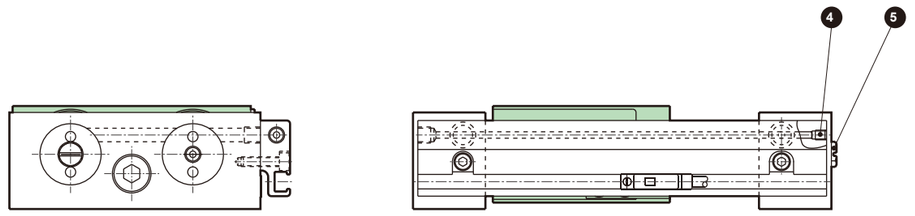
Note: The magnetic strength of the magnet is powerful. Do not disassemble.

Internal Structure and Materials

● MRL2-WL (with switch)



● MRL2-WL-□-R (with switch/common piping)



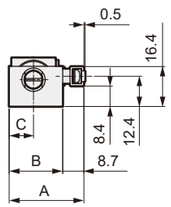
Do not disassemble

No.	Part Name	Material	Remarks	No.	Part Name	Material	Remarks
1	Switch			6	Magnet	Special alloy	
2	Hexagon Socket Head Cap Screw	Stainless Steel		7	Magnet Holder	Polyacetal	
3	Switch Rail	Aluminum Alloy	Alumite	8	Cross-Recessed Pan Head Screw	Stainless Steel	
4	Hexagon Socket Set Screw	Stainless Steel		9	Shield Plate	Steel	Nickel Plating
5	Plug	ø6 to ø20: FPL (CKD) ø25, ø32: Steel	ø25, ø32: Zinc Chromate				

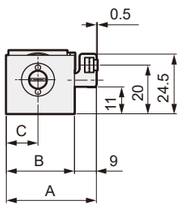
MRL2 Series Switch External Dimensions Diagram

● T2H/V, T2H/VR3, T3(P)H/V, T2WH/V, T3WH/V, T2WLH/V
● MRL2-L

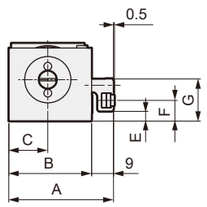
· In case of ø6

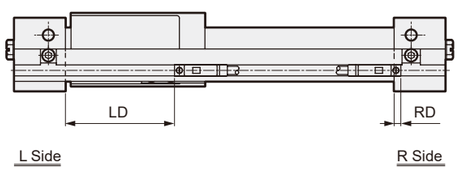


· In case of ø10



· In case of ø16 to ø32



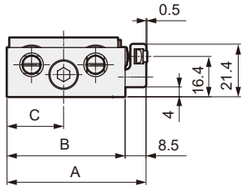


Code	MRL2-L, LF										
	A	B	C	D	E	F	G	T2, T3P, T2□R3		T2WL, T2W, T3W	
Bore Size (mm)								LD	RD	LD	RD
ø6	30.7	22	10	-	-	-	-	27	3.5	29	1.5
ø10	37	28	13	-	-	-	-	27	2.5	29	0.5
ø16	43	34	16	9	4	8.5	17.3	44	2.5	46	0.5
ø20	49	40	19	9	9	13.5	22.3	63.5	1	65.5	-1
ø25	60.7	52	26	8.7	2	7.5	21	58	2	60	0
ø32	68.7	60	30	8.7	10	15.5	29	67.5	1.5	69	-0.5

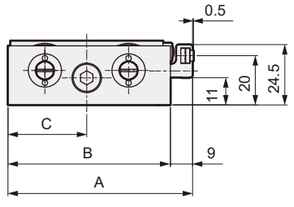
Note: For switch mountability, refer to the model number display method for each variation.

● T2H/V, T2H/VR3, T3(P)H/V, T2WH/V, T3WH/V, T2WLH/V
● MRL2-MRL2-GL, GLF, WL, WLF

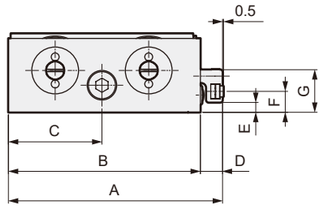
· In case of ø6

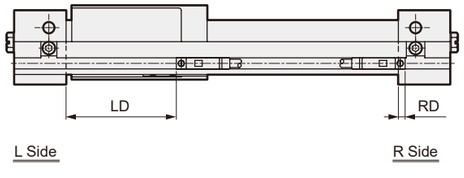


· In case of ø10



· In case of ø16 to ø32





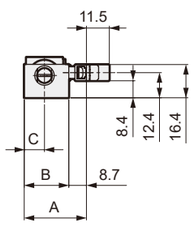
Code	MRL2-GL, GLF, WL, WLF										
	A	B	C	D	E	F	G	T2, T3P, T2□R3		T2WL, T2W, T3W	
Bore Size (mm)								LD	RD	LD	RD
ø6	56.5	48	23	-	-	-	-	27	3.5	29	1.5
ø10	75	66	32	-	-	-	-	27	2.5	29	0.5
ø16	87	78	38	9	4	8.5	17.3	44	2.5	46	0.5
ø20	101	92	45	9	9	13.5	22.3	63.5	1	65.5	-1
ø25	116.7	108	54	8.7	2	7.5	21	58	2	60	0
ø32	134.7	126	63	8.7	10	15.5	29	67.5	1.5	69	-0.5

Note: For switch mountability, refer to the model number display method for each variation.

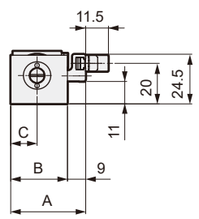
MRL2 Series Switch External Dimensions Diagram

● T1H/V
● MRL2-L

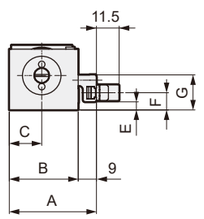
· In case of ø6

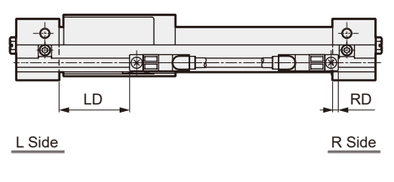


· In case of ø10



· In case of ø16 to ø32



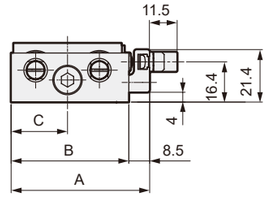


Code	MRL2-L, LF								
Bore Size (mm)	A	B	C	D	E	F	G	LD	RD
ø6	30.7	22	10	-	-	-	-	26	4.5
ø10	37	28	13	-	-	-	-	26	3.5
ø16	43	34	16	9	4	8.5	17.3	43	3.5
ø20	49	40	19	9	9	13.5	22.3	62.5	2
ø25	60.7	52	26	8.7	2	7.5	21	57	3
ø32	68.7	60	30	8.7	10	15.5	29	66	2.5

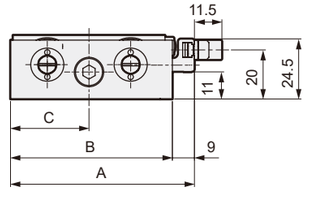
Note: For switch mountability, refer to the model number display method for each variation.

● T1H/V
● MRL2-GL, GLF, WL, WLF

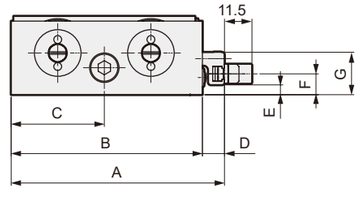
· In case of ø6

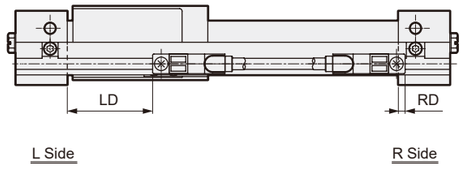


· In case of ø10



· In case of ø16 to ø32





Code	MRL2-GL, GLF, WL, WLF								
Bore Size (mm)	A	B	C	D	E	F	G	LD	RD
ø6	56.5	48	23	-	-	-	-	26	4.5
ø10	75	66	32	-	-	-	-	26	3.5
ø16	87	78	38	9	4	8.5	17.3	43	3.5
ø20	101	92	45	9	9	13.5	22.3	62.5	2
ø25	116.7	108	54	8.7	2	7.5	21	57	3
ø32	134.7	126	63	8.7	10	15.5	29	66	2.5

Note: For switch mountability, refer to the model number display method for each variation.

MRL2 Series Selection Guide

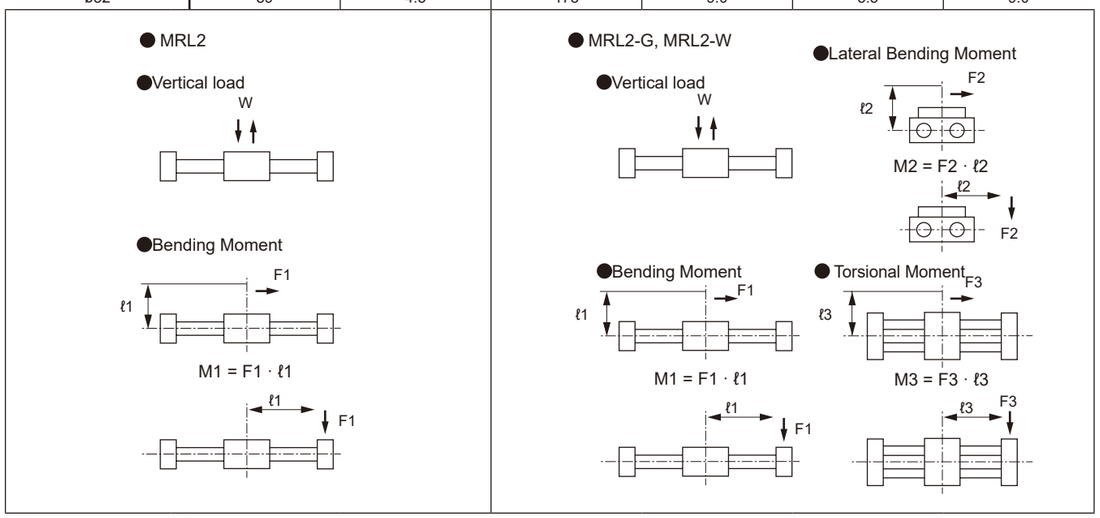
STEP-1 Allowable load judgment

(1) Calculate all loads (W) and moments (M1, M2, M3) for each load.
(2) Divide each load by the maximum value shown in the table below, determine the load/moment ratio, and confirm that the total is 1.0 or less.

$$\frac{W}{Wmax} + \frac{M1}{M1max} + \frac{M2}{M2max} + \frac{M3}{M3max} \leq 1.0$$

Max allowable load weight

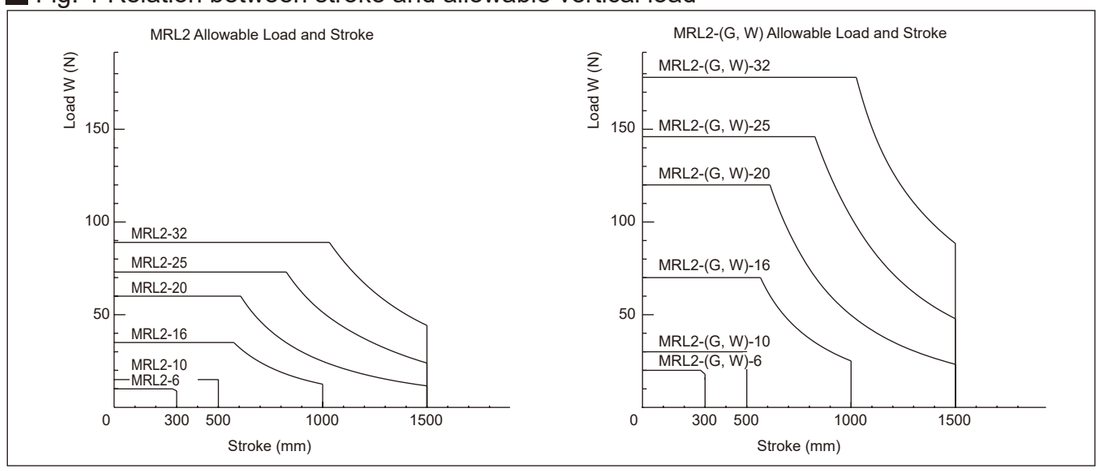
Item / Bore Size (mm)	MRL2 Vertical Load W (N)	MRL2 Bending moment M 1 (N·m)	MRL2-G · MRL2-W Vertical Load W (N)	MRL2-G · MRL2-W Bending moment M 1 (N·m)	MRL2-G · MRL2-W Lateral bending moment M 2 (N·m)	MRL2-G · MRL2-W Torsion moment M3 (N·m)
ø6	10	0.1	20	0.2	0.1	0.2
ø10	15	0.3	30	0.6	0.2	0.6
ø16	35	1.2	70	2.4	0.5	2.4
ø20	60	2.5	120	5.0	1.0	5.0
ø25	73	3.3	146	6.6	3.7	6.6
ø32	89	4.5	178	9.0	5.3	9.0



Note: Give sufficient consideration to inertia when the load moves or stops.

The value of allowable vertical load W varies depending on the Stroke. Select so that it is within the graph in Fig. 1.

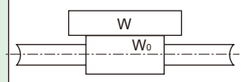
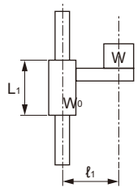
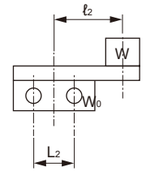
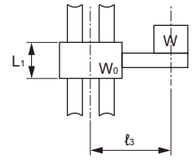
Fig. 1 Relation between stroke and allowable vertical load



STEP-2 Calculation of load factor

1. Calculate the required thrust based on Tables 2 and 3 below, according to the load size, direction, and mounting orientation.

Table 2

	Vertical load	Bending Moment	Lateral Bending Moment	Torsional Moment
Load size, direction				
Mounting Orientation	Horizontal	Vertical	Horizontal	Vertical
Required thrust	$F_N = 0.2(W+W_0)$	$F_N = \frac{0.2W\ell_1}{L_1} + W + W_0$	$F_N = 0.2\left(\frac{W\ell_2}{L_2} + W + W_0\right)$	$F_N = \frac{0.2W\ell_3}{L_1} + W + W_0$

As the slider rotates with the single type, radial moment and torsion moment cannot be applied.

F_N : Necessary Thrust (N)
W : Load (N)
W_0 : Slider self-weight (N)
ℓ_n (n = 1, 2, 3): Overhang (mm)
L_1 : Slider bearing pitch (mm)
L_2 : Pitch of guide (mm)

Table 3

Model Number	W_0	L_1	L_2
MRL2-6	0.4	27	-
10	0.6	27	-
16	1.2	39	-
20	2.4	58	-
25	3.8	70	-
32	5.2	78	-
MRL2-$^{G}_{W}$-6	0.9	27	26
10	1.7	27	34
16	3.0	39	38
20	5.9	58	46
25	8.5	70	50
32	11.9	78	60

2. Calculate the load factor from the required thrust calculated in 1 and ■Table 4, Fig. 2. (Ensure the load factor is approximately 50% or less.)

$$\text{Load factor } \alpha = \frac{F_N}{\frac{a}{100} \cdot A} \times 100$$

$$B = \frac{a}{100} \cdot A$$

F_N: Necessary Thrust (N)
a: Thrust Efficiency (%)
A: Theoretical thrust (N)
B: Effective thrust (N)

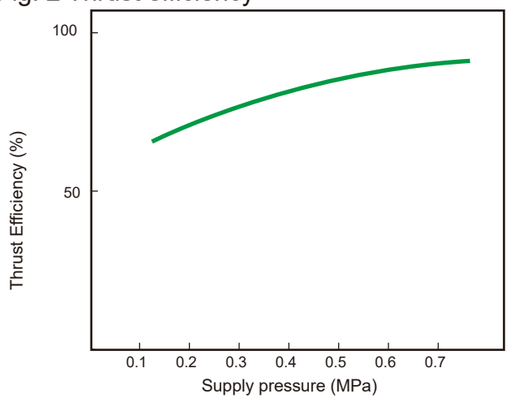
■ Table 4 Theoretical thrust table

N

Model Number	Display Code / Operating Pressure MPa					
	0.2	0.3	0.4	0.5	0.6	0.7
MRL2, MRL2-G-6	-	8	11	14	17	20
10	-	24	31	39	47	55
16	40	60	80	101	121	141
20	63	94	126	157	188	220
25	98	147	196	245	295	344
32	161	241	322	402	483	563
MRL2-W-6	-	17	23	28	34	40
10	-	47	63	79	94	110
16	80	121	161	201	241	281
20	126	188	251	314	377	440
25	196	295	393	491	590	687
32	322	483	643	804	966	1130

* At low pressures, thrust efficiency is low, so the difference between effective thrust and theoretical thrust becomes large. Please be careful.

■ Fig. 2 Thrust efficiency



STEP-3 Calculation of kinetic energy

Calculate kinetic energy from load weight (m) and speed (V), and ensure it is below the allowable value in ■ Table 5. When exceeding the allowable absorbed energy value, increase the cylinder size so that the value falls under the allowable absorbed energy or consider the use of an external shock absorber. Note that the speed at this time is not the average speed but the speed at cushion impact, so calculate the cushion impact speed from equation (1).

$$E=\frac{1}{2}mV^2$$

$$Va=\frac{L}{t}$$

$$V = Va \times (1 + 1.5\frac{\alpha}{100}) \quad -(1)$$

E: Kinetic Energy (J)
m: Weight (kg)
V: Cushion entry velocity (m/s)
Va: Average speed (m/s)
L: Stroke(m)
t: Travel time (s)
α: Load Factor (%)

■ Table 5 Allowable absorbed energy value

Bore Size	Allowable Absorbed Energy (J)	
	MRL2	MRL2-$\frac{G}{W}$
ø6	0.006	0.12
ø10	0.028	0.12
ø16	0.100	0.25
ø20	0.265	0.58
ø25	0.283	0.74
ø32	0.523	0.74

■ Shock absorber specifications

Bore Size	Maximum Absorption Energy J	Stroke (mm)
ø6	0.24	4
ø10	0.24	4
ø16	0.80	5.5
ø20	2.11	7.5
ø25	3.88	9.5
ø32	3.88	9.5

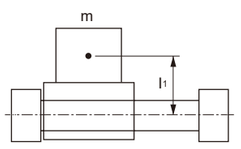
STEP-4 Confirmation of Inertial Load

Confirm that the weight (m), overhang (l_n (n = 1, 3)), and cushion entry velocity (V) multiplied together and then divided by the value of A shown in the table below is less than or equal to 1. If it exceeds 1, always increase the cylinder size or review the operating conditions so that it becomes 1 or less.

Bore Size	A	
	MRL2	MRL2-$\frac{G}{W}$
ø6	5.6	11.2
ø10	17	34
ø16	68	136
ø20	142	284
ø25	187	374
ø32	255	510

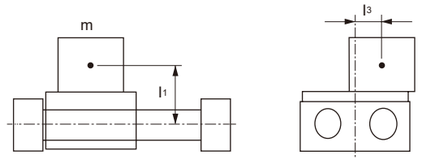
m : Weight (kg)
l_n (n=1,3) : Overhang (mm)
V : Cushion entry velocity (m/s)

● MRL2



$$\frac{m \cdot l_1 \cdot V}{A} \leq 1$$

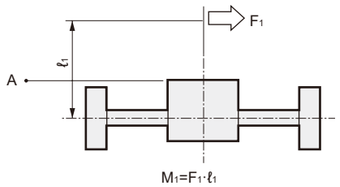
● MRL2-G, MRL2-W



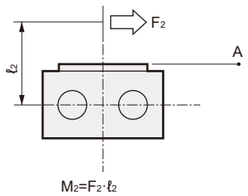
$$\frac{m \cdot (l_1 + l_3) \cdot V}{A} \leq 1$$

MRL2-G · MRL2-W Slider Deflection Amount

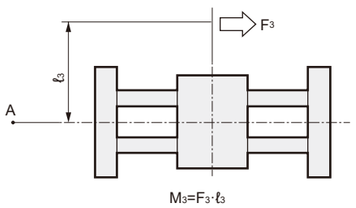
●Bending Moment



●Lateral Bending Moment



● Torsional Moment



Bore Size	Moment Load		Table deflection amount at point A (±mm)		
	MRL2	MRL2-G,W	M1 Direction	M2 Direction	M3 Direction
ø6	M1, M3: 0.2 N·m	M2: 0.1 N·m	1.5	1.46	1.05
ø10	M1, M3: 0.6 N·m	M2: 0.2 N·m	1.61	1.12	0.92
ø16	M1, M3: 2.5 N·m	M2: 0.5 N·m	1.3	1.16	0.87
ø20	M1, M2, M3: 2.5 N·m		0.89	0.96	0.65
ø25	M1, M2, M3: 5 N·m		1.1	0.92	0.7
ø32	M1, M2, M3: 5 N·m		1.0	0.77	0.6

Note: Point A is a point that is 200 mm away from the center of the slider.

Comparative Data of Rubber Cushion and Rubber Air Cushion (Reference Value)

Measure the noise level (dB) generated when the piston collides with the stroke end.

Measurement Conditions

1. Sample cylinder: MRL2 basic, stroke 200 mm
2. Piston speed upon collision at end of Stroke: V=300 mm/S
3. Distance between noise level meter and cylinder: 0.25 m
4. Load: No Load

Typical Example Unit: dB

Bore Size	Rubber Cushion	Rubber Air Cushion
ø6	51.2	44.7
ø10	51.2	45.6
ø16	63.4	48.2
ø20	75.9	59.3

MEMO

Pneumatic Component

To Use This Product Safely

Be sure to read this before use. For general cylinder information, see Intro 41, and for cylinder switches, see P. 1512.

Specific Precautions: Magnet rodless cylinder MRL2 Series

Design / Selection

1. Common

CAUTION

■Be careful of the gap between the end plate and the slider.
During cylinder operation, fingers or hands may be caught, causing injury, so be very careful.

■Do not apply a load to the cylinder that is greater than or equal to the allowable load listed in the selection guide.

■Do not use the product with the slider fixed.
Use the cylinder with the end plate fixed. Avoid using with the slider fixed.

■When fixing the basic type with switch with the guide, configure the rotational angle of the slider to be less than or equal to ±1°.

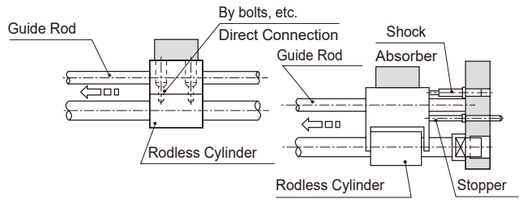
■Mount so that the slider functions with the Min Operating Pressure value of all processes.
If the flatness of the cylinder mounting surface is poor, twisting of the guide part will increase the minimum Operating Pressure and cause premature wear of the bearing part. Therefore, mount so that the slider operates at the minimum Operating Pressure for the entire stroke. A mounting mating surface with high flatness is desired, but if it cannot be sufficiently confirmed, perform shim adjustment, etc.

■Be careful to avoid scratching or denting the outer peripheral surface of the cylinder tube.
This can lead to damage to the Lube-Keeper, scraper, and slider wear ring, causing malfunction.

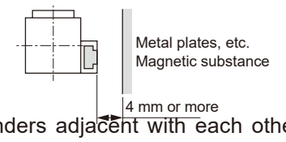
■With the basic MRL2, be careful of slider rotation.
Connect to an external bearing, or consider using MRL2-G or MRL2-W.

■Do not use the product in a state where the slider is displaced.
If the slider is displaced by an external force exceeding the magnet holding force, push it by hand to the stroke end to return it to its original position.

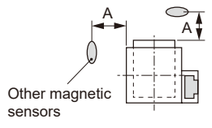
■Do not apply an eccentric load to the slider.
If the load and cylinder are directly mounted, misalignment of their respective shaft centers cannot be absorbed, resulting in a lateral load and causing malfunction (figure below left). Consider the connection method to absorb misalignment and deflection of the cylinder due to its own weight when using. The recommended mounting diagram is shown in the figure below right.



■The cylinder switch may malfunction if there is a magnetic substance such as a metal plate installed adjacently. Check that a distance of 4 mm is provided from the switch surface.



■When using cylinders adjacent with each other or when using other magnetic sensors nearby, in order to prevent malfunctioning due to the leaked magnetic field of the cylinder embedded magnet, make sure that the distance from the surface of the slider to the other magnetic sensors is separated by at least the values listed below.



Bore Size	A (mm)
ø6	10
ø10	20
ø16	20
ø20	37
ø25	50
ø32	80

If the A dimension is less than or equal to the value, malfunction can be prevented by inserting a magnetic material (iron plate thickness 2 mm or more) between it and the slider.

■When using in a dusty environment, selection of the type with scraper (option S) is recommended.

2. With Rubber Air Cushion MRL2-□C

CAUTION

■Due to the structure, if the air supply is cut off, the stroke end position cannot be maintained. Please be careful. When detecting the stroke end with a switch, it may be out of the detection range, so set the switch position in an air-pressurized state.

3. Slow Speed Type MRL2-F

CAUTION

■Use without lubrication.
Lubrication may change characteristics.

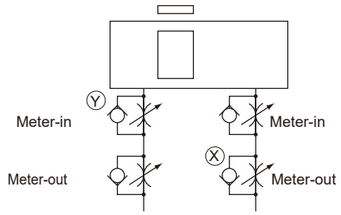
■Install the speed controller near the cylinder.
If installed far from the cylinder, speed will be unstable. Use SC-M3/M5-F, SC3W, SCD-M3/M5, or SC3U series speed controllers.

■Generally, the higher the air pressure and the lower the load factor, the more stable the speed.
Use with a load factor of 50% or less.

■Do not apply a lateral load to the slider.
Also, install the sliding guide without twisting. Fluctuations in load or resistance will cause unstable operation. Guides with a large difference between static and dynamic friction will result in unstable operation.

■Avoid use in locations with vibration.
Operation becomes unstable due to the influence of vibration.

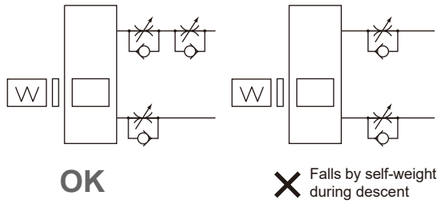
■Speed control is stable with a meter-out circuit.
● To make the operation even smoother at the start, add a meter-in circuit.



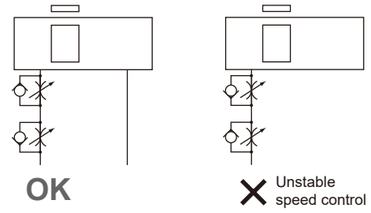
Speed adjustment method when moving to the right
1. Adjust speed with Ⓧ speed controller
2. Throttle with Ⓨ speed controller until starting is smooth
3. Reconfirmation of speed

*1: As this circuit narrows the intake side, a small amount of time is required until it starts to operate. (Changes depending on throttle adjustment) Please consider carefully before use.

*2: For vertical mounting, combine the cylinder with a meter-out circuit, as it will fall under its own weight when a meter-in circuit is used.



(*3) For series connection of speed controllers, use the circuit shown in the diagram below.



During Use

1. Common

WARNING

■The magnetic strength of the embedded magnet is powerful. Do not disassemble.

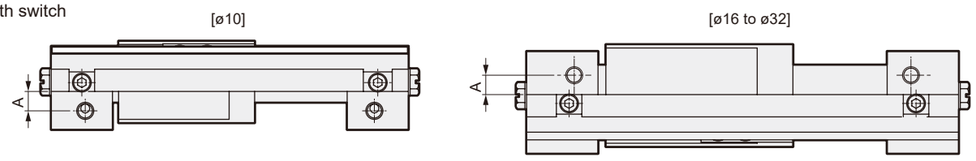
■For Bore Sizes of ø16 or less, because of changes in the cushion stiffness when left for long periods, the stroke may become slightly shorter than the standard value at the low pressure setting. Perform a run-in operation by operating it several times or reciprocating it at a high supply pressure.

CAUTION

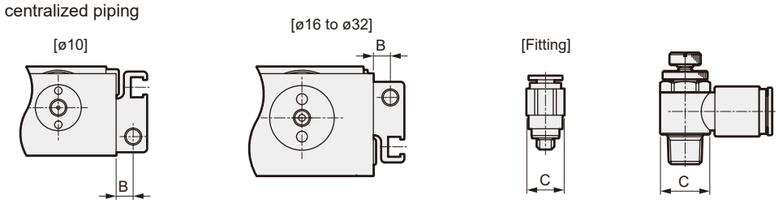
■Please treat our shock absorber as a consumable part. Replace if a decrease in energy absorption capacity is observed or if operation is no longer smooth.

■As compatible piping lengths are limited when with switch, refer to the table below to select the fitting.

· With switch



· Switch-equipped centralized piping



Item	Port Size	Port position dimension		Usable Fittings	Fitting outer diameter
Bore Size (mm)		A	B		øC
ø6	M5	-		SC3W-M5-4, SC3W-M5-6 SC3U-M5-4, SC3U-M5-6 GWS6-M5-S, GWS4-M5 etc.	ø11 or less
ø10		5.5	5		
ø16		5.5	5		
ø20		5.5	5		
ø25	Rc1/8	7.5	7.5	SC3W-6-4 / 6 / 8 GWS4-6, GWS6-6, GWS8-6, etc.	ø15 or less
ø32		7.5	7.5		

Note: A and B are the distances to the nearest interfering part of each port. "-" indicates no interference. For ø6, the side port is on the opposite side of the switch rail, so there is no A dimension. (There is no interference with the switch rail.) Also, since switch-equipped centralized piping is not possible, there is no B dimension (port).

2. Slow Speed Type MRL2-F

⚠CAUTION

■Avoid use in steam, humid environments, or alkaline atmospheres.

3. With Rubber Air Cushion MRL2-□C

⚠CAUTION

■Do not rapidly exhaust the air in the cylinder after operating at low speed outside the catalog specification range. (Example: Removing piping or coupler, etc.) The rubber-air cushion may become detached. Please be especially careful as this is more likely to occur when the air pressure is high.

For precautions during installation, adjustment, use, and maintenance, please refer to "During Use" in this catalog and the Instruction Manual on the CKD Component Product Site (https://www.ckd.co.jp/kiki/en/) -> "Model Number".

MEMO

Rodless type

MRG2

Magnet Type Rodless Cylinder High Precision Guide Type

ø10, ø16, ø25

CONTENTS

Product Introduction	202
Series System Chart	240
● Double Acting (MRG2)	242
Dimensions with Switch	249
Model Selection Guide	250
Technical Data	256
⚠Precautions for Use	258

Rodless Type
SRL3
SRG3
SRM3
SRT3
MRL2
MRG2
SM-25
Cylinder Switch
Ending

System Chart

Magnet Type Rodless Cylinder
High-Precision Guide Type MRG2 Series

●: Standard, ◎: Option, : Not available

Variations	Model No. circuit diagram code	Bore Size (mm)	Standard Stroke (mm)									Min Stroke (mm)	Max Stroke (mm)	Options			Switch	Page
			50	100	150	200	300	400	500	600	700			With full stroke adjustment bracket on both sides A	With R-side full stroke adjustment bracket A1	With L-side full stroke adjustment bracket A2		
Double Acting	MRG2	ø10	●	●	●	●	●					50	300	◎	◎	◎	◎	242
		ø16	●	●	●	●	●	●	●				500					
		ø25	●	●	●	●	●	●	●	●	●		700					

MEMO

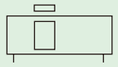
Rodless Type
SRL3
SRG3
SRM3
SRT3
MRL2
MRG2
SM-25
Cylinder Switch
Ending

Magnet Type Rodless Cylinder High Precision Guide Type

MRG2 Series

● Bore Size: ø10, ø16, ø25

Circuit Diagram Code



RoHS

Model No. Notation

Without Switch
(Built-in Magnet for Switch)

MRG2 - 10 - 100 ——— A

Model Number ❶ ❷ ❺

With Switch
(Built-in magnet for switch)

MRG2 - 10 - 100 - T2H - D - A

Model Number ❷ Stroke ❹ Number of Switches
❶ Bore Size ❸ Switch Model ❺ Option

❶ Bore Size (mm)

Code	Description
10	ø10
16	ø16
25	ø25

❷ Stroke (mm)

Code	Description	
50	50	
100	100	
150	150	
200	200	
300	300	
400	400	(ø16, ø25)
500	500	(ø16, ø25)
600	600	(ø25)
700	700	(ø25)

❸ Switch Model

For switch details, refer to P. 1457. Switches are shipped with the product.

Contact	Indicator LED Special Function	Wiring (Output)	Load Voltage (V) AC	Load Voltage (V) DC	Load Current (mA) AC	Load Current (mA) DC	Lead wire *1 Straight	Lead wire *1 L-shape	
Solid State	1-Color	2-wire	85 to 265	-	5 to 100	-	T1H□	T1V□	
			-	10 to 30	-	5 to 20 *2	T2H□	T2V□	
		3-wire (NPN)	-	30 or less	-	100 or less	T3H□	T3V□	
		3-wire (PNP)	-		-		T3PH□	T3PV□	
	2-color	2-wire	-	24 ± 10%	-	5 to 20	T2WH□	T2WV□	
		3-wire (NPN)	-	30 or less	-	50 or less	T3WH□	T3WV□	
	2-color Improved Water Resistance	2-wire	-	24 ± 10%	-	5 to 20	T2WLH□	T2WLV□	*3
	1-color Flexible Lead Wire Type		-	10 to 30	-	5 to 20 *2	T2HR3	T2VR3	
Contact	1-Color	2-wire	110	12/24	7 to 20	5 to 50	T0H□	T0V□	
	Without Indicator Lamp		110	5/12/24	20 or less	50 or less	T5H□	T5V□	

*1: Enter the code selected in the "*Lead wire length, connector specifications" table into "□" of the Switch Model.
*2: The maximum load current of 20 mA mentioned above is at 25°C. If the switch operating Ambient Temperature is higher than 25°C, it will be lower than 20 mA. (At 60°C, it will be 5 to 10 mA.)
*3: It does not guarantee the water resistance of the cylinder.
*4: Switches other than the above models are also available. (Custom Product) For details, see P. 1457.

***Lead wire length, connector specification**

Code	Content
Blank	1 m (Standard)
3	3 m (Option)
5	5m (Option)
W	M8 Connector, 1PIN (+), 4PIN (−) Lead wire 0.3 m

*5: T2WLH and T2WLV only can be selected.

Example) Lead wire length
1 m T0H
3 m T0H3
5 m T0H5

❹ Number of Switches

	Code	Description
*1	R	With 1 on R side
*1	L	With 1 on L side
	D	With 2 pcs
	T	With 3 pcs
	4	With 4 (For 4 or more, enter the number of switches)

*1: Refer to the switch mounting position dimensions (P. 249) for the R side and L side.

❺ Option

	Code	Description	
	A	With full stroke adjustment bracket on both sides	
*2	A1	With R-side full stroke adjustment bracket	
*2	A2	With L-side full stroke adjustment bracket	

*1: Full stroke adjustment bracket cannot be retrofitted.
*2: Refer to P. 247 for the R side and L side stroke adjustment bracket positions.

Rechargeable Battery Compatible Specification

(Catalog No. CC-1226AA)

●Structure usable in rechargeable battery manufacturing process

MRG2 - . . . . - P4*

*Please contact us for details.

Switch Individual Model No. Notation

SW - T0H□

❸ Switch Model

Shock Absorber Unit Model No. Notation

MRG2 - 10 - C

❶ Bore Size

Specifications

Item		MRG2		
Bore Size	mm	ø10	ø16	ø25
Operating Method		Double Acting Type		
Operating Fluid		Compressed Air		
Max Operating Pressure	MPa	0.7		
Min Operating Pressure	MPa	0.3	0.2	
Proof Pressure	MPa	1.05		
Ambient Temperature	°C	5 to 60		
Port Size		M5		Rc1/8
Stroke Tolerance	mm	-1.5 0		
Operating Piston Speed	mm/s	50 to 1000 (1.97 to 39.4 in/sec)		
Cushion		Shock Absorber		
Lubrication		Not Required (When lubricating, use Turbine Oil ISO VG32)		
Magnet Holding Force	N	63	166	350
Allowable Absorbed Energy	J	2.1	5.3	8.7

*1: It takes time to reach the stroke end due to shock absorber drag. Please consider carefully before use.
*2: Strokes other than Standard Strokes are custom items.

Stroke

Bore Size (mm)	Standard Stroke (mm)	Max Stroke (mm)	Min Stroke (mm)	Min stroke with switch (mm)
ø10	50, 100, 150, 200, 300	300	50	50 (In case of 2 pcs.) *2
ø16	50, 100, 150, 200, 300, 400, 500	500		
ø25	50, 100, 150, 200, 300, 400, 500, 600, 700	700		

*1: Strokes other than Standard Strokes are custom items.
*2: The minimum stroke for T1H, T2WLH/V with 2 switches is 70.

Cylinder Weight

Unit (g)

Model	Without Switch		Switch Weight	Full Stroke Adjustment Bracket Added Weight (Per piece)
	Product weight when stroke S = 0 mm	Added weight per S = 100 mm	Grommet per 1 pc	
MRG2-10	610	180	18	75
MRG2-16	1170	280		110
MRG2-25	3270	490		200

Theoretical Thrust Table

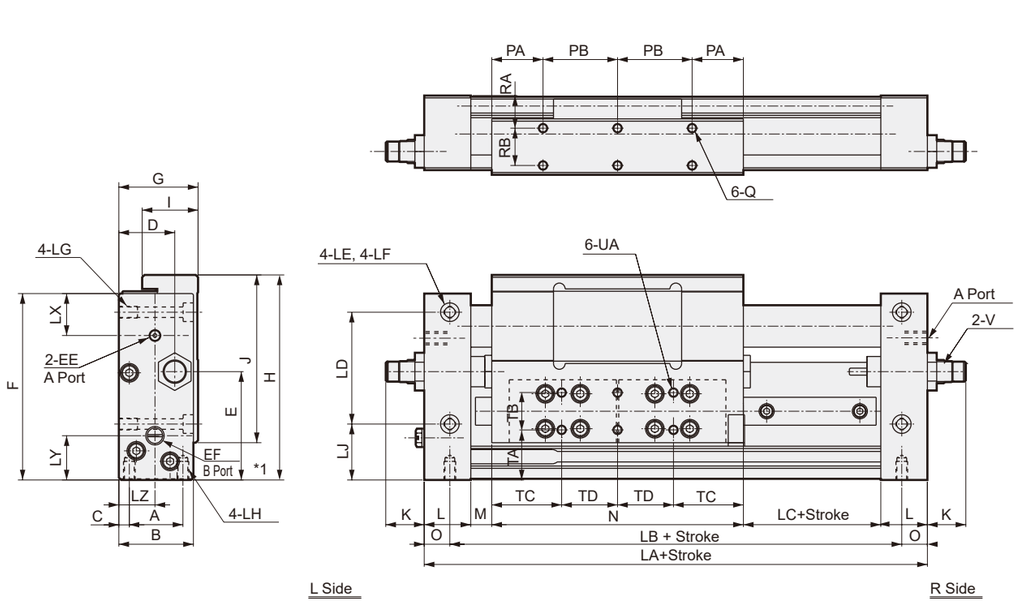
(Unit: N)

Bore Size (mm)	Operating Direction	Operating Pressure MPa					
		0.2	0.3	0.4	0.5	0.6	0.7
ø10	Push/Pull	-	23.6	31.4	39.3	47.1	55.0
ø16	Push/Pull	40.2	60.3	80.4	1.01×10^2	1.21×10^2	1.41×10^2
ø25	Push/Pull	98.2	1.47×10^2	1.96×10^2	2.45×10^2	2.95×10^2	3.44×10^2

MEMO

Dimensional Drawings

● MRG2 (High precision guide)



Code	External Dimensions					Mounting Dimensions							
Bore Size (mm)	LA	B	G	F	H	O	LB	LD	LJ	LE	LF	LG	LH
ø10	138	26	28	70	74	11	116	40	22	ø4.5	8 Counterbore Depth 4.4	M5 Depth 8	M4 Depth 8
ø16	166	32	34	80	88	11	144	48	24	ø4.5	8 Counterbore Depth 4.4	M5 Depth 8	M5 Depth 8
ø25	214	44	46	100	114	15	184	62	32	ø5.5	9.5 Counterbore Depth 5.4	M6 Depth 12	M6 Depth 10

Code	Mounting Dimensions											
Bore Size (mm)	A	C	PA	PB	RA	RB	Q	TA	TB	TC	TD	UA
ø10	18	4	16	24	12	12	M4 Depth 6	19.5	13	24	16	M4 Depth 6
ø16	23	4.5	22	32	14	16	M4 Depth 6	21.5	16	30	24	M4 Depth 6
ø25	23	5.5	34	40	20	20	M6 Depth 8	23	22	38	36	M6 Depth 8

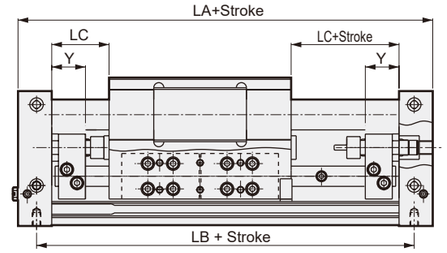
Code	General Dimensions													
Bore Size (mm)	D	LX	EE	LY	EF	LZ	E	I	J	K	L	M	N	LC	V
ø10	19	18	M5 Depth 4	17	M5 Depth 4	11.5	38.5	20	58	14	20	9	80	9	MRG2-10-C
ø16	24	18	M5 Depth 4	19	M5 Depth 4	15	46.5	24	72	16.5	20	9	108	9	MRG2-16-C
ø25	32.5	23	Rc1/8	21.5	Rc1/8	23	55	32	98	19	25	8	148	8	MRG2-25-C

*1: When using with single-surface centralized piping, remove the plug from port B and assemble that plug into the R-side A port for use.

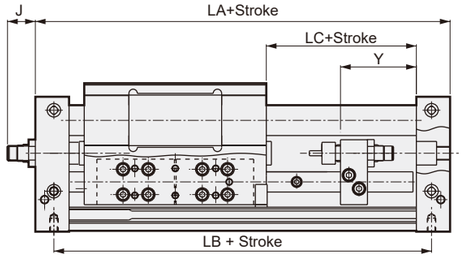
*2: **For dimensions with each switch, refer to P. 249.**

Dimensional Drawings

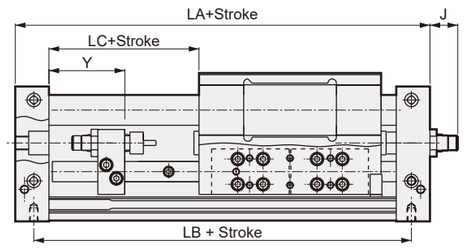
● MRG2-□-A (high precision guide, with both sided full stroke adjustable brackets)



● MRG2-□-A1 (high precision guide, with R side full stroke adjustable brackets)



● MRG2-□-A2 (high precision guide, with L side full stroke adjustable brackets)

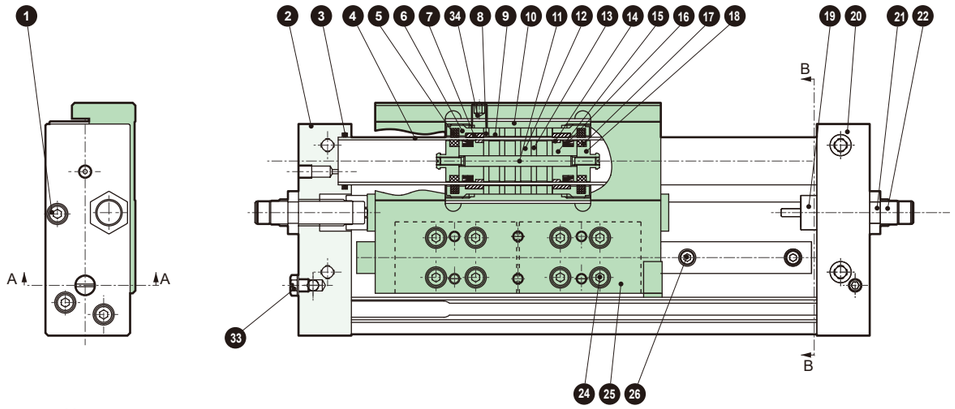


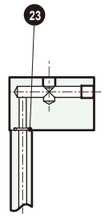
Code	LA			LB			LC			Y			J		
Bore Size (mm)	A	A1	A2	A	A1	A2	A	A1	A2	A	A1	A2	A	A1	A2
ø10		188			166		34	59		20	45		-	14	
ø16		216			194		34	59		20	45		-	16.5	
ø25		314			284		58	108		41	91		-	19	

Note: For dimensions with each switch, refer to P. 249.

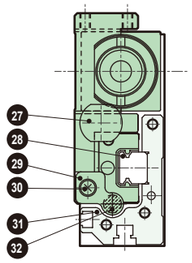
Internal Structure and Materials

● MRG2 (High precision guide)

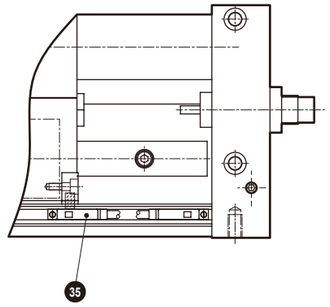




Section A-A



Section B-B



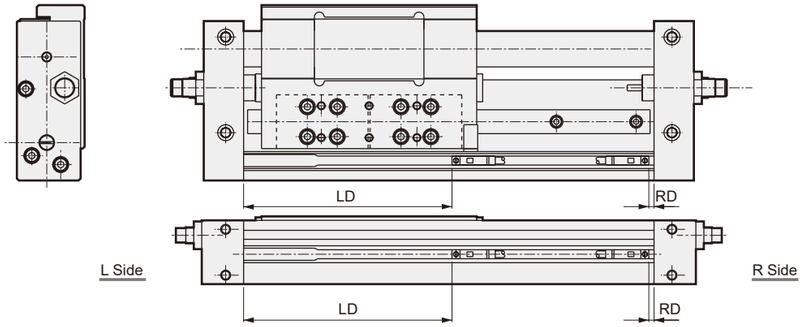
With Switch

Do not disassemble

No.	Part Name	Material	Remarks	No.	Part Name	Material	Remarks
1	Hexagon Socket Head Cap Screw	Stainless Steel		19	Stopper cap	Stainless Steel	
2	End plate (L)	Aluminum Alloy	Alumite	20	End plate (R)	Aluminum Alloy	Alumite
3	O-Ring	Nitrile Rubber		21	Hexagon Nut	Steel	Zinc Plated
4	Cylinder Tube	Stainless Steel		22	Shock Absorber		
5	Lube-Keeper (For slider)	Special rubber		23	O-Ring	Nitrile Rubber	
6	Slider Cover	Aluminum Alloy	Chromate	24	Hexagon Socket Head Cap Screw	Stainless Steel	
7	Slider wear ring	Polyacetal		25	Table	Aluminum Alloy	Alumite
8	Slider yoke	Steel	Zinc Plated	26	Hexagon Socket Head Cap Screw	Stainless Steel	
9	Magnet	Special alloy		27	Rod Support	Stainless Steel	
10	Slider	Aluminum Alloy	Chromate	28	Linear Guide		
11	Piston Shaft	Stainless Steel		29	Magnet Holder	Polyacetal	
12	Magnet	Special alloy		30	Cross-Recessed Pan Head Screw	Stainless Steel	
13	Piston yoke	Steel	Zinc Plated	31	Base	Aluminum Alloy	Alumite
14	Piston wear ring	Polyacetal		32	Magnet	Special alloy	
15	Piston (1)	Aluminum Alloy	Chromate	33	Plug	ø10, ø16: FPL (CKD) ø25: Stainless Steel	
16	Piston Packing	Nitrile Rubber					
17	Lube-Keeper (For piston)	Special rubber		34	Hexagon Socket Set Screw	Stainless Steel	ø25 only
18	Piston (2)	Aluminum Alloy	Chromate	35	Switch		

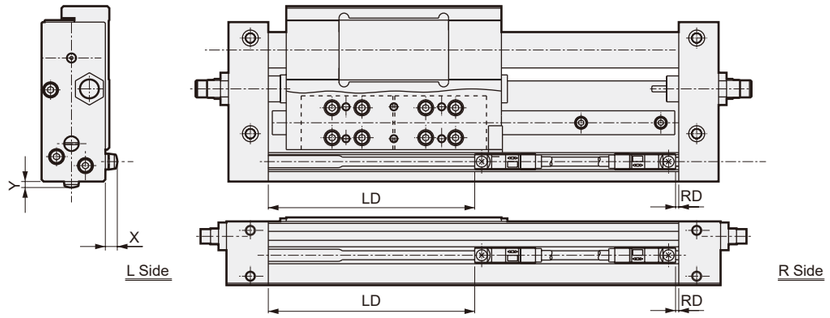
MRG2 Series Switch External Dimensions Diagram

● T0H/V, T5H/V, T2H/V, T3H/V, T2WH/V, T3WH/V, T2WLH/V



Model Number	Code / Bore Size (mm)	TO, T5 LD	TO, T5 RD	T2, T3 LD	T2, T3 RD	T2W, T3W, T2WL LD	T2W, T3W, T2WL RD
MRG2	ø10	75.5	1.5	76.5	2.5	78.5	4.5
	ø16	103.5	1.5	104.5	2.5	106.5	4.5
	ø25	142.5	0.5	143.5	1.5	145.5	3.5
MRG2-□-A	ø10	100.5	26.5	101.5	27.5	103.5	29.5
	ø16	128.5	26.5	129.5	27.5	131.5	29.5
	ø25	192.5	50.5	193.5	51.5	195.5	53.5
MRG2-□-A1	ø10	75.5	51.5	76.5	52.5	78.5	54.5
	ø16	103.5	51.5	104.5	52.5	106.5	54.5
	ø25	142.5	100.5	143.5	101.5	145.5	103.5
MRG2-□-A2	ø10	125.5	1.5	126.5	2.5	128.5	4.5
	ø16	153.5	1.5	154.5	2.5	156.5	4.5
	ø25	242.5	0.5	243.5	1.5	245.5	3.5

● T1H/V



Model Number	Code / Bore Size (mm)	X	Y	T1 LD	T1 RD
MRG2	ø10	11.5	8.5	75.5	1.5
	ø16			103.5	1.5
	ø25			142.5	0.5
MRG2-□-A	ø10			100.5	26.5
	ø16			128.5	26.5
	ø25			192.5	50.5
MRG2-□-A1	ø10			75.5	51.5
	ø16			103.5	51.5
	ø25			142.5	100.5
MRG2-□-A2	ø10			125.5	1.5
	ø16			153.5	1.5
	ø25			242.5	0.5

MRG2 Series selection guide

●The selection conditions differ from general air cylinders, so please check the suitability using the selection guide.

STEP-1

When selecting a new model → STEP-2

When usage conditions and size (I.D.) are already determined and suitability is checked → STEP-5

STEP-2

● Confirmation of operating conditions

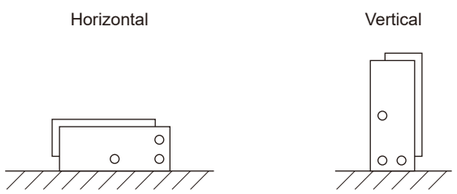
1. Operating Pressure (P) ☐ (MPa)
2. Applied load (W) ☐ (N) (applied load = workpiece load + jig load)
3. Mounting direction: Horizontal, Vertical (See "Fig. 1" below)
4. stroke (L) ☐ (m)
5. Travel time: (t) ☐ (s)
6. Average speed (Va) ☐ (m/s)

Calculation formula for cylinder average speed Va

$$Va = \frac{L}{t} \text{ (m/s)}$$

[Mounting Direction]
Operating direction: Horizontal, Vertical - Ascending, Vertical - Descending
Mounting direction: Horizontal, Vertical (See Fig. 1)

Fig. 1



STEP-3

● Calculation of required thrust

Calculate the required thrust (F_N) of the cylinder.

1. During horizontal operation
   $F_N = W \times 0.2 \dot{} =$ ☐ (N)
2. During vertical operation
   $F_N = W =$ ☐ (N)

Note: Frictional resistance value of the guide, etc., when a load is mounted on the slider. If there is further external resistance, please consider it separately.

STEP-4

● Selection of approximate size of cylinder

Required thrust of cylinder $F_N \leq$ theoretical thrust $\times \frac{\mu}{100} \times \frac{\alpha}{100}$

μ: Thrust efficiency (%) (refer to Fig. 2.)
α: Load factor (%) (refer to Table 2)

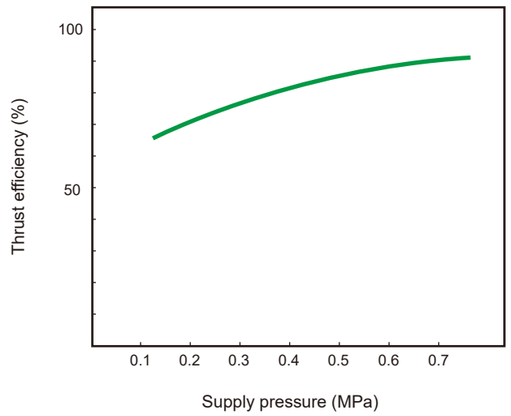
Select a cylinder size that satisfies this condition.

Table 1. Theoretical Thrust Value

(N)

Bore Size (mm)	Operating Pressure MPa					
	0.2	0.3	0.4	0.5	0.6	0.7
ø10	–	24	31	39	47	55
ø16	40	60	80	101	121	141
ø25	98	147	196	245	295	344

Fig. 2. Thrust Efficiency μ



Load factor α: For general use, the value within the range in Table 2 is desirable.

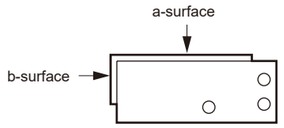
[Table 2] Guideline for Load Factor

Operating Pressure MPa	α (%)
0.2 to 0.3	α ≤ 40
0.3 to 0.6	α ≤ 50
0.6 to 0.7	α ≤ 60

STEP-5

● Calculate the vertical load and value for each moment

Calculate the vertical load (W1, W2) and moments (M1, M2, M3) according to the cylinder mounting state of the load.



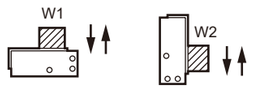
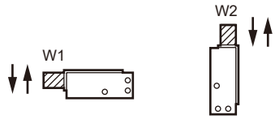
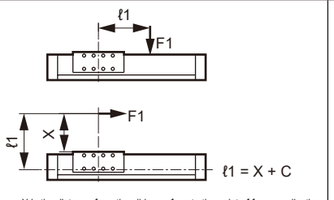
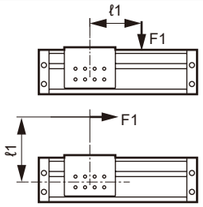
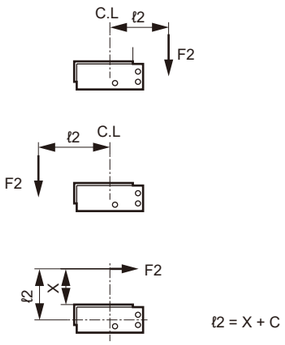
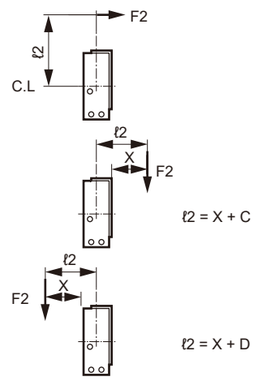
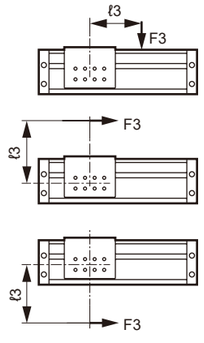
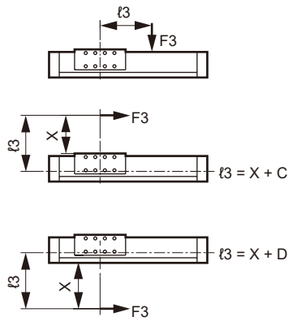
	Mounted on a-surface	Mounted on b-surface	Calculation Result
Vertical load W1 W2			W1 = □ W2 = □
Bending Moment M1 = F1 x ℓ1	 X is the distance from the slider surface to the point of force application		M1 = □
Lateral Bending Moment M2 = F2 x ℓ2	 C.L indicates the center between mounting screws on surface a		M2 = □
Torsional Moment M3 = F3 x ℓ3			M3= □

Table 3. Values of Each Parameter

(m)

Bore Size (mm)	C	D
ø10	0.016	0.012
ø16	0.020	0.014
ø25	0.026	0.020

STEP-6

● Confirmation of the vertical load and the composite value for each moment

Divide each load by the maximum allowable value in Table 4 and confirm that the total value is 1.0 or less.

$$\frac{W1\ (\text{or } W2)}{W1\ (\text{or } W2)\ \max} + \frac{M1}{M1\max} + \frac{M2}{M2\max} + \frac{M3}{M3\max} \leq 1.0$$

If the total value is greater than 1.0

1. Re-examine load → STEP-2
2. Implement reviews such as increasing the cylinder's inner diameter. → Increase cylinder Bore Size → STEP-5

Table 4. Maximum Allowable Values for Vertical Load and Each Moment

Bore Size (mm)	W1 max (N)	W2 max (N)	M1max (N·m)	M2max (N·m)	M3max (N·m)
ø10	44	35	2.2	1.2	2.2
ø16	103	91	7.4	3.2	7.4
ø25	176	176	18.3	7.3	18.3

STEP-7

● Confirmation of kinetic energy

Calculate the kinetic energy from the load weight m (kg) and speed V (m/s), and confirm that it is within the specification range of the shock absorber. If the specifications are exceeded, increase the cylinder size or arrange an external shock absorbing device.

(1) Kinetic energy calculation formula

$E_1 = \frac{1}{2} \times m \times V^2$ = □ (J)

$m = \frac{W}{9.8}$ = □ (kg)

$V = \frac{L}{t} \times \left(1 + 1.5 \times \frac{\alpha}{100}\right)$ = □ (m/s)

$\alpha = \frac{F_N}{\text{Cylinder theoretical thrust} \times \frac{\mu}{100}} \times 100$ = □ (%)

E_1	: Kinetic energy	(J)
m	: Load weight	(kg)
V	: Speed	(m/s)
W	: Applied load	(N)
L	: Cylinder Stroke	(m)
t	: Operating Time	(s)
α	: Cylinder Load Factor	(%)
F_N	: Necessary Thrust	(N)
μ	: Thrust efficiency	(%)

(2) About Shock Absorber

Table 5 shows the shock absorbers used with MRG2.

Table 5. Shock Absorber Specifications

Model	MRG2-10	MRG2-16	MRG2-25
Shock Absorber Model Number	MRG2-10-C (Using NCK-00-0.3)	MRG2-16-C (Using NCK-00-0.7)	MRG2-25-C (Using NCK-00-1.2)
Max Absorbed Energy (J) *1	2.1	5.3	8.7
Stroke (mm) *1	5	7	8.5
Absorbed Energy per Hour (kJ/hour)	6.3	12.6	21.6
Max Repetition Frequencycycles/min	35	30	30

*1: Since a stopper cap is used to stop before the stroke end, both energy and stroke are smaller than standard products.

Confirmation of Allowable Collision Energy of Shock Absorber

Using the calculation formulas in the table below, calculate the equivalent weight of impact object Me and impact energy E, and confirm that Me and E are below the allowable values in Fig. 4 and Table 5. Also, confirm that the cycle frequency is below the allowable value according to Table 5.

Code

E : Collision Energy □(J)
Me : Colliding object equivalent weight □(kg)
m : Load weight □(kg)
F : Cylinder Thrust □(N)
V : Collision Speed □(m/s)
St : Shock Absorber Stroke □(m)
g : Gravity acceleration 9.8 (m/s^2)

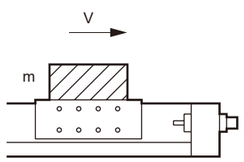
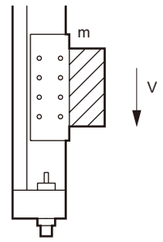
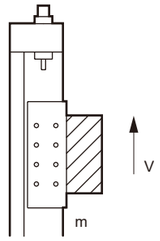
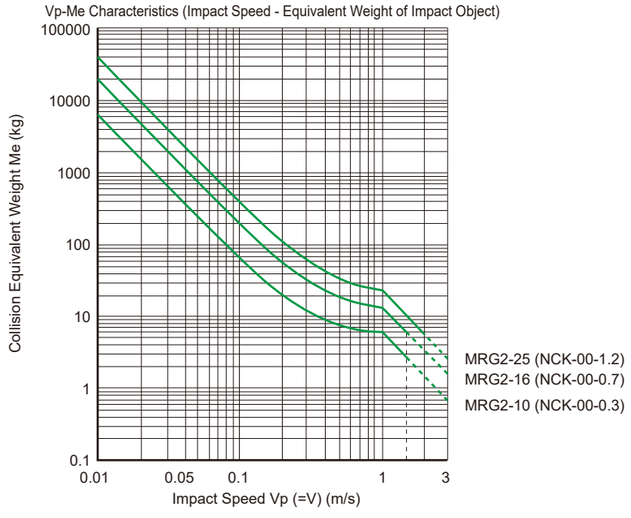
	Horizontal Movement	Vertical Descent	Vertical Ascent
Usage Example			
Equivalent Weight of Impact Object Me (kg)	$Me = m + \frac{2F \cdot St}{V^2}$	$Me = m + \frac{2 \cdot St\ (F + mg)}{V^2}$	$Me = m + \frac{2 \cdot St\ (F - mg)}{V^2}$
Energy E (J)	$E = \frac{mV^2}{2} + F \cdot St$	$E = \frac{mV^2}{2} + (F+mg) \cdot St$	$E = \frac{mV^2}{2} + (F-mg) \cdot St$

Fig. 4



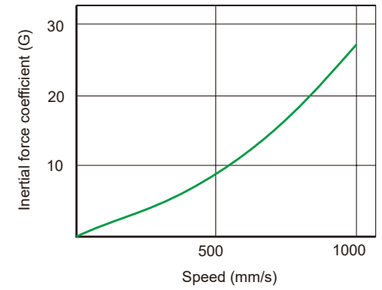
STEP-8

Confirmation of Inertial Load

At the stroke end, inertial force from the load acts. Confirm whether that force is within the allowable range.

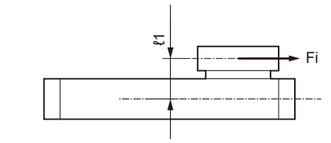
(1) Calculate the inertial force Fi from the speed V and the inertial force coefficient in Fig. 5.
Fi = 9.8 × m × G (N)
m: Load weight (kg)
G: Inertial force coefficient

Fig. 5. Inertial Force Coefficient

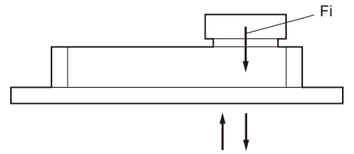


(2) Calculate the load and moment generated by inertial force.
(Example)

M1i = Fi × ℓ1



W1i = Fi



When moving the entire cylinder up and down

(3) Sum the loads and moments generated by static load and inertial force, divide by the allowable values in Table 4, and confirm that the total value is 1.0 or less.

W1 g = W1 + W1i
W2 g = W2 + W2i
M1 g = M1 + M1i
M2 g = M2 + M2i
M2 g = M3 + M3i

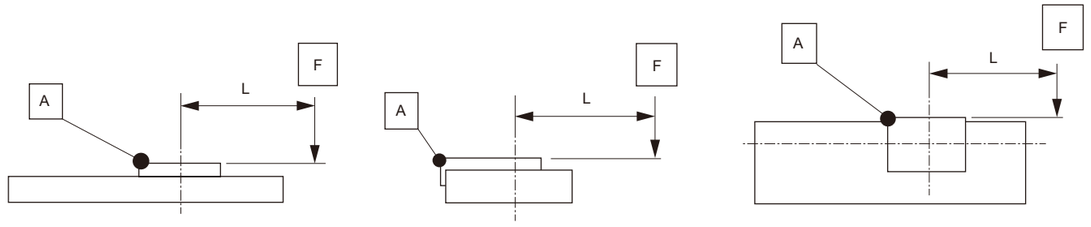
$$\frac{W1\ g\ (\text{or } W2\ g)}{W1\ (\text{or } W2)\ max} + \frac{M1\ g}{M1\ max} + \frac{M2\ g}{M2\ max} + \frac{M2\ g}{M3\ max} \leq 1.0$$

MRG2 Table Displacement Amount (Reference Value)

● Bending moment direction
M1 = F×L

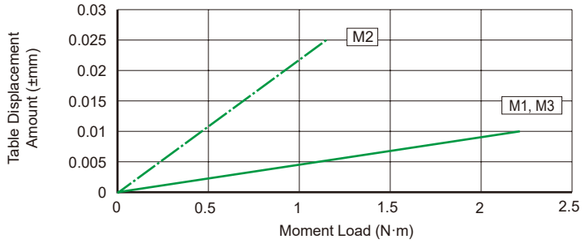
● Radial moment direction
M2 = F×L

● Torsion moment direction
M3 = F×L

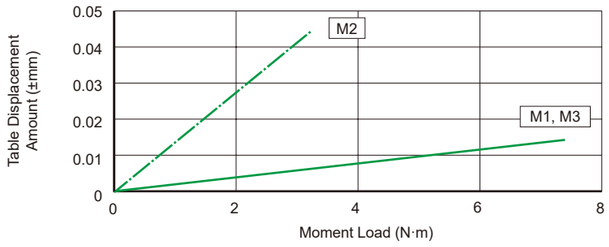


Displacement of A=Table displacement amount

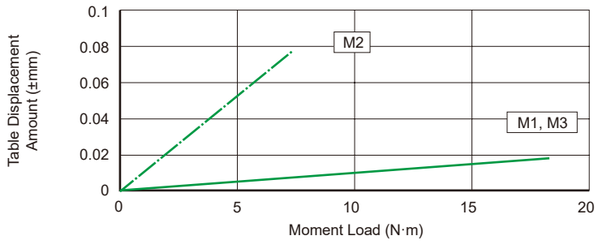
● MRG2-10



● MRG2-16



● MRG2-25



Note: The table deflection indicates a value for reference at the stroke end.

MEMO

Pneumatic Component

To Use This Product Safely

Be sure to read this before use. For general cylinder information, see Intro 41, and for cylinder switches, see P. 1512.

Specific Precautions: Rodless Cylinder MRG2 Series

Design / Selection

⚠Warning

■With the cylinder, there is the risk of the table popping out in cases when a change of force occurs due to disruption of the sliding portions of the machine.
In such cases, bodily injury such as trapped hands or feet may occur, and machine damage may result. Therefore, adjust the machine to ensure smooth movement and design it to prevent injury to the human body.

■When a deceleration circuit or shock absorber is necessary.
If the speed of the driven object is fast or the Weight is large, the standard equipped shock absorber alone may find it difficult to absorb the impact. Therefore, install a circuit that decelerates before entering the shock absorber, or use an external shock absorber to mitigate the impact. In this case, sufficiently consider the rigidity of the machinery.

■The piston may become derailed if the unit is used in an environment of pressure greater than the Max Operating Pressure or in cases when a load greater than the allowable value is applied.

During Use

⚠CAUTION

■Be careful of the gap between the end plate and the slider.
During cylinder operation, fingers or hands may be caught, causing injury, so be very careful.

■Do not apply a load to the cylinder that is greater than or equal to the allowable load listed in the materials for selection.

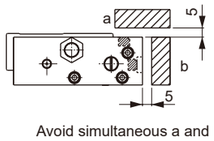
■Do not use with the table fixed.
Use the cylinder with the end plate fixed. Avoid using with the table fixed.

■Mount so that the table functions with the Min Operating Pressure value of all processes.
If the flatness of the cylinder mounting surface is poor, the minimum Operating Pressure will rise due to twisting of the guide section, causing early wear of the bearing section. Therefore, install so that the table operates at or below the minimum Operating Pressure for the entire stroke. A mounting mating surface with high flatness is desired, but if it cannot be sufficiently confirmed, perform shim adjustment, etc.

■Be careful to avoid scratching or denting the outer peripheral surface of the cylinder tube.
This may lead to damage of the lube keeper and slider wear ring, causing malfunction.

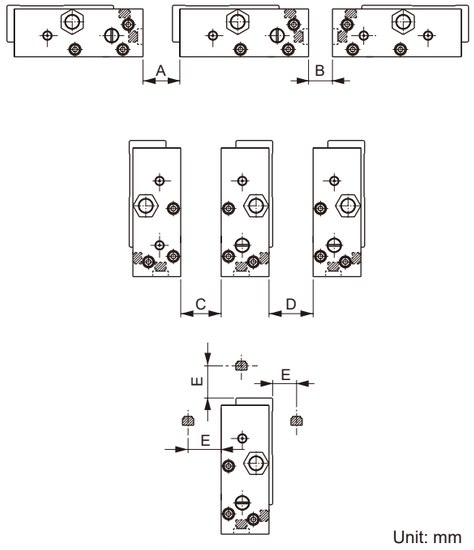
■The cylinder switch may malfunction if there is a magnetic substance such as a metal plate installed adjacently. Be sure that more clearance than the dimensions listed below is provided.

Magnetic substance such as steel plate



Avoid simultaneous a and b.

■When using cylinders adjacent with each other or when using other magnetic sensors nearby, in order to prevent malfunctioning due to the leaked magnetic field of the cylinder embedded magnet, separate the cylinder or magnetic sensors by at least the values listed below.

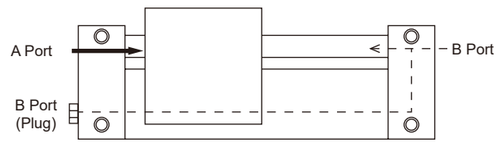


Unit: mm

Bore Size	A	B	C	D	E
ø10	20	10	10	10	20
ø16	20	10	10	10	20
ø25	50	20	20	20	50

If the distance is less than dimension E, malfunction can be prevented by inserting a magnetic substance (steel plate thickness 2 mm or more) between the tables.

■About Piping Port Position and Operation Direction



When A port is pressurized, the slide table moves to the right in the figure. When B port is pressurized, the slide table moves to the left in the figure. B port (plug) is sealed with a plug at the time of shipment. Centralized piping becomes possible by removing the plug and sealing the B port on the right side.

■Treat our shock absorbers as consumable parts.
Replace if a decrease in energy absorption capacity is observed or if operation is no longer smooth.

■The magnetic strength of the embedded magnet is powerful. Do not disassemble.

For precautions during installation, adjustment, use, and maintenance, please refer to "During Use" in this catalog and the Instruction Manual on the CKD Component Product Site (https://www.ckd.co.jp/kiki/en/) -> "Model Number".

Rodless type

SM-25

Shuttle Mover

ø25

CONTENTS

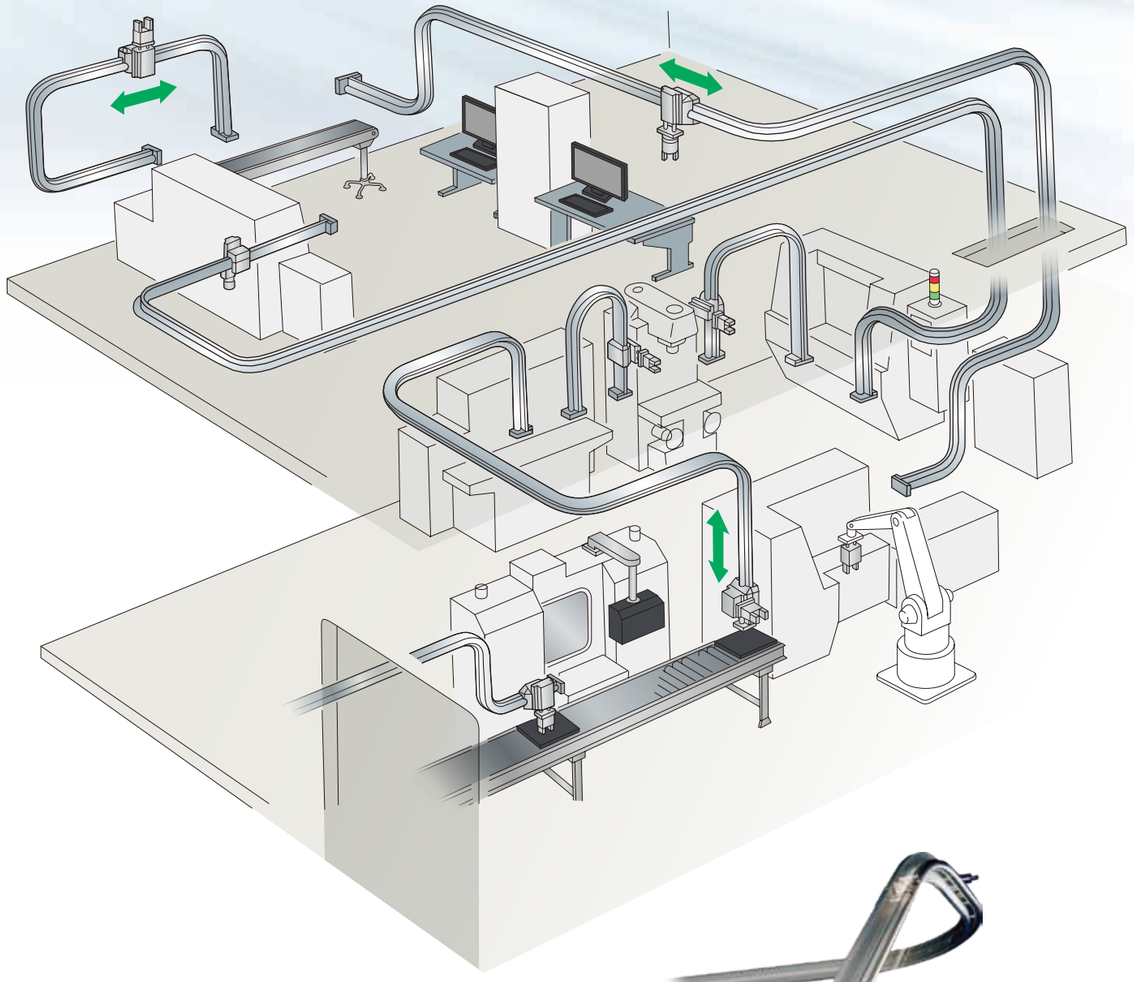
Product Introduction	262
● Standard Type / High Load Type (SM-25)	264
Technical Data	282
Q&A	284
⚠ Precautions for Use	286

Rodless Type
SRL3
SRG3
SRM3
SRT3
MRL2
MRG2
SM-25
Cylinder Switch
Ending

SM-25 Series

Enabled free 3D layout
Air-driven 3D transfer system

Effective use of space **Production efficiency UP**

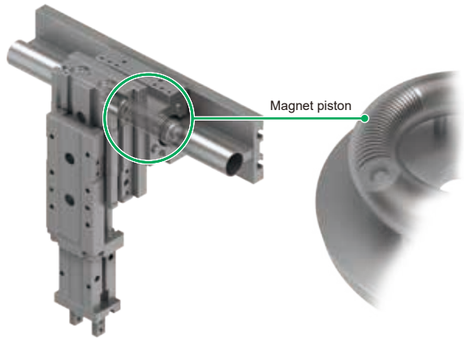


Application Examples

- Connecting between each process
- Removal and supply of parts from processing machine
- Transportation of parts in assembly lines

3D Transfer System Air Driven

A 3D transfer system where a piston with a magnet inside the cylinder tube is moved by air pressure, and the outer carrier is moved by that magnetic force.



O-rings adopted at the connection of each unit

Simple structure makes assembly easy, and there is no air leakage.

Flexible layout possible

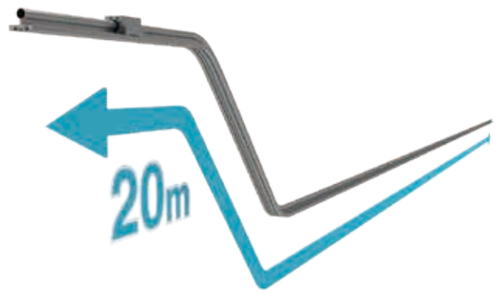
Layout fitted to each factory is possible by combining each unit (horizontal/vertical curve, straight)

Straight unit

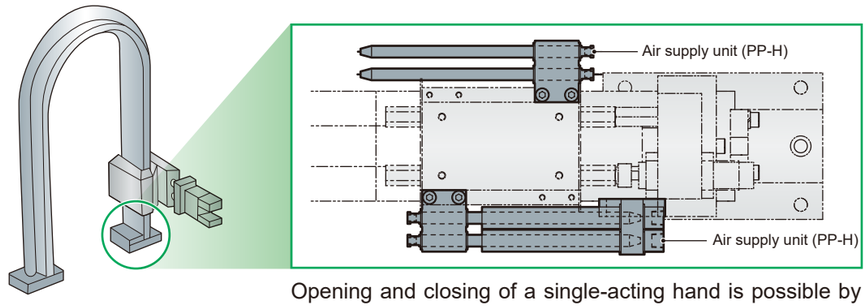
Curve unit 90 degree Horizontal/Vertical

Curve unit 45 degree Horizontal/Vertical

Max Conveyance Distance: Max 20 m



Gripper operation possible at stroke end



Opening and closing of a single-acting hand is possible by attaching air supply units to both ends

SM-25 Series Product System

Type	Bore Size	Magnet holding force	Max Allowable Payload*	Max transfer distance
Standard Type	ø25	120 N	2 kg	20 m
High Load Type	ø25	240 N	4 kg	20 m

*Total load Weight to be mounted

Rodless Type
SRL3
SRG3
SRM3
SRT3
MRL2
MRG2
SM-25
Cylinder Switch
Ending

Shuttle Mover Standard Type / High Load Type

SM-25 Series

Air-driven 3D transfer P&P system enabling free layout

RoHS

Model No. Notation

SM-25 – ST-H 100

1 Model Number

2 Stroke

1 Model Number

Code		Description
Standard Type	High Load Type	
CA	CA-H	Carrier
*1 RE	RE-H	Rail end
*2 ST	ST-H	Straight unit
SC90	SC-H90	Horizontal curve unit 90°
SC45	SC-H45	Horizontal curve unit 45°
VC90-IN	VC-H90-IN	Vertical (in) curve unit 90°
VC45-IN	VC-H45-IN	Vertical (in) curve unit 45°
VC90-OUT	VC-H90-OUT	Vertical (out) curve unit 90°
VC45-OUT	VC-H45-OUT	Vertical (out) curve unit 45°
PP *3	PP-H *4	Air supply unit (2 or 3 nozzles)
*5 PR	PR-H	Air supply unit (4 nozzles)
RJ	RJ-H	Joint

*1: 1 set (2 pieces) includes joint and shock absorber.
*2: Select stroke only for straight units (ST, ST-H).
*3: For 2 nozzles.
1 set includes 2 sets for rail end and 2 sets for carrier.
*4: For 3 nozzles.
1 set includes 2 sets for rail end and 2 sets for carrier.
*5: For 4 nozzles.
1 set includes 2 sets for rail end and 1 set for carrier.
*6: Each rail unit comes with 1 joint.
We recommend Shockless Valve SKH Series for the valve. For details, please refer to "Directional Control Valve (2)" No. RJ-012.

2 Stroke (mm)

Model Number	Stroke	Standard Stroke
ST ST-H	100 to 190	Every 10 mm
	200 to 2000	Every 100 mm

Note: Intermediate strokes are available in 1 mm increments. (Custom Product)

Specifications

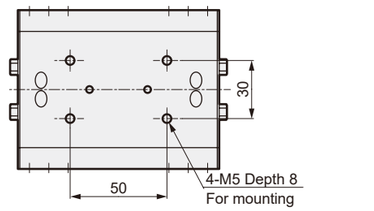
Model No. / Item		Standard Type	High Load Type
Operating Fluid		Compressed Air	
Max Operating Pressure	MPa	0.6	
Min Operating Pressure	MPa	0.3	
Ambient Temperature	°C	5 to 40	
Bore Size	mm	ø25	
Port Size		Rc3/8	
Magnet Holding Force	N	120	240
Max Allowable Load Weight	kg	2 (Total load Weight to be mounted)	4 (Total load Weight to be mounted)
Max Conveyance Distance	m	20	
Stroke End Adjustment Length	mm	±10	
Cushion	Piston	Rubber Cushion	
	Carrier	Shock Absorber	
Lubrication		Not required (Use Turbine Oil Class 1 ISO VG32 if lubricated)	

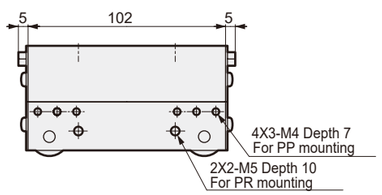
Weight

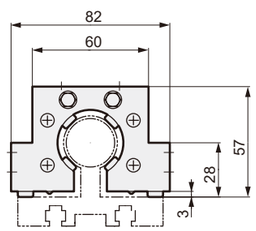
Model No.	Weight (kg)	
	Standard Type	High Load Type
Carrier	1	1.7
Rail end	2 x 2 pcs	3.6 x 2 pcs
Horizontal curve unit 90°	4	4
Horizontal curve unit 45°	2.4	2.4
Vertical (in) curve unit 90°	3	3
Vertical (in) curve unit 45°	1.8	1.8
Vertical (out) curve unit 90°	3	3
Vertical (out) curve unit 45°	1.8	1.8
Air supply unit (2 or 3 nozzles)	0.3 (End mounting part) x 2 pcs 0.2 (Carrier mounting part) x 2 pcs	0.4 (End mounting part) x 2 pcs 0.4 (Carrier mounting part) x 2 pcs
Air supply unit (4 nozzles)	1.6 (End mounting part) x 2 pcs 0.3 (Carrier mounting part) x 1 pc	1.6 (End mounting part) x 2 pcs 0.3 (Carrier mounting part) x 1 pc
Joint	0.3	0.4
Straight unit	0.4 (At 100 stroke) *Add 0.4 per 100mm stroke	0.4 (At 100 stroke) *Add 0.4 per 100mm stroke

Dimensional Drawings

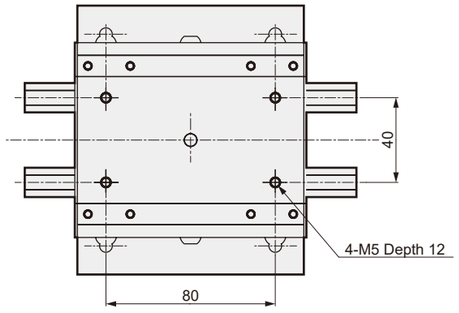
● Carrier (CA)

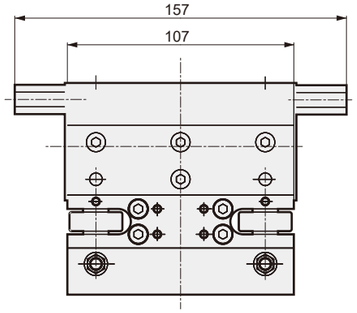


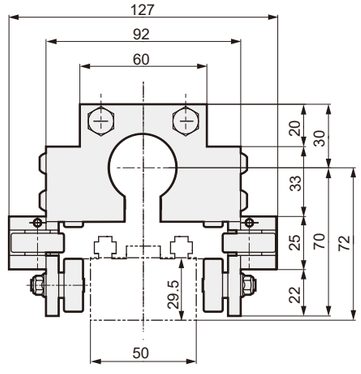




● Carrier/high load (CA-H)

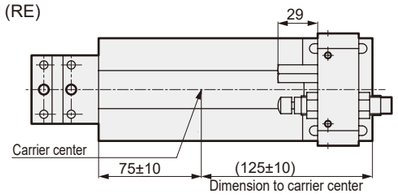


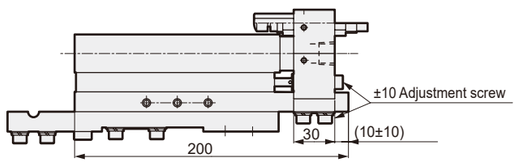


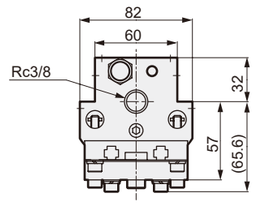


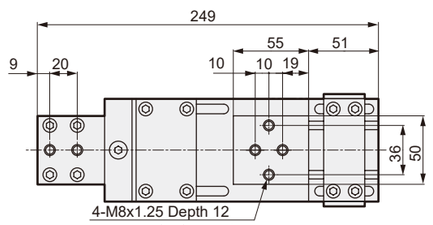
Dimensional Drawings

● Rail end (RE)

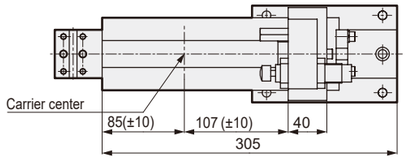


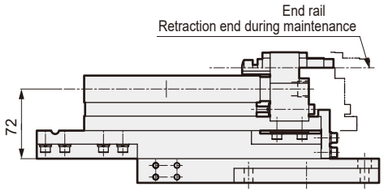


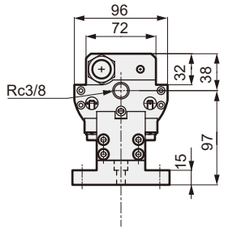


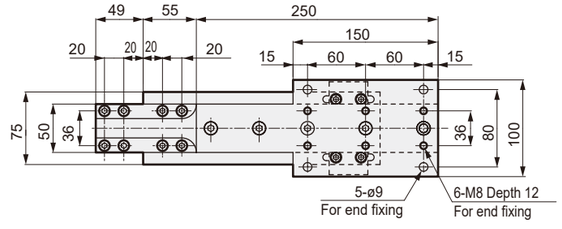


● Rail end/high load (RE-H)



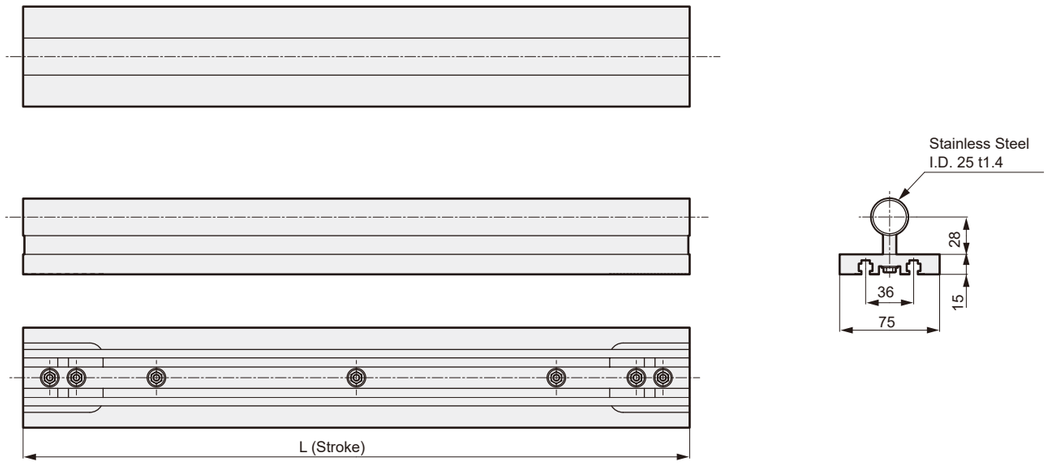






Dimensional Drawings

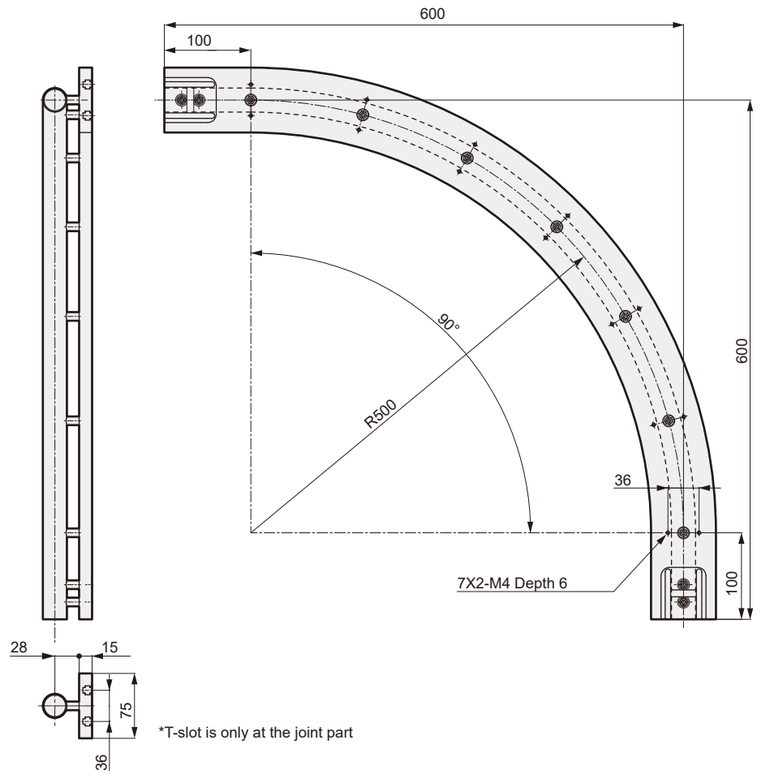
● Straight unit (ST)/high load (ST-H)



Note: Only the joint changes between ST (standard type) and ST-H (high load type). The dimensions of the unit body are the same.

Dimensional Drawings

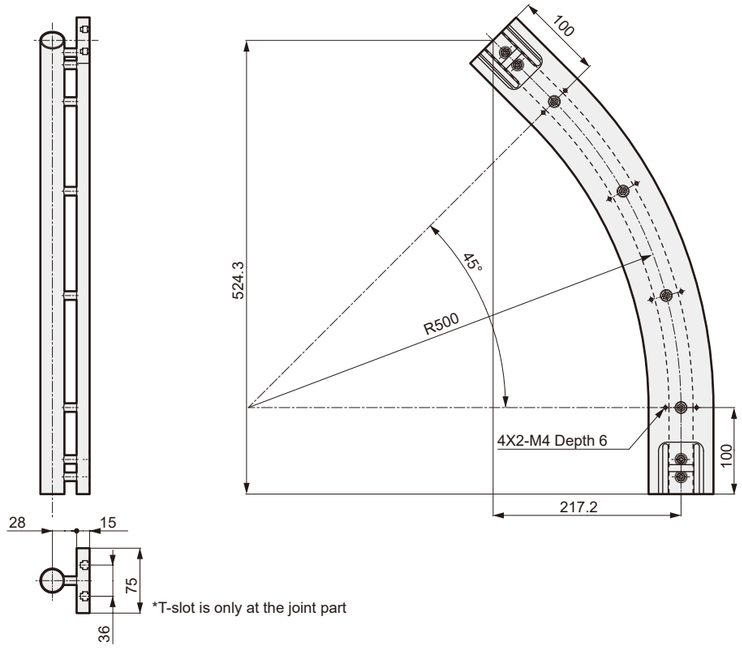
● Lateral curve unit 90° (SC90)/high load (SC-H90)



*T-slot is only at the joint part

Note: Only the joint changes between ST (standard type) and ST-H (high load type). The dimensions of the unit body are the same.

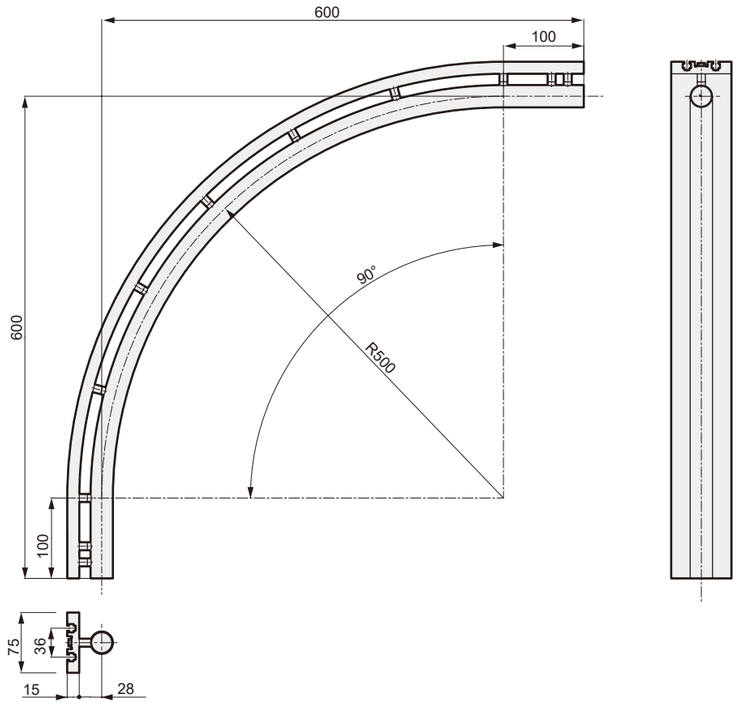
● Lateral curve unit 45° (SC45)/high load (SC-H45)



*T-slot is only at the joint part

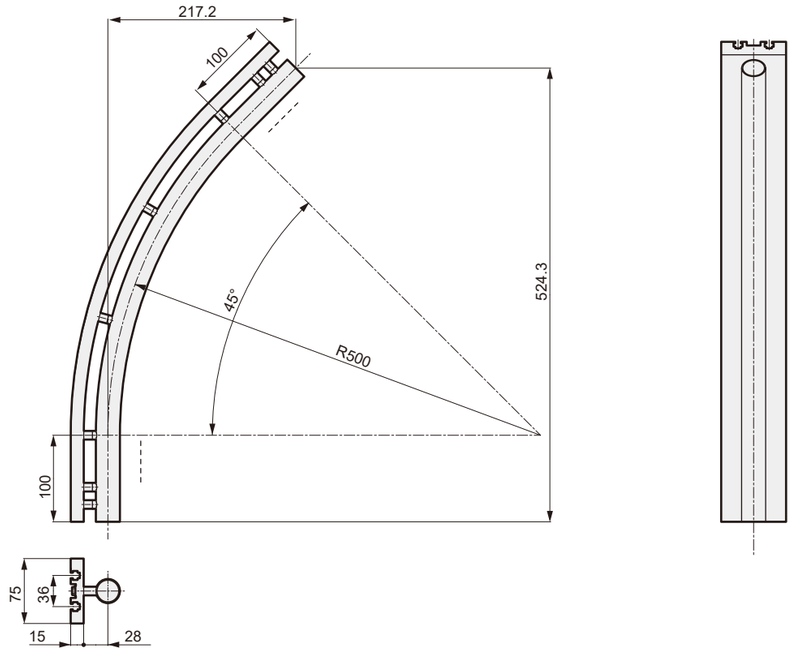
Dimensional Drawings

● Vertical (in) curve unit 90° (VC-90-IN)/high load (VC-H90-IN)



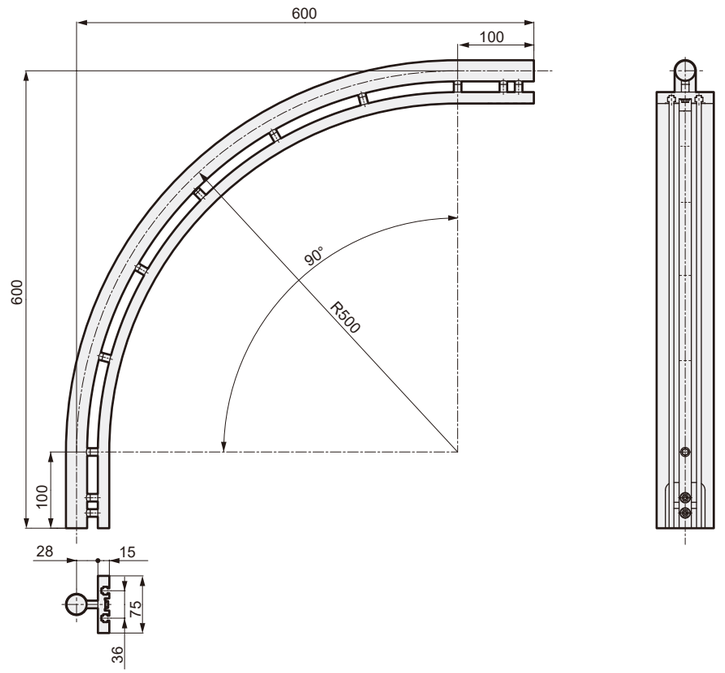
Note: Only the joint changes between ST (standard type) and ST-H (high load type). The dimensions of the unit body are the same.

● Vertical (in) curve unit 45° (VC-45-IN)/high load (VC-H45-IN)



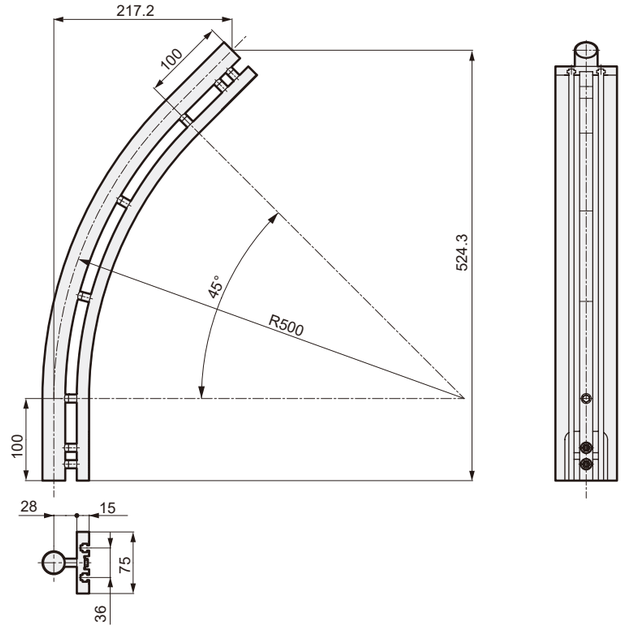
Dimensional Drawings

● Vertical (out) curve unit 90° (VC-90-OUT)/high load (VC-H90-OUT)



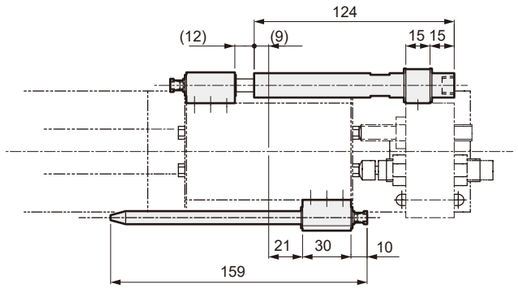
Note: Only the joint changes between ST (standard type) and ST-H (high load type). The dimensions of the unit body are the same.

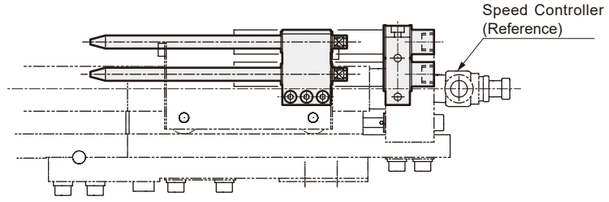
● Vertical (out) curve unit 45° (VC-45-OUT)/high load (VC-H45-OUT)

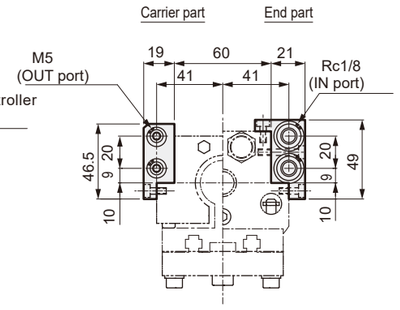


Dimensional Drawings

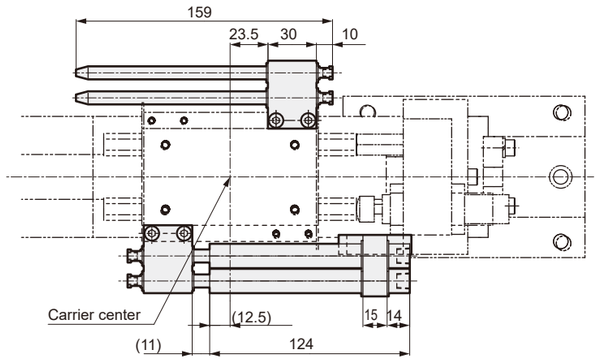
● Air supply unit (PP)

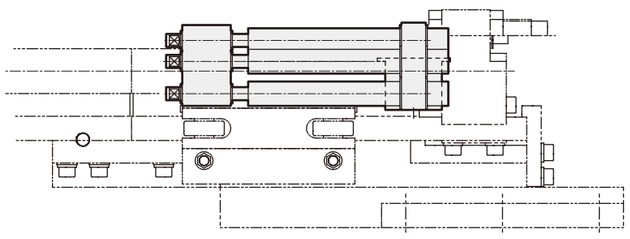


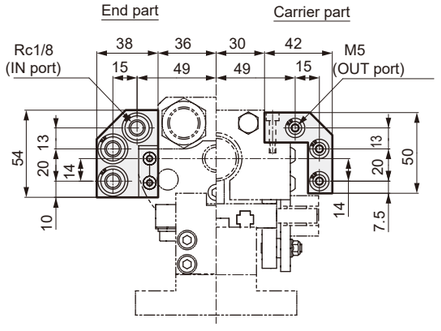




● Air supply unit/high load (PP-H)

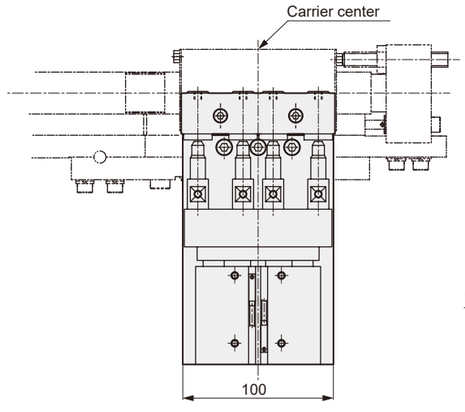


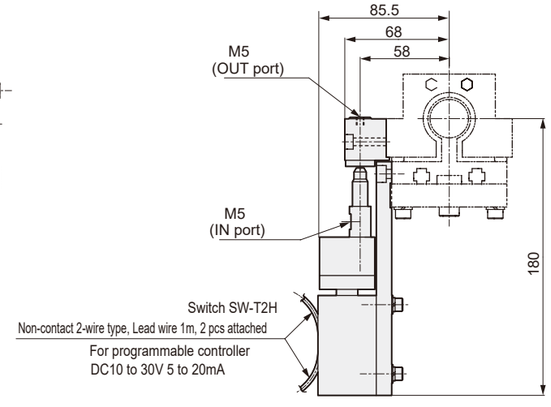




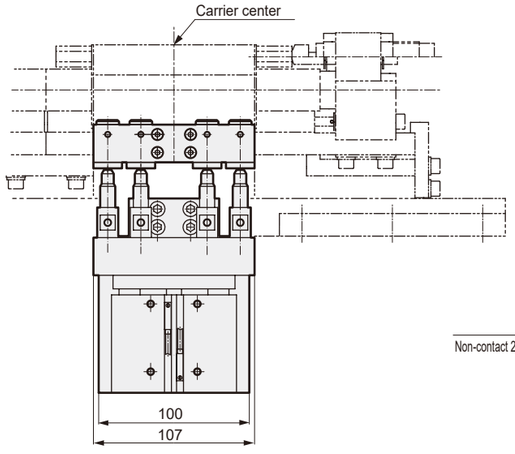
Dimensional Drawings

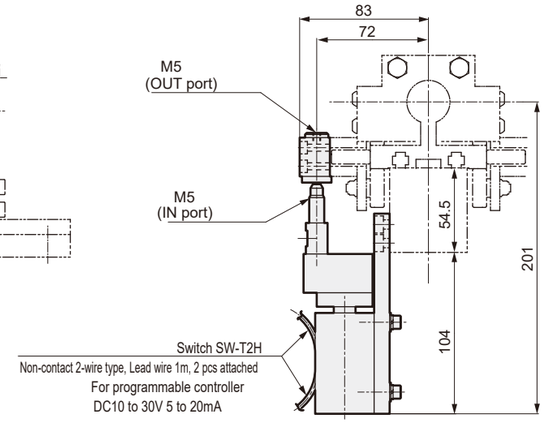
● Air Supply Unit (PR)





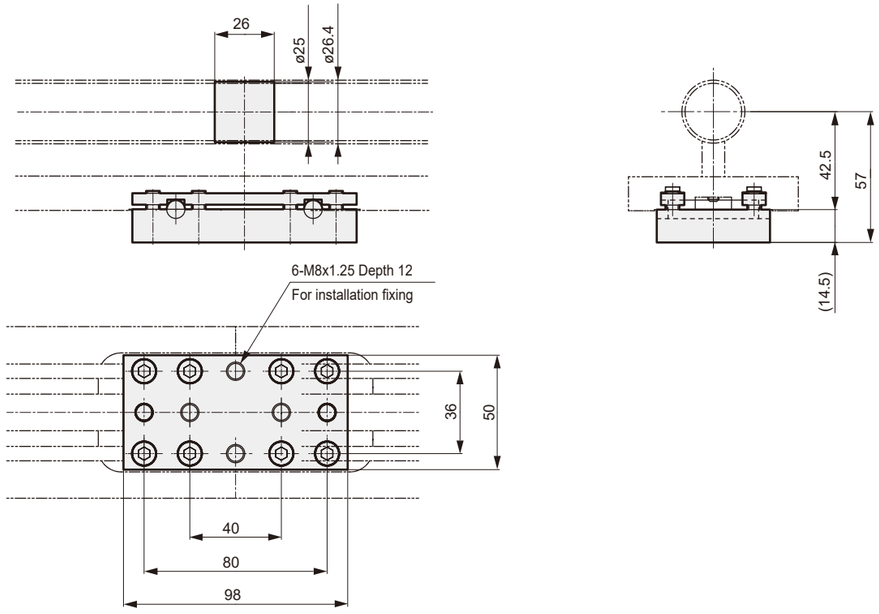
● Air supply unit/high load (PR-H)



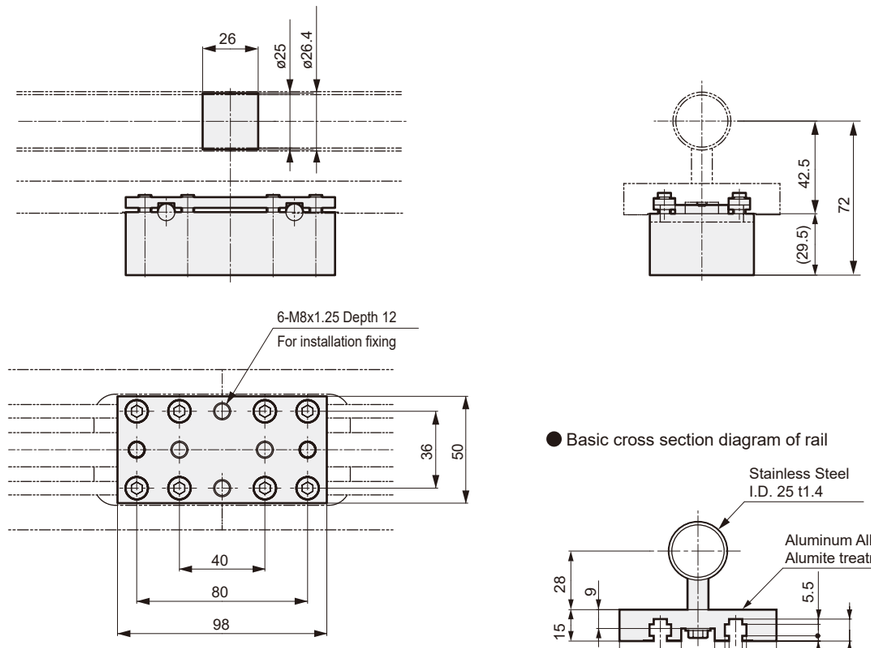


Dimensional Drawings

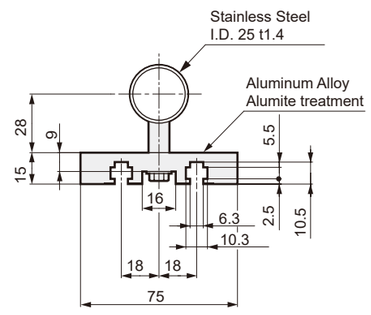
● Fitting (RJ)



● Fitting/high load (RJ-H)



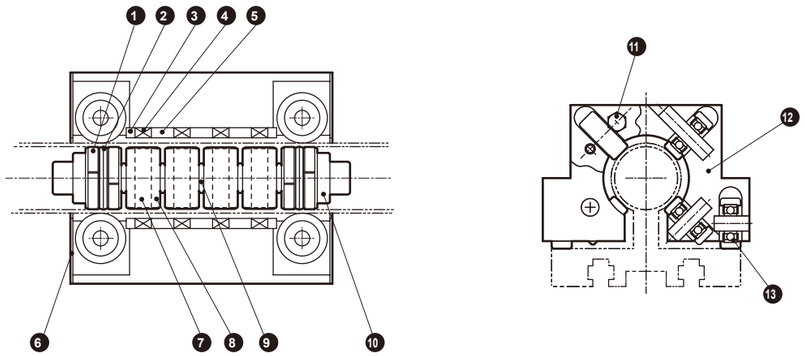
● Basic cross section diagram of rail



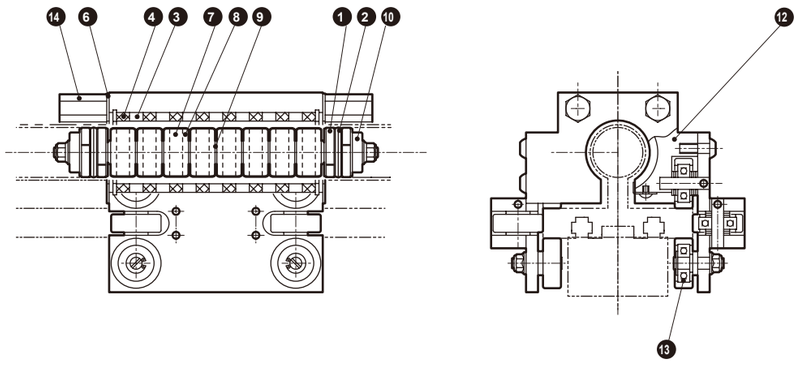
MEMO

Internal Structure and Materials

● Carrier (CA)



● Carrier/high load (CA-H)



No.	Part Name	Material	Remarks	No.	Part Name	Material	Remarks
1	Wear Ring	Polyacetal		8	Inner yoke	Steel	
2	Piston Packing	Nitrile Rubber		9	Flexible shaft	Nylon	
3	Outer external yoke	Steel		10	Piston	Aluminum Alloy	
4	External magnet	Rare earth magnet		11	Stop pin	Steel	
5	Inner external yoke	Steel		12	Housing	Aluminum Alloy	
6	Side Cover	Stainless Steel		13	Roller	Urethane Rubber	
7	Internal magnet	Rare earth magnet		14	Stopper bolt	Steel	

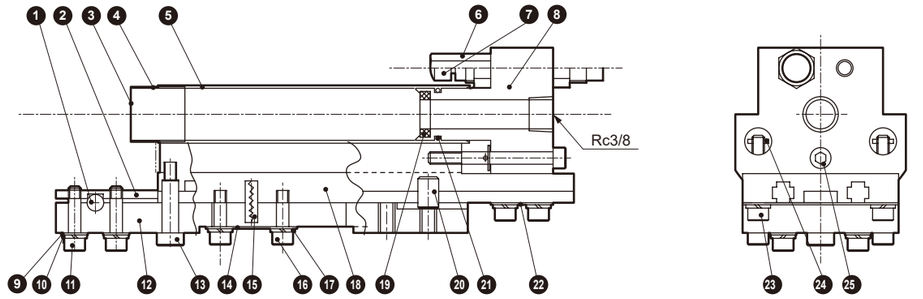
Replacement Parts List

Part Name	Series	Set No.	Replacement Part Number
Piston Set	Standard Type	SM-25-CA-PS	❶❷❼❽❾❿
	High Load Type	SM-25H-CA-PS	
Carrier Set	Standard Type	SM-25-CA-S	❸❹❺❻⓫⓬⓭
	High Load Type	SM-25H-CA-S	❸❹❻⓬⓭⓮
Packing Set (*1)	Standard Type	SM-25-CA-PK	❶❷
	High Load Type		

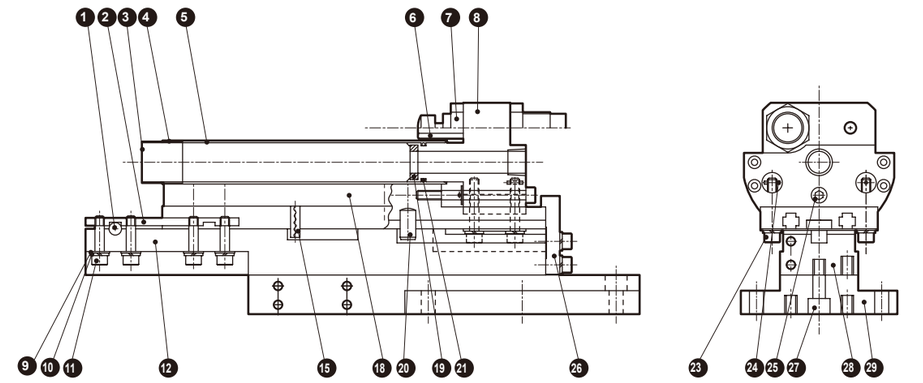
Note: The set contains 4 wear rings and 2 Piston Packings.

Internal Structure and Materials

● Rail end (RE)



● Rail end/high load (RE-H)

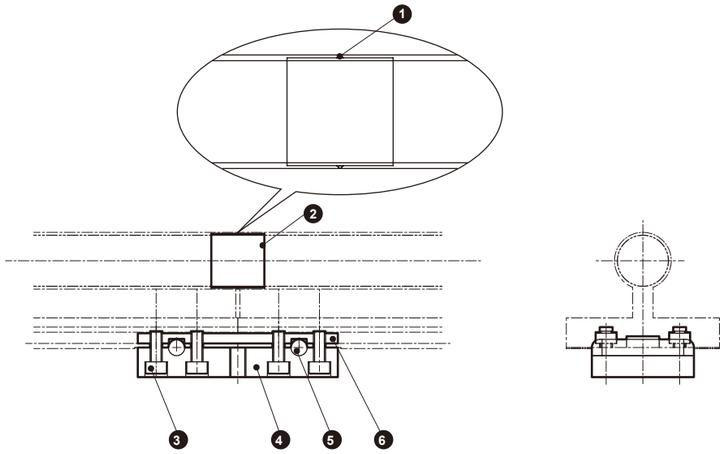


No.	Part Name	Material	Remarks	No.	Part Name	Material	Remarks
1	Positioning pin	Stainless Steel		16	Hexagon Socket Head Cap Screw	Steel	
2	Plate Nut	Steel		17	Spring washer	Steel	
3	Joint sleeve	Stainless Steel		18	End rail	Aluminum Alloy	
4	Tube packing	Nitrile Rubber		19	Cushion Rubber	Synthetic rubber	
5	End pipe	Stainless Steel		20	Pin	Steel	
6	Stopper bolt	Steel		21	O-ring	Nitrile Rubber	
7	Shock absorber (Note)			22	Stopper washer	Stainless Steel	
8	End block	Aluminum Alloy		23	Safety bolt	Steel	
9	Plain Washer	Steel		24	Spring pin	Stainless Steel	
10	Spring washer	Steel		25	Adjust bolt	Steel	
11	Hexagon Socket Head Cap Screw	Steel		26	Holding bracket	Steel	
12	Joint plate	Aluminum Alloy		27	Hexagon Socket Head Cap Screw	Steel	
13	Shoulder bolt	Steel		28	Joint plate	Aluminum Alloy	
14	Fixing washer	Stainless Steel		29	End bracket	Aluminum Alloy	
15	Spring pin	Stainless Steel					

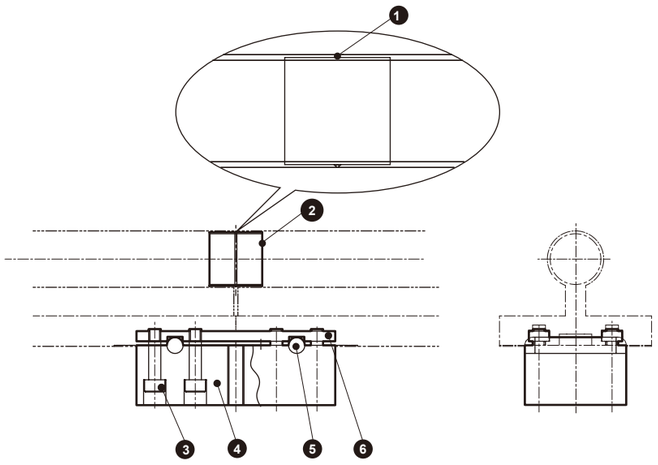
Note: ❼Shock Absorbers Standard NCK-00-2.6-C
High Load Type NCK-00-7-C

Internal Structure and Materials

● Fitting (RJ)



● Fitting/high load (RJ-H)



Part No.	Part Name	Material	Remarks	No.	Part Name	Material	Remarks
1	Tube packing	Nitrile Rubber		4	Joint plate	Aluminum Alloy	
2	Joint sleeve	Stainless Steel		5	Positioning pin	Stainless Steel	
3	Hexagon Socket Head Cap Screw	Steel		6	Connecting nut	Steel	

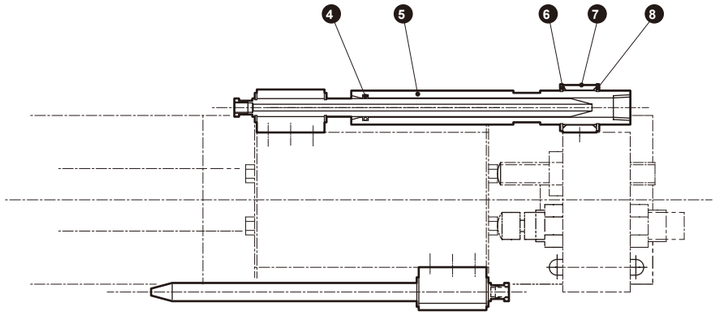
Replacement Parts List

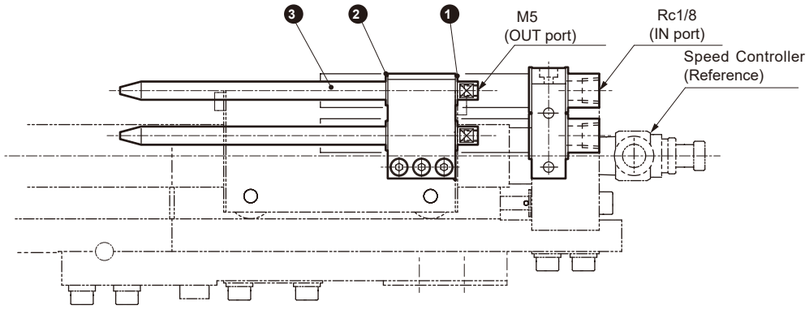
Part Name	Set No.	Replacement Part Number
Gasket Set (Note)	**SM-25-RJ-GS**	❶
Grease (50g)	**SM-25-GR**	-

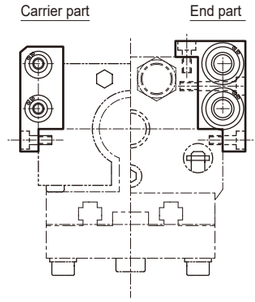
Note: 1 set contains 10 pieces.

Internal Structure and Materials

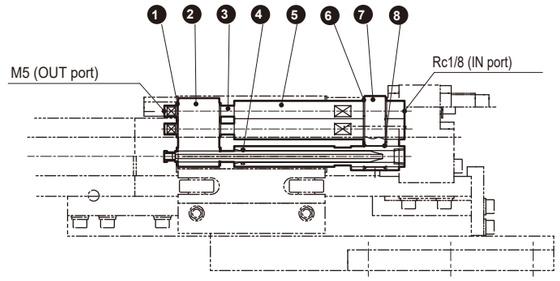
● Air supply unit (PP)

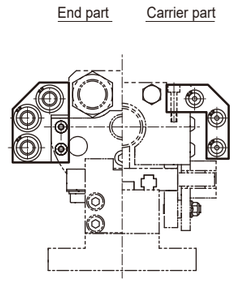






● Air supply unit/high load (PP-H)

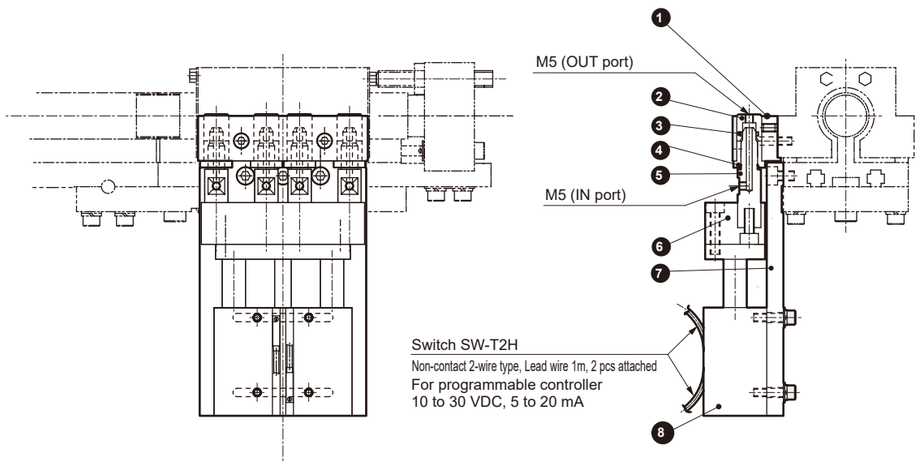




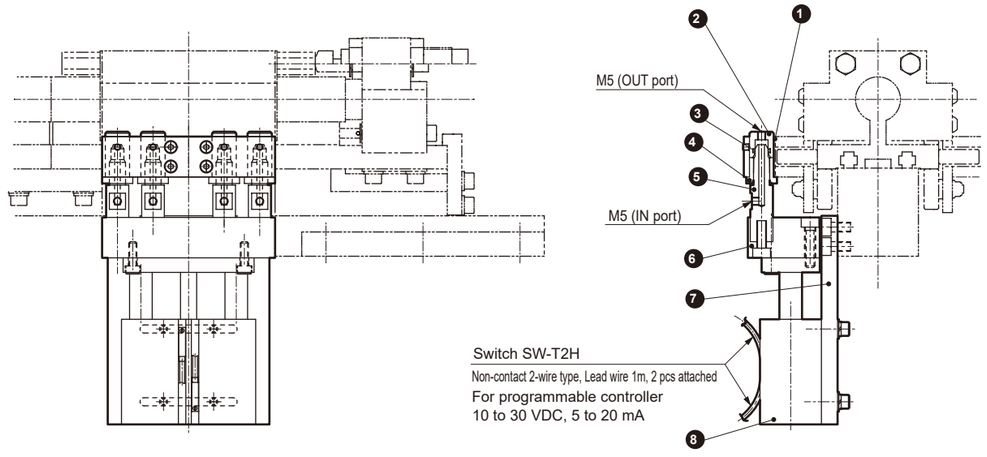
Part No.	Part Name	Material	Remarks	No.	Part Name	Material	Remarks
1	C-type Retaining Ring	Steel		5	Fixed nozzle	Steel	
2	Nozzle holder	Aluminum Alloy		6	C-type Retaining Ring	Steel	
3	Nozzle	Steel		7	Fixed holder	Steel	
4	O-ring	Nitrile Rubber		8	O-ring	Nitrile Rubber	

Internal Structure and Materials

● Air Supply Unit (PR)



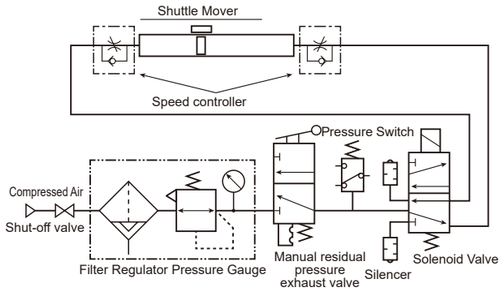
● Air supply unit/high load (PR-H)



No.	Part Name	Material	Remarks	No.	Part Name	Material	Remarks
1	Push holder	Aluminum Alloy		6	Pin holder	Aluminum Alloy	
2	Bush	Copper Alloy		7	Mounting plate	Aluminum Alloy	
3	O-Ring	Nitrile Rubber		8	Air Cylinder	STS-M-20-25 (CKD)	
4	Positioning bush	Steel		9	Switch	SW-T2H (CKD)	
5	Pin	Steel					

MEMO

1 Basic Circuit Diagram



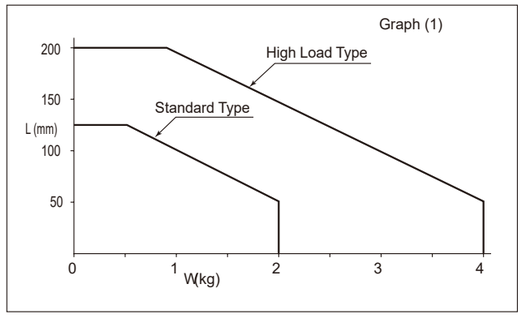
2 Selection Guide

The maximum allowable load Weight varies depending on the overhang amount of the load center of gravity and the average operating speed. Therefore, select so that both Step 1 and Step 2 below are satisfied.

STEP 1 Load Weight and Overhang Amount

*Allowable load Weight varies depending on the overhang amount. Use within the range of the following graph (1).
*Refer to the selection example for the calculation of the overhang amount L.

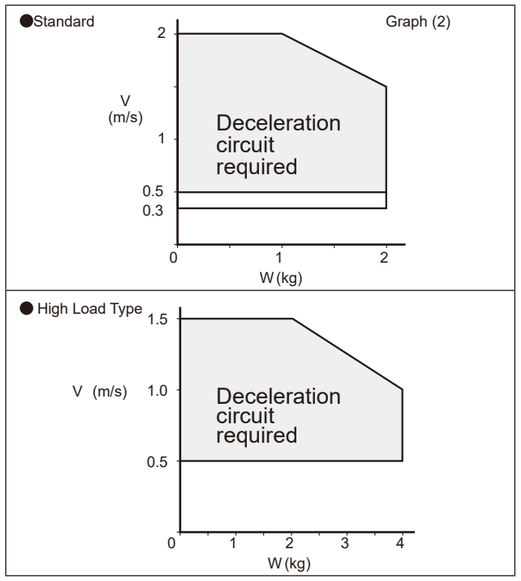
Graph (1)



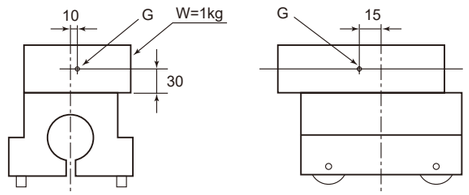
STEP 2 Load Weight and Average Speed

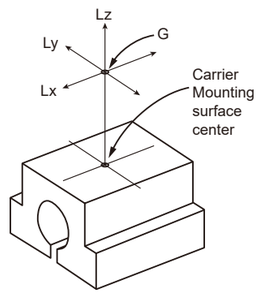
*Usable average speed varies depending on the load Weight. Use within the range of the following graph (2).
*When using at an average speed of 0.5 m/s or more, a deceleration circuit such as a shockless valve (SKH series) is required.
*Refer to the relevant page of the Pneumatic Valve General Catalog for the selection and use of the shockless valve (SKH series).

Graph (2)



Selection Examples





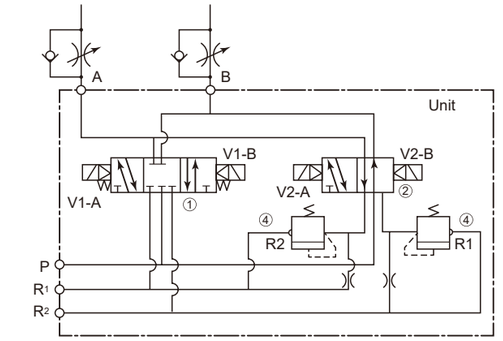
W: Load Weight
G: Load center of gravity
Lx: Deviation of G in X direction
Ly: Deviation of G in Y direction
Lz: Deviation of G in Z direction
L: Overhang amount
L=Lx+Ly+Lz

W=1 kg Ly=10 mm
V=1.5 m/s Lz=30 mm
Lx=15 mm L=15+10+30=55 mm

When used with a load Weight of 1 kg and a speed of 1.5 m/s, from graph (2), if W=1 kg, the speed is up to 2 m/s, so it is within the range. However, a deceleration circuit is required. Regarding the deviation of the center of gravity of the load, from graph (1), if W=1 kg, up to 100 mm is allowable, so L=55 mm center of gravity deviation is within the allowable range.

Example of deceleration circuit diagram

*This is an example using a shockless valve.



	Part Name	Model No.	Qty	Remarks
1	Solenoid Valve	4KB339	1	For high speed
2	Solenoid Valve	4KB329	1	For low speed
3	Manifold block		1	
4	Spacer relief valve	SKH-3SR	1	

Other precautions

(1) When operating a single-acting chuck etc. using the air supply unit (PP), a shuttle valve is required.
(2) Provide a mechanism capable of level adjustment in the vertical direction (use of leveling bolts, etc.) for the installation base, and fix it with anchor bolts, etc. after final adjustment.
(3) Use 2m spacing as a guide for the mounting pitch of legs during installation.
(4) When transferring workpieces between the shuttle mover and your company's equipment (conveyor, etc.), provide a transfer position adjustment mechanism on your company's equipment side.
(5) For other detailed designs, meetings are required, so please consult our sales representative.

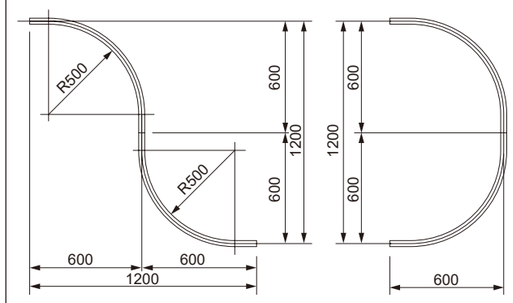
3 Stroke of each unit

Unit Name	Model No.	Stroke (mm)
Rail end	RE	75±10
Straight unit	[Example] ST-100	100
	ST-200	200
	ST-1000	1000
	ST-1015	1015
	ST-2000	2000
Curve Unit 90°	SC90	985
	VC90-IN	
	VC90-OUT	
Curve Unit 45°	SC45	590
	VC45-IN	
	VC45-OUT	

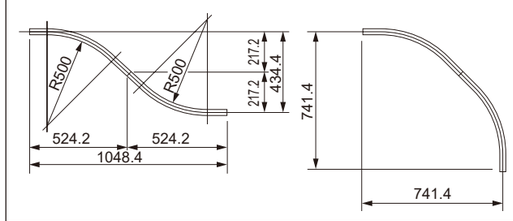
Note: Stroke is the same for standard type and high load type.

4 Minimum combination dimensions of curve units

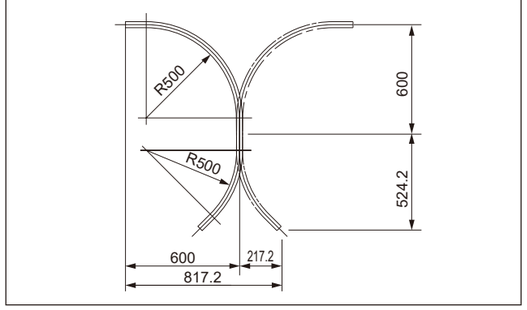
1) 90 degrees and 90 degrees



2) 45 degrees and 45 degrees



3) 90 degrees and 45 degrees



Question & Answer

Regarding Design

Q Can the carrier stop intermediately?

A Intermediate stop is not possible.

Q How much is the air consumption of SM-25?

A It is the same as a general cylinder with I.D. ø25.

Q What speed in m/s should be considered when examining the transfer time?
(When estimating by considering various conditions such as rail combination, load Weight difference, deceleration time, and Operating Pressure)

A Please estimate at 1 m/s.
(Example: For a stroke of 20 m, 20 m ÷ 1 m/s = 20 s, and this time does not include the workpiece loading time.)

Q Is the maximum allowable load Weight the Weight of the workpiece?

A It is the total load Weight mounted on the carrier. Hand chuck and Z-axis cylinder are also included.

Regarding Safety

Q Is a safety cover required?

A Since it runs overhead at high speed and is a joint type air cylinder, be sure to install a cover.

Q What happens if the carrier is not decelerated at the stroke end?
(However, in case of 0.5 m/s or more)

A Since there is a possibility of breaking the shock absorber, be sure to use a deceleration circuit such as a shockless valve (SKH series).

Regarding Maintenance

Q Can the carrier rollers be replaced?

A Special tools are required, so if you contact us, we will overhaul it for a fee.

Q Is lubrication required for the carrier rollers?

A Since a shielded type metal bearing with Urethane Rubber is used, it can be used without lubrication.

Q What should I do if I want to adjust the stroke?

A Adjustment of 10 mm forward and 10 mm backward is possible at the rail end part. Refer to the instruction manual for the adjustment method.

Regarding Electrical Control

Q Is there a reed switch for carrier detection?

A No. Please prepare proximity sensors, photoelectric sensors, or photo sensors.

Q How should the electrical signal for the actuator mounted on the carrier be handled?

A It is not possible because there is no power supply part for the operation check reed switch, etc.

Pneumatic Component

To Use This Product Safely

Be sure to read this before use.

For general cylinder information, see Intro 41, and for cylinder switches, see P. 1512.

Specific Precautions: Shuttle Mover SM Series

Design / Selection

Warning

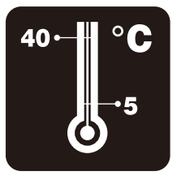
■ These products cannot be used in water, oil, or powder, or in places where the unit will be exposed to cutting fluid, coolant, etc., or cutting chips.

■ Consider safety by always placing an interlock in the control circuit for moving the carrier.

■ It is not possible to fix the carrier and use the rail portion as a mobile unit.

■ Avoid scratching the cylinder tube or rail with a workpiece, etc., that has been dropped by mistake during mounting or removal of a workpiece. It causes malfunction.

■ The most desirable range of the Ambient Temperature for use of the cylinders is 5 to 40°C. If this temperature exceeds 40°C, it may cause damage or malfunction, so do not use it. Also, if it is 5°C or less, moisture in the circuit may freeze and cause damage or malfunction, so please take measures to prevent freezing.



■ Be sure to install a safety cover in cases when this unit will be crossing pathways or working areas of people, or as a measure to prevent collapse and protect the operating region in areas where a human hand can reach inside.

CAUTION

■ Check that the cross-section of the pipe connecting the cylinder and directional control valve has sufficient effective cross-sectional area for attaining specified piston speed.

■ Use an interval of 2 m as a guide for the mounting pitch for the legs.

■ Consider the space described below near the end unit.

- Securing of space necessary for mounting and removing workpieces
- Securing of space for an adjustment of ±10 mm from the stroke end of the carrier
- Securing of space to enable movement when the tube piping to the piping port of the end is adjusted by ±10mm, and space for adjustment of the speed controller
- Securing of space for removal of end rail related components during piston maintenance

For precautions regarding mounting, installation, adjustment, operation, and maintenance, please refer to the CKD Equipment Product Site(https: //www.ckd.co.jp/kiki/en/) → 'model No.' → Instruction Manual.

MEMO

Rodless Type
SRL3
SRG3
SRM3
SRT3
MRL2
MRG2
SM-25
Cylinder Switch
Ending

Cylinder with Brake / with Lock

	Listed Page
Brake Cylinder **ULK** Series	293
Cell Top Cylinder (Small bore ø20 to 40) **JSK2**, **JSM2** Series	319
Tie Rod Cylinder with Brake **JSG** Series	371
Cell Top Cylinder (Medium/Large bore ø40 to 180) **JSC3**, **JSC4** Series	415
Super Compact Cylinder with Fall Prevention **USSD** Series	509
Flat Cylinder with Free Position Fall Prevention **UFCD** Series	563
Selex Cylinder with Free Position Fall Prevention **USC** Series	585

Cylinder with Brake / with Lock

Contributing to equipment safety improvement with reliable and proven mechanical lock mechanism

What is a cylinder with brake/lock?

Integrated brake unit/lock unit with air cylinder

Brake/lock activates when air supply is OFF

Prevents falling during equipment maintenance or power interruption due to power outage

Unlike end lock mechanism, it can stop anywhere during the stroke.

Safety

Ensures safety of workpieces etc. even during power outages or accidents.

Energy Saving

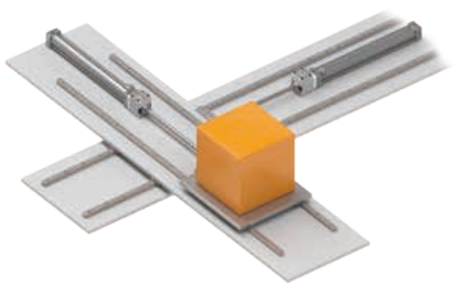
No power such as electricity or air is required while braking/locking.

Applications by Type

Cylinder Type	Application		Lock Direction	Circuit Configuration
Cylinder with Brake	Stop during operation	Stop position holding Multipoint positioning	Bi-directional	Balance regulator, brake release valve required
	Holding stationary state	Fall prevention during power outage/ emergency stop		
Cylinder with Lock	Holding stationary state	Fall prevention during power outage/ emergency stop	Uni-directional	Balance regulator, lock release valve not required

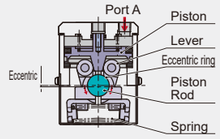
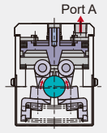
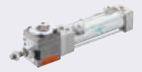
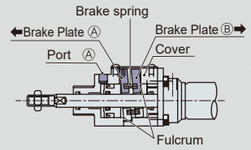
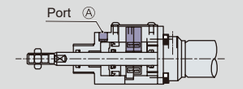
Application Example

Stop position holding

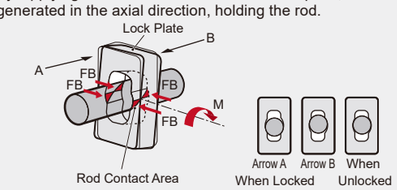
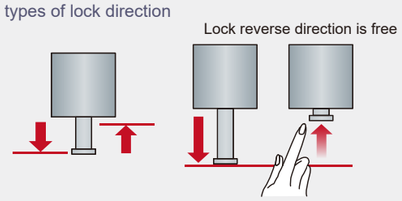


Position holding during power outage/

Cylinder with Brake

Model		Drive Cylinder	Holding Force (N)	Brake Method
JSK2		CMK2 ø20 to ø40	186 to 765	Rod clamping method  ●Brake release principle Air supplied from port A pushes the ? piston under it and opens the lever. The eccentric rings directly connected to the lever rotate and release the piston rod.  ●Brake operation principle If air is discharged from port A, the eccentric ring rotates due to the spring force, and the eccentric load is generated? to apply the brake to the piston rod.
JSM2		CMA2 ø20 to ø40	186 to 765	
JSG		SCG ø40 to ø100	980 to 6178	
JSC3		SCA2 ø40 to ø100	980 to 6178	
JSC4		SCS2 ø125 to ø180	9600 to 20000	
ULK		CMK2 ø20 to ø40	251 to 1005	Swash Plate Type  ●Brake operation principle When air is exhausted from port A, brake plates A and B tilt in the direction of the arrows from their respective fulcrums, the braking force is amplified by the cylinder thrust, and the piston rod is held.  ●Brake release principle When air is supplied through port A, brake plates A and B are pushed by the release piston, the brake plates and piston rod become perpendicular, and the piston rod becomes free.
SRT3		SRL3 ø12 to ø63	66 to 1870	

Cylinder with Lock

Model		Drive Cylinder	Locking Force (N)	Lock Method
USSD		SSD ø20 to ø100	150 to 3847	●High wear resistance circular slit method Adopts a new fall prevention mechanism with excellent durability. By applying rotational force M to the lock plate, a force F is generated in the axial direction, holding the rod.  ●2 types of lock direction 
USC		SCA2 ø40 to ø100	1005 to 6283	
UFCD		FCD ø25 to ø63	345 to 2200	
UCAC-N		CAC-N ø32 to ø40	631	
UCAC2		CAC4 ø50 to ø63	1470	

ULK

Brake Cylinder

ø20, ø25, ø32, ø40

Overview

It is a cylinder with brake that attaches a compact and highly reliable brake to the small and medium bore (ø20 to ø40) series among general type cylinders.

Features

Durability UP

By adopting the new swash plate brake method, the rod contact point during braking changes from 2 points in the conventional swash plate method to surface contact, dispersing the drag force applied to the rod. Wear resistance has improved, and durability has significantly increased compared to the conventional swash plate system.

Space Saving

The height of the brake unit has been reduced compared to our conventional products, achieving space savings.

Improved Holding Force

By adopting the new swash plate brake system, the rod holding force is comparable to the cylinder thrust at 0.8 MPa.

Easy Brake Release

To release the brake, simply screw in a bolt to tilt the brake plate, or use a flat-head screwdriver or similar tool to return the brake plate to its original inclination.

Simple Structure

The number of components in the brake section is extremely small, and the structure is simple.

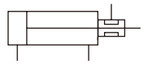
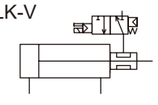
Stopping Accuracy ±1.0 mm

Stopping accuracy is as high as ±1.0 mm at cylinder speed of 300 mm/s and no load.

CONTENTS

Product Introduction	294
Series System Chart	294
● Double Acting/single rod (ULK) (ø20 to ø40)	296
● Double Acting with valve (ULK-V) (ø20 to ø40)	296
Accessories External Dimensions Diagram	308
Outer Dimensions Diagram with Switch	310
Applications and Usage Examples	312
Custom Products	313
⚠Precautions for Use	314

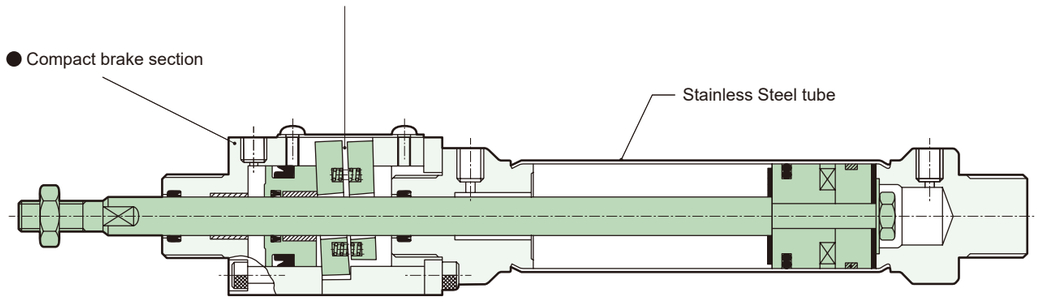
●: Standard ◎: Option ○: Custom Products ▒: Not Available

Variations	Model Number Circuit Diagram Code	Bore Size (mm)	Standard Stroke (mm) 15	25	30	45	50	60	75	100	150	200	250	300	Min Stroke (mm)		Max Stroke (mm)	Intermediate stroke (per mm)	Mounting Type: Basic type 00	Axial Foot Type LB	Rod side axial foot type LS	Rod Side Flange Type FA	Single clevis type CA	Double clevis type CB	Single clevis integrated type CC	Single clevis bush press-fit type CC1	Rod side trunnion type TA	Head side trunnion type TB	Options: Bellows (100 °C) J	Bellows (250 °C) L	Piston Rod material change M	Boss Cut V	Single Knuckle I	Double Knuckle Y	Single Bracket B1	Double bracket B2	Switch	Page
Double Acting Type	ULK 	ø20, ø25, ø32, ø40		●			●		●	●	●	●	●	●	5		700	1	●	●		●	●		●	●	●	●	◎	◎	◎	◎	◎	◎		◎	◎	296
Double Acting Type with Valve	ULK-V 	ø20, ø25, ø32, ø40		●			●		●	●	●	●	●	●	5		700	1	●	●		●	●		●	●	●	●	◎	◎	◎	◎	◎	◎		◎	◎	296

Product Introduction

● Stopping accuracy ±1.0 mm or less
Cylinder speed 300 mm/s at no load

● To release brake, simply screw the bolt and turn the brake plate.



Realized space saving.

With Brake / With Lock
ULK□
JSK2/ JSM2
JSG
JSC3, JSC4
USSD
UFCD
USC
Cylinder Switch
Ending

Cell Top Cylinder Double Acting, Double Acting with Brake Valve

ULK, ULK-V Series

●Bore Size: ø20, ø25, ø32, ø40

Circuit Diagram Code ●Double Acting Type

RoHS

Model No. Notation

●Without valve

Without Switch
(Built-in magnet for switch)

ULK - 00 - 20 - 100 ——— V I
1 2 3 4 8 9

With Switch
(Built-in magnet for switch)

ULK - 00 - 20 - 100 ——— T0H - R - V I
1 2 3 4 6 7 8 9

●With Valve for Brake

Without Switch
(Built-in magnet for switch)

ULK-V - 00 - 20 - 100 - 1 ——— V I
1 2 3 4 5 8 9

With Switch
(Built-in magnet for switch)

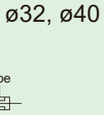
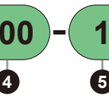
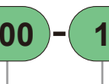
ULK-V - 00 - 20 - 100 - 1 - T0H - R - V I

1 Model No. 2 Mounting Type 3 Bore Size 4 Stroke 5 Valve voltage 6 Switch Model 7 Number of Switches 8 Option 9 Accessories

1 Model Number

Code	Description
ULK	Double Acting Type
ULK-V	Double Acting with Valve

2 Mounting Type

Code	Content	
00	Basic type	
LB	Axial Foot Type	
FA	Rod Side Flange Type	
CA	Single clevis type	
CC	Single clevis integrated type	
CC1	Single clevis bush press-fit type	
TA	Rod Side Trunnion Type	
TB	Head Side Trunnion Type	

3 Bore Size (mm)

Code	Content
20	ø20
25	ø25
32	ø32
40	ø40

4 Stroke (mm)

Bore Size	Stroke	Intermediate Stroke
ø20	5 to 700	in 1 mm increments
ø25	5 to 700	
ø32	5 to 700	
ø40	5 to 700	

Note: For minimum stroke with switch, refer to P. 298.

5 Valve voltage

Code	Content
1	100 VAC (50/60 Hz)
2	200 VAC (50/60 Hz)
3	24 VDC

Note: Valve voltage can be selected only for ULK-V (with brake valve).

6 Switch Model

For switch details, refer to P. 1457.
Switches are shipped with the product.

Contact	Indicator LED Special Function	Wiring (Output)	Load Voltage (V) AC	Load Voltage (V) DC	Load Current (mA) AC	Load Current (mA) DC	Lead wire *1 Straight	Lead wire *1 L-shape	
Solid State	1-Color	2-wire	85 to 265	-	5 to 100	—	T5V□	T1V□	
			—	10 to 30	-	5 to 20 *2	T2H□	T2V□	
		3-wire (NPN)	-	30 or less	-	100 or less	T3H□	T3V□	
		3-wire (PNP)	-		—		T3PH□	T3PV□	
	2-Color	2-wire	-	24 ± 10%	-	5 to 20	T2WH□	T2WV□	
		3-wire (NPN)	-	30 or less	-	50 or less	T3WH□	T3WV□	
	1-Color Off-Delay Type	2-wire	-	10 to 30	-	5 to 20 *2	T5V□	T2JV□	
	1-Color Flexible Lead Wire Type		-	10 to 30	—		T2HR3	T2VR3	
Reed	1-Color	2-wire	110	12/24	7 to 20	5 to 50	T0H□	T0V□	
	No Indicator LED		110	5/12/24	20 or less	50 or less	T5H□	T5V□	
	1-Color		110/220	12/24	7 to 20 / 7 to 10	5 to 50	T5V□	T8V□	

*1: Enter the code selected in the "Lead wire length" table into "□" of the Switch Model.
*2: The maximum load current of 20 mA mentioned above is at 25°C. If the switch operating Ambient Temperature is higher than 25°C, it will be lower than 20 mA. (At 60°C, it will be 5 to 10 mA.)
*3: Switches other than the above models are also available. (Custom Product) For details, refer to P. 1457.

***Lead Wire Length**

Code	Content
Blank	1 m (Standard)
3	3 m (Option)
5	5m (Option)

Example) Lead wire length
1 m T0H
3 m T0H3
5 m T0H5

7 Number of Switches

Code	Content
R	With 1 pc on rod side
H	With 1 pc on head side
D	With 2 pcs
T	With 3 pcs

Note: The maximum number of switches mounted is limited to 3. If 4 or more are required, please order the additional switches and mounting brackets separately.

8 Option

Code	Content	Max Ambient Temperature	Instantaneous Max Temperature	
J	Bellows	100°C	200°C	
L	Bellows	250°C	400°C	
M	Piston Rod material (Stainless Steel)			
V	Boss cut			

*1: For bellows "J", stroke must be 25 mm or more. Please contact us for strokes less than 25 mm.
*2: Maximum instantaneous temperature is the temperature when sparks or chips hit the bellows momentarily.

9 Accessories

Code	Content	
I	Single Knuckle	
Y	Double knuckle (Pin, washer, cotter pin attached)	
B2	Double bracket (Pin, Retaining Ring attached)	

Note: "I" and "Y" cannot be selected at the same time.

About specifications of custom products

For details, please refer to P. 313.

Code	Content
-XJ9	Without Bellows
-A2	With 2 rod nuts
Rod End thread custom order	Refer to Ending P. 11.

Model No. Ex.)
ULK - . . . . - XJ9

Switch Individual Model No. Notation

●Switch body+Mounting bracket set
ULK - T0H - 20
6 Switch Model, 3 Bore Size

● Switch Body Only
SW - T0H
6 Switch Model

●Mounting bracket set
ULK - T - 20
Mounting Bracket, 3 Bore Size

For individual order model numbers for brake valves and brake units, please refer to P. 311.

Specifications

Item		ULK				ULK-V			
Bore Size mm		ø20	ø25	ø32	ø40	ø20	ø25	ø32	ø40
Actuation method		Double Acting Type				Double Acting with brake valve			
Operating Fluid		Compressed Air							
Max Operating Pressure MPa		1.0				Cylinder section: 1.0 Brake section: 0.6			
Min Operating Pressure	Brake Part MPa	0.3							
	Cylinder Part MPa	0.15							
Proof Pressure MPa		1.6							
Ambient Temperature °C		-10 to 60 (No freezing)				-10 to 50 (No freezing)			
Port Size	Brake Part	Rc1/8							
	Cylinder Part	Rc1/8							
Stroke Tolerance mm		$^{+2.0}_{0}$ (up to 200) $^{+2.4}_{0}$ (200 or more)							
Operating Piston Speed mm/s		50 to 500							
Cushion		Rubber Cushion							
Lubrication		Not required (Use Turbine Oil Class 1 ISO VG32 if lubricated)							
Holding Force N		251	393	643	1005	251	393	643	1005
Allowable Absorbed Energy J		0.166	0.308	0.424	0.639	0.166	0.308	0.424	0.639

Note: For details of the valve (P5136 series), refer to "Directional Control Valve (2)" No. RJ-012AA.

Brake Valve Electrical Specifications

Item	ULK-V- Bore Size -VALVE-KIT- Voltage		
Rated voltage (V)	100 AC (50/60 Hz)	200 AC (50/60 Hz)	24 DC
Starting current (A)	0.056/0.044	0.034/0.026	0.075
Holding current (A)	0.028/0.022	0.017/0.013	
Power consumption (W)	1.8/1.4	2.1/1.6	1.8
Voltage fluctuation range	±10%		
Insulation class	Class B molded coil		

Note: 100/200 VAC coil can be used with 110/220 VAC (60 Hz).

Stroke

Bore Size (mm)	Standard Stroke (mm)	Max Stroke (mm)	Min Stroke (mm)
ø20	25, 50, 75, 100, 150 200, 250, 300	700	5
ø25			
ø32			
ø40			

*1: Intermediate strokes can be manufactured in 1 mm increments.
*2: The minimum stroke varies depending on how the switch is mounted. Refer to the table below.

Minimum stroke with switch

(Unit: mm)

Number of Switches	1					2				
	Solid State			Reed		Solid State			Reed	
Bore Size (mm)	T2, T3	T1	T□W	T0, T5	T8	T2, T3	T1	T□W	T0, T5	T8
ø20	10					25	35	30	25	35
ø25	10					25	35	30	25	35
ø32	10					25	35	30	25	35
ø40	10					25	35	30	25	35

Cylinder Weight

● ULK

(Unit: kg)

Item / Mounting Style / Bore Size (mm)	Product Weight at Stroke (S) = 0 mm: Basic Type (OO)	Axial Foot Type (LB)	Flange type (FA)	Clevis type (CA)	Clevis type (CC)	Trunnion type (TA/TB)	Switch Weight	Switch rail + band Weight	Added Weight per S = 10 mm
ø20	0.47	0.62	0.53	0.62	0.48	0.52	Refer to the Weight listed in the Switch Specifications on P. 1457.	0.005	0.01
ø25	0.84	1.10	0.99	1.08	0.84	0.94		0.005	0.01
ø32	0.88	1.14	1.03	1.12	0.88	0.98		0.009	0.02
ø40	1.47	1.73	1.62	1.71	1.49	1.63		0.009	0.02

● ULK-V (With Brake Valve)

(Unit: kg)

Item / Mounting Style / Bore Size (mm)	Product Weight at Stroke (S) = 0 mm: Basic Type (OO)	Axial Foot Type (LB)	Flange type (FA)	Clevis type (CA)	Clevis type (CC)	Trunnion type (TA/TB)	Switch Weight	Switch rail + band Weight	Added Weight per S = 10 mm
ø20	0.53	0.68	0.59	0.68	0.54	0.58	Refer to the Weight listed in the Switch Specifications on P. 1457.	0.005	0.01
ø25	0.90	1.16	1.05	1.14	0.90	1.00		0.005	0.01
ø32	0.94	1.20	1.09	1.18	0.94	1.04		0.009	0.02
ø40	1.53	1.79	1.68	1.77	1.55	1.69		0.009	0.02

Theoretical Thrust Table

(Unit: N)

Bore Size (mm)	Operating Direction	Operating Pressure MPa: 0.15	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
ø20	Push	47.1	62.8	94.2	1.26×10^2	1.57×10^2	1.88×10^2	2.20×10^2	2.51×10^2	2.83×10^2	3.14×10^2
	Pull	35.3	47.1	70.7	94.2	1.18×10^2	1.41×10^2	1.65×10^2	1.88×10^2	2.12×10^2	2.36×10^2
ø25	Push	73.6	98.2	1.47×10^2	1.96×10^2	2.45×10^2	2.95×10^2	3.44×10^2	3.93×10^2	4.42×10^2	4.91×10^2
	Pull	56.7	75.6	1.13×10^2	1.51×10^2	1.89×10^2	2.27×10^2	2.64×10^2	3.02×10^2	3.40×10^2	3.78×10^2
ø32	Push	1.21×10^2	1.61×10^2	2.41×10^2	3.22×10^2	4.02×10^2	4.83×10^2	5.63×10^2	6.43×10^2	7.24×10^2	8.04×10^2
	Pull	1.04×10^2	1.38×10^2	2.07×10^2	2.76×10^2	3.46×10^2	4.15×10^2	4.84×10^2	5.53×10^2	6.22×10^2	6.91×10^2
ø40	Push	1.88×10^2	2.51×10^2	3.77×10^2	5.03×10^2	6.28×10^2	7.54×10^2	8.80×10^2	1.01×10^3	1.13×10^3	1.26×10^3
	Pull	1.65×10^2	2.21×10^2	3.31×10^2	4.41×10^2	5.51×10^2	6.62×10^2	7.72×10^2	8.82×10^2	9.92×10^2	1.10×10^3

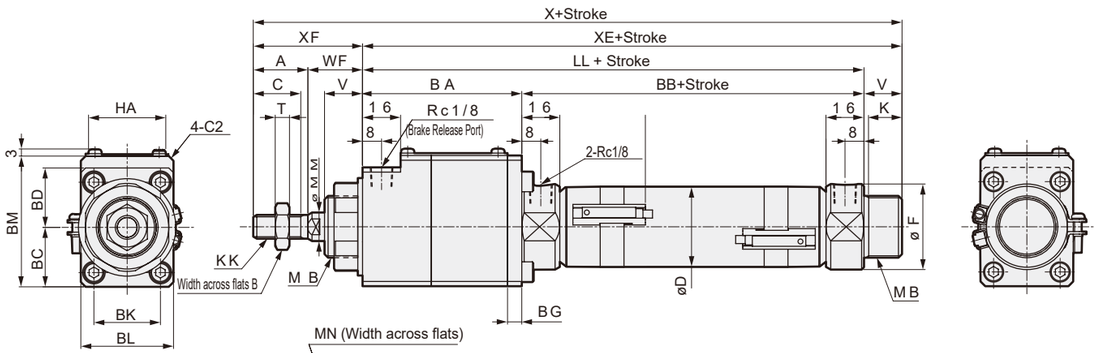
Mounting Bracket Model No. Notation

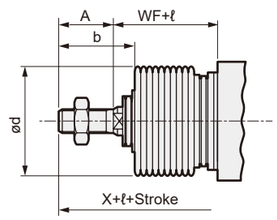
Bore Size (mm) / Mounting Bracket	ø20	ø25	ø32	ø40
Basic type (00) *3	M1-00-20	M1-00-30	M1-00-30	M1-00-30
Axial Foot Type (LB)	M1-LB-20	M1-LB-30	M1-LB-30	M1-LB-30
Flange (FA)	M1-FA-20	M1-FA-30	M1-FA-30	M1-FA-30
Single clevis (CA)	M1-CA-20	M1-CA-30	M1-CA-30	M1-CA-30
Trunnion (TA/TB)	M1-TA-20	M1-TA-30	M1-TA-30	M1-TA-40

*1: Mounting nut and toothed washer are attached to the axial foot type and flange type mounting brackets. Also, mounting nut is attached to the trunnion type.
2: For axial foot type, 2 sets of "M1-LB-" in the above table are required.
*3: Only mounting nut and toothed washer. One set is attached to the basic type (00) of the product, but use it when additional parts are required.

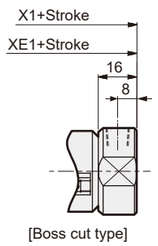
Dimensional Drawings

●Basic Type (OO)





[With bellows]



[Boss cut type]

Code	Basic Type (OO) Basic Dimensions													
Bore Size (mm)	A	B	BA	BB	BC	BD	BG	BK	BL	BM	C	D	F	HA
ø20	20	13	58	66	20	20	6	20	29	45	18	21.4	28	26
ø25	23	17	67	69	25	25	6	28	39	55	20	26.4	32	35
ø32	23	17	67	69	25	25	6	28	39	55	20	33.6	36	35
ø40	25	19	74	73	29	30	9	39	50	69	22	41.6	45	35

Code													
Bore Size (mm)	K	KK	LL	MB	MM	MN	MO	T	V	WF	X	XE	XF
ø20	12	M8x1.0	124	M18x1.5	10	8	5	5	14	24	182	138	44
ø25	14	M10x1.25	136	M26x1.5	12	10	5	6	16	23	198	152	46
ø32	14	M10x1.25	136	M26x1.5	12	10	5	6	16	23	198	152	46
ø40	14	M12x1.5	147	M26x1.5	14	12	6	7	16	23	211	163	48

Code	With Bellows			Boss cut type	
Bore Size (mm)	b	d	ℓ	X1	XE1
ø20	30	30	(Stroke/3)+6	168	124
ø25	32	46	(Stroke/3.25)+7	182	136
ø32	32	46	(Stroke/3.25)+7	182	136
ø40	34	46	(Stroke/3.25)+7	195	147

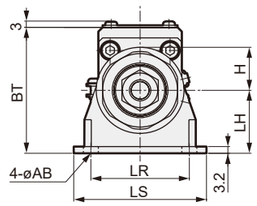
*1: Round up the ℓ dimension to the nearest integer.

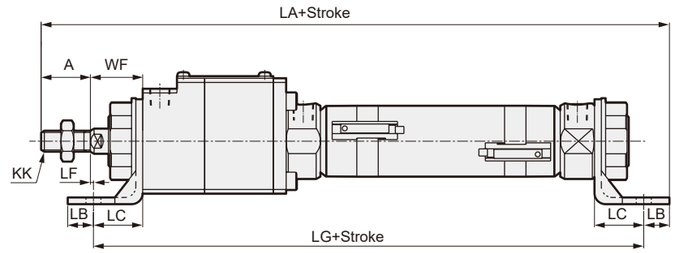
***2: For the external dimensions diagram of accessories, please refer to P. 308.**

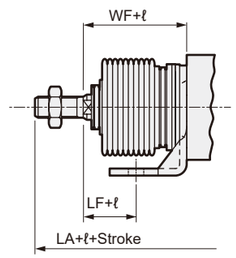
***3: For dimensions with each switch, refer to P. 313.**

Dimensional Drawings

●Axial Foot Type (LB)







[With bellows]

Code	Axial Foot Type (LB) Mounting Dimensions													
Bore Size (mm)	A	AB	BT	H	KK	WF	LA	LB	LC	LF	LG	LH	LR	LS
ø20	20	6	50	15	M8x1.0	24	196	10	18	6	160	25	30	44
ø25	23	7	60	20.5	M10x1.25	23	217	12	23	0	182	30	46	62
ø32	23	7	60	20.5	M10x1.25	23	217	12	23	0	182	30	46	62
ø40	25	7	70	20.5	M12x1.5	23	230	12	23	0	193	30	46	62

Code	With bellows
Bore Size (mm)	ℓ
ø20	(Stroke/3)+6
ø25	(Stroke/3.25)+7
ø32	(Stroke/3.25)+7
ø40	(Stroke/3.25)+7

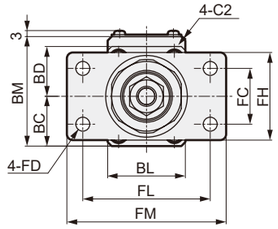
*1: Round up the ℓ dimension to the nearest integer.

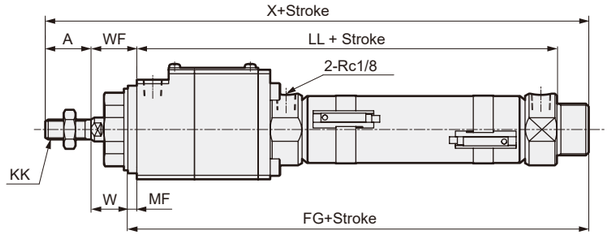
***2: For the external dimensions diagram of accessories, please refer to P. 308.**

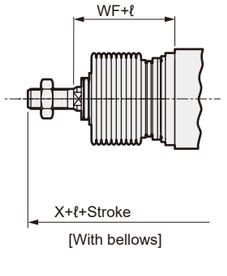
***3: For dimensions with each switch, refer to P. 313.**

Dimensional Drawings

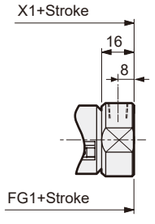
●Rod Side Flange Type (FA)







[With bellows]



[Boss cut type]

Code	Rod Side Flange Type (FA) Mounting Dimensions																
Bore Size (mm)	A	BC	BD	BL	BM	KK	LL	MF	W	WF	X	FC	FD	FG	FH	FL	FM
ø20	20	20	20	29	45	M8x1.0	124	3.2	20.8	24	182	20	6	141.2	34	40	54
ø25	23	25	25	39	55	M10x1.25	136	4.5	18.5	23	198	28	7	156.5	44	64	80
ø32	23	25	25	39	55	M10x1.25	136	4.5	18.5	23	198	28	7	156.5	44	64	80
ø40	25	29	30	50	69	M12x1.5	147	4.5	18.5	23	211	28	7	167.5	44	64	80

Code	With Bellows	Boss cut type	
Bore Size (mm)	ℓ	X1	FG1
ø20	(Stroke/3)+6	168	127.2
ø25	(Stroke/3.25)+7	182	140.5
ø32	(Stroke/3.25)+7	182	140.5
ø40	(Stroke/3.25)+7	195	151.5

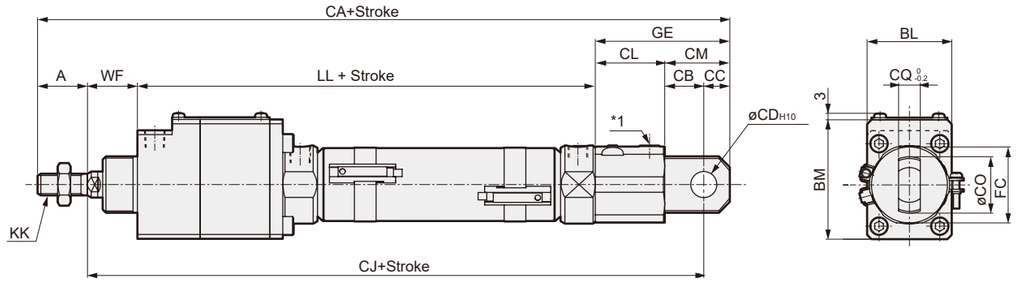
*1: Round up the ℓ dimension to the nearest integer.

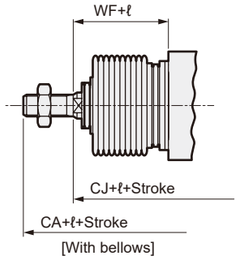
***2: For the external dimensions diagram of accessories, please refer to P. 308.**

***3: For dimensions with each switch, refer to P. 313.**

Dimensional Drawings

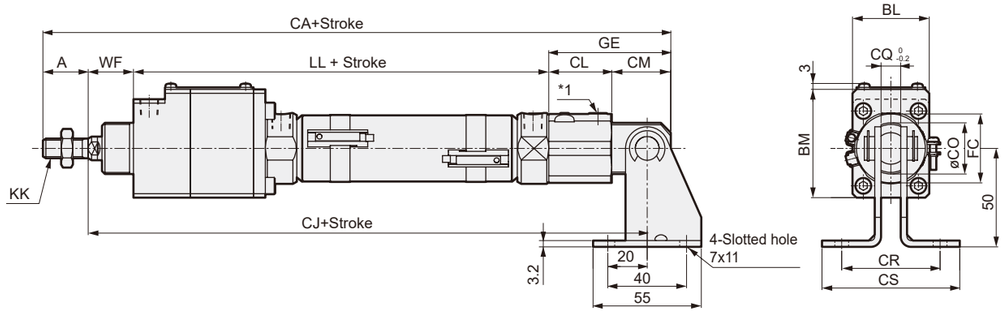
●Single Clevis Type (CA)





[With bellows]

● Eye bracket (CA) with bracket (Option B2)



Code	Single Clevis Type (CA) Mounting Dimensions																	
Bore Size (mm)	A	BL	BM	FC	GE	KK	LL	WF	CA	CB	CC	CD	CJ	CL	CM	CO	CQ	CR	CS
ø20	20	29	45	26	55	M8x1.0	124	24	223	14	10	10	193	31	24	22	8	48	68
ø25	23	39	55	35	62	M10x1.25	136	23	244	18	12	12	209	32	30	26	10	50	70
ø32	23	39	55	35	62	M10x1.25	136	23	244	18	12	12	209	32	30	26	10	50	70
ø40	25	50	69	35	62	M12x1.5	147	23	257	18	12	12	220	32	30	26	10	50	70

Code	With bellows
Bore Size (mm)	ℓ
ø20	(Stroke/3)+6
ø25	(Stroke/3.25)+7
ø32	(Stroke/3.25)+7
ø40	(Stroke/3.25)+7

*1: This is not a piping port.

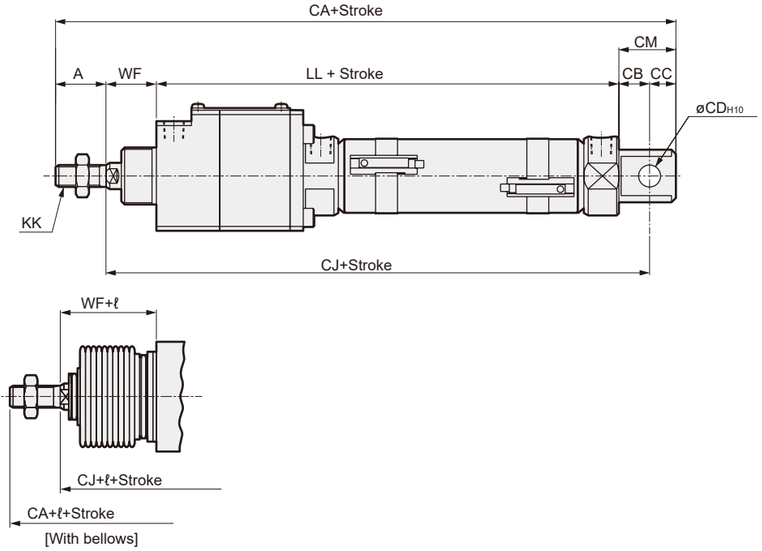
*2: Round up the ℓ dimension to the nearest integer.

***3: For outer dimensions diagram of accessories, refer to P. 308.**

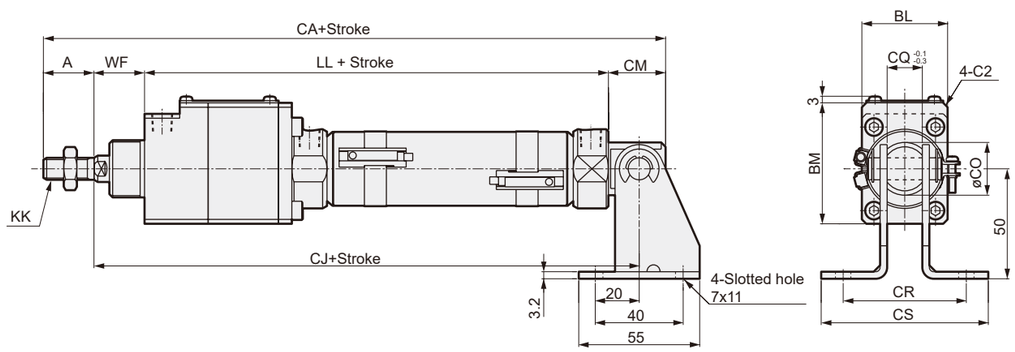
***3: For dimensions with each switch, refer to P. 313.**

Dimensional Drawings

● Single Clevis Integrated Type (CC)



● Eye bracket (CC) with bracket (Option B2)



Code	Single Clevis Integrated Type (CC) Mounting Dimensions															
Bore Size (mm)	A	BL	BM	KK	LL	WF	CA	CB	CC	CD	CJ	CM	CO	CQ	CR	CS
ø20	20	29	45	M8x1.0	124	24	189	12	9	8	160	21	22	16	56	76
ø25	23	39	55	M10x1.25	136	23	203	12	9	8	171	21	24	16	56	76
ø32	23	39	55	M10x1.25	136	23	208	14	12	10	173	26	24	16	56	76
ø40	25	50	69	M12x1.5	147	23	225	16	14	12	186	30	30	20	60	80

Code	With bellows
Bore Size (mm)	ℓ
ø20	(Stroke/3)+6
ø25	(Stroke/3.25)+7
ø32	(Stroke/3.25)+7
ø40	(Stroke/3.25)+7

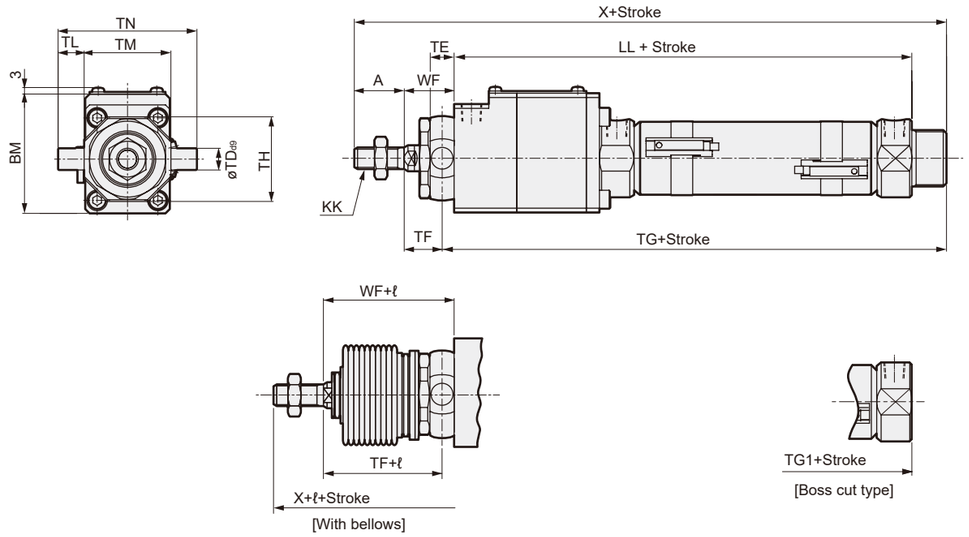
*1: Round up the ℓ dimension to the nearest integer.

***2: For the external dimensions diagram of accessories, please refer to P. 308.**

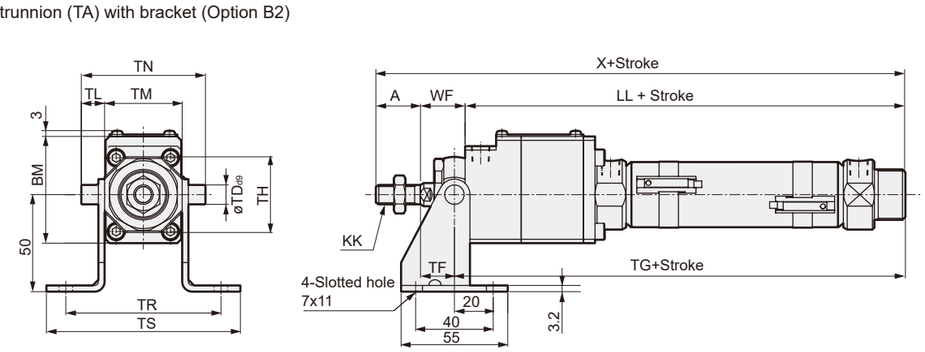
***3: For dimensions with each switch, refer to P. 313.**

Dimensional Drawings

●Rod side trunnion type (TA)



● Rod side trunnion (TA) with bracket (Option B2)



Code	Rod Side Trunnion Type (TA) Mounting Dimensions															
Bore Size (mm)	A	BM	KK	LL	WF	X	TD	TE	TF	TG	TH	TL	TM	TN	TR	TS
ø20	20	45	M8x1.0	124	24	182	8	9	19.5	142.5	29.5	8	30	46	70	90
ø25	23	55	M10x1.25	136	23	198	10	11	17.5	157.5	39	12	40	64	80	100
ø32	23	55	M10x1.25	136	23	198	10	11	17.5	157.5	39	12	40	64	80	100
ø40	25	69	M12x1.5	147	23	211	10	11	17.5	168.5	44	9.5	53	72	93	113

Code	With Bellows	Boss cut type
Bore Size (mm)	ℓ	TG1
ø20	(Stroke/3)+6	128.5
ø25	(Stroke/3.25)+7	141.5
ø32	(Stroke/3.25)+7	141.5
ø40	(Stroke/3.25)+7	152.5

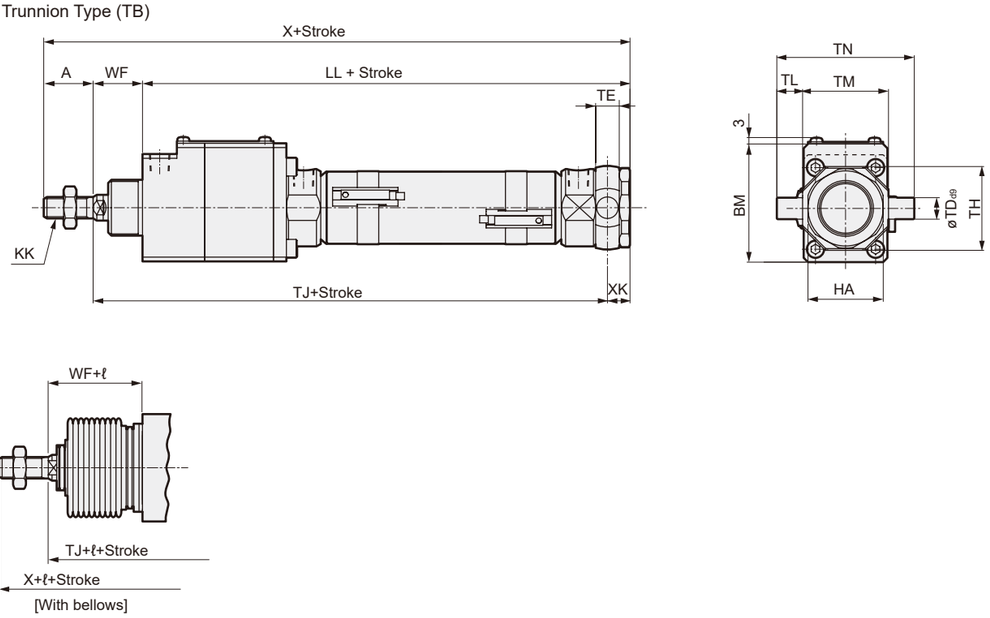
*1: Round up the ℓ dimension to the nearest integer.

***2: For the external dimensions diagram of accessories, please refer to P. 308.**

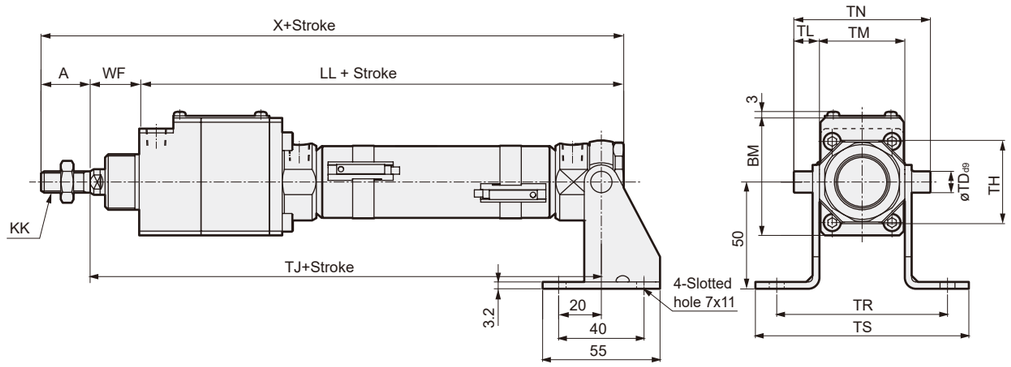
***3: For dimensions with each switch, refer to P. 313.**

Dimensional Drawings

●Head Side Trunnion Type (TB)



● Head side trunnion (TB) with bracket (option B2)



Code	Head Side Flange Type (TB) Mounting Dimensions															
Bore Size (mm)	A	BM	KK	LL	WF	X	XK	TD	TE	TH	TJ	TL	TM	TN	TR	TS
ø20	20	45	M8x1.0	124	24	182	9.5	8	9	29.5	152.5	8	30	46	70	90
ø25	23	55	M10x1.25	136	23	198	10.5	10	11	39	164.5	12	40	64	80	100
ø32	23	55	M10x1.25	136	23	198	10.5	10	11	39	164.5	12	40	64	80	100
ø40	25	69	M12x1.5	147	23	211	10.5	10	11	44	175.5	9.5	53	72	93	113

Code	With bellows
Bore Size (mm)	ℓ
ø20	(Stroke/3)+6
ø25	(Stroke/3.25)+7
ø32	(Stroke/3.25)+7
ø40	(Stroke/3.25)+7

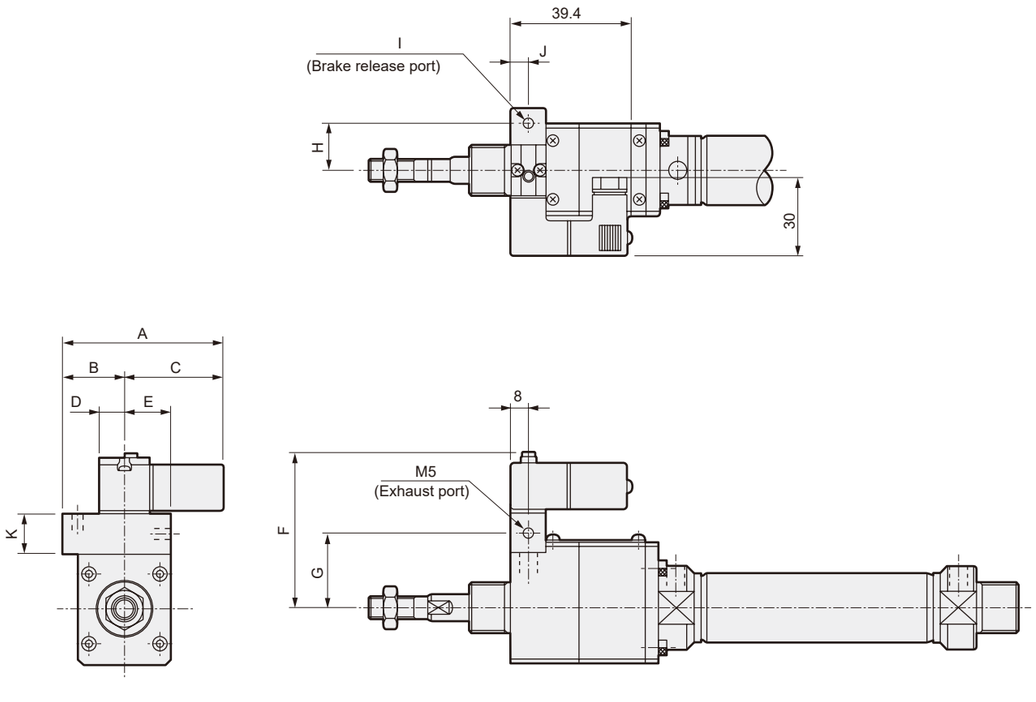
*1: Round up the ℓ dimension to the nearest integer.

***2: For the external dimensions diagram of accessories, please refer to P. 308.**

***3: For dimensions with each switch, refer to P. 313.**

Dimensional Drawings

● With Valve for Brake



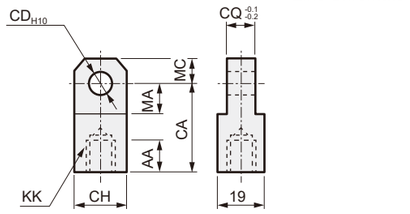
Code	A	B	C	D	E	F	G	H	I	J	K
Bore Size (mm)											
ø20	56.5	25	31.5	8	15	54	26.5	17	M5	8	12
ø25	57	21	36	4	18	60	31	16	Rc1/8	9	13
ø32	57	21	36	4	18	60	31	16	Rc1/8	9	13
ø40	57	24	33	7	18	65	36	16	Rc1/8	9	13

*1: Dimensions other than the above are the same as the basic type on P. 300.

Accessory External Dimensions

● Single Knuckle (I)

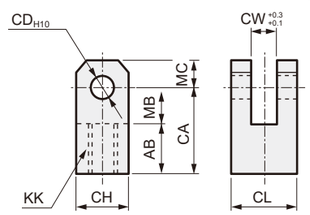
Material: Steel
Zinc Chromate



Model Number	Applicable Bore Size (mm)	AA	CA	CD	CH	CQ	KK	MA	MC	Weight (g)
M1-I-20	20	14	30	10	19	8	M8×1.0	13	10	60
M1-I-30	25/32	14	36	12	25	10	M10×1.25	16	12	106
M1-I-40	40	14	36	12	25	10	M12×1.5	16	12	100

●Double Knuckle (Y)

Material: Steel
Zinc Chromate

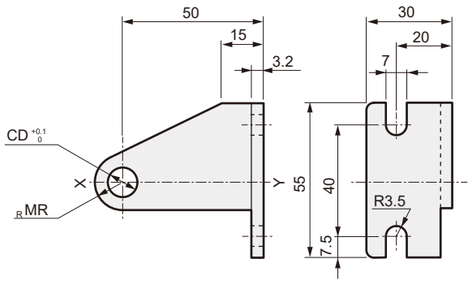


Pin, washer, and cotter pin are attached.

Model Number	Applicable Bore Size (mm)	AB	CA	CD	CH	CL	CW	KK	MB	MC	Weight (g)
M1-Y-20	20	17	30	10	19	19	8	M8×1.0	13	10	99
M1-Y-30	25/32	20	36	12	25	25	10	M10×1.25	16	12	197
M1-Y-40	40	20	36	12	25	25	10	M12×1.5	16	12	193

●Double Bracket (B2)

Material: Steel, Zinc Chromate

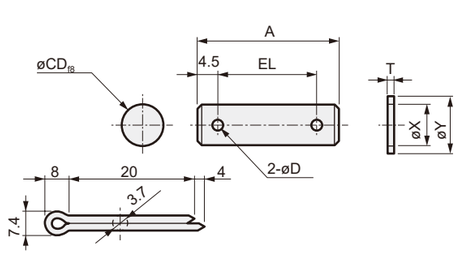


Model Number	Applicable Model	Applicable Bore Size (mm)	CD	MR	Weight (g)
M1-B2-20-CC	ULK-CC	20/25	8	8	145
M1-B2-30-CC		32	10	11	163
M1-B2-40-CC		40	12	11	170
M1-B2-30-CA	ULK-CA	20	10	11	158
M1-B2-40-CA		25, 32, 40	12	11	162
M1-B2-20-TA	ULK-TA/TB	20	8	8	132
M1-B2-30-TA		25, 32, 40	10	11	142

*1: A pair is symmetrical to the XY line.
*2: The above model numbers include Retaining Ring and pin. 2 pcs/set (However, not attached for trunnion type)

●Pin for Double Knuckle (P)

Material: Steel, Zinc Chromate

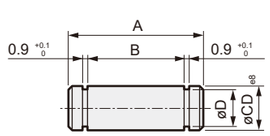


Model Number	Applicable Bore Size (mm)	A	D	CD	EL	T	X	Y	Weight (g)
M1-P-20	20	37	4	10	28	1.6	10.5	18	29
M1-P-30	25, 32, 40	46	4	12	37	2.3	12.5	22	50

Note: Pin, washer, and cotter pin for double knuckle use are attached to the product.

●Pin for Double Bracket (P1) (P2)

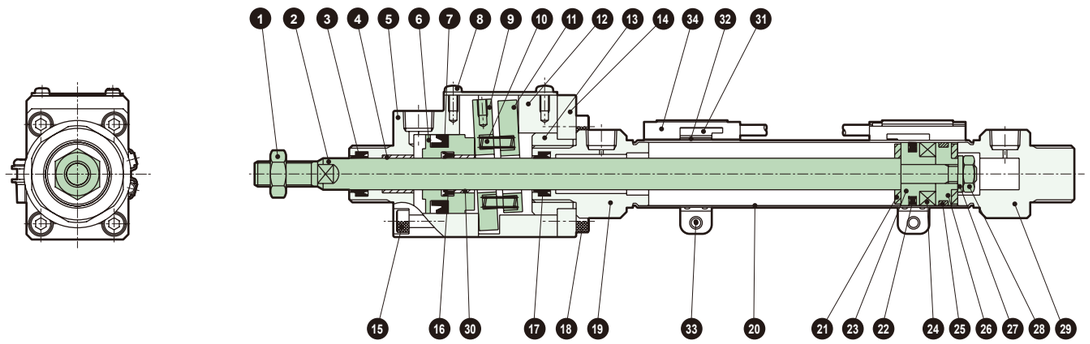
Material: Steel
Zinc Chromate

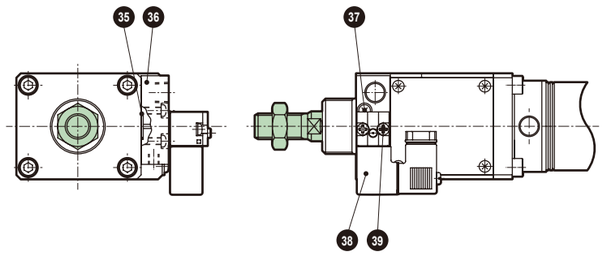


Model Number	Applicable Model and Applicable Bore Size (mm)	A	B	CD	D	Retaining Ring to Use	Weight (g)
M1-P1-20	ULK-CC-20/25	33	28	8	7	E-type 7	13
M1-P1-30	ULK-CC-32	33	28	10	9	E-type 9	21
M1-P1-40	ULK-CC-40	37	32	12	9	E-type 9	32
M1-P2-20	ULK-CA-20	25	20	10	9	E-type 9	16
M1-P2-30	ULK-CA-25/32/40	27	22	12	9	E-type 9	24

Note: Pin and Retaining Ring for bracket use are attached to the product. (However, not attached for trunnion type)

Internal Structure Diagram/Material





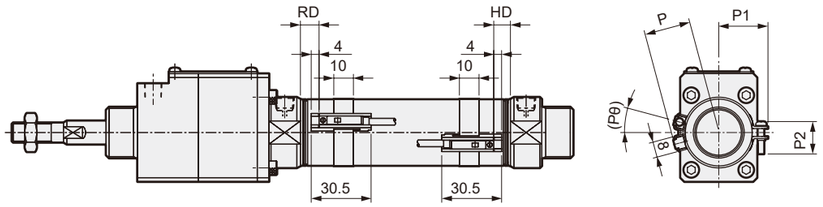
Do not disassemble

No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Rod Nut	Steel	Zinc Chromate	21	Cushion Rubber	Urethane Rubber	
2	Piston Rod	ø20, ø25: Stainless Steel ø32, ø40: Steel	Industrial Chrome Plating	22	Piston Packing	Nitrile Rubber	
				23	Piston A	Aluminum Alloy	
3	Brake Rod Packing	Nitrile Rubber		24	Magnet	Plastic	
4	Bearing	Polyacetal		25	Wear ring	Polyacetal	
5	Body A	Aluminum Alloy	Alumite	26	Piston B	Aluminum Alloy	
6	Release Piston	Aluminum Alloy	Alumite	27	Spacer	Steel	(ø20 to ø32 only)
7	Release Piston Packing	Nitrile Rubber		28	Hexagon Nut	Steel	Zinc Chromate
8	Pan Head Screw	Steel		29	Head cover	Aluminum Alloy	
9	Brake Plate A	Special Steel	Zinc Chromate	30	Release rod metal	Polyacetal	
10	Brake Spring	Piano Wire	Black Oxide	With Switch			
11	Brake Plate B	Special Steel	Zinc Chromate	31	Switch		
12	Body B	Aluminum Alloy	Alumite	32	Band	Stainless Steel	
13	Fixing Nut	Steel	Zinc Chromate	33	Pan Head Screw	Stainless Steel	
14	Brake flange	Steel	Zinc Chromate	34	Switch Rail	Stainless Steel	
15	Hexagon Socket Head Cap Screw	Steel	Black Oxide	With Valve			
16	Release Rod Packing	Nitrile Rubber		35	Gasket	Nitrile Rubber	
17	Rod Packing	Nitrile Rubber		36	Sub plate	Aluminum Alloy	Alumite
18	Hexagon Socket Head Cap Screw	Steel	Black Oxide	37	Cross-Recessed Pan Head Screw	Steel	Zinc Chromate
19	Rod Cover	Aluminum Alloy		38	Brake release valve		
20	Cylinder Tube	Stainless Steel		39	Cross-Recessed Pan Head Screw	Steel	Zinc Chromate

ULK Series Dimensions with Switch

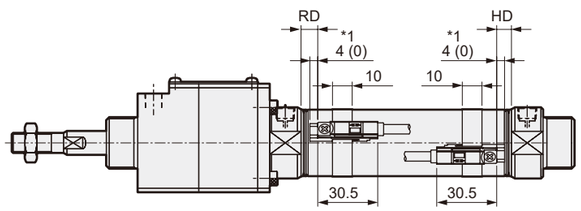
● T0H/V, T5H/V, T2H/V, T3H/V, T3PH/V, T2WH/V, T3WH/V, T2WLH/V

• ULK, ULK-V

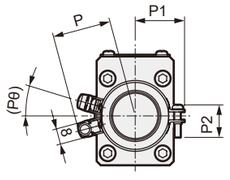


● T1H/V, T8H/V, T2JH/V

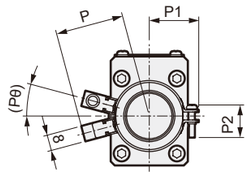
• ULK, ULK-V



[n case of T8H/V, T2JH/V]



[In case of T1H/V]



Code	ULK, ULK-V														
	P1	P2	(Pθ)	T0, T5, T2, T3, T3P, T2*R3			T2W, T3W, T2WL			T1, T2J			T8		
Bore Size (mm)				P	RD	HD	P	RD	HD	P	RD	HD	P	RD	HD
ø20	19.5	14	22	17.3	8	7	17.3	10	9	28.5	7	6	23.1	2	1
ø25	22	14	18	19.8	9.5	8.5	19.8	11.5	10.5	31	8.5	7.5	25.6	3.5	2.5
ø32	25.5	16	15	24.3	9.5	8.5	24.3	11.5	10.5	35.5	8.5	7.5	30.1	3.5	2.5
ø40	29.5	16	12	28.3	11.5	10.5	28.3	13.5	12.5	39.5	10.5	9.5	34.1	5.5	4.5

*1: In case of T1□, T2J□ switch and stroke less than 35 mm, it becomes ( ) dimension.
*2: For switch mountability, refer to the model number display method for each variation.

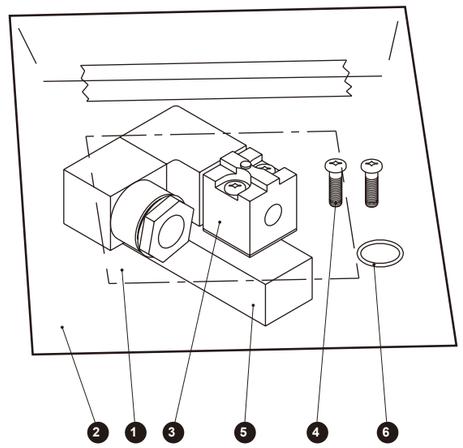
Single Unit Model No. Notation and Part Configuration

● Valve kit for brake

ULK-V - 20 - VALVE-KIT - Voltage - 1

❸ Bore Size

❺ Valve voltage

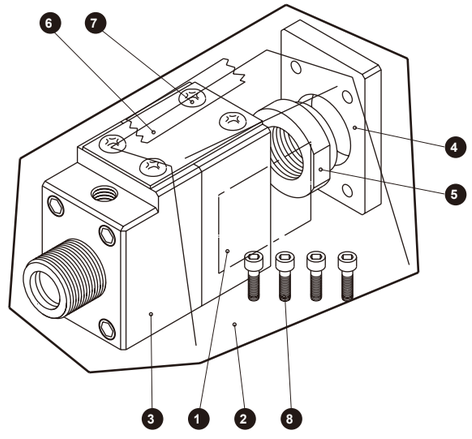


No.	Part Name	Quantity
1	Label	1
2	Plastic bag or vinyl sheet	1
3	Brake release valve	1
4	Cross-Recessed Pan Head Screw	2
5	Sub plate	1
6	Gasket	1

● Brake Unit

ULK - 20 - BRAKE-UNIT

❸ Bore Size



No.	Part Name	Quantity
1	Label	1
2	Plastic bag or vinyl sheet	1
3	Brake Assembly	1
4	Brake flange	1
5	Fixing Nut	1
6	Cover	1
7	Cross-Recessed Pan Head Screw	4
8	Hexagon Socket Head Cap Screw	4

Applications
It can be used for devices and equipment requiring the following functions.

1 When multipoint positioning is required (Transfer/Positioning)

It can stop accurately at multiple target positions.

2 When fall prevention is required

When the air pressure source and power supply are turned OFF (during power outage or accident), the brake is applied instantly and can be held, preventing equipment damage and ensuring safety.

3 When emergency stop is required

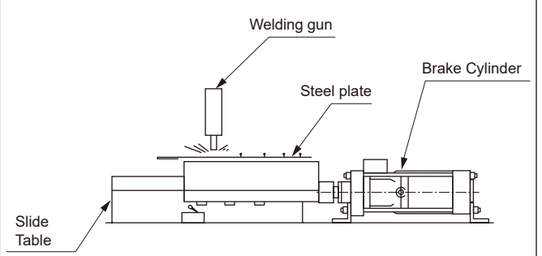
When a worker enters a dangerous area, the cylinder can be stopped by an electrical signal, etc.

4 Work lock

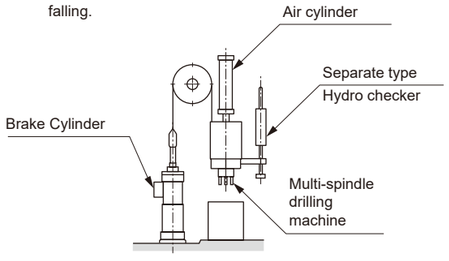
When locking a workpiece to a jig, mounting base, etc., it can be locked even without air pressure source or power supply. It can be transported while locked to the jig.

Usage Example

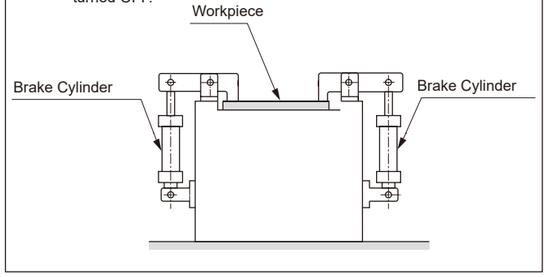
1 Linear multipoint welding
Movement and positioning of slide table or welding gun when welding many steel plates etc. in a straight line.



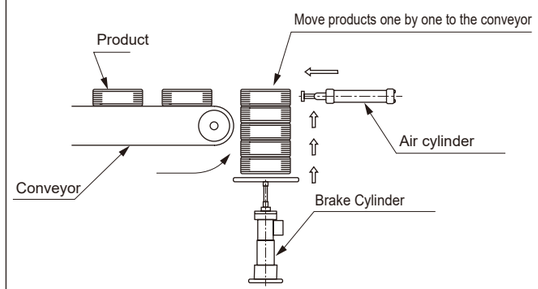
2 Fall prevention
When there is a load in the vertical direction and the pressure source stops, if it is problematic for the load to drop due to its own weight, the brake of the Cell Top cylinder is applied to prevent falling.



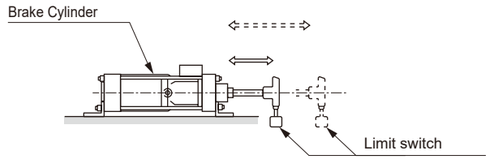
3 Work lock
When locking a workpiece to a jig etc., using a Cell Top cylinder ensures it remains locked even if the air pressure source power is turned OFF.



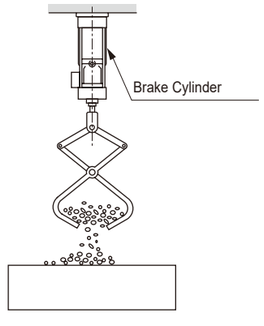
4 Move to conveyor
Move products one by one to the conveyor.



5 When it is necessary to have many cylinders with different strokes
When items of different sizes flow on a conveyor etc., the cylinders set there often need to change their strokes. In that case, using a Cell Top cylinder allows you to create cylinders with various strokes electrically.



6 Opening and closing of hopper
When closing when powder etc. reaches a predetermined weight, to ensure accurate weighing, stop the hopper opening just before fully closed to weigh accurately, and then fully close it.



Without Bellows (-XJ9)
Content: Piston Rod with dimensions for bellows, but bellows not assembled

Model No. Notation

ULK - 00 - 20 - 100 - XJ9

Model No.

Please refer to the ULK Series model No. Notation.

Dimensional Drawings
Same dimensions as with bellows, but bellows are not included.

With 2 Rod Nuts (-A2)
Content: Shipped with 2 rod nuts, same as standard.

Model No. Notation

ULK - 00 - 20 - 100 - A2

Model No.

Please refer to the ULK Series model No. Notation.

Dimensions
Same as standard type except that 2 rod nuts are included.

Pneumatic Equipment

To Use This Product Safely

Be sure to read this before use. For general cylinder information, see Intro 41, and for cylinder switches, see P. 1512.

Specific Precautions: Cell Top Cylinder ULK Series

Design / Selection

1. Common

Warning

■ Structure so that the human body does not directly touch the driven object and the moving parts of the cylinder with brake.

Install a protective cover so that the human body cannot touch it directly. Or, if there is a risk of touching, provide a sensor etc. to make a safe structure such as emergency stop before touching or sounding a warning sound to notify danger.

■ Use a balanced circuit that accommodates the protrusion of the Piston Rod.

If the brake is operated at any position during the stroke such as intermediate stop, and air pressure is applied to only one side of the cylinder, the Piston Rod will pop out at high speed when the brake is released. In such a case, there is a risk of causing injury to the human body such as pinching hands and feet, and causing damage to the machine, so use a balance circuit like the recommended pneumatic circuit to prevent shooting out. Since Cell Top cylinder is a non-lube specification, never lubricate it. It causes brake malfunction.

■ The holding force (Max static load) is the ability to hold static load that is not accompanied by vibration or shock, in a state where the brake is operating under no load.

Therefore, please be careful when using near the upper limit of the holding force at all times.

■ Do not apply impact load, strong vibration, or rotational force when the brake is operating.

If impact load, strong vibration, or rotational force is applied from the outside, the holding force will decrease and it is dangerous, so please be careful.

■ When performing intermediate stop, consider the stopping accuracy and overrun amount.

Because it is a mechanical lock, it does not stop instantly in response to the stop signal, but stops with a time delay. The stroke sliding due to this delay is the overrun amount. And the range between the maximum and minimum overrun amount is the stopping accuracy.

- Place the limit switch in front of the desired stop position by the overrun amount.
- The limit switch requires a detection length (dog length) of the overrun amount + α.
- The operating range of CKD cylinder switches is 7 to 16 mm, depending on the switch model. . If the overrun amount exceeds this, perform self-holding of the contact on the switch load side.

■ Do not use multiple cylinders with brakes in synchronization. If synchronization is lost, excessive moment load or load concentration may occur on the cylinder where the brake worked first, causing brake release failure, reduced life, damage, etc.

■ In order to improve stopping accuracy, ensure that the brake stops the cylinder as soon as possible after receiving the stop signal.

To do so, use a DC type control electric circuit and valve with good response, and place the valve and cylinder as close as possible.

■ Please note that stopping accuracy is affected by changes in piston speed.

If the piston speed changes due to load fluctuation or disturbance during the reciprocating stroke of the cylinder, the dispersion of the stop position will increase, so consider keeping the piston speed constant immediately before the stop position. Also, during the cushion stroke and while in the acceleration range from the start of operation, the speed change is large, so the dispersion of the stop position becomes large. The stopping accuracy at piston speed 300 mm/s and no load is ±1.0 mm (reference value). It varies depending on the equipment used. For details, refer to the page on stopping accuracy and overrun.

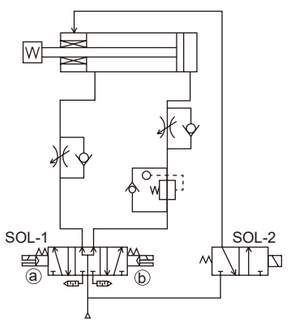
■ Basic circuit

Even when used for fall prevention or emergency stop, be sure to use the following circuit. 2-position valves cannot be used because the cylinder's own thrust acts on the brake part even when stopped. Balance the thrust and load with the following circuit. The brake may not release if a load is applied to the brake.

● For Horizontal Load

If piped as shown in Fig. 1, equal pressure is applied to both sides of the piston when stopped, preventing the rod from popping out when the brake is released. Also, install a regulator with check valve on the head side to balance the thrust.

Fig. 1

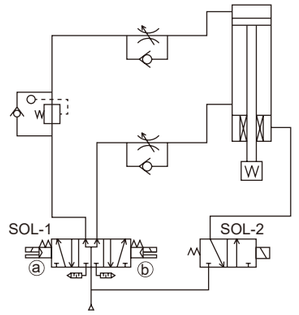


ⓐ SOL-1 ⓑ		SOL-2	Operating State
OFF	OFF	OFF	Stop
ON	OFF	ON	Retract
OFF	ON	ON	Advance

● For downward vertical load

As shown in Fig. 2, if the load is downward, the rod will malfunction in the Load Direction when the brake is released. Therefore, install a pressure reducing valve with a check valve on the head side, reduce the thrust in the Load Direction, and balance the load.

Fig. 2

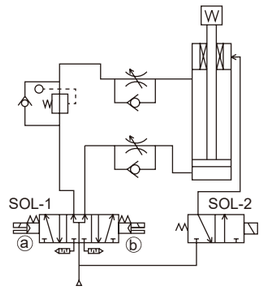


ⓐ SOL-1 ⓑ		SOL-2	Operating State
OFF	OFF	OFF	Stop
ON	OFF	ON	Descend
OFF	ON	ON	Ascend

● For upward vertical load

As shown in Fig. 3, if the load is upward, the rod will malfunction in the Load Direction when the brake is released. Therefore, install a pressure reducing valve with a check valve on the rod side, reduce the thrust in the Load Direction, and balance the load.

Fig. 3



ⓐ SOL-1 ⓑ		SOL-2	Operating State
OFF	OFF	OFF	Stop
ON	OFF	ON	Descend
OFF	ON	ON	Ascend

■ When releasing the brake, make sure to release the brake earlier than the cylinder operation. If the cylinder operation is faster, the brake may not release.

■ If back pressure is applied during locking, the lock may be released, so use a single valve or an individual exhaust type manifold for the brake release valve.

■ To prevent the piston from shooting out at startup, be sure to use a 3-position PAB connection (both-side pressurization) valve for cylinder drive.

■ To maintain balance of the thrust, including the load, the side with the larger thrust should have a Regulators with a check valve.

CAUTION

■ Stopping accuracy

● Stop Pitch and Load Factor

Stopping accuracy varies depending on stop pitch and load factor. The load factors in the table below are recommended to obtain the specified stopping accuracy.

Stop Pitch	Load Factor
50 mm or less	20% of Thrust
50 mm to 100 mm	40% of Thrust
100 mm or more	60% of Thrust

● Selection of Brake Valve

Stopping accuracy and overrun amount vary depending on the response of the brake valve. Select by referring to the ULK-V brake valve electrical specifications. Also, connect the valve directly to the brake port to improve stopping accuracy.

● When using a PLC (programmable controller)

If a PLC (Programmable Logic Controller) is used for the electrical control device of the brake valve, the stopping accuracy will deteriorate due to the scan time (calculation processing time). When using a PLC, do not incorporate only the brake valve into the PLC circuit.

■ Do not change the load weight significantly when the brake is stopped. The stop position may change.

■ Although the contact service life of the reed switch varies depending on usage conditions, it will generally last several million cycles. If the device used is in continuous operation day and night or high frequency operation, it will reach the contact life region in a short period of time, so use a solid state switch that does not have a contact part.

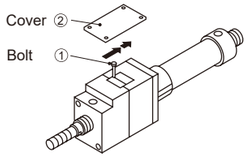
During Use

1. Common

⚠Warning

■ Release brakes before coupling the load to the end of the rod.
If done with the brake activated, rotational force or load exceeding the holding force will act on the Piston Rod, causing damage to the brake mechanism.

■ If the brake is released while air is applied to only one side of the cylinder, the Piston Rod can pop out at high speed, creating a dangerous situation. When releasing the brake during adjustment work, etc., always observe the following:
- Check that no one is in the movable range of the load and that no problems will arise if the load moves when brakes are released.
- When releasing the brake, perform position locking or take other measures:
  · Placing the load at the lower end
  · Pressurizing both sides
  · Placing a support
  Implement fall prevention measures such as these.
- Confirm that air is not pressurized on only one side of the cylinder when releasing brakes.
- The ULK Series can be manually released by pushing down the brake plate in the direction of the arrow using a bolt or the like. However, note that only the PUSH side will be released if the brake plate is not entirely pushed down. Since there are two brake plates, it will not release unless both brake plates are tilted. (During normal use, always remove the bolt and attach the cover before use.)①②



■ Brakes are released manually or by pressurizing the brake release port. During load installation, if the brake is left released by this operation, the load may fall. Therefore, always return the manual release operation to its initial state, or confirm that the brake is effective with no air in the brake release port before installation.

■ Do not apply torque to the rod when braking, as the holding force will decrease, creating hazardous conditions. Also, use with a mechanism that prevents rod rotation.

■ Do not apply force exceeding the brake holding force listed in the catalog to the cylinder.

■ If there is any play, such as looseness, in the brake signal dog, stopping accuracy is affected. Securely fix to eliminate play, etc.

■ If the piston speed is fast, the detection dog must be long enough to match relay response time. Note that if the dog length is short, the stop signal will not be output and it will not stop.

■ The brake section can be removed from the Cylinder Body. Do not disassemble or inspect brakes or hazards may result when brakes are used again.

■ The required amount of grease is applied to the brake part, so avoid applying more grease and do not wipe off the grease.

■ The required grease is applied when brakes are replaced, so there is no need to apply grease to rods.

■ Please always use with the dust cover attached except during manual release, as it may cause a malfunction.

⚠CAUTION

■ Adjust the air balance in the cylinder.
With the brake released, attach the load to the cylinder and balance the load by adjusting the air pressure on the rod side and head side of the cylinder. By ensuring this load balance, problems such as the Piston Rod popping out when the brake is released or the brake not releasing normally can be prevented.

■ Adjust the mounting position of the detection part such as the cylinder switch.
When performing intermediate stop, adjust the mounting position of the detection part such as the cylinder switch considering the overrun amount with respect to the desired stop position.

■ Load fluctuation during the reciprocating stroke of the cylinder causes changes in piston speed, and changes in piston speed increase the dispersion of the stop position. Adjust the mounting so that there is no load fluctuation during the cylinder reciprocating stroke, especially immediately before stopping.

■ During the cushion stroke and while in the acceleration range from the start of operation, the speed change is large, so the dispersion of the stop position becomes large. Therefore, be careful when performing step operation where the stroke from the start of operation to the next position is short.

■ Load to Piston Rod
More strictly than general air cylinders, use in a state where the load on the Piston Rod is always applied in the axial direction. Furthermore, when moving the load, regulate it sufficiently with a guide so that there is no backlash or twisting.

■ Maintaining the rod sliding parts
Be careful not to scratch or dent the Piston Rod sliding part. It causes damage to packings, leading to leakage or brake failure.

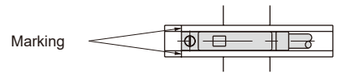
■ Air supply pipes that are too narrow or too long can reduce stopping accuracy.

■ If the cylinder has been stopped for a long time, such as first thing in the morning or afternoon, the frictional resistance increases and the piston speed changes, so the stopping accuracy may deteriorate. Perform a break-in operation to obtain stable stopping accuracy.

2. Common (With T-type Switch)

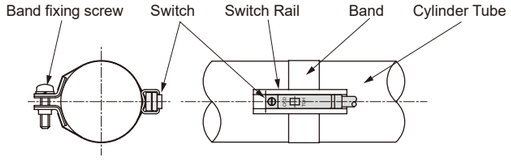
⚠CAUTION

■ When Moving the Switch Position in the Stroke Direction
- The 1-color indicator switch can be finely adjusted by about ±3 mm from the mounting position at the time of shipment. If the adjustment range exceeds ±3 mm, or if fine-tuning the position of a 2-color indicator switch, move the band position.
- Loosen the switch mounting screw, move the switch along the rail, and tighten at the specified position. For T2, T3, T0, T5, T2W, T3W, use a flathead screwdriver (watch screwdriver, precision screwdriver, etc.) with a grip diameter of 5 to 6 mm, tip width 2.4 mm or less, and thickness 0.3 mm or less to tighten the switch fixing screw with a tightening torque of 0.1 to 0.2 N·m. For T1, T□C, T2J, T2Y, T3Y, T8, tighten with a tightening torque of 0.5 to 0.7 N·m.
- The switch rail has a marking 4 mm from the end face of the rail. Use it as a guide for mounting position when replacing the switch. The switch rail marking is set to the switch maximum sensitivity position at factory shipment. If the switch type changes or the band is moved, the maximum sensitivity position changes, so adjust the position each time.



■ When Moving the Switch Position in the Circumferential Direction
- Loosen the band fixing screw, move the switch rail circumferentially, and tighten it at the specified position. The tightening torque is 0.6 to 0.8 N·m.

■ When Moving the Band Position
- Loosen the band fixing screw, move the switch rail and band along the cylinder tube, and tighten them at the specified position. The tightening torque is 0.6 to 0.8 N·m.



For precautions during mounting, installation, adjustment, use, and maintenance, please see "Precautions for Use" in this catalog and the CKD Components product site (https://www.ckd.co.jp/kiki/en/) → "Model No." → Instruction Manual.

JSK2 / JSM2

With Brake with Lock

Brake Cylinder (Small Bore)

ø20, ø25, ø30, ø32, ø40

Overview

This is a cylinder with brake, where a highly reliable brake is included with the medium bore (ø20 to ø40) series (CMA2, CMK2) among general type cylinders.

Features

[JSK2]
Crimped type using Stainless Steel tube
Lightweight due to adoption of aluminum cover

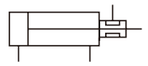
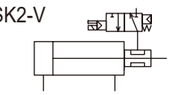
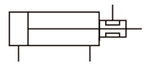
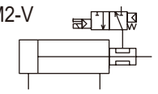
[JSM2]
Robust design to withstand harsh operating conditions.
Cover screw-in method for easy disassembly and assembly.

CONTENTS

Series variation 320
Product Introduction 320
Variation/Option Combination Availability Table 322
JSK2 (Crimped Type)
●Double Acting, Single rod type (JSK2) 324
● Double Acting with valve for brake (JSK2-V) 324
JSM2 (Dismountable Type)
●Double Acting, Single rod type (JSM2) 344
● Double Acting with valve for brake (JSM2-V) 344
Accessories External Dimensions Diagram 342
Outer Dimensions Diagram with Switch 360
Brake Cylinder Common Technical Data 362
Brake Cylinder Common Applications and Usage Examples 363
Custom Products 364
Precautions for Use 366

Brake Cylinder
JSK2, JSM2 Series

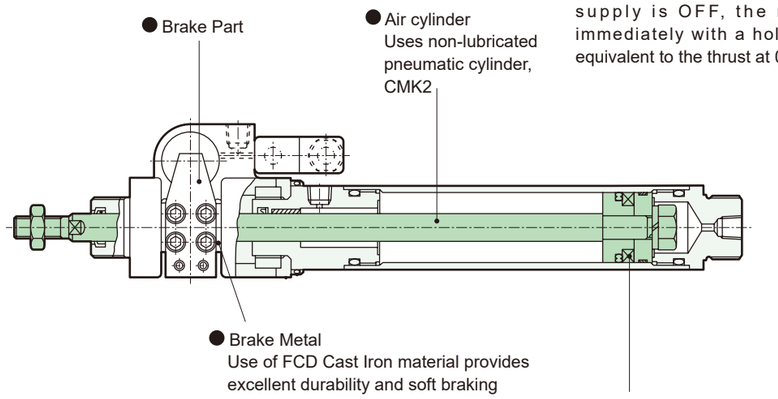
●: Standard, ◎: Option, : Not available

Variations	Model Number / Circuit Diagram / Code	Bore Size (mm)	Standard Stroke (mm) 25	50	75	100	125	150	175	200	250	300	Min Stroke (mm)	Max Stroke (mm)		Intermediate stroke (per mm)	Mounting Type: Basic type 00	Axial Foot Type LB	Rod Side Flange Type FA	Single clevis type CA	Single clevis integrated type CC	Rod side trunnion type TA	Head side trunnion type TB	Option: Bellows (100°C) J	Bellows (250°C) L	Piston Rod material change M	Same Port Position P	Boss cut V	With Brake Unit Cover *1 U	Accessories: Single knuckle I	Double knuckle Y	Double bracket B2	Switch	Page
Crimped type, Double Acting type	JSK2 	ø20, ø25, ø32, ø40	●	●	●	●	●	●	●	●	●	●	5	700		1	●	●	●	●	●	●	●	◎	◎	◎		◎	◎	◎	◎	◎	◎	324
Crimped type, Double Acting type, with brake valve	JSK2-V 	ø20, ø25, ø32, ø40	●	●	●	●	●	●	●	●	●	●	5	700		1	●	●	●	●	●	●	●	◎	◎	◎		◎	◎	◎	◎	◎	◎	324
Serviceable type, Double Acting type	JSM2 	ø20, ø30, ø40	●	●	●	●	●	●	●	●	●	●	1	700		1	●	●	●	●			●	●	◎	◎	◎	◎		◎	◎	◎	◎	◎	344
Serviceable type, Double Acting type, with brake valve	JSM2-V 	ø20, ø30, ø40	●	●	●	●	●	●	●	●	●	●	1	700		1	●	●	●	●		●	●	◎	◎	◎	◎		◎	◎	◎	◎	◎	344

*1: For mounting type "TA", brake unit cover "U" cannot be selected.

Product Introduction (JSK2)

- Stopping accuracy ±1.0 mm or less
  Cylinder speed 300 mm/s at no load
- High Safety
  Even if the pneumatic source/power supply is OFF, the rod locks immediately with a holding force equivalent to the thrust at 0.49 MPa.



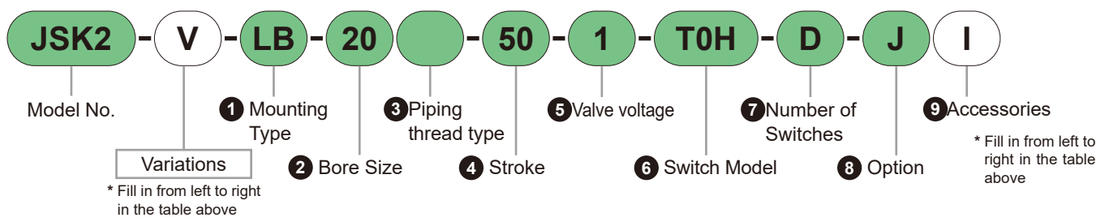
Original brake mechanism ensures high stopping accuracy and holding force
Safety is also further improved

Variation and Option Item Combination Availability Table

●Mark: Standard
◎Mark: Options
○Mark: Custom-made
△Mark: Manufacturable depending on conditions (please consult)
× Mark: Not available

Category		Category	Variation		Piping thread		Option				
			Double Acting Basic Type	With Valve	NPT	G	With bellows, Polyolefin	With Bellows, Silicone Rubber	Piston Rod material: Stainless Steel	Boss cut	With brake unit cover
		Code	None	V	N	G	J	L	M	V	U
Variations	Double Acting Basic Type	Blank	＼	＼	○	○	◎	◎	◎	◎	◎
	With Valve	V		＼	○	○	◎	◎	◎	◎	◎
Piping thread	NPT	N			＼	x	○	○	○	○	○
	G	G				＼	○	○	○	○	○
Options	With bellows, Polyolefin	J					＼	x	◎	◎	◎
	With bellows, Silicone rubber	L						＼	◎	◎	◎
	Piston Rod material: Stainless Steel	M							＼	◎	◎
	Boss cut	V								＼	◎
	With brake unit cover	U									＼
Accessories	Cylinder Switch	Separately Shown	◎	◎			◎	◎	◎	◎	◎
	Single knuckle	I	◎	◎			◎	◎	◎	◎	◎
	Double knuckle	Y	◎	◎			◎	◎	◎	◎	◎
	B2 Bracket	B2	◎	◎			◎	◎	◎	◎	◎

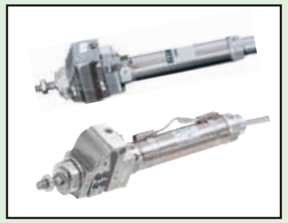
[Model No. Example]



Model No.: Brake Cylinder
●Variation: With Valve
❶ mounting style : Axial Foot Type
❷ Bore Size : ø20 mm
❸ Port thread : Rc Thread
❹ Stroke : 50 mm
❺ valve voltage : 100 VAC
❻ Switch model No. : Solid State T0H Switch, Lead Wire 1 m
❼ Switch quantity : With 2 pcs.
❽ Options : Bellows Max Ambient Temperature 100°C
❾ Accessory : Single knuckle

MEMO

With Brake / With Lock
ULK□
JSK2/ JSM2
JSG
JSC3, JSC4
USSD
UFCD
USC
Cylinder Switch
Ending

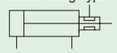


Brake Cylinder Small Bore / Crimped Type Double Acting Type / Double Acting with Brake Valve

JSK2, JSK2-V Series

●Bore Size: ø20, ø25, ø32, ø40

Circuit Diagram Code ●Double Acting Type



RoHS

Model No. Notation ●Without valve

Without Switch
(Built-in magnet for switch)

JSK2 - LB - 20 - 4 - 50 — J I
1 2 3 4 5 9 10

With Switch
(Built-in magnet for switch)

JSK2 - LB - 20 - 4 - 50 — T0H - R - J I
1 2 3 4 5 7 8 9 10

●With Valve for Brake

Without Switch
(Built-in magnet for switch)

JSK2-V - LB - 20 - 4 - 50 - 1 — J I
1 2 3 4 5 6 9 10

With Switch
(Built-in magnet for switch)

JSK2-V - LB - 20 - 4 - 50 - 1 - T0H - R - J I

1 Model Number
2 Mounting Type
3 Bore Size
4 Piping thread type
5 Stroke
6 Valve voltage
7 Switch Model
8 Number of Switches
9 Option
10 Accessories

1 Model Number

Code	Description
JSK2	Double Acting Type
JSK2-V	Double Acting with Valve

Note: Low hydraulic pressure type also manufactured as a custom item. Model numbers will be JSK2-H, JSK2-VH.

2 Mounting Type

Code	Content		Code	Content	
00	Basic Type		CC	Single clevis integrated type	
LB	Axial Foot Type		TA	Rod side trunnion type	
FA	Rod Side Flange Type		TB	Head side trunnion type	
CA	Single clevis type				

*1: When mounting style is TA, brake section cover and double bracket cannot be selected at the same time because they interfere.
*2: Mounting bracket is attached to the product for shipment. However, if bellows are included and mounting brackets are LB, FA, or TA, they will be shipped assembled.

3 Bore Size (mm)

Code	Content
20	ø20
25	ø25
32	ø32
40	ø40

4 Piping thread type

Code	Content
Blank	M5 (ø20)
	Rc thread (ø25 to ø40)
NN	NPT thread (ø25 or more) (Custom item)
GN	G thread (ø25 or more) (Custom item)

5 Stroke (mm)

Bore Size	Stroke	Intermediate Stroke
ø20	5 to 700	in 1 mm increments
ø25	5 to 700	
ø32	5 to 700	
ø40	5 to 700	

Note: For minimum stroke with switch and maximum/minimum stroke with bellows, refer to P. 326.

6 Valve voltage

Code	Content
1	100 VAC (50/60 Hz)
2	200 VAC (50/60 Hz)
3	24 VDC

Note: Valve voltage can be selected only for JSK2-V (with brake valve).

7 Switch Model No.

For switch details, refer to P. 1457. Switches are shipped with the product.

Contact	Indicator LED Special Function	Wiring (Output)	Load Voltage (V) AC	Load Voltage (V) DC	Load Current (mA) AC	Load Current (mA) DC	Lead wire *1 Straight	Lead wire *1 L-shape	
Solid State	1-Color	2-wire	85 to 265	-	5 to 100	-	T1H□	T1V□	
			-	10 to 30	-	5 to 20 *2	T2H□	T2V□	
		3-wire (NPN)	-	30 or less	-	100 or less	T3H□	T3V□	
		3-wire (PNP)	-		-		T3PH□	T3PV□	
	2-color	2-wire	-	24 ± 10%	-	5 to 20	T2WH□	T2WV□	
		3-wire (NPN)	-	30 or less	-	50 or less	T3WH□	T3WV□	
	1-Color Off-Delay Type	2-wire	-	10 to 30	-	5 to 20 *2	T2JH□	T2JV□	
	1-Color Flexible Lead Wire Type		-		-		T2HR3	T2VR3	
Contact	1-Color	2-wire	110	12/24	7 to 20	5 to 50	T0H□	T0V□	
	Without Indicator Lamp		110	5/12/24	20 or less	50 or less	T5H□	T5V□	
	1-Color		110/220	12/24	7 to 20 / 7 to 10	5 to 50	T8H□	T8V□	

*1: Enter the code selected in the "*Lead wire length" table into "□" of the Switch Model.
*2: The maximum load current of 20 mA mentioned above is at 25°C. If the switch operating Ambient Temperature is higher than 25°C, it will be lower than 20 mA. (At 60°C, it will be 5 to 10 mA.)
*3: Switches other than the above models are also available. (Custom Product) For details, refer to P. 1457.

***Lead wire length**

Code	Content
Blank	1 m (Standard)
3	3 m (Option)
5	5m (Option)

Example) Lead wire length
1 m T0H
3 m T0H3
5 m T0H5

8 Number of Switches

Code	Content
R	With 1 pc on rod side
H	With 1 pc on head side
D	With 2 pcs
T	With 3 pcs

Note: The maximum number of switches mounted is limited to 3. If 4 or more are required, please arrange for the missing switch mounting brackets separately as individual items.

9 Option

Code	Content	Max Ambient Temperature	Instantaneous Max Temperature	
J	Bellows	100°C	200°C	
L	Bellows	250°C	400°C	
M	Piston Rod material (Stainless Steel)			
V	Boss cut			
U	With brake unit cover			

*1: Instantaneous maximum temperature is the temperature when sparks, cutting chips, etc., instantaneously hit the bellows.
*2: When 2 Mounting Style is TA (Rod side trunnion type),Option U (with brake unit cover) cannot be selected.

10 Accessories

Code	Content	
I	Single knuckle	
Y	Double knuckle (Pin, washer, cotter pin attached)	
B2	Double bracket (Pin, Retaining Ring attached)	

Note: I and "Y" cannot be selected simultaneously.

About specifications of custom products

For details, please refer to P. 364.

Code	Content
-XJ9	Without Bellows
-A2	With 2 Rod Nuts

Model No. Ex.)
JSK2 - ..... - XJ9

For combinations of variations and options, please refer to P. 322.

Switch Individual Model No. Notation

● Switch body+Mounting bracket set
JSK2 - T0H - 20
7 Switch Model
3 Bore Size

● Switch body only
SW - T0H
7 Switch Model

● Mounting Bracket Set
JSK2 - T - 20
Mounting Bracket
3 Bore Size

Brake Valve Model No. Notation

JSK2-V - VALVE-KIT - 1
6 Valve voltage

Specifications

Item		JSK2				JSK2-V			
Bore Size mm		ø20	ø25	ø32	ø40	ø20	ø25	ø32	ø40
Actuation method		Double Acting Type				Double Acting Type with Valve			
Operating Fluid		Compressed Air							
Max Operating Pressure MPa		1.0				0.6			
Min Operating Pressure MPa	Brake Part	0.35				0.35			
	Cylinder Part	0.10				0.10			
Proof Pressure MPa		1.6							
Ambient Temperature °C		-10 to 60 (No freezing)				-10 to 50 (No freezing)			
Port Size	Brake Part	M5	Rc1/8			M5	Rc1/8		
	Cylinder Port	Rc1/8				Rc1/8			
Stroke Tolerance mm		$^{+2.0}_{0}$(up to 200), $^{+2.4}_{0}$(200 or more)							
Operating Piston Speed mm/s		50 to 500							
Cushion		Rubber Cushion							
Lubrication		Not required (Use Turbine Oil Class 1 ISO VG32 if lubricated)							
Holding Force N		186	431	431	765	186	431	431	765
Allowable Absorbed Energy J		0.166	0.308	0.424	0.639	0.166	0.308	0.424	0.639

Brake Valve Electrical Specifications

Item	JSK2-V-VALVE-KIT-Voltage		
Rated voltage (V)	100 AC (50/60 Hz)	200 AC (50/60 Hz)	24 DC
Starting current (A)	0.056/0.044	0.034/0.026	0.075
Holding current (A)	0.028/0.022	0.017/0.013	
Power consumption (W)	1.8/1.4	2.1/1.6	1.8
Voltage fluctuation range	±10%		
Heat Resistance Class	Class B molded coil		

*1: 100/200 VAC coils can be used at 110/220 VAC (60 Hz).

***2: For main specifications of valves (P5136 series), please refer to "Directional Control Valve ② No. RJ-012AA".**

Stroke

Bore Size (mm)	Standard Stroke (mm)	Max Stroke (mm)		Min Stroke (mm)	
		Without Bellows	With Bellows	Without Bellows	With Bellows
ø20	25, 50, 75, 100, 125, 150, 175, 200, 250, 300	700	600	5	5
ø25					
ø30					
ø40					

Note: Minimum stroke varies depending on the switch mounting method. Refer to the table below.

Minimum stroke with switch

(Unit: mm)

Number of Switches	1					2				
	Solid State			Reed		Solid State			Reed	
Bore Size (mm)	T2, T3	T1	T□W	T0, T5	T8	T2, T3	T1	T□W	T0, T5	T8
ø20	10					25	35	30	25	35
ø25	10					25	35	30	25	35
ø32	10					25	35	30	25	35
ø40	10					25	35	30	25	35

Note: Only up to 3 switches can be mounted.

Cylinder Weight

● JSK2 (Unit: kg)

Item / Mounting Style / Bore Size (mm)	Product Weight when stroke (S) = 0 mm						Switch Weight	Switch rail + band Weight	Added Weight per S = 10 mm
	Basic Type (00)	Axial Foot Type (LB)	Flange type (FA)	Clevis type (CA)	Clevis type (CC)	Trunnion Type (TA)			
ø20	0.67	0.82	0.73	0.82	0.68	0.72	Please refer to the Weight listed in the switch specifications. of P. 1457	0.005	0.01
ø25	1.18	1.44	1.33	1.42	1.18	1.28		0.005	0.01
ø32	1.22	1.48	1.37	1.46	1.22	1.32		0.009	0.02
ø40	1.91	2.17	2.06	2.15	1.93	2.07		0.009	0.02

● JSK2-V (With Valve) (Unit: kg)

Item / Mounting Style / Bore Size (mm)	Product Weight when stroke (S) = 0 mm						Switch Weight	Switch rail + band Weight	Added Weight per S = 10 mm
	Basic Type (00)	Axial Foot Type (LB)	Flange type (FA)	Clevis type (CA)	Clevis type (CC)	Trunnion Type (TA)			
ø20	0.72	0.87	0.78	0.87	0.73	0.77	Please refer to the Weight listed in the switch specifications. of P. 1457	0.005	0.01
ø25	1.23	1.49	1.38	1.47	1.23	1.33		0.005	0.01
ø32	1.27	1.53	1.42	1.51	1.27	1.37		0.009	0.02
ø40	1.96	2.22	2.11	2.20	1.98	2.12		0.009	0.02

(Example) JSK2-V-LB-20-100-2-TOH-D

Product Weight when S = 0 mm ..... 0.87 kg
Added weight when S = 100 mm ..... $0.01 \times \frac{100}{10} = 0.1$ kg
Weight of 2 switches..... 0.018 × 2 = 0.036 kg
Weight of switch rail+2 bands ..... 0.005 × 2 = 0.010 kg
Product Weight..... 0.87 kg + 0.1 kg + 0.036 kg + 0.010 kg = 1.016 kg

Theoretical Thrust Table

(Unit: N)

Bore Size (mm)	Operating Direction	Operating Pressure MPa						
		0.4	0.5	0.6	0.7	0.8	0.9	1.0
ø20	Push	1.26×10^2	1.57×10^2	1.88×10^2	2.20×10^2	2.51×10^2	2.83×10^2	3.14×10^2
	Pull	94.2	1.18×10^2	1.41×10^2	1.65×10^2	1.88×10^2	2.12×10^2	2.36×10^2
ø25	Push	1.96×10^2	2.45×10^2	2.95×10^2	3.44×10^2	3.93×10^2	4.42×10^2	4.91×10^2
	Pull	1.51×10^2	1.89×10^2	2.27×10^2	2.64×10^2	3.02×10^2	3.40×10^2	3.78×10^2
ø32	Push	3.22×10^2	4.02×10^2	4.83×10^2	5.63×10^2	6.43×10^2	7.24×10^2	8.04×10^2
	Pull	2.76×10^2	3.46×10^2	4.15×10^2	4.84×10^2	5.53×10^2	6.22×10^2	6.91×10^2
ø40	Push	5.03×10^2	6.28×10^2	7.54×10^2	8.80×10^2	1.01×10^3	1.13×10^3	1.26×10^3
	Pull	4.41×10^2	5.51×10^2	6.62×10^2	7.72×10^2	8.82×10^2	9.92×10^2	1.10×10^3

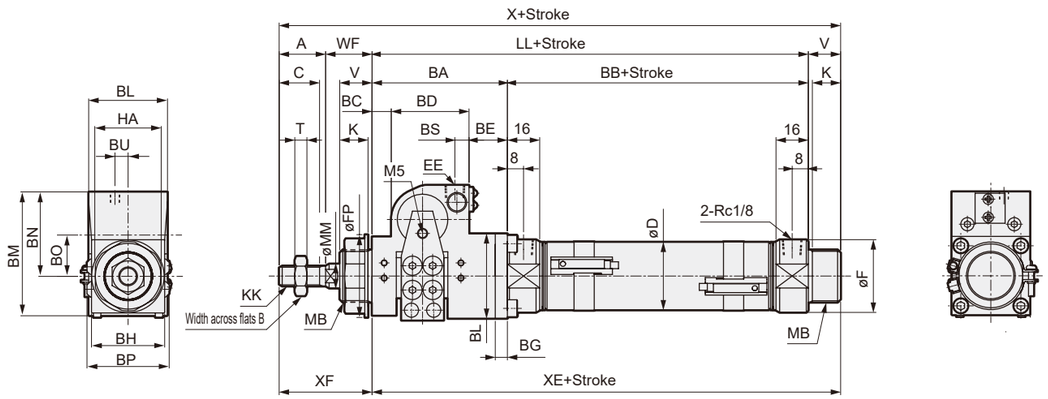
Mounting Bracket Model No. Notation

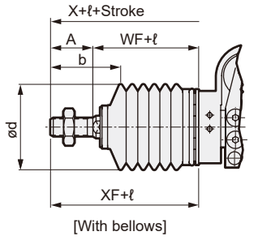
Bore Size (mm) / Mounting Bracket	ø20	ø25	ø32	ø40
Basic Type (00) *3	M1-00-20	M1-00-30	M1-00-30	M1-00-30
Axial Foot Type (LB)	M1-LB-20	M1-LB-30	M1-LB-30	M1-LB-30
Flange type (FA)	M1-FA-20	M1-FA-30	M1-FA-30	M1-FA-30
Single Clevis Type (CA)	M1-CA-20	M1-CA-30	M1-CA-30	M1-CA-30
Trunnion Type (TA/TB)	M1-TA-20	M1-TA-30	M1-TA-30	M1-TA-40

*1: Regarding mounting brackets, mounting nuts and toothed washers are included to axial foot types and flange types, and mounting nuts are included to trunnion types.
*2: For axial foot type, 2 sets of "M1-LB-□" in the above table are required.
*3: Only mounting nut and toothed washer. One set is included with the basic type (00) of the product, but please use it when additional sets are needed, etc.

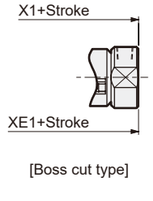
Dimensional Drawings

● Basic (JSK2-00)





[With bellows]



[Boss cut type]

Code	Without Valve / Basic Type (JSK2-00) Basic Dimensions																					
Bore Size (mm)	A	B	BA	BB	BC	BD	BE	BG	BH	BL	BM	BN	BO	BP	BS	BU	C	D	EE	F	FP	HA
ø20	20	13	58	66	9	30	19	5	29	34	55	38	19	38	4	3.8	18	21.4	M5	28	29	26
ø25	23	17	67	69	9.5	38.5	19	6	39	42	66	45	22	43.8	7	7	20	26.4	Rc1/8	32	41	35
ø32	23	17	67	69	9.5	38.5	19	6	39	42	66	45	22	43.8	7	7	20	33.6	Rc1/8	36	41	35
ø40	25	19	74	73	8	48	18	8	50	50	80.5	55.5	25	52	7	7	22	41.6	Rc1/8	45	41	35

Code												With Bellows			Boss Cut Type	
Bore Size (mm)	K	KK	LL	MB	MM	T	V	WF	X	XE	XF	b	d	ℓ	X1	XE1
ø20	12	M8x1.0	124	M18x1.5	10	5	14	24	182	138	44	30	30	(Stroke / 3)+6	168	124
ø25	14	M10x1.25	136	M26x1.5	12	6	16	23	198	152	46	32	46	(Stroke / 3.25)+7	182	136
ø32	14	M10x1.25	136	M26x1.5	12	6	16	23	198	152	46	32	46	(Stroke / 3.25)+7	182	136
ø40	14	M12x1.5	147	M26x1.5	14	7	16	23	211	163	48	34	46	(Stroke / 3.25)+7	195	147

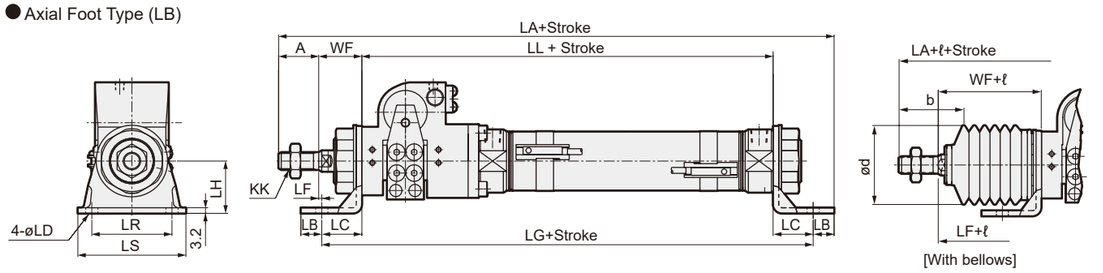
*1: Round up the ℓ dimension to the nearest integer.

***2: For the external dimensions diagram of accessories, please refer to P. 342.**

***3: For dimensions with each switch, refer to P. 360.**

Dimensional Drawings

● Axial Foot Type (LB)



[With bellows]

Code	Axial Foot Type (LB) Mounting Dimensions												
Bore Size (mm)	A	KK	LL	WF	LA	LB	LC	LD	LF	LG	LH	LR	LS
ø20	20	M8x1.0	124	24	196	10	18	6	6	160	25	30	44
ø25	23	M10x1.25	136	23	217	12	23	7	0	182	30	46	62
ø32	23	M10x1.25	136	23	217	12	23	7	0	182	30	46	62
ø40	25	M12x1.5	147	23	230	12	23	7	0	193	30	46	62

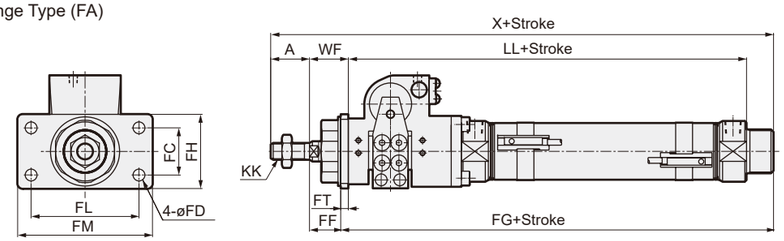
Code	With Bellows		
Bore Size (mm)	b	d	ℓ
ø20	30	30	(Stroke / 3)+6
ø25	32	46	(Stroke / 3.25)+7
ø32	32	46	(Stroke / 3.25)+7
ø40	34	46	(Stroke / 3.25)+7

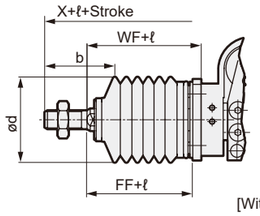
*1: Round up the ℓ dimension to the nearest integer.

***2: For the external dimensions diagram of accessories, please refer to P. 342.**

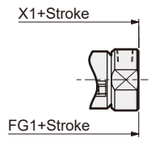
***3: For dimensions with each switch, refer to P. 360.**

● Rod Side Flange Type (FA)





[With bellows]



[Boss cut type]

Code	Rod Side Flange Type (FA) Mounting Dimensions												
Bore Size (mm)	A	KK	LL	WF	X	FC	FD	FF	FG	FH	FL	FM	FT
ø20	20	M8x1.0	124	24	182	20	6	20.8	141.2	34	40	54	3.2
ø25	23	M10x1.25	136	23	198	28	7	18.5	156.5	44	64	80	4.5
ø32	23	M10x1.25	136	23	198	28	7	18.5	156.5	44	64	80	4.5
ø40	25	M12x1.5	147	23	211	28	7	18.5	167.5	44	64	80	4.5

Code	With Bellows			Boss Cut Type	
Bore Size (mm)	b	d	ℓ	X1	FG1
ø20	30	30	(Stroke / 3)+6	168	127.2
ø25	32	46	(Stroke / 3.25)+7	182	140.5
ø32	32	46	(Stroke / 3.25)+7	182	140.5
ø40	34	46	(Stroke / 3.25)+7	195	151.5

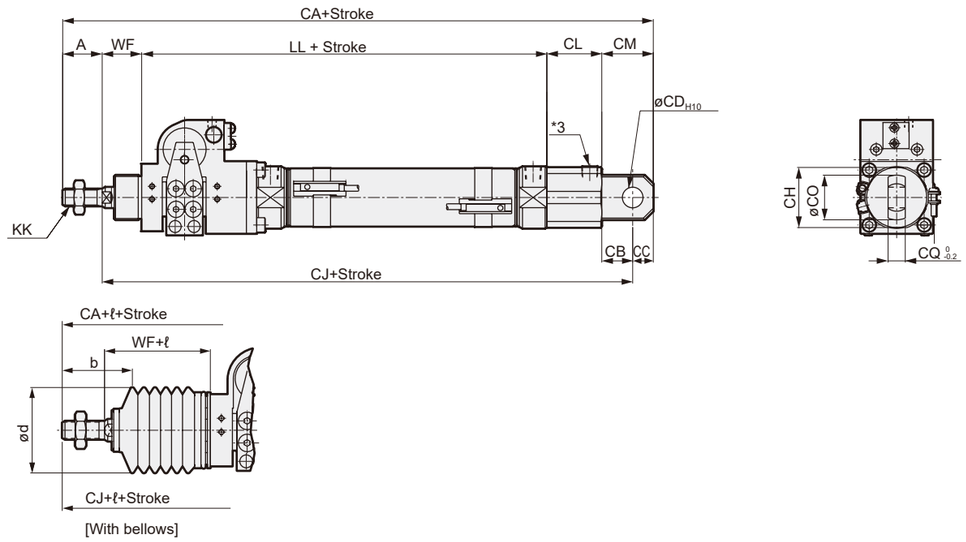
*1: Round up the ℓ dimension to the nearest integer.

***2: For the external dimensions diagram of accessories, please refer to P. 342.**

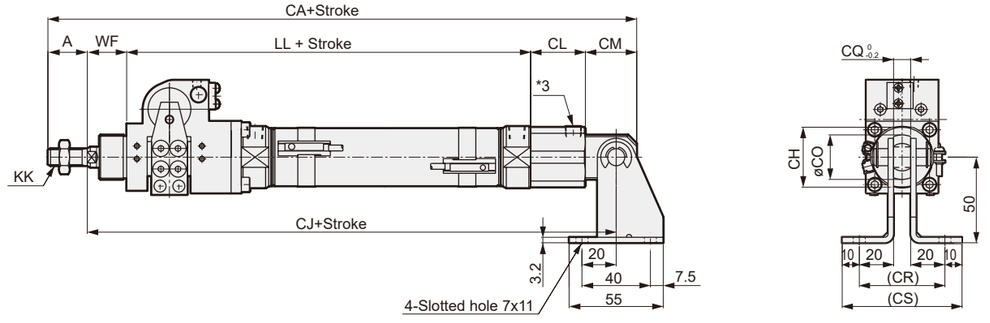
***3: For dimensions with each switch, refer to P. 360.**

Dimensional Drawings

● Single Clevis Type (CA)



● Eye bracket (CA) with bracket (option)



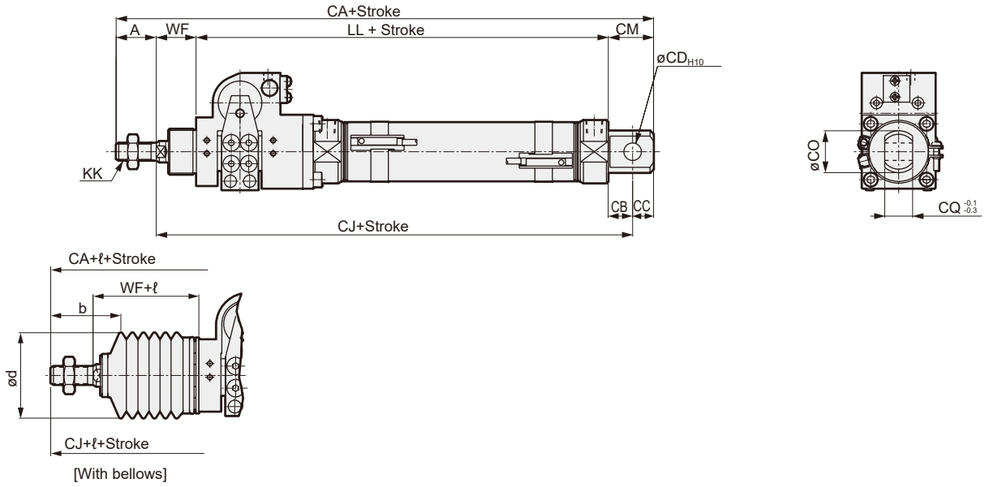
Code	Single Clevis Type (CA) Mounting Dimensions															
Bore Size (mm)	A	CH	KK	LL	WF	CA	CB	CC	CD	CJ	CL	CM	CO	CQ	CR	CS
ø20	20	26	M8x1.0	124	24	223	14	10	10	193	31	24	22	8	48	68
ø25	23	35	M10x1.25	135	23	244	18	12	12	209	32	30	26	10	50	70
ø32	23	35	M10x1.25	136	23	244	18	12	12	209	32	30	26	10	50	70
ø40	25	35	M12x1.5	147	23	257	18	12	12	220	32	30	26	10	50	70

Code	With Bellows		
Bore Size (mm)	b	d	ℓ
ø20	30	30	(Stroke / 3)+6
ø25	32	46	(Stroke / 3.25)+7
ø32	32	46	(Stroke / 3.25)+7
ø40	34	46	(Stroke / 3.25)+7

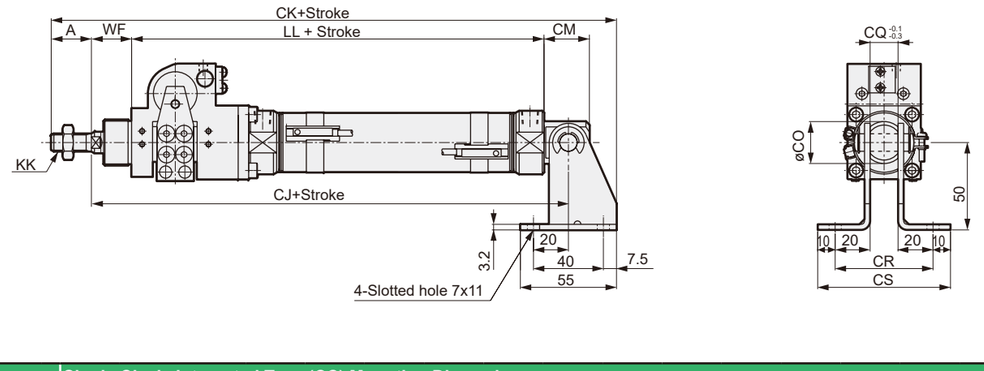
*1: This is not a piping port.
*2: Round up the ℓ dimension to the nearest integer.
***3: For the external dimensions diagram of accessories, please refer to P. 342.**
***4: For dimensions with each switch, refer to P. 360.**

Dimensional Drawings

●Single Clevis Integrated Type (CC)



● Eye bracket (CC) with bracket (option)



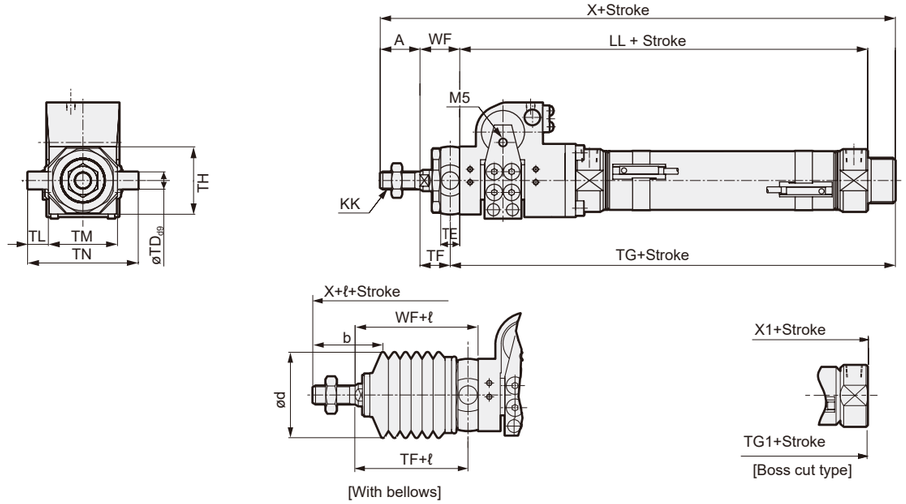
Code	Single Clevis Integrated Type (CC) Mounting Dimensions														
Bore Size (mm)	A	KK	LL	WF	CA	CB	CC	CD	CJ	CK	CM	CO	CQ	CR	CS
ø20	20	M8x1.0	124	24	189	12	9	8	160	207.5	21	22	16	56	76
ø25	23	M10x1.25	135	23	203	12	9	8	171	221.5	21	24	16	56	76
ø32	23	M10x1.25	136	23	208	14	12	10	173	223.5	26	24	16	56	76
ø40	25	M12x1.5	147	23	225	16	14	12	186	238.5	30	30	20	60	80

Code	With Bellows		
Bore Size (mm)	b	d	ℓ
ø20	30	30	(Stroke / 3)+6
ø25	32	46	(Stroke / 3.25)+7
ø32	32	46	(Stroke / 3.25)+7
ø40	34	46	(Stroke / 3.25)+7

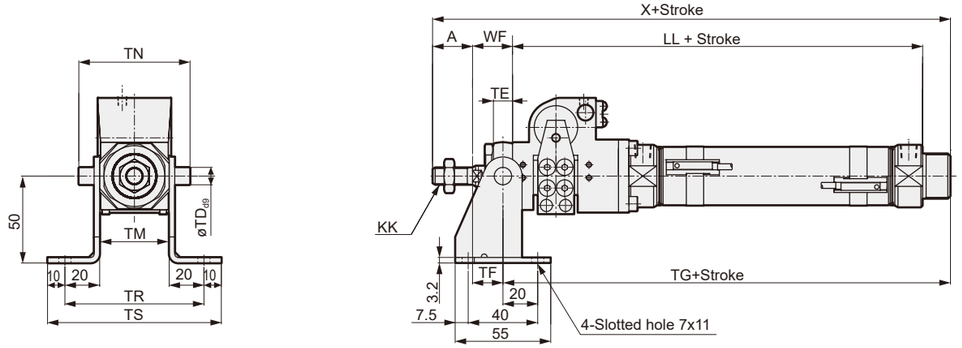
*1: Round up the ℓ dimension to the nearest integer.
***2: For the external dimensions diagram of accessories, please refer to P. 342.**
***3: For dimensions with each switch, refer to P. 360.**

Dimensional Drawings

● Rod side trunnion type (TA)



● Rod side trunnion (TA) with bracket (option)



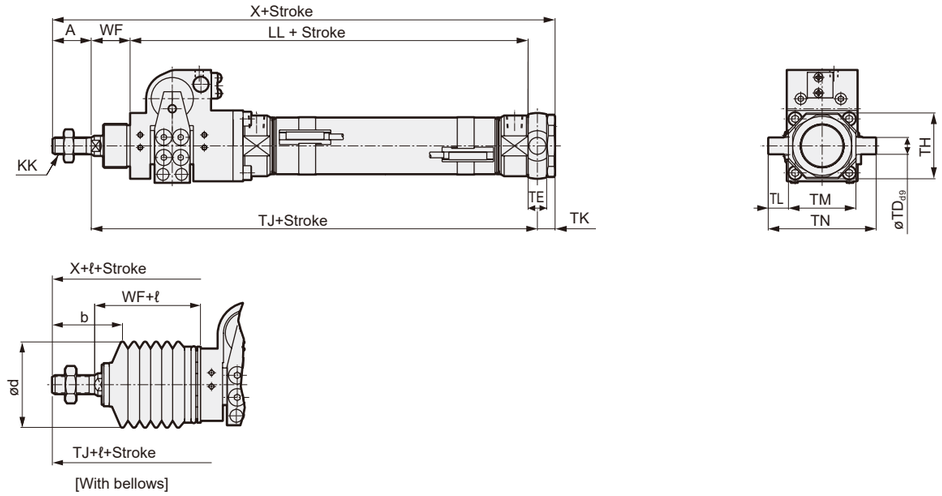
Code	Rod Type Trunnion Type (TA) Mounting Dimensions														
Bore Size (mm)	A	KK	LL	WF	X	TD	TE	TF	TG	TH	TL	TM	TN	TR	TS
ø20	20	M8x1.0	124	24	182	8	9	19.5	142.5	29.5	8	30	46	70	90
ø25	23	M10x1.25	136	23	198	10	11	17.5	157.5	39	12	40	64	80	100
ø32	23	M10x1.25	136	23	198	10	11	17.5	157.5	39	12	40	64	80	100
ø40	25	M12x1.5	147	23	211	10	11	17.5	168.5	44	9.5	53	72	93	113

Code	With Bellows			Boss Cut Type	
Bore Size (mm)	b	d	ℓ	X1	TG1
ø20	30	30	(Stroke / 3)+6	168	128.5
ø25	32	46	(Stroke / 3.25)+7	182	141.5
ø32	32	46	(Stroke / 3.25)+7	182	141.5
ø40	34	46	(Stroke / 3.25)+7	195	152.5

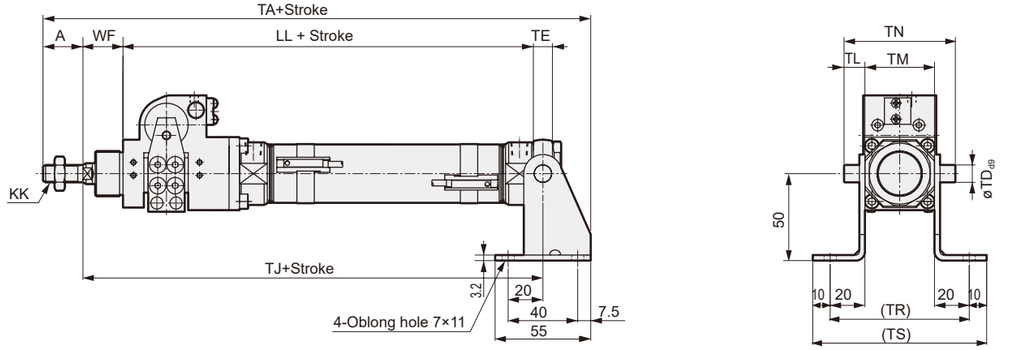
*1: Round up the ℓ dimension to the nearest integer.
*2: When brake unit cover "U" is included, bracket equipped type cannot be selected.
***3: For the external dimensions diagram of accessories, please refer to P. 342.**
***4: For dimensions with each switch, refer to P. 360.**

Dimensional Drawings

●Head Side Trunnion Type (TB)



● Head side trunnion (TB) with bracket (option)



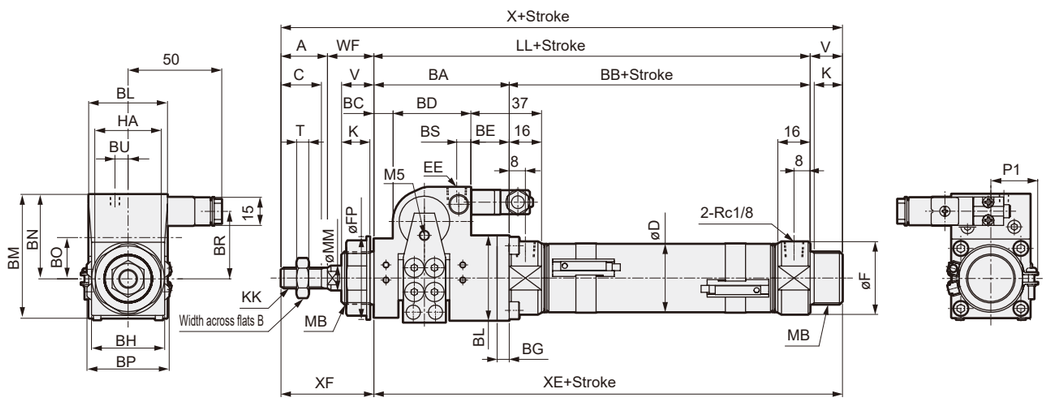
Code	Head Side Trunnion Type (TB) Mounting Dimensions														
Bore Size (mm)	A	KK	LL	WF	X	TA	TD	TE	TH	TJ	TK	TL	TM	TN	TR	TS
ø20	20	M8x1.0	124	24	182	200	8	9	29.5	152.5	9.5	8	30	46	70	90
ø25	23	M10x1.25	136	23	198	215	10	11	39	164.5	10.5	12	40	64	80	100
ø32	23	M10x1.25	136	23	198	215	10	11	39	164.5	10.5	12	40	64	80	100
ø40	25	M12x1.5	147	23	211	228	10	11	44	175.5	10.5	9.5	53	72	93	113

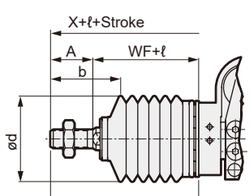
Code	With Bellows		
Bore Size (mm)	b	d	ℓ
ø20	30	30	(Stroke / 3)+6
ø25	32	46	(Stroke / 3.25)+7
ø32	32	46	(Stroke / 3.25)+7
ø40	34	46	(Stroke / 3.25)+7

*1: Round up the ℓ dimension to the nearest integer.
***2: For the external dimensions diagram of accessories, please refer to P. 342.**
***3: For dimensions with each switch, refer to P. 360.**

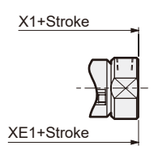
Dimensional Drawings

● Basic type (00)





[With bellows]



[Boss cut type]

Code	Without Valve / Basic Type (JSK2-00) Basic Dimensions																					
Bore Size (mm)	A	B	BA	BB	BC	BD	BE	BG	BH	BL	BM	BN	BO	BP	BR	BS	BU	C	D	EE	F	FP	HA
ø20	20	13	58	66	9	30	19	5	29	34	55	38	19	38	29	4	3.8	18	21.4	M5	28	29	26
ø25	23	17	67	69	9.5	38.5	19	6	39	42	66	45	22	43.8	34.5	7	7	20	26.4	Rc1/8	32	41	35
ø32	23	17	67	69	9.5	38.5	19	6	39	42	66	45	22	43.8	34.5	7	7	20	33.6	Rc1/8	36	41	35
ø40	25	19	74	73	8	48	18	8	50	50	80.5	55.5	25	52	39.5	7	7	22	41.6	Rc1/8	45	41	35

Code												With Bellows			Boss Cut Type	
Bore Size (mm)	K	KK	LL	MB	MM	T	V	WF	X	XE	XF	b	d	ℓ	X1	XE1
ø20	12	M8x1.0	124	M18x1.5	10	5	14	24	182	138	44	30	30	(Stroke / 3)+6	168	124
ø25	14	M10x1.25	136	M26x1.5	12	6	16	23	198	152	46	32	46	(Stroke / 3.25)+7	182	136
ø32	14	M10x1.25	136	M26x1.5	12	6	16	23	198	152	46	32	46	(Stroke / 3.25)+7	182	136
ø40	14	M12x1.5	147	M26x1.5	14	7	16	23	211	163	48	34	46	(Stroke / 3.25)+7	195	147

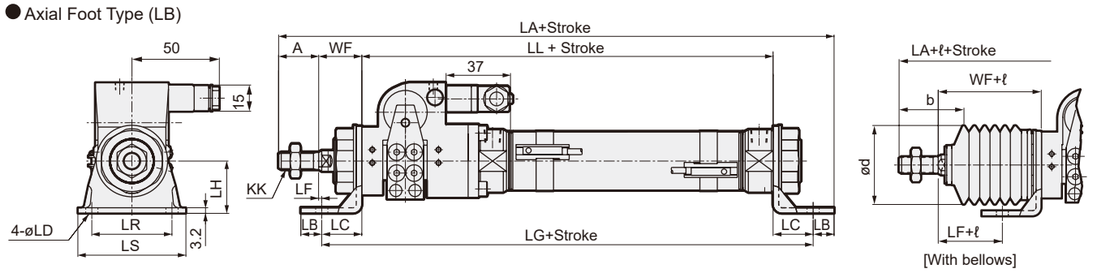
*1: Round up the ℓ dimension to the nearest integer.

***2: For the external dimensions diagram of accessories, please refer to P. 342.**

***3: For dimensions with each switch, refer to P. 360.**

Dimensional Drawings

● Axial Foot Type (LB)



[With bellows]

Code	Axial Foot Type (LB) Mounting Dimensions												
Bore Size (mm)	A	KK	LL	WF	LA	LB	LC	LD	LF	LG	LH	LR	LS
ø20	20	M8x1.0	124	24	196	10	18	6	6	160	25	30	44
ø25	23	M10x1.25	136	23	217	12	23	7	0	182	30	46	62
ø32	23	M10x1.25	136	23	217	12	23	7	0	182	30	46	62
ø40	25	M12x1.5	147	23	230	12	23	7	0	193	30	46	62

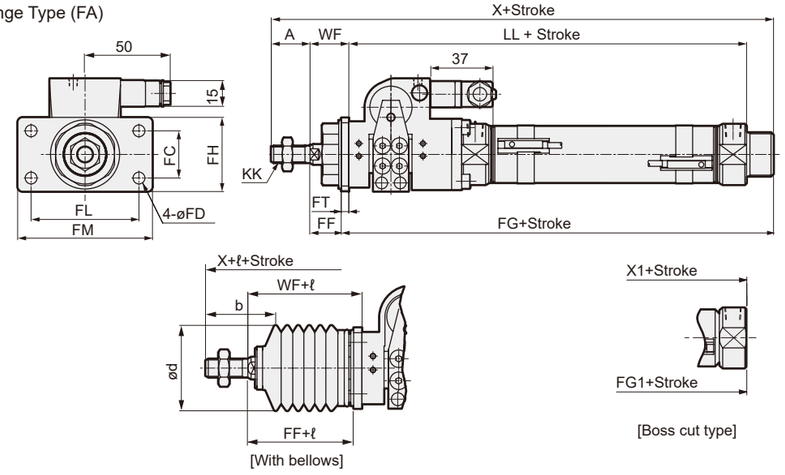
Code	With Bellows		
Bore Size (mm)	b	d	ℓ
ø20	30	30	(Stroke / 3)+6
ø25	32	46	(Stroke / 3.25)+7
ø32	32	46	(Stroke / 3.25)+7
ø40	34	46	(Stroke / 3.25)+7

*1: Round up the ℓ dimension to the nearest integer.

***2: For the external dimensions diagram of accessories, please refer to P. 342.**

***3: For dimensions with each switch, refer to P. 360.**

● Rod Side Flange Type (FA)



[With bellows]

[Boss cut type]

Code	Rod Side Flange Type (FA) Mounting Dimensions												
Bore Size (mm)	A	KK	LL	WF	X	FC	FD	FF	FG	FH	FL	FM	FT
ø20	20	M8x1.0	124	24	182	20	6	20.8	141.2	34	40	54	3.2
ø25	23	M10x1.25	136	23	198	28	7	18.5	156.5	44	64	80	4.5
ø32	23	M10x1.25	136	23	198	28	7	18.5	156.5	44	64	80	4.5
ø40	25	M12x1.5	147	23	211	28	7	18.5	167.5	44	64	80	4.5

Code	With Bellows			Boss Cut Type	
Bore Size (mm)	b	d	ℓ	X1	FG1
ø20	30	30	(Stroke / 3)+6	168	127.2
ø25	32	46	(Stroke / 3.25)+7	182	140.5
ø32	32	46	(Stroke / 3.25)+7	182	140.5
ø40	34	46	(Stroke / 3.25)+7	195	151.5

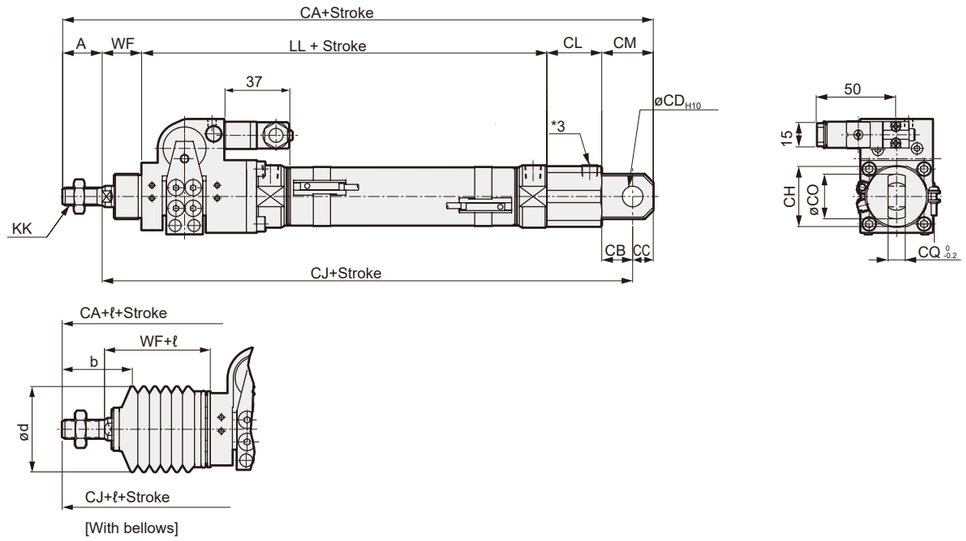
*1: Round up the ℓ dimension to the nearest integer.

***2: For the external dimensions diagram of accessories, please refer to P. 342.**

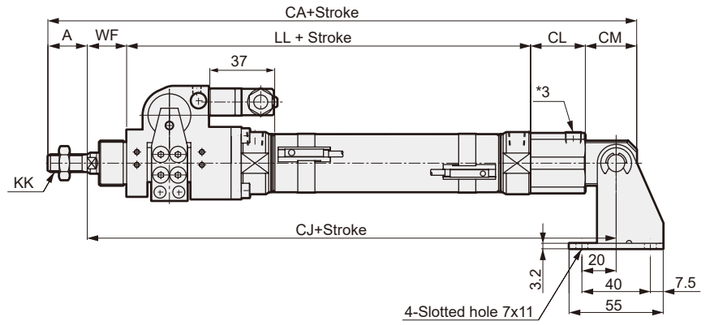
***3: For dimensions with each switch, refer to P. 360.**

Dimensional Drawings

● Single Clevis Type (CA)



● Eye bracket (CA) with bracket (option)



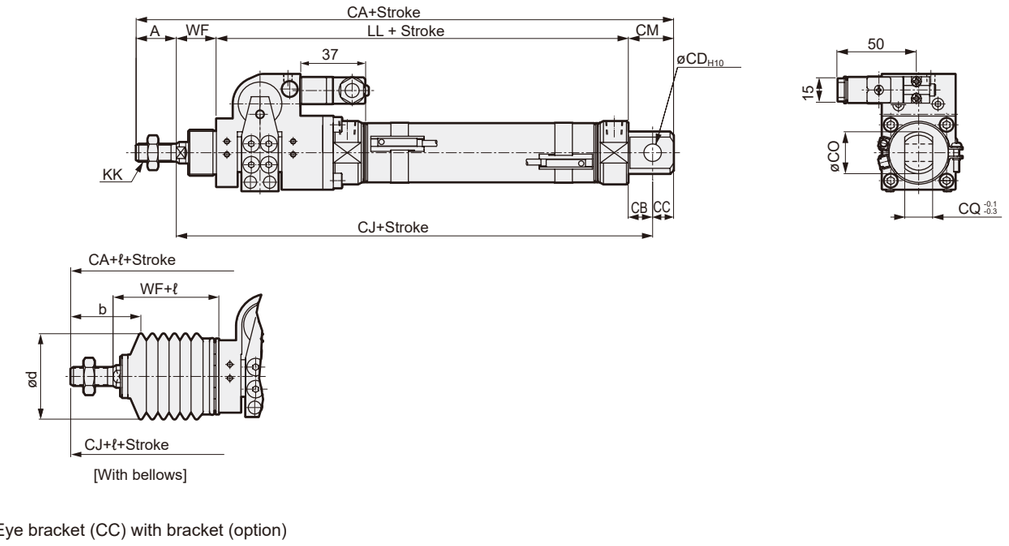
Code	Single Clevis Type (CA) Mounting Dimensions															
Bore Size (mm)	A	CH	KK	LL	WF	CA	CB	CC	CD	CJ	CL	CM	CO	CQ	CR	CS
ø20	20	26	M8x1.0	124	24	223	14	10	10	193	31	24	22	8	48	68
ø25	23	35	M10x1.25	135	23	244	18	12	12	209	32	30	26	10	50	70
ø32	23	35	M10x1.25	136	23	244	18	12	12	209	32	30	26	10	50	70
ø40	25	35	M12x1.5	147	23	257	18	12	12	220	32	30	26	10	50	70

Code	With Bellows		
Bore Size (mm)	b	d	ℓ
ø20	30	30	(Stroke / 3)+6
ø25	32	46	(Stroke / 3.25)+7
ø32	32	46	(Stroke / 3.25)+7
ø40	34	46	(Stroke / 3.25)+7

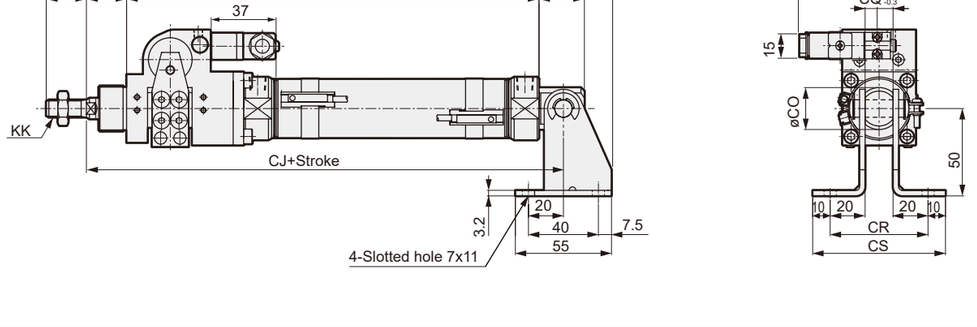
*1: This is not a piping port.
*2: Round up the ℓ dimension to the nearest integer.
***3: For the external dimensions diagram of accessories, please refer to P. 342.**
***4: For dimensions with each switch, refer to P. 360.**

Dimensional Drawings

● Single Clevis Integrated Type (CC)



● Eye bracket (CC) with bracket (option)



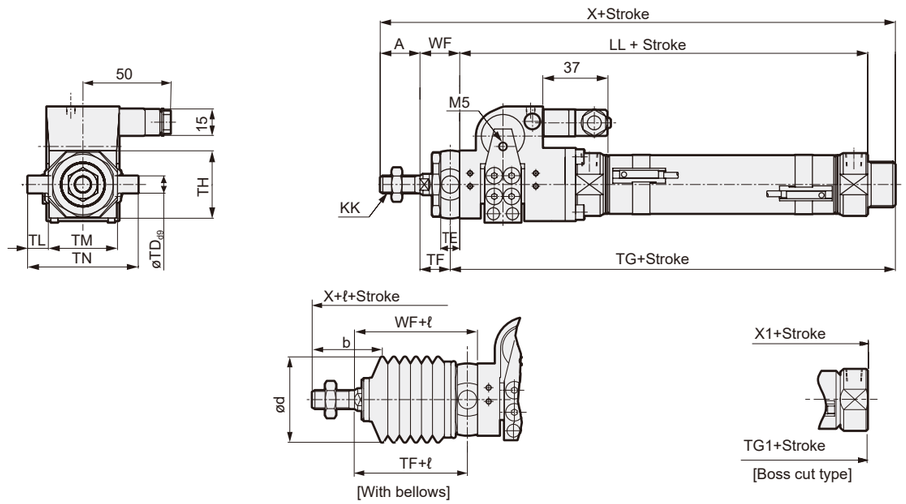
Code	Single Clevis Integrated Type (CC) Mounting Dimensions														
Bore Size (mm)	A	KK	LL	WF	CA	CB	CC	CD	CJ	CK	CM	CO	CQ	CR	CS
ø20	20	M8x1.0	124	24	189	12	9	8	160	207.5	21	22	16	56	76
ø25	23	M10x1.25	135	23	203	12	9	8	171	221.5	21	24	16	56	76
ø32	23	M10x1.25	136	23	208	14	12	10	173	223.5	26	24	16	56	76
ø40	25	M12x1.5	147	23	225	16	14	12	186	238.5	30	30	20	60	80

Code	With Bellows		
Bore Size (mm)	b	d	ℓ
ø20	30	30	(Stroke / 3)+6
ø25	32	46	(Stroke / 3.25)+7
ø32	32	46	(Stroke / 3.25)+7
ø40	34	46	(Stroke / 3.25)+7

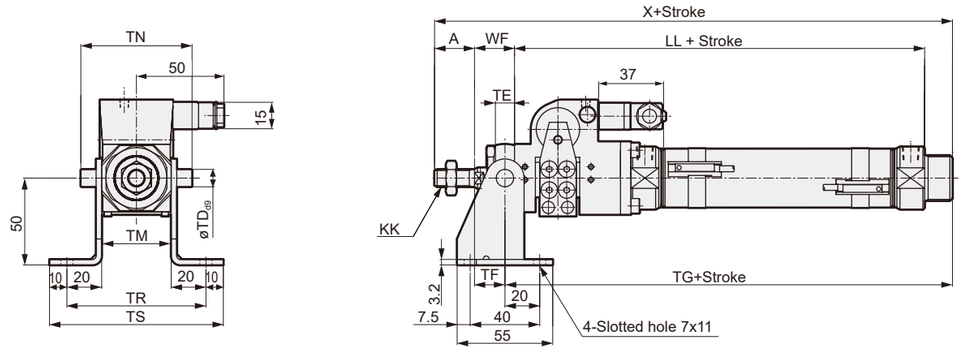
*1: Round up the ℓ dimension to the nearest integer.
***2: For the external dimensions diagram of accessories, please refer to P. 342.**
***3: For dimensions with each switch, refer to P. 360.**

Dimensional Drawings

● Rod side trunnion type (TA)



● Rod side trunnion (TA) with bracket (option)



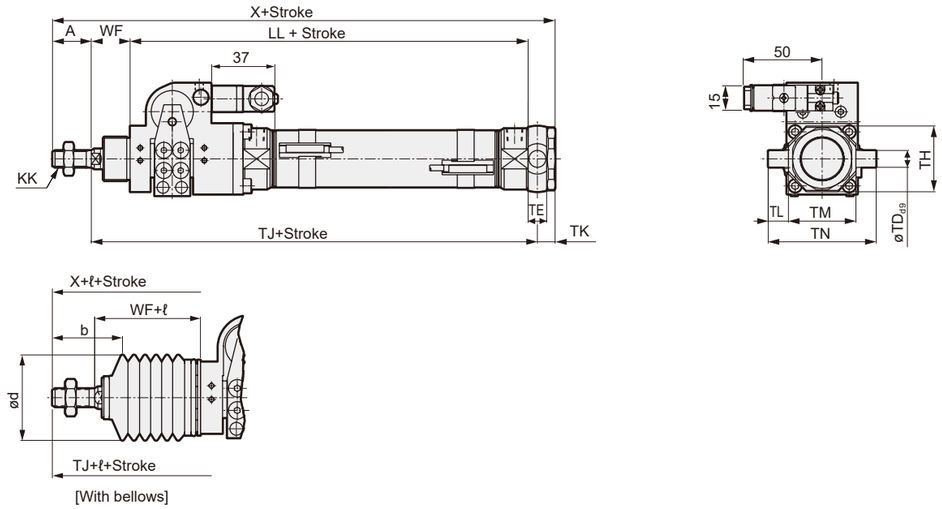
Code	Rod Type Trunnion Type (TA) Mounting Dimensions														
Bore Size (mm)	A	KK	LL	WF	X	TD	TE	TF	TG	TH	TL	TM	TN	TR	TS
ø20	20	M8x1.0	124	24	182	8	9	19.5	142.5	29.5	8	30	46	70	90
ø25	23	M10x1.25	136	23	198	10	11	17.5	157.5	39	12	40	64	80	100
ø32	23	M10x1.25	136	23	198	10	11	17.5	157.5	39	12	40	64	80	100
ø40	25	M12x1.5	147	23	211	10	11	17.5	168.5	44	9.5	53	72	93	113

Code	With Bellows			Boss Cut Type	
Bore Size (mm)	b	d	ℓ	X1	TG1
ø20	30	30	(Stroke / 3)+6	168	128.5
ø25	32	46	(Stroke / 3.25)+7	182	141.5
ø32	32	46	(Stroke / 3.25)+7	182	141.5
ø40	34	46	(Stroke / 3.25)+7	195	152.5

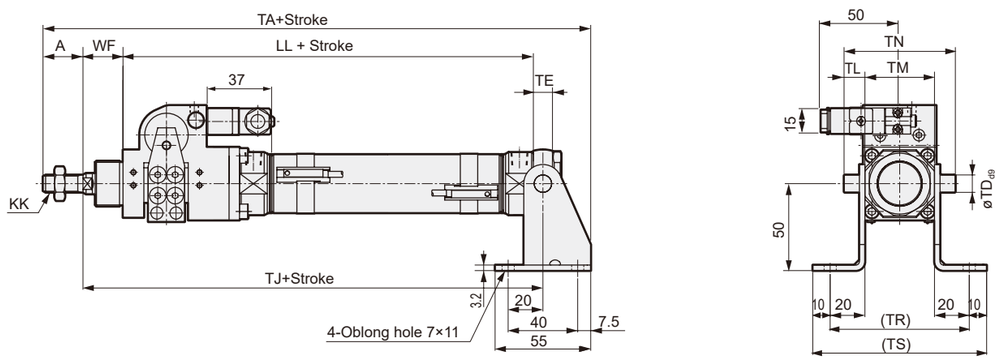
*1: Round up the ℓ dimension to the nearest integer.
*2: When brake unit cover "U" is included, bracket equipped type cannot be selected.
***3: For the external dimensions diagram of accessories, please refer to P. 342.**
***4: For dimensions with each switch, refer to P. 360.**

Dimensional Drawings

● Head Side Trunnion Type (TB)



● Head side trunnion (TB) with bracket (option)



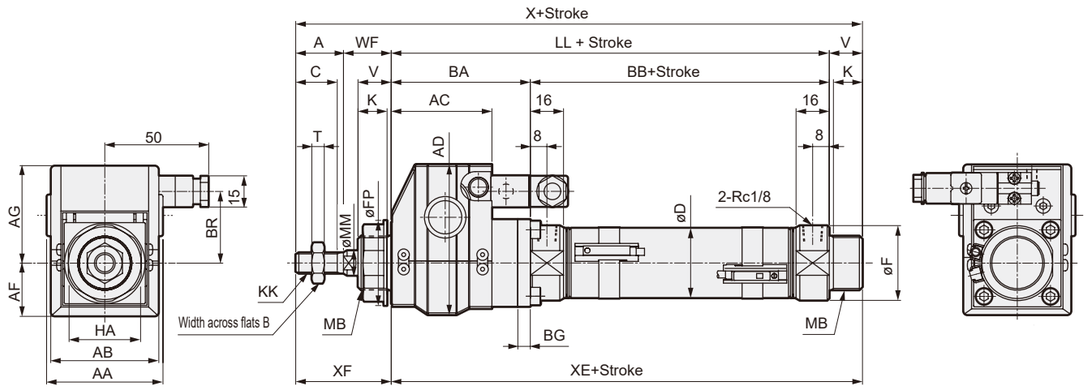
Code	Head Side Trunnion Type (TB) Mounting Dimensions														
Bore Size (mm)	A	KK	LL	WF	X	TA	TD	TE	TH	TJ	TK	TL	TM	TN	TR	TS
ø20	20	M8x1.0	124	24	182	200	8	9	29.5	152.5	9.5	8	30	46	70	90
ø25	23	M10x1.25	136	23	198	215	10	11	39	164.5	10.5	12	40	64	80	100
ø32	23	M10x1.25	136	23	198	215	10	11	39	164.5	10.5	12	40	64	80	100
ø40	25	M12x1.5	147	23	211	228	10	11	44	175.5	10.5	9.5	53	72	93	113

Code	With Bellows		
Bore Size (mm)	b	d	ℓ
ø20	30	30	(Stroke / 3)+6
ø25	32	46	(Stroke / 3.25)+7
ø32	32	46	(Stroke / 3.25)+7
ø40	34	46	(Stroke / 3.25)+7

*1: Round up the ℓ dimension to the nearest integer.
***2: For the external dimensions diagram of accessories, please refer to P. 342.**
***3: For dimensions with each switch, refer to P. 360.**

Dimensional Drawings with Option

● Brake section with cover/basic (JSK2-V-00)



Code	Basic Type (00) Basic Dimensions																		
Bore Size (mm)	A	AA	AB	AC	AD	AF	AG	B	BA	BB	BG	BR	C	D	F	FP	HA	K	KK
ø20	20	51	47	39	58.5	19.5	39	13	58	66	5	29	18	21.4	28	29	26	12	M8x1.0
ø25	23	56	52	48.5	72.5	25	47.5	17	67	69	6	34.5	20	26.4	32	41	35	14	M10×1.25
ø32	23	56	52	48.5	72.5	25	47.5	17	67	69	6	34.5	20	33.6	36	41	35	14	M10x1.25
ø40	25	69	65	56	85.75	28.75	57	19	74	73	8	39.5	22	41.6	45	41	35	14	M12x1.5

Code									
Bore Size (mm)	LL	MB	MM	T	V	WF	X	XE	XF
ø20	124	M18x1.5	10	5	14	24	182	138	44
ø25	136	M26x1.5	12	6	16	23	198	152	46
ø32	136	M26x1.5	12	6	16	23	198	152	46
ø40	147	M26x1.5	14	7	16	23	211	163	48

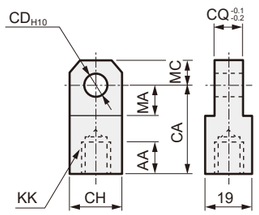
MEMO

With Brake / With Lock
ULK□
JSK2/ JSM2
JSG
JSC3, JSC4
USSD
UFCD
USC
Cylinder Switch
Ending

JSK2 / JSM2 Common Accessories Outline Dimension Drawing

● Single Knuckle (I)

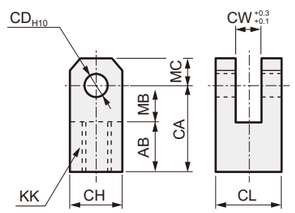
Material: Steel, Zinc Chromate



Model Number	Applicable Bore Size (mm)	AA	CA	CD	CH	CQ	KK	MA	MC	Weight (g)
M1-I-20	20	14	30	10	19	8	M8×1.0	13	10	60
M1-I-30	25, 30, 32	14	36	12	25	10	M10×1.25	16	12	106
M1-I-40	40	14	36	12	25	10	M12×1.5	16	12	100

●Double Knuckle (Y)

Material: Steel, Zinc Chromate

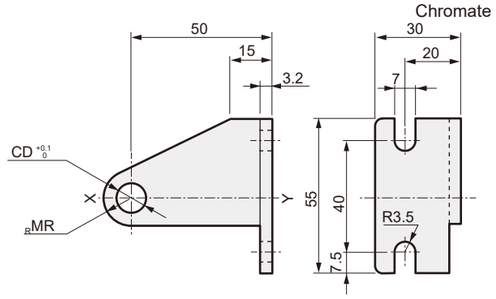


Model Number	Applicable Bore Size (mm)	AB	CA	CD	CH	CL	CW	KK	MB	MC	Weight (g)
M1-Y-20	20	17	30	10	19	19	8	M8×1.0	13	10	99
M1-Y-30	25, 30, 32	20	36	12	25	25	10	M10×1.25	16	12	197
M1-Y-40	40	20	36	12	25	25	10	M12×1.5	16	12	193

Note: Pin, washer, and cotter pin are attached.

●Double Bracket (B2)

Material: Steel, Zinc Chromate

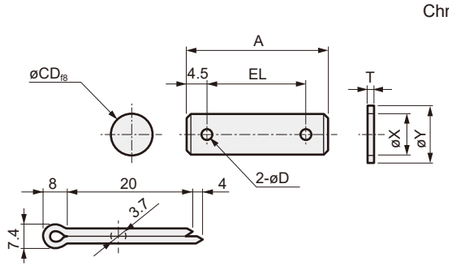


Model Number	Applicable Model	Applicable Bore Size (mm)	CD	MR	Weight (g)
M1-B2-20-CC	JSK2-CC	20/25	8	8	145
M1-B2-30-CC		32	10	11	163
M1-B2-40-CC		40	12	11	170
M1-B2-20-CA	JSK2-CA JSM2-CA	20	10	11	158
M1-B2-30-CA		25/32/40	12	11	162
M1-B2-20-TA	JSK2-TA/TB JSM2-TA/TB	20	8	8	132
M1-B2-30-TA		25, 32, 40	10	11	142

*1: A pair is symmetrical to the XY line.
*2: The above model number includes the Retaining Ring and pin. 2 pcs./ set. (However, not attached for trunnion type)
*3: Not included to mounting type TA with brake unit cover (U).

●Pin for Double Knuckle (P)

Material: Steel, Zinc Chromate

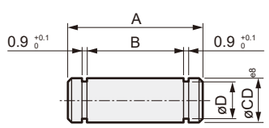


Model Number	Applicable Bore Size (mm)	A	D	CD	EL	T	X	Y	Weight (g)
M1-P-20	20	37	4	10	28	1.6	10.5	18	29
M1-P-30	25, 30, 32, 40	46	4	12	37	2.3	12.5	22	50

Note: Pin, washer, and cotter pin for double knuckle use are attached to the product.

●Pin for Double Bracket (P1) (P2)

Material: Steel Zinc Chromate

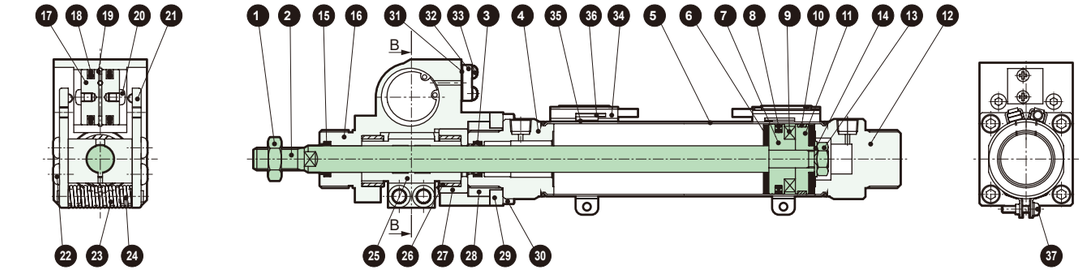


Model Number	Applicable Model and Applicable Bore Size (mm)	A	B	CD	D	Retaining Ring Used	Weight (g)
M1-P1-20	JSK2-CC-20/25	33	28	8	7	E-type 7	13
M1-P1-30	JSK2-CC-32	33	28	10	9	E-type 9	21
M1-P1-40	JSK2-CC-40	37	32	12	9	E-type 9	32
M1-P2-20	JSK2-CA-20 JSM2-CA-20	25	20	10	9	E-type 9	16
M1-P2-30	JSK2-CA-25/32/40 JSM2-CA-30/40	27	22	12	9	E-type 9	24

Note: Pin and Retaining Ring for bracket use are attached to the product. (However, not attached for trunnion type)

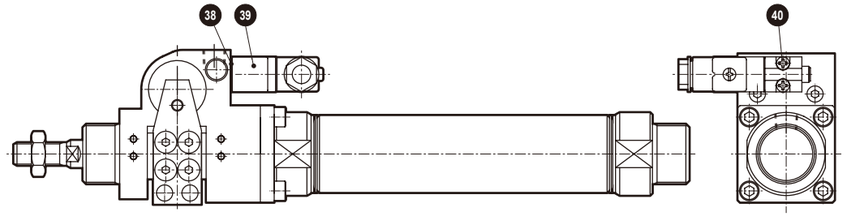
Internal Structure and Materials

● JSK2



B-B, Cross-sectional drawing

● JSK2-V (with valve)



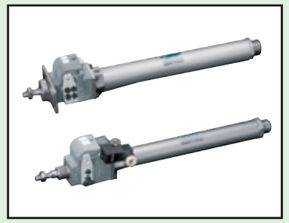
Do not disassemble

No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Rod Nut	Steel	Zinc Chromate	22	Hexagon Socket Button Head Screw	Steel	Black Oxide
2	Piston Rod	ø20, ø25: Stainless Steel ø32, ø40: Carbon Steel	Industrial Chrome Plating	23	Brake Spring	Steel	
				24	Hexagon Socket Head Cap Screw (ø20)	Steel	Black Oxide
					Guide pin (ø25 to ø40)	Steel	Zinc Chromate
3	Rod Packing	Nitrile Rubber		25	Brake Metal	Cast Iron	Nickel Plating
4	Rod Cover	Aluminum Alloy		26	Bushing	Bearing Alloy	
5	Cylinder Tube	Stainless Steel		27	Ring	Steel	Black Oxide
6	Cushion Rubber	Urethane Rubber		28	Fixed Ring	Steel	Zinc Chromate
7	Piston A	Aluminum Alloy		29	Square Flange	Steel	Zinc Chromate
8	Piston Packing	Nitrile Rubber		30	Hexagon Socket Head Cap Screw	Steel	Black Oxide
9	Magnet	Plastic		31	Body Gasket	Cork	
10	Wear Ring	Polyacetal		32	Masking Plate	Copper Alloy	
11	Piston B	Aluminum Alloy		33	Pan Head Screw	Steel	Zinc Chromate
12	Head Cover	Aluminum Alloy		With Switch			
13	Hexagon Nut	Steel	Zinc Chromate				
14	Spacer	Steel	Zinc Chromate (ø20 to ø32 only)	34	Switch		
15	Scraper	Nitrile Rubber		35	Band	Stainless Steel	
16	Brake Body	Cast Iron	Nickel Plating	36	Switch Rail	Stainless Steel	
17	Brake Piston	Copper Alloy		37	Pan Head Screw	Stainless Steel	
18	Piston Packing	Nitrile Rubber		With Valve			
19	C-type Retaining Ring	Stainless Steel		38	Body Gasket	Cork	
20	Pan Head Screw	Steel	Zinc Chromate	39	Brake Release Valve		P5136MO (CKD)
21	Lever	Steel	Zinc Chromate	40	Pan Head Screw	Steel	Zinc Chromate

Mounting Bracket Material

Mounting Type	Material	Remarks
Foot (LB)	Steel	Zinc Chromate
Flange (FA)	Steel	Zinc Chromate
Trunnion (TA / TB)	Steel	Zinc Chromate
Clevis (CA)	Steel	Zinc Chromate

Note: Mounting brackets are included with the product upon shipment. However, if bellows are included and mounting brackets are LB, FA, or TA, they will be shipped assembled.



Brake Cylinder Small Bore / Serviceable Type Double Acting Type / Double Acting with Brake Valve

JSM2, JSM2-V Series

●Bore Size: ø20, ø30, ø40

Circuit Diagram Code ● Double Acting type

RoHS

Model No. Notation ●Without valve

Without Switch (Built-in magnet for switch)

JSM2 - LB - 20 - 50 ——— P I
1 2 3 4 8 9

With Switch (Built-in magnet for switch)

JSM2 - LB - 20 - 50 — T0H - R - P I
1 2 3 4 6 7 8 9

●With Valve for Brake

Without Switch (Built-in magnet for switch)

JSM2-V - LB - 20 - 50 - 1 ——— P I
1 2 3 4 5 8 9

With Switch (Built-in magnet for switch)

JSM2-V - LB - 20 - 50 - 1 - T0H - R - P I

1 Model No. 2 Mounting Type 3 Bore Size 4 Stroke 5 Valve voltage 6 Switch Model 7 Number of Switches 8 Option 9 Accessories

1 Model Number

Code	Description
JSM2	Double Acting Type
JSM2-V	Double Acting with Valve

Note: Low hydraulic pressure type also manufactured as a custom item. Model numbers will be JSM2-H, JSM2-VH.

2 Mounting Type

Mounting brackets are included with the product for shipment.

Code	Content		Code	Content	
00	Basic type		TA	Rod Side Trunnion Type	
LB	Axial Foot Type		TB	Head Side Trunnion Type	
FA	Rod Side Flange Type				
CA	Single clevis type				

3 Bore Size (mm)

Code	Content
20	ø20
30	ø30
40	ø40

4 Stroke (mm)

Bore Size	Stroke	Intermediate Stroke
ø20	1 to 700	Every 1 mm
ø30	1 to 700	
ø40	1 to 700	

Note: For minimum stroke with switch, refer to P. 346.

5 Valve voltage

Code	Content
1	100 VAC (50/60 Hz)
2	200 VAC (50/60 Hz)
3	24 VDC

Note: Valve voltage can be selected only for JSM2-V (with brake valve).

6 Switch Model

For switch details, refer to P. 1457. Switches are shipped with the product.

Contact	Indicator LED Special Function	Wiring (Output)	Load Voltage (V) AC	Load Voltage (V) DC	Load Current (mA) AC	Load Current (mA) DC	Lead wire *1 Straight	Lead wire *1 L-shape	
Solid State	1-Color	2-wire	85 to 265	-	5 to 100	-	T1H□	T1V□	
			—	10 to 30	-	5 to 20 *2	T2H□	T2V□	
		3-wire (NPN)	-	30 or less	-	100 or less	T3H□	T3V□	
		3-wire (PNP)	-		-		T3PH□	T3PV□	
	2-color	2-wire	-	24 ± 10%	-	5 to 20	T2WH□	T2WV□	
		3-wire (NPN)	-	30 or less	-	50 or less	T3WH□	T3WV□	
	1-Color Off-Delay Type	2-wire	-	10 to 30	-	5 to 20 *2	T2JH□	T2JV□	
	1-Color Flexible Lead Wire Type		-	10 to 30	—		T2HR3	T2VR3	
Reed	1-Color	2-wire	110	12/24	7 to 20	5 to 50	T0H□	T0V□	
	No Indicator LED		110	5/12/24	20 or less	50 or less	T5H□	T5V□	
	1-Color		110/220	12/24	7 to 20 / 7 to 10	5 to 50	T8H□	T8V□	

*1: Enter the code selected in the "Lead wire length" table into "□" of the Switch Model.
*2: The maximum load current of 20 mA mentioned above is at 25°C. If the switch operating Ambient Temperature is higher than 25°C, it will be lower than 20 mA. (At 60°C, it will be 5 to 10 mA.)
*3: Switches other than the above models are also available. (Custom Product) For details, refer to P. 1457.

***Lead wire length**

Code	Content
Blank	1 m (Standard)
3	3 m (Option)
5	5m (Option)

Example) Lead wire length
1 m T0H
3 m T0H3
5 m T0H5

7 Number of Switches

Code	Content
R	With 1 pc on rod side
H	With 1 pc on head side
D	With 2 pcs
T	With 3 pcs

8 Option

Code	Content	Max Ambient Temperature	Instantaneous Max Temperature	
J	Bellows	100°C	200°C	
L	Bellows	250°C	400°C	
M	Piston Rod material (Stainless Steel)			-
P	Same Port Position			
U	With brake unit cover			

Note: If ❷ mounting type is TA, brake unit cover (U) cannot be selected.

9 Accessories

Code	Content	
I	Single knuckle	
Y	Double knuckle (Pin, washer, cotter pin attached)	
B2	Double bracket (Pin, Retaining Ring attached)	

About specifications of custom products

For details, please refer to P. 364.

Code	Content
-XJ9	Without Bellows
-A2	With 2 Rod Nuts

Model No. Ex.) JSM2 - ..... - XJ9

For combinations of variations and options, please refer to P. 322.

Switch Single Unit Model No. Display Method [T-type Switch]

●Switch body+Mounting bracket set
JSM2 - T0H - 20
6 Switch Model
3 Bore Size

● Switch Body Only
SW - T0H
6 Switch Model

●Mounting bracket set
JSM2 - T - 20
Mounting Bracket
3 Bore Size

Brake Valve Model No. Notation

JSM2-V - VALVE-KIT - 1
5 Valve voltage

Specifications

Item		JSM2			JSM2-V		
Bore Size mm		ø20	ø30	ø40	ø20	ø30	ø40
Actuation method		Double Acting Type			Double Acting Type with Valve		
Operating Fluid		Compressed Air					
Max Operating Pressure MPa		0.7			0.6		
Min Operating Pressure MPa	Brake Part	0.35					
	Cylinder Part	0.10					
Proof Pressure MPa		1.05					
Ambient Temperature °C		-10 to 60 (No freezing)			-10 to 50 (No freezing)		
Port Size	Brake Part	M5	Rc1/8		M5	Rc1/8	
	Cylinder Part	Rc1/8					
Stroke Tolerance mm		$^{+1.0}_{0}$ (up to 200)			$^{+1.2}_{0}$ (up to 1000)		
Operating Piston Speed mm/s		50 to 500					
Cushion		None					
Lubrication		Not required (Use Turbine Oil Class 1 ISO VG32 if lubricated)					
Holding Force N		186	431	765	186	431	765
Allowable Absorbed Energy J		0.024	0.05	0.093	0.024	0.05	0.093

Note: This product cannot absorb large energy generated by external loads. It is recommended to use an external shock absorbing device in conjunction.

Brake Valve Electrical Specifications

Item	JSM2-V-VALVE-KIT-Voltage		
Rated voltage (V)	100 AC (50/60 Hz)	200 AC (50/60 Hz)	24 DC
Starting current (A)	0.056/0.044	0.034/0.026	0.075
Holding current (A)	0.028/0.022	0.017/0.013	
Power consumption (W)	1.8/1.4	2.1/1.6	1.8
Voltage fluctuation range	±10%		
Heat Resistance Class	Class B molded coil		

*1: 100/200 VAC coils can be used at 110/220 VAC (60 Hz).
***2: For main specifications of valves (P5136 series), please refer to "Directional Control Valve ② No. RJ-012AA".**

Stroke

Bore Size (mm)	Standard Stroke (mm)	Max Stroke (mm)	Min Stroke (mm)
ø20	25, 50, 75, 100, 125, 150 175, 200, 250, 300	700	1
ø30			
ø40			

Note: For models with switches, the minimum stroke varies depending on the mounting method. Refer to the table below. Intermediate strokes can be manufactured in 1 mm increments.

Min Stroke with Switch (T-type Switch)

Switch Model	With 1 pc	With 2 pcs
T0, T5, T2, T3	10	27
T2W, T3W	10	31
T1	10	25
T8	10	23

Cylinder Weight

(Unit: kg)

Item / Mounting Style / Bore Size (mm)	Product Weight when stroke (S) = 0 mm: Basic Type (00)	Axial Foot Type (LB)	Flange Type (FA)	Clevis Type (CA)	Trunnion Type (TA/TB)	Switch Weight	Switch rail + band Weight	Valve Weight	Added Weight per S = 10 mm
ø20	0.48	0.63	0.54	0.61	0.53	Refer to the weight described in the switch specifications on P. 1457.	0.005	0.07	0.01
ø30	0.94	1.20	1.09	1.15	1.04		0.005		0.014
ø40	1.57	1.83	1.72	1.79	0.73		0.009		0.02

(Example) JSM2-V-LB-20-100-2-TOH-D

Product Weight when S = 0 mm 0.73 kg
Added weight when S = 100 mm $0.01\times\frac{100}{10}$ = 0.1 kg
Weight of 2 switches ..... (0.018 + 0.005) ×2 = 0.046 kg
Product weight ..... 0.73 kg + 0.1 kg + 0.046 kg = 0.88 kg

Theoretical Thrust Table

(Unit: N)

Bore Size (mm)	Operating Direction	Operating Pressure MPa: 0.1	0.15	0.2	0.3	0.4	0.5	0.6	0.7
ø20	Push	31.4	47.1	62.8	94.2	1.26×10^2	1.57×10^2	1.88×10^2	2.20×10^2
	Pull	23.6	35.3	47.1	70.7	94.2	1.18×10^2	1.41×10^2	1.65×10^2
ø30	Push	70.7	1.06×10^2	1.41×10^2	2.12×10^2	2.83×10^2	3.53×10^2	4.24×10^2	4.95×10^2
	Pull	59.4	89.1	1.19×10^2	1.78×10^2	2.38×10^2	2.97×10^2	3.56×10^2	4.16×10^2
ø40	Push	1.26×10^2	1.88×10^2	2.51×10^2	3.77×10^2	5.03×10^2	6.28×10^2	7.54×10^2	8.80×10^2
	Pull	1.10×10^2	1.65×10^2	2.21×10^2	3.31×10^2	4.41×10^2	5.51×10^2	6.62×10^2	7.72×10^2

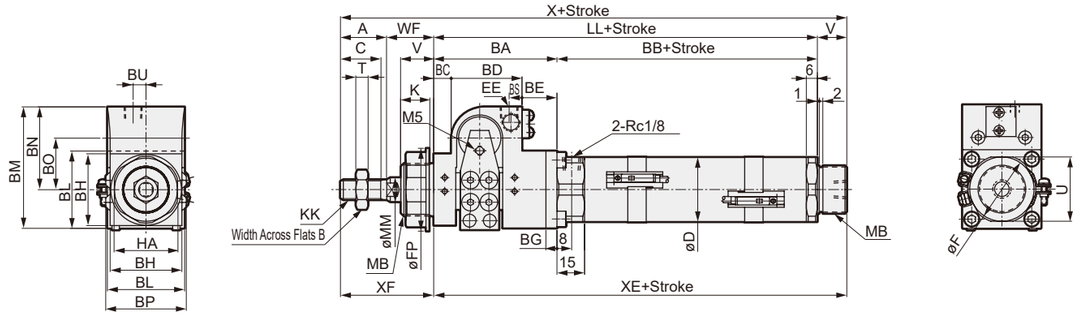
Mounting Bracket Model No. Notation

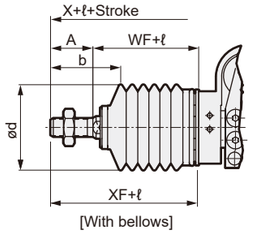
Bore Size (mm) / Mounting Bracket	ø20	ø30	ø40
Basic Type (00) *3	M1-0020	M1-00-30	M1-00-30
Axial Foot Type (LB)	M1-LB-20	M1-LB-30	M1-LB-30
Flange type (FA)	M1-FA-20	M1-FA-30	M1-FA-30
Single Clevis Type (CA)	M1-CA-20	M1-CA-30	M1-CA-30
Trunnion Type (TA/TB)	M1-TA-20	M1-TA-30	M1-TA-40

*1: Regarding mounting brackets, mounting nuts and toothed washers are included to axial foot types and flange types, and mounting nuts are included to trunnion types.
2: For axial foot type, 2 sets of "M1-LB-" in the above table are required.
*3: Only mounting nut and toothed washer. One set is included with the basic type (00) of the product, but please use it when additional sets are needed, etc.

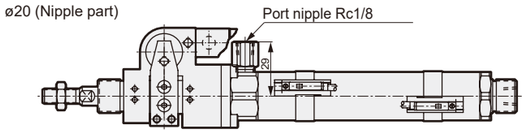
Dimensional Drawings

● Basic type (00)





[With bellows]



Note: JSM2 Bore Size ø20 has a port nipple attached as shown above. (Rod side only) The shape excluding the port nipple is the same as ø30 and ø40.

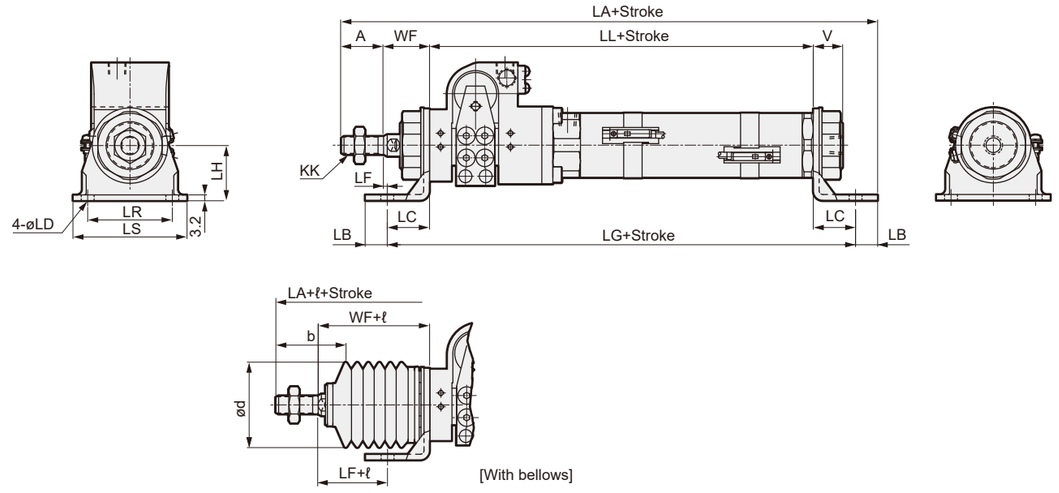
Code	Basic Type (00) Basic Dimensions																			
Bore Size (mm)	A	B	BA	BB	BC	BD	BE	BG	BH	BL	BM	BN	BO	BP	BS	BU	C	D	EE	F	FP
ø20	20	13	58	66	9	30	19	5	29	34	55	38	19	38	4	3.8	18	25	M5	28	29
ø30	23	17	67	72	9.5	38.5	19	6	39	42	66	45	22	43.8	7	7	20	35	Rc1/8	37	41
ø40	25	19	74	74	8	48	18	8	50	50	80.5	55	25	52	7	7	22	45	Rc1/8	48	41

Code														With Bellows		
Bore Size (mm)	HA	K	KK	LL	MB	MM	T	U	V	WF	X	XE	XF	b	d	ℓ
ø20	26	12	M8x1.0	124	M18x1.5	10	5	26	14	24	182	138	44	32	30	(Stroke/3)+6
ø30	35	14	M10x1.25	139	M26x1.5	12	6	35	16	23	201	155	46	38	46	(Stroke/3.25)+7
ø40	35	14	M12x1.5	148	M26x1.5	14	7	46	16	23	212	164	48	40	46	(Stroke/3.25)+7

*1: Round up the ℓ dimension to the nearest whole number.
***2: For the external dimensions diagram of accessories, please refer to P. 342.**
***3: For dimensions with each switch, refer to P. 360.**

Dimensional Drawings

●Axial Foot Type (LB)

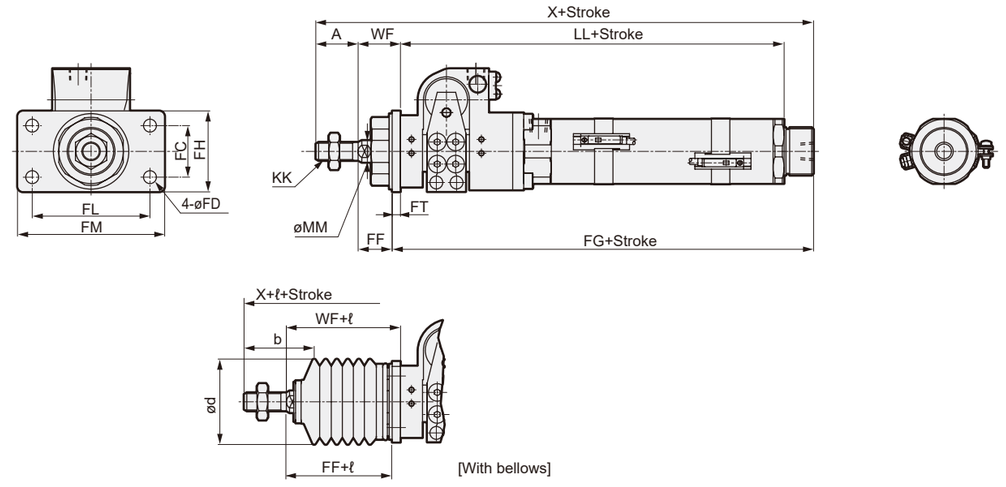


[With bellows]

Code	Axial Foot Type (LB) Mounting Dimensions													With Bellows		
Bore Size (mm)	A	KK	LL	WF	LA	LB	LC	LD	LF	LG	LH	LR	LS	b	d	ℓ
ø20	20	M8x1.0	124	24	196	10	18	6	6	160	25	30	44	32	30	(Stroke/3)+6
ø30	23	M10x1.25	139	23	220	12	23	7	0	185	30	46	62	38	46	(Stroke/3.25)+7
ø40	25	M12x1.5	148	23	231	12	23	7	0	194	30	46	62	40	46	(Stroke/3.25)+7

*1: Round up the ℓ dimension to the nearest whole number.
***2: For outline dimension drawings of accessories, please refer to P. 342.**
***3: For dimensions with each switch, refer to P. 360.**

● Rod Side Flange Type (FA)



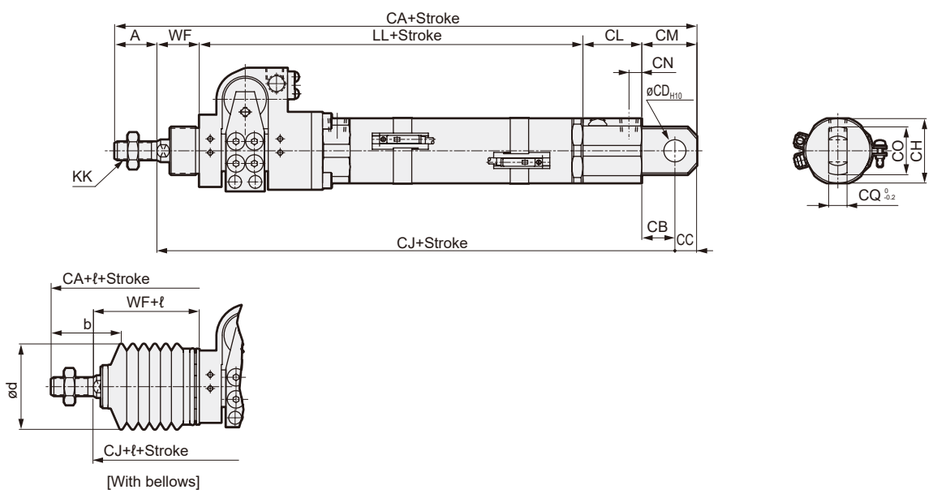
[With bellows]

Code	Rod Side Flange Type (FA) Mounting Dimensions													With Bellows		
Bore Size (mm)	A	KK	LL	WF	X	FC	FD	FF	FG	FH	FL	FM	FT	b	d	ℓ
ø20	20	M8x1.0	124	24	182	20	6	20.8	141.2	34	40	54	3.2	32	30	(Stroke/3)+6
ø30	23	M10x1.25	139	23	201	28	7	18.5	159.5	44	64	80	4.5	38	46	(Stroke/3.25)+7
ø40	25	M12x1.5	148	23	212	28	7	18.5	168.5	44	64	80	4.5	40	46	(Stroke/3.25)+7

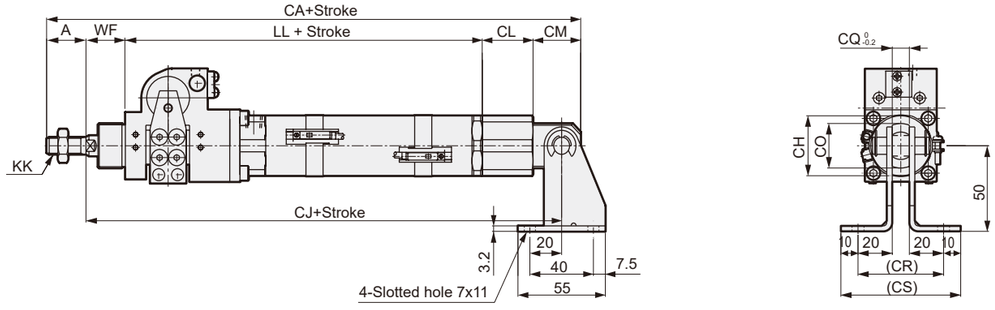
*1: Round up the ℓ dimension to the nearest whole number.
***2: For outline dimension drawings of accessories, please refer to P. 342.**
***3: For dimensions with each switch, refer to P. 360.**

Dimensional Drawings

● Single Clevis Type (CA)



● Eye bracket (CA) with bracket (option)



Code	Single Clevis Type (CA) Mounting Dimensions																	With Bellows		
Bore Size (mm)	A	KK	LL	WF	CA	CB	CC	CD	CH	CJ	CL	CM	CN	CO	CQ	CR	CS	b	d	ℓ
ø20	20	M8x1.0	124	24	223	14	10	10	26	193	31	24	8	22	8	48	68	32	30	(Stroke/3)+6
ø30	23	M10x1.25	139	23	247	18	12	12	35	212	32	30	7	26	10	50	70	38	46	(Stroke/3.25)+7
ø40	25	M12x1.5	148	23	258	18	12	12	35	221	32	30	7	26	10	50	70	40	46	(Stroke/3.25)+7

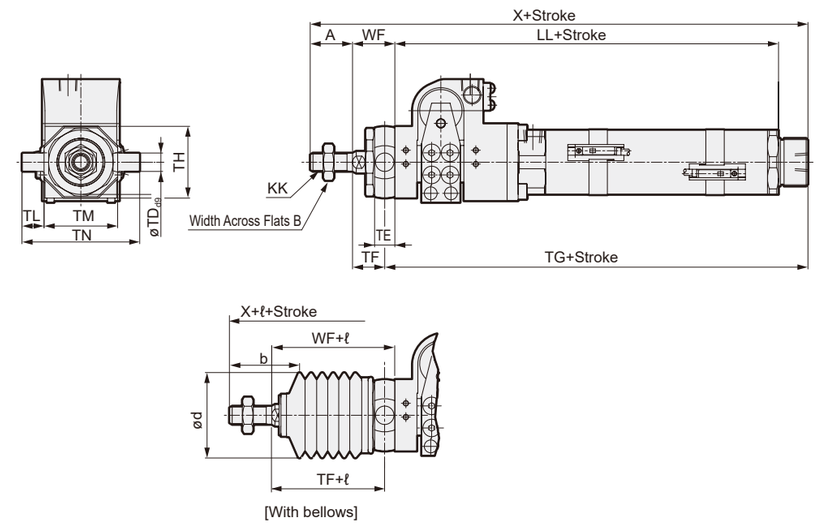
*1: Round up the ℓ dimension to the nearest whole number.

***2: For the external dimensions diagram of accessories, please refer to P. 342.**

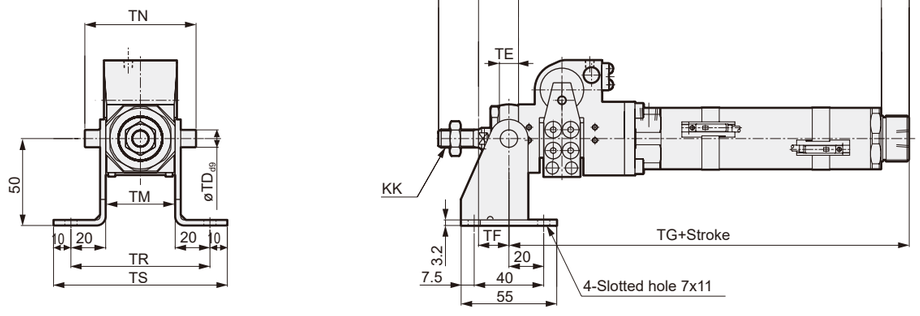
***3: For dimensions with each switch, refer to P. 360.**

Dimensional Drawings

● Rod side trunnion type (TA)



● Rod side trunnion (TA) with bracket (option)



Code	Rod Side Trunnion Type (TA) Mounting Dimensions														With Bellows		
Bore Size (mm)	A	KK	LL	WF	X	TD	TE	TF	TG	TH	TL	TM	TN	TR	TS	b	d	ℓ
ø20	20	M8x1.0	124	24	182	8	9	19.5	142.5	29.5	8	30	46	70	90	32	30	(Stroke/3)+6
ø30	23	M10x1.25	139	23	201	10	11	17.5	160.5	39	12	40	64	80	100	38	46	(Stroke/3.25)+7
ø40	25	M12x1.5	148	23	212	10	11	17.5	169.5	44	9.5	53	72	93	113	40	46	(Stroke/3.25)+7

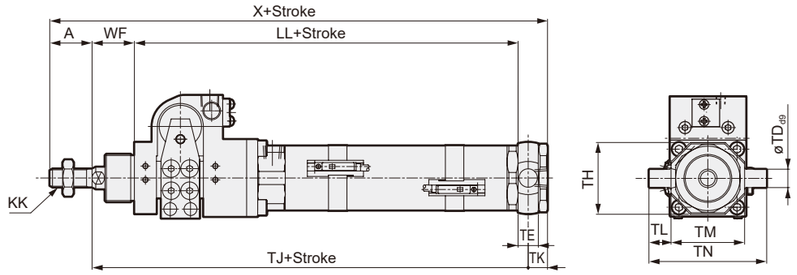
*1: Round up the ℓ dimension to the nearest whole number.

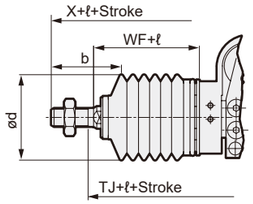
***2: For outline dimension drawings of accessories, please refer to P. 342.**

***3: For dimensions with each switch, refer to P. 360.**

Dimensional Drawings

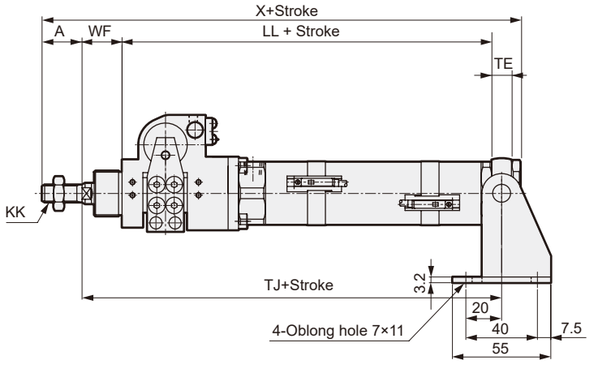
●Head Side Trunnion Type (TB)

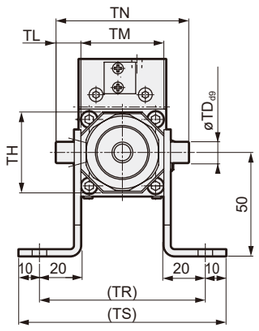




[With bellows]

● Head side trunnion (TB) with bracket (option)



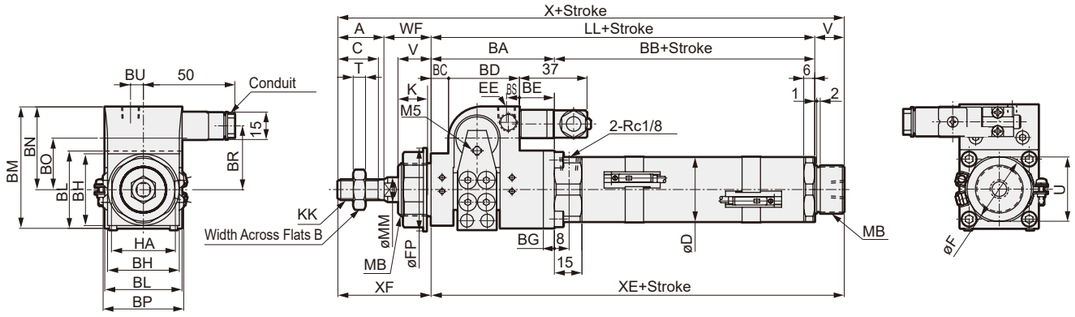


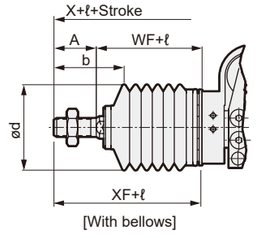
Code	Head Side Trunnion Type (TB) Mounting Dimensions															With Bellows		
Bore Size (mm)	A	KK	LL	WF	X	TD	TE	TH	TJ	TK	TL	TM	TN	TR	TS	b	d	ℓ
ø20	20	M8x1.0	124	24	182	8	9	29.5	152.5	9.5	8	30	46	70	90	32	30	(Stroke/3)+6
ø30	23	M10x1.25	139	23	201	10	11	39	167.5	10.5	12	40	64	80	100	38	46	(Stroke/3.25)+7
ø40	25	M12x1.5	148	23	212	10	11	44	176.5	10.5	9.5	53	72	93	113	40	46	(Stroke/3.25)+7

*1: Round up the ℓ dimension to the nearest whole number.
***2: For outline dimension drawings of accessories, please refer to P. 342.**
***3: For dimensions with each switch, refer to P. 360.**

Dimensional Drawings

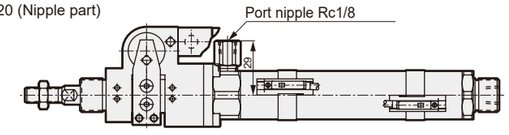
● Basic (JSM2-00)





[With bellows]

ø20 (Nipple part)



Note: JSM2 Bore Size ø20 has a port nipple attached as shown above. (Rod side only) The shape excluding the port nipple is the same as ø30 and ø40.

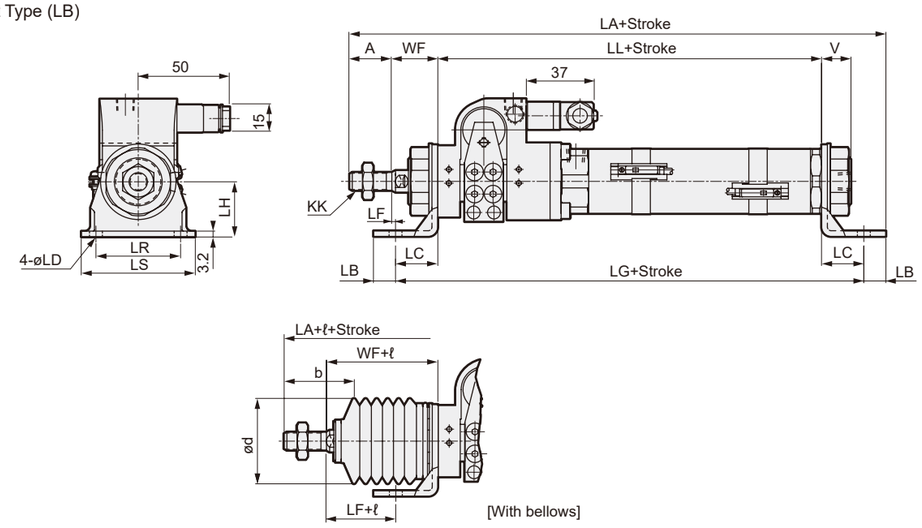
Code	Basic Type (00) Basic Dimensions																					With Bellows		
Bore Size (mm)	A	B	BA	BB	BC	BD	BE	BG	BH	BL	BM	BN	BO	BP	BR	BS	BU	C	D	EE	F	FP	b	d	ℓ
ø20	20	13	58	66	9	30	19	5	29	34	55	38	19	38	29	4	3.8	18	25	M5	28	29			
ø30	23	17	67	72	9.5	38.5	19	6	39	42	66	45	22	43.8	34.5	7	7	20	35	Rc1/8	37	41			
ø40	25	19	74	74	8	48	18	8	50	50	80.5	55	25	52	39.5	7	7	22	45	Rc1/8	48	41			

Code														With Bellows		
Bore Size (mm)	HA	K	KK	LL	MB	MM	T	U	V	WF	X	XE	XF	b	d	ℓ
ø20	26	12	M8x1.0	124	M18x1.5	10	5	26	14	24	182	138	44	32	30	(Stroke/3)+6
ø30	35	14	M10x1.25	139	M26x1.5	12	6	35	16	23	201	155	46	38	46	(Stroke/3.25)+7
ø40	35	14	M12x1.5	148	M26x1.5	14	7	46	16	23	212	164	48	40	46	(Stroke/3.25)+7

*1: Brake unit exhaust port size is the same as EE dimension.
*2: For ø30 and ø40, the conduit of the valve terminal box is on the opposite side of this figure.
***3: For outer dimensions diagram of accessories, refer to P. 342.**
***4: For dimensions with each switch, refer to P. 360.**

Dimensional Drawings

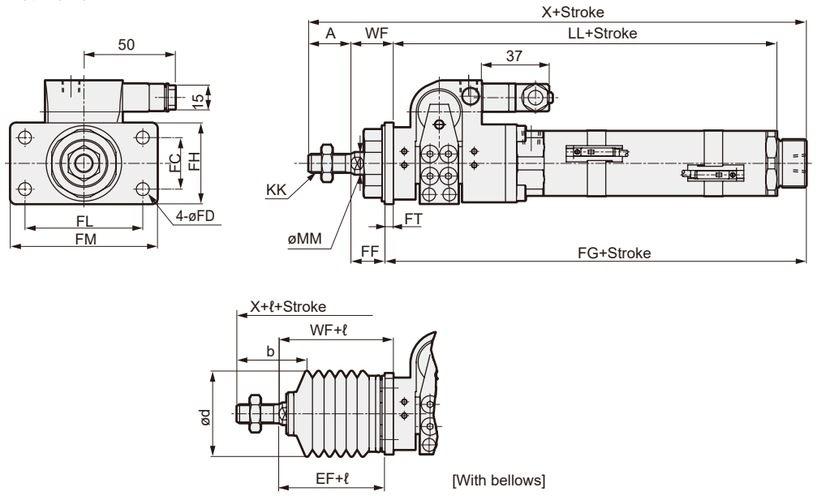
●Axial Foot Type (LB)



Code	Axial Foot Type (LB) Mounting Dimensions													With Bellows		
Bore Size (mm)	A	KK	LL	WF	LA	LB	LC	LD	LF	LG	LH	LR	LS	b	d	ℓ
ø20	20	M8x1.0	124	24	196	10	18	6	6	160	25	30	44	32	30	(Stroke/3)+6
ø30	23	M10x1.25	139	23	220	12	23	7	0	185	30	46	62	38	46	(Stroke/3.25)+7
ø40	25	M12x1.5	148	23	231	12	23	7	0	194	30	46	62	40	46	(Stroke/3.25)+7

*1: Round up the ℓ dimension to the nearest whole number.
***2: For outline dimension drawings of accessories, please refer to P. 342.**
***3: For dimensions with each switch, refer to P. 360.**

● Rod Side Flange Type (FA)

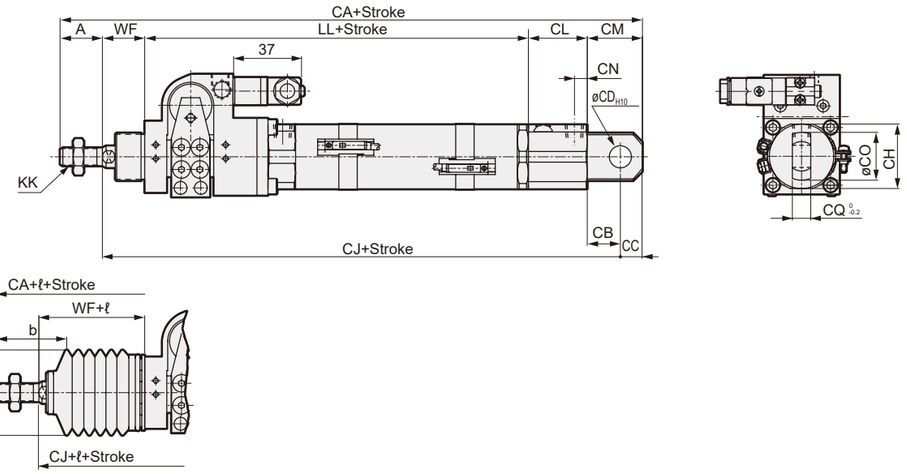


Code	Rod Side Flange Type (FA) Mounting Dimensions													With Bellows		
Bore Size (mm)	A	KK	LL	WF	X	FC	FD	FF	FG	FH	FL	FM	FT	b	d	ℓ
ø20	20	M8x1.0	124	24	182	20	6	20.8	141.2	34	40	54	3.2	32	30	(Stroke/3)+6
ø30	23	M10x1.25	139	23	201	28	7	18.5	159.5	44	64	80	4.5	38	46	(Stroke/3.25)+7
ø40	25	M12x1.5	148	23	212	28	7	18.5	168.5	44	64	80	4.5	40	46	(Stroke/3.25)+7

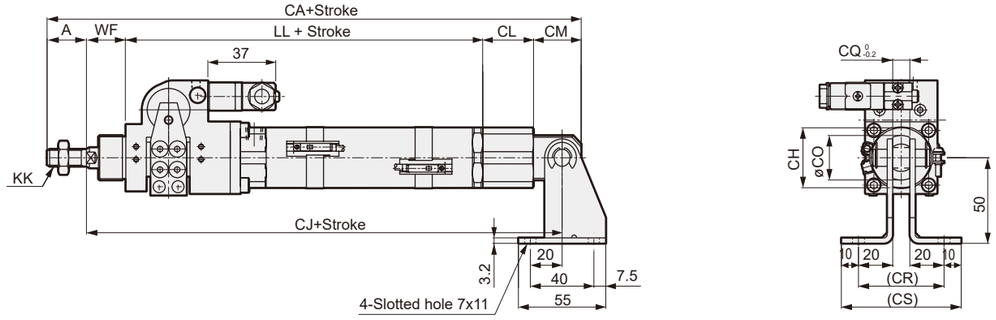
*1: Round up the ℓ dimension to the nearest whole number.
***2: For outline dimension drawings of accessories, please refer to P. 342.**
***3: For dimensions with each switch, refer to P. 360.**

Dimensional Drawings

●Single Clevis Type (CA)



● Eye bracket (CA) with bracket (option)

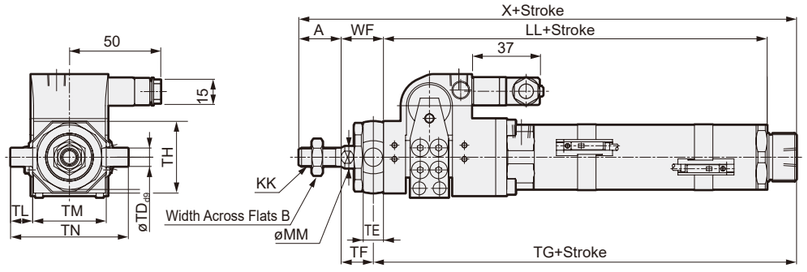


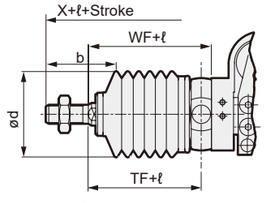
Code	Single Clevis Type (CA) Mounting Dimensions																	With Bellows		
Bore Size (mm)	A	KK	LL	WF	CA	CB	CC	CD	CH	CJ	CL	CM	CN	CO	CQ	CR	CS	b	d	ℓ
ø20	20	M8x1.0	124	24	223	14	10	10	26	193	31	24	8	22	8	48	68	32	30	(Stroke/3)+6
ø30	23	M10x1.25	139	23	247	18	12	12	35	212	32	30	7	26	10	50	70	38	46	(Stroke/3.25)+7
ø40	25	M12x1.5	148	23	258	18	12	12	35	221	32	30	7	26	10	50	70	40	46	(Stroke/3.25)+7

*1: Round up the ℓ dimension to the nearest whole number.
***2: For the external dimensions diagram of accessories, please refer to P. 342.**
***3: For dimensions with each switch, refer to P. 360.**

Dimensional Drawings

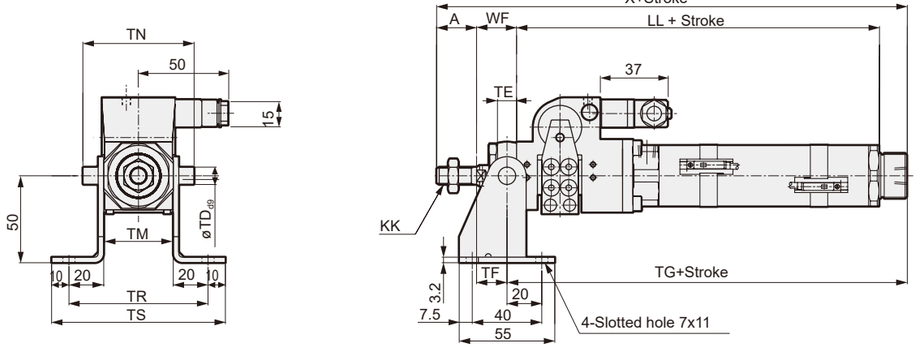
●Rod side trunnion type (TA)





[With bellows]

● Rod side trunnion (TA) with bracket (option)



Code	Rod Side Trunnion Type (TA) Mounting Dimensions															With Bellows		
Bore Size (mm)	A	KK	LL	WF	X	TD	TE	TF	TG	TH	TL	TM	TN	TR	TS	b	d	ℓ
ø20	20	M8x1.0	124	24	182	8	9	19.5	142.5	29.5	8	30	46	70	90	32	30	(Stroke/3)+6
ø30	23	M10x1.25	139	23	201	10	11	17.5	160.5	39	12	40	64	80	100	38	46	(Stroke/3.25)+7
ø40	25	M12x1.5	148	23	212	10	11	17.5	169.5	44	9.5	53	72	93	113	40	46	(Stroke/3.25)+7

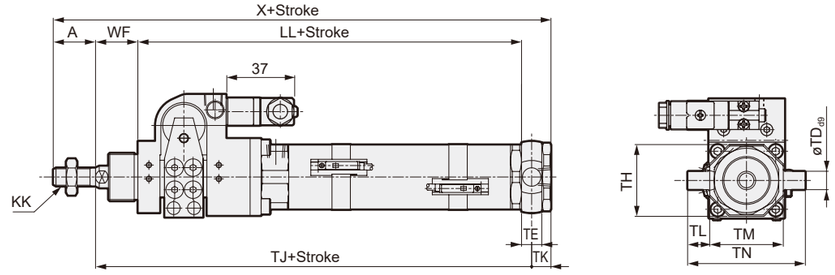
*1: Round up the ℓ dimension to the nearest whole number.

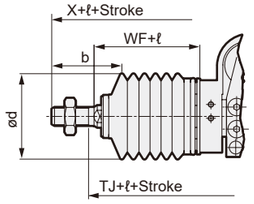
***2: For outline dimension drawings of accessories, please refer to P. 342.**

***3: For dimensions with each switch, refer to P. 360.**

Dimensional Drawings

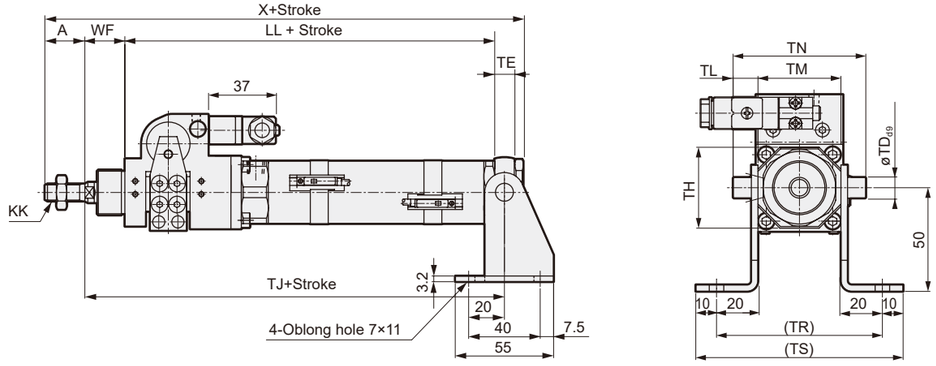
●Head Side Trunnion Type (TB)





[With bellows]

● Head side trunnion (TB) with bracket (option)



Code	Head Side Trunnion Type (TB) Mounting Dimensions															With Bellows		
Bore Size (mm)	A	KK	LL	WF	X	TD	TE	TH	TJ	TK	TL	TM	TN	TR	TS	b	d	ℓ
ø20	20	M8x1.0	124	24	182	8	9	29.5	152.5	9.5	8	30	46	70	90	32	30	(Stroke/3)+6
ø30	23	M10x1.25	139	23	201	10	11	39	167.5	10.5	12	40	64	80	100	38	46	(Stroke/3.25)+7
ø40	25	M12x1.5	148	23	212	10	11	44	176.5	10.5	9.5	53	72	93	113	40	46	(Stroke/3.25)+7

*1: Round up the ℓ dimension to the nearest whole number.

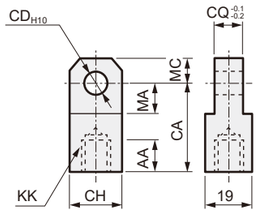
***2: For outline dimension drawings of accessories, please refer to P. 342.**

***3: For dimensions with each switch, refer to P. 360.**

JSM2 / JSM2-V Common Accessories Outline Dimension Drawing

● Single Knuckle (I)

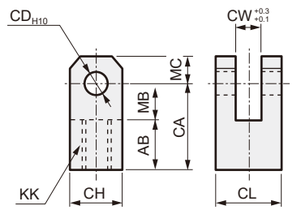
Material: Steel, Zinc Chromate



Model Number	Applicable Bore Size (mm)	AA	CA	CD	CH	CQ	KK	MA	MC	Weight (g)
M1-I-20	20	14	30	10	19	8	M8×1.0	13	10	60
M1-I-30	25, 30, 32	14	36	12	25	10	M10×1.25	16	12	106
M1-I-40	40	14	36	12	25	10	M12×1.5	16	12	100

●Double Knuckle (Y)

Material: Steel, Zinc Chromate

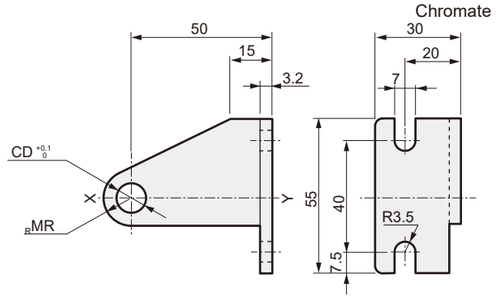


Model Number	Applicable Bore Size (mm)	AB	CA	CD	CH	CL	CW	KK	MB	MC	Weight (g)
M1-Y-20	20	17	30	10	19	19	8	M8×1.0	13	10	99
M1-Y-30	25, 30, 32	20	36	12	25	25	10	M10×1.25	16	12	197
M1-Y-40	40	20	36	12	25	25	10	M12×1.5	16	12	193

Note: Pin, washer, and cotter pin are attached.

●Double Bracket (B2)

Material: Steel, Zinc Chromate

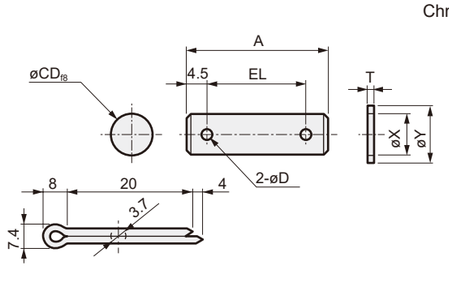


Model Number	Applicable Model	Applicable Bore Size (mm)	CD	MR	Weight (g)
M1-B2-20-CC	JSK2-CC	20/25	8	8	145
M1-B2-30-CC		32	10	11	163
M1-B2-40-CC		40	12	11	170
M1-B2-20-CA	JSK2-CA JSM2-CA	20	10	11	158
M1-B2-30-CA		25/32/40	12	11	162
M1-B2-20-TA	JSK2-TA/TB JSM2-TA/TB	20	8	8	132
M1-B2-30-TA		25, 32, 40	10	11	142

*1: A pair is symmetrical to the XY line.
*2: The above model number includes the Retaining Ring and pin. 2 pcs./ set. (However, not attached for trunnion type)
*3: Not included to mounting type TA with brake unit cover (U).

●Pin for Double Knuckle (P)

Material: Steel, Zinc Chromate

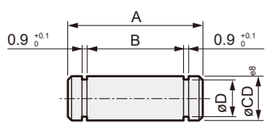


Model Number	Applicable Bore Size (mm)	A	D	CD	EL	T	X	Y	Weight (g)
M1-P-20	20	37	4	10	28	1.6	10.5	18	29
M1-P-30	25, 30, 32, 40	46	4	12	37	2.3	12.5	22	50

Note: Pin, washer, and cotter pin for double knuckle use are attached to the product.

●Pin for Double Bracket (P1) (P2)

Material: Steel Zinc Chromate

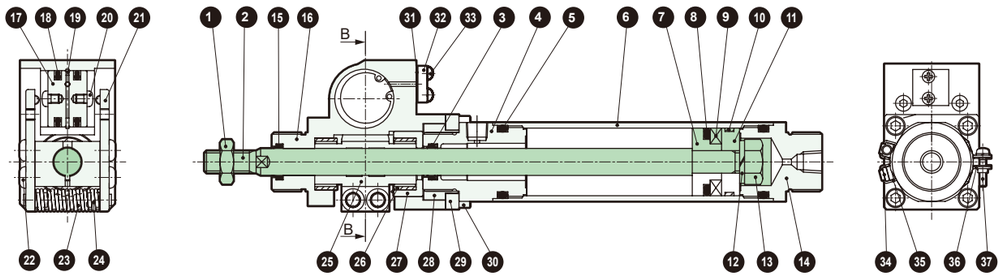


Model Number	Applicable Model and Applicable Bore Size (mm)	A	B	CD	D	Retaining Ring Used	Weight (g)
M1-P1-20	JSK2-CC-20/25	33	28	8	7	E-type 7	13
M1-P1-30	JSK2-CC-32	33	28	10	9	E-type 9	21
M1-P1-40	JSK2-CC-40	37	32	12	9	E-type 9	32
M1-P2-20	JSK2-CA-20 JSM2-CA-20	25	20	10	9	E-type 9	16
M1-P2-30	JSK2-CA-25/32/40 JSM2-CA-30/40	27	22	12	9	E-type 9	24

Note: Pin and Retaining Ring for bracket use are attached to the product. (However, not attached for trunnion type)

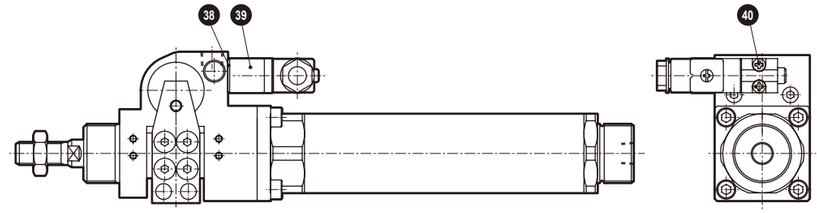
Internal Structure and Materials

● JSM2



B-B, Cross-sectional drawing

● JSM2-V (with valve)



Do Not Disassemble

Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Rod Nut	Steel	Zinc Chromate	22	Hexagon Socket Button Head Screw	Steel	Black Oxide
2	Piston Rod	ø20, ø30: Stainless Steel ø40: Carbon steel	Industrial Chrome Plating	23	Brake Spring	Steel	
				24	Hexagon Socket Head Cap Screw (ø20)	Steel	Black Oxide
3	Rod Packing	Nitrile Rubber			Guide pin (ø30, ø40)	Steel	Zinc Chromate
4	Rod Cover	Aluminum Alloy	Chromate	25	Brake Metal	Cast Iron	Nickel Plating
5	Cylinder Gasket	Nitrile Rubber		26	Bushing	Dry Bearing	
6	Cylinder Tube	Aluminum Alloy	Hard Anodized	27	Ring	Steel	Black Oxide
7	Piston A	Aluminum Alloy		28	Fixed Ring	Steel	Zinc Chromate
8	Piston Packing	Nitrile Rubber		29	Square Flange	Steel	Zinc Chromate
9	Magnet	Plastic		30	Hexagon Socket Head Cap Screw	Steel	Black Oxide
10	Wear Ring	Polyacetal		31	Body Gasket	Cork	
11	Piston B	Aluminum Alloy		32	Masking Plate	Copper Alloy	
12	Spring washer	Steel	Zinc Chromate	33	Pan Head Screw	Steel	Zinc Chromate
13	Hexagon Nut	Steel	Zinc Chromate	With Switch			
14	Head Cover	Aluminum Alloy	Chromate	34	Switch		
15	Scraper	Nitrile Rubber		35	Band	Stainless Steel	
16	Brake Body	Cast Iron	Nickel Plating	36	Switch Rail	Stainless Steel	
17	Brake Piston	Copper Alloy		37	Pan Head Screw	Stainless Steel	
18	Piston Packing	Nitrile Rubber		With Valve			
19	C-type Retaining Ring	Stainless Steel		38	Body Gasket	Cork	
20	Pan Head Screw	Steel	Zinc Chromate	39	Brake Release Valve		P5136M0 (CKD)
21	Lever	Steel	Zinc Chromate	40	Pan Head Screw	Steel	Zinc Chromate

Mounting Bracket Material

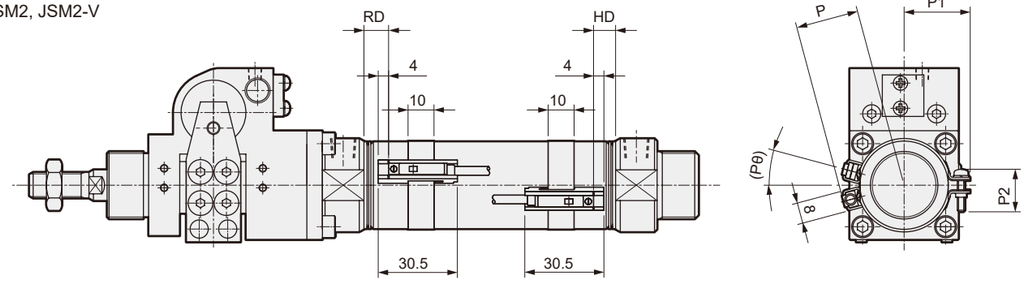
Mounting Type	Material	Remarks
Foot (LB)	Steel	Zinc Chromate
Flange (FA)	Steel	Zinc Chromate
Trunnion (TA / TB)	Steel	Zinc Chromate
Clevis (CA)	Steel	Zinc Chromate

Note: Mounting brackets are included with the product upon shipment. However, if bellows are included and mounting brackets are LB, FA, or TA, they will be shipped assembled.

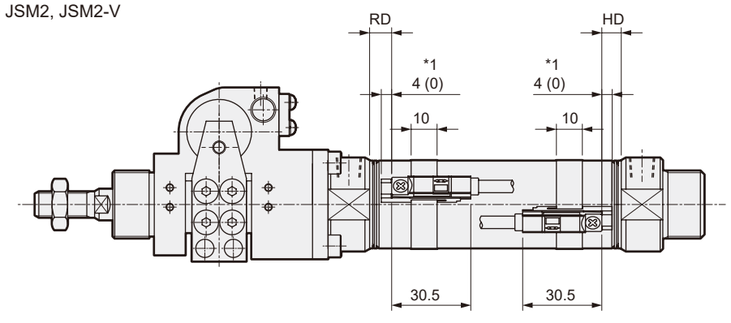
For maintenance parts, please visit the CKD Equipment Product Site (https: //www.ckd.co.jp/kiki/en/) → "model No." → Maintenance Parts.

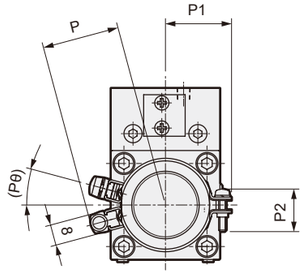
JSK2 / JSM2 Series Switch Equipped Outline Dimension Drawing

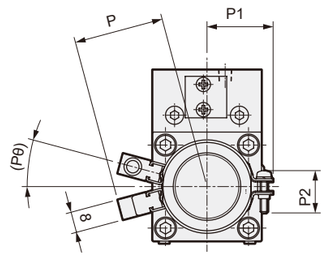
● T0H/V, T5H/V, T2H/V, T3H/V, T3PH/V, T2WH/V, T3WH/V, T2WLH/V
· JSK2, JSK2-V
· JSM2, JSM2-V



● T1H/V, T8H/V,T2JH/V
· JSK2, JSK2-V
· JSM2, JSM2-V







Code	JSK2, JSK2-V														
	P1	P2	Pθ	T0, T5, T2, T3, T3P, T2□R3			T2W, T3W, T2WL			T1, T2J			T8		
Bore Size (mm)				P	RD	HD	P	RD	HD	P	RD	HD	P	RD	HD
ø20	19.5	14	22	17.3	8	7	17.3	10	9	28.5	7	6	23.1	2	1
ø25	22	14	18	19.8	9.5	8.5	19.8	11.5	10.5	31	8.5	7.5	25.6	3.5	2.5
ø32	25.5	16	15	24.3	9.5	8.5	24.3	11.5	10.5	35.5	8.5	7.5	30.1	3.5	2.5
ø40	29.5	16	12	28.3	11.5	10.5	28.3	13.5	12.5	39.5	10.5	9.5	34.1	5.5	4.5

Code	JSM2, JSM2-V														
	P1	P2	Pθ	T0, T5, T2, T3, T3P, T2□R3			T2W, T3W, T2WL			T1, T2J			T8		
Bore Size (mm)				P	RD	HD	P	RD	HD	P	RD	HD	P	RD	HD
ø20	21	14	19	19.5	13	13	19.5	15	15	30.3	12	12	25.3	7	7
ø30	26	16	15	24.5	16	16	24.5	18	18	35.3	15	15	30.3	10	10
ø40	31	14	12	29.5	17	17	29.5	19	19	40.3	16	16	35.3	11	11

*1: For T1□, T2J□ switches and stroke 35 mm or more, the dimension will be ( ).
*2: For switch mountability, refer to the model number display method for each variation.

MEMO

*Related Equipment Selection Guide

Overrun amount and stopping accuracy vary depending on the valve used. Please use the related equipment below.

Model Name / Related Equipment Name / Bore Size (mm)	SOL-1	SOL-2	Reverse Regulator	Speed Controller	Silencer	Piping
JSM2 JSK2 ø20	4GB150R-06	3GA110R	R1100-6-W 2419-1C	SC3W-6-6 SC3R-6 SC1-6	SLW-6A	ø6 × ø4 Nylon Tubing
JSK2 ø25	4GB150R-06	3GA110R	R1100-6-W 2419-1C	SC3W-6-6 SC3R-6 SC1-6	SLW-6A	ø6 × ø4 Nylon Tubing
JSM2 ø30	4GB150R-06 4GA210R-06 4GB250R-06	3GA110R	R1100-6-W 2419-1C	SC3W-6-6 SC3R-3-6 SC1-6	SLW-6A	ø6 × ø4 Nylon Tubing
JSK2 ø32	4GB150R-06 4GA250R-06 4GB250R-06	B5136	R1100-6-W 2419-1C	SC3W-6-6 SC3R-3-6 SC1-6	SLW-6A	ø6 × ø4 Nylon Tubing
JSM2 JSK2 ø40	4GA250R-06 4GB250R-06	4GA110R-06 4GB110R-06	R1100-6-W 2419-1C	SC3W-6-8 SC3R-6 SC1-6	SLW-6A	ø8 × ø5.7 Nylon Tubing

Applications

It can be used for devices and equipment requiring the following functions.

1 When multipoint positioning is required (Transfer/Positioning)

It can stop accurately at multiple target positions.

2 When fall prevention is required

When the air pressure source and power supply are turned OFF (during power outage or accident), the brake is applied instantly and can be held, preventing equipment damage and ensuring safety.

3 When emergency stop is required

If a worker, etc., enters a hazardous area, the cylinder stops instantaneously due to an electrical signal.

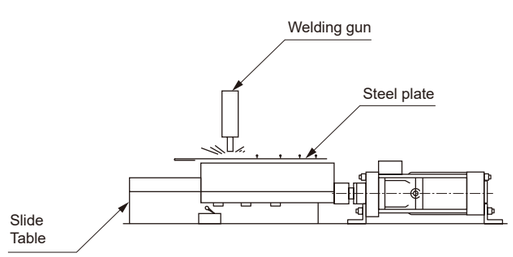
4 Work lock

When locking a workpiece to a jig, mounting base, etc., it can be locked even without a pneumatic source or power supply. Conveyance is possible while locked to the jig.

Usage Example

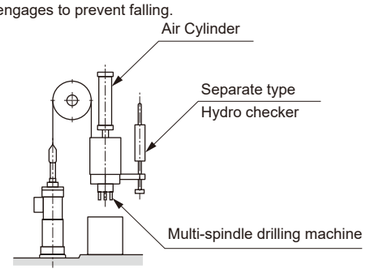
1 Linear multipoint welding

Movement and positioning of a slide table or welding gun when welding many steel plates, etc., in a straight line.



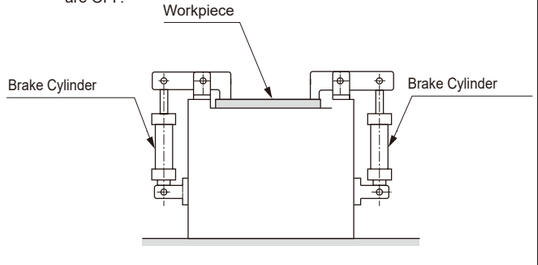
2 Fall prevention

If there is a load in the vertical direction and it is problematic for the load to fall under its own weight when the pressure source stops, the brake engages to prevent falling.



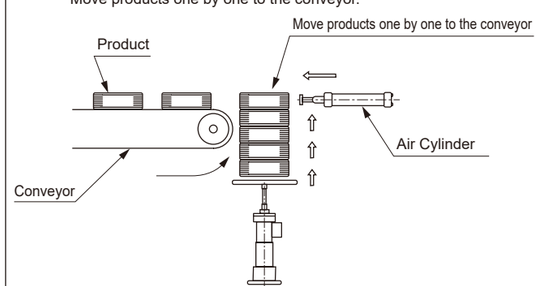
3 Work lock

When locking a workpiece to a jig, etc., if a Brake Cylinder is used, it remains locked even if the pneumatic source and power supply are OFF.



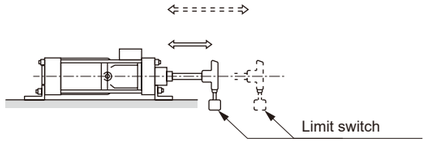
4 Move to conveyor

Move products one by one to the conveyor.



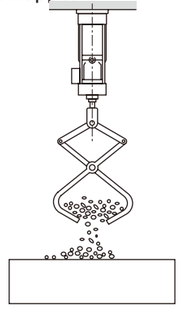
5 Cylinders with different strokes When it is necessary to have many

When items of different sizes flow on a conveyor etc., the cylinders set there often need to change their strokes. In that case, by using a Brake Cylinder, cylinders with various strokes can be made electrically.



6 Opening and closing of hopper

In processes like milling, when closing after reaching a predetermined weight, stop the hopper opening degree just before fully closed for accurate weighing, and then fully close it.



Custom-made

■Without Bellows (-XJ9)

Content: Piston Rod with dimensions for bellows, but bellows not assembled

Model No. Notation

JSK2 - 00 - 40 - 100 - XJ9

JSM2 - 00 - 40 - 100 - XJ9

Model No.

Please refer to the JSK2/JSM2 model number display method.

Dimensional Drawings

Same dimensions as with bellows, but bellows are not included.

■With 2 Rod Nuts (-A2)

Content: Shipped with 2 rod nuts, same as standard.

Model No. Notation

JSK2 - 00 - 40 - 100 - A2

JSM2 - 00 - 40 - 100 - A2

Model No.

Please refer to the JSK2/JSM2 model number display method.

Dimensions

Same as standard type except that 2 rod nuts are included.

MEMO

With Brake / With Lock
ULK□
JSK2/ JSM2
JSG
JSC3, JSC4
USSD
UFCD
USC
Cylinder Switch
Ending

Pneumatic Equipment

To Use This Product Safely

Be sure to read this before use. For general cylinder information, see Intro 41, and for cylinder switches, see P. 1512.

Specific Precautions: Brake cylinder JSK2/JSM2 Series

Design / Selection

1. Common

Warning

■ Structure so that the human body does not directly touch the driven object and the moving parts of the cylinder with brake.

Install a protective cover so that the human body cannot touch it directly. Or, if there is a risk of touching, provide a sensor etc. to make a safe structure such as emergency stop before touching or sounding a warning sound to notify danger.

■ Use a balanced circuit that accommodates the protrusion of the Piston Rod.

If the brake is operated at any position during the stroke such as intermediate stop, and air pressure is applied to only one side of the cylinder, the Piston Rod will pop out at high speed when the brake is released. In such a case, there is a risk of causing injury to the human body such as pinching hands and feet, and causing damage to the machine, so use a balance circuit like the recommended pneumatic circuit to prevent shooting out.

■ Please note that holding force is the ability to hold a static load without vibration or shock after the brake is activated under no load.

Therefore, please be careful when using near the upper limit of the holding force at all times.

■ Do not apply impact load, strong vibration, or rotational force when the brake is operating.

If impact load, strong vibration, or rotational force is applied from the outside, the holding force will decrease and it is dangerous, so please be careful.

■ When performing intermediate stop, consider the stopping accuracy and overrun amount.

Because it is a mechanical lock, it does not stop instantly in response to the stop signal, but stops with a time delay. The stroke sliding due to this delay is the overrun amount. And the range between the maximum and minimum overrun amount is the stopping accuracy.

- Place the limit switch in front of the desired stop position by the overrun amount.
- The limit switch requires a detection length (dog length) of the overrun amount + α.
- In the case of our cylinder switch, the operating range is 7 to 16 mm (depending on the switch model). If the overrun amount exceeds this, perform self-holding of the contact on the switch load side.

■ In order to improve stopping accuracy, ensure that the brake stops the cylinder as soon as possible after receiving the stop signal.

To do so, use a DC type control electric circuit and valve with good response, and place the valve and cylinder as close as possible.

■ Please note that stopping accuracy is affected by changes in piston speed.

If the piston speed changes due to load fluctuation or disturbance during the reciprocating stroke of the cylinder, the dispersion of the stop position will increase, so consider keeping the piston speed constant immediately before the stop position. Also, during the cushion stroke and while in the acceleration range from the start of operation, the speed change is large, so the dispersion of the stop position becomes large. The stopping accuracy at piston speed 300 mm/s and no load is ±1.0 mm (reference value). It varies depending on the equipment used. For details, please refer to the P. on stopping accuracy and overrun.

■ Do not use multiple cylinders with brakes in synchronization. If a synchronization error occurs, load may concentrate on the cylinder where the brake engaged first, potentially causing reduced lifespan or damage.

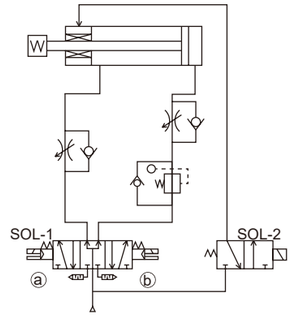
■ Basic circuit

Even when used for fall prevention or emergency stop, be sure to use the following circuit. 2-position valves cannot be used because the cylinder's own thrust acts on the brake part even when stopped. Balance the thrust and load with the following circuit. The brake may not release if a load is applied to the brake.

- Horizontal load

Piping as shown in Fig. 1 applies equal pressure to both sides of the piston when stopped, preventing rod projection when the brake is released. Also, install a pressure reducing valve with a check valve on the head side to balance the thrust.

Fig. 1

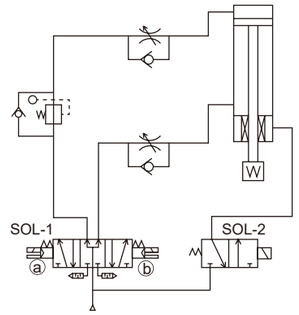


ⓐ SOL-1 ⓑ		SOL-2	Operating State
OFF	OFF	OFF	Stop
ON	OFF	ON	Retract
OFF	ON	ON	Advance

- For downward vertical load

As shown in Fig. 2, if the load is downward, the rod will malfunction in the Load Direction when the brake is released. Therefore, install a pressure reducing valve with a check valve on the head side, reduce the thrust in the Load Direction, and balance the load.

Fig. 2

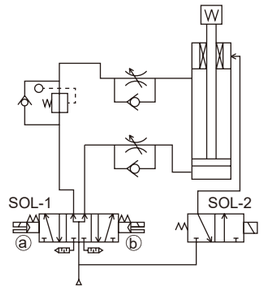


ⓐ SOL-1 ⓑ		SOL-2	Operating State
OFF	OFF	OFF	Stop
ON	OFF	ON	Descend
OFF	ON	ON	Ascend

- For upward vertical load

As shown in Fig. 3, if the load is upward, the rod will malfunction in the Load Direction when the brake is released. Therefore, install a pressure reducing valve with a check valve on the rod side, reduce the thrust in the Load Direction, and balance the load.

Fig. 3



ⓐ SOL-1 ⓑ		SOL-2	Operating State
OFF	OFF	OFF	Stop
ON	OFF	ON	Descend
OFF	ON	ON	Ascend

Warning

■ Drain

If the piping capacity is large relative to the cylinder volume for brake release, compressed air may not be completely exhausted when the solenoid valve switches, and water droplets condensed by adiabatic expansion may accumulate and become drain. Drain can wash away lubricating oil, causing poor lubrication, momentarily blocking flow paths, corroding the brake internals, etc., leading to brake malfunction and potentially causing problems such as poor stopping accuracy, brake failure, or failure to release.

To prevent drain generation, based on the ratio A of piping volume to cylinder volume, install a dryer and adjust the air quality so that the atmospheric pressure dew point of the compressed air used is as shown below. Alternatively, adjust the Bore Size and length so that the piping volume from the release port to the solenoid valve meets the conditions below, according to the atmospheric pressure dew point of the compressed air used.

Magnification A <1: Atmospheric dew point -20°C or less
1 ≤ Ratio A < 2: Atmospheric pressure dew point -25°C or less
Magnification A≥2 : Atmospheric dew point -30°C or less

Calculation of Ratio A of Piping Volume to Cylinder Volume

$$A = \frac{V_t + V_1}{V_0 (10P+1)}$$

V_t: Piping volume (mm³)
V_0: Brake release cylinder volume (mm³)
V_1: Brake release cylinder blank volume (mm³)
P: Operating Pressure (MPa)

	V_0 (mm³)	V_1 (mm³)
JSK2-20 JSM2-20	754	754
JSK2-25 JSK2-32 JSM2-30	1963	1865
JSK2-40 JSM2-40	4021	3860

Example) JSK2-20, Piping to the brake release port, Bore Size ø4/length 1.5 m Operating Pressure 0.5 MPa
Piping volume V_t = cross-sectional area × length = $4 \times 4 \times \pi/4 \times 1500 \approx 18850$ mm³

$$A = \frac{18850+754}{754\times(10\times0.5+1)} = 4.3$$

Therefore, adjust the air quality so that the atmospheric pressure dew point is -30°C or less.

- If adjustments are difficult, consider using a cylinder with valve (JSK2-V, JSM2-V).

■ When releasing the brake, make sure to release the brake earlier than the cylinder operation. If the cylinder operation is faster, the brake may not release.

■ If back pressure is applied to the locking mechanism, the brakes may be released. Use a discrete valve, or use a check valve on the side with an individual exhaust manifold.

■ Use a 3-position P/A/B connection (pressurization on both sides) solenoid valve for the cylinder drive to prevent the piston from popping out when starting.

■ To maintain balance of the thrust, including the load, the side with the larger thrust should have a Regulators with a check valve.

CAUTION

■ Precautions Regarding Stopping Accuracy

- Stop Pitch and Load Factor

Stopping accuracy varies depending on stopping pitch and load factor. To obtain stopping accuracy, the load factors in the table below are recommended.
*Stopping accuracy reference value: ±1.0 (300 mm/s at no load)

Stop Pitch	Load Factor
50 mm or less	20% of Thrust
50 mm to 100 mm	40% of Thrust
100 mm or more	60% of Thrust

- Selection of Brake Valve

Stopping accuracy and overrun amount vary depending on the response of the brake valve. Select by referring to the JSK2-V, JSM2-V brake valve electrical specifications. Also, connect the valve directly to the brake port to improve stopping accuracy.

● When using a PLC (programmable controller)
If a PLC (Programmable Logic Controller) is used for the electrical control device of the brake valve, the stopping accuracy will deteriorate due to the scan time (calculation processing time). When using a PLC, do not incorporate only the brake valve into the PLC circuit.

■ Do not change the load weight significantly when the brake is stopped. The stop position may change.

■ For mounting type TA, the brake unit cover and double yoke bracket interfere, so they cannot be selected simultaneously.

■ Although the contact service life of the reed switch varies depending on usage conditions, it will generally last several million cycles. If the equipment used operates continuously day and night or at high frequency, the contact life region will be reached in a short period, so use solid state switches without contact parts.

During Use

⚠Warning

■ Release brakes before coupling the load to the end of the rod. If performed with the brake activated, a load exceeding the rotational force or holding force will act on the Piston Rod, causing damage to the brake mechanism.

■ If the brake is released while air is applied to only one side of the cylinder, the Piston Rod can pop out at high speed, creating a dangerous situation. When releasing the brake during adjustment work, etc., always observe the following:
● Check that no one is in the movable range of the load and that no problems will arise if the load moves when brakes are released.
● When releasing the brake, perform position locking or take other measures:
· Placing the load at the lower end
· Pressurizing both sides
· Placing a support
Implement fall prevention measures such as these.
● Confirm that air is not pressurized on only one side of the cylinder when releasing brakes.

■ Brakes are released manually or by pressurizing the brake release port. During load installation, if the brake is left released by this operation, the load may fall. Therefore, always return the manual release operation to its initial state, or confirm that the brake is effective with no air in the brake release port before installation.

■ Do not apply torque to the rod when braking, as the holding force will decrease, creating hazardous conditions. Also, use with a mechanism that prevents rod rotation.

■ Do not apply force exceeding the brake holding force listed in the catalog to the cylinder.

■ With the JSM2 Series, the brakes can be manually released by screwing a Hexagon Socket head cap bolt into the brake release female thread on the side or top of the brakes. However, the brakes may be damaged if the bolt is screwed in too far; use the bolts attached with the product, or if using commercially available bolts, use the appropriate screw insertion depth for the release bolt shown in the table below.

I.D.	Bolt Rotation Count
ø20	8 to 9 rotations
ø25	11 to 12 rotations
ø30	
ø32	
ø40	14 to 15 rotations

ø20 to ø40 : Use bolt M5x15 or longer

■ If there is any play, such as looseness, in the brake signal dog, stopping accuracy is affected. Securely fix to eliminate play, etc.

■ If the piston speed is fast, the detection dog must be long enough to match relay response time. Note that if the dog length is short, the stop signal will not be output and it will not stop.

⚠CAUTION

■ Adjust the air balance in the cylinder.
With the brake released, attach the load to the cylinder and balance the load by adjusting the air pressure on the rod side and head side of the cylinder. By ensuring this load balance, problems such as the Piston Rod popping out when the brake is released or the brake not releasing normally can be prevented.

■ Adjust the mounting position of the detection part such as the cylinder switch.
When performing intermediate stop, adjust the mounting position of the detection part such as the cylinder switch considering the overrun amount with respect to the desired stop position.

■ Load fluctuation during the reciprocating stroke of the cylinder causes changes in piston speed, and changes in piston speed increase the dispersion of the stop position. Adjust the mounting so that there is no load fluctuation during the cylinder reciprocating stroke, especially immediately before stopping.

■ During the cushion stroke and while in the acceleration range from the start of operation, the speed change is large, so the dispersion of the stop position becomes large. For this reason, when performing step operation with a short stroke from the start of operation to the next position, stopping accuracy may worsen, so please be careful.

■ Load to Piston Rod
More strictly than in the case of general pneumatic cylinders, use with the load on the Piston Rod always applied axially. Furthermore, when moving the load, regulate it sufficiently with a guide so that there is no backlash or twisting.

■ Maintaining the rod sliding parts
Be careful not to scratch or dent the Piston Rod sliding part. It causes damage to packings, leading to leakage or brake failure.

■ Downward) when shipped to prevent damage. Change to the orientation to be used when wiring the terminal box.

1. Common

⚠Warning

■ The brake section can be removed from the Cylinder Body. Do not disassemble or inspect brakes or hazards may result when brakes are used again.

■ The required amount of grease is applied to the brake part, so avoid applying more grease and do not wipe off the grease.

■ The required grease is applied when brakes are replaced, so there is no need to apply grease to rods.

■ Please always use with the dust cover attached except during manual release, as it may cause a malfunction.

⚠CAUTION

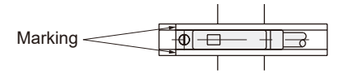
■ Air supply pipes that are too narrow or too long can reduce stopping accuracy.

■ If the cylinder has been stopped for a long time, such as first thing in the morning or afternoon, the frictional resistance increases and the piston speed changes, so the stopping accuracy may deteriorate. Perform a break-in operation to obtain stable stopping accuracy.

2. Common (With T-type Switch)

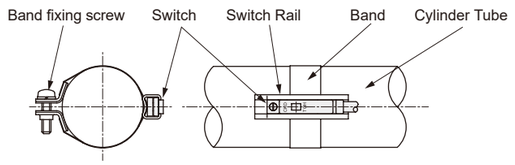
⚠CAUTION

■ When Moving the Switch Position in the Stroke Direction
● The 1-color indicator switch can be finely adjusted by about ±3 mm from the mounting position at the time of shipment. If the adjustment range exceeds ±3 mm, or if fine-tuning the position of a 2-color indicator switch, move the band position.
● Loosen the switch mounting screw, move the switch along the rail, and tighten at the specified position. For T2, T3, T0, T5, use a flat-head screwdriver (watchmaker's screwdriver, precision screwdriver, etc.) with a grip diameter of 5 to 6 mm, tip shape width of 2.4 mm or less, and thickness of 0.3 mm or less to tighten the switch fixing screw with a tightening torque of 0.1 to 0.2 N·m. For T□C, T1, T2J, T2Y, T3Y, T8, tighten with a tightening torque of 0.5 to 0.7 N·m.
● The switch rail has a marking 4 mm from the end face of the rail. Use it as a guide for mounting position when replacing the switch. The switch rail marking is set to the switch maximum sensitivity position at factory shipment. If the switch type changes or the band is moved, the maximum sensitivity position changes, so adjust the position each time.



■ When Moving the Switch Position in the Circumferential Direction
● Loosen the band fixing screw, move the switch rail circumferentially, and tighten it at the specified position. The tightening torque is 0.6 to 0.8 N·m.

■ When Moving the Band Position
● Loosen the band fixing screw, move the switch rail and band along the cylinder tube, and tighten them at the specified position. The tightening torque is 0.6 to 0.8 N·m.



For precautions during installation, adjustment, use, and maintenance, please refer to "During Use" in this catalog and the Instruction Manual on the CKD Component Product Site (https://www.ckd.co.jp/kiki/en/) -> "Model Number".

With Brake with Lock

JSG

Tie Rod Cylinder with Brake

ø40, ø50, ø63, ø80, ø100

CONTENTS

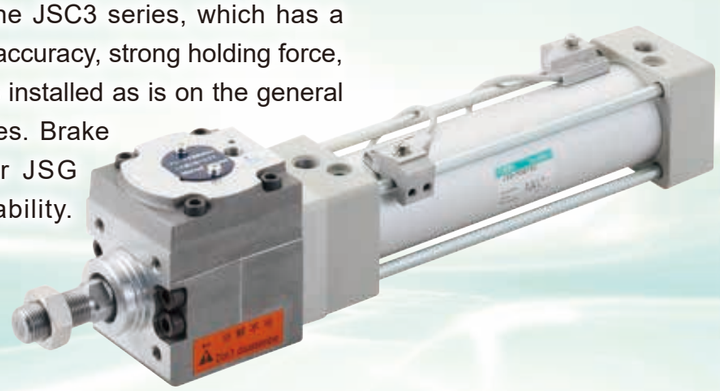
Product Introduction	372
Series System Chart	374
● Double Acting/single rod (JSG)	376
● Double Acting with valve for brake release (JSG-V)	376
Accessories External Dimensions Diagram	400
Outer Dimensions Diagram with Switch	404
Application Examples	405
Custom Products	406
⚠Precautions for Use	410

With Brake
Tie Rod Cylinder

JSG Series

Inheriting the excellent DNA of JSC3
Evolved to be more compact and easier to use

The brake mechanism of the JSC3 series, which has a reputation for high stopping accuracy, strong holding force, and outstanding reliability, is installed as is on the general purpose cylinder SCG series. Brake equipped tie-rod cylinder JSG series inheriting high reliability. (ø40 to ø100)



Safety

Ensures safety of workpieces, etc., even during power outages or accidents.

Energy Saving

No power such as electricity or air required while braking/locking.

Reliable and proven brake mechanism

The brake unit adopts the same mechanism as the renowned JSC3 Series. Possesses reliable durability.

Strong rod holding force

Original lock mechanism provides a strong holding force equivalent to twice the thrust (at 0.4 MPa Operating Pressure).

High response with valve

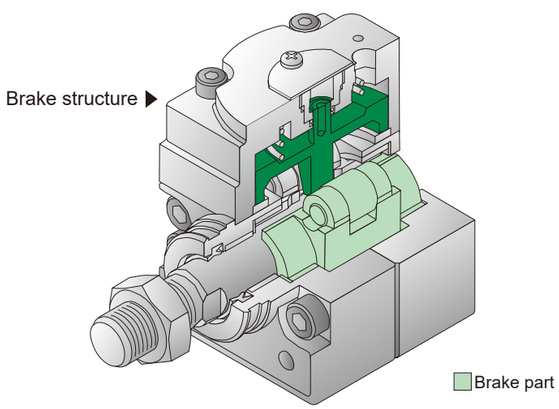
Brake release valve can be directly included with the brake. Improves brake response and positioning accuracy.

Lightweight

Achieved an average of 17% weight reduction compared to conventional cylinders.

Compact and reliable brake unit

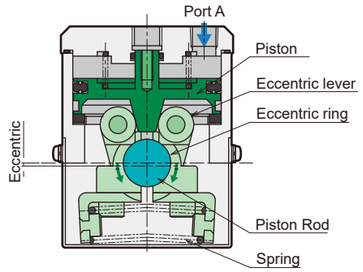
Overall length is shorter compared to JSC3, reducing installation space.



Operating Principle

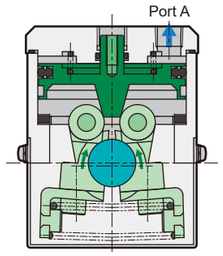
Brake Release Operating Principle

When air is supplied from port A, the lower piston is pushed, opening the lever, and the eccentric rings directly connected to the lever rotate in the direction of their respective arrows, freeing the Piston Rod.



Brake Activation Operating Principle

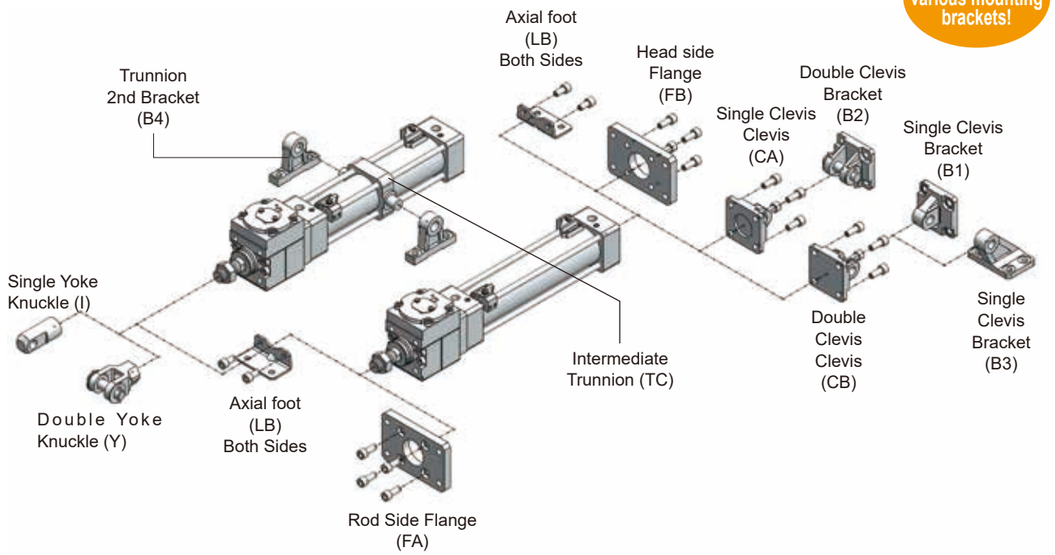
When air is exhausted from port A, the eccentric rings rotate in the direction of their respective arrows due to spring force, generating an eccentric load on the Piston Rod and braking the Piston Rod.



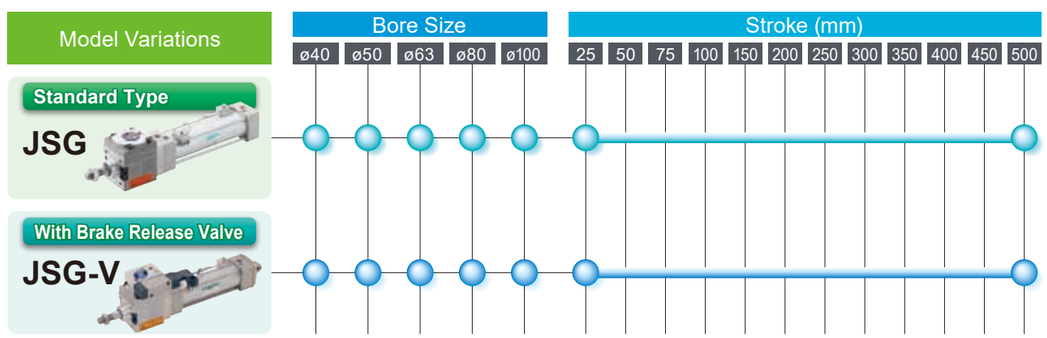
Abundant Mounting Brackets

Achieves high design flexibility with a wide variety of mounting brackets.

Compatible with various mounting brackets!



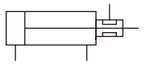
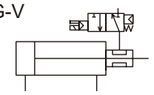
JSG Series Product System



System Chart

Tie Rod Cylinder with Brake
JSG Series

●: Standard, ◎: Option, ○ : Custom Products, : Not available

Variation	Model Number / Circuit Diagram Code	Bore Size (mm)	Standard Stroke (mm)												Min Stroke		Max Stroke	Producible Stroke	Intermediate Stroke	Mounting Type										Cushion		Option		Accessories						Switch	Page
			25	50	75	100	150	200	250	300	350	400	450	500						Basic Type	Axial Foot Type	Rod side Flange Type	Head Side Flange Type	Single Clevis Type	Double Clevis Type	Rod Side Trunnion Type	Head Side Trunnion Type	Intermediate Trunnion Type	Both Sides Air Cushion	Both Sides Rubber Cushion	Bellows (100 °C)	Piston Rod Material Stainless Steel	Single Knuckle	Double Knuckle	Single Bracket	Double Yoke Bracket	Single Bracket	Trunnion Type 2nd Bracket		
																				00	LB	FA	FB	CA	CB	TA	TB	TC	B	D	J	M	I	Y	B1	B2	B3	B4		
Double Acting/ Single Rod Type	JSG 	ø40	●	●	●	●	●	●	●	●	●	●	●	●	1		600	800	1	●	●	●	●	●	●	●	●	●	●	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	376
		ø50, ø63																1200																						
		ø80															700	1400																						
		ø100															800	1500																						
Double Acting with Brake Release Valve	JSG-V 	ø40	●	●	●	●	●	●	●	●	●	●	●	●	1		600	800	1	●	●	●	●	●	●	●	●	●		◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	376
		ø50, ø63																1200																						
		ø80															700	1400																						
		ø100															800	1500																						

With Brake / With Lock
ULK□
JSK2/ JSM2
JSG
JSC3, JSC4
USSD
UFCD
USC
Cylinder Switch
Ending

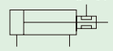
Tie Rod Cylinder with Brake, Double Acting Single Rod Type / Double Acting with Brake Release Valve

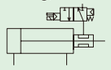
JSG, JSG-V Series

●Bore Size: ø40, ø50, ø63, ø80, ø100

●Double Acting Type ● Double Acting, with valve for brake release

Circuit Diagram Code





RoHS

Model No. Notation

●Without valve

Without Switch (Built-in magnet for switch): JSG - LB - 40 - [ ] - B - 100 - J - I

With Switch (Built-in magnet for switch): JSG - LB - 40 - [ ] - B - 100 - T2H - R - J - I

●With Brake Release Valve

Without Switch (Built-in magnet for switch): JSG-V - LB - 40 - [ ] - B - 100 - 1 - J - I

With Switch (Built-in magnet for switch): JSG-V - LB - 40 - [ ] - B - 100 - 1 - T2H - R - J - I

1	2	3	4	5	6	7	8	9	10	11
Model Number	Mounting Type	Bore Size	Piping thread type	Cushion	Stroke	Valve voltage	Switch Model	Number of Switches	Options	Accessories

❶ Model No.

Code	Description
JSG	Double Acting Type
JSG-V	Double Acting with Brake Release Valve

❷ Mounting Type

Mounting brackets are included with the product and shipped. However, the rod side flange for trunnion and bellows equipped types is shipped assembled.

Code	Content	
00	Basic Type	
LB	Axial Foot Type	
FA	Rod Side Flange Type	
FB	Head Side Flange Type	
CA	Single clevis type	
CB	Double Clevis Type (Pin and Split Pin Attached)	
TA	Rod side trunnion type	
TB	Head side trunnion type	
TC	Intermediate Trunnion Type	

❸ Bore Size (mm)

Code	Contents
40	ø40
50	ø50
63	ø63
80	ø80
100	ø100

❹ Piping thread type

Code	Content
Blank	Rc Thread
N	NPT thread (Custom item)
G	G thread (Custom item)

❺ Cushion

Code	Content
B	Both Sides Air Cushion (Basic type)
D	Both Sides Rubber Cushion

Note: Rubber cushion type has a longer overall length than air cushion.

❻ Stroke (mm)

Bore Size	Stroke	Intermediate Stroke
ø40	1 to 600	Every 1 mm
ø50		
ø63		
ø80	1 to 700	
ø100	1 to 800	

*1: If the Max Stroke is exceeded, the product specifications may not be met depending on the conditions, so please consult us. Also, please refer to Intro 29.

*2: Refer to P. 379, 380 for the Min Stroke with switch.

❼ Valve voltage

Code	Content
1	100 VAC
2	200 VAC
3	24 VDC
4	12 VDC

Note: Valve voltage can be selected only for JSG-V (with brake valve).

❽ Switch Model No.

For switch details, refer to P. 1457. Switches are shipped with the product.

Contact	Indicator LED Special Function	Wiring (Output)	Load Voltage (V) AC	Load Voltage (V) DC	Load Current (mA) AC	Load Current (mA) DC	Lead wire *1 Straight	Lead wire *1 L-shape	
Solid State	1-Color	2-wire	85 to 265	-	5 to 100	-	T1H□	T1V□	
			-	10 to 30	-	5 to 20 *2	T2H□	T2V□	
		3-wire (NPN)	-	30 or less	-	100 or less	T3H□	T3V□	
		3-wire (PNP)	-		-		T3PH□	T3PV□	
	2-color	2-wire	-	24 ± 10%	-	5 to 20	T2WH□	T2WV□	
		3-wire (NPN)	-	30 or less	-	50 or less	T3WH□	T3WV□	
	For 2-color AC Magnetic Field	2-wire	-	24 ± 10%	-	5 to 20	T2YD□	–	
			-		-		T2YDT□	–	
	1-Color Off-Delay Type		—	10 to 30	-	5 to 20 *2	T2JH□	T2JV□	
	1-Color Flexible Lead Wire Type		-		-		T2HR3	T2VR3	
Contact	1-Color	2-wire	110	12/24	7 to 20	5 to 50	T0H□	T0V□	
	Without Indicator Lamp		110	5/12/24	20 or less	50 or less	T5H□	T5V□	
	1-Color		110/220	12/24	7 to 20 / 7 to 10	5 to 50	T8H□	T8V□	

*1: Enter the code selected in the "Lead wire length" table into "□" of the Switch Model.

*2: The maximum load current of 20 mA mentioned above is at 25°C. If the switch operating Ambient Temperature is higher than 25°C, it will be lower than 20 mA. (At 60°C, it will be 5 to 10 mA.)

*3: Switches other than the above switch model numbers are also available. (Custom Product) For details, refer to P. 1457.

***Lead wire length**

Code	Content
Blank	1 m (Standard)
3	3 m (Option)
5	5m (Option)

Example) Lead wire length
1 m T0H
3 m T0H3
5 m T0H5

❾ Number of Switches

Code	Content
R	With 1 pc on rod side
H	With 1 pc on head side
D	With 2 pcs
T	With 3 pcs

Note: When selecting ❷mounting style TA or TB, the switch quantity is limited to "H" (1 on head side) for TA, and "R" (1 on rod side) for TB.

❿ Option

Code	Content	Maximum Ambient Temperature	Instantaneous Ambient Temperature	
J	Bellows	100°C	200°C	
M	Piston Rod material: Stainless Steel			

About specifications of custom products

For details, please refer to P. 406 to 409.

Code	Description
-XK□	Mounting Bracket Rotational Assembly
-XAQ□	Trunnion position fixed
-XP7	Knuckle fixed by pin driving
-XJ9	Without Bellows
-A2	With 2 Rod Nuts
Rod End thread custom order	Refer to Ending 11.

Model No. Ex.)

JSG-.....-XK□

⓫ Accessories

Code	Content	
I	Single knuckle	
Y	Double Knuckle (Pin and Split Pin Attached)	
B1	Single bracket	
B2	Double Yoke Bracket (Pin and Split Pin Attached)	
B3	Single bracket	
B4	Trunnion Type 2nd Bracket (2 pcs/set)	

Note: "I" and "Y" cannot be selected at the same time.

Switch Individual Model No. Notation

●Switch body+Mounting bracket set

SCG - T0H - 40

8 Switch Model; 3 Bore Size

● Switch Body Only

SW - T0H

8 Switch Model

Note: If using environmentally compatible T-type switches, please consult us separately.

●Switch mounting bracket set

SCG - T - 40

Mounting Bracket; 3 Bore Size

Specifications

Item		JSG					JSG-V				
Bore Size mm		ø40	ø50	ø63	ø80	ø100	ø40	ø50	ø63	ø80	ø100
Actuation method		Double Acting Type					Double Acting Type with Valve				
Operating Fluid		Compressed Air					Compressed Air				
Max Operating Pressure MPa		1.0					0.7				
Min Operating Pressure MPa		0.3					0.3				
Proof Pressure MPa		1.6					1.6				
Ambient Temperature °C		-10 to 60 (No freezing)					-10 to 60 (No freezing)				
Port Size	Brake Part	Rc1/8		Rc1/4		Rc3/8	Rc1/8		Rc1/4		
	Cylinder Part	Rc1/4		Rc3/8		Rc 1/2	Rc1/4		Rc3/8		Rc1/2
Stroke tolerance mm	With Rubber Cushion	$^{+1.4}_{0}$ (Up to 1000), $^{+1.8}_{0}$ (Up to 1500)					$^{+1.4}_{0}$ (Up to 1000), $^{-1.8}_{0}$ (Up to 1500)				
	With Air Cushion	$^{+1.0}_{0}$ (Up to 360), $^{+1.4}_{0}$ (Up to 1000), $^{+1.8}_{0}$ (Up to 1500)					$^{+1.0}_{0}$ (Up to 360), $^{+1.4}_{0}$ (Up to 1000), $^{+1.8}_{0}$ (Up to 1500)				
Operating Piston Speed mm/s		50 to 1000 (Please use within the allowable absorbed energy.)					50 to 1000 (Please use within the allowable absorbed energy.)				
Cushion		Air cushion/rubber cushion can be selected					Air cushion/rubber cushion can be selected				
Effective air cushion length mm		8.6	13.4	13.4	15.4	15.4	8.6	13.4	13.4	15.4	15.4
Lubrication		Not required (When lubricating, use turbine oil Class 1 ISO VG32)					Not required (When lubricating, use turbine oil Class 1 ISO VG32)				
Holding Force N		980	1569	2451	3922	6178	980	1569	2451	3922	6178
Allowable Absorbed Energy J	With Rubber Cushion	0.9	1.6	1.6	3.3	5.8	0.9	1.6	1.6	3.3	5.8
	With Air Cushion	3.7	8.0	14.4	25.4	45.6	3.7	8.0	14.4	25.4	45.6

Brake Valve Electrical Specifications

Item	Specifications		
Rated voltage (V)	100 AC (50/60 Hz)	200 AC (50/60 Hz)	24 DC
Starting current (A)	0.056/0.044	0.028/0.022	0.075
Holding current (A)	0.028/0.022	0.014/0.011	0.075
Power consumption (W)	1.8/1.4		1.8
Heat Resistance Class	Class B (Molded Coil)		

*1: 100/200 VAC coils can be used at 110/220 VAC (60 Hz).

***2: Valve specifications are the same as standard 4KB2. For details, please refer to "Directional Control Valve ①" (No. RJ-011AA). However, the model number at the time of order will be different, so please contact us.**

Stroke

Bore Size (mm)	Standard Stroke (mm)	Max Stroke (mm)	Manufacturable Stroke (mm)	Min Stroke (mm)
ø40	25, 50, 75, 100 150, 200, 250 300, 350, 400 450, 500	600	800	1
ø50			1200	
ø63				
ø80		700	1400	
ø100		800	1500	

*1: If the Max Stroke is exceeded, product specifications may not be met depending on the conditions, so please consult us. Also, please refer to Intro 29.
*2: Intermediate strokes can be manufactured in 1 mm increments.
*3: Minimum stroke varies depending on the switch mounting method. Please refer to the minimum stroke with switch on P. 379, 380.
*4: With bellows, the manufacturable stroke is as follows.
ø40: 500 mm
ø50, ø63: 600 mm
ø80, ø100: 750 mm

Minimum stroke with switch

●T0/T5 type switch

	Different Surface Mounting	Same Surface Mounting		Intermediate Trunnion Mounting		Rod Side Trunnion Mounting	Head Side Trunnion Mounting
Number of Switches	2	1	2	1	2	1	1
ø32	20 (18)	20 (10)	70 (40)	100 (70)	100 (70)	50 (35)	50 (35)
ø40	20 (19)	20 (10)	55 (40)	100 (70)	100 (70)	50 (35)	50 (35)
ø50	21 (19)	21 (10)	21 (19)	102 (72)	102 (72)	49 (34)	51 (36)
ø63	21 (20)	21 (11)	21 (20)	107 (77)	107 (77)	54 (39)	56 (41)
ø80	21 (21)	20 (11)	21 (21)	117 (87)	117 (87)	53 (38)	60 (45)
ø100	21 (21)	19 (11)	21 (21)	126 (96)	126 (96)	64 (49)	69 (54)

Note: Note: ( ) indicates T□V (lead wire L-type).

●T8 type switch

	Different Surface Mounting	Same Surface Mounting		Intermediate Trunnion Mounting		Rod Side Trunnion Mounting	Head Side Trunnion Mounting
Number of Switches	2	1	2	1	2	1	1
ø32	19 (18)	19 (10)	67 (31)	97 (61)	97 (61)	49 (31)	49 (31)
ø40	19 (19)	19 (10)	52 (31)	97 (61)	97 (61)	49 (31)	49 (31)
ø50	19 (19)	18 (10)	19 (19)	97 (61)	97 (61)	48 (30)	48 (30)
ø63	20 (20)	18 (11)	20 (20)	102 (66)	102 (66)	53 (35)	53 (35)
ø80	21 (21)	17 (11)	21 (21)	112 (76)	112 (76)	51 (33)	57 (39)
ø100	21 (21)	17 (11)	21 (21)	121 (85)	121 (85)	61 (43)	67 (49)

Note: Note: ( ) indicates T□V (lead wire L-type).

● T2/T3 type switch

	Different Surface Mounting	Same Surface Mounting		Intermediate Trunnion Mounting		Rod Side Trunnion Mounting	Head Side Trunnion Mounting
Number of Switches	2	1	2	1	2	1	1
ø32	20 (11)	20 (6)	70 (40)	100 (70)	100 (70)	50 (35)	50 (35)
ø40	20 (11)	20 (6)	55 (40)	100 (70)	100 (70)	50 (35)	50 (35)
ø50	21 (11)	21 (6)	21 (11)	102 (72)	102 (72)	49 (34)	51 (36)
ø63	21 (12)	21 (7)	21 (12)	107 (77)	107 (77)	54 (39)	56 (41)
ø80	20 (12)	20 (7)	20 (12)	117 (87)	117 (87)	53 (38)	60 (45)
ø100	19 (12)	19 (7)	19 (12)	126 (96)	126 (96)	64 (49)	69 (54)

*1: ( ) indicates T□V (L-shaped lead wire type).
*2: If the stroke is 15 mm or less, two switches may turn ON simultaneously. In this case, adjust the switch mounting positions so that they are further apart from each other.

● T1 type switch

	Different Surface Mounting	Same Surface Mounting		Intermediate Trunnion Mounting		Rod Side Trunnion Mounting	Head Side Trunnion Mounting
Number of Switches	2	1	2	1	2	1	1
ø32	19 (11)	19 (6)	68 (38)	98 (68)	98 (68)	49 (34)	49 (34)
ø40	19 (11)	19 (6)	53 (38)	98 (68)	98 (68)	49 (34)	49 (34)
ø50	20 (11)	20 (6)	20 (11)	100 (70)	100 (70)	48 (33)	50 (35)
ø63	20 (12)	20 (7)	20 (12)	105 (75)	105 (75)	53 (38)	55 (40)
ø80	19 (12)	19 (7)	19 (12)	115 (85)	115 (85)	52 (37)	59 (44)
ø100	18 (12)	18 (7)	18 (12)	124 (94)	124 (94)	63 (48)	68 (53)

*1: ( ) indicates T□V (L-shaped lead wire type).
*2: If the stroke is 15 mm or less, two switches may turn ON simultaneously. In this case, adjust the switch mounting positions so that they are further apart from each other.

Minimum stroke with switch

●T2W/T3W type switch

	Different Surface Mounting	Same Surface Mounting		Intermediate Trunnion Mounting		Rod Side Trunnion Mounting	Head Side Trunnion Mounting
Number of Switches	2	1	2	1	2	1	1
ø32	23 (12)	23 (8)	75 (45)	105 (75)	105 (75)	53 (38)	53 (38)
ø40	23 (12)	23 (8)	60 (45)	105 (75)	105 (75)	53 (38)	53 (38)
ø50	23 (13)	23 (8)	23 (13)	107 (77)	107 (77)	51 (36)	53 (38)
ø63	23 (13)	23 (8)	23 (13)	112 (82)	112 (82)	56 (41)	58 (43)
ø80	22 (14)	22 (8)	22 (14)	122 (92)	122 (92)	55 (40)	62 (47)
ø100	22 (14)	22 (8)	22 (14)	131 (101)	131 (101)	66 (51)	72 (57)

*1: ( ) indicates T□V (L-shaped lead wire type).
*2: If the stroke is 15 mm or less, two switches may turn ON simultaneously. In this case, adjust the switch mounting positions so that they are further apart from each other.

●T2YD type switch

	Different Surface Mounting	Same Surface Mounting		Intermediate Trunnion Mounting		Rod Side Trunnion Mounting	Head Side Trunnion Mounting
Number of Switches	2	1	2	1	2	1	1
ø32	23	23	75	105	105	53	53
ø40	23	23	60	105	105	53	53
ø50	23	23	23	107	107	51	53
ø63	23	23	23	112	112	56	58
ø80	22	22	22	122	122	55	62
ø100	22	22	22	131	131	66	72

Weight Table

Unit: kg

Bore Size (mm)	Product weight when stroke = 0 mm						Stroke: Added weight per 50 mm	Switch Weight	Switch Mounting Bracket Weight	Accessory Weight	
	Basic type (00)	Foot Type (LB)	Flange Type (FA, FB)	Single clevis type (CA)	Double Clevis Type (CB)	Trunnion Type (TA,TB,TC)				I	Y
ø40	1.75	1.89	2.16	1.94	1.94	2.09	0.17	Refer to the Weight listed in the Switch Specifications on P. 1457.	0.024	0.09	0.14
ø50	2.91	3.07	3.54	3.32	3.32	3.40	0.23		0.022	0.20	0.33
ø63	3.94	4.28	4.96	4.49	4.51	4.82	0.25		0.022	0.20	0.33
ø80	7.81	8.24	9.38	9.08	9.09	9.30	0.40		0.026	0.52	0.96
ø100	12.08	12.94	14.40	13.80	13.83	14.65	0.51		0.024	0.48	0.92

(Example) Product Weight of JSG-LB-50B-200-T0H-D-Y

Product weight for 0 mm stroke ..... 3.07 kg
Additional weight for 200 mm stroke ..... 0.23×200/50=0.92 kg
Weight of 2 T0H switches ..... 0.018×2=0.036 kg
Weight of 2 mounting brackets ..... 0.022×2=0.044 kg
Weight of rod clevis ..... 0.33 kg
Product weight ..... 3.07+0.92+0.036+0.044+0.33=4.4 kg

Theoretical Thrust Table

(Unit: N)

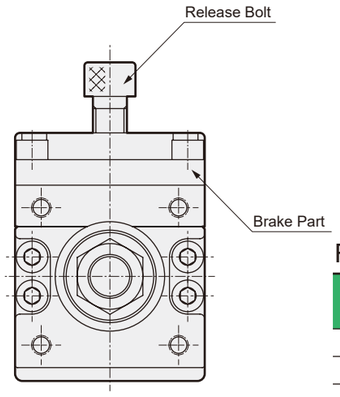
Bore Size (mm)	Operating Direction	Operating Pressure MPa							
		0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
ø40	Push	3.77×10^{2}	5.03×10^{2}	6.28×10^{2}	7.54×10^{2}	8.80×10^{2}	1.01×10^{3}	1.13×10^{3}	1.26×10^{3}
	Pull	3.17×10^{2}	4.22×10^{2}	5.28×10^{2}	6.33×10^{2}	7.39×10^{2}	8.44×10^{2}	9.50×10^{2}	1.06×10^{3}
ø50	Push	5.89×10^{2}	7.85×10^{2}	9.82×10^{2}	1.18×10^{3}	1.37×10^{3}	1.57×10^{3}	1.77×10^{3}	1.96×10^{3}
	Pull	4.95×10^{2}	6.60×10^{2}	8.25×10^{2}	9.90×10^{2}	1.15×10^{3}	1.32×10^{3}	1.48×10^{3}	1.65×10^{3}
ø63	Push	9.35×10^{2}	1.25×10^{3}	1.56×10^{3}	1.87×10^{3}	2.18×10^{3}	2.49×10^{3}	2.81×10^{3}	3.12×10^{3}
	Pull	8.41×10^{2}	1.12×10^{3}	1.40×10^{3}	1.68×10^{3}	1.96×10^{3}	2.24×10^{3}	2.52×10^{3}	2.80×10^{3}
ø80	Push	1.51×10^{3}	2.01×10^{3}	2.51×10^{3}	3.02×10^{3}	3.52×10^{3}	4.02×10^{3}	4.52×10^{3}	5.03×10^{3}
	Pull	1.36×10^{3}	1.81×10^{3}	2.27×10^{3}	2.72×10^{3}	3.17×10^{3}	3.63×10^{3}	4.08×10^{3}	4.54×10^{3}
ø100	Push	2.36×10^{3}	3.14×10^{3}	3.93×10^{3}	4.71×10^{3}	5.50×10^{3}	6.28×10^{3}	7.07×10^{3}	7.85×10^{3}
	Pull	2.14×10^{3}	2.86×10^{3}	3.57×10^{3}	4.29×10^{3}	5.00×10^{3}	5.72×10^{3}	6.43×10^{3}	7.15×10^{3}

Mounting Bracket Model No. Notation

Bore Size (mm) / Mounting Bracket	ø40	ø50	ø63	ø80	ø100
Foot (LB) *1	JSG-LB-40	JSG-LB-50	JSG-LB-63	SCG-LB-80	SCG-LB-100
Flange (FA) (FB) *2	JSG-FA-40	JSG-FA-50	JSG-FA-63	SCG-FA-80	SCG-FA-100
Single Clevis (CA)	SCG-CA-40	SCG-CA-50	SCG-CA-63	SCG-CA-80	SCG-CA-100
Double Yoke Clevis (CB) *3	SCG-CB-40	SCG-CB-50	SCG-CB-63	SCG-CB-80	SCG-CB-100

*1: Foot (LB) type mounting brackets are 2 pcs./set.
*2: For flange (FA) for bellows equipped type, please specify "JSG-FA-(Bore Size)-J".
*3: Includes pin, cotter pin, and flat washer.
*4: Mounting bolts are included with each mounting bracket.

Manual Release Method for Brake Unit



Screwing a bolt into the manual release port (female thread on the upper part of the brake unit) releases the brake. (Excessive screwing of the bolt may cause brake failure. Check the appropriate screw-in depth in the table below.) Always remove the bolt during normal use.

Release Bolt Size

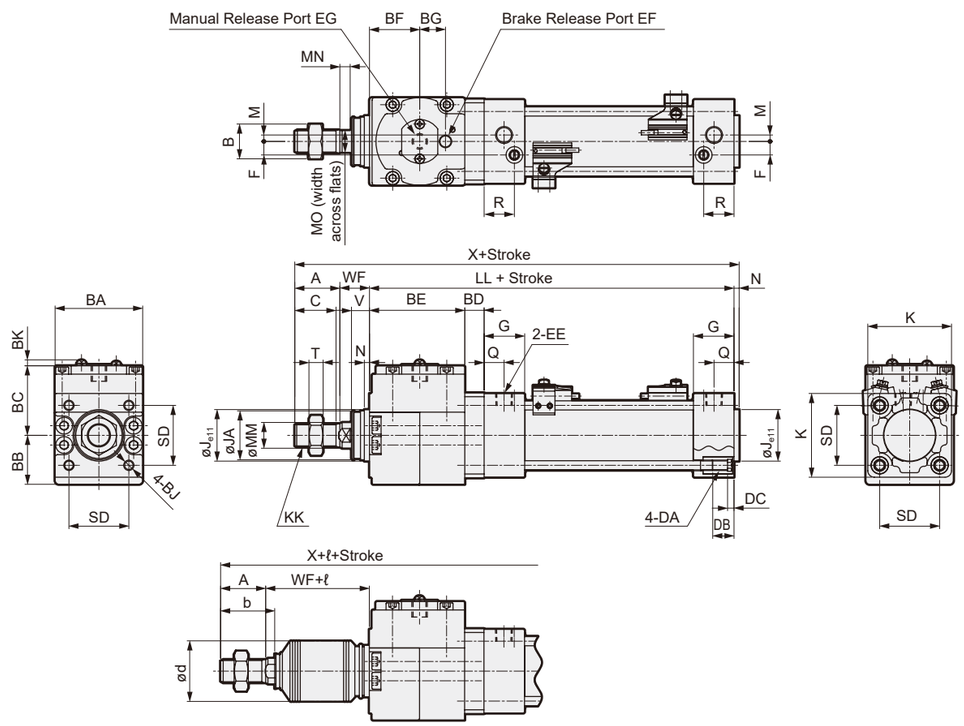
Bore Size	Bolt Thread Diameter	Bolt Length		Appropriate Tightening Amount
		JSG	JSG-V	
ø40	M12×1.75	16 or more	40 or more	3 rotations or less
ø50	M12×1.75	16 or more	40 or more	4 rotations or less
ø63	M14×2	16 or more	40 or more	4 rotations or less
ø80	M16×2	20 or more	40 or more	4.5 rotations or less
ø100	M18×2.5	20 or more	50 or more	5 rotations or less

MEMO

With Brake / With Lock
ULK□
JSK2/ JSM2
JSG
JSC3, JSC4
USSD
UFCD
USC
Cylinder Switch
Ending

Dimensional Drawings

● Basic type (00)



[With Bellows]

Code / Bore Size (mm)	A	B	BA	BB	BC	BD	BE	BF	BG	BJ	BK	C	DA	DB	DC	EE	EF	EG	F	G	J	JA	K
ø40	30	22	57	31.5	46.5	14	63	32.5	20	M6 Depth 12	4.6	27	M6	16	5	Rc1/4	Rc1/8	M12	9	27	35	31	52
ø50	35	27	68	38	54	15	74	39	20	M8 Depth 12	4.6	32	M8	16	5	Rc1/4	Rc1/8	M12	10.5	31.5	40	38	65
ø63	35	27	78	43	59	15	88	44.5	27	M8 Depth 14	4.6	32	M8	16	5	Rc3/8	Rc1/4	M14	12	31.5	45	38	75
ø80	40	32	98	53	72.5	23	108	54.5	27	M10 Depth 16	4.6	37	M10	16	5	Rc3/8	Rc1/4	M16	14	38	45	43	95
ø100	40	41	118	63	80.5	22.5	128.5	65.5	35	M10 Depth 18	4.6	37	M10	16	5	Rc 1/2	Rc3/8	M18	15	38	55	51	114

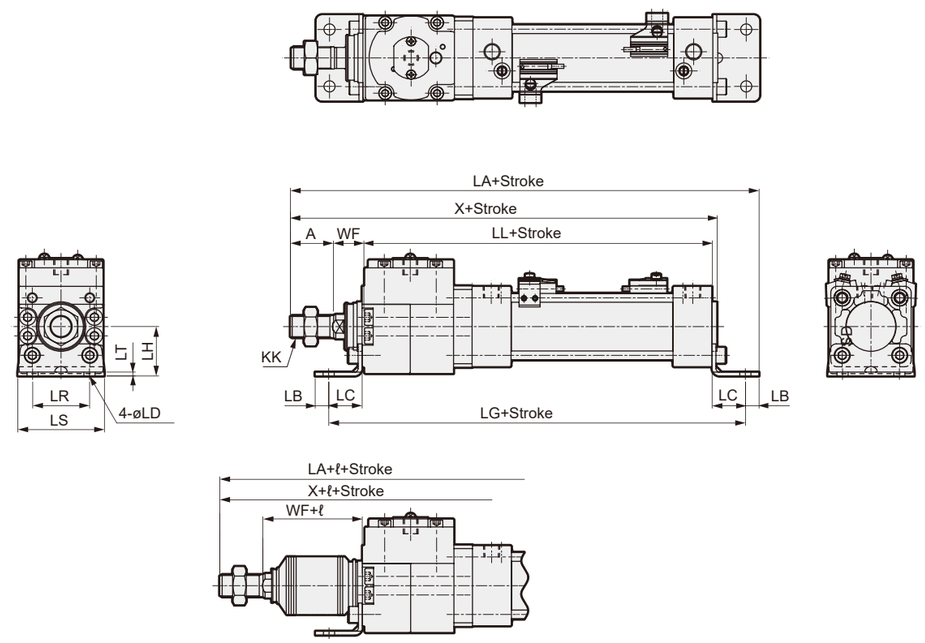
Code / Bore Size (mm)	KK	LL *1	M	MM	MN	MO	N	Q	R	SD	T	V	WF	X *1
ø40	M14x1.5	161 (167)	4	16	6	14	4	14	19	38	8	13	21	216 (222)
ø50	M18x1.5	183 (191)	5	20	8	17	4	15.5	23.5	46.5	11	14	23	245 (253)
ø63	M18x1.5	197 (205)	9	20	8	17	4	16.5	21.5	56.5	11	14	23	259 (267)
ø80	M22×1.5	245 (255)	11.5	25	11	22	4	19	28	72	13	20	32	321 (331)
ø100	M26x1.5	265 (275)	17	30	13	27	4	19	28	89	16	20	32	341 (351)

Code / Bore Size (mm)	With Bellows																
	A	b	d	WF	ℓ												
					50 or less	Over 50 to 100 or Less	Over 100 to 150 or Less	Over 150 to 200 or Less	Over 200 to 300 or Less	Over 300 to 400 or Less	Over 400 to 500 or Less	Over 500 to 600 or Less	Over 600 up to 700	Over 700 up to 750	Over 750 up to 800	Over 800	
ø40	30	35	40	21	30	43	55	68	93	118	143	0.35×Stroke - 32					
ø50	35	42	47	23	31	44	56	69	94	119	144	169	0.35×Stroke - 41				
ø63	35	42	47	23	31	44	56	69	94	119	144	169	0.35×Stroke - 41				
ø80	40	50	53	32	29	42	54	67	92	117	142	167	192	204	217	0.35×Stroke - 63	
ø100	40	52.5	61	32	29	42	54	67	92	117	142	167	192	204	217	0.35×Stroke - 63	

*1: Dimensions in ( ) indicate the case of rubber cushion type.
***2: For dimensions with each switch, refer to P. 404.**
*3: For outline dimensions of models with valve (JSG-V), please refer to P. 398.

Dimensional Drawings

● Axial Foot Type (LB)



[With Bellows]

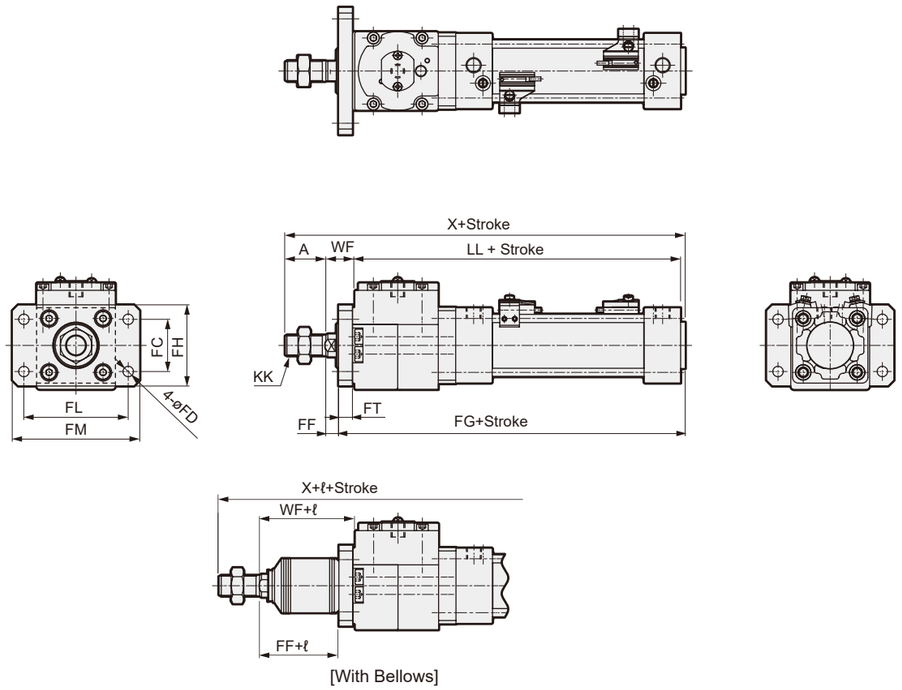
Code / Bore Size (mm)	A	LA *1	LB	LC	LD	LG *1	LH	LR	LS	LT	KK	LL *1	WF	X *1
ø40	30	247 (253)	11	24	9	209 (215)	33	38	55	3.2	M14x1.5	161 (167)	21	216 (222)
ø50	35	279 (287)	11	27	9	237 (245)	40	46	70	3.2	M18x1.5	183 (191)	23	245 (253)
ø63	35	296 (304)	14	27	12	251 (259)	48	56	80	4.5	M18x1.5	197 (205)	23	259 (267)
ø80	40	361 (371)	14	30	12	305 (315)	55	72	95	4.5	M22×1.5	245 (255)	32	321 (331)
ø100	40	385 (395)	16	32	14	329 (339)	65	89	114	6	M26x1.5	265 (275)	32	341 (351)

Code / Bore Size (mm)	With Bellows											
	ℓ											
	50 or less	Over 50 to 100 or Less	Over 100 to 150 or Less	Over 150 to 200 or Less	Over 200 to 300 or Less	Over 300 to 400 or Less	Over 400 to 500 or Less	Over 500 to 600 or Less	Over 600 up to 700	Over 700 up to 750	Over 750 up to 800	Over 800
ø40	30	43	55	68	93	118	143	0.35×Stroke - 32				
ø50	31	44	56	69	94	119	144	169	0.35×Stroke - 41			
ø63	31	44	56	69	94	119	144	169	0.35×Stroke - 41			
ø80	29	42	54	67	92	117	142	167	192	204	217	0.35×Stroke - 63
ø100	29	42	54	67	92	117	142	167	192	204	217	0.35×Stroke - 63

*1: Dimensions in ( ) indicate the case of rubber cushion type.
***2: For dimensions with each switch, refer to P. 404.**
*3: For outline dimensions of models with valve (JSG-V), please refer to P. 398.

Dimensional Drawings

●Rod Side Flange Type (FA)



[With Bellows]

Code	Rod Side Flange Type (FA) Mounting Dimensions												
Bore Size (mm)	A	FC	FD	FF	FG *1	FH	FL	FM	FT	KK	LL *1	WF	X *1
ø40	30	46	9	11	175 (181)	65	83	101	10	M14x1.5	161 (167)	21	216 (222)
ø50	35	52	9	11	199 (207)	77	100	120	12	M18x1.5	183 (191)	23	245 (253)
ø63	35	62	9	11	213 (221)	92	115	135	12	M18x1.5	197 (205)	23	259 (267)
ø80	40	63	12	16	265 (275)	100	126	153	16	M22×1.5	245 (255)	32	321 (331)
ø100	40	75	14	16	285 (295)	120	150	178	16	M26x1.5	265 (275)	32	341 (351)

Code	With Bellows											
Bore Size (mm)	ℓ											
	50 or less	Over 50 to 100 or Less	Over 100 to 150 or Less	Over 150 to 200 or Less	Over 200 to 300 or Less	Over 300 to 400 or Less	Over 400 to 500 or Less	Over 500 to 600 or Less	Over 600 up to 700	Over 700 up to 750	Over 750 up to 800	Over 800
ø40	30	43	55	68	93	118	143	0.35×Stroke - 32				
ø50	31	44	56	69	94	119	144	169	0.35×Stroke - 41			
ø63	31	44	56	69	94	119	144	169	0.35×Stroke - 41			
ø80	29	42	54	67	92	117	142	167	192	204	217	0.35×Stroke - 63
ø100	29	42	54	67	92	117	142	167	192	204	217	0.35×Stroke - 63

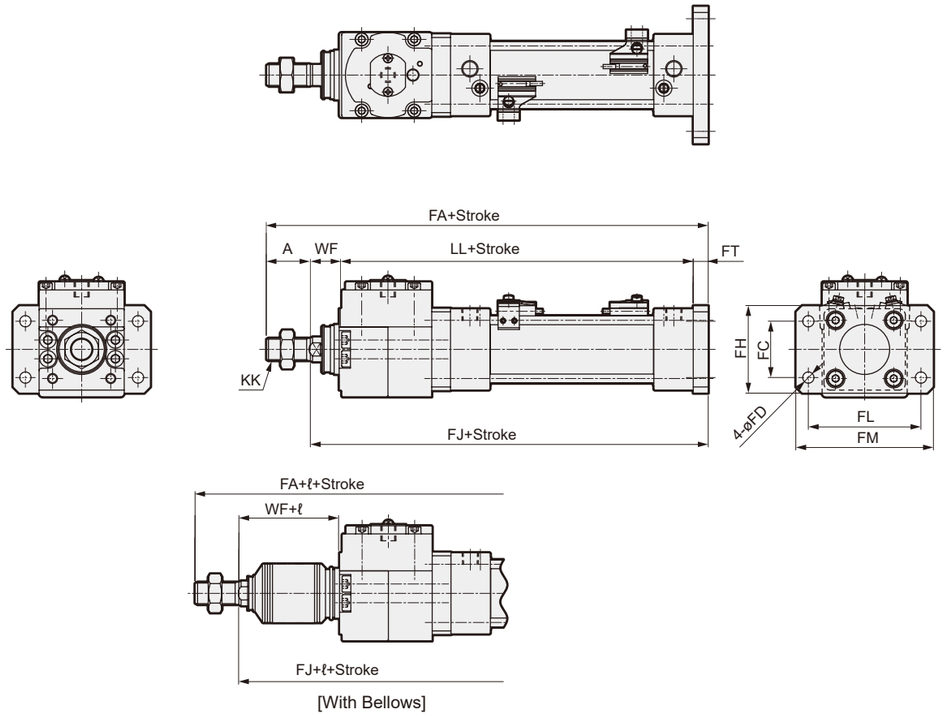
*1: Dimensions in ( ) indicate the case of rubber cushion type.

***2: For dimensions with each switch, refer to P. 404.**

*3: For outline dimensions of models with valve (JSG-V), please refer to P. 398.

Dimensional Drawings

●Head Side Flange Type (FB)



[With Bellows]

Code	Head Side Flange Type (FB) Mounting Dimensions											
Bore Size (mm)	A	FA *1	FC	FD	FH	FJ *1	FL	FM	FT	KK	LL *1	WF
ø40	30	222 (228)	46	9	65	192 (198)	83	101	10	M14x1.5	161 (167)	21
ø50	35	253 (261)	52	9	77	218 (226)	100	120	12	M18x1.5	183 (191)	23
ø63	35	267 (275)	62	9	92	232 (240)	115	135	12	M18x1.5	197 (205)	23
ø80	40	333 (343)	63	12	100	293 (303)	126	153	16	M22×1.5	245 (255)	32
ø100	40	353 (363)	75	14	120	313 (323)	150	178	16	M26x1.5	265 (275)	32

Code	With Bellows											
Bore Size (mm)	ℓ											
	50 or less	Over 50 to 100 or Less	Over 100 to 150 or Less	Over 150 to 200 or Less	Over 200 to 300 or Less	Over 300 to 400 or Less	Over 400 to 500 or Less	Over 500 to 600 or Less	Over 600 up to 700	Over 700 up to 750	Over 750 up to 800	Over 800
ø40	30	43	55	68	93	118	143	0.35×Stroke - 32				
ø50	31	44	56	69	94	119	144	169	0.35×Stroke - 41			
ø63	31	44	56	69	94	119	144	169	0.35×Stroke - 41			
ø80	29	42	54	67	92	117	142	167	192	204	217	0.35×Stroke - 63
ø100	29	42	54	67	92	117	142	167	192	204	217	0.35×Stroke - 63

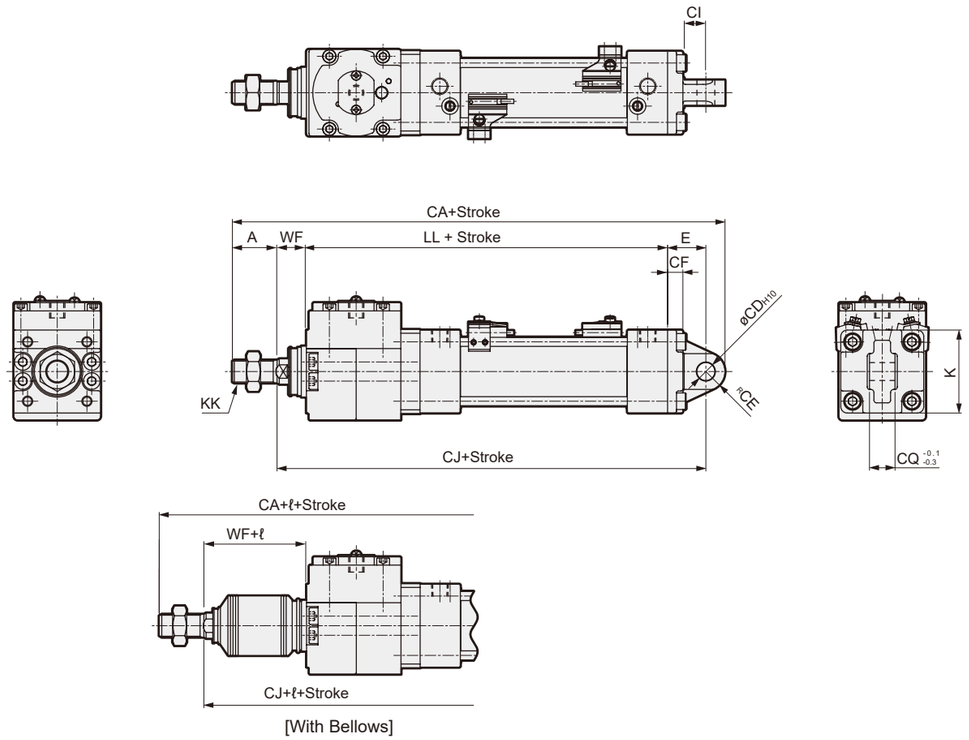
*1: Dimensions in ( ) indicate the case of rubber cushion type.

***2: For dimensions with each switch, refer to P. 404.**

*3: For outline dimensions of models with valve (JSG-V), please refer to P. 398.

Dimensional Drawings

●Single Clevis Type (CA)



[With Bellows]

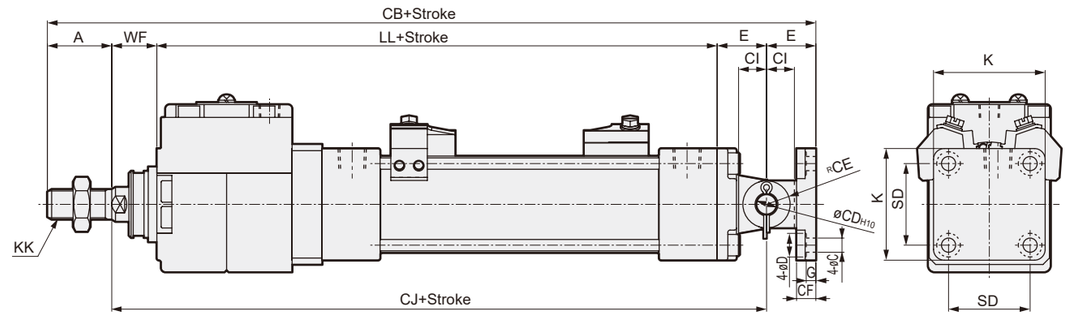
Code	Single Clevis Type (CA) Mounting Dimensions											
Bore Size (mm)	A	CA *1	CD	CE	CF	CI	CJ *1	CQ	E	KK	LL *1	WF
ø40	30	246 (252)	10	11	9	13	205 (211)	14	23	M14x1.5	161 (167)	21
ø50	35	286 (294)	14	15	12	17	236 (244)	20	30	M18x1.5	183 (191)	23
ø63	35	300 (308)	14	15	12	17	250 (258)	20	30	M18x1.5	197 (205)	23
ø80	40	382 (392)	22	23	15	26	319 (329)	30	42	M22×1.5	245 (255)	32
ø100	40	402 (412)	22	23	15	26	339 (349)	30	42	M26x1.5	265 (275)	32

Code	With Bellows											
	ℓ											
Bore Size (mm)	50 or less	Over 50 to 100 or Less	Over 100 to 150 or Less	Over 150 to 200 or Less	Over 200 to 300 or Less	Over 300 to 400 or Less	Over 400 to 500 or Less	Over 500 to 600 or Less	Over 600 up to 700	Over 700 up to 750	Over 750 up to 800	Over 800
ø40	30	43	55	68	93	118	143	0.35×Stroke - 32				
ø50	31	44	56	69	94	119	144	169	0.35×Stroke - 41			
ø63	31	44	56	69	94	119	144	169	0.35×Stroke - 41			
ø80	29	42	54	67	92	117	142	167	192	204	217	0.35×Stroke - 63
ø100	29	42	54	67	92	117	142	167	192	204	217	0.35×Stroke - 63

*1: Dimensions in ( ) indicate the case of rubber cushion type.
***2: For dimensions with each switch, refer to P. 404.**
*3: For outline dimensions of models with valve (JSG-V), please refer to P. 398.

Dimensional Drawings

●Single Clevis Type (CA) with Bracket (Option Code B2)

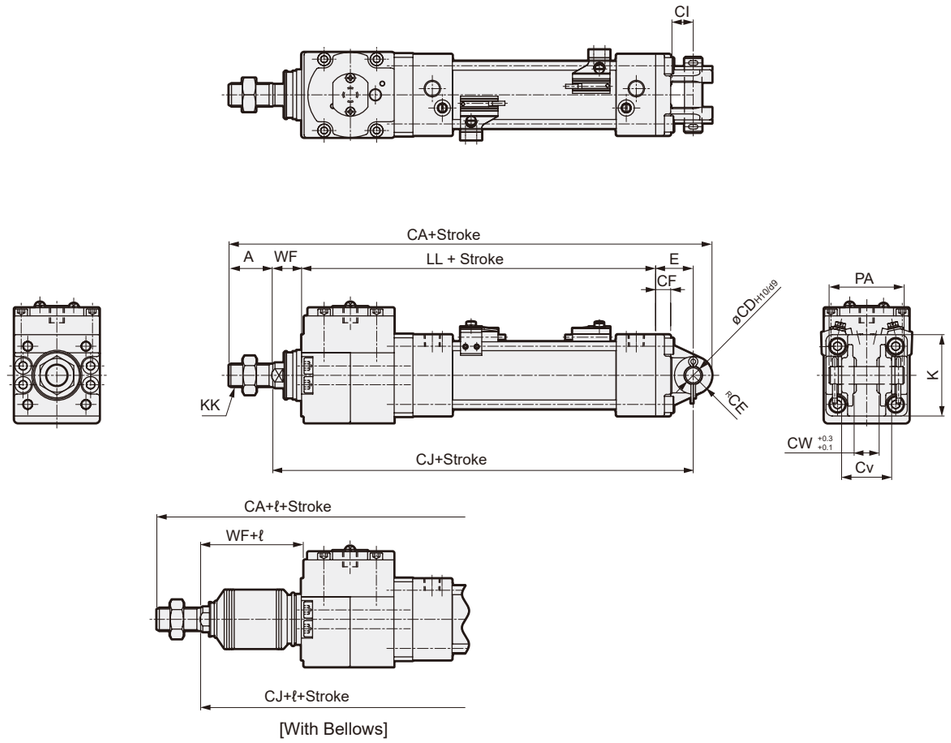


Code	Single Clevis Type (CA) With Bracket (Option Code B2) Mounting Dimensions															
Bore Size (mm)	A	E	KK	LL	WF	C	CB	CD	CE	CF	CI	CJ	D	G	K	SD
ø40	30	23	M14x1.5	161 (167)	21	6.6	258 (264)	10	11	9	13	205 (211)	11	4.5	52	38
ø50	35	30	M18x1.5	183 (191)	23	9	301 (309)	14	15	12	17	236 (244)	14	6.5	65	46.5
ø63	35	30	M18x1.5	197 (205)	23	9	315 (323)	14	15	12	17	250 (258)	14	6.5	75	56.5
ø80	40	42	M22×1.5	245 (255)	32	11	401 (411)	22	23	15	26	319 (329)	17	8.5	95	72
ø100	40	42	M26x1.5	265 (275)	32	11	421 (431)	22	23	15	26	339 (349)	17	8.5	114	89

*1: Dimensions in ( ) indicate the case of rubber cushion type.
***2: For dimensions with each switch, refer to P. 404.**
*3: For outline dimensions of models with valve (JSG-V), please refer to P. 398.

Dimensional Drawings

●Double clevis type (CB)



[With Bellows]

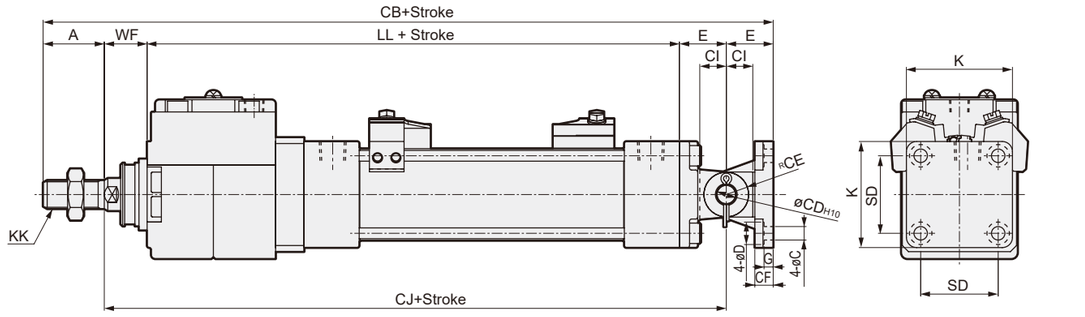
Code	Double Clevis Type (CB) Mounting Dimensions													
Bore Size (mm)	A	CA *1	CD	CE	CF	CI	CJ *1	Cv	CW	E	K	KK	LL *1	PA	WF
ø40	30	246 (252)	10	11	9	13	205 (211)	28	14	23	52	M14x1.5	161 (167)	44	21
ø50	35	286 (294)	14	15	12	17	236 (244)	40	20	30	65	M18x1.5	183 (191)	60	23
ø63	35	300 (308)	14	15	12	17	250 (258)	40	20	30	75	M18x1.5	197 (205)	60	23
ø80	40	382 (392)	22	23	15	26	319 (329)	60	30	42	95	M22×1.5	245 (255)	82	32
ø100	40	402 (412)	22	23	15	26	339 (349)	60	30	42	114	M26x1.5	265 (275)	82	32

Code	With Bellows											
Bore Size (mm)	ℓ											
	50 or less	Over 50 to 100 or Less	Over 100 to 150 or Less	Over 150 to 200 or Less	Over 200 to 300 or Less	Over 300 to 400 or Less	Over 400 to 500 or Less	Over 500 to 600 or Less	Over 600 up to 700	Over 700 up to 750	Over 750 up to 800	Over 800
ø40	30	43	55	68	93	118	143	0.35×Stroke - 32				
ø50	31	44	56	69	94	119	144	169	0.35×Stroke - 41			
ø63	31	44	56	69	94	119	144	169	0.35×Stroke - 41			
ø80	29	42	54	67	92	117	142	167	192	204	217	0.35×Stroke - 63
ø100	29	42	54	67	92	117	142	167	192	204	217	0.35×Stroke - 63

*1: Dimensions in ( ) indicate the case of rubber cushion type.
***2: For dimensions with each switch, refer to P. 404.**
*3: For outline dimensions of models with valve (JSG-V), please refer to P. 398.

Dimensional Drawings

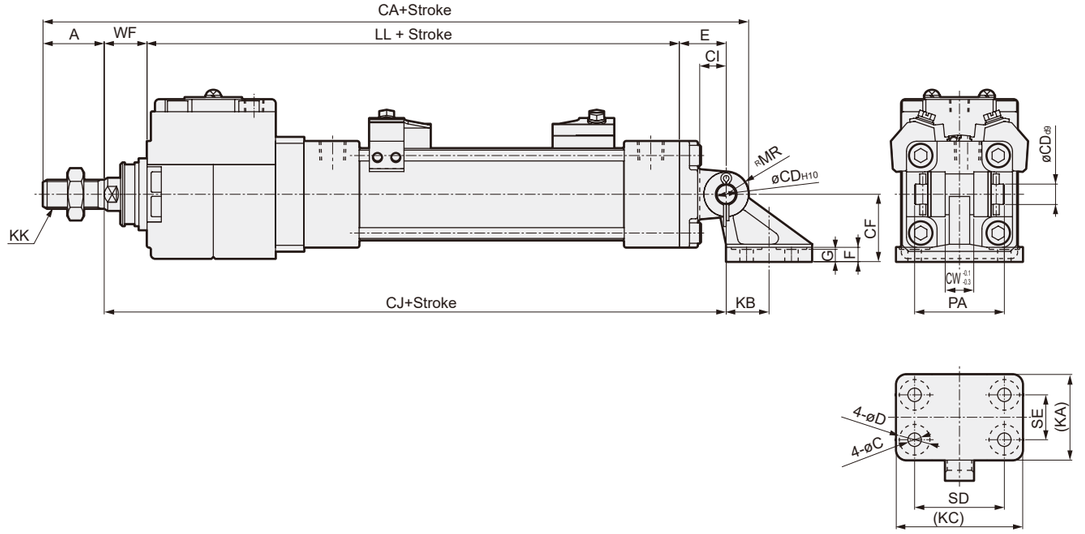
●Double clevis type (CB) with bracket (Option Code B1)



Code	Double Clevis Type (CB) With Bracket (Option Code B1) Mounting Dimensions															
Bore Size (mm)	A	E	KK	LL	WF	C	CB	CD	CE	CF	CI	CJ	D	G	K	SD
ø40	30	23	M14x1.5	161 (167)	21	6.6	258 (264)	10	11	9	13	205 (211)	11	4.5	52	38
ø50	35	30	M18x1.5	183 (191)	23	9	301 (309)	14	15	12	17	236 (244)	14	6.5	65	46.5
ø63	35	30	M18x1.5	197 (205)	23	9	315 (323)	14	15	12	17	250 (258)	14	6.5	75	56.5
ø80	40	42	M22×1.5	245 (255)	32	11	401 (411)	22	23	15	26	319 (329)	17	8.5	95	72
ø100	40	42	M26x1.5	265 (275)	32	11	421 (431)	22	23	15	26	339 (349)	17	8.5	114	89

*1: Dimensions in ( ) indicate the case of rubber cushion type.
***2: For dimensions with each switch, refer to P. 404.**
*3: For outline dimensions of models with valve (JSG-V), please refer to P. 398.

●Double clevis type (CB) with bracket (Option Code B3)

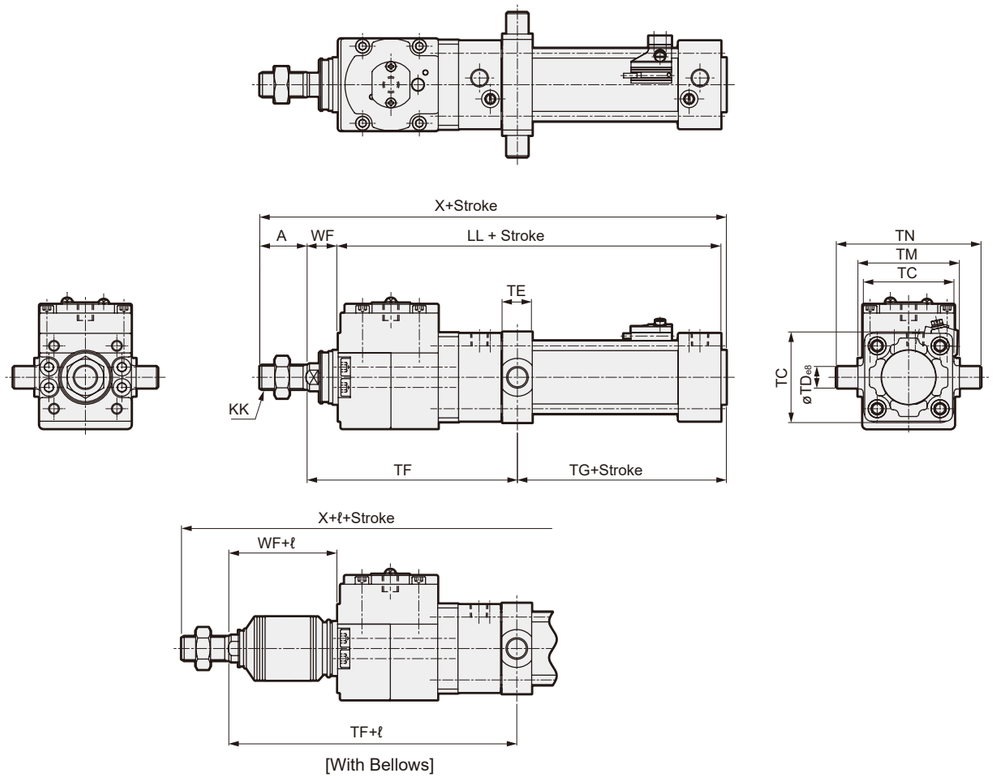


Code	Double clevis type (CB) with bracket (Option Code B3) Mounting dimensions																		
Bore Size (mm)	A	CI	E	KK	LL	WF	C	CA	CD	MR	CF	CJ	D	F	G	KA	KB	KC	SD	SE
ø40	30	13	23	M14x1.5	161 (167)	21	6.6	246 (252)	10	11	33	205 (211)	15	7	6	42	21	62	44	22
ø50	35	17	30	M18x1.5	183 (191)	23	9	286 (294)	14	15	45	236 (244)	18	8	7	53	28	81	60	30
ø63	35	17	30	M18x1.5	197 (205)	23	9	300 (308)	14	15	45	250 (258)	18	8	7	53	28	81	60	30
ø80	40	26	42	M22×1.5	245 (255)	32	11	382 (392)	22	23	65	319 (329)	22	10	9	73	41.5	111	86	45
ø100	40	26	42	M26x1.5	265 (275)	32	11	402 (412)	22	23	65	339 (349)	22	10	9	73	41.5	111	86	45

*1: Dimensions in ( ) indicate the case of rubber cushion type.
***2: For dimensions with each switch, refer to P. 404.**
*3: For outline dimensions of models with valve (JSG-V), please refer to P. 398.

Dimensional Drawings

●Rod side trunnion type (TA)



[With Bellows]

Code	Rod Side Trunnion Type (TA) Mounting Dimensions											
Bore Size (mm)	A	KK	LL *1	WF	TC	TD	TE	TF	TG *1	TM	TN	X *1
ø40	30	M14x1.5	161 (167)	21	57	16	22	137	49 (55)	63	95	216 (222)
ø50	35	M18x1.5	183 (191)	23	67	16	22	155.5	54.5 (62.5)	75	107	245 (253)
ø63	35	M18x1.5	197 (205)	23	82	20	28	172.5	51.5 (59.5)	90	130	259 (267)
ø80	40	M22×1.5	245 (255)	32	100	20	34	219	62 (72)	110	150	321 (331)
ø100	40	M26x1.5	265 (275)	32	121	25	40	242	59 (69)	132	182	341 (351)

Code	With Bellows											
	ℓ											
Bore Size (mm)	50 or less	Over 50 to 100 or Less	Over 100 to 150 or Less	Over 150 to 200 or Less	Over 200 to 300 or Less	Over 300 to 400 or Less	Over 400 to 500 or Less	Over 500 to 600 or Less	Over 600 up to 700	Over 700 up to 750	Over 750 up to 800	Over 800
ø40	30	43	55	68	93	118	143	0.35×Stroke - 32				
ø50	31	44	56	69	94	119	144	169	0.35×Stroke - 41			
ø63	31	44	56	69	94	119	144	169	0.35×Stroke - 41			
ø80	29	42	54	67	92	117	142	167	192	204	217	0.35×Stroke - 63
ø100	29	42	54	67	92	117	142	167	192	204	217	0.35×Stroke - 63

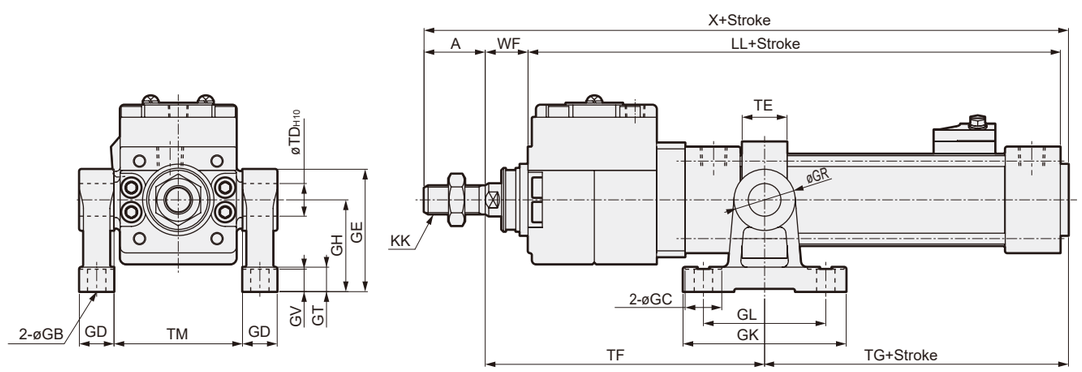
*1: Dimensions in ( ) indicate the case of rubber cushion type.

***2: For dimensions with each switch, refer to P. 404.**

*3: For outline dimensions of models with valve (JSG-V), please refer to P. 398.

Dimensional Drawings

●Rod side trunnion type (TA) with bracket (Option Code B4)



Code	Rod Side Trunnion Type (TA) with Bracket (Option Code B4) Mounting Dimensions																		
Bore Size (mm)	A	KK	LL	WF	X	TE	TF	TG	TM	GB	GC	GD	GE	GH	GK	GL	GR	GT	GV	TD
ø40	30	M14x1.5	93 (167)	33.5	216 (222)	22	137	49 (55)	63	9	18	17	60	45	80	60	30	12	11	16
ø50	35	M18x1.5	101 (191)	37	245 (253)	22	155.5	54.5 (63)	75	9	18	17	60	45	80	60	30	12	11	16
ø63	35	M18x1.5	105 (205)	35	259 (267)	28	172.5	51.5 (60)	90	11	22	20	80	60	100	70	40	14	13	20
ø80	40	M22×1.5	116 (255)	48	321 (331)	34	219	62 (72)	110	11	22	20	80	60	100	70	40	14	13	20
ø100	40	M26x1.5	128 (275)	53	341 (351)	40	242	59 (69)	132	13.5	24	26	100	75	120	90	50	17	16	25

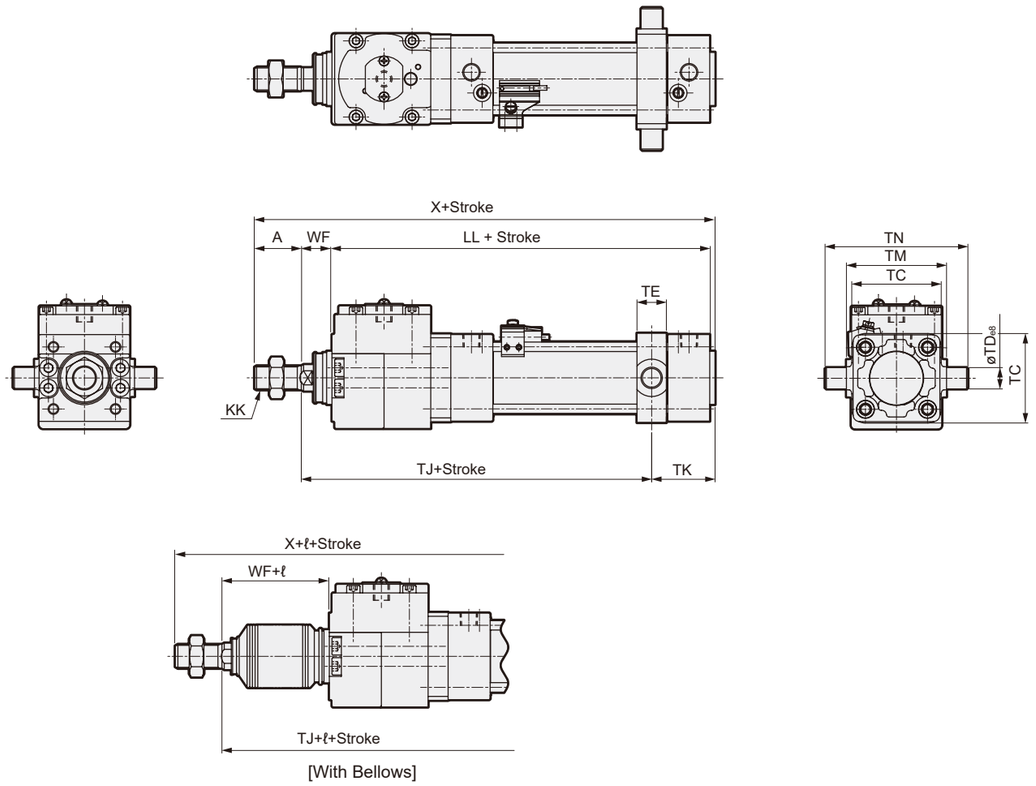
*1: Dimensions in ( ) indicate the case of rubber cushion type.

***2: For dimensions with each switch, refer to P. 404.**

*3: For outline dimensions of models with valve (JSG-V), please refer to P. 398.

Dimensional Drawings

●Head Side Trunnion (TB)



[With Bellows]

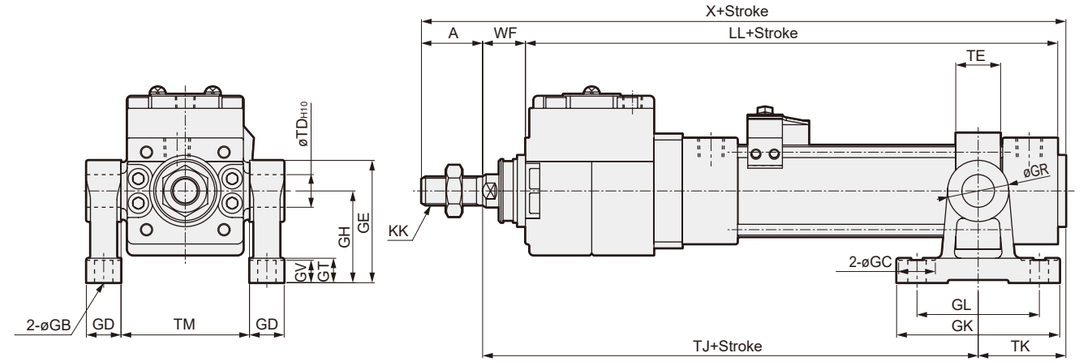
Code	Head Side Trunnion Type (TB) Mounting Dimensions												
Bore Size (mm)	A	EF	KK	LL *1	TC	TD	TE	TJ *1	TK	TM	TN	WF	X *1
ø40	30	Rc1/8	M14x1.5	161 (167)	57	16	22	143 (149)	43	63	95	21	216 (222)
ø50	35	Rc1/8	M18x1.5	183 (191)	67	16	22	162.5 (170.5)	47.5	75	107	23	245 (253)
ø63	35	Rc1/4	M18x1.5	197 (205)	82	20	28	173.5 (181.5)	50.5	90	130	23	259 (267)
ø80	40	Rc1/4	M22×1.5	245 (255)	100	20	34	221 (231)	60	110	150	32	321 (331)
ø100	40	Rc3/8	M26x1.5	265 (275)	121	25	40	238 (248)	63	132	182	32	341 (351)

Code	With Bellows											
Bore Size (mm)	ℓ											
	50 or less	Over 50 to 100 or Less	Over 100 to 150 or Less	Over 150 to 200 or Less	Over 200 to 300 or Less	Over 300 to 400 or Less	Over 400 to 500 or Less	Over 500 to 600 or Less	Over 600 up to 700	Over 700 up to 750	Over 750 up to 800	Over 800
ø40	30	43	55	68	93	118	143	0.35×Stroke - 32				
ø50	31	44	56	69	94	119	144	169	0.35×Stroke - 41			
ø63	31	44	56	69	94	119	144	169	0.35×Stroke - 41			
ø80	29	42	54	67	92	117	142	167	192	204	217	0.35×Stroke - 63
ø100	29	42	54	67	92	117	142	167	192	204	217	0.35×Stroke - 63

*1: Dimensions in ( ) indicate the case of rubber cushion type.
***2: For dimensions with each switch, refer to P. 404.**
*3: For outline dimensions of models with valve (JSG-V), please refer to P. 398.

Dimensional Drawings

●Head side trunnion type (TB) with bracket (Option Code B4)

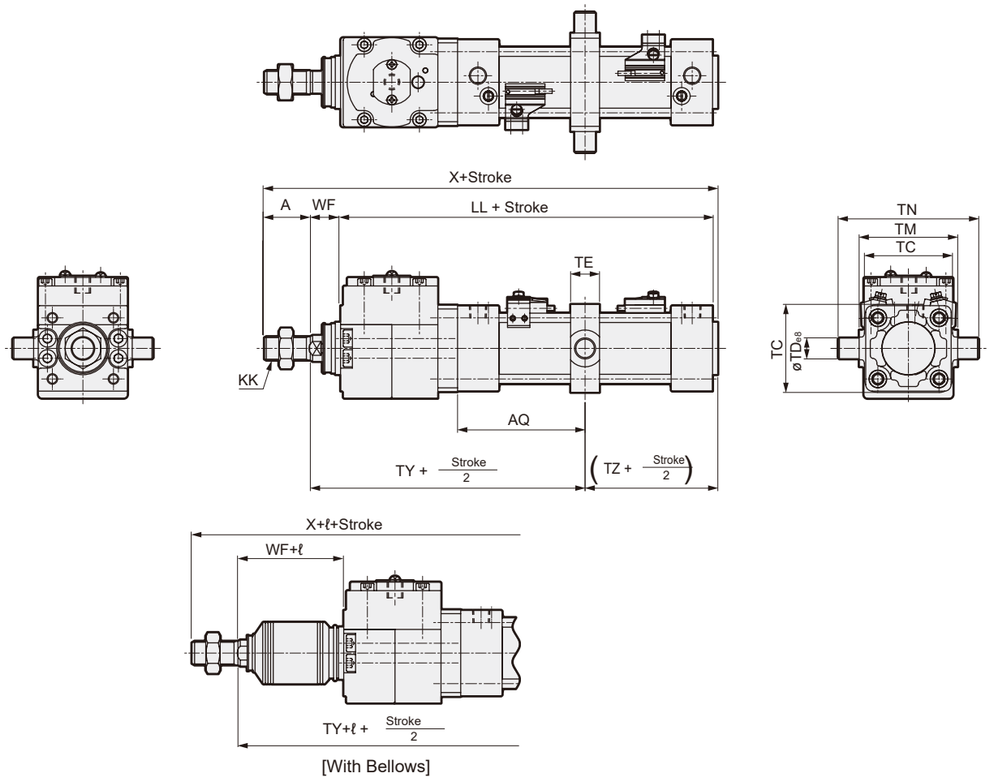


Code	Head Side Trunnion Type (TB) with Bracket (Option Code B4) Mounting Dimensions																		
Bore Size (mm)	A	KK	LL	WF	X	TE	TJ	TK	TM	GB	GC	GD	GE	GH	GK	GL	GR	GT	GV	TD
ø40	30	M14x1.5	93 (167)	33.5	216 (222)	22	143 (149)	43	63	9	18	17	60	45	80	60	30	12	11	16
ø50	35	M18x1.5	101 (191)	37	245 (253)	22	162.5 (170.5)	47.5	75	9	18	17	60	45	80	60	30	12	11	16
ø63	35	M18x1.5	105 (205)	35	259 (267)	28	173.5 (181.5)	50.5	90	11	22	20	80	60	100	70	40	14	13	20
ø80	40	M22×1.5	116 (255)	48	321 (331)	34	221 (231)	60	110	11	22	20	80	60	100	70	40	14	13	20
ø100	40	M26x1.5	128 (275)	53	341 (351)	40	238 (248)	63	132	13.5	24	26	100	75	120	90	50	17	16	25

*1: Dimensions in ( ) indicate the case of rubber cushion type.
***2: For dimensions with each switch, refer to P. 404.**
*3: For outline dimensions of models with valve (JSG-V), please refer to P. 398.

Dimensional Drawings

●Intermediate trunnion type (TC)



[With Bellows]

Code	Intermediate Trunnion Type (TC) Mounting Dimensions												
Bore Size (mm)	A	KK	LL *1	TC	TD	TE	TM	TN	TY *1	TZ *1	AQ *1	WF	X *1
ø40	30	M14x1.5	161 (167)	57	16	22	63	95	140 (143)	46 (49)	42 (45)+Stroke/2	21	216 (222)
ø50	35	M18x1.5	183 (191)	67	16	22	75	107	159 (163)	51 (55)	47 (51)+Stroke/2	23	245 (253)
ø63	35	M18x1.5	197 (205)	82	20	28	90	130	173 (177)	51 (55)	47 (51)+Stroke/2	23	259 (267)
ø80	40	M22×1.5	245 (255)	100	20	34	110	150	220 (225)	61 (66)	57 (62)+Stroke/2	32	321 (331)
ø100	40	M26x1.5	265 (275)	121	25	40	132	182	240 (245)	61 (66)	57 (62)+Stroke/2	32	341 (351)

Code	With Bellows											
Bore Size (mm)	ℓ											
	50 or less	Over 50 to 100 or Less	Over 100 to 150 or Less	Over 150 to 200 or Less	Over 200 to 300 or Less	Over 300 to 400 or Less	Over 400 to 500 or Less	Over 500 to 600 or Less	Over 600 up to 700	Over 700 up to 750	Over 750 up to 800	Over 800
ø40	30	43	55	68	93	118	143	0.35×Stroke - 32				
ø50	31	44	56	69	94	119	144	169	0.35×Stroke - 41			
ø63	31	44	56	69	94	119	144	169	0.35×Stroke - 41			
ø80	29	42	54	67	92	117	142	167	192	204	217	0.35×Stroke - 63
ø100	29	42	54	67	92	117	142	167	192	204	217	0.35×Stroke - 63

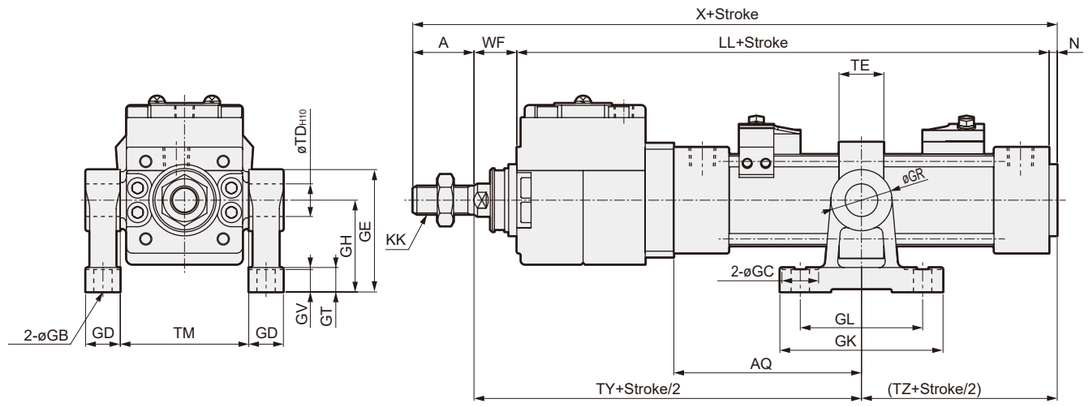
*1: Dimensions in ( ) indicate the case of rubber cushion type.

***2: For dimensions with each switch, refer to P. 404.**

*3: For outline dimensions of models with valve (JSG-V), please refer to P. 398.

Dimensional Drawings

●Intermediate trunnion type (TC) with bracket (Option Code B4)



Code	Intermediate Trunnion Type (TC) with Bracket (Option Code B4) Mounting Dimensions																				
Bore Size (mm)	A	KK	LL	WF	X	AQ	TE	TY	TZ	TM	GB	GC	GD	GE	GH	GK	GL	GR	GT	GV	TD
ø40	30	M14x1.5	93 (167)	33.5	216 (222)	42 (45)+Stroke/2	22	140 (143)	46 (49)	63	9	18	17	60	45	80	60	30	12	11	16
ø50	35	M18x1.5	101 (191)	37	245 (253)	47 (51)+Stroke/2	22	159 (163)	51 (55)	75	9	18	17	60	45	80	60	30	12	11	16
ø63	35	M18x1.5	105 (205)	35	259 (267)	47 (51)+Stroke/2	28	173 (177)	51 (55)	90	11	22	20	80	60	100	70	40	14	13	20
ø80	40	M22×1.5	116 (255)	48	321 (331)	57 (62)+Stroke/2	34	220 (225)	61 (66)	110	11	22	20	80	60	100	70	40	14	13	20
ø100	40	M26x1.5	128 (275)	53	341 (351)	57 (62)+Stroke/2	40	240 (245)	61 (66)	132	13.5	24	26	100	75	120	90	50	17	16	25

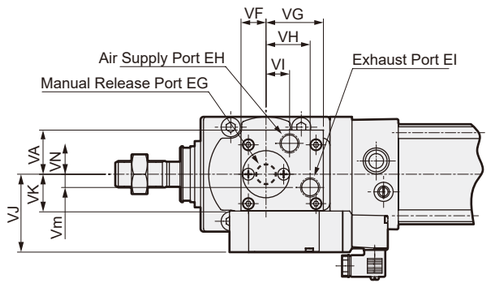
*1: Dimensions in ( ) indicate the case of rubber cushion type.

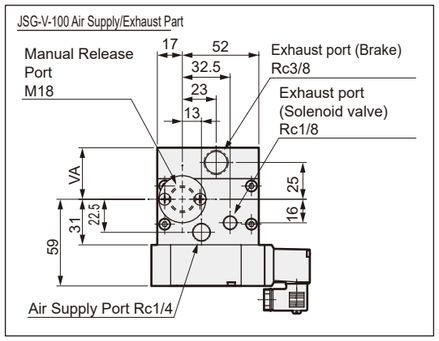
***2: For dimensions with each switch, refer to P. 404.**

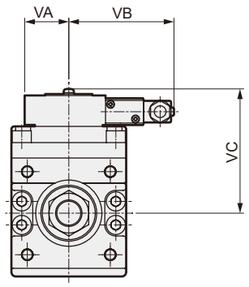
*3: For outline dimensions of models with valve (JSG-V), please refer to P. 398.

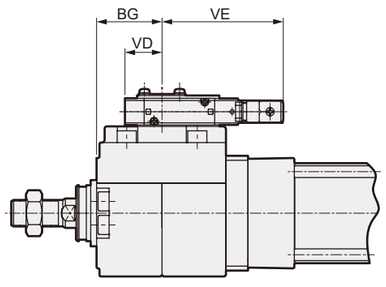
Dimensional Drawings

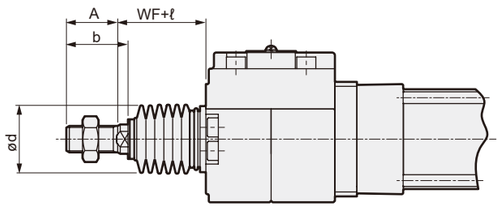
● JSG-V (with valve for brake release)











Code	With Brake Release Valve (JSG-V) Mounting Dimensions																
Bore Size (mm)	BG	EG	EH	EI	VA	VB	VC	VD	VE	VF	VG	VH	VI	VJ	VK	Vm	VN
ø40	32.5	M12	Rc1/8	Rc1/8	26	62.5	72	24	83.5	19	38	30	12.5	44	16	4	16
ø50	39	M12	Rc1/8	Rc1/8	26	62.5	79.5	24	83.5	19	38	30	12.5	44	16	4	16
ø63	44.5	M14	Rc1/4	Rc1/4	30	71.5	84.5	25	82.5	17	39	30	16	53	25	9	21
ø80	54.5	M16	Rc1/4	Rc1/4	30	71.5	98	25	82.5	17	39	30	16	53	25	9	21
ø100	65.5	M18	*1		35	77.5	113	21	86.5	*1							

Code	With Bellows													
Bore Size (mm)	A	b	d	WF	ℓ									
					50 or less	Over 50 to 100 or Less	Over 100 to 150 or Less	Over 150 to 200 or Less	Over 200 to 300 or Less	Over 300 to 400 or Less	Over 400 to 500 or Less	Over 500 to 600 or Less	Over 600 up to 700	Over 700 up to 750
ø40	30	35	40	21	30	43	55	68	93	118	143	–	–	–
ø50	35	42	47	23	31	44	56	69	94	119	144	169	–	–
ø63	35	42	47	23	31	44	56	69	94	119	144	169	–	–
ø80	40	50	53	32	29	42	54	67	92	117	142	167	192	204
ø100	40	52.5	61	32	29	42	54	67	92	117	142	167	192	204

*1: The shape of the air supply/exhaust part for JSG-V-100 is different from other sizes. Please refer to the dimension drawing of the JSG-V-100 air supply/exhaust part in the upper right figure.

***2: Dimensions other than the above are the same as the Double Acting, single rod type. Please refer to P. 384 to 397.**

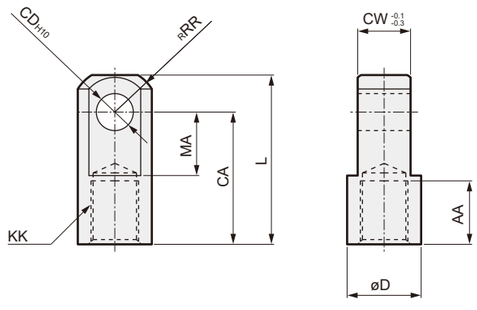
MEMO

With Brake / With Lock
ULK□
JSK2/ JSM2
JSG
JSC3, JSC4
USSD
UFCD
USC
Cylinder Switch
Ending

JSG Series Common Accessories (Knuckle/Bracket) Outline Dimension Drawing

● Rod eye (I)

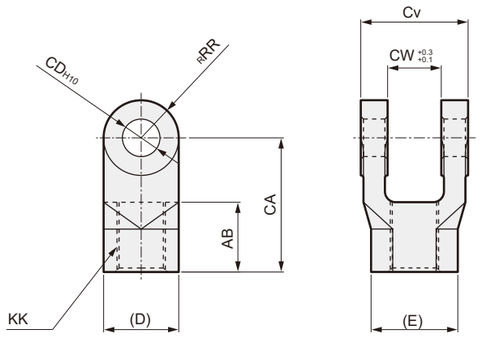
Material: Steel, Paint treatment



Model No.	Applicable tube inner diameter (mm)	AA	CA	CD	CW	D	KK	L	MA	RR	Weight (kg)
SCG-I-40	40	19	40	10	14	22	M14x1.5	50	19	12.5	0.07
SCG-I-50	50, 63	24	50	14	20	28	M18x1.5	64	24	16.5	0.20
SCG-I-80	80	26	60	22	30	40	M22×1.5	80	34	23.5	0.52
SCG-I-100	100	26	60	22	30	40	M26x1.5	80	34	23.5	0.48

● Rod clevis (Y)

Material: Cast Iron, Painted

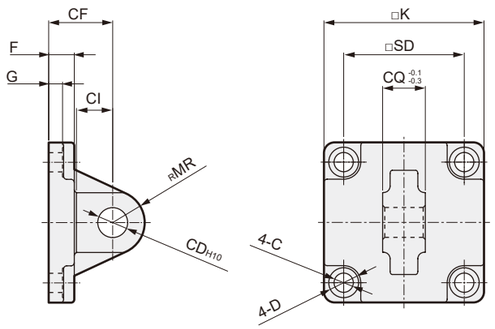


Model No.	Applicable tube inner diameter (mm)	AB	CA	CD	Cv	CW	D	E	KK	RR	Weight (kg)
SCG-Y-40	40	21	40	10	28	14	22	22.4	M14×1.5	11	0.13
SCG-Y-50	50, 63	26	50	14	40	20	28	29.3	M18×1.5	14	0.30
SCG-Y-80	80	31	65	22	60	30	40	43.2	M22×1.5	20	0.94
SCG-Y-100	100	31	65	22	60	30	40	43.2	M26×1.5	20	0.92

Note: Pin, split pin, and plain washer are Included.

●Single Bracket (B1)

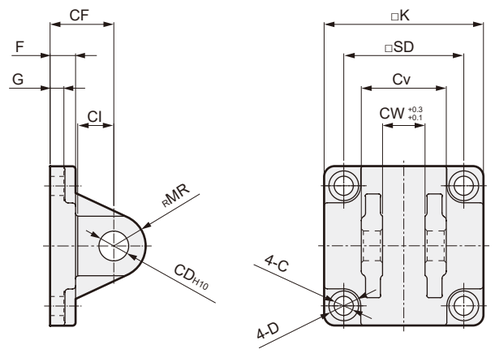
Material: Cast Iron, Painted



Model No.	Applicable tube inner diameter (mm)	C	CD	CF	CI	CQ	D	F	G	K	MR	SD	Weight (kg)
SCG-B1-40	40	6.6	10	23	13	14	11	9	4.5	52	11	38	0.16
SCG-B1-50	50	9	14	30	17	20	14	12	6.5	65	15	46.5	0.38
SCG-B1-63	63	9	14	30	17	20	14	12	6.5	75	15	56.5	0.48
SCG-B1-80	80	11	22	42	26	30	17	15	8.5	95	23	72	1.19
SCG-B1-100	100	11	22	42	26	30	17	15	8.5	114	23	89	1.56

● Clevis bracket (B2)

Material: Cast Iron, Painted



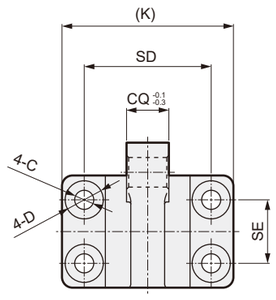
Model No.	Applicable tube inner diameter (mm)	C	CD	CF	CI	Cv	CW	D	F	G	K	MR	SD	Weight (kg)
SCG-B2-40	40	6.6	10	23	13	28	14	11	9	4.5	52	11	38	0.20
SCG-B2-50	50	9	14	30	17	40	20	14	12	6.5	65	15	46.5	0.46
SCG-B2-63	63	9	14	30	17	40	20	14	12	6.5	75	15	56.5	0.58
SCG-B2-80	80	11	22	42	26	60	30	17	15	8.5	95	23	72	1.52
SCG-B2-100	100	11	22	42	26	60	30	17	15	8.5	114	23	89	1.91

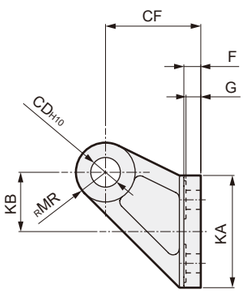
Note: Pin, split pin, and plain washer are Included.

Accessory External Dimensions

●Single Bracket (B1)

Material: Cast Iron, Painted

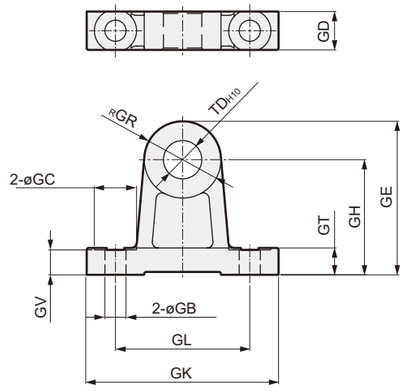




Model No.	Applicable tube inner diameter (mm)	C	CD	CF	CQ	D	F	G	K	KA	KB	MR	SD	SE	Weight (kg)
SCG-B3-32	40	6.6	10	33	14	15	7	6	62	42	21	10	44	22	0.21
SCG-B3-50	50, 63	9	14	45	20	18	8	7	81	53	28	14	60	30	0.45
SCG-B3-80	80.100	11	22	65	30	22	10	9	111	73	41.5	22	86	45	1.23

●Trunnion type 2nd bracket (B4)

Material: Cast Iron, Painted

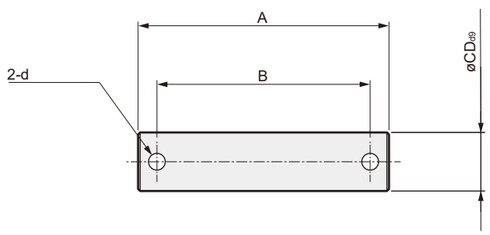


Model No.	Applicable tube inner diameter (mm)	GB	GC	GD	GE	GR	GH	GK	GL	GT	GV	TD	Weight (kg)
SCG-B4-40	40, 50	9	18	17	60	30	45	80	60	12	11	16	0.43
SCG-B4-63	63, 80	11	22	20	80	40	60	100	70	14	13	20	0.87
SCG-B4-100	100	13.5	24	26	100	50	75	120	90	17	16	25	1.75

Note: Brackets come in sets of 2.

●Pin (P)

Material: Steel, Zinc Chromate treatment

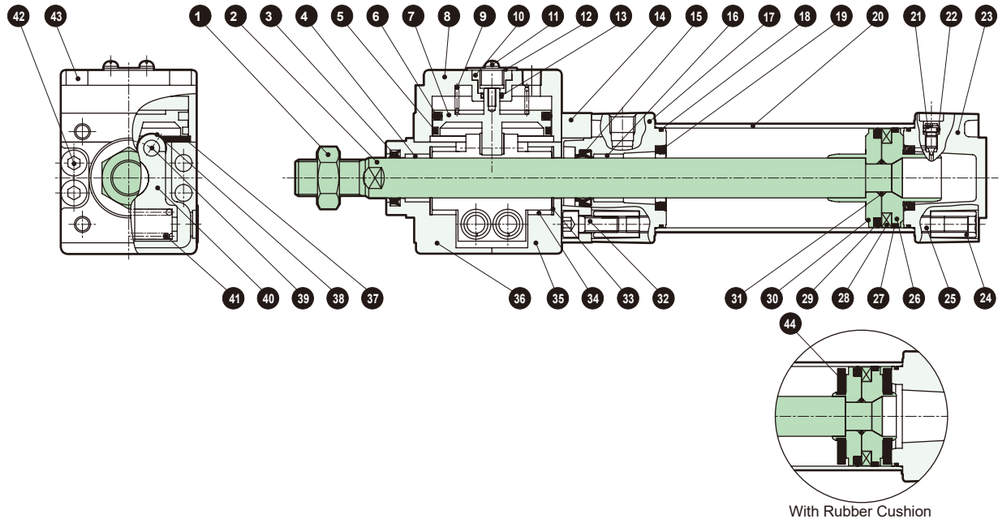


Model No.	Applicable tube inner diameter (mm)	A	B	CD	d	Weight (kg)
SCG-P-32	40	44	36	10	3	0.04
SCG-P-50	50, 63	60	51	14	4	0.10
SCG-P-80	80.100	82	72	22	4	0.34

Note: Cotter pin and plain washer are attached.

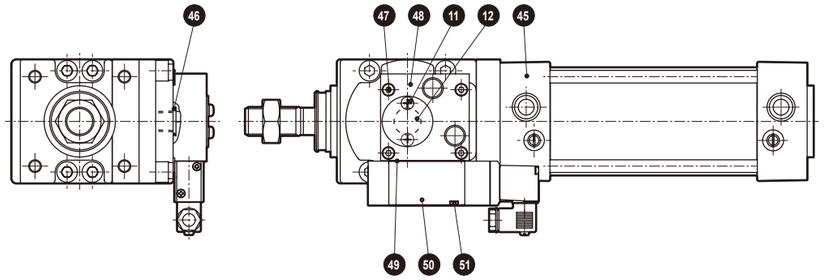
Internal Structure and Materials

● JSG



With Rubber Cushion

● JSG-V



Do Not Disassemble

Material

No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Rod Nut	Steel	Nickel Plating	27	Wear Ring	Polyacetal	
2	Piston Rod	Steel	Industrial Hard Chrome Plating	28	Magnet	Resin	
3	Scraper	Nitrile Rubber		29	Piston Packing	Nitrile Rubber	
4	Bushing	Oil Impregnated Bearing Alloy		30	Piston R	Aluminum Alloy	
5	Wear Ring	Polyacetal		31	Piston Gasket	Nitrile Rubber	
6	Piston Packing B	Nitrile Rubber		32	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide
7	Piston for Brake	Cast Iron	Phosphate	33	Thrust Washer	Stainless Steel	
8	Body H	Aluminum Alloy	Chromate	34	Bushing	Bearing Alloy	
9	Piston Spring	Piano Wire	Painted	35	Body R	Aluminum Alloy	Chromate
10	Piston Guide	Cast Iron	Phosphate Coating	36	Body F	Aluminum Alloy	Chromate
11	Pan Head Screw with cross recess and captive washer	Steel	Zinc Chromate	37	Cushion Rubber	Urethane Rubber	
12	Dust Cover	Aluminum Alloy	Alumite	38	Bearing		
13	Gasket	Nitrile Rubber		39	Pin	Alloy Steel	
14	Joint plate	Aluminum Alloy	Alumite	40	Brake Metal	Cast Iron	Nickel Plating
15	Rod Packing	Nitrile Rubber		41	Brake Spring	Piano Wire	
16	Bushing	Oil Impregnated Bearing Alloy		42	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide
17	Rod Cover	Aluminum Alloy	Painted	43	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide
18	Cylinder Gasket	Nitrile Rubber		44	Cushion Rubber	Urethane Rubber	
19	Cushion Packing	Nitrile Rubber, Steel	Zinc Chromate	With Valve			
20	Cylinder Tube	Aluminum Alloy	Hard Alumite	45	Rod Cover	Aluminum Alloy	Painting
21	Cushion Needle	Copper Alloy	Nickel Plating	46	O-Ring	Nitrile Rubber	
22	Needle Gasket	Nitrile Rubber		47	Hexagon Socket Head Cap Screw	Steel	Black Oxide
23	Head cover	Aluminum Alloy	Painted	48	Sub plate	Aluminum Alloy	
24	Round Nut	Steel	Zinc Chromate	49	Gasket	Nitrile Rubber	
25	Tie Rod	Steel	Zinc Chromate	50	Selex valve		4KB (CKD)
26	Piston H	Aluminum Alloy		51	Pan Head Screw	Steel	Zinc Chromate

Note: Contains a strong spring and is Never disassemble the brake.

Mounting Bracket Material

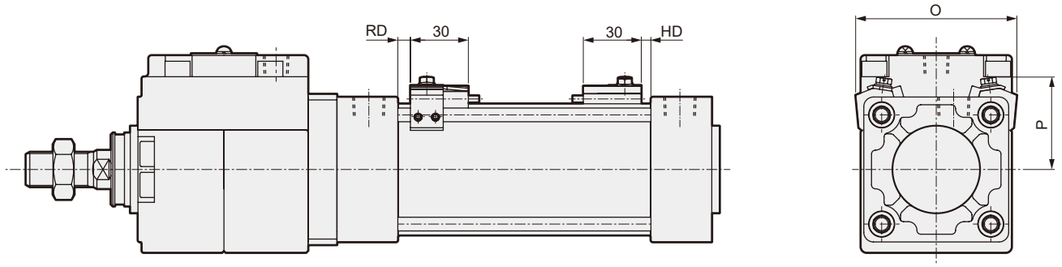
Mounting Type	Material	Remarks
Foot (LB)	Steel	Nickel Plating
Flange (FA / FB)	Steel	Painted
Clevis (CA/CB)	Cast Iron	Painting
Trunnion (TA, TB, TC)	Cast Iron	Painted

For maintenance parts, please visit the CKD Equipment Product Site (https: //www.ckd.co.jp/kiki/en/) → "model No." → Maintenance Parts.

JSG Series Switch Equipped Outline Dimension Drawing

● T0H/V, T5H/V, T2H/V, T3H/V, T3PH/V, T2 [H/V] R3, T2WH/V, T3WH/V, T8H/V, T2JH/V

· JSG, JSG-V

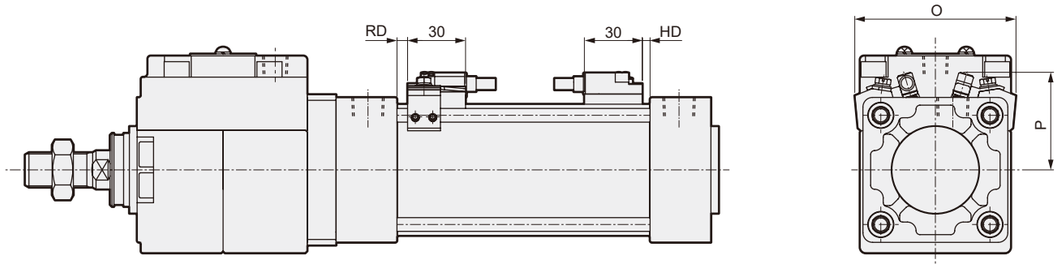


Code / Bore Size (mm)	O	P	T0, T5, T2, T3, T3P, T2□R3 RD	T0, T5, T2, T3, T3P, T2□R3 HD	T2W, T3W RD	T2W, T3W HD	T8 RD	T8 HD	T2J RD	T2J HD
ø40	66	41	5 (8)	5 (8)	7.5 (10.5)	7.5 (10.5)	0 (2)	0 (2)	4 (7)	4 (7)
ø50	72	43	6.5 (10.5)	5 (9)	9 (13)	7 (11)	0.5 (4.5)	0 (3)	5.5 (9.5)	4 (8)
ø63	83	48	6.5 (10.5)	5 (9)	9 (13)	7 (11)	0.5 (4.5)	0 (3)	5.5 (9.5)	4 (8)
ø80	104	57	12.5 (17.5)	6 (11)	15 (20)	8 (13)	6.5 (11.5)	0 (5)	11.5 (16.5)	5 (10)
ø100	121	63	12 (17)	6.5 (11.5)	14.5 (19.5)	8.5 (13.5)	6 (11)	0.5 (5.5)	11 (16)	5.5 (10.5)

*1: Dimensions in ( ) indicate the case of rubber cushion type.
*2: For switch mountability, refer to the model number display method for each variation.

● T1H/V, T2YD, T2YDT

· JSG, JSG-V



Code / Bore Size (mm)	O	P	T1,T2YD,T2YDT RD	T1,T2YD,T2YDT HD
ø40	66	41	4 (7)	4 (7)
ø50	72	44	5.5 (9.5)	4 (8)
ø63	83	50	5.5 (9.5)	4 (8)
ø80	104	57	11.5 (16.5)	5 (10)
ø100	121	64	11 (16)	5.5 (10.5)

*1: Dimensions in ( ) indicate the case of rubber cushion type.
*2: For switch mountability, refer to the model number display method for each variation.

Applications

It can be used for devices and equipment requiring the following functions.

1 When multipoint positioning is required (Transfer/Positioning)

It can stop accurately at multiple target positions.

2 When fall prevention is required

When the air pressure source and power supply are turned OFF (during power outage or accident), the brake is applied instantly and can be held, preventing equipment damage and ensuring safety.

3 When emergency stop is required

If a worker, etc., enters a hazardous area, the cylinder stops instantaneously due to an electrical signal.

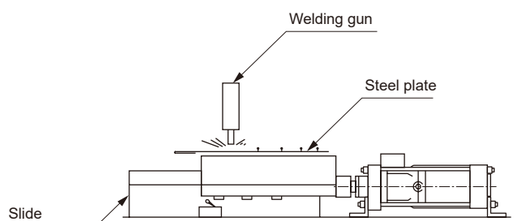
4 Work lock

When locking a workpiece to a jig, mounting base, etc., it can be locked even without a pneumatic source or power supply. Conveyance is possible while locked to the jig.

Usage Example

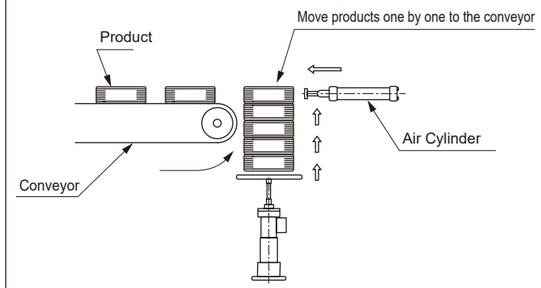
1 Linear multipoint welding

Movement and positioning of a slide table or welding gun when welding many steel plates, etc., in a straight line.



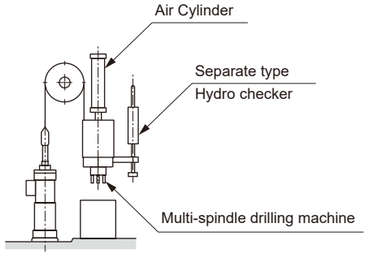
4 Move to conveyor

Move products one by one to the conveyor.



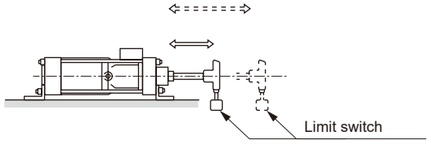
2 Fall prevention

If there is a load in the vertical direction and it is problematic for the load to fall under its own weight when the pressure source stops, the brake engages to prevent falling.



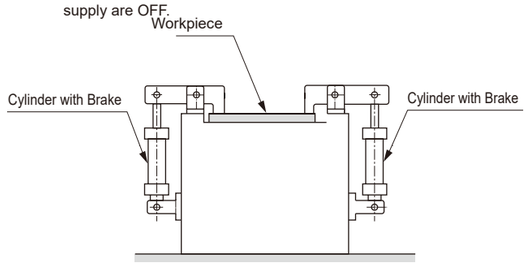
5 When it is necessary to have many cylinders with different strokes

When items of different sizes flow on a conveyor etc., the cylinders set there often need to change their strokes. In that case, by using a Brake Cylinder, cylinders with various strokes can be made electrically.



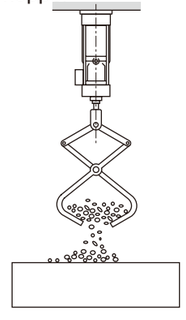
3 Work lock

When locking a workpiece to a jig, etc., if a cylinder with brake is used, it remains locked even if the pneumatic source and power supply are OFF.



6 Opening and closing of hopper

In processes like milling, when closing after reaching a predetermined weight, stop the hopper opening degree just before fully closed for accurate weighing, and then fully close it.



■Mounting Bracket Rotated Assembly (-XK□)

Content: Specifies the mounting position of the mounting bracket.

Model No. Notation

JSG - 00 - 40 B - 100 - XK1

Model Number
See the JSG model number display method.

⑫ Mounting bracket mounting position

⑫ Mounting bracket mounting position

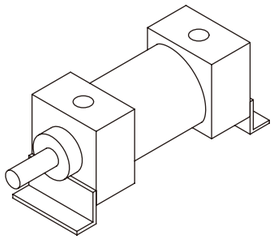
Code	Content
XK1	Rotate mounting bracket 90° clockwise
XK3	Rotate mounting bracket 270° clockwise

Note: For flanges and trunnions, only XK1 (90° rotation) is applicable.

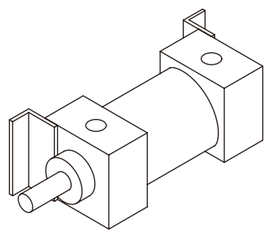
External view

*Port and cushion needle positions do not change.

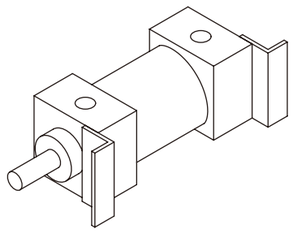
● Basic



● K1



● K3



■Trunnion Position Specification (-XAQ□□)

Content: Specify the dimension from the rod cover end face to the center of the trunnion axis.

Model No. Notation

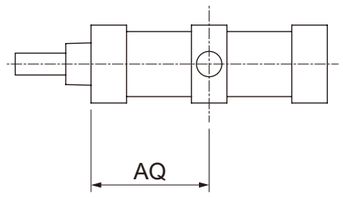
JSG - TC - 40 B - 100 - XAQ 130

Model Number
See the JSG model number display method.

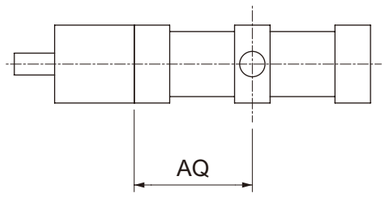
* Describe the AQ dimension length.
Example) AQ dimension = 130 mm

Note: The rod cover is also the standard for cylinders with brakes. (Please note that it is not the brake end face.)

Dimensions



Basic type



With brake

■Knuckle Fixed by Pinning (-XP7)

Content: Also, drive a spring pin into the knuckle to prevent loosening.

Model No. Notation

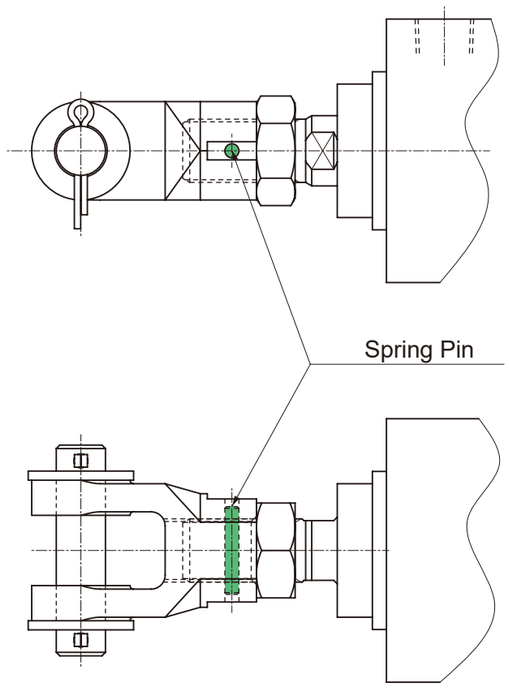
JSG - TC - 40 B - 100 - Y - XP7

Model Number

See the JSG model number display method.

Dimensions

Same as with Knuckle specification. (Spring pin driving direction varies depending on the model.)



■Without Bellows (-XJ9)

Content: Piston Rod with dimensions for bellows, but bellows not assembled

Model No. Notation

JSG - 00 - 40 B - 100 - XJ9

Model Number

See the JSG model number display method.

Dimensional Drawings

Same dimensions as with bellows, but bellows are not included.

■With 2 Rod Nuts

Content: Shipped with 2 rod nuts, same as standard.

Model No. Notation

JSG - 00 - 40 B - 100 - A2

Model Number

See the JSG model number display method.

Dimensions

Same as standard type except that 2 rod nuts are included.

To Use This Product Safely

Be sure to read this before use. For general cylinder information, see Intro 41, and for cylinder switches, see P. 1512.

Specific Precautions: Brake Equipped Tie-rod Type JSG Series

Design / Selection

Warning

■Ensure the structure prevents direct human contact with the driven object and the moving parts of the cylinder with brake.

Install a protective cover so that the human body cannot touch it directly. Or, if there is a risk of touching, provide a sensor etc. to make a safe structure such as emergency stop before touching or sounding a warning sound to notify danger.

■Use a balance circuit that considers Piston Rod projection.

If the brake is operated at any position during the stroke such as intermediate stop, and air pressure is applied to only one side of the cylinder, the Piston Rod will pop out at high speed when the brake is released. In such cases, there is a risk of personal injury, such as getting hands or feet caught, and damage to machinery. Therefore, use a balance circuit like the basic circuit to prevent projection.

■Please note that holding force is the ability to hold a static load without vibration or impact after the brake is activated in an unloaded state.

Therefore, please be careful when using near the upper limit of the holding force at all times.

■When the brake is activated, do not apply loads with impact, strong vibrations, or rotational forces.

If impact load, strong vibration, or rotational force is applied from the outside, the holding force will decrease and it is dangerous, so please be careful.

■When performing an intermediate stop, consider the stopping accuracy and overrun amount.

Because it is a mechanical lock, it does not stop instantly in response to the stop signal, but stops with a time delay. The stroke sliding due to this delay is the overrun amount. And the range between the maximum and minimum overrun amount is the stopping accuracy.

- Position the limit switch in front of the desired stop position by the overrun amount.
- The limit switch requires a detection length (dog length) of overrun amount+α.
- The operating range of CKD cylinder switches is 7 to 16 mm, depending on the switch model. . If the overrun amount exceeds this, perform self-holding of the contact on the switch load side.

■Do not use multiple cylinders with brakes in synchronization. If a synchronization error occurs, load may concentrate on the cylinder where the brake engaged first, potentially causing reduced lifespan or damage.

■To further improve stopping accuracy, shorten the time from the stop signal to when the brake activates and stops as much as possible.

For this purpose, use DC type control electric circuits and valves with good responsiveness, and place the pneumatic piping between the valve and cylinder as close as possible.

■Please note that stopping accuracy is affected by changes in piston speed.

If the piston speed changes due to load fluctuations or disturbances during cylinder operation, the variation in the stop position will increase. Therefore, ensure that the piston speed is constant just before the stop position. Also, during operation in the cushion region and while in the acceleration zone from the start of operation, the speed change is large, so the variation in the stop position will be large. The stopping accuracy at piston speed 300 mm/s and no load is ±1.0 mm (reference value). It varies depending on the equipment used. For details, refer to the page on stopping accuracy and overrun.

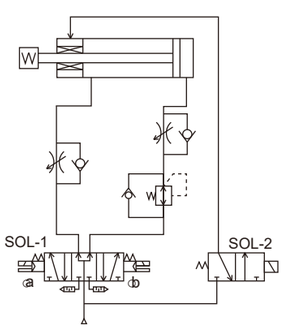
■About Basic Circuits

Even when used for fall prevention or emergency stop, be sure to use the following circuit. 2-position valves cannot be used because the cylinder's own thrust acts on the brake part even when stopped. Balance the thrust and load with the following circuit. The brake may not release if a load is applied to the brake.

● In case of horizontal load

Piping as shown in Fig. 1 applies equal pressure to both sides of the piston when stopped, preventing rod projection when the brake is released. Also, install a pressure reducing valve with a check valve on the head side to balance the thrust.

Fig. 1

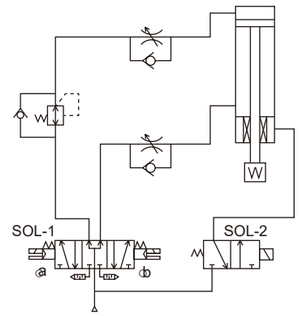


SOL-1		SOL-2	Operating State
OFF	OFF	OFF	Stop
ON	OFF	ON	Retract
OFF	ON	ON	Advance

● In case of downward vertical load

As shown in Fig. 2, if the load is downward, the rod will malfunction in the Load Direction when the brake is released. Therefore, install a pressure reducing valve with a check valve on the head side, reduce the thrust in the Load Direction, and balance the load.

Fig. 2

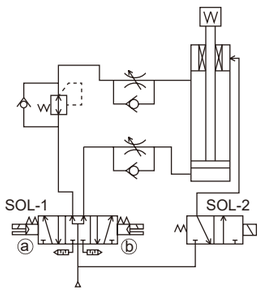


ⓐ SOL-1 ⓑ		SOL-2	Operating State
OFF	OFF	OFF	Stop
ON	OFF	ON	Descend
OFF	ON	ON	Ascend

● In case of upward vertical load

As shown in Fig. 3, if the load is upward, the rod will malfunction in the Load Direction when the brake is released. Therefore, install a pressure reducing valve with a check valve on the rod side, reduce the thrust in the Load Direction, and balance the load.

Fig. 3



ⓐ SOL-1 ⓑ		SOL-2	Operating State
OFF	OFF	OFF	Stop
ON	OFF	ON	Descend
OFF	ON	ON	Ascend

CAUTION

■Install a speed controller on the cylinder.

Install a speed controller on the cylinder. Please use within the operating piston speed range of each series.

■About Stopping Accuracy

● Stopping Pitch and Load Factor

Stopping accuracy varies depending on stopping pitch and load factor. To obtain stopping accuracy, the load factors in the table below are recommended.

* Stopping accuracy reference value: ±1.0 (300 mm/s at no load)

Stop Pitch	Load Factor
	JSG
50 mm or less	20% of Thrust
50 mm to 100 mm	40% of Thrust
100 mm or more	60% of Thrust

● Selection of Brake Valve

Stopping accuracy and overrun amount vary depending on the response of the brake valve. Select from our company's Selex Valve 4KB2 series by referring to the JSG-V brake valve electrical specifications. Also, connect the valve directly to the brake port to improve stopping accuracy.

● When using PLC (Programmable Logic Controller)

If a PLC (Programmable Logic Controller) is used for the electrical control device of the brake valve, the stopping accuracy will deteriorate due to the scan time (calculation processing time). When using a PLC, do not incorporate only the brake valve into the PLC circuit.

■Do not significantly change the load when the brake is stopped. The stop position may change.

CAUTION

■Cushion mechanisms incorporated in the cylinder include rubber cushion type and air cushion type. The purpose of the air cushion is to absorb the kinetic energy held by the piston by utilizing the compressibility of air, and to prevent the piston and cover from hitting impulsively at the stroke end. Therefore, the cushion is not for low-speed operation (deceleration operation) of the piston speed from near the stroke end. The table below shows the kinetic energy that can be absorbed by the cushion. If the kinetic energy exceeds this value or if you want to avoid bouncing due to air compressibility, please consider a separate shock absorber.

Bore Size (mm)	Rubber Cushion	Air Cushion	
	Allowable Absorbed Energy J	Effective Air Cushion Length (mm)	Allowable Absorbed Energy J
ø40	0.9	8.6	3.7
ø50	1.6	13.4	8.0
ø63	1.6	13.4	14.4
ø80	3.3	15.4	25.4
ø100	5.8	15.4	45.6

Kinetic Energy (J) =

$$\frac{1}{2}\text{1/2}\times\text{Weight (kg)}\times[\text{Speed (m/s)}]^2$$

(Note) How to calculate kinetic energy

The average speed of the cylinder is determined by Va = L/T.

Va: Average speed $\frac{L}{T}$ (m/s)

L: Cylinder Stroke (m)

T: Operating Time (s)

On the other hand, the cylinder speed just before entering the cushion is

It can be obtained by the following simplified formula.

$Vm = \frac{L}{T} \times(1+1.5\times \frac{\omega}{100})$

Vm: Speed just before entering cushion (m/s)

ω: Cylinder load factor (%)

For calculating kinetic energy, use this Vm value as the speed.

During Use

Warning

■Always connect the rod tip and the load with the brake released. If done with the brake activated, rotational force or load exceeding the holding force will act on the Piston Rod, causing damage to the brake mechanism.

■If the brake is released while only one side of the cylinder is pressurized with air, the Piston Rod will project at high speed, which is very dangerous. When releasing the brake during adjustment work, etc., always observe the following:

- Confirm that there are no people within the load's movement range when the brake is released, or that there is no problem even if the load moves.
- When releasing the brake, prevent the load from falling by
  - · Placing the load at the lower end
  - · Pressurizing both sides
  - · Placing a support

  Implement fall prevention measures such as these.
- When releasing the brake, always confirm that only one side of the cylinder is not pressurized with air.

■The brake can be released by manual release operation or by pressurizing the brake release port with air. During load installation, if the brake is left released by this operation, the load may fall. Therefore, always return the manual release operation to its initial state, or confirm that the brake is effective with no air in the brake release port before installation.

■As holding force will decrease and it is dangerous, do not apply rotational force (torque) to the rod when the brake is activated. Also, use with a mechanism that prevents rod rotation.

■Do not apply force exceeding the brake holding force stated in the catalog to the cylinder.

Warning

■For the JSG series, when manually releasing the brake, screwing a Hexagon Socket Head Cap Screw into the female thread for brake release on the upper part of the brake will release the brake. However, overtightening will cause brake damage, so follow the appropriate tightening amount for release bolts in the table below.

Bore Size	Appropriate Tightening Amount
ø40	3 rotations or less
ø50	4 rotations or less
ø63	4 rotations or less
ø80	4.5 rotations or less
ø100	5 rotations or less

■If there is play such as backlash in the dog for the brake signal, it will affect stopping accuracy, so fix it securely so there is no backlash, etc.

■If the piston speed is high, the length of the detection dog must be sufficient to account for the relay response time. Please note that if the dog length is short, a stop signal will not be output, and it will not stop.

■The brake unit can be removed from the Cylinder Body, but absolutely do not disassemble or inspect the brake unit, as it is dangerous upon reuse.

■The brake unit is coated with the necessary amount of grease, so avoid applying more grease and do not wipe off the grease.

■When replacing the brake unit, the necessary amount of grease is applied, so there is no need to apply grease to the rod.

■As it may cause a malfunctions, always use with the dust cover included, except during manual release.

CAUTION

■Adjust the air balance of the cylinder.
With the brake released, attach the load to the cylinder and balance the load by adjusting the air pressure on the rod side and head side of the cylinder. By ensuring this load balance, problems such as the Piston Rod popping out when the brake is released or the brake not releasing normally can be prevented.

■Adjust the mounting position of detection units such as cylinder switches.
When performing intermediate stop, adjust the mounting position of the detection part such as the cylinder switch considering the overrun amount with respect to the desired stop position.

■Load fluctuations during the cylinder's reciprocating stroke cause changes in piston speed, and changes in piston speed increase the variation in the stop position. Adjust the mounting so that there is no load fluctuation during the cylinder reciprocating stroke, especially immediately before stopping.

■During the cushion stroke and while in the acceleration zone from the start of operation, the speed change is large, so the variation in the stop position will be large. Therefore, please note that if step operation with a short stroke from the start of operation to the next position is performed, the accuracy in the specification column may not be achieved.

■Load on Piston Rod
When moving the load, regulate it sufficiently with guides to prevent backlash or twisting.

■Maintenance of Rod Sliding Part
Be careful not to scratch or dent the Piston Rod sliding part. It causes damage to packings, leading to leakage or brake failure.

■If the air supply piping is thin or long, stopping accuracy will worsen, so please consider this carefully.

■If the cylinder has been stopped for a long time, such as first thing in the morning or first thing after lunch, frictional resistance will increase, and piston speed will change, which may worsen stopping accuracy. Perform a break-in operation to obtain stable stopping accuracy.

For precautions during mounting, installation, adjustment, use, and maintenance, refer to "During Use" in this catalog and the CKD Components Product website (https://www.ckd.co.jp/kiki/en/) -> "Model No." -> Instruction Manual.

JSC3, JSC4

Brake Cylinder

ø40, ø50, ø63, ø80, ø100
ø125, ø140, ø160, ø180

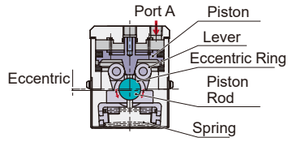
With Brake with Lock

Overview

This is a cylinder with brake, where a highly reliable brake is included with the medium bore (ø40 to ø100) series (SCA2) and large bore (ø125 to ø180) series (SCS2) among general type cylinders.

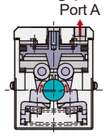
Operational Principle

● Brake release operating principle



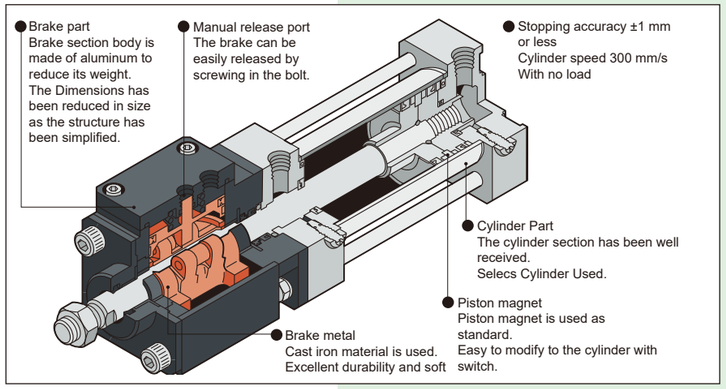
ⓐBrake Release Operating Principle
When air is supplied from port A, the lower piston is pushed, opening the lever, and the eccentric rings directly connected to the lever rotate in the direction of their respective arrows, freeing the Piston Rod.

● Brake operating principle



ⓑBrake Activation Operating Principle
When air is exhausted from port A, the eccentric rings rotate in the direction of their respective arrows due to spring force, generating an eccentric load on the Piston Rod and braking the Piston Rod.

Features



CONTENTS

Product Introduction	290
Series System Chart	416
Option/Variation Combination Availability Table	418
● Double Acting / Single Rod Type (JSC3) / Non-lubricated Large Bore Type (JSC4-N)	422
● Double Acting with Brake Valve (JSC3-V)	460
● Double Acting / Low Hydraulic Pressure Type (JSC3-H / JSC4-H)	470
● Double Acting / Heat Resistant Type (JSC3-T / JSC4-T)	486
Accessories External Dimensions Diagram	454
Dimensions with Switch	494
Brake Cylinder Common Technical Data	496
Brake Cylinder Common Applications and Usage Examples	497
Custom Products	498
⚠Precautions for Use	504

●: Standard, ◎: Option, ○: Custom Product, : Not available

Variation	Model Number Circuit Diagram Code	Bore Size (mm)	Standard Stroke (mm) 50	75	100	150	200	250	300	350	400	450	500	Min Stroke (mm)	Max Stroke (mm)	Intermediate Stroke (per mm)	Producible Stroke (mm)	Mounting Type: Basic type 00	Axial Foot Type LB	Rod side Flange Type FA	Head side Flange Type FB	Head side special flange type FC	Single Clevis Type CA	Double clevis type CB	Intermediate Trunion Square Type TC	Rod side trunnion type TA	Head side trunnion type TB	Option: Bellows (100°C) J	Bellows (250°C) L	Piston Rod material change M	Cushion needle position R R	Cushion needle position S S	Cushion needle position T T	With Indicator G	Accessories: Single knuckle I	Double Knuckle Y	Single Bracket B1	Double Yoke Bracket B2	Single bracket B3	Trunnion Type 2nd Bracket B4	Switch	Page
Double Acting Type	JSC3	ø40												1	600	1	1600	●	●	●	●	●	●	●	●	●	●	◎	◎	◎	●	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	422
		ø50	●	●	●	●	●	●	●	●	●	●	●				2,000																									
		ø63																																							
		ø80	●	●	●	●	●	●	●	●	●	●	●		700		2500 *1	●	●	●	●	●	●	●	●	●	●	◎	◎	◎	●	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	
		ø100	●	●	●	●	●	●	●	●	●	●	●		800			●	●	●	●	●	●	●	●	●	●	◎	◎	◎	●	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	
	JSC4-N JSC4-LN	ø125, ø140, ø160	●	●	●	●	●	●	●					1	800		2000		●	●	●		●	●	●	●	●	◎	◎	◎	◎	◎	◎		◎	◎	◎	◎			◎	
		ø180	●	●	●	●	●	●	●						900				●	●	●		●	●	●	●	●	◎	◎	◎	◎	◎	◎		◎	◎	◎	◎			◎	
Double Acting Type with Brake Valve	JSC3-V	ø40												1	600	1	1000	●	●	●	●	●	●	●	●	●	●	◎	◎	◎	●	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	460
		ø50	●	●	●	●	●	●	●	●	●	●	●				2,000																									
		ø63																																							
		ø80	●	●	●	●	●	●	●	●	●	●	●		700		2500 *1	●	●	●	●	●	●	●	●	●	●	◎	◎	◎	●	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	
		ø100	●	●	●	●	●	●	●	●	●	●	●	1	800			●	●	●	●	●	●	●	●	●	●	◎	◎	◎	●	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	
Double Acting, Low Hydraulic Pressure Type	JSC3-H	ø40												1	600	1	600	●	●	●	●	●	●	●	●	●	●	◎	◎	◎	●	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	470
		ø50	●	●	●	●	●	●	●	●	●	●	●																													
		ø63																																							
		ø80	●	●	●	●	●	●	●	●	●	●	●		700		700	●	●	●	●	●	●	●	●	●	●	◎	◎	◎	●	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	
		ø100	●	●	●	●	●	●	●	●	●	●	●		800		800	●	●	●	●	●	●	●	●	●	●	◎	◎	◎	●	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	
	JSC4-H JSC4-LH	ø125, ø140, ø160	○	○	○	○	○	○	○	○	○	○	○	1	800		800		○	○	○		○	○	○	○	○	◎	◎	◎	◎	◎	◎		◎	◎	◎	◎			◎	
		ø180	○	○	○	○	○	○	○	○	○	○	○		900		900		○	○	○		○	○	○	○	○	◎	◎	◎	◎	◎	◎		◎	◎	◎	◎			◎	
Double Acting/ Heat Resistant Type	JSC3-T	ø40												1	600	1	700	●	●	●	●	●	●	●	●	●	●		◎	◎	●	◎	◎	◎	◎	◎	◎	◎	◎			486
		ø50	●	●	●	●	●	●	●	●	●	●	●																													
		ø63																																							
		ø80	●	●	●	●	●	●	●	●	●	●	●		700		700	●	●	●	●	●	●	●	●	●	●		◎	◎	●	◎	◎	◎	◎	◎	◎	◎	◎			
		ø100	●	●	●	●	●	●	●	●	●	●	●		800		800	●	●	●	●	●	●	●	●	●	●		◎	◎	●	◎	◎	◎	◎	◎	◎	◎	◎			
	JSC4-T	ø125, ø140, ø160	○	○	○	○	○	○	○	○	○	○	○	1	800		800		○	○	○		○	○	○	○	○		◎	◎	◎	◎	◎		◎	◎	◎	◎				
		ø180	○	○	○	○	○	○	○	○	○	○	○		900		900		○	○	○		○	○	○	○	○		◎	◎	◎	◎	◎		◎	◎	◎	◎				

*1: For bellows-equipped models with tube inner diameters ø63 to ø100, the manufacturable stroke is up to 2000 mm.

Variation and Option Item Combination Availability Table

JSC3 (ø40 to ø100)

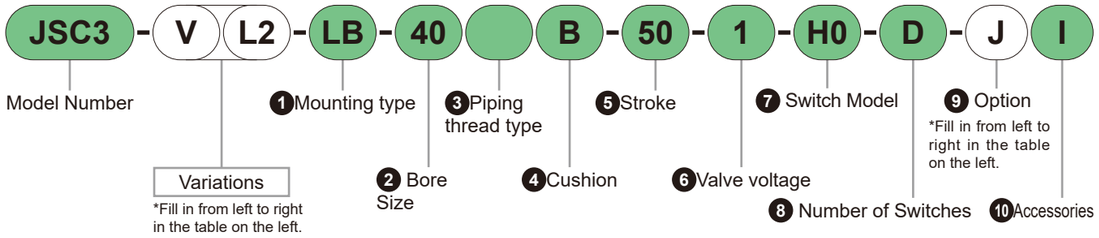
***For ø125 to ø180, please refer to P. 420.**

●Mark: Standard
◎Mark: Options
○Mark: Custom-made
△Mark: Manufacturable depending on conditions (please consult)
× Mark: Not available

Category		Category	Variation							Piping thread			Option				
			Double Acting Basic Type	With Cushion	With Valve	Low Hydraulic Pressure	Heat Resistant (120°C)	With cylinder switch, for strong magnetic field		NPT	G		With bellows, Polyolefin	With Bellows, Silicone Rubber	Piston Rod material (Stainless Steel)	Cushion needle position specification	With Indicator
		Code	None	None	V	H	T	L2		N	G		J	L	M	R.S.T	G
Variations	Double Acting Basic Type	Blank	＼	◎	●	●	●	◎		○	○		*1	*1	◎	◎	◎
	With Cushion	Blank		＼	◎	◎	◎	◎		○	○		◎	◎	◎	◎	◎
	With Valve	V			＼	△	x	◎		○	○		◎	◎	◎	◎	◎
	Low Hydraulic Pressure	H				＼	x	○		○	○		◎	◎	◎	◎	◎
	Heat Resistant (120°C)	T					＼	x		○	○		x	◎	◎	◎	◎
	With cylinder switch, for strong magnetic field	L2						＼		○	○		◎	◎	◎	◎	◎
Piping thread	NPT	N							＼	x			○	○	○	○	○
	G	G								＼			○	○	○	○	○
											＼						
Options	With bellows, Polyolefin	J										＼		x	○	○	○
	With Bellows, Silicone Rubber	L											＼		○	○	○
	Piston Rod material (Stainless Steel)	M												＼		○	○
	Cushion needle position specification	R.S.T													＼		○
	With Indicator	G														＼	
Accessories	Cylinder Switch	Separately Shown	◎	◎	◎	◎	x	◎					◎	◎	◎	◎	◎
	Single knuckle	I	◎	◎	◎	◎	◎	◎					◎	◎	◎	◎	◎
	Double knuckle	Y	◎	◎	◎	◎	◎	◎					◎	◎	◎	◎	◎
	Single bracket	B1	◎	◎	◎	◎	◎	◎					◎	◎	◎	◎	◎
	Double bracket	B2	◎	◎	◎	◎	◎	◎					◎	◎	◎	◎	◎
	Bracket for trunnion	B4	◎	◎	◎	◎	◎	◎					◎	◎	◎	◎	◎

*1: For bellows-equipped models with tube inner diameters ø63 to ø100, the manufacturable stroke is up to 2000 mm.

[Model No. Example]



Model No.: Brake Cylinder
●Variations: With valve and strong magnetic field proof switch
1 mounting style: Axial Foot Type
2 Bore Size: ø40 mm
3 Port thread: Rc Thread
4 Cushion: Both sides cushion
5 Stroke: 50 mm
6 valve voltage: 100 VAC
7 Switch model No.: Reed, switch for strong magnetic fields, lead wire 1 m
8 Switch quantity: With 2 pcs
9 Options: Bellows Max Ambient Temperature 100°C
10 Accessory: Single knuckle

Variation and Option Item Combination Availability Table

JSC4 (ø125 to ø180)

***For ø40 to ø100, please refer to P. 418.**

●Mark: Standard
◎Mark: Options
○Mark: Custom-made
△Mark: Manufacturable depending on conditions (please consult)
× Mark: Not available

Category		Category	Variation					Piping thread		Option		
			Double Acting Basic Type	With Cushion	With Cylinder Switch	Low Hydraulic Pressure	Heat Resistant (120°C)	NPT	G	With bellows, Neoprene	With bellows, Silicone rubber	Piston Rod material (Stainless Steel)
		Code	N		L	H	T	N	G	J	L	M
Variations	Double Acting basic type (Non-lubricated type)	N	＼	◎	◎	＼	＼	○	○	◎	◎	◎
	With Cushion			＼	◎	○	○	○	○	◎	◎	◎
	With Cylinder Switch	L			＼	○	x	○	○	◎	◎	◎
	Low Hydraulic Pressure	H				＼	x	○	○	◎	◎	◎
	Heat Resistant (120°C)	T					＼	○	○	x	◎	◎
Piping thread	NPT	N						＼	x	○	○	○
	G	G							＼	○	○	○
Options	With bellows, Neoprene	J								＼	x	○
	With Bellows, Silicone Rubber	L									＼	○
	Piston Rod material (Stainless Steel)	M										＼
Accessories	Cylinder Switch	Separately Shown	◎	◎	◎	◎	×			◎	◎	◎
	Single knuckle	I	◎	◎	◎	◎	◎			◎	◎	◎
	Double knuckle	Y	◎	◎	◎	◎	◎			◎	◎	◎
	Single bracket	B1	◎	◎	◎	◎	◎			◎	◎	◎
	Double bracket	B2	◎	◎	◎	◎	◎			◎	◎	◎

[Model No. Example]

JSC4 - L H - LB - 125 [ ] - B - 50 - T0H - D - J - I

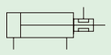
- JSC4: Model Number
- L H: Variations (*Fill in from left to right in the table on the left.)
- LB: 1 Mounting type
- 125: 2 Bore Size
- [ ]: 3 Piping thread type
- B: 4 Cushion
- 50: 5 Stroke
- T0H: 6 Switch Model
- D: 7 Number of Switches
- J: 8 Option (*Fill in from left to right in the table on the left.)
- I: 9 Accessories

Model Number
●Variation: Low hydraulic type with switch
1 Mounting style: Axial Foot Type
2 Bore Size: ø125 mm
3 Port thread: Rc Thread
4 Cushion: Both sides cushion
5 Stroke: 50 mm
6 Switch model No.: Solid State T0H Switch, Lead Wire 1 m
7 Switch quantity: With 2 pcs
8 Options: Bellows for Max Ambient Temperature 60°C
9 Accessory: Single knuckle

Brake Cylinder Double Acting, Single Rod Type / Double Acting, Non-lubricated Type

JSC3, JSC4-N Series

● Bore Size
JSC3: ø40, ø50, ø63, ø80, ø100, JSC4: ø125, ø140, ø160, ø180

Circuit Diagram Code 

RoHS

Model No. Notation (ø40 to ø100)

Without Switch (Built-in magnet for switch)

JSC3 - ① — LB - 40 ③ ④ B ⑤ - 50 ⑥ — S ⑨ I ⑩
Model No.

With Switch (Built-in magnet for switch)

JSC3 - ① — LB - 40 ③ ④ B ⑤ - 50 ⑥ T0H ⑦ - R ⑧ - S ⑨ I ⑩
Model Number

Strong magnetic field resistant (For H0, H0Y switch)
With Switch (Built-in magnet for switch)

JSC3 - ① L2 - LB - 40 ③ ④ B ⑤ - 50 ⑥ H0 ⑦ - R ⑧ - S ⑨ I ⑩
Model Number
① Brake Release Pressure
② Mounting Type
③ Bore Size
④ Piping thread type
⑤ Cushion
⑥ Stroke
⑦ Switch Model
⑧ Number of Switches
⑨ Option
⑩ Accessories

① Brake Release Pressure

Code	Content
Blank	Standard Type (0.3 MPa)
S	Low Pressure Release Type (0.25 MPa)

② Mounting Type

Mounting brackets are pre-assembled on the product for shipment. (However, head side special flange type is shipped included.)

Code	Content		Code	Content	
00	Basic Type		CA	Single clevis type	
LB	Axial Foot Type		CB	Double Clevis Type (Pin and Retaining Ring included)	
FA	Rod Side Flange Type		TC	Intermediate Trunnion Type	
FB	Head Side Flange Type		TA	Rod side trunnion type	
FC	Head side special flange type		TB	Head side trunnion type	

③ Bore Size (mm)

Code	Contents
40	ø40
50	ø50
63	ø63
80	ø80
100	ø100

④ Piping thread type

Code	Content
Blank	Rc Thread
N	NPT Thread (Custom Order Product)
G	G Thread (Custom Order Product)

⑤ Cushion

Code	Content
B	Both sides cushion
R	Rod side cushion
H	Head side cushion
N	Without Cushion

⑥ Stroke (mm)

Bore Size	Stroke	Intermediate Stroke
ø40	1 to 600	Every 1 mm
ø50	1 to 600	
ø63	1 to 600	
ø80	1 to 700	
ø100	1 to 800	

Note: For minimum stroke with switch, please refer to P. 429, 430.

⑦ Switch Model No.

For switch details, refer to P. 1457. Switches are shipped with the product.

Contact	Indicator LED Special Function	Wiring (Output)	Load Voltage (V) AC	Load Voltage (V) DC	Load Current (mA) AC	Load Current (mA) DC	Lead wire *1 Straight	Lead wire *1 L-shape	
Solid State	1-Color	2-wire	85 to 265	-	5 to 100	-	T1H□	T1V□	
			-	10 to 30	-	5 to 20 *2	T2H□	T2V□	
		3-wire (NPN)	-	30 or less	-	100 or less	T3H□	T3V□	
		3-wire (PNP)	-		-		T3PH□	T3PV□	
	2-color	2-wire	-	24 ± 10%	-	5 to 20	T2WH□	T2WV□	
		3-wire (NPN)	-	30 or less	-	50 or less	T3WH□	T3WV□	
	For 2-color AC Magnetic Field	2-wire	-	24 ± 10%	-	5 to 20	T2YD□	–	
			-		-		T2YDT□	–	
	1-Color Off-Delay Type		—	10 to 30	-	5 to 20 *2	T2JH□	T2JV□	
	1-Color Flexible Lead Wire Type		-	10 to 30	—		T2HR3	T2VR3	
Contact	1-Color	2-wire	110	12/24	7 to 20	5 to 50	T0H□	T0V□	
	Without Indicator Lamp		110	5/12/24	20 or less	50 or less	T5H□	T5V□	
	1-Color		110/220	12/24	7 to 20 / 7 to 10	5 to 50	T8H□	T8V□	
	For 1-color strong magnetic field		110	12/24	7 to 20	5 to 50	H0□	-	
	For 2-color strong magnetic field		—	24 ± 10%	-	5 to 20	H0Y□	-	

*1: Enter the code selected in the "Lead wire length" table into "□" of the Switch Model.
*2: The maximum load current of 20 mA mentioned above is at 25°C. If the switch operating Ambient Temperature is higher than 25°C, it will be lower than 20 mA. (At 60°C, it will be 5 to 10 mA.)
*3: Switches other than the above switch model numbers are also available. (Custom Product) For details, refer to P. 1457.

***Lead Wire Length**

Code	Content
Blank	1 m (Standard)
3	3 m (Option)
5	5m (Option)

Example) Lead wire length
1 m T0H
3 m T0H3
5 m T0H5

⑧ Number of Switches

Code	Content
R	With 1 pc on rod side
H	With 1 pc on head side
D	With 2 pcs
T	With 3 pcs

Note: If ❶mounting type TA or TB is selected, the number of switches is limited to "H" (1 on head side) for TA, and "R" (1 on rod side) for TB.

⑨ Option

Code	Content			
		Max Ambient Temperature	Instantaneous Max Temperature	
J	Bellows	100°C	200°C	
L	Bellows	250°C	400°C	
M	Piston Rod material (Stainless Steel)			
Blank	Cushion needle position R (Standard)			T R (Standard) S
S	Cushion needle position S			
T	Cushion needle position T			
G	With Indicator			

*1: Check the position indication of "S" and "T" in each dimensional drawing.
*2: If ❶mounting type "TA" or "TB" is selected, the cushion needle position cannot be changed. (If Blank, cushion needle position will be "S".)

⑩ Accessories

	Code	Description	
*1	I	Single knuckle	
*1	Y	Double knuckle (Pin and Retaining Ring included)	
	B1	Single bracket	
	B2	Double bracket (Pin and Retaining Ring included)	
	B3	Single bracket	
	B4	Trunnion Type 2nd Bracket (Set of 2)	

*1: "I" and "Y" cannot be selected simultaneously.

* For combinations of variations and options, please refer to P. 418 to 421.

About specifications of custom products

For details, please refer to P. 498 to 503.

Code	Content
-XK□	Mounting Bracket Rotational Assembly
-XAQ□□	Trunnion Position Specification
-XP5	Knuckle Pin/Clevis Pin Split Pin
-XP7	Knuckle fixed by pin driving
-XP8	Knuckle pin/clevis pin split pin specification, knuckle fixed by pin driving
-XJ9	Without Bellows
-A2	With 2 Rod Nuts
Rod End Shape change	Refer to Ending 11.

Model No. Ex.)
JSC3 - ..... - XK□

Oil-free Compatible Specification
(Catalog No. RJ-001AA)
●Grease scatter prevention structure
JSC3 - . . . . - P12

Brake Unit Model No. Notation

JSC3 - 40 - BRAKE-UNIT
3 Bore Size

● FA mounting style

JSC3 - FA - 40 - BRAKE-UNIT
3 Bore Size

T-type Switch Individual Model No. Notation

● Switch body+Mounting bracket set

JSC3 - T0H - 40
7 Switch Model
3 Bore Size

● Switch Body Only

SW - T0H
7 Switch Model

● Mounting bracket set

JSC3 - TS - 40
Mounting Bracket
3 Bore Size

T2YD type switch single item model number notation method

● Switch body+Mounting bracket set
· ø40 to ø100

JSC3 - T2YD - 40
7 Switch Model
3 Bore Size

● Switch Body Only
· ø40 to ø100

SW - T2YD
7 Switch Model

● Mounting bracket set

JSC3 - T - 40
Mounting Bracket
3 Bore Size

H type switch single item model number notation method

● Switch body+Mounting bracket set

JSC3-L2 - H0 - 40
7 Switch Model
3 Bore Size

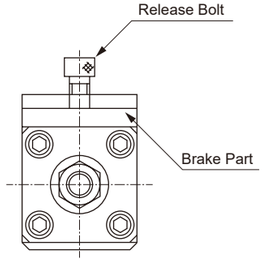
● Switch Body Only

SW - H0
7 Switch Model

● Mounting bracket set

JSC3-L2 - H - 40
Mounting Bracket
3 Bore Size

Manual Brake Release Method



Note: Brake release method

· Screwing the release bolt (included with the product) 2 to 3 rotations into the female thread on the upper part of the brake unit (next to the brake release port) releases the brake. (Always remove the release bolt during normal use.)
· When manually releasing the brake, always use the release bolt included with the product. Using other bolts may cause the brake to fail.

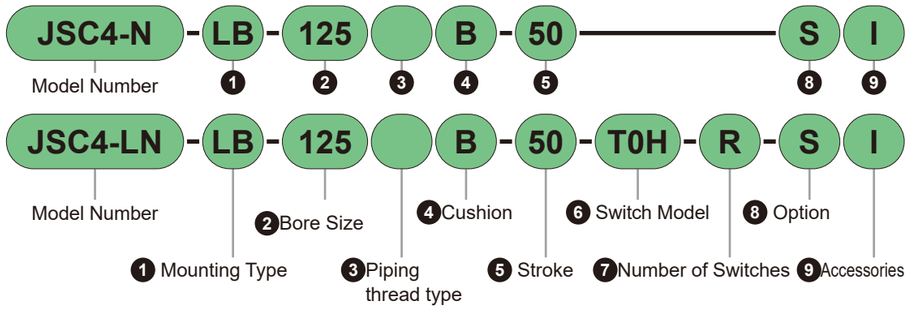
MEMO

With Brake / With Lock
ULK□
JSK2/ JSM2
JSG
JSC3, JSC4
USSD
UFCD
USC
Cylinder Switch
Ending

Model No. Notation (ø125 to ø180)

Without Switch
(Without magnet for switch)

With Switch
(Built-in magnet for switch)



1 Mounting Type
Mounting brackets are pre-assembled on the product for shipment.

Code	Content		Code	Content	
LB	Axial Foot Type		CB	Double Clevis Type (Pin and Retaining Ring included)	
FA	Rod Side Flange Type		TC	Intermediate Trunnion Type	
FB	Head Side Flange Type		TA	Rod side trunnion type	
CA	Single clevis type		TB	Head side trunnion type	

2 Bore Size (mm)

Code	Content
125	ø125
140	ø140
160	ø160
180	ø180

3 Piping thread type

Code	Content
Blank	Rc Thread
N	NPT Thread (Custom Order Product)
G	G Thread (Custom Order Product)

4 Cushion

Code	Content
B	Both sides cushion
R	Rod side cushion
H	Head side cushion
N	Without Cushion

5 Stroke (mm)

Bore Size	Stroke	Intermediate Stroke
ø125	1 to 800	in 1 mm increments
ø140	1 to 800	
ø160	1 to 800	
ø180	1 to 900	

Note: Refer to P. 430 for the minimum stroke with switch.

6 Switch Model
For switch details, refer to P. 1457. Switches are shipped with the product.

Contact	Indicator LED Special Function	Wiring (Output)	Load Voltage (V) AC	Load Voltage (V) DC	Load Current (mA) AC	Load Current (mA) DC	Lead wire *1 Straight	Lead wire *1 L-shape	
Solid State	1-Color	2-wire	85 to 265	-	5 to 100	-	T1H□	T1V□	
			-	10 to 30	-	5 to 20 *2	T2H□	T2V□	
		3-wire (NPN)	-	30 or less	-	100 or less	T3H□	T3V□	
		3-wire (PNP)	-		-		T3PH□	T3PV□	
	2-color	2-wire	-	24 ± 10%	-	5 to 20	T2WH□	T2WV□	
		3-wire (NPN)	-	30 or less	-	50 or less	T3WH□	T3WV□	
	For 2-color AC Magnetic Field	2-wire	-	24 ± 10%	-	5 to 20	T2YD□	–	
			-		-		T2YDT□	–	
	1-Color Off-Delay Type		—	10 to 30	-	5 to 20 *2	T2JH□	T2JV□	
	1-Color Flexible Lead Wire Type		-	10 to 30	—		T2HR3	T2VR3	
Contact	1-Color	2-wire	110	12/24	7 to 20	5 to 50	T0H□	T0V□	
	Without Indicator Lamp		110	5/12/24	20 or less	50 or less	T5H□	T5V□	
	1-Color		110/220	12/24	7 to 20 / 7 to 10	5 to 50	T8H□	T8V□	

*1: Enter the code selected in the "Lead wire length" table into "□" of the Switch Model.
*2: The maximum load current of 20 mA mentioned above is at 25°C. If the switch operating Ambient Temperature is higher than 25°C, it will be lower than 20 mA. (At 60°C, it will be 5 to 10 mA.)
*3: Switches other than the above switch model numbers are also available. (Custom Product) For details, refer to P. 1457.

*Lead Wire Length

Code	Content
Blank	1 m (Standard)
3	3 m (Option)
5	5 m (Option)

Example) Lead wire length
1 m T0H
3 m T0H3
5 m T0H5

7 Number of Switches

Code	Content
R	With 1 pc on rod side
H	With 1 pc on head side
D	With 2 pcs
T	With 3 pcs

Note: If 1 mounting type TA or TB is selected, the number of switches is limited to "H" (1 on head side) for TA, and "R" (1 on rod side) for TB.

9 Accessories

	Code	Description	
*1	I	Single knuckle	
*1	Y	Double Knuckle (pin and Retaining Ring included)	
	B1	Single bracket	
	B2	Double bracket	

*1: "I" and "Y" cannot be selected simultaneously.

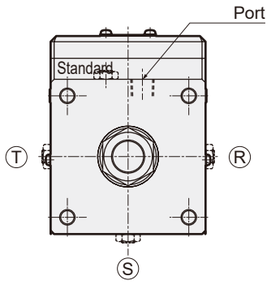
8 Option

Code	Content			
		Max Ambient Temperature	Instantaneous Max Temperature	
J	Bellows	100°C	200°C	
L	Bellows	250°C	400°C	
M	Piston Rod Material (Stainless Steel)			
Blank	Cushion needle position Standard			Standard T R S
R	Cushion Needle Position R			
S	Cushion Needle Position S			
T	Cushion Needle Position T			
C2	With check valve in cushion part			

Note: For cushion needle position display, please check the figure below.

About Cushion Needle Position

(Needle position with port facing upward from rod direction)



Stroke subject to Type 2 pressure vessel inspection

Bore Size	Stroke
ø160	1948 or more
ø180	1526 or more

About specifications of custom products

For details, please refer to P. 498 to 503.

Code	Content
-XK□	Mounting Bracket Rotational Assembly
-XAQ□□	Trunnion Position Specification
-XP5	Knuckle Pin/Clevis Pin Split Pin
-XP7	Knuckle fixed by pin driving
-XP8	Knuckle pin/clevis pin split pin specification, knuckle fixed by pin driving
-XJ9	Without Bellows
-A2	With 2 Rod Nuts
Rod End Shape change	Refer to Ending P. 11.

Model No. Ex.)

JSC4 – ..... – XK□

Brake Unit Model No. Notation

JSC4 - 125 - BRAKE-UNIT

② Bore Size

T-type Switch Individual Model No. Notation

●Switch body+Mounting bracket set

JSC4-LN - T0H - 125

⑥ Switch Model

② Bore Size

● Switch Body Only

SW - T0H

⑥ Switch Model

●Mounting bracket set

JSC4-LN - TS - 125

② Bore Size

T2YD type switch single item model number notation method

●Switch body+Mounting bracket set

JSC4-LN - T2YD - 125

⑥ Switch Model

② Bore Size

● Switch Body Only

SW - T2YD

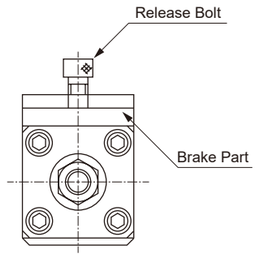
⑥ Switch Model

●Mounting bracket set

JSC4-LN - T - 125

② Bore Size

Manual Brake Release Method



Note: Brake release method

- Screwing the release bolt (included with the product) 2 to 3 rotations into the female thread on the upper part of the brake unit (next to the brake release port) releases the brake. (Always remove the release bolt during normal use.)
- When manually releasing the brake, always use the release bolt included with the product. Using other bolts may cause the brake to fail.

Specifications

Item		JSC3 (with Switch)					JSC3-S (with Switch)					JSC4-N			
Bore Size mm		ø40	ø50	ø63	ø80	ø100	ø40	ø50	ø63	ø80	ø100	ø125	ø140	ø160	ø180
Operating Method		Double Acting Type					Double Acting, low pressure release type					Double Acting Type			
Operating Fluid		Compressed Air													
Max Operating Pressure MPa		1.0													
Min Operating Pressure MPa	Brake Part	0.3					0.25					0.3			
	Cylinder Part	0.1					0.1					0.05			
Proof Pressure MPa		1.6													
Ambient Temperature °C		-10 to 60 (however, no freezing)					-10 to 60 (however, no freezing)					-5 to 60 (However, no freezing)			
Port Size	Brake Part	Rc1/8		Rc1/4		Rc3/8	Rc1/8		Rc1/4		Rc3/8	Rc 1/2			
	Cylinder Part	Rc1/4	Rc3/8		Rc 1/2		Rc1/4	Rc3/8		Rc 1/2		Rc 1/2	Rc 3/4		
Stroke Tolerance mm		$^{-0.9}_{0}$(Up to 360), $^{+1.4}_{0}$ (Up to 1000)					$^{+1.0}_{0}$(Up to 360), $^{+1.4}_{0}$ (Up to 1000)					$^{+1.0}_{0}$(Up to 300), $^{+1.4}_{0}$(Up to 1000), $^{+1.8}_{0}$ (Up to 2000)			
Operating Piston Speed mm/s		50 to 1000 (Use within allowable absorbed energy)													
Cushion		Air Cushion													
Effective air cushion length mm		14.6	16.6		20.6	23.6	14.6	16.6		20.6	23.6	21.6			
Lubrication		Not required (When lubricating, use turbine oil Class 1 ISO VG32)													
Holding Force N		980	1569	2451	3922	6178	784	1255	1961	3138	4941	9600	12000	15800	20000
Allowable Absorbed Energy J	With Cushion	4.29	8.37	15.8	27.9	49.8	4.29	8.37	15.8	27.9	49.8	63.6	91.5	116	152
	Without cushion	0.067	0.079	0.079	0.201	0.301	0.067	0.079	0.079	0.201	0.301	0.371	0.386	0.386	0.958
		Note: Without cushion, large energy generated by external load cannot be absorbed. It is recommended to use an external shock absorber together.													

Stroke

Bore Size (mm)		Standard Stroke (mm)	Max Stroke (mm)	Manufacturable Stroke (mm)	Min Stroke (mm)
JSC3	ø40	50, 75, 100, 150, 200, 250, 300, 350, 400, 450, 500	600	1600	1
	ø50			2,000	
	ø63			2500	
	ø80		700		
	ø100		800	*4	
JSC4	ø125	50, 75, 100, 150, 200, 250, 300	800	2000	
	ø140				
	ø160				
	ø180		900		

***1: If the Max Stroke is exceeded, the product specifications may not be met depending on the conditions, so please consult us. Also, please refer to Intro 29.**

***2: Intermediate strokes can be manufactured in 2 mm increments.**

*3: Minimum stroke varies depending on the switch mounting method. Refer to the table below.

*4: For bellows-equipped models with tube inner diameters ø63 to ø100, the producible stroke is up to 2000 mm.

Minimum Stroke for JSC3 with Switch (T-type switch)

●Minimum stroke with T0/T5 type switch

Number of Switches	Different Surface Mounting	Same Surface Mounting		Intermediate Trunnion Mounting		Rod Side Trunnion Mounting Position detection at the rod side stroke end is not possible.	Head Side Trunnion Mounting Position detection at the head side stroke end is not possible.
Bore Size	2	1	2	1	2	1	1
ø40	20 (20)	20 (10)	60 (45)	110 (110)	110 (110)	50 (50)	50 (50)
ø50	20 (20)	15 (10)	20 (20)	135 (135)	135 (135)	60 (60)	60 (60)
ø63	20 (20)	15 (10)	20 (20)	110 (95)	110 (95)	50 (45)	50 (45)
ø80	25 (25)	15 (15)	25 (25)	115 (85)	115 (85)	55 (40)	55 (40)
ø100	25 (25)	15 (15)	25 (25)	125 (95)	125 (95)	60 (45)	60 (45)

*1: ( ) indicates T□V (L-shaped lead wire type).

*2: If the stroke is 15 mm or less, two switches may turn ON simultaneously. In this case, adjust the switch mounting positions so that they are further apart from each other.

Minimum Stroke for JSC3 with Switch (T-type switch)

● Minimum stroke with T8 type switch

Number of Switches	Different Surface Mounting	Same Surface Mounting		Intermediate Trunnion Mounting		Rod Side Trunnion Mounting Position detection at the rod side stroke end is not possible.	Head Side Trunnion Mounting Position detection at the head side stroke end is not possible.
Bore Size	2	1	2	1	2	1	1
ø40	20 (20)	15 (10)	50 (35)	95 (85)	95 (85)	45 (40)	45 (40)
ø50	20 (20)	10 (10)	20 (20)	115 (115)	115 (115)	50 (50)	50 (50)
ø63	20 (20)	10 (10)	20 (20)	95 (75)	95 (75)	45 (35)	45 (35)
ø80	25 (25)	15 (15)	25 (25)	100 (70)	100 (70)	50 (35)	50 (35)
ø100	25 (25)	15 (15)	25 (25)	110 (80)	110 (80)	55 (40)	55 (40)

*1: ( ) indicates T□V (L-shaped lead wire type).
*2: If the stroke is 15 mm or less, two switches may turn ON simultaneously. In this case, adjust the switch mounting positions so that they are further apart from each other.

● Minimum stroke with T2/T3 type switch

Number of Switches	Different Surface Mounting	Same Surface Mounting		Intermediate Trunnion Mounting		Rod Side Trunnion Mounting Position detection at the rod side stroke end is not possible.	Head Side Trunnion Mounting Position detection at the head side stroke end is not possible.
Bore Size	2	1	2	1	2	1	1
ø40	20 (15)	20 (10)	60 (45)	105 (75)	105 (75)	50 (35)	50 (35)
ø50	15 (15)	15 (10)	15 (15)	105 (75)	105 (75)	45 (30)	45 (30)
ø63	15 (15)	15 (10)	15 (15)	110 (80)	110 (80)	50 (35)	50 (35)
ø80	15 (15)	15 (10)	15 (15)	115 (85)	115 (85)	55 (40)	55 (40)
ø100	15 (15)	10 (10)	15 (15)	125 (95)	125 (95)	60 (45)	60 (45)

*1: ( ) indicates T□V (L-shaped lead wire type).
*2: If the stroke is 15 mm or less, two switches may turn ON simultaneously. In this case, adjust the switch mounting positions so that they are further apart from each other.

● Minimum stroke with T1/T2YD type switch

	Different Surface Mounting	Same Surface Mounting		Intermediate Trunnion Mounting		Rod Side Trunnion Mounting Position detection at the rod side stroke end is not possible.	Head Side Trunnion Mounting Position detection at the head side stroke end is not possible.
Number of Switches	2	1	2	1	2	1	1
ø40	20 (15)	20 (10)	60 (45)	105 (75)	105 (75)	50 (35)	50 (35)
ø50	15 (15)	15 (10)	15 (15)	100 (70)	100 (70)	45 (30)	45 (30)
ø63	15 (15)	15 (10)	15 (15)	105 (75)	105 (75)	50 (35)	50 (35)
ø80	15 (15)	15 (10)	15 (15)	110 (80)	110 (80)	55 (40)	55 (40)
ø100	15 (15)	10 (10)	15 (15)	120 (90)	120 (90)	60 (45)	60 (45)

*1: ( ) indicates T□V (L-shaped lead wire type). However, T2YD does not have an L-shaped lead wire type (V).
*2: If the stroke is 15 mm or less, two switches may turn ON simultaneously. In this case, adjust the switch mounting positions so that they are further apart from each other.

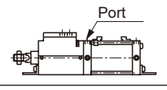
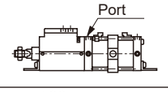
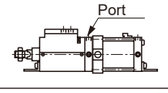
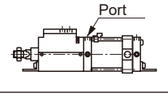
● Min Stroke with T2W/T3W switches

	Different Surface Mounting	Same Surface Mounting		Intermediate Trunnion Mounting		Rod Side Trunnion Mounting Position detection at the rod side stroke end is not possible.	Head Side Trunnion Mounting Position detection at the head side stroke end is not possible.
Number of Switches	2	1	2	1	2	1	1
ø40	20 (10)	20 (5)	65 (50)	110 (80)	110 (80)	50 (35)	50 (35)
ø50	20 (10)	20 (5)	20 (10)	110 (80)	110 (80)	50 (35)	50 (35)
ø63	20 (10)	20 (5)	20 (10)	115 (85)	115 (85)	55 (40)	55 (40)
ø80	15 (10)	15 (5)	15 (10)	120 (90)	120 (90)	55 (40)	55 (40)
ø100	10 (10)	10 (5)	10 (10)	130 (100)	130 (100)	60 (45)	60 (45)

*1: ( ) indicates T□V (L-shaped lead wire type).
*2: If the stroke is 15 mm or less, two switches may turn ON simultaneously. In this case, adjust the switch mounting positions so that they are further apart from each other.

Minimum Stroke for JSC4 with Switch (T-type switch)

● ø125 to ø180 (Unit: mm)

Item / Bore Size (mm)	Stroke when mounted on the same surface	Intermediate trunnion mounting stroke	Rod side trunnion mounting stroke	Head side trunnion mounting stroke
				
ø125	20 or more	120 or more	70 or more	
ø140		125 or more	75 or more	
ø160		130 or more	80 or more	
ø180		135 or more	85 or more	

Cylinder Weight

● JSC3 (ø40 to ø100) [Unit: kg]

Item / Mounting Style / Bore Size (mm)	Product Weight when stroke (S) = 0 mm: Basic Type (00)	Foot Type (LB)	Flange type (FA, FB)	Single Clevis Type (CA)	Double Yoke Clevis Type (CB)	Trunnion Type (TC)	Switch Weight	Mounting Bracket Weight: T Type	H type	Added weight per S = 100 mm
ø40	2.48	2.66	2.91	2.83	2.83	2.86	Refer to the Weight listed in the Switch Specifications on P. 1457.	0.024	0.028	0.39
ø50	3.47	3.67	3.97	3.87	3.87	3.97		0.022	0.026	0.46
ø63	5.09	5.49	6.19	5.79	5.79	5.89		0.020	0.024	0.50
ø80	8.15	8.85	9.95	9.65	9.65	9.45		0.026	0.029	0.90
ø100	14.70	15.70	17.40	16.90	16.90	17.30		0.024	0.028	1.12

(Example) Product Weight of JSC3-LB-50B-200-T0H-D

Product weight for 0 mm stroke ..... 3.67 kg
Additional weight for 200 mm stroke ... $0.46 \times \frac{200}{100} = 0.92$ kg
Weight of 2 T0H switches ..... 0.018×2=0.036 kg
Weight of 2 mounting brackets ..... 0.022×2=0.044 kg
Product weight ..... 3.67+0.92+0.036+0.044=4.670 kg

● JSC4 (ø125 to ø180) (Unit: kg)

Item / Mounting Style / Bore Size (mm)	Product Weight when stroke (S) = 0 mm: Axial Foot Type (LB)	Flange Type (FA, FB)	Single Clevis Type (CA)	Double Clevis Type (CB)	Trunnion Type (TA, TB, TC)	Switch Weight: Switch	Mounting bracket	Added weight per S = 100 mm
ø125	25.72	27.52	27.22	27.32	27.62	Refer to the Weight listed in the Switch Specifications on P. 1457.	0.028	1.54
ø140	32.95	36.35	34.75	34.95	34.15		0.030	1.78
ø160	42.85	46.65	44.75	45.05	46.15		0.034	2.22
ø180	61.55	69.05	64.45	64.95	65.15		0.038	2.96

(Example) Product Weight of JSC4-LN-LB-125B-300-T0H-D

Product Weight at S = 0 mm: ..... 25.72 kg
Additional weight when S = 300 mm ..... $1.54 \times \frac{300}{100} = 4.62$ kg
Weight of 2 switches (T0H-D) ..... 0.018×2 = 0.036 kg
Weight of 2 switch brackets ..... 0.028×2 = 0.056 kg
Product weight ..... 25.72+4.62+0.036+0.056 = 30.432 kg

Theoretical Thrust Table

(Unit: N)

Bore Size (mm)		Operating Direction	Operating Pressure MPa: 0.1	0.15	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
JSC3	ø40	Push	1.26×10^2	1.88×10^2	2.51×10^2	3.77×10^2	5.03×10^2	6.28×10^2	7.54×10^2	8.80×10^2	1.01×10^3	1.13×10^3	1.26×10^3
		Pull	1.06×10^2	1.58×10^2	2.11×10^2	3.17×10^2	4.22×10^2	5.28×10^2	6.33×10^2	7.39×10^2	8.44×10^2	9.50×10^2	1.06×10^3
	ø50	Push	1.96×10^2	2.95×10^2	3.93×10^2	5.89×10^2	7.85×10^2	9.82×10^2	1.18×10^3	1.37×10^3	1.57×10^3	1.77×10^3	1.96×10^3
		Pull	1.65×10^2	2.47×10^2	3.30×10^2	4.95×10^2	6.60×10^2	8.25×10^2	9.90×10^2	1.15×10^3	1.32×10^3	1.48×10^3	1.65×10^3
	ø63	Push	3.12×10^2	4.68×10^2	6.23×10^2	9.35×10^2	1.25×10^3	1.56×10^3	1.87×10^3	2.18×10^3	2.49×10^3	2.81×10^3	3.12×10^3
		Pull	2.80×10^2	4.20×10^2	5.61×10^2	8.41×10^2	1.12×10^3	1.40×10^3	1.68×10^3	1.96×10^3	2.24×10^3	2.52×10^3	2.80×10^3
	ø80	Push	5.03×10^2	7.54×10^2	1.01×10^3	1.51×10^3	2.01×10^3	2.51×10^3	3.02×10^3	3.52×10^3	4.02×10^3	4.52×10^3	5.03×10^3
		Pull	4.54×10^2	6.80×10^2	9.07×10^2	1.36×10^3	1.81×10^3	2.27×10^3	2.72×10^3	3.17×10^3	3.63×10^3	4.08×10^3	4.54×10^3
	ø100	Push	7.85×10^2	1.18×10^3	1.57×10^3	2.36×10^3	3.14×10^3	3.93×10^3	4.71×10^3	5.50×10^3	6.28×10^3	7.07×10^3	7.85×10^3
		Pull	7.15×10^2	1.07×10^3	1.43×10^3	2.14×10^3	2.86×10^3	3.57×10^3	4.29×10^3	5.00×10^3	5.72×10^3	6.43×10^3	7.15×10^3
JSC4	ø125	Push	1.23×10^3	1.84×10^3	2.45×10^3	3.68×10^3	4.91×10^3	6.14×10^3	7.36×10^3	8.59×10^3	9.82×10^3	1.10×10^4	1.23×10^4
		Pull	1.13×10^3	1.70×10^3	2.26×10^3	3.39×10^3	4.52×10^3	5.65×10^3	6.79×10^3	7.92×10^3	9.05×10^3	1.02×10^4	1.13×10^4
	ø140	Push	1.54×10^3	2.31×10^3	3.08×10^3	4.62×10^3	6.16×10^3	7.70×10^3	9.24×10^3	1.08×10^4	1.23×10^4	1.39×10^4	1.54×10^4
		Pull	1.44×10^3	2.16×10^3	2.89×10^3	4.33×10^3	5.77×10^3	7.22×10^3	8.66×10^3	1.01×10^4	1.15×10^4	1.30×10^4	1.44×10^4
	ø160	Push	2.01×10^3	3.02×10^3	4.02×10^3	6.03×10^3	8.04×10^3	1.01×10^4	1.21×10^4	1.41×10^4	1.61×10^4	1.81×10^4	2.01×10^4
		Pull	1.88×10^3	2.83×10^3	3.77×10^3	5.65×10^3	7.54×10^3	9.42×10^3	1.13×10^4	1.32×10^4	1.51×10^4	1.70×10^4	1.88×10^4
	ø180	Push	2.54×10^3	3.82×10^3	5.09×10^3	7.63×10^3	1.02×10^4	1.27×10^4	1.53×10^4	1.78×10^4	2.04×10^4	2.29×10^4	2.54×10^4
		Pull	2.39×10^3	$3.58+10^3$	4.77×10^3	7.16×10^3	9.54×10^3	1.19×10^4	1.43×10^4	1.67×10^4	1.91×10^4	2.15×10^4	2.39×10^4

Mounting Bracket Model No. Notation

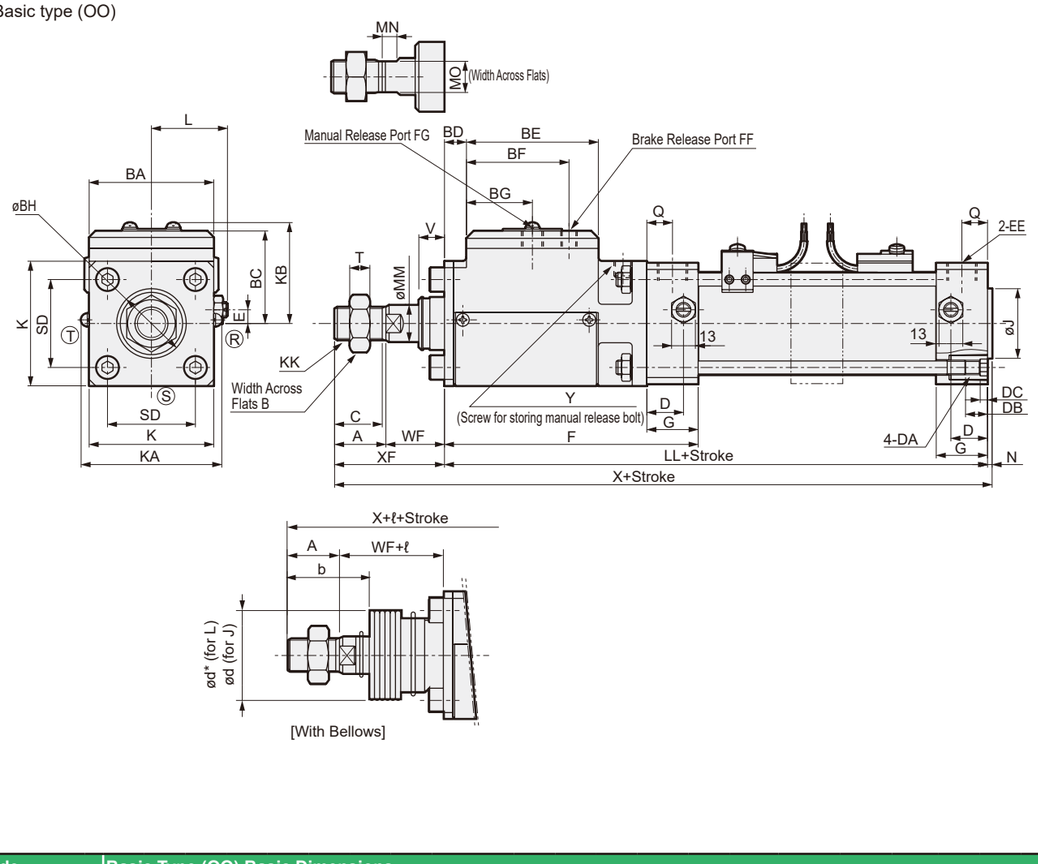
●ø40 to ø100

Bore Size (mm) / Mounting Bracket	ø40	ø50	ø63	ø80	ø100
Foot (LB) *1	JSC3-40-LB	JSC3-50-LB	JSC3-63-LB	JSC3-80-LB	JSC3-100-LB
Flange (FB)	JSC3-40-FB	JSC3-50-FB	JSC3-63-FB	JSC3-80-FB	JSC3-100-FB
Single clevis (CA)	S1-CA-40	S1-CA-50	S1-CA-63	S1-CA-80	S1-CA-100
Double Yoke Clevis (CB) *2	S1-CB-40	S1-CB-50	S1-CB-63	S1-CB-80	S1-CB-100

*1: Foot type mounting brackets are 2 pcs/set.
*2: Pins and Retaining Rings are included.
*3: Mounting bolts are included with each mounting bracket.

Outline Dimension Drawing (Bore Size: ø40 to ø100)

● Basic type (OO)



[With Bellows]

Code	Basic Type (OO) Basic Dimensions																				
Bore Size (mm)	A	B	BA	BC	BD	BE	BF	BG	BH	C	D	DA	DB	DC	E	EE	F	FF	FG	G	J	K
ø40	22	22	58	46	9	62	51	31	31	20	18	M8	12	4	7.5	Rc1/4	121	Rc1/8	M10	26	31	57
ø50	28	27	68	50.5	12	72	56	36	38	26	20	M8	12	4	0	Rc3/8	138.5	Rc1/8	M10	28	38	68
ø63	28	27	80	54	13	86	70	43	38	26	22	M8	12	4	0	Rc3/8	154	Rc1/4	M12	30	38	80
ø80	36	32	98	66	13	106	80	53	43	34	26	M12	16	5	0	Rc 1/2	179.5	Rc1/4	M14	34	43	98
ø100	45	41	118	74	17.5	132	101	66	51	43	28	M12	16	5	0	Rc 1/2	220.5	Rc3/8	M16	36	51	118

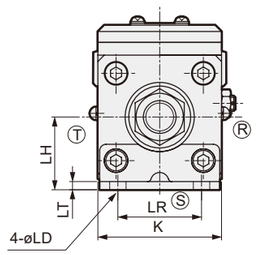
Code																
Bore Size (mm)	KA	KB	KK	L	LL	MM	MN	M0	N	Q	SD	T	V	WF	X	XF	Y
ø40	66	50.5	M14x1.5	38 to 39.5	188	16	8	14	2	13	40.5	8	15	30	242	52	M10 Depth 9
ø50	77	55	M18x1.5	41.0 to 43.5	211.5	20	8	17	2.5	14	48	11	16	34	276	62	M10 Depth 9
ø63	89	58.5	M18x1.5	47.5 to 50.0	229	20	8	17	3	15	59	11	16	30	290	58	M12 Depth 10
ø80	107	70.5	M22×1.5	56 to 59	261.5	25	11	22	3.5	17	74	13	17.5	43.5	344.5	79.5	M14 Depth 11
ø100	127	78.5	M26x1.5	66 to 69	312.5	30	13	27	4	18	90	16	26	48	409.5	93	M16 Depth 13

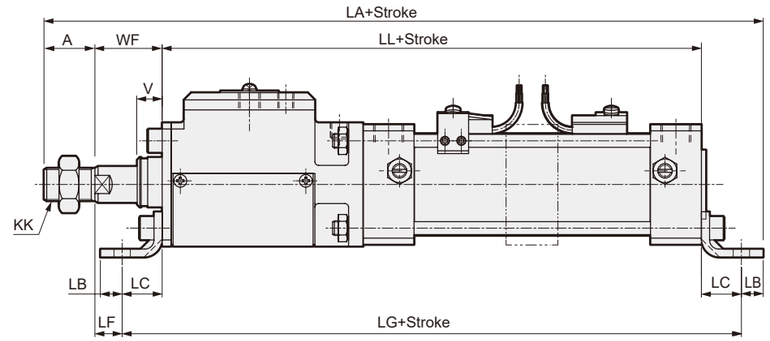
Code	With Bellows						ℓ							
Bore Size (mm)	A	WF	FF	b	d	d*	50 or less	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500	501 or more
ø40	22	30	22	41	40	40	25.5	41.5	58.5	75.5	108.5	141.5	174.5	(Stroke/3.0)+8
ø50	28	34	27	47	47	48	22	36	49	63	90	119	146	(Stroke/3.6)+7.5
ø63	28	30	22	45	47	48	22	36	49	63	90	119	146	(Stroke/3.6)+7.5
ø80	36	43.5	30.5	58.5	53	55	14	26	38	49	72	96	119	(Stroke/4.3)+2.5
ø100	45	48	35.5	69.5	61	65	20	32	42	53	76	98	120	(Stroke/4.5)+9

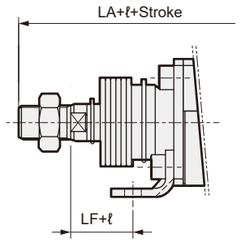
*1: Round up the ℓ dimension to the nearest whole number.
*2: Ⓡ Ⓢ Ⓣ indicates the position of the cushion needle.
*3: Manual release bolt is included.
***4: For outline dimension drawings of accessories, please refer to P. 453 to 455.**
***5: An intermediate support head (two-dot chain line) is added depending on the stroke. For details on dimensions, please refer to P. 443.**
***6: For dimensions with each switch, refer to P. 494.**

Outline Dimension Drawing (Bore Size: ø40 to ø100)

● Axial Foot Type (LB)







[With Bellows]

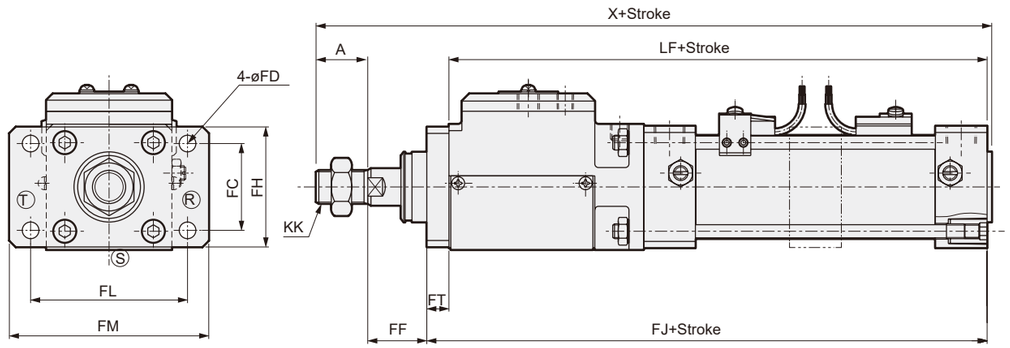
Code	Axial Foot Type (LB) Mounting Dimensions														
Bore Size (mm)	A	K	KK	V	WF	LL	LA	LB	LC	LD	LF	LG	LH	LR	LT
ø40	22	57	M14x1.5	15	30	188	269.5	10	19.5	9	10.5	227	40	40	3.2
ø50	28	68	M18x1.5	16	34	211.5	307.5	12	22	9	12	255.5	40	46	4.5
ø63	28	80	M18x1.5	16	30	229	329	12	30	11	0	289	50	60	4.5
ø80	36	98	M22×1.5	17.5	43.5	261.5	392	14	37	14	6.5	335.5	60	74	6.0
ø100	45	118	M26x1.5	26	48	312.5	457.5	21	31	14	17	374.5	67	80	6.0

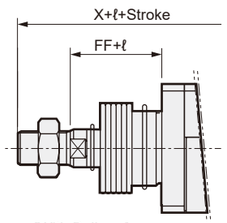
Code	With Bellows ℓ							
Bore Size (mm)	50 or less	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500	501 or more
ø40	25.5	41.5	58.5	75.5	108.5	141.5	174.5	(Stroke/3.0)+8
ø50	22	36	49	63	90	119	146	(Stroke/3.6)+7.5
ø63	22	36	49	63	90	119	146	(Stroke/3.6)+7.5
ø80	14	26	38	49	72	96	119	(Stroke/4.3)+2.5
ø100	20	32	42	53	76	98	120	(Stroke/4.5)+9

*1: Round up the ℓ dimension to the nearest whole number.
*2: Ⓡ Ⓢ Ⓣ indicates the position of the cushion needle.
*3: Manual release bolt is included.
***4: For outline dimension drawings of accessories, please refer to P. 453 to 455.**
***5: An intermediate support head (two-dot chain line) is added depending on the stroke. For details on dimensions, please refer to P. 443.**
***6: For dimensions with each switch, refer to P. 494.**

Outline Dimension Drawing (Bore Size: ø40 to ø100)

●Rod Side Flange Type (FA)





[With Bellows]

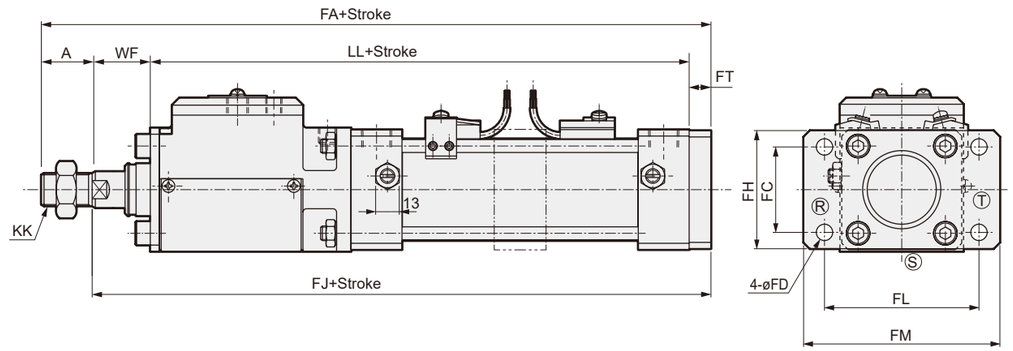
Code	Rod Side Flange Type (FA) Mounting Dimensions											
Bore Size (mm)	A	K	LF	X	FC	FD	FF	FH	FJ	FL	FM	FT
ø40	22	57	184	242	40	9	22	57	196	80	100	12
ø50	28	68	206.5	276	47	9	27	65	218.5	85	108	12
ø63	28	80	221	290	60	11	22	80	237	106	130	16
ø80	36	98	255.5	344.5	74	14	30.5	98	274.5	125	153	19
ø100	45	118	306	409.5	88	14	35.5	118	325	144	180	19

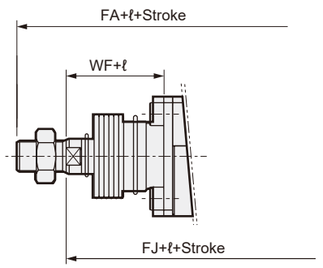
Code	With Bellows ℓ							
Bore Size (mm)	50 or less	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500	501 or more
ø40	25.5	41.5	58.5	75.5	108.5	141.5	174.5	(Stroke/3.0)+8
ø50	22	36	49	63	90	119	146	(Stroke/3.6)+7.5
ø63	22	36	49	63	90	119	146	(Stroke/3.6)+7.5
ø80	14	26	38	49	72	96	119	(Stroke/4.3)+2.5
ø100	20	32	42	53	76	98	120	(Stroke/4.5)+9

*1: Round up the ℓ dimension to the nearest whole number.
*2: Ⓡ Ⓢ Ⓣ indicates the position of the cushion needle.
*3: Since the rod metal is not fixed, it cannot be reassembled to the head side flange.
*4: Manual release bolt is included.
***5: For outline dimension drawings of accessories, please refer to P. 453 to 455.**
***6: An intermediate support head (two-dot chain line) is added depending on the stroke. For details on dimensions, please refer to P. 443.**
***7: For dimensions with each switch, refer to P. 494.**

Outline Dimension Drawing (Bore Size: ø40 to ø100)

●Head Side Flange Type (FB)





[With Bellows]

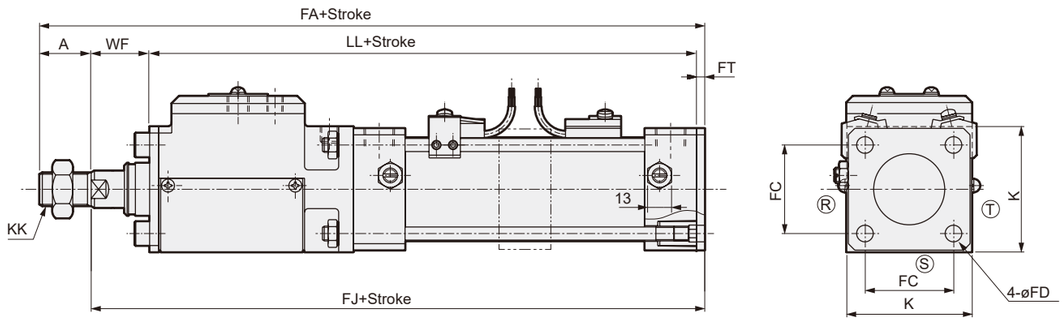
Code	Head Side Flange Type (FB) Mounting Dimensions											
Bore Size (mm)	A	KK	LL	WF	FA	FC	FD	FH	FJ	FL	FM	FT
ø40	22	M14x1.5	188	30	252	40	9	57	230	80	100	12
ø50	28	M18x1.5	211.5	34	285.5	47	9	65	257.5	85	108	12
ø63	28	M18x1.5	229	30	303	60	11	80	275	106	130	16
ø80	36	M22×1.5	261.5	43.5	360	74	14	98	324	125	153	19
ø100	45	M26x1.5	312.5	48	424.5	88	14	118	379.5	144	180	19

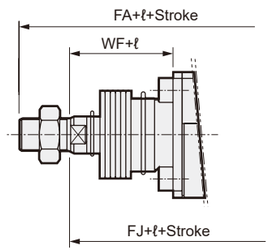
Code	With Bellows ℓ							
Bore Size (mm)	50 or less	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500	501 or more
ø40	25.5	41.5	58.5	75.5	108.5	141.5	174.5	(Stroke/3.0)+8
ø50	22	36	49	63	90	119	146	(Stroke/3.6)+7.5
ø63	22	36	49	63	90	119	146	(Stroke/3.6)+7.5
ø80	14	26	38	49	72	96	119	(Stroke/4.3)+2.5
ø100	20	32	42	53	76	98	120	(Stroke/4.5)+9

*1: Round up the ℓ dimension to the nearest whole number.
*2: Ⓡ Ⓢ Ⓣ indicates the position of the cushion needle.
*3: Since the Piston Rod protrusion length (from flange end face), rod metal, and flange mounting bolts change, it cannot be reassembled to the rod side flange.
*4: Manual release bolt is included.
***5: For outline dimension drawings of accessories, please refer to P. 453 to 455.**
***6: An intermediate support head (two-dot chain line) is added depending on the stroke. For details on dimensions, please refer to P. 443.**
***7: For dimensions with each switch, refer to P. 494.**

Outline Dimension Drawing (Bore Size: ø40 to ø100)

●Head side special flange type (FC)





[With bellows]

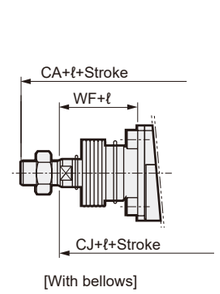
Code	Head Side Flange Type (FC) Mounting Dimensions									
Bore Size (mm)	A	K	KK	LL	WF	FA	FC	FD	FJ	FT
ø40	22	57	M14x1.5	188	30	244.5	40.5	9	222.5	4.5
ø50	28	68	M18x1.5	211.5	34	278	48	9	250	4.5
ø63	28	80	M18x1.5	229	30	291.5	59	9	263.5	4.5
ø80	36	98	M22×1.5	261.5	43.5	347	74	14	311	6
ø100	45	118	M26x1.5	312.5	48	411.5	90	14	366.5	6

Code	With Bellows ℓ							
Bore Size (mm)	50 or less	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500	501 or more
ø40	25.5	41.5	58.5	75.5	108.5	141.5	174.5	(Stroke/3.0)+8
ø50	22	36	49	63	90	119	146	(Stroke/3.6)+7.5
ø63	22	36	49	63	90	119	146	(Stroke/3.6)+7.5
ø80	14	26	38	49	72	96	119	(Stroke/4.3)+2.5
ø100	20	32	42	53	76	98	120	(Stroke/4.5)+9

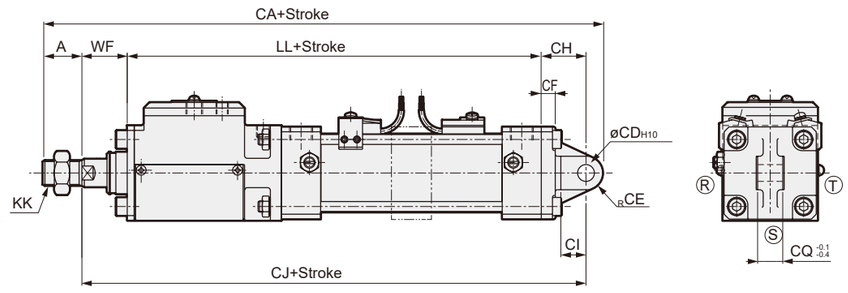
*1: Round up the ℓ dimension to the nearest whole number.
*2: Ⓡ Ⓢ Ⓣ indicates the position of the cushion needle.
*3: Manual release bolt is included.
***4: For outline dimension drawings of accessories, please refer to P. 453 to 455.**
***5: An intermediate support head (two-dot chain line) is added depending on the stroke. For details on dimensions, please refer to P. 443.**
***6: For dimensions with each switch, refer to P. 494.**

Outline Dimension Drawing (Bore Size: ø40 to ø100)

●Single Clevis Type (CA)



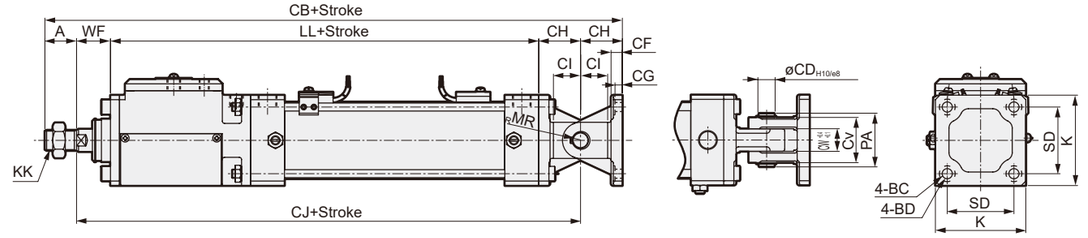
[With bellows]



Code	Single Clevis Type (CA) Mounting Dimensions												With Bellows ℓ							
Bore Size (mm)	A	KK	LL	WF	CA	CD	CE	CF	CH	CI	CJ	CQ	50 or less	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500	501 or more
ø40	22	M14x1.5	188	30	284	12	12	10	32	18	250	18	25.5	41.5	58.5	75.5	108.5	141.5	174.5	(Stroke/3.0)+8
ø50	28	M18x1.5	211.5	34	317.5	12	12	10	32	18	277.5	18	22	36	49	63	90	119	146	(Stroke/3.6)+7.5
ø63	28	M18x1.5	229	30	340	14	16	10	37	24	296	20	22	36	49	63	90	119	146	(Stroke/3.6)+7.5
ø80	36	M22×1.5	261.5	43.5	413	20	20	14	52	30	357	28	14	26	38	49	72	96	119	(Stroke/4.3)+2.5
ø100	45	M26x1.5	312.5	48	477.5	20	20	16	52	30	412.5	28	20	32	42	53	76	98	120	(Stroke/4.5)+9

*1: Round up the ℓ dimension to the nearest whole number.
*2: Ⓡ Ⓢ Ⓣ indicates the position of the cushion needle.
***3: For outline dimension drawings of accessories, please refer to P. 453 to 455.**
***4: An intermediate support head (two-dot chain line) is added depending on the stroke. For details on dimensions, please refer to P. 443.**
***5: For dimensions with each switch, refer to P. 494.**

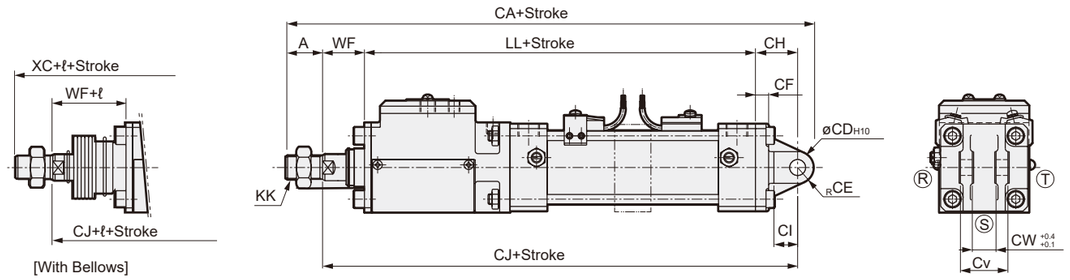
● Eye bracket (CA) with clevis bracket (B2)



Code	Single Yoke Clevis Type (CA), with Double Yoke Bracket (B2) Mounting Dimensions																	
Bore Size (mm)	A	KK	LL	WF	CB	CD	CF	CG	CH	CI	CJ	Cv	CW	BC	BD	K	MR	PA	SD
ø40	22	M14x1.5	188	30	304	12	10	6.5	32	18	250	36	18	9	14	57	12	43.5	40.5
ø50	28	M18x1.5	211.5	34	337.5	12	10	6.5	32	18	277.5	36	18	9	14	66	12	43.5	48
ø63	28	M18x1.5	229	30	361	14	10	6.5	37	24	296	40	20	9	14	80	16	47.5	59
ø80	36	M22×1.5	261.5	43.5	445	20	14	10.5	52	30	357	56	28	14	20	98	20	64	74
ø100	45	M26x1.5	312.5	48	509.5	20	16	10.5	52	30	412.5	56	28	14	20	118	20	64	90

Outline Dimension Drawing (Bore Size: ø40 to ø100)

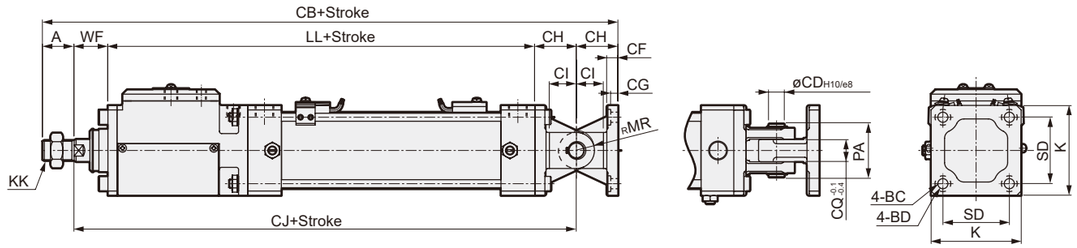
●Double clevis type (CB)



Code	Double Yoke Clevis Type (CA) Mounting Dimensions													With Bellows ℓ							
Bore Size (mm)	A	KK	LL	WF	CA	CD	CE	CF	CH	CI	CJ	Cv	CW	50 or less	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500	501 or more
ø40	22	M14x1.5	188	30	284	12	12	10	32	18	250	36	18	25.5	41.5	58.5	75.5	108.5	141.5	174.5	(Stroke/3.0)+8
ø50	28	M18x1.5	211.5	34	317.5	12	12	10	32	18	277.5	36	18	22	36	49	63	90	119	146	(Stroke/3.6)+7.5
ø63	28	M18x1.5	229	30	340	14	16	10	37	24	296	40	20	22	36	49	63	90	119	146	(Stroke/3.6)+7.5
ø80	36	M22×1.5	261.5	43.5	413	20	20	14	52	30	357	56	28	14	26	38	49	72	96	119	(Stroke/4.3)+2.5
ø100	45	M26x1.5	312.5	48	477.5	20	20	16	52	30	412.5	56	28	20	32	42	53	76	98	120	(Stroke/4.5)+9

*1: Round up the ℓ dimension to the nearest whole number.
*2: Ⓡ Ⓢ Ⓣ indicates the position of the cushion needle.
*3: Pin and Retaining Ring are included.
***4: For outline dimension drawings of accessories, please refer to P. 453 to 455.**
***5: An intermediate support head (two-dot chain line) is added depending on the stroke. For details on dimensions, please refer to P. 443.**
***6: For dimensions with each switch, refer to P. 494.**

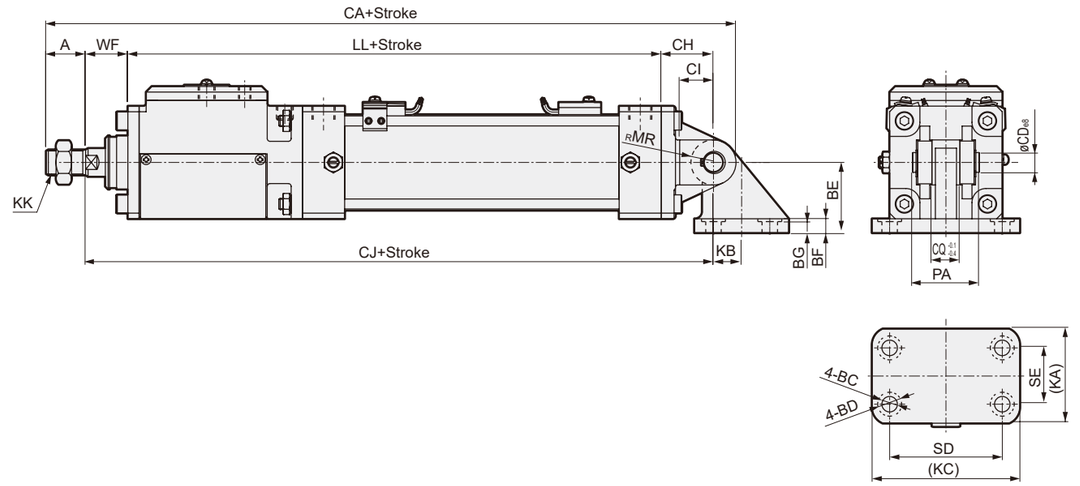
● Clevis bracket (CB) with eye bracket (B1)



Code	Double Yoke Clevis Type (CB), with Single Yoke Bracket (B1) Mounting Dimensions																	
Bore Size (mm)	A	KK	LL	WF	CB	CD	CF	CG	CH	CI	CJ	CQ	BC	BD	K	MR	PA	SD
ø40	22	M14x1.5	188	30	304	12	10	6.5	32	18	250	18	9	14	57	12	43.5	40.5
ø50	28	M18x1.5	211.5	34	337.5	12	10	6.5	32	18	277.5	18	9	14	66	12	43.5	48
ø63	28	M18x1.5	229	30	361	14	10	6.5	37	24	296	20	9	14	80	16	47.5	59
ø80	36	M22×1.5	261.5	43.5	445	20	14	10.5	52	30	357	28	14	20	98	20	64	74
ø100	45	M26x1.5	312.5	48	509.5	20	16	10.5	52	30	412.5	28	14	20	118	20	64	90

Outline Dimension Drawing (Bore Size: ø40 to ø100)

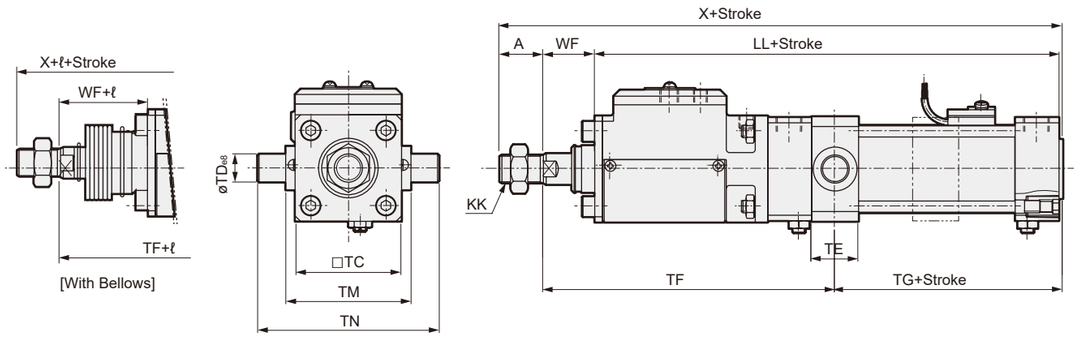
● Clevis bracket (CB) with eye bracket (B3)



Code	Double Yoke Clevis Type (CB), with Single Yoke Bracket (B3) Mounting Dimensions																				
Bore Size (mm)	A	KK	LL	WF	CA	CD	CH	CI	CJ	CQ	BC	BD	BE	BF	BG	KA	KB	KC	MR	PA	SD	SE
ø40	22	M14x1.5	188	30	284	12	32	18	250	18	9	14	40	8	6.5	57	17.5	85	12	43.5	40.5	35
ø50	28	M18x1.5	211.5	34	317.5	12	32	18	277.5	18	9	14	40	8	6.5	57	17.5	85	12	43.5	48	35
ø63	28	M18x1.5	229	30	340	14	37	24	296	20	9	14	50	10	8	67	20	105	16	47.5	59	40
ø80	36	M22×1.5	261.5	43.5	413	20	52	30	357	28	14	20	65	12	10	93	30	130	20	64	74	60
ø100	45	M26x1.5	312.5	48	477.5	20	52	30	412.5	28	14	20	65	12	10	93	30	130	20	64	90	60

Outline Dimension Drawing (Bore Size: ø40 to ø100)

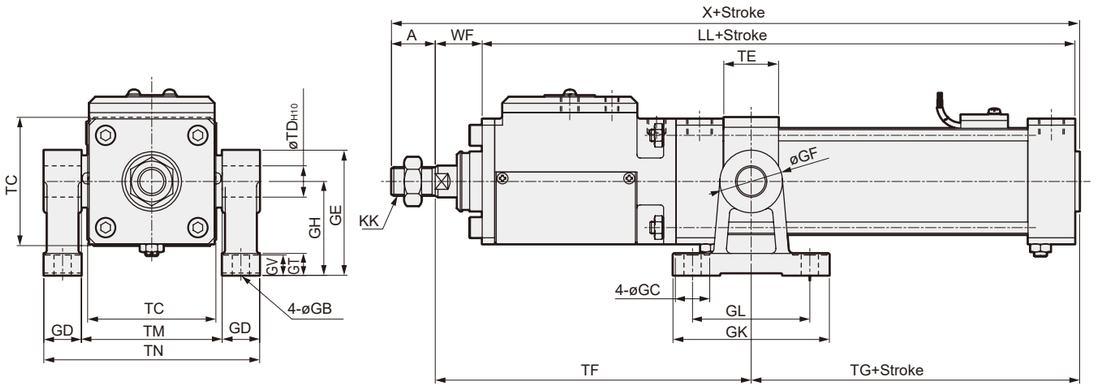
●Rod side trunnion type (TA)



Code	Rod Side Trunnion Type (TA) Mounting Dimensions											With Bellows ℓ							
Bore Size (mm)	A	KK	LL	WF	TC	TD	TE	TF	TG	TM	TN	50 or less	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500	501 or more
ø40	22	M14x1.5	188	30	57	16	30	166.5	53.5	63	95	25.5	41.5	58.5	75.5	108.5	141.5	174.5	(Stroke/3.0)+8
ø50	28	M18x1.5	211.5	34	67	18	30	188	60	80	116	22	36	49	63	90	119	146	(Stroke/3.6)+7.5
ø63	28	M18x1.5	229	30	82	20	35	202	60	90	130	22	36	49	63	90	119	146	(Stroke/3.6)+7.5
ø80	36	M22×1.5	261.5	43.5	100	25	40	243.5	65	115	165	14	26	38	49	72	96	119	(Stroke/4.3)+2.5
ø100	45	M26x1.5	312.5	48	121	35	50	294	70.5	135	205	20	32	42	53	76	98	120	(Stroke/4.5)+9

*1: Round up the ℓ dimension to the nearest whole number.
*2: Position detection at the rod side stroke end is not possible.
*3: Cushion needle position cannot be changed.
***4: For outline dimension drawings of accessories, please refer to P. 453 to 455.**
***5: An intermediate support head (two-dot chain line) is added depending on the stroke. For details on dimensions, please refer to P. 443.**
***6: For dimensions with each switch, refer to P. 494.**

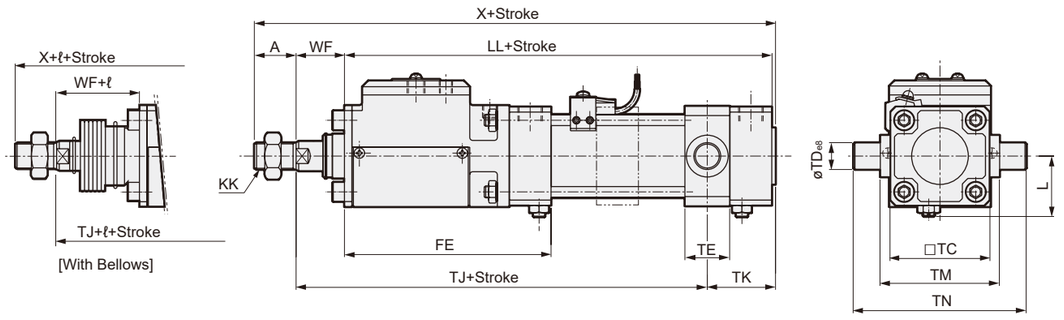
● Rod side trunnion (TA), trunnion with second bracket (B4)



Code	Rod Side Trunnion Type (TA), with Trunnion Type 2nd Bracket (B4) Mounting Dimensions																					
Bore Size (mm)	A	KK	LL	WF	X	TC	TD	TE	TF	TG	TM	TN	GB	GC	GD	GE	GF	GH	GK	GL	GT	GV
ø40	22	M14x1.5	188	30	242	57	16	30	166.5	53.5	63	95	9	17	19	61	32	45	80	60	12	11
ø50	28	M18x1.5	211.5	34	276	67	18	30	188	60	80	116	9	17	19	63	36	45	85	65	12	11
ø63	28	M18x1.5	229	30	290	82	20	35	202	60	90	130	11	22	24	80	40	60	100	75	14	13
ø80	36	M22×1.5	261.5	43.5	344.5	100	25	40	243.5	65	115	165	14	24	26	85	50	60	115	85	14	13
ø100	45	M26x1.5	312.5	48	409.5	121	35	50	294	70.5	135	205	14	24	35	107	64	75	130	100	17	16

Outline Dimension Drawing (Bore Size: ø40 to ø100)

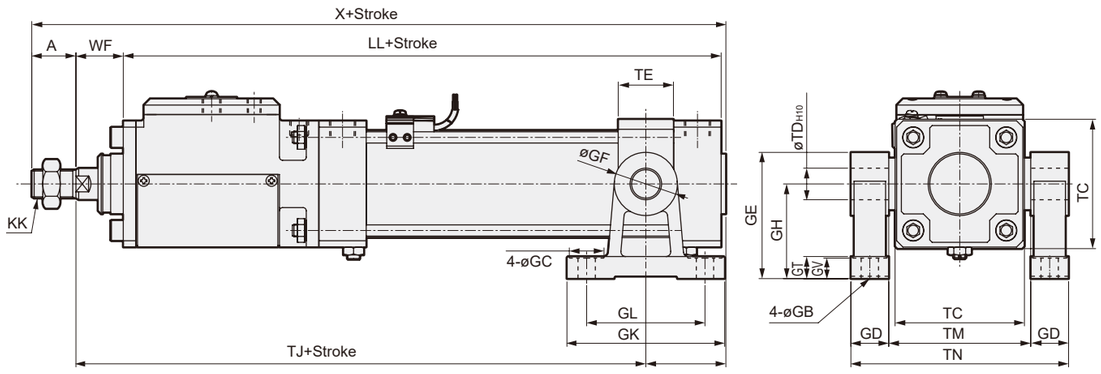
●Head Side Trunnion Type (TB)



Code	Head Side Trunnion Type (TB) Mounting Dimensions												With Bellows ℓ							
Bore Size (mm)	A	KK	LL	WF	FE	L	X	TC	TD	TE	TJ	TK	TM	TN	50 or less	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500	501 or more
ø40	22	M14x1.5	188	30	121	38 to 39.5	242	57	16	30	176.5	43.5	63	95	25.5	41.5	58.5	75.5	108.5	141.5	174.5	(Stroke/3.0)+8
ø50	28	M18x1.5	211.5	34	138.5	41.0 to 43.5	276	67	18	30	202	46	80	116	22	36	49	63	90	119	146	(Stroke/3.6)+7.5
ø63	28	M18x1.5	229	30	154	47.5 to 50.0	290	82	20	35	211	51	90	130	22	36	49	63	90	119	146	(Stroke/3.6)+7.5
ø80	36	M22×1.5	261.5	43.5	179.5	56 to 59	344.5	100	25	40	250.5	58	115	165	14	26	38	49	72	96	119	(Stroke/4.3)+2.5
ø100	45	M26x1.5	312.5	48	220.5	66 to 69	409.5	121	35	50	299	65.5	135	205	20	32	42	53	76	98	120	(Stroke/4.5)+9

*1: Round up the ℓ dimension to the nearest whole number.
*2: Position detection at the head side stroke end is not possible.
*3: Cushion needle position cannot be changed.
***4: For outline dimension drawings of accessories, please refer to P. 453 to 455.**
***5: An intermediate support head (two-dot chain line) is added depending on the stroke. For details on dimensions, please refer to P. 443.**
***6: For dimensions with each switch, refer to P. 494.**

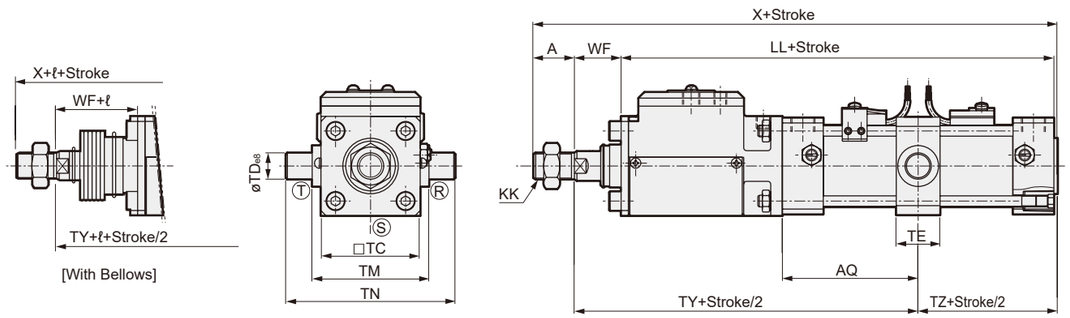
● Head side trunnion (TB), trunnion with No. 2 bracket (B4)



Code	Head Side Trunnion Type (TB), with Trunnion Type 2nd Bracket (B4) Mounting Dimensions																				
Bore Size (mm)	A	KK	LL	WF	X	TC	TD	TE	TJ	TK	TM	TN	GB	GC	GD	GE	GF	GH	GK	GL	GT	GV
ø40	22	M14x1.5	188	30	242	57	16	30	176.5	43.5	63	95	9	17	19	61	32	45	80	60	12	11
ø50	28	M18x1.5	211.5	34	276	67	18	30	202	46	80	116	9	17	19	63	36	45	85	65	12	11
ø63	28	M18x1.5	229	30	290	82	20	35	211	51	90	130	11	22	24	80	40	60	100	75	14	13
ø80	36	M22×1.5	261.5	43.5	344.5	100	25	40	250.5	58	115	165	14	24	26	85	50	60	115	85	14	13
ø100	45	M26x1.5	312.5	48	409.5	121	35	50	299	65.5	135	205	14	24	35	107	64	75	130	100	17	16

Outline Dimension Drawing (Bore Size: ø40 to ø100)

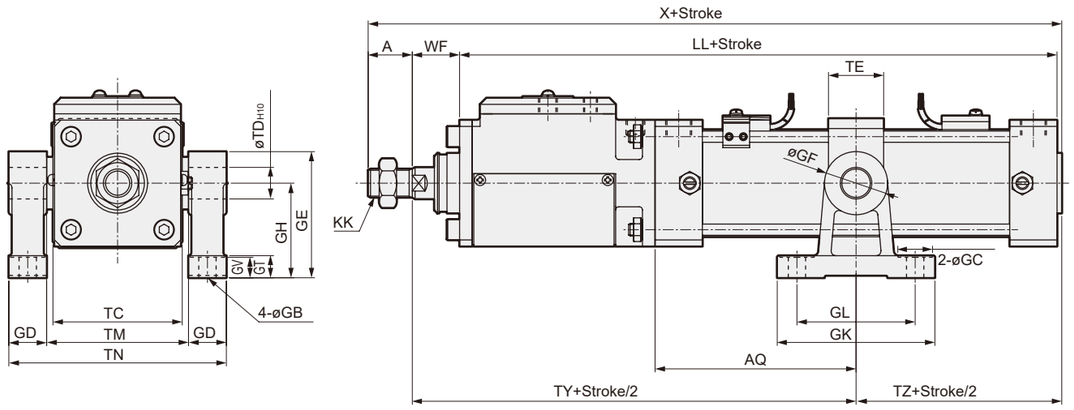
●Intermediate trunnion type (TC)



Code	Intermediate Trunnion Type (TC) Mounting Dimensions													With Bellows ℓ							
Bore Size (mm)	A	KK	LL	WF	X	AQ	TC	TD	TE	TM	TN	TY	TZ	50 or less	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500	501 or more
ø40	22	M14x1.5	188	30	242	46.5+Stroke/2	57	16	30	63	95	171.5	48.5	25.5	41.5	58.5	75.5	108.5	141.5	174.5	(Stroke/3.0)+8
ø50	28	M18x1.5	211.5	34	276	50.5+Stroke/2	67	18	30	80	116	195	53	22	36	49	63	90	119	146	(Stroke/3.6)+7.5
ø63	28	M18x1.5	229	30	290	52.5+Stroke/2	82	20	35	90	130	206.5	55.5	22	36	49	63	90	119	146	(Stroke/3.6)+7.5
ø80	36	M22×1.5	261.5	43.5	344.5	58+Stroke/2	100	25	40	115	165	247	61.5	14	26	38	49	72	96	119	(Stroke/4.3)+2.5
ø100	45	M26x1.5	312.5	48	409.5	64+Stroke/2	121	35	50	135	205	296.5	68	20	32	42	53	76	98	120	(Stroke/4.5)+9

*1: Round up the ℓ dimension to the nearest whole number.
*2: Ⓡ Ⓢ Ⓣ indicates the position of the cushion needle.
***3: For outline dimension drawings of accessories, please refer to P. 453 to 455.**
***4: For dimensions with each switch, refer to P. 494.**

● Intermediate trunnion (TC), trunnion with second bracket (B4)

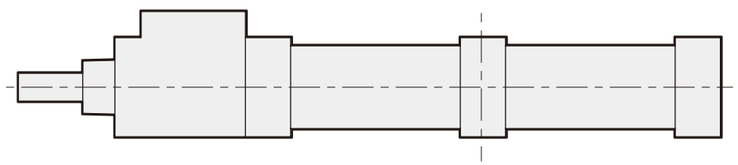


Code	Intermediate Trunnion Type (TC), with Trunnion Type 2nd Bracket (B4) Mounting Dimensions																					
Bore Size (mm)	A	KK	LL	WF	X	AQ	TC	TD	TE	TY	TZ	TM	TN	GB	GC	GD	GE	GF	GH	GK	GL	GT	GV
ø40	22	M14x1.5	188	30	242	46.5+Stroke/2	57	16	30	171.5	48.5	63	95	9	17	19	61	32	45	80	60	12	11
ø50	28	M18x1.5	211.5	34	276	50.5+Stroke/2	67	18	30	195	53	80	116	9	17	19	63	36	45	85	65	12	11
ø63	28	M18x1.5	229	30	290	52.5+Stroke/2	82	20	35	206.5	55.5	90	130	11	22	24	80	40	60	100	75	14	13
ø80	36	M22×1.5	261.5	43.5	344.5	58+Stroke/2	100	25	40	247	61.5	115	165	14	24	26	85	50	60	115	85	14	13
ø100	45	M26x1.5	312.5	48	409.5	64+Stroke/2	121	35	50	296.5	68	135	205	14	24	35	107	64	75	130	100	17	16

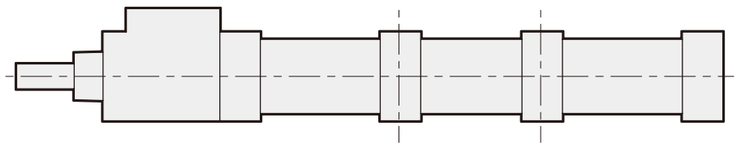
● Non-sag block (Bore Size: ø40 to ø100)

An intermediate support head is added to the center of the cylinder depending on the stroke. The quantity of intermediate support heads varies depending on the tube diameter and stroke as shown in the table below.

Quantity of intermediate support heads by stroke		
Tube Diameter (mm)	Stroke mm	Intermediate support head quantity
ø40	1200 to 1600	1
ø50	1200 to 1800	1
	1801 to 2000	2
ø63	1200 to 1800	1
	1801 to 2500	2
ø80	1500 to 2000	1
	2001 to 2500	2
ø100	1500 to 2000	1
	2001 to 2500	2

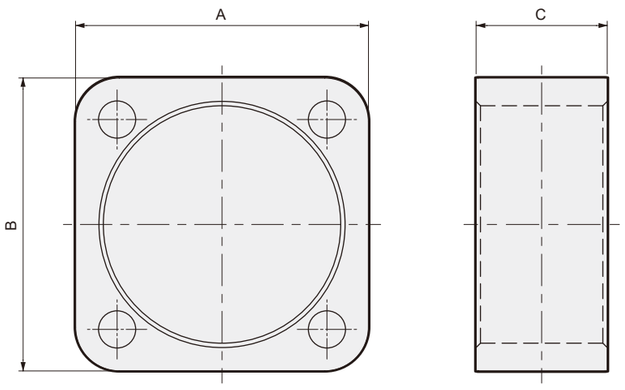


One non-sag block: Assembled in the center between the covers



Two non-sag blocks: Assembled to divide the space between covers into three equal parts

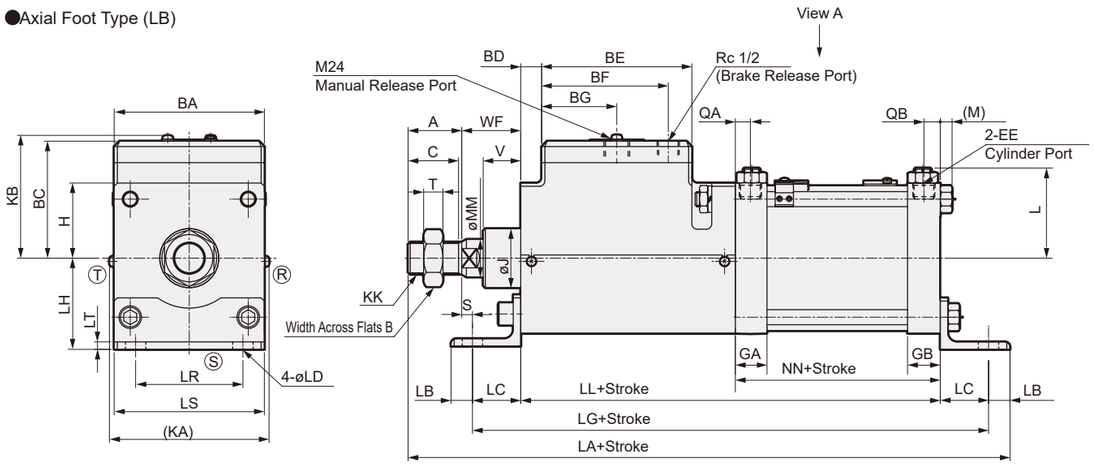
Also, the dimensions of the intermediate support head are as shown in the figure below, so please consider the dimensions of the intermediate support head when installing the cylinder.

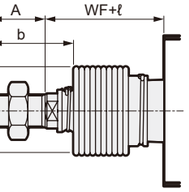


Intermediate Support Head Dimension Table			
Tube Diameter (mm)	Intermediate support head dimensions		
	A	B	C
ø40	56	57	30
ø50	66	67	30
ø63	81	82	35
ø80	99	100	40
ø100	120	121	50

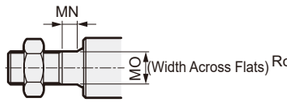
Outline Dimension Drawing (Bore Size: ø125 to ø180)

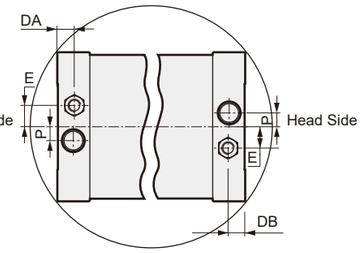
●Axial Foot Type (LB)





[With Bellows]





Port position diagram (View A)

Code	Axial Foot (LB) Mounting Dimensions															
Bore Size (mm)	A	B	BA	BC	BD	BE	BF	BG	C	DA	DB	E	EE	F	GA	GB
ø125	50	46	140	109	19.5	140	118	70	47	15	16	20	Rc 1/2	200	29.5	30.5
ø140	50	46	157	116.5	18.5	157	128.5	78.5	47	19	20	20	Rc 3/4	216	33.5	34.5
ø160	56	55	177	128	23	177	146.5	88.5	53	19	20	24	Rc 3/4	245	33.5	34.5
ø180	63	60	200	146	14	200	170	100	60	19	20	24	Rc 3/4	264	33.5	34.5

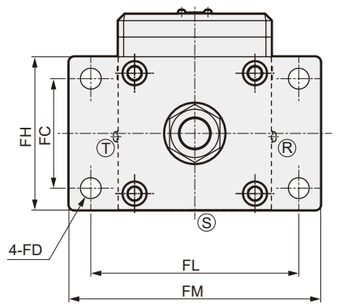
Code																			
Bore Size (mm)	H	J	L	KA	KB	KK	LL	M	MM	MN	MO	NN	P	QA	QB	S	T	V	WF
ø125	70	55	78 to 82	150	115	M30×1.5	291	11	35	14	30	91	13	14	15	10	18	35	55
ø140	78.5	55	86.5 to 91	167	122.5	M30×1.5	318	11	35	14	30	102	15	16	17	7	18	35	57
ø160	88.5	62.5	96.5 to 101	189	134	M36×1.5	350	13	40	16	36	105	15	16	17	18.5	21	48	71.5
ø180	100	68.5	108 to 112	213	152	M40×1.5	373	15	45	18	41	109	15	16	17	18.5	24	53	78.5

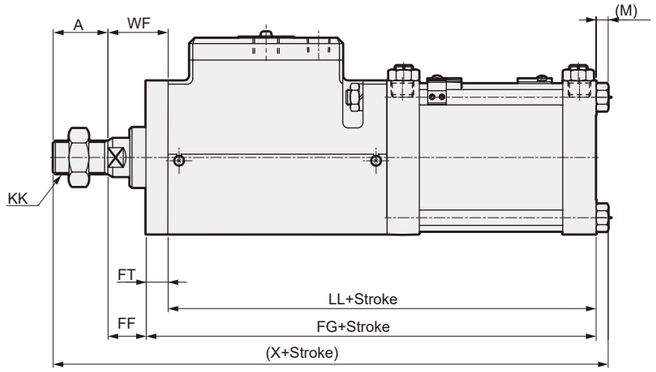
Code										With Bellows		
Bore Size (mm)	LA	LB	LC	LD	LG	LH	LR	LS	LT	b	d	ℓ
ø125	460	19	45	19	381	85	100	140	7	74	75	(Stroke/4.55)+11
ø140	495	20	50	19	418	100	112	157	8	74	75	(Stroke/4.55)+9
ø160	550.5	20	53	19	456	106	118	177	10	81	80	(Stroke/5.15)+9
ø180	601.5	27	60	24	493	125	132	200	10	90	90	(Stroke/5.15)+9

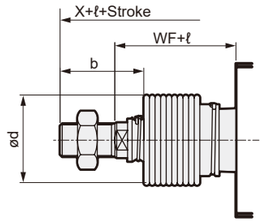
*1: Ⓡ Ⓢ Ⓣ indicates the position of the cushion needle.
*2: The ℓ dimension is rounded up to the nearest whole number.
***3: For outer dimensions diagram of accessories, refer to P. 456.**
***4: For dimensions with each switch, refer to P. 495.**

Outline Dimension Drawing (Bore Size: ø125 to ø180)

●Rod Side Flange Type (FA)







[With Bellows]

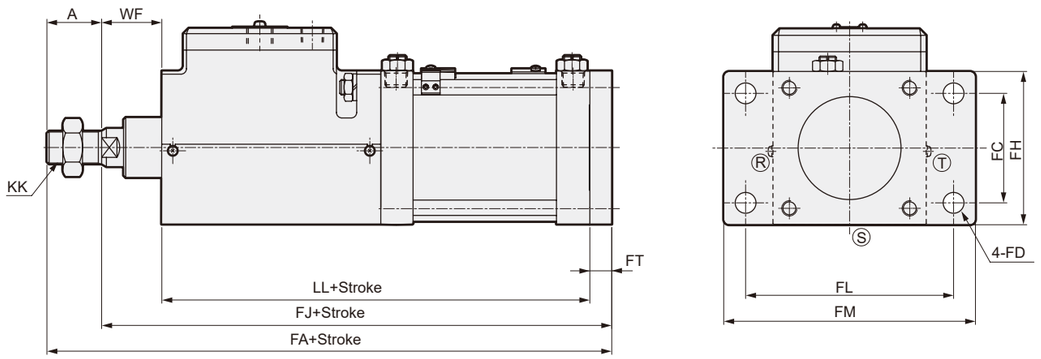
Code	Rod Side Flange Type (FA) Mounting Dimensions													
Bore Size (mm)	A	KK	LL	M	WF	X	FC	FD	FF	FG	FH	FL	FM	FT
ø125	50	M30×1.5	291	11	55	407	100	19	35	311	140	190	230	20
ø140	50	M30×1.5	318	11	57	436	112	19	37	338	157	212	250	20
ø160	56	M36×1.5	350	13	71.5	490.5	118	19	49.5	372	177	236	280	22
ø180	63	M40×1.5	373	15	78.5	529.5	132	24	53.5	398	200	265	310	25

Code	With Bellows		
Bore Size (mm)	b	d	ℓ
ø125	74	75	(Stroke/4.55)+11
ø140	74	75	(Stroke/4.55)+9
ø160	81	80	(Stroke/5.15)+9
ø180	90	90	(Stroke/5.15)+9

*1: Ⓡ Ⓢ Ⓣ indicates the position of the cushion needle.
*2: The ℓ dimension is rounded up to the nearest whole number.
***3: For outer dimensions diagram of accessories, refer to P. 456.**
***4: For dimensions with each switch, refer to P. 495.**

Outline Dimension Drawing (Bore Size: ø125 to ø180)

●Head Side Flange Type (FB)



[With Bellows]

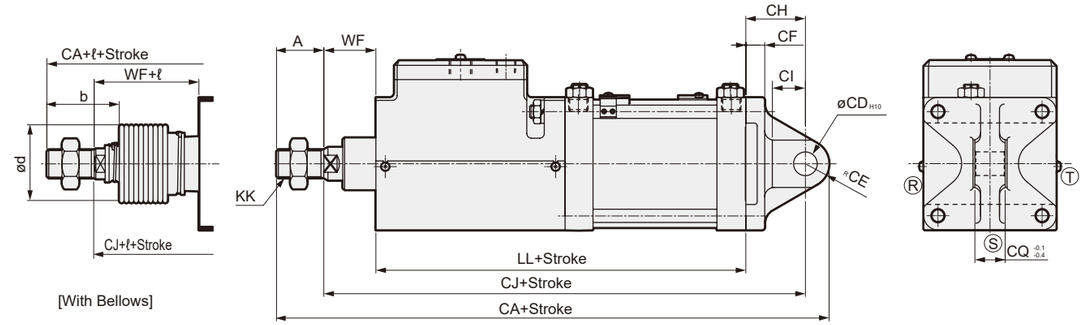
Code	Head Side Flange Type (FB) Mounting Dimensions											
Bore Size (mm)	A	KK	LL	WF	FA	FC	FD	FH	FJ	FL	FM	FT
ø125	50	M30×1.5	291	55	410	100	19	140	360	190	230	14
ø140	50	M30×1.5	318	57	444	112	19	157	394	212	250	19
ø160	56	M36×1.5	350	71.5	496.5	118	19	177	440.5	236	280	19
ø180	63	M40×1.5	373	78.5	539.5	132	24	200	476.5	265	310	25

Code	With Bellows		
Bore Size (mm)	b	d	ℓ
ø125	74	75	(Stroke/4.55)+11
ø140	74	75	(Stroke/4.55)+9
ø160	81	80	(Stroke/5.15)+9
ø180	90	90	(Stroke/5.15)+9

*1: Ⓡ Ⓢ Ⓣ indicates the position of the cushion needle.
*2: The ℓ dimension is rounded up to the nearest whole number.
***3: For outer dimensions diagram of accessories, refer to P. 456.**
***4: For dimensions with each switch, refer to P. 495.**

Outline Dimension Drawing (Bore Size: ø125 to ø180)

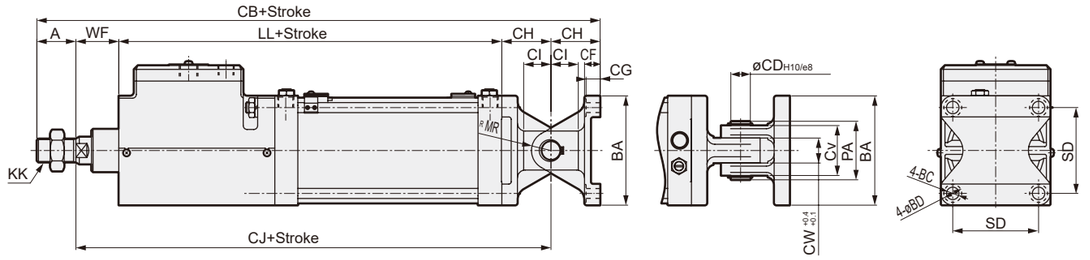
●Single Clevis Type (CA)



Code	Single Clevis Type (CA) Mounting Dimensions												With Bellows		
Bore Size (mm)	A	KK	LL	WF	CA	CD	CE	CF	CH	CI	CJ	CQ	b	d	ℓ
ø125	50	M30×1.5	291	55	484	25	25	20	63	35	409	32	74	75	(Stroke/4.55)+11
ø140	50	M30×1.5	318	57	528	28	28	22	75	40	450	36	74	75	(Stroke/4.55)+9
ø160	56	M36×1.5	350	71.5	584.5	32	32	24	75	40	496.5	40	81	80	(Stroke/5.15)+9
ø180	63	M40×1.5	373	78.5	644.5	40	40	25	90	55	541.5	50	90	90	(Stroke/5.15)+9

*1: Ⓡ Ⓢ Ⓣ indicates the position of the cushion needle.
*2: The ℓ dimension is rounded up to the nearest whole number.
***3: For outer dimensions diagram of accessories, refer to P. 456.**
***4: For dimensions with each switch, refer to P. 495.**

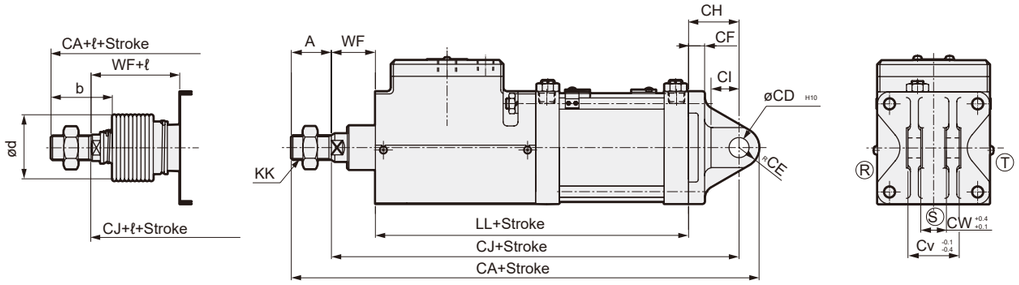
● Eye bracket (CA) with clevis bracket (B2)



Code	Single Yoke Clevis Type (CA), with Double Yoke Bracket (B2) Mounting Dimensions																	
Bore Size (mm)	A	KK	LL	WF	CB	CD	CF	CG	CH	CI	CJ	Cv	CW	BA	BC	BD	MR	PA	SD
ø125	50	M30×1.5	291	55	522	25	20	18	63	35	409	64	32	140	16	23	25	75	110
ø140	50	M30×1.5	318	57	575	28	22	20	75	40	450	72	36	154	16	23	28	84	124
ø160	56	M36×1.5	350	71.5	627.5	32	24	22	75	40	496.5	80	40	174	18	26	32	92	142
ø180	63	M40×1.5	373	78.5	694.5	40	25	23	90	55	541.5	100	50	196	20	29	40	115	160

Outline Dimension Drawing (Bore Size: ø125 to ø180)

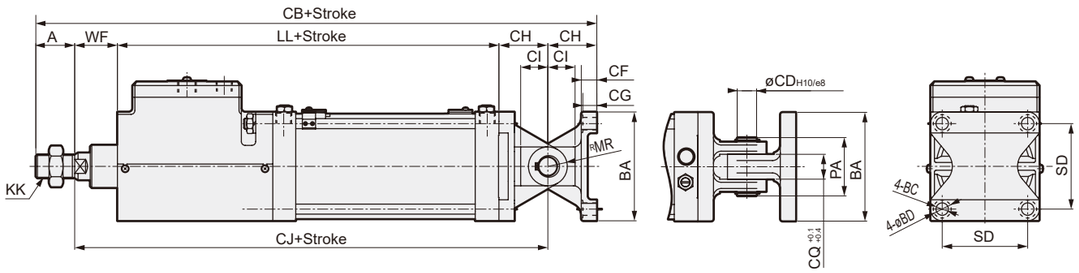
●Double clevis type (CB)



Code	Double Clevis Type (CB) Mounting Dimensions													With Bellows		
Bore Size (mm)	A	KK	LL	WF	CA	CD	CE	CF	CH	CI	CJ	Cv	CW	b	d	ℓ
ø125	50	M30×1.5	291	55	484	25	25	20	63	35	409	64	32	74	75	(Stroke/4.55)+11
ø140	50	M30×1.5	318	57	528	28	28	22	75	40	450	72	36	74	75	(Stroke/4.55)+9
ø160	56	M36×1.5	350	71.5	584.5	32	32	24	75	40	496.5	80	40	81	80	(Stroke/5.15)+9
ø180	63	M40×1.5	373	78.5	644.5	40	40	25	90	55	541.5	100	50	90	90	(Stroke/5.15)+9

*1: Ⓡ Ⓢ Ⓣ indicates the position of the cushion needle.
*2: The ℓ dimension is rounded up to the nearest whole number.
***3: For outer dimensions diagram of accessories, refer to P. 456.**
***4: For dimensions with each switch, refer to P. 495.**

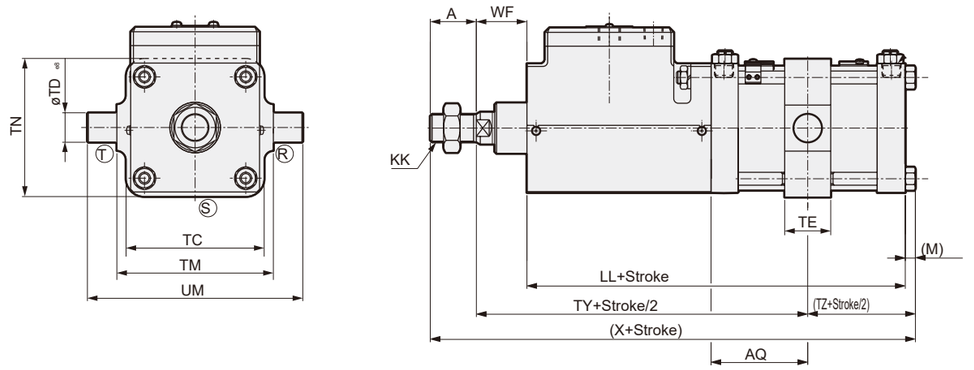
● Clevis bracket (CB) with eye bracket (B1)



Code	Double Yoke Clevis Type (CB), with Single Yoke Bracket (B1) Mounting Dimensions																	
Bore Size (mm)	A	KK	LL	WF	CB	CD	CF	CG	CH	CI	CJ	CQ	BA	BC	BD	MR	PA	SD
ø125	50	M30×1.5	291	55	522	25	20	18	63	35	409	32	140	16	23	25	75	110
ø140	50	M30×1.5	318	57	575	28	22	20	75	40	450	36	154	16	23	28	84	124
ø160	56	M36×1.5	350	71.5	627.5	32	24	22	75	40	496.5	40	174	18	26	32	92	142
ø180	63	M40×1.5	373	78.5	694.5	40	25	23	90	55	541.5	50	196	20	29	40	115	160

Outline Dimension Drawing (Bore Size: ø125 to ø180)

●Intermediate trunnion type (TC)



[With Bellows]

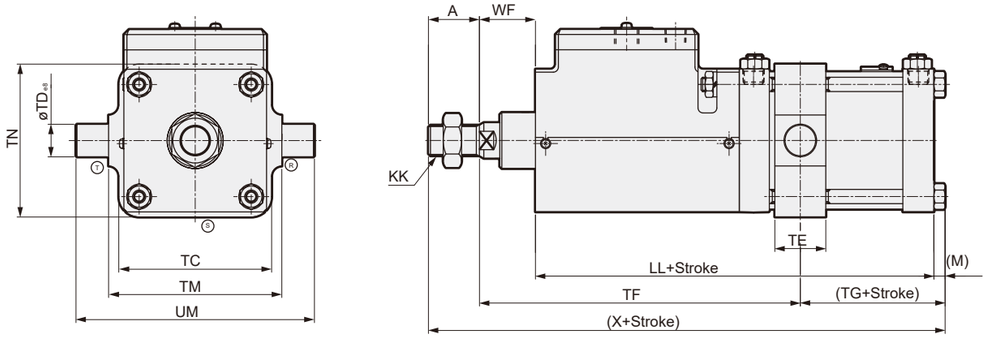
Code	Intermediate Trunnion Type (TC) Mounting Dimensions															
Bore Size (mm)	A	KK	LL	M	WF	X	AQ	TC	TN	TD	TE	TM	UM	TY	TZ
ø125	50	M30×1.5	291	11	55	407	45+Stroke/2	150	150	32	50	170	234	300	57
ø140	50	M30×1.5	318	11	57	436	50.5+Stroke/2	154	170	36	55	190	262	323.5	62.5
ø160	56	M36×1.5	350	13	71.5	490.5	52+Stroke/2	190	190	40	60	212	292	368.5	66
ø180	63	M40×1.5	373	15	78.5	529.5	54+Stroke/2	210	210	45	65	236	326	396.5	70

Code	With Bellows		
Bore Size (mm)	b	d	ℓ
ø125	74	75	(Stroke/4.55)+11
ø140	74	75	(Stroke/4.55)+9
ø160	81	80	(Stroke/5.15)+9
ø180	90	90	(Stroke/5.15)+9

*1: Ⓡ Ⓢ Ⓣ indicates the position of the cushion needle.
*2: The ℓ dimension is rounded up to the nearest whole number.
***3: For outer dimensions diagram of accessories, refer to P. 456.**
***4: For dimensions with each switch, refer to P. 495.**

Outline Dimension Drawing (Bore Size: ø125 to ø180)

●Rod side trunnion type (TA)



[With Bellows]

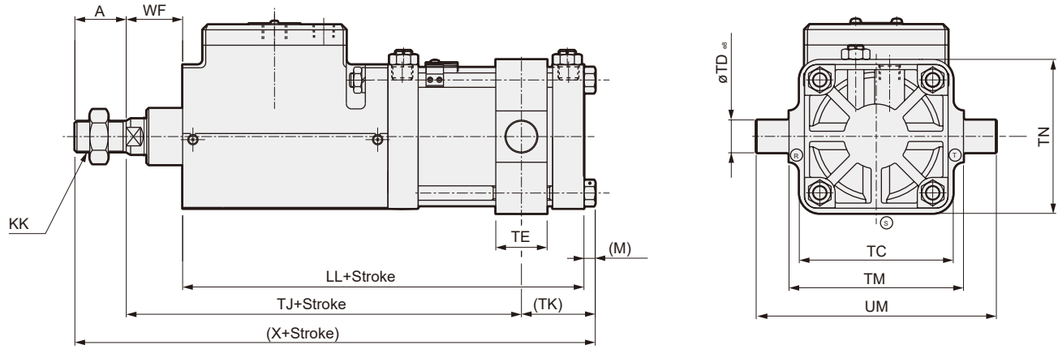
Code	Rod Side Trunnion Type (TA) Mounting Dimensions													
Bore Size (mm)	A	KK	LL	M	WF	X	TC	TD	TE	TF	TG	TM	TN	UM
ø125	50	M30×1.5	291	11	55	407	150	32	50	315	42	170	150	234
ø140	50	M30×1.5	318	11	57	436	154	36	55	339.5	46.5	190	170	262
ø160	56	M36×1.5	350	13	71.5	490.5	190	40	60	385.5	49	212	190	292
ø180	63	M40×1.5	373	15	78.5	529.5	210	45	65	414	52.5	236	210	326

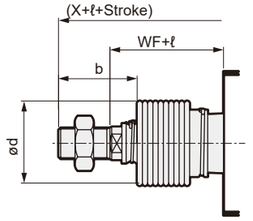
Code	With Bellows		
Bore Size (mm)	b	d	ℓ
ø125	74	75	(Stroke/4.55)+11
ø140	74	75	(Stroke/4.55)+9
ø160	81	80	(Stroke/5.15)+9
ø180	90	90	(Stroke/5.15)+9

*1: Ⓡ Ⓢ Ⓣ indicates the position of the cushion needle.
*2: The ℓ dimension is rounded up to the nearest whole number.
***3: For outer dimensions diagram of accessories, refer to P. 456.**
***4: For dimensions with each switch, refer to P. 495.**

Outline Dimension Drawing (Bore Size: ø125 to ø180)

●Head Side Trunnion Type (TB)





[With Bellows]

Code	Head Side Trunnion Type (TB) Mounting Dimensions													
Bore Size (mm)	A	KK	LL	M	WF	X	TC	TD	TE	TJ	TK	TM	TN	UM
ø125	50	M30×1.5	291	11	55	407	150	32	50	285	72	170	150	234
ø140	50	M30×1.5	318	11	57	436	154	36	55	307.5	78.5	190	170	262
ø160	56	M36×1.5	350	13	71.5	490.5	190	40	60	351.5	83	212	190	292
ø180	63	M40×1.5	373	15	78.5	529.5	210	45	65	379	87.5	236	210	326

Code	With Bellows		
Bore Size (mm)	b	d	ℓ
ø125	74	75	(Stroke/4.55)+11
ø140	74	75	(Stroke/4.55)+9
ø160	81	80	(Stroke/5.15)+9
ø180	90	90	(Stroke/5.15)+9

*1: Ⓡ Ⓢ Ⓣ indicates the position of the cushion needle.
*2: The ℓ dimension is rounded up to the nearest whole number.
***3: For outer dimensions diagram of accessories, refer to P. 456.**
***4: For dimensions with each switch, refer to P. 495.**

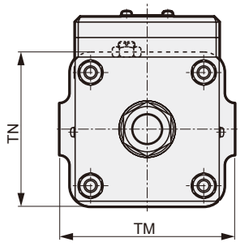
● Non-sag block (Bore Size: ø125, ø140)

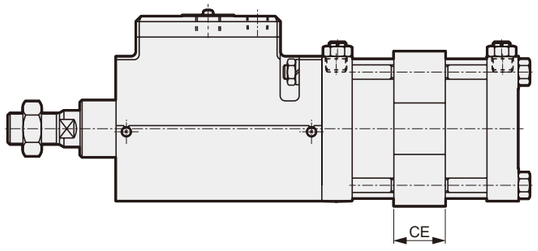
In the case of the strokes in the table below, an intermediate support head is added to the center of the cylinder.

Intermediate support head additional stroke

Bore Size (mm)	Stroke (mm)
ø125	1801 to 2000
ø140	

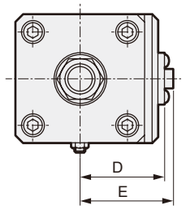
Code / Bore Size (mm)	TM	TN	CE
ø125	150	150	50
ø140	190	170	55

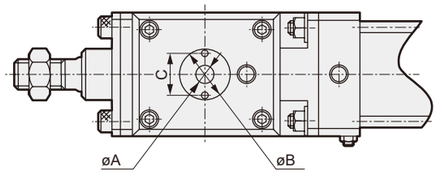




Accessories Outline Dimension Drawing (Bore Size: ø40 to ø100)

●Indicator





● The operational status of the brake is easily detectable from outside.

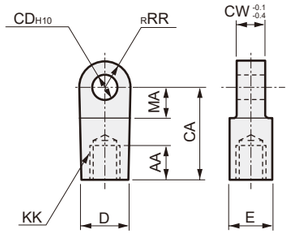
Code / Bore Size (mm)	A	B	C	D	E
ø40	8	25	18	51	51 to 59
ø50	8	25	18	55.5	55.5 to 63.5
ø63	10	32	24	59	59 to 68
ø80	12	32	24	69	69 to 80
ø100	14	32	24	78	78 to 90

Accessories Outline Dimension Drawing (Bore Size: ø40 to ø100)

, The mounting dimensions (øCD, CW, CQ) of the clevis type, knuckle, and 2nd bracket are the same, and all combinations are possible.

● Rod eye for JSC3 (I)

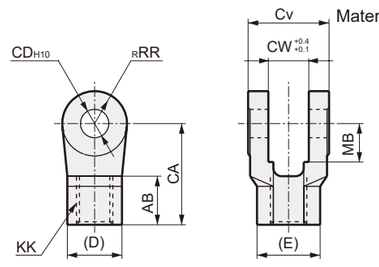
Material: Cast Iron coating



Model No.	Applicable Bore Size (mm)	AA	CA	CD	CW	D	E	KK	MA	RR	Weight (kg)
S1-I-40	40	20	50	12	18	27	27	M14×1.5	21	16	0.26
S1-I-50	50	21	50	12	18	27	27	M18×1.5	21	16	0.24
S1-I-63	63	21	50	14	20	27	27	M18×1.5	21	16	0.25
S1-I-80	80	30	70	20	28	46	41	M22×1.5	30	25	0.80
S1-I-100	100	30	70	20	28	46	41	M26×1.5	30	25	0.84

● For JSC3Double Knuckle (Y)

Material: Cast Iron coating

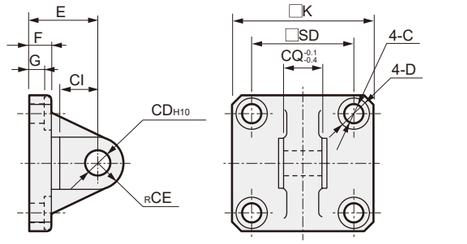


Model No.	Applicable Bore Size (mm)	AB	CA	CD	Cv	CW	D	E	KK	MB	RR	Weight (kg)
S1-Y-40	40	24	50	12	36	18	27	31.2	M14×1.5	19	16	0.25
S1-Y-50	50	24	50	12	36	18	27	31.2	M18×1.5	19	16	0.24
S1-Y-63	63	24	50	14	40	20	27	31.2	M18×1.5	19	16	0.26
S1-Y-80	80	35	70	20	56	28	41	47.3	M22×1.5	30	25	0.90
S1-Y-100	100	35	70	20	56	28	41	47.3	M26×1.5	30	25	0.85

*1: MB dimension represents the CW dimension effective length.
*2: Pins and Retaining Rings are included.

● For JSC3Single Bracket (B1)

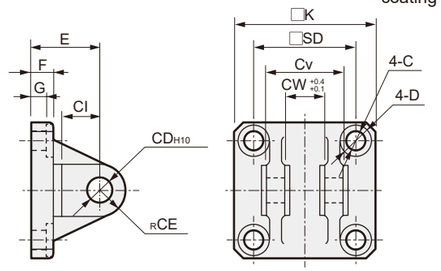
Material: Cast Iron coating



Model No.	Applicable Bore Size (mm)	C	CD	CE	CI	CQ	D	E	F	G	K	SD	Weight (kg)
S1-B1-40	40	9	12	12	18	18	14	32	10	6.5	57	40.5	0.32
S1-B1-50	50	9	12	12	18	18	14	32	10	6.5	66	48	0.38
S1-B1-63	63	9	14	16	24	20	14	37	10	6.5	80	59	0.57
S1-B1-80	80	14	20	20	30	28	20	52	14	10.5	98	74	1.27
S1-B1-100	100	14	20	20	30	28	20	52	16	10.5	118	90	1.64

● For JSC3Clevis bracket (B2)

Material: Cast Iron coating

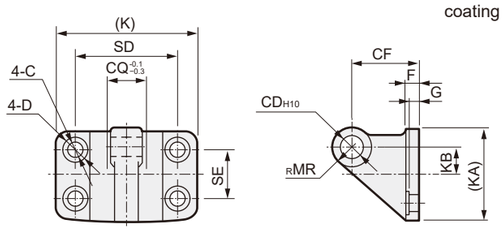


Model No.	Applicable Bore Size (mm)	C	CD	CE	CI	Cv	CW	D	E	F	G	K	SD	Weight (kg)
S1-B2-40	40	9	12	12	18	36	18	14	32	10	6.5	57	40.5	0.36
S1-B2-50	50	9	12	12	18	36	18	14	32	10	6.5	66	48	0.41
S1-B2-63	63	9	14	16	24	40	20	14	37	10	6.5	80	59	0.62
S1-B2-80	80	14	20	20	30	56	28	20	52	14	10.5	98	74	1.48
S1-B2-100	100	14	20	20	30	56	28	20	52	16	10.5	118	90	1.82

Note: Pin and Retaining Ring are included.

● For JSC3Single Bracket (B3)

Material: Cast Iron coating

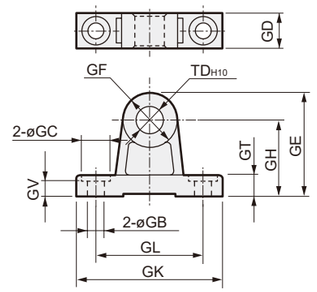


Model No.	Applicable Bore Size (mm)	C	CD	CF	CQ	D	F	G	K	KA	KB	MR	SD	SE	Weight (kg)
S1-B3-40	ø40, ø50	9	12	40	18	14	8	6.5	85	57	17.5	12	65	35	0.44
S1-B3-63	ø63	11	14	50	20	17	10	8	105	67	20	16	80	40	0.77
S1-B3-80	ø80, ø100	14	20	65	28	20	12	10	130	93	30	20	100	60	1.64

Accessories Outline Dimension Drawing (Bore Size: ø40 to ø100)

● Trunnion type 2nd bracket (B4)

Material: Cast Iron coating

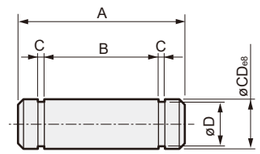


Model No. \ Code	GB	GC	GD	GE	GF	GH	GK	GL	GT	GV	TD	Weight (kg)
S1-B4-40	9	17	19	61	32	45	80	60	12	11	16	0.25
S1-B4-50	9	17	19	63	36	45	85	65	12	11	18	0.28
S1-B4-63	11	22	24	80	40	60	100	75	14	13	20	0.52
S1-B4-80	14	24	26	85	50	60	115	85	14	13	25	0.70
S1-B4-100	14	24	35	107	64	75	130	100	17	16	35	1.48

Note: Brackets are 2 pcs/set.

● Pin (P)

Material: Steel, Zinc Chromate



Model No.	Applicable Bore Size (mm)	A	B	C	D	CD	Retaining Ring to Use	Weight (kg)
S1-P-40	40, 50	43.5	36.2	1.15	11.5	12	C-type for Shaft 12	0.04
S1-P-63	63	47.5	40.2	1.15	13.4	14	C-type 14 for Shaft	0.06
S1-P-80	80, 100	64	56.2	1.35	19	20	C-type for shaft 20	0.16

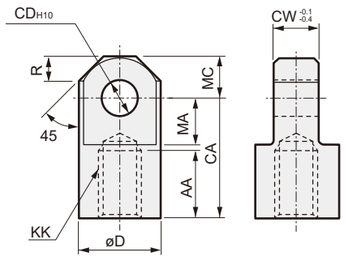
● Release bolt size (Hexagon Socket Head Cap Screw)

Bore Size	Size	
	JSC3	JSC3-V
ø40, ø50	M10×8	M10×29
ø63	M12×9	M12×30
ø80	M14×10	M14×31
ø100	M16×12	M16×40

Accessories Outline Dimension Drawing (Bore Size: ø125 to ø180)

● Rod eye for JSC4 (I)

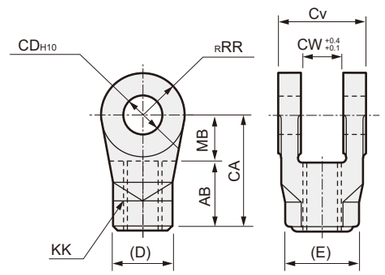
Material: Cast Iron coating



Model No. \ Code	AA	CA	CD	CW	D	KK	MA	MC	R	Weight (kg)
SCS2-125-I	50	85	25	32	55	M30×1.5	32	27.5	15.5	1.25
SCS2-140-I	50	90	28	36	60	M30×1.5	35	30	18	1.65
SCS2-160-I	60	105	32	40	70	M36×1.5	40	35	21	2.55
SCS2-180-I	65	115	40	50	85	M40×1.5	47.5	42.5	29	4.20

● Rod clevis for JSC4 (Y)

Material: Cast Iron coating



Model No. \ Code	AB	CA	CD	Cv	CW	D	E	KK	MB	RR	Weight (kg)
SCS2-125-Y	50	85	25	64	32	46	53.1	M30×1.5	35	27.5	1.30
SCS2-140-Y	50	90	28	72	36	46	53.1	M30×1.5	40	30	1.65
SCS2-160-Y	60	105	32	80	40	55	63.5	M36×1.5	45	35	2.55
SCS2-180-Y	65	115	40	100	50	60	69.3	M40×1.5	50	42.5	4.40

Note: Pin and Retaining Ring are included.

● Eye bracket for JSC4 (B1)

Material: Cast Iron coating

Model No. \ Code	A	C	CD	CE	CI	CQ	D	E	F	G	K	Weight (kg)
SCS2-125-B1	140	16	25	25	35	32	23	63	20	18	110	2.35
SCS2-140-B1	154	16	28	28	40	36	23	75	22	20	124	3.30
SCS2-160-B1	174	18	32	32	40	40	26	75	24	22	142	4.65
SCS2-180-B1	196	20	40	40	55	50	29	90	25	23	160	6.75

● JSC4 pin (P)

Material: Carbon steel, Zinc Chromate

Model No. \ Code	A	B	C	CD	D	Retaining Ring to Use	Weight (kg)	Applicable Model
SCS2-125-P	75	66.3	1.35	25	23.9	C-type for shaft 25	0.25	JSC3-125
SCS2-140-P	84	74.7	1.65	28	26.6	C-type for shaft 28	0.40	JSC3-140
SCS2-160-P	92	82.7	1.65	32	30.3	C-type for shaft 32	0.50	JSC3-160
SCS2-180-P	115	103.2	1.9	40	38	C-type for shaft 40	1.15	JSC3-180

● Clevis bracket for JSC4 (B2)

Material: Cast Iron coating

Model No. \ Code	A	C	CD	CE	CI	Cv	CW	D	E	F	G	K	Weight (kg)
SCS2-125-B2	140	16	25	25	35	64	32	23	63	20	18	110	2.65
SCS2-140-B2	154	16	28	28	40	72	36	23	75	22	20	124	3.85
SCS2-160-B2	174	18	32	32	40	80	40	26	75	24	22	142	5.45
SCS2-180-B2	196	20	40	40	55	100	50	29	90	25	23	160	8.70

Note: Pin and Retaining Ring are included.

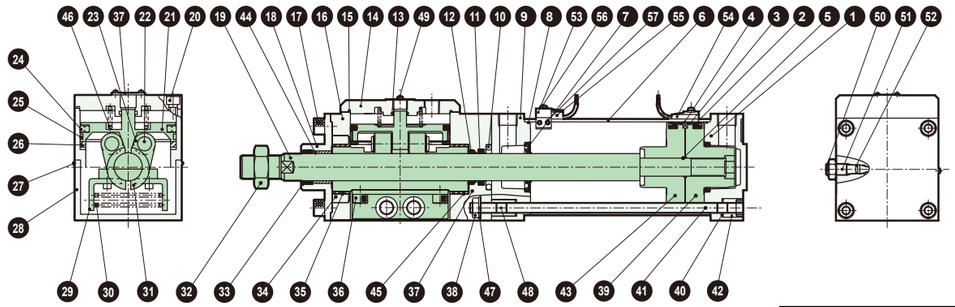
● Release bolt size (Hexagon Socket Head Cap Screw)

Bore Size	Size	
	JSC3	JSC3-V
ø40, ø50	M10×8	M10×29
ø63	M12×9	M12×30
ø80	M14×10	M14×31
ø100	M16×12	M16×40

MEMO

With Brake / With Lock
ULK□
JSK2/ JSM2
JSG
JSC3, JSC4
USSD
UFCD
USC
Cylinder Switch
Ending

Internal Structure / Materials (Bore Size: ø40 to ø100)



Do Not Disassemble

Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Head cover	Aluminum Alloy	Painted	30	Spring	Piano Wire	
2	Piston Packing	Nitrile Rubber		31	Brake metal	Cast Iron	Nickel Plating
3	Wear ring	Polyacetal		32	Rod nut	Steel	Zinc Chromate
4	Magnet	Plastic		33	Scraper	Nitrile Rubber	
5	Piston gasket	Nitrile Rubber		34	DU ring	Steel	Black Oxide
6	Cylinder Tube	Aluminum Alloy	Hard Alumite	35	Bush	Oil-Impregnated Bearing Alloy	
7	Cushion Packing	Nitrile Rubber, Steel		36	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide
8	Cylinder gasket	Nitrile Rubber		37	Dust cover	Aluminum Alloy	Alumite
9	Rod Cover	Aluminum Alloy	Painted	38	Hexagon Nut	Steel	Black Oxide
10	Metal seal	Nitrile Rubber		39	Piston H	Aluminum Alloy	
11	Rod Packing	Nitrile Rubber		40	Tie rod	Steel	Zinc Chromate
12	Scraper	Nitrile Rubber		41	Belleville washer	Steel	Black Oxide
13	Cap gasket A	Nitrile Rubber		42	Round nut	Steel	Zinc Chromate
14	Body cap	Cast Iron	Manganese Phosphate treatment	43	Piston R	Aluminum Alloy	
15	Cap gasket B	Nitrile Rubber		44	Bush B	Oil impregnated Bearing Alloy	
16	Brake body	Aluminum Alloy	Alumite	45	Thrust washer		
17	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide	46	Spring	Piano Wire	Painted
18	Rod metal	Steel	Manganese Phosphate	47	Toothed washer	Steel	Black Oxide
19	Piston Rod	Steel	Industrial Chrome Plating	48	Hexagon Socket Set Screw	Alloy Steel	Black Oxide
20	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide	49	Cross-Recessed pan head machine screw with washer	Steel	Zinc Chromate
21	Brake piston	Cast Iron	Manganese Phosphate	50	Cushion needle	Copper Alloy	Nickel Plating
22	Parallel pin	Steel		51	Needle nut	Copper Alloy	Nickel Plating
23	Bearing			52	Needle gasket	Nitrile Rubber	
24	Piston Packing B	Nitrile Rubber		With switch			
25	Wear ring	Polyacetal		53	Switch mounting base	Aluminum Alloy	
26	Cushion rubber	Urethane Rubber		54	Switch holder	Aluminum Alloy	
27	Cross-Recessed Pan Head Screw	Steel	Zinc Chromate	55	Cross-Recessed Pan Head Screw	Steel	Zinc Chromate
28	Cover	Steel	Painted	56	Hexagon Socket Set Screw	Alloy Steel	Black Oxide
29	Spring seat	Steel	Zinc Chromate	57	Switch		

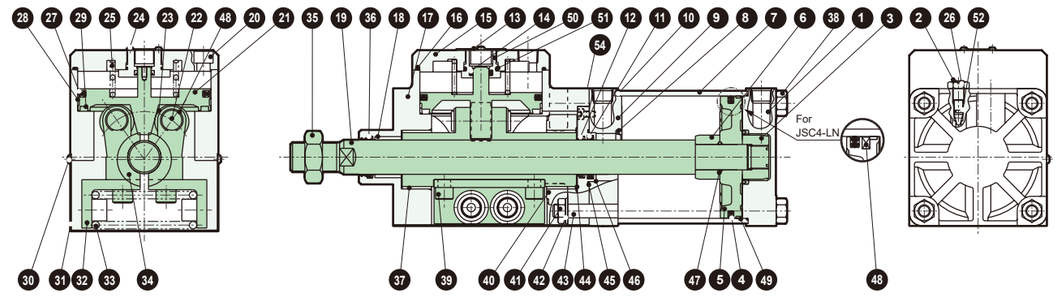
Note: Never disassemble the brake as it contains a strong spring and is dangerous.

●Material of mounting bracket (ø40 to ø100)

Mounting Style	Material	Remarks
Foot (LB)	Steel	Painted
Flange (FA, FB)	Steel	Painted
Clevis (CA/CB)	Cast Iron	Painted
Trunnion (TC)	Cast Iron	Painted

For maintenance parts, please visit the CKD Equipment Product Site (https: //www.ckd.co.jp/kiki/en/) → "model No." → Maintenance Parts.

Internal Structure / Materials (Bore Size: ø125 to ø180)



Do Not Disassemble

Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Head cover	Aluminum Alloy	Chromate	28	Wear ring	Polyacetal	
2	Cushion needle	Copper Alloy		29	Cushion Rubber	Urethane Rubber	
3	Cushion ring A	Steel	Zinc Chromate	30	Cross-Recessed Pan Head Screw	Steel	Zinc Chromate
4	Piston Packing	Nitrile Rubber		31	Cover	Steel	Painted
5	Piston	Aluminum Alloy		32	Spring seat	Steel	Manganese Phosphate
6	Cushion ring B	Steel	Zinc Chromate	33	Spring	Piano Wire	Black Oxide
7	Cylinder Tube	Aluminum Alloy	Hard Alumite	34	Brake metal	Cast Iron	Nickel Plating
8	Cushion Packing	Nitrile Rubber, Steel		35	Rod nut	Steel	Zinc Chromate
9	Rod Cover	Aluminum Alloy	Chromate	36	Scraper	Nitrile Rubber	
10	Cylinder gasket	Nitrile Rubber		37	Bush A	Bearing Alloy	
11	Rod Packing	Nitrile Rubber		38	Hexagon Nut	Steel	Zinc Chromate
12	Scraper	Nitrile Rubber		39	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide
13	Dust cover	Aluminum Alloy	Alumite	40	Ring	Steel	Black Oxide
14	Rod Packing	Nitrile Rubber		41	Hexagon Nut	Steel	Zinc Chromate
15	Body cap	Aluminum Alloy	Black alumite	42	Toothed washer	Steel	Zinc Chromate
16	Cap gasket	Nitrile Rubber		43	Tie rod	Steel	Zinc Chromate
17	Brake body	Aluminum Alloy	Alumite	44	Thrust washer	Steel	
18	Bush B	Oil impregnated Bearing Alloy		45	Metal gasket	Nitrile Rubber	
19	Piston Rod	Steel	Industrial Chrome Plating	46	Rod metal	Cast Iron	Zinc Chromate
20	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide	47	Piston gasket	Nitrile Rubber	
21	Brake piston	Cast Iron	Manganese Phosphate	48	Magnet	Rubber	JSC4-LN only
22	Bearing pin	Steel		49	Wear ring	Polyacetal	
23	Bearing			50	Body cap	Cast Iron	Manganese Phosphate
24	Cross-Recessed pan head machine screw with washer	Steel	Zinc Chromate	51	O-ring	Nitrile Rubber	
25	Spring	Piano Wire	Painted	52	Needle gasket	Nitrile Rubber	
26	Needle nut	Steel	Zinc Chromate	53	E-type Retaining Ring	Steel	Zinc Chromate
27	Piston Packing B	Nitrile Rubber		54	Hexagon Socket Head Cap Screw	Steel	Black Oxide

●Mounting Bracket Material (ø125 to ø180)

Mounting Style	Material	Remarks
Foot (LB)	Steel	Painted
Rod Side Flange (FA)	Carbon steel	Parkerizing
Single clevis (CA)	Cast Iron	Painted
Double Yoke Clevis (CB)	Cast Iron	Painted
Trunnion (TC/TA/TB)	Cast Iron	Painted
Head Side Flange (FB)	Carbon steel	Painted

●Release bolt size (Hexagon Socket Head Cap Screw)

Bore Size	Size
ø125	M24x16 or more
ø140	M24x20 or more
ø160	M24x20 or more
ø180	M24x24 or more

For maintenance parts, please visit the CKD Equipment Product Site (https: //www.ckd.co.jp/kiki/en/) → "model No." → Maintenance Parts.

Cell Top Cylinder Double Acting with Brake Valve

JSC3-V Series

●Bore Size: ø40, ø50, ø63, ø80, ø100

Circuit Diagram Code

RoHS

Model No. Notation

Without Switch (Built-in magnet for switch)

JSC3 - ① V — LB - ② 40 - ③ ④ B - ⑤ 50 - ⑥ 1 - ⑦ — S - ⑩ I - ⑪

Model No.

With Switch (Built-in magnet for switch)

JSC3 - ① V — LB - ② 40 - ③ ④ B - ⑤ 50 - ⑥ 1 - ⑦ T0H - ⑧ R - ⑨ S - ⑩ I - ⑪

Model No.

Strong magnetic field resistant (For H0, H0Y switch) With Switch (Built-in magnet for switch)

JSC3 - ① V L2 - LB - ② 40 - ③ ④ B - ⑤ 50 - ⑥ 1 - ⑦ H0 - ⑧ R - ⑨ S - ⑩ I - ⑪

Model No.

① Brake Release Pressure

② Mounting Type

③ Bore Size

④ Piping thread type

⑤ Cushion

⑥ Stroke

⑦ Valve voltage

⑧ Switch Model

⑨ Number of Switches

⑩ Option

⑪ Accessories

① Brake Release Pressure

Code	Content
Blank	Standard Type (0.3 MPa)
S	Low pressure release type (0.25 MPa)

② Mounting Type

Mounting brackets are pre-assembled on the product for shipment. (However, head side special flange type is attached for shipment.)

Code	Content		Code	Content	
00	Basic type		CA	Single Clevis Type	
LB	Axial Foot Type		CB	Double Clevis Type (Pin and Retaining Ring attached)	
FA	Rod Side Flange Type		TC	Center trunnion type	
FB	Head Side Flange Type		TA	Rod Side Trunnion Type	
FC	Head side special flange type		TB	Head Side Trunnion Type	

③ Bore Size (mm)

Code	Contents
40	ø40
50	ø50
63	ø63
80	ø80
100	ø100

④ Piping thread type

Code	Content
Blank	Rc Thread
N	NPT Thread (Custom Order Product)
G	G thread (Custom product)

⑤ Cushion

Code	Content
B	Both sides cushion
R	Rod side cushion
H	Head side cushion
N	Without cushion

⑥ Stroke (mm)

Bore Size	Stroke	Intermediate Stroke
ø40	1 to 600	Every 1 mm
ø50	1 to 600	
ø63	1 to 600	
ø80	1 to 700	
ø100	1 to 800	

Note: For minimum stroke with switch, please refer to P. 464.

⑦ Valve voltage

Code	Content
1	100 VAC
2	200 VAC
3	24 VDC
4	12 VDC

⑧ Switch Model No.

For switch details, refer to P. 1457. Switches are shipped with the product.

Contact	Indicator LED Special Function	Wiring (Output)	Load Voltage (V) AC	Load Voltage (V) DC	Load Current (mA) AC	Load Current (mA) DC	Lead wire *1 Straight	Lead wire *1 L-shape	
Solid State	1-Color	2-wire	85 to 265	—	5 to 100	-	T1H□	T1V□	
			—	10 to 30	—	5 to 20 *2	T2H□	T2V□	
		3-wire (NPN)	—	30 or less	—	100 or less	T3H□	T3V□	
		3-wire (PNP)	—		-		T3PH□	T3PV□	
	2-color	2-wire	—	24 ± 10%	—	5 to 20	T2WH□	T2WV□	
		3-wire (NPN)	—	30 or less	—	50 or less	T3WH□	T3WV□	
	For 2-color AC Magnetic Field	2-wire	—	24 ± 10%	—	5 to 20	T2YD□	–	
			—		-		T2YDT□	–	
	1-Color Off-Delay Type		—	10 to 30	—	5 to 20 *2	T2JH□	T2JV□	
	1-color Flexible Lead Wire Type		—	10 to 30	—		T2HR3	T2VR3	
Reed	1-Color	2-wire	110	12/24	7 to 20	5 to 50	T0H□	T0V□	
	No Indicator LED		110	5/12/24	20 or less	50 or less	T5H□	T5V□	
	1-color		110/220	12/24	7 to 20 / 7 to 10	5 to 50	T8H□	T8V□	
	1-color For Strong Magnetic Fields		110	12/24	7 to 20	5 to 50	H0□	-	
	2-color For strong magnetic field		—	24 ± 10%	—	5 to 20	H0Y□	-	

*1: Insert the code selected in the “Lead wire length" table into "□" of the switch Model No..
*2: The maximum load current value above, 20 mA, is at 25°C. If the switch operating Ambient Temperature is higher than 25°C, it will be lower than 20 mA. (At 60°C, it will be 5 to 10 mA.)
*3: Switches other than the above models are also available. (Custom Product) For details, refer to P. 1457.

***Lead wire length**

Code	Content
Blank	1 m (Standard)
3	3 m (Option)
5	5m (Option)

Example) Lead wire length
1 m T0H
3 m T0H3
5 m T0H5

⑨ Number of Switches

Code	Content
R	With 1 pc on rod side
H	With 1 pc on head side
D	With 2 pcs
T	With 3 pcs

Note: If ①mounting type TA or TB is selected, the number of switches is limited to "H" (1 on head side) for TA, and "R" (1 on rod side) for TB.

⑪ Accessories

	Code	Content	
*1	I	Single knuckle	
*1	Y	Double yoke knuckle (pin and Retaining Ring included)	
	B1	Single bracket	
	B2	Double yoke bracket (pin and Retaining Ring included)	
	B3	Single bracket	
	B4	Trunnion Type 2nd Bracket (Set of 2)	

*1: "I" and "Y" cannot be selected simultaneously.

⑩ Option

Code	Content	Max Ambient Temperature	Instantaneous Max Temperature	
J	Bellows	100°C	200°C	
L	Bellows	250°C	400°C	
M	Piston Rod material (Stainless Steel)			
Blank	Cushion needle position R (Standard)			T R (Standard) S
S	Cushion needle position S			
T	Cushion needle position T			
G	With Indicator			

Note: For "S" and "T" position display, please check the respective outline dimension drawings.

About specifications of custom products

For details, please refer to P. 498 to 503.

Code	Content
-XK◇	Mounting Bracket Rotational Assembly
-XAQ◇◇	Trunnion Position Specification
-XP5	Knuckle Pin/Clevis Pin Split Pin
-XP7	Knuckle fixed by pin driving
-XP8	Knuckle pin/clevis pin split pin specification, knuckle fixed by pin driving
-XJ9	Without Bellows
-A2	With 2 Rod Nuts
Rod End Shape Modification	Refer to Ending P. 11.

Model No. Ex.)

JSC3-V-..... -XK□

Brake Unit (Without Solenoid Valve / Sub-plate) Model No. Notation

JSC3 - 40 - BRAKE-UNIT
3 Bore Size

● FA mounting style
JSC3 - FA - 40 - BRAKE-UNIT
3 Bore Size

T-type Switch Individual Model No. Notation

●Switch body+Mounting bracket set
JSC3 - T0H - 40
8 Switch Model
3 Bore Size

●Switch body only
SW - T0H
8 Switch Model

●Mounting bracket set
JSC3 - TS - 40
Mounting Bracket
3 Bore Size

H type switch single item Model No. Notation

●Switch body+Mounting bracket set
JSC3-L2 - H0 - 40
8 Switch Model
3 Bore Size

●Switch body only
SW - H0
8 Switch Model

●Mounting bracket set
JSC3-L2 - H - 40
Mounting Bracket
3 Bore Size

T2YD type switch single item Model No. Notation

●Switch body+Mounting bracket set
JSC3 - T2YD - 40
8 Switch Model
3 Bore Size

●Switch body only
SW - T2YD
8 Switch Model

●Mounting bracket set
JSC3 - T - 40
Mounting Bracket
3 Bore Size

Specifications

Item		JSC3-V (With Switch)					JSC3-SV (With Switch)				
Bore Size mm		ø40	ø50	ø63	ø80	ø100	ø40	ø50	ø63	ø80	ø100
Operation type		Double Acting with brake valve					Double Acting, low pressure release type, with brake valve				
Operating Fluid		Compressed Air									
Max Operating Pressure MPa		0.7									
Min Operating Pressure MPa	Brake Part	0.3					0.25 (36 psi)				
	Cylinder Part	0.1									
Proof Pressure MPa		1.05									
Ambient Temperature °C		-5 to 50 (However, no freezing)									
Port Size	Brake Part	Rc1/8		Rc1/4		Rc3/8	Rc1/8		Rc1/4		Rc3/8
	Cylinder Part	Rc1/4	Rc3/8		Rc 1/2		Rc1/4	Rc3/8		Rc1/2	
Stroke Tolerance mm		$^{-0.9}_{0}$ (to 360), $^{+1.4}_{0}$ (to 1000)									
Operating Piston Speed mm/s		50 to 1000 (Use within allowable absorbed energy)									
Cushion		Air Cushion									
Effective air cushion length mm		14.6	16.6	16.6	20.6	23.6	14.6	16.6	16.6	20.6	23.6
Lubrication		Not required (When lubricating, use turbine oil Class 1 ISO VG32)									
Holding Force N		980	1569	2451	3922	6178	784	1255	1961	3138	4941
Allowable absorption energy J	With Cushion	4.29	8.37	15.8	27.9	49.8	4.29	8.37	15.8	27.9	49.8
	Without cushion	0.067	0.079	0.079	0.201	0.301	0.067	0.079	0.079	0.201	0.301
		Note: Without cushion, large energy generated by external load cannot be absorbed. It is recommended to use an external shock absorbing device in conjunction.									

Brake Valve Electrical Specifications

Item	4KB2		
Rated voltage (V)	100 AC (50/60 Hz)	200 AC (50/60 Hz)	24 DC
Starting current (A)	0.056/0.044	0.028/0.022	0.075
Holding current (A)	0.028/0.022	0.014/0.011	0.075
Power consumption (W)	1.8/1.4		1.8
Heat Resistance Class	Class B (Molded Coil)		

*1: 100 / 200 VAC coils can be used at 110 / 220 VAC (60 Hz).
***2: Main specifications of the valve are the same as standard product 4KB2. For details, please refer to "Directional Control Valve ②" No. RJ-012AA.**

Stroke

Bore Size (mm)	Standard Stroke (mm)	Max Stroke (mm)	Manufacturable Stroke (mm)	Min Stroke (mm)
ø40	50, 75, 100, 150, 200, 250 300, 350, 400, 450, 500	600	1000	1
ø50			2,000	
ø63			2500	
ø80		700		
ø100		800	*4	

***1: If the Max Stroke is exceeded, the product specifications may not be met depending on the conditions, so please consult us. Also, please refer to Intro 29.**
***2: Intermediate strokes can be manufactured in 2 mm increments.**
*3: The minimum stroke varies depending on how the switch is mounted. Please refer to P. 464.
***4: For Bore Size ø63 to ø100 with bellows, the manufacturable stroke is up to 2000 mm.**

Min Stroke with Switch (T-type Switch)

● Minimum stroke with T0/T5 type switch

Number of Switches	Different Surface Mounting	Same Surface Mounting		Intermediate Trunnion Mounting		Position detection at the rod side stroke end with rod side trunnion mounting is not possible.	Position detection at the head side stroke end with head side trunnion mounting is not possible.
Bore Size	2	1	2	1	2	1	1
ø40	20 (20)	20 (10)	60 (45)	110 (110)	110 (110)	50 (50)	50 (50)
ø50	20 (20)	15 (10)	20 (20)	135 (135)	135 (135)	60 (60)	60 (60)
ø63	20 (20)	15 (10)	20 (20)	110 (95)	110 (95)	50 (45)	50 (45)
ø80	25 (25)	15 (15)	25 (25)	115 (85)	115 (85)	55 (40)	55 (40)
ø100	25 (25)	15 (15)	25 (25)	125 (95)	125 (95)	60 (45)	60 (45)

*1: ( ) indicates T□V (L-shaped lead wire type).
*2: If the stroke is 15 mm or less, two switches may turn ON simultaneously. In this case, adjust the switch mounting positions so that they are further apart from each other.

● Minimum stroke with T8 type switch

Number of Switches	Different Surface Mounting	Same Surface Mounting		Intermediate Trunnion Mounting		Position detection at the rod side stroke end with rod side trunnion mounting is not possible.	Position detection at the head side stroke end with head side trunnion mounting is not possible.
Bore Size	2	1	2	1	2	1	1
ø40	20 (20)	15 (10)	50 (35)	95 (85)	95 (85)	45 (40)	45 (40)
ø50	20 (20)	10 (10)	20 (20)	115 (115)	115 (115)	50 (50)	50 (50)
ø63	20 (20)	10 (10)	20 (20)	95 (75)	95 (75)	45 (35)	45 (35)
ø80	25 (25)	15 (15)	25 (25)	100 (70)	100 (70)	50 (35)	50 (35)
ø100	25 (25)	15 (15)	25 (25)	110 (80)	110 (80)	55 (40)	55 (40)

*1: ( ) indicates T□V (L-shaped lead wire type).
*2: If the stroke is 15 mm or less, two switches may turn ON simultaneously. In this case, adjust the switch mounting positions so that they are further apart from each other.

● Minimum stroke with T2/T3 type switch

Number of Switches	Different Surface Mounting	Same Surface Mounting		Intermediate Trunnion Mounting		Position detection at the rod side stroke end with rod side trunnion mounting is not possible.	Position detection at the head side stroke end with head side trunnion mounting is not possible.
Bore Size	2	1	2	1	2	1	1
ø40	20 (15)	20 (10)	60 (45)	105 (75)	105 (75)	50 (35)	50 (35)
ø50	15 (15)	15 (10)	15 (15)	105 (75)	105 (75)	45 (30)	45 (30)
ø63	15 (15)	15 (10)	15 (15)	110 (80)	110 (80)	50 (35)	50 (35)
ø80	15 (15)	15 (10)	15 (15)	115 (85)	115 (85)	55 (40)	55 (40)
ø100	15 (15)	10 (10)	15 (15)	125 (95)	125 (95)	60 (45)	60 (45)

*1: ( ) indicates T□V (L-shaped lead wire type).
*2: If the stroke is 15 mm or less, two switches may turn ON simultaneously. In this case, adjust the switch mounting positions so that they are further apart from each other.

● Minimum stroke with T1/T2YD type switch

Number of Switches	Different Surface Mounting	Same Surface Mounting		Intermediate Trunnion Mounting		Position detection at the rod side stroke end with rod side trunnion mounting is not possible.	Position detection at the head side stroke end with head side trunnion mounting is not possible.
Bore Size	2	1	2	1	2	1	1
ø40	20 (15)	20 (10)	60 (45)	105 (75)	105 (75)	50 (35)	50 (35)
ø50	15 (15)	15 (10)	15 (15)	100 (70)	100 (70)	45 (30)	45 (30)
ø63	15 (15)	15 (10)	15 (15)	105 (75)	105 (75)	50 (35)	50 (35)
ø80	15 (15)	15 (10)	15 (15)	110 (80)	110 (80)	55 (40)	55 (40)
ø100	15 (15)	10 (10)	15 (15)	120 (90)	120 (90)	60 (45)	60 (45)

*1: ( ) indicates T□V (L-shaped lead wire type). However, T2YD does not have an L-shaped lead wire type (V).
*2: If the stroke is 15 mm or less, two switches may turn ON simultaneously. In this case, adjust the switch mounting positions so that they are further apart from each other.

● Min Stroke with T2W/T3W switches

Number of Switches	Different Surface Mounting	Same Surface Mounting		Intermediate Trunnion Mounting		Position detection at the rod side stroke end with rod side trunnion mounting is not possible.	Position detection at the head side stroke end with head side trunnion mounting is not possible.
Bore Size	2	1	2	1	2	1	1
ø40	20 (10)	20 (5)	65 (50)	110 (80)	110 (80)	50 (35)	50 (35)
ø50	20 (10)	20 (5)	20 (10)	110 (80)	110 (80)	50 (35)	50 (35)
ø63	20 (10)	20 (5)	20 (10)	115 (85)	115 (85)	55 (40)	55 (40)
ø80	15 (10)	15 (5)	15 (10)	120 (90)	120 (90)	55 (40)	55 (40)
ø100	10 (10)	10 (5)	10 (10)	130 (100)	130 (100)	60 (45)	60 (45)

*1: ( ) indicates T□V (L-shaped lead wire type).
*2: If the stroke is 15 mm or less, two switches may turn ON simultaneously. In this case, adjust the switch mounting positions so that they are further apart from each other.

Cylinder Weight

[Unit: kg]

Item / Mounting Style / Bore Size (mm)	Product Weight when stroke (S) = 0 mm						Switch Weight	Mounting Bracket Weight		Added weight per S = 100 mm	Valve Weight
	Basic Type (00)	Foot Type (LB)	Flange type (FA, FB)	Single Clevis Type (CA)	Double Yoke Clevis Type (CB)	Trunnion Type (TC)		T Type	H type		
ø40	2.48	2.66	2.91	2.83	2.83	2.86	Refer to the Weight listed in the Switch Specifications on P. 1457.	0.024	0.028	0.39	0.32
ø50	3.47	3.67	3.97	3.87	3.87	3.97		0.022	0.026	0.46	
ø63	5.09	5.49	6.19	5.79	5.79	5.89		0.020	0.024	0.50	0.35
ø80	8.15	8.85	9.95	9.65	9.65	9.45		0.026	0.029	0.90	
ø100	14.70	15.70	17.40	16.90	16.90	17.30		0.024	0.028	1.12	0.49

(Example) Product Weight of JSC3-V-LB-50B-200-T0H-D

Product weight for 0 mm stroke ..... 3.67 kg
Additional weight for 200 mm stroke $0.46 \times \frac{200}{100} = 0.92$ kg
Weight of 2 T0H switches ..... 0.018×2=0.036 kg
Weight of 2 mounting brackets ..... 0.022×2=0.044 kg
Valve weight ..... 0.32 kg
Product weight ..... 3.67+0.92+0.036+0.044+0.32=4.990 kg

Theoretical Thrust Table

(Unit: N)

Bore Size (mm)	Operating Direction	Operating Pressure MPa							
		0.1	0.15	0.2	0.3	0.4	0.5	0.6	0.7
ø40	Push	1.26×10^2	1.88×10^2	2.51×10^2	3.77×10^2	5.03×10^2	6.28×10^2	7.54×10^2	8.80×10^2
	Pull	1.06×10^2	1.58×10^2	2.11×10^2	3.17×10^2	4.22×10^2	5.28×10^2	6.33×10^2	7.39×10^2
ø50	Push	1.96×10^2	2.95×10^2	3.93×10^2	5.89×10^2	7.85×10^2	9.82×10^2	1.18×10^3	1.37×10^3
	Pull	1.65×10^2	2.47×10^2	3.30×10^2	4.95×10^2	6.60×10^2	8.25×10^2	9.90×10^2	1.15×10^3
ø63	Push	3.12×10^2	4.68×10^2	6.23×10^2	9.35×10^2	1.25×10^3	1.56×10^3	1.87×10^3	2.18×10^3
	Pull	2.80×10^2	4.20×10^2	5.61×10^2	8.41×10^2	1.12×10^3	1.40×10^3	1.68×10^3	1.96×10^3
ø80	Push	5.03×10^2	7.54×10^2	1.01×10^3	1.51×10^3	2.01×10^3	2.51×10^3	3.02×10^3	3.52×10^3
	Pull	4.54×10^2	6.80×10^2	9.07×10^2	1.36×10^3	1.81×10^3	2.27×10^3	2.72×10^3	3.17×10^3
ø100	Push	7.85×10^2	1.18×10^3	1.57×10^3	2.36×10^3	3.14×10^3	3.93×10^3	4.71×10^3	5.50×10^3
	Pull	7.15×10^2	1.07×10^3	1.43×10^3	2.14×10^3	2.86×10^3	3.57×10^3	4.29×10^3	5.00×10^3

Mounting Bracket Model No. Notation

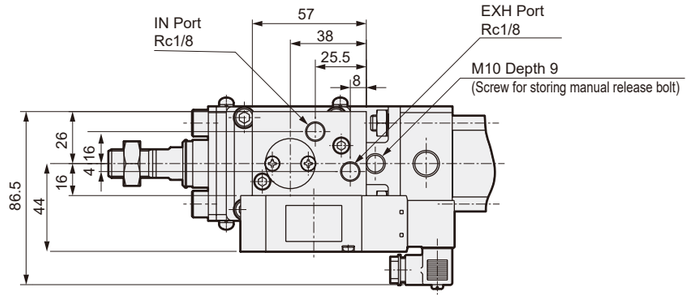
Bore Size (mm) / Mounting Bracket	ø40	ø50	ø63	ø80	ø100
Foot (LB) *1	JSC3-40-LB	JSC3-50-LB	JSC3-63-LB	JSC3-80-LB	JSC3-100-LB
Flange (FB)	JSC3-40-FB	JSC3-50-FB	JSC3-63-FB	JSC3-80-FB	JSC3-100-FB
Single clevis (CA)	S1-CA-40	S1-CA-50	S1-CA-63	S1-CA-80	S1-CA-100
Double Yoke Clevis (CB) *2	S1-CB-40	S1-CB-50	S1-CB-63	S1-CB-80	S1-CB-100

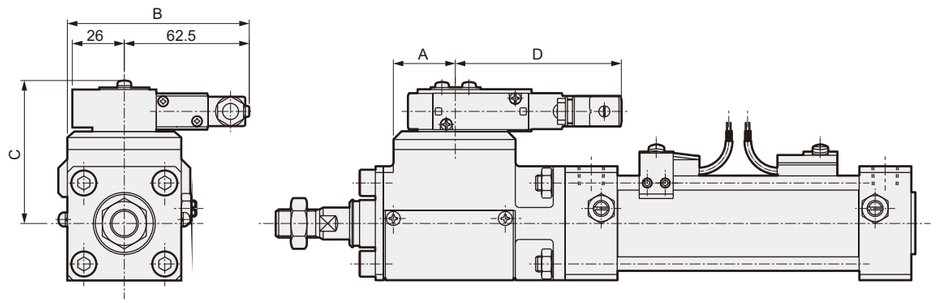
*1: Foot type mounting brackets are 2 pcs/set.
*2: Pins and Retaining Rings are included.
*3: Mounting bolts are included with each mounting bracket.

Outline Dimension Drawing (Bore Size: ø40 to ø63)

With Valve for Brake

● JSC3-V-40
-50



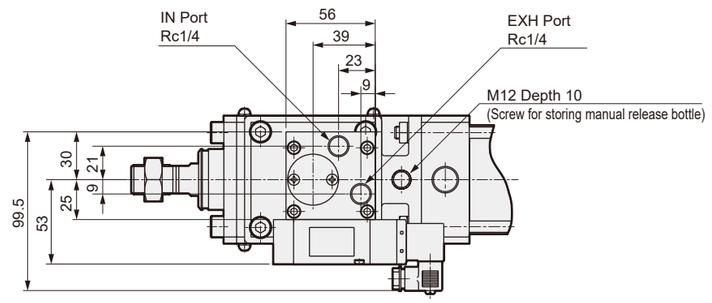


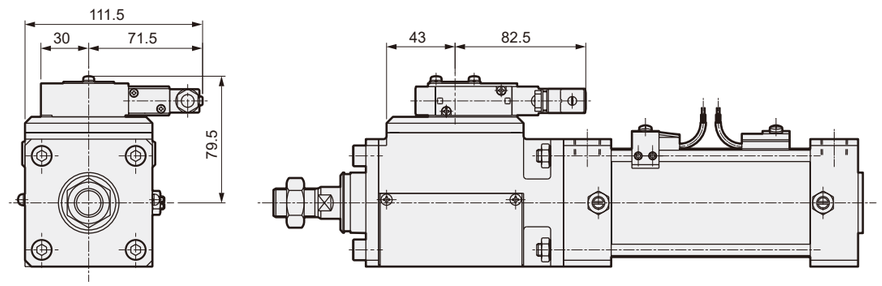
Code / Bore Size (mm)	A	B	C	D
ø40	31	91	71.5	83.5
ø50	36	96.5	76	86.5

***1: Same as standard type except for the above dimensions. Please refer to P. 432.**
***2: For dimensions with each switch, please refer to P. 494.**

With Valve for Brake

● JSC3-V-63



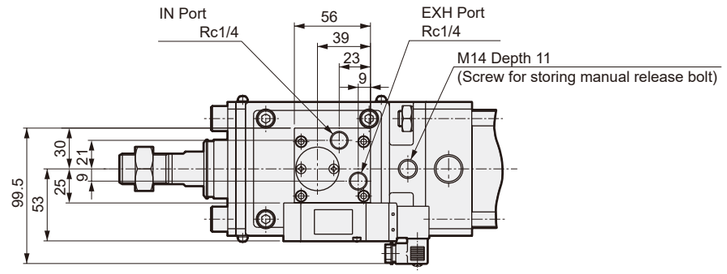


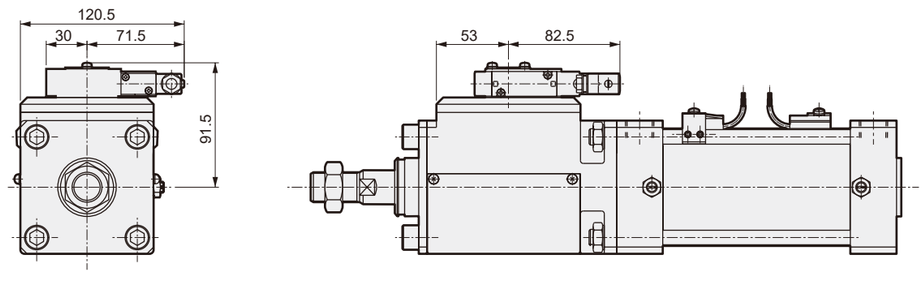
***1: Same as standard type except for the above dimensions. Please refer to P. 432.**
***2: For dimensions with each switch, please refer to P. 494.**

Outline Dimension Drawing (Bore Size: ø80, ø100)

With Valve for Brake

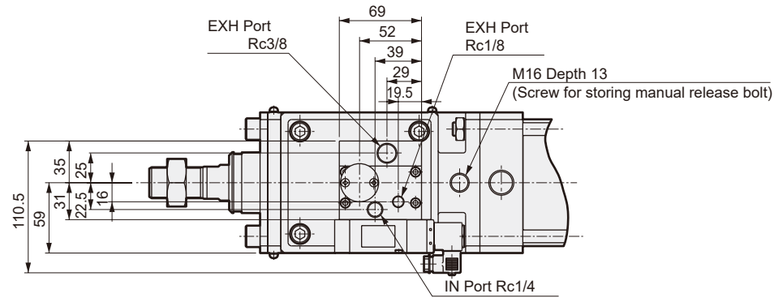
● JSC3-V-80

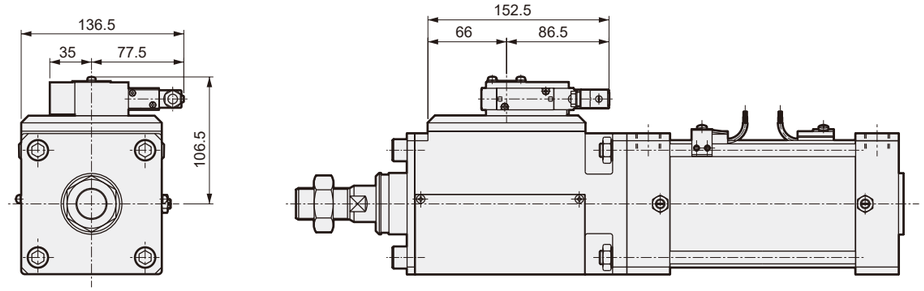




***1: Same as standard type except for the above dimensions. Please refer to P. 432.**
***2: For dimensions with each switch, please refer to P. 494.**

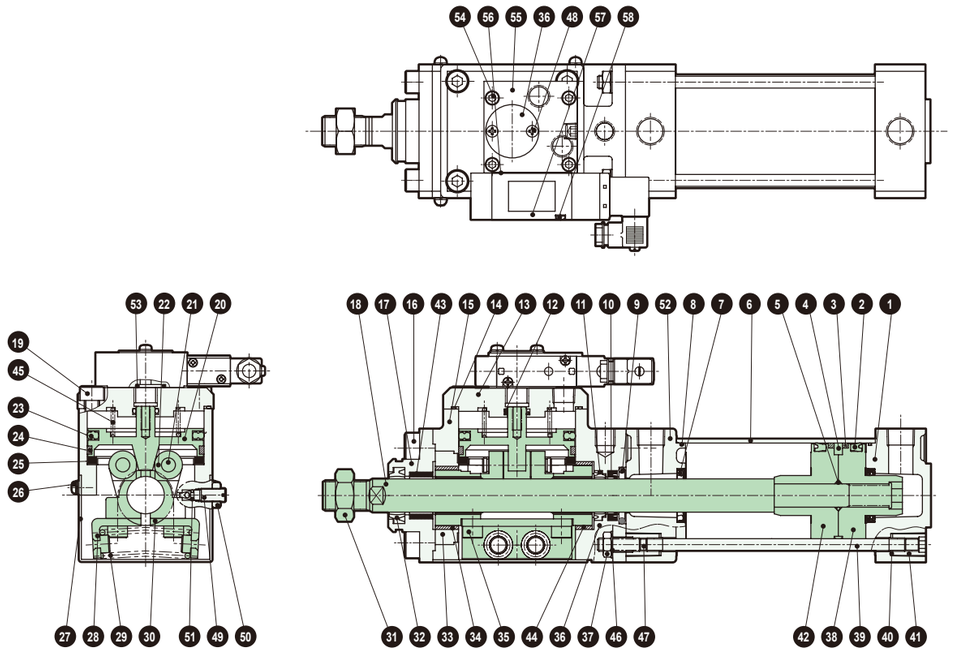
● JSC3-V-100

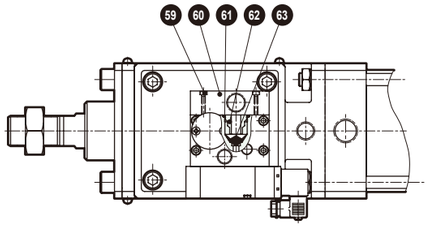




***1: Same as standard type except for the above dimensions. Please refer to P. 432.**
***2: For dimensions with each switch, please refer to P. 494.**

Internal Structure Diagram/Material (Bore Size: ø40 to ø100)





For ø63

Material

Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Head cover	Aluminum Alloy	Painted	33	DU ring	Steel	Black Oxide
2	Piston Packing	Nitrile Rubber		34	Bush	Oil-Impregnated Bearing Alloy	
3	Wear ring	Polyacetal		35	Hexagon Socket Head Cap Screw	Steel	Black Oxide
4	Magnet	Plastic		36	Dust cover	Aluminum Alloy	Painting
5	Piston gasket	Nitrile Rubber		37	Hexagon Nut	Steel	Black Oxide
6	Cylinder Tube	Aluminum Alloy	Hard Anodized	38	Piston H	Aluminum Alloy	
7	Cushion Packing	Nitrile Rubber, Steel		39	Tie rod	Steel	Zinc Chromate
8	Cylinder gasket	Nitrile Rubber		40	Belleville washer	Steel	Black Oxide
9	Metal seal	Nitrile Rubber		41	Round nut	Steel	Zinc Chromate
10	Rod Packing	Nitrile Rubber		42	Piston R	Aluminum Alloy	
11	Dust Wiper	Nitrile Rubber		43	Bush B	Oil impregnated Bearing Alloy	
12	Cap gasket A	Nitrile Rubber		44	Thrust washer	Stainless Steel	
13	Body cap	Cast Iron	Nitriding Treatment	45	Piston Spring	Steel	Painted
14	Cap gasket B	Nitrile Rubber		46	Toothed washer	Steel	Black Oxide
15	Brake body	Aluminum Alloy	Alumite	47	Hexagon Socket Set Screw	Steel	Black Oxide
16	Hexagon Socket Head Cap Screw	Steel	Black Oxide	48	Pan Head Screw	Steel	Zinc Chromate
17	Rod metal	Steel	Manganese Phosphate	49	Cushion needle	Copper Alloy	Nickel Plating
18	Piston Rod	Steel	Industrial Chrome Plating	50	Needle nut	Copper Alloy	Nickel Plating
19	Hexagon Socket Head Cap Screw	Steel	Black Oxide	51	Needle gasket	Nitrile Rubber	
20	Brake piston	Cast Iron	Manganese Phosphate	52	Rod Cover	Aluminum Alloy Die Cast	Painted
21	Parallel pin	Steel		53	O-Ring	Nitrile Rubber	
22	Bearing			54	Hexagon Socket Head Cap Screw	Steel	Black Oxide
23	Piston Packing B	Nitrile Rubber		55	Sub plate	Aluminum Alloy	
24	Wear ring	Polyacetal		56	Gasket	Nitrile Rubber	
25	Cushion Rubber	Urethane Rubber	With switch only	57	Selex Valve		4KB (Custom item) (CKD)
26	Cross-Recessed Pan Head Screw	Steel	Zinc Chromate	58	Pan Head Screw	Steel	Zinc Chromate
27	Cover	Steel	Painted	59	Hexagon Socket Head Cap Screw	Steel	Black Oxide
28	Spring seat	Steel	Zinc Chromate	60	Sub-plate 2	Aluminum Alloy	
29	Brake Spring	Steel		61	O-Ring	Nitrile Rubber	
30	Brake metal	Cast Iron	Nickel Plating	62	Sub-plate Valve Seat	Aluminum Alloy	
31	Rod nut	Steel	Zinc Chromate	63	Quick Packing	Urethane Rubber	
32	Dust Wiper	Nitrile Rubber					

For maintenance parts, please visit the CKD Equipment Product Site (https: //www.ckd.co.jp/kiki/en/) → "model No." → Maintenance Parts.

Celtop Cylinder Double Acting / Low Hydraulic Pressure Type

JSC3-H, JSC4-H Series

● Bore Size
JSC3: ø40, ø50, ø63, ø80, ø100
JSC4: ø125, ø140, ø160, ø180

Circuit Diagram Code

RoHS

Model No. Notation (ø40 to ø100)

Without switch (Built-in magnet for switch)

JSC3 - ❶ H — LB - ❷ 40 ❸ ❹ B - ❺ 50 ❻ — S ❾ I ❿

Model No.

With switch (Built-in magnet for switch)

JSC3 - ❶ H — LB - ❷ 40 ❸ ❹ B - ❺ 50 ❻ T0H ❼ R ❽ S ❾ I ❿

Model No.

Strong magnetic field resistant (For H0, H0Y switch)
With Switch (Built-in magnet for switch)

JSC3 - ❶ H L2 - LB - ❷ 40 ❸ ❹ B - ❺ 50 ❻ H0 ❼ R ❽ S ❾ I ❿

Model No.

❶ Brake Release Pressure
❷ Mounting Type
❸ Bore Size
❹ Piping thread type
❺ Cushion
❻ Stroke
❼ Switch Model
❽ Number of Switches
❾ Option
❿ Accessories

❶ Brake Release Pressure

Code	Content
Blank	Standard Type (0.3 MPa)
S	Low pressure release type (0.25 MPa)

❷ Mounting Type

Mounting brackets are pre-assembled on the product for shipment. (However, head side special flange type is attached for shipment.)

Code	Content		Code	Content	
00	Basic type		CA	Single Clevis Type	
LB	Axial Foot Type		CB	Double Clevis Type (Pin and Retaining Ring attached)	
FA	Rod Side Flange Type		TC	Intermediate Trunnion Type	
FB	Head Side Flange Type		TA	Rod Side Trunnion Type	
FC	Head side special flange type		TB	Head Side Trunnion Type	

❸ Bore Size (mm)

Code	Contents
40	ø40
50	ø50
63	ø63
80	ø80
100	ø100

❹ Piping thread type

Code	Content
Blank	Rc Thread
N	NPT Thread (Custom Order Product)
G	G thread (Custom product)

❺ Cushion

Code	Content
B	Both sides cushion
R	Rod side cushion
H	Head side cushion
N	Without cushion

❻ Stroke (mm)

Bore Size	Stroke	Intermediate Stroke
ø40	1 to 600	Every 1 mm
ø50	1 to 600	
ø63	1 to 600	
ø80	1 to 700	
ø100	1 to 800	

Note: For minimum stroke with switch, please refer to P. 478, 479.

❼ Switch Model No.

For switch details, refer to P. 1457. Switches are shipped with the product.

Contact	Indicator LED Special Function	Wiring (Output)	Load Voltage (V) AC	Load Voltage (V) DC	Load Current (mA) AC	Load Current (mA) DC	Lead wire *1 Straight	Lead wire *1 L-shape	
Solid State	1-Color	2-wire	85 to 265	—	5 to 100	-	T1H□	T1V□	
			-	10 to 30	—	5 to 20 *2	T2H□	T2V□	
		3-wire (NPN)	—	30 or less	—	100 or less	T3H□	T3V□	
		3-wire (PNP)	—		—		T3PH□	T3PV□	
	2-Color	2-wire	—	24 ± 10%	—	5 to 20	T2WH□	T2WV□	
		3-wire (NPN)	—	30 or less	—	50 or less	T3WH□	T3WV□	
	For 2-color AC Magnetic Field	2-wire	—	24 ± 10%	—	5 to 20	T2YD□	–	
			—		-		T2YDT□	–	
	1-Color Off-Delay Type		—	10 to 30	—	5 to 20 *2	T2JH□	T2JV□	
	1-color Flexible Lead Wire Type		—	10 to 30	—		T2HR3	T2VR3	
Reed	1-Color	2-wire	110	12/24	7 to 20	5 to 50	T0H□	T0V□	
	No Indicator LED		110	5/12/24	20 or less	50 or less	T5H□	T5V□	
	1-Color		110/220	12/24	7 to 20 / 7 to 10	5 to 50	T8H□	T8V□	
	1-color For Strong Magnetic Fields		110	12/24	7 to 20	5 to 50	H0□	-	
	2-color For strong magnetic field		—	24 ± 10%	—	5 to 20	H0Y□	-	

*1: Insert the code selected in the "Lead wire length" table into "□" of the switch Model No..
*2: The maximum load current value above, 20 mA, is at 25°C. If the switch operating Ambient Temperature is higher than 25°C, it will be lower than 20 mA. (At 60°C, it will be 5 to 10 mA.)
*3: Switches other than the above models are also available. (Custom Product) For details, refer to P. 1457.

***Lead Wire Length**

Code	Content
Blank	1 m (Standard)
3	3 m (Option)
5	5m (Option)

Example) Lead wire length
1 m T0H
3 m T0H3
5 m T0H5

❽ Number of Switches

Code	Content
R	With 1 pc on rod side
H	With 1 pc on head side
D	With 2 pcs
T	With 3 pcs

Note: ❶If mounting type TA or TB is selected, the number of switches is limited to "H" (1 on head side) for TA, and "R" (1 on rod side) for TB.

❿ Accessories

	Code	Content	
*1	I	Single knuckle	
*1	Y	Double knuckle (Pin and Retaining Ring included)	
	B1	Single bracket	
	B2	Double yoke bracket (pin and Retaining Ring included)	
	B3	Single bracket	
	B4	Trunnion Type 2nd Bracket (Set of 2)	

*1: "I" and "Y" cannot be selected simultaneously.

❾ Option

Code	Content	Max Ambient Temperature	Instantaneous Max Temperature	
J	Bellows	100°C	200°C	
L	Bellows	250°C	400°C	
M	Piston Rod material (Stainless Steel)			
Blank	Cushion needle position R (Standard)			T R (Standard) S
S	Cushion needle position S			
T	Cushion needle position T			
G	With Indicator			

Note: For "S" and "T" position display, please check the respective outline dimension drawings.

About specifications of custom products

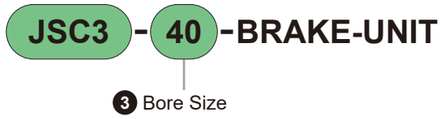
For details, please refer to P. 498 to 503.

Code	Content
-XK◇	Mounting Bracket Rotational Assembly
-XAQ◇◇	Trunnion Position Specification
-XP5	Knuckle Pin/Clevis Pin Split Pin
-XP7	Knuckle fixed by pin driving
-XP8	Knuckle pin/clevis pin split pin specification, knuckle fixed by pin driving
-XJ9	Without Bellows
-A2	With 2 Rod Nuts
Rod End Shape change	Refer to Ending P. 11.

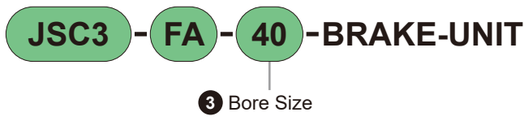
Model No. Ex.)
JSC3-H-..... -XK□

JSC3-H Series

Brake Unit Model No. Notation

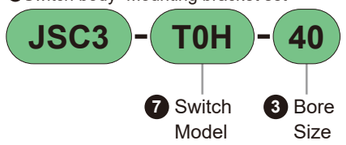


● FA mounting style

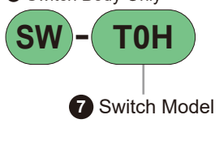


T-type Switch Individual Model No. Notation

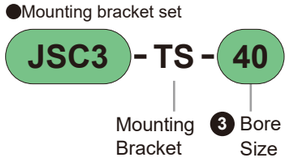
●Switch body+Mounting bracket set



● Switch Body Only

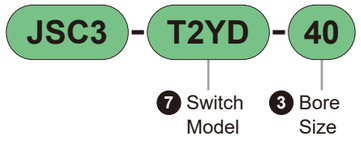


●Mounting bracket set

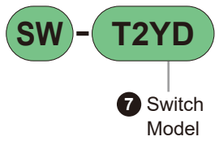


T2YD type switch single item Model No. Notation

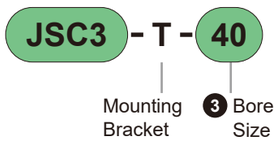
●Switch body+Mounting bracket set
· ø40 to ø100



● Switch Body Only
· ø40 to ø100

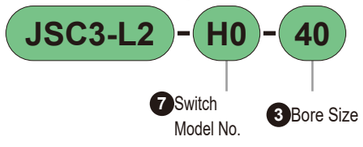


●Mounting bracket set

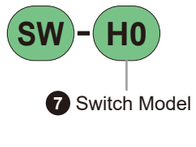


H type switch single item Model No. Notation

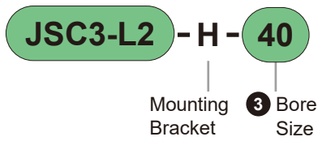
●Switch body+Mounting bracket set



● Switch Body Only



●Mounting bracket set



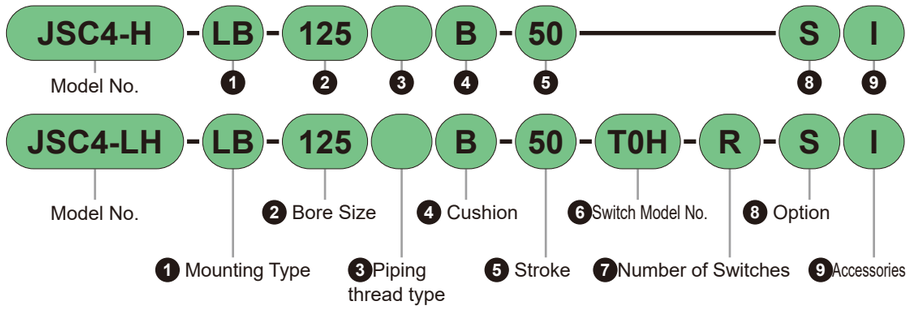
MEMO

With Brake / With Lock
ULK□
JSK2/ JSM2
JSG
JSC3, JSC4
USSD
UFCD
USC
Cylinder Switch
Ending

Model No. Notation

Without switch
(Without magnet for switch)

With Switch
(Built-in magnet for switch)



1 Mounting type
Mounting bracket is pre-assembled on the product for shipment.

Code	Content		Code	Content	
LB	Axial foot type		CB	Double Clevis Type (Pin and Retaining Ring attached)	
FA	Rod side flange type		TC	Center trunnion type	
FB	Head Side Flange Type		TA	Rod side trunnion type	
CA	Single clevis type		TB	Head side trunnion type	

2 Bore Size (mm)

Code	Content
125	ø125
140	ø140
160	ø160
180	ø180

3 Piping thread type

Code	Content
Blank	Rc Thread
N	NPT Thread (Custom Order Product)
G	G thread (Custom product)

4 Cushion

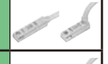
Code	Content
B	Both sides cushion
R	Rod side cushion
H	Head side cushion
N	Without cushion

5 Stroke (mm)

Bore Size	Stroke	Intermediate Stroke
ø125	1 to 800	in 1 mm increments
ø140	1 to 800	
ø160	1 to 800	
ø180	1 to 900	

Note: Refer to P. 479 for the Min Stroke with switch.

6 Switch Model No.
For switch details, refer to P. 1457. Switches are shipped with the product.

Contact	Indicator LED Special Function	Wiring (Output)	Load Voltage (V) AC	Load Voltage (V) DC	Load Current (mA) AC	Load Current (mA) DC	Lead wire *1 Straight	Lead wire *1 L-shape	
Solid State	1-Color	2-wire	85 to 265	—	5 to 100	—	T1H□	T1V□	
			-	10 to 30	—	5 to 20 *2	T2H□	T2V□	
		3-wire (NPN)	—	30 or less	—	100 or less	T3H□	T3V□	
		3-wire (PNP)	—		—		T3PH□	T3PV□	
	2-Color	2-wire	—	24 ± 10%	—	5 to 20	T2WH□	T2WV□	
		3-wire (NPN)	—	30 or less	—	50 or less	T3WH□	T3WV□	
	2-Color AC For Magnetic Field	2-wire	—	24 ± 10%	—	5 to 20	T2YD□	–	
			-		-		T2YDT□	–	
	1-Color Off-Delay Type		—	10 to 30	—	5 to 20 *2	T2JH□	T2JV□	
	1-color Flexible Lead Wire Type		—	10 to 30	—		T2HR3	T2VR3	
Contact	1-Color	2-wire	110	12/24	7 to 20	5 to 50	T0H□	T0V□	
	Without Indicator Lamp		110	5/12/24	20 or less	50 or less	T5H□	T5V□	
	1-Color		110/220	12/24	7 to 20 / 7 to 10	5 to 50	T8H□	T8V□	

*1: Insert the code selected in the "Lead wire length" table into "□" of the switch Model No..
*2: The maximum load current value above, 20 mA, is at 25°C. If the switch operating Ambient Temperature is higher than 25°C, it will be lower than 20 mA. (At 60°C, it will be 5 to 10 mA.)
*3: Switches other than the above models are also available. (Custom Product) For details, refer to P. 1457.

***Lead Wire Length**

Code	Content
Blank	1 m (Standard)
3	3 m (Option)
5	5m (Option)

Example) Lead wire length
1 m T0H
3 m T0H3
5 m T0H5

7 Number of Switches

Code	Content
R	With 1 pc on rod side
H	With 1 pc on head side
D	With 2 pcs
T	With 3 pcs

Note: If 1 mounting type TA or TB is selected, the number of switches is limited to "H" (1 on head side) for TA, and "R" (1 on rod side) for TB.

9 Accessories

	Code	Content	
*1	I	Single knuckle	
*1	Y	Double Knuckle (Pin and Retaining Ring attached)	
	B1	Single bracket	
	B2	Double bracket	

*1: "I" and "Y" cannot be selected simultaneously.

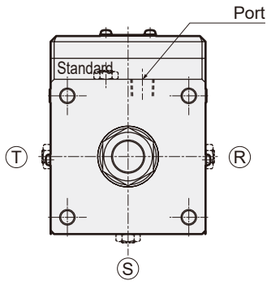
8 Option

Code	Content			
		Max Ambient Temperature	Instantaneous Max Temperature	
J	Bellows	100°C	200°C	
L	Bellows	250°C	400°C	
M	Piston Rod Material (Stainless Steel)			-
Blank	Cushion needle position Standard			Standard T R S
R	Cushion Needle Position R			
S	Cushion Needle Position S			
T	Cushion Needle Position T			
C2	With check valve in cushion part			

Note: For cushion needle position display, please check the figure below.

About Cushion Needle Position

(Needle position with port facing upward from rod direction)



About specifications of custom products

For details, please refer to P. 498 to 503.

Code	Content
-XK□	Mounting Bracket Rotational Assembly
-XAQ□□	Trunnion Position Specification
-XP5	Knuckle Pin/Clevis Pin Split Pin
-XP7	Knuckle fixed by pin driving
-XP8	Knuckle pin/clevis pin split pin specification, knuckle fixed by pin driving
-XJ9	Without Bellows
-A2	With 2 Rod Nuts
Rod End Shape change	Refer to Ending P. 11.

Model No. Ex.)
JSC4-H-..... -XK□

Note: Refer to P. 484 for compatible dimensions of JSC3-LH.

JSC4-H Series

Brake Unit Model No. Notation

JSC4 - 125 - BRAKE-UNIT

❷ Bore Size

T-type Switch Individual Model No. Notation

●Switch body+Mounting bracket set

JSC4-LN - T0H - 125

❻ Switch Model

❷ Bore Size

● Switch Body Only

SW - T0H

❻ Switch Model

●Mounting bracket set

JSC4-LN - TS - 125

❷ Bore Size

T2YD type switch single item Model No. Notation

●Switch body+Mounting bracket set

JSC4-LN - T2YD - 125

❻ Switch Model

❷ Bore Size

● Switch Body Only

SW - T2YD

❻ Switch Model

●Mounting bracket set

JSC4-LN - T - 125

❷ Bore Size

MEMO

With Brake / With Lock
ULK□
JSK2/ JSM2
JSG
JSC3, JSC4
USSD
UFCD
USC
Cylinder Switch
Ending

Specifications

Item			JSC3-H (With Switch)					JSC3-SH (With Switch)					JSC4-H			
Bore Size		mm	ø40	ø50	ø63	ø80	ø100	ø40	ø50	ø63	ø80	ø100	ø125	ø140	ø160	ø180
Operation type			Double Acting, Low Hydraulic Pressure Type					Double Acting, low pressure release, low hydraulic pressure type					Double Acting / Low Hydraulic Type			
Operating Fluid			Hydraulic operating fluid (Brake unit uses compressed air)													
Max Operating Pressure		MPa	1.0													
Min Operating Pressure	Brake Part	MPa	0.3					0.25 (36 psi)					0.3			
	Cylinder Part	MPa	0.2 (29 psi)					0.2 (29 psi)					0.1			
Proof Pressure		MPa	1.6													
Ambient Temperature		°C	5 to 50													
Port Size	Brake Part		Rc1/8		Rc1/4		Rc3/8	Rc1/8		Rc1/4		Rc3/8	Rc 1/2			
	Cylinder Part		Rc1/4	Rc3/8		Rc 1/2		Rc1/4	Rc3/8		Rc 1/2		Rc 1/2	Rc 3/4		
Stroke Tolerance		mm	$^{+0.9}_{0}$ (to 360), $^{+1.4}_{0}$ (to 1000)					$^{-0.9}_{0}$ (to 360), $^{+1.4}_{0}$ (to 1000)					$^{+1.0}_{0}$ (to 300), $^{+1.4}_{0}$ (to 1000), $^{-1.8}_{0}$ (to 2000)			
Cushion			Air Cushion										With cushion			
Effective air cushion length		mm	14.6	16.6		20.6	23.6	14.6	16.6		20.6	23.6	21.6			
Holding Force		N	980	1569	2451	3922	6178	784	1255	1961	3138	4941	9600	12000	15800	20000
Allowable Absorbed Energy	With Cushion	J	Note: The cushioning capacity of low hydraulic pressure cylinders cannot absorb large energy. It is recommended to use an external shock absorber together.													
	Without cushion	J	Note: Without cushion, large energy generated by external load cannot be absorbed. It is recommended to use an external shock absorber together.													

Note: Brake section is air operated.

Stroke

Bore Size (mm)		Standard Stroke (mm)	Max Stroke (mm)	Min Stroke (mm)
JSC3	ø40	50, 75, 100, 150, 200, 50, 300, 350, 400, 450, 500	600	1
	ø50			
	ø63			
	ø80		700	
	ø100		800	
JSC4	ø125	50, 75, 100, 150, 200, 250, 300		
	ø140			
	ø160			
	ø180		900	

***1: If the Max Stroke is exceeded, the product specifications may not be met depending on the conditions, so please consult us. Also, please refer to Intro 29.**
***2: Intermediate strokes can be manufactured in 2 mm increments.**
*3: Minimum stroke varies depending on the switch mounting method. Refer to the table below.

Minimum Stroke for JSC3 with Switch (T-type switch)

●Minimum stroke with T0/T5 type switch

Number of Switches	Different Surface Mounting	Same Surface Mounting		Intermediate Trunnion Mounting		Rod Side Trunnion Mounting Position detection at the rod side stroke end is not possible.	Head Side Trunnion Mounting Position detection at the head side stroke end is not possible.
Bore Size	2	1	2	1	2	1	1
ø40	20 (20)	20 (10)	60 (45)	110 (110)	110 (110)	50 (50)	50 (50)
ø50	20 (20)	15 (10)	20 (20)	135 (135)	135 (135)	60 (60)	60 (60)
ø63	20 (20)	15 (10)	20 (20)	110 (95)	110 (95)	50 (45)	50 (45)
ø80	25 (25)	15 (15)	25 (25)	115 (85)	115 (85)	55 (40)	55 (40)
ø100	25 (25)	15 (15)	25 (25)	125 (95)	125 (95)	60 (45)	60 (45)

*1: ( ) indicates T□V (L-shaped lead wire type).
*2: If the stroke is 15 mm or less, two switches may turn ON simultaneously. In this case, adjust the switch mounting positions so that they are further apart from each other.

Minimum Stroke for JSC3 with Switch (T-type switch)

● Minimum stroke with T8 type switch

Number of Switches	Different Surface Mounting	Same Surface Mounting		Intermediate Trunnion Mounting		Rod Side Trunnion Mounting Position detection at the rod side stroke end is not possible.	Head Side Trunnion Mounting Position detection at the head side stroke end is not possible.
Bore Size	2	1	2	1	2	1	1
ø40	20 (20)	15 (10)	50 (35)	95 (85)	95 (85)	45 (40)	45 (40)
ø50	20 (20)	10 (10)	20 (20)	115 (115)	115 (115)	50 (50)	50 (50)
ø63	20 (20)	10 (10)	20 (20)	95 (75)	95 (75)	45 (35)	45 (35)
ø80	25 (25)	15 (15)	25 (25)	100 (70)	100 (70)	50 (35)	50 (35)
ø100	25 (25)	15 (15)	25 (25)	110 (80)	110 (80)	55 (40)	55 (40)

*1: ( ) indicates T□V (L-shaped lead wire type).
*2: If the stroke is 15 mm or less, two switches may turn ON simultaneously. In this case, adjust the switch mounting positions so that they are further apart from each other.

●Minimum stroke with T2/T3 type switch

Number of Switches	Different Surface Mounting	Same Surface Mounting		Intermediate Trunnion Mounting		Rod Side Trunnion Mounting Position detection at the rod side stroke end is not possible.	Head Side Trunnion Mounting Position detection at the head side stroke end is not possible.
Bore Size	2	1	2	1	2	1	1
ø40	20 (15)	20 (10)	60 (45)	105 (75)	105 (75)	50 (35)	50 (35)
ø50	15 (15)	15 (10)	15 (15)	105 (75)	105 (75)	45 (30)	45 (30)
ø63	15 (15)	15 (10)	15 (15)	110 (80)	110 (80)	50 (35)	50 (35)
ø80	15 (15)	15 (10)	15 (15)	115 (85)	115 (85)	55 (40)	55 (40)
ø100	15 (15)	10 (10)	15 (15)	125 (95)	125 (95)	60 (45)	60 (45)

*1: ( ) indicates T□V (L-shaped lead wire type).
*2: If the stroke is 15 mm or less, two switches may turn ON simultaneously. In this case, adjust the switch mounting positions so that they are further apart from each other.

● Min Stroke with T1/T2W/T3W/T2YD switches

Number of Switches	Different Surface Mounting	Same Surface Mounting		Intermediate Trunnion Mounting		Rod Side Trunnion Mounting Position detection at the rod side stroke end is not possible.	Head Side Trunnion Mounting Position detection at the head side stroke end is not possible.
Bore Size	2	1	2	1	2	1	1
ø40	20 (15)	20 (10)	60 (45)	105 (75)	105 (75)	50 (35)	50 (35)
ø50	15 (15)	15 (10)	15 (15)	100 (70)	100 (70)	45 (30)	45 (30)
ø63	15 (15)	15 (10)	15 (15)	105 (75)	105 (75)	50 (35)	50 (35)
ø80	15 (15)	15 (10)	15 (15)	110 (80)	110 (80)	55 (40)	55 (40)
ø100	15 (15)	10 (10)	15 (15)	120 (90)	120 (90)	60 (45)	60 (45)

*1: ( ) indicates T□V (L-shaped lead wire type). However, T2YD does not have an L-shaped lead wire type (V).
*2: If the stroke is 15 mm or less, two switches may turn ON simultaneously. In this case, adjust the switch mounting positions so that they are further apart from each other.

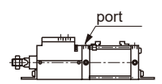
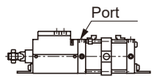
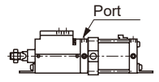
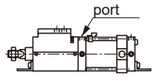
● Min Stroke with T2W/T3W switches

Number of Switches	Different Surface Mounting	Same Surface Mounting		Intermediate Trunnion Mounting		Rod Side Trunnion Mounting Position detection at the rod side stroke end is not possible.	Head Side Trunnion Mounting Position detection at the head side stroke end is not possible.
Bore Size	2	1	2	1	2	1	1
ø40	20 (10)	20 (5)	65 (50)	110 (80)	110 (80)	50 (35)	50 (35)
ø50	20 (10)	20 (5)	20 (10)	110 (80)	110 (80)	50 (35)	50 (35)
ø63	20 (10)	20 (5)	20 (10)	115 (85)	115 (85)	55 (40)	55 (40)
ø80	15 (10)	15 (5)	15 (10)	120 (90)	120 (90)	55 (40)	55 (40)
ø100	10 (10)	10 (5)	10 (10)	130 (100)	130 (100)	60 (45)	60 (45)

*1: ( ) indicates T□V (L-shaped lead wire type).
*2: If the stroke is 15 mm or less, two switches may turn ON simultaneously. In this case, adjust the switch mounting positions so that they are further apart from each other.

Minimum Stroke with JSC4 Switch (T-type Switch)

● ø125 to ø180

Item / Bore Size (mm)	Stroke when mounted on the same surface	Intermediate trunnion mounting stroke	Rod side trunnion mounting stroke	Head side trunnion mounting stroke
				
ø125	20 or more	120 or more	70 or more	
ø140		125 or more	75 or more	
ø160		130 or more	80 or more	
ø180		135 or more	85 or more	

Cylinder Weight

● JSC3 (ø40 to ø100)

[Unit: kg]

Item / Mounting Style / Bore Size (mm)	Product Weight when stroke (S) = 0 mm: Basic Type (00)	Foot Type (LB)	Flange type (FA, FB)	Single Clevis Type (CA)	Double Yoke Clevis Type (CB)	Trunnion Type (TC)	Switch Weight	Of mounting bracket Weight: T Type	H type	Per S = 100 mm Added Weight
ø40	2.48	2.66	2.91	2.83	2.83	2.86	Please refer to the Weight described in the switch specifications on P. 1457.	0.024	0.028	0.39
ø50	3.47	3.67	3.97	3.87	3.87	3.97		0.022	0.026	0.46
ø63	5.09	5.49	6.19	5.79	5.79	5.89		0.020	0.024	0.50
ø80	8.15	8.85	9.95	9.65	9.65	9.45		0.026	0.029	0.90
ø100	14.70	15.70	17.40	16.90	16.90	17.30		0.024	0.028	1.12

(Example) Product Weight of JSC3-H-LB-50B-200-T0H-D

Product weight for 0 mm stroke ..... 3.67 kg
Added Weight at 200 mm stroke ..... $0.46 \times \frac{200}{100}$ =0.92 kg
Weight of 2 T0H switches ..... 0.018×2=0.036 kg
Weight of 2 mounting brackets ..... 0.022×2=0.044 kg
Product weight ..... 3.67+0.92+0.036+0.044=4.670 kg

● JSC4 (ø125 to ø180)

(Unit: kg)

Item / Mounting Style / Bore Size (mm)	Product Weight when stroke (S) = 0 mm: Axial foot type (LB)	Flange Type (FA, FB)	Single Clevis Type (CA)	Double Clevis Type (CB)	Trunnion Type (TA, TB, TC)	Switch Weight: Switch	Mounting bracket	S = 100 mm Per Added Weight
ø125	25.72	27.52	27.22	27.32	27.62	Please refer to the Weight described in the switch specifications on P. 1457.	0.028	1.54
ø140	32.95	36.35	34.75	34.95	34.15		0.030	1.78
ø160	42.85	46.65	44.75	45.05	46.15		0.034	2.22
ø180	61.55	69.05	64.45	64.95	65.15		0.038	2.96

Example) Product Weight of JSC4-H-LB-125B-300-T0H-D

Product Weight at S = 0 mm: ..... 25.72 kg
Additional weight when S=300 mm ..... $1.54 \times \frac{300}{100}$ = 4.62 kg
Weight of 2 switches (T0H-D) ..... 0.018×2=0.036 kg
Weight of 2 switch brackets ..... 0.028×2=0.056 kg
Product weight ..... 25.72+4.62+0.036+0.056=30.432 kg

Theoretical Thrust Table

(Unit: N)

Bore Size (mm)		Operating Direction	Operating Pressure MPa: 0.1	0.15	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0 (145 psi)
JSC3	ø40	Push	1.26×10^{2}	1.88×10^{2}	2.51×10^{2}	3.77×10^{2}	5.03×10^{2}	6.28×10^{2}	7.54×10^{2}	8.80×10^{2}	1.01×10^{3}	1.13×10^{3}	1.26×10^{3}
		Pull	1.06×10^{2}	1.58×10^{2}	2.11×10^{2}	3.17×10^{2}	4.22×10^{2}	5.28×10^{2}	6.33×10^{2}	7.39×10^{2}	8.44×10^{2}	9.50×10^{2}	1.06×10^{3}
	ø50	Push	1.96×10^{2}	2.95×10^{2}	3.93×10^{2}	5.89×10^{2}	7.85×10^{2}	9.82×10^{2}	1.18×10^{3}	1.37×10^{3}	1.57×10^{3}	1.77×10^{3}	1.96×10^{3}
		Pull	1.65×10^{2}	2.47×10^{2}	3.30×10^{2}	4.95×10^{2}	6.60×10^{2}	8.25×10^{2}	9.90×10^{2}	1.15×10^{3}	1.32×10^{3}	1.48×10^{3}	1.65×10^{3}
	ø63	Push	3.12×10^{2}	4.68×10^{2}	6.23×10^{2}	9.35×10^{2}	1.25×10^{3}	1.56×10^{3}	1.87×10^{3}	2.18×10^{3}	2.49×10^{3}	2.81×10^{3}	3.12×10^{3}
		Pull	2.80×10^{2}	4.20×10^{2}	5.61×10^{2}	8.41×10^{2}	1.12×10^{3}	1.40×10^{3}	1.68×10^{3}	1.96×10^{3}	2.24×10^{3}	2.52×10^{3}	2.80×10^{3}
	ø80	Push	5.03×10^{2}	7.54×10^{2}	1.01×10^{3}	1.51×10^{3}	2.01×10^{3}	2.51×10^{3}	3.02×10^{3}	3.52×10^{3}	4.02×10^{3}	4.52×10^{3}	5.03×10^{3}
		Pull	4.54×10^{2}	6.80×10^{2}	9.07×10^{2}	1.36×10^{3}	1.81×10^{3}	2.27×10^{3}	2.72×10^{3}	3.17×10^{3}	3.63×10^{3}	4.08×10^{3}	4.54×10^{3}
	ø100	Push	7.85×10^{2}	1.18×10^{3}	1.57×10^{3}	2.36×10^{3}	3.14×10^{3}	3.93×10^{3}	4.71×10^{3}	5.50×10^{3}	6.28×10^{3}	7.07×10^{3}	7.85×10^{3}
		Pull	7.15×10^{2}	1.07×10^{3}	1.43×10^{3}	2.14×10^{3}	2.86×10^{3}	3.57×10^{3}	4.29×10^{3}	5.00×10^{3}	5.72×10^{3}	6.43×10^{3}	7.15×10^{3}
JSC4	ø125	Push	1.23×10^{3}	1.84×10^{3}	2.45×10^{3}	3.68×10^{3}	4.91×10^{3}	6.14×10^{3}	7.36×10^{3}	8.59×10^{3}	9.82×10^{3}	1.10×10^{4}	1.23×10^{4}
		Pull	1.13×10^{3}	1.70×10^{3}	2.26×10^{3}	3.39×10^{3}	4.52×10^{3}	5.65×10^{3}	6.79×10^{3}	7.92×10^{3}	9.05×10^{3}	1.02×10^{4}	1.13×10^{4}
	ø140	Push	1.54×10^{3}	2.31×10^{3}	3.08×10^{3}	4.62×10^{3}	6.16×10^{3}	7.70×10^{3}	9.24×10^{3}	1.08×10^{4}	1.23×10^{4}	1.39×10^{4}	1.54×10^{4}
		Pull	1.44×10^{3}	2.16×10^{3}	2.89×10^{3}	4.33×10^{3}	5.77×10^{3}	7.22×10^{3}	8.66×10^{3}	1.01×10^{4}	1.15×10^{4}	1.30×10^{4}	1.44×10^{4}
	ø160	Push	2.01×10^{3}	3.02×10^{3}	4.02×10^{3}	6.03×10^{3}	8.04×10^{3}	1.01×10^{4}	1.21×10^{4}	1.41×10^{4}	1.61×10^{4}	1.81×10^{4}	2.01×10^{4}
		Pull	1.88×10^{3}	2.83×10^{3}	3.77×10^{3}	5.65×10^{3}	7.54×10^{3}	9.42×10^{3}	1.13×10^{4}	1.32×10^{4}	1.51×10^{4}	1.70×10^{4}	1.88×10^{4}
	ø180	Push	2.54×10^{3}	3.82×10^{3}	5.09×10^{3}	7.03×10^{3}	1.02×10^{3}	1.27×10^{4}	1.53×10^{4}	1.78×10^{4}	2.04×10^{4}	2.29×10^{4}	2.54×10^{4}
		Pull	2.39×10^{3}	$3.58+10^{3}$	4.77×10^{3}	7.16×10^{3}	9.54×10^{3}	1.19×10^{4}	1.43×10^{4}	1.67×10^{4}	1.91×10^{4}	2.15×10^{4}	2.39×10^{4}

Mounting Bracket Model No. Notation (ø40 to ø100)

Bore Size (mm) / Mounting Bracket	ø40	ø50	ø63	ø80	ø100
Foot (LB) *1	JSC3-40-LB	JSC3-50-LB	JSC3-63-LB	JSC3-80-LB	JSC3-100-LB
Flange (FB)	JSC3-40-FB	JSC3-50-FB	JSC3-63-FB	JSC3-80-FB	JSC3-100-FB
Single clevis (CA)	S1-CA-40	S1-CA-50	S1-CA-63	S1-CA-80	S1-CA-100
Double Yoke Clevis (CB) *2	S1-CB-40	S1-CB-50	S1-CB-63	S1-CB-80	S1-CB-100

*1: Foot type mounting brackets are 2 pcs/set. *2: Pins and Retaining Rings are included. *3: Mounting bolts are included with each mounting bracket.

Dimensional Drawings

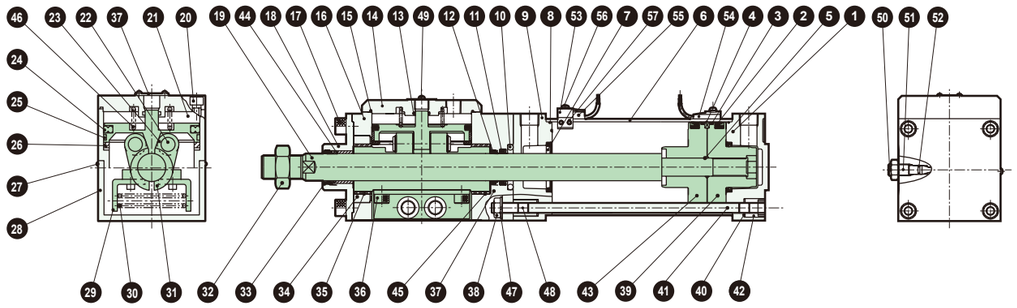
● ø40 to ø100

Same as JSC3 (Double Acting, single rod type). Please refer to P. 432 to 442.

● ø125 to ø180

Same as JSC4-N (Double Acting, non-lubricated type). Please refer to P. 444 to 451.

Internal Structure / Materials (Bore Size: ø40 to ø100)



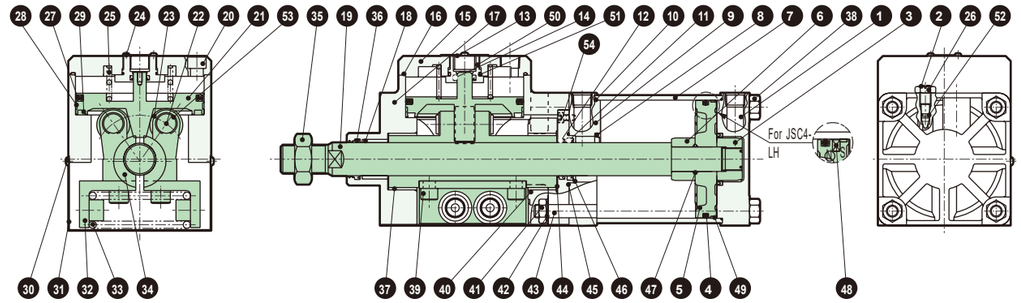
Do Not Disassemble

Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Head cover	Aluminum Alloy	Painted	30	Spring	Piano Wire	
2	Piston Packing	Nitrile Rubber		31	Brake metal	Cast Iron	Nickel Plating
3	Wear ring	Polyacetal		32	Rod nut	Steel	Zinc Chromate
4	Magnet	Plastic		33	Scraper	Nitrile Rubber	
5	Piston gasket	Nitrile Rubber		34	DU ring	Steel	Black Oxide
6	Cylinder Tube	Aluminum Alloy	Hard Alumite	35	Bush	Oil-Impregnated Bearing Alloy	
7	Cushion packing	Nitrile Rubber, Steel		36	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide
8	Cylinder gasket	Nitrile Rubber		37	Dust cover	Aluminum Alloy	Painting
9	Rod Cover	Aluminum Alloy	Painted	38	Hexagon Nut	Steel	Black Oxide
10	Metal seal	Nitrile Rubber		39	Piston H	Aluminum Alloy	
11	Rod Packing	Nitrile Rubber		40	Tie rod	Steel	Zinc Chromate
12	Scraper	Nitrile Rubber		41	Belleville washer	Steel	Black Oxide
13	Cap gasket A	Nitrile Rubber		42	Round nut	Steel	Zinc Chromate
14	Body cap	Cast Iron	Nitriding Treatment	43	Piston R	Aluminum Alloy	
15	Cap gasket B	Nitrile Rubber		44	Bush B	Oil impregnated Bearing Alloy	
16	Brake body	Aluminum Alloy	Alumite	45	Thrust washer		
17	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide	46	Spring	Piano Wire	Painted
18	Rod metal	Steel	Manganese Phosphate	47	Toothed washer	Steel	Black Oxide
19	Piston Rod	Steel	Industrial Chrome Plating	48	Hexagon Socket Set Screw	Steel	Black Oxide
20	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide	49	Cross-Recessed pan head machine screw with washer	Steel	Zinc Chromate
21	Brake piston	Cast Iron	Manganese Phosphate	50	Cushion needle	Copper Alloy	Nickel Plating
22	Parallel pin	Steel		51	Needle nut	Copper Alloy	Nickel Plating
23	Bearing			52	Needle gasket	Nitrile Rubber	
24	Piston Packing B	Nitrile Rubber		With switch			
25	Wear ring	Polyacetal		53	Switch mounting base	Aluminum Alloy	
26	Cushion rubber	Urethane Rubber		54	Switch holder	Aluminum Alloy	
27	Cross-Recessed Pan Head Screw	Steel	Zinc Chromate	55	Cylinder Switch		
28	Cover	Steel	Painted	56	Cross-Recessed Pan Head Screw	Steel	Zinc Chromate
29	Spring seat	Steel	Zinc Chromate	57	Hexagon Socket Set Screw	Alloy Steel	Black Oxide

Note: Contains a strong spring and Never disassemble the brake.

For maintenance parts, refer to the CKD component product site
(https://www.ckd.co.jp/kiki/en/) -> "Model No." -> See "Maintenance Parts".

Internal Structure / Materials (Bore Size: ø125 to ø180)



Do Not Disassemble

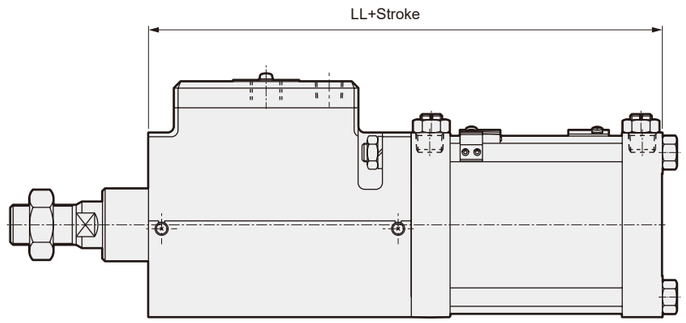
Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Head cover	Aluminum Alloy	Chromate	28	Wear ring	Polyacetal	
2	Cushion needle	Copper Alloy		29	Cushion Rubber	Urethane Rubber	
3	Cushion ring A	Steel	Zinc Chromate	30	Cross-Recessed Pan Head Screw	Steel	Zinc Chromate
4	Piston Packing	Nitrile Rubber		31	Cover	Steel	Painted
5	Piston	Aluminum Alloy		32	Spring seat	Steel	Manganese Phosphate
6	Cushion ring B	Steel	Zinc Chromate	33	Spring	Piano Wire	Black Oxide
7	Cylinder Tube	Aluminum Alloy	Hard Alumite	34	Brake metal	Cast Iron	Nickel Plating
8	Cushion Packing	Nitrile Rubber, Steel		35	Rod nut	Steel	Zinc Chromate
9	Rod Cover	Aluminum Alloy	Chromate	36	Scraper	Nitrile Rubber	
10	Cylinder gasket	Nitrile Rubber		37	Bush A	Bearing Alloy	
11	Rod Packing	Nitrile Rubber		38	Hexagon Nut	Steel	Zinc Chromate
12	Scraper	Nitrile Rubber		39	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide
13	Dust cover	Aluminum Alloy	Alumite	40	Ring	Steel	Black Oxide
14	Rod Packing	Nitrile Rubber		41	Hexagon Nut	Steel	Zinc Chromate
15	Body cap	Aluminum Alloy	Black alumite	42	Toothed washer	Steel	Zinc Chromate
16	Cap gasket	Nitrile Rubber		43	Tie rod	Steel	Zinc Chromate
17	Brake body	Aluminum Alloy	Alumite	44	Thrust washer	Steel	
18	Bush B	Oil impregnated Bearing Alloy		45	Metal gasket	Nitrile Rubber	
19	Piston Rod	Steel	Industrial Chrome Plating	46	Rod metal	Cast Iron	Zinc Chromate
20	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide	47	Piston gasket	Nitrile Rubber	
21	Brake piston	Cast Iron	Manganese Phosphate	48	Magnet	Rubber	JSC4-LN only
22	Bearing pin	Steel		49	Wear ring	Polyacetal	
23	Bearing	-		50	Body cap	Cast Iron	Manganese Phosphate
24	Cross-Recessed pan head machine screw with washer	Steel	Zinc Chromate	51	O-ring	Nitrile Rubber	
25	Spring	Piano Wire	Painted	52	Needle gasket	Nitrile Rubber	
26	Needle nut	Steel	Zinc Chromate	53	E-type Retaining Ring	Steel	Zinc Chromate
27	Piston Packing B	Nitrile Rubber		54	Hexagon Socket Head Cap Screw	Steel	Black Oxide

For maintenance parts, please visit the CKD Equipment Product Site
(https: //www.ckd.co.jp/kiki/en/) → "model No." → Maintenance Parts.

Brake Cylinder JSC3-LH

As of March 2015, the JSC3-LH series has been model changed to the JSC4-LH Series. JSC3-LH has different overall length dimensions from JSC4-LH. Compatible machines corresponding to these have been prepared. (Custom order) Currently, if you are using JSC3-LH and require a dimensionally compatible machine, please order by adding "-S092" to the end of the Model No..

Dimensional Drawings



Note: LL dimensions on P. 444 to 451 are as follows.

Code / Bore Size (mm)	Dimension table LL
ø125	311
ø140	338
ø160	367
ø180	388

*Please check with us for details.

MEMO

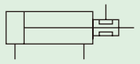
With Brake / With Lock
ULK□
JSK2/ JSM2
JSG
JSC3, JSC4
USSD
UFCD
USC
Cylinder Switch
Ending

Brake Cylinder Double Acting / Heat Resistant Type

JSC3-T, JSC4-T Series

● Bore Size
JSC3: ø40, ø50, ø63, ø80, ø100, ø125
JSC4: ø140, ø160, ø180

Circuit Diagram Code



RoHS

Model No. Notation (ø40 to ø100)

Without switch

JSC3 - ( ) T - LB - 40 ( ) B - 50 - S I

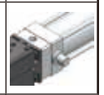
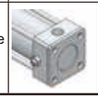
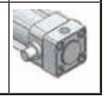
- Model No.
- ( ) Brake Release Pressure
- T
- LB: 2 Mounting Type
- 40: 3 Bore Size
- ( ): 4 Piping thread type
- B: 5 Cushion
- 50: 6 Stroke
- S: 7 Option
- I: 8 Accessories

1 Brake Release Pressure

Code	Content
Blank	Standard Type (0.3 MPa)
S	Low pressure release type (0.25 MPa)

2 Mounting Type

Mounting bracket is pre-assembled on the product for shipment. (However, head side special flange type is attached for shipment.)

Code	Content		Code	Content	
00	Basic Type		CA	Single clevis type	
LB	Axial foot type		CB	Double Clevis Type (Pin and Retaining Ring attached)	
FA	Rod side flange type		TC	Center trunnion type	
FB	Head Side Flange Type		TA	Rod side trunnion type	
FC	Head side special flange type		TB	Head side trunnion type	

3 Bore Size (mm)

Code	Contents
40	ø40
50	ø50
63	ø63
80	ø80
100	ø100

4 Piping thread type

Code	Content
Blank	Rc Thread
N	NPT Thread (Custom Order Product)
G	G thread (Custom product)

5 Cushion

Code	Content
B	Both sides cushion
R	Rod side cushion
H	Head side cushion
N	Without cushion

6 Stroke (mm)

Bore Size	Stroke	Intermediate Stroke
ø40	1 to 600	Every 1 mm
ø50	1 to 600	
ø63	1 to 600	
ø80	1 to 700	
ø100	1 to 800	

7 Option

Code	Content			
		Max Ambient Temperature	Instantaneous Max Temperature	
L	Bellows	250°C	400°C	
M	Piston Rod material (Stainless Steel)			
Blank	Cushion needle position R (Standard)			T R (Standard) S
S	Cushion needle position S			
T	Cushion needle position T			
G	With Indicator			

Note: For "S" and "T" position display, please check the respective outline dimension drawings.

8 Accessories

	Code	Content	
*1	I	Single knuckle	
*1	Y	Double yoke knuckle (pin and Retaining Ring included)	
	B1	Single bracket	
	B2	Double yoke bracket (pin and Retaining Ring included)	
	B3	Single bracket	
	B4	Trunnion Type 2nd Bracket (Set of 2)	

*1: "I" and "Y" cannot be selected simultaneously.

About specifications of custom products

For details, please refer to P. 498 to 503.

Code	Content
-XK◇	Mounting Bracket Rotational Assembly
-XAQ◇◇	Trunnion Position Specification
-XP5	Knuckle Pin/Clevis Pin Split Pin
-XP7	Knuckle fixed by pin driving
-XP8	Knuckle pin/clevis pin split pin specification, knuckle fixed by pin driving
-XJ9	Without Bellows
-A2	With 2 Rod Nuts
Rod End Shape change	Refer to Ending P. 11.

Model No. Ex.)

JSC3-T - ..... - XK□

Model No. Notation (ø125 to ø180)

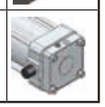
Without switch

JSC4-T - LB - 125 [ ] B - 50 - S [ ]

- JSC4-T: Model No.
- LB: 1 Mounting Type
- 125: 2 Bore Size
- [ ]: 3 Piping thread type
- B: 4 Cushion
- 50: 5 Stroke
- S: 6 Option
- [ ]: 7 Accessories

1 Mounting Type

Mounting bracket is pre-assembled on the product for shipment.

Code	Content		Code	Content	
LB	Axial foot type		CB	Double Clevis Type (Pin and Retaining Ring attached)	
FA	Rod side flange type		TC	Center trunnion type	
FB	Head Side Flange Type		TA	Rod side trunnion type	
CA	Single clevis type		TB	Head side trunnion type	

2 Bore Size (mm)

Code	Content
125	ø125
140	ø140
160	ø160
180	ø180

3 Piping thread type

Code	Content
Blank	Rc Thread
N	NPT Thread (Custom Order Product)
G	G thread (Custom product)

4 Cushion

Code	Content
B	Both sides cushion
R	Rod side cushion
H	Head side cushion
N	Without cushion

5 Stroke (mm)

Bore Size	Stroke	Intermediate Stroke
ø125	1 to 800	in 1 mm increments
ø140	1 to 800	
ø160	1 to 800	
ø180	1 to 900	

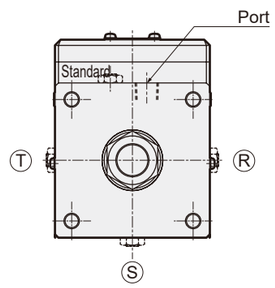
6 Option

Code	Content			
		Max Ambient Temperature	Instantaneous Max Temperature	
L	Bellows	250°C	400°C	
M	Piston Rod Material (Stainless Steel)			
Blank	Cushion needle position Standard			Standard T R S
R	Cushion Needle Position R			
S	Cushion Needle Position S			
T	Cushion Needle Position T			
C2	With check valve in cushion part			

Note: For cushion needle position display, please check the figure below.

About Cushion Needle Position

(Needle position with port facing upward from rod direction)



7 Accessories

	Code	Content	
*1	I	Single knuckle	
*1	Y	Double Knuckle (pin and Retaining Ring included)	
	B1	Single bracket	
	B2	Double bracket	

*1: "I" and "Y" cannot be selected simultaneously.

About specifications of custom products

For details, please refer to P. 498 to 503.

Code	Content
-XK□	Mounting Bracket Rotational Assembly
-XAQ□□	Trunnion Position Specification
-XP5	Knuckle Pin/Clevis Pin Split Pin
-XP7	Knuckle fixed by pin driving
-XP8	Knuckle pin/clevis pin split pin specification, knuckle fixed by pin driving
-XJ9	Without Bellows
-A2	With 2 Rod Nuts
Rod End Shape change	Refer to Ending P. 11.

Model No. Ex.)

JSC4-T - ..... - XK□

Specifications

Item			JSC3-T					JSC3-ST					JSC4-T			
Bore Size		mm	ø40	ø50	ø63	ø80	ø100	ø40	ø50	ø63	ø80	ø100	ø125	ø140	ø160	ø180
Operation type			Double Acting/Heat Resistant Type					Double Acting, low pressure release, heat resistant type					Double Acting/Heat Resistant Type			
Operating Fluid			Compressed Air													
Max Operating Pressure		MPa	1.0 (145 psi)													
Min Operating Pressure MPa	Brake Part		0.3					0.25 (36 psi)					0.3			
	Cylinder Part		0.1					0.1					0.05			
Proof Pressure		MPa	1.6													
Ambient Temperature		°C	5 to 120													
Port Size	Brake Part		Rc1/8		Rc1/4		Rc3/8	Rc1/8		Rc1/4		Rc3/8	Rc 1/2			
	Cylinder Part		Rc1/4	Rc3/8		Rc 1/2		Rc1/4	Rc3/8		Rc 1/2		Rc 1/2	Rc 3/4		
Stroke Tolerance		mm	$^{+0.9}_{0}$ (to 360), $^{+1.4}_{0}$ (to 1000)					$^{-0.9}_{0}$ (to 360), $^{+1.4}_{0}$ (to 1000)					$^{+1.0}_{0}$ (to 300), $^{+1.4}_{0}$ (to 1000), $^{-1.8}_{0}$ (to 2000)			
Operating Piston Speed		mm/s	50 to 1000 (Use within allowable absorbed energy)													
Cushion			Air Cushion													
Effective air cushion length		mm	14.6	16.6		20.6	23.6	14.6	16.6		20.6	23.6	21.6			
Lubrication *1			Not allowed													
Holding Force		N	980	1569	2451	3922	6178	784	1255	1961	3138	4941	9600	12000	15800	20000
Allowable Absorbed Energy J	With Cushion		4.29	8.37	15.8	27.9	49.8	4.29	8.37	15.8	27.9	49.8	63.6	91.5	116	152
	Without cushion		0.067	0.079	0.079	0.201	0.301	0.067	0.079	0.079	0.201	0.301	0.371	0.386	0.386	0.958
			Note: Without cushion, large energy generated by external load cannot be absorbed. It is recommended to use an external shock absorber together.													

*1: Grease up regularly with heat-resistant grease.

Stroke

Bore Size (mm)	Standard Stroke (mm)	Max Stroke (mm)	Min Stroke (mm)
ø40	50, 75, 100, 150, 200, 250, 300, 350, 400, 450, 500	600	1
ø50			
ø63			
ø80		700	
ø100		800	
ø125	50, 75, 100, 150, 200, 250, 300		
ø140			
ø160			
ø180		900	

***1: If the Max Stroke is exceeded, the product specifications may not be met depending on the conditions, so please consult us. Also, please refer to Intro 29.**
***2: Intermediate strokes can be manufactured in 2 mm increments.**
*3: Minimum stroke varies depending on the switch mounting method. Refer to the table below.

Cylinder Weight

● JSC3 (ø40 to ø100) [Unit: kg]

Item / Mounting Style / Bore Size (mm)	Product Weight when stroke (S) = 0 mm						Added weight per S = 100 mm
	Basic Type (00)	Foot Type (LB)	Flange Type (FA, FB)	Single Yoke Clevis Type (CA)	Double Yoke Clevis Type (CB)	Trunnion Type (TC)	
ø40	2.48	2.66	2.91	2.83	2.83	2.86	0.39
ø50	3.47	3.67	3.97	3.87	3.87	3.97	0.46
ø63	5.09	5.49	6.19	5.79	5.79	5.89	0.50
ø80	8.15	8.85	9.95	9.65	9.65	9.45	0.90
ø100	14.70	15.70	17.40	16.90	16.90	17.30	1.12

(Example) Product Weight of JSC3-T-LB-50B-200
Product weight for 0 mm stroke ..... 3.67 kg
Additional weight for 200 mm stroke ... $0.46 \times \frac{200}{100} = 0.92$ kg
Product weight ..... 3.67 kg+0.92 kg=4.59 kg

● JSC4 (ø125 to ø180) (Unit: kg)

Item / Mounting Style / Bore Size (mm)	Product Weight at stroke (S) = 0 mm					Added Weight per S=100 mm
	Axial foot type (LB)	Flange Type (FA/FB)	Single clevis type (CA)	Double Clevis Type (CB)	Trunnion Type (TA, TB, TC)	
ø125	25.72	27.52	27.22	27.32	27.62	1.54
ø140	32.95	36.35	34.75	34.95	34.15	1.78
ø160	42.85	46.65	44.75	45.05	46.15	2.22
ø180	61.55	69.05	64.45	64.95	65.15	2.96

(Example) Product Weight of JSC4-T-LB-125B-300
●Product weight when S = 0 mm ..... 25.72 kg
●Additional weight when S = 300 mm $1.54 \times \frac{300}{100} = 4.62$ kg
●Product weight ..... 25.72 + 4.62 = 30.34 kg

Theoretical Thrust Table

(Unit: N)

Bore Size (mm)		Operating Direction	Operating Pressure MPa										
			0.1	0.15	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0 (145 psi)
JSC3	ø40	Push	1.26×10^{2}	1.88×10^{2}	2.51×10^{2}	3.77×10^{2}	5.03×10^{2}	6.28×10^{2}	7.54×10^{2}	8.80×10^{2}	1.01×10^{3}	1.13×10^{3}	1.26×10^{3}
		Pull	1.06×10^{2}	1.58×10^{2}	2.11×10^{2}	3.17×10^{2}	4.22×10^{2}	5.28×10^{2}	6.33×10^{2}	7.39×10^{2}	8.44×10^{2}	9.50×10^{2}	1.06×10^{3}
	ø50	Push	1.96×10^{2}	2.95×10^{2}	3.93×10^{2}	5.89×10^{2}	7.85×10^{2}	9.82×10^{2}	1.18×10^{3}	1.37×10^{3}	1.57×10^{3}	1.77×10^{3}	1.96×10^{3}
		Pull	1.65×10^{2}	2.47×10^{2}	3.30×10^{2}	4.95×10^{2}	6.60×10^{2}	8.25×10^{2}	9.90×10^{2}	1.15×10^{3}	1.32×10^{3}	1.48×10^{3}	1.65×10^{3}
	ø63	Push	3.12×10^{2}	4.68×10^{2}	6.23×10^{2}	9.35×10^{2}	1.25×10^{3}	1.56×10^{3}	1.87×10^{3}	2.18×10^{3}	2.49×10^{3}	2.81×10^{3}	3.12×10^{3}
		Pull	2.80×10^{2}	4.20×10^{2}	5.61×10^{2}	8.41×10^{2}	1.12×10^{3}	1.40×10^{3}	1.68×10^{3}	1.96×10^{3}	2.24×10^{3}	2.52×10^{3}	2.80×10^{3}
	ø80	Push	5.03×10^{2}	7.54×10^{2}	1.01×10^{3}	1.51×10^{3}	2.01×10^{3}	2.51×10^{3}	3.02×10^{3}	3.52×10^{3}	4.02×10^{3}	4.52×10^{3}	5.03×10^{3}
		Pull	4.54×10^{2}	6.80×10^{2}	9.07×10^{2}	1.36×10^{3}	1.81×10^{3}	2.27×10^{3}	2.72×10^{3}	3.17×10^{3}	3.63×10^{3}	4.08×10^{3}	4.54×10^{3}
	ø100	Push	7.85×10^{2}	1.18×10^{3}	1.57×10^{3}	2.36×10^{3}	3.14×10^{3}	3.93×10^{3}	4.71×10^{3}	5.50×10^{3}	6.28×10^{3}	7.07×10^{3}	7.85×10^{3}
		Pull	7.15×10^{2}	1.07×10^{3}	1.43×10^{3}	2.14×10^{3}	2.86×10^{3}	3.57×10^{3}	4.29×10^{3}	5.00×10^{3}	5.72×10^{3}	6.43×10^{3}	7.15×10^{3}
JSC4	ø125	Push	1.23×10^{3}	1.84×10^{3}	2.45×10^{3}	3.68×10^{3}	4.91×10^{3}	6.14×10^{3}	7.36×10^{3}	8.59×10^{3}	9.82×10^{3}	1.10×10^{4}	1.23×10^{4}
		Pull	1.13×10^{3}	1.70×10^{3}	2.26×10^{3}	3.39×10^{3}	4.52×10^{3}	5.65×10^{3}	6.79×10^{3}	7.92×10^{3}	9.05×10^{3}	1.02×10^{4}	1.13×10^{4}
	ø140	Push	1.54×10^{3}	2.31×10^{3}	3.08×10^{3}	4.62×10^{3}	6.16×10^{3}	7.70×10^{3}	9.24×10^{3}	1.08×10^{4}	1.23×10^{4}	1.39×10^{4}	1.54×10^{4}
		Pull	1.44×10^{3}	2.16×10^{3}	2.89×10^{3}	4.33×10^{3}	5.77×10^{3}	7.22×10^{3}	8.66×10^{3}	1.01×10^{4}	1.15×10^{4}	1.30×10^{4}	1.44×10^{4}
	ø160	Push	2.01×10^{3}	3.02×10^{3}	4.02×10^{3}	6.03×10^{3}	8.04×10^{3}	1.01×10^{4}	1.21×10^{4}	1.41×10^{4}	1.61×10^{4}	1.81×10^{4}	2.01×10^{4}
		Pull	1.88×10^{3}	2.83×10^{3}	3.77×10^{3}	5.65×10^{3}	7.54×10^{3}	9.42×10^{3}	1.13×10^{4}	1.32×10^{4}	1.51×10^{4}	1.70×10^{4}	1.88×10^{4}
	ø180	Push	2.54×10^{3}	3.82×10^{3}	5.09×10^{3}	7.03×10^{3}	1.02×10^{3}	1.27×10^{4}	1.53×10^{4}	1.78×10^{4}	2.04×10^{4}	2.29×10^{4}	2.54×10^{4}
		Pull	2.39×10^{3}	$3.58+10^{3}$	4.77×10^{3}	7.16×10^{3}	9.54×10^{3}	1.19×10^{4}	1.43×10^{4}	1.67×10^{4}	1.91×10^{4}	2.15×10^{4}	2.39×10^{4}

Mounting Bracket Model No. Notation (ø40 to ø100)

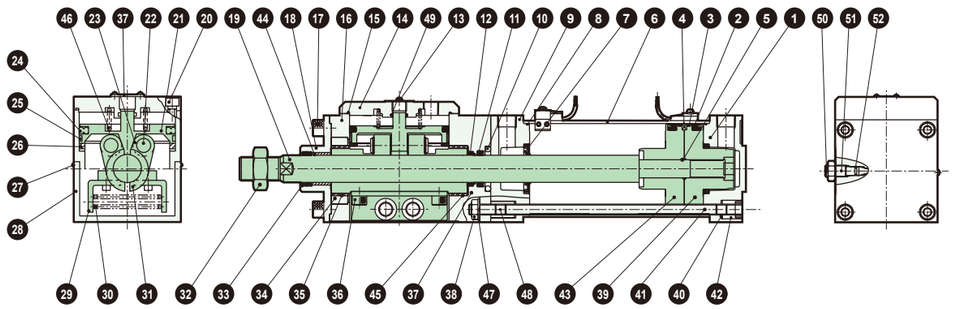
Bore Size (mm) / Mounting Bracket	ø40	ø50	ø63	ø80	ø100
Foot (LB) *1	JSC3-40-LB	JSC3-50-LB	JSC3-63-LB	JSC3-80-LB	JSC3-100-LB
Flange (FB)	JSC3-40-FB	JSC3-50-FB	JSC3-63-FB	JSC3-80-FB	JSC3-100-FB
Single clevis (CA)	S1-CA-40	S1-CA-50	S1-CA-63	S1-CA-80	S1-CA-100
Double Yoke Clevis (CB) *2	S1-CB-40	S1-CB-50	S1-CB-63	S1-CB-80	S1-CB-100

*1: Foot type mounting brackets are 2 pcs/set.
*2: Pins and Retaining Rings are included.
*3: Mounting bolts are included with each mounting bracket.

Dimensional Drawings

- The dimensions of ø40 to ø100 is the same as that of JSC3 (Double Acting/single). Refer to P. 432 to 442.
- Dimensions of ø125 to ø180 is the same as that of JSC4-N (Double Acting/no-lubrication). Refer to P. 444 to 451. However, switches are not included.

Internal Structure / Materials (Bore Size: ø40 to ø100)



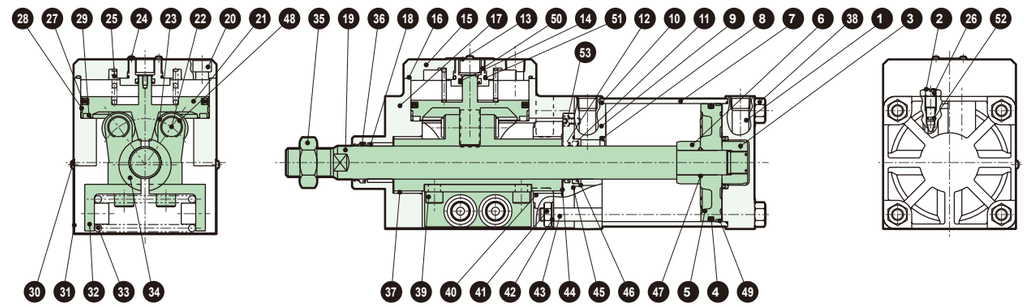
Do Not Disassemble

Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Head cover	Aluminum Alloy	Painted	27	Cross-Recessed Pan Head Screw	Steel	Zinc Chromate
2	Piston Packing	Fluoro Rubber		28	Cover	Steel	Painted
3	Wear ring	Polytetrafluoroethylene resin		29	Spring seat	Steel	Zinc Chromate
4	Piston Ring	Steel		30	Spring	Piano Wire	
5	Piston gasket	Fluoro Rubber		31	Brake metal	Cast Iron	Nickel Plating
6	Cylinder Tube	Aluminum Alloy	Hard Anodized	32	Rod nut	Steel	Zinc Chromate
7	Cushion packing	Fluororubber, Steel		33	Scraper	Fluoro Rubber	
8	Cylinder gasket	Fluoro Rubber		34	DU ring	Steel	Black Oxide
9	Rod Cover	Aluminum Alloy	Painted	35	Bush	Oil-Impregnated Bearing Alloy	
10	Metal seal	Fluoro Rubber		36	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide
11	Rod Packing	Fluoro Rubber		37	Dust cover	Aluminum Alloy	Painted
12	Scraper	Fluoro Rubber		38	Hexagon Nut	Steel	Black Oxide
13	Cap gasket A	Fluoro Rubber		39	Piston H	Aluminum Alloy	
14	Body cap	Cast Iron	Nitriding Treatment	40	Tie rod	Steel	Zinc Chromate
15	Cap gasket B	Fluoro Rubber		41	Belleville washer	Steel	Black Oxide
16	Brake body	Aluminum Alloy	Alumite	42	Round nut	Steel	Zinc Chromate
17	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide	43	Piston R	Aluminum Alloy	
18	Rod metal	Steel	Manganese Phosphate	44	Bush B	Oil impregnated Bearing Alloy	
19	Piston Rod	Steel	Industrial Chrome Plating	45	Thrust washer		
20	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide	46	Spring	Piano Wire	Painted
21	Brake piston	Cast Iron	Manganese Phosphate	47	Toothed washer	Steel	Black Oxide
22	Parallel pin	Steel		48	Hexagon Socket Set Screw	Steel	Black Oxide
23	Bearing			49	Cross-Recessed pan head machine screw with washer	Steel	Zinc Chromate
24	Piston Packing B	Fluoro Rubber		50	Cushion needle	Copper Alloy	Nickel Plating
25	Wear ring	Special resin		51	Needle nut	Copper Alloy	Nickel Plating
26	Cushion rubber	Fluorosilicone rubber		52	Needle gasket	Fluoro Rubber	

Note: Contains a strong spring and Never disassemble the brake.

For maintenance parts, please visit the CKD Equipment Product Site (https: //www.ckd.co.jp/kiki/en/) → "model No." → Maintenance Parts.

Internal Structure / Materials (Bore Size: ø125 to ø180)



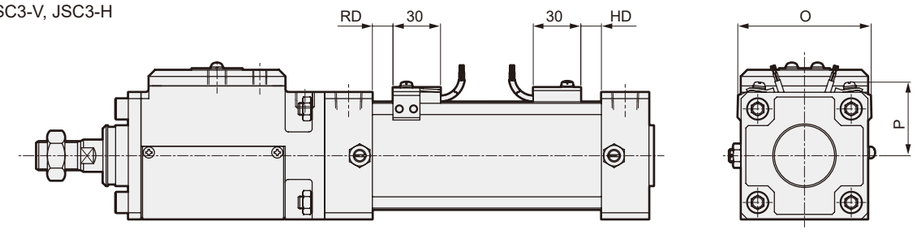
Do Not Disassemble

Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Head cover	Aluminum Alloy	Chromate	27	Piston Packing B	Fluoro Rubber	
2	Cushion needle	Copper Alloy		28	Wear ring	Polyacetal	
3	Cushion ring A	Steel	Zinc Chromate	29	Cushion rubber	Silicone Rubber	
4	Piston Packing	Fluoro Rubber		30	Cross-Recessed Pan Head Screw	Steel	Zinc Chromate
5	Piston	Aluminum Alloy		31	Cover	Steel	Painted
6	Cushion ring B	Steel	Zinc Chromate	32	Spring seat	Steel	Manganese Phosphate
7	Cylinder Tube	Aluminum Alloy	Hard Alumite	33	Spring	Piano Wire	Black Oxide
8	Cushion Packing	Fluororubber, Steel		34	Brake metal	Cast Iron	Nickel Plating
9	Rod Cover	Aluminum Alloy	Chromate	35	Rod nut	Steel	Zinc Chromate
10	Cylinder gasket	Fluoro Rubber		36	Scraper	Fluoro Rubber	
11	Rod Packing	Fluoro Rubber		37	Bush A	Bearing Alloy	
12	Scraper	Fluoro Rubber		38	Hexagon Nut	Steel	Zinc Chromate
13	Dust cover	Aluminum Alloy	Alumite	39	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide
14	Rod Packing	Fluoro Rubber		40	Ring	Steel	Black Oxide
15	Body cap	Aluminum Alloy	Black alumite	41	Hexagon Nut	Steel	Zinc Chromate
16	Cap gasket	Fluoro Rubber		42	Toothed washer	Steel	Zinc Chromate
17	Brake body	Aluminum Cast Iron	Alumite	43	Tie rod	Steel	Zinc Chromate
18	Bush B	Oil impregnated Bearing Alloy		44	Thrust washer	Steel	
19	Piston Rod	Steel	Industrial Chrome Plating	45	Metal gasket	Fluoro Rubber	
20	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide	46	Rod metal	Cast Iron	Zinc Chromate
21	Brake piston	Cast Iron	Manganese Phosphate	47	Piston gasket	Fluoro Rubber	
22	Bearing pin	Steel		48	E-type Retaining Ring	Steel	Zinc Chromate
23	Bearing	-		49	Wear ring	Fabric-Reinforced Phenolic Resin	
24	Cross-Recessed pan head machine screw with washer	Steel	Zinc Chromate	50	Body cap	Cast Iron	Manganese Phosphate
25	Spring	Piano Wire	Painted	51	O-ring	Fluoro Rubber	
26	Needle nut	Steel	Zinc Chromate	52	Needle gasket	Fluoro Rubber	
				53	Hexagon Socket Head Cap Screw	Steel	Black Oxide

For maintenance parts, please visit the CKD Equipment Product Site (https: //www.ckd.co.jp/kiki/en/) → "model No." → Maintenance Parts.

JSC3 Series Switch Equipped Outline Dimension Drawing

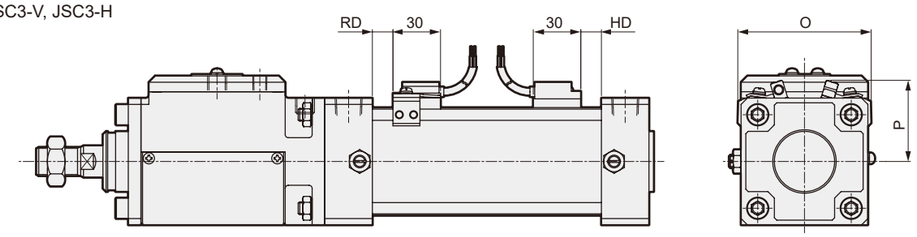
● T0H/V, T5H/V, T2H/V, T3H/V, T3PH/V, T2 [H/V] R3, T2WH/V, T3WH/V, T8H/V, T2JH/V
· JSC3, JSC3-V, JSC3-H



Code / Bore Size (mm)	JSC3, JSC3-V, JSC3-H									
	O	P	T0, T5, T2, T3, T3P, T2□R3		T2W, T3W		T8		T2J	
			RD	HD	RD	HD	RD	HD	RD	HD
ø40	66	41.5	11	11	13	13	5	5	10	10
ø50	73	43	13	13	15	15	7	7	12	12
ø63	85	47	13	13	15	15	7	7	12	12
ø80	105	57	14.5	14.5	16.5	16.5	8.5	8.5	13.5	13.5
ø100	121	63	18.5	18.5	20.5	20.5	12.5	12.5	17.5	17.5

Note: For switch mountability, refer to the Model No. display method for each variation.

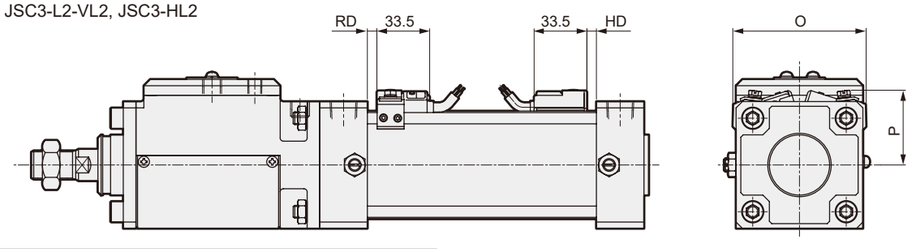
● T1H/V, T2YD, T2YDT
· JSC3, JSC3-V, JSC3-H



Code / Bore Size (mm)	JSC3, JSC3-V, JSC3-H			
	O	P	T1,T2YD,T2YDT	
			RD	HD
ø40	66	40	10	10
ø50	73	44.5	12	12
ø63	85	50	12	12
ø80	105	60	13.5	13.5
ø100	121	68	17.5	17.5

Note: For switch mountability, refer to the Model No. display method for each variation.

● H0, H0Y
· JSC3-L2, JSC3-L2-VL2, JSC3-HL2

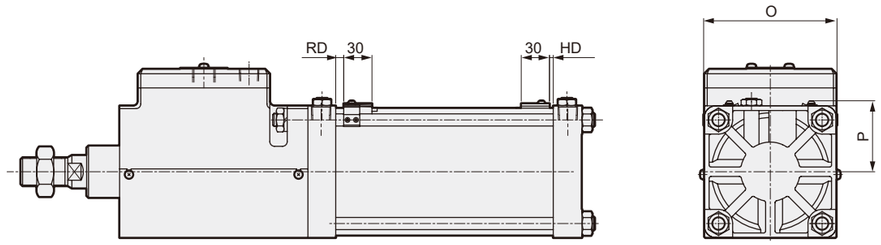


Code / Bore Size (mm)	JSC3-L2, JSC3-L2-VL2, JSC3-HL2			
	O	P	H0, H0Y	
			RD	HD
ø40	66	42	4	4
ø50	73	44	6	6
ø63	84	47	6	6
ø80	104	58	7.5	7.5
ø100	120	64	11.5	11.5

Note: For switch mountability, refer to the Model No. display method for each variation.

JSC4 Series Switch Equipped Outline Dimension Drawing

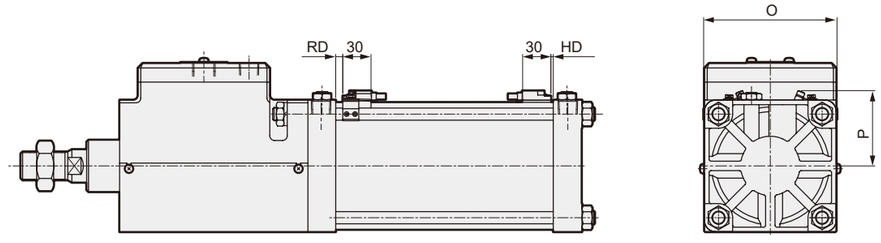
● T0H/V, T5H/V, T2H/V, T3H/V, T3PH/V, T2 [H/V] R3, T2WH/V, T3WH/V, T8H/V, T2JH/V
· JSC4-LN, JSC4-LH



Code / Bore Size (mm)	JSC4-LN, JSC4-LH									
	O	P	T0,T5,T2,T3,T3P		T2W, T3W		T2J		T8	
			RD	HD	RD	HD	RD	HD	RD	HD
ø125	142	76	8.5	4	10.5	5.5	7.5	2.5	2.5	0
ø140	156	82	8.5	7	10.5	8.5	7.5	5.5	2.5	0.5
ø160	175	90	10.5	8	12.5	10	9.5	7	4.5	1.5
ø180	196	98	13	9.5	14.5	11.5	11.5	8.5	6.5	3.5

Note: For switch mountability, refer to the Model No. display method for each variation.

● T1, T2YD, T2YDT
· JSC4-LN, JSC4-LH



Code / Bore Size (mm)	JSC4-LN, JSC4-LH			
	O	P	T2YD, T2YDT, T1	
			RD	HD
ø125	142	80	7.5	2.5
ø140	156	86	7.5	5.5
ø160	175	95	9.5	7
ø180	196	103	11.5	8.5

Note: For switch mountability, refer to the Model No. display method for each variation.

*Related Equipment Selection Guide

Overrun amount and stopping accuracy vary depending on the valve used. Please use the related equipment below.

Model Name	Related Equipment Name / Bore Size (mm)	SOL-1	SOL-2	Reverse Regulator	Speed Controller	Silencer	Piping
JSC3	ø40	4GB250R-08 4GB350R-08 PV5G-6-FIG-D-1-A02	4GA210R-06 4GB210R-06	R3100-8-W R2100-8-W	SC3W-8-8 SC3R-8 SC1-8	SLW-8A	ø8 × ø5.7 Nylon Tubing
	ø50	4GA350R-08 4GB350R-10 PV5G-6-FIG-D-1-A03	4GA210R-06 4GB210R-08	R3100-10-W R2100-10-W	SC3W-10-10 SC3R-10 SC1-10	SLW-10A	ø10 × ø7.2 Nylon Tubing
	ø63	4GB350R-08 4GB350R-10 PV5G-6-FIG-D-1-A03	4GA210R-06 4GB210R-08	R4100-10-W	SC3W-10 SC3R-10 SC1-10	SLW-10A	ø10 × ø7.2 Nylon Tubing
	ø80	4GB450-15 PV5G-8-FIG-D-1-A04	4GA210R-06 4GB210R-08	R4100-15-W	SC3W-15-12 SC3R-15 SC1-15	SLW-15A	ø12 × ø8.9 Nylon Tubing
	ø100	4GB450-15 PV5G-8-FIG-D-1-A04	4GB310R-10	R4100-15-W	SC3W-15-12 SC3R-15 SC1-15	SLW-15A	ø12 × ø8.9 Nylon Tubing
JSC4	ø125	4GB450-15 PV5G-8-FIG-D-1-A04	4GB310R-10 4F310R-10	R4100-15-W	SC3R-15 SC1-15	SLW-15A	ø12 Rubber Hose SGP3/8B SGP1/2B
	ø140	4F650-20	4GB310R-10 4F310R-10	R4100-15-W-A20W R6100-20-W	SC-20A	SL-20A	ø19 Rubber Hose SGP1/2B SGP3/4B
	ø160	4F650-20 4F750-20	4GB310R-10 4F310R-10	R4100-15-W-A20W R6100-20-W	SC-20A	SL-20A	ø19 Rubber Hose SGP1/2B SGP3/4B
	ø180	4F750-20	4GA410-10 4GB410-10 4F310-10	R4100-15-W-A20W R6100-20-W	SC-20A	SL-20A	ø19 Rubber Hose SGP1/2B SGP3/4B

Note: JSC3-V is assembled with a brake release valve (SOL2).

Applications

It can be used for devices and equipment requiring the following functions.

1 When multipoint positioning is required (Transfer/Positioning)

It can stop accurately at multiple target positions.

2 When fall prevention is required

When the air pressure source and power supply are turned OFF (during power outage or accident), the brake is applied instantly and can be held, preventing equipment damage and ensuring safety.

3 When emergency stop is required

If a worker, etc., enters a hazardous area, the cylinder stops instantaneously due to an electrical signal.

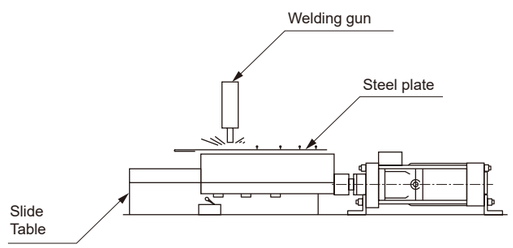
4 Work lock

When locking a workpiece to a jig, mounting base, etc., it can be locked even without a pneumatic source or power supply. Conveyance is possible while locked to the jig.

Usage Example

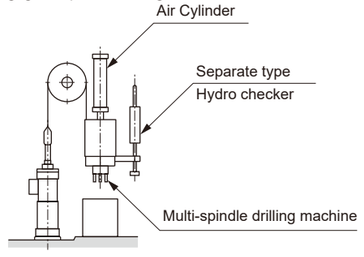
1 Linear multipoint welding

Movement and positioning of a slide table or welding gun when welding many steel plates, etc., in a straight line.



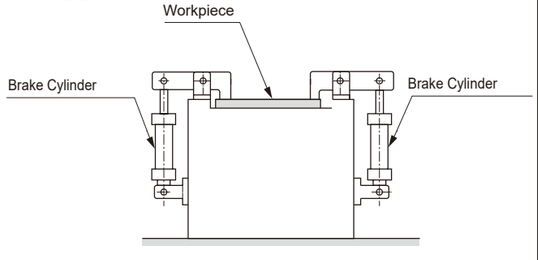
2 Fall prevention

If there is a load in the vertical direction and it is problematic for the load to fall under its own weight when the pressure source stops, the brake engages to prevent falling.



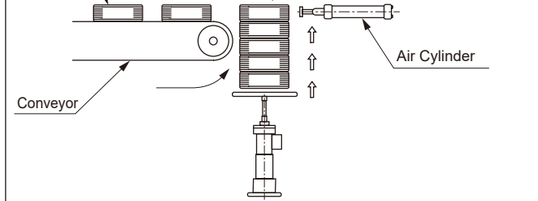
3 Work lock

When locking a workpiece to a jig, etc., if a Brake Cylinder is used, it remains locked even if the pneumatic source and power supply are OFF.



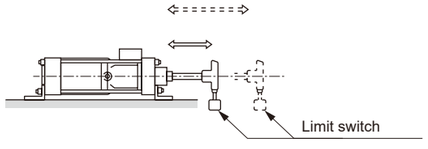
4 Move to conveyor

Move products one by one to the conveyor.



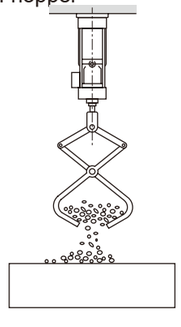
5 Cylinders with different strokes When it is necessary to have many

When items of different sizes flow on a conveyor etc., the cylinders set there often need to change their strokes. In that case, by using a Brake Cylinder, cylinders with various strokes can be made electrically.



6 Opening and closing of hopper

In processes like milling, when closing after reaching a predetermined weight, stop the hopper opening degree just before fully closed for accurate weighing, and then fully close it.



Mounting bracket rotation assembly (-XK□)

Content: Specifies the mounting position of the mounting bracket.

Model No. Notation

JSC3, JSC4 - 00 - 40 B - 100 - XK1

- Model No. — Please refer to the JSC3/JSC4 Model No. display method.
- ❶ Mounting bracket mounting position

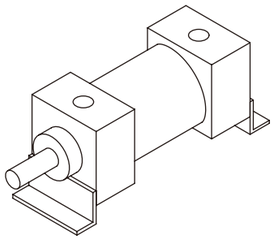
❶ Mounting bracket mounting position

	Code	Content
*1	XK1	Rotate mounting bracket 90° clockwise
	XK2	Rotate mounting bracket 180° clockwise
	XK3	Rotate mounting bracket 270° clockwise

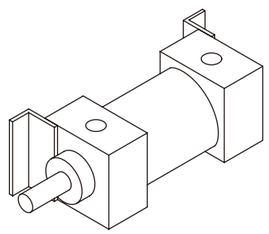
*1: For flanges and trunnions, only XK1 (90° rotation) is applicable.

Dimensional Drawings

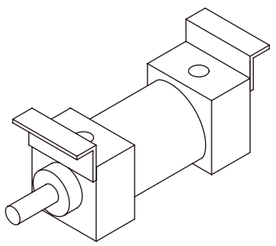
● Basic



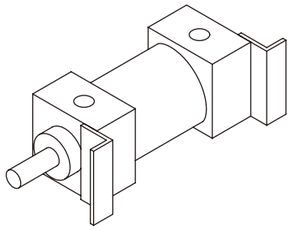
● K1



● K2



● K3



*Port and cushion needle positions do not change. Please be careful with piping routing and cushion needle usability. If piping/cushion needle and mounting surface are the same, relief for piping/cushion needle is required on the mounting surface. In the case of K2, relief for the brake unit (including piping) is required on the mounting surface.

Trunnion position specification (-XAQ□□)

Content: Specify the dimension from the rod cover end face to the center of the trunnion axis.

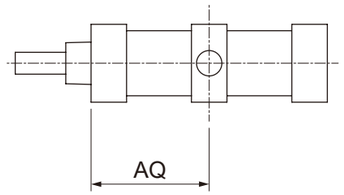
Model No. Notation

JSC3, JSC4 - TC - 40 B - 100 - XAQ 130

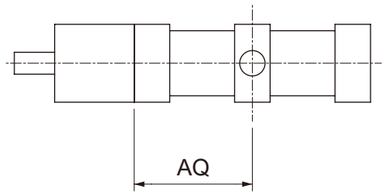
- Model No. — Please refer to the JSC3/JSC4 Model No. display method.
- Custom-made dimension — Refer to the external dimensions list.

*1: For two-stage type and back-to-back type, please consult us separately.

Dimensional Drawings



Basic type



With Brake

Knuckle Pin/Clevis Pin Split Pin (-XP5)

Content: Change the snap ring of rod eye pin and clevis pin to the split pin.

Model No. Notation

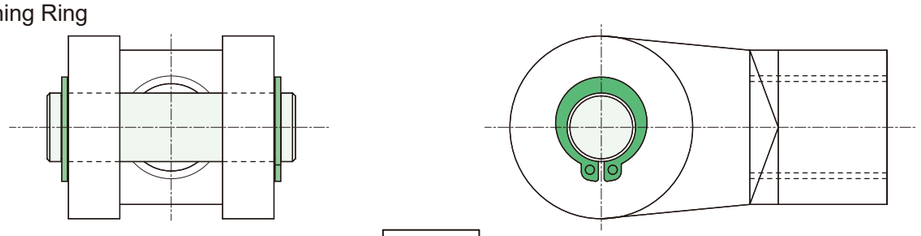
JSC3, JSC4 - 00 - 40 B - 100 - Y - XP5

Model No.

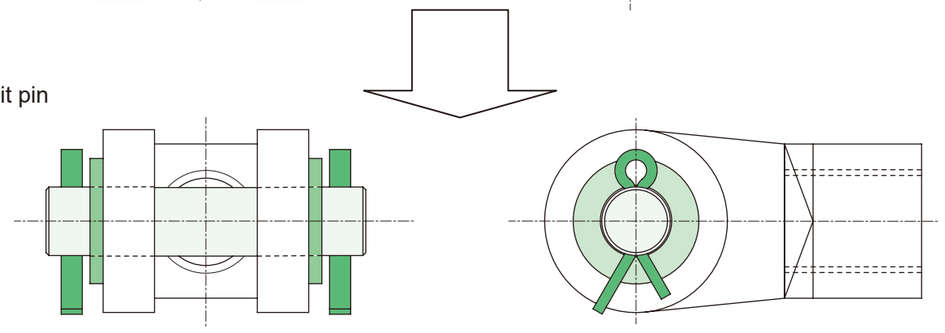
Please refer to the JSC3/JSC4 Model No. display method.

Dimensional Drawings

●Retaining Ring



●Split pin



Pin Diameter	Split Pin Size
12	ø4×20
14	ø4×20
20	ø4×25
25	ø4×30
28	ø5×35
32	ø5×40
40	ø5×50
50	ø5×60

Knuckle Fixed by Pinning (-XP7)

Content: Also, drive a spring pin into the knuckle to prevent loosening.

Model No. Notation

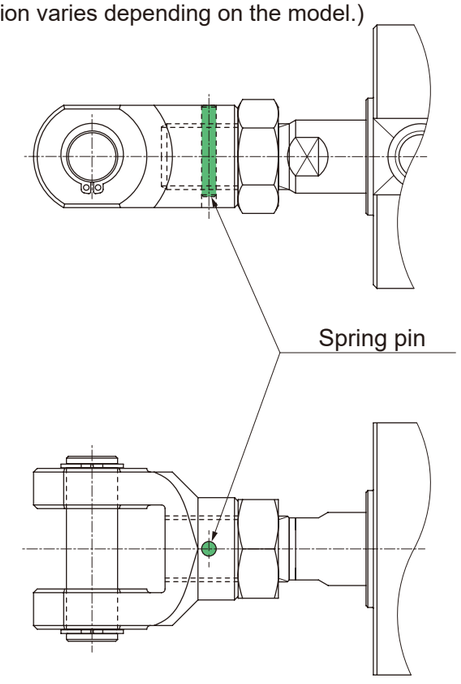
JSC3, JSC4 - TC - 40 B - 100 - Y - XP7

Model No.

Please refer to the JSC3/JSC4 Model No. display method.

Dimensional Drawings

Same as with Knuckle specification.
(Spring pin driving direction varies depending on the model.)



Knuckle Pin/Clevis Pin Split Pin Specification, Knuckle Fixed by Pinning (-XP8)

Content: Change the snap ring of rod eye pin and clevis pin to the split pin. Also, a spring pin on the knuckle Prevents loosening by hammering. (XP5+XP7)

Model No. Notation

JSC3, JSC4 - 00 - 40 B - 100 - Y - XP8

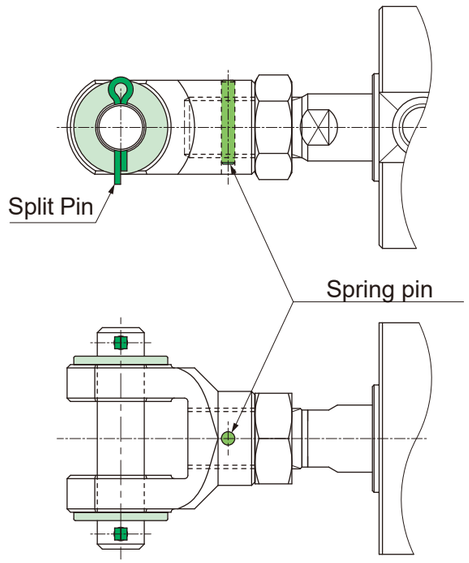
Model No.

Please refer to the JSC3/JSC4 Model No. display method.

Dimensional Drawings

Mounting dimensions are the same as with Knuckle specification.

A combination of XP5(P. 500) and XP7 (P. 501).



Without Bellows (-XJ9)

Content: Piston Rod with dimensions for bellows, but bellows not assembled

Model No. Notation

JSC3, JSC4 - 00 - 40 B - 100 - XJ9

Model No.

Please refer to the JSC3/JSC4 Model No. display method.

Dimensional Drawings

It has the same dimensions as with bellows, but without bellows attached.

With 2 Rod Nuts (-A2)

Content: Shipped with 2 rod nuts, same as standard.

Model No. Notation

JSC3, JSC4 - 00 - 40 B - 100 - A2

JSC3, JSC4 - 50 - 50 - NA2

Model No.

Please refer to the JSC3/JSC4 Model No. display method.

Dimensional Drawings

Same as standard type except that 2 rod nuts are included.

Pneumatic Equipment

To Use This Product Safely

Be sure to read this before use. For general cylinder information, see Intro 41, and for cylinder switches, see P. 1512.

Individual Precautions: Brake cylinder JSK2, JSM2 Series

Design / Selection

1. Common

⚠ WARNING

■ Structure so that the human body does not directly touch the driven object and the moving parts of the cylinder with brake.
Install a protective cover so that the human body cannot touch it directly. Or, if there is a risk of touching, provide a sensor etc. to make a safe structure such as emergency stop before touching or sounding a warning sound to notify danger.

■ Use a balanced circuit that accommodates the protrusion of the Piston Rod.
If the brake is operated at any position during the stroke such as intermediate stop, and air pressure is applied to only one side of the cylinder, the Piston Rod will pop out at high speed when the brake is released. In such cases, there is a risk of personal injury, such as getting hands or feet caught, and damage to machinery. Therefore, use a balance circuit like the basic circuit to prevent projection.
When using a low hydraulic pressure type Brake Cylinder, always operate the brake unit by pneumatic pressure.

■ The holding force (Max static load) is the ability to hold static load that is not accompanied by vibration or shock, in a state where the brake is operating under no load.
Therefore, please be careful when using near the upper limit of the holding force at all times.

■ Do not apply impact load, strong vibration, or rotational force when the brake is operating.
If impact load, strong vibration, or rotational force is applied from the outside, the holding force will decrease and it is dangerous, so please be careful.

■ When performing intermediate stop, consider the stopping accuracy and overrun amount.
Because it is a mechanical lock, it does not stop instantly in response to the stop signal, but stops with a time delay. The stroke sliding due to this delay is the overrun amount. And the range between the maximum and minimum overrun amount is the stopping accuracy.
- Place the limit switch in front of the desired stop position by the overrun amount.
- The limit switch requires a detection length (dog length) of the overrun amount + α.
- The operating range of CKD cylinder switches is 7 to 16 mm, depending on the switch model. . If the overrun amount exceeds this, perform self-holding of the contact on the switch load side.

■ In order to improve stopping accuracy, ensure that the brake stops the cylinder as soon as possible after receiving the stop signal.
To do so, use a DC type control electric circuit and valve with good response, and place the valve and cylinder as close as possible.

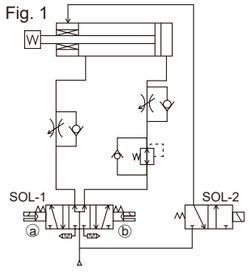
■ Please note that stopping accuracy is affected by changes in piston speed.
If the piston speed changes due to load fluctuations or disturbances during cylinder operation, the variation in the stop position will increase. Therefore, ensure that the piston speed is constant just before the stop position. Also, during operation in the cushion region and while in the acceleration zone from the start of operation, the speed change is large, so the variation in the stop position will be large.

The stopping accuracy at a piston speed of 300 mm/s under no load is ±1.0 mm (reference value). It varies depending on the equipment used. For details, refer to the page on stopping accuracy and overrun.

■ Basic circuit
Even when used for fall prevention or emergency stop, be sure to use the following circuit. 2-position valves cannot be used because the cylinder's own thrust acts on the brake part even when stopped. Balance the thrust and load with the following circuit. The brake may not release if a load is applied to the brake.

● For Horizontal Load
Piping as shown in Fig. 1 applies equal pressure to both sides of the piston when stopped, preventing rod projection when the brake is released. Also, install a pressure reducing valve with a check valve on the head side to balance the thrust.

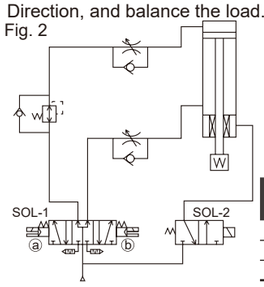
Fig. 1



ⓐ SOL-1ⓑ		SOL-2	Operating State
OFF	OFF	OFF	Stop
ON	OFF	ON	Retract
OFF	ON	ON	Advance

● For downward vertical load
As shown in Fig. 2, if the load is downward, the rod will malfunction in the Load Direction when the brake is released. Therefore, install a pressure reducing valve with a check valve on the head side, reduce the thrust in the Load Direction, and balance the load.

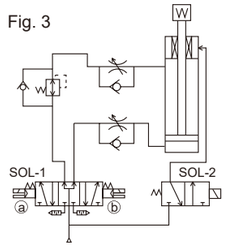
Fig. 2



ⓐ SOL-1ⓑ		SOL-2	Operating State
OFF	OFF	OFF	Stop
ON	OFF	ON	Descend
OFF	ON	ON	Ascend

● For upward vertical load
If the load is upward as shown in Fig. 3, the rod will malfunction in the Load Direction when the brake is released, so install a pressure reducing valve with check valve on the rod side to reduce the thrust in the Load Direction and balance the load.

Fig. 3



ⓐ SOL-1ⓑ		SOL-2	Operating State
OFF	OFF	OFF	Stop
ON	OFF	ON	Descend
OFF	ON	ON	Ascend

■ Do not use multiple cylinders with brakes in synchronization. If a synchronization error occurs, load may concentrate on the cylinder where the brake engaged first, potentially causing reduced lifespan or damage.

■ Do not apply torque to the rod when braking, as the holding force will decrease, creating hazardous conditions. Also, use with a mechanism that prevents rod rotation.

■ Do not apply force exceeding the brake holding force listed in the catalog to the cylinder.

■ If the piston speed is fast, the detection dog must be long enough to match relay response time. Please note that if the dog length is short, a stop signal will not be output, and it will not stop.

⚠ CAUTION

■ Stopping accuracy

● Stop Pitch and Load Factor
Stopping accuracy varies depending on stop pitch and load factor. To obtain stopping accuracy, the load factors in the table below are recommended.
*Stop position reference value: ±1.0 (300 mm/s at no load)

Stop Pitch	Load Factor	
	JSC3-□	JSC3-S□
50 mm or less	20% of Thrust	15% of thrust
50 mm to 100 mm	40% of Thrust	30% of thrust
100 mm or more	60% of Thrust	45% of thrust

● Selection of Brake Valve
Stopping accuracy and overrun amount vary depending on the response of the brake valve. Select from our company's Selex Valve 4GB2 Series by referring to the JSC3-V brake valve electrical specifications. Also, connect the valve directly to the brake port to improve stopping accuracy.

● When using a PLC (programmable controller)
If a PLC (Programmable Logic Controller) is used for the electrical control device of the brake valve, the stopping accuracy will deteriorate due to the scan time (calculation processing time). When using a PLC, do not incorporate only the brake valve into the PLC circuit.

■ Do not change the load weight significantly when the brake is stopped. The stop position may change.

■ During the cushion stroke and while in the acceleration range from the start of operation, the speed change is large, so the dispersion of the stop position becomes large. For this reason, when performing step operation with a short stroke from the start of operation to the next position, the stop position will be large, so please be careful.

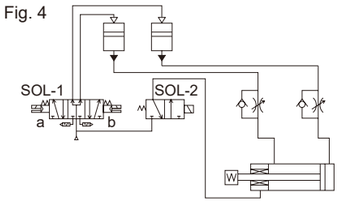
■ Load to Piston Rod
More strictly than in the case of general pneumatic cylinders, use with the load on the Piston Rod always applied axially. Furthermore, when moving the load, regulate it sufficiently with a guide so that there is no backlash or twisting.

2. Low hydraulic JSC3-H, JSC4-H

⚠ Warning

■ If the load fluctuates during the stroke, use the JSC3-H and a converter.

Fig. 4



■ When releasing the brake, make sure to release the brake earlier than the cylinder operation. If the cylinder operation is faster, the brake may not release.

■ If back pressure is applied during locking, the lock may be released, so use a single valve or an individual exhaust type manifold for the brake release valve.

■ Use a 3-position P/A/B connection (pressurization on both sides) valve for the cylinder drive to prevent the piston from popping out when starting.

■ To maintain balance of the thrust, including the load, the side with the larger thrust should have a Regulators with a check valve.

⚠ CAUTION

■ This product is a pneumatic cylinder that can use hydraulic operating fluid as the operating fluid. Does not comply with JIS standards for hydraulic cylinders regarding operation and leakage inspection.

3. Low pressure release JSC3-S

⚠ CAUTION

■ Due to release pressure reduction, care must be taken because brake holding force is also reduced.

During Use

1. Common

⚠ Warning

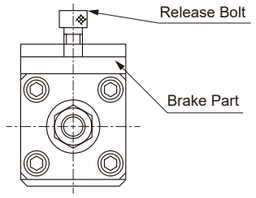
■ Release brakes before coupling the load to the end of the rod. If done with the brake activated, rotational force or load exceeding the holding force will act on the Piston Rod, causing damage to the brake mechanism.

■ If the brake is released while air is applied to only one side of the cylinder, the Piston Rod can pop out at high speed, creating a dangerous situation. When releasing the brake during adjustment work, etc., always observe the following:

- Check that no one is in the movable range of the load and that no problems will arise if the load moves when brakes are released.
- When releasing the brake, perform position locking or take other measures:
  · Placing the load at the lower end
  · Pressurizing both sides
  · Placing a support

  etc.
- Confirm that air is not pressurized on only one side of the cylinder when releasing brakes.

■ How to manually release the brake



Note: Brake release method

- The brakes are released by completely screwing the release bolt (attached with product) into the female threads (brake release port) on the top of the brakes. (For ø125 or more, screwing it in 2 to 3 rotations releases the brake.) (Always remove the release bolt during normal use.)
- When releasing the brake manually, be sure to use the release bolt attached to the product. Using other bolts may cause brake damage due to overtightening, so when using general bolts, follow the appropriate tightening amount in the table below.

Bore Size	Size		Appropriate Tightening Amount
	JSC3	JSC3-V	
ø40 / ø50	M10x8	M10x29	4 rotations or less
ø63	M12x9	M12x30	
ø80	M14x10	M14x31	
ø100	M16x12	M16x40	
ø125	M24x16 or more		2 to 3 rotations
ø140	M24x20 or more		
ø160	M24x20 or more		
ø180	M24x24 or more		

■ Brakes are released manually or by pressurizing the brake release port. During load installation, if the brake is left released by this operation, the load may fall. Therefore, always return the manual release operation to its initial state, or confirm that the brake is effective with no air in the brake release port before installation.

■ Do not apply torque to the rod when braking, as the holding force will decrease, creating hazardous conditions. Also, use with a mechanism that prevents rod rotation.

■ Do not apply force exceeding the brake holding force listed in the catalog to the cylinder.

■ If there is any play, such as looseness, in the brake signal dog, stopping accuracy is affected. Securely fix to eliminate play, etc.

⚠ CAUTION

■ Adjust the air balance in the cylinder.
With the brake released, attach the load to the cylinder and balance the load by adjusting the air pressure on the rod side and head side of the cylinder. By ensuring this load balance, problems such as the Piston Rod popping out when the brake is released or the brake not releasing normally can be prevented.

■ Adjust the mounting position of the detection part such as the cylinder switch.
When performing intermediate stop, adjust the mounting position of the detection part such as the cylinder switch considering the overrun amount with respect to the desired stop position.

■ Load fluctuation during the reciprocating stroke of the cylinder causes changes in piston speed, and changes in piston speed increase the dispersion of the stop position. Adjust the mounting so that there is no load fluctuation during the cylinder reciprocating stroke, especially immediately before stopping.

■ Maintaining the rod sliding parts
Be careful not to scratch or dent the Piston Rod sliding part. It causes damage to packings, leading to leakage or brake failure.

1. Common

⚠ Warning

■ The brake section can be removed from the Cylinder Body. Do not disassemble or inspect brakes or hazards may result when brakes are used again.

■ The required amount of grease is applied to the brake part, so avoid applying more grease and do not wipe off the grease.

■ The required grease is applied when brakes are replaced, so there is no need to apply grease to rods.

■ Please always use with the dust cover attached except during manual release, as it may cause a malfunction.

⚠ CAUTION

■ Air supply pipes that are too narrow or too long can reduce stopping accuracy.

■ If the cylinder has been stopped for a long time, such as first thing in the morning or afternoon, the frictional resistance increases and the piston speed changes, so the stopping accuracy may deteriorate. Perform a break-in operation to obtain stable stopping accuracy.

■ If the manual release bolt is removed while the Piston Rod is pulled out, the bolt cannot be screwed in. If removed, supply air from the brake release port and screw in the manual release bolt.

■ Inspection of Type 2 pressure vessels
Based on the Ordinance of the Ministry of Health, Labour and Welfare, cylinders falling under the following categories must undergo inspection by the Japan Boiler Association.

① Cylinders with a rated pressure exceeding 0.2 MPa and cylinder capacity exceeding 0.04 m^3

② Cylinders with a rated pressure exceeding 0.2 MPa, an inner diameter of the cylinder tube of 200 mm or more, and a body length (cylinder tube length) of 1000 mm or more

$$V=\frac{D^2\times S\times 3.14}{4\times 10^9}$$

V: Cylinder capacity (m^3)
D: Bore Size (mm)
S: Body length (cylinder tube length) (mm)

Stroke subject to Type 2 pressure vessel inspection

Bore Size	Stroke
ø160	1948 or more
ø180	1526 or more

■ With cushion section check valve (C2)
If the load is large, the delay in cylinder starting time will increase. If you want to reduce the starting time, please use the model with a check valve in the cushion part (C2).

For precautions during mounting, installation, adjustment, use, and maintenance, refer to "During Use" in this catalog and the CKD Components Product website (https://www.ckd.co.jp/kiki/en/) -> "Model No." -> Instruction Manual.

With Brake with Lock

USSD

Super Compact Cylinder with Fall Prevention

ø20, ø25, ø32, ø40
ø50, ø63, ø80, ø100

CONTENTS

Product Introduction	510
Series System Chart	512
● Double Acting, single rod (USSD)	514
● Double Acting, single rod, high load (USSD-K)	514
Accessories External Dimensions Diagram	536
External Dimensions Diagram with Switch	552
Custom Items	556
⚠ Precautions for Use	558

With Brake / With Lock
ULK□
JSK2/
JSM2
JSG
JSC3,
JSC4
USSD
UFCD
USC
Cylinder
Switch
Ending

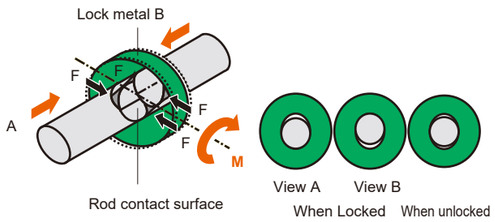
USSD Series

Space-saving, short-stroke type super compact cylinder equipped with fall prevention mechanism

Ensures safety of workpieces, etc., even during power outages or accidents

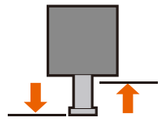
High wear resistance circular slit system

Adoption of fall prevention mechanism with excellent lifespan. By applying rotational force M to the lock metal, axial force F is generated, holding the rod.



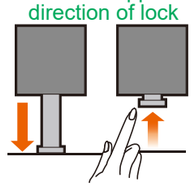
Lock Direction

2 types of lock direction



Selectable from either forward or reverse direction locking.

Free in the opposite direction of lock



In the reverse locking direction, the rod is free, allowing workpieces to be easily removed even if they are trapped.

Fall prevention is possible throughout the entire stroke

Stop position can be locked at any position during the entire stroke, including the stroke end, as long as the Piston Rod is stationary.

Safety

Ensures safety of workpieces etc. even during power outages or accidents.

Energy Saving

No power such as electricity or air is required while braking/locking.

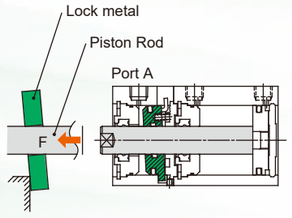
Easy Lock Release

Easy lock release with a flat-head screwdriver.

Lock in operation

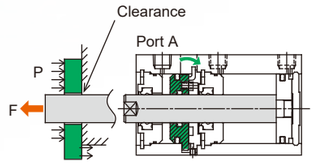
Lock release

Operation Explanation



Lock operation

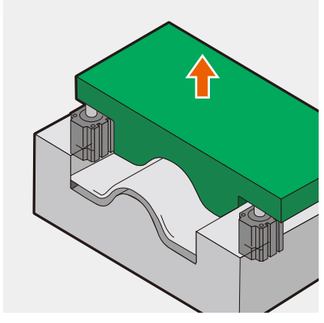
When Port A is exhausted, the spring force causes the lock metal to tilt and hold the piston rod.



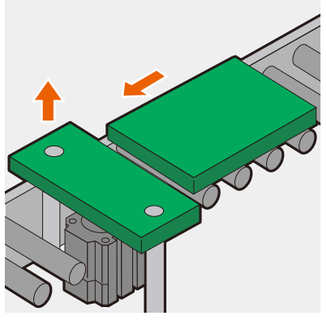
Lock release

When air is supplied to Port A, the lock metal stands upright, creating a clearance between it and the piston rod, allowing the rod to move freely.

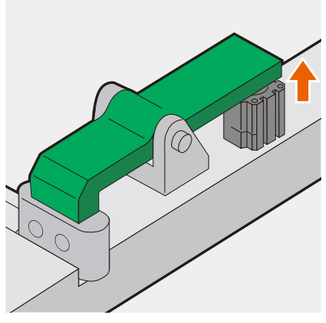
Application Example



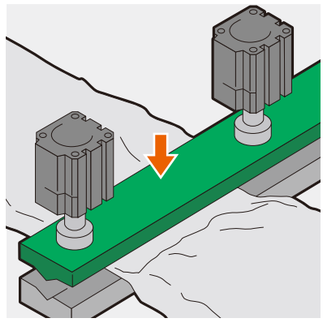
Safety mechanism during die lifting



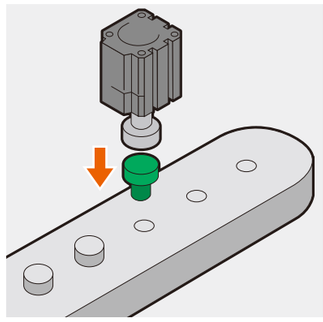
Prevention of stopper falling



Prevention of clamp fixture falling



Prevention of press fixture falling



Prevention of press-fit fixture falling

USSD Series Product System

Model Variation		Bore Size (mm)	Standard Stroke (mm)	Max. Stroke (mm)
Double Acting Type With Switch	USSD USSD-L	ø20	5 10 15 20 25 30 40 50 60 70 80 90 100	30
		ø25·ø32·ø40·ø50		50
		ø63·ø80·ø100		50
Double Acting, High Load Type With Switch	USSD-K USSD-KL	ø20		200
		ø25·ø32·ø40·ø50		300
		ø63·ø80·ø100		300

Variation Table

Super Compact Cylinder with Fall Prevention
USSD Series

●: Standard, ◎: Option, : Not available

Variation	Model No.	Bore Size (mm)	Standard Stroke (mm)						Stroke (mm)							Min Stroke (mm)	Max Stroke (mm)	Intermediate stroke (mm) increments	Option	Mounting Bracket		Switch	Page
																			Rod End male thread	Foot	Double Clevis		
			5	10	15	20	25	30		40	50	60	70	80	90	100				N	LB	CB		
Double Acting type with switch	USSD USSD-L	ø20	●	●	●	●	●	●									1	30	1	◎	◎	◎	◎	514
		ø25, ø32, ø40, ø50	●	●	●	●	●	●		●	●							50		◎	◎	◎		
		ø63, ø80, ø100	●	●		●		●		●	●							50		◎	◎	◎		
Double Acting, High Load Type with Switch	USSD-K USSD-KL	ø20	●	●	●	●	●	●		●	●						1	200	1	◎	◎	◎	◎	514
		ø25, ø32, ø40, ø50		●	●	●	●	●		●	●	●	●	●	●	●		300		◎	◎	◎		
		ø63, ø80, ø100		●		●		●		●	●	●	●	●	●	●		300		◎	◎	◎		

With Brake / With Lock
ULK□
JSK2/ JSM2
JSG
JSC3, JSC4
USSD
UFCD
USC
Cylinder Switch
Ending

Super Compact Cylinder with Fall Prevention

USSD, USSD-K Series

● Bore Size ø20, ø25, ø32, ø40, ø50, ø63, ø80, ø100

RoHS

Model No. Notation

Without switch
(Without magnet for switch)

USSD-K - 20 - 5 - F ——— N - LB
1 2 3 4 7 8

With switch
(Built-in magnet for switch)

USSD-KL - 20 - 5 - F - T0H - R - N - LB

1 Model No. 2 Bore Size 3 Stroke 4 Lock Direction 5 Switch Model No. 6 Number of Switches 7 Option 8 Mounting bracket

1 Model No.

Code	Content
USSD	Double Acting type
USSD-L	Double Acting type, With switch
USSD-K	Double Acting, High Load Type
USSD-KL	Double Acting, High Load Type, With Switch

2 Bore Size (mm)

Code	Content
20	ø20
25	ø25
32	ø32
40	ø40
50	ø50
63	ø63
80	ø80
100	ø100

3 Stroke

● USSD

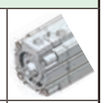
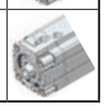
Bore Size	Stroke	Intermediate Stroke
ø20	**1 to 30**	in 1 mm increments
ø25 to ø50	**1 to 50**	
ø63 to ø100	**1 to 50**	

● USSD-K

Bore Size	Stroke	Intermediate Stroke
ø20	**1 to 200**	in 1 mm increments
ø25 to ø100	**1 to 300**	

Note: Refer to P. 516 for details on strokes .

4 Lock Direction

Code	Content	
F	Forward Direction Lock	
B	Reverse Direction Lock	

5 Switch Model No.

For switch details, refer to P. 1457. Switches are shipped with the product.

Contact	Indicator LED Special Function	Wiring (Output)	Load Voltage (V) AC	Load Voltage (V) DC	Load Current (mA) AC	Load Current (mA) DC	Lead wire *1 Straight	Lead wire *1 L-shape	
Solid State	1-Color	2-wire	85 to 265	—	5 to 100	-	**T1H□**	**T1V□**	
			-	10 to 30	—	5 to 20 *2	**T2H□**	**T2V□**	
		3-wire (NPN)	—	30 or less	—	100 or less	**T3H□**	**T3V□**	
		3-wire (PNP)	—		-		**T3PH□**	**T3PV□**	
	2-color	2-wire	—	24 ± 10%	—	5 to 20	**T2WH□**	**T2WV□**	
		3-wire (NPN)	—	30 or less	—	50 or less	**T3WH□**	**T3WV□**	
	1-color Off-Delay Type	2-wire	—	10 to 30	—	5 to 20 *2	**T2JH□**	**T2JV□**	
	1-color Flexible Lead Wire Type		—	10 to 30	—		**T2HR3**	**T2VR3**	
Contact	1-Color	2-wire	110	12/24	7 to 20	5 to 50	**T0H□**	**T0V□**	
	Without Indicator Lamp		110	5/12/24	20 or less	50 or less	**T5H□**	**T5V□**	
	1-color		110/220	12/24	7 to 20 / 7 to 10	5 to 50	**T8H□**	**T8V□**	

*1: Insert the code selected in the "Lead wire length" table into "□" of the switch Model No..
*2: The maximum load current value above, 20 mA, is at 25°C. If the switch operating Ambient Temperature is higher than 25°C, it will be lower than 20 mA. (At 60°C, it will be 5 to 10 mA.)
3:USSD-□L ❷ Bore Size ø20 to ø32 cannot be equipped with a T8 switch.
*4: Switches other than the Model No.s listed above are also available. (Custom Product) For details, refer to P. 1457.

***Lead wire length**

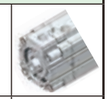
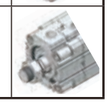
Code	Content
Blank	1 m (Standard)
3	3 m (Option)
5	5m (Option)

Example) Lead wire length
1 m T0H
3 m T0H3
5 m T0H5

6 Number of Switches

Code	Content
R	With 1 pc on rod side
H	With 1 pc on head side
D	With 2 pcs

7 Option

Code	Content	
Blank	Rod End female thread	
N	Rod End male thread	

8 Mounting bracket

Mounting bracket is included for shipment.

Code	Content	
LB	Axial foot	
CB	Double Clevis (Pin and Retaining Ring attached)	

About specifications of custom products

For details, please refer to P. 556.

Code	Content
-A2	With 2 rod nuts

Model No. Ex.)
USSD-..... **-A2**
USSD-K -..... **-A2**

Rechargeable Battery Compatible Specification

(Catalog No. CC-1226AA)

●Design compatible with rechargeable battery manufacturing process

USSD- ····· **-P4***

USSD-K- ····· **-P4***

*Please contact us for details.

Switch Single Unit Model No. Notation

SW - T0H
5 Switch Model

Common Specifications

Item		USSD/USSD-K							
Bore Size	mm	ø20	ø25	ø32	ø40	ø50	ø63	ø80	ø100
Operation type		Double Acting Type							
Operating Fluid		Compressed Air							
Max Operating Pressure	MPa	1.0							
Min Operating Pressure	MPa	0.25 (no load) *1							
Proof Pressure	MPa	1.5							
Ambient Temperature	°C	-10 to 60 (however, no freezing)							
Port Size		M5		Rc1/8		Rc1/4		Rc3/8	
Stroke Tolerance	mm	USSD: $^{+1.0}_{0}$ USSD-K: $^{+2.0}_{0}$							
Operating Piston Speed	mm/s	50 to 500					50 to 300		
Cushion		USSD: None					USSD-K: Rubber Cushion		
Lubrication		Not required (When lubricating, use turbine oil Class 1 ISO VG32)							
Locking Force	N	150	235	386	603	943	1497	2413	3770
Allowable absorbed Energy	USSD	0.016	0.021	0.025	0.092	0.1	0.12	0.27	0.56
	J USSD-K	0.157	0.157	0.402	0.628	0.98	1.56	2.51	7.92

*1: Depending on the non-operating conditions, the Piston Rod may start to move from 0.05 MPa, so please be careful about residual pressure and exhaust pressure.

Stroke

Series	Stroke (mm)		Bore Size (mm) ø20	ø25	ø32	ø40	ø50	ø63	ø80	ø100
USSD	Standard Stroke	5	●	●	●	●	●	●	●	●
		10	●	●	●	●	●	●	●	●
		15	●	●	●	●	●			
		20	●	●	●	●	●	●	●	●
		25	●	●	●	●	●			
		30	●	●	●	●	●	●	●	●
		40		●	●	●	●	●	●	●
		50		●	●	●	●	●	●	●
	Min Stroke	*3	1							
	Max Stroke		ø20: 30 ø25 to ø100: 50							
	Intermediate Stroke	*2	1							
USSD-K	Standard Stroke	5	●							
		10	●	●	●	●	●	●	●	●
		15	●	●	●	●	●			
		20	●	●	●	●	●	●	●	●
		25	●	●	●	●	●			
		30	●	●	●	●	●	●	●	●
		40	●	●	●	●	●	●	●	●
		50	●	●	●	●	●	●	●	●
		60		●	●	●	●	●	●	●
		70		●	●	●	●	●	●	●
		80		●	●	●	●	●	●	●
		90		●	●	●	●	●	●	●
		100		●	●	●	●	●	●	●
	Min Stroke	*3	1							
	Max Stroke	*1	ø20: 200 ø25 to ø100: 300							
	Intermediate Stroke	*2	1							

*1: Strokes exceeding the Standard Stroke up to the Max Stroke can be manufactured in increments of 10. (Example) USSD-K-20: 60, 70, 80, 90, 100 .....
*2: Intermediate strokes can be manufactured in 1 mm increments. However, the overall length dimension will be the same as the dimension of the Standard Stroke above it. Intermediate strokes (e.g., 64 stroke) will have the same external dimensions as the stroke above them (e.g., 70 stroke).
*3: The minimum stroke can be manufactured from 1 mm, but please consider the stroke tolerance.
*4: Products less than 10 mm with 2-color indicator, off-delay type, strong magnetic field, or T1□, T8□ switch cannot be manufactured.
*5: USSD-K ø20: Over 100 to 200, ø25 to ø50: Over 150 to 300, ø63 to ø100: Over 200 to 300, some internal structures and total length dimensions differ.

USSD Cylinder Weight Table (Weight with switch is for when 2 cylinder switches are included)

Unit: g

Stroke mm	5		10		15		20		25		30		40		50	
Bore Size (mm)	Without switch	With switch	Without switch	With switch	Without switch	With switch	Without switch	With switch	Without switch	With switch	Without switch	With switch	Without switch	With switch	Without switch	With switch
ø20	173	228	185	260	198	273	211	286	223	298	236	311	-	-	-	-
ø25	247	338	262	353	278	369	294	385	310	401	325	416	357	448	388	479
ø32	342	456	364	478	386	500	408	522	429	543	451	565	495	609	538	652
ø40	493	636	520	663	546	689	573	716	600	743	626	769	679	822	732	875
ø50	859	1053	901	1095	943	1137	985	1179	1027	1221	1070	1264	1154	1348	1238	1432
ø63	1342	1621	1397	1676	-	-	1507	1786	-	-	1617	1896	1728	2007	1838	2117
ø80	2591	3004	2678	3091	-	-	2851	3264	-	-	3024	3437	3198	3611	3371	3784
ø100	4219	4786	4333	4900	-	-	4560	5127	-	-	4788	5355	5015	5582	5243	5810

USSD-K Cylinder Weight Table (Weight with switch is for 2 cylinder switches)

Unit: g

Stroke mm	5		10		15		20		25		30		40		50		60		70		80	
Bore Size (mm)	Without switch	With switch	Without switch	With switch	Without switch	With switch	Without switch	With switch	Without switch	With switch	Without switch	With switch	Without switch	With switch	Without switch	With switch	Without switch	With switch	Without switch	With switch	Without switch	With switch
ø20	185	260	198	273	211	286	223	298	236	311	248	323	273	348	298	373	323	398	348	423	373	448
ø25	-	-	278	369	294	385	310	401	325	416	342	433	374	465	406	497	438	529	470	561	502	593
ø32	-	-	408	522	429	543	451	565	473	587	495	609	538	652	581	695	624	738	667	781	710	824
ø40	-	-	573	716	600	743	626	769	652	795	679	822	732	875	785	928	838	981	891	1034	944	1087
ø50	-	-	985	1179	1027	1221	1070	1264	1113	1307	1154	1348	1238	1432	1322	1516	1406	1600	1490	1684	1574	1768
ø63	-	-	1507	1786	-	-	1617	1896	-	-	1728	2007	1838	2117	1948	2227	2058	2337	2168	2447	2278	2557
ø80	-	-	2851	3264	-	-	3024	3437	-	-	3198	3611	3371	3784	3544	3957	3717	4130	3890	4303	4063	4476
ø100	-	-	4560	5127	-	-	4788	5355	-	-	5015	5582	5243	5810	5471	6038	5699	6266	5927	6494	6155	6722

Stroke mm	90		100		110		120		130		140		150		160		170		180		190	
Bore Size (mm)	Without switch	With switch	Without switch	With switch	Without switch	With switch	Without switch	With switch	Without switch	With switch	Without switch	With switch	Without switch	With switch	Without switch	With switch	Without switch	With switch	Without switch	With switch	Without switch	With switch
ø20	398	473	423	498	448	523	473	548	498	573	523	598	548	623	573	648	598	673	623	698	648	723
ø25	534	625	566	657	598	689	630	721	662	753	694	785	726	817	758	849	790	881	822	913	854	945
ø32	753	867	796	910	839	953	882	996	925	1039	968	1082	1011	1125	1053	1167	1096	1210	1139	1253	1182	1296
ø40	997	1140	1050	1193	1103	1246	1156	1299	1209	1352	1262	1405	1315	1458	1368	1511	1421	1564	1474	1617	1527	1670
ø50	1658	1852	1742	1936	1826	2020	1910	2104	1994	2188	2078	2272	2162	2356	2260	2454	2345	2539	2430	2624	2515	2709
ø63	2388	2667	2498	2777	2608	2887	2718	2997	2828	3107	2938	3217	3048	3327	3158	3437	3268	3547	3378	3657	3488	3767
ø80	4236	4649	4409	4822	4582	4995	4755	5168	4928	5341	5101	5514	5274	5687	5447	5860	5620	6033	5793	6206	5966	6379
ø100	6383	6950	6611	7178	6839	7406	7067	7634	7295	5252	7523	8090	7751	8318	7979	8546	8207	8774	8435	9002	8663	9230

Stroke mm	200		210		220		230		240		250		260		270		280		290		300	
Bore Size (mm)	Without switch	With switch	Without switch	With switch	Without switch	With switch	Without switch	With switch	Without switch	With switch	Without switch	With switch	Without switch	With switch	Without switch	With switch	Without switch	With switch	Without switch	With switch	Without switch	With switch
ø20	673	748	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ø25	886	977	929	1009	961	1041	993	1073	1025	1105	1057	1137	1089	1169	1121	1201	1153	1233	1185	1265	1217	1297
ø32	1225	1339	1268	1382	1311	1425	1354	1468	1397	1511	1440	1554	1483	1597	1526	1640	1569	1683	1612	1726	1655	1769
ø40	1580	1723	1633	1776	1686	1829	1739	1882	1792	1935	1845	1988	1898	2041	1951	2094	2004	2147	2057	2200	2110	2253
ø50	2600	2794	2685	2879	2770	2964	2855	3049	2940	3134	3025	3219	3110	3304	3195	3389	3280	3474	3365	3559	3450	3644
ø63	3598	3877	3707	3986	3817	4096	3927	4206	4037	4316	4147	4426	4257	4536	4367	4646	4477	4756	4587	4866	4697	4976
ø80	4139	6552	6311	6724	6484	6897	6657	7070	6830	7243	7003	7416	7176	7589	7349	7762	7522	6360	7695	8108	7868	8281
ø100	8891	9458	9120	9687	9348	9915	9576	10143	9804	10371	10032	10599	10260	10827	10488	11055	10716	11283	10944	11511	11172	11739

Theoretical Thrust Table

(Unit: N)

Bore Size (mm)	Operating Direction	Operating Pressure MPa								
		0.25 (36 psi)	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
ø20	Push	78.5	94.2	1.26×10^{2}	1.57×10^{2}	1.88×10^{2}	2.20×10^{2}	2.51×10^{2}	2.83×10^{2}	3.14×10^{2}
	Pull	58.9	70.7	94.2	1.18×10^{2}	1.41×10^{2}	1.65×10^{2}	1.88×10^{2}	2.12×10^{2}	2.36×10^{2}
ø25	Push	1.23×10^{2}	1.47×10^{2}	1.96×10^{2}	2.45×10^{2}	2.95×10^{2}	3.44×10^{2}	3.93×10^{2}	4.42×10^{2}	4.91×10^{2}
	Pull	94.3	1.13×10^{2}	1.51×10^{2}	1.89×10^{2}	2.27×10^{2}	2.64×10^{2}	3.02×10^{2}	3.40×10^{2}	3.78×10^{2}
ø32	Push	2.01×10^{2}	2.41×10^{2}	3.22×10^{2}	4.02×10^{2}	4.83×10^{2}	5.63×10^{2}	6.43×10^{2}	7.24×10^{2}	8.04×10^{2}
	Pull	1.51×10^{2}	1.81×10^{2}	2.41×10^{2}	3.02×10^{2}	3.62×10^{2}	4.22×10^{2}	4.83×10^{2}	5.43×10^{2}	6.03×10^{2}
ø40	Push	3.14×10^{2}	3.77×10^{2}	5.03×10^{2}	6.28×10^{2}	7.54×10^{2}	8.80×10^{2}	1.01×10^{3}	1.13×10^{3}	1.26×10^{3}
	Pull	2.64×10^{2}	3.17×10^{2}	4.22×10^{2}	5.28×10^{2}	6.33×10^{2}	7.39×10^{2}	8.44×10^{2}	9.50×10^{2}	1.06×10^{3}
ø50	Push	4.91×10^{2}	5.89×10^{2}	7.85×10^{2}	9.82×10^{2}	1.18×10^{3}	1.37×10^{3}	1.57×10^{3}	1.77×10^{3}	1.96×10^{3}
	Pull	4.13×10^{2}	4.95×10^{2}	6.60×10^{2}	8.25×10^{2}	9.90×10^{2}	1.15×10^{3}	1.32×10^{3}	1.48×10^{3}	1.65×10^{3}
ø63	Push	7.79×10^{2}	9.35×10^{2}	1.25×10^{3}	1.56×10^{3}	1.87×10^{3}	2.18×10^{3}	2.49×10^{3}	2.81×10^{3}	3.12×10^{3}
	Pull	7.01×10^{2}	8.41×10^{2}	1.12×10^{3}	1.40×10^{3}	1.68×10^{3}	1.96×10^{3}	2.24×10^{3}	2.52×10^{3}	2.80×10^{3}
ø80	Push	1.26×10^{3}	1.51×10^{3}	2.01×10^{3}	2.51×10^{3}	3.02×10^{3}	3.52×10^{3}	4.02×10^{3}	4.52×10^{3}	5.03×10^{3}
	Pull	1.13×10^{3}	1.36×10^{3}	1.81×10^{3}	2.27×10^{3}	2.72×10^{3}	3.17×10^{3}	3.63×10^{3}	4.08×10^{3}	4.54×10^{3}
ø100	Push	1.97×10^{3}	2.36×10^{3}	3.14×10^{3}	3.93×10^{3}	4.71×10^{3}	5.50×10^{3}	6.28×10^{3}	7.07×10^{3}	7.85×10^{3}
	Pull	1.79×10^{3}	2.14×10^{3}	2.86×10^{3}	3.57×10^{3}	4.29×10^{3}	5.00×10^{3}	5.72×10^{3}	6.43×10^{3}	7.15×10^{3}

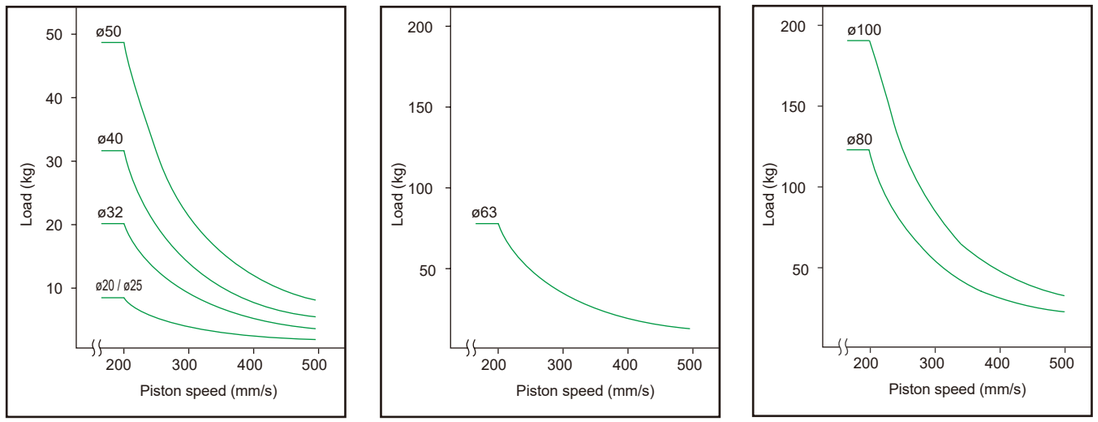
Mounting Bracket Model No. Notation

Bore Size (mm) / Mounting bracket	ø20	ø25	ø32	ø40	ø50	ø63	ø80	ø100
Foot (LB)	USSD-LB-20	USSD-LB-25	USSD-LB-32	USSD-LB-40	USSD-LB-50	USSD-LB-63	USSD-LB-80	USSD-LB-100
Double Clevis (CB)	SSD-CB-20	SSD-CB-25	SSD-CB-32	SSD-CB-40	SSD-CB-50	SSD-CB-63	SSD-CB-80	SSD-CB-100

Note: Foot type mounting bracket is 2 pcs/set.

USSD-K High Load Type Allowable Energy Graph

High Load Type Allowable Energy Graph

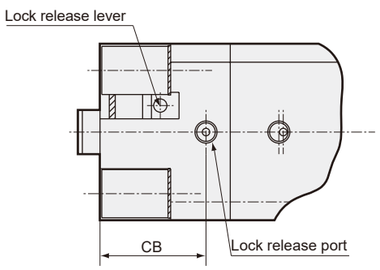


● Note: The range on the lower left side of the curve is usable. The upper right range requires an external cushion.

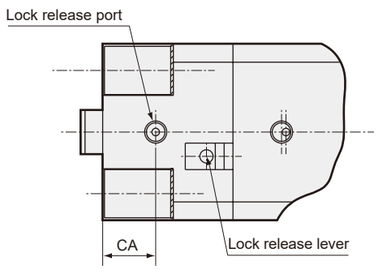
Dimensions (Bore Size: ø20, ø25)

● USSD-L-20, 25
● USSD-20, 25

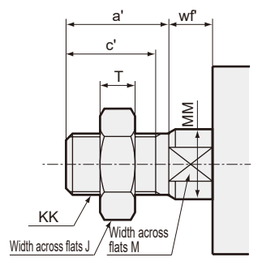
Type B

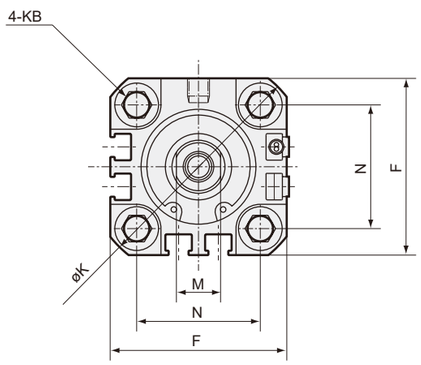


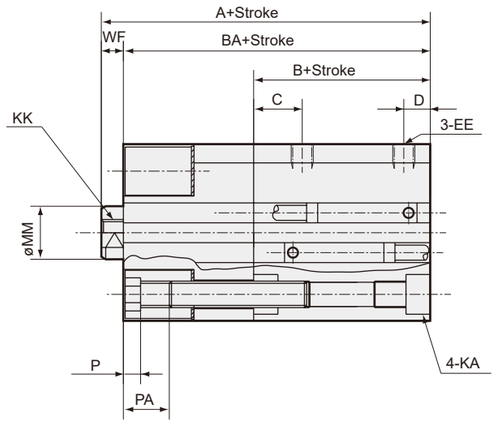
Type F



● Dimensions of Rod End male thread part







Code / Bore Size (mm)	Dimensions with Switch A *1	B *1	BA *1	Dimensions without Switch A *1	B *1	BA *1	Common Dimensions C	CA	CB	D	EE	F
ø20	61	29.5	56.5	51	19.5	46.5	8	10	22	5.5	M5	36
ø25	69	32.5	64	59	22.5	54	11	12	26	6	M5	40

Code / Bore Size (mm)	Common Dimensions KB	K	KA	KK	M	MM	N	WF	P	PA
ø20	M6	47	9 Counterbore depth 5.5 M6 Depth 11	M5 Depth 7	8	10	25.5	4.5	3.5	10
ø25	M6	51	9 Counterbore depth 5.5 M6 Depth 11	M6 Depth 12	10	12	28	5	3.5	10

Rod End Male Thread Dimensions

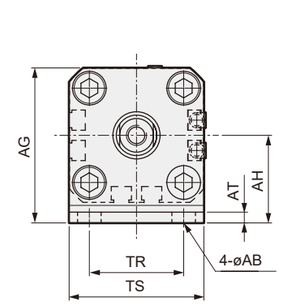
Code / Bore Size (mm)	a'	c'	J	KK	M	MM	T	wf'
ø20	14	12	13	M8	8	10	5	4.5
ø25	17.5	15	17	M10x1.25	10	12	6	5

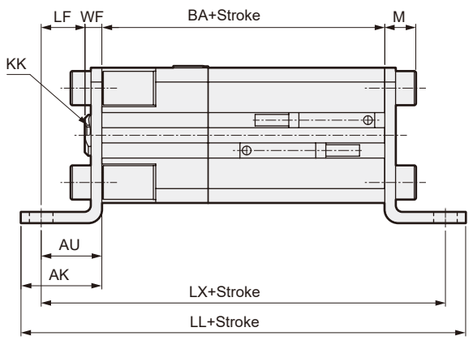
*1: When calculating A+Stroke, B+Stroke, and BA+Stroke dimensions for intermediate strokes, do not use the intermediate stroke value but use the Standard Stroke value just above it. (Ex.) For intermediate stroke 7 mm, use Standard Stroke 10 mm for calculation.

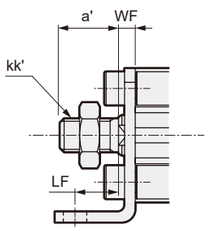
***2: For dimensions with each switch, please refer to P. 552 to 554.**

Dimensions (Bore Size: ø20, ø25)

●Axial Foot Type (LB)







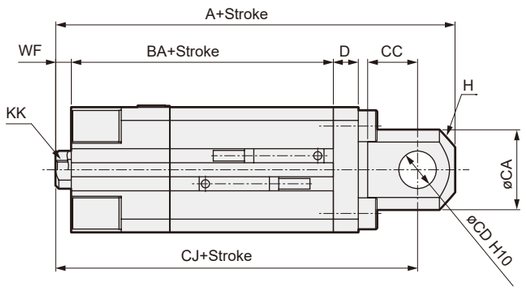
Code / Bore Size (mm)	Common Dimensions AB	AG	AH	AK	AT	AU	TR	TS	M	With female thread KK	WF	LF	With switch BA *1	LL *1	LX *1	Without switch BA *1	LL *1	LX *1
ø20	7	42	24	24	3.2	16	24	36	9.2	M5 Depth 7	4.5	11.5	56.5	104.5	88.5	46.5	94.5	78.5
ø25	7	46	26	24	3.2	16	28	40	9.2	M6 Depth 12	5	11	64	112	96	54	102	86

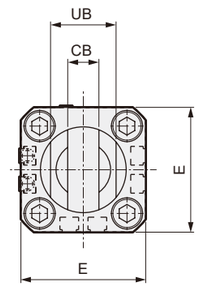
Code / Bore Size (mm)	With male thread a'	kk'	wf	LF	With switch BA *1	LL *1	LX *1	Without switch BA *1	LL *1	LX *1
ø20	14	M8	4.5	11.5	56.5	104.5	88.5	46.5	94.5	78.5
ø25	17.5	M10x1.25	5	11	64	112	96	54	102	86

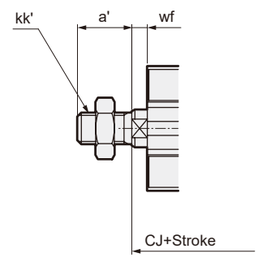
*1: When calculating BA+Stroke, LL+Stroke, and LX+Stroke dimensions for intermediate strokes, do not use the intermediate stroke value but use the Standard Stroke value just above it. (Ex.) For intermediate stroke 7 mm, use Standard Stroke 10 mm for calculation.

***2: For dimensions with each switch, please refer to P. 552 to 554.**

●Double clevis type (CB)







Code / Bore Size (mm)	Common Dimensions CA	CB	CC	CD	D	E	H	UB
ø20	24	8 $^{+0.4}_{+0.1}$	12	10	8	36	C4	19 $^{-0.1}_{-0.4}$
ø25	27.5	10 $^{+0.4}_{+0.1}$	16	12	8	40	C5	21 $^{-0.1}_{-0.4}$

Code / Bore Size (mm)	With female thread KK	WF	With switch A *1	BA *1	CJ *1	Without switch A *1	BA *1	CJ *1	With male thread a'	kk'	wf	With switch A *1	BA *1	CJ *1	Without switch A *1	BA *1	CJ *1
ø20	M5 Depth 7	4.5	94	56.5	84	84	46.5	74	14	M8	4.5	108	56.5	84	98	46.5	74
ø25	M6 Depth 12	5	108	64	96	98	54	86	17.5	M10x1.25	5	125.5	64	96	115.5	54	86

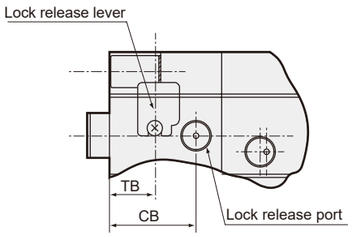
*1: When calculating A+Stroke, BA+Stroke, and CJ+Stroke dimensions for intermediate strokes, do not use the intermediate stroke value but use the Standard Stroke value just above it. (Ex.) For intermediate stroke 7 mm, use Standard Stroke 10 mm for calculation.

***2: For dimensions with each switch, please refer to P. 552 to 554.**

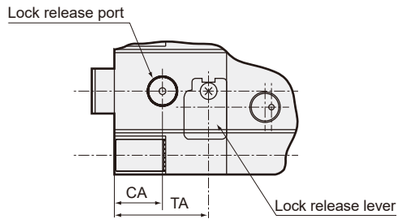
Dimensions (Bore Size: ø32 to ø63)

● USSD-L-32 to 63
● USSD-32 to 63

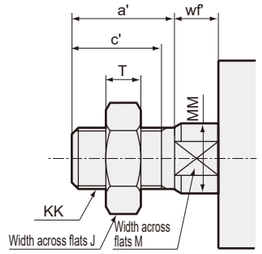
Type B



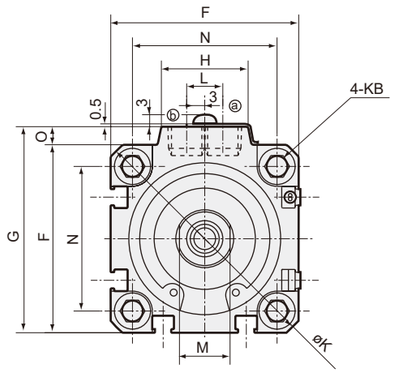
Type F

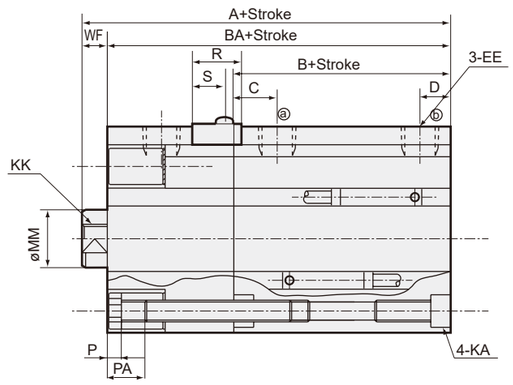


● Dimensions of Rod End male thread part



Note) The figure below is F type





Code / Bore Size (mm)	Dimensions with Switch A *1	B *1	BA *1	Dimensions without Switch A *1	B *1	BA *1	Common Dimensions C	CA	CB	D	EE	F	G
ø32	73.5	33	66.5	63.5	23	56.5	8	12	25.5	8	RC1/8	45	49.5
ø40	81.5	39.5	74.5	71.5	29.5	64.5	12	15	27	8.5	RC1/8	52	57
ø50	87.5	40.5	79.5	77.5	30.5	69.5	10.5	15	30	10.5	RC1/4	64	71
ø63	98.5	46	90.5	88.5	36	80.5	13	15.5	34	11	RC1/4	77	84

Code / Bore Size (mm)	Common Dimensions H	KB	K	KA	KK	L	M	MM	N	O	WF	P
ø32	24	M6	60	9 Counterbore depth 5.5 M6 depth 11	M8 Depth 13	10	14	16	34	4.5	7	3.5
ø40	24	M6	69	9 Counterbore depth 5.5 M6 depth 11	M8 Depth 13	10	14	16	40	5	7	3.5
ø50	33	M8	86	11 Counterbore depth 6.5 M8 Depth 13	M10 Depth 15	15	17	20	50	7	8	4
ø63	33	M10	103	14 Counterbore depth 9 M10 Depth 25	M10 Depth 15	15	17	20	60	7	8	4

Code / Bore Size (mm)	PA	R	S	TA
ø32	10	14	9	29.5
ø40	10	12	6	30.3
ø50	12.5	14	7	33
ø63	13.5	17	8.5	37

Rod End Male Thread Dimensions

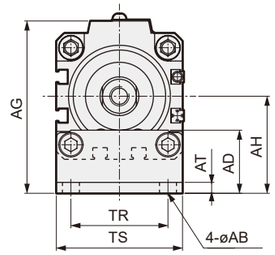
Code / Bore Size (mm)	a'	c'	J	KK	M	MM	T	wf'
ø32	23.5	20.5	22	M14×1.5	14	16	8	5
ø40	23.5	20.5	22	M14×1.5	14	16	8	5
ø50	28.5	26	27	M18x1.5	17	20	11	5
ø63	28.5	26	27	M18x1.5	17	20	11	5

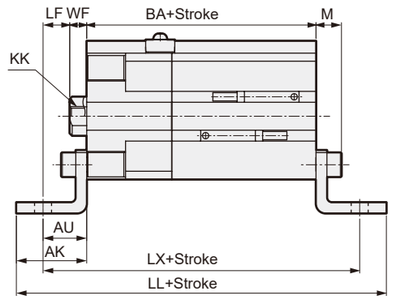
*1: When calculating A+Stroke, B+Stroke, and BA+Stroke dimensions for intermediate strokes, do not use the intermediate stroke value but use the Standard Stroke value just above it. (Ex.) For intermediate stroke 7 mm, use Standard Stroke 10 mm for calculation.

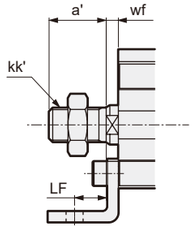
***2: For dimensions with each switch, please refer to P. 552 to 554.**

Dimensions (Bore Size: ø32 to ø63)

●Axial Foot Type (LB)







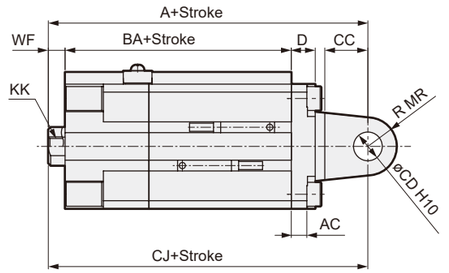
Code / Bore Size (mm)	Common Dimensions AB	AD	AG	AH	AK	AT	AU	TR	TS	M	With female thread KK	WF	LF	With switch BA *1	With switch LL *1	With switch LX *1	Without switch BA *1	Without switch LL *1	Without switch LX *1
ø32	7	53.5	53.5	31	24	3.2	16	34	45	9.2	M8 Depth 13	7	9	66.5	114.5	98.5	56.5	104.5	88.5
ø40	7	26	71	40	29	4.5	19	40	52	10	M8 Depth 13	7	12	74.5	132.5	112.5	64.5	122.5	102.5
ø50	9	23	79	40	34	4.5	22	46	64	13	M10 Depth 15	8	14	79.5	147.5	123.5	68.5	136.5	112.5
ø63	11	33	96.5	51	40	4.5	25	60	77	15	M10 Depth 15	8	17	90.5	170.5	140.5	80.5	160.5	130.5

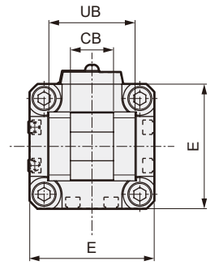
Code / Bore Size (mm)	With male thread a'	kk'	wf	LF	With switch BA *1	With switch LL *1	With switch LX *1	Without switch BA *1	Without switch LL *1	Without switch LX *1
ø32	23.5	M14x1.5	5	11	66.5	114.5	98.5	56.5	104.5	88.5
ø40	23.5	M14x1.5	5	14	74.5	132.5	112.5	64.5	122.5	102.5
ø50	28.5	M18x1.5	5	17	79.5	147.5	123.5	68.5	136.5	112.5
ø63	28.5	M18x1.5	5	20	90.5	170.5	140.5	80.5	160.5	130.5

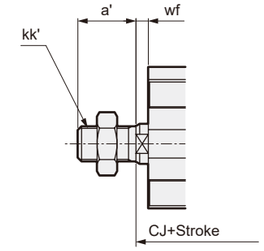
*1: When calculating BA+Stroke, LL+Stroke, and LX+Stroke dimensions for intermediate strokes, do not use the intermediate stroke value but use the Standard Stroke value just above it. (Ex.) For intermediate stroke 7 mm, use Standard Stroke 10 mm for calculation.

***2: For dimensions with each switch, please refer to P. 552 to 554.**

●Double clevis type (CB)







Code / Bore Size (mm)	Common Dimensions AC	CB	CC	CD	D	E	MR	UB
ø32	9.5	$10^{+0.4}_{+0.1}$	16	12	10	45	12	$21^{-0.1}_{-0.4}$
ø40	6.5	$18^{+0.4}_{+0.1}$	18	12	10	52	12	$36^{-0.1}_{-0.4}$
ø50	6.5	$18^{+0.4}_{+0.1}$	18	12	10	64	12	$36^{-0.1}_{-0.4}$
ø63	7.5	$20^{+0.4}_{+0.1}$	24	14	10	77	16	$40^{-0.1}_{-0.4}$

Code / Bore Size (mm)	With female thread KK	WF	With switch A *1	With switch BA *1	With switch CJ *1	Without switch A *1	Without switch BA *1	Without switch CJ *1	With male thread a'	kk'	wf	With switch A *1	With switch BA *1	With switch CJ *1	Without switch A *1	Without switch BA *1	Without switch CJ *1
ø32	M8 Depth 13	7	115.5	66.5	103.5	105.5	56.5	93.5	23.5	M14x1.5	5	137	66.5	101.5	127	56.5	91.5
ø40	M8 Depth 13	7	125.5	74.5	113.5	115.5	64.5	103.5	23.5	M14x1.5	5	147	74.5	111.5	137	64.5	101.5
ø50	M10 Depth 15	8	131.5	79.5	119.5	120.5	68.5	108.5	28.5	M18x1.5	5	157	79.5	116.5	146	68.5	105.5
ø63	M10 Depth 15	8	151.5	90.5	135.5	141.5	80.5	125.5	28.5	M18x1.5	5	177	90.5	132.5	167	80.5	122.5

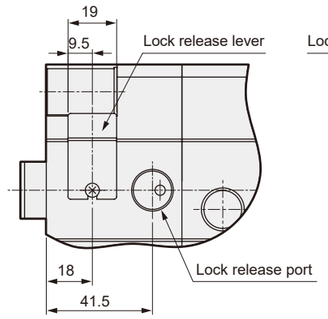
*1: When calculating A+Stroke, BA+Stroke, and CJ+Stroke dimensions for intermediate strokes, do not use the intermediate stroke value but use the Standard Stroke value just above it. (Ex.) For intermediate stroke 7 mm, use Standard Stroke 10 mm for calculation.

***2: For dimensions with each switch, please refer to P. 552 to 554.**

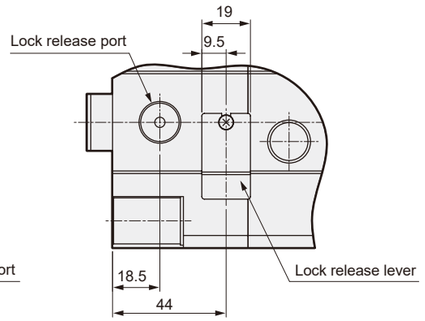
External dimensions diagram (Bore Size: ø80)

● USSD-L-80
● USSD-80

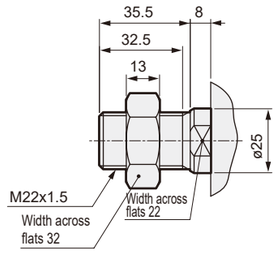
Type B



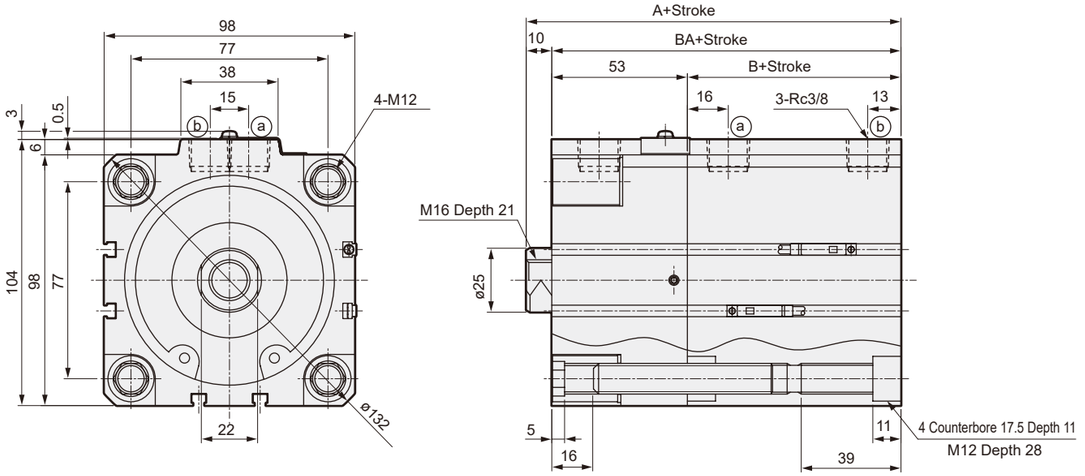
Type F



● Dimensions of Rod End male thread part



Note) The figure below is F type



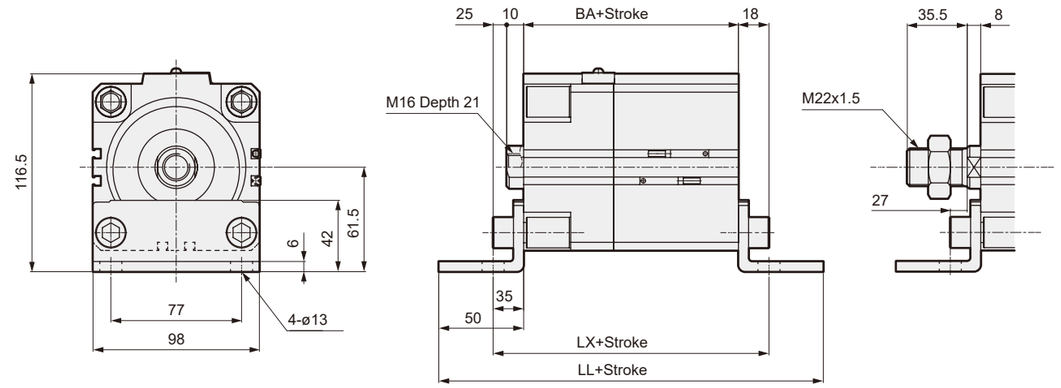
Code / Bore Size (mm)	Dimensions with Switch			Dimensions without Switch		
	A	B	BA	A	B	BA
ø80	116.5	53.5	106.5	106.5	43.5	96.5

*1: When calculating A+Stroke, B+Stroke, and BA+Stroke dimensions for intermediate strokes, do not use the intermediate stroke value but use the Standard Stroke value just above it. (Ex.) For intermediate stroke 7 mm, use Standard Stroke 10 mm for calculation.

***2: For dimensions with each switch, please refer to P. 552 to 554.**

External dimensions diagram (Bore Size: ø80)

●Axial Foot Type (LB)

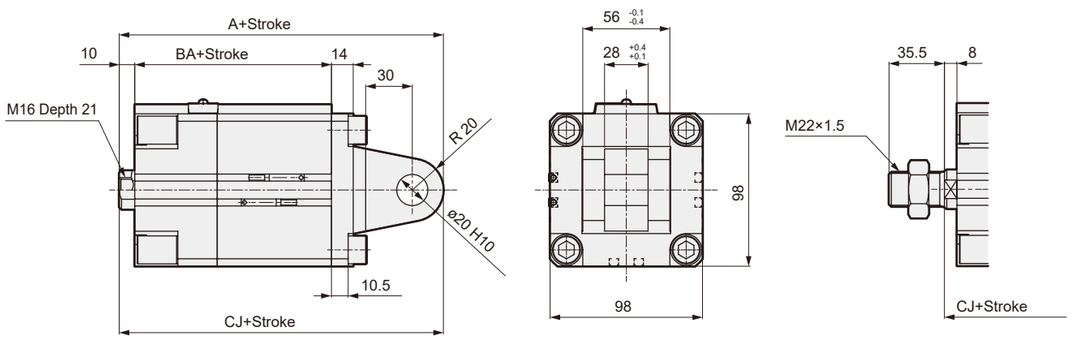


Code / Bore Size (mm)	With female thread						With male thread					
	With switch			Without switch			With switch			Without switch		
	BA	LL	LX	BA	LL	LX	BA	LL	LX	BA	LL	LX
ø80	106.5	206.5	176.5	96.5	196.5	166.5	106.5	206.5	176.5	96.5	196.5	166.5

*1: To calculate BA+ stroke, LL+ stroke or LX+ stroke when using custom stroke, apply the next longer Standard Stroke (instead of the custom stroke) to the stroke value. (Ex.) For intermediate stroke 7 mm, use Standard Stroke 10 mm for calculation.

***2: For dimensions with each switch, please refer to P. 552 to 554.**

●Double clevis type (CB)



Code / Bore Size (mm)	With male thread						With male thread					
	With switch			Without switch			With switch			Without switch		
	A	BA	CJ	A	BA	CJ	A	BA	CJ	A	BA	CJ
ø80	188.5	106.5	168.5	178.5	96.5	158.5	222	106.5	166.5	212	96.5	156.5

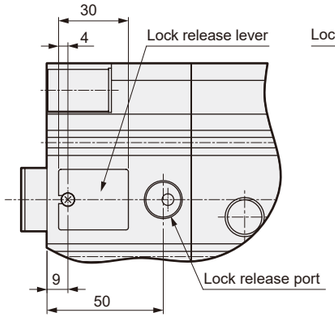
*1: To calculate A + stroke, BA + stroke or CJ + stroke when using custom stroke, apply the next longer Standard Stroke (instead of the custom stroke) to the stroke value. (Ex.) For intermediate stroke 7 mm, use Standard Stroke 10 mm for calculation.

***2: For dimensions with each switch, please refer to P. 552 to 554.**

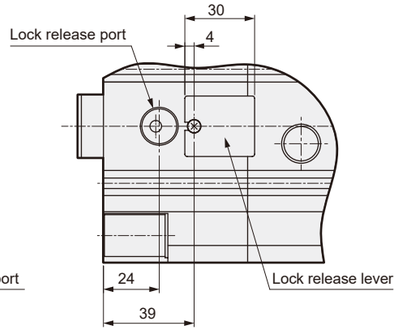
External dimensions diagram (Bore Size: ø100)

● USSD-L-100
● USSD-100

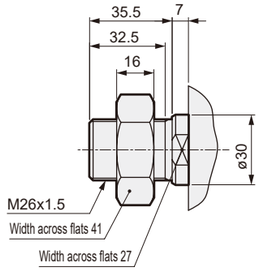
Type B



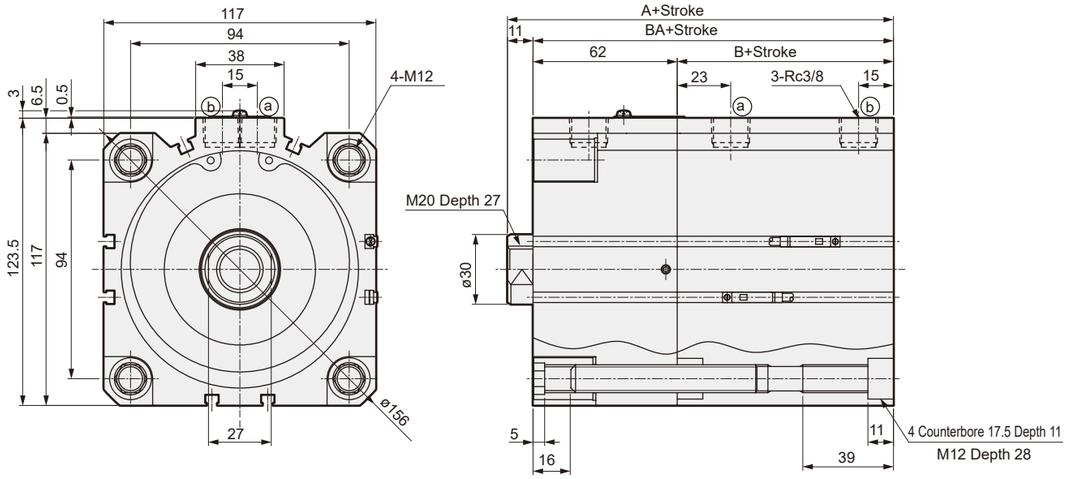
Type F



● Dimensions of Rod End male thread part



Note) The figure below is F type



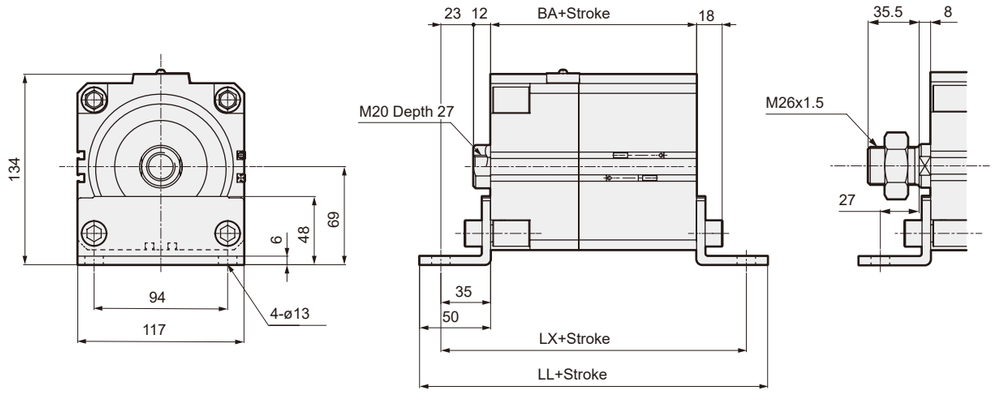
Code	Dimensions with Switch			Dimensions without Switch		
Bore Size (mm)	A	B	BA	A	B	BA
ø100	136	63	125	126	53	115

*1: To calculate A + stroke or B + stroke when using custom stroke, apply the next longer Standard Stroke (instead of the custom stroke) to the stroke value. (Ex.) For intermediate stroke 7 mm, use Standard Stroke 10 mm for calculation.

***2: For dimensions with each switch, please refer to P. 552 to 554.**

External dimensions diagram (Bore Size: ø100)

●Axial Foot Type (LB)

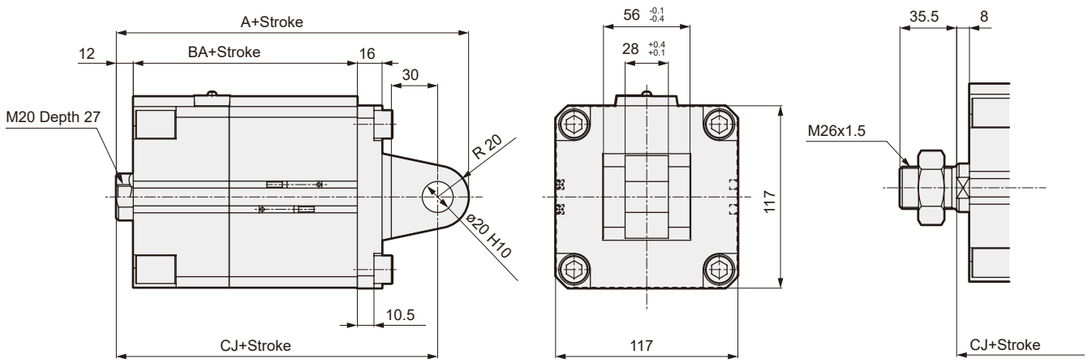


Code	With female thread						With male thread					
	With switch			Without switch			With switch			Without switch		
Bore Size (mm)	BA	LL	LX	BA	LL	LX	BA	LL	LX	BA	LL	LX
ø100	125	225	195	115	215	185	125	225	195	115	215	185

*1: To calculate BA+ stroke, LL+ stroke or LX+ stroke when using custom stroke, apply the next longer Standard Stroke (instead of the custom stroke) to the stroke value. (Ex.) For intermediate stroke 7 mm, use Standard Stroke 10 mm for calculation.

***2: For dimensions with each switch, please refer to P. 552 to 554.**

●Double clevis type (CB)



Code	With female thread						With male thread					
	With switch			Without switch			With switch			Without switch		
Bore Size (mm)	A	BA	CJ	A	BA	CJ	A	BA	CJ	A	BA	CJ
ø100	209	125	189	199	115	179	240.5	125	185	230.5	115	175

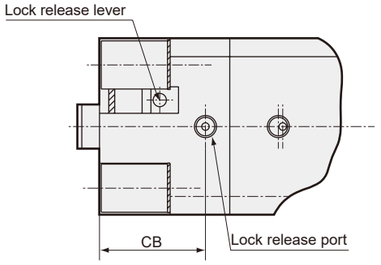
*1: To calculate A + stroke, BA + stroke or CJ + stroke when using custom stroke, apply the next longer Standard Stroke (instead of the custom stroke) to the stroke value. (Ex.) For intermediate stroke 7 mm, use Standard Stroke 10 mm for calculation.

***2: For dimensions with each switch, please refer to P. 552 to 554.**

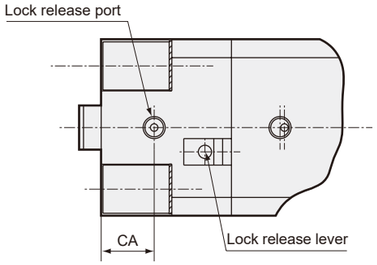
Outline Dimension Drawing (High Load Type, Bore Size: ø20, ø25)

● USSD-KL-20, 25
● USSD-K-20, 25

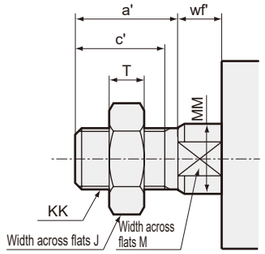
Type B

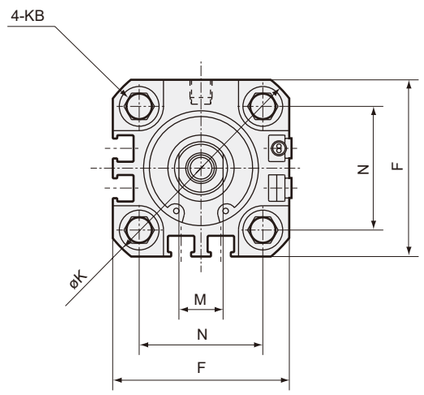


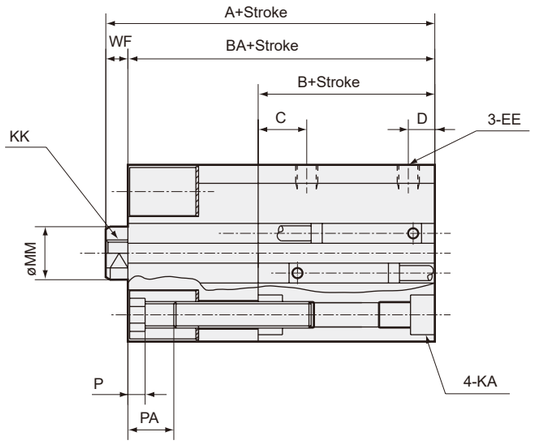
Type F



● Dimensions of Rod End male thread part







Code / Bore Size (mm)	Dimensions with Switch			Dimensions without Switch			Common Dimensions					
	A *1, *2	B *1, *2	BA *1, *2	A *1, *2	B *1, *2	BA *1, *2	C	CA	CB	D	EE	F
ø20	66 (77.5)	34.5 (46)	61.5 (73)	56 (67.5)	24.5 (36)	51.5 (63)	8	10	22	5.5 (8)	M5	36
ø25	74 (87.5)	37.5 (51)	69 (82.5)	64 (77.5)	27.5 (41)	59 (72.5)	11	12	26	6 (11)	M5	40

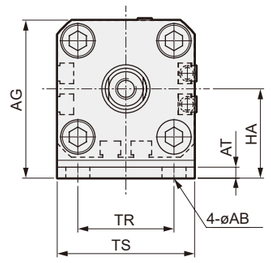
Code / Bore Size (mm)	Common Dimensions									
	KB	K	KA	KK	M	MM	N	WF	P	PA
ø20	M6	47	9 Counterbore depth 5.5 M6 Depth 11	M5 Depth 7	8	10	25.5	4.5	3.5	10
ø25	M6	51	9 Counterbore depth 5.5 M6 Depth 11	M6 Depth 7	10	12	28	5	3.5	10

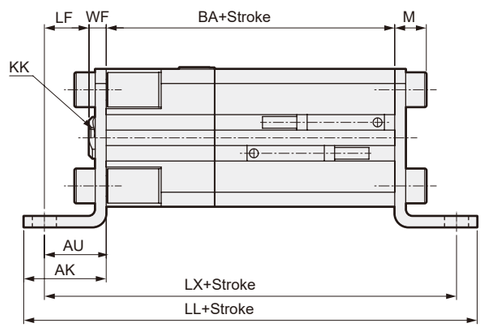
Rod End Male Thread Dimensions Code / Bore Size (mm)	a'	c'	J	KK	M	MM	T	wf'
ø20	14	12	13	M8	8	10	5	4.5
ø25	17.5	15	17	M10x1.25	10	12	6	5

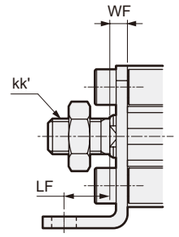
*1: When calculating A+Stroke, B+Stroke, and BA+Stroke dimensions for intermediate strokes, do not use the intermediate stroke value but use the Standard Stroke value just above it. (Ex.) For intermediate stroke 7 mm, use Standard Stroke 10 mm for calculation.
*2: For ø20: exceeding 100 stroke, ø25: exceeding 150 stroke, the A, B, BA, D dimensions are the values in ( ), and there is no KA counterbore.
***3: For dimensions with each switch, please refer to P. 552 to 554.**

Outline Dimension Drawing (High Load Type, Bore Size: ø20, ø25)

●Axial Foot Type (LB)





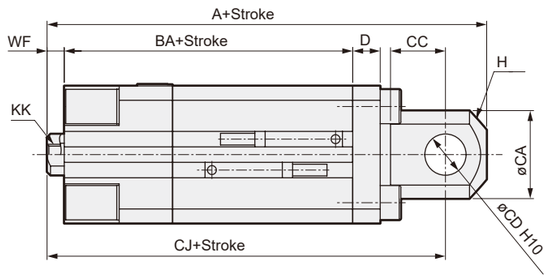


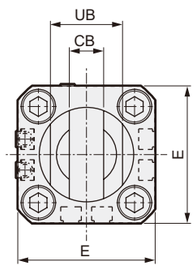
Code / Bore Size (mm)	Common Dimensions									With female thread								
	AB	AG	AH	AK	AT	AU	TR	TS	M	KK	WF	LF	With switch			Without switch		
													BA *1, *2	LL *1, *2	LX *1, *2	BA *1, *2	LL *1, *2	LX *1, *2
ø20	7	42	24	24	3.2	16	24	36	9.2	M5 Depth 7	4.5	11.5	61.5 (73)	109.5 (121)	93.5 (105)	51.5 (63)	99.5 (111)	83.5 (95)
ø25	7	46	26	24	3.2	16	28	40	9.2	M6 Depth 12	5	11	69 (82.5)	117 (130.5)	101 (114.5)	59 (72.5)	107 (120.5)	91 (104.5)

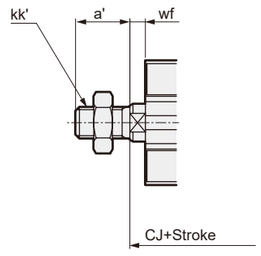
Code / Bore Size (mm)	With male thread									
	a'	kk'	wf	LF	With switch			Without switch		
					BA *1, *2	LL *1, *2	LX *1, *2	BA *1, *2	LL *1, *2	LX *1, *2
ø20	14	M8	4.5	11.5	61.5 (73)	109.5 (121)	93.5 (105)	51.5 (63)	99.5 (111)	83.5 (95)
ø25	17.5	M10x1.25	5	11	69 (82.5)	117 (130.5)	101 (114.5)	59 (72.5)	107 (120.5)	91 (104.5)

*1: For ø20: exceeding 100 stroke, ø25: exceeding 150 stroke, the BA, LL, LX dimensions are the values in ( ).
*2: When calculating BA+Stroke, LL+Stroke, and LX+Stroke dimensions for intermediate strokes, do not use the intermediate stroke value but use the Standard Stroke value just above it. (Ex.) For intermediate stroke 7 mm, use Standard Stroke 10 mm for calculation.
***3: For dimensions with each switch, please refer to P. 552 to 554.**

●Double clevis type (CB)







Code / Bore Size (mm)	Common Dimensions								With female thread							
	CA	CB	CC	CD	D	E	H	UB	KK	WF	With switch			Without switch		
											A *1, *2	BA *1, *2	CJ *1, *2	A *1, *2	BA *1, *2	CJ *1, *2
ø20	24	8 +0.4 +0.1	12	10	8	36	C4	19 -0.1 -0.4	M5 Depth 7	4.5	99 (110.5)	61.5 (73)	89 (100.5)	89 (100.5)	51.5 (63)	79 (90.5)
ø25	27.5	10 +0.4 +0.1	16	12	8	40	C5	21 -0.1 -0.4	M6 Depth 12	5	113 (126.5)	69 (82.5)	101 (114.5)	103 (116.5)	59 (72.5)	91 (104.5)

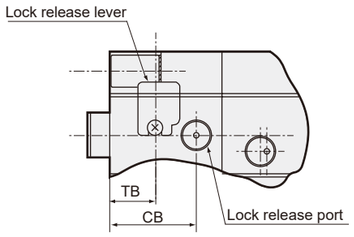
Code / Bore Size (mm)	With male thread							
	a'	kk'	wf	With switch			Without switch		
				A *1, *2	BA *1, *2	CJ *1, *2	A *1, *2	BA *1, *2	CJ *1, *2
ø20	14	M8	4.5	113 (124.5)	61.5 (73)	89 (100.5)	103 (114.5)	51.5 (63)	79 (90.5)
ø25	17.5	M10x1.25	5	130.5 (144)	69 (82.5)	101 (114.5)	120.5 (134)	59 (72.5)	91 (104.5)

*1: For ø20: exceeding 100 stroke, ø25: exceeding 150 stroke, the A, BA, CJ dimensions are the values in ( ).
*2: When calculating A+Stroke, BA+Stroke, and CJ+Stroke dimensions for intermediate strokes, do not use the intermediate stroke value but use the Standard Stroke value just above it.
(Ex.) For intermediate stroke 7 mm, use Standard Stroke 10 mm for calculation.
***3: For dimensions with each switch, please refer to P. 552 to 554.**

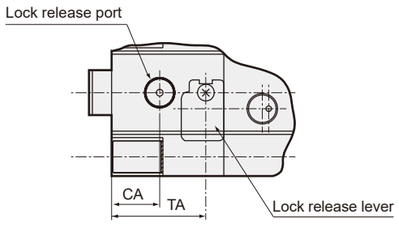
Outline Dimension Drawing (High Load Type, Bore Size: ø32 to ø63)

● USSD-KL-32 to 63
● USSD-K-32 to 63

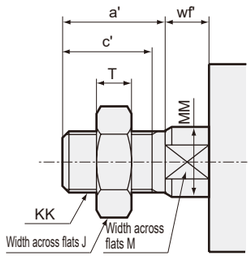
Type B



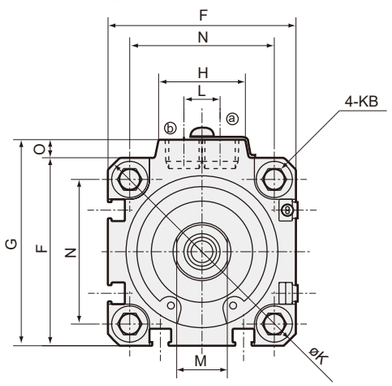
Type F

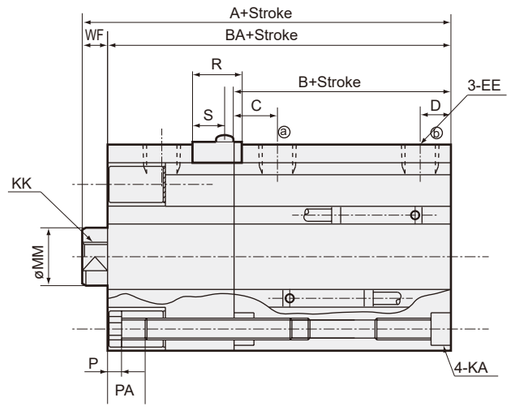


● Dimensions of Rod End male thread part



Note) The figure below is F type





Code / Bore Size (mm)	Dimensions with Switch A *1	B *1	BA *1	Dimensions without Switch A *1	B *1	BA *1	Common Dimensions C	CA	CB	D	EE	F	G
ø32	83.5 (91)	43 (50.5)	76.5 (84)	73.5 (81)	33 (40.5)	66.5 (74)	8	12	25.5	8	RC1/8	45	49.5
ø40	91.5 (101)	49.5 (59)	84.5 (94)	81.5 (91)	39.5 (49)	74.5 (84)	12	15	27	8.5 (12)	RC1/8	52	57
ø50	97.5 (111)	50.5 (64)	89.5 (103)	87.5 (101)	40.5 (54)	79.5 (93)	10.5	15	30	10.5	RC1/4	64	71
ø63	108.5 (118.5)	56 (66)	100.5 (110.5)	98.5 (108.5)	46 (56)	90.5 (100.5)	13	15.5	34	11 (13)	RC1/4	77	84

Code / Bore Size (mm)	Common Dimensions H	KB	K	KA	KK	L	M	MM	N	O	WF	P	PA
ø32	24	M6	60	9 Counterbore depth 5.5 M6 Depth 11	M8 Depth 13	10	14	16	34	4.5	7	3.5	10
ø40	24	M6	69	9 Counterbore depth 5.5 M6 Depth 11	M8 Depth 13	10	14	16	40	5	7	3.5	10
ø50	33	M8	86	11 Counterbore depth 6.5 M8 Depth 13	M10 Depth 15	15	17	20	50	7	8	4	12.5
ø63	33	M10	103	14 Counterbore depth 9 M10 Depth 25	M10 Depth 15	15	17	20	60	7	8	4	13.5

Code / Bore Size (mm)	R	S	TA	TB
ø32	14	9	29.5	12.4
ø40	12	6	30.3	14.7
ø50	14	7	33	15.7
ø63	17	8.5	37	16.2

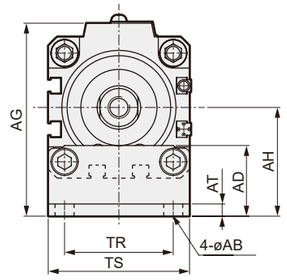
Rod End Male Thread Dimensions

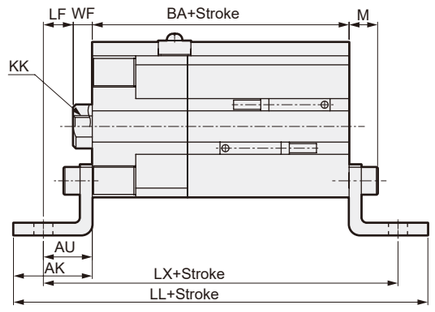
Code / Bore Size (mm)	a'	c'	J	KK	M	MM	T	wf'
ø32	23.5	20.5	22	M14×1.5	14	16	8	5
ø40	23.5	20.5	22	M14×1.5	14	16	8	5
ø50	28.5	26	27	M18x1.5	17	20	11	5
ø63	28.5	26	27	M18x1.5	17	20	11	5

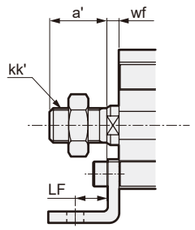
*1: When calculating A+Stroke, B+Stroke, and BA+Stroke dimensions for intermediate strokes, do not use the intermediate stroke value but use the Standard Stroke value just above it. (Ex.) For intermediate stroke 7 mm, use Standard Stroke 10 mm for calculation.
*2: For ø32 to ø50: exceeding 150 stroke, ø63: exceeding 200 stroke, the A, B, BA, HD, D dimensions are the values in ( ), and there is no KA counterbore.
***3: For dimensions with each switch, please refer to P. 552 to 554.**

Outline Dimension Drawing (High Load Type, Bore Size: ø32 to ø63)

●Axial Foot Type (LB)





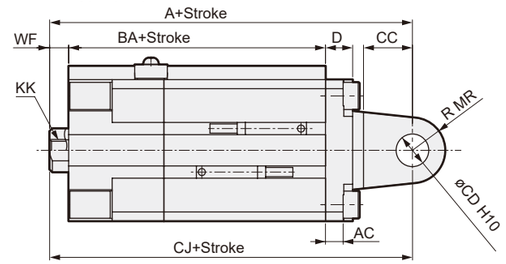


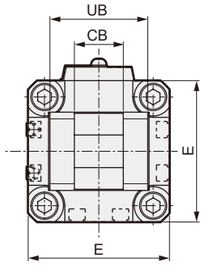
Code / Bore Size (mm)	Common Dimensions AB	AD	AG	AH	AK	AT	AU	TR	TS	M	With female thread KK	WF	LF	With switch BA *1, *2	With switch LL *1, *2	With switch LX *1, *2	Without switch BA *1, *2	Without switch LL *1, *2	Without switch LX *1, *2
ø32	7	53.5	53.5	31	24	3.2	16	34	45	9.2	M8 Depth 13	7	9	76.5 (84)	124.5 (132)	108.5 (116)	66.5 (74)	114.5 (122)	98.5 (106)
ø40	7	26	71	40	29	4.5	19	40	52	10	M8 Depth 13	7	12	84.5 (94)	142.5 (152)	122.5 (132)	74.5 (84)	132.5 (142)	112.5 (122)
ø50	9	23	79	40	34	4.5	22	46	64	13	M10 Depth 15	8	14	89.5 (103)	157.5 (171)	133.5 (147)	79.5 (93)	147.5 (161)	123.5 (137)
ø63	11	33	96.5	51	40	4.5	25	60	77	15	M10 Depth 15	8	17	100.5 (110.5)	180.5 (190.5)	150.5 (160.5)	90.5 (100.5)	170.5 (180.5)	140.5 (150.5)

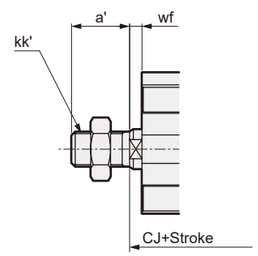
Code / Bore Size (mm)	With male thread a'	kk'	wf	LF	With switch BA *1, *2	With switch LL *1, *2	With switch LX *1, *2	No Switch BA *1, *2	No Switch LL *1, *2	No Switch LX *1, *2
ø32	23.5	M14x1.5	5	11	76.5 (84)	124.5 (132)	108.5 (116)	66.5 (74)	114.5 (122)	98.5 (106)
ø40	23.5	M14x1.5	5	14	84.5 (94)	142.5 (152)	122.5 (132)	74.5 (84)	132.5 (142)	112.5 (122)
ø50	28.5	M18x1.5	5	17	89.5 (103)	157.5 (171)	133.5 (147)	79.5 (93)	147.5 (161)	123.5 (137)
ø63	28.5	M18x1.5	5	20	100.5 (110.5)	180.5 (190.5)	150.5 (160.5)	90.5 (100.5)	170.5 (180.5)	140.5 (150.5)

*1: For ø32 to ø50: Over 150 stroke, and ø63: Over 200 stroke, BA, LL, LX dimensions are the values in ( ).
*2: When calculating BA+Stroke, LL+Stroke, and LX+Stroke dimensions for intermediate strokes, do not use the intermediate stroke value but use the Standard Stroke value just above it. (Ex.) For intermediate stroke 7 mm, use Standard Stroke 10 mm for calculation.
***3: For dimensions with each switch, please refer to P. 552 to 554.**

●Double clevis type (CB)







Code / Bore Size (mm)	Common Dimensions AC	CB	CC	CD	D	E	MR	UB	With female thread KK	WF	With switch A *1, *2	With switch BA *1, *2	With switch CJ *1, *2	Without switch A *1, *2	Without switch BA *1, *2	Without switch CJ *1, *2
ø32	9.5	10 $^{+0.4}_{+0.1}$	16	12	10	45	12	21 $^{-0.1}_{-0.4}$	M8 Depth 13	7	125.5 (133)	76.5 (84)	113.5 (121)	115.5 (123)	66.5 (74)	103.5 (111)
ø40	6.5	18 $^{+0.4}_{+0.1}$	18	12	10	52	12	36 $^{-0.1}_{-0.4}$	M8 Depth 13	7	135.5 (145)	84.5 (94)	123.5 (133)	125.5 (135)	74.5 (84)	113.5 (123)
ø50	6.5	18 $^{+0.4}_{+0.1}$	18	12	10	64	12	36 $^{-0.1}_{-0.4}$	M10 Depth 15	8	141.5 (155)	89.5 (103)	129.5 (143)	131.5 (145)	79.5 (93)	119.5 (133)
ø63	7.5	20 $^{+0.4}_{+0.1}$	24	14	10	77	16	40 $^{-0.1}_{-0.4}$	M10 Depth 15	8	161.5 (171.5)	100.5 (110.5)	145.5 (155.5)	151.5 (161.5)	90.5 (100.5)	135.5 (145.5)

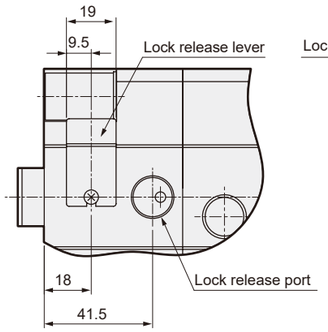
Code / Bore Size (mm)	With male thread a'	kk'	wf	With switch A *1 *2	With switch BA *1 *2	With switch CJ *1 *2	Without switch A *1 *2	Without switch BA *1 *2	Without switch CJ *1 *2
ø32	23.5	M14x1.5	5	147 (154.5)	76.5 (84)	111.5 (119)	137 (144.5)	66.5 (74)	101.5 (109)
ø40	23.5	M14x1.5	5	157 (166.5)	84.5 (94)	121.5 (131)	147 (156.5)	74.5 (84)	111.5 (121)
ø50	28.5	M18x1.5	5	167 (180.5)	89.5 (103)	126.5 (140)	157 (170.5)	79.5 (93)	116.5 (130)
ø63	28.5	M18x1.5	5	187 (197)	100.5 (110.5)	142.5 (152.5)	177 (187)	90.5 (100.5)	132.5 (142.5)

*1: For ø32 to ø50: Over 150 stroke, and ø63: Over 200 stroke, A, BA, CJ dimensions are the values in ( ).
*2: When calculating A+Stroke, BA+Stroke, and CJ+Stroke dimensions for intermediate strokes, do not use the intermediate stroke value but use the Standard Stroke value just above it. (Ex.) For intermediate stroke 7 mm, use Standard Stroke 10 mm for calculation.
***3: For dimensions with each switch, please refer to P. 552 to 554.**

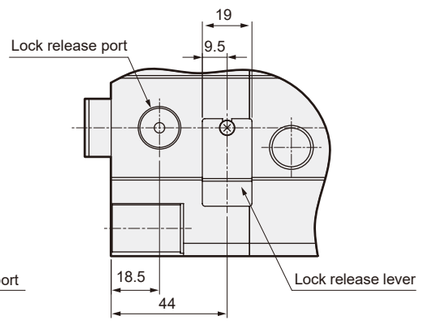
Dimensions (High Load Type Bore Size: ø80)

● USSD-KL-80
● USSD-K-80

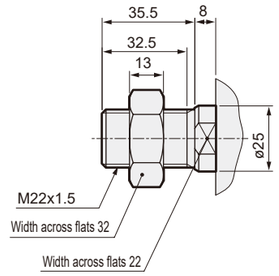
Type B



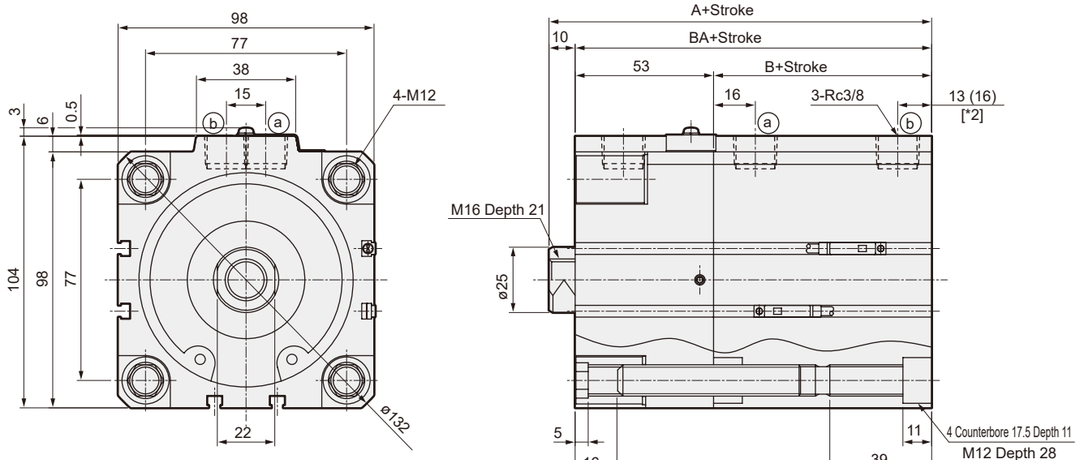
Type F



● Dimensions of Rod End male thread part



Note) The figure below is F type

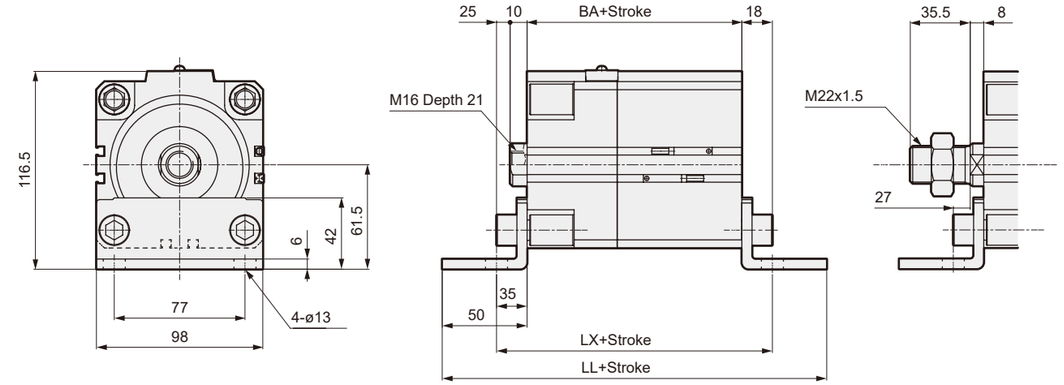


Code / Bore Size (mm)	Dimensions with Switch			Dimensions without Switch		
	A *1, *2	B *1, *2	BA *1, *2	A *1, *2	B *1, *2	BA *1, *2
ø80	126.5 (136.5)	63.5 (73.5)	116.5 (126.5)	116.5 (126.5)	53.5 (63.5)	106.5 (116.5)

*1: When calculating A+Stroke, B+Stroke, and BA+Stroke dimensions for intermediate strokes, do not use the intermediate stroke value but use the Standard Stroke value just above it. (Ex.) For intermediate stroke 7 mm, use Standard Stroke 10 mm for calculation.
*2: When the stroke exceeds 200, A, B, and BA dimensions are the values in ( ), and there is no counterbore in the mounting hole.
***3: For dimensions with each switch, please refer to P. 552 to 554.**

Dimensions (High Load Type Bore Size: ø80)

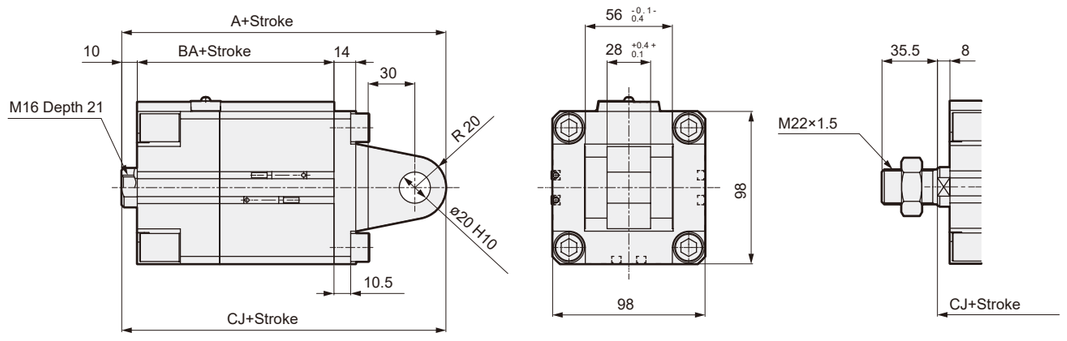
●Axial Foot Type (LB)



Code / Bore Size (mm)	With female thread					
	With switch			Without switch		
	BA	LL	LX	BA	LL	LX
ø80	116.5 (126.5)	216.5 (226.5)	186.5 (196.5)	106.5 (116.5)	206.5 (216.5)	176.5 (186.5)
Code / Bore Size (mm)	**With male thread**					
	With switch			Without switch		
	BA	LL	LX	BA	LL	LX
ø80	116.5 (126.5)	216.5 (226.5)	186.5 (196.5)	106.5 (116.5)	206.5 (216.5)	176.5 (186.5)

*1: When the stroke exceeds 200, BA, LL, and LX dimensions are the values in ( ).
*2: When calculating BA+Stroke, LL+Stroke, and LX+Stroke dimensions for intermediate strokes, do not use the intermediate stroke value but use the Standard Stroke value just above it. (Ex.) For intermediate stroke 7 mm, use Standard Stroke 10 mm for calculation.
***3: For dimensions with each switch, please refer to P. 552 to 554.**

●Double clevis type (CB)



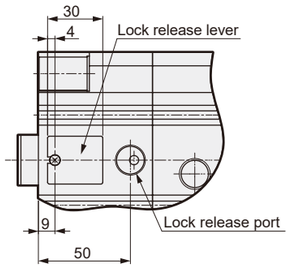
Code / Bore Size (mm)	With female thread					
	With switch			Without switch		
	A	BA	CJ	A	BA	CJ
ø80	198.5 (208.5)	116.5 (126.5)	178.5 (188.5)	188.5 (198.5)	106.5 (116.5)	168.5 (178.5)
Code / Bore Size (mm)	**With male thread**					
	With switch			Without switch		
	A	BA	CJ	A	BA	CJ
ø80	232 (242)	116.5 (126.5)	176.5 (186.5)	222 (232)	106.5 (116.5)	166.5 (176.5)

*1: When the stroke exceeds 200, A, BA, and CJ dimensions are the values in ( ).
*2: When calculating A+Stroke, BA+Stroke, and CJ+Stroke dimensions for intermediate strokes, do not use the intermediate stroke value but use the Standard Stroke value just above it. (Ex.) For intermediate stroke 7 mm, use Standard Stroke 10 mm for calculation.
***3: For dimensions with each switch, please refer to P. 552 to 554.**

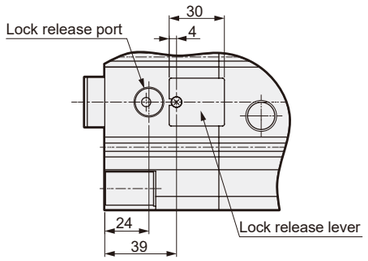
Dimensions (High Load Type Bore Size: ø100)

● USSD-KL-100
● USSD-K-100

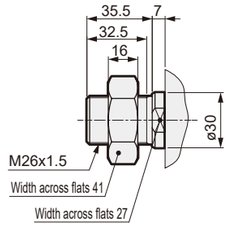
Type B



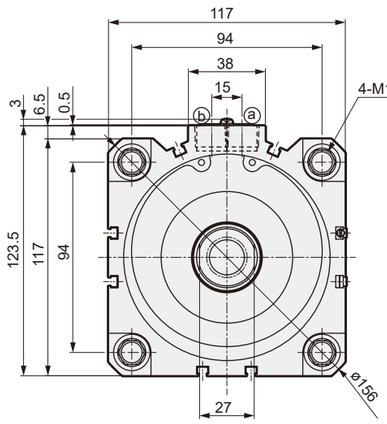
Type F

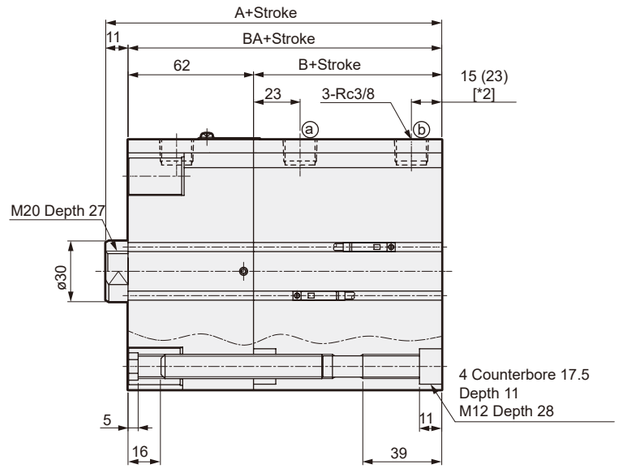


● Dimensions of Rod End male thread part



Note) The figure below is F type



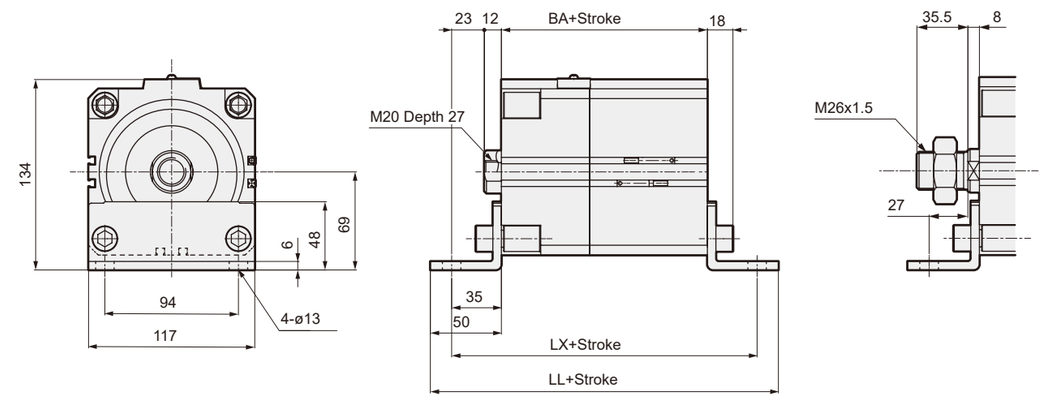


Code / Bore Size (mm)	Dimensions with Switch			Dimensions without Switch		
	A	B	BA	A	B	BA
ø100	146 (156)	73 (83)	135 (145)	136 (136)	63 (73)	125 (135)

*1: When calculating A+Stroke, B+Stroke, and BA+Stroke dimensions for intermediate strokes, do not use the intermediate stroke value but use the Standard Stroke value just above it. (Ex.) For intermediate stroke 7 mm, use Standard Stroke 10 mm for calculation.
*2: When the stroke exceeds 200, A, B, and BA dimensions are the values in ( ), and there is no counterbore in the mounting hole.
***3: For dimensions with each switch, please refer to P. 552 to 554.**

Dimensions (High Load Type Bore Size: ø100)

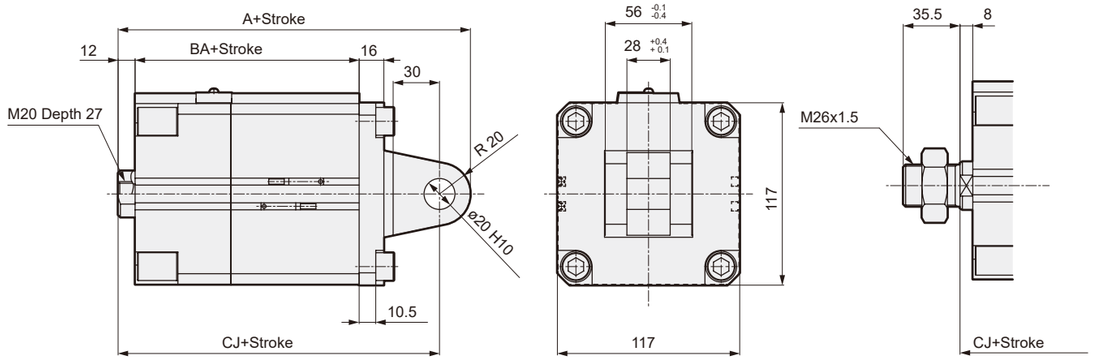
●Axial Foot Type (LB)



Code / Bore Size (mm)	With female thread					
	With switch			Without switch		
	BA	LL	LX	BA	LL	LX
ø100	135 (145)	235 (245)	205 (215)	125 (135)	225 (235)	195 (205)
Code / Bore Size (mm)	**With male thread**					
	With switch			Without switch		
	BA	LL	LX	BA	LL	LX
ø100	135 (145)	235 (245)	205 (215)	125 (135)	225 (235)	195 (205)

*1: When the stroke exceeds 200, BA, LL, and LX dimensions are the values in ( ).
*2: When calculating BA+Stroke, LL+Stroke, and LX+Stroke dimensions for intermediate strokes, do not use the intermediate stroke value but use the Standard Stroke value just above it. (Ex.) For intermediate stroke 7 mm, use Standard Stroke 10 mm for calculation.
***3: For dimensions with each switch, please refer to P. 552 to 554.**

●Double clevis type (CB)



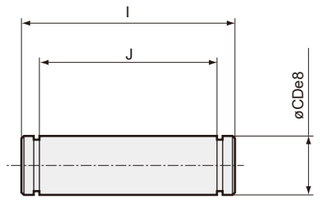
Code / Bore Size (mm)	With female thread					
	With switch			Without switch		
	A	BA	CJ	A	BA	CJ
ø100	219 (229)	135 (145)	199 (209)	209 (219)	125 (135)	189 (199)
Code / Bore Size (mm)	**With male thread**					
	With switch			Without switch		
	A	BA	CJ	A	BA	CJ
ø100	250.5 (260.5)	135 (145)	195 (205)	240.5 (250.5)	125 (135)	185 (195)

*1: When the stroke exceeds 200, A, BA, and CJ dimensions are the values in ( ).
*2: When calculating A+Stroke, BA+Stroke, and CJ+Stroke dimensions for intermediate strokes, do not use the intermediate stroke value but use the Standard Stroke value just above it. (Ex.) For intermediate stroke 7 mm, use Standard Stroke 10 mm for calculation.
***3: For dimensions with each switch, please refer to P. 552 to 554.**

Accessory External Dimensions

● Clevis bracket (CB) attached pin dimensions table

Material: Steel, Zinc Chromate



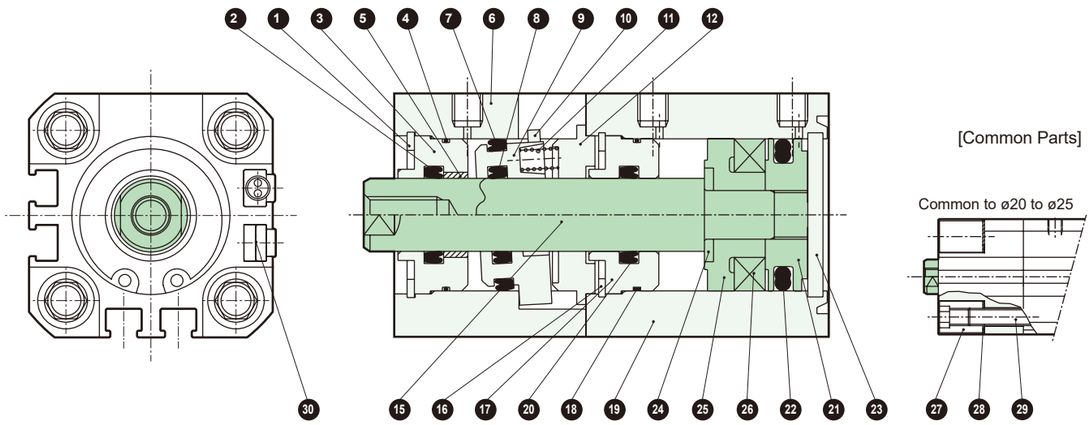
Model No.	Applicable Bore Size	I	J	CD	Weight (g)	Retaining Ring Used
SSD-P-20	ø20	25	20	10	17	E-type 9
SSD-P-25	ø25	27	22	12	25	E-type 9
SSD-P-32	ø32	27	22	12	25	E-type 9
SSD-P-40	ø40	43.5	36.2	12	39	C-type Retaining Ring for shaft 12
SSD-P-50	ø50	43.5	36.2	12	39	C-type Retaining Ring for shaft 12
SSD-P-63	ø63	47.5	40.2	14	58	C-type Retaining Ring for shaft 12
SSD-P-80	ø80	64	56.2	20	156	C-type Retaining Ring for shaft 20
SSD-P-100	ø100	64	56.2	20	156	C-type Retaining Ring for shaft 20

MEMO

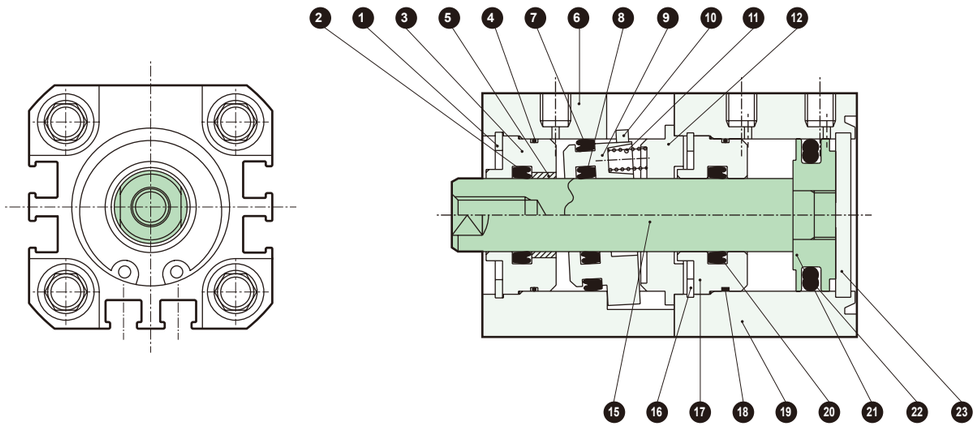
With Brake / With Lock
ULK□
JSK2/ JSM2
JSG
JSC3, JSC4
USSD
UFCD
USC
Cylinder Switch
Ending

Internal Structure / Materials (Bore Size: ø20, ø25)

● USSD-L-20, 25-F
(Double Acting, with switch, Forward Locking: F)



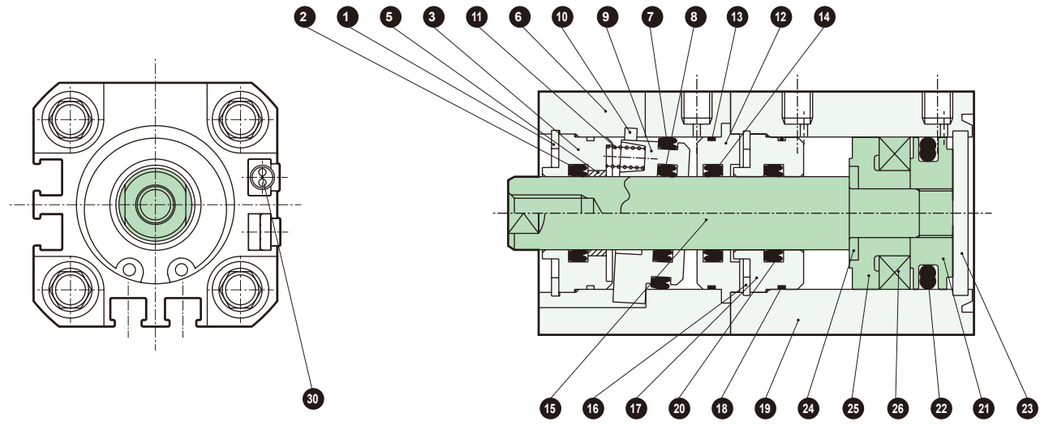
● USSD-20, 25-F
(Double Acting, Forward Locking: F)



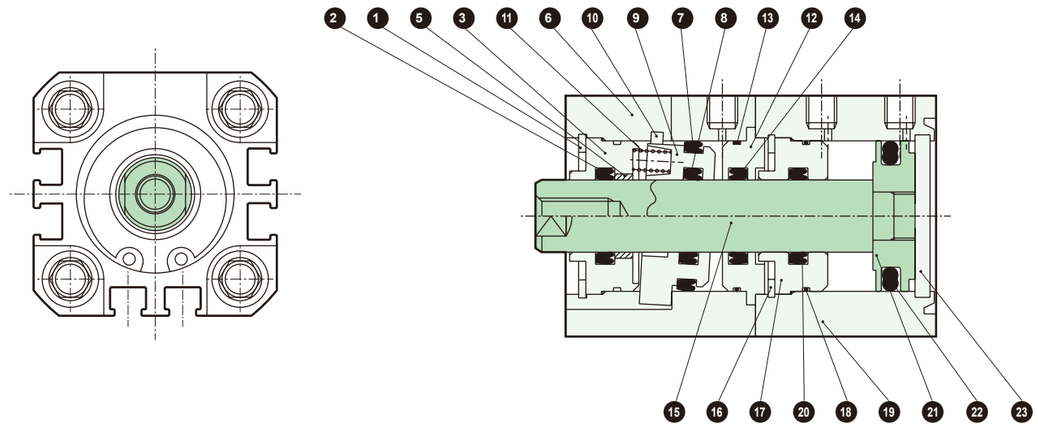
Do not disassemble

Internal Structure / Materials (Bore Size: ø20, ø25)

● USSD-L-20, 25-B
(Double Acting, with switch, Backward Locking: B)



● USSD-20, 25-B
(Double Acting, Backward Locking: B)



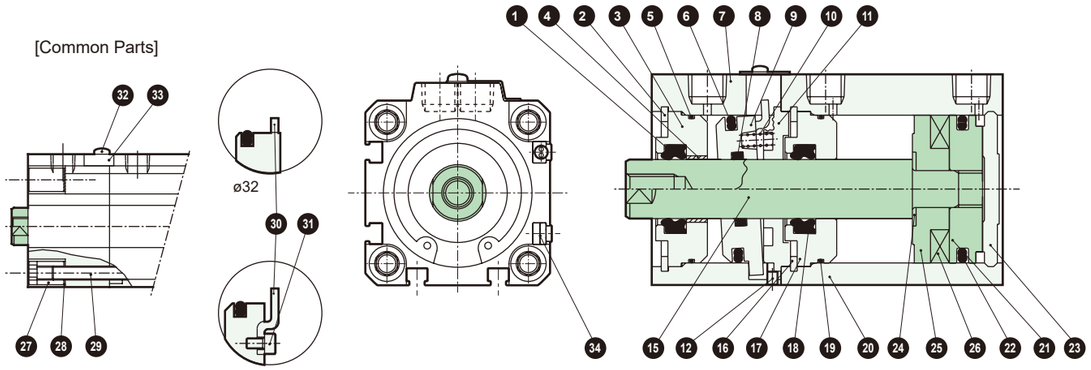
Do not disassemble

Part Number	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	C-type Retaining Ring (2)	Steel	Zinc Phosphate coating	17	Rod metal (1)	Aluminum Alloy	Alumite
2	Rod Packing (2)	Nitrile Rubber		18	Rod metal gasket (1)	Nitrile Rubber	
3	Rod metal (2)	Aluminum Alloy	Alumite	19	Cylinder Body	Aluminum Alloy	Hard Anodized
4	Rod metal gasket (2)	Nitrile Rubber		20	Rod Packing (1)	Nitrile Rubber	
5	Bush (2)	Bearing Alloy steel		21	Piston	Stainless Steel	
6	Lock body	Aluminum Alloy	Hard Anodized	22	Piston Packing (1)	Nitrile Rubber	
7	Piston Packing (2)	Nitrile Rubber		23	Cover	Stainless Steel	
8	Rod Packing (3)	Nitrile Rubber		24	Spacer washer	Stainless Steel	
9	Lock metal	Special Steel	Zinc Chromate	25	Spacer	Special resin	
10	Release lever	Steel	Black Oxide	26	Piston magnet	Plastic	
11	Spring	Piano Wire	Black Oxide	27	Round nut	Steel	Zinc Chromate
12	Joint	Aluminum Alloy		28	Belleville washer	Steel	Black Oxide
13	Rod metal gasket (3)	Nitrile Rubber	Type B only	29	Hexagon Socket Set Screw	Steel	Black Oxide
14	Rod Packing (4)	Nitrile Rubber	Type B only	With switch			
15	Piston Rod	Stainless Steel	Industrial Chrome Plating	30	Switch		
16	C-type Retaining Ring (1)	Steel	Zinc Phosphate coating				

Internal Structure / Materials (Bore Size: ø32 to ø50)

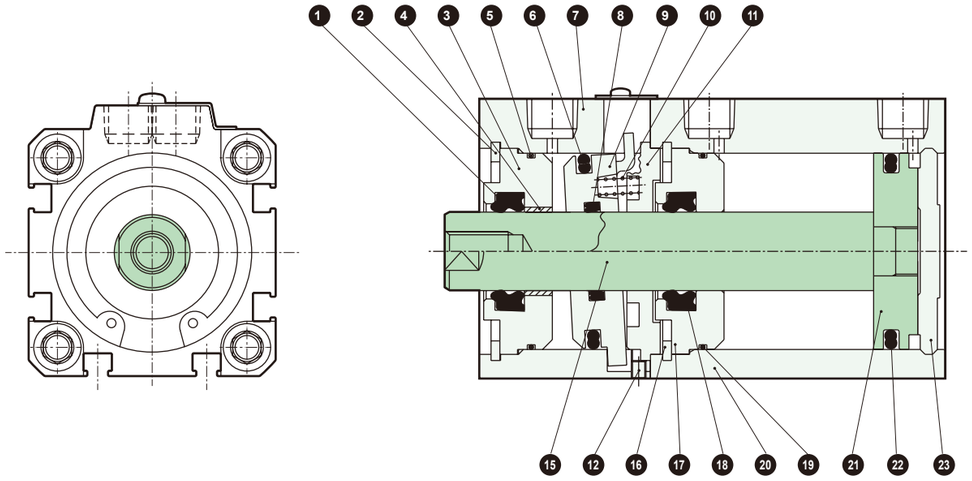
● USSD-L-32 to 50-F
(Double Acting, with switch, Forward Locking: F)

[Common Parts]



ø40, ø50
Release Lever Detail View

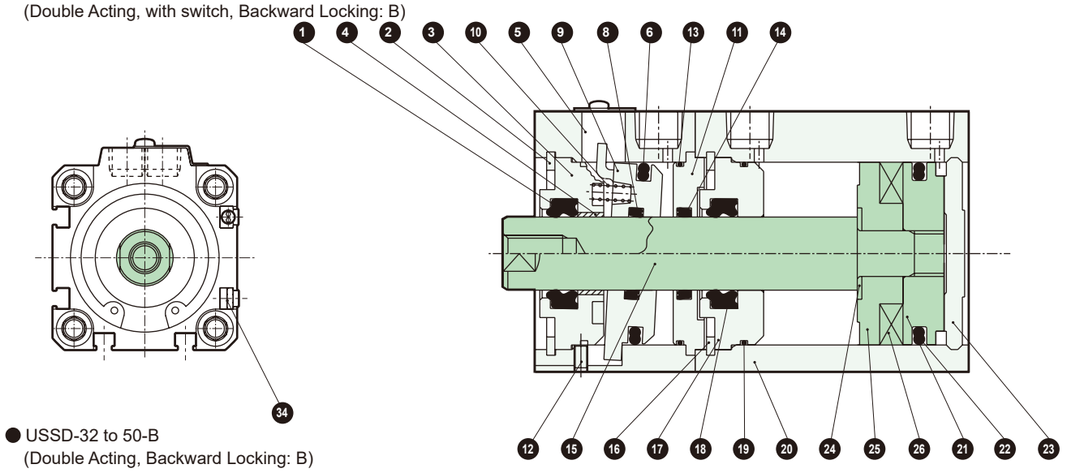
● USSD-32 to 50-F
(Double Acting, Forward Locking: F)



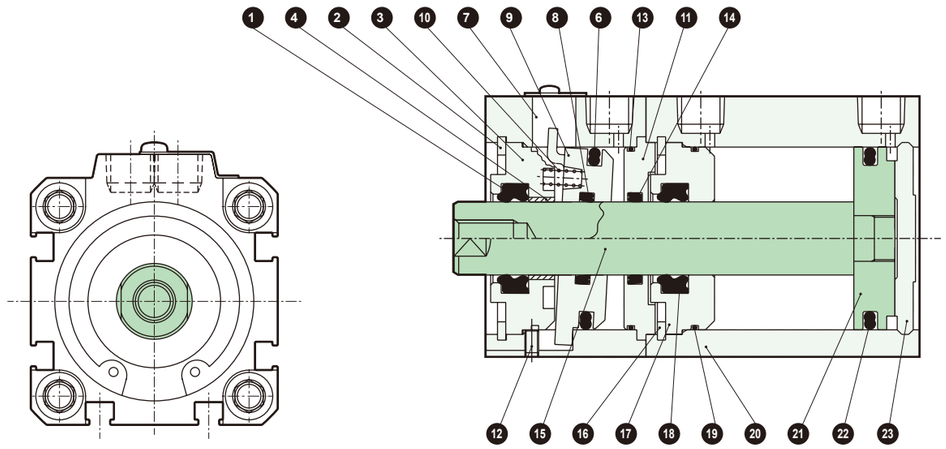
Do not disassemble

Internal Structure / Materials (Bore Size: ø32 to ø50)

● USSD-L-32 to 50-B
(Double Acting, with switch, Backward Locking: B)



● USSD-32 to 50-B
(Double Acting, Backward Locking: B)



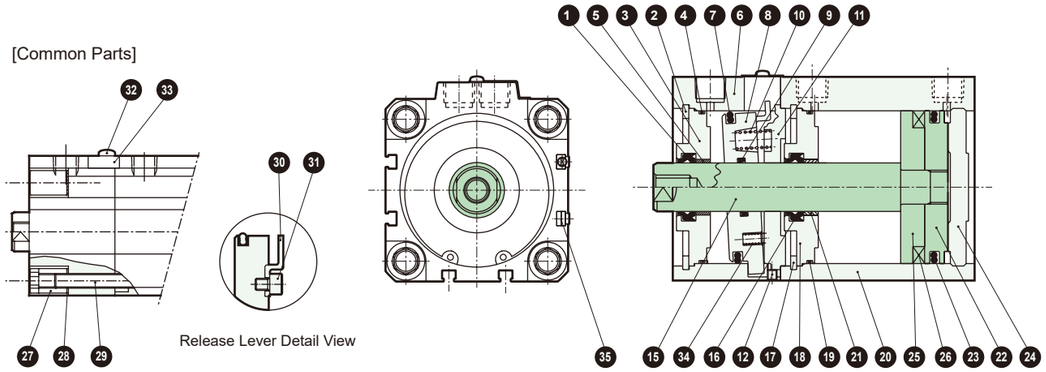
Do not disassemble

Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Rod Packing (2)	Nitrile Rubber		19	Rod metal gasket (1)	Nitrile Rubber	
2	C-type Retaining Ring (2)	Steel	Zinc Phosphate coating	20	Cylinder Body	Aluminum Alloy	Hard Anodized
3	Rod metal (2)	Aluminum Alloy	Alumite (Note)	21	Piston	Aluminum Alloy	
4	Bush (2)	Bearing Alloy		22	Piston Packing (1)	Nitrile Rubber	
5	Rod metal gasket (2)	Nitrile Rubber		23	Cover	Aluminum Alloy	
6	Piston Packing (2)	Nitrile Rubber		24	Spacer washer	Stainless Steel	
7	Lock body	Aluminum Alloy	Hard Alumite	25	Spacer	Special resin	
8	Rod Packing (3)	Nitrile Rubber		26	Piston magnet	Plastic	
9	Lock metal	Special Steel	Zinc Chromate	27	Round nut	Steel	Zinc Chromate
10	Spring	Piano Wire	Black Oxide	28	Belleville washer	Steel	Black Oxide
11	Joint	Aluminum Alloy		29	Hexagon Socket Set Screw	Steel	Black Oxide
12	Hexagon Socket Set Screw	Steel	Black Oxide (ø40 to ø50)	30	Release lever	Steel	ø32: Black Oxide ø40, ø50: Zinc Chromate
13	Rod metal gasket (3)	Nitrile Rubber	Type B only				
14	Rod Packing (4)	Nitrile Rubber	Type B only	31	Hexagon Socket Head Cap Screw	Steel	ø40, ø50 only
15	Piston Rod	Steel	Industrial Chrome Plating	32	Cross-Recessed round head machine screw	Steel	
16	C-type Retaining Ring (1)	Steel	Zinc Phosphate coating	33	Dust cover	Stainless Steel	
17	Rod metal (1)	Aluminum Alloy	Alumite	With switch			
18	Rod Packing (1)	Nitrile Rubber		34	Switch		

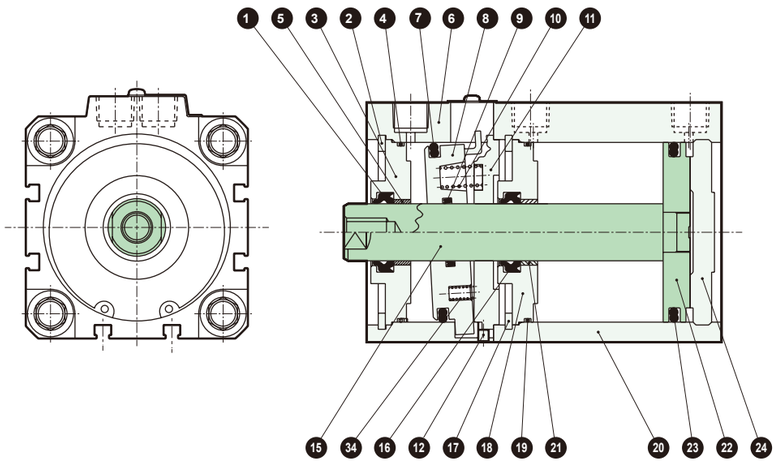
Note: In case of ø32 and lock direction F, surface treatment is chromate.

Internal Structure / Materials (Bore Size: ø63 to 100)

● USSD-L-63 to 100-F
(Double Acting, with switch, Forward Locking: F)



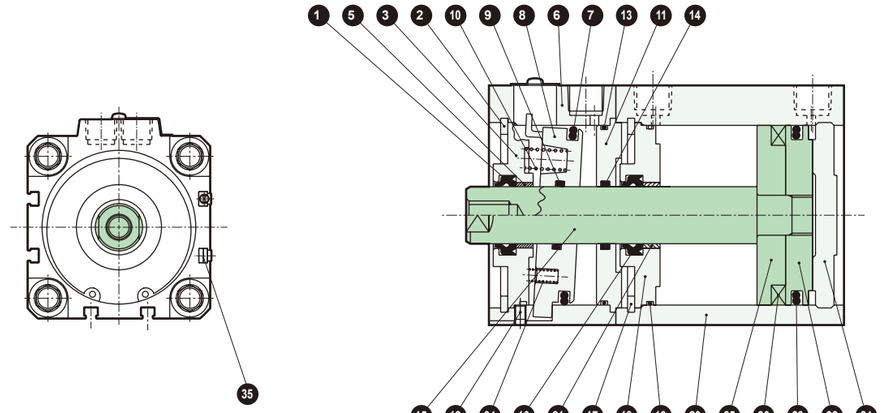
● USSD-63 to 100-F
(Double Acting, Forward Locking: F)



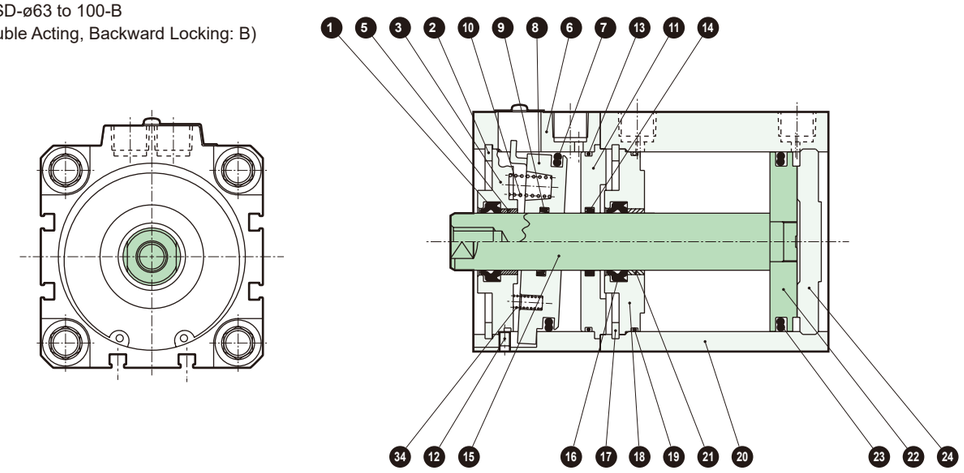
Do not disassemble

Internal Structure Drawing / Material (Bore Size: ø63 to 100)

● USSD-L-ø63 to 100-B
(Double Acting, with switch, Backward Locking: B)



● USSD-ø63 to 100-B
(Double Acting, Backward Locking: B)



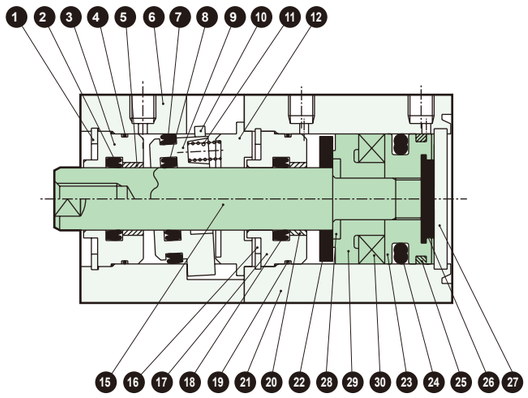
Do not disassemble

Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Rod Packing (2)	Nitrile Rubber		19	Rod metal gasket (1)	Nitrile Rubber	
2	C-type Retaining Ring (2)	Steel	Zinc Phosphate coating	20	Cylinder Body	Aluminum Alloy	Hard Anodized
3	Rod metal (2)	Aluminum Alloy	Alumite	21	Bush (1)	Bearing Alloy	
4	Rod metal gasket (2)	Nitrile Rubber		22	Piston	Aluminum Alloy	Chromate
5	Bush (2)	Bearing Alloy		23	Piston Packing (1)	Nitrile Rubber	
6	Lock body	Aluminum Alloy	Hard Anodized	24	Cover	Aluminum Alloy	Chromate
7	Piston Packing (2)	Nitrile Rubber		25	Spacer	Aluminum Alloy	Chromate
8	Lock metal	Special Steel	Zinc Chromate	26	Piston magnet	Plastic	
9	Rod Packing (3)	Nitrile Rubber		27	Round nut	Steel	Zinc Chromate
10	Spring (1)	Piano Wire	Black Oxide	28	Belleville washer	Steel	Black Oxide
11	Joint	Aluminum Alloy		29	Hexagon Socket Set Screw	Steel	Black Oxide
12	Hexagon Socket Set Screw	Steel	Black Oxide	30	Release lever	Steel	Zinc Chromate
13	Rod metal gasket (3)	Nitrile Rubber	Type B only	31	Hexagon Socket Head Cap Screw	Steel	Black Oxide
14	Rod Packing (4)	Nitrile Rubber	Type B only	32	Cross-Recessed round head machine screw	Steel	
15	Piston Rod	Steel	Industrial Chrome Plating	33	Dust cover	Stainless Steel	
16	Rod Packing (1)	Nitrile Rubber		34	Spring (2)	Piano Wire	Black Oxide (ø80, ø100 only)
17	C-type Retaining Ring (1)	Steel	Zinc Phosphate coating	With switch			
18	Rod metal (1)	Aluminum Alloy	Alumite	35	Switch		

Internal Structure Drawing / Material (High Load Type, Bore Size: ø20, ø25)

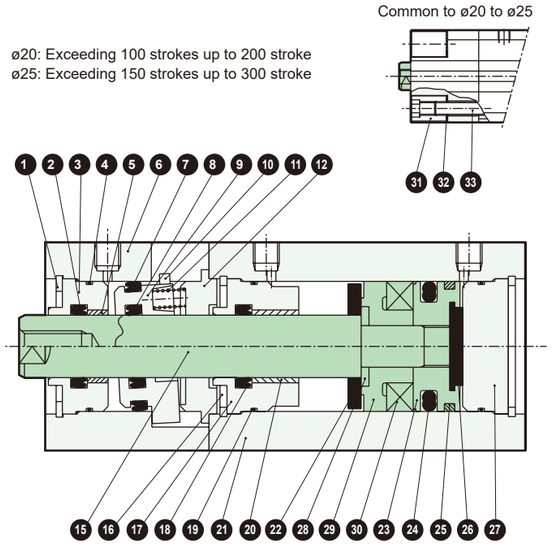
● USSD-KL-20, 25-F (Internal structure varies depending on stroke.)
(Double Acting/high load, with switch, Forward Locking: F)

ø20: 100 strokes or less
ø25: 150 strokes or less



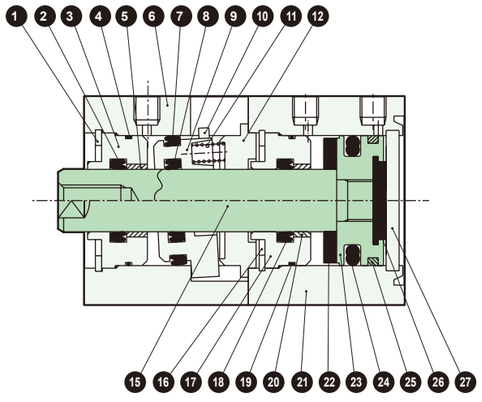
ø20: Exceeding 100 strokes up to 200 stroke
ø25: Exceeding 150 strokes up to 300 stroke

Common to ø20 to ø25

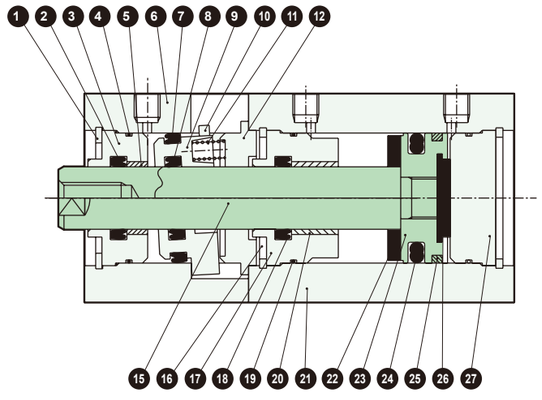


● USSD-K-20, 25-F (Internal structure varies depending on stroke.)
(Double Acting, high load, Forward Locking: F)

ø20: 100 strokes or less
ø25: 150 strokes or less



ø20: Exceeding 100 strokes up to 200 stroke
ø25: Exceeding 150 strokes up to 300 stroke

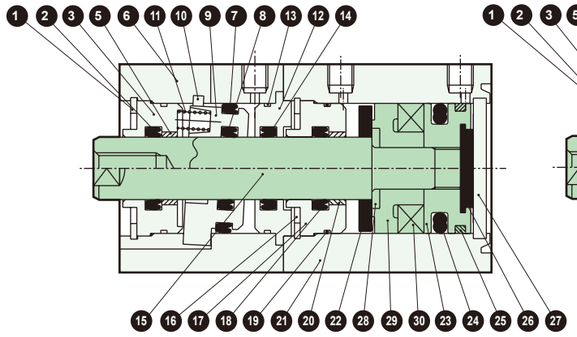


Do not disassemble

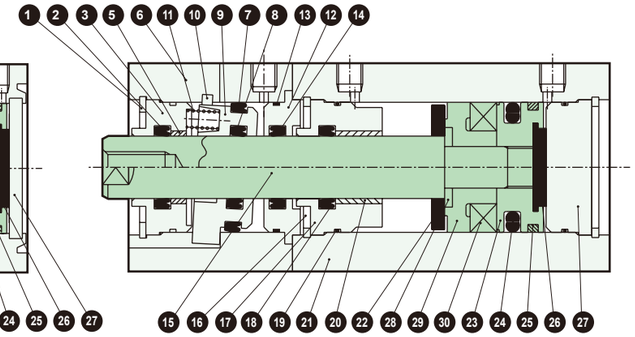
Internal Structure Drawing / Material (High Load Type, Bore Size: ø20, ø25)

● USSD-KL-20, 25-B (Internal structure varies depending on stroke.)
(Double Acting/high load, with switch, Backward Locking: B)

ø20: 100 strokes or less
ø25: 150 strokes or less

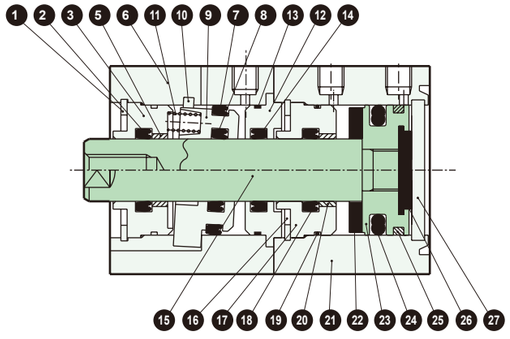


ø20: Exceeding 100 strokes up to 200 stroke
ø25: Exceeding 150 strokes up to 300 stroke

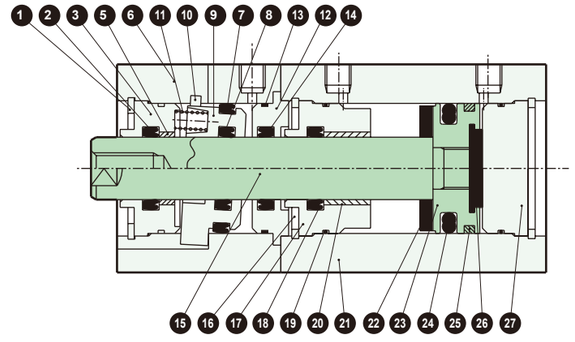


● USSD-K-20, 25-B (Internal structure varies depending on stroke.)
(Double Acting, high load, Backward Locking: B)

ø20: 100 strokes or less
ø25: 150 strokes or less



ø20: Exceeding 100 strokes up to 200 stroke
ø25: Exceeding 150 strokes up to 300 stroke



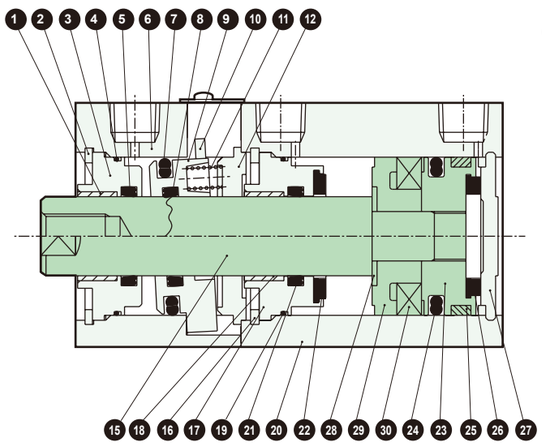
Do not disassemble

Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	C-type Retaining Ring (2)	Steel	Zinc Phosphate coating	18	Rod Packing (1)	Nitrile Rubber	
2	Rod Packing (2)	Nitrile Rubber		19	Rod metal gasket (1)	Nitrile Rubber	
3	Rod metal (2)	Aluminum Alloy	Alumite	20	Bush (1)	Bearing Alloy	
4	Rod metal gasket (2)	Nitrile Rubber		21	Cylinder Body	Aluminum Alloy	Hard Anodized
5	Bush (2)	Bearing Alloy		22	Cushion rubber (R)	Urethane Rubber	
6	Lock body	Aluminum Alloy	Hard Anodized	23	Piston	Stainless Steel	
7	Piston Packing (2)	Nitrile Rubber		24	Piston Packing (1)	Nitrile Rubber	
8	Rod Packing (3)	Nitrile Rubber		25	Wear ring	Polyacetal	
9	Lock metal	Special Steel	Zinc Chromate	26	Cushion rubber (H)	Urethane Rubber	
10	Release lever	Steel	Black Oxide	27	Cover	Stainless Steel	
11	Spring	Piano Wire	Black Oxide		Cover (Long stroke)	Aluminum Alloy	Alumite
12	Joint	Aluminum Alloy		28	Spacer washer	Stainless Steel	
13	Rod metal gasket (3)	Nitrile Rubber	Type B only	29	Spacer	Special resin	
14	Rod Packing (4)	Nitrile Rubber	Type B only	30	Piston magnet	Plastic	
15	Piston Rod	Stainless Steel	Industrial Chrome Plating	31	Round nut	Steel	Zinc Chromate
16	C-type Retaining Ring (1)	Steel	Zinc Phosphate coating	32	Belleville washer	Steel	Black Oxide
17	Rod metal (1)	Aluminum Alloy	Alumite	33	Hexagon Socket Set Screw	Steel	Black Oxide

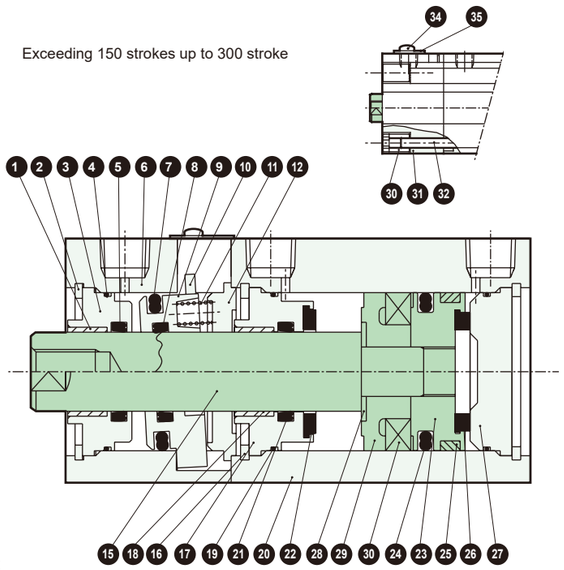
Internal Structure Drawing / Material (High Load Type, Bore Size: ø32)

● USSD-KL-32-F (Internal structure varies depending on stroke.)
(Double Acting/high load, with switch, Forward Locking: F)

150 strokes or less

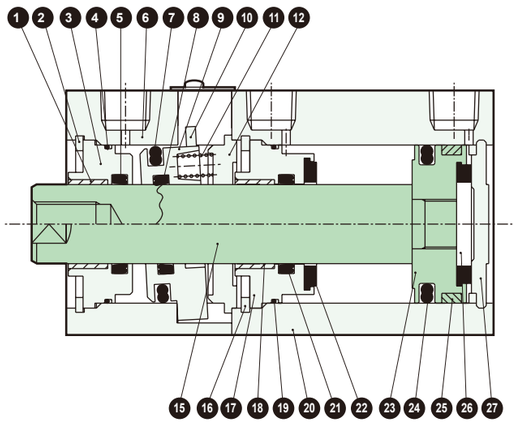


Exceeding 150 strokes up to 300 stroke

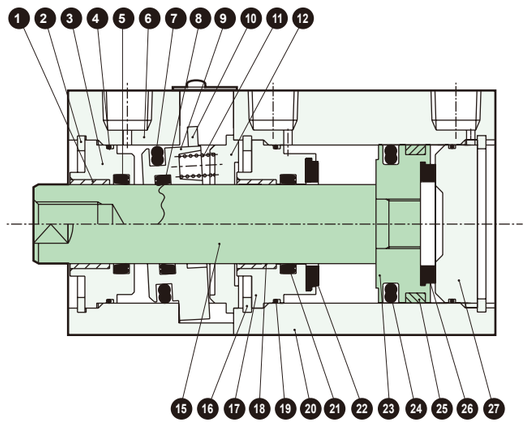


● USSD-K-32-F (Internal structure varies depending on stroke.)
(Double Acting, high load, Forward Locking: F)

150 strokes or less



Exceeding 150 strokes up to 300 stroke

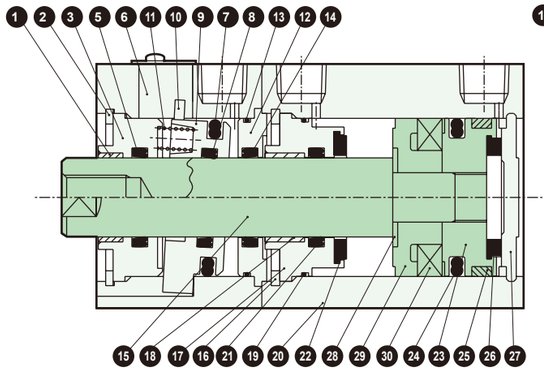


Do not disassemble

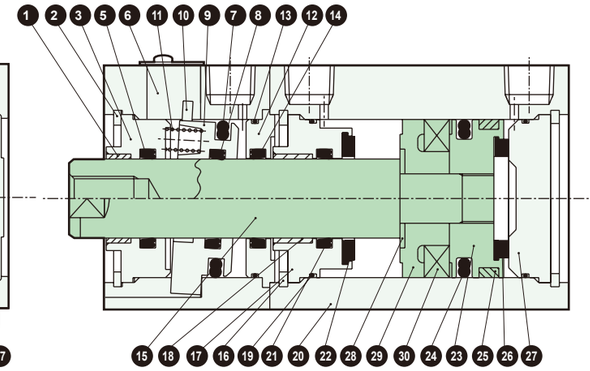
Internal Structure Drawing / Material (High Load Type, Bore Size: ø32)

● USSD-KL-32-B (Internal structure varies depending on stroke.)
(Double Acting/high load, with switch, Backward Locking: B)

150 strokes or less



Exceeding 150 strokes up to 300 stroke



● USSD-K-32-B (Internal structure varies depending on stroke.)
(Double Acting, high load, Backward Locking: B)

150 strokes or less

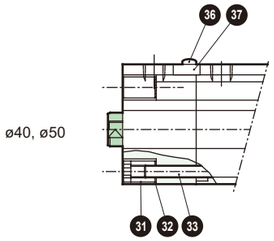
Exceeding 150 strokes up to 300 stroke

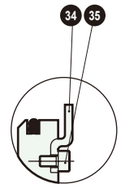
Do not disassemble

Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Bush (2)	Bearing Alloy		19	Rod metal gasket (1)	Nitrile Rubber	
2	C-type Retaining Ring (2)	Steel	Zinc Phosphate coating	20	Cylinder Body	Aluminum Alloy	Hard Anodized
3	Rod metal (2)	Aluminum Alloy	Type B Alumite Type F Chromate	21	Rod Packing (1)	Nitrile Rubber	
				22	Cushion rubber (R)	Urethane Rubber	
4	Rod metal gasket (2)	Nitrile Rubber		23	Piston	Stainless Steel	
5	Rod Packing (2)	Nitrile Rubber		24	Piston Packing (1)	Nitrile Rubber	
6	Lock body	Aluminum Alloy	Hard Alumite	25	Wear ring	Polyacetal	
7	Piston Packing (2)	Nitrile Rubber		26	Cushion rubber (H)	Urethane Rubber	
8	Rod Packing (3)	Nitrile Rubber		27	Cover	Aluminum Alloy	Alumite
9	Lock metal	Special Steel	Zinc Chromate		Cover (Long stroke)	Aluminum Alloy	Chromate
10	Release lever	Steel	Black Oxide	28	Spacer washer	Stainless Steel	
11	Spring	Steel	Black Oxide	29	Spacer	Special resin	
12	Joint	Aluminum Alloy		30	Piston magnet	Plastic	
13	Rod metal gasket (3)	Nitrile Rubber	Type B only	31	Round nut	Steel	Zinc Chromate
14	Rod Packing (4)	Nitrile Rubber	Type B only	32	Belleville washer	Steel	Black Oxide
15	Piston Rod	Stainless Steel	Industrial Chrome Plating	33	Hexagon Socket Set Screw	Steel	Black Oxide
16	C-type Retaining Ring (1)	Steel	Zinc Phosphate coating	34	Cross-Recessed round head machine screw	Steel	
17	Rod metal (1)	Aluminum Alloy	Chromate	35	Dust cover	Stainless Steel	
18	Bush (1)	Bearing Alloy					

Internal Structure Drawing / Material (High Load Type, Bore Size: ø40, ø50)

[Common Parts]

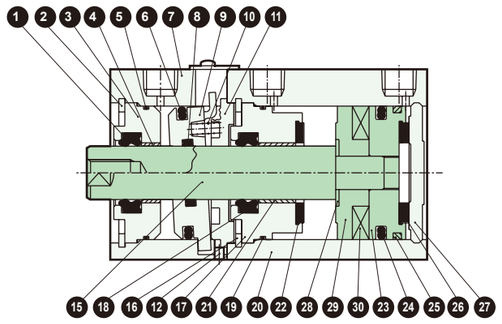




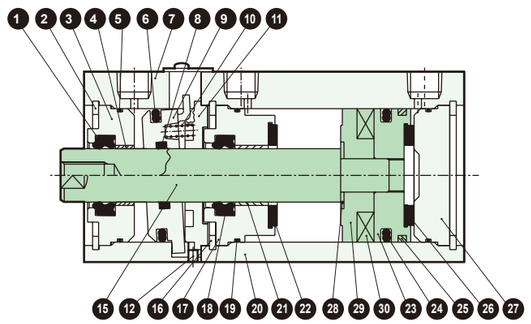
Release Lever Detail View

● USSD-KL-40, 50-F (Internal structure varies depending on stroke.)
(Double Acting/high load, with switch, Forward Locking: F)

ø40, ø50: 150 stroke or less

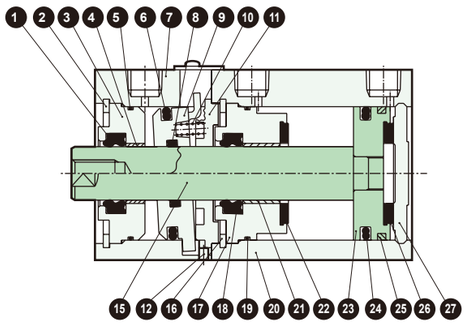


ø40, ø50: Exceeding 150 strokes, up to 300 stroke

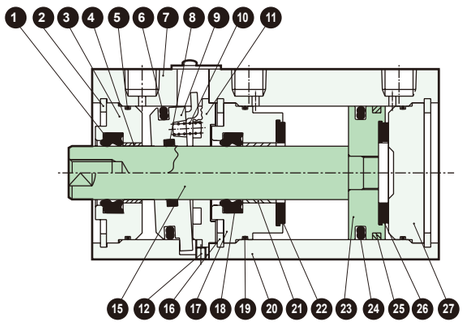


● USSD-K-40, 50-F (Internal structure varies depending on stroke.)
(Double Acting, high load, Forward Locking: F)

ø40, ø50: 150 stroke or less



ø40, ø50: Exceeding 150 strokes, up to 300 stroke

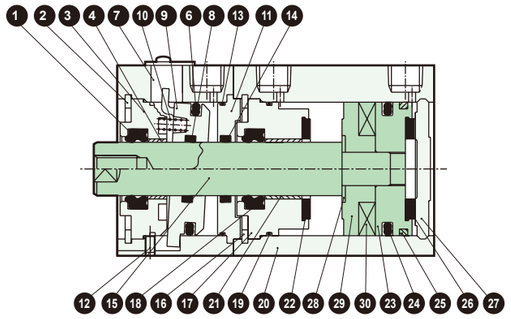


Do not disassemble

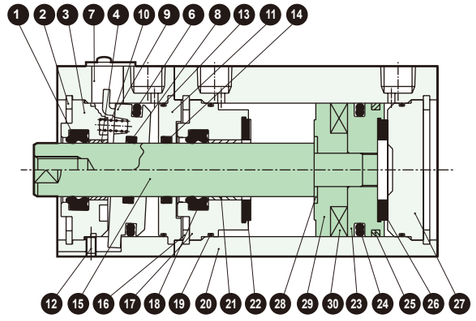
Internal Structure Drawing / Material (High Load Type, Bore Size: ø40, ø50)

● USSD-KL-40, 50-B (Internal structure varies depending on stroke.)
(Double Acting/high load, with switch, Backward Locking: B)

ø40, ø50: 150 stroke or less



Exceeding 150 strokes up to 300 stroke



● USSD-K-40, 50-B (Internal structure varies depending on stroke.)
(Double Acting, high load, Backward Locking: B)

ø40, ø50: 150 stroke or less

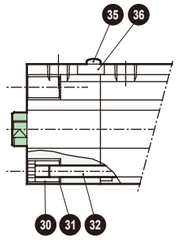
Exceeding 150 strokes up to 300 stroke

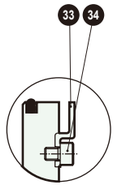
Do not disassemble

Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Rod Packing (2)	Nitrile Rubber		20	Cylinder Body	Aluminum Alloy	Hard Anodized
2	C-type Retaining Ring (2)	Steel	Zinc Phosphate coating	21	Bush (1)	Bearing Alloy	
3	Rod metal (2)	Aluminum Alloy	Alumite	22	Cushion rubber (R)	Urethane Rubber	
4	Bush (2)	Bearing Alloy		23	Piston	Aluminum Alloy	
5	Rod metal gasket (2)	Nitrile Rubber		24	Piston Packing (1)	Nitrile Rubber	
6	Piston Packing (2)	Nitrile Rubber		25	Wear ring	Polyacetal	
7	Lock body	Aluminum Alloy	Hard Anodized	26	Cushion rubber (H)	Urethane Rubber	
8	Rod Packing (3)	Nitrile Rubber		27	Cover	Aluminum Alloy	Alumite
9	Lock metal	Special Steel	Zinc Chromate		Cover (Long stroke)	Aluminum Alloy	Chromate
10	Spring	Piano Wire	Black Oxide	28	Spacer washer	Stainless Steel	
11	Joint	Aluminum Alloy		29	Spacer	Special resin	
12	Hexagon Socket Set Screw	Steel	Black Oxide	30	Piston magnet	Plastic	
13	Rod metal gasket (3)	Nitrile Rubber	Type B only	31	Round nut	Steel	Zinc Chromate
14	Rod Packing (4)	Nitrile Rubber	Type B only	32	Belleville washer	Steel	Black Oxide
15	Piston Rod	Steel	Industrial Chrome Plating	33	Hexagon Socket Set Screw	Steel	Black Oxide
16	C-type Retaining Ring (1)	Steel	Zinc Phosphate coating	34	Release lever	Steel	Zinc Chromate
17	Rod metal (1)	Aluminum Alloy	Chromate	35	Hexagon Socket Head Cap Screw	Steel	Black Oxide
18	Rod Packing (1)	Nitrile Rubber		36	Cross-Recessed round head machine screw	Steel	
19	Rod metal gasket (1)	Nitrile Rubber		37	Dust cover	Stainless Steel	

Internal Structure Drawing / Material (High Load Type, Bore Size: ø63 to ø100)

[Common Parts]

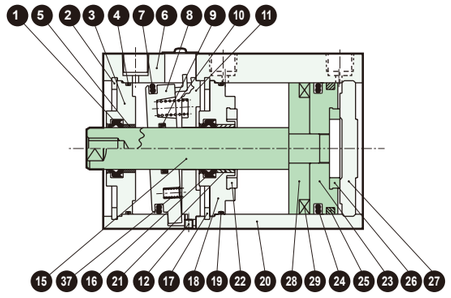




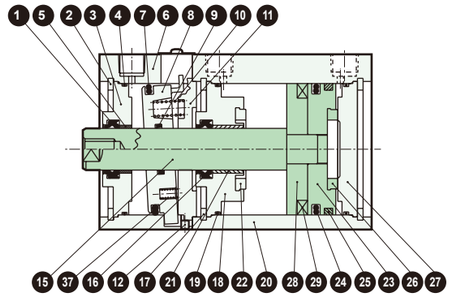
Release Lever Detail View

● USSD-KL-63 to 100-F (Internal structure varies depending on stroke.)
(Double Acting/high load, with switch, Forward Locking: F)

200 strokes or less

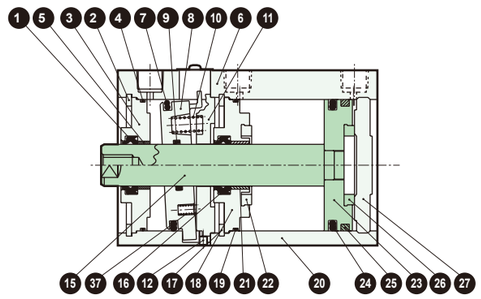


Exceeding 200 strokes up to 300 stroke

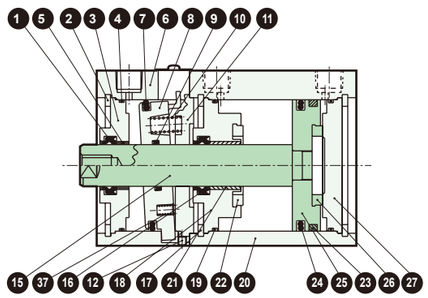


● USSD-K-63 to 100-F (Internal structure varies depending on stroke.)
(Double Acting, high load, Forward Locking: F)

200 strokes or less



Exceeding 200 strokes up to 300 stroke

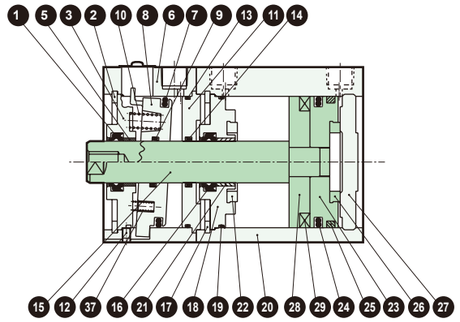


Do not disassemble

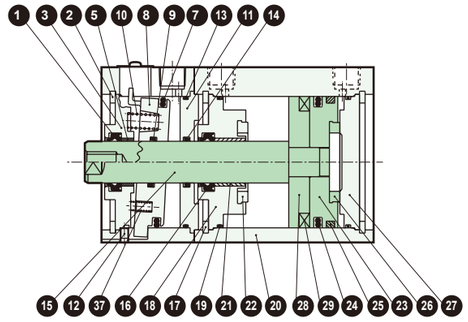
Internal Structure Drawing / Material (High Load Type, Bore Size: ø63 to ø100)

● USSD-KL-63 to 100-B (Internal structure varies depending on stroke.)
(Double Acting/high load, with switch, Backward Locking: B)

200 strokes or less

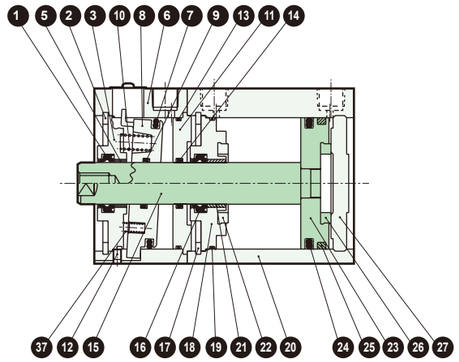


Exceeding 200 strokes up to 300 stroke

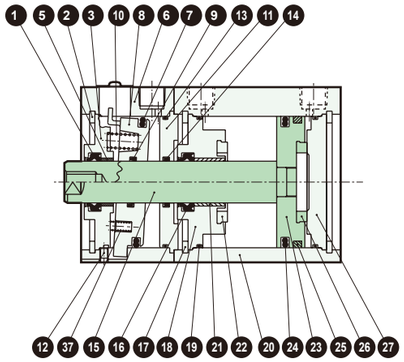


● USSD-K-63 to 100-B (Internal structure varies depending on stroke.)
(Double Acting, high load, Backward Locking: B)

200 strokes or less



Exceeding 200 strokes up to 300 stroke



Do not disassemble

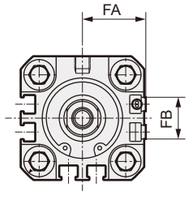
Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Rod Packing (2)	Nitrile Rubber		20	Cylinder Body	Aluminum Alloy	Hard Anodized
2	C-type Retaining Ring (2)	Steel	Zinc Phosphate coating	21	Bush (1)	Bearing Alloy	
3	Rod metal (2)	Aluminum Alloy	Alumite	22	Cushion rubber (R)	Urethane Rubber	
4	Rod metal gasket (2)	Nitrile Rubber		23	Piston	Aluminum Alloy	Chromate
5	Bush (2)	Bearing Alloy		24	Piston Packing (1)	Nitrile Rubber	
6	Lock body	Aluminum Alloy	Hard Alumite	25	Wear ring	Polyacetal	
7	Piston Packing (2)	Nitrile Rubber		26	Cushion rubber (H)	Urethane Rubber	
8	Lock metal	Special Steel	Zinc Chromate	27	Cover	Aluminum Alloy	Alumite
9	Rod Packing (3)	Nitrile Rubber			Cover (Long stroke)	Aluminum Alloy	Chromate
10	Spring (1)	Piano Wire	Black Oxide	28	Spacer	Aluminum Alloy	Chromate
11	Joint	Aluminum Alloy		29	Piston magnet	Plastic	
12	Hexagon Socket Set Screw	Steel	Black Oxide	30	Round nut	Steel	Zinc Chromate
13	Rod metal gasket (3)	Nitrile Rubber	Type B only	31	Belleville washer	Steel	Black Oxide
14	Rod Packing (4)	Nitrile Rubber	Type B only	32	Hexagon Socket Set Screw	Steel	Black Oxide
15	Piston Rod	Steel	Industrial Chrome Plating	33	Release lever	Steel	Zinc Chromate
16	Rod Packing (1)	Nitrile Rubber		34	Hexagon Socket Head Cap Screw	Steel	Black Oxide
17	C-type Retaining Ring (1)	Steel	Zinc Phosphate coating	35	Cross-Recessed round head machine screw	Steel	
18	Rod metal (1)	Aluminum Alloy	Alumite	36	Dust cover	Stainless Steel	
19	Rod metal gasket (1)	Nitrile Rubber		37	Spring (2)	Piano Wire	Black Oxide (ø80, ø100 only)

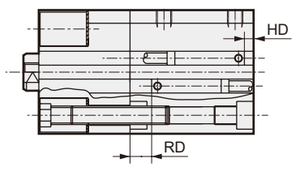
USSD Series Dimensions with Switch

● TOH/V,T5H/V,T2H/V,T3H/V,T3PH/V,T2WH/V,T3WH/V

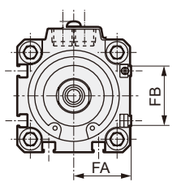
・USSD-L, USSD-KL

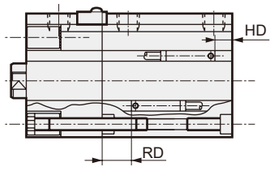
ø20 / ø25



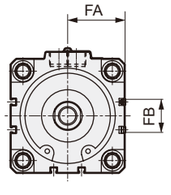


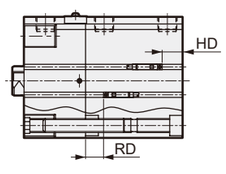
ø32 to ø63





ø80 to ø100





USSD-L

Code	Common Dimensions		T0, T5		T2, T3, T3P		T2W, T3W	
Bore Size (mm)	FA	FB	RD *1	HD *1	RD *1	HD *1	RD	HD
ø20	18.5	12.5	6.5	3	6.5	3	6.5	3
ø25	20.5	13.5	9.5	3	9.5	3	9.5	3
ø32	23	20.5	9	3.5	9	3.5	9	3.5
ø40	26.5	27.5	12.0	7.0	12.0	7.0	12.0	7.0
ø50	32.5	28.5	12.5	7.5	12.5	7.5	12.5	7.5
ø63	39	28.5	13.0	12.5	13.0	12.5	13.0	12.5
ø80	49.5	28.5	15.5	17.5	15.5	17.5	15.5	17.5
ø100	59	28.5	19.5	23	19.5	23	19.5	23

*1: HD and RD dimensions for 5 mm stroke differ from these dimensions due to individual settings.

USSD-KL

Code	Common Dimensions		T0, T5		T2, T3, T3P		T2W, T3W	
Bore Size (mm)	FA	FB	RD *1, *2	HD *1, *2	RD *1, *2	HD *1, *2	RD *1	HD *1
ø20	-	-	8.5 (13.5)	6.0 (12.5)	8.5 (13.5)	6 (12.5)	8.5 (13.5)	6 (12.5)
ø25	-	-	12 (17)	5.5 (14)	12 (17)	5.5 (14)	12 (17)	5.5 (14)
ø32	23	20.5	14 (14)	8.5 (16)	14 (14)	8.5 (16)	14 (14)	8.5 (16)
ø40	26.5	27.5	19.5 (19.5)	9.5 (19)	19.5 (19.5)	9.5 (19)	19.5 (19.5)	9.5 (19)
ø50	32.5	28.5	20 (25)	10 (19)	20 (25)	10 (19)	20 (25)	10 (19)
ø63	39	28.5	18 (23)	17.5 (23)	18 (23)	17.5 (23)	18 (23)	17.5 (23)
ø80	49.5	28.5	20.5 (25.5)	22 (28)	20.5 (25.5)	22.5 (28)	20.5 (25.5)	22.5 (28)
ø100	59	28.5	24.5 (29.5)	28 (33.5)	24.5 (29.5)	28 (33.5)	24.5 (29.5)	28 (33.5)

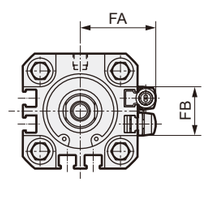
*1: For ø20: Over 100 stroke, ø25 to ø50: Over 150 stroke, and ø63 to ø100: Over 200 stroke, RD and HD dimensions are the values in ( ).
*2: HD and RD dimensions for 5 mm stroke are adjusted at shipment and differ from these dimensions.
*3: For switch mountability, refer to the model number notation of each variation.

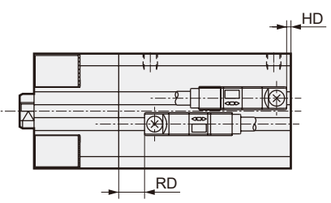
USSD Series Dimensions with Switch

● T2JH/V,T8H/V

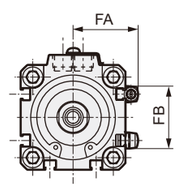
・USSD-L, USSD-KL

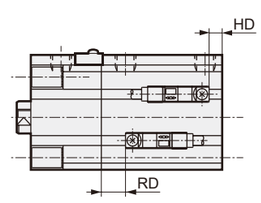
ø20 / ø25



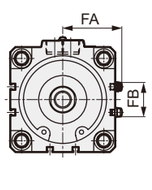


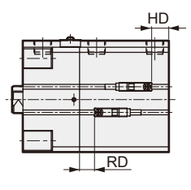
ø32 to ø63





ø80 to ø100





USSD-L

Code	Common Dimensions		T2J		T8	
Bore Size (mm)	FA	FB	RD	HD	RD	HD
ø20	24.3	16	5	1.5	–	–
ø25	26.3	17	8	1.5	–	–
ø32	28.8	24	7.5	2	–	–
ø40	32.3	31	10.5	5.5	6	1
ø50	38.3	32	11	6	6.5	1.5
ø63	44.8	32	11.5	11	7	6.5
ø80	55.3	32	14	16	9.5	11.5
ø100	64.8	32	18	21.5	13.5	7

USSD-KL

Code	Common Dimensions		T2J		T8	
Bore Size (mm)	FA	FB	RD	HD	RD	HD
ø20	24.3	16	7 (12)	4.5 (11)	2.5 (7.5)	0 (6.5)
ø25	26.3	17	10.5 (15.5)	4 (12.5)	6 (11)	0 (8)
ø32	28.8	24	12.5 (12.5)	8 (14.5)	8 (8)	3.5 (10)
ø40	32.3	31	18 (18)	8 (17.5)	13.5 (13.5)	3.5 (13)
ø50	38.3	32	18.5 (23.5)	8.5 (17.5)	14 (19)	4 (13)
ø63	44.8	32	16.5 (21.5)	16 (21.5)	12 (17)	11.5 (17)
ø80	55.3	32	19 (24)	20.5 (26.5)	14.5 (19.5)	16 (22)
ø100	64.8	32	23 (28)	26.5 (32)	18.5 (23.5)	22 (27.5)

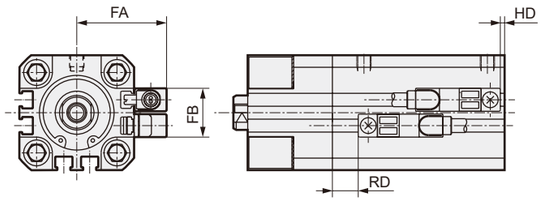
*1: For ø20: Over 100 stroke, ø25 to ø50: Over 150 stroke, and ø63 to ø100: Over 200 stroke, RD and HD dimensions are the values in ( ).
*2: For switch mountability, refer to the model number notation of each variation.

USSD Series Dimensions with Switch

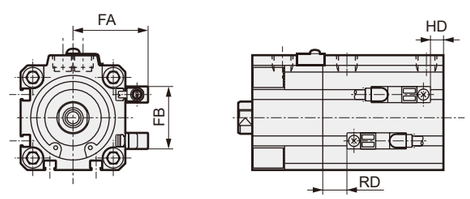
● T1H/V

• USSD-L, USSD-KL

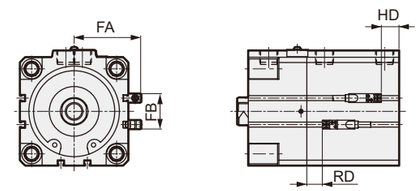
ø20 / ø25



ø32 to ø63



ø80 to ø100



USSD-L

Code / Bore Size (mm)	FA	FB	RD	HD	RD	HD
ø20	29.3	16	5	1.5	-	-
ø25	31.3	17	8	1.5	-	-
ø32	33.8	24	7.5	2	-	-
ø40	37.3	31	10.5	5.5	-	-
ø50	43.3	32	11	6	-	-
ø63	49.8	32	11.5	11	-	-
ø80	60.3	32	14	16	14	16
ø100	69.8	32	18	21.5	18	21.5

USSD-KL

Code / Bore Size (mm)	FA	FB	RD	HD
ø20	29.3	16	7 (12)	4.5 (11)
ø25	31.3	17	10.5 (15.5)	4 (12.5)
ø32	33.8	24	12.5 (12.5)	8 (14.5)
ø40	37.3	31	18 (18)	8 (17.5)
ø50	43.3	32	18.5 (23.5)	8.5 (17.5)
ø63	49.8	32	16.5 (21.5)	16 (21.5)
ø80	60.3	32	19 (24)	20.5 (26.5)
ø100	69.8	32	23 (28)	26.5 (32)

*1: For ø20: Over 100 stroke, ø25 to ø50: Over 150 stroke, and ø63 to ø100: Over 200 stroke, RD and HD dimensions are the values in ( ).
*2: For switch mountability, refer to the model number notation of each variation.

MEMO

With Brake / With Lock
ULK□
JSK2/ JSM2
JSG
JSC3, JSC4
USSD
UFCD
USC
Cylinder Switch
Ending

Custom-made

With 2 Rod Nuts (-A2)

Content: Shipped with 2 rod nuts, same as standard.

Model No. Notation

Model Number

Please refer to the USSD series model number notation method.

* Since the Piston Rod tip shape is standard female thread, be sure to include the "N" code.

Dimensions

Same as standard type except that 2 rod nuts are included.

MEMO

With Brake / With Lock
ULK□
JSK2/ JSM2
JSG
JSC3, JSC4
USSD
UFCD
USC
Cylinder Switch
Ending

To Use This Product Safely

Be sure to read this before use. For general cylinder information, see Intro 41, and for cylinder switches, see P. 1512.

Individual Precautions: Super Compact Cylinder with Fall Prevention USSD Series

Design / Selection

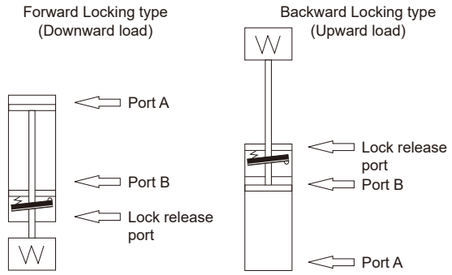
Warning

■ This cylinder is equipped with a fall prevention (holding of cylinder stationary state) mechanism. If used for emergency stop or urgent stop (stopping from cylinder operating state), the service life will be significantly reduced.

■ If back pressure is applied during locking, the lock may disengage. Therefore, use a standalone valve or an individual exhaust type manifold.

■ As holding force will decrease and it is dangerous, do not apply rotational force (torque) to the rod when the lock is activated. Also, use with a mechanism that prevents rod rotation.

■ When releasing the lock, always supply pressure to port B for forward direction lock type and port A for reverse direction lock type, ensuring no load is on the lock mechanism before releasing the lock. If pressure is supplied to port A for Forward Locking type or port B for Backward Locking type while both ports A and B are exhausted and the piston is locked, the lock may not release, or even if released, the Piston rod may extend suddenly, which is very dangerous.



■ Do not use multiple synchronized cylinders with position locking. If a synchronization error occurs, excessive moment load or load concentration may occur on the cylinder that locked first, potentially causing lock release failure, reduced lifespan, or damage.

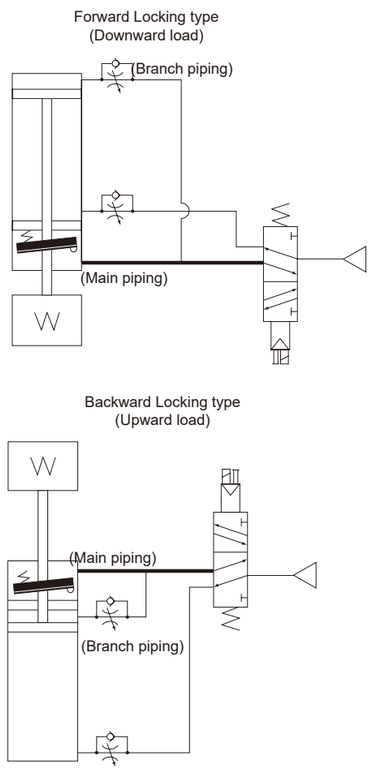
CAUTION

■ Basic Circuit Diagram

Configure the air piping for this cylinder as shown below. Piping to the fall prevention unit alone or piping different from the figure below may cause problems such as response delay.

1. Be sure to branch the piping after the valve as shown below, and pipe to the fall prevention unit (lock release port as main piping) and cylinder unit (cylinder port as branch piping).

2. If cylinder operation is faster than lock release, the lock may not release or the Piston rod may extend suddenly, so design the piping so that lock release is faster than cylinder operation.



If emergency stop or urgent stop is performed with the air piping shown above, the Forward Locking type will continue to retract and the Backward Locking type will continue to extend, returning to the origin position. (If residual pressure is gone, it will stop at that position.)

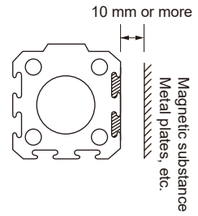
Warning

■ Applying rotational force (torque) to the Piston Rod will reduce holding force, so do not use in a way that applies rotational force.

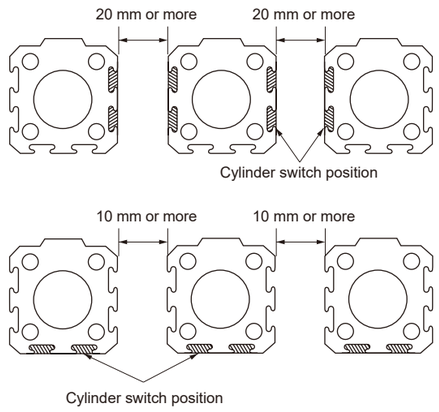
CAUTION

■ The main piping in the basic circuit diagram on the previous P. should be thicker and shorter than the branch piping.

■ If there is a magnetic material such as an iron plate near the cylinder switch, it may cause a malfunction. Therefore, maintain a distance of 10 mm or more from the cylinder surface.
(Common to all Bore Sizes)

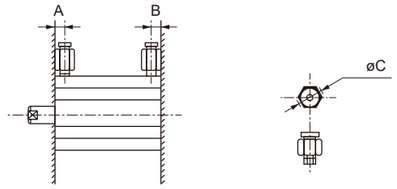


■ If cylinders are adjacent, it may cause cylinder switch malfunction. Therefore, maintain the following distance from the cylinder surface.
(Common to all Bore Sizes)



■ When using multiple cylinders in synchronization, always provide a separate guide. Using only the cylinder may impair synchronicity and cause the rod to twist, leading to malfunctions.

■ There are restrictions on usable piping fittings, so please refer to the following and use accordingly.



Item / Bore Size (mm)	Port Size	Port position dimension A	Port position dimension B	Usable fittings	Fitting O.D. øC	Unusable fittings
ø20	M5x0.8	10	5.5	SC3W-M5-4 SC3W-M5-6 GWS4-M5-S GWS4-M5 GWL4-M5 GWL6-M5	ø11 or less	GWS6-M5
ø25		12	6			
ø32	Rc1/8	12	8	SC3W-6-4/6/8 GWS4-6 GWS6-6 GWS8-6 GWL4-6 GWL6-6	ø15 or less	GWS10-6 GWL8-6 GWL10-6
ø40		15	8.5			
ø50	Rc1/4	15	10.5	SC3W-8-6/8/10 GWS4-8 GWS6-8 GWS10-8 GWL4 to 12-8	ø21 or less	GWS12-8
ø63		15.5	11			
ø80	Rc3/8	16	13	SC3W-10-6/8/10 GWS6-10 GWS8-10 GWS10-10 GWL6 to 12-10	ø21 or less	---
ø100		23	15			

CAUTION

■ After using in the unlocked state for a long time, if you try to lock it, a response delay in locking may occur. Do not leave the lock part pressurized; operate the lock part with each cylinder operation. (Please use the basic circuit diagram on P. 558)

■ If the cylinder is held with pressure applied to the lock mechanism, the lock may be released. Do not use 3-position closed-center and 3-position P·A·B connection solenoid valves.

■ Due to the structure, a drop of about 1 mm (Piston Rod movement) occurs during locking.

■ Operating units with excessive inertia, etc., will cause damage to the Cylinder Body and malfunction. Therefore, always use within the allowable absorbed energy range.

During Use

⚠Warning

■ As holding force will decrease and it is dangerous, do not apply grease to the Piston Rod.

■ The brake unit is coated with the necessary amount of grease, so avoid applying more grease and do not wipe off the grease.

■ Never disassemble.

■ As it may cause a malfunctions, always use with the dust cover included, except during manual release operation.

■ When used in vertical mounting, etc., if there is no air pressure, holding force will be lost during manual release operation, and the rod may move (descend) due to the load's own weight, etc. Please be careful. In that case, for safety, perform the following preparations before manual release.

- Move the load to the lower end.
- Provide a stopper for the load
- Apply air pressure to the cylinder to balance the load.

For precautions during mounting, installation, adjustment, use, and maintenance, refer to "During Use" in this catalog and the CKD Components Product website (https://www.ckd.co.jp/kiki/en/) -> "Model No." -> Instruction Manual.

MEMO

With Brake / With Lock
ULK□
JSK2/ JSM2
JSG
JSC3, JSC4
USSD
UFCD
USC
Cylinder Switch
Ending

With Brake with Lock

UFCD

Flat Cylinder with Free Position Fall Prevention

ø25, ø32, ø40, ø50, ø63

CONTENTS

Product Introduction 564
Series System Chart 565
●Double Acting / Single Rod Type (UFCD-KL) 566
External Dimensions Diagram with Switch 578
⚠Precautions for Use 580

With Brake / With Lock

ULK□

JSK2/
JSM2

JSG

JSC3,
JSC4

USSD

UFCD

USC

Cylinder
Switch

Ending

Free position locking Flat Cylinder

UFCD Series

Improved safety with free position fall prevention added to Flat Cylinder FCD series

Safety

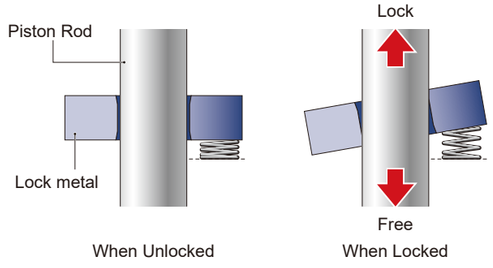
Ensures safety of workpieces etc. even during power outages or accidents.

Energy Saving

No power (electricity, air, etc.) is required while braking/locking.

Equipped with Free Position Fall Prevention Mechanism

- Can be locked at any position as long as the Piston Rod remains still.
- The direction of the lock can either be forward or backward.
- Easy to remove even with workpiece clamped as the cylinder moves freely in the reverse lock direction.



Space-saving / Simple Design

- Flat and can be installed in a tight space or arranged side-by-side.
- Even with its position locking mechanism, it has a simple design that can work with any device.

Anti-rotation not required

- Due to the oval piston structure, the Cylinder Body has a rotation-stop function. Therefore, a separate rotation-stop mechanism is not required.

UFCD Series Product System

Model Variations		Bore Size	Stroke (mm)	Lock Direction	Rod End
Flat Cylinder with Free Position Fall Prevention	UFCD	ø25 or equiv. to ø63 or equiv.	to 150	Forward Direction Lock Reverse Direction Lock	Female Thread Male thread

Variation Table

Flat Cylinder with Free Position Fall Prevention UFCD Series

●: Standard, ◎: Option

Variation	Model No.	Bore Size (mm)	Standard Stroke (mm) 5	10	15	20	25	30	40	50	Min Stroke (mm)	Intermediate Stroke (per mm)	Max Stroke (mm)	Option: Rod End male thread N	Switch	Page
Double Acting/ Single Rod Type	UFCD-KL	Equivalent to ø25, ø32 Equivalent to ø40, ø50, ø63	●	●	●	●	●	●	●	●	1	1	150	◎	◎	566

Flat Cylinder with Free Position Fall Prevention Double Acting / Single Rod Type

UFCD Series

● Bore Size: ø25, ø32, ø40, ø50, ø63 or equiv.

RoHS

Model No. Notation

Without switch
(Built-in magnet for switch)

UFCD-KL - 25 - [ ] - 10 - F ——— N

Model Number ❶ ❷ ❸ ❹ ❼

With switch
(Built-in magnet for switch)

UFCD-KL - 25 - [ ] - 10 - F - M2V - R - N

Model Number
❶Bore Size
❷Piping thread type
❸Stroke
❹Lock Direction
❺Switch Model
❻Number of Switches
❼Option

❶ Bore Size (mm)

Code	Content
25	Equivalent to ø25
32	Equivalent to ø32
40	Equivalent to ø40
50	Equivalent to ø50
63	Equivalent to ø63

❷Piping thread type

Code	Content
Blank	M5 (Equivalent to ø25, ø32)
	Rc thread (Equivalent to ø40 to ø63)
NN	NPT thread (Equivalent to ø40 or more) (Custom item)
GN	G thread (Equivalent to ø40 or more) (Custom item)

❸Stroke (mm)

Bore Size	Stroke	Intermediate Stroke
Equivalent to ø25 to ø63	1 to 150	in 1 mm increments

Note: For Standard Stroke and minimum stroke with switch, please refer to P. 568.

❹ Lock Direction

Code	Content	
F	Forward Direction Lock	
B	Reverse Direction Lock	

❺ Switch Model

For switch details, refer to P. 1457. Switches are pre-assembled on the product before shipment.

Contact	Indicator LED Special Function	Wiring (Output)	Load Voltage (V) AC	Load Voltage (V) DC	Load Current (mA) AC	Load Current (mA) DC	Lead wire *1 L-shape	
Solid State	1-Color	2-wire	—	10 to 30	-	5 to 30	M2V□	
		3-wire (NPN)	—	30 or less	—	100 or less	M3V□	
	1-color (Custom order)	3-wire (PNP)	—		-		M3PV□	
	2-color	2-wire	—	10 to 30	-	5 to 30	M2WV□	
		3-wire (NPN)	—	30 or less	—	100 or less	M3WV□	
Contact	1-Color	2-wire	110	12/24	7 to 20	5 to 50	M0V□	
	Without Indicator Lamp			5/12/24	20 or less	50 or less	M5V□	

*1: Insert the code selected in the "Lead wire length" table into "□" of the switch model number.

***Lead Wire Length**

Code	Content
Blank	1 m (Standard)
3	3 m (Option)
5	5m (Option)

Example) Lead wire length
1 m M0V
3 m M0V3
5 m M0V5

❻ Number of Switches

Code	Content
R	With 1 pc on rod side
H	With 1 pc on head side
D	With 2 pcs

❼ Option

Code	Content	
Blank	Rod End female thread	
N	Rod End male thread	

Switch Single Unit Model No. Notation

● Switch body+Mounting bracket set

FCS - M2V

❺ Switch Model

● Switch body only

SW - M2V

❺ Switch Model

● Mounting bracket set

FCS - M

Mounting bracket

Specifications

Item		UFCD-KL				
Bore Size	mm	Equivalent to ø25	Equivalent to ø32	Equivalent to ø40	Equivalent to ø50	Equivalent to ø63
Operation type		Double Acting Type				
Operating Fluid		Compressed Air				
Max Operating Pressure	MPa	0.7				
Min Operating Pressure	MPa	0.25 (36 psi)				
Proof Pressure	MPa	1.05				
Ambient Temperature	°C	-10 to 60 (No freezing)				
Port Size		M5		Rc1/8		Rc1/4
Stroke Tolerance	mm	$^{+1.5}_{0}$ (up to 50) + $^{+2.0}_{0}$ (up to 150)				
Operating Piston Speed	mm/s	50 to 500				
Cushion		Rubber Cushion				
Lubrication		Not required (When lubricating, use turbine oil Class 1 ISO VG32)				
Locking Force	N	345	543	904	1350	2220
Allowable Absorbed Energy	J	0.34	0.54	0.67	1.02	1.56

Non-rotation accuracy / Allowable rotational torque

Item		Equivalent to ø25	Equivalent to ø32	Equivalent to ø40	Equivalent to ø50	Equivalent to ø63
Non-rotation accuracy	*2	±1°	±0.8°	±0.5°	±0.5°	±0.5°
Allowable rotational torque	N·m	1	1.6	2.5	3.9	5.9

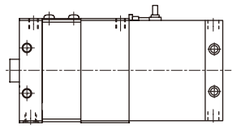
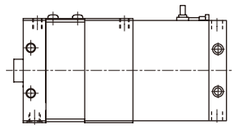
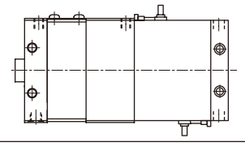
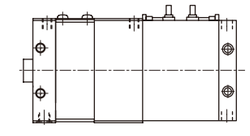
*1: Avoid use where rotational torque is applied impulsively or where the direction of torque load changes impulsively.
*2: The "non-rotation accuracy" value is the value when a torque load of 10% of the "allowable rotational torque" is applied to the tip of the Piston Rod.

Stroke

Model No.	Bore Size (mm)	Standard Stroke (mm)	Max Stroke (mm)	Min Stroke (mm)
UFCD-KL	ø25, ø32 ø40, ø50 Equivalent to ø63	5, 10, 15, 20, 25 30, 40, 50	150	1

*1: Intermediate strokes can be manufactured in 1 mm increments.
*2: The minimum stroke varies depending on the switch mounting method. Refer to the table below.

Minimum stroke with switch

With 1 pc		With 2 pcs	
Rod Side Mounting	Head Side Mounting	For different surface mounting	In case of same surface mounting
			
10 mm		15 mm	35 mm (Equivalent to ø25, 32, 40, 50) 30 mm (Equivalent to ø63)

Cylinder Weight

(Unit: g)

Bore Size (mm)	Product Weight when stroke (S) = 0 mm	Added Weight per S = 10 mm	Switch Weight	Mounting Bracket Weight
Equivalent to ø25	454	26	Please refer to the Weight listed in the switch specifications on P. 1457.	2
Equivalent to ø32	613	37		
Equivalent to ø40	1046	46		
Equivalent to ø50	1730	71		
Equivalent to ø63	3088	90		

(Example) Product Weight of UFCD-KL-32-20
- Product weight when S=0 mm ..... 613 g
- Additional weight when S=20 mm ..... $37g \times \frac{20}{10} = 74$ g
- Product weight ..... 613 g+74 g=687 g

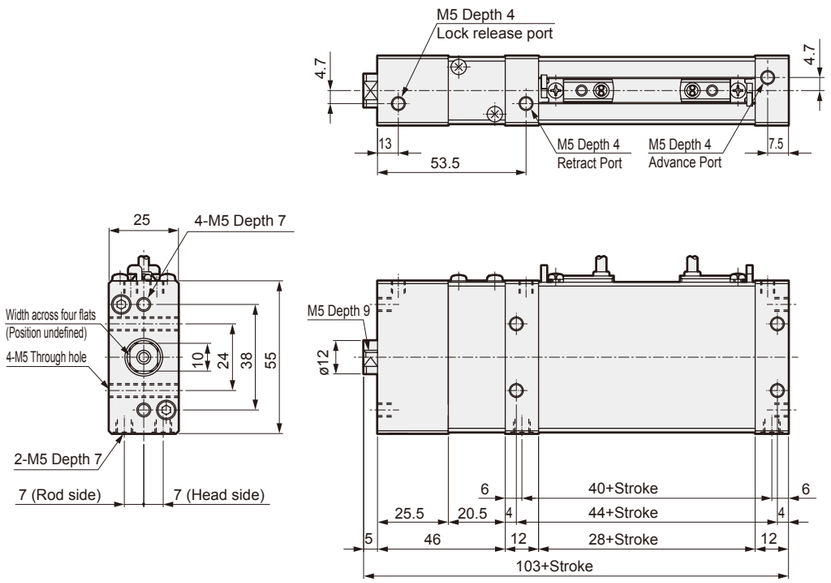
Theoretical Thrust Table

(Unit: N)

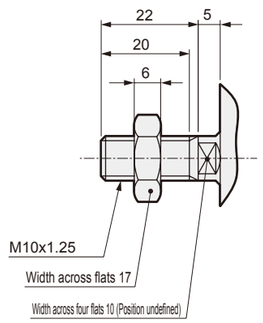
Bore Size (mm)	Operating Direction	Operating Pressure MPa 0.3	0.4	0.5	0.6	0.7
Equivalent to ø25	Push	1.48×10^2	1.97×10^2	2.46×10^2	2.96×10^2	3.45×10^2
	Pull	1.14×10^2	1.52×10^2	1.90×10^2	2.28×10^2	2.66×10^2
Equivalent to ø32	Push	2.33×10^2	3.10×10^2	3.88×10^2	4.66×10^2	5.43×10^2
	Pull	1.73×10^2	2.30×10^2	2.88×10^2	3.45×10^2	4.03×10^2
Equivalent to ø40	Push	3.87×10^2	5.16×10^2	6.45×10^2	7.75×10^2	9.04×10^2
	Pull	3.27×10^2	4.36×10^2	5.45×10^2	6.54×10^2	7.63×10^2
Equivalent to ø50	Push	5.80×10^2	7.73×10^2	9.66×10^2	1.16×10^3	1.35×10^3
	Pull	4.85×10^2	6.47×10^2	8.09×10^2	9.71×10^2	1.13×10^3
Equivalent to ø63	Push	9.53×10^2	1.27×10^3	1.59×10^3	1.91×10^3	2.22×10^3
	Pull	8.59×10^2	1.15×10^3	1.43×10^3	1.72×10^3	2.00×10^3

External dimensions diagram (Bore Size: Equivalent to ø25)

● UFCD-KL-25-F (Forward Locking)

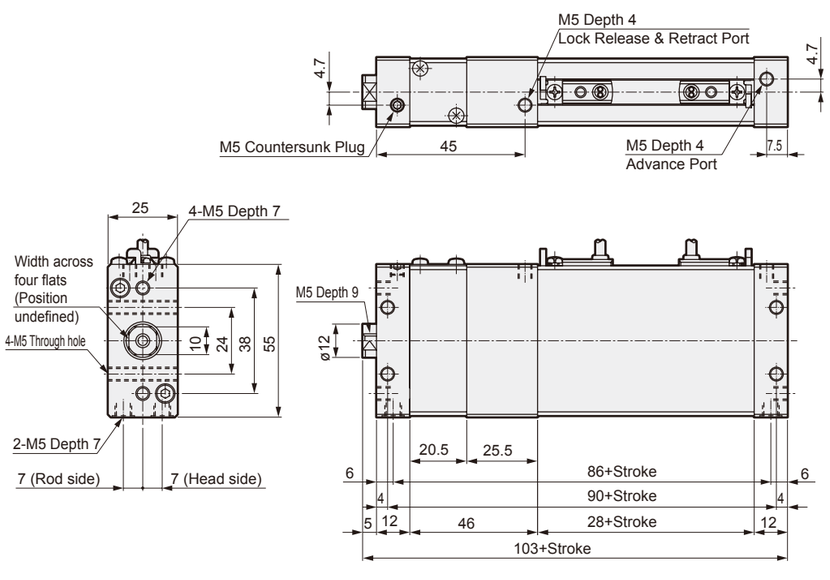


● Rod End male thread
(Option Code N)



***1: For same-surface installation with 2 switches, the stroke of 35 mm and over is required. If less than that, it will be different-surface mounting.**
***2: For dimensions of models with switches, see P. 578.**

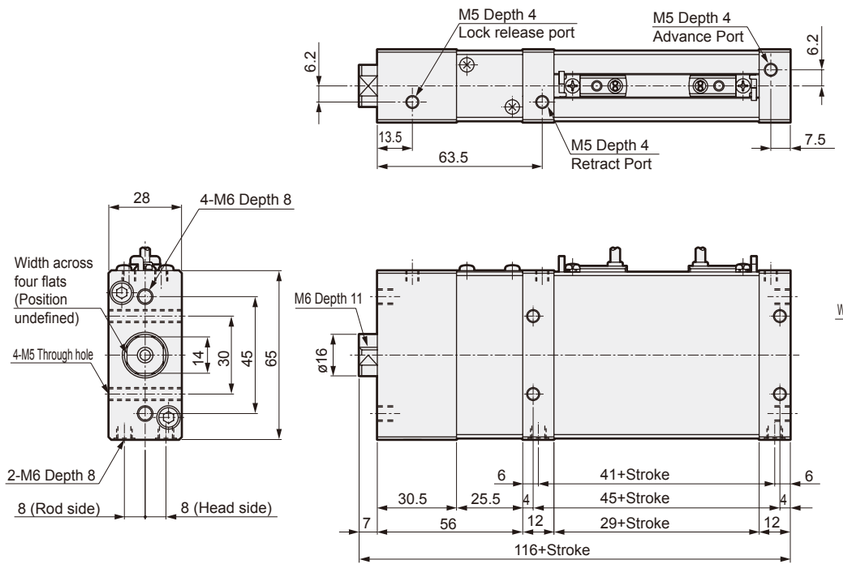
● UFCD-KL-25-B (Backward Locking)



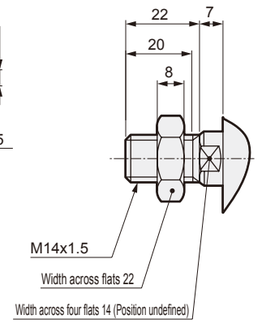
***1: For same-surface installation with 2 switches, the stroke of 35 mm and over is required. If less than that, it will be different-surface mounting.**
***2: For dimensions of models with switches, see P. 578.**

Outline Dimension Drawing (Bore Size: Equivalent to ø32)

● UFCD-KL-32-F (Forward Locking)

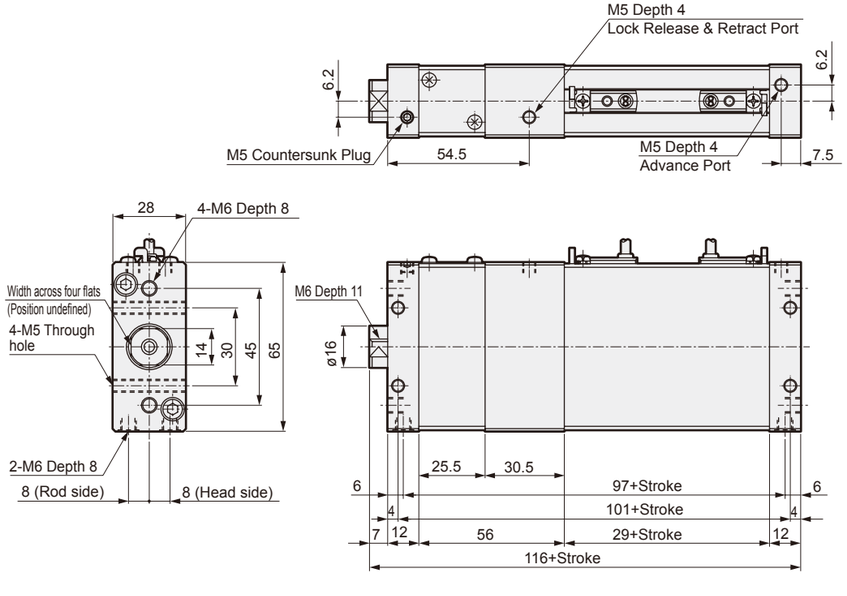


● Rod End male thread
(Option Code N)



***1: For same-surface installation with 2 switches, the stroke of 35 mm and over is required. If less than that, it will be different-surface mounting.**
***2: For dimensions of models with switches, see P. 578.**

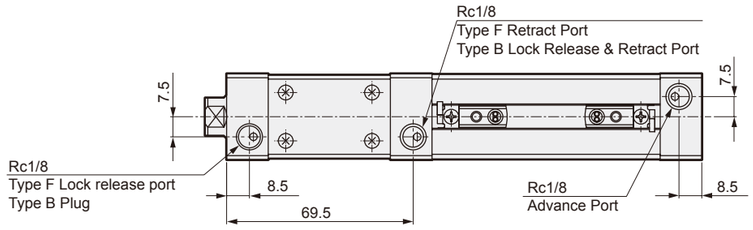
● UFCD-KL-32-B (Backward Locking)

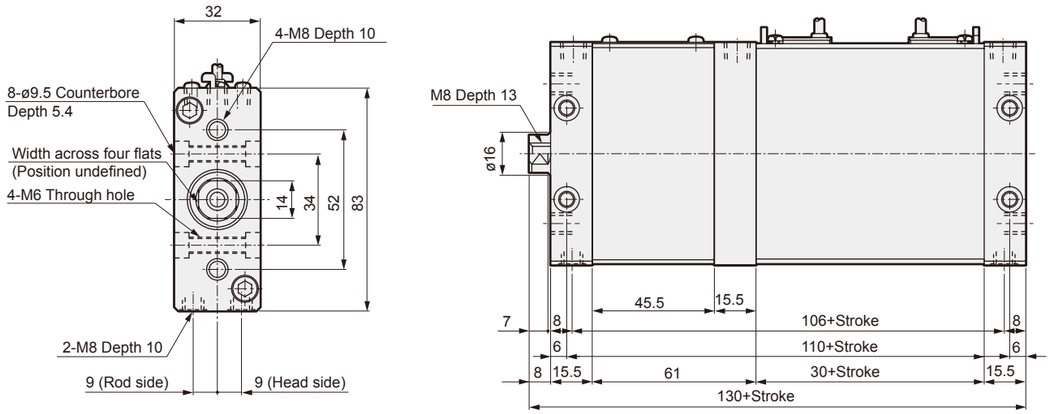


***1: For same-surface installation with 2 switches, the stroke of 35 mm and over is required. If less than that, it will be different-surface mounting.**
***2: For dimensions of models with switches, see P. 578.**

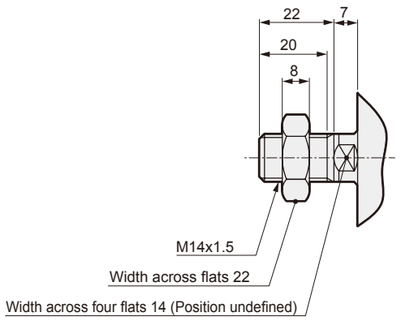
Outline Dimension Drawing (Bore Size: Equivalent to ø40)

● UFCD-KL-40-F/B (forward/Backward Locking)





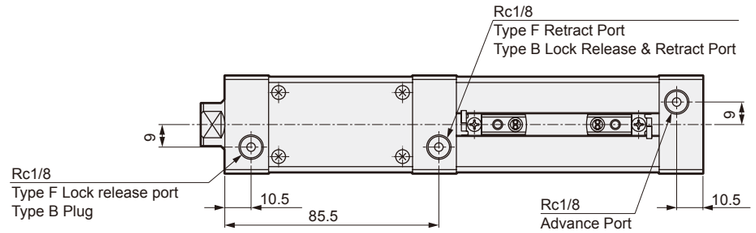
● Rod End male thread
(Option Code N)

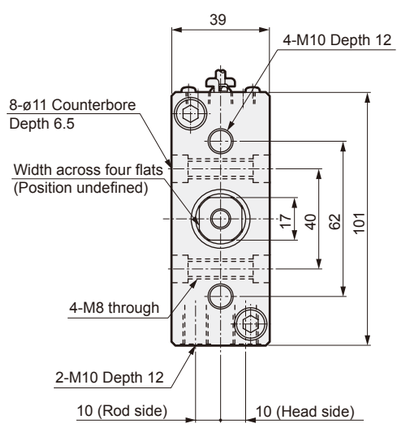


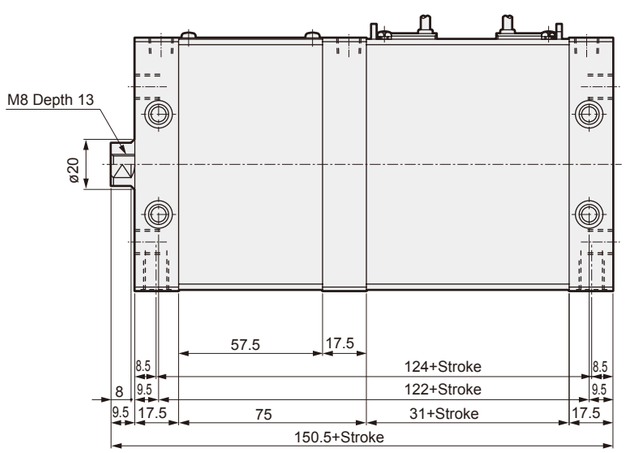
***1: For same-surface installation with 2 switches, the stroke of 35 mm and over is required. If less than that, it will be different-surface mounting.**
***2: For dimensions of models with switches, see P. 578.**

Outline Dimension Drawing (Bore Size: Equivalent to ø50)

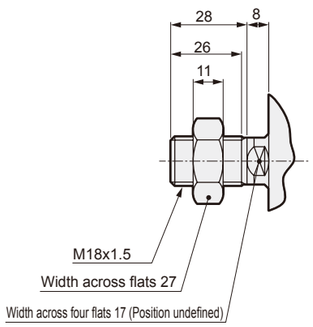
● UFCD-KL-50-F/B (forward/Backward Locking)







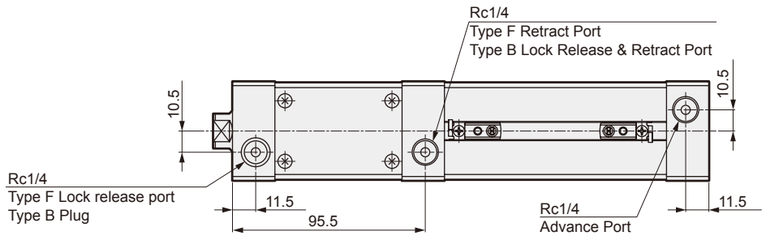
● Rod End male thread
(Option Code N)

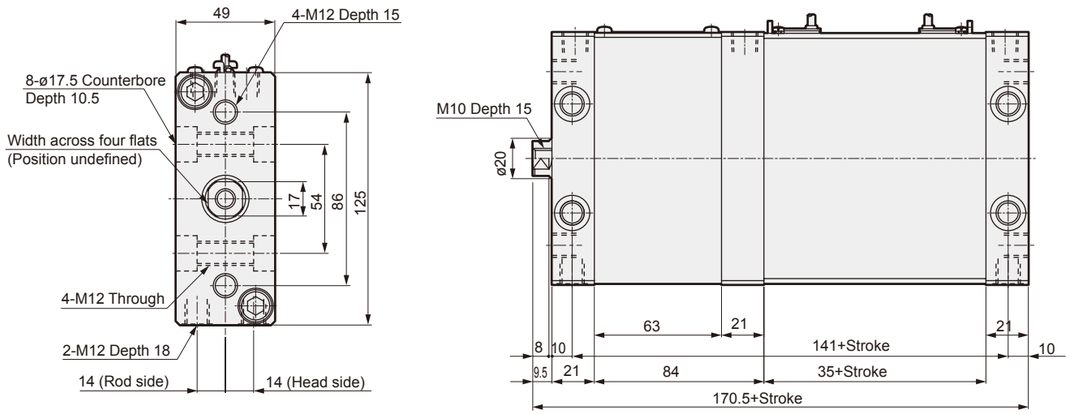


***1: For same-surface installation with 2 switches, the stroke of 35 mm and over is required. If less than that, it will be different-surface mounting.**
***2: For dimensions of models with switches, see P. 578.**

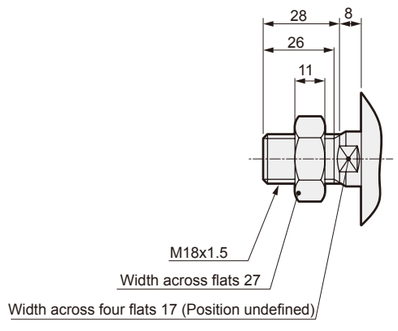
Outline Dimension Drawing (Bore Size: Equivalent to ø63)

● UFCD-KL-63-F/B (forward/Backward Locking)





● Rod End male thread
(Option Code N)



***1: For same-surface installation with 2 switches, the stroke of 30 mm and over is required. If less than that, it will be different-surface mounting.**
***2: For dimensions of models with switches, see P. 578.**

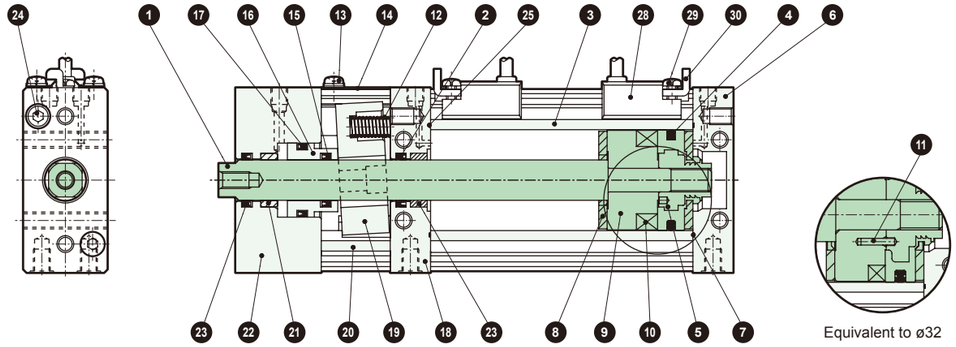
MEMO

With Brake / With Lock
ULK□
JSK2/ JSM2
JSG
JSC3, JSC4
USSD
UFCD
USC
Cylinder Switch
Ending

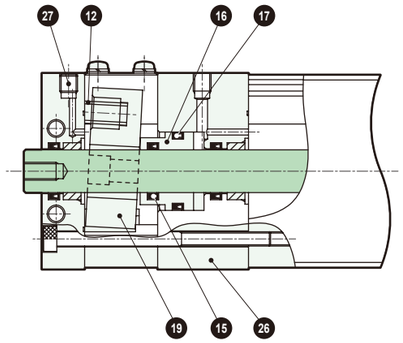
Internal Structure Drawing / Material (Bore Size: Equivalent to ø25, ø32)

● UFCD-KL-25, 32

• Lock Direction: F (Forward Locking)



• Lock Direction: B (Backward Locking)



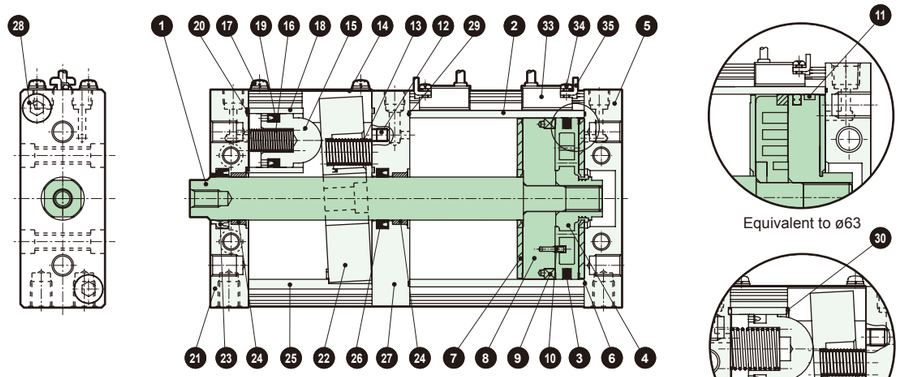
Do not disassemble

Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Piston Rod	Steel	Industrial Hard Chrome Plating	17	Piston Packing	Nitrile Rubber	
2	Rod Packing	Nitrile Rubber		18	Rod Cover	Aluminum Alloy	Black alumite
3	Cylinder Body	Aluminum Alloy	Hard Anodized	19	Lock plate	Cast Iron	Zinc Chromate
4	Piston Packing	Nitrile Rubber		20	Lock Tube	Aluminum Alloy	Alumite
5	Piston	Aluminum Alloy, Polyacetal		21	Metal Bushing	Bearing Alloy	
6	Head cover	Aluminum Alloy	Black alumite	22	Lock Body F	Aluminum Alloy	Black alumite
7	Cover gasket	Nitrile Rubber		23	Rod Packing	Nitrile Rubber	
8	Cushion Rubber	Urethane Rubber		24	Hexagon Socket Head Cap Screw	Steel	Black Oxide
9	Spacer	Aluminum Alloy		25	Cover gasket	Nitrile Rubber	
10	Magnet	Plastic		Reverse Direction Lock			
11	Spring pin	Steel		26	Lock Body B	Aluminum Alloy	Black alumite
12	Brake Spring	Piano Wire	Black Oxide	27	Hexagon Socket Set Screw	Steel	Black Oxide
13	Pan Head Screw	Steel	Zinc Chromate	With switch			
14	Dust cover	Stainless Steel		28	Switch		
15	Rod Packing	Nitrile Rubber		29	Pan Head Screw	Steel	Zinc Chromate
16	Release Piston	Copper Alloy		30	Switch Mounting Bracket	Stainless Steel	

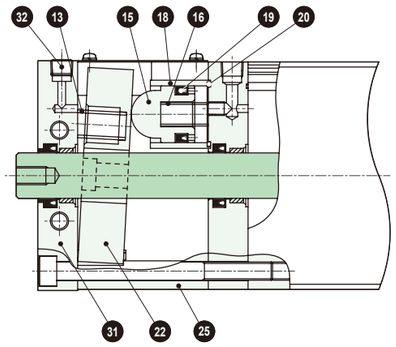
Internal Structure Drawing / Material (Bore Size: Equivalent to ø40 to ø63)

● UFCD-KL-40 to 63

• Lock Direction: F (Forward Locking)



• Lock Direction: B (Backward Locking)

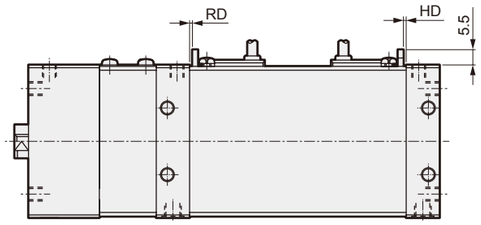


Do not disassemble

Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Piston Rod	Steel	Industrial Hard Chrome Plating	18	Release Piston Tube	Stainless Steel	
2	Cylinder Body	Aluminum Alloy	Hard Anodized	19	Piston Packing	Nitrile Rubber	
3	Piston Packing	Nitrile Rubber		20	O-ring	Nitrile Rubber	
4	Piston	Equivalent to ø40, ø50: Aluminum Alloy, Polyacetal		21	Rod Cover F	Aluminum Alloy	Black alumite
				22	Lock plate	Cast Iron	Zinc Chromate
		Equivalent to ø63 Aluminum Alloy	Equivalent to ø63 Chromate	23	Rod Packing	Nitrile Rubber	
5	Head cover	Aluminum Alloy	Black alumite	24	Metal Bushing	Bearing Alloy	
6	Cover gasket	Nitrile Rubber		25	Lock Tube	Aluminum Alloy	Alumite
7	Cushion Rubber	Urethane Rubber		26	Rod Packing	Nitrile Rubber	
8	Spacer	Equivalent to ø40, ø50: Aluminum Alloy		27	Lock body	Aluminum Alloy	Black alumite
		Equivalent to ø63 Polyamide		28	Hexagon Socket Head Cap Screw	Steel	Black Oxide
9	Magnet	Plastic		29	Cover gasket	Nitrile Rubber	
10	Spring pin	Steel		30	Metal Washer	Stainless Steel	Equivalent to ø63 only
11	Wear Ring	Polyacetal	Equivalent to ø63 only	Reverse Direction Lock			
12	Hexagon Socket Set Screw	Steel	Black Oxide	31	Rod Cover B	Aluminum Alloy	Black alumite
13	Brake Spring	Piano Wire	Black Oxide	32	Hexagon Socket tapered screw plug	Steel	Black Oxide
14	Dust cover	Stainless Steel		With switch			
15	Release Piston	Copper Alloy		33	Switch		
16	Piston Spring	Piano Wire	Black Oxide	34	Switch Mounting Bracket	Stainless Steel	
17	Pan Head Screw	Steel	Zinc Chromate	35	Pan Head Screw	Steel	Zinc Chromate

UFCD Series Switch Equipped Outline Dimension Drawing

● UFCD-KL
M2V, M3V, M2WV, M3WV, M3PV, M0V, M5V



Bore Size (mm)	RD	HD
Equivalent to ø25	1	1
Equivalent to ø32	2	1
Equivalent to ø40	2	2
Equivalent to ø50	2	3
Equivalent to ø63	2	7

Note: For same-surface installation with 2 switches, ø25 to ø50 or equivalent: 35 mm or more, ø63 or equivalent: The stroke must be at least 30 mm. If less than that, it will be different-surface mounting.

MEMO

With Brake / With Lock
ULK□
JSK2/ JSM2
JSG
JSC3, JSC4
USSD
UFCD
USC
Cylinder Switch
Ending

Pneumatic Equipment

To Use This Product Safely

Be sure to read this before use. For general cylinder information, see Intro 41, and for cylinder switches, see P. 1512.

Individual Precautions: Free position locking flat cylinder UFCD Series

Design / Selection

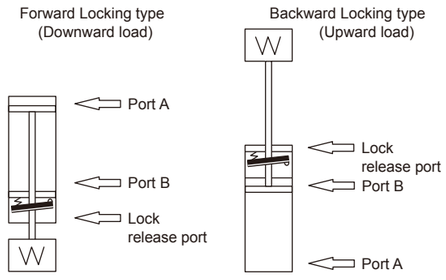
⚠Warning

■ Cylinder with position locking mechanism (for holding cylinder stationary). If used for emergency stop or urgent stop (stopping from cylinder operating state), the service life will be significantly reduced.

■ If back pressure is applied to the locking mechanism, the lock may be released. Use a discrete valve, or use an individual exhaust manifold.

■ Do not apply torque to the rod when locked because the holding force may decrease, creating a dangerous condition. Also, use with a mechanism that prevents rod rotation.

■ To release the lock, when using Forward Locking, supply pressure to port B, and when using Backward Locking, supply pressure to port A. Check that load is not applied to the locking mechanism. If pressure is supplied to port A for Forward Locking type or port B for Backward Locking type while both ports A and B are exhausted and the piston is locked, the lock may not release, or even if released, the Piston rod may extend suddenly, which is very dangerous.



■ Do not use multiple synchronized cylinders with position locking. If a synchronization error occurs, excessive moment load or load concentration may occur on the cylinder that locked first, potentially causing lock release failure, reduced lifespan, or damage.

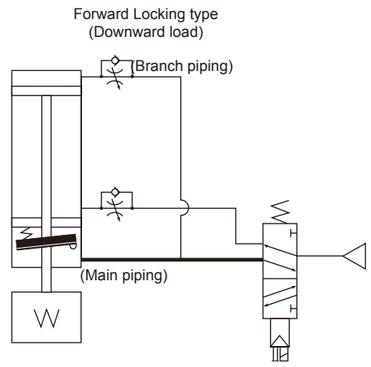
⚠CAUTION

■ Basic Circuit Diagram

Configure the air piping for this cylinder as shown below. Piping to the fall prevention unit alone or piping different from the figure below may cause problems such as response delay.

1. Be sure to branch the piping after the valve as shown below, and pipe to the fall prevention unit (lock release port as main piping) and cylinder unit (cylinder port as branch piping).

2. If cylinder operation is faster than lock release, the lock may not release or the Piston rod may extend suddenly, so design the piping so that lock release is faster than cylinder operation.



If emergency stop or urgent stop is performed with the air piping shown above, the Forward Locking type will continue to retract and the Backward Locking type will continue to extend, returning to the origin position. (If residual pressure is gone, it will stop at that position.)

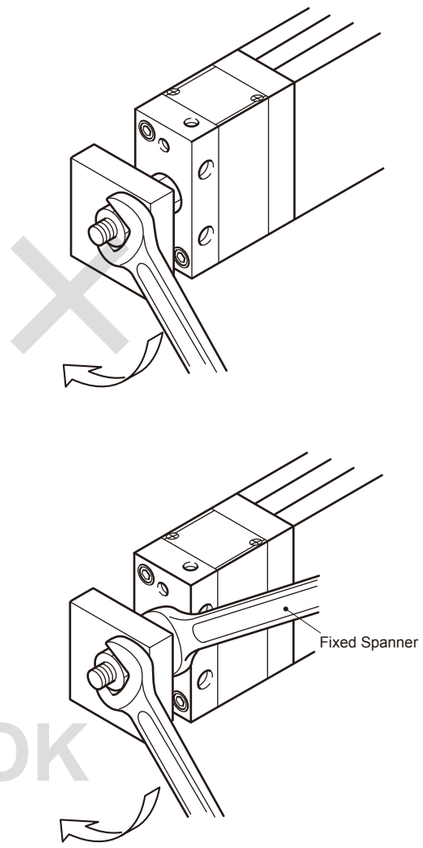
⚠Warning

■ Do not apply grease to the Piston Rod because holding force drops and creates a hazard.

⚠CAUTION

■ Main piping in the basic circuit diagram on the previous page should be thicker and shorter than branch piping.

■ For male threads with load mounted on ends, fix the wrench hook at the end of the rod with a wrench and tighten.



■ For female threads, fix the wrench hook at the end of the rod with a wrench using a standard tool (Allen wrench), and tighten.

■ Avoid using the product so as to apply rotation torque to the Piston Rod. If unavoidable, use within the allowable rotational torque range.

Item \ Model No.	Equivalent to ø25	Equivalent to ø32	Equivalent to ø40	Equivalent to ø50	Equivalent to ø63
Allowable rotational torque (N·m)	1	1.6	2.5	3.9	5.9

○ Even when the value is within the allowable torque range, do not apply rotation torque with impact, or with instantaneous changes in torque Load Direction.

■ When locking the first time after leaving the lock released for long periods, a delayed response may occur in the lock. Do not leave the lock part pressurized; operate the lock part with each cylinder operation. (Please use the basic circuit diagram on P. 580)

■ If the cylinder is held with pressure applied on the locking mechanism, the lock could be released. Do not use 3-position closed-center and 3-position P·A·B connection solenoid valves.

■ Due to the structure, the Piston Rod drops by about 1 mm when the lock is applied.

■ The Cylinder Body may be damaged or may malfunction if a unit with excessive inertia, etc., is actuated. Use within the allowable absorbed energy range.

During Use

⚠Warning

■ Do not apply additional grease to the Piston Rod or wipe off the grease that is already applied.

■ Do not disassemble the unit, as doing so may be dangerous.

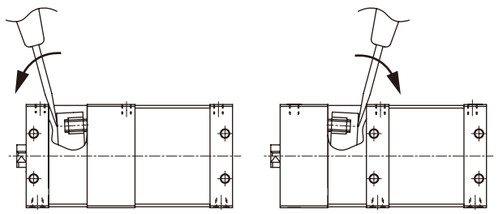
■ Always use the product with the dust cover on, except for when performing manual release, in order to prevent failure or malfunction.

■ If no air pressure is supplied in vertical mounting, etc., holding force may not be sufficient when the lock is manually released. This may cause the rod to move (drop) with the load's weight. In that case, for safety, perform the following preparations before manual release.

- Move the load to the bottom end.
- Provide a stopper to the load
- Apply air pressure to the cylinder to balance the load.

⚠CAUTION

■ How to unlock manually



Forward direction lock
(Lock direction ←)

Reverse direction lock
(Lock direction →)

- Remove the cover, insert a flathead screwdriver or the like and lightly push it down in the direction of arrow A to lift the lock plate, unlock and free the Piston Rod.

For precautions during mounting, installation, adjustment, use, and maintenance, please see "Precautions for Use" in this catalog and the CKD Components product site (https://www.ckd.co.jp/kiki/en/) → "Model No." → Instruction Manual.

MEMO

With Brake with Lock

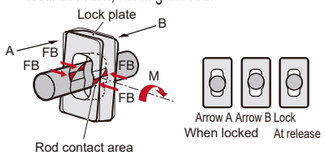
Overview

This is a cylinder in the SCA2 series of general-type cylinders with medium bore (ø40 to ø100) equipped with a mechanism that enables fall prevention at any position of the stroke.

Features

High wear resistance circular slit method

Adopts a new fall prevention mechanism with excellent lifespan. By applying rotational force M to the lock plate, force F is generated in the axial direction, holding the rod.



Drop prevention is possible throughout the entire stroke

Drop prevention is possible at any position where the Piston Rod is stationary during the entire stroke, including the stroke end.

Eliminates workpiece damage

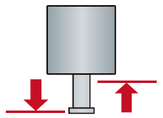
Prevents the cylinder from falling under its own weight due to troubles such as power outages. Eliminates damage to workpieces, etc.

Easy lock release

Loosening the nut and rotating the release lever can release the lock.

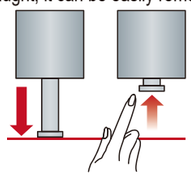
2 types of lock direction

You can choose either forward direction lock or reverse direction lock.



Free in the opposite direction of lock

In the opposite direction of the lock, the rod is free, so even if a workpiece is caught, it can be easily removed.



USC

Selex Cylinder with Free Position Fall Prevention

ø40, ø50, ø63, ø80, ø100

CONTENTS

Product Introduction	290
Series System Chart	586
Operating Explanation	586
● Double Acting, Single Rod Type (USC)	588
● Double Acting, With Coil Scraper (USC-G1)	588
Accessories External Dimensions Diagram	604
External Dimensions Diagram with Switch	609
⚠Precautions for Use	610

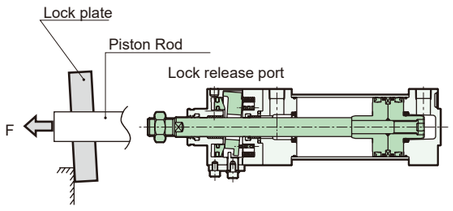
Variation Table

Selex Cylinder with Free Position Fall Prevention
USC Series

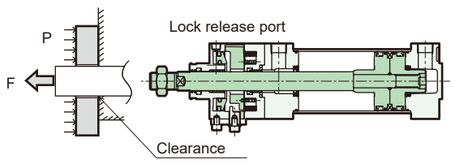
●: Standard, ◎: Option, : Not available

Variation	Model No. Circuit Diagram Code	Bore Size (mm)	Standard Stroke (mm)												Min Stroke (mm)	Max Stroke (mm)	Producible Stroke (mm)	Intermediate stroke (per mm)	Mounting Type Mounting Type										Cushion				Option					Accessories					Switch	Page
			25	50	75	100	150	200	250	300	350	400	450	500					Basic type	Axial Foot Type		Rod side Flange Type	Head side Flange Type	Head side special flange type	Single Clevis Type	Double Clevis Type	Intermediate Trunnion Type	Rod Side Trunnion Type	Head side trunnion type	Without cushion	Both sides cushion	Rod side cushion	Head side cushion	Bellows (100°C)	Bellows (250°C)	Piston Rod Material Change (Stainless Steel)	Cushion needle position S	Cushion needle position T	Single knuckle	Double Knuckle	Single Bracket	Double bracket	Trunnion Type 2nd Bracket		
																			00	LB		FA	FB	FC	CA	CB	TC	TA	TB	N	B	R	H	J	L	M	S	T	I	Y	B1	B2	B4		
Double Acting Type	USC	ø40	●	●	●	●	●	●	●	●	●	●	●	●	1	600	1600	1	●	●		●	●	●	●	●	●	●	●	●	●	●	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	588
		ø50	●	●	●	●	●	●	●	●	●	●	●	●			2,000		●	●		●	●	●	●	●	●	●	●	●	●	●	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎		
		ø63	●	●	●	●	●	●	●	●	●	●	●	●			2500		●	●		●	●	●	●	●	●	●	●	●	●	●	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎		
		ø80	●	●	●	●	●	●	●	●	●	●	●	●		700	2500		●	●		●	●	●	●	●	●	●	●	●	●	●	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎		
		ø100	●	●	●	●	●	●	●	●	●	●	●	●		800	2500		●	●		●	●	●	●	●	●	●	●	●	●	●	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎		
Double Acting Coil with Scraper	USC-G1	ø40	●	●	●	●	●	●	●	●	●	●	●	●	1	600	1600	1	●	●		●	●	●	●	●	●	●	●	●	●	●	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	588
		ø50	●	●	●	●	●	●	●	●	●	●	●	●			2,000		●	●		●	●	●	●	●	●	●	●	●	●	●	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎		
		ø63	●	●	●	●	●	●	●	●	●	●	●	●			2500		●	●		●	●	●	●	●	●	●	●	●	●	●	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎		
		ø80	●	●	●	●	●	●	●	●	●	●	●	●		700	2500		●	●		●	●	●	●	●	●	●	●	●	●	●	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎		
		ø100	●	●	●	●	●	●	●	●	●	●	●	●		800	2500		●	●		●	●	●	●	●	●	●	●	●	●	●	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎		

Operation Explanation



■ Lock operation
When air is exhausted from the lock release port, the spring force causes the lock plate to tilt and hold the Piston Rod.



■ Lock release
When air is supplied from the lock release port, the lock plate stands upright, creating a clearance with the Piston Rod, and the rod operates freely.

Medium Bore Size Cylinder with Free Position Fall Prevention
Double Acting, Single Rod Type
Double Acting, Coil scraper type

USC, USC-G1 Series

●Bore Size: ø40, ø50, ø63, ø80, ø100

RoHS

Model No. Notation

Without Switch
(Built-in magnet for switch)

With R-type Switch
(Built-in magnet for switch)

With Strong Magnetic Field Resistant Switch
(H0, H0Y switch)
(Built-in magnet for switch)

	1	2	3	4	5	6	7	8	9	10
Without Switch	USC	LB	40	B	100	F			S	I
With R-type Switch	USC	LB	40	B	100	F	T0H	R	S	I
With Strong Magnetic Field Resistant Switch	USC-L2	LB	40	B	100	F	H0Y	R	S	I
	Model Number	Mounting Style	Bore Size	Cushion	Stroke	Lock Direction	Switch Model	Number of Switches	Option	Accessories

❶ Model Number

Code	Content
USC	Double Acting/Single Rod Type
USC-G1	Double Acting, With Coil Scraper
USC-L2	Double Acting, With Strong Magnetic Field Resistant Switch
USC-GIL2	Double Acting, Coil scraper type With Strong Magnetic Field Resistant Switch

❷ Mounting Type

Mounting bracket is included for shipment.

Code	Content	
00	Basic type	
LB	Axial foot type	
FA	Rod side flange type	
FB	Head Side Flange Type	
FC	Head side special flange type	
CA	Single clevis type	
CB	Double Clevis Type (Pin and Retaining Ring attached)	
TC	Center trunnion type	
TA	Rod side trunnion type	
TB	Head side trunnion type	

❸ Bore Size (mm)

Code	Contents
40	ø40
50	ø50
63	ø63
80	ø80
100	ø100

❹ Cushion

Code	Content
B	With Cushion on Both Sides
R	With rod side cushion
H	With head side cushion
N	Without cushion

❺ Stroke (mm)

Bore Size	Stroke	Intermediate Stroke
ø40	1 to 600	Every 1 mm
ø50	1 to 600	
ø63	1 to 600	
ø80	1 to 700	
ø100	1 to 800	

***1: For minimum stroke with switch, please refer to P. 591.**

❻ Lock Direction

Code	Content
F	Forward Direction Lock
B	Reverse Direction Lock

❼ Switch Model

For switch details, refer to P. 1457. Switches are pre-assembled on the product before shipment.

Contact	Indicator LED Special Function	Wiring (Output)	Load Voltage (V) AC	Load Voltage (V) DC	Load Current (mA) AC	Load Current (mA) DC	Lead wire *1 Straight	Lead wire *1 L-shape	
Solid State	1-Color	2-wire	85 to 265	—	5 to 100	-	T1H□	T1V□	
			-	10 to 30	—	5 to 20 *2	T2H□	T2V□	
		3-wire (NPN)	—	30 or less	—	100 or less	T3H□	T3V□	
		3-wire (PNP)	—		-		T3PH□	T3PV□	
	2-color	2-wire	—	24 ± 10%	—	5 to 20	T2WH□	T2WV□	
		3-wire (NPN)	—	30 or less	—	50 or less	T3WH□	T3WV□	
	For 2-color AC Magnetic Field	2-wire	—	24 ± 10%	—	5 to 20	T2YD□	–	
			-		-		T2YDT□	–	
	1-Color Off-Delay Type		—	10 to 30	—	5 to 20 *2	T2JH□	T2JV□	
	1-Color Flexible Lead Wire Type		—	10 to 30	—		T2HR3	T2VR3	
Contact	1-Color	2-wire	110	12/24	7 to 20	5 to 50	T0H□	T0V□	
	Without Indicator Lamp		110	5/12/24	20 or less	50 or less	T5H□	T5V□	
	1-Color		110/220	12/24	7 to 20 / 7 to 10	5 to 50	T8H□	T8V□	
	For 1-color strong magnetic field	2-wire	110	12/24	7 to 20	5 to 50	H0□	–	*3
	For 2-color strong magnetic field		—	24 ± 10%	—	5 to 20	H0Y□	–	

*1: Insert the code selected in the "Lead wire length" table into "□" of the switch model number.
*2: The maximum load current value above, 20 mA, is at 25°C. If the switch operating Ambient Temperature is higher than 25°C, it will be lower than 20 mA. (At 60°C, it will be 5 to 10 mA.)
*3: H0□ and H0Y□ switch lead wires are grommet.
*4: Switches other than the above model No. are also available. (Custom Product) For details, refer to P. 1457.

❽ Number of Switches

Code	Content
R	With 1 pc on rod side
H	With 1 pc on head side
D	With 2 pcs
T	With 3 pcs

Note: When TA or TB is selected as the ❶mounting type, the number of switches is limited to "H" (1 pc. on head side) for TA, and "R" (1 pc. on rod side) for TB.

❾ Option

Code	Content	Max Ambient Temperature	Instantaneous Max Temperature	
J	Bellows	100°C	200°C	
L		250°C	400°C	
M	Piston Rod Material (Stainless Steel)			
Blank	Cushion needle position R (Standard)			T R (Standard) S
S	Cushion needle position S			
T	Cushion needle position T			

*1: Instantaneous maximum temperature is the temperature when sparks, cutting chips, etc., instantaneously hit the bellows.
*2: When ❶mounting type "TA" or "TB" is selected, the cushion needle position is fixed to "S" (no symbol) and cannot be selected.

❿Accessories

Code	Content	
I	Single knuckle *1	
Y	Double Knuckle (Pin and Retaining Ring included) *1	
B1	Single bracket	
B2	Double Yoke Bracket (Pin and Retaining Ring included)	
B4	Trunnion Type 2nd Bracket (2 pieces/set)	

*1: "I" and "Y" cannot be selected at the same time.

□Lead Wire Length

Code	Content
Blank	1 m (Standard)
3	3 m (Option)
5	5m (Option)

Example) Lead wire length
1 m T0H
3 m T0H3
5 m T0H5

Switch Single Unit Model No. Notation

[T type switch]

●Switch body+Mounting bracket set
SCA2 – T0H – 40
(7) Switch Model, (3) Bore Size

●Switch body only
SW – T0H
(7) Switch Model

●Switch mounting bracket set
SCA2 – TS – 40
Mounting bracket, (3) Bore Size

* Please consult us separately if using environmentally compatible T-type switches.

[H type switch]

●Switch body+Mounting bracket set
SCA2-L2 – H0 – 40
(7) Switch Model, (3) Bore Size

●Switch body only
SW – H0
(7) Switch Model

●Mounting bracket set
SCA2-L2 – H – 40
(3) Bore Size

[T2YD type switch]

●Switch body+Mounting bracket set
SCA2 – T2YD – 40
(7) Switch Model, (3) Bore Size

●Switch body only
SW – T2YD
(7) Switch Model

●Mounting bracket set
SCA2 – T – 40
(3) Bore Size

Specifications

Item		USC (Double Acting, Single Rod Type)/USC-G1 (Double Acting, With Coil Scraper)				
Operation type		Double Acting Type				
Operating Fluid		Compressed Air				
Max Operating Pressure MPa		1.0				
Min Operating Pressure MPa	Cylinder Part	0.1				
	Lock Mechanism Part	0.25 (36 psi)				
Proof Pressure MPa		1.6				
Ambient Temperature °C		-10 to 60 (No freezing)				
Bore Size mm		ø40	ø50	ø63	ø80	ø100
Port Size Rc	Cylinder Part	1/4	3/8	3/8	1/2	1/2
	Lock Mechanism Part	1/8				
Stroke Tolerance mm		$^{+0.9}_{0}$ (to 300) $^{+1.4}_{0}$ (to 1000)				
Locking Force N		1005	1570	2493	4021	6283
Operating Piston Speed mm/s		50 to 1000 (Please use within the absorbed energy.)				
Cushion		Cushion available/not available selectable				
Effective Cushion Length mm		14.6	16.6	16.6	20.6	23.6
Lubrication		Not required (When lubricating, use turbine oil Class 1 ISO VG32)				
Allowable Absorbed Energy J *1	With Cushion	4.29	8.37	15.8	27.9	49.8
	Without cushion	Large energy generated by external load cannot be absorbed. It is recommended to use an external shock absorber together.				

*1: If the kinetic energy is high due to high load or fast piston speeds, consider the use of a separate shock absorber and use the product within the range where the kinetic energy can be absorbed.

Stroke

Bore Size (mm)	Standard Stroke (mm)	Max Stroke (mm)	Producible stroke (mm)	Min Stroke (mm)
ø40	25, 50, 75, 100, 150, 200 250, 300, 350, 400, 450 500	600	1600	1
ø50			2,000	
ø63			2500	
ø80		700		
ø100		800	*5	*3

*1: Intermediate strokes can be produced in 1 mm increments.
*2: For models with switch, the minimum stroke changes depending on the mounting method. Please refer to the table on the next page. If the stroke is 15 mm or less, two switches may turn ON simultaneously. In this case, adjust the switch mounting positions so that they are further apart from each other.
*3: The minimum stroke can be manufactured from 1 mm, but please consider the stroke tolerance.
***4: If the Max Stroke is exceeded, the product specifications may not be met depending on the conditions, so please refer to Intro 29.**
*5: For with bellows with tube inner diameter ø63 to ø100, the manufacturable stroke is up to 2000 mm.

Minimum Stroke with Switch (T-type Switch)

● T0/T5

Number of Switches	Different Surface Mounting		Same Surface Mounting		Intermediate Trunnion Mounting		Rod Side Trunnion Mounting Position detection at the rod side stroke end is not possible.	Head Side Trunnion Mounting Position detection at the head side stroke end is not possible.
Bore Size	1	2	1	2	1	2	1	1
ø40	20 (10)	20 (20)	20 (10)	60 (45)	110 (110)	110 (110)	50 (50)	50 (50)
ø50	15 (10)	20 (20)	15 (10)	20 (20)	135 (135)	135 (135)	60 (60)	60 (60)
ø63	15 (10)	20 (20)	15 (10)	20 (20)	110 (95)	110 (95)	50 (45)	50 (45)
ø80	15 (15)	25 (25)	15 (15)	25 (25)	115 (85)	115 (85)	55 (40)	55 (40)
ø100	15 (15)	25 (25)	15 (15)	25 (25)	125 (95)	125 (95)	60 (45)	60 (45)

*1: ( ) indicates T□V (L-shaped lead wire type).
*2: If the stroke is 15 mm or less, two switches may turn ON simultaneously. In this case, adjust the switch mounting positions so that they are further apart from each other.

● T8

Number of Switches	Different Surface Mounting		Same Surface Mounting		Intermediate Trunnion Mounting		Rod Side Trunnion Mounting Position detection at the rod side stroke end is not possible.	Head Side Trunnion Mounting Position detection at the head side stroke end is not possible.
Bore Size	1	2	1	2	1	2	1	1
ø40	15 (10)	20 (20)	15 (10)	50 (35)	95 (85)	95 (85)	45 (40)	45 (40)
ø50	10 (10)	20 (20)	10 (10)	20 (20)	115 (115)	115 (115)	50 (50)	50 (50)
ø63	10 (10)	20 (20)	10 (10)	20 (20)	95 (75)	95 (75)	45 (35)	45 (35)
ø80	15 (15)	25 (25)	15 (15)	25 (25)	100 (70)	100 (70)	50 (35)	50 (35)
ø100	15 (15)	25 (25)	15 (15)	25 (25)	110 (80)	110 (80)	55 (40)	55 (40)

*1: ( ) indicates T□V (L-shaped lead wire type).
*2: If the stroke is 15 mm or less, two switches may turn ON simultaneously. In this case, adjust the switch mounting positions so that they are further apart from each other.

● T2/T3/T3P/T2□R3

Number of Switches	Different Surface Mounting		Same Surface Mounting		Intermediate Trunnion Mounting		Rod Side Trunnion Mounting Position detection at the rod side stroke end is not possible.	Head Side Trunnion Mounting Position detection at the head side stroke end is not possible.
Bore Size	1	2	1	2	1	2	1	1
ø40	20 (10)	20 (15)	20 (10)	60 (45)	105 (75)	105 (75)	50 (35)	50 (35)
ø50	15 (10)	15 (15)	15 (10)	15 (15)	105 (75)	105 (75)	45 (30)	45 (30)
ø63	15 (10)	15 (15)	15 (10)	15 (15)	110 (80)	110 (80)	50 (35)	50 (35)
ø80	15 (10)	15 (15)	15 (10)	15 (15)	115 (85)	115 (85)	55 (40)	55 (40)
ø100	10 (10)	15 (15)	10 (10)	15 (15)	125 (95)	125 (95)	60 (45)	60 (45)

*1: ( ) indicates T□V (L-shaped lead wire type).
*2: If the stroke is 15 mm or less, two switches may turn ON simultaneously. In this case, adjust the switch mounting positions so that they are further apart from each other.

● T1/T2YD

Number of Switches	Different Surface Mounting		Same Surface Mounting		Intermediate Trunnion Mounting		Rod Side Trunnion Mounting Position detection at the rod side stroke end is not possible.	Head Side Trunnion Mounting Position detection at the head side stroke end is not possible.
Bore Size	1	2	1	2	1	2	1	1
ø40	20 (10)	20 (15)	20 (10)	60 (45)	105 (75)	105 (75)	50 (35)	50 (35)
ø50	15 (10)	15 (15)	15 (10)	15 (15)	100 (70)	100 (70)	45 (30)	45 (30)
ø63	15 (10)	15 (15)	15 (10)	15 (15)	105 (75)	105 (75)	50 (35)	50 (35)
ø80	15 (10)	15 (15)	15 (10)	15 (15)	110 (80)	110 (80)	55 (40)	55 (40)
ø100	10 (10)	15 (15)	10 (10)	15 (15)	120 (90)	120 (90)	60 (45)	60 (45)

*1: ( ) indicates T□V (L-shaped lead wire type). However, T2YD does not have an L-shaped lead wire type (V).
*2: If the stroke is 15 mm or less, two switches may turn ON simultaneously. In this case, adjust the switch mounting positions so that they are further apart from each other.

●T2W/T3W

Number of Switches	Different Surface Mounting		Same Surface Mounting		Intermediate Trunnion Mounting		Rod Side Trunnion Mounting Position detection at the rod side stroke end is not possible.	Head Side Trunnion Mounting Position detection at the head side stroke end is not possible.
Bore Size	1	2	1	2	1	2	1	1
ø40	20 (5)	20 (10)	20 (5)	65 (50)	110 (80)	110 (80)	50 (35)	50 (35)
ø50	20 (5)	20 (10)	20 (5)	20 (10)	110 (80)	110 (80)	50 (35)	50 (35)
ø63	20 (5)	20 (10)	20 (5)	20 (10)	115 (85)	115 (85)	55 (40)	55 (40)
ø80	15 (5)	15 (10)	15 (5)	15 (10)	120 (90)	120 (90)	55 (40)	55 (40)
ø100	10 (5)	10 (10)	10 (5)	10 (10)	130 (100)	130 (100)	60 (45)	60 (45)

*1: ( ) indicates T□V (L-shaped lead wire type).
*2: If the stroke is 15 mm or less, two switches may turn ON simultaneously. In this case, adjust the switch mounting positions so that they are further apart from each other.

Cylinder Weight Table

(Unit: kg)

Bore Size	Product Weight when stroke (S) = 0 mm							Switch Weight	Mounting Bracket Weight		Added weight per S = 100 mm
	Basic Type (00)	Foot Type (LB)	Flange Type (FA, FB)	Special flange type (FC)	Single Clevis Type (CA)	Single clevis type (CB)	Trunnion Type (TA,TB,TC)		T Type	H type	
ø40	1.40	1.58	1.83	1.49	1.75	1.75	1.78	Refer to the Weight listed in the Switch Specifications on P. 1457.	0.024	0.028	0.39
ø50	2.04	2.21	2.54	2.15	2.48	2.48	2.56		0.022	0.026	0.46
ø63	2.83	3.2	3.89	3.01	3.38	3.43	3.68		0.020	0.024	0.50
ø80	4.94	5.71	6.82	5.30	6.48	6.49	6.30		0.026	0.029	0.90
ø100	8.03	8.95	10.72	8.58	10.18	10.14	10.55		0.024	0.028	1.12

Theoretical Thrust Table

(Unit: N)

Bore Size (mm)	Operating Direction	Operating Pressure MPa										
		0.1	0.15	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
ø40	Push	1.26×10^{2}	1.88×10^{2}	2.51×10^{2}	3.77×10^{2}	5.03×10^{2}	6.28×10^{2}	7.54×10^{2}	8.80×10^{2}	1.01×10^{3}	1.13×10^{3}	1.26×10^{3}
	Pull	1.06×10^{2}	1.58×10^{2}	2.11×10^{2}	3.17×10^{2}	4.22×10^{2}	5.28×10^{2}	6.33×10^{2}	7.39×10^{2}	8.44×10^{2}	9.50×10^{2}	1.06×10^{3}
ø50	Push	1.96×10^{2}	2.95×10^{2}	3.93×10^{2}	5.89×10^{2}	7.85×10^{2}	9.82×10^{2}	1.18×10^{3}	1.37×10^{3}	1.57×10^{3}	1.77×10^{3}	1.96×10^{3}
	Pull	1.65×10^{2}	2.47×10^{2}	3.30×10^{2}	4.95×10^{2}	6.60×10^{2}	8.25×10^{2}	9.90×10^{2}	1.15×10^{3}	1.32×10^{3}	1.48×10^{3}	1.65×10^{3}
ø63	Push	3.12×10^{2}	4.68×10^{2}	6.23×10^{2}	9.35×10^{2}	1.25×10^{3}	1.56×10^{3}	1.87×10^{3}	2.18×10^{3}	2.49×10^{3}	2.81×10^{3}	3.12×10^{3}
	Pull	2.80×10^{2}	4.20×10^{2}	5.61×10^{2}	8.41×10^{2}	1.12×10^{3}	1.40×10^{3}	1.68×10^{3}	1.96×10^{3}	2.24×10^{3}	2.52×10^{3}	2.80×10^{3}
ø80	Push	5.03×10^{2}	7.54×10^{2}	1.01×10^{3}	1.51×10^{3}	2.01×10^{3}	2.51×10^{3}	3.02×10^{3}	3.52×10^{3}	4.02×10^{3}	4.52×10^{3}	5.03×10^{3}
	Pull	4.54×10^{2}	6.80×10^{2}	9.07×10^{2}	1.36×10^{3}	1.81×10^{3}	2.27×10^{3}	2.72×10^{3}	3.17×10^{3}	3.63×10^{3}	4.08×10^{3}	4.54×10^{3}
ø100	Push	7.85×10^{2}	1.18×10^{3}	1.57×10^{3}	2.36×10^{3}	3.14×10^{3}	3.93×10^{3}	4.71×10^{3}	5.50×10^{3}	6.28×10^{3}	7.07×10^{3}	7.85×10^{3}
	Pull	7.15×10^{2}	1.07×10^{3}	1.43×10^{3}	2.14×10^{3}	2.86×10^{3}	3.57×10^{3}	4.29×10^{3}	5.00×10^{3}	5.72×10^{3}	6.43×10^{3}	7.15×10^{3}

Mounting Bracket Model No.

Bore Size (mm) / Mounting bracket	ø40	ø50	ø63	ø80	ø100
Foot (LB)	S1-LB-40	S1-LB-50	S1-LB-63	S1-LB-80	S1-LB-100
Flange (FA)	USC-FA-40	USC-FA-50	USC-FA-63	USC-FA-80	USC-FA-100
Flange (FB)	S1-FA-40	S1-FA-50	S1-FA-63	S1-FA-80	S1-FA-100
Single Yoke Clevis (CA)	S1-CA-40	S1-CA-50	S1-CA-63	S1-CA-80	S1-CA-100
Double Yoke Clevis (CB)	S1-CB-40	S1-CB-50	S1-CB-63	S1-CB-80	S1-CB-100

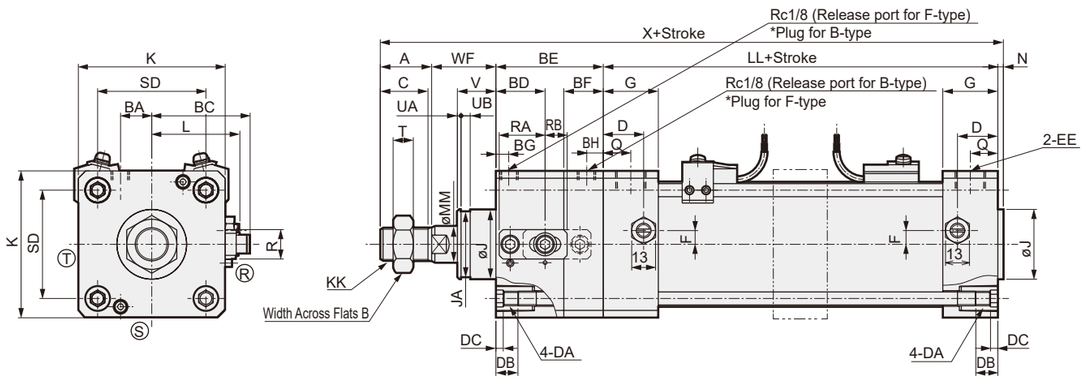
Note: Foot type mounting bracket is 2 pcs/set.

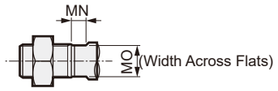
MEMO

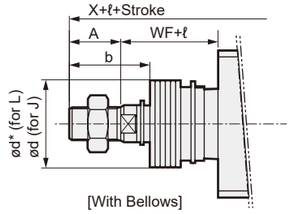
With Brake / With Lock
ULK
JSK2/ JSM2
JSG
JSC3, JSC4
USSD
UFCD
USC
Cylinder Switch
Ending

Dimensional Drawings

● Basic type (00)







[With Bellows]

Code	Basic Type (00) Basic Dimensions																			
Bore Size	A	B	BA	BC	BD	BE	BF	BG	BH	C	D	DA	DB	DC	EE	F	G	J	K	L
ø40	22	22	7.5	39.5	22	47	18	7	7	20	18	M8	12	4	Rc1/4	7.5	26	31	57	38 to 39.5
ø50	28	27	10	43.5	25	54	20	7	8	26	20	M8	12	4	Rc3/8	0	28	38	66	41 to 43.5
ø63	28	27	17	53.5	26.8	58.5	21.5	7	9	26	22	M8	12	4	Rc3/8	0	30	38	80	47.5 to 50.0
ø80	36	32	21	62.5	33.3	71	25	8	10	34	26	M12	16	5	Rc1/2	0	34	43	98	56 to 59
ø100	45	41	25	72.5	38	81.5	28.5	8	10.5	43	28	M12	16	5	Rc1/2	0	36	51	118	66 to 69

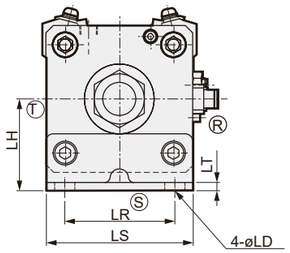
Code	KK	LL	MM	MN	MO	N	Q	SD	T	V	R	RA	RB	JA	UA	UB	WF	X
Bore Size																		
ø40	M14x1.5	93	16	8	14	2	13	40.5	8	18.5	16	18	10	29	2	5	33.5	197.5
ø50	M18x1.5	101	20	8	17	2.5	14	48	11	20.5	16	18	10	36	2	5	37	222.5
ø63	M18x1.5	105	20	8	17	3	15	59	11	21	16	25	12	36	2	5	35	229.5
ø80	M22x1.5	116	25	11	22	3.5	17	74	13	23.5	16	25	12	41	2	5	48	274.5
ø100	M26x1.5	128	30	13	27	4	18	90	16	32	16	25	12	49	3	6	53	311.5

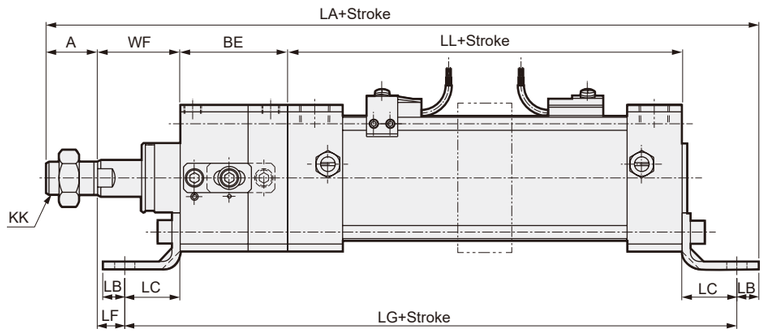
Code	With Bellows										
Bore Size	b	d	d*	ℓ							
				50 or less	Over 50 to 100 or Less	Over 100 to 150 or Less	Over 150 to 200 or Less	Over 200 to 300 or Less	Over 300 to 400 or Less	Over 400 to 500 or Less	When exceeding 500 *1
ø40	41	40	40	25.5	41.5	58.5	75.5	108.5	141.5	174.5	(Stroke/3.0)+8
ø50	47	47	48	22	36	49	63	90	119	146	(Stroke/3.6)+7.5
ø63	45	47	48	22	36	49	63	90	119	146	(Stroke/3.6)+7.5
ø80	58.5	53	55	14	26	38	49	72	96	119	(Stroke/4.3)+2.5
ø100	69.5	61	65	20	32	42	53	76	98	120	(Stroke/4.5)+9

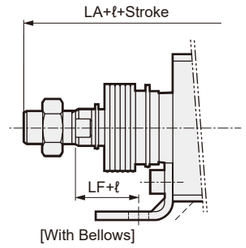
*1: Round up decimal places.
*2: Ⓡ Ⓢ Ⓣ indicates the position of the cushion needle.
***3: For outer dimensions diagram of accessories, refer to P. 604.**
***4: An intermediate support head (two-dot chain line) is added depending on the stroke. Please refer to P. 608.**
***5: For dimensions of models with switches, see P. 609.**

Dimensional Drawings

●Axial Foot Type (LB)







[With Bellows]

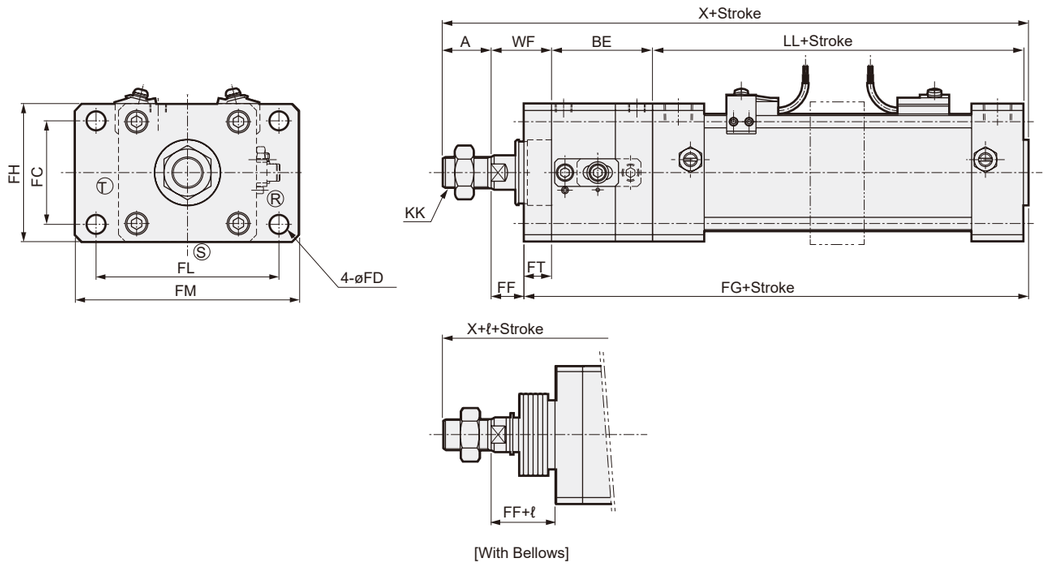
Code	Axial Foot Type (LB) Mounting Dimensions														
Bore Size	A	BE	KK	LL	WF	LA	LB	LC	LD	LF	LG	LH	LR	LS	LT
ø40	22	47	M14x1.5	93	33.5	225	10	19.5	9	14	179	40	40	57	3.2
ø50	28	54	M18x1.5	101	37	254	12	22	9	15	199	40	46	66	4.5
ø63	28	58.5	M18x1.5	105	35	268.5	12	30	11	5	223.5	50	60	80	4.5
ø80	36	71	M22x1.5	116	48	322	14	37	14	11	261	60	74	98	6
ø100	45	81.5	M26x1.5	128	53	359.5	21	31	14	22	271.5	67	80	118	6

Code	With Bellows							
Bore Size	ℓ							
	50 or less	Over 50 to 100 or Less	Over 100 to 150 or Less	Over 150 to 200 or Less	Over 200 to 300 or Less	Over 300 to 400 or Less	Over 400 to 500 or Less	When exceeding 500 *1
ø40	25.5	41.5	58.5	75.5	108.5	141.5	174.5	(Stroke/3.0)+8
ø50	22	36	49	63	90	119	146	(Stroke/3.6)+7.5
ø63	22	36	49	63	90	119	146	(Stroke/3.6)+7.5
ø80	14	26	38	49	72	96	119	(Stroke/4.3)+2.5
ø100	20	32	42	53	76	98	120	(Stroke/4.5)+9

*1: Round up decimal places.
*2: Ⓡ Ⓢ Ⓣ indicates the position of the cushion needle.
***3: For outer dimensions diagram of accessories, refer to P. 604.**
***4: An intermediate support head (two-dot chain line) is added depending on the stroke. Please refer to P. 608.**
***5: For dimensions of models with switches, see P. 609.**

Dimensional Drawings

●Rod Side Flange Type (FA)



[With Bellows]

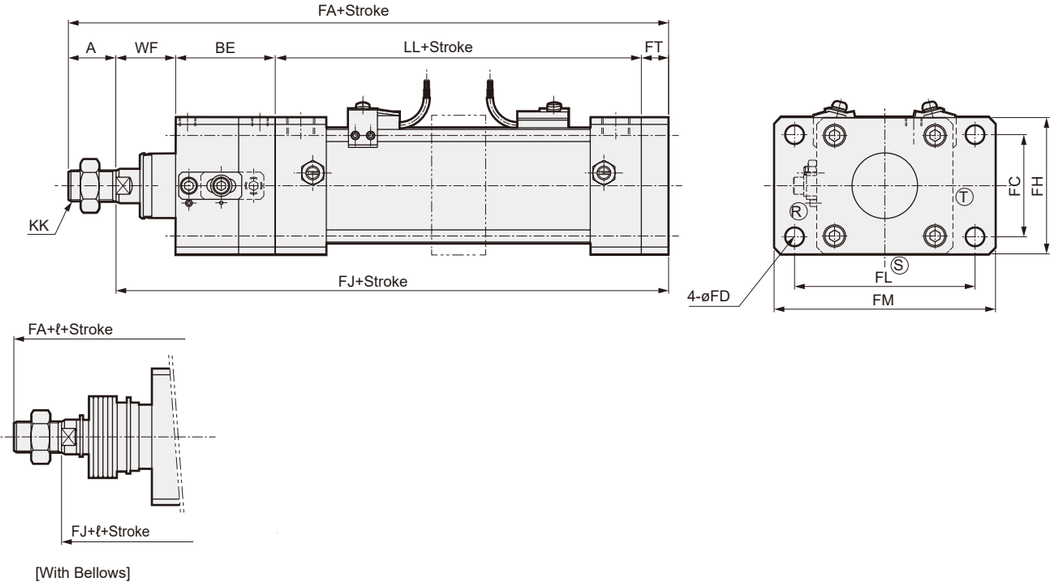
Code	Rod Side Flange Type (FA) Mounting Dimensions													
Bore Size	A	BE	KK	LL	WF	X	FC	FD	FF	FG	FH	FL	FM	FT
ø40	22	47	M14x1.5	93	33.5	197.5	40	9	21.5	154	57	80	100	12
ø50	28	54	M18x1.5	101	37	222.5	47	9	25	169.5	65	85	108	12
ø63	28	58.5	M18x1.5	105	35	229.5	60	11	19	182.5	80	106	130	16
ø80	36	71	M22x1.5	116	48	274.5	74	14	29	209.5	98	125	153	19
ø100	45	81.5	M26x1.5	128	53	311.5	88	14	34	232.5	118	144	180	19

Code	With Bellows							
	ℓ							
Bore Size	50 or less	Over 50 to 100 or Less	Over 100 to 150 or Less	Over 150 to 200 or Less	Over 200 to 300 or Less	Over 300 to 400 or Less	Over 400 to 500 or Less	When exceeding 500 *1
ø40	25.5	41.5	58.5	75.5	108.5	141.5	174.5	(Stroke/3.0)+8
ø50	22	36	49	63	90	119	146	(Stroke/3.6)+7.5
ø63	22	36	49	63	90	119	146	(Stroke/3.6)+7.5
ø80	14	26	38	49	72	96	119	(Stroke/4.3)+2.5
ø100	20	32	42	53	76	98	120	(Stroke/4.5)+9

*1: Round up decimal places.
*2: Ⓡ Ⓢ Ⓣ indicates the position of the cushion needle.
***3: For outer dimensions diagram of accessories, refer to P. 604.**
***4: An intermediate support head (two-dot chain line) is added depending on the stroke. Please refer to P. 608.**
***5: For dimensions of models with switches, see P. 609.**

Dimensional Drawings

●Head Side Flange Type (FB)



[With Bellows]

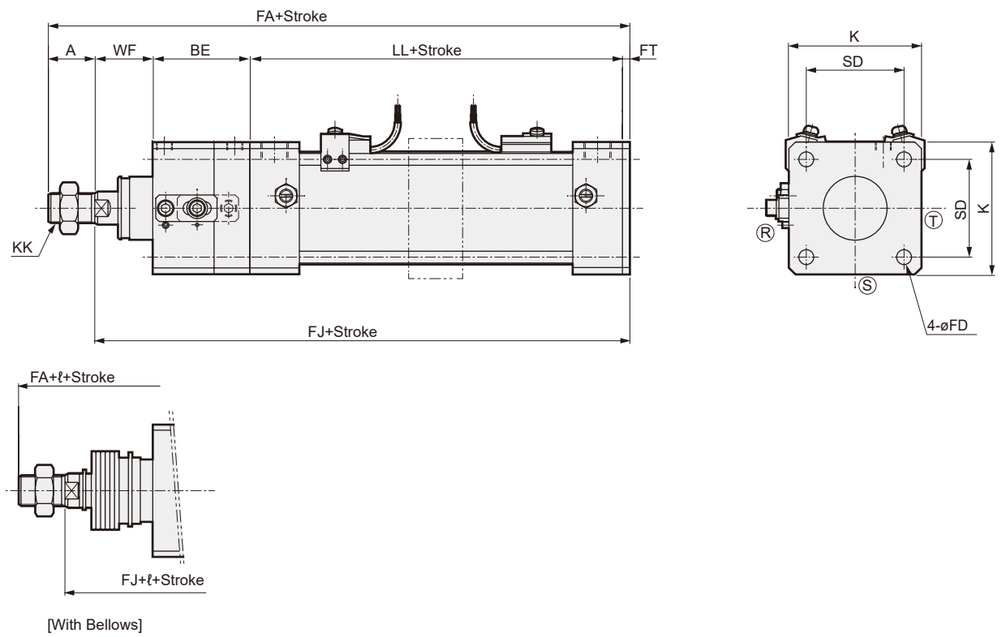
Code	Head Side Flange Type (FB) Mounting Dimensions												
Bore Size	A	BE	KK	LL	WF	FA	FC	FD	FH	FJ	FL	FM	FT
ø40	22	47	M14x1.5	93	33.5	207.5	40	9	57	185.5	80	100	12
ø50	28	54	M18x1.5	101	37	232	47	9	65	204	85	108	12
ø63	28	58.5	M18x1.5	105	35	242.5	60	11	80	214.5	106	130	16
ø80	36	71	M22x1.5	116	48	290	74	14	98	254	125	153	19
ø100	45	81.5	M26x1.5	128	53	326.5	88	14	118	281.5	144	180	19

Code	With Bellows							
	ℓ							
Bore Size	50 or less	Over 50 to 100 or Less	Over 100 to 150 or Less	Over 150 to 200 or Less	Over 200 to 300 or Less	Over 300 to 400 or Less	Over 400 to 500 or Less	When exceeding 500 *1
ø40	25.5	41.5	58.5	75.5	108.5	141.5	174.5	(Stroke/3.0)+8
ø50	22	36	49	63	90	119	146	(Stroke/3.6)+7.5
ø63	22	36	49	63	90	119	146	(Stroke/3.6)+7.5
ø80	14	26	38	49	72	96	119	(Stroke/4.3)+2.5
ø100	20	32	42	53	76	98	120	(Stroke/4.5)+9

*1: Round up decimal places.
*2: Ⓡ Ⓢ Ⓣ indicates the position of the cushion needle.
***3: For outer dimensions diagram of accessories, refer to P. 604.**
***4: An intermediate support head (two-dot chain line) is added depending on the stroke. Please refer to P. 608.**
***5: For dimensions of models with switches, see P. 609.**

Dimensional Drawings

●Head side special flange type (FC)



[With Bellows]

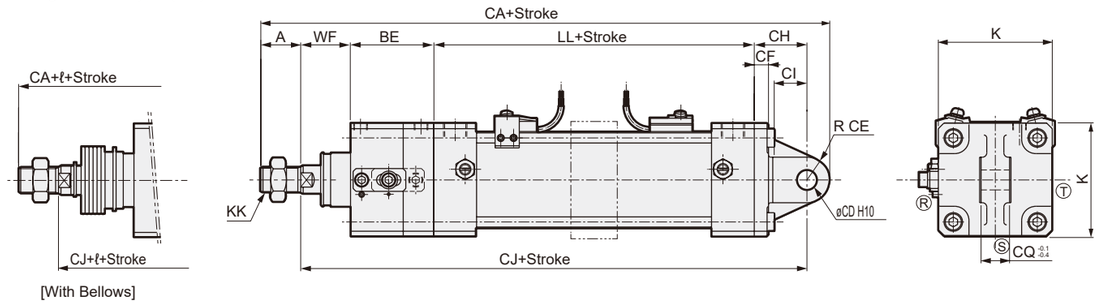
Code	Head side special flange type (FC) Mounting dimensions										
Bore Size	A	BE	KK	LL	WF	FA	FD	FJ	FT	K	SD
ø40	22	47	M14x1.5	93	33.5	200	9	178	4.5	57	40.5
ø50	28	54	M18x1.5	101	37	224.5	9	196.5	4.5	66	48
ø63	28	58.5	M18x1.5	105	35	231	11	203	4.5	80	59
ø80	36	71	M22x1.5	116	48	277	14	241	6	98	74
ø100	45	81.5	M26x1.5	128	53	313.5	14	268.5	6	118	90

Code	With Bellows							
	ℓ							
Bore Size	50 or less	Over 50 100 or less	Over 100 150 or Less	Over 150 200 or Less	Over 200 300 or Less	Over 300 400 or Less	Over 400 500 or Less	When exceeding 500 *1
ø40	25.5	41.5	58.5	75.5	108.5	141.5	174.5	(Stroke/3.0)+8
ø50	22	36	49	63	90	119	146	(Stroke/3.6)+7.5
ø63	22	36	49	63	90	119	146	(Stroke/3.6)+7.5
ø80	14	26	38	49	72	96	119	(Stroke/4.3)+2.5
ø100	20	32	42	53	76	98	120	(Stroke/4.5)+9

*1: Round up decimal places.
*2: Ⓡ Ⓢ Ⓣ indicates the position of the cushion needle.
***3: For outer dimensions diagram of accessories, refer to P. 604.**
***4: An intermediate support head (two-dot chain line) is added depending on the stroke. Please refer to P. 608.**
***5: For dimensions of models with switches, see P. 609.**

Dimensional Drawings

●Single Clevis Type (CA)



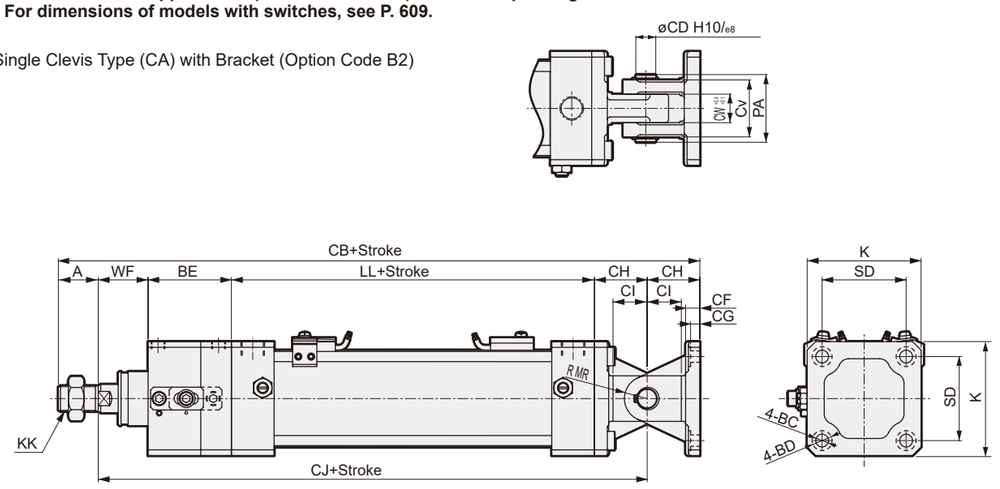
[With Bellows]

Code	Single Clevis Type (CA) Mounting Dimensions													
Bore Size	A	BE	KK	LL	WF	CA	CD	CE	CF	CH	CI	CJ	CQ	K
ø40	22	47	M14x1.5	93	33.5	239.5	12 $^{+0.070}_{0}$	12	10	32	18	205.5	18	57
ø50	28	54	M18x1.5	101	37	264	12 $^{+0.070}_{0}$	12	10	32	18	224	18	66
ø63	28	58.5	M18x1.5	105	35	279.5	14 $^{+0.070}_{0}$	16	10	37	24	235.5	20	80
ø80	36	71	M22x1.5	116	48	343	20 $^{+0.084}_{0}$	20	14	52	30	287	28	98
ø100	45	81.5	M26x1.5	128	53	379.5	20 $^{+0.084}_{0}$	20	16	52	30	314.5	28	118

Code	With Bellows							
	ℓ							
Bore Size	50 or less	Over 50 100 or less	Over 100 150 or Less	Over 150 200 or Less	Over 200 300 or Less	Over 300 400 or Less	Over 400 500 or Less	When exceeding 500 *1
ø40	25.5	41.5	58.5	75.5	108.5	141.5	174.5	(Stroke/3.0)+8
ø50	22	36	49	63	90	119	146	(Stroke/3.6)+7.5
ø63	22	36	49	63	90	119	146	(Stroke/3.6)+7.5
ø80	14	26	38	49	72	96	119	(Stroke/4.3)+2.5
ø100	20	32	42	53	76	98	120	(Stroke/4.5)+9

*1: Round up decimal places.
*2: Ⓡ Ⓢ Ⓣ indicates the position of the cushion needle.
***3: For outer dimensions diagram of accessories, refer to P. 604.**
***4: An intermediate support head (two-dot chain line) is added depending on the stroke. Please refer to P. 608.**
***5: For dimensions of models with switches, see P. 609.**

●Single Clevis Type (CA) with Bracket (Option Code B2)

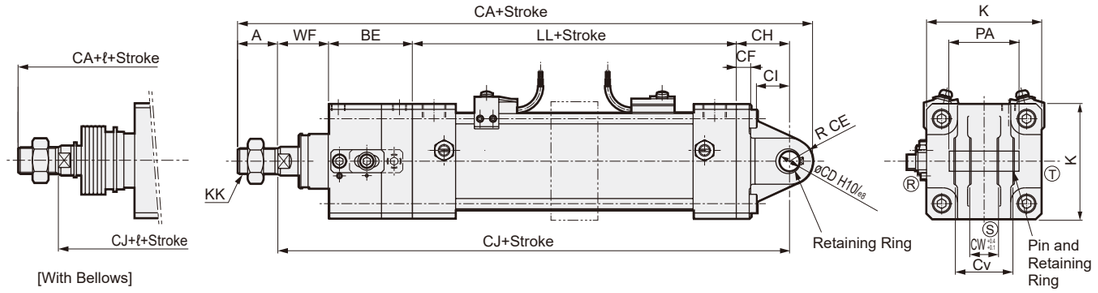


Code	Single Clevis Type (CA) With Bracket (Option Code B2) Mounting Dimensions																			
Bore Size	A	BE	KK	LL	WF	CB	CD	CF	CG	CH	CI	CJ	Cv	CW	BC	BD	K	MR	PA	SD
ø40	22	47	M14x1.5	93	33.5	259.5	12	10	6.5	32	18	205.5	36	18	9	14	57	12	43.5	40.5
ø50	28	54	M18x1.5	101	37	284	12	10	6.5	32	18	224	36	18	9	14	66	12	43.5	48
ø63	28	58.5	M18x1.5	105	35	300.5	14	10	6.5	37	24	235.5	40	20	9	14	80	16	47.5	59
ø80	36	71	M22x1.5	116	48	375	20	14	10.5	52	30	287	56	28	14	20	98	20	64	74
ø100	45	81.5	M26x1.5	128	53	411.5	20	16	10.5	52	30	314.5	56	28	14	20	118	20	64	90

***1: For outer dimensions diagram of accessories, refer to P. 604.**
***2: An intermediate support head (two-dot chain line) is added depending on the stroke. Please refer to P. 608.**
***3: For dimensions of models with switches, see P. 609.**

Dimensional Drawings

●Double clevis type (CB)

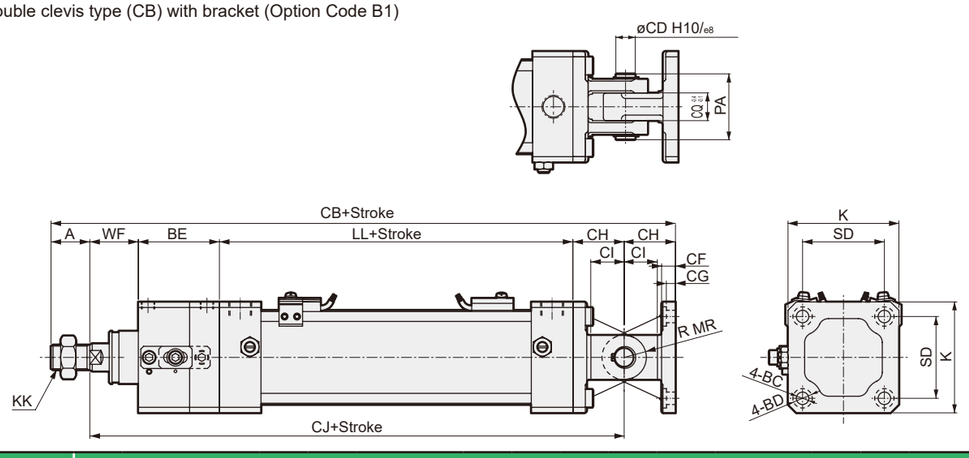


Code	Double Clevis Type (CB) Mounting Dimensions																
Bore Size	A	BE	KK	LL	WF	CA	CD	CE	CF	CH	CI	CJ	Cv	CW	K	PA
ø40	22	47	M14x1.5	93	33.5	239.5	$12^{+0.070}_{0}$	12	10	32	18	205.5	36	18	57	43.5
ø50	28	54	M18x1.5	101	37	264	$12^{+0.070}_{0}$	12	10	32	18	224	36	18	66	43.5
ø63	28	58.5	M18x1.5	105	35	279.5	$14^{+0.070}_{0}$	16	10	37	24	235.5	40	20	80	47.5
ø80	36	71	M22x1.5	116	48	343	$20^{+0.084}_{0}$	20	14	52	30	287	56	28	98	64
ø100	45	81.5	M26x1.5	128	53	379.5	$20^{+0.084}_{0}$	20	16	52	30	314.5	56	28	118	64

Code	With Bellows							
	ℓ							
Bore Size	50 or less	Over 50 100 or less	Over 100 150 or Less	Over 150 200 or Less	Over 200 300 or Less	Over 300 400 or Less	Over 400 500 or Less	When exceeding 500 *1
ø40	25.5	41.5	58.5	75.5	108.5	141.5	174.5	(Stroke/3.0)+8
ø50	22	36	49	63	90	119	146	(Stroke/3.6)+7.5
ø63	22	36	49	63	90	119	146	(Stroke/3.6)+7.5
ø80	14	26	38	49	72	96	119	(Stroke/4.3)+2.5
ø100	20	32	42	53	76	98	120	(Stroke/4.5)+9

*1: Round up decimal places.
*2: Ⓡ Ⓢ Ⓣ indicates the position of the cushion needle.
***3: For outer dimensions diagram of accessories, refer to P. 604.**
***4: An intermediate support head (two-dot chain line) is added depending on the stroke. Please refer to P. 608.**
***5: For dimensions of models with switches, see P. 609.**

●Double clevis type (CB) with bracket (Option Code B1)

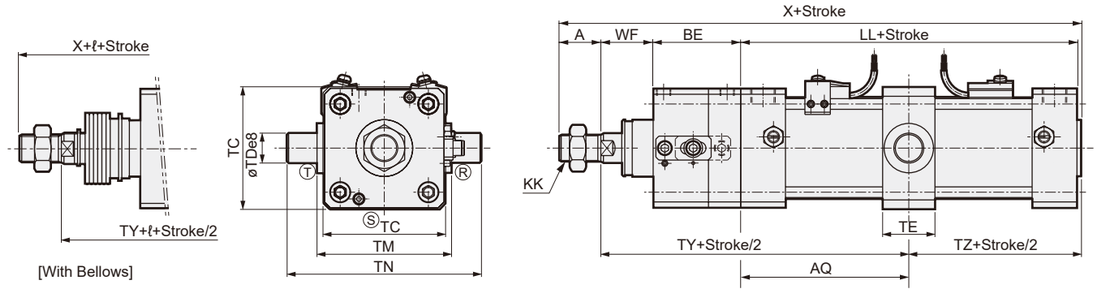


Code	Double Clevis Type (CB) With Bracket (Option Code B1) Mounting Dimensions																	
Bore Size	A	BE	KK	LL	WF	CB	CD	CF	CG	CH	CI	CJ	CQ	BC	BD	K	MR	PA	SD
ø40	22	47	M14x1.5	93	33.5	259.5	12	10	6.5	32	18	205.5	18	9	14	57	12	43.5	40.5
ø50	28	54	M18x1.5	101	37	284	12	10	6.5	32	18	224	18	9	14	66	12	43.5	48
ø63	28	58.5	M18x1.5	105	35	300.5	14	10	6.5	37	24	235.5	20	9	14	80	16	47.5	59
ø80	36	71	M22x1.5	116	48	375	20	14	10.5	52	30	287	28	14	20	98	20	64	74
ø100	45	81.5	M26x1.5	128	53	411.5	20	16	10.5	52	30	314.5	28	14	20	118	20	64	90

***1: For outer dimensions diagram of accessories, refer to P. 604.**
***2: An intermediate support head (two-dot chain line) is added depending on the stroke. Please refer to P. 608.**
***3: For dimensions of models with switches, see P. 609.**

Dimensional Drawings

●Intermediate trunnion type (TC)

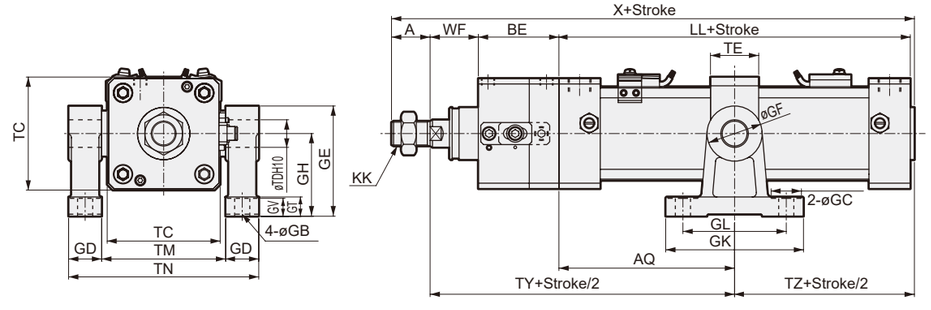


Code	Intermediate Trunnion Type (TC) Mounting Dimensions												
Bore Size	A	BE	KK	LL	WF	X	AQ	TC	TD	TE	TM	TN	TY	TZ
ø40	22	47	M14x1.5	93	33.5	197.5	46.5 + Stroke/2	57	$16^{-0.032}_{-0.059}$	30	63	95	127	48.5
ø50	28	54	M18x1.5	101	37	222.5	50.5 + Stroke/2	67	$18^{-0.032}_{-0.059}$	30	80	116	141.5	53
ø63	28	58.5	M18x1.5	105	35	229.5	52.5 + Stroke/2	82	$20^{-0.04}_{-0.073}$	35	90	130	146	55.5
ø80	36	71	M22x1.5	116	48	274.5	58 + Stroke/2	100	$25^{-0.04}_{-0.073}$	40	115	165	177	61.5
ø100	45	81.5	M26x1.5	128	53	311.5	64 + Stroke/2	121	$35^{-0.05}_{-0.089}$	50	135	205	198.5	68

Code	With Bellows							
	ℓ							
Bore Size	50 or less	Over 50 100 or less	Over 100 150 or Less	Over 150 200 or Less	Over 200 300 or Less	Over 300 400 or Less	Over 400 500 or Less	When exceeding 500 *1
ø40	25.5	41.5	58.5	75.5	108.5	141.5	174.5	(Stroke/3.0)+8
ø50	22	36	49	63	90	119	146	(Stroke/3.6)+7.5
ø63	22	36	49	63	90	119	146	(Stroke/3.6)+7.5
ø80	14	26	38	49	72	96	119	(Stroke/4.3)+2.5
ø100	20	32	42	53	76	98	120	(Stroke/4.5)+9

*1: Round up decimal places.
*2: Ⓡ Ⓢ Ⓣ indicates the position of the cushion needle.
***3: For outer dimensions diagram of accessories, refer to P. 604.**
***4: For dimensions of models with switches, see P. 609.**

●Intermediate trunnion type (TC) with bracket (Option Code B4)

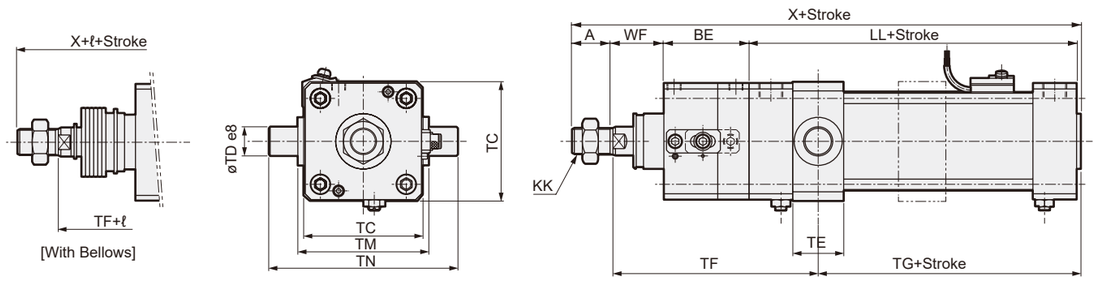


Code	Intermediate Trunnion Type (TC) with Bracket (Option Code B4) Mounting Dimensions																					
Bore Size	A	BE	KK	LL	WF	X	AQ	TC	TD	TE	TY	TZ	TM	TN	GB	GC	GD	GE	GF	GH	GK	GL	GT	GV
ø40	22	47	M14x1.5	93	33.5	197.5	46.5+Stroke/2	57	16	30	127	48.5	63	95	9	17	19	61	32	45	80	60	12	11
ø50	28	54	M18x1.5	101	37	222.5	50.5+Stroke/2	67	18	30	141.5	53	80	116	9	17	19	63	36	45	85	65	12	11
ø63	28	58.5	M18x1.5	105	35	229.5	52.5+Stroke/2	82	20	35	146	55.5	90	130	11	22	24	80	40	60	100	75	14	13
ø80	36	71	M22x1.5	116	48	274.5	58+Stroke/2	100	25	40	177	61.5	115	165	14	24	26	85	50	60	115	85	14	13
ø100	45	81.5	M26x1.5	128	53	311.5	64+Stroke/2	121	35	50	198.5	68	135	205	14	24	35	107	64	75	130	100	17	16

***1: For outer dimensions diagram of accessories, refer to P. 604.**
***2: For dimensions of models with switches, see P. 609.**

Dimensional Drawings

●Rod side trunnion type (TA)

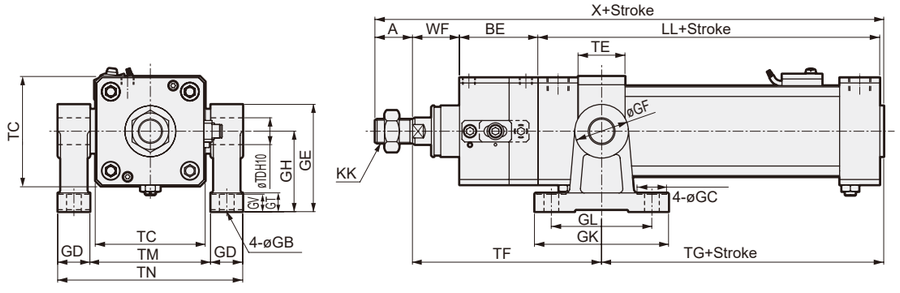


Code	Rod Type Trunnion Type (TA) Mounting Dimensions												
Bore Size	A	BE	KK	LL	WF	X	TC	TD	TE	TF	TG	TM	TN
ø40	22	47	M14x1.5	93	33.5	197.5	57	16 $^{-0.032}_{-0.059}$	30	121.5	54	63	95
ø50	28	54	M18x1.5	101	37	222.5	67	18 $^{-0.032}_{-0.059}$	30	134	60.5	80	116
ø63	28	58.5	M18x1.5	105	35	229.5	82	20 $^{-0.040}_{-0.073}$	35	141	60.5	90	130
ø80	36	71	M22x1.5	116	48	274.5	100	25 $^{-0.040}_{-0.073}$	40	173	65.5	115	165
ø100	45	81.5	M26x1.5	128	53	311.5	121	35 $^{-0.050}_{-0.089}$	50	195.5	71	135	205

Code	With Bellows							
	ℓ							
Bore Size	50 or less	Over 50 100 or less	Over 100 150 or Less	Over 150 200 or Less	Over 200 300 or Less	Over 300 400 or Less	Over 400 500 or Less	When exceeding 500 *1
ø40	25.5	41.5	58.5	75.5	108.5	141.5	174.5	(Stroke/3.0)+8
ø50	22	36	49	63	90	119	146	(Stroke/3.6)+7.5
ø63	22	36	49	63	90	119	146	(Stroke/3.6)+7.5
ø80	14	26	38	49	72	96	119	(Stroke/4.3)+2.5
ø100	20	32	42	53	76	98	120	(Stroke/4.5)+9

*1: Round up decimal places.
*2: The position of the cushion needle cannot be changed.
***3: For outer dimensions diagram of accessories, refer to P. 604.**
***4: An intermediate support head (two-dot chain line) is added depending on the stroke. Please refer to P. 608.**
***5: For dimensions of models with switches, see P. 609.**

●Rod side trunnion type (TA) with bracket (Option Code B4)

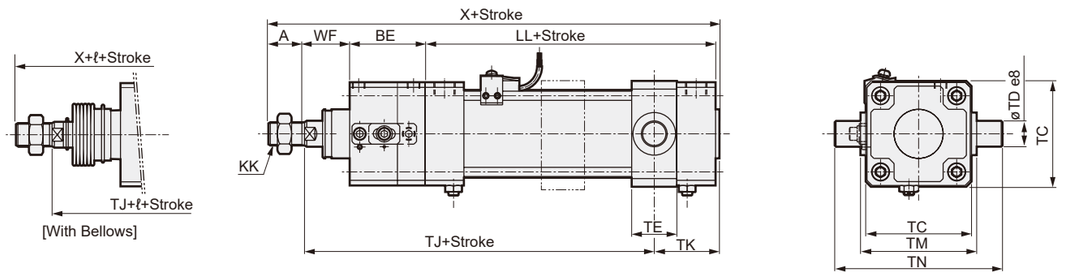


Code	Rod Side Trunnion Type (TA) with Bracket (Option Code B4) Mounting Dimensions																						
Bore Size	A	BE	KK	LL	WF	X	TC	TD	TE	TF	TG	TM	TN	GB	GC	GD	GE	GF	GH	GK	GL	GT	GV
ø40	22	47	M14x1.5	93	33.5	197.5	57	16	30	121.5	54	63	95	9	17	19	61	32	45	80	60	12	11
ø50	28	54	M18x1.5	101	37	222.5	67	18	30	134	60.5	80	116	9	17	19	63	36	45	85	65	12	11
ø63	28	58.5	M18x1.5	105	35	229.5	82	20	35	141	60.5	90	130	11	22	24	80	40	60	100	75	14	13
ø80	36	71	M22x1.5	116	48	274.5	100	25	40	173	65.5	115	165	14	24	26	85	50	60	115	85	14	13
ø100	45	81.5	M26x1.5	128	53	311.5	121	35	50	195.5	71	135	205	14	24	35	107	64	75	130	100	17	16

***1: For outer dimensions diagram of accessories, refer to P. 604.**
***2: An intermediate support head (two-dot chain line) is added depending on the stroke. Please refer to P. 608.**
***3: For dimensions of models with switches, see P. 609.**

Dimensional Drawings

●Head Side Trunnion Type (TB)

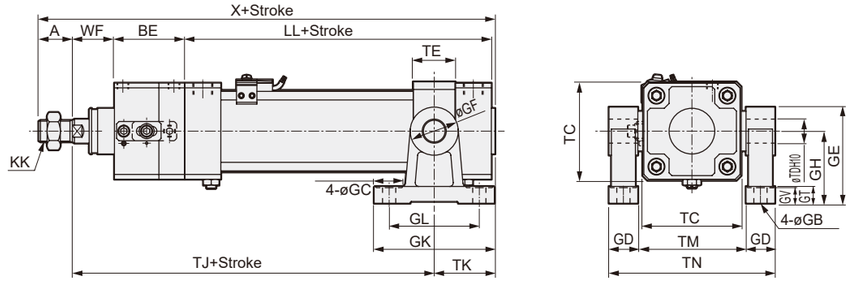


Code	Head Side Trunnion Type (TB) Mounting Dimensions												
Bore Size	A	BE	KK	LL	WF	X	TC	TD	TE	TJ	TK	TM	TN
ø40	22	47	M14x1.5	93	33.5	197.5	57	16 $^{-0.032}_{-0.059}$	30	132	43.5	63	95
ø50	28	54	M18x1.5	101	37	222.5	67	18 $^{-0.032}_{-0.059}$	30	148.5	46	80	116
ø63	28	58.5	M18x1.5	105	35	229.5	82	20 $^{-0.040}_{-0.073}$	35	150.5	51	90	130
ø80	36	71	M22x1.5	116	48	274.5	100	25 $^{-0.040}_{-0.073}$	40	180.5	58	115	165
ø100	45	81.5	M26x1.5	128	53	311.5	121	35 $^{-0.050}_{-0.089}$	50	201	65.5	135	205

Code	With Bellows							
	ℓ							
Bore Size	50 or less	Over 50 100 or less	Over 100 150 or Less	Over 150 200 or Less	Over 200 300 or Less	Over 300 400 or Less	Over 400 500 or Less	When exceeding 500 *1
ø40	25.5	41.5	58.5	75.5	108.5	141.5	174.5	(Stroke/3.0)+8
ø50	22	36	49	63	90	119	146	(Stroke/3.6)+7.5
ø63	22	36	49	63	90	119	146	(Stroke/3.6)+7.5
ø80	14	26	38	49	72	96	119	(Stroke/4.3)+2.5
ø100	20	32	42	53	76	98	120	(Stroke/4.5)+9

*1: Round up decimal places.
*2: The position of the cushion needle cannot be changed.
***3: For outer dimensions diagram of accessories, refer to P. 604.**
***4: An intermediate support head (two-dot chain line) is added depending on the stroke. Please refer to P. 608.**
***5: For dimensions of models with switches, see P. 609.**

●Head side trunnion type (TB) with bracket (Option Code B4)

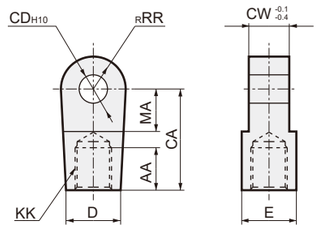


Code	Head Side Trunnion Type (TB) with Bracket (Option Code B4) Mounting Dimensions																						
Bore Size	A	BE	KK	LL	WF	X	TC	TD	TE	TJ	TK	TM	TN	GB	GC	GD	GE	GF	GH	GK	GL	GT	GV
ø40	22	47	M14x1.5	93	33.5	197.5	57	16	30	132	43.5	63	95	9	17	19	61	32	45	80	60	12	11
ø50	28	54	M18x1.5	101	37	222.5	67	18	30	148.5	46	80	116	9	17	19	63	36	45	85	65	12	11
ø63	28	58.5	M18x1.5	105	35	229.5	82	20	35	150.5	51	90	130	11	22	24	80	40	60	100	75	14	13
ø80	36	71	M22x1.5	116	48	274.5	100	25	40	180.5	58	115	165	14	24	26	85	50	60	115	85	14	13
ø100	45	81.5	M26x1.5	128	53	311.5	121	35	50	201	65.5	135	205	14	24	35	107	64	75	130	100	17	16

***1: For outer dimensions diagram of accessories, refer to P. 604.**
***2: An intermediate support head (two-dot chain line) is added depending on the stroke. Please refer to P. 608.**
***3: For dimensions of models with switches, see P. 609.**

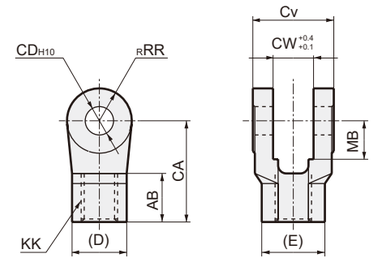
Accessories (Knuckle/Bracket/Pin) External Dimensions Diagram

● Single Knuckle (I) Material: Cast Iron, Painting



Model No.	Applicable Tube Inner Diameter (mm)	AA	CA	CD	CW	D	E	KK	MA	RR	Weight (kg)
S1-I-40	40	20	50	12	18	27	27	M14×1.5	21	16	0.26
S1-I-50	50	21	50	12	18	27	27	M18×1.5	21	16	0.24
S1-I-63	63	21	50	14	20	27	27	M18×1.5	21	16	0.25
S1-I-80	80	30	70	20	28	46	41	M22×1.5	30	25	0.88
S1-I-100	100	30	70	20	28	46	41	M26×1.5	30	25	0.84

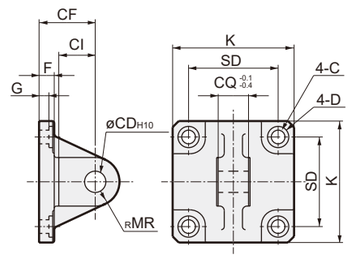
●Double Knuckle (Y) Material: Cast Iron, Painting



Model No.	Applicable Tube Inner Diameter (mm)	AB	CA	CD	Cv	CW	D	E	KK	MB	RR	Weight (kg)
S1-Y-40	40	24	50	12	36	18	27	31.2	M14×1.5	19	16	0.25
S1-Y-50	50	24	50	12	36	18	27	31.2	M18×1.5	19	16	0.24
S1-Y-63	63	24	50	14	40	20	27	31.2	M18×1.5	19	16	0.26
S1-Y-80	80	35	70	20	56	28	41	47.3	M22×1.5	30	25	0.90
S1-Y-100	100	35	70	20	56	28	41	47.3	M26×1.5	30	25	0.85

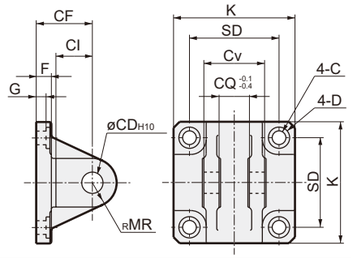
*1: MB dimension represents CW dimension effective length.
*2: Pins and Retaining Rings are included.

●Single Bracket (B1) Material: Cast Iron, Painted



Model No.	Applicable Tube Inner Diameter (mm)	C	CD	CF	CI	CQ	D	F	G	K	MR	SD	Weight (kg)
S1-B1-40	40	9	12	32	18	18	14	10	6.5	57	12	40.5	0.32
S1-B1-50	50	9	12	32	18	18	14	10	6.5	66	12	48	0.38
S1-B1-63	63	9	14	37	24	20	14	10	6.5	80	16	59	0.57
S1-B1-80	80	14	20	52	30	28	20	14	10.5	98	20	74	1.27
S1-B1-100	100	14	20	52	30	28	20	16	10.5	118	20	90	1.64

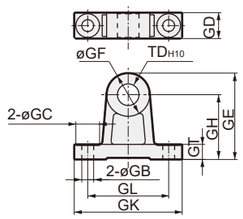
●Double Bracket (B2) Material: Cast Iron, Painted



Model No.	Applicable Tube Inner Diameter (mm)	C	CD	CF	CI	Cv	CQ	D	F	G	K	MR	SD	Weight (kg)
S1-B2-40	40	9	12	32	18	36	18	14	10	6.5	57	12	40.5	0.36
S1-B2-50	50	9	12	32	18	36	18	14	10	6.5	66	12	48	0.41
S1-B2-63	63	9	14	37	24	40	20	14	10	6.5	80	16	59	0.62
S1-B2-80	80	14	20	52	30	56	28	20	14	10.5	98	20	74	1.48
S1-B2-100	100	14	20	52	30	56	28	20	16	10.5	118	20	90	1.82

*1: Pins and Retaining Rings are included.

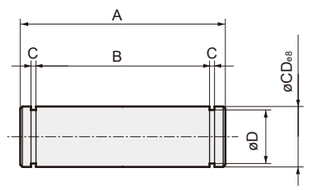
●Trunnion type 2nd bracket (B4) Material: Cast Iron, Painting



Model No.	GB	GC	GD	GE	GF	GH	GK	GL	GT	TD	Weight (kg)
S1-B4-40	9	17	19	61	32	45	80	60	12	16	0.25
S1-B4-50	9	17	19	63	36	45	85	65	12	18	0.28
S1-B4-63	11	22	24	80	40	60	100	75	14	20	0.52
S1-B4-80	14	24	26	85	50	60	115	85	14	25	0.70
S1-B4-100	14	24	35	107	64	75	130	100	17	35	1.48

Note: The trunnion No. 2 bracket is provided as 2 pcs./set.

●Pin (P) Material: Steel, Zinc Chromate

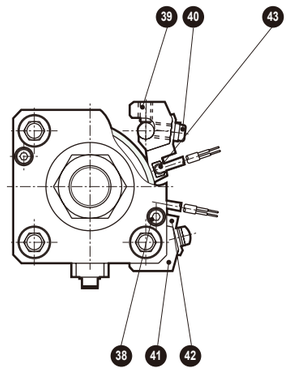


Model No.	Applicable Tube Inner Diameter (mm)	A	B	C	D	CD	Weight (kg)	Retaining Ring Used
S1-P-40	40, 50	43.5	36.3	1.15	11.5	12	0.04	C-type Retaining Ring for shaft 12
S1-P-63	63	47.5	40.2	1.15	13.4	14	0.06	C-type Retaining Ring for shaft 14
S1-P-80	80.100	64	56.2	1.35	19	20	0.16	C-type Retaining Ring for shaft 20

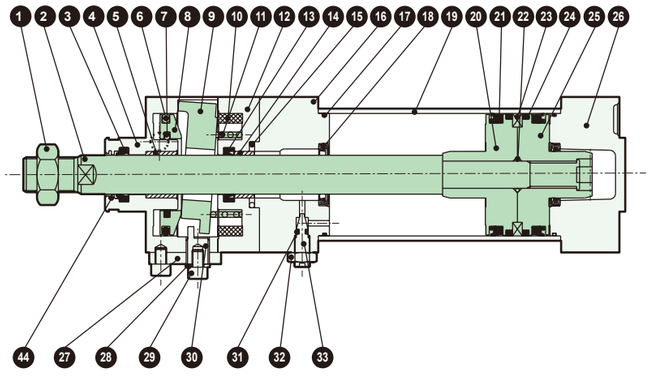
MEMO

Internal Structure / Materials

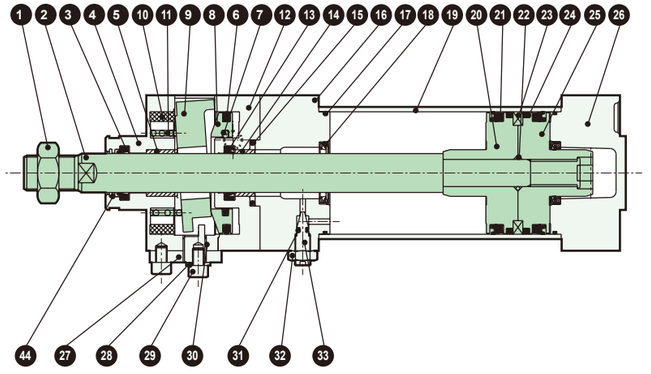
[Common for F, B]



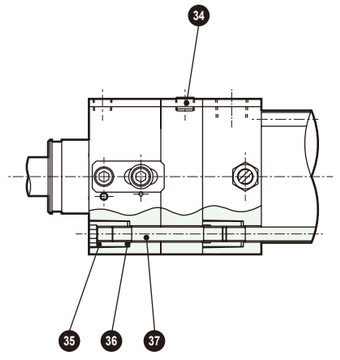
[F: Forward Locking type]



[B: Backward Locking type]



[Common for F, B]



Do Not Disassemble

Material

Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Rod Nut	Steel	Zinc Chromate	23	Magnet	Plastic	
2	Piston Rod	Steel	Industrial Hard Chrome Plating	24	Wear ring	Polyacetal	
3	Scraper	Nitrile Rubber		25	Piston H	Aluminum Alloy	
4	Brake Body A	Aluminum Alloy	Black alumite	26	Head Cover	Aluminum Alloy	Painting
5	Bushing	Oil impregnated Bearing Alloy		27	Release lever	Steel	
6	Release Piston Packing A	Nitrile Rubber		28	Plain Washer	Steel	
7	Release Piston Packing B	Nitrile Rubber		29	Hexagon Socket Head Cap Screw	Steel	
8	Release Piston	Steel	Zinc Chromate	30	Release Cam	Steel	
9	Lock plate	Special Steel		31	Needle gasket	Nitrile Rubber	
10	Cushion Rubber	Urethane Rubber		32	Needle nut	Copper Alloy	
11	Spring	Piano Wire	Black Oxide	33	Cushion needle	Copper Alloy	
12	Brake Body B	Aluminum Alloy	Black alumite	34	Blanking Plug	Steel	
13	Rod Packing	Nitrile Rubber		35	Round nut	Steel	Zinc Chromate
14	Bush	Oil impregnated Bearing Alloy		36	Belleville washer	Steel	Black Oxide
15	Gasket	Nitrile Rubber		37	Tie rod	Steel	Zinc Chromate
16	Rod Cover	Aluminum Alloy	Painted	38	Hexagon Socket Head Cap Screw	Steel	
17	Cylinder gasket	Nitrile Rubber		39	Hexagon Socket Set Screw	Steel	Black Oxide
18	Cushion Packing	Urethane Rubber, Steel		40	Cross-Recessed Pan Head Screw	Steel	Zinc Chromate
19	Cylinder Tube	Aluminum Alloy	Hard Anodized	41	Switch mounting base	Aluminum Alloy	
20	Piston R	Aluminum Alloy		42	Switch holder	Aluminum Alloy	
21	Piston Packing	Nitrile Rubber		43	Cylinder Switch		
22	Piston gasket	Nitrile Rubber		44	Coil Scraper	Phosphor bronze	With Coil Scraper (G1) only

Consumable Parts List (Standard Type)

Bore Size (mm)	Kit Number	Replacement Part Number
ø40	**USC-40K**	③ ⑬ ⑮ ⑰ ⑱ ㉑ ㉔ ㉜
ø50	**USC-50K**	
ø63	**USC-63K**	
ø80	**USC-80K**	
ø100	**USC-100K**	

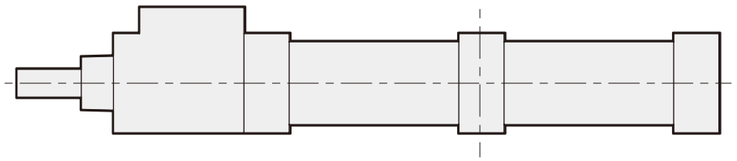
Note: When replacing consumable parts, it is necessary to remove the lock mechanism part, but do not disassemble the lock mechanism part as the spring may pop out or performance may not be maintained.

About Center Holding Head Details

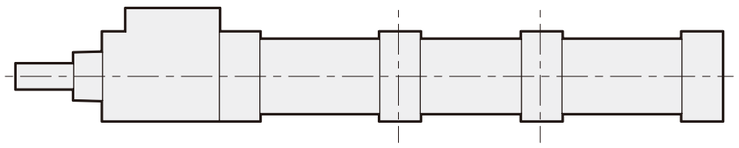
An intermediate support head is added to the center of the cylinder depending on the stroke. The quantity of intermediate support heads varies depending on the tube diameter and stroke as shown in the table below.

Quantity of intermediate support heads by stroke

Tube Diameter (mm)	Stroke mm	Intermediate support head quantity
ø40	1200 to 1600	1
ø50	1200 to 1800	1
	1801 to 2000	2
ø63	1200 to 1800	1
	1801 to 2500	2
ø80	1500 to 2000	1
	2001 to 2500	2
ø100	1500 to 2000	1
	2001 to 2500	2

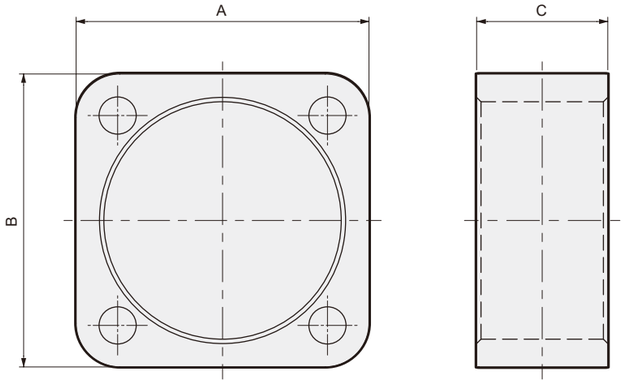


One non-sag block: Assembled in the center between the covers



Two non-sag blocks: Three plates from the cover

Also, the dimensions of the intermediate support head are as shown in the figure below, so please consider the dimensions of the intermediate support head when installing the cylinder.

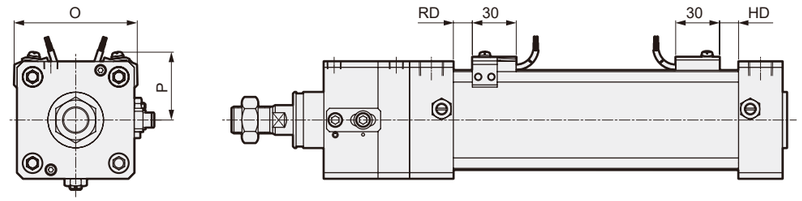


Intermediate Support Head Dimension Table

Tube Diameter (mm)	Intermediate support head dimensions		
	A	B	C
ø40	56	57	30
ø50	66	67	30
ø63	81	82	35
ø80	99	100	40
ø100	120	121	50

USC Series External Dimensions Diagram with Switch

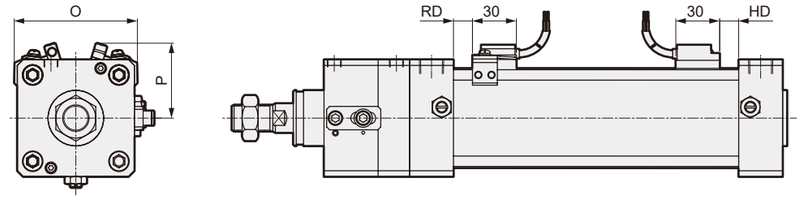
● T0, T5, T2, T3, T3P, T2□R3, T2W, T3W, T2WL T8, T2J
• USC, USC-G1



Code	USC, USC-G1									
Bore Size (mm)	O	P	T0, T5, T2, T3, T3P, T2□R3		T2W, T3W, T2WL		T8		T2J	
			RD	HD	RD	HD	RD	HD	RD	HD
ø40	66	41.5	11	11	13	13	5	5	10	10
ø50	73	43	13	13	15	15	7	7	12	12
ø63	85	47	13	13	15	15	7	7	12	12
ø80	105	57	14.5	14.5	16.5	16.5	8.5	8.5	13.5	13.5
ø100	121	63	18.5	18.5	20.5	20.5	12.5	12.5	17.5	17.5

Note: For switch mountability, refer to the model number display method for each variation.

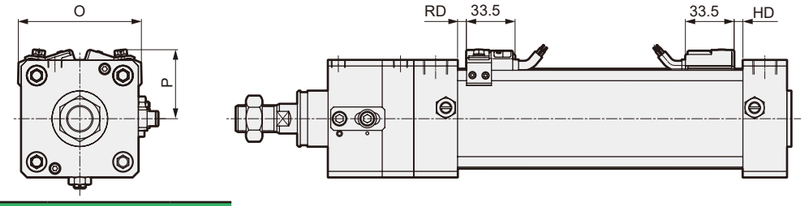
● T1, T2YD, T2YDT
• USC, USC-G1



Code	USC, USC-G1			
Bore Size (mm)	O	P	T1,T2YD,T2YDT	
			RD	HD
ø40	66	40	10	10
ø50	73	44.5	12	12
ø63	85	50	12	12
ø80	105	60	13.5	13.5
ø100	121	68	17.5	17.5

Note: For switch mountability, refer to the model number display method for each variation.

● H0, H0Y
• USC-L2, USC-G1L2



Code	USC-L2, USC-G1L2			
Bore Size (mm)	O	P	RD	HD
ø40	66	42	4	4
ø50	73	44	6	6
ø63	84	47	6	6
ø80	104	58	7.5	7.5
ø100	120	64	11.5	11.5

Note: For switch mountability, refer to the model number display method for each variation.

To Use This Product Safely

Be sure to read this before use. For general cylinder information, see Intro 41, and for cylinder switches, see P. 1512.

Individual Precautions: Free position locking large Bore Size cylinder USC Series

Design / Selection

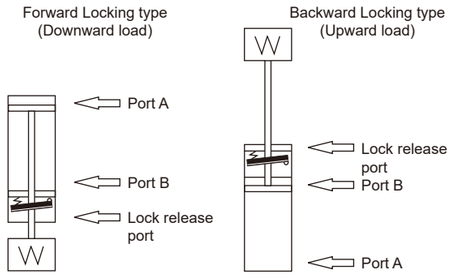
⚠Warning

■ This cylinder is equipped with a fall prevention (holding of cylinder stationary state) mechanism. If used for emergency stop or urgent stop (stopping from cylinder operating state), the service life will be significantly reduced.

■ If back pressure is applied during locking, the lock may disengage. Therefore, use a standalone valve or an individual exhaust type manifold.

■ Since the locking force will decrease and it is dangerous, do not apply rotational force (torque) to the rod during lock operation. Also, use with a mechanism that prevents rod rotation.

■ When releasing the lock, always supply pressure to port B for forward direction lock type and port A for reverse direction lock type, ensuring no load is on the lock mechanism before releasing the lock. If pressure is supplied to port A for Forward Locking type or port B for Backward Locking type while both ports A and B are exhausted and the piston is locked, the lock may not release, or even if released, the Piston rod may extend suddenly, which is very dangerous.



■ Do not use multiple synchronized cylinders with position locking. If a synchronization error occurs, excessive moment load or load concentration may occur on the cylinder that locked first, potentially causing lock release failure, reduced lifespan, or damage.

■ Since the locking force will decrease and it is dangerous, do not apply rotational force (torque) to the rod during lock operation. Also, use with a mechanism that prevents rod rotation.

⚠CAUTION

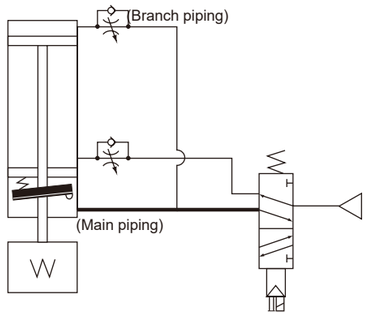
■ Basic Circuit Diagram

The air piping for this cylinder should be as shown in the diagram below. If piping differently from the diagram below, such as piping to the fall prevention part as a single unit, it may cause a malfunctions such as response delays.

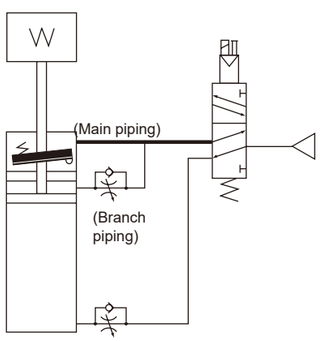
1. Be sure to branch the piping after the valve as shown below, and pipe to the fall prevention unit (lock release port as main piping) and cylinder unit (cylinder port as branch piping).

2. If cylinder operation is faster than lock release, the lock may not release or the Piston rod may extend suddenly, so design the piping so that lock release is faster than cylinder operation.

Forward Locking type
(Downward load)



Backward Locking type
(Upward load)



If emergency stop or urgent stop is performed with the air piping shown above, the Forward Locking type will continue to retract and the Backward Locking type will continue to extend, returning to the origin position. (It will stop at that position when residual pressure is gone.)

■ The main piping in the basic circuit diagram on the previous P. should be thicker and shorter than the branch piping.

■ After using in the unlocked state for a long time, if you try to lock it, a response delay in locking may occur. Do not leave the lock part pressurized; operate the lock part with each cylinder operation. (Please use the basic circuit diagram on P. 610)

■ If the cylinder is held with pressure applied to the lock mechanism, the lock may be released. Do not use 3-position closed center and 3-position P.A.B connection solenoid valves.

■ Due to the structure, a drop of about 1 mm (Piston Rod movement) occurs during locking.

■ Operating units with excessive inertia may cause damage to the Cylinder Body or malfunction, so be sure to use within the allowable absorbed energy range.

During Use

⚠Warning

■ Since the locking force will decrease and it is dangerous, do not apply grease to the Piston Rod during use.

■ The necessary amount of grease is applied to the Piston Rod, so avoid applying more grease and do not wipe off the grease.

■ Since it is dangerous, never disassemble the lock part.

■ As it may cause a malfunctions, always use with the dust cover included, except during manual release operation.

■ During equipment maintenance, for safety, please take separate measures to prevent the load from falling under its own weight.

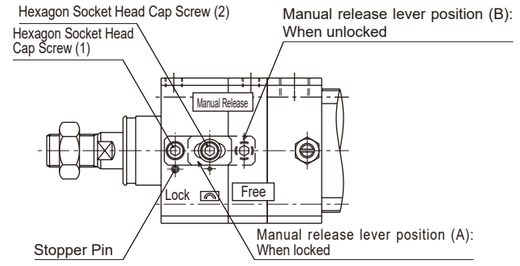
⚠CAUTION

■ When used in vertical mounting, etc., if there is no air pressure, the locking force will be lost during manual release operation, and the rod may move (descend) due to the load's own weight, etc., so please be careful. In that case, for safety, perform the following preparations before manual release.

● Move the load to the lower end.
● Provide a stopper for the load
● Apply air pressure to the cylinder to balance the load.

■ During normal operation, use with the manual release lever in the lock position.

■ Manual Release Method



● Lock Release
①Loosen Hexagon Socket Head Cap Screw (1) by 3 to 4 turns.
②Loosen Hexagon Socket Head Cap Screw (2) by 1 to 2 turns.
③ Rotate the release lever 180° in the direction of the arrow from manual release lever position (A) to (B).
㊀The Piston Rod becomes free.

● Lock Operation
① Rotate the release lever 180° in the direction of the arrow from manual release lever position (B) to (A).
② Tighten Hexagon Socket Head Cap Screw (1) at the position where the release lever hits the stopper pin.
③Tighten Hexagon Socket Head Cap Screw (2).
④The Piston Rod becomes locked.

Note: When manually releasing, be sure to rotate the release lever in the direction of the arrow. Removal of the release lever is strictly prohibited. Hexagon Socket Head Cap Screw (2) can be rotated by loosening it only 1 to 2 turns. Be careful as loosening it too much will cause the release lever to come off. Tighten the Hexagon Socket Head Cap Screws with a torque of 8 to 11 N·m.

For precautions during mounting, installation, adjustment, use, and maintenance, refer to "During Use" in this catalog and the CKD Components Product website (https://www.ckd.co.jp/kiki/en/) -> "Model No." -> Instruction Manual.

Lock Unit

	Listed Page
Lock Unit **UB** Series	617
Brake Unit **JSB3** Series	625
Linear Guide Lock **LMB** Series	633
Linear Guide Lock **LML** Series	641

Lock Unit

A series compatible with shafts and linear guides is available,

ideal for safety and clamp mechanisms of various devices

Safety

Ensures the safety of workpieces, etc., even during power outages or accidents.

Energy saving

No power such as electricity or air is required while braking/locking.

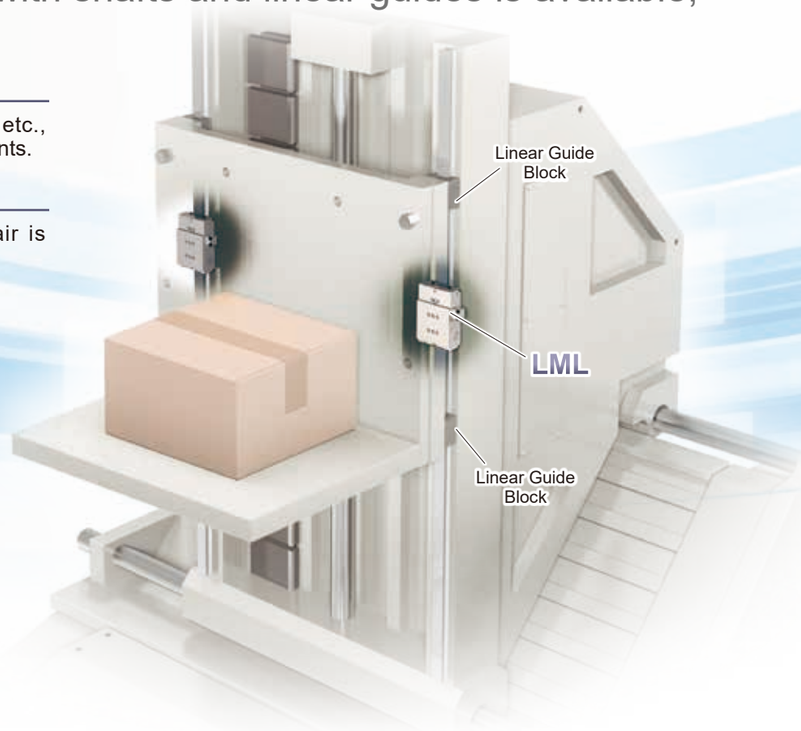
Intermediate Stop/Fall Prevention

Positioning

Easy Air Control

Release — When air is **supplied**, brake/lock is **released**

Operation — When air is **exhausted**, brake/lock **operates**



Product Variation Lineup

Shaft compatible model

Model	Function	Product appearance	Size (shaft diameter: ø) 8 16 20 25 30 35 40 45	Product weight (g)	Holding Force (N)
UB Series	Locking in a stationary state			99 to 578	180 to 450
JSB3 Series	Brake (Stop during operation)			LB*1 : 1800 to 44000 FA*2 : 1800 to 51500	980 to 20000

*1. Axial foot *2. Flange

Linear guide compatible model

Model	Function	Product appearance	Size (rail width: mm) 15 20 25 30 35	Product weight (g)	Holding Force (N)
LMB Series	Locking in a stationary state			600 to 1900	1175 to 2450
LML Series	Locking in a stationary state			600 to 2800	300 to 1150

Features of each series model

UB Series

Locking in stationary state

Lightweight/Slim

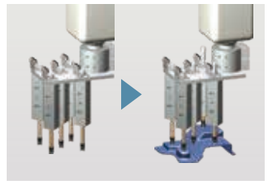
Tracing conveyance possible because it is light and compact. Conveyance by robot becomes faster.

2 types of lock direction

Selection of unidirectional lock and bidirectional lock is possible. For unidirectional lock, the rod is free in the direction opposite to the lock, so even if a workpiece is caught, it can be easily removed.

Usage Example ❶

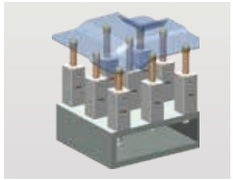
Robot hand



You can make the workpiece conform to its shape simply by pressing it against the shaft.

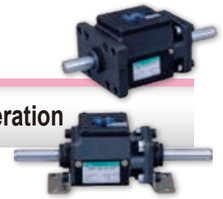
Usage Example ❷

Bottom support tracing unit



By placing the workpiece on the shaft, you can make it conform to the shape of the workpiece.

JSB3 Series



Brake: Stopping during operation

High Precision

Due to the adoption of a unique brake mechanism, the repetitive stopping accuracy of the rod is ±1.0 mm or less (rod speed 300 mm/s, piping 1 m or less, no load). Contributes to improving device accuracy.

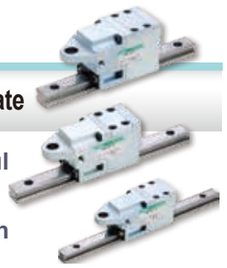
Strong Holding Force

Possesses a strong holding force of 980 N to 20000 N according to rod diameters ø16 to ø45.

Excellent durability

Achieves soft braking force and excellent durability.

LMB Series

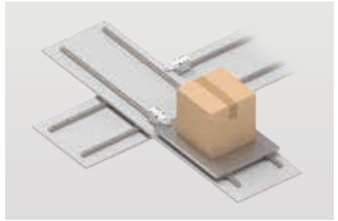


Locking in stationary state

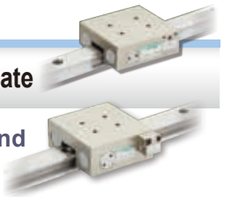
- **Compact but powerful holding force.**
- **Very little backlash when locked**
- **Dust-proofing handled by front and back Lock UnitsScraper provided as standard**

Usage Example

Fixing and holding of X/Y table



LML Series

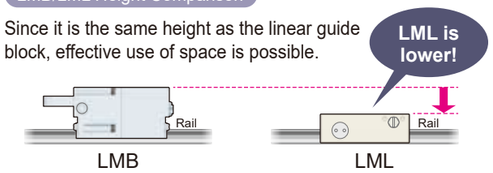


Locking in stationary state

- **Linear guide block and Same height**

LMB/LML Height Comparison

Since it is the same height as the linear guide block, effective use of space is possible.



- **Environmental measures (LML-G Series)**

Can select with scraper as a dustproof measure.

LMB/LML Comparison

	LMB		LML	Remarks
Height	60.5 mm	>	28 mm	For rail size 20
Width	45 mm	<	66 mm	For rail size 20
Holding force	1960 N	>	450 N	For rail size 20
Compatible rail width	3 sizes	<	5 sizes	

UB
Lock Unit
ø8, ø16

CONTENTS

Product Introduction 618
Series variation 618
● UB 620
Precautions for Use 623

Proposing new ways to use light, slim lock units

Fixing mechanism that can operate lock/unlock of linear movement with air. Remote operation is possible with easy air control, enabling "fixing," "improved safety," and "fall prevention." Furthermore, "tracing conveyance" is possible precisely because it is light and compact. This is a proposal for new ways to use lock units.

Lightweight / Slim

Image of weight comparison with our brake unit

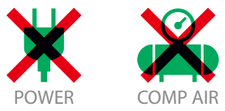
Conveyance by robot becomes faster

Manual release possible

Manual release is possible by inserting a flat-blade screwdriver into the manual release hole and sliding the piston. Manual release is possible during assembly or maintenance even without air. (Please be careful about the insertion position of the screwdriver.)

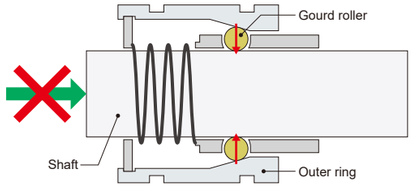
Energy Saving

No power such as electricity or air is required while locked.



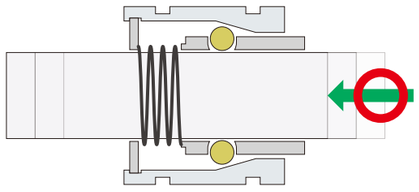
Lock Mechanism

Lock Direction



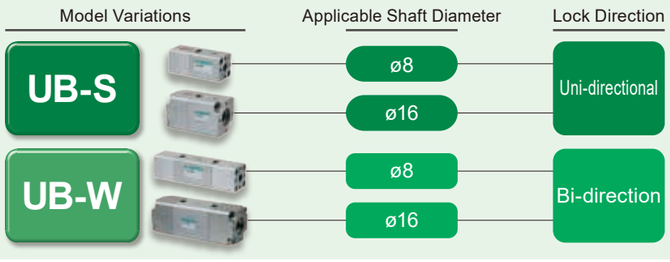
It locks when the guard roller rolls into the wedge-shaped space formed by the shaft and outer ring.

Free direction



It does not lock in the opposite direction.

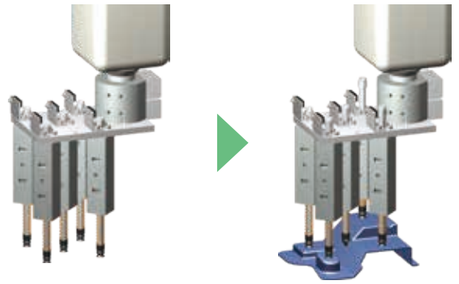
Lock Unit UB Series Product System



Application Example

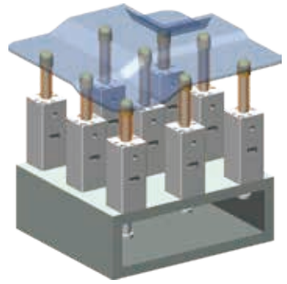
New ways to use lock units, possible precisely because they are lightweight and compact.

Robot hand



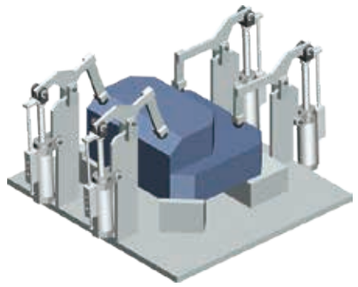
You can make the workpiece conform to its shape simply by pressing it against the shaft.

Bottom support tracing unit



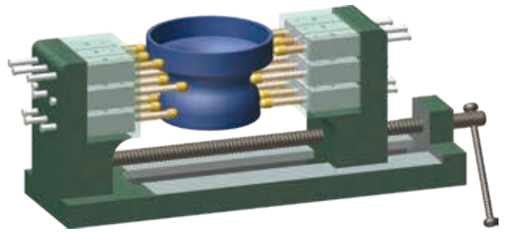
By placing the workpiece on the shaft, you can make it conform to the shape of the workpiece.

Fixed holding of clamp cylinder



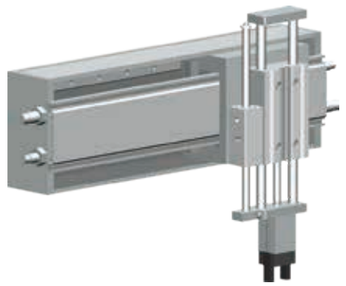
Since air is not required during locking, there is an energy saving effect. (However, clamping force is not generated on the workpiece)

Three-dimensional vise



By pressing the workpiece with shafts on both sides, it can be made to conform to the workpiece shape.

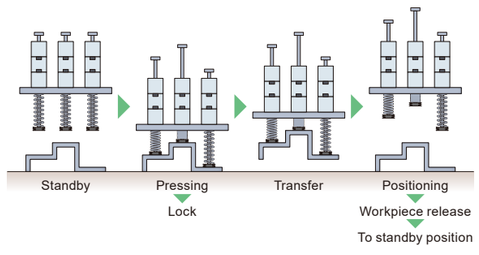
Fixed holding at stop of Pick & Place (Fail-safe)



Cylinder position can be maintained with an inexpensive mechanism, and fall prevention is possible in case of emergency. Protects workpieces from damage due to falling during power outages or air shortages.

Principle of tracing (copying)

The shaft is pressed against the workpiece, the shape of the workpiece is transferred to the shaft (tracing), and the adjusted posture is fixed by the lock unit.



Lock Unit

UB Series

●Applicable Rod Diameter : ø8, ø16

RoHS

Model No. Notation

UB - 08 S

Model Number

❶Applicable Rod Diameter

❷ Lock Direction

❶Applicable Rod Diameter

Code	Content
08	ø8
16	ø16

❷ Lock Direction

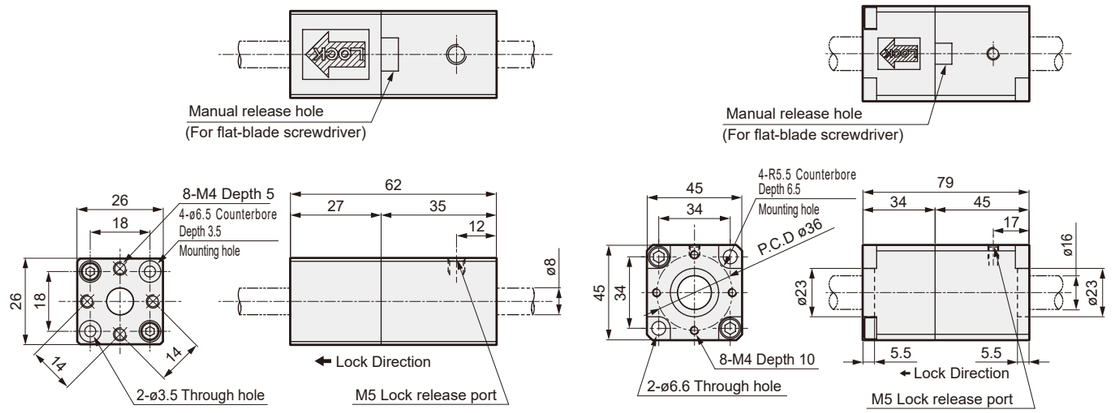
Code	Content
S	Uni-directional
W	Bi-directional

Specifications

Item		UB-08S	UB-16S	UB-08W	UB-16W
Operating Fluid		Compressed Air			
Max Operating Pressure	MPa	1.0			
Min Operating Pressure	MPa	0.3			
Proof Pressure	MPa	1.6			
Ambient Temperature	°C	-5 to 60 (however, no freezing)			
Holding Force	N	180	450	180	450
Lubrication		Not required (When lubricating, use turbine oil type 1 ISO VG32)			
Lock Direction		Uni-directional		Bi-directional	
Applicable Rod Diameter and Dimensional Tolerance	mm	ø8±0.05	ø16±0.10	ø8±0.05	ø16±0.10
Weight	g	99	367	160	578

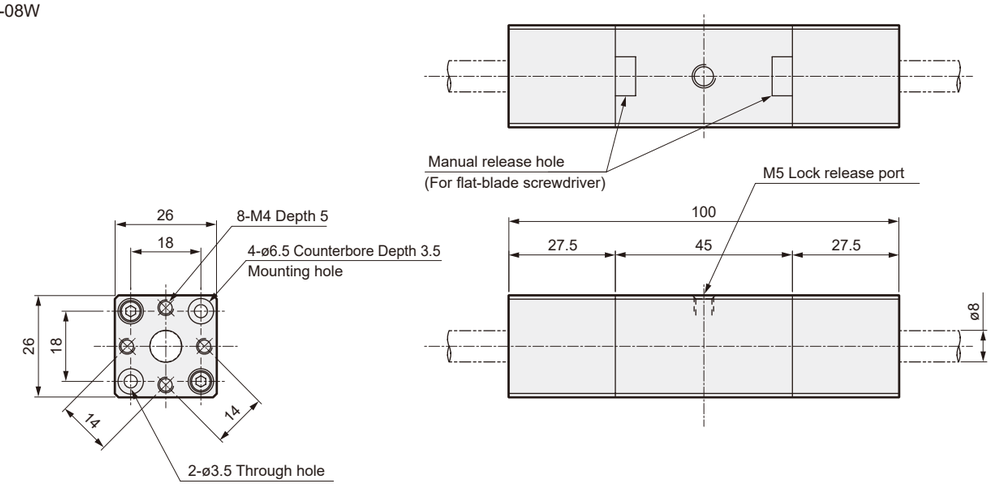
Dimensional Drawings

●UB-08S

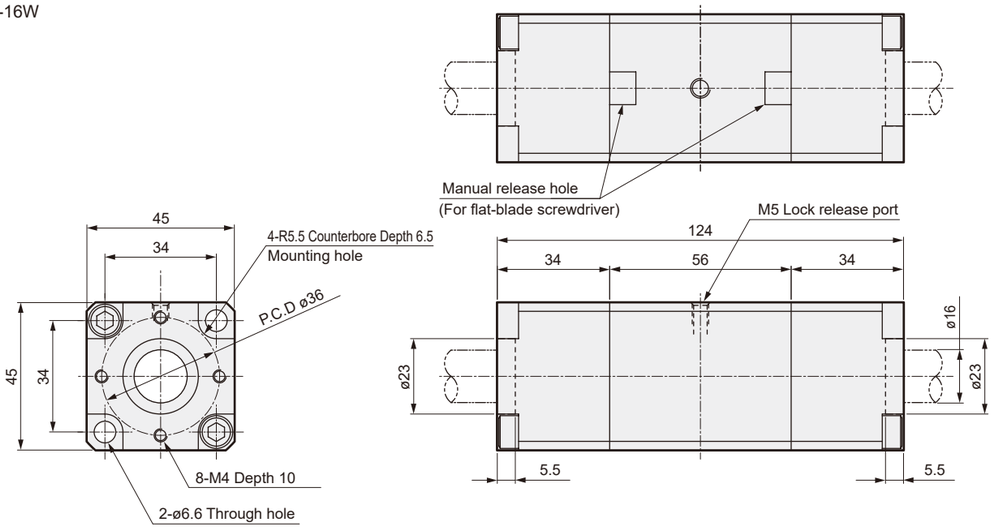


●UB-16S

●UB-08W

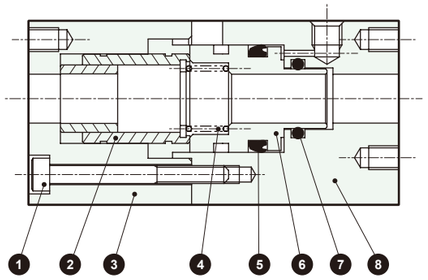


●UB-16W

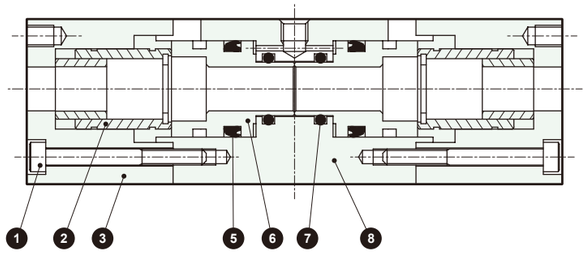


Internal Structure / Materials

●UB-08/16S



●UB-08/16W



Do not disassemble

Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Hexagon Socket Head Cap Screw	Stainless Steel		5	Piston Packing	Nitrile Rubber	
2	Clamper	–		6	Piston	Aluminum Alloy	Alumite
3	Clamper Case	Aluminum Alloy	Hard Anodized	7	O-ring	Nitrile Rubber	
4	Spring	Steel	Electrodeposition Coating	8	Main unit	Aluminum Alloy	Hard Alumite

Pneumatic Components

To Use This Product Safely

Be sure to read this before use. For general information on cylinders, please check Intro 41.

Individual Precautions: Position locking unit UB Series

Design / Selection

Warning

■ The catalog shows static load. Cannot be used as an emergency stop or emergency stop brake.

■ The rod may not lock when there is residual air pressure.

CAUTION

■ Disassembly of the parts may lead to the ingress of debris or the deterioration of component assembly precision.

■ Prevent the ingress of foreign matter, as contamination by foreign matter such as debris or cutting powder may lead to damage or functional deterioration of the rollers and other circulatory parts.

■ In usage conditions where corrosive solvents, coolant, etc., may splash onto and enter the product, prevent adherence or entrance to the Lock Units body with the use of a bellows, cover, etc.

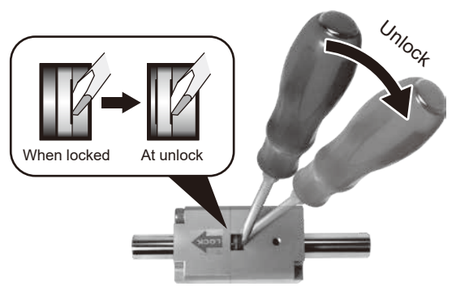
■ The lock unit does not have a bearing function. Avoid using it with radial or moment loads applied.

During Use

CAUTION

■ Manual Release Method

Insert a flat-blade screwdriver into the manual release hole and slide the piston for manual release. Manual release is possible during assembly or maintenance even without air. (Please be careful about the insertion position of the screwdriver.)



■ Mounting Method

Be sure to lock it to centering the Lock Units and shaft.

Lock Unit

JSB3

Brake Unit

ø16, ø20, ø25, ø30, ø35, ø40, ø45

Overview

Ten models of brake parts for Brake Cylinders with intermediate stop (ø40 to ø180) are sold individually. This is a compact function that can instantly stop and strongly lock the movable rod. Please use it widely for safety mechanisms and clamp mechanisms of various devices, etc.

Features

High Precision

Due to the adoption of a unique brake mechanism, the rod stopping accuracy is ±1.0 mm or less (rod speed 300 mm/s, piping 1 m or less, no load). Increases the accuracy of the device.

Strong Holding Force

Possesses a strong holding force of 980 N to 20000 N according to rod diameters ø16 to ø45. Even if the air source is cut off due to an accident, etc., the rod is held and it is safe.

Increased design flexibility

Can be freely applied to various devices, etc. using air pressure, expanding design flexibility.

CONTENTS

Product Introduction 626
Series System Chart 626
● JSB3 628
⚠ Precautions for Use 630

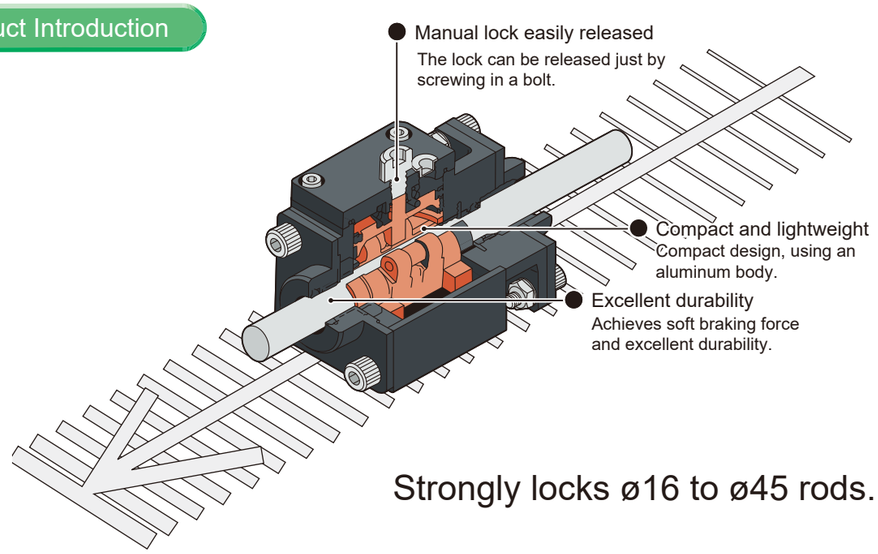
Variation Table

Brake Unit JSB3 Series

●: Standard, ◎: Option

Model No.	Rod Diameter (mm)	Rod Length (mm)									Mounting Style		Page
		200	300	400	500	600	700	800	900	1000	Axial foot type LB	Flange Type FA	
JSB3	ø16, ø20, ø25	●	●	●	●	●	●	●	●	●	◎	◎	628
	ø30, ø35	-	●	●	●	●	●	●	●	●	◎	◎	
	ø40, ø45	-	-	●	●	●	●	●	●	●	◎	◎	

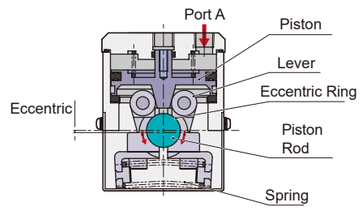
Product Introduction



Strongly locks ø16 to ø45 rods.

Operational Principle

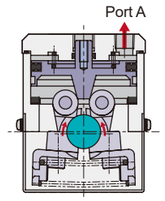
● Brake release operating principle



ⓐ Brake Release Operating Principle

When air is supplied from port A, the lower piston is pushed, opening the lever, and the eccentric rings directly connected to the lever rotate in the direction of their respective arrows, freeing the Piston Rod.

● Brake operating principle



ⓑ Brake Activation Operating Principle

When air is exhausted from port A, the eccentric rings rotate in the direction of their respective arrows due to spring force, generating an eccentric load on the Piston Rod and braking the Piston Rod.

Brake Unit

JSB3 Series

Do not disassemble

● Rod diameter: ø16, ø20, ø25, ø30, ø35, ø40, ø45

RoHS

Model No. Notation

JSB3 - LB - 16 - 500

- JSB3: Model Number
- LB: ❶ Mounting type
- 16: ❷ Rod Diameter
- 500: ❸ Rod Length

❶ Mounting Type

Code	Content
LB	Axial foot type
FA	Flange Type

❷ Rod Diameter (mm)

Code	Content
16	ø16
20	ø20
20 A	ø20
25	ø25
30	ø30
35	ø35
35A	ø35
40	ø40
45	ø45

❸ Rod Length (mm)

Code	Content	Rod Diameter		
		ø16, ø20, ø25	ø30, ø35	ø40, ø45
Blank	Not attached	●	●	●
200	200	●		
300	300	●	●	
400	400	●	●	●
500	500	●	●	●
600	600	●	●	●
700	700	●	●	●
800	800	●	●	●
900	900	●	●	●
1000	1000	●	●	●

*1: Available up to 3000 mm in 1 mm increments.
*2: Rod length represents the total length of the rod. Please note that it is not the stroke.

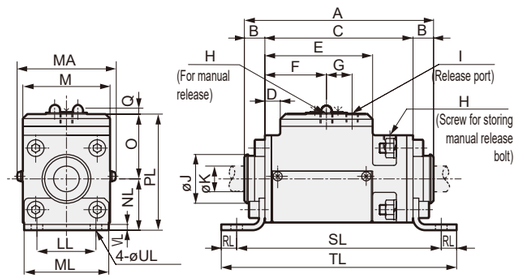
Specifications

Item		JSB3								
Rod Diameter Code		16	20	20 A	25	30	35	35A	40	45
Operating Fluid		Compressed Air								
Max Operating Pressure MPa		1.0								
Min Operating Pressure MPa		0.3								
Proof Pressure MPa		1.6								
Ambient Temperature °C		-10 to 60 (No freezing)								
Port Size		Rc1/8		Rc1/4		Rc3/8	Rc 1/2			
Operating Rod Speed mm/s		10 to 1000								
Lubrication		Not required (When lubricating, use turbine oil Class 1 ISO VG32)								
Holding Force N		980	1569	2451	3922	6178	9600	12000	15800	20000
Rod Diameter and Dimensional Tolerance mm		ø16f8	ø20f8		ø25f8	ø30f8	ø35f8		ø40f8	ø45f8
Rod Surface Roughness µmRz		1.2 to 1.6								
Weight kg	LB	1.8	2.5	3.7	6.7	11.6	18.5	20.3	33.0	44.0
	FA	1.8	2.5	4.1	7.3	12.1	20.3	26.4	36.8	51.5
	Added Weight per 100 m of Rod	0.16	0.25 (36 psi)	0.25 (36 psi)	0.39	0.56	0.76	0.76	0.99	1.25

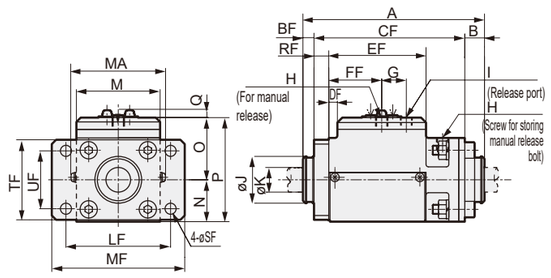
Note: The stopping accuracy diminishes if the brake valve is separated. The above values are for piping within 1 m.

Dimensional Drawings

● Axial foot (LB) ø16 to ø30



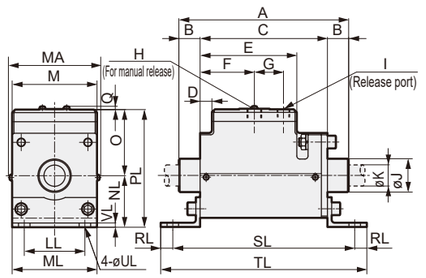
● Rod side flange (FA) ø16 to ø30



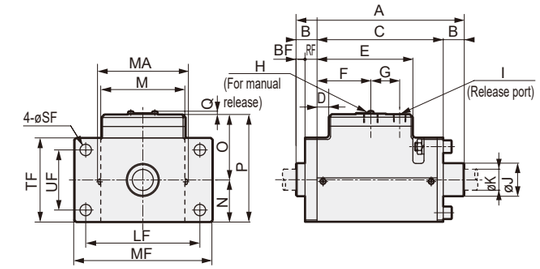
Code / Rod Diameter Code	A	B	BF	C	CF	D	DF	E	EF	F	FF	G	H	I	J	K	LL	LF
ø16	129	15	7	99	107	9	5	70	66	40	36	20	M10	Rc1/8	31	16	40	80
ø20	147.5	16	9	115.5	122.5	12	7	84	79	48	43	20	M10	Rc1/8	38	20	46	85
ø20A	164	16	8	132	140	13	5	99	91	56	48	27	M12	Rc1/4	38	20	60	106
ø25	186.5	17.5	4.5	151.5	164.5	13	7	119	113	66	60	27	M14	Rc1/4	43	25	74	125
ø30	243	26	13.5	191	203.5	17.5	11	149.5	143	83.5	77	35	M16	Rc3/8	51	30	80	144

Code / Rod Diameter Code	ML	MF	NL	N	O	PL	P	Q	RL	RF	SL	SF	TL	TF	UL	UF	VL	M	MA
ø16	57	100	40	28.5	46	86	74.5	5	10	12	138	9	158	57	9	40	3.2	57	66
ø20	66	108	40	34	50.5	90.5	84.5	5	12	12	159.5	9	183.5	65	9	47	4.5	68	77
ø20A	80	130	50	40	54	104	94	5	12	16	192	11	216	80	11	60	4.5	80	89
ø25	98	153	60	49	66	126	115	5	14	19	225.5	14	253.5	98	14	74	6.0	98	107
ø30	118	180	67	59	74	141	133	5	21	19	253	14	295	118	14	88	6.0	118	127

● Axial foot (LB) ø35 to ø45



● Rod side flange (FA) ø35 to ø45



Code / Rod Diameter Code	A	B	BF	C	D	E	F	G	H	I	J	K	LF	LL	M	MA	MF
ø35	280	35	15	210	19.5	159.5	89.5	48	M24	Rc 1/2	55	35	190	100	140	150	230
ø35A	296	35	15	226	18.5	175.5	97	50	M24	Rc 1/2	55	35	212	112	157	167	250
ø40	356	48	26	260	23	200	111.5	58	M24	Rc 1/2	62.5	40	236	118	177	190	280
ø45	385	53	28	279	14	214	114	70	M24	Rc 1/2	68.5	45	265	132	200	213	310

Code / Rod Diameter Code	ML	NL	N	O	PL	P	Q	RF	RL	SL	SF	TL	TF	UL	UF	VL
ø35	140	85	70	109	194	179	5	20	20	300	19	340	140	19	100	7
ø35A	157	100	78.5	116.5	216.5	195	5	20	20	326	19	366	157	19	112	8
ø40	177	106	88.5	128	234	216.5	5	22	20	366	19	406	177	19	118	10
ø45	200	125	100	146	271	246	5	25	27	399	24	453	200	24	132	10

To Use This Product Safely

Be sure to read this before use. For general cylinder information, see Intro 41, and for cylinder switches, see P. 1512.

Individual Precautions: Brake unit JSB3 Series

Design / Selection

⚠ Warning

■ Use a rod with a surface roughness between 1.2 to 1.6 μmRz. Using a non-standard rod will cause abnormal wear of the brake metal or a decrease in holding force.

■ Use a rod treated with industrial chromium plating (coating thickness of 15 μm or more).

■ Do not use multiple synchronized Brake Units. If synchronization is lost, the load will concentrate on the brake unit that braked first, which may lead to a decrease in service life or damage.

■ Never disassemble the brake section, as this is dangerous.

■ Note that stopping accuracy is adversely affected if the brake unit air supply pipe is too long.

⚠ CAUTION

■ The stopping accuracy is susceptible to fluctuations in rod speed and load. The stopping position accuracy is ±1.0 mm (reference value) at a rod speed of 300 mm/s, piping of 1 m or less, and no load.

■ Connect with spherical bearings (floating fittings) to prevent damage to the screw at the Rod End, to prevent wear or seizure in the brake unit, and to prevent twisting of the rod and brake unit at any position during travel.

■ Sliding resistance is generated in this product even with brake released. We recommend using it with a thrust greater than or equal to the following.

Rod Diameter Code	16	20	20 A	25	30	35	35A	40	45
Estimated Required Thrust [N]	53	82	140	227	357	565	722	942	1193

■ As shown in Fig.1, the Brake Units is fixed to the table, so keep it parallel to the direction of table travel.

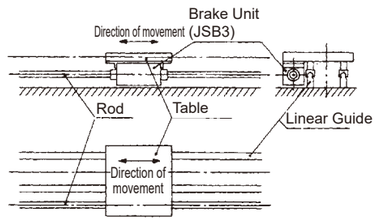


Fig. 1

■ Do not use for rotating rod braking.

■ Do not apply lateral load moment to brake units when using in a horizontal state.

■ Check that load is applied axially on the rod.

■ Make sure that water and oil do not contact the brake unit and rod section.
If water splashes on it, there is a risk of malfunction due to corrosion. If oil splashes on it, it may affect holding force and stopping accuracy.

For maintenance parts, please visit the CKD Equipment Product Site (https: //www.ckd.co.jp/kiki/en/) → "model No." → Maintenance Parts.

MEMO

Lock Unit
UB
JSB3
LMB
LML
Cylinder Switch
Ending

Lock Unit

LMB
Linear Guide Lock

Overview

In systems using linear guides, this is a lock unit that can respond to cases where you want to lock the workpiece at a predetermined position after moving it, or for emergency stops for safety.

Features

- Compact but powerful holding force.
- Very little backlash when locked.
- Unit available for holding when stopped, stopping in emergencies, or position locking.
- Unlocked by air supply. (Manual release also possible)
- Dust-proofing handled by a scraper provided as standard in front of and behind the lock unit.

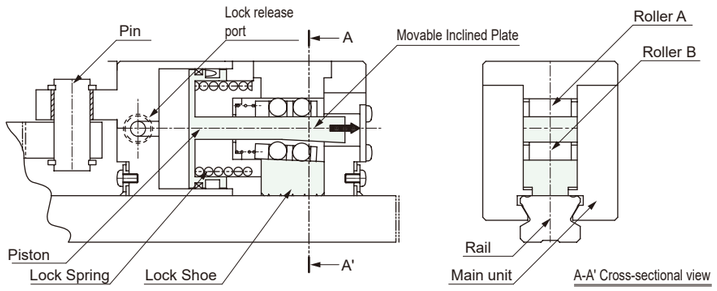
CONTENTS

● LMB 636
Operating Principle 634
Usage Example 635
⚠ Precautions for Use 638

Lock Unit
UB
JSB3
LMB
LML

Operational Principle

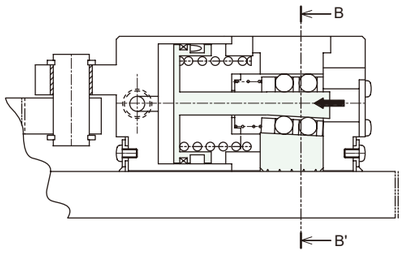
● At Lock Release

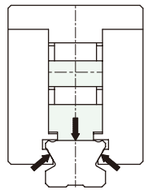


A-A' Cross-sectional view

By pressurizing air to the lock release port, the piston and the tapered movable inclined plate connected to the piston move in the direction of the arrow, and roller B and the movable inclined plate become non-contact. The pressing force of the lock shoe against the rail is eliminated, and the lock is released. However, the lock shoe and rail may be in contact.

● At Lock



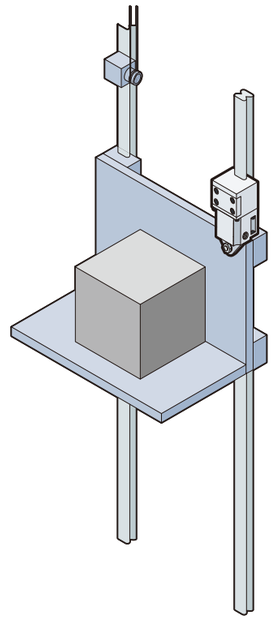


B-B' Cross-sectional view

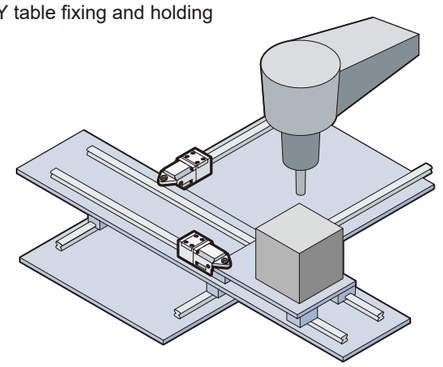
By exhausting air from the lock release port, the lock spring causes the piston and the tapered movable inclined plate connected to the piston to move in the direction of the arrow, and the amplification effect of the taper strongly presses the lock shoe against the rail via roller B. Frictional force is generated on the rail by the three-directional pressurizing force as shown with the arrows in the B-B' sectional view, and the rail is held with force.

Application Examples

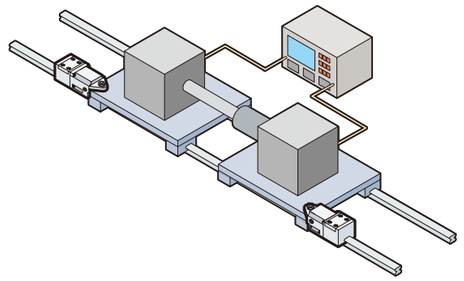
● Table fixing and position locking

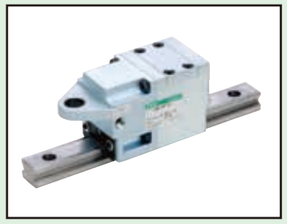


● X-Y table fixing and holding



● Table fixing and holding at the desired position





Linear Guide Lock

LMB Series

Do not disassemble

RoHS

Model No. Notation

Compatible guide: Made by THK CO., LTD.

LMB - SR - 15

Model Number

1 Operating Rail Size

1 Operating Rail Size

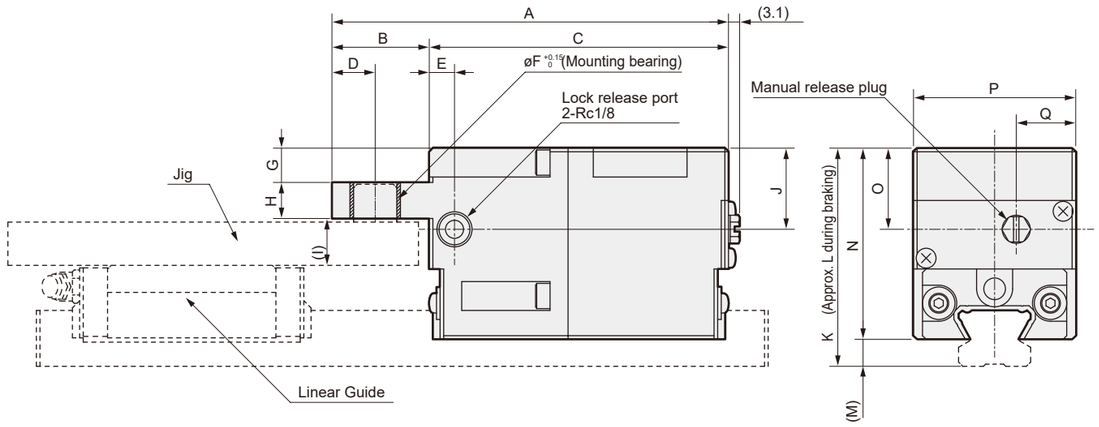
Code	Content
15	SR-15/SSR-15
20	SR-20/SSR-20
25	SR-25/SSR-25

Specifications

Item	LMB-SR-15	LMB-SR-20	LMB-SR-25
Operating Rail	SR-15/SSR-15 Made by THK CO., LTD.	SR-20/SSR-20 Made by THK CO., LTD.	SR-25/SSR-25 Made by THK CO., LTD.
Operating Fluid	Compressed Air		
Max Operating Pressure MPa	1.0		
Min Operating Pressure MPa	0.35		
Proof Pressure MPa	1.5		
Ambient Temperature °C	-5 to 60°C (however, no freezing)		
Lubrication	Not required (When lubricating, use turbine oil Class 1 ISO VG32)		
Port Size	Rc1/8		
Holding Force N *1	1175	1960	2450
Sliding resistance value N Reference value *2	5.8 or less	9.8 or less	15.6 or less
Weight g	600	1100	1900

*1: Holding force is the ability to hold a static load without vibration or impact in the locked operating state under no load.
*2: This is the resistance value (reference value) when sliding horizontally on a rail coated with Albania Grease No. 2 (Showa Shell Sekiyu).

Dimensional Drawings



Model No.	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
LMB-SR-15	100	24	76	10	7	10	7	8	8	16.5	47	47.5	6.5	40.5	17.5	35	13
LMB-SR-20	110	27	83	12	7	12	9.5	10	13	22.5	60.5	61	7.5	53	22.5	45	16.5
LMB-SR-25	125	32	93	13.5	7	15	13	10	17	27.5	73	73.5	9	64	27.5	55	19.5

Note: The rail and slide table dimensions are not shown since they are manufactured by THK.

To Use This Product Safely

Be sure to read this before use. For general cylinder information, see Intro 41, and for cylinder switches, see P. 1512.

Individual Precautions: Linear guide lock LMB Series

Design / Selection

CAUTION

■Make sure that impact load is not applied to the Lock Units. There is a possibility of slipping due to impact force.

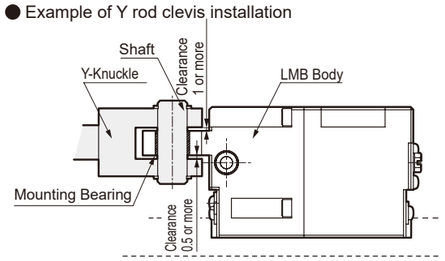
■Do not apply the lateral load moment to a lock unit.

■Avoid use in very dusty areas, or where water or oil could come in contact. This will cause a decrease in holding force.

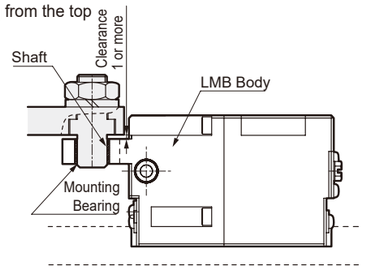
■Do not place a workpiece directly onto the lock unit.

■Mounting Method

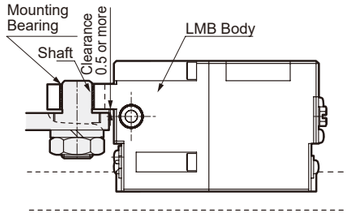
● Example of Y rod clevis installation



● Fixing from the top



● Fixing from the bottom



Insert a shaft (pin) into the mounting bearing and connect it to the slide table. At that time, provide clearance as shown in the diagram above. Structurally, the LMB body moves up and down during lock operation, so if it is fixed without clearance, the lock will not engage.

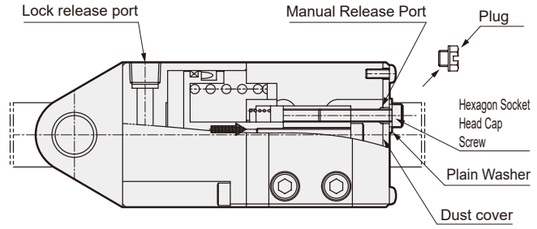
During Use

Warning

■Never disassemble the lock unit, as this is dangerous.

CAUTION

■How to unlock manually



● Confirm that external force is not applied when there is no air at the lock release port, and then disconnect the plug.

● From the hole from which the plug was removed, insert the M3×18 (LMB-SR-15) or M4×22 (LMB-SR-20, 25) Hexagon Socket Head Cap Screw until the screw is engaged. When inserting Hexagon Socket Head Cap Screws, insert a flat washer and prevent the bolt seating surface from contacting the dustproof cover.

● From the state where the threads are caught, if the screw is screwed in until it no longer moves, the lock will be released and freed.

*1) The product is in a manually released state at the time of shipment. Store the Hexagon Socket Head Cap Screws and flat washers so as not to lose them.

*2) Do not use Hexagon Socket Head Cap Screws of sizes other than those listed above. There is a possibility of screw damage or inability to release the lock.

*3) If manually released with the Hexagon Socket Head Cap Screw seating surface in contact with the dustproof cover, the dustproof cover will be scraped and dust will be generated. Also, since the plug may not be able to be screwed in, insert a flat washer and manually release it in a non-contact state.

For precautions during mounting, installation, adjustment, use, and maintenance, refer to "During Use" in this catalog and the CKD Components Product website (https://www.ckd.co.jp/kiki/en/) -> "Model No." -> Instruction Manual.

Lock Unit

LML

Linear Guide Lock

Overview

In systems using linear guides, this is a lock unit that can respond to cases where you want to lock the workpiece at a predetermined position after moving it, or for holding during stops for safety and fall prevention.

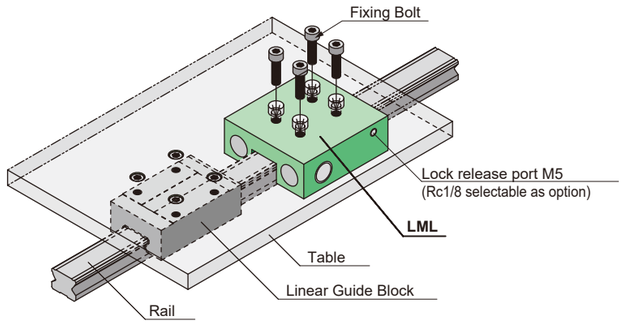
CONTENTS

Product Introduction/Usage Examples	642
● LML	643
⚠ Precautions for Use	648

Lock Unit
UB
JSB3
LMB
LML
Cylinder Switch
Ending

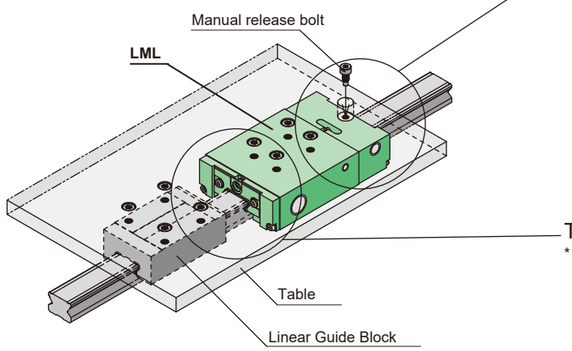
Product Introduction

Since it is the same height as the linear guide block, the lock can make good use of the empty space.



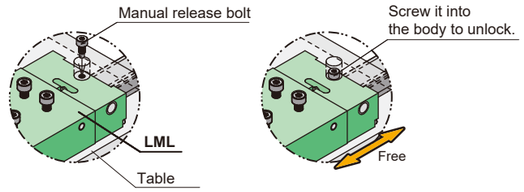
- ◆Compact but powerful holding force.
- ◆Unlocked by air supply
  (Manual release option is available separately)
- ◆Useful for holding the cylinder during stop and position locking (holding the cylinder stationary)
- ◆RoHS Directive compliant

Options



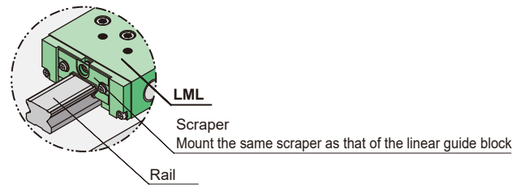
Manual release option "-H"

* Unlocking is possible even if air is not supplied.



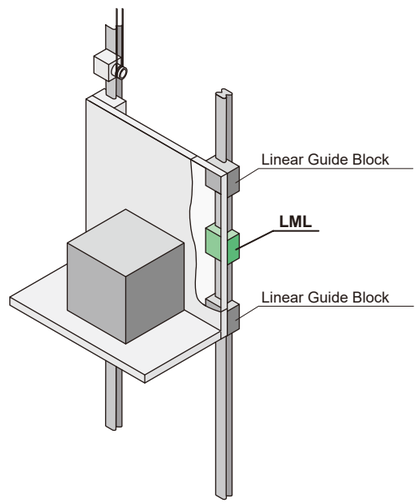
Type with scraper (LML-G)

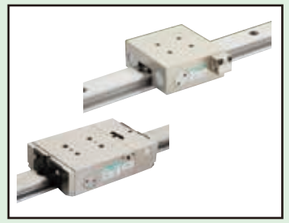
* Dust-proof scraper is provided.



Application Examples

●Table fixing, position locking and holding





Linear Guide Lock

LML Series

Do not disassemble

RoHS

Model No. Notation

Compatible guide: Made by THK CO., LTD.

Without scraper: **LML - SR 20 W - B H**

Model No.

With Scraper: **LML-G - SR 20 W - B H**

Model Number

❷ Operating Rail Width

❹ Port

❶ Operating Rail Type ❸ Operating Unit Type ❺ Manual Release

*Please refer to the table below for combinations.

❶Operating Rail Type ❷Operating Rail Width ❸Operating Unit Type

❷Operating Rail Width	❶ Operating Rail Type																											
	SR						SSR				HSR										SHS							
15	●		–				●	●			●		–								●				●		–	
20	●		–				●	●			●		●								●				–		–	
25	–		●				●	●			●		●								●				●		●	
30	●		–				●	–			●		●								●				●		●	
35	●		–				●	–			●		●								●				●		●	
❸Operating Unit Type	W	V	TB	SB	WY	VY	TBY	SBY	XW	XV	XTB	A	B	R	LA	LB	LR	CA	HA	CB	HB	C	LC	V	LV	R	LR	

❷Operating Rail Width	❶ Operating Rail Type															
	NR						NRS				SNR				SNS			
15	–						–				–				–			
20	–						–				–				–			
25	–						–				–				–			
30	●						●				●				●			
35	●						●				●				●			
❸Operating Unit Type	A	LA	B	LB	R	LR	A	LA	B	LB	R	LR	C	LC	R	LR	C	LC	R	LR

❹Port

Code	Content
Blank	Lock release port M5
B	Lock release port Rc1/8

❺Manual Release

*1

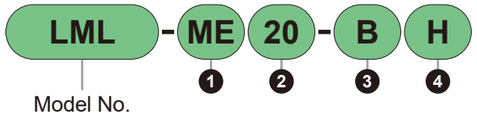
Code	Content
Blank	None
H	Available (dedicated release bolt included)

*1: When performing manual release, always do so with the LML attached to the rail.

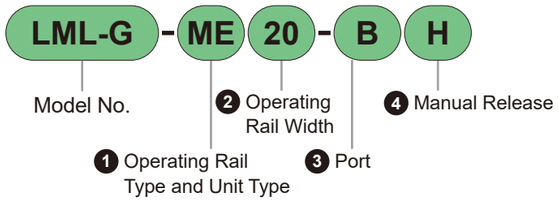
Model No. Notation

Compatible guide: IKO

Without scraper



With Scraper



*Please refer to the table below for combinations.

❶Operating Rail Type and Unit Type ❷Operating Rail Width

❷Operating Rail Width	❶ Operating Rail Type and Unit Type																	
	ME	MEC	MET	METC	LWE	LWEC	LWET	LWETC	MES	MESC	LWES	LWESC	MEG	METG	LWEG	LWETG	MESG	LWESG
15	●				●				●		●		●					
20	●				●				●		●		●					
25	●				●				●		●		●					
30	●				●				●		●		●					
35	●				●				●		●		–					

❷Operating Rail Width	❶ Operating Rail Type and Unit Type															
	LWH	LWHT	LWHD	LWHS	MH	MHT	MHD	MHS	LWHTG	MHG	MHTG	LWHSG	MHSG	LWHG	MHDG	LWHDG
15	●		●	●	●		●	●	–			–		–	–	–
20	●		–	●	●		–	●	●			●		●	–	–
25	●		●	●	●		●	●	●			●		●	●	●
30	●		●	●	●		●	●	●			●		●	●	●
35	●		●	–	●		●	–	●			–		●	●	●

❸Port

Code	Content
Blank	Lock release port M5
B	Lock release port Rc1/8

*1

❹Manual Release

Code	Content
Blank	None
H	Available (dedicated release bolt included)

*1: When performing manual release, always do so with the LML attached to the rail.

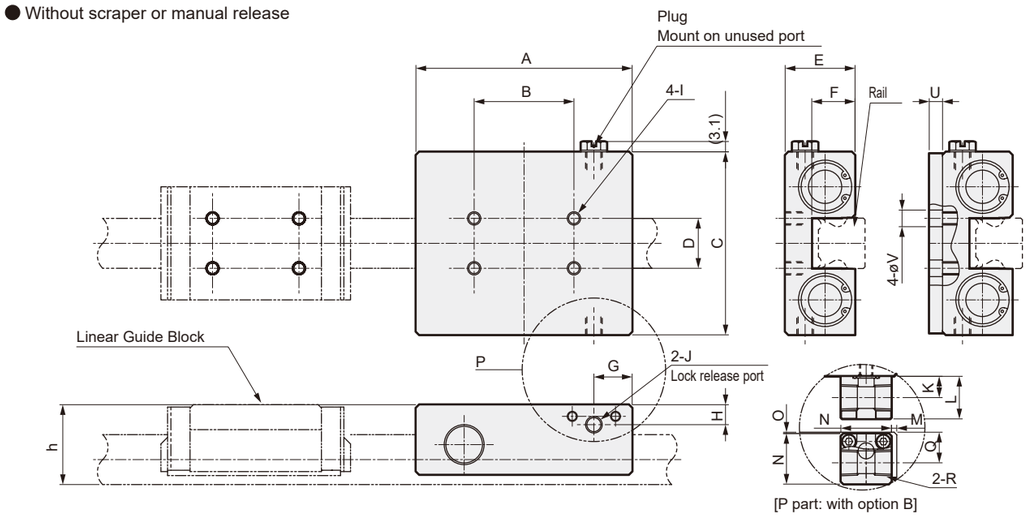
Specifications

Item		LML-15 / LML-G15	LML-20 / LML-G-20	LML-25 / LML-G-25	LML-30 / LML-G-30	LML-35 / LML-G-35
Rail Width	mm	15	20	25	30	35
Compatible Guide Manufacturer		Made by THK CO., LTD./NIPPON THOMPSON CO., LTD.				
Operating Fluid		Compressed Air				
Max Operating Pressure	MPa	1.0				
Min Operating Pressure	MPa	0.35				
Proof Pressure	MPa	1.5				
Ambient Temperature	°C	-5 to 60 (however, no freezing)				
Lubrication		Not allowed				
Port Size		M5 (Rc1/8: Option selection)				
Holding Force	N *2	300	450	600	850	1150
Initial Backlash		±0.05				
Weight g	Main unit	600	900	1200	1900	2800
	Scraper Added Weight	50	70	100	180	220
	Manual Release Added Weight	160	230	340	550	820

*1 For operating rail types and unit types, refer to "How to order".
*2 Holding force is the ability to hold a static load without vibration or impact in the locked operating state under no load. Note that the above holding force is the value when Albania Grease No. 2 (Showa Shell Sekiyu) is applied, and the holding force may not be satisfied depending on the operating environment.

Dimensional Drawings

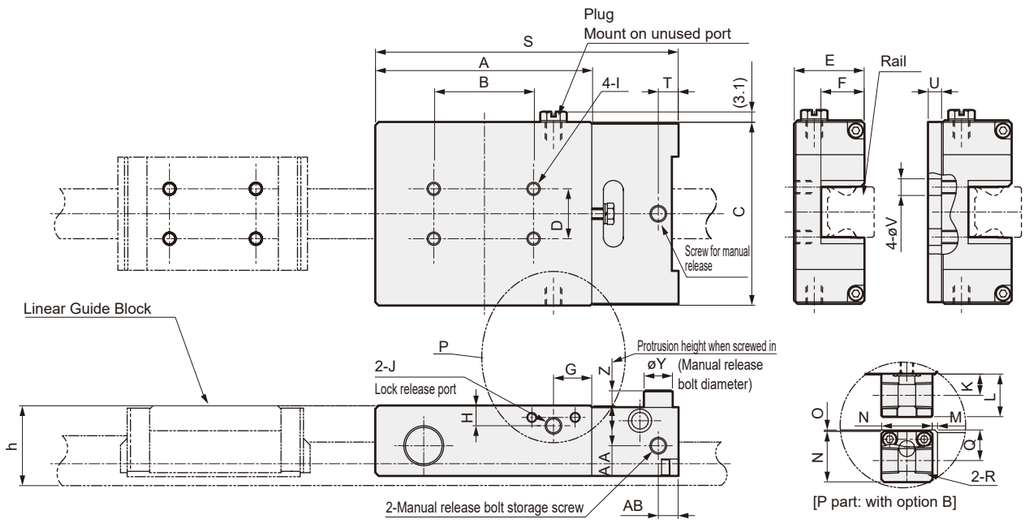
● Without scraper or manual release



Model No.	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	Q	R	U	V
LML-□-15	65	30	55	15	21	13	11.5	6	M4 Depth 5	M5	8	16	2	19	0.5	11.5	Rc1/8	4	5
LML-□-20	70	30	66	20	24.5	13.5	12	6	M5 Depth 6	M5	8	16	2.5	19	0.5	11.5	Rc1/8	-	-
LML-□-25	75	30	75	20	29	16	10	6	M6 Depth 7	M5	8	16	0.5	19	0.5	11.5	Rc1/8	4	7
LML-□-30	82	30	88	25	35.5	20.5	12	6.5	M6 Depth 9	M5	8	16	2.5	19	1	12	Rc1/8	3	7
LML-□-35	90	40	102	30	40	22	12	7	M8 Depth 9	M5	8	16	2.5	19	1.5	12.5	Rc1/8	7	9

*1: h dimension is determined by the guide used. Please refer to the relevant catalog, etc.
*2: U and V dimensions are only for HSR/SHS-R/LR (made by THK CO., LTD.) and MHD(G)/LWHD(G) (made by NIPPON THOMPSON CO., LTD.) types.

● Without scraper, with manual release

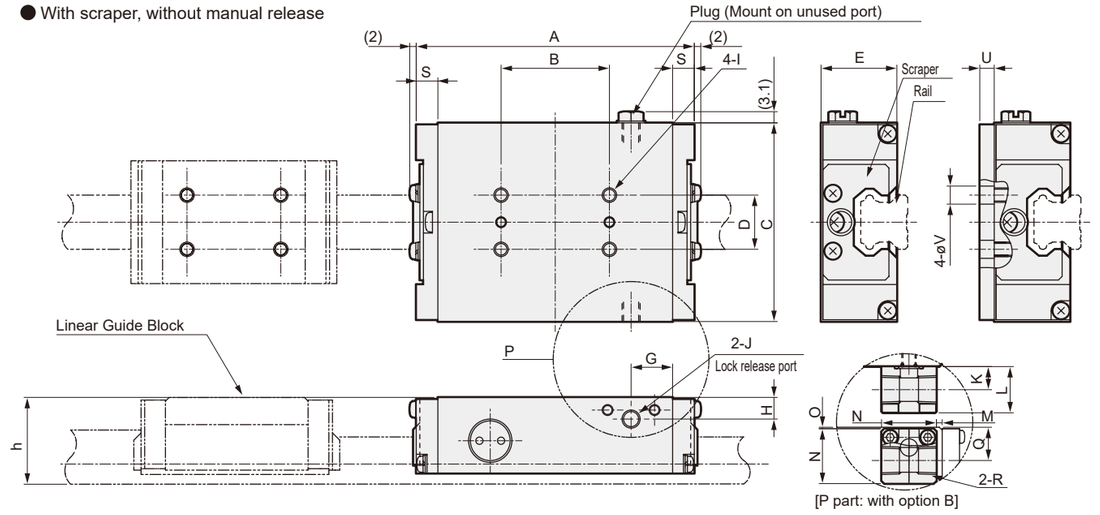


Model No.	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	Q	R	S	T	U	V	Y	Z	AA	AB
LML-□-15-□-H	65	30	55	15	21	13	11.5	6	M4 Depth 5	M5	8	16	2	19	0.5	11.5	Rc1/8	91	6	4	5	8.5	4.5	12	6
LML-□-20-□-H	70	30	66	20	24.5	13.5	12	6	M5 Depth 6	M5	8	16	2.5	19	0.5	11.5	Rc1/8	98	6.5	-	-	8.5	4.5	15.5	6
LML-□-25-□-H	75	30	75	20	29	16	10	6	M6 Depth 7	M5	8	16	0.5	19	0.5	11.5	Rc1/8	105	6.5	4	7	10	5.5	19	7
LML-□-30-□-H	82	30	88	25	35.5	20.5	12	6.5	M6 Depth 9	M5	8	16	2.5	19	1	12	Rc1/8	117	8.5	3	7	10	5.5	25.5	9
LML-□-35-□-H	90	40	102	30	40	22	12	7	M8 Depth 9	M5	8	16	2.5	19	1.5	12.5	Rc1/8	130	9.5	7	9	13	7.5	30	10

*1: h dimension is determined by the guide used. Please refer to the relevant catalog, etc.
*2: U and V dimensions are only for HSR/SHS-R/LR (made by THK CO., LTD.) and MHD(G)/LWHD(G) (made by NIPPON THOMPSON CO., LTD.) types.

Dimensional Drawings

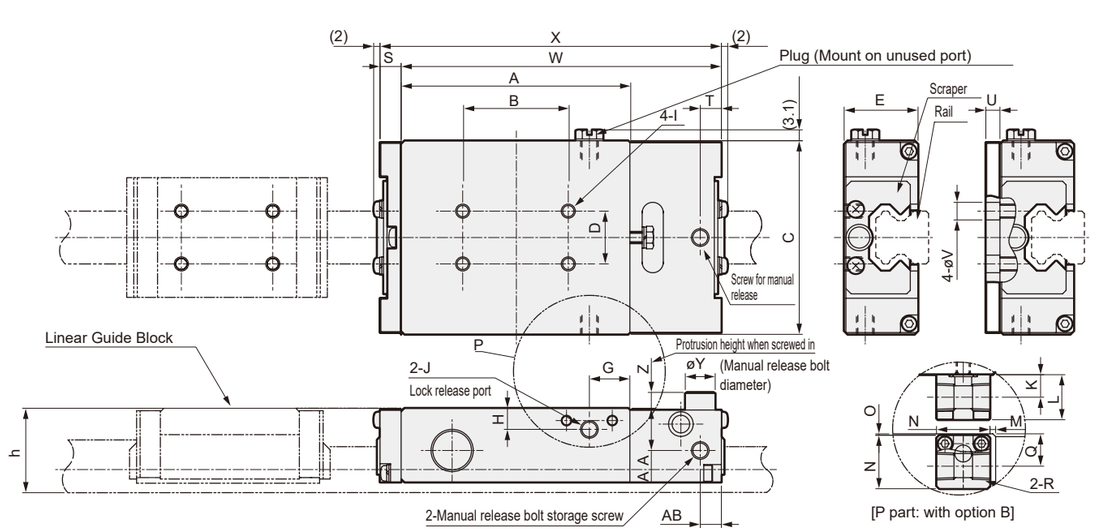
● With scraper, without manual release



Model No.	A	B	C	D	E	G	H	I	J	K	L	M	N	O	Q	R	S	U	V
LML-G-□-15	77	30	55	15	21	11.5	6	M4 Depth 5	M5	8	16	2	19	0.5	11.5	Rc1/8	6	4	5
LML-G-□-20	82	30	66	20	24.5	12	6	M5 Depth 6	M5	8	16	2.5	19	0.5	11.5	Rc1/8	6	-	-
LML-G-□-25	87	30	75	20	29	10	6	M6 Depth 7	M5	8	16	0.5	19	0.5	11.5	Rc1/8	6	4	7
LML-G-□-30	100	30	88	25	35.5	12	6.5	M6 Depth 9	M5	8	16	2.5	19	1	12	Rc1/8	9	3	7
LML-G-□-35	108	40	102	30	40	12	7	M8 Depth 9	M5	8	16	2.5	19	1.5	12.5	Rc1/8	9	7	9

*1: h dimension is determined by the guide used. Please refer to the relevant catalog, etc.
*2: U and V dimensions are only for HSR/SHS-R/LR (made by THK CO., LTD.) and MHD(G)/LWHD(G) (made by NIPPON THOMPSON CO., LTD.) types.

● With scraper and manual release



Model No.	A	B	C	D	E	G	H	I	J	K	L	M	N	O	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
LML-G-□-15-□-H	65	30	55	15	21	11.5	6	M4 Depth 5	M5	8	16	2	19	0.5	11.5	Rc1/8	6	6	4	5	91	97	8.5	4.5	12	6
LML-G-□-20-□-H	70	30	66	20	24.5	12	6	M5 Depth 6	M5	8	16	2.5	19	0.5	11.5	Rc1/8	6	6.5	-	-	98	104	8.5	4.5	15.5	6
LML-G-□-25-□-H	75	30	75	20	29	10	6	M6 Depth 7	M5	8	16	0.5	19	0.5	11.5	Rc1/8	6	6.5	4	7	105	111	10	5.5	19	7
LML-G-□-30-□-H	82	30	88	25	35.5	12	6.5	M6 Depth 9	M5	8	16	2.5	19	1	12	Rc1/8	9	8.5	3	7	117	126	10	5.5	25.5	9
LML-G-□-35-□-H	90	40	102	30	40	12	7	M8 Depth 9	M5	8	16	2.5	19	1.5	12.5	Rc1/8	9	9.5	7	9	130	139	13	7.5	30	10

*1: h dimension is determined by the guide used. Please refer to the relevant catalog, etc.
*2: U and V dimensions are only for HSR/SHS-R/LR (made by THK CO., LTD.) and MHD(G)/LWHD(G) (made by NIPPON THOMPSON CO., LTD.) types.

To Use This Product Safely

Be sure to read this before use. For general cylinder information, see Intro 41, and for cylinder switches, see P. 1512.

Individual Precautions: Linear guide lock LML Series

Design / Selection

⚠CAUTION

■Make sure that impact load is not applied to the Lock Units. There is a possibility of slipping due to impact force.

■Do not apply the lateral load moment to a lock unit.

■Avoid use in very dusty areas, or where water or oil could come in contact. This will cause a decrease in holding force.

■Do not place a workpiece directly onto the lock unit.

■The product cannot function as brake (to stop a moving workpiece). When used for fall prevention (holding in a stationary state), please use at 50% or less of the holding force.

During Use

⚠Warning

■Never disassemble the lock unit, as this is dangerous.

⚠CAUTION

■Be sure to mount LML on rail before operating manual release. Also, as it may cause a malfunction, use the dedicated release bolt included with the product for manual release.

For precautions during mounting, installation, adjustment, use, and maintenance, refer to "During Use" in this catalog and the CKD Components Product website (https://www.ckd.co.jp/kiki/en/) -> "Model No." -> Instruction Manual.

MEMO

Lock Unit
UB
JSB3
LMB
LML
Cylinder Switch
Ending

Cylinder with Valve

Listed Page

Compact cylinder with valve
CKV2 Series 653

Cell Cylinder
CAV2-COVPN2 Series 685

CKV2

Compact cylinder with valve

ø20, ø25, ø32, ø40

CONTENTS

Product Introduction	654
Series System Chart	656
Variation/Option Combination Availability Table	658
● Double Acting, Single rod type (CKV2)	660
● Double Acting, Non-rotating Type (CKV2-M)	670
Accessories External Dimensions Diagram	677
Outer Dimensions Diagram with Switch	679
Custom Items	680
⚠Precautions for Use	682

Compact Cell Cylinder **CKV2 Series**

Cylinder with valve integrating 4-port solenoid valve compactly into CMK2 Series

Since a speed adjustment valve is also built-in, it is space-saving and has excellent installability.

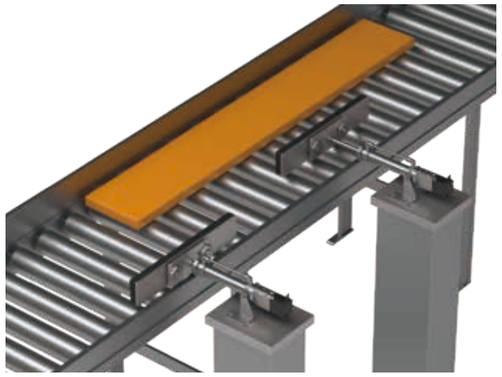
Bore Size: ø20, ø25, ø32, ø40

Effect

- Reduced mounting and piping work
- Reduced installation space
- Reduced air consumption between valve and cylinder

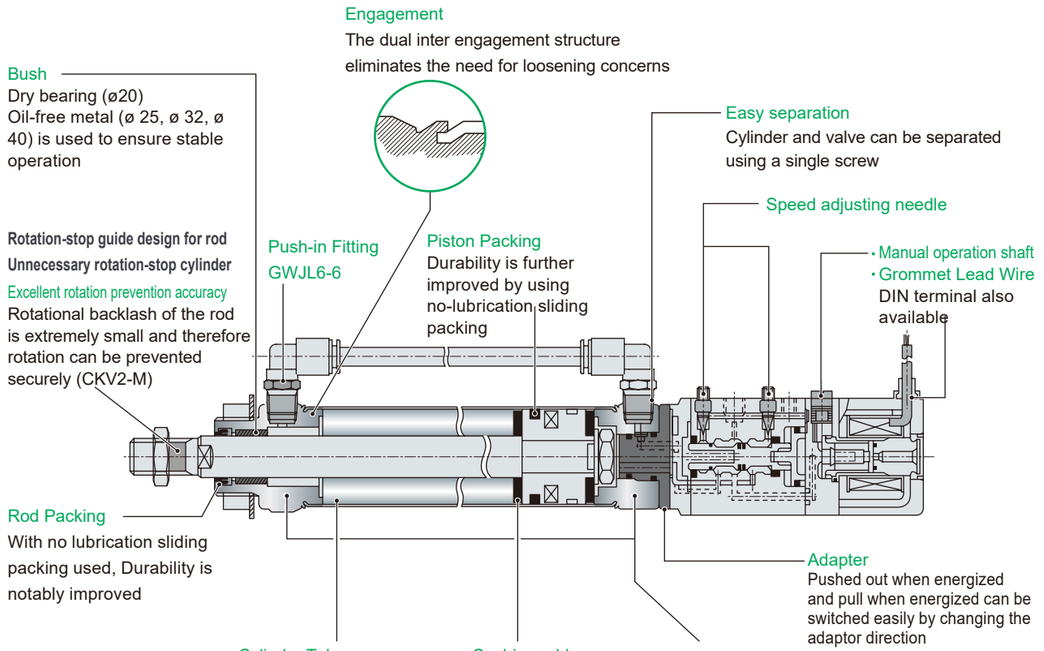
Application Example

Conveyor width adjustment



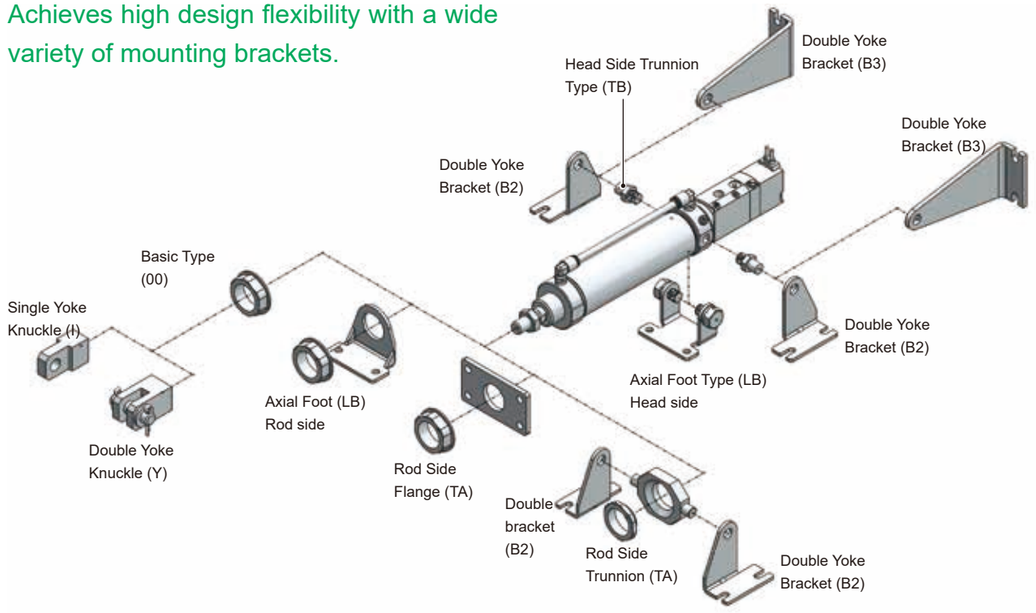
Panel clamp

Product Introduction



Abundant Mounting Brackets

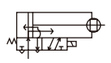
Achieves high design flexibility with a wide variety of mounting brackets.



Variation Table

Compact cylinder with valve
CKV2 Series

●: Standard, ◎: Option, ○: Custom Products

Variation	Model No. / Circuit Diagram / Code	Bore Size (mm)	Standard Stroke (mm)						Min Stroke (mm)	Max Stroke (mm)	Intermediate stroke (per mm)	Mounting Style			Mounting Style			Option							Accessories				Switch	Page
			25	50	75	100	150	200				Basic type	Axial Foot Type		Rod side flange type	Rod side trunnion type	Head side trunnion type	Bellows (100°C)	Bellows (250°C)	Piston Rod Material (Stainless Steel)	With Silencer	With Surge Suppressor	With Lamp	Energized retraction type	Single knuckle	Double Knuckle	Single bracket	Double clevis bracket Clevis type		
												00	LB		FA	TA	TB	J	L	M	W	G	E	X	I	Y	B2	B3		
Double Acting/ Single Rod Type	CKV2	ø20, ø25, ø32, ø40	●	●	●	●	●	●	5	750	1	●	●		●	●	●	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	660
Double Acting/ Non-rotating Type	CKV2-M 	ø20, ø25, ø32, ø40	●	●	●	●	●	●	5	750	1	●	●		●	●	●	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	670

Variation and Option Item Combination Availability Table

●Mark: Standard
◎Mark: Option
○Mark: Custom Products
△Mark: Manufacturable depending on conditions (Please consult)
× Mark: Not manufacturable

Category		Category	Variation			Piping Screw		Connection		Option								
			Double Acting Basic Type	Non-rotating		NPT		Grommet	DIN terminal box	With bellows Polyolefin	With bellows Silicone rubber	Piston Rod Material (Stainless Steel)	Rod End Shape Modification	With Silencer	With Surge Suppressor	With neon lamp	Energized retraction type	
		Code	None	M		NN		None	U	J	L	M	N	W	G	E	X	
Variation	Double Acting Basic Type	Blank				○		●	◎	◎	◎	◎	◎	◎	◎	◎	◎	
	Non-rotating	M				○		●	◎	◎	◎	*2	◎	◎	◎	◎	◎	
Piping Screw	NPT	NN						○	○	○	○	○	○	○	○	○	○	
Connection	Grommet	Blank							x	◎	◎	◎	◎	◎	◎	x	◎	
	DIN Terminal Box	U								◎	◎	◎	◎	◎	◎	◎	◎	
Option	With bellows Polyolefin	J									x	◎	◎	◎	◎	◎	◎	
	With bellows Silicone rubber	L										◎	◎	◎	◎	◎	◎	
	Piston Rod Material (Stainless Steel)	M											◎	◎	◎	◎	◎	
	Rod End Shape Modification	N												◎	◎	◎	◎	
	With Silencer	W													◎	◎	◎	
	With Surge Suppressor	G														◎	◎	
	With neon lamp	E															◎	
	Energized retraction type	X																
Accessories	Cylinder Switch	Separately Shown	◎	◎		○		◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	
	Single knuckle	I	◎	◎		○		◎	◎	◎	◎	◎	*1	◎	◎	◎	◎	
	Double Knuckle	Y	◎	◎		○		◎	◎	◎	◎	◎	*1	◎	◎	◎	◎	
	B2 Bracket	B2	◎	◎		○		◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	
	B3 Bracket	B3	◎	◎		○		◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	

*1: If the thread size at the Piston Rod End changes, it is excluded from this combination. Please consult us separately.
*2: The material of the non-rotating Piston Rod is Stainless Steel. If option M (Piston Rod material (Stainless Steel)) is selected, the rod nut material will be Stainless Steel.

[Model No. Notation]

CKV2 - M - LB - 20 - [ ] - 25 - [ ] - 1 - T0H - D - J - I

CKV2	M	LB	20	[ ]	25	[ ]	1	T0H	D	J	I
Model Number	Variation *Fill in from left to right in the table on the left.	❶ Mounting Style	❷ Bore Size	❸ Piping thread type	❹ Stroke	❺ Wiring method	❻ Voltage	❼ Switch Model	❽ Number of Switches	❾ Option	❿ Accessories *Fill in from left to right in the table on the left.

Model No.: Compact cylinder with valve
●Variation: Double Acting, non-rotating type
❶ Mounting style: : Axial Foot Type
❷ Bore Size : ø20 mm
❸ Port thread : Rc Thread
❹ stroke : 25 mm
❺ Wiring method : Grommet
❻ Voltage : 100 VAC
❼ Switch model No.: Solid State TOH Switch, Lead Wire 1 m
❽ Switch quantity : With 2 pcs
❾ Options : Bellows, max Ambient Temperature 100°C
❿ Accessory : Single knuckle

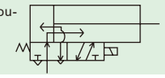
Small Cell Cylinder Double Acting/Single Rod Type

CKV2 Series

●Bore Size: ø20, ø25, ø32, ø40

Circuit Diagram Code

● Valve-equipped Double Acting cylinder



RoHS

Model No. Notation

Without switch (Built-in magnet for switch)

CKV2 - LB - 20 [ ] - 25 - U - 1 ——— J I

Model Number ❶ ❷ ❸ ❹ ❺ ❻ ❾ ❿

With switch (Built-in magnet for switch)

CKV2 - LB - 20 [ ] - 25 - U - 1 - T0H - R - J I

Model Number ❶ ❷ ❸ ❹ ❺ ❻ ❼ ❽ ❾ ❿

❶ Mounting Style ❷ Bore Size ❸ Piping thread type ❹ Stroke ❺ Wiring method ❻ Voltage ❼ Switch Model ❽ Number of Switches ❾ Option ❿ Accessories

❶Mounting Style

Mounting bracket is included for shipment. However, LB, FA, TA with bellows are assembled and shipped.

Code	Content	
00	Basic type	
LB	Axial Foot Type (Double Side)	
FA	Rod side flange type	
TA	Rod side trunnion type	
TB	Head side trunnion type	

❷Bore Size (mm)

Code	Content
20	ø20
25	ø25
32	ø32
40	ø40

❸Piping thread type

Code	Content
Blank	M5 (Exhaust port) Rc1/8 (Air supply port)
NN	M5 (Exhaust port) NPT thread (Air supply port) (Custom product)

❹Stroke (mm)

Bore Size	Stroke	Intermediate Stroke
ø20	5 to 750	Every 1 mm
ø25	5 to 750	
ø32	5 to 750	
ø40	5 to 750	

Note: For minimum stroke with switch, refer to P. 662.

❺Wiring method

Code	Content	
Blank	Grommet lead wire (300 mm)	
U	DIN Terminal	

❻Voltage

Code	Content
1	100 VAC
2	200 VAC
3	24 VDC

❼Switch Model No.

For switch details, refer to P. 1457. Switches are shipped with the product.

Contact	Indicator LED Special Function	Wiring (Output)	Load Voltage (V) AC	Load Voltage (V) DC	Load Current (mA) AC	Load Current (mA) DC	Lead wire *1 Straight	Lead wire *1 L-shape	
Solid State	1-Color	2-wire	85 to 265	—	5 to 100	-	T1H□	T1V□	
			-	10 to 30	—	5 to 20 *2	T2H□	T2V□	
		3-wire (NPN)	—	30 or less	—	100 or less	T3H□	T3V□	
		3-wire (PNP)	—		-		T3PH□	T3PV□	
	2-color	2-wire	—	24 ± 10%	—	5 to 20	T2WH□	T2WV□	
		3-wire (NPN)	—	30 or less	—	50 or less	T3WH□	T3WV□	
	2-color Improved Water Resistance	2-wire	—	24 ± 10%	—	5 to 20	T2WLH□	T2WLV□	*3
	1-Color Off-Delay Type		—	10 to 30	—	5 to 20 *2	T2JH□	T2JV□	
	1-color Flexible Lead Wire Type		-		-		T2HR3	T2VR3	
Contact	1-Color	2-wire	110	12/24	7 to 20	5 to 50	T0H□	T0V□	
	Without Indicator Lamp		110	5/12/24	20 or less	50 or less	T5H□	T5V□	
	1-color		110/220	12/24	7 to 20 / 7 to 10	5 to 50	T8H□	T8V□	

*1: For "□" in the switch model number, enter the code selected from the "Lead wire length, connector specification" table.
*2: The maximum load current value above, 20 mA, is at 25°C. If the switch operating Ambient Temperature is higher than 25°C, it will be lower than 20 mA. (At 60°C, it will be 5 to 10 mA.)
*3: This does not guarantee the water resistance of the cylinder.
*4: Switches other than the model numbers listed above are also available. (Custom Product) For details, refer to P. 1457.

*Lead wire length, connector specification

Code	Content
Blank	1 m (Standard)
3	3 m (Option)
5	5 m (Option)
W	M8 Connector, 1PIN (+), 4PIN (−) Lead Wire 0.3 m

*5: Only T2WLH and T2WLV can be selected.

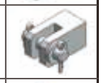
Example) Lead wire length
1 m T0H
3 m T0H3
5 m T0H5

❽Number of Switches

Code	Content
R	With 1 pc on rod side
H	With 1 pc on head side
D	With 2 pcs
T	With 3 pcs

Note: The maximum number of switches mounted is limited to 3. If 4 or more are required, please arrange for the shortage of switch mounting brackets separately by single item model number.

❿Accessories

	Code	Content	
*1	I	Single knuckle	
*1	Y	Double Knuckle (With pin, washer, split pin)	
	B2	Double bracket	
	B3	Double bracket (Clevis type)	

*1: "I" and "Y" cannot be selected at the same time.

❾Option

	Code	Content	Max Ambient Temperature	Instantaneous Max Temperature	
*1 *4	J	Bellows	100°C	200°C	
	L		250°C	400°C	
*5	M	Piston Rod, Rod nut material (Stainless Steel)			
	W	With Silencer			
*2	G	With Surge Suppressor			
*3	E	With Lamp			
	X	Energized retraction type			

*1: For bellows "J", stroke must be 25 mm or more. Please inquire each time for strokes less than 25 mm.
*2: Surge suppressor "G" is attached when the wiring method is grommet lead wire.
*3: With lamp "E" can be manufactured only when the wiring method is DIN terminal "U".
*4: Instantaneous maximum temperature is the temperature when fire or chips momentarily hit the bellows.
*5: When ❷tube inner diameter ø20 or ø25 is selected, the Piston Rod material is already Stainless Steel. If option "M" is selected, the rod nut material will also be Stainless Steel.

About specifications of custom products

For details, please refer to P. 680.

Code	Content
- D	Double solenoid type
Rod End Shape Modification	Refer to Ending P. 11.

Model No. Ex.)

CKV2 - D -.....

* For combinations of variations and options, please refer to P. 658, 659.

Switch Single Unit Model No. Notation

●Switch body+Mounting bracket set

CKV2 - T0H - 20

❼ Switch Model ❷ Bore Size

●Switch body only

SW - T0H

❼ Switch Model

●Mounting bracket set

CKV2 - T - 20

Mounting Bracket ❷ Bore Size

Specifications

Item	CKV2 (Standard type, with switch)			
Bore Size mm	ø20	ø25	ø32	ø40
Operation type	Double Acting / With Valve			
Operating Fluid	Compressed Air			
Max Operating Pressure MPa	1			
Min Operating Pressure MPa	0.15			
Proof Pressure MPa	1.6			
Ambient Temperature °C	-5 to 60 (However, no freezing)			
Port Size	Rc1/8			
Stroke Tolerance mm	$^{+2.0}_{0}$ (up to 200) $^{+2.4}_{0}$ (201 to 750)			
Operating Piston Speed mm/s	50 to 500		50 to 430	50 to 300
Cushion	Rubber Cushion			
Lubrication	Not required (When lubricating, use turbine oil Class 1 ISO VG32)			
Allowable Absorbed Energy J	0.166	0.308	0.424	0.639
Solenoid Valve Specifications				
Rated Voltage (Note) V	100 AC (50/60Hz)	200 AC (50/60Hz)	24 DC	
Starting Current (A)	0.056/0.048	0.028/0.024	0.110	
Holding Current (A)	0.028/0.024	0.014/0.012		
Power consumption W	2.0	2.0	2.5	
Voltage fluctuation range	±10%			
Heat Resistance Class	Equivalent to Class B			

Note: 100/200 VAC are available with 110/220 VAC (60 Hz).

Stroke

(Unit: mm)

Bore Size	Standard Stroke	Max Stroke	Min Stroke
ø20	25, 50, 75, 100, 150, 200	750	5
ø25			
ø32			
ø40			

*1: Intermediate strokes can be manufactured in 1 mm increments.
*2: In the case of bellows "J", manufacturing is for strokes of 25 mm or more. Please contact us for strokes less than 25 mm.

Minimum stroke with switch

(Unit: mm)

Number of Switches	Solid State						Contact			
	T2, T3		T2W, T3W, T2WL		T1		T0, T5		T8	
Bore Size (mm)	1	2	1	2	1	2	1	2	1	2
ø20	10	25	10	30	10	35	10	25	10	35
ø25										
ø32										
ø40										

Cylinder Weight

(Unit: kg)

Item / Mounting Style / Bore Size (mm)	Product Weight at Stroke (S) = 0 mm					Switch Weight	Switch rail + band Weight	Added Weight per S = 10 mm
	Basic Type (OO)	Axial Foot Type (LB)	Rod Side Flange Type (FA)	Rod side trunnion type (TA)	Head Side Trunnion Type (TB)			
ø20	0.47	0.63	0.53	0.52	0.49	Refer to the Weight listed in the Switch Specifications on P. 1457.	0.005	0.01
ø25	0.57	0.79	0.72	0.67	0.60		0.005	0.01
ø32	0.62	0.84	0.77	0.72	0.65		0.009	0.02
ø40	0.81	1.08	0.96	0.97	0.85		0.009	0.02

(Example) Product weight of CKV2-FA-32-50-1-T0H-D

Product Weight at S = 0 mm: … 0.77 kg
Additional weight when S = 50 mm. S = Additional weight when 10 mm $0.02 \times \frac{\text{Product Stroke (50)}}{10} = 0.10$ kg
Weight of 2 switches ……0.036 kg
Weight of switch rail + 2 bands … 0.018 kg
Product weight …… 0.77 kg+0.1 kg+0.036 kg+0.018 kg=0.924 kg

Theoretical Thrust Table

(Unit: N)

Bore Size (mm)	Operating Direction	Operating Pressure MPa									
		0.15	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
ø20	Push	47.1	62.8	94.2	1.26×10^2	1.57×10^2	1.88×10^2	2.20×10^2	2.51×10^2	2.83×10^2	3.14×10^2
	Pull	35.3	47.1	70.7	94.2	1.18×10^2	1.41×10^2	1.65×10^2	1.88×10^2	2.12×10^2	2.36×10^2
ø25	Push	73.6	98.2	1.47×10^2	1.96×10^2	2.45×10^2	2.95×10^2	3.44×10^2	3.93×10^2	4.42×10^2	4.91×10^2
	Pull	56.7	75.6	1.13×10^2	1.51×10^2	1.89×10^2	2.27×10^2	2.64×10^2	3.02×10^2	3.40×10^2	3.78×10^2
ø32	Push	1.21×10^2	1.61×10^2	2.41×10^2	3.22×10^2	4.02×10^2	4.83×10^2	5.63×10^2	6.43×10^2	7.24×10^2	8.04×10^2
	Pull	1.04×10^2	1.38×10^2	2.07×10^2	2.76×10^2	3.46×10^2	4.15×10^2	4.84×10^2	5.53×10^2	6.22×10^2	6.91×10^2
ø40	Push	1.88×10^2	2.51×10^2	3.77×10^2	5.03×10^2	6.28×10^2	7.54×10^2	8.80×10^2	1.01×10^3	1.13×10^3	1.26×10^3
	Pull	1.65×10^2	2.21×10^2	3.31×10^2	4.41×10^2	5.51×10^2	6.62×10^2	7.72×10^2	8.82×10^2	9.92×10^2	1.10×10^3

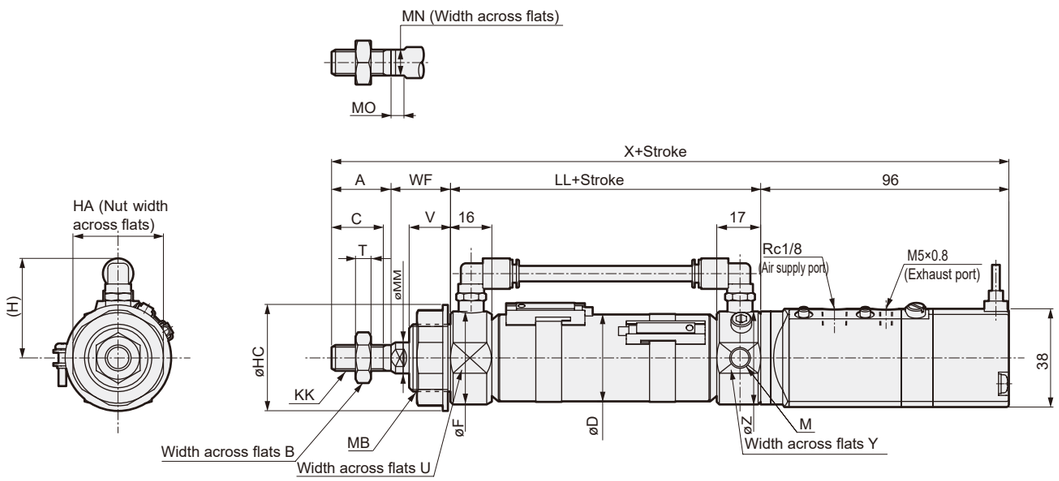
Mounting Bracket Model No. Notation

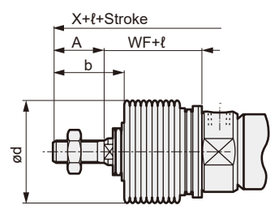
Bore Size (mm) / Mounting Bracket	ø20	ø25	ø32	ø40
Axial Foot Type (LB) Rod Side	M1-LB-20	M1-LB-30	M1-LB-30	M1-LB-30
Axial Foot Type (LB) Head Side	M1-LBV-20	M1-LBV-30	M1-LBV-30	M1-LBV-40
Flange (FA)	M1-FA-20	M1-FA-30	M1-FA-30	M1-FA-30
Trunnion (TA)	M1-TA-20	M1-TA-30	M1-TA-30	M1-TA-40
Bolt for Head Side Trunnion (TB)	M1-TB-20	M1-TB-30	M1-TB-30	M1-TB-40

*1: Regarding mounting brackets, mounting nuts/toothed washers are attached for axial foot type rod side and flange type, mounting nuts for trunnion type, and mounting bolts for axial foot type head side.
***2: For the material of the mounting brackets, please refer to P. 669.**
*3: For axial foot type, 1 set each of "M1-LB-□" and "M1-LBV-□" from the table above is required.

Dimensional Drawings

●Basic Type (OO)





[With bellows]

Code	Basic Type (OO) Basic Dimensions																	
Bore Size (mm)	A	B	C	D	F	(H)	HA	KK	LL	M	MB	MM	MN	MO	T	HC	U	V
ø20	20	13	18	21.4	28	38.5	26	M8x1.0	67	M8	M18×1.5	10	8	5	5	29	24	14
ø25	23	17	20	26.4	32	38.5	35	M10x1.25	70	M8	M26×1.5	12	10	5	6	41	30	16
ø32	23	17	20	33.6	36	38.5	35	M10x1.25	70	M8	M26×1.5	12	10	5	6	41	34	16
ø40	25	19	22	41.6	45	43.0	35	M12x1.5	74	M10	M26×1.5	14	12	6	7	41	43	16

Code					With Bellows		
Bore Size (mm)	WF	X	Y	Z	b	d	ℓ
ø20	24	207	34	36	30	30	(Stroke/3)+6
ø25	23	212	34	36	32	46	(Stroke/3.25)+7
ø32	23	212	34	36	32	46	(Stroke/3.25)+7
ø40	23	218	43	45	34	46	(Stroke/3.25)+7

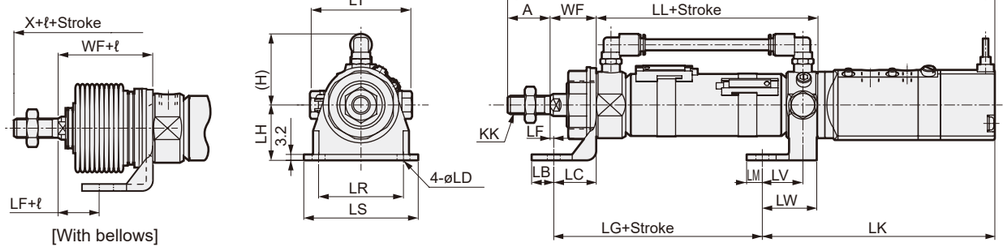
*1: Round up the ℓ dimension to the nearest integer.

***2: For dimensions with each switch, refer to P. 679.**

***3: For the external dimensions diagram of accessories, please refer to P. 677.**

Dimensional Drawings

●Axial Foot Type (LB)



Code	Axial Foot Type (LB) Mounting Dimensions					
Bore Size (mm)	A	(H)	KK	LL	WF	X
ø20	20	38.5	M8x1.0	67	24	207
ø25	23	38.5	M10x1.25	70	23	212
ø32	23	38.5	M10x1.25	70	23	212
ø40	25	43	M12x1.5	74	23	218

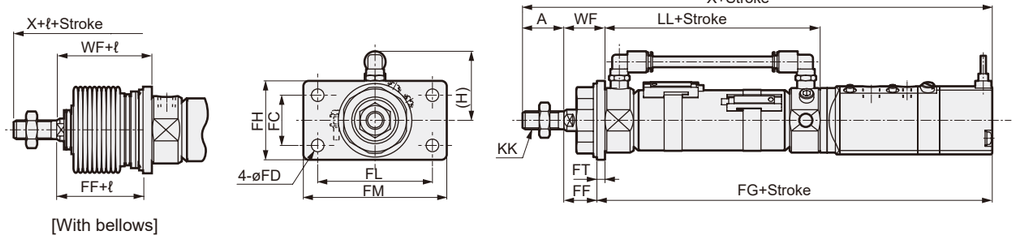
Code	Mounting Dimensions													With Bellows
Bore Size (mm)	LB	LC	LD	LF	LG	LH	LK	LM	LR	LS	LT	LV	LW	ℓ
ø20	10	18	6	6	55	25	126	7.5	30	44	55.4	22	29.5	(Stroke/3)+6
ø25	12	23	7	0	63	30	126	8.5	46	62	55.4	22	29.5	(Stroke/3.25)+7
ø32	12	23	7	0	63	30	126	8.5	46	62	55.4	22	29.5	(Stroke/3.25)+7
ø40	12	23	7	0	64	30	129	8	46	62	68.4	25	35	(Stroke/3.25)+7

*1: Round up the ℓ dimension to the nearest integer.

***2: For dimensions with each switch, refer to P. 679.**

***3: For the external dimensions diagram of accessories, please refer to P. 677.**

●Rod Side Flange Type (FA)



Code	Rod Side Flange Type (FA) Mounting Dimensions													
Bore Size (mm)	A	(H)	KK	LL	WF	X	FC	FD	FF	FG	FH	FL	FM	FT
ø20	20	38.5	M8x1.0	67	24	207	20	6	20.8	166.2	34	40	54	3.2
ø25	23	38.5	M10x1.25	70	23	212	28	7	18.5	170.5	44	64	80	4.5
ø32	23	38.5	M10x1.25	70	23	212	28	7	18.5	170.5	44	64	80	4.5
ø40	25	43	M12x1.5	74	23	218	28	7	18.5	174.5	44	64	80	4.5

Code	With Bellows
Bore Size (mm)	ℓ
ø20	(Stroke/3)+6
ø25	(Stroke/3.25)+7
ø32	(Stroke/3.25)+7
ø40	(Stroke/3.25)+7

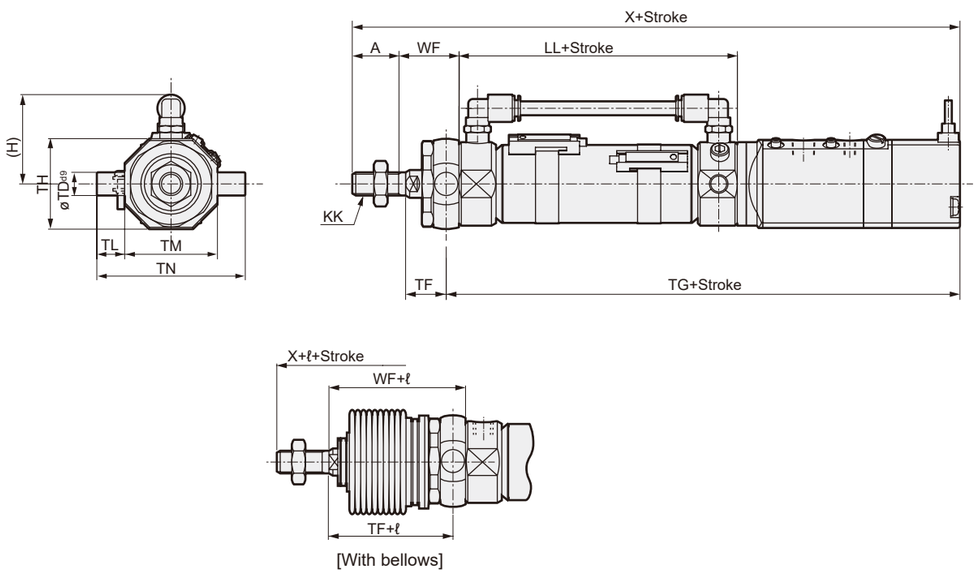
*1: Round up the ℓ dimension to the nearest integer.

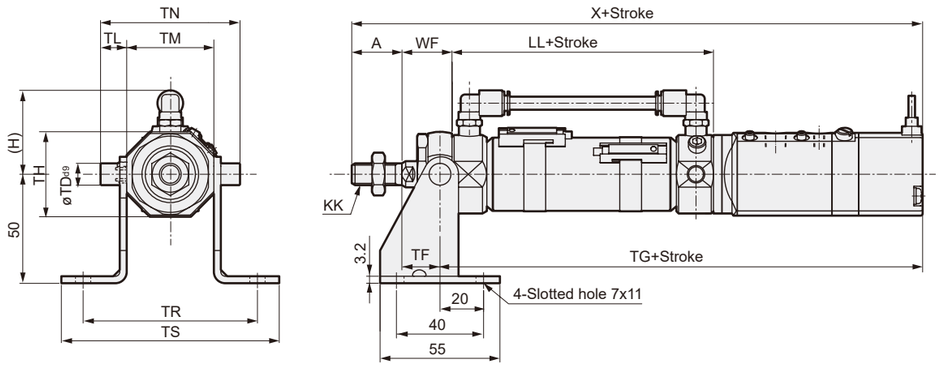
***2: For dimensions with each switch, refer to P. 679.**

***3: For the external dimensions diagram of accessories, please refer to P. 677.**

Dimensional Drawings

●Rod side trunnion type (TA)





Code	Rod Side Trunnion Type (TA) Mounting Dimensions					
Bore Size (mm)	A	(H)	KK	LL	WF	X
ø20	20	38.5	M8x1.0	67	24	207
ø25	23	38.5	M10x1.25	70	23	212
ø32	23	38.5	M10x1.25	70	23	212
ø40	25	43	M12x1.5	74	23	218

Code	Mounting Dimensions									With Bellows
Bore Size (mm)	TD	TF	TG	TH	TL	TM	TN	TR	TS	ℓ
ø20	8	19.5	167.5	29.5	8	30	46	70	90	(Stroke/3)+6
ø25	10	17.5	171.5	39	12	40	64	80	100	(Stroke/3.25)+7
ø32	10	17.5	171.5	39	12	40	64	80	100	(Stroke/3.25)+7
ø40	10	17.5	175.5	44	9.5	53	72	93	113	(Stroke/3.25)+7

*1: Round up the ℓ dimension to the nearest integer.

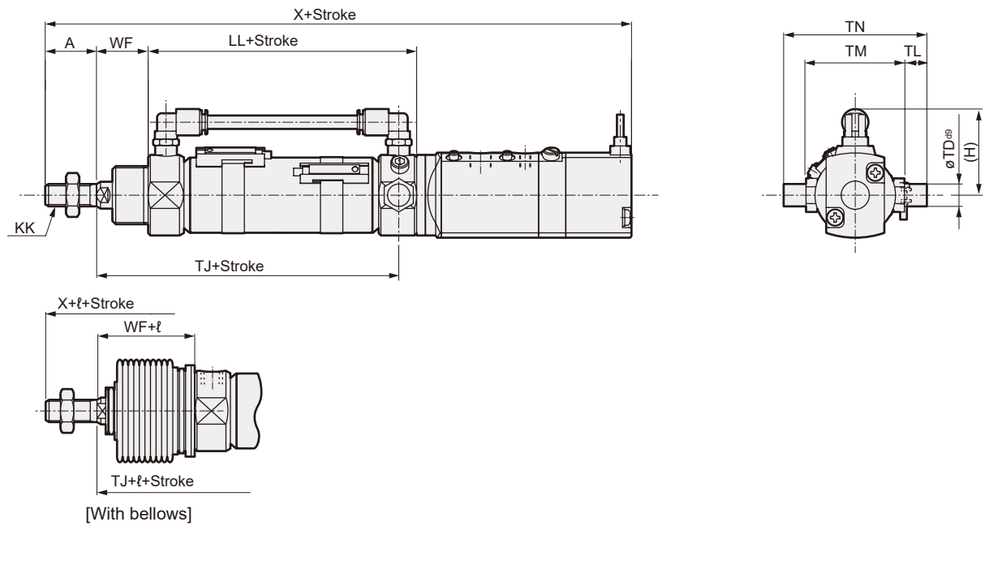
***2: For dimensions with each switch, refer to P. 679.**

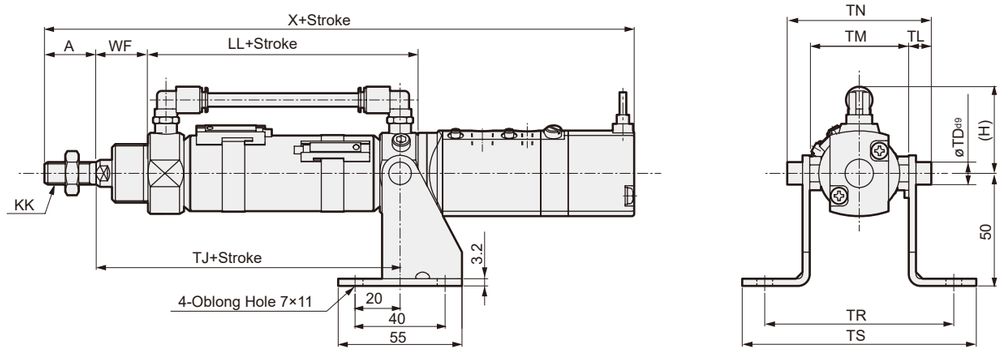
***3: For the external dimensions diagram of accessories, please refer to P. 677.**

● Rod side trunnion (TA) bracket (option code B2)

Dimensional Drawings

●Head Side Trunnion Type (TB)





Code	Head Side Trunnion Type (TB) Mounting Dimensions													With Bellows
Bore Size (mm)	A	(H)	KK	LL	WF	X	TD	TJ	TL	TM	TN	TR	TS	ℓ
ø20	20	38.5	M8x1.0	67	24	207	8	83	8	44	60	84	104	(Stroke/3)+6
ø25	23	38.5	M10x1.25	70	23	212	10	85	10	44	64	84	104	(Stroke/3.25)+7
ø32	23	38.5	M10x1.25	70	23	212	10	85	10	44	64	84	104	(Stroke/3.25)+7
ø40	25	43	M12x1.5	74	23	218	10	89	10	53	73	93	113	(Stroke/3.25)+7

*1: Round up the ℓ dimension to the nearest integer.

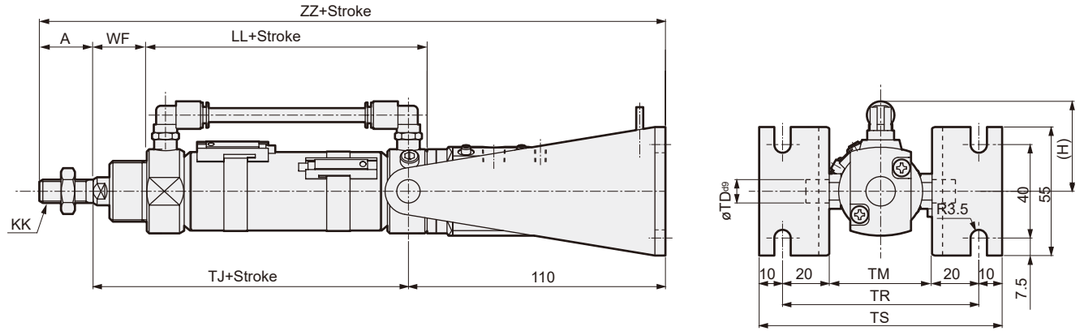
***2: For dimensions with each switch, refer to P. 679.**

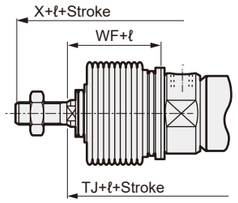
***3: For the external dimensions diagram of accessories, please refer to P. 677.**

●Head side trunnion type (TB) with bracket (Option Code B2)

Dimensional Drawings

●Head side trunnion type (TB) with bracket (Option Code B3)





[With bellows]

Code	Head Side Trunnion Type (TB) With Bracket (Option Code B3) Mounting Dimensions												With Bellows
Bore Size (mm)	A	(H)	KK	LL	WF	TD	TJ	TL	TM	TN	TR	TS	ℓ
ø20	20	38.5	M8x1.0	67	24	8	83	8	44	60	84	104	(Stroke/3)+6
ø25	23	38.5	M10x1.25	70	23	10	85	10	44	64	84	104	(Stroke/3.25)+7
ø32	23	38.5	M10x1.25	70	23	10	85	10	44	64	84	104	(Stroke/3.25)+7
ø40	25	43	M12x1.5	74	23	10	89	10	53	73	93	113	(Stroke/3.25)+7

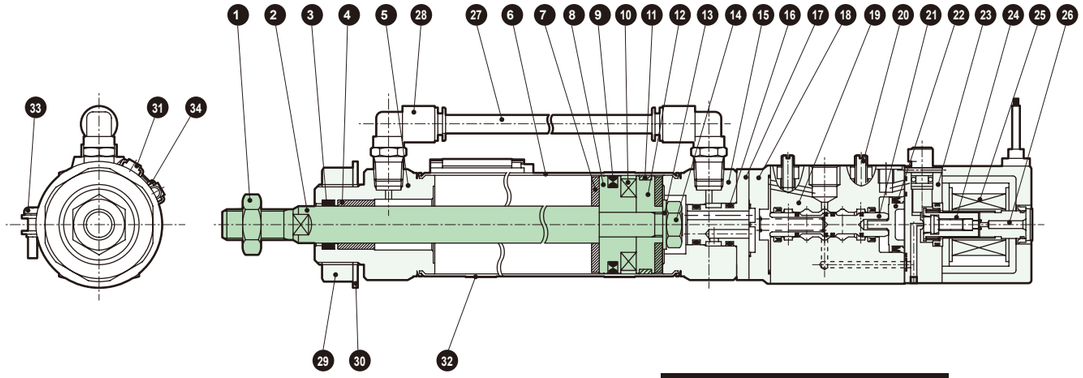
*1: Round up the ℓ dimension to the nearest integer.

***2: For dimensions with each switch, refer to P. 679.**

***3: For the external dimensions diagram of accessories, please refer to P. 677.**

Internal Structure / Materials

● CKV2 (with switch)



Do not disassemble

Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Rod Nut	Steel	Zinc Chromate	17	Adapter	Steel	Zinc Chromate
2	Piston Rod	ø20, ø25: Stainless Steel	Industrial Chrome Plating	18	Cap	Aluminum Alloy	Chromate
		ø32, ø40: Carbon Steel		19	Valve Body	Aluminum Alloy	Alumite
3	Rod Packing	Nitrile Rubber		20	Speed adjustment needle	Alloy	
4	Bushing	ø20: Bearing Alloy		21	Spool Assembly		
		ø25, ø32, ø40: Oil Impregnated Bearing Alloy		22	Piston Assembly		
5	Rod Cover	Aluminum Alloy		23	Pilot Valve Body	Nylon	
6	Cylinder Tube	Stainless Steel		24	Plunger Assembly		
7	Cushion Rubber	Urethane Rubber		25	Coil Assembly		
8	Piston A	Aluminum Alloy		26	Core Assembly		
9	Piston Packing	Nitrile Rubber		27	Soft Nylon Tubing		
10	Magnet	Plastic		28	New Joint, Long Elbow		GWJL6-6 (CKD)
11	Wear Ring	Polyacetal		29	Nut	Steel	Zinc Chromate
12	Piston B	Aluminum Alloy		30	Toothed washer	Steel	Zinc Chromate
13	Spacer	Steel	Zinc Chromate (ø20 to ø32 only)	With switch			
14	Hexagon Nut	Steel	Zinc Chromate	31	Switch		
15	Head Cover	Aluminum Alloy		32	Band	Stainless Steel	
16	O-ring	Nitrile Rubber		33	Pan Head Screw	Stainless Steel	
				34	Switch Rail	Stainless Steel	

Mounting Bracket Material

Mounting Style	Material	Remarks
Axial Foot Type (LB)	Steel	Zinc Chromate
Rod Side Flange Type (FA)	Steel	Zinc Chromate
Rod side trunnion type (TA)	Steel	Zinc Chromate

Valve Part Consumable Parts List

Kit Number	Replacement Part Number
CKV2-VK	16 21 22

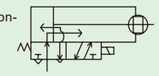
Small Cell Cylinder Double Acting/Non-Rotating Type

CKV2-M Series

●Bore Size: ø20, ø25, ø32, ø40

Circuit Diagram Code

● Double Acting cylinder rotation-stop with valve



RoHS

Model No. Notation

Without Switch (Built-in magnet for switch)

With switch (Built-in magnet for switch)

	Model Number	❶ Mounting type	❷ Bore Size	❸ Piping thread type	❹ Stroke	❺ Wiring method	❻ Voltage	❼ Switch Model	❽ Number of Switches	❾ Option	❿ Accessories
Without Switch	CKV2-M	LB	20		25	U	1			J	Y
With switch	CKV2-M	LB	20		25	U	1	T0H	R	J	Y

❶ Mounting Type

Mounting bracket is included for shipment. However, LB, FA, TA with bellows are assembled and shipped.

Code	Content	
00	Basic type	
LB	Axial Foot Type (Double Side)	
FA	Rod side flange type	
TA	Rod Side Trunnion Type	
TB	Head side trunnion type	

❷ Bore Size (mm)

Code	Content
20	ø20
25	ø25
32	ø32
40	ø40

❸ Piping thread type

Code	Content
Blank	M5 (Exhaust port)
	Rc1/8 (Air supply port)
NN	M5 (Exhaust port)
	NPT thread (Air supply port) (Custom product)

❹ Stroke (mm)

Bore Size	Stroke	Intermediate Stroke
ø20	5 to 750	in 1mm increments
ø25	5 to 750	
ø32	5 to 750	
ø40	5 to 750	

Note: For minimum stroke with switch, refer to P. 672.

❺ Wiring method

Code	Content	
Blank	Grommet lead wire (300 mm)	
U	DIN Terminal	

❻ Voltage

Code	Content
1	100 VAC
2	200 VAC
3	24 VDC

❼ Switch Model No.

For switch details, refer to P. 1457. Switches are shipped with the product.

	Indicator LED Special Function	Wiring (Output)	Load Voltage (V) AC	Load Voltage (V) DC	Load Current (mA) AC	Load Current (mA) DC	Lead wire *1 Straight	Lead wire *1 L-shape	
Solid State	1-Color	2-wire	85 to 265	—	5 to 100	-	T1H□	T1V□	
			—	10 to 30	—	5 to 20 *2	T2H□	T2V□	
		3-wire (NPN)	—	30 or less	—	100 or less	T3H□	T3V□	
		3-wire (PNP)	—		-		T3PH□	T3PV□	
	2-color	2-wire	—	24 ± 10%	—	5 to 20	T2WH□	T2WV□	
		3-wire (NPN)	—	30 or less	—	50 or less	T3WH□	T3WV□	
	2-color Improved Water Resistance	2-wire	—	24 ± 10%	—	5 to 20	T2WLH□	T2WLV□	*3
	1-Color Off-Delay Type		—	10 to 30	—	5 to 20 *2	T2JH□	T2JV□	
	1-color Flexible Lead Wire Type		-		-		T2HR3	T2VR3	
Reed	1-Color	2-wire	110	12/24	7 to 20	5 to 50	T0H□	T0V□	
	No Indicator LED		110	5/12/24	20 or less	50 or less	T5H□	T5V□	
	1-color		110/220	12/24	7 to 20 / 7 to 10	5 to 50	T8H□	T8V□	

*5

***Lead wire length, connector specification**

Code	Content
Blank	1 m (Standard)
3	3 m (Option)
5	5 m (Option)
W	M8 Connector, 1PIN (+), 4PIN (−) Lead Wire 0.3 m

*5: Only T2WLH and T2WLV can be selected.

Example) Lead wire length
1 m T0H
3 m T0H3
5 m T0H5

*1: For "□" in the switch model number, enter the code selected from the "Lead wire length, connector specification" table.
*2: The maximum load current value above, 20 mA, is at 25°C. If the switch operating Ambient Temperature is higher than 25°C, it will be lower than 20 mA. (At 60°C, it will be 5 to 10 mA.)
*3: This does not guarantee the water resistance of the cylinder.
*4: Switches other than the model numbers listed above are also available. (Custom Product) For details, refer to P. 1457.

❽ Number of Switches

Code	Content
R	With 1 pc on rod side
H	With 1 pc on head side
D	With 2 pcs
T	With 3 pcs

Note: The maximum number of switches that can be installed is 3. If 4 or more are required, please arrange for the shortage of switch mounting brackets separately by single item model number.

❿ Accessories

	Code	Content	
*1	I	Single knuckle	
*1	Y	Double Knuckle (Pin, washer, split pin included)	
	B2	Double bracket	
	B3	Double bracket (Clevis type)	

*1: "I" and "Y" cannot be selected at the same time.

❾ Option

	Code	Content			
			Max Ambient Temperature	Instantaneous Max Temperature	
*1 *4	J	Bellows	100°C	200°C	
	L		250°C	400°C	
*5	M	Piston Rod, Rod nut material (Stainless Steel)			
	W	With Silencer			
*2	G	With Surge Suppressor			
*3	E	With Lamp			
	X	Energized retraction type			

*1: For bellows "J", stroke must be 25 mm or more. Please inquire each time for strokes less than 25 mm.
*2: Surge suppressor "G" is attached when the wiring method is grommet lead wire.
*3: With lamp "E" can be manufactured only when the wiring method is DIN terminal "U".
*4: Instantaneous maximum temperature is the temperature when fire or chips momentarily hit the bellows.
*5: When ❷Bore size ø20 or ø25 is selected, the Piston Rod material is already Stainless Steel. If option "M" is selected, the rod nut material will also be Stainless Steel.

About specifications of custom products

For details, please refer to P. 680.

Code	Content
- D	Double solenoid type
Rod End Shape Modification	Refer to Ending P. 11.

Model No. Ex.)
CKV2-D M-.....

* For combinations of variations and options, please refer to P. 658, 659.

Switch Single Unit Model No. Notation

●Switch body+Mounting bracket set

CKV2 - T0H - 20
(7 Switch Model No., 2 Bore Size)

●Switch body only

SW - T0H
(7 Switch Model)

●Mounting bracket set

CKV2 - T - 20
(Mounting Bracket, 2 Bore Size)

Specifications

Item		CKV2-M			
Bore Size	mm	ø20	ø25	ø32	ø40
Actuation method		Double Acting, Non-Rotating Type			
Operating Fluid		Compressed Air			
Max Operating Pressure	MPa	1			
Min Operating Pressure	MPa	0.15			
Proof Pressure	MPa	1.6			
Ambient Temperature	°C	-5 to 60 (However, no freezing)			
Port Size		Rc1/8			
Stroke Tolerance	mm	$^{+2.0}_{0}$ (to 200) $^{+2.4}_{0}$(201 to 750)			
Operating Piston Speed	mm/s	50 to 500		50 to 430	50 to 300
Cushion		Rubber Cushion			
Lubrication		Not required (Use Turbine Oil Class 1 ISO VG32 if lubricated)			
Non-rotating accuracy *1	degree	±1.5			±1
Allowable Absorbed Energy	J	0.166	0.308	0.424	0.639

*1: Value at stroke 0 (excluding Piston Rod deflection)

Solenoid Valve Specifications				
Rated Voltage	V	100 AC (50/60Hz)	200 AC (50/60Hz)	24 DC
Starting Current	A	0.056/0.048	0.028/0.024	0.110
Holding Current	A	0.028/0.024	0.014/0.012	
Power consumption	W	2.0	2.0	2.5
Voltage fluctuation range		±10%		
Heat Resistance Class		Equivalent to Class B		

Note: 100/200 VAC are available with 110/220 VAC (60 Hz).

Stroke

(Unit: mm)

Bore Size	Standard Stroke	Max Stroke	Min Stroke
ø20	25, 50, 75 100, 150, 200	750	5
ø25			
ø32			
ø40			

*1: Intermediate strokes can be manufactured in 1 mm increments.
*2: In the case of bellows "J", manufacturing is for strokes of 25 mm or more. Please contact us for strokes less than 25 mm.

Minimum stroke with switch

(Unit: mm)

Number of Switches	Solid State						Contact			
	T2, T3		T2W, T3W, T2WL		T1		T0, T5		T8	
Bore Size (mm)	1	2	1	2	1	2	1	2	1	2
ø20	10	25	10	30	10	35	10	25	10	35
ø25										
ø32										
ø40										

Cylinder Weight

(Unit: kg)

Item / Mounting Style / Bore Size (mm)	Product Weight when stroke (S) = 0 mm					Switch Weight	Switch rail + band Weight	Added Weight per S = 10 mm
	Basic Type (00)	Axial Foot Type (LB)	Rod Side Flange Type (FA)	Rod side trunnion type (TA)	Head Side Trunnion Type (TB)			
ø20	0.47	0.63	0.53	0.52	0.49	Please refer to the mass described in the switch specifications on page 1457.	0.005	0.01
ø25	0.57	0.79	0.72	0.67	0.60		0.005	0.01
ø32	0.62	0.84	0.77	0.72	0.65		0.009	0.02
ø40	0.81	1.08	0.96	0.97	0.85		0.009	0.02

(Example) Product weight of CKV2-M-FA-32-50-1-TOH-D

Product Weight at S = 0 mm: … 0.77 kg
Additional weight when S = 50 mm S = Additional weight when 10 mm 0.02 x $\frac{\text{Product Stroke (50)}}{10}$ = 0.10 kg
Weight of 2 switches …… 0.036 kg
Weight of switch rail + 2 bands …… 0.018 kg
Product weight …… 0.77 kg+0.1 kg+0.036 kg+0.018 kg=0.924 kg

Theoretical Thrust Table

(Unit: N)

Bore Size (mm)	Operating Direction	Operating Pressure MPa									
		0.15	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
ø20	Push	47.1	62.8	94.2	1.26×10^{2}	1.57×10^{2}	1.88×10^{2}	2.20×10^{2}	2.51×10^{2}	2.83×10^{2}	3.14×10^{2}
	Pull	35.3	47.1	70.7	94.2	1.18×10^{2}	1.41×10^{2}	1.65×10^{2}	1.88×10^{2}	2.12×10^{2}	2.36×10^{2}
ø25	Push	73.6	98.2	1.47×10^{2}	1.96×10^{2}	2.45×10^{2}	2.95×10^{2}	3.44×10^{2}	3.93×10^{2}	4.42×10^{2}	4.91×10^{2}
	Pull	56.7	75.6	1.13×10^{2}	1.51×10^{2}	1.89×10^{2}	2.27×10^{2}	2.64×10^{2}	3.02×10^{2}	3.40×10^{2}	3.78×10^{2}
ø32	Push	1.21×10^{2}	1.61×10^{2}	2.41×10^{2}	3.22×10^{2}	4.02×10^{2}	4.83×10^{2}	5.63×10^{2}	6.43×10^{2}	7.24×10^{2}	8.04×10^{2}
	Pull	1.04×10^{2}	1.38×10^{2}	2.07×10^{2}	2.76×10^{2}	3.46×10^{2}	4.15×10^{2}	4.84×10^{2}	5.53×10^{2}	6.22×10^{2}	6.91×10^{2}
ø40	Push	1.88×10^{2}	2.51×10^{2}	3.77×10^{2}	5.03×10^{2}	6.28×10^{2}	7.54×10^{2}	8.80×10^{2}	1.01×10^{3}	1.13×10^{3}	1.26×10^{3}
	Pull	1.65×10^{2}	2.21×10^{2}	3.31×10^{2}	4.41×10^{2}	5.51×10^{2}	6.62×10^{2}	7.72×10^{2}	8.82×10^{2}	9.92×10^{2}	1.10×10^{3}

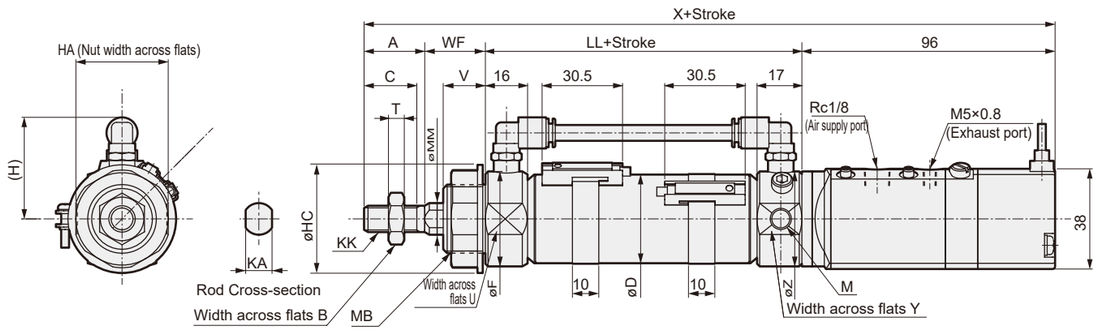
Mounting Bracket Model No. Notation

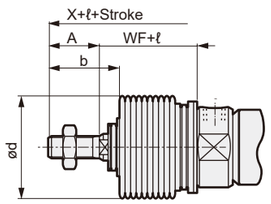
Bore Size (mm) / Mounting Bracket	ø20	ø25	ø32	ø40
Axial Foot Type (LB) Rod Side	M1-LB-20	M1-LB-30	M1-LB-30	M1-LB-30
Axial Foot Type (LB) Head Side	M1-LBV-20	M1-LBV-30	M1-LBV-30	M1-LBV-40
Flange (FA)	M1-FA-20	M1-FA-30	M1-FA-30	M1-FA-30
Trunnion (TA)	M1-TA-20	M1-TA-30	M1-TA-30	M1-TA-40
Bolt for Head Side Trunnion (TB)	M1-TB-20	M1-TB-30	M1-TB-30	M1-TB-40

*1: Regarding mounting brackets, mounting nuts/toothed washers are attached for axial foot type rod side and flange type, mounting nuts for trunnion type, and mounting bolts for axial foot type head side.
***2: For the material of the mounting brackets, please refer to P. 669.**
*3: For axial foot type, 1 set each of "M1-LB-□" and "M1-LBV-□" from the table above is required.

Dimensional Drawings

●Basic Type (OO)





[With bellows]

Code	Basic Type (OO) Basic Dimensions																	
Bore Size (mm)	A	B	C	D	F	(H)	HA	KA	KK	LL	M	MB	MM	T	HC	U	V	WF
ø20	20	13	18	21.4	28	38.5	26	8	M8x1.0	67	M8	M18×1.5	10	5	29	24	14	24
ø25	23	17	20	26.4	32	38.5	35	10	M10x1.25	70	M8	M26×1.5	12	6	41	30	16	23
ø32	23	17	20	33.6	36	38.5	35	10	M10x1.25	70	M8	M26×1.5	12	6	41	34	16	23
ø40	25	19	22	41.7	45	43.0	35	12	M12x1.5	74	M10	M26×1.5	14	7	41	43	16	23

Code				With Bellows		
Bore Size (mm)	X	Y	Z	b	d	ℓ
ø20	207	34	36	30	30	(Stroke/3)+6
ø25	212	34	36	32	46	(Stroke/3.25)+7
ø32	212	34	36	32	46	(Stroke/3.25)+7
ø40	218	43	45	34	46	(Stroke/3.25)+7

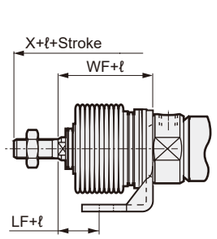
*1: Round up the ℓ dimension to the nearest integer.

***2: For dimensions with each switch, refer to P. 679.**

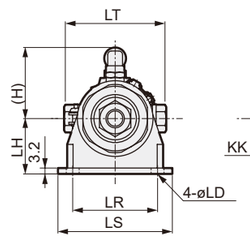
***3: For the external dimensions diagram of accessories, please refer to P. 677.**

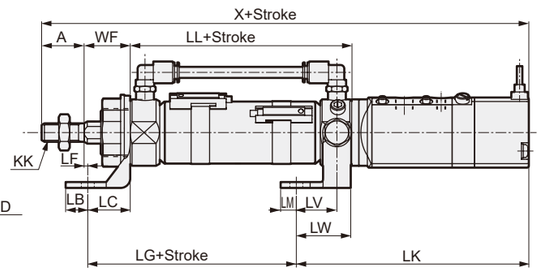
Dimensional Drawings

●Axial Foot Type (LB)



[With bellows]





Code	Axial Foot Type (LB) Mounting Dimensions					
Bore Size (mm)	A	(H)	KK	LL	WF	X
ø20	20	38.5	M8x1.0	67	24	207
ø25	23	38.5	M10x1.25	70	23	212
ø32	23	38.5	M10x1.25	70	23	212
ø40	25	43	M12x1.5	74	23	218

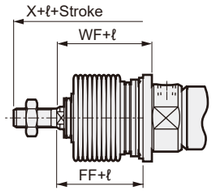
Code	Mounting Dimensions													With Bellows
Bore Size (mm)	LB	LC	LD	LF	LG	LH	LK	LM	LR	LS	LT	LV	LW	ℓ
ø20	10	18	6	6	55	25	126	7.5	30	44	55.4	22	29.5	(Stroke/3)+6
ø25	12	23	7	0	63	30	126	8.5	46	62	55.4	22	29.5	(Stroke/3.25)+7
ø32	12	23	7	0	63	30	126	8.5	46	62	55.4	22	29.5	(Stroke/3.25)+7
ø40	12	23	7	0	64	30	129	8	46	62	68.4	25	35	(Stroke/3.25)+7

*1: Round up the ℓ dimension to the nearest integer.

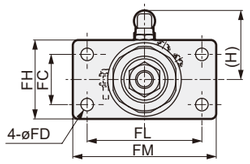
***2: For dimensions with each switch, refer to P. 679.**

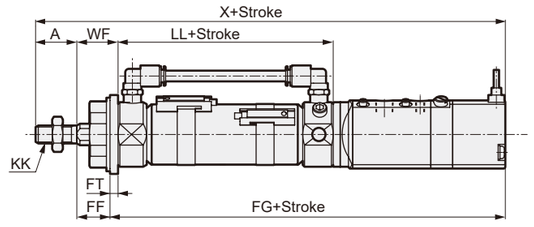
***3: For the external dimensions diagram of accessories, please refer to P. 677.**

●Rod Side Flange Type (FA)



[With bellows]





Code	Rod Side Flange Type (FA) Mounting Dimensions					
Bore Size (mm)	A	(H)	KK	LL	WF	X
ø20	20	38.5	M8x1.0	67	24	207
ø25	23	38.5	M10x1.25	70	23	212
ø32	23	38.5	M10x1.25	70	23	212
ø40	25	43	M12x1.5	74	23	218

Code	Mounting Dimensions								With Bellows
Bore Size (mm)	FC	FD	FF	FG	FH	FL	FM	FT	ℓ
ø20	20	6	20.8	166.2	34	40	54	3.2	(Stroke/3)+6
ø25	28	7	18.5	170.5	44	64	80	4.5	(Stroke/3.25)+7
ø32	28	7	18.5	170.5	44	64	80	4.5	(Stroke/3.25)+7
ø40	28	7	18.5	174.5	44	64	80	4.5	(Stroke/3.25)+7

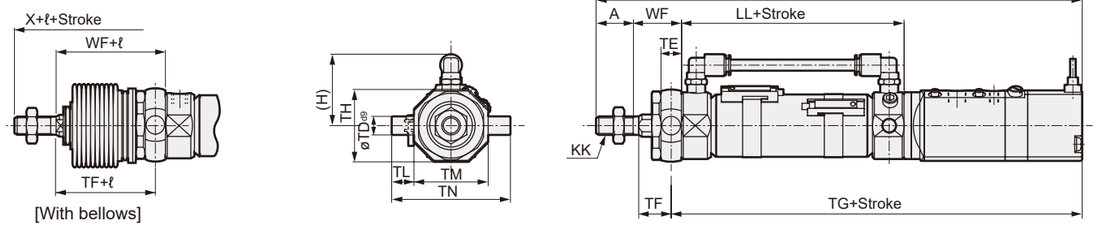
*1: Round up the ℓ dimension to the nearest integer.

***2: For dimensions with each switch, refer to P. 679.**

***3: For the external dimensions diagram of accessories, please refer to P. 677.**

Dimensional Drawings

●Rod side trunnion type (TA)

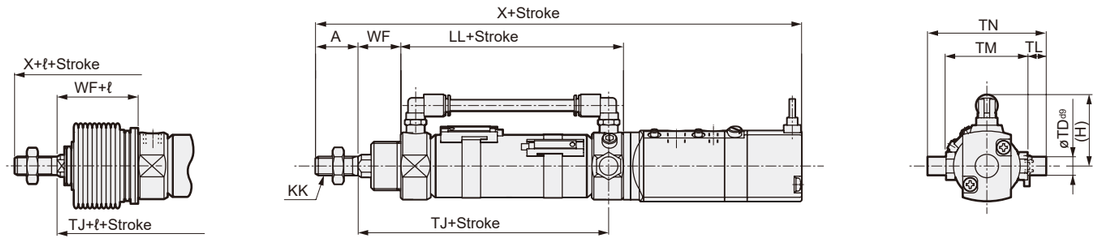


Code	Rod Side Trunnion Type (TA) Mounting Dimensions					
Bore Size (mm)	A	(H)	KK	LL	WF	X
ø20	20	38.5	M8x1.0	67	24	207
ø25	23	38.5	M10x1.25	70	23	212
ø32	23	38.5	M10x1.25	70	23	212
ø40	25	43	M12x1.5	74	23	218

Code	Mounting Dimensions										With Bellows
Bore Size (mm)	TD	TE	TF	TG	TH	TL	TM	TN	TR	TS	ℓ
ø20	8	9	19.5	167.5	29.5	8	30	46	70	90	(Stroke/3)+6
ø25	10	11	17.5	171.5	39	12	40	64	80	100	(Stroke/3.25)+7
ø32	10	11	17.5	171.5	39	12	40	64	80	100	(Stroke/3.25)+7
ø40	10	11	17.5	175.5	44	9.5	53	72	93	113	(Stroke/3.25)+7

*1: Round up the ℓ dimension to the nearest integer.
***2: For dimensions with each switch, refer to P. 679.**
***3: For the external dimensions diagram of accessories, please refer to P. 677.**

●Head Side Trunnion Type (TB)

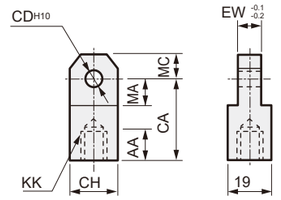


Code	Head Side Trunnion Type (TB) Mounting Dimensions													With Bellows
Bore Size (mm)	A	(H)	KK	LL	WF	X	TD	TJ	TL	TM	TN	TR	TS	ℓ
ø20	20	38.5	M8x1.0	67	24	207	8	83	8	44	60	84	104	(Stroke/3)+6
ø25	23	38.5	M10x1.25	70	23	212	10	85	10	44	64	84	104	(Stroke/3.25)+7
ø32	23	38.5	M10x1.25	70	23	212	10	85	10	44	64	84	104	(Stroke/3.25)+7
ø40	25	43	M12x1.5	74	23	218	10	89	10	53	73	93	113	(Stroke/3.25)+7

*1: Round up the ℓ dimension to the nearest integer.
***2: For dimensions with each switch, refer to P. 679.**
***3: For the external dimensions diagram of accessories, please refer to P. 677.**

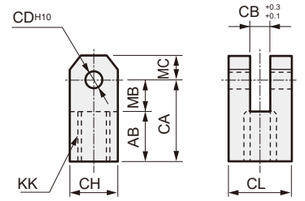
Accessory External Dimensions

● Single Knuckle (I) Material: Steel, Zinc Chromate



Model No.	Applicable Bore Size (mm)	AA	CA	CD	CH	EW	KK	MA	MC	Weight (g)
M1-I-20	ø20	14	30	10	19	8	M8×1.0	13	10	60
M1-I-30	ø25, ø32	14	36	12	25	10	M10×1.25	16	12	110
M1-I-40	ø40	14	36	12	25	10	M12×1.5	16	12	100

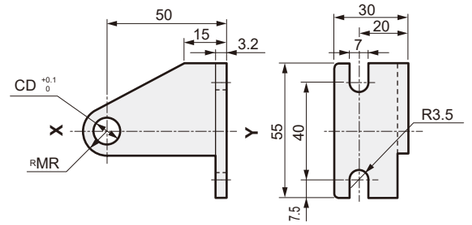
●Double Knuckle (Y) Material: Steel, Zinc Chromate



Model No.	Applicable Bore Size (mm)	AB	CA	CB	CD	CH	CL	KK	MB	MC	Weight (g)
M1-Y-20	ø20	17	30	8	10	19	19	M8×1.0	13	10	100
M1-Y-30	ø25, ø30	20	36	10	12	25	25	M10×1.25	16	12	210
M1-Y-40	ø40	20	36	10	12	25	25	M12×1.5	16	12	200

Note: Pin, washer, and split pin are attached.

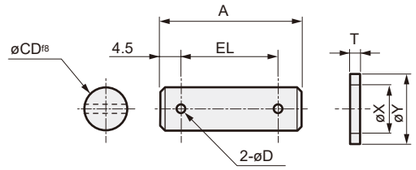
●Double Bracket (B2) Material: Steel, Zinc Chromate



Model No.	Applicable Bore Size (mm)	CD	MR	Weight (g)
M1-B2-20-TA	ø20	8	8	130
M1-B2-30-TA	ø25, ø32, ø40	10	11	150

*1: A pair is symmetrical to the XY line.
*2: Retaining Ring and pin are not included.

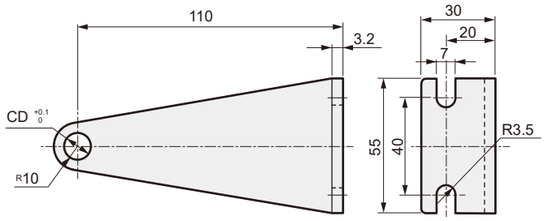
●Pin for Double Knuckle (P) Material: Steel, Zinc Chromate



Model No.	Applicable Bore Size (mm)	A	D	CD	EL	T	X	Y	Weight (g)
M1-P-20	ø20	37	4	10	28	1.6	10.5	18	30
M1-P-30	ø25, ø32, ø40	46	4	12	37	2.3	12.5	22	50

Note: Pin, washer, and split pin for double knuckle use are attached to the product.

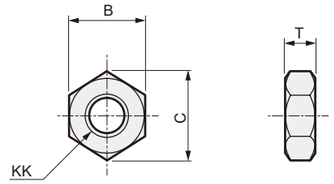
●Double Bracket (B3) Material: Steel, Zinc Chromate



Model No.	Applicable Bore Size (mm)	CD	Weight (g)
M1-B3-20-TA	ø20	8	370
M1-B3-30-TA	ø25, ø32, ø40	10	360

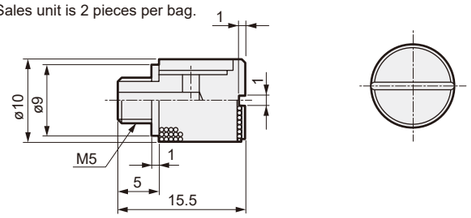
Note: Retaining Ring and pin are not attached.

● Rod End nut (NR) Material: Steel, Zinc Chromate

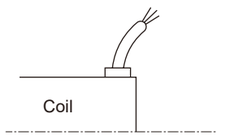
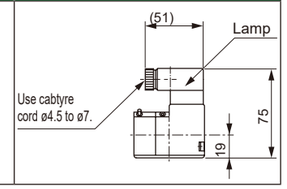


Model No.	Applicable Bore Size (mm)	B	C	KK	T	Weight (g)
M1-NR-20	ø20	13	15	M8×1.0	5	3
M1-NR-30	ø25, ø32	17	19.6	M10×1.25	6	7
M1-NR-40	ø40	19	21.9	M12×1.5	7	9

● Silencer (SL-M5)
*Sales unit is 2 pieces per bag.



Wiring method

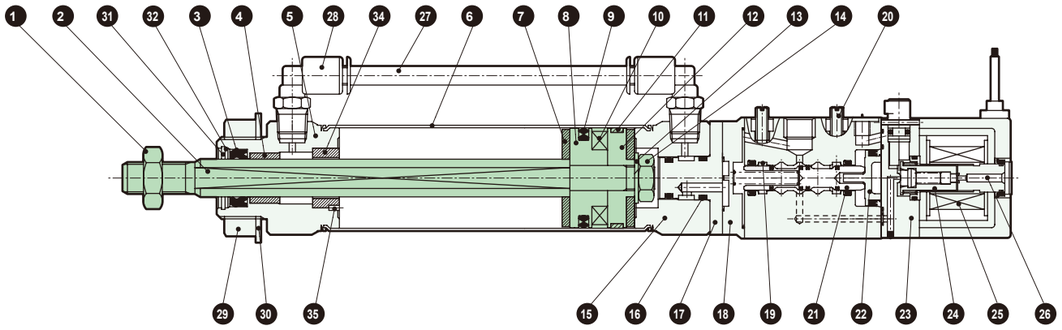
Grommet	DIN Terminal (U)/Lamp (E)
	

*1: Lamps and surge suppressors cannot be incorporated into grommets.
***2: For connection to the DIN terminal box, please refer to "Terminal Box Wiring Method" on P. 683.**

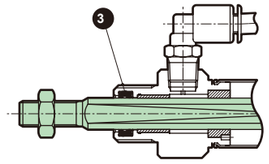
Internal Structure / Materials

● CKV2-M (with switch)

ø25 to ø40



ø20

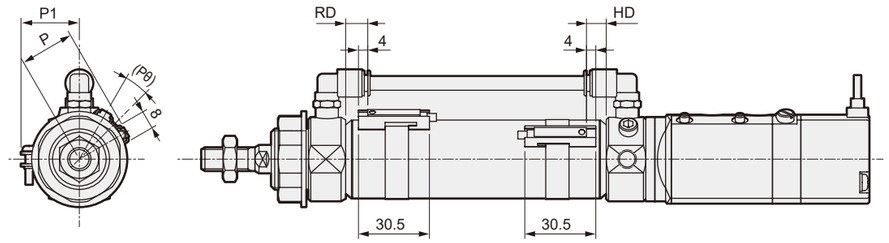


Do not disassemble

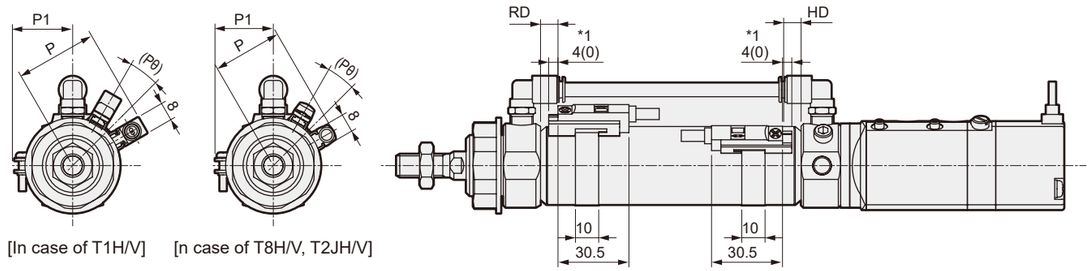
Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Rod Nut	Steel	Zinc Chromate	18	Cap	Aluminum Alloy	Chromate
2	Piston Rod	Stainless Steel		19	Valve Body	Aluminum Alloy	Alumite
3	Rod Packing	Nitrile Rubber		20	Speed adjustment needle	Brass	
4	Bushing	Oil-Impregnated Bearing Alloy		21	Spool Assembly	———	
5	Rod Cover	Aluminum Alloy		22	Piston Assembly	———	
6	Cylinder Tube	Stainless Steel		23	Pilot Valve Body	Nylon	
7	Cushion Rubber	Urethane Rubber		24	Plunger Assembly	———	
8	Piston A	Aluminum Alloy		25	Coil Assembly	———	
9	Piston Packing	Nitrile Rubber		26	Core Assembly	———	
10	Magnet	Plastic		27	Soft Nylon Tubing		
11	Wear Ring	Polyacetal		28	New Joint, Long Elbow	———	GWJL6-6 (CKD)
12	Piston B	Aluminum Alloy		29	Nut	Steel	Zinc Chromate
13	Spacer	Steel	Zinc Chromate (ø20 to ø32 only)	30	Toothed washer	Steel	Zinc Chromate
14	Hexagon Nut	Steel	Zinc Chromate	With Switch			
15	Head Cover	Aluminum Alloy		31	Packing Retainer	Steel	Zinc Chromate
16	O-ring	Nitrile Rubber		32	Retaining Ring	Steel	Zinc Phosphate treatment
17	Adapter	Steel	Zinc Chromate				

CKV2 Series External Dimensions Diagram with Switch

● T0H/V, T5H/V, T2H/V, T3H/V, T3PH/V, T2WH/V, T3WH/V, T2WLH/V



● T1H/V, T8H/V, T2JH/V



[In case of T1H/V] [n case of T8H/V, T2JH/V]

Code / Bore Size (mm)	P1	Pθ	CKV2													
			T0, T5, T2, T3, T3P			T2W, T3W, T2WL			T1			T2J			T8	
			RD	HD	P	RD	HD	P	RD	HD	P	RD	HD	P	RD	HD	P
ø20	19.5	22	8	7	17.3	10	9	17.3	7	6	28.5	7	6	23.1	2	1	23.1
ø25	22	18	9.5	8.5	19.8	11.5	10.5	19.8	8.5	7.5	31	8.5	7.5	25.6	3.5	2.5	25.6
ø32	25.5	15	9.5	8.5	24.3	11.5	10.5	24.3	8.5	7.5	35.5	8.5	7.5	30.1	3.5	2.5	30.1
ø40	29.5	12	11.5	10.5	28.3	13.5	12.5	28.3	10.5	9.5	39.5	10.5	9.5	34.1	5.5	4.5	34.1

*1: For T1□, T2J□ switches and stroke of 35 mm or more, or for T8 switch, the dimension will be ( ).
*2: For switch mountability, refer to the model number notation of each variation.

Double solenoid type (-D)

Model No. Notation

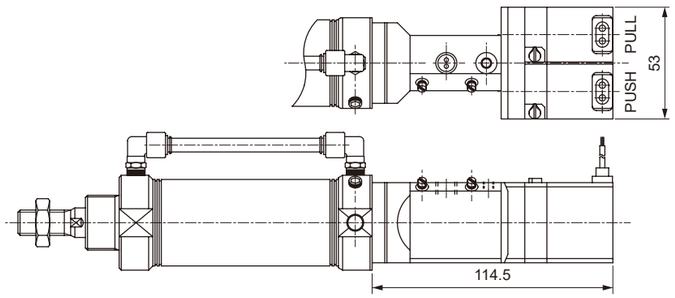
CKV2 - D - LB - 20 - 100

Model Number

Please see the CKV2 series model number display method.

Dimensions

Except for the dimensions below, it is the same as the standard type.



MEMO

With Valve
CKV2
CAV2/
COVP/
N2
Cylinder
Switch
Ending

Pneumatic Components

To Use This Product Safely

Be sure to read this before use. For general cylinder information, see Intro 41, and for cylinder switches, see P. 1512.

Individual Precautions: Small Cell Cylinder CKV2 Series

Design / Selection

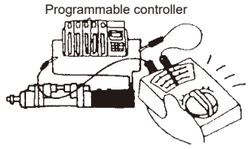
⚠Warning

■Air may be taken in at the exhaust port of the valve due to valving element operation, causing the intake of foreign matter near the exhaust port. Foreign matter may also enter when the exhaust port is pointed upwards. Install a silencer or pipe the exhaust port downward.
- The actuator will not operate correctly if the exhaust air is not discharged smoothly.

⚠CAUTION

■Check leakage current to prevent malfunction caused by leakage current from other fluid control components.
- When using a programmable controller, leakage current may affect the valve and cause a malfunction.
- The values affected by leakage current depend on the voltage type. Refer to the table below.

Programmable controller



Reference

For 100 VAC	3.0 mA or less
For 200 VAC	1.5 mA or less
For 24 VDC	1.8 mA or less

■Switch the valve at least once every 30 days to prevent malfunction.

■Although the contact service life of the reed switch varies depending on usage conditions, it will generally last several million cycles. If the device used is in continuous operation day and night or high frequency operation, it will reach the contact life region in a short period of time, so use a solid state switch that does not have a contact part.

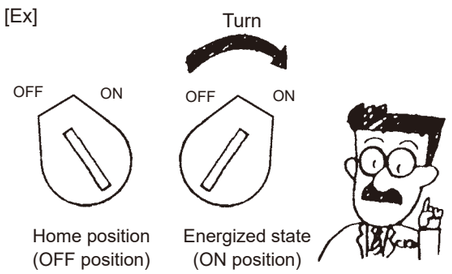
During Use

1. Common

⚠Warning

■Manual operation causes the connected device to function. Make sure that there is no danger before performing manual operation. If the manual operating device of the valve has been activated, be sure to return it to the home position (OFF position) before operating the equipment. If it is not in the home position, supplying compressed air will simultaneously activate the cylinder, creating a dangerous situation.

[Ex]



⚠CAUTION

■Be careful not to hit the solenoid valve with a tool or the equipment during mounting.

■Do not support the cylinder with pipes during mounting.

■Do not pick up the product by the coil lead wire.
- This may lead to disconnection.

■Polarity
All series have no polarity. (Non-polar type)

■Applied voltage
When wiring the valve electrically, do not mistake the type of voltage (AC, DC) and the voltage. This will cause a malfunction or coil burnout.

■Checking wiring
After wiring is complete, check that there are no errors in the connection.

⚠CAUTION

■When disassembling and assembling the valve, be sure to confirm that it operates normally according to the following work procedure.

Work procedure

1. Check that the manual override is at the origin (OFF position).
2. Set to low pressure. (0.15 MPa)
3. Switch the manual operating device to the operating side (ON position) and confirm that the cylinder operates.
4. Return the manual operating device to the initial position (OFF position) and confirm that the cylinder returns. (Operation confirmation by manual operation is complete.)
5. Perform operation check by electricity.
   - After manual operation check, energize/de-energize to confirm operation.

■With the DIN terminal box, as the Ambient Temperature is high and the gaskets will deteriorate due to heat when used with continuously powered specifications, be sure to regularly replace the gaskets.

■How to wire the terminal box

Refer to the diagram below and wire the terminal box according to steps ① to ③.

①Pass the cabtyre cable ❼through the cap❹, washer❺, and gasket ❻in that order, and ❷insert it into the case.

②When using crimp terminals, process the cabtyre cable ❼ to an appropriate length as shown in the diagram and ❾ crimp the crimp terminal to its end.

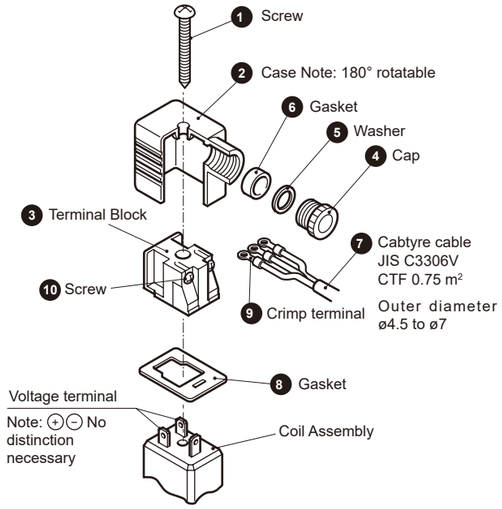
③Remove the ❿screw from the ❸terminal block, pass the ❾ crimp terminal through (for Y-type terminals, loosen and insert), and tighten the ❿screw again.

(Note) Tighten with a torque in the range of 0.5 N·m ±15%.

Remarks:
- It is possible to wire the terminals with bare wires. In that case, loosen the screw, ❿insert the lead wire into the fitting, and tighten it again.
- The orientation of the cord can be changed by pulling out the terminal block from the case, rotating it by 180°, and returning the block to the case.
- The crimping terminals ❾listed in the table below can be used.

Nichifu Terminal Industries Co., Ltd.		Fuji Terminal Industry Co., Ltd.		J.S.T. Mfg. Co., Ltd.	
O-Terminal	Y-Terminal	O-Terminal	Y-Terminal	O-Terminal	Y-Terminal
0.3-3 1.25-3 1.25-3S	0.3-3 1.25Y-3 1.25Y-3.5	1.25-3	1.25-YAS3 1.25-YAS3.5	0.5-3 1.25-3	0.25-B3A 1.25-C3A

If using other manufacturers, please use equivalent products.

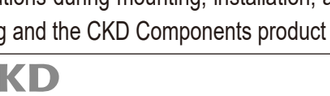


2. Common (With T-type Switch)

⚠CAUTION

■When Moving the Switch Position in the Stroke Direction

- The T2, T3, T0, and T5 switches can be fine-tuned by approximately ±3 mm from the default position of installation. If the adjustment range exceeds ±3 mm, or when finely adjusting the position of other switches, move the position of the band.
- Loosen the switch mounting screw, move the switch along the rail, and tighten at the specified position. For T2, T3, T0, T5, use a flat-head screwdriver (watchmaker's screwdriver, precision screwdriver, etc.) with a grip diameter of 5 to 6 mm, tip shape width of 2.4 mm or less, and thickness of 0.3 mm or less to tighten the switch fixing screw with a tightening torque of 0.1 to 0.2 N·m. For T1, T□C, T2J, T2Y, T3Y, T8, tighten with a tightening torque of 0.5 to 0.7 N·m.
- The switch rail has a marking 4 mm from the end face of the rail. Use it as a guide for mounting position when replacing the switch. The switch rail marking is set to the switch maximum sensitivity position at factory shipment. If the switch type changes or the band is moved, the maximum sensitivity position changes, so adjust the position each time.

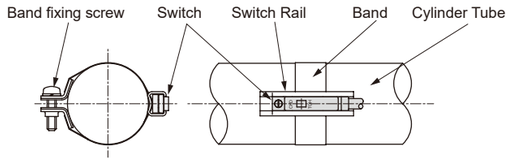


■When Moving the Switch Position in the Circumferential Direction

- Loosen the band fixing screw, move the switch rail circumferentially, and tighten it at the specified position. The tightening torque is 0.6 to 0.8 N·m.

■When Moving the Band Position

- Loosen the band fixing screw, move the switch rail and band along the cylinder tube, and tighten them at the specified position. The tightening torque is 0.6 to 0.8 N·m.



For precautions during mounting, installation, adjustment, use, and maintenance, please see "Precautions for Use" in this catalog and the CKD Components product site (https://www.ckd.co.jp/kiki/en/) → "Model No." →Instruction Manual.

CAV2, COVPN2

With Valve

Cell Cylinder®

ø50, ø75, ø100

CONTENTS

Product Introduction	686
Series variation	688
Variation/Option Combination Availability Table	690
Operating Explanation	692
● Double Acting/double solenoid/lubrication (CAV2)	694
● Double Acting, single solenoid, pushed out when energized, Lubricated Type (COVP2)	694
● Double Acting, single solenoid, pull when energized, Lubricated Type (COVN2)	694
● Double Acting, double solenoid, no-lubrication (CAV2-N)	694
● Double Acting, single solenoid, pushed out when energized, Non-lube Type (COVP2-N)	694
● Double Acting, single solenoid, pull when energized, no-lubrication (COVN2-N)	694
Short overall length type with cushion	
● Double Acting, double solenoid, lubrication (CAV2-S)	694
● Double Acting, single solenoid, pushed out when energized, lubrication (COVP2-S)	694
● Double Acting, single solenoid, pull when energized, Lubricated Type (COVN2-S)	694
● Double Acting, double solenoid, no lubrication (CAV2-NS)	694
● Double Acting, single solenoid, pushed out when energized, Lubricated Type (COVP2-NS)	694
● Double Acting/single solenoid, pull when energized, Lubricated Type (COVN2-NS)	694
Accessories External Dimensions Diagram	722
External Dimensions Diagram with Switch	726
Custom Items	727
⚠Precautions for Use	728

With Valve Cell Cylinder

CAV2/COVP/N2 Series

(ø50, ø75, ø100)

Features of Cell Cylinder

- Cylinder with valve allows no worries about solenoid valve installation and straightforward piping
- No piping between cylinders ↔ valves, reducing air consumption
- The distance between the cylinder and valve is minimized for quick response
- Single solenoid can be changed to pushed out when energized ↔ pull when energized
- Double solenoid that self-holds the cylinder position when energized is OFF also available (CAV2)
- Robust design with tie rod enables use with long periods of safety

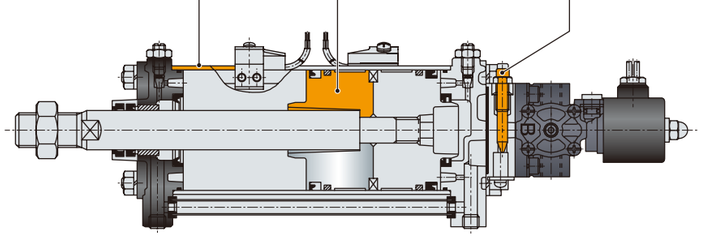
Product Introduction

Cylinder Tube
Highly corrosion resistant aluminum tube

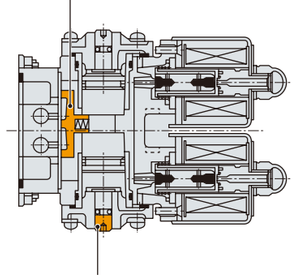
Piston
No-lubrication sliding packing used. Durability is also notably improved

Speed adjustment needle
The advance speed and return speed can be adjusted separately

Slide valve
Tetrafluoroethylene resin body with high abrasion resistance and long service life



New short overall length type
Helps save installation space



Valve rod
Can be manually switched by pushing with a Drivers, etc

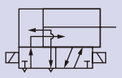
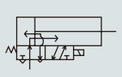
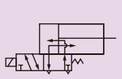
Application Example

Ideal when the cylinder position is far from the control panel, etc., and there is no installation space for a solenoid valve nearby.

For driving air operated gate valves

For opening/closing hopper gates

CAV2/COVP/N2 Series Product System

Model Variations	Lubrication	Variation	Variation model No.	JIS Symbol
Double acting/ double solenoid CAV2	Lubricated Type		CAV2	
		With Cushion Short overall length type	CAV2-S	
	Non-lube Type		CAV2-N	
		With Cushion Short overall length type	CAV2-NS	
Double acting type, single solenoid Pushed out when energized COVP2	Lubricated Type		COVP2	
		With Cushion Short overall length type	COVP2-S	
	Non-lube Type		COVP2-N	
		With Cushion Short overall length type	COVP2-NS	
Double acting type, single solenoid Energized retraction type COVN2	Lubricated Type		COVN2	
		With Cushion Short overall length type	COVN2-S	
	Non-lube Type		COVN2-N	
		With Cushion Short overall length type	COVN2-NS	

Cell Cylinder CAV2/COVPN2 Series

●: Standard, ◎: Option, : Not Available

Variation	Model No. / Circuit Diagram Code	Bore Size (mm)	Standard Stroke (mm) 50	75	100	150	200	300	Min Stroke (mm)	Max Stroke (mm)	Producible Stroke (mm)	Intermediate stroke (per mm)	Mounting Style: Axial foot type LB	Rod Side Flange Type FA	Single clevis type CA	Intermediate trunnion type Shaft type TC	Intermediate trunnion type Hole type TF	Cushion: Without cushion N	Both sides cushion B	Option: Bellows (100°C) J	Round Terminal Box TB1	Square terminal box TB2	With muffler MF1	Molded coil Z	Air supply block Q	Accessories: Single knuckle I	Double Knuckle Y	Double bracket B2	Switch	Page
Double Acting/Double Solenoid Lubricated Type	CAV2	ø50	●	●	●	●	●	●	1	500	1000	1	●	●	●	●	●	●	●	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	694
		ø75	●	●	●	●	●	●		600			●	●	●	●	●	●	●	◎	◎	◎	◎	◎	◎	◎	◎	◎		
		ø100	●	●	●	●	●	●		800			●	●	●	●	●	●	●	◎	◎	◎	◎	◎	◎	◎	◎	◎		
Double Acting type, single solenoid, energized push type Lubricated Type	COVP2	ø50	●	●	●	●	●	●	1	500	1000	1	●	●	●	●	●	●	●	◎	◎		◎	●	◎	◎	◎	◎	◎	694
		ø75	●	●	●	●	●	●		600			●	●	●	●	●	●	●	◎	◎		◎	●	◎	◎	◎	◎		
		ø100	●	●	●	●	●	●		800			●	●	●	●	●	●	●	◎	◎		◎	●	◎	◎	◎	◎		
Double Acting type, single solenoid, energized retraction type Lubricated Type	COVN2	ø50	●	●	●	●	●	●	1	500	1000	1	●	●	●	●	●	●	●	◎	◎		◎	●	◎	◎	◎	◎	◎	694
		ø75	●	●	●	●	●	●		600			●	●	●	●	●	●	●	◎	◎		◎	●	◎	◎	◎	◎		
		ø100	●	●	●	●	●	●		800			●	●	●	●	●	●	●	◎	◎		◎	●	◎	◎	◎	◎		
Double Acting/Double Solenoid Non-lube Type	CAV2-N	ø50	●	●	●	●	●	●	1	500	1000	1	●	●	●	●	●	●	●	◎	◎	◎	●	◎	◎	◎	◎	◎	◎	694
		ø75	●	●	●	●	●	●		600			●	●	●	●	●	●	●	◎	◎	◎	●	◎	◎	◎	◎	◎		
		ø100	●	●	●	●	●	●		800			●	●	●	●	●	●	●	◎	◎	◎	●	◎	◎	◎	◎	◎		
Double Acting type, single solenoid, energized push type Non-Lube Type	COVP2-N	ø50	●	●	●	●	●	●	1	500	1000	1	●	●	●	●	●	●	●	◎	◎		●	●	◎	◎	◎	◎	◎	694
		ø75	●	●	●	●	●	●		600			●	●	●	●	●	●	●	◎	◎		●	●	◎	◎	◎	◎		
		ø100	●	●	●	●	●	●		800			●	●	●	●	●	●	●	◎	◎		●	●	◎	◎	◎	◎		
Double Acting type, single solenoid, energized retraction type Non-Lube Type	COVN2-N	ø50	●	●	●	●	●	●	1	500	1000	1	●	●	●	●	●	●	●	◎	◎		●	●	◎	◎	◎	◎	◎	694
		ø75	●	●	●	●	●	●		600			●	●	●	●	●	●	●	◎	◎		●	●	◎	◎	◎	◎		
		ø100	●	●	●	●	●	●		800			●	●	●	●	●	●	●	◎	◎		●	●	◎	◎	◎	◎		
Double Acting type, double solenoid with cushion Short overall length type	CAV2-S / CAV2-NS	ø50	●	●	●	●	●	●	1	500	1000	1	●	●	●	●	●		●	◎	◎	◎	Lubrication ◎ / Non-lube ●	◎	◎	◎	◎	◎	◎	694
		ø75	●	●	●	●	●	●		600			●	●	●	●	●		●	◎	◎	◎	Lubrication ◎ / Non-lube ●	◎	◎	◎	◎	◎		
		ø100	●	●	●	●	●	●		800			●	●	●	●	●		●	◎	◎	◎	Lubrication ◎ / Non-lube ●	◎	◎	◎	◎	◎		
Double Acting type, single solenoid Energized push type with cushion Short overall length type	COVP2-S / COVP2-NS	ø50	●	●	●	●	●	●	1	500	1000	1	●	●	●	●	●		●	◎	◎		Lubrication ◎ / Non-lube ●	●	◎	◎	◎	◎	◎	694
		ø75	●	●	●	●	●	●		600			●	●	●	●	●		●	◎	◎		Lubrication ◎ / Non-lube ●	●	◎	◎	◎	◎		
		ø100	●	●	●	●	●	●		800			●	●	●	●	●		●	◎	◎		Lubrication ◎ / Non-lube ●	●	◎	◎	◎	◎		
Double Acting type, single solenoid, energized retraction type with cushion Short overall length type	COVN2-S / COVN2-NS	ø50	●	●	●	●	●	●	1	500	1000	1	●	●	●	●	●		●	◎	◎		Lubrication ◎ / Non-lube ●	●	◎	◎	◎	◎	◎	694
		ø75	●	●	●	●	●	●		600			●	●	●	●	●		●	◎	◎		Lubrication ◎ / Non-lube ●	●	◎	◎	◎	◎		
		ø100	●	●	●	●	●	●		800			●	●	●	●	●		●	◎	◎		Lubrication ◎ / Non-lube ●	●	◎	◎	◎	◎		

With Valve
CKV2
CAV2/ COVP/ N2
Cylinder Switch
Ending

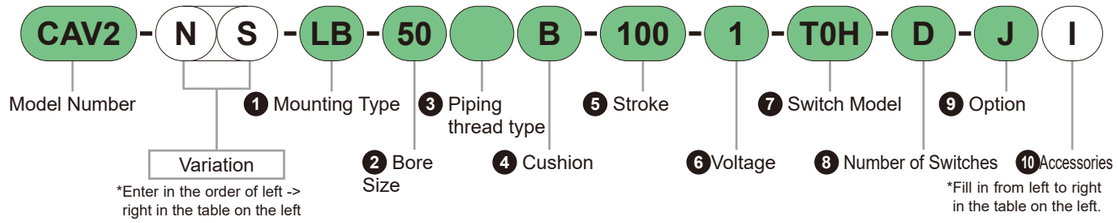
Variation and Option Item Combination Availability Table

◎Mark: Option
○Mark: Custom-made
△Mark: Manufacturable depending on conditions (please consult)
× Mark: Not available

Category		Category	Variation							Piping thread			Option					
			Double Acting basic type (Lubricated type)	Non-lube	Short overall length type	Double Solenoid	Single solenoid	With Cushion	With Cylinder Switch	NPT	G		With bellows, Neoprene	Round Terminal Box	Square terminal box	With muffler	Molded coil	Intake block
		Code	None	N	S	CAV2	COV□2	None	None	N	G		J	TB1	TB2	MF1	Z	Q
Variation	Double Acting basic type (Lubricated type)	Blank			◎	◎	◎	◎	◎	◎	◎		◎	◎	◎	◎	◎	◎
	Non-lube	N			◎	◎	◎	◎	◎	◎	◎		◎	◎	◎	×	◎	◎
	Short overall length type	S				◎	◎	*1	◎	◎	◎		◎	◎	◎	◎	◎	◎
	Double Solenoid	CAV2						◎	◎	◎	◎		◎	◎	◎	◎	◎	◎
	Single solenoid	COV□2						◎	◎	◎	◎		◎	◎	x	◎	*2	◎
	With Cushion	Blank							◎	◎	◎		◎	◎	◎	◎	◎	◎
	With Cylinder Switch	Blank								◎	◎		◎	◎	◎	◎	◎	◎
Piping thread	NPT	N									x		◎	◎	◎	◎	◎	◎
	G	G											◎	◎	○	◎	◎	◎
Option	With bellows, Neoprene	J												◎	◎	◎	◎	◎
	Round Terminal Box	TB1													x	◎	◎	x
	Square terminal box	TB2														◎	◎	x
	With muffler	MF1															◎	◎
	Molded coil	Z																x
	Intake block	Q																
Accessories	Cylinder Switch	Separately Shown	◎	◎	◎	◎	◎	◎	◎	○	○		◎	◎	◎	◎	◎	◎
	Single knuckle	I	◎	◎	◎	◎	◎	◎	◎	○	○		◎	◎	◎	◎	◎	◎
	Double Knuckle	Y	◎	◎	◎	◎	◎	◎	◎	○	○		◎	◎	◎	◎	◎	◎
	Double bracket	B2	◎	◎	◎	◎	◎	◎	◎	○	○		◎	◎	◎	◎	◎	◎

*1: Short overall length type is only available with cushion.
*2: The coil for COV□2 is standardly a molded type.

[Model No. Example]



Model No.: Cell Cylinder
●Variation: Non-lubricated, with cushion, short overall length type
1 mounting style : Axial foot type
2 Bore Size : ø50 mm
3 Port thread : Rc Thread
4 Cushion : With Cushion on Both Sides
5 Stroke : 100 mm
6 Voltage : 100 VAC
7 Switch model No. : Solid State T0H Switch, Lead Wire 1 m
8 Switch quantity : With 2 pcs.
9 Options : Bellows, max Ambient Temperature 100°C
10 Accessory : Single knuckle

Operation description

Air supply Exhaust ●For explanation purposes, the valve position is rotated 90° counterclockwise when viewed from the Piston Rod side.

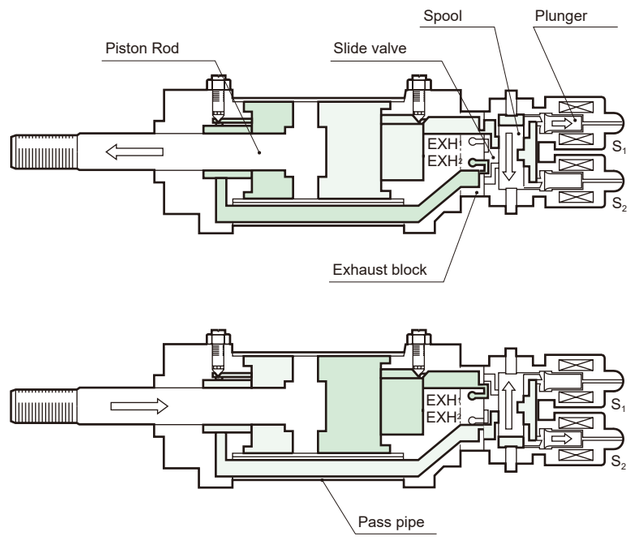
● CAV2, CAV2-N, CAV2-S, CAV2-NS

A In case of Piston Rod push

1. When the solenoid S1 is energized, the plunger is suctioned.
2. Since the orifice opens, air moves the spool, and the slide valve moves downward.
3. Air immediately passes through the exhaust block, flows into the cylinder, and pushes out the Piston Rod.
4. As the spool is self-held after the solenoid valve S1 is de-energized, the Piston Rod remains protruding.

B In case of Piston Rod retraction

1. When the solenoid S2 is energized, the plunger is suctioned.
2. Since the orifice opens, air moves the spool, and the slide valve moves upward.
3. Air immediately passes through the exhaust block and pass pipe, flows into the cylinder, and retracts the Piston Rod.
4. As the spool is self-held after the solenoid valve S2 is de-energized, the Piston Rod remains retracted.



● COVP N2, COVP N2-N, C0VP N2-S, COVP N2-NS

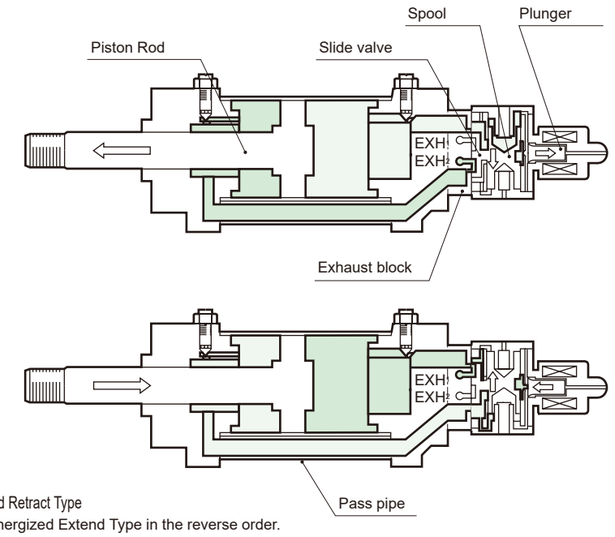
This operating explanation is for the energized push type (P-type). In the case of the energized retraction type (N-type), the operation is reversed.

A When solenoid is energized

1. When the solenoid valve is energized, the plunger is suctioned and the orifice opens.
2. The force on the upper side of the spool becomes greater than the force on the lower side, moving the spool and causing the slide valve to move downward. (Due to the difference in pressure receiving area)
3. Air immediately passes through the exhaust block, flows into the cylinder, and pushes out the Piston Rod.

B When energization to solenoid is stopped

1. When energization to the solenoid is stopped, the plunger moves down due to the spring force and closes the orifice.
2. Compressed air stops flowing to the upper side of the spool, the force on the lower side of the spool becomes greater, moving the spool and causing the slide valve to move upward.
3. Air immediately passes through the exhaust block and pass pipe, flows into the cylinder, and retracts the Piston Rod.



C Method of changing between Energized Extend Type ⟶ Energized Retract Type

*1: Perform the change from Energized Retract Type to Energized Extend Type in the reverse order.

⚠ CAUTION

*1: Be sure to stop the air before changing.

1. Loosen and remove Ⓑ the screws of the cap and fixing piston Ⓐ (four screws each) with a Phillips screwdriver as shown in Fig. 1.
2. Switch the positions of the cap and fixing piston ⒷⒶ as shown in Fig. 2 and tighten the screws.

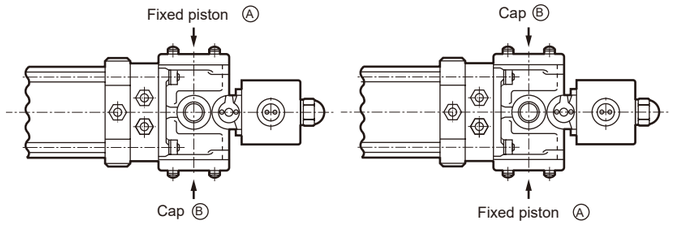


Fig. 1 Energized extend type

Fig. 2 Energized retract type

MEMO

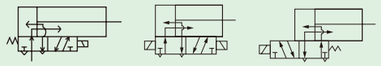
With Valve
CKV2
CAV2/ COVP/ N2
Cylinder Switch
Ending

Cell Cylinder

CAV2(-S), CAV2-N(S) COV$^{P}_{N}$2(-S), COV$^{P}_{N}$2-N(S) Series

● Bore Size: ø50, ø75, ø100

Circuit Diagram Code



RoHS

Model No. Notation

Without switch (Built-in magnet for switch)

CAV2 - ( ) - LB - 50 ( ) B - 100 - 1 ——— J I

With switch (Built-in magnet for switch)

CAV2 - ( ) - LB - 50 ( ) B - 100 - 1 - T0H - R - J I

1	2	3	4	5	6	7	8	9	10	11	12
Model Number	Variation	Mounting Style	Bore Size	Piping thread type	Cushion	Stroke	Voltage	Switch Model	Number of Switches	Option	Accessories

1 Model Number

Code	Content
CAV2	Double Acting double solenoid
COVP2	Double Acting single solenoid energized push type
COVN2	Double Acting single solenoid energized retraction type

2 Variation

Code	Content
Blank	Lubricated Type
N	Non-Lube Type
S	Short overall length type with cushion Lubricated type
NS	Short overall length type with cushion Non-lubricated type

3 Mounting Type

Mounting brackets are assembled and shipped.

Code	Content	
LB	Axial foot type	
FA	Rod side flange type	
CA	Clevis type	
TC	Intermediate Trunnion Type (Shaft type)	
TF	Intermediate Trunnion Type (Hole type)	

4 Bore Size (mm)

Code	Content
50	ø50
75	ø75
100	ø100

5 Piping thread type

Code	Content
Blank	Rc Thread
N	NPT Thread (Custom Order Product)
G	G thread (Custom product)

6 Cushion

Code	Content
B	With Air Cushion on Both Sides
*1 N	Without cushion

*1: Cannot be selected for short overall length type with cushion S-NS.

7 Stroke (mm)

Bore Size	Stroke	Intermediate Stroke
ø50	1 to 500	in 1mm increments
ø75	1 to 600	
ø100	1 to 800	

*1: If the maximum stroke is exceeded, product specifications may not be met depending on the conditions, so please consult us.
*2: A non-sag block is attached per 500 mm if the stroke is longer than 500 mm.
*3: For minimum stroke with switch, refer to P. 697.

8 Voltage

Code	Content
*1 Blank	Without valve
1	100 VAC
2	200 VAC
24 VDC	24 VDC (Custom product)

*1: 11 Option "Q" is blank only when air supply block is selected.

9 Switch Model

For switch details, refer to P. 1457. Switches are shipped with the product.

Contact	Indicator LED Special Function	Wiring (Output)	Load Voltage (V) AC	Load Voltage (V) DC	Load Current (mA) AC	Load Current (mA) DC	Lead wire *1 Straight	Lead wire *1 L-shape	
Solid State	1-Color	2-wire	85 to 265	—	5 to 100	-	T1H□	T1V□	
			-	10 to 30	—	5 to 20 *2	T2H□	T2V□	
		3-wire (NPN)	—	30 or less	—	100 or less	T3H□	T3V□	
		3-wire (PNP)	—		-		T3PH□	T3PV□	
	2-color	2-wire	—	24 ± 10%	—	5 to 20	T2WH□	T2WV□	
		3-wire (NPN)	—	30 or less	—	50 or less	T3WH□	T3WV□	
	2-color Improved Water Resistance	2-wire	—	24 ± 10%	—	5 to 20	T2WLH□	T2WLV□	*3
	1-Color Off-Delay Type		—	10 to 30	—	5 to 20 *2	T2JH□	T2JV□	
	1-color Flexible Lead Wire Type		—	10 to 30	—		T2HR3	T2VR3	
Contact	1-Color	2-wire	110	12/24	7 to 20	5 to 50	T0H□	T0V□	
	Without Indicator Lamp		110	5/12/24	20 or less	50 or less	T5H□	T5V□	
	1-color		110/220	12/24	7 to 20 / 7 to 10	5 to 50	T8H□	T8V□	

*1: For "□" in the switch model number, enter the code selected from the "Lead wire length, connector specification" table.
*2: The maximum load current value above, 20 mA, is at 25°C. If the switch operating Ambient Temperature is higher than 25°C, it will be lower than 20 mA. (At 60°C, it will be 5 to 10 mA.)
*3: It does not guarantee the water resistance performance of the cylinder (including the valve).
*4: Switches other than the model numbers listed above are also available. (Custom Product) For details, refer to P. 1457.

*Lead wire length, connector specification

Code	Content
Blank	1 m (Standard)
3	3 m (Option)
5	5 m (Option)
*5 W	M8 Connector, 1PIN (+), 4PIN (−) Lead Wire 0.3 m

*5: Only T2WLH and T2WLV can be selected.

Example) Lead wire length
1 m T0H
3 m T0H3
5 m T0H5

10 Number of Switches

Code	Content
R	With 1 pc on rod side
H	With 1 pc on head side
D	With 2 pcs
T	With 3 pcs

11 Option

Code	Content			
J	Bellows	Max Ambient Temperature 100°C	Instantaneous Max Temperature 200°C	
TB1	Round Terminal Box			
*1 TB2	Square terminal box (Cannot be selected for single solenoid type.)			
MF1	With muffler (Lubrication only. Attached as standard with no-lubrication)			
*4 Z	Molded coil (Applicable only to CAV2)			
*3 Q	Air supply block			

*1: For 3 mounting type "CA" with ø75, ø100, "TB2" cannot be selected.
*2: Instantaneous maximum temperature is the temperature when fire, chips, etc. momentarily contact the bellows.
*3: When option "Q" is selected, only "J" can be selected for other options.
*4: Since COVP2 and COVN2 adopt molded coils as standard, option "Z" cannot be selected.

12 Accessories

Code	Content	
*1 I	Single knuckle	
*1 Y	Double Knuckle (With pin, washer, split pin)	
*2 B2	Double bracket (With pin, washer, split pin)	

*1: "I" and "Y" cannot be selected at the same time.
*2: "B2" is not available for "TC" and "TF" 3 mounting styles.

About specifications of custom products

For details, please refer to P. 727.

Code	Content
-XAQ◇◇	Trunnion Position Specification

Model No. Ex.)

CAV2 - ..... - XAQ□□

COV□2 - ..... - XAQ□□

Switch Single Unit Model No. Notation

T-type Switch

●Switch body+Mounting bracket set

CAV2 - T0H - 50

9 Switch Model; 4 Bore Size

●Switch body only

SW - T0H

9 Switch Model

●Mounting bracket set

CAV2 - TS - 50

4 Bore Size

Valve Unit Model No.

Model Number		Model No.
CAV2	Lubricated Type	CAV2-ACTUATOR-□
		CAV2-ACTUATOR-□-Z *2
	Non-Lube Type	CAV2-N-ACTUATOR-□
		CAV2-N-ACTUATOR-□-Z *2
COVP2	Lubricated Type	COVP2-ACTUATOR-□
	Non-Lube Type	COVP2-N-ACTUATOR-□
COVN2	Lubricated Type	COVN2-ACTUATOR-□
	Non-Lube Type	COVN2-N-ACTUATOR-□

*1: For □, enter voltage code "1" or "2".
1...100 VAC 2...200 VAC
*2: For option, molded coil (Z).

Specifications

Item		CAV2 CAV2-S			CAV2-N CAV2-NS			COVP N2 COVP N2-S			COVP N2-N COVP N2-NS		
Bore Size	mm	ø50	ø75	ø100	ø50	ø75	ø100	ø50	ø75	ø100	ø50	ø75	ø100
Operation type		Double Acting / With Valve											
Number of solenoids		Double Solenoid						Single solenoid					
Operating Fluid		Compressed Air											
Max Operating Pressure	MPa	0.7											
Min Operating Pressure	MPa	0.15											
Proof Pressure	MPa	1											
Ambient Temperature	°C	5 to 40											
Port Size		Rc1/4											
Stroke Tolerance	mm	$^{-0.9}_{0}$ (up to 360), $^{+1.4}_{0}$ (361 or more)											
Operating Piston Speed	mm/s	50 to 750	50 to 450	50 to 250	50 to 750	50 to 450	50 to 250	50 to 750	50 to 450	50 to 250	50 to 750	50 to 450	50 to 250
Cushion		Air cushion available/not available selectable											
Effective air cushion length	mm	6.5	6.5	5	6.5	6.5	5	6.5	6.5	5	6.5	6.5	5
Lubrication	(*1)	Required			Not Required			Required			Not Required		
Allowable Absorbed Energy J	With cushion	1.37	3.33	10.3	1.37	3.33	10.3	1.37	3.33	10.3	1.37	3.33	10.3
	Without cushion	0.072	0.154	0.154	0.072	0.154	0.154	0.072	0.154	0.154	0.072	0.154	0.154
		Without cushion, large energy generated by external load cannot be absorbed. It is recommended to use an external shock absorber together.											

*1: When lubricating, please use turbine oil type 1 ISO VG32.

Valve specifications

Valve specifications		
Rated Voltage V	100 VAC (50/60Hz)	200 VAC (50/60Hz)
Starting Current (A)	0.29/0.27	0.15/0.14
Holding Current (A)	0.11/0.09	0.06/0.04
Power consumption W	6/5	6/5
Voltage fluctuation range	±10%	
Heat Resistance Class	Class A (CAV2)	Class B (COVP N2)

Stroke

Bore Size (mm)	Standard Stroke (mm)	Maximum Stroke (mm)	Producible Stroke (mm)	Min Stroke (mm)
ø50	50, 75, 100 150, 200, 300	500	1000	1
ø75		600		
ø100		800		

*1: If the maximum stroke is exceeded, the product specifications may not be met depending on the conditions, so please consult us.
*2: Intermediate strokes can be manufactured in 1 mm increments.
*3: Minimum stroke varies depending on the switch mounting method. Please refer to the minimum stroke with switch on the next page.

Minimum stroke with switch

● T0/T5/T8 type switch, no cushion type (Unit: mm)

Number of Switches	Different Surface Mounting	Same Surface Mounting		Intermediate Trunnion Mounting	
Bore Size	2	1	2	1	2
ø50	18 (18)	13 (9)	18 (18)	215 (215)	215 (215)
ø75	19 (19)	12 (10)	19 (19)	203 (203)	203 (203)
ø100	19 (19)	10 (10)	19 (19)	119 (89)	119 (89)

*1: ( ) indicates T□V (L-shaped lead wire type).

● T0/T5/T8 type switch, with cushion type (Unit: mm)

Number of Switches	Different Surface Mounting	Same Surface Mounting		Intermediate Trunnion Mounting	
Bore Size	2	1	2	1	2
ø50	18 (18)	9 (9)	18 (18)	241 (241)	241 (241)
ø75	19 (19)	10 (10)	19 (19)	241 (241)	241 (241)
ø100	19 (19)	10 (10)	19 (19)	120 (108)	120 (108)

*1: ( ) indicates T□V (L-shaped lead wire type).

● T1/T2/T3 type switch, no cushion type (Unit: mm)

Number of Switches	Different Surface Mounting	Same Surface Mounting		Intermediate Trunnion Mounting	
Bore Size	2	1	2	1	2
ø50	13 (10)	13 (6)	13 (10)	100 (70)	100 (70)
ø75	12 (11)	12 (6)	12 (11)	100 (70)	100 (70)
ø100	12 (12)	7 (6)	12 (12)	119 (89)	119 (89)

*1: ( ) indicates T□V (L-shaped lead wire type).
*2: If the stroke is 15 mm or less, two switches may turn ON simultaneously. In this case, adjust the switch mounting positions so that they are further apart from each other.

● T1/T2/T3 type switch, with cushion type (Unit: mm)

Number of Switches	Different Surface Mounting	Same Surface Mounting		Intermediate Trunnion Mounting	
Bore Size	2	1	2	1	2
ø50	10 (10)	6 (6)	10 (10)	102 (72)	102 (72)
ø75	11 (11)	6 (6)	11 (11)	102 (72)	102 (72)
ø100	12 (12)	6 (6)	12 (12)	121 (91)	121 (91)

*1: ( ) indicates T□V (L-shaped lead wire type).
*2: If the stroke is 15 mm or less, two switches may turn ON simultaneously. In this case, adjust the switch mounting positions so that they are further apart from each other.

● T2W/T3W type switch without cushion (Unit: mm)

Number of Switches	Different Surface Mounting	Same Surface Mounting		Intermediate Trunnion Mounting	
Bore Size	2	1	2	1	2
ø50	10 (10)	16 (5)	16 (10)	106 (76)	106 (76)
ø75	15 (11)	15 (5)	15 (11)	106 (76)	106 (76)
ø100	12 (12)	10 (6)	12 (12)	125 (95)	125 (95)

*1: ( ) indicates T□V (L-shaped lead wire type).
*2: If the stroke is 15 mm or less, two switches may turn ON simultaneously. In this case, adjust the switch mounting positions so that they are further apart from each other.

● T2W/T3W type switch, with cushion type (Unit: mm)

Number of Switches	Different Surface Mounting	Same Surface Mounting		Intermediate Trunnion Mounting	
Bore Size	2	1	2	1	2
ø50	10 (10)	5 (5)	10 (10)	106 (76)	106 (76)
ø75	11 (11)	5 (5)	11 (11)	106 (76)	106 (76)
ø100	12 (12)	6 (6)	12 (12)	125 (95)	125 (95)

*1: ( ) indicates T□V (L-shaped lead wire type).
*2: If the stroke is 15 mm or less, two switches may turn ON simultaneously. In this case, adjust the switch mounting positions so that they are further apart from each other.

● T2WL type switch, no cushion type (Unit: mm)

Number of Switches	Different Surface Mounting	Same Surface Mounting		Intermediate Trunnion Mounting	
Bore Size	2	1	2	1	2
ø50	17 (9)	17 (5)	17 (9)	108 (76)	108 (76)
ø75	16 (9)	16 (5)	16 (9)	108 (76)	108 (76)
ø100	11 (9)	11 (5)	11 (9)	127 (95)	127 (95)

*1: ( ) indicates T□V (L-shaped lead wire type).
*2: If the stroke is 15 mm or less, two switches may turn ON simultaneously. In this case, adjust the switch mounting positions so that they are further apart from each other.

●T2WL type switch, with cushion type (Unit: mm)

Number of Switches	Different Surface Mounting	Same Surface Mounting		Intermediate Trunnion Mounting	
Bore Size	2	1	2	1	2
ø50	9 (9)	5 (5)	9 (9)	108 (76)	108 (76)
ø75	9 (9)	5 (5)	9 (9)	108 (76)	108 (76)
ø100	9 (9)	5 (5)	9 (9)	127 (95)	127 (95)

*1: ( ) indicates T□V (L-shaped lead wire type).
*2: If the stroke is 15 mm or less, two switches may turn ON simultaneously. In this case, adjust the switch mounting positions so that they are further apart from each other.

Cylinder Weight

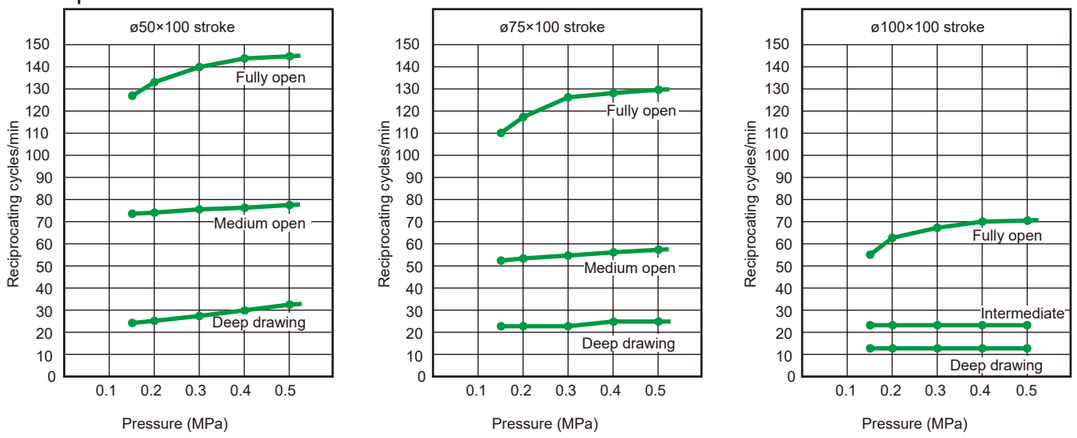
(Unit: kg)

Item / Mounting Style	Cushion Available/ Not available	Product Weight when stroke (S) = 0 mm								Switch Weight (Per piece)	Switch Mounting Bracket Weight	S = Added weight per 100 mm
		Foot type LB		Flange type FA		Clevis type CA		Trunnion type TC/TF				
Bore Size (mm)		CAV2 CAV2-S	COV$^{P}_{N}$2 COV$^{P}_{N}$2-S	CAV2 CAV2-S	COV$^{P}_{N}$2 COV$^{P}_{N}$2-S	CAV2 CAV2-S	COV$^{P}_{N}$2 COV$^{P}_{N}$2-S	CAV2 CAV2-S	COV$^{P}_{N}$2 COV$^{P}_{N}$2-S			
ø50	B (Available)	2.1	1.9	2.3	2.1	2.2	2.0	2.4	3.2	Refer to the Weight listed in the Switch Specifications on P. 1457.	0.024	0.50
	N (Not available)	1.9	2.2	2.1	1.9	2.0	1.8	2.2	2.0			
ø75	B (Available)	3.6	4.5	3.8	3.6	4.3	4.1	4.3	4.1		0.020	1.20
	N (Not available)	3.3	3.1	3.5	3.3	4.0	3.8	4.0	3.8			
ø100	B (Available)	4.7	10.2	5.7	5.9	5.5	5.7	7.1	7.3		0.026	1.50
	N (Not available)	4.1	6.4	5.1	5.3	4.9	5.1	6.5	6.7			

(Example) CAV2-LB-50B-200-1-TOH-R

- Product Weight at S = 0 mm: ..... 2.1 kg
- Additional weight when S = 200 mm ..... $0.50 \times \frac{200}{100} = 1.0$ kg
- Weight of 1 switches ..... 0.018 kg
- Product weight ..... 2.1 kg+1.0 kg+0.018 kg = 3.118 kg

Piston speed



Note: Deep throttle, intermediate, and full open indicate the throttle condition of the speed adjustment needle. Note that this value is for no load.

Theoretical Thrust Table

(Unit: N)

Bore Size (mm)	Operating Direction	Operating Pressure MPa						
		0.15	0.2	0.3	0.4	0.5	0.6	0.7
ø50	Push	2.95×10^{2}	3.93×10^{2}	5.89×10^{2}	7.85×10^{2}	9.82×10^{2}	1.18×10^{3}	1.37×10^{3}
	Pull	2.48×10^{2}	3.30×10^{2}	4.95×10^{2}	6.60×10^{2}	8.25×10^{2}	9.90×10^{2}	1.15×10^{3}
ø75	Push	6.63×10^{2}	8.84×10^{2}	1.33×10^{3}	1.77×10^{3}	2.21×10^{3}	2.65×10^{3}	3.09×10^{3}
	Pull	5.90×10^{2}	7.85×10^{2}	1.18×10^{3}	1.57×10^{3}	1.96×10^{3}	2.36×10^{3}	2.75×10^{3}
ø100	Push	1.18×10^{3}	1.57×10^{3}	2.36×10^{3}	3.14×10^{3}	3.93×10^{3}	4.71×10^{3}	5.50×10^{3}
	Pull	1.11×10^{3}	1.47×10^{3}	2.21×10^{3}	2.95×10^{3}	3.68×10^{3}	4.42×10^{3}	5.15×10^{3}

Mounting Bracket Model No.

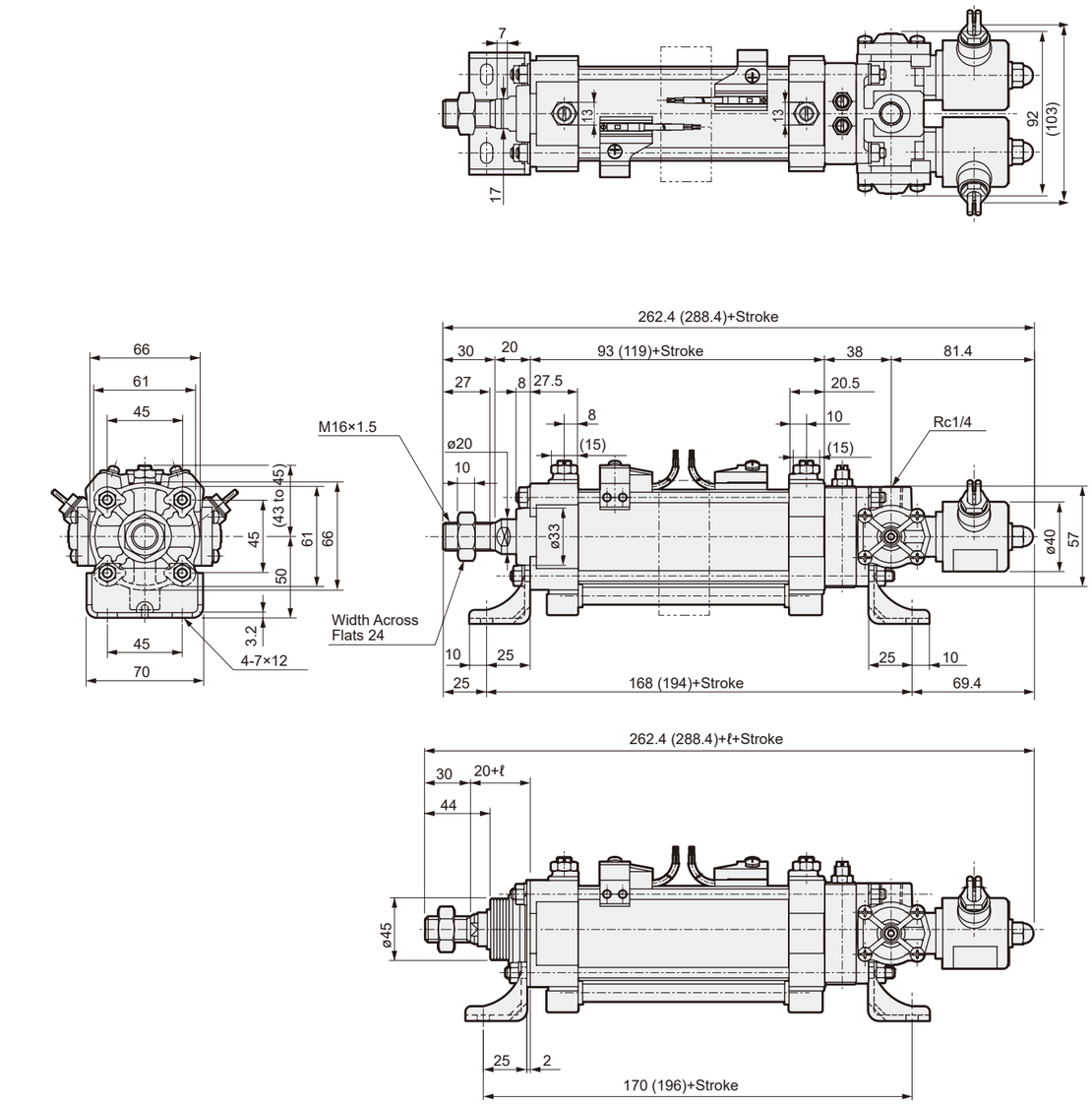
Bore Size (mm) / Mounting bracket	ø50	ø75	ø100
Foot (LB)	CAV2-50-LB	CAV2-75-LB	CAV2-100-LB
Flange (FA)	CAV2-50-FA	CAV2-75-FA	CAV2-100-FA
Clevis (CA)	CAV2-50-CA	CAV2-75-CA	CAV2-100-CA
Shaft type trunnion (TC)	CAV2-50-TC	CAV2-75-TC	CAV2-100-TC
Hole type trunnion (TF)	CAV2-50-TF	CAV2-75-TF	CAV2-100-TF

*1: The above model numbers are for the mounting bracket single unit only and do not include tie rods.
*2: Foot type mounting brackets come in sets of 2.

MEMO

External Dimensions Diagram (Double Solenoid CAV2)

● Axial foot (LB) ø50



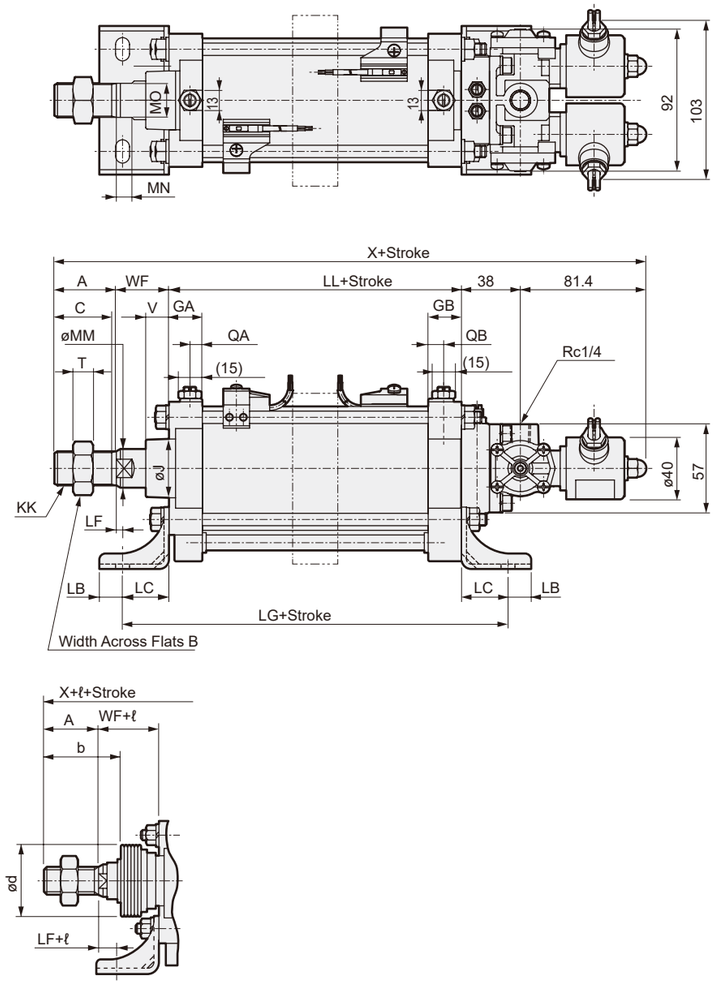
[With bellows]

Code	With Bellows						
	ℓ						
Bore Size (mm)	50 or less	Over 50 to 100 or Less	Over 100 to 150 or Less	Over 150 to 200 or Less	Over 200 to 250 or Less	Over 250 to 300 or Less	Exceeding 300
ø50	17	24	37	47	57	67	(Stroke/5)

*1: Dimensions in ( ) indicate the case of with cushion (B).
*2: Round up the ℓ dimension to the nearest integer.
*3: The external dimensions diagram for the short overall length type with cushion (-S, -NS) is the same as the dimensions for the no cushion (N) type in this diagram.
***4: For external dimensions of accessories, please refer to P. 722.**
***5: An intermediate support head (two-dot chain line) is added depending on the stroke. Please refer to P. 712.**
***6: For dimensions of models with switches, see P. 726.**

External Dimensions Diagram (Double Solenoid CAV2)

● Axial foot (LB) ø75, ø100



[With bellows]

Code	Axial Foot Type Basic Dimensions																			
Bore Size (mm)	A	B	C	GA	GB	J	K	KK	L	LL	MM	MN	MO	QA	QB	SD	T	V	WF	X
ø75	40	32	37	22	22	38	86	M22×1.5	52 to 54	91 (139)	25	10	22	8.7	10.7	66	13	15	34	284.4 (332.4)
ø100	40	32	37	24.5	24.5	38	109	M22×1.5	60.5 to 62.5	105 (142)	25	10	22	10.7	10.7	86.3	13	15	35	299.4 (336.4)

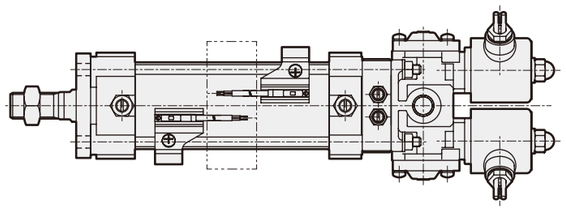
Code	Mounting Dimensions									With Bellows								
												ℓ						
Bore Size (mm)	LB	LC	LD	LF	LG	LH	LR	LS	LT	b	d	50 or less	Over 50 to 100 or Less	Over 100 to 150 or Less	Over 150 to 200 or Less	Over 200 to 250 or Less	Over 250 to 300 or Less	Exceeding 300
ø75	15	30	9×15	4	151 (199)	65	66	96	3.2	55	50	7	14	27	37	47	57	(Stroke/5)
ø100	15	30	11×20	5	165 (202)	85	85	120	3.2	55	50	7	14	27	37	47	57	(Stroke/5)

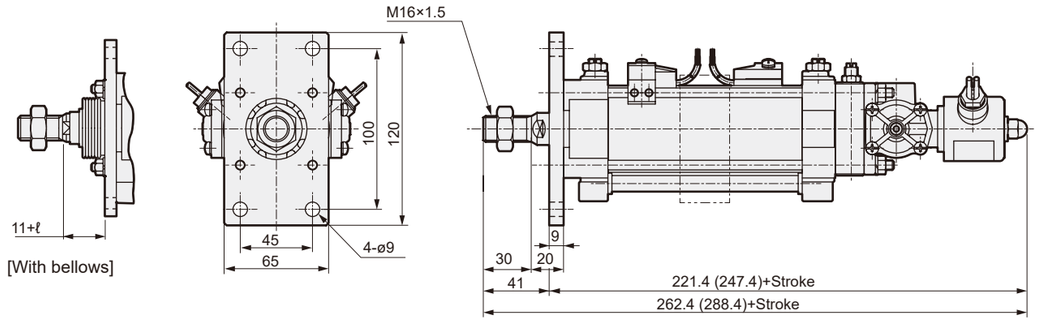
*1: Dimensions in ( ) indicate the case of with cushion (B).
*2: Round up the ℓ dimension to the nearest integer.
*3: The external dimensions diagram for the short overall length type with cushion (-S, -NS) is the same as the dimensions for the no cushion (N) type in this diagram.
***4: For external dimensions of accessories, please refer to P. 722.**
***5: An intermediate support head (two-dot chain line) is added depending on the stroke. Please refer to P. 712.**
***6: For dimensions of models with switches, see P. 726.**

External Dimensions Diagram (Double Solenoid CAV2)

● Rod side flange (FA) ø50

*1: Dimensions in ( ) indicate the case of with cushion (B).
*2: Round up the ℓ dimension to the nearest integer.
*3: The external dimensions diagram for the short overall length type with cushion (-S, -NS) is the same as the dimensions for the no cushion (N) type in this diagram.
*4: In case of with bellows, the bellows mounting surface, Hexagon Nut (M6), etc. protrude from the flange mounting surface. Provide a relief of ø77 or more and depth 11 or more.
***5: For external dimensions of accessories, please refer to P. 722.**
***6: An intermediate support head (two-dot chain line) is added depending on the stroke. Please refer to P. 712.**
***7: For dimensions of models with switches, see P. 726.**

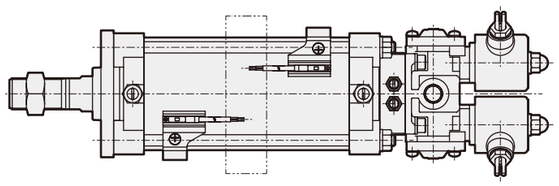


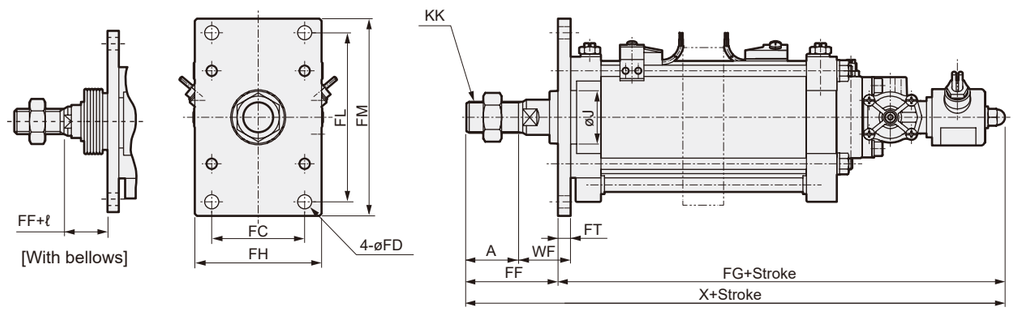


Code	With Bellows						
	ℓ						
Bore Size (mm)	50 or less	Over 50 to 100 or Less	Over 100 to 150 or Less	Over 150 to 200 or Less	Over 200 to 250 or Less	Over 250 to 300 or Less	Exceeding 300
ø50	17	24	37	47	57	67	(Stroke/5)

● Rod side flange (FA) ø75, ø100

*1: Dimensions in ( ) indicate the case of with cushion (B).
*2: Round up the ℓ dimension to the nearest integer.
*3: The external dimensions diagram for the short overall length type with cushion (-S, -NS) is the same as the dimensions for the no cushion (N) type in this diagram.
***4: For external dimensions of accessories, please refer to P. 722.**
***5: An intermediate support head (two-dot chain line) is added depending on the stroke. Please refer to P. 712.**
***6: For dimensions of models with switches, see P. 726.**



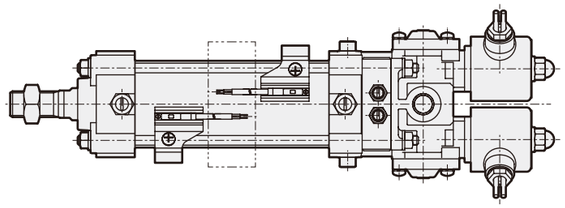


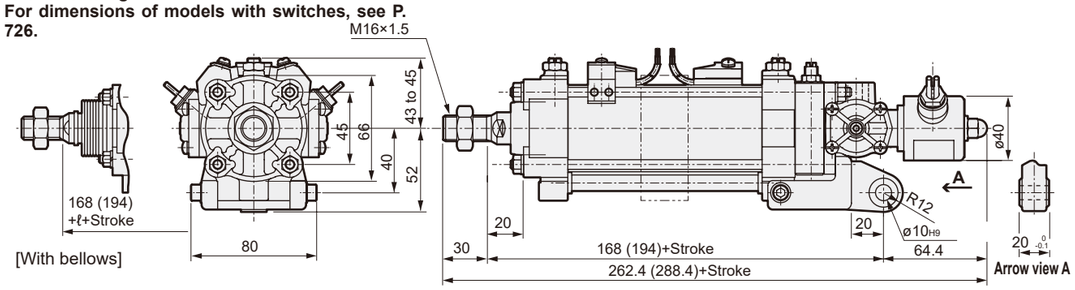
Code	Rod Side Flange Type Mounting Dimensions											With Bellows						
												ℓ						
Bore Size (mm)	A	KK	WF	X	FC	FD	FF	FG	FH	FL	FM	FT	50 or less	Over 50 to 100 or Less	Over 100 to 150 or Less	Over 150 to 200 or Less	Over 200 to 250 or Less	Over 250 to 300 or Less	Exceeding 300
ø75	40	M22×1.5	34	284.4 (332.4)	66	10	65	219.4 (267.4)	90	120	140	9	7	14	27	37	47	57	(Stroke/5)
ø100	40	M22×1.5	35	299.4 (336.4)	85	12	63	236.4 (273.4)	120	150	180	12	7	14	27	37	47	57	(Stroke/5)

External Dimensions Diagram (Double Solenoid CAV2)

● Clevis (CA) ø50

*1: Dimensions in ( ) indicate the case of with cushion (B).
*2: Round up the ℓ dimension to the nearest integer.
***3: For the swing range of combination with double yoke bracket (B2), please refer to P. 728.**
*4: The outline dimensional drawing of short overall length type with cushion (-S, -NS) is the same as the dimensions of no cushion (N) in this figure.
***5: For the external dimensions diagram of accessories, please refer to P. 722.**
***6: An intermediate support head (two-dot chain line) is added depending on the stroke. Please refer to catalog P. 712.**
***7: For dimensions of models with switches, see P. 726.**

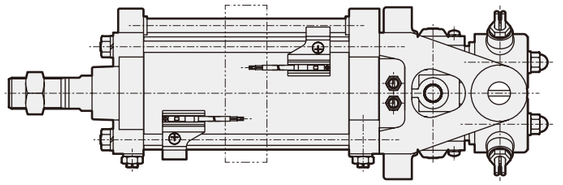


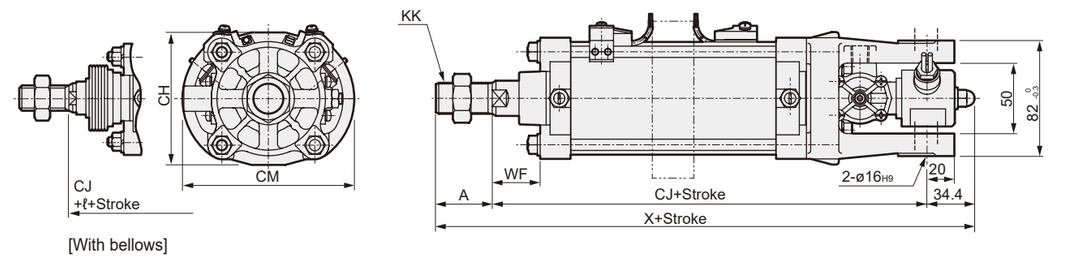


Code	Clevis type with bellows						
	ℓ						
Bore Size (mm)	50 or less	Over 50 to 100 or Less	Over 100 to 150 or Less	Over 150 to 200 or Less	Over 200 to 250 or Less	Over 250 to 300 or Less	Exceeding 300
ø50	17	24	37	47	57	67	(Stroke/5)

● Eye bracket (CA) ø75, ø100

*1: Dimensions in ( ) indicate the case of with cushion (B).
*2: Round up the ℓ dimension to the nearest integer.
***3: For the swing range of combination with double yoke bracket (B2), please refer to P. 728.**
*4: Manual operation of the valve is not possible. Please be forewarned.
*5: The outline dimensional drawing of short overall length type with cushion (-S, -NS) is the same as the dimensions of no cushion (N) in this figure.
***6: For the external dimensions diagram of accessories, please refer to P. 722.**
***7: An intermediate support head (double-dot chain line) is added depending on the stroke. Please refer to catalog P. 712.**
***8: For dimensions of models with switches, see P. 726.**



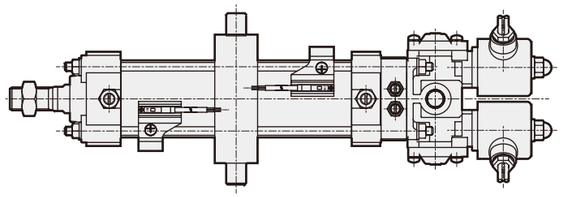


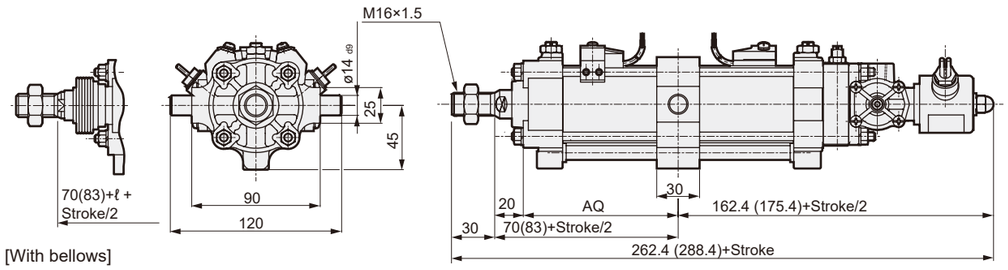
Code	Single Yoke Clevis Type Mounting Dimensions							With Bellows						
								ℓ						
Bore Size (mm)	A	KK	WF	X	CH	CJ	CM	50 or less	Over 50 to 100 or Less	Over 100 to 150 or Less	Over 150 to 200 or Less	Over 200 to 250 or Less	Over 250 to 300 or Less	Exceeding 300
ø75	40	M22×1.5	34	284.4 (332.4)	94	210 (258)	122	7	14	27	37	47	57	(Stroke/5)
ø100	40	M22×1.5	35	299.4 (336.4)	109	225 (262)	124	7	14	27	37	47	57	(Stroke/5)

External Dimensions Diagram (Double Solenoid CAV2)

● Intermediate trunnion (shaft) (TC) ø50

*1: Dimensions in ( ) indicate the case of with cushion (B).
*2: Round up the ℓ dimension to the nearest integer.
*3: The external dimensions diagram for the short overall length type with cushion (-S, -NS) is the same as the dimensions for the no cushion (N) type in this diagram.
***4: For the external dimensions diagram of accessories, please refer to P. 722.**
***5: For dimensions of models with switches, see P. 726.**

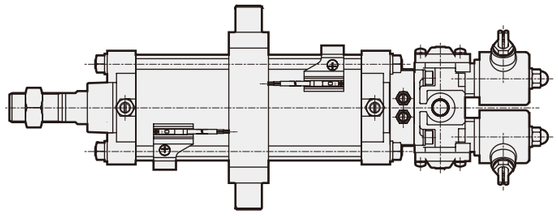


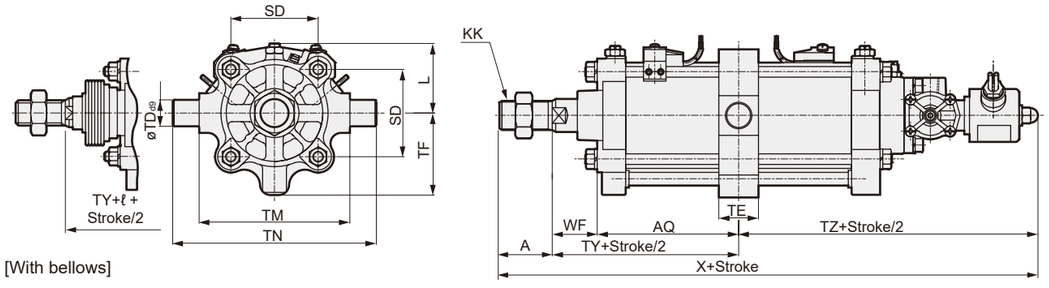


Code	Intermediate Trunnion Type (Shaft type) ø50 Mounting Dimensions	With Bellows						
Bore Size (mm)	AQ	ℓ						
		50 or less	Over 50 to 100 or Less	Over 100 to 150 or Less	Over 150 to 200 or Less	Over 200 to 250 or Less	Over 250 to 300 or Less	Exceeding 300
ø50	50 (63)+Stroke/2	17	24	37	47	57	67	(Stroke/5)

● Intermediate trunnion (shaft) (TC) ø75, ø100

*1: Dimensions in ( ) indicate the case of with cushion (B).
*2: Round up the ℓ dimension to the nearest integer.
*3: The outline dimensional drawing of short overall length type with cushion (-S, -NS) is the same as the dimensions of no cushion (N) in this figure.
***4: For the external dimensions diagram of accessories, please refer to P. 722.**
***5: For dimensions of models with switches, see P. 726.**





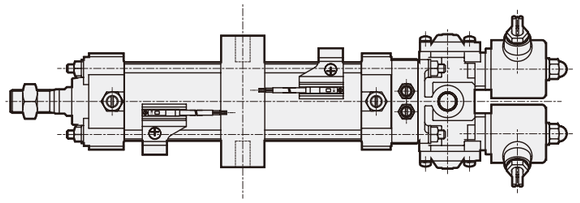
Code	Intermediate Trunnion Type (Shaft type) ø75, ø100 Mounting Dimensions											
Bore Size (mm)	A	KK	WF	X	AQ	TD	TE	TF	TM	TN	TZ	TY
ø75	40	M22×1.5	34	284.4 (332.4)	45.5 (69.5) + Stroke/2	20	30	62	114	154	164.9 (188.9)	79.5 (103.5)
ø100	40	M22×1.5	35	299.4 (336.4)	52.5 (71) + Stroke/2	35	50	78	135	205	171.9 (190.4)	87.5 (106)

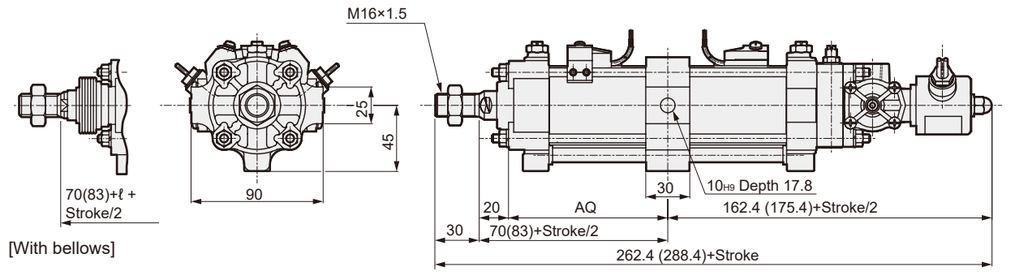
Code	With Bellows						
Bore Size (mm)	ℓ						
	50 or less	Over 50 to 100 or Less	Over 100 to 150 or Less	Over 150 to 200 or Less	Over 200 to 250 or Less	Over 250 to 300 or Less	Exceeding 300
ø75	7	14	27	37	47	57	(Stroke/5)
ø100	7	14	27	37	47	57	(Stroke/5)

External Dimensions Diagram (Double Solenoid CAV2)

● Intermediate trunnion (supporting hole type) (TF) ø50

*1: Dimensions in ( ) indicate the case of with cushion (B).
*2: Round up the ℓ dimension to the nearest integer.
*3: The external dimensions diagram for the short overall length type with cushion (-S, -NS) is the same as the dimensions for the no cushion (N) type in this diagram.
***4: For the external dimensions diagram of accessories, please refer to P. 722.**
***5: For dimensions of models with switches, see P. 726.**

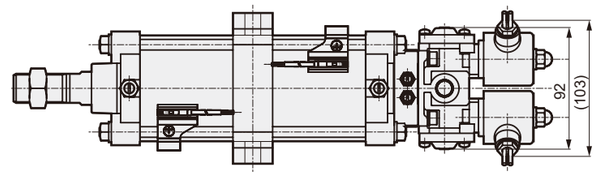


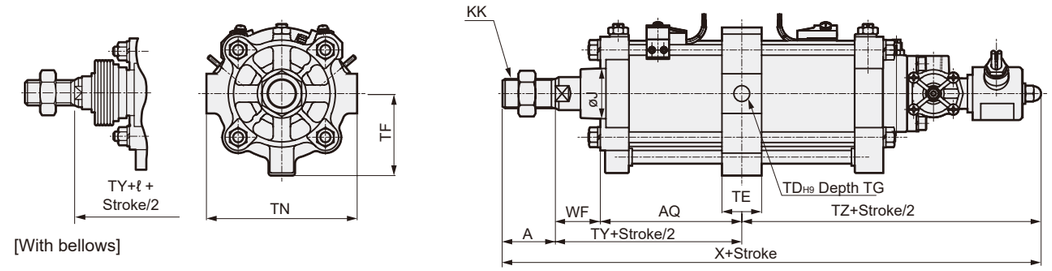


Code	Intermediate Trunnion Type (Hole type) ø50 Mounting Dimensions	With Bellows						
Bore Size (mm)	AQ	ℓ						
		50 or less	Over 50 to 100 or Less	Over 100 to 150 or Less	Over 150 to 200 or Less	Over 200 to 250 or Less	Over 250 to 300 or Less	Exceeding 300
ø50	50 (63)+Stroke/2	17	24	37	47	57	67	(Stroke/5)

● Intermediate trunnion (supporting hole type) (TF) ø75, ø100

*1: Dimensions in ( ) indicate the case of with cushion (B).
*2: Round up the ℓ dimension to the nearest integer.
*3: The external dimensions diagram for the short overall length type with cushion (-S, -NS) is the same as the dimensions for the no cushion (N) type in this diagram.
***4: For the external dimensions diagram of accessories, please refer to P. 722.**
***5: For dimensions of models with switches, see P. 726.**



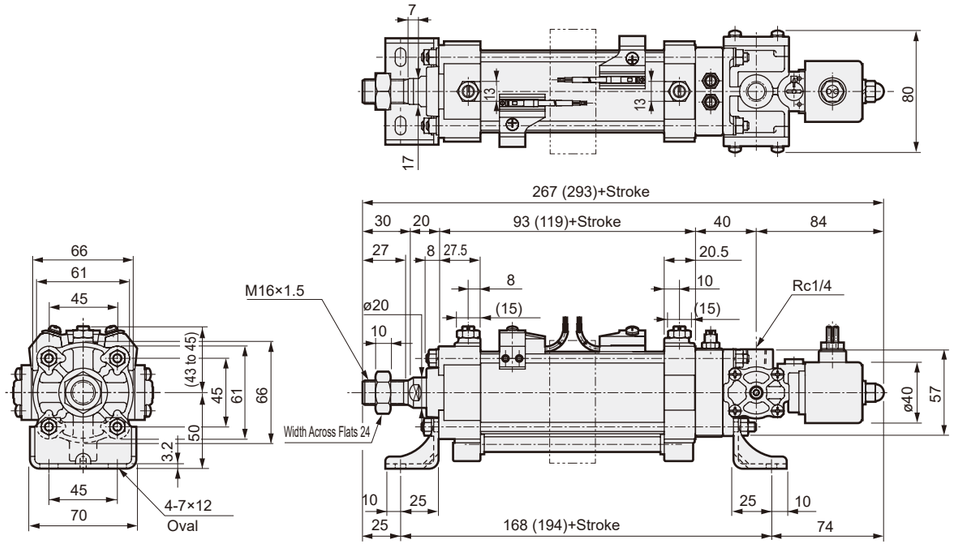


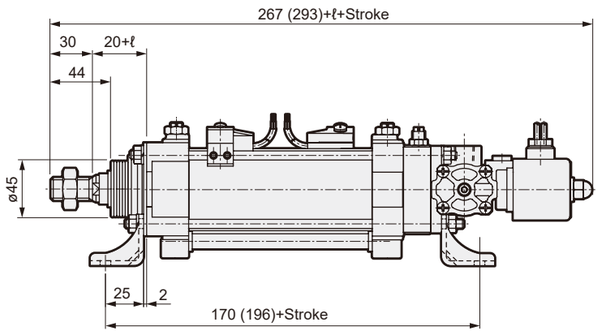
Code	Intermediate Trunnion Type (Hole type) ø75, ø100 Mounting Dimensions												
Bore Size (mm)	A	KK	WF	X	J	AQ	TD	TE	TF	TG	TN	TZ	TY
ø75	40	M22×1.5	34	284.4 (332.4)	38	45.5 (69.5) + Stroke/2	12	30	62	16.8	114	164.9 (188.9)	79.5 (103.5)
ø100	40	M22×1.5	35	299.4 (336.4)	38	52.5 (71) + Stroke/2	16	40	78	18.6	144	171.9 (190.4)	87.5 (106)

Code	With Bellows						
Bore Size (mm)	ℓ						
	50 or less	Over 50 to 100 or Less	Over 100 to 150 or Less	Over 150 to 200 or Less	Over 200 to 250 or Less	Over 250 to 300 or Less	Exceeding 300
ø75	7	14	27	37	47	57	(Stroke/5)
ø100	7	14	27	37	47	57	(Stroke/5)

External Dimensions Diagram (Single Solenoid COV$^{P}_{N}$2)

● Axial foot (LB) ø50





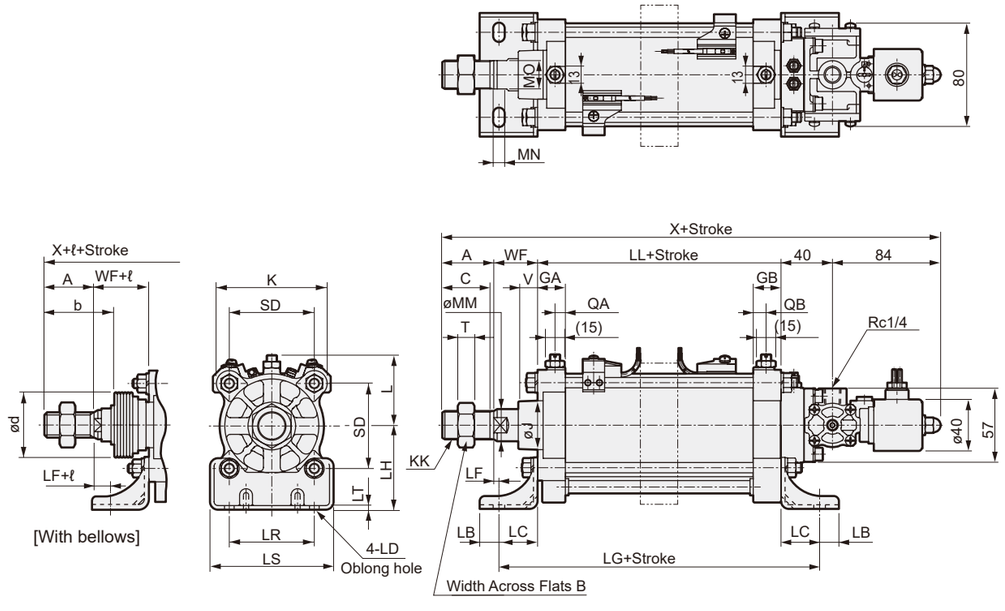
[With bellows]

Code	Axial foot type ø50 with bellows						
	ℓ						
Bore Size (mm)	50 or less	Over 50 to 100 or Less	Over 100 to 150 or Less	Over 150 to 200 or Less	Over 200 to 250 or Less	Over 250 to 300 or Less	Exceeding 300
ø50	17	24	37	47	57	67	(Stroke/5)

*1: Dimensions in ( ) indicate the case of with cushion (B).
*2: Round up the ℓ dimension to the nearest integer.
*3: The external dimensions diagram for the short overall length type with cushion (-S, -NS) is the same as the dimensions for the no cushion (N) type in this diagram.
***4: For external dimensions of accessories, please refer to P. 722.**
***5: An intermediate support head (two-dot chain line) is added depending on the stroke. Please refer to P. 712.**
***6: For dimensions of models with switches, see P. 726.**

External Dimensions Diagram (Single Solenoid COV$^{P}_{N}$2)

● Axial foot (LB) ø75, ø100



Code	Axial Foot Type ø75, ø100 Basic Dimensions																			
Bore Size (mm)	A	B	C	GA	GB	J	K	KK	L	LL	MM	MN	MO	QA	QB	SD	T	V	WF	X
ø75	40	32	37	22	22	38	86	M22×1.5	52 to 54	91 (139)	25	10	22	8	10	66	13	15	34	289 (337)
ø100	40	32	37	24.5	24.5	38	109	M22×1.5	60.5 to 62.5	105 (142)	25	10	22	10.7	10.7	86.3	13	15	35	304 (341)

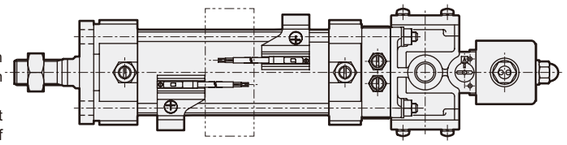
Code	Mounting Dimensions									With Bellows								
												ℓ						
Bore Size (mm)	LB	LC	LD	LF	LG	LH	LR	LS	LT	b	d	50 or less	Over 50 to 100 or Less	Over 100 to 150 or Less	Over 150 to 200 or Less	Over 200 to 250 or Less	Over 250 to 300 or Less	Exceeding 300
ø75	15	30	9×15	4	151 (199)	65	66	96	3.2	55	50	7	14	27	37	47	57	(Stroke/5)
ø100	15	30	11×20	5	165 (202)	85	85	120	3.2	55	50	7	14	27	37	47	57	(Stroke/5)

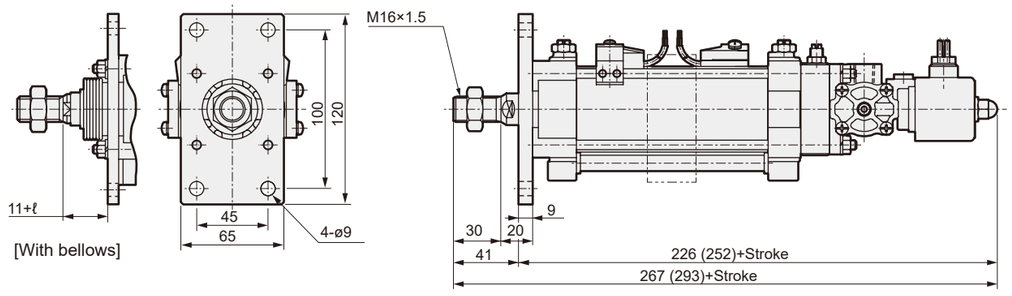
*1: Dimensions in ( ) indicate the case of with cushion (B).
*2: Round up the ℓ dimension to the nearest integer.
*3: The external dimensions diagram for the short overall length type with cushion (-S, -NS) is the same as the dimensions for the no cushion (N) type in this diagram.
***4: For external dimensions of accessories, please refer to P. 722.**
***5: An intermediate support head (two-dot chain line) is added depending on the stroke. Please refer to P. 712.**
***6: For dimensions of models with switches, see P. 726.**

External Dimensions Diagram (Single Solenoid COV$^{P}_{N}$2)

● Rod side flange (FA) ø50

*1: Dimensions in ( ) indicate the case of with cushion (B).
*2: Round up the ℓ dimension to the nearest integer.
*3: The external dimensions diagram for the short overall length type with cushion (-S, -NS) is the same as the dimensions for the no cushion (N) type in this diagram.
*4: In case of with bellows, the bellows mounting surface, Hexagon Nut (M6), etc. protrude from the flange mounting surface. Provide a relief of Ø77 or more and depth 11 or more.
***5: For the external dimensions diagram of accessories, please refer to P. 722.**
***6: An intermediate support head (two-dot chain line) is added depending on the stroke. Please refer to P. 712.**
***7: For dimensions of models with switches, see P. 726.**

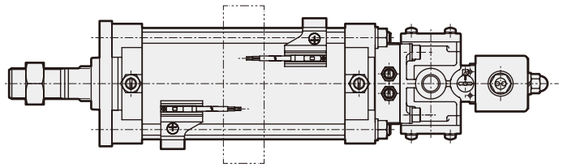


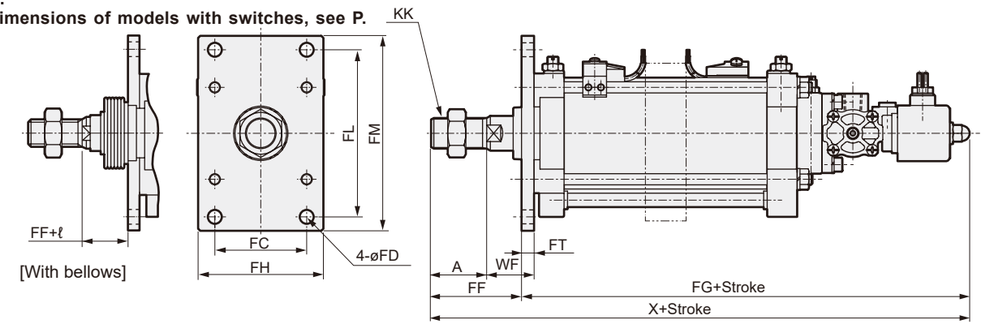


Code	Rod side flange type ø50 with bellows						
Bore Size (mm) \ ℓ	50 or less	Over 50 to 100 or Less	Over 100 to 150 or Less	Over 150 to 200 or Less	Over 200 to 250 or Less	Over 250 to 300 or Less	Exceeding 300
ø50	17	24	37	47	57	67	(Stroke/5)

● Rod side flange (FA) ø75, ø100

*1: Dimensions in ( ) indicate the case of with cushion (B).
*2: Round up the ℓ dimension to the nearest integer.
*3: The external dimensions diagram for the short overall length type with cushion (-S, -NS) is the same as the dimensions for the no cushion (N) type in this diagram.
***4: For the external dimensions diagram of accessories, please refer to P. 722.**
***5: An intermediate support head (two-dot chain line) is added depending on the stroke. Please refer to P. 712.**
***6: For dimensions of models with switches, see P. 726.**





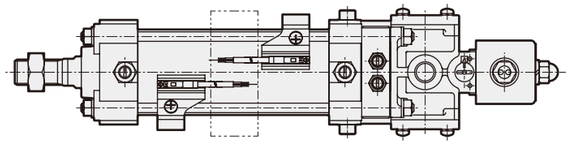
Code	Rod Side Flange Type ø75, ø100 Mounting Dimensions											
Bore Size (mm) \	A	KK	WF	X	FC	FD	FF	FG	FH	FL	FM	FT
ø75	40	M22×1.5	34	289 (337)	66	10	25	224 (272)	90	120	140	9
ø100	40	M22×1.5	35	304 (341)	85	12	23	241 (278)	120	150	180	12

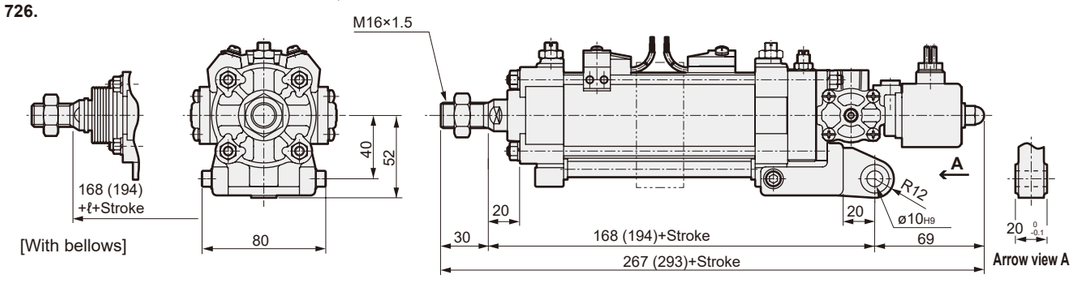
Code	With Bellows						
Bore Size (mm) \ ℓ	50 or less	Over 50 to 100 or Less	Over 100 to 150 or Less	Over 150 to 200 or Less	Over 200 to 250 or Less	Over 250 to 300 or Less	Exceeding 300
ø75	7	14	27	37	47	57	(Stroke/5)
ø100	7	14	27	37	47	57	(Stroke/5)

External Dimensions Diagram (Single Solenoid COV$^{P}_{N}$2)

● Clevis (CA) ø50

*1: Dimensions in ( ) indicate the case of with cushion (B).
*2: Round up the ℓ dimension to the nearest integer.
***3: For the swing range of combination with double yoke bracket (B2), please refer to P. 728.**
*4: The external dimensions diagram for the short overall length type with cushion (-S, -NS) is the same as the dimensions for the no cushion (N) type in this diagram.
***5: For the external dimensions diagram of accessories, please refer to P. 722.**
***6: An intermediate support head (two-dot chain line) is added depending on the stroke. Please refer to P. 712.**
***7: For dimensions of models with switches, see P. 726.**

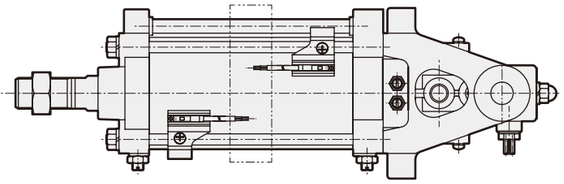


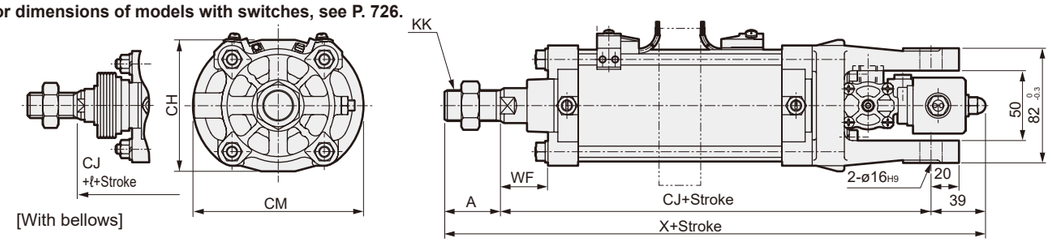


Code	Clevis type ø50 with bellows						
Bore Size (mm) \ ℓ	50 or less	Over 50 to 100 or Less	Over 100 to 150 or Less	Over 150 to 200 or Less	Over 200 to 250 or Less	Over 250 to 300 or Less	Exceeding 300
ø50	17	24	37	47	57	67	(Stroke/5)

● Eye bracket (CA) ø75, ø100

*1: Dimensions in ( ) indicate the case of with cushion (B).
*2: Round up the ℓ dimension to the nearest integer.
***3: For the swing range of combination with double yoke bracket (B2), please refer to P. 728.**
*4: Manual operation of the valve is not possible. Please be forewarned.
*5: The external dimensions diagram for the short overall length type with cushion (-S, -NS) is the same as the dimensions for the no cushion (N) type in this diagram.
***6: For the external dimensions diagram of accessories, please refer to P. 722.**
***7: An intermediate support head (double-dot chain line) is added depending on the stroke. Please refer to P. 712.**
***8: For dimensions of models with switches, see P. 726.**





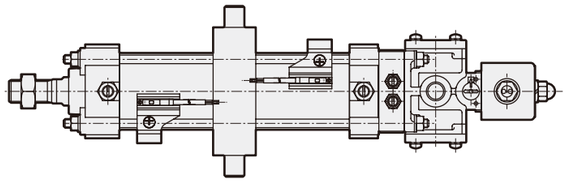
Code	Single Yoke Clevis Type ø75, ø100 Mounting Dimensions							
Bore Size (mm) \	A	K	KK	WF	X	CH	CJ	CM
ø75	40	86	M22×1.5	34	289 (337)	94	210 (258)	122
ø100	40	109	M22×1.5	35	304 (341)	109	225 (262)	124

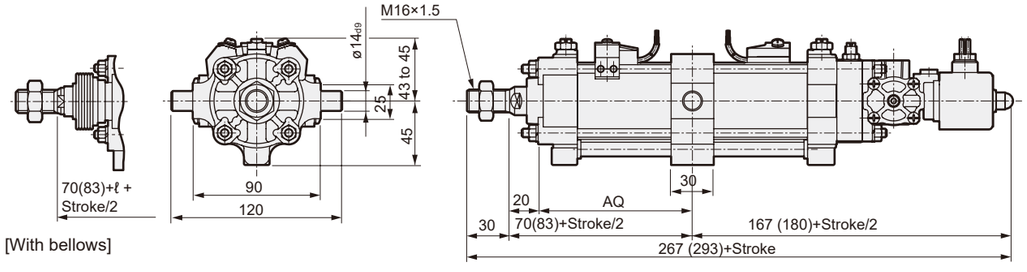
Code	With Bellows						
Bore Size (mm) \ ℓ	50 or less	Over 50 to 100 or Less	Over 100 to 150 or Less	Over 150 to 200 or Less	Over 200 to 250 or Less	Over 250 to 300 or Less	Exceeding 300
ø75	7	14	27	37	47	57	(Stroke/5)
ø100	7	14	27	37	47	57	(Stroke/5)

External Dimensions Diagram (Single Solenoid COV$^{P}_{N}$2)

● Intermediate trunnion (shaft) (TC) ø50

*1: Dimensions in ( ) indicate the case of with cushion (B).
*2: Round up the ℓ dimension to the nearest integer.
*3: The external dimensions diagram for the short overall length type with cushion (-S, -NS) is the same as the dimensions for the no cushion (N) type in this diagram.
***4: For the external dimensions diagram of accessories, please refer to P. 722.**
***5: For dimensions of models with switches, see P. 726.**



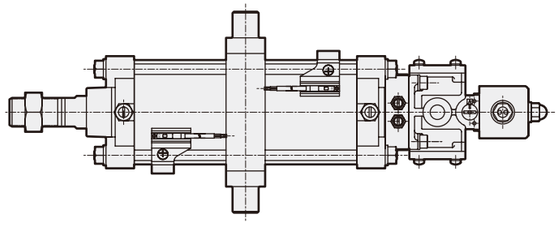


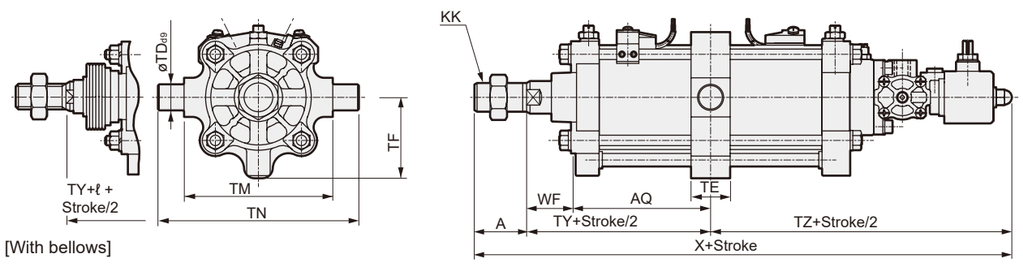
[With bellows]

Code / Bore Size (mm)	Mounting Dimensions AQ	With Bellows ℓ 50 or less	Over 50 to 100 or Less	Over 100 to 150 or Less	Over 150 to 200 or Less	Over 200 to 250 or Less	Over 250 to 300 or Less	Exceeding 300
ø50	50 (63)+Stroke/2	17	24	37	47	57	67	(Stroke/5)

● Intermediate trunnion (shaft) (TC) ø75, ø100

*1: Dimensions in ( ) indicate the case of with cushion (B).
*2: Round up the ℓ dimension to the nearest integer.
*3: The external dimensions diagram for the short overall length type with cushion (-S, -NS) is the same as the dimensions for the no cushion (N) type in this diagram.
***4: For the external dimensions diagram of accessories, please refer to P. 722.**
***5: For dimensions of models with switches, see P. 726.**





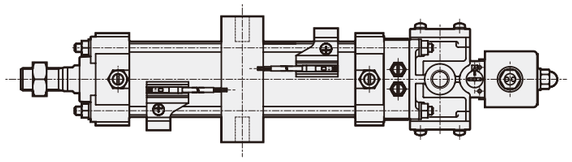
[With bellows]

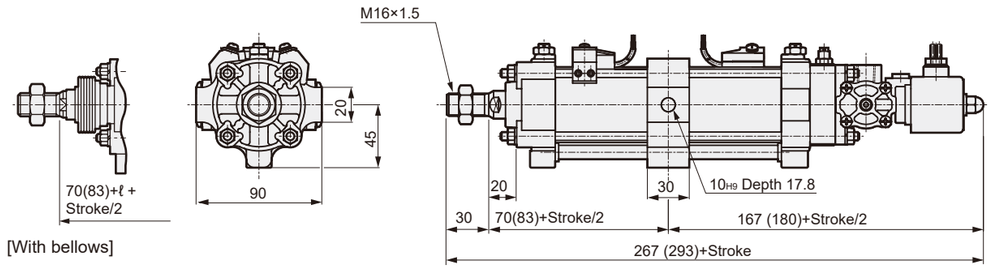
Code / Bore Size (mm)	Intermediate Trunnion Type (Shaft type) ø75, ø100 Mounting Dimensions A	KK	WF	X	AQ	TD	TE	TF	TM	TN	TZ	TY	With Bellows ℓ 50 or less	Over 50 to 100 or Less	Over 100 to 150 or Less	Over 150 to 200 or Less	Over 200 to 250 or Less	Over 250 to 300 or Less	Exceeding 300
ø75	40	M22×1.5	34	289 (337)	45.5 (69.5) +Stroke/2	20	30	62	114	154	169.5 (193.5)	79.5 (103.5)	7	14	27	37	47	57	(Stroke/5)
ø100	40	M22×1.5	35	304 (341)	52.5 (71) +Stroke/2	35	50	78	135	205	176.5 (195)	87.5 (106)	7	14	27	37	47	57	(Stroke/5)

External Dimensions Diagram (Single Solenoid COV$^{P}_{N}$2)

● Intermediate trunnion (supporting hole type) (TF) ø50

*1: Dimensions in ( ) indicate the case of with cushion (B).
*2: Round up the ℓ dimension to the nearest integer.
*3: The external dimensions diagram for the short overall length type with cushion (-S, -NS) is the same as the dimensions for the no cushion (N) type in this diagram.
***4: For the external dimensions diagram of accessories, please refer to P. 722.**
***5: For dimensions of models with switches, see P. 726.**



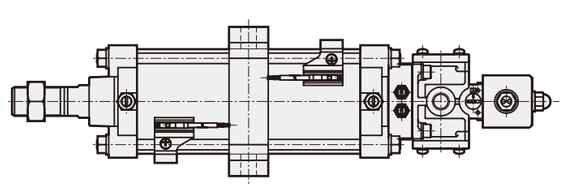


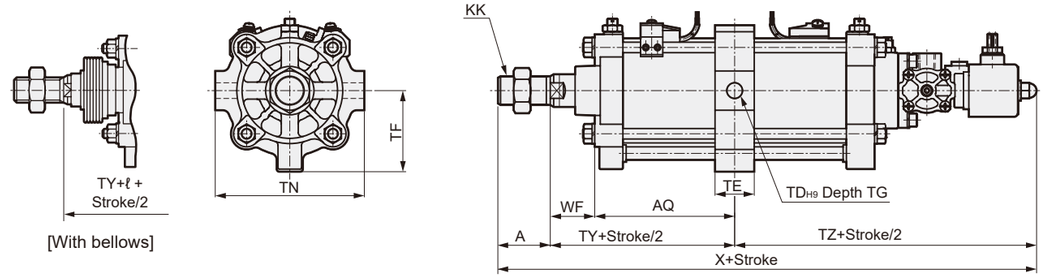
[With bellows]

Code / Bore Size (mm)	Mounting Dimensions AQ	With Bellows ℓ 50 or less	Over 50 to 100 or Less	Over 100 to 150 or Less	Over 150 to 200 or Less	Over 200 to 250 or Less	Over 250 to 300 or Less	Exceeding 300
ø50	50 (63)+Stroke/2	17	24	37	47	57	67	(Stroke/5)

● Intermediate trunnion (supporting hole type) (TF) ø75, ø100

*1: Dimensions in ( ) indicate the case of with cushion (B).
*2: Round up the ℓ dimension to the nearest integer.
*3: The external dimensions diagram for the short overall length type with cushion (-S, -NS) is the same as the dimensions for the no cushion (N) type in this diagram.
***4: For the external dimensions diagram of accessories, please refer to P. 722.**
***5: For dimensions of models with switches, see P. 726.**





[With bellows]

Code / Bore Size (mm)	Intermediate Trunnion Type (Hole type) ø75, ø100 Mounting Dimensions A	KK	WF	X	L	AQ	TD	TE	TF	TG	TN	TZ	TY	With Bellows ℓ 50 or less	Over 50 to 100 or Less	Over 100 to 150 or Less	Over 150 to 200 or Less	Over 200 to 250 or Less	Over 250 to 300 or Less	Exceeding 300
ø75	40	M22×1.5	34	289 (337)	52 to 54	45.5 (69.5) +Stroke/2	12	30	62	16.8	114	169.5 (193.5)	79.5 (103.5)	7	14	27	37	47	57	(Stroke/5)
ø100	40	M22×1.5	35	304 (341)	60.5 to 62.5	52.5 (71) +Stroke/2	16	40	78	18.6	144	176.5 (195)	87.5 (106)	7	14	27	37	47	57	(Stroke/5)

About intermediate support head

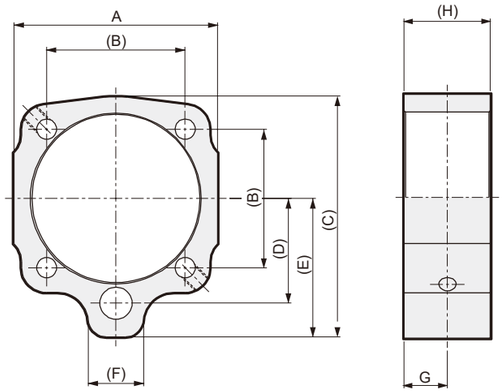
An intermediate support head is added to the center of the cylinder depending on the stroke.

Quantity of intermediate support heads by stroke

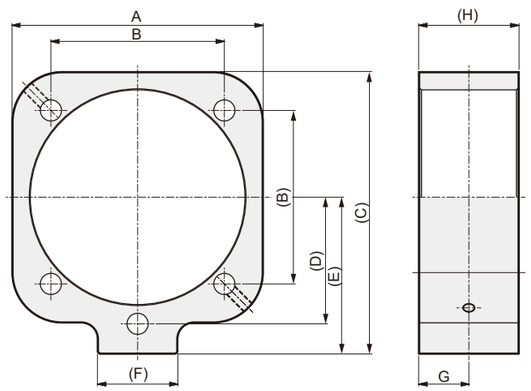
Tube diameter (mm)	Stroke (mm)	Intermediate support head quantity
ø50	501 to 1000	1
ø75	501 to 1000	1
ø100	501 to 1000	1

Also, the dimensions of the center holding head are as shown in the diagram below, so please consider the dimensions of the center holding head when installing the cylinder.

● ø50, ø75



●ø100



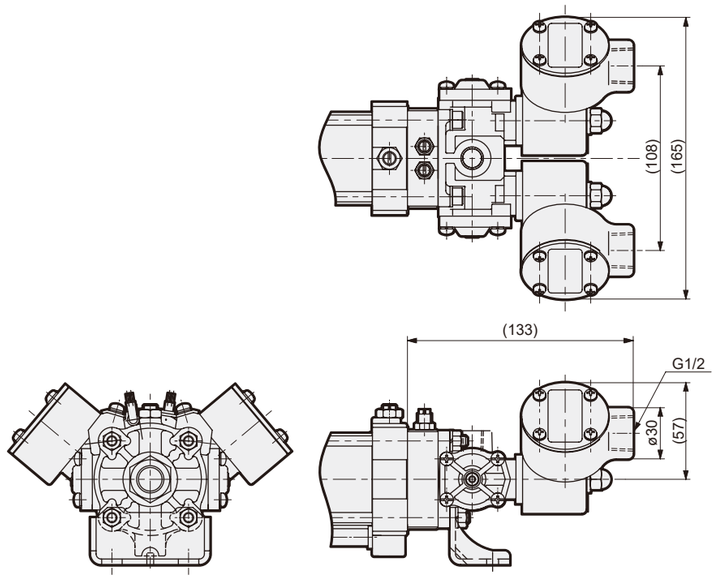
Tube diameter (mm)	Intermediate support head dimensions							
	A	B	C	D	E	F	G	H
ø50	66	45	78	34	45	18	15	30
ø75	100	66	112	48	62	22	15	30
ø100	125	86	140.5	63	78	40	25	50

MEMO

External Dimensions Diagram with Options (Double Solenoid, TB1)

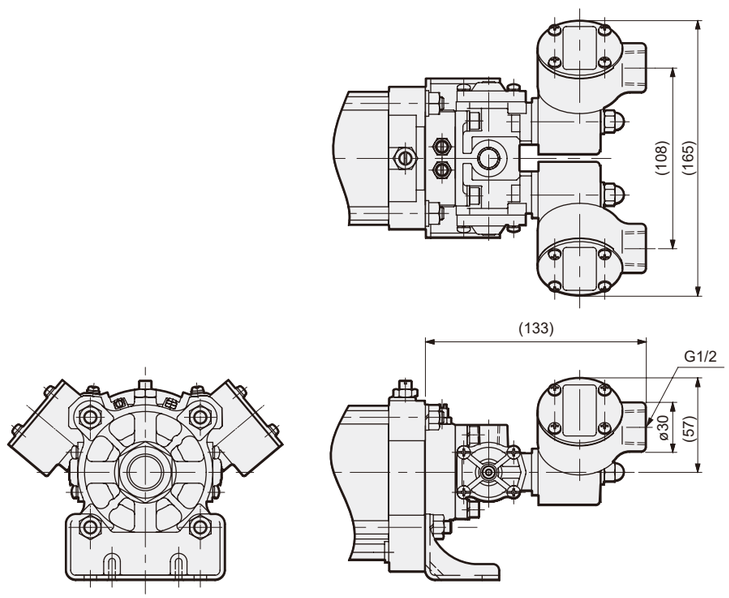
● CAV2-LB, CAV2-N-LB (double solenoid)
Axial Foot Type (LB), With Round Terminal Box (TB1) ø50
Rod Side Flange Type (FA), With Round Terminal Box (TB1) ø50
Intermediate Trunnion Type (Shaft type) (TC), With Round Terminal Box (TB1) ø50

***1: For detailed external dimensions of the terminal box, please refer to P. 721.**
***2: Dimensions with terminal box of the rod side flange and intermediate trunnion are the same as those of the axial foot (figure below). For mounting method, please refer to P. 700.**



● CAV2-LB, CAV2-N-LB (double solenoid)
Axial Foot Type (LB), With Round Terminal Box (TB1) ø75, ø100
Rod Side Flange Type (FA), With Round Terminal Box (TB1) ø75, ø100
Intermediate Trunnion Type (Shaft type) (TC), With Round Terminal Box (TB1) ø75, ø100

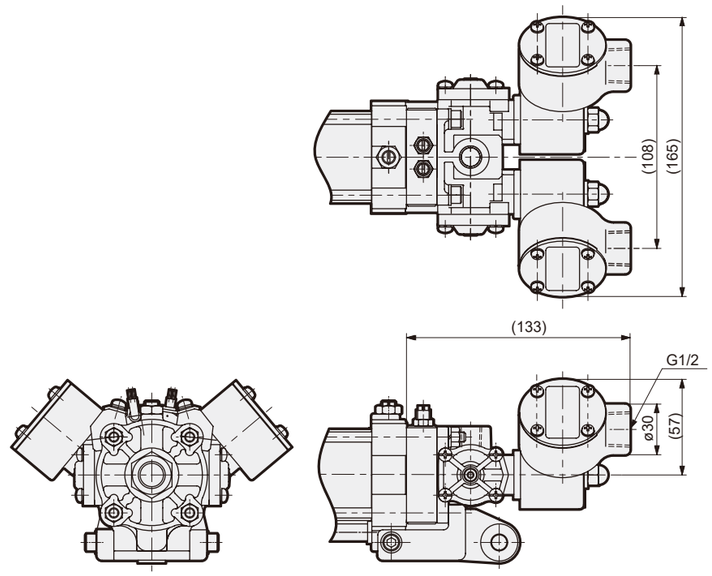
***1: For detailed external dimensions of the terminal box, please refer to P. 721.**
***2: Dimensions with terminal box of the rod side flange and intermediate trunnion are the same as those of the axial foot (figure below). For mounting method, please refer to P. 701.**



External Dimensions Diagram with Options (Double Solenoid, TB1)

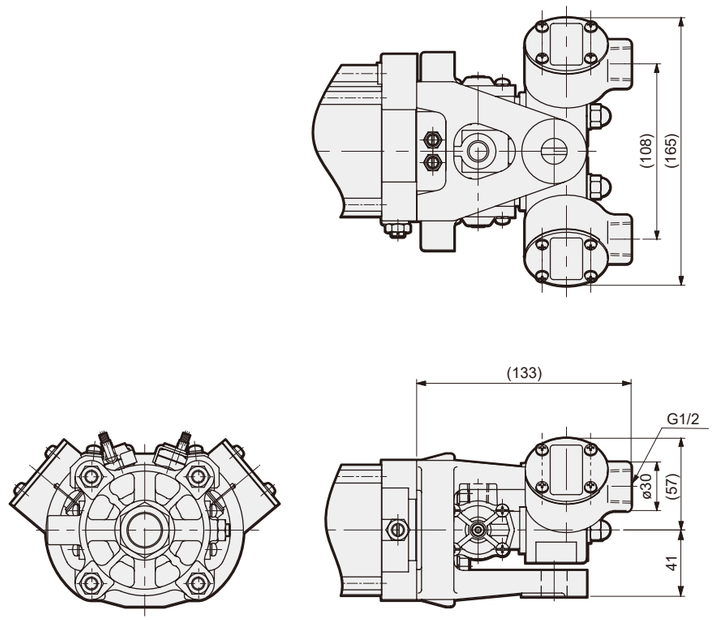
● CAV2-CA, CAV2-N-CA (double solenoid)
Clevis Type (CA), With Round Terminal Box (TB1) ø50

***1: For detailed external dimensions of the terminal box, please refer to P. 721.**



● CAV2-CA/CAV2-N-CA (double solenoid)
Clevis Type (CA), With Round Terminal Box (TB1) ø75, ø100

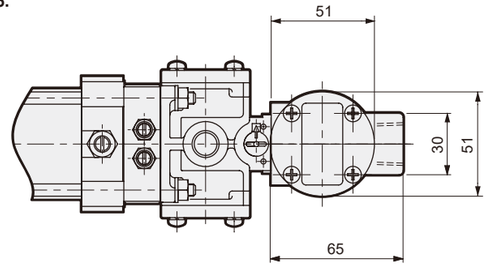
***1: For detailed external dimensions of the terminal box, please refer to P. 721.**

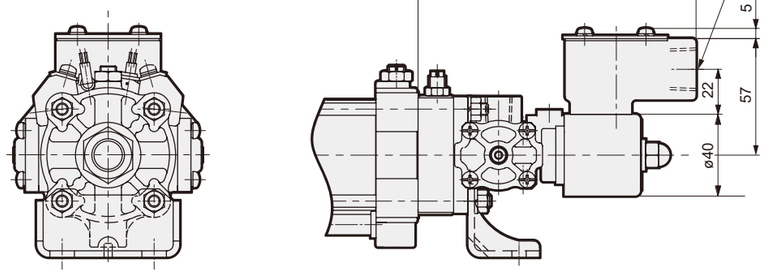


External Dimensions Diagram with Options (Single Solenoid, TB1)

● COV$^{P}_{N}$2-LB/COV$^{P}_{N}$2-N-LB (single solenoid)
Axial Foot Type (LB), With Round Terminal Box (TB1) ø50
Rod Side Flange Type (FA), With Round Terminal Box (TB1) ø50
Intermediate Trunnion Type (Shaft type) (TC), With Round Terminal Box (TB1) ø50

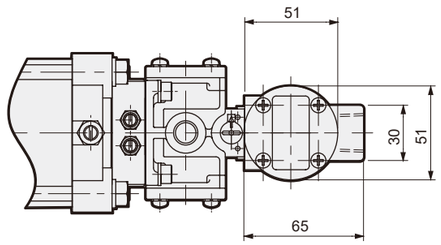
***1: For detailed external dimensions of the terminal box, please refer to P. 721.**
***2: Dimensions with terminal box of the rod side flange and intermediate trunnion are the same as those of the axial foot (figure below). For mounting method, please refer to P. 706.**

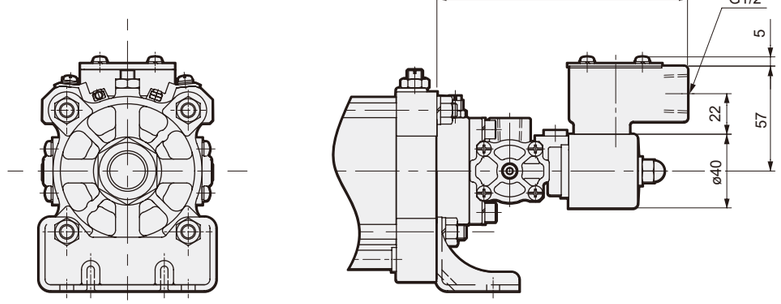




● COV$^{P}_{N}$2-LB/COV$^{P}_{N}$2-N-LB (single solenoid)
Axial Foot Type (LB), With Round Terminal Box (TB1) ø75, ø100
Rod Side Flange Type (FA), With Round Terminal Box (TB1) ø75, ø100
Intermediate Trunnion Type (Shaft type) (TC), With Round Terminal Box (TB1) ø75, ø100

***1: For detailed external dimensions of the terminal box, please refer to P. 721.**
***2: Dimensions with terminal box of the rod side flange and intermediate trunnion are the same as those of the axial foot (figure below). For mounting method, please refer to P. 707.**

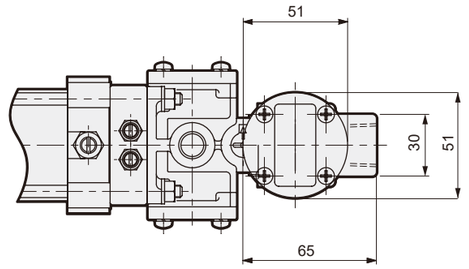


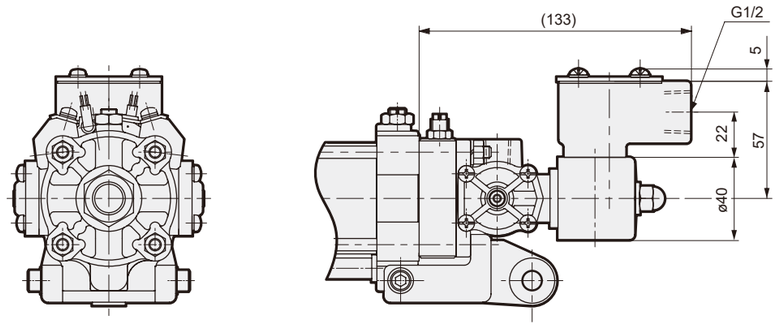


External Dimensions Diagram with Options (Single Solenoid, TB1)

● COV$^{P}_{N}$2-CA/COV$^{P}_{N}$2-N-CA (single solenoid)
Clevis Type (CA), With Round Terminal Box (TB1) ø50

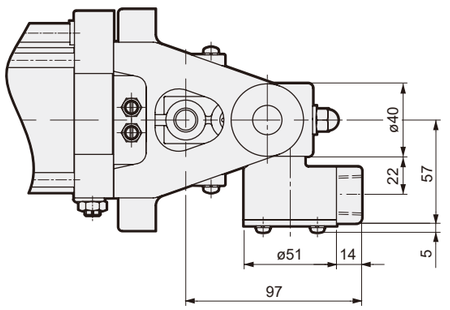
***1: For detailed external dimensions of the terminal box, please refer to P. 721.**

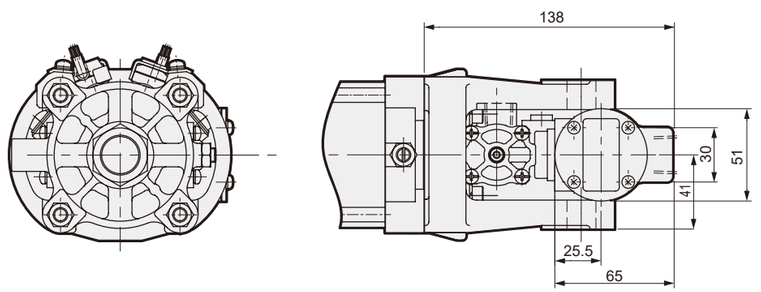




● COV$^{P}_{N}$2-CA/COV$^{P}_{N}$2-N-CA (single solenoid)
Clevis Type (CA), With Round Terminal Box (TB1) ø75, ø100

***1: For detailed external dimensions of the terminal box, please refer to P. 721.**

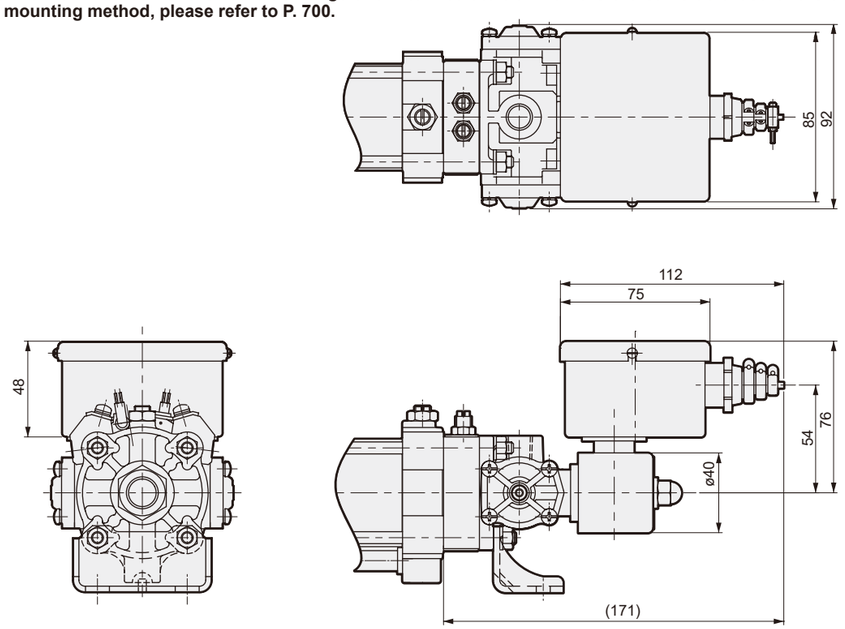




External Dimensions Diagram with Options (Double Solenoid, TB2)

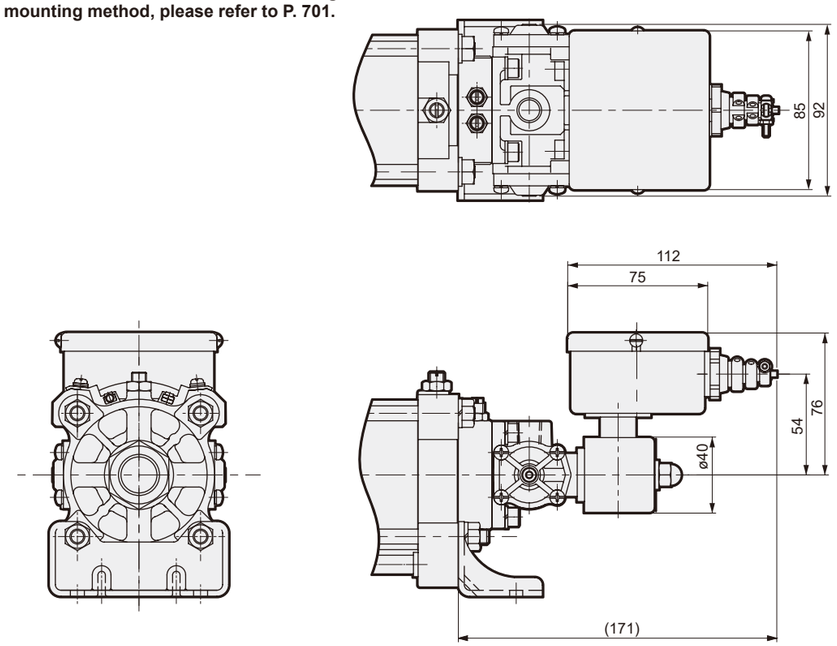
● CAV2-LB, CAV2-N-LB (double solenoid)
Axial Foot Type (LB), With Square Terminal Box (TB2) ø50
Rod Side Flange Type (FA), With Round Terminal Box (TB1) ø50
Intermediate Trunnion Type (Shaft type) (TC), With Round Terminal Box (TB1) ø50

***1: For detailed external dimensions of the terminal box, please refer to P. 721.**
***2: Dimensions with terminal box of the rod side flange and intermediate trunnion are the same as those of the axial foot (figure below). For mounting method, please refer to P. 700.**



● CAV2-LB, CAV2-N-LB (double solenoid)
Axial Foot Type (LB), With Square Terminal Box (TB1) ø75, ø100
Rod Side Flange Type (FA), With Round Terminal Box (TB1) ø75, ø100
Intermediate Trunnion Type (Shaft type) (TC), With Round Terminal Box (TB1) ø75, ø100

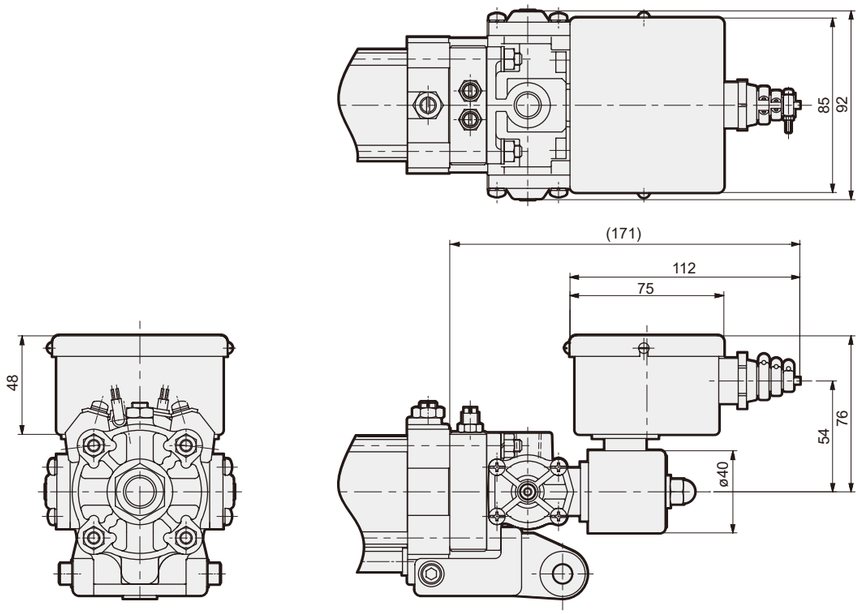
***1: For detailed external dimensions of the terminal box, please refer to P. 721.**
***2: Dimensions with terminal box of the rod side flange and intermediate trunnion are the same as those of the axial foot (figure below). For mounting method, please refer to P. 701.**



External Dimensions Diagram with Options (Double Solenoid, TB2)

● CAV2-CA/CAV2-N-CA (double solenoid)
Clevis Type (CA), With Square Terminal Box (TB2) ø50

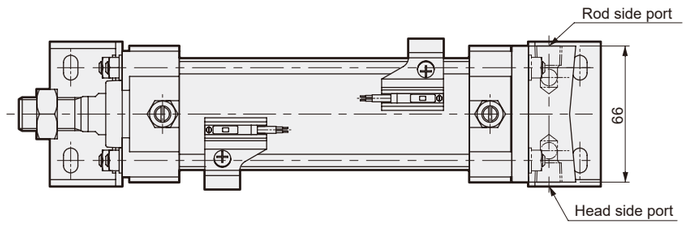
***1: For detailed external dimensions of the terminal box, please refer to P. 721.**

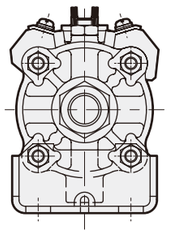


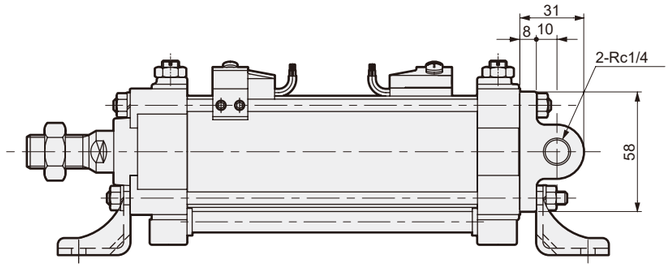
External Dimensions Diagram with Option (Q)

● CAV2/COVP N2, CAV2-N/COVP N2-N
Air supply block (Q) ø50

***1: For detailed external dimensions of the air supply block, please refer to P. 721.**
***2: Dimensions with supply block on the rod side flange and intermediate trunnion are the same as those of the axial foot (figure below). For mounting method, please refer to P. 700, 706.**

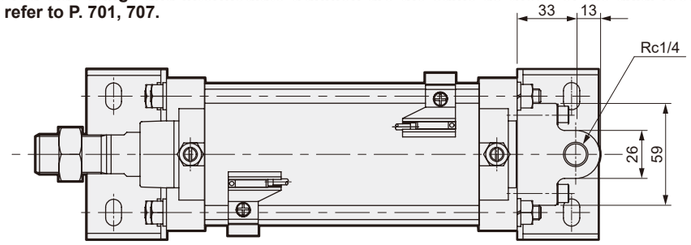


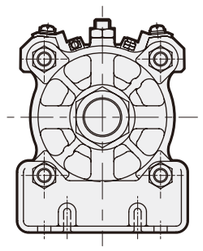


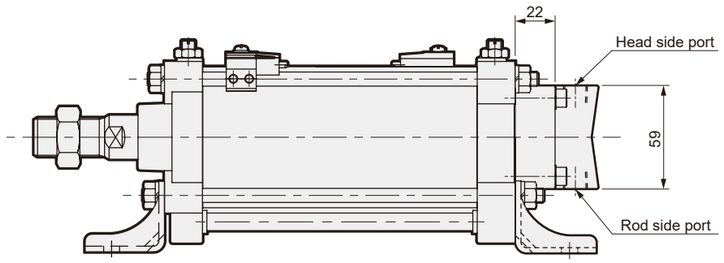


● CAV2/COVP N2, CAV2-N/COVP N2-N
Air supply block (Q) ø75, ø100

***1: For detailed external dimensions of the air supply block, please refer to P. 721.**
***2: Dimensions with supply block on the rod side flange and intermediate trunnion are the same as those of the axial foot (figure below). For mounting method, please refer to P. 701, 707.**



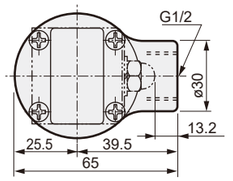


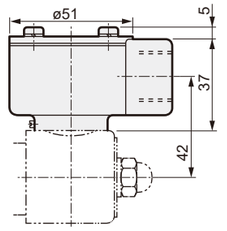


Dimensional Drawings with Option

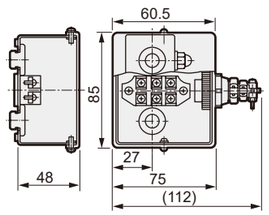
●Terminal box

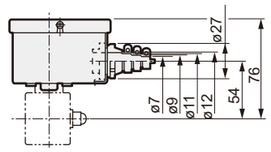
TB1 (For double solenoid type, single solenoid type)





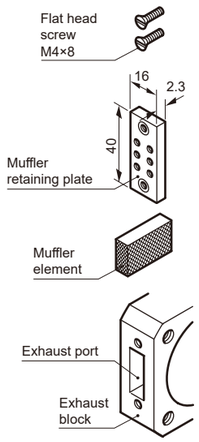
TB2 (For double solenoid type)



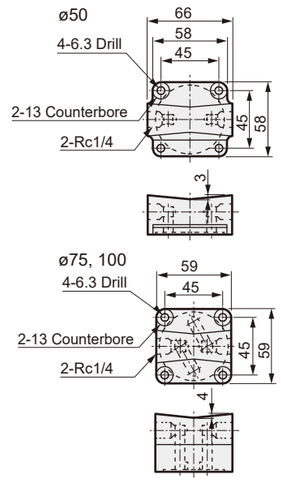


*1: If ordered at the same time as the cylinder, it will be assembled and shipped.
*2: Do not rotate the bonnet with the cap nut tightened. The coil and lead wires will break.

● Muffler (MF1)



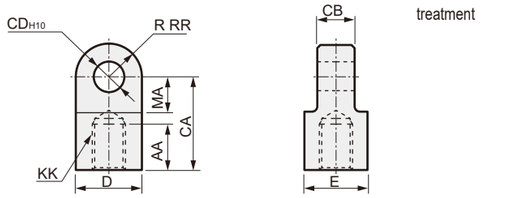
● Supply block (Q)



Accessory External Dimensions

● Single Knuckle (I)

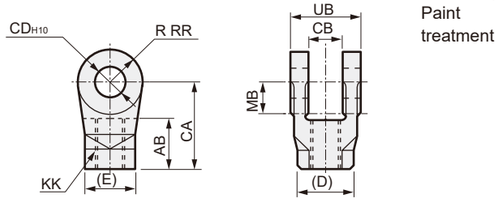
Material: Cast Iron, Paint treatment



Model No.	Applicable Bore Size (mm)	AA	CA	CB	CD	D	E	KK	MA	RR	Weight (g)
CAV2-50-I	ø50	25	50	20 $^{0}_{-0.3}$	14	26	26	M16×1.5	20	15	217
CAV2-75-I	ø75, 100	30	65	28 $^{0}_{-0.3}$	20	38	35	M22×1.5	28	22.5	622

●Double Knuckle (Y)

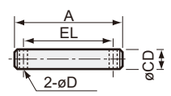
Material: Cast Iron, Paint treatment



Model No.	Applicable Bore Size (mm)	AB	CA	CB	CD	D	E	KK	MB	RR	UB	Weight (g)
CAV2-50-Y	ø50	25	50	20 $^{+0.3}_{0}$	14	26.6	23	M16×1.5	20	15	42	189
CAV2-75-Y	ø75, 100	30	65	28 $^{+0.3}_{0}$	20	40.4	35	M22×1.5	30	22.5	60	577

*1: MB dimension represents CB dimension effective length.
*2: Pin, washer, and split pin are included with the product.

● Rod eye pin (P1)



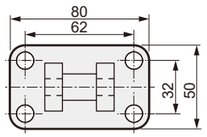
Model No.	Applicable Bore Size (mm)	A	CD	D	EL	Plain Washer	Split Pin	Weight (g)
CAV2-50-P1	ø50	62	ø14 $^{-0.042}_{-0.075}$	4	53	For M14	ø4×20	96
CAV2-75-P1	ø75, 100	82	ø20 $^{-0.012}_{-0.045}$	4	72	For M20	ø4×25	243

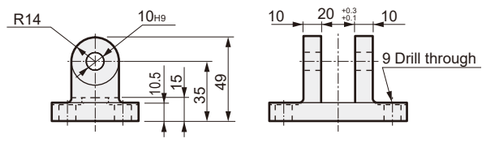
Note: Split pin and washer are included with the product.

● Clevis bracket (B2)/pin (P2) for ø50

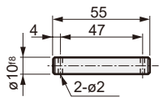
Model No.
CAV2-50-B2

Material: Body: Cast Iron, Painted
Pin: Steel, Zinc Chromate treated





Model No.
CAV2-50-P2

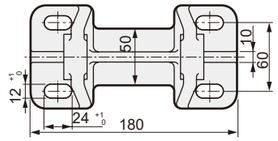


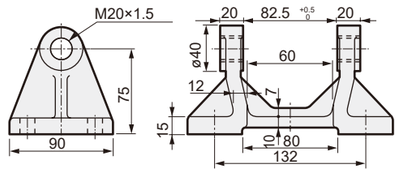
*1: Clevis bracket includes a pin, a split pin (ISO ø1234 1976 2×15) and a plain washer.
***2: For the swing range of combination with single yoke clevis (CA), please refer to P. 728.**

●Clevis bracket (B2)/pin (P2) for ø75, ø100

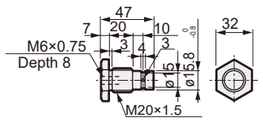
Model No.
CAV2-75-B2

Material: Body: Cast Iron, Painted
Pin: Steel, Zinc Chromate treated





Model No.
CAV2-75-P2

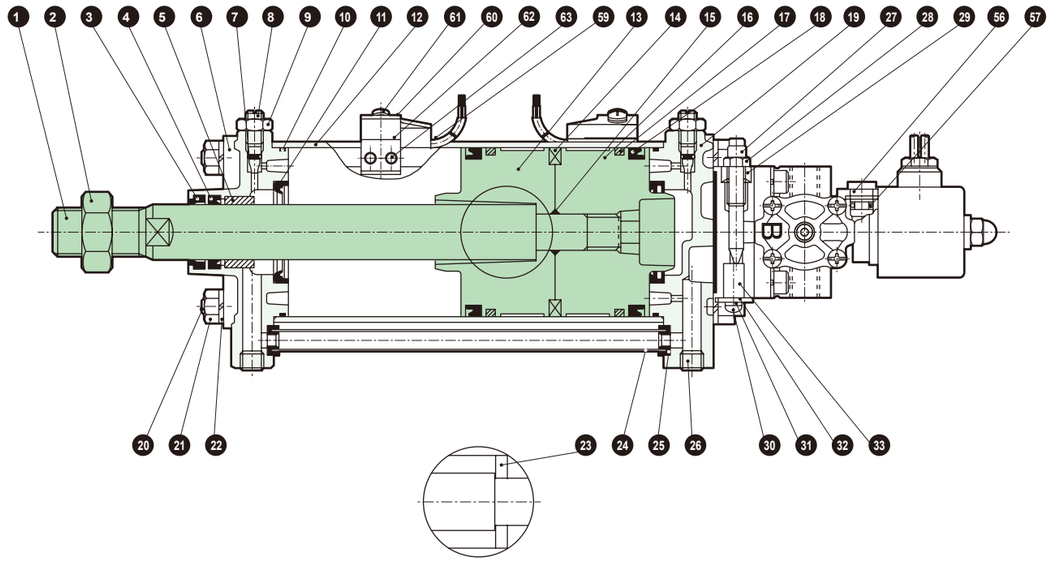


*1: Double yoke bracket comes with pin and toothed washer.
***2: For the swing range of combination with single yoke clevis (CA), please refer to P. 728.**

MEMO

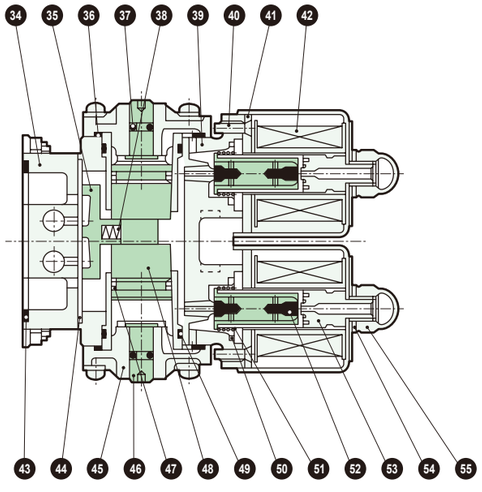
Internal Structure / Materials

● CAV2, COVP N2

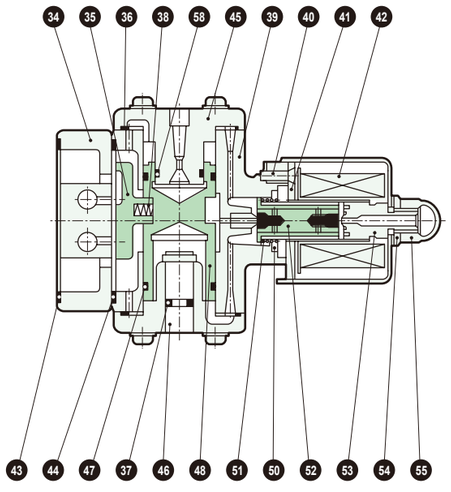


23 washer is attached to the ○ part of cylinder Bore Size ø100 only.

● CAV2, CAV2-N (double solenoid)



● COVP N2, COVP N2-N (single solenoid)



Material

Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Piston Rod	Steel	Industrial Chrome Plating	34	Exhaust block	Aluminum Alloy	Hard anodize (Lubricated type only) Nickel Plating (Non-lube type only)
2	Hexagon Nut	Steel	Zinc Chromate				
3	Scraper	Nitrile Rubber		35	Slide valve	Polytetrafluoroethylene resin	
4	Rod Packing	Nitrile Rubber		36	Cap gasket	Nitrile Rubber	
5	Bushing	Oil-Impregnated Bearing Alloy		37	Rod gasket	Nitrile Rubber	O-ring
6	Rod Cover	Aluminum Alloy	Painted	38	Port spring	Stainless Steel	
7	Needle gasket	Nitrile Rubber		39	Port body	Aluminum Alloy	
8	Cushion needle	Copper Alloy		40	Phillips flat head screw	Steel	Zinc Chromate
9	Needle nut	Copper Alloy		41	Ring core	Steel	
10	Cylinder gasket	Nitrile Rubber		42	Coil Assembly		Bobbin type [CAV2], Mold [COV2]
11	Cushion Packing	Nitrile Rubber, Steel		43	Exhaust block gasket	Nitrile Rubber	
12	Cylinder Tube	Aluminum Alloy	Hard Alumite	44	Port body gasket	Nitrile Rubber	
13	Piston (R)	Aluminum Alloy		45	Cap	Aluminum Alloy	
14	Magnet	Plastic		46	Valve rod	Aluminum Alloy	
15	Piston gasket	Nitrile Rubber		47	Spool packing	Nitrile Rubber	
16	Piston (H)	Aluminum Alloy		48	Spool	Aluminum Alloy	
17	Wear Ring	Polyacetal		49	Sleeve gasket	Nitrile Rubber	CAV□2 only
18	Piston Packing	Nitrile Rubber		50	Core gasket	Nitrile Rubber	
19	Head Cover	Aluminum Alloy	Painted	51	Plunger spring	Stainless Steel	
20	Tie rod	Steel	Zinc Chromate	52	Plunger Assembly	Stainless Steel, Nitrile Rubber	
21	Hexagon Nut	Steel	Zinc Chromate	53	Core Assembly	Stainless Steel, Copper	
22	Spring washer	Steel	Zinc Chromate	54	Spring washer	Steel	
23	Washer	Steel	Zinc Chromate (ø100 only)	55	Cap nut	Steel	
24	Pass pipe	Aluminum Alloy		56	Manual knob	Polyacetal	COV□2 only
25	Pipe gasket	Nitrile Rubber		57	Manual gasket	Nitrile Rubber	COV□2 only
26	Plug	Steel	Black Oxide	58	Spool packing	Nitrile Rubber	COV□2 only
27	Speed adjustment needle	Steel	Nickel Plating	With switch			
28	Lock Nut	Steel	Zinc Chromate	59	Switch		
29	U-nut	Steel	Zinc Chromate	60	Switch holder	Stainless Steel	
30	Cross-Recessed Pan Head Screw	Steel	Zinc Chromate [Non-lube type only]	61	Cross-Recessed Pan Head Screw	Steel	
31	Spring washer	Steel	Zinc Chromate [Non-lube type only]	62	Switch mounting base	Aluminum Alloy	
32	Muffler retaining plate	Steel	Zinc Chromate [Non-lube type only]	63	Set Screw	Steel	
33	Element	Resin	[Non-lube type only]				

Note: The No. 7, 8, 9, 11 without cushion is not available.

Mounting Bracket Material

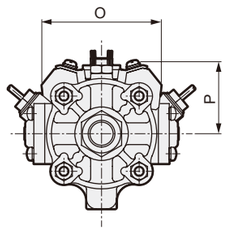
Mounting Style	Material	Remarks
Foot (LB)	Steel	Black Oxide
Flange (FA)	Steel	Painted
Clevis (CA)	Cast Iron	Painted
Trunnion (TC, TF)	Cast Iron	Painting

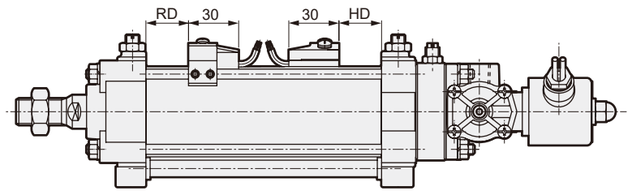
Note: All are assembled before shipment.

For maintenance parts, refer to the CKD component product site (https://www.ckd.co.jp/kiki/en/) -> "Model No." -> See "Maintenance Parts".

CAV2, COVP2, COVN2 Series External Dimensions Diagram with Switch

● T0H/V,T5H/V,T2H/V,T3H/V,T3PH/V,T2[H/V]R3,T2WH/V,T3WH/V,T2WLH/V,T8H/V,T2JH/V
• CAV2, COVP2, COVN2

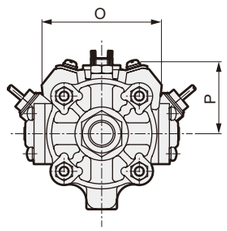


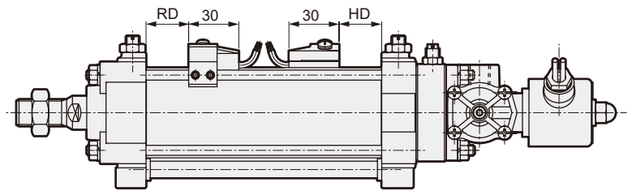


Code / Bore Size (mm)	O	P	T0,T5,T2,T3,T3P T2*R3		T2W, T3W, T2WL		T8		T2J	
			RD	HD	RD	HD	RD	HD	RD	HD
ø50	73	44	12.5 (25.5)		15.5 (28.5)		7 (20.5)		12.5 (25.5)	
ø75	92	52	13.5 (37.5)		16.5 (40.5)		8.5 (32.5)		13.5 (37.5)	
ø100	118	64	17.5 (36.0)		20.5 (39.0)		12.5 (31)		17.5 (36.0)	

*1: Dimensions in ( ) indicate the case with cushion (B).
*2: For switch mountability, refer to the model number notation of each variation.

● T1H/V, T2YD
• CAV2, COVP2, COVN2





Code / Bore Size (mm)	O	P	T1, T2YD	
			RD	HD
ø40	73	45	12.5 (25.5)	
ø50	92	56	13.5 (37.5)	
ø63	118	68	17.5 (36.0)	

*1: Dimensions in ( ) indicate the case with cushion (B).
*2: For switch mountability, refer to the model number notation of each variation.

■ Trunnion Position Specification (-XAQ□□)

Content: Specify the dimension from the rod cover end face to the center of the trunnion axis.

Model No. Notation

CAV2 - TC - 50 B - 100 - XAQ 130

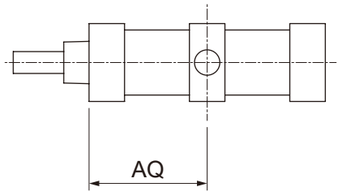
COV□2 - TC - 50 B - 100 - XAQ 130

Model Number

Please see the model number display method for CAV2, COV□2.

* Describe the AQ dimension length.
Example) AQ dimension = 130 mm

Note: The rod cover is also the standard for cylinders with brakes. (Please note that it is not the brake end face.)



Dimensions

Pneumatic Components

To Use This Product Safely

Be sure to read this before use. For general cylinder information, see Intro 41, and for cylinder switches, see P. 1512.

Individual Precautions: Cylinder with valve CAV2, COVPN2 Series

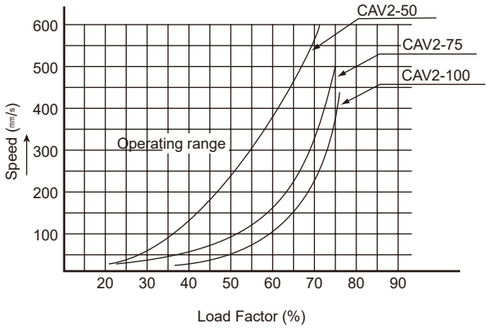
Design / Selection

Warning

■Air may be taken in at the exhaust port of the valve due to valving element operation, causing the intake of foreign matter near the exhaust port. Foreign matter may also enter when the exhaust port is pointed upwards. Install a silencer or pipe the exhaust port downward.

● The actuator will not operate correctly if the exhaust air is not discharged smoothly.

■When moving the load with CAV2/COV2 attached vertically, use within the specified range shown as below. Outside this range, cylinder speed adjustment will not be possible.



CAUTION

■Instantaneous energization

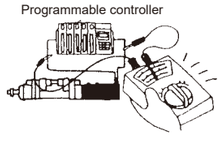
When using the double solenoid type with instantaneous energization, ensure the energization time is 0.1 seconds or more.

■If the 2-position double solenoid is started and then switched, it will hold that status unless a reverse operation electrical signal is input.

■Check leakage current to prevent malfunction caused by leakage current from other fluid control components.

● When using a programmable controller, leakage current may affect the valve and cause a malfunction.

● The values affected by leakage current depend on the voltage type. Refer to the table below.



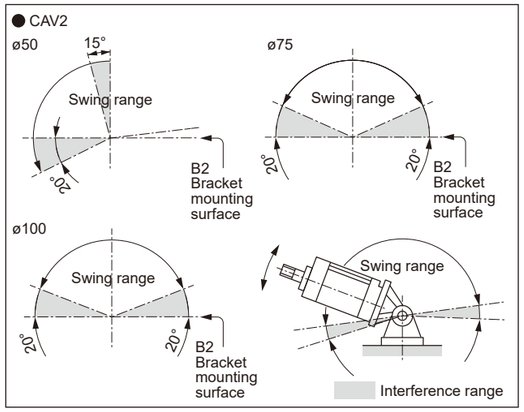
Reference

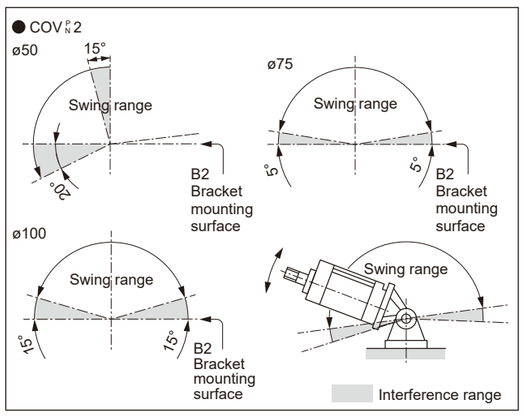
For 100 VAC	3.0 mA or less
For 200 VAC	1.5 mA or less

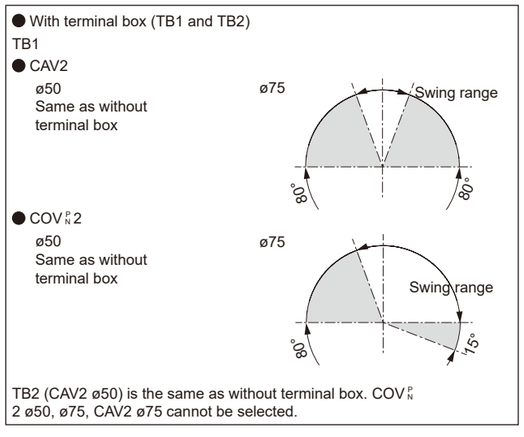
■Switch the valve at least once every 30 days to prevent malfunction.

■Oscillating range

◎ Note that the oscillating range of the combination of eye bracket (CA) and clevis bracket (B2) is limited as in the figure below.





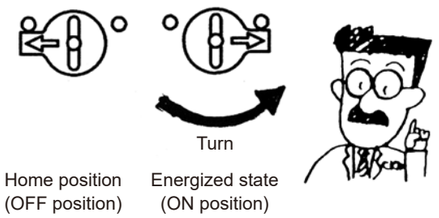


During Use

Warning

■Manual operation causes the connected device to function. Make sure that there is no danger before performing manual operation.
If the manual operating device of the valve has been activated, be sure to return it to the home position (OFF state) before operating the equipment. Non-locking type (CAV2, COVPN2) automatically returns; for locking type (COVPN2), always confirm the home position (OFF state).

[Example]



● If compressed air is supplied when not at origin, the cylinder will become operational, creating hazardous conditions.

CAUTION

■Be careful not to hit the solenoid valve with a tool or the equipment during mounting.

■Do not support the cylinder with pipes during mounting.

■Do not pick up the product by the coil lead wire.

● This may lead to disconnection.

■Infrequent use

● Switch the valve at least once every 30 days to prevent malfunction.

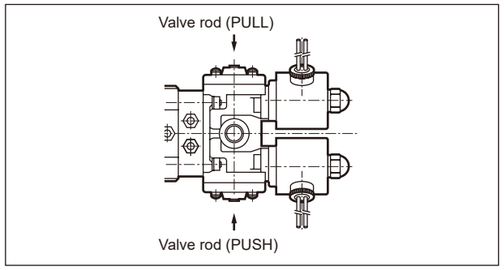
■When disassembling and assembling the valve, be sure to confirm that it operates normally according to the following work procedure.

Work procedure

1. Check that the locking manual override is at the origin (OFF state).
2. Set to low pressure. (0.15 MPa)
3. Set the manual override to the operation side (push the non-locking type, turn the manual dial for the locking type) to check that the cylinder is operational.
4. Return the locking manual override to the origin (OFF state) and check that the cylinder returns. (Operation confirmation by manual operation is complete.)
5. Perform operation check by electricity.
● After manual operation check, energize/de-energize to confirm operation.

■Manual operation

● For CAV2

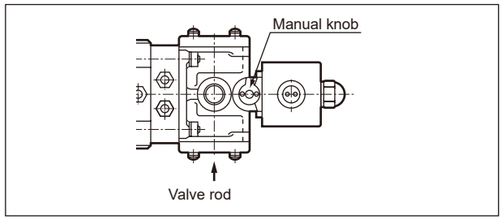


● Pushing the valve rod (PUSH) with a Drivers extrudes the Piston Rod.

● Pushing the valve rod (PULL) with a Drivers retracts the Piston Rod.

● Although this product is non-locking, the Piston Rod is held as it is when PUSH or PULL is pressed.

● For COV2

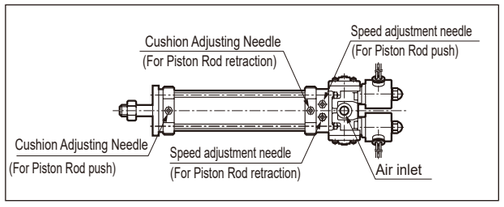


● Turning the manual dial energizes the solenoid. (Locking type)

● Pressing the valve rod with a Drivers, etc., energizes the solenoid. (Non-locking type)

⚠For COV2-75 and 100 with CA or B2 mounting bracket, manual operation is possible with non-locking but not with locking.

■How to adjust the speed and cushion of CAV2/COV2



1. The speed decreases when the speed adjustment needle is turned clockwise with a Drivers, and increases when it is turned counterclockwise.
2. The cushioning effect increases when the cushion needle is turned clockwise with a Drivers, and decreases when it is turned counterclockwise.

For precautions during mounting, installation, adjustment, use, and maintenance, refer to "During Use" in this catalog and the CKD Components Product website (https://www.ckd.co.jp/kiki/en/) -> "Model No." -> Instruction Manual.

MEMO

MEMO

Clamp Cylinder

Listed Page

Clamp Cylinder
CAC4 Series — 739

Clamp Cylinder with Fall Prevention
UCAC2 Series — 769

Lightweight Clamp Cylinder
CAC-N32/40 Series — 789

Lightweight clamp cylinder with fall prevention
UCAC-N32/40 Series — 798

Rotary Clamp Cylinder (Single Guide Type)
RCS2 Series — 811

Rotary Clamp Cylinder
RCC2 Series — 845

Pin Clamp Cylinder
PCC Series — 875

Clamp Cylinder

Cylinder for Workpiece Clamping Jigs in Welding Processes

Suitable for welding process environments, achieving durability and weight reduction

Lightweight Clamp Cylinder, Double Acting, Single Rod Type

CAC-N Series (ø32, ø40)

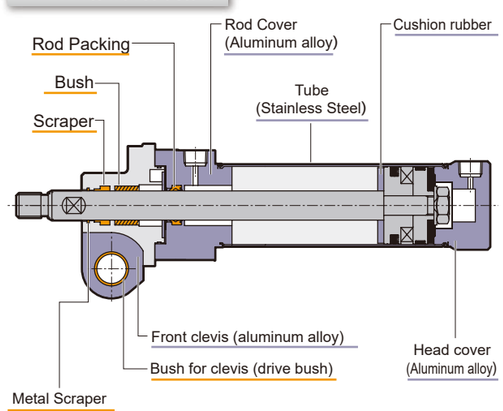
Compact and lightweight clamp cylinder contributing to weight reduction of welding jigs, etc.

High reliability

The Cylinder Body adopts the highly reliable and lightweight CMK2 series.

Lighter weight and compatible with external environment-resistant structure

CAC-N internal structure

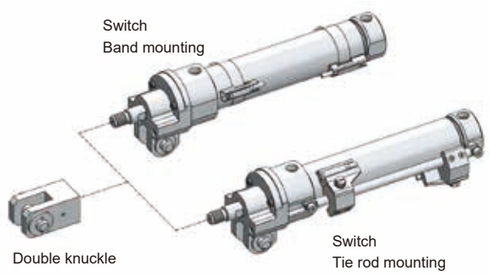


Lightweight

CAC-40-150 has a weight of Approx. 950 g, achieving Approx. 56% of the conventional ratio.

Metal scraper standardly built-in

System Configuration



Clamp Cylinder, Double Acting, Single Rod Type

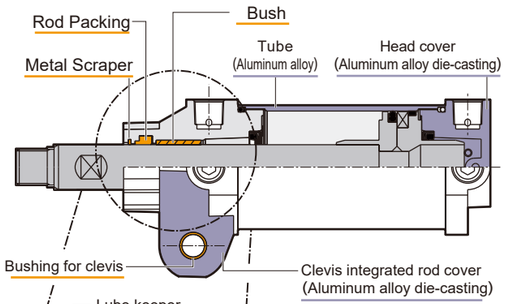
CAC4 Series (ø40 to ø80)

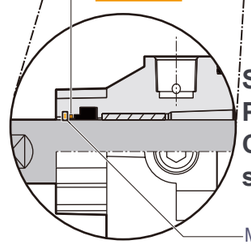
Dedicated clamp cylinder most suitable for harsh welding environments

Sputter adhesion prevention type

Sputter adhesion prevention type CAC4-G4 series also selectable.

CAC4 internal structure





Spatter Adherence Prevention Type CAC4-G4 internal structure

Metal scraper standardly built-in

Cylinder switch installable

Cylinder switch for AC magnetic fields/magnetized environments installable.

*Strong magnetic field switch (H0, H0Y) installable (CAC4-L2)

Solid state 2-color indicator type
For AC Magnetic Field

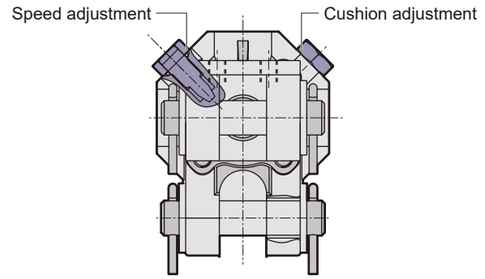
T2YD

2-color LED reed
For Magnetized Environments

T0Y

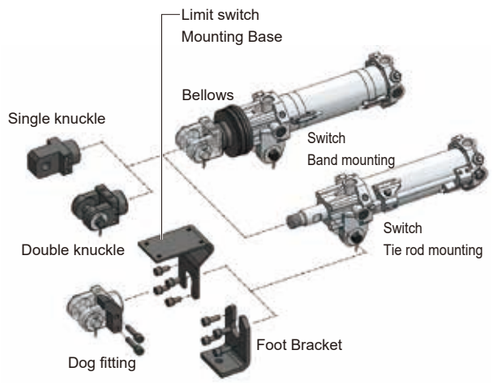
Built-in speed controller

Minimizes needle protrusion, achieving both ease of adjustment and high safety.



Metal scraper standardly built-in

System Configuration



Clamp Cylinder with Fall Prevention

Lock mechanism installed in clamp cylinder considering safety and maintainability of welding equipment

Locks the rod when air supply stops due to power outage or accident, preventing load from falling under its own weight. The position locking mechanism acts as a one-way lock that allows the rod to be moved in the opposite direction to facilitate the emergency removal of workpieces, etc.

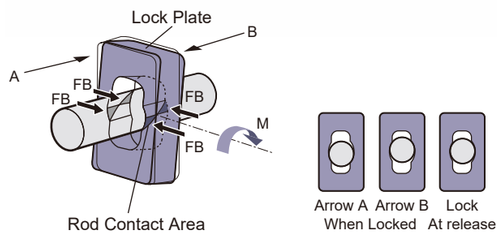
Fall prevention is possible throughout the entire stroke

Unidirectional lock makes the opposite direction free. Forward direction lock and reverse direction lock types selectable.

Fall Prevention Structure/Principle

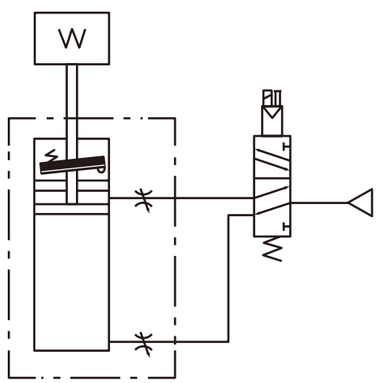
Circular slit method

Installation of new swash plate type lock mechanism enables fall prevention at free position. By applying rotational force M to the lock metal, axial force F is generated, holding the rod.

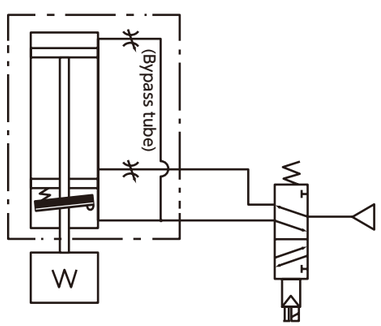


Position locking circuit example

Backward locking B type



Forward locking F type



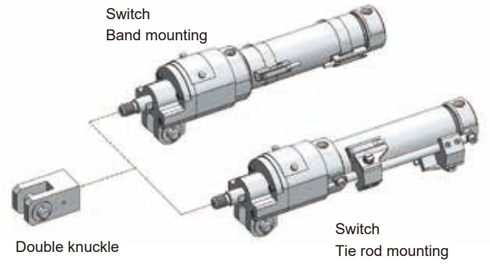
Lightweight clamp cylinder with fall prevention

UCAC-N Series (ø32, ø40)

Lock mechanism installed in compact and lightweight clamp cylinder contributing to weight reduction of welding jigs, etc.

Metal scraper standardly built-in

System Configuration



Clamp Cylinder with Fall Prevention

UCAC2 Series (ø50, ø63)

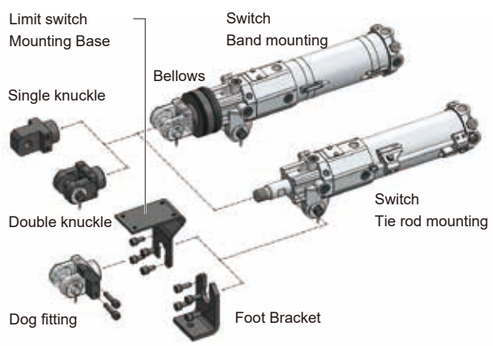
Lock mechanism installed in dedicated clamp cylinder most suitable for harsh welding environments

Built-in speed controller

Minimizes needle protrusion, achieving both ease of adjustment and high safety.

Metal scraper standardly built-in

System Configuration



Cylinder switch installable

For AC magnetic fields. Cylinder switch for magnetized environments installable.

*Strong magnetic field switch (H0, H0Y) installable (UCAC2-L2)

Solid state 2-color indicator type
For AC Magnetic Field

T2YD

2-color LED reed
For Magnetized Environments

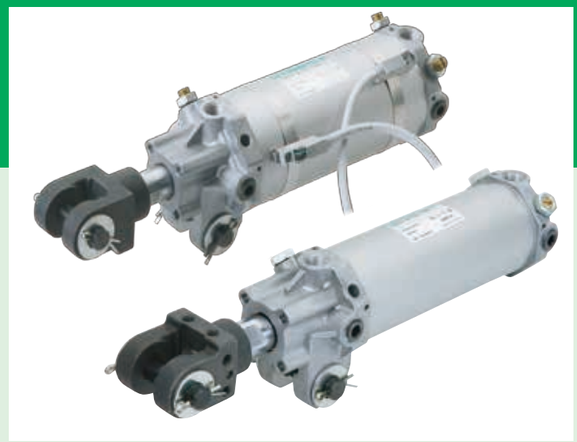
T0Y

Clamp Cylinder

CAC4

Clamp Cylinder

ø40, ø50, ø63, ø80



Overview

Clevis mounting with double yoke knuckle. This is a dedicated cylinder for clamping.

Features

Optimization of cover shape achieves product weight reduction and slimming. Minimizes needle protrusion, achieving both ease of adjustment and high safety. Sputter adhesion prevention type CAC4-G4 series also selectable.

●Selectable Switch Mounting Method

In addition to the conventional tie rod method, a band method that allows free rotation (circumferential direction) and movement adjustment of the switch has been added.

●Switch mounting position can be found at a glance

The switch rail has markings for mounting at the highest sensitivity position, significantly reducing switch position setting time during maintenance. (Limited to stroke end detection. Excluding two-color indicator type and for strong magnetic fields)

●Capable of free rotation of switch

By simply loosening the fixing screw, the switch rail can be freely rotated and moved in the circumferential direction without changing the position of the band fixing part. On-site position adjustment of the switch position becomes easier.

●Fixing screw fallout prevention

Anti-slip rubber is included with the inside of the band. It will not fall off even if the screw is loosened.

CONTENTS

Series System Chart	740
Variation/Option Combination Availability Table	741
●Double Acting, Single rod type (CAC4)	742
● Double Acting/anti-spatter adherence (CAC4-G4)	756
Accessories External Dimensions Diagram	752
Outer Dimensions Diagram with Switch	764
⚠Precautions for Use	767

Variation Table

Clamp Cylinder CAC4 Series

●: Standard, ◎: Option, : Not available

Variation	Model No. / Circuit Diagram Code	Bore Size (mm)	Standard Stroke (mm) 50	75	100	125	150	Max Stroke (mm)	Option: Bellows (100 °C) K	Option: Limit switch mounting base with dog D	Option: Limit switch mounting base without dog D1	Accessories: Clamp fitting Q	Accessories: Double yoke knuckleCast Iron Y	Accessories: Double yoke knuckle Steel Y1	Accessories: Single knuckle joint Steel I	Switch	Page
Double Acting, Single Rod Type	CAC4	ø40, ø50, ø63	●	●	●	●	●	150	◎	◎	◎	◎	◎	◎	◎	◎	742
		ø80	●	●	●	●	●	150						◎		◎	
Double Acting, Spatter Adhesion Prevention Type	CAC4-G4	ø40, ø50, ø63	●	●	●	●	●	150		◎	◎	◎	◎	◎	◎	◎	756
		ø80	●	●	●	●	●	150						◎		◎	

Variation Combination Availability Table

Category		Code	Variation: Double Acting type (Built-in magnet for T-type switch)	Variation: Sputter adhesion prevention type	Variation: Double Acting type (Built-in magnet for strong magnetic field switch H0□)		Piping thread: NPT	Piping thread: G		Switch: T-type Switch (Separately Shown)	Switch: H0 switch (Separately Shown)	
			Double Acting type (Built-in magnet for T-type switch)	Sputter adhesion prevention type	Double Acting type (Built-in magnet for strong magnetic field switch H0□)		NPT	G		T-type Switch	H0 switch	
			None	G4	L2		N	G		Separately Shown	Separately Shown	
Variation	Double Acting type (Built-in magnet for T-type switch)	Blank		◎	x		○	○		◎	x	
	Sputter adhesion prevention type	G4			◎		○	○		◎	x	
	Double Acting type (Built-in magnet for strong magnetic field switch H0□)	L2					○	○		x	◎	
Piping thread	NPT	N						x		-	-	
	G	G								-	-	
Switch	T-type Switch	Separately Shown									x	
	H0 switch	Separately Shown										

◎Mark : Option
○Mark : Custom-made
× Mark : Not Available

Accessory Combination Availability Table

Category		Code	Blank	Accessories: Double knuckle joint Cast Iron *1 Y	Double yoke knuckle, Steel Y1	Single knuckle joint Steel *1 I	With bellows Neoprene *1 K	Limit switch mounting base with dog *1 D	Limit switch mounting base without dog *1 D1	With clamp fitting *1 Q	
		Blank		◎	◎	◎	x	x	◎	x	
Accessories	Double knuckle joint Cast Iron *1	Y			x	x	◎	◎	◎	◎	
	Double knuckle joint Steel	Y1				x	◎	◎	◎	◎	
	Single knuckle joint Steel *1	I					◎	◎	◎	x	
	With bellows Neoprene *1	K						x	×	x	
	Limit switch mounting base with dog *1	D							×	x	
	Without dog *1	D1								x	
	With clamp fitting *1	Q									

*1: Excluding ø80

[Model No. Example]

CAC4 - L2 - A - 40 [ ] - N - 50 - R - H0 - D - B - I - K

- CAC4: Model Number
- L2: Variation
- A: ❶ Clevis Width
- 40: ❷ Bore Size
- [ ]: ❸ Piping thread type
- N: ❹ Cushion
- 50: ❺ Stroke
- R: ❻ Speed adjustment needle
- H0: ❼ Switch Model
- D: ❽ Number of Switches
- B: ❾ Switch Mounting Position
- I: ❿ Accessories
- K: ⓫ Accessories

*Fill in from left to right in the table on the left.

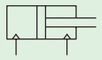
Model No.: Clamp Cylinder
●Variation : With Strong Magnetic Field Resistant Switch
❶ Clevis Width : 16.5 mm
❷ Bore Size : ø40 mm
❸ Port thread : Rc Thread
❹ Cushion : Without cushion
❺ stroke : 50 mm
❻ Speed adjustment needle : Rod side included
❼ Switch model No. : Reed HO switch, lead wire 1 m
❽ Switch quantity : With 2 pcs
❾ Switch mounting position : B
❿ Accessory : Single knuckle joint Steel
⓫ Accessory : Bellows (Neoprene) 100°C

Clamp cylinder Double Acting/Single rod type

CAC4 Series

● Bore Size: ø40, ø50, ø63, ø80

Circuit Diagram Code



RoHS

Model No. Notation

Without Switch
(Built-in magnet for switch)

CAC4 - A - 40 - B - 50 - R — Y1
Model No. ❶ ❷ ❸ ❹ ❺ ❻ ❿

With switch
(Built-in magnet for switch)

CAC4 - A - 40 - B - 50 - R - T0H - R - B - Y1
Model No. ❶ ❷ ❸ ❹ ❺ ❻ ❼ ❽ ❾ ❿

Strong magnetic field resistant
(HO, HOY switch)
With switch
(Built-in magnet for switch)

CAC4-L2 - A - 40 - B - 50 - R - H0 - R - B - Y1
Model No. ❶ ❷ ❸ ❹ ❺ ❻ ❼ ❽ ❾ ❿

❶ Clevis Width ❷ Bore Size ❸ Piping thread type ❹ Cushion ❺ Stroke ❻ Speed adjustment needle ❼ Switch Model ❽ Number of Switches ❾ Switch Mounting Position and Mounting Method ❿ Accessories

❶ Clevis Width (mm)

Code	Content	Bore Size ø40	ø50	ø63	ø80	
Blank	28				●	Clevis Width
A	16.5	●	●	●		
B	19.5	●	●	●		Clevis Width
AL	16.5 (Axial foot type)	●	●	●		
BL	19.5 (Axial foot type)	●	●	●		

Note: Clevis pins, split pins, and flat washers are included to A, B, AL, and BL. Clevis width and double yoke knuckle width are the same dimension.

❷ Bore Size (mm)

Code	Contents
40	ø40
50	ø50
63	ø63
80	ø80

❸ Piping thread type

Code	Content
Blank	Rc Thread
N	NPT Thread (Custom Order Product)
G	G thread (Custom product)

❹ Cushion

Code	Content
Blank	With Air Cushion on Head Side (Port thread: When blank)
H	With Air Cushion on Head Side (Port thread: When N, G)
B	With Air Cushion on Both Sides
N	Without cushion

❺ Stroke (mm)

Code	Content
50	50
75	75
100	100
125	125
150	150

❻ Speed adjustment needle

Code	Content	
Blank	Both sides included	
R	Rod side included	
H	Head side included	
N	None	

❼ Switch Model

For switch details, refer to P. 1457. Switches are pre-assembled on the product and shipped, except in the case of band mounting.

Contact	Indicator LED Special Function	Wiring (Output)	Load Voltage (V) AC	DC	Load Current (mA) AC	DC	Lead wire *1 Straight	L-shape	
Solid State	1-Color	2-wire	85 to 265	—	5 to 100	—	T1H□	T1V□	
			—	10 to 30	—	5 to 20 *2	T2H□	T2V□	
		3-wire (NPN)	—	30 or less	—	100 or less	T3H□	T3V□	
		3-wire (PNP)	—		-		T3PH□	T3PV□	
	2-color	2-wire	—	24 ± 10%	—	5 to 20	T2WH□	T2WV□	
		3-wire (NPN)	—	30 or less	—	50 or less	T3WH□	T3WV□	
	2-color Improved Water Resistance	2-wire	—	24 ± 10%	—	5 to 20	T2WLH□	T2WLV□	*3
	2-Color for AC Magnetic Field		—	24 ± 10%	—		T2YD□	–	
			—		—		T2YDT□	–	
	With 2-color AC magnetic field proof connector (Custom order)		—		—		T2YDU	–	
	1-Color Off-Delay Type		—	10 to 30	—	5 to 20 *2	T2JH□	T2JV□	
	1-color Flexible Lead Wire Type		—	10 to 30	—		T2HR3	T2VR3	
Contact	1-Color	2-wire	110	12/24	7 to 20	5 to 50	T0H□	T0V□	
	Without Indicator Lamp		110	5/12/24	20 or less	50 or less	T5H□	T5V□	
	1-color		110/220	12/24	7 to 20 / 7 to 10	5 to 50	T8H□	T8V□	
	For 1-color strong magnetic field		110	12/24	7 to 20	5 to 50	H0□	-	
	For 2-color strong magnetic field		—	24 ± 10%	—	5 to 20	H0Y□	-	

*1: For "□" in the switch model number, enter the code selected from the "Lead wire length, connector specification" table.
*2: The maximum load current value above, 20 mA, is at 25°C. If the switch operating Ambient Temperature is higher than 25°C, it will be lower than 20 mA. (At 60°C, it will be 5 to 10 mA.)
*3: This does not guarantee the water resistance of the cylinder. Also, the T2WLV switch is included with the product and shipped.
*4: Switches other than the model numbers listed above are also available. (Custom Product) For details, refer to P. 1457.

*Lead wire length, connector specification

Code	Content
Blank	1 m (Standard)
3	3 m (Option)
5	5 m (Option)
W	M8 Connector, 1PIN (+), 4PIN (−) Lead Wire 0.3 m

*5: Only T2WLH and T2WLV can be selected.

Example) Lead wire length
1 m T0H
3 m T0H3
5 m T0H5

❽ Number of Switches

Code	Content
R	With 1 pc on rod side
H	With 1 pc on head side
D	With 2 pcs

❾ Switch Mounting Position and Mounting Method

Code	Content		
Switch model number selection available			
Blank	Tie rod mounting	B / C / Blank	
B			
C			
Z	Band mounting		*1, *2
No switch model number selection			
Blank	Without tie rod		
A	Tie rod mounting	B / C / A	
B			
C			

*1: ❼Cannot be selected for Switch Model No. "H0□" and "H0Y□".
*2: In the case of band mounting, the switch body + mounting bracket set + band are shipped attached to the product.
*3: When setting the switch mounting position to the same side as the port surface, a thick fitting cannot be installed. Estimated mountable fitting outer diameter
Bore Size ø40 to ø63: ø17.5 or less
Bore Size ø80: ø28 or less

❿ Accessories

Code	Content		Bore Size ø40	ø50	ø63	ø80	
Blank	No accessories		●	●	●	●	
Y	Double yoke knuckle, Cast Iron (Pin, split pin, flat washer included)		●	●	●		
Y1	Double yoke knuckle, Steel (Pin, split pin, flat washer included)		●	●	●	●	
I	Single yoke knuckle, Steel		●	●	●		
K	Bellows		●	●	●		*3 *4 *5
D	With dog	Limit switch mounting base	●	●	●		
D1	Without dog		●	●	●		
Q	Clamp fitting		●	●	●		*1 *2

*1: Q cannot be mounted on the standard type because the Piston Rod projection length is different from the standard type.
*2: When selecting "Q", the ❶ clevis width becomes "A".
*3: Bellows maximum Ambient Temperature 100°C, instantaneous maximum temperature 200°C
*4: K (bellows) is not available for ❶ clevis width AL and BL.
*5: For type with bellows, a knuckle joint must be selected.
*6: Refer to the accessory selection table on P. 741 if accessories are available for selection.

Switch Single Unit Model No. Notation

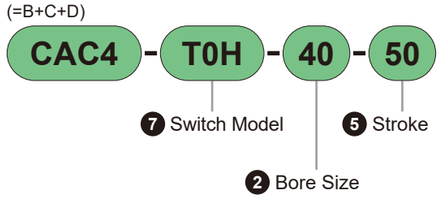
***Pay attention to direction when installing tie rod. Please refer to P. 764 to 766.**

MEMO

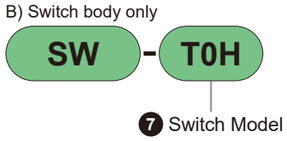
[Switch mounting: Tie rod method]

●T-type Switch

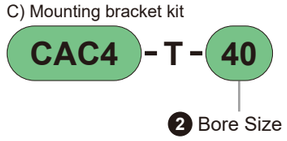
A) Switch body+Mounting bracket set (=B+C+D)



B) Switch body only



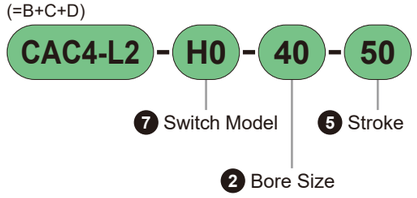
C) Mounting bracket kit



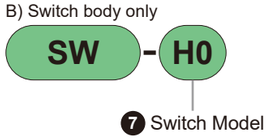
D) Mounting tie rod kit

●H-type Switch

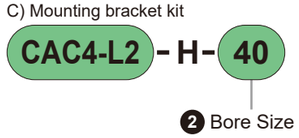
A) Switch body+Mounting bracket set (=B+C+D)



B) Switch body only



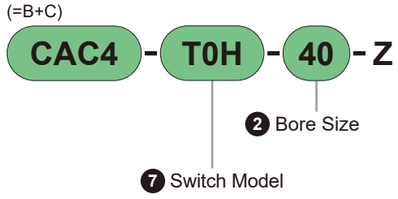
C) Mounting bracket kit



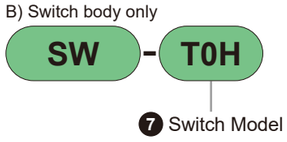
D) Mounting tie rod kit

[Switch mounting: Band Type

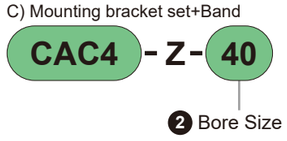
A) Switch body+Mounting bracket set+Band (=B+C)



B) Switch body only



C) Mounting bracket set+Band



Clamping
CAC4
UCAC2
CAC-N
UCAC-N
RCS2
RCC2
PCC
Cylinder Switch
Ending

Specifications

Item	CAC4			
Bore Size mm	ø40	ø50	ø63	ø80
Operating type	Double Acting Type			
Operating Fluid	Compressed Air			
Max Operating Pressure MPa	1.0			
Min Operating Pressure MPa	0.1			
Proof Pressure MPa	1.6			
Ambient Temperature °C	-10 to 60 (No freezing)			
Port Size	Rc1/4			Rc3/8
Standard Stroke mm	50, 75, 100, 125, 150			
Operating Piston Speed mm/s	50 to 500	50 to 400	50 to 300	
Cushion	With Air Cushion on Head Side			
Effective Air Cushion Length mm	13.5			15.4
Lubrication	Not Required (When lubricating, use Turbine Oil ISO VG32)			
Mounting Style	Double Clevis			

Note: Please use within the absorbed energy. Refer to the table below.

Stroke

Bore Size (mm)	Standard Stroke (mm)	Maximum Stroke (mm)	Min Stroke (mm)	Minimum stroke with switch (mm)
ø40	50, 75, 100, 125, 150	150	50	50
ø50				
ø63				
ø80				

Note: Strokes other than Standard Strokes are custom products.

Cushion Characteristic Table

Bore Size (mm)	Effective Cushion Length (mm)	Allowable Energy (J)	
		With cushion	Without cushion
ø40	13.5	5.14	0.137
ø50	13.5	6.41	0.137
ø63	13.5	11.37	0.205
ø80	15.4	25.4	0.360

●Air Cushion

The purpose of the air cushion is to absorb the kinetic energy held by the piston by utilizing the compressibility of air, and to prevent the piston and cover from forcefully striking at the stroke end. Therefore, the air cushion is not for operating the piston speed at low speed near the stroke end. Note that the table on the left shows the kinetic energy that can be absorbed by the air cushion. If the kinetic energy exceeds this value or if you want to avoid bouncing due to air compressibility, please consider a separate shock absorber.

Kinetic Energy (J) = $\frac{1}{2}$ ×Weight (kg)×[Speed (m/s)]^2

Cylinder Weight

(Unit: kg)

Bore Size (mm)	Product weight per stroke = 0 mm	Added weight per stroke = 100 mm	Accessory Weight					Switch Weight	Switch Mounting Bracket Weight			Mounting tie rod weight at stroke = 0 mm	Added weight per S = 10 mm of mounting tie rod
			Axial foot	Double Knuckle	Single knuckle	Limit switch mounting base	Dog fitting		T Type: Tie rod mounting	T Type: Band mounting	H type		
ø40	0.75	0.34	0.21	0.37	0.27	0.18	0.08	Refer to the Weight listed in the Switch Specifications on P. 1457.	0.021	0.007	0.024	0.019	0.003
ø50	0.82	0.36								0.008			
ø63	1.03	0.39								0.009			
ø80	2.80	0.60	-	0.95	-	-	-			0.010		0.030	

(Example) Product weight of CAC4-A-40-150-Y

- Stroke for 0 mm ..... 0.75 kg
- Additional weight for 150 mm stroke..... 0.34×$\frac{150}{100}$ = 0.51 kg
- Accessory weight (rod clevis) ..... 0.37 kg
- Product weight ..... 0.75+0.51+0.37=1.63 kg

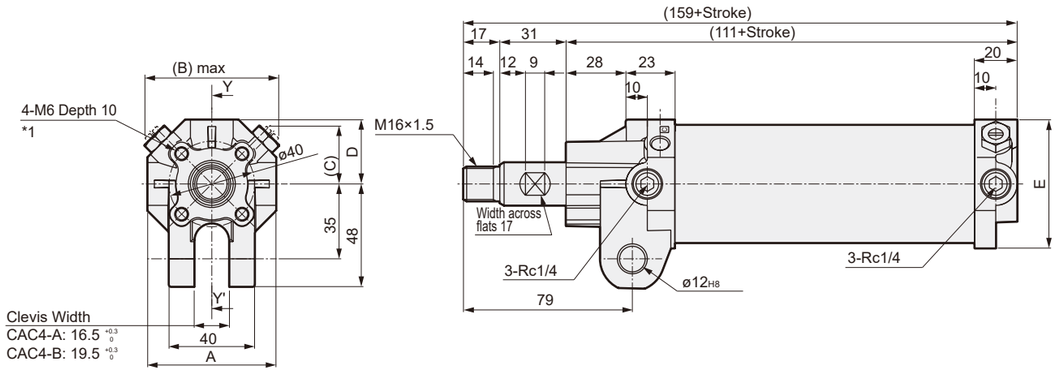
Theoretical Thrust Table

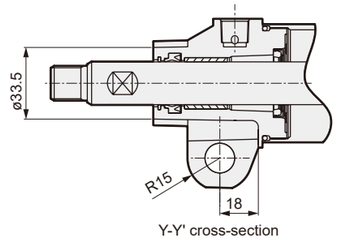
(Unit: N)

Bore Size (mm)	Operating Direction	Operating Pressure MPa										
		0.1	0.15	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
ø40	Push	1.26×10^2	1.88×10^2	2.51×10^2	3.77×10^2	5.03×10^2	6.28×10^2	7.54×10^2	8.80×10^2	1.01×10^3	1.13×10^3	1.26×10^3
	Pull	94.2	1.41×10^2	1.88×10^2	2.83×10^2	3.77×10^2	4.71×10^2	5.65×10^2	6.60×10^2	7.54×10^2	8.48×10^2	9.42×10^2
ø50	Push	1.96×10^2	2.95×10^2	3.93×10^2	5.89×10^2	7.85×10^2	9.82×10^2	1.18×10^3	1.37×10^3	1.57×10^3	1.77×10^3	1.96×10^3
	Pull	1.65×10^2	2.47×10^2	3.30×10^2	4.95×10^2	6.60×10^2	8.25×10^2	9.90×10^2	1.15×10^3	1.32×10^3	1.48×10^3	1.65×10^3
ø63	Push	3.12×10^2	4.68×10^2	6.23×10^2	9.35×10^2	1.25×10^3	1.56×10^3	1.87×10^3	2.18×10^3	2.49×10^3	2.81×10^3	3.12×10^3
	Pull	2.80×10^2	4.20×10^2	5.61×10^2	8.41×10^2	1.12×10^3	1.40×10^3	1.68×10^3	1.96×10^3	2.24×10^3	2.52×10^3	2.80×10^3
ø80	Push	5.03×10^2	7.54×10^2	1.01×10^3	1.51×10^3	2.01×10^3	2.51×10^3	3.02×10^3	3.52×10^3	4.02×10^3	4.52×10^3	5.03×10^3
	Pull	4.54×10^2	6.80×10^2	9.07×10^2	1.36×10^3	1.81×10^3	2.27×10^3	2.72×10^3	3.17×10^3	3.63×10^3	4.08×10^3	4.54×10^3

External Dimensions Diagram (Bore Size: ø40, ø50, ø63)

●Without knuckle





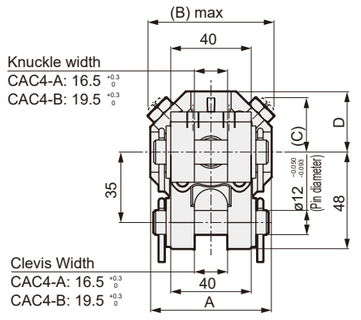
Code / Bore Size	A	(B)	(C)	D	E
ø40	60	63	27	30	60
ø50	60	63	27	30	60
ø63	70	66	33	35	70

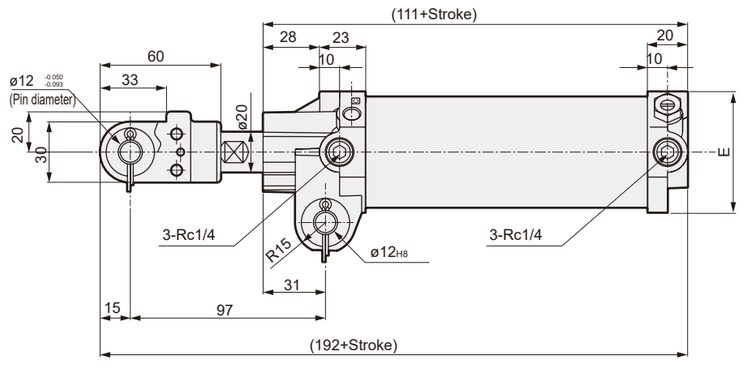
*1: 4-M6 is for fixing the axial foot or limit switch mounting base. Cannot be used for fixing the product.

***2: For dimensions with each switch, please refer to P. 764 to 766.**

External Dimensions Diagram (Bore Size: ø40, ø50, ø63)

●With double yoke knuckle (Y)

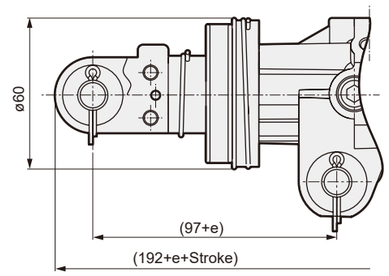




Code / Bore Size	A	(B)	(C)	D	E
ø40	60	63	27	30	60
ø50	60	63	27	30	60
ø63	70	66	33	35	70

*1: Clevis pin, knuckle pin, split pin, and flat washer are included.

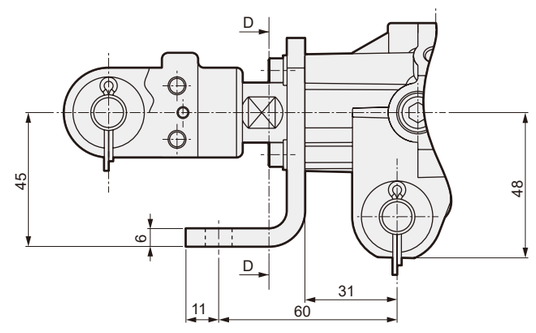
● With bellows (K)

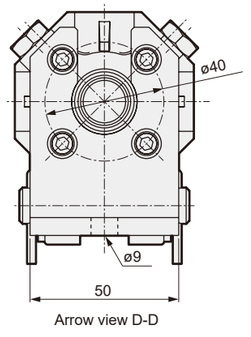


● Dimensions for units with bellows

Stroke	Double yoke knuckle, with bellows				
Code	50	51 to 75	76 to 100	101 to 125	126 to 150
e	0	10	18	31	31

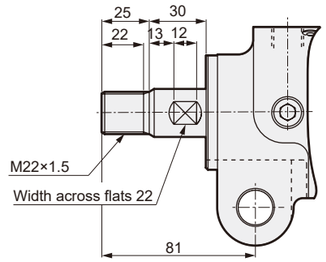
●Axial foot type
For ø40 to ø63



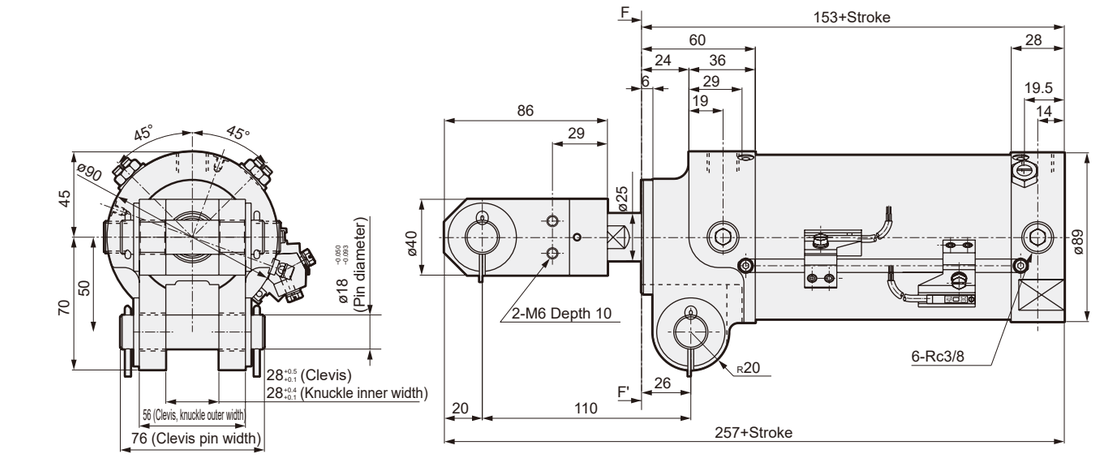


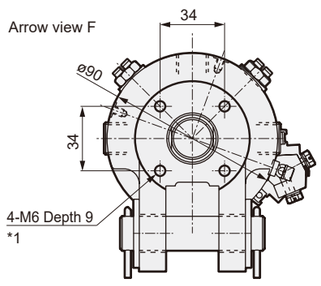
External dimensions diagram (Bore Size: ø80)

●Without knuckle



● With rod clevis (Y1)



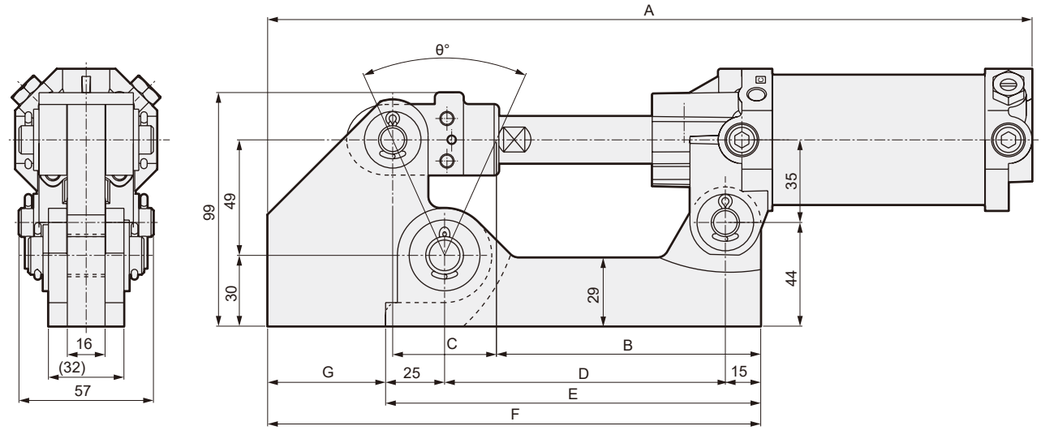


Arrow view F-F'

*1: 4-M6 is for fixing jigs that are not subjected to load. Cannot be used for fixing the product.

Dimensional Drawings

● Clamp bracket (ø40 to ø63)



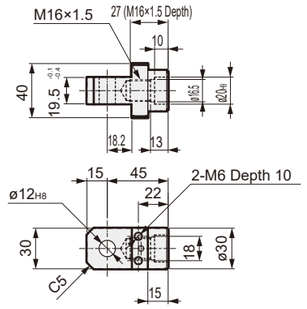
Code / Model No.	Stroke	A	B	C	D	E	F	G	θ°
CAC4-A-50-Q	50	324	97	44	119	159	209	50	48
CAC4-A-75-Q	75	372	107	70	142	182	232	50	71
CAC4-A-100-Q	100	415	115	90	160	200	250	50	85
CAC4-A-125-Q	125	468	128	120	188	228	278	50	101
CAC4-A-150-Q	150	513	128	140	198	238	298	60	110

*1: Since the rod protrusion dimension is different from the standard product, it cannot be included with the standard product.
*2: The diagram shows the dimensions when the rod is protruding. Dimension B represents the center position of the knuckle pin when the rod is retracted.
*3: With bellows also has the same dimensions.
*4: This product is a type that is mounted by welding.
*5: ø80 is not available.
*6: The diagram shows the external dimensions for CAC4-A-50-Q. The shape varies depending on the stroke.

Accessory External Dimensions

● Rod eye dimensions
For ø40 to ø63

Material: Steel, Black Oxide

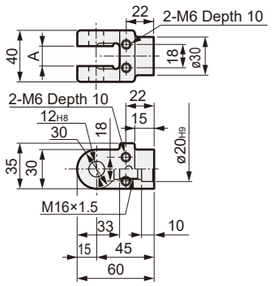


Model No.	Applicable Cylinder	Weight (kg)
CAC4-IB	CAC4-A(L), CAC4-B(L)	0.27

*Spring pin included.

● Rod clevis Cast Iron (Y) Dimensions
For ø40 to ø63

Material: Cast Iron, Manganese Phosphate



Model No.	A	Applicable Cylinder	Weight (kg)
CAC4-YA	16.5 $^{+0.3}_{0}$	CAC4-A(L)	0.37
CAC4-YB	19.5 $^{+0.3}_{0}$	CAC4-B(L)	0.37

*Pin, split pin, spring pin, and flat washer are included.

● Rod clevis steel (Y1) dimensions
For ø40 to ø63

Material: Steel, Black Oxide

Model No.	A	Applicable Cylinder	Weight (kg)
CAC4-Y1A	16.5 $^{+0.3}_{0}$	CAC4-A(L)	0.37
CAC4-Y1B	19.5 $^{+0.3}_{0}$	CAC4-B(L)	0.37

*Pin, split pin, spring pin, and flat washer are included.

For ø80

Model No.	Applicable Cylinder	Weight (kg)
CAC4-Y1-80	CAC4-A, CAC4-B	0.95

*Pin, split pin, spring pin, and flat washer are included.

● Clevis pin dimensions
For ø40 to ø63

Material: Steel, Zinc Chromate

Model No.	Applicable Cylinder	Weight (kg)
CAC4-P	CAC4-A(L), CAC4-B(L)	0.05

*Split pin and flat washer are included.

For ø80

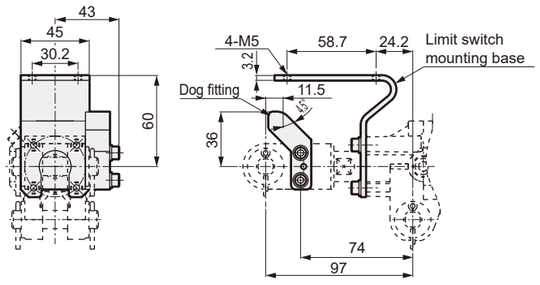
Model No.	Applicable Cylinder	Weight (kg)
CAC4-P-80	CAC4-80	0.15

*Split pin and flat washer are included.

Accessory External Dimensions

● Limit switch mounting base dimensions
● Dog bracket dimensions
For ø40 to ø63

Material: Steel, Black Oxide
Material: Steel, Black Oxide

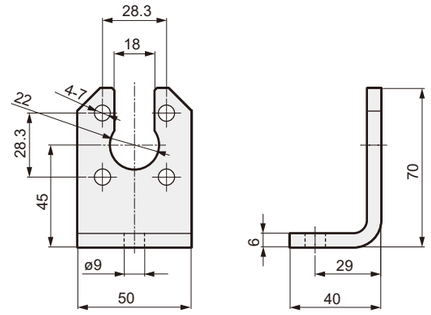


Model No.	Product Name	Applicable Cylinder	Weight (kg)
CAC4-L	Limit switch mounting base	CAC4-A, CAC4-B	0.18
CAC4-D	Dog fitting		0.08

*Please use a limit switch equivalent to WLH2 type [OMRON Corporation].

● AL, BL axial Foot Bracket
For ø40 to ø63

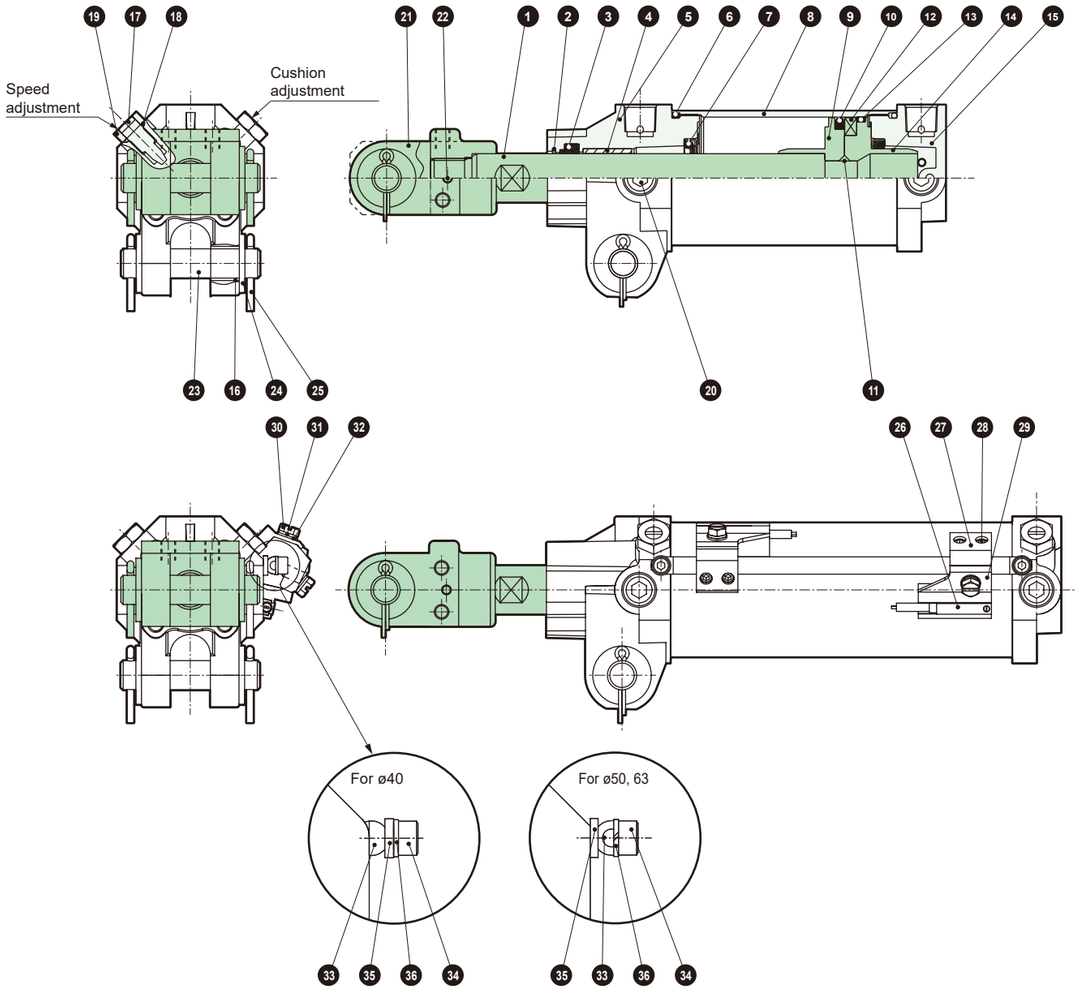
Material: Steel, Black Oxide



Model No.	Applicable Cylinder	Weight (kg)
CAC4-F	CAC4-AL, CAC4-BL	0.21

*Hexagon Socket head cap bolts and countersunk spring washers, 4 each, are included.

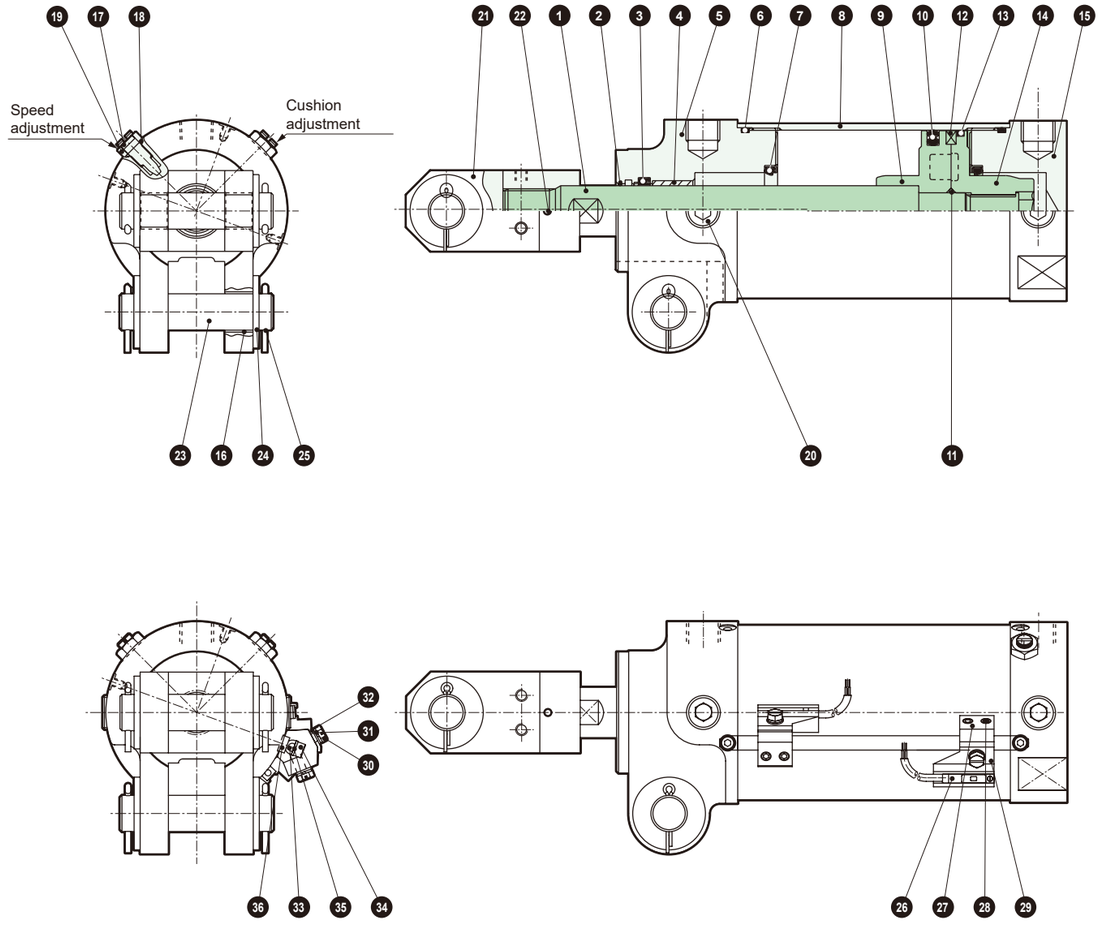
Internal structure diagram/materials (Bore Size: ø40 to ø63)



No.	Part Name	Material	Remarks	No.	Part Name	Material	Remarks
1	Piston Rod	Steel	Industrial Chrome Plating	20	Hexagon Socket head countersunk plug	Steel	Black Oxide
2	Metal Scraper	Copper Alloy		21	Double Knuckle	Y: Cast Iron Y1: Steel	Y: Manganese Phosphate Y1: Black Oxide finish
3	Rod Packing	Nitrile Rubber		22	Spring pin	Steel	Black Oxide
4	Bushing	Copper Alloy		23	Clevis pin	Steel	Black Oxide
5	Rod Cover	Aluminum Alloy	Chromate	24	Plain Washer	Steel	Chromate
6	Cylinder Gasket	Nitrile Rubber		25	Split pin	Steel	Chromate
7	Cushion packing	Nitrile Rubber, Steel	Chromate	With switch			
8	Cylinder Tube	Aluminum Alloy	Hard Anodized	26	Switch		
9	Piston (R)	Aluminum Alloy		27	Switch mounting base	Aluminum Alloy	
10	Piston Packing	Nitrile Rubber		28	Hexagon Socket Set Screw	Steel	Black Oxide
11	Piston Gasket	Nitrile Rubber		29	Switch holder	Aluminum Alloy	
12	Magnet	Plastic		30	Slotted Hexagon Bolt	Stainless Steel	
13	Wear Ring	Polyacetal		31	Spring washer	Stainless Steel	
14	Piston (H)	Aluminum Alloy		32	Plain Washer	Stainless Steel	
15	Head Cover	Aluminum Alloy	Chromate	33	Switch mounting rod	Steel	Zinc Chromate
16	Bushing for clevis	Steel, Copper		34	Hexagon Socket Head Cap Screw	Steel	Black Oxide
17	Needle	Copper Alloy		35	Spacer	Steel	Zinc Chromate
18	Needle Gasket	Nitrile Rubber		36	Spring washer	Steel	Black Oxide
19	Hexagon Nut	Steel	Chromate				

*1: The ❼cushion packing of is included with the rod side only when cushions are provided on both sides.

Internal structure diagram / Material (Bore Size: ø80)



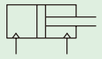
No.	Part Name	Material	Remarks	No.	Part Name	Material	Remarks
1	Piston Rod	Steel	Industrial Chrome Plating	20	Hexagon Socket head countersunk plug	Steel	Black Oxide
2	Metal Scraper	Copper Alloy		21	Double Knuckle	Steel	Black Oxide
3	Rod Packing	Nitrile Rubber		22	Spring pin	Steel	Black Oxide
4	Bushing	Copper Alloy		23	Clevis pin	Steel	Black Oxide
5	Rod Cover	Aluminum Alloy	Chromate	24	Plain Washer	Steel	Chromate
6	Cylinder Gasket	Nitrile Rubber		25	Split pin	Steel	Chromate
7	Cushion packing	Nitrile Rubber, Steel	Chromate	With switch			
8	Cylinder Tube	Aluminum Alloy	Hard Anodized	26	Switch		
9	Piston (R)	Aluminum Alloy		27	Switch mounting base	Aluminum Alloy	
10	Piston Packing	Nitrile Rubber		28	Hexagon Socket Set Screw	Steel	Black Oxide
11	Piston Gasket	Nitrile Rubber		29	Switch holder	Aluminum Alloy	
12	Magnet	Plastic		30	Slotted Hexagon Bolt	Stainless Steel	
13	Wear Ring	Polyacetal		31	Spring washer	Stainless Steel	
14	Piston (H)	Aluminum Alloy		32	Plain Washer	Stainless Steel	
15	Head Cover	Aluminum Alloy	Chromate	33	Switch mounting rod	Steel	Zinc Chromate
16	Bushing for clevis	Steel, Copper		34	Hexagon Socket Head Cap Screw	Steel	Black Oxide
17	Needle	Steel	Chromate	35	Spacer	Steel	Zinc Chromate
18	Needle Gasket	Nitrile Rubber		36	Spring washer	Steel	Black Oxide
19	Hexagon Nut	Steel	Chromate				

*1: The ❼cushion packing of is included with the rod side only when cushions are provided on both sides.

Clamp Cylinder, Sputter Adhesion Prevention Type

CAC4-G4 Series

● Bore Size: ø40, ø50, ø63, ø80

Circuit Diagram Code 

RoHS

Model No. Notation

Without Switch
(Built-in magnet for switch)

CAC4-G4 - A - 40 - B - 50 - R ——— Y1
Model No. 1 2 3 4 5 6 10

With Switch
(Built-in magnet for switch)

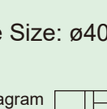
CAC4-G4 - A - 40 - B - 50 - R - T2YD - R - B - Y1
Model No. 1 2 3 4 5 6 7 8 9 10

Strong magnetic field resistant
(H0, H0Y switch)
With switch
(Built-in magnet for switch)

CAC4-G4L2 - A - 40 - B - 50 - R - H0 - R - B - Y1
Model No. 1 Clevis Width, 2 Bore Size, 3 Piping thread type, 4 Cushion, 5 Stroke, 6 Speed adjustment needle, 7 Switch Model, 8 Number of Switches, 9 Switch Mounting Position and Mounting Method, 10 Accessories

❶ Clevis Width (mm)

Code	Content	Bore Size ø40	ø50	ø63	ø80
Blank	28				●
A	16.5	●	●	●	
B	19.5	●	●	●	
AL	16.5 (Axial foot type)	●	●	●	
BL	19.5 (Axial foot type)	●	●	●	



Note: Clevis pins, split pins, and flat washers are included to A, B, AL, and BL. Clevis width and double yoke knuckle width are the same dimension.

❷ Bore Size (mm)

Code	Contents
40	ø40
50	ø50
63	ø63
80	ø80

Piping thread type

Code	Content
Blank	Rc Thread
N	NPT Thread (Custom Order Product)
G	G thread (Custom product)

❹ Cushion

Code	Content
Blank	With Air Cushion on Head Side (Port thread: When blank)
H	With Air Cushion on Head Side (Port thread: When N, G)
B	With Air Cushion on Both Sides
N	Without cushion

❺ Stroke (mm)

Code	Content
50	50
75	75
100	100
125	125
150	150

❻ Speed adjustment needle

Code	Content	
Blank	Both sides included	
R	Rod side included	
H	Head side included	
N	None	

❼ Switch Model

For switch details, refer to P. 1457. Switches are pre-assembled on the product and shipped, except in the case of band mounting.

	Indicator LED Special Function	Wiring (Output)	Load Voltage (V) AC	DC	Load Current (mA) AC	DC	Lead wire *1 Straight	L-shape	
Contact	2-Color for AC Magnetic Field	2-wire	—	24 ± 10%	—	5 to 20	T2YD□	–	
Solid State	2-Color for AC Magnetic Field		—		—		T2YDT□	–	
Solid State	With 2-color AC magnetic field proof connector		—	24 ± 10%	—		T2YDU	–	
Reed	1-Color For strong magnetic field	2-wire	110	12/24	7 to 20	5 to 50	H0□	-	
Reed	2-color For strong magnetic field		—	24 ± 10%	—	5 to 20	H0Y□	-	

*1: Insert the code selected in the "Lead wire length" table into "□" of the switch model number.
*2: Switches other than the above switch model numbers are also available. (Custom Product) For details, refer to P. 1457.

***Lead Wire Length**

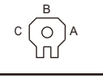
Code	Content
Blank	1 m (Standard)
3	3 m (Option)
5	5m (Option)

Example) Lead wire length
1 m H0
3 m H0 3
5 m H0 5

❽ Number of Switches

Code	Content
R	With 1 pc on rod side
H	With 1 pc on head side
D	With 2 pcs

❾ Switch Mounting Position and Mounting Method

	Code	Content	
	Switch model number selection available		
*1, *2	Blank	Tie rod mounting	
*1, *2	B		
*1, *2	C		
*1, *2	Z	Band mounting	
	No switch model number selection		
	Blank	Without tie rod	
	A	Tie rod mounting	
	B		
	C		

*1: Cannot be selected for ❼Switch model No. "H0□" and "H0Y□".
*2: In the case of band mounting, the switch body + mounting bracket set + band are shipped attached to the product.
*3: When setting the switch mounting position to the same side as the port surface, a thick fitting cannot be installed.
Estimated mountable fitting outer diameter
Bore Size ø40 to ø63: ø17.5 or less
Bore Size ø80: ø28 or less

❿ Accessories

Code	Content		Bore Size ø40	ø50	ø63	ø80	
Blank	Accessories (Knuckle) None		●	●	●	●	
Y	Double yoke knuckle, Cast Iron (Pin, split pin, flat washer included)		●	●	●		
Y1	Double yoke knuckle, Steel (Pin, split pin, flat washer included)		●	●	●	●	
I	Single yoke knuckle, Steel		●	●	●		
D	With dog	Limit Switch Mounting Base	●	●	●		
D1	Without dog		●	●	●		
*1 *2 Q	Clamp fitting		●	●	●		

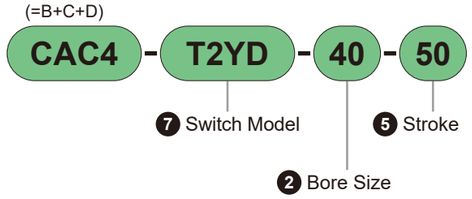
*1: Q cannot be mounted on the standard type because the Piston Rod projection length is different from the standard type.
*2: When selecting "Q", the ❶ clevis width becomes "A".
*3: Refer to the accessory selection table on P. 741 if accessories are available for selection.

Switch Single Unit Model No. Notation

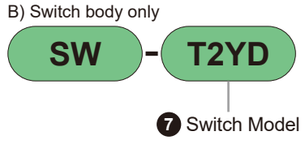
MEMO

● T2YD□ switch

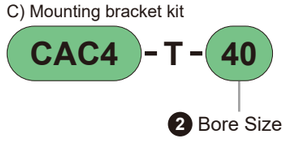
A) Switch body+Mounting bracket set (=B+C+D)



B) Switch body only



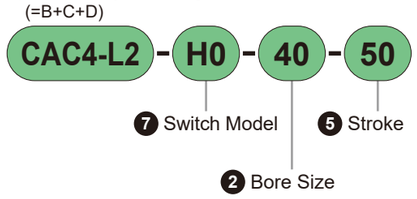
C) Mounting bracket kit



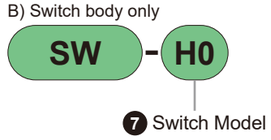
D) Mounting tie rod kit

●H-type Switch

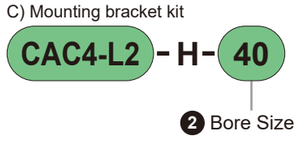
A) Switch body+Mounting bracket set (=B+C+D)



B) Switch body only



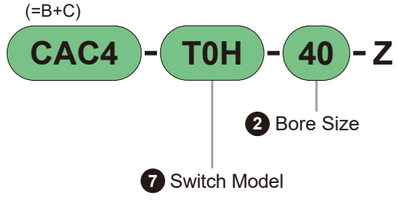
C) Mounting bracket kit



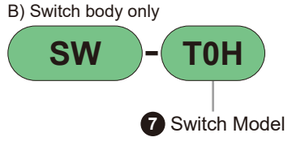
D) Mounting tie rod kit

[Switch mounting: Band Type

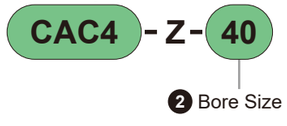
A) Switch body+Mounting bracket set+Band (=B+C)



B) Switch body only



C) Mounting bracket set+Band



Clamping
CAC4
UCAC2
CAC-N
UCAC-N
RCS2
RCC2
PCC
Cylinder Switch
Ending

Specifications

Item		CAC4-G4/CAC4-G4L2			
Bore Size	mm	ø40	ø50	ø63	ø80
Operation type		Double Acting Type			
Operating Fluid		Compressed Air			
Max Operating Pressure	MPa	1.0			
Min Operating Pressure	MPa	0.1			
Proof Pressure	MPa	1.6			
Ambient Temperature	°C	-10 to 60 (however, no freezing)			
Port Size		Rc1/4			Rc3/8
Standard Stroke	mm	50, 75, 100, 125, 150			
Operating Piston Speed	mm/s	50 to 500	50 to 400	50 to 300	
Cushion		With Air Cushion on Head Side			
Effective Air Cushion Length	mm	13.5			15.4
Lubrication		Not Required (When lubricating, use Turbine Oil ISO VG32)			
Mounting Style		Double Clevis			

Note: Please use within the allowable absorbed energy. Please refer to the table below (Cushion Characteristic Table).

Stroke

Bore Size (mm)	Standard Stroke (mm)	Maximum Stroke (mm)	Min Stroke (mm)	Minimum stroke with switch (mm)
ø40	50, 75, 100, 125, 150	150	50	50
ø50				
ø63				
ø80				

Note: Strokes other than Standard Strokes are custom products.

Cushion Characteristic Table

Bore Size (mm)	Effective Cushion Length (mm)	Allowable Absorption Energy (J)	
		With cushion	Without cushion
ø40	13.5	5.14	0.137
ø50	13.5	6.41	0.137
ø63	13.5	11.37	0.205
ø80	15.4	25.4	0.360

●Air Cushion

The purpose of the air cushion is to absorb the kinetic energy held by the piston by utilizing the compressibility of air, and to prevent the piston and cover from forcefully striking at the stroke end. Therefore, the air cushion is not for operating the piston speed at low speed near the stroke end. Note that the table on the left shows the kinetic energy that can be absorbed by the air cushion. If the kinetic energy exceeds this value or if you want to avoid bouncing due to air compressibility, please consider a separate shock absorber.

Kinetic Energy (J) $= \frac{1}{2} \times$ Weight (kg) $\times$ {Speed (m/s)}^{2}

Cylinder Weight

(Unit: kg)

Bore Size (mm)	Product weight per stroke = 0 mm	Added weight per stroke = 100 mm	Accessory Weight					Switch Weight	Switch Mounting Bracket Weight			Mounting tie rod weight at stroke = 0 mm	Added weight per S = 10 mm of mounting tie rod
			Axial foot	Double Knuckle	Single knuckle	Limit switch mounting base	Dog fitting		T Type		H type		
									Tie rod mounting	Band mounting			
ø40	0.75	0.34	0.21	0.37	0.27	0.18	0.08	Refer to the Weight listed in the Switch Specifications on P. 1457.	0.021	0.007	0.024	0.019	0.003
ø50	0.82	0.36								0.008			
ø63	1.03	0.39								0.009			
ø80	2.80	0.60	-	0.95	-	-	-			0.010		0.030	

(Example) Product weight of CAC4-G4-A-40-150-Y

- Stroke for 0 mm ..... 0.75 kg
- Additional weight for 150 mm stroke..... $0.34 \times \frac{150}{100} = 0.51$ kg
- Accessory weight (rod clevis) ..... 0.37 kg
- Product weight ..... 0.75+0.51+0.37=1.63 kg

Theoretical Thrust Table

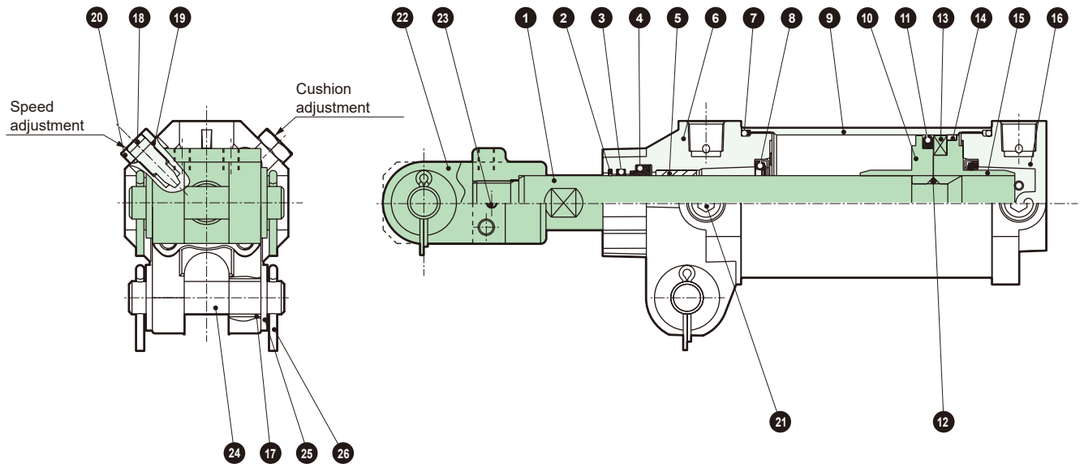
(Unit: N)

Bore Size (mm)	Operating Direction	Operating Pressure MPa										
		0.1	0.15	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
ø40	Push	1.26×10^2	1.88×10^2	2.51×10^2	3.77×10^2	5.03×10^2	6.28×10^2	7.54×10^2	8.80×10^2	1.01×10^3	1.13×10^3	1.26×10^3
	Pull	94.2	1.41×10^2	1.88×10^2	2.83×10^2	3.77×10^2	4.71×10^2	5.65×10^2	6.60×10^2	7.54×10^2	8.48×10^2	9.42×10^2
ø50	Push	1.96×10^2	2.95×10^2	3.93×10^2	5.89×10^2	7.85×10^2	9.82×10^2	1.18×10^3	1.37×10^3	1.57×10^3	1.77×10^3	1.96×10^3
	Pull	1.65×10^2	2.47×10^2	3.30×10^2	4.95×10^2	6.60×10^2	8.25×10^2	9.90×10^2	1.15×10^3	1.32×10^3	1.48×10^3	1.65×10^3
ø63	Push	3.12×10^2	4.68×10^2	6.23×10^2	9.35×10^2	1.25×10^3	1.56×10^3	1.87×10^3	2.18×10^3	2.49×10^3	2.81×10^3	3.12×10^3
	Pull	2.80×10^2	4.20×10^2	5.61×10^2	8.41×10^2	1.12×10^3	1.40×10^3	1.68×10^3	1.96×10^3	2.24×10^3	2.52×10^3	2.80×10^3
ø80	Push	5.03×10^2	7.54×10^2	1.01×10^3	1.51×10^3	2.01×10^3	2.51×10^3	3.02×10^3	3.52×10^3	4.02×10^3	4.52×10^3	5.03×10^3
	Pull	4.54×10^2	6.80×10^2	9.07×10^2	1.36×10^3	1.81×10^3	2.27×10^3	2.72×10^3	3.17×10^3	3.63×10^3	4.08×10^3	4.54×10^3

Dimensional Drawings

Same as Double Acting/single rod type. Please refer to P. 748 to 751. Also, for accessories, please refer to P. 752, P. 753.

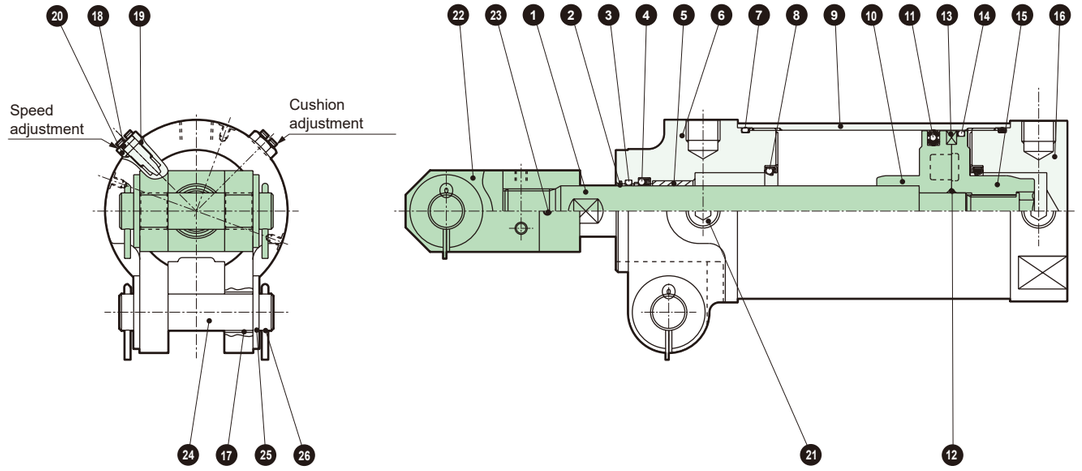
Internal structure diagram/materials (Bore Size: ø40 to ø63)



Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Piston Rod	Steel	Industrial Hard Chrome Plating	15	Piston (H)	Aluminum Alloy	
2	Metal Scraper	Copper Alloy		16	Head Cover	Aluminum Alloy	Chromate
3	Lube keeper	Special rubber		17	Bushing for clevis	Steel, Copper	
4	Rod Packing	Nitrile Rubber		18	Needle	Copper Alloy	
5	Bushing	Copper Alloy		19	Needle Gasket	Nitrile Rubber	
6	Rod Cover	Aluminum Alloy	Chromate	20	Hexagon Nut	Steel	Chromate
7	Cylinder Gasket	Nitrile Rubber		21	Hexagon Socket head countersunk plug	Steel	Black Oxide
8	Cushion Packing	Nitrile Rubber, Steel	Chromate	22	Double Knuckle	Y: Cast Iron Y1: Steel	Y: Manganese Phosphate Y1: Black Oxide finish
9	Cylinder Tube	Aluminum Alloy	Hard Anodized				
10	Piston (R)	Aluminum Alloy		23	Spring pin	Steel	Black Oxide
11	Piston Packing	Nitrile Rubber		24	Clevis pin	Steel	Black Oxide
12	Piston Gasket	Nitrile Rubber		25	Plain Washer	Steel	Chromate
13	Magnet	Plastic		26	Split pin	Steel	Chromate
14	Wear Ring	Polyacetal					

Note: ❽cushion packing is attached to the rod side only when both sides are cushioned.

Internal structure diagram / Material (Bore Size: ø80)



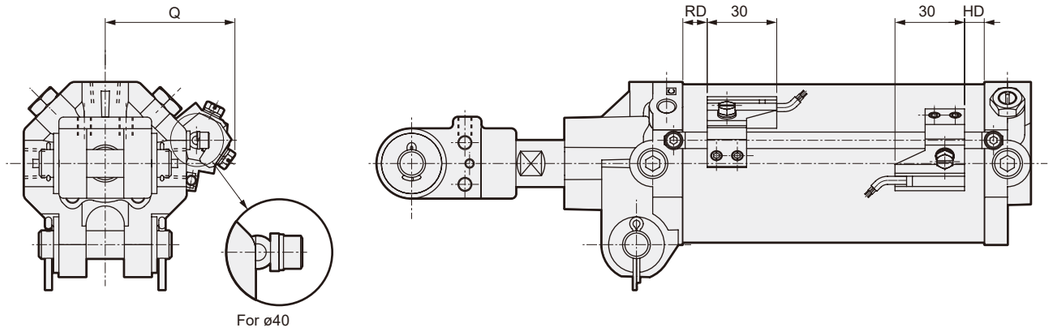
Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Piston Rod	Steel	Industrial Hard Chrome Plating	14	Wear Ring	Polyacetal	
2	Metal Scraper	Copper Alloy		15	Piston (H)	Aluminum Alloy	
3	Lube keeper	Special rubber		16	Head Cover	Aluminum Alloy	Chromate
4	Rod Packing	Nitrile Rubber		17	Bushing for clevis	Steel, Copper	
5	Bushing	Copper Alloy		18	Needle	Steel	Chromate
6	Rod Cover	Aluminum Alloy	Chromate	19	Needle Gasket	Nitrile Rubber	
7	Cylinder Gasket	Nitrile Rubber		20	Hexagon Nut	Steel	Chromate
8	Cushion Packing	Nitrile Rubber, Steel	Chromate	21	Hexagon Socket head countersunk plug	Steel	Black Oxide
9	Cylinder Tube	Aluminum Alloy	Hard Anodized	22	Double Knuckle	Steel	Black Oxide
10	Piston (R)	Aluminum Alloy		23	Spring pin	Steel	Black Oxide
11	Piston Packing	Nitrile Rubber		24	Clevis pin	Steel	Black Oxide
12	Piston Gasket	Nitrile Rubber		25	Plain Washer	Steel	Chromate
13	Magnet	Plastic		26	Split pin	Steel	Chromate

Note: ❽cushion packing is attached to the rod side only when both sides are cushioned.

CAC4 Series External Dimensions Diagram with Switch

● T0H/V, T5H/V, T2H/V, T3H/V, T3PH/V, T2H/VR3, T2WH/V, T3WH/V, T2WLH/V

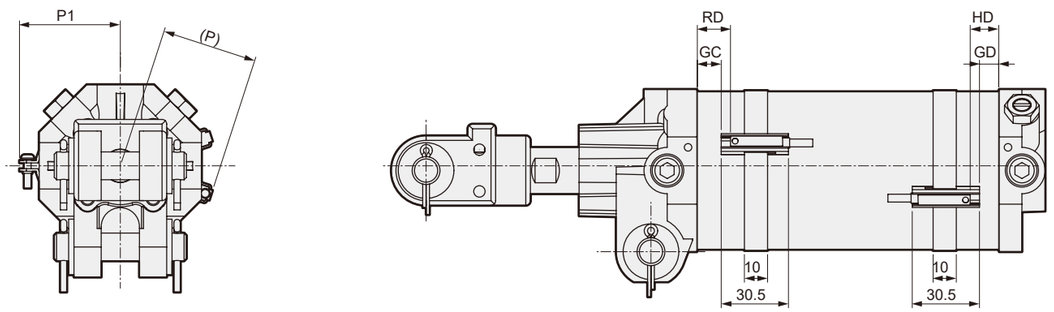
Tie rod mounting
・CAC4, CAC4-G4



Code / Bore Size (mm)	Q	T0, T5, T2, T3, T3P, T2□R3		T2W, T3W, T2WL	
		RD	HD	RD	HD
ø40	46	10.5	8.5	13.5	11.5
ø50	50.5	10.5	8.5	13.5	11.5
ø63	56	10.5	8.5	13.5	11.5
ø80	65	26	19	28.5	21.5

Note: For switch mountability, refer to the model number display method for each variation.

Band mounting
・CAC4, CAC4-G4



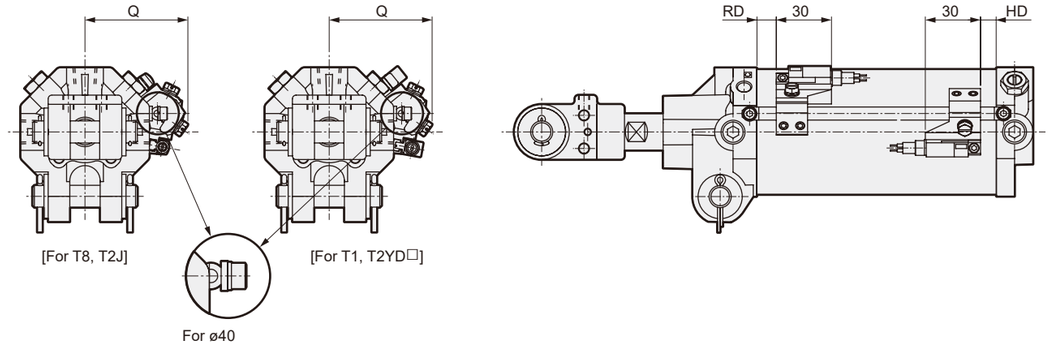
Code / Bore Size (mm)	P	P1	T0, T5, T2, T3, T3P, T2□R3				T2W, T3W, T2WL			
			GC	GD	RD	HD	GC	GD	RD	HD
ø40	30	31	6.5	4.5	10.5	8.5	9.5	7.5	13.5	11.5
ø50	34.5	36	6.5	4.5	10.5	8.5	9.5	7.5	13.5	11.5
ø63	41	42.5	6.5	4.5	10.5	8.5	9.5	7.5	13.5	11.5
ø80	50	52	19	12	26	19	22	15	28.5	21.5

Note: For switch mountability, refer to the model number display method for each variation.

CAC4 Series External Dimensions Diagram with Switch

● T8H/V, T2JH/V, T1H/V, T2YD, T2YDT, T2YDU

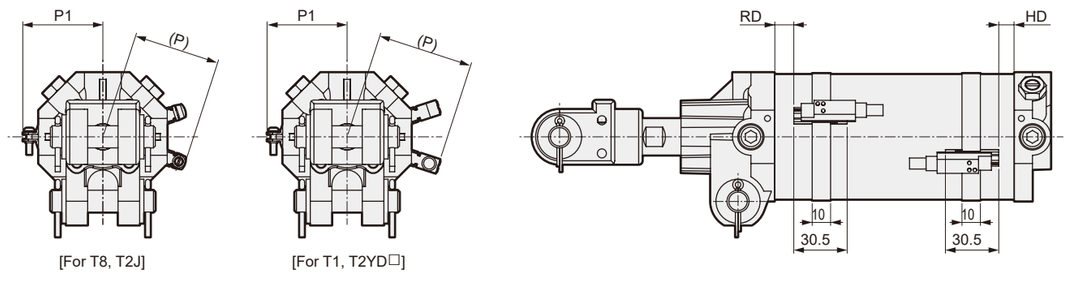
Tie rod mounting
・CAC4, CAC4-G4



Code / Bore Size (mm)	Q	T8		T2J		T1, T2YD, T2YDT, T2YDU	
		RD	HD	RD	HD	RD	HD
ø40	46	5.5	3.5	10.5	8.5	10.5	8.5
ø50	50.5	5.5	3.5	10.5	8.5	10.5	8.5
ø63	56	5.5	3.5	10.5	8.5	10.5	8.5
ø80	65	20.5	13.5	26	19	26	19

Note: For switch mountability, refer to the model number display method for each variation.

Band mounting
・CAC4, CAC4-G4



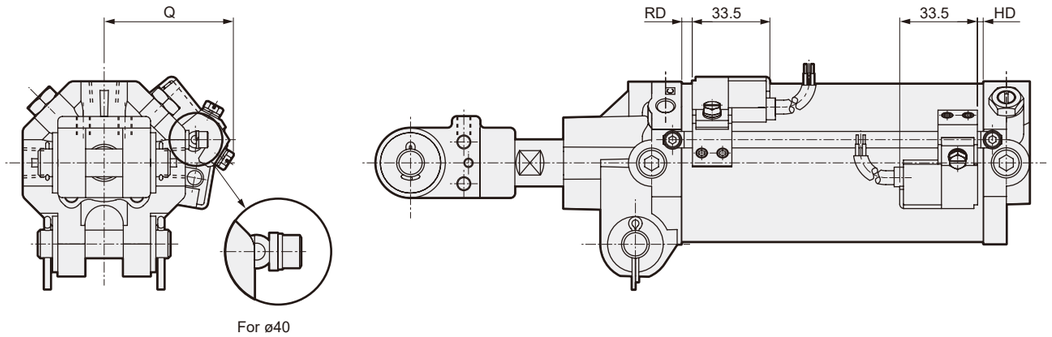
Code / Bore Size (mm)	P	P1	T8		T2J				T1, T2YD, T2YDT, T2YDU			
			RD	HD	P	P1	RD	HD	P	P1	RD	HD
ø40	36	31	5.5	3.5	36	31	10.5	8.5	41	31	10.5	8.5
ø50	40	36	5.5	3.5	40	36	10.5	8.5	45.5	36	10.5	8.5
ø63	46.5	42.5	5.5	3.5	46.5	42.5	10.5	8.5	52	42.5	10.5	8.5
ø80	56	52	20.5	13.5	56	52	26	19	61	52	26	19

Note: For switch mountability, refer to the model number display method for each variation.

CAC4 Series External Dimensions Diagram with Switch

●H0, H0Y

Tie rod mounting
・CAC4-L2, CAC4-G4L2



For ø40

Code / Bore Size (mm)	Q	H0, H0Y	
		RD	HD
ø40	46	4.5	2.5
ø50	50.5	4.5	2.5
ø63	56	4.5	2.5
ø80	65	19.5	12.5

Note: For switch mountability, refer to the model number display method for each variation.

Pneumatic Components

To Use This Product Safely

Be sure to read this before use. For general cylinder information, see Intro 41, and for cylinder switches, see P. 1512.

Individual Precautions: Clamp cylinder CAC4 Series

Design / Selection

1. Weld spatter resistant type CAC4-G4

Warning

■ This cylinder series has improved durability in a spatter scattering atmosphere compared to general-purpose cylinders. However, please note that durability may be inferior to general type cylinders when used in other atmospheres.

During Use

1. Common (T type switch: Band mounting method)

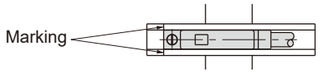
Warning

■ When Moving the Switch Position in the Stroke Direction

● The 1-color indicator switch can be finely adjusted by about ±3 mm from the mounting position at the time of shipment. If the adjustment range exceeds ±3 mm, or if fine-tuning the position of a 2-color indicator switch, move the band position.

● Loosen the switch mounting screw, move the switch along the rail, and tighten at the specified position. For T2, T3, T0, T5, use a flat-head screwdriver (watchmaker's screwdriver, precision screwdriver, etc.) with a grip diameter of 5 to 6 mm, tip shape width of 2.4 mm or less, and thickness of 0.3 mm or less to tighten the switch fixing screw with a tightening torque of 0.1 to 0.2 N·m. For T□C, T2J, T2Y, T3Y, tighten with a torque of 0.5 to 0.7 N·m.

● The switch rail has a marking 4 mm from the end face of the rail. Use it as a guide for mounting position when replacing the switch. Note that the marking on the switch rail is set to the switch maximum sensitivity position, which is the switch mounting position of the external dimensions. If the switch type changes or the band is moved, the maximum sensitivity position changes, so adjust the position each time.

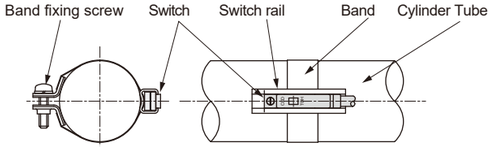


■ When Moving the Switch Position in the Circumferential Direction

● Loosen the band fixing screw, move the switch rail circumferentially, and tighten it at the specified position. The tightening torque for the band fixing screw is 0.6 to 0.8 N·m.

■ When Moving the Band Position

● Loosen the band fixing screw, move the switch rail and band along the cylinder tube, and tighten them at the specified position. The tightening torque for the band fixing screw is 0.6 to 0.8 N·m.



For precautions during mounting, installation, adjustment, use, and maintenance, refer to "During Use" in this catalog and the CKD Components Product website (https://www.ckd.co.jp/kiki/en/) -> "Model No." -> Instruction Manual.

UCAC2

Clamp cylinder with drop prevention

ø50, ø63

Clamp Cylinder

Overview

The clamp cylinder with fall prevention is a fall prevention cylinder developed in consideration of equipment maintainability. The new swash plate mechanism locks the rod when air supply stops due to power outage, accident, etc., preventing the load from falling under its own weight. Moreover, due to the unidirectional lock, the rod can be moved in the opposite direction, allowing for emergency removal of workpieces, etc.

Features

Drop prevention is possible throughout the entire stroke

Drop prevention is possible at any position where the Piston Rod is stationary during the entire stroke, including the stroke end.

2 types of lock direction.

The lock direction can be selected from forward direction lock and reverse direction lock type.

Unidirectional lock makes the opposite direction free.

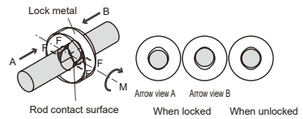
Even if a workpiece is caught, the rod moves in the free direction, so the workpiece can be removed.

Various detection switches can be installed.

Cylinder switches for various purposes such as non-contact type and strong magnetic field proof switches can be installed.

Drop prevention structure.

Installation of a new swash plate type lock mechanism has made fall prevention at free position possible. By applying rotational force M to the lock metal, axial force F is generated, holding the rod.



Selectable Switch Mounting Method

In addition to the conventional tie rod method, a band method that allows free rotation (circumferential direction) and movement adjustment of the switch has been added.

CONTENTS

●Double Acting, Single Rod Type (UCAC2)	772
Accessories External Dimensions Diagram	780
Outer Dimensions Diagram with Switch	782
⚠Precautions for Use	784

Variation Table

●: Standard, ◎: Option

Variation	Model No. JIS Symbol	Bore Size (mm)	Standard Stroke (mm)					Min Stroke (mm)	Max Stroke (mm)	Options/Accessories								Switch	Page
			50	75	100	125	150			Bellows (100 °C) K	Limit switch mounting base with dog D	Limit switch mounting base without dog D1	Toggle fitting Q	Double knuckle joint Cast Iron Y	Double knuckle joint Steel Y1	Single knuckle joint Steel I		
Double Acting type, single rod type	UCAC2	ø50, ø63	●	●	●	●	●	50	150	◎	◎	◎	◎	◎	◎	◎	◎	772

Variation Combination Availability Table

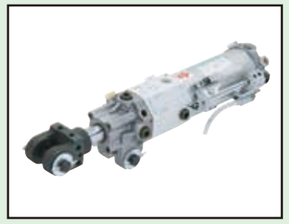
◎Mark: Option
○Mark: Custom-made
× Mark: Not available

Category		Category	Variation			Piping thread			Switch		
			Double Acting type (Built-in magnet for T-type switch)	Double Acting type (Built-in magnet for strong magnetic field switch H0□)		NPT	G		T type switch	H0 Switch	
		Code	None	L2		N	G		Separately Shown	Separately Shown	
Variation	Double Acting type (Built-in magnet for T-type switch)	Blank		x		○	○		◎	x	
	Double Acting type (Built-in magnet for strong magnetic field switch H0□)	L2				○	○		x	◎	
Piping thread	NPT	N					x		-	-	
	G	G							-	-	
Switch	T type switch	Separately Shown								x	
	H0 switch	Separately Shown									

Accessory Combination Availability Table

Category		Category		Accessories							
				Double yoke knuckle, Cast Iron	Double yoke knuckle, Steel	Single yoke knuckle, Steel	With bellows, Neoprene	Limit switch mounting base with dog	Limit switch mounting base without dog	With clamp fitting	
		Code	Blank	Y	Y1	I	K	D	D1	Q	
Accessories		Blank		◎	◎	◎	x	x	◎	x	
	Double yoke knuckle, Cast Iron	Y			x	x	◎	◎	◎	◎	
	Double yoke knuckle, Steel	Y1				x	◎	◎	◎	◎	
	Single yoke knuckle, Steel	I					◎	◎	◎	x	
	With bellows, Neoprene	K						x	×	x	
	Limit switch mounting base with dog	D							×	x	
	Without dog	D1								x	
	With clamp fitting	Q									

MEMO



Clamp cylinder with drop prevention

UCAC2 Series

● Bore Size: ø50, ø63

RoHS

Model No. Notation

Without Switch
(Built-in magnet for switch)

UCAC2 - A - 50 N B - 50 N - B ——— Y1
Model No. ① ② ③ ④ ⑤ ⑥ ⑦ ⑪

With Switch
(Built-in magnet for switch)

UCAC2 - A - 50 N B - 50 N - B - T2H - D B - Y1
Model No. ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪

For strong magnetic field
(H0, H0Y switch)

With switch
(Built-in magnet for switch)

UCAC2-L2 - A - 50 N B - 50 N - B - H0 - D B - Y1
Model No. ① ② ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪

① Clevis Width
② Bore Size
④ Cushion
⑤ Stroke
⑥ Speed adjustment needle
⑦ Lock direction, Bypass tube position
⑧ Switch Model
⑨ Number of Switches
⑩ Switch Mounting Position and Mounting Method
⑪ Accessories
Piping thread type

① Clevis Width (mm)

Code	Content	
A	16.5	
B	19.5	
AL	16.5 (Axial foot type)	
BL	19.5 (Axial foot type)	

Note: Clevis pin, split pin, and flat washer are attached to A, B, AL, BL. Clevis width and double yoke knuckle width are the same dimension.

② Bore Size (mm)

Code	Content
50	ø50
63	ø63

③ Piping thread type

Code	Content
Blank	Rc Thread
N	NPT Thread (Custom Order Product)
G	G thread (Custom product)

④ Cushion

Code	Content
Blank	With head end cushion (Port thread: When blank)
H	With head end cushion (Port thread: When N, G)
B	With Cushion on Both Sides
N	Without Cushion

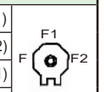
⑤ Stroke

Code	Content
50	50
75	75
100	100
125	125
150	150

⑥ Speed adjustment needle

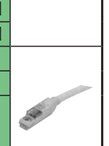
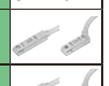
Code	Content
Blank	Both sides included
R	Rod side included
H	Head side included
N	None

⑦ Lock direction/Bypass tube position

Code	Content	
F	Forward direction lock (Bypass tube position F, Port position F1)	
F1	Forward direction lock (Bypass tube position F1, Port position F2)	
F2	Forward direction lock (Bypass tube position F2, Port position F1)	
B	Reverse Direction Lock	

⑧ Switch Model

For switch details, refer to P. 1457. Switches are pre-assembled on the product before shipment.

Contact	Indicator LED Special Function	Wiring (Output)	Load Voltage (V) AC	Load Voltage (V) DC	Load Current (mA) AC voltage	Load Current (mA) DC voltage	Lead Wire Straight	Lead Wire L-shape	
Solid State	1-Color	2-wire	85 to 265	—	5 to 100	—	T1H□	T1V□	
			—	10 to 30	—	5 to 20 *2	T2H□	T2V□	
		3-wire (NPN)	—	30 or less	—	100 or less	T3H□	T3V□	
		3-wire (PNP)	—		—		T3PH□	T3PV□	
	2-Color	2-wire	—	24 ± 10%	—	5 to 20	T2WH□	T2WV□	
		3-wire (NPN)	—	30 or less	—	50 or less	T3WH□	T3WV□	
	For 2-color AC Magnetic Field	2-wire	—	24 ± 10%	—	5 to 20	T2YD□	–	
			—		—		T2YDT□	–	
	With 2-color AC magnetic field proof connector		—		—		T2YDU	–	
	1-Color Off-Delay Type		—	10 to 30	—	5 to 20 *2	T2JH□	T2JV□	
	1-color Flexible Lead Wire Type		—	10 to 30	—		T2HR3	T2VR3	
Reed	1-Color	2-wire	110	12/24	7 to 20	5 to 50	T0H□	T0V□	
	No Indicator LED		110	5/12/24	20 or less	50 or less	T5H□	T5V□	
	1-Color		110/220	12/24	7 to 20 / 7 to 10	5 to 50	T8H□	T8V□	
	1-color For Strong Magnetic Fields		110	12/24	7 to 20	5 to 50	H0□	-	
	2-color For strong magnetic field		—	24 ± 10%	—	5 to 20	H0Y□	-	

*1: Insert the code selected in the "Lead wire length" table into "□" of the switch model number.
*2: The maximum load current value above, 20 mA, is at 25°C. If the switch operating Ambient Temperature is higher than 25°C, it will be lower than 20 mA. (At 60°C, it will be 5 to 10 mA.)
*3: Switches other than the above models are also available. (Custom Product) For details, refer to P. 1457.

***Lead wire length**

Code	Content
Blank	1 m (Standard)
3	3 m (Option)
5	5 m (Option)

Example) Lead wire length
1 m H0H
3 m H0H3
5 m H0H5

⑨ Number of Switches

Code	Content
R	With 1 pc on rod side
H	With 1 pc on head side
D	With 2 pcs
T	With 3 pcs

⑩ Switch Mounting Position and Mounting Method

Code	Content	
Blank	Tie rod mounting	
B		
C		
*2 Z	Band mounting	
* Selectable only when no switch model number is selected Tie rod mounting position		
Blank	Without tie rod	
A		
B		
C		

*1: The switch cannot be mounted on the same surface as the bypass tube mounting position.
*2: "Z" is not available for ⑧Switch model No. "H0□" "H0Y□".

⑪ Accessories

Code	Content		
Blank	Accessories (knuckle) None		
Y	Double knuckle joint Cast Iron (Pin, split pin, flat washer included)		
Y1	Double knuckle joint Steel (Pin, split pin, flat washer included)		
I	Single knuckle joint Steel		
*3 *4 *5 K	Bellows		
*5 D	Limit switch mounting base	With dog	
D1		Without dog	
*1 *2 *6 Q	Clamp fitting		

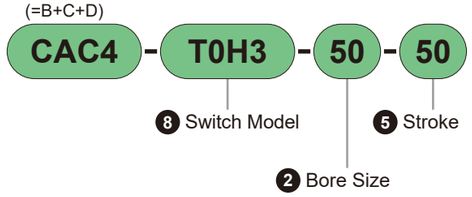
*1: Q cannot be mounted on the standard type because the Piston Rod projection length is different from the standard type.
*2: When selecting "Q", ①Clevis width will be "A".
*3: Bellows maximum Ambient Temperature is 100°C, instantaneous maximum temperature is 200°C.
*4: If ①clevis width is "AL" or "BL", "K" cannot be selected.
*5: When selecting "K" and "D", select "Y", "Y1" and "I".
*6: When selecting "Q", please select "Y" or "Y1".

Switch Single Unit Model No. Notation *Pay attention to direction when installing tie rod. See P. 782, 783.

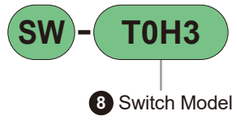
[Switch mounting: Tie rod method]

T-type Cylinder Switch

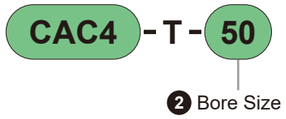
A) Switch body+Mounting bracket set (=B+C+D)



B) Switch body only



C) Mounting bracket kit

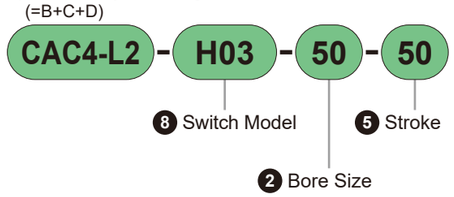


D) Mounting tie rod kit

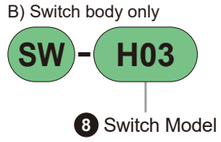
Strong magnetic field resistant cylinder switch

● H-type cylinder switch

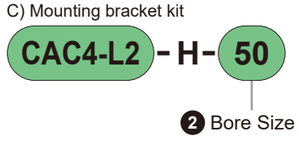
A) Switch body+Mounting bracket set (=B+C+D)



B) Switch body only



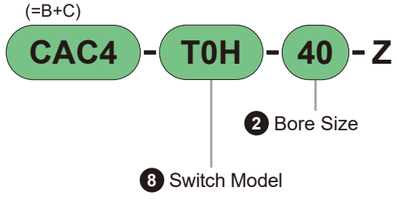
C) Mounting bracket kit



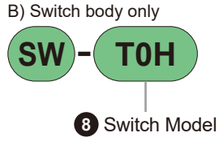
D) Mounting tie rod kit

[Switch mounting: Band Type

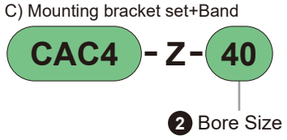
A) Switch body+Mounting bracket set+Band (=B+C)



B) Switch body only



C) Mounting bracket set+Band



MEMO

Specifications

Item		UCAC2	
Bore Size	mm	ø50	ø63
Actuation method		Double Acting Type	
Operating Fluid		Compressed Air	
Max Operating Pressure	MPa	1.0	
Min Operating Pressure	MPa	0.25 (36 psi)	
Proof Pressure	MPa	1.6	
Ambient Temperature	°C	-10 to 60 (however, no freezing)	
Port Size		Rc1/4	
Standard Stroke	mm	50, 75, 100, 125, 150	
Stroke tolerance		$^{+1.0}_{0}$	
Operating Piston Speed	mm/s	50 to 400	50 to 300
Cushion		With Air Cushion on Head Side	
Lubrication		Not allowed	
Mounting Style		Double Clevis	
Fall prevention mechanism		Forward direction lock or reverse direction lock	
Locking Force	N	1470	
Allowable Absorbed Energy J	With Cushion	6.54	11.63
	Without cushion	0.137	0.206

Note: No cushion cannot absorb large energy generated by external load. It is recommended to use an external shock absorber together.

Stroke

Bore Size (mm)	Standard Stroke (mm)	Min Stroke (mm)	Max Stroke (mm)
ø50	50, 75, 100, 125, 150	50	150
ø63			

Strokes other than Standard Strokes are custom products.

Cylinder Weight

(Unit: kg)

Bore Size (mm)		Product weight per stroke = 0 mm	Added weight per stroke = 100 mm	Accessory Weight: Axial foot	Double Knuckle	Single knuckle	Limit switch mounting base	Dog fitting	Switch Weight	Mounting Bracket Weight: T Type Tie rod mounting	T Type Band mounting	H type	Mounting tie rod weight at stroke = 0 mm	Added weight per S = 10 mm of mounting tie rod
ø50	Forward lock: F	1.61	0.40	0.21	0.37	0.27	0.18	0.08	Please refer to the mass described in the switch specifications on page 1457.	0.021	0.008	0.024	0.019	0.003
	Backward lock: B	1.56	0.39											
ø63	Forward lock: F	2.11	0.40								0.009			
	Backward lock: B	2.06	0.39											

(Example) Product weight of UCAC2-A-50B-50R-B-T0H-D

- Product weight for 0 mm stroke (Backward Locking: B) ..... 1.56 kg
- Additional weight for 50 mm stroke ..... $0.39 \times \frac{50}{100}$ =0.195 kg
- Weight of tie rod at 0 mm stroke ..... 0.019 kg
- Additional weight of tie rod on stroke 50mm ..... $0.003 \times \frac{50}{10}$=0.015 kg
- Weight of 2 T0H switches..... 0.018×2=0.036 kg
- Weight of 2 mounting brackets ..... 0.021×2=0.042 kg
- Product weight ..... 1.56+0.195+0.019+0.015+0.036+0.042=1.867 kg

Theoretical Thrust Table

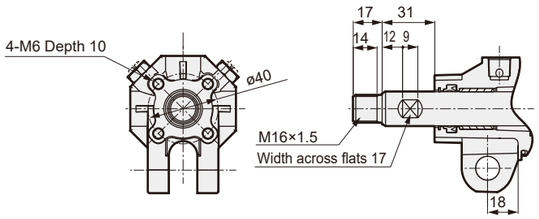
(Unit: N)

Bore Size (mm)	Operating Direction	Operating Pressure MPa: 0.25 (36 psi)	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
ø50	Push	4.91×10^{2}	5.89×10^{2}	7.85×10^{2}	9.82×10^{2}	1.18×10^{3}	1.37×10^{3}	1.57×10^{3}	1.77×10^{3}	1.96×10^{3}
	Pull	4.12×10^{2}	4.95×10^{2}	6.60×10^{2}	8.25×10^{2}	9.90×10^{2}	1.15×10^{3}	1.32×10^{3}	1.48×10^{3}	1.65×10^{3}
ø63	Push	7.79×10^{2}	9.35×10^{2}	1.25×10^{3}	1.56×10^{3}	1.87×10^{3}	2.18×10^{3}	2.49×10^{3}	2.81×10^{3}	3.12×10^{3}
	Pull	7.01×10^{2}	8.41×10^{2}	1.12×10^{3}	1.40×10^{3}	1.68×10^{3}	1.96×10^{3}	2.24×10^{3}	2.52×10^{3}	2.80×10^{3}

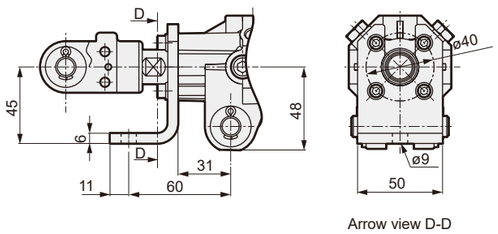
MEMO

Dimensional Drawings

● Without knuckle

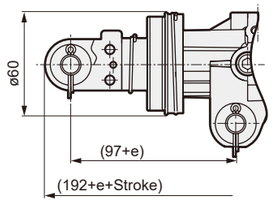


● Axial Foot Type



Arrow view D-D

● With Bellows (K)

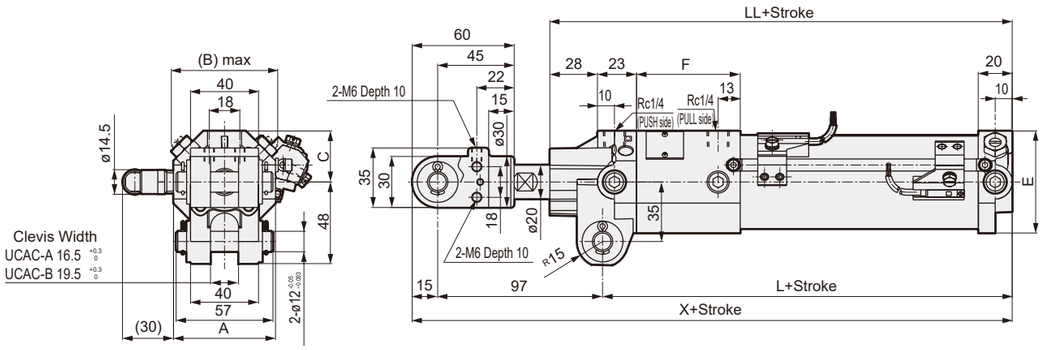


● Double yoke knuckle, dimensions with bellows

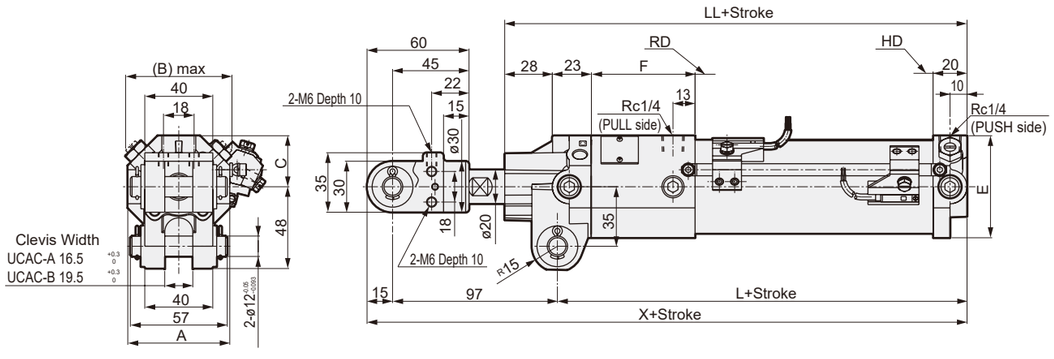
Stroke	e				
Bore Size (mm)	50	51 to 75	76 to 100	101 to 125	126 to 150
ø50, ø63	0	10	18	31	31

Note: For dimensions with each switch, please refer to P. 782, 783.

● With Forward Direction Lock (UCAC2-F)



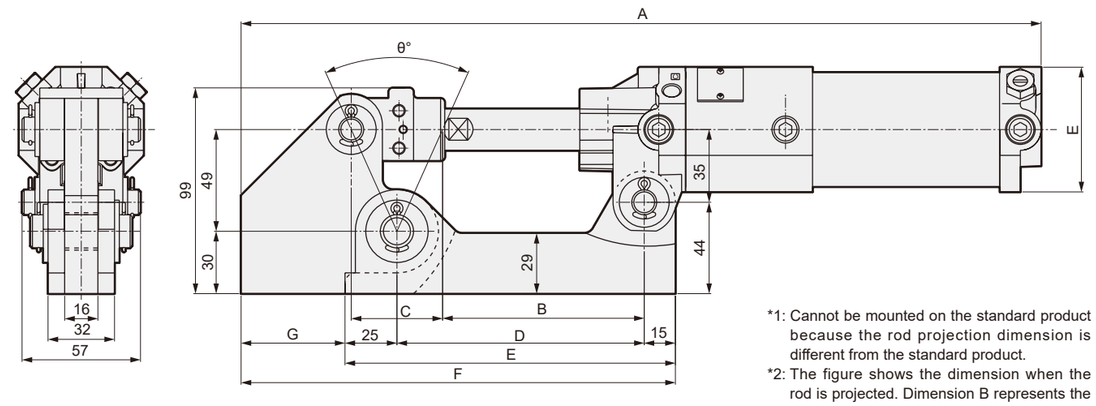
● With Reverse Direction Lock (UCAC2-B)



Code / Bore Size (mm)	A	(B)	C	E	F	L	LL	X
ø50	60	63	30	60	61	141	172	253
ø63	70	66	35	70	63	143	174	255

Dimensional Drawings

● Clamp Fitting External Dimensions Diagram

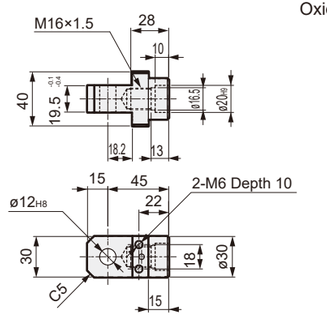


*1: Cannot be mounted on the standard product because the rod projection dimension is different from the standard product.
*2: The figure shows the dimension when the rod is projected. Dimension B represents the center position of the knuckle pin when the rod is retracted.
*3: With bellows also has the same dimensions.
*4: This product is a type that is mounted by welding.

Code / Model No.	Stroke	A	B	C	D	E	F	G	θ°
UCAC2-A-50□-Q	50	387	97	44	119	159	209	50	48
UCAC2-A-75□-Q	75	435	107	70	142	182	232	50	71
UCAC2-A-100□-Q	100	478	115	90	160	200	250	50	85
UCAC2-A-125□-Q	125	531	128	120	188	228	278	50	101
UCAC2-A-150□-Q	150	576	128	140	198	238	298	60	110

Accessory External Dimensions

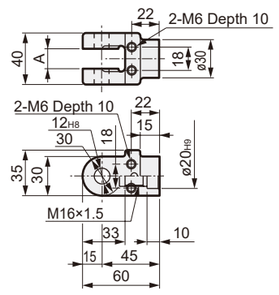
● Single Yoke Knuckle External Dimensions Material: Steel,Black Oxide



*Spring pin included.

Model No.	A	Applicable Cylinder	Weight (kg)
CAC4-IB	$19.5^{-0.1}_{-0.4}$	UCAC2-A(L), UCAC2-B(L)	0.27

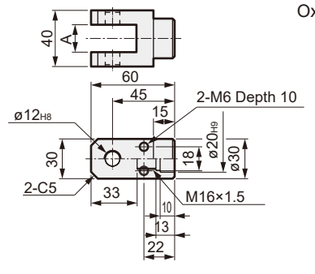
● Double Yoke Knuckle Cast Iron (Y) External Dimensions Material: Cast Iron, Manganese Phosphate



*Pin, split pin, spring pin, and flat washer are included.

Model No.	A	Applicable Cylinder	Weight (kg)
CAC4-YA	$16.5^{+0.3}_{0}$	UCAC2-A(L)	0.37
CAC4-YB	$19.5^{+0.3}_{0}$	UCAC2-B(L)	0.37

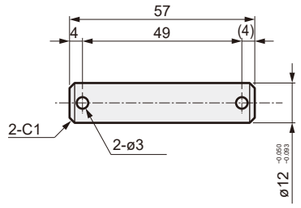
● Double Yoke Knuckle Steel (Y1) External Dimensions Material: Steel, Black Oxide
For ø40 to ø63



* Pin, split pin, spring pin, and flat washer are included.

Model No.	A	Applicable Cylinder	Weight (kg)
CAC4-Y1A	$16.5^{+0.3}_{0}$	UCAC2-A(L)	0.37
CAC4-Y1B	$19.5^{+0.3}_{0}$	UCAC2-B(L)	0.37

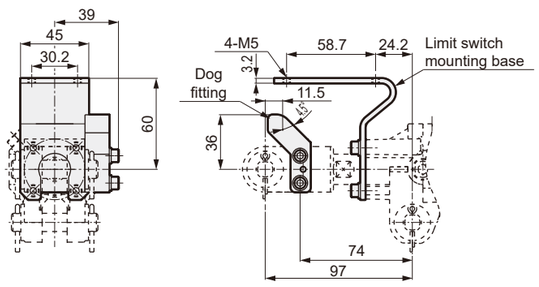
● Clevis Pin External Dimensions Material: Steel, Zinc Chromate



* Split pin and flat washer are included.

Model No.	Applicable Cylinder	Weight (kg)
CAC4-P	UCAC2-A(L), UCAC2-B(L)	0.05

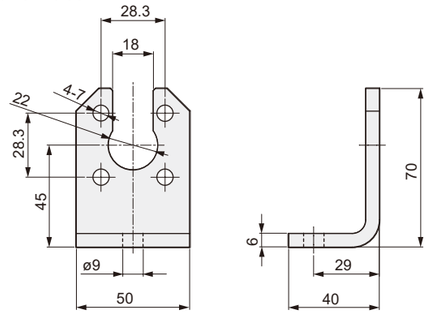
● Limit Switch Mounting Base External Dimensions Material: Steel, Black Oxide
● Dog Fitting External Dimensions Material: Steel, Black Oxide



● Please use a limit switch equivalent to WLH2 type [OMRON Corporation].

Model No.	Product Name	Applicable Cylinder	Weight (kg)
CAC4-L	Limit switch mounting base	UCAC2-A, UCAC2-B	0.18
CAC4-D	Dog fitting		0.08

● AL, BL Axial Foot Fitting Material: Steel, Black Oxide
For ø40 to ø63

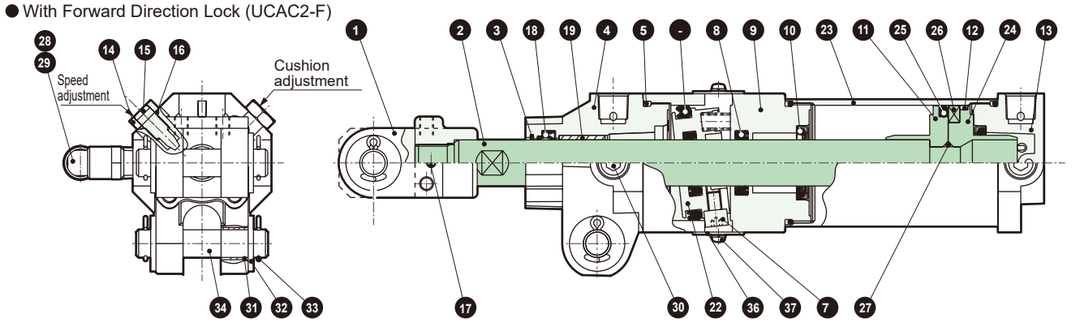


* Hexagon Socket head cap bolts and countersunk spring washers, 4 each, are included.

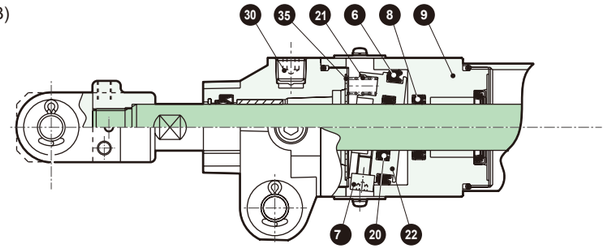
Model No.	Applicable Cylinder	Weight (kg)
CAC4-F	UCAC4-AL, UCAC4-BL	0.21

Internal Structure / Materials

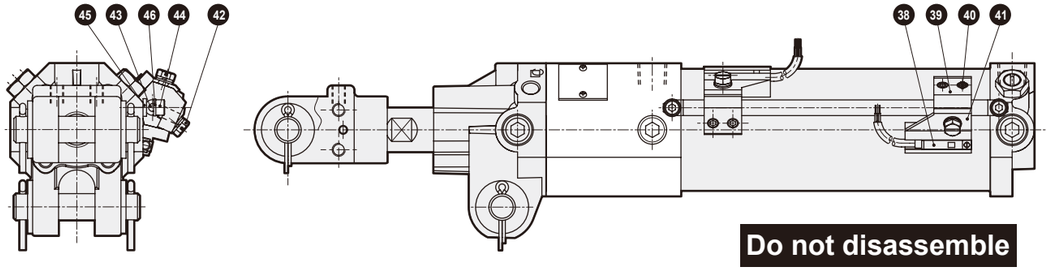
● With Forward Direction Lock (UCAC2-F)



● With Reverse Direction Lock (UCAC2-B)



● With Switch



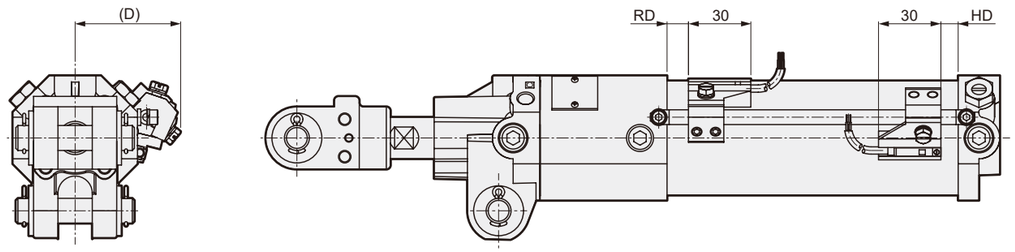
Do not disassemble

Part No.	Part Name	Material	Remarks
1	Double Knuckle	Y: Cast Iron Y1: Steel	Y: Manganese Phosphate Y1: Black Oxide finish
2	Piston Rod	Steel	Industrial Hard Chrome Plating
3	Metal Scraper	Copper Alloy	
4	Rod Cover	Aluminum Alloy	Chromate
5	Cylinder Gasket	Nitrile Rubber	
6	Lock Piston Packing	Nitrile Rubber	
7	Fulcrum nut	Steel	Chromate
8	Rod Packing	Nitrile Rubber	
9	Intermediate Cover	Aluminum Alloy	
10	Cushion Packing	Nitrile Rubber, Steel	Chromate (With cushion only)
11	Piston (H)	Aluminum Alloy	
12	Wear Ring	Polyacetal	
13	Head Cover	Aluminum Alloy	
14	Hexagon Nut	Steel	Chromate
15	Needle	Copper Alloy	
16	Needle Gasket	Nitrile Rubber	
17	Spring pin	Steel	Black Oxide
18	Rod Packing	Nitrile Rubber	
19	Bushing	Oil Impregnated Bearing Alloy	
20	Lock Rod Packing	Nitrile Rubber	
21	Lock spring	Piano Wire	Black Oxide
22	Lock metal	Special Steel	Chromate
23	Cylinder Tube	Aluminum Alloy	
24	Piston (R)	Aluminum Alloy	
25	Piston Packing	Nitrile Rubber	
26	Magnet	Plastic	
27	Piston gasket	Nitrile Rubber	
28	Bypass tube		Forward direction lock only
29	New joint, Single-ended elbow		Forward direction lock only
30	Countersunk plug with sealant	Steel	Black Oxide
31	Bushing for clevis	Bearing Alloy	
32	Plain Washer	Steel	Chromate
33	Split Pin	Steel	Chromate
34	Clevis pin	Steel	Black Oxide
35	Washer	Steel	Zinc Chromate (Forward direction lock only)
36	Dust cover	Aluminum Alloy	
37	Machine screw	Steel	Chromate
With switch			
38	Switch		
39	Switch mounting base	Aluminum Alloy	
40	Hexagon Socket Set Screw	Steel alloy	Black Oxide
41	Holder	Aluminum Alloy	
42	Hexagon Bolt with captive washer and seat	Stainless Steel	
43	Switch mounting rod	Steel	Zinc Chromate
44	Hexagon Socket Head Cap Screw	Steel alloy	Black Oxide
45	Spacer	Steel	Zinc Chromate
46	Spring washer	Steel	Black Oxide

UCAC2 Series External Dimensions Diagram with Switch

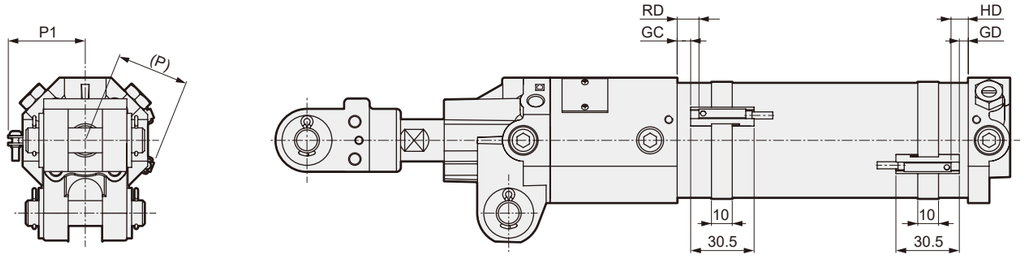
● T0H/V, T5H/V, T2H/V, T3H/V, T3PH/V, T2H/VR3, T2WH/V, T3WH/V, T2WLH/V

Tie rod mounting
・UCAC2



Code / Bore Size (mm)	D	T0, T5, T2, T3, T3P, T2□R3		T2W, T3W, T2WL	
		RD	HD	RD	HD
ø50	50.5	10.5	8.5	13.5	11.5
ø63	56	10.5	8.5	13.5	11.5

Band mounting
・UCAC2

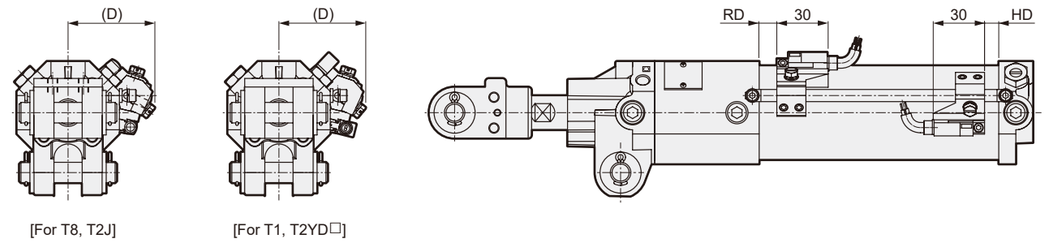


Code / Bore Size (mm)	P	P1	T0, T5, T2, T3, T3P, T2□R3				T2W, T3W, T2WL			
			GC	GD	RD	HD	GC	GD	RD	HD
ø50	34.5	36	6.5	4.5	10.5	8.5	9.5	7.5	13.5	11.5
ø63	41	42.5	6.5	4.5	10.5	8.5	9.5	7.5	13.5	11.5

UCAC2 Series External Dimensions Diagram with Switch

● T8H/V, T2JH/V, T1H/V, T2YD, T2YDT, T2YDU

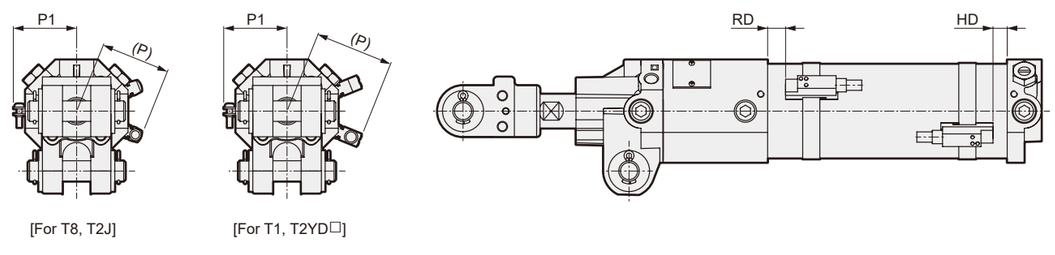
Tie rod mounting
・UCAC2



[For T8, T2J] [For T1, T2YD□]

Code / Bore Size (mm)	D	T8		T2J		T1, T2YD, T2YDT, T2YDU	
		RD	HD	RD	HD	RD	HD
ø50	50.5	5.5	3.5	10.5	8.5	10.5	8.5
ø63	56	5.5	3.5	10.5	8.5	10.5	8.5

Band mounting
・UCAC2

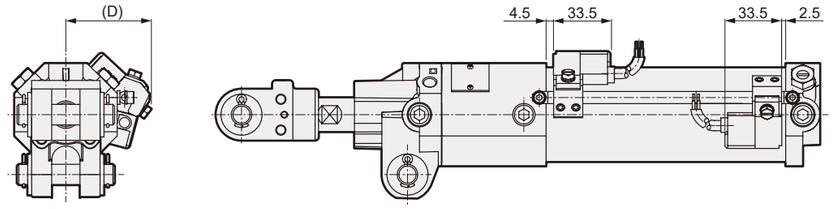


[For T8, T2J] [For T1, T2YD□]

Code / Bore Size (mm)	T8				T2J				T1, T2YD, T2YDT, T2YDU			
	P	P1	RD	HD	P	P1	RD	HD	P	P1	RD	HD
ø50	40	36	5.5	3.5	40	36	10.5	8.5	45.5	36	10.5	8.5
ø63	46.5	42.5	5.5	3.5	46.5	42.5	10.5	8.5	52	42.5	10.5	8.5

● H0, H0Y

Tie rod mounting
・UCAC2



Code / Bore Size (mm)	H0, H0Y
	D
ø50	50.5
ø63	56

To Use This Product Safely

Be sure to read this before use. For general cylinder information, see Intro 41, and for cylinder switches, see P. 1512.

Individual Precautions: Clamp cylinder with drop prevention UCAC2 Series

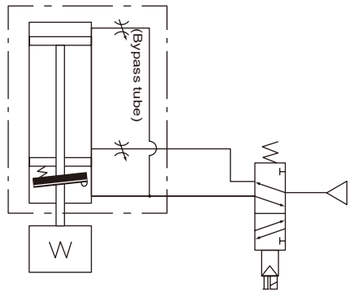
Design / Selection

⚠CAUTION

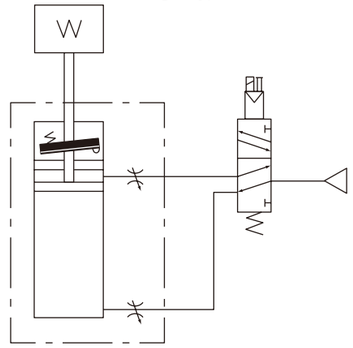
■ Basic Circuit Diagram

Since a throttle valve is built-in, installation of a speed controller for speed control is not particularly necessary, but because both meter-in and meter-out are throttled, adjusting one needle will change both forward and reverse speeds. Therefore, if you want to control the forward and reverse speeds separately, installation of a speed controller is necessary.

● Forward Locking F type



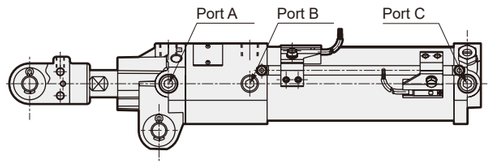
● Backward Locking B type



When an emergency stop or urgent stop is performed, the forward direction lock type will continue to retract, and the reverse direction lock type will continue to advance and return to the home position. (If residual pressure is gone, it will stop at that position.)

■ The piping port position of UCAC2 can be changed in the same way as the CAC4 Series. Be sure not to use the incorrect pressure port when doing so.

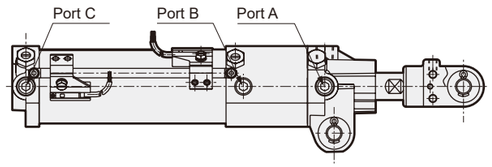
● When the port position is on the right side (lock direction F1 is on the right side as standard)



port / Lock Direction	port A	Port B	port C
Forward Direction Lock F type *1	PUSH side port	PULL side port	Plug
Reverse Direction Lock Type B	Plug	PULL side port	PUSH side port

*1: The lock direction F2 type cannot have the port on the right side because of the bypass tube.

● When the port position is on the left side



port / Lock Direction	Port A	Port B	Port C
Forward Direction Lock F type *1	PUSH side port	PULL side port	Plug
Reverse Direction Lock Type B	Plug	PULL side port	PUSH side port

*1: The lock direction F type cannot have the port on the left side because of the bypass tube.

■ The purpose of the cushion is to absorb the piston's kinetic energy with air compressibility, preventing the piston and cover from colliding at the stroke end.

Therefore, the cushion is not intended to operate the piston at low speed near the stroke end. The table below shows the kinetic energy that can be absorbed by the cushion. If the kinetic energy exceeds this value or if you want to avoid bouncing due to air compressibility, please consider a separate shock absorbing device.

$$\text{Kinetic Energy (J)} = \frac{1}{2} \times \text{Weight (kg)} \times \{\text{Speed (m/s)}\}^2$$

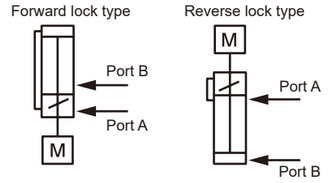
Cushion Characteristic Table

Bore Size (mm)	Effective Cushion Length (mm)	Allowable Absorption Energy (J)	
		With cushion	Without cushion
ø50	13.5	6.54	0.14
ø63	13.5	11.63	0.21

■ Do not use the product so as to apply torque to the rod when locked because the locking force may decrease, creating a dangerous condition.

■ Make sure to supply pressure to port B , and before unlocking, check that load is not applied to the lock mechanism.

If pressure is supplied to port A while both ports A and B are exhausted and the piston is locked, the lock may not be released, or the Piston rod may extend suddenly even if the lock is released, which is very dangerous.



■ If the cylinder is held with pressure applied on the locking mechanism, the lock could be released.

Do not use 3-position closed center and 3-position P·A·B connection solenoid valves.

■ If a back pressure is applied while locked, the lock may be released. Use a discrete solenoid valve for brake release, or use an individual exhaust manifold.

■ Do not use with the by-pass tube disconnected as lock response could be delayed.

■ Note that due to the structure, a 1 mm deviation may occur when stopped with the lock.

During Use

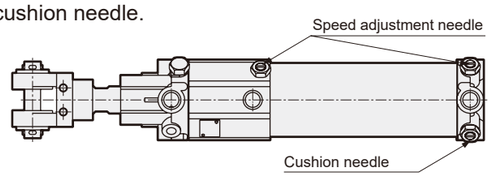
⚠ Warning

■ Do not disassemble the unit, as doing so may be dangerous.

■ During equipment maintenance, please take separate measures for safety so that the load does not fall due to its own weight.

⚠ CAUTION

■ Do not mistake the speed adjustment needle for the cushion needle.

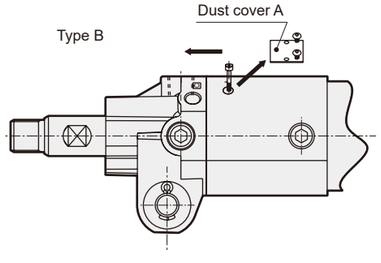


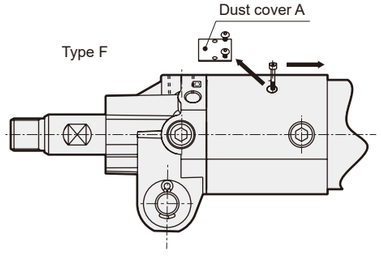
■ Flush the connected pipe sufficiently to prevent foreign materials or cutting chips from entering the cylinder when installing the product.

■ Be careful not to scratch or dent the Piston Rod sliding part.
This can lead to damage to packings and cause air leakage.

■ How to unlock manually

1. Remove dust cover A.
2. Screw a Hexagon Socket Head Cap Screw (length 40 or more) into the screw hole M4 of the lock metal until the end.
3. Tilt the Hexagon Socket Head Cap Screw in the direction of the arrow to free the rod. (This frees the rod.)





1. Common (T type switch: Band mounting method)

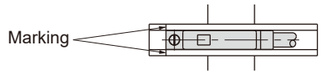
⚠ CAUTION

■ When Moving the Switch Position in the Stroke Direction

- The 1-color indicator switch can be finely adjusted by about ±3 mm from the mounting position at the time of shipment. If the adjustment range exceeds ±3 mm, or if fine-tuning the position of a 2-color indicator switch, move the band position.
- Loosen the switch mounting screw, move the switch along the rail, and tighten at the specified position. For T2, T3, T0, T5, use a flat-head screwdriver (watchmaker's screwdriver, precision screwdriver, etc.) with a grip diameter of 5 to 6 mm, tip shape width of 2.4 mm or less, and thickness of 0.3 mm or less to tighten the switch fixing screw with a tightening torque of 0.1 to 0.2 N·m. For T□C, T2J, T2Y, T3Y, tighten with a torque of 0.5 to 0.7 N·m.
- The switch rail has a marking 4 mm from the end face of the rail. Use it as a guide for mounting position when replacing the switch. Note that the marking on the switch rail is set to the switch maximum sensitivity position, which is the switch mounting position of the external dimensions. If the switch type changes or the band is moved, the maximum sensitivity position changes, so adjust the position each time.

■ When Moving the Switch Position in the Circumferential Direction

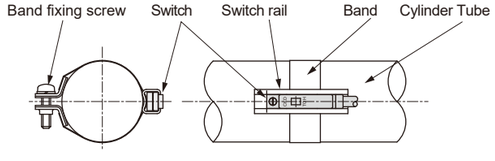
- Loosen the band fixing screw, move the switch rail circumferentially, and tighten it at the specified position.



The tightening torque for the band fixing screw is 0.6 to 0.8 N·m.

■ When Moving the Band Position

- Loosen the band fixing screw, move the switch rail and band along the cylinder tube, and tighten them at the specified position. The tightening torque for the band fixing screw is 0.6 to 0.8 N·m.



For precautions during mounting, installation, adjustment, use, and maintenance, refer to "During Use" in this catalog and the CKD Components Product website (https://www.ckd.co.jp/kiki/en/) -> "Model No." -> Instruction Manual.

MEMO

Clamp Cylinder

CAC-N32/40
UCAC-N32/40
Lightweight Clamp Cylinder

ø32, ø40

CONTENTS

Product Introduction	790
Series System Chart	791
● Double Acting/single rod (CAC-N32/40)	792
● Position locking/Double Acting/single rod (UCAC-N32/40)	798
External Dimensions Diagram with Switch	804
⚠ Precautions for Use	806

Clamping
CAC4
UCAC2
CAC-N
UCAC-N
RCS2
RCC2
PCC
Cylinder Switch
Ending

Clamp Cylinder

CAC-N/UCAC-N Series

Compact and lightweight clamp cylinder contributing to weight reduction of welding jigs, etc.

Clamp Cylinder
CAC-N Series

Inner diameter ø32, ø40

- The Cylinder Body adopts the highly reliable and lightweight CMK2 series.
- A variety of switches can be mounted including reed, proximity, 2-color display, and strong magnetic field.

CAC-N-40-150-Y Weight Approx. **950 g**

Achieved Approx. **56%** of conventional ratio *

* (CAC4-A-40-150-Y1)

Clamp cylinder with drop prevention
UCAC-N Series

Inner diameter ø32, ø40

- CAC-N series with free position locking mechanism
- Can be locked at any position when the cylinder is stationary.
- Free in the opposite direction of lock

Selectable switch mounting method

Band mounting method

Tie rod mounting method

Variation Table

Lightweight Clamp Cylinder/Lightweight Clamp Cylinder with Fall Prevention
CAC-N32/40 / UCAC-N32/40 Series

●: Standard ◎Option

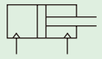
Variation	Model No. / Circuit Diagram Code	Bore Size (mm)	Stroke (mm)	Min Stroke (mm)	Max Stroke (mm)	Accessories: Double Knuckle Y	Switch	Page
Lightweight Clamp Cylinder	CAC-N32/40	ø32, ø40	50, 75, 100, 125, 150	5	150	◎	◎	792
Lightweight clamp cylinder with drop prevention	UCAC-N32/40	ø32, ø40	50, 75, 100, 125, 150	5	150	◎	◎	798

Lightweight clamp cylinder Double Acting/Single rod type

CAC-N32/N40 Series

● Bore Size: ø32, ø40

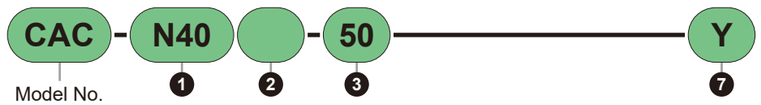
Circuit Diagram Code



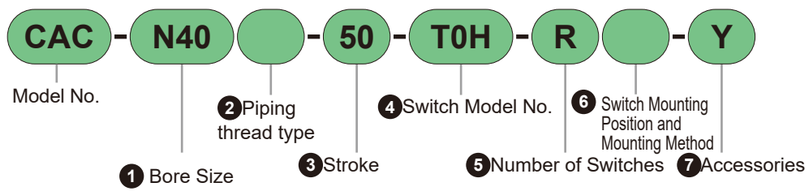
RoHS

Model No. Notation

Without switch
(Built-in magnet for switch)



With Switch
(Built-in magnet for switch)



1 Bore Size (mm)

Code	Content
N32	ø32
N40	ø40

2 Piping thread type

Code	Content
Blank	Rc Thread
N	NPT Thread (Custom Order Product)
G	G thread (Custom product)

3 Stroke (mm)

Bore Size	Code	Intermediate Stroke
ø32 ø40	50 75 100 125 150	in 1mm increments

4 Switch Model No.

For switch details, refer to P. 1457. Switches are shipped with the product.

Contact	Indicator LED Special Function	Wiring (Output)	Load Voltage (V) AC	Load Voltage (V) DC	Load Current (mA) AC	Load Current (mA) DC	Lead wire *1 Straight	Lead wire *1 L-shape	
Solid State	1-Color	2-wire	85 to 265	—	5 to 100	—	T1H□	T1V□	
			—	10 to 30	—	5 to 20 *2	T2H□	T2V□	
		3-wire (NPN)	—	30 or less	—	100 or less	T3H□	T3V□	*5
		3-wire (PNP)	—		—		T3PH□	T3PV□	
	2-color	2-wire	—	24 ± 10%	—	5 to 20	T2WH□	T2WV□	
		3-wire (NPN)	—	30 or less	—	50 or less	T3WH□	T3WV□	
	2-Color Improved Water Resistance	2-wire	—	24 ± 10%	—	5 to 20	T2WLH□	T2WLV□	*3
	2-Color for AC Magnetic Field		—	24 ± 10%	—		T2YD□	–	
			—		—		T2YDT□	–	
	1-Color Off-Delay Type		—	10 to 30	—	5 to 20 *2	T2JH□	T2JV□	
	1-color Flexible Lead Wire Type		—	10 to 30	—	5 to 20 *2	T2HR3	T2VR3	
Reed	1-Color	2-wire	110	12/24	7 to 20	5 to 50	T0H□	T0V□	
	No Indicator LED		110	5/12/24	20 or less	50 or less	T5H□	T5V□	
	1-color		110/220	12/24	7 to 20 / 7 to 10	5 to 50	T8H□	T8V□	

*Lead wire length, connector specification

Code	Content
Blank	1 m (Standard)
3	3 m (Option)
5	5 m (Option)
W	M8 Connector, 1PIN (+), 4PIN (−) Lead Wire 0.3 m

*5: Only T2WLH and T2WLV can be selected.

Example) Lead wire length
1 m T0H
3 m T0H3
5 m T0H5

*1: For "□" in the switch model number, enter the code selected from the "Lead wire length, connector specification" table.
*2: The maximum load current value above, 20 mA, is at 25°C. If the switch operating Ambient Temperature is higher than 25°C, it will be lower than 20 mA. (At 60°C, it will be 5 to 10 mA.)
*3: This does not guarantee the water resistance of the cylinder.
*4: Switches other than the model numbers listed above are also available. (Custom Product) For details, refer to P. 1457.

5 Number of Switches

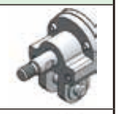
Code	Content
R	With 1 pc on rod side
H	With 1 pc on head side
D	With 2 pcs

6 Switch Mounting Position and Mounting Method

	Code	Content	
*1	A	Tie rod mounting	
*1	C		
*2	Blank	Band mounting	

*1: If the switch model No. is not specified, only the tie rod is installed.
*2: Tie rods cannot be retrofitted to cylinders with blank switch mounting position and mounting method.

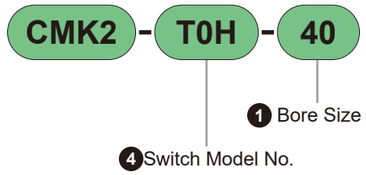
7 Accessories

Code	Content	
Blank	Accessories (knuckle) None	
Y	Double knuckle joint (Pin, split pin, and flat washer are attached)	

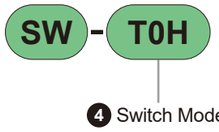
Switch Single Unit Model No. Notation

[Switch mounting: Band Type

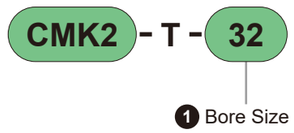
A) Switch body+Mounting bracket set



B) Switch body only

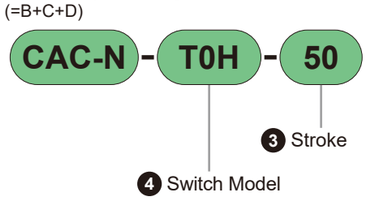


C) Mounting bracket set

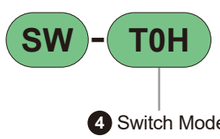


[Switch mounting: Tie rod method]

A) Switch body+Mounting bracket set
(=B+C+D)



B) Switch body only



C) Mounting bracket kit

D) Mounting tie rod kit

Specifications

Item		CAC-N32	CAC-N40
Bore Size mm		ø32	ø40
Operation type		Double Acting Type	
Max Operating Pressure	MPa	1.0	0.7
Min Operating Pressure	MPa	0.15	
Proof Pressure	MPa	1.6	1.05
Ambient Temperature	°C	-10 to 60 (however, no freezing)	
Port Size		Rc1/8	
Operating piston speed	mm/s	50 to 500	50 to 400
Cushion		Rubber Cushion	
Lubrication		Not required (When lubricating, use turbine oil ISO VS32)	
Mounting Style		Double Clevis	
Allowable Absorbed Energy J	PUSH	0.424	
	PULL	0.424	0.639

Stroke

Bore Size (mm)	Standard Stroke (mm)	Maximum Stroke (mm)	Min Stroke (mm)	Minimum stroke with switch (mm)
ø32	50, 75, 100, 125, 150	150	5	10
ø40				

Note: Intermediate strokes can be produced in 1 mm increments.

Cylinder Weight

(Unit: kg)

Bore Size (mm)	Product weight per stroke = 0 mm	Added weight per stroke = 100 mm	Weight per Switch	Switch rail+Band weight (Per Switch)	Mounting Bracket Weight (Tie rod mounting)	Mounting tie rod weight at stroke = 0 mm	Additional weight per S = 10 mm of mounting tie rod
ø32	0.45	0.15	Refer to the Weight listed in the Switch Specifications on P. 1457.	0.009	0.021	0.019	0.003
ø40	0.53	0.17					

(Example) Product weight of CAC-N40-50-TOH-R

- Product weight for 0 mm stroke .....0.53 kg
- Additional weight for 50 mm stroke .....0.17 × $\frac{50}{100}$ = 0.085 kg
- Weight of TOH switch .....0.018 kg
- Weight of switch rail + 1 band .....0.009 kg
- Product weight .....0.53+0.085+0.018+0.009=0.642 kg

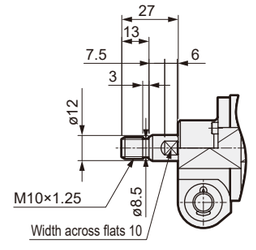
Theoretical Thrust Table

(Unit: N)

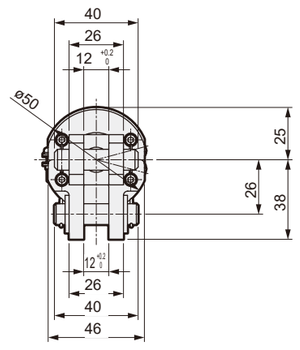
Bore Size (mm)	Operating Direction	Operating Pressure MPa 0.15	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
ø32	Push	1.21×10^2	1.61×10^2	2.41×10^2	3.22×10^2	4.02×10^2	4.83×10^2	5.63×10^2	6.43×10^2	7.24×10^2	8.04×10^2
	Pull	1.04×10^2	1.38×10^2	2.07×10^2	2.76×10^2	3.46×10^2	4.15×10^2	4.84×10^2	5.53×10^2	6.22×10^2	6.91×10^2
ø40	Push	1.88×10^2	2.51×10^2	3.77×10^2	5.03×10^2	6.28×10^2	7.54×10^2	8.80×10^2	—	-	—
	Pull	1.65×10^2	2.21×10^2	3.31×10^2	4.41×10^2	5.51×10^2	6.62×10^2	7.72×10^2	—	-	—

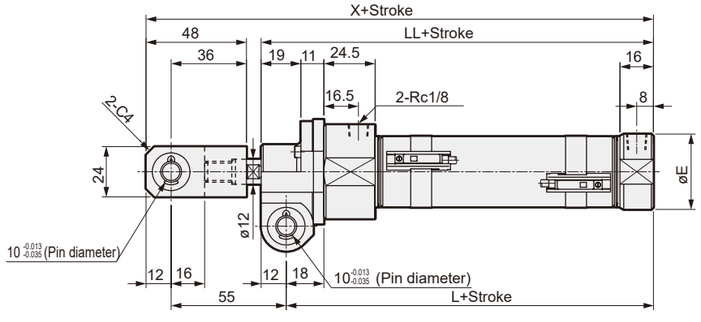
Dimensional Drawings

●Without knuckle



●With double yoke knuckle (Y)



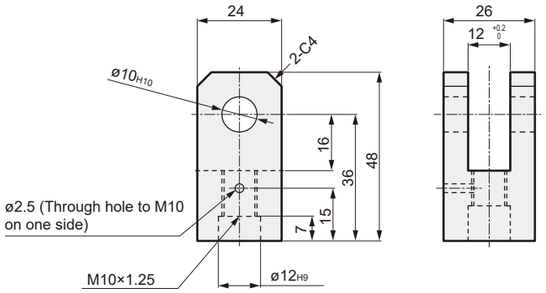


Code / Bore Size	E	L	LL	X
ø32	36	95.5	107.5	162.5
ø40	45	99.5	111.5	166.5

Note: For dimensions with each switch, please refer to P. 804.

Accessory External Dimensions

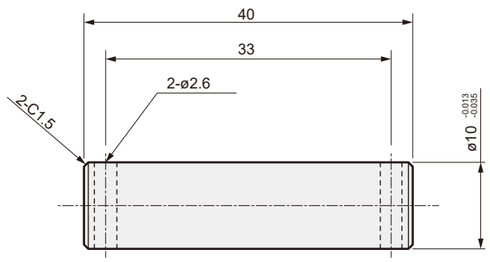
●Double Knuckle (Y) Material: Steel
Zinc Chromate



Model No.	Weight (kg)
CAC-N-Y	0.15

* Pin, split pin, spring pin, and flat washer are included.

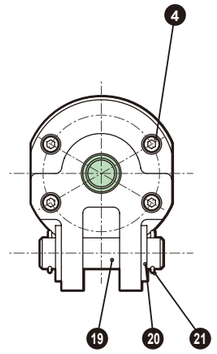
●Clevis pin Material: Steel
Zinc Chromate

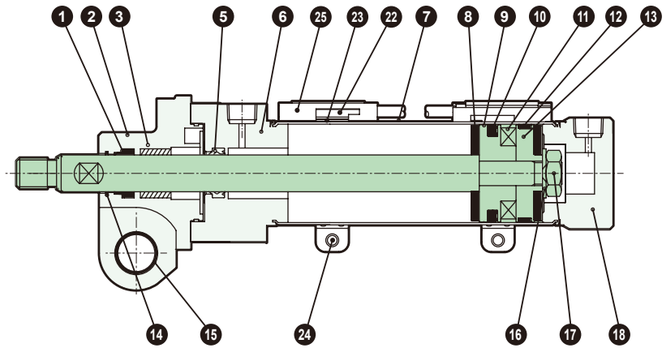


Model No.	Weight (kg)
CAC-N-P	0.02

* Split pin and flat washer are included.

Internal Structure Diagram/Material





Do not disassemble

Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Scraper	Nitrile Rubber		14	Metal Scraper	Copper	
2	Front clevis	Aluminum Alloy	Alumite	15	Bushing for clevis	Bearing Alloy	
3	Bushing	Oil-Impregnated Bearing Alloy		16	Plain Washer	Steel	Chromate (ø32 only)
4	Hexagon Socket Head Cap Screw	Steel		17	Hexagon Nut	Steel	Chromate
5	Rod Packing	Nitrile Rubber		18	Head Cover	Aluminum Alloy	
6	Rod Cover	Aluminum Alloy		19	Pin	Steel	Chromate
7	Cylinder Tube	Stainless Steel		20	Plain Washer	Steel	Chromate
8	Cushion Rubber	Urethane Rubber		21	Split pin	Steel	Chromate
9	Piston A	Aluminum Alloy		With Switch			
10	Piston Packing	Nitrile Rubber		22	Switch		
11	Magnet	Plastic		23	Band	Stainless Steel	
12	Wear ring	Acetal		24	Pan Head Screw	Stainless Steel	
13	Piston B	Aluminum Alloy		25	Switch Rail	Stainless Steel	

Lightweight clamp cylinder with drop prevention

UCAC-N32/N40 Series

● Bore Size: ø32, ø40

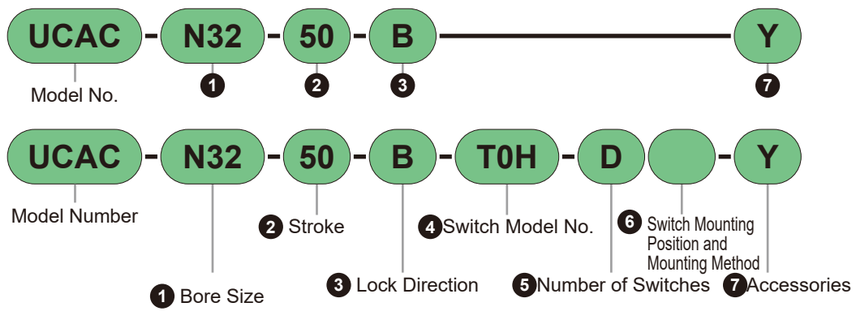
Circuit Diagram Code

RoHS

Model No. Notation

Without switch
(Built-in magnet for switch)

With Switch
(Built-in magnet for switch)



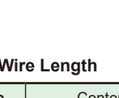
1 Bore Size (mm)

Code	Content
N32	ø32
N40	ø40

2 Stroke (mm)

Bore Size	Code	Intermediate Stroke
ø32 ø40	50 75 100 125 150	in 1mm increments

3 Lock Direction

Code	Content	
F	Forward Direction Lock	
B	Reverse Direction Lock	

4 Switch Model

For switch details, refer to P. 1457. Switches are pre-assembled on the product before shipment.

Contact	Indicator LED Special Function	Wiring (Output)	Load Voltage (V) AC	Load Voltage (V) DC	Load Current (mA) AC	Load Current (mA) DC	Lead wire *1 Straight	Lead wire *1 L-shape	
Solid State	1-Color	2-wire	85 to 265	—	5 to 100	—	T1H□	T1V□	
			—	10 to 30	—	5 to 20 *2	T2H□	T2V□	
		3-wire (NPN)	—	30 or less	—	100 or less	T3H□	T3V□	
		3-wire (PNP)	—		—		T3PH□	T3PV□	
	For 2-color AC Magnetic Field	2-wire	—	24 ± 10%	—	5 to 20	T2YD□	–	
			—		—		T2YDT□	–	
	1-Color Off-Delay Type		—	10 to 30	—	5 to 20 *2	T2JH□	T2JV□	
	1-color Flexible Lead Wire Type		—	10 to 30	—	5 to 20 *2	T2HR3	T2VR3	
Reed	1-Color	2-wire	110	12/24	7 to 20	5 to 50	T0H□	T0V□	
	Without Indicator Lamp		110	5/12/24	20 or less	50 or less	T5H□	T5V□	
	1-color		110/220	12/24	7 to 20 / 7 to 10	5 to 50	T8H□	T8V□	

*1: Insert the code selected in the "Lead wire length" table into "□" of the switch model number.
*2: The maximum load current value above, 20 mA, is at 25°C. If the switch operating Ambient Temperature is higher than 25°C, it will be lower than 20 mA. (At 60°C, it will be 5 to 10 mA.)
*3: Switches other than the above models are also available. (Custom Product) For details, refer to P. 1457.

*Lead Wire Length

Code	Content
Blank	1 m (Standard)
3	3 m (Option)
5	5m (Option)

Example) Lead wire length
1 m T0H
3 m T0H3
5 m T0H5

5 Number of Switches

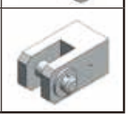
Code	Content
R	With 1 pc on rod side
H	With 1 pc on head side
D	With 2 pcs

6 Switch Mounting Position and Mounting Method

	Code	Content	
*1	A	Tie rod mounting	
*1	C		
*2	Blank	Band mounting	

*1: If the switch model No. is not specified, only the tie rod is installed.
*2: Tie rods cannot be retrofitted to cylinders with blank switch mounting position and mounting method.

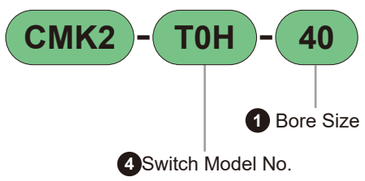
7 Accessories

Code	Content	
Blank	Accessories (knuckle) None	
Y	Double knuckle joint (Pin, split pin, and flat washer attached)	

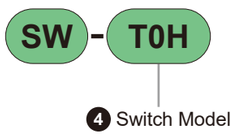
Switch Single Unit Model No. Notation

[Switch mounting: Band Type

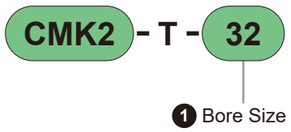
A) Switch body+Mounting bracket set



B) Switch body only

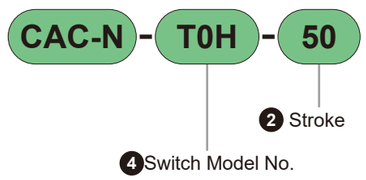


C) Mounting bracket set

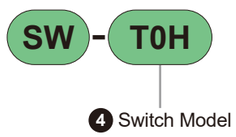


[Switch mounting: Tie rod method]

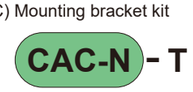
A) Switch body+Mounting bracket set
(=B+C+D)



B) Switch body only



C) Mounting bracket kit



D) Mounting tie rod kit

Specifications

Item		UCAC-N32	UCAC-N40
Bore Size	mm	ø32	ø40
Operation type		Double Acting Type	
Max Operating Pressure	MPa	1.0	0.7
Min Operating Pressure	MPa	0.25 (36 psi)	
Proof Pressure	MPa	1.6	1.05
Ambient Temperature	°C	-10 to 60 (however, no freezing)	
Port Size		Rc1/8	
Operating piston speed	mm/s	50 to 500	50 to 400
Cushion		Rubber Cushion	
Lubrication		Not required (When lubricating, use turbine oil ISO VS32)	
Mounting Style		Double Clevis	
Fall prevention mechanism		Forward direction lock or reverse direction lock	
Locking Force	N	631	
Allowable Absorbed Energy J	PUSH	0.424	
	PULL	0.424	0.639

Stroke

Bore Size (mm)	Standard Stroke (mm)	Maximum Stroke (mm)	Min Stroke (mm)	Minimum stroke with switch (mm)
ø32	50, 75, 100, 125, 150	150	5	10
ø40				

Note: Intermediate strokes can be produced in 1 mm increments.

Cylinder Weight

(Unit: kg)

Bore Size (mm)		Product weight per stroke = 0 mm	Added weight per stroke = 100 mm	Weight per Switch	Switch rail+Band weight (Per Switch)	Mounting Bracket Weight (Tie rod mounting)	Mounting tie rod weight at stroke = 0 mm	Additional weight per S = 10 mm of mounting tie rod
ø32	Forward direction lock: F	0.71	0.15	Refer to the Weight listed in the Switch Specifications on P. 1457.	0.009	0.024	0.019	0.003
	Backward direction lock: B	0.65						
ø40	Forward direction lock: F	0.78	0.17					
	Backward direction lock: B	0.72						

(Example) Product weight of UCAC-N32-50-B-TOH-D

- Product weight for 0 mm stroke (Backward Locking: B) ... 0.65 kg
- Additional weight for 50 mm stroke ..... 0.15 x $\frac{50}{100}$ = 0.075 kg
- Weight of 2 TOH switches ..... 0.018×2=0.036 kg
- Weight of switch rail + 2 bands ..... 0.009×2=0.018 kg
- Product weight ..... 0.65+0.075+0.036+0.018=0.779 kg

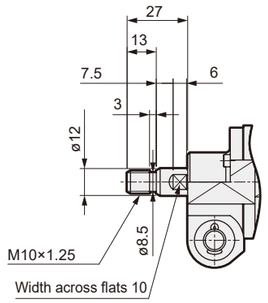
Theoretical Thrust Table

(Unit: N)

Bore Size (mm)	Operating Direction	Operating Pressure MPa 0.25 (36 psi)	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
ø32	Push	2.01×10²	2.41×10^2	3.22×10^2	4.02×10^2	4.83×10^2	5.63×10^2	6.43×10^2	7.24×10^2	8.04×10^2
	Pull	1.73×10²	2.07×10^2	2.76×10^2	3.46×10^2	4.15×10^2	4.84×10^2	5.53×10^2	6.22×10^2	6.91×10^2
ø40	Push	3.14×10^2	3.77×10^2	5.03×10^2	6.28×10^2	7.54×10^2	8.80×10^2	—	-	—
	Pull	2.76×10^2	3.31×10^2	4.41×10^2	5.51×10^2	6.62×10^2	7.72×10^2	—	-	—

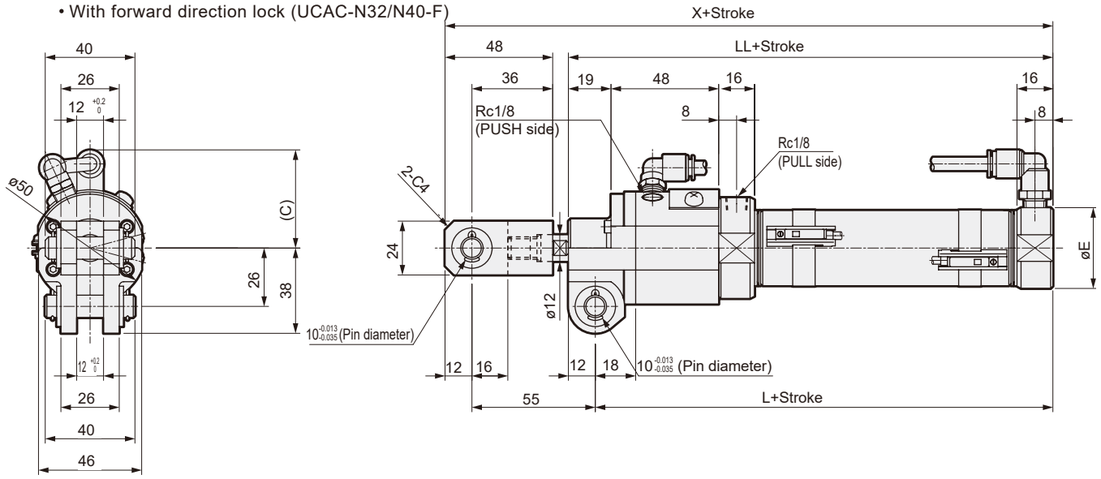
Dimensional Drawings

●Without knuckle

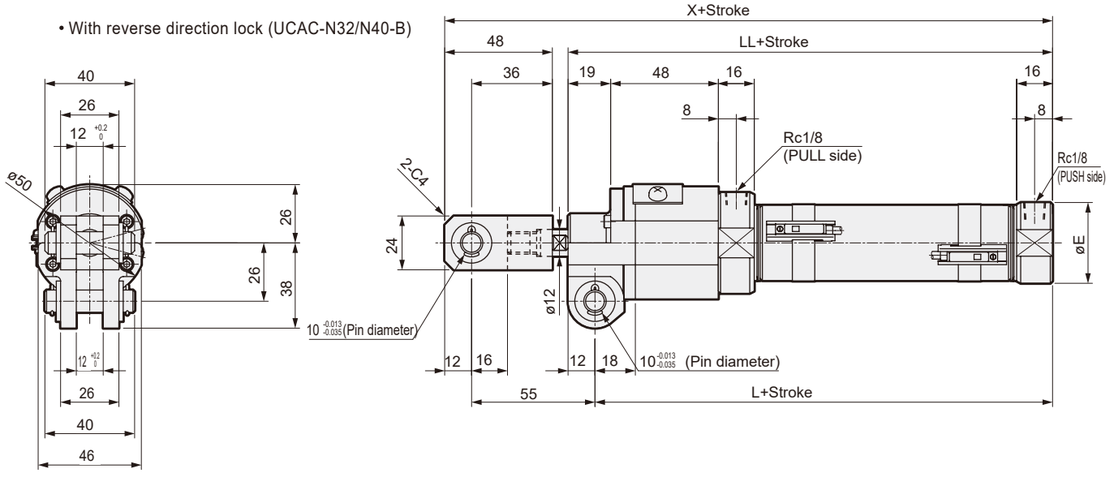


●With double yoke knuckle (Y)

• With forward direction lock (UCAC-N32/N40-F)



• With reverse direction lock (UCAC-N32/N40-B)

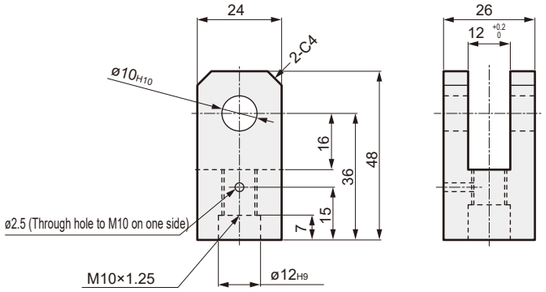


Code / Bore Size	C	E	L	LL	X
ø32	44	36	124	136	191
ø40	49	45	128	140	195

Note: For dimensions of models with switches, refer to P. 804.

Accessory External Dimensions

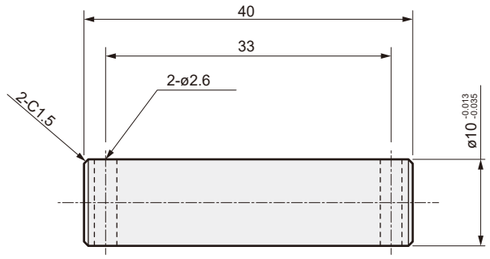
●Double Knuckle (Y) Material: Steel, Zinc Chromate



Model No.	Weight (kg)
CAC-N-Y	0.15

* Pin, split pin, spring pin, and flat washer are attached.

●Clevis pin Material: Steel, Zinc Chromate

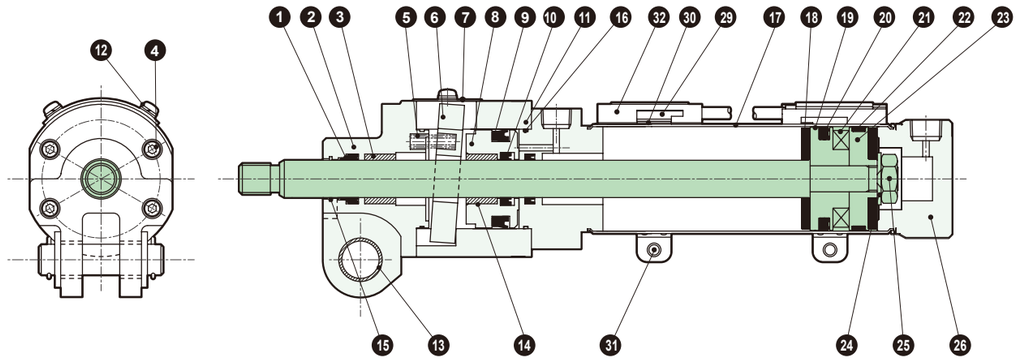


Model No.	Weight (kg)
CAC-N-P	0.02

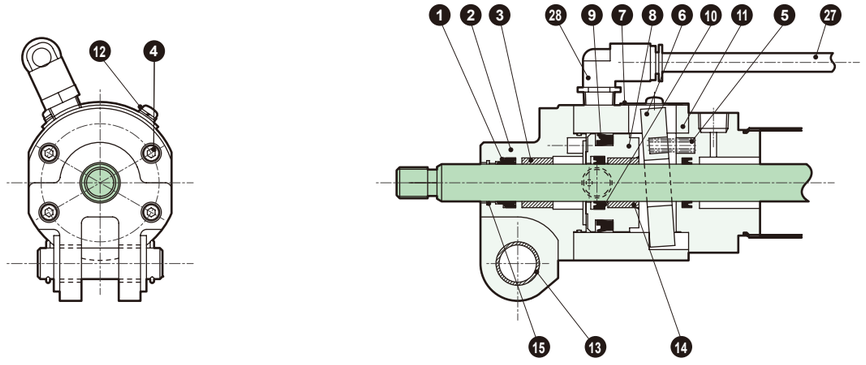
* Split pin and flat washer are included.

Internal Structure / Materials

●With reverse direction lock (UCAC-N32/N40-B)



●With forward direction lock (UCAC-N32/N40-F)



Do not disassemble

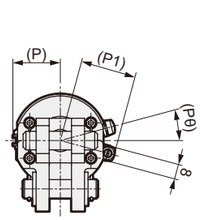
Part No.	Part Name	Material	Remarks
1	Scraper	Nitrile Rubber	
2	Rod Cover	Aluminum Alloy	Alumite
3	Metal	Oil-Impregnated Bearing Alloy	
4	Hexagon Socket Head Cap Screw	Steel	
5	Coil Spring	Steel	Black Oxide
6	Lock plate	Cast Iron	
7	Dust cover	Stainless Steel	
8	Release Piston	Aluminum Alloy	Alumite
9	Lock Piston Packing	Nitrile Rubber	
10	Lock Rod Packing	Nitrile Rubber	
11	Intermediate Cover	Aluminum Alloy	Alumite
12	Cross-Recessed Pan Head Screw	Steel	Chromate
13	Bushing for clevis	Bearing Alloy	
14	Metal	Oil-Impregnated Bearing Alloy	
15	Metal Scraper	Copper Alloy	
16	Gasket	Nitrile Rubber	
17	Cylinder Tube	Stainless Steel	

Part No.	Part Name	Material	Remarks
18	Cushion Rubber	Urethane Rubber	
19	Piston A	Aluminum Alloy	
20	Piston Packing	Nitrile Rubber	
21	Magnet	Plastic	
22	Wear ring	Polyacetal	
23	Piston B	Aluminum Alloy	
24	Metal Scraper	Copper	
25	Bushing for clevis	Bearing Alloy	
26	Plain Washer	Steel	Chromate (ø32 only)
27	Tube		
28	Push-in Fitting		
With Switch			
29	Switch		
30	Band	Stainless Steel	
31	Pan Head Screw	Stainless Steel	
32	Switch Rail	Stainless Steel	

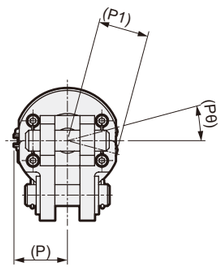
CAC-N/UCAC-N Series External Dimensions Diagram with Switch

● T0H/V, T5H/V, T2H/V, T3H/V, T2□ R3, T3PH/V, T2WH/V, T3WH/V, T2WLH/V, T1H/V, T2YD□, T2JH/V, T8H/V

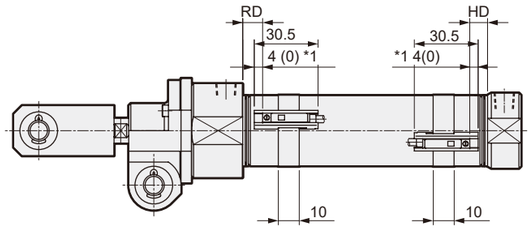
- Switch mounting method: Band Type



[For T1, T2YD, T2J, T8]



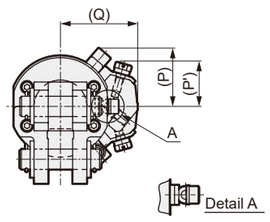
[Other cases]

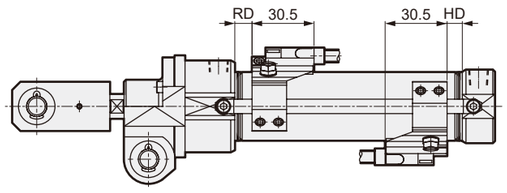


Code / Bore Size	P	Pθ	CAC-N, UCAC-N														
			T0,T5,T2,T3,T3P			T2W, T3W, T2WL			T1, T2YD			T2J			T8		
			P1	RD	HD	P1	RD	HD	P1	RD	HD	P1	RD	HD	P1	RD	HD
ø32	25.5	15	24.3	9.5	8.5	24.3	11.5	10.5	35.1	8.5	7.5	30.1	8.5	7.5	30.1	3.5	2.5
ø40	29.5	12	28.3	11.5	10.5	28.3	13.5	12.5	39.1	10.5	9.5	34.1	10.5	9.5	34.1	5.5	4.5

Note: The dimension is ( ) for T1*, T2J*, T2YD*, T8* switches with a stroke of 35 mm or more.

- Switch mounting method: Tie rod method





Code / Bore Size	Q	CAC-N, UCAC-N														
		T0,T5,T2,T3,T3P			T2W, T3W, T2WL			T1, T2YD			T2J			T8		
		P'	RD	HD	P'	RD	HD	P	RD	HD	P	RD	HD	P	RD	HD
ø32	38	22	9.5	8.5	22	11.5	10.5	29	8.5	7.5	26	8.5	7.5	26	3.5	2.5
ø40	42	22	11.5	10.5	22	13.5	12.5	30	10.5	9.5	26	10.5	9.5	26	5.5	4.5

MEMO

To Use This Product Safely

Be sure to read this before use. For general cylinder information, see Intro 41, and for cylinder switches, see P. 1512.

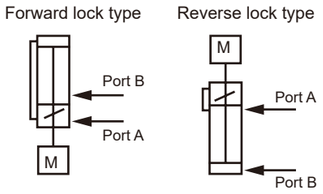
Individual Precautions: Lightweight clamp cylinder CAC-N32/40 / Lightweight clamp cylinder with drop prevention UCAC-N32/N40

Design / Selection

UCAC-N32/N40

Warning

■ Make sure to supply pressure to port B , and before unlocking, check that load is not applied to the lock mechanism.
If pressure is supplied to port A while both ports A and B are exhausted and the piston is locked, the lock may not be released, or the Piston rod may extend suddenly even if the lock is released, which is very dangerous.



■ If the cylinder is held with pressure applied on the locking mechanism, the lock could be released.
Do not use 3-position closed center and 3-position P·A·B connection solenoid valves.

■ If a back pressure is applied while locked, the lock may be released. Use a discrete solenoid valve for brake release, or use an individual exhaust manifold.

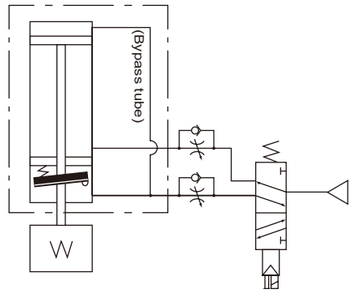
■ Do not use with the by-pass tube disconnected as lock response could be delayed.

■ Note that due to the structure, a 1 mm deviation may occur when stopped with the lock.

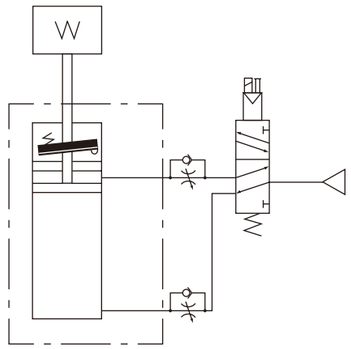
CAUTION

■ Basic Circuit Diagram
If you want to control each speed separately, installation of a speed controller is necessary.

● Forward Locking F type



● Backward Locking B type



When an emergency stop or urgent stop is performed, the forward direction lock type will continue to retract, and the reverse direction lock type will continue to advance and return to the home position. (It will stop at that position when residual pressure is gone)

During Use

1. Common

CAUTION

■ Flush the connected pipe sufficiently to prevent foreign materials or cutting chips from entering the cylinder when installing the product.

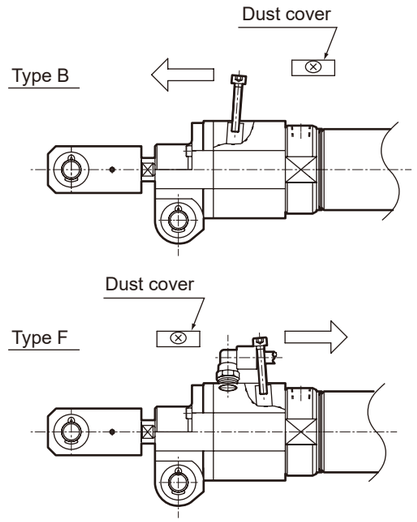
■ Be careful not to scratch or dent the Piston Rod sliding part.
This can lead to damage to packings and cause air leakage.

2. UCAC-N32/N40

Warning

■ During equipment maintenance, please take separate measures for safety so that the load does not fall due to its own weight. Since the locking force will decrease and it is dangerous, do not apply rotational force (torque) to the rod during lock operation.
Also, use with a mechanism that prevents rod rotation.

■ How to unlock manually
1. Remove dust cover A.
2. Hexagon Socket Head Cap Screw in screw hole M4 of lock metal(Length 40 or more recommended) Screw in all the way.
3. Tilt the Hexagon Socket Head Cap Screw in the direction of the arrow to free the rod.



■ Do not disassemble the unit, as doing so may be dangerous.

3. Common (With T-type switch)

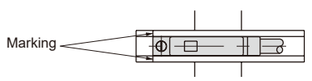
CAUTION

■ When Moving the Switch Position in the Stroke Direction

● The 1-color indicator switch can be finely adjusted by about ±3 mm from the mounting position at the time of shipment. If the adjustment range exceeds ±3 mm, or if fine-tuning the position of a 2-color indicator switch, move the band position.

● Loosen the switch mounting screw, move the switch along the rail, and tighten at the specified position. For T2, T3, T0, T5, use a flat-head screwdriver (watchmaker's screwdriver, precision screwdriver, etc.) with a grip diameter of 5 to 6 mm, tip shape width of 2.4 mm or less, and thickness of 0.3 mm or less to tighten the switch fixing screw with a tightening torque of 0.1 to 0.2 N·m. For T1, T□C, T2J, T2Y, T3Y, T8, tighten with a tightening torque of 0.5 to 0.7 N·m.

● The switch rail has a marking 4 mm from the end face of the rail. Use it as a guide for mounting position when replacing the switch. The switch rail marking is set to the switch maximum sensitivity position at factory shipment. If the switch type changes or the band is moved, the maximum sensitivity position changes, so adjust the position each time.

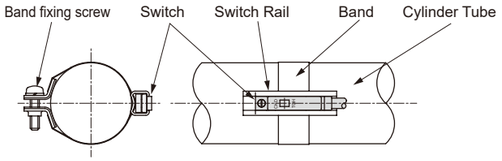


■ When Moving the Switch Position in the Circumferential Direction

● Loosen the band fixing screw, move the switch rail circumferentially, and tighten it at the specified position. The tightening torque is 0.6 to 0.8 N·m.

■ When Moving the Band Position

● Loosen the band fixing screw, move the switch rail and band along the cylinder tube, and tighten them at the specified position. The tightening torque is 0.6 to 0.8 N·m.



■ Switch mounting and travel method for tie rod mounting (A/C)

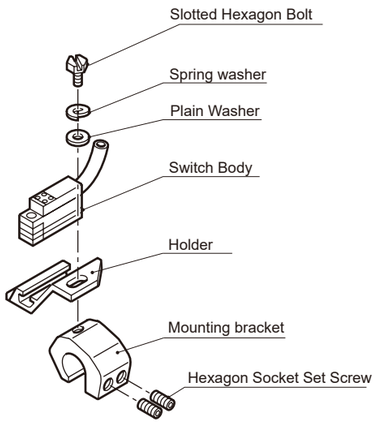
Mounting method

(1) Pass a spring washer and flat washer through the slotted Hexagon Bolt and set the holder.
(2) Fit the mounting bracket onto the cylinder tie rod and tighten the Hexagon Socket Head Cap Screw. Tightening torque is 0.5 to 0.7 N·m.
(3) Finally, tighten the Hexagon Socket head Set Screw. Tightening torque is 1.7 to 2.0 N·m.

Movement method

① Fine adjustment
Loosen the slotted Hexagon Bolt, move only the switch body, and tighten it at the specified position. Tightening torque is 0.5 to 0.7 N·m.

② Coarse adjustment
Loosen all slotted Hexagon Bolts and Set Screws, move the entire mounting bracket to the specified position, and then tighten the slotted Hexagon Bolts. Tightening torque is 0.5 to 0.7 N·m. Then, tighten the Set Screw. Tightening torque is 1.7 to 2.0 N·m.



For precautions during mounting, installation, adjustment, use, and maintenance, refer to "During Use" in this catalog and the CKD Components Product website (https://www.ckd.co.jp/kiki/en/) -> "Model No." -> Instruction Manual.

Rotary clamp cylinder

Achieves compact clamping by combining rotational and linear motion

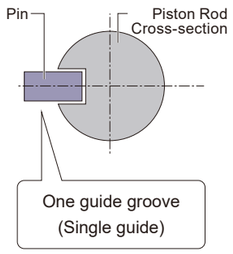
RCS2 Series

(ø12 to ø63)

Standard single guide

Simple single guide structure contributes to space saving.

By providing a guide groove (1 place) on the Piston Rod and making it slide on the pin, linear and rotational motion is performed.



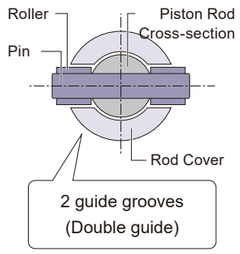
RCC2 Series

(ø16 to ø63)

Robust type with 2-groove guide

Adopts a 2-guide groove structure to improve wear resistance of the guide grooves. Rollers are equipped on the guide pins for ø32 to ø50.

By providing guide grooves (2 places) on the rod cover and making them slide on the pins, linear and rotational motion is performed.

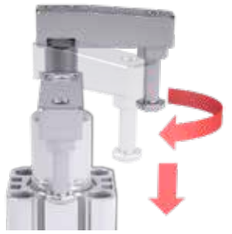


Consideration for environmental resistance

Coil scraper is standardly equipped for ø20 and above.

Combination of rotational and linear motion

Since the clamp lever rotates 90° during unclamping, setting and removing the workpiece can be done easily.



Clockwise 90° (R: Right rotation)

Counter-clockwise 90° (L: Left rotation)

Improved accuracy of mounting repeatability

All models are standardly equipped with a rod side spigot joint. (RCS2 also supports head side spigot joint as an option)

Sputter adhesion prevention type

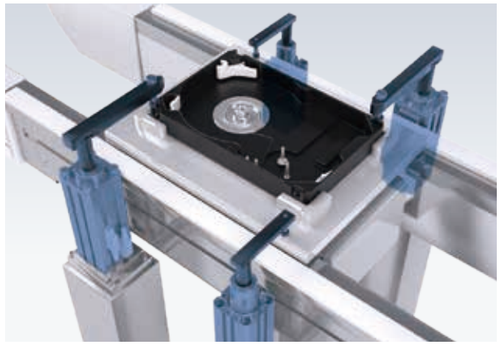
We offer a sputter adhesion prevention type that can withstand harsh environments in welding processes. (G4 type: Available for RCS2 Series ø32 and larger, RCC2 Series ø20 and larger)

Strong magnetic field proof switch T2YD type

Strong magnetic field proof switch T2YD type for AC magnetic fields can be installed. (ø20 or more)

Application Example

Clamping of jigs (pallets) and workpieces on conveyors

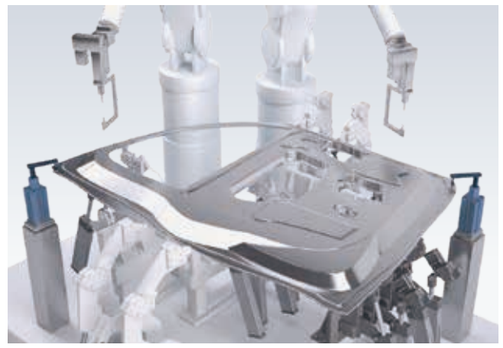


*short lever: RCS2 Long lever: RCC2

Workpiece clamping in dry deburring and finishing processes

Workpiece auxiliary holding for transfer robots

Workpiece clamping with welding jigs



Clamp Cylinder

RCS2

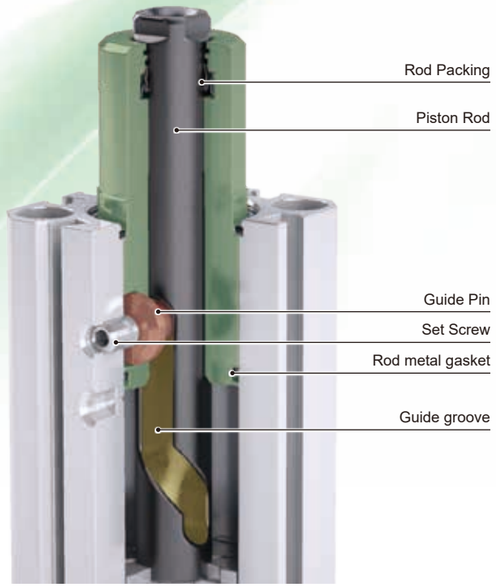
Rotary Clamp Cylinder (Single Guide Type)

ø12, ø16, ø20, ø25, ø32, ø40, ø50, ø63

CONTENTS

Product Introduction	812
Series variation	814
●Double Acting, Single Rod Type (RCS2)	816
● Double Acting/packing material Fluoro Rubber (RCS2-T2)	826
● Double Acting/anti-spatter adherence (RCS2-G4)	832
External Dimensions Diagram with Switch	838
Technical Data	840
⚠Precautions for Use	842

Simple design for compact clamping



Simple structure contributing to space saving

Single guide structure

By providing one guide groove on the Piston Rod and making it slide on the guide pin, linear and rotational motion is performed.

High maintainability

Consumable parts can be replaced

Guide pins and packings can be replaced.

Easy orientation of clamp lever

Rod End processed to 4-flat width

Orientation of the clamp lever can be easily performed based on the four-flat width of the Rod End.

Cylinder switch according to application

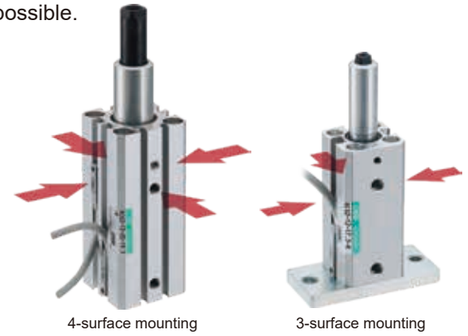
Abundant lineup

T-type and ultra-compact F-type switches can be installed.

2-color indicator type AC magnetic field proof cylinder switch (T2YD, T2YDT) can be installed

Achieves high visibility

Multi-surface mounting emphasizing visibility is possible.



4-surface mounting (RCS2-20 to 63)

3-surface mounting (RCS2-12/16)

High installation repeatability

Reduced centering time during cylinder replacement

Centering during cylinder replacement can be easily performed using the spigot joint.

Rod side spigot joint (Standard specification)

Head side spigot joint (Option)

Combination of rotational and linear motion

Clamp lever rotates 90°

Since the clamp lever rotates 90° during unclamping, setting and removing the workpiece can be done easily.

Clockwise 90° (R: Right rotation)

Counter-clockwise 90° (L: Left rotation)

Structure considering environmental resistance

Coil scraper equipped as standard

Coil scraper is standardly equipped for tube inner diameter ø20 or more. Removes sputter from the rod surface and prevents entry into the cylinder.

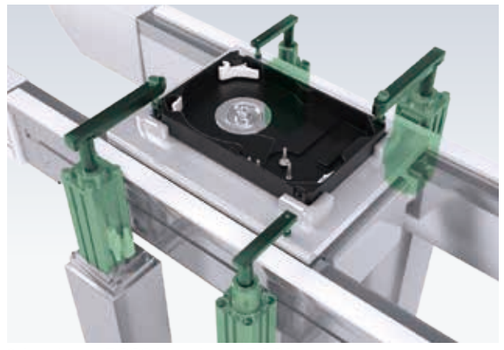
Sputter adhesion prevention type (G4) selectable

G4, a sputter adhesion prevention specification equipped with a lubekeeper using a fiber aggregate impregnated with sputter adhesion inhibitor and a coil scraper, is selectable (tube inner diameter ø32 or more). More strongly prevents sputter adhesion to the Piston Rod during arc welding.

Seal material fluoroelastomer (Variation code: T2) can be selected

Case Studies

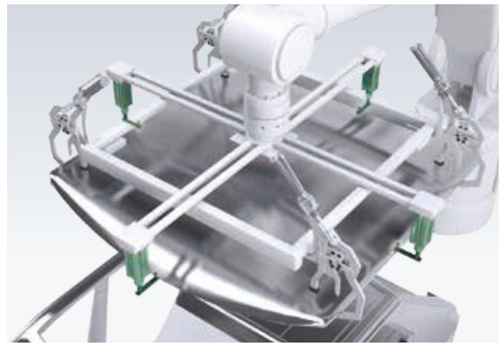
Clamping of jigs (pallets) and workpieces on conveyors



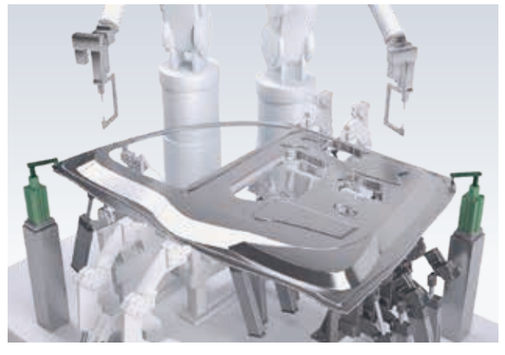
*short lever: RCS2 Long lever: RCC2

Workpiece clamping in dry deburring and finishing processes

Workpiece auxiliary holding for transfer robots

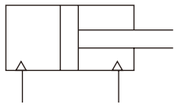
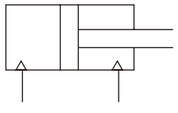
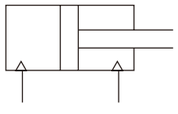


Workpiece clamping with welding jigs



Rotary clamp cylinder RCS2 Series

●: Standard, ◎: Option, : Not available

Variation	Model Number / Circuit Diagram Code	Bore Size (mm)	Stroke (mm)									Stroke (mm)						Rotation stroke	Clamp stroke	Mounting Style			Option	Accessories	Switch	Page
			17.5	19.5	25	29	27.5	29.5	35	39		37.5	39.5	45	49	65	69	(mm)	(mm)	Basic type 00	Rod side flange type FA	Head Side Flange Type FB	Head side spigot joint H	Clamp lever A		
Double Acting, Single Rod Type	RCS2 	ø12, ø16	●				●					●						7.5	10, 20, 30	◎	◎	◎	◎	◎	◎	816
		ø20, ø25		●				●					●					9.5								
		ø32, ø40			●				●					●		●		15								
		ø50, ø63				●				●					●		●	19	30, 50							
Double Acting Seal material: Fluoro Rubber	RCS2-T2 	ø12, ø16	●				●					●						7.5	10, 20, 30	◎	◎	◎	◎	◎	◎	826
		ø20, ø25		●				●					●					9.5								
		ø32, ø40			●				●					●		●		15								
		ø50, ø63				●				●					●		●	19	30, 50							
Double Acting Sputter adhesion prevention type	RCS2-G4 	ø32, ø40			●				●					●		●		15	10, 20, 30	◎	◎	◎	◎	◎	◎	832
		ø50, ø63				●				●					●		●	19	30, 50							

Rotary Clamp Cylinder, Single Guide Type, Double Acting, Single Rod Type

RCS2 Series

●Bore Size: ø12, ø16, ø20, ø25, ø32, ø40, ø50, ø63

Circuit Diagram Code ●Double Acting Type

RoHS

Model No. Notation

Without Switch (Built-in magnet for switch)

RCS2 - 00 - 12 - 17.5 - R — H A

Model No. ① ② ③ ④ ⑤ ⑧ ⑨

With Switch (Built-in magnet for switch)

RCS2 - 00 - 12 - 17.5 - R - T0H - D - H A

Model No.
① Mounting Type
② Bore Size
③ Piping thread type
④ Stroke
⑤ Direction of rotation
⑥ Switch Model No.
⑦ Number of Switches
⑧ Option
⑨ Accessories

① Mounting Type

Code	Content	
00	Basic type	
FA	Rod Side Flange Type	
FB	Head Side Flange Type	

② Bore Size (mm)

Code	Content
12	ø12
16	ø16
20	ø20
25	ø25
32	ø32
40	ø40
50	ø50
63	ø63

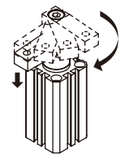
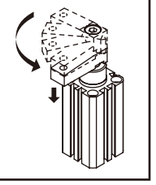
③ Piping thread type

Code	Content
Blank	M5 (ø12 to ø25) Rc thread (ø32 to ø63)
N	NPT thread (ø32 or more)
G	G thread (ø32 or more)

④ Stroke (mm)

Stroke	Bore Size (ø)								Rotation stroke	Clamp stroke
	12	16	20	25	32	40	50	63		
17.5	●	●							7.5	10
19.5			●	●					9.5	
25					●	●			15	
29							●	●	19	
27.5	●	●							7.5	20
29.5			●	●					9.5	
35					●	●			15	
39							●	●	19	
37.5	●	●							7.5	30
39.5			●	●					9.5	
45					●	●			15	
49							●	●	19	
65					●	●			15	50
69							●	●	19	

⑤ Direction of rotation

Code	Content	
R	90° clockwise rotation during retraction	
L	90° counterclockwise rotation during retraction	

⑥ Switch Model No.

For switch details, please see P. 1457. Switches are shipped with the product.

	Indicator LED Special Function	Wiring (Output)	Load Voltage (V) AC	Load Voltage (V) DC	Load Current (mA) AC	Load Current (mA) DC	Lead wire *1 Straight	Lead wire *1 L-shape	
Solid State (Contact)	1-Color	2-wire	-	10 to 30	-	5 to 20	-	F2S□	
		3-wire (NPN)	-	30 or less	-	50 or less	-	F3S□	
		2-wire	-	10 to 30	-	5 to 20 *2	F2H□	F2V□	
		3-wire (NPN)	-	30 or less	-	50 or less	F3H□	F3V□	
		3-wire (PNP)	-	30 or less	-	50 or less	F3PH□	F3PV□	
	2-Color	2-wire	-	24 ± 10%	-	5 to 20	F2YH□	F2YV□	
		3-wire (NPN)	-	30 or less	-	50 or less	F3YH□	F3YV□	
	1-color	2-wire	85 to 265	-	5 to 100	-	T1H□	T1V□	*5
			-	10 to 30	-	5 to 20 *2	T2H□	T2V□	
		3-wire (NPN)	-	30 or less	-	100 or less	T3H□	T3V□	
		3-wire (PNP)	-		-		T3PH□	T3PV□	
	2-Color	2-wire	-	24 ± 10%	-	5 to 20	T2WH□	T2WV□	
		3-wire (NPN)	-	30 or less	-	50 or less	T3WH□	T3WV□	
	2-Color Improved Water Resistance	2-wire	-	24 ± 10%	-	5 to 20	T2WLH□	T2WLV□	*3
	2-Color for AC Magnetic Field		-		-		T2YD□	–	
			-		-		T2YDT□	–	
	1-Color Off-Delay Type		-	10 to 30	-	5 to 20 *2	T2JH□	T2JV□	
	1-color Flexible Lead Wire Type		-	10 to 30	-		T2HR3	T2VR3	
Reed (Contact)	1-Color Without Indicator Lamp	2-wire	110	12/24	7 to 20	5 to 50	T0H□	T0V□	
			110	5/12/24	20 or less	50 or less	T5H□	T5V□	
	1-color		110/220	12/24	7 to 20 / 7 to 10	5 to 50	T8H□	T8V□	*5

*1: For "□" in the switch model number, enter the code selected from the "Lead wire length, connector specification" table.
*2: The maximum load current value above, 20 mA, is at 25°C. If the switch operating Ambient Temperature is higher than 25°C, it will be lower than 20 mA.(At 60°C, it will be 5 to 10 mA.)
*3: This does not guarantee the water resistance of the cylinder.
*4: Switches other than the model numbers listed above are also available. (Custom product) For details, see P. 1457Please refer to the weight listed in the switch specifications.
*5: For ø12, ø16, T1□, T8□, T2YD□, T2YDT□, T2J□ switches cannot be selected.
*6: F type switch can be selected only for ø20 and ø25.

*Lead wire length, connector specification

Code	Content
Blank	1 m (Standard)
3	3 m (Option)
*8 5	5 m (Option)
*7 W	M8 Connector, 1PIN (+), 4PIN (−) Lead Wire 0.3 m

*7: Only T2WLH, T2WLV can be selected.
*8: F-type switch with 5 m lead wire length cannot be selected.

Example) Lead wire length
1 m T0H
3 m T0H3
5 m T0H5

⑦ Number of Switches

Code	Content
R	With 1 pc on rod side
H	With 1 pc on head side
D	Both sides included

⑧ Option

Code	Content	
Blank	No option	
*1 H	Head side spigot joint	

*1: If (1) Mounting Type is "FA""FB", option "H" cannot be selected.

⑨ Accessories

Code	Content	
Blank	No accessories	
A	Clamp lever	

Switch Single Unit Model No.

SW - T0H3

⑥ Switch Model No.

Clamp Lever Kit Model No.

RCS2 - A - 12

Code	Bore Size
12	ø12
16	ø16
20	ø20, ø25
32	ø32, ø40
50	ø50, ø63

Flange Kit Model No.

RCS2 - FA - 12

② Bore Size

Specifications

Item		RCS2							
Bore Size	mm	ø12	ø16	ø20	ø25	ø32	ø40	ø50	ø63
Actuation method		Double Acting Type							
Operating Fluid		Compressed Air							
Max Operating Pressure	MPa	1.0							0.6
Min Operating Pressure	MPa	0.1 *1							
Proof Pressure	MPa	1.6							
Ambient Temperature	°C	-10 to 60 (however, no freezing)							
Connection Port	Rc, NPT, G	M5				1/8		1/4	
Stroke tolerance	mm	+1.0 0		+1.2 0					
Operating piston speed	mm/s	50 to 200							
Cushion		With rod side rubber cushion, without head side cushion							
Lubrication		Not required (Use Turbine Oil Class 1 ISO VG32 if lubricated)							
Rotation Angle		90° ±10°							
Direction of rotation		Right/Left							
Non-rotation accuracy (during clamping, initial value)		±1.4°		±1.2°		±0.9°		±0.7°	
Pressure Receiving Area	mm² Retraction side	84	150	201	377	603	1056	1649	2803
	mm² Push side	113	201	314	490	804	1256	1963	3117

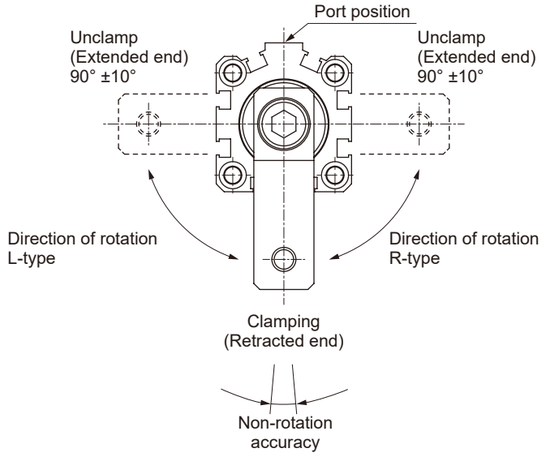
*1: At constant pressure pressurization

Stroke

Bore Size (mm)	Stroke (mm)	Rotation stroke *1 (mm)	Clamp stroke *2 (mm)
ø12, ø16	17.5, 27.5, 37.5	7.5	10, 20, 30
ø20, ø25	19.5, 29.5, 39.5	9.5	10, 20, 30
ø32, ø40	25, 35, 45, 65	15	10, 20, 30, 50
ø50, ø63	29, 39, 49, 69	19	10, 20, 30, 50

*1: Rotary stroke is the dimension of linear operation in the clamping direction while rotating from the unclamp end.
*2: Clamp stroke is the dimension of linear operation in the clamping direction after rotation.

Rotation Angle, Rotation Direction, Non-rotation Accuracy



Cylinder Weight

(Unit: g)

Bore Size (mm)	Stroke mm														Rod Side Flange (FA)	Head Side Flange (FB)	Switch Weight
	17.5	19.5	25	29	27.5	29.5	35	39	37.5	39.5	45	49	65	69			
ø12	69				84				99						49	49	Refer to the Weight listed in the Switch Specifications on P. 1457.
ø16	100				123				146						59	59	
ø20		212				252				292					114	114	
ø25		267				314				361					125	125	
ø32			333				372				411		489		145	145	
ø40			554				629				704		854		193	193	
ø50				997				1118				1239		1481	335	335	
ø63				1373				1526				1679		1985	464	464	

Theoretical Thrust Table

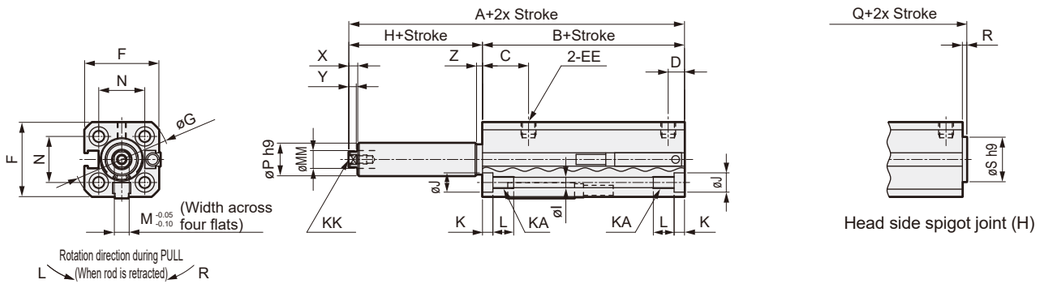
(Unit: N)

Bore Size (mm)	Operating Direction	Operating Pressure MPa									
		0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
ø12	Push	11.3	22.6	33.9	45.2	56.5	67.9	79.2	90.5	1.02×10^2	1.13×10^2
	Pull	8.5	17.0	25.4	33.9	42.4	50.9	59.4	67.9	76.3	84.8
ø16	Push	20.1	40.2	60.3	80.4	1.01×10^2	1.21×10^2	1.41×10^2	1.61×10^2	1.81×10^2	2.01×10^2
	Pull	15.1	30.2	45.2	60.3	75.4	90.5	1.06×10^2	1.21×10^2	1.36×10^2	1.51×10^2
ø20	Push	31.4	62.8	94.2	1.26×10^2	1.57×10^2	1.88×10^2	2.20×10^2	2.51×10^2	2.83×10^2	3.14×10^2
	Pull	20.1	40.2	60.3	80.4	1.01×10^2	1.21×10^2	1.41×10^2	1.61×10^2	1.81×10^2	2.01×10^2
ø25	Push	49.1k	98.2	1.47×10^2	1.96×10^2	2.45×10^2	2.95×10^2	3.44×10^2	3.93×10^2	4.42×10^2	4.91×10^2
	Pull	37.8	75.6	1.13×10^2	1.51×10^2	1.89×10^2	2.27×10^2	2.64×10^2	3.02×10^2	3.40×10^2	3.78×10^2
ø32	Push	80.4	1.61×10^2	2.41×10^2	3.22×10^2	4.02×10^2	4.83×10^2	5.63×10^2	6.43×10^2	7.24×10^2	8.04×10^2
	Pull	60.3	1.21×10^2	1.81×10^2	2.41×10^2	3.02×10^2	3.62×10^2	4.22×10^2	4.83×10^2	5.43×10^2	6.03×10^2
ø40	Push	1.26×10^2	2.51×10^2	3.77×10^2	5.03×10^2	6.28×10^2	7.54×10^2	8.80×10^2	1.01×10^3	1.13×10^3	1.26×10^3
	Pull	1.06×10^2	2.11×10^2	3.17×10^2	4.22×10^2	5.28×10^2	6.33×10^2	7.39×10^2	8.44×10^2	9.50×10^2	1.06×10^3
ø50	Push	1.96×10^2	3.93×10^2	5.89×10^2	7.85×10^2	9.82×10^2	1.18×10^3	1.37×10^3	1.57×10^3	1.77×10^3	1.96×10^3
	Pull	1.65×10^2	3.30×10^2	4.95×10^2	6.60×10^2	8.25×10^2	9.90×10^2	1.15×10^3	1.32×10^3	1.48×10^3	1.65×10^3
ø63	Push	3.12×10^2	6.23×10^2	9.35×10^2	1.25×10^3	1.56×10^3	1.87×10^3	–	–	–	–
	Pull	2.80×10^2	5.61×10^2	8.41×10^2	1.12×10^3	1.40×10^3	1.68×10^3	–	–	–	–

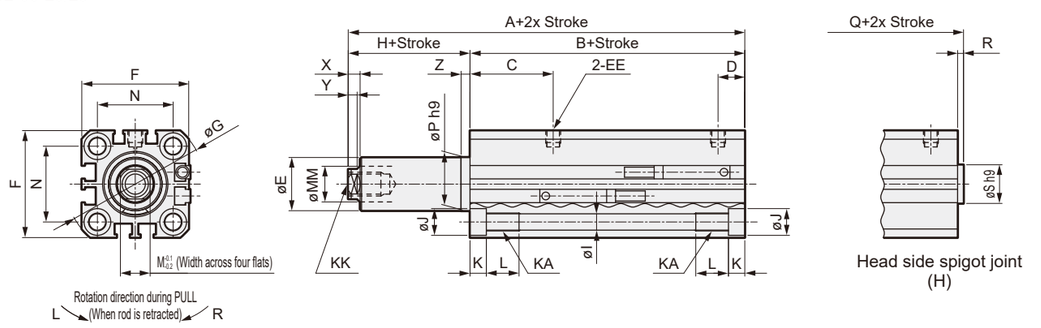
Dimensional Drawings

● Basic type (00)

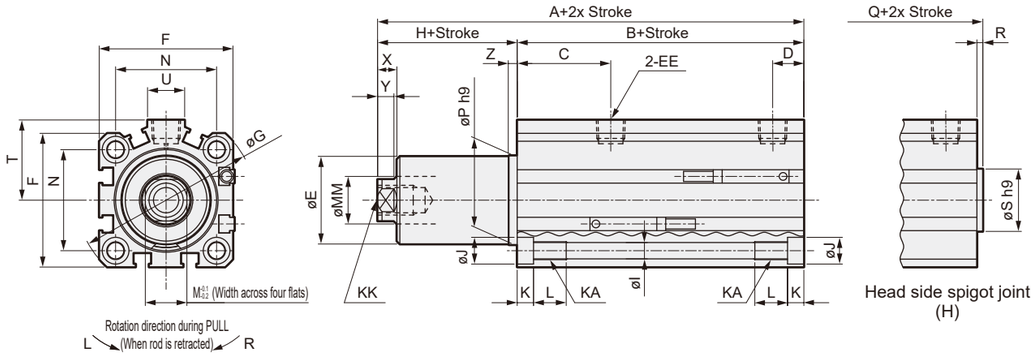
RCS2-00-12/16



RCS2-00-20/25



RCS2-00-32, 40, 50, 63



Code	Basic Type (00) Basic Dimensions																								
Bore Size (mm)	A	B	C	D	E	EE	F	G	H	I	J	K	KA	KK	L	M	MM	N	P	Q	R	S	T	U	X	Y	Z
ø12	33	28	15.5	5.5	–	M5 Depth 4	25	32	5	3.5	6.5	3.5	M4	M3 Depth 5.5	7	5	6	15.5	11	34.5	1.5	15	–	–	3	2.5	2
ø16	33.5	28.5	15	5.5	–	M5 Depth 4	29	38	5	3.5	6.5	3.5	M4	M5 Depth 6.5	7	7	8	20	14	34.9	1.5	20	–	–	3	2.5	2.2
ø20	53.5	52.5	28	9	17.9	M5 Depth 4	36	47	1	5.5	9	5.5	M6	M8 Depth 11	11	10	12	25.5	18	55.5	2	13	–	–	4	3	3
ø25	54.5	53.5	27.5	10.5	22.5	M5 Depth 4	40	51	1	5.5	9	5.5	M6	M8 Depth 11	11	10	12	28	23	56.5	2	15	–	–	4	3	3
ø32	63.5	56.5	31.5	10.5	29.5	Rc1/8	45	60	7	5.5	9	5.5	M6	M10 Depth 12	11	14	16	34	30	65.5	2	21	27	12.5	6.5	5.5	3
ø40	64.5	50	29	9	29.5	Rc1/8	52	69	14.5	5.5	9	5.5	M6	M10 Depth 12	11	14	16	40	30	66.5	2	28	31	15	6.5	5.5	3
ø50	74	57.5	34	11.5	36.5	Rc1/4	64	86	16.5	6.9	11	6.5	M8	M12 Depth 16	14	17	20	50	37	76	2	35	39	18	7.5	5.5	3.5
ø63	77	61	34.5	10.5	47.5	Rc1/4	77	103	16	8.7	14	9	M10	M12 Depth 16	20	17	20	60	48	79	2	35	45.5	23	7.5	5.5	3.5

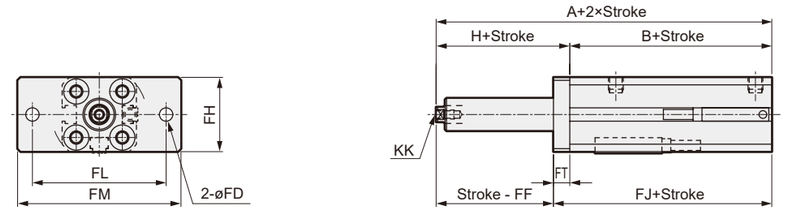
*1: Only F type switch can be mounted on the port surface of Bore Sizes ø20 and ø25.

***2: For dimensions with each switch, please refer to P. 838, 839.**

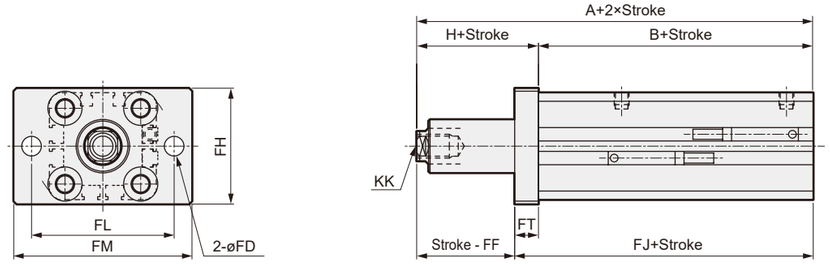
Dimensional Drawings

●Rod Side Flange Type (FA)

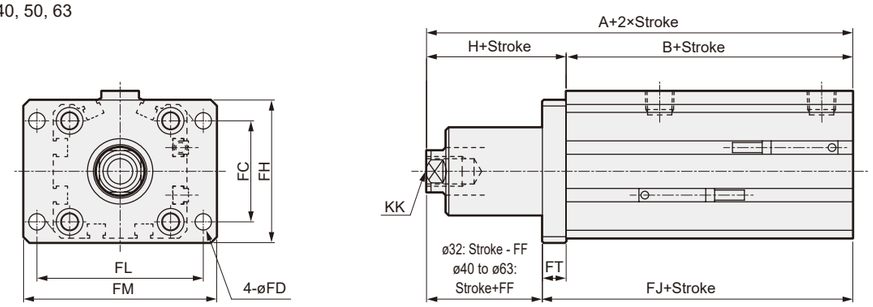
RCS2-FA-12/16



RCS2-FA-20/25



RCS2-FA-32, 40, 50, 63



Code	Rod Side Flange Type (FA) Mounting Dimensions											
Bore Size (mm)	A	B	H	KK	FC	FD	FF	FJ	FH	FL	FM	FT
ø12	33	28	5	M3 Depth 5.5	–	4.5	0.5	33.5	25	45	55	5.5
ø16	33.5	28.5	5	M5 Depth 6.5	–	4.5	0.6	34	30	45	55	5.5
ø20	53.5	52.5	1	M8 Depth 11	–	6.6	7	60.5	39	48	60	8
ø25	54.5	53.5	1	M8 Depth 11	–	6.6	7	61.5	42	52	64	8
ø32	63.5	56.5	7	M10 Depth 12	34	5.5	1	64.5	48	56	65	8
ø40	64.5	50	14.5	M10 Depth 12	40	5.5	6.5	58	54	62	72	8
ø50	74	57.5	16.5	M12 Depth 16	50	6.6	7.5	66.5	67	76	89	9
ø63	77	61	16	M12 Depth 16	60	9	7	70	80	92	108	9

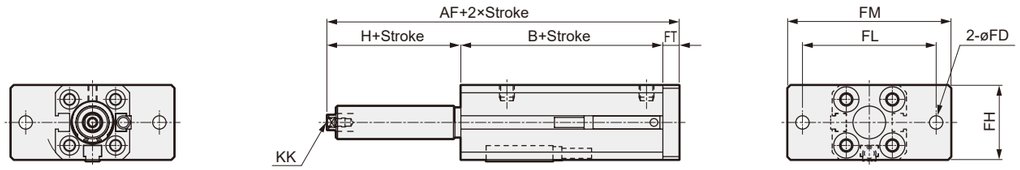
*1: Only F type switch can be mounted on the port surface of Bore Sizes ø20 and ø25.

***2: For dimensions with each switch, please refer to P. 838, 839.**

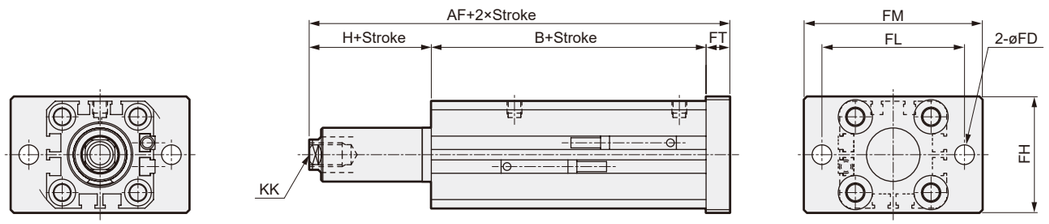
Dimensional Drawings

●Head Side Flange Type (FB)

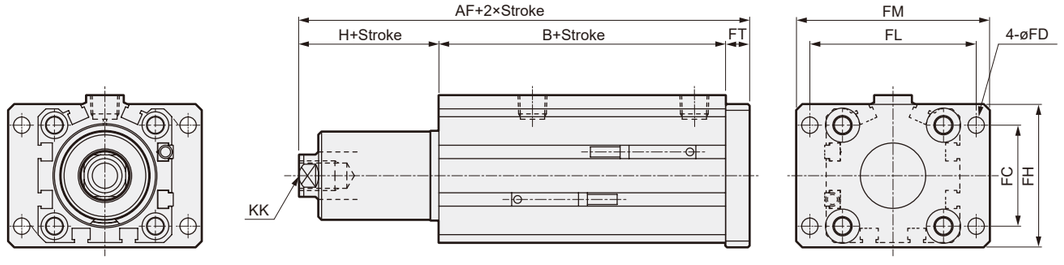
RCS2-FB-12/16



RCS2-FB-20/25



RCS2-FB-32, 40, 50, 63



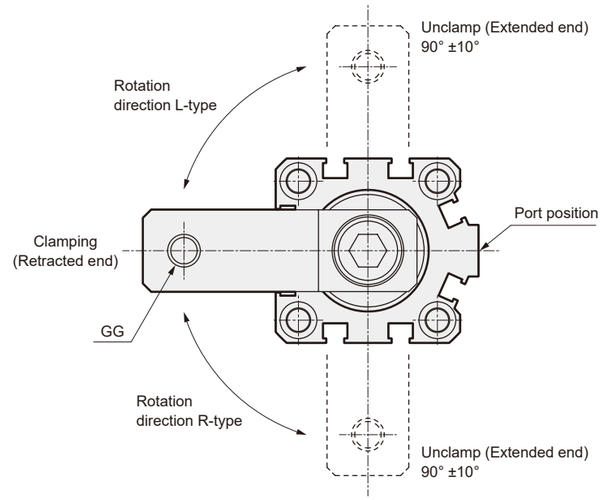
Code	Head Side Flange Type (FB) Mounting Dimensions									
Bore Size (mm)	AF	B	H	KK	FC	FD	FH	FL	FM	FT
ø12	38.5	28	5	M3 Depth 5.5	–	4.5	25	45	55	5.5
ø16	39	28.5	5	M5 Depth 6.5	–	4.5	30	45	55	5.5
ø20	61.5	52.5	1	M8 Depth 11	–	6.6	39	48	60	8
ø25	62.5	53.5	1	M8 Depth 11	–	6.6	42	52	64	8
ø32	71.5	56.5	7	M10 Depth 12	34	5.5	48	56	65	8
ø40	72.5	50	14.5	M10 Depth 12	40	5.5	54	62	72	8
ø50	83	57.5	16.5	M12 Depth 16	50	6.6	67	76	89	9
ø63	86	61	16	M12 Depth 16	60	9	80	92	108	9

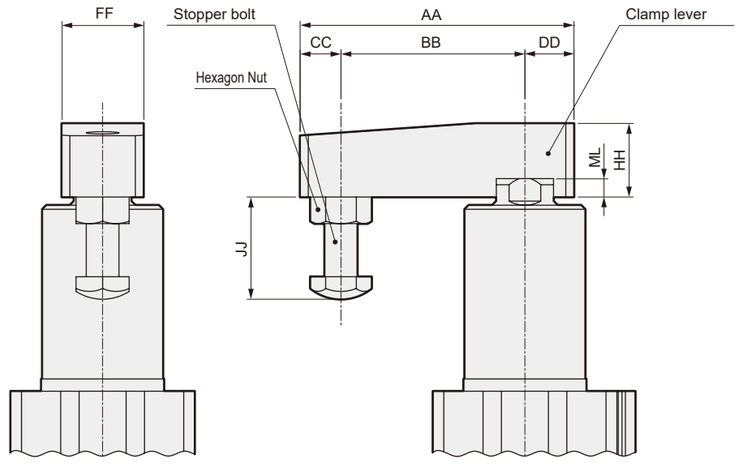
*1: Only F type switch can be mounted on the port surface of Bore Sizes ø20 and ø25.

***2: For dimensions with each switch, please refer to P. 838, 839.**

Accessory External Dimensions

● Clamp lever (A)



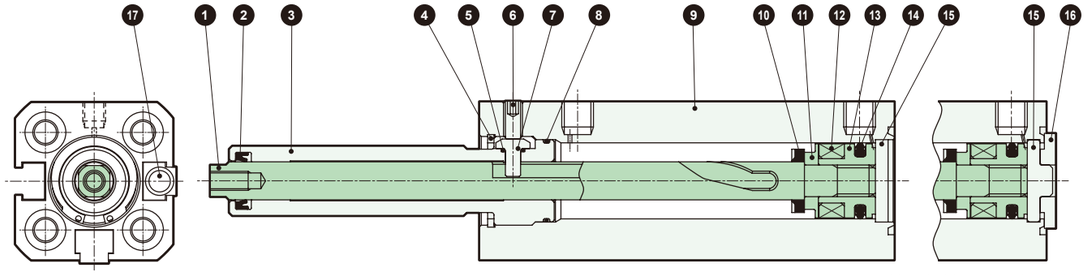


Code	With clamp lever									Moment of Inertia (kg·m²)	
Bore Size (mm)	AA	BB	CC	DD	FF	GG	HH	JJ	ML	Clamp lever single unit	With stopper bolt
ø12	29	20	4	5	8	M3×0.5	8	8 to 18	2	1.9×10^{-6}	2.7×10^{-6}
ø16	36	25	5	6	11	M4×0.7	11	8 to 18	2	7.3×10^{-6}	9.8×10^{-6}
ø20, 25	51	35	7	9	16	M6×1.0	14	12 to 22	2.5	3.6×10^{-5}	5×10^{-5}
ø32, 40	67	45	10	12	20	M8×1.25	18	15 to 25	4.5	1.3×10^{-4}	1.8×10^{-4}
ø50, 63	88	65	10	13	22	M10×1.5	22	30 to 40	4.5	4×10^{-4}	6.2×10^{-4}

Note: The material of the clamp lever, stopper bolt, and Hexagon Nut is steel.

Internal structure / Material (Bore Size: ø12, ø16, ø20, ø25)

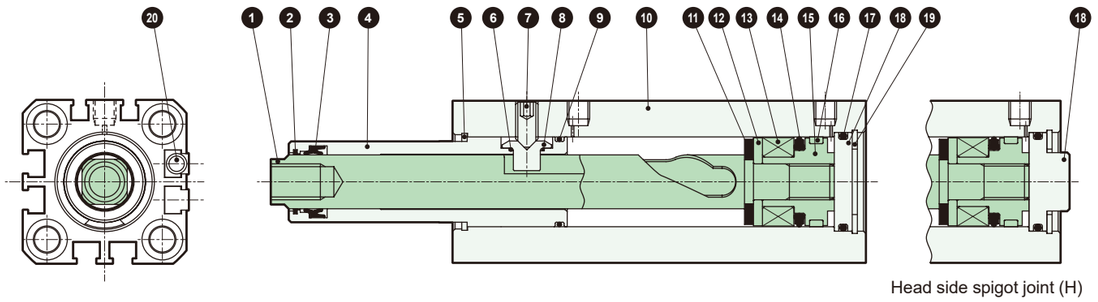
●ø12, ø16



Head side spigot joint (H)

Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Piston Rod	Stainless Steel	Special treatment	11	Spacer	ø12: Aluminum Alloy ø16: Special plastic	ø12: Zinc Chromate
2	Rod Packing	Nitrile Rubber					
3	Rod Metal	Aluminum Alloy	Hard Anodized	12	Magnet	Plastic	
4	Round R Type Retaining Ring	Steel	Zinc Phosphate	13	Piston	Aluminum Alloy	Zinc Chromate
5	Guide pin gasket	Nitrile Rubber		14	Piston Packing	Nitrile Rubber	
6	Hexagon Socket Set Screw	Stainless Steel		15	Cover	Stainless Steel	
7	Guide Pin	Steel	Special treatment	16	Spigot joint ring	Aluminum Alloy	Zinc Chromate
8	Rod metal gasket	Nitrile Rubber		With Switch			
9	Cylinder Body	Aluminum Alloy	Hard Anodized	17	Switch		
10	Cushion rubber (R)	Urethane Rubber					

●ø20, ø25



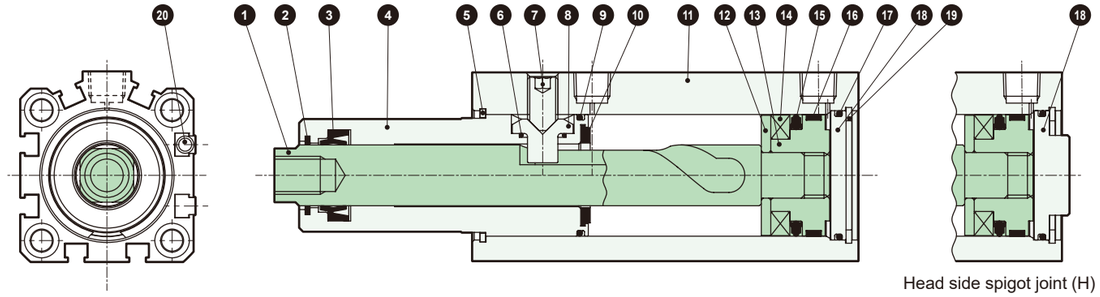
Head side spigot joint (H)

Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Piston Rod	Stainless Steel	Special treatment	12	Spacer	Aluminum Alloy	Zinc Chromate
2	Coil Scraper	Copper Alloy		13	Magnet	Plastic	
3	Rod Packing	Nitrile Rubber		14	Piston Packing	Nitrile Rubber	
4	Rod metal	Aluminum Alloy	Hard Anodized	15	Piston	Aluminum Alloy	Zinc Chromate
5	Circlip	Steel		16	Wear Ring	Polyacetal	
6	Guide pin gasket	Nitrile Rubber		17	Cover gasket	Nitrile Rubber	
7	Hexagon Socket Set Screw	Stainless Steel		18	Bottom plate	Aluminum Alloy	Zinc Chromate
8	Guide Pin	Steel	Special treatment	19	C-type Retaining Ring	Steel	Zinc Phosphate
9	Rod metal gasket	Nitrile Rubber		With Switch			
10	Cylinder Body	Aluminum Alloy	Hard Anodized	20	Switch		
11	Cushion rubber (R)	Urethane Rubber					

For maintenance parts, please visit the CKD Equipment Product Site (https: //www.ckd.co.jp/kiki/en/) → "model No." → Maintenance Parts.

Internal structure / Material (Bore Size: ø32, ø40, ø50, ø63)

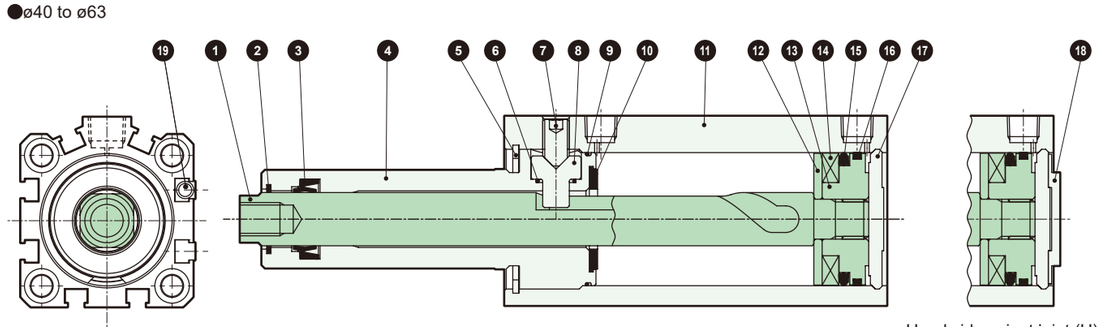
●ø32



Head side spigot joint (H)

Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Piston Rod	Stainless Steel	Special treatment	12	Spacer	Aluminum Alloy	
2	Coil Scraper	Copper Alloy		13	Piston	Aluminum Alloy	Zinc Chromate
3	Rod Packing	Nitrile Rubber		14	Magnet	Plastic	
4	Rod metal	Aluminum Alloy	Hard Anodized	15	Piston Packing	Nitrile Rubber	
5	Circlip	Steel		16	Wear Ring	Polyacetal	
6	Guide pin gasket	Nitrile Rubber		17	Cover gasket	Nitrile Rubber	
7	Hexagon Socket Set Screw	Stainless Steel		18	Bottom plate	Aluminum Alloy	Zinc Chromate
8	Guide Pin	Steel	Special treatment	19	C-type Retaining Ring	Steel	Zinc Phosphate
9	Rod metal gasket	Nitrile Rubber		With Switch			
10	Cushion rubber (R)	Urethane Rubber					
11	Cylinder Body	Aluminum Alloy	Hard Anodized				

●ø40 to ø63



Head side spigot joint (H)

Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Piston Rod	Stainless Steel	Special treatment	11	Cylinder Body	Aluminum Alloy	Hard Anodized
2	Coil Scraper	Copper Alloy		12	Spacer	Aluminum Alloy	
3	Rod Packing	Nitrile Rubber		13	Piston	Aluminum Alloy	Zinc Chromate
4	Rod metal	Aluminum Alloy	Hard Anodized	14	Magnet	Plastic	
5	C-type Retaining Ring	Steel	Zinc Phosphate	15	Piston Packing	Nitrile Rubber	
6	Guide pin gasket	Nitrile Rubber		16	Wear Ring	Polyacetal	
7	Hexagon Socket Set Screw	Stainless Steel		17	Cover	Aluminum Alloy	
8	Guide Pin	Steel	Special treatment	18	Spigot joint ring	Aluminum Alloy	Zinc Chromate
9	Rod metal gasket	Nitrile Rubber		With Switch			
10	Cushion rubber (R)	Urethane Rubber		19	Switch		

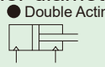
For maintenance parts, please visit the CKD Equipment Product Site (https: //www.ckd.co.jp/kiki/en/) → "model No." → Maintenance Parts.

Rotary Clamp Cylinder, Single Guide Type, Double Acting, Packing Material Fluororubber

RCS2-T2 Series

●Tube inner diameter :ø12, ø16, ø20, ø25, ø32, ø40, ø50, ø63

Circuit Diagram Code ● Double Acting type



RoHS

Model No. Notation

Without Switch
(Built-in magnet for switch)

RCS2-T2 - 00 - 12 - [ ] - 17.5 - R ——— H A

Model No. ❶ ❷ ❸ ❹ ❺ ❽ ❾

With Switch
(Built-in magnet for switch)

RCS2-T2 - 00 - 12 - [ ] - 17.5 - R - T0H - D - H A

Model No.
❶ Mounting Type
❷ Bore Size
❸ Piping thread type
❹ Stroke
❺ Direction of rotation
❻ Switch Model No.
❼ Number of Switches
❽ Option
❾ Accessories

❶ Mounting Type

Code	Content	
00	Basic type	
FA	Rod side flange type	
FB	Head Side Flange Type	

❷ Bore Size (mm)

Code	Content
12	ø12
16	ø16
20	ø20
25	ø25
32	ø32
40	ø40
50	ø50
63	ø63

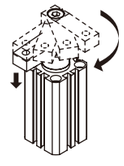
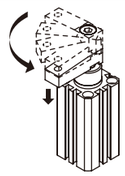
❸ Piping thread type

Code	Content
Blank	M5 (ø12 to ø25) Rc thread (ø32 to ø63)
N	NPT thread (ø32 or more)
G	G thread (ø32 or more)

❹ Stroke (mm)

Stroke	Bore Size (ø)								Rotation Stroke	Clamp stroke
	12	16	20	25	32	40	50	63		
17.5	●	●							7.5	10
19.5			●	●					9.5	
25					●	●			15	
29							●	●	19	
27.5	●	●							7.5	20
29.5			●	●					9.5	
35					●	●			15	
39							●	●	19	
37.5	●	●							7.5	30
39.5			●	●					9.5	
45					●	●			15	
49							●	●	19	
65					●	●			15	50
69							●	●	19	

❺ Direction of rotation

Code	Content	
R	90° clockwise rotation during retraction	
L	90° counterclockwise rotation during retraction	

❻ Switch Model No.

For switch details, please see P. 1457. Switches are shipped with the product.

Contact	Indicator LED Special Function	Wiring (Output)	Load Voltage (V) AC	Load Voltage (V) DC	Load Current (mA) AC	Load Current (mA) DC	Lead wire *1 Straight	Lead wire *1 L-shape	
Solid State	1-Color	2-wire	-	10 to 30	-	5 to 20	-	F2S□	
		3-wire (NPN)	-	30 or less	-	50 or less	-	F3S□	
		2-wire	-	10 to 30	-	5 to 20 *2	F2H□	F2V□	
		3-wire (NPN)	-	30 or less	-	50 or less	F3H□	F3V□	
		3-wire (PNP)	-	30 or less	-	50 or less	F3PH□	F3PV□	
	2-Color	2-wire	-	24 ± 10%	-	5 to 20	F2YH□	F2YV□	
		3-wire (NPN)	-	30 or less	-	50 or less	F3YH□	F3YV□	
	1-color	2-wire	85 to 265	-	5 to 100	-	T1H□	T1V□	
			-	10 to 30	-	5 to 20 *2	T2H□	T2V□	
		3-wire (NPN)	-	30 or less	-	100 or less	T3H□	T3V□	
		3-wire (PNP)	-		-		T3PH□	T3PV□	
	2-Color	2-wire	-	24 ± 10%	-	5 to 20	T2WH□	T2WV□	
		3-wire (NPN)	-	30 or less	-	50 or less	T3WH□	T3WV□	
	2-Color Improved Water Resistance	2-wire	-	24 ± 10%	-	5 to 20	T2WLH□	T2WLV□	*3
	2-Color for AC Magnetic Field		-		-		T2YD□	–	
			-		-		T2YDT□	–	
	1-Color Off-Delay Type		-	10 to 30	-	5 to 20 *2	T2JH□	T2JV□	
	1-color Flexible Lead Wire Type		-	10 to 30	-		T2HR3	T2VR3	
Reed	1-Color	2-wire	110	12/24	7 to 20	5 to 50	T0H□	T0V□	
	Without Indicator Lamp		110	5/12/24	20 or less	50 or less	T5H□	T5V□	
	1-color		110/220	12/24	7 to 20 / 7 to 10	5 to 50	T8H□	T8V□	

*1: For "□" in the switch model number, enter the code selected from the "Lead wire length, connector specification" table.
*2: The maximum load current value above, 20 mA, is at 25°C. If the switch operating Ambient Temperature is higher than 25°C, it will be lower than 20 mA.(At 60°C, it will be 5 to 10 mA.)
*3: This does not guarantee the water resistance of the cylinder.
*4: Switches other than the model numbers listed above are also available. (Custom Product) For details, refer to P. 1457.
*5: For ø12, ø16, T1□, T8□, T2YD□, T2YDT□, T2J□ switches cannot be selected.
*6: F type switch can be selected only for ø20 and ø25.

*Lead wire length, connector specification

	Code	Content
	Blank	1 m (Standard)
	3	3 m (Option)
*6	5	5 m (Option)
*5	W	M8 Connector, 1PIN (+), 4PIN (−) Lead Wire 0.3 m

*5: Only T2WLH and T2WLV can be selected.
*6: F-type switch with 5 m lead wire length cannot be selected.

Example) Lead wire length
1 m T0H
3 m T0H3
5 m T0H5

❼ Number of Switches

Code	Content
R	With 1 pc on rod side
H	With 1 pc on head side
D	Both sides included

❽ Option

	Code	Content	
	Blank	No option	
*1	H	Head side spigot joint	

*1: If (1) Mounting Type is "FA""FB", option "H" cannot be selected.

❾ Accessories

Code	Content	
Blank	No accessories	
A	Clamp lever	

Switch Single Unit Model No.

SW - T0H3
❻ Switch Model No.

Clamp Lever Kit Model No.

RCS2 - A - 12

Code	Bore Size
12	ø12
16	ø16
20	ø20, ø25
32	ø32, ø40
50	ø50, ø63

Flange Kit Model No.

RCS2 - FA - 12
❷ Bore Size

Specifications

Item		RCS2-T2							
Bore Size	mm	ø12	ø16	ø20	ø25	ø32	ø40	ø50	ø63
Actuation method		Double Acting Type							
Operating Fluid		Compressed Air							
Max Operating Pressure	MPa	1.0							0.6
Min Operating Pressure	MPa	0.2 *1					0.1		
Proof Pressure	MPa	1.6							
Ambient Temperature	°C	5 to 60							
Connection Port	Rc, NPT, G	M5				1/8		1/4	
Stroke tolerance	mm	+1.0 0		+1.2 0					
Operating piston speed	mm/s	50 to 200							
Cushion		With rod side rubber cushion, without head side cushion							
Lubrication		Not required (When lubricating, use turbine oil Class 1 ISO VG32)							
Rotation Angle		90° ±10°							
Direction of rotation		Right/Left							
Non-rotation accuracy (during clamping, initial value)		±1.4°		±1.2°		±0.9°		±0.7°	
Pressure Receiving Area	mm² Retraction side	84	150	201	377	603	1056	1649	2803
	mm² Push side	113	201	314	490	804	1256	1963	3117

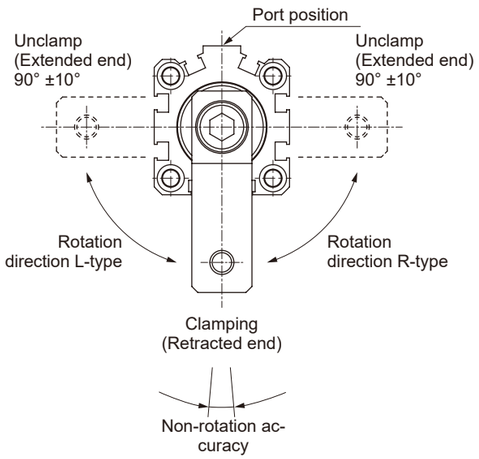
*1: At constant pressure pressurization

Stroke

Bore Size (mm)	Stroke (mm)	Rotation stroke *1 (mm)	Clamp stroke *2 (mm)
ø12, ø16	17.5, 27.5, 37.5	7.5	10, 20, 30
ø20, ø25	19.5, 29.5, 39.5	9.5	10, 20, 30
ø32, ø40	25, 35, 45, 65	15	10, 20, 30, 50
ø50, ø63	29, 39, 49, 69	19	10, 20, 30, 50

*1: Rotary stroke is the dimension of linear operation in the clamping direction while rotating from the unclamp end.
*2: Clamp stroke is the dimension of linear operation in the clamping direction after rotation.

Rotation Angle, Rotation Direction, Non-rotation Accuracy



Cylinder Weight

(Unit: g)

Bore Size (mm)	Stroke mm														Rod Side Flange (FA)	Head Side Flange (FB)	Switch Weight
	17.5	19.5	25	29	27.5	29.5	35	39	37.5	39.5	45	49	65	69			
ø12	69				84				99						49	49	Refer to the Weight listed in the Switch Specifications on P. 1457.
ø16	100				123				146						59	59	
ø20		212				252				292					114	114	
ø25		267				314				361					125	125	
ø32			333				372				411		489		145	145	
ø40			554				629				704		854		193	193	
ø50				997				1118				1239		1481	335	335	
ø63				1373				1526				1679		1985	464	464	

Theoretical Thrust Table

(Unit: N)

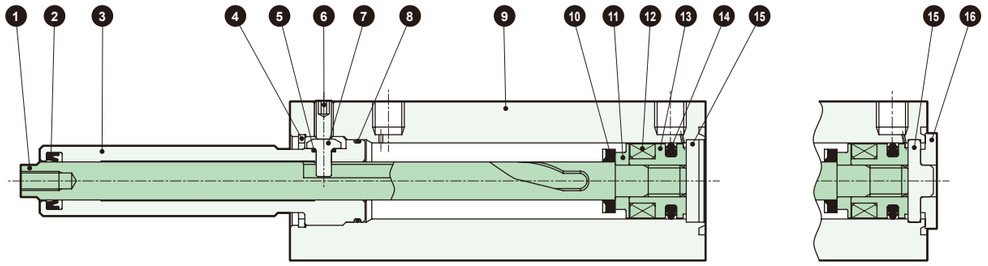
Bore Size (mm)	Operating Direction	Operating Pressure MPa									
		0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
ø12	Push	–	22.6	33.9	45.2	56.5	67.9	79.2	90.5	1.02×10^2	1.13×10^2
	Pull	–	17.0	25.4	33.9	42.4	50.9	59.4	67.9	76.3	84.8
ø16	Push	–	40.2	60.3	80.4	1.01×10^2	1.21×10^2	1.41×10^2	1.61×10^2	1.81×10^2	2.01×10^2
	Pull	–	30.2	45.2	60.3	75.4	90.5	1.06×10^2	1.21×10^2	1.36×10^2	1.51×10^2
ø20	Push	–	62.8	94.2	1.26×10^2	1.57×10^2	1.88×10^2	2.20×10^2	2.51×10^2	2.83×10^2	3.14×10^2
	Pull	–	40.2	60.3	80.4	1.01×10^2	1.21×10^2	1.41×10^2	1.61×10^2	1.81×10^2	2.01×10^2
ø25	Push	–	98.2	1.47×10^2	1.96×10^2	2.45×10^2	2.95×10^2	3.44×10^2	3.93×10^2	4.42×10^2	4.91×10^2
	Pull	–	75.6	1.13×10^2	1.51×10^2	1.89×10^2	2.27×10^2	2.64×10^2	3.02×10^2	3.40×10^2	3.78×10^2
ø32	Push	–	1.61×10^2	2.41×10^2	3.22×10^2	4.02×10^2	4.83×10^2	5.63×10^2	6.43×10^2	7.24×10^2	8.04×10^2
	Pull	–	1.21×10^2	1.81×10^2	2.41×10^2	3.02×10^2	3.62×10^2	4.22×10^2	4.83×10^2	5.43×10^2	6.03×10^2
ø40	Push	1.26×10^2	2.51×10^2	3.77×10^2	5.03×10^2	6.28×10^2	7.54×10^2	8.80×10^2	1.01×10^3	1.13×10^3	1.26×10^3
	Pull	1.06×10^2	2.11×10^2	3.17×10^2	4.22×10^2	5.28×10^2	6.33×10^2	7.39×10^2	8.44×10^2	9.50×10^2	1.06×10^3
ø50	Push	1.96×10^2	3.93×10^2	5.89×10^2	7.85×10^2	9.82×10^2	1.18×10^3	1.37×10^3	1.57×10^3	1.77×10^3	1.96×10^3
	Pull	1.65×10^2	3.30×10^2	4.95×10^2	6.60×10^2	8.25×10^2	9.90×10^2	1.15×10^3	1.32×10^3	1.48×10^3	1.65×10^3
ø63	Push	3.12×10^2	6.23×10^2	9.35×10^2	1.25×10^3	1.56×10^3	1.87×10^3	–	–	–	–
	Pull	2.80×10^2	5.61×10^2	8.41×10^2	1.12×10^3	1.40×10^3	1.68×10^3	–	–	–	–

External FormDimension Diagram

Same as RCS2 series basic type. Please refer to P. 820 to P. 823.

Internal structure / Material (Bore Size: ø12, ø16, ø20, ø25)

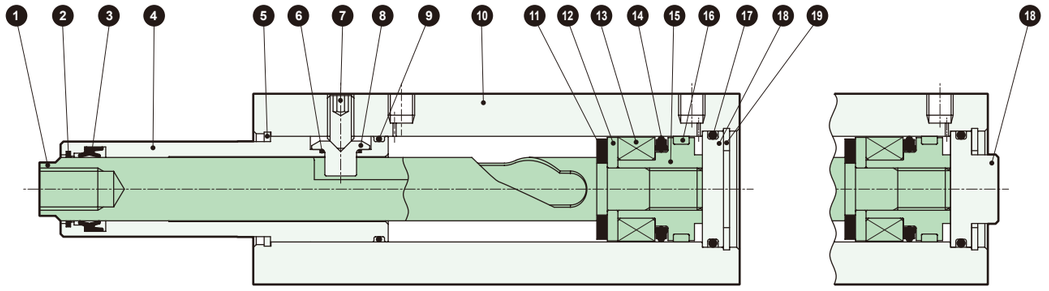
●ø12, ø16



Head side spigot joint (H)

Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Piston Rod	Stainless Steel	Special treatment	10	Cushion rubber (R)	Urethane Rubber	
2	Rod Packing	Fluoro Rubber		11	Spacer	ø12: Aluminum Alloy	Zinc Chromate
3	Rod Metal	Aluminum Alloy	Hard Anodized			ø16: Special plastic	
4	Round R Type Retaining Ring	Steel	Zinc Phosphate	12	Magnet	Plastic	
5	Guide pin gasket	Fluoro Rubber		13	Piston	Aluminum Alloy	Zinc Chromate
6	Hexagon Socket Set Screw	Stainless Steel		14	Piston Packing	Fluoro Rubber	
7	Guide Pin	Steel	Special treatment	15	Cover	Stainless Steel	
8	Rod metal gasket	Fluoro Rubber		16	Spigot joint ring	Aluminum Alloy	Zinc Chromate
9	Cylinder Body	Aluminum Alloy	Hard Anodized				

●ø20, ø25



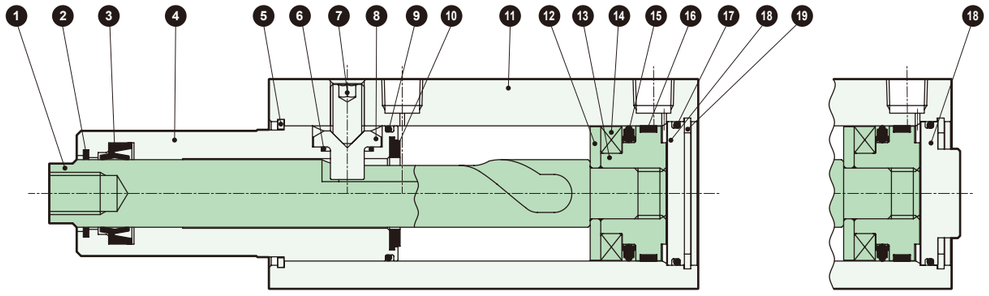
Head side spigot joint (H)

Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Piston Rod	Stainless Steel	Special treatment	11	Cushion rubber (R)	Urethane Rubber	
2	Coil Scraper	Copper Alloy		12	Spacer	Aluminum Alloy	Zinc Chromate
3	Rod Packing	Fluoro Rubber		13	Magnet	Plastic	
4	Rod metal	Aluminum Alloy	Hard Anodized	14	Piston Packing	Fluoro Rubber	
5	Circlip	Steel		15	Piston	Aluminum Alloy	Zinc Chromate
6	Guide pin gasket	Fluoro Rubber		16	Wear Ring	Polyacetal	
7	Hexagon Socket Set Screw	Stainless Steel		17	Cover gasket	Fluoro Rubber	
8	Guide Pin	Steel	Special treatment	18	Bottom plate	Aluminum Alloy	Zinc Chromate
9	Rod metal gasket	Fluoro Rubber		19	C-type Retaining Ring	Steel	Zinc Phosphate
10	Cylinder Body	Aluminum Alloy	Hard Anodized				

For maintenance parts, refer to the CKD component product site (https://www.ckd.co.jp/kiki/en/) -> "Model No." -> See "Maintenance Parts".

Internal structure / Material (Bore Size: ø32, ø40, ø50, ø63)

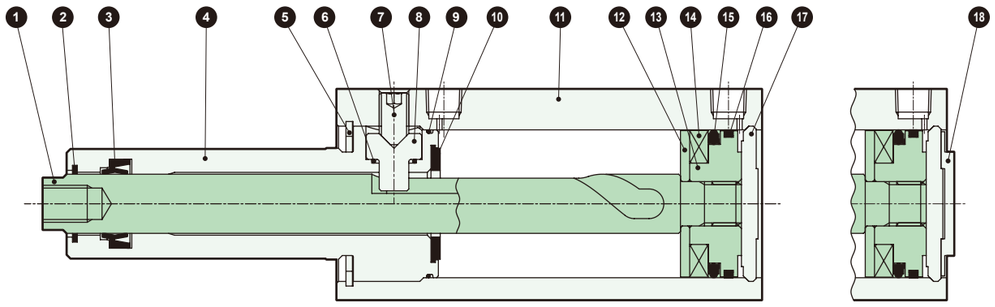
●ø32



Head side spigot joint (H)

Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Piston Rod	Stainless Steel	Special treatment	11	Cylinder Body	Aluminum Alloy	Hard Anodized
2	Coil Scraper	Copper Alloy		12	Spacer	Aluminum Alloy	
3	Rod Packing	Fluoro Rubber		13	Piston	Aluminum Alloy	Zinc Chromate
4	Rod metal	Aluminum Alloy	Hard Anodized	14	Magnet	Plastic	
5	Circlip	Steel		15	Piston Packing	Fluoro Rubber	
6	Guide pin gasket	Fluoro Rubber		16	Wear Ring	Polyacetal	
7	Hexagon Socket Set Screw	Stainless Steel		17	Cover gasket	Fluoro Rubber	
8	Guide Pin	Steel	Special treatment	18	Bottom plate	Aluminum Alloy	Zinc Chromate
9	Rod metal gasket	Fluoro Rubber		19	C-type Retaining Ring	Steel	Zinc Phosphate
10	Cushion rubber (R)	Urethane Rubber					

●ø40 to ø63



Head side spigot joint (H)

Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Piston Rod	Stainless Steel	Special treatment	10	Cushion rubber (R)	Urethane Rubber	
2	Coil Scraper	Copper Alloy		11	Cylinder Body	Aluminum Alloy	Hard Anodized
3	Rod Packing	Fluoro Rubber		12	Spacer	Aluminum Alloy	
4	Rod metal	Aluminum Alloy	Hard Anodized	13	Piston	Aluminum Alloy	Zinc Chromate
5	C-type Retaining Ring	Steel	Zinc Phosphate	14	Magnet	Plastic	
6	Guide pin gasket	Fluoro Rubber		15	Piston Packing	Fluoro Rubber	
7	Hexagon Socket Set Screw	Stainless Steel		16	Wear Ring	Polyacetal	
8	Guide Pin	Steel	Special treatment	17	Cover	Aluminum Alloy	
9	Rod metal gasket	Fluoro Rubber		18	Spigot joint ring	Aluminum Alloy	Zinc Chromate

For maintenance parts, please visit the CKD Equipment Product Site (https: //www.ckd.co.jp/kiki/en/) → "model No." → Maintenance Parts .

Rotary Clamp Cylinder, Single Guide Type, Double Acting, Sputter Adhesion Prevention Type

RCS2-G4 Series

●Bore Size: ø32, ø40, ø50, ø63

Circuit Diagram Code ● Double Acting type

RoHS

Model No. Notation

Without Switch
(Built-in magnet for switch)

RCS2-G4 - 00 - 32 - [ ] - 25 - R ——— H A

Model No. ❶ ❷ ❸ ❹ ❺ ❽ ❾

With Switch
(Built-in magnet for switch)

RCS2-G4 - 00 - 32 - [ ] - 25 - R - T2YD3 - D - H A

Model No. ❷Bore Size ❸Piping thread type ❹Stroke ❺Direction of rotation ❻Switch Model No. ❼Number of Switches ❽Option ❾Accessories

❶Mounting Type

❶ Mounting Type

Code	Content	
00	Basic type	
FA	Rod Side Flange Type	
FB	Head Side Flange Type	

❷ Bore Size (mm)

Code	Content
32	ø32
40	ø40
50	ø50
63	ø63

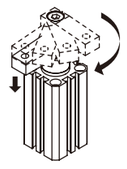
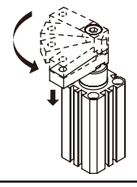
❸Piping thread type

Code	Content
Blank	Rc Thread
N	NPT thread
G	G thread

❹Stroke (mm)

Stroke	Bore Size (ø)				Rotation stroke	Clamp stroke
	32	40	50	63		
25	●	●			15	10
29			●	●	19	
35	●	●			15	20
39			●	●	19	
45	●	●			15	30
49			●	●	19	
65	●	●			15	50
69			●	●	19	

❺Direction of rotation

Code	Content	
R	90° clockwise rotation during retraction	
L	90° counterclockwise rotation during retraction	

❻Switch Model No.

For switch details, refer to P. 1457. Switches are shipped with the product.

Contact	Indicator LED Special Function	Wiring (Output)	Load Voltage (V)		Load Current (mA)		Lead wire *1		
			AC	DC	AC	DC	Straight	L-shape	
Solid State	2-Color AC For Magnetic Field	2-wire	-	24 ± 10%	-	5 to 20	T2YD□	–	
			-		-		T2YDT□	–	

*1: Insert the code selected in the "*Lead wire length" table into "□" of the switch model number.
*2: Switches other than the above switch model numbers are also available. (Custom Product) For details, refer to P. 1457.

*** Lead wire length**

Code	Content
Blank	1 m (Standard)
3	3 m (Option)
5	5m (Option)

Example) Lead wire length
1 m T2YD
3 m T2YD 3
5 m T2YD 5

❼Number of Switches

Code	Content
R	With 1 pc on rod side
H	With 1 pc on head side
D	Both sides included

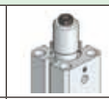
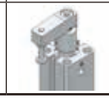
❽ Option

Code	Content	
Blank	No option	
H	Head side spigot joint	

*1

*1: If (1) Mounting Type is "FA""FB", option "H" cannot be selected.

❾ Accessories

Code	Content	
Blank	No accessories	
A	Clamp lever	

Switch Single Unit Model No.

SW - T2YD3

❻Switch Model No.

Clamp Lever Kit Model No.

RCS2 - A - 32

Code	Bore Size
32	ø32, ø40
50	ø50, ø63

Flange Kit Model No.

RCS2 - FA - 32

❷ Bore Size

Specifications

Item		RCS2-G4			
Bore Size	mm	ø32	ø40	ø50	ø63
Actuation method		Double Acting Type			
Operating Fluid		Compressed Air			
Max Operating Pressure	MPa	1.0			0.6
Min Operating Pressure	MPa	0.1 *1			
Proof Pressure	MPa	1.6			
Ambient Temperature	°C	-10 to 60 (however, no freezing)			
Connection Port	Rc, NPT, G	1/8		1/4	
Stroke tolerance	mm	+1.2 0			
Operating piston speed	mm/s	50 to 200			
Cushion		With rod side rubber cushion, without head side cushion			
Lubrication		Not required (When lubricating, use turbine oil Class 1 ISO VG32)			
Rotation Angle		90° ±10°			
Direction of rotation		Right/Left			
Non-rotation accuracy (during clamping, initial value)		±0.9°		±0.7°	
Pressure Receiving Area	mm² Retraction side	603	1056	1649	2803
	mm² Push side	804	1256	1963	3117

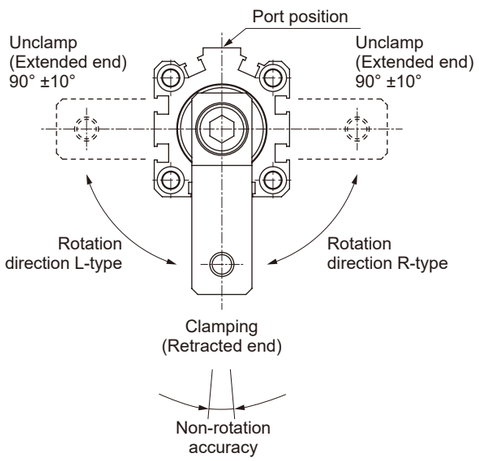
*1: At constant pressure pressurization

Stroke

Bore Size (mm)	Stroke (mm)	Rotation stroke *1 (mm)	Clamp stroke *2 (mm)
ø32, ø40	25, 35, 45, 65	15	10, 20, 30, 50
ø50, ø63	29, 39, 49, 69	19	10, 20, 30, 50

*1: Rotary stroke is the dimension of linear operation in the clamping direction while rotating from the unclamp end.
*2: Clamp stroke is the dimension of linear operation in the clamping direction after rotation.

Rotation Angle, Rotation Direction, Non-rotation Accuracy



Cylinder Weight

(Unit: g)

Bore Size (mm)	Stroke mm 25	29	35	39	45	49	65	69	Rod Side Flange (FA)	Head Side Flange (FB)	Switch Weight
ø32	333		372		411		489		145	145	Please refer to the mass described in the switch specifications on page 1457.
ø40	554		629		704		854		193	193	
ø50		997		1118		1239		1481	335	335	
ø63		1373		1526		1679		1985	464	464	

Theoretical Thrust Table

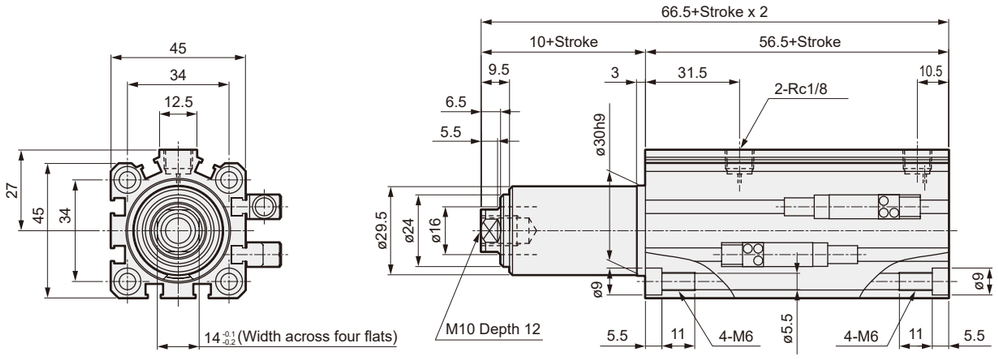
(Unit: N)

Bore Size (mm)	Operating Direction	Operating Pressure MPa 0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
ø32	Push	80.4	1.61×10^2	2.41×10^2	3.22×10^2	4.02×10^2	4.83×10^2	5.63×10^2	6.43×10^2	7.24×10^2	8.04×10^2
	Pull	60.3	1.21×10^2	1.81×10^2	2.41×10^2	3.02×10^2	3.62×10^2	4.22×10^2	4.83×10^2	5.43×10^2	6.03×10^2
ø40	Push	1.26×10^2	2.51×10^2	3.77×10^2	5.03×10^2	6.28×10^2	7.54×10^2	8.80×10^2	1.01×10^3	1.13×10^3	1.26×10^3
	Pull	1.06×10^2	2.11×10^2	3.17×10^2	4.22×10^2	5.28×10^2	6.33×10^2	7.39×10^2	8.44×10^2	9.50×10^2	1.06×10^3
ø50	Push	1.96×10^2	3.93×10^2	5.89×10^2	7.85×10^2	9.82×10^2	1.18×10^3	1.37×10^3	1.57×10^3	1.77×10^3	1.96×10^3
	Pull	1.65×10^2	3.30×10^2	4.95×10^2	6.60×10^2	8.25×10^2	9.90×10^2	1.15×10^3	1.32×10^3	1.48×10^3	1.65×10^3
ø63	Push	3.12×10^2	6.23×10^2	9.35×10^2	1.25×10^3	1.56×10^3	1.87×10^3	–	–	–	–
	Pull	2.80×10^2	5.61×10^2	8.41×10^2	1.12×10^3	1.40×10^3	1.68×10^3	–	–	–	–

Dimensional Drawings

● Basic type (00)

RCS2-G4-00-32

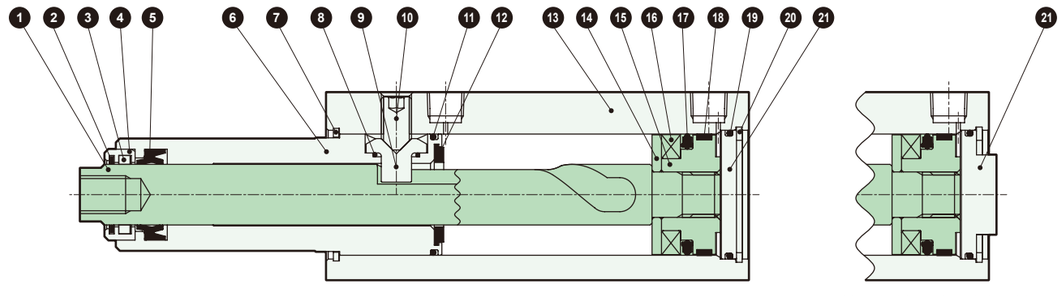


* The external dimensions diagram for RCS2-G4-40, 50, 63 is the same as the RCS2 series basic type. Please refer to P. 820.

* The external dimensions diagram for mounting types FA and FB is the same as the RCS2 series basic type. Please refer to P. 821, 822.

Internal Structure / Materials

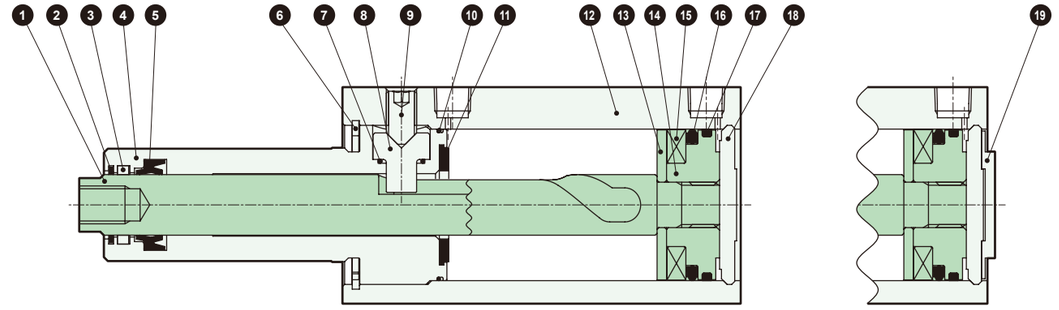
●ø32



Head side spigot joint (H)

Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Piston Rod	Stainless Steel	Special treatment	12	Cushion Rubber	Urethane Rubber	
2	Coil Scraper	Copper Alloy		13	Cylinder Body	Aluminum Alloy	Hard Anodized
3	Lube keeper			14	Spacer	Aluminum Alloy	Zinc Chromate
4	Holder	Aluminum Alloy	Zinc Chromate	15	Piston	Aluminum Alloy	Zinc Chromate
5	Rod Packing	Nitrile Rubber		16	Piston magnet	Plastic	
6	Rod Metal	Aluminum Alloy	Hard Anodized	17	Piston Packing	Nitrile Rubber	
7	Circlip	Steel	Zinc Phosphate	18	Wear Ring	Polyacetal	
8	Guide pin gasket	Nitrile Rubber		19	Cover gasket	Nitrile Rubber	
9	Guide Pin	Steel	Special treatment	20	C-type Retaining Ring	Steel	Zinc Phosphate
10	Hexagon Socket Set Screw	Stainless Steel		21	Bottom plate	Aluminum Alloy	Zinc Chromate
11	Rod metal gasket	Nitrile Rubber					

●ø40 to ø63



Head side spigot joint (H)

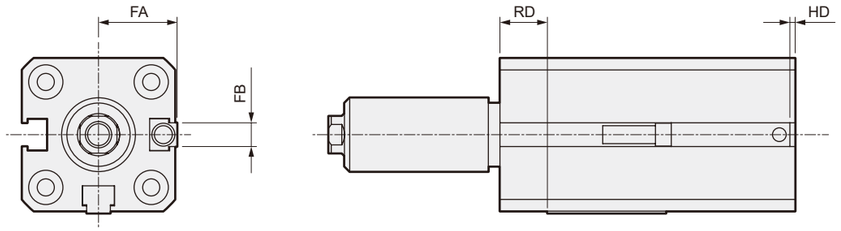
Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Piston Rod	Stainless Steel	Special treatment	11	Cushion Rubber	Urethane Rubber	
2	Coil Scraper	Copper Alloy		12	Cylinder Body	Aluminum Alloy	Hard Anodized
3	Lube keeper			13	Spacer	Aluminum Alloy	Zinc Chromate
4	Rod metal	Aluminum Alloy	Hard Anodized	14	Piston	Aluminum Alloy	Zinc Chromate
5	Rod Packing	Nitrile Rubber		15	Piston magnet	Plastic	
6	C-type Retaining Ring	Steel	Zinc Phosphate	16	Piston Packing	Nitrile Rubber	
7	Guide pin gasket	Nitrile Rubber		17	Wear Ring	Polyacetal	
8	Guide Pin	Steel	Special treatment	18	Cover	Aluminum Alloy	Zinc Chromate
9	Hexagon Socket Set Screw	Stainless Steel		19	Spigot joint ring	Aluminum Alloy	Zinc Chromate
10	Rod metal gasket	Nitrile Rubber					

For maintenance parts, please visit the CKD Equipment Product Site (https: //www.ckd.co.jp/kiki/en/) → "model No." → Maintenance Parts .

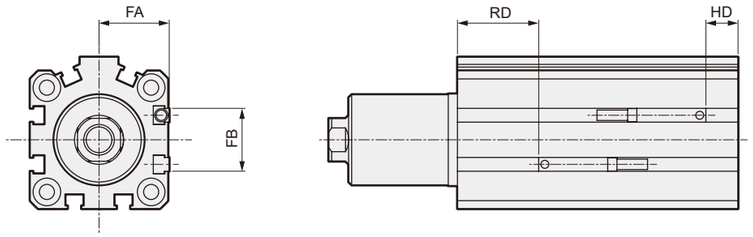
RCS2 Series External Dimensions Diagram with Switch

● T0H/V,T5H/V,T2H/V,T3H/V,T3PH/V,T2□R3,T2WH/V,T3WH/V,T2WLH/V
• RCS2, RCS2-T2

ø12, ø16



ø20 to ø63

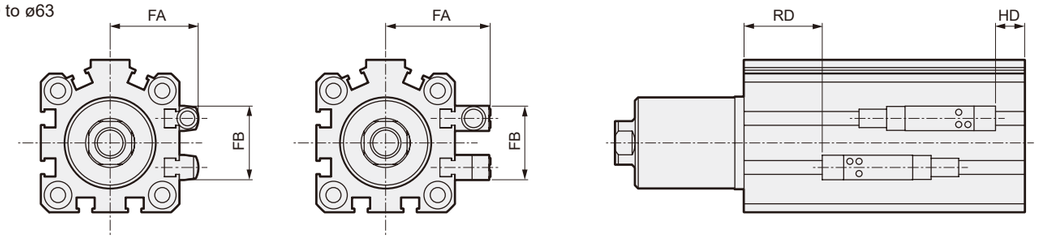


Code / Bore Size (mm)	FA	FB	T0, T5, T2, T3, T3P, T2□R3		T2W, T3W, T2WL	
			RD	HD	RD	HD
ø12	13.0	4.5	8.5	0.5	10.5	2.5
ø16	15.0	4.5	9	0.5	11	2.5
ø20	18.5	12.5	23.5	10	25.5	12
ø25	20.5	13.5	24.5	9.5	26.5	11.5
ø32	23.0	20.5	26.5	10.5	28.5	12.5
ø40	26.5	27.5	23.5	7.5	25.5	9.5
ø50	32.5	28.5	28.5	10	30.5	12
ø63	39.0	28.5	27.5	14.5	29.5	16.5

*1: FA dimension is for the straight lead wire type.
*2: For switch mountability, refer to the model number notation of each variation.

● T8H/V,T2JH/V,T1H/V,T2YD,T2YDT
• RCS2, RCS2-T2, RCS2-G4

ø20 to ø63



[For T2JH/V, T8H/V] [For T2YD□, T1H/V]

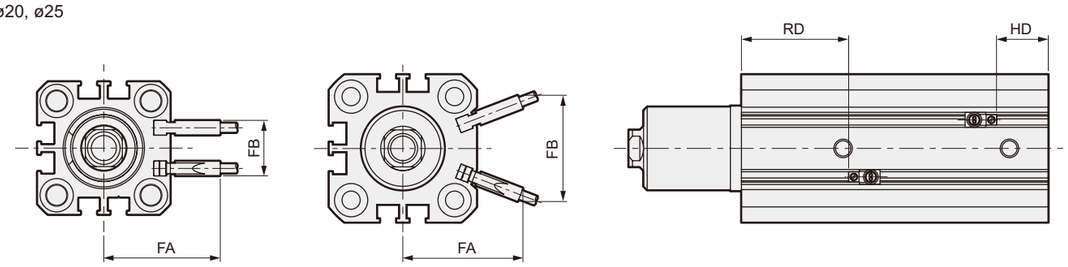
Code / Bore Size (mm)	T8				T2J				T1,T2YD,T2YDT			
	FA	FB	RD	HD	FA	FB	RD	HD	FA	FB	RD	HD
ø20	24.3	16	17.5	4	24.3	16	22.5	9	29.3	16	22.5	9
ø25	26.3	17	18.5	3.5	26.3	17	23.5	8.5	31.3	17	23.5	8.5
ø32	28.8	24	20.5	4.5	28.8	24	25.5	9.5	33.8	24	25.5	9.5
ø40	32.3	31	17.5	1.5	32.3	31	22.5	6.5	37.3	31	22.5	6.5
ø50	38.3	32	22.5	4	38.3	32	27.5	9	43.3	32	27.5	9
ø63	44.8	32	21.5	8.5	44.8	32	26.5	13.5	49.8	32	26.5	13.5

*1: FA dimension is for the straight lead wire type.
*2: For switch mountability, refer to the model number notation of each variation.

RCS2 Series External Dimensions Diagram with Switch

●F2S,F3S
• RCS2, RCS2-T2

ø20, ø25



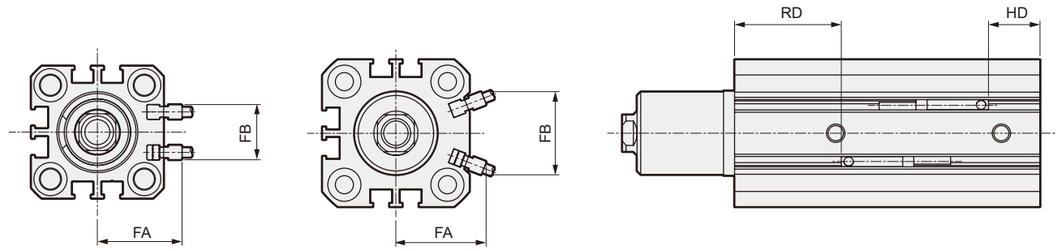
[For ø20] [For ø25]

Code / Bore Size (mm)	F2S,F3S			
	FA	FB	RD	HD
ø20	31.5	15	27	13.5
ø25	32.5	28	28	13

Note: For switch mountability, refer to the model number display method for each variation.

● F2H/V, F3H/V, F3PH/V, F2YH/V, F3YH/V
• RCS2, RCS2-T2

ø20, ø25



[For ø20] [For ø25]

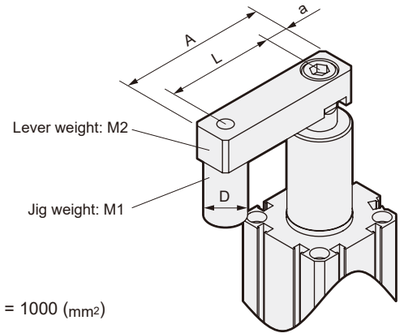
Code / Bore Size (mm)	FA *1	FB *1	F2, F3, F3P, F2Y, F3Y	
			RD	HD
ø20	23	15	28	14.5
ø25	24.5	22	29	14

*1: FA dimension is for the L-shaped lead wire type.
*2: For switch mountability, refer to the model number notation of each variation.

Technical Data (Selection Example)

[Specifications]

- Required clamping force: 400 N
- Operating Pressure: 0.5 MPa
- Maximum piston speed: 100 mm/s
- Lever shape
  M2: 0.31 kg L: 0.08 m
  A: 0.1 m a: 0.01 m
- Jig shape
  M1: 0.04 kg D: 0.02 m



1. Calculate the required pressure receiving area.

$$\text{Required pressurized area } (mm^2) = \frac{\text{Required clamping force (N)}}{\text{Operating Pressure (MPa)} \times \text{Efficiency}} = \frac{400}{0.5 \times 80\%} = 1000\ (mm^2)$$

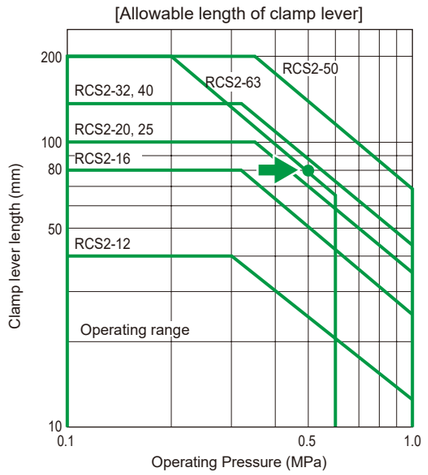
Note: Efficiency varies depending on the shape and material of the clamp lever.

2. Select the cylinder size from the pressure receiving area (retraction side) in the specification list.

ø40 pressurized area: 1055 (mm^2) > Required pressurized area: 1000 (mm^2)

3. Confirm the allowable length of the clamp lever.

Operating Pressure 0.5 MPa, clamp lever length 80 mm → Working range



4. Confirm the allowable moment of inertia of the clamp lever.

Calculation of moment of inertia
(Use the formula for concentrated load on P. 841)

$$\text{Moment of inertia } I = M_1 (R_1^2 + K_1^2) + \frac{M_2 R_2^2}{3}$$

$$\text{Because } R_1 = L,\ R_2 = A-a,\ K_1^2 = \frac{D^2}{8}$$

$$I = 0.04 \times \left(0.08^2 + \frac{0.02^2}{8}\right) + \frac{0.31 \times (0.1-0.01)^2}{3}$$

$$= 1.10 \times 10^{-3}\ kg \cdot m^2$$

Moment of inertia 1.10×10^{-3} kg·m²
Maximum piston speed 100 mm/s
→ Within operating range

From the above, select size ø40.

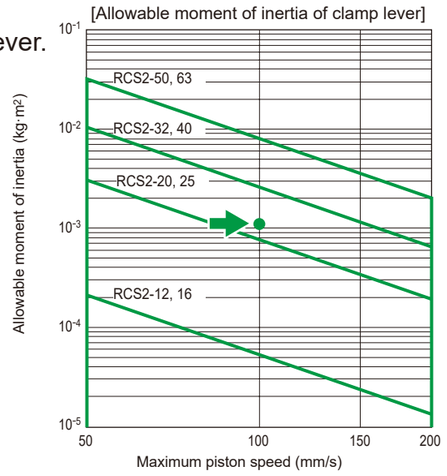
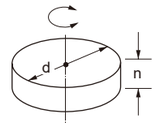
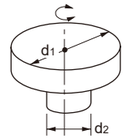
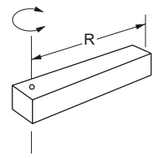
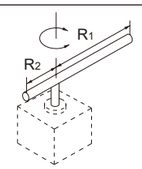
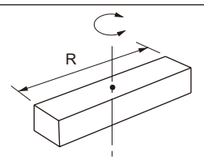
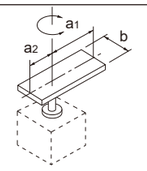
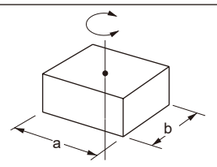
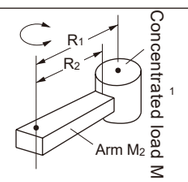


Diagram for calculating moment of inertia

Shape	Diagram	Required Items	Moment of Inertia I kg·m²	Radius of gyration K_1^2	Remarks
Disk		●Diameter d (m) ●Weight M (kg)	$I = \frac{Md^2}{8}$	$\frac{d^2}{8}$	●No mounting direction
Stepped disk		●Diameter d_1 (m) d_2 (m) ●Weight d_1 section M_1 (kg) d_2 part M_2 (kg)	$I = \frac{1}{8}(M_1 d_1^2 + M_2 d_2^2)$	$\frac{d_1^2+d_2^2}{8}$	●If d_2 part is very small compared to d_1 part, it can be ignored
Rod (center of rotation is at the end)		●Bar length R (m) ●Weight M (kg)	$I = \frac{MR^2}{3}$	$\frac{R^2}{3}$	●Mounting direction is horizontal
Thin rod		●Bar length R_1 R_2 ●Weight M_1 M_2	$I = \frac{M_1 \cdot R_1^2}{3} + \frac{M_2 \cdot R_2^2}{3}$	$\frac{R_1^2+R_2^2}{3}$	●Mounting direction is horizontal
Rod (center of rotation is at the center of gravity)		●Bar length R (m) ●Weight M (kg)	$I = \frac{MR^2}{12}$	$\frac{R^2}{12}$	●No mounting direction
Thin rectangular plate (cuboid)		●Plate Length a_1 a_2 ●Side Length b ●Weight M_1 M_2	$I = \frac{M_1}{12}(4a_1^2+b^2) + \frac{M_2}{12}(4a_2^2+b^2)$	$\frac{(4a_1^2+b^2)+(4a_2^2+b^2)}{12}$	●Mounting direction is horizontal
Cuboid		●Side length a (m) ●Weight b (m) M (kg)	$I = \frac{M}{12}(a^2+b^2)$	$\frac{a^2+b^2}{12}$	●No mounting direction
Concentrated load		●Shape of concentrated load ●Length to center of gravity of concentrated Length R_1 ●Arm Length R_2(m) ●Weight of Concentrated Load M_1(kg) ●Weight of Arm M_2(kg)	$I = M_1(R_1^2+k_1^2) + \frac{M_2 R_2^2}{3}$	k_1^2 is calculated based on the shape of the concentrated load	●Mounting direction is horizontal ●If M_2 is very small compared to M_1, you can calculate with M_2=0.

To Use This Product Safely

Be sure to read this before use. For general information on cylinders, please check Intro 41, and for cylinder switches, please check P. 1512.

Individual Precautions: Rotary clamp cylinder, single guide type RCS2 Series

Design / Selection

1. Common

Warning

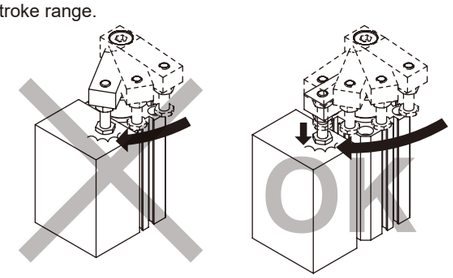
■Precautions for operation

This cylinder's Piston Rod rotates 90° during operation. When rotating, ensure that the clamp lever included with the Piston Rod tip does not interfere with external peripheral equipment. Also, if the rotation of the clamp lever may pose a danger to humans, take safety measures such as installing a protective cover around the clamp lever.

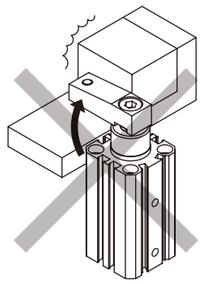
CAUTION

■Using this product so as to apply rotation to the Piston Rod may lead to damage, faulty operation, or a reduction in non-rotating accuracy. Be sure to observe the following precautions.

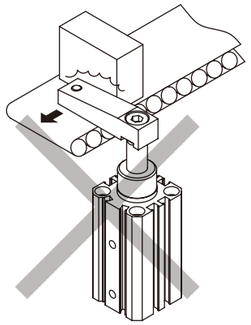
1. Do not clamp during the rotary stroke. Clamp at a position 3 mm or more before the stroke end within the clamp stroke range.



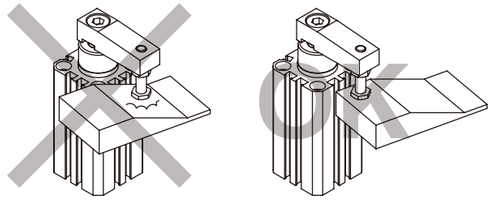
2. Do not clamp in the rotation direction.



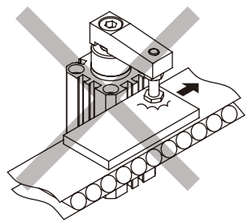
3. Do not use as a stopper.



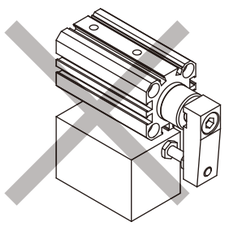
4. Do not clamp on inclined parts.



5. Ensure that the workpiece does not move due to external force during clamping.

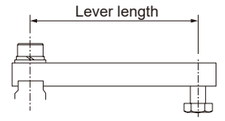


6. Do not use in horizontal installation.

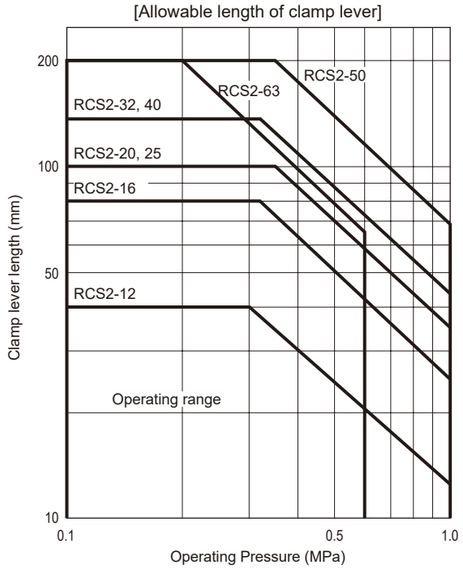


■Clamp lever allowable length and Operating Pressure

The upper limit of the allowable length of the clamp lever varies depending on the Operating Pressure. Please set within the range shown in the diagram below.



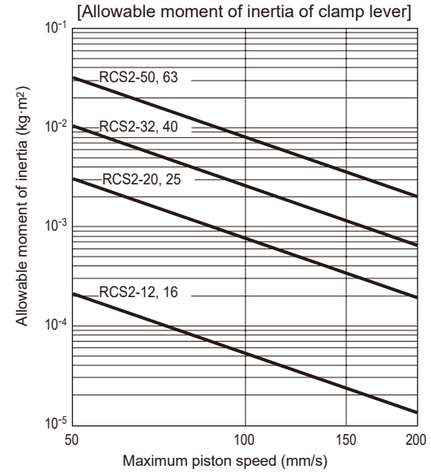
[Allowable length of clamp lever]



■Clamp lever allowable moment of inertia and piston speed

The upper limit of the allowable moment of inertia of the clamp lever varies depending on the piston speed. Please set within the range shown in the diagram below.

[Allowable moment of inertia of clamp lever]



2. Weld spatter resistant type RCS2-G4

■The durability of this cylinder is improved in comparison to standard cylinders when used in an atmosphere exposed to spatter. If used in an atmosphere other than sputter scattering, durability may be inferior to general type cylinders. Do not use in atmospheres other than sputter scattering.

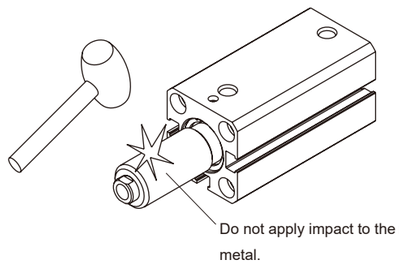
■Anti-spatter adherence agent is volatile. If the adhesion inhibitor on the rod surface begins to dry, apply sputter adhesion inhibitor to the rod surface to replenish it.

During Use

CAUTION

■Impact

Do not apply impact to the rod metal part. There is a risk of damage.



For precautions during mounting, installation, adjustment, use, and maintenance, please see "Precautions for Use" in this catalog and the CKD Components product site (https://www.ckd.co.jp/kiki/en/) → "Model No." → Instruction Manual.

Clamp Cylinder

RCC2

Rotary clamp cylinder

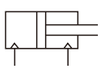
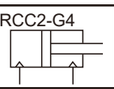
ø16, ø20, ø25, ø32, ø40, ø50, ø63

CONTENTS

Product Introduction	808
Series variation	845
● Double Acting / Single Rod Type (RCC2)	846
● Double Acting/anti-spatter adherence (RCC2-G4)	860
External Dimensions Diagram with Switch	869
⚠Precautions for Use	872

Variation Table

○: Custom Products

Variation	Model No. Circuit Diagram Code	Bore Size (mm)	Stroke (mm)								Rotating part stroke	Clamping part stroke	Mounting Style				Option	Switch	Page
			19	21	25	29	31	35	40	70	(mm)	(mm)	Basic type 00	Rod side flange type FA	Head Side Flange Type FB	Head side with spigot joint HI	Rod End width across 4 flats N4		
Double Acting, Single Rod Type	RCC2 	ø16	○			○					9		○	○	○	○	○	○	846
		ø20, ø25		○			○				11	10, 20	○	○	○	○			
		ø32, ø40			○			○			15		○	○	○	○			
		ø50, ø63							○	○	20	20, 50	○	○	○	○			
Double Acting Sputter adhesion prevention type	RCC2-G4 	ø20, ø25		○			○				11	10, 20	○	○	○			○	860
		ø32, ø40			○			○			15		○	○	○				
		ø50, ø63							○	○	20	20, 50	○	○	○				

Rotary Clamp Cylinder, Double Acting, Single Rod Type

RCC2 Series

● Bore Size: ø16, ø20, ø25, ø32, ø40, ø50, ø63

Circuit Diagram Code: ● Double Acting type

Custom-made RoHS

Model No. Notation

Without Switch
(Built-in magnet for switch)

RCC2 - 00 - 20 - 21 - R - ( ) — 7

Model No. ① ② ③ ④ 7

With Switch
(Built-in magnet for switch)

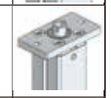
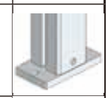
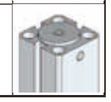
RCC2 - 00 - 20 - 21 - R - T0H - R - ( ) — 7

Model No. ② Bore Size ④ Direction of rotation ⑥ Number of Switches

① Mounting type ③ Stroke ⑤ Switch Model No. 7 Option

① Mounting type

Mounting bracket is attached to the product for shipment.

Code	Content	
00	Basic type	
FA	Rod side flange type	
FB	Head Side Flange Type	
HI	Head side with spigot joint	

*1: For models with switch, depending on the switch mounting surface and switch type, there is a possibility of interference with the fixing screws.

② Bore Size (mm)

Code	Content
16	ø16
20	ø20
25	ø25
32	ø32
40	ø40
50	ø50
63	ø63

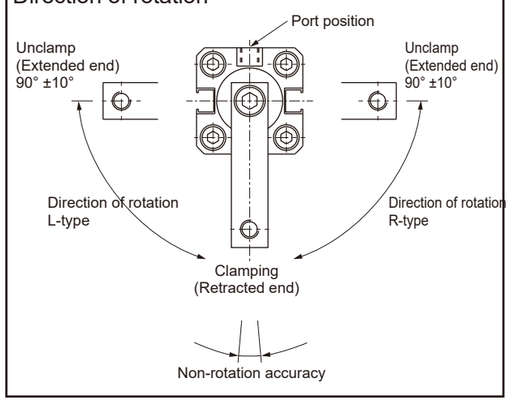
③ Stroke (mm)

Stroke	Bore Size (ø)							Rotation stroke	Clamp stroke
	16	20	25	32	40	50	63		
19	●							9	10
21		●	●					11	
25				●	●			15	
29	●							9	20
31		●	●					11	
35				●	●			15	
40						●	●	20	
70						●	●		50

④ Direction of rotation

Code	Content
R	Clamp (Pull) looking from rod side: rotated 90° in CW direction
L	Clamp (Pull) looking from rod side: rotated 90 degrees counterclockwise

Direction of rotation



⑤ Switch Model No.

For switch details, refer to P. 1457. Switches are shipped with the product.

	Indicator LED Special Function	Wiring (Output)	Load Voltage (V) AC	Load Voltage (V) DC	Load Current (mA) AC	Load Current (mA) DC	Lead wire *1 Straight	Lead wire *1 L-shape	
Solid State (Contact)	1-Color	2-wire	—	10 to 30	—	5 to 20 *2	T2H□	T2V□	
		3-wire (NPN)	—	30 or less	—	100 or less	T3H□	T3V□	
		3-wire (PNP)	—		—		T3PH□	T3PV□	
	2-Color	2-wire	—	24 ± 10%	—	5 to 20	T2WH□	T2WV□	
		3-wire (NPN)	—	30 or less	—	50 or less	T3WH□	T3WV□	
	2-Color Water Resistance Improved	2-wire	—	24 ± 10%	—	5 to 20	T2WLH□	T2WLV□	*3
	2-Color AC For Magnetic Field		—	24 ± 10%	—		T2YD□	–	
			—		—		T2YDT□	–	
	1-Color Flexible Lead Wire Type		—	10 to 30	—	5 to 20 *2	T2HR3	T2VR3	
Reed (Contact)	1-Color	2-wire	110	12/24	7 to 20	5 to 50	T0H□	T0V□	
	No Indicator LED		110	5/12/24	20 or less	50 or less	T5H□	T5V□	

*1: For "□" in the switch Model No., enter the code selected from the "Lead wire length, connector specification" table.
*2: The maximum load current value above, 20 mA, is at 25°C. If the switch operating Ambient Temperature is higher than 25°C, it will be lower than 20 mA. (At 60°C, it will be 5 to 10 mA.)
*3: This does not guarantee the water resistance of the cylinder.
*4: For ø16, T2YD□, T2YDT□ switches cannot be used.
*5: Switches other than the Model No.s listed above are also available. (Custom Product) For details, refer to P. 1457.

*Lead wire length, connector specification

Code	Content
Blank	1 m (Standard)
3	3 m (Option)
5	5 m (Option)
W	M8 Connector, 1PIN (+), 4PIN (−) Lead Wire 0.3 m

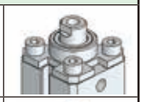
*6: Only T2WLH and T2WLV can be selected.

Example) Lead wire length
1m T0H
3m T0H3
5m T0H5

⑥ Number of Switches

Code	Content
R	With 1 pc on rod side
H	With 1 pc on head side
D	With 2 pcs

⑦ Option

Code	Content	
Blank	Rod End width across 2 flats	
N4	Rod End width across 4 flats (ø16 only)	

Switch Single Unit Model No. Notation

SW - T0H

⑤ Switch Model No.

Switch Single Unit Model No.

SW - T0H3

⑤ Switch Model No.

Specifications

*This is a custom order product.

Item		RCC2						
Bore Size mm		ø16	ø20	ø25	ø32	ø40	ø50	ø63
Actuation method		Double Acting Type						
Operating Fluid		Compressed Air						
Max Operating Pressure MPa		1.0						
Min Operating Pressure MPa		0.2						
Proof Pressure MPa		1.6						
Ambient Temperature °C		-10 to 60 (however, no freezing)						
Port Size		M5			Rc1/8		Rc1/4	
Operating Piston Speed mm/s		50 to 200						
Cushion		With Rubber Cushion						
Lubrication		Not required (Use Turbine Oil Class 1 ISO VG32 if lubricated)						
Rotation Angle		90° ±10°						
Direction of rotation		Right/Left						
Non-rotating accuracy (clamping): Initial value		±1°			±0.9°		±0.7°	
Pressure receiving area mm^2	Retraction side	123	201	377	603	1055	1649	2626
	Push side	201	314	490	804	1256	1963	3117
Durability		1 million cycles						

Stroke

Bore Size (mm)	Stroke (mm)	Rotating part stroke (mm)	Clamping part stroke (mm)
ø16	19, 29	9	10, 20
ø20	21, 31	11	10, 20
ø25			
ø32	25, 35	15	10, 20
ø40			
ø50	40, 70	20	20, 50
ø63			

Cylinder Weight

(Unit: kg)

Item / Mounting Style / Bore Size (mm)	Stroke (mm)								Rod side Flange (FA)	Head side Flange (FB)	Switch Weight
	19	29	21	31	25	35	40	70			
ø16	0.22	0.28	-	-	-	-	-	-	0.07	0.07	Refer to the switch weight listed in the switch specifications on P. 1457.
ø20	-	-	0.35	0.43	-	-	-	-	0.13	0.13	
ø25	-	-	0.38	0.45	-	-	-	-	0.16	0.16	
ø32	-	-	-	-	0.8	0.9	-	-	0.16	0.16	
ø40	-	-	-	-	1.0	1.1	-	-	0.25	0.25	
ø50	-	-	-	-	-	-	1.6	2.2	0.5	0.5	
ø63	-	-	-	-	-	-	2.8	3.6	0.65	0.65	

Theoretical Thrust Table

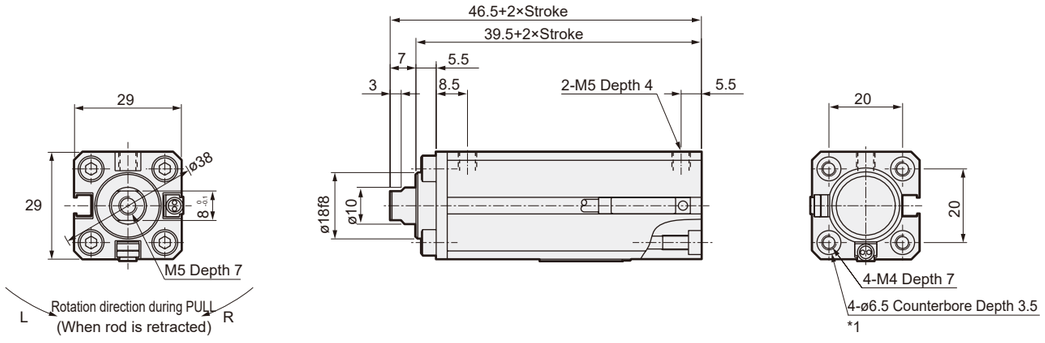
(Unit: N)

Bore Size (mm)	Operating Direction	Operating Pressure MPa								
		0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
ø16	Push	40.2	60.3	80.4	1.01×10^2	1.21×10^2	1.41×10^2	1.61×10^2	1.81×10^2	2.01×10^2
	Pull	24.5	36.8	49.0	61.3	73.5	85.8	98.0	1.10×10^2	1.23×10^2
ø20	Push	62.8	94.2	1.26×10^2	1.57×10^2	1.89×10^2	2.20×10^2	2.51×10^2	2.83×10^2	3.14×10^2
	Pull	40.2	60.3	80.4	1.01×10^2	1.21×10^2	1.41×10^2	1.61×10^2	1.81×10^2	2.01×10^2
ø25	Push	98.2	1.47×10^2	1.96×10^2	2.45×10^2	2.95×10^2	3.44×10^2	3.93×10^2	4.42×10^2	4.91×10^2
	Pull	75.6	1.13×10^2	1.51×10^2	1.89×10^2	2.27×10^2	2.64×10^2	3.02×10^2	3.40×10^2	3.78×10^2
ø32	Push	1.61×10^2	2.41×10^2	3.22×10^2	4.02×10^2	4.83×10^2	5.63×10^2	6.43×10^2	7.24×10^2	8.04×10^2
	Pull	1.21×10^2	1.81×10^2	2.41×10^2	3.02×10^2	3.62×10^2	4.22×10^2	4.83×10^2	5.43×10^2	6.03×10^2
ø40	Push	2.51×10^2	3.77×10^2	5.03×10^2	6.28×10^2	7.54×10^2	8.80×10^2	1.01×10^3	1.13×10^3	1.26×10^3
	Pull	2.11×10^2	3.17×10^2	4.22×10^2	5.28×10^2	6.33×10^2	7.39×10^2	8.45×10^2	9.50×10^2	1.06×10^3
ø50	Push	3.93×10^2	5.89×10^2	7.85×10^2	9.82×10^2	1.18×10^3	1.37×10^3	1.57×10^3	1.77×10^3	1.96×10^3
	Pull	3.30×10^2	4.95×10^2	6.60×10^2	8.25×10^2	9.90×10^2	1.15×10^3	1.32×10^3	1.48×10^3	1.65×10^3
ø63	Push	6.23×10^2	9.35×10^2	1.25×10^3	1.56×10^3	1.87×10^3	2.18×10^3	2.49×10^3	2.81×10^3	3.12×10^3
	Pull	5.25×10^2	7.88×10^2	1.05×10^3	1.31×10^3	1.58×10^3	1.84×10^3	2.10×10^3	2.36×10^3	2.63×10^3

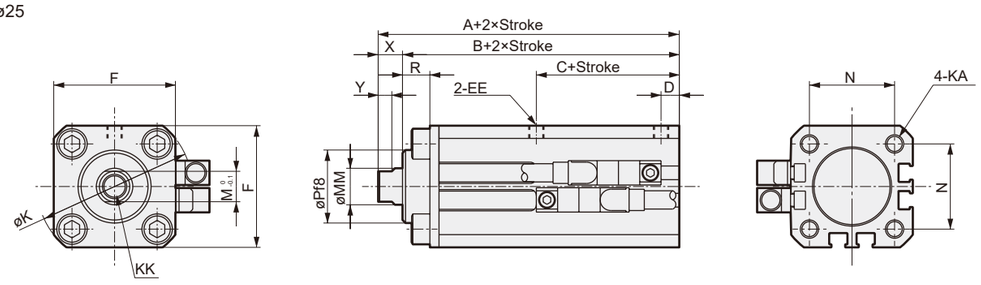
External dimensions diagram (Bore Size: ø16, ø20, ø25)

● Basic Type (00)

ø16



ø20, ø25



Code	Basic Type (00) Basic Dimensions															
Bore Size (mm)	A	B	C	D	EE	F	K	KA	KK	M	MM	N	P	R	X	Y
ø20	56	48	24	5.5	M5x0.8	36	47	M6 Depth 11	M8 Depth 15	10	12	25.5	24	9	8	4.5
ø25	57	49	26	6	M5x0.8	40	51	M6 Depth 11	M8 Depth 15	10	12	28	24	9	8	4.5

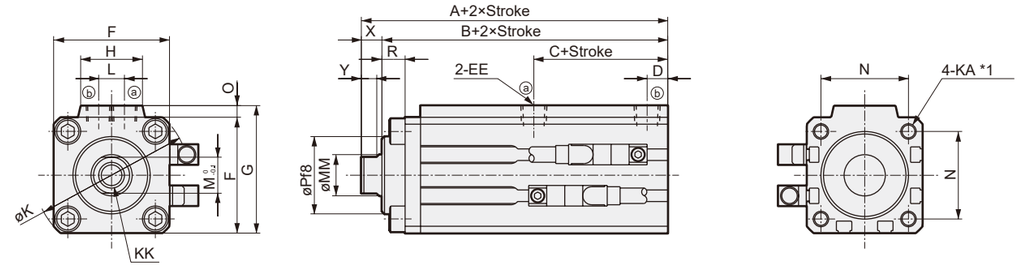
*1: Mounting with through bolts is not possible.

***2: For dimensions of models with switches, see P. 869.**

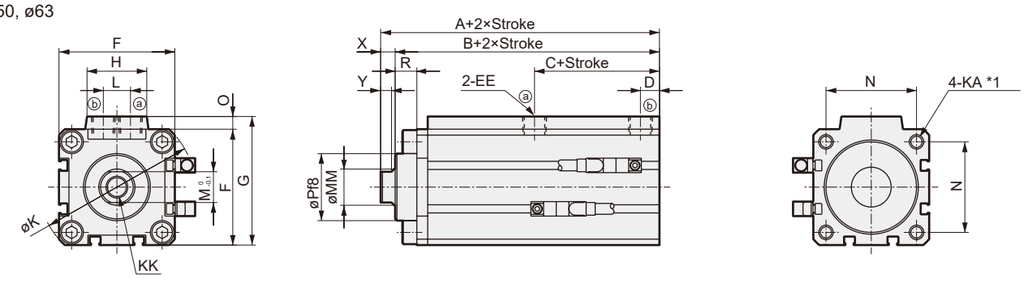
External dimensions diagram (Bore Size: ø32, ø40, ø50, ø63)

● Basic Type (00)

ø32, ø40



ø50, ø63



Code	Basic Type (00) Mounting Dimensions																			
Bore Size (mm)	A	B	C	D	EE	F	G	H	K	KA	KK	L	M	MM	N	O	P	R	X	Y
ø32	69	61	27	8	Rc1/8	45	49.5	24	60	M6 Depth 11	M10 Depth 15	10	14	16	34	4.5	30	9	8	6
ø40	70	62	29	8.5	Rc1/8	52	57	24	69	M6 Depth 11	M10 Depth 15	10	14	16	40	5	35	9	8	6
ø50	74	66	29	10.5	Rc1/4	64	71	33	86	M8 Depth 13	M12 Depth 15	15	17	20	50	7	37	12	8	6
ø63	85	75	38	11	Rc1/4	77	84	33	103	M10 Depth 25	M16 Depth 21	15	22	25	60	7	48	12	10	8

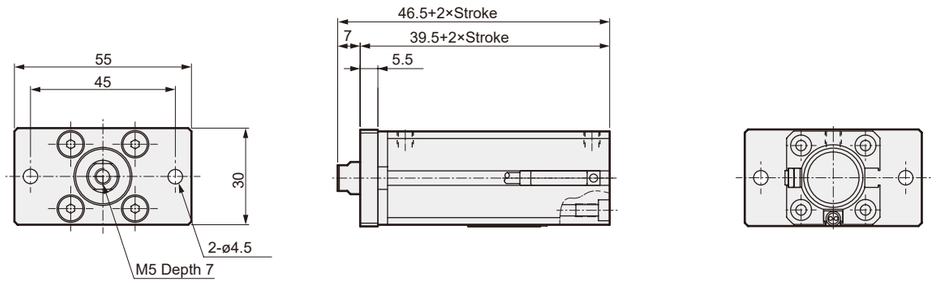
*1: Mounting with through bolts is not possible.

***2: For dimensions of models with switches, see P. 869.**

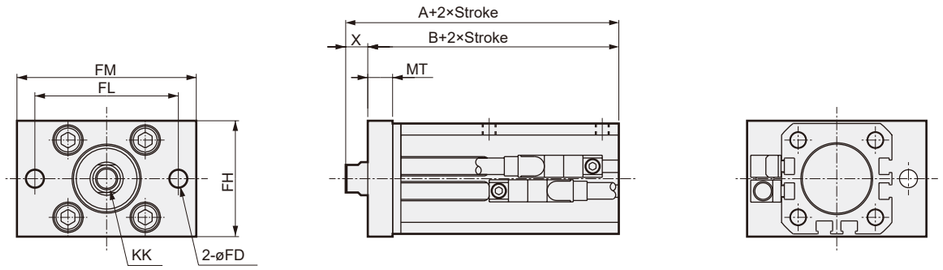
External dimensions diagram (Bore Size: ø16, ø20, ø25)

● Rod Side Flange Type (FA)

ø16



ø20, ø25



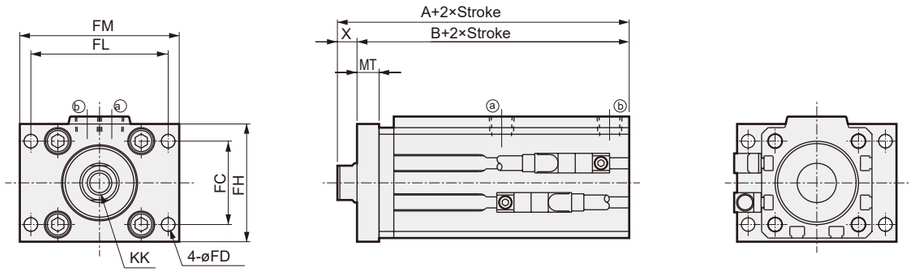
Code	Rod Side Flange Type (FA) Mounting Dimensions								
Bore Size (mm)	A	B	KK	X	FD	FH	FL	FM	MT
ø20	56	48	M8 Depth 15	8	6.5	38	48	60	9
ø25	57	49	M8 Depth 15	8	6.5	42	52	65	9

Note: For dimensions with each switch, please refer to P. 869.

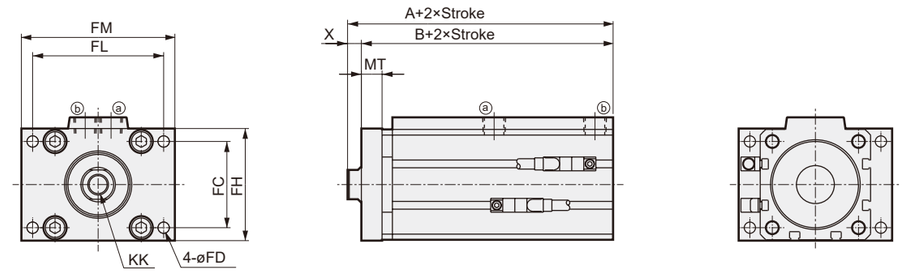
External dimensions diagram (Bore Size: ø32, ø40, ø50, ø63)

● Rod Side Flange Type (FA)

ø32, ø40



ø50, ø63



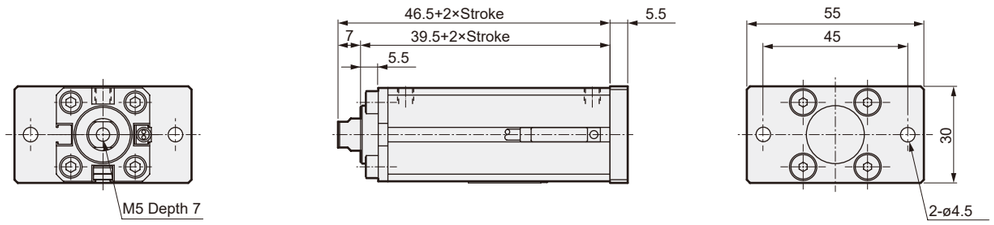
Code	Rod Side Flange Type (FA) Mounting Dimensions									
Bore Size (mm)	A	B	KK	X	FD	FC	FH	FL	FM	MT
ø32	69	61	M10 Depth 15	8	5.5	34	48	56	65	9
ø40	70	62	M10 Depth 15	8	5.5	40	55	62	75	9
ø50	74	66	M12 Depth 15	8	6.5	50	66	76	89	12
ø63	85	75	M16 Depth 21	10	9	60	82	92	108	12

Note: For dimensions with each switch, please refer to P. 869.

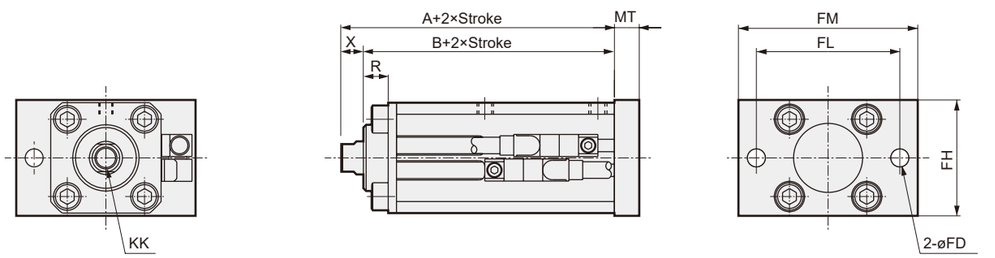
External dimensions diagram (Bore Size: ø16, ø20, ø25)

● Head Side Flange Type (FB)

ø16



ø20, ø25



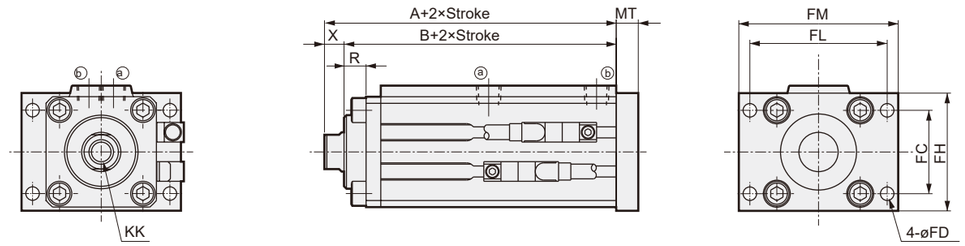
Code	Head Side Flange Type (FB) Mounting Dimensions									
Bore Size (mm)	A	B	KK	R	X	FD	FH	FL	FM	MT
ø20	56	48	M8 Depth 15	9	8	6.5	38	48	60	9
ø25	57	49	M8 Depth 15	9	8	6.5	42	52	65	9

Note: For dimensions with each switch, please refer to P. 869.

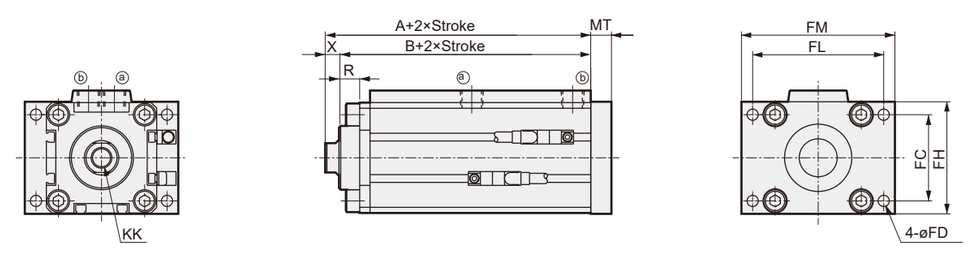
External dimensions diagram (Bore Size: ø32, ø40, ø50, ø63)

● Head Side Flange Type (FB)

ø32, ø40



ø50, ø63



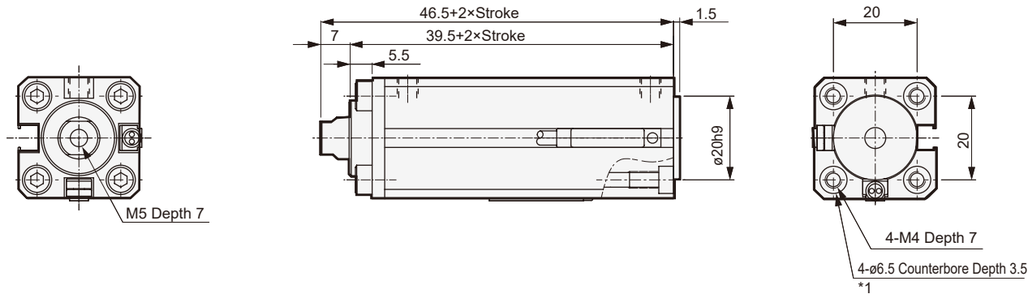
Code	Head Side Flange Type (FB) Mounting Dimensions										
Bore Size (mm)	A	B	KK	R	X	FD	FC	FH	FL	FM	MT
ø32	69	61	M10 Depth 15	9	8	5.5	34	48	56	65	9
ø40	70	62	M10 Depth 15	9	8	5.5	40	55	62	75	9
ø50	74	66	M12 Depth 15	12	8	6.5	50	66	76	89	12
ø63	85	75	M16 Depth 21	12	10	9	60	82	92	108	12

Note: For dimensions with each switch, please refer to P. 869.

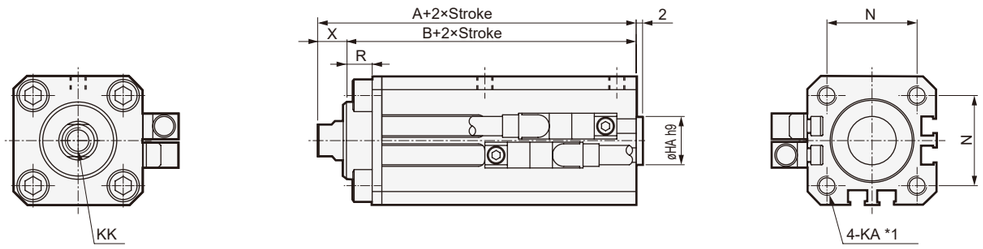
External dimensions diagram (Bore Size: ø16, ø20, ø25)

● With Head Side Spigot Joint (HI)

ø16



ø20, ø25



Code	With Head Side Spigot Joint (HI) Mounting Dimensions							
Bore Size (mm)	A	B	HA	KA	KK	N	R	X
ø20	56	48	13	M6 Depth 11	M8 Depth 15	25.5	9	8
ø25	57	49	15	M6 Depth 11	M8 Depth 15	28	9	8

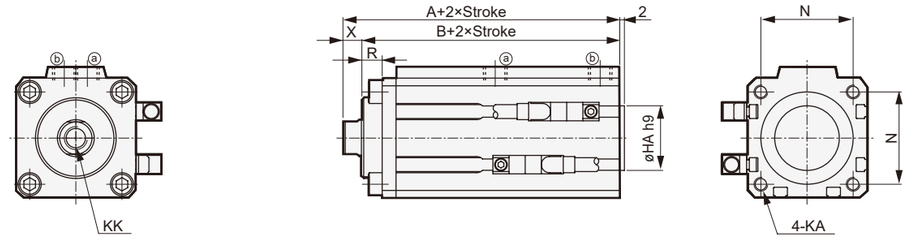
*1: Mounting with through bolts is not possible.

***2: For dimensions of models with switches, see P. 869.**

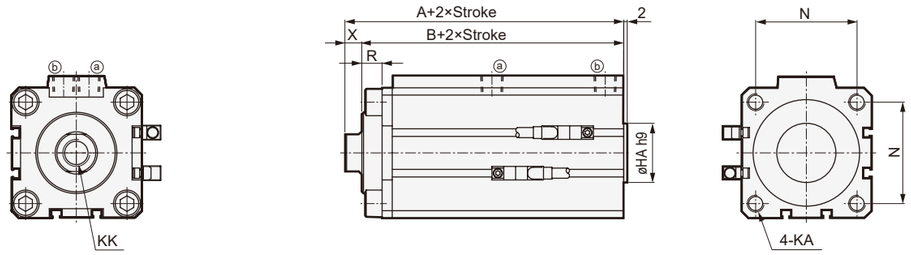
External dimensions diagram (Bore Size: ø32, ø40, ø50, ø63)

● With Head Side Spigot Joint (HI)

ø32, ø40



ø50, ø63



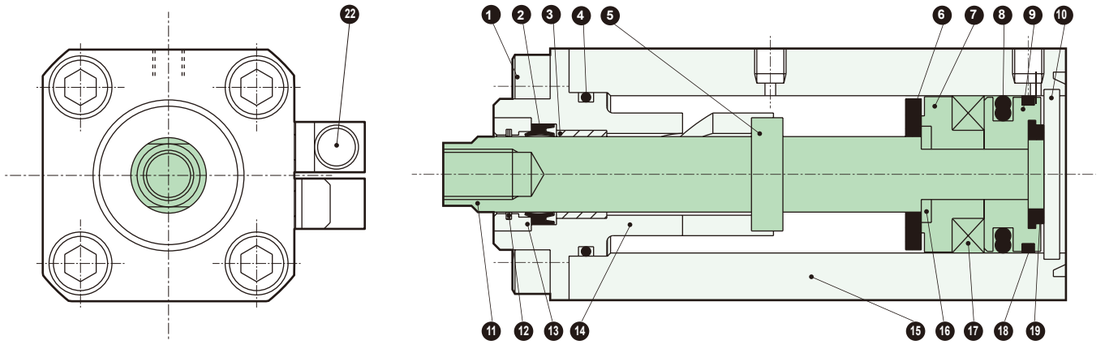
Code	With Head Side Spigot Joint (HI) Mounting Dimensions							
Bore Size (mm)	A	B	HA	KA	KK	N	R	X
ø32	69	61	21	M6 Depth 11	M10 Depth 15	34	9	8
ø40	70	62	28	M6 Depth 11	M10 Depth 15	40	9	8
ø50	74	66	35	M8 Depth 13	M12 Depth 15	50	12	8
ø63	85	75	35	M10 Depth 25	M16 Depth 21	60	12	10

*1: Mounting with through bolts is not possible.

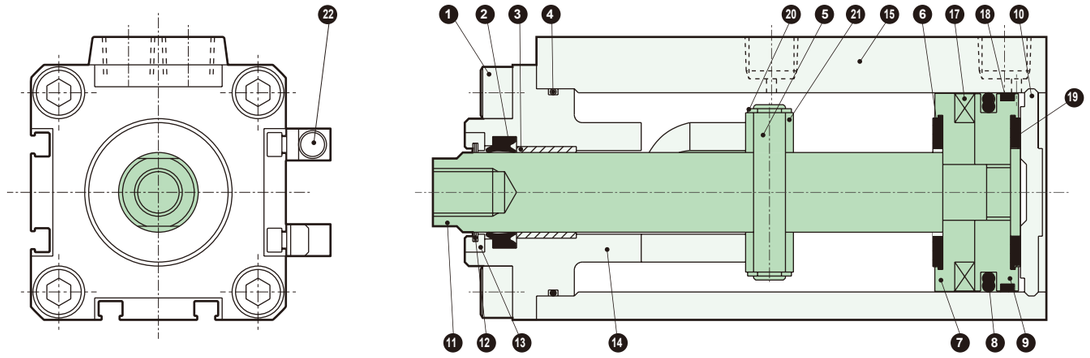
***2: For dimensions of models with switches, see P. 869.**

Internal Structure / Materials

● ø16 to ø25



● ø32 to ø63



Part No.	Part Name	Material	Remarks
1	Hexagon Socket Head Cap Screw	Stainless Steel	
2	Rod Packing	Nitrile Rubber	
3	Bushing	Oil-Impregnated Bearing Alloy	
4	Cylinder Gasket	Nitrile Rubber	
5	Pin	Steel	
6	Cushion rubber (R)	Urethane Rubber	
7	Spacer	ø20, ø25: Special resin ø16, ø32 to ø63: Aluminum Alloy	
8	Piston Packing	Nitrile Rubber	
9	Piston	Aluminum Alloy	
10	Cover	ø16, ø20, ø25: Stainless Steel ø32 to ø63: Aluminum Alloy	
11	Piston Rod	ø16: Stainless Steel ø20 to ø63: Steel	

Part No.	Part Name	Material	Remarks
12	Coil Scraper	Copper Alloy	ø20 to ø63 only
13	Holder	Aluminum Alloy	
14	Rod Cover	Steel	
15	Cylinder Body	Aluminum Alloy	
16	Spacer washer	Stainless Steel	ø20, ø25 only
17	Magnet	Plastic	
18	Wear ring	Polyacetal	
19	Cushion rubber (H)	Urethane Rubber	
20	E-type Retaining Ring	Steel	
21	Roller	Steel	
With Switch			
22	Switch		

For maintenance parts, refer to the CKD component product site (https://www.ckd.co.jp/kiki/en/) -> "Model No." -> See "Maintenance Parts".

MEMO

Clamping
CAC4
UCAC2
CAC-N
UCAC-N
RCS2
RCC2
PCC
Cylinder Switch
Ending

Rotary Clamp Cylinder, Double Acting, Sputter Adhesion Prevention Type

RCC2-G4 Series

● Bore Size: ø20, ø25, ø32, ø40, ø50, ø63

Circuit Diagram Code

Custom-made RoHS

Model No. Notation

Without Switch
(Built-in magnet for switch)

RCC2-G4 - 00 - 20 - 21 - R

Model No. ❶ ❷ ❸ ❹

With Switch
(Built-in magnet for switch)

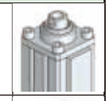
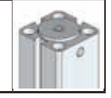
RCC2-G4 - 00 - 20 - 21 - R - T0H - R

Model No. ❷Bore Size ❹Direction of rotation ❻Number of Switches

❶Mounting type ❸Stroke ❺Switch Model No.

❶Mounting type

Mounting bracket is attached to the product for shipment.

Code	Content	
00	Basic type	
FA	Rod side flange type	
FB	Head Side Flange Type	
HI	Head side with spigot joint	

*1 : For models with switch, depending on the switch mounting surface and switch type, there is a possibility of interference with the fixing screws.

❷Bore Size (mm)

Code	Content
20	ø20
25	ø25
32	ø32
40	ø40
50	ø50
63	ø63

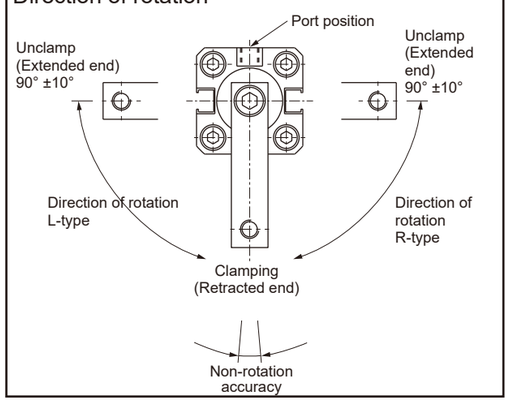
❸Stroke (mm)

Stroke	20	25	32	40	50	63	Rotation	Clamping Stroke
21	●	●					11	10
25			●	●			15	
31	●	●					11	20
35			●	●			15	
40					●	●	20	
70					●	●		50

❹Direction of rotation

Code	Content
R	Clamp (Pull) looking from rod side: rotated 90° in CW direction
L	Clamp (Pull) looking from rod side: rotated 90 degrees counterclockwise

Direction of rotation



❺Switch Model No.

For switch details, refer to P. 1457. Switches are shipped with the product.

Contact	Indicator LED Special Function	Wiring (Output)	Load Voltage (V)		Load Current (mA)		Lead wire *1		
			AC	DC	AC	DC	Straight	L-shape	
Solid State	2-Color AC For Magnetic Field	2-wire	—	24 ± 10%	—	5 to 20	T2YD□	–	
			—		—		T2YDT□	–	

*1: For "□" in the switch Model No., enter the code selected from the "*Lead wire length" table.
*2: Switches other than the Model No.s listed above are also available. (Custom Product) For details, refer to P.1457.

*** Lead Wire Length**

Code	Content
Blank	1 m (Standard)
3	3 m (Option)
5	5 m (Option)

Example) Lead wire length
1 m T2YD
3 m T2YD3
5 m T2YD5

❻Number of Switches

Code	Content
R	With 1 pc on rod side
H	With 1 pc on head side
D	With 2 pcs

Switch Single Unit Model No. Notation

SW - T0H

❺Switch Model No.

Switch Single Unit Model No.

SW - T0H3

❺Switch Model No.

Specifications

*This is a custom order product.

Item		RCC2-G4					
Bore Size	mm	ø20	ø25	ø32	ø40	ø50	ø63
Actuation method		Double Acting Type					
Max Operating Pressure	MPa	1					
Min Operating Pressure	MPa	0.2					
Proof Pressure	MPa	1.6					
Ambient Temperature	°C	-10 to 60 (However, no freezing)					
Port Size		M5		Rc1/8		Rc1/4	
Operating Piston Speed	mm/s	50 to 200					
Cushion		With Rubber Cushion					
Lubrication		Not required (Use Turbine Oil Class 1 ISO VG32 if lubricated)					
Rotation Angle		90° ±10°					
Direction of rotation		Right/Left					
Non-rotating accuracy (clamping): Initial value		±1°		±0.9°		±0.7°	
Pressure Receiving Area mm^2	Retraction side	201	377	603	1055	1649	2626
	Push side	314	490	804	1256	1963	3117

Stroke

Bore Size (mm)	Stroke mm	Rotating part stroke (mm)	Clamping part stroke (mm)
ø20	21, 31	11	10, 20
ø25			
ø32	25, 35	15	10, 20
ø40			
ø50	40, 70	20	20, 50
ø63			

Theoretical Thrust Table

(Unit: N)

Bore Size (mm)	Operating Direction	Operating Pressure MPa								
		0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
ø20	Push	62.8	94.2	1.26×10^2	1.57×10^2	1.89×10^2	2.20×10^2	2.51×10^2	2.83×10^2	3.14×10^2
	Pull	40.2	60.3	80.4	1.01×10^2	1.21×10^2	1.41×10^2	1.61×10^2	1.81×10^2	2.01×10^2
ø25	Push	98.2	1.47×10^2	1.96×10^2	2.45×10^2	2.95×10^2	3.44×10^2	3.93×10^2	4.42×10^2	4.91×10^2
	Pull	75.6	1.13×10^2	1.51×10^2	1.89×10^2	2.27×10^2	2.64×10^2	3.02×10^2	3.40×10^2	3.78×10^2
ø32	Push	1.61×10^2	2.41×10^2	3.22×10^2	4.02×10^2	4.83×10^2	5.63×10^2	6.43×10^2	7.24×10^2	8.04×10^2
	Pull	1.21×10^2	1.81×10^2	2.41×10^2	3.02×10^2	3.62×10^2	4.22×10^2	4.83×10^2	5.43×10^2	6.03×10^2
ø40	Push	2.51×10^2	3.77×10^2	5.03×10^2	6.28×10^2	7.54×10^2	8.80×10^2	1.01×10^3	1.13×10^3	1.26×10^3
	Pull	2.11×10^2	3.17×10^2	4.22×10^2	5.28×10^2	6.33×10^2	7.39×10^2	8.45×10^2	9.50×10^2	1.06×10^3
ø50	Push	3.93×10^2	5.89×10^2	7.85×10^2	9.82×10^2	1.18×10^3	1.37×10^3	1.57×10^3	1.77×10^3	1.96×10^3
	Pull	3.30×10^2	4.95×10^2	6.60×10^2	8.25×10^2	9.90×10^2	1.15×10^3	1.32×10^3	1.48×10^3	1.65×10^3
ø63	Push	6.23×10^2	9.35×10^2	1.25×10^3	1.56×10^3	1.87×10^3	2.18×10^3	2.49×10^3	2.81×10^3	3.12×10^3
	Pull	5.25×10^2	7.88×10^2	1.05×10^3	1.31×10^3	1.58×10^3	1.84×10^3	2.10×10^3	2.36×10^3	2.63×10^3

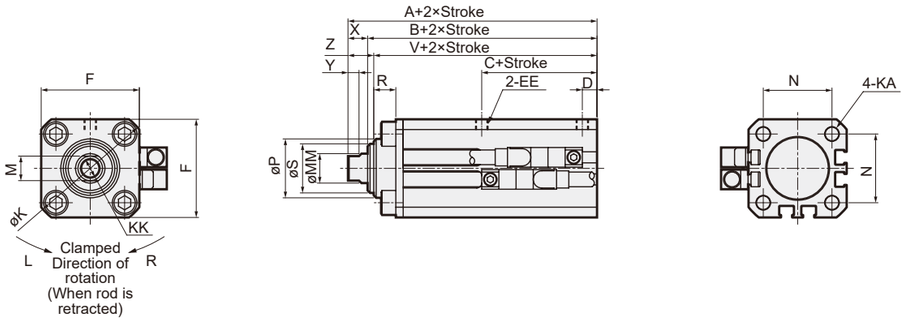
MEMO

Clamping
CAC4
UCAC2
CAC-N
UCAC-N
RCS2
RCC2
PCC
Cylinder Switch
Ending

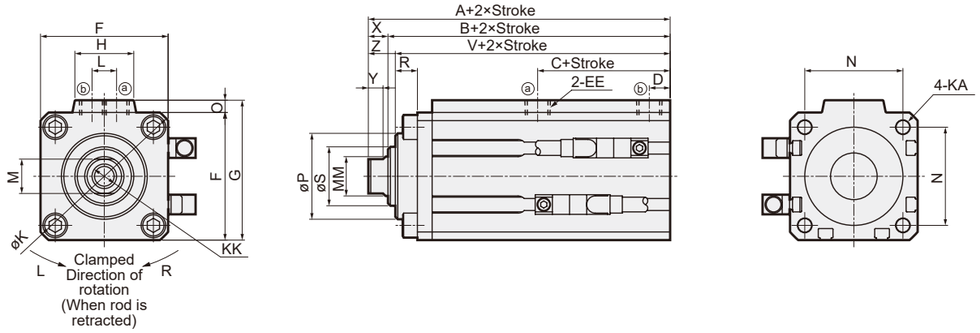
Dimensional Drawings

● Basic Type (00)

ø20, ø25



ø32 to ø63



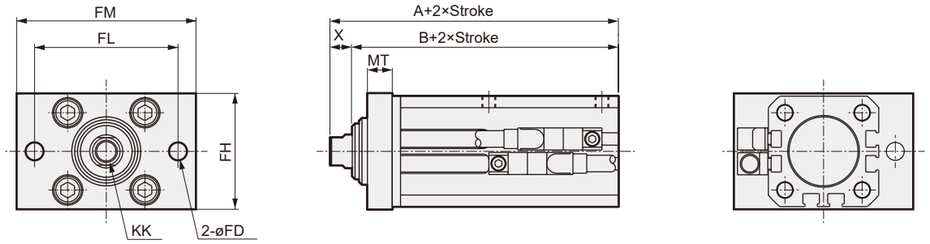
Code / Bore Size (mm)	A	B	C	D	EE	F	G	H	K	KA	KK	L	M	MM
ø20	58.5	50.5	24	5.5	M5x0.8	36	-	-	47	M6 Depth 11	M8 Depth 15	-	10	12
ø25	59.5	51.5	26	6	M5x0.8	40	-	-	51	M6 Depth 11	M8 Depth 15	-	10	12
ø32	72	64	27	8	Rc1/8	45	49.5	24	60	M6 Depth 11	M10 Depth 15	10	14	16
ø40	73	65	29	8.5	Rc1/8	52	57	24	69	M6 Depth 11	M10 Depth 15	10	14	16
ø50	77	69	29	10.5	Rc1/4	64	71	33	86	M8 Depth 13	M12 Depth 15	15	17	20
ø63	88	78	38	11	Rc1/4	77	84	33	103	M10 Depth 25	M16 Depth 21	15	22	25

Code / Bore Size (mm)	N	O	P	R	X	Y	V	Z	S
ø20	25.5	-	24	9	8	4.5	48	10.5	20
ø25	28	-	24	9	8	4.5	49	10.5	20
ø32	34	4.5	30	9	8	6	61	11	24
ø40	40	5	35	9	8	6	62	11	24
ø50	50	7	37	12	8	6	66	11	30
ø63	60	7	48	12	10	8	75	13	36

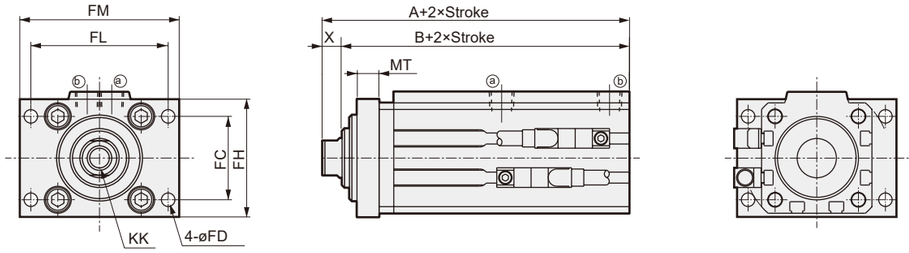
Dimensional Drawings

● Rod Side Flange Type (FA)

ø20, ø25



ø32 to ø63



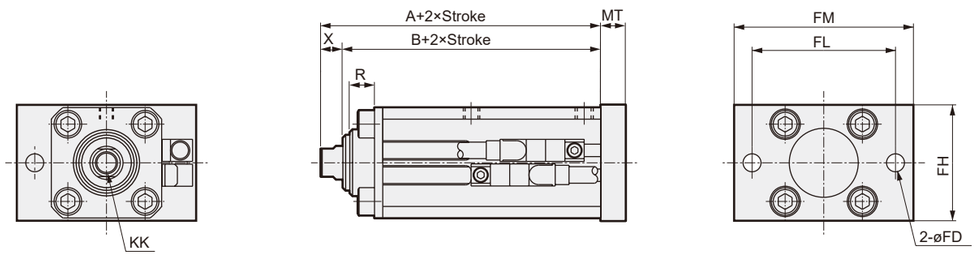
Code / Bore Size (mm)	Rod Side Flange Type (FA) Mounting Dimensions									
	A	B	KK	X	FD	FC	FH	FL	FM	MT
ø20	58.5	50.5	M8 Depth 15	8	6.5	–	38	48	60	9
ø25	59.5	51.5	M8 Depth 15	8	6.5	–	42	52	65	9
ø32	72	64	M10 Depth 15	8	5.5	34	48	56	65	9
ø40	73	65	M10 Depth 15	8	5.5	40	55	62	75	9
ø50	77	69	M12 Depth 15	8	6.5	50	66	76	89	12
ø63	88	78	M16 Depth 21	10	9	60	82	92	108	12

Note: For dimensions with each switch, please refer to P. 869.

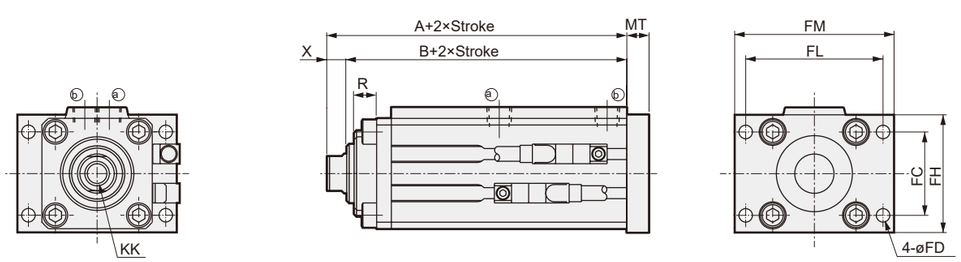
Dimensional Drawings

● Head Side Flange Type (FB)

ø20, ø25



ø32 to ø63



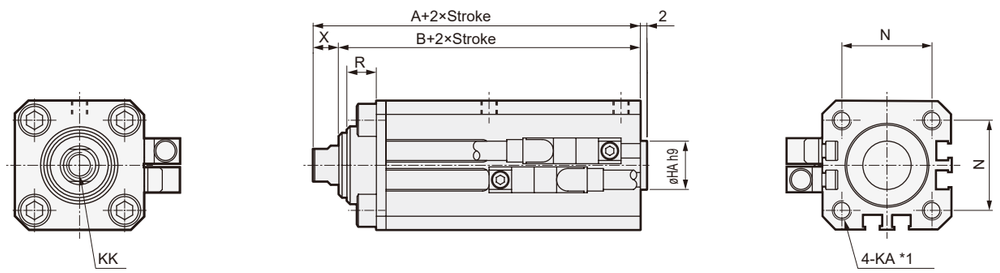
Code	Head Side Flange Type (FB) Mounting Dimensions										
Bore Size (mm)	A	B	KK	R	X	FD	FC	FH	FL	FM	MT
ø20	58.5	50.5	M8 Depth 15	9	8	6.5	–	38	48	60	9
ø25	59.5	51.5	M8 Depth 15	9	8	6.5	–	42	52	65	9
ø32	72	64	M10 Depth 15	9	8	5.5	34	48	56	65	9
ø40	73	65	M10 Depth 15	9	8	5.5	40	55	62	75	9
ø50	77	69	M12 Depth 15	12	8	6.5	50	66	76	89	12
ø63	88	78	M16 Depth 21	12	10	9	60	82	92	108	12

Note: For dimensions with each switch, please refer to P. 869.

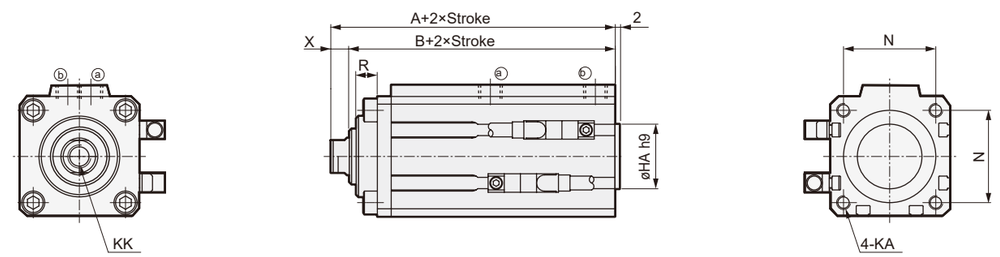
Dimensional Drawings

● With Head Side Spigot Joint (HI)

ø20, ø25



ø32 to ø63



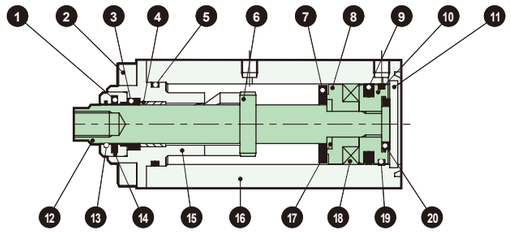
Code	With Head Side Spigot Joint (HI) Mounting Dimensions							
Bore Size (mm)	A	B	HA	KA	KK	N	R	X
ø20	58.5	50.5	13	M6 Depth 11	M8 Depth 15	25.5	9	8
ø25	59.5	51.5	15	M6 Depth 11	M8 Depth 15	28	9	8
ø32	72	64	21	M6 Depth 11	M10 Depth 15	34	9	8
ø40	73	65	28	M6 Depth 11	M10 Depth 15	40	9	8
ø50	77	69	35	M8 Depth 13	M12 Depth 15	50	12	8
ø63	88	78	35	M10 Depth 25	M16 Depth 21	60	12	10

*1: Mounting with through bolts is not possible.

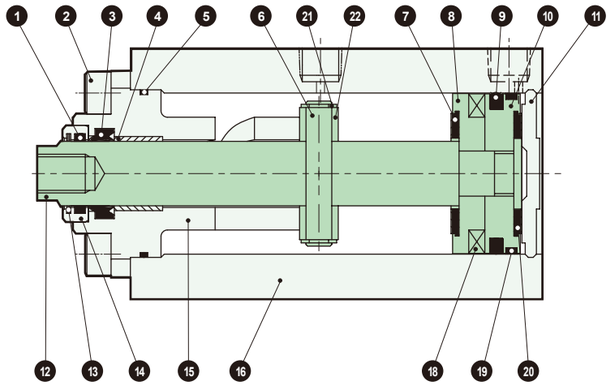
***2: For dimensions of models with switches, see P. 869.**

Internal Structure / Materials

● ø20, ø25



● ø32 to ø63



Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Lube keeper	Special rubber		12	Piston Rod	Steel	
2	Hexagon Socket Head Cap Screw	Stainless Steel		13	Coil Scraper	Copper Alloy	
3	Rod Packing	Nitrile Rubber		14	Holder	Aluminum Alloy	
4	Bushing	Oil-Impregnated Bearing Alloy		15	Rod Cover	Steel	
5	Cylinder Gasket	Nitrile Rubber		16	Cylinder Body	Aluminum Alloy	
6	Pin	Steel		17	Spacer washer	Stainless Steel	
7	Cushion rubber (R)	Urethane Rubber		18	Magnet	Plastic	
8	Spacer	ø20, ø25: Special resin ø32 to ø63: Aluminum Alloy		19	Wear ring	Polyacetal	
				20	Cushion rubber (H)	Urethane Rubber	
9	Piston Packing	Nitrile Rubber		21	E-type Retaining Ring	Steel	
10	Piston	Aluminum Alloy		22	Roller	Steel	
11	Cover	ø20, ø25: Stainless Steel ø32 to ø63: Aluminum Alloy					

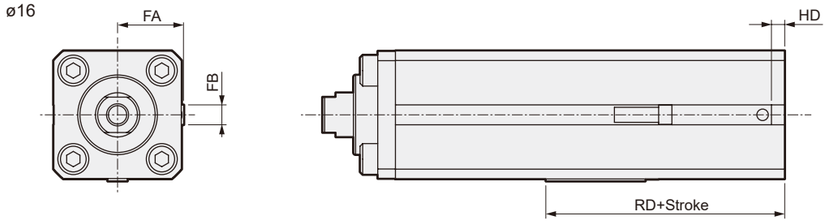
For maintenance parts, refer to the CKD component product site (https://www.ckd.co.jp/kiki/en/) -> "Model No." -> See "Maintenance Parts".

RCC2 Series External Dimensions Diagram with Switch

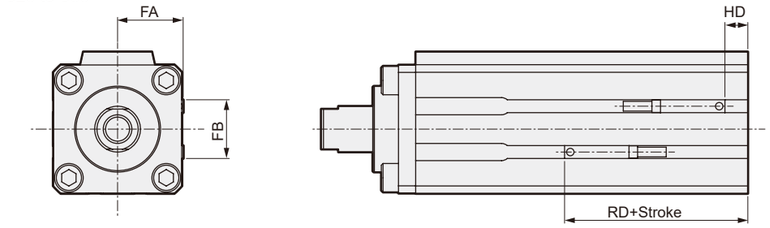
● T0H/V, T5H/V, T2H/V, T3H/V, T3PH/V, T2H/VR3, T2WH/V, T3WH/V, T2WLH/V

• RCC2

ø16



ø20 to ø63



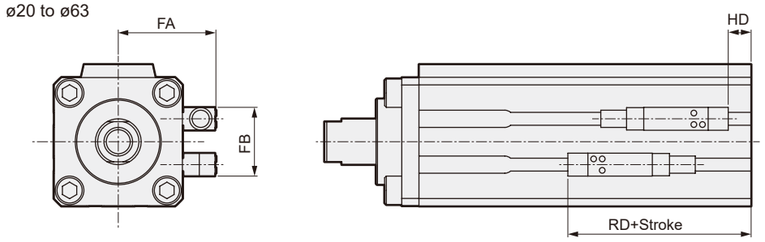
Code / Bore Size (mm)	FA	FB	T2, T3, T3P, T2□R3		T0, T5		T2W, T3W, T2WL	
			RD	HD	RD	HD	RD	HD
ø16	15.0	4.5	25	3	25	3	23	5
ø20	18.5	12.5	26	7	27	6	25	8
ø25	20.5	13.5	25	6	26	5	24	7
ø32	23.0	20.5	28	9	29	8	27	10
ø40	26.5	27.5	29	10	30	9	28	11
ø50	32.5	28.5	30	11	31	10	29	12
ø63	39.0	28.5	37	19	38	18	36	20

*1: FA dimension is the dimension for straight type lead wire.
*2: For switch mountability, refer to the Model No. notation of each variation.

● T2YD, T2YDT

• RCC2, RCC2-G4

ø20 to ø63



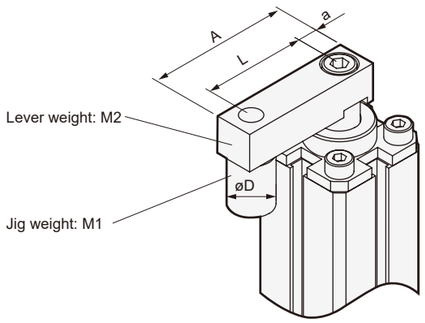
Code / Bore Size (mm)	T2YD,T2YDT			
	FA	FB	RD	HD
ø20	29.3	16	27	6
ø25	31.3	17	26	5
ø32	33.8	24	29	8
ø40	37.3	31	30	9
ø50	43.3	32	31	10
ø63	49.8	32	38	18

*1: FA dimension is the dimension for straight type lead wire.
*2: For switch mountability, refer to the Model No. notation of each variation.

Technical Data (Selection Example)

[Specifications]

- Required clamping force: 400 N
- Operating Pressure: 0.5 MPa
- Maximum piston speed: 100 mm/s
- Lever shape
  M2:0.31 kg L: 0.080 m
  A: 0.1 m a: 0.010 m
- Jig shape
  M1:0.04 kg D: 0.020 m



1. Calculate the required pressure receiving area.

$$\text{Required pressure receiving area (mm}^2\text{)} = \frac{\text{Required clamping force (N)}}{\text{Operating Pressure (MPa)} \times \text{Efficiency}} = \frac{400}{0.5 \times 80\%} = 1000\ (\text{mm}^2)$$

Note: Efficiency varies depending on lever length or cylinder resistance.

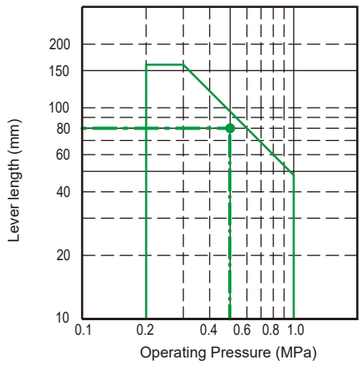
2. Select the cylinder size from the pressure receiving area (retraction side) in the specification list.

ø40 pressurized area: 1055 (mm^2) > required pressurized area: 1000 (mm^2)

3. Confirm the allowable lever length.

Operating Pressure 0.5 MPa, Lever length 80 mm
Confirm with the graph on P. 872
→ Within operating range

[Allowable lever length]



4. Confirm the allowable lever moment of inertia.

Calculation of moment of inertia
(Use the formula for concentrated load on P. 871)

$$\text{Moment of inertia } I = M_1 (R_1^2 + K_1^2) + \frac{M_2 R_2^2}{3}$$

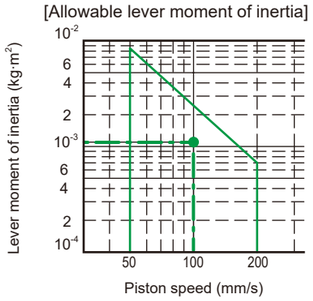
Because $R_1 = L$, $R_2 = A\text{-}a$, $K_1^2 = \frac{D^2}{8}$

$$I = 0.04 \times \left(0.08^2 + \frac{0.02^2}{8}\right) + \frac{0.31 \times (0.1 \text{ to } 0.01)^2}{3}$$

$$= 1.10 \times 10^{-3}\ \text{kg·m}^2$$

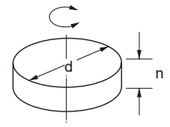
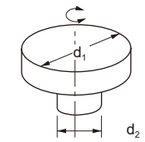
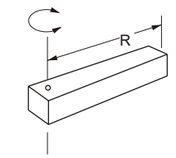
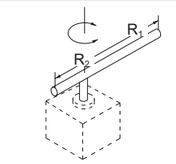
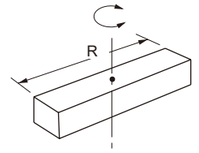
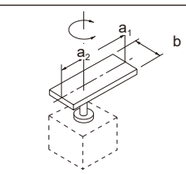
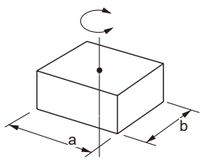
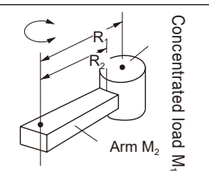
Moment of inertia 1.10×10^{-3} kg·m²
Maximum piston speed 100 mm/s
Confirm with the graph on P. 872
→ Within operating range

[Allowable lever moment of inertia]



From the above, select size ø40.

Diagram for calculating moment of inertia

Shape	Diagram	Required Items	Moment of Inertia I kg·m²	Radius of gyration K_1^2	Remarks
Disk		● Diameter d(m) ● Weight M(kg)	$I = \frac{Md^2}{8}$	$\frac{d^2}{8}$	● No specific mounting direction
Stepped disk		● Diameter d_1(m), d_2(m) ● Weight d_1 part M_1(kg), d_2 part M_2(kg)	$I = \frac{1}{8}(M_1 d_1^2 + M_2 d_2^2)$	$\frac{d_1^2+d_2^2}{8}$	● d_2 compared to d_1 section Very small part Ignore when Good
Rod (center of rotation is at the end)		● Rod length R(m) ● Weight M(kg)	$I = \frac{MR^2}{3}$	$\frac{R^2}{3}$	● Mounting direction is horizontal
Thin rod		● Rod length R_1, R_2 ● Weight M_1, M_2	$I = \frac{M_1 R_1^2}{3} + \frac{M_2 R_2^2}{3}$	$\frac{R_1^2+R_2^2}{3}$	● Mounting direction is horizontal
Rod (center of rotation is at the center of gravity)		● Rod length R(m) ● Weight M(kg)	$I = \frac{MR^2}{12}$	$\frac{R^2}{12}$	● No specific mounting direction
Thin rectangular plate (cuboid)		● Plate length a_1, a_2 ● Side length b ● Weight M_1, M_2	$I = \frac{M_1}{12}(4a_1^2+b^2) + \frac{M_2}{12}(4a_2^2+b^2)$	$\frac{(4a_1^2 b^2)+(4a_2^2+b^2)}{12}$	● Mounting direction is horizontal
Cuboid		● Side length a(m) ● Weight b(m), M (kg)	$I = \frac{M}{12}(a^2+b^2)$	$\frac{a^2+b^2}{12}$	● No specific mounting direction
Concentrated load		● Shape of concentrated load ● To the center of gravity of the concentrated load Length R_1 ● Arm length R_2(m) ● Weight of concentrated load M_1(kg) ● Weight of arm M_2(kg)	$I = M_1(R_1^2+k_1^2) + \frac{M_2 R_2^2}{3}$	k_1^2 is calculated based on the shape of the concentrated load	● Mounting direction is horizontal ● If M_2 is very small compared to M_1, it can be calculated with $M_2 = 0$

To Use This Product Safely

Be sure to read this before use. For general cylinder information, see Intro 41, and for cylinder switches, see P. 1512.

Individual Precautions: Rotary clamp cylinder RCC2 Series

Design / Selection

1. Common

Warning

■This cylinder strokes while the Piston Rod rotates (90°) during operation.

Ensure that the lever included with the Piston Rod tip does not interfere with external parts when rotating. Since the lever included with the Piston Rod tip rotates, if there is a risk of danger to humans, take safety measures such as installing a protective cover.

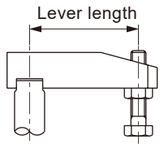
CAUTION

■About Clamp Position

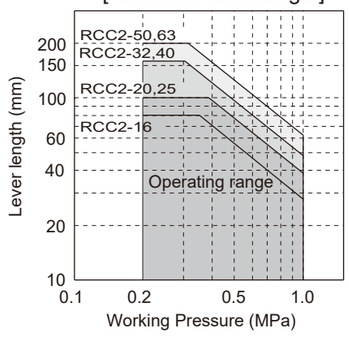
· Do not clamp while swiveling. Clamp at a position 3 mm or more before the stroke end within the clamp stroke range.
· Do not perform clamping that applies rotational force to the Piston Rod.
(a) Do not clamp in the rotational direction.
(b) Do not clamp inclined parts.
(c) Cannot be used if the workpiece moves during clamping.

■About Lever Length and Operating Pressure

Please set the lever length and Operating Pressure within the range shown in the diagram below.



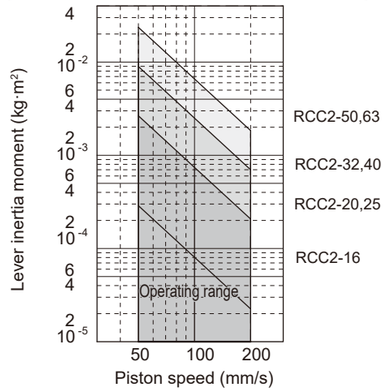
[Allowable lever length]



■About Lever Moment of Inertia and Piston Speed

Please set the lever moment of inertia and piston speed within the range shown in the diagram below.

[Allowable moment of inertia for lever]



Note) The lever allowable moment of inertia graph is applicable only for vertical top/bottom mounting.

■About Operating Environment

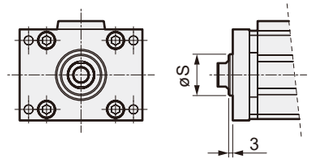
ø16 does not have a built-in coil scraper for welding environments.

2. Anti-spatter adherence RCC2-G4

■This cylinder has improved durability in a sputter scattering atmosphere compared to general type cylinders. If used in an atmosphere other than sputter scattering, durability may be inferior to general type cylinders. Do not use in atmospheres other than sputter scattering.

■Sputter adhesion inhibitor is volatile, so if the adhesion inhibitor on the rod surface begins to dry, apply it to the rod surface to replenish it.

■For mounting type FA (rod side flange), the holder will protrude from the flange end face, so please be careful.



Code Bore Size	S
ø20	20
ø25	20
ø32	24
ø40	24
ø50	30
ø63	36

For notes on mounting, installation, adjustment, use, and maintenance,
CKD Components Product Site (https://www.ckd.co.jp/kiki/en/) → "Model No." → Instruction Manual.

MEMO

Clamp Cylinder

PCC

Pin Clamp Cylinder

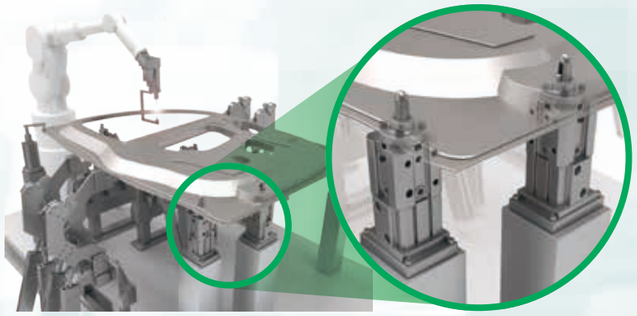
ø50

CONTENTS

Product Introduction 876
● Double Acting, basic (PCC) 878
● Double Acting, position locking (PCC-Q) 878
External Dimensions Diagram with Switch 890
Special Order Product Specification Sheet 892
⚠Precautions for Use 898

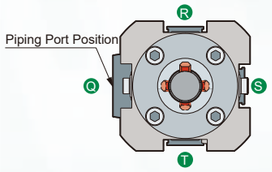
PCC Series (Bore size ø50)

Mainly used for positioning and clamping of chassis in automobile welding processes

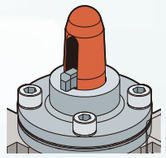


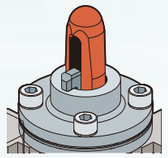
- Double Acting, basic (PCC)
- Double Acting, position locking (PCC-Q)

Lever direction can be selected from 4 options

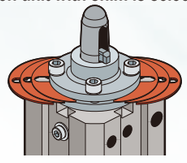


Two types of locating pin shape are available.


Round pin


Diamond pin

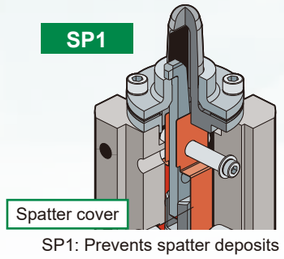
The receiving surface position of the workpiece can be adjusted by up to 2 mm (when unit with shim is selected)



0.5mm to 2 mm adjustable
One side 1×t1+2×t0.5
(One side: 3 sheets Both sides: 6 sheets)

Sputter countermeasures

SP1

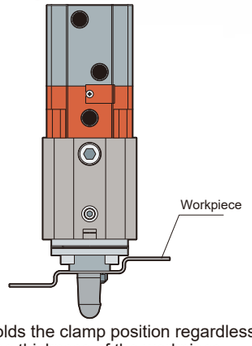


SP1: Prevents spatter deposits in the clamp lever cam groove.

With cleaning holes as standard.

As the cleaning hole has tapered pipe threading (Rc3/8), it can be used as an air blow port for internal cleaning.

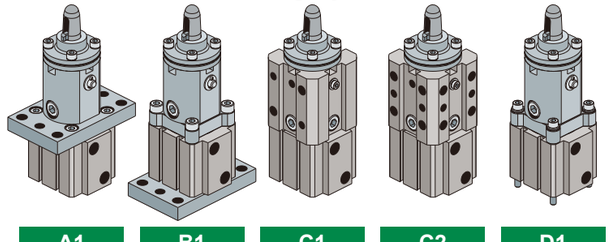
Position locking mechanism can be selected



- It holds the clamp position regardless of the thickness of the workpiece
- It prevents the workpiece from falling out in emergencies.

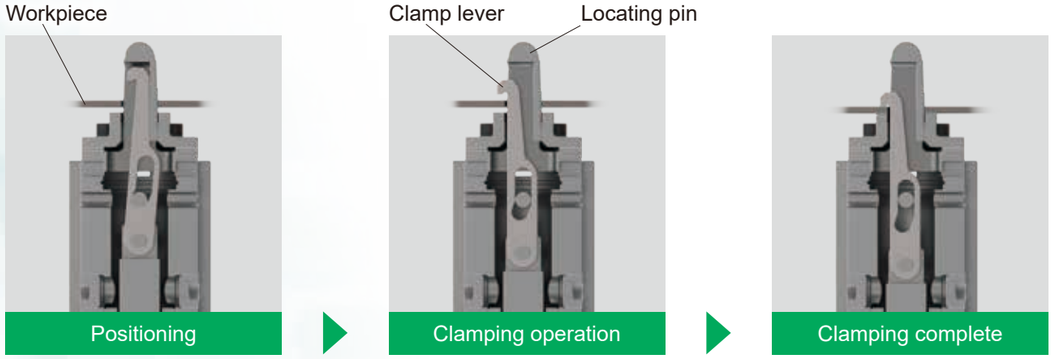
Note: The D1 type is not supported.

Extensive mounting styles are available.

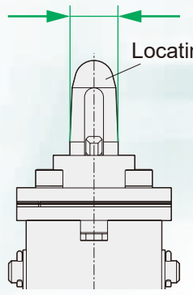


A1	B1	C1	C2	D1
Top surface flange	Bottom surface flange	Side mounting (2 surfaces)	Side mounting (2 surfaces)	Bottom mounting

Operation Overview



Supports 35 standard locating pin diameters



Code	Locating pin diameter	Applicable workpiece hole diameter	Code	Locating pin diameter	Applicable workpiece hole diameter
125	ø12.5	ø13	179	ø17.9	ø18
127	ø12.7		180	ø18.0	
128	ø12.8		195	ø19.5	ø20
129	ø12.9		197	ø19.7	
130	ø13.0		198	ø19.8	
145	ø14.5	ø15	199	ø19.9	
147	ø14.7		200	ø20.0	
148	ø14.8		245	ø24.5	ø25
149	ø14.9		247	ø24.7	
150	ø15.0		248	ø24.8	
155	ø15.5	ø16	249	ø24.9	
157	ø15.7		250	ø25.0	
158	ø15.8		295	ø29.5	ø30
159	ø15.9		297	ø29.7	
160	ø16.0		298	ø29.8	
175	ø17.5	ø18	299	ø29.9	
177	ø17.7		300	ø30.0	
178	ø17.8				

Installed cylinder switch

Solid state 2-color indicator type
For AC Magnetic Fields

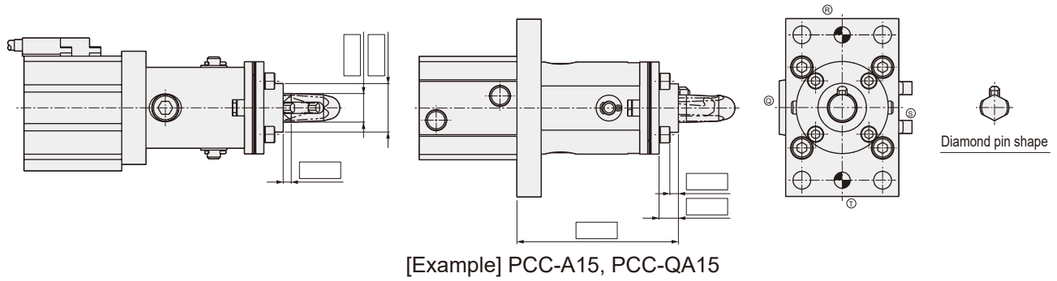
T2YD

Reed 2-color indicator type
For magnetized environment

T0Y

Supports dimension-specified special specification products

Please inform us of your desired dimensions in the specification sheet (described on P. 892 to 896).



[Example] PCC-A15, PCC-QA15

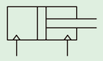
Pin Clamp Cylinder

Double Acting, Basic Type **PCC Series**

Double Acting, Fall Prevention Type **PCC-Q Series**

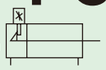
RoHS

Circuit Diagram Code



Double Acting, basic type

Circuit Diagram Code



Double Acting, Drop Prevention Type

Model No. Notation

Basic type, without switch (Built-in magnet for switch)

PCC — C1 5 R 177 D — 2 SP1

Basic type, with switch (Built-in magnet for switch)

PCC — C1 5 R 177 D - T2YD D - 2 SP1

With fall prevention, without switch (Built-in magnet for switch)

PCC-Q C1 5 R 177 D — 2 SP1

With fall prevention, with switch (Built-in magnet for switch)

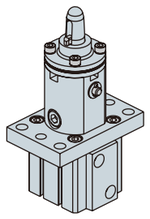
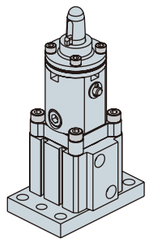
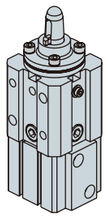
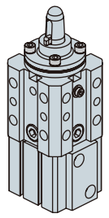
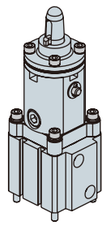
PCC-Q C1 5 R 177 D - T2YD D - 2 SP1

1 Model No. 2 Mounting Type 3 Clamp lever direction 4 Locating pin diameter 5 Locating pin shape 6 Switch Model 7 Number of Switches 8 Shim 9 Sputter countermeasures

1 Model No.

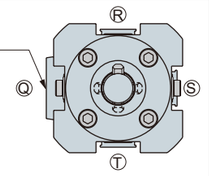
Code	Content
PCC	Basic type
PCC-Q	With Fall Prevention

2 Mounting Type

Code	A1	B1	C1	C2	D1 *1
Content	Top surface flange 	Bottom surface flange 	Side mounting (2 surfaces) 	Side mounting (2 surfaces) 	Bottom mounting 

*1: When selecting fall prevention type (Q), D1 (bottom mounting) cannot be selected.

3 Clamp lever direction

Code	Content
Q	Piping Port Position 
R	
S	
T	

4 Locating pin diameter

Code	Locating pin diameter	Applicable workpiece hole diameter	Code	Locating pin diameter	Applicable workpiece hole diameter
125	ø12.5	ø13	179	ø17.9	ø18
127	ø12.7		180	ø18.0	
128	ø12.8		195	ø19.5	ø20
129	ø12.9		197	ø19.7	
130	ø13.0		198	ø19.8	
145	ø14.5	ø15	199	ø19.9	
147	ø14.7		200	ø20.0	
148	ø14.8		245	ø24.5	ø25
149	ø14.9		247	ø24.7	
150	ø15.0		248	ø24.8	
155	ø15.5	ø16	249	ø24.9	
157	ø15.7		250	ø25.0	
158	ø15.8		295	ø29.5	ø30
159	ø15.9		297	ø29.7	
160	ø16.0		298	ø29.8	
175	ø17.5	ø18	299	ø29.9	
177	ø17.7		300	ø30.0	
178	ø17.8				

Note: Consult with us separately for other locating pin diameters.

5 Locating pin shape

Code	Content
Blank	Round pin
D	Diamond pin

6 Switch Model No.

For switch details, refer to P. 1457. Switches are shipped with the product.

Contact	Indicator LED Special Function	Wiring (Output)	Load Voltage (V) AC	Load Voltage (V) DC	Load Current (mA) AC	Load Current (mA) DC	Lead wire *1 Straight	Lead wire *1 L-shape	
Solid State	2-Color for AC Magnetic Field	2-wire	—	24 ± 10%	—	5 to 20	T2YD□	–	
			—		—		T2YDT□	–	
	For 2-color AC Magnetic Field Connector specifications		—		—		T2YDU	–	

*1: Insert the code selected in the "*Lead wire length" table into "□" of the switch model number.
*2: Consult with us separately regarding H type and V type magnetic field resistant switches.
*3: Switches other than the above models are also available. (Custom Product) For details, refer to P. 1457.

*** Lead wire length**

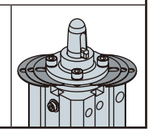
Code	Content
Blank	1 m (Standard)
3	3 m (Option)
5	5m (Option)

Example) Lead wire length
1 m T2YD
3 m T2YD3
5 m T2YD5

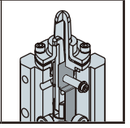
7 Number of Switches

Code	Content
R	With unclamp side switch
H	With clamp side switch
D	With switches on both sides

8 Shim

Code	Content	
0	Without shim	
2	With 2 mm shim	

9 Sputter countermeasures

Code	Content	
Blank	No sputter countermeasures	
SP1	With sputter cover	

Common Specifications

Item	PCC/PCC-Q
Bore Size mm	50
Operation type	Double Acting Type
Operating Fluid	Compressed Air
Max Operating Pressure MPa	0.5
Min Operating Pressure MPa	PCC: 0.2 PCC-Q: 0.25 (36 psi)
Proof Pressure MPa	1.0
Ambient Temperature °C	-10 to 60 (No freezing)
Port Size	Rc1/4
Operating Piston Speed mm/s	50 to 300
Cushion	None
Lubrication	Not Required

Theoretical clamping force

(Unit: N)

Pressure (MPa)	0.2	0.3	0.4	0.5
Clamping force (N)	329	494	659	824

Clamp part specifications

Item		PCC/PCC-Q	
Clamp stroke	mm	With shim	Without shim
		10 to 12	12
Escape stroke	mm	5	
Locating pin shape		Round Shape	Diamond type
Clamp lever		Single jaw	

Drop prevention (lock) part specifications

Item	PCC-Q
Drop prevention (lock) method	Circular slit method
Lock Direction	Lock during clamping (cylinder forward direction)
Locking Force N	943
Max Operating Pressure MPa	0.5
Min Operating Pressure MPa	0.25 (Note)
Port Size	Rc1/4
Lubrication	Not Required

Note: Depending on the non-operating conditions, it may operate from 0.05 MPa, so please be careful about residual pressure and exhaust pressure.

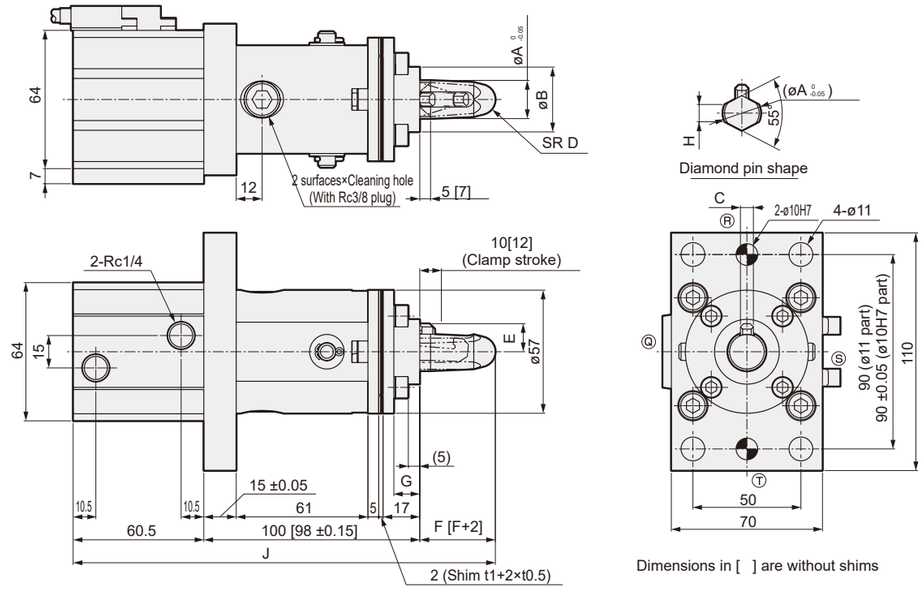
Cylinder Weight

(Unit: kg)

Model/Mounting Type	Standard Type					With Fall Prevention			
Locating pin diameter (mm)	A1	B1	C1	C2	D1	A1	B1	C1	C2
ø12.5 to ø13.0	1.8	2.0	2.0	2.0	1.7	2.2	2.4	2.4	2.4
ø14.5 to ø15.0	1.8	2.0	2.0	2.0	1.7	2.2	2.4	2.4	2.4
ø15.5 to ø16.0	1.8	2.0	2.0	2.0	1.7	2.2	2.4	2.4	2.4
ø17.5 to ø18.0	1.9	2.0	2.0	2.0	1.8	2.3	2.4	2.4	2.4
ø19.5 to ø20.0	1.9	2.1	2.0	2.0	1.8	2.3	2.5	2.4	2.4
ø24.5 to ø25.0	2.0	2.1	2.1	2.1	1.9	2.4	2.5	2.5	2.5
ø29.5 to ø30.0	2.1	2.2	2.2	2.2	2.0	2.5	2.6	2.6	2.6

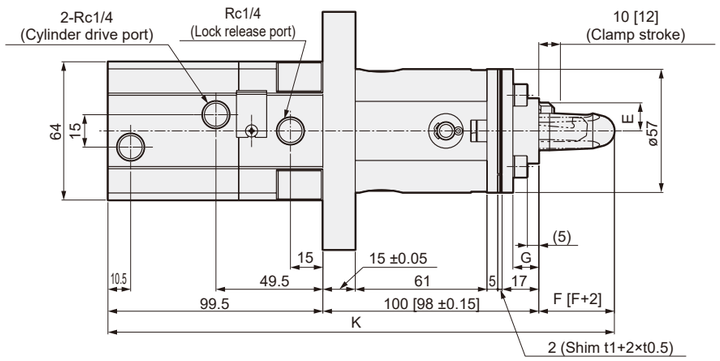
Dimensional Drawings

● Top flange (A1)
・PCC-A1



Dimensions in [ ] are without shims

● Top flange (QA1)
(with position locking)
・PCC-QA1

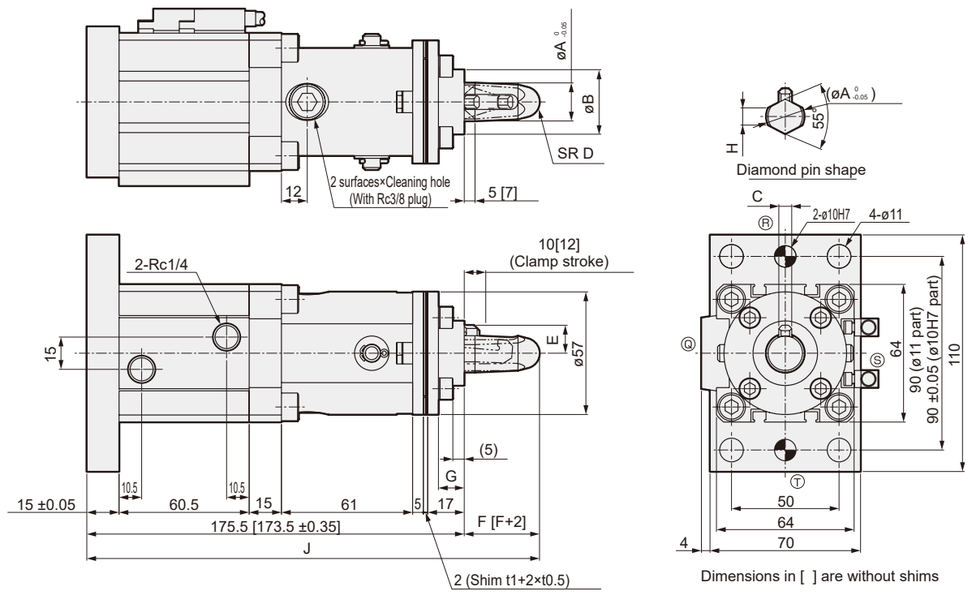


Code	Common Dimensions (mm)										Code	Common Dimensions (mm)									
Locating pin diameter (mm)	A	B	C	D	E	F	G	H	J	K	Locating pin diameter (mm)	A	B	C	D	E	F	G	H	J	K
ø12.5	12.5	30	4.5	5	9.5	30	12	6	190.5	229.5	ø17.9	17.9	30	6	7	13	35	12	8	195.5	234.5
ø12.7	12.7	30	4.5	5	9.5	30	12	6	190.5	229.5	ø18.0	18.0	30	6	7	13.5	35	12	8	195.5	234.5
ø12.8	12.8	30	4.5	5	9.5	30	12	6	190.5	229.5	ø19.5	19.5	30	6	8	14	35	12	10	195.5	234.5
ø12.9	12.9	30	4.5	5	9.5	30	12	6	190.5	229.5	ø19.7	19.7	30	6	8	14	35	12	10	195.5	234.5
ø13.0	13.0	30	4.5	5	10	30	12	7	190.5	229.5	ø19.8	19.8	30	6	8	14	35	12	10	195.5	234.5
ø14.5	14.5	30	6	5	11	30	12	7	190.5	229.5	ø19.9	19.9	30	6	8	14	35	12	10	195.5	234.5
ø14.7	14.7	30	6	5	11	30	12	7	190.5	229.5	ø20.0	20.0	30	6	8	14.5	35	12	10	195.5	234.5
ø14.8	14.8	30	6	5	11	30	12	7	190.5	229.5	ø24.5	24.5	40	6	9	16.5	35	11.5	12	195.5	234.5
ø14.9	14.9	30	6	5	11	30	12	7	190.5	229.5	ø24.7	24.7	40	6	9	16.5	35	11.5	12	195.5	234.5
ø15.0	15.0	30	6	6	11.5	30	12	7	190.5	229.5	ø24.8	24.8	40	6	9	16.5	35	11.5	12	195.5	234.5
ø15.5	15.5	30	6	6	11.5	30	12	7	190.5	229.5	ø24.9	24.9	40	6	9	16.5	35	11.5	12	195.5	234.5
ø15.7	15.7	30	6	6	11.5	30	12	7	190.5	229.5	ø25.0	25.0	40	6	9	17	35	11.5	12	195.5	234.5
ø15.8	15.8	30	6	6	11.5	30	12	7	190.5	229.5	ø29.5	29.5	40	6	12	19.5	35	11.5	14	195.5	234.5
ø15.9	15.9	30	6	6	11.5	30	12	7	190.5	229.5	ø29.7	29.7	40	6	12	19.5	35	11.5	14	195.5	234.5
ø16.0	16.0	30	6	6	12	30	12	7	190.5	229.5	ø29.8	29.8	40	6	12	19.5	35	11.5	14	195.5	234.5
ø17.5	17.5	30	6	7	13	35	12	8	195.5	234.5	ø29.9	29.9	40	6	12	19.5	35	11.5	14	195.5	234.5
ø17.7	17.7	30	6	7	13	35	12	8	195.5	234.5	ø30.0	30.0	40	6	12.5	20	35	11.5	15	195.5	234.5
ø17.8	17.8	30	6	7	13	35	12	8	195.5	234.5											

Note: For dimensions of models with switches, see P. 890 and 891.

Dimensional Drawings

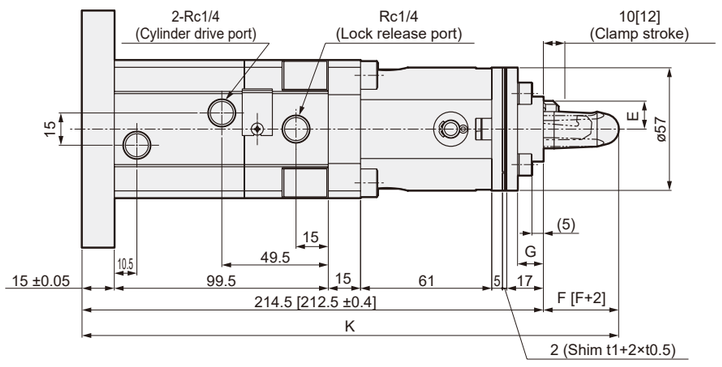
● Bottom flange (B1)
・PCC-B1



Diamond pin shape

Dimensions in [ ] are without shims

● Bottom flange (QB1)
(with position locking)
・PCC-QB1

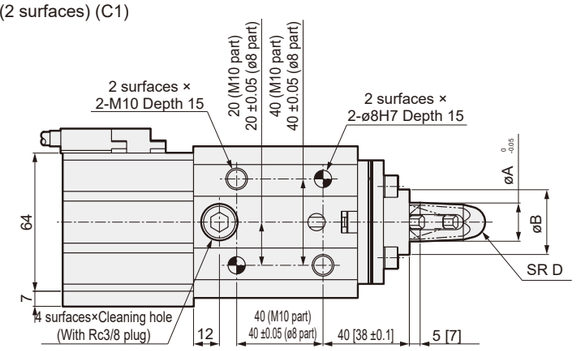


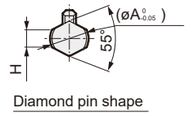
Code	Common Dimensions (mm)										Code	Common Dimensions (mm)									
Locating pin diameter (mm)	A	B	C	D	E	F	G	H	J	K	Locating pin diameter (mm)	A	B	C	D	E	F	G	H	J	K
ø12.5	12.5	30	4.5	5	9.5	30	12	6	205.5	244.5	ø17.9	17.9	30	6	7	13	35	12	8	210.5	249.5
ø12.7	12.7	30	4.5	5	9.5	30	12	6	205.5	244.5	ø18.0	18.0	30	6	7	13.5	35	12	8	210.5	249.5
ø12.8	12.8	30	4.5	5	9.5	30	12	6	205.5	244.5	ø19.5	19.5	30	6	8	14	35	12	10	210.5	249.5
ø12.9	12.9	30	4.5	5	9.5	30	12	6	205.5	244.5	ø19.7	19.7	30	6	8	14	35	12	10	210.5	249.5
ø13.0	13.0	30	4.5	5	10	30	12	7	205.5	244.5	ø19.8	19.8	30	6	8	14	35	12	10	210.5	249.5
ø14.5	14.5	30	6	5	11	30	12	7	205.5	244.5	ø19.9	19.9	30	6	8	14	35	12	10	210.5	249.5
ø14.7	14.7	30	6	5	11	30	12	7	205.5	244.5	ø20.0	20.0	30	6	8	14.5	35	12	10	210.5	249.5
ø14.8	14.8	30	6	5	11	30	12	7	205.5	244.5	ø24.5	24.5	40	6	9	16.5	35	11.5	12	210.5	249.5
ø14.9	14.9	30	6	6	11	30	12	7	205.5	244.5	ø24.7	24.7	40	6	9	16.5	35	11.5	12	210.5	249.5
ø15.0	15.0	30	6	6	11.5	30	12	7	205.5	244.5	ø24.8	24.8	40	6	9	16.5	35	11.5	12	210.5	249.5
ø15.5	15.5	30	6	6	11.5	30	12	7	205.5	244.5	ø24.9	24.9	40	6	9	16.5	35	11.5	12	210.5	249.5
ø15.7	15.7	30	6	6	11.5	30	12	7	205.5	244.5	ø25.0	25.0	40	6	9	17	35	11.5	12	210.5	249.5
ø15.8	15.8	30	6	6	11.5	30	12	7	205.5	244.5	ø29.5	29.5	40	6	12	19.5	35	11.5	14	210.5	249.5
ø15.9	15.9	30	6	6	11.5	30	12	7	205.5	244.5	ø29.7	29.7	40	6	12	19.5	35	11.5	14	210.5	249.5
ø16.0	16.0	30	6	6	12	30	12	7	205.5	244.5	ø29.8	29.8	40	6	12	19.5	35	11.5	14	210.5	249.5
ø17.5	17.5	30	6	7	13	35	12	8	210.5	249.5	ø29.9	29.9	40	6	12	19.5	35	11.5	14	210.5	249.5
ø17.7	17.7	30	6	7	13	35	12	8	210.5	249.5	ø30.0	30.0	40	6	12.5	20	35	11.5	15	210.5	249.5
ø17.8	17.8	30	6	7	13	35	12	8	210.5	249.5											

Note: For dimensions of models with switches, see P. 890, 891.

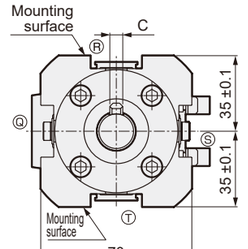
Dimensional Drawings

● Side mounting (2 surfaces) (C1)
・PCC-C1



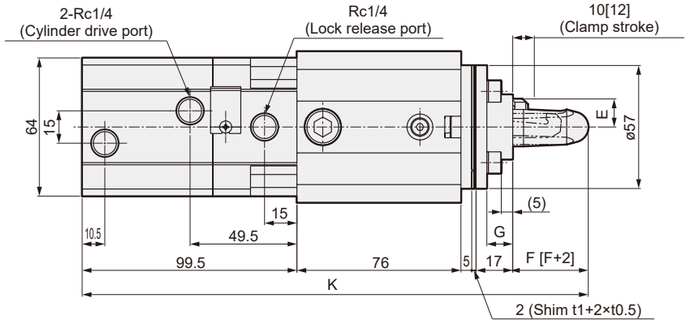


Diamond pin shape



Dimensions in [ ] are without shims

● Side mounting (2 surfaces)
(C1)
(with position locking)
・PCC-QC1

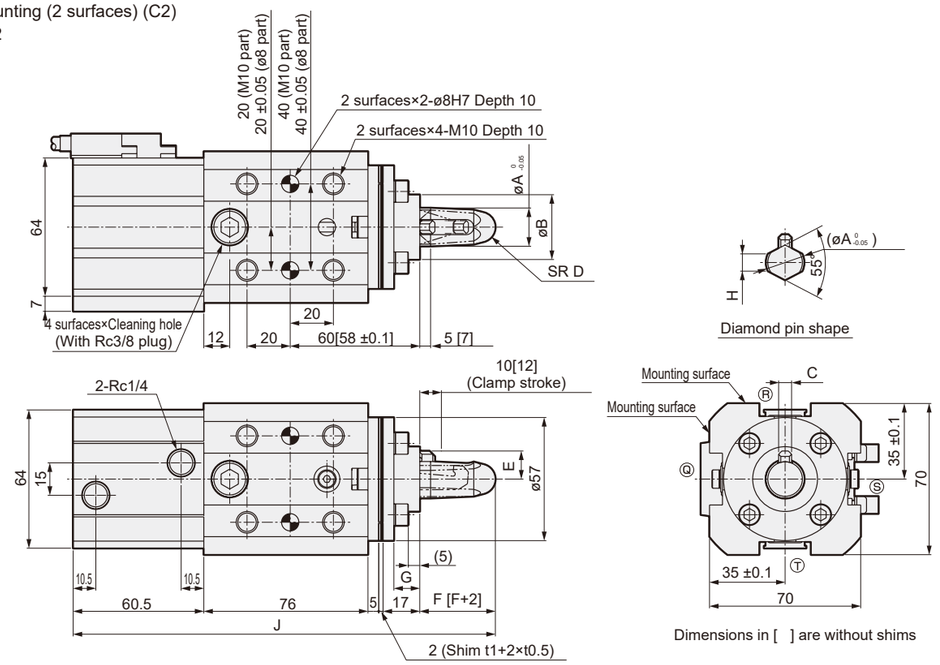


Code	Common Dimensions (mm)										Code	Common Dimensions (mm)									
Locating pin diameter (mm)	A	B	C	D	E	F	G	H	J	K	Locating pin diameter (mm)	A	B	C	D	E	F	G	H	J	K
ø12.5	12.5	30	4.5	5	9.5	30	12	6	190.5	229.5	ø17.9	17.9	30	6	7	13	35	12	8	195.5	234.5
ø12.7	12.7	30	4.5	5	9.5	30	12	6	190.5	229.5	ø18.0	18.0	30	6	7	13.5	35	12	8	195.5	234.5
ø12.8	12.8	30	4.5	5	9.5	30	12	6	190.5	229.5	ø19.5	19.5	30	6	8	14	35	12	10	195.5	234.5
ø12.9	12.9	30	4.5	5	9.5	30	12	6	190.5	229.5	ø19.7	19.7	30	6	8	14	35	12	10	195.5	234.5
ø13.0	13.0	30	4.5	5	10	30	12	7	190.5	229.5	ø19.8	19.8	30	6	8	14	35	12	10	195.5	234.5
ø14.5	14.5	30	6	5	11	30	12	7	190.5	229.5	ø19.9	19.9	30	6	8	14	35	12	10	195.5	234.5
ø14.7	14.7	30	6	5	11	30	12	7	190.5	229.5	ø20.0	20.0	30	6	8	14.5	35	12	10	195.5	234.5
ø14.8	14.8	30	6	5	11	30	12	7	190.5	229.5	ø24.5	24.5	40	6	9	16.5	35	11.5	12	195.5	234.5
ø14.9	14.9	30	6	5	11	30	12	7	190.5	229.5	ø24.7	24.7	40	6	9	16.5	35	11.5	12	195.5	234.5
ø15.0	15.0	30	6	6	11.5	30	12	7	190.5	229.5	ø24.8	24.8	40	6	9	16.5	35	11.5	12	195.5	234.5
ø15.5	15.5	30	6	6	11.5	30	12	7	190.5	229.5	ø24.9	24.9	40	6	9	16.5	35	11.5	12	195.5	234.5
ø15.7	15.7	30	6	6	11.5	30	12	7	190.5	229.5	ø25.0	25.0	40	6	9	17	35	11.5	12	195.5	234.5
ø15.8	15.8	30	6	6	11.5	30	12	7	190.5	229.5	ø29.5	29.5	40	6	12	19.5	35	11.5	14	195.5	234.5
ø15.9	15.9	30	6	6	11.5	30	12	7	190.5	229.5	ø29.7	29.7	40	6	12	19.5	35	11.5	14	195.5	234.5
ø16.0	16.0	30	6	6	12	30	12	7	190.5	229.5	ø29.8	29.8	40	6	12	19.5	35	11.5	14	195.5	234.5
ø17.5	17.5	30	6	7	13	35	12	8	195.5	234.5	ø29.9	29.9	40	6	12	19.5	35	11.5	14	195.5	234.5
ø17.7	17.7	30	6	7	13	35	12	8	195.5	234.5	ø30.0	30.0	40	6	12.5	20	35	11.5	15	195.5	234.5
ø17.8	17.8	30	6	7	13	35	12	8	195.5	234.5											

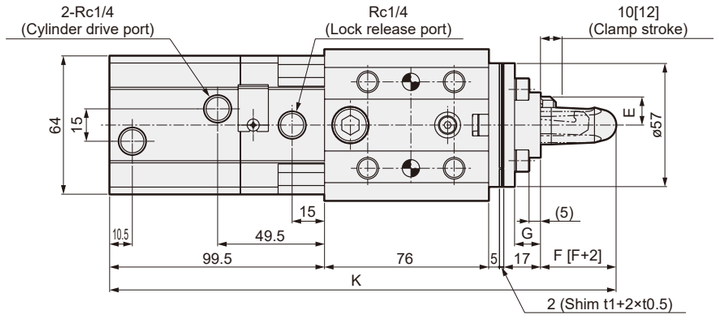
Note: For dimensions of models with switches, see P. 890 and 891.

Dimensional Drawings

● Side mounting (2 surfaces) (C2)
・PCC-C2



● Side mounting (2 surfaces) (C2)
(with position locking)
・PCC-QC2



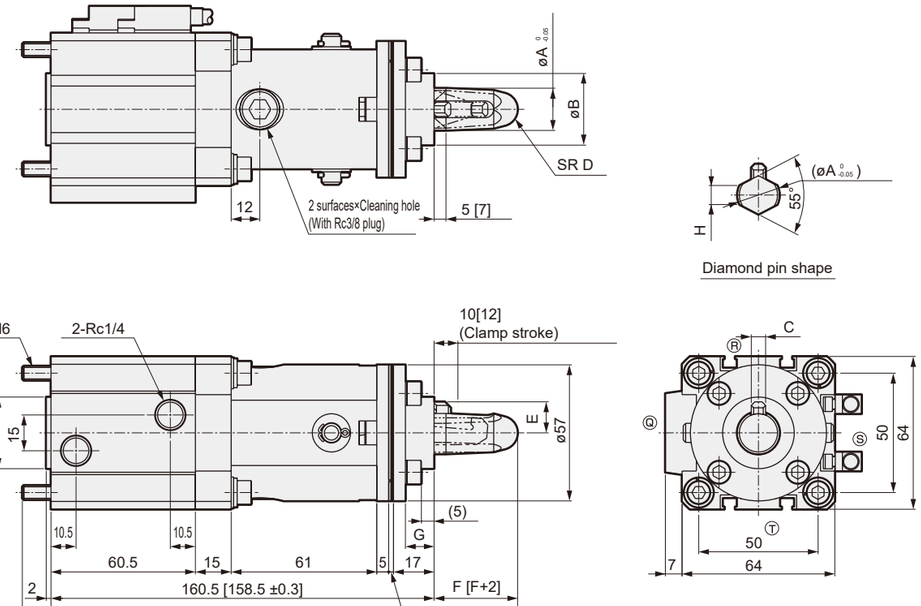
Code	Common Dimensions (mm)									
Locating pin diameter (mm)	A	B	C	D	E	F	G	H	J	K
ø12.5	12.5	30	4.5	5	9.5	30	12	6	190.5	229.5
ø12.7	12.7	30	4.5	5	9.5	30	12	6	190.5	229.5
ø12.8	12.8	30	4.5	5	9.5	30	12	6	190.5	229.5
ø12.9	12.9	30	4.5	5	9.5	30	12	6	190.5	229.5
ø13.0	13.0	30	4.5	5	10	30	12	7	190.5	229.5
ø14.5	14.5	30	6	5	11	30	12	7	190.5	229.5
ø14.7	14.7	30	6	5	11	30	12	7	190.5	229.5
ø14.8	14.8	30	6	5	11	30	12	7	190.5	229.5
ø14.9	14.9	30	6	5	11	30	12	7	190.5	229.5
ø15.0	15.0	30	6	6	11.5	30	12	7	190.5	229.5
ø15.5	15.5	30	6	6	11.5	30	12	7	190.5	229.5
ø15.7	15.7	30	6	6	11.5	30	12	7	190.5	229.5
ø15.8	15.8	30	6	6	11.5	30	12	7	190.5	229.5
ø15.9	15.9	30	6	6	11.5	30	12	7	190.5	229.5
ø16.0	16.0	30	6	6	12	30	12	7	190.5	229.5
ø17.5	17.5	30	6	7	13	35	12	8	195.5	234.5
ø17.7	17.7	30	6	7	13	35	12	8	195.5	234.5
ø17.8	17.8	30	6	7	13	35	12	8	195.5	234.5

Code	Common Dimensions (mm)									
Locating pin diameter (mm)	A	B	C	D	E	F	G	H	J	K
ø17.9	17.9	30	6	7	13	35	12	8	195.5	234.5
ø18.0	18.0	30	6	7	13.5	35	12	8	195.5	234.5
ø19.5	19.5	30	6	8	14	35	12	10	195.5	234.5
ø19.7	19.7	30	6	8	14	35	12	10	195.5	234.5
ø19.8	19.8	30	6	8	14	35	12	10	195.5	234.5
ø19.9	19.9	30	6	8	14	35	12	10	195.5	234.5
ø20.0	20.0	30	6	8	14.5	35	12	10	195.5	234.5
ø24.5	24.5	40	6	9	16.5	35	11.5	12	195.5	234.5
ø24.7	24.7	40	6	9	16.5	35	11.5	12	195.5	234.5
ø24.8	24.8	40	6	9	16.5	35	11.5	12	195.5	234.5
ø24.9	24.9	40	6	9	16.5	35	11.5	12	195.5	234.5
ø25.0	25.0	40	6	9	17	35	11.5	12	195.5	234.5
ø29.5	29.5	40	6	12	19.5	35	11.5	14	195.5	234.5
ø29.7	29.7	40	6	12	19.5	35	11.5	14	195.5	234.5
ø29.8	29.8	40	6	12	19.5	35	11.5	14	195.5	234.5
ø29.9	29.9	40	6	12	19.5	35	11.5	14	195.5	234.5
ø30.0	30.0	40	6	12.5	20	35	11.5	15	195.5	234.5

Note: For dimensions of models with switches, see P. 890 and 891.

Dimensional Drawings

● Bottom mounting (D1)
・PCC-D1

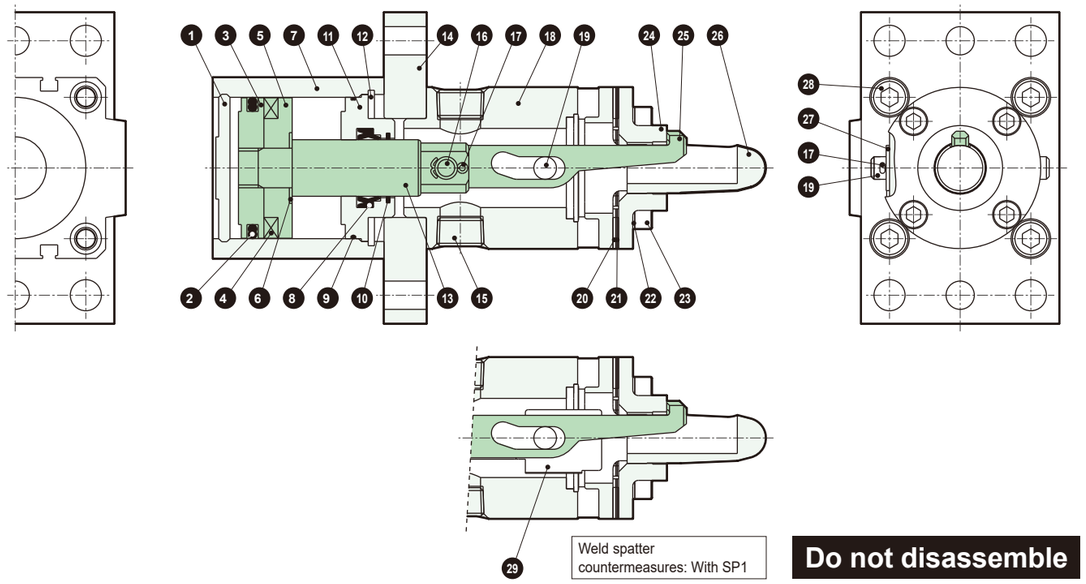


Code	Common Dimensions (mm)								
Locating pin diameter (mm)	A	B	C	D	E	F	G	H	J
ø12.5	12.5	30	4.5	5	9.5	30	12	6	190.5
ø12.7	12.7	30	4.5	5	9.5	30	12	6	190.5
ø12.8	12.8	30	4.5	5	9.5	30	12	6	190.5
ø12.9	12.9	30	4.5	5	9.5	30	12	6	190.5
ø13.0	13.0	30	4.5	5	10	30	12	7	190.5
ø14.5	14.5	30	6	5	11	30	12	7	190.5
ø14.7	14.7	30	6	5	11	30	12	7	190.5
ø14.8	14.8	30	6	5	11	30	12	7	190.5
ø14.9	14.9	30	6	5	11	30	12	7	190.5
ø15.0	15.0	30	6	6	11.5	30	12	7	190.5
ø15.5	15.5	30	6	6	11.5	30	12	7	190.5
ø15.7	15.7	30	6	6	11.5	30	12	7	190.5
ø15.8	15.8	30	6	6	11.5	30	12	7	190.5
ø15.9	15.9	30	6	6	11.5	30	12	7	190.5
ø16.0	16.0	30	6	6	12	30	12	7	190.5
ø17.5	17.5	30	6	7	13	35	12	8	195.5
ø17.7	17.7	30	6	7	13	35	12	8	195.5
ø17.8	17.8	30	6	7	13	35	12	8	195.5

Code	Common Dimensions (mm)								
Locating pin diameter (mm)	A	B	C	D	E	F	G	H	J
ø17.9	17.9	30	6	7	13	35	12	8	195.5
ø18.0	18.0	30	6	7	13.5	35	12	8	195.5
ø19.5	19.5	30	6	8	14	35	12	10	195.5
ø19.7	19.7	30	6	8	14	35	12	10	195.5
ø19.8	19.8	30	6	8	14	35	12	10	195.5
ø19.9	19.9	30	6	8	14	35	12	10	195.5
ø20.0	20.0	30	6	8	14.5	35	12	10	195.5
ø24.5	24.5	40	6	9	16.5	35	11.5	12	195.5
ø24.7	24.7	40	6	9	16.5	35	11.5	12	195.5
ø24.8	24.8	40	6	9	16.5	35	11.5	12	195.5
ø24.9	24.9	40	6	9	16.5	35	11.5	12	195.5
ø25.0	25.0	40	6	9	17	35	11.5	12	195.5
ø29.5	29.5	40	6	12	19.5	35	11.5	14	195.5
ø29.7	29.7	40	6	12	19.5	35	11.5	14	195.5
ø29.8	29.8	40	6	12	19.5	35	11.5	14	195.5
ø29.9	29.9	40	6	12	19.5	35	11.5	14	195.5
ø30.0	30.0	40	6	12.5	20	35	11.5	15	195.5

Note: For dimensions of models with switches, see P. 890 and 891.

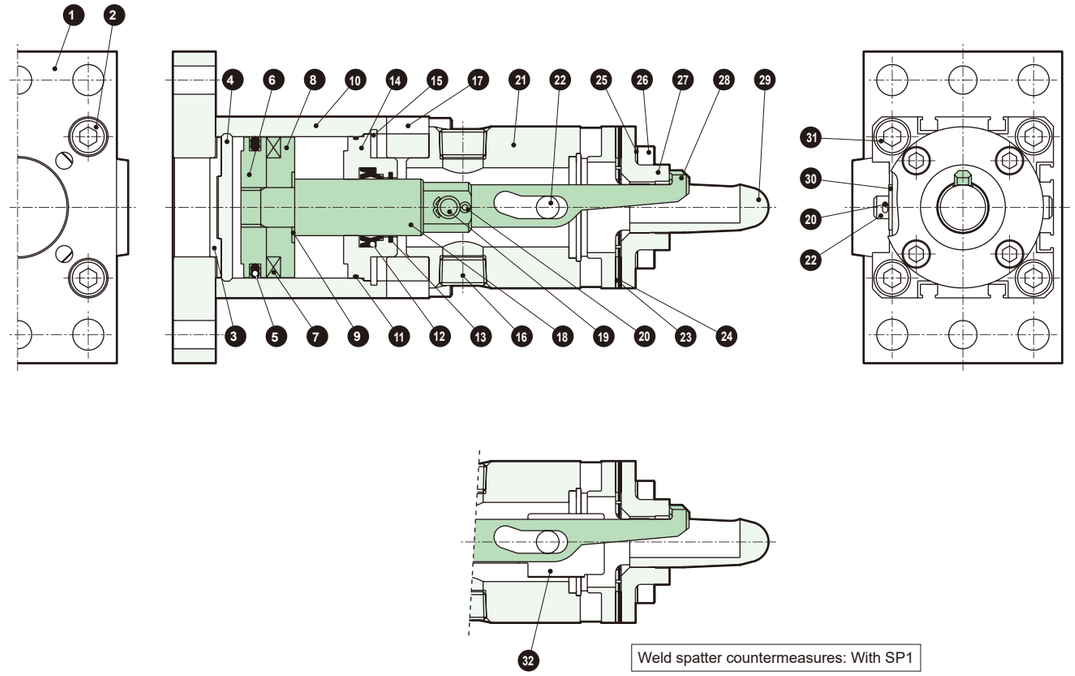
Internal Structure Diagram/Material (PCC-A1)



Do not disassemble

Part No.	Part Name	Material	Part No.	Part Name	Material
1	Cover	Aluminum Alloy	16	Hinge pin (2)	Steel
2	Piston Packing	Nitrile Rubber	17	Split Pin	Steel
3	Piston	Aluminum Alloy	18	Guide	Aluminum Alloy
4	Piston magnet	Plastic	19	Hinge pin (1)	Steel
5	Spacer	Special resin	20	Shim 1	Stainless Steel
6	Spacer washer	Stainless Steel	21	Shim 0.5	Stainless Steel
7	Cylinder Body	Aluminum Alloy	22	Belleville washer	Steel
8	Rod Packing	Nitrile Rubber	23	Hexagon Socket Head Cap Screw	Steel
9	Rod metal gasket	Nitrile Rubber	24	Spacer	Steel
10	Coil Scraper	Phosphor bronze	25	Clamp lever	Steel
11	Rod Metal	Aluminum Alloy	26	Locating pin	Steel
12	C-type Retaining Ring	Steel	27	Plain Washer	Steel
13	Piston Rod	Steel	28	Hexagon Socket Head Cap Screw	Steel
14	Flange	Aluminum Alloy	29	Sputter cover	Copper Alloy
15	Plug	Steel			

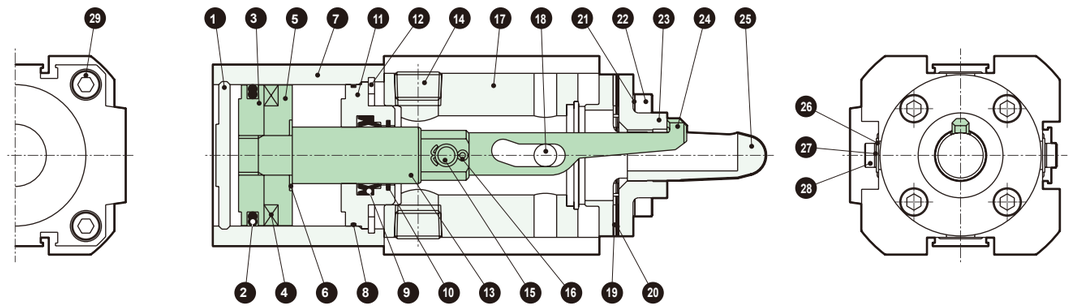
Internal Structure Diagram/Material (PCC-B1)

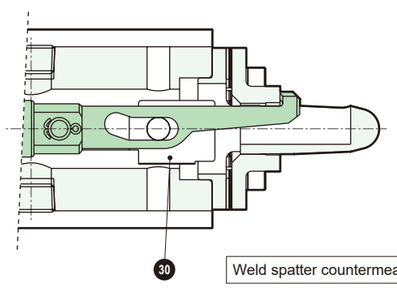


Do not disassemble

Part No.	Part Name	Material	Part No.	Part Name	Material
1	Flange	Aluminum Alloy	17	Color	Aluminum Alloy
2	Hexagon Socket Head Cap Screw	Steel	18	Piston Rod	Steel
3	Spigot joint ring	Aluminum Alloy	19	Hinge pin (2)	Steel
4	Cover	Aluminum Alloy	20	Split Pin	Steel
5	Piston Packing	Nitrile Rubber	21	Guide	Aluminum Alloy
6	Piston	Aluminum Alloy	22	Hinge pin (1)	Steel
7	Piston magnet	Plastic	23	Shim 1	Stainless Steel
8	Spacer	Special resin	24	Shim 0.5	Stainless Steel
9	Spacer washer	Stainless Steel	25	Belleville washer	Steel
10	Cylinder Body	Aluminum Alloy	26	Hexagon Socket Head Cap Screw	Steel
11	Rod metal gasket	Nitrile Rubber	27	Spacer	Steel
12	Rod Packing	Nitrile Rubber	28	Clamp lever	Steel
13	Coil Scraper	Phosphor bronze	29	Locating pin	Steel
14	Rod Metal	Aluminum Alloy	30	Plain Washer	Steel
15	C-type Retaining Ring	Steel	31	Hexagon Socket Head Cap Screw	Steel
16	Plug	Steel	32	Sputter cover	Copper Alloy

Internal Structure Diagram/Material (PCC-C1, PCC-C2)



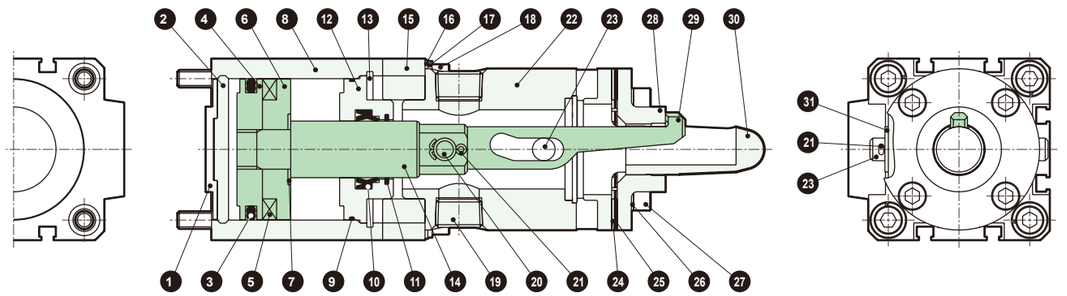


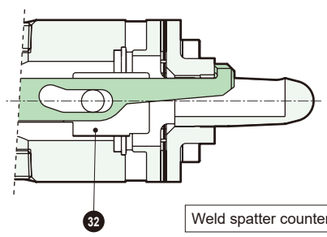
Weld spatter countermeasures: With SP1

Do not disassemble

Part No.	Part Name	Material	Part No.	Part Name	Material
1	Cover	Aluminum Alloy	16	Split Pin	Steel
2	Piston Packing	Nitrile Rubber	17	Guide	Aluminum Alloy
3	Piston	Aluminum Alloy	18	Hinge pin (1)	Steel
4	Piston magnet	Plastic magnet	19	Shim 1	Stainless Steel
5	Spacer	Special resin	20	Shim 0.5	Stainless Steel
6	Spacer washer	Stainless Steel	21	Belleville washer	Steel
7	Cylinder Body	Aluminum Alloy	22	Hexagon Socket Head Cap Screw	Steel
8	Rod metal gasket	Nitrile Rubber	23	Spacer	Steel
9	Rod Packing	Nitrile Rubber	24	Clamp lever	Steel
10	Coil Scraper	Phosphor bronze	25	Locating pin	Steel
11	Rod Metal	Aluminum Alloy	26	Plain Washer	Steel
12	C-type Retaining Ring	Steel	27	Belleville washer	Steel
13	Piston Rod	Steel	28	Hexagon Socket Head Cap Screw	Steel
14	Plug	Steel	29	Hexagon Socket Head Cap Screw	Steel
15	Hinge pin (2)	Steel	30	Sputter cover	Copper Alloy

Internal Structure Diagram/Material (PCC-D1)





Weld spatter countermeasures: With SP1

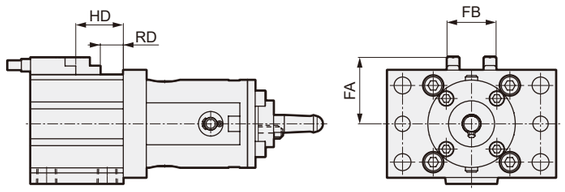
Do not disassemble

Part No.	Part Name	Material	Part No.	Part Name	Material
1	Spigot joint ring	Aluminum Alloy	17	Spring washer	Steel
2	Cover	Aluminum Alloy	18	Hexagon Socket Head Cap Screw	Steel
3	Piston Packing	Nitrile Rubber	19	Plug	Steel
4	Piston	Aluminum Alloy	20	Hinge pin (2)	Steel
5	Piston magnet	Plastic	21	Split Pin	Steel
6	Spacer	Special resin	22	Guide	Aluminum Alloy
7	Spacer washer	Stainless Steel	23	Hinge pin (1)	Steel
8	Cylinder Body	Aluminum Alloy	24	Shim 1	Stainless Steel
9	Rod metal gasket	Nitrile Rubber	25	Shim 0.5	Stainless Steel
10	Rod Packing	Nitrile Rubber	26	Belleville washer	Steel
11	Coil Scraper	Phosphor bronze	27	Hexagon Socket Head Cap Screw	Steel
12	Rod Metal	Aluminum Alloy	28	Spacer	Steel
13	C-type Retaining Ring	Steel	29	Clamp lever	Steel
14	Piston Rod	Steel	30	Locating pin	Steel
15	Color	Aluminum Alloy	31	Plain Washer	Steel
16	Plain Washer	Steel	32	Sputter cover	Copper Alloy

PCC Series External Dimensions Diagram with Switch

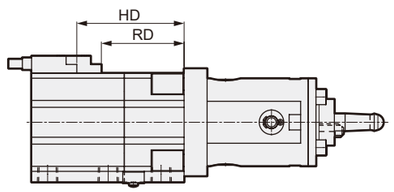
● T2YD, T2YDT, T2YDTU

• PCC-A1



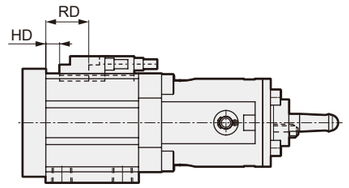
T2YD, T2YDT, T2YDTU			
FA	FB	RD	HD
43.3	32	12.5	30.5

• PCC-QA1



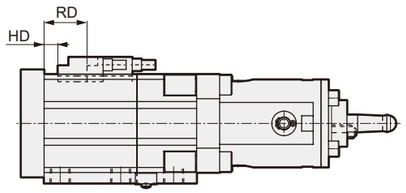
T2YD, T2YDT, T2YDTU			
FA	FB	RD	HD
43.3	32	51.5	69.5

• PCC-B1



T2YD, T2YDT, T2YDTU			
FA	FB	RD	HD
43.3	32	27.5	8.5

• PCC-QB1

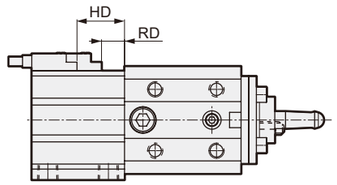


T2YD, T2YDT, T2YDTU			
FA	FB	RD	HD
43.3	32	27.5	8.5

Note: Switch position indicates the position at full stroke. The switch position during clamping changes depending on the workpiece thickness, so please adjust it according to the workpiece.

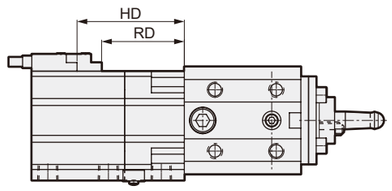
PCC Series External Dimensions Diagram with Switch

• PCC-C1/C2



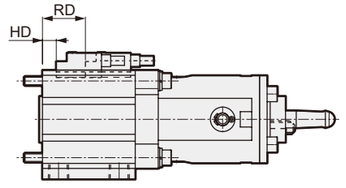
T2YD, T2YDT, T2YDTU			
FA	FB	RD	HD
43.3	32	12.5	30.5

• PCC-QC1/QC2



T2YD, T2YDT, T2YDTU			
FA	FB	RD	HD
43.3	32	51.5	69.5

• PCC-D1



T2YD, T2YDT, T2YDTU			
FA	FB	RD	HD
43.3	32	27.5	8.5

Note: Switch position indicates the position at full stroke. The switch position during clamping changes depending on the workpiece thickness, so please adjust it according to the workpiece.

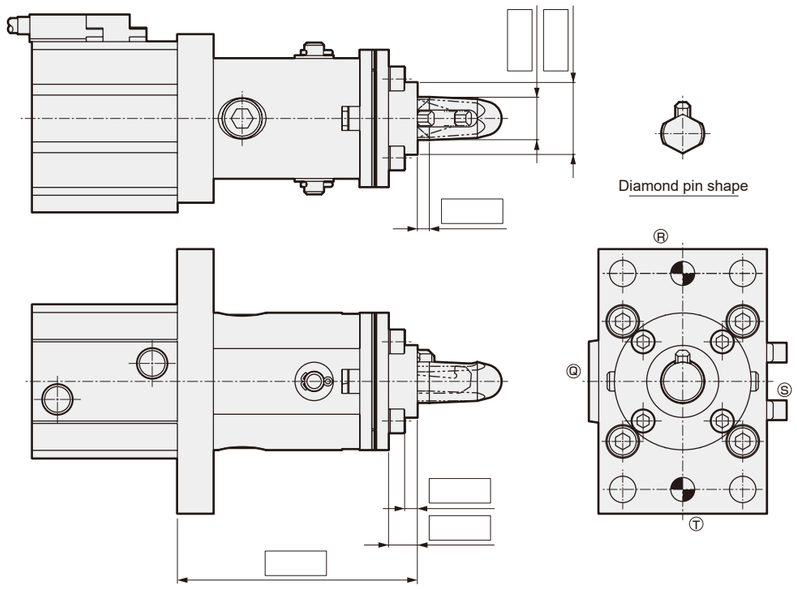
PCC-A1 Special Order Product Specification Sheet (Please copy and use)

1. Basic model number

PCC-A15 □ □ □ - □ □ - □ □ **...Basic type**

PCC-QA15 □ □ □ - □ □ - □ □ **...Drop prevention type**

2. Dimension designation area (Please fill in the blanks where necessary)



3. Other special notes

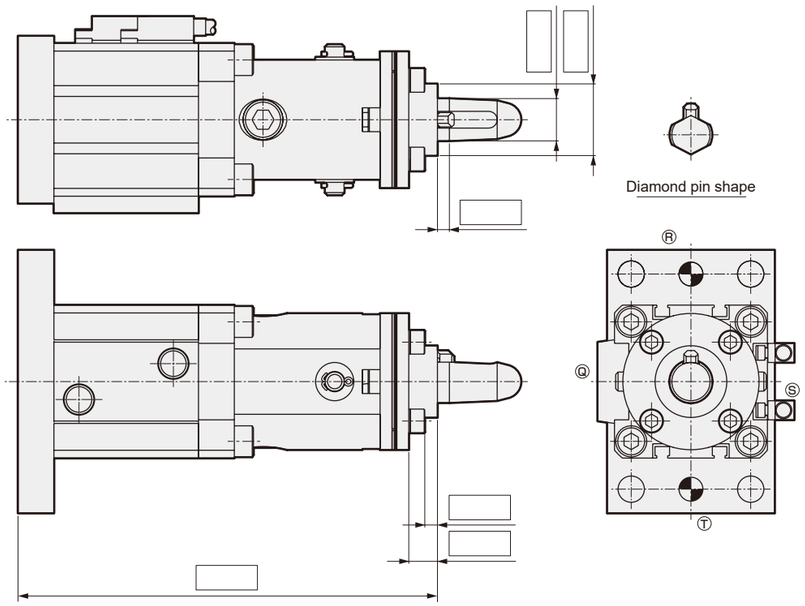
PCC-B1 Special Order Product Specification Sheet (Please copy and use)

1. Basic model number

PCC-B15 □ □ □ - □ □ - □ □ **...Basic type**

PCC-QB15 □ □ □ - □ □ - □ □ **...Drop prevention type**

2. Dimension designation area (Please fill in the blanks where necessary)



3. Other special notes

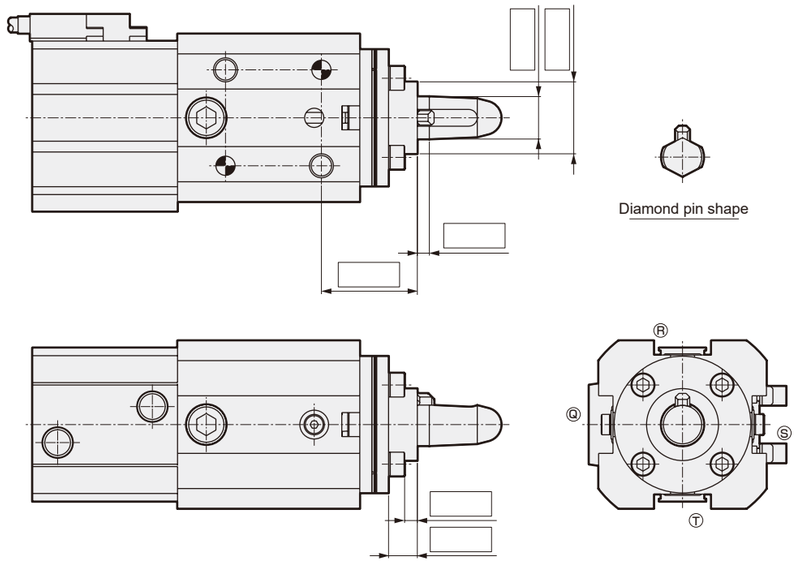
PCC-C1 Special Order Product Specification Sheet (Please copy and use)

1. Basic model number

PCC-C15 □ □ □ - □ - □ □ **...Basic type**

PCC-QC15 □ □ □ - □ - □ □ **...Drop prevention type**

2. Dimension designation area (Please fill in the blanks where necessary)



3. Other special notes

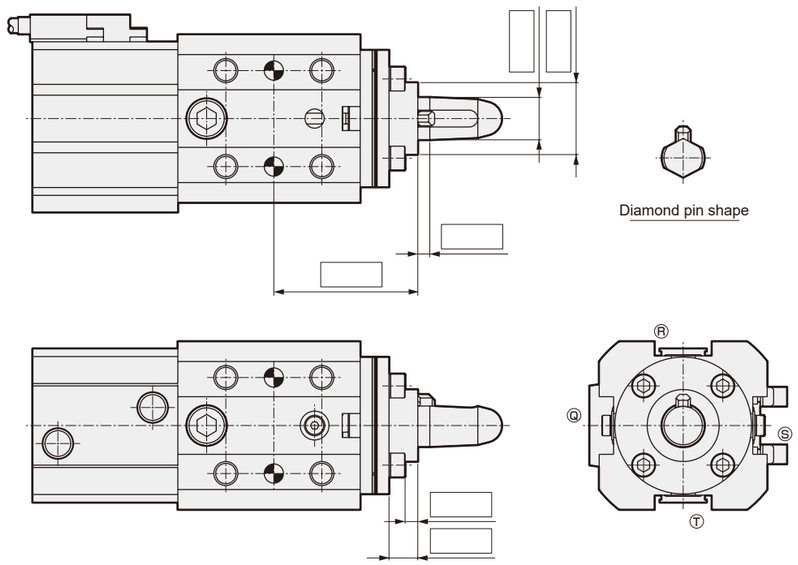
PCC-C2 Special Order Product Specification Sheet (Please copy and use)

1. Basic model number

PCC-C25 □ □ □ - □ - □ □ **...Basic type**

PCC-QC25 □ □ □ - □ - □ □ **...Drop prevention type**

2. Dimension designation area (Please fill in the blanks where necessary)



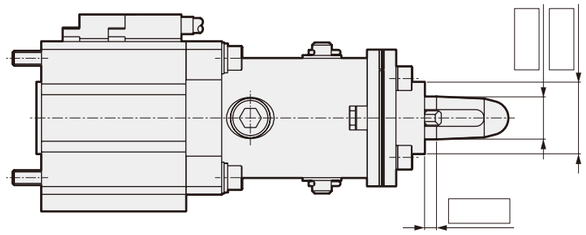
3. Other special notes

PCC-D1 Special Order Product Specification Sheet (Please copy and use)

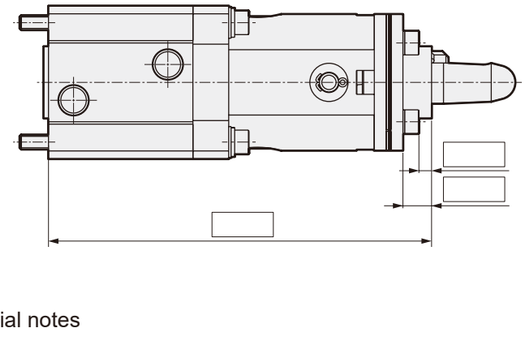
1. Basic model number

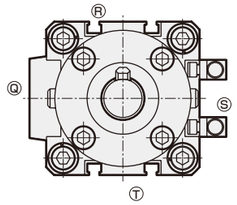
PCC-D15 □ □ □ - □ □ - □ □ ...Basic type

2. Dimension designation area (Please fill in the blanks where necessary)



Diamond pin shape





3. Other special notes

MEMO

Clamping
CAC4
UCAC2
CAC-N
UCAC-N
RCS2
RCC2
PCC
Cylinder Switch
Ending

To Use This Product Safely

Be sure to read this before use. For general cylinder information, see Intro 41, and for cylinder switches, see P. 1512.

Individual Precautions: Pin clamp cylinder PCC Series

Design / Selection

1. Common

Warning

■ This cylinder has been designed to simultaneously perform positioning and clamping of the workpiece. Do not use it for other applications, as this may cause accidents, damage to the cylinder, etc.

■ If fingers may be caught in the clamp lever, install a protective cover, etc.

■ When the circuit pressure drops due to power outage or problems in the air source, the clamping force drops, which may cause the workpiece to fall out depending on the mounting orientation of the product. Use a cylinder with fall prevention or take measures on the equipment side to prevent injury or damage to humans or machinery.

■ When mounting this cylinder to a transport robot or the like, it may not be possible to maintain clamping force due to the weight of the workpiece to be transported, inertial force during transportation, etc. Sufficiently consider the weight of the workpiece to be transferred and the inertial force of the workpiece during transfer, and take measures to prevent workpiece scattering as necessary.

2. Drop prevention type PCC-Q

Warning

■ This cylinder is equipped with position locking mechanism (for holding clamping position). When used in emergency or emergency stops (while in operation), the service life can be reduced significantly.

■ If back pressure is applied to the locking mechanism, the lock may be released. Use an individual exhaust Discrete or manifold for the valve.

■ When unlocking, make sure to supply pressure to the clamp (rod) side port, and before unlocking, check that load is not applied to the lock mechanism.

■ Due to the structure, the clamp lever moves by about 1 mm when the lock is applied.

CAUTION

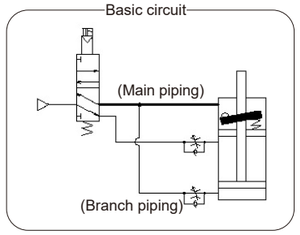
■ Set the clamping of the workpiece within the clamp stroke range.

■ When using this product in the welding process, be sure to ground to avoid current leading to the product.

■ Arrange the air piping of this cylinder (position locking) as shown in the figure below. If piping differently from the diagram below, such as piping to the fall prevention part as a single unit, it may cause a malfunctions such as response delays.

· Be sure to branch the piping for this cylinder after the valve as shown in the figure below, and pipe to the drop prevention unit (main piping) and the cylinder unit (branch piping).

· If the cylinder operation is faster than the unlocking, there is a risk that the lock will not release or the Piston Rod will jump out even if released, so design the piping so that the unlocking is faster than the cylinder operation.



During Use

1. Drop prevention type PCC-Q

Warning

■ Do not lubricate the lock, as this may cause the holding force to decrease.

■ Do not disassemble the lock, as doing so may be dangerous.

■ Always use the product with the dust cover on, except for when performing manual release, in order to prevent failure or malfunction.

CAUTION

■ Remove spatter from the product upon removing the plug (R3, 8) of the product side cleaning hole. When working, do not scratch or dent the Piston Rod sliding part.

■ Locating pin and clamp lever are consumable parts. If the locating pin or clamp lever is used in a worn state, etc., the workpiece position may shift during clamping, or clamping may not be possible normally.

■ When locking the first time after leaving the lock released for long periods, a delayed response may occur in the lock. Do not leave the lock part pressurized; operate the lock part with each cylinder operation.

■ If no air pressure is supplied in vertical downward mounting, etc., holding force may not be sufficient when the lock is manually released. This may cause the clamp to release and the workpiece to fall from its own weight.

Special cylinder

Listed Page

Compact Cylinder with Vacuum Suction
MVC Series 903

Stopper Cylinder
STK Series 919

Mechanical Power Cylinder
MCP Series 991

Guideless Cylinder
GLC Series 1013

Balancer Unit
BBS Series 1033

New Handling System
NHS Series 1071

Hybrid Robot
HR Series 1117

Cylinder/Gripper with Linear Norm
LN Series 1135

Special

MVC

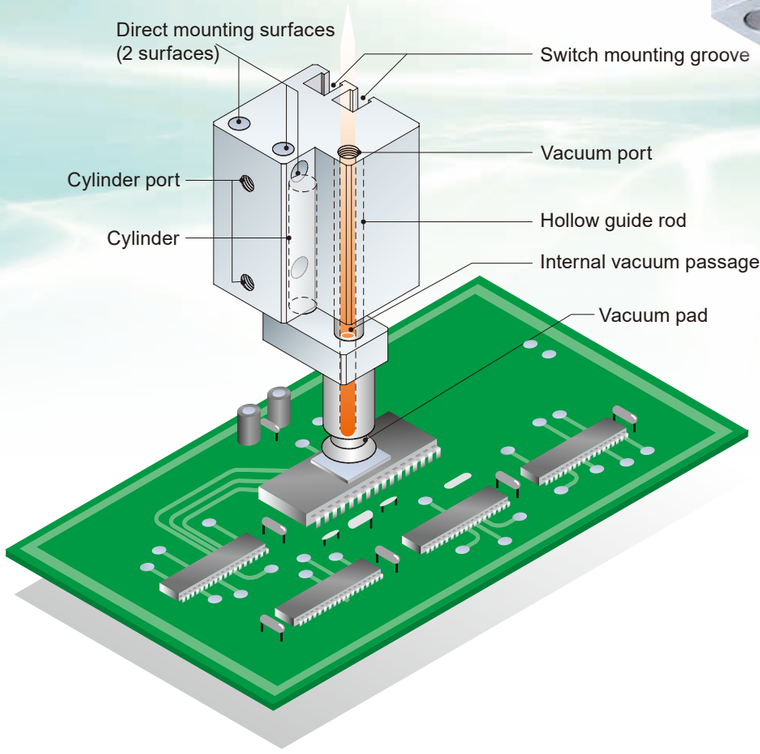
Compact Cylinder with Vacuum Suction

ø6, ø10

CONTENTS

Product Introduction	904
Series variation	906
● Double Acting / Single Rod Type	908
External Dimensions Diagram with Switch	915
Technical Data	916
⚠ Precautions for Use	917

Cylinder and vacuum suction pad are compactly integrated. Ideal for suction conveyance of electronic parts and precision parts.



No pulling of piping

Since the vacuum port is on the Cylinder Body, there is no pulling of the tube even when the cylinder operates.

Man-hour reduction

Cylinder, suction pad, non-rotating mechanism, and buffer (option) integrated. Significantly reduces the number of purchased parts and assembly man-hours.

Space-saving design

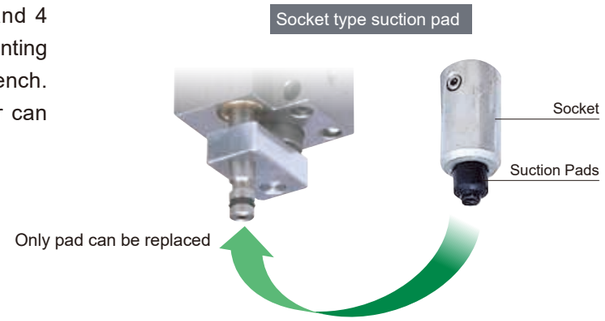
Cylinder and guide rod integrated. Significant space saving has been achieved because the vacuum flow path is inside the hollow structure guide rod.

High-precision non-rotating mechanism

Equipped with a guide rod for non-rotation, preventing workpiece rotation with excellent non-rotation accuracy.

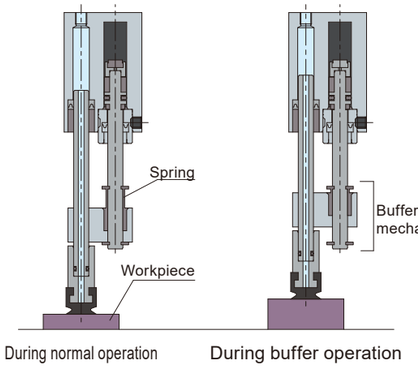
Wide selection of suction pads

Selectable from pad diameters ø2 to ø10 and 4 types of materials. It is a socket type, and mounting to the rod is easy with a single hexagon wrench. Nozzles, etc. manufactured by the customer can also be easily included.



Selectable with buffer

Buffer function is also compactly integrated. (When buffer option is selected) Absorbs impact during suction and protects delicate workpieces.

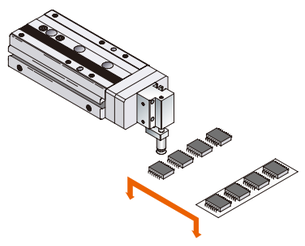


Variation

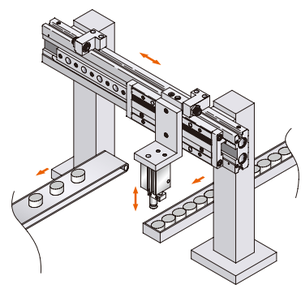
Bore Size	Stroke (mm)	Pad Diameter	Pad type
ø6	5	ø2	Nitrile Rubber
ø10	10	ø3.5	Urethane Rubber
	15	ø5	Silicone Rubber
	20	ø6	Fluoro Rubber
	25	ø8	
	30	ø10	

Application Example

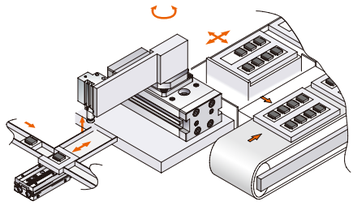
●Suction/transport of electronic parts



●Transport system of small parts



●Transport system of electronic parts

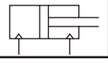


Variation Table

Compact Cylinder with Vacuum Suction
MVC Series

MEMO

●: Standard, ◎: Option

Variation	Model No. Circuit Diagram Code	Bore Size (mm)	Standard Stroke (mm)						Min Stroke	Max Stroke	Pad type				Option	Switch	Page
											Material Nitrile Rubber	Material Urethane Rubber	Material Silicone Rubber	Material Fluoro Rubber	With buffer		
			5	10	15	20	25	30	(mm)	(mm)	P□A	P□AU	P□AS	P□AF	B		
Double Acting, Single Rod Type	MVC 	ø6, ø10	●	●	●	●	●	●	5	30	◎	◎	◎	◎	◎	◎	908

Special
MVC
STK
MCP
GLC
BBS
NHS
HR
LN
Cylinder Switch
Ending

Compact vacuum suction cylinder Double Acting, single rod type

MVC Series

● Bore Size: ø6, ø10

Circuit Diagram
Code

● Double Acting type

RoHS

Model No. Notation

Without Switch
(Built-in magnet for switch)

MVC - 6 - 10 ——— P2A - B

Model No. ❶ ❷ ❺ ❻

With Switch
(Built-in magnet for switch)

MVC - 6 - 10 - F2V - R - P2A - B

Model Number
❶ Bore Size
❷ Stroke
❸ Switch Model No.
❹ Number of Switches
❺ Pad type
❻ Buffer

❶ Bore Size (mm)

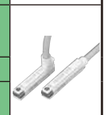
Code	Content
6	ø6
10	ø10

❷ Stroke (mm)

Code	Content
5	5
10	10
15	15
20	20
25	25
30	30

❸ Switch Model No.

For switch details, refer to P. 1457. Switches are shipped with the product.

Contact	Indicator LED Special Function	Wiring (Output)	Load Voltage (V) AC	Load Voltage (V) DC	Load Current (mA) AC	Load Current (mA) DC	Lead Wire *1 Straight	Lead Wire *1 L-shape	
Reed	1-Color	2-wire	—	24 ± 10%	—	5 to 20	F0H	F0V	
Solid State	1-Color	2-wire	—	10 to 30	—	5 to 20	—	F2S□	
		3-wire (NPN)	—	30 or less	—	50 or less	—	F3S□	
		2-wire	—	10 to 30	—	5 to 20 *2	F2H□	F2V□	
		3-wire (NPN)	—	30 or less	—	50 or less	F3H□	F3V□	
		3-wire (PNP)	—	30 or less	—	50 or less	F3PH□	F3PV□	
	2-Color	2-wire	—	24 ± 10%	—	5 to 20	F2YH□	F2YV□	
		3-wire (NPN)	—	30 or less	—	50 or less	F3YH□	F3YV□	

*1: Insert the code selected in the "Lead wire length" table into "□" of the switch model number.
*2: The maximum load current value above, 20 mA, is at 25°C. If the switch operating Ambient Temperature is higher than 25°C, it will be lower than 20 mA. (At 60°C, it will be 5 to 10 mA.)
*3: Switches other than the above models are also available. (Custom Product) For details, refer to P. 1457.

*** Lead wire length**

Code	Content
Blank	1 m (Standard)
3	3 m (Option)

Example) Lead wire length
1 m F0H
3 m F0H3

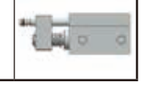
❹ Number of Switches

Code	Content
R	With 1 pc on rod side
H	With 1 pc on head side
D	With 2 pcs

❺ Pad type

Code	Content	
Blank	Without pad	
P2A	Material: Nitrile Rubber	
P3.5A		
P5A		
P6A		
P8A		
P10A		
P2AU	Material: Urethane Rubber	
P3.5AU		
P5AU		
P6AU		
P8AU		
P10AU		
P2AS	Material: Silicone Rubber	
P3.5AS		
P5AS		
P6AS		
P8AS		
P10AS		
P2AF	Material: Fluoro Rubber	
P3.5AF		
P5AF		
P6AF		
P8AF		
P10AF		

❻ Buffer

Code	Content	
Blank	Without buffer	
B	With buffer	

Special
MVC
STK
MCP
GLC
BBS
NHS
HR
LN
Cylinder Switch
Ending

Rechargeable Battery Compatible Specification (Catalog No. CC-1226AA)

●Design compatible with rechargeable battery manufacturing process

MVC- .... - P4*

*Please contact us for details.

Switch Single Unit Model No. Notation

SW - F0H

❸ Switch Model No.

Socket & Pad Assembly Part Model No. Notation

(Assembly parts: Socket + Pad + Hexagon Socket Set Screw)

MVC - P2A

❺ Pad type

Pad Single Unit Model No. Notation

MVC - P2A -PAD

❺ Pad type

Note: The socket differs depending on the pad size. If changing pads, please contact our sales department.

Specifications

Item		MVC	
Bore Size	mm	ø6	ø10
Actuation method		Double Acting Type	
Operating Fluid		Compressed Air	
Max Operating Pressure	MPa	0.7	
Min Operating Pressure	MPa	0.15	0.1
Proof Pressure	MPa	1.05	
Vacuum port pressure		-101 KPa to 0.6 MPa *1	
Ambient Temperature	°C	0 to 60 (however, no freezing) *2	
Port Size		M3	M5
Stroke tolerance	mm	+1.0 0	
Operating Piston Speed	mm/s	50 to 500	
Cushion		Rubber Cushion	
Non-rotating accuracy	degrees	±0.5 (*3)	
Lubrication		Not Required (When lubricating, use Turbine Oil ISO VG32)	
Applicable pad		For details, please refer to P. 909, 916.	
Allowable Absorbed Energy	J	0.0046	0.035

*1: Pressurization from the vacuum port should only be done during vacuum break. Also, use a breaking pressure at that time that is below the cylinder Operating Pressure.
*2: When using MVC with solid state switch, please use at an Ambient Temperature of 40°C or less. This will cause switch detection failure.
*3: This is the initial value at the retraction end.

With buffer specification

Specifications other than those listed below are the same as above.

Item		MVC-□-□-B
Buffer Stroke	mm	4
Buffer portion spring load	N	At setting: 1.3 At operation: 1.62 (At buffer stroke 4 mm operation)
Non-rotation accuracy (Reference value)	Degrees	±2.6 (ø6), ±2.0 (ø10) (*2)

*1: Do not use with a buffer stroke of 4 mm or more. It causes malfunction.
*2: Initial value at retracted end.

Stroke

Bore Size (mm)	Standard Stroke (mm)	Minimum stroke with 1 switch (mm)		Minimum stroke with 2 switches (mm)	
		Reed switch	Solid state switch	Reed switch	Solid state switch
ø6	5, 10, 15, 20, 25, 30	5	5	10	5 (10)
ø10	5, 10, 15, 20, 25, 30	5	5	10	5 (10)

*1: Only Standard Strokes can be manufactured.
*2: For F2Y, F3Y, F3P, the minimum stroke is the dimension in ( ).

Cylinder Weight Table

(Unit: g)

Stroke (mm) / Bore Size (mm)	5	10	15	20	25	30	1 switch Weight per
ø6	30.8	35.6	40.4	45.2	50	54.8	10
ø10	43.8	50	54.7	59.4	64.1	68.8	10

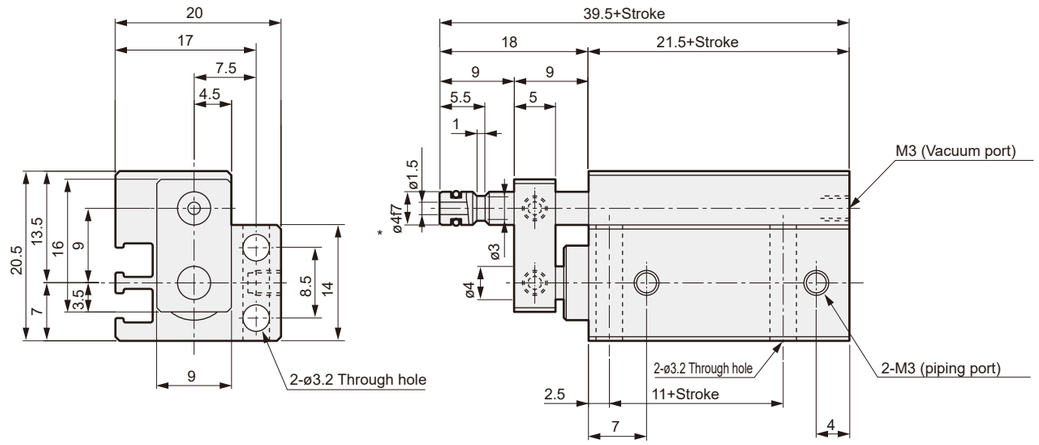
Theoretical Thrust Table

(Unit: N)

Bore Size (mm)	Operating Direction	Operating Pressure MPa							
		0.1	0.15	0.2	0.3	0.4	0.5	0.6	0.7
ø6	Push	-	4.24	5.65	8.48	11.3	14.1	17.0	19.8
	Pull	-	2.36	3.14	4.71	6.28	7.85	9.42	11.0
ø10	Push	7.85	11.8	15.7	23.6	31.4	39.3	47.1	55.0
	Pull	5.03	7.54	10.1	15.1	20.1	25.1	30.2	35.2

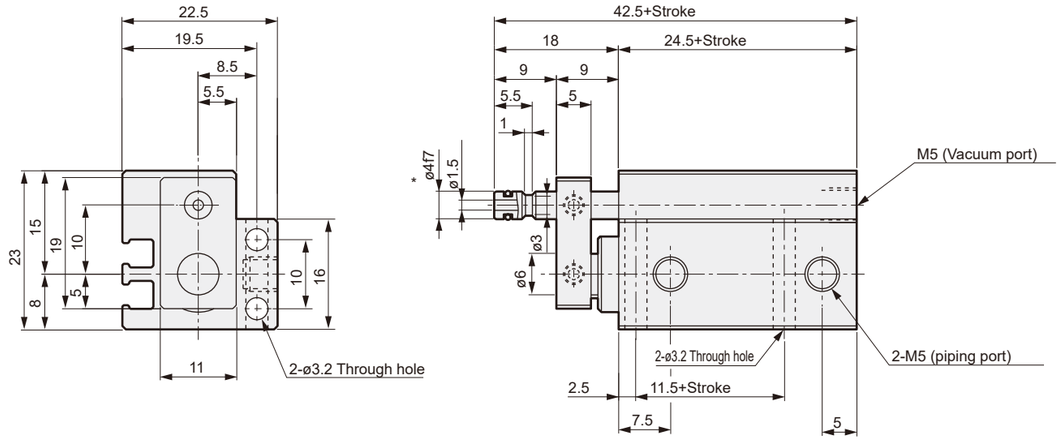
Dimensional Drawings

● MVC-6 (without pad)



*Recommended inner diameter tolerance of mating socket: H8

● MVC-10 (without pad)

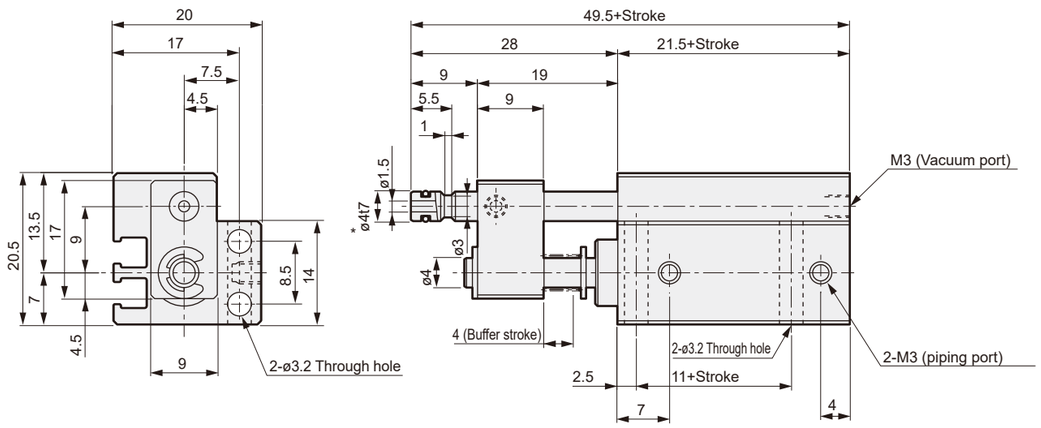


*Recommended inner diameter tolerance of mating socket: H8

Note: For dimensions with each switch, please refer to P. 915.

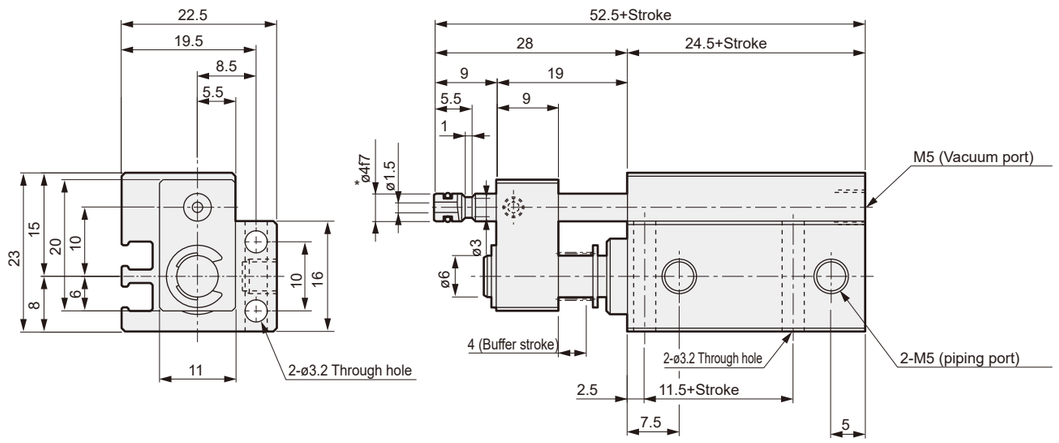
Dimensional Drawings with Option

● MVC-6-□-B (with buffer)



*Recommended inner diameter tolerance of mating socket: H8

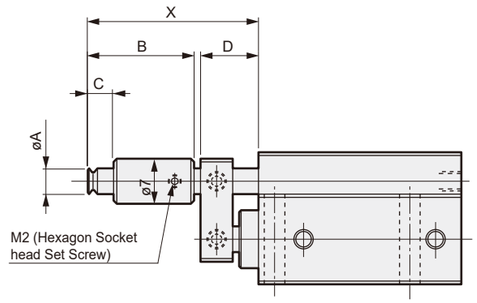
● MVC-10-□-B (with buffer)



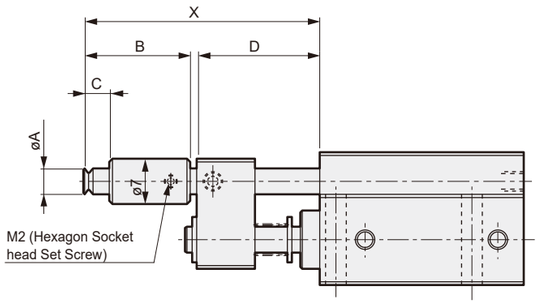
*Recommended inner diameter tolerance of mating socket: H8

Dimensional Drawings with Option

● MVC-6/10 (with pad)



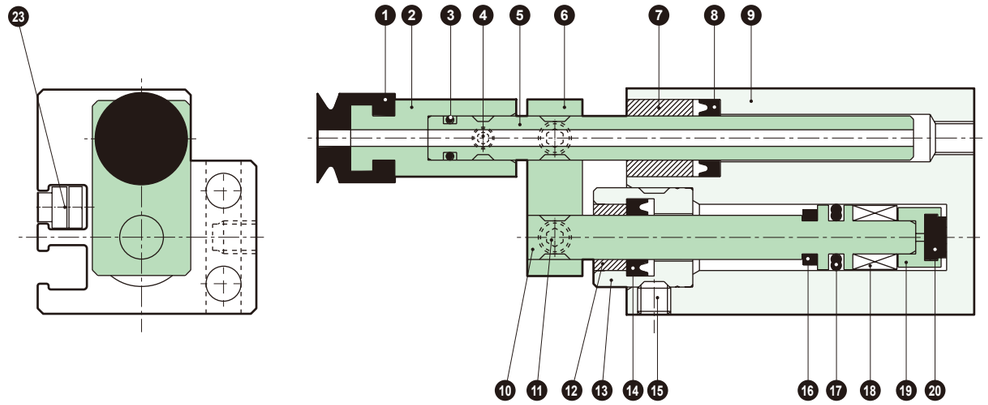
● MVC-6/10-B (with pad with buffer)



Code	Common Dimensions			Dimensions without buffer		Dimensions with buffer	
Pad type	A	B	C	X	D	X	D
P2A	ø2	16.5	4	26.5	9	36.5	19
P3.5A	ø3.5	16.5	4	26.5	9	36.5	19
P5A	ø5	17.5	6.5	27.5	9	37.5	19
P6A	ø6	17.5	6.5	27.5	9	37.5	19
P8A	ø8	18	7	28	9	38	19
P10A	ø10	18.5	7.5	28.5	9	38.5	19

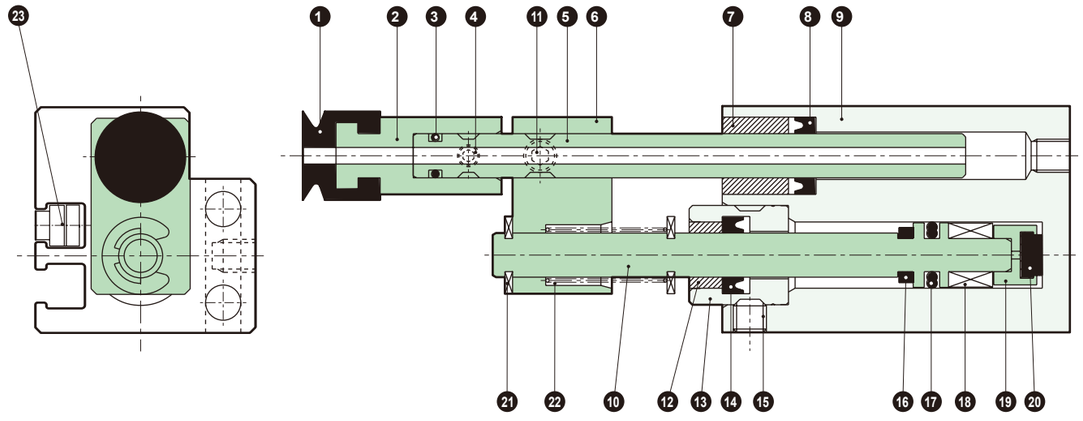
Internal Structure / Materials

● MVC-6, 10



* The diagram above shows the internal structure diagram when a pad is included. But no ❶ ❷ ❹ when without the pad.

● MVC-6,10-B (with buffer)



* The diagram above shows the internal structure diagram when a pad is included. But no ❶ ❷ ❹ when without the pad.

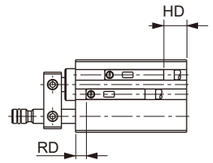
Do not disassemble

Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Pad			13	Rod metal	Stainless Steel	
2	Socket	Aluminum Alloy	Chromate	14	Rod Packing	Nitrile Rubber	
3	O-ring	Nitrile Rubber		15	Hexagon Socket Set Screw	Stainless Steel	
4	Hexagon Socket Set Screw	Stainless Steel		16	Cushion rubber R	Urethane Rubber	
5	Guide Rod	Stainless Steel		17	Piston Packing	Nitrile Rubber	
6	Plate	Aluminum Alloy	Chromate	18	Magnet	Plastic	
7	Guide bush	Copper Alloy		19	Adapter	Aluminum Alloy	
8	Guide packing	Nitrile Rubber		20	Cushion rubber H	Urethane Rubber	
9	Cylinder Body	Aluminum Alloy	Hard Anodized	21	E-type ring	Stainless Steel	
10	Piston	Stainless Steel		22	Spring	Piano Wire	Electrodeposition Coating
11	Hexagon Socket head Set Screw	Stainless Steel		With Switch			
12	Bushing	Oil-Impregnated Bearing Alloy		23	Switch		

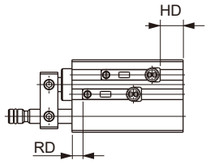
MVC Series External Dimensions Diagram with Switch

●F0H/V

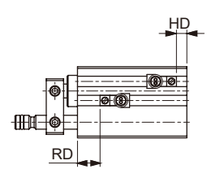
• Lead wire straight type (H)

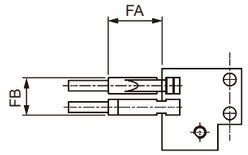


• Lead wire L-shaped type (V)



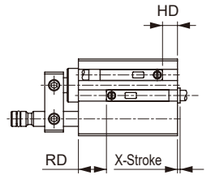
●F2S, F3S



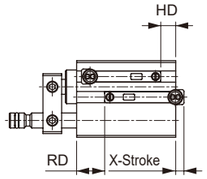


●F2H/V, F3H/V, F2YH/V, F3YH/V, F3PH/V

• Lead wire straight type (H)



• Lead wire L-shaped type (V)



(mm)

Code	MVC											
	F0H/V		F2S, F3S				F2H/V, F3H/V			F3PH/V, F2YH/V, F3YH/V		
Bore Size (mm)	RD	HD	RD	HD	FA	FB	RD	HD	X (*3)	RD	HD	X (*3)
ø6	3	1.5	6.5	3	13.5	7.5	7.5	4	5.7 (2.7)	7.5	4	10.2 (7.2)
ø10	4.5	3	8	4.5	13.5	8	9	5.5	4.2 (1.2)	9	5.5	8.7 (5.7)

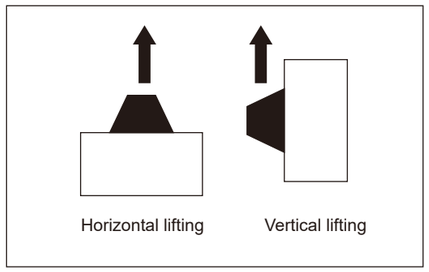
*1: The minimum stroke with 2 reed switches is 10 mm.
*2: X-stroke dimension indicates the protrusion dimension from the switch body end face. (If the calculated value is negative, there is no protrusion from the body end face.)
*3: The X dimension for L-shaped lead wire type is the dimension in ( ).

Technical Data

■ Formula for lifting capacity

$$W = \frac{P \times A}{-101.3} \times \frac{1}{0.102}$$ However { W = Lifting capacity (N); P = Vacuum pressure kPa; A = Pad area cm^2

- The value obtained by this equation is a theoretical value. For actual design, please consider a safety factor of 4 times for horizontal lifting and 6 to 8 times or more for vertical lifting.
- When lifting and then moving, ensure an adequate safety factor by considering the weight due to acceleration.
- Diameter of the pad under suction increases by Approx. 10%.
- Pay attention to the position of center of gravity for the workpiece. If the workpiece tilts, the suction force will be significantly weakened.



■ Theoretical lifting force

- Circular pad

(N)

Pad Diameter (ømm)	2	3.5	5	6	8	10
Suction Area (cm^2) / Vacuum pressure	0.031	0.096	0.196	0.282	0.502	0.785
-93.3 KPa	0.284	0.873	1.765	2.550	4.511	7.061
-80.8 KPa	0.245	0.745	1.569	2.158	3.923	6.080
-66.7 KPa	0.206	0.618	1.275	1.863	3.236	5.099
-53.4 KPa	0.167	0.500	0.981	1.471	2.550	4.021
-40.0 KPa	0.118	0.373	0.785	1.079	1.961	3.040

The values in the table are calculated values.

■ Pad material and characteristics

Item / Material	Hardness HS	Tensile Strength N/cm^2	Tear Strength N/cm^2	Elongation %	Heat Resistant Temperature °C	Oil Resistance	Sunlight Resistance	Ozone Resistance	Acid Resistance	Alkali Resistance	Abrasion Resistance	Electrical Insulation	Gas Permeability Resistance
Nitrile Rubber (NBR)	50° to 90°	686 to 1961	313 to 490	150 to 620	-26 to 120	◎	x	x	△	○	◎	x	○
Silicone Rubber (SI)	54° to 80°	441 to 784	117 to 411	100 to 300	-60 to 250	△	◎	◎	△	○	x	◎	x
Urethane Rubber (U)	50° to 80°	686 to 4315	588 to 1961	310 to 750	-20 to 75	△	◎	◎	x	x	◎	○	○
Fluororubber (FKM)	58° to 90°	931 to 1765	166 to 470	100 to 350	-10 to 230	◎	◎	◎	◎	△	◎	◎	◎

This table shows the general characteristics of synthetic rubber that we can handle.
◎: Good for use ○: Suitable for use △: Durable depending on conditions ×: Unsuitable

- Refer to "Precision Components/Vacuum Components (catalog No.RJ-010AA)" for vacuum components selection.

Pneumatic Components

To Use This Product Safely

Be sure to read this before use. For general cylinder information, see Intro 41, and for cylinder switches, see P. 1512.

Individual Precautions: Compact vacuum suction cylinder MVC Series

Design / Selection

⚠ Warning

■ In the case of a system incorporating a vacuum ejector, etc., if a suctioned workpiece (suctioned object) is thought to be dangerous in the event of it falling, provide a mechanical fall prevention measure for safety.

⚠ CAUTION

■ Select a vacuum ejector, etc., that has an appropriate suction flow rate. Low suction flow rate will cause suction failure.

■ When using the product with MVC cylinder buffer, the buffer stroke must be within 4 mm. Do not use beyond 4 mm.

During Use

⚠ CAUTION

■ Perform piping with a sufficient effective cross-sectional area. For the vacuum piping side, select piping with a sufficient effective cross-sectional area that allows the maximum suction flow rate of the ejector to flow.

■ When using MVC with reed switch, the cylinder cannot be mounted on a magnetic substance (iron plate, etc.). This will cause switch detection failure.

For precautions during mounting, installation, adjustment, use, and maintenance, refer to "During Use" in this catalog and the CKD Components Product website (https://www.ckd.co.jp/kiki/en/) -> "Model No." -> Instruction Manual.

STK

Stopper Cylinder

ø20, ø32, ø40, ø50

CONTENTS

Product Introduction	920
Series variation	922
● Double Acting/round Rod End (STK)	924
● Single Acting, pull, round Rod End (STK-Y)	932
● Double Acting, spring integrated, round Rod End (STK-Y1)	940
● Double Acting, Rod End chamfered type (STK-M)	948
● Single Acting, pull type, Rod End shape chamfered type (STK-MY)	956
● Double Acting, with spring type, Rod End shape chamfered type (STK-MY1)	964
● Single Acting, pull type, Rod End shape roller type (STK-JY)	972
● Double Acting, Spring loaded type, Rod End shape roller type (STK-JY1)	978
External Dimensions Diagram with Switch	984
List of mounting bolts	985
Model Selection Guide	986
⚠ Precautions for Use	988

Special
MVC
STK
MCP
GLC
BBS
NHS
HR
LN
Cylinder Switch
Ending

Stopper Cylinder **STK** Series

Resists lateral load firmly even in a small space

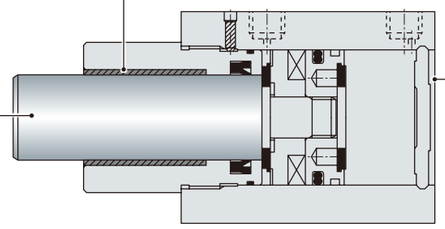
Square type, space-saving stopper cylinder (ø20, ø32, ø40, ø50) with strong bearings that can withstand large lateral loads such as those encountered when used as a stopper

STK/STK-Y Series | STK-M Series | STK/STK-Y Series | STK-JY Series

Structure of STK Series

Long and strong bush
Strengthened bearing part by significantly lengthening the bush

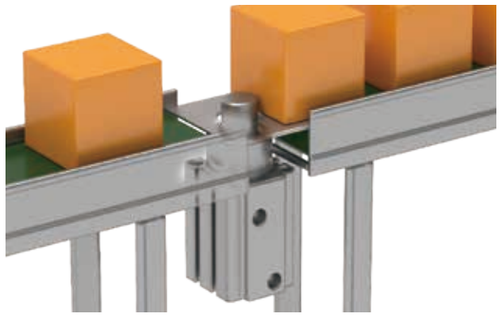
Thick Piston Rod
Adopts a rod that is one rank or more thicker than the normal rod diameter



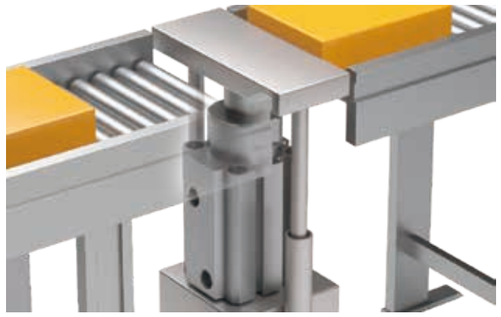
Compact body
Direct mounting possible with Hexagon Socket head cap bolts
Two mounting methods: screwing and through bolts

Application Example

Workpiece stopper applications

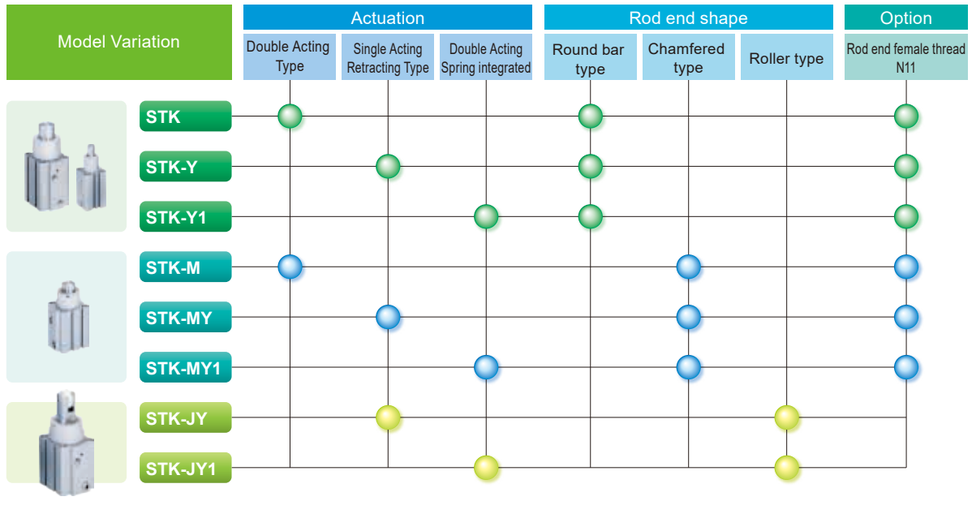


Position holding during power outage/



A wide variety of variations available to choose from depending on usage and space

STK Series Product System



4 types of Rod End shapes according to usage scene

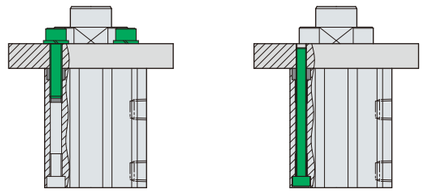
Rod End shape round bar type | Rod End shape female thread | Rod End Shape: Chamfered Type | Rod End shape roller type

Mounting Method

Through hole+taps on both ends equipped as standard

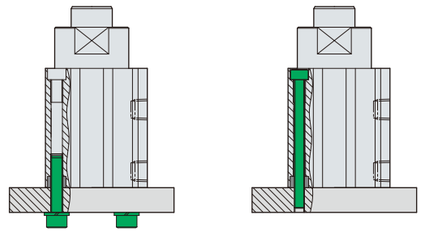
Rod Side Mounting

Screw-in mounting | Through-bolt mounting



Head Side Mounting

Screw-in mounting | Through-bolt mounting



●: Standard, ◎: Option, : Not available

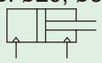
Variation	Model No. / Circuit Diagram Code	Bore Size (mm)	Standard Stroke (mm) 10	15		20	25	30	Min Stroke (mm)	Max Stroke (mm)	Option: With Rod End female thread N11	Switch	Page
Double Acting type, Rod End shape round bar type	STK	Equivalent to ø20 / Equivalent to ø32	●	●		●			10	20	◎	◎	924
		Equivalent to ø40 / Equivalent to ø50				●	●	●	20	30	◎		
Single Acting, Retraction type Rod End shape round bar type	STK-Y	Equivalent to ø20 / Equivalent to ø32	●	●		●			10	20	◎	◎	932
		Equivalent to ø40 / Equivalent to ø50				●	●	●	20	30	◎		
Double Acting, Spring loaded type Rod End shape round bar type	STK-Y1	Equivalent to ø20 / Equivalent to ø32	●	●		●			10	20	◎	◎	940
		Equivalent to ø40 / Equivalent to ø50				●	●	●	20	30	◎		
Double Acting type, Rod End shape chamfered type	STK-M	Equivalent to ø20 / Equivalent to ø32	●	●		●			10	20	◎	◎	948
		Equivalent to ø40 / Equivalent to ø50				●	●	●	20	30	◎		
Single Acting, Retraction type Rod End shape chamfered type	STK-MY	Equivalent to ø20 / Equivalent to ø32	●	●		●			10	20	◎	◎	956
		Equivalent to ø40 / Equivalent to ø50				●	●	●	20	30	◎		
Double Acting, Spring loaded type Rod End shape chamfered type	STK-MY1	Equivalent to ø20 / Equivalent to ø32	●	●		●			10	20	◎	◎	964
		Equivalent to ø40 / Equivalent to ø50				●	●	●	20	30	◎		
Single Acting, Retraction type Rod End shape roller type	STK-JY	Equivalent to ø20 / Equivalent to ø32	●	●		●			10	20		◎	972
		Equivalent to ø40 / Equivalent to ø50				●	●	●	20	30			
Double Acting, Spring loaded type Rod End shape roller type	STK-JY1	Equivalent to ø20 / Equivalent to ø32	●	●		●			10	20		◎	978
		Equivalent to ø40 / Equivalent to ø50				●	●	●	20	30			

Stopper Cylinder, Double Acting Type,
Rod End Shape Round Bar Type

STK Series

● Bore Size: ø20, ø32, ø40, ø50

Circuit Diagram
Code



Double Acting

RoHS

Model No. Notation

Without Switch
(Built-in magnet for switch)

STK - 20 [ ] - 10 ——— N11

Model No. ❶ ❷ ❸ ❻

With switch
(Built-in magnet for switch)

STK - 20 [ ] - 10 - T0H - R - N11

Model No. ❷ Piping thread type ❹ Switch Model ❻ Option
❶ Bore Size ❸ Stroke ❺ Number of Switches

❶ Bore Size (mm)

Code	Content
20	ø20
32	ø32
40	ø40
50	ø50

❷ Piping thread type

Code	Content
Blank	M5 (ø20)
	Rc thread (ø32 to ø50)
NN	NPT thread (ø32 or more) (Custom product)
GN	G thread (ø32 or more) (Custom product)

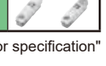
❸ Stroke (mm)

Bore Size	Stroke
ø20	10 to 20
ø32	10 to 20
ø40	20 to 30
ø50	20 to 30

Note: For Standard Stroke and minimum stroke with switch, please refer to P. 926.

❹ Switch Model No.

For switch details, refer to P. 1457.
Switches are shipped with the product.

Contact	Indicator LED Special Function	Wiring (Output)	Load Voltage (V) AC	Load Voltage (V) DC	Load Current (mA) AC	Load Current (mA) DC	Lead wire *1 Straight	Lead wire *1 L-shape	
Solid State	1-Color	2-wire	85 to 265	—	5 to 100	—	T1H□	T1V□	
			—	10 to 30	—	5 to 20 *2	T2H□	T2V□	
		3-wire (NPN)	—	30 or less	—	100 or less	T3H□	T3V□	
		3-wire (PNP)	—		—		T3PH□	T3PV□	
	2-Color	2-wire	—	24 ± 10%	—	5 to 20	T2WH□	T2WV□	
		3-wire (NPN)	—	30 or less	—	50 or less	T3WH□	T3WV□	
	2-Color Improved Water Resistance	2-wire	—	24 ± 10%	—	5 to 20	T2WLH□	T2WLV□	*3
	1-Color Off-Delay Type		—	10 to 30	—	5 to 20 *2	T2JH□	T2JV□	
	1-Color Flexible Lead Wire Type		—	10 to 30	—	5 to 20 *2	T2HR3	T2VR3	
Reed	1-Color	2-wire	110	12/24	7 to 20	5 to 50	T0H□	T0V□	
	Without Indicator Lamp		110	5/12/24	20 or less	50 or less	T5H□	T5V□	
	1-Color		110/220	12/24	7 to 20 / 7 to 10	5 to 50	T8H□	T8V□	

*1: For "□" in the switch Model No., enter the code selected from the "Lead wire length, connector specification" table.
*2: The maximum load current value above, 20 mA, is at 25°C. If the switch operating Ambient Temperature is higher than 25°C, it will be lower than 20 mA. (At 60°C, it will be 5 to 10 mA.)
*3: This does not guarantee the water resistance of the cylinder.
*4: Switches other than the Model No.s listed above are also available. (Custom Product) For details, refer to P. 1457.

*5 * Lead wire length, connector specification

Code	Content
Blank	1 m (Standard)
3	3 m (Option)
5	5 m (Option)
W	M8 Connector, 1PIN (+), 4PIN (−) Lead Wire 0.3 m

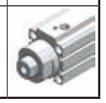
*5: Only T2WLH and T2WLV can be selected.

Example) Lead wire length
1 m T0H
3 m T0H3
5 m T0H5

❺ Number of Switches

Code	Content
R	With 1 pc on rod side
H	With 1 pc on head side
D	With 2 pcs

❻ Option

Code	Content	
Blank	Rod End without thread	
N11	With Rod End female thread	

Rechargeable Battery Compatible Specification (Catalog No. CC-1226AA)

●Design compatible with rechargeable battery manufacturing process

STK - .... - P4*

* Please contact us for details.

Switch Single Unit Model No. Notation

SW - T0H

❹ Switch Model

Specifications

Item		STK			
Bore Size	mm	ø20	ø32	ø40	ø50
Actuation method		Double Acting Type			
Operating Fluid		Compressed Air			
Max Operating Pressure	MPa	1.0			
Min Operating Pressure	MPa	0.15	0.1		
Proof Pressure	MPa	1.6			
Ambient Temperature	°C	-10 to 60 (however, no freezing)			
Port Size		M5	Rc1/8		Rc1/4
Stroke tolerance	mm	+2.0 0			
Operating Piston Speed	mm/s	50 to 500			
Cushion		With Rubber Cushion			
Lubrication		Not required (Use Turbine Oil Class 1 ISO VG32 if lubricated)			
Rod End shape		Round bar type			
Allowable Absorbed Energy	J	Refer to P. 986.			

Stroke

Bore Size (mm)	Stroke (mm)	Maximum Stroke (mm)	Min Stroke (mm)	Minimum stroke with switch (mm)	
				T2WL	Other switches
ø20	10, 15, 20	20	10	20	10
ø32					
ø40	20, 25, 30	30	20	20	20
ø50					

Note: Strokes other than Standard Strokes are custom products.

Cylinder Weight Table

(Unit: g)

Stroke / Bore Size	10	15	20	25	30	Switch Weight (Grommet)
ø20	214	229	243	—	—	Refer to the mass listed in the Switch Specifications on P. 1457.
ø32	438	463	488	—	—	
ø40	-	—	793	834	875	
ø50	-	—	1285	1311	1337	

Theoretical Thrust Table

(Unit: N)

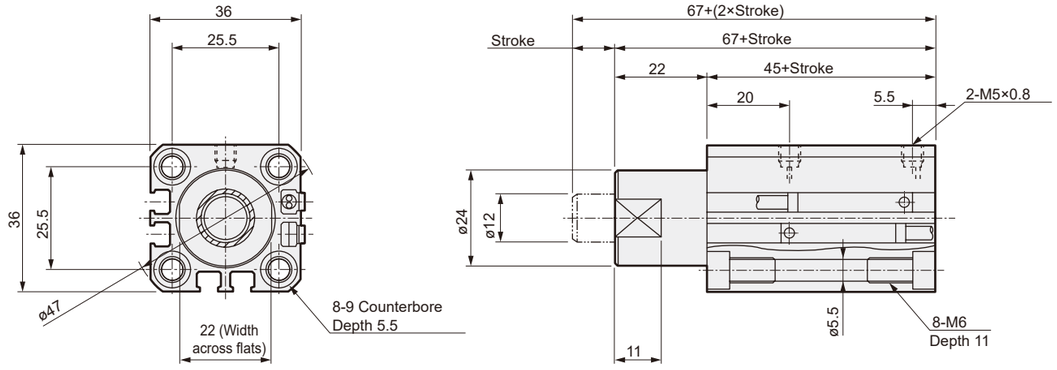
Bore Size (mm)	Operating Direction	Operating Pressure MPa										
		0.1	0.15	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
ø20	Push	-	-	62.8	94.2	1.26×10^2	1.57×10^2	1.88×10^2	2.20×10^2	2.51×10^2	2.83×10^2	3.14×10^2
	Pull	-	-	40.2	60.3	80.4	1.01×10^2	1.21×10^2	1.41×10^2	1.61×10^2	1.81×10^2	2.01×10^2
ø32	Push	80.4	1.21×10^2	1.61×10^2	2.41×10^2	3.22×10^2	4.02×10^2	4.83×10^2	5.63×10^2	6.43×10^2	7.24×10^2	8.04×10^2
	Pull	49.0	73.5	98.0	1.47×10^2	1.96×10^2	2.45×10^2	2.94×10^2	3.43×10^2	3.92×10^2	4.41×10^2	4.90×10^2
ø40	Push	1.26×10^2	1.88×10^2	2.51×10^2	3.77×10^2	5.03×10^2	6.28×10^2	7.54×10^2	8.80×10^2	1.01×10^3	1.13×10^3	1.26×10^3
	Pull	76.6	1.15×10^2	1.53×10^2	2.30×10^2	3.06×10^2	3.83×10^2	4.59×10^2	5.36×10^2	6.13×10^2	6.89×10^2	7.66×10^2
ø50	Push	1.96×10^2	2.95×10^2	3.93×10^2	5.89×10^2	7.85×10^2	9.82×10^2	1.18×10^3	1.37×10^3	1.57×10^3	1.77×10^3	1.96×10^3
	Pull	1.26×10^2	1.88×10^2	2.51×10^2	3.77×10^2	5.03×10^2	6.28×10^2	7.54×10^2	8.80×10^2	1.01×10^3	1.13×10^3	1.26×10^3

MEMO

Special
MVC
STK
MCP
GLC
BBS
NHS
HR
LN
Cylinder Switch
Ending

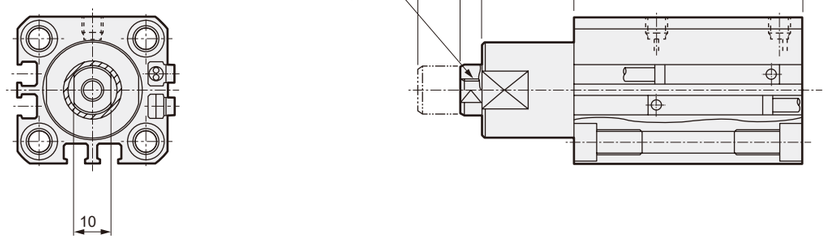
Dimensional Drawings

● STK-20



Note: For dimensions with each switch, please refer to P. 984.

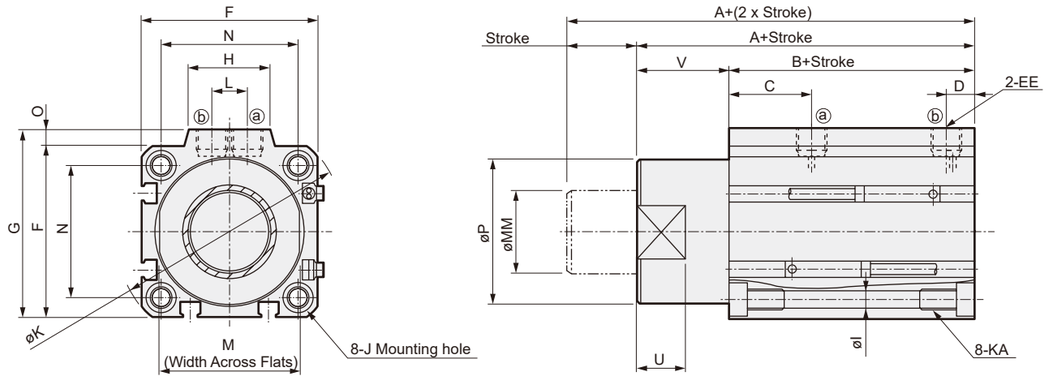
● STK-20-N11 (Dimensions other than displayed dimensions are the same as those of the above (STK-20).)

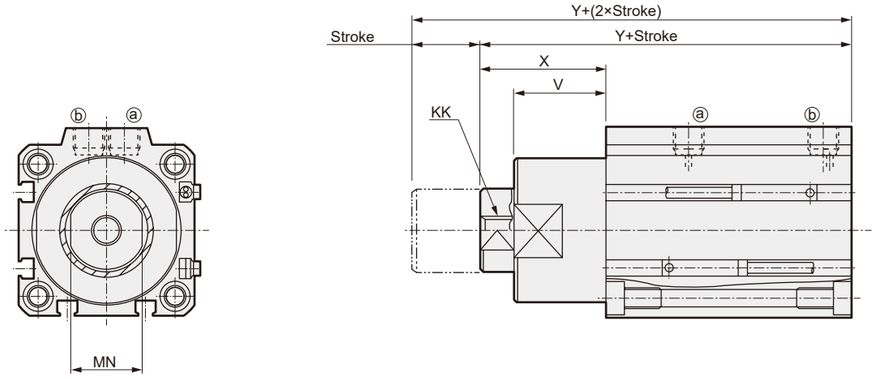


Note: For dimensions with each switch, please refer to P. 984.

Dimensional Drawings

● STK-32/40/50





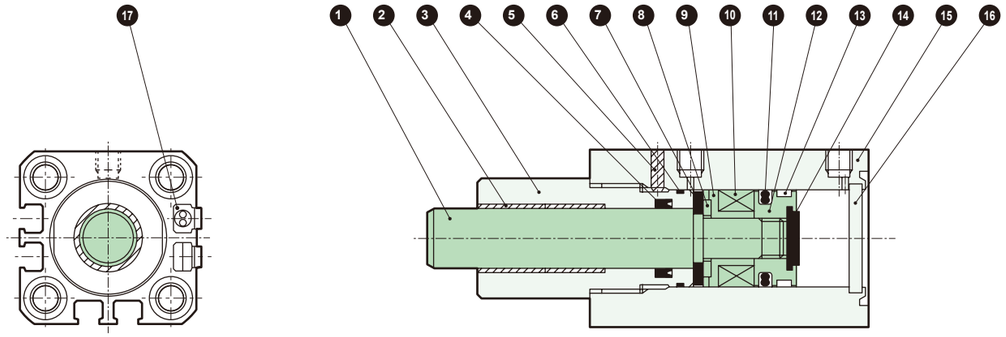
● STK-32/40/50-N11 (Dimensions other than displayed dimensions are the same as those of the above (STK-32, 40, 50).)

Code / Bore Size	A	B	C	D	EE	F	G	H	I	J	K	KA	KK	L	M	MM	MN	N	O	P	U	V	X	Y
ø32	68	48	20	8	Rc1/8	45	49.5	24	5.5	9 Counterbore Depth 5.5	60	M6 Depth 11	M8 Depth 13	10	32	20	17	34	4.5	36	13	20	30	78
ø40	80.5	52.5	24.5	8.5	Rc1/8	52	57	24	5.5	9 Counterbore Depth 5.5	69	M6 Depth 11	M8 Depth 13	10	41	25	22	40	5	44	15	28	38	90.5
ø50	82	54	24.5	10.5	Rc1/4	64	71	33	6.9	11 Counterbore Depth 6.5	86	M8 Depth 13	M10 Depth 15	15	50	30	27	50	7	56	15	28	43	97

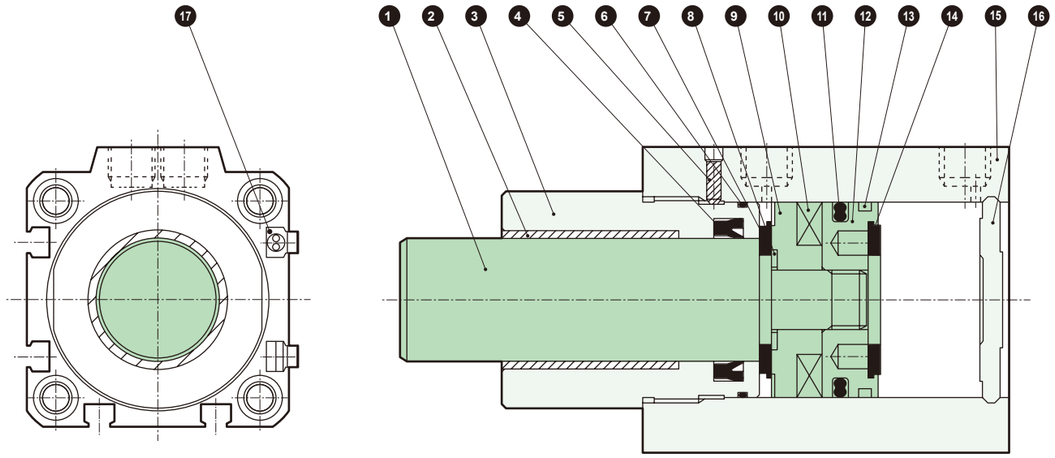
Note: For dimensions with each switch, please refer to P. 984.

Internal Structure / Materials

● STK-20



● STK-32, 40, 50



Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Piston Rod	ø20: Stainless Steel ø32 to ø50: Steel	ø20: Industrial Chrome Plating ø32 to ø50: Industrial Chrome Plating	10	Magnet	Plastic	
				11	Piston Packing	Nitrile Rubber	
2	Bushing	Bearing Alloy		12	Piston	Aluminum Alloy	Chromate
3	Rod Cover	Aluminum Alloy	Alumite	13	Wear Ring	Polyacetal	
4	Rod Packing	Nitrile Rubber		14	Cushion rubber (H)	Urethane Rubber	
5	Hexagon Socket Set Screw	Steel	Black Oxide	15	Cylinder Body	Aluminum Alloy	Hard Anodized
6	Metal gasket	Nitrile Rubber		16	Cover	ø20: Stainless Steel ø32 to 50: Aluminum Alloy	ø32 to ø50: Anodized
7	Cushion rubber (R)	Urethane Rubber					
8	Spacer washer	Stainless Steel		With Switch			
9	Spacer	Polyamide		17	Switch		

For maintenance parts, please visit the CKD Equipment Product Site (https: //www.ckd.co.jp/kiki/en/) → "model No." → Maintenance Parts.

MEMO

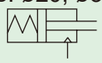
Special
MVC
STK
MCP
GLC
BBS
NHS
HR
LN
Cylinder Switch
Ending

Stopper cylinder Single Acting, pull type
Rod End shape round bar type

STK-Y Series

● Bore Size: ø20, ø32, ø40, ø50

Circuit Diagram
Code



Single Acting, Retracting Type

RoHS

Model No. Notation

Without Switch
(Built-in magnet for switch)

STK-Y – 20 – [ ] – 10 ——— N11

Model No. ❶ ❷ ❸ ❻

With Switch
(Built-in magnet for switch)

STK-Y – 20 – [ ] – 10 – T0H – R – N11

Model No. ❶Bore Size ❷Piping thread type ❸Stroke ❹Switch Model ❺Number of Switches ❻Option

❶ Bore Size (mm)

Code	Content
20	ø20
32	ø32
40	ø40
50	ø50

❷Piping thread type

Code	Content
Blank	M5 (ø20)
	Rc thread (ø32 to ø50)
NN	NPT thread (ø32 or more) (Custom product)
GN	G thread (ø32 or more) (Custom product)

❸Stroke (mm)

Bore Size	Stroke
ø20	10 to 20
ø32	10 to 20
ø40	20 to 30
ø50	20 to 30

Note: For Standard Stroke and minimum stroke with switch, please refer to P. 934.

❹Switch Model No.

For switch details, refer to P. 1457. Switches are shipped with the product.

Contact	Indicator LED Special Function	Wiring (Output)	Load Voltage (V) AC	Load Voltage (V) DC	Load Current (mA) AC	Load Current (mA) DC	Lead wire *1 Straight	Lead wire *1 L-shape	
Solid State	1-Color	2-wire	85 to 265	—	5 to 100	—	T1H□	T1V□	
			—	10 to 30	—	5 to 20 *2	T2H□	T2V□	
		3-wire (NPN)	—	30 or less	—	100 or less	T3H□	T3V□	
		3-wire (PNP)	—		—		T3PH□	T3PV□	
	2-Color	2-wire	—	24 ± 10%	—	5 to 20	T2WH□	T2WV□	
		3-wire (NPN)	—	30 or less	—	50 or less	T3WH□	T3WV□	
	2-Color Improved Water Resistance	2-wire	—	24 ± 10%	—	5 to 20	T2WLH□	T2WLV□	*3
	1-Color Off-Delay Type		—	10 to 30	—	5 to 20 *2	T2JH□	T2JV□	
	1-Color Flexible Lead Wire Type		—	10 to 30	—	5 to 20 *2	T2HR3	T2VR3	
Reed	1-Color	2-wire	110	12/24	7 to 20	5 to 50	T0H□	T0V□	
	Without Indicator Lamp		110	5/12/24	20 or less	50 or less	T5H□	T5V□	
	1-Color		110/220	12/24	7 to 20 / 7 to 10	5 to 50	T8H□	T8V□	

*1: For "□" in the switch Model No., enter the code selected from the "Lead wire length, connector specification" table.
*2: The maximum load current value above, 20 mA, is at 25°C. If the switch operating Ambient Temperature is higher than 25°C, it will be lower than 20 mA. (At 60°C, it will be 5 to 10 mA.)
*3: This does not guarantee the water resistance of the cylinder.
*4: Switches other than the Model No.s listed above are also available. (Custom Product) For details, refer to P. 1457.

*5

*** Lead wire length, connector specification**

Code	Content
Blank	1 m (Standard)
3	3 m (Option)
5	5 m (Option)
W	M8 Connector, 1PIN (+), 4PIN (−) Lead Wire 0.3 m

*5: Only T2WLH and T2WLV can be selected.

Example) Lead wire length
1 m T0H
3 m T0H3
5 m T0H5

❺Number of Switches

Code	Content
R	With 1 pc on rod side
H	With 1 pc on head side
D	With 2 pcs

❻ Option

Code	Content	
Blank	Rod End without thread	
N11	With Rod End female thread	

Switch Single Unit Model No. Notation

SW – T0H

❹ Switch Model

Specifications

Item		STK-Y			
Bore Size	mm	ø20	ø32	ø40	ø50
Operation type		Single Acting, Retracting Type			
Operating Fluid		Compressed Air			
Max Operating Pressure	MPa	1.0			
Min Operating Pressure	MPa	0.22	0.12		
Proof Pressure	MPa	1.6			
Ambient Temperature	°C	-10 to 60 (however, no freezing)			
Port Size		M5	Rc1/8		Rc1/4
Stroke tolerance	mm	+2.0 0			
Operating Piston Speed	mm/s	50 to 500			
Cushion		With Rubber Cushion			
Lubrication		Not required (Use Turbine Oil Class 1 ISO VG32 if lubricated)			
Rod End shape		Round bar type			
Allowable Absorbed Energy	J	Refer to P. 986.			

Stroke

Bore Size (mm)	Stroke (mm)	Max Stroke (mm)	Min Stroke (mm)	Min stroke with switch (mm)	
				T2WL	Other switches
ø20	10, 15, 20	20	10	20	10
ø32					
ø40	20, 25, 30	30	20	20	20
ø50					

Note: Strokes other than Standard Strokes are custom products.

Spring Load

(Unit: N)

Bore Size (mm)	Stroke (mm)	At 0 Stroke	At Full Stroke Operation
ø20	10	11.5	14.7
	15	9.9	
	20	8.2	
ø32	10	24.5	31.4
	15	21.1	
	20	17.6	
ø40	20	29.0	44.4
	25	25.3	
	30	21.5	
ø50	20	55.4	84.8
	25	48.0	
	30	40.7	

Cylinder Weight Table

(Unit: g)

Stroke / Bore Size	10	15	20	25	30	Switch Weight (Grommet)
ø20	217	232	246	—	—	Refer to the mass listed in the Switch Specifications on P. 1457.
ø32	454	479	504	—	—	
ø40	-	—	809	850	891	
ø50	-	—	1299	1325	1351	

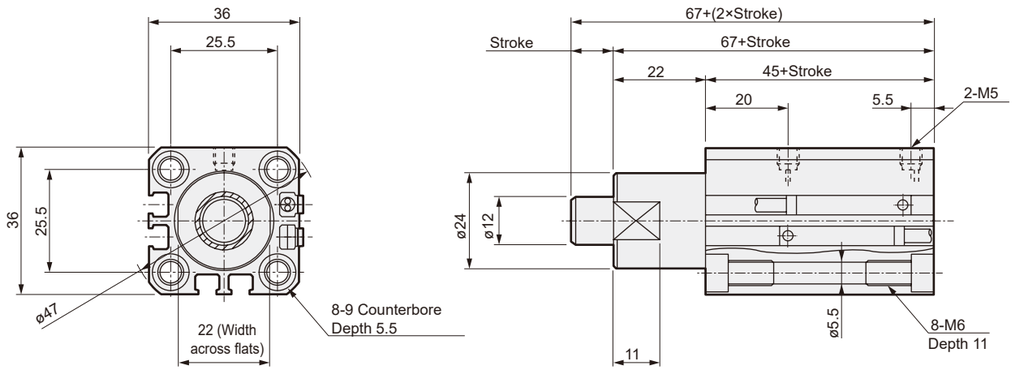
Theoretical Thrust Table

(Unit: N)

Bore Size (mm)	Operating Pressure MPa								
	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
ø20	-	45.6	65.7	85.8	1.06×10^2	1.26×10^2	1.46×10^2	1.66×10^2	1.86×10^2
ø32	66.6	1.16×10^2	1.65×10^2	2.14×10^2	2.63×10^2	3.12×10^2	3.61×10^2	4.10×10^2	4.59×10^2
ø40	1.09×10^2	1.85×10^2	2.62×10^2	3.38×10^2	4.15×10^2	4.92×10^2	5.68×10^2	6.45×10^2	7.21×10^2
ø50	1.67×10^2	2.92×10^2	4.18×10^2	5.44×10^2	6.69×10^2	7.95×10^2	9.21×10^2	1.05×10^3	1.17×10^3

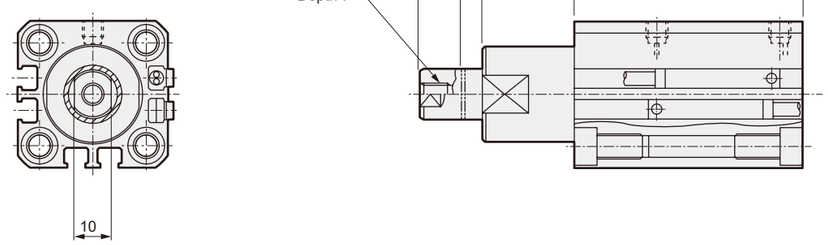
Dimensional Drawings

● STK-Y-20



Note: For dimensions with each switch, please refer to P. 984.

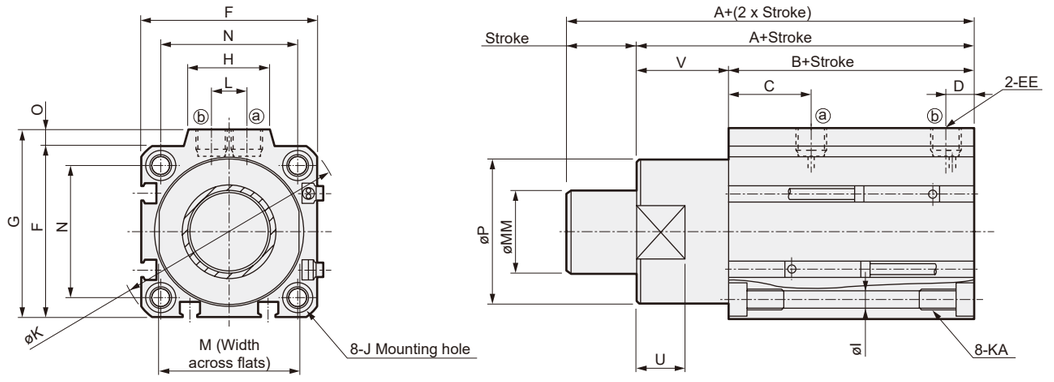
● STK-Y-20-N11 (Dimensions other than displayed dimensions are the same as those of the above (STK-Y-20).)



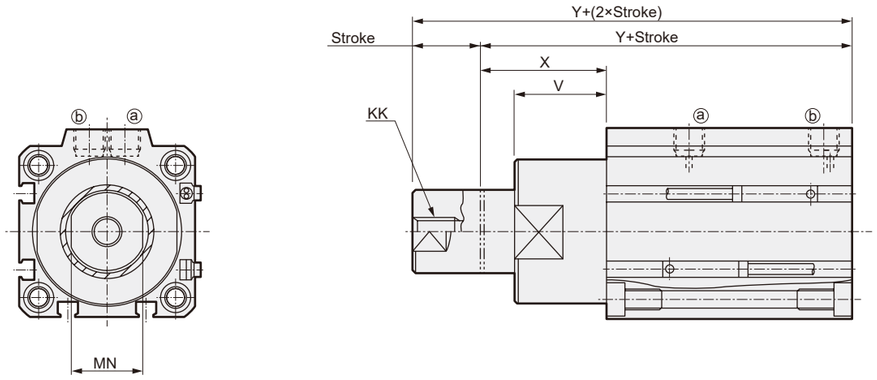
Note: For dimensions with each switch, please refer to P. 984.

Dimensional Drawings

● STK-Y-32/40/50



● STK-Y-32/40/50-N11 (Dimensions other than displayed dimensions are the same as those of the above (STK-Y-32/40/50).)

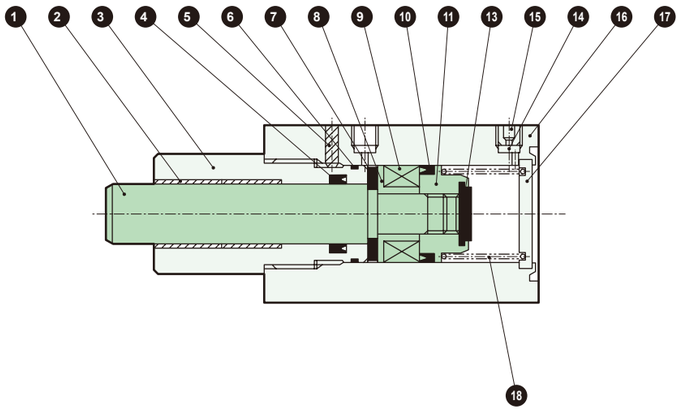


Code / Bore Size	A	B	C	D	EE	F	G	H	I	J	K	KA	KK	L	M	MM	MN	N	O	P	U	V	X	Y
ø32	68	48	20	8	Rc1/8	45	49.5	24	5.5	9 Counterbore Depth 5.5	60	M6 Depth 11	M8 Depth 13	10	32	20	17	34	4.5	36	13	20	30	78
ø40	80.5	52.5	24.5	8.5	Rc1/8	52	57	24	5.5	9 Counterbore Depth 5.5	69	M6 Depth 11	M8 Depth 13	10	41	25	22	40	5	44	15	28	38	90.5
ø50	82	54	24.5	10.5	Rc1/4	64	71	33	6.9	11 Counterbore Depth 6.5	86	M8 Depth 13	M10 Depth 15	15	50	30	27	50	7	56	15	28	43	97

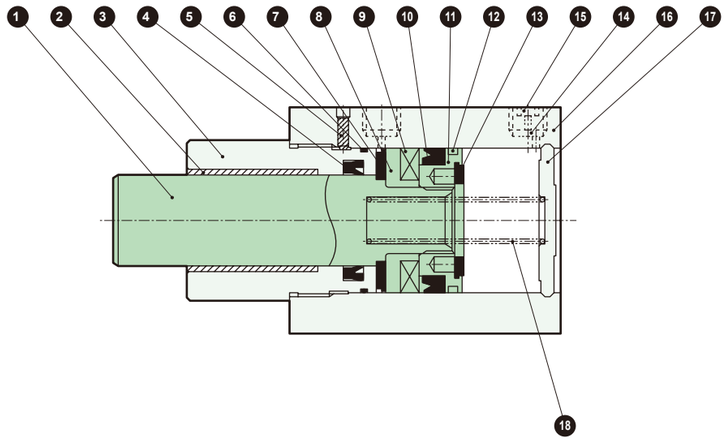
Note: For dimensions with each switch, please refer to P. 984.

Internal Structure / Materials

● STK-Y-20



● STK-Y-32/40/50



Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Piston Rod	ø20: Stainless Steel ø32 to ø50: Steel	ø20: Industrial Chrome Plating ø32 to ø50: Industrial Chrome Plating	10	Piston Packing	Nitrile Rubber	
				11	Piston	Aluminum Alloy	Chromate
2	Bushing	Bearing Alloy		12	Wear Ring	Polyacetal	
3	Rod Cover	Aluminum Alloy	Alumite	13	Cushion rubber (H)	Urethane Rubber	
4	Rod Packing	Nitrile Rubber		14	Stainless Steel Wire Mesh	Stainless Steel	
5	Hexagon Socket Set Screw	Steel	Black Oxide	15	Plug	Stainless Steel	
6	Metal gasket	Nitrile Rubber		16	Cylinder Body	Aluminum Alloy	Hard Anodized
7	Cushion rubber (R)	Urethane Rubber		17	Cover	ø20: Steel ø32 to ø50: Aluminum Alloy	ø20: Zinc plating ø32 to ø50: Anodized
8	Spacer	Aluminum Alloy	Chromate				
9	Magnet	Plastic		18	Coil Spring	Piano Wire	Electrodeposition Coating

For maintenance parts, please visit the CKD Equipment Product Site (https: //www.ckd.co.jp/kiki/en/) → "model No." → Maintenance Parts.

MEMO

Special
MVC
STK
MCP
GLC
BBS
NHS
HR
LN
Cylinder Switch
Ending

Stopper Cylinder, Double Acting, Spring Loaded Type,
Rod End Shape Round Bar Type

STK-Y1 Series

● Bore Size: ø20, ø32, ø40, ø50

Circuit Diagram Code

Double Acting, spring loaded type

RoHS

Model No. Notation

Without Switch
(Built-in magnet for switch)

STK-Y1 – 20 – ( ) – 10 ——— N11

Model No. ❶ ❷ ❸ ❻

With Switch
(Built-in magnet for switch)

STK-Y1 – 20 – ( ) – 10 – T0H – R – N11

Model No. ❷Piping thread type ❸ Stroke ❹ Switch Model ❺ Number of Switches ❻ Option

❶Bore Size

❶ Bore Size (mm)

Code	Content
20	ø20
32	ø32
40	ø40
50	ø50

❷Piping thread type

Code	Content
Blank	M5 (ø20)
	Rc thread (ø32 to ø50)
NN	NPT thread (ø32 or more) (Custom product)
GN	G thread (ø32 or more) (Custom product)

❸Stroke (mm)

Bore Size	Stroke
ø20	10 to 20
ø32	10 to 20
ø40	20 to 30
ø50	20 to 30

Note: For Standard Stroke and minimum stroke with switch, please refer to P. 942.

❹Switch Model No.

For switch details, refer to P. 1457. Switches are shipped with the product.

	Indicator LED Special Function	Wiring (Output)	Load Voltage (V) AC	Load Voltage (V) DC	Load Current (mA) AC	Load Current (mA) DC	Lead wire *1 Straight	Lead wire *1 L-shape	
Solid State	1-Color	2-wire	85 to 265	—	5 to 100	—	T1H□	T1V□	
			—	10 to 30	—	5 to 20 *2	T2H□	T2V□	
		3-wire (NPN)	—	30 or less	—	100 or less	T3H□	T3V□	
		3-wire (PNP)	—		—		T3PH□	T3PV□	
	2-Color	2-wire	—	24 ± 10%	—	5 to 20	T2WH□	T2WV□	
		3-wire (NPN)	—	30 or less	—	50 or less	T3WH□	T3WV□	
	2-Color Water Resistance Improved	2-wire	—	24 ± 10%	—	5 to 20	T2WLH□	T2WLV□	*3
	1-Color Off-Delay Type		—	10 to 30	—	5 to 20 *2	T2JH□	T2JV□	
	1-Color Flexible Lead Wire Type		—	10 to 30	—	5 to 20 *2	T2HR3	T2VR3	
Contact	1-Color	2-wire	110	12/24	7 to 20	5 to 50	T0H□	T0V□	
	Without Indicator Lamp		110	5/12/24	20 or less	50 or less	T5H□	T5V□	
	1-Color		110/220	12/24	7 to 20 / 7 to 10	5 to 50	T8H□	T8V□	

*5

*1: For "□" in the switch Model No., enter the code selected from the "Lead wire length, connector specification" table.
*2: The maximum load current value above, 20 mA, is at 25°C. If the switch operating Ambient Temperature is higher than 25°C, it will be lower than 20 mA. (At 60°C, it will be 5 to 10 mA.)
*3: This does not guarantee the water resistance of the cylinder.
*4: Switches other than the Model No.s listed above are also available. (Custom Product) For details, refer to P. 1457.

*** Lead wire length, connector specification**

Code	Content
Blank	1 m (Standard)
3	3 m (Option)
5	5 m (Option)
W	M8 Connector, 1PIN (+), 4PIN (−) Lead Wire 0.3 m

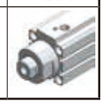
*5: Only T2WLH and T2WLV can be selected.

Example) Lead wire length
1 m T0H
3 m T0H3
5 m T0H5

❺Number of Switches

Code	Content
R	With 1 pc on rod side
H	With 1 pc on head side
D	With 2 pcs

❻ Option

Code	Content	
Blank	Rod End without thread	
N11	With Rod End female thread	

Switch Single Unit Model No. Notation

SW – T0H

❹ Switch Model

Specifications

Item		STK-Y1			
Bore Size	mm	ø20	ø32	ø40	ø50
Operation type		Double Acting spring loaded type			
Operating Fluid		Compressed Air			
Max Operating Pressure	MPa	1.0			
Min Operating Pressure	MPa	0.22	0.12		
Proof Pressure	MPa	1.6			
Ambient Temperature	°C	-10 to 60 (however, no freezing)			
Port Size		M5	Rc1/8		Rc1/4
Stroke tolerance	mm	+2.0 0			
Operating Piston Speed	mm/s	50 to 500			
Cushion		With Rubber Cushion			
Lubrication		Not required (Use Turbine Oil Class 1 ISO VG32 if lubricated)			
Rod End shape		Round bar type			
Allowable Absorbed Energy	J	Refer to P. 986.			

Stroke

Bore Size (mm)	Stroke (mm)	Maximum Stroke (mm)	Min Stroke (mm)	Minimum stroke with switch (mm)	
				T2WL	Other switches
ø20	10, 15, 20	20	10	20	10
ø32					
ø40	20, 25, 30	30	20	20	20
ø50					

Note: Strokes other than Standard Strokes are custom products.

Spring Load

(Unit: N)

Bore Size (mm)	Stroke (mm)	At 0 Stroke	At Full Stroke Operation
ø20	10	11.5	14.7
	15	9.9	
	20	8.2	
ø32	10	24.5	31.4
	15	21.1	
	20	17.6	
ø40	20	29.0	44.4
	25	25.3	
	30	21.5	
ø50	20	55.4	84.8
	25	48.0	
	30	40.7	

Cylinder Weight Table

(Unit: g)

Stroke / Bore Size	10	15	20	25	30	Switch weight (Grommet)
ø20	217	232	246	—	—	Refer to the mass listed in the Switch Specifications on P. 1457.
ø32	454	479	504	—	—	
ø40	-	—	809	850	891	
ø50	-	—	1299	1325	1351	

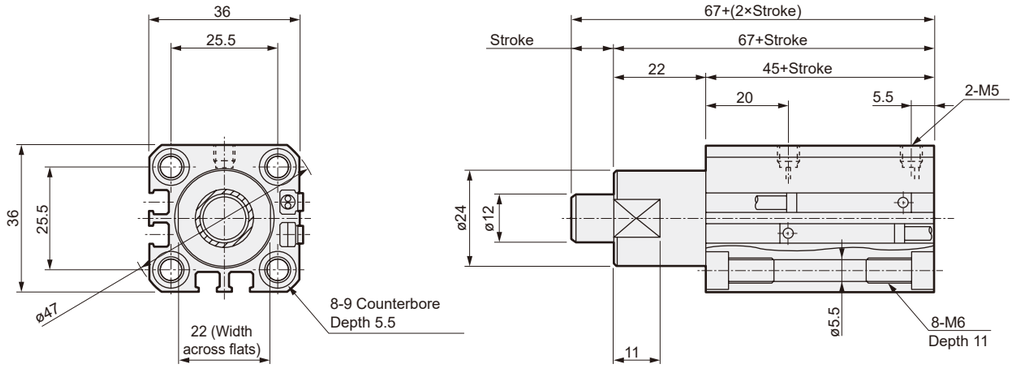
Theoretical Thrust Table

(Unit: N)

Bore Size (mm)	Operating Direction	Operating Pressure MPa									
		0.15	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
ø20	Push	-	-	94.2	1.26×10^2	1.57×10^2	1.88×10^2	2.20×10^2	2.51×10^2	2.83×10^2	3.14×10^2
	Pull	-	-	45.6	65.7	85.8	1.06×10^2	1.26×10^2	1.46×10^2	1.66×10^2	1.86×10^2
ø32	Push	1.21×10^2	1.61×10^2	2.41×10^2	3.22×10^2	4.02×10^2	4.83×10^2	5.63×10^2	6.43×10^2	7.24×10^2	8.04×10^2
	Pull	42.1	66.6	1.16×10^2	1.65×10^2	2.14×10^2	2.63×10^2	3.12×10^2	3.61×10^2	4.10×10^2	4.59×10^2
ø40	Push	1.88×10^2	2.51×10^2	3.77×10^2	5.03×10^2	6.28×10^2	7.54×10^2	8.80×10^2	1.01×10^3	1.13×10^3	1.26×10^3
	Pull	70.5	1.09×10^2	1.85×10^2	2.62×10^2	3.38×10^2	4.15×10^2	4.92×10^2	5.68×10^2	6.45×10^2	7.21×10^2
ø50	Push	2.95×10^2	3.93×10^2	5.89×10^2	7.85×10^2	9.82×10^2	1.18×10^3	1.37×10^3	1.57×10^3	1.77×10^3	1.96×10^3
	Pull	1.04×10^2	1.67×10^2	2.92×10^2	4.18×10^2	5.44×10^2	6.69×10^2	7.95×10^2	9.21×10^2	1.05×10^3	1.17×10^3

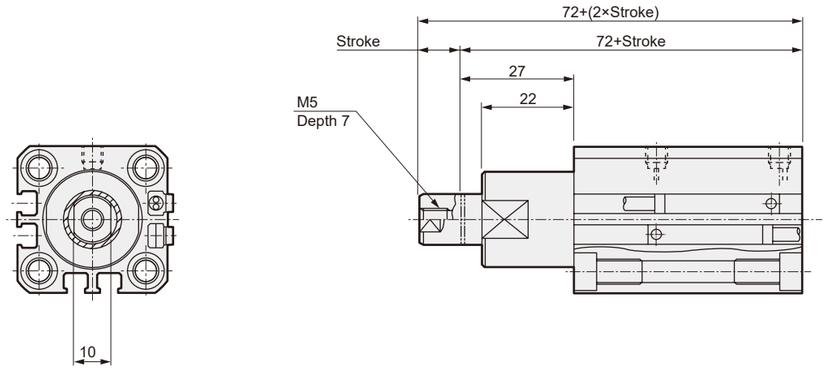
Dimensional Drawings

● STK-Y1-20



Note: For dimensions with each switch, please refer to P. 984.

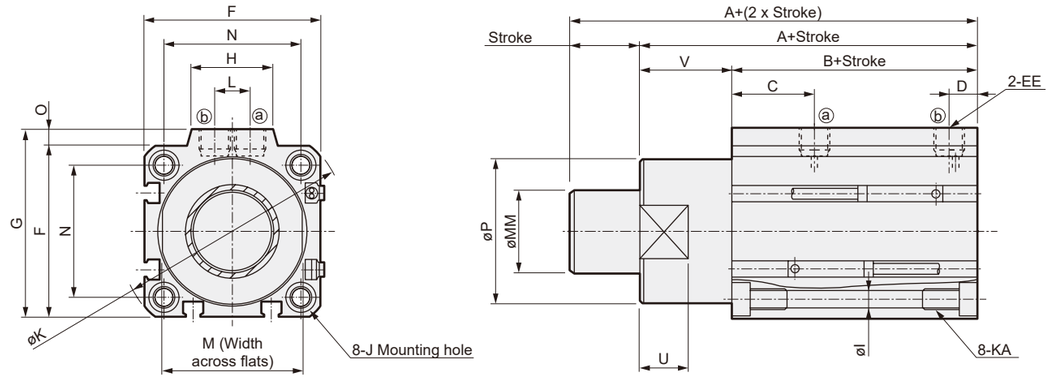
● STK-Y1-20-N11 (Dimensions other than displayed dimensions are the same as those of the above (STK-Y1-20).)



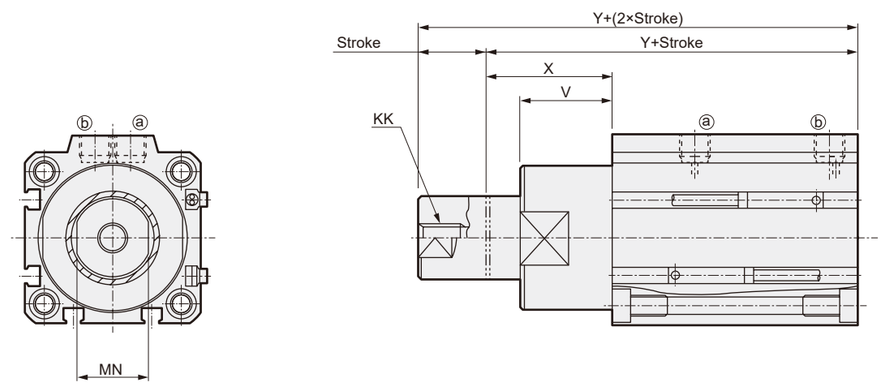
Note: For dimensions with each switch, please refer to P. 984.

Dimensional Drawings

● STK-Y1-32/40/50



● STK-Y1-32/40/50-N11 (Dimensions other than displayed dimensions are the same as those of the above (STK-Y1-32/40/50).)

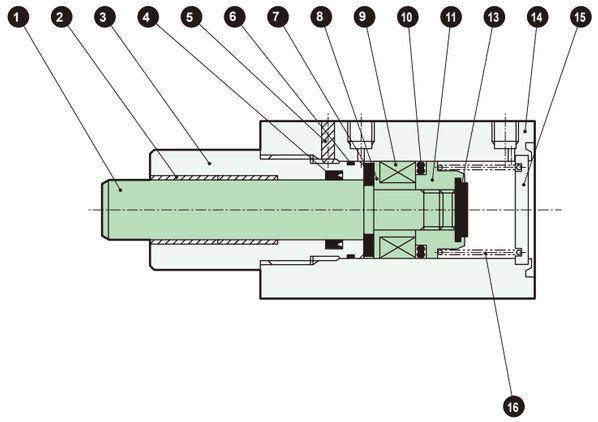


Code / Bore Size	A	B	C	D	EE	F	G	H	I	J	K	KA	KK	L	M	MM	MN	N	O	P	U	V	X	Y
ø32	68	48	20	8	Rc1/8	45	49.5	24	5.5	9 Counterbore Depth 5.5	60	M6 Depth 11	M8 Depth 13	10	32	20	17	34	4.5	36	13	20	30	78
ø40	80.5	52.5	24.5	8.5	Rc1/8	52	57	24	5.5	9 Counterbore Depth 5.5	69	M6 Depth 11	M8 Depth 13	10	41	25	22	40	5	44	15	28	38	90.5
ø50	82	54	24.5	10.5	Rc1/4	64	71	33	6.9	11 Counterbore Depth 6.5	86	M8 Depth 13	M10 Depth 15	15	50	30	27	50	7	56	15	28	43	97

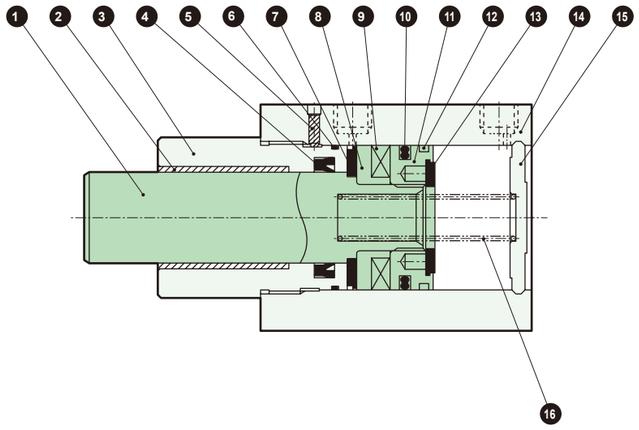
Note: For dimensions with each switch, please refer to P. 984.

Internal Structure / Materials

● STK-Y1-20



● STK-Y1-32/40/50



Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Piston Rod	ø20: Stainless Steel ø32 to ø50: Steel	ø20: Industrial Chrome Plating ø32 to ø50: Industrial Chrome Plating	9	Magnet	Plastic	
				10	Piston Packing	Nitrile Rubber	
2	Bushing	Bearing Alloy		11	Piston	Aluminum Alloy	Chromate
3	Rod Cover	Aluminum Alloy	Alumite	12	Wear Ring	Polyacetal	
4	Rod Packing	Nitrile Rubber		13	Cushion rubber (H)	Urethane Rubber	
5	Hexagon Socket Set Screw	Steel	Black Oxide	14	Cylinder Body	Aluminum Alloy	Hard Anodized
6	Metal gasket	Nitrile Rubber		15	Cover	ø20: Steel ø32 to ø50: Aluminum Alloy	ø20: Zinc plating ø32 to ø50: Anodized
7	Cushion rubber (R)	Urethane Rubber					
8	Spacer	Aluminum Alloy	Chromate	16	Coil Spring	Piano Wire	Electrodeposition Coating

For maintenance parts, please visit the CKD Equipment Product Site (https: //www.ckd.co.jp/kiki/en/) → "model No." → Maintenance Parts.

MEMO

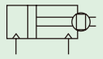
Special
MVC
STK
MCP
GLC
BBS
NHS
HR
LN
Cylinder Switch
Ending

Stopper cylinder Double Acting, Rod End shape chamfered type

STK-M Series

● Bore Size: ø20, ø32, ø40, ø50

Circuit Diagram
Code



Double Acting

RoHS

Model No. Notation

Without Switch
(Built-in magnet for switch)

STK-M – 20 – [ ] – 10 ——— N11

Model No. ❶ ❷ ❸ ❻

With Switch
(Built-in magnet for switch)

STK-M – 20 – [ ] – 10 – T0H – R – N11

Model No. ❶Bore Size ❷Piping thread type ❸Stroke ❹Switch Model ❺Number of Switches ❻Option

❶ Bore Size (mm)

Code	Content
20	ø20
32	ø32
40	ø40
50	ø50

❷Piping thread type

Code	Content
Blank	M5 (ø20)
	Rc thread (ø32 to ø50)
NN	NPT thread (ø32 or more) (Custom product)
GN	G thread (ø32 or more) (Custom product)

❸Stroke (mm)

Bore Size	Stroke
ø20	10 to 20
ø32	10 to 20
ø40	20 to 30
ø50	20 to 30

Note: For Standard Stroke and minimum stroke with switch, please refer to P. 950.

❹Switch Model No.

For switch details, refer to P. 1457. Switches are shipped with the product.

Contact	Indicator LED Special Function	Wiring (Output)	Load Voltage (V) AC	Load Voltage (V) DC	Load Current (mA) AC	Load Current (mA) DC	Lead wire *1 Straight	Lead wire *1 L-shape	
Solid State	1-Color	2-wire	85 to 265	—	5 to 100	—	T1H□	T1V□	
			—	10 to 30	—	5 to 20 *2	T2H□	T2V□	
		3-wire (NPN)	—	30 or less	—	100 or less	T3H□	T3V□	
		3-wire (PNP)	—		—		T3PH□	T3PV□	
	2-Color	2-wire	—	24 ± 10%	—	5 to 20	T2WH□	T2WV□	
		3-wire (NPN)	—	30 or less	—	50 or less	T3WH□	T3WV□	
	2-Color Improved Water Resistance	2-wire	—	24 ± 10%	—	5 to 20	T2WLH□	T2WLV□	*3
	1-Color Off-Delay Type		—	10 to 30	—	5 to 20 *2	T2JH□	T2JV□	
	1-Color Flexible Lead Wire Type		—	10 to 30	—	5 to 20 *2	T2HR3	T2VR3	
Reed	1-Color	2-wire	110	12/24	7 to 20	5 to 50	T0H□	T0V□	
	Without Indicator Lamp		110	5/12/24	20 or less	50 or less	T5H□	T5V□	
	1-Color		110/220	12/24	7 to 20 / 7 to 10	5 to 50	T8H□	T8V□	

*1: For "□" in the switch Model No., enter the code selected from the "*Lead wire length, connector specification" table.
*2: The maximum load current value above, 20 mA, is at 25°C. If the switch operating Ambient Temperature is higher than 25°C, it will be lower than 20 mA. (At 60°C, it will be 5 to 10 mA.)
*3: This does not guarantee the water resistance of the cylinder.
*4: Switches other than the Model No.s listed above are also available. (Custom Product) For details, refer to P. 1457.

*5

*** Lead wire length, connector specification**

Code	Content
Blank	1 m (Standard)
3	3 m (Option)
5	5 m (Option)
W	M8 Connector, 1PIN (+), 4PIN (−) Lead Wire 0.3 m

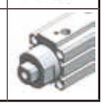
*5: Only T2WLH and T2WLV can be selected.

Example) Lead wire length
1 m T0H
3 m T0H3
5 m T0H5

❺Number of Switches

Code	Content
R	With 1 pc on rod side
H	With 1 pc on head side
D	With 2 pcs

❻ Option

Code	Content	
Blank	Rod End without thread	
N11	With Rod End female thread	

Switch Single Unit Model No. Notation

SW – T0H

❹ Switch Model

Specifications

Item		STK-M			
Bore Size	mm	ø20	ø32	ø40	ø50
Actuation method		Double Acting Type			
Operating Fluid		Compressed Air			
Max Operating Pressure	MPa	1.0			
Min Operating Pressure	MPa	0.15	0.1		
Proof Pressure	MPa	1.6			
Ambient Temperature	°C	-10 to 60 (however, no freezing)			
Port Size		M5	Rc1/8		Rc1/4
Stroke tolerance	mm	+2.0 0			
Operating Piston Speed	mm/s	50 to 500			
Cushion		With Rubber Cushion			
Lubrication		Not required (Use Turbine Oil Class 1 ISO VG32 if lubricated)			
Rod End shape		Chamfered type			
Allowable Absorbed Energy	J	Refer to P. 986.			

Stroke

Bore Size (mm)	Stroke (mm)	Max Stroke (mm)	Min Stroke (mm)	Min stroke with switch (mm)	
				T2WL	Other switches
ø20	10, 15, 20	20	10	20	10
ø32					
ø40	20, 25, 30	30	20	20	20
ø50					

Note: Strokes other than Standard Strokes are custom products.

Cylinder Weight Table

(Unit: g)

Stroke / Bore Size	10	15	20	25	30	Switch Weight (Grommet)
ø20	215	230	244	—	—	Refer to the mass listed in the Switch Specifications on P. 1457.
ø32	441	466	491	—	—	
ø40	-	—	796	837	878	
ø50	-	—	1288	1314	1340	

Theoretical Thrust Table

(Unit: N)

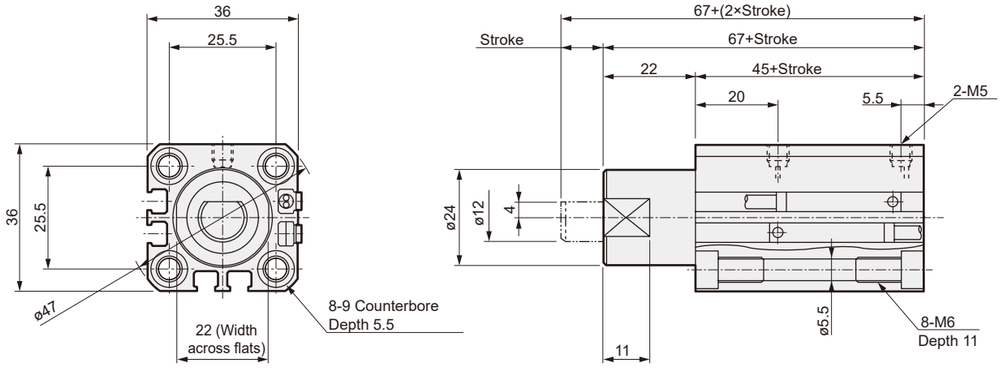
Bore Size (mm)	Operating Direction	Operating Pressure MPa										
		0.1	0.15	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
ø20	Push	-	-	62.8	94.2	1.26×10^2	1.57×10^2	1.88×10^2	2.20×10^2	2.51×10^2	2.83×10^2	3.14×10^2
	Pull	-	-	40.2	60.3	80.4	1.01×10^2	1.21×10^2	1.41×10^2	1.61×10^2	1.81×10^2	2.01×10^2
ø32	Push	80.4	1.21×10^2	1.61×10^2	2.41×10^2	3.22×10^2	4.02×10^2	4.83×10^2	5.63×10^2	6.43×10^2	7.24×10^2	8.04×10^2
	Pull	49.0	73.5	98.0	1.47×10^2	1.96×10^2	2.45×10^2	2.94×10^2	3.43×10^2	3.92×10^2	4.41×10^2	4.90×10^2
ø40	Push	1.26×10^2	1.88×10^2	2.51×10^2	3.77×10^2	5.03×10^2	6.28×10^2	7.54×10^2	8.80×10^2	1.01×10^3	1.13×10^3	1.26×10^3
	Pull	76.6	1.15×10^2	1.53×10^2	2.30×10^2	3.06×10^2	3.83×10^2	4.59×10^2	5.36×10^2	6.13×10^2	6.89×10^2	7.66×10^2
ø50	Push	1.96×10^2	2.95×10^2	3.93×10^2	5.89×10^2	7.85×10^2	9.82×10^2	1.18×10^3	1.37×10^3	1.57×10^3	1.77×10^3	1.96×10^3
	Pull	1.26×10^2	1.88×10^2	2.51×10^2	3.77×10^2	5.03×10^2	6.28×10^2	7.54×10^2	8.80×10^2	1.01×10^3	1.13×10^3	1.26×10^3

MEMO

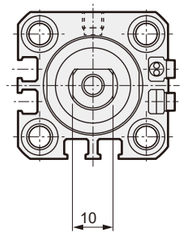
Special
MVC
STK
MCP
GLC
BBS
NHS
HR
LN
Cylinder Switch
Ending

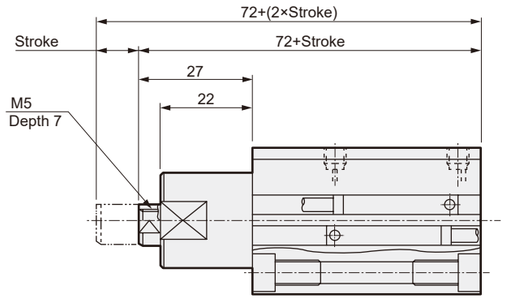
Dimensional Drawings

● STK-M-20



● STK-M-20-N11 (Dimensions other than displayed dimensions are the same as those of the above (STK-M-20).)

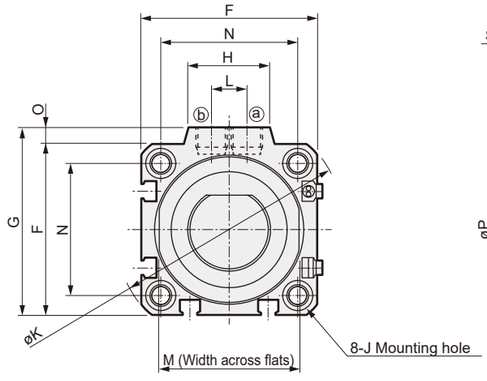




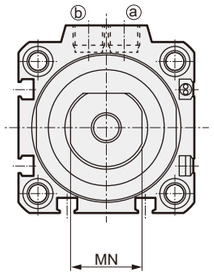
Note: For dimensions with each switch, please refer to P. 984.

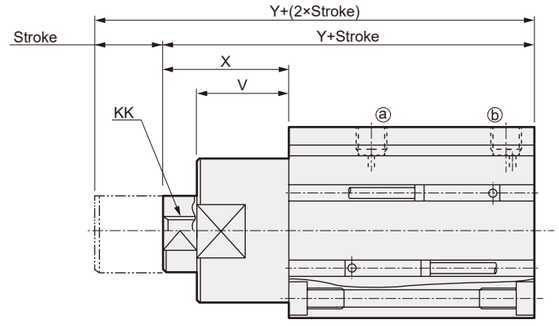
Dimensional Drawings

● STK-M-32/40/50



● STK-M-32/40/50-N11 (Dimensions other than displayed dimensions are the same as those of the above (STK-M-32/40/50).)



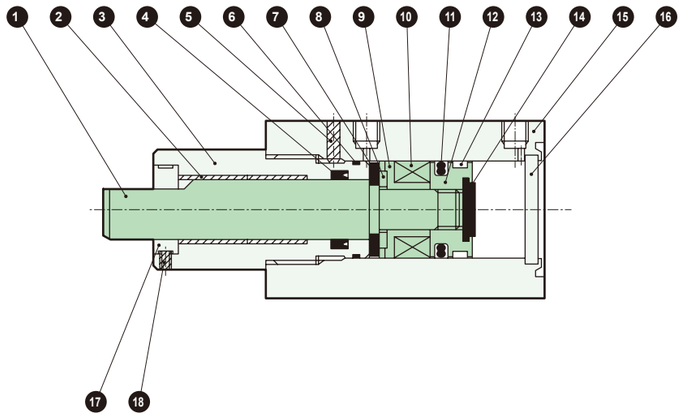


Code / Bore Size	A	B	C	D	EE	F	G	H	I	J	K	KA	KK	L	M	MM	MN	N	O	P	T	U	V	X	Y
ø32	68	48	20	8	Rc1/8	45	49.5	24	5.5	9 Counterbore Depth 5.5	60	M6 Depth 11	M8 Depth 13	10	32	20	17	34	4.5	36	8	13	20	30	78
ø40	80.5	52.5	24.5	8.5	Rc1/8	52	57	24	5.5	9 Counterbore Depth 5.5	69	M6 Depth 11	M8 Depth 13	10	41	25	22	40	5	44	10	15	28	38	90.5
ø50	82	54	24.5	10.5	Rc1/4	64	71	33	6.9	11 Counterbore Depth 6.5	86	M8 Depth 13	M10 Depth 15	15	50	30	27	50	7	56	12	15	28	43	97

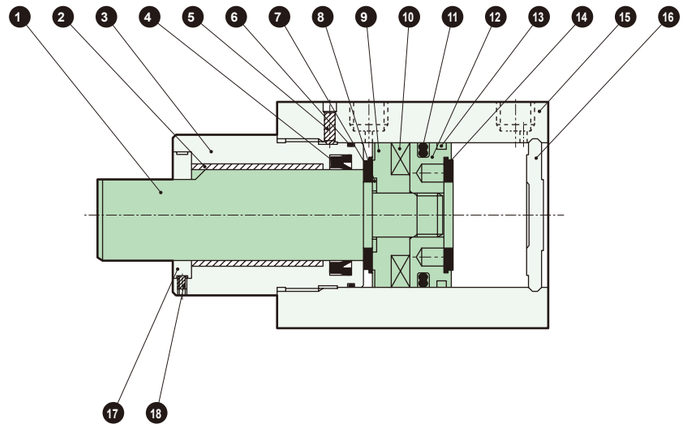
Note: For dimensions with each switch, please refer to P. 984.

Internal Structure / Materials

● STK-M-20



● STK-M-32/40/50



Part No.	Part Name	Material	Remarks
1	Piston Rod	Stainless Steel	Industrial Hard Chrome Plating
2	Bushing	Bearing Alloy	
3	Rod Cover	Aluminum Alloy	Alumite
4	Rod Packing	Nitrile Rubber	
5	Hexagon Socket Set Screw	Steel	Black Oxide
6	Metal gasket	Nitrile Rubber	
7	Cushion rubber (R)	Urethane Rubber	
8	Spacer washer	Stainless Steel	
9	Spacer	Polyamide	
10	Magnet	Plastic	

Part No.	Part Name	Material	Remarks
11	Piston Packing	Nitrile Rubber	
12	Piston	Aluminum Alloy	Chromate
13	Wear Ring	Polyacetal	
14	Cushion rubber (H)	Urethane Rubber	
15	Cylinder Body	Aluminum Alloy	Hard Anodized
16	Cover	ø20: Stainless Steel ø32 to 50: Aluminum Alloy	ø32 to ø50: Anodized
17	Non-rotating spacer	Steel	Nickel Plating
18	Hexagon Socket Set Screw	Steel	Black Oxide

For maintenance parts, please visit the CKD Equipment Product Site (https: //www.ckd.co.jp/kiki/en/) → "model No." → Maintenance Parts.

MEMO

Special
MVC
STK
MCP
GLC
BBS
NHS
HR
LN
Cylinder Switch
Ending

Stopper Cylinder, Single Acting, Retraction Type,
Rod End Shape Chamfered Type

STK-MY Series

● Bore Size: ø20, ø32, ø40, ø50

Circuit Diagram Code

Single Acting, Retracting Type

RoHS

Model No. Notation

Without Switch
(Built-in magnet for switch)

STK-MY – 20 – ( ) – 10 ——— N11

Model No. ❶ ❷ ❸ ❻

With Switch
(Built-in magnet for switch)

STK-MY – 20 – ( ) – 10 – T0H – R – N11

Model No. ❶Bore Size ❷Piping thread type ❸Stroke ❹Switch Model ❺Number of Switches ❻Option

❶ Bore Size (mm)

Code	Content
20	ø20
32	ø32
40	ø40
50	ø50

❷Piping thread type

Code	Content
Blank	M5 (ø20)
	Rc thread (ø32 to ø50)
NN	NPT thread (ø32 or more) (Custom product)
GN	G thread (ø32 or more) (Custom product)

❸Stroke (mm)

Bore Size	Stroke
ø20	10 to 20
ø32	10 to 20
ø40	20 to 30
ø50	20 to 30

Note: For Standard Stroke and minimum stroke with switch, please refer to P. 958.

❹Switch Model No.

For switch details, refer to P. 1457. Switches are shipped with the product.

Contact	Indicator LED Special Function	Wiring (Output)	Load Voltage (V) AC	Load Voltage (V) DC	Load Current (mA) AC	Load Current (mA) DC	Lead wire *1 Straight	Lead wire *1 L-shape	
Solid State	1-Color	2-wire	85 to 265	—	5 to 100	—	T1H□	T1V□	
			—	10 to 30	—	5 to 20 *2	T2H□	T2V□	
		3-wire (NPN)	—	30 or less	—	100 or less	T3H□	T3V□	
		3-wire (PNP)	—		—		T3PH□	T3PV□	
	2-Color	2-wire	—	24 ± 10%	—	5 to 20	T2WH□	T2WV□	
		3-wire (NPN)	—	30 or less	—	50 or less	T3WH□	T3WV□	
	2-Color Water Resistance Improved	2-wire	—	24 ± 10%	—	5 to 20	T2WLH□	T2WLV□	*3
	1-Color Off-Delay Type		—	10 to 30	—	5 to 20 *2	T2JH□	T2JV□	
	1-Color Flexible Lead Wire Type		—	10 to 30	—	5 to 20 *2	T2HR3	T2VR3	
Reed	1-Color	2-wire	110	12/24	7 to 20	5 to 50	T0H□	T0V□	
	Without Indicator Lamp		110	5/12/24	20 or less	50 or less	T5H□	T5V□	
	1-Color		110/220	12/24	7 to 20 / 7 to 10	5 to 50	T8H□	T8V□	

*5

*1: For "□" in the switch Model No., enter the code selected from the "*Lead wire length, connector specification" table.
*2: The maximum load current value above, 20 mA, is at 25°C. If the switch operating Ambient Temperature is higher than 25°C, it will be lower than 20 mA. (At 60°C, it will be 5 to 10 mA.)
*3: This does not guarantee the water resistance of the cylinder.
*4: Switches other than the Model No.s listed above are also available. (Custom Product) For details, refer to P. 1457.

*** Lead wire length, connector specification**

Code	Content
Blank	1 m (Standard)
3	3 m (Option)
5	5 m (Option)
W	M8 Connector, 1PIN (+), 4PIN (−) Lead Wire 0.3 m

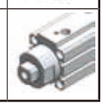
*5: Only T2WLH and T2WLV can be selected.

Example) Lead wire length
1 m T0H
3 m T0H3
5 m T0H5

❺Number of Switches

Code	Content
R	With 1 pc on rod side
H	With 1 pc on head side
D	With 2 pcs

❻ Option

Code	Content	
Blank	Rod End without thread	
N11	With Rod End female thread	

Switch Single Unit Model No. Notation

SW – T0H

❹ Switch Model

Specifications

Item		STK-MY			
Bore Size	mm	ø20	ø32	ø40	ø50
Operation type		Single Acting, Retracting Type			
Operating Fluid		Compressed Air			
Max Operating Pressure	MPa	1.0			
Min Operating Pressure	MPa	0.22	0.12		
Proof Pressure	MPa	1.6			
Ambient Temperature	°C	-10 to 60 (however, no freezing)			
Port Size		M5	Rc1/8		Rc1/4
Stroke tolerance	mm	+2.0 0			
Operating Piston Speed	mm/s	50 to 500			
Cushion		With Rubber Cushion			
Lubrication		Not required (Use Turbine Oil Class 1 ISO VG32 if lubricated)			
Rod End shape		Chamfered type			
Allowable Absorbed Energy	J	Refer to P. 986.			

Stroke

Bore Size (mm)	Stroke (mm)	Maximum Stroke (mm)	Min Stroke (mm)	Minimum stroke with switch (mm)	
				T2WL	Other switches
ø20	10, 15, 20	20	10	20	10
ø32					
ø40	20, 25, 30	30	20	20	20
ø50					

Note: Strokes other than Standard Strokes are custom products.

Spring Load

(Unit: N)

Bore Size (mm)	Stroke (mm)	At 0 Stroke	At Full Stroke Operation
ø20	10	11.5	14.7
	15	9.9	
	20	8.2	
ø32	10	24.5	31.4
	15	21.1	
	20	17.6	
ø40	20	29.0	44.4
	25	25.3	
	30	21.5	
ø50	20	55.4	84.8
	25	48.0	
	30	40.7	

Cylinder Weight Table

(Unit: g)

Stroke / Bore Size	10	15	20	25	30	Switch Weight (Grommet)
ø20	218	233	247	—	—	Refer to the mass
ø32	457	482	507	—	—	listed in the Switch
ø40	-	—	812	853	894	Specifications on P.
ø50	-	—	1302	1328	1354	1457.

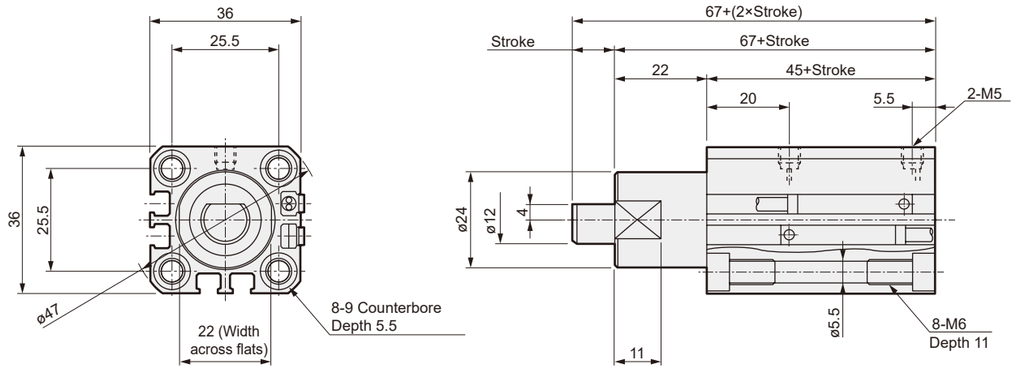
Theoretical Thrust Table

(Unit: N)

Bore Size (mm)	Operating Pressure MPa								
	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
ø20	-	45.6	65.7	85.8	1.06×10^2	1.26×10^2	1.46×10^2	1.66×10^2	1.86×10^2
ø32	66.6	1.16×10^2	1.65×10^2	2.14×10^2	2.63×10^2	3.12×10^2	3.61×10^2	4.10×10^2	4.59×10^2
ø40	1.09×10^2	1.85×10^2	2.62×10^2	3.38×10^2	4.15×10^2	4.92×10^2	5.68×10^2	6.45×10^2	7.21×10^2
ø50	1.67×10^2	2.92×10^2	4.18×10^2	5.44×10^2	6.69×10^2	7.95×10^2	9.21×10^2	1.05×10^3	1.17×10^3

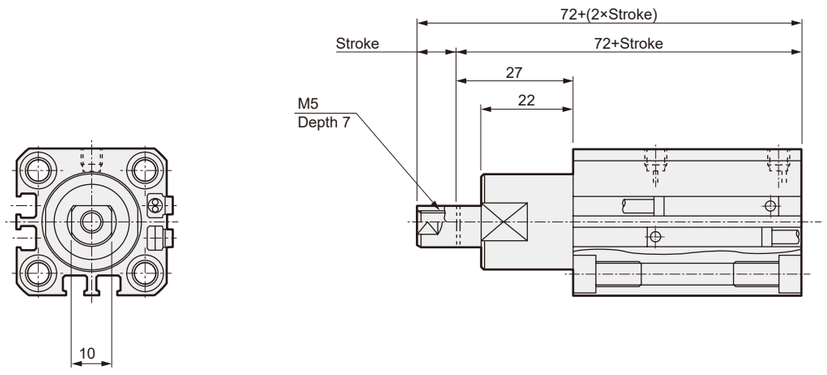
Dimensional Drawings

● STK-MY-20



Note: For dimensions with each switch, please refer to P. 984.

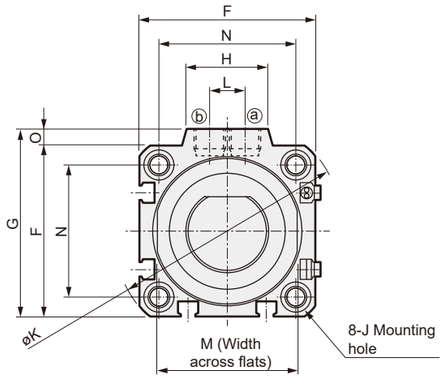
● STK-MY-20-N11 (Dimensions other than displayed dimensions are the same as those of the above (STK-MY-20).)

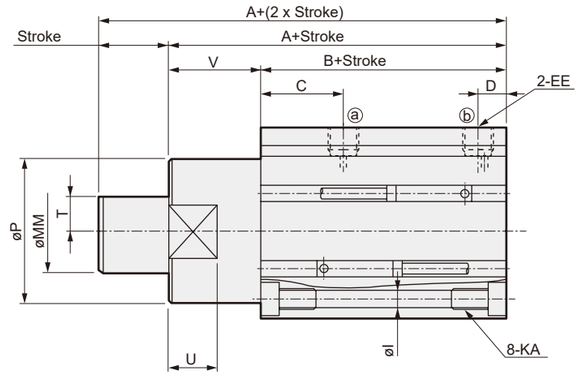


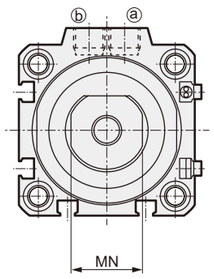
Note: For dimensions with each switch, please refer to P. 984.

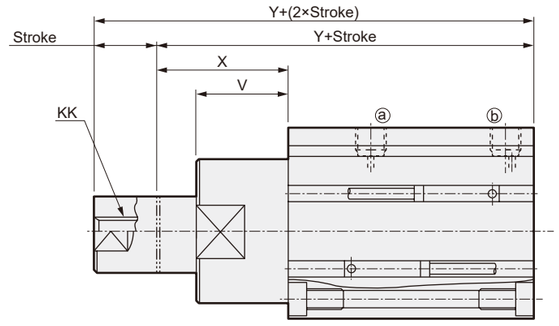
Dimensional Drawings

● STK-MY-32/40/50







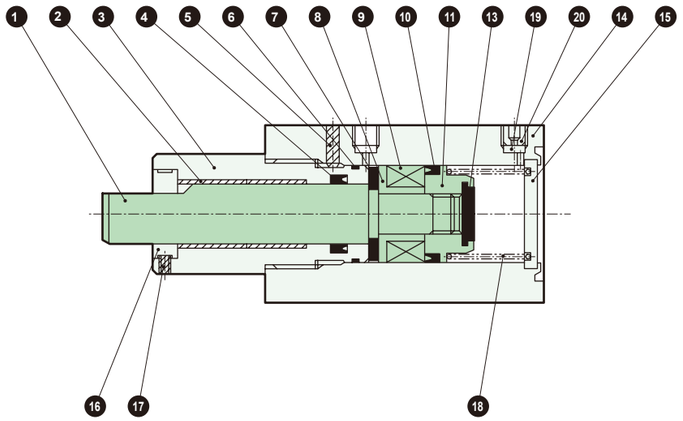


Code / Bore Size	A	B	C	D	EE	F	G	H	I	J	K	KA	KK	L	M	MM	MN	N	O	P	T	U	V	X	Y
ø32	68	48	20	8	Rc1/8	45	49.5	24	5.5	9 Counterbore Depth 5.5	60	M6 Depth 11	M8 Depth 13	10	32	20	17	34	4.5	36	8	13	20	30	78
ø40	80.5	52.5	24.5	8.5	Rc1/8	52	57	24	5.5	9 Counterbore Depth 5.5	69	M6 Depth 11	M8 Depth 13	10	41	25	22	40	5	44	10	15	28	38	90.5
ø50	82	54	24.5	10.5	Rc1/4	64	71	33	6.9	11 Counterbore Depth 6.5	86	M8 Depth 13	M10 Depth 15	15	50	30	27	50	7	56	12	15	28	43	97

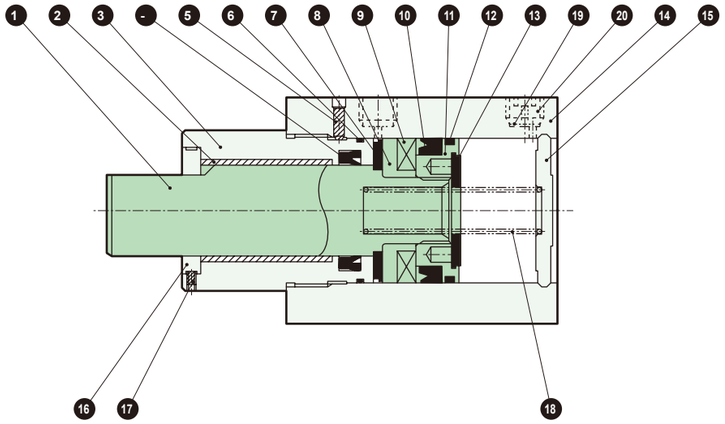
Note: For dimensions with each switch, please refer to P. 984.

Internal Structure / Materials

● STK-MY-20



● STK-MY-32/40/50



Part No.	Part Name	Material	Remarks
1	Piston Rod	Stainless Steel	Industrial Hard Chrome Plating
2	Bushing	Bearing Alloy	
3	Rod Cover	Aluminum Alloy	Alumite
4	Rod Packing	Nitrile Rubber	
5	Hexagon Socket Set Screw	Steel	Black Oxide
6	Metal gasket	Nitrile Rubber	
7	Cushion rubber (R)	Urethane Rubber	
8	Spacer	Aluminum Alloy	
9	Magnet	Plastic	Chromate
10	Piston Packing	Nitrile Rubber	
11	Piston	Aluminum Alloy	Chromate

Part No.	Part Name	Material	Remarks
12	Wear Ring	Polyacetal	
13	Cushion rubber (H)	Urethane Rubber	
14	Cylinder Body	Aluminum Alloy	Hard Anodized
15	Cover	ø20: Steel ø32 to 50: Aluminum Alloy	ø20: Zinc plating ø32 to ø50: Anodized
16	Non-rotating spacer	Steel	Nickel Plating
17	Hexagon Socket Set Screw	Steel	Black Oxide
18	Coil Spring	Piano Wire	Electrodeposition Coating
19	Stainless Steel Wire Mesh	Stainless Steel	
20	Plug	Stainless Steel	

For maintenance parts, please visit the CKD Equipment Product Site (https: //www.ckd.co.jp/kiki/en/) → "model No." → Maintenance Parts.

MEMO

Special
MVC
STK
MCP
GLC
BBS
NHS
HR
LN
Cylinder Switch
Ending

Stopper Cylinder, Double Acting, Spring Loaded Type, Rod End Shape Chamfered Type

STK-MY1 Series

● Bore Size: ø20, ø32, ø40, ø50

Circuit Diagram Code

Double Acting, spring loaded type

RoHS

Model No. Notation

Without Switch
(Built-in magnet for switch)

STK-MY1 - 20 ( ) - 10 ——— N11

Model No. ❶ ❷ ❸ ❻

With Switch
(Built-in magnet for switch)

STK-MY1 - 20 ( ) - 10 - T0H - R - N11

Model No. ❶Bore Size ❷Piping thread type ❸Stroke ❹Switch Model No. ❺Number of Switches ❻Option

❶ Bore Size (mm)

Code	Content
20	ø20
32	ø32
40	ø40
50	ø50

❷Piping thread type

Code	Content
Blank	M5 (ø20)
	Rc thread (ø32 to ø50)
NN	NPT thread (ø32 or more) (Custom product)
GN	G thread (ø32 or more) (Custom product)

❸Stroke (mm)

Bore Size	Stroke
ø20	10 to 20
ø32	10 to 20
ø40	20 to 30
ø50	20 to 30

Note: For Standard Stroke and minimum stroke with switch, please refer to P. 966.

❹Switch Model No.

For switch details, refer to P. 1457. Switches are shipped with the product.

Contact	Indicator LED Special Function	Wiring (Output)	Load Voltage (V) AC	Load Voltage (V) DC	Load Current (mA) AC	Load Current (mA) DC	Lead wire *1 Straight	Lead wire *1 L-shape	
Solid State	1-Color	2-wire	85 to 265	—	5 to 100	—	T1H□	T1V□	
			—	10 to 30	—	5 to 20 *2	T2H□	T2V□	
		3-wire (NPN)	—	30 or less	—	100 or less	T3H□	T3V□	
		3-wire (PNP)	—		—		T3PH□	T3PV□	
	2-Color	2-wire	—	24 ± 10%	—	5 to 20	T2WH□	T2WV□	
		3-wire (NPN)	—	30 or less	—	50 or less	T3WH□	T3WV□	
	2-Color Improved Water Resistance	2-wire	—	24 ± 10%	—	5 to 20	T2WLH□	T2WLV□	*3
	1-Color Off-Delay Type		—	10 to 30	—	5 to 20 *2	T2JH□	T2JV□	
	1-Color Flexible Lead Wire Type		—	10 to 30	—	5 to 20 *2	T2HR3	T2VR3	
Reed	1-Color	2-wire	110	12/24	7 to 20	5 to 50	T0H□	T0V□	
	Without Indicator Lamp		110	5/12/24	20 or less	50 or less	T5H□	T5V□	
	1-Color		110/220	12/24	7 to 20 / 7 to 10	5 to 50	T8H□	T8V□	

*1: For "□" in the switch Model No., enter the code selected from the "*Lead wire length, connector specification" table.
*2: The maximum load current value above, 20 mA, is at 25°C. If the switch operating Ambient Temperature is higher than 25°C, it will be lower than 20 mA. (At 60°C, it will be 5 to 10 mA.)
*3: This does not guarantee the water resistance of the cylinder.
*4: Switches other than the Model No. listed above are also available. (Custom Product) For details, refer to P. 1457.

*Lead wire length, connector specification

Code	Content
Blank	1 m (Standard)
3	3 m (Option)
5	5 m (Option)
W	M8 Connector, 1PIN (+), 4PIN (−) Lead Wire 0.3 m

*5

*5: Only T2WLH and T2WLV can be selected.

Example) Lead wire length
1 m T0H
3 m T0H3
5 m T0H5

❺Number of Switches

Code	Content
R	With 1 pc on rod side
H	With 1 pc on head side
D	With 2 pcs

❻ Option

Code	Content	
Blank	Rod End without thread	
N11	With Rod End female thread	

Switch Single Unit Model No. Notation

SW - T0H

❹ Switch Model

Specifications

Item		STK-MY1			
Bore Size	mm	ø20	ø32	ø40	ø50
Operation type		Double Acting spring loaded type			
Operating Fluid		Compressed Air			
Max Operating Pressure	MPa	1.0			
Min Operating Pressure	MPa	0.22	0.12		
Proof Pressure	MPa	1.6			
Ambient Temperature	°C	-10 to 60 (however, no freezing)			
Port Size		M5	Rc1/8		Rc1/4
Stroke tolerance	mm	+2.0 0			
Operating Piston Speed	mm/s	50 to 500			
Cushion		With Rubber Cushion			
Lubrication		Not required (Use Turbine Oil Class 1 ISO VG32 if lubricated)			
Rod End shape		Chamfered type			
Allowable Absorbed Energy	J	Refer to P. 986.			

Stroke

Bore Size (mm)	Stroke (mm)	Maximum Stroke (mm)	Min Stroke (mm)	Minimum stroke with switch (mm)	
				T2WL	Other switches
ø20	10, 15, 20	20	10	20	10
ø32					
ø40	20, 25, 30	30	20	20	20
ø50					

Note: Strokes other than Standard Strokes are custom products.

Spring Load

(Unit: N)

Bore Size (mm)	Stroke (mm)	At 0 Stroke	At Full Stroke Operation
ø20	10	11.5	14.7
	15	9.9	
	20	8.2	
ø32	10	24.5	31.4
	15	21.1	
	20	17.6	
ø40	20	29.0	44.4
	25	25.3	
	30	21.5	
ø50	20	55.4	84.8
	25	48.0	
	30	40.7	

Cylinder Weight

(Unit: g)

Stroke / Bore Size	10	15	20	25	30	Switch Weight (Grommet)
ø20	218	233	247	—	—	Refer to the mass listed in the Switch Specifications on P. 1457.
ø32	457	482	507	—	—	
ø40	-	—	812	853	894	
ø50	-	—	1302	1328	1354	

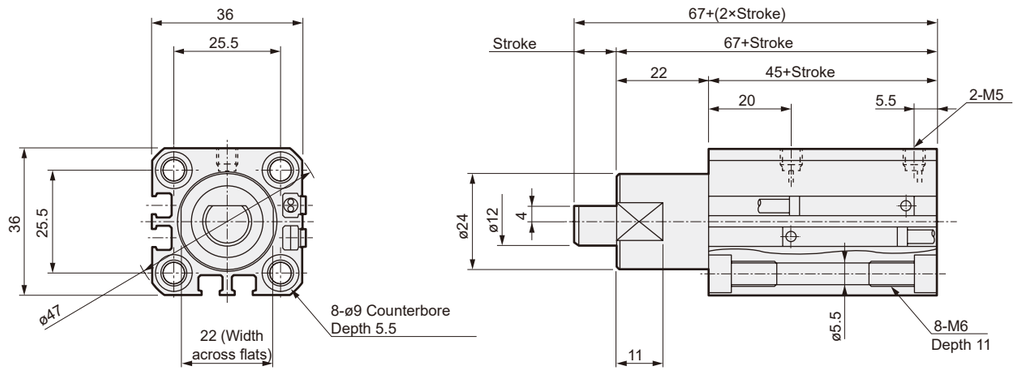
Theoretical Thrust Table

(Unit: N)

Bore Size (mm)	Operating Direction	Operating Pressure MPa									
		0.15	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
ø20	Push	-	-	94.2	1.26×10^2	1.57×10^2	1.88×10^2	2.20×10^2	2.51×10^2	2.83×10^2	3.14×10^2
	Pull	-	-	45.6	65.7	85.8	1.06×10^2	1.26×10^2	1.46×10^2	1.66×10^2	1.86×10^2
ø32	Push	1.21×10^2	1.61×10^2	2.41×10^2	3.22×10^2	4.02×10^2	4.83×10^2	5.63×10^2	6.43×10^2	7.24×10^2	8.04×10^2
	Pull	42.1	66.6	1.16×10^2	1.65×10^2	2.14×10^2	2.63×10^2	3.12×10^2	3.61×10^2	4.10×10^2	4.59×10^2
ø40	Push	1.88×10^2	2.51×10^2	3.77×10^2	5.03×10^2	6.28×10^2	7.54×10^2	8.80×10^2	1.01×10^3	1.13×10^3	1.26×10^3
	Pull	70.5	1.09×10^2	1.85×10^2	2.62×10^2	3.38×10^2	4.15×10^2	4.92×10^2	5.68×10^2	6.45×10^2	7.21×10^2
ø50	Push	2.95×10^2	3.93×10^2	5.89×10^2	7.85×10^2	9.82×10^2	1.18×10^3	1.37×10^3	1.57×10^3	1.77×10^3	1.96×10^3
	Pull	1.04×10^2	1.67×10^2	2.92×10^2	4.18×10^2	5.44×10^2	6.69×10^2	7.95×10^2	9.21×10^2	1.05×10^3	1.17×10^3

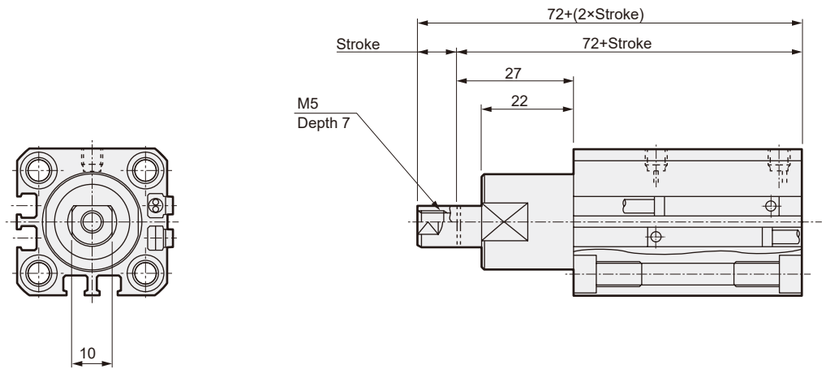
Dimensional Drawings

● STK-MY1-20



Note: For dimensions with each switch, please refer to P. 984.

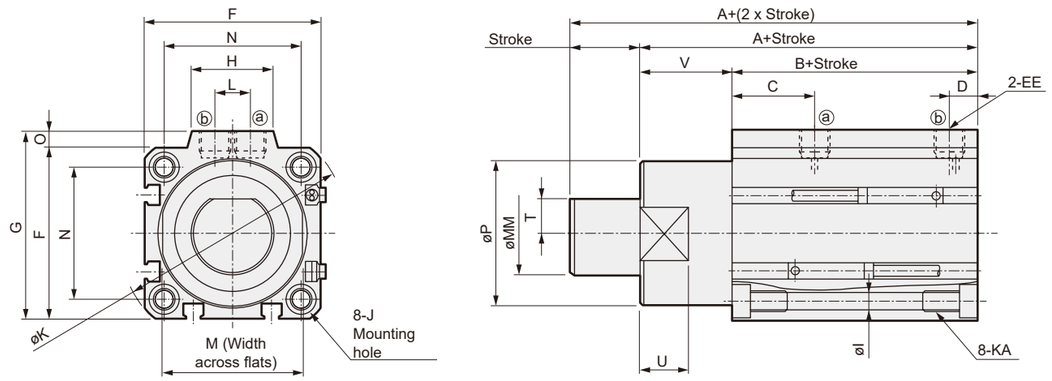
● STK-MY1-20-N11 (Dimensions other than displayed dimensions are the same as those of the above (STK-MY1-20).)



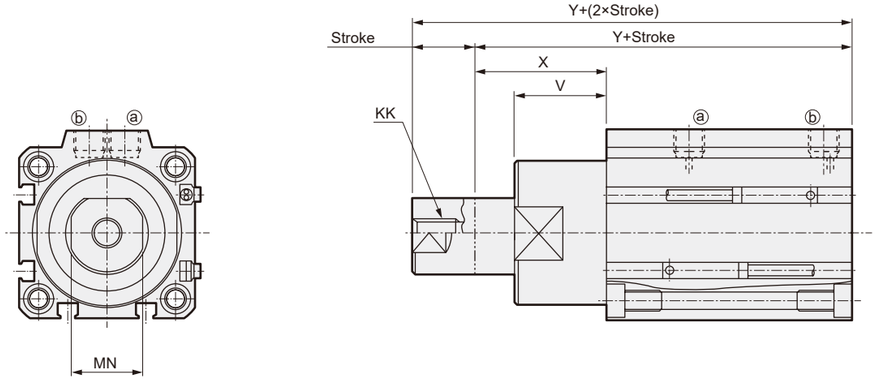
Note: For dimensions with each switch, please refer to P. 984.

Dimensional Drawings

● STK-MY1-32/40/50



● STK-MY1-32/40/50-N11 (Dimensions other than displayed dimensions are the same as those of the above (STK-MY1-32/40/50).)

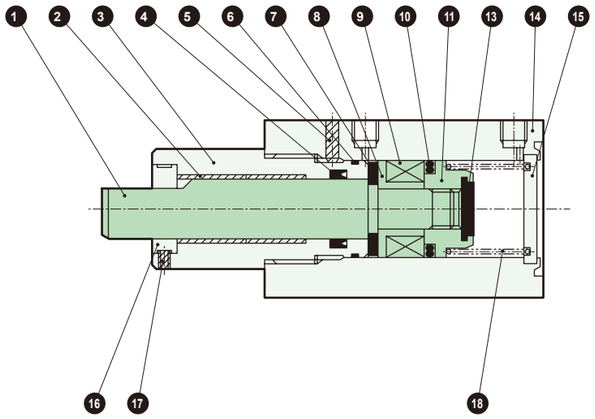


Code / Bore Size	A	B	C	D	EE	F	G	H	I	J	K	KA	KK	L	M	MM	MN	N	O	P	T	U	V	X	Y
ø32	68	48	20	8	Rc1/8	45	49.5	24	5.5	9 Counterbore Depth 5.5	60	M6 Depth 11	M8 Depth 13	10	32	20	17	34	4.5	36	8	13	20	30	78
ø40	80.5	52.5	24.5	8.5	Rc1/8	52	57	24	5.5	9 Counterbore Depth 5.5	69	M6 Depth 11	M8 Depth 13	10	41	25	22	40	5	44	10	15	28	38	90.5
ø50	82	54	24.5	10.5	Rc1/4	64	71	33	6.9	11 Counterbore Depth 6.5	86	M8 Depth 13	M10 Depth 15	15	50	30	27	50	7	56	12	15	28	43	97

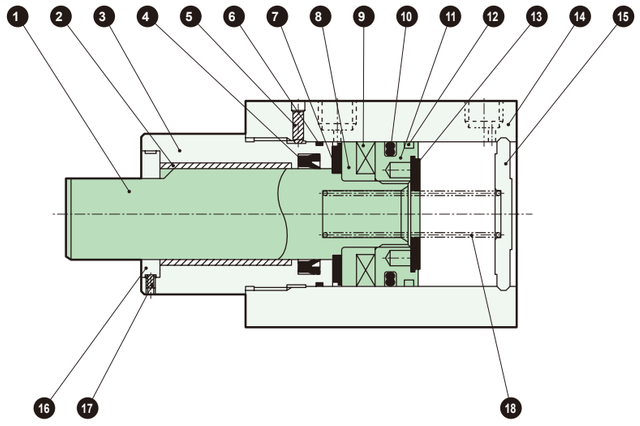
Note: For dimensions with each switch, please refer to P. 984.

Internal Structure / Materials

● STK-MY1-20



● STK-MY1-32/40/50



Part No.	Part Name	Material	Remarks
1	Piston Rod	Stainless Steel	Industrial Hard Chrome Plating
2	Bushing	Bearing Alloy	
3	Rod Cover	Aluminum Alloy	Alumite
4	Rod Packing	Nitrile Rubber	
5	Hexagon Socket Set Screw	Steel	Black Oxide
6	Metal gasket	Nitrile Rubber	
7	Cushion rubber (R)	Urethane Rubber	
8	Spacer	Aluminum Alloy	Chromate
9	Magnet	Plastic	
10	Piston Packing	Nitrile Rubber	

Part No.	Part Name	Material	Remarks
11	Piston	Aluminum Alloy	Chromate
12	Wear Ring	Polyacetal	
13	Cushion rubber (H)	Urethane Rubber	
14	Cylinder Body	Aluminum Alloy	Hard Anodized
15	Cover	ø20: Steel ø32 to 50: Aluminum Alloy	ø20: Zinc plating ø32 to ø50: Anodized
16	Non-rotating spacer	Steel	Nickel Plating
17	Hexagon Socket Set Screw	Steel	Black Oxide
18	Coil Spring	Piano Wire	Electrodeposition Coating

For maintenance parts, please visit the CKD Equipment Product Site (https: //www.ckd.co.jp/kiki/en/) → "model No." → Maintenance Parts.

MEMO

Special
MVC
STK
MCP
GLC
BBS
NHS
HR
LN
Cylinder Switch
Ending

Stopper Cylinder, Single Acting, Retraction Type, Rod End Shape Roller Type

STK-JY Series

● Bore Size: ø20, ø32, ø40, ø50

Circuit Diagram Code

Single Acting, Retracting Type

RoHS

Model No. Notation

Without Switch
(Built-in magnet for switch)

STK-JY - 20 [ ] - 10

Model No. ❶ ❷ ❸

With Switch
(Built-in magnet for switch)

STK-JY - 20 [ ] - 10 - T0H - R

Model No. ❶Bore Size ❷Piping thread type ❸Stroke ❹Switch Model No. ❺Number of Switches

❶ Bore Size (mm)

Code	Content
20	ø20
32	ø32
40	ø40
50	ø50

❷Piping thread type

Code	Content
Blank	M5 (ø20)
	Rc thread (ø32 to ø50)
NN	NPT thread (ø32 or more) (Custom product)
GN	G thread (ø32 or more) (Custom product)

❸Stroke (mm)

Bore Size	Stroke
ø20	10 to 20
ø32	10 to 20
ø40	20 to 30
ø50	20 to 30

Note: For Standard Stroke and minimum stroke with switch, please refer to P. 974.

❹Switch Model No.

For switch details, refer to P. 1457. Switches are shipped with the product.

Contact	Indicator LED Special Function	Wiring (Output)	Load Voltage (V) AC	Load Voltage (V) DC	Load Current (mA) AC	Load Current (mA) DC	Lead wire *1 Straight	Lead wire *1 L-shape	
Solid State	1-Color	2-wire	85 to 265	—	5 to 100	—	T1H□	T1V□	
			—	10 to 30	—	5 to 20 *2	T2H□	T2V□	
		3-wire (NPN)	—	30 or less	—	100 or less	T3H□	T3V□	
		3-wire (PNP)	—		—		T3PH□	T3PV□	
	2-Color	2-wire	—	24 ± 10%	—	5 to 20	T2WH□	T2WV□	
		3-wire (NPN)	—	30 or less	—	50 or less	T3WH□	T3WV□	
	2-Color Improved Water Resistance	2-wire	—	24 ± 10%	—	5 to 20	T2WLH□	T2WLV□	*3
	1-Color Off-Delay Type		—	10 to 30	—	5 to 20 *2	T2JH□	T2JV□	
	1-Color Flexible Lead Wire Type		—	10 to 30	—	5 to 20 *2	T2HR3	T2VR3	
Reed	1-Color	2-wire	110	12/24	7 to 20	5 to 50	T0H□	T0V□	
	No Indicator LED		110	5/12/24	20 or less	50 or less	T5H□	T5V□	
	1-Color		110/220	12/24	7 to 20 / 7 to 10	5 to 50	T8H□	T8V□	

*1: For "□" in the switch Model No., enter the code selected from the "*Lead wire length, connector specification" table.
*2: The maximum load current value above, 20 mA, is at 25°C. If the switch operating Ambient Temperature is higher than 25°C, it will be lower than 20 mA. (At 60°C, it will be 5 to 10 mA.)
*3: This does not guarantee the water resistance of the cylinder.
*4: Switches other than the Model No. listed above are also available. (Custom Product) For details, refer to P. 1457.

*Lead wire length, connector specification

Code	Content
Blank	1 m (Standard)
3	3 m (Option)
5	5 m (Option)
W	M8 Connector, 1PIN (+), 4PIN (−) Lead Wire 0.3 m

*5

*5: Only T2WLH and T2WLV can be selected.

Example) Lead wire length
1 m T0H
3 m T0H3
5 m T0H5

❺Number of Switches

Code	Content
R	With 1 pc on rod side
H	With 1 pc on head side
D	With 2 pcs

Switch Single Unit Model No. Notation

SW - T0H

❹ Switch Model

Specifications

Item		STK-JY			
Bore Size	mm	ø20	ø32	ø40	ø50
Operation type		Single Acting, Retracting Type			
Operating Fluid		Compressed Air			
Max Operating Pressure	MPa	1.0			
Min Operating Pressure	MPa	0.22	0.12		
Proof Pressure	MPa	1.6			
Ambient Temperature	°C	-10 to 60 (however, no freezing)			
Port Size		M5	Rc1/8		Rc1/4
Stroke tolerance	mm	+2.0 0			
Operating Piston Speed	mm/s	50 to 500			
Cushion		With Rubber Cushion			
Lubrication		Not required (Use Turbine Oil Class 1 ISO VG32 if lubricated)			
Rod End shape		Roller type			
Allowable Absorbed Energy	J	Refer to P. 986.			

Stroke

Bore Size (mm)	Stroke (mm)	Maximum Stroke (mm)	Min Stroke (mm)	Minimum stroke with switch (mm)	
				T2WL	Other switches
ø20	10, 15, 20	20	10	20	10
ø32					
ø40	20, 25, 30	30	20	20	20
ø50					

Note: Strokes other than Standard Strokes are custom products.

Spring Load

(Unit: N)

Bore Size (mm)	Stroke (mm)	At 0 Stroke	At Full Stroke Operation
ø20	10	11.5	14.7
	15	9.9	
	20	8.2	
ø32	10	24.5	31.4
	15	21.1	
	20	17.6	
ø40	20	29.0	44.4
	25	25.3	
	30	21.5	
ø50	20	55.4	84.8
	25	48.0	
	30	40.7	

Cylinder Weight

(Unit: g)

Stroke / Bore Size	10	15	20	25	30	Switch Weight (Grommet)
ø20	225	240	254	—	—	Refer to the mass listed in the Switch Specifications on P. 1457.
ø32	482	507	532	—	—	
ø40	-	—	862	903	944	
ø50	-	—	1362	1388	1414	

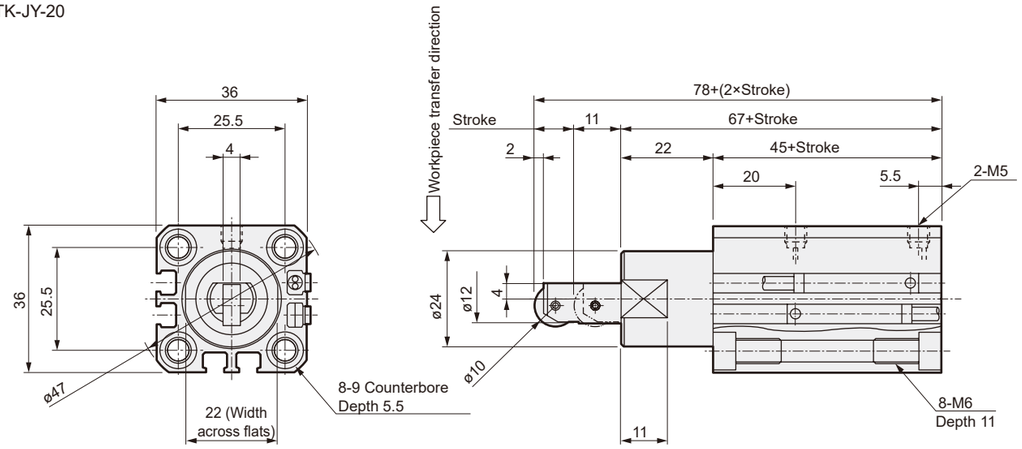
Theoretical Thrust Table

(Unit: N)

Bore Size (mm)	Operating Pressure MPa								
	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
ø20	-	45.6	65.7	85.8	1.06×10^2	1.26×10^2	1.46×10^2	1.66×10^2	1.86×10^2
ø32	66.6	1.16×10^2	1.65×10^2	2.14×10^2	2.63×10^2	3.12×10^2	3.61×10^2	4.10×10^2	4.59×10^2
ø40	1.09×10^2	1.85×10^2	2.62×10^2	3.38×10^2	4.15×10^2	4.92×10^2	5.68×10^2	6.45×10^2	7.21×10^2
ø50	1.67×10^2	2.92×10^2	4.18×10^2	5.44×10^2	6.69×10^2	7.95×10^2	9.21×10^2	1.05×10^3	1.17×10^3

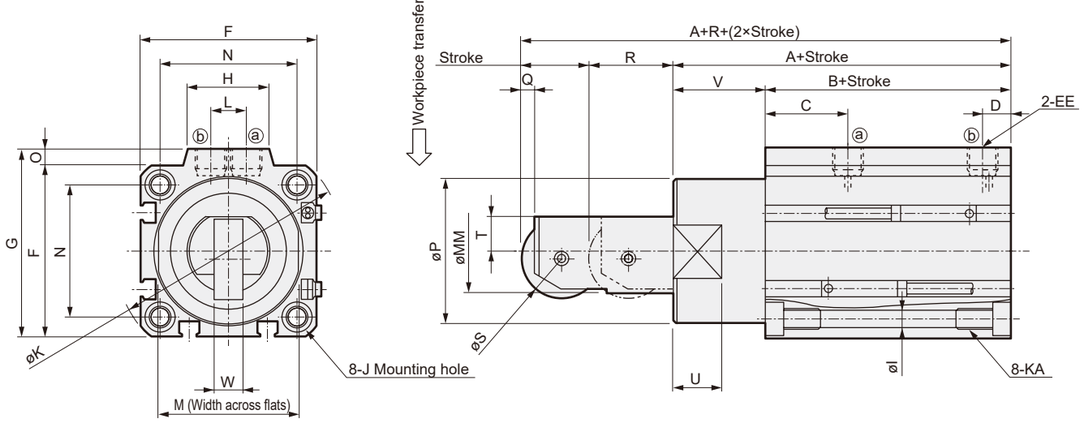
Dimensional Drawings

● STK-JY-20



Note: For dimensions with each switch, please refer to P. 984.

● STK-JY-32/40/50

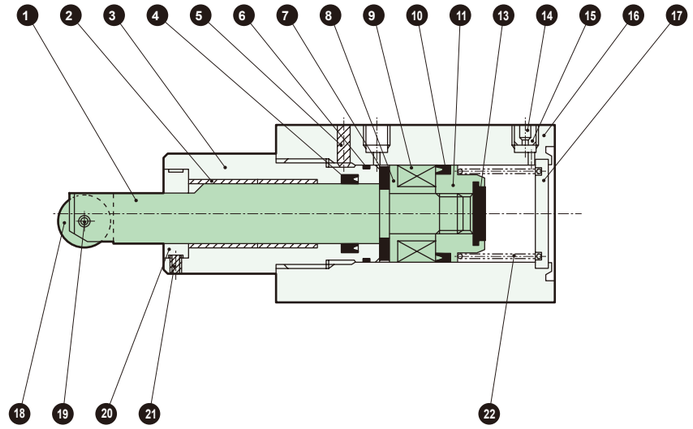


Code / Bore Size	A	B	C	D	EE	F	G	H	I	J	K	KA	L	M	MM	N	O	P	Q	R	S	T	U	V	W
ø32	68	48	20	8	Rc1/8	45	49.5	24	5.5	9 Counterbore Depth 5.5	60	M6 Depth 11	10	32	20	34	4.5	36	3	19	18	8	13	20	8
ø40	80.5	52.5	24.5	8.5	Rc1/8	52	57	24	5.5	9 Counterbore Depth 5.5	69	M6 Depth 11	10	41	25	40	5	44	4	25	24	10	15	28	9
ø50	82	54	24.5	10.5	Rc1/4	64	71	33	6.9	11 Counterbore Depth 6.5	86	M8 Depth 13	15	50	30	50	7	56	4	25	28	12	15	28	10

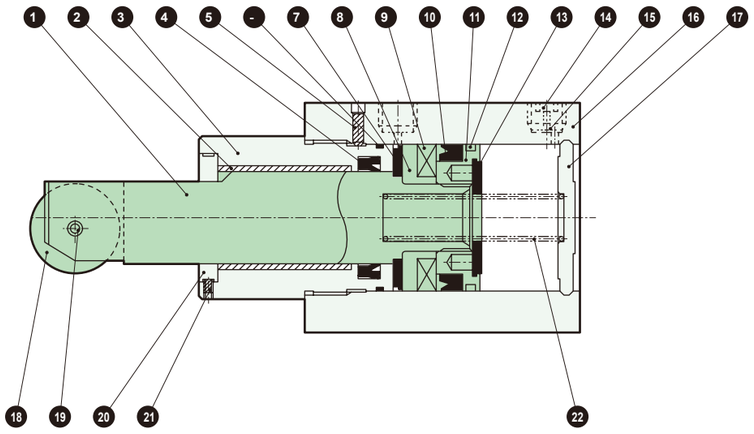
Note: For dimensions with each switch, please refer to P. 984.

Internal Structure / Materials

● STK-JY-20



● STK-JY-32/40/50



Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Piston Rod	Stainless Steel	Industrial Hard Chrome Plating	13	Cushion rubber (H)	Urethane Rubber	
2	Bushing	Bearing Alloy		14	Stainless Steel	Stainless Steel	
3	Rod Cover	Aluminum Alloy	Alumite	15	Plug	Stainless Steel	
4	Rod Packing	Nitrile Rubber		16	Cylinder Body	Aluminum Alloy	Hard Anodized
5	Hexagon Socket Set Screw	Steel	Black Oxide	17	Cover	ø20: Steel	ø20: Zinc plating
6	Metal gasket	Nitrile Rubber				ø32 to 50: Aluminum Alloy	ø32 to ø50: Anodized
7	Cushion rubber (R)	Urethane Rubber		18	Roller	Resin	
8	Spacer	Aluminum Alloy	Chromate	19	Spring Pin	Steel	
9	Magnet	Plastic		20	Non-rotating spacer	Steel	Nickel Plating
10	Piston Packing	Nitrile Rubber		21	Hexagon Socket Set Screw	Steel	Black Oxide
11	Piston	Aluminum Alloy	Chromate	22	Coil Spring	Piano Wire	Electrodeposition Coating
12	Wear Ring	Polyacetal					

For maintenance parts, please visit the CKD Equipment Product Site (https: //www.ckd.co.jp/kiki/en/) → "model No." → Maintenance Parts.

Stopper Cylinder, Double Acting, Spring Loaded Type,
Rod End Shape Roller Type

STK-JY1 Series

● Bore Size: ø20, ø32, ø40, ø50

Circuit Diagram Code

Double Acting, spring loaded type

RoHS

Model No. Notation

Without Switch
(Built-in magnet for switch)

STK-JY1 - 20 [ ] - 10

Model No. ❶ ❷ ❸

With Switch
(Built-in magnet for switch)

STK-JY1 - 20 [ ] - 10 - T0H - R

Model No. ❶Bore Size ❷Piping thread type ❸Stroke ❹Switch Model No. ❺Number of Switches

❶ Bore Size (mm)

Code	Content
20	ø20
32	ø32
40	ø40
50	ø50

❷Piping thread type

Code	Content
Blank	M5 (ø20)
	Rc thread (ø32 to ø50)
NN	NPT thread (ø32 or more) (Custom product)
GN	G thread (ø32 or more) (Custom product)

❸Stroke (mm)

Bore Size	Stroke
ø20	10 to 20
ø32	10 to 20
ø40	20 to 30
ø50	20 to 30

Note: For Standard Stroke and minimum stroke with switch, please refer to P. 980.

❹Switch Model No.

For switch details, refer to P. 1457. Switches are shipped with the product.

Contact	Indicator LED Special Function	Wiring (Output)	Load Voltage (V) AC	Load Voltage (V) DC	Load Current (mA) AC	Load Current (mA) DC	Lead wire *1 Straight	Lead wire *1 L-shape	
Solid State	1-Color	2-wire	85 to 265	—	5 to 100	—	T1H□	T1V□	
			—	10 to 30	—	5 to 20 *2	T2H□	T2V□	
		3-wire (NPN)	—	30 or less	—	100 or less	T3H□	T3V□	
		3-wire (PNP)	—		—		T3PH□	T3PV□	
	2-Color	2-wire	—	24 ± 10%	—	5 to 20	T2WH□	T2WV□	
		3-wire (NPN)	—	30 or less	—	50 or less	T3WH□	T3WV□	
	2-Color Improved Water Resistance	2-wire	—	24 ± 10%	—	5 to 20	T2WLH□	T2WLV□	*3
	1-Color Off-Delay Type		—	10 to 30	—	5 to 20 *2	T2JH□	T2JV□	
	1-Color Flexible Lead Wire Type		—	10 to 30	—	5 to 20 *2	T2HR3	T2VR3	
Reed	1-Color	2-wire	110	12/24	7 to 20	5 to 50	T0H□	T0V□	
	Without Indicator Lamp		110	5/12/24	20 or less	50 or less	T5H□	T5V□	
	1-Color		110/220	12/24	7 to 20 / 7 to 10	5 to 50	T8H□	T8V□	

*1: For "□" in the switch Model No., enter the code selected from the "Lead wire length, connector specification" table.
*2: The maximum load current value above, 20 mA, is at 25°C. If the switch operating Ambient Temperature is higher than 25°C, it will be lower than 20 mA. (At 60°C, it will be 5 to 10 mA.)
*3: This does not guarantee the water resistance of the cylinder.
*4: Switches other than the Model No. listed above are also available. (Custom Product) For details, refer to P. 1457.

*Lead wire length, connector specification

Code	Content
Blank	1 m (Standard)
3	3 m (Option)
5	5 m (Option)
W	M8 Connector, 1PIN (+), 4PIN (−) Lead Wire 0.3 m

*5

*5: Only T2WLH and T2WLV can be selected.

Example) Lead wire length
1 m T0H
3 m T0H3
5 m T0H5

❺Number of Switches

Code	Content
R	With 1 pc on rod side
H	With 1 pc on head side
D	With 2 pcs

Switch Single Unit Model No. Notation

SW - T0H

❹ Switch Model

Specifications

Item		STK-JY1			
Bore Size	mm	ø20	ø32	ø40	ø50
Operation type		Double Acting spring loaded type			
Operating Fluid		Compressed Air			
Max Operating Pressure	MPa	1.0			
Min Operating Pressure	MPa	0.22	0.12		
Proof Pressure	MPa	1.6			
Ambient Temperature	°C	-10 to 60 (however, no freezing)			
Port Size		M5	Rc1/8		Rc1/4
Stroke tolerance	mm	+2.0 0			
Operating Piston Speed	mm/s	50 to 500			
Cushion		With Rubber Cushion			
Lubrication		Not required (Use Turbine Oil Class 1 ISO VG32 if lubricated)			
Rod End shape		Roller type			
Allowable Absorbed Energy	J	Refer to P. 986.			

Stroke

Bore Size (mm)	Stroke (mm)	Max Stroke (mm)	Min Stroke (mm)	Min stroke with switch (mm)	
				T2WL	Other switches
ø20	10, 15, 20	20	10	20	10
ø32					
ø40	20, 25, 30	30	20	20	20
ø50					

Note: Strokes other than Standard Strokes are custom products.

Spring Load

(Unit: N)

Bore Size (mm)	Stroke (mm)	At 0 Stroke	At Full Stroke Operation
ø20	10	11.5	14.7
	15	9.9	
	20	8.2	
ø32	10	24.5	31.4
	15	21.1	
	20	17.6	
ø40	20	29.0	44.4
	25	25.3	
	30	21.5	
ø50	20	55.4	84.8
	25	48.0	
	30	40.7	

Cylinder Weight Table

(Unit: g)

Stroke / Bore Size	10	15	20	25	30	Switch Weight (Grommet)
ø20	225	240	254	—	—	Refer to the mass listed in the Switch Specifications on P. 1457.
ø32	482	507	532	—	—	
ø40	-	—	862	903	944	
ø50	-	—	1362	1388	1414	

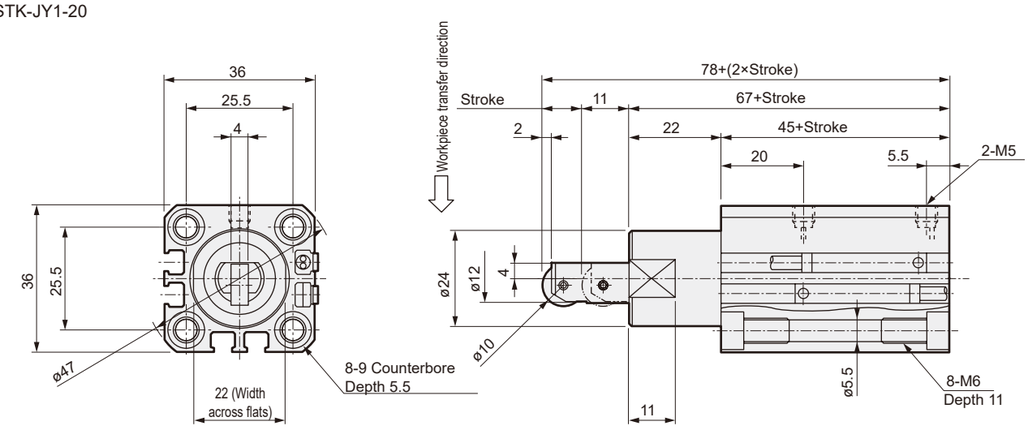
Theoretical Thrust Table

(Unit: N)

Bore Size (mm)	Operating Direction	Operating Pressure MPa									
		0.15	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
ø20	Push	-	-	94.2	1.26×10^2	1.57×10^2	1.88×10^2	2.20×10^2	2.51×10^2	2.83×10^2	3.14×10^2
	Pull	-	-	45.6	65.7	85.8	1.06×10^2	1.26×10^2	1.46×10^2	1.66×10^2	1.86×10^2
ø32	Push	1.21×10^2	1.61×10^2	2.41×10^2	3.22×10^2	4.02×10^2	4.83×10^2	5.63×10^2	6.43×10^2	7.24×10^2	8.04×10^2
	Pull	42.1	66.6	1.16×10^2	1.65×10^2	2.14×10^2	2.63×10^2	3.12×10^2	3.61×10^2	4.10×10^2	4.59×10^2
ø40	Push	1.88×10^2	2.51×10^2	3.77×10^2	5.03×10^2	6.28×10^2	7.54×10^2	8.80×10^2	1.01×10^3	1.13×10^3	1.26×10^3
	Pull	70.5	1.09×10^2	1.85×10^2	2.62×10^2	3.38×10^2	4.15×10^2	4.92×10^2	5.68×10^2	6.45×10^2	7.21×10^2
ø50	Push	2.95×10^2	3.93×10^2	5.89×10^2	7.85×10^2	9.82×10^2	1.18×10^3	1.37×10^3	1.57×10^3	1.77×10^3	1.96×10^3
	Pull	1.04×10^2	1.67×10^2	2.92×10^2	4.18×10^2	5.44×10^2	6.69×10^2	7.95×10^2	9.21×10^2	1.05×10^3	1.17×10^3

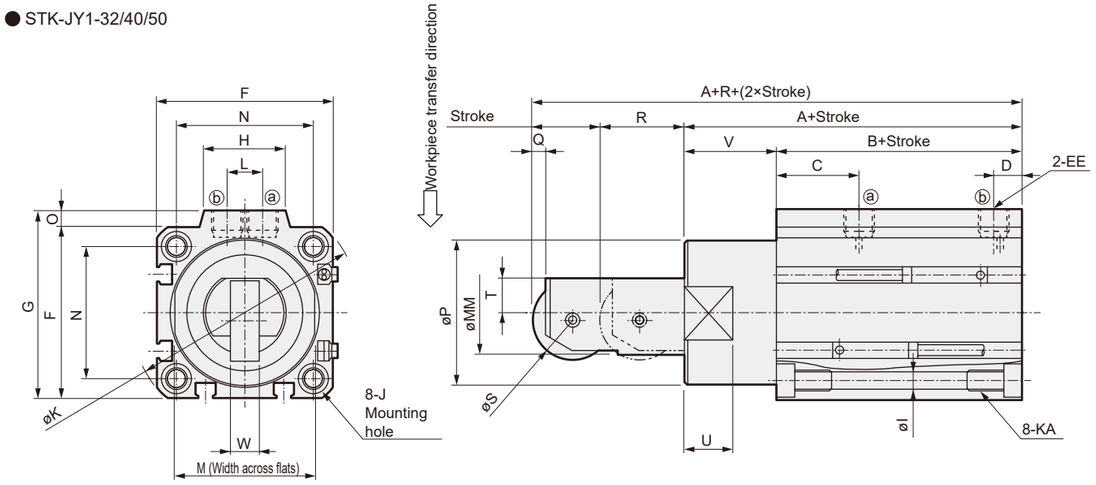
Dimensional Drawings

● STK-JY1-20



Note: For dimensions with each switch, please refer to P. 984.

● STK-JY1-32/40/50

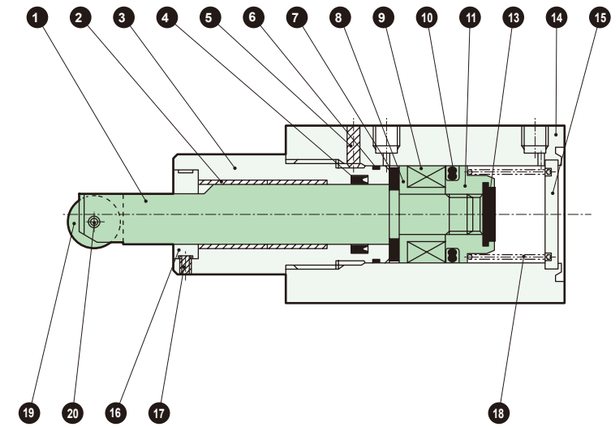


Code / Bore Size	A	B	C	D	EE	F	G	H	I	J	K	KA	L	M	MM	N	O	P	Q	R	S	T	U	V	W
ø32	68	48	20	8	Rc1/8	45	49.5	24	5.5	9 Counterbore Depth 5.5	60	M6 Depth 11	10	32	20	34	4.5	36	3	19	18	8	13	20	8
ø40	80.5	52.5	24.5	8.5	Rc1/8	52	57	24	5.5	9 Counterbore Depth 5.5	69	M6 Depth 11	10	41	25	40	5	44	4	25	24	10	15	28	9
ø50	82	54	24.5	10.5	Rc1/4	64	71	33	6.9	11 Counterbore Depth 6.5	86	M8 Depth 13	15	50	30	50	7	56	4	25	28	12	15	28	10

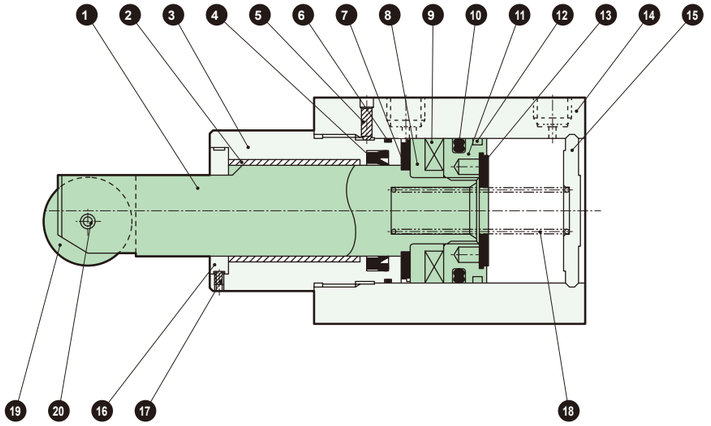
Note: For dimensions with each switch, please refer to P. 984.

Internal Structure / Materials

● STK-JY1-20



● STK-JY1-32/40/50

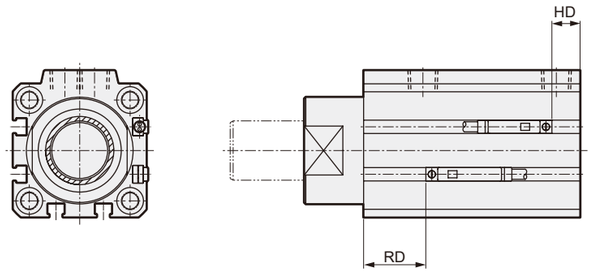


Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Piston Rod	Stainless Steel	Industrial Hard Chrome Plating	12	Wear Ring	Polyacetal	
2	Bushing	Bearing Alloy		13	Cushion rubber (H)	Urethane Rubber	
3	Rod Cover	Aluminum Alloy	Alumite	14	Cylinder Body	Aluminum Alloy	Hard Anodized
4	Rod Packing	Nitrile Rubber		15	Cover	ø20: Steel	ø20: Zinc plating
5	Hexagon Socket Set Screw	Steel	Black Oxide			ø32 to 50: Aluminum Alloy	ø32 to ø50: Anodized
6	Metal gasket	Nitrile Rubber		16	Non-rotating spacer	Steel	Nickel Plating
7	Cushion rubber (R)	Urethane Rubber		17	Hexagon Socket Set Screw	Steel	Black Oxide
8	Spacer	Aluminum Alloy	Chromate	18	Coil Spring	Piano Wire	Electrodeposition Coating
9	Magnet	Plastic		19	Roller	Resin	
10	Piston Packing	Nitrile Rubber		20	Spring Pin	Steel	
11	Piston	Aluminum Alloy	Chromate				

For maintenance parts, please visit the CKD Equipment Product Site (https: //www.ckd.co.jp/kiki/en/) → "model No." → Maintenance Parts.

STK Series External Dimensions Diagram with Switch

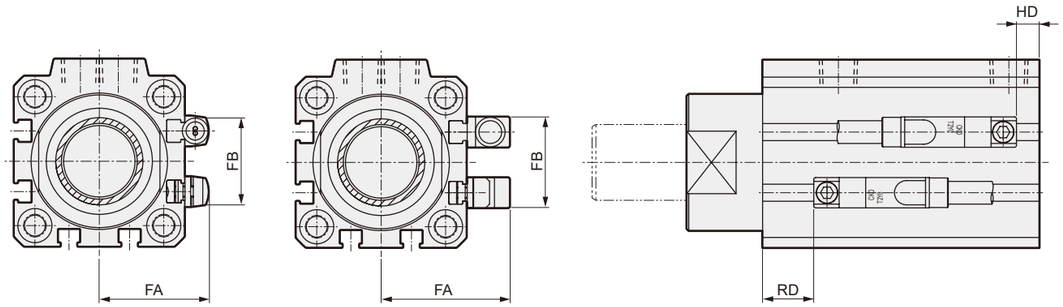
● T0, T5, T2, T3, T3P, T2□R3, T2W, T3W, T2WL



Code	STK, STK-M								STK-Y□, STK-MY□, STK-JY□							
	T0, T5, T2, T3, T3P, T2□R3				T2W, T3W, T2WL				T0, T5, T2, T3, T3P, T2□R3				T2W, T3W, T2WL			
Bore Size (mm)	FA	FB	RD	HD	FA	FB	RD	HD	FA	FB	RD	HD	FA	FB	RD	HD
ø20	18.5	12.5	21	5.5	18.5	12.5	23	7.5	18.5	12.5	19.5	7	18.5	12.5	21.5	9
ø32	23	20.5	21	9.5	23	20.5	23	11.5	23	20.5	20	10.5	23	20.5	22	12.5
ø40	26.5	27.5	24	10.5	26.5	27.5	26	12.5	26.5	27.5	23	11.5	26.5	27.5	25	1.5
ø50	32.5	28.5	24	11.5	32.5	28.5	26	13.5	32.5	28.5	23	12.5	32.5	28.5	25	14.5

Note: For switch mountability, refer to the Model No. display method for each variation.

● T8,T2J,T1,T2YD,T2YDT



[For T8, T2J] [For T1, T2YD, T2YDT]

Code	STK, STK-M											
	T8				T2J				T1,T2YD,T2YDT			
Bore Size (mm)	FA	FB	RD	HD	FA	FB	RD	HD	FA	FB	RD	HD
ø20	24.3	16	15	0	24.3	16	20	4.5	29.3	16	20	4.5
ø32	28.8	24	15	3.5	28.8	24	20	8.5	33.8	24	20	8.5
ø40	32.3	31	18	4.5	32.3	31	23	9.5	37.3	31	23	9.5
ø50	38.3	32	18	5.5	38.3	32	23	10.5	43.3	32	23	10.5
Code	**STK-Y□, STK-MY□, STK-JY□**											
	T8				T2J				T1,T2YD,T2YDT			
Bore Size (mm)	FA	FB	RD	HD	FA	FB	RD	HD	FA	FB	RD	HD
ø20	24.3	16	13.5	1	24.3	16	18.5	6	29.3	16	18.5	6
ø32	28.8	24	14	4.5	28.8	24	19	9.5	33.8	24	19	9.5
ø40	32.3	31	17	5.5	32.3	31	22	10.5	37.3	31	22	10.5
ø50	38.3	32	17	6.5	38.3	32	22	11.5	43.3	32	22	11.5

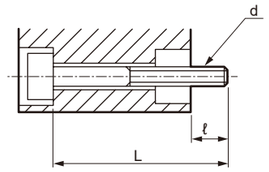
Note: For switch mountability, refer to the Model No. display method for each variation.

Mounting Bolt Model No.

STK - BOLT - M5×60

Mounting bolts (Bolts are a set of 4.)

How to read the list



Material: Steel
Treatment: Black Oxide
d: Mounting bolt thread diameter
L: Mounting bolt length
ℓ: Screw-in depth of mating part
(Note) Mounting bolts are indicated by d×L.

Mounting bolt for STK-□

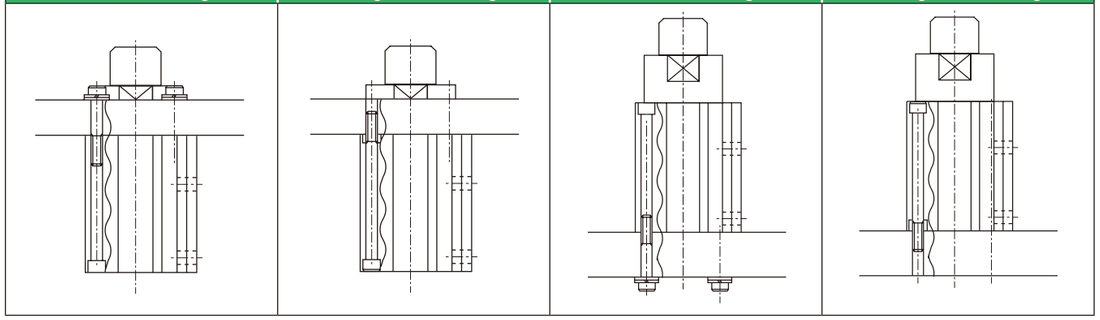
Model No.	ℓ	d×L
STK-20-10	10.5	M5×60
15		×65
20		×70
STK-32-10	12.5	M5×65
15		×70
20		×75

Model No.	ℓ	d×L
STK-40-20	13	M5×80
25		×85
30		×90
STK-50-20	12.5	M6×80
25		×85
30		×90

Stopper Cylinder Model Selection Guide

Allowable absorbed energy differs depending on the mounting method. Please check whether mounting is A or B in the diagram below and select accordingly.

A. Rod side mounting		B. Head side mounting	
Screw-in mounting	Through-bolt mounting	Screw-in mounting	Through-bolt mounting



1. Selection method for operating range

Select a model so that it is below the allowable absorbed energy in the graph on the right, based on the conveyed weight (m) and conveyance speed (V).

Formula for Kinetic Energy

$E=\frac{1}{2}mV^2$

E: Kinetic energy J
m: Transport weight kg
V: Transport speed m/s

(Example) Conveyance speed 15 m/min, Conveyed weight 40 kg

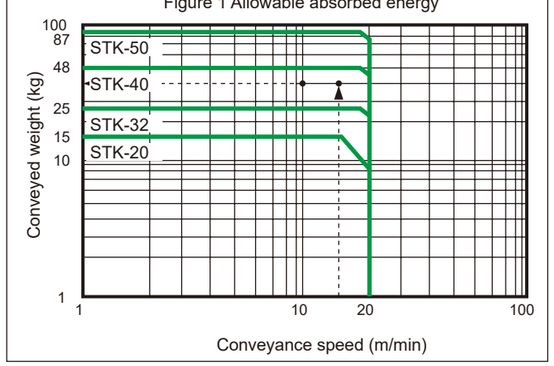
A. In case of rod side mounting

[How to Read the Graph]

To select the above specifications, find the intersection of the speed 15 m/min on the horizontal axis and the weight 40 kg on the vertical axis from graph Figure 1 on the upper right, and select STK-40 which is within the allowable absorbed energy range.

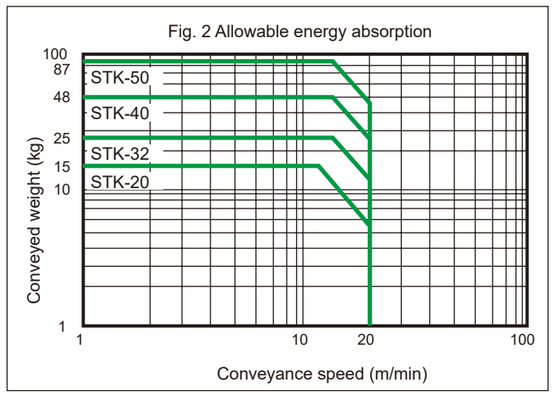
A. Rod side mounting

Figure 1 Allowable absorbed energy



B. Head side mounting

Fig. 2 Allowable energy absorption



(Note) Rod End shape: Applicable to all round bar, chamfered, and roller types.

Lateral load and Operating Pressure

Since the Operating Pressure during cylinder retraction varies depending on the magnitude of the lateral load applied to the Rod End, please calculate the necessary Operating Pressure according to the following steps.

1. Determine the lateral load (F) applied to the rod tip.

$F=10\cdot m\cdot n\cdot \mu_1$

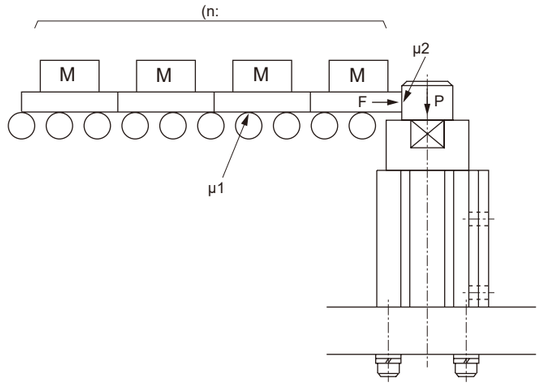
F : Lateral load (N)
m : Transport weight (kg)
n : Quantity of transported items
μ_1: Coefficient of friction between transport pallet and conveyor

2. Determine the necessary thrust (P) during cylinder retraction.

$P=F\cdot \mu_2$

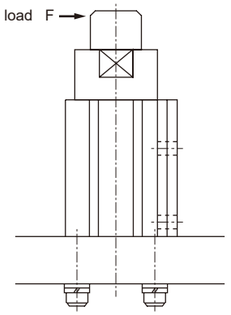
P : Required thrust (N)
μ_2: Coefficient of friction between transported item and rod
(Note) Since the coefficient of friction varies depending on the material of the conveyed object, refer to the coefficients in the table below.
Please consider.

Material of transported item	Steel	Aluminum	Urethane
μ2	0.5	0.8	2.0



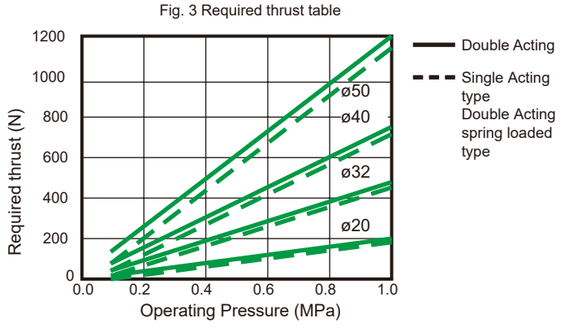
Allowable Lateral Load (Unit: N)

Bore Size	Stroke				
	10	15	20	25	30
ø20	106.5	99.4	93.2	—	—
ø32	272.8	254.6	238.7	—	—
ø40	-	—	371.3	352.1	334.8
ø50	-	—	582.8	552.8	525.8



3. Determine the Operating Pressure from the necessary thrust (P) from Figure 3.

Fig. 3 Required thrust table



To Use This Product Safely

Be sure to read this before use. For general cylinder information, see Intro 41, and for Cylinder Switches, see P. 1512.

Individual Precautions: Stopper cylinder STK Series

Design / Selection

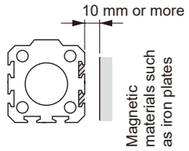
1. Common

⚠CAUTION

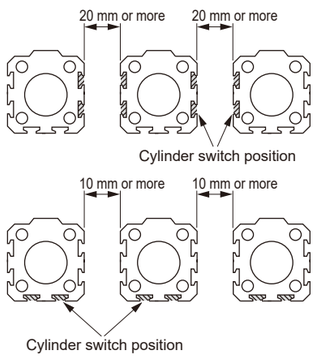
■When using a stopper cylinder to brake loads directly connected to cylinder, etc

● The specified range is only for stopping pallets on the conveyor. When stopping a load directly connected to a cylinder, etc. with a stopper cylinder, the cylinder thrust becomes a lateral load, so please select a cylinder so that it is within the range of allowable absorbed energy and allowable lateral load.

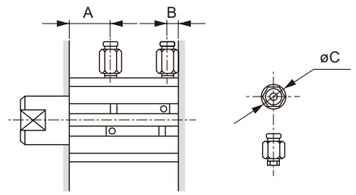
■If there is a magnetic body such as an iron plate near the cylinder switch, it will cause a malfunction, so please keep a distance of 10 mm or more from the cylinder surface.
(Common to all Bore Sizes)



■The cylinder switch could malfunction if cylinders are installed adjacently. Check that the following distances are allocated between cylinders.
(Common to all Bore Sizes)



■There are restrictions on usable piping fittings. Refer to the following and use accordingly.



Item / Bore Size (mm)	Port Size	Port position dimension A	Port position dimension B	Usable Fittings	Fitting outer diameter øC	Unusable fittings
ø20	M5	8	5.5	SC3W-M5-4 SC3W-M5-6 GWS4-M5-S GWS4-M5 GWL4-M5 GWL6-M5	ø11 or less	GWS6-M5
ø32	Rc1/8	8	8	SC3W-6-4/6/8 GWS4-6 GWS6-6 GWS8-6 GWL4-6 GWL6-6	ø15 or less	GWS10-6 GWL-8-6 GWL10-6
ø40		12	8.5			
ø50	Rc1/4	10.5	10.5	SC3W-8-6/8/10 GWS4-8 GWS6-8 GWS10-8 GWL4 to 12-8	ø21 or less	GWS-12-8

2. Single Acting type STK-Y

⚠CAUTION

■Do not apply pressure from the head side for the Single Acting type.

● If air is introduced for the head side for Single Acting, air leakage will occur.

■Do not leave Single Acting cylinders pressurized. If left pressurized, the Piston Rod may not return by spring force when the pressure is released.

3. Double Acting type with spring STK-Y1

⚠CAUTION

■Spring integrated Double Acting is usually used as a Double Acting. When the air is shut off for any reason, the rod is Push and the stopper function is maintained.

4. Rod End shape chamfered type with female thread STK-M-N11

⚠CAUTION

■Avoid using the product so as to apply rotation torque to the Piston Rod.
The non-rotating spacer may come off and the orientation of the chamfered Piston Rod may change.

During Use

1. Common

⚠CAUTION

■Do not apply rotation torque to the Piston Rod. Install the Piston Rod so that its contact surface is parallel to the pallet contact surface to avoid applying rotational torque.

■Avoid using oil, etc., for the Piston Rod sliding section.

● Otherwise, cylinder malfunctions, etc., may result.

■When changing the direction of the rotation-stop type, loosen the rod cover Set Screws (3 positions) to change position arbitrarily and then tighten them again.

2. Rod End shape chamfered type with female thread STK-M-N11

⚠CAUTION

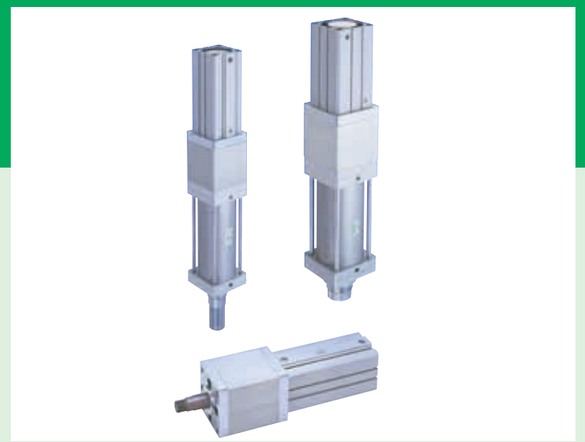
■When fixing a workpiece onto the end of the Piston Rod, push the Piston Rod to the stroke end and apply a wrench to the section projecting from the rod's parallel section. Be careful when tightening so that torque is not applied to the Cylinder Body.

For precautions during mounting, installation, adjustment, use, and maintenance, refer to "During Use" in this catalog and the CKD Components Product website (https://www.ckd.co.jp/kiki/en/) -> "Model No." -> Instruction Manual.

MCP

Mechanical Power Cylinder

For effective thrust 2t / 5t



CONTENTS

Product Introduction	992
Series System Chart	994
● Mechanical power cylinder (MCP)	996
External Dimensions Diagram with Switch	1006
⚠Precautions for Use	1008

Achieves high thrust force of Approx. 7t at any position with only air using a wedge mechanism. Flexibly responds to multi-product production.

Drive is by pneumatic source only.
Since hydraulic pressure is not used, no oil change is required, and there is no concern about oil leakage.

High thrust with wedge mechanism

The intensifier mechanism using a wedge mechanism achieves 8 times higher thrust compared to a cylinder with the same inner diameter.

Convenient fast feed mechanism

The operating speed has been increased by a 2-stage mechanism combining a fast feed cylinder and an intensifier cylinder.

Intensification possible at any position

Since intensification becomes possible from the position where it contacts the workpiece, it can also handle workpieces of different heights or with variations.

Intensifier stroke of 10 mm or more possible

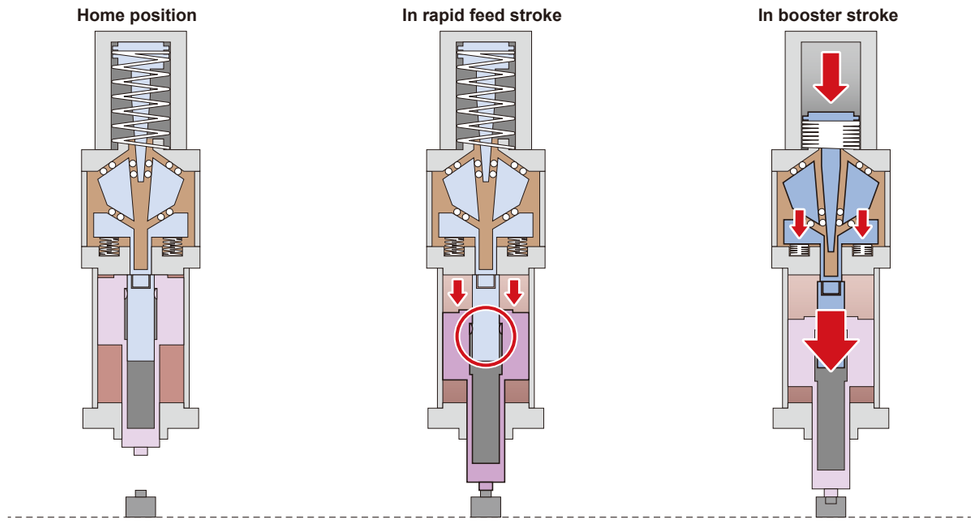
While holding the workpiece with fast feed, the necessary intensifier stroke can be achieved by repeatedly pressurizing and exhausting the intensifier section.

Free mounting direction

Can be used in downward, upward, horizontal, and any direction.

MCP-W-00-5 (Theoretical thrust at 0.6 MPa)

Operating Principle

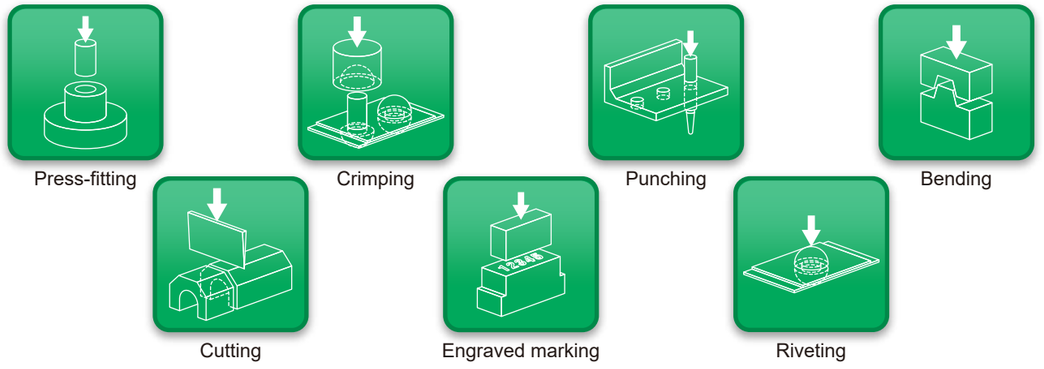


The rapid feed cylinder starts operating from the origin.

If the rapid feed cylinder contacts the workpiece, the internal mechanism causes the red-round section to connect.

After connection, operation of the booster section transmits the force to the rapid feed section, generating high thrust.

Applications



MCP Series Product System

Model Variation		Effective Thrust (Thrust at 0.6 MPa)	Stroke (mm)
Fast Feed + Intensification	MCP-W	For 2t / For 5t	50 100 150 200 250 300 350 400 450 500
Intensification Part Only	MCP-S	For 2t / For 5t	10

* The intensifier stroke of MCP-W is 10 mm.

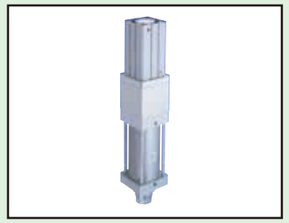
Variation Table

Mechanical Power Cylinder MCP Series

●: Standard ◎: Option

Variation	Model No.	Effective thrust (Thrust at 0.6 MPa)	Stroke mm		Min Stroke	Max Stroke	Mounting Style		Option	Page
							Basic type	Rod side flange type	Rod End male thread	
					(mm)	(mm)	00	FA	N	
Fast Forward + Power Boost	MCP-W	For 2t/For 5t	50, 100, 150, 200, 250, 300, 350, 400, 450, 500		50	500	●	●	◎	996
Power Boost Section Only	MCP-S	For 2t/For 5t	10		-	-	●	●	◎	

Special
MVC
STK
MCP
GLC
BBS
NHS
HR
LN
Cylinder Switch
Ending



Mechanical Power Cylinder

MCP Series

●Effective thrust For 2t, 5t

RoHS

Model No. Notation

Without switch
(Built-in magnet for switch)

MCP-S - 00 - 2 ——— N
1 2 3 7

MCP-W - 00 - 2 - 100 ——— N
1 2 3 4 7

With switch
(Built-in magnet for switch)

MCP-S - 00 - 2 ——— T2H - R - N
1 2 3 5 6 7

MCP-W - 00 - 2 - 100 - T2H - R - N

1 Model No. 3 Effective thrust 5 Switch Model No. 7 Option
2 Mounting Type 4 Total stroke 6 Number of Switches

1 Model No.

	Code	Content
*1	MCP-W	Fast Forward + Power Boost
	MCP-S	Power Boost Section Only

*1: Since a piston magnet is also incorporated in the intensifier section of MCP-W, a switch can be mounted. Please purchase only the switch body separately.

2 Mounting Type

Mounting brackets are pre-assembled on the product and shipped.

Code	Content	
00	Basic type	
FA	Rod side flange type	

3 Effective thrust

Code	Content
2	For 2t
5	For 5t

4 Total stroke (mm)

*1

Code	Content
50	50
100	100
150	150
200	200
250	250
300	300
350	350
400	400
450	450
500	500

*1: In the case of MCP-S, stroke = power stroke = 10 mm fixed. Total stroke cannot be selected.

5 Switch Model

For switch details, refer to P. 1457. Switches are pre-assembled on the product before shipment.

Contact	Indicator LED Special Function	Wiring (Output)	Load Voltage (V) AC	Load Voltage (V) DC	Load Current (mA) AC	Load Current (mA) DC	Lead wire *1 Straight	Lead wire *1 L-shape	
Solid State	1-Color	2-wire	85 to 265	—	5 to 100	—	T1H□	T1V□	
			—	10 to 30	—	5 to 20 *2	T2H□	T2V□	
		3-wire (NPN)	—	30 or less	—	100 or less	T3H□	T3V□	
		3-wire (PNP)	—		—		T3PH□	T3PV□	
	2-Color	2-wire	—	24 ± 10%	—	5 to 20	T2WH□	T2WV□	
		3-wire (NPN)	—	30 or less	—	50 or less	T3WH□	T3WV□	
	2-Color Improved Water Resistance	2-wire	—	24 ± 10%	—	5 to 20	T2WLH□	T2WLV□	*3
	1-Color Off-Delay Type		—	10 to 30	—	5 to 20 *2	T2JH□	T2JV□	
	1-Color Flexible Lead Wire Type		—	10 to 30	—		T2HR3	T2VR3	
Reed	1-Color	2-wire	110	12/24	7 to 20	5 to 50	T0H□	T0V□	
	No Indicator LED		110	5/12/24	20 or less	50 or less	T5H□	T5V□	
	1-Color		110/220	12/24	7 to 20 / 7 to 10	5 to 50	T8H□	T8V□	

*1: For "□" in the switch Model No., enter the code selected from the "*Lead wire length, connector specification" table.
*2: The maximum load current value above, 20 mA, is at 25°C. If the switch operating Ambient Temperature is higher than 25°C, it will be lower than 20 mA. (At 60°C, it will be 5 to 10 mA.)
*3: This does not guarantee the water resistance of the cylinder. Also, the T2WLV switch is included with the product and shipped.
*4: Switches other than the Model No.s listed above are also available. (Custom Product) For details, refer to P. 1457.

*5

*Lead wire length, connector specification

Code	Content
Blank	1 m (Standard)
3	3 m (Option)
5	5 m (Option)
W	M8 Connector, 1PIN (+), 4PIN (−) Lead Wire 0.3 m

*5: Only T2WLH and T2WLV can be selected.

Example) Lead wire length
1 m T0H
3 m T0H3
5 m T0H5

6 Number of Switches

Code	Content
R	With 1 pc on rod side
H	With 1 pc on head side
D	With 2 pcs

7 Option

Code	Content	
Blank	Rod End female thread	
N	Rod End male thread	

Switch Single Unit Model No. Notation

●Switch body+Mounting bracket set

MCP - T0H - 2
5 Switch Model No.
3 Effective thrust

●Switch body only

SW - T0H
5 Switch Model

●Switch mounting bracket set

MCP - T - 2
Mounting bracket
3 Effective thrust

Note: For MCP-S, switch brackets are not required.

Specifications

Item		Effective thrust (Thrust at 0.6 MPa)	
		2 (For 2t)	5 (For 5t)
Operating Fluid		Compressed Air	
Operation type		Fast feed section: Double Acting type Intensifier section: Single Acting Push type	
Min Operating Pressure	MPa	Fast feed section: 0.3 Intensifier section and MCP-S: 0.2	
Max Operating Pressure	MPa	0.6	
Proof Pressure	MPa	0.9	
Ambient Temperature	°C	-5 to 60 (however, no freezing)	
Rod End shape		Female thread (Male thread is option)	
Booster stroke	mm	10 $^{+5}_{0}$ *1	
Fast feed section connection port size		Rc1/4	Rc3/8
Intensifier section connection port size		Rc3/8	
Rapid feed working piston speed	mm/s	50 to 300	
Booster working piston speed	mm/s	10 to 50	
Lubrication		Not allowed	
Intensifier section theoretical thrust (When the pressure of the intensifier section and fast feed section is the same) *2	At 0.3 MPa	S=11.5 W=13.9	S=28.5 W=33.1
	At 0.4 MPa	S=15.7 W=18.9	S=38.7 W=44.9
	At 0.5 MPa	S=19.9 W=23.8	S=49.0 W=56.7
KN	At 0.6 MPa	S=24.1 W=28.8	S=59.2 W=68.4
Fast feed section theoretical thrust	At 0.3 MPa	Advance 2.3 Retract 1.6	Advance 4.6 Retract 2.9
	At 0.4 MPa	Advance 3.1 Retract 2.1	Advance 6.1 Retract 3.8
	At 0.5 MPa	Advance 3.9 Retract 2.7	Advance 7.6 Retract 4.8
KN	At 0.6 MPa	Advance 4.7 Retract 3.2	Advance 9.2 Retract 5.8

*1: By repeatedly pressurizing and exhausting only the intensifier section, it can be intensified by 10 mm each time within the total stroke.
*2: Actual thrust is 70% to 90% of theoretical thrust.
*3: Since MCP-S is a Single Acting cylinder, the payload (jig weight) to be mounted on the Piston Rod tip should be 20 kg or less for 2t type and 50 kg or less for 5t type.

Air consumption

1 reciprocating air consumption of intensifier stroke section L (ANR)

Pressure (MPa) / Thrust	0.3	0.4	0.5	0.6
2t	2.51	3.13	3.76	4.38
5t	6.13	7.65	9.18	10.70

1 reciprocating air consumption per 100 mm of fast feed stroke section L (ANR)

Pressure (MPa) / Thrust	0.3	0.4	0.5	0.6
2t	5.28	6.60	7.91	9.23
5t	9.95	12.43	14.91	17.39

Total stroke *1

Standard Stroke (mm)	Maximum Stroke (mm)	Min Stroke (mm)	With Switch Min Stroke (mm)
50, 100, 150, 200, 250, 300, 350, 400, 450, 500	500	50	50

*1: Set the total stroke to "Fast feed stroke+Intensifier stroke"+"5 mm or more".

Cylinder Weight

● MCP-S (booster only) Unit: kg

Item	Product weight for stroke 10st		Addition per 100 mm	Male thread (N) Addition of	Switch Mass
	Basic Type (00)	Rod Side Flange Type (FA)			
MCP-S-2-10	14.3	16.9	—	0.4	Refer to the mass listed in the Switch Specifications on P. 1457.
MCP-S-5-10	36.1	43.4	—	1.2	

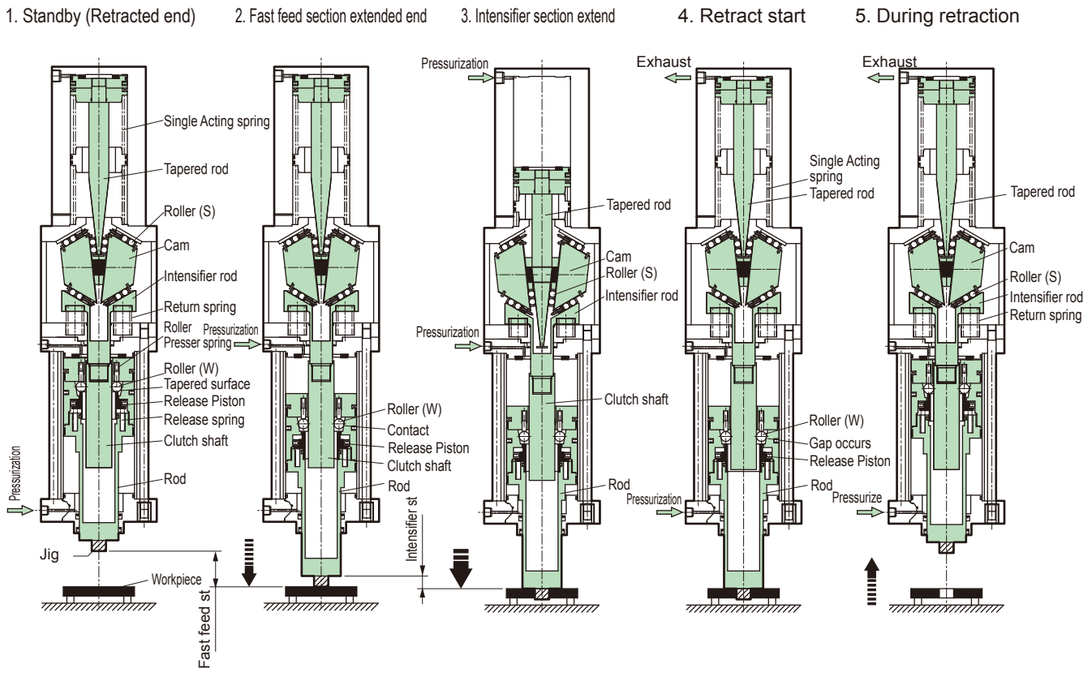
● MCP-W (rapid feed + booster) Unit: kg

Item	Product Weight at Stroke 0 mm		Addition per 100 mm	Male thread (N) Addition of	Switch Mass	Mounting Bracket Weight
	Basic Type (00)	Rod Side Flange Type (FA)				
MCP-W-2	24.3	26.9	1.9	0.95	Refer to the mass listed in the Switch Specifications on P. 1457.	0.024
MCP-W-5	63.8	71.1	4.5	4.6		0.030

(Example) Product weight of MCP-W-00-2-100-T2H-D-N

- ●Product weight for 0 mm stroke .....24.3 kg
- ● Additional weight for 100 mm stroke .....1.9x $\frac{100}{100}$ = 1.9 kg
- ● Male thread additional weight .....0.92 kg
- ● Weight of 2 T2H switches .....0.018×2=0.036 kg
- ● Weight of 2 mounting brackets .....0.024×2=0.048 kg
- ● Product weight .....24.3+1.9+0.92+0.036+0.048=27.204 kg

Operating Principle



Since the 6 rollers (W) have a gap with the tapered surface due to the release spring, when the fast feed section head side is pressurized, the rod advances. After advancing until it hits the workpiece, when exhausted, the release piston is pushed, the release spring contracts, and the roller (W) contacts the clutch shaft and tapered surface.

When the intensifier section head side is pressurized, the force of the tapered rod advancing is amplified by the wedge effect, and by spreading the cam left and right via the roller (S), the clutch shaft integrated with the intensifier rod intensifies in the vertical direction. The rod is connected to the clutch shaft by the wedge effect, intensifies, and punches the workpiece.

When the pressure in the intensifier section is exhausted, the tapered rod is pushed back by the Single Acting spring. After that, when the fast feed section rod side is pressurized, the release piston is pushed back, and the connection is released by the roller (W) creating a gap with the tapered surface, and the rod retracts.

When the tapered rod is pushed back, the intensifier rod is pushed back by the return spring, and the cam is returned to its original position via the roller (S).

By repeatedly pressurizing and exhausting only the intensifier section, it can be intensified by 10 mm each time within the total stroke.

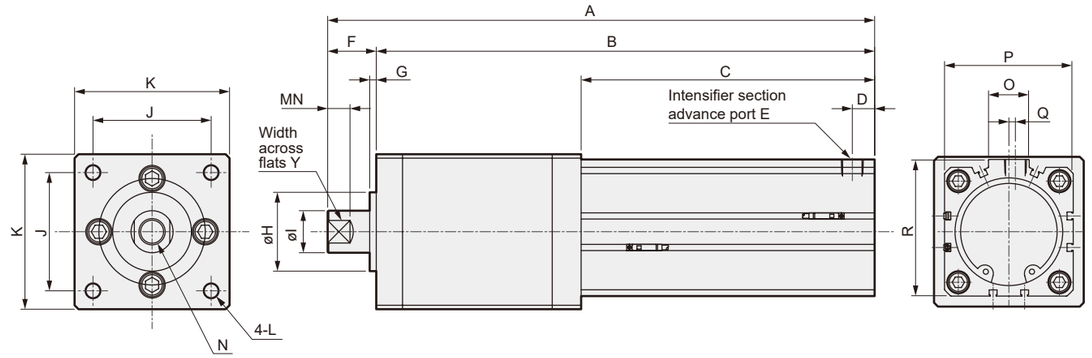
⚠ CAUTION

Set the total stroke with a margin of 5 mm or more with respect to "Fast feed stroke+Intensifier stroke". For setting the total stroke, please refer to the precautions on P. 1009.

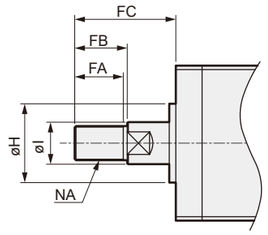
MEMO

External Dimensions Diagram (MCP-S)

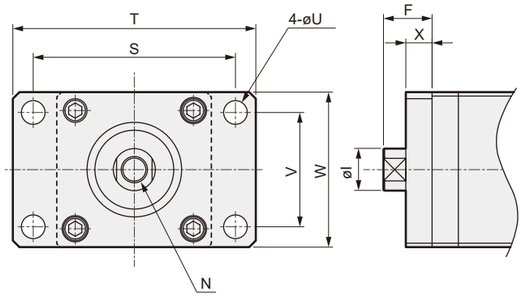
● Basic type (00)

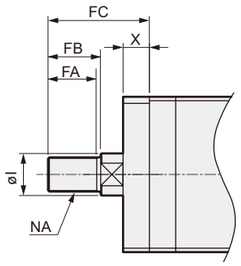


● Rod End male thread (N)



●Rod Side Flange Type (FA)





Male Thread Type

Code / Thrust	Basic dimensions											
	A	B	C	D	E	F	G	H	I	J	K	L
2 (For 2t)	416.5	379.5	223.5	17	Rc3/8	37	5	60	32	90	118	M12 Depth 20
5 (For 5t)	501	447	252	23.5	Rc3/8	54	12	100	45	128	167	M16 Depth 25

Code / Thrust	Basic dimensions						
	MN	N	O	P	Q	R	Y
2 (For 2t)	17	M20 Depth 24	31	98	—	104	27
5 (For 5t)	24	M30 Depth 36	—	142	36	142	41

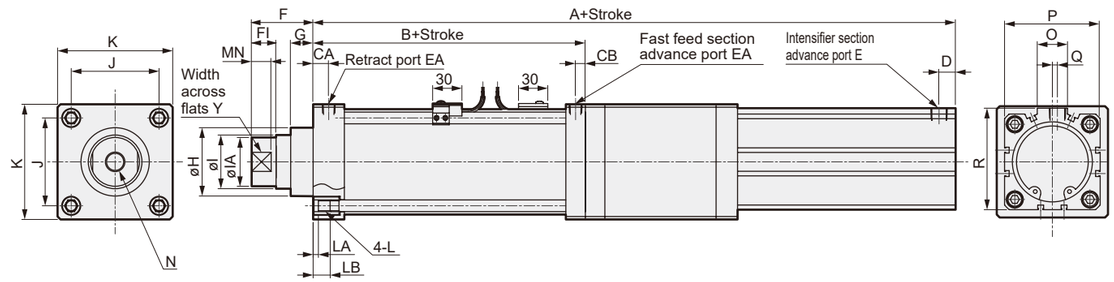
Code / Thrust	Rod Side Flange Type (FA)						Rod End male thread (N)			
	S	T	U	V	W	X	FA	FB	FC	NA
2 (For 2t)	154	185	18	87	118	20	37	40	77	M26×1.5
5 (For 5t)	208	250	22	126	171	30	60	63	117	M40x1.5

*1: The width across flats of part Y is not fixed.

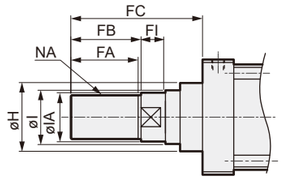
***2: For dimensions with each switch, please refer to P. 1006.**

External Dimensions Diagram (MCP-W)

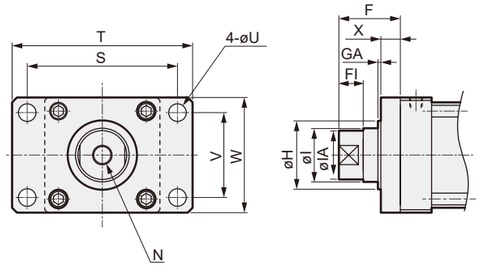
● Basic type (00)

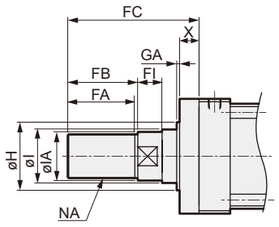


● Rod End male thread (N)



●Rod Side Flange Type (FA)





Male Thread Type

Code / Thrust	Basic dimensions												
	A	B	CA	CB	D	E	EA	F	FI	G	H	I	IA
2 (For 2t)	559.5	180	16	10	17	Rc3/8	Rc1/4	63	25	23	70	55	50
5 (For 5t)	692	245	24	15	23.5	Rc3/8	Rc3/8	73	30	33	110	85	80

Code / Thrust	Basic dimensions											
	J	K	L	LA	LB	MN	N	O	P	Q	R	Y
2 (For 2t)	90	118	M12	(5.4)	16	20	M20 Depth 24	31	98	—	104	46
5 (For 5t)	128	167	M16	(6.5)	25	25	M30 Depth 36	—	142	36	142	75

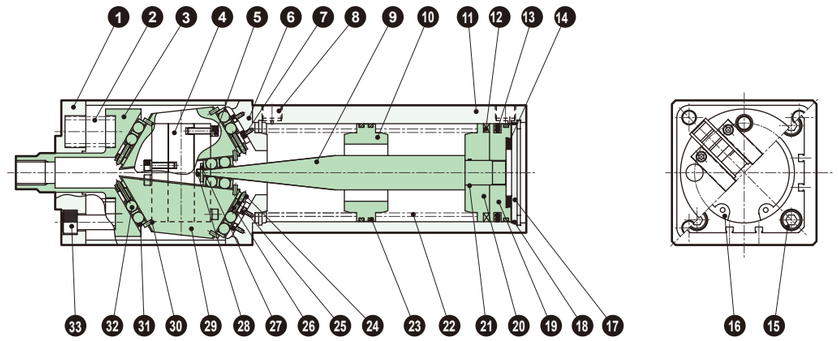
Code / Thrust	Rod Side Flange Type (FA)							Rod End male thread (N)			
	S	T	U	V	W	GA	X	FA	FB	FC	NA
2 (For 2t)	154	185	18	87	118	3	20	69	72	135	M45×1.5
5 (For 5t)	208	250	22	126	171	3	30	135	140	213	M72×2.0

*1: The width across flats of part Y is not fixed.

2: For dimensions with each switch, please refer to P. 1006.

Internal Structure / Materials

● MCP-S (booster only)

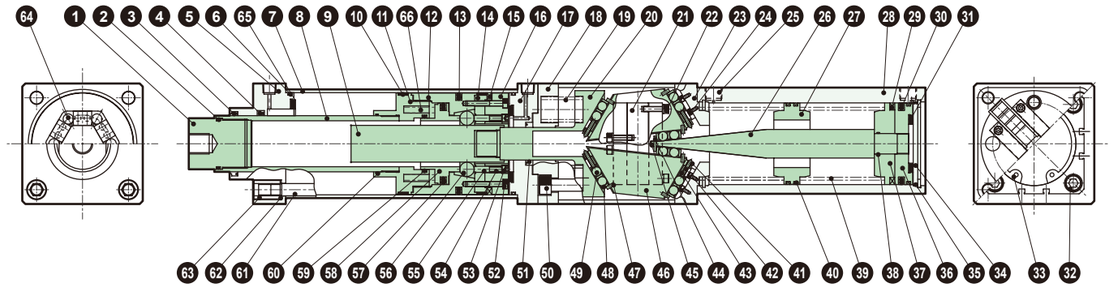


Do not disassemble

Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Rod cover (S)	Cast Iron	Trivalent chromate	18	Gasket	Nitrile Rubber	
2	Return spring	Piano Wire	Black Oxide	19	Piston	Aluminum Alloy	Alumite
3	Intensifier rod	Alloy Steel	Electroless Nickel Plating	20	Spacer	Aluminum Alloy	Alumite
4	Slide bar	Steel		21	Gasket	Nitrile Rubber	
5	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide	22	Single Acting spring	Piano Wire	Black Oxide
6	Intermediate Cover	Steel	Trivalent chromate	23	Wear ring (S)	Polyacetal	
7	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide	24	Spring seat	Steel	Trivalent chromate
8	Plug silencer	Steel, Sintered alloy	Zinc Plating	25	Spring retainer pin	Stainless Steel	
9	Tapered rod	Alloy Steel		26	Retainer spring	Piano Wire	Black Oxide
10	Single Acting spring retainer	Steel	Trivalent chromate	27	Tip plate	Steel	Trivalent chromate
11	Intensifier cylinder tube	Aluminum Alloy	Hard Anodized	28	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide
12	Magnet (S)	Plastic		29	Cam	Alloy Steel	
13	Piston Packing (S)	Nitrile Rubber		30	Pin	Steel	
14	Cushion Rubber	Urethane Rubber		31	Retainer	Steel	Trivalent chromate
15	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide	32	Roller (S)	Alloy Steel	
16	C-type Retaining Ring (for hole)	Steel	Black Oxide	33	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide
17	Cover	Aluminum Alloy					

Internal Structure / Materials

● MCP-W (rapid feed + booster)

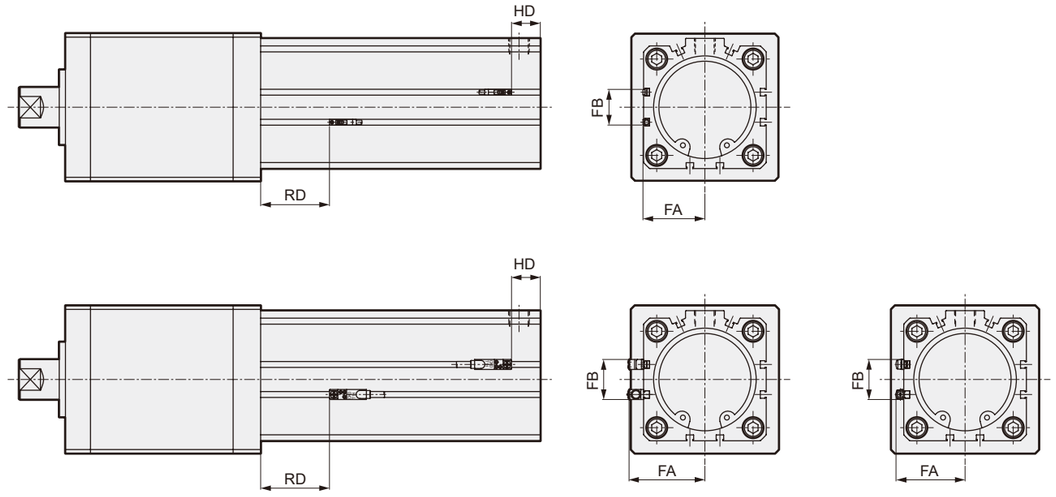


Do not disassemble

Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Plug	Steel	Trivalent chromate	34	Gasket	Nitrile Rubber	
2	Gasket	Nitrile Rubber		35	Cover	Aluminum Alloy	
3	Dust Wiper	Nitrile Rubber		36	Piston	Aluminum Alloy	Alumite
4	Rod Packing (W)	Nitrile Rubber		37	Spacer	Aluminum Alloy	Alumite
5	Rod cover (W)	Cast Iron	Trivalent chromate	38	Gasket	Nitrile Rubber	
6	Gasket	Nitrile Rubber		39	Single Acting spring	Piano Wire	Black Oxide
7	Moving cylinder tube	Aluminum Alloy	Alumite	40	Wear ring (S)	Polyacetal	
8	Piston Rod	Steel	Hard Chrome Plating	41	Spring seat	Steel	Trivalent chromate
9	Clutch shaft	Steel		42	Spring retainer pin	Stainless Steel	
10	Wear ring (W)	Fabric-reinforced phenol		43	Retainer spring	Piano Wire	Black Oxide
11	Connecting piston B	Steel	Trivalent chromate	44	Tip plate	Steel	Trivalent chromate
12	Connecting piston A	Alloy Steel		45	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide
13	Piston Packing (W)	Nitrile Rubber		46	Cam	Alloy Steel	
14	Magnet spacer A	Stainless Steel		47	Pin	Steel	
15	Magnet (W)	Plastic		48	Retainer	Steel	Trivalent chromate
16	Magnet spacer B	Aluminum Alloy	Alumite	49	Roller (S)	Alloy Steel	
17	Head cover (W)	Aluminum Alloy	Alumite	50	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide
18	Rod cover (S)	Cast Iron	Trivalent chromate	51	Rod Packing (S)	Nitrile Rubber	
19	Return spring	Piano Wire	Black Oxide	52	Hexagon Socket Head Cap Screw	Stainless Steel	
20	Intensifier rod	Alloy Steel		53	Hexagon Socket Set Screw	Alloy Steel	Black Oxide
21	Slide bar	Steel		54	Roller retainer spring	Steel	Black Oxide
22	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide	55	Roller retainer	Alloy Steel	
23	Intermediate Cover	Steel	Trivalent chromate	56	Roller (W)	Alloy Steel	
24	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide	57	Release Piston Packing	Nitrile Rubber	
25	Plug silencer	Steel, Sintered alloy	Zinc Plating	58	Release Piston	Steel	Trivalent chromate
26	Tapered rod	Alloy Steel		59	Gasket	Nitrile Rubber	
27	Single Acting spring retainer	Steel	Trivalent chromate	60	Gasket	Nitrile Rubber	
28	Intensifier cylinder tube	Aluminum Alloy	Hard Anodized	61	Tie rod	Steel	Trivalent chromate
29	Magnet (S)	Plastic		62	Belleville washer	Steel	Black Oxide
30	Piston Packing (S)	Nitrile Rubber		63	Round nut	Steel	Trivalent chromate
31	Cushion rubber (S)	Urethane Rubber		64	Guide rubber	Urethane Rubber	
32	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide	65	Cushion rubber (W)	Urethane Rubber	
33	C-type Retaining Ring (for hole)	Steel	Black Oxide	66	Release spring	Piano Wire	Black Oxide

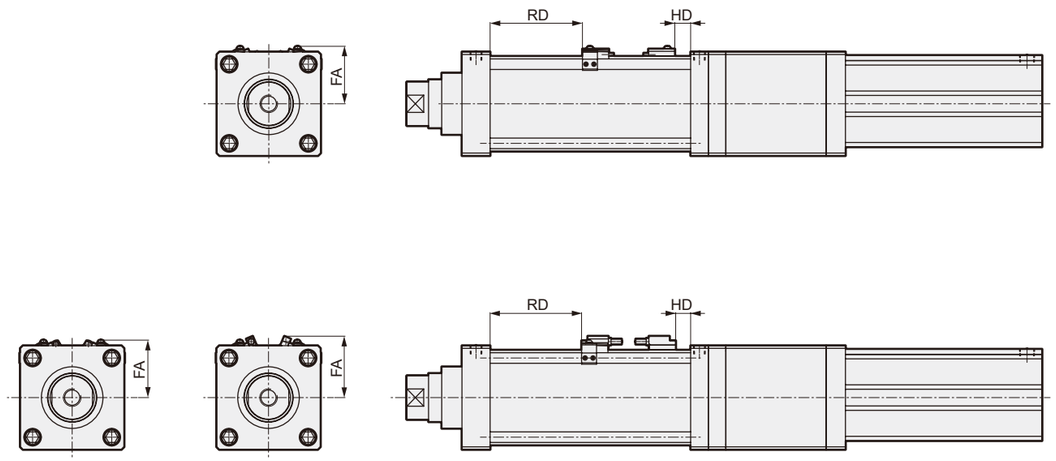
MCP Series External Dimensions Diagram with Switch

● MCP-S-2,5



Code	T0, T5, T2, T3				T2W, T3W				T2J				T8				T1			
Thrust	FA	FB	RD	HD	FA	FB	RD	HD	FA	FB	RD	HD	FA	FB	RD	HD	FA	FB	RD	HD
2 (For 2t)	49.5	28.5	55.5	23	49.5	28.5	57.5	25	55.3	32	54.5	22	55.3	32	49.5	17	60.3	32	54.5	22
5 (For 5t)	71.5	44.5	80.5	26	71.5	44.5	83	28	77.3	48	80	25	77.3	48	74.5	20	82.3	48	80	25

● MCP-W-2,5



Code	T0, T5, T2, T3			T2W, T3W			T2J			T8			T1		
Thrust	FA	RD	HD	FA	RD	HD	FA	RD	HD	FA	RD	HD	FA	RD	HD
2 (For 2t)	65.5	105	18	65.5	107	20	65.5	104	17	65.5	99	12	70	104	17
5 (For 5t)	84.5	140	21.5	84.5	142	24	84.5	139	21	84.5	134	16	89	139	21

*1: The width across flats of part Y is not fixed.

***2: Fast feed section RD dimension is 15 mm before the rod side stroke end. Please refer to P. 1009.**

***3: For RD/HD dimensions of the intensifier section, please refer to the external dimensions diagram with switch for MCP-S-2.5.**

***4: For dimensions with each switch, please refer to P. 1006.**

MEMO

Pneumatic Equipment

To Use This Product Safely

Be sure to read this before use. For general cylinder information, see Intro 41, and for Cylinder Switches, see P. 1512.

Individual Precautions: Mechanical power cylinder MCP Series

Design / Selection

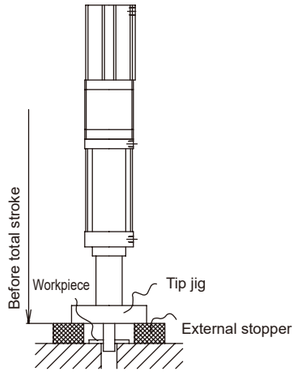
Danger

■ Before starting, be sure to supply air to the travel section's retract side to apply back pressure. The Piston Rod will fly out, which is very dangerous.

CAUTION

■ If an external force in the direction of cylinder retraction is applied to the Piston Rod when the cylinder retracts after the boost, operate within the following value limits (maximum) to prevent the risk of coupling release failure or booster failure.
MCP-W-2: 1000 N or less
MCP-W-5: 3000 N or less

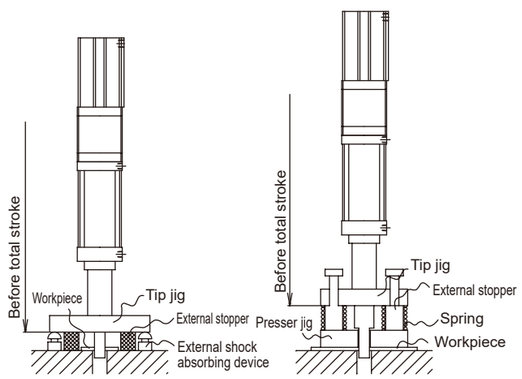
■ When using the product for punching out or cutting workpieces, the Piston rod may extend suddenly. If the Piston Rod flies out, it will hit the rod cover (W) of the fast feed section cylinder, which may cause impact noise or damage to the cylinder due to impact, so be sure to provide an external stopper or shock absorbing device, etc. before the total stroke.



■ Do not apply lateral load or eccentric load to the Piston Rod. Note that when the cylinder operates in a direction other than vertical, the tip load acts as a load on the cylinder, so please install a guide so that no load is applied to the cylinder.

■ Use the cylinder in a mechanism in which the Piston Rod does not rotate so that no torque is applied to the rod. Otherwise, there is a risk of coupling release failure or booster failure.

■ Do not use multiple cylinders synchronized.



When the cylinder retracts, if an external force is applied in the cylinder retraction direction by a spring, external shock absorbing device, etc., set the external force to the value below or less.
MCP-W-2: 1000 N or less
MCP-W-5: 3000 N or less

■ After boosting, provide a time lag of 0.5 seconds or more between booster section retraction and rapid feed section retraction. If the fast feed section retracts before the intensifier section retracts, the intensifier section may fly out when the connection is released, causing cylinder damage.

■ Do not use the booster while in the meter-out position. The intensifier section may fly out when the connection is released, causing cylinder damage.

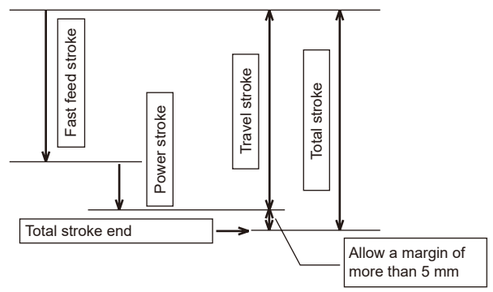
■ Use discrete solenoid valves for booster and rapid feed sections. Or when using a manifold, take measures such as using an individual exhaust spacer.

■ Do not advance the booster at the same time that the rapid feed section reaches the end of its travel. This will cause connection failure. After the fast feed section advances and stops until it hits the workpiece, provide a time lag of 1 second or more before the intensifier section advances.

■ Using the product near a welder, etc., can magnetize the product, which may cause the cylinder switch to malfunction. Please use in an environment where no magnetic field is generated.

■ Because MCP-S is a Single Acting cylinder, the applied load (jig weight) on the Piston Rod End should be 20 kg or less for 2t and 50 kg or less for 5t.

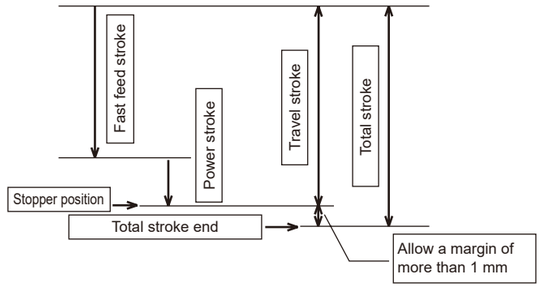
■ When using the booster stroke, the total stroke should be well within the stroke end.
1. When there is no external stopper etc. (When using the power stroke to the end)



Set the total stroke so that Total stroke > Moving stroke+5 mm. Note that Moving stroke = Fast feed stroke+Intensifier stroke.

Usage Example
· Press fitting, bending (press), etc.

2. When providing an external stopper etc.
(When not using the intensifier stroke to the end)



Set the external stopper, etc. so that Total stroke > Moving stroke+1 mm. Note that Moving stroke = Fast feed stroke+Press-fitting amount.

Usage Example
· Punch, cutting, etc.

■ The retraction end of the booster section can be detected by installing a cylinder switch on the booster section.
When attaching a cylinder switch, please purchase only the switch body.

■ In the state where the booster section has not been allowed to completely return, if the booster is made to move forward repeatedly, damage to the booster section cylinder could result. If the cycle time is short, detect with a cylinder switch that the intensifier section cylinder has retracted to the stroke end.

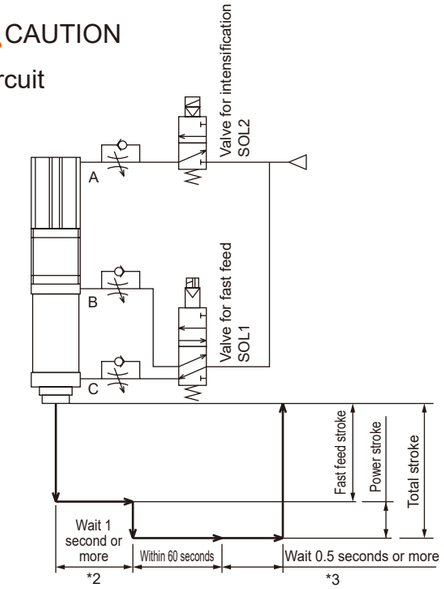
■ Because there is a possibility of a failed release of connection or a run-out of the Piston Rod, do not use the quick exhaust valve on the head side of the rapid feed section.

■ MCP-W cannot be held in the booster state for long periods. Retract within approximately 60 seconds after starting intensification.

Design / Selection

⚠CAUTION

Circuit



Solenoid Valve / Operating state	Travel stroke SOL1	Power stroke SOL2
Fast feed section advance	ON	OFF
Fast feed stroke end	ON	OFF
Wait 1 second or more *2	ON	OFF
Intensifier section advance	ON	ON
Intensifier section retract *1	ON	OFF
Wait 0.5 second or more *3	ON	OFF
Fast feed section retract	OFF	OFF

*1: The Piston Rod does not retract when the intensifier section retracts.
*2: Time until the air on the rod side of the fast feed section is exhausted and the fast feed section and intensifier section are connected.
*3: Time until the air on the head side of the intensifier section is exhausted and the connection between the fast feed section and intensifier section is released.

■ Due to the time required to couple the rapid feed section and booster section, a 1-second wait is necessary before the booster cylinder starts to advance from the rapid feed stroke end (after the rapid feed cylinder advances and stops).

Note that if the exhaust on the fast feed section rod side is throttled as shown below, 1 second or more may be required. Please set the waiting time with a margin.

- When solenoid valve flow rate is low
- When the rod side speed controller (C in the figure above) of the fast feed section cylinder is restricted
- When piping length of the fast approach section is long
- When piping diameter of the fast approach section is small

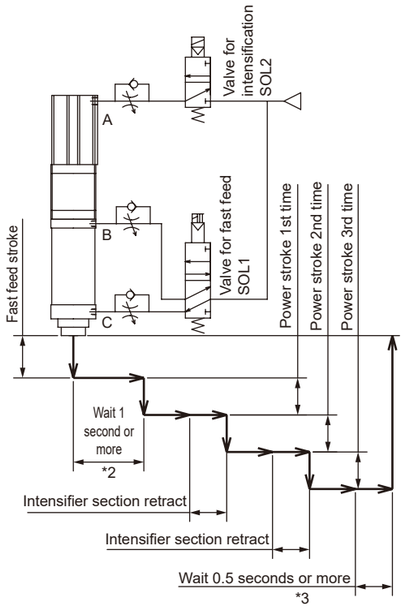
■ Because the booster section is retracted before the rapid feed section, a 0.3 to 0.5-second wait is necessary from the start of booster cylinder retraction to the start of rapid feed cylinder retraction.

Note that if the exhaust of the intensifier section is throttled as shown below, 0.5 seconds or more may be required. Please set the waiting time with a margin.

- When solenoid valve flow rate is low
- When piping length of the boost section is long
- When piping diameter of the boost section is small

■ By repeating pressurizing and exhaust of only the booster section after rapid feed, a 10-mm boost can be obtained per repeat. (If 30 mm intensification is required, repeat intensification 3 times)

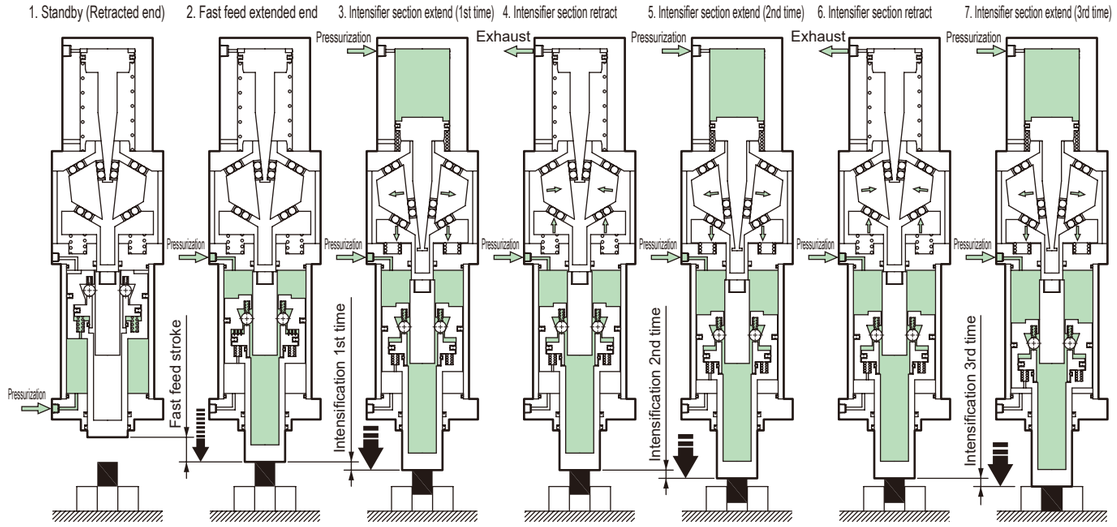
[Circuit example for 30 mm press fitting]



Solenoid Valve / Operating state	Fast feed stroke SOL1	Power stroke SOL2
Fast feed section advance	ON	OFF
Fast feed stroke end	ON	OFF
Wait 1 second or more *2	ON	OFF
Intensifier section advance 1st time	ON	ON
Intensifier section retract *1	ON	OFF
Intensifier section advance 2nd time	ON	ON
Intensifier section retract *1	ON	OFF
Intensifier section advance 3rd time	ON	ON
Intensifier section retract *1	ON	OFF
Wait 0.5 second or more *3	ON	OFF
Fast feed section retract	OFF	OFF

*1: The Piston Rod does not retract when the intensifier section retracts.
*2: Time until the air on the rod side of the fast feed section is exhausted and the fast feed section and intensifier section are connected.
*3: Time until the air on the head side of the intensifier section is exhausted and the connection between the fast feed section and intensifier section is released.

[Operation diagram for 30 mm press fitting]



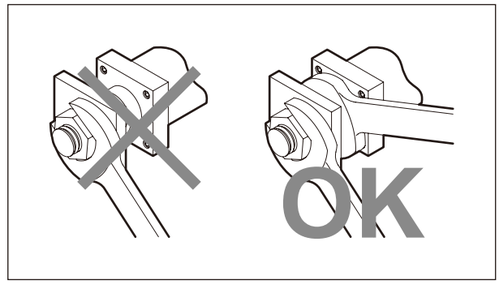
During Use

⚠CAUTION

■ Do not grease the cylinder. Additional grease can cause a malfunctions.

■ While the mounting direction is unrestricted, if the cylinder is operating in a direction other than the vertical direction, the tip load will be applied to the cylinder. In this case, use a guide that prevents the load from being applied to the cylinder.

■ Tighten so that torque is not applied to the cylinder. When fixing a workpiece to the Piston Rod tip, fix and attach it with a wrench.



For precautions during mounting, installation, adjustment, use, and maintenance, please see "Precautions for Use" in this catalog and the CKD Components product site (https://www.ckd.co.jp/kiki/en/) → "Model No." → Instruction Manual.

GLC

Guideless Cylinder

ø40, ø50, ø63, ø80, ø100

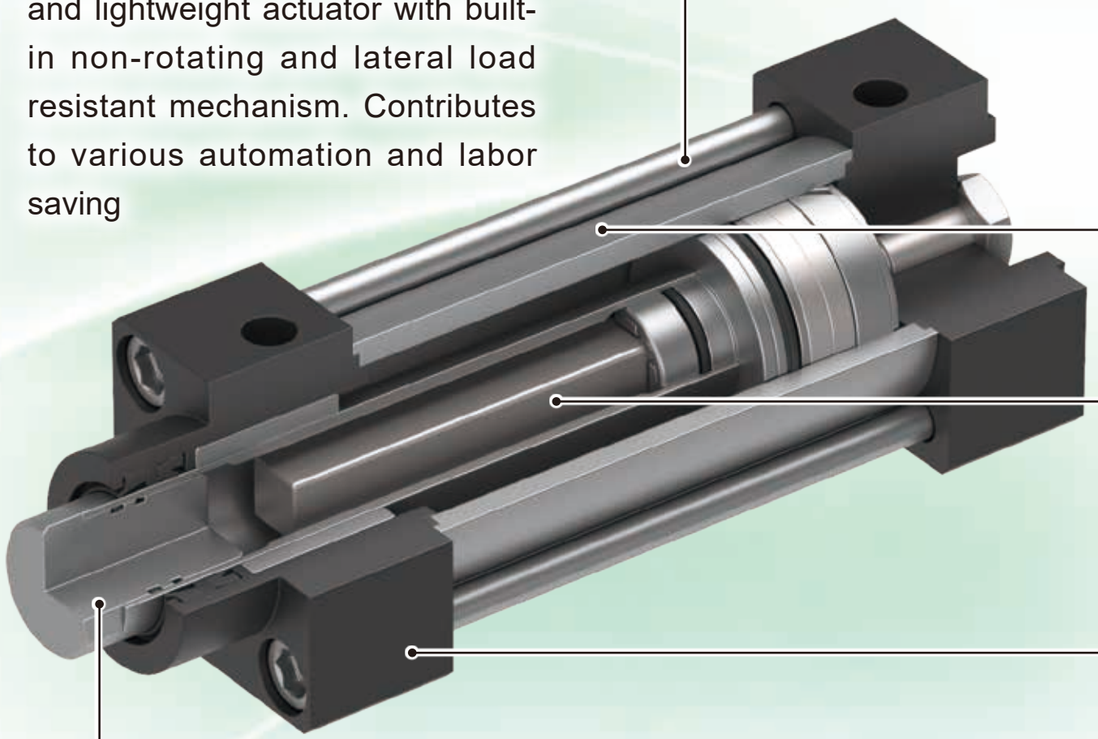
CONTENTS

Product Introduction	1014
Series System Chart	1016
●Double Acting type (GLC)	1018
Outer Dimensions Diagram with Switch	1026
Model Selection Guide	1028
Technical Data	1029
⚠Precautions for Use	1031

Demonstrates strength against lateral loads

High-performance cylinder (ø40 to ø100) that does not require a guide, adopting a non-rotating and lateral load resistant mechanism

Guideless cylinder is a compact and lightweight actuator with built-in non-rotating and lateral load resistant mechanism. Contributes to various automation and labor saving



R-type and H-type switches can be installed. Easy position confirmation.

R-type Switch

H-type Switch

Lightweight by adopting aluminum tube.

Built-in non-rotating mechanism with square non-rotating shaft and long width non-rotating plate (bearing). Contributes to device downsizing.

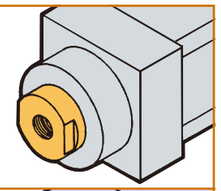
Lightweight by adopting aluminum material for cover and piston.

Adopts a thick Piston Rod that can sufficiently withstand lateral loads.

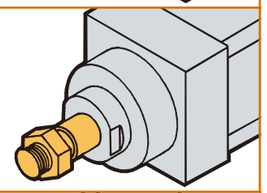
Selectable Rod End shape

The Rod End shape can be selected from female thread type (Blank), male thread type (N), and flange type (F) according to the application.

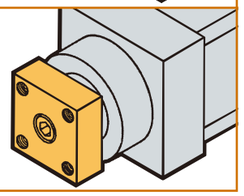
●Female Thread Type (Blank)



●Male thread (N)



●Flange (F)



High lateral load strength

Adopts a Piston Rod with a large shaft diameter. Can withstand large lateral loads.

Detection switch installable

Two types can be installed: solid state switch R-type and strong magnetic field proof switch H-type. Piston position can be easily confirmed.

Compact design

Built-in non-rotating mechanism. Achieves a compact body.

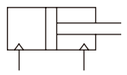
Lightweight

Aluminum material is used for parts other than strength parts. Achieves weight reduction.

Variation Table

Guideless Cylinder
GLC Series

●: Standard, ◎: Option, : Not available

Variation	Model No. Circuit Diagram Code	Bore Size (mm)	Standard Stroke (mm)					Stroke (mm)			Min Stroke (mm)	Max Stroke (mm)	Intermediate Stroke (per mm)	Mounting Type				Rod End shape			Piping Port Position				Switch	Page
			100	200	300	400	500	600	700	800				Basic type 00	Axial Foot Type LB	Rod side Flange Type FA	Head Side Flange Type FB	Female Thread Type Blank	Male Thread Type N	Flange type F	Upper side when viewed from rod side Blank	Right side when viewed from rod side R	Left side when viewed from rod side T	Lower side when viewed from rod side S		
Double Acting Type	GLC 	ø40, ø50, ø63	●	●	●	●	●				5	500	5	●	●	●	●	●	◎	◎	●	◎	◎	◎	◎	1018
		ø80	●	●	●	●	●	●	●			700														
		ø100	●	●	●	●	●	●	●	●		800														

Special
MVC
STK
MCP
GLC
BBS
NHS
HR
LN
Cylinder Switch
Ending

Guideless Cylinder (Double Acting type)

GLC Series

● Equivalent Bore Size: ø40, ø50, ø63, ø80, ø100

Circuit Diagram Code

RoHS

Model No. Notation

Without Switch
(Built-in magnet for switch)

GLC - LB - 40 - 100 ——— N - R

Model No. ❶ ❷ ❸ ❻ ❼

With R-type Switch
(Built-in magnet for switch)

GLC - LB - 40 - 100 - R0 - R - N - R

Model No. ❶ ❷ ❸ ❹ ❺ ❻ ❼

H-type (Strong magnetic field) With Switch
(Built-in magnet for switch)

GLC-L2 - LB - 40 - 100 - H0 - R - N - R

Model No. ❷ Bore Size ❹ Switch Model No. ❻ Rod End shape
❶ Mounting type ❸ Stroke ❺ Number of Switches ❼ Piping Port Position

❶ Mounting Type

Mounting bracket is pre-assembled on the product at the time of shipment.

Code	Content	
00	Basic type	
LB	Axial foot type	
FA	Rod Side Flange Type	
FB	Head Side Flange Type	

❷ Bore Size (mm)

Code	Contents
40	ø40
50	ø50
63	ø63
80	ø80
100	ø100

❸ Stroke (mm)

Bore Size	Stroke	Intermediate Stroke
ø40	5 to 500	Every 5 mm
ø50	5 to 500	
ø63	5 to 500	
ø80	5 to 700	
ø100	5 to 800	

❹ Switch Model

For switch details, refer to P. 1457. Switches are pre-assembled on the product before shipment.

Contact	Indicator LED Special Function	Wiring (Output)	Load Voltage (V) AC	Load Voltage (V) DC	Load Current (mA) AC	Load Current (mA) DC	Lead wire *1 Straight	Lead wire *1 L-shape	
Solid State	1-Color	2-wire	85 to 265	—	5 to 100	—	R1□	R1B	
			—	10 to 30	-	5 to 30	R2□	R2B	
	1-Color	3-wire (NPN)	—	30 or less	—	200 or Less	R3□	R3B	
Reed	1-Color	2-wire	110/220	12/24	7 to 20/7 to 10	5 to 50	R0□	R0B	
	1-Color Lights up when OFF		110/220	—	20 to 220/ 10 to 200	—	R4□	R4B	
	Without Indicator Lamp		110/220	5/12/24	20/10 or less	50 or less	R5□	R5B	
	1-Color With DC self-holding function		—	24 ± 10%	—	5 to 50	R6□	R6B	
	1-Color For strong magnetic field	2-wire	110	12/24	7 to 20	5 to 50	H0□	—	

*1: Insert the code selected in the "*Lead wire length" table into "□" of the switch Model No..
*2: Switches other than the above switch Model No.s are also available. (Custom Product) For details, refer to P. 1457.

*** Lead wire length**

Code	Content
Blank	1 m (Standard)
3	3 m (Option)
5	5m (Option)

Example) Lead wire length
1 m R0
3 m R0 3
5 m R0 5

❺ Number of Switches

Code	Content
R	With 1 pc on rod side
H	With 1 pc on head side
D	With 2 pcs

❻ Rod End shape

Code	Content	
Blank	Female Thread Type	
N	Male Thread Type	
F	Flange type	

❼ Piping Port Position

Code	Content	
Blank	Upper side when viewed from rod side	Standard T R S
R	Right side when viewed from rod side	
T	Left side when viewed from rod side	
S	Lower side when viewed from rod side	

R-type Switch Single Unit Model No. Notation

A) Switch body+Mounting bracket

GLC - R0□ - 40

❹ Switch Model No. ❷ Bore Size

B) Switch body only

SW - R0□

❹ Switch Model No.

C) Mounting bracket set (ø50 to ø100: **Rubber plate** included)

GLC - R - 40

❷ Bore Size

D) Terminal box only

● For R□B

SW - RB

Note: When using cylinder switches R1□, R2□, R3□, please attach the included rubber plate to the bottom surface of the switch.
Number of sheets to attach
(ø40 : 0)
ø50 : 4
ø63 : 3
ø80 : 5
ø100 : 3

H type switch single item Model No. notation

A) Switch body+Mounting bracket set

GLC-L2 - H0□ - 40

❹ Switch Model No. ❷ Bore Size

B) Switch body only

SW - H0□

❹ Switch Model No.

C) Mounting bracket set

GLC-L2 - H - 40

❷ Bore Size

Specifications

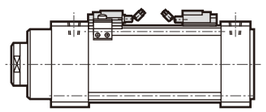
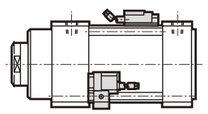
Item		GLC				
Bore Size	mm	ø40	ø50	ø63	ø80	ø100
Actuation method		Double Acting Type				
Operating Fluid		Compressed Air				
Max Operating Pressure	MPa	1.0				
Min Operating Pressure	MPa	0.15				
Proof Pressure	MPa	1.6				
Ambient Temperature	°C	-10 to 60 (No freezing)				
Port size	Rc	1/8	1/4		3/8	
Stroke Tolerance	mm	$^{+0.5}_{0}$ (Stroke 300 or less), $^{+1.0}_{0}$ (Stroke exceeding 300)				
Operating Piston Speed	mm/s	50 to 500 (Please use within the allowable absorbed energy.)				
Cushion		Rubber Cushion				
Lubrication		Not required (When lubricating, use turbine oil type 1 ISO VG32)				
Allowable Absorbed Energy	J	0.73	1.01	2.42	4.63	9.94

Stroke

Bore Size (mm)	Standard Stroke (mm)	Maximum Stroke (mm)	Min Stroke (mm)
ø40	100, 200, 300, 400, 500	500	5 (*2)
ø50			
ø63			
ø80	100, 200, 300, 400, 500, 600, 700	700	
ø100	100, 200, 300, 400, 500, 600, 700, 800	800	

*1: Intermediate strokes can be manufactured in 5 mm increments.
*2: For models with switch, the minimum stroke changes depending on the mounting method. Refer to the table below.

Minimum stroke with switch

Diagram	When mounting on the same surface		When mounting on different surfaces	
				
I.D.	R-type Switch	H-type Switch	R-type Switch	H-type Switch
ø40	34	34	20	25
ø50				
ø63	20	25		
ø80				
ø100				

Cylinder Weight

(Unit: kg)

Bore Size (mm)	Product weight at stroke (S) 0 mm			Switch Weight	Mounting Bracket Weight		Added weight per S = 50 mm	Added weight for N-type	Added weight for F-type
	Basic type (00)	Axial Foot Type (LB)	Flange Type (FA/FB)		R-type	H type			
ø40	1.15	1.3	1.4	Refer to the weight listed in the switch specifications on P. 1457.	0.023	0.028	0.3	0.07	0.17
ø50	1.68	1.8	2.24		0.021	0.026	0.48	0.09	0.3
ø63	2.4	2.7	3.0		0.019	0.024	0.6	0.13	0.35
ø80	4.4	4.8	5.5		0.025	0.029	0.97	0.24	1.0
ø100	6.93	7.8	9.0		0.023	0.028	1.02	0.46	1.4

(Example) Product weight of GLC-00-40-200-R0-D-R

- Product weight for 0 mm stroke.....1.15 Kg
- Additional weight for stroke 200 mm.....$0.3 \times \frac{200}{50} = 1.2$ Kg
- Weight of 2 R0 switches.....0.042×2=0.084 Kg
- Weight of 2 mounting brackets .....0.023×2=0.046 Kg
- Product weight .....1.15+1.2+0.084+0.046=2.480 Kg

Theoretical Thrust Table

(Unit: N)

Bore Size (mm)	Operating Direction	Operating Pressure MPa									
		0.15	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
ø40	Push	1.88×10^{2}	2.51×10^{2}	3.77×10^{2}	5.03×10^{2}	6.28×10^{2}	7.54×10^{2}	8.80×10^{2}	1.01×10^{3}	1.13×10^{3}	1.26×10^{3}
	Pull	1.14×10^{2}	1.53×10^{2}	2.30×10^{2}	3.06×10^{2}	3.83×10^{2}	4.59×10^{2}	5.36×10^{2}	6.13×10^{2}	6.89×10^{2}	7.66×10^{2}
ø50	Push	2.94×10^{2}	3.93×10^{2}	5.89×10^{2}	7.85×10^{2}	9.82×10^{2}	1.18×10^{3}	1.37×10^{3}	1.57×10^{3}	1.77×10^{3}	1.96×10^{3}
	Pull	1.50×10^{2}	2.00×10^{2}	3.00×10^{2}	4.01×10^{2}	5.01×10^{2}	6.01×10^{2}	7.01×10^{2}	8.01×10^{2}	9.01×10^{2}	1.00×10^{3}
ø63	Push	4.67×10^{2}	6.23×10^{2}	9.35×10^{2}	1.25×10^{3}	1.56×10^{3}	1.87×10^{3}	2.18×10^{3}	2.49×10^{3}	2.81×10^{3}	3.12×10^{3}
	Pull	2.79×10^{2}	3.72×10^{2}	5.58×10^{2}	7.44×10^{2}	9.30×10^{2}	1.12×10^{3}	1.30×10^{3}	1.49×10^{3}	1.67×10^{3}	1.86×10^{3}
ø80	Push	7.53×10^{2}	1.01×10^{3}	1.51×10^{3}	2.01×10^{3}	2.51×10^{3}	3.02×10^{3}	3.52×10^{3}	4.02×10^{3}	4.52×10^{3}	5.03×10^{3}
	Pull	4.59×10^{2}	6.13×10^{2}	9.19×10^{2}	1.23×10^{3}	1.53×10^{3}	1.84×10^{3}	2.14×10^{3}	2.45×10^{3}	2.76×10^{3}	3.06×10^{3}
ø100	Push	1.17×10^{2}	1.57×10^{3}	2.36×10^{3}	3.14×10^{3}	3.93×10^{3}	4.71×10^{3}	5.50×10^{3}	6.28×10^{3}	7.07×10^{3}	7.85×10^{3}
	Pull	7.53×10^{2}	1.01×10^{3}	1.51×10^{3}	2.01×10^{3}	2.51×10^{3}	3.02×10^{3}	3.52×10^{3}	4.02×10^{3}	4.52×10^{3}	5.03×10^{3}

Mounting Bracket Model No. Notation

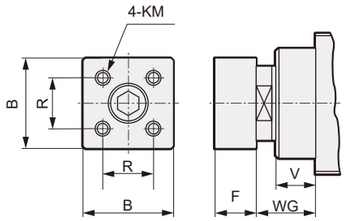
Bore Size (mm) / Mounting bracket		ø40	ø50	ø63	ø80	ø100
Foot (LB)	*1	GLC-40-LB	GLC-50-LB	GLC-63-LB	GLC-80-LB	GLC-100-LB
Flange (FA/FB)		GLC-40-FA	GLC-50-FA	GLC-63-FA	GLC-80-FA	GLC-100-FA

***1: Foot type mounting brackets are 2 pcs/set.**

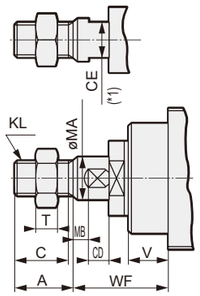
Dimensional Drawings

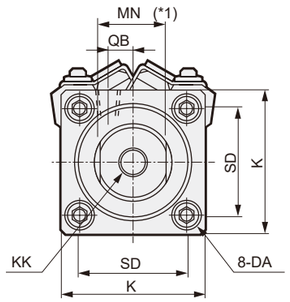
● Basic type (00)

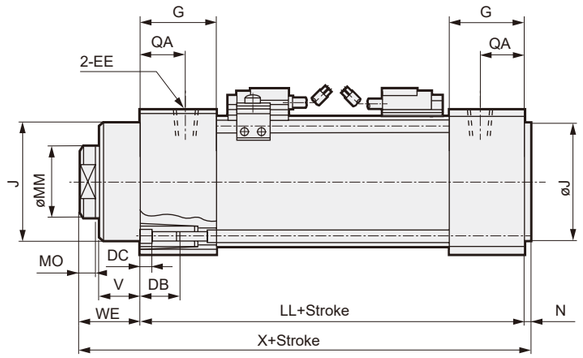
Flange type



Male Thread Type







Code	Basic Type (00) Basic Dimensions																
Bore Size (mm)	A	B	C	CD	CE	DA	DB	DC	EE	F	G	J	K	KK	KL	KM	LL
ø40	21.5	35	20	6.5	14	M8	12	4	Rc1/8	18	30	40	57	M10 Depth 15	M14×1.5	M6	97
ø50	23.5	45	22	9	17	M8	12	4	Rc1/4	20	34	52	66	M12 Depth 18	M16×1.5	M8	107
ø63	26.5	50	25	10	17	M8	12	4	Rc1/4	20	34	64	80	M14 Depth 20	M18×1.5	M8	110.5
ø80	30	70	29	14	22	M12	16	5	Rc3/8	27	41	75	98	M18 Depth 25	M22×1.5	M10	134.5
ø100	34.5	80	34	13.5	27	M12	16	5	Rc3/8	30	46	95	118	M20 Depth 30	M27×2	M10	151.5

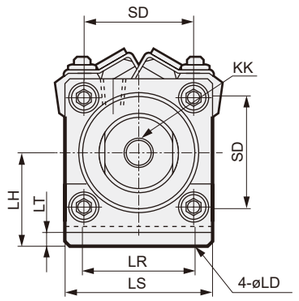
Code																
Bore Size (mm)	MA	MB	MM	MN	MO	N	QA	QB	R	SD	T	V	WE	WF	WG	X
ø40	17	11.5	25	23	8	2	18	7.5	24	40.5	8	20	35	54.5	33.5	134
ø50	19	11.5	35	31	8	2	20	9	32	48	10	20	35	56.5	33.5	144
ø63	21	11.5	40	36	8	2	22	10	36	59	11	24	39	62.5	37.5	151.5
ø80	26	12	50	44	10	2	25	10	50	74	13	27	44	72	42.5	180.5
ø100	34	13.5	60	54	10	2	25	10	60	90	16	27	47	77.5	45.5	200.5

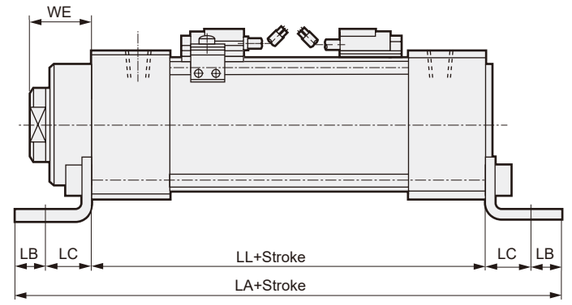
*1: Width Across Flats (female thread: MN, male thread: CE) position is unspecified.

***2: For dimensions of models with switches, see P. 1026.**

Dimensional Drawings

●Axial Foot Type (LB)



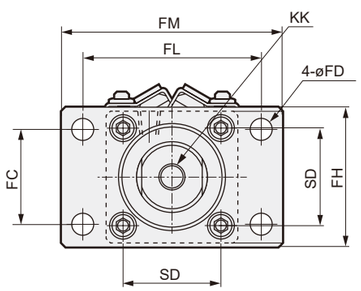


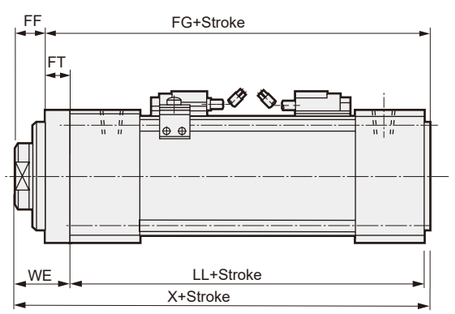
Code	Axial Foot Type (LB) Mounting Method											
Bore Size (mm)	KK	LL	SD	WE	LA	LB	LC	LD	LH	LR	LS	LT
ø40	M10 Depth 15	97	40.5	35	156	10	19.5	9	40	40	57	3.2
ø50	M12 Depth 18	107	48	35	175	12	22	9	40	46	66	4.5
ø63	M14 Depth 20	110.5	59	39	194.5	12	30	11	50	60	80	4.5
ø80	M18 Depth 25	134.5	74	44	236.5	14	37	14	60	74	98	6.0
ø100	M20 Depth 30	151.5	90	47	255.5	21	31	14	67	80	118	6.0

*1: Width Across Flats (female thread: MN, male thread: CE) position is unspecified.

***2: For dimensions of models with switches, see P. 1026.**

●Rod Side Flange Type (FA)





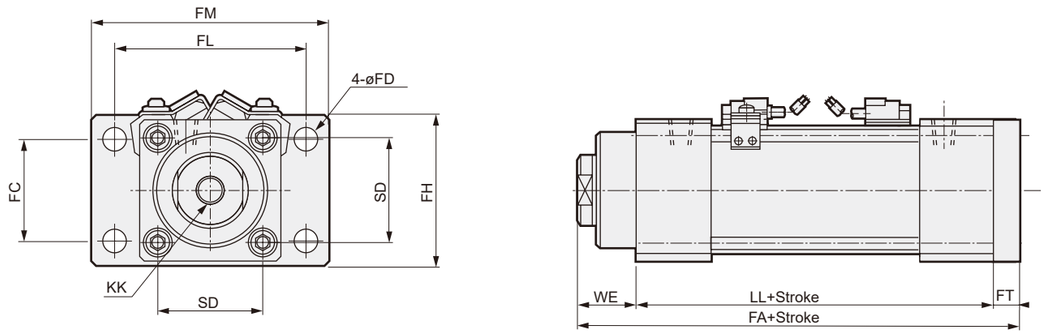
Code	Rod Side Flange Type (FA) Mounting Method												
Bore Size (mm)	KK	LL	SD	WE	X	FC	FD	FF	FG	FH	FL	FM	FT
ø40	M10 Depth 15	97	40.5	35	134	40	9	23	111	57	80	100	12
ø50	M12 Depth 18	107	48	35	144	47	9	23	121	65	85	108	12
ø63	M14 Depth 20	110.5	59	39	151.5	60	11	23	128.5	80	106	130	16
ø80	M18 Depth 25	134.5	74	44	180.5	74	14	25	155.5	98	125	153	19
ø100	M20 Depth 30	151.5	90	47	200.5	88	14	28	172.5	118	144	180	19

*1: Width Across Flats (female thread: MN, male thread: CE) position is unspecified.

***2: For dimensions of models with switches, see P. 1026.**

Dimensional Drawings

●Head Side Flange Type (FB)

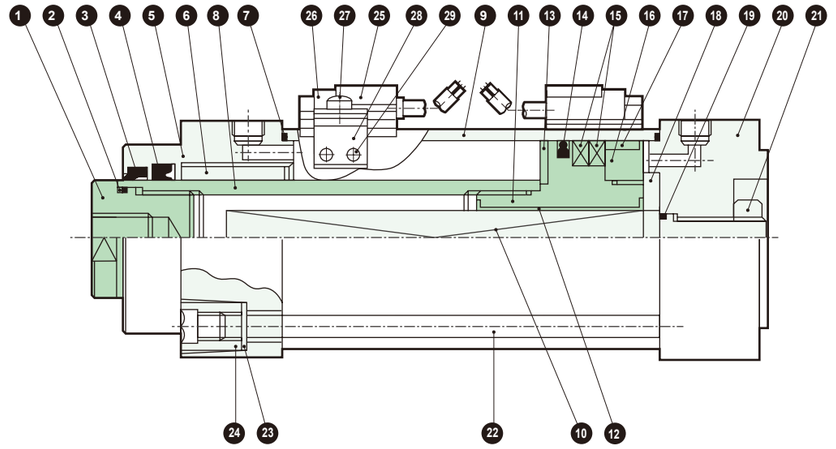


Code	Head Side Flange Type (FB) Mounting Method										
Bore Size (mm)	KK	LL	SD	WE	FA	FC	FD	FH	FL	FM	FT
ø40	M10 Depth 15	97	40.5	35	144	40	9	57	80	100	12
ø50	M12 Depth 18	107	48	35	154	47	9	65	85	108	12
ø63	M14 Depth 20	110.5	59	39	165.5	60	11	80	106	130	16
ø80	M18 Depth 25	134.5	74	44	197.5	74	14	98	125	153	19
ø100	M20 Depth 30	151.5	90	47	217.5	88	14	118	144	180	19

*1: Width Across Flats (female thread: MN, male thread: CE) position is unspecified.

***2: For dimensions of models with switches, see P. 1026.**

Internal Structure Diagram/Material



Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Tip cap	Steel	Manganese Phosphate	16	Piston (B)	Aluminum Alloy	
2	Gasket	Nitrile Rubber		17	Wear ring	Polyacetal	
3	Dust Wiper	Nitrile Rubber		18	Cushion Rubber	Urethane Rubber	
4	Rod Packing	Nitrile Rubber		19	Gasket	Nitrile Rubber	
5	Rod Cover	Aluminum Alloy	Black alumite	20	Head Cover	Aluminum Alloy	Black alumite
6	Bushing	Copper Alloy		21	Fixing Nut	Steel	Zinc Chromate
7	Cylinder Gasket	Nitrile Rubber		22	Tie rod	Steel	Zinc Chromate
8	Piston Rod	Steel	Industrial Hard Chrome Plating	23	Belleville washer	Steel	
9	Cylinder Tube	Aluminum Alloy	Hard Anodized	24	Round Nut	Steel	Zinc Chromate
10	Non-rotating shaft	Steel	Industrial Hard Chrome Plating	With Switch			
11	Piston (A)	Aluminum Alloy		25	Switch		
12	Non-rotating plate	Oil-Impregnated Bearing Alloy		26	Switch holder	Stainless Steel	
13	Cushion Rubber	Urethane Rubber		27	Pan Head Screw with captive washer and Phillips recess	Steel	Zinc Chromate
14	Piston Packing	Nitrile Rubber		28	Switch mounting base	Aluminum Alloy	
15	Magnet	Plastic		29	Hexagon Socket Set Screw	Alloy Steel	Black Oxide

Replacement Parts List

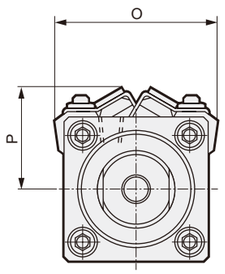
Bore Size (mm)	Kit Number	Replacement Part Number
ø40	**GLC-40K**	❸ ❹ ❼ ⓬ ⓮ ⓱
ø50	**GLC-50K**	
ø63	**GLC-63K**	
ø80	**GLC-80K**	
ø100	**GLC-100K**	

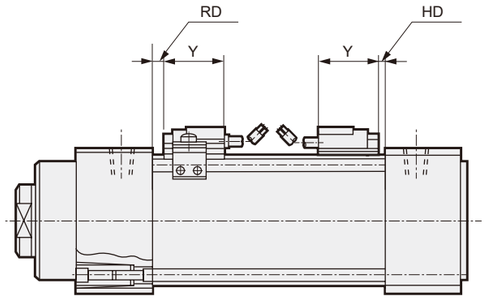
*1: Please specify the kit number when ordering consumable parts.

***2: The procedure for replacing consumable parts is different from that for general cylinders. For details, please refer to the Guideless Cylinder "Disassembly/Assembly Manual" (SM-323965).**

GLC Series External Dimensions Diagram with Switch

● R0/B, R4/B, R5/B, R6/B, R1/B, R2/B, R3/B, HO
GLC-(L2)





Code	R-type Switch							H-type Switch				
Bore Size (mm)	O	P	Y	R0, R4, R5, R6		R1, R2, R3		O	P	Y	RD	HD
				RD	HD	RD	HD					
ø40	66	39.5	31.5	0	3	0	4	66	39.5	33.5	0	4
ø50	74	44.5		2.5	5.5	3	6	74	44.5		3	6
ø63	90	51		4.5	7	5	7.5	90	51		5	7.5
ø80	114	59.5		7	14.5	7.5	15	114	59.5		7.5	15
ø100	128	67		8.5	18.5	10	19.5	128	67		10	19.5

*1: Width Across Flats (female thread: MN, male thread: CE) position is unspecified.

MEMO

Special
MVC
STK
MCP
GLC
BBS
NHS
HR
LN
Cylinder Switch
Ending

Model selection guide

Condition…stroke χ=300 mm, load weight at end m=15 kg, eccentricity L_2= 50 mm, distance b=50 mm from end to center of gravity of load, force F=m×g (N) applied to Rod End (g: Gravity acceleration 9.8 m/s²)

① First, calculate the lateral load moment F·L.

* For dimension a, first substitute 34 (mm) of the provisionally selected ø63 and calculate.

L = 34+300+50 = 384 (mm) = 0.384 (m)
F = 15×9.8 = 147 (N)
F·L = 147×0.384 = 56.4 (N·m)

② Calculate the self-weight moment M due to the Piston Rod, etc.

$$M = \frac{\chi^2}{2} \times C \times g + (a+\chi) \times D \times g$$
$$= \frac{300^2}{2} \times 4.3 \times 10^{-3} \times 9.8 +$$
$$(34+300) \times 0.24 \times 9.8$$
$$= 2682\ (N \cdot mm) \approx 2.7\ (N \cdot m)$$

③ The sum of ① and ② is the lateral load moment.

F·L+M = 56.4+2.7 = 59.1 (N·m)

④ Next, calculate the rotational torque F·L_2.

L_2 = 50 (mm) = 0.05 (m)
F = 147 (N)
F·L_2 = 147×0.05 = 7.35 (N·m)

⑤ Refer to the allowable lateral load moment table and allowable rotational torque table on the right to see if each moment is below the allowable value.

Current lateral load moment 59.1 (N·m)
Rotation torque 7.35 (N·m)

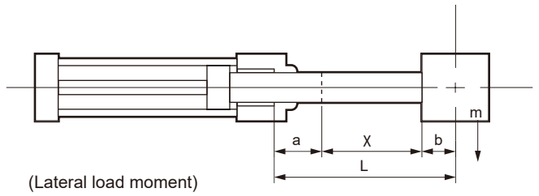
Allowable lateral load moment
ø50…92.8 N·m .....OK
ø63…144.6 N·m .....OK
Allowable rotational torque
ø50…4.2 N·m .....NG
ø63…8.8 N·m .....OK

In this case, ø50 may be acceptable for the lateral load moment, but since the rotational torque exceeds the allowable value, ø63 is used. Select so that both the lateral load moment and rotational torque are below the allowable values in this way.

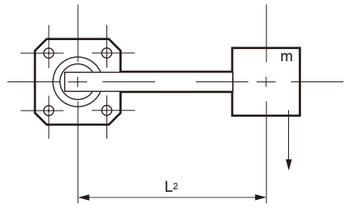
⑥ The minimum Operating Pressure is the sum of the Operating Pressures for rotational torque and lateral load moment.

0.18 MPa+0.23 MPa = 0.41 MPa

The Operating Pressure is obtained from the graph on the next page.



(Lateral load moment)

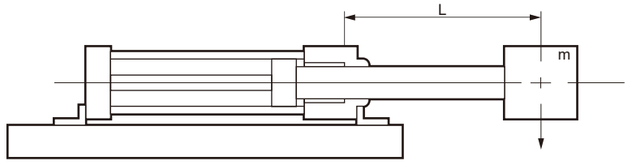


(Rotational torque)

m :	Payload				kg
L =	a + χ +b				mm
χ :	Stroke				mm
b :	Distance from top to load center				mm
a :	Dimensions of projecting section				mm
M :	Self-weight moment = $\frac{\chi^2}{2}$×C×g+(a+χ)×D×g				
g :	Gravity acceleration 9.8				m/s^2
C :	Piston Rod mass per unit length				kg/mm
D :	Tip cap weight				kg

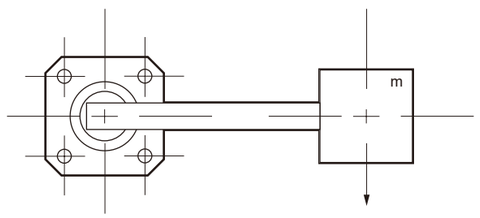
	ø40	ø50	ø63	ø80	ø100
a	32	34	34	36	39
C	1.3×10^{-3}	3.7×10^{-3}	4.3×10^{-3}	7.4×10^{-3}	9.7×10^{-3}
D	0.06	0.17	0.24	0.35	0.68

Allowable lateral load moment



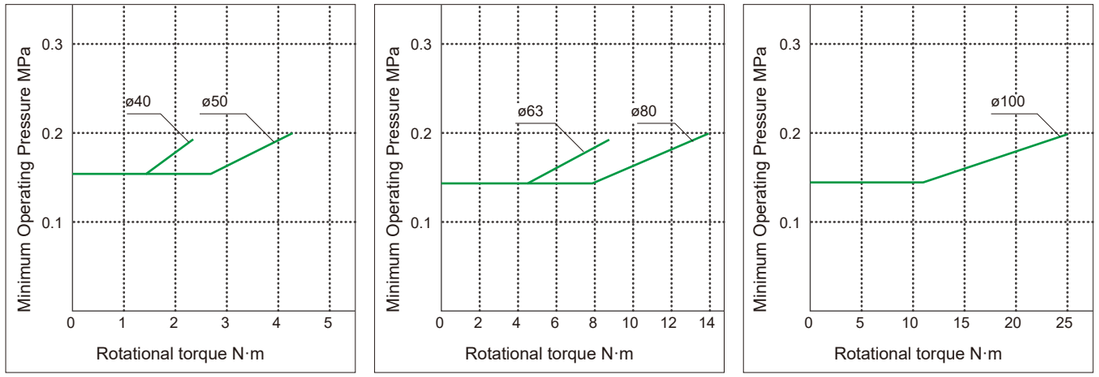
Bore Size	Allowable lateral load moment
ø40	54.6 N·m
ø50	92.8 N·m
ø63	144.6 N·m
ø80	275.0 N·m
ø100	468.1 N·m

Allowable rotational torque



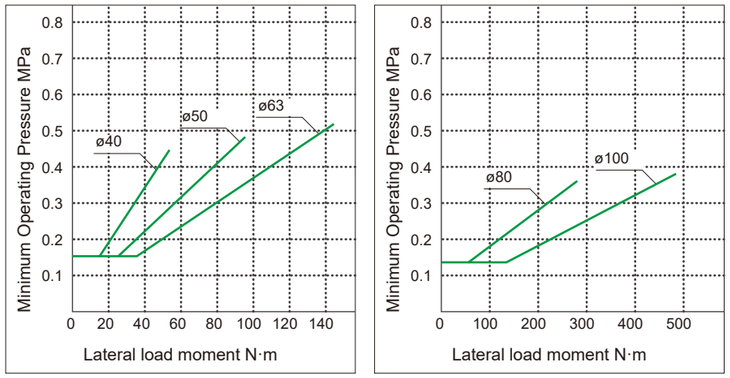
Bore Size	Allowable rotational torque
ø40	2.4 N·m
ø50	4.2 N·m
ø63	8.8 N·m
ø80	13.8 N·m
ø100	19.9 N·m

Relationship between rotational torque and minimum Operating Pressure



Note: Select within the allowable torque. (Ideally 70% or less of the allowable rotational torque.)

Relationship between lateral load moment and minimum Operating Pressure

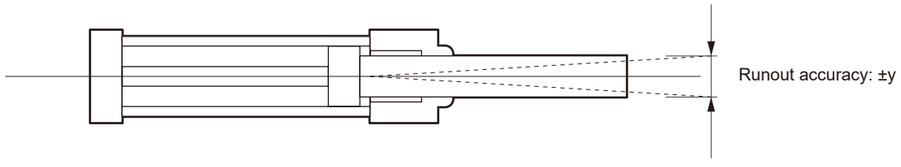


Note: Select within the allowable lateral load moment. (Ideally 70% or less of the allowable lateral load moment.)

Allowable Absorbed Energy

Bore Size	Allowable absorbed energy J
ø40	0.73
ø50	1.01
ø63	2.42
ø80	4.63
ø100	9.94

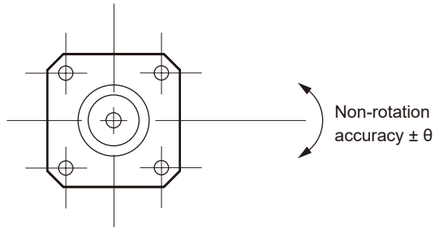
Runout accuracy



(Unit: mm)

Bore Size	Runout accuracy: ±y (Default value)	Standard Stroke						
		100	200	300	400	500	600	700
ø40	$y = (74+Stroke)\times3.66\times10^{-3}$	0.64	1.00	1.37	1.73	2.10	–	–
ø50	$y = (82.5+Stroke)\times3.50\times10^{-3}$	0.64	0.99	1.34	1.69	2.04	–	–
ø63	$y = (88+Stroke)\times3.36\times10^{-3}$	0.63	0.98	1.30	1.64	1.98	–	–
ø80	$y = (108+Stroke)\times3.36\times10^{-3}$	0.58	0.86	1.14	1.42	1.70	1.98	2.26
ø100	$y = (122.5+Stroke)\times3.36\times10^{-3}$	0.64	0.92	1.21	1.50	1.78	2.07	2.35

Non-rotation accuracy



(Unit: Degrees)

Bore Size	Non-rotation accuracy ±θ (Default value)
ø40	0.57
ø50	0.38
ø63	0.33
ø80	0.28
ø100	0.24

Pneumatic Equipment

To Use This Product Safely

Be sure to read this before use. For general cylinder information, see Intro 41, and for Cylinder Switches, see P. 1512.

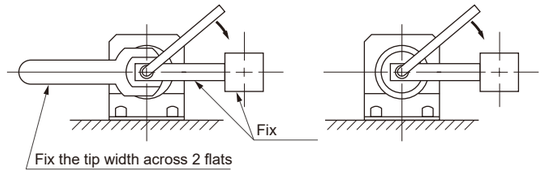
Individual Precautions: High rigidity guideless cylinder GLC Series

Design / Selection

Warning

■ Assembling the Piston Rod End

When assembling jigs, etc. to the Piston Rod tip (female thread type, male thread type, flange type), do not apply torque exceeding 5 times the allowable rotational torque to the cylinder and Piston Rod. This will cause damage to the non-rotating mechanism. When tightening, fix the width across 2 flats of the Rod End and the tip flange and tighten.



OK ✕

CAUTION

■ When using cylinder switch R1□, R2□ or R3□, place the attached rubber plate under the switch base when mounting.

Number of sheets to attach

ø40 : 0
ø50 : 4
ø63 : 3
ø80 : 5
ø100: 3

During Use

Warning

■ Cushion is provided (rubber cushion). Please use within the allowable absorbed energy. If used beyond the allowable value, the product may be damaged.

For precautions during mounting, installation, adjustment, use, and maintenance, refer to "During Use" in this catalog and the CKD Components Product website (https://www.ckd.co.jp/kiki/en/) -> "Model No." -> Instruction Manual.

BBS

Balancer Unit

ø50, ø63, ø80, ø100

CONTENTS

Product Introduction	1034
Series System Chart	1036
● Auto pressure adjustment (BBS-A)	1038
● Fixed Pressure Adjustment (BBS-O)	1054
Accessories External Dimensions Diagram	1047
Technical Data	1066
⚠ Precautions for Use	1068

Heavy objects up to 285 kg can be easily operated with air assistance

Balancer unit integrating a unique balance mechanism, automatic load detection function, and brake mechanism into a low-friction cylinder.

Workpiece weight to be balanced is...

In case of many types

Automatic Pressure Adjustment Type

BBS-A

Supports multi-product workpieces with load detection function

Even when the load changes for each workpiece to be transferred, it recognizes it with simple operation and maintains optimal balance.

In case of 1 type

Fixed Pressure Adjustment type

BBS-O

Control Box Integrated type

BBS-OB

Balanced state simultaneously with air source connection

Once the balance pressure is adjusted according to the workpiece weight, no further adjustment is necessary. It becomes a balanced state simultaneously with air connection.

Brake considering safety is standardly equipped

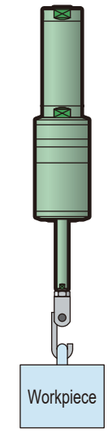
Highly reliable brake standardly equipped. Even if the air source is cut off, there is no workpiece falling or bouncing after recovery.

Also supports all-air system (option)

Supports all-air system that does not require electricity. Can also be used in atmospheres requiring explosion-proof.

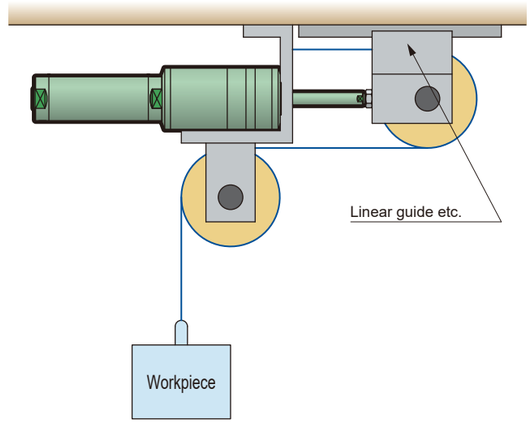
Application Example

Standard use



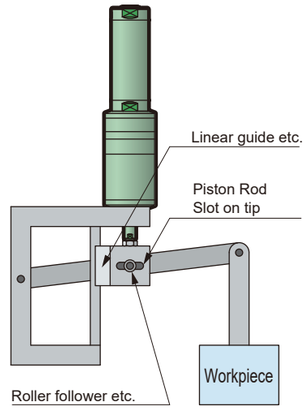
Hang BBS vertically and move the workpiece up and down.

Horizontal facing usage



Mounting the BBS horizontally can suppress the height of the entire unit.

Lever use



Use the BBS and link mechanism together.

BBS Series Product System

Variation

Pressure adjustment method	Model No.	Bore Size (mm)	Stroke Range (mm)
Automatic Pressure Adjustment Type	BBS-A	ø50 ø63 ø80 ø100	100 to 1500
Fixed Pressure Adjustment Type Control box separate type	BBS-O		
Fixed Pressure Adjustment Type Control box integrated type	BBS-OB		300 to 1500

Load range

Bore Size (mm)	Load		
	Minimum *1 (kg)	Minimum Workpiece *2 (kg)	Maximum *3 (kg)
ø50	10	20	70
ø63	16	31	115
ø80	25	51	180
ø100	40	80	285

*1: This is the load of the jig only without a workpiece.
*2: Applicable only to automatic pressure adjustment type.
*3: At 0.6 MPa. Jig+Workpiece load. Varies depending on Operating Pressure.

System Related Products

Control Box (For automatic pressure adjustment type)

- For electric system
- For electric, 2-stage speed switchable
- For air system

Operation Switch (For automatic pressure adjustment air system)

- Push type
- Hand type
- Lever type
- Grip type

Balancer Unit
BBS Series

●: Standard, ◎: Option ■: Not available

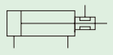
Variation	Model No.	Bore Size (mm)	Stroke (mm)		Max Stroke (mm)	Min Stroke (mm)	Mounting Style: Basic type 00	Mounting Style: Single clevis type CA	Mounting Style: Double Clevis Type CB	Mounting Style: Rod Side Flange Type FA	Mounting Style: Head Side Flange Type FB	Accessories: Single knuckle I	Accessories: Double Knuckle Y	Page
Automatic Pressure Adjustment Type	BBS-A	ø50, ø63	100, 200, 300, 400, 500, 600, 700, 800, 900, 1000, 1100, 1200, 1300, 1400, 1500		1500	100	●	●		●	●	●	●	1038
		ø80, ø100					●		●	●	●	●	●	
Fixed Pressure Adjustment Type Control box separate type	BBS-O	ø50, ø63	100, 200, 300, 400, 500, 600, 700, 800, 900, 1000, 1100, 1200, 1300, 1400, 1500		1500	100	●	●		●	●	●	●	1054
		ø80, ø100					●		●	●	●	●	●	
Fixed Pressure Adjustment Type Control box integrated type	BBS-OB	ø50, ø63	100, 200, 300, 400, 500, 600, 700, 800, 900, 1000, 1100, 1200, 1300, 1400, 1500		1500	300	●	●		●	●	●	●	1054
		ø80, ø100					●		●	●	●	●	●	

Balancer Unit
Automatic Pressure Adjustment Type

BBS-A Series

Do not disassemble

● Bore Size: ø50, ø63, ø80, ø100

JIS Symbol 

For compatible detailed model No.s, please visit the CKD website.

Model No. Notation

BBS-A - A D 1 - CB - 80 D - 300 - Y

- BBS-A: Model No.
- A: ❶ System
- D: ❷ Load Direction
- 1: ❸ Cylinder orientation (Piston Rod direction)
- CB: ❹ Mounting type
- 80: ❺ Bore Size
- D: ❻ Stroke
- 300: ❻ Stroke
- Y: ❼ Accessories

❶ System

Code	Content
Blank	Electric system (24 VDC)
*1 A	Air system

*1: When automatic pressure adjustment is selected for the air method, be sure to use the control box (BBS-A-TB P. 1050).

❷ Load Direction

Code	Content	
D	Push side	
U	Retraction side	

Note: Load Direction refers to the input direction of the load to the cylinder.

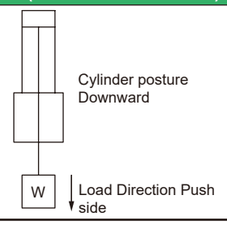
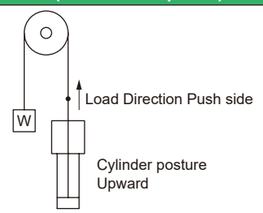
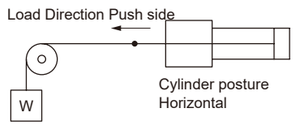
❸ Cylinder orientation (Piston Rod direction)

Code	Content
Blank	Downward
1	Upward
2	Horizontal

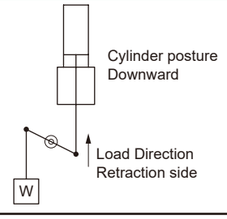
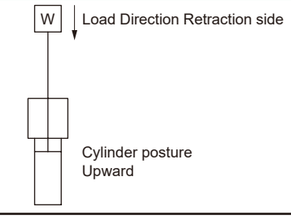
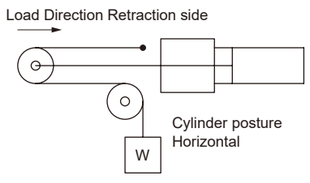
Note: Cylinder posture refers to the posture of the cylinder at the time of installation. Please refer to the diagram below.

Load Direction and cylinder posture

Load Direction Push side (D)

D (Piston Rod downward)	D1 (Piston Rod upward)	D2 (Piston Rod horizontal)
		

Load Direction Retract side (U)

U (Piston Rod downward)	U1 (Piston Rod upward)	U2 (Piston Rod horizontal)
		

❹ Mounting type

Mounting bracket is included with the product.

Code	Content	
OO	Basic type	
CA	Single Yoke Clevis (ø50, ø63) (Pin and Retaining Ring attached)	
CB	Double Yoke Clevis (ø80, ø100) (Pin and Retaining Ring attached)	
FA	Rod Side Flange	
FB	Head Side Flange	

❺ Bore Size (mm)

Code	Content
50	ø50
63	ø63
80	ø80
100	ø100

❻ Stroke (mm)

Model No.	Bore Size	Stroke
BBS-A	ø50 to ø100	100 to 1500

❼ Accessories

Code	Content	
I	Single Knuckle	
Y	Double Knuckle (pin and Retaining Ring included)	

Note: I and "Y" cannot be selected simultaneously.

Specifications

Item \ Model No.	BBS-A-50	BBS-A-63	BBS-A-80	BBS-A-100
Operating Fluid	Clean compressed air			
Max Operating Pressure MPa	0.60			
Min Operating Pressure MPa	0.25			
Proof Pressure MPa	0.90			
Ambient Temperature °C	-5 to 50 (however, no freezing)			
Bore Size mm	ø50	ø63	ø80	ø100
Max Stroke mm	1500			
Operating Piston Speed mm/s	1 to 200			
Cushion	Rubber Cushion			
Lubrication	Not allowed			
Minimum load (jig) kg	10	16	25	40
Minimum load (workpiece) (Reference) kg	20	31	51	80
Maximum load (jig+workpiece) *1 kg	70	115	180	285
Operating force N	Refer to P. 1052 BBS Operating Force Data			
Holding Force N	1539		3940	

***1: Please refer to P. 1052 BBS Maximum Load Data for Operating Pressure.**

Stroke

Standard Stroke (mm)	Maximum Stroke (mm)	Min Stroke (mm)
100, 200, 300, 400, 500, 600, 700, 800, 900, 1000, 1100, 1200, 1300, 1400, 1500	1500	100

Note: Intermediate strokes can be produced in 1 mm increments.

Weight Table

(Unit: kg)

Bore Size (mm)	Stroke: Product weight when 0 mm					Stroke: Added weight per 100 mm
	Basic Type (00)	Single Clevis (CA)	Double Clevis (CB)	Flange FA	Flange FB	
ø50	7.22	7.62	-	8.35	7.56	0.44
ø63	7.52	8.20	-	8.65	8.02	0.52
ø80	10.96	-	11.67	12.88	11.67	0.70
ø100	12.09	-	13.37	14.01	13.44	0.86

Mounting Bracket Model No. Notation

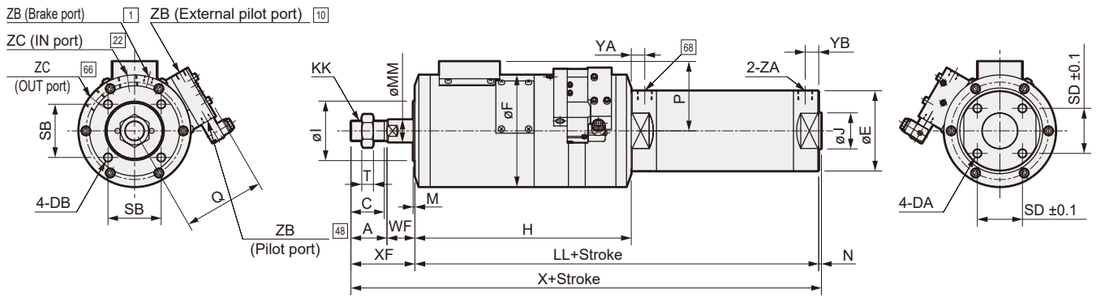
Bore Size (mm) / Mounting bracket	ø50	ø63	ø80	ø100
Flange (FA)	BBS-FA-50	BBS-FA-50	BBS-FA-80	BBS-FA-80
Flange (FB)	SCM-FA-50	SCM-FA-63	SCM-FA-80	SCM-FA-100
Single clevis (CA)	SCM-CA-50	SCM-CA-63	-	-
Double Clevis (CB)	-	-	SCM-CB-80	SCM-CB-100

Note: Mounting bolts are included with each mounting bracket.

MEMO

Dimensional Drawings

● Basic Type (OO) Load Direction Push Side (D)



● Basic Type (OO) Load Direction Retract Side (U)

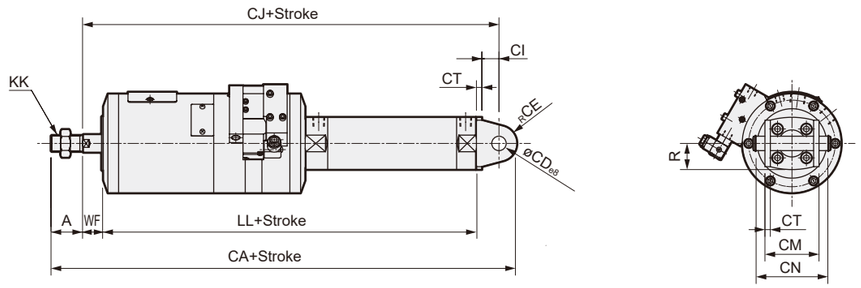
Note : Inside □ indicates the piping connection number in the air circuit diagram.

Code / Bore Size (mm)	A	C	DA	DB	E	F	H	I	J	KK	LL	MM
ø50	35	32	M8×1.25 Depth 16	M8×1.25 Depth 15	58	110	224	60	30	M18×1.5	314	20
ø63	35	32	M10×1.5 Depth 16	M8×1.25 Depth 15	72	110	224	60	32	M18×1.5	314	20
ø80	40	37	M10×1.5 Depth 22	M10×1.5 Depth 15	89	124	240	66	40	M22×1.5	348	25
ø100	40	37	M12×1.5 Depth 22	M10×1.5 Depth 15	110	124	240	66	50	M22×1.5	348	25

Code / Bore Size (mm)	M	N	P	Q	SB	SD	T	WF	X	XF	YA	YB	YC	YD	ZA	ZB	ZC
ø50	2	2	57	81	50	32	11	23	374	58	15	12	32	52	Rc1/4	Rc1/8	Rc3/8
ø63	2	2	57	81	50	38	11	23	374	58	15	12	32	52	Rc1/4	Rc1/8	Rc3/8
ø80	2	3	77	90	59	50	13	31	422	71	15	15	34	55.7	Rc3/8	Rc1/8	Rc 1/2
ø100	2	3	77	90	59	60	13	31	422	71	15	15	34	55.7	Rc 1/2	Rc1/8	Rc 1/2

Dimensional Drawings

● Single Yoke Clevis Type (CA) Load Direction Push Side (D)

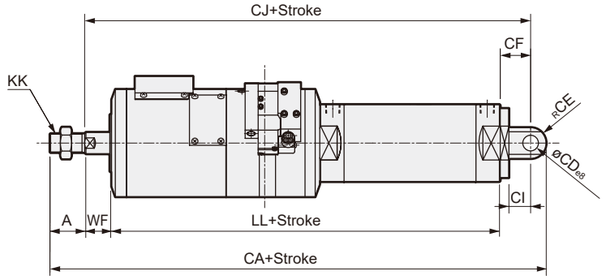


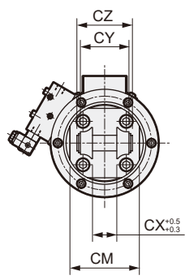
● Single Yoke Clevis Type (CA) Load Direction Retract Side (U)

Code / Bore Size (mm)	A	KK	LL	R	WF	CA	CD	CE	CI	CT	CJ	CM	CN
ø50	35	M18×1.5	314	29	23	417	16	20	19	6	362	60	79.6
ø63	35	M18×1.5	314	36	23	424	18	22	22	8	367	74	97.8

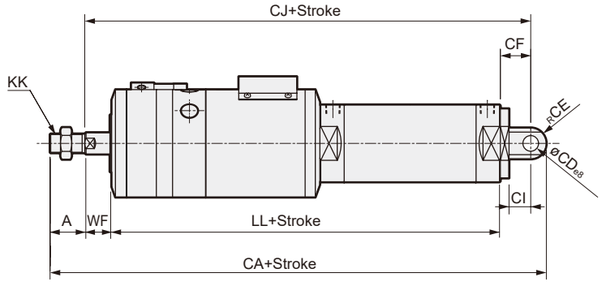
Dimensional Drawings

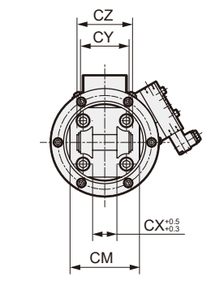
● Double Yoke Clevis Type (CB) Load Direction Push Side (D)





● Double Yoke Clevis Type (CB) Load Direction Retract Side (U)

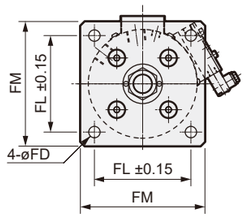


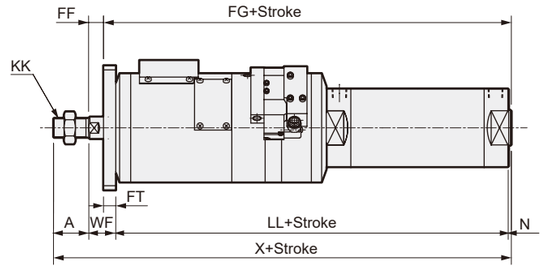


Code / Bore Size (mm)	A	KK	LL	WF	CA	CD	CE	CF	CI	CJ	CM	CX	CY	CZ
ø80	40	M22×1.5	348	31	472	18	18	35	25	414	80	28	56	64
ø100	40	M22×1.5	348	31	484	22	22	43	31	422	100	32	64	72

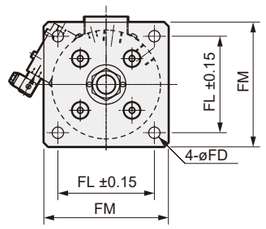
Dimensional Drawings

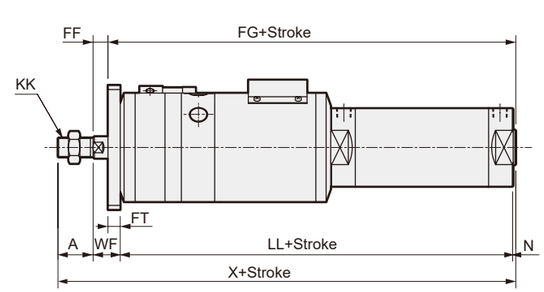
● Rod Side Flange Type (FA) Load Direction Push Side (D)





● Rod Side Flange Type (FA) Load Direction Retract Side (U)

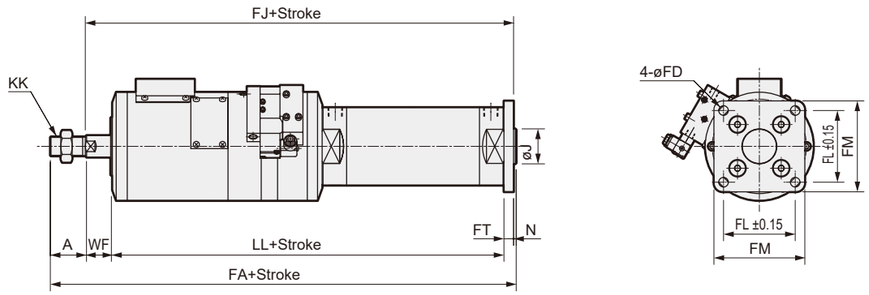




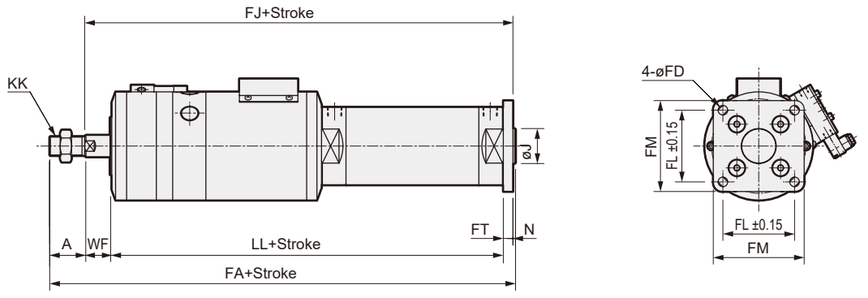
Code / Bore Size (mm)	A	KK	LL	N	WF	X	FD	FF	FG	FL	FM	FT
ø50	35	M18×1.5	314	2	23	374	11	11	328	95	120	12
ø63	35	M18×1.5	314	2	23	374	11	11	328	95	120	12
ø80	40	M22×1.5	348	3	31	422	13	17	365	110	142	14
ø100	40	M22×1.5	348	3	31	422	13	17	365	110	142	14

Dimensional Drawings

● Head Side Flange Type (FB) Load Direction Push Side (D)



● Head Side Flange Type (FB) Load Direction Retract Side (U)

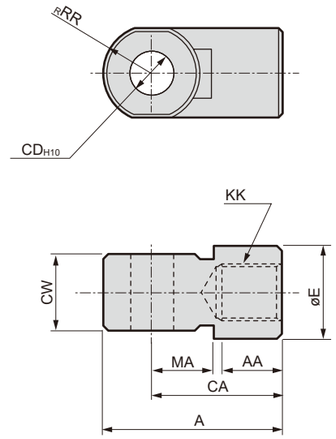


Code / Bore Size (mm)	A	J	KK	LL	N	WF	FA	FD	FJ	FL	FM	FT
ø50	35	30	M18×1.5	314	2	23	383	9	346	58	76	9
ø63	35	32	M18×1.5	314	2	23	383	11	346	70	92	9
ø80	40	40	M22×1.5	348	3	31	433	11	390	82	104	11
ø100	40	50	M22×1.5	348	3	31	436	13	393	100	128	14

Accessory External Dimensions

● Rod eye

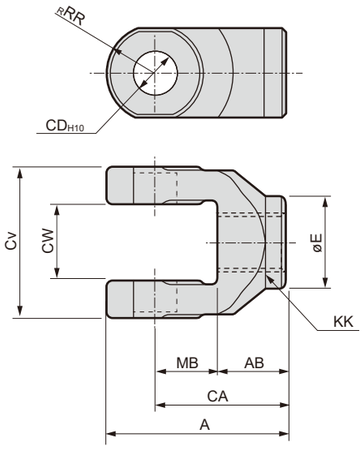
Material: Cast Iron, Painting



Part No.	Applicable Bore Size (mm)	A	AA	CA	CD	CW	E	KK	MA	RR	Weight (g)
SCM-I-50	50, 63	56	18	40	14	22 $^{-0.3}_{-0.5}$	28	M18×1.5	20	16	158
SCM-I-80	80, 100	71	21	50	18	28 $^{-0.3}_{-0.5}$	38	M22×1.5	27	21	395

● Rod clevis

Material: Cast Iron, Painting

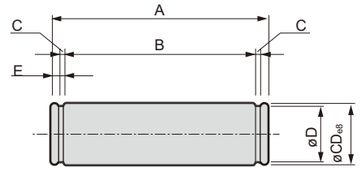


Part No.	Applicable Bore Size (mm)	A	AB	CA	CD	Cv	CW	E	KK	MB	RR	Applicable Pin Part Number	Weight (g)
SCM-Y-50	50, 63	56	20	40	14	44	22 $^{+0.5}_{+0.3}$	28	M18×1.5	20	16	SCM-P-50	258
SCM-Y-80	80, 100	71	23	50	18	56	28 $^{+0.5}_{+0.3}$	38	M22×1.5	27	21	SCM-P-80	590

Note: The pin and Retaining Ring are included.

● Pin for clevis

Material: Steel, Zinc Chromate plating

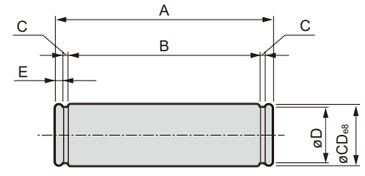


Part No.	Applicable Bore Size (mm)	A	B	C	CD	D	E	Retaining Ring Used	Weight (g)
SCM-P1-50	50	86	79.6	1.15	16	15.2	2.1	C-type for Shaft 16	133
SCM-P1-63	63	105.4	97.8	1.35	18	17	2.5	C-type for Shaft 18	207

Note: For ø80, ø100, it is shared with knuckle pin.

● Pin for rod eye

Material: Steel, Zinc Chromate plating



Part No.	Applicable Bore Size (mm)	A	B	C	CD	D	E	Retaining Ring Used	Weight (g)
SCM-P-50	50, 63	50.6	44.2	1.15	14	13.4	2.1	C-type 14 for Shaft	60
SCM-P-80	80, 100	64	56.2	1.35	18	17	2.6	C-type for Shaft 18	126

Control Box (For electric system)

Model No. Notation

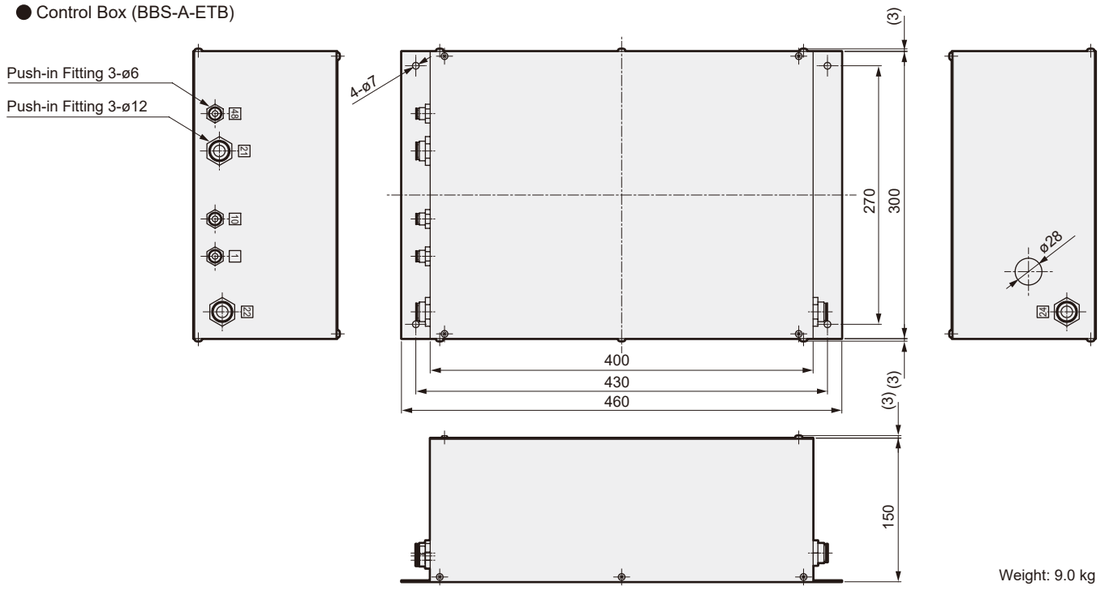
BBS-A - ETB

Model No.

Control Box

Dimensional Drawings

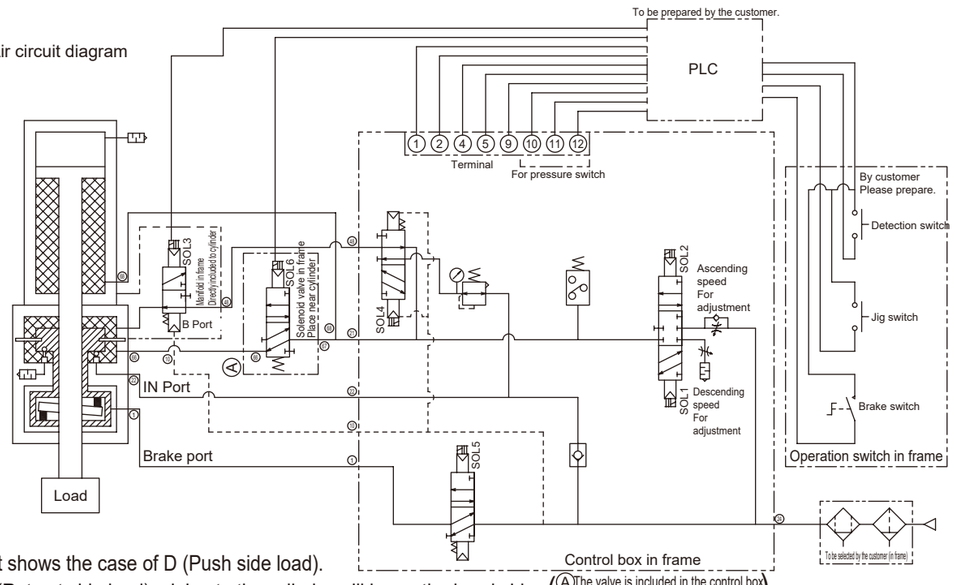
● Control Box (BBS-A-ETB)



Weight: 9.0 kg

Air circuit diagram

● Control Box (BBS-A-ETB) Air circuit diagram



The above circuit shows the case of D (Push side load).
In the case of U (Retract side load), piping to the cylinder will be on the head side.

Control Box (For electric system, 2-speed switching type)

Model No. Notation

BBS-A - ETB2

Model No.

Control Box

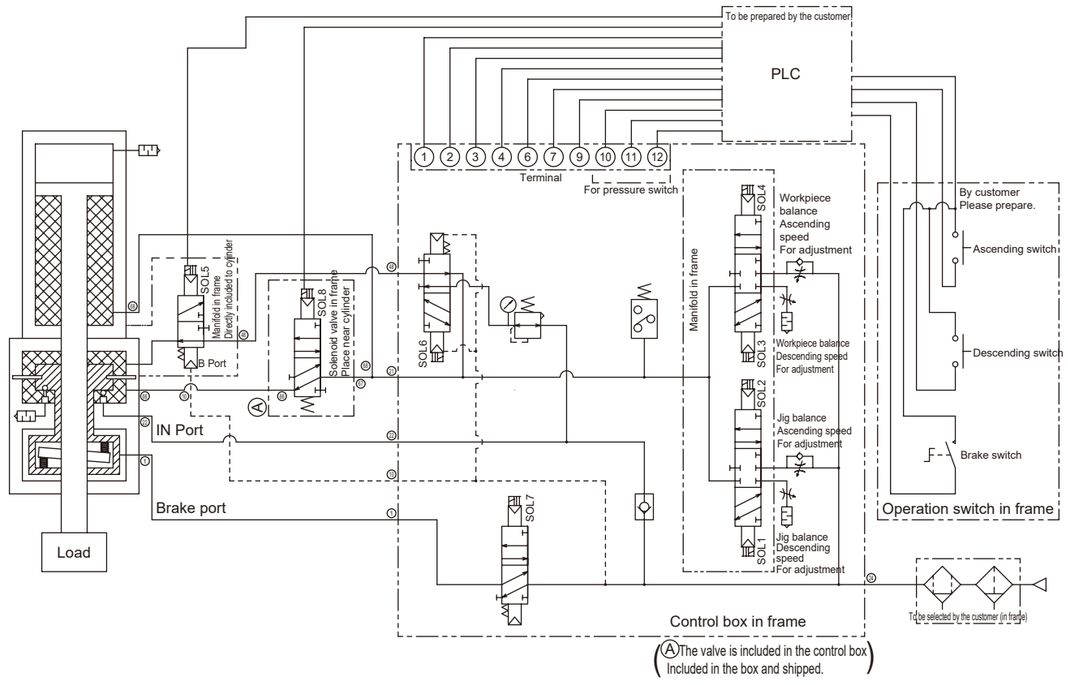
Dimensional Drawings

● Same as Control Box (BBS-A-ETB). Please refer to P. 1048.

Weight: 9.5 kg

Air circuit diagram

● Control Box (BBS-A-ETB2) Air circuit diagram



The above circuit shows the case of D (Push side load). In the case of U (Retract side load), piping to the cylinder will be on the head side.

Control Box (For air system)

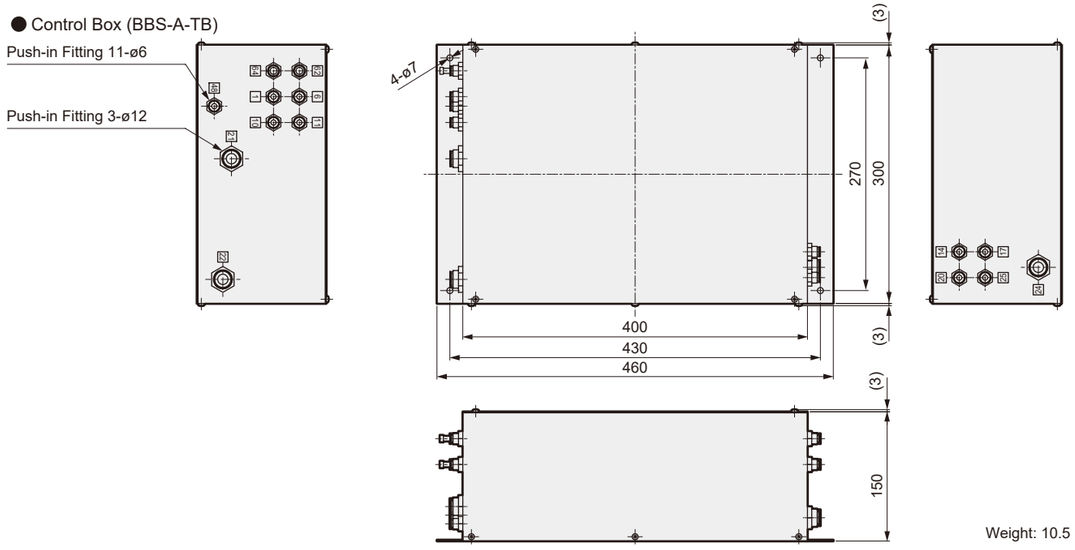
Model No. Notation

BBS-A - TB

- BBS-A: Model No.
- TB: Control Box

Dimensional Drawings

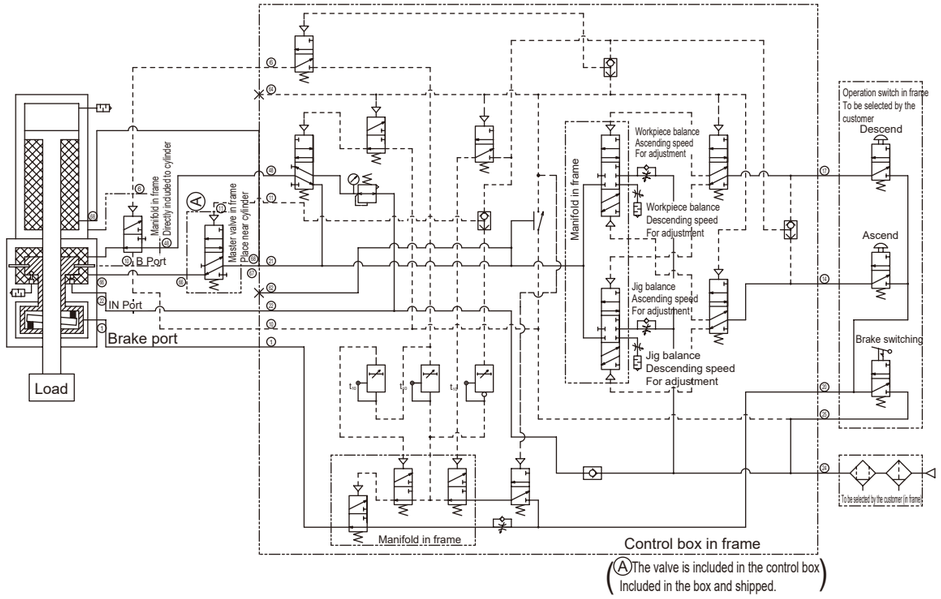
● Control Box (BBS-A-TB)



Weight: 10.5 kg

Air circuit diagram

● Control Box (BBS-A-TB) Air circuit diagram



The above circuit shows the case of D (Push side load). In the case of U (Retract side load), piping to the cylinder will be on the head side.

Operation Switch (For air system)

Model No. Notation

BBS - CSW - R

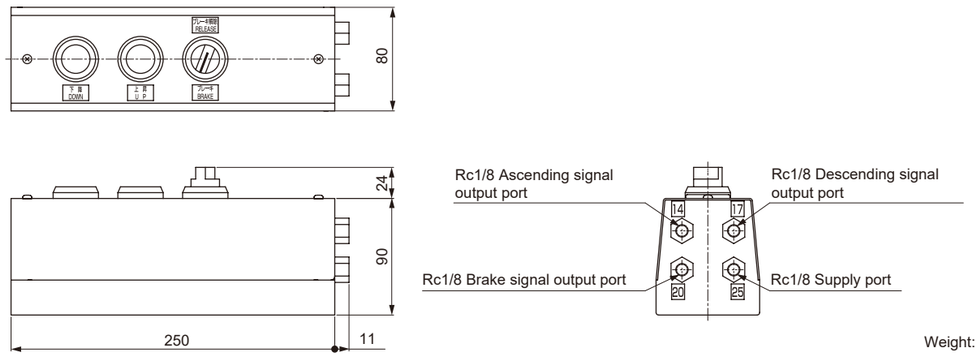
- BBS: Model No.
- CSW: Operation switch
- R: ❶ Type

❶ Type

Code	Content
P	Push type
H	Hand type
R	Lever type
G	Grip type

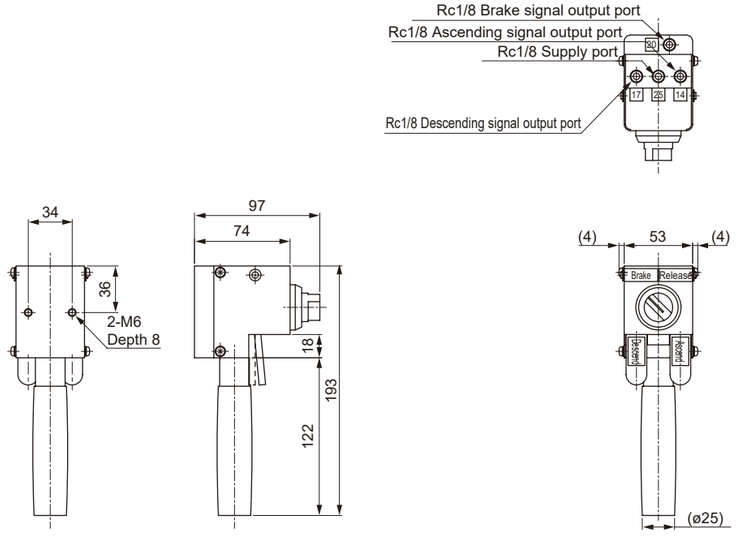
Operation Switch External View Diagram

● Push Type (BBS-CSW-P)



Weight: 1.4 kg

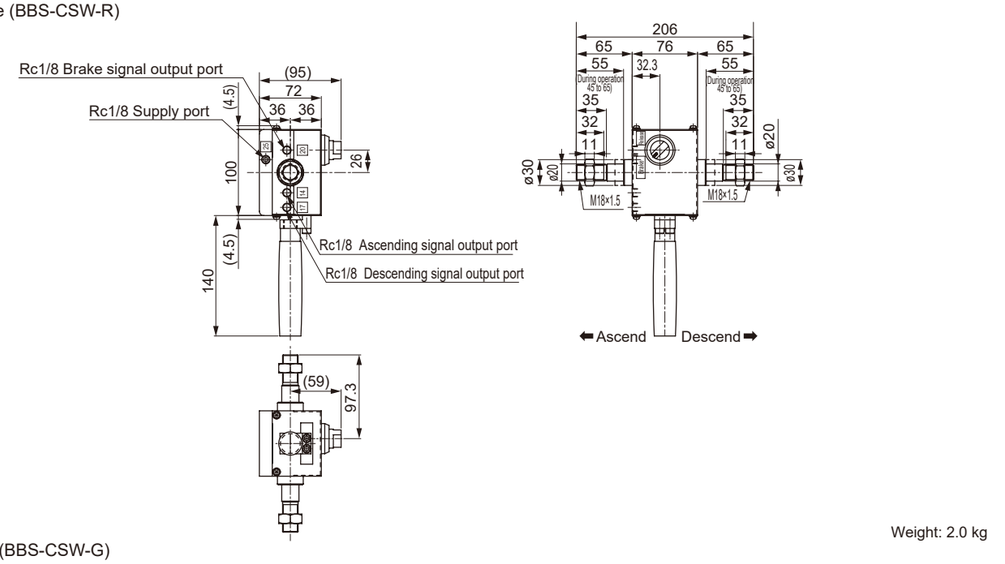
● Hand Type (BBS-CSW-H)



Weight: 1.0 kg

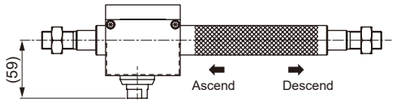
Operation Switch External View Diagram

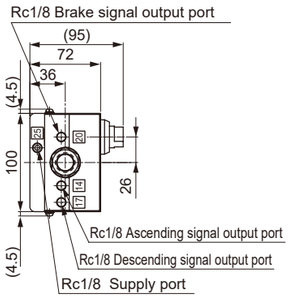
● Lever Type (BBS-CSW-R)

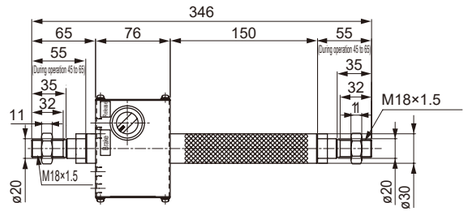


Weight: 2.0 kg

● Grip Type (BBS-CSW-G)



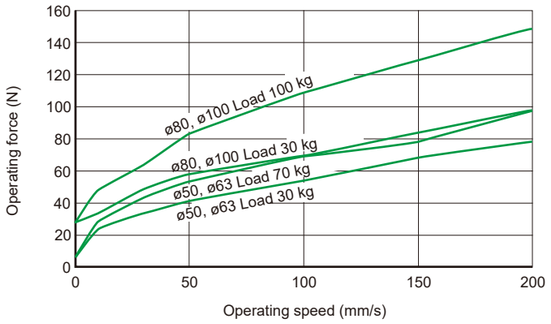




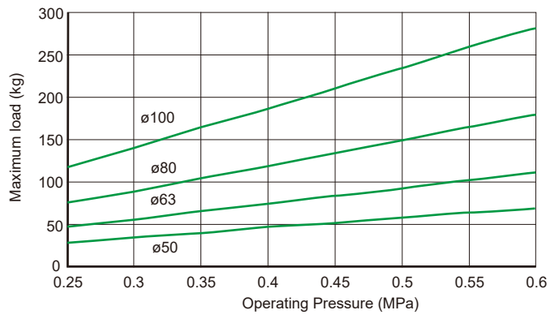
Weight: 2.5 kg

Please use the lever type and grip type operation switches by assembling them to the Piston Rod.

Operating force (Reference)



Maximum load for Operating Pressure



MEMO

Balancer Unit
Fixed Pressure Adjustment Type
Control box separated

BBS-O Series

● Bore Size: ø50, ø63, ø80, ø100

Do not disassemble

Control box integrated

BBS-OB Series

RoHS

Model No. Notation

BBS-O - D - CB - 80 D - 300 - Y

1 Model No. | 2 Load Direction | 3 Mounting type | 4 Bore Size | 5 Stroke | 6 Accessories

1 Model No.

	Code	Content
*1	BBS-O	Control box separate type
	BBS-OB	Control box integrated type

*1: BBS-O control boxes are attached separately. Connection with the cylinder is the customer's responsibility.

2 Load Direction

Code	Content	
D	Push side	
U	Retraction side	

Note: Load Direction refers to the input direction of the load to the cylinder.

3 Mounting type

Mounting bracket is included with the product.

Code	Content	
OO	Basic type	
CA	Single Yoke Clevis (ø50, ø63) (Pin and Retaining Ring attached)	
CB	Double Yoke Clevis (ø80, ø100) (Pin and Retaining Ring attached)	
FA	Rod Side Flange	
FB	Head Side Flange	

4 Bore Size (mm)

Code	Content
50	ø50
63	ø63
80	ø80
100	ø100

5 Stroke (mm)

Model No.	Bore Size	Stroke
BBS-O	ø50 to ø100	100 to 1500
BBS-OB	ø50 to ø100	300 to 1500

6 Accessories

Code	Content	
I	Single knuckle	
Y	Double Knuckle (pin and Retaining Ring included)	

Note: "I" and "Y" cannot be selected together.

Specifications

Item \ Model No.	BBS-O-50	BBS-O-63	BBS-O-80	BBS-O-100
Operating Fluid	Clean compressed air			
Max Operating Pressure MPa	0.60			
Min Operating Pressure MPa	0.25 (36 psi)			
Proof Pressure MPa	0.90			
Ambient Temperature °C	-5 to 50 (however, no freezing)			
Bore Size mm	ø50	ø63	ø80	ø100
Max Stroke (mm)	1500			
Operating Piston Speed mm/s	1 to 200			
Cushion	Rubber Cushion			
Lubrication	Not allowed			
Minimum load (jig) kg	10	16	25	40
Minimum load (workpiece) (Reference) kg	20	31	51	80
Maximum load (jig+workpiece) *1 kg	70	115	180	285
Operating force N	Refer to P. 1052 BBS Operating Force Data			
Holding Force N	1539		3940	

***1: Please refer to P. 1052 BBS Maximum Load Data for Operating Pressure.**

Stroke

Model	Standard Stroke (mm)	Maximum Stroke (mm)	Min Stroke (mm)
BBS-O	100, 200, 300, 400, 500, 600, 700, 800, 900, 1000, 1100, 1200, 1300, 1400, 1500	1500	100
BBS-OB	300, 400, 500, 600, 700, 800, 900, 1000, 1100, 1200, 1300, 1400, 1500	1500	300

Note: Intermediate strokes can be produced in 1 mm increments.

Weight Table

● Control Box Separate Type BBS-O (Unit: kg)

Bore Size (mm)	Stroke: Product weight when 0 mm					Stroke: 100 mm Added weight per
	Basic Type (00)	Single Clevis (CA)	Double Clevis (CB)	Flange FA	Flange FB	
ø50	7.22	7.62	|	8.35	7.56	0.44
ø63	7.52	8.20	|	8.65	8.02	0.52
ø80	10.96	|	11.67	12.88	11.67	0.70
ø100	12.09	|	13.37	14.01	13.44	0.86

● Control Box Integrated Type BBS-OB (Unit: kg)

Bore Size (mm)	Stroke: Product weight when 0 mm					Stroke: 100 mm Added weight per
	Basic Type (00)	Single Clevis (CA)	Double Clevis (CB)	Flange FA	Flange FB	
ø50	11.14	11.54	|	12.27	11.48	0.58
ø63	11.44	12.12	|	12.57	11.94	0.66
ø80	14.78	|	15.49	16.70	15.49	0.84
ø100	15.91	|	17.19	17.83	17.26	1.00

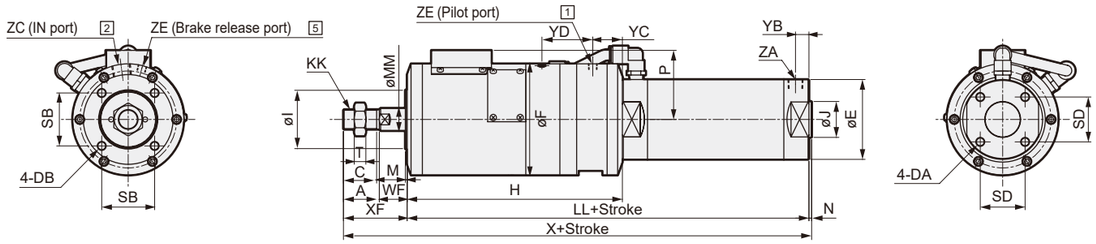
Mounting Bracket Model No. Notation

Bore Size (mm) \ Mounting bracket	ø50	ø63	ø80	ø100
Flange (FA)	BBS-FA-50	BBS-FA-50	BBS-FA-80	BBS-FA-80
Flange (FB)	SCM-FA-50	SCM-FA-63	SCM-FA-80	SCM-FA-100
Single clevis (CA)	SCM-CA-50	SCM-CA-63	-	-
Double Clevis (CB)	-	-	SCM-CB-80	SCM-CB-100

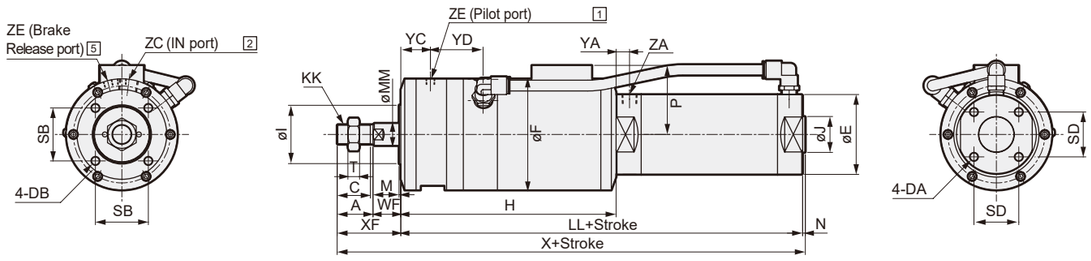
Note: Mounting bolts are included with each mounting bracket.

Dimensional Drawings

● Control Box Separate Type, Basic Type (OO), Load Direction Push Side (D)



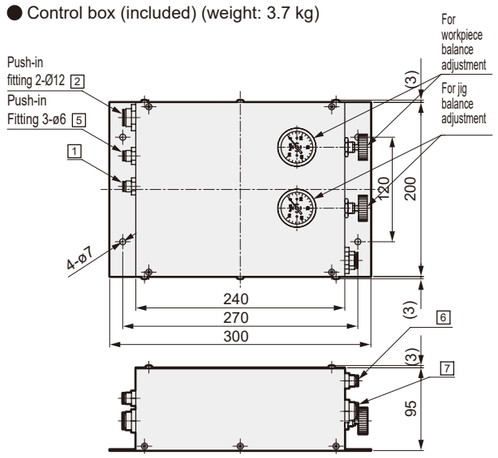
● Control Box Separate Type, Basic Type (OO), Load Direction Retract Side (U)



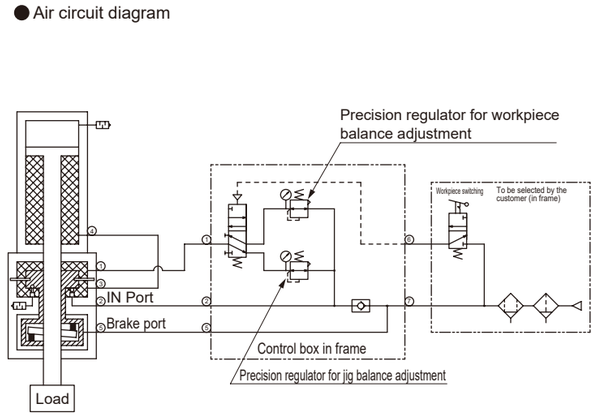
Code / Bore Size (mm)	A	C	DA	DB	E	F	H	I	J	KK	LL	MM	M	N
ø50	35	32	M8×1.25 Depth 16	M8×1.25 Depth 15	58	110	224	60	30	M18×1.5	314	20	2	2
ø63	35	32	M10×1.5 Depth 16	M8×1.25 Depth 15	72	110	224	60	32	M18×1.5	314	20	2	2
ø80	40	37	M10×1.5 Depth 22	M10×1.5 Depth 15	89	124	240	66	40	M22×1.5	348	25	2	3
ø100	40	37	M12×1.5 Depth 22	M10×1.5 Depth 15	110	124	240	66	50	M22×1.5	348	25	2	3

Code / Bore Size (mm)	P	SB	SD	T	WF	X	XF	YA	YB	YC	YD	ZA	ZE	ZC
ø50	57	50	32	11	23	374	58	15	12	37	48.5	Rc1/4	Rc1/8	Rc3/8
ø63	57	50	38	11	23	374	58	15	12	37	48.5	Rc1/4	Rc1/8	Rc3/8
ø80	77	59	50	13	31	422	71	15	15	33	56.7	Rc3/8	Rc1/8	Rc 1/2
ø100	77	59	60	13	31	422	71	15	15	33	56.7	Rc 1/2	Rc1/8	Rc 1/2

● Control box (included) (weight: 3.7 kg)

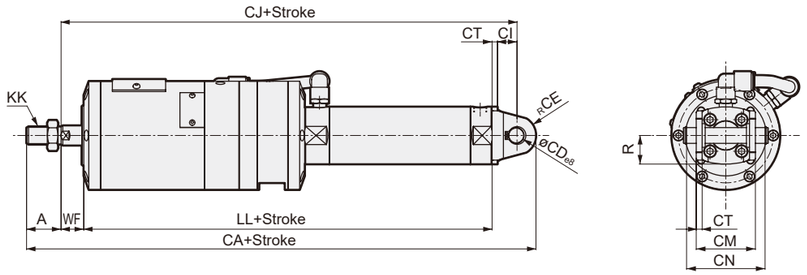


● Air circuit diagram

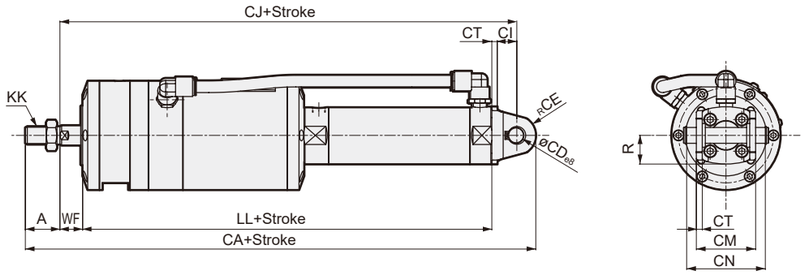


Dimensional Drawings

● Control Box Separate Type, Single Yoke Clevis Type (CA), Load Direction Push Side (D)



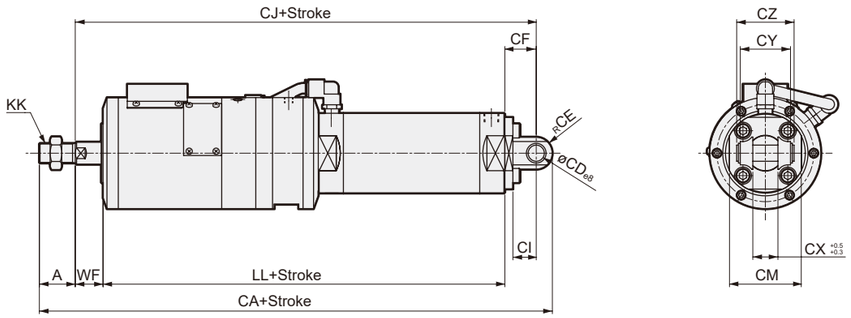
● Control Box Separate Type, Single Yoke Clevis Type (CA), Load Direction Retract Side (U)



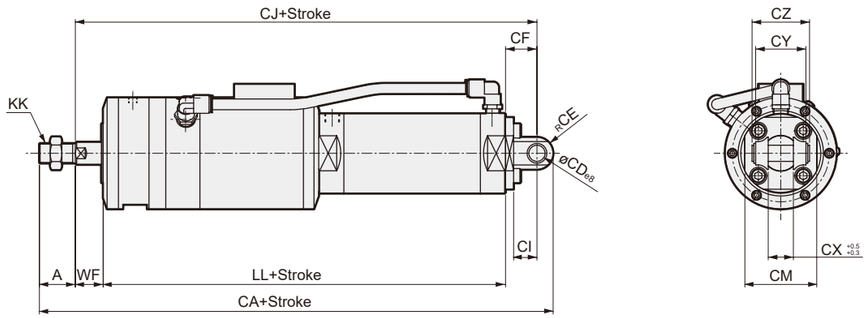
Code / Bore Size (mm)	A	KK	LL	R	WF	CA	CD	CE	CI	CT	CJ	CM	CN
ø50	35	M18×1.5	314	29	23	417	16	20	19	6	362	60	79.6
ø63	35	M18×1.5	314	36	23	424	18	22	22	8	367	74	97.8

Dimensional Drawings

● Control Box Separate Type, Double Yoke Clevis Type (CB), Load Direction Push Side (D)



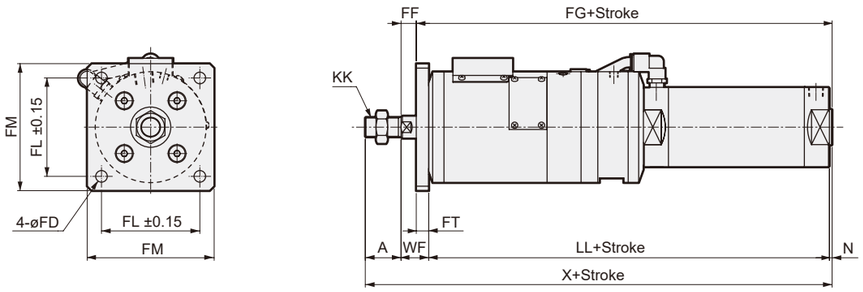
● Control Box Separate Type, Double Yoke Clevis Type (CB), Load Direction Retract Side (U)



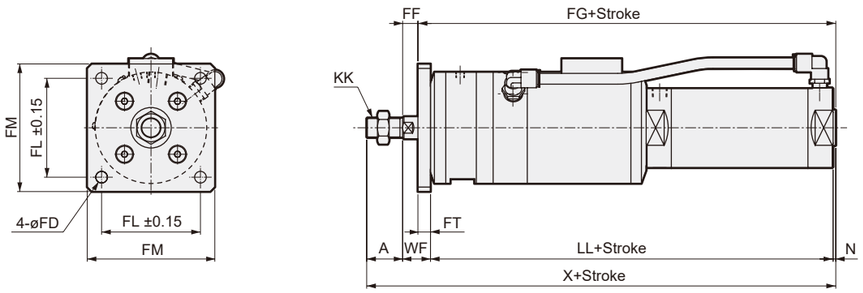
Code / Bore Size (mm)	A	KK	LL	WF	CA	CD	CE	CF	CI	CJ	CM	CX	CY	CZ
ø80	40	M22×1.5	348	31	472	18	18	35	25	414	80	28	56	64
ø100	40	M22×1.5	348	31	484	22	22	43	31	422	100	32	64	72

Dimensional Drawings

● Control Box Separate Type, Rod Side Flange Type (FA), Load Direction Push Side (D)



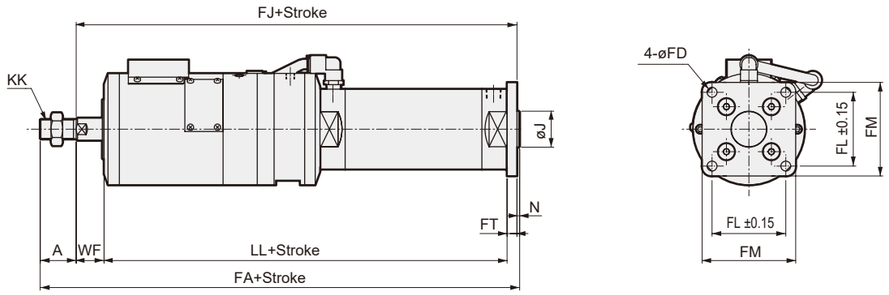
● Control Box Separate Type, Rod Side Flange Type (FA), Load Direction Retract Side (U)



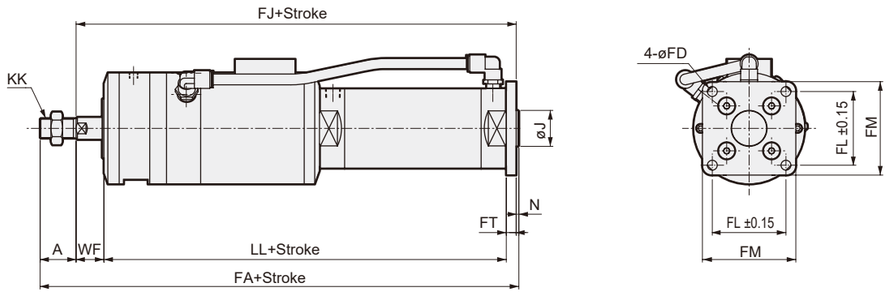
Code / Bore Size (mm)	A	KK	LL	N	WF	X	FD	FF	FG	FL	FM	FT
ø50	35	M18×1.5	314	2	23	374	11	11	328	95	120	12
ø63	35	M18×1.5	314	2	23	374	11	11	328	95	120	12
ø80	40	M22×1.5	348	3	31	422	13	17	365	110	142	14
ø100	40	M22×1.5	348	3	31	422	13	17	365	110	142	14

Dimensional Drawings

● Control Box Separate Type, Head Side Flange Type (FB), Load Direction Push Side (D)



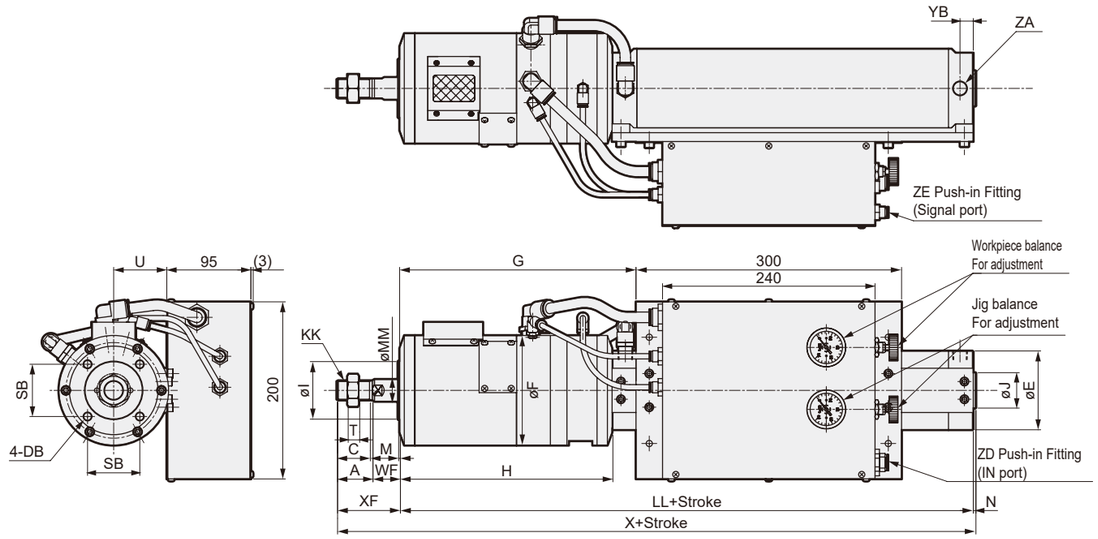
● Control Box Separate Type, Head Side Flange Type (FB), Load Direction Retract Side (U)



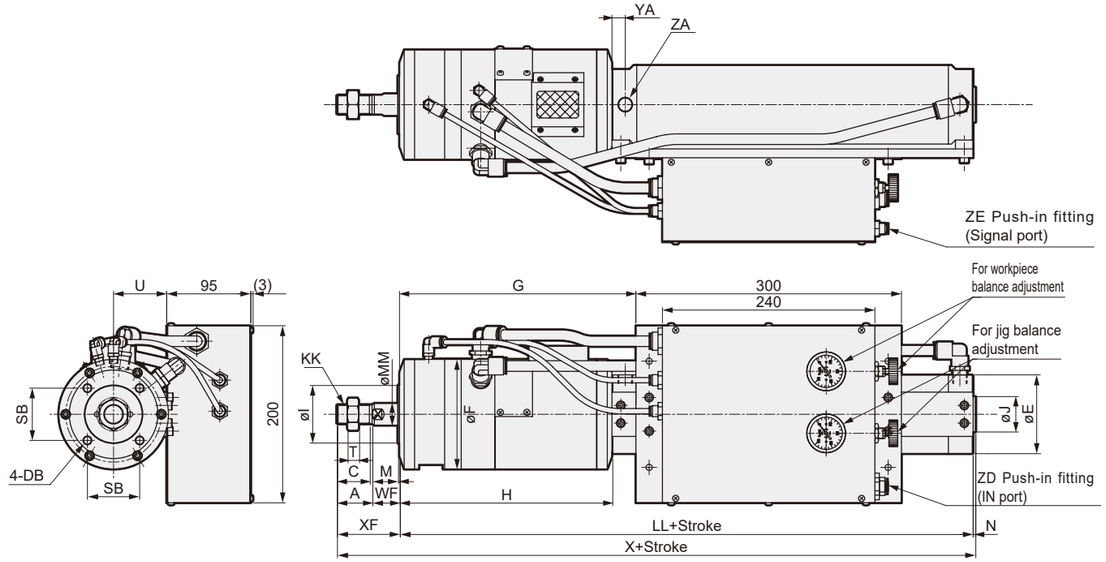
Code / Bore Size (mm)	A	J	KK	LL	N	WF	FA	FD	FJ	FL	FM	FT
ø50	35	30	M18×1.5	314	2	23	383	9	346	58	76	9
ø63	35	32	M18×1.5	314	2	23	383	11	346	70	92	9
ø80	40	40	M22×1.5	348	3	31	433	11	390	82	104	11
ø100	40	50	M22×1.5	348	3	31	436	13	393	100	128	14

Dimensional Drawings

● Control Box Integrated Type, Basic Type (OO), Load Direction Push Side (D)



● Control Box Integrated Type, Basic Type (OO), Load Direction Retract Side (U)

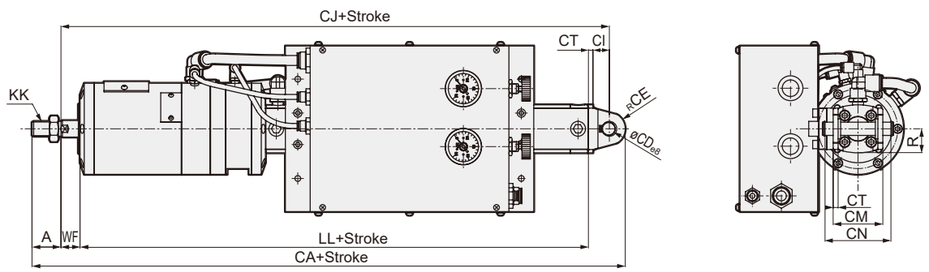


Code / Bore Size (mm)	A	C	(DA)	DB	E	F	G	H	I	J	KK	LL
ø50	35	32	M8×1.25 Depth 16	M8×1.25 Depth 15	58	110	248	224	60	30	M18×1.5	314
ø63	35	32	M10×1.5 Depth 16	M8×1.25 Depth 15	72	110	248	224	60	32	M18×1.5	314
ø80	40	37	M10×1.5 Depth 22	M10×1.5 Depth 15	89	124	267	240	66	40	M22×1.5	348
ø100	40	37	M12×1.5 Depth 22	M10×1.5 Depth 15	110	124	267	240	66	50	M22×1.5	348

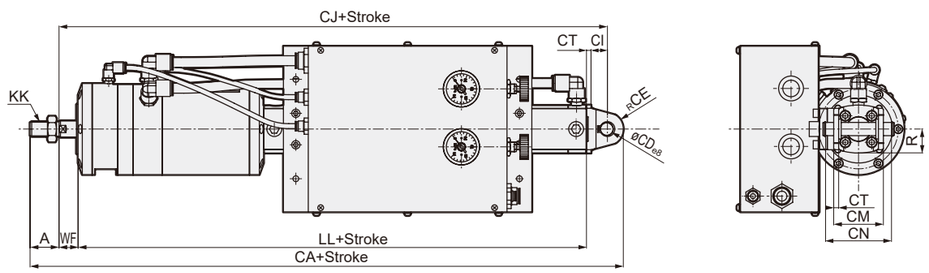
Code / Bore Size (mm)	MM	M	N	SB	(SD)	T	U	WF	X	XF	YA	YB	ZA	ZD	ZE
ø50	20	2	2	50	32	11	47.5	23	374	58	15	12	Rc1/4	ø12	ø6
ø63	20	2	2	50	38	11	54.5	23	374	58	15	12	Rc1/4	ø12	ø6
ø80	25	2	3	59	50	13	60	31	422	71	15	15	Rc3/8	ø12	ø6
ø100	25	2	3	59	60	13	70	31	422	71	15	15	Rc 1/2	ø12	ø6

Dimensional Drawings

● Control Box Integrated Type, Single Yoke Clevis Type (CA), Load Direction Push Side (D)



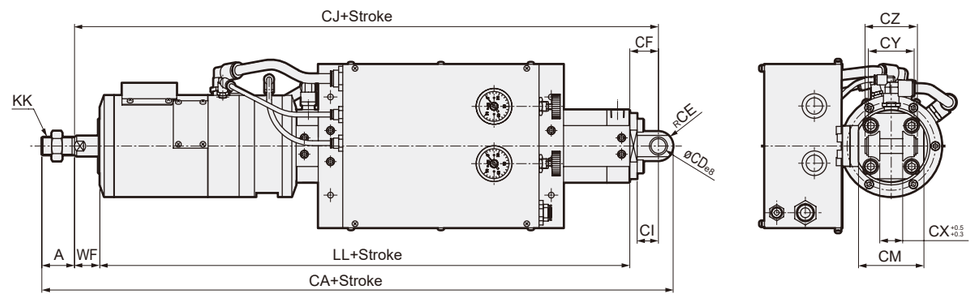
● Control Box Integrated Type, Single Yoke Clevis Type (CA), Load Direction Retract Side (U)



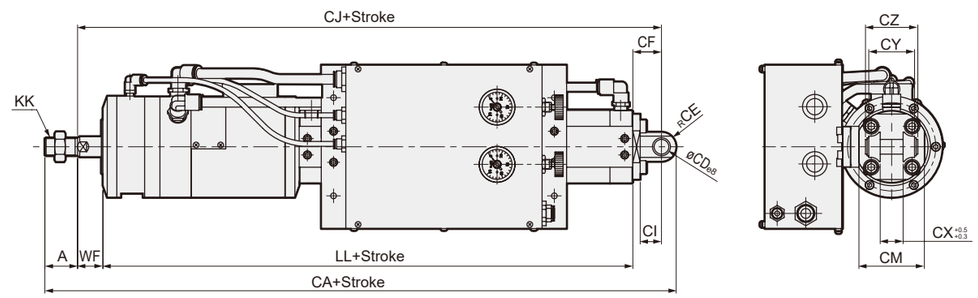
Code / Bore Size (mm)	A	KK	LL	R	WF	CA	CD	CE	CI	CT	CJ	CM	CN
ø50	35	M18×1.5	314	29	23	417	16	20	19	6	362	60	79.6
ø63	35	M18×1.5	314	36	23	424	18	22	22	8	367	74	97.8

Dimensional Drawings

● Control Box Integrated Type, Double Yoke Clevis Type (CB), Load Direction Push Side (D)



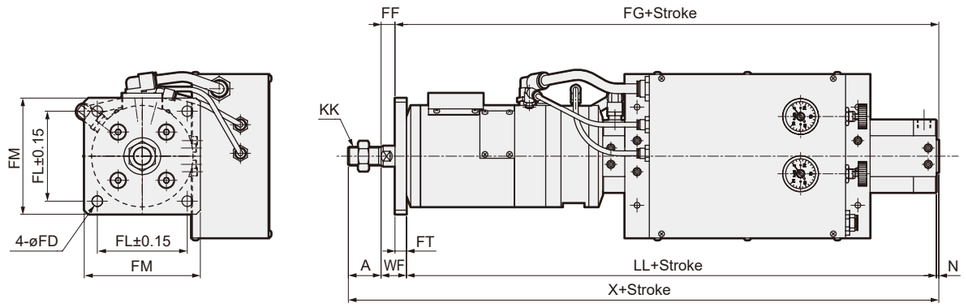
● Control Box Integrated Type, Double Yoke Clevis Type (CB), Load Direction Retract Side (U)



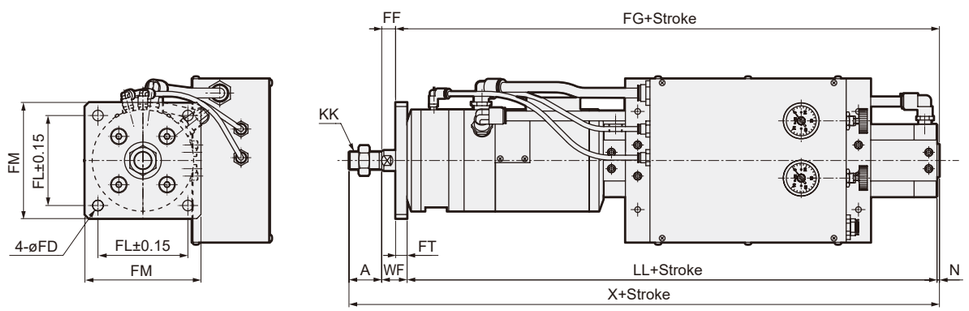
Code / Bore Size (mm)	A	KK	LL	WF	CA	CD	CE	CF	CI	CJ	CM	CX	CY	CZ
ø80	40	M22×1.5	348	31	472	18	18	35	25	414	80	28	56	64
ø100	40	M22×1.5	348	31	484	22	22	43	31	422	100	32	64	72

Dimensional Drawings

● Control Box Integrated Type, Rod Side Flange Type (FA), Load Direction Push Side (D)



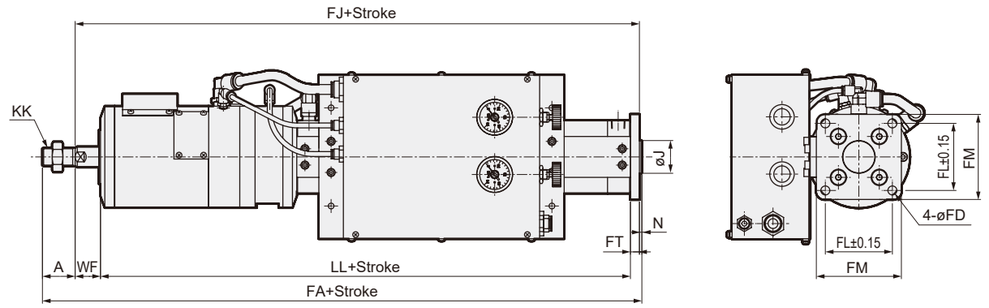
● Control Box Integrated Type, Rod Side Flange Type (FA), Load Direction Retract Side (U)



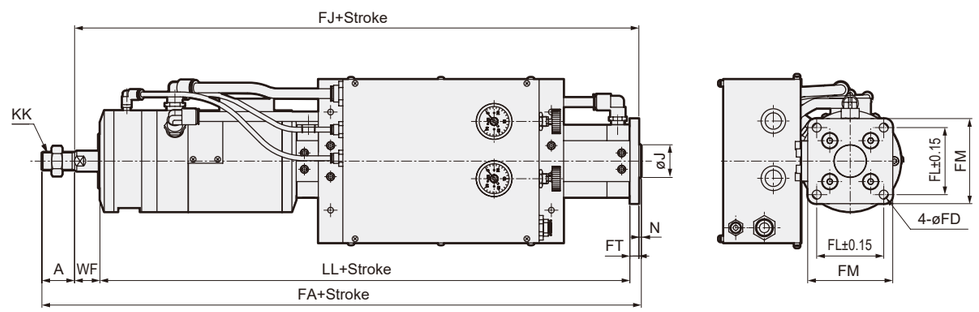
Code / Bore Size (mm)	A	KK	LL	N	WF	X	FD	FF	FG	FL	FM	FT
ø50	35	M18×1.5	314	2	23	374	11	11	328	95	120	12
ø63	35	M18×1.5	314	2	23	374	11	11	328	95	120	12
ø80	40	M22×1.5	348	3	31	422	13	17	365	110	142	14
ø100	40	M22×1.5	348	3	31	422	13	17	365	110	142	14

Dimensional Drawings

● Control Box Integrated Type, Head Side Flange Type (FB), Load Direction Push Side (D)

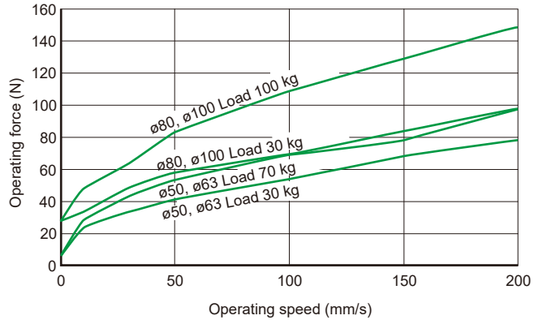


● Control Box Integrated Type, Head Side Flange Type (FB), Load Direction Retract Side (U)

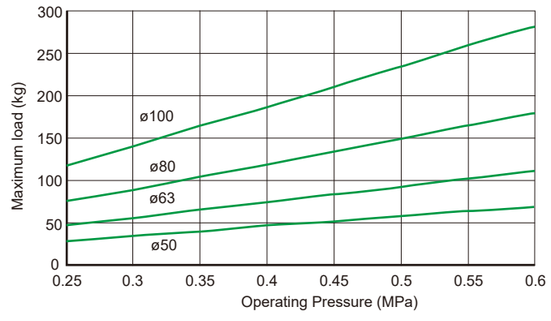


Code / Bore Size (mm)	A	J	KK	LL	N	WF	FA	FD	FJ	FL	FM	FT
ø50	35	30	M18×1.5	314	2	23	383	9	346	58	76	9
ø63	35	32	M18×1.5	314	2	23	383	11	346	70	92	9
ø80	40	40	M22×1.5	348	3	31	433	11	390	82	104	11
ø100	40	50	M22×1.5	348	3	31	436	13	393	100	128	14

Operating force (Reference)



Maximum load for Operating Pressure



BBS-A Series (Automatic pressure adjustment type) Operation Method

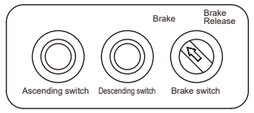
Perform the operation in the following procedure.

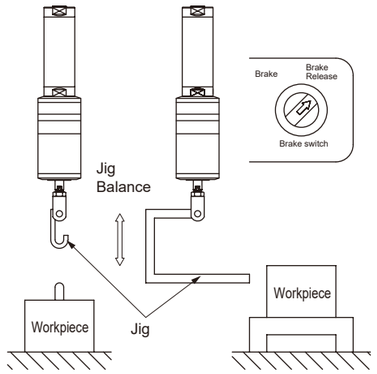
1) Check if the brake switch is on the brake side (brake is applied).

2) Supply air.

3) Operate the brake switch to release the brake. (Jig balance state)

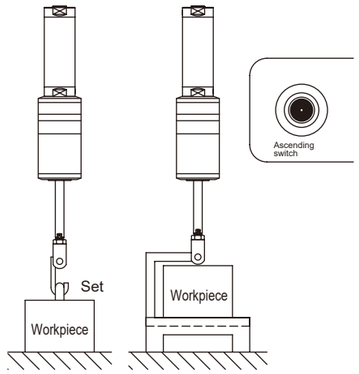
4) Ascending, descending switches, manually operable.





5) Set the jig on the workpiece.

6) Press and hold the ascending switch to raise, and release the ascending switch when the workpiece has risen about 50 mm. Workpiece balance will be achieved after about 1 second.
(Note) The weight detection time is about 1 second from the time the switch is released. If external force is applied to the workpiece, jig, etc. during that time, it will be detected up to that force, resulting in poor balance, so please be careful.

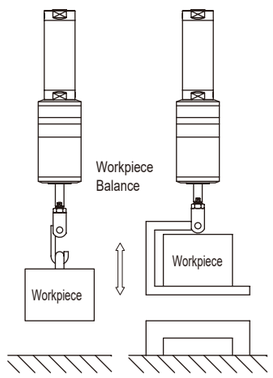


7) Ascending, descending switches, manually operable. However, continuous operation (inching operation) by switch is not possible.

8) Set the workpiece to the specified position and press the descending switch for about 1 second to achieve jig balance.

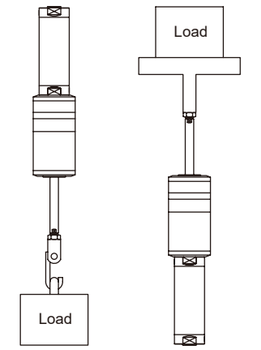
Return to 4) and proceed to the next operation.

If the main air source is shut off due to trouble, etc., the built-in brake will activate the fall prevention function. Also, for safety, switch the brake switch to the brake side after work is complete.



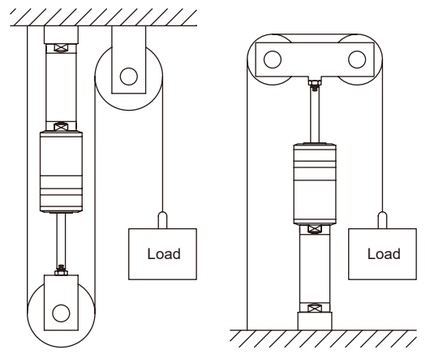
To use the balancer unit more effectively

Standard use



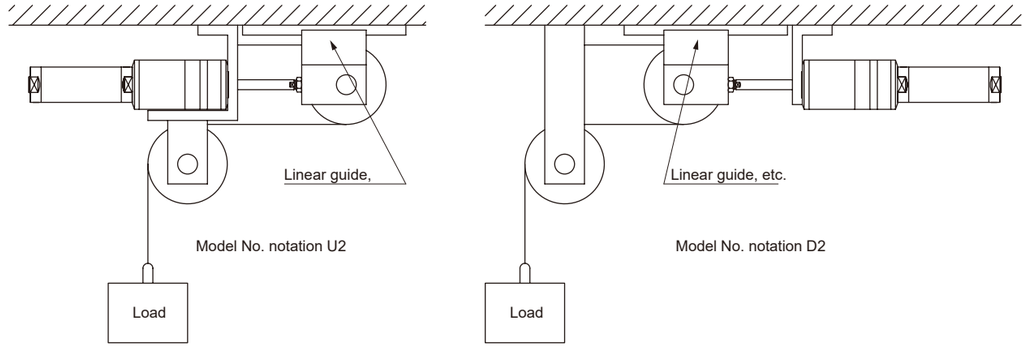
This is the easiest way to use it. If the cylinder stroke is long, the overall height of the entire unit will be long. When moving the workpiece at high speed, the operating force becomes slightly heavier due to flow resistance.

Double speed use



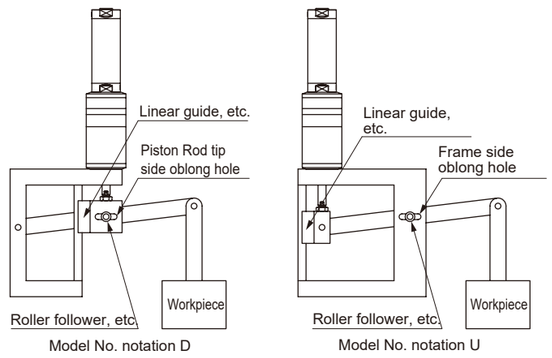
Compared to standard use, the cylinder stroke is halved, so the overall height of the entire unit is shortened. (At double speed) Theoretically, the operating force is half of standard use, but the allowable maximum load is also halved.

Horizontal double speed use



The basic specifications are the same as for double speed use, but since the cylinder is horizontal, the overall height of the entire unit is significantly shortened. (At double speed) Theoretically, the operating force is half of standard use, but the allowable maximum load is also halved. It is necessary to use a linear guide, etc. and be careful not to apply self-weight moment to the Piston Rod and cylinder.

Lever use



Compared to double speed use, the lever ratio can be freely selected, expanding design flexibility. Theoretically, the operating force is the value divided by the lever ratio multiplier. However, the allowable maximum load is also the load divided by the lever ratio multiplier. It is necessary to use a linear guide, etc. to prevent eccentric load on the Piston Rod, and to use a roller follower, etc. and be careful that the lever ratio does not change due to vertical movement.

Pneumatic Equipment

To Use This Product Safely

Be sure to read this before use. For general cylinder information, see Intro 41, and for Cylinder Switches, see P. 1512.

Individual Precautions: Balancer unit BBS Series

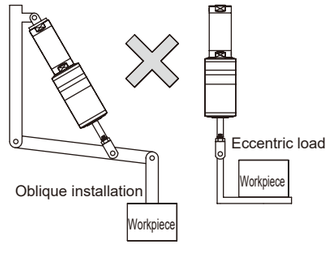
Design / Selection

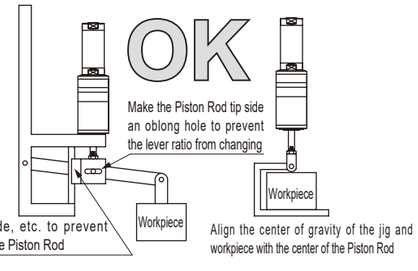
Warning

- Do not use the balancer unit exceeding the maximum Operating Pressure or operating piston speed.
- Do not rotate the Piston Rod while the brake is applied. This will cause damage.
- Do not disassemble.

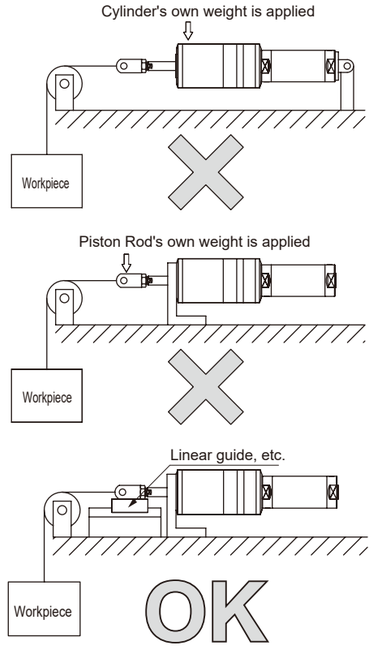
CAUTION

- If the automatic pressure adjustment air system is selected, be sure to use the control box (BBS-A-TB).
- Lubrication is not required for this unit. Also, if lubricated, it will cause trouble, so please refrain from doing so.
- This balancer unit should basically be used indoors. Although the unit can be used outdoors in a mobile manner, please move it indoors and store it after use.
- Since this balancer unit has a mechanism to automatically detect the load applied to the Piston Rod, please install it so that no eccentric load (oblique installation, eccentric load, etc.) is applied to the Piston Rod. The Piston Rod will operate poorly if an eccentric load is applied, requiring additional operating force. Furthermore, the automatic detection function may produce inaccurate results.

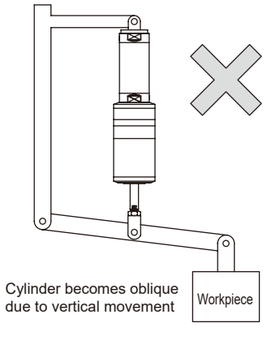


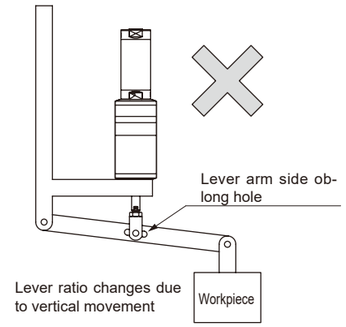


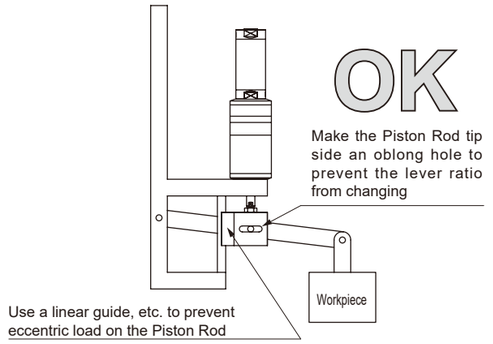
- When using the balancer horizontally, please consider so that no moment due to the Piston Rod and its own weight is applied.



- When used in a link type, please use a structure where the lever ratio does not change. (Example: Fulcrum movement) If the lever ratio changes with vertical movement, the load could move up or down depending on the detection position regardless of manual operation.







- Do not rotate the Piston Rod while the load is held by the brake. Since the Piston Rod, brake, and detection part are connected, applying rotational torque may damage the detection part and brake.
- Consider the supplied air flow rate when piping between the balancer unit and control box. Moreover, the control box should be placed as close to the balancer as possible in order to reduce the piping length. If the flow rate is low or the piping is long, the operating force will increase.
- If BBS-A air system is selected, a pressure gauge and air lamp (two pressure gauges are also acceptable) are used for initial setting. Please prepare these devices by yourself.
- Use clean, dry air that has passed through an air filter and oil mist filter as the compressed air. For this reason, use a filter in the circuit, and pay attention to the filter's filtration degree (preferably 5 μm or less), flow rate, mounting position (close to the control circuit), etc.
- Please note that the operating force may change during operation depending on the usage conditions.

During Use

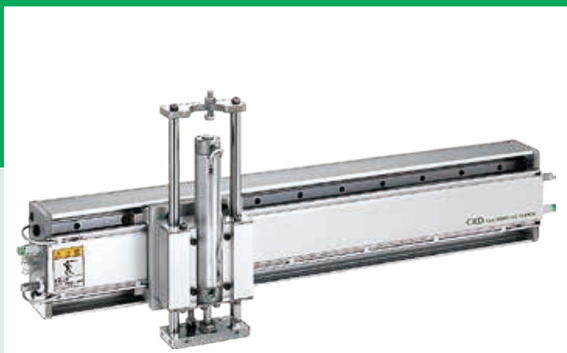
CAUTION

- Periodically drain the accumulated condensate in the filter before it exceeds the specified line.
- If compressor oil carbides (carbon or tar-like substances) enter the circuit, valves and cylinders will malfunction. Pay close attention to compressor maintenance and inspection.
- If left unattended during work, be sure to apply the brake. There is a risk of serious accidents such as falling jigs or workpieces.
- Since the pilot chamber valve is included with the product, do not loosen or remove the bolts. This will cause air leakage, lower the detection pressure, and may cause jigs, workpieces, etc. to fall during operation.
- For safety, switch the brake switch to the brake side after work is complete.

For precautions during mounting, installation, adjustment, use, and maintenance, please see "Precautions for Use" in this catalog and the CKD Components product site (https://www.ckd.co.jp/kiki/en/) → "Model No." → Instruction Manual.

NHS

New Handling System



CONTENTS

Product Introduction	1072
Series System Chart	1074
● NSR (X-axis Module)	1076
● NHS=H (Z-axis Module HRL)	1088
● NHS-S (Z-axis Module STL-B)	1100
External Dimensions Diagram with Switch	1107
Accessory External Dimensions Diagram	1108
Q&A	1110
Technical Data	1112
⚠ Precautions for Use	1114

Special
MVC
STK
MCP
GLC
BBS
NHS
HR
LN
Cylinder Switch
Ending

Small parts handling system that realizes design savings with flexible combinations

NSR X-axis Module

With Shock Killer
Absorber for smooth stopping at the stroke end

High rigidity linear guide
Equipped with two guide rails to achieve high precision, rigidity, and large allowable moment loads

Air drive with rodless cylinder
Equipped with a non-lubricated rodless cylinder that achieves high speed

Integrally molded high rigidity aluminum frame

Finely adjustable stop bolt

T-slot for frame body assembly
Incorporates square nuts and can be mounted at any position along the entire length of the frame

Front cover
Decorative plate functioning as both dust protection and a sensor rail

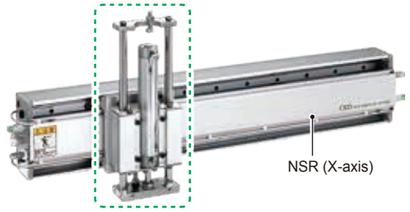
Stroke end position detection switch
Cylinder switch for high reliability and secure operation

NSR X-axis module system

Model Variation		Payload (kg)				Max. Stroke (mm)	Maximum slider speed (mm/s)
		10	15	30	50		
X Axis Module	NSR	●	●	●	●	2000	1000

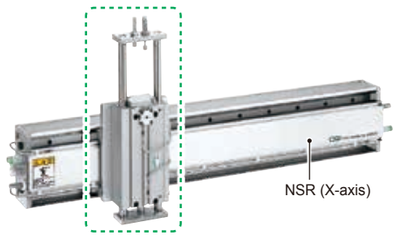
NHS: XZ-axis system

NHS-H NSR (X-axis) + HRL (Z-axis)



HRL (Z-axis)
HRL, which integrates a high-rigidity guide rod with a round general-type cylinder SCM, is installed. Supports high load and long stroke

NHS-S NSR (X-axis) + STL (Z-axis)



STL (Z-axis)
Low-cost type equipped with guided cylinder STL-B

NHS XZ-axis system products

Model Variation		Payload (kg)												Max. stroke (mm)	
		X-axis				Z-axis								X-axis	Z-axis
		10	15	30	50	3	4	5	6	7	10	12	20	33	
XZ system Z-axis cylinder: HRL	NHS-H	●	●	●	●			●		●	●	●	●	●	2000 / 600
XZ system Z-axis cylinder: STL	NHS-S	●	●	●	●	●				●		●		●	2000 / 200

Abundant option lineup corresponding to various needs

Stroke adjustment block
Block that enables adjustment of the entire stroke. Shock absorber and stop bolt also included.

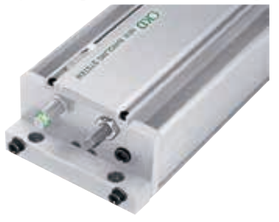
Cable Carrier
Two types available: horizontal mounting and vertical mounting. Two types available: standard capacity and large capacity. (NSR-10, 15, NHS-□ -10, 15)

2 heads
Double head prepared for 2-stage feed and high moment.

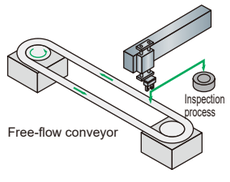
Fall prevention
Drop prevention mechanism provided for Z-axis. (Excluding STL-BP-16)

Speed Controller
Selectable with speed controller.

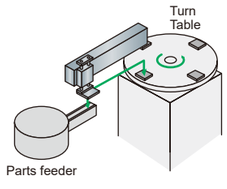
LB bracket
LB type bracket with high merit for bottom mounting is prepared, improving ease of mounting. (Suspension or upside-down suspension with LB bracket is not possible)



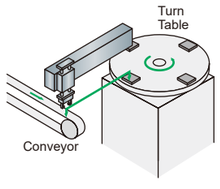
Application Example



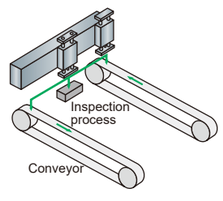
Small valves are taken out from the free flow conveyor, inspected, and returned to the conveyor.



Two electrical parts aligned from the parts feeder are vacuum-sucked simultaneously and transferred to a jig on a turntable for assembly.



Automobile parts flowing from the conveyor are transferred to a jig on a turntable.



Since there is an inspection process between conveyors, 2 automobile parts are transferred simultaneously with 2 heads.

Variation Table

New Handling System NHS Series

●: Standard, :Not available

Variation	Payload (kg)													Stroke (mm)																X-axis Max Stroke	Z-axis cylinder	Page
	X-axis				Z-axis									X-axis			X-axis		Z-axis												
	10	15	30	50	3	4	5	6	7	10	12	20	33	10	15		30	50	30	40	50	75	100	125	150	175	200	250	300	301 to 600	(mm)		
NSR (X-axis module)	●	●	●	●										50 to 2000	50 to 2000		50 to 2000	50 to 2000													2,000	—	1076
NHS-H (H: Z-axis module HRL)	●	●	●	●			●		●	●	●	●	●	50 to 2000	50 to 2000		50 to 2000	50 to 2000			●	●	●	●	●		●	●	●	●	2,000	HRL	1088
NHS-S (S: Z-axis module STL-B)	●	●	●	●	●				●		●		●	50 to 2000	50 to 2000		50 to 2000	50 to 2000			●	●	●	●	●	●	●				2,000	STL-B	1100

New Handling System X-axis Module

NSR Series

- Stroke: 50 to 2000 mm
- Payload: 10, 15, 30, 50 kg

RoHS

Model No. Notation

NSR - 2 - 10 - 1000 - 500 - L - 3 - B - A

- NSR: Model No.
- 2: ❶Number of heads
- 10: ❷Payload
- 1000: ❸X-axis stroke
- 500: ❹Pitch Between Heads
- L: ❺Stroke adjustment block
- 3: ❻Port position, Speed controller, Mounting bracket
- B: ❼Cable Carrier
- A: ❽Switch

❶Number of heads

Code	Content
1	1 pc.
2	2 pcs.

❷Payload (kg)

Code	Content
10	10
15	15
30	30
50	50

❸X-axis stroke (1 mm pitch)

Code	Content
50 to 2000	50 to 2000

*1: For X-axis stroke 1001 mm or more, the front cover becomes tension type.
*2: When the number of heads is 2, select so that the sum of pitch between heads and X-axis stroke is 2000 mm or less.

❹Pitch between heads (1 mm pitch)

Payload (kg)	Code
10	200 to 999
15	
30	260 to 999
50	310 to 999

*1: Selectable only when the number of heads is 2.
*2: Select so that the sum of pitch between heads and X-axis stroke is 2000 mm or less.

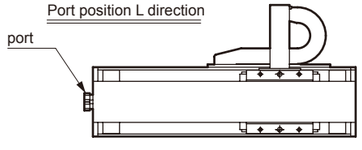
❺Stroke adjustment block

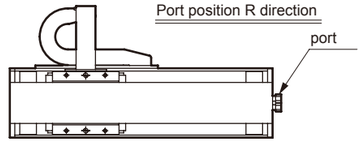
Code	Content
Blank	None
L	Left side
R	Right side
D	Both Sides

❻Port position/Speed controller/Mounting bracket

	Code	Content
	Blank	Port position L
*2	2	Port position R
	3	Port position L, with speed controller
*2	4	Port position R, with speed controller
*1	5	Port position L, with mounting bracket LB
*1, *2	6	Port position R, with mounting bracket LB
*1	7	Port position L, with speed controller, with mounting bracket LB
*1, *2	8	Port position R, with speed controller, with mounting bracket LB

*1: Combination with cable bear B, W is not possible.
*2: If port position R is selected, mounting direction of the cableveyor is reversed. (Outlet is port side)





❼Cable Carrier

Code	Content
Blank	None
B	Vertical mounting
F	Horizontal mounting
W	Vertical mounting (10, 15 kg)
X	Horizontal mounting (10, 15 kg)

Note: For details on the cableveyor, refer to P. 1078.

❽Switch

Code	Content
Blank	2-wire solid state T2H3 (with 2 pcs.)
A	3-wire solid state T3H3 (with 2 pcs.)

Note: For details, please refer to the table below.

Switches are pre-assembled on the product before shipment.

	Indicator LED Special Function	Wiring (Output)	Load Voltage (V)		Load Current (mA)		Lead Wire	
			AC	DC	AC	DC	Straight	
Contact Solid State	1-Color	2-wire	—	10 to 30	—	5 to 20 *1	T2H3	
		3-wire (NPN)	—	30 or less	—	100 or less	T3H3	

*1: The maximum load current value above, 20 mA, is at 25°C. If the switch operating Ambient Temperature is higher than 25°C, it will be lower than 20 mA. (At 60°C, it will be 5 to 10 mA.)

Specifications

Item		NSR-10	NSR-15	NSR-30	NSR-50
Bore Size	mm	ø20		ø32	ø40
Slider speed	mm/s	100 to 1000			
Shock Absorber		NCK-00-1.2-C	NCK-00-2.6-C	FCK-M-3-C	FCK-M-5-C
Stroke	mm	50 to 2000 (1 mm pitch)			
Max Stroke	(mm)	2,000			
Allowable moment *2	N·m	M1=36.4, M2=30.6, M3=34.2		M1, M3=85.9 M2=82.9	M1, M3=156.2 M2=150.7
Slider inclination		±0.1° or less			
Piping connection port size		Rc1/8		Rc1/4	Rc1/2
Position detection sensor		T-type solid state switch lead wire 3 m			
Max horizontal payload	kg	10	15	30	50
Speed controller (Option)		SC3W-6-6		SC3W-8-8	SC3W-15-10
Operating Fluid		Clean compressed air			
Operating Pressure	MPa	0.2 to 0.7			
Proof Pressure	MPa	1.05			
Ambient Temperature	°C	5 to 60			
Lubrication		See P. 1114, About lubrication			
Repeat stopping accuracy	mm	±0.02			
Weight *1	kg	(st×0.0109)+5.5	(st×0.0109)+5.6	(st×0.0176)+10.7	(st×0.0311)+17.9

*1: st represents stroke.
*2: M1 represents bending moment, M2 represents lateral bending moment, and M3 represents torsional moment. For details, please refer to P. 1112.

Stroke adjustment part specifications

Item		Blank	R	L	D
Adjustable stroke right	mm	-15 to 0	Full stroke	-15 to 0	Full stroke
Adjustable stroke left	mm	-15 to 0	-15 to 0	Full stroke	Full stroke

Shock absorber specifications

Item		NCK-00-1.2-C	NCK-00-2.6-C	FCK-M-3-C	FCK-M-5-C
Max Absorption Capacity	J	12	26	30	50
Absorption Stroke	mm	10	15	16	25
Max impact speed	mm/s	2,000			
Max Operating Frequency	cycle/min	30	25	20	12

Cable bear specifications

Item	Cable bear model no.	Inner diameter dimension (mm)	Loading capacity (kg/m)
For NSR-10, 15-B, F	TKP35H22-30W25R37	22×25	MAX 1.6
For NSR-10, 15-W	TKP45H25-30W38R50	25×38	MAX 3.0
For NSR-10, 15-X	TKP35H22-30W50R37	22×50	MAX 1.6
For NSR-30-B, F	TKP45H25-30W58R50	25×58	MAX 3.0
For NSR-50-B, F	TKP45H25-30W78R50	25×78	MAX 3.0

Stroke Adjustment Block Added Weight List

Model No.	Added weight (kg)
NSR-1-10-R	0.685
NSR-1-10-L	0.685
NSR-1-10-D	1.370
NSR-1-15-R	0.810
NSR-1-15-L	0.810
NSR-1-15-D	1.620
NSR-1-30-R	1.140
NSR-1-30-L	1.140
NSR-1-30-D	2.280
NSR-1-50-R	1.750
NSR-1-50-L	1.750
NSR-1-50-D	3.499

Mounting Bracket LB Added Weight List

Model No.	Added weight (kg)
NSR-10	0.8
NSR-15	0.8
NSR-30	2.9
NSR-50	4.8

Cable Bear Added Weight List

Model No.	Added weight (kg)
NSR-1-10,15-B	(Stroke ÷ 2×0.0011)+0.482
NSR-1-10,15-W	(Stroke ÷ 2×0.0018)+0.55
NSR-1-10,15-F	(Stroke+178)×0.0024+0.125
NSR-1-10,15-X	(Stroke+178)×0.003+0.13
NSR-1-30-B	(Stroke ÷ 2×0.0028)+1.148
NSR-1-30-F	(Stroke+234)×0.0042+0.2
NSR-1-50-B	(Stroke ÷ 2×0.0034)+1.234
NSR-1-50-F	(Stroke+178)×0.0049+0.22

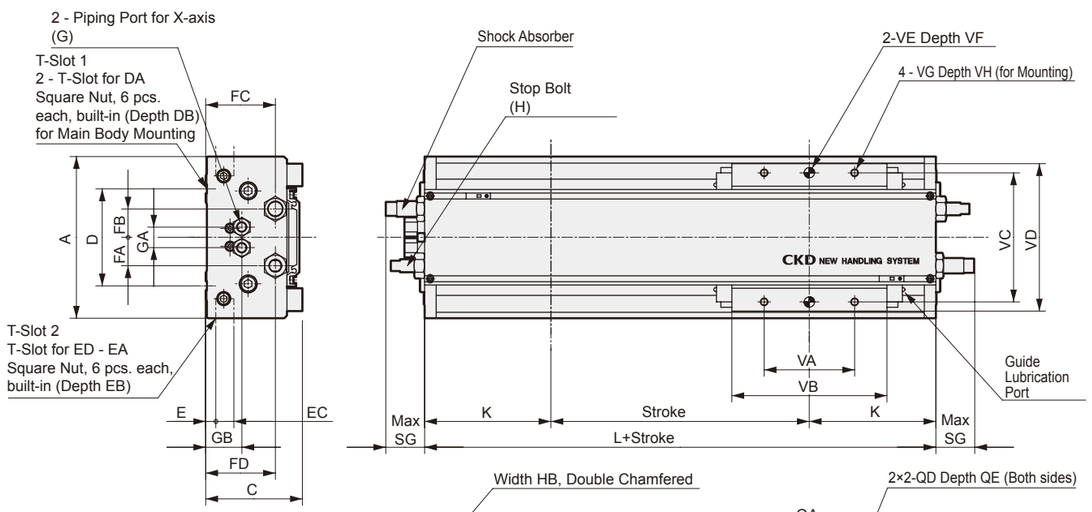
2-Head Specification

Item		NSR-2-10	NSR-2-15	NSR-2-30	NSR-2-50
Max Horizontal Conveying Weight	kg/1 Head	5	7.5	15	25
Stroke	mm	50 to 1000			
Maximum Stroke	mm	1800		1740	1690
Pitch between heads	mm	200 to 999		260 to 999	310 to 999
Max Pitch Between Heads	mm	999			
Product Additional Mass	kg	(Pitch Between Heads×0.0109)+1.7		(Pitch Between Heads×0.0176)+2.79	(Pitch Between Heads×0.0311)+4.66

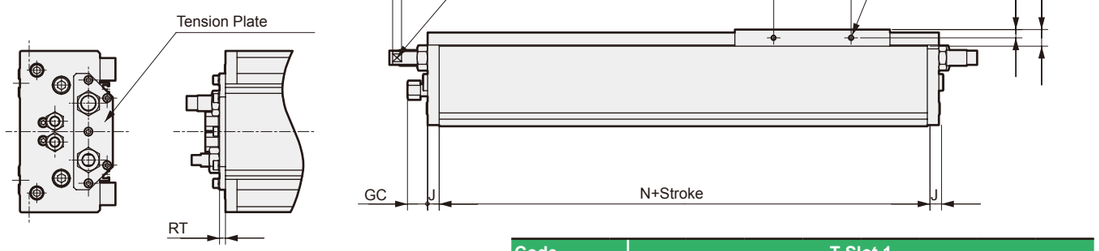
Note: Select so that the sum of the pitch between heads and the X-axis stroke is 2000 mm or less.

Dimensional Drawings

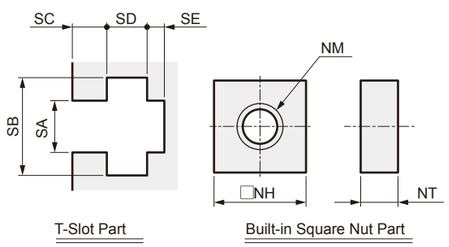
●Basic type



●Tension Plate Type



●T-Slot Part Detail Dimensions



Code / Model No.	T-Slot 1 SA	SB	SC	SD	SE	NH	NM	NT
NSR-10	7	11	5	6	1	10	M6	5
NSR-15	7	11	5	6	1	10	M6	5
NSR-30	10.5	17.6	8	9	2	17	M10	8
NSR-50	12.5	19.6	9	10.4	1.6	19	M12	10

Code / Model No.	T-Slot 2 SA	SB	SC	SD	SE	NH	NM	NT
NSR-10	5	8.5	4	4	1	8	M4	3.2
NSR-15	5	8.5	4	4	1	8	M4	3.2
NSR-30	5.5	9.5	4	4.5	2.5	9	M5	4
NSR-50	6.5	10.6	4.5	6	3	10	M6	5

Code / Model No.	A	C	D	DA	DB	E	EA	EB	EC	ED	FA	FB	FC	FD	G	GA	GB	GC	H	HA	HB	J	K	L	N	QA	QB	QC	QD	QE	RT	SG	VA	VB
NSR-10	125	75	75	M6	11	8	M4	8	-	2	22	22	54	54	Rc1/8	16	28	16	M10×1.25	7	8	9	98	196	178	60	6.5	13	M4	10	4.5	30	70	120
NSR-15	125	75	75	M6	11	8	M4	8	-	2	22	22	54	54	Rc1/8	16	28	16	M10×1.25	7	8	9	98	196	178	60	6.5	13	M4	10	4.5	56	70	120
NSR-30	165	105	110	M10	18	11.5	M5	10.5	14	4	25	24	78	82	Rc1/4	27	37.5	8.5	M12×1.25	9	10	16	133	266	234	70	8	17	M5	12	4.5	66	110	150
NSR-50	200	120	130	M12	21	11.5	M6	13	16	4	30	30	88.5	88.5	Rc 1/2	35	46.5	5.5	M12×1.25	9	10	16	143	286	254	70	9.5	20	M6	14	4.5	101.5	135	177

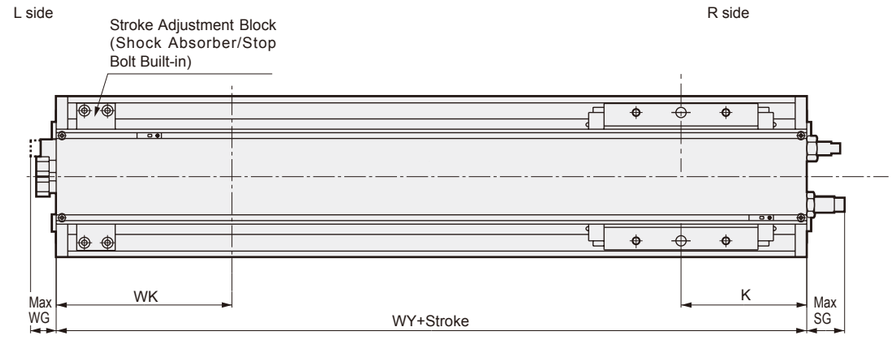
Code / Model No.	VC	VD	VE	VF	VG	VH	WG	WK	WL	WY
NSR-10	100	114	ø8H7	12	M6	12	-	137	274	235
NSR-15	100	114	ø8H7	12	M6	12	20	137	274	235
NSR-30	130	154	ø10H7	15	M10	24	25	174	348	307
NSR-50	165	190	ø10H7	15	M12	25	48.5	196	392	339

Note: For outline dimension drawings with each switch, refer to P. 1107.

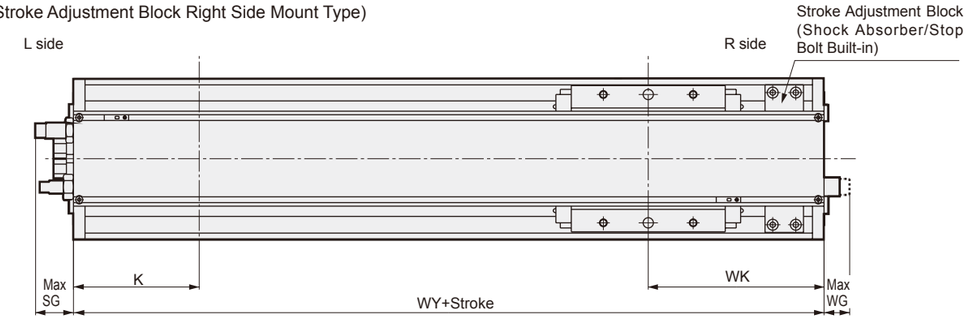
Dimensional Drawings

●Type with Stroke Adjustment Block

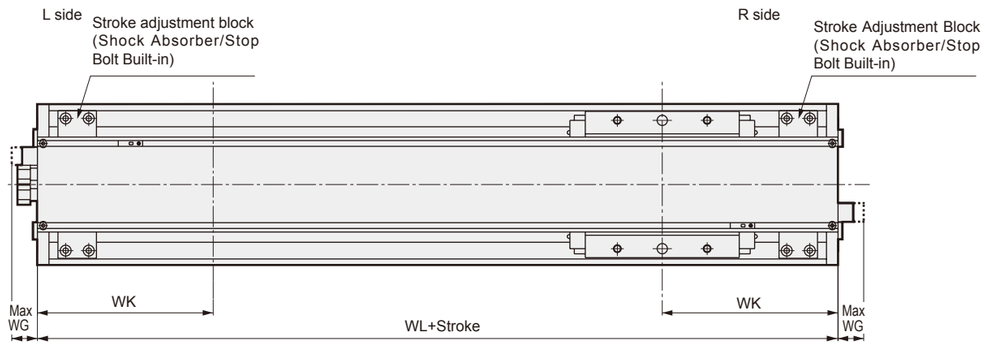
• L (Stroke Adjustment Block Left Side Mount Type)



• R (Stroke Adjustment Block Right Side Mount Type)

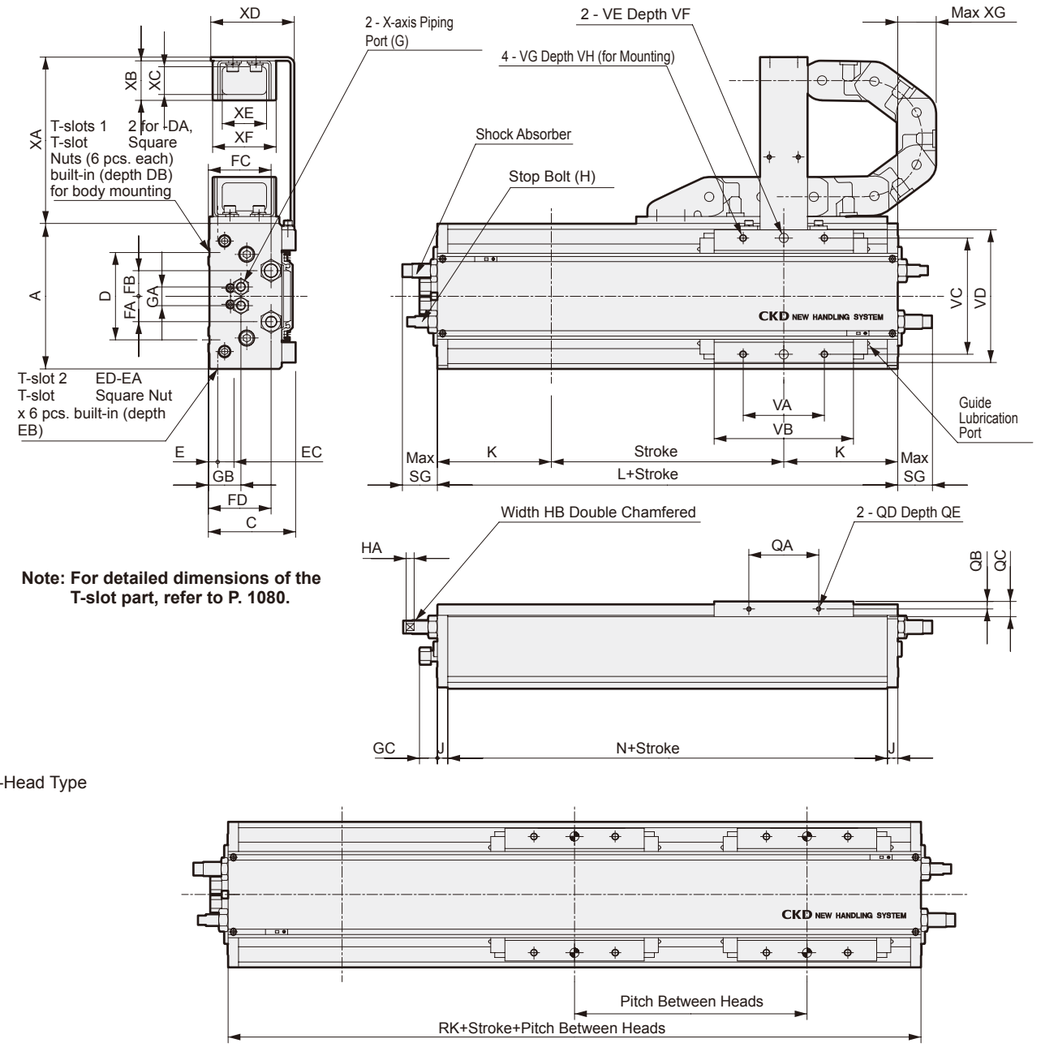


• D (Stroke Adjustment Block Both Sides Mount Type)



Dimensional Drawings

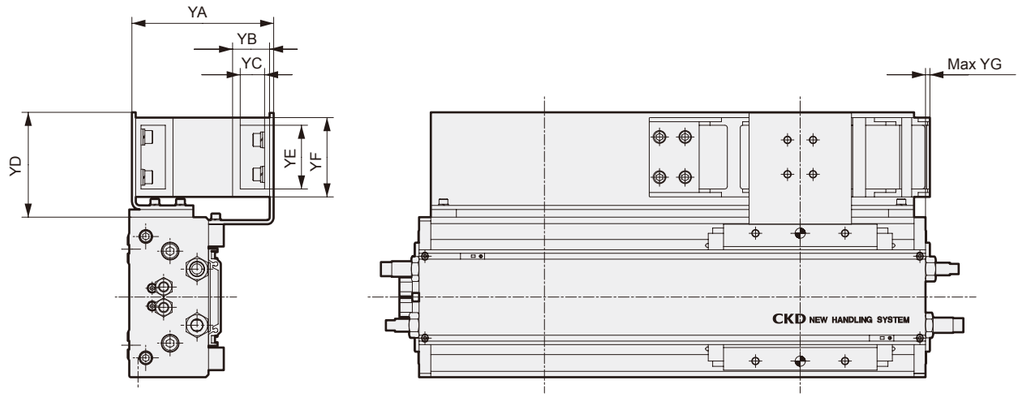
●Type with Cableveyor (Vertical Mount)



Note: For detailed dimensions of the T-slot part, refer to P. 1080.

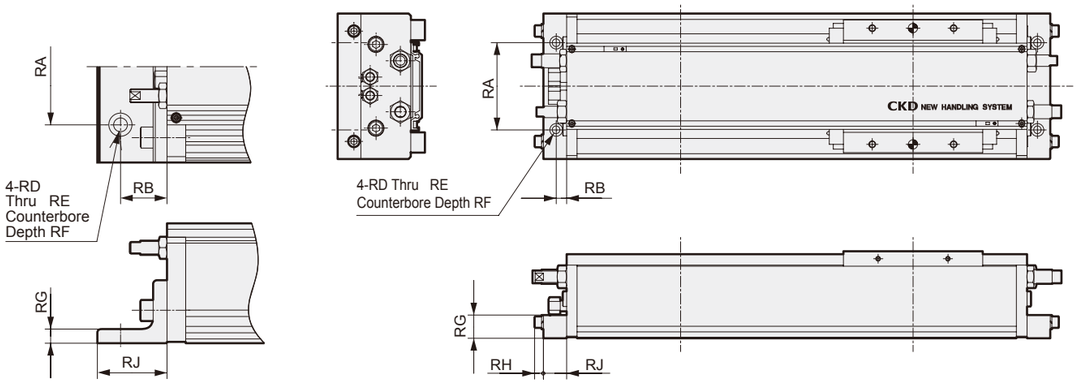
●2-Head Type

●Type with Cableveyor (Horizontal Mount)



●Type with LB Bracket

[NSR-30/50]



Code / Model No.	A	C	D	DA	DB	E	EA	EB	EC	ED	FA	FB	FC	FD	G	GA	GB			GC	H	HA	HB	J	K	L	N	QA	QB	QC	QD	QE	RA	RB	RD	RE	RF
NSR-10	125	75	75	M6	11	8	M4	8	–	2	22	22	54	54	Rc1/8	16	28			16	M10×1.25	7	8	9	98	196	178	60	6.5	13	M4	10	75	9	ø7	ø12	6.5
NSR-15	125	75	75	M6	11	8	M4	8	–	2	22	22	54	54	Rc1/8	16	28			16	M10×1.25	7	8	9	98	196	178	60	6.5	13	M4	10	75	9	ø7	ø12	6.5
NSR-30	165	105	110	M10	18	11.5	M5	10.5	14	4	25	24	78	82	Rc1/4	27	37.5			8.5	M12×1.25	9	10	16	133	266	234	70	8	17	M5	12	100	40	ø12	ø20	1
NSR-50	200	120	130	M12	21	11.5	M6	13	16	4	30	30	88.5	88.5	Rc 1/2	35	46.5			5.5	M12×1.25	9	10	16	143	286	254	70	9.5	20	M6	14	100	40	ø14.5	ø26	1

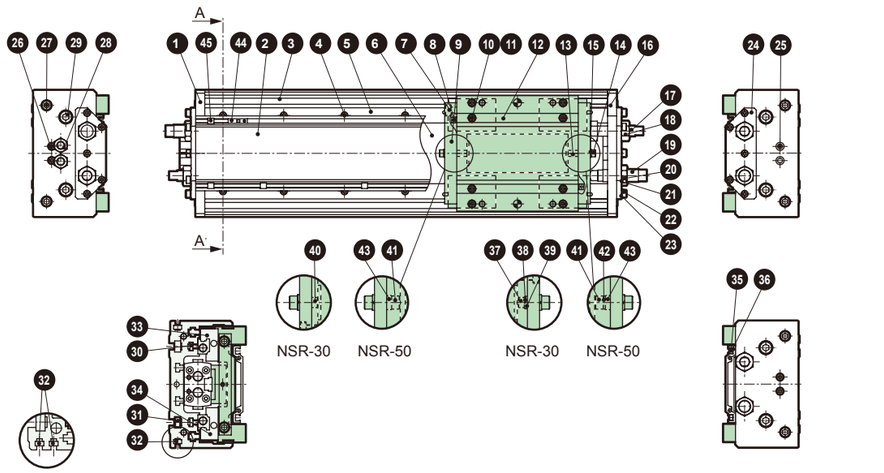
Code / Model No.	RG	RH	RJ	RK	SG	VA	VB	VC	VD	VE	VF	VG	VH	Cable Carrier	XA	XB	XC			XD	XE	XF	XG	Cable Carrier	YA	YB	YC	YD	YE	YF	YG
NSR-10	20	7.5	20	196	30	70	120	100	114	ø8H7	12	M6	12	B	112.2	30	22			65	25	37	33	F	111	30	22	56	25	37	34
														W	145.2	36	25			72.5	38	58	75	X	111	30	22	82	50	62	34
NSR-15	20	7.5	20	196	56	70	120	100	114	ø8H7	12	M6	12	B	112.2	30	22			65	25	37	33	F	111	30	22	56	25	37	34
														W	145.2	36	25			72.5	38	58	75	X	111	30	22	82	50	62	34
NSR-30	12	–	60	266	66	110	150	130	154	ø10H7	15	M10	24	–	160.5	36	25			100.5	58	78	46	–	155	34	25	95	58	74	45
NSR-50	15	–	60	286	101.5	135	177	165	190	ø10H7	15	M12	25	–	162.5	36	25			117.5	78	98	36	–	155	34	25	115	78	94	35

Note: For outline dimension drawings with each switch, refer to P. 1107.

Internal Structure Diagram/Material

●X-axis Module

• 1 Head



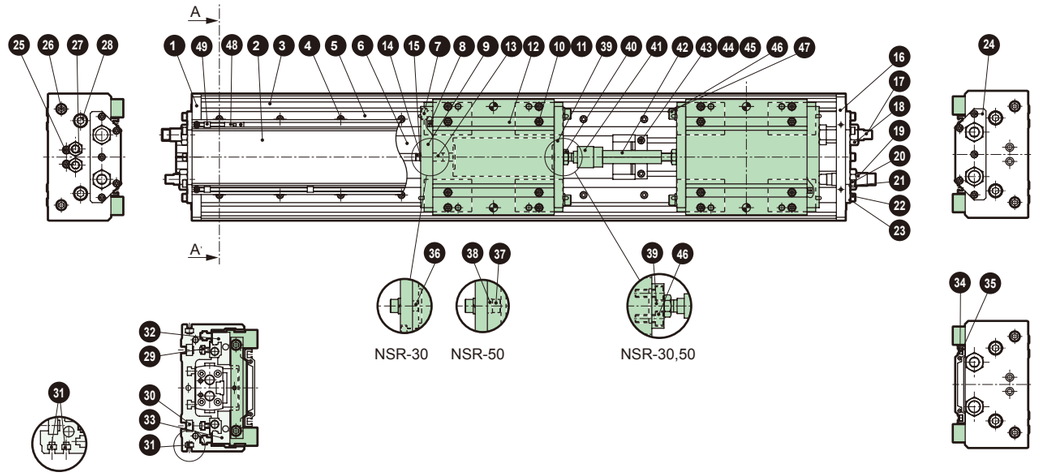
NSR-30,50 A-A' Cross-sectional View NSR-10,15 (Stroke 1000 mm or less)

Part No.	Part Name	Material	Remarks
1	Side Plate (L)	Steel	Zinc Chromate
2	Cover	Aluminum Alloy	Alumite
3	Frame	Aluminum Alloy	Alumite
4	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide
5	LM Rail		
6	Super Rodless Cylinder		SRL (CKD)
7	Hexagon Socket Head Bolt (10, 15 kg)	Stainless Steel	
	Hexagon Socket Head Bolt (30, 50 kg)	Steel	Black Oxide
8	Magnet		
9	Side Bar	Stainless Steel	
10	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide
11	Spring washer	Steel	Black Oxide Finish (10, 15 kg only)
12	Slider	Aluminum Alloy	Alumite
13	Spacer	Steel	Zinc Chromate
14	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide
15	Spring washer	Steel	Black Oxide
16	Side Plate (R)	Steel	Zinc Chromate
17	Stopper bolt	Steel	Black Oxide
18	Hexagon Nut	Steel	Zinc Chromate
19	Shock Absorber		CKD
20	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide
21	Spring washer	Steel	Black Oxide
22	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide
23	Spring washer	Steel	Black Oxide
24	Tension Plate	Steel	Zinc Chromate
25	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide
26	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide
27	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide
28	Hexagon Nut	Steel	Zinc Chromate
29	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide
30	Nut Rail	Steel	Zinc Chromate
31	Square Nut	Steel	Nickel Plating
32	Square Nut	Steel	Nickel Plating
33	LM Block		
34	LM Block		
35	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide
36	Spring washer	Steel	Black Oxide
37	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide
38	Spring washer	Steel	Black Oxide
39	Plain Washer	Steel	Black Oxide
40	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide
41	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide
42	Washer	Alloy Steel	
43	Washer/Spacer	Alloy Steel	
With Switch			
44	Switch		
45	Sensor Wire Retainer	Polyacetal	

Internal Structure Diagram/Material

●X-axis Module

• 2 Heads

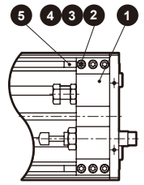


NSR-30,50 A-A' Cross-sectional View NSR-10,15 (Stroke 1000 mm or less)

Part No.	Part Name	Material	Remarks
1	Side Plate (L)	Steel	Zinc Chromate
2	Cover	Aluminum Alloy	Alumite
3	Frame	Aluminum Alloy	Alumite
4	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide
5	LM Rail		
6	Super Rodless Cylinder		SRL (CKD)
7	Hexagon Socket Head Bolt (10, 15 kg)	Stainless Steel	
	Hexagon Socket Head Bolt (30, 50 kg)	Steel	Black Oxide
8	Magnet		
9	Side Bar	Stainless Steel	
10	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide
11	Spring washer	Steel	Black Oxide Finish (10, 15 kg only)
12	Slider	Aluminum Alloy	Alumite
13	Spacer	Steel	Zinc Chromate
14	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide
15	Spring washer	Steel	Black Oxide
16	Side Plate (R)	Steel	Zinc Chromate
17	Stopper bolt	Steel	Black Oxide
18	Hexagon Nut	Steel	Zinc Chromate
19	Shock Absorber		CKD
20	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide
21	Spring washer	Steel	Black Oxide
22	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide
23	Spring washer	Steel	Black Oxide
24	Tension Plate	Steel	Zinc Chromate
25	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide
26	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide
27	Hexagon Nut	Steel	Zinc Chromate
28	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide
29	Nut Rail	Steel	Zinc Chromate
30	Square Nut	Steel	Nickel Plating
31	Square Nut	Steel	Nickel Plating
32	LM Block		
33	LM Block		
34	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide
35	Spring washer	Steel	Black Oxide
36	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide
37	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide
38	Washer/Spacer	Alloy Steel	
39	Head Connection Plate	Steel	Zinc Chromate
40	Hexagon Nut	Steel	Zinc Chromate
41	Free Joint		CKD
42	Head Connection Rod	Steel	Zinc Chromate
43	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide
44	Spring washer	Steel	Black Oxide
45	Plain Washer	Steel	Black Oxide
46	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide
47	Spring washer	Steel	Black Oxide
With Switch			
48	Switch		
49	Sensor Wire Retainer	Polyacetal	

Internal structure diagram/materials (Option)

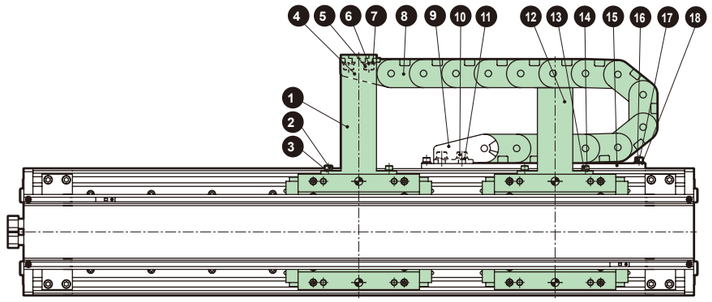
●Stroke Adjustment Block (L, R, D)



Part No.	Part Name	Material	Remarks
1	Stroke adjustment block	Steel	Zinc Chromate
2	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide
3	Spring washer	Steel	Black Oxide Finish (30, 50 kg only)
4	Plain Washer	Steel	Black Oxide Finish (30, 50 kg only)
5	Nut Rail	Steel	Zinc Chromate

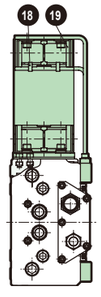
●Type with Cableveyor

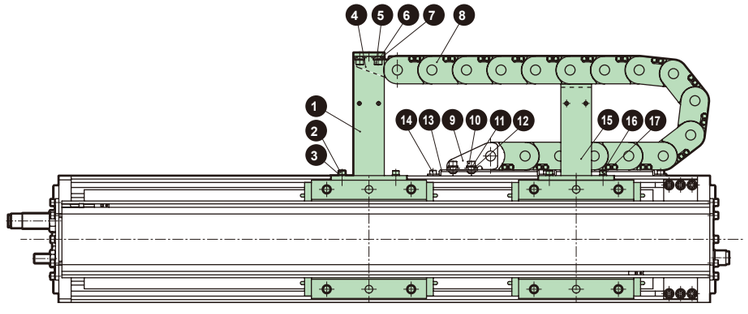
• Vertical Mount B
10 to 15 kg



Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Cableveyor Holder	Steel	Zinc Chromate	10	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide
2	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide	11	Spring washer	Steel	Black Oxide
3	Spring washer	Steel	Black Oxide	12	Cableveyor Support	Steel	Zinc Chromate
4	Moving End Bracket	Resin		13	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide
5	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide	14	Spring washer	Steel	Black Oxide
6	Spring washer	Steel	Black Oxide	15	Cableveyor Mounting Plate	Aluminum Alloy	Alumite
7	Plain Washer	Steel	Black Oxide	16	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide
8	Cableveyor Main Body	Resin		17	Spring washer	Steel	Black Oxide
9	Fixed End Bracket	Resin		18	Plain Washer	Steel	Black Oxide

30, 50 kg



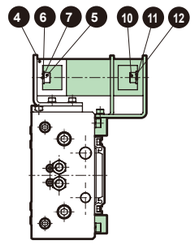


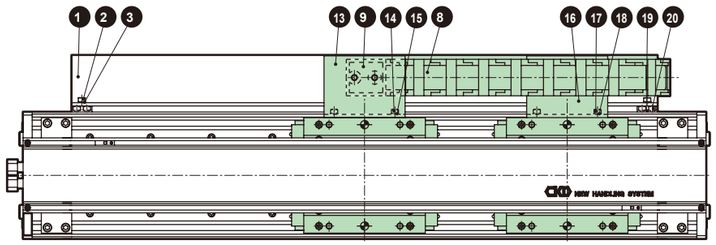
Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Cableveyor Holder	Steel	Zinc Chromate	11	Spring washer	Steel	Black Oxide
2	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide	12	Plain Washer	Steel	Black Oxide
3	Spring washer	Steel	Black Oxide	13	Cableveyor Mounting Plate	Steel	Zinc Chromate
4	Moving End Bracket	Steel	Zinc Chromate	14	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide
5	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide	15	Cableveyor Support	Steel	Zinc Chromate
6	Spring washer	Steel	Black Oxide	16	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide
7	Plain Washer	Steel	Black Oxide	17	Spring washer	Steel	Black Oxide
8	Cableveyor Main Body	Resin		18	Cable Tie	Resin	
9	Fixed End Bracket	Steel	Zinc Chromate	19	Partition Plate	Resin	
10	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide				

Internal structure diagram/materials (Option)

●Type with Cableveyor

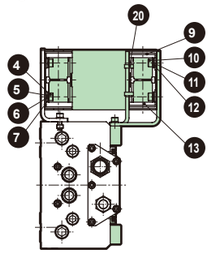
• Horizontal Mount F
10 to 15 kg

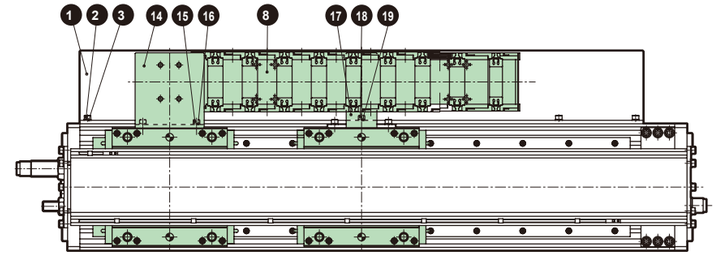




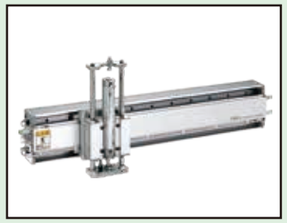
Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Cableveyor Mounting Plate	Steel	Zinc Chromate	11	Spring washer	Steel	Black Oxide
2	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide	12	Plain Washer	Steel	Black Oxide
3	Spring washer	Steel	Black Oxide	13	Cableveyor Holder	Steel	Zinc Chromate
4	Cableveyor Fixing Bracket	Resin		14	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide
5	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide	15	Spring washer	Steel	Black Oxide
6	Spring washer	Steel	Black Oxide	16	Cableveyor Support	Steel	Zinc Chromate
7	Plain Washer	Steel	Black Oxide	17	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide
8	Cable Carrier	Resin		18	Spring washer	Steel	Black Oxide
9	Cableveyor Moving Bracket	Resin		19	Cableveyor Mount	Steel	Zinc Chromate
10	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide	20	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide

30, 50 kg





Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Cableveyor Mounting Plate	Steel	Zinc Chromate	11	Spring washer	Steel	Black Oxide
2	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide	12	Plain Washer	Steel	Black Oxide
3	Spring washer	Steel	Black Oxide	13	Partition Plate	Resin	
4	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide	14	Cableveyor Holder	Steel	Zinc Chromate
5	Spring washer	Steel	Black Oxide	15	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide
6	Plain Washer	Steel	Black Oxide	16	Spring washer	Steel	Black Oxide
7	Fixed End Bracket	Steel	Zinc Chromate	17	Cableveyor Support	Steel	Zinc Chromate
8	Cableveyor Main Body	Resin		18	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide
9	Moving End Bracket	Steel	Zinc Chromate	19	Spring washer	Steel	Black Oxide
10	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide	20	Cable Tie	Resin	



New Handling System Z-axis Module (HRL)

NHS-H Series

●X-axis stroke 50 to 2000 mm Z-axis stroke: 50 to 600 mm
Payload: 5, 7, 10, 12, 20, 33 kg

RoHS

Model No. Notation

NHS - 2 - 1005 - 1000 - H100 - 500 - L 3 B A Q

- NHS: Model No.
- 2: ❶Number of X-axis Heads
- 1005: ❷Payload
- 1000: ❸X-axis stroke
- H100: ❹Z-axis Type / ❺Z-axis stroke
- 500: ❻Pitch Between Heads
- L: ❼Stroke adjustment block
- 3: ❽Port Position and Speed Controller
- B: ❾Cable Carrier
- A: ❿Switch
- Q: ⓫Z-axis Fall prevention

❶Number of X-axis Heads

Code	Content
1	1 pc.
2	2 pcs.

❷Payload (kg)

Code	Content	
	X-axis	Z-axis
1005	10	5
1007		7
1505	15	5
1507		7
1510		10
1512		12
3010	30	10
3012		12
3020		20
5010	50	10
5012		12
5020		20
5033		33

❸X-axis stroke (1 mm pitch)

Code	Content
50 to 2000	50 to 2000

*1: For X-axis stroke 1001 mm or more, the front cover becomes tension type.
*2: When the number of heads is 2, select so that the sum of pitch between heads and X-axis stroke is 2000 mm or less.

❹Z-axis Type

Code	Content
H	HRL-05
	HRL-10
	HRL-15
	HRL-15H
	HRL-25
	HRL-50

❺Z-axis Stroke (1 mm Pitch)

Code	Z-axis stroke	
50	50	Standard Body
75	75	
100	100	
125	125	
150	150	
200	200	
250	250	
300	300	
301 to 600	301 to 600	Long body

❻Pitch between heads (1 mm pitch)

Payload (kg)	Code
10	200 to 999
15	
30	260 to 999
50	310 to 999

*1: Selectable only when the number of heads is 2.
*2: Select so that the sum of pitch between heads and X-axis stroke is 2000 mm or less.

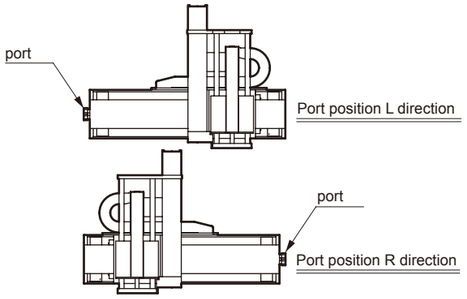
❼Stroke adjustment block

Code	Content
Blank	None
L	Left side
R	Right side
D	Both Sides

❽Port Position and Speed Controller

	Code	Content
	Blank	X-axis Port Position L
*1	2	X-axis Port Position R
	3	X-axis Port Position L, with XZ-axis Speed Controller
*1	4	X-axis Port Position R, with XZ-axis Speed Controller

*1: If port position R is selected, mounting direction of the cableveyor is reversed. (Outlet is port side)



❾Cable Carrier

Code	Content
Blank	None
B	X-axis Vertical Mount
T	X-axis Vertical Mount, Z-axis Mount
W	X-axis vertical mounting (10, 15 kg)
Y	X-axis vertical mounting, Z-axis mounting (10, 15 kg)

Note: For details on the X/Z-axis cableveyor, refer to P. 1091.

❿Switch

Code	Content
Blank	2-wire Solid State Switch X-axis: T2H3, Z-axis: T2H3
A	3-wire Solid State Switch X-axis: T3H3, Z-axis: T3H3

1: Two switches are mounted on each of the X-axis and Z-axis.
2: Refer to the table below for details.

Switches are pre-assembled on the product before shipment.

Contact	Indicator LED Special Function	Wiring (Output)	Load Voltage (V) AC	Load Voltage (V) DC	Load Current (mA) AC	Load Current (mA) DC	Lead Wire Straight	
Solid State	1-Color	2-wire	—	10 to 30	—	5 to 20 *1	T2H3	
		3-wire (NPN)	—	30 or less	—	100 or less	T3H3	

*1: The maximum load current value above, 20 mA, is at 25°C. If the switch operating Ambient Temperature is higher than 25°C, it will be lower than 20 mA. (At 60°C, it will be 5 to 10 mA.)

⓫Z-axis Fall Prevention

Code	Content
Blank	None
Q	Yes

Specifications

Combination Model No.		NHS-□-10□□□	NHS-□-15□□	NHS-□-30□□	NHS-□-50□□
Item		NSR-10	NSR-15	NSR-30	NSR-50
Bore Size	mm	ø20		ø32	ø40
Slider speed	mm/s	100 to 1000			
Shock Absorber		NCK-00-1.2-C	NCK-00-2.6-C	FCK-M-3-C	FCK-M-5-C
Stroke	mm	50 to 2000 (1 mm pitch)			
Max Stroke	(mm)	2,000			
Allowable moment *2	N·m	M1=36.4, M2=30.6, M3=34.2		M1, M3=85.9 M2=82.9	M1, M3=156.2 M2=150.7
Slider inclination		±0.1° or less			
Piping connection port size		Rc1/8		Rc1/4	Rc1/2
Position detection sensor		T-type solid state switch lead wire 3 m			
Max horizontal payload	kg	10	15	30	50
Speed controller (Option)		SC3W-6-6		SC3W-8-8	SC3W-15-10
Repeat stopping accuracy	mm	±0.02			
Weight *1	kg	(st×0.0109)+5.5	(st×0.0109)+5.6	(st×0.0176)+10.7	(st×0.0311)+17.9

*1: st represents stroke.
*2: M1 represents bending moment, M2 represents lateral bending moment, and M3 represents torsional moment. For details, please refer to P. 1112.

Z-axis Combination Specifications

Combination Model No.		NHS-□-1005	NHS-□-1007				
		NHS-□-1505	NHS-□-1507	NHS-□-1510	NHS-□-1512		
				NHS-□-3010	NHS-□-3012	NHS-□-3020	
				NHS-□-5010	NHS-□-5012	NHS-□-5020	NHS-□-5033
Z-axis Model No.		HRL-1□-05	HRL-1□-10	HRL-1□-15	HRL-1□-15H	HRL-1□-25	HRL-1□-50
Bore Size	mm	ø20	ø25	ø32	ø32	ø40	ø50
Speed	mm/s	50 to 300					
Shock Absorber *1		NCK-00-0.7		NCK-00-1.2		NCK-00-12	
Stroke	mm	50 to 300 (Standard Body) 301 to 600 (Long Body)					
Allowable Moment	N·m	Refer to Technical Data (P. 1112, 1113)					
Piping connection port size		Rc1/8					Rc1/4
Position detection sensor		T-type solid state switch lead wire 3 m					
Max payload *2	kg	5	7	10	12	20	33
Stroke adjustment amount	mm	0 to -10 (Lowering End Side)					
Speed controller (Option)		SC3W-6-6				SC3W-6-8	SC3W-8-8
Operating Fluid		Clean compressed air					
Operating Pressure	MPa	0.3 to 0.7					
Guaranteed Proof Pressure	MPa	1.05					
Ambient Temperature	°C	5 to 60					
Lubrication		See P. 1114, regarding lubrication					
Repeat stopping accuracy	mm	±0.1					
Product weight (standard body)	kg	2+(0.003×st)	2.1+(0.0037×st)	2.8+(0.0051×st)	2.9+(0.0069×st)	10.8+(0.0081×st)	11.9+(0.0122×st)
Product weight (long body)	kg	2.3+(0.003×st)	2.4+(0.0037×st)	3.1+(0.0051×st)	3.2+(0.0069×st)	12.5+(0.0081×st)	13.6+(0.0122×st)
Movable part weight (standard body)	kg	0.9+(0.0025×st)	0.9+(0.0027×st)	1.3+(0.0041×st)	1.6+(0.0059×st)	4.1+(0.0066×st)	5.2+(0.0102×st)
Movable part weight (long body)	kg	1.0+(0.0025×st)	1.0+(0.0027×st)	1.5+(0.0041×st)	1.8+(0.0059×st)	4.4+(0.0066×st)	5.7+(0.0102×st)

*1: Use at 74% or less of the allowable value of the shock absorber at the operating speed and air pressure.
*2: Payload varies depending on air pressure, speed, absorbed energy, load center of gravity, number of X-axis heads, and Z-axis stroke.
*3: st represents stroke.

X-axis Stroke Adjustment Part Specifications

Item		Blank	R	L	D
Adjustable stroke right	mm	-15 to 0	Full stroke	-15 to 0	Full stroke
Adjustable stroke left	mm	-15 to 0	-15 to 0	Full stroke	Full stroke

Z-axis Shock Absorber Specifications

Item	HRL-1□-05,10	HRL-1□-15,15H	HRL-1□-25,50
Shock Absorber	NCK-00-0.7	NCK-00-1.2	NCK-00-12
Max absorbing capacity J	7	12	120
Absorbing stroke mm	8	10	25
Max colliding speed mm/s	1500	2,000	3,000
Max operating frequency cycle/Min	30	30	12

Note: Use at 74% or less of the allowable value of the shock absorber at the speed and air pressure used.

Attachment Weight

X-axis Model No.		For NSR-10	For NSR-15	For NSR-30	For NSR-50
Attachment weight	kg	0.4	0.4	1	1.4

X-axis Shock Absorber Specifications

Item		NCK-00-1.2-C	NCK-00-2.6-C	FCK-M-3-C	FCK-M-5-C
Max absorbing capacity	J	12	26	30	50
Absorbing stroke	mm	10	15	16	25
Max colliding speed	mm/s	2,000			
Max operating frequency	cycle/Min	30	25	20	12

Cable bear specifications

Item		Cable bear model no.	Inner diameter dimension (mm)	Loading capacity (kg/m)
For Z-axis	For HRL-05, 10, 15, 15H	TKP18H14-30W40R28TC	14×40	MAX 1.0
	For HRL-25, 50	TKP35H22-30W50R37	19×50	MAX 1.6
For X-axis	For NHS-10, 15-B, T	TKP35H22-30W25R37	19×24	MAX 1.6
	For NHS-10, 15-W, Y	TKP45H25-30W38R50	25×38	MAX 3.0
	For NHS-30-B, T	TKP45H25-30W58R50	25×58	MAX 3.0
	For NHS-50-B, T	TKP45H25-30W78R50	25×78	MAX 3.0

Stroke Adjustment Block Added Weight List

Model No.	Added weight (kg)
NSR-1-10-R	0.685 kg
NSR-1-10-L	0.685 kg
NSR-1-10-D	1.370 kg
NSR-1-15-R	0.810 kg
NSR-1-15-L	0.810 kg
NSR-1-15-D	1.620 kg
NSR-1-30-R	1.140 kg
NSR-1-30-L	1.140 kg
NSR-1-30-D	2.280 kg
NSR-1-50-R	1.750 kg
NSR-1-50-L	1.750 kg
NSR-1-50-D	3.499 kg

Cable Bear Added Weight List

Model No.	Added weight (kg)
NHS-1-10,15□□-B	(X Stroke ÷ 2×0.0011)+0.482
NHS-1-10,15□□-W	(X Stroke ÷ 2×0.0018)+0.55
NHS-1-10,15□□-T	(X stroke/2×0.0011)+(Z stroke×0.0006)+0.682
NHS-1-10,15□□-Y	(X stroke/2×0.0018)+(Z stroke×0.0006)+0.75
NHS-1-30□□-B	(X Stroke ÷ 2×0.0028)+1.148
NHS-1-30□□-T	(X stroke/2×0.0028)+(Z stroke×0.0006)+1.348
NHS-1-50□□-B	(X Stroke ÷ 2×0.0034)+1.234
NHS-1-50□□-T	(X stroke/2×0.0034)+(Z stroke×0.0006)+1.434

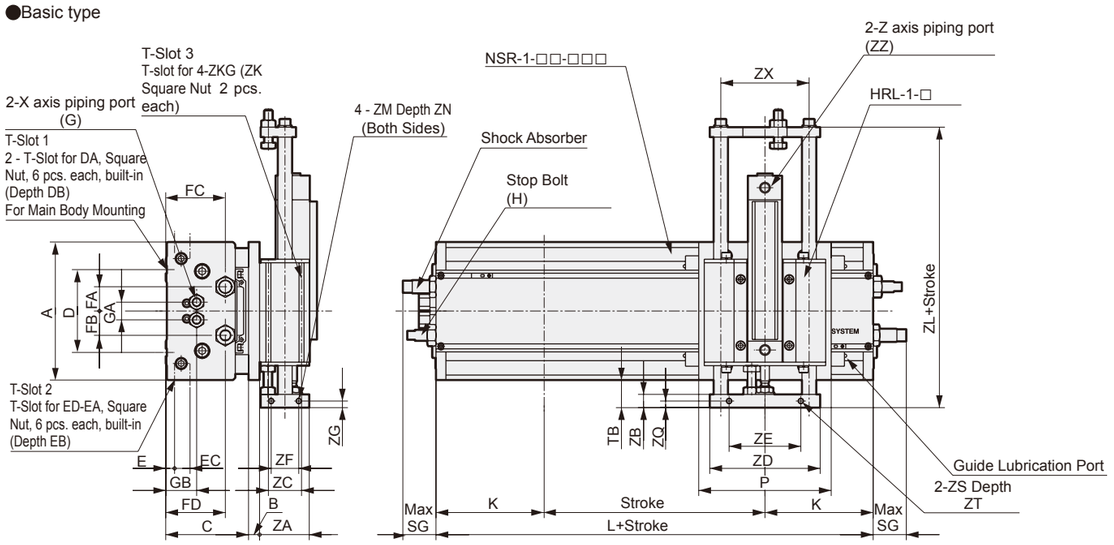
2-Head Specification

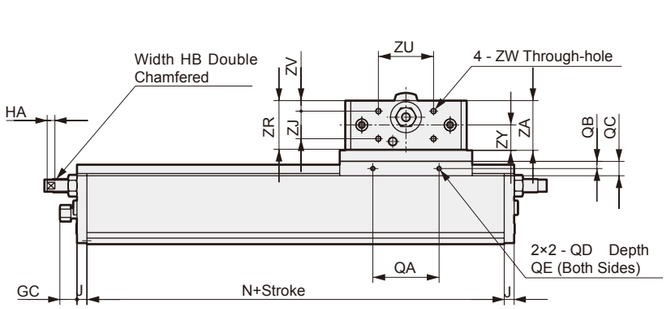
Item		NHS-2-10	NHS-2-15	NHS-2-30	NHS-2-50
Max Horizontal Conveying Weight	kg/1 Head	5	7.5	15	25
Stroke	mm	50 to 1000			
Max Stroke	mm	1800		1731	1690
Pitch between heads	mm	200 to 999		269 to 999 (*1)	310 to 999
Max pitch between heads	mm	999			
Product additional weight	kg	(Pitch Between Heads×0.0109)+1.7		(Pitch Between Heads×0.0176)+2.79	(Pitch Between Heads×0.0311)+4.66

*1: For NHS-H type with NHS-2-30 combination, please note that the pitch between heads is different from the X-axis single unit.

Dimensional Drawings

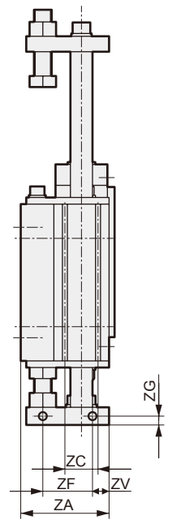
●Basic type



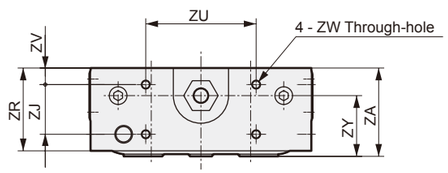


Note: For detailed dimensions of T-Slot 1 and 2 parts, refer to P. 1080. For detailed dimensions of the T-slot 3 part, refer to P. 1124 to 1127.

●For HRL-1-25 or more



When HRL-1-25 or larger



Note: When installing X-axis options, refer to P. 1080 to 1083 NSR Outline Dimension Drawings for external dimensions (stroke adjustment block, with cableveyor, etc.).

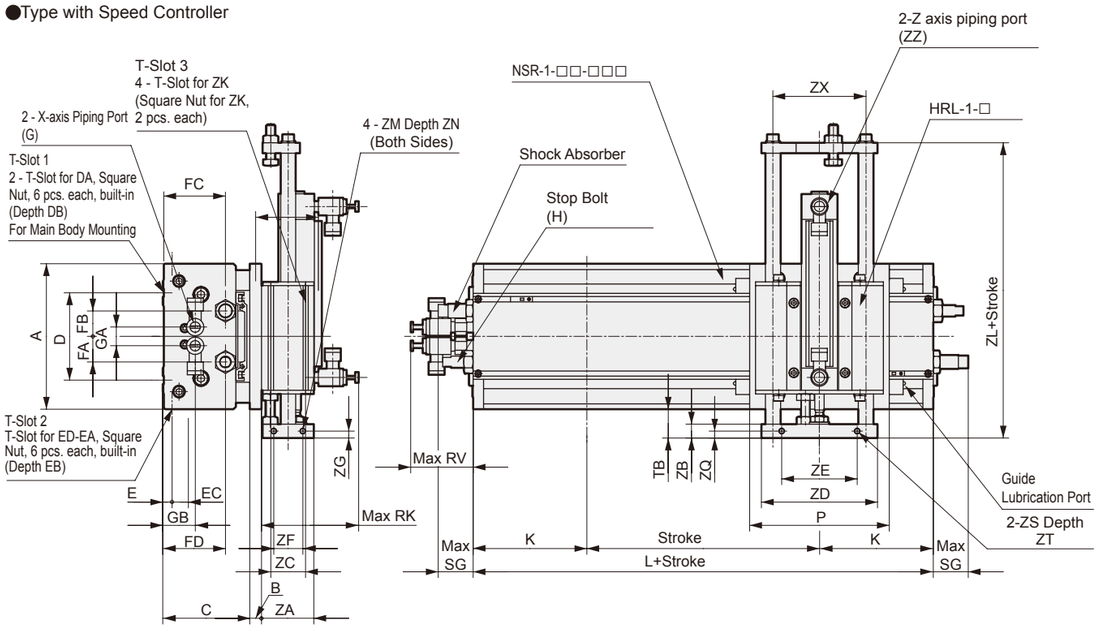
Code / Model No.	A	B	C	D	DA	DB	E	EA	EB	EC	ED	FA	FB	FC	FD	G	GA	GB	GC	H	HA	HB	J	K	L	N	P	QA	QB	QC	QD	QE	SG
NHS-□-10□□-H	125	10	75	75	M6	11	8	M4	8	–	2	22	22	54	54	Rc1/8	16	28	16	M10×1.25	7	8	9	98	196	178	120	60	6.5	13	M4	10	30
NHS-□-15□□-H	125	10	75	75	M6	11	8	M4	8	–	2	22	22	54	54	Rc1/8	16	28	16	M10×1.25	7	8	9	98	196	178	120	60	6.5	13	M4	10	56
NHS-□-30□□-H	165	15	105	110	M10	18	11.5	M5	10.5	14	4	25	24	78	82	Rc1/4	27	37.5	8.5	M12×1.25	9	10	16	133	266	234	150	70	8	17	M5	12	66
NHS-□-50□□-H	200	15	120	130	M12	21	11.5	M6	13	16	4	30	30	88.5	88.5	Rc 1/2	35	46.5	5.5	M12×1.25	9	10	16	143	286	254	177	70	9.5	20	M6	14	101.5

Code / Model No.	TB Standard Body	TB Long body	ZA	ZB	ZC	ZD	ZE	ZF	ZG	ZJ	ZK	ZL Standard Body	ZL Long body	ZM	ZN	ZQ	ZR	ZS	ZT	ZU	ZV	ZW	ZX	ZY	ZZ
HRL-1-05	25	47.5	45	12	30	100	65	25	6	25	M4	154	199	M5	10	6	44	M5	10	50	9.5	M5	80	23	Rc1/8
HRL-1-10	25	47.5	45	12	30	100	65	25	6	25	M4	154	199	M5	10	6	44	M5	10	50	9.5	M5	80	23	Rc1/8
HRL-1-15	25	52.5	45	12	30	120	75	25	6	25	M4	154	209	M5	10	6	44	M5	10	60	9.5	M5	94	23	Rc1/8
HRL-1-15H	25	52.5	45	12	30	120	75	25	6	25	M4	154	209	M5	10	6	44	M5	10	60	9.5	M5	94	23	Rc1/8
HRL-1-25	45	74	80	16	30	200	–	45	8	45	M4	252	310	M8	10	–	75	–	–	100	15	M8	150	55	Rc1/8
HRL-1-50	25	54	80	19	30	200	–	45	9.5	45	M4	255	313	M8	10	–	75	–	–	100	15	M8	150	55	Rc1/4

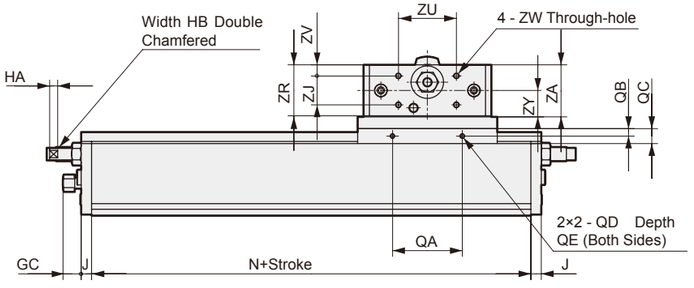
Note: For outline dimension drawings with each switch, refer to P. 1107.

Dimensional Drawings

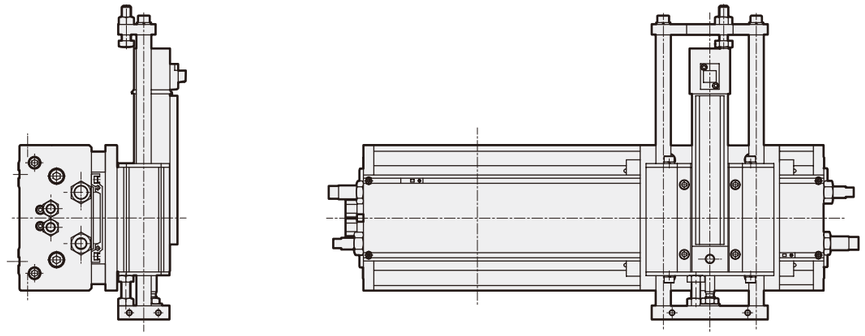
●Type with Speed Controller



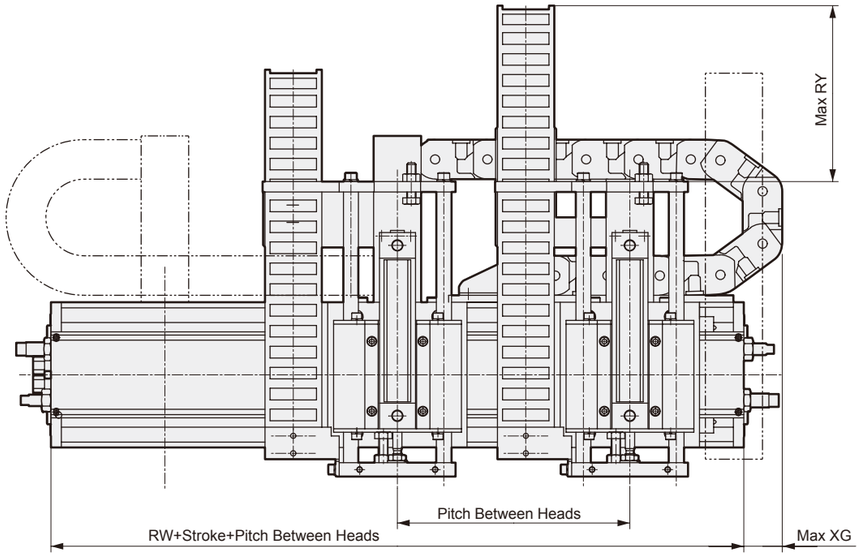
Note: For detailed dimensions of T-Slot 1 and 2 parts, refer to P. 1080. For detailed dimensions of the T-slot 3 part, refer to P. 1124 to 1127.



●Type with Z-axis Fall Prevention



●2-Head Type



Note: When installing X-axis options, refer to P. 1080 to 1083 NSR Outline Dimension Drawings for external dimensions (stroke adjustment block, with cableveyor, etc.).

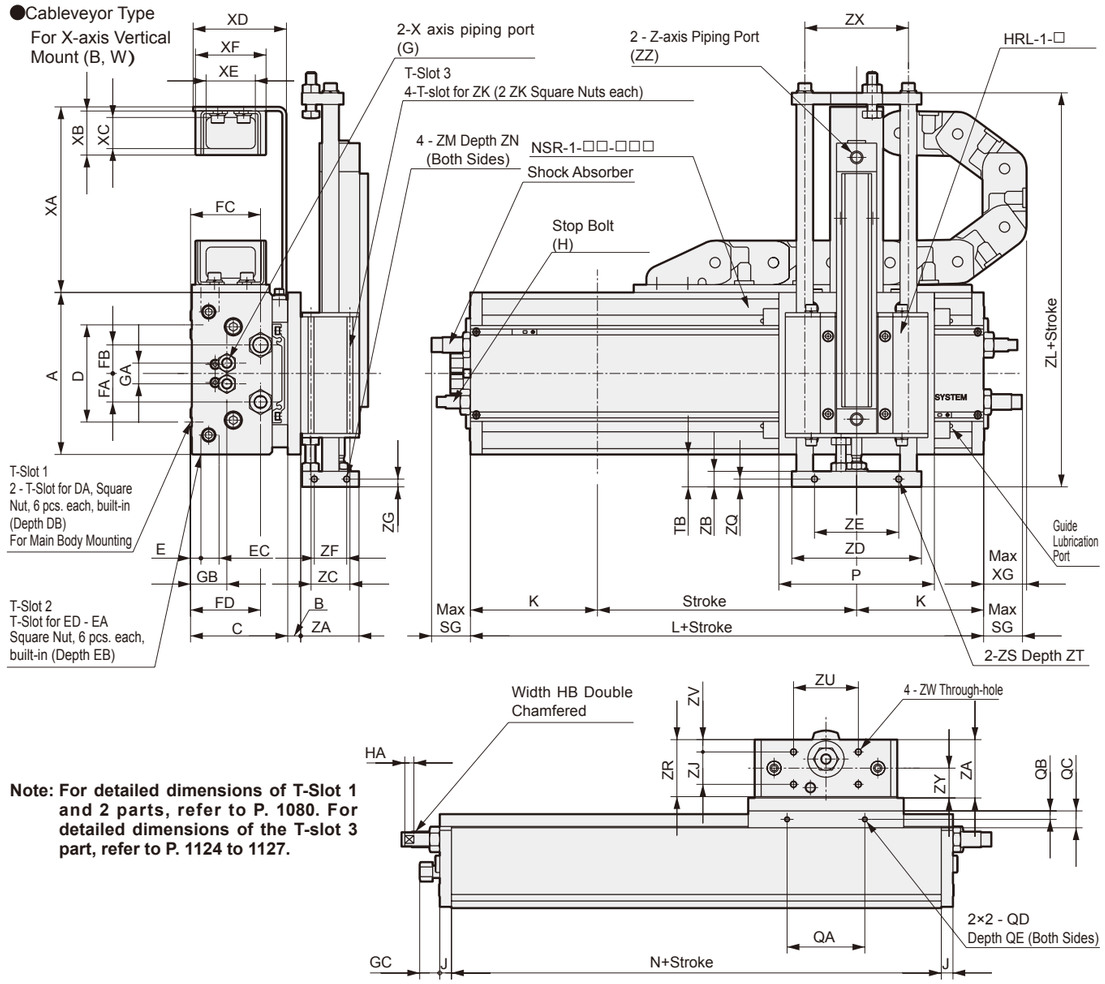
Code / Model No.	A	B	C	D	DA	DB	E	EA	EB	EC	ED	FA	FB	FC	FD	G	GA	GB	GC	H	HA	HB	J	K	L	N	P	QA	QB	QC	QD	QE	RV	RW	SG	XG B.T	XG W.Y
NHS-□-10□□-H	125	10	75	75	M6	11	8	M4	8	–	2	22	22	54	54	Rc1/8	16	28	16	M10×1.25	7	8	9	98	196	178	120	60	6.5	13	M4	10	54.2	196	30	33	75
NHS-□-15□□-H	125	10	75	75	M6	11	8	M4	8	–	2	22	22	54	54	Rc1/8	16	28	16	M10×1.25	7	8	9	98	196	178	120	60	6.5	13	M4	10	54.2	196	56	33	75
NHS-□-30□□-H	165	15	105	110	M10	18	11.5	M5	10.5	14	4	25	24	78	82	Rc1/4	27	37.5	8.5	M12×1.25	9	10	16	133	266	234	150	70	8	17	M5	12	53.2	266	66	46	-
NHS-□-50□□-H	200	15	120	130	M12	21	11.5	M6	13	16	4	30	30	88.5	88.5	Rc 1/2	35	46.5	5.5	M12×1.25	9	10	16	143	286	254	177	70	9.5	20	M6	14	65.2	286	101.5	36	-

Code / Model No.	RK	RY	TB Standard Body	TB Long body	ZA	ZB	ZC	ZD	ZE	ZF	ZG	ZJ	ZK	ZL Standard Body	ZL Long body	ZM	ZN	ZQ	ZR	ZS	ZT	ZU	ZV	ZW	ZX	ZY	ZZ
HRL-1-05	79.7	215	25	47.5	45	12	30	100	65	25	6	25	M4	154	199	M5	10	6	44	M5	10	50	9.5	M5	80	23	Rc1/8
HRL-1-10	82.2	215	25	47.5	45	12	30	100	65	25	6	25	M4	154	199	M5	10	6	44	M5	10	50	9.5	M5	80	23	Rc1/8
HRL-1-15	85.7	215	25	52.5	45	12	30	120	75	25	6	25	M4	154	209	M5	10	6	44	M5	10	60	9.5	M5	94	23	Rc1/8
HRL-1-15H	85.7	215	25	52.5	45	12	30	120	75	25	6	25	M4	154	209	M5	10	6	44	M5	10	60	9.5	M5	94	23	Rc1/8
HRL-1-25	115.2	335	45	74	80	16	30	200	–	45	8	45	M4	252	310	M8	10	–	75	-	-	100	15	M8	150	55	Rc1/8
HRL-1-50	126.2	335	25	54	80	19	30	200	–	45	9.5	45	M4	255	313	M8	10	–	75	-	-	100	15	M8	150	55	Rc1/4

Note: For outline dimension drawings with each switch, refer to P. 1107.

Dimensional Drawings

●Cableveyor Type
For X-axis Vertical Mount (B, W)



Note: For detailed dimensions of T-Slot 1 and 2 parts, refer to P. 1080. For detailed dimensions of the T-slot 3 part, refer to P. 1124 to 1127.

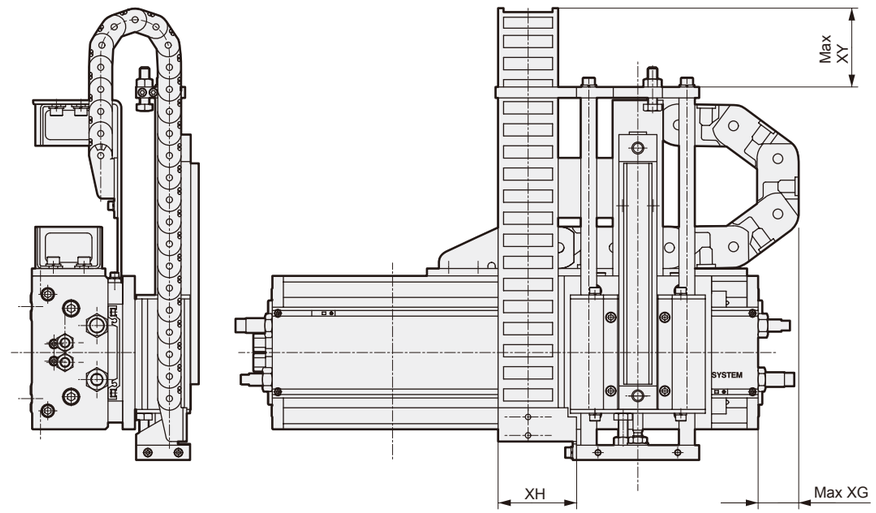
Code / Model No.	A	B	C	D	DA	DB	E	EA	EB	EC	ED	FA	FB	FC	FD	G
NHS-1-10□□-H	125	10	75	75	M6	11	8	M4	8	–	2	22	22	54	54	Rc1/8
NHS-1-15□□-H	125	10	75	75	M6	11	8	M4	8	–	2	22	22	54	54	Rc1/8
NHS-1-30□□-H	165	15	105	110	M10	18	11.5	M5	10.5	14	4	25	24	78	82	Rc1/4
NHS-1-50□□-H	200	15	120	130	M12	21	11.5	M6	13	16	4	30	30	88.5	88.5	Rc 1/2

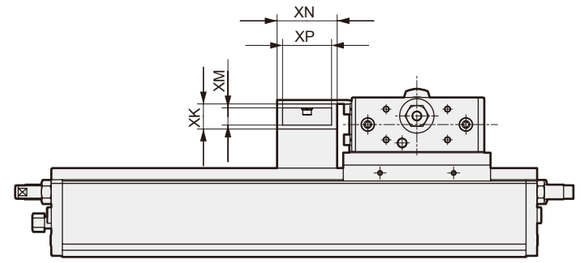
Code / Model No.	GA	GB	GC	H	HA	HB	J	K	L	N	P	QA	QB	QC	QD	QE	SG
NHS-1-10□□-H	16	28	16	M10×1.25	7	8	9	98	196	178	120	60	6.5	13	M4	10	30
NHS-1-15□□-H	16	28	16	M10×1.25	7	8	9	98	196	178	120	60	6.5	13	M4	10	56
NHS-1-30□□-H	27	37.5	8.5	M12×1.25	9	10	16	133	266	234	150	70	8	17	M5	12	66
NHS-1-50□□-H	35	46.5	5.5	M12×1.25	9	10	16	143	286	254	177	70	9.5	20	M6	14	101.5

Code / Model No.	Cable Carrier	XA	XB	XC	XD	XE	XF	XG
NHS-1-10□□-H	B	112.2	30	22	65	25	37	33
	W	145.2	36	25	72	38	58	75
NHS-1-15□□-H	B	112.2	30	22	65	25	37	33
	W	145.2	36	25	72	38	58	75
NHS-1-30□□-H	B, W	160.5	36	25	100.5	58	78	46
NHS-1-50□□-H	B, W	162.5	36	25	117.5	78	98	36

Note: For outline dimension drawings with each switch, refer to P. 1107.

●Cableveyor Type
For X-axis Vertical Mount/2-axis Mount (T, Y)





Note: When installing X-axis options, refer to P. 1080 to 1083 NSR Outline Dimension Drawings for external dimensions (stroke adjustment block, with cableveyor, etc.).

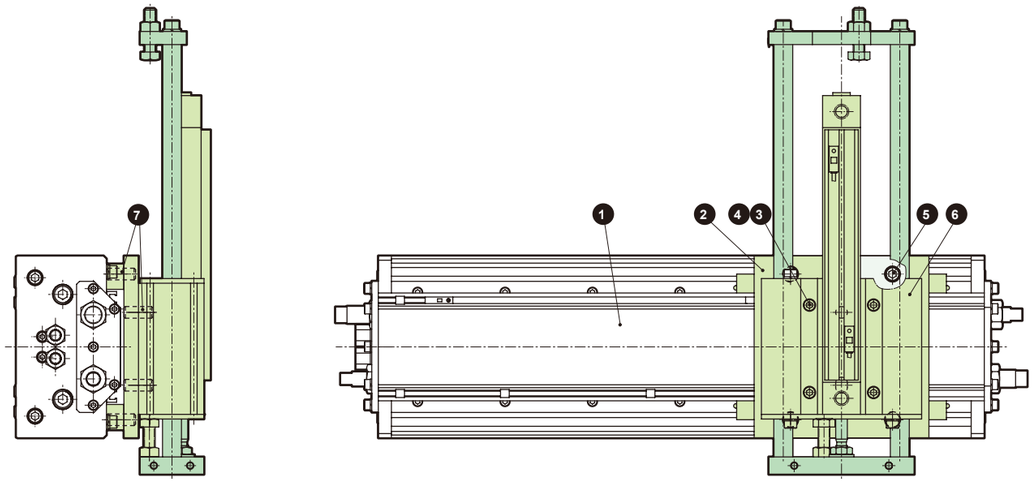
Code / Model No.	TB Standard Body	TB Long body	XH	XK	XM	XN	XP	XY	ZA	ZB	ZC	ZD	ZE	ZF	ZG	ZJ	ZK
HRL-1-05	25	47.5	64	19	14	49	40	150	45	12	30	100	65	25	6	25	M4
HRL-1-10	25	47.5	64	19	14	49	40	150	45	12	30	100	65	25	6	25	M4
HRL-1-15	25	52.5	64	19	14	49	40	150	45	12	30	120	75	25	6	25	M4
HRL-1-15H	25	52.5	64	19	14	49	40	150	45	12	30	120	75	25	6	25	M4
HRL-1-25	45	74	75	30	22	62	50	300	80	16	30	200	-	45	8	45	M4
HRL-1-50	25	54	75	30	22	62	50	300	80	19	30	200	-	45	9.5	45	M4

Code / Model No.	ZL Standard Body	ZL Long body	ZM	ZN	ZR	ZS	ZT	ZU	ZV	ZW	ZX	ZY	ZZ
HRL-1-05	154	199	M5	10	44	M5	10	50	9.5	M5	80	23	Rc1/8
HRL-1-10	154	199	M5	10	44	M5	10	50	9.5	M5	80	23	Rc1/8
HRL-1-15	154	209	M5	10	44	M5	10	60	9.5	M5	94	23	Rc1/8
HRL-1-15H	154	209	M5	10	44	M5	10	60	9.5	M5	94	23	Rc1/8
HRL-1-25	252	310	M8	10	75	-	-	100	15	M8	150	55	Rc1/8
HRL-1-50	255	313	M8	10	75	-	-	100	15	M8	150	55	Rc1/4

Note: For outline dimension drawings with each switch, refer to P. 1107.

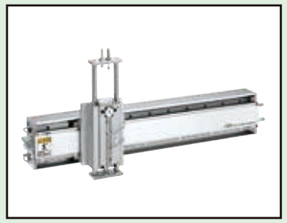
Internal Structure Diagram/Material

●Z-axis Module HRL



Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	New Handling System X-axis Module		NSR (CKD)	4	Spring washer	Steel	Black Oxide
				5	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide
2	Z-axis Bracket	Aluminum Alloy	Alumite	6	Hybrid Robot		HRL (CKD)
3	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide	7	Parallel Pin with Female Thread	Alloy Steel	

MEMO



New Handling System Z-axis Module (STL-B)

NHS-S Series

- X-axis stroke 50 to 2000 mm Z-axis stroke: 50 to 200 mm
  Payload: 3, 7, 12, 33 kg

RoHS

Model No. Notation

NHS - 2 - 1003 - 1000 - S100 - 500 - L - 3 - B - A - Q

- NHS: Model No.
- 2: ❶ Number of X-axis Heads
- 1003: ❷ Payload
- 1000: ❸ X-axis stroke
- S100: ❹ Z-axis Type / ❺ Z-axis stroke
- 500: ❻ Pitch Between Heads
- L: ❼ Stroke adjustment block
- 3: ❽ Port Position and Speed Controller
- B: ❾ Cable Carrier
- A: ❿ Switch
- Q: ⓫ Z-axis Fall Prevention

❶Number of X-axis Heads

Code	Content
1	1 pc.
2	2 pcs.

❷Payload (kg)

Code	Content	
	X-axis	Z-axis
1003	10	3
1503	15	3
1507	15	7
1512	15	12
3007	30	7
3012	30	12
5007	50	7
5012	50	12
5033	50	33

❸X-axis stroke (1 mm pitch)

Code	Content
50 to 2000	50 to 2000

*1: For X-axis stroke 1001 mm or more, the front cover becomes tension type.
*2: When the number of heads is 2, select so that the sum of pitch between heads and X-axis stroke is 2000 mm or less.

❹Z-axis Type

Code	Content
S	STL-BP-16
	STL-BP-25
	STL-BP-32
	STL-BP-50

❺Z-axis Stroke (mm)

Code	Z-axis stroke
50	50
75	75
100	100
125	125
150	150
175	175
200	200

❻Pitch between heads (1 mm pitch)

Code	Payload (kg)			
	10	15	30	50
200	200	200	260	310
to	to	to	to	to
999	999	999	999	999

*1: Can be selected only for 2-head type.
*2: Select so that the sum of pitch between heads and X-axis stroke is 2000 mm or less.

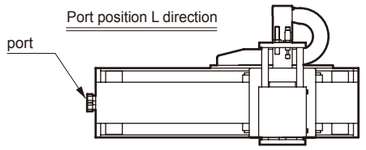
❼Stroke adjustment block

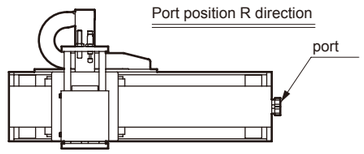
Code	Content
Blank	None
L	Left side
R	Right side
D	Both Sides

❽Port Position and Speed Controller

	Code	Content
	Blank	X-axis Port Position L
*1	2	X-axis Port Position R
	3	X-axis Port Position L, with XZ-axis Speed Controller
*1	4	X-axis Port Position R, with XZ-axis Speed Controller

*1: If port position R is selected, mounting direction of the cableveyor is reversed. (Outlet is port side)





❾Cable Carrier

Code	Content
Blank	None
B	X-axis Vertical Mount
W	X-axis Vertical Mount

Note: For details on the cableveyor, refer to P. 1103.

❿Switch

Code	Content
Blank	2-wire Solid State Switch X-axis: T2H3, Z-axis: T2H3
A	3-wire Solid State Switch X-axis: T3H3, Z-axis: T3H3

*1: Two switches are mounted on each of the X-axis and Z-axis.
*2: Refer to the table below for details.

Switches are pre-assembled on the product before shipment.

	Indicator LED Special Function	Wiring (Output)	Load Voltage (V) AC	Load Voltage (V) DC	Load Current (mA) AC	Load Current (mA) DC	Lead Wire Straight	
Contact/Solid State	1-Color	2-wire	—	10 to 30	—	5 to 20 *1	T2H3	
		3-wire (NPN)	—	30 or less	—	100 or less	T3H3	

*1: The maximum load current value above, 20 mA, is at 25°C. If the switch operating Ambient Temperature is higher than 25°C, it will be lower than 20 mA. (At 60°C, it will be 5 to 10 mA.)

⓫Z-axis Fall Prevention

	Code	Content
	Blank	None
*1	Q	Yes

*1: Cannot be selected when Z-axis type is STL-BP-16.

X-axis Specifications

Combination Model No.		NHS-□-10□□	NHS-□-15□□	NHS-□-30□□	NHS-□-50□□
Item		NSR-10	NSR-15	NSR-30	NSR-50
Bore Size	mm	ø20		ø32	ø40
Slider speed	mm/s	100 to 1000			
Shock Absorber		NCK-00-1.2-C	NCK-00-2.6-C	FCK-M-3-C	FCK-M-5-C
Stroke	mm	50 to 2000 (1 mm pitch)			
Max Stroke	mm	2,000			
Allowable moment *2	N·m	M1=36.4, M2=30.6, M3=34.2		M1, M3=85.9 M2=82.9	M1, M3=156.2 M2=150.7
Slider Inclination		±0.1° or less			
Piping connection port size		Rc1/8		Rc1/4	Rc1/2
Position detection sensor		T-type solid state switch lead wire 3 m			
Max horizontal payload	kg	10	15	30	50
Speed controller (Option)		SC3W-6-6		SC3W-8-8	SC3W-15-10
Repeat stopping accuracy	mm	±0.02			
Weight *1	kg	(st×0.0109)+5.5	(st×0.0109)+5.6	(st×0.00176)+10.7	(st×0.00311)+17.9

*1: st represents stroke.
*2: M1 represents bending moment, M2 represents lateral bending moment, and M3 represents torsional moment. For details, please refer to P. 1112.

Z-axis Combination Specifications

Combination Model No.		NHS-□-1003			
		NHS-□-1503	NHS-□-1507	NHS-□-1512	
			NHS-□-3007	NHS-□-3012	
			NHS-□-5007	NHS-□-5012	NHS-□-5033
Z-axis Model No.		STL-B-16	STL-B-25	STL-B-32	STL-B-50
Bore Size	mm	ø16	ø25	ø32	ø50
Speed	mm/s	50 to 300			
Cushion		Lowering End Side Shock Absorber, Ascending End Side Rubber Cushion			
Stroke	mm	50, 75, 100, 125, 150, 175, 200			
Allowable Moment	N·m	Refer to Technical Data (P. 1112, 1113)			
Piping connection port size		M5		Rc1/8	Rc1/4
Position detection sensor		T-type solid state switch lead wire 3 m			
Max payload *2	kg	3	7	12	33
Stroke adjustment amount	mm	0 to -25 (Lowering End Side)			
Speed controller (Option)		SC3W-M5-6		SC3W-6-6	SC3W-8-8
Operating Fluid		Clean compressed air			
Operating Pressure	MPa	0.3 to 0.7			
Guaranteed Proof Pressure	MPa	1.05			
Ambient Temperature	°C	5 to 60			
Lubrication		See P. 1114, regarding lubrication			
Repeat stopping accuracy	mm	±0.5			
Product weight *2	kg	st×0.015+0.53	st×0.0229+1.16	st×0.0335+2.5	st×0.062+4.46

*1: Payload varies depending on air pressure, speed, absorbed energy, load center of gravity, number of X-axis heads, and Z-axis stroke.
*2: st represents stroke.

X-axis Stroke Adjustment Part Specifications

Item	Blank	R	L	D
Adjustable stroke right mm	0 to -15	Full stroke	0 to -15	Full stroke
Adjustable stroke left mm	0 to -15	0 to -15	Full stroke	Full stroke

Z-axis Shock Absorber Specifications

Item	STL-B-16	STL-B-25	STL-B-32	STL-B-50
Shock Absorber	NCK-00-0.3	NCK-00-0.7	NCK-00-1.2	NCK-00-2.6
Max absorbing capacity J	3	7	12	50
Absorbing stroke mm	7	8	10	15
Max colliding speed mm/s	1500	1500	2,000	2,000
Max operating frequency cycle/Min	35	30	30	25

X-axis Shock Absorber Specifications

Item	NCK-00-1.2-C	NCK-00-2.6-C	FCK-M-3-C	FCK-M-5-C
Max absorbing capacity J	12	26	30	26
Absorbing stroke mm	10	15	16	25
Max colliding speed mm/s	2,000			
Max operating frequency cycle/Min	30	25	20	12

Attachment Weight

Item		For NSR-10	For NSR-15	For NSR-30	For NSR-50
Attachment weight	kg	0.5	0.5	1	1.4

Cable bear specifications

Item	Cable bear model no.	Inner diameter dimension (mm)	Loading capacity (kg/m)
For NHS-10, 15-B	TKP35H22-30W25R37	22×25	MAX 1.6
For NHS-10, 15-W	TKP45H25-30W38R50	25×38	MAX 3.0
For NHS-30-B	TKP45H25-30W58R50	25×58	MAX 3.0
For NHS-50-B	TKP45H25-30W78R50	25×78	MAX 3.0

Stroke Adjustment Block Added Weight List

Model No.	Added weight (kg)
NSR-1-10-R	0.685 kg
NSR-1-10-L	0.685 kg
NSR-1-10-D	1.370 kg
NSR-1-15-R	0.810 kg
NSR-1-15-L	0.810 kg
NSR-1-15-D	1.620 kg
NSR-1-30-R	1.140 kg
NSR-1-30-L	1.140 kg
NSR-1-30-D	2.280 kg
NSR-1-50-R	1.750 kg
NSR-1-50-L	1.750 kg
NSR-1-50-D	3.499 kg

Cable Bear Added Weight List

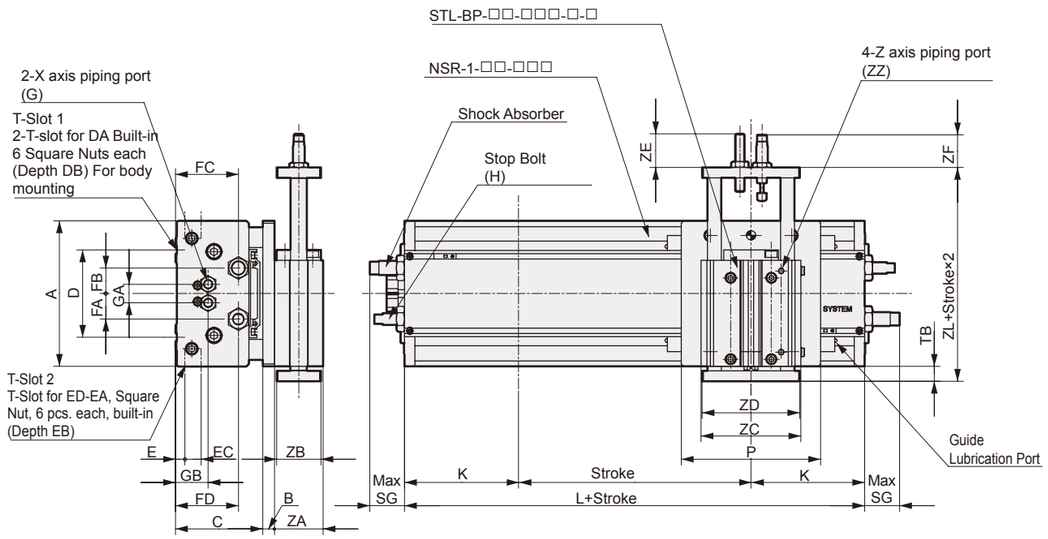
Model No.	Added weight (kg)
NHS-1-10,15□□-B	(X Stroke ÷ 2×0.0011)+0.482
NHS-1-10,15□□-W	(X Stroke ÷ 2×0.0018)+0.55
NHS-1-30□□-B	(X Stroke ÷ 2×0.0028)+1.148
NHS-1-50□□-B	(X Stroke ÷ 2×0.0034)+1.234

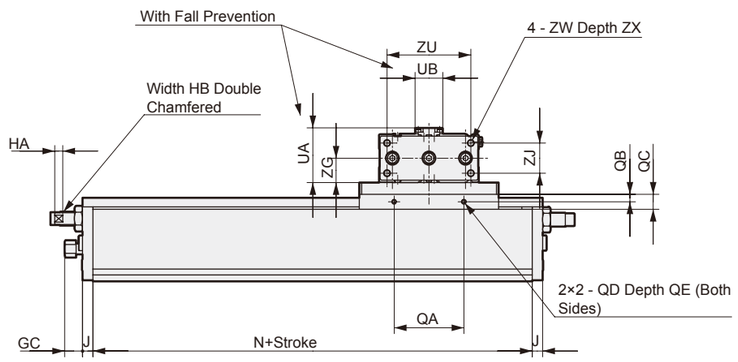
2-Head Specification

Item		NHS-2-10	NHS-2-15	NHS-2-30	NHS-2-50
Max Horizontal Conveying Weight kg/1 Head		5	7.5	15	25
Stroke	mm	50 to 1000			
Maximum Stroke	mm	1800		1740	1690
Pitch between heads	mm	200 to 999		260 to 999	310 to 999
Max Pitch Between Heads	mm	999			
Product Additional Mass	kg	(Pitch Between Heads×0.0109)+1.7		(Pitch Between Heads×0.0176)+2.79	(Pitch Between Heads×0.0311)+4.66

Dimensional Drawings

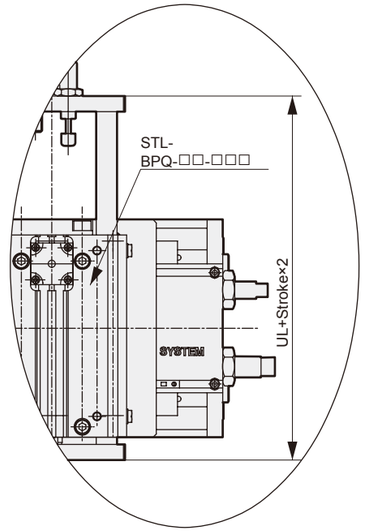
●Basic type





Note: For detailed dimensions of the T-slot part, refer to P. 1080.

●Type with Fall Prevention



Note: When installing X-axis options, refer to P. 1080 to 1083 NSR Outline Dimension Drawings for external dimensions (stroke adjustment block, with cableveyor, etc.).

Code / Model No.	A	B	C	D	DA	DB	E	EA	EB	EC	ED	FA	FB	FC	FD
NHS-□-10□□-S	125	10	75	75	M6	11	8	M4	8	–	2	22	22	54	54
NHS-□-15□□-S	125	10	75	75	M6	11	8	M4	8	–	2	22	22	54	54
NHS-□-30□□-S	165	15	105	110	M10	18	11.5	M5	10.5	14	4	25	24	78	82
NHS-□-50□□-S	200	15	120	130	M12	21	11.5	M6	13	16	4	30	30	88.5	88.5

Code / Model No.	G	GA	GB	GC	H	HA	HB	J	K	L	N	P	QA	QB	QC	QD	QE
NHS-□-10□□-S	Rc1/8	16	28	16	M10×1.25	7	8	9	98	196	178	120	60	6.5	13	M4	10
NHS-□-15□□-S	Rc1/8	16	28	16	M10×1.25	7	8	9	98	196	178	120	60	6.5	13	M4	10
NHS-□-30□□-S	Rc1/4	27	37.5	8.5	M12×1.25	9	10	16	133	266	234	150	70	8	17	M5	12
NHS-□-50□□-S	Rc1/2	35	46.5	5.5	M12×1.25	9	10	16	143	286	254	177	70	9.5	20	M6	14

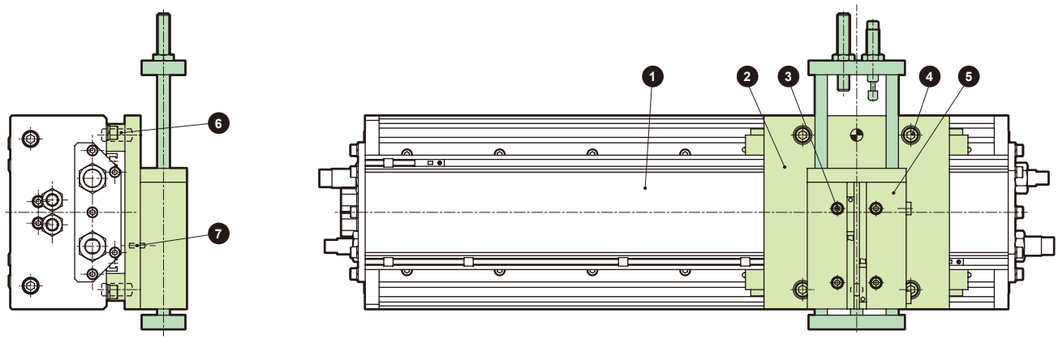
Code / Model No.	SG	TB
NHS-□-10□□-S	30	13
NHS-□-15□□-S	56	13
NHS-□-30□□-S	66	13
NHS-□-50□□-S	101.5	13

Model No. / Model No.	UA	UB	UL	ZA	ZB	ZC	ZD	ZE	ZF	ZG	ZJ	ZL	ZU	ZW	ZX	ZZ
STL-BP-16	–	–	–	30	28	64	62	30.5	25.5	15	18	73.5	52	M5	Through	M5
STL-BP-25	47	24	109	42	38	86	84	29	28	21	26	84	72	M6	Through	M5
STL-BP-32	54	32	129.5	47	45	111	109	45.5	30.5	23.5	29	104.5	93	M8	Through	Rc1/8
STL-BP-50	73.5	43	174	66	64	147	145	49	50	33	44	124	125	M10	Through	Rc1/4

Note: For outline dimension drawings with each switch, refer to P. 1107.

Internal Structure Diagram/Material

●Z-axis Module STL-B

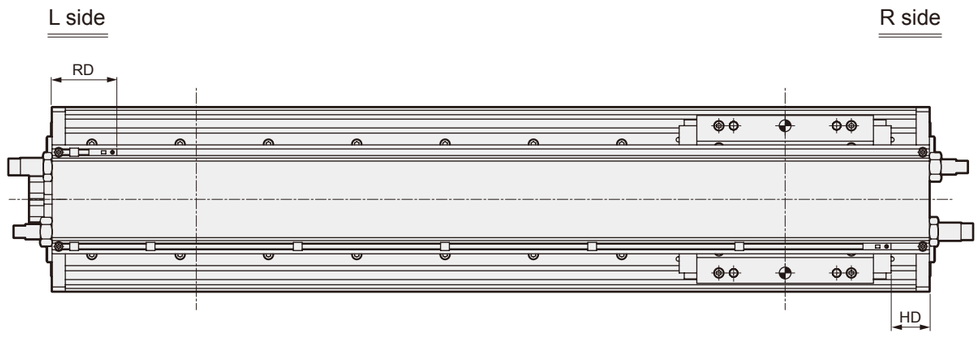


Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	New Handling System X-axis Module		NSR (CKD)	4	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide
				5	Guided Cylinder		STL-BP (CKD)
2	Z-axis Bracket	Aluminum Alloy	Alumite	6	Parallel Pin with Female Thread	Alloy Steel	
3	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide	7	Parallel pin	Alloy Steel	

NSR/NHS Series Outline Dimension Drawing with Switch

●T2H3, T3H3

• NSR, NHS-H (X-axis), NHS-S (X-axis)

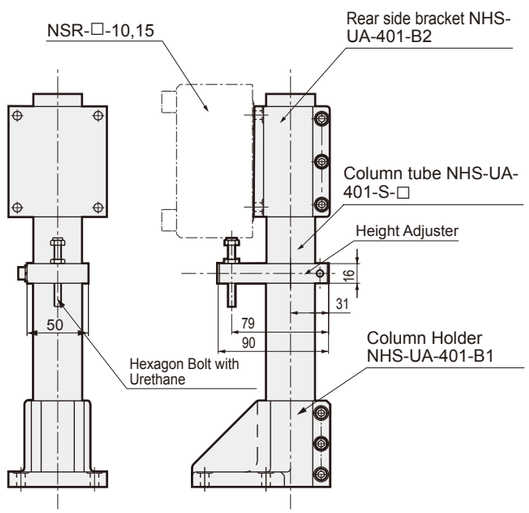


Code / Model No.	RD T2/T3	HD T2/T3
NSR-□-10, 15	44.0	26.0
NSR-□-10,15-L	83.0	26.0
NSR-□-10,15-R	44.0	65.0
NSR-□-10,15-D	83.0	65.0
NSR-□-30	64.0	46.0
NSR-□-30-L	105.0	46.0
NSR-□-30-R	64.0	87.0
NSR-□-30-D	105.0	87.0
NSR-□-50	60.5	42.5
NSR-□-50-L	113.5	42.5
NSR-□-50-R	60.5	95.5
NSR-□-50-D	113.5	95.5

*1: NHS-H Dimensions diagram with switch for the Z-axis (HRL-1), refer to P. 1130 (HRL-1), and when selecting Z-axis position locking (Q), refer to P. 1130 (HRL-1-□Q).
*2: For dimensions of NHS-S Z-axis (STL) with switch, refer to STL in "Pneumatic Cylinder 3" (No. RJ-004AA), and when Z-axis drop prevention (Q) is selected, refer to STL-Q-H in "Pneumatic Cylinder 3" (No. RJ-004AA).

Accessory Frame Combination Outline Dimension Drawing Dedicated for NSR/NHS-□-10□□, 15□□

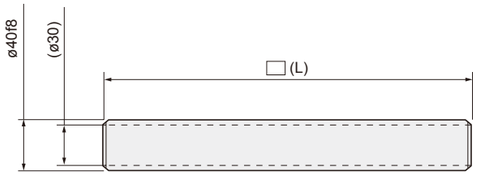
●NHS-UA-401 - Length
300, 400, 500, 600



●With Height Adjuster
●Accessories
NHS Mounting Bolt Set
Hexagon Socket Head Bolt M6×20...4 pcs.
Spring Washer Nominal 6.....4 pcs.
Plain Washer Nominal 6.....4 pcs.
●For combination Model No.s, it will be 1 pc./1 set.

Column Tube

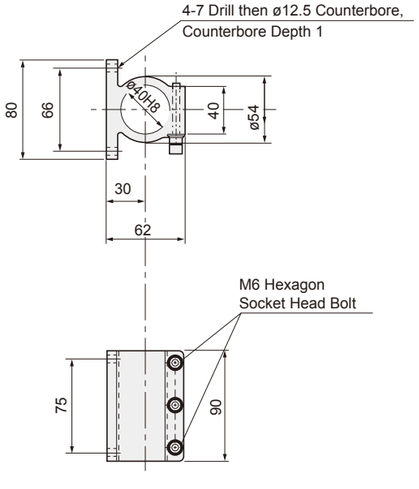
●NHS-UA-401-S - Length
300, 400, 500, 600



Material: Steel

Rear Bracket

●NHS-UA-401-B2

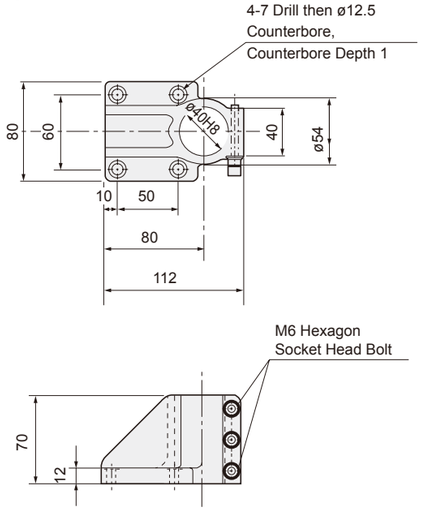


●Accessories
NHS Mounting Bolt Set
Hexagon Socket Head Bolt M6×20...4 pcs.
Spring Washer Nominal 6.....4 pcs.
Plain Washer Nominal 6.....4 pcs.

Material: Aluminum Alloy

Column Holder

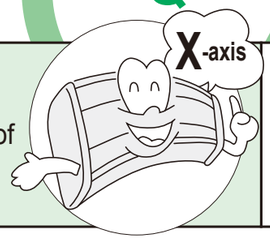
●NHS-UA-401-B1



Material: Cast Iron

MEMO

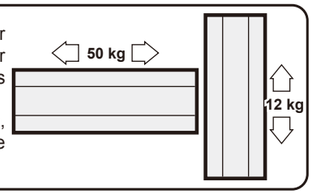
Q1
What are the features of the X-axis module?



The first feature is its large moment payload. Since two THK LM Guides are used on rails, it can withstand high moment loads. The second feature is the abundance of options. Full stroke adjustment type (both sides or one side). Various options can be selected according to the purpose of use, such as type with cableveyor (horizontal mount or vertical mount), piping port position, etc.

Q2
Is the payload of the X-axis module also Max 50 kg in the vertical direction?

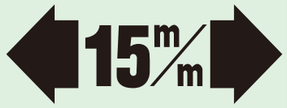
Payload Max 50 kg is for horizontal conveyance. For vertical conveyance, it is Approx. 12 kg.
* For vertical conveyance, select based on the internal cylinder thrust.



Q3
Can a reed type sensor be used for the X-axis module?

The sensor for the X-axis module is included with the T-slot on the front cover. Therefore, there are restrictions on the distance to the magnet included with the slider, and reed switches cannot be used. T2 or T3 type cylinder switches can be mounted. If using a sequencer where leakage current is a concern, use the T3 type (leakage current 10 μA or less).

Q4
How much stroke adjustment is possible for the X-axis module?

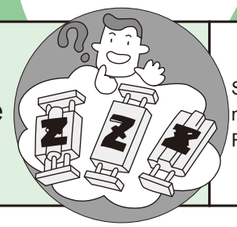


With the standard type, the stroke can be shortened by up to 15 mm from both the left and right sides. If a larger stroke adjustment is required, select the full stroke adjustment type available as an option. However, no type can increase the stroke beyond the Standard Stroke.

Q5
What is different when the X-axis module has a Standard Stroke (1000 mm) or more?

NSR-10 and 15 have a tension mechanism on the front cover. The Max stroke is 2000 mm. NSR-30 and 50 have no changes.

Q6
How should I select the Z-axis module?



Select based on payload and required accuracy. For medium accuracy and high load, use HRL (NHS-H).
For low accuracy and low cost, use STL (NHS-S).

Q7
Does the Z-axis module have a fall prevention mechanism?

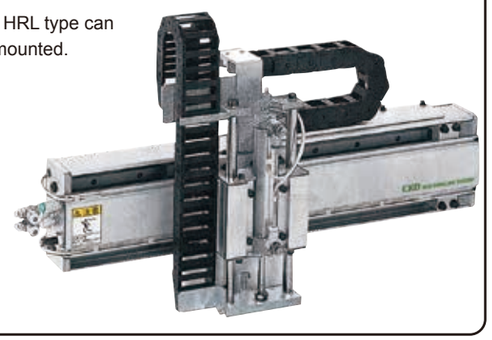
Except for STL-BP-16, it is available as an option on all models.

Q8
Are valves included with the X-axis and Z-axis modules?

Valves are not included with each module. Please install them yourself.

Q9
Does the Z-axis module come with a cableveyor?

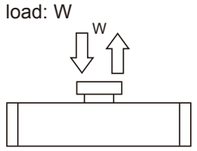
The HRL type can be mounted.



About the Cylinder Used for the X-axis (NSR)

About Payload and Moment Load

● Vertical load: W

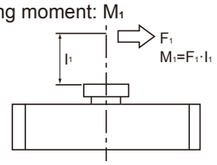


● Use so that the payload and moment load do not exceed the graphs below. If the specifications exceed the graph, it will be damaged. Also, use the moment within a range where the total value calculated using the formula below is 1.0 or less.

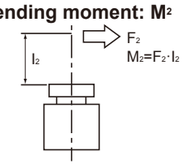
● Calculation formula

$$\frac{M1}{M1\ max} + \frac{M2}{M2\ max} + \frac{M3}{M3\ max} \leq 1.0$$

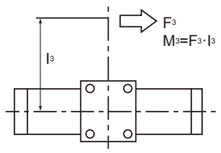
● Bending moment: M_1



● **Lateral bending moment: M_2**



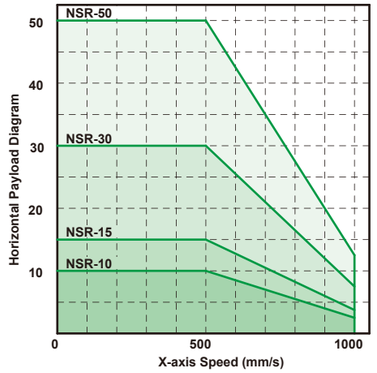
● **Torsional Moment: M_3**



Allowable Load Value

Model No.	Bending moment M1 max	Lateral bending moment M2 max	Torsional moment M3 max
NSR-10	36.4 N·m	30.6 N·m	34.2 N·m
NSR-15	36.4 N·m	30.6 N·m	34.2 N·m
NSR-30	85.9 N·m	82.9 N·m	85.9 N·m
NSR-50	156.2 N·m	150.7 N·m	156.2 N·m

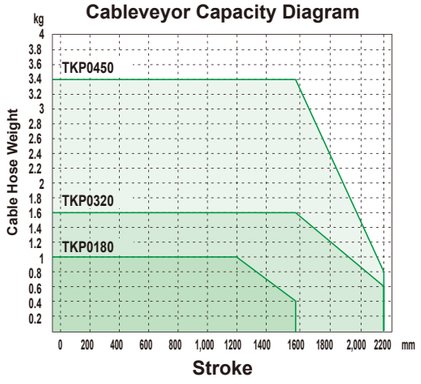
X-axis Speed - Payload Diagram



About Cableveyor Hose Weight

● Ensure the cableveyor hose weight is below the weight shown in the graph below. Also, use with a volume ratio of 50% or less. If the capacity is insufficient, please consult us separately.

Cableveyor Capacity Diagram

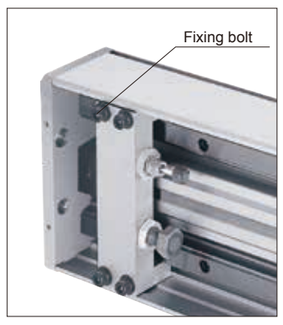


About Stroke Adjustment Block

● The stroke adjustment block can be moved by loosening the fixing bolt.

● After moving the stroke adjustment block to the desired position, tighten it with the torque shown in the table below. If tightened with other than the above, the stroke adjustment block may shift.

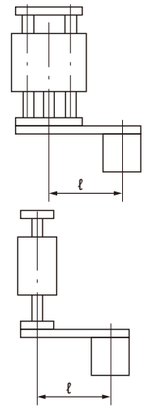
Model No.	Tightening torque
NSR-10,15	520 to 560 N·cm
NSR-30	980 to 1200 N·cm
NSR-50	2800 to 2950 N·cm



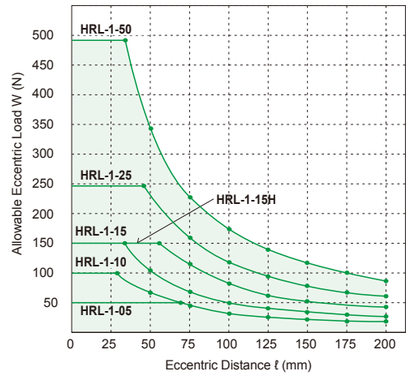
About the Cylinder Used for the Z-axis

A About HRL Type Allowable Load

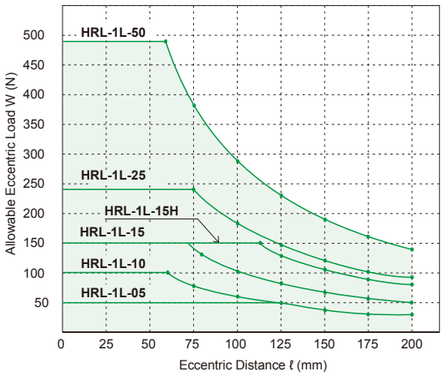
● Use HRL below the allowable eccentric load shown below.
HRL-1□-05/10/15/15H/25/50



● HRL-1 (Basic Type)

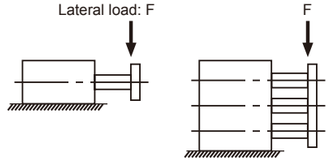


●HRL-1L (Long Body Type)



B STL Type Allowable Lateral Load/Allowable Rotational Torque/Non-rotating Accuracy

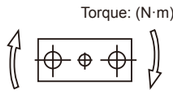
●Allowable Lateral Load



Unit: N

Bore Size mm	Model No.	Stroke (mm)						
		50	75	100	125	150	175	200
ø16	STL-B-16	34	25	19	16	13	11	10
ø25	STL-B-25	68	50	39	32	27	23	20
ø32	STL-B-32	100	76	62	51	44	38	34
ø50	STL-B-50	161	126	103	87	75	66	58

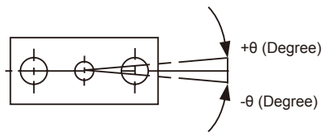
●Allowable rotational torque



Unit: N·m

Bore Size mm	Model No.	Stroke (mm)						
		50	75	100	125	150	175	200
ø16	STL-B-16	0.39	0.29	0.22	0.18	0.15	0.13	0.12
ø25	STL-B-25	1.07	0.79	0.61	0.50	0.43	0.36	0.32
ø32	STL-B-32	2.03	1.54	1.26	1.03	0.89	0.77	0.69
ø50	STL-B-50	4.43	3.47	2.83	2.39	2.06	1.82	1.60

●Non-rotation accuracy

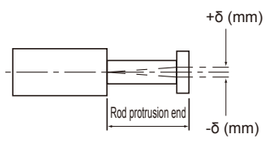


Bore Size mm	Non-rotation accuracy θ (degrees)
ø16	±0.06
ø25	±0.08
ø32	±0.04
ø50	±0.03

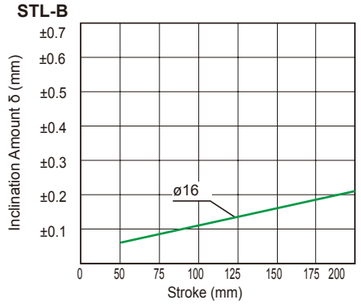
(PULL time initial value) Note: Excluding guide rod deflection amount

●Runout accuracy

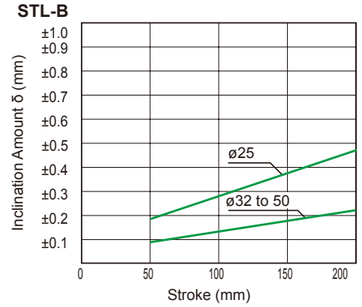
(Excluding the amount of deflection of the guide rod)



●ø16 Rolling Bearing



● ø25, ø32 to ø50 ball bearing



Pneumatic Equipment

To Use This Product Safely

Be sure to read this before use. For general cylinder information, see Intro 41, and for Cylinder Switches, see P. 1512.

Individual Precautions: New Handling System

Design / Selection

1. About lubrication

⚠CAUTION

■Cylinder

Can be used without lubrication, but if lubricating, please use turbine oil type 1 ISO VG32. Using other lubricating oils will cause abnormalities in the packing, resulting in malfunction. If lubricating, be careful not to run out of oil. If oil runs out, operation will become unstable.

■LM guide

Lubricate from the grease nipple every 100 km of travel distance. Use either lithium-based grease (JIS No. 2) or urea-based grease (JIS No. 2) for lubrication.

2. Service life

⚠CAUTION

■The life of the unit is greatly affected by the life of pneumatic components.

Since general pneumatic equipment is used, the operating life is Approx. 3 to 5 million cycles, or a travel distance of Approx. 1,000 km. (Since usage conditions, operating environment, etc. greatly affect the service life, the above values are not guaranteed values)

During Use

1. Mounting Posture

⚠Warning

■Units other than HRL-1(L) are all horizontally mounted only. Do not use in an inverted mounting position as it will cause damage.

Also, for vertical mounting (Z-axis direction), select the payload based on the internal cylinder thrust.

For precautions during mounting, installation, adjustment, use, and maintenance, refer to "During Use" in this catalog and the CKD Components Product website (https://www.ckd.co.jp/kiki/en/) -> "Model No." -> Instruction Manual.

MEMO

Special
MVC
STK
MCP
GLC
BBS
NHS
HR
LN
Cylinder Switch
Ending

HRL

Hybrid Robot

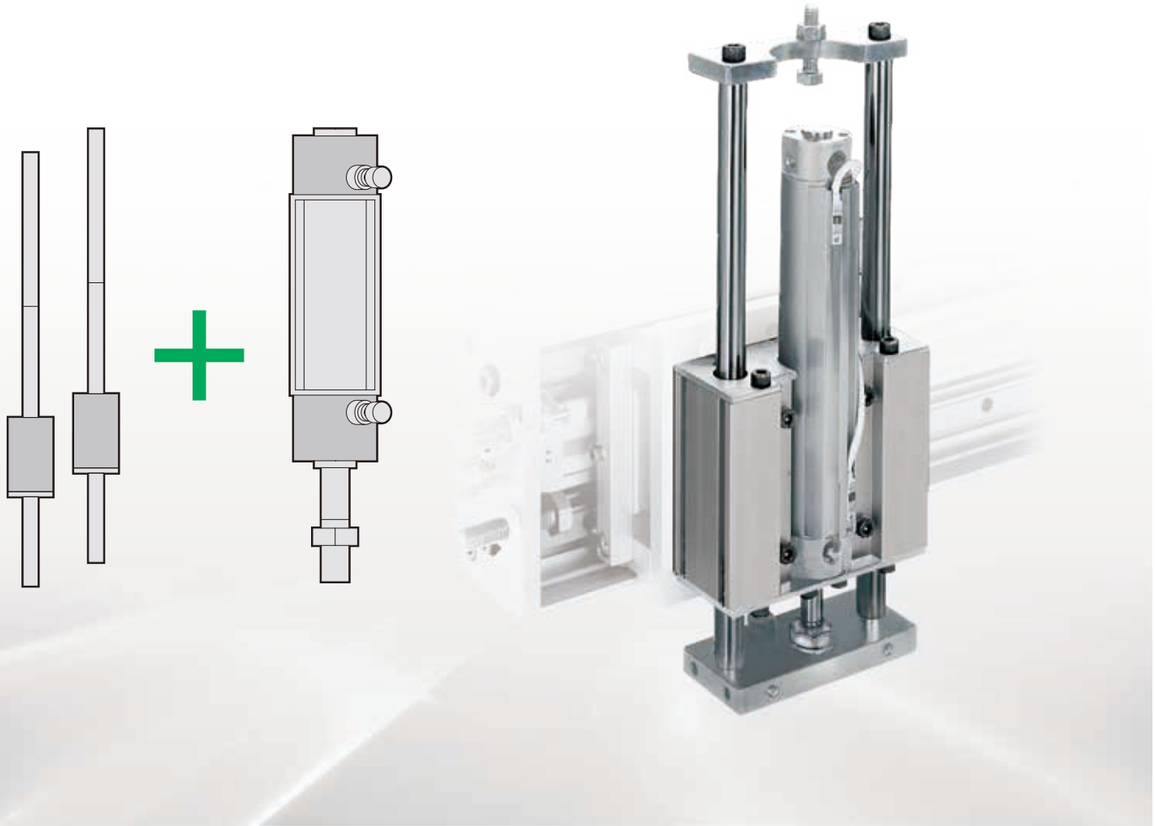
CONTENTS

Product Introduction 1118
● HRL-1 (Single axis unit) 1120
External Dimensions Diagram with Switch 1130
⚠ Precautions for Use 1133

Model No.	Payload (kg)	Basic cylinder	Stroke (mm)		Page
			Basic body shape	Long body shape	
HRL-1□	5, 10, 15, 25, 50, 65	SCM	50, 75, 100, 125, 150, 200, 250, 300	350, 400, 450, 500, 550, 600	1120

Thin, high-rigidity Z-axis module Supports long stroke of Max 600 mm

Z-axis module that performs conveyance work closest to the target object. The HRL series meets many functional requirements such as appropriate rigidity, thinness, space saving, as well as shock absorption, non-rotation, and fall prevention.



Guide rod and cylinder integrated.
Reduction of customer assembly man-hours.

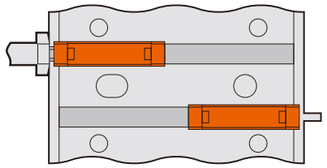
Optimal functions for Z-axis module

With stroke adjustment

Stroke adjustment range:
0 to 10 mm (Push side)

Built-in shock suppressor

Since a shock absorber is standardly equipped, shock and vibration during stopping can be absorbed.



Ball bush adopted

Since the two guide rods are supported by ball bushes, they operate smoothly and can maintain high positioning accuracy.

Drop prevention option

The lock operates when air is exhausted at the head end of the stroke. Damage to workpieces, jigs, etc. due to falling of the Piston Rod can be prevented.

With Speed Controller

Since a speed controller is included, there is no need to arrange it separately.

Long stroke compatible guided cylin-

STG Series

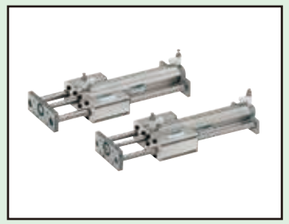
Max Stroke
400 mm

HRL Series

Max Stroke
600 mm

HRL Series Product System

Model No.	Payload (kg)	Basic Cylinder	Stroke (mm)	
			Standard body	Long body
HRL-1	5 10 15 25 50 65	SCM	50 75 100 125 150 200 250 300	350 400 450 500 550 600

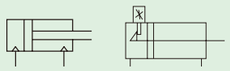


Hybrid Robot Single axis unit

HRL-1 Series

●Payload: 5, 10, 15, 25, 50 ,65 kg

Circuit Diagram
Code



RoHS

Model No. Notation

Without Switch
(Built-in magnet for switch)
*1

HRL-1 L - 05 - 350 - Q

Model No. ❶ ❷ ❸ ❹

With Switch
(Built-in magnet for switch)

HRL-1 L - 05 - 350 - Q - T0H3 - R

Model No. ❷Payload (Vertical) ❹Drop prevention mechanism ❻Number of Switches
❶Basic shape ❸Stroke ❺Switch Model No.

Note: In the case of without switch, the presence or absence of a switch rail for the cylinder varies depending on the presence or absence of a fall prevention mechanism.
Without position locking mechanism: Without switch rail
With position locking mechanism: With switch rail

❶Basic shape

Code	Content	
Blank	Basic type	
L	Long body	
F	Basic type front flange	
LF	Long body front flange	

❷Payload (Vertical)

Code	Content
05	5 kg
10	10 kg
15	15 kg (Guide rod diameter) (6 mm)
15H	15 kg (Guide rod diameter) (20 mm)
25	25 kg
50	50 kg
65	65 kg

❸Stroke (mm)

Stroke	Content
[Basic body shape] (Blank, F)	
50	50
75	75
100	100
125	125
150	150
200	200
250	250
300	300
[Long body shape] (L, LF)	
350	350
400	400
450	450
500	500
550	550
600	600

❹Drop prevention mechanism

Code	Content	
Blank	None	
Q	Yes	

*1

*1: The drop prevention mechanism can only be mounted on the head side of the cylinder.

❺Switch Model No.

For switch details, refer to P. 1457. Switches are shipped with the product.

Contact	Indicator LED Special Function	Wiring (Output)	Load Voltage (V) AC	Load Voltage (V) DC	Load Current (mA) AC	Load Current (mA) DC	Lead Wire *1 Straight	Lead Wire *1 L-shape	
Solid State	1-Color	2-wire	85 to 265	—	5 to 100	—	T1H□	T1V□	
			—	10 to 30	—	5 to 20 *2	T2H□	T2V□	
		3-wire (NPN)	—	30 or less	—	100 or less	T3H□	T3V□	
		3-wire (PNP)	—		—		T3PH□	T3PV□	
	2-Color	2-wire	—	24 ± 10%	—	5 to 20	T2WH□	T2WV□	
		3-wire (NPN)	—	30 or less	—	50 or less	T3WH□	T3WV□	
	2-Color Improved Water Resistance	2-wire	—	24 ± 10%	—	5 to 20	T2WLH□	T2WLV□	*3 *4
	For 2-color AC Magnetic Field		—	24 ± 10%	—		T2YD□	–	
			—		—		T2YDT□	–	
	1-Color Off-Delay Type		—	10 to 30	—	5 to 20 *2	T2JH□	T2JV□	
	1-Color Flexible Lead Wire Type		—	10 to 30	—		T2HR3	T2VR3	
Reed	1-Color	2-wire	110	12/24	7 to 20	5 to 50	T0H□	T0V□	
	Without Indicator Lamp		110	5/12/24	20 or less	50 or less	T5H□	T5V□	
	1-Color		110/220	12/24	7 to 20 / 7 to 10	5 to 50	T8H□	T8V□	

*1: For switch model No. "□", select the code from the "Lead wire length / Connector specifications" table.
*2: The maximum load current value above, 20 mA, is at 25°C. If the switch operating Ambient Temperature is higher than 25°C, it will be lower than 20 mA. (At 60°C, it will be 5 to 10 mA.)
*3: This does not guarantee the water resistance of the cylinder.
*4: Cannot be selected for drop prevention mechanism (Q).
*5: Switches other than the Model No. listed above are also available. (Custom Product) For details, refer to P. 1457.

*Lead wire length, connector specification

Code	Content
Blank	1 m (Standard)
3	3 m (Option)
5	5 m (Option)
W	M8 Connector, 1PIN (+), 4PIN (−) Lead Wire 0.3 m

*5

*5: Only T2WLH and T2WLV can be selected.

Example) Lead wire length
1 m T0H
3 m T0H3
5 m T0H5

❻Number of Switches

Code	Content
R	With 1 pc on rod side
H	With 1 pc on head side
D	With 2 pcs
T	With 3 pcs

Rechargeable Battery Compatible Specification (Catalog No. CC-1226AA)

●Structure usable in secondary battery manufacturing processes

HRL-1 – .... – P4*

* Please contact us for details.

Specifications

Item		HRL-1□-05	HRL-1□-10	HRL-1□-15	HRL-1□-15H	HRL-1□-25	HRL-1□-50	HRL-1□-65
Payload (Vertical) *1 kg		5	10	15		25	50	65
Basic cylinder		SCM-00-20D	SCM-00-25D	SCM-00-32D		SCM-00-40D	SCM-00-50D	SCM-00-63B
Bore Size mm		20	25	32		40	50	63
Guide rod diameter mm		13	13	16	20	20	25	30
Speed mm/s		50 to 500						
Operating Pressure MPa		0.3 to 0.7						
Stroke adjustment range *2 mm		0 to -10 mm (Push side)						
Shock absorber *3		NCK-00-0.7		NCK-00-1.2		NCK-00-12		
Product weight kg	Basic type	2+(0.0033 x stroke)	2.1+(0.0037×Stroke)	2.8+(0.0051×Stroke)	2.9+(0.0069×Stroke)	10.8+(0.0081×Stroke)	11.9+(0.0122×Stroke)	13.3+(0.02×Stroke)
	Long body type	2.3+(0.0033×Stroke)	2.4+(0.0037×Stroke)	3.1+(0.0051×Stroke)	3.2+(0.0069×Stroke)	12.5+(0.0081×Stroke)	13.6+(0.0122×Stroke)	15+(0.02 x stroke)
Moving part weight kg	Basic type	0.9+(0.0025×Stroke)	0.9+(0.0027×Stroke)	1.3+(0.0041×Stroke)	1.6+(0.0059×Stroke)	4.1+(0.0066×Stroke)	5.2+(0.0102×Stroke)	6.1+(0.0137×Stroke)
	Long body type	1.0+(0.0025×Stroke)	1.0+(0.0027×Stroke)	1.5+(0.0041×Stroke)	1.8+(0.0059×Stroke)	4.4+(0.0066×Stroke)	5.7+(0.0102×Stroke)	6.8+(0.0137×Stroke)
Speed controller *4		SC3W-6-6				SC3W-6-8	SC3W-8-8	

*1: Payload varies depending on air pressure, speed, and absorbed energy. (Numerical values are for reference only.)
*2: Stroke adjustment is not possible on the retraction side.
*3: Shock absorber is built into the body part. Note that please use below the following with respect to the allowable value of the shock absorber at the operating speed and air pressure.
- HRL-1□Pull side of F-05/10/15/15H...70% or less
- HRL-1□Pull side of F-25/50/65...65% or less
- Other than above... 74% or less

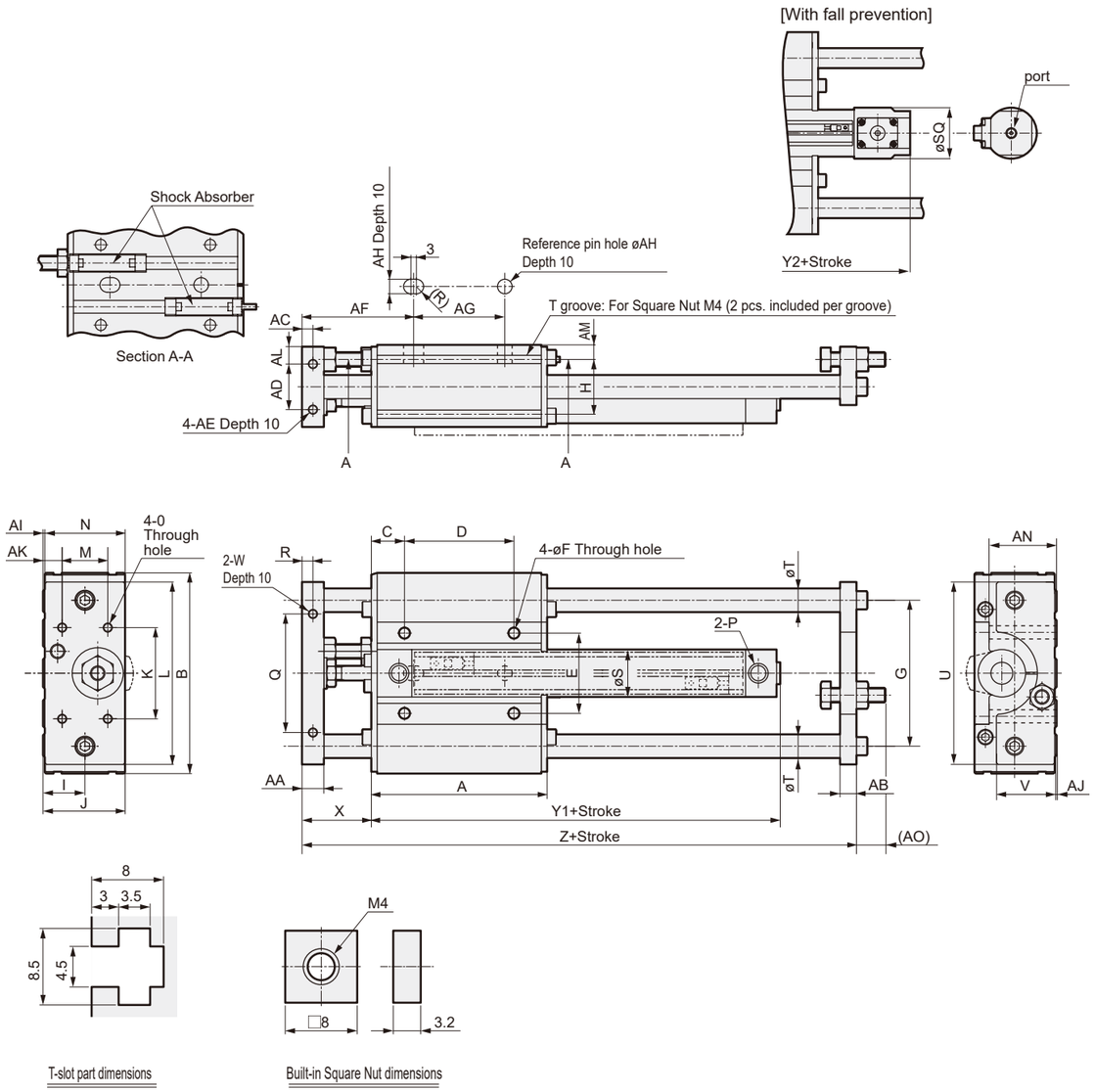
*4: Speed controller is an included part.

MEMO

Special
MVC
STK
MCP
GLC
BBS
NHS
HR
LN
Cylinder Switch
Ending

Dimensional Drawings

● HRL-1-05 to 15H (basic body)



T-slot part dimensions

Built-in Square Nut dimensions

Code / Model No.	Stroke Range (mm)	A	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO *1	B	C	D	E
HRL-1-05	50, 75,	96.4	12	9	6	25	M5	61.2	50	8 +0.03 0	1	1	10.5	9.5	8	37	15.9	110	18.2	60	44
-10	100, 125,																				
-15	150, 200,																	130			52
-15H	250, 300																				

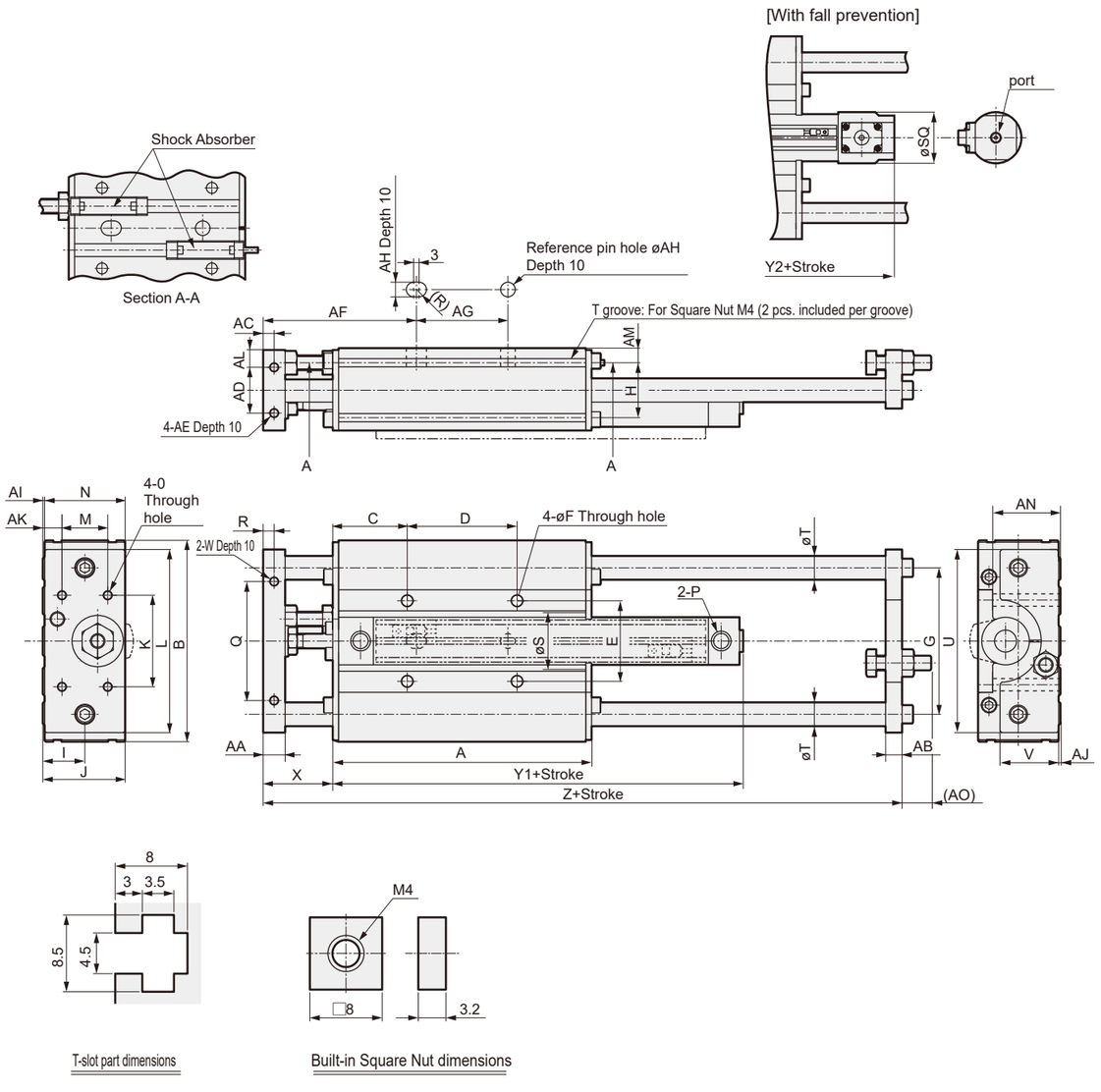
Code / Model No.	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	SQ	T	U	V	W	X	Y1	Y2	Z
HRL-1-05	6	80	30	23	45	50	100	25	44	M5	Rc1/8	65	6	26	30	13	100	32	M5	38	74.2	94.2	154
-10														31	35								
-15	7	94				60	120					75		38	38.1	16	120	38			76.2	96.2	
-15H																20							

*1: AO dimension indicates the dimension at the time of shipment.

***2: For dimensions with each switch, please refer to P. 1130, 1131.**

Dimensional Drawings

● HRL-1L-05 to 15H (long body)



T-slot part dimensions

Built-in Square Nut dimensions

Code / Model No.	Stroke Range (mm)	A	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO *1	B	C	D	E
HRL-1L-05	350, 400,	141.4	12	9	6	25	M5	83.7	50	8 +0.03 0	1	1	10.5	9.5	8	37	15.9	110	40.7	60	44
-10	450, 500,																				
-15	550, 600																	130	45.7		52
-15H		151.4						88.7													

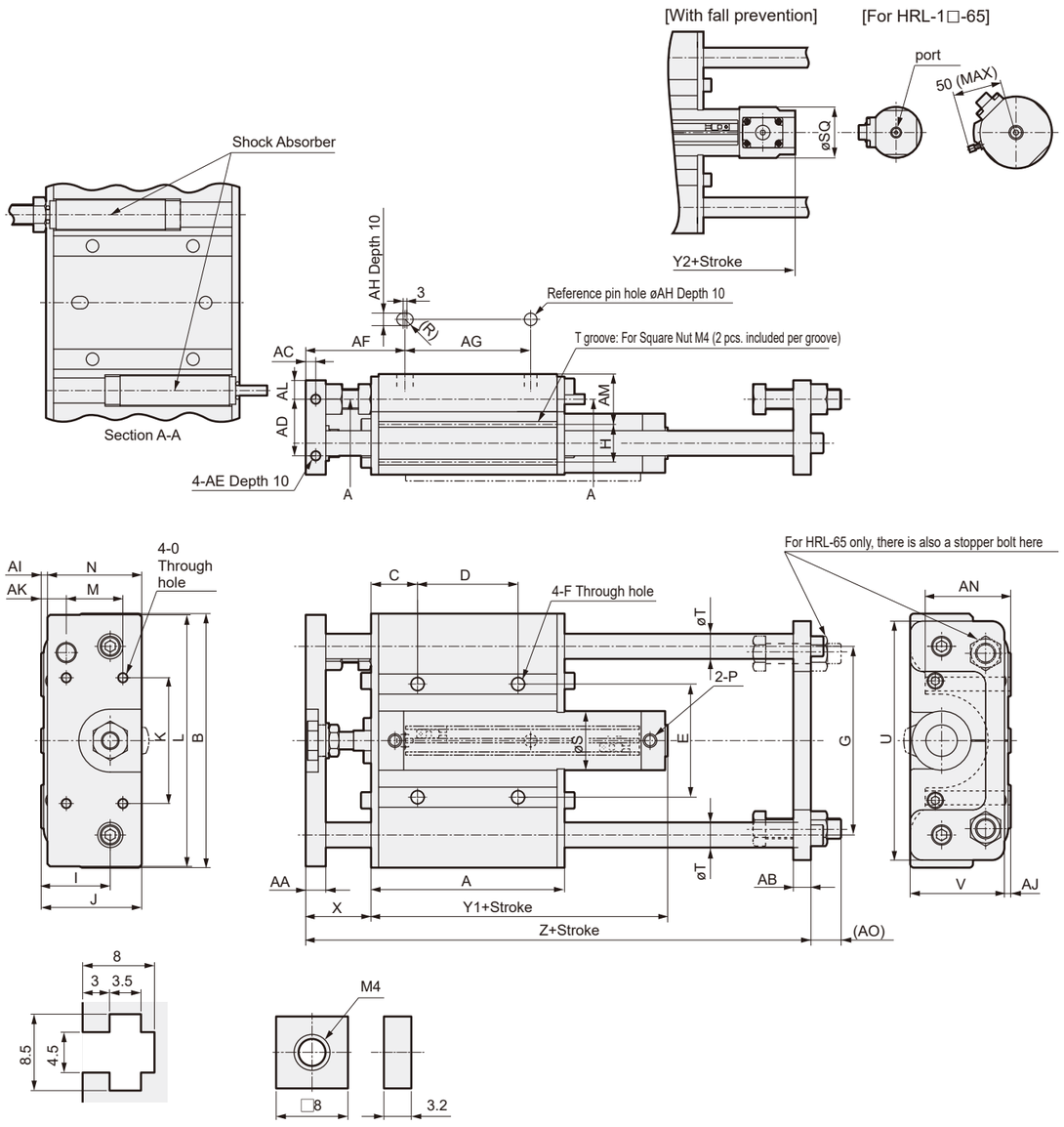
Code / Model No.	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	SQ	T	U	V	W	X	Y1	Y2	Z
HRL-1L-05	6	80	30	23	45	50	100	25	44	M5	Rc1/8	65	6	26	30	13	100	32	M5	38	74.2	94.2	199
-10														31	35								
-15	7	94				60	120					75		38	38.1	16	120	38			76.2	96.2	209
-15H																20							

*1: AO dimension indicates the dimension at the time of shipment.

***2: For dimensions with each switch, please refer to P. 1130, 1131.**

Dimensional Drawings

● HRL-1-25 to 65 (basic body)



T-slot part dimensions

Built-in Square Nut dimensions

Code / Model No.	Stroke Range (mm)	A	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO *1	B	C	D
HRL-1-25	50, 75, 100,	154	16	14	8	45	M8	79	100	$10^{+0.03}_{0}$	5	5	20	15	40	68	24	202	37	80
-50	125, 150, 200,		19		9.5			82												
-65	250, 300											2								

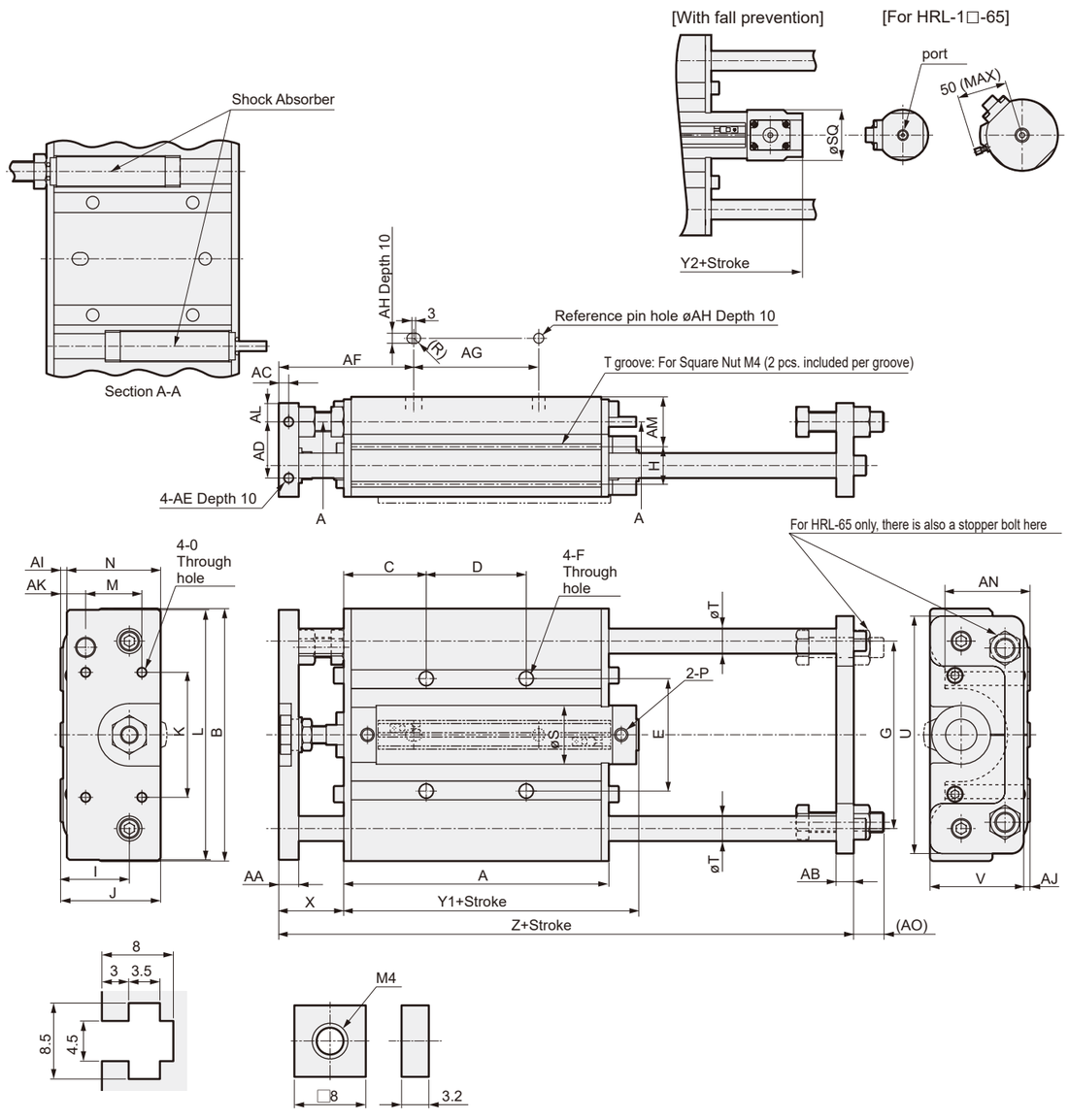
Code / Model No.	E	F	G	H	I	J	K	L	M	N	O	P	R	S	SQ	T	U	V	X	Y1	Y2	Z
HRL-1-25	90	11	150	30	55	80	100	200	45	75	M8	Rc1/8	5	47	51	20	190	75	52	86	121	252
-50												Rc1/4		58	60	25			55	98	138	255
-65						92								72	72.1	30		78				

*1: AO dimension indicates the dimension at the time of shipment.

***2: For dimensions with each switch, please refer to P. 1130, 1131.**

Dimensional Drawings

● HRL-1L-25 to 65 (long body)



T-slot part dimensions

Built-in Square Nut dimensions

Code / Model No.	Stroke Range (mm)	A	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO *1	B	C	D
HRL-1L-25	350, 400,	212	16	14	8	45	M8	108	100	$10^{+0.03}_{0}$	5	5	20	15	40	68	24	202	66	80
-50	450, 500,		19		9.5			111												
-65	550, 600											2								

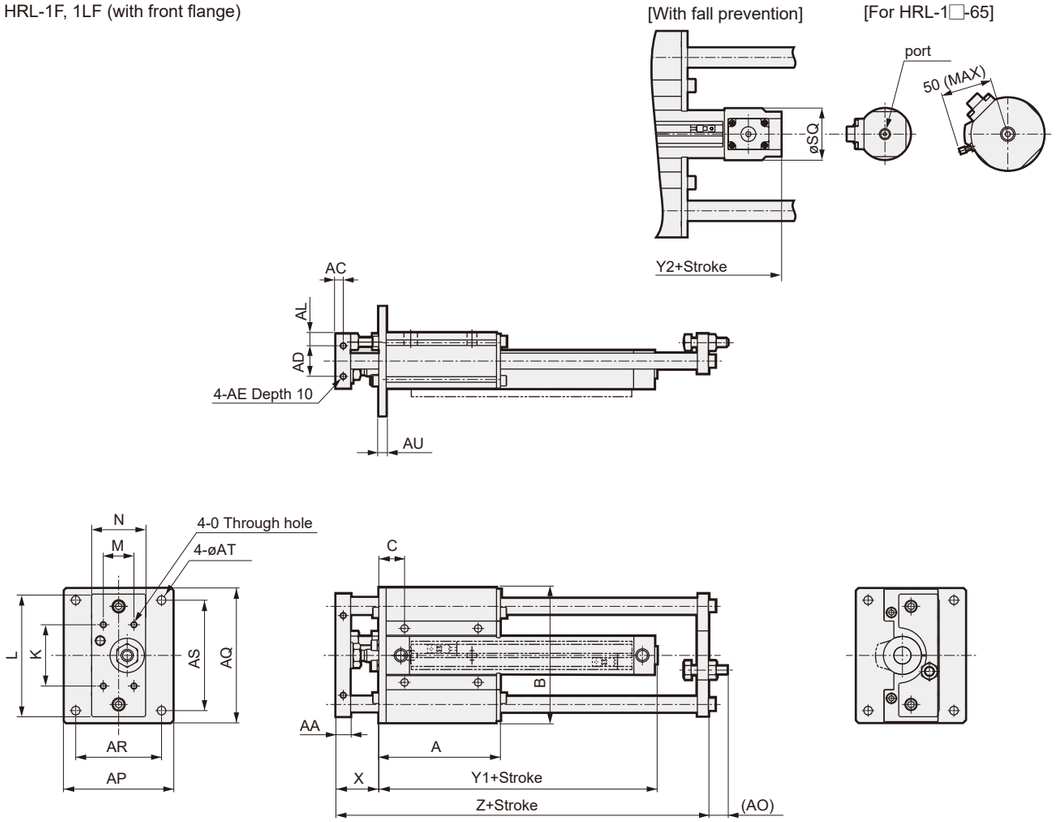
Code / Model No.	E	F	G	H	I	J	K	L	M	N	O	P	R	S	SQ	T	U	V	X	Y1	Y2	Z
HRL-1L-25	90	11	150	30	55	80	100	200	45	75	M8	Rc1/8	5	47	51	20	190	75	52	86	121	310
-50												Rc1/4		58	60	25			55	98	138	313
-65						92								72	72.1	30		78				

*1: AO dimension indicates the dimension at the time of shipment.

***2: For dimensions with each switch, please refer to P. 1130, 1131.**

Dimensional Drawings

● HRL-1F, 1LF (with front flange)



Code / Model No.	A: Basic type	A: Long body type	B	C: Basic type	C: Long body type	K	L	M	N	O	X	Y	Z: Basic type	Z: Long body type
HRL-1□F-05	99.2	144.2	110	21	43.5	50	100	25	44	M5	35	77	154	199
-10														
-15		154.2	130		48.5	60	120					79		209
-15H														
-25	160	218	202	43	72	100	200	45	75	M8	46	92	252	310
-50											49	104	255	313
-65														

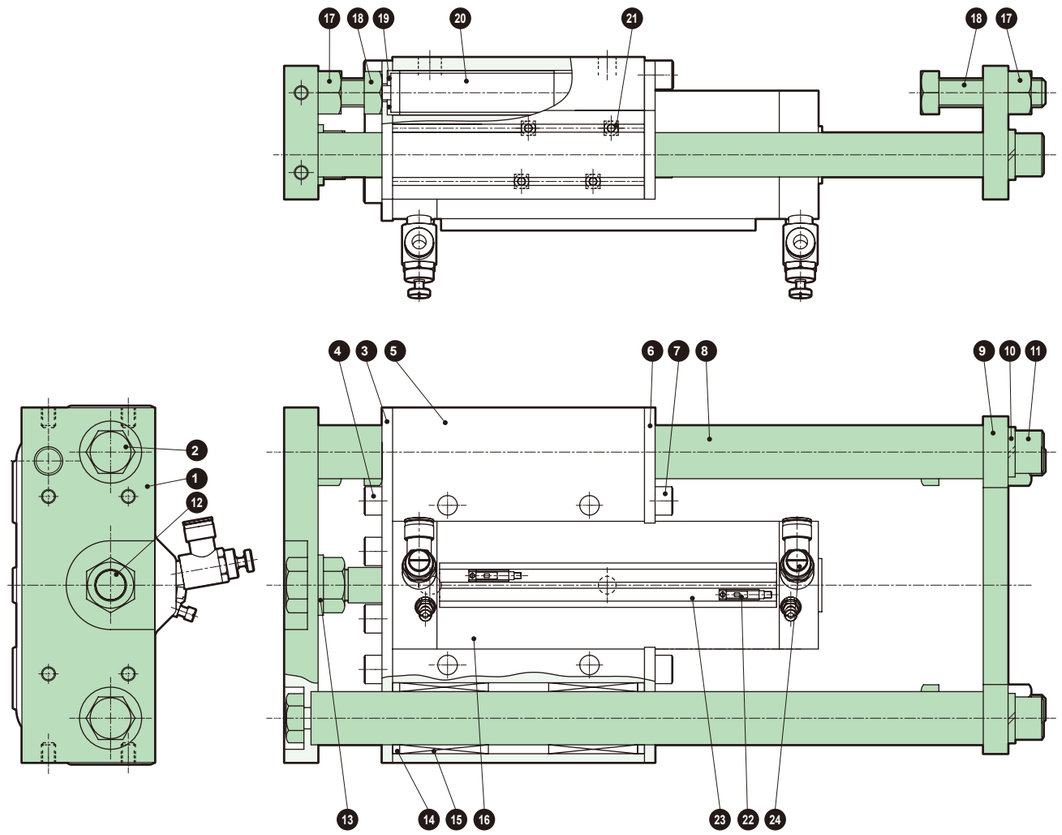
Code / Model No.	AA	AC	AD	AE	AL	AO *1	AP	AQ	AR	AS	AT	AU	Y1	Y2
HRL-1□F-05	12	6	25	M5	9.5	15.9	90	110	70	90	7	6	74.2	94.2
-10														
-15								130		100			76.2	96.2
-15H														
-25	16	8	45	M8	15	24	140	200	110	170	11	12	86	121
-50	19	9.5											98	138
-65														

*1: AO dimension indicates the dimension at the time of shipment.

***2: For dimensions with each switch, please refer to P. 1130, 1131.**

Internal Structure Diagram/Material

●HRL-1



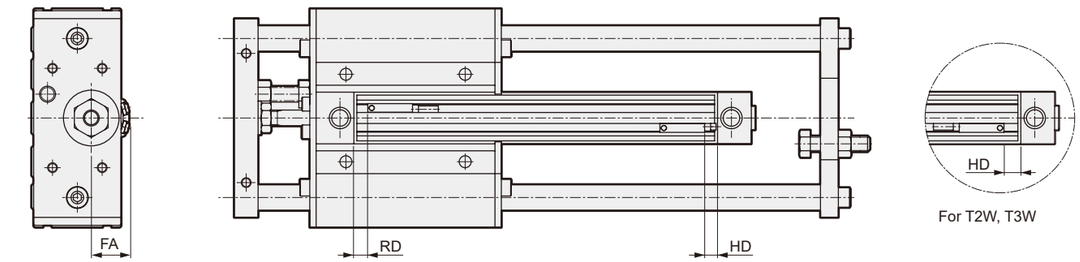
Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Head plate	Steel	Zinc Chromate	13	Plain Washer	Steel	Zinc Chromate
2	Low head Hexagon Socket Head Cap Screw (05 to 50 kg)	Alloy Steel	Zinc Chromate	14	Combination seal	Synthetic rubber	15H, 65 kg only
	Hexagon Bolt (65 kg)	Steel	Zinc Chromate	15	Ball bush		
3	Body plate (2)	Steel	Zinc Chromate	16	Super Micro Cylinder		SCM (CKD)
4	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide		Round shaped cylinder, Drop prevention type		SCM-Q (CKD)
5	Cylinder Body	Aluminum Alloy	Anodized, Painted	17	Hexagon Nut	Steel	Zinc Chromate
6	Body plate (1)	Steel	Zinc Chromate	18	Hexagon Bolt	Steel	Zinc Chromate
7	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide	19	O-ring	Nitrile Rubber	25 to 65 kg only
8	Slide shaft	Steel	Industrial Chrome Plating	20	Shock Absorber		
9	Joint plate	Steel	Zinc Chromate	21	Square Nut	Steel	Nickel Plating
10	Spring washer	Steel	Black Oxide Finish (30, 50 kg only)	22	Switch		
11	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide	23	Mounting Rail	Aluminum Alloy, Double-sided tape	
12	Joint pin	Steel	Zinc Chromate	24	Speed Controller		SC3W (CKD)

Note: Speed controllers are shipped with the product.

HRL-1 Series External Dimensions Diagram with Switch

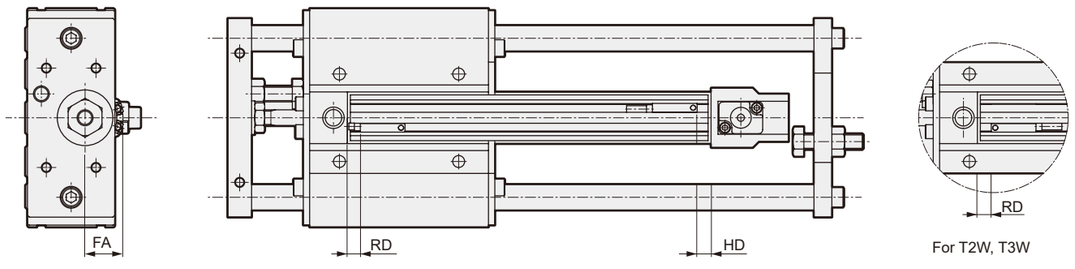
●T0, T5, T2, T2□3, T3, T3P, T2W, T3W, T2WL

• HRL-1



Code / Model No.	FA	T0/T5	T2/T2R T3/T3P	T2W/T3W T2WL	T0/T5	T2/T2R T3/T3P	T2W/T3W T2WL
		RD			HD		
HRL-1□-05	19.5	7.5	7.5	9.5	3.0	6.5	8.5
-10	22	8.5	8.5	10.5	2.0	5.5	7.5
-15	25.5	9.5	9.5	11.5	3.0	6.5	8.5
-15H							
-25	30	11.5	11.5	13.5	5.0	8.5	10.5
-50	35.5	13.0	13.0	15.0	7.5	11.0	13.0
-65	42.5	13.0	13.0	15.0	7.5	11.0	13.0

• HRL-1-□-Q

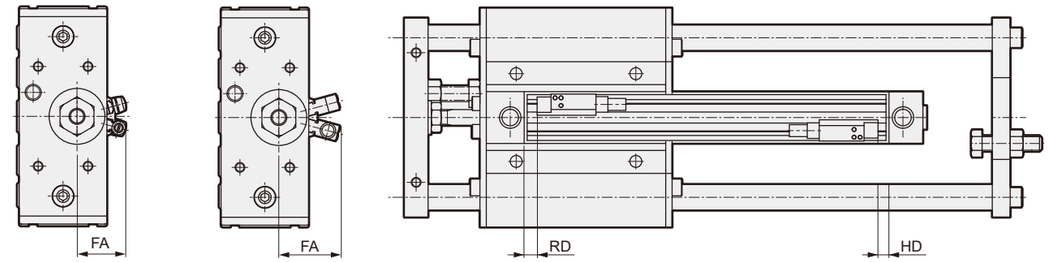


Code / Model No.	FA	T0/T5	T2/T2R T3/T3P	T2W/T3W	T0/T5	T2/T2R T3/T3P	T2W/T3W
		RD			HD		
HRL-1□-05-Q	19.5	4.0	7.5	9.5	6.5	6.5	8.5
-10-Q	22	5.0	8.5	10.5	5.5	5.5	7.5
-15-Q	25.5	6.0	9.5	11.5	6.5	6.5	8.5
-15H-Q							
-25-Q	30	8.0	11.5	13.5	8.5	8.5	10.5
-50-Q	35.5	9.5	13.0	15.0	11.0	11.0	13.0
-65-Q	42.5	9.5	13.0	15.0	11.0	11.0	13.0

HRL-1 Series External Dimensions Diagram with Switch

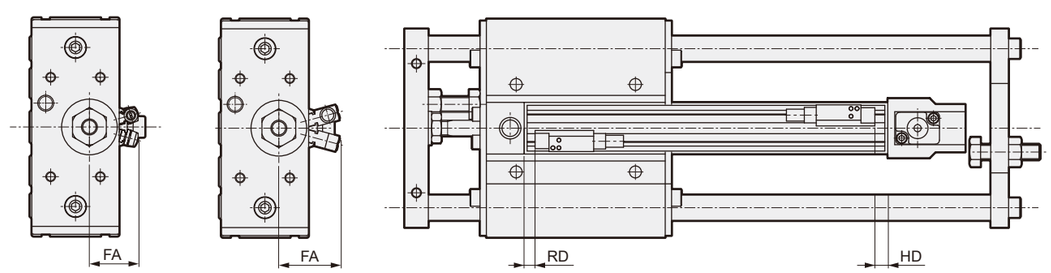
●T8H/V, T2JH/V, T1H/V, T2YD, T2YDT

• HRL-1



Code / Model No.	T8H, T2JH	T2YD□, T1H	T1, T2J, T2YD□	T8	T1, T2J, T2YD□	T8
	FA		RD		HD	
HRL-1□-05	24.0	29.5	6.5	1.5	5.5	0.5
-10	26.5	32.0	7.5	2.5	4.5	0.0
-15	30.0	35.5	8.5	3.5	5.5	0.5
-15H						
-25	34.5	40.0	10.5	5.5	7.5	2.5
-50	40.0	45.5	12.0	7.0	10.0	5.0
-65	47.0	52.5	12.0	7.0	10.0	5.0

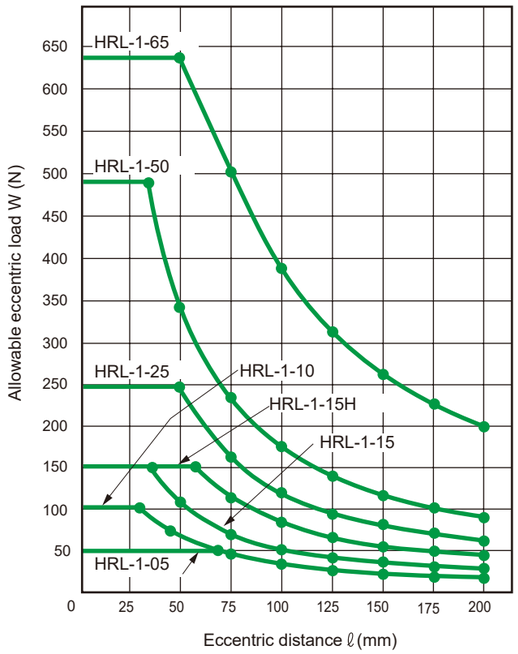
• HRL-1-□-Q

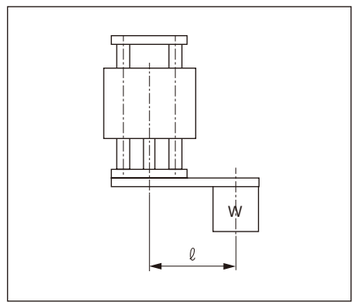


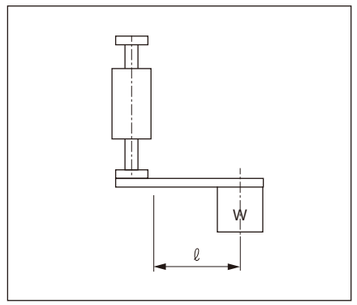
Code / Model No.	T8H, T2JH	T2YD□, T1H	T1, T2J, T2YD*	T8	T1, T2J, T2YD*	T8
	FA		RD		HD	
HRL-1□-05-Q	24.0	29.5	6.5	1.5	5.5	0.5
-10-Q	26.5	32.0	7.5	2.5	4.5	0.0
-15-Q	30.0	35.5	8.5	3.5	5.5	0.5
-15H-Q						
-25-Q	34.5	40.0	10.5	5.5	7.5	2.5
-50-Q	40.0	45.5	12.0	7.0	10.0	5.0
-65-Q	47.0	52.5	12.0	7.0	10.0	5.0

Allowable eccentric load

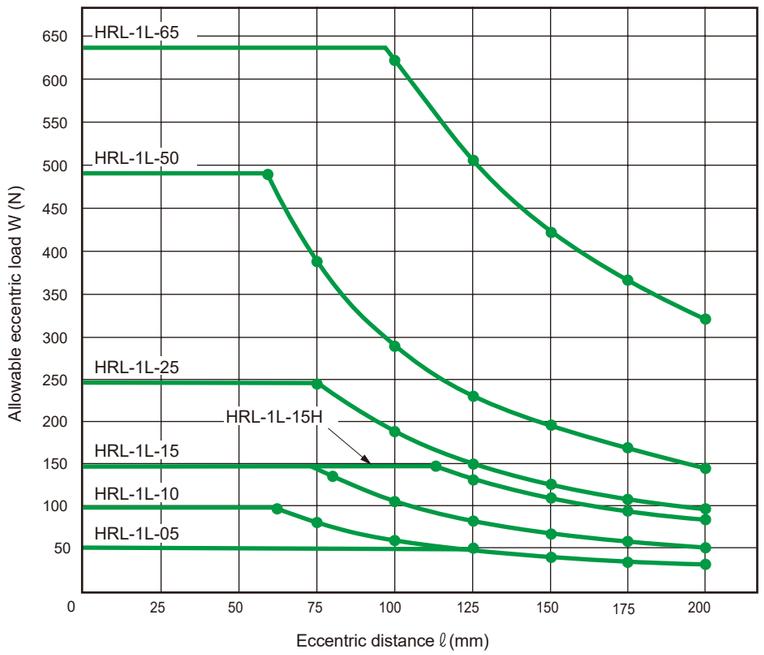
● HRL-1 (Basic Type)







HRL-1L (Long Body Type)



Pneumatic Equipment

To Use This Product Safely

Be sure to read this before use. For general cylinder information, see Intro 41, and for Cylinder Switches, see P. 1512.

Individual Precautions: Hybrid Robot

Design / Selection

1. About lubrication

CAUTION

■ Cylinder

Can be used without lubrication, but if lubricating, please use turbine oil type 1 ISO VG32. Using other lubricating oils will cause abnormalities in the packing, resulting in malfunction. If lubricating, be careful not to run out of oil. If oil runs out, operation will become unstable.

2. Service life

CAUTION

■ The service life of the unit is greatly affected by the service life of each pneumatic device.

Since general pneumatic equipment is used, the number of operations is about 3 to 5 million times, and the travel distance is about 1,000 km. (Since usage conditions, operating environment, etc. greatly affect the service life, the above values are not guaranteed values)

For precautions regarding mounting, installation, adjustment, operation, and maintenance, please refer to the CKD Equipment Product Site(https: //www.ckd.co.jp/kiki/en/) → 'model No.' → Instruction Manual.

SSD-LN
BH□-LN

Linear Norm® Sensor Cylinder/Gripper

ø12, ø16, ø20, ø25, ø32, ø50

CONTENTS

Product Introduction 1136

● Sensors, amplifiers, and indicators 1140
● Cylinder with Linear Norm sensor (SSD-LN/SSD-O-LN) 1144
● Hand with Linear Norm sensor (BHA/BHG/BHE-LN) 1150

Technical Data 1168
⚠ Precautions for Use 1172

2-Function Integrated Actuator

Compact cylinder and gripper equipped with newly developed Linear Norm sensor.
Achieves actuator function and length measurement function simultaneously

●Length measuring sensor

A coined word combining "linear" (meaning straight line) and "norm" (meaning standard), it is a newly developed special magnetic sensor that provides nearly linear output corresponding to the movement amount of a piston with a magnet.

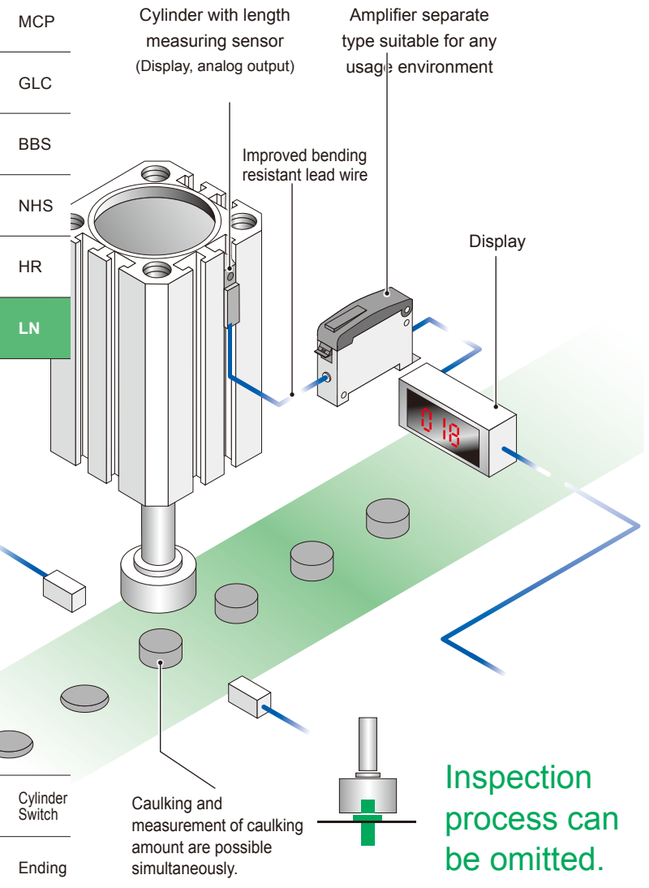
Cylinder with Linear Norm Sensor

Super compact type

SSD-LN (Double Acting Type)

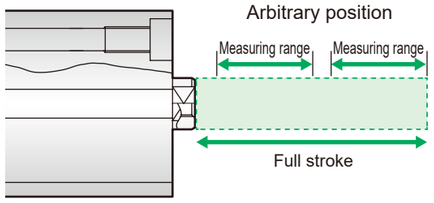
SSD-O-LN Series (Double Acting, Low Speed Type)

System Configuration



What is a Cylinder with Linear Norm Sensor?

Length measurement is possible within any set detection range (8 mm or 10 mm) within the stroke; the measurement range can be easily adjusted and changed.



Applications

Workpiece Good/No Good Judgment, Workpiece Type Judgment, Confirmation of Clamping Status, Measurement of Caulking/Press-fitting Amount, etc.

Variation

Bore Size (mm)	Stroke (mm)
ø12, ø16	20, 30
ø20, ø30, ø50	20, 50

Output Type	Indicator	Detection Range (mm)
Analog Output	None	8
Switch Output & Analog Output	Yes	10

Gripper with Linear Norm Sensor

Compact Cross Roller Parallel Gripper
BHA-LN Series

Small cross roller parallel hand (With rubber cover)
BHG-LN Series

Centering Gripper
BHE-LN Series

What is a Gripper with Linear Norm Sensor?

Length measurement possible across the full stroke of the gripper. Intermediate detection, which was difficult with conventional cylinder switches, can be easily performed.

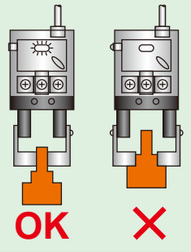
Variation

Item			BHA/BHG 01CS, 03CS	BHA/BHG 04CS, 05CS	BHE 01CS, 03CS	BHE 04CS, 05CS
Bore Size (mm)			Equivalent to ø12, ø16	Equivalent to ø20, ø25	Equivalent to ø12, ø16	Equivalent to ø20, ø25
Stroke (mm)			5, 9	11, 15	7, 10	14, 16
Gripping Force (N) *Per 1 Finger			15, 27	35, 80	15, 29	48, 80
Output Type	1-point Switch Output	1 point ON-OFF output between full strokes of both fingers (Amplifier mounted type only)	●	●	●	●
	2-point Switch Output	2-point ON-OFF output between full stroke of both fingers	●	●	●	●
	Analog Output	1-5 V voltage output between full stroke of both fingers	—	●	—	●
	Switch Output & Analog Output	1-5V voltage output and 4 point switch output x 2CH between full strokes of both fingers (Using display LN-LDS, up to 2 displays can be connected)	—	●	—	●

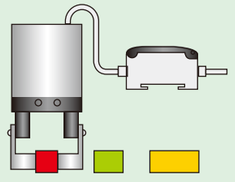
* Gripping force is the value at 0.5 MPa air pressure, when closed. Actual gripping force varies depending on the distance to the gripping point and the angle of the fingers, so please check the catalog when selecting.

Application Examples of Gripper with Linear Norm Sensor

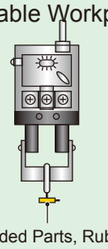
Confirmation of Workpiece Gripping Posture



Workpiece Identification



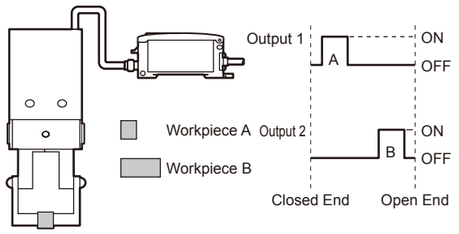
Gripping Confirmation of Deformable Workpieces



Resin Molded Parts, Rubber, etc.

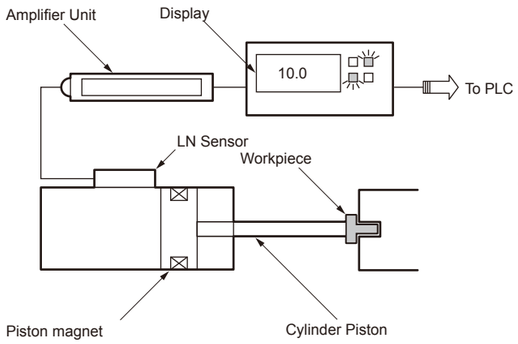
Application Examples

1 Identification of Irregularly Shaped Workpieces



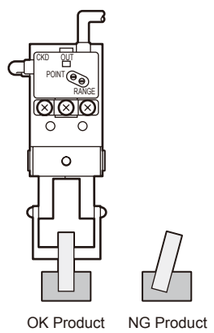
When there are workpieces A and B of different sizes, and you want to distinguish them when each is gripped, set output 1 when A is gripped, and output 2 when B is gripped. For switch type, settings can be easily adjusted with the trimmer on the amplifier unit of the Linear Norm sensor. (Indicator of switch outputs are digitally set with buttons.) The trimmer can change the operation point and range, so signals for each A and B workpiece can be output if a narrow operation range is set, and so the load side (example: PLC) can be used to judge workpieces. Furthermore, for the analog output type, the analog output changes according to the size of the workpiece, so control is possible by incorporating that change into the PLC.

2 Workpiece Press-fitting



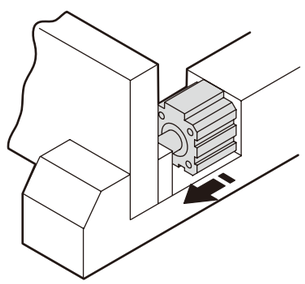
This is an example of using a Linear Norm sensor of the compact cylinder mounted type to inspect the press-fitting state of a workpiece using the output of the Linear Norm sensor while press-fitting the workpiece with the cylinder. Furthermore, when an indicator is used, the thickness of the workpiece can be measured on the display unit. Also, by incorporating the judged signal into the PLC, line automation can be performed. In the case of the cylinder type, the measurement range is limited, but it will be set at the factory according to the customer's detection position, so it can be used immediately after wiring.

3 Confirmation of Workpiece Gripping Posture



Can be used to confirm whether the workpiece is gripped in the correct posture. Set the operating range narrowly so that it turns ON only for normal workpiece gripping posture.

4 Confirmation of Clamping Status



By taking the cylinder piston stop position with the output of the Linear Norm sensor, the clamping state can be managed.

MEMO

Special
MVC
STK
MCP
GLC
BBS
NHS
HR
LN
Cylinder Switch
Ending

Sensor, Amplifier, Indicator

CE * Excluding indicator UKCA * Excluding indicator RoHS

For compatible detailed Model No.s, please see our website.

Sensor/Amplifier Unit Specifications

Item		Amplifier installed/ switch output LN-□ VS1PAH/V	Amplifier separate/ switch output LN-□H/□ VCSS	Amplifier separate/ analog output LN-10□ CLS	Amplifier separate/display (LN-DN) dedicated LN-10□CLDS
Applications		PLC/Relay		PLC	————
Power supply voltage		24 VDC ±10%			
Current consumption		20 mA or less		30 mA or less	
Indicator LED		Switch Output Indicator LED (Yellow LED ON when lit)		Green LED lights up when power is applied Sensor Mounting Position Indication Yellow LED lights up	
Number of Switch Outputs		1	2	————	
Switch Output		NPN Open Collector Output, 30 VDC or less, 50 mA or less, Internal Voltage Drop 1.2 V or less		————	
Analog Output		————		1-5 V Connecting load 50 kΩ and over	1-4.5 V (Input to display)
Analog Output Linearity		————		±5% F.S. or less	————
Effective Measurement Range		————		Gripper Double jaw full stroke Cylinder At any 8 mm area over the piston stroke	Gripper Double jaw full stroke Cylinder At any 10mm interval with piston stroke
Lead Wire	Sensor Unit	35mm (oil resistant vinyl cabtyre cable 3-conductor 0.2 mm²)	2 m (oil resistant vinyl cabtyre cable 3-conductor 0.2 mm² shielded bend resistant wire)		
	Amplifier Unit	3 m (oil resistant vinyl cabtyre cable 3-conductor, 0.2 mm², bend resistant wire)	3 m (oil resistant vinyl cabtyre cable 4-conductor 0.2 mm²)	3 m (oil resistant vinyl cabtyre cable 4-conductor, 0.2 mm², shielded wire)	3 m (oil resistant vinyl cabtyre cable 7-conductor, 0.2 mm², shielded wire)
Insulation resistance		20 MΩ or more with 500 VDC megger			
Withstand Voltage		No abnormality when 1000 VAC is applied			
Shock Resistance	Sensor Unit	294 m/s²	980 m/s²		
	Amplifier Unit		294 m/s²		
Enclosure	Sensor Unit	IEC Standard IP65	IEC Standard IP67		
	Amplifier Unit		IEC Standard IP65		
Ambient Temperature/Humidity		-10 to 60°C, 85% RH or less			
Switch Operating Range Adjustment Range (*3)		0 to 80% or more of full stroke (For the stroke of one of the two gripper fingers)		————	
Switch Operating Point Temperature Drift		0.1 mm/10°C or less			
Analog Output Temperature Drift		————		50 mV/10°C or less	————
Repeatability (*1)		±0.1 mm or less (at 25°C, no external magnetic field, no deformation or wear of actuator/jig)			————
Mounting method		Dedicated Bracket Mounting	DIN Rail or Direct Mounting		
Weight (g)		54	172	175	199

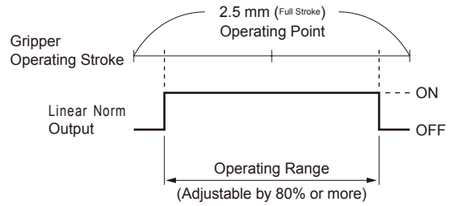
*1: Value including actuator repeatability. Also, in the case of a gripper, it is for the stroke of one of the two fingers.

***2: Refer to P. 1172 as a guide for model selection for mixed workpiece sorting applications.**

*3: Switch operating range adjustment range

Example) BHA-LN-01CS operating stroke - 5 mm

For two jaws, 5mm→1 for two jaws, 2.5mm.



When the operating point is set to the center of the stroke, adjustment of 80% or more of the full stroke is possible.

Indicator Unit Specifications

Item	LN-DN
Power supply voltage	24 VDC ±10%
Current consumption	150 mA or less
Sensor Input	2CH (1-4.5 V voltage input)
Output Type	• Analog Output (1 point)×2CH (1-5 V voltage output) • Switch Output (4 points)×2CH (ON-OFF output based on any 1 set position, or window output based on 2 set positions)
Display Type	• 7-segment display (Max display ±1999.9 mm, Min unit 0.1 mm) • Absolute/Relative Value Identification Display, CH Identification Display, Switch Output Display, Switch Output Short Circuit Display
Switch Output	NPN Open Collector Output (*4), 30 VDC / 50 mA or less, Internal Voltage Drop 1.2 V or less, PLC/Relay Compatible
Analog Output	1-5 V Voltage Output, Connection Load 500 kΩ or more
Analog Output Linear Accuracy(*1)	±1% F.S. or less (at 25°C, according to our company's specified measurement method)
7-Segment Display Linear Accuracy (*2)	7-segment display is a reference value
Repeatability (*3)	±0.1 mm or less (at 25°C, no external magnetic field, no deformation or wear of actuator/jig)
Analog Output Temperature Drift	50 mV/10°C or less (Equivalent to a variation of Approx. ±0.1 mm in terms of displayed value)
Insulation resistance	20 MΩ or more with 500 VDC megger
Withstand Voltage	No abnormality when 1000 VAC is applied
Shock Resistance	294 m/s²
Enclosure	IEC Standard IP40
Ambient Temperature/Humidity	-10 to 60°C, 85% RH or less
Mounting method	DIN Rail or Direct Mounting
Weight (g)	93

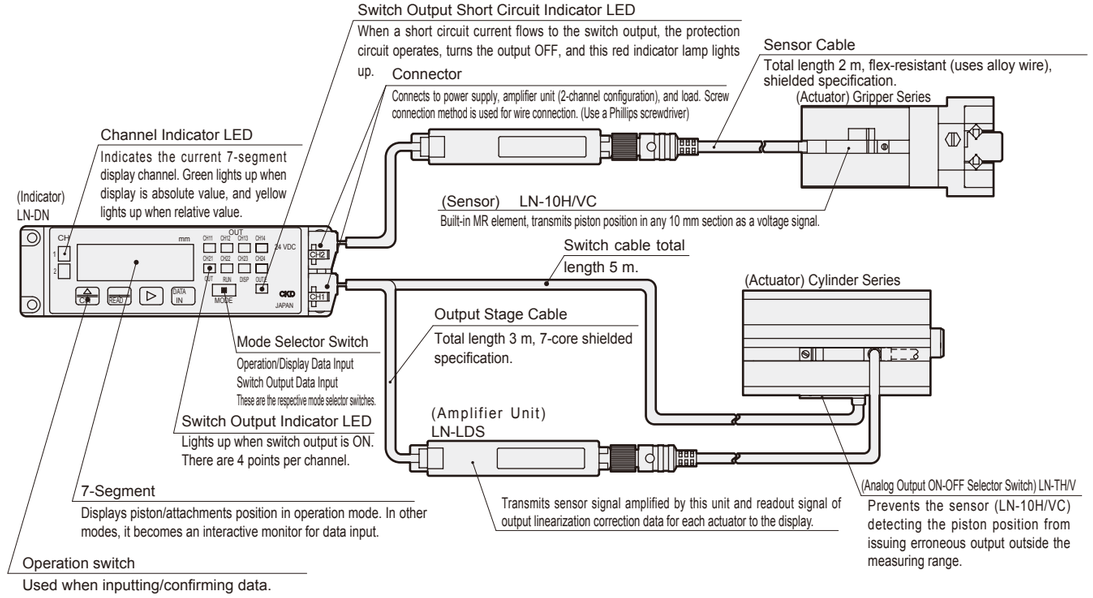
*1: Since an analog sensor that converts the magnitude of piston magnet magnetic flux density into a voltage value is used, accuracy decreases in actual use if a magnetic body contacts from both end directions of the piston stroke or if disturbance magnetic fields enter.

*2: Display accuracy changes depending on the span setting value for the two piston stop positions.

*3: Includes the repetitive accuracy of the actuator. Also, in the case of a hand, it is relative to the stroke of one of the two fingers.

*4: For PNP open collector output, please consult us separately.

Configuration of Indicator Type

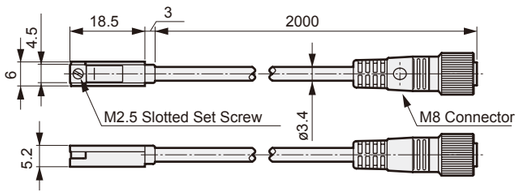


Dimensional Drawings

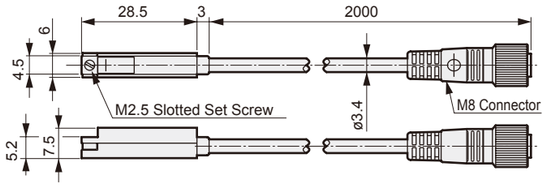
Sensor Unit

●Separate Amplifier Type

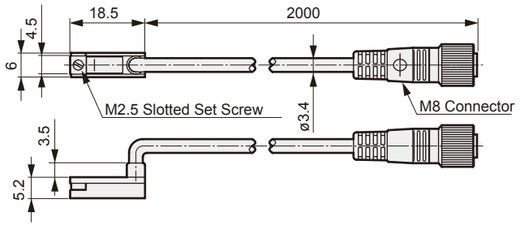
●LN-05HC



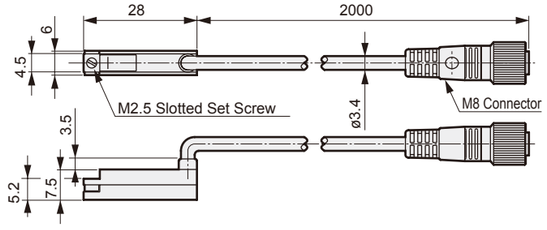
●LN-10HC



●LN-05VC



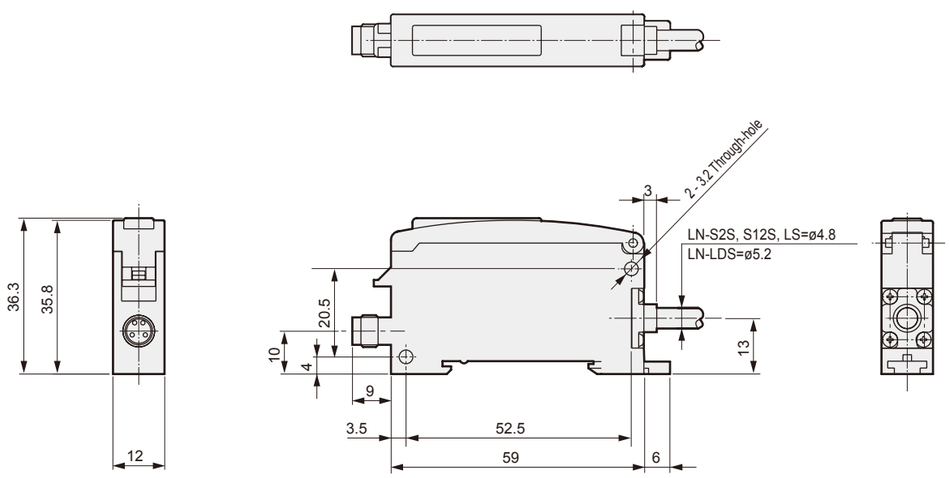
●LN-10VC



Amplifier Unit

●Separate Amplifier Type

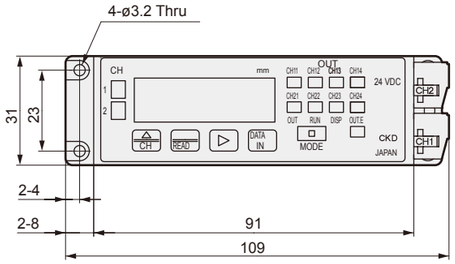
●LN-□S

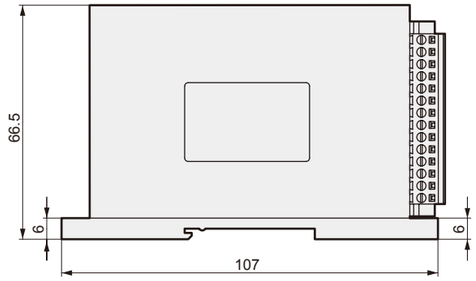


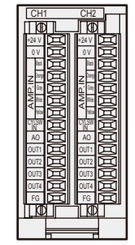
Dimensional Drawings

Indicator Unit

●LN-DN







Cylinder with Linear Norm Sensor

SSD-LN Series

● Bore Size: ø12, ø16, ø20, ø32, ø50

CE * Excluding indicator　UKCA * Excluding indicator　RoHS

For compatible detailed Model No.s, please see our website.

Model No. Notation

SSD - LN - 20 20 - 10 H C 1 2 5 LDS DN

1. Drive Components
2. Cylinder Bore Size
3. Cylinder Stroke
4. Sensor Lead Wire Extraction Direction
5. Sensor Mounting Surface
6. Analog output ON/OFF switch mounting surface
7. Detection Position
8. Amplifier Unit Output Type and Shape
9. Indicator
10. Output format
11. Lead Wire Extraction Direction
12. Lead wire length

1 Drive Components

Code	Content
SSD	Super compact type (Double Acting Type)
SSD-O	Super compact type (Double Acting, Low Speed Type)

2 Cylinder Bore Size (mm)

Code	Content
12	ø12
16	ø16
20	ø20
32	ø32
50	ø50

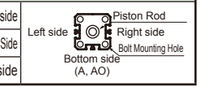
3 Cylinder Stroke (mm)

Code	Content
20	20
30	30 (ø12, ø16)
50	50 (ø20 to ø50)

4 Sensor Lead Wire Extraction Direction

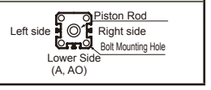
Code	Content
H	Straight lead wire type
V	Lead wire L-type

5 Sensor Mounting Surface

Code	Content	
1	Right side	
2	Lower Side	
3	Left side	

Note: The sensor and analog output ON-OFF selector switch cannot be mounted on the same surface. (ø12, ø16 only)

6 Analog Output ON-OFF Selector Switch Mounting Surface

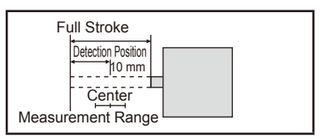
Code	Content	
1	Right side	
2	Lower Side	
3	Left side	

*1: Sensor and analog output ON-OFF switch cannot be installed on the same surface. (ø12, ø16 only)
*2: The lead wire outlet direction of analog output ON-OFF switch, the same one as the sensor, will be selected automatically. Lead wire length is 5 m specifications.

7 Detection Position (mm)

Cylinder Stroke	Detection Position		
	LS		LDS
	ø12, ø16	ø20 to ø50	ø12 to ø50
20	5 to 15	4 to 16	5 to 15
30	5 to 25	—	5 to 25
50	—	4 to 46	5 to 45

*2: Detection position can be selected every 1 mm.



*1: When the detection position is "10", the center point of the detection position is 10 mm before the extended end of the cylinder full stroke, and the measuring range is ±4 (±5) mm from this center point.

8 Amplifier Unit Output Type and Shape

Code	Content
LS	Separate Amplifier/Analog Output Type
LDS	Separate Amplifier/For Indicator (LN-DN)

9 Indicator

Code	Content
DN	Switch Output Unit NPN Type Indicator

*1: Can be selected only when Amplifier separate / For display (LN-DN) (LDS) is selected.
*2: Two channels can be used for display. 1ch is for the amount arranged with this Model No. display. If you wish to use another channel, please arrange it separately.
①-LN-②③-10④⑤⑥⑦CLDS

Cylinder Mounting Bracket Model No.

LN - A - LB - 20

1. Model No.
2. Cylinder Bore Size

Note: Axial foot (2 pcs.) and mounting Hexagon Socket head bolts (8 pcs., 4 pcs. for ø50 only) are included.

Cylinder Switch Single Unit Model No.

SW - T 0 H 3

1. Model No.
10. Output format
11. Lead Wire Extraction Direction
12. Lead wire length

Note: Cylinder mounting brackets (axial foot type) are also available, so please order separately if required. The appearance and external dimensions are the same as the Compact Cylinder, but the material of the mounting bolts is different. (Stainless Steel bolt used) Cylinder switches may be mountable in a separate groove for piston protrusion and pull end confirmation. Order separately when required.

10 Output format

Code	Content
0	Reed 2-wire type
5	Reed 2-wire No Indicator LED
2	Solid state 2-wire type
3	Solid state 3-wire type
2W	Solid State 2-wire 2-Color Indicator
3W	Solid State 3-wire 2-Color Indicator

11 Lead Wire Extraction Direction

Code	Content
H	Straight lead wire type
V	Lead wire L-type

12 Lead wire length

Code	Content
Blank	1 m (Standard)
3	3 m (Option)
5	5 m (Option)

Individual Order Model No. for Maintenance

For adjustment and setting methods when ordered individually, please see the product specification sheet or the instruction manual included with the product.

● Cylinder

SSD - LN - 20 20

1 2 3

●Sensor

LN - 10 H C

4

●Amplifier Unit

LN - LDS

8

●Indicator

LN - DN

Analog Output ON-OFF Selector Switch

● Amplifier separate/analog output (LS) ø20 or more

SW - T0H5

Code	Content
T0H5	Reed 2-wire, Straight Lead Wire
T0V5	Reed 2-wire, L-shaped Lead Wire Type

● Amplifier separate/analog output (LS) for ø12, ø16
● Amplifier separate/for display (LN-DN) (LDS)

LN - TH

Code	Content
TH	Reed 2-wire, Straight Lead Wire
TV	Reed 2-wire, L-shaped Lead Wire Type

Cylinder Unit Specifications

● SSD-**LN Series**

Item \ Model No. (*1)	SSD-LN	SSD-O-LN
Actuation method	Double Acting, Single Rod Type	Double Acting, Single Rod, Low Speed Type
Operating Fluid	Compressed Air	
Max Operating Pressure MPa	1.0	
Min Operating Pressure MPa	0.1	0.05
Proof Pressure MPa	1.6	
Ambient Temperature °C	-10 to 60 (No freezing)	
Bore Size mm	ø12, ø16, ø20, ø32, ø50	
Stroke mm	20, 30 (ø12, ø16), 20, 50 (ø20, ø32, ø50)	
Stroke Tolerance mm	0 to +1	
Port Size	M5 (ø12, ø16, ø20), Rc1/8 (ø32), Rc1/4 (ø50)	
Piston speed (mm/s)	50 to 500	10 to 200
Cushion	None	
Lubrication	Not required (When lubricating, use turbine oil Class 1 ISO VG32)	Not allowed
Non-rotating accuracy °	±2 (ø12), ±1.5 (ø16, ø20), ±1 (ø32, ø50)	

Note: The appearance of the cylinder is the same as the Compact Cylinder SSD-ML (Double Acting, non-rotating type), but please note that they are not compatible in terms of internal structure. (This cylinder is dedicated for Linear Norm.)

SSD-LN

MEMO

Sensor/Amplifier Unit (Separate Type) Specifications

Refer to P. 1140.

Indicator Unit Specifications

Refer to P. 1141.

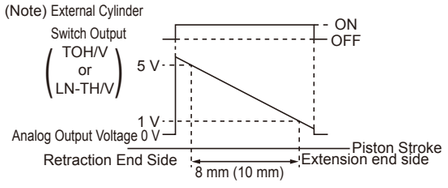
Weight Table

Unit (g)

Stroke / Tube I.D.	20	30	50
ø12	111	122	
ø16	135	157	
ø20	189		263
ø32	346		476
ø50	661		914

Linear Norm Sensor Output Characteristics

(Note) External Cylinder Switch Output (TOH/V or LN-TH/V)

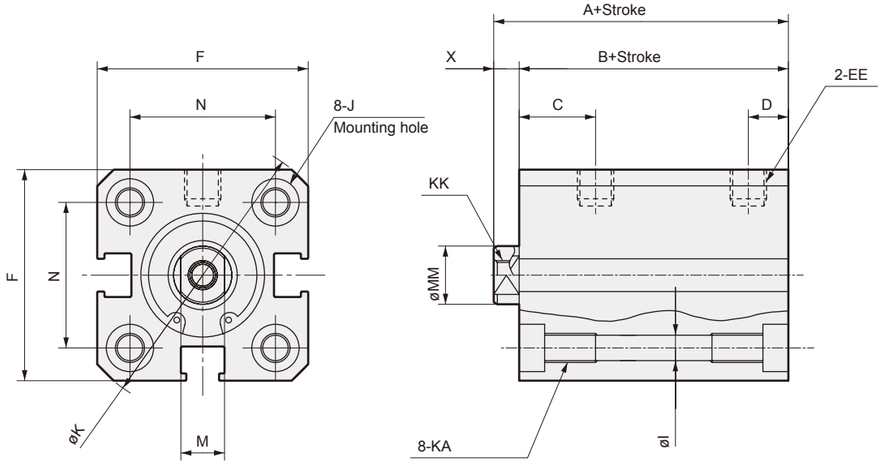


(Note)
An analog output ON-OFF selector switch is separately required to extract analog output voltage in an arbitrary 8 mm (10 mm for indicator type) section relative to the cylinder full stroke. The combinations are as shown in the table below.

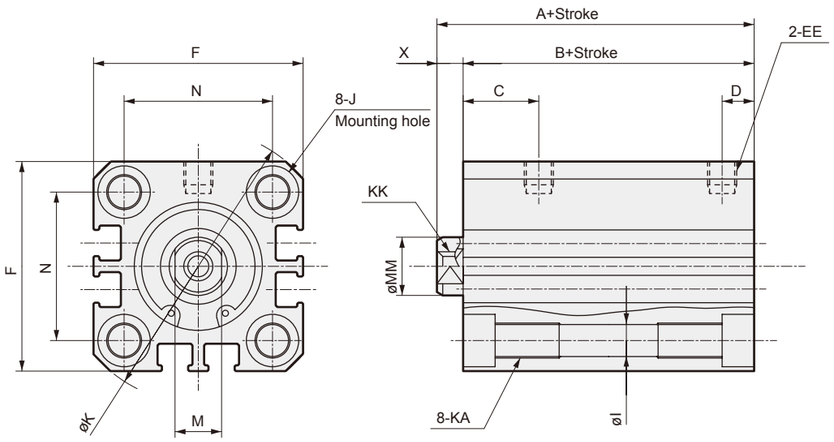
Analog Output ON-OFF Selector Switch Model No.	Output Type	Measurement Range
TOH/V5	Analog Output Type	8 mm
LN-TH/V	Indicator Type	10 mm

Dimensional Drawings

● SSD-LN, SSD-O-LN
• ø12, ø16

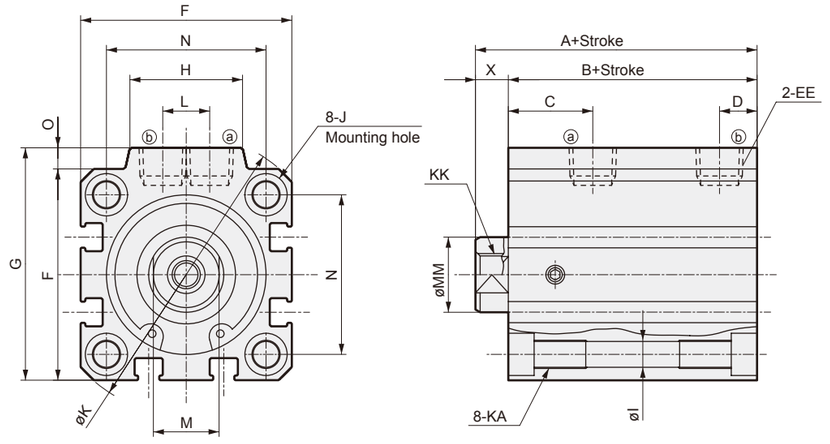


●SSD-LN / SSD-O-LN
·ø20



Dimensional Drawings

●SSD-LN, SSD-O-LN
• ø32, ø50



Code / Bore Size (mm)	A	B	C	D	EE	F	G	H	I	J	K	KA	KK	L
ø12	35.5	32	10.5	5.5	M5	25	–	–	3.5	6.5 Counterbore Depth 3.5	32	M4 Depth 7	M3 Depth 6	–
ø16	35.5	32	10.5	5.5	M5	29	–	–	3.5	6.5 Counterbore Depth 3.5	38	M4 Depth 7	M4 Depth 8	–
ø20	39	34.5	13	5.5	M5	36	–	–	5.5	9 Counterbore Depth 5.5	47	M6 Depth 11	M5 Depth 7	–
ø32	50	43	18	8	RC1/8	45	49.5	24	5.5	9 Counterbore Depth 5.5	60	M6 Depth 11	M8 Depth 13	10
ø50	53.5	45.5	15.5	10.5	RC1/4	64	71	33	6.9	11 Counterbore Depth 6.5	86	M8 Depth 13	M10 Depth 15	15

Code / Bore Size (mm)	M	MM	N	O	X	Remarks
ø12	5	6	15.5	–	3.5	Total length is 5 mm longer than the standard product (SSD-ML). Others are the same dimensions as the standard product.
ø16	6	8	20	–	3.5	Total length is 5 mm longer than the standard product (SSD-ML). Others are the same dimensions as the standard product.
ø20	8	10	25.5	–	4.5	Dimensions are the same as the standard product (SSD-ML).
ø32	14	16	34	4.5	7	Dimensions are the same as the standard product (SSD-ML).
ø50	18	20	50	7	8	Dimensions are the same as the standard product (SSD-ML).

Note: For outline dimension drawings of the sensor unit/amplifier unit (separate type) and indicator unit, refer to P. 1142, 1143.

Gripper with Linear Norm Sensor

BHA, BHG, BHE-LN Series

●Operating stroke:
BHA-LN, BHG-LN: 5, 9, 11, 15mm
BHE-LN 7, 10, 14, 16 mm

CE * Excluding indicator
UKCA * Excluding indicator
RoHS

For compatible detailed Model No.s, please see our website.

Model No. Notation

Analog Output Type

BHE - LN - 04CS - 10 H C LDS DN

1 Drive Components: BHE
2 Cylinder Bore: 04CS
3 Compatible Sensor: 10
4 Sensor Lead Wire Extraction Direction: H
5 Sensor Lead Wire Terminal Specification: C
6 Amplifier Unit Output Type and Shape: LDS
7 Display: DN

Switch Output Type

BHE - LN - 05CS - 10 H C S12S

1 Drive Components: BHE
2 Cylinder Bore: 05CS
3 Compatible Sensor: 10
4 Sensor Lead Wire Extraction Direction: H
5 Sensor Lead Wire Terminal Specification: C
6 Amplifier Unit Output Type and Shape: S12S

Note: Please note that the compatible sensor/amplifier unit differs depending on the Linear Norm sensor equipped drive equipment Model No..

❶Drive Components

Code	Content
BHA	Cross Roller Parallel Gripper (Double Acting Type)
BHG	Cross Roller Parallel Gripper (Double Acting Type, With Rubber Cover)
BHE	Centering Gripper (Double Acting Type)

❷Cylinder Bore

Code	Content
01CS	ø12
03CS	ø16
04CS	ø20
05CS	ø25

❸Compatible Sensor

Code	Content
05	For 01CS, 03CS
10	For 04CS, 05CS

❹Sensor Lead Wire Extraction Direction

Code	Content
H	Straight lead wire type
V	Lead wire L-type (V only for amplifier-mounted type)

❺Sensor Lead Wire Terminal Specification

Code	Content
Blank	Without Connector (Applicable to amplifier-mounted type)
C	With M8 Connector (Applicable to separate amplifier type)

❻Amplifier Unit Output Type and Shape

Code	Content
S1PAH	Amplifier Mounted, Straight Lead Wire, 1-point Switch Output Type
S1PAV	Amplifier Mounted, L-shaped Lead Wire, 1-point Switch Output Type
S2S	Separate Amplifier, 2-point Switch Output Type (For 01CS, 03CS compatibility)
S12S	Separate Amplifier, 2-point Switch Output Type (For 04CS, 05CS compatibility)
LS	Separate Amplifier, Analog Output Type (For 04CS, 05CS compatibility)
LDS	Separate Amplifier, For Indicator (LN-DN) (For 04CS, 05CS compatibility)

❼Display

Code	Content
DN	Switch Output Unit NPN Type Indicator

*1: Can be selected only when Amplifier separate / For display (LN-DN) (LDS) is selected.
*2: Two channels can be used for display. 1ch is for the amount arranged with this Model No. display. If you wish to use another channel, please arrange it separately.
①-LN-②-③④⑤LDS

Cylinder Switch Single Unit Model No.

SW - T 2 H 3

Model No.
8 Output format: 2
9 Lead Wire Extraction Direction: H
10 Lead Wire Length: 3

Note: In the case of a gripper, regardless of analog output type or switch output type, one cylinder switch can be mounted in a separate groove for confirming finger opening/closing, so please order separately if required.

❽Output format

Code	Content
2	Solid state 2-wire type
3	Solid state 3-wire type

❾Lead Wire Extraction Direction

Code	Content
H	Straight lead wire type
V	Lead wire L-type

❿Lead wire length

Code	Content
Blank	1 m (Standard)
3	3 m (Option)
5	5 m (Option)

Individual Order Model No. for Maintenance

For adjustment and setting methods when ordered individually, please see the product specification sheet or the instruction manual included with the product.

●Hand (Gripper)

BHE - LN - 04CS
1 2

●Sensor

LN - 10 H C
3 4 5

●Amplifier Unit

LN - LSD
6

●Amplifier unit with sensor

LN - 10 V LDS
3 6

●Display

LN - DN

BH □-LN Series

Specifications

Gripper Unit Specifications

●BHA Series

Item	Cross Roller Parallel Gripper (Double Acting Type)			
	BHA-LN-01CS	BHA-LN-03CS	BHA-LN-04CS	BHA-LN-05CS
Cylinder bore mm	ø12	ø16	ø20	ø25
Operating Fluid	Compressed Air			
Max Operating Pressure MPa	0.7			
Min Operating Pressure MPa	0.1			
Ambient Temperature °C	5 to 60			
Double jaw stroke mm	5	9	11	15
Port Size	M3	M5		
Weight g	140	200	290	460
Lubrication	Not required (When lubricating, use turbine oil Class 1 ISO VG32)			

BHA

●BHG Series

Item	Cross Roller Parallel Gripper (Double Acting Type, With Rubber Cover)			
	BHG-LN-01CS	BHG-LN-03CS	BHG-LN-04CS	BHG-LN-05CS
Cylinder bore mm	ø12	ø16	ø20	ø25
Operating Fluid	Compressed Air			
Max Operating Pressure MPa	0.7			
Min Operating Pressure MPa	0.15			
Ambient Temperature °C	5 to 60			
Double jaw stroke mm	5	9	11	15
Port Size	M3	M5		
Weight g	170	230	320	490
Lubrication	Not required (When lubricating, use turbine oil Class 1 ISO VG32)			

BHG

●BHE Series

Item	Centering Gripper (Double Acting Type)			
	BHE-LN-01CS	BHE-LN-03CS	BHE-LN-04CS	BHE-LN-05CS
Cylinder bore mm	ø12	ø16	ø20	ø25
Operating Fluid	Compressed Air			
Max Operating Pressure MPa	0.7			
Min Operating Pressure MPa	0.2			
Ambient Temperature °C	5 to 60			
Double jaw stroke mm	7	10	14	16
Port Size	M3	M5		
Weight g	130	180	300	480
Lubrication	Not required (When lubricating, use turbine oil Class 1 ISO VG32)			

BHE

Note: The appearance of the gripper is the same as the standard type, but please note that the internal structure is different. (This gripper is dedicated for Linear Norm.)

For gripping force performance data, refer to Pneumatic Cylinder ⑤ (No. RJ-006AA).

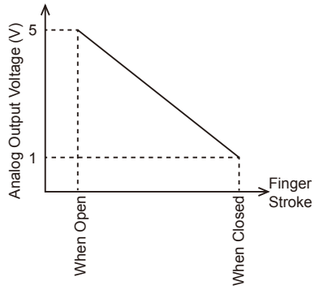
Sensor/Amplifier Unit (Separate Type) Specifications

Refer to P. 1140.

Indicator Unit Specifications

Refer to P. 1141.

Linear Norm Sensor Output Characteristics

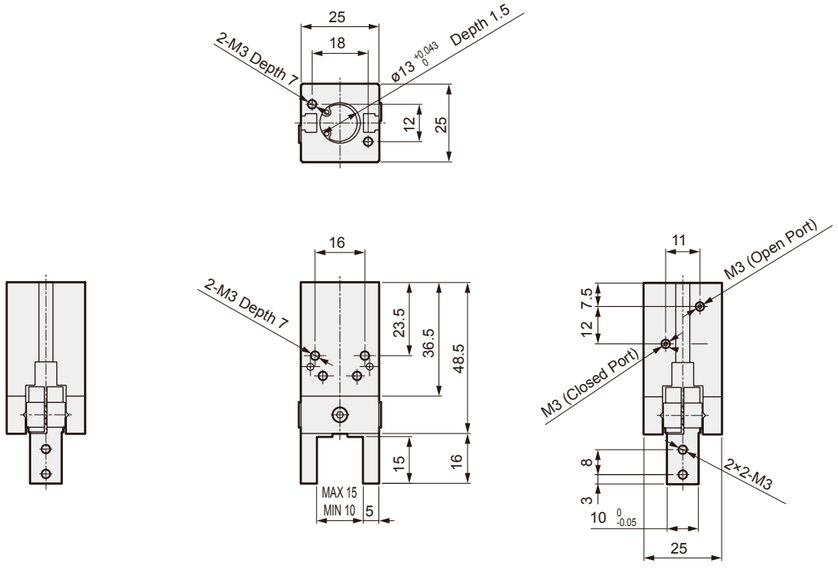


MEMO

Dimensional Drawings

BHA-LN (Separate Amplifier Type)

●BHA-LN-01CS

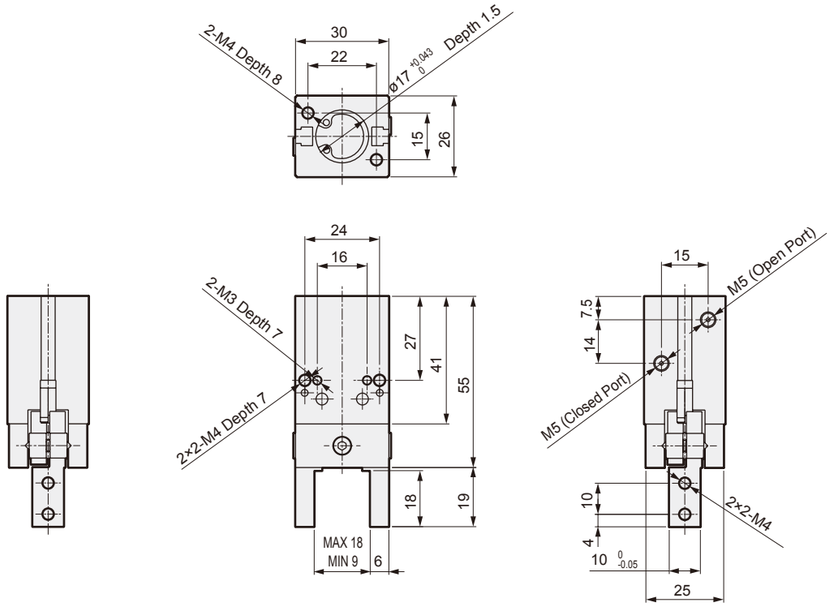


*1: Lengthwise direction is 3 mm longer than the standard product. Others are the same dimensions as the standard product.

***2: For outline dimension drawings of the sensor unit/amplifier unit (separate type) and indicator unit, refer to P. 1142, 1143.**

*3: Indicator type/analog output type are only equipped with cylinder bore code 04CS/05CS.

●BHA-LN-03CS



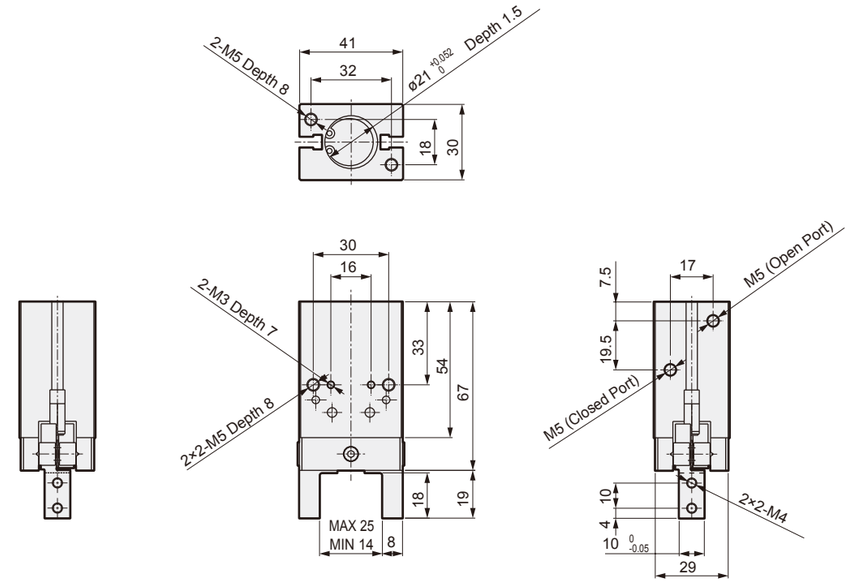
*1: Lengthwise direction is 2 mm longer than the standard product. Others are the same dimensions as the standard product.

***2: For outline dimension drawings of the sensor unit/amplifier unit (separate type) and indicator unit, refer to P. 1142, 1143.**

*3: Indicator type/analog output type are only equipped with cylinder bore code 04CS/05CS.

Dimensional Drawings

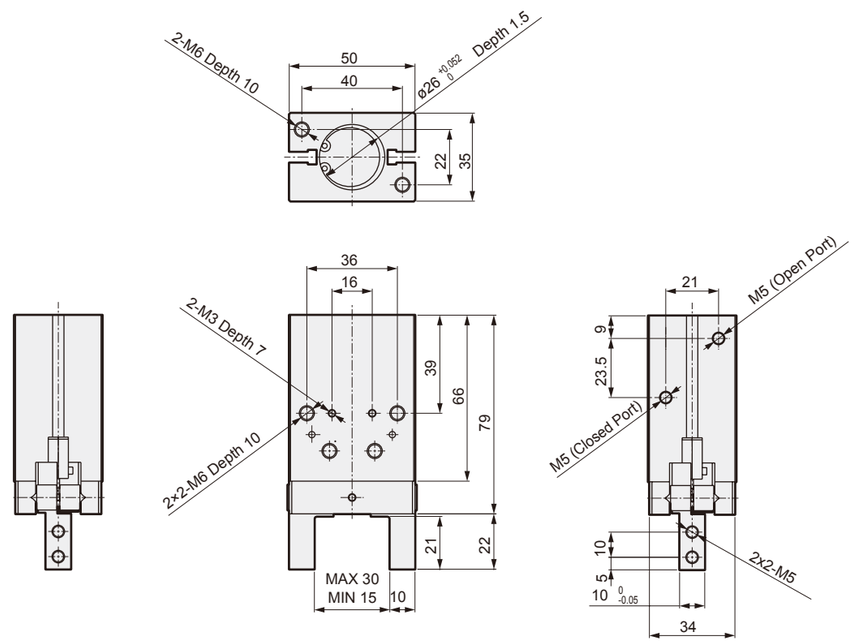
●BHA-LN-04CS



*1: Lengthwise direction is 5 mm longer than the standard product. Others are the same dimensions as the standard product.

***2: For outline dimension drawings of the sensor unit/amplifier unit (separate type) and indicator unit, refer to P. 1142, 1143.**

BHA-LN-05CS



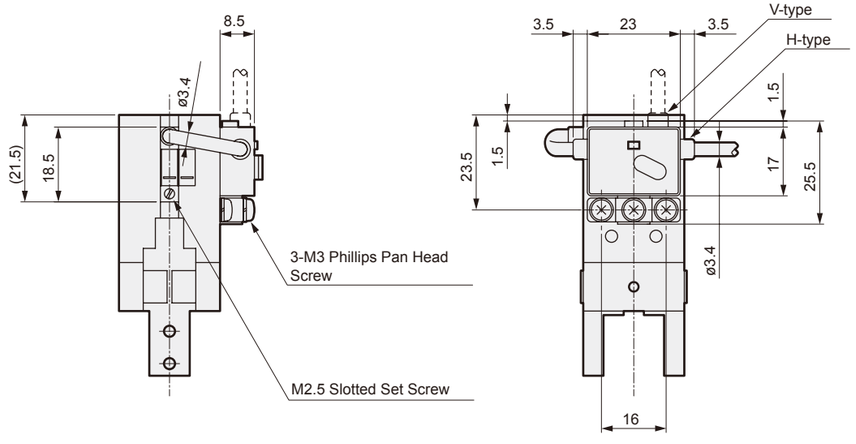
*1: Lengthwise direction is 5 mm longer than the standard product. Others are the same dimensions as the standard product.

***2: For outline dimension drawings of the sensor unit/amplifier unit (separate type) and indicator unit, refer to P. 1142, 1143.**

Dimensional Drawings

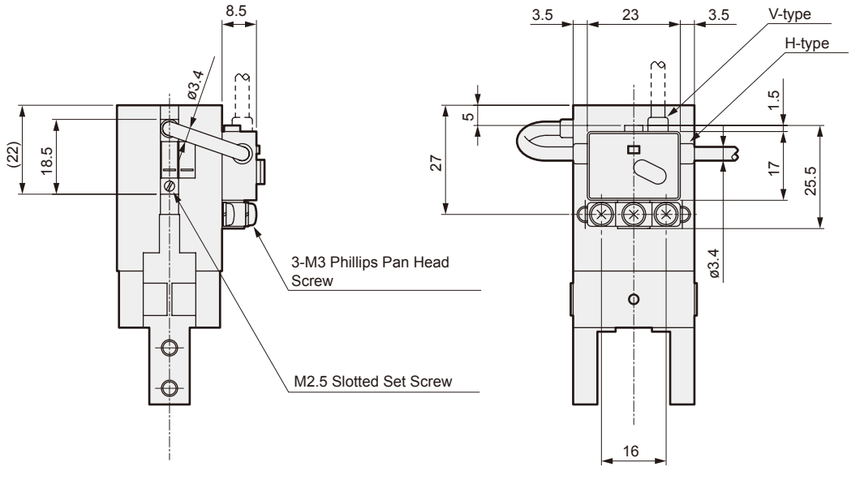
BHA-LN (Amplifier Unit with Amplifier-mounted Sensor)

●BHA-LN-01CS Mounting Drawing



*1: For gripper external dimensions, refer to the external dimensions of the separate amplifier type.
*2: The sensor lead wire extraction direction is V-type. H/V can be selected for the output stage lead wire.

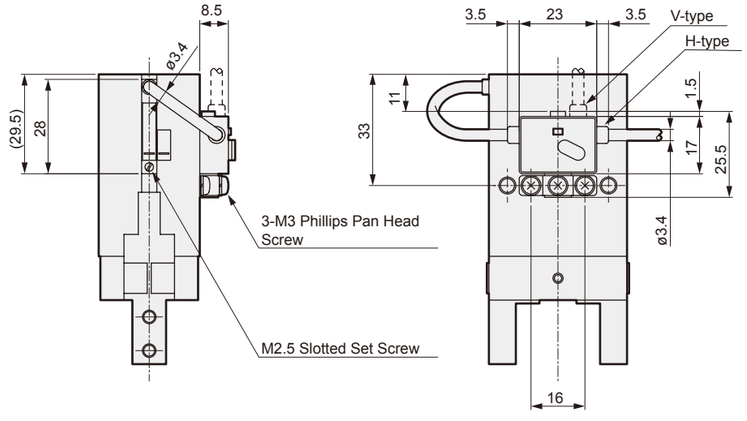
●BHA-LN-03CS Mounting Drawing



*1: For gripper external dimensions, refer to the external dimensions of the separate amplifier type.
*2: The sensor lead wire extraction direction is V-type. H/V can be selected for the output stage lead wire.

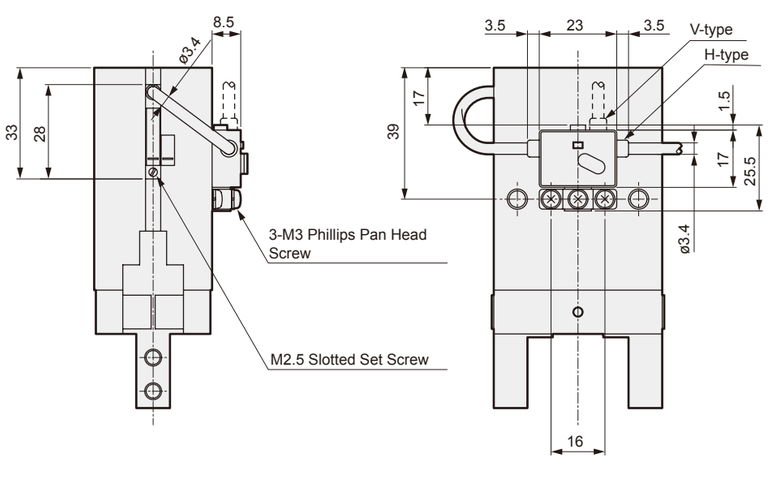
Dimensional Drawings

BHA-LN-04CS Mounting Drawing



*1: For gripper external dimensions, refer to the external dimensions of the separate amplifier type.
*2: The sensor lead wire extraction direction is V-type. H/V can be selected for the output stage lead wire.

●BHA-LN-05CS Mounting Drawing

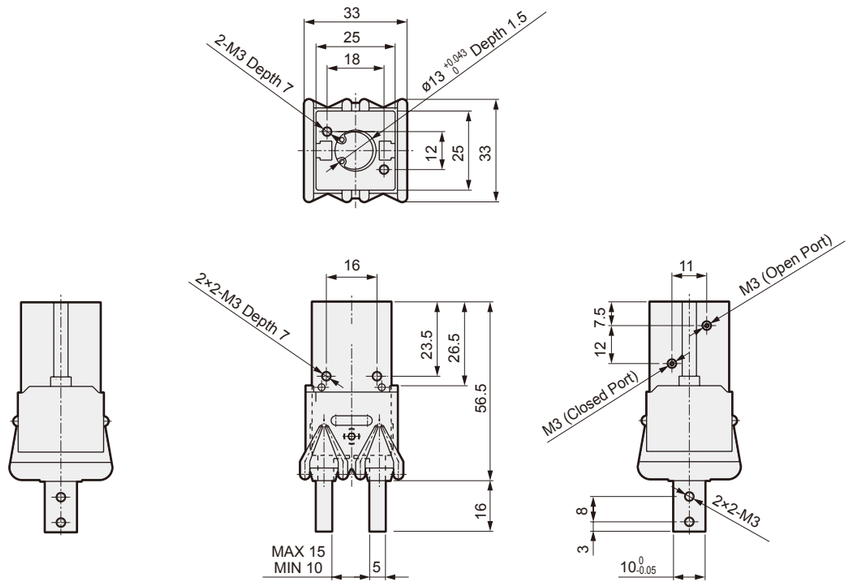


*1: For gripper external dimensions, refer to the external dimensions of the separate amplifier type.
*2: The sensor lead wire extraction direction is V-type. H/V can be selected for the output stage lead wire.

Dimensional Drawings

BHG-LN (Separate Amplifier Type)

●BHG-LN-01CS

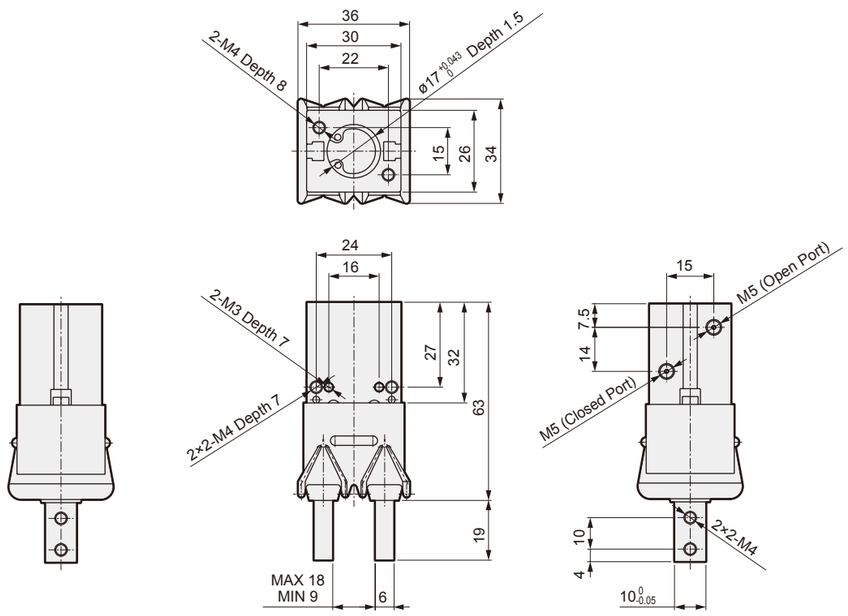


*1: Lengthwise direction is 3 mm longer than the standard product. Others are the same dimensions as the standard product.

***2: For outline dimension drawings of the sensor unit/amplifier unit (separate type) and indicator unit, refer to P. 1142, 1143.**

*3: Indicator type/analog output type are only equipped with cylinder bore code 04CS/05CS.

●BHG-LN-03CS



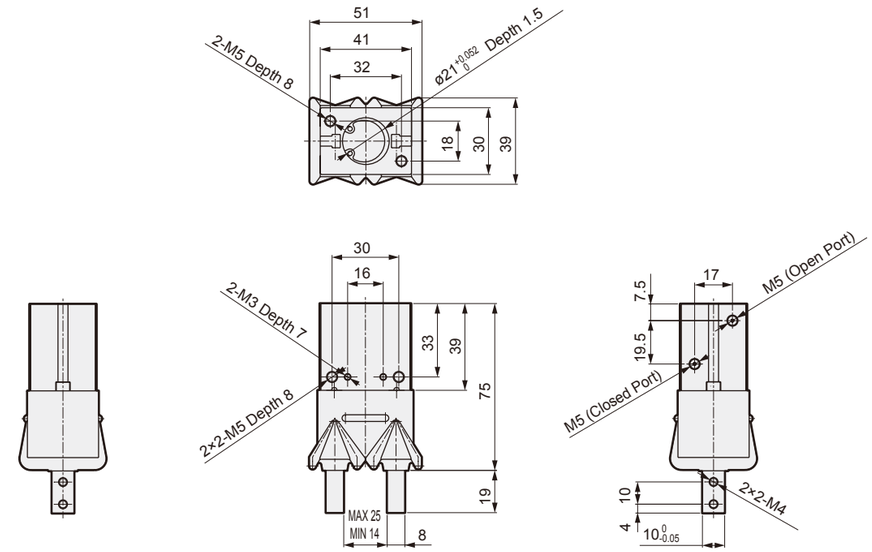
*1: Lengthwise direction is 2 mm longer than the standard product. Others are the same dimensions as the standard product.

***2: For outline dimension drawings of the sensor unit/amplifier unit (separate type) and indicator unit, refer to P. 1142, 1143.**

*3: Indicator type/analog output type are only equipped with cylinder bore code 04CS/05CS.

Dimensional Drawings

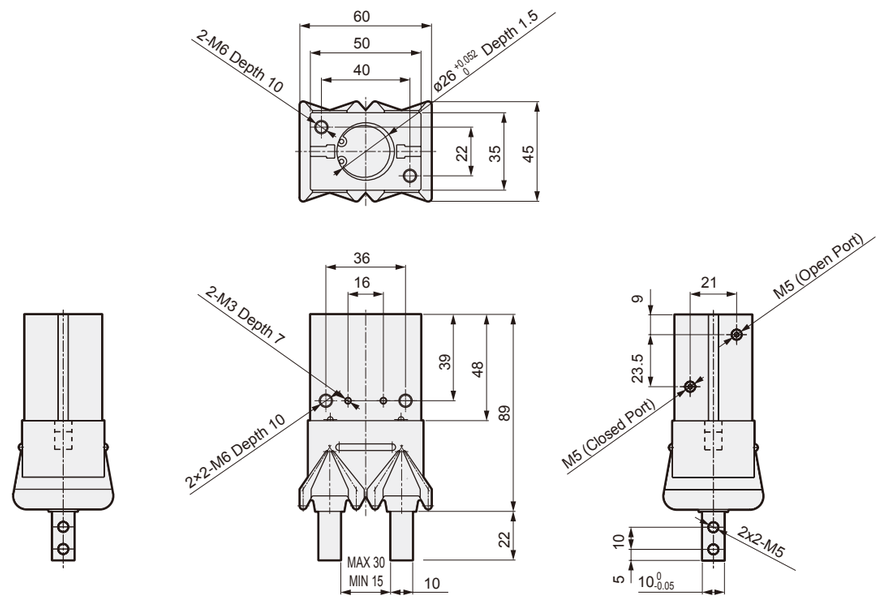
●BHG-LN-04CS



*1: Lengthwise direction is 5 mm longer than the standard product. Others are the same dimensions as the standard product.

***2: For outline dimension drawings of the sensor unit/amplifier unit (separate type) and indicator unit, refer to P. 1142, 1143.**

●BHG-LN-05CS



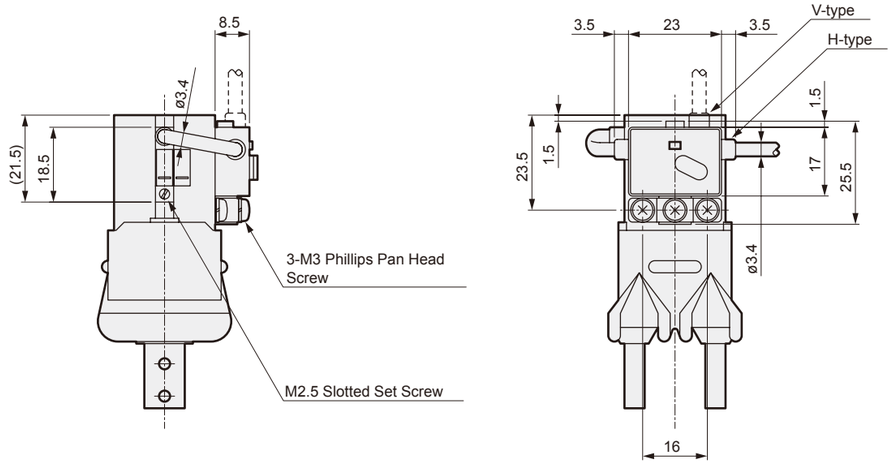
*1: Lengthwise direction is 5 mm longer than the standard product. Others are the same dimensions as the standard product.

***2: For outline dimension drawings of the sensor unit/amplifier unit (separate type) and indicator unit, refer to P. 1142, 1143.**

Dimensional Drawings

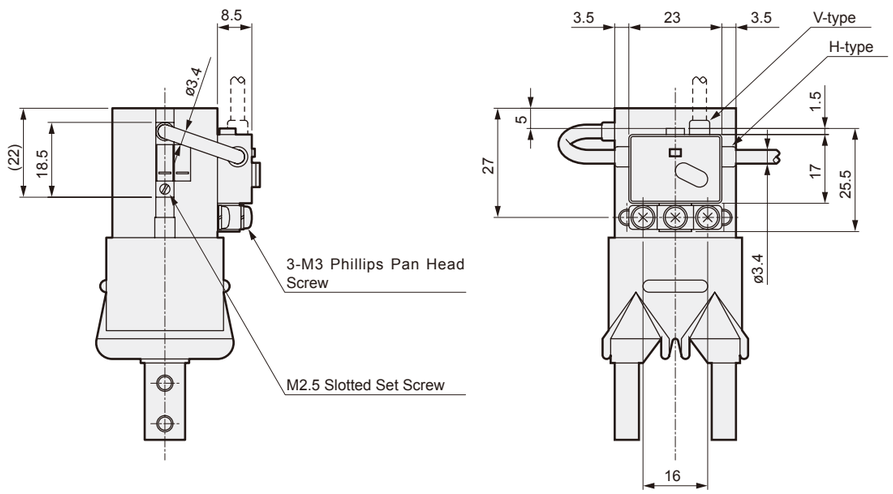
BHG-LN (Amplifier Unit with Amplifier-mounted Sensor)

●BHG-LN-01CS Mounting Drawing



*1: For gripper external dimensions, refer to the external dimensions of the separate amplifier type.
*2: The sensor lead wire extraction direction is V-type. H/V can be selected for the output stage lead wire.

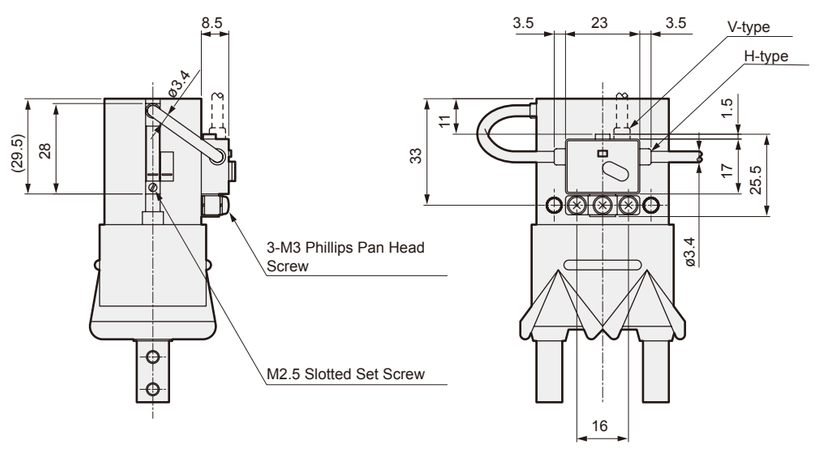
●BHG-LN-03CS Mounting Drawing



*1: For gripper external dimensions, refer to the external dimensions of the separate amplifier type.
*2: The sensor lead wire extraction direction is V-type. H/V can be selected for the output stage lead wire.

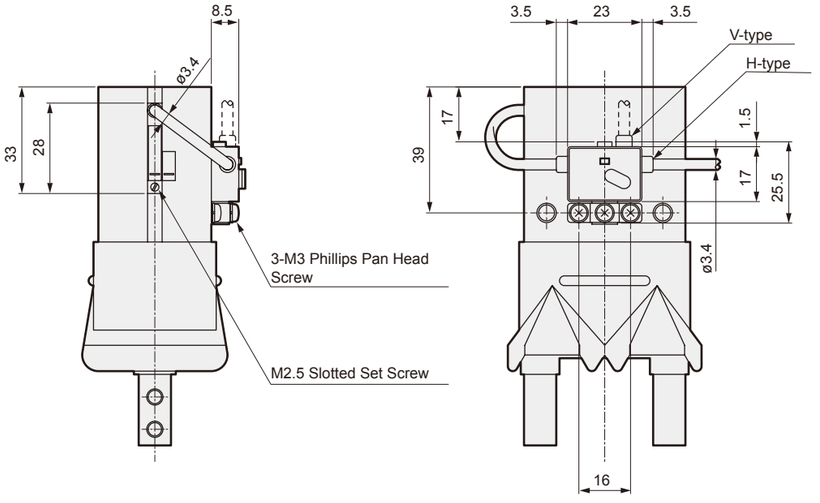
Dimensional Drawings

●BHG-LN-04CS Mounting Drawing



*1: For gripper external dimensions, refer to the external dimensions of the separate amplifier type.
*2: The sensor lead wire extraction direction is V-type. H/V can be selected for the output stage lead wire.

●BHG-LN-05CS Mounting Drawing

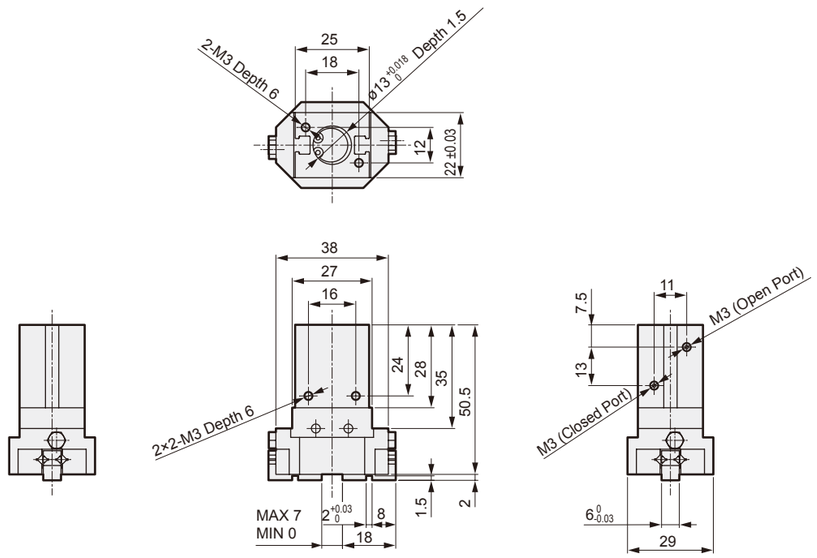


*1: For gripper external dimensions, refer to the external dimensions of the separate amplifier type.
*2: The sensor lead wire extraction direction is V-type. H/V can be selected for the output stage lead wire.

Dimensional Drawings

BHE-LN (Separate Amplifier Type)

●BHE-LN-01CS

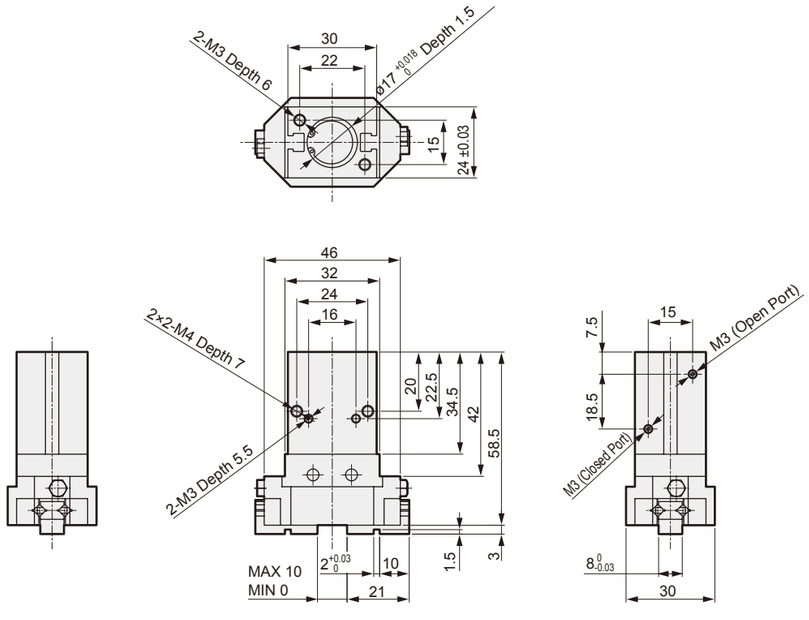


*1: Lengthwise direction is 3 mm longer than the standard product. Others are the same dimensions as the standard product.

***2: For outline dimension drawings of the sensor unit/amplifier unit (separate type) and indicator unit, refer to P. 1142, 1143.**

*3: Indicator type/analog output type are only equipped with cylinder bore code 04CS/05CS.

●BHE-LN-03CS



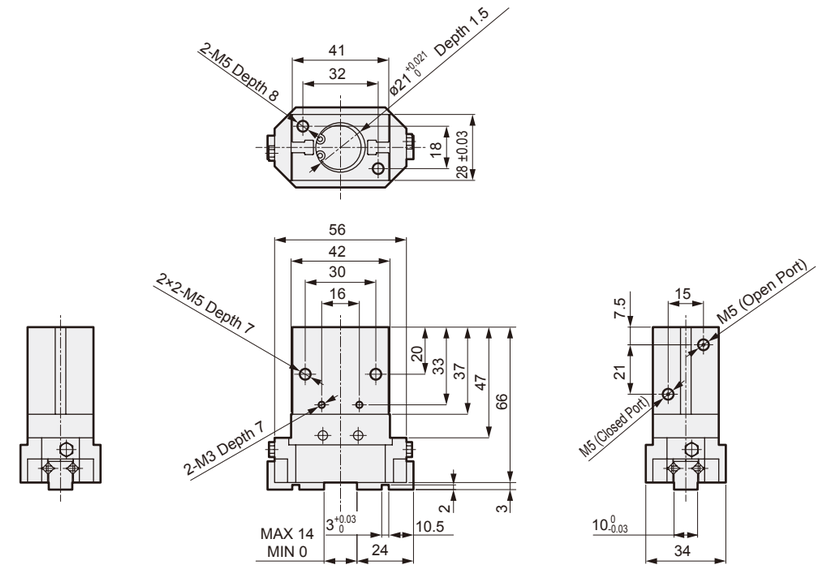
*1: Lengthwise direction is 6.5 mm longer than the standard product. Others are the same dimensions as the standard product.

***2: For outline dimension drawings of the sensor unit/amplifier unit (separate type) and indicator unit, refer to P. 1142, 1143.**

*3: Indicator type/analog output type are only equipped with cylinder bore code 04CS/05CS.

Dimensional Drawings

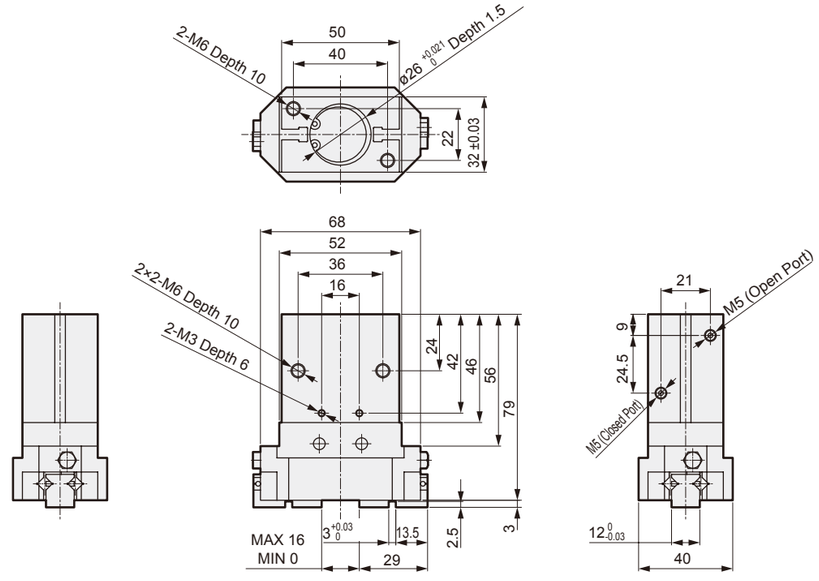
●BHE-LN-04CS



*1: Lengthwise direction is 5 mm longer than the standard product. Others are the same dimensions as the standard product.

***2: For outline dimension drawings of the sensor unit/amplifier unit (separate type) and indicator unit, refer to P. 1142, 1143.**

●BHE-LN-05CS



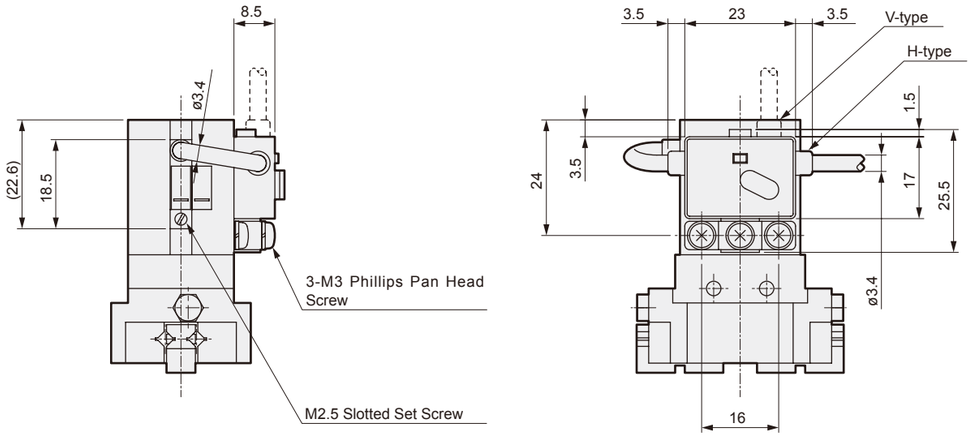
*1: Lengthwise direction is 5 mm longer than the standard product. Others are the same dimensions as the standard product.

***2: For outline dimension drawings of the sensor unit/amplifier unit (separate type) and indicator unit, refer to P. 1142, 1143.**

Dimensional Drawings

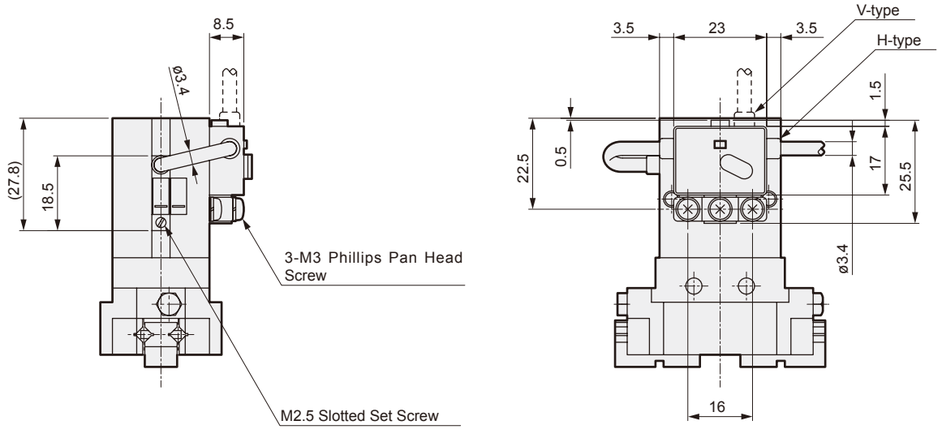
BHE-LN (Amplifier Unit with Amplifier-mounted Sensor)

●BHE-LN-01CS Mounting Drawing



*1: For gripper external dimensions, refer to the external dimensions of the separate amplifier type.
*2: The sensor lead wire extraction direction is V-type. H/V can be selected for the output stage lead wire.

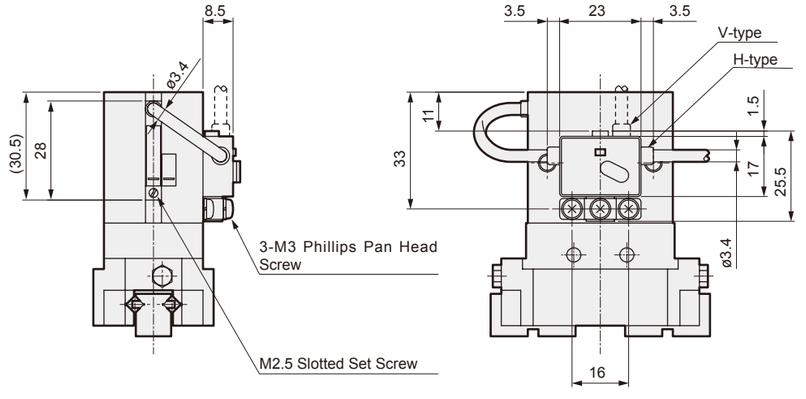
●BHE-LN-03CS Mounting Drawing



*1: For gripper external dimensions, refer to the external dimensions of the separate amplifier type.
*2: The sensor lead wire extraction direction is V-type. H/V can be selected for the output stage lead wire.

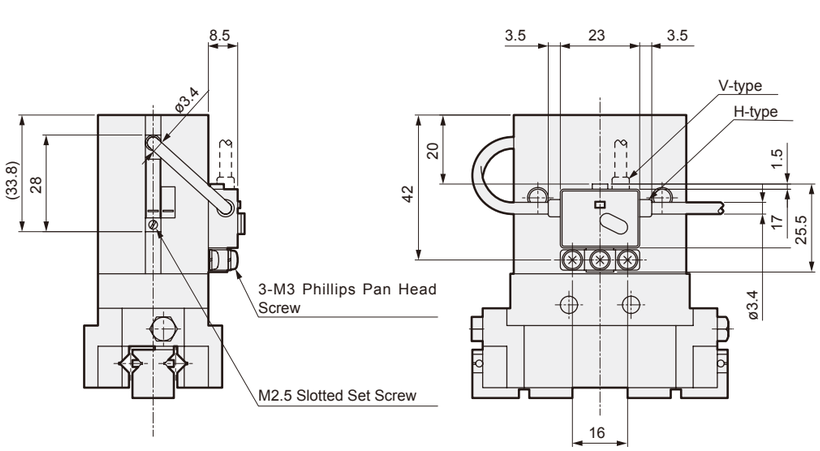
Dimensional Drawings

●BHE-LN-04CS Mounting Drawing



*1: For gripper external dimensions, refer to the external dimensions of the separate amplifier type.
*2: The sensor lead wire extraction direction is V-type. H/V can be selected for the output stage lead wire.

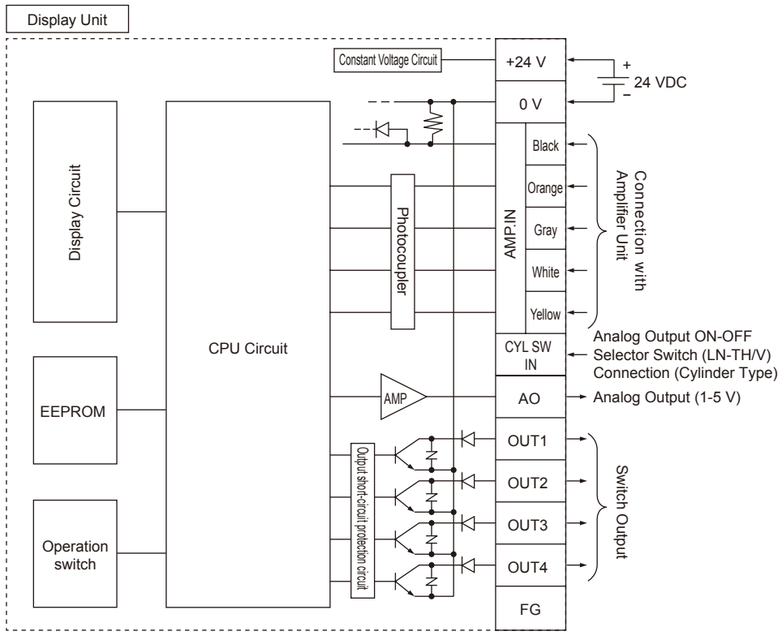
●BHE-LN-05CS Mounting Drawing



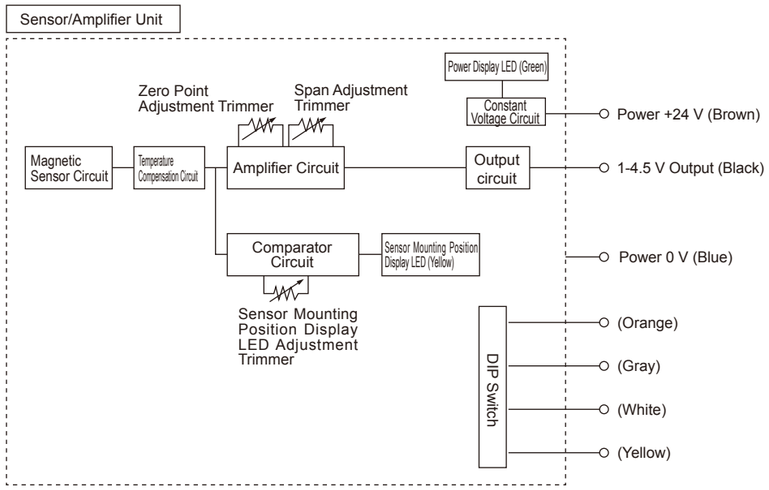
*1: For gripper external dimensions, refer to the external dimensions of the separate amplifier type.
*2: The sensor lead wire extraction direction is V-type. H/V can be selected for the output stage lead wire.

Internal circuit diagram

●Display Type

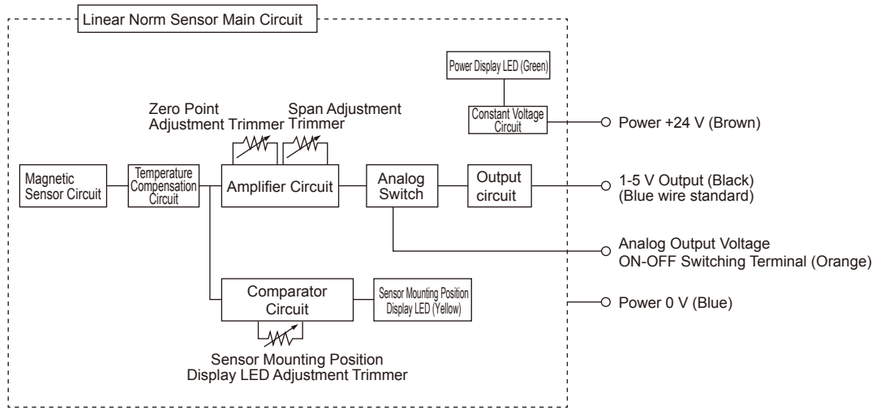


●The output stage transistor can be selected to be ON or OFF at piston detection using the operation switch.

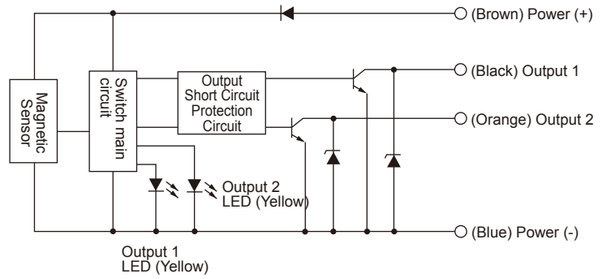


Internal circuit diagram

●Analog Output Type

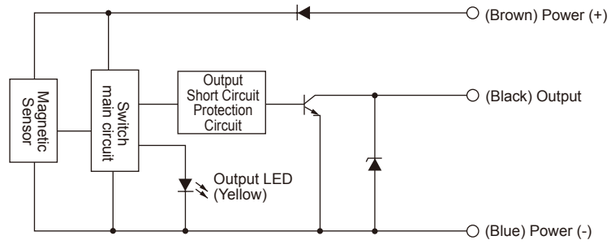


●Switch Output Type, Separate Amplifier Type



●The output stage transistor turns ON at piston detection.

●Switch Output Type, Amplifier Mounted Type



●The output stage transistor turns ON at piston detection.

When Mounting Analog Output Type Cylinder

When adjusting the sensor mounting position and analog output voltage, it is recommended to prepare a workpiece (master gauge) that allows the piston to stop at 4 mm on the extension end side and 4 mm on the return end side, respectively, with reference to the center of the measurement range and the same center. Also, perform these adjustments at the same air pressure as in actual use.

1. Sensor Mounting Position Adjustment Method

The sensor mounting position is set to the center of the specified measurement range (e.g., if from 8 mm before the piston extension end to the extension end, set to its center) and shipped. However, if changing the sensor mounting surface or measurement range, please perform according to the following procedure.

(1) With the sensor removed, move the sensor mounting position indicator lamp adjustment trimmer so that the sensor mounting position indicator lamp (yellow LED) is constantly lit, and set the trimmer to the center of the yellow LED lighting section. (As it is adjusted before shipping, please perform this even if you have inadvertently touched this trimmer.)

(2) Position the cylinder piston at the center of the measurement range.

(3) Mount the sensor on the cylinder. At that time, fix it in a position that satisfies the following operation depending on the insertion direction. Sensor tightening torque is 0.1 to 0.2 N·m. Also, be sure to install the sensor case so that the sensor mounting screw (M2.5 slotted Set Screw) faces the cylinder head side.

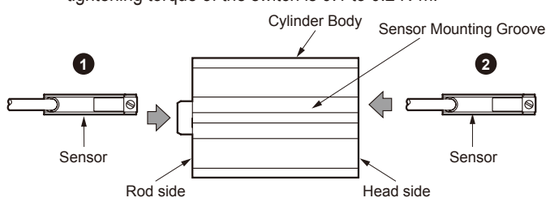
① When inserting from the rod side

Fix at the center position of the second lighting section of the sensor mounting position indicator lamp, including the lighting in (1). (The second lighting section is a short section of about 1 mm in terms of piston stroke.)

② When inserting from the head side

Fix at the center position of the second lighting section of the sensor mounting position indicator lamp, including the lighting in (1). (The second lighting section is a short section of about 1 mm in terms of piston stroke.)

(4) If the piston stroke of the cylinder to which the sensor is mounted is longer than 8 mm, and an 8 mm stroke range within it is to be measured, connect the cylinder switch T0H/V between the orange wire and the blue wire to prevent unnecessary analog output voltage from appearing outside the measurement range. (When the stroke is 8 mm or less, it will be short-circuited across the orange and blue wires.) As with the conventional cylinder switch, perform step (2) above, and then position this switch between ON points. The tightening torque of the switch is 0.1 to 0.2 N·m.



2. Analog Output Voltage Adjustment Method

The analog output voltage is adjusted and shipped so that, for the specified measurement range, for example, from 8 mm before the piston extension end to the extension end, it is 5 V at 8 mm before the extension end and 1 V at the extension end. However, slight deviations may occur depending on the operating environment (influence of surrounding magnetic materials), so please make fine adjustments according to the following procedure.

(1) Connect the brown wire of the output stage lead wire to the (+) side of the 24 VDC stabilized power supply, connect the orange wire to the brown wire of the cylinder switch T0H/V, and connect both blue wires to the (-) side of the power supply.

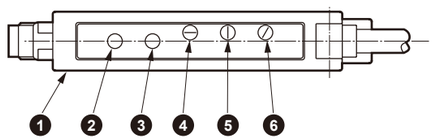
(2) Connect the black wire to the (+) side of the voltmeter, and the blue wire to the (-) side of the voltmeter.

(3) Move the cylinder piston, and enter the measured range length start (example: 8 mm in front of projecting end) and end (example: Output end) voltage value.

(4) If the voltage difference in (2) is 4 V or less, turn the span adjustment trimmer slightly clockwise. If it is 4 V or more, slightly move the trimmer counterclockwise.

(5) Move the cylinder piston again, read the voltages at the start end and end of the measurement range respectively, and move the zero point adjustment trimmer so that it is 5 V when referenced to the start end and 1 V when referenced to the end.

(6) Furthermore, repeat (3) → (4) → (5) several times to make fine adjustments.



1. Amplifier unit case
2. Power indicator lamp
3. Sensor installation position indicator
4. Sensor installation position indicator adjustment trimmer
5. Zero point adjustment trimmer
6. Span adjustment trimmer

When Mounting Analog Output Type Gripper

1. Sensor Mounting Position Adjustment Method

The sensor mounting position is set to the center of the both-finger stroke and shipped. However, if changing the sensor mounting surface or replacing the gripper, please perform according to the following procedure.

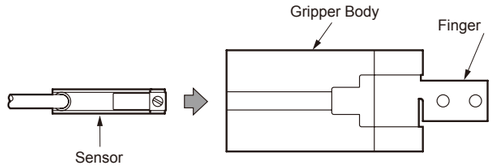
(1) With the sensor removed, move the sensor mounting position indicator lamp adjustment trimmer so that the sensor mounting position indicator lamp (yellow LED) is constantly lit, and set the trimmer to the center of the yellow LED lighting section. (As it is adjusted before shipping, please perform this even if you have inadvertently touched this trimmer.)

(2) Position the gripper finger at the center of the stroke.

(3) Mount the sensor on the gripper. At that time, fix it in a position that satisfies the following operation. Sensor tightening torque is 0.1 to 0.2 N·m. Also, be sure to install the sensor case so that the sensor mounting screw (M2.5 slotted Set Screw) faces the finger side.

① Sensor Mounting Position

Fix at the center position of the second lighting section of the sensor mounting position indicator lamp, including the lighting in (1). (The second lighting section is a short section of about 1 mm in terms of piston stroke.)



2. Analog Output Voltage Adjustment Method

The analog output voltage is adjusted so that the full stroke of the finger is 5 V when open and 1 V when closed. However, slight deviations may occur depending on the operating environment (influence of surrounding magnetic materials), so please make fine adjustments according to the following procedure.

(1) Connect the brown wire to the (+) side of the 24 VDC stabilized power supply, and connect the blue and orange wires to the (-) side.

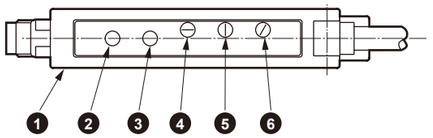
(2) Connect the black wire to the (+) side of the voltmeter, and the blue wire to the (-) side of the voltmeter.

(3) Move the finger and read the voltage values when open and closed, respectively.

(4) If the voltage difference in (3) is 4 V or less, turn the span adjustment trimmer slightly clockwise. If it is 4 V or more, slightly move the trimmer counterclockwise.

(5) Move the finger again, read the voltages when open and closed respectively, and move the zero point adjustment trimmer so that it is 5 V when referenced to open and 1 V when referenced to closed.

(6) Furthermore, repeat (3) → (4) → (5) several times to make fine adjustments.



1. Amplifier unit case
2. Power indicator lamp
3. Sensor installation position indicator
4. Sensor installation position indicator adjustment trimmer
5. Zero point adjustment trimmer
6. Span adjustment trimmer

Switch Output Type

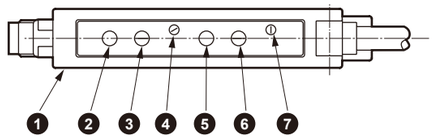
1 Sensor Mounting Position Adjustment Method

The sensor mounting position is set to the center of the both-finger stroke and shipped. However, if changing the sensor mounting surface or replacing the gripper, please perform according to the following procedure.

(1) Align the red lines included with each sensor and gripper, and tighten the sensor with a torque of 0.1 to 0.2 N·m.

(2) Be sure to install the sensor so that the mounting screw (M2.5 slotted Set Screw) faces the finger side.

Separate Amplifier Type



1 Amplifier unit case
2 Output 1 indicator lamp
3 Output 1 operating range adjustment trimmer
4 Output 1 operation point adjustment trimmer
5 Output 2 indicator lamp
6 Output 2 operating range adjustment trimmer
7 Output 2 indicator

2 Switch Output Position Setting Method

(1) Move the gripper finger to the position where you want to get the switch output.

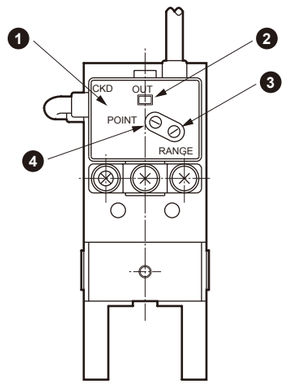
(2) Temporarily set the operating range adjustment trimmer to a position slightly clockwise from the counter-clockwise end.

(3) Move the operating point adjustment trimmer to turn the output ON. Then, set the trimmer to the center of the ON section.

(4) Finally, move the operating range adjustment trimmer to determine the operating range. At this time, the operating range is expanded/contracted with the center of the operating point as a reference.

(5) Move the finger several times, turn the switch output ON/OFF, and repeat (3) and (4) above to make fine adjustments.

Amplifier Mounted Type



1 Amplifier unit case
2 Output indicator
3 Output operation range adjustment trimmer
4 Output operation point adjustment trimmer

* For adjustment and setting methods of the indicator type, please refer to the instruction manual included with the product.

MEMO

To Use This Product Safely

Be sure to read this before use. For general cylinder information, see Intro 41, and for Cylinder Switches, see P. 1512.

Individual Precautions: Cylinder with length measuring sensor/hand/actuator

Design / Selection

1. Cylinder

CAUTION

■Since SSD-LN and SSD-O-LN series use a non-rotating type, avoid using them in a way that applies rotational torque to the Piston Rod of SSD-LN and SSD-O-LN series. The non-rotating bush will deform, and the service life will be significantly reduced. If you require a standard Piston Rod, please contact us.

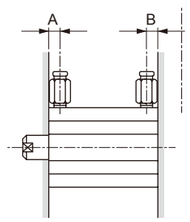
■Use so that the load on the Piston Rod is always applied in the axial direction of the Piston Rod.

■SSD-LN, SSD-O-LNWhen fixing a workpiece onto the tip of the series Piston Rod, retract the Piston Rod to the stroke end and apply a wrench to the section protruding from the rod's parallel section. Tighten so that torque is not applied to the Cylinder Body.

■Please note that usable piping fittings vary depending on the cylinder bore.

• SSD-LN, SSD-O-LN

Item / Bore Size (mm)	Port Size	Port position dimension A	Port position dimension B	Usable Fittings	Fitting outer diameter	Unusable fittings
ø12·16	M5x0.8	5.5	5.5	SC3W-M5-4 SC3W-M5-6 GWS4-M5-S GWS4-M5 GWL4-M5 GWL6-M5	ø11 or less	GWS6-M5
ø20		8	5.5			
ø32	Rc1/8	8	8	SC3W-6-4/6/8 GWS4-6 GWS6-6 GWS8-6 GWL4-6 GWL6-6	ø15 or less	GWS10-6 GWL8-6 GWL10-6
ø50	Rc1/4	10.5	10.5	SC3W-8-6/8/10 GWS4-8 GWS6-8 GWS10-8 GWL4 to 12-8	ø21 or less	GWS-12-8



2. Gripper

CAUTION

■Gripping force varies depending on the length of the fingers included with the gripper, applied pressure, bore diameter, etc., so please determine it according to the workpiece to be gripped.

■The gripping characteristics of BHA, BHG, and BHE are equivalent to the standard type. Refer to "Pneumatic Cylinder ⑤" (No. RJ-006AA). Also, please check the common notes for grippers.

■Avoid outdoor use.

■The most desirable Ambient Temperature range for using the gripper is 5 to 60°C. If this temperature exceeds 60°C, it may cause damage or malfunction, so do not use it. Also, if it is 5°C or less, moisture in the circuit may freeze and cause damage or malfunction, so please take measures to prevent freezing.

■Do not use in an atmosphere where there is a risk of corrosion. Use in such an environment will cause damage or malfunction.

■Clamping operation becomes more accurate by performing it as softly and slowly as possible. Also, repeatability becomes stable.

■Use so as not to apply excessive lateral load to the fingers.

■Model Selection for Mixed Workpiece Sorting Applications

Select the output type according to the difference in workpiece external shape.

Workpiece External Shape Difference ≥ 1 mm + Workpiece Tolerance Variation ... Switch Output Type

Workpiece External Shape Difference ≤ 1 mm + Workpiece Tolerance Variation ... Analog Output Type

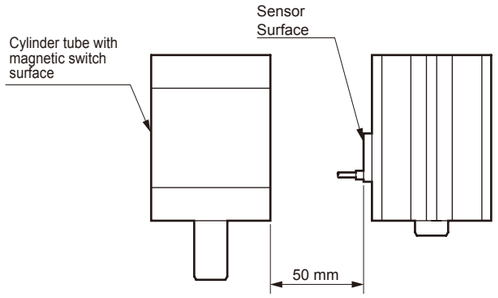
* For the switch output type, the switch output position setting is rough. The above values are guidelines and vary depending on the operating environment. Please contact us for details.

Individual Precautions: Sensor/amplifier/display

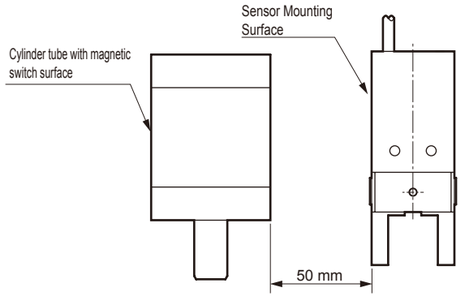
Design / Selection

CAUTION

■This product cannot be used in an environment where strong magnetic fields are generated (spot welding machine, etc.) because the sensor detection accuracy drops markedly. Also, be careful when this cylinder/gripper is close to other cylinders with magnetic switches. As a guideline, if the distance between the sensor surface and the cylinder tube surface is 50 mm or more, as shown in the figure below, there is no problem.



■If the sensor surface (sensor nameplate mounting surface) is covered with a magnetic material such as an iron plate, the magnetism will be disturbed and the sensor will not be able to detect the magnetic field, so please be careful when installing the actuator.



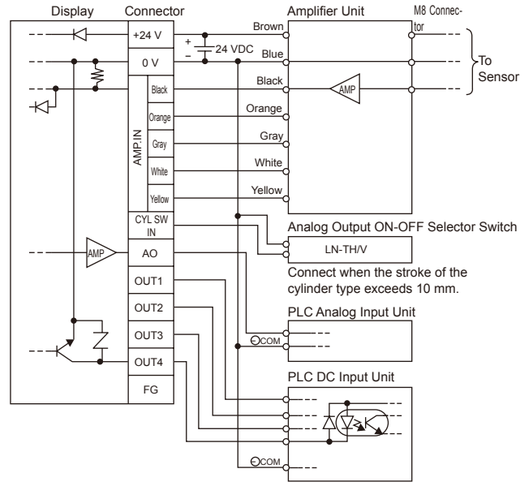
■When mounting the amplifier unit case with separated amplifier using a side through hole, use M3 cross-recessed pan head machine screws, with tightening torque of 0.5 to 0.7 N·m.

■Rubber plugs are attached to devices with the amplifier installed operating points adjustment trimmer and operating range adjustment trimmer section to maintain water resistance. Fit these plugs in after adjusting.

■When mounting the display using a bottom through hole, use M3 cross-recessed pan head machine screws, with tightening torque of 0.5 to 0.7 N·m.

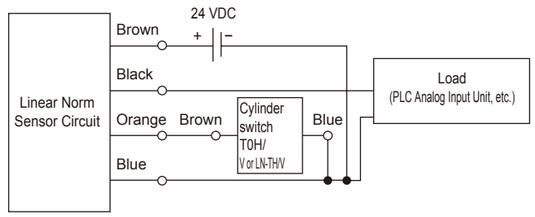
■Connecting the lead wire

● Display Type

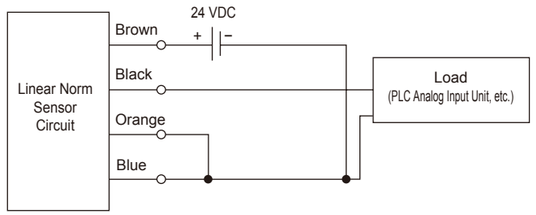


1. Since the indicator is a 2-channel specification, there are two +24 V and 0 V connections each in the connector part, but they are electrically connected inside the indicator, so it will operate with wiring to either one.
2. When connecting only one amplifier unit, the channel of the connector part does not matter.
3. Perform wiring with the power turned off.
4. When connecting wires to the indicator connector part, do so with the female side unplugged.
5. The connectable wire size for the indicator connector part is 0.08 to 1.5 mm^2, and its terminal screw tightening torque is 0.25 N·m.
6. Do not plug or unplug the connector while it is energized.
7. If the stroke of the cylinder type exceeds 10 mm, connect the "Analog Output ON-OFF Selector Switch" to the indicator, connecting its brown wire to the "CYL SW IN" terminal and its blue wire as 0 V.
8. Shielded Wire Processing
   If affected by noise, connect the shielded wire to COM or FG. Normally, connection is not required.

● When Mounting Analog Output Type Cylinder

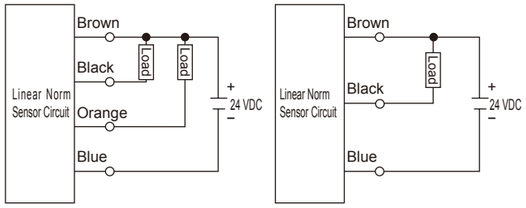


● When Mounting Analog Output Type Gripper



Be sure to connect the orange wire to the blue wire (-).

● Switch Output Type



Separate Amplifier Type　　Amplifier Mounted Type

The output of the switch output type is NPN transistor open collector type.

During Use

1. Common

⚠CAUTION

■Use only a DC safety power supply. Do not connect motors, valves, etc., that generate noise to the power supply used in this device.

■When wiring, be careful not to use the same piping and wiring (multi-core cables, etc.) as the power line of the motor, etc., so that induction noise is not applied to the linear noise sensor. Also, pay attention to the inverter power supply and its wiring. (Ensure the frame ground of the inverter power supply is properly grounded so that noise can escape.)

■Note that noise resistance performance may be adversely affected if the length of the sensor cable or output stage cable lead wire is changed.

■A bend-resistant lead wire is used for the sensor cable and output stage cable. To optimize bend resistant performance, check that the wire is not bent locally and that tension is not applied. Note that compared to the middle section of the load, elasticity drops at the outlet from the sensor case or amplifier unit case and at the M8 connector section because the lead is fixed. Check that repeated bending is not applied to these sections.

■Locations where the operating Ambient Temperature fluctuates suddenly (example: This product cannot be used with localized air conditioning.

■This product cannot be used outdoors or in an atmosphere containing corrosive elements.

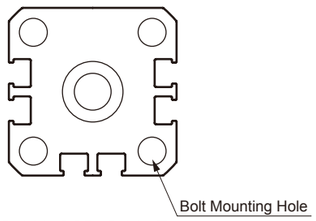
■Select switch output type when conducting rough judgments and analog output type or display when conducting detailed judgments, including length measurement.

2. Analog Output/Indicator Type

⚠CAUTION

■Cylinder equipped

● When fixing the cylinder, use Stainless Steel bolts for cylinder bolt mounting to maintain sensor characteristics. Using iron bolts will cause distortion in the sensor output voltage waveform, increasing the display error of the indicator or reducing the linearity of the analog output voltage. (Although it does not affect repeatability, please check the performance during actual use.) Also, similar phenomena may be observed if a part of the Cylinder Body comes into contact with a magnetic material. Please note that this tendency is particularly noticeable near the LN sensor surface or when an iron plate is shorter than the actuator body.



Ex. SSD-LN, SSD-O-LN Type

● The Linear Norm sensor and the TOH/V (Note) or LN-TH/V switch for analog output voltage ON-OFF switching, or other cylinder switches can be mounted on the same surface if their mounting positions do not interfere with each other.

● Be sure to connect a cylinder switch (TOH/V or LN-TH/V) to extract analog output voltage in an arbitrary 8 mm section (10 mm for indicator type) relative to the cylinder full stroke.

● The sensor tightening torque should be 0.1 to 0.2 N·m, and install so that the sensor mounting screw faces the cylinder head side.

(Note) The switch selected differs depending on the mounted cylinder model, analog output type, and indicator type.

■Hand equipped

● If this gripper is top-mounted using the spigot joint, and the base is a magnetic material such as an iron plate, distortion will occur in the sensor output voltage waveform, increasing the display error of the indicator or reducing the linearity of the analog output voltage. (Although it does not affect repeatability, please check the performance during actual use.) Similar phenomena may be observed if a part of the gripper front/side comes into contact with a magnetic material. Please note that this tendency is particularly noticeable near the LN sensor surface or when an iron plate is shorter than the actuator body. Also, regardless of top, side, or front mounting, use Stainless Steel bolts when fixing the gripper to maintain sensor characteristics.

● The sensor tightening torque should be 0.1 to 0.2 N·m, and install so that the sensor mounting screw faces the finger side.

■Cylinder/hand common items

● For the indicator type, if a load short-circuit current flows to the switch output stage transistor due to wiring mistakes, misconnections, etc., the internal short-circuit protection circuit will operate and cut off the short-circuit current. (At this time, the output indicator lamp (yellow) turns off, and the short-circuit indicator lamp (red) turns on.) To release the short-circuit protection, temporarily cut off the supply current, correct wiring mistakes, etc., and then reapply power. Please note that the protection circuit of this product is effective only against specific incorrect connections and load short circuits, and cannot protect against all incorrect connections.

3. Switch Output Type

⚠CAUTION

■If the operating range is too narrow or if the operating points are incorrectly adjusted when setting the switch output operating position, the output may or may not turn ON. Readjust in this case. It will stabilize by turning the operating range adjustment trimmer clockwise to slightly widen the operating range.

■If load short-circuit current flows to output stage transistors due to wiring errors/connection, the internal short-circuit protection circuit is activated (turns display OFF from ON) and the short-circuit current is cut. To release the short-circuit protection, temporarily cut off the supply power, correct wiring mistakes, etc., and then reapply power. Please note that the protection circuit of this product is effective only against specific incorrect connections and load short circuits, and cannot protect against all incorrect connections.

■Install the sensor at a position where the red lines on the hand and sensor are aligned. Also, the sensor tightening torque should be 0.1 to 0.2 N·m, and ensure the sensor mounting screw faces the finger side.

For precautions during mounting, installation, adjustment, use, and maintenance, refer to "During Use" in this catalog and the CKD Components Product website (https://www.ckd.co.jp/kiki/en/) -> "Model No." -> Instruction Manual.

High Speed Cylinder

Listed Page

Series System Chart 1180

High Energy Absorption Cylinder
HCM Series 1183

High Speed Cylinder
HCA Series 1203

High-Speed System Cylinder

Cylinder capable of high-speed operation and high energy absorption

Reliably absorbs energy even in locations where shock absorber installation is difficult, greatly contributing to shortening equipment cycle time

High-Speed Operation

High energy absorption eliminates the need for shock absorbers

* Use within the allowable shock absorption energy.

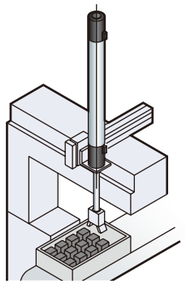
2 Selectable Series

High Energy Absorption Cylinder
HCM Series
Max Speed 2,000 mm/s

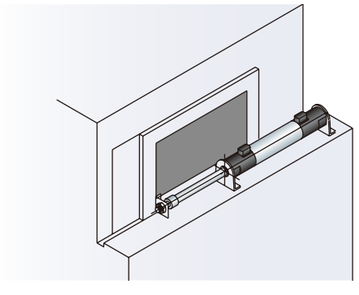
High Speed Cylinder
HCA Series
Max Speed 3,000 mm/s

Application Example

Resin Molding Machine Take-out Robot



For Machine Tool Door Opening/Closing

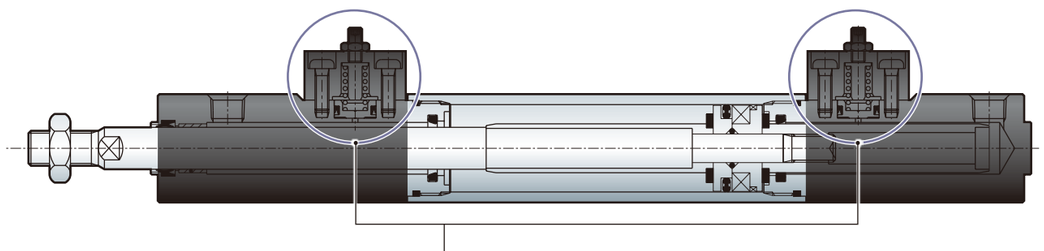


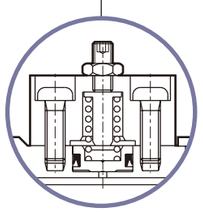
High Energy Absorption Cylinder HCM Series

Bore Size: ø20 to ø63
Max Speed 2000 m/s

Shock absorption capacity 5 times that of conventional cylinders

Particularly excellent characteristics for heavy loads at medium to high speeds.





New Cushion Mechanism Built-in

Achieves smooth stopping at the stroke end. With adjustment mechanism, easily adjustable to a wide range of conditions.

Prevention of jumping out at start

Floating method adopted for cushion. Prevents jumping out due to cracking pressure at start.

Cushion Characteristic Table

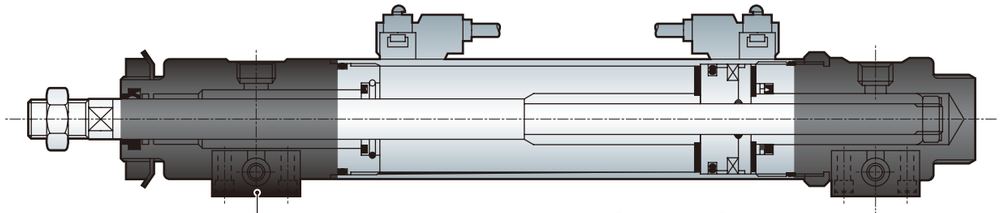
Bore Size (mm)	Allowable Absorption Energy (J)
ø20	3
ø25	5
ø32	9
ø40	14
ø50	23
ø63	30

High Speed Cylinder HCA Series

Bore Size: ø20 to ø100
Max Speed 3000 m/s

Shock absorption capacity 6 to 8 times that of conventional cylinders

Higher speed operation possible at Max speed of 3000 mm/sec.



Cushion adjustment is easy with only relief pressure setting

High Absorption Energy

The compressibility of air works effectively, providing superior shock absorption performance than shock absorbers.

Cushion Characteristic Table

Bore Size (mm)	Allowable Absorption Energy (J)
ø20	7.54
ø25	11.8
ø32	18.6
ø40	29.4
ø50	46.1
ø63	73.5
ø80	118
ø100	184

High Energy Absorption Cylinder HCM Series

●: Standard, ◎: Option, : Not available

Variation	Model No. / Circuit Diagram / Code	Bore Size (mm)	Standard Stroke (mm) 200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000	Min Stroke (mm) *1	Max Stroke (mm)	Intermediate Stroke (per mm)	Mounting Style: Basic type 00	Axial Foot Type LB	Rod side Flange Type FA	Head Side Flange Type FB	Cushion: With Cushion on Both Sides B	With rod side cushion R	With head side cushion H	Without cushion N	Option: Shipped with Switch Rail Attached Q	Piston Rod Material (Stainless Steel) M	Accessories: Single Knuckle I	Double Knuckle Y	Switch	Page
Double Acting, Single Rod Type	HCM	ø20, ø25, ø32	●	●	●	●	●	●	●	●	●	●	●							150	700	1	●	●	●	●	●	●	●	●	◎	◎	◎	◎	◎	1183
		ø40, ø50, ø63	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		1000															

High Speed Cylinder HCA Series

●: Standard, ◎: Option, : Not available

Variation	Model No. / Circuit Diagram / Code	Bore Size (mm)	Standard Stroke (mm) 400	450	500	550	600	650	700	750	800	Stroke (mm) 850	900	950	1,000	Min Stroke (mm) *1	Max Stroke (mm)	Intermediate Stroke (per mm)	Mounting Style: Basic type 00	Axial Foot Type LB	Rod side Flange Type FA	Head Side Flange Type FB	Cushion: With Cushion on Both Sides B	With rod side cushion R	With head side cushion H	Without cushion N	Switch	Page
Double Acting, Single Rod Type	HCA	ø20, ø25, ø32	●	●	●	●	●	●	●							200	700	1	●	●	●	●	●	●	●	●	◎	1203
		ø40, ø50, ø63 ø80, ø100	●	●	●	●	●	●	●	●	●	●	●	●	●		1000										◎	

*1: This product is designed with a longer cushion area than general cylinders to absorb high energy. Therefore, with short strokes, most of it becomes the cushion area, and the effect of high-speed use cannot be obtained.

Model No.	Recommended Stroke
HCM	300 mm Stroke or more
HCA	400 mm Stroke or more

High Speed Type

HCM

High Energy Absorption Cylinder

ø20, ø25, ø32, ø40, ø50, ø63

CONTENTS

Product Introduction	1178
Series System Chart	1180
Variation/Option Combination Availability Table	1184
Operating Principle	1185
●Double Acting, Single Rod Type (HCM)	1186
Accessory External Dimensions	1193
Outer Dimensions Diagram with Switch	1195
Model Selection Guide	1196
⚠Precautions for Use	1200

Variation and Option Item Combination Availability Table

◎ Mark : Option
○ Mark : Custom-made
△ Mark : Manufacturable depending on conditions (please consult)
× Mark : Not available

Category		Category	Variation		Piping thread			Option		
			Double Acting Basic Type		NPT	G		Shipped with Switch Rail Attached	Piston Rod Material (Stainless Steel)	
		Code	None		N	G		Q	M	
Variation	Double Acting Basic Type	Blank		○	○		○	◎	
Piping thread	NPT	N				x		○	○	
	G	G						○	○	
Option	Shipped with Switch Rail Attached	Q							◎	
	Piston Rod Material (Stainless Steel) *1	M								
Accessories	Cylinder Switch	Separately Shown	◎	○	○		◎	◎	
	Single Knuckle	I	◎	○	○		◎	◎	
	Double Knuckle	Y	◎	○	○		◎	◎	

Note: For ø20, 25, Stainless Steel is the standard Piston Rod material. Optionally available for ø32 to ø63 only.

[Model No. Example]

HCM - LB - 40 [ ] B - 500 - T0H - D - Q M

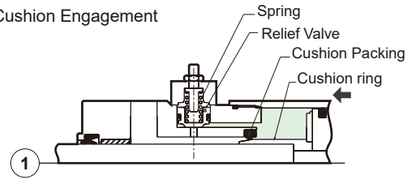
- HCM: Model No.
- LB: ① Mounting Type
- 40: ② Bore Size
- [ ]: Piping thread type
- B: ④ Cushion
- 500: ⑤ Stroke
- T0H: ⑥ Switch Model No.
- D: ⑦ Number of Switches
- Q M: ⑧ Option
  * Fill in from left to right in the table above

Model No.: High Energy Absorption Cylinder
● Variation : Double Acting Basic Type
① mounting style : Axial Foot Type
② Bore Size : ø40 mm
③ Port thread : Rc Thread
④ Cushion : With Cushion on Both Sides
⑤ stroke : 500 mm
⑥ Switch model No. : Solid State TOH Switch, Lead Wire 1 m
⑦ Switch quantity : With 2 pcs
⑧ Option : Shipped with switch rail attached, Piston Rod material (Stainless Steel)

Cushion Operating Principle

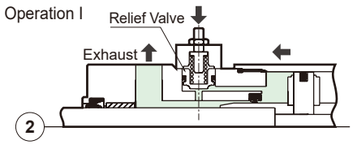
① When the piston operates and the cushion ring rushes into the cushion packing, an airtight space is formed in the [ ]. As the piston moves further, the air at [ ] is compressed and absorbs the kinetic energy in the operating direction.

● Before Cushion Engagement



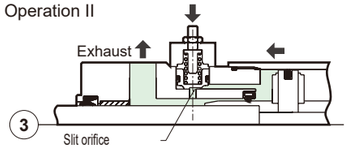
② Simultaneously, the compressed air opens the relief valve, the compressed air is instantly exhausted, and the relief valve closes.

● Cushion Operation I



③ After the relief valve closes, the remaining compressed air is exhausted from the slit orifice, the piston moves, and finally hits the cover, completing the energy absorption stroke.

● Cushion Operation II



High Energy Absorption Cylinder Double Acting, Single Rod Type

HCM Series

●Bore Size: ø20, ø25, ø32, ø40, ø50, ø63

Circuit Diagram Code

RoHS

Model No. Notation

Without switch
(Built-in magnet for switch)

HCM - LB - 40 [ ] B - 500 ——— I

Model No. ❶ ❷ ❸ ❹ ❺ ❾

With Switch
(Built-in magnet for switch)

HCM - LB - 40 [ ] B - 500 - T2H□ - D - Q - I

Model No. ❷ Bore Size ❹ Cushion ❻ Switch Model No. ❽ Option

❶ Mounting type — Piping thread type — ❺ Stroke — ❼ Number of Switches — ❾ Accessories

❶ Mounting type

Mounting bracket is included with the product.

Code	Content	
00	Basic type	
LB	Axial Foot Type (Double Side)	
FA	Rod side Flange Type	
FB	Head Side Flange Type	

❷ Bore Size (mm)

Code	Content
20	ø20
25	ø25
32	ø32
40	ø40
50	ø50
63	ø63

❸ Piping thread type

Code	Content
Blank	Rc Thread
NN	NPT Thread (Custom Order Product)
GN	G thread (Custom product)

❹ Cushion

Code	Content
B	With Cushion on Both Sides
R	With rod side cushion
H	With head side cushion
N	Without cushion

❺ Stroke (mm)

Bore Size	Stroke	Intermediate Stroke	Recommended Stroke
ø20 to ø32	150 to 700	in 1mm increments	300 mm or more
ø40 to ø63	150 to 1000		

Note: This product is designed with a longer cushion area than general cylinders to absorb high energy. Therefore, with short strokes, most of it becomes the cushion area, and the effect of high-speed use cannot be obtained.

❻ Switch Model No.

For switch details, refer to P. 1457. Switches are shipped with the product.

Contact	Indicator LED Special Function	Wiring (Output)	Load Voltage (V) AC	Load Voltage (V) DC	Load Current (mA) AC	Load Current (mA) DC	Lead wire *1 Straight	Lead wire *1 L-shape	
Solid State	1-Color	2-wire	85 to 265	—	5 to 100	—	T1H□	T1V□	
			—	10 to 30	—	5 to 20 *2	T2H□	T2V□	
		3-wire (NPN)	—	30 or less	—	100 or less	T3H□	T3V□	
		3-wire (PNP)	—		—		T3PH□	T3PV□	
	2-Color	2-wire	—	24 ± 10%	—	5 to 20	T2WH□	T2WV□	
		3-wire (NPN)	—	30 or less	—	50 or less	T3WH□	T3WV□	
	2-Color Improved Water Resistance	2-wire	—	24 ± 10%	—	5 to 20	T2WLH□	T2WLV□	*3
	2-Color for AC Magnetic Field		—	24 ± 10%	—		T2YD□	–	
			—		—		T2YDT□	–	
	1-Color Off-Delay Type		—	10 to 30	—	5 to 20 *2	T2JH□	T2JV□	
	1-Color Flexible Lead Wire Type		—	10 to 30	—		T2HR3	T2VR3	
Reed	1-Color	2-wire	110	12/24	7 to 20	5 to 50	T0H□	T0V□	
	Without Indicator Lamp		110	5/12/24	20 or less	50 or less	T5H□	T5V□	
	1-Color		110/220	12/24	7 to 20 / 7 to 10	5 to 50	T8H□	T8V□	

*1: For "□" in the switch Model No., enter the code selected from the "Lead wire length, connector specification" table.
*2: The maximum load current value above, 20 mA, is at 25°C. If the switch operating Ambient Temperature is higher than 25°C, it will be lower than 20 mA. (At 60°C, it will be 5 to 10 mA.)
*3: This does not guarantee the water resistance of the cylinder.
*4: Switches other than the Model No.s listed above are also available. (Custom Product) For details, refer to P. 1457.

*Lead wire length, connector specification

Code	Content
Blank	1 m (Standard)
3	3 m (Option)
5	5 m (Option)
W	M8 Connector, 1PIN (+) 4PIN (-) Lead Wire 0.3 m

*5

*5: Only T2WLH and T2WLV can be selected.

Example) Lead wire length
1 m T0H
3 m T0H3
5 m T0H5

❼ Number of Switches

Code	Content
R	With 1 pc on rod side
H	With 1 pc on head side
D	With 2 pcs

❽ Option

Code	Content
Q	Shipped with Switch Rail Attached
M	Piston Rod Material (Stainless Steel)

*1

*1: ø20, ø25 cannot be selected. (Stainless Steel is the standard Piston Rod material.)

❾ Accessories

Code	Content	
I	Single Knuckle	
Y	Double Knuckle (Pin and Retaining Ring included)	

Note: "I" and "Y" cannot be selected at the same time.

Switch Single Unit Model No. Notation

● Switch body + mounting rail set

HCM - T0H - D - 40 - 100

❻ Switch Model No. — ❼ Number of Switches — ❷ Bore Size — ❺ Stroke (*1)

● Switch only

SW - T0H

❻ Switch Model

●Mounting Rail Only

HCM - T - 40 - 100

Mounting Rail — ❷ Bore Size (*1) (*2) — ❺ Stroke

*1: Indicate × if the stroke exceeds 300 mm. For strokes exceeding 300 mm, one short rail (switch adjustment travel distance 100 mm) is included per switch.
*2: When indicating x for mounting rail only, order the same number of rails as the number of switches used.

Specifications

Item			HCM					
Bore Size		mm	ø20	ø25	ø32	ø40	ø50	ø63
Actuation method			Double Acting Type					
Operating Fluid			Compressed Air					
Max Operating Pressure		MPa	1.0					
Min Operating Pressure		MPa	0.15					
Proof Pressure		MPa	1.6					
Ambient Temperature		°C	-10 to 60 (No freezing)					
Port Size			Rc1/8	Rc1/8	Rc1/4	Rc1/4	Rc3/8	Rc3/8
Stroke Tolerance		mm	$^{+2.0}_{0}$					
Operating Piston Speed		mm/s	50 to 2000 (Use within the allowable absorption energy.)					
Cushion			With Air Cushion					
Lubrication			Not Required (When lubricating, use turbine oil Class 1 ISO VG32)					
Allowable Absorption Energy *1	With air cushion	J	3	5	9	14	23	30
Effective air cushion length		mm	56.5	56.5	56.5	55.5	58.5	58.5

***1: If kinetic energy exceeds these values, consider using a separate shock absorber. For energy calculation and size selection, refer to P. 1196 to 1199.**

Stroke

Bore Size (mm)	Standard Stroke (mm)	Maximum Stroke (mm)	Min Stroke (mm)	Recommended Stroke (mm)
ø20 to ø32	200 to 700	700	150	300 or more
ø40 to ø63	200 to 1000	1000		

*1: Intermediate strokes can be manufactured in 1 mm increments.
*2: This product is designed with a longer cushion area than general cylinders to absorb high energy. Therefore, with short strokes, most of it becomes the cushion area, and the effect of high-speed use cannot be obtained.

Cylinder Weight

(Unit: kg)

Bore Size		mm	ø20	ø25	ø32	ø40	ø50	ø63
Product Weight at 0 mm Stroke	Basic Type	(00)	0.33	0.47	0.62	0.98	1.58	2.27
	Axial Foot Type	(LB)	0.44	0.6	0.78	1.2	2.06	2.99
	Flange Type	(FA/FB)	0.36	0.51	0.68	1.06	1.92	2.77
Switch Weight (per piece)			Refer to the weight listed in the switch specifications on P. 1457.					
Additional Weight per 100 mm Stroke without Switch Rail			0.012	0.016	0.017	0.027	0.040	0.044
Additional Weight per 100 mm Stroke with Switch Rail			0.014	0.018	0.019	0.029	0.042	0.046

Calculation Example
Product Weight of HCM-LB-40B-500-T2H-D

Product weight for 0 mm stroke 1.2 kg
Additional weight when 500 mm $0.029 \times \frac{500}{100} = 0.145$ kg
Weight of 2 switches $0.018 \times 2 = 0.036$ kg
Product weight $1.2+0.145+0.036=1.381$ kg

Theoretical Thrust Table

(Unit: N)

Bore Size (mm)	Operating Direction	Operating Pressure MPa									
		0.15	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
ø20	Push	47.1	62.8	94.2	1.26×10^2	1.57×10^2	1.88×10^2	2.20×10^2	2.51×10^2	2.83×10^2	3.14×10^2
	Pull	35.3	47.1	70.7	94.2	1.18×10^2	1.41×10^2	1.65×10^2	1.88×10^2	2.12×10^2	2.36×10^2
ø25	Push	73.6	98.2	1.47×10^2	1.96×10^2	2.45×10^2	2.95×10^2	3.44×10^2	3.93×10^2	4.42×10^2	4.91×10^2
	Pull	56.7	75.6	1.13×10^2	1.51×10^2	1.89×10^2	2.27×10^2	2.64×10^2	3.02×10^2	3.40×10^2	3.78×10^2
ø32	Push	1.21×10^2	1.61×10^2	2.41×10^2	3.22×10^2	4.02×10^2	4.83×10^2	5.63×10^2	6.43×10^2	7.24×10^2	8.04×10^2
	Pull	1.04×10^2	1.38×10^2	2.07×10^2	2.76×10^2	3.46×10^2	4.15×10^2	4.84×10^2	5.53×10^2	6.22×10^2	6.91×10^2
ø40	Push	1.88×10^2	2.51×10^2	3.77×10^2	5.03×10^2	6.28×10^2	7.54×10^2	8.80×10^2	1.01×10^3	1.13×10^3	1.26×10^3
	Pull	1.58×10^2	2.11×10^2	3.17×10^2	4.22×10^2	5.28×10^2	6.33×10^2	7.39×10^2	8.44×10^2	9.50×10^2	1.06×10^3
ø50	Push	2.95×10^2	3.93×10^2	5.89×10^2	7.85×10^2	9.82×10^2	1.18×10^3	1.37×10^3	1.57×10^3	1.77×10^3	1.96×10^3
	Pull	2.47×10^2	3.30×10^2	4.95×10^2	6.60×10^2	8.25×10^2	9.90×10^2	1.15×10^3	1.32×10^3	1.48×10^3	1.65×10^3
ø63	Push	4.68×10^2	6.23×10^2	9.35×10^2	1.25×10^3	1.56×10^3	1.87×10^3	2.18×10^3	2.49×10^3	2.81×10^3	3.12×10^3
	Pull	4.20×10^2	5.61×10^2	8.41×10^2	1.12×10^3	1.40×10^3	1.68×10^3	1.96×10^3	2.24×10^3	2.52×10^3	2.80×10^3

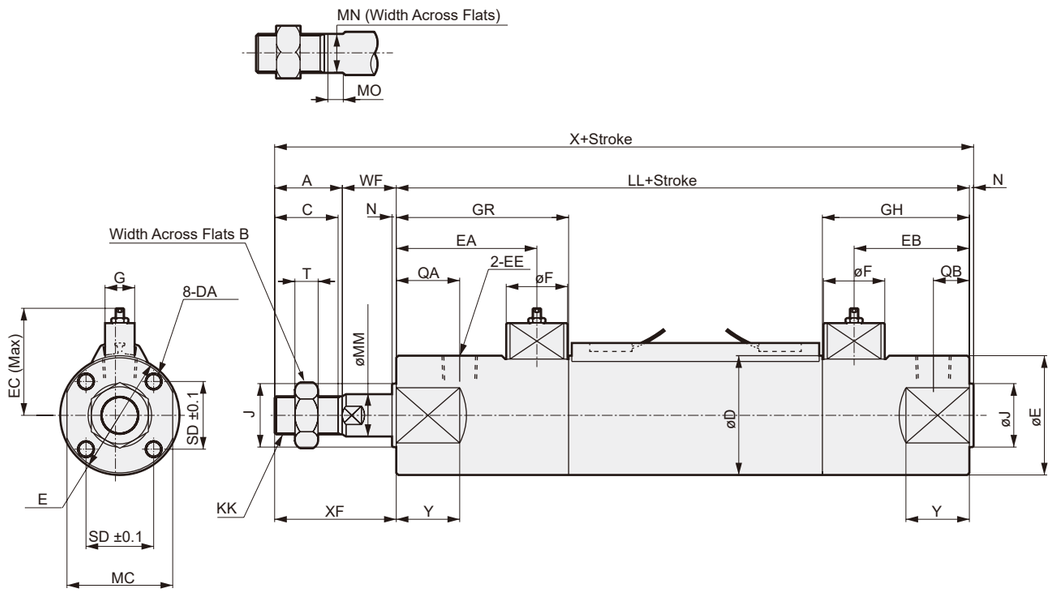
Mounting Bracket Model No.

Bore Size / Mounting Style	Foot (LB)	Flange (FA/FB)
ø20	**HCM-LB-20**	**HCM-FA-20**
ø25	**HCM-LB-25**	**HCM-FA-25**
ø32	**HCM-LB-32**	**HCM-FA-32**
ø40	**HCM-LB-40**	**HCM-FA-40**
ø50	**HCM-LB-50**	**HCM-FA-50**
ø63	**HCM-LB-63**	**HCM-FA-63**

*1: Foot type mounting brackets are 2 pcs/set.
*2: Mounting bolts are included with each mounting bracket.

Dimensional Drawings

● Basic type (00)



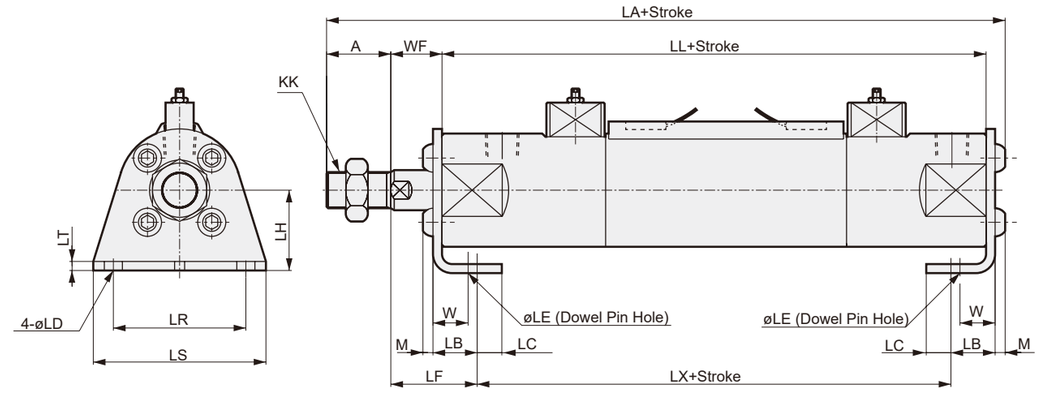
Code / Bore Size	A	B	C	D	DA	E	EA	EB	EC	EE	F	G	J	KK	LL
ø20	18	13	16	26	M4 Depth 8	28	52	43	32.7	Rc1/8	29	14	13	M8	164
ø25	20	17	18	31	M5 Depth 9	31	56.5	47.5	34.5	Rc1/8	29	14	15	M10X1.25	173
ø32	20	17	18	37	M5 Depth 9	37	56.5	47.5	37.8	Rc1/4	29	14	18	M10X1.25	173
ø40	26	22	24	46	M6 Depth 10	46	62	51	47.3	Rc1/4	29	14	25	M14X1.5	186
ø50	32	27	30	56.4	M8 Depth 12	56.4	66.5	54.5	52.6	Rc3/8	29	14	30	M18X1.5	196
ø63	32	27	30	69.4	M10 Depth 15	69.4	66.5	54.5	59.3	Rc3/8	29	14	32	M18X1.5	196

Code / Bore Size	MC	MM	MN	MO	N	QA	QB	SD	T	WF	X	XF	Y	GR	GH
ø20	24	10	8	5	2	18	10	14	5	15.5	199.5	33.5	20	67	58
ø25	27	12	10	6	2	20	10	16.5	6	17	212	37	20	71.5	62.5
ø32	32	12	10	6	2	20	12	20	6	17	212	37	28	71.5	62.5
ø40	41	16	14	7	2	26	14	26	8	20.5	234.5	46.5	28	77	66
ø50	50	20	17	8	2	30	17	32	11	25.5	255.5	57.5	30	81.5	69.5
ø63	60	20	17	8	2	30	17	38	11	25.5	255.5	57.5	30	81.5	69.5

*1: For ø20 only, tube outer diameter øD and cover outer diameter øE are different.
***2: For outer dimensions diagram of accessories, refer to P. 1193.**
***3: For dimensions of models with switches, see P. 1195.**

Dimensional Drawings

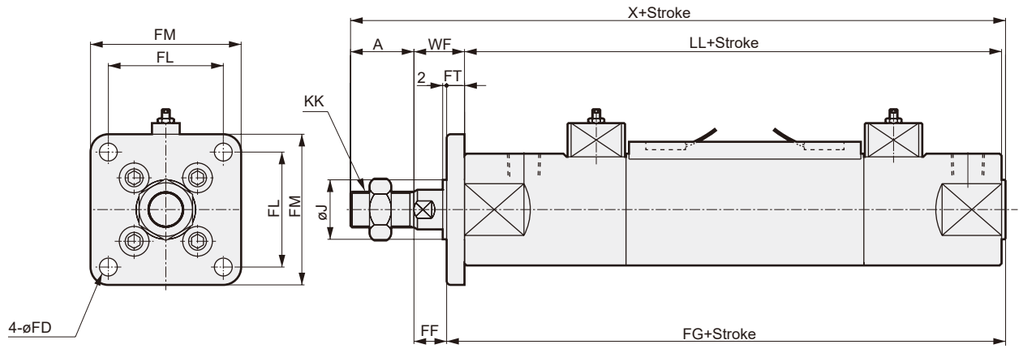
● Axial Foot Type (LB)



Code / Bore Size	A	KK	LA	LB	LC	LD	LE	LF	LH	LL	LR	LS	LT	LX	M	W	WF
ø20	18	M8	203.3	15.1	7.1	5.7	4	27	20	164	32	44	3.2	140.2	2.6	10	15.5
ø25	20	M10X1.25	216.6	15.1	7.1	5.7	4	28.9	22	173	36	49	3.2	149.2	3.4	10	17
ø32	20	M10X1.25	216.6	16.1	8.1	6.8	4	29.9	25	173	44	58	3.2	147.2	3.4	10	17
ø40	26	M14X1.5	239.7	16.6	9.1	6.8	4	33.9	30	186	54	71	3.2	159.2	4	10	20.5
ø50	32	M18X1.5	263	22	11	9	5	43	40	196	66	86	4.5	161	5	17.5	25.5
ø63	32	M18X1.5	263	22	13	11	5	43	45	196	82	106	4.5	161	5	17.5	25.5

***1: For the external dimensions diagram of accessories, please refer to P. 1193.**
***2: For dimensions of models with switches, see P. 1195.**

● Rod Side Flange Type (FA)

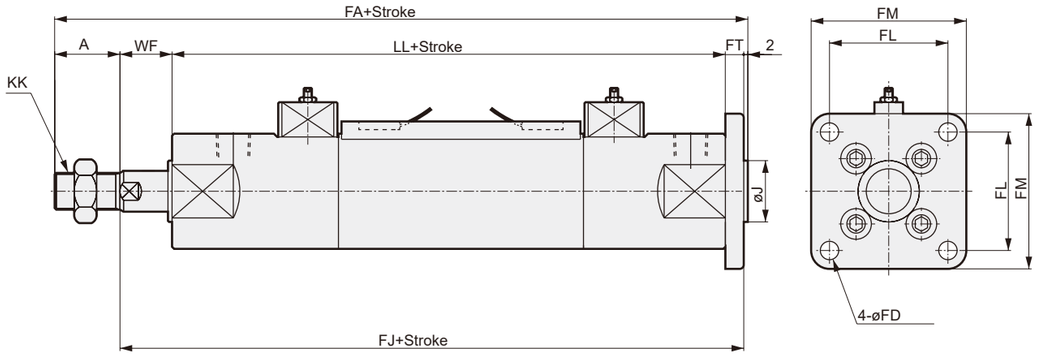


Code / Bore Size	A	FD	FF	FG	FL	FM	FT	J	KK	LL	WF	X
ø20	18	5.5	9.5	172	28	40	6	13	M8	164	15.5	199.5
ø25	20	5.5	10	182	32	44	7	15	M10X1.25	173	17	212
ø32	20	6.6	10	182	38	53	7	18	M10X1.25	173	17	212
ø40	26	6.6	12.5	196	46	61	8	25	M14X1.5	186	20.5	234.5
ø50	32	9	16.5	207	58	76	9	30	M18X1.5	196	25.5	255.5
ø63	32	11	16.5	207	70	92	9	32	M18X1.5	196	25.5	255.5

*1: For ø20 only, tube outer diameter øD and cover outer diameter øE are different.
***2: For outer dimensions diagram of accessories, refer to P. 1193.**
***3: For dimensions of models with switches, see P. 1195.**

Dimensional Drawings

● Head Side Flange Type (FB)



Code / Bore Size	A	FA	FD	FJ	FL	FM	FT	J	KK	LL	WF
ø20	18	205.5	5.5	185.5	28	40	6	13	M8	164	15.5
ø25	20	219	5.5	197	32	44	7	15	M10X1.25	173	17
ø32	20	219	6.6	197	38	53	7	18	M10X1.25	173	17
ø40	26	242.5	6.6	214.5	46	61	8	25	M14X1.5	186	20.5
ø50	32	264.5	9	230.5	58	76	9	30	M18X1.5	196	25.5
ø63	32	264.5	11	230.5	70	92	9	32	M18X1.5	196	25.5

*1: For ø20 only, tube outer diameter øD and cover outer diameter øE are different.

***2: For the external dimensions diagram of accessories, please refer to P. 1193.**

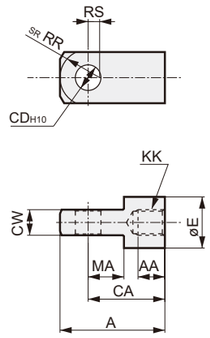
***3: For dimensions of models with switches, see P. 1195.**

Accessory External Dimensions

Single Knuckle

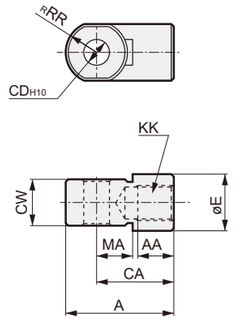
● HCM-I-ø20 to ø25

Material: Steel, Zinc Chromate



● HCM-I-ø40 to ø63

Material: Cast Iron

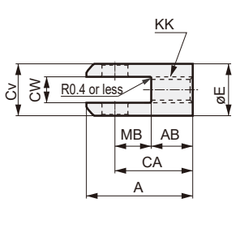


Model No.	Applicable Bore Size (mm)	A	AA	CA	CD	CW	E	KK	MA	RR	RS	Weight (g)
HCM-I-20	20	34	8.5	25	8	8 $^{-0.2}_{-0.4}$	16	M8	11.5	13.4	3.1	39
HCM-I-25	25/32	41	10.5	30	10	10 $^{-0.2}_{-0.4}$	20	M10×1.25	14	17.1	4.5	72
HCM-I-40	40	42	14	30	10	18 $^{-0.3}_{-0.5}$	22	M14×1.5	14	12	–	152
HCM-I-50	50, 63	56	18	40	14	22 $^{-0.3}_{-0.5}$	28	M18×1.5	20	16	–	158

Double Knuckle

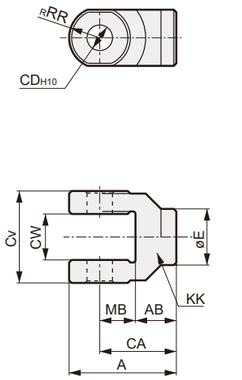
● HCM-Y-ø20 to ø25

Material: Steel, Zinc Chromate



● HCM-Y-ø40 to ø63

Material: Cast Iron

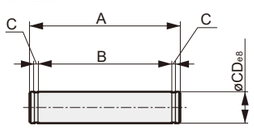


Model No.	Applicable Bore Size (mm)	A	AB	CA	CD	Cv	CW	E	KK	MB	RR	RS	Weight (g)	Applicable Pin Model No.
HCM-Y-20	20	34	13.5	25	8	16	8 $^{+0.2}_{+0.4}$	16	M8	11.5	13.4	3.1	46	HCM-P-20
HCM-Y-25	25/32	41	16	30	10	20	10 $^{+0.2}_{+0.4}$	20	M10×1.25	14	17.1	4.5	85	HCM-P-25
HCM-Y-40	40	42	16	30	10	36	18 $^{+0.3}_{+0.5}$	22	M14×1.5	14	12	–	122	HCM-P-40
HCM-Y-50	50, 63	56	20	40	14	44	22 $^{+0.3}_{+0.5}$	28	M18×1.5	20	16	–	258	HCM-P-50

Note: Pin and snap ring are attached to the double knuckle.

Pin for Knuckle

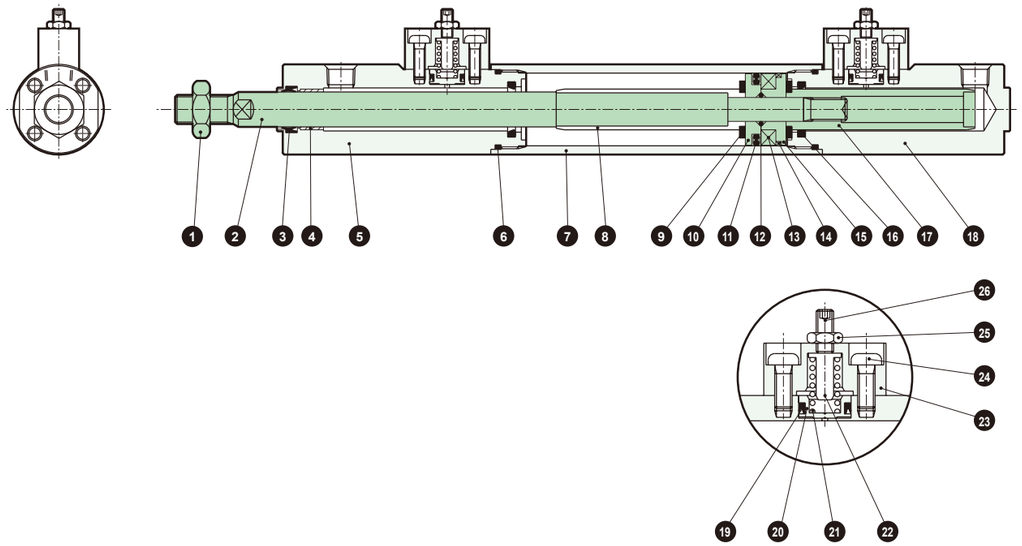
Material: Steel, Zinc Chromate



Model No.	Applicable Bore Size (mm)	A	B	C	CD	Weight (g)	Retaining Ring Used
HCM-P-20	20	21	16.2	0.9	8	9	Shaft C-type 8
HCM-P-25	25/32	25.6	20.2	1.15	10	16	C-type for Shaft 10
HCM-P-40	40	41.6	36.2	1.15	10	26	C-type for Shaft 10
HCM-P-50	50, 63	50.6	44.2	1.15	14	60	C-type 14 for Shaft

Note: Pin and snap ring are attached to the double knuckle.

Internal Structure Diagram/Material



Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Rod Nut	Steel	Nickel Plating	14	Wear ring	Polyacetal	
2	Piston Rod	ø20, ø25: Stainless Steel ø32 to ø63: Steel	Industrial Hard Chrome Plating	15	Piston (H)	Aluminum Alloy	Chromate
3	Rod Packing	Nitrile Rubber		16	Cushion Packing	ø20 to ø32: Urethane ø40 to ø63: Urethane, Steel	
4	Bushing	Oil-Impregnated Bearing Alloy		17	Cushion Ring (H)	Aluminum Alloy	Chromate
5	Rod Cover	Aluminum Alloy	Black alumite	18	Head Cover	Aluminum Alloy	Black alumite
6	Cylinder Gasket	Nitrile Rubber		19	Relief Valve Packing	Nitrile Rubber	
7	Cylinder Tube	Aluminum Alloy	Hard Anodized	20	Relief Valve	Copper Alloy	
8	Cushion Ring (R)	Aluminum Alloy	Chromate	21	Spring	Piano Wire	Electrodeposition Coating
9	Cushion Rubber	Urethane Rubber		22	Spring Collar	Steel	Chromate
10	Piston (R)	Aluminum Alloy	Chromate	23	Relief Valve Retainer	Aluminum Alloy	Black alumite
11	Piston Packing	Nitrile Rubber		24	Cross-Recessed Pan Head Screw	Steel	Zinc Chromate
12	Piston Gasket	Nitrile Rubber	ø25 to ø63 only	25	Hexagon Nut	Steel	Black Oxide
13	Magnet	Plastic		26	Hexagon Socket Set Screw	Steel	Black Oxide

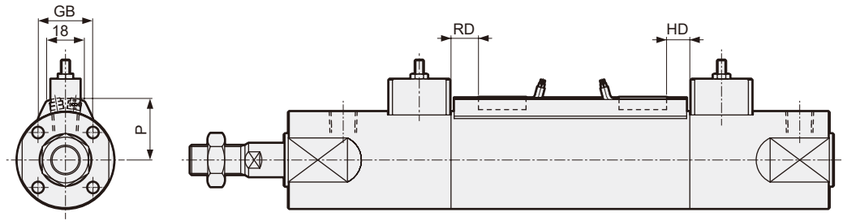
Mounting Bracket Material/Treatment

Mounting Style	Material	Treatment
Foot (LB)	Steel	Zinc Chromate
Flange (FA, FB)	ø20 to ø40: Aluminum Alloy ø50, ø63: Steel	ø20 to ø40: Black Alumite ø50, ø63: Zinc Chromate

For maintenance parts, please visit the CKD Equipment Product Site (https: //www.ckd.co.jp/kiki/en/) → "model No." → Maintenance Parts.

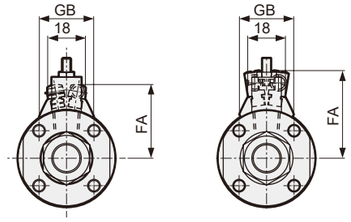
HCM Series Outline Dimension Drawing with Switch

● T0H/V, T5H/V, T2H/V, T3H/V, T3PH/V, T2WH/V, T3WH/V, T2WLH/V, T2H/VR3



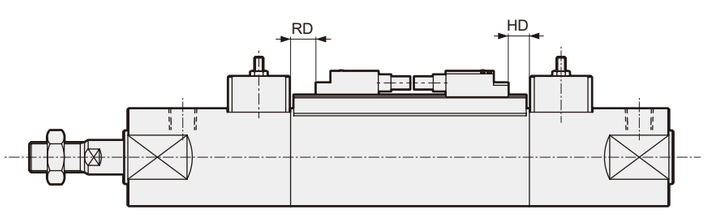
Code / Bore Size	GB	P	T0,T5,T2,T3,T3P		T2W, T3W, T2WL	
			RD	HD	RD	HD
ø20	23	19.5	10	10	12	12
ø25	24.4	22	11	9	13	11
ø32	25	25	11	9	13	11
ø40	25.7	29.5	13	11	15	13
ø50	26.2	34.7	14	12	16	14
ø63	26.5	41.2	14	12	16	14

● T8H/V, T1H/V, T2JH/V, T2YD, T2YDT



[For T8H/V, T2JH/V]

[For T1H/V, T2YD, T2YDT]



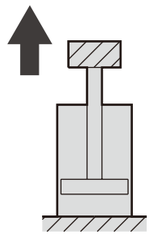
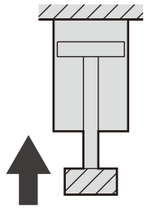
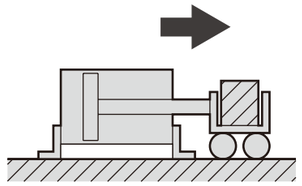
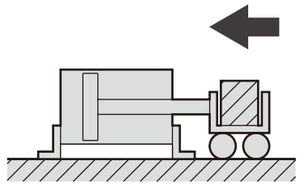
Code / Bore Size	GB	T8			T1,T2YD,T2YDT			T2J		
		FA	RD	HD	FA	RD	HD	FA	RD	HD
ø20	23	24.0	4	4	29.5	9	9	24.0	9	9
ø25	24.4	26.5	5	3	32.0	10	8	26.5	10	8
ø32	25	29.5	5	3	35.0	10	8	29.5	10	8
ø40	25.7	34.0	7	5	39.5	12	10	34.0	12	10
ø50	26.2	39.2	8	6	44.7	13	11	39.2	13	11
ø63	26.5	45.7	8	6	51.2	13	11	45.7	13	11

Cylinder and System Model Selection Guide

This varies slightly depending on usage conditions, so please use it as a guideline only.

STEP-1 Confirmation of operating conditions

① Load weight M (kg)
② Stroke St (mm)
③ Travel time T (s)
④ Cylinder average speed V0 (m/s)
V0 = St / (T×1000)
⑤ Operating Pressure P (MPa)
⑥ Mounting Method/Direction

A	B	C	D
Vertical Upward Push Operation	Vertical Downward Retraction Operation	Horizontal Push Operation	Horizontal Retraction Operation
			

Note: In the case of vertical lowering, cylinder thrust is hardly required. Select the cylinder size on the rising side that requires thrust.

STEP-2 Approximate Cylinder Size Selection

① Set the load factor (α) according to the piston speed.
For high speed operation (1 to 2 m/s) α=20%
For medium speed operation (1 m/s or less) α=50%

② Calculate the required cylinder thrust (F).

$$F(N)=\frac{980\times M\times \mu}{\alpha}$$

M: Payload (kg)
α: Load factor (%)
μ: Coefficient of friction
Mounting Method C/D Horizontal Rolling = 0.1
Mounting Method A/B Vertical Up/Down = 1

③ Determine the cylinder Bore Size (D).

$$D\ (mm)=\sqrt{\frac{F}{0.25\times P\times \pi}}$$

P: Operating Pressure (MPa)
F: Required cylinder thrust (N)

④ Select a size larger than the value obtained in "③".

Size	Cylinder Bore Size (mm)
ø20	20
ø25	25
ø32	32
ø40	40
ø50	50
ø63	63

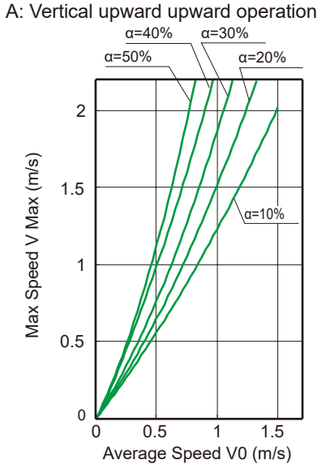
STEP-3 Calculation of Max Speed

● [Step 1] working conditions (average speed V0/mounting method/direction) and [Step 2] Find maximum speed (Vmax) in Graph 1 according to load factor α of . If the Max speed (Vmax) exceeds 2 m/s, return to [Step 1] and lower the average speed V0.

[Graph-1]

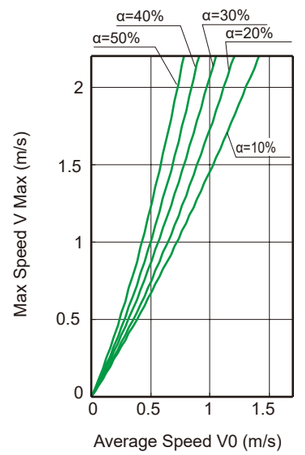
For Mounting Method/Direction A

A: Vertical upward upward operation



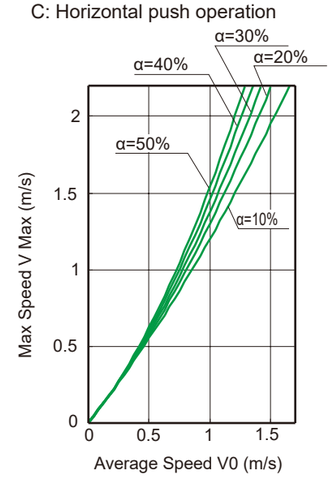
For Mounting Method/Direction B

B: Vertical downward upward operation



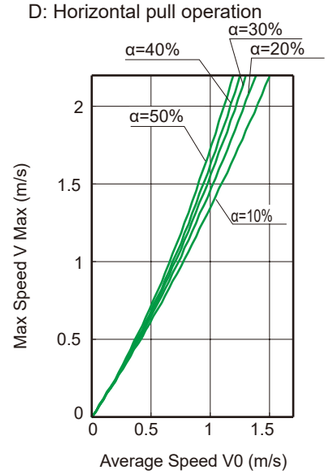
For Mounting Method/Direction C

C: Horizontal push operation



For Mounting Method/Direction D

D: Horizontal pull operation



This is for when Operating Pressure P = 0.5 MPa and piping length is Approx. 2 m.
Please use as a guideline if using under other conditions.

STEP-4 Confirmation of cushion capacity

● Check if the kinetic energy generated by movement of load is absorbed by the cylinder cushion.

Calculate the kinetic energy (E1) from the load weight M in [Step 1] and the Max speed Vmax obtained in [Step 3].

$E1(J) = 0.5\times(Vmax)^2\times M$

• E1 must be less than or equal to the allowable absorption energy E2 in Table 1. When E1>E2, decrease average speed V_0 or install an external shock absorber (Shock Absorbers).

[Table 1]

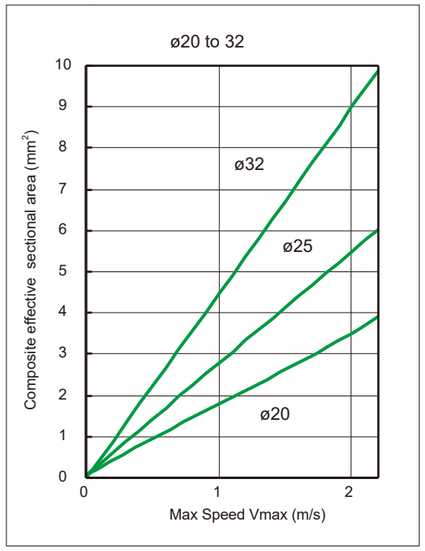
Bore Size	Allowable Absorption Energy E2 (J)
ø20	3
ø25	5
ø32	9
ø40	14
ø50	23
ø63	30

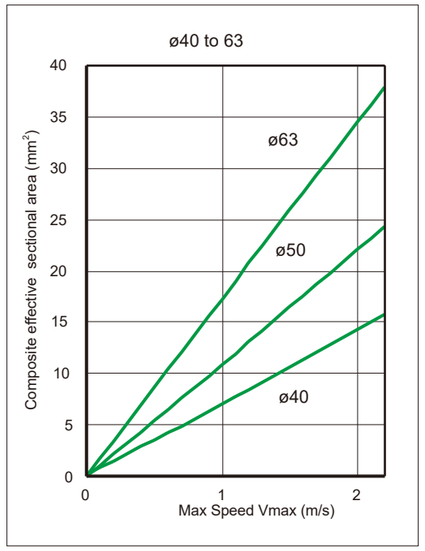
Note: Energy is absorbed during vertical upward retraction operation and vertical downward push operation, but smooth stopping is not possible. If smooth stopping (no bouncing, etc.) is required, use a load factor of 10% or less and a maximum speed of 1 m/s or less as a guide.

STEP-5 Calculation of Required Combined Effective Cross-sectional Area

Determine the required effective cross-sectional area S given the Max speed Vmax obtained in [Step 3] and the cylinder Bore Size obtained in [Step 2].

[Graph 2]





STEP-6 System Circuit Selection

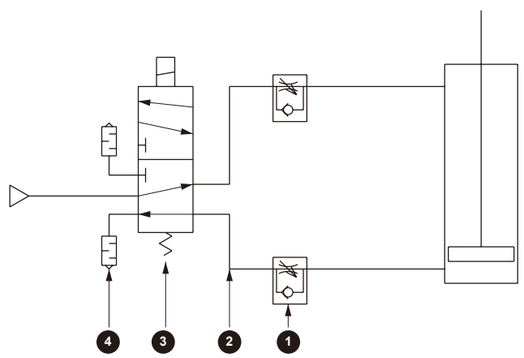
● Select the system circuit using [Table 2]] from the required combined effective cross-sectional area obtained in <Step 5>.

[Table 2] The code S in the table represents the individual effective cross-sectional area (mm^2).

Combined Effective Cross-sectional Area (mm^2)	Solenoid Valve								Speed Controller		Silencer		Piping (Piping Length 2 m)
	Direct Type				Sub-plate Type								
	Single solenoid	S	Double Solenoid	S	Single solenoid	S	Double Solenoid	S		S		S	
1.2	4KA110-M5 4GA110R-M5	3	4KA120-M5 4GA120R-M5	3	4KB110-06 4GB110R-06	4	4KB120-06 4GB120R-06	4	SC3W-6-4	2.8	SLW-6A	10	ø4×ø2.5
2	4KA110-M5 4GA110R-M5	3	4KA120-M5 4GA120R-M5	3					SC3W-6-6	3.6	SLW-6A	10	ø6×ø4
2.3					4KB110-06 4GB110R-06	4	4KB120-06 4GB120R-06	4	SC3W-6-6	3.6	SLW-6A	10	ø6×ø4
3.1	4KA210-06 4GA210R-06	13	4KA220-06 4GA220R-06	12.5					SC3W-6-8	3.6	SLW-6A	10	ø8×ø5.7
3.2					4KB210-06 4GB210R-06	14	4KB220-06 4GB220R-06	14	SC3W-6-8	3.6	SLW-6A	10	ø8×ø5.7
3.6	4KA210-06 4GA210R-06	13	4KA220-06 4GA220R-06	12.5					SC1-6	8	SLW-6A	10	ø6×ø4
3.7					4KB210-06 4GB210R-06	14	4KB220-06 4GB220R-06	14	SC1-6	8	SLW-6A	10	ø6×ø4
5	4KA210-06 4GA210R-06	13	4KA220-06 4GA220R-06	12.5	4KB210-06 4GB210R-06	14	4KB220-06 4GB220R-06	14	SC1-6	8	SLW-6A	10	ø8×ø5.7
5.3					4KB210-08 4GB210R-08	14	4KB220-08 4GB220R-08	14	SC3W-8-8	7	SLW-8A	20	ø8×ø5.7
5.9					4KB210-08 4GB210R-08	14	4KB220-08 4GB220R-08	14	SC3W-8-10	7	SLW-8A	20	ø10×ø7.2
6.1	4F210-08	18	4F220-08	18					SC3W-8-10	7	SLW-8A	20	ø10×ø7.2
6.4	4KA310-08 4GA310R-08	25	4KA320-08 4GA320R-08	25	4KB310-08 4GB310R-08	28	4KB320-08 4GB320R-08	28	SC3W-8-10	7	SLW-8A	20	ø10×ø7.2
6.5	4KA210-06 4GA210R-06	13	4KA220-06 4GA220R-06	12.5					SC1-8	13	SLW-6A	10	ø10×ø7.2
6.9					4KB210-08 4GB210R-08	14	4KB220-08 4GB220R-08	14	SC1-8	13	SLW-8A	20	ø8×ø5.7
8.5					4F210-08	18	4F220-08	18	SC1-8	13	SLW-8A	20	ø10×ø7.2
9	4KA310-08 4GA310R-08	25	4KA320-08 4GA320R-08	25	4KB310-08 4GB310R-08	28	4KB320-08 4GB320R-08	28	SC1-8	13	SLW-8A	20	ø10×ø7.2
9.9	4F310-10	32	4F320-10	32					SC3W-10-10	15	SLW-8A	20	ø10×ø7.2
10	4KA410-10 4GA410-10	50	4KA420-10 4GA420-10	50	4KB410-10 4GB410-10	60	4KB420-10 4GB420-10	60	SC3W-10-10	15	SLW-8A	20	ø10×ø7.2
11	4KA410-10 4GA410-10	50	4KA420-10 4GA420-10	50	4KB410-10 4GB410-10	60	4KB420-10 4GB420-10	60	SC3W-10-12	15	SLW-8A	20	ø12×ø8.9
13					4F410-10	32	4F420-10	32	SC1-10	25	SLW-8A	20	ø12×ø8.9
15.8					4F510-10	47	4F520-10	47	SC1-10	25	SLW-10A	30	ø12×ø8.9
17					4F510-10	47	4F520-10	47	SC1-10	25	SLW-10A	30	ø15×ø11.5
19.6					4F510-10	47	4F520-10	47	SC1-15	36	SLW-10A	30	ø15×ø11.5
20					4F610-15	90	4F620-15	90	SC1-15	36	SLW-15A	40	ø12×ø8.9
24					4F610-15	90	4F620-15	90	SC1-15	36	SLW-15A	40	ø15×ø11.5
30					4F610-15	90	4F620-15	90	SC-20A	110	SLW-15A	40	ø15×ø11.5
41					4F610-15	90	4F620-15	90	SC-20A	110	SL-15A	92	ø15×ø11.5
45					4F610-15	90	4F620-15	90	SC-20A	110	SL-20A	160	ø15×ø11.5

[Circuit Diagram]

1. Speed Controller
2. Piping
3. Solenoid Valve
4. Silencer



To Use This Product Safely

Be sure to read this before use. For general cylinder information, see Intro 41, and for Cylinder Switches, see P. 1512.

Individual Precautions: High Energy Absorption Cylinder HCM Series

Design / Selection

⚠CAUTION

■ Although the cylinder port is designed to achieve speeds of 2000 mm/s or more, be sure to mount a speed controller in order to use it within the specified range.

■ The Max speed for the working piston is 2000 mm/s, which is not the average speed.

■ Avoid using the product so as to apply lateral load to the Piston Rod of the cylinder. If a lateral load is applied, the desired speed cannot be obtained, and the bearing part will wear unevenly, significantly reducing performance.

■ Cushion
The air cushion absorbs kinetic energy that the piston generates by using air compressibility and prevents the piston and cover from colliding at the stroke end. Therefore, note that it is not a function for reducing the piston speed near the stroke end.

■ Consider the system selection guide of the cylinder only as a guideline, as it may vary depending on the operating conditions (Operating Pressure, travel method and direction of the load and piping length).

■ Operating the cylinder at high speed increases the instantaneous flow rate of the air, allowing drainage to accumulate more easily. Install an air tank to prevent drain from entering the cylinder and prevent pressure loss when passing through the oil mist filter.

■ Install the speed controller near the cylinder piping port. If installed far away, speed control will not be possible.

■ If the cushion specifications (allowable absorption energy) are exceeded, install a separate shock absorbing device.

During Use

⚠CAUTION

■ When adjusting speed with the speed controller, gradually open the needle from the closed state and increase speed. Adjusting from the open state is dangerous as the Piston Rod may suddenly fly out.

■ If operation is started while the exhaust side is at atmospheric pressure, the rod could pop out and cause a dangerous situation. Apply pressure to the exhaust side at startup.

■ Since the switch rail is joined with industrial adhesive tape, use in an atmosphere of inorganic/organic solventsand steam will cause rail peeling, so do not use.
Main Inorganic/Organic Solvents
Inorganic/Organic Solvents: Sodium Hydroxide, Hydrochloric Acid, etc.
Organic Solvents: Toluene, ethanol, hexane, Gasoline, kerosene, etc.

■ Remove all oil, water, dust, etc., from the body (tube) before laying adhesive tape for switch rails. (Adhere by referring to the instruction manual included with the parts.)

■ When disassembling the cylinder, grip the tang portion of either of the head cover or the rod cover with a vice, etc., apply a wrench or an adjustable wrench to the tang portion of the other cover and loosen it to remove the cover.

When retightening the cover with the "LB" Foot Bracket, tighten so brackets on both sides have no play. When using other than an "LB" Foot Bracket, retighten from the position set before disassembly.

For precautions during mounting, installation, adjustment, use, and maintenance, please see "Precautions for Use" in this catalog and the CKD Components product site (https://www.ckd.co.jp/kiki/en/) → "Model No." → Instruction Manual.

MEMO

HCA

High Speed Cylinder

ø20, ø25, ø32, ø40, ø50, ø63, ø80, ø100

CONTENTS

Product Introduction	1178
Series System Chart	1180
Variation/Option Combination Availability Table	1204
● Double Acting/single rod (HCA)	1206
Accessories External Dimensions Diagram	1214
Outer Dimensions Diagram with Switch	1216
Model Selection Guide	1218
⚠ Precautions for Use	1221

Variation and Option Item Combination Availability Table

◎Mark : Option
○Mark : Custom-made
△Mark : Manufacturable depending on conditions (please consult)
× Mark : Not Available

Category		Category	Variation		Piping thread		
			Double Acting Basic Type		NPT	G	
		Code	None		N	G	
Variations	Double Acting Basic Type	Blank			○	○	
Piping thread	NPT	N				x	
	G	G					
Accessories	Cylinder Switch	Separately Shown	◎		○	○	
	Single Knuckle	I	◎		○	○	
	Double Knuckle	Y	◎		○	○	

[Model No. Example]

HCA - 00 - 32 [ ] B - 500 - R1 - D - [ ] I

- HCA: Model No.
- 00: ❶ Mounting Type
- 32: ❷ Bore Size
- [ ]: ❸ Piping thread type
- B: ❹ Cushion
- 500: ❺ Stroke
- R1: ❻ Switch Model No.
- D: ❼ Number of Switches
- [ ]: ❽ Option
- I: ❾ Accessories

Model No.: High Speed Cylinder
●Variation : Double Acting, Basic, With switch
❶ mounting style : Basic type
❷ Bore Size : ø32 mm
❸ Port thread : Rc Thread
❹ Cushion : With Cushion on Both Sides
❺ stroke : 500 mm
❻ Switch model No. : Solid State R1 Switch, Lead Wire 1 m
❼ Switch quantity : With 2 pcs
❽ Option : None
❾ Accessories: Single Knuckle

MEMO

High Speed Type
HCM
HCA
Cylinder Switch
Ending

High Speed Cylinder Double Acting, Single Rod Type

HCA Series

● Bore Size: ø20, ø25, ø32, ø40, ø50, ø63, ø80, ø100

Circuit Diagram Code

RoHS

Model No. Notation

Without Switch
(Built-in magnet for switch)

HCA - 00 - 20 [ ] B - 400 ——— I

HCA: Model No. | 00: 1 | 20: 2 | [ ]: 3 | B: 4 | 400: 5 | I: 8

With Switch
(Built-in magnet for switch)

HCA - 00 - 20 [ ] B - 400 - R0 - R - I

HCA: Model No. | 00: 1 Mounting type | 20: 2 Bore Size | [ ]: 3 Piping thread type | B: 4 Cushion | 400: 5 Stroke | R0: 6 Switch Model No. | R: 7 Number of Switches | I: 8 Accessories

1 Mounting type

Mounting brackets, nuts, and tooth washers are shipped included with the product.

Code	Content	
00	Basic type	
LB	Axial Foot Type (Double Side)	
FA	Rod side Flange Type	
FB	Head Side Flange Type	

2 Bore Size (mm)

Code	Content
20	ø20
25	ø25
32	ø32
40	ø40
50	ø50
63	ø63
80	ø80
100	ø100

3 Piping thread type

Code	Content
Blank	Rc Thread
N	NPT Thread (Custom Order Product)
G	G thread (Custom product)

4 Cushion

Code	Content
B	With Cushion on Both Sides
R	With rod side cushion
H	With head side cushion
N	Without cushion

5 Stroke (mm)

Bore Size	Stroke	Intermediate Stroke	Recommended Stroke
ø20 to ø32	200 to 700	in 1 mm increments	400 mm or more
ø40 to ø100	200 to 1000		

Note: This product is designed with a longer cushion area than general cylinders to absorb high energy. Therefore, with short strokes, most of it becomes the cushion area, and the effect of high-speed use cannot be obtained.

6 Switch Model No.

For switch details, refer to P. 1457. Switches are shipped with the product.

Contact	Indicator LED Special Function	Wiring (Output)	Load Voltage (V) AC	Load Voltage (V) DC	Load Current (mA) AC	Load Current (mA) DC	Lead Wire Note 1 Grommet	Lead Wire Note 1 Terminal box	
Solid State	1-Color	2-wire	85 to 265	-	5 to 100	-	R1(K)□	R1B	
			-	10 to 30	-	5 to 30	R2(K)□	R2B	
		3-wire (NPN)	-	30 or less	-	200 or Less	R3(K)□	R3B	
	2-Color	2-wire	-	10 to 30	-	5 to 30	R2Y(K)□	R2YB	
		3-wire (NPN)	-	30 or less	-	100 or less	R3Y(K)□	R3YB	
Reed	1-Color	2-wire	110/220	12/24	7 to 20/7 to 10	5 to 50	R0□	R0B	
	1-Color Lights up when OFF		110/220	-	20 to 200/ 10 to 200	-	R4□	R4B	
	Without Indicator Lamp		110/220	5/12/24	20/10 or less	50 or less	R5□	R5B	
	1-Color With DC self-holding function		-	24 ± 10%	-	5 to 100	R6□	R6B	

*1: Insert the code selected in the "Lead wire length" table into "□" of the switch Model No..

*** Lead wire length**

Code	Content
Blank	1 m (Standard)
3	3 m (Option)
5	5 m (Option)

Example) Lead wire length
1 m R1
3 m R1 3
5 m R1 5

7 Number of Switches

Code	Content
R	With 1 pc on rod side
H	With 1 pc on head side
D	With 2 pcs

8 Accessories

Code	Content	
I	Single Knuckle	
Y	Double Knuckle (pin and Retaining Ring included)	

Switch Single Unit Model No. Notation

●Switch body+Mounting bracket set

HCA - R0 - 20

R0: 6 Switch Model | 20: 2 Bore Size

● Switch Body Only

SW - R0

R0: 6 Switch Model

●Mounting bracket set

HCA - R - 20

R: Mounting bracket | 20: 2 Bore Size

● Terminal box only
・For R□B

SW - RB

Specifications

Item		HCA (Standard Type, With Switch)							
Bore Size	mm	ø20	ø25	ø32	ø40	ø50	ø63	ø80	ø100
Actuation method		Double Acting Type							
Operating Fluid		Compressed Air							
Max Operating Pressure	MPa	1.0							
Min Operating Pressure	MPa	0.1							
Proof Pressure	MPa	1.6							
Ambient Temperature	°C	-10 to 60 (No freezing)							
Port Size		Rc1/8		Rc1/4		Rc3/8		Rc1/2	
Stroke Tolerance	mm	$^{+2.4}_{0}$	$^{+3.6}_{0}$	$^{+4.3}_{0}$				$^{+5.0}_{0}$	
Operating Piston Speed	mm/s	50 to 3000							
Cushion		Air Cushion							
Lubrication		Not Required (When lubricating, etc., use turbine oil Class 1 ISO VG32)							
Allowable absorbed energy J	With Cushion	7.54	11.8	18.6	29.4	46.1	73.5	118	184
	Without cushion	Large energy generated by external load cannot be absorbed. It is recommended to use an external shock absorber together.							
Effective air cushion length	mm	85	75	70	70	70	70	70	70

Note: Refer to P. 1220 for absorbed energy.

Stroke

Bore Size (mm)	Stroke (mm)	Max Stroke (mm)	Min Stroke (mm)	Recommended Stroke (mm)
ø20 to ø32	400 to 700	700	200	400 or more
ø40 to ø100	400 to 1000	1000		

*1: Intermediate strokes can be manufactured in 1 mm increments.

*2: This product is designed with a longer cushion area than general cylinders to absorb high energy. Therefore, with short strokes, most of it becomes the cushion area, and the effect of high-speed use cannot be obtained.

Cylinder Mass

(Unit: kg)

Bore Size (mm)	Product Weight when stroke S = 0 mm			Weight per Switch	Mounting Bracket Weight per Switch	Added mass per S=100 mm
	Basic type 00	Foot Type (LB)	Flange Type (FA, FB)			
ø20	0.73	0.91	0.80	Refer to the weight listed in the switch specifications on P. 1457.	0.02	0.11
ø25	0.80	0.98	0.87		0.02	0.14
ø32	0.85	1.03	0.92		0.02	0.16
ø40	1.37	1.63	1.69		0.02	0.27
ø50	2.13	2.56	2.50		0.02	0.34
ø63	3.17	3.88	3.81		0.03	0.42
ø80	5.75	7.27	7.12		0.03	0.67
ø100	7.92	9.94	9.75		0.03	0.91

(Example) Product Weight of HCA-00-40B-500-R0-D

- Product Weight at 0 mm stroke ..... 1.37 kg
- Additional weight for 500 mm stroke.....0.27 x $\frac{500}{100}$ = 1.35 kg
- Weight of 2 switches..... 2 x 0.042 kg + 2 x 0.02 kg = 0.124 kg
- Product weight.....1.37+1.35+0.124=2.844 kg

Theoretical Thrust Table

(Unit: N)

Bore Size (mm)	Operating Direction	Operating Pressure MPa										
		0.1	0.15	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
ø20	Push	31.4	47.1	62.8	94.2	1.26×10^2	1.57×10^2	1.88×10^2	2.20×10^2	2.51×10^2	2.83×10^2	3.14×10^2
	Pull	23.6	35.3	47.1	70.7	94.2	1.18×10^2	1.41×10^2	1.65×10^2	1.88×10^2	2.12×10^2	2.36×10^2
ø25	Push	49.1k	73.6	98.2	1.47×10^2	1.96×10^2	2.45×10^2	2.95×10^2	3.44×10^2	3.93×10^2	4.42×10^2	4.91×10^2
	Pull	37.8	56.7	75.6	1.13×10^2	1.51×10^2	1.89×10^2	2.27×10^2	2.64×10^2	3.02×10^2	3.40×10^2	3.78×10^2
ø32	Push	80.4	1.21×10^2	1.61×10^2	2.41×10^2	3.22×10^2	4.02×10^2	4.83×10^2	5.63×10^2	6.43×10^2	7.24×10^2	8.04×10^2
	Pull	69.1	1.04×10^2	1.38×10^2	2.07×10^2	2.76×10^2	3.46×10^2	4.15×10^2	4.84×10^2	5.53×10^2	6.22×10^2	6.91×10^2
ø40	Push	1.26×10^2	1.88×10^2	2.51×10^2	3.77×10^2	5.03×10^2	6.28×10^2	7.54×10^2	8.80×10^2	1.01×10^3	1.13×10^3	1.26×10^3
	Pull	1.06×10^2	1.58×10^2	2.11×10^2	3.17×10^2	4.22×10^2	5.28×10^2	6.33×10^2	7.39×10^2	8.44×10^2	9.50×10^2	1.06×10^3
ø50	Push	1.96×10^2	2.95×10^2	3.93×10^2	5.89×10^2	7.85×10^2	9.82×10^2	1.18×10^3	1.37×10^3	1.57×10^3	1.77×10^3	1.96×10^3
	Pull	1.65×10^2	2.47×10^2	3.30×10^2	4.95×10^2	6.60×10^2	8.25×10^2	9.90×10^2	1.15×10^3	1.32×10^3	1.48×10^3	1.65×10^3
ø63	Push	3.12×10^2	4.68×10^2	6.23×10^2	9.35×10^2	1.25×10^3	1.56×10^3	1.87×10^3	2.18×10^3	2.49×10^3	2.81×10^3	3.12×10^3
	Pull	2.80×10^2	4.20×10^2	5.61×10^2	8.41×10^2	1.12×10^3	1.40×10^3	1.68×10^3	1.96×10^3	2.24×10^3	2.52×10^3	2.80×10^3
ø80	Push	5.03×10^2	7.54×10^2	1.01×10^3	1.51×10^3	2.01×10^3	2.51×10^3	3.02×10^3	3.52×10^3	4.02×10^3	4.52×10^3	5.03×10^3
	Pull	4.54×10^2	6.80×10^2	9.07×10^2	1.36×10^3	1.81×10^3	2.27×10^3	2.72×10^3	3.17×10^3	3.63×10^3	4.08×10^3	4.54×10^3
ø100	Push	7.85×10^2	1.18×10^3	1.57×10^3	2.36×10^3	3.14×10^3	3.93×10^3	4.71×10^3	5.50×10^3	6.28×10^3	7.07×10^3	7.85×10^3
	Pull	7.15×10^2	1.07×10^3	1.43×10^3	2.14×10^3	2.86×10^3	3.57×10^3	4.29×10^3	5.00×10^3	5.72×10^3	6.43×10^3	7.15×10^3

Mounting Bracket Model No. Notation

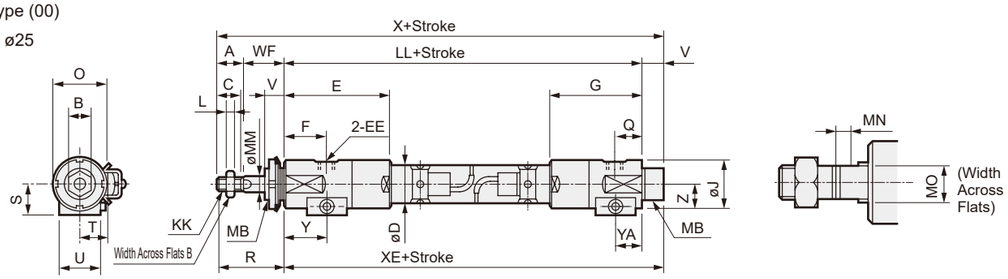
Bore Size (mm) / Mounting bracket	20	25	32	40	50	63	80	100
Foot (LB)	HCA-LB-20	HCA-LB-25	HCA-LB-32	HCA-LB-40	HCA-LB-50	HCA-LB-63	HCA-LB-80	HCA-LB-100
Flange (FA/FB)	HCA-FA-20	HCA-FA-25	HCA-FA-32	HCA-FA-40	HCA-FA-50	HCA-FA-63	HCA-FA-80	HCA-FA-100

Note: Foot type mounting bracket is 2 pcs/set.

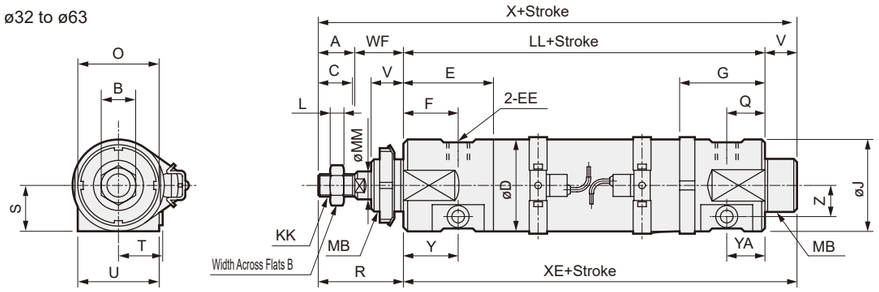
Dimensional Drawings

● Basic type (00)

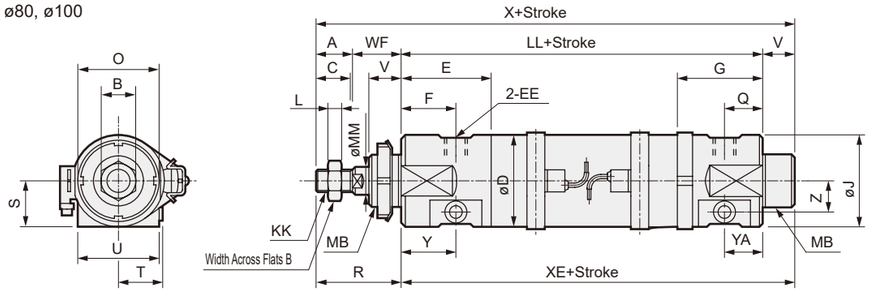
ø20, ø25



ø32 to ø63



ø80, ø100



Code	Basic Type (OO) Basic Dimensions															
Bore Size (mm)	A	B	C	D	E	EE	F	G	J	KK	L	LL *1	MB	MM	MN	MO
ø20	20	13	18	25	86	Rc1/8	34	74	33	M8×1	5	223	M25x1.5	10	4	8
ø25	20	17	18	30	82	Rc1/8	32.5	71	37	M10×1.25	6	213	M25x1.5	12	5	10
ø32	22	17	20	37	67	Rc1/4	42	57	37	M10×1.25	6	197	M25x1.5	12	5	10
ø40	22	22	20	46	73	Rc1/4	45.5	57	46	M14×1.5	8	203	M35×1.5	16	6	14
ø50	28	27	26	56.4	77	Rc3/8	47.5	60	56	M18×1.5	11	211	M40x1.5	20	7	17
ø63	28	27	26	69.4	69	Rc3/8	42	65	69.4	M18×1.5	11	214	M40x1.5	20	7	17
ø80	36	32	34	88	73	Rc 1/2	45	70	88	M22×1.5	13	232	M60×2	25	10	22
ø100	45	41	43	108	72	Rc 1/2	42	72	108	M26×1.5	16	235	M60×2	30	11	27

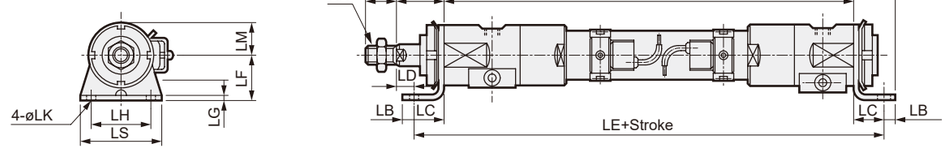
Code													
Bore Size (mm)	O	Q	R	S	T	U	V	WF	X *1	XE *1	Y	YA	Z
ø20	42	22	44	21.5	17 to 20	29	16	24	283	239	34	22	15
ø25	42	21.5	52	23.5	18.5 to 22	32	16	32	281	229	32.5	21.5	17
ø32	42	25	52	23.5	18.5 to 22	32	20	30	269	217	42	25	17
ø40	57	25	54	28.5	22 to 27	38	20	32	277	223	45.5	25	21
ø50	62	24.5	61	35.5	27 to 34.5	48	20	33	292	231	47.5	24.5	25.5
ø63	62	29	66	35.7	34 to 43	62	25	38	305	239	42	29	25.7
ø80	86	31.5	78	46.5	41 to 51	76	25	42	335	257	45	31.5	34.5
ø100	86	30	93	55.5	48 to 60	90	30	48	358	265	42	30	43.5

***1: Due to the product structure, LL, X, and XE dimensions may be longer by Approx. 1 mm for ø20/ø25, 3 mm for ø32 to ø63, and 4 mm for ø80/ø100.**
***2: For the external dimensions diagram of accessories, please refer to P. 1214.**
***3: For dimensions with each switch, refer to P. 1216.**

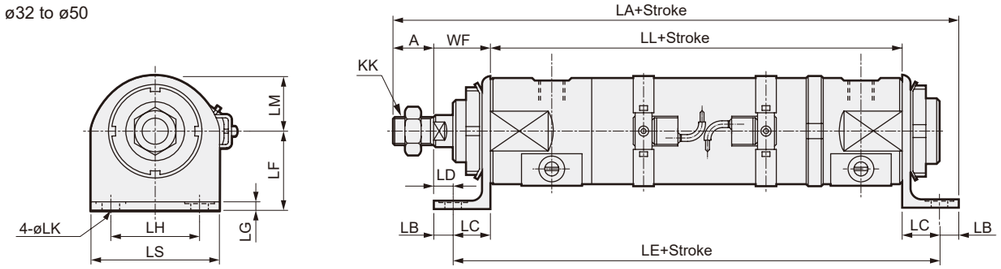
Dimensional Drawings

● Axial foot type (LB)

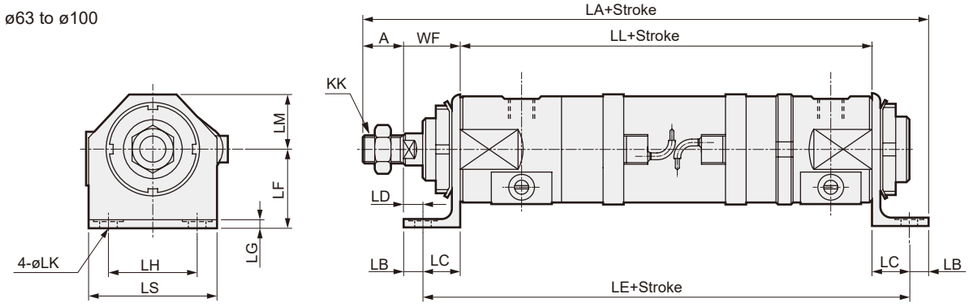
ø20, ø25



ø32 to ø50



ø63 to ø100



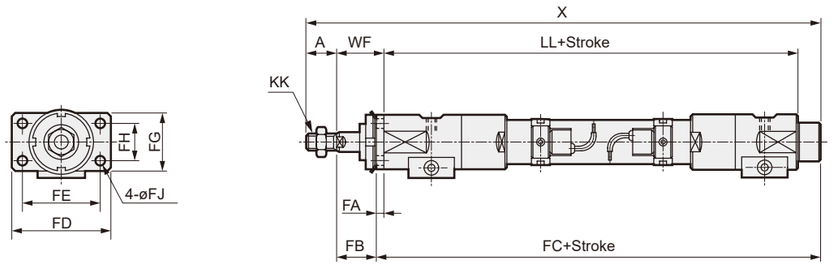
Code	Axial Foot Type (LB)														
Bore Size (mm)	A	KK	LA *1	LB	LC	LD	LE *1	LF	LG	LH	LK	LL *1	LM	LS	WF
ø20	20	M8×1	295	8	20	4	263	30	3.2	40	6.6	223	19	54	24
ø25	20	M10×1.25	293	8	20	12	253	30	3.2	40	6.6	213	19	54	32
ø32	22	M10×1.25	277	8	20	10	237	30	3.2	40	6.6	197	19	54	30
ø40	22	M14×1.5	289	10	22	10	247	40	3.2	40	9	203	24	58	32
ø50	28	M18×1.5	307	10	25	8	261	45	4.5	45	9	211	29	63	33
ø63	28	M18×1.5	318	13	25	13	264	53	5.5	60	11	214	36.5	86	38
ø80	36	M22×1.5	355	15	30	12	292	63	8	71	14	232	45	102	42
ø100	45	M26×1.5	373	15	30	18	295	75	8	85	14	235	54	118	48

***1: Due to the product structure, LL, LA, and LE dimensions may be longer by Approx. 1 mm for ø20/ø25, 3 mm for ø32 to ø63, and 4 mm for ø80/ø100.**
***2: For the external dimensions diagram of accessories, please refer to P. 1214.**
***3: For dimensions of models with switches, see P. 1216.**

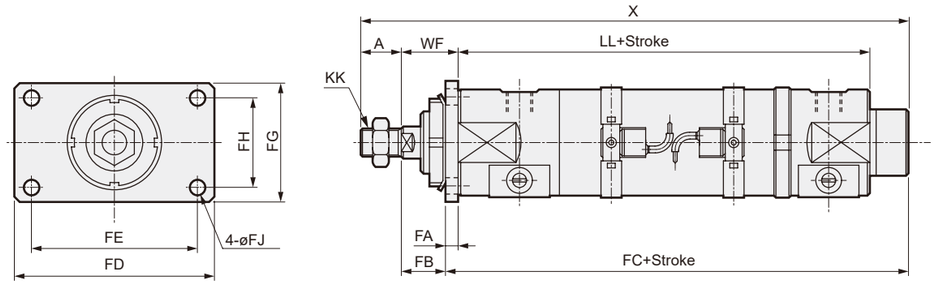
Dimensional Drawings

●Rod Side Flange Type (FA)

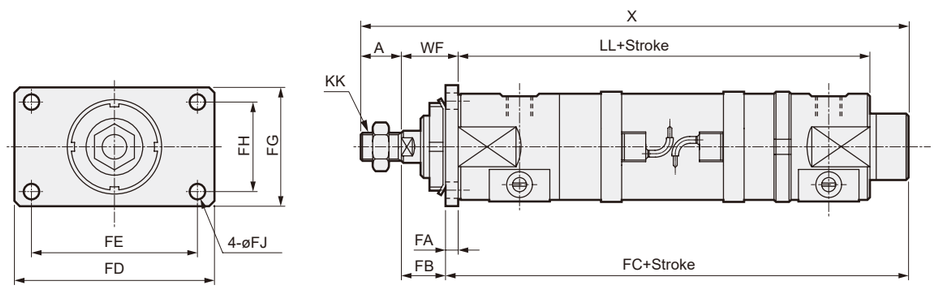
ø20, ø25



ø32 to ø63



ø80, ø100



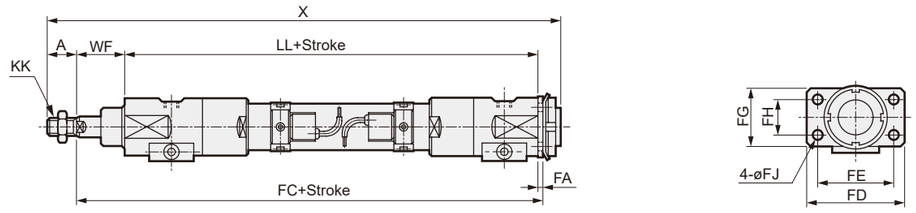
Code	Rod Side Flange Type (FA)												
Bore Size (mm)	A	FA	FB	FC *1	FD	FE	FG	FH	FJ	KK	LL *1	WF	X *1
ø20	20	4.5	19.5	243.5	66	52	38	24	6.6	M8×1	223	24	283
ø25	20	4.5	27.5	233.5	66	52	38	24	6.6	M10×1.25	213	32	281
ø32	22	4.5	25.5	221.5	66	52	38	24	6.6	M10×1.25	197	30	269
ø40	22	9	23	232	100	80	58	40	9	M14×1.5	203	32	277
ø50	28	9	24	240	108	90	65	45	9	M18×1.5	211	33	292
ø63	28	9	29	248	134	112	80	60	11	M18×1.5	214	38	305
ø80	36	14	28	271	160	132	100	71	14	M22×1.5	232	42	335
ø100	45	14	34	279	178	150	114	85	14	M26×1.5	235	48	358

***1: Due to the product structure, LL, X, and FC dimensions may be longer by Approx. 1 mm for ø20/ø25, 3 mm for ø32 to ø63, and 4 mm for ø80/ø100.**
***2: For the external dimensions diagram of accessories, please refer to P. 1214.**
***3: For dimensions of models with switches, see P. 1216.**

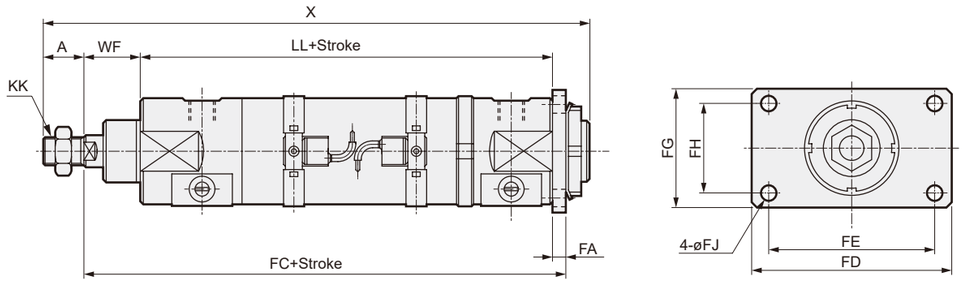
Dimensional Drawings

●Head Side Flange Type (FB)

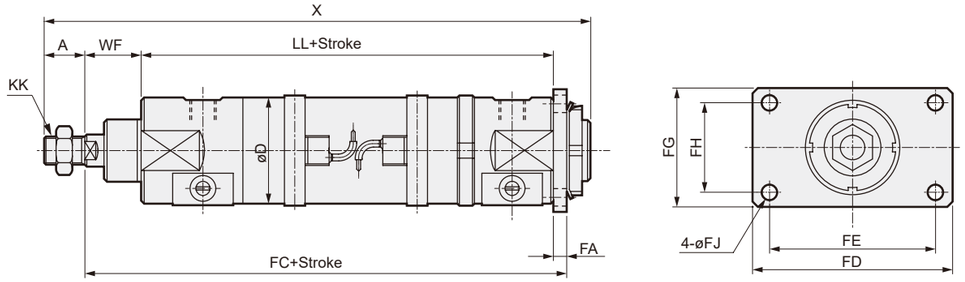
ø20, ø25



ø32 to ø63



ø80, ø100



Code	Head Side Flange Type (FB)											
Bore Size (mm)	A	FA	FC *1	FD	FE	FG	FH	FJ	KK	LL *1	WF	X *1
ø20	20	4.5	251.5	66	52	38	24	6.6	M8×1	223	24	283
ø25	20	4.5	249.5	66	52	38	24	6.6	M10×1.25	213	32	281
ø32	22	4.5	231.5	66	52	38	24	6.6	M10×1.25	197	30	269
ø40	22	9	244	100	80	58	40	9	M14×1.5	203	32	277
ø50	28	9	253	108	90	65	45	9	M18×1.5	211	33	292
ø63	28	9	261	134	112	80	60	11	M18×1.5	214	38	305
ø80	36	14	288	160	132	100	71	14	M22×1.5	232	42	335
ø100	45	14	297	178	150	114	85	14	M26×1.5	235	48	358

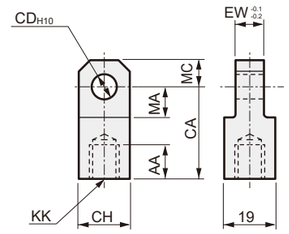
***1: Due to the product structure, LL, X, and FC dimensions may be longer by Approx. 1 mm for ø20/ø25, 3 mm for ø32 to ø63, and 4 mm for ø80/ø100.**
***2: For the external dimensions diagram of accessories, please refer to P. 1214.**
***3: For dimensions of models with switches, see P. 1216.**

Accessory External Dimensions

● Rod eye/clevis dimensions (ø20, 25, 32)

Single Knuckle (I)

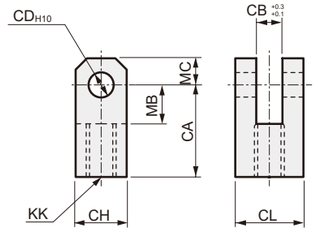
Material: Steel, Zinc Chromate



Model No.	Applicable Bore Size (mm)	AA	CA	CD	CH	EW	KK	MA	MC	Weight (g)
M1-I-20	20	14	30	10	19	8	M8×1	13	10	60
M1-I-30	25, 32	14	36	12	25	10	M10×1.25	16	12	110

Double Knuckle (Y)

Material: Steel, Zinc Chromate



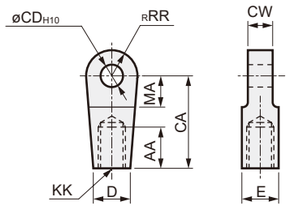
Model No.	Applicable Bore Size (mm)	CA	CB	CD	CH	CL	KK	MB	MC	Weight (g)
M1-Y-20	20	30	8	10	19	19	M8×1	13	10	100
M1-Y-30	25, 32	36	10	12	25	25	M10×1.25	16	12	210

*1: Pins, washers, and split pins are included.

● Rod eye/clevis dimensions (ø40, 50, 63, 80, 100)

Single Knuckle (I)

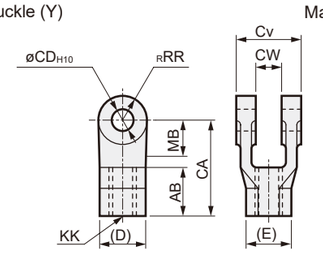
Material: Cast Iron painted



Model No.	Applicable Bore Size (mm)	AA	CA	CD	CW	D	E	KK	MA	RR	Weight (kg)
S1-I-40	40	20	50	12	18 -0.1 -0.4	27	27	M14×1.5	21	16	0.26
S1-I-50	50	21	50	12	18 -0.1 -0.4	27	27	M18×1.5	21	16	0.24
S1-I-63	63	21	50	14	20 -0.1 -0.4	27	27	M18×1.5	21	16	0.25 (36 psi)
S1-I-80	80	30	70	20	28 -0.1 -0.4	46	41	M22×1.5	30	25	0.88
S1-I-100	100	30	70	20	22 -0.1 -0.4	46	41	M26×1.5	30	25	0.84

Double Knuckle (Y)

Material: Cast Iron painted



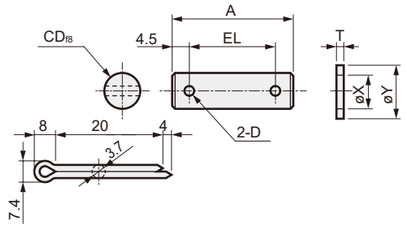
Model No.	Applicable Bore Size (mm)	AB	CA	CD	CV	CW	D	E	KK	MB	RR	Weight (kg)
S1-Y-40	40	24	50	12	36	18 +0.4 +0.1	27	31.2	M14×1.5	19	16	0.25
S1-Y-50	50	24	50	12	36	18 +0.4 +0.1	27	31.2	M18×1.5	19	16	0.24
S1-Y-63	63	24	50	14	40	20 +0.4 +0.1	27	31.2	M18×1.5	19	16	0.26
S1-Y-80	80	35	70	20	56	28 +0.4 +0.1	41	47.3	M22×1.5	30	25	0.90
S1-Y-100	100	35	70	20	56	28 +0.4 +0.1	41	47.3	M26×1.5	30	25	0.85

*1: Pin and Retaining Ring are included.
*2: MB dimension represents the effective length of CW dimension.

● Pin dimensions

Pin (P) (ø20, 30)

Material: Steel, Zinc Chromate

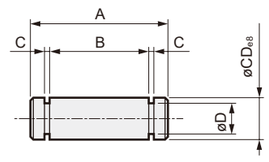


Model No.	Applicable Bore Size (mm)	A	D	CD	EL	T	X	Y	Weight (g)
M1-P-20	20	37	4	10	28	1.6	10.5	18	30
M1-P-30	25/32	46	4	12	37	2.3	12.5	22	50

*1: Pins, washers, and split pins for use with double projection knuckle are included with the product.

Pin (P) (ø40, 50, 63, 80, 100)

Material: Steel, Zinc Chromate



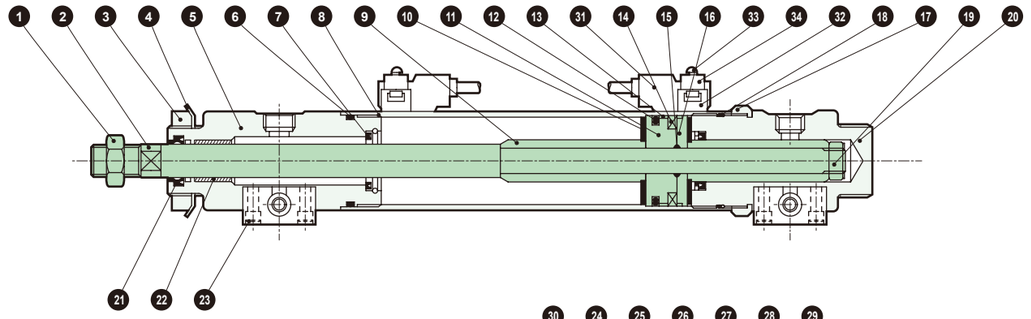
Model No.	Applicable Bore Size (mm)	A	B	C	D	CD	Weight (g)	Retaining Ring Used
S1-P-40	40, 50	43.5	36.2	1.15	11.5	12	40	C-type Retaining Ring for shaft 12
S1-P-63	63	47.5	40.2	1.15	13.4	14	60	C-type 14 for Shaft
S1-P-80	80, 100	64	56.2	1.35	19	20	100	C-type Retaining Ring for shaft 20

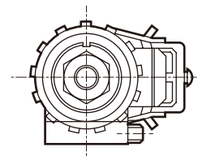
*1: Pins and Retaining Rings for use with double projection knuckle are included with the product.

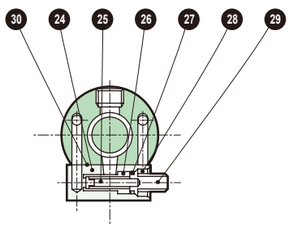
* Please specify by Model No. when ordering.

Internal Structure Diagram/Material

● HCA







Note: Shape is different for ø20 only.

Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Rod Nut	Steel	Zinc Chromate	19	Piston Nut	Steel	Zinc Chromate
2	Piston Rod	Steel	Industrial Chrome Plating	20	Head Cover	Aluminum Alloy	Alumite
3	Nut	Steel	Zinc Plating	21	Rod Packing	Nitrile Rubber	
4	Tooth Washer	Steel	Zinc Plating	22	Bushing	Oil-Impregnated Bearing Alloy	
5	Rod Cover	Aluminum Alloy	Alumite	23	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide
6	Cylinder Gasket	Nitrile Rubber		24	Adjuster Case	Aluminum Alloy	Alumite
7	Cushion Packing	Urethane, Steel		25	Check Valve	Copper Alloy	
8	Cylinder Tube	Aluminum Alloy	Hard Anodized	26	Spring	Stainless Steel	
9	Cushion ring	Steel	Industrial Hard Chrome Plating	27	Adjust Gasket	Nitrile Rubber	
10	Cushion Rubber	Urethane Rubber		28	U-nut	Steel	Zinc Chromate
11	Piston	Aluminum Alloy	Chromate	29	Adjust bolt	Steel	Nickel Plating
12	Piston Packing	Nitrile Rubber		30	Case Gasket	Special Fiber Cloth	Special Fiber, Nitrile Rubber
13	Wear Ring	Polyacetal		With Switch			
14	Magnet	Plastic		31	Switch		
15	Piston gasket	Nitrile Rubber		32	Band	Stainless Steel	
16	Piston Retainer	Aluminum Alloy	Chromate	33	Pan Head Screw	Steel	
17	Lock Nut	Steel	Black Chrome Plating	34	Mounting bracket	Stainless Steel	
18	Backup Ring	Steel	Zinc Chromate				

Mounting Bracket Material

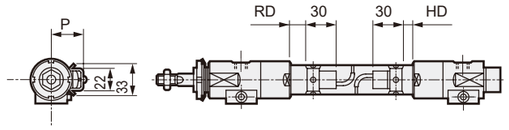
Mounting Style	Material	Remarks
Foot (LB)	Steel	Zinc Plating
Flange (FA, FB)	Steel	Zinc Plating

For maintenance parts, please visit the CKD Equipment Product Site (https: //www.ckd.co.jp/kiki/en/) → "model No." → Maintenance Parts.

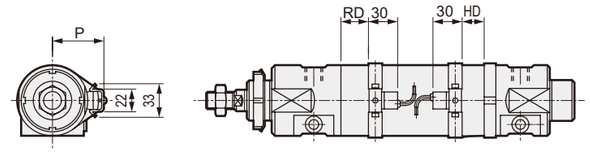
HCA Series Outline Dimension Drawing with Switch

● R1 (K), R2 (K), R2Y (K), R3Y (K), R4, R5, R6

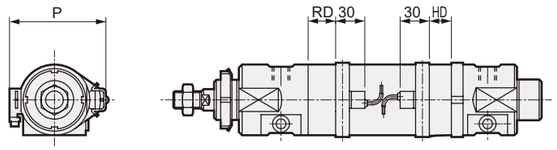
ø20, ø25



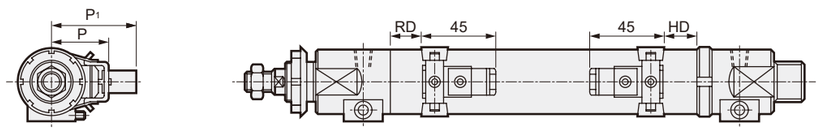
ø32 to ø63



ø80, ø100



● R1B, R2B, R2YB, R3B, R3YB, R0B, R4B, R5B, R6B



Code / Bore Size (mm)	RD	HD	P	P1
ø20	17.5	15.5	28	48
ø25	14.5	13	34	54
ø32	21	22	35	55
ø40	21	22	39	59
ø50	25	19	44	64
ø63	28	21	52	72
ø80	33.5	24.5	58.5	134
ø100	35	25	68.5	154

MEMO

High Speed Type
HCM
HCA
Cylinder Switch
Ending

Model Selection

When using a high-speed cylinder, particular attention should be paid to the cylinder speed and kinetic energy.

Step 1 High-Speed Cylinder Model Selection

Since pneumatic cylinders use compressible fluid, the average speed and the Max speed at cushion engagement are different. Obtain the required composite effective sectional area S and maximum speed V when you want to operate the load W at the average speed V1 from the following table. However, this table is a guideline and varies slightly depending on the Load Direction, piping length, etc.

Average Speed and Max Speed at Load Factor of High-Speed Cylinder (When Air Pressure = 0.5 MPa)

Bore Size (mm) \ Average speed / Load factor		V1=500 mm/s			V1=1,000 mm/s			V1=2,000 mm/s		
		10%	20%	30%	10%	20%	30%	10%	20%	30%
ø20 (A2=2.356)	W	1.57	3.14	4.71	1.57	3.14	4.71	1.57	3.14	4.71
	S	0.80	0.89	0.98	1.60	1.78	1.96	3.19	3.56	3.93
	V	630	689	714	1,260	1.378	1.482	2.512	2.756	2.971
ø25 (A2=3.778)	W	2.45	4.91	7.36	2.45	4.91	7.36	2.45	4.91	7.36
	S	1.28	1.43	1.57	2.56	2.85	3.15	5.12	5.71	6.30
	V	628	690	740	1.257	1.376	1.485	2.514	2.757	2.970
ø32 (A2=6.912)	W	4.02	8.04	12.1	4.02	8.04	12.1	4.02	8.04	12.1
	S	2.34	2.61	2.88	4.68	5.22	5.76	9.36	12.4	11.5
	V	630	692	747	1.261	1.383	1.494	2.521	2.758	2.983
ø40 (A2=10.56)	W	6.28	12.6	18.8	6.28	12.6	18.8	6.28	12.6	18.8
	S	3.57	3.99	4.40	7.15	7.97	8.80	14.3	15.9	17.6
	V	630	693	747	1.261	1.383	1.494	2.521	2.765	2.988
ø50 (A2=16.49)	W	9.82	19.6	29.5	9.82	19.6	29.5	9.82	19.6	29.5
	S	5.58	6.23	6.87	11.2	12.5	13.7	22.3	24.9	27.5
	V	630	693	747	1.265	1.389	1.490	2.518	2.768	2.990
ø63 (A2=28.03)	W	15.6	31.2	46.8	15.6	31.2	46.8	15.6	31.2	46.8
	S	9.49	10.6	11.7	19.0	21.2	23.4	38.0	42.3	46.7
	V	632	694	749	1.266	1.389	1.498	2.531	2.771	2.989
ø80 (A2=45.36)	W	25.1	50.3	75.4	25.1	50.3	75.4	25.1	50.3	75.4
	S	15.4	17.1	18.9	30.7	34.3	37.8	61.4	68.5	75.6
	V	634	692	744	1.264	1.388	1.495	2.527	2.773	2.990
ø100 (A2=71.47)	W	39.3	78.5	118	39.3	78.5	118	39.3	78.5	118
	S	24.2	27.0	29.8	48.4	54.0	59.6	96.8	108	119
	V	632	694	748	1.264	1.387	1.496	2.529	2.774	2.987

W: Load weight (kg) S: Composite effective sectional area (mm^2) V: Max speed (mm/s) V1: Average speed (mm/s) A2: Piston Rod side cross-section areas (cm^2)

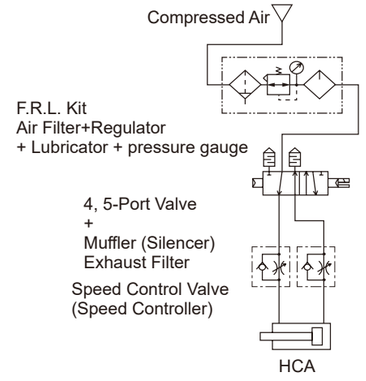
For example, when HCA-40 is used and the average speed V1 is 2,000 mm/s at a load of 6.28 kgf (load factor 10%, 0.5 MPa), the maximum speed will be 1.26 times, which is 2,521 mm/s. In this case, required composite effective sectional area is 14.3 mm^2. Select system equipment that matches the combined effective cross-sectional area from the table on the next page.

System Selection Guide Table

For each Bore Size, optimal system selection matching the specified cylinder speed can be performed.

Bore Size	Port Size	Required effective sectional area (mm^2)	4, 5-Port Valve for Pneumatic Control		Pneumatic Auxiliary Components		Piping
			Single solenoid	Double Solenoid	Speed Controller	Silencer	Piping (/m) (Between Valve and Cylinder)
ø20	Rc1/8	1.3	4KA110-M5 / 4KB110-06 4GA110R-M5 / 4GB110R-06	4KA120-M5 / 4KB120-06 4GA120R-M5 / 4GB120R-06	SC3W-6 / SC3R-6	SLW-6A	ø4×2.5NT
		2.0	4KA110-M5 / 4KB110-06 4GA110R-M5 / 4GB110R-06	4KA120-M5 / 4KB120-06 4GA120R-M5 / 4GB120R-06	SC3R-6	SLW-6A	ø6×ø4NT
		2.8	4KA210-06 / 4KB210-06 4GA210R-06 / 4GB210R-08	4KA220-06 / 4KB220-06 4GA220R-06 / 4GB220R-08	SC3R-6	SLW-6A	ø8×ø5.7NT
		3.6	4KA210-06 / 4KB210-06 4GA210R-06 / 4GB210R-08	4KA220-06 / 4KB220-06 4GA220R-06 / 4GB220R-08	SC1-6	SLW-6A	ø6×ø4NT
		4.3	4KA210-06 / 4KB210-06 4GA210R-06 / 4GB210R-08	4KA220-06 / 4KB220-06 4GA220R-06 / 4GB220R-08	SC1-6	SLW-6A	ø8×ø5.7NT
ø25	Rc1/8	1.4	4KA110-M5 / 4KB110-06 4GA110R-M5 / 4GB110R-06	4KA120-M5 / 4KB120-06 4GA120R-M5 / 4GB120R-06	SC3W-6	SLW-6A	ø4×ø2.5NT
		2.4	4KA110-M5 / 4KB110-06 4GA110R-M5 / 4GB110R-06	4KA120-M5 / 4KB120-06 4GA120R-M5 / 4GB120R-06	SC3W-6	SLW-6A	ø6×ø4NT
		4.4	4KA210-06 / 4KB210-06 4GA210R-06 / 4GB210R-08	4KA220-06 / 4KB220-06 4GA220R-06 / 4GB220R-08	SC1-6	SLW-6A	ø6×ø4NT
		5.8	4KA210-06 / 4KB210-06 4GA210R-06 / 4GB210R-08	4KA220-06 / 4KB220-06 4GA220R-06 / 4GB220R-08	SC1-6	SLW-6A	ø8×ø5.7NT
		6.6	4KA210-06 / 4KB210-06 4GA210R-06 / 4GB210R-08	4KA220-06 / 4KB220-06 4GA220R-06 / 4GB220R-08	SC1-8	SLW-6A	ø10×ø7.2NT
ø32	Rc1/4	3.6	4KB210-08 / 4GB210R-08	4KB220-08 / 4GB220R-08	SC3W-8 / SC3R-8	SLW-8A	ø6×ø4NT
		5.9	4KB210-08 / 4GB210R-08	4KB220-08 / 4GB220R-08	SC1-8	SLW-8A	ø8×ø5.7NT
		8.4	4F210-08 / 4KB310-08 4GB310R-08	4F220-08 / 4KB320-08 4GB320R-08	SC1-8	SLW-8A	ø10×ø7.2NT
		9.5	4KB310-08 / 4F310-08 4GB310R-08	4KB320-08 / 4F320-08 4GB320R-08	SC1-8	SLW-8A	ø10×ø7.2NT
		11.6	4F310-08 / 4F410-08 4GB310R-08	4F320-08 / 4F420-08 4GB320R-08	SC3W-10 / SC3R-10	SLW-8A	ø12×ø8.9NT
ø40	Rc1/4	3.6	4KB210-08 / 4GB310R-08	4KB220-08 / 4GB320R-08	SC3W-8 / SC3R-8	SLW-8A	ø6×ø4NT
		8.5	4F210-08 / 4KB310-08 4GB310R-08	4F220-08 / 4KB320-08 4GB320R-08	SC1-8	SLW-8A	ø10×ø7.2NT
		12.0	4F310-08 / 4F410-08 4GB310R-08	4F320-08 / 4F420-08 4GB320R-08	SC3W-10 / SC3R-10	SLW-8A	ø12×ø8.9NT
		15.2	4F410-08	4F420-08	SC-1-10	SLW-8A	ø12×ø8.9NT
		18.4	4F510-10	4F520-10	SC-1-10	SLW-10A	ø15×ø11.5NT
ø50	Rc3/8	5.5	4KB310-10 / 4F310-10	4KB320-10 / 4F320-10	SC3W-10 / SC3R-10	SLW-10A	ø6×ø4NT
		12.0	4K310-10 / 4F310-10	4K320-10 / 4F320-10	SC3W-10 / SC3R-10	SLW-10A	ø12×ø8.9NT
		18.1	4F510-10	4F520-10	SC1-10	SLW-10A	ø12×ø8.9NT
		23.5	4F510-10	4F520-10	SC1-15	SLW-10A	ø15×ø11.5NT
		26.9	4F610-15	4F620-15	SC1-15	SLW-15A	ø15×ø11.5NT
ø63	Rc3/8	11.0	4K310-10 / 4F310-10	4K320-10 / 4F320-10	SC3W-10 / SC3R-10	SLW-10A	ø10×ø7.2NT
		18.0	4K410-10 / 4F510-10	4K420-10 / 4F520-10	SC1-10	SL-10A	ø10×ø7.2NT
		26.9	4F610-15	4F620-15	SC1-15	SLW-15A	ø10×ø8.9NT
		43.1	4F610-15	4F620-15	SC-20A	SLW-15A	ø15×ø11.5NT
		62.8	4F610-20	4F620-20	SC-20A	SL-20A	Rc1/2 Steel Pipe
ø80	Rc 1/2	19.5	4F610-15	4F620-15	SC3W-15 / SC3R-15	SLW-15A	ø12×ø8.9NT
		31.3	4F610-15	4F620-15	SC1-15	SLW-15A	ø15×ø11.5NT
		67.4	4F610-20	4F620-20	SC-20A	SL-20A	Rc3/4 Steel Pipe
		85.9	4F710-20	4F720-20	SC-20A	SL-20A	Rc3/4 Steel Pipe
		95.9	4F710-20	4F720-20	SC-25A	SL-20A	Rc3/4 Steel Pipe
ø100	Rc 1/2	31.8	4F610-15	4F620-15	SC1-15	SLW-15A	ø15×ø11.5NT
		67.4	4F610-20	4F620-20	SC-20A	SL-20A	Rc3/4 Steel Pipe
		85.9	4F710-20	4F720-20	SC-20A	SL-20A	Rc3/4 Steel Pipe
		95.9	4F710-20	4F720-20	SC-25A	SL-20A	Rc3/4 Steel Pipe
		109.9	4F710-25	4F720-25	SC-25A	SL-25A	Rc3/4 Steel Pipe

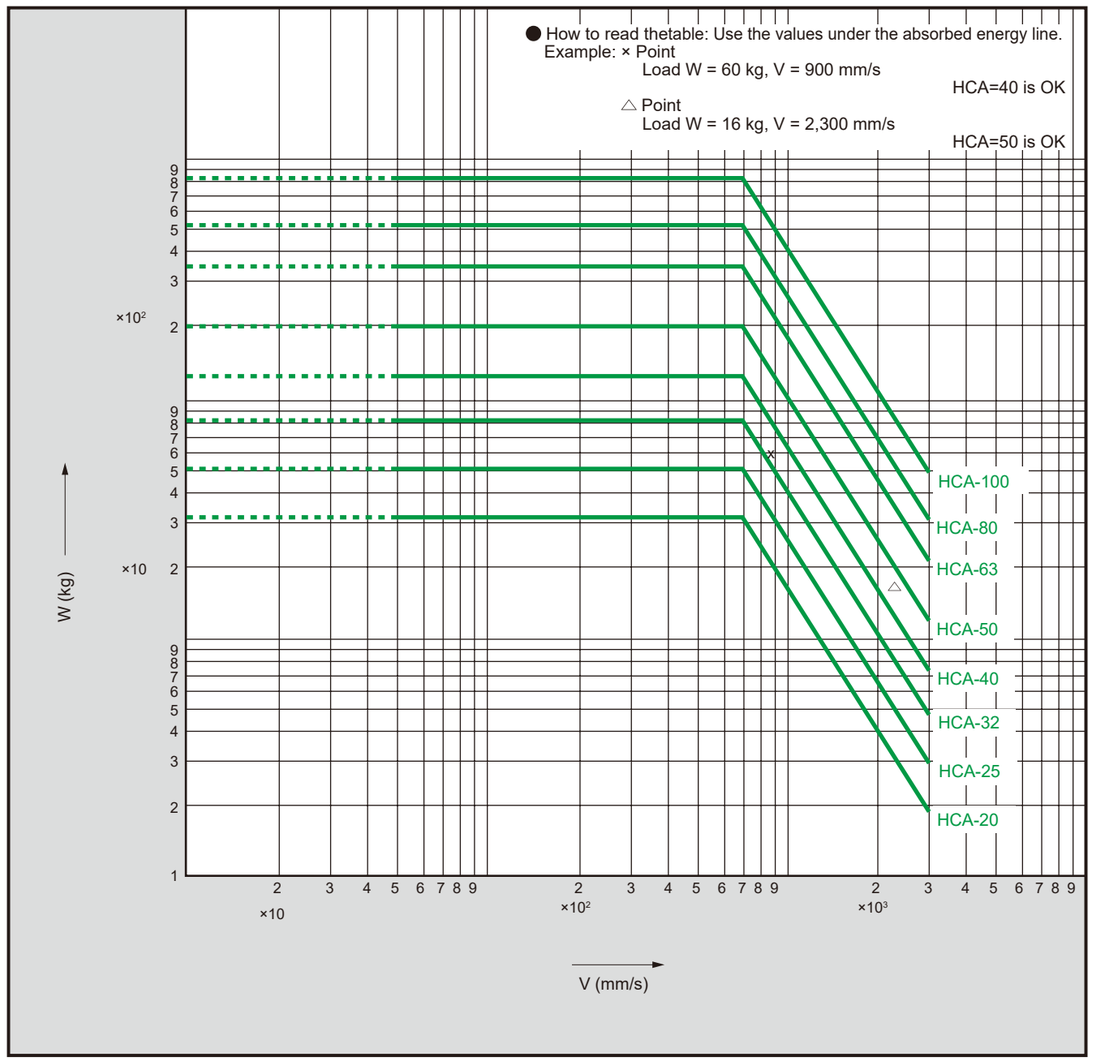
● Pneumatics basic circuit diagram



Step 2 High-Speed Cylinder Model Selection

Determine the model from the following table based on the relationship between load W and Max speed V.

High-Speed Cylinder Absorption Energy List



Note: Please be careful when reading the graph as it is a log-log scale.

For example, when the load W=16 kg and the maximum speed is 2300 mm/s, the △ mark indicates that HCA-40 cannot be used, and HCA-50 should be selected.

Pneumatic Equipment

To Use This Product Safely

Be sure to read this before use. For general cylinder information, see Intro 41, and for Cylinder Switches, see P. 1512.

Individual Precautions: High Speed Cylinder HCA Series

Design / Selection

CAUTION

■ Avoid using the product so as to apply lateral load to the Piston Rod of the cylinder. If a lateral load is applied, the desired speed cannot be obtained, and the bearing part will wear unevenly, significantly reducing performance.

■ Cushion
The air cushion absorbs kinetic energy that the piston generates by using air compressibility and prevents the piston and cover from colliding at the stroke end. Therefore, note that it is not a function for reducing the piston speed near the stroke end.

■ Consider the system selection guide of the cylinder only as a guideline, as it may vary depending on the operating conditions (Operating Pressure, travel method and direction of the load and piping length).

■ Operating the cylinder at high speed increases the instantaneous flow rate of the air, allowing drainage to accumulate more easily. Install an air tank to prevent drain from entering the cylinder and prevent pressure loss when passing through the oil mist filter.

■ The Max speed for the working piston is 3000 mm/s, which is not the average speed.

■ The Cylinder Body restriction is designed for a speed of 3000 mm/s and over, and should not be constricted by piping, valves, or speed controllers.

■ If started with the exhaust side at atmospheric pressure, the rod may extend suddenly, which is dangerous. Apply pressure to the exhaust side at startup.

■ If the cushion specifications (allowable absorption energy) are exceeded, install a separate shock absorbing device.

For precautions regarding mounting, installation, adjustment, operation, and maintenance, please refer to the CKD Equipment Product Site(https: //www.ckd.co.jp/kiki/en/) → 'model No.' → Instruction Manual.

Oscillating/Rotary Cylinder

Listed Page

Selex Rotary
RRC Series 1225

Table Type Rotary
Actuator
GRC Series 1243

Selex Rotary
Vane Type
RV□ Series 1283

RRC

Selex Rotary

Size 8, 32, 63

CONTENTS

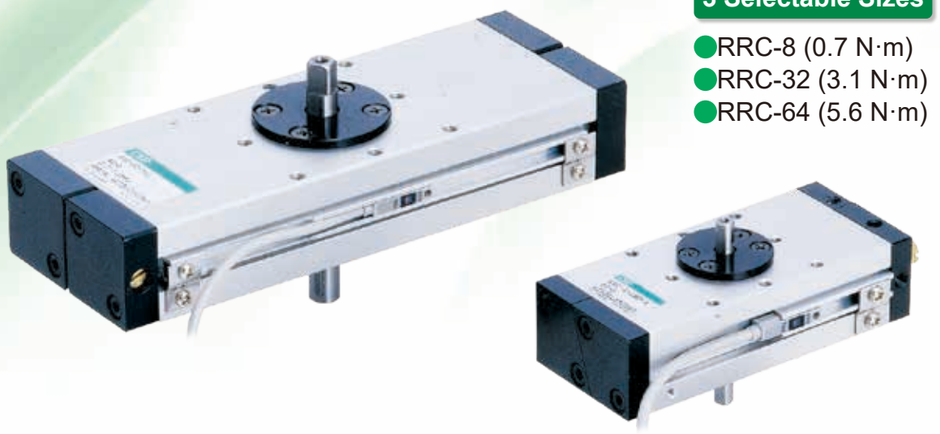
Product Introduction	1226
Series Variation	1228
● Rack & Pinion Type (RRC)	1230
Outer Dimensions Diagram with Switch	1236
Model Selection Guide	1238
⚠Precautions for Use	1240

Rack & pinion type, compact oscillating type

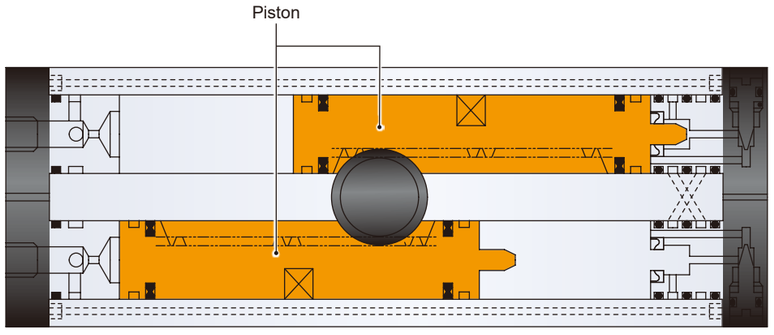
Oscillating/Rotary Drive Type 0.7 to 5.6 N·m (at 0.5 MPa)
Max Oscillation Angle 90°, 180°, 270°

3 Selectable Sizes

- RRC-8 (0.7 N·m)
- RRC-32 (3.1 N·m)
- RRC-64 (5.6 N·m)



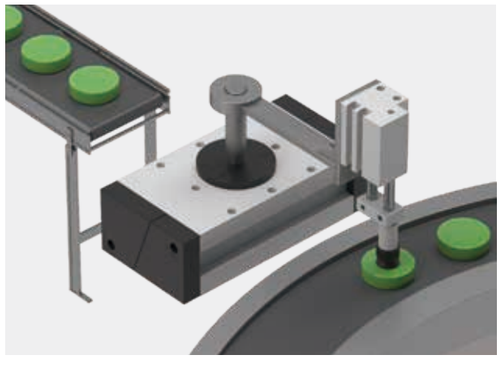
Adopts double piston system, compact with high torque, eliminates backlash



Application Example

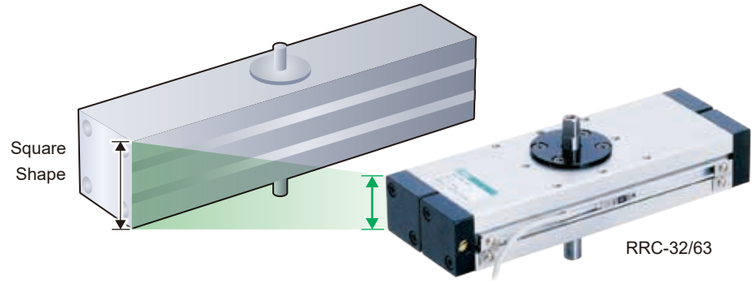
Conveyor Stopper Opening/Closing

Conveyor Workpiece Transfer



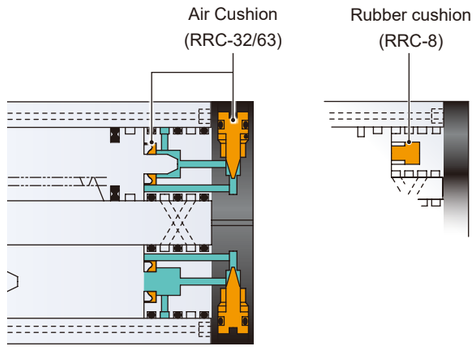
Space saving

Compact and thin design allows for installation in small spaces.



Cushion Standard Equipped

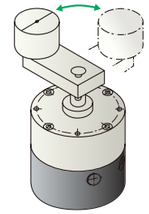
Rubber cushion or air cushion standard equipped.



Stable Torque/Long Life

Adopts a unique mechanism combining two cylinders and a rack & pinion. Torque is stable even at low pressure, with minimal internal/external leakage*, and long life.

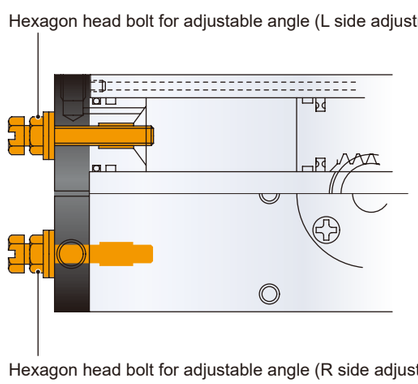
*Compared to the vane type (RV3□ Series), air leakage is less, saving energy.

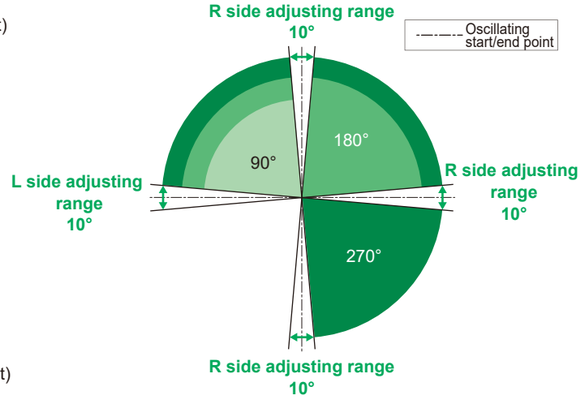


RV3□ Series

With Angle Adjustment (Option)

Angle adjustment of 10° is possible at each oscillation end point. (Max Oscillation Angle Tolerance (+1 to +8°))





Variation Table

Selex Rotary RRC Series

●:Standard, ◎: Option, ○: Custom Products, : Not Available

Variation	Model No. Circuit Diagram Code	Size	Effective Torque (at 0.5 MPa) (N·m)	Max Swing Angle (°)		Max Oscillation Angle (°)		Option	Switch	Page
				90		180	270	With Angle Adjustment A		
Rack Pinion Type	RRC	8	0.7	●		●	●	◎	◎	1230
		32	3.1							
		63	5.6							

Swing/Rotary Type
RRC
GRC
RV3□
Cylinder Switch
Ending

Selex Rotary Rack & Pinion Type

RRC Series

- Size: 8, 32, 63
- Oscillation Angle: 90°, 180°, 270°

Circuit Diagram Code

RoHS

Model Number Notation

Without Switch
(Built-in magnet for switch)

RRC - 8 - 90 ——— A

Model No. ❶ ❷ ❺

With Switch
(Built-in magnet for switch)

RRC - 8 - 90 - T2H - R - A

Model No. ❷Max Oscillation Angle ❹Number of Switches

❶ Size ❸Switch Model No. ❺ Option

❶ Size

Model No.	Effective Torque
8	0.7 N·m
32	3.1 N·m
63	5.6 N·m

❷Max Oscillation Angle

Code	Content
90	90°
180	180°
270	270°

❸Switch Model No.

For switch details, refer to P. 1457. Switches are shipped with the product.

Contact	Indicator LED Special Function	Wiring (Output)	Load Voltage (V) AC	Load Voltage (V) DC	Load Current (mA) AC	Load Current (mA) DC	Lead wire *1 Straight	Lead wire *1 L-shape	
Solid State	1-Color	2-wire	85 to 265	—	5 to 100	—	T1H□	T1V□	
			—	10 to 30	—	5 to 20 *2	T2H□	T2V□	
		3-wire (NPN)	—	30 or less	—	100 or less	T3H□	T3V□	*5
		3-wire (PNP)	—		—		T3PH□	T3PV□	
	2-Color	2-wire	—	24 ± 10%	—	5 to 20 *2	T2WH□	T2WV□	
		3-wire (NPN)	—	30 or less	—	50 or less	T3WH□	T3WV□	
	2-Color Improved Water Resistance	2-wire	—	24 ± 10%	—	5 to 20	T2WLH□	T2WLV□	*3
	1-Color Flexible Lead Wire Type		—	10 to 30	—	5 to 20 *2	T2HR3	T2VR3	
Reed	1-Color	2-wire	110	12/24	7 to 20	5 to 50	T0H□	T0V□	
	No Indicator LED		110	5/12/24	20 or less	50 or less	T5H□	T5V□	
	1-Color		110/220	12/24	7 to 20 / 7 to 10	5 to 50	T8H□	T8V□	

*1: For "□" in the switch model number, enter the code selected from the "Lead wire length, connector specification" table.
*2: The maximum load current value above, 20 mA, is at 25°C. If the switch operating Ambient Temperature is higher than 25°C, it will be lower than 20 mA. (At 60°C, it will be 5 to 10 mA.)
*3: This does not guarantee the water resistance of the cylinder.
*4: Switches other than the model numbers listed above are also available. (Custom Product) For details, refer to P. 1457.

*Lead wire length, connector specification

Code	Content
Blank	1 m (Standard)
3	3 m (Option)
5	5 m (Option)
W	M8 Connector, 1PIN (+), 4PIN (−) Lead Wire 0.3 m

*5: Only T2WLH and T2WLV can be selected.

Example) Lead wire length
1 m T0H□
3 m T0H3
5 m T0H5

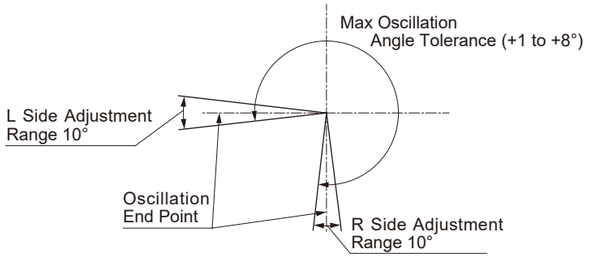
❹Number of Switches

Code	Content
R	With 1 Right Rotation Detection
L	With 1 Left Rotation Detection
D	With 2 pcs

❺ Option

Code	Content	
A	With Angle Adjustment	

*Turning the angle adjustment Hexagon Bolt clockwise reduces the cylinder oscillation angle.



Switch Single Unit Model No. Notation

●Switch Body+Mounting Bracket Set (including rail)

RRC - T2H - 8 - 90

❸ Switch Model ❷Max Oscillation Angle

❶ Size

● Switch Body Only

SW - T2H

❸Switch Model No.

●Mounting Bracket Set (including rail)

RRC - T - 8 - 90

Bracket ❷Max Oscillation Angle

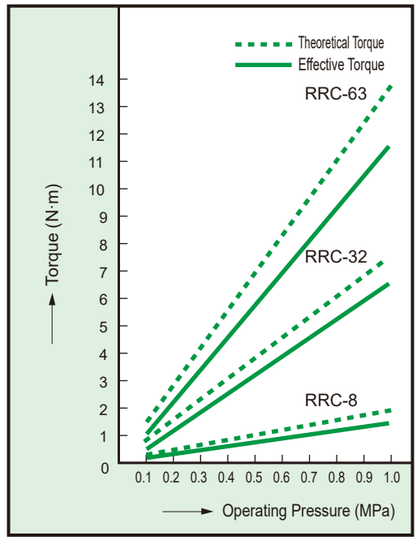
❶ Size

Specifications

Item		RRC		
Size		8	32	63
Effective torque *1	N·m	0.7	3.1	5.6
Actuation method		Rack & Pinion Type		
Operating Fluid		Compressed Air		
Max Operating Pressure	MPa	1.0		
Min Operating Pressure *2	MPa	0.1		
Proof Pressure	MPa	1.6		
Ambient Temperature	°C	-10 to 60 (No freezing)		
Port Size		Rc1/8		
Oscillating angle tolerance	Degrees	90 +8 +5 , 180 +8 +1 , 270 +8 +1		
Cushion		Rubber Cushion	Air Cushion	
Effective Cushion Length	mm	–	4.8	5.8
Allowable Absorbed Energy	J	0.05	0.21	0.41
Volumetric capacity	cm³ 90°	3	12	22
	cm³ 180°	6	24	44
	cm³ 270°	9	36	66
Lubrication		Not Required (When lubricating, use turbine oil ISO VG32)		

*1: Effective torque value is at 0.5 MPa Operating Pressure.
*2: When using RRC-8 at Max oscillation angle, ensure Operating Pressure is 0.3 MPa or more.
***3: Angle adjustment is available as an option (refer to P. 1234).**

Torque



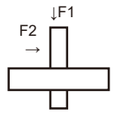
Maximum load

Use so that the load applied to the shaft is below the following values.

Unit: N

Model No. / Load Direction	RRC-8	RRC-32	RRC-63
Thrust Load F1	9.8	39.2	58.8
Radial Load F2	19.6	78.4	117.6

• Load



Cylinder Weight

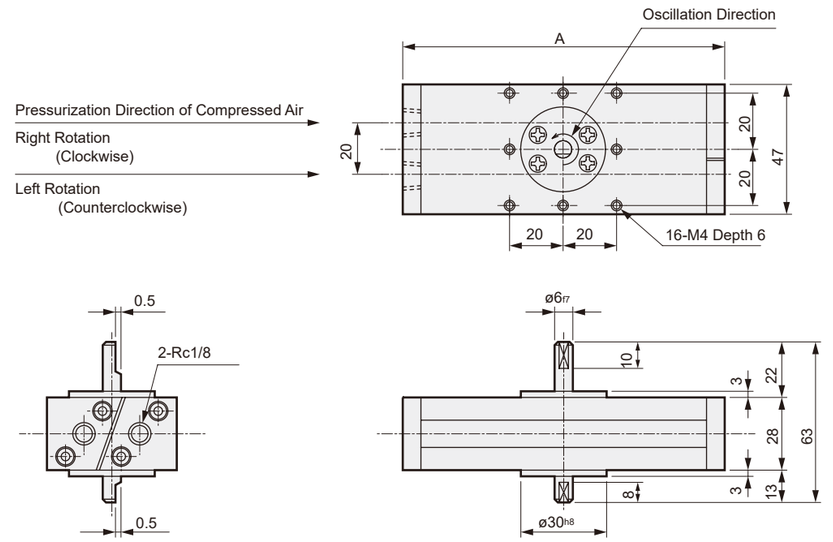
Unit: kg

Oscillation Angle / Model No.	90°	180°	270°	Switch Weight (per piece)	Switch Mounting Bracket 90°	180°	270°
RRC-8	0.39	0.43	0.49	Refer to the mass listed in the Switch Specifications on P. 1457.	0.005		
RRC-32	1.02	1.23	1.45		0.011	0.013	0.015
RRC-63	1.68	2.03	2.37		0.012	0.014	0.016

(Example) Product Weight of RRC-8-90-T2H-D
Body Weight.....0.39 kg
Switch weight...0.018 × 2 (pcs) = 0.036 kg
Switch Mounting Bracket Weight...0.005×2 (pcs.) = 0.010 kg
Product weight.....0.39 kg+0.036 kg+0.010 kg = 0.436 kg

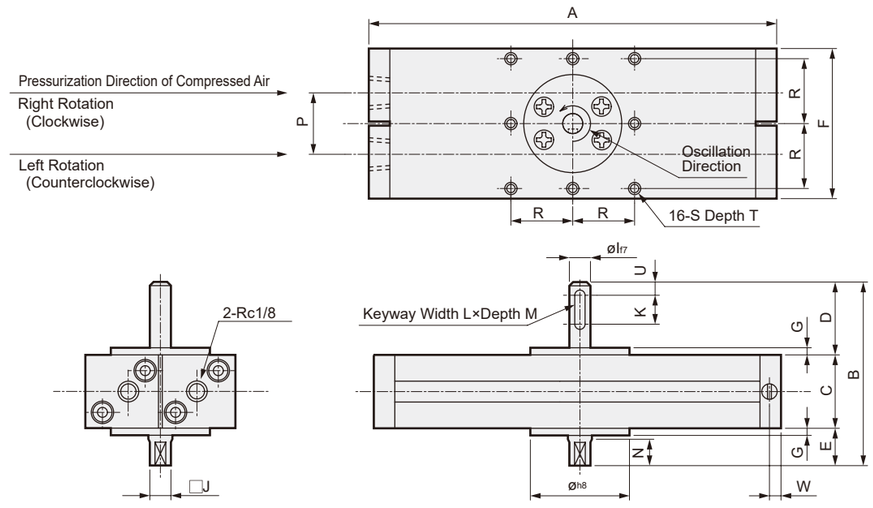
Dimensional Drawings

● RRC-8



Code / Model No.	A Oscillation Angle 90°	180°	270°
RRC-8	94	109	124

● RRC-32, 63

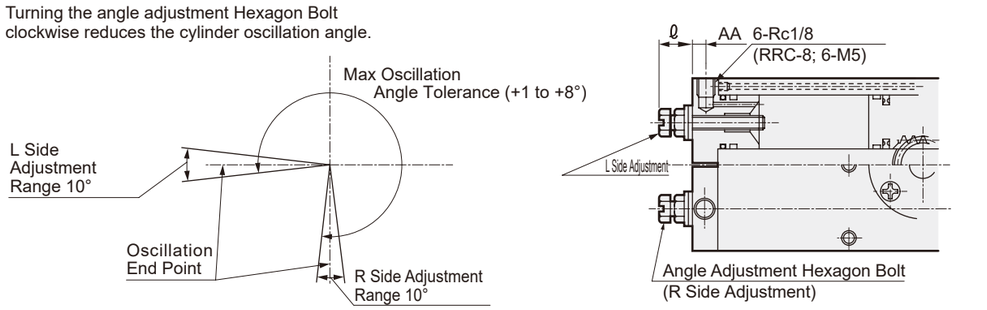


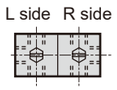
* Keys are shipped included.

Code / Model No.	A Oscillation Angle 90°	180°	270°	B	C	D	E	F	G	H	I	J	K	L	M	N	P	R	S	T	U	W
RRC-32	153	191	229	84	33	31	20	67	3	44	10	8	13	3	1.8	10	34	29	M5	8	4.5	6
RRC-63	172	216	260	101	38	41.5	21.5	78	4.5	52	12	10	16	4	2.5	13	40	34	M6	9	7	7

Dimensional Drawings with Option

●With Angle Adjustment

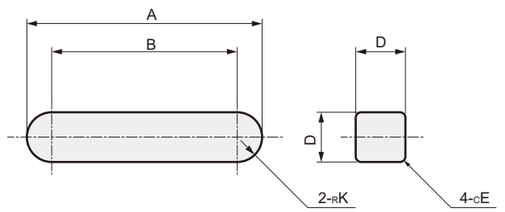




There are 3 port positions on both the R and L sides as shown in the figure above.

Code / Model No.	L MIN	L MAX	AA	Allowable Absorption Energy J (When angle adjustment is 10° on one side)	Angle Adjustment Hexagon Bolt Dimensions (Common for R, L)
RRC-8	10.7	11.5	4	0.02	M5×0.5
RRC-32	13.4	15.5	6	0.06	M6×0.75
RRC-63	13.5	16.0	7	0.13	M6×0.75

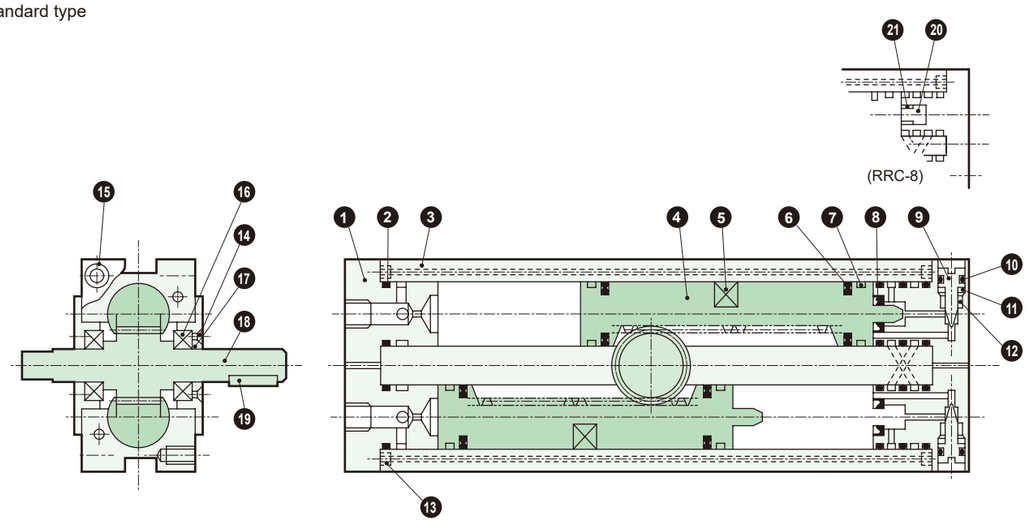
●Key Dimension Drawing



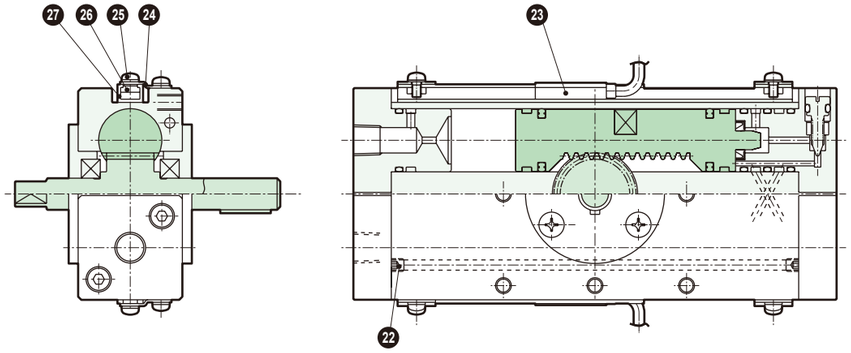
Code / Model No.	A	B	K	D	E
RRC-32	$16^{0}_{-0.18}$	13	1.5	$3^{0}_{-0.025}$	0.2
RRC-63	$20^{0}_{-0.21}$	16	2	$4^{0}_{-0.030}$	0.2

Internal Structure Diagram/Material

●Standard type



●With Switch

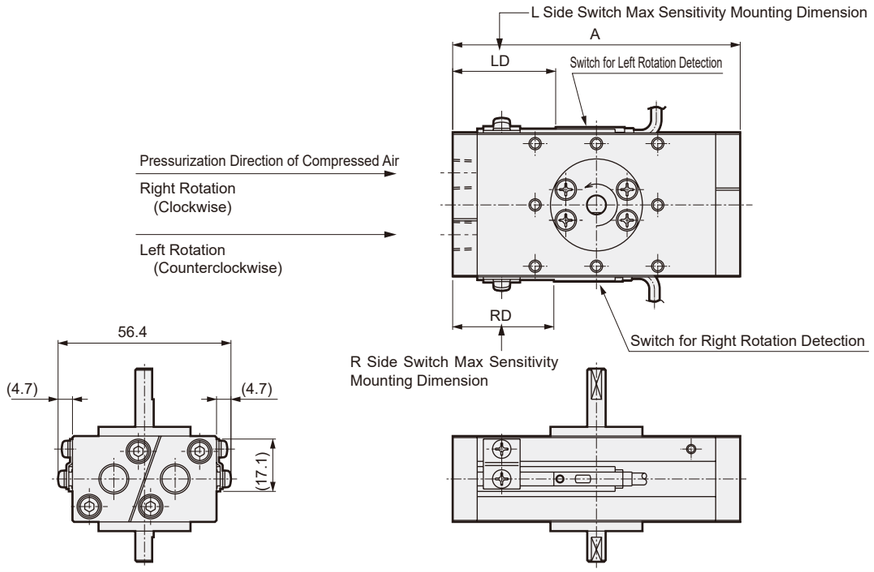


Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Cap (2)	Aluminum Alloy		15	Hexagon Socket Head Cap Screw	Alloy Steel	
2	Cap gasket	Nitrile Rubber		16	Bearing		
3	Body	Aluminum Alloy		17	Cover	Aluminum Alloy	
4	Piston	Stainless Steel		18	Shaft	Steel	
5	Magnet	Plastic		19	Key	Steel	
6	Piston Packing	Nitrile Rubber		20	Cushion Rubber	Urethane Rubber	RRC-8 only
7	Wear Ring	Polyacetal		21	Bushing	Bearing Alloy	RRC-8 only
8	Cushion Packing	Nitrile Rubber	RRC-32, 63 only	22	Hexagon Socket Set Screw	Steel	
9	Needle	Copper Alloy	RRC-32, 63 only	With Switch			
10	Needle Gasket	Nitrile Rubber	RRC-32, 63 only	23	Switch		
11	Cap (1)	Aluminum Alloy		24	Stopper plate	Stainless Steel	
12	U-nut	Steel	RRC-32, 63 only	25	Cross-Recessed pan head machine screw with washer	Steel	
13	Hexagon Socket Set Screw	Alloy Steel		26	Fixing Nut	Stainless Steel	
14	Phillips flat head screw	Steel		27	Switch Rail	Aluminum Alloy	

For maintenance parts, please visit the CKD Equipment Product Site (https: //www.ckd.co.jp/kiki/en/) → "model No." → Maintenance Parts.

RRC Series Outline Dimension Drawing with Switch

• ø8

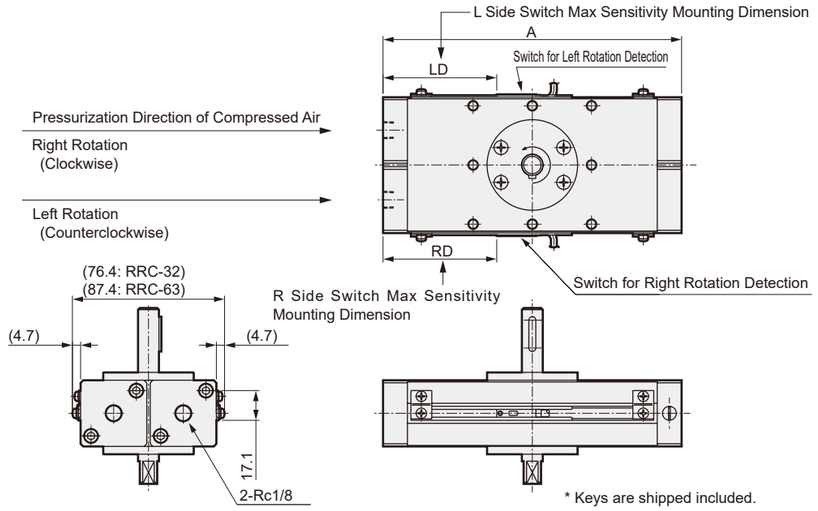


Code	A			RD														
Oscillation Angle				T1			T2, T3, T2□R3			T0, T5			T8			T2W, T3W, T2WL		
Model No.	90°	180°	270°	90°	180°	270°	90°	180°	270°	90°	180°	270°	90°	180°	270°	90°	180°	270°
RRC-8	94	109	124	31	36	40	33	37	41	30	37	41	24	31	35	34	39	43

Code	LD														
Oscillation Angle	T1			T2, T3, T2□R3			T0, T5			T8			T2W, T3W, T2WL		
Model No.	90°	180°	270°	90°	180°	270°	90°	180°	270°	90°	180°	270°	90°	180°	270°
RRC-8	31	36	40	33	37	41	30	37	41	24	31	35	34	39	43

Note: Dimensions other than the above are the same as those without switch.

• ø32, ø63



* Keys are shipped included.

Code	A			RD														
Oscillation Angle				T1			T2, T3, T2□R3			T0, T5			T8			T2W, T3W, T2WL		
Model No.	90°	180°	270°	90°	180°	270°	90°	180°	270°	90°	180°	270°	90°	180°	270°	90°	180°	270°
RRC-32	153	191	229	56	66	75	58	67	77	57	67	76	51	61	70	59	69	78
RRC-63	172	216	260	64	75	86	65	76	87	65	76	87	59	70	81	67	78	89

Code	LD														
Oscillation Angle	T1			T2, T3, T2□R3			T0, T5			T8			T2W, T3W, T2WL		
Model No.	90°	180°	270°	90°	180°	270°	90°	180°	270°	90°	180°	270°	90°	180°	270°
RRC-32	56	66	75	58	67	77	57	67	76	51	61	70	59	69	78
RRC-63	64	75	86	65	76	87	65	76	87	59	70	81	67	78	89

Note: Dimensions other than the above are the same as those without switch.

MEMO

Selex Rotary Model Selection Guide

Step 1 Oscillation Time Check

Use the oscillation time within the range shown in the table below. Unit: S

Oscillation Angle (°) / Model No.	90	180	270
RRC-8	0.015 to 0.151	0.030 to 0.302	0.045 to 0.452
RRC-32	0.038 to 0.377	0.075 to 0.754	0.113 to 1.131
RRC-63	0.073 to 0.440	0.147 to 0.880	0.220 to 1.320

* The oscillation time in the table is the time from the start of movement until the oscillation end is reached.

Step 2 Size Selection

●When simple static force is required, such as clamping

For Static Load

①Determine the Operating Pressure. P (MPa) F
②Determine the required force. (N)
③Determine the arm length from the Selex Rotary. ℓm

➡ Calculation of Required Torque T = F ℓ (N·m) ➡ Determine the size of the Selex Rotary from the output torque graph.

● When Moving a Load

For Resistive Load

When force due to friction, gravity, or other external forces (resistive load) is applied.
①Determine the Operating Pressure. P (MPa)
②Determine the required force. F_R (N)
③Determine the arm length from the Selex Rotary. ℓ m

➡ Calculation of Resistive Torque
$T_R = K \times F_R \times \ell$ (N·m)
K: Margin coefficient
No load fluctuation K=2
With load fluctuation K=5
(When resistance torque due to gravity acts) If K<5 with load fluctuation, the change in angular velocity becomes large.

⬇

Required Torque T = $T_R + T_A$

⬆

Calculation of Acceleration Torque
$T_A = 5 \times I \times \alpha$ (N·m)
T_A is the torque required to accelerate an inertial load to a constant speed.

For Inertial Load

When rotating an object.
①Determine the oscillation angle, oscillation time, and Operating Pressure.
Oscillation Angle θ (rad)
Oscillation Time t (s)
Operating Pressure P (MPa)
90° = 1.5708 (rad)
180° = 3.1416 (rad)
270° = 4.7124 (rad)
②Calculate the moment of inertia of the load from its shape and weight. Refer to the moment of inertia table for the calculation formula.
I (kg·m²)
③Calculate the Max angular acceleration.
$\alpha = \frac{2\theta}{t^2}$ (rad/s²)
θ: Oscillating angle (rad)
t: Oscillation Time (S)

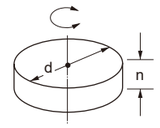
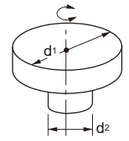
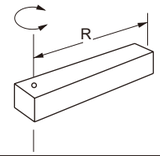
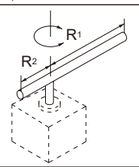
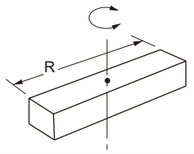
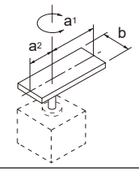
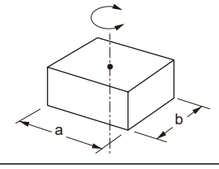
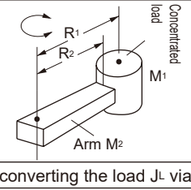
➡

Step 3 Allowable Energy Check

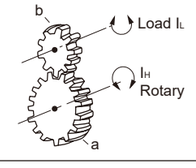
For inertial load, use so that the load energy is below the allowable energy of the Selex Rotary.
①Calculation of Angular Velocity at Oscillation End $\omega = \frac{2\theta}{t}$ (rad/s)
θ: Oscillating angle (rad) t: Oscillation Time (S)
②Calculation of Load Inertial Energy
$E = \frac{1}{2} \times I \times \omega^2$ (J)
I: Load moment of inertia (kg·m²)
③Confirm that the load inertial energy E is below the allowable energy of the Selex Rotary. If the allowable energy is exceeded, an external shock absorption device such as a shock absorber is required.

Diagram for calculating moment of inertia

●When the rotating shaft passes through the workpiece

Shape	Diagram	Required Items	Moment of Inertia I kg·m²	Radius of gyration K_1^2	Remarks
Disk		●Diameter d (m) ●Weight M (kg)	$I = \frac{Md^2}{8}$	$\frac{d^2}{8}$	● No particular mounting direction ● Consider separately when used by sliding
Stepped disk		●Diameter d_1 (m), d_2 (m) ●Weight d_1 Part M_1 (kg) d_2 Part M_2 (kg)	$I = \frac{1}{8}(M_1 d_1^2 + M_2 d_2^2)$	$\frac{d_1^2+d_2^2}{8}$	●If the d_2 part is very small compared to the d_1 part, it can be ignored.
Rod (center of rotation is at the end)		●Rod length R (m) ●Weight M (kg)	$I = \frac{MR^2}{3}$	$\frac{R^2}{3}$	● Mounting direction is horizontal ● When the mounting direction is vertical, the oscillation time changes.
Thin rod		●Rod length R_1, R_2 ●Weight M_1, M_2	$I = \frac{M_1 \cdot R_1^2}{3} + \frac{M_2 \cdot R_2^2}{3}$	$\frac{R_1^2+R_2^2}{3}$	●Mounting direction is horizontal ●When the mounting direction is vertical, the oscillation time changes.
Rod (center of rotation is at the center of gravity)		●Rod length R (m) ●Weight M (kg)	$I = \frac{MR^2}{12}$	$\frac{R^2}{12}$	● No particular mounting direction
Thin rectangular plate (cuboid)		●Plate length a_1, a_2 ●Side length b ●Weight M_1, M_2	$I = \frac{M_1}{12}(4a_1^2+b^2) = \frac{M_2}{12}(4a_2^2+b^2)$	$\frac{(4a_1^2+b^2)+(4a_2^2+b^2)}{12}$	● Mounting direction is horizontal ● When the mounting direction is vertical, the oscillation time changes.
Cuboid		●Side length a (m), b (m) ●Weight M (kg)	$I = \frac{M}{12}(a^2+b^2)$	$\frac{a^2+b^2}{12}$	● No particular mounting direction ● Consider separately when used by sliding
Concentrated load		● Shape of concentrated load ● Length to the center of gravity of the concentrated load R_1 (m), R_2 (m) ● Arm length ● Weight of concentrated load M_1 (kg) ● Weight of arm M_2 (kg)	$I = M_1(R_1^2+k_1^2) + \frac{M_2 R_2^2}{3}$	k_1^2 is calculated based on the shape of the concentrated load	● Mounting direction is horizontal ●If M_2 is very small compared to M_1, you can calculate with M_2=0.

Method of converting the load J_L via gears to the rotary actuator shaft axis

Gear		● Gear Rotary Side (Number of Teeth) a Load Side (Number of Teeth) b ● Moment of Inertia of Load N·m	Moment of inertia around the rotary axis of the load $I_H = \left(\frac{a}{b}\right)^2 I_L$		●If the shape of the gear is large, it is necessary to consider the moment of inertia of the gear.

To Use This Product Safely

Be sure to read this before use. For general cylinder information, see Intro 41, and for cylinder switches, see P. 1512.

Individual Precautions: Selex Rotary Rack & Pinion RRC Series

Design / Selection

⚠CAUTION

■Do not apply torque exceeding rated output to the product.
If an external force exceeding the rated output of the product is applied to the product, it will cause damage to the product.

■If oscillating angle repeatability is required, directly stop external load.
Even for products with angle adjustment, the initial oscillation angle may change.

■If the axial load (thrust load) on the shaft exceeds the allowable value, faulty operation could occur. Therefore, do not apply a load in excess of the allowable value. If unavoidable, use a structure with a thrust bearing as shown in Figure 1.

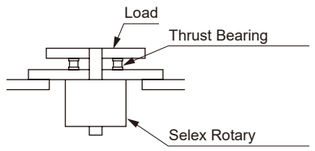


Figure 1

■Avoid applying bending (radial) load exceeding the allowable value onto the shaft end, or operation faults could occur.
If unavoidable, use a mechanism where only rotational force is transmitted, as shown in Figure 2. To prevent shaft breakage, bearing wear/seizure, etc., connect the shaft tip and load with a flexible coupling, etc., that does not cause prying at any position within the oscillation range.

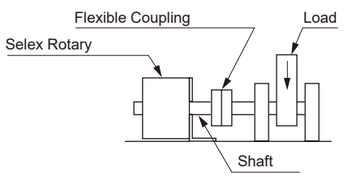


Figure 2 Radial Load

■Install the external stopper in a position far from the rotary shaft.
If a stopper is installed near the rotating shaft, the reaction force acting on the stopper due to the torque generated by the product itself will be applied to the rotating shaft, causing damage to the rotating shaft and bearings, which may cause injury or damage to personnel, equipment, and devices.

■If the load weight is large and oscillation is fast, large inertia could be generated and allowable absorbed energy exceeded, possibly damaging the rotary actuator.
Install a shock absorber to absorb inertia.

■The retention torque of the oscillating end is about half that of the effective torque, so a load factor of 50% or less should be used.

■Generally, select a model so that the output torque is twice or more the torque required by the load.
Since the RRC series adopts a double piston method, if the oscillation angle is adjusted with a stopper bolt, the holding torque at the oscillation end will be half the effective torque. is included.

■Even if the required torque of the load is small during oscillating motion, the inertial force of the load may cause damage to the actuator. Be sure to consider the moment of inertia of the load, kinetic energy, and oscillation time, and use below the allowable energy.

During Use

⚠CAUTION

■When installing a load or jig, etc., on the rotary actuator shaft, check that load is not applied to the body as shown in Fig.3.

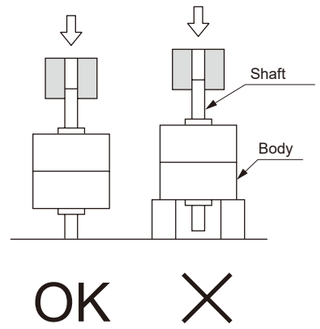


Fig. 3

■When adjusting the angle by supplying pressure, do not rotate the device too much in advance.
Adjustment by supplying pressure may cause rotation and falling during adjustment depending on the mounting posture of the device, etc., which may cause injury or damage to personnel, equipment, and devices.

■Do not loosen the angle adjustment Hexagon Bolt beyond the adjusting range.
Loosening beyond the adjustment range may cause the angle adjustment Hexagon Bolt to come off, which may cause injury or damage to personnel, equipment, and devices. Turning the angle adjustment Hexagon Bolt clockwise reduces the cylinder oscillation angle.

■Observe steps to when adjusting the angle. If adjustment is not performed by this method, the seal washer will be damaged after 1 or 2 adjustments.

[Angle Adjustment Procedure]

(1) First, loosen the Hexagon Nut to the state shown in Figure 1.

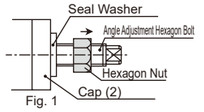


Fig. 1

(2) Next, release the seal washer from the cap (2) by hand to the state shown in Figure 2.

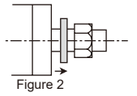


Figure 2

(3) Turn the angle adjustment Hexagon Bolt, Hexagon Nut, and seal washer together as shown in Fig.3, and adjust the angle. At this time, be careful not to let the rubber part of the seal washer get caught in the threaded part.

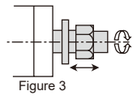


Figure 3

(4) After angle adjustment, first bring the seal washer close to the cap (2) by hand as shown in Figure 4.

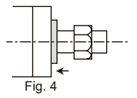


Fig. 4

(5) Then, securely tighten with the Hexagon Nut as shown in Figure 5. At this time, be careful not to let the rubber part of the seal washer get caught in the threaded part.

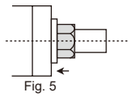


Fig. 5

■Securely tighten the Hexagon Nut after adjusting the angle. If tightening is insufficient, the Hexagon Nut will loosen during use, causing external leakage.

For precautions during mounting, installation, adjustment, use, and maintenance, refer to "During Use" in this catalog and the CKD Components Product website (https://www.ckd.co.jp/kiki/en/) -> "Model No." -> Instruction Manual.

Swing/Rotary Type

GRC

Table Type Rotary Actuator

Size 5, 10, 20, 30, 50, 80

CONTENTS

Product Introduction 1244
Series Variation 1246
● Basic (GRC) 1248
● High Accuracy (GRC-K) 1248
● Fine Speed (GRC-F) 1262
● High-Precision Type / Slow-Speed Type (GRC-KF) 1262
External Dimensions Diagram with Switch 1265
Model Selection Guide 1266
Technical Data 1272
⚠ Precautions for Use 1280

Swing/Rotary Type
RRC
GRC
RV3□
Cylinder Switch
Ending

GRC Series

Bearing guide enables direct mounting of high loads and high positional accuracy

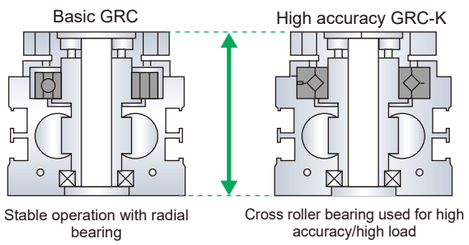
Excellent Design Freedom

Abundant Torque Sizes

6 sizes selectable from compact 0.5 N·m to 8.1 N·m.

Standard type and high-precision type selectable with the same dimensions

Product type change on lines, etc. (standard type, high-precision type) can be handled speedily.



90° specification and 180° specification available separately

When selecting 90° oscillation angle type, further compactness is achieved.

GRC Series Product System

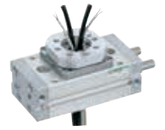
	Basic type GRC	High-Precision Type GRC-K
With Switch	●	●
Size (Torque Value, at 0.5 MPa)		
5 (0.5 N·m)	●	-
10 (1.0 N·m)	●	●
20 (2.0 N·m)	●	●
30 (3.0 N·m)	●	●
50 (5.2 N·m)	●	●
80 (8.1 N·m)	●	●
Oscillation Angle		
90° Type	●	●
180° Type	●	●
Option		
Shock suppressor type Stopper	●	●

Excellent Installability

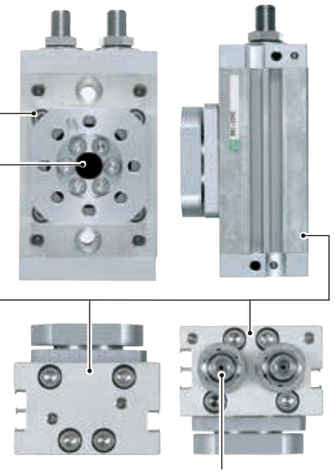
① Spigot joint for positioning on table top surface (4 locations) and main body bottom surface (1 location)

② Large hollow hole allows for neat piping/wiring

Hollow hole diameters ø4 to ø17 available.



③ Piping port extraction direction selectable from 3 faces

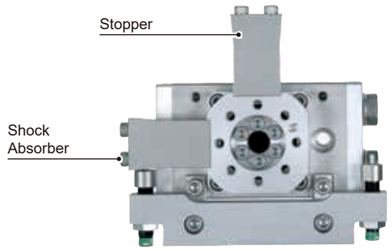


④ Angle adjustment bolt with rubber cushion for adjusting oscillation angle

Excellent Operability

Stable operation with external stopper

Smooth stopping without backlash is possible with external stopper and shock absorber (option).



Energy saving

Compared to vane type (RV3□ Series), air leakage is less, saving energy.

Gentle, slow-speed operation possible for workpieces

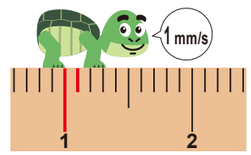
Large pinion diameter and long piston stroke achieve low-speed operation.

Variation	Model No.	Oscillation Time Adjustment Range s/90°
Basic Type/High-Precision Type	GRC, GRC-K	0.2 to 1.5
Slow-Speed Type/ High-Precision Slow-Speed Type	GRC-F, GRC-KF	0.2 to 25

Ultra Low Speed Type

Ultra-low speed drive up to 1 mm/s possible

No stick-slip, stable operation even at fine speeds. Ideal for conveying and positioning delicate products.

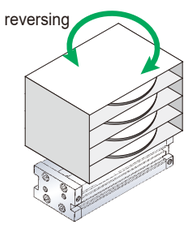


Sliding Structure

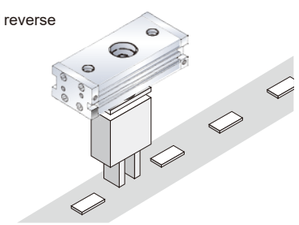
- **Special treatment of tube inner surface**
- **Special treatment of packing surface and optimization of hardness**
- **Optimal grease selection**

Application Example

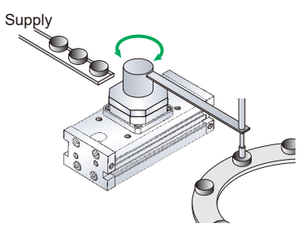
Cassette reversing



Hand reverse



Parts Supply



Variation Table

Table Type Rotary Actuator
GRC Series

●: Standard, ◎Option, : Not Available

Variation	Model No. Circuit Diagram Code	Size							Max Swing Angle (°)		Option			Switch	Page
		5	10	20	30		50	80	90	180	With External Shock Absorber ① A1	With External Shock Absorber ② A2	With Mounting Groove Machining for Retrofitting External Shock Absorber A3		
Basic type	GRC	●	●	●	●		●	●	●	●	◎	◎	◎	◎	1248
High-Precision Type	GRC-K		●	●	●		●	●	●	●	◎	◎	◎	◎	1248
Ultra Low Speed Type	GRC-F	●	●	●	●		●	●	●	●	◎	◎	◎	◎	1262
High-Precision Type / Ultra Low Speed Type	GRC-KF		●	●	●		●	●	●	●	◎	◎	◎	◎	1262

Note: Refer to P. 1254 for external Shock Absorbers
.

Table Type Rotary Actuator
Basic Type/High-Precision Type

GRC, GRC-K Series

● Size: 5, 10, 20, 30, 50, 80

Circuit Diagram Code

RoHS

Model Number Notation

Without switch
(Built-in magnet for switch)

GRC - 10 - [ ] - 90 ——— A1
1 2 3 4 7

With Switch
(Built-in magnet for switch)

GRC - 30 - [ ] - 180 - T2H□ - R - A2

1 Model Number
2 Size
3 Piping thread type
4 Oscillation Angle:
5 Switch Model
6 Number of Switches
7 Option

1 Model Number

Code	Content
GRC	Basic type
GRC-K	High-Precision Type

Note: The port position for basic type/high-precision type is on the side. Other ports are fitted with plugs.

2 Size

	Model No.	Theoretical Torque
*1	5	0.5 N·m
	10	1.0 N·m
	20	2.0 N·m
	30	3.0 N·m
	50	5.2 N·m
	80	8.1 N·m

*1: For size "5", GRC-K cannot be selected.

3 Piping thread type

Code	Content
Blank	M5 (Size 5 to 30)
	Rc Thread (Size 50, 80)
NN	NPT Thread (Size 50 or more) (Custom Product)
GN	G Thread (Size 50 or more) (Custom Product)

4 Oscillation Angle:

Code	Content
90	90°
180	180°

5 Switch Model No.

For switch details, refer to P. 1457. Switches are shipped with the product.

Contact	Indicator LED Special Function	Wiring (Output)	Load Voltage (V) AC	Load Voltage (V) DC	Load Current (mA) AC	Load Current (mA) DC	Lead Wire *1 Straight	Lead Wire *1 L-shape	
Solid State	1-Color	2-wire	85 to 265	—	5 to 100	—	T5V□	T1V□	
			—	10 to 30	—	5 to 20 *2	T2H□	T2V□	
		3-wire (NPN)	—	30 or less	—	100 or less	T3H□	T3V□	
		3-wire (PNP)	—		—		T3PH□	T3PV□	
	2-Color	2-wire	—	24 ± 10%	—	5 to 20	T2WH□	T2WV□	
		3-wire (NPN)	—	30 or less	—	50 or less	T3WH□	T3WV□	
	2-Color Improved Water Resistance	2-wire	—	24 ± 10%	—	5 to 20	T2WLH□	T2WLV□ *3	
	1-Color Flexible Lead Wire Type		—	10 to 30	—	5 to 20 *2	T2HR3	T2VR3	

*5

*Lead wire length, connector specification

Code	Content
Blank	1 m (Standard)
3	3 m (Option)
5	5 m (Option)
W	M8 Connector, 1PIN (+), 4PIN (−) Lead Wire 0.3 m

*5: Only T2WLH and T2WLV can be selected.

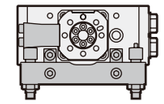
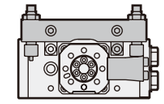
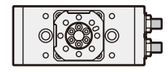
Example) Lead wire length
1 m T1H
3 m T1H3
5 m T1H5

*1: For "□" in the switch model number, enter the code selected from the "*Lead wire length, connector specification" table.
*2: The maximum load current value above, 20 mA, is at 25°C. If the switch operating Ambient Temperature is higher than 25°C, it will be lower than 20 mA. (At 60°C, it will be 5 to 10 mA.)
*3: This does not guarantee the water resistance of the cylinder.
*4: Switches other than the model numbers listed above are also available. (Custom Product) For details, refer to P. 1457.

6 Number of Switches

Code	Content
R	With 1 Right Rotation Detection
L	With 1 Left Rotation Detection
D	With 2 pcs

7 Option

Code	Content	
Blank	Stopper, Urethane-Tipped Hexagon Socket Head Set Screw Type	
A With External Shock Absorber		
A1	Mounting Position①	
A2	Mounting Position②	
A3	For Retrofitting External Shock Absorber (With Mounting Groove Machining)	

*1: The external Shock Absorbers cannot be retrofitted onto the basic/high accuracy type. If retrofitting is possible, select A3 type as an option.
*2: A3, if an external Shock Absorbers is retrofit on the A1, will be the same. Please consult us for use with A2 type.

Clean Specification (Catalog No. CB-033SAA)

●Dust prevention structure usable in cleanrooms

GRC - . . . . - P7□ GRC-K - . . . . - P7□
GRC - . . . . - P5□ GRC-K - . . . . - P5□

Rechargeable Battery Compatible Specification

(Catalog No. CC-1226AA)

●Design compatible with rechargeable battery manufacturing process

GRC - . . . . - P4*

*Please contact us for details.

Switch Single Unit Model No. Notation

● Switch Body Only

SW - T2H
5 Switch Model No.

Consumable Parts Kit Model No. Notation

● Set of consumable parts such as packing

GRC - 5 K
2 Size

Specifications

Item			GRC-5	GRC-10 GRC-K-10	GRC-20 GRC-K-20	GRC-30 GRC-K-30	GRC-50 GRC-K-50	GRC-80 GRC-K-80
Size			5	10	20	30	50	80
Theoretical Torque *1		N·m	0.5	1.0	2.0	3.0	5.2	8.1
Actuation method			Rack & Pinion Type					
Operating Fluid			Compressed Air					
Max Operating Pressure		MPa	1.0					
MinOperating Pressure *2	Basic type		0.10					
MPa	High-Precision Type		—	0.15		0.10		
	With External Shock Absorber		0.25 (36 psi)	0.20	0.15			
Proof Pressure		MPa	1.6					
Ambient Temperature		°C	0 to 60 (provided there is no freezing)					
Port Size			M5				Rc1/8	
Cushion	Basic Type/High-Precision Type		Rubber Cushion					
	With External Shock Absorber		Shock Absorber					
	Shock suppressor model number		NCK-0.3		NCK-0.7		NCK-1.2	NCK-2.6
Allowable Absorbed Energy	Basic Type/High-Precision Type		0.005	0.008	0.03		0.04	0.11
J	With External Shock Absorber *7		0.46	0.59	1.15	1.71	2.33	2.78
Shock absorber stroke		mm	3.5	3.5	5	5	5.5	6.5
Lubrication			Not Required (When lubricating, use Turbine Oil ISO VG32)					
Volumetric capacity *3		cm^3	90°	1.3	3.5	7.0	10.5	18.1	28.3
			180°	3.4	6.6	13.4	20.0	34.4	53.7
Oscillation Angle Adjustment Range *4	Basic Type/High-Precision Type		90°	0° to 100°					
			180°	90° to 190°					
	With External Shock Absorber		90°	90° ±6°					
			180°	180° ±6°					
Oscillating time adjusting range *5 *8		s/90°	0.2 to 1.5					
Table Runout Accuracy (Reference Value) *6		Basic type	±0.17°			±0.23°	±0.26°	±0.32°
		High-Precision Type	—	±0.026°				

*1: Theoretical torque is at 0.5 MPa Operating Pressure.
*2: To fully compress the rubber cushion built into the basic type/high-precision type, the Operating Pressure must be 0.3 MPa or more.
*3: Internal volume is at the Max oscillation angle of the oscillation angle adjustment range.
*4: Oscillation angle adjustment range is when adjusted with stopper bolts (shock absorbers) on both sides.
*5: Oscillation time adjustment range is at 0.5 MPa Operating Pressure.
***6: Technical Data (P. 1275) shows the table displacement at a point 100 mm away from the center of rotation.**
***7: The values in the table indicate the absorbed energy at the maximum oscillation speed. Since the absorption energy value changes with oscillation speed, refer to the graph on P. 1272 "Absorption Energy and Oscillation Time."**
*8: For types with shock absorbers, it is the time until impact with the tip of the shock absorber (rod tip). (It is not the oscillation time to the stroke end of the shock absorber.)

Min Oscillation Angle with Switch

Size	5	10	20	30	50	80
T-type Solid State T-type 2-Color Indicator	20°	15°	17.5°	12.5°	12.5°	12.5°

Theoretical Torque Table

(Unit: N·m)

Size	Operating Pressure (MPa)									
	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
5	–	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
10	–	0.4	0.6	0.8	1.0	1.2	1.4	1.6	1.8	2.0
20	–	0.8	1.2	1.6	2.0	2.4	2.8	3.2	3.6	4.0
30	0.6	1.2	1.8	2.4	3.0	3.6	4.2	4.8	5.4	6.0
50	1.0	2.1	3.1	4.1	5.2	6.2	7.3	8.3	9.3	10.4
80	1.6	3.2	4.9	6.5	8.1	9.7	11.3	13.0	14.6	16.2

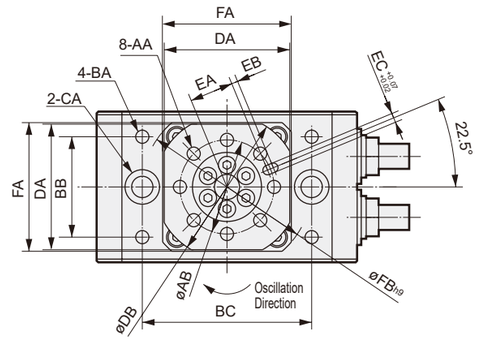
Product Weight

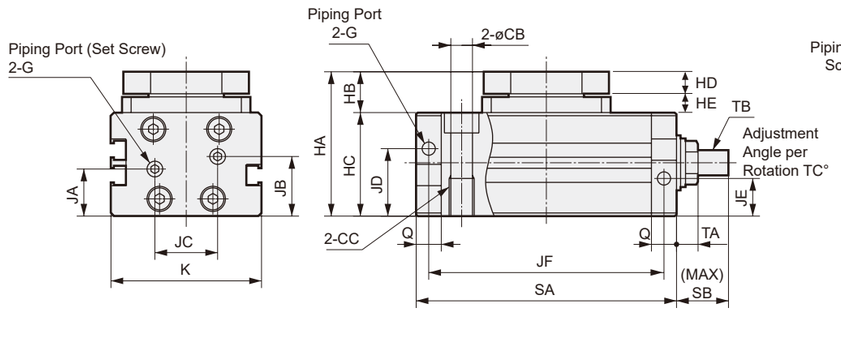
(Unit: kg)

Oscillation Angle / Model No.	90°		180°		External Shock Absorber Weight	Switch Weight (per piece)
	Basic type	High-Precision Type	Basic type	High-Precision Type		
GRC-5	0.39	–	0.43	–	0.20	0.02
GRC-10	0.48	0.50	0.56	0.58	0.30	
GRC-20	0.78	0.80	0.88	0.90	0.40	
GRC-30	1.05	1.30	1.25	1.50	0.50	
GRC-50	1.80	2.10	2.10	2.40	0.60	
GRC-80	2.30	2.60	2.70	3.00	0.70	

Dimensional Drawings

●GRC Basic Type
●GRC-K High-Precision Type





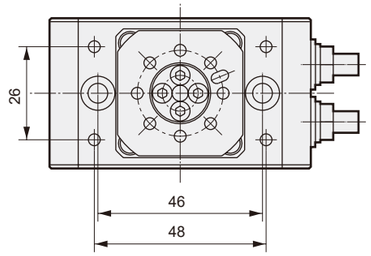
Code / Size	AA	AB	BA	BB	BC	CA	CB	CC	DA	DB	EA	EB	EC	FA	FB	G	HA	HB	HC	HD	HE	JA	JB	JC	JD	JE	JF 90°	JF 180°	JG	JH	K	MA	MB	NA	NB	NC	PA	PB	Q
5	M4 Depth 7	24	M4 Depth 6.5	26	48	Counterbore ø9.5 Depth 5.4	5.2	M6 Depth 12	35	42	11	2	3 Depth 3.5	36	48	M5	43	13	30	7	6	15	18	16	21	11.5	65	82	5.6	29	42	17	2	4	5.5	2.4	12	3.5	8
10	M5 Depth 7	30	M5 Depth 7	32	54	Counterbore ø11 Depth 6.5	6.6	M8 Depth 12	40	46	14	2	3 Depth 3.5	41	54	M5	46	13	33	7	6	15	19	20	21.5	12	75	99	5.6	37	48	22	2	8	5.5	2.4	18	2.5	8
20	M6 Depth 9	36	M6 Depth 8	42	62	Counterbore ø11 Depth 6.5	6.9	M8 Depth 12	47	55	17	2	4 Depth 4.5	48	64	M5	53	16	37	9	7	14.5	20.5	27	22	13	86	115	5.6	47	58	27	2	11	6.5	3.9	20	2.5	10
30	M6 Depth 9	44	M6 Depth 8	52	74	Counterbore ø14 Depth 8.6	8.7	M10 Depth 15	58	67	21	2	4 Depth 4.5	59	78	M5	55	18	37	9	9	14.5	20.5	37	22	13	111	155	5.6	57	68	32	2	13	7.5	2.9	26	2.5	10
50	M8 Depth 13	50	M8 Depth 12	60	88	Counterbore ø17.5 Depth 10.8	10.5	M12 Depth 18	66	74	24	2	5 Depth 5.5	69	92	Rc1/8	71	23	48	13	10	21.5	27.5	36	32.5	17.5	129	177	8.1	58	75	37	4	14	10.5	5.3	28	4.5	15
80	M8 Depth 13	54	M8 Depth 12	66	94	Counterbore ø17.5 Depth 10.8	10.5	M12 Depth 18	69	80	26	2	5 Depth 5.5	76	101	Rc1/8	80	25	55	13	12	24	30	40	35	19	135	183	8.1	58	80	40	3	17	9.5	4.4	36	3.5	15

Code / Size	SA 90°	SA 180°	SB	TA	TB	TC	UA	UB	V	W	X
5	73	90	14	6.5	M6×1	8.7	16.6	16	3	10	12.6
10	83	107	15	4.9	M8×0.75	4.9	17.1	19.4	4	11	13.1
20	96	125	17	6.1	M10×1	5.7	17.6	24	5	13	13.6
30	121	165	25	6.1	M10×1	3.8	17.6	34	5	13	13.6
50	144	192	29.5	7	M12×1	3.5	24.6	35	6	14	20.6
80	150	198	29.5	7	M12×1	3.5	27.1	36	6	14	23.1

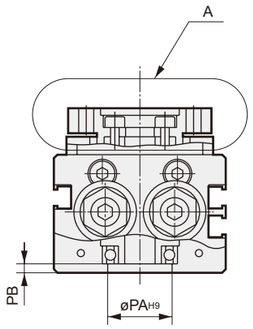
*1: For size 5, GRC-K cannot be manufactured.
***2: For dimensions of models with switches, see P. 1265.**

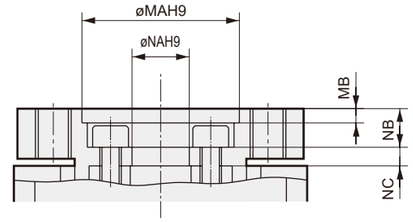
Dimensional Drawings

GRC-5

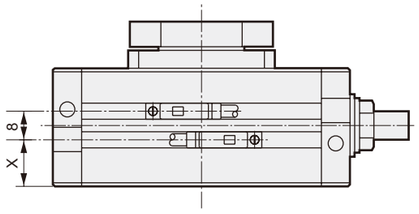


For GRC-5 only, the positions of 4-BA and 2-CA are different.



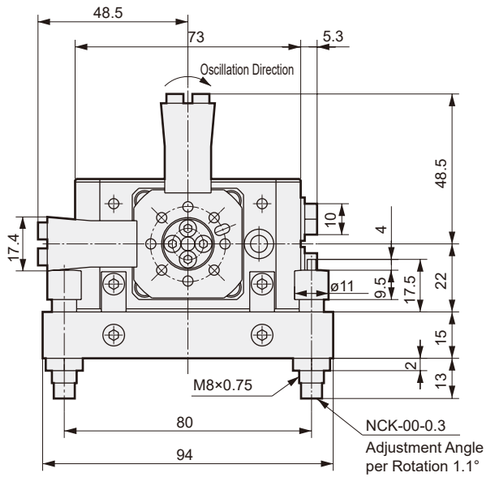


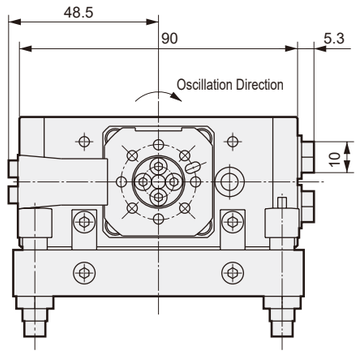
Detail A



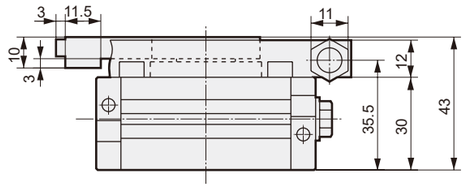
Outline Dimension Drawing with Option (With External Shock Absorber Size 5)

●GRC-5-□-A1/A2
Note: The drawing is for A1 type (mounting position①)



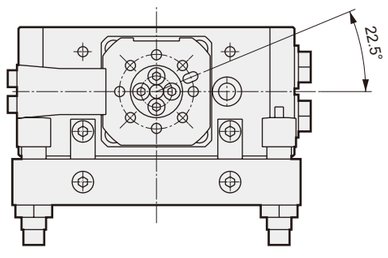


180° Specification

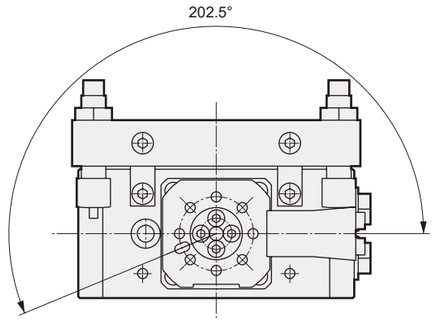


90° Specification

Note: Dimensions of the rotary actuator body are the same as the basic type, but it cannot be fixed using the 4 taps on the top of the body. Also, the position of the positioning pin hole on the top of the table varies depending on the mounting position of the external shock absorber.



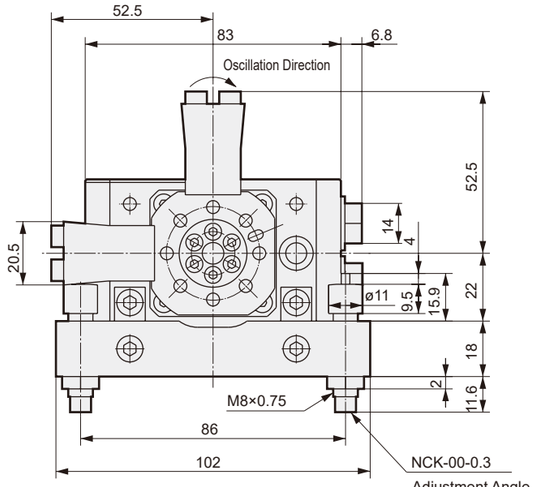
For GRC-5-□-A1

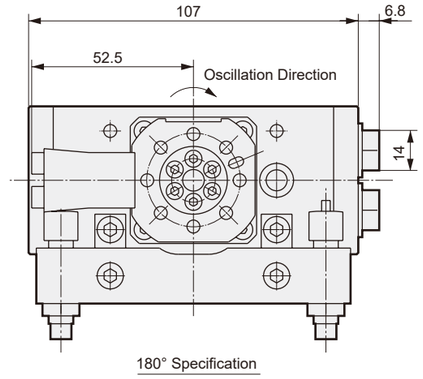


For GRC-5-□-A2

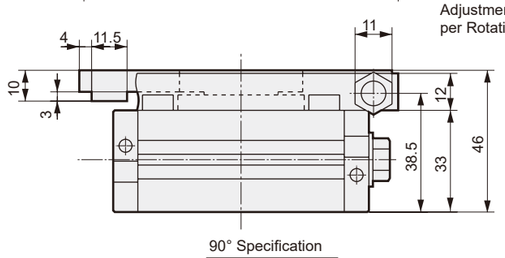
Outline Dimension Drawing with Option (With External Shock Absorber Size 10, 20)

●GRC-10-□-A1/A2
Note: The drawing is for A1 type (mounting position①)





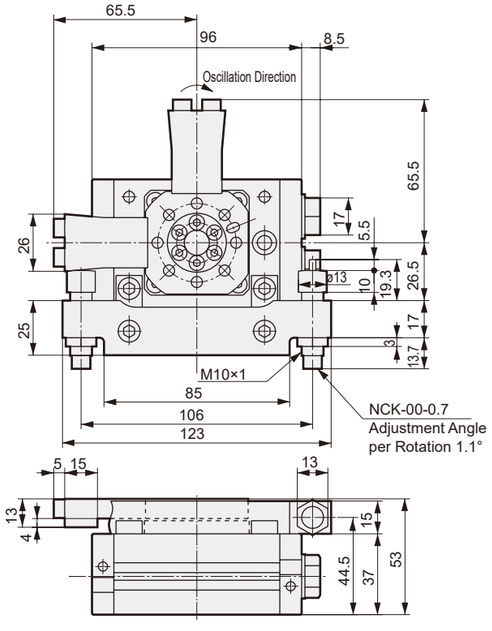
180° Specification



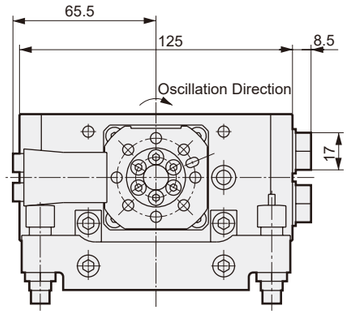
90° Specification

Note: Dimensions of the rotary actuator body are the same as the basic type, but it cannot be fixed using the 4 taps on the top of the body. Also, the position of the positioning pin hole on the top of the table varies depending on the mounting position of the external shock absorber. (Refer to GRC-5-□-A1/A2.)

●GRC-20-□-A1/A2
Note: The drawing is for A1 type (mounting position①)



90° Specification

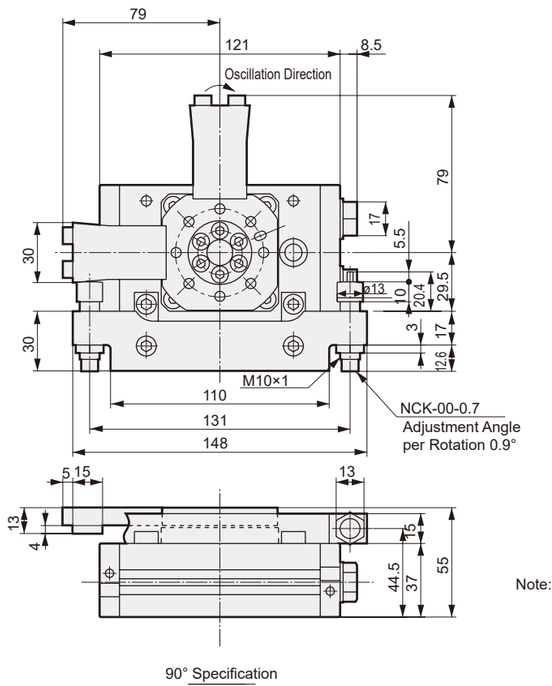


180° Specification

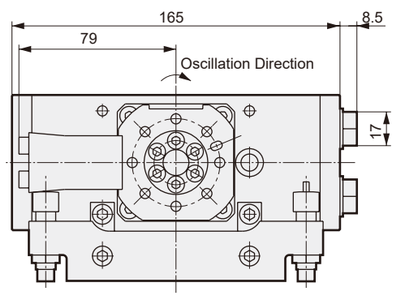
Note: Dimensions of the rotary actuator body are the same as the basic type, but it cannot be fixed using the 4 taps on the top of the body. Also, the position of the positioning pin hole on the top of the table varies depending on the mounting position of the external shock absorber. (Refer to GRC-5-□-A1/A2.)

Outline Dimension Drawing with Option (With External Shock Absorber Size 30, 50)

●GRC-30-□-A1/A2
Note: The drawing is for A1 type (mounting position①)



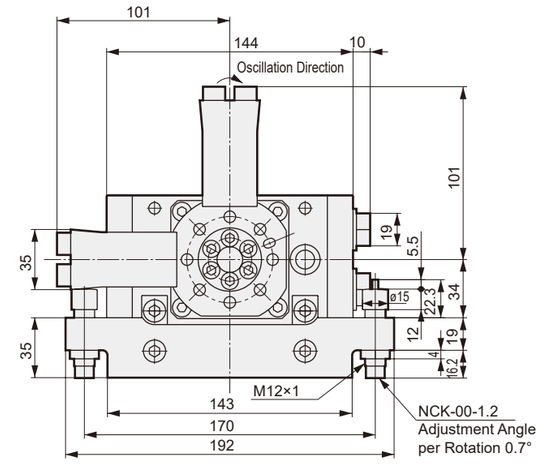
90° Specification



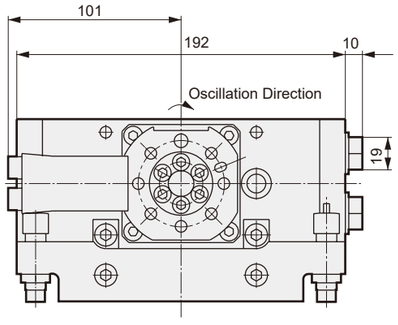
180° Specification

Note: Dimensions of the rotary actuator body are the same as the basic type, but it cannot be fixed using the 4 taps on the top of the body. Also, the position of the positioning pin hole on the top of the table varies depending on the mounting position of the external shock absorber. (Refer to GRC-5-□-A1/A2.)

●GRC-50-□-A1/A2
Note: The drawing is for A1 type (mounting position①)



90° Specification

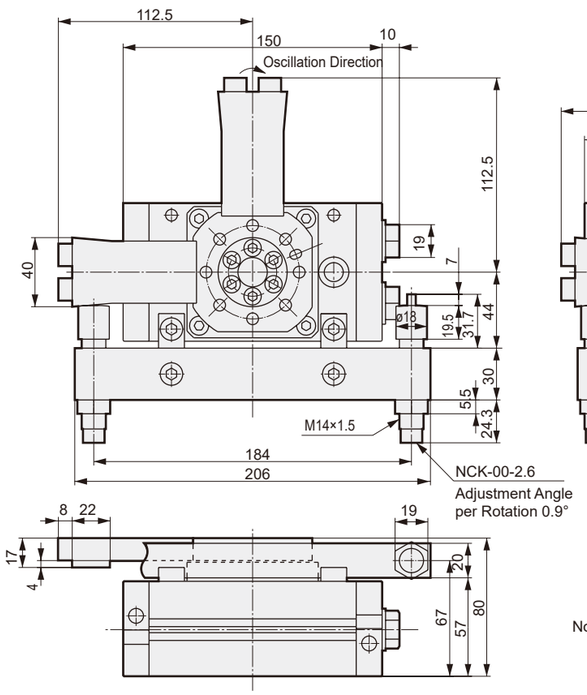


180° Specification

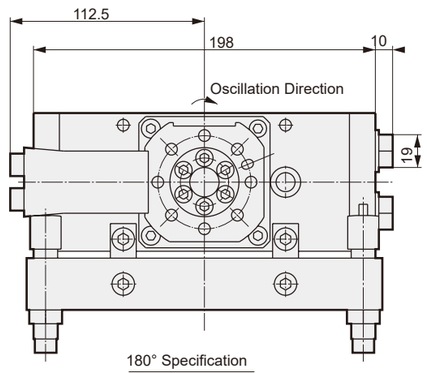
Note: Dimensions of the rotary actuator body are the same as the basic type, but it cannot be fixed using the 4 taps on the top of the body. Also, the position for the locating pin hole on the table top surface varies depending on the mounting position of the external shock absorber. (Refer to GRC-5-□-A1/A2.)

Outline Dimension Drawing with Option (With External Shock Absorber Size 80)

●GRC-80-□-A1/A2
Note: The drawing is for A1 type (mounting position①)



90° Specification

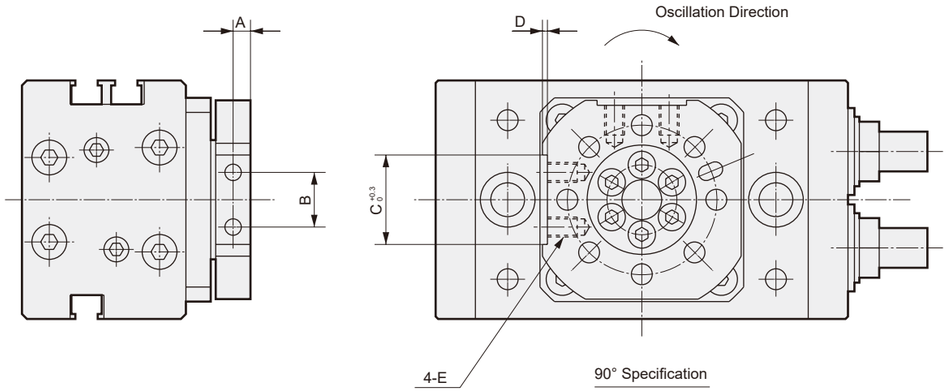


180° Specification

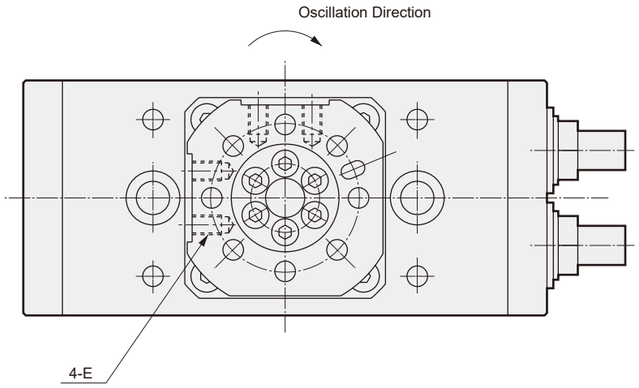
Note: Dimensions of the rotary actuator body are the same as the basic type, but it cannot be fixed using the 4 taps on the top of the body. Also, the position of the positioning pin hole on the top of the table varies depending on the mounting position of the external shock absorber. (Refer to GRC-5-□-A1/A2.)

Outline Dimension Drawing with Option (For Retrofitting External Shock Absorber Size 5 to 80)

●GRC-□-A3

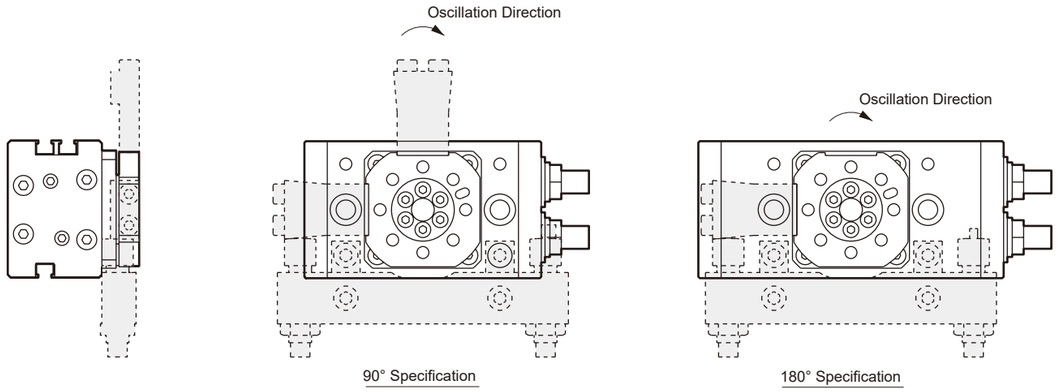


Code / Size	A	B	C	D	E
5	3.5	8.4	15	1	M3 Depth 6.5
10	3.8	11	18	1	M4 Depth 6
20	4.5	13.4	23	1	M5 Depth 7.5
30	4.5	17	27	2	M5 Depth 8.5
50	6.9	18.4	32	2	M8 Depth 9
80	6.9	20	36	2	M8 Depth 9



When external shock absorber set is installed (▯ part is the external shock absorber set.)

Note: If an external shock absorber set is installed on A3 type, it becomes A1 type. Please consult us if you wish to use A2 type. (Refer to P. 1254 for mounting position)



Set Model No. Notation

GRC - 5 - A 2

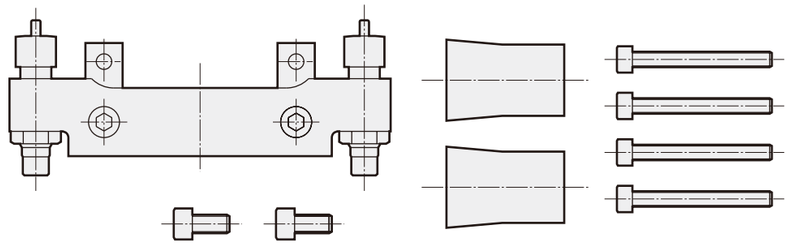
❷ Size

❹ Oscillation Angle:

External Shock Absorber Set Model No. Notation

●Set of plate part, shock absorber, and lever

Used when retrofitting an external shock absorber to A3 type



❹ Oscillation Angle:

Code	Content
1	For 90° Specification
2	For 180° Specification

❹ Specify 1 or 2 for the part.

Note: Set contents differ for 90° specification and 180° specification. The figure is for 90° specification.

Angle Adjustment Stopper Bolt Set Model No. Notation

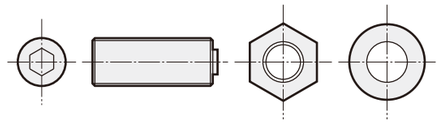
●Set of urethane-tipped Hexagon Socket head Set Screw, Hexagon Nut, and plain washer

Used when removing the external shock absorber

Quantity: 1 pc each

GRC - 5 S

❷ Size



Size	Weight g
5	4
10	7
20	14
30	19
50	32
80	

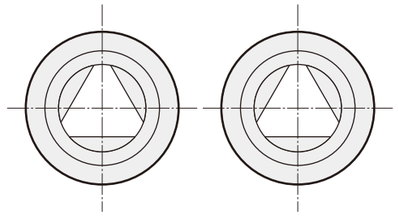
Seal Washer Set Model No. Notation

Used when replacing seal washer

Contains 2 seal washers

GRC - 5 D

❷ Size



Size	Weight g
5	2
10	4
20	
30	
50	8
80	

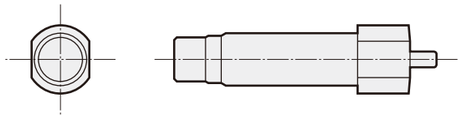
Angle Adjustment Shock Absorber Set Model No. Notation

●Set of shock absorber and stopper

Quantity: 1 pc

GRC - 5 - A01

❷ Size

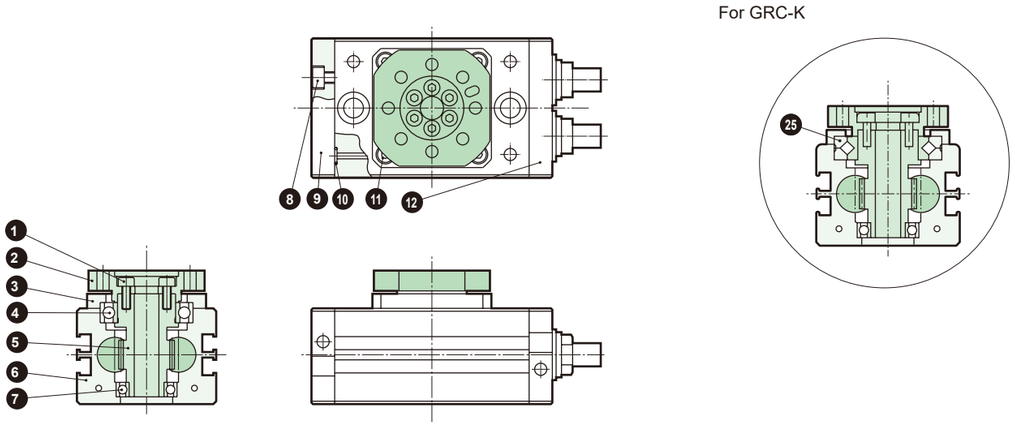


Shock suppressor model number used

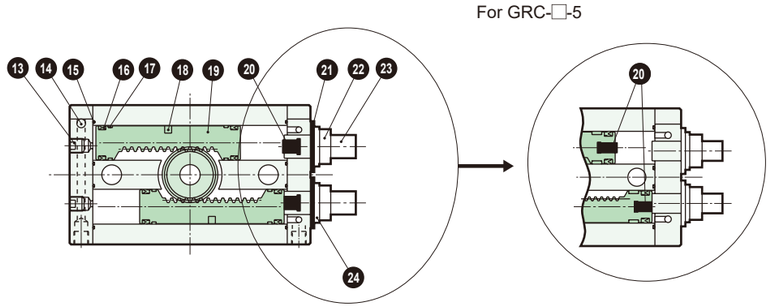
Model	Shock suppressor model number	Weight g
GRC-5	NCK-00-0.3	12
GRC-10	NCK-00-0.3	
GRC-20	NCK-00-0.7	20
GRC-30	NCK-00-0.7	
GRC-50	NCK-00-1.2	40
GRC-80	NCK-00-2.6	70

Internal Structure Diagram/Material

●GRC (Basic Type)
●GRC-K (High-Precision Type)



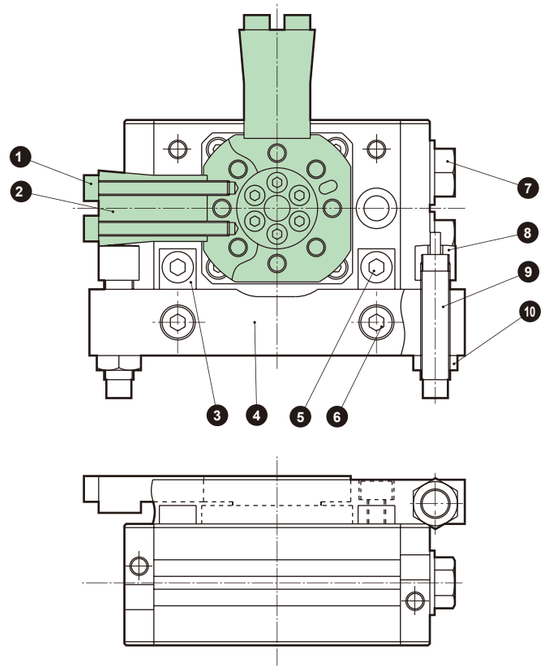
For GRC-□-5



Part No.	Part Name	Material	Remarks
1	Hexagon Socket Head Cap Screw	Stainless Steel	
2	Table	Aluminum Alloy	Alumite
3	Bearing Cover	GRC Aluminum Alloy GRC-K Stainless Steel	GRC Alumite
4	Ball Bearing (1)	Alloy Steel	GRC only
5	Shaft	Alloy Steel	
6	Cylinder Body	Aluminum Alloy	Hard Anodized
7	Ball Bearing (2)	Alloy Steel	
8	Hexagon Socket Head Cap Screw	Stainless Steel	
9	Head Cover (1)	Aluminum Alloy	Alumite
10	Gasket	Nitrile Rubber	
11	Hexagon Socket Head Cap Screw	Stainless Steel	
12	Head Cover (2)	Aluminum Alloy	Alumite
13	Hexagon Socket head Set Screw	Stainless Steel	
14	Steel ball	Stainless Steel	
15	Cylinder Gasket	Nitrile Rubber	
16	Piston Packing	Nitrile Rubber	
17	Wear ring	Polyacetal Resin	
18	Magnet	5, 10: Special Alloy 20 to 80: Plastic	5, 10: Nickel Plating
19	Piston	Stainless Steel	
20	Cushion Rubber	Urethane Rubber	
21	Seal Washer	Steel, Nitrile Rubber	Zinc plating
22	Hexagon Nut	Steel	Nickel Plating
23	Stopper bolt	Alloy Steel	Nickel Plating
24	Plain Washer	Stainless Steel	
25	Cross Roller Bearing	Alloy Steel	GRC-K only

Internal Structure Diagram/Material

● GRC-□-A (with external Shock Absorbers)
Note: Figure shows 90° spec. Materials, etc. are the same for 180° specification.



Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Hexagon Socket Head Cap Screw	Stainless Steel		6	Hexagon Socket Head Cap Screw	Stainless Steel	
2	Lever	Steel or Alloy Steel	Nickel Phosphorus Plating	7	Hexagon Bolt	Stainless Steel	
3	Connector	Steel	Nickel Plating	8	Stopper	Stainless Steel	
4	Plate	Aluminum Alloy	Alumite	9	Shock Absorber		
5	Hexagon Socket Head Cap Screw	Stainless Steel		10	Hexagon Nut	Steel	Nickel Plating

Consumable Parts Kit

Kit Number	Replacement Part Number
GRC-5K	⑩ ⑮ ⑯ ⑰ ㉑
GRC-10K	
GRC-20K	
GRC-30K	
GRC-50K	
GRC-80K	

*1: Please specify the kit number when ordering consumable parts.
*2: Avoid disassembly/repair, since high accuracy type uses highly controlled precision parts. If repairing the high-precision type, please consult us.

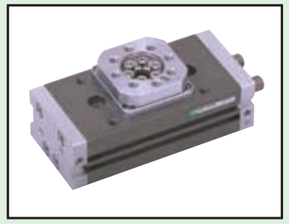


Table Type Rotary Actuator
Slow-Speed Type/High-Precision Slow-Speed Type

GRC-F, GRC-KF Series

● Size: 5, 10, 20, 30, 50, 80

Circuit Diagram Code

RoHS

Model Number Notation

Without switch
(Built-in magnet for switch)

GRC-F – 10 – ( ) – 90 ——— A1
① ② ③ ④ ⑦

With Switch
(Built-in magnet for switch)

GRC-F – 30 – ( ) – 180 – T2H□ – R – A2

① Model Number
② Size
③ Piping thread type
④ Oscillation Angle:
⑤ Switch Model No.
⑥ Number of Switches
⑦ Option

① Model Number

Code	Content
GRC-F	Ultra Low Speed Type
GRC-KF	High-Precision Ultra Low Speed Type

Note: The port position for slow-speed type/high-precision slow-speed type is on the side. Other ports are fitted with plugs.

② Size

	Model No.	Theoretical Torque
*1	5	0.5 N·m
	10	1.0 N·m
	20	2.0 N·m
	30	3.0 N·m
	50	5.2 N·m
	80	8.1 N·m

*1: For size "5", GRC-KF cannot be selected.

③ Piping thread type

Code	Content
Blank	M5 (Size 5 to 30)
	Rc Thread (Size 50, 80)
NN	NPT Thread (Size 50 or more) (Custom Product)
GN	G Thread (Size 50 or more) (Custom Product)

④ Oscillation Angle:

Code	Content
90	90°
180	180°

⑤ Switch Model No.

For switch details, refer to P. 1457. Switches are shipped with the product.

Contact	Indicator LED Special Function	Wiring (Output)	Load Voltage (V) AC	Load Voltage (V) DC	Load Current (mA) AC	Load Current (mA) DC	Lead Wire *1 Straight	Lead Wire *1 L-shape	
Solid State	1-Color	2-wire	85 to 265	—	5 to 100	—	T5V□	T1V□	
			—	10 to 30	—	5 to 20 *2	T2H□	T2V□	
		3-wire (NPN)	—	30 or less	—	100 or less	T3H□	T3V□	
		3-wire (PNP)	—		—		T3PH□	T3PV□	
	2-Color	2-wire	—	24 ± 10%	—	5 to 20	T2WH□	T2WV□	
		3-wire (NPN)	—	30 or less	—	50 or less	T3WH□	T3WV□	
	2-Color Improved Water Resistance	2-wire	—	24 ± 10%	—	5 to 20	T2WLH□	T2WLV□	*3
	1-Color Flexible Lead Wire Type		—	10 to 30	—	5 to 20 *2	T2HR3	T2VR3	

*5

*1: For "□" in the switch model number, enter the code selected from the "*Lead wire length, connector specification" table.
*2: The maximum load current value above, 20 mA, is at 25°C. If the switch operating Ambient Temperature is higher than 25°C, it will be lower than 20 mA. (At 60°C, it will be 5 to 10 mA.)
*3: This does not guarantee the water resistance of the cylinder.
*4: Switches other than the model numbers listed above are also available. (Custom Product) For details, refer to P. 1457.

*Lead wire length, connector specification

Code	Content
Blank	1 m (Standard)
3	3 m (Option)
5	5 m (Option)
W	M8 Connector, 1PIN (+), 4PIN (−) Lead Wire 0.3 m

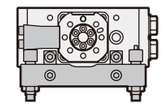
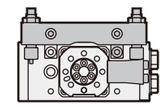
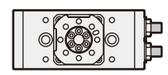
*5: Only T2WLH and T2WLV can be selected.

Example) Lead wire length
1 m T1H
3 m T1H3
5 m T1H5

⑥ Number of Switches

Code	Content
R	With 1 Right Rotation Detection
L	With 1 Left Rotation Detection
D	With 2 pcs

⑦ Option

Code	Content	
Blank	Stopper, Urethane-Tipped Hexagon Socket Head Set Screw Type	
A With External Shock Absorber		
A1	Mounting Position①	
A2	Mounting Position②	
A3	For Retrofitting External Shock Absorber (With Mounting Groove Machining)	

*1: The external Shock Absorbers cannot be retrofitted onto the basic/high accuracy type. If retrofitting is possible, select A3 type as an option.
*2: A3, if an external Shock Absorbers is retrofit on the A1, will be the same. Please consult us for use with A2 type.

Note: For switch/option single unit model numbers, refer to P. 1249, 1259. *Contact us for details.

Clean Specification (Catalog No. CB-033SAA)

●Dust prevention structure usable in cleanrooms

GRC-F – . . . . – P7□

GRC-KF – . . . . – P7□

Rechargeable Battery Compatible Specification (Catalog No. CC-1226AA)

●Design compatible with rechargeable battery manufacturing process

GRC – . . . . – P4□

Specifications

Item			GRC-F-5	GRC-F-10 GRC-KF-10	GRC-F-20 GRC-KF-20	GRC-F-30 GRC-KF-30	GRC-F-50 GRC-KF-50	GRC-F-80 GRC-KF-80
Size			5	10	20	30	50	80
Theoretical Torque *1		N·m	0.5	1.0	2.0	3.0	5.2	8.1
Actuation method			Rack & Pinion Type					
Operating Fluid			Compressed Air					
Max Operating Pressure		MPa	1.0					
Min Operating Pressure *2 MPa	Ultra Low Speed Type		0.10					
	High-Precision Ultra Low Speed Type		—	0.15		0.10		
	With External Shock Absorber		0.25 (36 psi)	0.20	0.15			
Proof Pressure		MPa	1.6					
Ambient Temperature		°C	5 to 60					
Port Size			M5				Rc1/8	
Cushion	Slow-Speed Type/High-Precision Slow-Speed Type		Rubber Cushion					
	With External Shock Absorber		Shock Absorber					
	Shock suppressor model number		NCK-0.3		NCK-0.7		NCK-1.2	NCK-2.6
Allowable Absorption Energy J	Slow-Speed Type/High-Precision Slow-Speed Type		0.005	0.008	0.03		0.04	0.11
	With External Shock Absorber *6		0.46	0.59	1.15	1.71	2.33	2.78
Shock absorber stroke		mm	3.5	3.5	5	5	5.5	6.5
Lubrication			Lubrication Not Possible					
Volumetric capacity *3		cm³ 90°	1.3	3.5	7.0	10.5	18.1	28.3
		180°	3.4	6.6	13.4	20.0	34.4	53.7
Oscillation Angle Adjustment Range *4	Slow-Speed Type/High-Precision Slow-Speed Type	90° Specification	0° to 100°					
		180° Specification	90° to 190°					
	With External Shock Absorber	90° Specification	90° ±6°					
		180° Specification	180° ±6°					
Oscillation Time Adjustment Range *5 *7		s/90°	0.2 to 25					

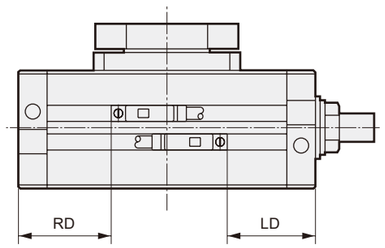
*1: Theoretical torque is at 0.5 MPa Operating Pressure.
*2: To fully compress the built-in rubber cushion in the low speed / high precision low speed type, the Operating Pressure must be 0.3 MPa or higher.
*3: Internal volume is at the Max oscillation angle of the oscillation angle adjustment range.
*4: The angle adjustment range is when adjusted with stopper bolts (shock absorbers) on both sides. For types with shock absorber, the shock absorber part does not have slow-speed specification.
*5: Oscillation time adjustment range is at 0.5 MPa Operating Pressure.
***6: The values in the table indicate the absorbed energy at the maximum oscillation speed. Since the absorption energy value changes with oscillation speed, refer to the graph on P. 1272 "Absorption Energy and Oscillation Time."**
*7: For types with shock absorbers, it is the time until impact with the tip of the shock absorber (rod tip). (It is not the oscillation time to the stroke end of the shock absorber.)

Dimensional Drawings

Same as Slow-Speed GRC Series and High-Precision Slow-Speed GRC-K Series. Please refer to P. 1252 to 1258.

GRC Series Outline Dimension Drawing with Switch

● T1H/V, T2H/V, T3H/V, T3PH/V, T2WH/V, T3WH/V, T2WLH/V, T2H/VR3



Switch Mounting Position

Switch	T1, T2, T3, T3P, T2□R3				T2W, T3W, T2WL			
Code	RD		LD		RD		LD	
Size	90°	180°	90°	180°	90°	180°	90°	180°
5	22.5	25.5	21.5	25.5	25.5	28.5	24.5	28.5
10	26	30.5	24.5	30.5	29	33.5	27.5	33.5
20	31	37.5	31	37.5	34	40.5	34	40.5
30	40	49.5	38.5	49.5	43	52.5	41.5	52.5
50	51	61	48.5	61	54	64	51.5	64
80	54	64	51.5	64	57	67	54.5	67

Selection method

Select according to the following procedure.

Step 1 Confirmation of Oscillation Time

Step 2 Size (Torque) Selection
- ①Static Load
- ②Resistive Load
- ③Inertial Load

Step 3 Confirmation of Allowable Energy

Step 4 Confirmation of Allowable Load
- ①Thrust Load
- ②Radial Load
- ③Moment Load

Step 1 Confirmation of Oscillation Time

If the oscillation time is set outside the specification range, the actuator operation may become unstable or cause damage to the actuator. Be sure to use within the specified oscillation time adjustment range.

	When used at 90°	When used at 180°
Oscillation Time (S)	0.2 to 1.5	0.4 to 3.0

Step 2 Size (Torque) Selection

Load types are broadly divided into three categories. Calculate the required torque for each case. For combined loads, sum each torque to determine the required torque. Select a size that satisfies the required torque from the theoretical torque table or effective torque diagram according to the Operating Pressure.

①Static Load (Ts)

When static pushing force such as clamping is required

$$Ts=Fs\times L$$

Ts : Required torque (N·m)
Fs : Required thrust (N)
L : Length from the center of rotation to the point of action (m)

②Resistive Load (T_R)

When forces due to friction, gravity, and other external forces are applied

$$T_R=K\times F_R\times L$$

T_R : Required torque (N·m)
K : Slack coefficient [When load does not fluctuate K=2 / With load fluctuation K=5
F_R : Required thrust (N)
L : Length from the center of rotation to the point of action (m)

③Inertial Load (TA)

When rotating an object

$$T_A=5\times I\times \dot{\omega}$$
$$\dot{\omega}=\frac{2\theta}{t^2}$$

T_A : Required torque (N·m)
I : Moment of inertia (kg·m²)
ω : Maximum angular acceleration (rad/s²)
θ : Oscillating angle (rad)
t : Oscillation Time (s)

Calculate moment of inertia using moment of inertia and oscillating time (P. 1272) or figure for moment of inertia calculation (P. 1273).

Step 3 Confirmation of Allowable Energy

For inertial load, if the kinetic energy of the load at the oscillation end exceeds the allowable value, it will cause damage to the actuator. Select according to Table 1 so that it is within the allowable energy value. If the energy is too large, use an external shock absorber, etc., to stop the load.

$$E=\frac{1}{2}\times I\times\omega^2$$
$$\omega=\frac{2\theta}{t}$$

E : Kinetic energy J
I : Moment of inertia (kg·m²)
ω : Angular velocity at oscillating end (rad/s)
θ : Oscillating angle (rad)
t : Oscillation Time (s)

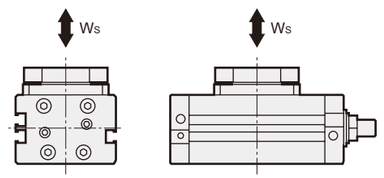
Calculate moment of inertia using moment of inertia and oscillation time (P. 1272) or figure for moment of inertia calculation (P. 1273).

Selection method

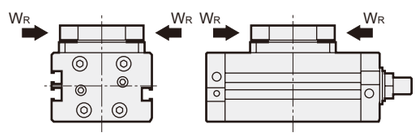
Step 4 Confirmation of Allowable Load

If the load is applied directly to the table, ensure it is within the allowable values in Table 2. In the case of combined load, ensure that the sum of the ratios to the allowable value of each load is 1.0 or less. Load is divided into the following 3 types.

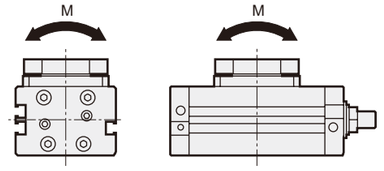
①Thrust Load (Axial Load)



②Radial Load (Lateral Load)



③Moment Load



After calculating each load, substitute into the following formula and confirm.

$$\frac{W_S}{W_{smax}}+\frac{W_R}{W_{Rmax}}+\frac{M}{M_{max}}\le 1.0$$

W_S : Thrust Load (N)
W_R : Radial Load (N)
M : Moment load (N·m)
W_{smax} : Allowable Thrust Load (N)
$W_{R\,max}$: Allowable Radial Load (N)
M_{max} : Allowable moment load (N·m)

The allowable absorption energy value and the allowable value for each load are shown in the table below.

Table 1 Allowable Absorption Energy Value [J]

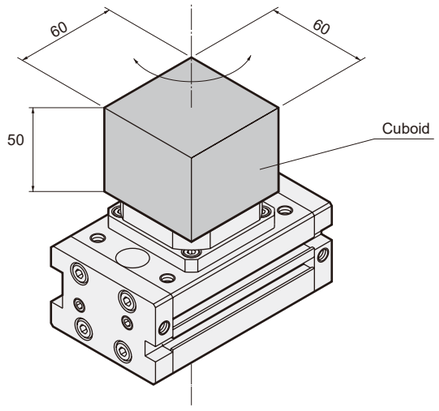
Size	5	10	20	30	50	80
Basic Type/High-Precision Type	0.005	0.008	0.03		0.04	0.11
With External Shock Absorber	0.46	0.59	1.15	1.71	2.33	2.78

Table 2 Allowable Load Value W_{SMax} W_{RMax} M_{max}

Size		5	10	20	30	50	80
Thrust load	Basic type	50	80	140	200	450	580
W_{Smax} [N]	High-Precision Type	–	120	220	440	550	650
Radial load	Basic type	30	80	150	200	320	400
W_{Rmax} [N]	High-Precision Type	–	100	160	240	380	480
Moment Load	Basic type	1.5	2.5	4.0	5.5	10.0	13.0
M_{max} [N·m]	High-Precision Type	–	3.0	5.0	7.0	12.0	15.0

Selection Example 1

When there is a rectangular parallelepiped load



[Operating Conditions]
Pressure : 0.5 (MPa)
Oscillation Angle : 90°
Oscillation Time : 0.6 (s)
Load (Material : Aluminum Alloy)
[Cuboid] : 0.5 (kg)

Step 1 Confirmation of Oscillation Time

From the operating conditions, the oscillation time is 0.6 (s/90°). Since it is within the oscillation time adjustment range of 0.2 to 1.5 (s/90°), proceed to the next step.

Step 2 Size (Torque) Selection

For inertial load, first calculate the moment of inertia (I).
[Cuboid]

$$I=0.5\times \frac{0.06^2}{6}=3\times10^{-4}\ (kg\cdot m^2)\ \cdots①$$

Next, calculate the Max angular acceleration ($\dot{\omega}$).

From the conditions $\theta=90°=\frac{\pi}{2}$(rad), t=0.6 (s)

Therefore,

$$\dot{\omega}=\frac{2\theta}{t^2}=\frac{\pi}{0.6^2}=8.73\ (rad/s^2)\ \cdots\cdots②$$

Therefore, from ①and ②, the inertial load (T_A) is
$T_A = 5\times3\times10^{-4}\times8.73$
$= 0.0131$ (N·m) ..... ③
From the value of ③, operating conditions, and torque at 0.5 (MPa)
GRC-5-90 ……Ⓐ
can be selected.

Step 3 Confirmation of Allowable Energy

Calculate the kinetic energy and confirm if it is within the allowable energy value. Calculate the angular velocity ω at the oscillation end.

From the conditions $\theta=90°=\frac{\pi}{2}$(rad), t=0.6 (s)

Therefore,

$$\omega=\frac{2\theta}{t}=\frac{\pi}{0.6}=5.24\ (rad/s)$$

Therefore, the kinetic energy (E) is,

$$E=\frac{1}{2}\times3\times10^{-4}\times5.24^2$$
$$=0.00412(J)\quad\cdots\cdots④$$

From ④and Ⓐselected in Step 2
GRC-5-90 ……Ⓑ
can be selected.

Step 4 Confirmation of Allowable Load

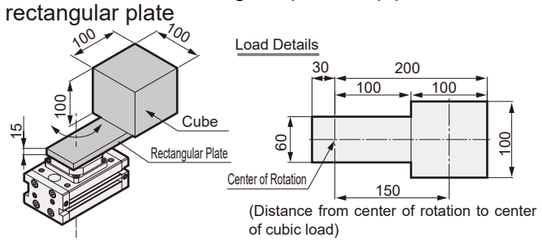
Finally, calculate the load value applied by the load to the table and confirm if it is within the allowable load value.
[Thrust Load]
Thrust load (Ws) is,
Ws = 0.5×9.8 = 4.9 (N) .....⑤
[Radial Load]
Since no radial load is applied,
W_R=0(N) ……⑥
[Moment Load]
Since no moment load is applied,
M = 0 (N·m) ..... ⑦
From ⑤, ⑥, ⑦, and Ⓑ

$$\frac{W_S}{W_{Smax}}+\frac{W_R}{W_{Rmax}}+\frac{M}{M_{max}}$$
$$=\frac{4.9}{50}+\frac{0}{30}+\frac{0}{1.5}=0.098\le1.0\quad\cdots\cdots Ⓒ$$

From Ⓑ and Ⓒ, since the total load value is within the allowable load value, GRC-5-90
can be selected.

Selection Example ②

When there is a rectangular parallelepiped load on a rectangular plate



[Operating Conditions]
Pressure : 0.5 (MPa)
Oscillation Angle : 90°
Oscillation Time : 1.0 (s)
Load (Material : Steel)
[Rectangular plate on the left side of the rotation center]: 0.21 (kg)
[Rectangular plate on the right side of the rotation center]: 1.40 (kg)
[Cube] : 7.8 (kg)

Step 1 Confirmation of Oscillation Time

From the operating conditions, the oscillation time is 1.0 (s/90°). Since it is within the oscillation time adjustment range of 0.2 to 1.5 (s/90°), proceed to the next step.

Step 2 Size (Torque) Selection

For inertial load, first calculate the moment of inertia (I).
[Rectangular plate]

$$I_1=1.40\times\frac{4\times0.20^2+0.06^2}{12}+0.21\times\frac{4\times0.03^2+0.06^2}{12}$$
$$=1.92\times10^{-2}\ (kg\cdot m^2)$$

[Cube]

$$I_2=7.8\times\frac{0.1^2}{6}+7.8\times0.15^2$$
$$=0.189\ (kg\cdot m^2)$$

Therefore, the overall moment of inertia (I) is as follows.
$I = I_1+I_2 = 0.21$ (kg·m²) ..... ①
Next, calculate the Max angular acceleration ($\dot{\omega}$).

From the conditions $\theta=90°=\frac{\pi}{2}$(rad), t=1.0 (s)

Therefore,

$$\dot{\omega}=\frac{2\theta}{t^2}=\frac{\pi}{1.0^2}=3.14\ (rad/s^2)\quad\cdots\cdots②$$

Therefore, from ①and ②, the inertial load (T_A) is
$T_A = 5\times0.21\times3.14$
$= 3.30$ (N·m) ……③
From the value of ③and operating conditions, from the torque at 0.5 (MPa)
GRC-50-90 ……Ⓐ
can be selected.

Step 3 Confirmation of Allowable Energy

Calculate the kinetic energy and confirm if it is within the allowable energy value. Calculate the angular velocity ω at the oscillation end.

From the conditions $\theta=90°=\frac{\pi}{2}$(rad), t=1.0 (s)

Therefore,

$$\omega=\frac{2\theta}{t}=\frac{\pi}{1.0}=3.14\ (rad/s)$$

Therefore, the kinetic energy (E) is,

$$E=\frac{1}{2}\times0.21\times3.14^2$$
$$=1.035(J)\ \cdots\cdots④$$

GRC-50 - 90 - A1, A2 ……Ⓑ
from ④and Ⓐselected at Step 2
can be selected.

Step 4 Confirmation of Allowable Load

Finally, calculate the load value applied by the load to the table and confirm if it is within the allowable load value.
[Thrust Load]
Total weight is,
7.8+1.40+0.21 = 9.41 (kg)
Therefore, the thrust load (Ws) is,
Ws = 9.41×9.8 = 92.2 (N) ..... ⑤
[Radial Load]
Since no radial load is applied,
W_R = 0 (N) ..... ⑥
[Moment Load]
Moment load (M_1) due to rectangular plate is,
1.40×9.8 = 13.72 (N)
0.21×9.8 = 2.06 (N)
Therefore,
$M_1 = 13.72\times0.1 - 2.06\times0.015$
$= 1.34$ (N·m)
Moment load (M_2) due to rectangular parallelepiped is,
7.8×9.8 = 76.44 (N)
Therefore,
$M_2 = 76.44\times0.15 = 11.47$ (N·m)
Therefore, summing M_1 and M_2,
M = 1.34+11.47 = 12.81 (N·m) ..... ⑦
From ⑤, ⑥, ⑦, and Ⓑ,

$$\frac{W_S}{W_{Smax}}+\frac{W_R}{W_{Rmax}}+\frac{M}{M_{max}}$$
$$=\frac{92.2}{450}+\frac{0}{320}+\frac{12.8}{10}=1.48>1.0$$

Since the moment load exceeds the allowable value, increase the size by one and recalculate with GRC-80-90.

$$\frac{W_S}{W_{Smax}}+\frac{W_R}{W_{Rmax}}+\frac{M}{M_{max}}$$
$$=\frac{92.2}{580}+\frac{0}{400}+\frac{12.8}{13}=1.14>1.0$$

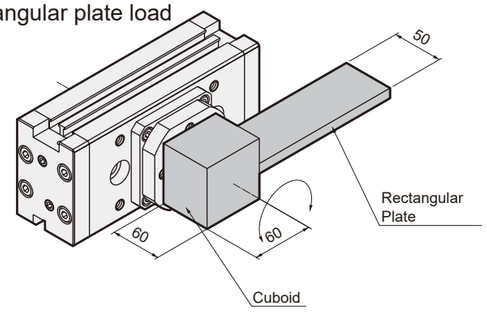
Still, the total load value exceeds the allowable value, so select the high-precision type and calculate,

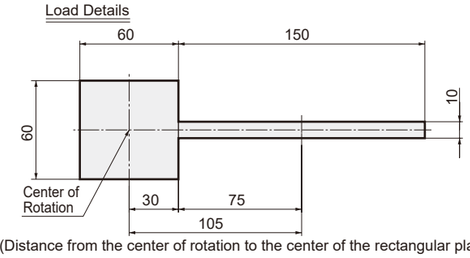
$$\frac{W_S}{W_{Smax}}+\frac{W_R}{W_{Rmax}}+\frac{M}{M_{max}}$$
$$=\frac{92.2}{650}+\frac{0}{480}+\frac{12.8}{15}=0.99\le1.0\ \cdots Ⓒ$$

According to Ⓒ, total load value is within the allowable load value, so GRC - K - 80 - 90 - A1, A2 can be selected.

Selection Example ③

When the rotating shaft is horizontal and there is a rectangular plate load





(Distance from the center of rotation to the center of the rectangular plate load)

[Operating Conditions]
Pressure : 0.5 (MPa)
Oscillation Angle : 180°
Oscillation Time : 0.5 (s)
Load (Material Aluminum Alloy)
[Rectangular plate] 0.2 (kg)
Cuboid 0.5 (kg)

Step 1 Confirmation of Oscillation Time

From the operating conditions, the oscillation time is 0.5 (s/180°). Since it is within the oscillation time adjustment range of 0.4 to 3.0 (s/180°), proceed to the next step.

Step 2 Size (Torque) Selection

For resistive load due to gravity and inertial load, calculate the resistive load (T_R) and moment of inertia (I).
[Resistive Load]
Resistive load changes with table rotation.
$F_R = 0.2 \times 9.8 = 1.96$ (N)
$R = 0.105$ (m)
Therefore,
$T_R = 5 \times 1.96 \times 0.105 = 1.03$ (N·m) ……①
[Inertial Load]
[Rectangular Plate]

$$I_1 = 0.2 \times \frac{0.15^2}{12} + 0.2 \times 0.105^2$$

$$= 2.58 \times 10^{-3} \text{ (kg·m}^2\text{)}$$

[Rectangular Parallelepiped Part]

$$I_2 = 0.5 \times \frac{0.06^2}{6} = 3 \times 10^{-4} \text{ (kg·m}^2\text{)}$$

Therefore, the overall moment of inertia (I) is as follows.
$I = I_1 + I_2 = 2.88 \times 10^{-3}$ (kg·m²) ……②
Next, calculate the Max angular acceleration (ώ).
From the conditions, θ = 180° = π (rad), t = 0.5 (s)
Therefore,

$$\dot{\omega} = \frac{2\theta}{t^2} = \frac{2\pi}{0.5^2} = 25.13 \text{ (rad/s}^2\text{)} \quad \cdots\cdots ③$$

Therefore, from ② and ③, the inertial load (T_A) is
$T_A = 5 \times 2.88 \times 10^{-3} \times 25.13$
$= 0.362$ (N·m) ..... ④
From ① and ④, the total torque (T) is,
$T = 1.03 + 0.362 = 1.39$ (N·m) ..... ⑤
From the value of ⑤ and operating conditions, from the torque at 0.5 (MPa)
GRC - 20 - 180 ..... Ⓐ
can be selected.

Step 3 Confirmation of Allowable Energy

Calculate the kinetic energy and confirm if it is within the allowable energy value. Calculate the angular velocity ω at the oscillation end.
From the conditions, θ = 180° = π (rad), t = 0.5 (s)
Therefore,

$$\omega = \frac{2\theta}{t} = \frac{2\pi}{0.5} = 12.57 \text{ (rad/s)}$$

Therefore, the kinetic energy (E) is,

$$E = \frac{1}{2} \times 2.88 \times 10^{-3} \times 12.57^2$$

$$= 0.23 \text{ (J)} \quad \cdots\cdots ⑥$$

From ⑥ and Ⓐ selected in Step 2
GRC - 20 - 180 - A1, A2 .....Ⓑ
can be selected.

Selection Example ③

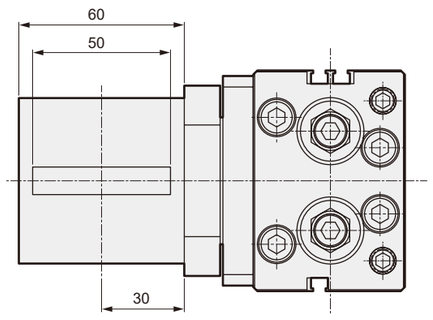
Step 4 Confirmation of Allowable Load

Finally, calculate the load value applied by the load to the table and confirm if it is within the allowable load value.
[Thrust Load]
Since no thrust load is applied, the thrust load (Ws) is,
Ws = 0 (N) ..... ⑦
[Radial Load]
Total weight is,
0.2+0.5 = 0.7 (kg)
Therefore,
$W_R = 0.7 \times 9.8 = 6.9$ (N) ..... ⑧
[Moment Load]
Moment load (M) is, from the figure below
$M = 0.03 \times (0.2+0.5) \times 9.8$
$= 0.21$ (N·m) ..... ⑨
From ⑦, ⑧, ⑨, Ⓑ,

$$\frac{W_S}{W_{Smax}} + \frac{W_R}{W_{R\,max}} + \frac{M}{M_{max}}$$

$$= \frac{0}{150} + \frac{6.9}{140} + \frac{0.21}{4.0} = 0.101 \leq 1.0 \ldots Ⓒ$$

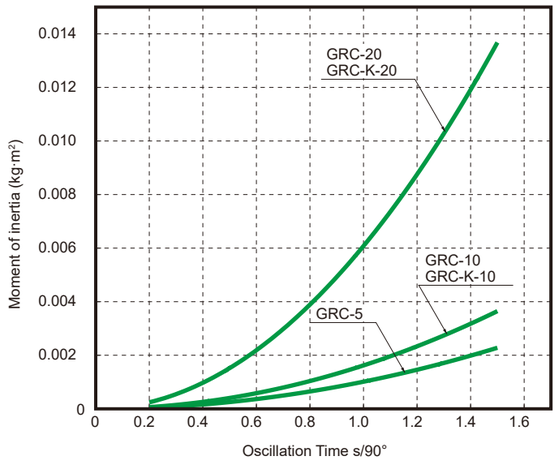
From Ⓑ and Ⓒ, since the total load value is within the allowable load value,
GRC-20-180-A1, A2
can be selected.



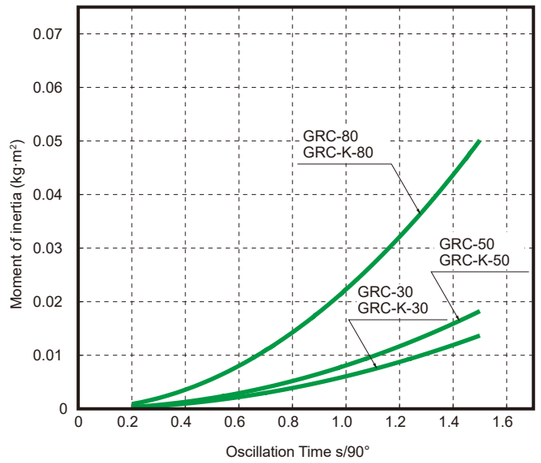
1. Energy Absorption Capacity and Oscillation Time

①For rubber cushion, the relationship between moment of inertia and oscillation time is shown in the diagram below. There is a risk of damage to shafts, etc., so be sure to use within the lower right area of the graph. Please refer to this for model selection.

●Basic Type/High-Precision Type



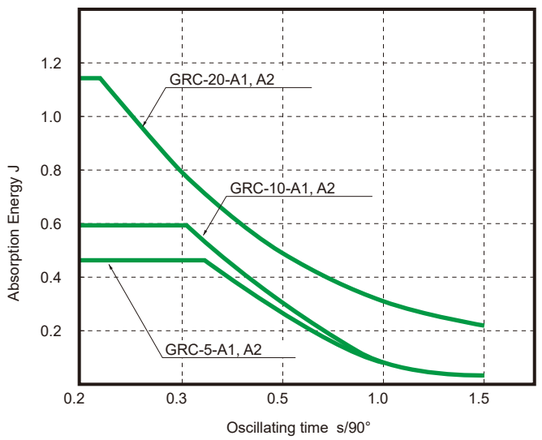
Size 5, 10, 20



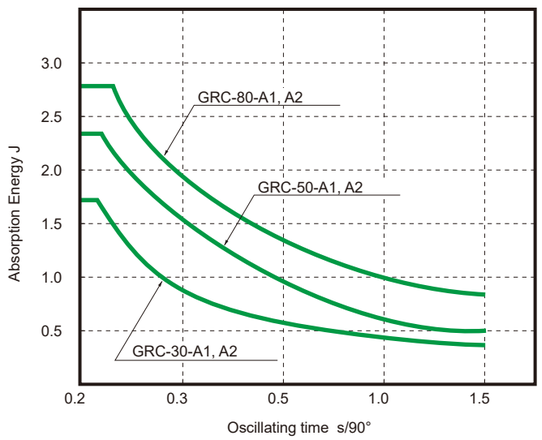
Size 30, 50, 80

②For type with external shock absorber, the relationship between absorption energy and oscillation time is shown in the diagram below. There is a risk of damage to shafts, etc., so be sure to use within the lower left area of the graph. Please refer to this for model selection.

● Absorption Energy and Oscillation Time



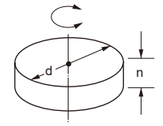
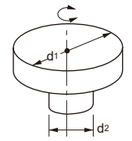
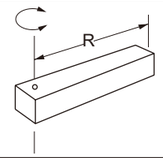
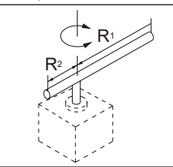
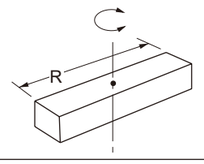
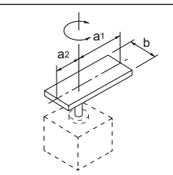
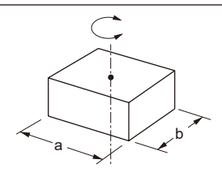
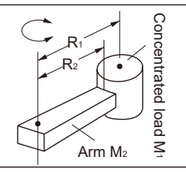
Size 5, 10, 20



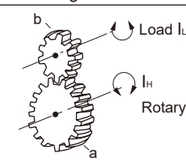
Size 30, 50, 80

2. Diagram for Calculating Moment of Inertia

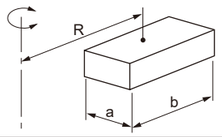
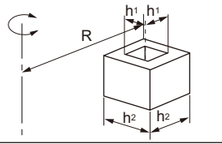
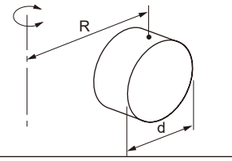
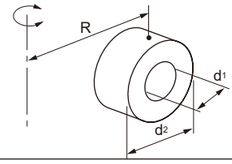
When the rotating shaft passes through the workpiece

Shape	Diagram	Required Items	Moment of Inertia I kg·m²	Radius of gyration K_1^2	Remarks
Disk		●Diameter d (m) ●Weight M (kg)	$I = \frac{Md^2}{8}$	$\frac{d^2}{8}$	● No particular mounting direction ● Consider separately when used by sliding
Stepped disk		●Diameter d_1 (m) d_2 (m) ●Weight d_1 part M_1 (kg) d_2 part M_2 (kg)	$I = \frac{1}{8}(M_1d_1^2+M_2d_2^2)$	$\frac{d_1^2+d_2^2}{8}$	● If the d_2 part is very small compared to the d_1 part, it can be ignored.
Rod (center of rotation is at the end)		●Rod length R (m) ●Weight M (kg)	$I = \frac{MR^2}{3}$	$\frac{R^2}{3}$	● Mounting direction is horizontal ● When the mounting direction is vertical, the oscillation time changes.
Thin rod		●Rod length R_1 R_2 ●Weight M_1 M_2	$I = \frac{M_1 \cdot R_1^2}{3} + \frac{M_2 \cdot R_2^2}{3}$	$\frac{R_1^2+R_2^2}{3}$	● Mounting direction is horizontal ● When the mounting direction is vertical, the oscillation time changes.
Rod (center of rotation is at the center of gravity)		●Rod length R (m) ●Weight M (kg)	$I = \frac{MR^2}{12}$	$\frac{R^2}{12}$	● No particular mounting direction
Thin rectangular plate (cuboid)		●Plate length a_1 a_2 ●Side length b ●Weight M_1 M_2	$I = \frac{M_1}{12}(4a_1^2+b^2) + \frac{M_2}{12}(4a_2^2+b^2)$	$\frac{(4a_1^2+b^2)+(4a_2^2+b^2)}{12}$	● Mounting direction is horizontal ● When the mounting direction is vertical, the oscillation time changes.
Cuboid		●Side length a (m) b (m) ●Weight M (kg)	$I = \frac{M}{12}(a^2+b^2)$	$\frac{a^2+b^2}{12}$	● No particular mounting direction ● Consider separately when used by sliding
Concentrated load		● Shape of concentrated load ● Length to the center of gravity of the concentrated load R_1 ● Arm length R_2 (m) ● Weight of concentrated load M_1 (kg) ● Weight of arm M_2 (kg)	$I=M_1(R_1^2+k_1^2) + \frac{M_2R_2^2}{3}$	k_1^2 is calculated based on the shape of the concentrated load	● Mounting direction is horizontal ● If M_2 is very small compared to M_1, you can calculate with M_2=0.

Method of converting load J_L around the rotary actuator shaft when mediated by gears

Gear		● Gear Rotary Side (Number of Teeth) a Load Side (Number of Teeth) b ● Inertia of Load Moment N·m	Moment of inertia around the rotary axis of the load $I_H=\left(\frac{a}{b}\right)^2 I_L$		● If the shape of the gear is large, it is necessary to consider the moment of inertia of the gear.

●When the rotating shaft is offset from the workpiece

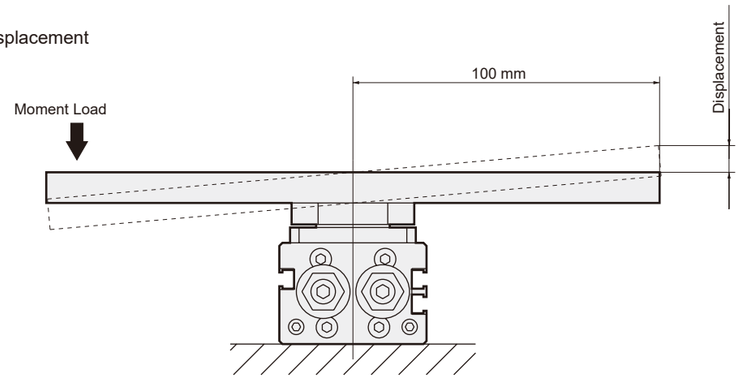
Shape	Diagram	Required Items	Moment of inertia I kg·m2	Remarks
Cuboid		●Side length a (m) ●Distance from rotating shaft to load center b (m) R (m) ●Weight M (kg)	$I = \frac{M}{12}(a^2+b^2)+MR^2$	●Same for cube
Hollow cuboid		●Side length h1 (m) h2 (m) ●Distance from rotating shaft to load center R (m) ●Weight M (kg)	$I = \frac{M}{12}(1^2+h_2^2)+MR^2$	●Cross-section is cube only
Cylinder		●Diameter d (m) ●Distance from rotating shaft to load center R (m) ●Weight M (kg)	$I = \frac{Md^2}{16}+MR^2$	
Hollow cylinder		●Diameter d1 (m) d2 (m) ●Distance from rotating shaft to load center R (m) ●Weight M (kg)	$I = \frac{M}{16}(d_1^2+d_2^2)+MR^2$	

* When determining the moment of inertia, first model the load, jigs, etc., convert the shape to a simple one, and then perform calculations. In the case of a composite load, calculate the individual moments of inertia and sum them.

3. About Table Displacement (Reference Value)

The table displacement (reference value) at a point 100 mm away from the center of rotation when a moment load is applied to GRC is shown below. (Assumes the table is in a non-rotating, stationary state.)

Measurement Method



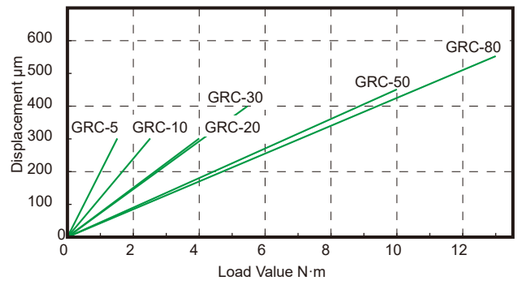


Table Displacement of GRC (Basic Type)

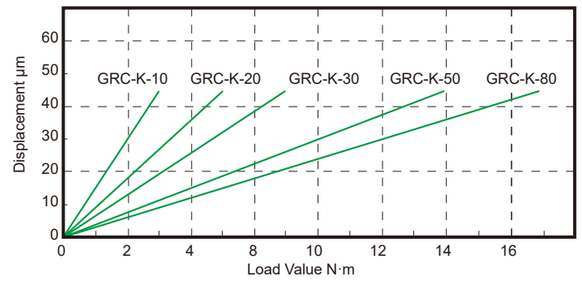
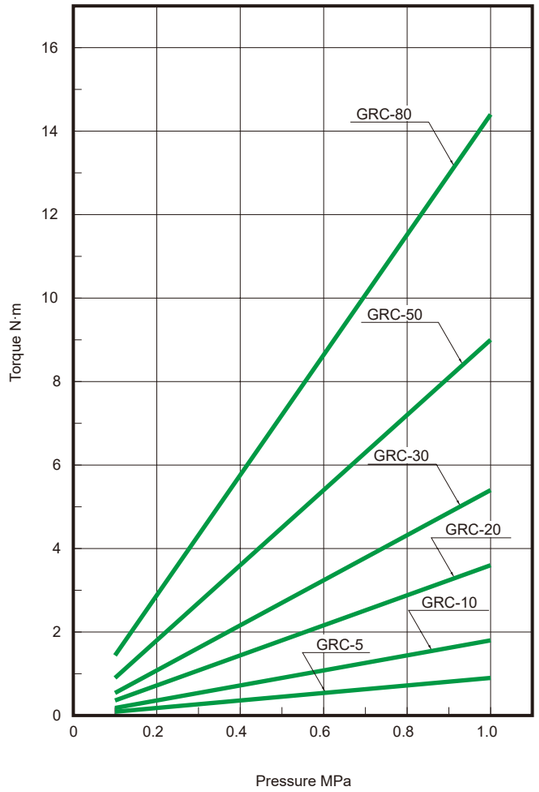


Table Displacement of GRC-K (High-Precision Type)

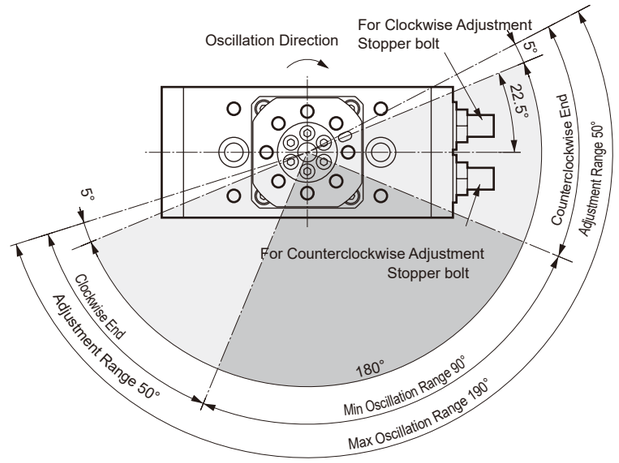
4. Effective Torque Diagram

Please note that the torque at the oscillation end will be half the value of the graph below. (If the end stopper is an external stopper (shock absorber, etc.), the torque will be as shown in the table.)

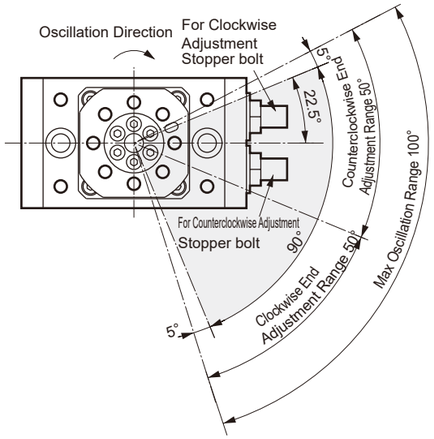


5. About Oscillation Angle Adjustment Method

●Basic Type/High-Precision Type

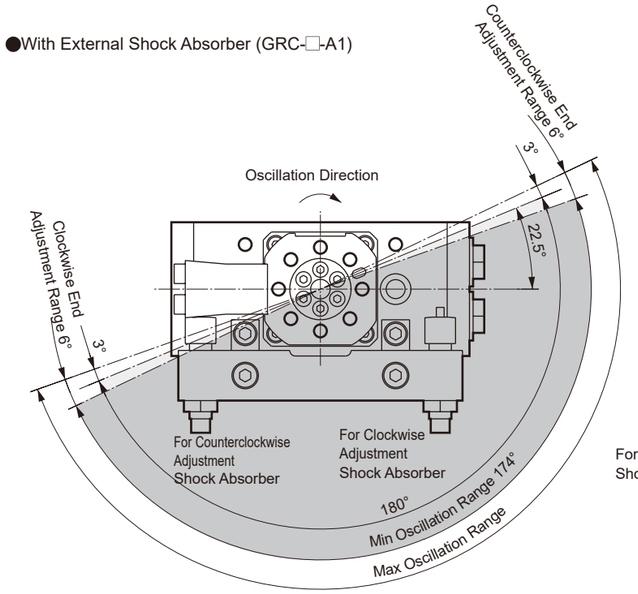


180° Specification

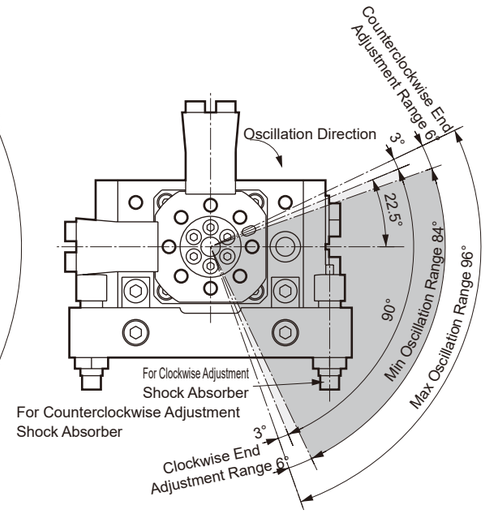


90° Specification

●With External Shock Absorber (GRC-□-A1)

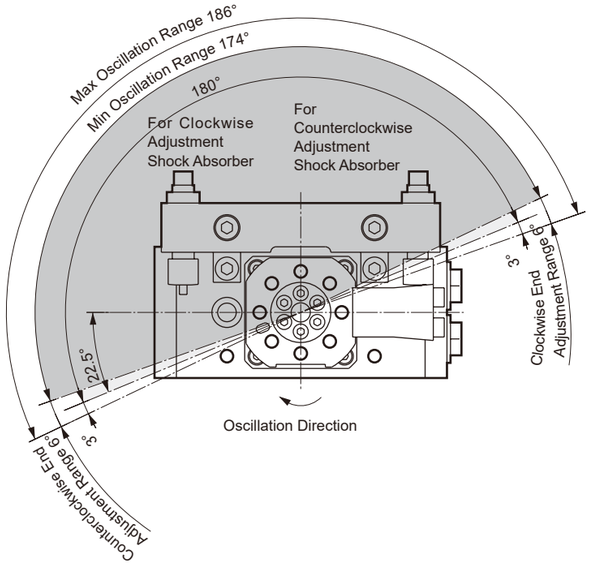


180° Specification

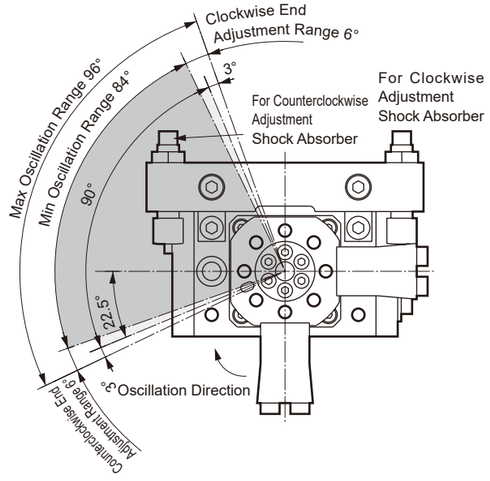


90° Specification

●With External Shock Absorber (GRC-□-A2)



180° Specification



90° Specification

MEMO

Swing/Rotary Type
RRC
GRC
RV3□
Cylinder Switch
Ending

To Use This Product Safely

Be sure to read this before use. For general cylinder information, see Intro 41, and for cylinder switches, see P. 1512.

Individual Precautions: Rotary actuator GRC Series

Design / Selection

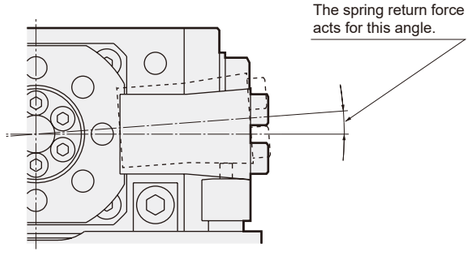
1. Common

CAUTION

■Generally, select a model so that the output torque is twice or more the torque required by the load.
Since the GRC series adopts a double piston system, if the oscillation angle is adjusted with a stopper bolt, the holding torque at the oscillation end will be half the effective torque.

■Even if the required torque of the load is small during oscillating motion, the inertial force of the load may cause damage to the actuator. Be sure to consider the moment of inertia of the load, kinetic energy, and oscillation time, and use below the allowable energy.

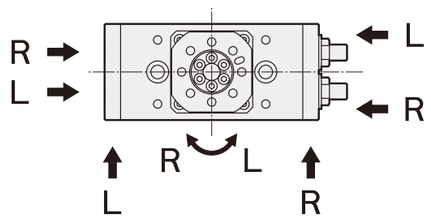
■For types with external shock absorber, please note that the torque at the oscillation end will decrease by the return force of the shock absorber's internal spring.



■The external shock absorber is a device that absorbs the kinetic energy of the workpiece at the oscillation end and buffers the impact. Smooth stopping may not be possible depending on load conditions.

■Be sure to use a speed controller in the piping.

■The relationship between each piping port and oscillation direction is shown below.



(R) Clockwise rotation (right)
L: Counterclockwise rotation (left)

■Angle adjustment screw (stopper bolt or shock absorber) that can adjust the oscillation angle is standard equipped. At shipment, the angle adjustment screw is set to an arbitrary position within the oscillation adjustment range, so please readjust to the required angle before use.

■When adjusting the angle, use within the adjustment range specified for the product.
Using beyond the adjustment range will cause a malfunction and damage to the product. Refer to product specifications (P. 1250) and oscillating angle adjustment (P. 1277).

■Treat our shock suppressors as consumable parts.
Replace when a decrease in energy absorption capacity is observed or when operation is no longer smooth.

2. Slow-Speed Type GRC-F

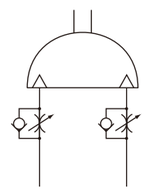
CAUTION

■Use without lubrication. (Lubrication not possible)
Lubrication may change characteristics.

■Install the speed controller near the rotary actuator.
If installed far from the rotary actuator, adjustment will become unstable. Use SC-M3/M5, SC3W, SCD-M3/M5, SC3U series speed controllers.

■Generally, the higher the air pressure and the lower the load factor, the more stable the speed.
Use with a load factor of 50% or less.

■Speed control with a meter-out circuit provides stability.



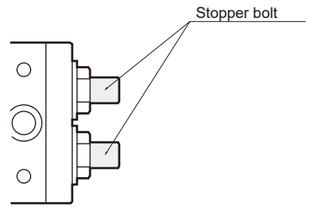
■Avoid use in places with vibration.
Operation becomes unstable due to the influence of vibration.

During Use

CAUTION

■The adjustment angle per rotation of the angle adjustment screw (stopper bolt or shock absorber) is shown below.

Basic Type/ High-Precision Type



With External Shock Absorber

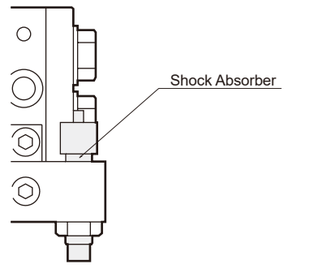


Table 1

Size	Adjustment Angle per Stopper Bolt Rotation	Adjustment Angle per Shock Absorber Rotation
5	8.7°	1.1°
10	4.9°	1.0°
20	5.7°	1.1°
30	3.8°	0.9°
50	3.5°	0.7°
80	3.5°	0.9°

■When performing angle adjustment, strictly follow the next steps (1) to (5). If adjustment is not performed by this method, the seal washer will be damaged after 1 or 2 adjustments.

[Angle Adjustment Procedure]

(1) First, loosen the Hexagon Nut to the state shown in Figure 1.

(2) Next, release the seal washer from the head cover by hand to the state shown in Figure 2.

(3) In that state, turn the stopper bolt, Hexagon Nut, and seal washer together as shown in Figure 3 to adjust the angle. At this time, be careful not to let the rubber part of the seal washer get caught in the threaded part.

(4) After angle adjustment, first bring the seal washer close to the head cover by hand as shown in Figure 4.

(5) Then, securely tighten with the Hexagon Nut as shown in Figure 5. At this time, be careful not to let the rubber part of the seal washer get caught in the threaded part.

After angle adjustment, securely tighten the Hexagon Nut according to the tightening torque in Table 2. If the tightening torque is not observed, the Hexagon Nut will loosen during use, causing external leakage.

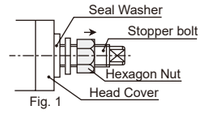


Fig. 1

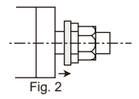


Fig. 2

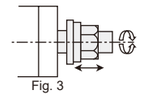


Fig. 3

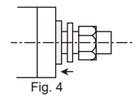


Fig. 4

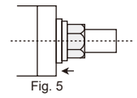


Fig. 5

Table 2

Size	Tightening Torque (N·m)	
	Basic Type/High-Precision Type	With External Shock Absorber
5	5.9 ±10%	3.4 ±10%
10	9.4 ±10%	4.9 ±10%
20	11.8 ±10%	6.9 ±10%
30	11.8 ±10%	6.9 ±10%
50	22.1 ±10%	8.8 ±10%
80	22.1 ±10%	8.8 ±10%

■When retrofitting an external shock absorber set to A3 type, the tightening torque for the mounting Hexagon Socket head bolt and lever mounting Hexagon Socket head bolt is shown in Table 3.

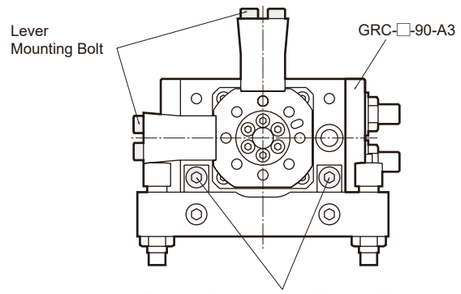


Table 3

Size	Lever Mounting Bolt	External Shock Absorber Mounting Bolt
	Tightening torque (N·m)	Tightening torque (N·m)
5	0.6 ±20%	1.4 ±20%
10	1.4 ±20%	2.9 ±20%
20	2.8 ±20%	4.8 ±20%
30	2.8 ±20%	4.8 ±20%
50	12.0 ±20%	12.0 ±20%
80	12.0 ±20%	12.0 ±20%

For precautions during mounting, installation, adjustment, use, and maintenance, refer to "During Use" in this catalog and the CKD Components Product website (https://www.ckd.co.jp/kiki/en/) -> "Model No." -> Instruction Manual.

RV3□

Selex Rotary Vane Type

Torque Size 0.12 to 206 N·m

CONTENTS

Product Introduction 1284
Series System Chart 1286

Compact Selex Rotary Vane Type
- Standard Type (RV3$^{S}_{D}$) 1288
- With valve (RV3$^{SV}_{DW}$) 1304
- Angle variable (RV3$^{S}_{D}$A) 1312

Large Selex Rotary Vane Type
- Standard Type (RV3$^{S}_{D}$) 1324
- With valve (RV3$^{SV}_{DW}$) 1334
- Low hydraulic (RV3$^{S}_{D}$H) 1344

Various Units/Options
- Shock Absorber (RVC) 1350
- Switch Unit
  - For Compact (Standard Type, With Valve) 1354
  - Compact (angle variable) 1356
  - For Large Type 1358

Replacement Parts List 1361
Repair Parts Kit 1363
Model Selection Guide 1365
Precautions for Use 1374

Vane type rotary actuator with excellent durability, switch mountable, and abundant torque sizes

Applications

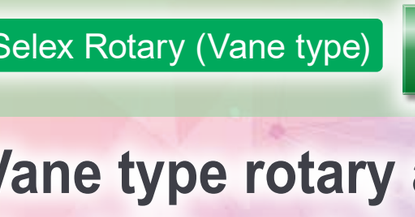
Rotation

Clamping

Opening/Closing

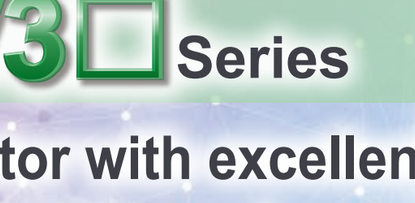
Vane Type Rotary Actuator

●Single Vane



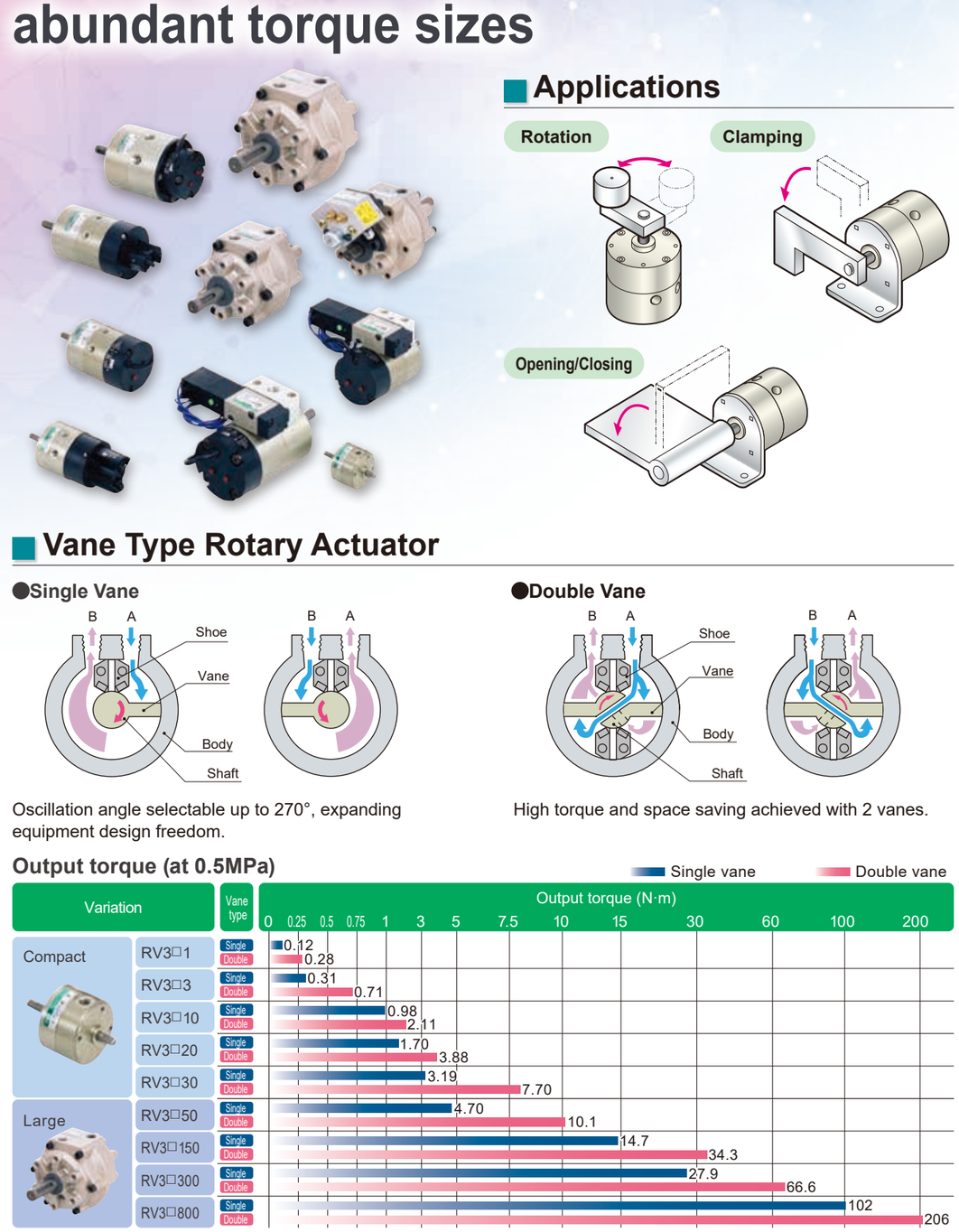
Oscillation angle selectable up to 270°, expanding equipment design freedom.

●Double Vane



High torque and space saving achieved with 2 vanes.

Output torque (at 0.5MPa)



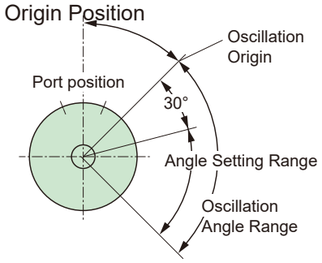
Contributes to higher precision of machinery with variable angle type

RV3SA, RV3DA Size: 3 to 30

●Oscillation Angle Setting Range and Oscillation Origin

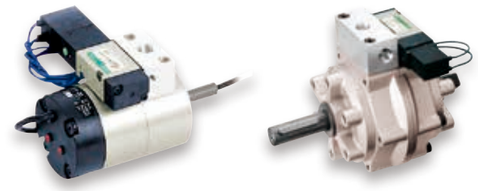
Model No.		Oscillation Angle Setting Range	Oscillation Origin
Single Vane	RV3SA3	30 to 180°	90°
	RV3SA10		
	RV3SA20		
	RV3SA30	30 to 270°	45°
Double Vane	RV3DA3	30 to 90°	45°
	RV3DA10		
	RV3DA20		
	RV3DA30		

●Oscillation Origin Position



Selection of with valve allows driving with a single supply air pipe

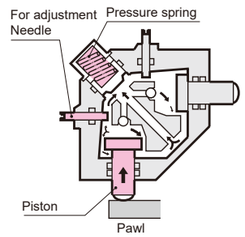
RV3SV, RV3DW Size: 10 to 300



Absorbs impact energy with shock absorber

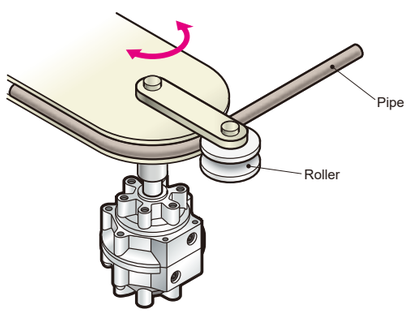
RVC Size: 50 to 800

[Side Image]



Smooth swivel achieved with the low hydraulic

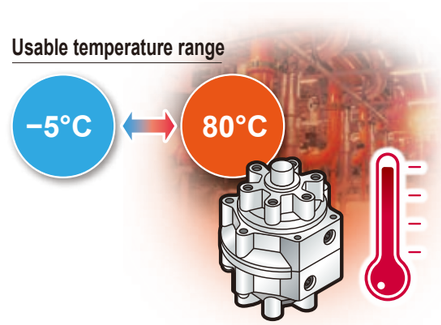
RV3SDH, RV3DH Size: 50 to 800



High temperature use possible

RV3S, 3 V3D Size: 1, 3, 75, 100, 150, 200, 250, 300

Usable in the range of -5 to 80°C. (Excluding with switch, size 30 or more, with valve)



Variation Table

Selex Rotary (Vane Type) RV3□ Series

● Compact (RV3□1 to RV3□30)　　●: Standard, ◎: Option, : Not available

Variation	Model No.		Vane Type	Effective Torque (at 0.5 MPa) (N·m)	Oscillation Angle 90°	100°	180°	270°	280°	With Switch	Port Position Axial Direction With switch not possible S	With Flange Bracket FA	With Foot Bracket LS	With Shock Absorber C	Page
Standard Type		RV3S1	Single	0.12	●		●	●			◎	◎	◎		1288
		RV3D1	Double	0.28	●						◎	◎	◎		
		RV3S3	Single	0.31	●		●	●		●	◎	◎	◎		
		RV3D3	Double	0.71	●					●	◎	◎	◎		
		RV3S10	Single	0.98	●		●	●		●	◎	◎	◎		
		RV3D10	Double	2.11	●					●	◎	◎	◎		
		RV3S20	Single	1.70	●		●	●		●	◎	◎	◎		
		RV3D20	Double	3.88	●					●	◎	◎	◎		
		RV3S30	Single	3.19	●		●	●		●		◎	◎		
		RV3D30	Double	7.70	●					●		◎	◎		
With Valve		RV3S$^{V}_{W}$10	Single	0.98	●		●	●		●		◎	◎		1304
		RV3D$^{V}_{W}$10	Double	2.11	●					●		◎	◎		
		RV3S$^{V}_{W}$20	Single	1.70	●		●	●		●		◎	◎		
		RV3D$^{V}_{W}$20	Double	3.88	●					●		◎	◎		
		RV3S$^{V}_{W}$30	Single	3.19	●		●	●		●		◎	◎		
		RV3D$^{V}_{W}$30	Double	7.70	●					●		◎	◎		
Variable Angle Type		RV3SA3	Single	0.31			● (30 to 90° variable)			●		◎	◎		1312
		RV3DA3	Double	0.71	● (30 to 90° variable)					●		◎	◎		
		RV3SA10	Single	0.98			● (30 to 90° variable)			●		◎	◎		
		RV3DA10	Double	2.11	● (30 to 90° variable)					●		◎	◎		
		RV3SA20	Single	1.70			● (30 to 90° variable)			●		◎	◎		
		RV3DA20	Double	3.88	● (30 to 90° variable)					●		◎	◎		
		RV3SA30	Single	3.19				● (30 to 90° variable)		●		◎	◎		
		RV3DA30	Double	7.70	● (30 to 90° variable)					●		◎	◎		

● Large (RV3□50 to RV3□800)　　●: Standard, ◎: Option, : Not available

Variation	Model No.		Vane Type	Effective Torque	Oscillation Angle 90°	100°	180°	270°	280°	With Switch	Port Position Axial Direction S	With Flange Bracket FA	With Foot Bracket LS	With Shock Absorber C	Page
Standard Type		RV3S50	Single	4.7	●		●	●	●	●		◎	◎	◎	1324
		RV3D50	Double	10.1	●	●				●		◎	◎	◎	
		RV3S150	Single	14.7	●		●	●	●	●		◎	◎	◎	
		RV3D150	Double	34.3	●	●				●		◎	◎	◎	
		RV3S300	Single	27.9	●		●	●	●	●			◎	◎	
		RV3D300	Double	66.6	●	●				●			◎	◎	
		RV3S800	Single	102	●		●	●	●	●			◎	◎	
		RV3D800	Double	206	●	●				●			◎	◎	
With Valve		RV3S$^{V}_{W}$50	Single	4.7	●		●	●	●	●		◎	◎	◎	1334
		RV3D$^{V}_{W}$50	Double	10.1	●	●				●		◎	◎	◎	
		RV3S$^{V}_{W}$150	Single	14.7	●		●	●	●	●		◎	◎	◎	
		RV3D$^{V}_{W}$150	Double	34.3	●	●				●		◎	◎	◎	
		RV3S$^{V}_{W}$300	Single	27.9	●		●	●	●	●			◎	◎	
		RV3D$^{V}_{W}$300	Double	66.6	●	●				●			◎	◎	
Low Hydraulic Pressure Type		RV3SH50	Single	4.7	●		●	●	●	●		◎	◎	◎	1344
		RV3DH50	Double	10.1	●	●				●		◎	◎	◎	
		RV3SH150	Single	14.7	●		●	●	●	●		◎	◎	◎	
		RV3DH150	Double	34.3	●	●				●		◎	◎	◎	
		RV3SH300	Single	27.9	●		●	●	●	●			◎	◎	
		RV3DH300	Double	66.6	●	●				●			◎	◎	
		RV3SH800	Single	102	●		●	●	●	●			◎	◎	
		RV3DH800	Double	206	●	●				●			◎	◎	
Shock Absorber		RVC50			●	●	●	●	●	—					1350
		RVC150			●	●	●	●	●	—					
		RVC300			●	●	●	●	●	—					

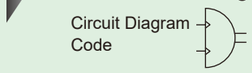
Compact Selex Rotary Vane Type, Standard Type

RV3$^{S}_{D}$ Series

●Torque Size: 1, 3, 10, 20, 30

●Oscillation Angle: 90°, 180°, 270°

Circuit Diagram Code



RoHS

Model Number Notation

●Compact rotary actuator (standard), RV3□

RV3S - 3 - 90 - 45 - SR-U - FA

❶ Model Number ❷ Nominal Size ❸ Oscillation Angle ❹ Oscillation Origin ❺ Switch Type ❻ Option

❶ Model Number

Code	Content
RV3S	Single Vane Type
RV3D	Double Vane Type

❷ Nominal Size

Code	Content	Model No. RV3S	Model No. RV3D
1	Effective Torque at 0.5 MPa	0.12 N·m	0.27 N·m
3		0.31 N·m	0.71 N·m
10		0.98 N·m	2.11 N·m
20		1.70 N·m	3.88 N·m
30		3.19 N·m	7.7 N·m

❸ Swing Angle (°)

Code	Content	Model No. RV3S	Model No. RV3D
90	90°	●	●
180	180°	●	
270	270°	●	

❹ Oscillation Origin (°)

Code	Content	RV3S 1	3	10	20	30	RV3D 1	3	10	20	30
45	45°	●	●	●	●	●	●	●	●	●	●
90	90° (excluding 270° oscillation angle)	●	●	●	●						

❺ Switch Type

Code	Content	RV3S 1	3	10	20	30	RV3D 1	3	10	20	30	
Blank	Without switch	●	●	●	●	●	●	●	●	●	●	
SR	With Lead Wire Axial Direction Switch		●	●	●	●		●	●	●	●	
SR-U	With Lead Wire Perpendicular to Axis Direction Switch		●	●	●	●		●	●	●	●	

❻ Option

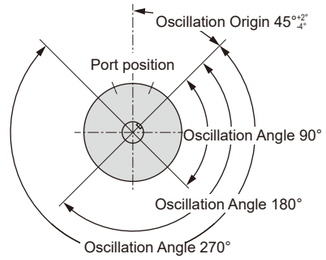
	Code	Content	Model No. RV3S 1	3	10	20	30	RV3D 1	3	10	20	30	
	Blank	No option	●	●	●	●	●	●	●	●	●	●	
*1	S	Port Position Axial Direction	●	●	●	●		●	●	●	●		
*2	FA	With Flange Bracket	●	●	●	●	●	●	●	●	●	●	
*2	LS	With Foot Bracket	●	●	●	●	●	●	●	●	●	●	

*1: For port position axial direction "S", with switch cannot be manufactured.

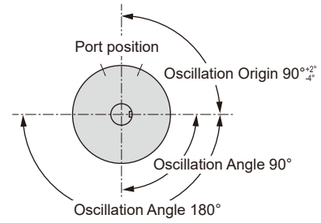
***2: Mounting brackets (FA, LS) are shipped included with the product. For external dimensions, refer to P. 1292, 1294, 1296, 1298, and 1300.**

Oscillation Origin Position

● Oscillation Origin 45°
RV3$^{S}_{D}$1 to 30



● Oscillation Origin 90°
RV3S1 to 20



*1: The tolerance of the oscillation origin is based on the mounting screw position.

*2: The runout angle of the torsion angle between the keyway (or cut surface) on the long axis side and the square surface on the short axis side is within 1.5°.

●Switch Unit Model No. Notation

RV3S - SR-3 - 90 - 45 - U

Model No. ❶ Model ❷ Oscillation Angle ❸ Oscillation Origin ❹ Lead Wire Extraction Direction

❶ Model

Code	Content
SR-3	Applicable Actuator: RV3$^{S}_{D}$ 3
SR-10	Applicable Actuator: RV3$^{S}_{D}$ 10
SR-20	Applicable Actuator: RV3$^{S}_{D}$ 20
SR-30	Applicable Actuator: RV3$^{S}_{D}$ 30

❷ Oscillation Angle:

Code	Content
90	90°
180	180°
270	270°

❸ Oscillation Origin

	Code	Content
*1	45	45°
	90	90°

*1: For oscillation origin "90", SR-30 cannot be selected.

❹ Lead Wire Extraction Direction

Code	Content
Blank	With Lead Wire Axial Direction Switch
U	With Lead Wire Perpendicular to Axis Direction Switch

● How to order flange bracket

Model No. - FA

❶ Model Number — Flange Bracket

❶ Model Number

Code	Applicable Model
RVS1	RV3$^{S}_{D}$ 1
RVS3	RV3$^{S}_{D}$ 3
RVS10	RV3$^{S}_{D}$ 10
RVS20	RV3$^{S}_{D}$ 20
RVS30	RV3$^{S}_{D}$ 30

● How to order Foot Bracket

Model No. - LS

❶ Model Number — Foot Bracket

❶ Model Number

Code	Applicable Model
RVS1	RV3$^{S}_{D}$ 1
RVS3	RV3$^{S}_{D}$ 3
RVS10	RV3$^{S}_{D}$ 10
RVS20	RV3$^{S}_{D}$ 20
RVS30	RV3$^{S}_{D}$ 30

Specifications

●Single Vane Type

Item		RV3S														
Size		1			3			10			20			30		
Effective torque	N·m	0.12			0.31			0.98			1.70			3.19		
Actuation method		Single Vane														
Operating Fluid		Compressed Air														
Max Operating Pressure	MPa	0.7									1.0					
Min Operating Pressure	MPa	0.2														
Proof Pressure	MPa	1.05									1.5					
Ambient Temperature	°C	-5 to 80 *3 (provided there is no freezing)												-5 to 60 *3 (provided there is no freezing)		
Port Size		M5												Rc1/8		
Oscillating angle tolerance	°	90^{+4}_{0}	180^{+4}_{0}	270^{+4}_{0}	90^{+4}_{0}	180^{+4}_{0}	270^{+4}_{0}	90^{+4}_{0}	180^{+4}_{0}	270^{+4}_{0}	90^{+4}_{0}	180^{+4}_{0}	270^{+4}_{0}	90^{+3}_{0}	180^{+3}_{0}	270^{+3}_{0}
Oscillation Origin	°	45, 90		45	45, 90		45	45, 90		45	45, 90		45	45		
Allowable Absorption Energy *1	mJ	0.6			1.5			3			15			25		
Max Operating Frequency *2	cycle/min	300	180	96	240	150	60	240	150	90	210	120	84	180	90	60
Volumetric capacity	cm^3	1.4	1.4	1.5	3.4		4	9.8		12	17		21	37		43
Allowable Radial Load	N	30			40			50			300			400		
Allowable Thrust Load	N	3			4						25			30		
Weight	kg	0.036			0.07			0.14			0.25			0.47		0.46
Switch Unit Weight	kg	—			0.04			0.04			0.05			0.05		
Lubrication		Not Required (When lubricating, use turbine oil Class 1 ISO VG32)														

●Double Vane Type

Item		RV3D				
Size		1	3	10	20	30
Effective torque	N·m	0.28	0.71	2.11	3.88	7.70
Actuation method		Double Vane				
Operating Fluid		Compressed Air				
Max Operating Pressure	MPa	0.7			1.0	
Min Operating Pressure	MPa	0.2				
Proof Pressure	MPa	1.05			1.5	
Ambient Temperature	°C	-5 to 80 *3 (provided there is no freezing)				-5 to 60 *3 (provided there is no freezing)
Port Size		M5				Rc1/8
Oscillating angle tolerance	°	90^{+4}_{0}				90^{+3}_{0}
Oscillation Origin	°	45				
Allowable Absorption Energy *1	mJ	0.6	1.5	3	15	25
Max Operating Frequency *2	cycle/min	300	240		210	180
Volumetric capacity	cm^3	1.1	2.8	8.1	15	34
Allowable Radial Load	N	30	40	50	300	400
Allowable Thrust Load	N	3	4		25	30
Weight	kg	0.037	0.072	0.14	0.26	0.48
Switch Unit Weight	kg	—	0.04	0.04	0.05	0.05
Lubrication		Not Required (When lubricating, use turbine oil ISO VG32)				

***1: Calculate the allowable energy as follows, where it is the inertial energy that the Selex Rotary shaft can tolerate. (Allowable Energy) ≥ $1/2I\omega^2\times10^3$ (For detailed calculation, refer to P. 1366.)**

*2: Max operating frequency is at supply pressure 0.5 MPa <no load condition>

*3: For type with switch, it is 5 to 60°C.

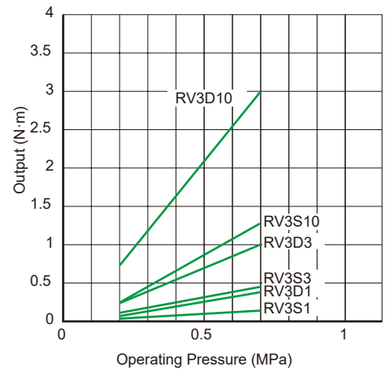
*4: Keys are included to Selex Rotary with keyway.

*5: Please consult us separately for non-standard specifications.

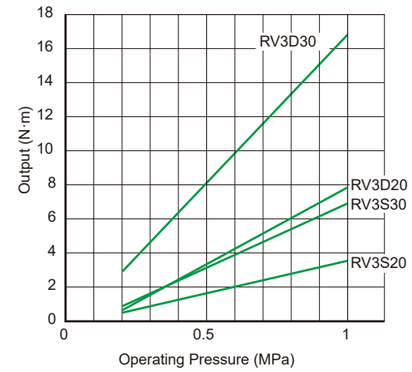
***6: For switch specifications, refer to P. 1354, 1355.**

Output Characteristic Diagram (Effective Torque)

● RV3 S D 1 to 10



● RV3 S D 20, 30



Output Table (Effective Torque) (N·m)

Operating Pressure (MPa) / Model No.		0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
Single Vane	RV3S1	0.04	0.07	0.10	0.12	0.15	0.18	–	–	–
	RV3S3	0.1	0.17	0.24	0.31	0.38	0.45	–	–	–
	RV3S10	0.35	0.56	0.75	0.98	1.2	1.39	–	–	–
	RV3S20	0.59	0.95	1.33	1.7	2.1	2.49	2.87	3.26	3.68
	RV3S30	1.1	1.8	2.5	3.19	4.1	4.8	5.8	6.5	7.2
Double Vane	RV3D1	0.10	0.16	0.22	0.28	0.34	0.40	–	–	–
	RV3D3	0.25	0.39	0.54	0.71	0.86	1.01	–	–	–
	RV3D10	0.76	1.17	1.62	2.11	2.54	3.03	–	–	–
	RV3D20	1.4	2.22	3.06	3.88	4.7	5.53	6.33	7.17	8.07
	RV3D30	2.7	4.4	6	7.7	9.5	11.2	12.99	14.8	16.6

Oscillation Time Setting

1. Use the oscillating time within the range in the table below as a guide.

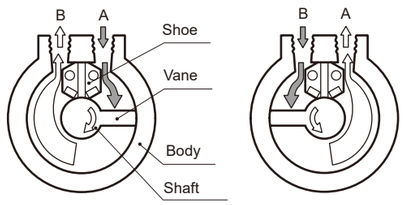
Compact Selex Rotary

Model No.	Oscillation Angle		
	90°	180°	270°
RV3 S D 1	0.03 to 0.3	0.06 to 0.6	0.09 to 0.9
RV3 S D 3	0.04 to 0.8	0.08 to 1.6	0.12 to 2.4
RV3 S D 10	0.045 to 0.9	0.09 to 1.8	0.135 to 2.7
RV3 S D 20	0.05 to 1.0	0.10 to 2	0.15 to 3
RV3 S D 30	0.07 to 0.7	0.14 to 1.4	0.21 to 2.1

Operational Principle

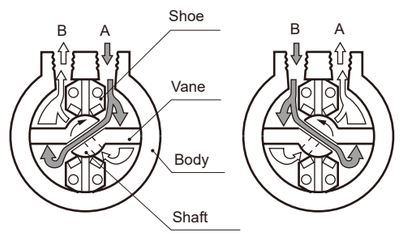
●Single Vane

1. Consists of a vane that slides on the inner surface of the body, a shaft integrated with it, and a shoe (stopper).
2. When air enters from port A, the air pushes the vane to rotate the shaft and generate torque.
3. Air in the opposite chamber is exhausted through port B, and it rotates clockwise.
4. The vane hits the shoe and stops.
5. When air is introduced from port B, it similarly rotates counterclockwise.



●Double Vane

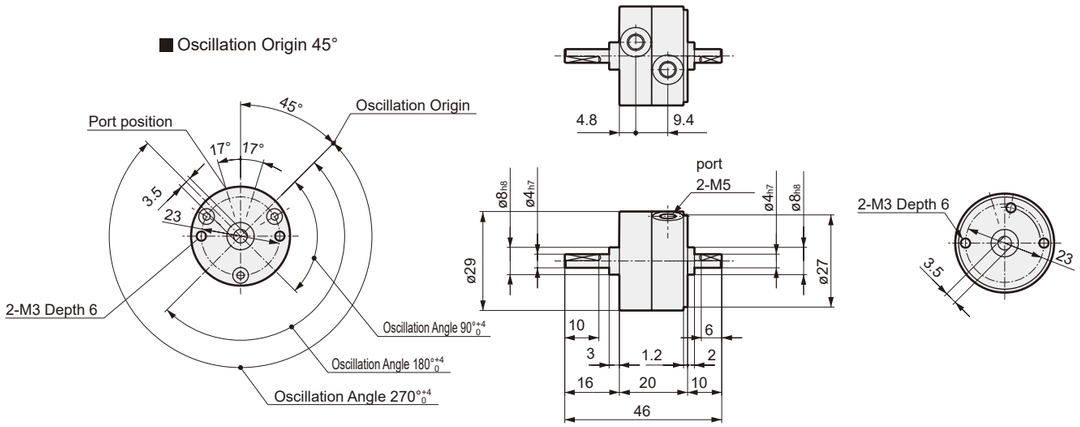
1. Consists of two vanes that slide on the inner surface of the body, a shaft integrated with them, and two shoes (stoppers).
2. When air enters from port A, the air pushes one vane, passes through the shaft passage, pushes the other vane, rotates the shaft, and generates torque.
3. Operation is similar to single vane rotation.



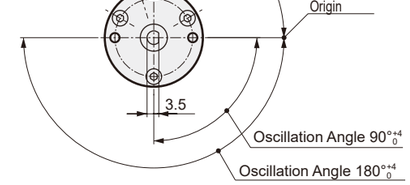
Dimensional Drawings

● RV3S/D1

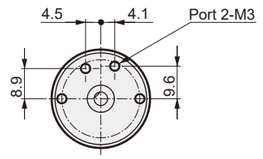
■ Oscillation Origin 45°



■ Oscillation Origin 90°

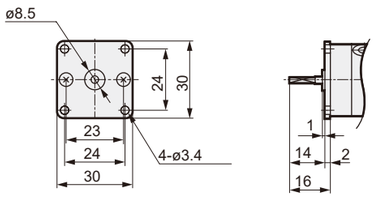


● S Type (Port Position Axial Direction)



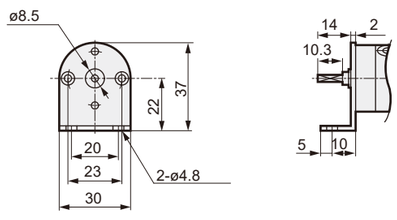
● RV3S/D1-FA

■ With flange



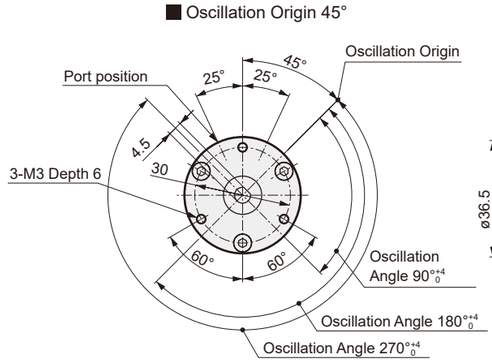
● RV3S/D1-LS

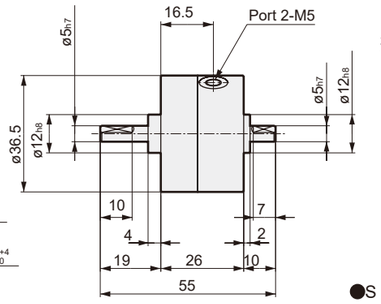
■ With foot

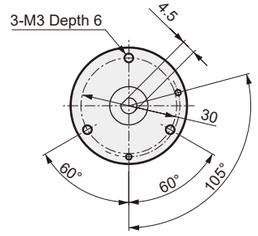


● RV3S/D3

■ Oscillation Origin 45°

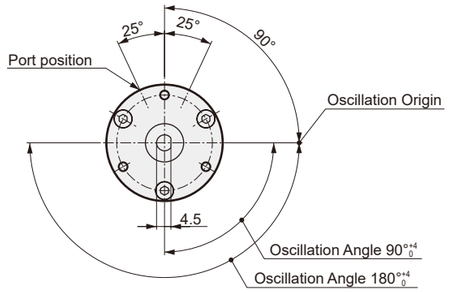


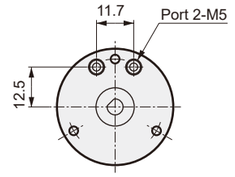




●S Type (Port Position Axial Direction)

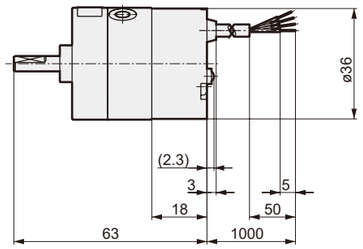
■ Oscillation Origin 90°

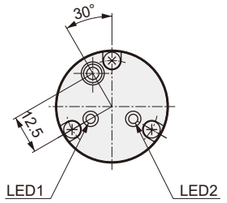




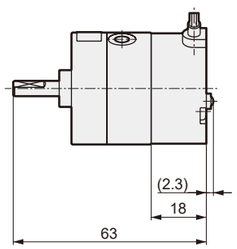
● RV3S/D3-□-SR (U)

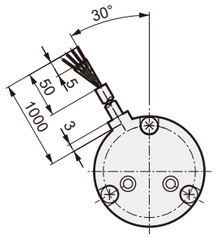
■ Lead Wire Axial Direction Extraction





■ Lead Wire Perpendicular to Axis Direction Extraction

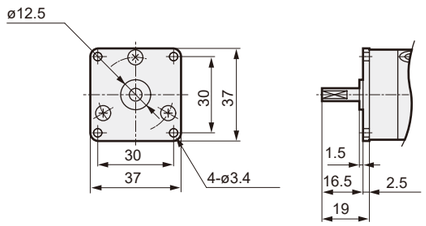




Dimensional Drawings

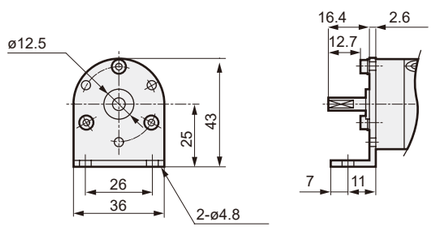
● RV3S/D3-FA

■ With flange



● RV3S/D3-LS

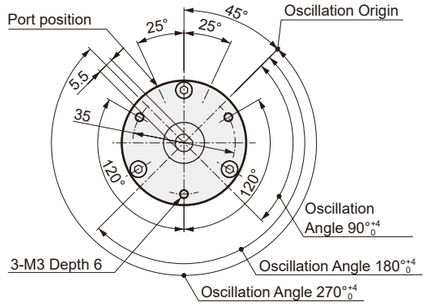
■ With foot

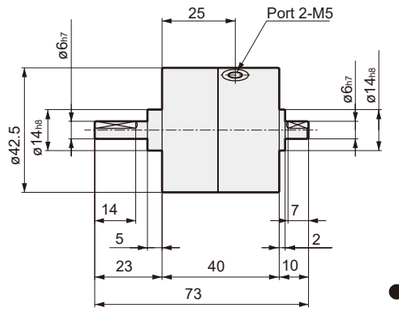


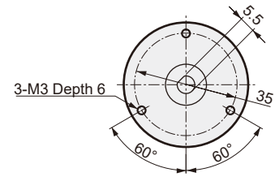
Dimensional Drawings

● RV3S/D10

■ Oscillation Origin 45°

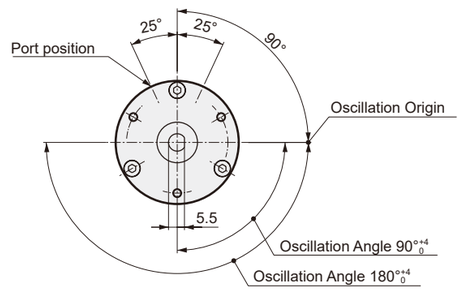


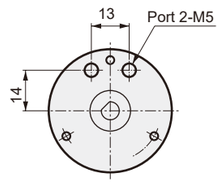




●S Type (Port Position Axial Direction)

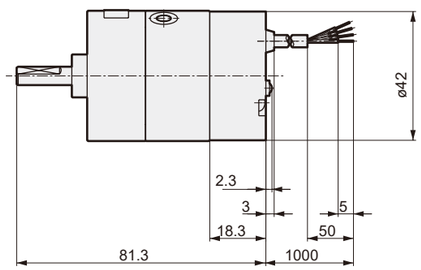
■Oscillation Origin 90°

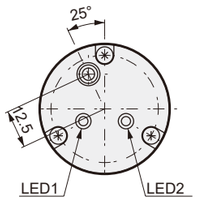




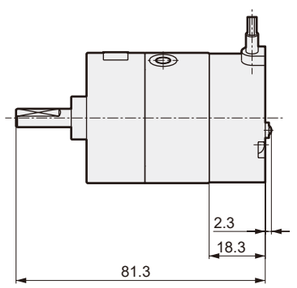
● RV3S/D10-□-SR (U)

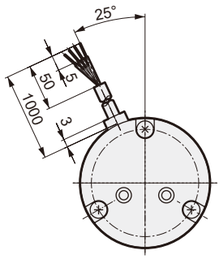
■ Lead Wire Axial Direction Extraction





■ Lead Wire Perpendicular to Axis Direction Extraction

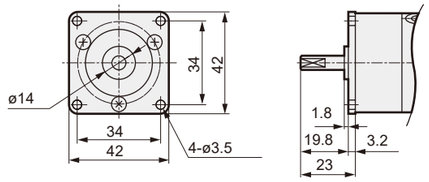




Dimensional Drawings

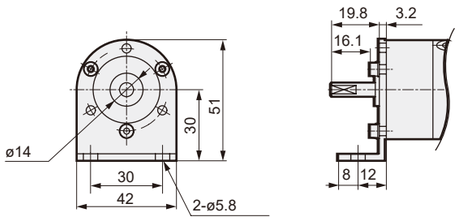
● RV3 S D 10-FA

■ With flange



● RV3 S D 10-LS

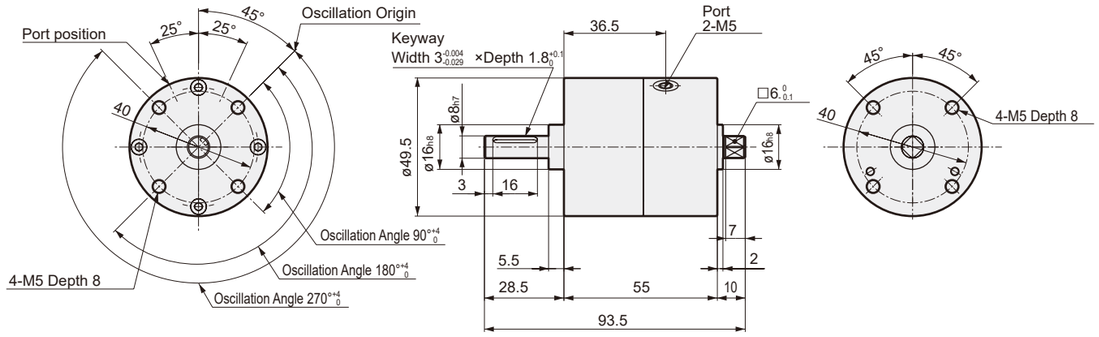
■ With foot



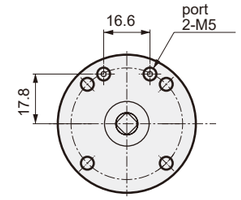
Dimensional Drawings

● RV3 S D 20

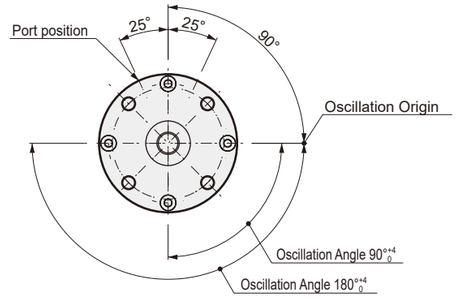
■ Oscillation Origin 45°



●S Type
(Port Position Axial Direction)

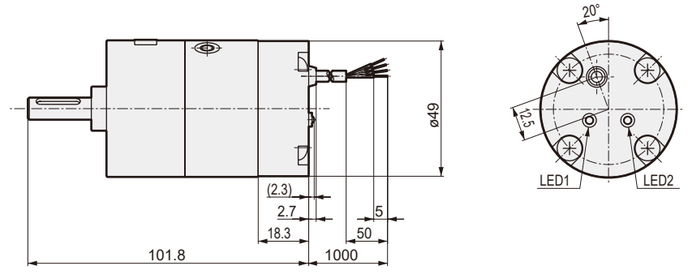


■ Oscillation Origin 90°

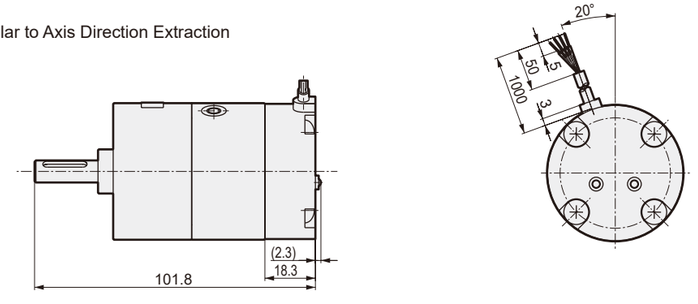


● RV3 S D 20-□-SR (U)

■ Lead Wire Axial Direction Extraction

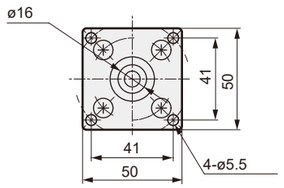


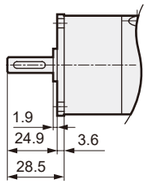
■ Lead Wire Perpendicular to Axis Direction Extraction



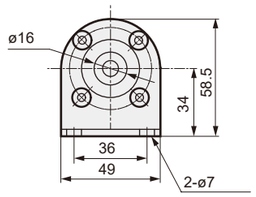
Dimensional Drawings

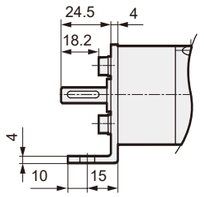
● RV3 S D 20-FA
■ With flange





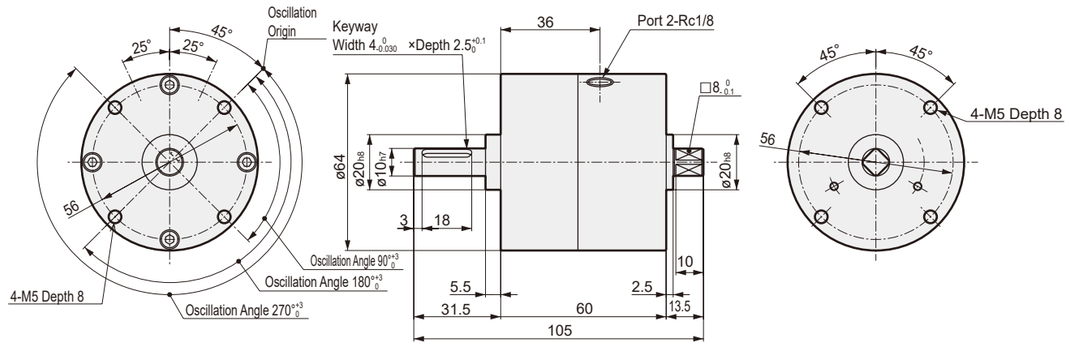
● RV3 S D 20-LS
■ With foot



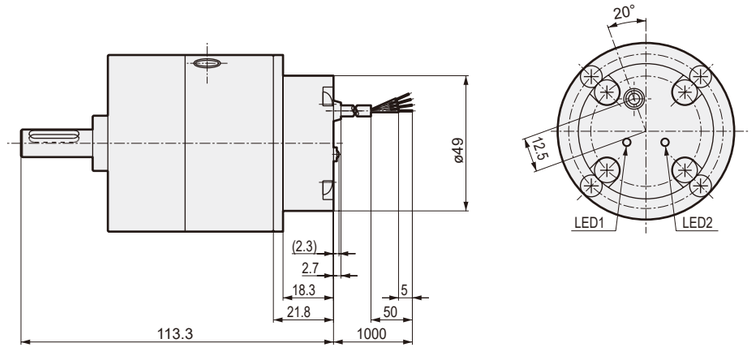


Dimensional Drawings

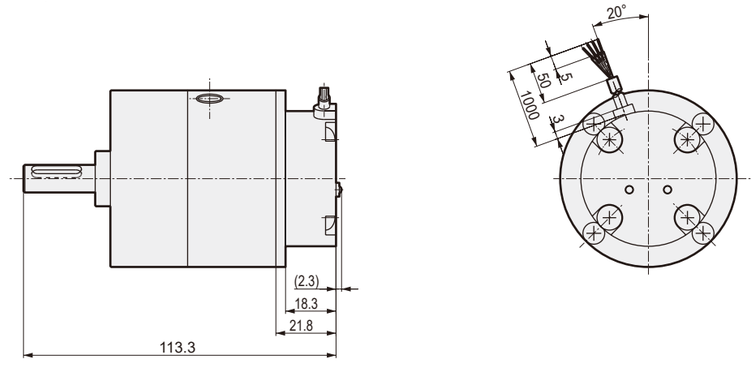
● RV3 S D 30



● RV3 S D 30-□-SR (U)
■ Lead Wire Axial Direction Extraction

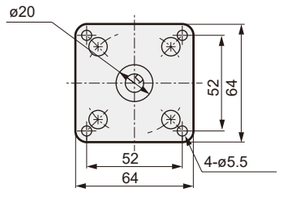


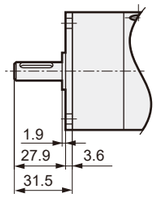
■ Lead Wire Perpendicular to Axis Direction Extraction



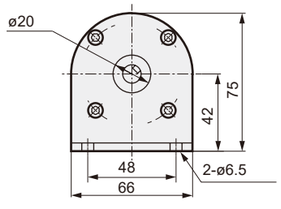
Dimensional Drawings

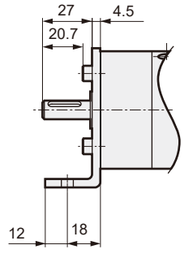
● RV3 S D 30-FA
■ With flange





● RV3 S D 30-LS
■ With foot

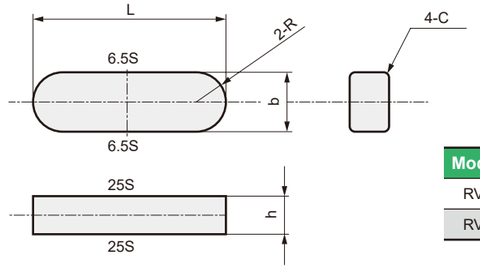




Accessory External Dimensions

● JIS B1301 Parallel Key b×h×L, Both Ends Rounded S45C

The following keys are included to Selex Rotary with keyway, respectively.

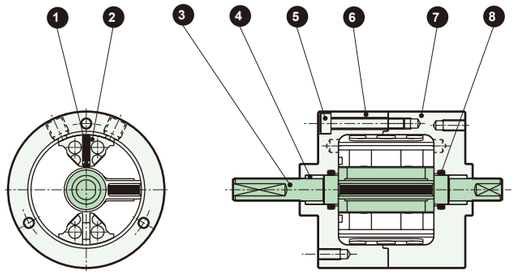


Unit: mm

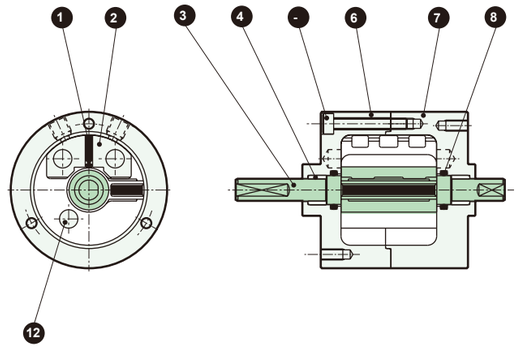
Model No.	Key Nominal Size	b	h	L	C	R
RV3□20	3×3×16	$3^{0}_{-0.025}$	$3^{0}_{-0.025}$	$16^{0}_{-0.18}$	0.16 to 0.25 (R0.16 to 0.25)	1.5
RV3□30	4×4×18	$4^{0}_{-0.03}$	$4^{0}_{-0.03}$	$18^{0}_{-0.18}$	0.16 to 0.25 (R0.16 to 0.25)	2

Internal Structure Diagram/Material

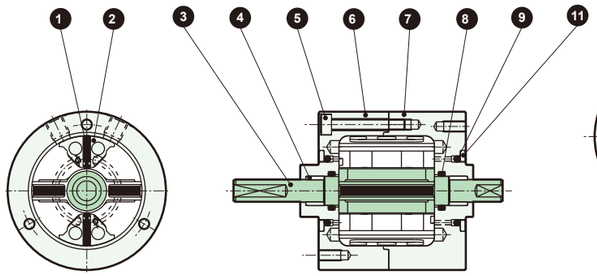
● RV3S1 to 30
Oscillation Origin 45°



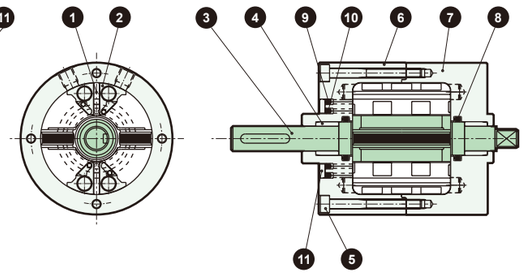
● RV3S1 to 30
Oscillation Origin 90°



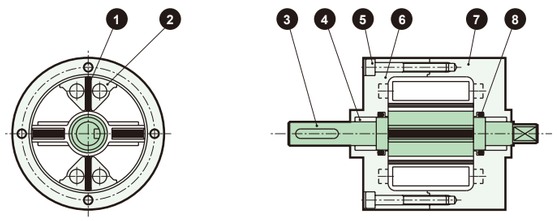
● R V3D1 to 10



● RV3D20



● RV3D30



Part No.	Part Name	Material	Part No.	Part Name	Material
1	Shoe Seal	Nitrile Rubber	7	Body B	Aluminum Alloy
2	Shoe	Resin	8	O-ring	Nitrile Rubber
3	Vane Shaft	Steel, Resin, Nitrile Rubber	9	O-ring	Nitrile Rubber
4	Bearing	Oil-Impregnated Bearing Alloy	10	O-ring	Nitrile Rubber
5	Mounting Bolt	Steel	11	Plate	Steel
6	Body A	Aluminum Alloy	12	Stopper pin	Steel

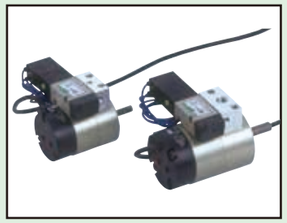
For the consumable parts list, refer to P. 1361.

Mounting Type Material

Mounting Style	Material	Remarks
Foot (FA)	Steel	Zinc Chromate
Flange (LS)	Steel	Zinc Chromate

MEMO

Swing/Rotary Type
RRC
GRC
RV3□
Cylinder Switch
Ending



Compact Selex Rotary Vane Type, With Valve

RV3$^{SV}_{DW}$ Series

- Torque Size: 10, 20, 30
- Oscillation Angle: 90°, 180°, 270°

Circuit Diagram Code

RoHS

Model Number Notation

●Compact rotary actuator (with valve) RV3□$^{V}_{W}$

RV3S - V - 10 - 90 - 45 - 1 - SR-U - LS

1 Model Number
2 Valve
3 Nominal Size
4 Oscillation Angle:
5 Oscillation Origin
6 Valve voltage
7 Switch Type
8 Option

1 Model No.

Code	Content
RV3S	Single Vane Type
RV3D	Double Vane Type

2 Valve

Code	Content
V	Single solenoid
W	Double Solenoid

3 Nominal Size

Code	Content	Model No. RV3S	Model No. RV3D
10	Effective Torque at 0.5 MPa	0.98 N·m	2.11 N·m
20		1.70 N·m	3.88 N·m
30		3.19 N·m	7.7 N·m

4 Swing Angle (°)

Code	Content	Model No. RV3S	Model No. RV3D
90	90°	●	●
180	180°	●	
270	270°	●	

5 Oscillation Origin (°)

Code	Content	Model No. RV3S Nominal Size 10	20	30	RV3D Nominal Size 10	20	30
45	45°	●	●	●	●	●	●
90	90° (excluding 270° oscillation angle)	●	●				

6 Valve voltage

Code	Content
1	100 VAC
2	200 VAC
3	24 VDC

7 Switch Type

Code	Content	
Blank	Without switch	
SR	With Lead Wire Axial Direction Switch	
SR-U	With Lead Wire Perpendicular to Axis Direction Switch	

8 Option

Code	Content	
Blank	No option	
*1 FA	With Flange Bracket	
*1 LS	With Foot Bracket	

***1: Mounting bracket (FA, LS) is included with the product. For external dimensions, refer to P. 1309.**

●Switch Unit Model No. Notation

RV3S - SR-10 - 90 - 45 - U

Model No.
1 Model
2 Oscillation Angle:
3 Oscillation Origin
4 Lead Wire Extraction Direction

1 Model

Code	Content
SR-10	Applicable Actuator: RV3$^{S}_{D}$10
SR-20	Applicable Actuator: RV3$^{S}_{D}$20
SR-30	Applicable Actuator: RV3$^{S}_{D}$30

2 Oscillation Angle:

Code	Content
90	90°
180	180°
270	270°

3 Oscillation Origin

Code	Content
45	45°
*1 90	90°

*1: For oscillation origin "90", SR-30 cannot be selected.

4 Lead Wire Extraction Direction

Code	Content
Blank	With Lead Wire Axial Direction Switch
U	With Lead Wire Perpendicular to Axis Direction Switch

Specifications

●Single Vane Type

Item		RV3S$_W^V$								
Size		10			20			30		
Effective torque	N·m	0.98			1.70			3.19		
Actuation method		Single Vane								
Operating Fluid		Compressed Air								
Max Operating Pressure	MPa	0.7								
Min Operating Pressure	MPa	0.2								
Proof Pressure	MPa	1.05								
Ambient Temperature	°C	-5 to 50 *3 (provided there is no freezing)								
Port Size		M5			Rc1/8					
Oscillating angle tolerance	°	90^{+4}_{0}	180^{+4}_{0}	270^{+4}_{0}	90^{+4}_{0}	180^{+4}_{0}	270^{+4}_{0}	90^{+3}_{0}	180^{+3}_{0}	270^{+3}_{0}
Oscillation Origin	°	45, 90		45	45, 90		45	45		
Allowable Absorption Energy *1	mJ	3			15			25		
Max Operating Frequency *2	cycle/min	240	150	90	210	120	84	180	90	60
Internal Volume	cm^3	9.8		12	17		21	37		43
Allowable Radial Load	N	50			300			400		
Allowable Thrust Load	N	4			25			30		
Weight	kg	0.28			0.37			0.59		0.58
Switch Unit Weight	kg	0.04			0.05			0.05		
Lubrication		Not Required (When lubricating, use turbine oil ISO VG32)								

●Double Vane Type

Item		RV3D$_W^V$		
Size		10	20	30
Effective torque *1	N·m	2.11	3.88	7.70
Actuation method		Double Vane		
Operating Fluid		Compressed Air		
Max Operating Pressure	MPa	0.7		
Min Operating Pressure	MPa	0.2		
Proof Pressure	MPa	1.05		
Ambient Temperature	°C	-5 to 50 *3 (provided there is no freezing)		
Port Size		M5	Rc1/8	
Oscillating angle tolerance	°	90^{+4}_{0}		90^{+3}_{0}
Oscillation Origin	°	45		
Allowable Absorption Energy *1	mJ	3	15	25
Max Operating Frequency *2	cycle/min	240	210	180
Internal Volume	cm^3	8.1	15	34
Allowable Radial Load	N	50	300	400
Allowable Thrust Load	N	4	25	30
Weight	kg	0.28	0.38	0.60
Switch Unit Weight	kg	0.04	0.05	0.05
Lubrication		Not Required (When lubricating, use turbine oil ISO VG32)		

***1: Calculate the allowable energy as follows, where it is the inertial energy that the Selex Rotary shaft can tolerate. (Allowable Energy) ≥ $1/2I\omega^2\times10^3$ (For detailed calculation, refer to P. 1366.)**

*2: Max operating frequency is at supply pressure 0.5 MPa [no load condition]

*3: For type with switch, it is 5 to 50°C.

*4: Keys are included to Selex Rotary with keyway.

*5: Please consult us separately for non-standard specifications.

***6: For switch specifications, refer to P. 1354, 1355.**

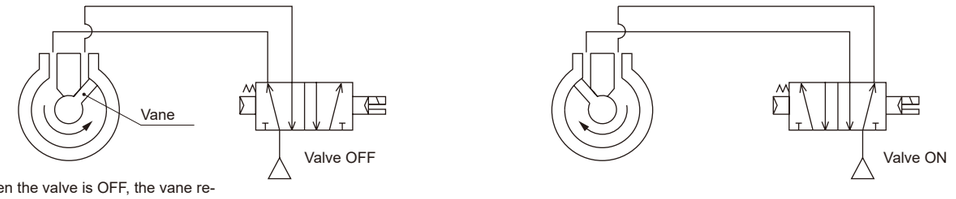
Valve specifications

Item		Specifications (4KB1 Series)		
Rated Voltage	V	100 VAC (50/60Hz)	200 VAC (50/60Hz)	24 VDC
Starting Current	(A)	0.056 / 0.044	0.034 / 0.026	0.075
Holding Current	A	0.028 / 0.022	0.017 / 0.013	
Power consumption	W	1.8 / 1.4	2.1 / 1.6	1.8
Voltage fluctuation range		±10%		
Heat Resistance Class		Class B molded coil		

*1: 100 VAC / 200 VAC can be used at 110 VAC, 220 VAC (60 Hz).

***2: For details on the valve, refer to "Directional Control Valve ❷" No. RJ-012AA.**

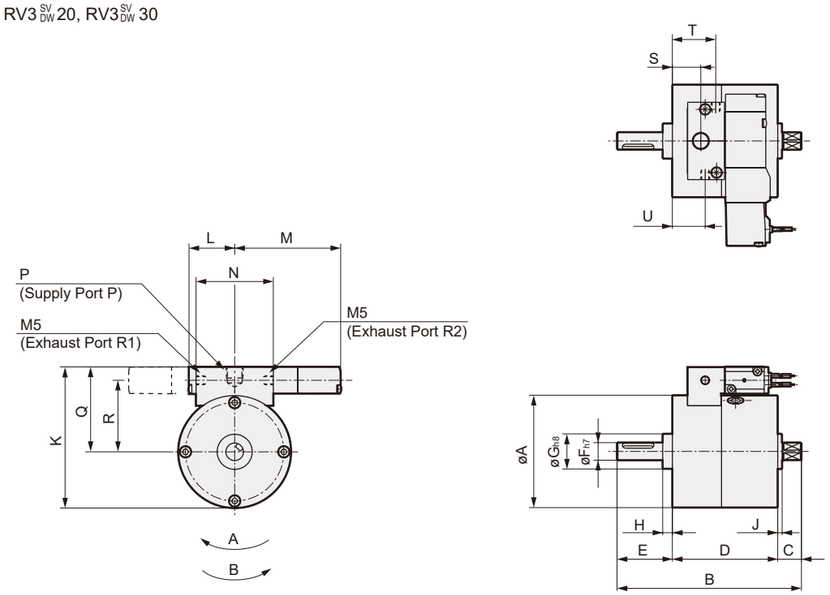
Operational Principle



When the valve is OFF, the vane returns to the oscillation origin position.

Dimensional Drawings

● RV3 SV DW 10, RV3 SV DW 20, RV3 SV DW 30



Single solenoid	Double Solenoid
ON → A Direction	B Solenoid ON → A Direction
OFF → B Direction	A Solenoid ON → B Direction

Code / Model No.	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U
RV3 SV DW 10	42.5	73	10	40	23	6	14	5	2	58.3	26	60	35	M5	37	29.5	13.6	13.6	13.6
RV3 SV DW 20	49.5	93.5	10	55	28.5	8	16	5.5	2	65.2	26	60	37	Rc1/8	40.4	32.9	16.2	23.2	23.2
RV3 SV DW 30	64	105	13.5	60	31.5	10	20	5.5	2.5	80	26	60	44	Rc1/8	48	40.5	16.2	24.7	18.7

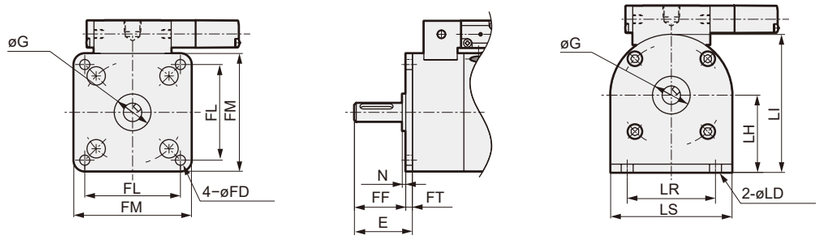
***1: Key included. For key outline dimension drawing, refer to P. 1301.**

*2: Detailed dimensions of each part body are in order of RV3 S D 10, RV3 S D 20, RV3 S D 30.

Dimensional Drawings

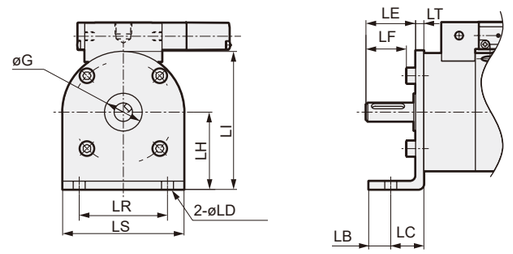
● RV3 SV DW 30-FA

■ With flange



● RV3 SV DW 30-LS

■ With foot

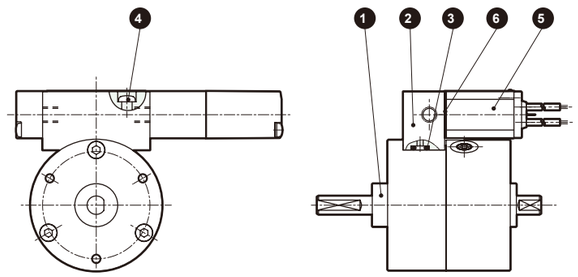


Code / Model No.	E	FD	FF	G	FL	FM	FT	N
RV3 SV DW 10	23	3.5	19.8	14	34	42	3.2	1.8
RV3 SV DW 20	28.5	5.5	24.9	16	41	50	3.6	1.9
RV3 SV DW 30	31.5	5.5	27.9	20	52	64	3.6	1.9

Code / Model No.	G	LB	LC	LD	LE	LF	LH	LI	LR	LS	LT
RV3 SV DW 10	14	8	12	5.8	19.8	16.1	30	51	30	42	3.2
RV3 SV DW 20	16	10	15	7	24.5	18.2	34	58.5	36	49	4
RV3 SV DW 30	20	12	18	6.5	27	20.7	42	75	48	66	4.5

Internal Structure Diagram/Material

● RV3SV10



Part No.	Part Name	Material	Remarks
1	Compact Selex Rotary Vane Type		RV3 (CKD)
2	Sub-base	Aluminum Alloy	
3	O-ring	Nitrile Rubber	
4	Phillips Pan Head Screw	Steel	Zinc Chromate
5	Selex Valve		4KB (CKD)
6	Gasket	Nitrile Rubber	

MEMO

Swing/Rotary Type
RRC
GRC
RV3□
Cylinder Switch
Ending

Compact Selex Rotary Vane Type, Variable Angle Type

RV3$^{S}_{D}$A Series

- Torque Size: 3, 10, 20, 30
- Oscillation Angle: Angle specification

Circuit Diagram Code

RoHS

Model Number Notation

- Compact rotary actuator (angle variable) RV3□A

RV3SA - 3 - 0 - 90 - FR-U - FA

1 Model Number
2 Nominal Size
3 Oscillation Angle
4 Oscillation Origin
5 Switch Type
6 Option

1 Model Number

Code	Content
RV3SA	Single Vane Type, Variable Angle Type
RV3DA	Double Vane Type, Variable Angle Type

2 Nominal Size

Code	Content	Model No. RV3SA	Model No. RV3DA
3	Effective Torque at 0.5 MPa	0.31 N·m	0.71 N·m
10		0.98 N·m	2.11 N·m
20		1.70 N·m	3.88 N·m
30		3.19 N·m	7.70 N·m

3 Swing Angle (°)

	Model No.	Nominal Size	Code	Content
*1	RV3SA, RV3DA	3 to 30	0	No Angle Specification
	RV3SA	3 to 20	30 to 180	With Angle Specification *2, *3
		30	30 to 270	
	RV3DA	3 to 30	30 to 90	

*1: For "No angle designation", the reference point stopper is included, and the angle setting stopper is shipped included with the product, so be sure to attach it when using.
*2: The desired angle is set to an approximate angle from the oscillating starting point, so be sure to perform final angle adjustment with the fine adjustment screw when using.
*3: The desired angle is in 10° increments.

4 Oscillation Origin (°)

Code	Content	RV3SA Nominal Size 3	10	20	30	RV3DA Nominal Size 3	10	20	30
45	45°				●	●	●	●	●
90	90°	●	●	●					

5 Switch Type

Code	Content	
Blank	Without switch	
FR	With Lead Wire Axial Direction Switch	
FR-U	With Lead Wire Perpendicular to Axis Direction Switch	

*1: 2 switches are included.
*2: If the type with switch is selected, a switch unit is shipped with the product. Assemble after adjusting the external stopper.

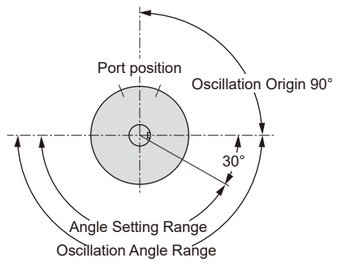
6 Option

	Code	Content	
	Blank	No option	
*2	FA	With Flange Bracket	
*2	LS	With Foot Bracket	
*1	K	With Protective Cover	

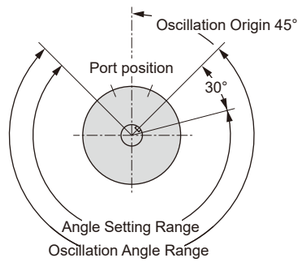
*1: For with switch, "K" (With protective cover) cannot be selected.
***2: Mounting bracket (FA, LS) is included with the product. For external dimensions, refer to P. 1318 to 1321.**

Oscillation Origin Position

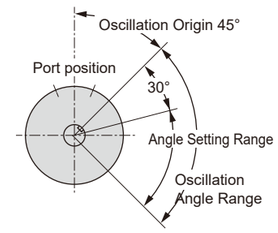
● Oscillating origin 90°
RV3SA3 to 20



● Oscillating origin 45°
RV3SA30



RV3DA3 to 30



Note: The tolerance of the oscillation origin is based on the mounting screw position.

Switch Unit Model No. Notation

RV3S - FR-3 - U

Model No.
1 Model
2 Lead Wire Extraction Direction

1 Model

Code	Content
FR-3	Applicable Actuator: RV3$^{S}_{D}$A3
FR-10	Applicable Actuator: RV3$^{S}_{D}$A10
FR-20	Applicable Actuator: RV3$^{S}_{D}$A20
FR-30	Applicable Actuator: RV3$^{S}_{D}$A30

2 Lead Wire Extraction Direction

Code	Content
Blank	With Lead Wire Axial Direction Switch
U	With Lead Wire Perpendicular to Axis Direction Switch

Specifications

●Single Vane Type

Item		RV3SA			
Size		3	10	20	30
Effective torque	N·m	0.31	0.98	1.70	3.19
Actuation method		Single Vane			
Operating Fluid		Compressed Air			
Max Operating Pressure	MPa	0.7		1.0	
Min Operating Pressure	MPa	0.2			
Proof Pressure	MPa	1.05		1.5	
Ambient Temperature	°C	-5 to 80 *4 (provided there is no freezing)			-5 to 60 *4 (provided there is no freezing)
Port Size		M5			Rc1/8
Oscillating angle setting range	°	30 to 180			30 to 270
Oscillation Origin	°	90			45
Allowable Absorption Energy *2	mJ	1	2	3	7
Max Operating Frequency *3	cycle/min	150	150	120	90
Internal Volume	cm^3	3.3	9.8	18	43
Allowable Radial Load	N	40	50	300	400
Allowable Thrust Load	N	4.0		25	30
Weight	kg	0.085	0.17	0.28	0.51
Switch Unit Weight	kg	0.06	0.06	0.07	0.07
Lubrication		Not Required (When lubricating, use turbine oil ISO VG32)			

●Double Vane Type

Item		RV3DA			
Size		3	10	20	30
Effective torque	N·m	0.71	2.11	3.88	7.7
Actuation method		Double Vane			
Operating Fluid		Compressed Air			
Max Operating Pressure	MPa	0.7		1.0	
Min Operating Pressure	MPa	0.2			
Proof Pressure	MPa	1.05		1.5	
Ambient Temperature	°C	-5 to 80 *4 (provided there is no freezing)			-5 to 60 *4 (provided there is no freezing)
Port Size		M5			Rc1/8
Oscillating angle setting range	°	30 to 90			
Oscillation Origin	°	45			
Allowable Absorption Energy *2	mJ	1	2	3	7
Max Operating Frequency *3	cycle/min	240	240	180	180
Internal Volume	cm^3	2.8	8.1	15	34
Allowable Radial Load	N	40	50	300	400
Allowable Thrust Load	N	4.0		25	30
Weight	kg	0.087	0.18	0.29	0.53
Switch Unit Weight	kg	0.06	0.06	0.07	0.07
Lubrication		Not Required (When lubricating, use turbine oil ISO VG32)			

*1: Allowable absorption energy is different from Compact Selex Rotary RV3□ series.

***2: Calculate the allowable energy as follows, where it is the inertial energy that the Selex Rotary shaft can tolerate. (Allowable Energy) ≥ $1/2I\omega^2\times10^3$ (For detailed calculation, refer to P. 1366.)**

*3: Max operating frequency is at supply pressure 0.5 MPa [no load condition]

*4: For type with switch, it is 5 to 60°C.

*5: Keys are included to Selex Rotary with keyway.

*6: Please consult us separately for non-standard specifications.

***7: For switch specifications, refer to P. 1356.**

External Stopper Specifications

Item		RV3SA3	RV3SA10	RV3SA20	RV3SA30	RV3DA3	RV3DA10	RV3DA20	RV3DA30
Min setting angle	°	30							
Max setting angle	°	180			270	90			
Angle setting pitch	°	15							
Stopper fine adjustment range for angle setting	°	-9 to +6							
Stopper fine adjustment range for reference point	°	±3				-1 to +3	±3		
Angle Setting Stopper Fine Adjustment Width at Max Setting Angle	°	-9 to +6			-9 to +3	-9 to +1	-9 to +3		

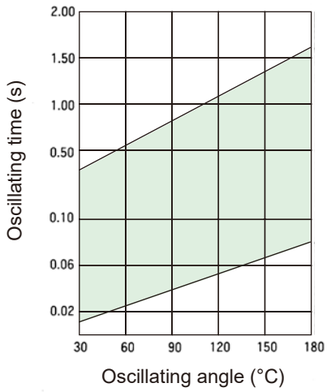
Oscillation Angle Setting Range and Oscillation Origin

Model No.		Oscillation Angle Setting Range	Oscillation Origin
Single Vane	RV3SA3	30 to 180°	90°
	RV3SA10		
	RV3SA20		
	RV3SA30	30 to 270°	45°
Double Vane	RV3DA3	30 to 90°	45°
	RV3DA10		
	RV3DA20		
	RV3DA30		

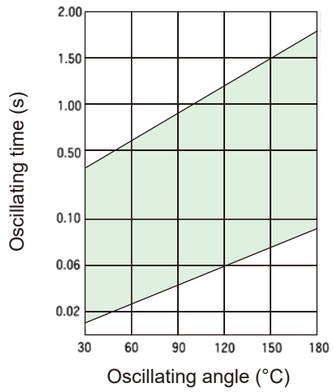
Oscillation Time Setting

1. Use the oscillating time within the range in the table below. If used outside this range, smooth operation may not be obtained due to stick-slip phenomenon, etc.

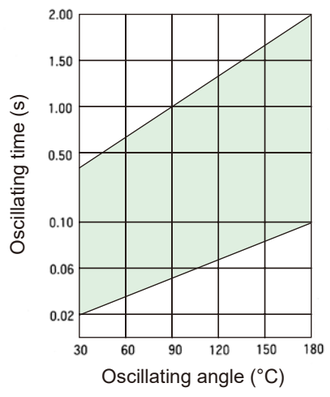
●RV3SDA3



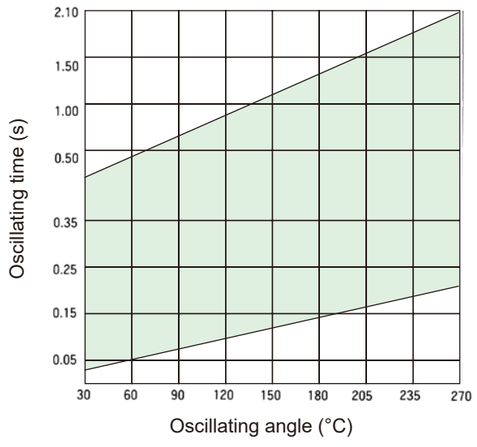
●RV3SDA5



●RV3SDA10

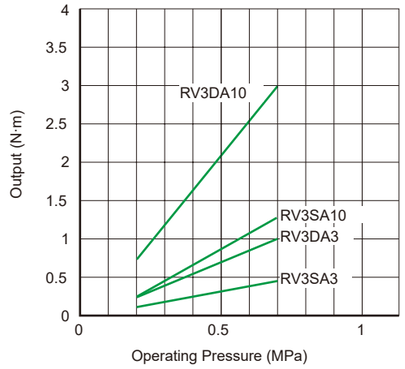


●RV3SDA20

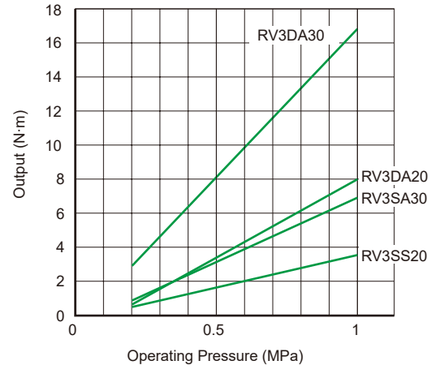


Output Table (Effective Torque)

●RV3SDA3 to 10



●RV3SDA20, 30



Output Table (Effective Torque)

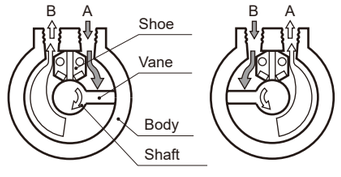
Unit: N·m

Operating Pressure (MPa) / Model No.		0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
Single Vane	RV3SA3	0.1	0.17	0.24	0.31	0.38	0.45	–	–	–
	RV3SA10	0.35	0.56	0.75	0.98	1.2	1.39	–	–	–
	RV3SA20	0.59	0.95	1.33	1.7	2.1	2.49	2.87	3.26	3.68
	RV3SA30	1.1	1.8	2.5	3.19	4.1	4.8	5.8	6.5	7.2
Double Vane	RV3DA3	0.25	0.39	0.54	0.71	0.86	1.01	–	–	–
	RV3DA10	0.76	1.17	1.62	2.11	2.54	3.03	–	–	–
	RV3DA20	1.4	2.22	3.06	3.88	4.7	5.53	6.33	7.17	8.07
	RV3DA30	2.7	4.4	6	7.7	9.5	11.2	12.99	14.8	16.6

Operational Principle

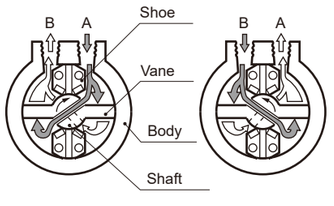
●Single Vane

1. Consists of a vane that slides on the inner surface of the body, a shaft integrated with it, and a shoe (stopper).
2. When air enters from port A, the air pushes the vane to rotate the shaft and generate torque.
3. Air in the opposite chamber is exhausted through port B, and it rotates clockwise.
4. The vane hits the shoe and stops.
5. When air is introduced from port B, it similarly rotates counterclockwise.



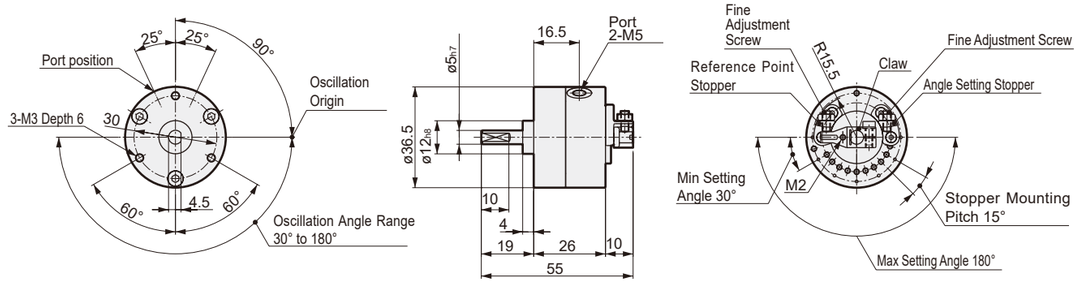
●Double Vane

1. Consists of two vanes that slide on the inner surface of the body, a shaft integrated with them, and two shoes (stoppers).
2. When air enters from port A, the air pushes one vane, passes through the shaft passage, pushes the other vane, rotates the shaft, and generates torque.
3. Operation is similar to single vane rotation.

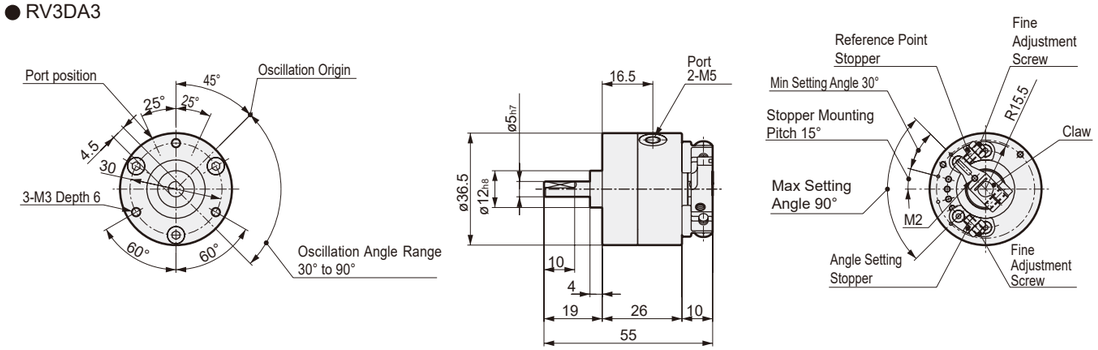


Dimensional Drawings

● RV3SA3

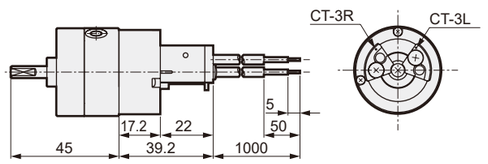


● RV3DA3

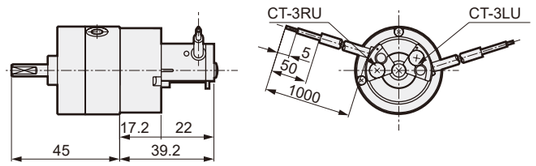


● RV3SDA3-□-FR(U)

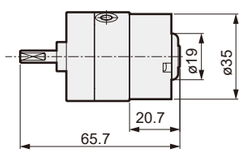
■ Lead Wire Axial Direction Extraction



■ Lead Wire Perpendicular to Axis Direction Extraction

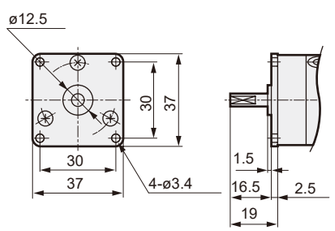


● RV3SDA3-□-K
(With Protective Cover)



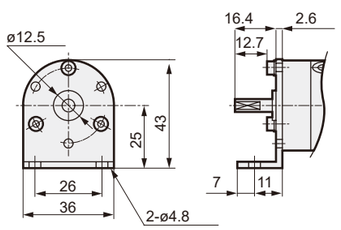
● RV3SDA3-FA

■ With flange



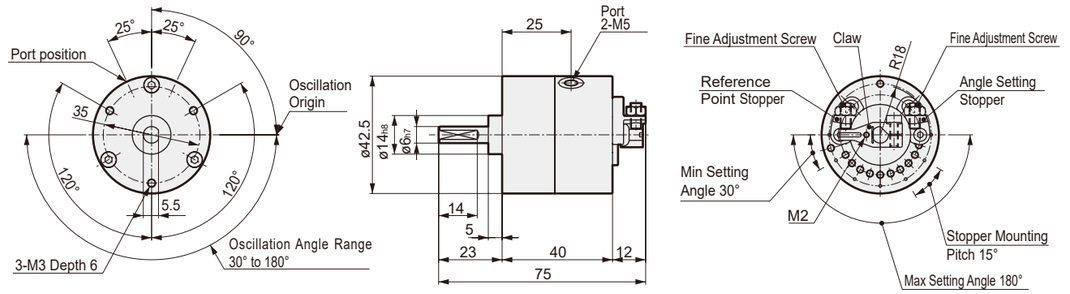
● RV3SDA3-LS

■ With foot

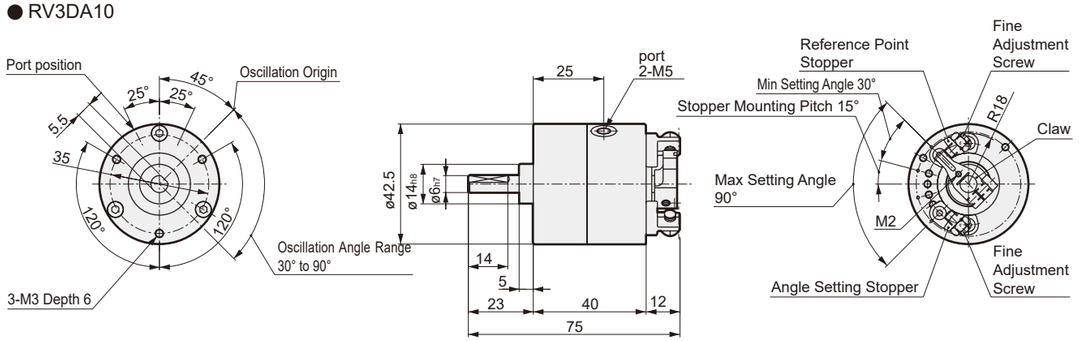


Dimensional Drawings

● RV3SA10

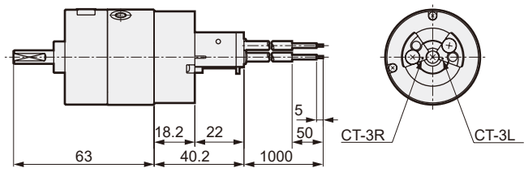


● RV3DA10

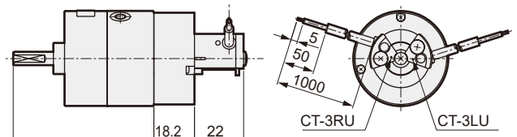


●RV3SDA10-□-FR(U)

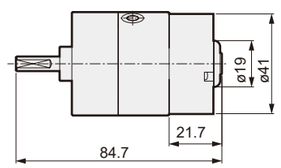
■ Lead Wire Axial Direction Extraction



■ Lead Wire Perpendicular to Axis Direction Extraction

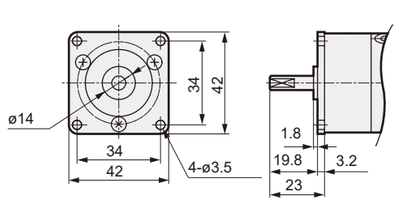


●RV3SDA10-□-K
(With Protective Cover)



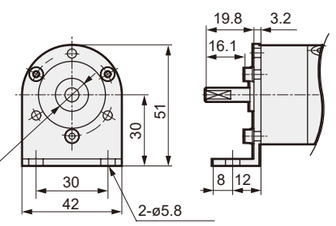
● RV3SDA10-FA

■ With flange



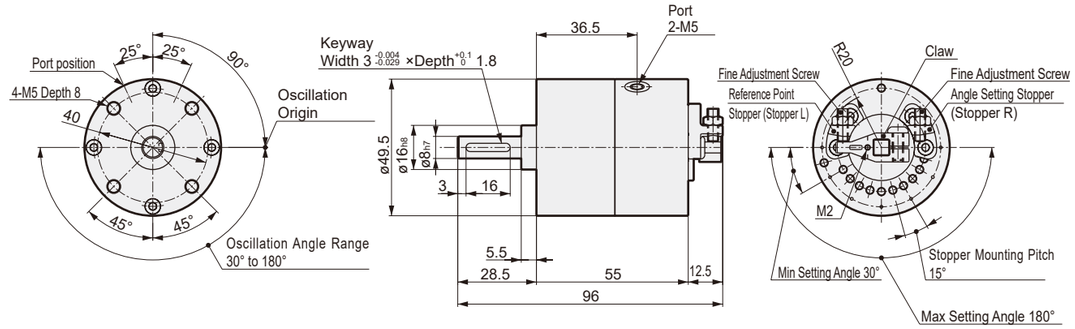
● RV3SDA10-LS

■ With foot



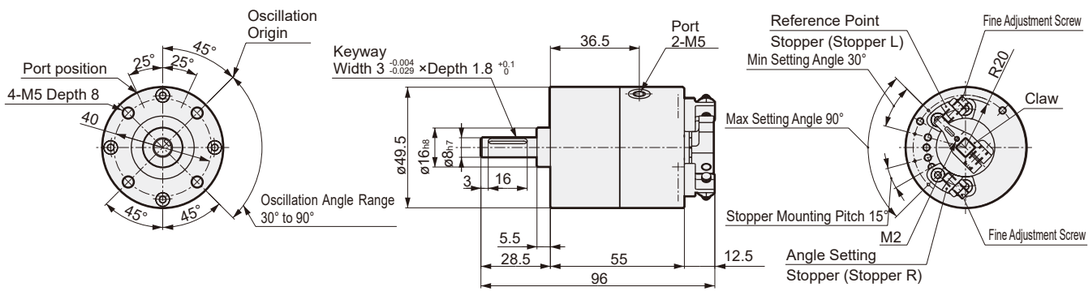
Dimensional Drawings

● RV3SA20



***1: Key included. For key outline dimension drawing, refer to P. 1301.**

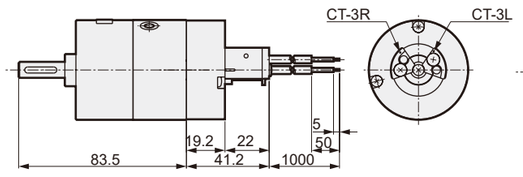
● RV3DA20



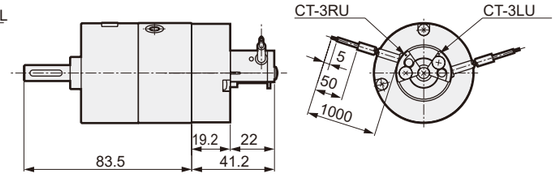
***1: Key included. For key outline dimension drawing, refer to P. 1301.**

●RV3 S D A20-□-FR(U)

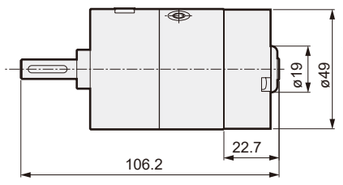
■ Lead Wire Axial Direction Extraction



■ Lead Wire Perpendicular to Axis Direction Extraction

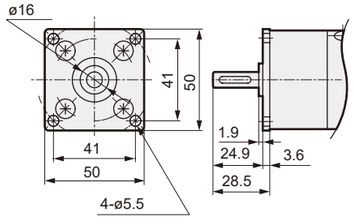


●RV3 S D A20-□-K
(With Protective Cover)



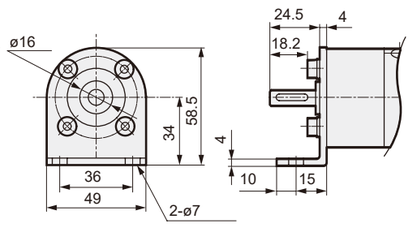
● RV3 S D A20-FA

■ With flange



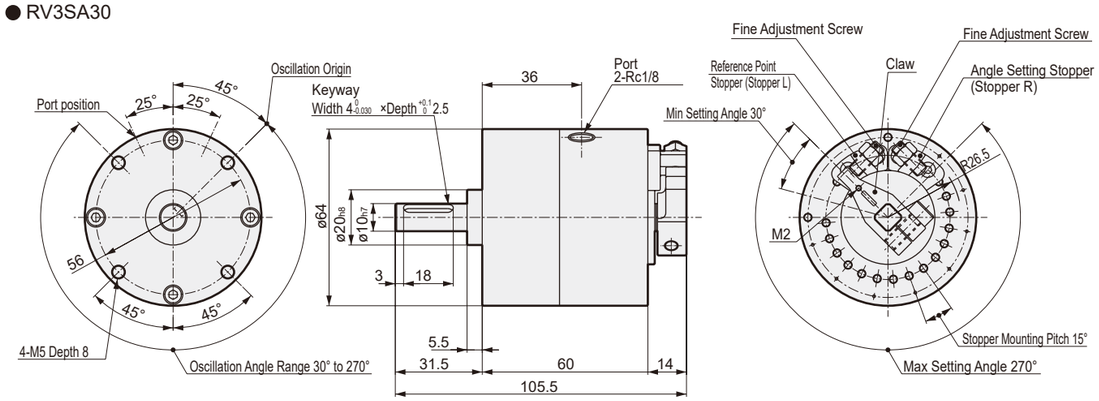
● RV3 S D A20-LS

■ With foot



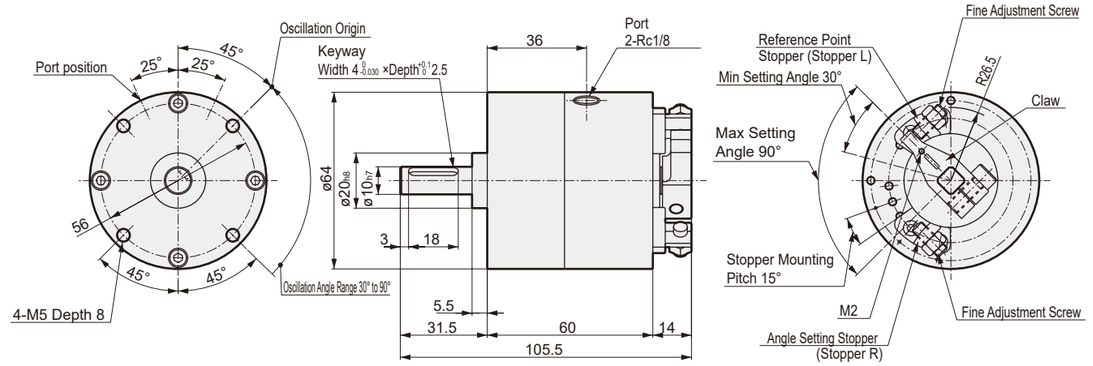
Dimensional Drawings

● RV3SA30



***1: Key included. For key outline dimension drawing, refer to P. 1301.**

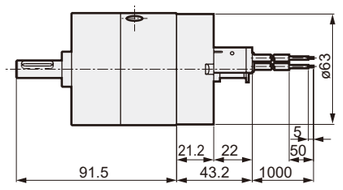
● RV3DA30



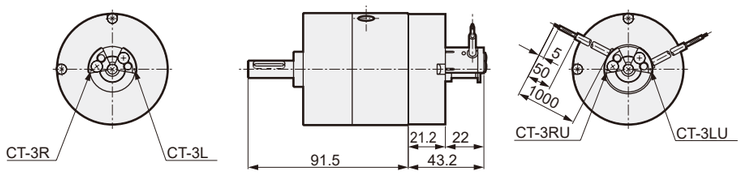
***1: Key included. For key outline dimension drawing, refer to P. 1301.**

●RV3 S D A30-□-FR(U)

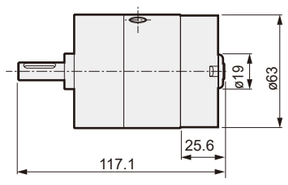
■ Lead Wire Axial Direction Extraction



■ Lead Wire Perpendicular to Axis Direction Extraction

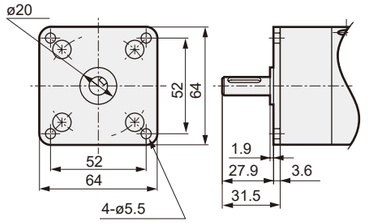


●RV3 S D A30-□-K
(With Protective Cover)



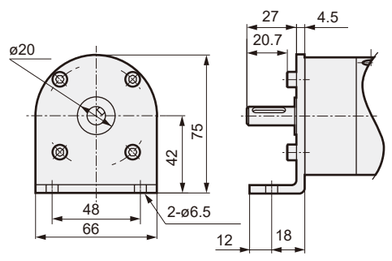
● RV3 S D A30-FA

■ With flange



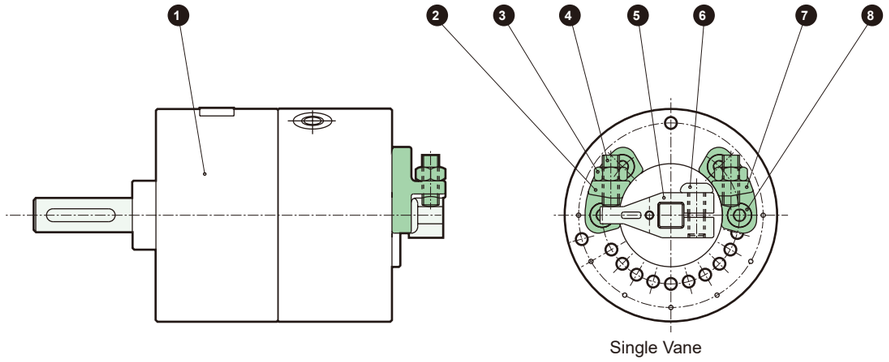
● RV3 S D A30-LS

■ With foot



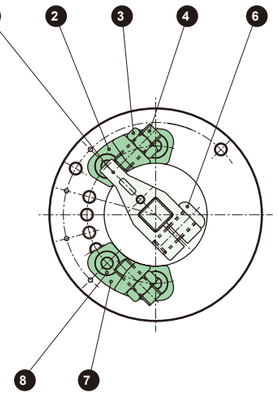
Internal Structure Diagram/Material

●RV3SA□



Single Vane

●RV3SDA□



Double Vane

Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Compact Selex Rotary Vane Type		RV3 (CKD)	5	Claw	Steel	
2	Stopper L	Steel	For Reference Point	6	Claw Mounting Bolt	Steel	
3	Lock Nut	Steel		7	Stopper R	Steel	For Angle Setting
4	Fine Adjustment Screw	Steel		8	Stopper Mounting Bolt	Steel	

MEMO

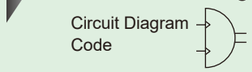
Swing/Rotary Type
RRC
GRC
RV3□
Cylinder Switch
Ending

Large Selex Rotary Vane Type, Standard Type

RV3 S D Series

- Torque Size: 50, 150, 300, 800
- Oscillation Angle: 90°/100°/180°/270°/280°

Circuit Diagram Code



RoHS

Model No. Notation

- Large rotary actuator (standard) RV3□

RV3S - 50 - 90 - 45 - M2V - R - C

1 Model No. | 2 Nominal Size | 3 Oscillation Angle | 4 Oscillation Origin | 5 Switch Model No. | 6 Number of Switches | 7 Option

1 Model No.

Code	Content
RV3S	Single Vane Type
RV3D	Double Vane Type

2 Nominal Size

Code	Content	Model No. RV3S	Model No. RV3D
50	Effective Torque at 0.5 MPa	4.7 N·m	10.1 N·m
150		14.7 N·m	34.3 N·m
300		27.9 N·m	66.6 N·m
800		102 N·m	206 N·m

3 Swing Angle (°)

Code	Content	Model No. RV3S	Model No. RV3D
90	90°	●	●
100	100°		●
180	180°	●	
270	270°	●	
*1 280	280°	●	

*1: In the case of with shock absorber, with switch cannot be manufactured.

4 Oscillation Origin (°)

Code	Content	Model No. RV3S	Model No. RV3D
40	40°	●	●
45	45°	●	●

Note: Refer to the table below for the relationship between oscillation angle and oscillation origin.

Relationship between Oscillation Angle and Oscillation Origin

Oscillation Angle	Oscillation Origin 40°	Oscillation Origin 45°
90°		●
100°	●	
180°		●
270°		●
280°	●	

5 Switch Model

For switch details, refer to P. 1359.
Switches are pre-assembled on the product before shipment.

Contact	Indicator LED Special Function	Wiring (Output)	Load Voltage (V) AC	Load Voltage (V) DC	Load Current (mA) AC	Load Current (mA) DC	Lead wire *1 L-shape
Solid State	1-Color	2-wire	—	10 to 30	-	5 to 30	M2V□
		3-wire (NPN)	—	30 or less	—	100 or less	M3V□
Reed	1-Color	2-wire	110	12/24	—	5 to 50	M0V□
	None		110	5/12/24	—	50 or less	M5V□

*1: For "□" in the switch model number, enter the code selected from the "Lead wire length" table.
*2: Switches other than the above switch model numbers are also available. (Custom Product) For details, refer to P. 1457.

* Lead Wire Length

Code	Content
Blank	1 m (Standard)
3	3 m (Option)
5	5 m (Option)

Example) Lead wire length
1 m M2V
3 m M2V 3
5 m M2V 5

6 Number of Switches

Code	Content
R	With 1 Right Rotation Detection
L	With 1 Left Rotation Detection
D	With 2 pcs

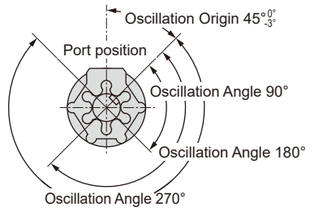
7 Option

	Code	Content	Model No. RV3S Nominal Size 50	150	300	800	RV3D 50	150	300	800	
	Blank	No option	●	●	●	●	●	●	●	●	
*1	FA	With Flange Bracket	●	●			●	●			
*1	LS	With Foot Bracket	●	●	●	●	●	●	●	●	
*2 *3	C	With Shock absorber	●	●	●	●	●	●	●	●	

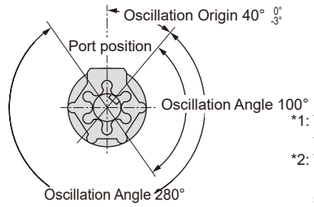
***1: Mounting bracket (FA, LS) is included with the product. For external dimensions, refer to P. 1332.**
***2: Refer to P. 1350 for details on Shock Absorbers (C).**
*3: Switches cannot be included with the 280° oscillating angle with shock absorber.

Oscillation Origin Position

● Oscillation Origin 45°
RV3□50 to 800



● Oscillation Origin 40°
RV3□50 to 800



*1: The tolerance of the oscillating starting point is based on the mounting screw position.
*2: The runout angle of the torsion angle between the keyway (or cut surface) on the long axis side and the square surface on the short axis side is within 1.5°.

● How to order flange bracket

Model No. - FA

1 Model No. | Flange Bracket

1 Model No.

Code	Applicable Model
RVS50	RV3 S D 50
RVS150	RV3 S D 150

● How to order Foot Bracket

Model No. - LS

1 Model No. | Foot Bracket

1 Model No.

Code	Applicable Model
RVS50	RV3 S D 50
RVS150	RV3 S D 150
RVS300	RV3 S D 300
RVS800	RV3 S D 800

Switch Unit Model No. Notation

Switch Unit

RVU50 - C - 90 - M2V - R

1 Model Name
2 Unit Type
3 Oscillation Angle:
4 Switch Model No.
5 Number of Switches

1 Model Name

Code	Content
RVU50	Applicable Actuator: For RV3S/D50
RVU150	Applicable Actuator: For RV3S/D150
RVU300	Applicable Actuator: For RV3S/D300
RVU800	Applicable Actuator: For RV3S/D800

2 Unit Type

Code	Content
Blank	Standard
C	For Type with Shock Absorber

*1

*1: For with shock absorber, please purchase the shock absorber body separately.

3 Oscillation Angle:

Code	Content
90	90°
100	100°
180	180°
270	270°
280	280°

*1

*1: "C" (for with shock absorber) cannot be selected.

4 Switch Model

For switch details, refer to P. 1359. Switches are pre-assembled on the product before shipment.

Contact	Indicator LED Special Function	Wiring (Output)	Load Voltage (V) AC	Load Voltage (V) DC	Load Current (mA) AC	Load Current (mA) DC	Lead wire *1 L-shape	
Reed	1-Color	2-wire	110	12/24	—	5 to 50	M0V□	
Reed	None	2-wire	110	5/12/24	—	50 or less	M5V□	
Solid State	1-Color	2-wire	—	10 to 30	-	5 to 30	M2V□	
Solid State	1-Color	3-wire (NPN)	—	30 or less	—	100 or less	M3V□	

*1: For "□" in the switch model number, enter the code selected from the "Lead wire length" table.
*2: Switches other than the above switch model numbers are also available. (Custom Product) For details, refer to P. 1457.

* Lead Wire Length

Code	Content
Blank	1 m (Standard)
3	3 m (Option)
5	5m (Option)

Example) Lead wire length
1 m M2V
3 m M2V3
5 m M2V5

5 Number of Switches

Code	Content
R	With 1 Right Rotation Detection
L	With 1 Left Rotation Detection
D	With 2 pcs

Specifications

● Single Vane Type

Item		Single Vane Type RV3S															
Size		50				150				300				800			
Effective Torque	(N·m)	4.7				14.7				27.9				102			
Actuation method		Single Vane															
Operating Fluid		Compressed Air															
Max Operating Pressure	MPa	1.0															
Min Operating Pressure	MPa	0.2 *1															
Proof Pressure	MPa	1.5															
Ambient Temperature	°C	5 to 60															
Port Size		Rc1/8				Rc1/4				Rc3/8				Rc 1/2			
Oscillating angle tolerance	°	90 +3 0	180 +3 0	270 +3 0	280 +3 0	90 +3 0	180 +3 0	270 +3 0	280 +3 0	90 +3 0	180 +3 0	270 +3 0	280 +3 0	90 +3 0	180 +3 0	270 +3 0	280 +3 0
Oscillation Origin	°	45		40		45		40		45		40		45		40	
Allowable Absorption Energy *2	mJ	49				225				1078				3820			
Max Operating Frequency *3	cycle/min	180	90	60		120	80	50		90	60	40		70	45	30	
Volumetric capacity	cm^3	51	61	62		146	179	185		244	283	352	365	754	869	1036	1046
Allowable Radial Load	N	588				1176				1960				4900			
Allowable Thrust Load	N	44.1				88.2				147				490			
Weight	kg	0.82	0.79	0.73	0.7	2.0	1.9	1.7	1.6	3.7		3.6		12.7	12.2	11.2	11.0
Switch Unit Weight kg *6	Without Shock Absorber	0.1				0.14				0.18				0.28			
	With Shock Absorber 90°	0.16				0.27				0.50				2.9			
	With Shock Absorber 100°	0.15				0.26				0.49				2.8			
	With Shock Absorber 180°	0.16				0.27				0.50				2.9			
	With Shock Absorber 270°	0.14				0.23				0.41				2.7			
	With Shock Absorber 280°	0.14				0.22				0.39				2.6			
Lubrication		Not required (When lubricating, use turbine oil Class 1 ISO VG32)															

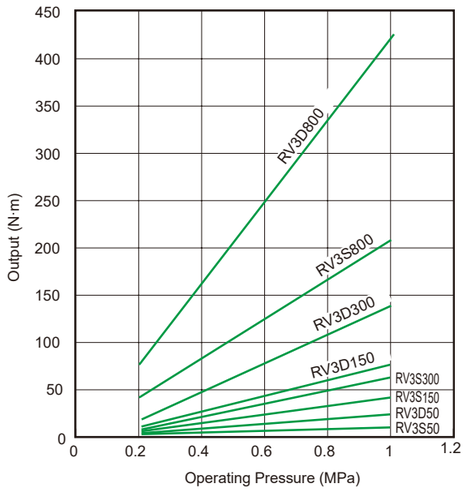
● Double Vane Type

Item		Double Vane Type RV3D							
Size		50		150		300		800	
Effective Torque	(N·m)	10.1		34.3		66.6		206	
Actuation method		Double Vane							
Operating Fluid		Compressed Air							
Max Operating Pressure	MPa	1.0							
Min Operating Pressure	MPa	0.2 *1							
Proof Pressure	MPa	1.5							
Ambient Temperature	°C	5 to 60							
Port Size		Rc1/8		Rc1/4		Rc3/8		Rc 1/2	
Oscillating angle tolerance	°	90 +3 0	100 +3 0	90 +3 0	100 +3 0	90 +3 0	100 +3 0	90 +3 0	100 +3 0
Oscillation Origin	°	45	40	45	40	45	40	45	40
Allowable Absorption Energy *2	mJ	49		225		1078		3820	
Max Operating Frequency *3	cycle/min	180		120		90		90	70
Volumetric capacity	cm^3	42	43	127	123	244	271	754	774
Allowable Radial Load	N	588		1176		1960		4900	
Allowable Thrust Load	N	44.1		88.2		147		490	
Weight	kg	0.82	0.8	2.0	1.9	4.3	4.1	12.7	12.5
Switch Unit Weight kg *6	Without Shock Absorber	0.1		0.14		0.18		0.28	
	With Shock Absorber 90°	0.16		0.27		0.50		2.9	
	With Shock Absorber 100°	0.15		0.26		0.49		2.8	
	With Shock Absorber 180°	0.16		0.27		0.50		2.9	
	With Shock Absorber 270°	0.14		0.23		0.41		2.7	
	With Shock Absorber 280°	0.14		0.22		0.39		2.6	
Lubrication		Not Required (When lubricating, use turbine oil ISO VG32)							

*1: If with optional shock absorber, Min Operating Pressure will be 0.3 MPa.
***2: Calculate the allowable energy as follows, where it is the inertial energy that the Selex Rotary shaft can tolerate. [Allowable energy] ≥ (1/2) × I × ω2 × 10^3 (Refer to P. 1366 for details on calculation.) If the above formula is not satisfied, defects such as shaft breakage may occur.**
*3: Max operating frequency is at supply pressure 0.5 MPa [no load condition].
*4: Keys are included to Selex Rotary with keyway.
*5: Please consult us separately for non-standard specifications.
*6: Switch unit weight is the weight when 2 pcs. are included.
***7: For switch specifications, refer to P. 1359.**

Output Characteristic Diagram (Effective Torque)

● RV3 S D 50, 150, 300, 800



Output Table (Effective Torque) Unit: N·m

Operating Pressure (MPa) / Model No.		0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
Single Vane	RV3S50	1.25	2.59	3.69	4.79	5.9	7	8.29	9.5	10.6
	RV3S150	5.5	8.5	11.5	15	18	21	24	27.3	30.5
	RV3S300	10.5	16.5	22.5	28.5	34.5	40.5	46	51.8	57.5
	RV3S800	37.8	59.1	81	102	123	144	166	186	205
Double Vane	RV3D50	3.3	5.79	8.29	10.4	12.8	15.1	17.6	20.1	22.5
	RV3D150	12.5	19	27	35	41.5	48	55	62	69
	RV3D300	25.5	39	54	68	83	97	110	124	137
	RV3D800	77.4	120	161	206	247	288	332	371	411

Oscillation Time Setting

1. Use the oscillating time within the range in the table below. If used outside this range, smooth operation may not be obtained due to stick-slip phenomenon, etc.

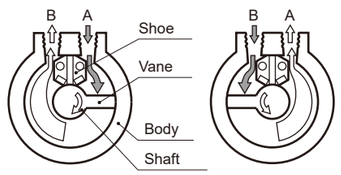
Unit: S

Model No.	Oscillation Angle				
	90°	100°	180°	270°	280°
RV3 S D 50	0.08 to 0.8	0.09 to 0.9	0.16 to 1.6	0.24 to 2.4	0.25 to 2.5
RV3 S D 150	0.12 to 1.2	0.13 to 1.3	0.24 to 2.4	0.36 to 3.6	0.37 to 3.7
RV3 S D 300	0.16 to 1.6	0.17 to 1.7	0.32 to 3.2	0.48 to 4.8	0.49 to 4.9
RV3□800	0.22 to 2.2	0.24 to 2.4	0.44 to 4.4	0.66 to 6.6	0.68 to 6.8

Operational Principle

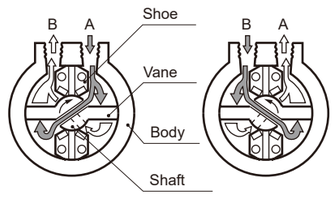
●Single Vane

1. Consists of a vane that slides on the inner surface of the body, a shaft integrated with it, and a shoe (stopper).
2. When air enters from port A, the air pushes the vane to rotate the shaft and generate torque.
3. Air in the opposite chamber is exhausted through port B, and it rotates clockwise.
4. The vane hits the shoe and stops.
5. When air is introduced from port B, it similarly rotates counterclockwise.



●Double Vane

1. Consists of two vanes that slide on the inner surface of the body, a shaft integrated with them, and two shoes (stoppers).
2. When air enters from port A, the air pushes one vane, passes through the shaft passage, pushes the other vane, rotates the shaft, and generates torque.
3. Operation is similar to single vane rotation.

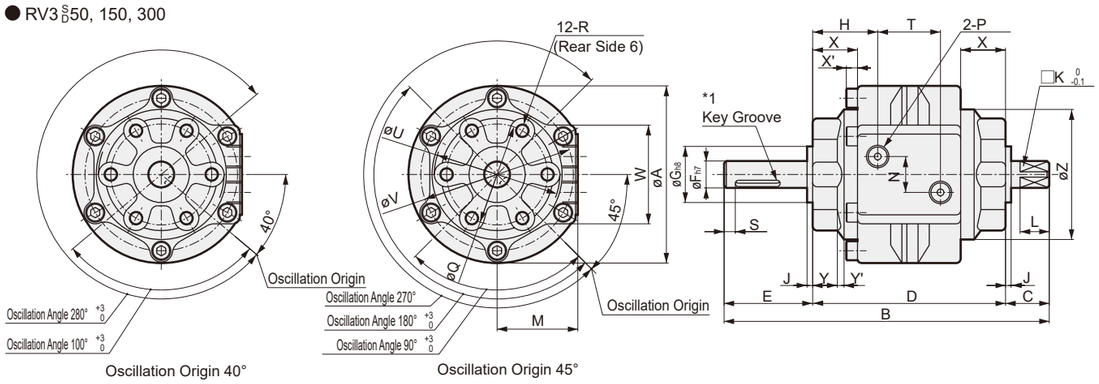


MEMO

Swing/Rotary Type
RRC
GRC
RV3□
Cylinder Switch
Ending

Dimensional Drawings

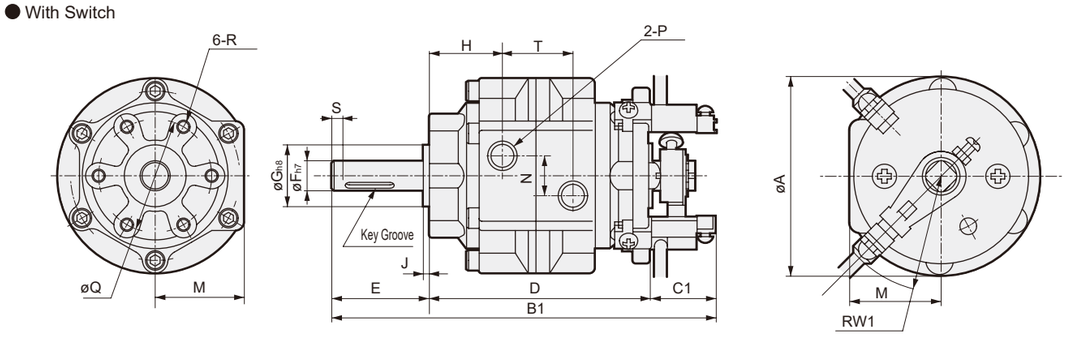
● RV3 S D 50, 150, 300



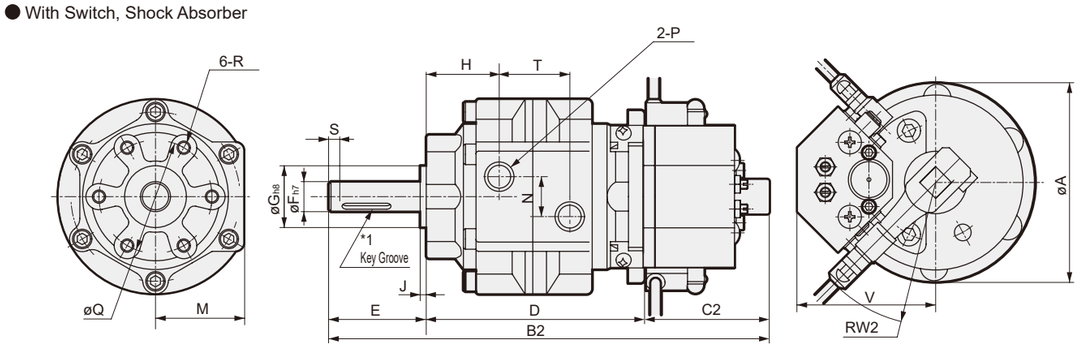
Code / Model No.	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	Key Groove WxDxL	U	W	V	Z	X	X'	Y	Y'
RV3 S D 50	79	145	19.5	86	39.5	12	25	29	2.5	10	13	36	16	Rc1/8	45	M6 Depth 9	5	28	4×2.5×20	57	44	68	58	20	5	11	3
RV3 S D 150	110	180	23.5	103	53.5	17	30	34.5	3	13	16	51	24	Rc1/4	70	M8 Depth 12	5	34	5×3×36	85	61	97	85.2	23.5	6	10.5	5
RV3 S D 300	141.5	220	30	125	65	25	45	41.5	3.5	19	22	66	32	Rc3/8	80	M10 Depth 15	5	42	7×4×40	98.5	78	125	110	27.5	8	13	4.5

***1: Key included. For key outline dimension drawing, refer to P. 1332.**

● With Switch



● With Switch, Shock Absorber

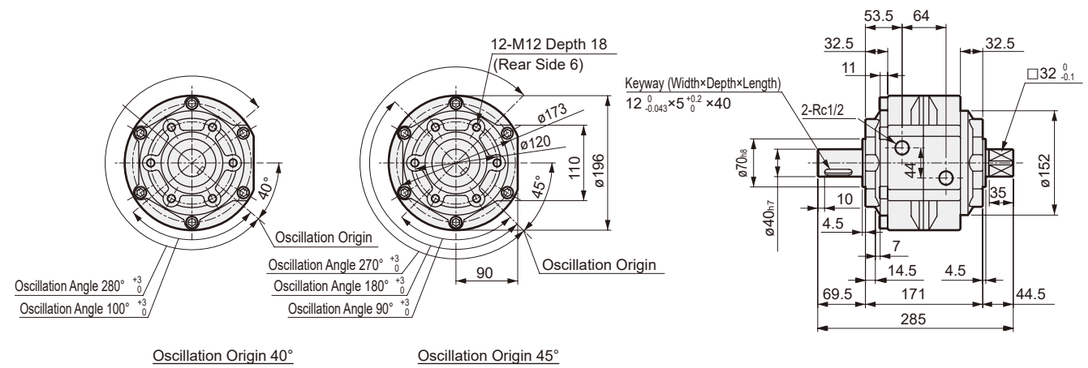


Code / Model No.	A	B1	B2	C1	C2	D	E	F	G	H	J	M	N	P	Q	R	S	T	V	W1	W2	Key Groove WxDxL
RV3 S D 50	79	157.2	177.2	30.5	50.5	87.2	39.5	12	25	29	2.5	36	16	Rc1/8	45	M6 Depth 9	5	28	54	47	58	4×2.5×20
RV3 S D 150	110	188.2	214.2	30.5	56.5	104.2	53.5	17	30	34.5	3	51	24	Rc1/4	70	M8 Depth 12	5	34	71.5	61	72	5×3×36
RV3 S D 300	141.5	221.7	253.7	30.5	62.5	126.2	65	25	45	41.5	3.5	66	32	Rc3/8	80	M10 Depth 15	5	42	95	69	88	7×4×40

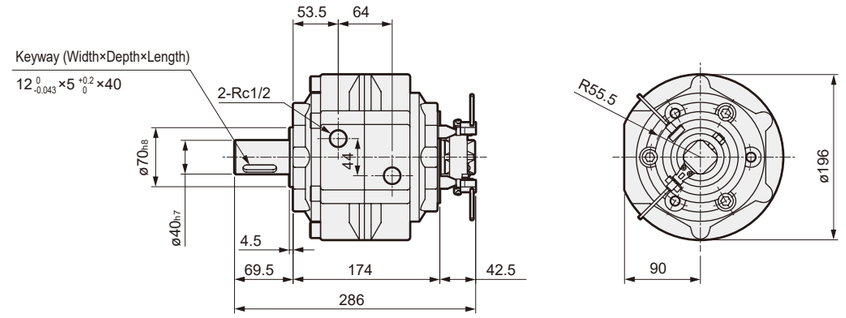
***1: Key included. For key outline dimension drawing, refer to P. 1332.**

Dimensional Drawings

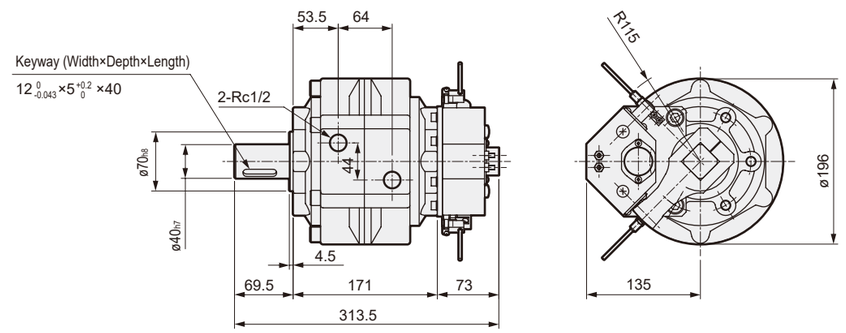
● RV3 S D 800



● With Switch

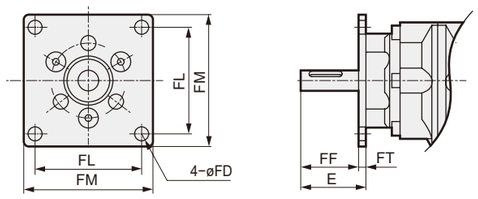


● With Switch, Shock Absorber

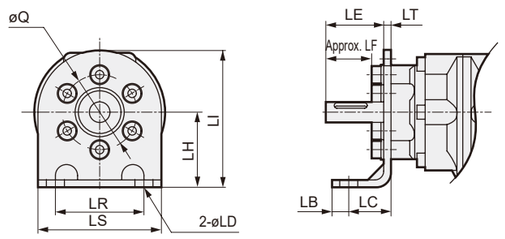


Dimensional Drawings with Option

● RVS 50 150 -FA *2



● RVS 50 150 300 800 -LS



Model No.	E	FD	FF	FL	FM	FT
RV□50	39.5	7	35	64	80	4.5
RV□150	53.5	9	47.5	88	110	6

*1: Shipped with 1 bracket and mounting bolts (required quantity).
*2: RV□300 does not have a flange bracket.

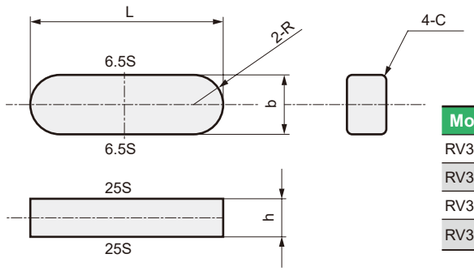
Model No.	LB	LC	LD	LE	LF	LH	LI	LR	LS	LT	Q
RV□50	10	25	11	35	27.5	45	82.5	55	75	4.5	45
RV□150	12	28	13	43.5	33.5	65	115	80	110	10	70
RV□300	13	32	15	53	40.5	80	135	100	140	12	80
RV□800	15	35	15	54.5	39.5	110	185	140	185	15	120

*1: LI dimension indicates the dimension of the Foot Bracket.
*2: The Foot Bracket can be rotated by 60° for mounting.

Accessory External Dimensions

● JIS B1301 Parallel Key b×h×L, Both Ends Rounded S45C

The following keys are included to Selex Rotary with keyway, respectively.

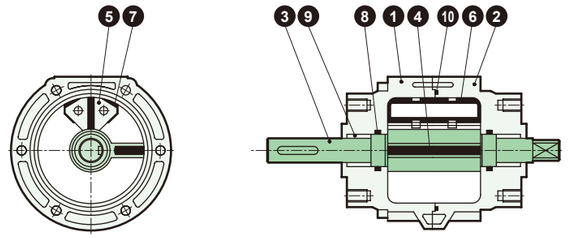


Unit: mm

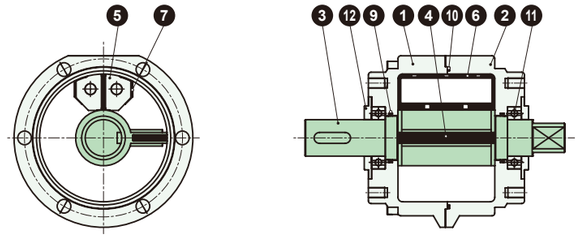
Model No.	Key Nominal Size	b	h	L	C	R
RV3□50	4×4×20	$4^{0}_{-0.03}$	$4^{0}_{-0.03}$	$20^{0}_{-0.21}$	0.16 to 0.25 (R0.16 to 0.25)	2
RV3□150	5×5×36	$5^{0}_{-0.03}$	$5^{0}_{-0.03}$	$36^{0}_{-0.25}$	0.25 to 0.40 (R0.25 to 0.40)	2.5
RV3□300	7×7×40	$7^{0}_{-0.036}$	$7^{0}_{-0.036}$	$40^{0}_{-0.25}$	0.25 to 0.40 (R0.25 to 0.40)	3.5
RV3□800	12×8×40	$12^{0}_{-0.043}$	$8^{0}_{-0.09}$	$40^{0}_{-0.25}$	0.40 to 0.60	6

Internal Structure Diagram/Material

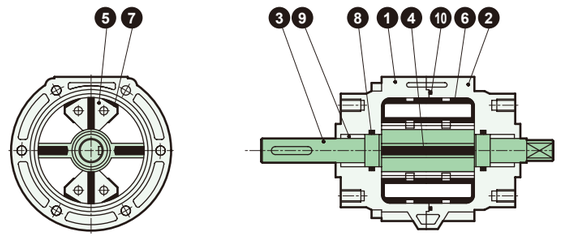
● RV3S50, 150, 300



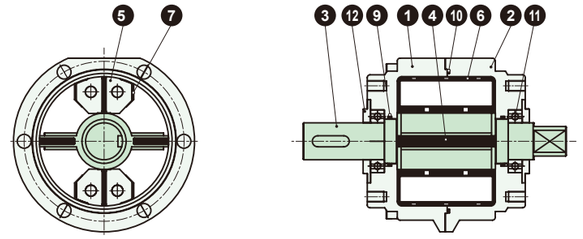
● RV3S800



● RV3D50, 150, 300



● RV3D800

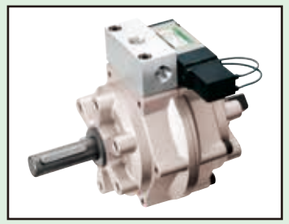


Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Body A	Aluminum Alloy		7	Damper	Urethane Rubber	
2	Body B	Aluminum Alloy		8	O-ring	Nitrile Rubber	
3	Vane Shaft	Steel		9	Bearing	Oil-Impregnated Bearing Alloy	
4	Vane Seal, Vane Shaft	Nitrile Rubber		10	O-ring	Nitrile Rubber	
5	Shoe	Zinc Alloy		11	Bearing	Steel	
6	Shoe Seal	Nitrile Rubber		12	Cover Plate	Steel	

***1: Vane seal and vane shaft are integrated.**
***2: For the consumable parts list, refer to P. 1362.**

Mounting Type Material

Mounting Style	Material	Remarks
Flange (FA)	Steel	Zinc Chromate
Foot (LS)	50, 150: Steel 300, 800: Cast Iron	Zinc Chromate

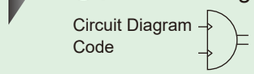


Large Selex Rotary Vane Type, With Valve

RV3 SV DW Series

- Torque Size: 50, 150, 300
- Oscillation Angle: 90°, 100°, 180°, 270°, 280°

Circuit Diagram Code



RoHS

Model No. Notation

● Large Selex Rotary (with valve) RV3□ V/W

RV3S - V - 150 - 90 - 45 - 1 - M2V - R - C

1 Model No. | 2 Valve | 3 Nominal Size | 4 Oscillation Angle | 5 Oscillation Origin | 6 Valve voltage | 7 Switch Model | 8 Number of Switches | 9 Option

1 Model No.

Code	Content
RV3S	Single Vane Type
RV3D	Double Vane Type

2 Valve

Code	Content
V	Single solenoid
W	Double Solenoid

3 Nominal Size

Code	Content	Model No. RV3S	Model No. RV3D
50	Effective Torque at 0.5 MPa	4.7 N·m	10.1 N·m
150		14.7 N·m	34.3 N·m
300		27.9 N·m	66.6 N·m

4 Swing Angle (°)

Code	Content	Model No. RV3S	Model No. RV3D
90	90°	●	●
100	100°		●
180	180°	●	
270	270°	●	
280	280° (With switch cannot be manufactured for type with shock absorber)	●	

5 Oscillation Origin (°)

Code	Contents
40	40°
45	45°

*1: Refer to the table below for the relationship between oscillating angle and oscillating starting point.

Relationship between Oscillation Angle and Oscillation Origin

Oscillation Angle	Oscillation Origin 40°	Oscillation Origin 45°
90°		●
100°	●	
180°		●
270°		●
280°	●	

6 Valve voltage

Code	Content
1	100 VAC
2	200 VAC
3	24 VDC

7 Switch Model

For switch details, refer to P. 1359. Switches are pre-assembled on the product before shipment.

Contact	Indicator LED Special Function	Wiring (Output)	Load Voltage (V) AC	Load Voltage (V) DC	Load Current (mA) AC	Load Current (mA) DC	Lead wire *1 L-shape
Reed	1-Color	2-wire	110	12/24	—	5 to 50	M0V□
	None		110	5/12/24	—	50 or less	M5V□
Solid State	1-Color	2-wire	—	10 to 30	-	5 to 30	M2V□
		3-wire (NPN)	—	30 or less	—	100 or less	M3V□

*1: Insert the code selected in the "*Lead wire length" table into "□" of the switch model number.
*2: Switches other than the above switch model numbers are also available. (Custom Product) For details, refer to P. 1457.

* Lead Wire Length

Code	Content
Blank	1 m (Standard)
3	3 m (Option)
5	5m (Option)

Example) Lead wire length
1 m M2V
3 m M2V 3
5 m M2V 5

8 Number of Switches

Code	Content
R	With 1 Right Rotation Detection
L	With 1 Left Rotation Detection
D	With 2 pcs

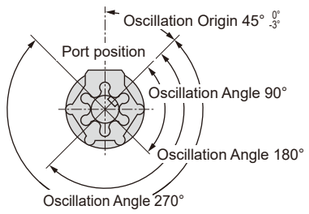
9 Option

	Code	Content	Model No. RV3S Nominal Size 50	150	300	Model No. RV3D Nominal Size 50	150	300	
	Blank	No option	●	●	●	●	●	●	
*1	FA	With Flange Bracket	●	●		●	●		
*1	LS	With Foot Bracket	●	●	●	●	●	●	
*2 *3	C	With Shock absorber	●	●	●	●	●	●	

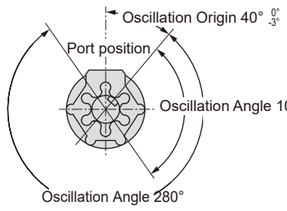
***1: Mounting bracket (FA, LS) is included with the product. For external dimensions, refer to P. 1341.**
***2: Refer to P. 1350 for details on Shock Absorbers (C).**
*3: Switches cannot be included with the 280° oscillating angle with shock absorber.

Oscillation Origin Position

● Oscillation Origin 45°
RV3□50 to 800

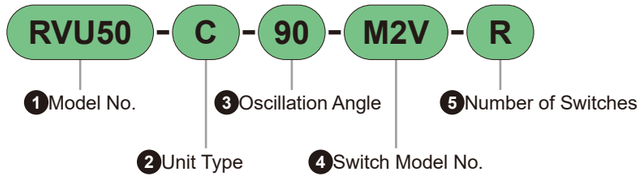


● Oscillation Origin 40°
RV3□50 to 800



*1: The tolerance of the oscillating starting point is based on the mounting screw position.
*2: The runout angle of the torsion angle between the keyway (or cut surface) on the long axis side and the square surface on the short axis side is within 1.5°.

Switch Unit Model No. Notation



1 Model No.

Code	Content
RVU50	Applicable Actuator: For RV3S/D50
RVU150	Applicable Actuator: For RV3S/D150
RVU300	Applicable Actuator: For RV3S/D300

2 Unit Type

*1

Code	Content
Blank	Standard
C	For Type with Shock Absorber

*1: For with shock absorber, please purchase the shock absorber body separately.

3 Oscillation Angle

*1

Code	Content
90	90°
100	100°
180	180°
270	270°
280	280°

*1: "C" (for with shock absorber) cannot be selected.

4 Switch Model

For switch details, refer to P. 1359.
Switches are pre-assembled on the product before shipment.

Contact	Indicator LED Special Function	Wiring (Output)	Load Voltage (V) AC	Load Voltage (V) DC	Load Current (mA) AC	Load Current (mA) DC	Lead wire *1 L-shape
Reed	1-Color	2-wire	110	12/24	—	5 to 50	M0V□
	None		110	5/12/24	—	50 or less	M5V□
Solid State	1-Color	2-wire	—	10 to 30	-	5 to 30	M2V□
		3-wire (NPN)	—	30 or less	—	100 or less	M3V□

*1: Insert the code selected in the "*Lead wire length" table into "□" of the switch model number.
*2: Switches other than the above switch model numbers are also available. (Custom Product) For details, refer to P. 1457.

* Lead Wire Length

Code	Content
Blank	1 m (Standard)
3	3 m (Option)
5	5m (Option)

Example) Lead wire length
1 m M2V
3 m M2V 3
5 m M2V 5

5 Number of Switches

Code	Content
R	With 1 Right Rotation Detection
L	With 1 Left Rotation Detection
D	With 2 pcs

Specifications

Item		Single Vane Type RV3SV/RV3SW												Double Vane Type RV3DV/RV3DW					
Size		50			150			300						50		150		300	
Effective Torque N·m		4.7			14.7			27.9						10.1		34.3		66.6	
Actuation method		Single Vane												Double Vane					
Operating Fluid		Compressed Air																	
Max Operating Pressure MPa		0.7																	
Min Operating Pressure MPa		0.2 *1																	
Proof Pressure MPa		1.05																	
Ambient Temperature °C		5 to 50																	
Connection Port (Intake)		Rc1/8			Rc1/4			Rc3/8						Rc1/8		Rc1/4		Rc3/8	
Connection Port (Exhaust)		M5			Rc1/4									M5		Rc1/4			
Oscillating angle tolerance°		90 +3 0	180 +3 0	270 +3 0	280 +3 0	90 +3 0	180 +3 0	270 +3 0	280 +3 0	90 +3 0	180 +3 0	270 +3 0	280 +3 0	90 +3 +0	100 +3 +0	90 +3 +0	100 +3 +0	90 +3 +0	100 +3 +0
Oscillation Origin °		45		40		45		40		45		40		45	40	45	40	45	40
Allowable Absorption Energy *2 mJ		49				225				1078				49		225		1078	
Max Operating Frequency *3 cycle/min		180	90	60		120	80	50		90	60	40		180		120		90	
Volumetric capacity cm³		51	61	62		146	179	185		244	283	352	365	42	43	127	123	244	271
Allowable Radial Load N		588				1176				1960				588		1176		1960	
Allowable Thrust Load N		44.1				88.2				147				44.1		88.2		147	
Mounted Solenoid Valve		4KB119 / 4KB129				4KB219 / 4KB229								4KB119 / 4KB129		4KB219 / 4KB229			
Weight kg		0.9	0.84	0.81		2.2	2.0	1.9		4.1			4.0	0.93	0.91	2.3	2.2	4.7	4.5
Switch Unit Weight kg *6	Without Shock Absorber	0.1				0.14				0.18				0.1		0.14		0.18	
	With Shock Absorber 90°	0.16				0.27				0.58				0.16		0.27		0.50	
	With Shock Absorber 100°	0.15				0.26				0.49				0.15		0.26		0.49	
	With Shock Absorber 180°	0.16				0.27				0.50				0.16		0.27		0.50	
	With Shock Absorber 270°	0.14				0.23				0.41				0.14		0.23		0.41	
	With Shock Absorber 280°	0.14				0.22				0.39				0.14		0.22		0.39	
Lubrication		Not required (When lubricating, use turbine oil Class 1 ISO VG32)												Not Required (When lubricating, use turbine oil ISO VG32)					

*1: If with optional shock absorber, Min Operating Pressure will be 0.3 MPa.
***2: Calculate the allowable energy as follows, where it is the inertial energy that the Selex Rotary shaft can tolerate. [Allowable energy] ≥ (1/2) × I × ω^2 × 10^3 (Refer to P. 1366 for details on calculation.) If the left formula is not satisfied, defects such as shaft breakage may occur.**
*3: Max operating frequency is at supply pressure 0.5 MPa [no load condition].
*4: Keys are included to Selex Rotary with keyway.
*5: Please consult us separately for non-standard specifications.
*6: Switch unit weight is the weight when 2 pcs. are included.
***7: For switch specifications, refer to P. 1359.**

Valve specifications

Item		Specifications (4KB2 Series) *2		
Rated Voltage *1	V	100 VAC (50/60Hz)	200 VAC (50/60Hz)	24 VDC
Starting Current	A	0.056 / 0.044	0.028 / 0.022	0.075
Holding Current	A	0.028 / 0.022	0.014/0.011	
Power consumption	W	1.8 / 1.4		1.8
Voltage fluctuation range		±10%		
Heat Resistance Class		Class B molded coil		

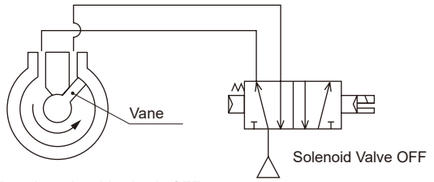
*1: 100 VAC / 200 VAC can be used at 110 VAC, 220 VAC (60 Hz).

***2: Refer to P. 1307 for 4KB1 Series specifications.**

***3: For details on the valve, refer to "Directional Control Valve ②" No. RJ-012AA.**

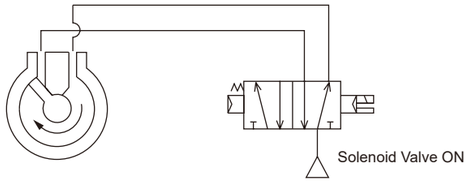
Operational Principle

(1) Single Solenoid



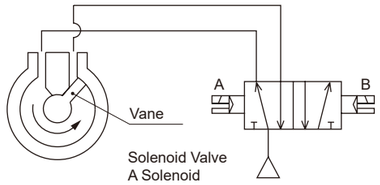
Solenoid Valve OFF

When the solenoid valve is OFF, the vane returns to the oscillation origin position.



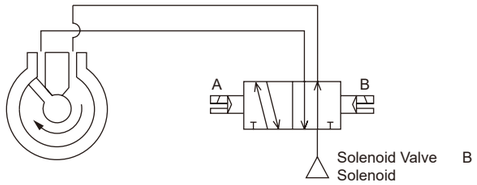
Solenoid Valve ON

(2) Double Solenoid



Solenoid Valve
A Solenoid

When solenoid A of the solenoid valve is ON, the vane returns to the oscillation origin position.



Solenoid Valve
Solenoid B

When solenoid B of the solenoid valve is ON, the vane operates in the oscillation direction.

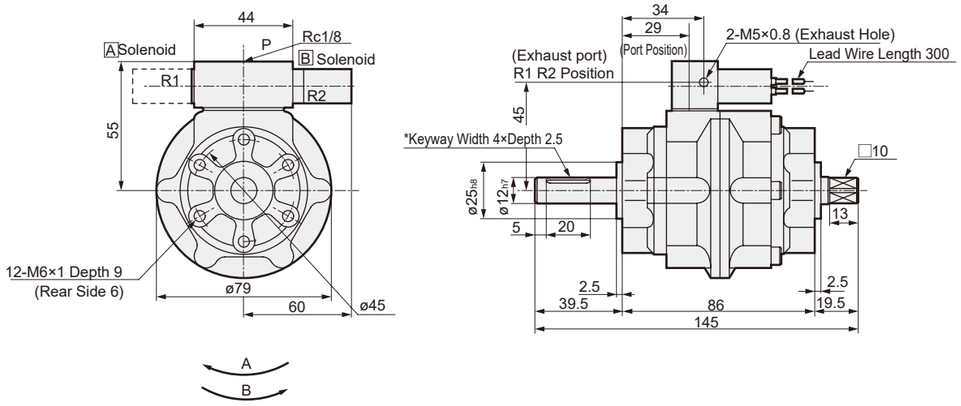
For double solenoid type solenoid valves, if both A and B solenoids are OFF, a self-holding state is maintained, but please use in an energized state while the vane is moving.

MEMO

Swing/Rotary Type
RRC
GRC
RV3□
Cylinder Switch
Ending

Dimensional Drawings

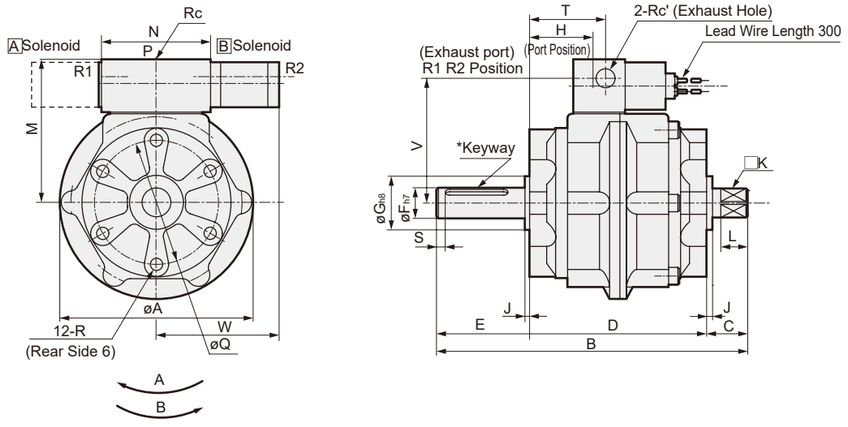
● RV3$^{SV}_{DW}$ 50



Single solenoid	Double Solenoid
ON → A Direction	B Solenoid ON → A Direction
OFF → B Direction	A Solenoid ON → B Direction

***1: Key included. For key outline dimension drawing, refer to P. 1332.**

● RV3$^{SV}_{DW}$150/300



Single solenoid	Double Solenoid
ON → A Direction	B Solenoid ON → A Direction
OFF → B Direction	A Solenoid ON → B Direction

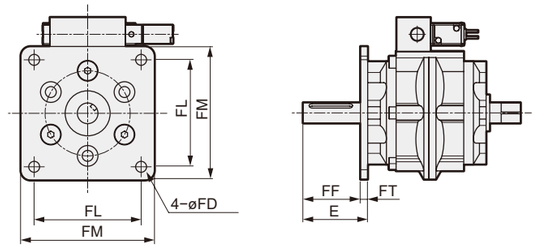
***1: Key included. For key outline dimension drawing, refer to P. 1332.**

Code / Model No.	A	B	C	D	E	F	G	H	J	K	L	M	N	Rc	Rc'	Q	R	S	T	V	W	Key Groove WxDxL
RV3□V150	110	180	23.5	103	53.5	17	30	36	3	13	16	79	62	1/4	1/4	70	M8 Depth 12	5	41	65	70	5×3×36
RV3□V300	141.5	220	30	125	65	25	45	47.5	3.5	19	22	95	72	3/8	1/4	80	M10 Depth 15	5	50.5	80	70	7×4×40

Dimensional Drawings

● RVS$^{50}_{150}$ -FA *2

■ With flange



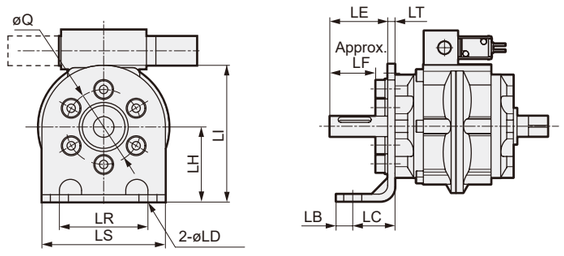
*1: The Foot Bracket can be rotated by 60° for mounting.

Model No.	E	FD	FF	FL	FM	FT
RV□50	39.5	7	35	64	80	4.5
RV□150	53.5	9	47.5	88	110	6

*1: Shipped with 1 bracket and mounting bolts (required quantity).
*2: RV□300 does not have a flange bracket.

● RVS$^{50}_{150}_{300}_{800}$-LS

■ With foot



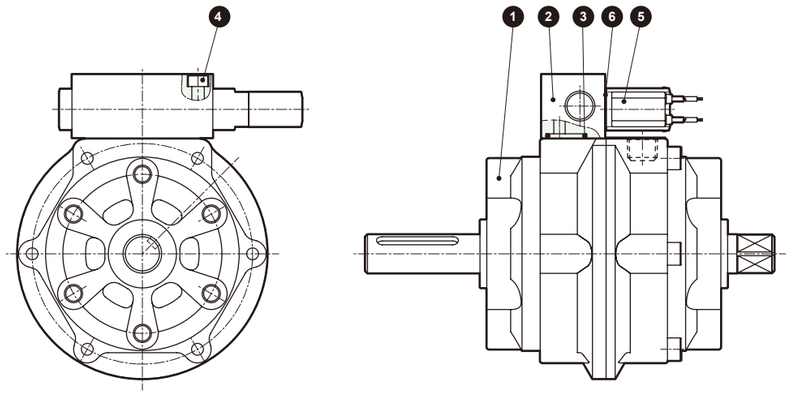
*1: The Foot Bracket can be rotated by 60° for mounting.

Model No.	LB	LC	LD	LE	LF	LH	LI	LR	LS	LT	Q
RV□50	10	25	11	35	27.5	45	82.5	55	75	4.5	45
RV□150	12	28	13	43.5	33.5	65	115	80	110	10	70
RV□300	13	32	15	53	40.5	80	135	100	140	12	80

Note: LI dimension shows the dimension of the Foot Bracket.

Internal Structure Diagram/Material

● RV3SV/RV3SW/RV3DV/RV3DW Large



Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Large Selex Rotary Vane Type		RV3 (CKD)	4	Hexagon Socket bolt	Alloy Steel	Zinc Chromate
2	Sub-base	Aluminum Alloy		5	Selex Valve		4KB (CKD)
3	O-ring	Nitrile Rubber		6	Gasket	Nitrile Rubber	

MEMO

Swing/Rotary Type
RRC
GRC
RV3□
Cylinder Switch
Ending

Large Selex Rotary Low Oil Pressure Type

RV3 S/D H Series

- Torque Size: 50, 150, 300, 800
- Oscillation Angle: 90°, 100°, 180°, 270°, 280°

Circuit Diagram Code

RoHS

Model No. Notation

- Large Selex Rotary (Low Oil Pressure Type) RV3□H

RV3SH - 50 - 90 - 45 - M2V - R - C

1 Model No. | 2 Nominal Size | 3 Oscillation Angle | 4 Oscillation Origin | 5 Switch Model No. | 6 Number of Switches | 7 Option

1 Model No.

Code	Content
RV3SH	Single Vane Type, Low Oil Pressure Type
RV3DH	Double Vane Type, Low Oil Pressure Type

2 Nominal Size

Code	Content	Model No. RV3SH	Model No. RV3DH
50	Effective Torque at 0.5 MPa	4.7 N·m	10.1 N·m
150		14.7 N·m	34.3 N·m
300		27.9 N·m	66.6 N·m
800		102 N·m	206 N·m

3 Oscillation Angle

Code	Content	Model No. RV3SH	Model No. RV3DH
90	90°	●	●
100	100°		●
180	180°	●	
270	270°	●	
280	280° (With switch cannot be manufactured for type with shock absorber)	●	

4 Oscillation Origin

Code	Contents
40	40°
45	45°

Note: Refer to the table below for the relationship between oscillation angle and oscillation origin.

Relationship between Oscillation Angle and Oscillation Origin

Oscillation Angle	Oscillation Origin 40°	Oscillation Origin 45°
90°		●
100°	●	
180°		●
270°		●
280°	●	

5 Switch Model

For switch details, refer to P. 1359. Switches are pre-assembled on the product before shipment.

Contact	Indicator LED Special Function	Wiring (Output)	Load Voltage (V) AC	Load Voltage (V) DC	Load Current (mA) AC	Load Current (mA) DC	Lead wire *1 L-shape	
Reed	1-Color	2-wire	110	12/24	—	5 to 50	M0V□	
	None		110	5/12/24	—	50 or less	M5V□	
Solid State	1-Color	2-wire	—	10 to 30	-	5 to 30	M2V□	
		3-wire (NPN)	—	30 or less	—	100 or less	M3V□	

*1: Insert the code selected in the "*Lead wire length" table into "□" of the switch model number.
*2: Switches other than the above switch model numbers are also available. (Custom Product) For details, refer to P. 1457.

* Lead Wire Length

Code	Content
Blank	1 m (Standard)
3	3 m (Option)
5	5m (Option)

Example) Lead wire length
1 m M2V
3 m M2V 3
5 m M2V 5

6 Number of Switches

Code	Content
R	With 1 Right Rotation Detection
L	With 1 Left Rotation Detection
D	With 2 pcs

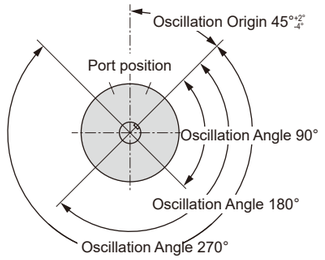
7 Option

	Code	Content	Model No. RV3SH Nominal Size 50	150	300	800	RV3DH 50	150	300	800	
	Blank	No option	●	●	●	●	●	●	●	●	
*1	FA	With Flange Bracket	●	●			●	●			
*1	LS	With Foot Bracket	●	●	●	●	●	●	●	●	
*2 *3	C	With Shock absorber	●	●	●	●	●	●	●	●	

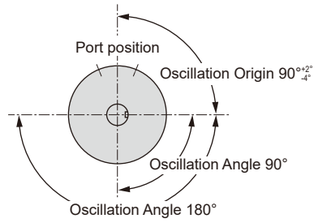
***1: Mounting bracket (FA, LS) is included with the product. For external dimensions, refer to P. 1332.**
***2: Refer to P. 1350 for details on Shock Absorbers (C).**
*3: Switches cannot be included with the 280° oscillating angle with shock absorber.

Oscillation Origin Position

● Oscillation Origin 45°
RV3 S/D 1 to 30

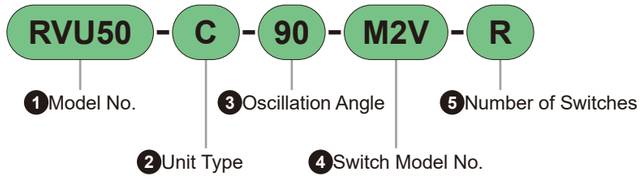


● Oscillation Origin 90°
RV3S1 to 20



*1: The tolerance of the oscillation origin is based on the mounting screw position.
*2: The runout angle of the torsion angle between the keyway (or cut surface) on the long axis side and the square surface on the short axis side is within 1.5°.

Switch Unit Model No. Notation



1 Model No.

Code	Content
RVU50	Applicable Actuator: For RV3S/D50
RVU150	Applicable Actuator: For RV3S/D150
RVU300	Applicable Actuator: For RV3S/D300
RVU800	Applicable Actuator: For RV3S/D800

2 Unit Type

Code	Content
Blank	Standard
C	For Type with Shock Absorber

*1

*1: For with shock absorber, please purchase the shock absorber body separately.

3 Oscillation Angle

Code	Content
90	90°
100	100°
180	180°
270	270°
280	280°

*1

*1: "C" (for with shock absorber) cannot be selected.

4 Switch Model

For switch details, refer to P. 1359. Switches are pre-assembled on the product before shipment.

Contact	Indicator LED Special Function	Wiring (Output)	Load Voltage (V) AC	Load Voltage (V) DC	Load Current (mA) AC	Load Current (mA) DC	Lead wire *1 L-shape
Reed	1-Color	2-wire	110	12/24	—	5 to 50	M0V□
	None		110	5/12/24	—	50 or less	M5V□
Solid State	1-Color	2-wire	—	10 to 30	-	5 to 30	M2V□
		3-wire (NPN)	—	30 or less	—	100 or less	M3V□

*1: Insert the code selected in the "*Lead wire length" table into "□" of the switch model number.
*2: Switches other than the above switch model numbers are also available. (Custom Product) For details, refer to P. 1457.

* Lead Wire Length

Code	Content
Blank	1 m (Standard)
3	3 m (Option)
5	5m (Option)

Example) Lead wire length
1 m M2V
3 m M2V 3
5 m M2V 5

5 Number of Switches

Code	Content
R	With 1 Right Rotation Detection
L	With 1 Left Rotation Detection
D	With 2 pcs

Specifications

Item	RV3SH/RV3DH			
Size	50	150	300	800
Operating Fluid	Hydraulic Operating Fluid			
Max Operating Pressure MPa	1.0			
Min Operating Pressure MPa	0.2 *1			
Proof Pressure MPa	1.5			
Ambient Temperature °C	5 to 60			

*1: If with optional shock absorber, Min Operating Pressure will be 0.3 MPa.
*2: Use hydraulic fluid of JIS turbine oil class 1 ISO VG32 or equivalent viscosity for lubricant. However, note that some are inapplicable with flame-resistant hydraulic oil. Hydraulic fluid of viscosity 40 mm^2/s (40 cSt) is recommended at working oil temperature. For oil, use Fuji Kosan FUCHS Hydrol ×22 or equivalent oils such as Mitsubishi Diamond Powerful Fluid 18, Showa Shell Tellus Oil 22, Esso Univis J26, Mobil Mobil DTE22, Cosmo Hydro HV22, Nisseki Mitsubishi Highland Wide 22, Idemitsu Daphne Super Hydro 22WR.
***3: For information about weight, refer to P. 1327 on the weight of the standard large rotary actuator with a vane mechanism.**
***4: Refer to P. 1359 for switch specifications.**

Min Oscillation Time

Unit: S

Item		RV3□H50	RV3□H150	RV3□H300	RV3□H800	Number of Vanes
Oscillation Angle	90°	0.3	0.4	0.4	0.7	Single Vane
	180°	0.5	0.7	0.7	1.3	
	270°	0.7	0.9	1.0	1.8	
	280°	0.7	1.0	1.0	1.8	
	90°	0.6	1.3	1.9	2.4	Double Vane
	100°	0.7	1.4	2.1	2.6	

Structure

●Basic structure is exactly the same as for pneumatic use.

Item		RV3□H50	RV3□H150	RV3□H300	RV3□H800
Port Size		Rc1/8	Rc1/4	Rc3/8	Rc1/2
Orifice diameter	Low Oil Pressure Specification	ø7	ø9.5	ø13	ø16
	For Pneumatic Use	ø2.8	ø4	ø4.5	ø6

Note: In the case of double vane, the orifice diameter of the shaft cannot be changed, so it is the same as for pneumatic use.

●Internal Volume

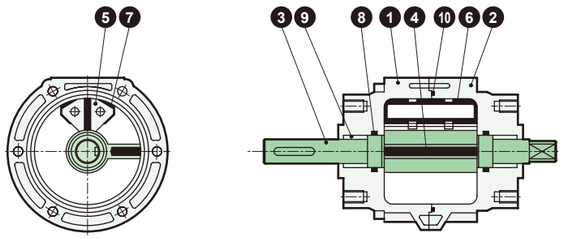
Model No.	Selex Rotary Volumetric capacity (Cm3) 90°	100°	180°	270°	280°	Port Size
RV3SH50	51	-	51	61	62	Rc1/8
RV3DH50	42	43	-	-	-	
RV3SH150	146	-	146	179	185	Rc1/4
RV3DH150	127	123	-	-	-	
RV3SH300	244	-	283	352	365	Rc3/8
RV3DH300	244	271	-	-	-	
RV3SH800	754	—	869	1036	1046	Rc1/2
RV3DH800	754	754	—	-	—	

Dimensional Drawings

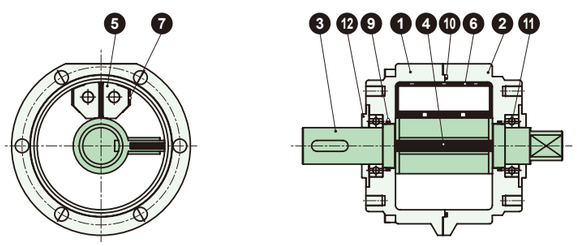
Same as Large Selex Rotary Vane Type, Standard Type RV3SDH Series. Please refer to P. 1330.

Internal Structure Diagram/Material

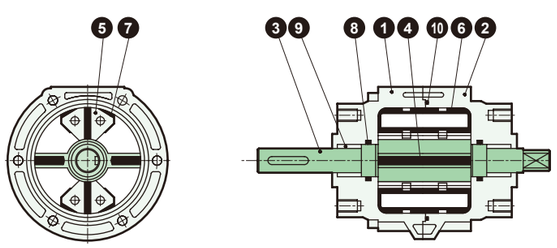
●RV3SH50, 150, 300



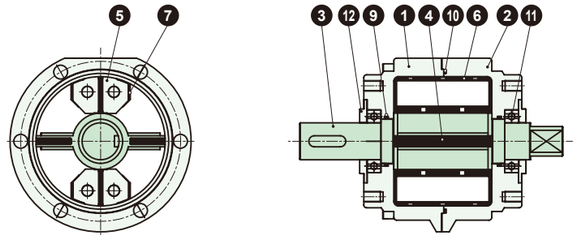
● RV3SH800



●RV3DH50, 150, 300



● RV3DH800



Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Body A	Aluminum Alloy		7	Damper	Urethane Rubber	
2	Body B	Aluminum Alloy		8	O-ring	Nitrile Rubber	
3	Vane Shaft	Steel		9	Bearing	Oil-Impregnated Bearing Alloy	
4	Vane Seal, Vane Shaft	Nitrile Rubber		10	O-ring	Nitrile Rubber	
5	Shoe	Zinc Alloy		11	Bearing	Steel	
6	Shoe Seal	Nitrile Rubber		12	Cover Plate	Steel	

***1: Vane seal and vane shaft are integrated.**
***2: For the consumable parts list, refer to P. 1362.**

Mounting Type Material

Mounting Style	Material	Remarks
Flange (FA)	Steel	Zinc Chromate
Foot (LS)	50, 150: Steel 300, 800: Cast Iron	Zinc Chromate

MEMO

Swing/Rotary Type
RRC
GRC
RV3□
Cylinder Switch
Ending

Shock Absorber

RVC Series

- Torque Size: 50, 150, 300, 800
- Absorption Energy: 2.9, 9.8, 19.6, 58.8J

RoHS

Model No. Notation

●Body

RVC50

1 Model No.

●Pawl for shock absorber

RVC50 - 90 - T

1 Model No. 2 Oscillation Angle 3 Parts (Lever)

1 Model No.

	Code	Applicable Selex Rotary
	RVC50	RV3□50
	RVC150	RV3□150
	RVC300	RV3□300
*1	RVC800	RV3□800 (Without Switch)

*1: The shock absorber for RV3*800 (with switch) is the following model number.
For oscillation origin 40°: RVU800-A1-C-40
For oscillation origin 45°: RVU800-A1-C-45

1 Model No.

Code	Applicable Selex Rotary
RVC50	RV3□50
RVC150	RV3□150
RVC300	RV3□300
RVC800	RV3□800

2 Oscillation Angle

Code	Content
90	90°
100	100°
180	180°
270	270°
280	280°

3 Parts (Lever)

Code	Content
T	Shock Absorber Lever

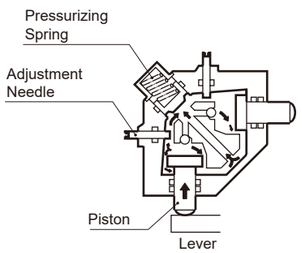
Specifications

Item		RVC			
Size		50	150	300	800
Load Range	kg/m2	0.098	0.294	0.588	1.961
Allowable Absorbed Energy	J	2.9	9.8	19.6	58.8
Max Impact Angular Velocity	rad/s	14.8	13.0	11.3	9.6
Max Energy Capacity per Minute *1	J/min	20	72	140	350
Ambient Temperature	°C	5 to 50			
Absorption Angle (One Side)	rad	0.19	0.20	0.24	0.26
Weight	kg	0.24	0.42	0.78	1.62
Lever Weight kg	90°	0.07	0.15	0.36	1.0
	100°	0.07	0.14	0.35	1.0
	180°	0.07	0.15	0.37	1.0
	270°	0.05	0.11	0.28	0.8
	280°	0.05	0.10	0.25 (36 psi)	0.7

*1: Energy capacity per minute = Absorption energy×n times/min n: Number of times lever hits cushion piston
*2: When using with shock absorber, ensure Selex Rotary Operating Pressure is 0.3 MPa or more.

Operational Principle

When the lever included with the Selex Rotary shaft collides with the piston, it is converted into pressure (hydraulic pressure) on the back of the piston. This pressure energy becomes thermal energy when passing through the clearance between the piston and cylinder bore and the adjustment needle part, is radiated from the main body surface to the atmosphere, and is consumed before the piston stops at the stroke end. The piston on the opposite side is pressurized by the spring force and always returns to the origin.



About Impact Energy

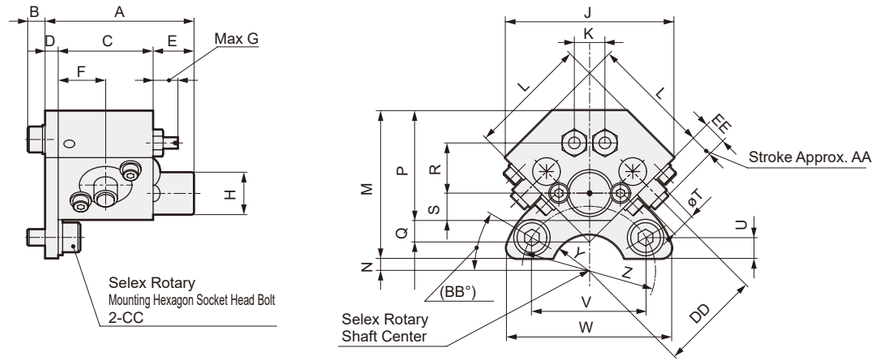
1. Determine the moment of inertia from the load size and check if it is within the load range.
2. Check if the impact angular velocity is within the range.
   $\omega_0 \approx 1.2\omega$
   ω_0: Impact Angular Velocity (rad/s)
   ω: Average angular speed (rad/s)
3. Determine the impact energy from the load and impact angular velocity.
   $E_1=1/2I\omega_0^2$
   I: Moment of Inertia (kg·m²)
   ω_0: Impact Angular Velocity (rad/s)
4. Determine the energy due to the torque of the Selex Rotary.
   $E_2=1/2T\theta'$
   T : Selex Rotary Torque (N·m)
   θ: Shock Absorber Absorption Angle (One Side))(rad)
5. Confirm that E_1+E_2 is less than or equal to the Max absorption energy.
6. Determine the energy per minute from the frequency.
   $E_m = (E_1+E_2)\times n$
   n: Cushion Piston No. of times jaws contact.

Confirm that Em is less than or equal to the Max energy capacity per minute.

Outline Dimension Drawing (RVC50, 150, 300)

(Unit: mm)

● RVC50, 150, 300

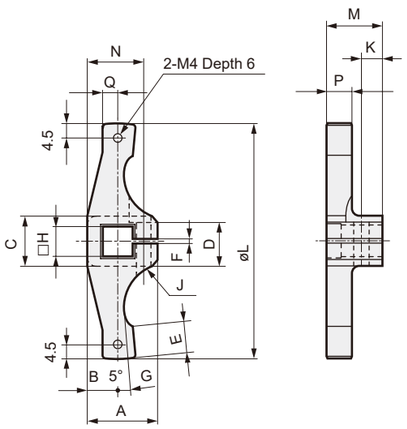


Code / Model No.	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	Y	Z	AA	BB	CC	DD	EE
RVC50	50.5	6	32	4.5	14	16	8.5	14.4	56.6	9.9	40	50	4	37	7.1	17	9.2	8	7.2	39	56	12.5	ø45	6.5	30	M6×12ℓ	34	8
RVC150	56.5	7.2	36	4.5	16	18	8.5	18.4	70.7	11.3	50	62	9.5	49	8.4	25.5	11.4	10	8	60.6	80	15	ø70	10	30	M8×16ℓ	46	12
RVC300	62.5	7.2	42	4.5	16	21	12	22.5	91.9	12.7	65	87	8	61	14.2	33.2	14.1	12	12	69.2	95	22.5	ø80	15	30	M10×20ℓ	62	18

Note: Large Selex Rotary Vane Type Refer to P. 1330, 1331 for dimensions when equipped with RV3$^{S}_{D}$.

Shock Absorber Lever Outline Dimension Drawing

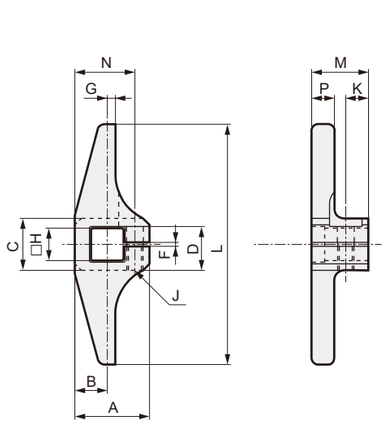
●For 90° Oscillation Angle (Oscillation Origin 45°)



Material: S50C equivalent

Code / Model No.	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q
RVC50-90-T	23	10	16	13.7	10	1.2	2.5	10	M5	7	76	18	18.5	8	5
RVC150-90-T	28	12	24	19.5	12	1.2	3.9	13	M6	7.5	102	20	23	10	5
RVC300-90-T	40	18	35	30.5	14	1.2	5.4	19	M8	9	136	23.5	33.5	12	9

●For 100° Oscillation Angle (Oscillation Origin 40°)

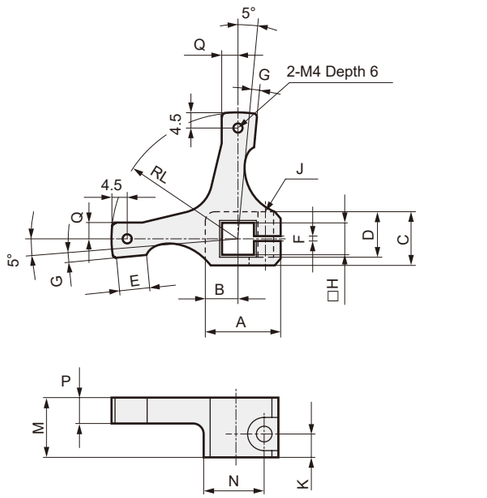


Material: S50C equivalent

Code / Model No.	A	B	C	D	F	G	H	J	K	L	M	N	P
RVC50-100-T	23	10	16	13.5	1.2	2.5	10	M5	7	74	17.5	18.5	7
RVC150-100-T	28	12	24	19.5	1.2	4	13	M6	9	102	20	23	10
RVC300-100-T	40	18	35	30.5	1.2	5.5	19	M8	11	136	23.5	33.5	12

Shock Absorber Lever Outline Dimension Drawing (RVC50, 150, 300)

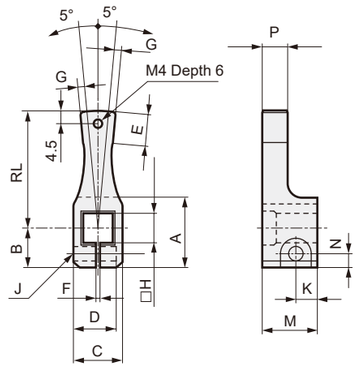
● For 180° Oscillation Angle (Oscillation Origin 45°)



Material: Steel

Code / Model No.	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q
RVC50-180-T	23	10	16	13.7	10	1.2	2.5	10	M5	7	38	18	18.5	8	5
RVC150-180-T	28	12	24	19.5	12	1.2	3.9	13	M6	9	51	20	23	10	5
RVC300-180-T	40	18	35	30.5	14	1.2	5.4	19	M8	11	68	23.5	33.5	12	9

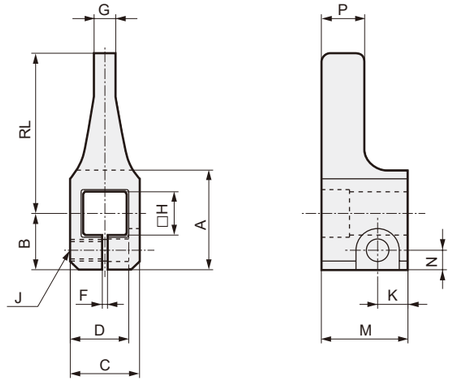
● For 270° Oscillation Angle (Oscillation Origin 45°)



Material: Steel

Code / Model No.	A	B	C	D	E	F	G	H	J	K	L	M	N	P
RVC50-270-T	23	13	16	13.7	10	1.2	2.6	10	M5	7	38	18	4.5	8
RVC150-270-T	28	16	24	19.5	12	1.2	4	13	M6	9	51	20	5	10
RVC300-270-T	40	22	35	30.5	14	1.2	5.5	19	M8	11	68	23.5	6.5	12

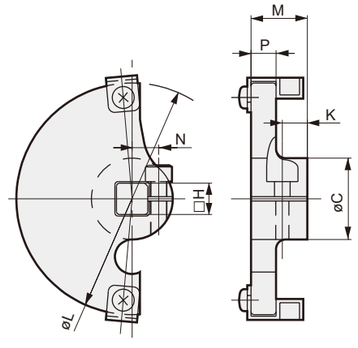
● For 280° Oscillation Angle (Oscillation Origin 40°)



Material: Steel

Code / Model No.	A	B	C	D	F	G	H	J	K	L	M	N	P
RVC50-280-T	23	13	16	13.5	1.2	5	10	M5	7	37	20	4.5	10
RVC150-280-T	28	16	24	19.5	1.2	8	13	M6	9	51	20	5	10
RVC300-280-T	40	22	35	30.5	1.2	11	19	M8	11	68	24	6.5	12.5

● For 100° Oscillation Angle (With Magnet)



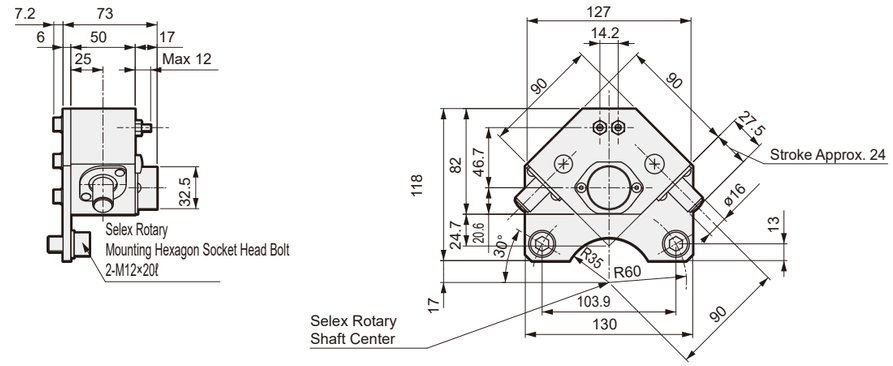
Material: Steel

Code / Model No.	C	H	K	L	M	N	P
RVU50-100-A1-C	26	10	8	74	18	8.5	8
RVU150-100-A1-C	32	13	9	102	20	11	10
RVU300-100-A1-C	48	19	11	136	23.5	15	12

Note: Refer to P. 1363, 1364 for model No. of small parts with switch, valve, or Shock Absorbers , etc.

Outline Dimension Drawing (RVC800)

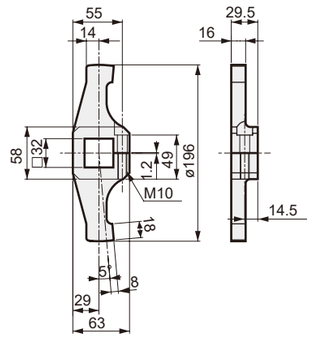
● RVC800



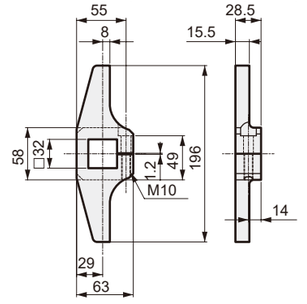
Note: Large Selex Rotary Vane Type ☞Refer to P. 1330, 1331 for dimensions when equipped with RV3.

Shock Absorber Lever Outline Dimension Drawing (RVC800)

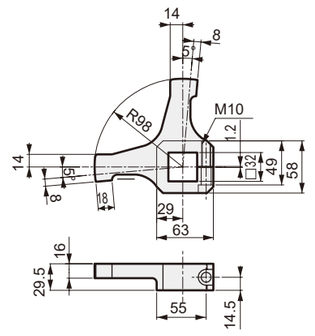
● For 90° Oscillation Angle (Oscillation Origin 45°)



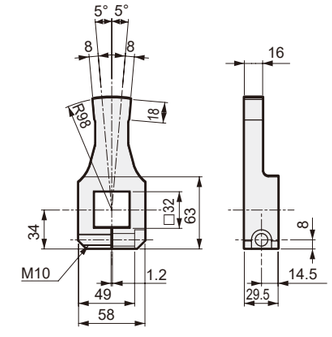
● For 100° Oscillation Angle (Oscillation Origin 40°)



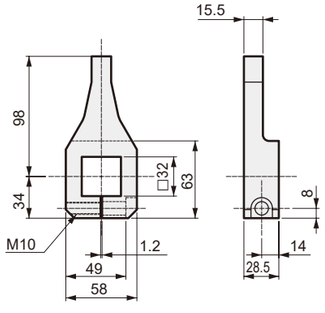
● For 180° Oscillation Angle (Oscillation Origin 45°)



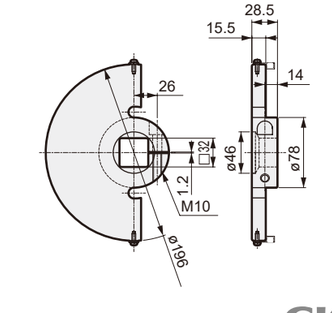
● For 270° Oscillation Angle (Oscillation Origin 45°)



● For 280° Oscillation Angle (Oscillation Origin 40°)



● Oscillating angle 100° (with magnet)



Model No. Notation

●Switch Unit

RV3S - SR-3 - 90 - 45 - U

- RV3S: Model No.
- SR-3: ❶Model
- 90: ❷Oscillation Angle
- 45: ❸Oscillation Origin
- U: ❹Lead Wire Extraction Direction

❶Model

Code	Content
SR-3	Applicable Actuator: RV3$^{S}_{D}$3
SR-10	Applicable Actuator: RV3$^{S}_{D}$10
SR-20	Applicable Actuator: RV3$^{S}_{D}$20
SR-30	Applicable Actuator: RV3$^{S}_{D}$30

❷Oscillation Angle

Code	Content
90	90°
180	180°
270	270°

❸ Oscillation Origin

Code	Content
45	45°
90	90°

*1

*1: For oscillation origin "90", SR-30 cannot be selected.

❹Lead Wire Extraction Direction

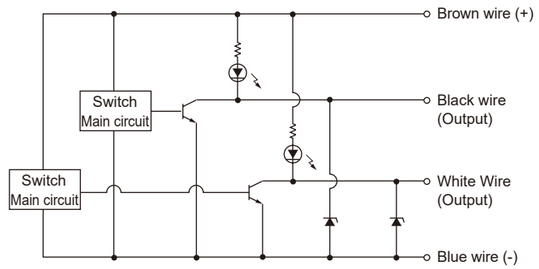
Code	Content
Blank	With Lead Wire Axial Direction Switch
U	With Lead Wire Perpendicular to Axis Direction Switch

Switch Unit Compact Type Standard/with valve Specifications

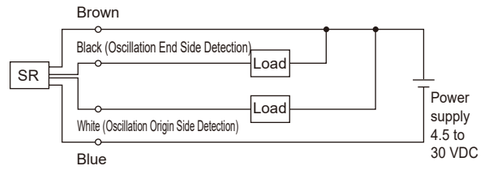
Item	Solid state switch
	SR-□(-U)
Applications	For Programmable Controller, Relay, IC Circuit, Compact Solenoid Valve
Power supply voltage	5 to 30 VDC
Load Voltage/Current	5 to 30 VDC, 200 mA or less
Current consumption	20 mA or less at 24 VDC
Internal voltage drop	1.5 V or less
Indicator LED	LED (Lights up when ON)
Leakage current	10 μA or less
Lead Wire Length	1 m (oil resistant vinyl cabtyre cable 4-conductor 0.2 mm^2)
Shock Resistance	490 m/s^2
Insulation resistance	100 MΩ or more at 500 V Megger
Withstand Voltage	No abnormality when 1000 VAC is applied for 1 minute
Ambient Temperature	5 to 60°C
Enclosure	IEC Standard IP67, IEC 60529 2001 (Submersible Type)

* mark indicates the size of the Selex Rotary. (3, 10, 20)

Switch internal circuit diagram

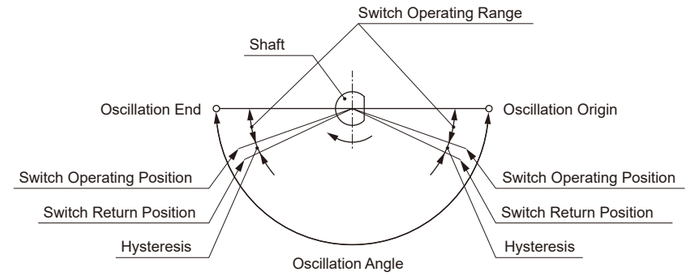


Switch Wiring Procedure



Note: Use the same power supply for the switch and the load.

Switch Hysteresis and Operating Range



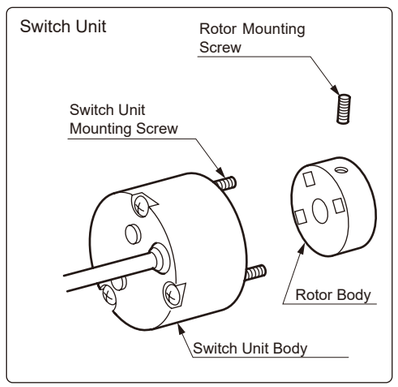
Selex Rotary Body	Operating Range	Hysteresis
RV3$^{S}_{D}$-3	15°±7°	3° or less
RV3$^{S}_{D}$-10		
RV3$^{S}_{D}$-20		

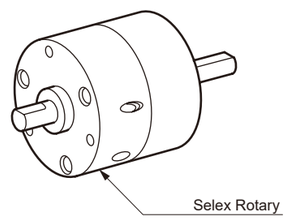
Since the switch is fixed, position adjustment is not possible.

Switch Unit Parts Configuration

Parts Configuration

●Rotor Mounting Screw
●Rotor Body
●Switch Unit Mounting Screw
●Switch Unit Body

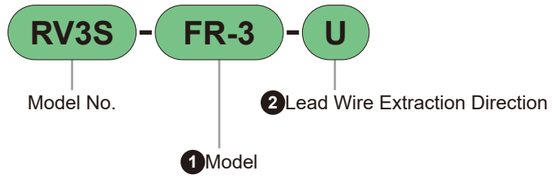




*By attaching a switch unit to a Selex Rotary without a switch, it becomes a Selex Rotary with a switch. RV3S1 with switch cannot be manufactured.

Model No. Notation

●Switch Unit



1 Model

Code	Content
FR-3	Applicable Actuator: RV3□A3
FR-10	Applicable Actuator: RV3□A10
FR-20	Applicable Actuator: RV3□A20
FR-30	Applicable Actuator: RV3□A30

2 Lead Wire Extraction Direction

Code	Content
Blank	With Lead Wire Axial Direction Switch
U	With Lead Wire Perpendicular to Axis Direction Switch

Switch Unit Compact Type Oscillation Angle Variable specifications

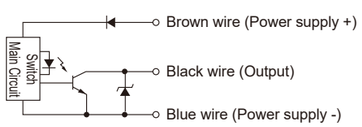
Item	Solid state switch FR-□(-U)
Applications	Programmable Controller, Relay, IC Circuit
Power supply voltage	5 to 30 VDC
Load voltage	5 to 30 VDC
Load current	5 to 200 mA
Current consumption	20 mA or less at 24 VDC, 10 mA or less at 12 VDC, 4 mA or less at 5 VDC
Internal voltage drop	1.5 V or less
Indicator LED	LED (Lights up when ON)
Leakage current	10 μA or less
Lead Wire Length	1.0 m (Oil-resistant black 3-core cord)
Shock Resistance	490m/s^2
Insulation resistance	100 MΩ or more at 500 V Megger
Withstand Voltage	No abnormality when 1500 VAC is applied for 1 minute
Ambient Temperature	5 to 60°C
Enclosure	IEC Standard IP67, IEC 60529 2001 (Submersible Type)

* mark indicates the size of the Selex Rotary. (3, 10, 20, 30)

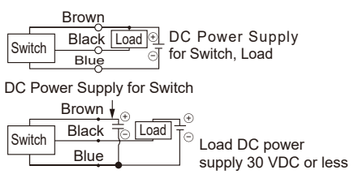
Switch Hysteresis and Operating Range

Switch Type	Operating Range	Hysteresis
CT-3	23° ±7°	Approx. 2°

Switch internal circuit diagram



Switch Wiring Procedure

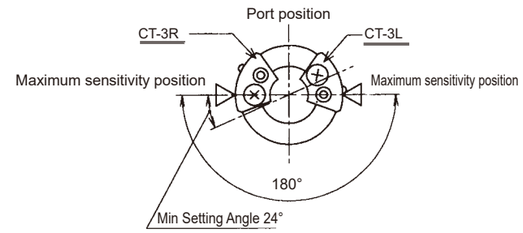


Oscillation Angle and Switch Mounting Position

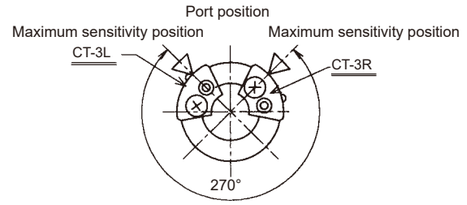
● When ordering variable oscillation angle type RV3□A series with switch, the switch unit will be shipped included. Install the angle setting stopper to the set angle, and after adjustment, install the switch according to the combination in the table below.

Oscillation Angle	Switch Combination
30° to 186°	Combination A
187° to 270°	Combination B

Combination A



Combination B



Switch Unit Assembly and Switch Adjustment Method

● Mounting of Switch Unit Body

Mount to the Selex Rotary body with the switch case mounting screws. Refer to the table below for tightening torque.

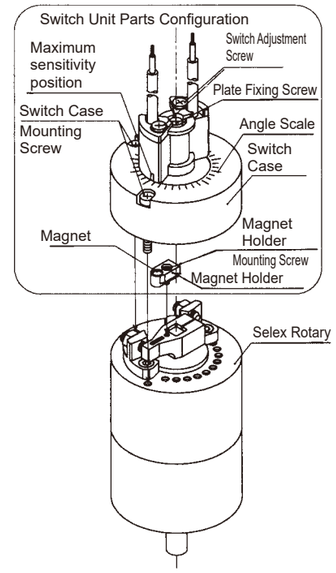
Model No.	Tightening Torque (N·m)
For RV3□A3	0.06 to 0.2
For RV3□A10	0.1 to 0.2
For RV3□A20	0.2 to 0.3
For RV3□A30	

● Switch Position Adjustment

Loosen the switch adjustment screw, align the switch's Max sensitivity position with the angle scale corresponding to the Selex Rotary's set angle, and fix it. Tighten with a torque of 40 to 50 N·cm. The angle scale is a guideline, so check the LED lighting and perform final adjustment.

● Replacement of switch

Remove the switch adjustment screw and plate fixing screw to replace the switch. When fixing, tighten with 40 to 50 N·cm. Assemble in reverse order of removal, and be sure to adjust the switch position.



Switch Unit Model No. Notation

RVU50 - C - 90 - M2V - R

1 Model No. 2 Unit Type 3 Oscillation Angle 4 Switch Model No. 5 Number of Switches

1 Model No.

Code	Content
RVU50	Applicable Actuator: For RV3S/D50
RVU150	Applicable Actuator: For RV3S/D150
RVU300	Applicable Actuator: For RV3S/D300
RVU800	Applicable Actuator: For RV3S/D800

2 Unit Type

Code	Content
Blank	Standard
C	For Type with Shock Absorber

*1

*1: For with shock absorber, please purchase the shock absorber body separately.

3 Oscillation Angle

Code	Content
90	90°
100	100°
180	180°
270	270°
280	280°

*1

*1: "C" (for with shock absorber) cannot be selected.

4 Switch Model

For switch details, refer to P. 1359. Switches are pre-assembled on the product before shipment.

	Contact	Indicator LED Special Function	Wiring (Output)	Load Voltage (V) AC	Load Voltage (V) DC	Load Current (mA) AC	Load Current (mA) DC	Lead wire *1 L-shape	
Reed		1-Color	2-wire	110	12/24	—	5 to 50	M0V□	
Reed		None	2-wire	110	5/12/24	—	50 or less	M5V□	
Solid State		1-Color	2-wire	—	10 to 30	-	5 to 30	M2V□	
Solid State		1-Color	3-wire (NPN)	—	30 or less	—	100 or less	M3V□	

*1: Insert the code selected in the "*Lead wire length" table into "□" of the switch model number.
*2: Switches other than the above switch model numbers are also available. (Custom Product) For details, refer to P. 1457.

* Lead Wire Length

Code	Content
Blank	1 m (Standard)
3	3 m (Option)
5	5m (Option)

Example) Lead wire length
1 m M2V
3 m M2V3
5 m M2V5

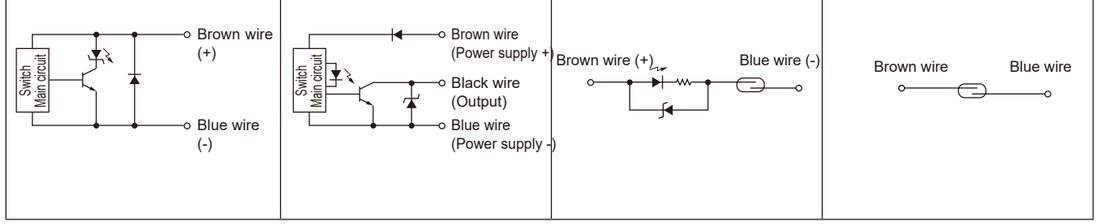
5 Number of Switches

Code	Content
R	With 1 Right Rotation Detection
L	With 1 Left Rotation Detection
D	With 2 pcs

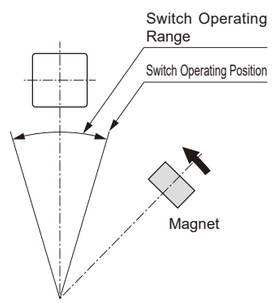
Switch Specifications

Item	Solid state 2-wire type	Solid state 3-wire type	Reed 2-wire type			
	M2V	M3V	M0V		M5V	
Applications	PLC Dedicated	For programmable controller, relay, IC circuit, small solenoid valve	For programmable controller, relay		For programmable controller, relay, IC circuit (no indicator light), series connection	
Output Method	–	NPN output	–			
Power supply voltage	–	4.5 to 28 VDC	–			
Load voltage	10 to 30 VDC	30 VDC or less	12/24 VDC	110 VAC	5/12/24 VDC	110 VAC
Load current	5 to 30 mA	100 mA or less	5 to 50 mA	7 to 20 mA	50 mA or less	20 mA or less
Current consumption	–	10 mA or less at 24 VDC	–			
Internal voltage drop	4 V or less	0.5 V or less	3 V or less (In case of DC, when load current is 30 mA)		0.1 V or less (*4)	
Indicator LED	Red LED (Lights up when ON)		Red LED (Lights up when ON)		No Indicator LED	
Leakage current	1 mA or less	10 μA or less	0 mA			
Lead Wire Length	1 m (Oil-resistant vinyl cabtyre cord 2-core 0.2 mm²)	1 m (Oil-resistant vinyl cabtyre tire cable 3-conductor 0.15 mm²)	1 m (Oil-resistant vinyl cabtyre cord 2-core 0.2 mm²)			
Shock Resistance	980m/s²		294 m/s²			
Insulation resistance	100 MΩ or more with 500 VDC megger					
Withstand Voltage	No abnormality when 1000 VAC is applied for 1 minute					
Ambient Temperature	-10 to +60°C					
Enclosure	IEC Standard IP67, IEC 60529 2001 (Submersible Type)					
Contact protection circuit	–		None			
Weight	1 m: 22 g 3 m: 57 g 5 m: 93 g					

Switch internal circuit diagram



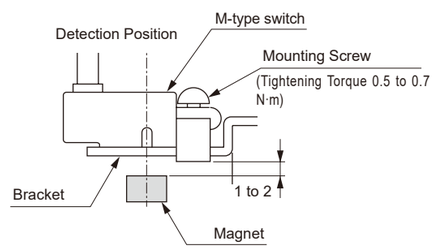
Switch Operating Range



Item / Model No.	Operating Range M2V, M3V	Operating Range M0V, M5V
RV3S50, RV3D50	Approx. 40°	Approx. 25°
RV3S150, RV3D150	Approx. 25°	Approx. 15°
RV3S300, RV3D300	Approx. 25°	Approx. 15°
RV3S800, RV3D800	Approx. 25°	Approx. 15°

Switch Adjustment Method

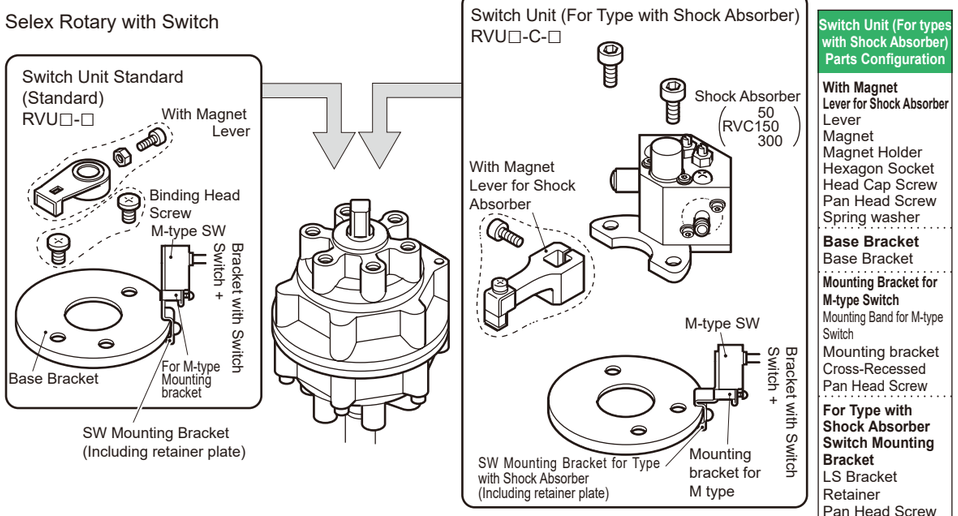
When retrofitting the switch unit, if the gap between the switch and magnet is not within the dimensions shown in the figure below, slightly bend the bracket to adjust.



Switch Unit Parts Configuration

●RVU50, 150, 300

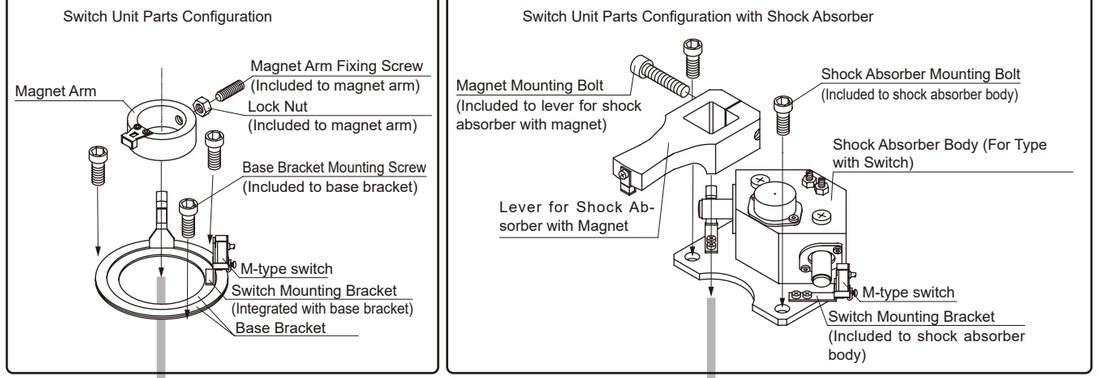
Switch Unit (Standard) Parts Configuration
Lever with Magnet
Lever
Boss
Magnet
Pan Head Screw
Nut
Base Bracket
Base Bracket
Binding Head Screw
Mounting Bracket for M-type Switch
Mounting Band for M-type Switch
Mounting bracket
Cross-Recessed Pan Head Screw
Switch Mounting Bracket
LS Bracket
Retainer
Pan Head Screw
Spring washer
M-type switch



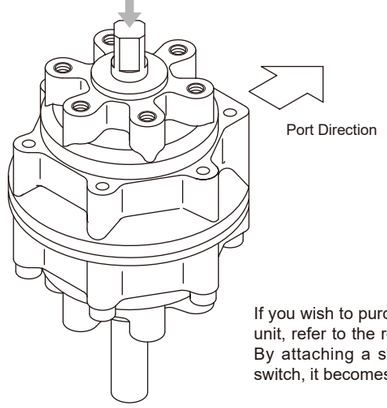
Switch Unit (For types with Shock Absorber) Parts Configuration
With Magnet Lever for Shock Absorber
Lever
Magnet
Magnet Holder
Hexagon Socket Head Cap Screw
Pan Head Screw
Spring washer
Base Bracket
Base Bracket
Mounting Bracket for M-type Switch
Mounting Band for M-type Switch
Mounting bracket
Cross-Recessed Pan Head Screw
For Type with Shock Absorber Switch Mounting Bracket
LS Bracket
Retainer
Pan Head Screw
Spring washer
M-type switch

(Note) Shock absorber body is not included in the switch unit. (Refer to P. 1350 for shock absorber model number.)

● RVU800



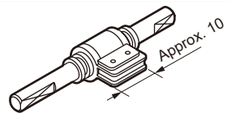
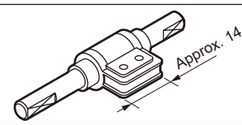
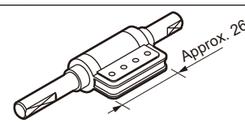
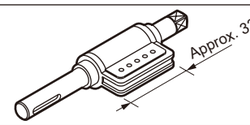
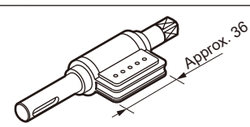
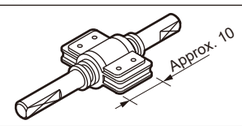
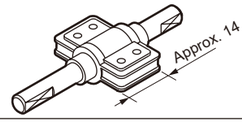
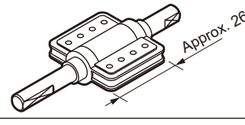
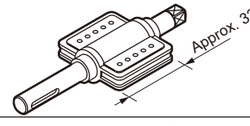
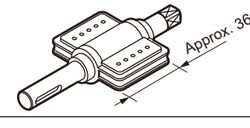
(Note) Shock absorber body is not included in the switch unit. (Refer to P. 1350 for shock absorber model number.)



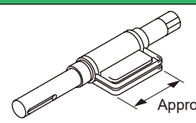
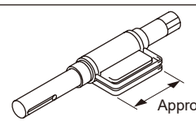
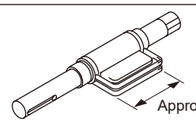
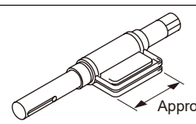
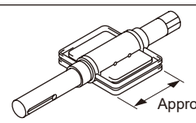
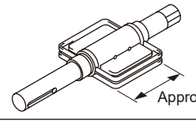
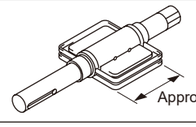
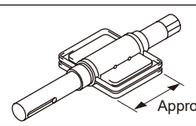
If you wish to purchase combinations other than the switch unit, refer to the repair parts kit on P. 1363, 1364 to order. By attaching a switch unit to a Selex Rotary without a switch, it becomes a Selex Rotary with a switch.

Replacement Parts List

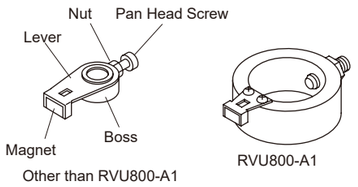
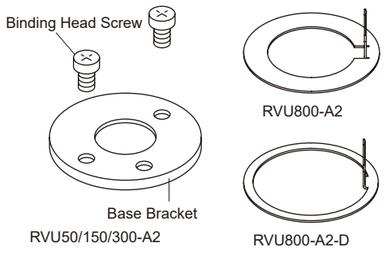
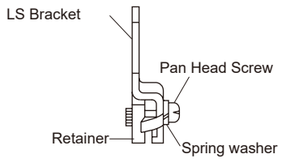
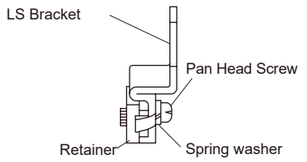
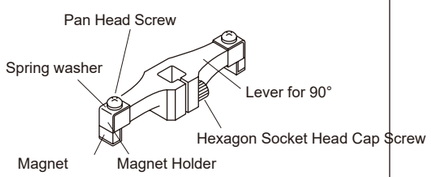
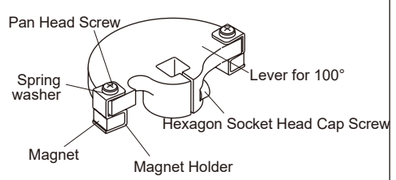
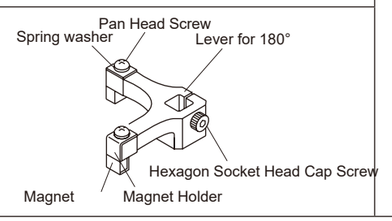
● Compact Selex Rotary

Part No./Part Name / Model	Part No. / Kit No. / Part Name	3 Vane Shaft	1 Shoe Seal	8 O-ring (2 pcs. each)
RV3S1	**RV3S1-K**		Approx. 10	ø1×ø3.8 (W×ID)
RV3S3	**RV3S3-K**		Approx. 14	ø1.42×ø6.8
RV3S10	**RV3S10-K**		Approx. 26	ø1.5×ø8
RV3S20	**RV3S20-K**		Approx. 32	ø2×ø10.5
RV3S30	**RV3S30-K**		Approx. 36	P-14
RV3D1	**RV3D1-K**		Approx. 10	ø1×ø3.8 (W×ID)
RV3D3	**RV3D3-K**		Approx. 14	ø1.42×ø6.8
RV3D10	**RV3D10-K**		Approx. 26	ø1.5×ø8
RV3D20	**RV3D20-K**		Approx. 32	ø2×ø10.5
RV3D30	**RV3D30-K**		Approx. 36	P-14

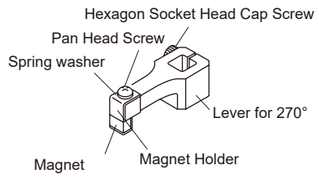
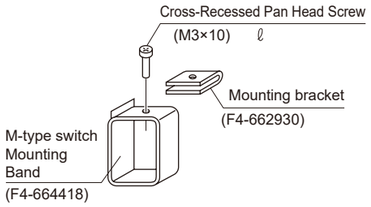
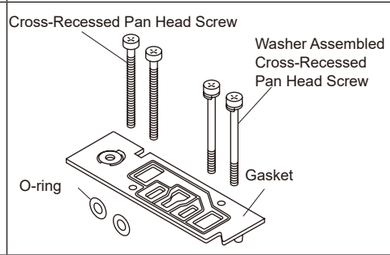
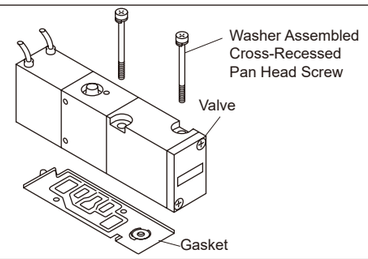
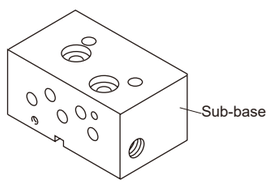
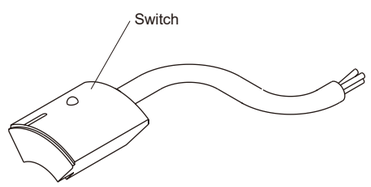
● Large Selex Rotary

Part No./Part Name / Model	Part No. / Kit No.	4 Vane Shaft	6 Shoe Seal	8 O-ring (2 pcs. each)	10 O-ring
RV3S50	**RVS50-K**	 Approx. 46	Approx. 46	P-16	ø1.8×ø56.2
RV3S150	**RVS150-K**	 Approx. 60	Approx. 60	P-22	ø1.9×ø82
RV3S300	**RVS300-K**	 Approx. 71	Approx. 71	P-31	ø3×ø105
RV3S800	**RVS800-K**	 Approx. 107	Approx. 107	P-48	ø3.1×ø150
RV3D50	**RVD50-K**	 Approx. 46	Approx. 46	P-16	ø1.8×ø56.2
RV3D150	**RVD150-K**	 Approx. 60	Approx. 60	P-22	ø1.9×ø82
RV3D300	**RVD300-K**	 Approx. 71	Approx. 71	P-31	ø3×ø105
RV3D800	**RVD800-K**	 Approx. 107	Approx. 107	P-48	ø3.1×ø150

Repair Parts Kit

Part Name	Kit Number	Appearance	Part name	Quantity
Lever with Magnet	● **RVU50-A1** **RVU150-A1** **RVU300-A1** **RVU800-A1**		Lever Boss Magnet Pan Head Screw Nut	1 1 1 1 1
Base Bracket	● **RVU50-A2** **RVU150-A2** **RVU300-A2** **RVU800-A2** *1 **RVU800-A2-D** *2 *1 For type with 1 switch *2 For the second switch of type with 2 switches Refer to P. 1360 for configuration with switch.		Base Bracket Binding Head Screw	1 2 *3 *3 RVU800-A2 is 3 pcs. RVU800-A2-D is None
Switch Mounting Bracket	● **RVU50-A3** **RVU150-A3** **RVU300-A3**		LS Bracket Retainer Pan Head Screw Spring washer	1 1 1 1
Switch Mounting Bracket for Type with Shock Absorber	● **RVU50-A3-C** **RVU150-A3-C** **RVU300-A3-C** **RVU800-A3-C**		LS Bracket Retainer Pan Head Screw Spring washer	1 1 1 1
Jaw with magnet for shock absorber (Outline Dimensions Refer to P. 1352 for types without switch.)	● **RVU50-90-A1-C** **RVU150-90-A1-C** **RVU300-90-A1-C** **RVU800-90-A1-C**		Lever Magnet Magnet Holder Hexagon Socket Head Cap Screw Pan Head Screw Spring washer	1 2 2 1 2 2
	● **RVU50-100-A1-C** **RVU150-100-A1-C** **RVU300-100-A1-C** **RVU800-100-A1-C**			
	● **RVU50-180-A1-C** **RVU150-180-A1-C** **RVU300-180-A1-C** **RVU800-180-A1-C**			

Repair Parts Kit

Part Name	Kit Number	Appearance	Part name	Quantity
Jaw with magnet for shock absorber (Lever for shock absorber with magnet for 280° cannot be manufactured.)	● **RVU50-270-A1-C** **RVU150-270-A1-C** **RVU300-270-A1-C** **RVU800-270-A1-C** **Outline dimensions For the type without switch, see P. 1352.**		Lever Magnet Magnet Holder Hexagon Socket Head Bolt Pan Head Screw Spring washer	1 1 1 1 1 1
Mounting Bracket for M-type SW	●**RVU-00-A1**		M-type SW Mounting Band Mounting Bracket Cross-Recessed Pan Head Screw	1 1 1
Packing Screw Kit	●**RVU10-B1** **RVU20-B1** **RVU30-B1** **RVU50-B1** **RVU150-B1** **RVU300-B1**		O-ring Gasket Phillips Pan Head Screw Screw Washer Assembled Phillips Pan Head Screw	2 1 2 2
Valve Kit	● **RVU □□- □-B2** 10 20 30 50 150 300 1: 100 VAC 2: 200 VAC 3: 24 VDC **V : Single Solenoid** **W : Double Solenoid**		Valve Washer Assembled Phillips Pan Head Screw Gasket	1 2 1
Sub-base	●**RV3U10-B3** **RV3U20-B3** **RV3U30-B3** **RV3U50-B3** **RV3U150-B3** **RV3U300-B3**		Sub-base	1
Variable Angle Type Switch	● **RV3U-CT-□** **3R : For Right Mounting** **3L : For Left Mounting** **3RU : Right-angle Lead Wire For Right Mounting** **3LU : Right-angle Lead Wire For Left Mounting**		Switch	1

Selex Rotary Selection Method

Select according to the following procedure

STEP 1 Size (Torque) Selection
① Static Load
② Resistive Load
③ Inertial Load

↓

STEP 2 Confirmation of Oscillation Time

↓

STEP 3 Confirmation of Allowable Energy

STEP 1 Size (Torque) Selection

Load types are broadly divided into three categories. Calculate the required torque for each case. For combined loads, sum each torque to determine the required torque. Select a size that satisfies the required torque from the output table (effective torque table) according to the Operating Pressure.

① Static Load (T_S)
When static pushing force such as clamping is required

$T_S = F_S \times L$

T_S : Required torque (N·m)
F_S : Required thrust (N)
L : Length from the center of rotation to the point of action (m)

② Resistive Load (T_R)
When forces due to friction, gravity, and other external forces are applied

$T_R = K \times F_R \times L$

T_R : Required torque (N·m)
K : Margin coefficient Load fluctuation: None K = 2, With load fluctuation K=5
F_R : Required thrust (N)
L : Length from the center of rotation to the point of action (m)

③ Inertial Load (T_A)
When rotating an object

$T_A = 5 \times I \times \dot{\omega}$
$\dot{\omega} = \theta / t^2$

T_A : Required torque (N·m)
I : Moment of Inertia (kg·m²)
ω : Angular Acceleration (rad/s²)
θ : Oscillating angle (rad)
t : Oscillation Time (s)

Calculate the moment of inertia using the diagram for calculating moment of inertia on P. 1368.

Output Table (Effective Torque) Unit: N·m

Operating Pressure (MPa) / Model No.		0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
Single Vane	RV3S1	–	0.07	0.10	0.12	0.15	0.18	–	–	–
	RV3S3	0.1	0.17	0.24	0.31	0.38	0.45	–	–	–
	RV3S10	0.35	0.56	0.75	0.98	1.2	1.39	–	–	–
	RV3S20	0.59	0.95	1.33	1.7	2.1	2.49	2.87	3.26	3.68
	RV3S30	1.1	1.8	2.5	3.19	4.1	4.8	5.8	6.5	7.2
	RV3S50	1.25	2.59	3.69	4.79	5.9	7	8.29	9.5	10.6
	RV3S150	5.5	8.5	11.5	15	18	21	24	27.3	30.5
	RV3S300	10.5	16.5	22.5	28.5	34.5	40.5	46	51.8	57.5
	RV3S800	37.8	59.1	81	102	123	144	166	186	205
Double Vane	RV3D1	–	0.16	0.22	0.27	0.34	0.41	–	–	–
	RV3D3	0.25	0.39	0.54	0.71	0.86	1.01	–	–	–
	RV3D10	0.76	1.17	1.62	2.11	2.54	3.03	–	–	–
	RV3D20	1.4	2.22	3.06	3.88	4.17	5.53	6.38	7.17	8.07
	RV3D30	2.7	4.4	6	7.7	9.5	11.2	12.99	14.8	16.6
	RV3D50	3.3	5.79	8.29	10.4	12.8	15.1	17.6	20.1	22.5
	RV3D150	12.5	19	27	35	41.5	48	55	62	69
	RV3D300	25.5	39	54	68	83	97	110	124	137
	RV3D800	77.4	120	161	206	247	288	332	371	411

STEP 2 Confirmation of Oscillation Time

If the oscillation time is set outside the specification range, the actuator operation may become unstable or cause damage to the actuator. Be sure to use within the specified oscillation time adjustment range.

Compact Selex Rotary (s)

Model No.	Oscillation Angle		
	90°	180°	270°
RV3$^{S}_{D}$1	0.03 to 0.6	0.06 to 1.2	0.09 to 1.8
RV3$^{S}_{D}$3	0.04 to 0.8	0.08 to 1.6	0.12 to 2.4
RV3$^{S}_{D}$10	0.045 to 0.9	0.09 to 1.8	0.135 to 2.7
RV3$^{S}_{D}$20	0.05 to 1.0	0.10 to 2	0.15 to 3
RV3$^{S}_{D}$30	0.07 to 0.7	0.14 to 1.4	0.21 to 2.1

Large Selex Rotary (s)

Model No.	Oscillation Angle				
	90°	100°	180°	270°	280°
RV3$^{S}_{D}$50	0.08 to 0.8	0.09 to 0.9	0.16 to 1.6	0.24 to 2.4	0.25 to 2.5
RV3$^{S}_{D}$150	0.12 to 1.2	0.13 to 1.3	0.24 to 2.4	0.36 to 3.6	0.37 to 3.7
RV3$^{S}_{D}$300	0.16 to 1.6	0.17 to 1.7	0.32 to 3.2	0.48 to 4.8	0.49 to 4.9
RV3□800	0.22 to 2.2	0.24 to 2.4	0.44 to 4.4	0.66 to 6.6	0.68 to 6.8

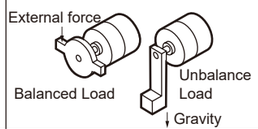
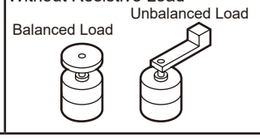
*For oscillation time of variable angle type, refer to P. 1316

STEP 3 Confirmation of Allowable Energy

For inertial load, if the kinetic energy of the load at the oscillation end exceeds the allowable value, it will cause damage to the actuator. Calculate the energy below and select so that it is within the allowable value. If the energy is too large, use a shock absorber, etc., to absorb the energy.

$E = (1/2)\times I\times\omega_0^2\times10^3$
$\omega_0 \approx 1.2\times\omega$
$\omega = \theta/t$

E : Kinetic Energy (mJ)
I : Moment of Inertia (kg·m²)
ω_0 : Colliding angular speed (rad/s)
ω : Average angular velocity (rad/s)
θ : Oscillating angle (rad)
t : Oscillation Time (s)

Calculation of Resistive Torque	Horizontal Load	Vertical load
Required	With Resistive Load	With Resistive Load 
Not Required	Without Resistive Load 	Without Resistive Load

Calculate the moment of inertia using the diagram for calculating moment of inertia on P. 1368.

Selection Method for Rotary Shock Absorber

STEP 1 Check if load is within load range
↓
STEP 2 Confirmation of Allowable Energy
↓
STEP 3 Confirmation of Shock Absorber Capacity

STEP 1 Load Confirmation

Confirm that the load size is below the load range (refer to RVC specifications section).

STEP 2 Confirmation of Allowable Energy

Determine the kinetic energy of the load, and if its value exceeds the allowable energy of the Selex Rotary, install a shock absorber suitable for that Selex Rotary. For kinetic energy of the load, refer to Selex Rotary Selection Method STEP 3.

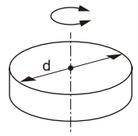
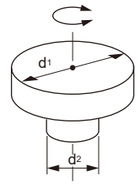
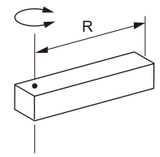
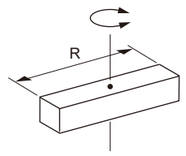
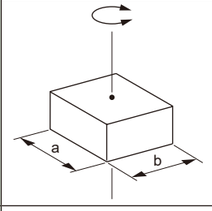
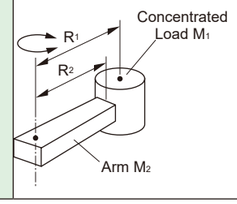
STEP 3 Confirmation of Shock Absorber Capacity

If the impact energy of the load at the oscillation end exceeds the allowable value, it will cause damage to the shock absorber. Calculate the energy below and select so that it is within the allowable value. If the energy is too large, consider a separate shock absorbing device with a large absorption capacity.

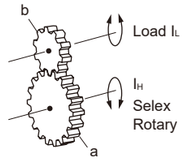
$E = E_1+E_2$
$E_1 = (1/2)\times I\times\omega_0^2$
$\omega_0 \approx 1.2\times\omega$
$\omega = \theta/t$
$E_2 = (1/2)\times T\times\theta'$
$E_m = E\times n$

E : Collision energy (J)
E_1 : Kinetic energy (J)
E_2 : Thrust energy (J)
ω_0 : Colliding angular speed (rad/s)
ω : Average angular velocity (rad/s)
I : Moment of Inertia (kg·m²)
θ : Oscillating angle (rad)
θ' : Shock Absorber Absorbing angle (rad)
t : Oscillation Time (s)
T : Selex Rotary Torque (N·m)
E_m : Energy per minute (J/min)
n : Operating Frequency times/min

Calculation of Moment of Inertia

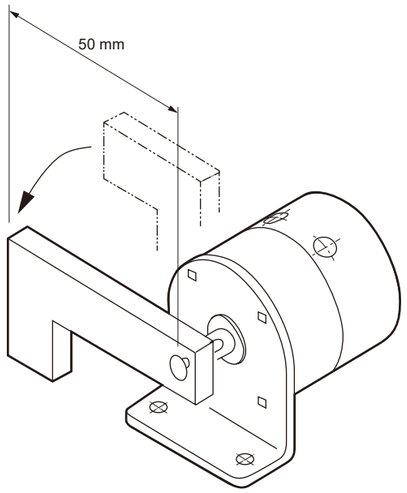
Shape	Diagram	Required Items	Moment of Inertia I kg·m²	Radius of gyration	K_1^2	Remarks
Disk		● Diameter d (m) ● Weight M (kg)	$I = \frac{Md^2}{8}$	$\frac{d^2}{8}$		● No particular mounting direction ● Consider separately when used by sliding
Stepped disk		● Diameter d_1(m) d_2 (m) ● Weight d_1 section M_1 (kg) d_2 part M_2(kg)	$I= \frac{1}{8}(M_1d_1^2+M_2d_2^2)$	$\frac{d_1^2+d_2^2}{8}$		● If d_2 part is very small compared to d_1 part, it can be ignored
Rod (center of rotation is at the end)		● Bar length R(m) ● Weight M (kg)	$I= \frac{MR^2}{3}$	$\frac{R^2}{3}$		● Mounting direction is horizontal ● When the mounting direction is vertical, the oscillation time changes.
Rod (center of rotation is at the center of gravity)		● Bar length R(m) ● Weight M (kg)	$I = \frac{MR^2}{12}$	$\frac{R^2}{12}$		● No particular mounting direction
Rectangular / Method / Parallelepiped		● Side length a (m) b (m) ● Weight M (kg)	$I= \frac{M}{12}(a^2+b^2)$	$\frac{a^2+b^2}{12}$		● No particular mounting direction ● Consider separately when used by sliding
Concentrated load		● Shape of concentrated load ● Length to center of gravity of concentrated load R_1 ● Arm Length R_2 (m) ● Weight of Concentrated Load M_1 (kg) ● Weight of Arm M_2 (kg)	$I = M_1(R_1^2+k_1^2)+\frac{M_2R_2^2}{3}$	k_1^2 is calculated based on the shape of the concentrated load		● Mounting direction is horizontal ● If M_2 is very small compared to M_1, calculate with $M_2 = 0$

Method of converting load J_L around the Selex Rotary shaft when mediated by gears

Gear		● Gear Selex Rotary Side (Number of Teeth) a Load Side (Number of Teeth) b ● Inertia of Load Moment N·m	Moment of Inertia of Load around Selex Rotary Shaft $I_H=\left(\frac{a}{b}\right)^2 I_L$		● If the shape of the gear is large, it is necessary to consider the moment of inertia of the gear.

MEMO

Selection Example 1 For Clamping



[Operating Conditions]

Pressure:	0.5 MPa
Oscillation Angle	90°
Oscillation Time	0.3 s
Clamp Lever Weight	0.1 kg
Clamping Force	20 N
Clamp Position	50 mm

STEP 1 Size (Torque) Selection

Since it is a static load, calculate the required torque.

F_S = clamping force: 20 N
R = Clamp position: 0.050 m

$T_S = 20 \times 0.05 = 1.0$ N·m

Temporarily select RV3S20-90 based on required torque

STEP 2 Confirmation of Oscillation Time

Check if the oscillation time under operating conditions is within the specified value.

Operating time is 0.3 seconds for 90°, while the oscillation time adjustment range for RV3S20-90 is 0.05 to 1.0, so it is OK. Proceed to the next step.

STEP 3 Confirmation of Allowable Energy

Calculate the kinetic energy and check if it is within the allowable energy value.

Calculate the moment of inertia I of the clamp lever.
[Rod (Center of Rotation at End)]

$I = M \times R^2/3 = 0.1 \times 0.05^2/3$
$= 0.0000833$ kg·m²

Calculate the impact angular velocity ω_0.

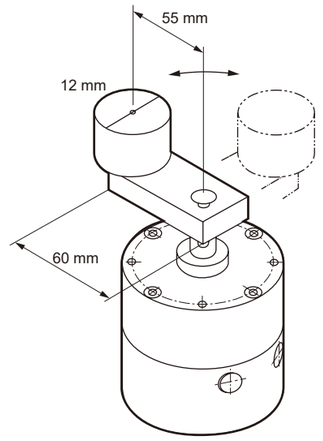
$\theta = 90° = \pi/2$ (rad)
$t = 0.3$ s
$\omega = \theta/t = (\pi/2)/0.3 = 5.236$ (rad/s)
$\omega_0 = 1.2 \times \omega = 6.283$ (rad/s)

Therefore, the kinetic energy (E) is

$E = (1/2) \times 8.33 \times 10^{-5} \times 6.283^2 \times 10^3$
$= 1.64$ (mJ)

Since the allowable energy is satisfied, RV3S20-90 can be selected.

Selection Example 2 When there is a disk-shaped load at the tip of the rod



[Operating Conditions]

Pressure:	0.5 MPa
Oscillation Angle	90°
Oscillation Time	0.2 s
Rod Length	60 mm
Rod Weight	0.1 kg
Distance to Disk	55 mm
Disk Diameter	12 mm
Disk Weight	0.12 kg

STEP 1 Size (Torque) Selection

Since it is an inertial load, calculate the moment of inertia.

$I = M_1 (R_1^2 + K_1^2) + M_2 R_2^2/3$
$= 0.12 \times (0.055^2 + (0.012^2/8)) + 0.1 \times 0.06^2/3$
$= 4.85 \times 10^{-4}$

Next, calculate the angular acceleration $\dot{\omega}$.
From the conditions
$\theta = 90° = \pi/2$ (rad)
$t = 0.2$ s
$\dot{\omega} = \theta/t^2 = (\pi/2)/0.2^2$
$= 39.27$ (rad/s²)
Therefore, the inertial torque (T_A) is
$T_A = 5 \times 4.85 \times 10^{-4} \times 39.27$
$= 0.095$ (N·m)

Temporarily select RV3S3-90 based on inertial torque

STEP 2 Confirmation of Oscillation Time

Check if the oscillation time under operating conditions is within the specified value.

Operating time is 0.2 seconds for 90°, while the oscillation time adjustment range for RV3S3-90 is 0.04 to 0.8, so it is OK. Proceed to the next step.

STEP 3 Confirmation of Allowable Energy

Calculate the kinetic energy and check if it is within the allowable energy value.

Calculate the impact angular velocity ω_0 from the conditions.

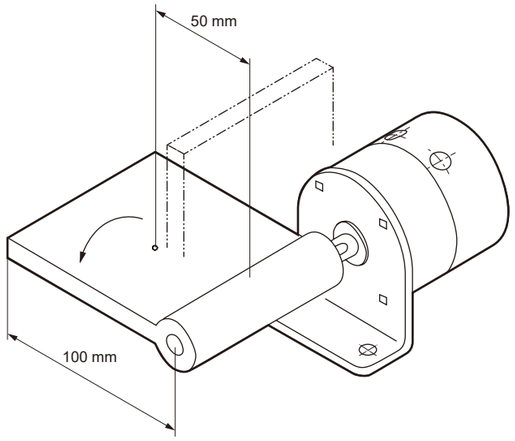
$\theta = 90° = \pi/2$ (rad)
$t = 0.2$ s
$\omega = \theta/t = (\pi/2)/0.2$
$= 7.854$ (rad/s)
$\omega_0 = 1.2 \times \omega = 1.2 \times 7.854 = 9.425$ (rad/s)

Therefore, the kinetic energy (E) is

$E = (1/2) \times 4.85 \times 10^{-4} \times 9.425^2 \times 10^3$
$= 21.54$ (mJ)

Since the allowable energy is exceeded, select RV3S50 which is within the allowable range, or an external shock absorbing device must be installed.

Selection Example 3 When the rotating shaft is horizontal and there is a plate-shaped load



[Operating Conditions]

Pressure:	0.5 MPa
Oscillation Angle	90°
Oscillation Time	0.15 s
Plate Length	100 mm
Plate Weight	1.5 kg
Distance to Center of Gravity	50 mm
Operating Frequency	5 times/min

STEP 1 Size (Torque) Selection

Calculate the resistive torque (TR) and inertial torque (TA) for resistive load due to gravity and inertial load.

[Resistive Torque]
ResistiResistive torque changes with rotation, so calculate the Max value.ve torque changes with rotation, so calculate the Max value.

F_R = gravity = 1.5 x 9.8 = 14.7 N
R = distance to center of gravity: 0.050 m

$T_R = 5 \times 14.7 \times 0.05 = 3.675$ N·m ··①

[Inertial Torque]
Rod (center of rotation is at the end)
$I = 1.5 \times 0.1^2/3 = 0.005$ (kg·m²)
From the conditions
θ = 90° = π/2 (rad)
t = 0.15 s
$\dot{\omega} = \theta/t^2 = (\pi/2)/0.15s^2$
$= 69.8$ (rad/s²)
Therefore, the inertial torque (T_A) is
$T_A = 5 \times 0.005 \times 69.8$
$= 1.745$ (N·m)·····②
Summing the resistive torque and inertial torque
$T = T_R + T_A = 3.675 + 1.745 = 5.420$ (N·m)

Temporarily select RV3S150-90 based on required torque

STEP 2 Confirmation of Oscillation Time

Check if the oscillation time under operating conditions is within the specified value.

Operating time is 0.15 seconds for 90°, while the oscillation time adjustment range for RV3S150-90 is 0.12 to 1.2, so it is OK. Proceed to the next step.

STEP 3 Confirmation of Allowable Energy

Calculate the kinetic energy and check if it is within the allowable energy value. Calculate the impact angular velocity from the conditions.
θ = 90° = π/2 (rad)
t = 0.15 s
ω = θ/t = (π/2)/0.15
= 10.47 (rad/s)
ω_0 = 1.2 × ω=1.2×10.47=12.57 (rad/s)
Therefore, the kinetic energy (E) is
$E = (1/2) \times 0.005 \times 12.57^2 \times 10^3$
= 395 (mJ)
Consider shock absorber as allowable energy is exceeded

Shock Absorber Consideration

Shock Absorber STEP 1 Confirmation of Allowable Energy

Since the allowable energy of the Selex Rotary was exceeded, check the shock absorber capacity in the next STEP

Shock Absorber STEP 2 Confirmation of Shock Absorber Capacity

Impact Angular Velocity
ω_0 = 12.6 (rad/S)
Kinetic Energy
$E1 = (1/2) \times 0.005 \times 12.6^2 = 0.395$ (J)
Torque of RV3S150 at 0.5 MPa: 14.7 (N·m)
Shock absorber absorption angle: 0.2 (rad)
Thrust Energy
$E2 = (1/2) \times 14.7 \times 0.2 = 1.47$ (J)
Therefore, the impact energy (E) is
E = E1 + E2=0.395 + 1.47≈1.86 (J)

Energy per minute (Em) is
Em = 1.86 × 5 = 9.32 (J)

Since all shock absorber specification values are satisfied, RV3S150 with shock absorber can be selected.

Pneumatic Equipment

To Use This Product Safely

Be sure to read this before use. For general cylinder information, see Intro 41, and for cylinder switches, see P. 1512.

Individual Precautions: Selex Rotary Vane Type RV3 Series

Design / Selection

1. Common

⚠ Warning

■ Do not brake or hold the product by trapping it with pneumatic pressure.
If there is no external stopping device for the product, stopping midway by trapping air with a directional control valve may result in the inability to hold the stop position due to air leaks, etc., which may cause injury or damage to personnel, equipment, and devices.

■ Consider load fluctuation, rising/lowering operation and changes in frictional resistance for safe design.
The operating speed of the rotary actuator will increase, which may cause damage to personnel or machinery.

■ Do not use the rotary actuator as a shock absorbing structure.
If abnormal pressure is applied or air leakage occurs, the deceleration effect will be significantly impaired, which may cause damage to personnel or machinery.

■ Be sure to tighten very securely in order to prevent the fixed parts or connected sections from loosening.
When using a high rotor with high operating frequency or in places with much vibration, adopt a particularly secure fastening method.

■ Rotary actuator modification
Do not modify the rotary actuator.

⚠ CAUTION

■ Do not apply torque exceeding rated output to the product.
If an external force exceeding the rated output of the product is applied to the product, it will cause damage to the product.

■ If repeatability is required for the oscillating angle, provide an external stopper to directly stop the load.
If stopped by the stopper provided on the rotary actuator, the oscillation angle may change from the initial setting.

■ Always use the rotary actuator within the specified oscillation time range.
If used in a low-speed range below this range, it will not operate smoothly due to stick-slip phenomenon.

■ Install a speed controller in order to control the oscillation speed of the rotary actuator.
Adjust gradually from the low speed side to the specified speed.

■ Precautions for rotary actuator switch
Be careful about the proximity of rotary actuators to each other.
When using two or more rotary actuators with switches in close proximity, or when a magnetic body moves very close to a rotary actuator, the switches may malfunction due to mutual magnetic interference. Design so that the distance between rotary actuators is 40 mm or more. (If an allowable distance is indicated for each rotary actuator, follow it.)

At intermediate positions of the oscillation angle, pay attention to the switch ON time.
If the switch is set to an intermediate position of the oscillation angle and the load is driven when the magnet passes, be careful as if the oscillation speed is too high, the switch may turn ON, but the operating time may be short, and the load may not be able to complete its operation.

In that case, the oscillation speed will be:

$$V = \frac{\text{Switch Operating Range (°)}}{\text{Load Operating Time (ms)}} \times 1000\ (°/s)$$

■ This rotary actuator is a no-lubrication actuator.
The actuator can be lubricated, but once it has been oiled, it must be maintained in an lubricated state. Lubrication may cause the pre-applied lubricant to be washed away, and interruption may lead to malfunction. When lubricating, use turbine oil Class 1 (non-additive) ISO VG32. Never use other oils (spindle oil, machine oil, etc.). Use will damage the seal part. Recommended lubricants are shown in the table below. Please refer to the weight listed in the switch specifications.

Manufacturer	Name
Idemitsu Kosan Co.,Ltd.	Diana Fresia S-32
Fuji Kosan Co., Ltd.	FUCHS Turbine 32
Mitsubishi Oil Co., Ltd.	Mitsubishi Turbine Oil 32
Showa Shell Sekiyu K.K.	Shell Vitrea 32
Mitsui & Co. Petroleum Ltd.	Mitsui Turbine Oil 32
Japan Energy Corporation	Turbine 32
Nippon Oil Corporation	Turbine Oil 32
Cosmo Oil Co., Ltd.	Cosmo Turbine 32
Esso Sekiyu K.K.	Stanol 43N
Kygnus Sekiyu K.K.	Turbine Oil 32

During Use

1. Common

⚠ CAUTION

■ Do not wipe items showing the model number, such as the nameplate, with organic solvents.
This will cause the display to disappear.

2. Variable Oscillation Angle Type RV3$^{S}_{D}$A

⚠ Warning

■ Do not loosen the angle adjustment screws outside of the adjusting range for variable oscillation angle rotary actuators.
Loosening beyond the adjustment range may cause the angle adjustment screw to come off, which may cause injury or damage to personnel or machinery.

⚠ CAUTION

■ Stopper
- Operate the rotary actuator only after installing a stopper to serve both as a reference point stopper and angle setting device.
- When the stopper is set to the oscillating origin or Max oscillating angle, if set to the positive side beyond the adjusting range, the vane could hit the internal stopper and cause damage. Always adjust the angle so that the jaw stops at the external stopper.
- The reference point stopper is fixed in position and cannot be moved.

■ The stopping angle is set by touching the fine adjusting screw of each stopper with the jaw.
Stop angle accuracy does not include wear due to operation. If the stop angle changes due to wear, readjust with the fine adjustment screw.

For precautions during mounting, installation, adjustment, use, and maintenance, please see "Precautions for Use" in this catalog and the CKD Components product site (https://www.ckd.co.jp/kiki/en/) → "Model No." → Instruction Manual.

Related Equipment

Listed Page

Shock Absorber
SKL, NCK, SCK, FCK Series 1379

Free Joint
FJ Series 1439

Simple Flow Controller
FK Series 1451

SKL, NCK, SCK, FCK

Shock Absorber

Related Components

CONTENTS

● Shock Absorber, Fixed Type (SKL) 1383
● Shock Absorber, Fixed Type (NCK) 1391
● Shock Absorber, Adjustable Type (SCK) 1403
● Shock Absorber, Adjustable Type (FCK) 1411
⚠ Precautions for Use 1432

Variation Table

●: Standard, ◎: Option, : Not available

Method	Model No.		Max Impact Speed Operating Range m/s	Max Absorbed Energy (J) 5 10 50 100 500 1000	Mounting Style: Basic type 00	Mounting Style: Flange FA	Option: With Stop Nut N1	Option: With Tip Cap C	Option: Offset Angle Adapter	Page
Fixed	SKL		to 1.0	0.2 – 3.6						1383
	NCK		to 3.0	1 – 200	●	◎	◎	◎		1391
Adjustable	SCK		to 4.0	0.049 – 588	●	◎	◎			1403
	FCK	Low Speed Type	to 1	1.5 – 720	●		◎	◎	◎	1411
		Medium Speed Type	to 2		●		◎	◎	◎	
		High Speed Type	to 3		●		◎	◎	◎	

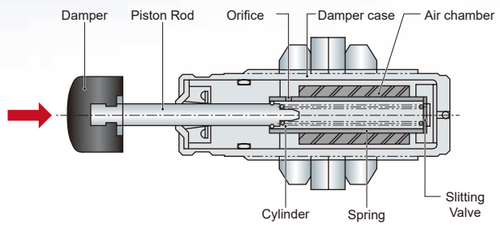
Shock Absorber

Absorbs impact during conveyance and assembly, reducing damage to workpieces and equipment with smooth stopping!

Improvement of Production Efficiency **Noise Reduction in Factory**

Extension of maintenance cycle due to vibration generated during high-speed operation

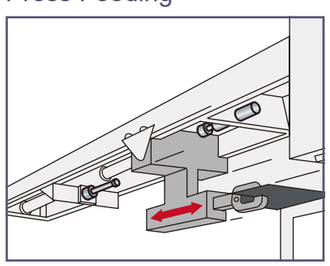
The impact force applied to the damper pushes the Piston Rod, pressurizes the oil in the cylinder, and the generated hydraulic pressure absorbs the shock when flowing into the damper case via the orifice.



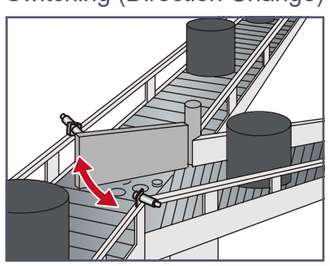
*The figure shows the case of SCK.

Application Example

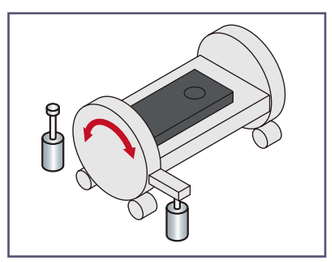
Press Feeding



Switching (Direction Change)

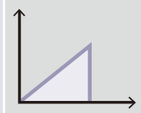
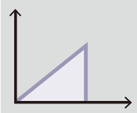
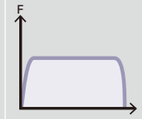
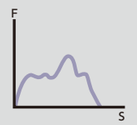
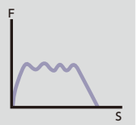
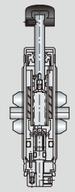
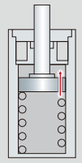
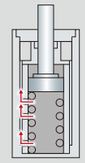
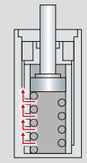


Rollover



Optimal selection possible based on operating speed, energy absorption characteristics, etc.

◎: Best, ○: Good, △: Yes

		SKL	NCK	SCK	FCK		
					L (Low Speed)	M (Medium Speed)	H (High Speed)
Operating Speed	Low Speed (up to 1 m/s)	◎	◎	△	◎	–	–
	Medium Speed (1 to 2 m/s)	–	◎	△	–	◎	–
	High Speed (from 2 m/s)	–	△	◎	–	–	◎
Operating Conditions	Thrust combined	◎	◎	△	△	◎	△
	Free Fall (High-Speed Impact)	△	△	◎	△	○	○
Energy Absorption Characteristics	Stroke (S) – Resistance (F) Relationship						
	Product Overview	Slit orifice matched to linear slide cylinder provides high cycle time and smooth stopping accuracy.	Smooth stopping accuracy is obtained by slit orifice.	Trapezoidal waveform allows for most efficient energy absorption.	Resistance force is large immediately after impact and decreases as stroke progresses.	Ideally absorbs energy against cylinder thrust.	Resistance force fluctuates in a ripple pattern, but Max resistance force can be kept low.
Size/Structure	Size	Small	Small	Large	Medium	Medium	Medium
	Adjuster adjustment	Fixed	Fixed	Adjustable (Fixed Type)	Adjustable	Adjustable	Adjustable
	Orifice	Slit orifice	Slit orifice	Balance valve 	Single-hole orifice 	Irregular multi-hole orifice 	Multi-hole orifice 
	Tube	Single	Single	Double	Single/Double	Double	Double

Abundant Mounting Types/Options

Tip cap

For Impact Noise Countermeasures

Flange

When normal mounting is difficult

Stopper Nut

When external stopper cannot be installed

Offset Angle Adapter

Max Operating Offset Angle ±10°

SKL

Shock Absorber, Fixed Type

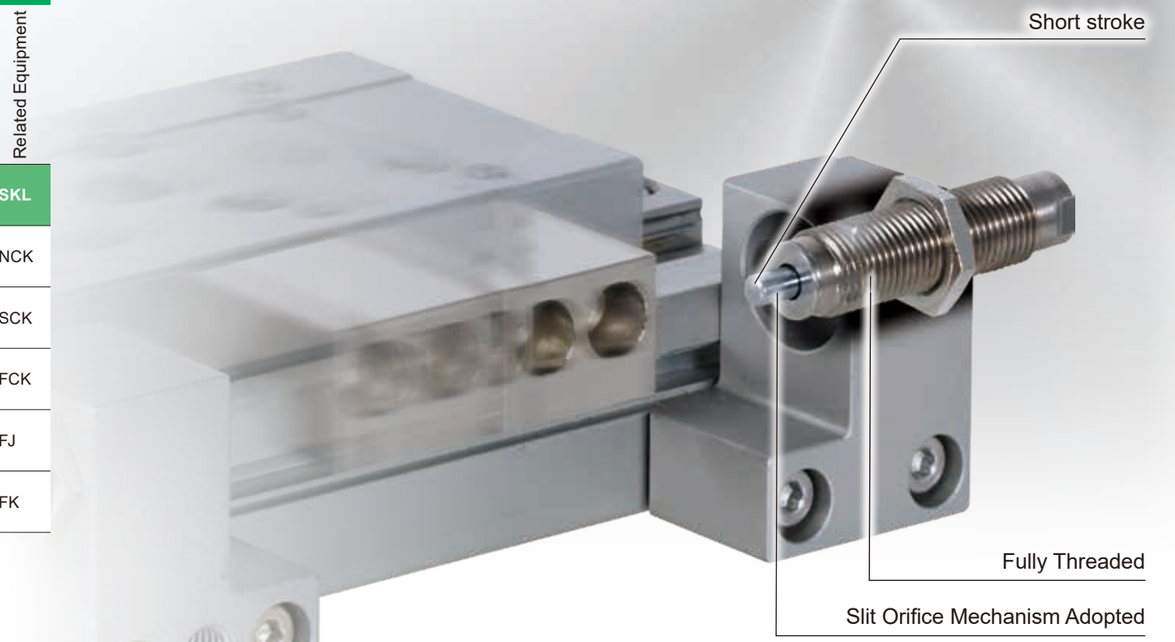
CONTENTS

Series variation 1379
Product Introduction 1384
● SKL (Max absorbed energy: 0.2 to 3.6 J) 1386
Model Selection Guide 1388
⚠ Precautions for Use 1432

SKL Series

Achieves equipment cycle time reduction and contributes to productivity improvement!

Mounted on LCR, LCG Optimized



Fast, Soft, Durable

Model Variations

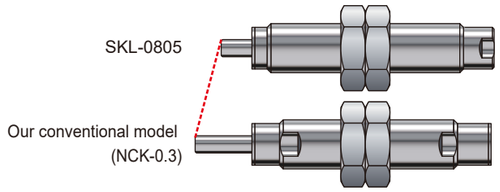
4 types available to match the Max absorption energy suitable for linear slide cylinders.

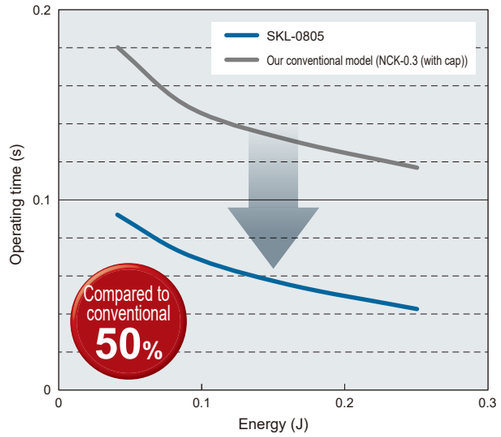
Model Variation	Thread size	Stroke (mm)	Absorbed energy (J)
SKL Series SKL-0804	M8x0.75	3.5	0 0.2 0.4 0.6 0.8 1.0 1.2 3.6
SKL Series SKL-0805	M8x0.75	4.5	
SKL Series SKL-1006	M10x1.0	6	
SKL Series SKL-1208	M12x1.0	8	

High cycle

Significant reduction in operating time due to short stroke

Compatible with high cycle time and high precision of linear slide cylinders. Achieves reduction in equipment operating time and contributes to productivity improvement.



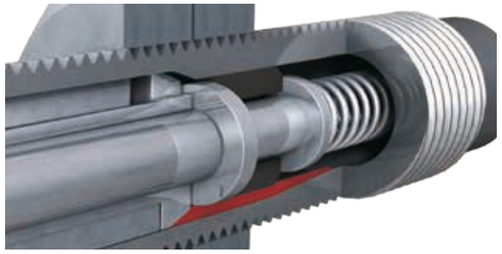


* The data are reference values at a cylinder thrust of 160 N and room temperature. Operating time varies depending on impact conditions.

Achieves long life with soft stopping

Smooth shock absorption characteristics due to adoption of slit orifice mechanism

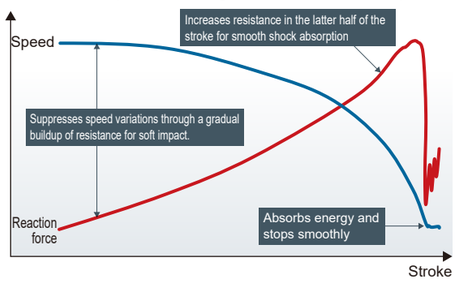
Adopts a slit orifice mechanism where the orifice area smoothly decreases with piston movement. Achieves an ideal triangular waveform and mitigates impact with soft absorption characteristics.



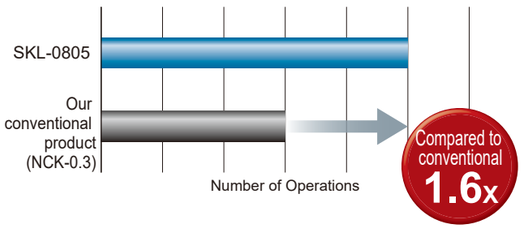
Slit orifice mechanism achieving long life

While inheriting the conventionally well-regarded slit orifice mechanism, it has been specialized and optimized for linear slide cylinders.

Gradual speed change enables soft stop



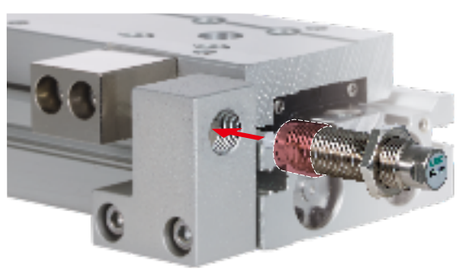
Long Service Life

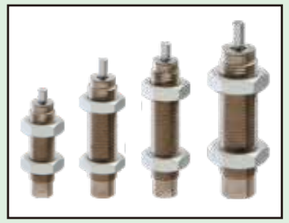


High maintainability

Easy mounting without tip cap

Adopts a structure where the slider is directly received by the main body. Since there is no tip cap and it can be mounted from the rod side, the shock absorber can be replaced while the linear slide cylinder is installed.





Shock Absorber

SKL Series

● Max absorbed energy: 0.2 to 3.6 J

RoHS

Model Number Notation

SKL - 08 05

Model No. / ② Stroke / ① Thread Size

① Thread Size

Code	Content
08	M8×0.75
10	M10×1.0
12	M12×1.0

②Stroke (mm)

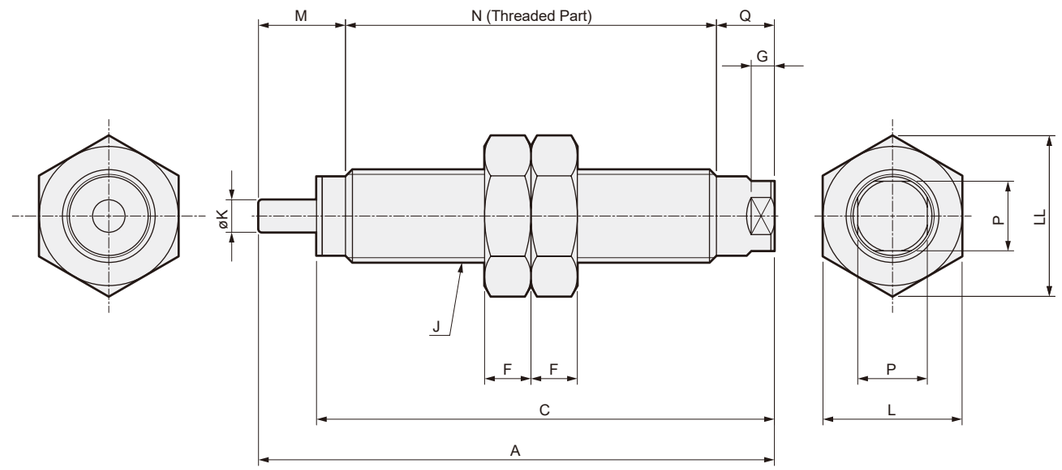
Code	Content	Thread Size		
		08	10	12
04	3.5 mm	●		
05	4.5 mm	●		
06	6 mm		●	
08	8 mm			●

Specifications

Item		SKL			
Model No.		SKL-0804	SKL-0805	SKL-1006	SKL-1208
Maximum absorption energy	J	0.2	0.5	1.2	3.6
Outer diameter thread size	mm	M8×0.75		M10×1.0	M12×1.0
Stroke	mm	3.5	4.5	-	8
Max Absorption Energy per Hour	kJ/hour	0.9	2.4	4.3	12.9
Max Impact Speed	m/s	1.0			
Max Repetition Frequency	cycles/min	80		60	
Ambient Temperature	°C	-10 to 60 (however, no freezing)			
Max Allowable Thrust	N	40	158	281	687
Max Load (Rated Resistance Force)	N	152	277	484	1064
Required mounting strength	N	456	831	1452	3192
Return Time	s	0.3 or less			
Weight	g	9	12	20	40
Return	At Extension N	3.3	3.3	2.3	3.4
Spring Force	At Compression N	4.6	4.6	4.2	5.9

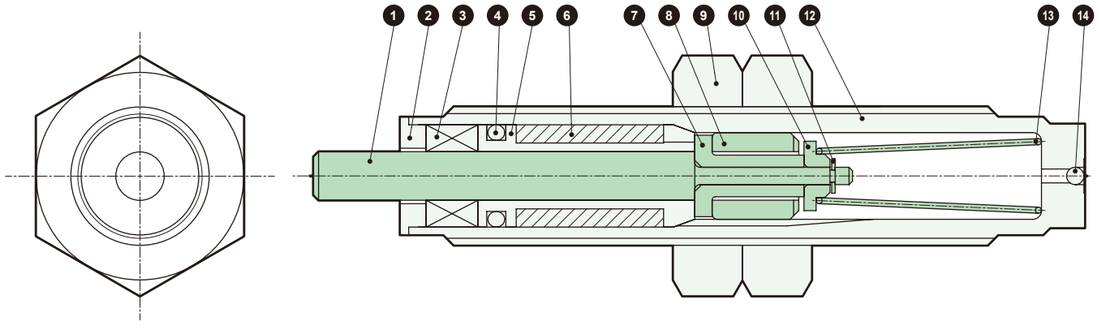
Note: The absorption capacity of the shock absorber changes depending on the speed and Ambient Temperature. The above specification values are at normal temperature.

Dimensional Drawings



Model No.	A	C	F	G	J	K	L	LL	M	N	P	Q
SKL-0804	34.5	30.5	4	2	M8×0.75	2.8	12	13.9	6.5	23	6	5
SKL-0805	44.5	39.5	4	2	M8×0.75	2.8	12	13.9	7.5	32	6	5
SKL-1006	49	42.5	4	2	M10×1.0	3	14	16.2	9	34	8	6
SKL-1208	56	47.5	5	2	M12×1.0	3.5	17	19.6	12	37	10	7

Internal Structure Diagram/Material



Do not disassemble

Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Piston Rod	Steel	Industrial Hard Chrome Plating	8	Piston	Cast Iron	
2	Cover	Stainless Steel		9	Hexagon Nut	Steel	Zinc Plating
3	Oil Seal	Special Nitrile Rubber		10	Valve Stopper	Steel	
4	O-ring	Nitrile Rubber		11	E-type Retaining Ring	Stainless Steel	
5	Rod Guide	Aluminum Alloy		12	Damper Case	Steel	Nickel Plating
6	Air Chamber	Nitrile Rubber		13	Spring	Piano Wire	
7	Valve	Steel		14	Steel ball	Steel	

Shock Absorber Model Selection Guide

1 Clarify the equipment impact pattern

- Horizontal Motion
  - a. Simple Horizontal Impact
  - b. Impact with Cylinder Thrust
  - c. Impact with Motor Driving Force
- Vertical Motion
  - d. Impact due to Free Fall
  - e. Impact with Cylinder Thrust (Lowering)
  - f. Impact with Cylinder Thrust (Ascending)
- Inclined Motion
  - g. Impact due to Free Sliding
  - h. Impact with Cylinder Thrust (Lowering)
  - i. Impact with Cylinder Thrust (Ascending)
- Oscillating Motion Rotation
  - j. Impact due to Free Oscillation Fall
  - k. Impact with Torque from Motor, etc. (Oscillation)
  - l. Impact with Torque from Motor, etc. (Rotation)

Note: Refer to "Collision Pattern Diagram Examples".

2 Clarify conditions/items necessary for energy calculation

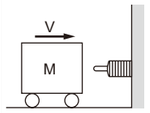
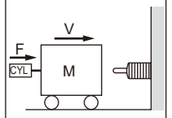
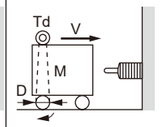
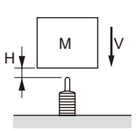
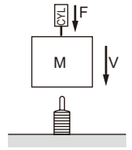
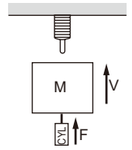
E = Total Absorption Energy (J)
E_1 = Kinetic Energy (J)
E_2 = Thrust / Self-weight Energy (J)

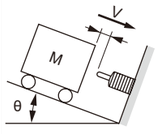
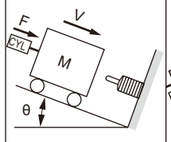
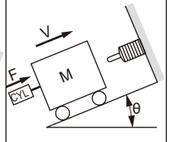
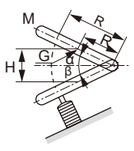
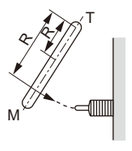
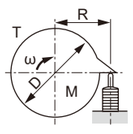
L = Impact Object Travel Distance (m)
(Inclined Free Fall)
R = Distance from Center of Rotation to Impact Point (m)
r = Distance from Center of Rotation to Center of Gravity (m)
G = Center of Gravity Position

M = Impact Weight (kg)
V = Impact Speed (m/s)
S = SKL Stroke (m)
F = Pushing Force (N)
g = Acceleration of Gravity 9.8 m/s^2
ω = Angular Velocity (rad/s)
J = Moment of Inertia ($kg \cdot m^2$)
D = Diameter (m)
N = Rotational Speed (rpm)
Me = Equivalent Weight (kg)

H = Fall Height (m)
T = Torque (N·m)
Td = Motor Starting Torque (N·m)
K = Reduction Ratio
θ, α, β = Inclination Angle (deg)

3 Actually calculate energy according to impact pattern diagram examples

	Horizontal Impact			Vertical Impact		
	a. Simple Horizontal Impact	b. When there is cylinder pushing force	c. When there is motor pushing force	d. Free Fall	e. Cylinder Lower Limit Stopper	f. Cylinder Upper Limit Stopper
Usage Example						
Kinetic Energy E_1 (J)	$\frac{1}{2}\cdot M\cdot V^2$	$\frac{1}{2}\cdot M\cdot V^2$	$\frac{1}{2}\cdot M\cdot V^2$	$\frac{1}{2}\cdot M\cdot V^2$	$\frac{1}{2}\cdot M\cdot V^2$	$\frac{1}{2}\cdot M\cdot V^2$
Thrust/Self-weight Energy E_2 (J)	——	F·S	$2\cdot\frac{K}{D}\cdot Td\cdot S$	M·g·S	(M·g+F)·S	(F−M·g)·S
Total Absorption Energy E (J)	$E = E_1$	$E=E_1+E_2$	$E=E_1+E_2$	$E=E_1+E_2$	$E=E_1+E_2$	$E=E_1+E_2$
Equivalent Weight Me (kg)	$Me = M$	$Me=\frac{2\cdot E}{V^2}$	$Me=\frac{2\cdot E}{V^2}$	$Me=\frac{2\cdot E}{V^2}$ $(V=\sqrt{2\cdot g\cdot H})$	$Me=\frac{2\cdot E}{V^2}$	$Me=\frac{2\cdot E}{V^2}$

	Inclined Impact			Oscillating Impact		Rotational Impact
	g. Free Fall	h. When there is cylinder pushing force	i. When there is cylinder pushing force	j. Free Fall	k. When there is torque from motor, etc.	L. When there is torque from motor, etc.
Usage Example						
Kinetic Energy E_1 (J)	$\frac{1}{2}\cdot M\cdot V^2$	$\frac{1}{2}\cdot M\cdot V^2$	$\frac{1}{2}\cdot M\cdot V^2$	M·g·H	$\frac{J\cdot\omega^2}{2}$ or $\frac{1}{2}\cdot M\cdot V^2$	$\frac{J\cdot\omega^2}{2}=\frac{M\cdot D^2\cdot\omega^2}{16}$
Thrust/Self-weight Energy E_2 (J)	M·g·S·sinθ	(M·g·sinθ+F)·S	(F−M·g·sinθ)·S	$\frac{r}{R}\cdot M\cdot g\cdot S$	$\frac{T}{R}\cdot S$	$\frac{T}{R}\cdot S$
Total Absorption Energy E (J)	$E=E_1+E_2$	$E=E_1+E_2$	$E=E_1+E_2$	$E=E_1+E_2$	$E=E_1+E_2$	$E = E_1+E_2$
Equivalent Weight Me (kg)	$Me=\frac{2\cdot E}{V^2}$ $(V=\sqrt{2\cdot g\cdot L\cdot\sin\theta})$	$Me=\frac{2\cdot E}{V^2}$	$Me=\frac{2\cdot E}{V^2}$	$Me=\frac{2\cdot E}{V^2}$ $(V=\frac{R}{r}\sqrt{\frac{3\cdot g\cdot H}{2}})$	$Me=\frac{2\cdot E}{V^2}$ $(V=\omega\cdot R)$	$Me=\frac{2\cdot E}{V^2}$ $(V=\omega\cdot R,\ \omega=\frac{2\pi\cdot N}{60})$

● Explanation of code
E = Total Absorption Energy J
E_1 = Kinetic Energy J
E_2 = Thrust / Self-weight Energy J

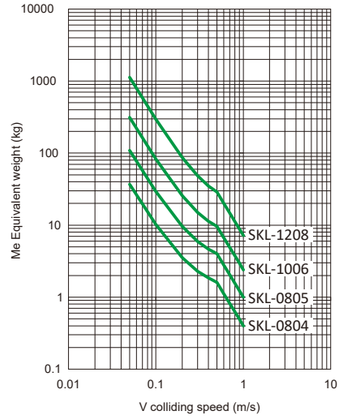
a. Kinetic Energy …… Calculate the value of E_1 according to the "Impact Pattern Diagram Examples."
b. Thrust/Self-weight Energy … Calculate the value of E_2 according to the "Impact Pattern Diagram Examples."For S (SKL stroke) in the calculation formula, select a model whose Max absorption energy exceeds E_1, and substitute S for that model number.
c. Total Absorption Energy … Then, if the calculation result exceeds Emax (Max absorption energy), select an SKL one size larger than the previously selected model number and recalculate. It is OK if the calculated value of E is less than the Emax of the model number selected here.

4 Confirmation of Equivalent Weight

a. Calculate the value of Me according to the impact pattern diagram examples.
b. From the Me (catalog value) for the model number selected in 3 and the calculation result of a, it can be used if Me under the current conditions is within the Me range of the selected model (calculated value of Me < specified value of Me).
c. If it exceeds the range of Me of the model selected in b, select an SKL one size larger and check in the same way.

Note) Equivalent weight corresponds to the weight of the workpiece when considering that even for an object moving with thrust, etc., it is all only kinetic energy. This performs load limitation under very low speed conditions.

Equivalent weight graph



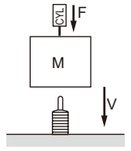
5 Confirmation of Shock Absorber Specification Range

a. Max Repetition Frequency	[times/min]	c. Ambient Temperature	[°C]
b. Maximum collision speed	[m/s]	d. Return time	[s]

Note: The value of energy that can be absorbed may change depending on the impact speed.

Selection Example

1 Clarify the equipment impact pattern

	Vertical Impact
	e. Cylinder Lower Limit Stopper
Usage Example	
Kinetic Energy E_1 (J)	$E_1=\frac{1}{2}\cdot M\cdot V^2$
Thrust/Self-weight Energy E_2 (J)	$E_2=(Mg+F)\cdot S$
Total Absorption Energy E (J)	$E=E_1+E_2$
Equivalent Weight Me (kg)	$Me=\frac{2\cdot E}{V^2}$

2 Clarify conditions/items necessary for energy calculation

(Example)

Impact Material Weight:	M=1.0 kg
Impact Speed:	V=0.5 m/s
Pushing Force:	F=70 N
aAmbient Temperature:	23°C
Return Time:	2 seconds (Time until re-impact)

3 Actually calculate energy according to impact pattern diagram examples

Calculate E_1

$E_1=\frac{1}{2}\cdot MV^2=\frac{1}{2}\times1\times0.5^2=0.13$ (J)

Temporarily select SKL-0804 from E_1 and calculate E_2

$E_2=(Mg+F)\cdot S=(1\times9.8+70)\times0.0035=0.28$ (J)

Since the allowable absorption energy of SKL-0804 is exceeded, recalculate with SKL-0805, one size larger

$E_2=(Mg+F)\cdot S=(1\times9.8+70)\times0.0045=0.36$ (J)

$E=E_1+E_2=0.13+0.36=0.49$ (J)

OK because it is below the SKL-0805 allowable absorption energy

4 Confirmation of Equivalent Weight

$Me=\frac{2E}{V^2}=\frac{2\times0.49}{0.5^2}=3.92$ (kg)

OK because it is below the allowable value of SKL-0805
Select SKL-0805

NCK

Shock Absorber, Fixed Type

Overview

Compared to SCK, shock absorber NCK is an optimal shock absorbing device for stopping workpieces with thrust at medium and low speeds. Adopting the slit orifice method, which was considered difficult in structure, achieves high absorption capacity in the low-speed range, linear soft stopping, etc. Moreover, its compact and slim design allows it to function in FA system construction with space saving.

Features

Compatible with Thrust Energy

Demonstrates power in absorbing thrust energy from cylinders, etc. Stopping is also extremely soft touch.

Smooth absorption even at low speed

Particularly excellent for low speeds, enabling smooth shock absorption.

Large absorption capacity even though compact

Despite its compact and slim design, absorption energy is large. It is a space-efficient product.

Simple Mounting

Linear Soft Stopping

Wide Variety of Models

8 types available by absorption energy. Selectable according to application.

CONTENTS

Series variation	1379
Product Introduction	1380
● NCK (Max Absorption Energy 1 to 200 J)	1392
Model Selection Guide	1398
⚠ Precautions for Use	1432

Shock Absorber

NCK Series

●Max Absorbed Energy: 1 to 200 J

RoHS

Model Number Notation

NCK - 00 - 0.7 - N1

1 Mounting type
2 Series (Max Absorption Energy)
3 Option
Model No.

1 Mounting type

Code	Content	
00	Basic type	
FA	Flange Type	

2 Series (Max Absorption Energy)

Code	Content
0.1	1J
0.3	3J
0.7	7J
1.2	12J
2.6	26J
7	70J
12	120J
20	200J

3 Option

Code	Content	
Blank	Standard	
N1	With Stop Nut	
C	With Tip Cap	

*1

*1: N1 specification products come with 3 Hexagon Nuts.

Accessory Parts Model No. Notation Method

● Flange Bracket (1 pc.)

NCK - 0.7 - FA
2

● Stop Nut+Hexagon Nut (1 pc. each)

NCK - 0.7 - N1
2

● Hexagon Nut (1 pc.)

NCK - 0.7 - NT
2

Rechargeable Battery Compatible Specification (Catalog No. CC-1226AA)

●Structure usable in rechargeable battery manufacturing processes

NCK - · · · · - P4*

* Please contact us for details.

Specifications

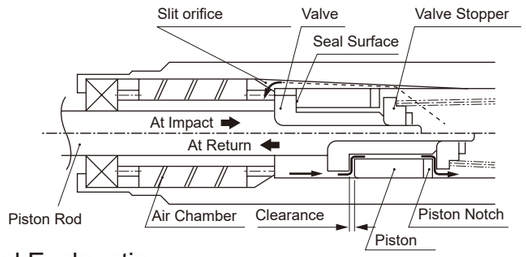
Item		NCK							
Series		0.1	0.3	0.7	1.2	2.6	7	12	20
Model / Classification		Without Adjuster Spring Return Type							
Maximum absorption energy	J	1	3	7	12	26	70	120	200
Outer diameter thread size	mm	M8×0.75		M10×1.0	M12×1.0	M14×1.5	M20×1.5	M25×1.5	M27×1.5
Stroke	mm	4.5	-	8	10	15	20	25	30
Per hour Max Absorption Energy	kJ/hour	4.8	6.3	12.6	21.6	39.0	84.0	86.4	108.0
Max Impact Speed	m/s	1.0	1.5		2.0		2.5	3.0	
Max Repetition Frequency	cycles/min	80	35	30		25	20	12	9
Ambient Temperature	°C	-10 to 80 (provided there is no freezing)							
Max Load (Resistance Force Value)	N	525	1150	2010	2750	4000	7980	10950	15380
Return Time	s	0.3 or less					0.4 or less		0.5 or less
Weight	kg	0.009	0.012	0.02	0.04	0.07	0.2	0.3	0.45
Return Spring Force	At Extension N	2.9		2.0	2.9	5.9	9.8	16.3	
	At Compression N	4.5		4.3	5.9	11.8	21.6	33.9	

Note: Shock absorber absorption capacity changes depending on speed and Ambient Temperature. The above specification values are at normal temperature.

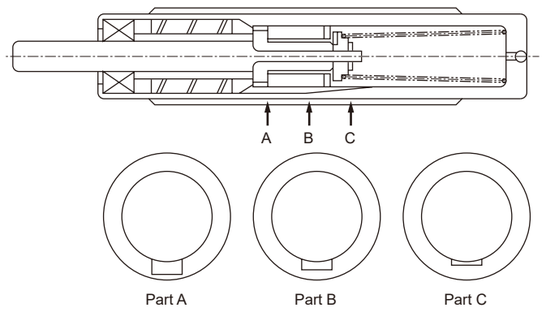
Operation Explanation

① At Impact
When the workpiece collides with the Piston Rod, the piston is simultaneously pushed in, pressurizing the oil in the tube. The pressurized oil passes through our company's unique slit orifice groove and flows towards the oil chamber with the air chamber. The piston is further pushed in by the cylinder thrust, workpiece self-weight, etc., but as the piston moves, the area of the slit orifice also gradually decreases, generating even higher resistance force. This series of operations is performed continuously, smoothly stopping the workpiece.

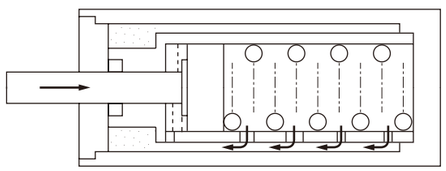
② At Return
When released from the workpiece, the piston attempts to return by the internal spring. At that time, since the piston moves from the seal surface side to the valve stopper side, the oil return flow path is opened by the piston notch. The oil passes through this flow path and slit orifice, returning to the state before workpiece impact. In this state, it will wait for the next workpiece impact.



Structural Explanation

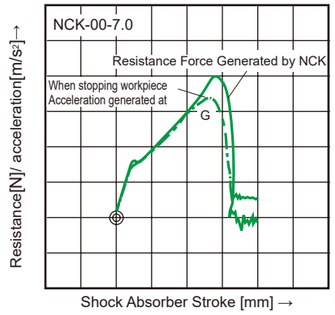


1. The slit orifice has a structure in which the orifice area changes smoothly (decreases) with the movement of the piston as shown in the figure above. This structure was known to achieve an ideal "stop" for hydraulic dampers, but it had not been adopted in other companies' products until now due to manufacturing difficulties. Our company deliberately challenged this difficult problem and established linear stopping performance as shown in Figure 1.



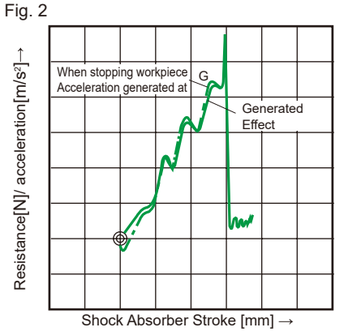
2. As a structure in which the orifice area changes with the movement of the piston, one using a double tube as shown in the figure above is common. Multiple small orifice holes are provided in the inner pipe, and the orifice holes are closed as the piston moves. In this structure, performance is greatly affected by hole position accuracy, and also, as shown in Figure 2, the resistance force changes for each orifice, resulting in characteristics lacking smoothness.

Fig. 1

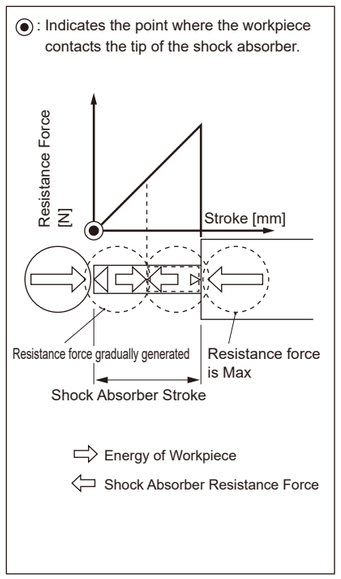


● Characteristic wave form of slit orifice integrated with NCK Series

Fig. 2

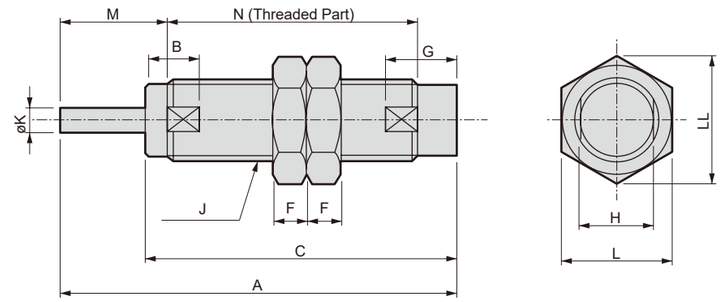


● Characteristic waveform attained with conventional porous orifice

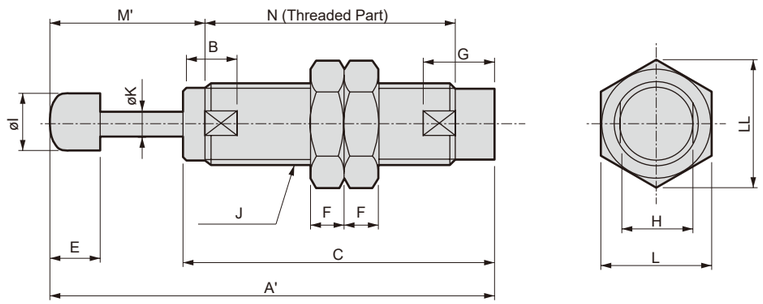


Dimensional Drawings

● Standard (NCK-□□-□□)



● Capped (NCK-□□-□□-C)



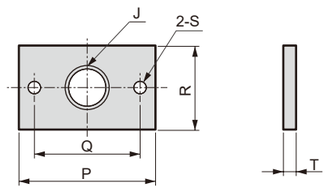
Code	Basic Type (00)															
Model No.	A	A'	B	C	E	F	G	H	I	J	K	L	LL	M	M'	N
NCK-00-0.1	34.5	40.5	4	29.5	6	4	7.5	7	6	M8×0.75	2.8	12	13.9	6	12	23
NCK-00-0.3	45.5	51.5	7.5	39	6	4	8	7	6	M8×0.75	2.8	12	13.9	11	16.5	29.0
NCK-00-0.7	50	57	7.5	41.5	7	4	9	9	8	M10×1.0	3	14	16.2	13	20	31
NCK-00-1.2	57.5	65	8.5	47	7.5	5	11	11	10	M12×1.0	3.5	17	19.6	15	22.5	35.5
NCK-00-2.6	86	96	10.5	70.5	10	5.5	14	13	12	M14×1.5	5	19	21.9	20	30	58
NCK-00-7	98.5	109.5	12.5	78	11	8	18	19	16	M20×1.5	6	27	31.2	25	36	63.5
NCK-00-12	129	142	15.5	103.5	13	10	23	24	22	M25x1.5	8	32	37	30	43	87
NCK-00-20	141	154	15.5	110.5	13	10	25	24	22	M27x1.5	8	32	37	35	48	92

Dimensional Drawings with Option

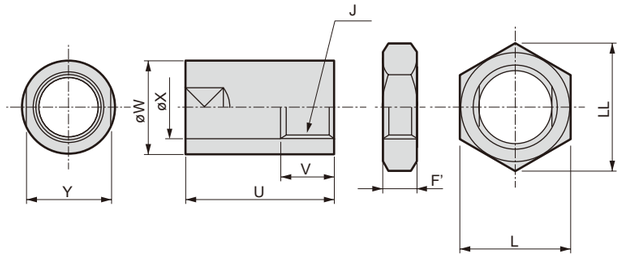
Flange (Mounting Bracket) Stop Nut

● NCK- 0.1 / 0.3 / 0.7 / 1.2 -□□

Flange (FA)
Material: Steel

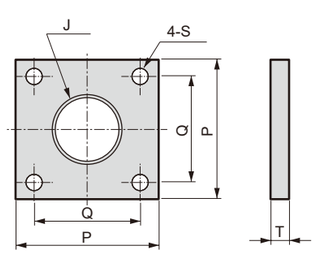


Stop Nut (N1)
Material: Steel

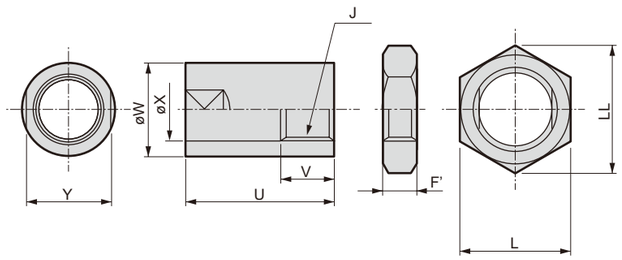


● NCK- 2.6 / 7 / 12 / 20 -□□

Flange (FA)
Material: Steel



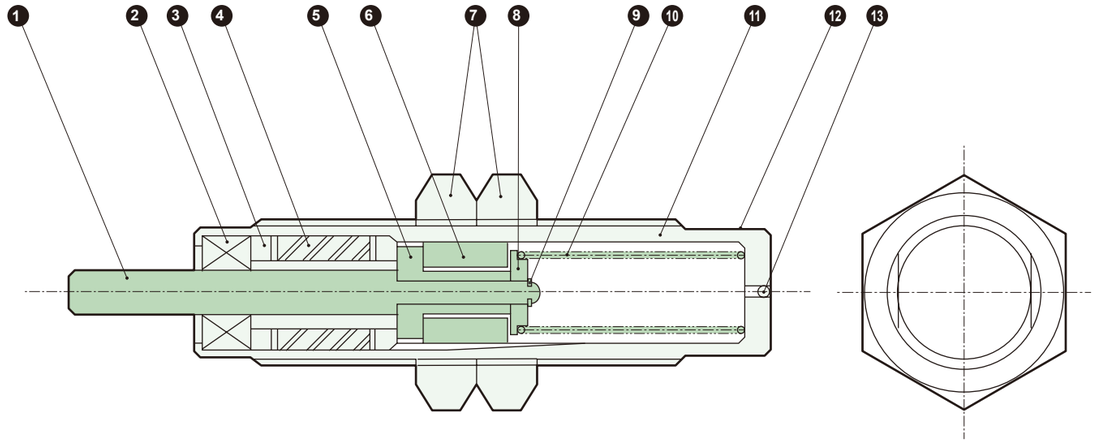
Stop Nut (N1)
Material: Steel



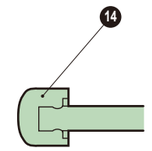
Code	Flange (FA)						Weight	Stop Nut (N1)									Weight
Model No.	J	P	Q	R	S	T	(g)	F'	J	L	LL	U	V	W	X	Y	(g)
NCK-0.1-□□	M8×0.75	42	30	20	5.5	2.3	14	4	M8×0.75	12	13.9	15	8	14	9	12	13
NCK-0.3-□□	M8×0.75	42	30	20	5.5	2.3	14	4	M8×0.75	12	13.9	15	8	14	9	12	13
NCK-0.7-□□	M10×1.0	42	30	20	5.5	2.3	14	4	M10×1.0	14	16.2	17	10	15	11	13	15
NCK-1.2-□□	M12×1.0	46	34	20	5.5	3.6	22	5	M12×1.0	17	19.6	23	10	19	13	17	34
NCK-2.6-□□	M14×1.5	52	38	–	6.5	6	115	5.5	M14×1.5	19	21.9	26.5	10	20	15	17	37
NCK-7-□□	M20×1.5	52	38	–	6.5	6	108	8	M20×1.5	27	31.2	36.5	15	26	21	24	77
NCK-12-□□	M25x1.5	52	38	–	6.5	6	100	10	M25x1.5	32	37	35	15	32	26	30	112
NCK-20-□□	M27x1.5	52	38	–	6.5	6	100	10	M27x1.5	32	37	45.5	15	35	28	32	155

Internal Structure Diagram/Material

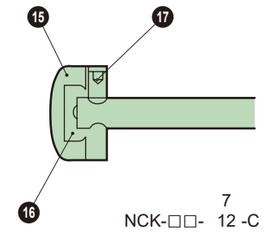
● Basic Type (Without Tip Cap)



● With Tip Cap



NCK-□□- 0.1 / 0.3 / 0.7 / 1.2 / 2.6 -C



NCK-□□- 7 / 12 / 20 -C

Do not disassemble

Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Rod	Steel	Industrial Hard Chrome Plating	10	Spring	Piano Wire	
2	Oil Seal	Special Nitrile Rubber		11	Damper Case	Steel	Chromium plating
3	Rod Guide	Copper Alloy		12	Label	Polyester Film	
4	Air Chamber	Nitrile Rubber		13	Ball	Alloy Steel	
5	Valve	Steel		14	Damper Cushion	Polyamide	Black
6	Piston	Cast Iron		15	Damper Cushion	Polyester	Black
7	Hexagon Nut	Steel	Zinc Plating	16	Cushion Stopper	Steel	Zinc Plating
8	Valve Stopper	Steel		17	Hexagon Socket Set Screw	Steel	
9	E-type Retaining Ring	Steel	Zinc Plating				

Shock Absorber Model Selection Guide (1)

1 Clarify the equipment impact pattern

- Horizontal Motion
  - a. Simple Horizontal Impact
  - b. Impact with Cylinder Thrust
  - c. Impact with Motor Driving Force
- Vertical Motion
  - d. Impact due to Free Fall
  - e. Impact with Cylinder Thrust (Lowering)
  - f. Impact with Cylinder Thrust (Ascending)
- Inclined Motion
  - g. Impact due to Free Sliding
  - h. Impact with Cylinder Thrust (Lowering)
  - i. Impact with Cylinder Thrust (Ascending)
- Oscillating Motion Rotation
  - j. Impact due to Free Oscillation Fall
  - k. Impact with Torque from Motor, etc. (Oscillation)
  - l. Impact with Torque from Motor, etc. (Rotation)

Note: Refer to "Collision Pattern Diagram Examples".

2 Clarify conditions/items necessary for energy calculation

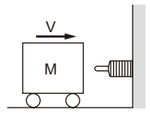
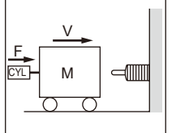
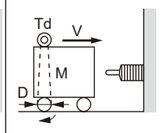
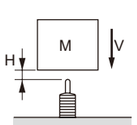
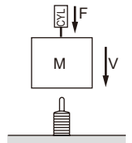
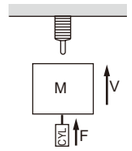
E = Total Absorption Energy (J)
E_1 = Kinetic Energy (J)
E_2 = Thrust / Self-weight Energy (J)

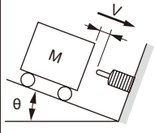
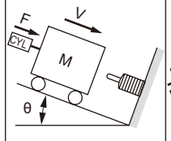
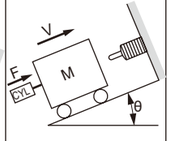
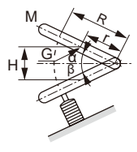
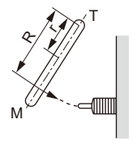
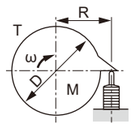
M = Impact Weight (kg)
V = Impact Speed (m/s)
S = NCK Stroke (m)
F = Pushing Force (N)
g = Acceleration of Gravity 9.8 m/s²
ω = Angular Velocity (rad/s)
J = Moment of Inertia (kg·m²)
D = Diameter (m)
N = Rotational Speed (rpm)
Me = Equivalent Weight (kg)

H = Fall Height (m)
T = Torque (N·m)
Td = Motor Starting Torque (N·m)
K = Reduction Ratio
θ, α, β = Inclination Angle (deg)

L = Impact Object Travel Distance (m) (Inclined Free Fall)
R = Distance from Center of Rotation to Impact Point (m)
r = Distance from Center of Rotation to Center of Gravity (m)
G = Center of Gravity Position

Impact Pattern Diagram Examples

	Horizontal Impact			Vertical Impact		
	a. Simple Horizontal Impact	b. When there is cylinder pushing force	c. When there is motor pushing force	d. Free Fall	e. Cylinder Lower Limit Stopper	f. Cylinder Upper Limit Stopper
Usage Example						
Kinetic Energy E_1 (J)	$\frac{1}{2}\cdot M\cdot V^2$	$\frac{1}{2}\cdot M\cdot V^2$	$\frac{1}{2}\cdot M\cdot V^2$	$\frac{1}{2}\cdot M\cdot V^2$	$\frac{1}{2}\cdot M\cdot V^2$	$\frac{1}{2}\cdot M\cdot V^2$
Thrust/Self-weight Energy E_2 (J)	———	F·S	$2\frac{K}{D}\cdot Td\cdot S$	M·g·S	(M·g+F)·S	(F−M·g)·S
Total Absorption Energy E (J)	$E = E_1$	$E=E_1+E_2$	$E=E_1+E_2$	$E = E_1+E_2$	$E=E_1+E_2$	$E=E_1+E_2$
Equivalent Weight Me (kg)	Me = M	$Me=\frac{2\cdot E}{V^2}$	$Me=\frac{2\cdot E}{V^2}$	$Me=\frac{2\cdot E}{V^2}$ $(V=\sqrt{2\cdot g\cdot H})$	$Me=\frac{2\cdot E}{V^2}$	$Me=\frac{2\cdot E}{V^2}$

	Inclined Impact			Oscillating Impact		Rotational Impact
	g. Free Fall	h. When there is cylinder pushing force	i. When there is cylinder pushing force	j. Free Fall	k. When there is torque from motor, etc.	L. When there is torque from motor, etc.
Usage Example						
Kinetic Energy E_1 (J)	$\frac{1}{2}\cdot M\cdot V^2$	$\frac{1}{2}\cdot M\cdot V^2$	$\frac{1}{2}\cdot M\cdot V^2$	M·g·H	$\frac{J\cdot\omega^2}{2}$ or $\frac{1}{2}\cdot M\cdot V^2$	$\frac{J\cdot\omega^2}{2}=\frac{M\cdot D^2\cdot\omega^2}{16}$
Thrust/Self-weight Energy E_2 (J)	M·g·S·sinθ	(M·g·sinθ+F)·S	(F−M·g·sinθ)·S	$\frac{r}{R}\cdot M\cdot g\cdot S$	$\frac{T}{R}\cdot S$	$\frac{T}{R}\cdot S$
Total Absorption Energy E (J)	$E=E_1+E_2$	$E=E_1+E_2$	$E=E_1+E_2$	$E = E_1+E_2$	$E=E_1+E_2$	$E = E_1+E_2$
Equivalent Weight Me (kg)	$Me=\frac{2\cdot E}{V^2}$ $(V=\sqrt{2\cdot g\cdot L\cdot\sin\theta})$	$Me=\frac{2\cdot E}{V^2}$	$Me=\frac{2\cdot E}{V^2}$	$Me=\frac{2\cdot E}{V^2}$ $(V=\frac{R}{r}\sqrt{\frac{3\cdot g\cdot H}{2}})$	$Me=\frac{2\cdot E}{V^2}$ $(V=\omega\cdot R)$	$Me=\frac{2\cdot E}{V^2}$ $(V=\omega\cdot R,\ \omega=\frac{2\pi\cdot N}{60})$

3 Confirm items in shock absorber specification range

a. Max Repetition Frequency [times/min]
b. Maximum collision speed [m/s]
c. Ambient Temperature [°C]
d. Return time [s]

Note: The value of energy that can be absorbed may change depending on the impact speed. Refer to P. 1401, Graph 5.

4 Actually calculate energy according to "Impact Pattern Diagram Examples"

● Code Explanation
E = Total Absorption Energy J
E_1 = Kinetic Energy J
E_2 = Thrust / Self-weight Energy J

a. Kinetic Energy .....
b. Thrust/Self-weight Energy ...
c. Total Absorption Energy .....

Calculate the value of E_1 according to the "Impact Pattern Diagram Examples." Calculate the value of E_2 according to "Impact Pattern Diagram Examples.". For S (stroke of NCK) in the formula, select a model whose Max energy absorption exceeds E_1, and use S per model No.
If after that the calculation result exceeds Emax (Max energy absorption), select one size larger NCK than the previously selected model No., and recalculate. It is OK if the calculated value of E is less than the Emax of the model number selected here.

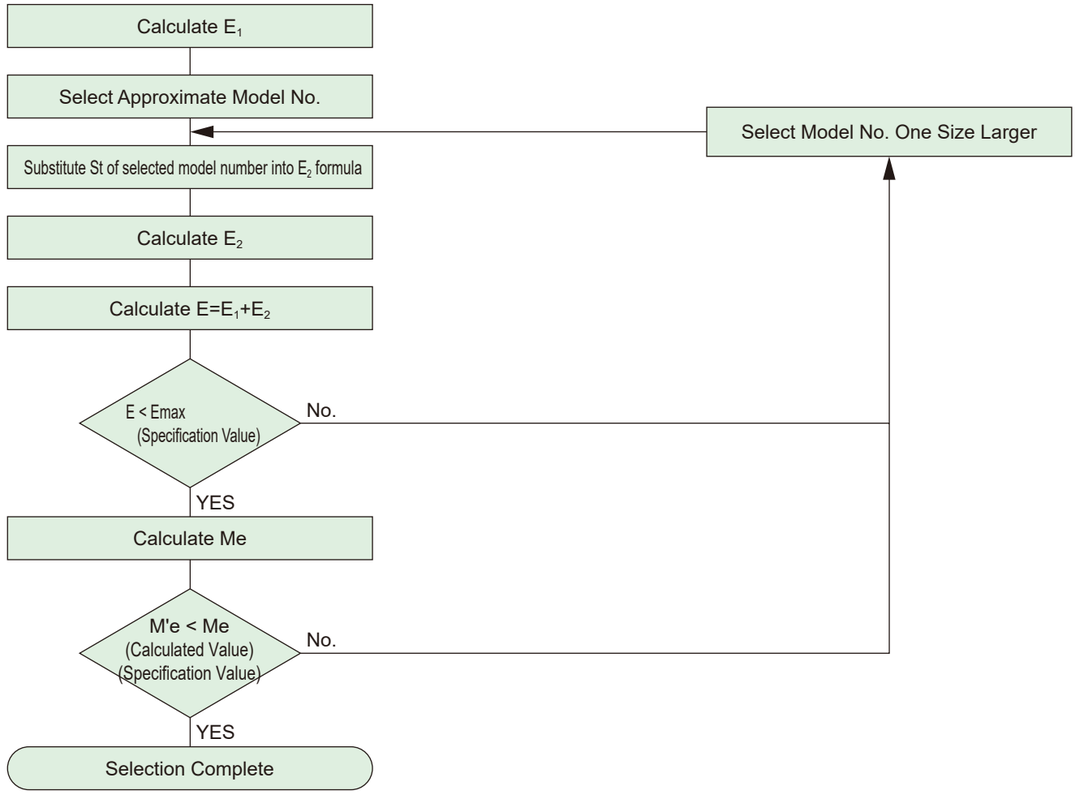
5 Confirm Equivalent Weight

Me = Equivalent Weight [kg]

Note: Equivalent mass corresponds to the mass of the workpiece when considering that even an object moving with thrust etc. is all kinetic energy only. Using only the energy calculation formula, the workpiece weight becomes abnormally large under very low speed conditions, so load limitation is performed using equivalent weight.

a. Calculate the value of Me according to the impact pattern diagram examples.
b. Based on the results of calculating Me (catalog value) and a for the model number selected in 4, it can be used if Me under these conditions is within the Me range of the selected model (calculated Me value < Me specification value).
c. If it exceeds the range of Me of the model selected in b, select an NCK one size larger and check in the same way.
Note) Equivalent weight (Me) is described on P. 1401 (Graph 4).

6 The calculation for 4 and 5 can be summarized as a flowchart as follows



Shock Absorber Model Selection Guide (2)

In addition to the method of performing all calculations as in (1) for shock absorber model selection, there is also a method of determining by graph. If it is not necessary to grasp intermediate values such as energy values during calculation, using this graph allows for very efficient model selection.

Conditions of this diagram example: Horizontal collision with thrust

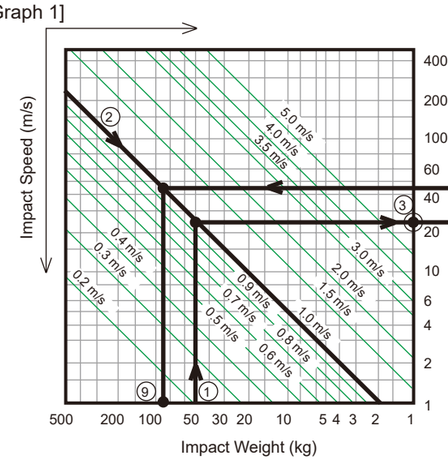
m=50 kg, V=1.0 m/s

Cylinder Bore ø50 Supply Pressure = 0.5 MPa

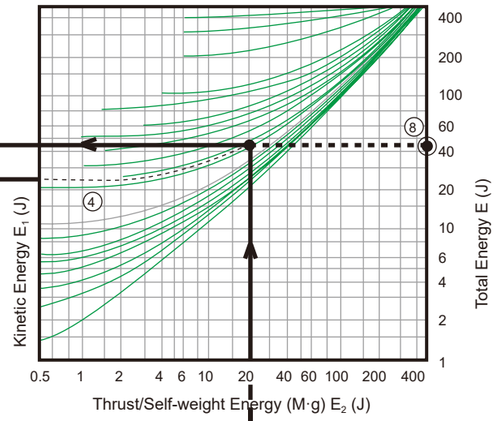
Energy Calculation Graph

● Thrust applies at the horizontal collision

[Graph 1]



[Graph 2]



a) Determine the colliding weight M [kg]...①

b) Colliding speed V [m/s]...②

c) Point of intersection between M and V is kinetic energy E_1 [J]. ...③

d) Extend ③ to [Graph 2], and refer to the curve in the figure to draw a similar curve. (Dotted Line) ...④

e) Next, if thrust applies, determine thrust F [N] (from inner diameter and pressure of cylinder) by the right end chart of [Graph 3] ...⑤

f) Determine model No. of NCK according to stroke and Max energy absorption. ...⑥

(Select a model number whose Max absorption energy exceeds E_1 obtained from ③.)

g) The point of intersection between F and NCK model No. shows the thrust/self-weight energy E_2 [J]. ...⑦

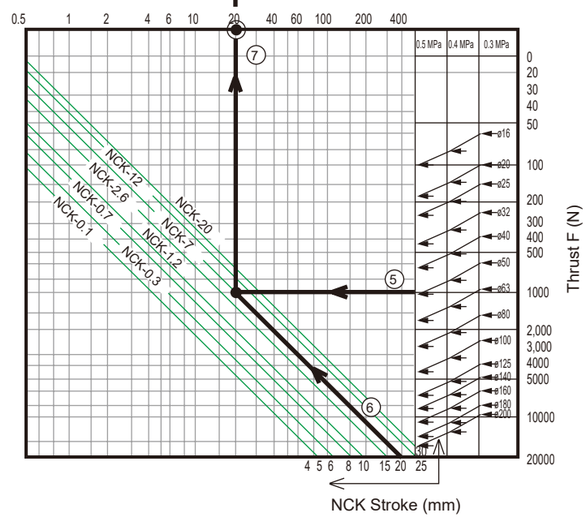
h) Extend point Ⓑ and connect it with [Graph 2]; the intersection ⑧ with curve ④ is the total energy E(=E_1+E_2)[J]. ...⑧

Here, if value E exceeds the selected NCK Emax (Max absorbed energy) at (f), select an NCK model No. one size larger again, and then find E with the same procedure.

i) Here, if "Ⓒ" and ⑧ are extended to [Graph 1], the point of intersection ⑨ with V (m/s) represents the equivalent weight Me. ...⑨

Here, confirm that the equivalent weight is within the range of the specified value) [Graph 4]. (If Me exceeds the specified value, return to (f) and repeat the same procedure.)

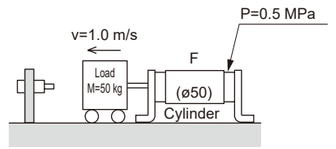
[Graph 3]



Selection Example

Let's try selecting a shock absorber using an actual example.

Example Problem: Select a shock absorber that smoothly stops load M under the conditions shown in the left figure.



Frequency 10 cycle/Min (Refer to equipment indoors.)

1 The equipment impact pattern corresponds to "b".

2 Summarize the conditions/items necessary for calculation.

a. Colliding object weight M=50 kg

b. Colliding speed V=1.0 m/s

c. Cylinder thrust $F=\pi/4\times50^2$ mm×0.5 MPa=981.7 N

3 Confirm the specification range.

a. Frequency 10 times/min ..... NG because Max repetition frequency of NCK-20 is 9 times/min [This means it will be limited to models NCK-12 or less.]]

b. Impact Speed 1.0 m/s ..... All models usable

c. Ambient Temperature: Indoor equipment ... All models usable

d. Return Time: No specific restriction ... All models usable

4 Actually calculate the energy.

● From pattern figure example "b"

a. Kinetic Energy: $E_1=\frac{1}{2}\cdot m\cdot V_2=\frac{1}{2}\times50$ [kg] $\times1.0^2$ [m/s] =25(J)
Here, since E_1 alone was 25 J, NCK-2.6 [Emax=26J] (St = 15 mm) can be temporarily selected.

b. Thrust Energy: E_2 = F×S=981.7 [N] ×0.015 [m] = 14.7 [J]

c. Total Absorption Energy: E=E_1+E_2=25 [J] +14.7 [J] =39.7 [J]
Recalculate with one size larger NCK-7, since this E = 39.7 [J] cannot be absorbed with the NCK-2.6 provisionally selected earlier.

b'. E_2=F×S=981.7 [N] ×0.02 [m] =19.6 [J]

c'. E=E_1+E_2=25 [J] +19.6 [J] =44.6 [J]
The E = 44.6 [J] obtained here can be absorbed by NCK-7, so proceed to confirm the equivalent mass of the impact object.

5 Confirm the equivalent weight.

● From pattern figure example "b" the same as 4

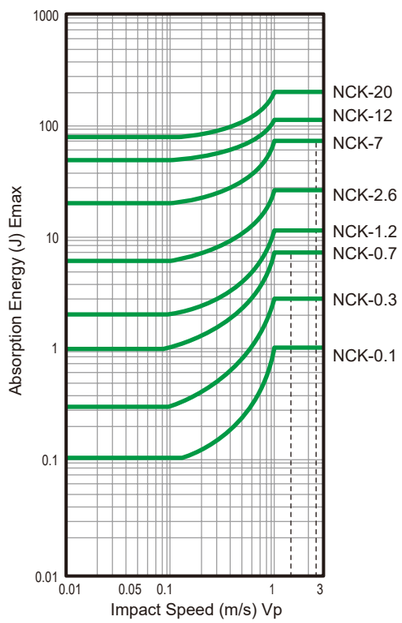
a. Equivalent Weight $Me=\frac{2\cdot E}{V^2}=\frac{2\times44.6\ [J]}{1.0^2\ [m/s]}$=89.2 kg

b. NCK-7 Me is 150 [kg], larger than the calculated equivalent weight. Therefore, NCK-7 is OK for use under these conditions.

Equivalent Weight/Absorption Energy Impact Speed Characteristic Graph

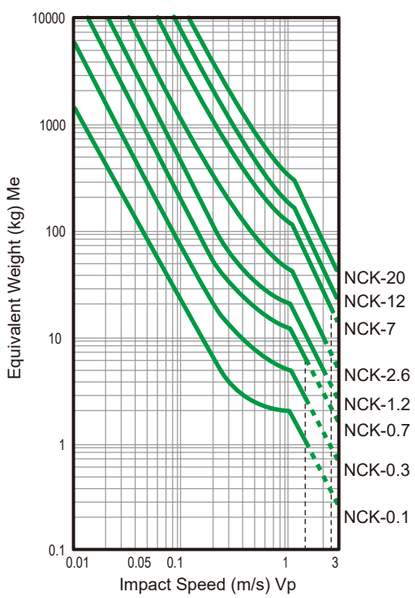
[Graph 5]

Vp-Emax Characteristics (Impact Speed - Absorption Energy)



[Graph 4]

Vp-Me Characteristics (Impact Speed - Equivalent Weight)



Related Components

SCK

Shock Absorber, Adjustable Type

Overview

Absorbs impact force with a unique mechanism. Adjustable shock absorber that extends the life of facilities/equipment and enhances production efficiency. Compared to NCK, shock absorber SCK is an optimal shock absorbing device for stopping workpieces that move at high speed or free fall.

Features

Safely stops moving objects. Increases manufacturing cycle. Extends the life of machinery. Improves the environment of machinery and prevents noise. Prevents machine breakdowns.

CONTENTS

Series variation 1379
Product Introduction 1380
● SCK (Max Absorption Energy 0.049 to 588 J) 1404
Model Selection Guide 1409
⚠ Precautions for Use 1432

Shock Absorber
SCK Series

●Max Absorbed Energy: 0.049 to 588 J

RoHS

Model Number Notation

SCK - 00 - 0.3 - N1

Model No. ❶Mounting type ❷Series (Max Absorption Energy) ❸Option

❶Mounting type

Code	Content	
00	Basic type	
FA	Flange Type	

❷ Series (Max Absorption Energy)

Code	Content	Code	Content
0.005	0.049J	12	118J
0.01	0.098J	20	196J
0.03	0.294J	30	294J
0.3	2.94J	40	392J
0.6	5.88J	60	588J
1.2	11.8J	0.25M	3.43J
2.6	25.5J	0.5M	11.8J
6.5	63.7J	1.0M	74.5J
8	78.4J		

❸ Option

Code	Content	
Blank	Standard	
N1	With Stop Nut	

Accessory Parts Model No. Notation Method

● Flange bracket (1 pc.)

SCK - 0.01 - FA

❷

● Stop nut + Hexagon Nut (each 1 pc.)

SCK - 0.01 - N1

❷

● Hexagon Nut (1 pc.)

SCK - 0.01 - NT

❷

Specifications

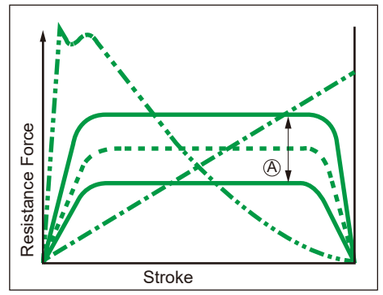
Item		SCK																
Series		0.005	0.01	0.03	0.3	0.6	1.2	2.6	6.5	8	12	20	30	40	60	0.25M	0.5M	1.0M
Model / Classification		Without Adjuster Spring Return Type			Adjustable spring return type											Adjustable spring return type (Large thread pitch)		
Maximum absorption energy J		0.049	0.098	0.294	2.94	5.88	11.8	25.5	63.7	78.4	118	196	294	392	588	3.43	11.8	74.5
Outer diameter thread size	mm	M10×1.0	M12×1.0	M16×1.0	M20×1.0		M25×1.5		M30×1.5		M40×1.5				M45×1.5	M14×1.5	M20×1.5	M27×3.0
Stroke	mm	7	10				15		25			40	60	70		10	15	30
Max Absorption Energy per Hour	kJ/hour	0.135	0.27	0.98	8.1	10.8	21.6	39	78	86.4		108	126	120	144	9.2	21.2	80.5
Max Impact Speed	m/s	1.0				1.5	2.0		2.5		3.0				4.0	1.0	2.0	2.5
Max Repetition Frequency	cycles/min	45				30		25	20	18	12	9	7	5	4	45	30	18
Ambient Temperature	°C	-10 to 80 (provided there is no freezing)																
Max Load (Resistance Force Value)	N	39	59	147	540	1000	1400	3100	4600	5700	8600	9000		10000	15000	630	1440	4560
Return Time	s	0.3 or less			0.4 or less				0.5 or less			0.6 or less				0.4 or less		0.5 or less
Weight	kg	0.02	0.04	0.07	0.2		0.32		0.63		1.17	1.25	1.39	1.45	2.05	0.05	0.13	0.39
Return Spring Force	At Extension N	1.2	2.0	5.9	5.9		6.9		12.0			20.0			29.0	3.9	5.5	7.6
	At Compression N	2.6	5.0	10.5	11.3		17.2		30.0		39.0	51.0	68.0	75.0	84.0	8.4	11.5	21.0

Note: Use with a minimum absorption energy of 1/5 or more of the maximum absorption energy.

Shock Absorber and Other

As shown in the right figure

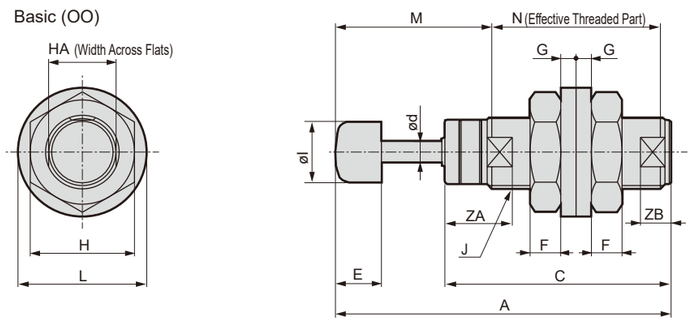
- The spring accumulates energy and functions as spring return force at the stroke end.
- Cylinder cushion (single orifice connected to hydraulic cylinder) increases resistance sharply at collision and does not decelerate smoothly.
- Shock absorbers without adjuster have a preset level of energy that is absorbed and so working conditions are limited (SCK-00-0.03 or below).
- Shock absorbers with adjuster have roughly constant resistance throughout the stroke, uniformly decelerating the object's speed. Adjustment allows the curve to move parallelly up and down, enabling absorption of impact energy without excess or deficiency.



Dimensional Drawings

●SCK-00-0.005
0.01
0.03

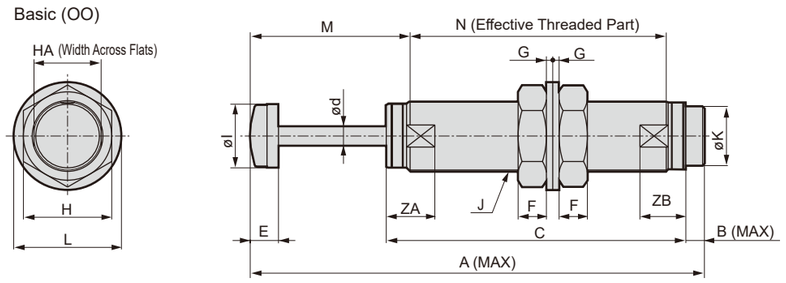
Basic (OO)



Code	Basic (OO)														
Model No.	A	C	E	F	G	H	I	J	L	M	N	d	HA	ZA	ZB
SCK-00-0.005	41.5	27	7	4	2	14	8	M10×1.0	18	21.3	18.5	3.0	9	9	4
SCK-00-0.01	55	37	7.5	5	2.5	17	10	M12×1.0	21	25.5	27.5	3.5	11	11	5
SCK-00-0.03	70	49.5	10	6.5	2.5	22	14	M16×1.0	27	28.3	39.5	4.0	15	12	6

● SCK-00-0.3 to 60, 0.25M to 1.0M
(Screw pitch Large)

Basic (OO)



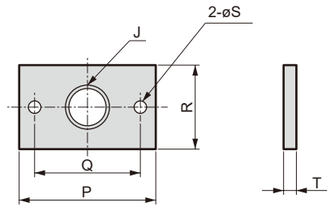
Code	Basic (OO)																
Model No.	A	B	C	E	F	G	H	I	J	K	L	M	N	d	HA	ZA	ZB
SCK-00-0.3	94.6	5.8	66.8	11	8	2.9	27	16	M20×1.0	13.5	33	33.5	45.7	5	17	17.5	16
SCK-00-0.6	94.6	5.8	66.8	11	8	2.9	27	16	M20×1.0	13.5	33	33.5	45.7	5	17	17.5	16
SCK-00-1.2	122.5	7.5	86	13	10	2.9	32	22	M25x1.5	19.5	39	40.5	65.4	6	24	21	18
SCK-00-2.6	122.5	7.5	86	13	10	2.9	32	22	M25x1.5	19.5	39	40.5	65.4	6	24	21	18
SCK-00-6.5	157.4	7.9	109.5	14	12	3.6	41	27	M30×1.5	23.5	50	51.5	89.4	8	27	21.5	19.5
SCK-00-8	157.4	7.9	109.5	14	12	3.6	41	27	M30×1.5	23.5	50	51.5	89.4	8	27	21.5	19.5
SCK-00-12	175.6	10.5	123.1	16	16	3.6	50	36	M40x1.5	33.5	61	55.5	98.5	11	38	27.5	26
SCK-00-20	205.6	10.5	138.1	16	16	3.6	50	36	M40x1.5	33.5	61	70.5	113.5	11	38	27.5	26
SCK-00-30	257.1	10.5	169.6	16	16	3.6	50	36	M40x1.5	33.5	61	90.5	145	11	38	27.5	26
SCK-00-40	277.1	10.5	179.6	16	16	3.6	50	36	M40x1.5	33.5	61	100.5	155	11	38	27.5	26
SCK-00-60	298.4	10.9	198.6	18	18	4.5	55	42	M45×1.5	37.5	67	102.9	172.5	12.5	43.5	31.5	30
SCK-00-0.25M	96.6	6.5	69.1	10	5.5	2.5	19	12	M14×1.5	10	24	26.1	53.5	4	12.4	10	15.5
SCK-00-0.5M	111.4	6.5	77.9	11	8	2.9	27	16	M20×1.5	13.5	33	33	60.8	5	17	12	17.5
SCK-00-1.0M	161.6	7.7	109.9	13	10	2.9	32	22	M27×3.0	19.5	39	50.5	90.3	6	24	15	22

Dimensional Drawings with Option

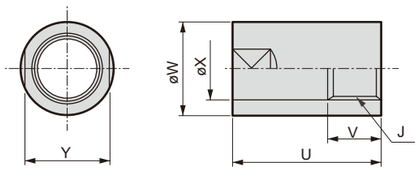
Flange (Mounting Bracket) Stop Nut

●SCK-0.005-□□
0.01
0.03

Flange (FA)

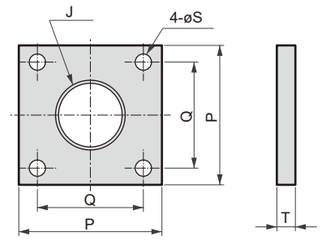


Stop Nut (N1)

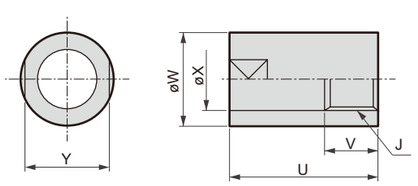


● SCK-0.3 to 60, 0.25M to 1.0M-□□
(Screw pitch: Large)

Flange (FA)



Stop Nut (N1)



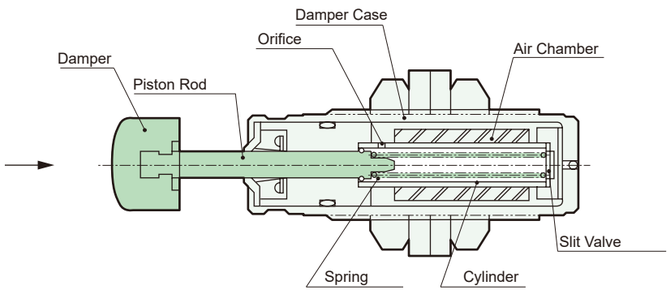
Code	Flange (FA)						Weight	Stop Nut (N1)						Weight
Model No.	J	P	Q	R	S	T	(g)	J	U	V	W	X	Y	(g)
SCK-0.005-□□	M10×1.0	42	30	20	5.5	2.3	14	M10×1.0	17	10	15	11	13	12
SCK-0.01-□□	M12×1.0	46	34	20	5.5	3.6	22	M12×1.0	23	10	19	13	17	19
SCK-0.03-□□	M16×1.0	52	40	32	5.5	4.5	51	M16×1.0	23	10	22	17	19	30
SCK-0.3-□□	M20×1.0	52	38	-	6.5	6	107	M20×1.0	32.5	15	26	21	24	52
SCK-0.6-□□	M20×1.0	52	38	-	6.5	6	107	M20×1.0	32.5	15	26	21	24	52
SCK-1.2-□□	M25x1.5	52	38	-	6.5	6	100	M25x1.5	35	15	32	26	30	82
SCK-2.6-□□	M25x1.5	52	38	-	6.5	6	100	M25x1.5	35	15	32	26	30	82
SCK-6.5-□□	M30×1.5	66	48	-	8.5	6	163	M30×1.5	40	15	40	31	36	162
SCK-8-□□	M30×1.5	66	48	-	8.5	6	163	M30×1.5	40	15	40	31	36	162
SCK-12-□□	M40x1.5	84	64	-	10.5	9	390	M40x1.5	69.5	20	50	41	46	362
SCK-20-□□	M40x1.5	84	64	-	10.5	9	390	M40x1.5	69.5	20	50	41	46	362
SCK-30-□□	M40x1.5	84	64	-	10.5	9	390	M40x1.5	69.5	20	50	41	46	362
SCK-40-□□	M40x1.5	84	64	-	10.5	9	390	M40x1.5	69.5	20	50	41	46	362
SCK-60-□□	M45×1.5	84	64	-	10.5	9	390	M45×1.5	70	20	60	46	55	649
SCK-0.25M-□□	M14×1.5	52	38	-	6.5	6	115	M14×1.5	26.5	10	20	15	17	30
SCK-0.5M-□□	M20×1.5	52	38	-	6.5	6	108	M20×1.5	36.5	15	26	21	24	59
SCK-1.0M-□□	M27×3.0	52	38	-	6.5	6	106	M27×3.0	45.5	15	35	28	32	134

Internal Structure Drawing and Operating Explanation

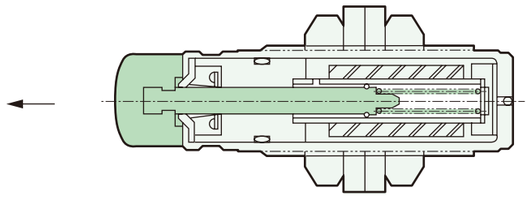
●SCK-00-0.005
00-0.01
00-0.03

Do not disassemble

At Impact



At Return



At Impact

The impact force applied to the damper pushes the Piston Rod, pressurizes the oil in the cylinder, and the generated hydraulic pressure absorbs the shock when flowing into the damper case via the orifice. The oil flowing into the damper case pressurizes the air chamber, reducing the volume of the air chamber itself.

Note) This product is structured so that internal pressure increases due to workpiece speed at impact, generating resistance force and absorbing energy. Therefore, although the resistance force may feel low when pushed with fingers, there is no abnormality in the product.

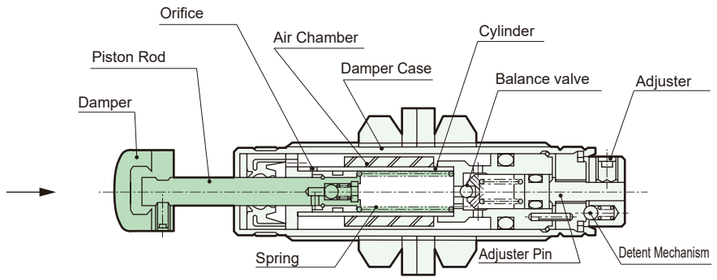
At Return

When the impacted workpiece is gone, the Piston Rod extends due to the built-in spring, and simultaneously, the slit valve (check valve) opens due to the pressure in the air chamber. When oil finishes flowing into the inner pipe, the slit valve closes.

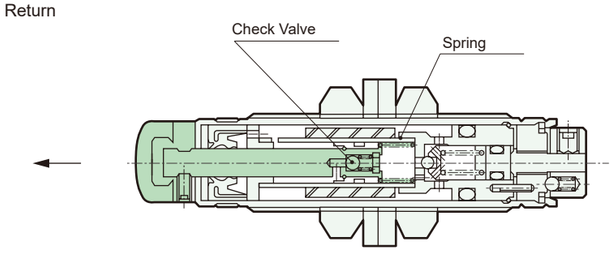
● SCK-00-0.3 to 60

Do not disassemble

At Impact



At Return



At Impact

The impact force applied to the damper pushes the piston via the Piston Rod, pressurizes the oil in the cylinder, and the generated hydraulic pressure absorbs the shock when flowing into the damper case via the orifice and balance valve. Turning the adjuster clockwise moves the adjust pin, strengthens the balance valve spring, reduces oil flow, and withstands large impact forces.

Note) This product is structured so that internal pressure increases due to workpiece speed at impact, generating resistance force and absorbing energy. Therefore, although the resistance force may feel low when pushed with fingers, there is no abnormality in the product.

At Return

When the impacted workpiece is gone, the Piston Rod extends due to the built-in spring, and simultaneously, the check valve opens due to the pressure in the air chamber. When oil finishes flowing into the inner pipe, the check valve closes.

Model selection guide

Setting of Operating Conditions

When selecting a shock absorber, please clarify the following operating conditions.

① Payload (kg)
② Impact speed at the moment of hitting the shock absorber (m/s)
③ If there is an external force applied to the load, its thrust (kgf)

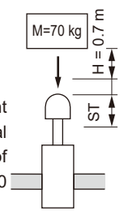
Code

D = Cylinder Diameter (mm)
E = Kinetic Energy (J)
P = Operating Pressure (MPa)
K = Radius of Gyration (m)(Distance from load center to center of rotation)
ω = Impact Angular Velocity (rad/s)
I = Moment of Inertia (kg·m^2)
F = Thrust (N)
T = Torque (N·m)
V = Impact Speed (m/s)
H = Height (m)
St = Shock Absorber Stroke (m)
M = Workpiece Weight (kg)
g = Gravitational Acceleration 9.8 m/s^2

Calculation Example

① Vertical Fall Motion (Free Fall)

$E=\frac{1}{2}\cdot M\cdot V^2+Mg\cdot St$



When a workpiece with weight (M) of 70 kg undergoes vertical fall motion from a height (H) of 0.7 m, consider if SCK-00-60 can be used.

Determine the Max impact speed under these conditions.

$V=\sqrt{2\cdot g\cdot H}=\sqrt{19.6\times H}$

$V=\sqrt{19.6\times 0.7}=3.7$ m/s < 4 m/s

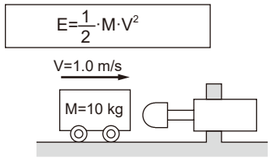
(SCK-00-60)

$E=\frac{1}{2}\times 70\times 3.7^2+70\times 9.8\times 0.07=527.2$

From the impact speed characteristic graph of absorption energy amount in Graph 1, the absorption energy of SCK-00-60 is larger. Therefore, energy can be absorbed by SCK-00-60.

② Horizontal Motion (Inertial Motion)

$E=\frac{1}{2}\cdot M\cdot V^2$



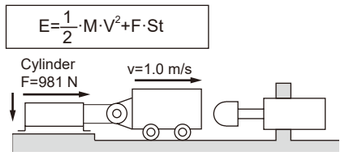
When a workpiece with weight (M) of 10 kg has an impact speed (V) of 1.0 m/s,

$E=\frac{1}{2}\times 10\times(1.0)^2=5.0$ J

SCK-00-1.2 can be used.

③ Horizontal Motion (With Thrust)

$E=\frac{1}{2}\cdot M\cdot V^2+F\cdot St$



When moving the workpiece from calculation ② with a pneumatic cylinder (D)ø50 mm at air pressure (P) 0.5 MPa, the pneumatic cylinder thrust is

$F=\frac{\pi}{4}\times D^2\times P=\frac{\pi}{4}\times 50^2\times 0.5=981$ N

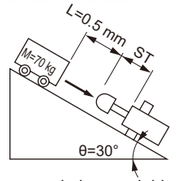
Consider if SCK-00-6.5 can be used.

$E=\frac{1}{2}\times 10\times(1.0)^2+981\times 0.025$

≈ 29.5

Therefore, energy can be absorbed with SCK-00-6.5.

④ Inclined Fall Motion



$E=(\frac{1}{2}MV^2)+(Mg\cdot St\cdot\sin\theta)$

When a workpiece weighing 70 kgf undergoes inclined fall motion at 30°, consider if SCK-00-40 can be used. Determining the Max impact speed under the same conditions

$V=\sqrt{19.6\times H(H=0.5\times\sin 30°)}$

$=\sqrt{19.6\times 0.5\times\sin 30°}$

$= 2.2$ m/s < 3 m/s

$E=(\frac{1}{2}\times 70\times 2.2^2)+(70\times 9.8\times 0.07\times\sin 30°)$

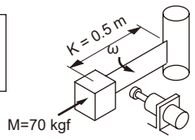
≈ 193.4 J

Therefore, energy can be absorbed with SCK-00-20.

⑤ Horizontal Rotational Motion (Inertial Motion)

$I=WK^2$

$E=\frac{I\cdot\omega^2}{2}$



When a workpiece weighing 70 kgf is operating with a radius of gyration (K) of 0.5 m and an impact angular velocity of 1 rad/s, consider if SCK-00-1.2 can be used.

$I=70\times(0.5)^2=17.5$ kg·m^2

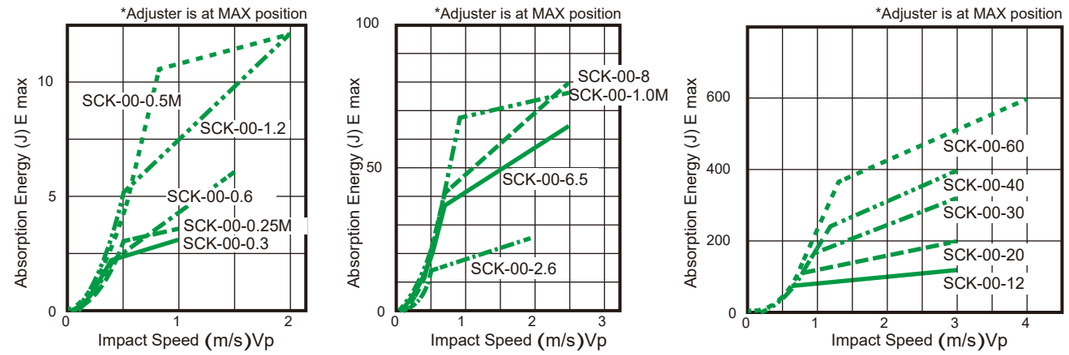
$E=\frac{(1)^2}{2}=\frac{17.5\times(1)^2}{2}$

$= 8.8$ J

Therefore, energy can be absorbed with SCK-00-1.2.

(Graph 1)

Vp·Emax Characteristics (Impact Speed/Absorption Energy)



*At low speed, absorption energy decreases, so please be careful.

FCK

Shock Absorber, Adjustable Type

CONTENTS

Series variation 1379
Product Introduction 1412
● FCK-L Low Speed Type (Max Absorption Energy 1.5 to 79.3 J) 1414
● FCK-M Medium Speed Type (Max Absorption Energy 1.8 to 720 J) 1414
● FCK-H High Speed Type (Max Absorption Energy 1.8 to 720 J) 1414
Optional Parts (Stopper Nut, Offset Angle Adapter) 1420
Model Selection Guide 1422
⚠ Precautions for Use 1432

Selectable from 3 stages: Low, Medium, High Speed

3 stages of impact speed, 3 types of mechanism

By changing the orifice structure, it is equipped with absorption functions suitable for low, medium, and high impact speeds.

With Rotation Stopper

Lock screw adopted to prevent adjuster from becoming misaligned during use. (Not available on some compact models)

Easy mounting with outer diameter thread

Outer diameter threads M10 to M27 for low speed, M10 to M42 for medium/high speed, with nut. Mounting and position adjustment are easy.

Presence or absence of tip cap can be selected (Excluding some sizes)

High-efficiency thread machining

Since the outer pipe is threaded, the surface area is large, enhancing heat dissipation.

Hard chrome plated Piston Rod

Usable at -5 to 70°C

Adoption of special oil allows use over a wide temperature range.

With Adjuster

Adjuster allows adjustment of shock absorption according to impact conditions.

Shock Absorber 5 Merits

- Safely stops the colliding object
- Increases manufacturing cycle.
- Life of machinery is extended
- Reduces noise and improves the environment around machinery
- Prevents machine breakdown

Shock Absorber FCK Series with 32 models available

Optimal shock absorption matching impact conditions/ characteristics is possible

8 Low Speed Models

- Colliding speed range: 0.3 to 1 m/s
- Max absorbed energy 1.5 to 79.3 J
- Single-hole Orifice Structure

12 Medium Speed Models

- Colliding speed range: 0.3 to 2 m/s
- Max absorbed energy 1.8 to 720 J
- Multi-hole Irregular Orifice Structure

12 High Speed Models

- Colliding speed range: 0.7 to 3 m/s
- Max absorbed energy 1.8 to 720 J
- Multi-hole Orifice Structure

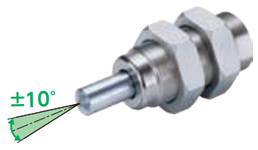
Option

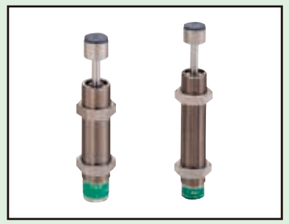
Stopper Nut

Positioning is possible with stopper nut.

Offset Angle Adapter

Absorbs offset angle of Max ±10° at workpiece impact.





Shock Absorber

FCK Series

● Max Absorbed Energy: 1.5 to 720 J

RoHS

Model Number Notation

●Low Speed Type: **FCK-L** – **0.15** – **C**

● Medium Speed Type: **FCK-M** – **0.18** – **C**

● High Speed Type: **FCK-H** – **0.18** – **C**

1 Model No. 2 Series (Max Absorption Energy) 3 Option

Rechargeable Battery Compatible Specification (Catalog No. CC-1226AA)

●Design compatible with rechargeable battery manufacturing process

FCK – . . . . – P4*

* Please contact us for details.

1 Model No.

Code	Content
FCK-L	Low Speed Type
FCK-M	Medium Speed Type
FCK-H	High Speed Type

3 Option

Code	Content	
Blank	Without Tip Cap	
C	With Tip Cap	

2 Series (Max Absorption Energy)

	Code	Content	Low Speed Type FCK-L	Medium Speed Type FCK-M	High Speed Type FCK-H
	0.15	1.5J	●		
	0.18	1.8J		●	●
	0.3	2.9J	●		
	0.4	3.9J	●		
	0.5	4.9J		●	●
	0.6	5.9J		●	●
	1	9.8J	●	●	●
	3	29.4J	●	●	●
	5	49J	●	●	●
*1	6.5	63.7J	●	●	●
	8.1	79.3J	●	●	●
	20	196J		●	●
	40	392J		●	●
*1	45	441J		●	●
*1	73.5	720J		●	●

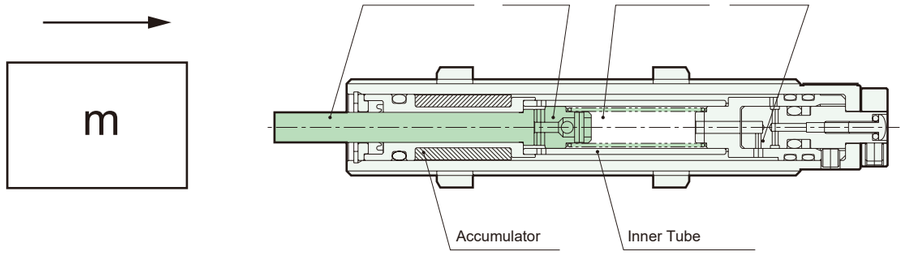
*1: Without cap is not available for 6.5 (63.7J), 45 (441J), 73.5 (720J) .

indicates not manufacturable.

Specifications

Item			FCK													
Series			0.15	0.18	0.3	0.5	0.4	0.6	1	3	5	6.5	8.1	20	40	45	73.5
Model / Classification			Adjustable spring return type														
Maximum absorption energy		J	1.5	1.8	2.9	4.9	3.9	5.9	9.8	29.4	49	63.7	79.3	196	392	441	720
Outer diameter thread size		mm	M10×1.0		M12×1.0		M14×1.5		M16×1.5	M20×1.5	M25×1.5		M27×1.5	M30×1.5	M36×1.5	M42×1.5	
Stroke		mm	8		10				12	16	30	40	25	35	50		80
Max Absorption Energy per Hour		kJ/hour	3.5		5.9		8.8		14.1	20.6	29.4	38.2	32.3	70.5	141.1	164.6	264.6
Maximum collision speed	L	m/s	0.3 to 1	-	0.3 to 1	-	0.3 to 1	-	0.3 to 1					-	-	-	-
	M	m/s	-	0.3 to 2	-	0.3 to 2	-	0.3 to 2	0.3 to 2					0.3 to 2			
	H	m/s	-	0.7 to 3	-	0.7 to 3	-	0.7 to 3	0.7 to 3					0.7 to 3			
Max Repetition Frequency (20°C)		cycles/min	60											30		10	6
Ambient Temperature		°C	-5 to 70 (provided there is no freezing)														
Max Load (Resistance Force Value)	L	N	637		1,470		1,813		2,646	4.900			6,370	16,660	23,520	27,028	
	M	N								3,528	3,920						
	H	N															
Return Time		s	0.5 or less											1 or less		2 or less	
Weight	Without cap	g	26.5		44		68		108	180	406	-	411	710	1300	-	-
	With cap	g	27		47		73		117	202	436	459	460	760	1410	1560	2010
Return Spring Force	At Extension	N	2.9		4.9		4.5		5.4	12.0	16.6	23.8	16.2	19.6	22.5	24.5	
	At Compression	N	5.9		9.8				14.7	18.0	33.1	71.4	27.2	44.1	68.6	83.3	98.0

Operational Principle

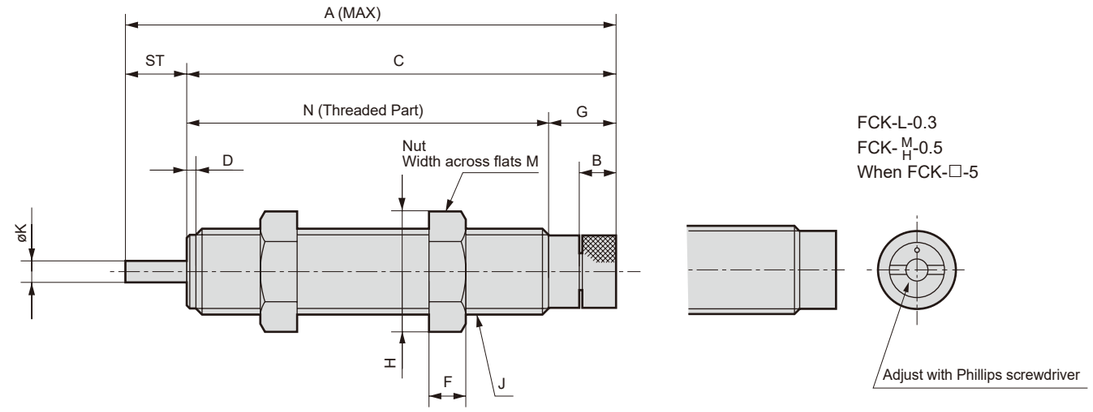


When an object collides with the Piston Rod, its motion is transmitted to the oil in the pressure chamber enclosed by the piston and inner tube. The oil in the pressure chamber flows out from the orifice provided in the inner tube. At that time, a resistance force F represented by the following formula is generated.
$F = av^2+bv+cx$ (v indicates impact speed, x indicates travel stroke. a, b, c are constants)

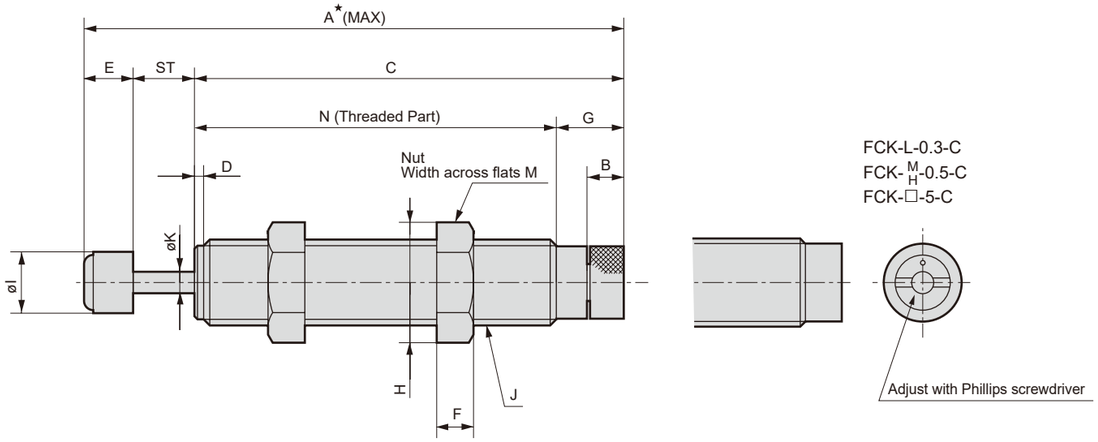
The first term represents velocity squared resistance and accounts for a large weight within the resistance force.
The second term represents viscous resistance and accounts for a large proportion when the impact speed is small.
The third term represents the Piston Rod return force. (Since it is extremely small compared to the first and second terms, it can usually be ignored.) The product of this generated reaction force and the stroke of the Piston Rod becomes the absorption energy of the shock absorber. The shock absorber achieves ideal shock absorption by controlling the first and second terms.

Dimensional Drawings

● Standard (FCK-□-□)



● Capped (FCK-□-□-C)

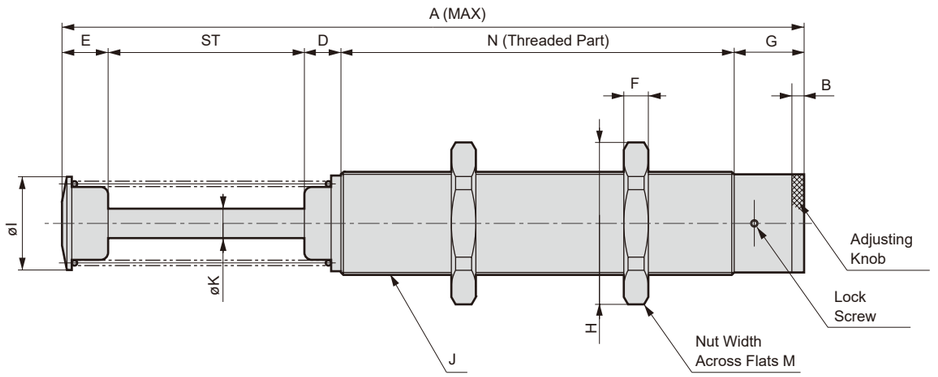


Model No.	A	A*	B	C	ST	D	E	F	G	H	I	J	K	N	M
FCK-L-0.15	58.9	65.2	3.5	50.9	8	1.5	6.3	3	8.7	14.2	6	M10×1	2.4	42.2	13
FCK-MH-0.18															
FCK-L-0.3	76	84	-	66	10	1.5	8	4	5	16.2	8	M12×1	3.5	61	14
FCK-MH-0.5															
FCK-L-0.4	80	88	6	70	10	1.5	8	6	11	19.6	10	M14×1.5	3.5	59	17
FCK-MH-0.6															
FCK-□-1	102	117	4.5	90	12	-	15	6	14.5	20	13.5	M16×1.5	5	75.5	19
FCK-□-3	110	127	4	94	16	-	17	8	18	27.7	18	M20×1.5	6	76	24
FCK-□-5	155	173	-	125	30	-	18	10	15	37	22	M25x1.5	8	110	32
FCK-□-8.1	136	156	5	111	25	-	20	10	20	37	24	M27x1.5	8	91	32
FCK-MH-20	188	206.5	5	153	35	-	18.5	14	25	41.6	27	M30×1.5	10	128	36
FCK-MH-40	235	254.5	5	185	50	-	19.5	15	25	53.1	33	M36x1.5	12	160	46

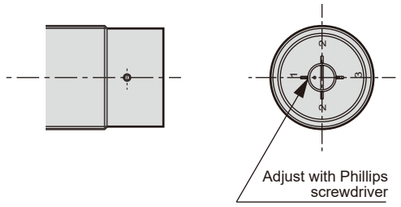
Note: In the table above □ indicates Low speed (L), Medium speed (M), High speed (H).

Dimensional Drawings

● FCK-□- 6.5 / 45 / 73.5 -C



FCK-□-6.5-C
When FCK-MH-45-C



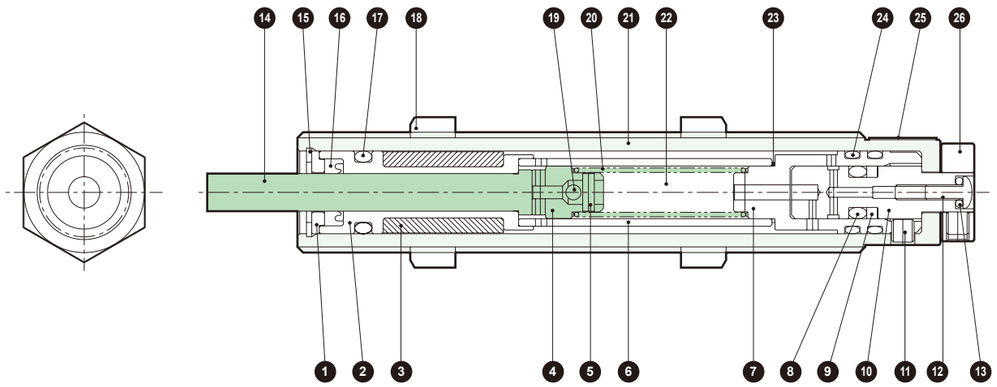
Model No.	A	B	ST	D	E	F	G	H	I	J	K	N	M
FCK-□-6.5-C	200.5	–	40	6.5	29	10	15	37	22	M25x1.5	8	110	32
FCK-MH-45-C	212.5	–	50	7	19	25	23	66	38	M42×1.5	12	113.5	60
FCK-MH-73.5-C	302.5	5	80	15	19	25	28.5	66	38	M42×1.5	12	160	60

Note: In the table above □ indicates Low speed (L), Medium speed (M), High speed (H).

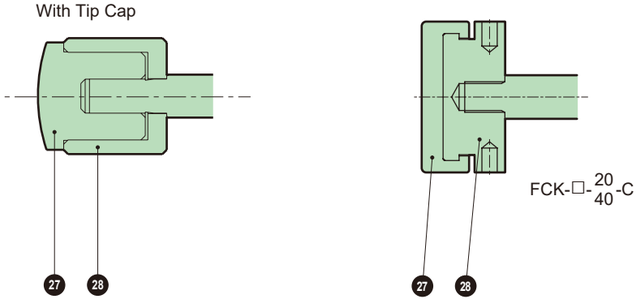
Internal Structure Diagram/Material

● FCK-□-□

Basic Type (Without Tip Cap)



With Tip Cap



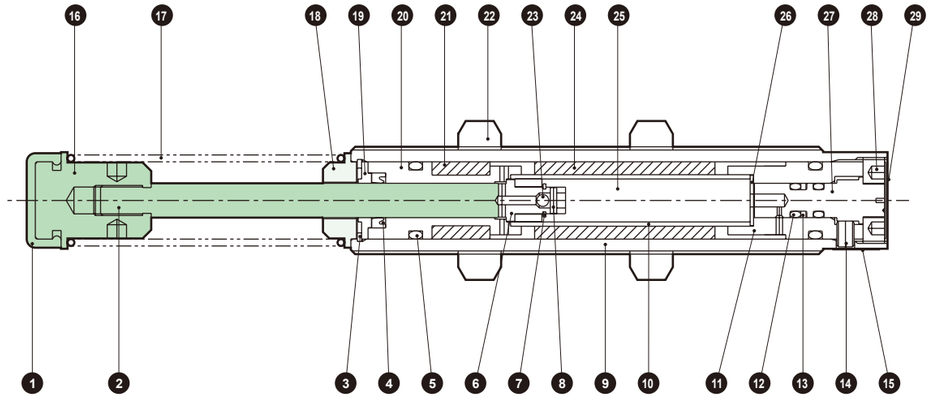
Do not disassemble

Part No.	Part Name	Material	Part No.	Part Name	Material
1	Packing Retainer	Copper Alloy	15	Retaining Ring	Steel
2	Guide	Copper Alloy	16	U-Packing	Nitrile Rubber
3	Accumulator	Nitrile Rubber	17	O-ring	Nitrile Rubber
4	Piston	Copper Alloy	18	Hexagon Nut	Steel
5	Spring pin	Stainless Steel	19	Steel ball	Bearing Steel
6	Inner Tube	Steel	20	Spring	Piano Wire
7	Bottom	Copper Alloy	21	Outer Tube	Steel
8	O-ring	Nitrile Rubber	22	Oil	Oil
9	Backup Ring	Resin	23	Spacer	Nitrile Rubber
10	Adjusting Shaft	Copper Alloy	24	O-ring	Nitrile Rubber
11	Hexagon Socket Set Screw	Alloy Steel	25	Product Nameplate	
12	Phillips Head Set Screw	Alloy Steel	26	Knob	Copper Alloy
13	O-ring	Nitrile Rubber	27	Rod Cap	Resin *2
14	Piston Rod	Alloy Steel	28	Reinforcing Ring	Steel

*1: Structure varies slightly depending on the model.
*2: Size 20, 40 are Urethane Rubber.

Internal Structure Diagram/Material

● FCK-□- 6.5 / 45 / 73.5 -C (Capped)



Do not disassemble

Part No.	Part Name	Material	Part No.	Part Name	Material
1	Rod Cover	Urethane Rubber (*2)	16	Spring Guide	Steel
2	Piston Rod	Alloy Steel	17	Spring	Piano Wire
3	Retaining Ring (Round R Type)	Steel	18	Spring Guide	Steel
4	U-Packing	Nitrile Rubber	19	Packing Retainer	Copper Alloy
5	O-ring	Nitrile Rubber	20	Guide	Copper Alloy
6	Piston	Copper Alloy	21	Accumulator	Nitrile Rubber
7	Retaining Ring (E-type)	Steel	22	Hexagon Nut	Steel
8	Spring pin	Stainless Steel	23	Steel ball	Bearing Steel
9	Outer Tube	Steel	24	Accumulator	Nitrile Rubber
10	Inner Tube	Steel	25	Oil	Oil
11	Bottom	Copper Alloy	26	Washer	Steel
12	O-ring	Nitrile Rubber	27	Adjusting Shaft	Copper Alloy
13	Backup Ring	Resin	28	Retainer Screw	Steel
14	Hexagon Socket Set Screw	Alloy Steel	29	Adjustment Label	Steel
15	Product Nameplate				

*1: Structure varies slightly depending on the model.
*2: Size 45, 73.5 do not come with a rod cover (resin) cap.

Shock Absorber **FCK Series** Optional Parts

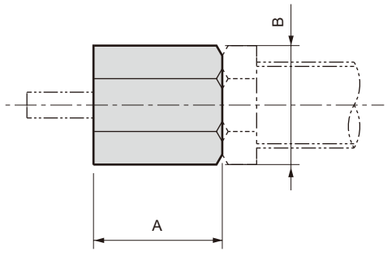
FCK-□-N1, FCK-□-C-N1

(Stopper Nut)

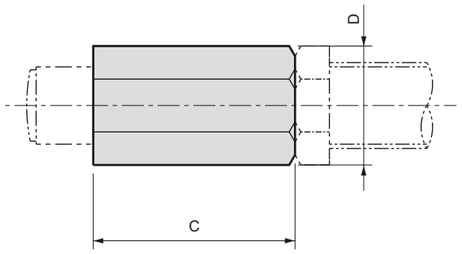
RoHS

Dimensional Drawings

● FCK-□-N1 (standard)
Material: Steel



● FCK-□-C-N1 (capped)
Material: Steel



(For Standard Type)

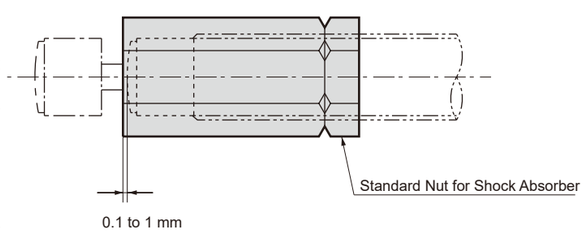
Model No.	Applicable Models	A	B	Weight (g)
FCK-0.18-N1	FCK-L-0.15 FCK-M-0.18 FCK-H-0.18	10	15	5
FCK-0.5-N1	FCK-L-0.3 FCK-M-0.5 FCK-H-0.5	12	16.2	5
FCK-0.6-N1	FCK-L-0.4 FCK-M-0.6 FCK-H-0.6	12	19.6	9
FCK-1-N1	FCK-L-1 FCK-M-1 FCK-H-1	15	21.9	13
FCK-3-N1	FCK-L-3 FCK-M-3 FCK-H-3	30	27.7	43
FCK-5-N1	FCK-L-5 FCK-M-5 FCK-H-5	20	37	62
FCK-8.1-N1	FCK-L-8.1 FCK-M-8.1 FCK-H-8.1	35	37	86
FCK-20-N1	FCK-M-20 FCK-H-20	38	41.6	123
FCK-40-N1	FCK-M-40 FCK-H-40	45	53.1	286

(For Type with Cap)

Model No.	Applicable Models	C	D	E	F	Weight (g)
FCK-0.18-C-N1	FCK-L-0.15-C FCK-M-0.18-C FCK-H-0.18-C	16	15	13	M10×1	8
FCK-0.5-C-N1	FCK-L-0.3-C FCK-M-0.5-C FCK-H-0.5-C	16	16.2	14	M12×1	7
FCK-0.6-C-N1	FCK-L-0.4-C FCK-M-0.6-C FCK-H-0.6-C	20	19.6	17	M14×1.5	15
FCK-1-C-N1	FCK-L-1-C FCK-M-1-C FCK-H-1-C	30	21.9	19	M16×1.5	26
FCK-3-C-N1	FCK-L-3-C FCK-M-3-C FCK-H-3-C	47	27.7	24	M20×1.5	68
FCK-5-C-N1	FCK-L-5-C FCK-M-5-C FCK-H-5-C	32	37	32	M25x1.5	99
FCK-6.5-C-N1	FCK-L-6.5-C FCK-M-6.5-C FCK-H-6.5-C	50	37	32	M25x1.5	154
FCK-8.1-C-N1	FCK-L-8.1-C FCK-M-8.1-C FCK-H-8.1-C	55	37	32	M27x1.5	135
FCK-20-C-N1	FCK-M-20-C FCK-H-20-C	58	41.6	36	M30×1.5	188
FCK-40-C-N1	FCK-M-40-C FCK-H-40-C	65	53.1	46	M36x1.5	413

1 When using a stopper nut, please note the following points.

- For types without cap, attach the stopper nut so that it protrudes 0.1mm to 1 mm outward along the Shock Absorbers rod from the piston body (cylinder top). For capped types, attach the stopper nut so that it protrudes 0.5 mm to 1 mm plus the cap length outward along the Piston Rod from the shock absorber body (cylinder section).
- Fix with the standard nut for Shock Absorbers after installing the stopper nut.
- Cannot be used with a deflection angle adaptor.



Shock Absorber **FCK Series** Optional Parts

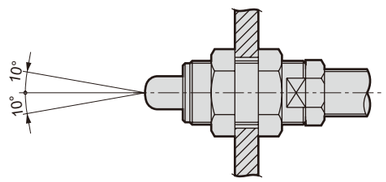
FCK-□-A

(Offset Angle Adapter)

RoHS

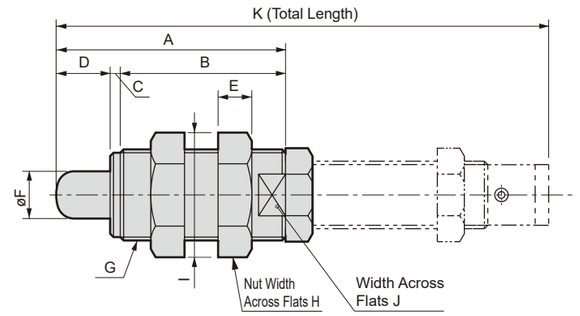
Specifications

Max Operating Offset Angle ±10°



Dimensional Drawings

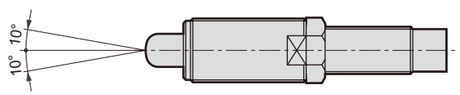
● FCK-□-A



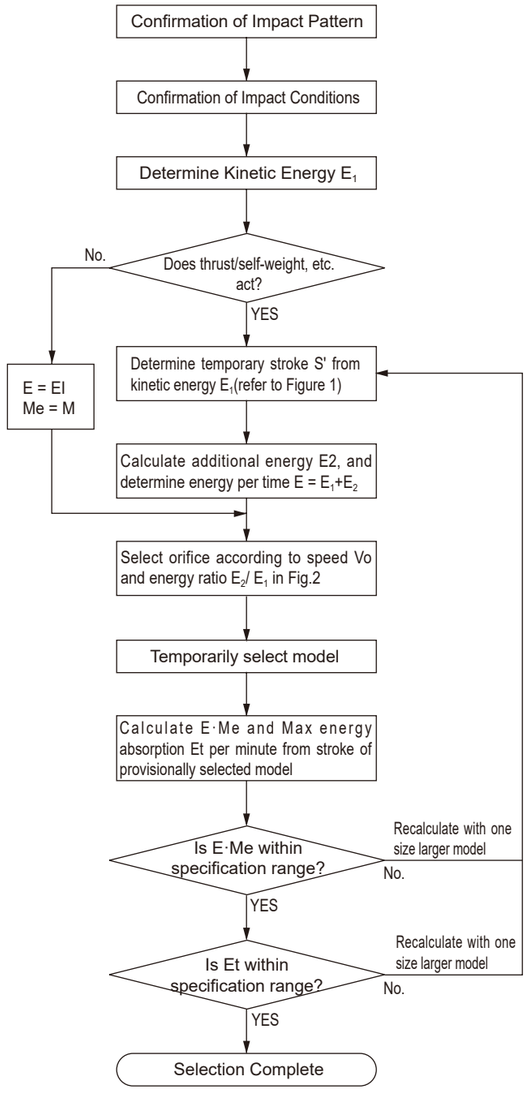
Model No.	Applicable Models	A	B	C	D	E	F	G	H	I	J	K	Tip Part Material	Weight (g)
FCK-0.18-A	FCK-L-0.15 FCK-M-0.18 FCK-H-0.18	38	28	2	8	-	8	M16×1.5	19	20	13	75.7	Polyacetal	37
FCK-0.5-A	FCK-L-0.3 FCK-M-0.5 FCK-H-0.5	48	35	3	10	5	10	M18×1.5	21	24.3	14	97.8		49
FCK-0.6-A	FCK-L-0.4 FCK-M-0.6 FCK-H-0.6	51	38	3	10	7	11	M22×1.5	24	27.7	19	103		83
FCK-1-A	FCK-L-1 FCK-M-1 FCK-H-1	60	45	3	12	7	12	M22×1.5	24	27.7	19	129		81
FCK-3-A	FCK-L-3 FCK-M-3 FCK-H-3	68	49	3	16	10	14	M27x1.5	32	37	24	146	Ferrous	214
FCK-5-A	FCK-L-5 FCK-M-5 FCK-H-5	107.5	67.5	10	30	15	16	M36x1.5	46	53.1	32	212		630
FCK-8.1-A	FCK-L-8.1 FCK-M-8.1 FCK-H-8.1	97	62	10	25	15	16	M36x1.5	46	53.1	32	188		582
FCK-20-A	FCK-M-20 FCK-H-20	127	82	10	35	15	18	M40x1.5	50	57.7	36	255		838
FCK-40-A	FCK-M-40 FCK-H-40	167	107	10	50	15	20	M45×1.5	55	63.5	41	322		1265

1 When using an offset angle adapter, please note the following points.

- Keep the angle within ±10° of the center line of the deflection angle adaptor cap.
- Cannot be used with stopper nut.
- Cannot be used with cap.

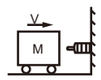
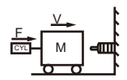
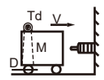


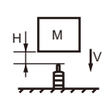
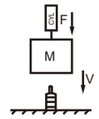
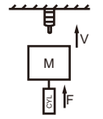
Model Selection Flowchart

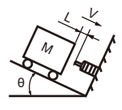
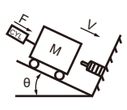
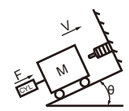


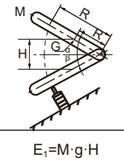
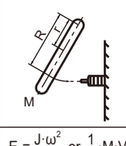
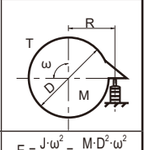
Code	Operating Conditions	Unit
E	Absorption Energy	J
E_1	Kinetic Energy	J
E_2	Thrust/Self-weight Energy	J
G	Center of Gravity Position	
S	FCK Stroke	m
g	Gravitational Acceleration (9.8)	m/s^2
N	Rotations	rpm
Me	Equivalent Weight	kg
Td	Motor Starting Torque	N·m
K	Reduction Ratio	

Impact Pattern Diagram Examples

	Horizontal Impact		
	a. Simple Horizontal Impact	b. When there is cylinder thrust	c. When there is motor driving force
Usage Example			
Kinetic Energy E_1 (J)	$E_1=\frac{1}{2}\cdot M\cdot V^2$	$E_1=\frac{1}{2}\cdot M\cdot V^2$	$E_1=\frac{1}{2}\cdot M\cdot V^2$
Thrust/Self-generated Energy E_2 (J)	———	$E_2 = F\cdot S$	$E_2=2\cdot\frac{K}{D}\cdot Td\cdot S$
Total Absorption Energy E (J)	$E = E_1$	$E = E_1+E_2$	$E = E_1+E_2$
Equivalent Weight Me (kg)	Me = M	$Me=\frac{2\cdot E}{V^2}$	$Me=\frac{2\cdot E}{V^2}$
Absorption Energy per Hour Et (J/h)	$E_t=60\cdot E\cdot n$	$E_t=60\cdot E\cdot n$	$E_t = 60\cdot E\cdot n$

	Vertical Impact		
	d. Free Fall	e. Cylinder Lower Limit Stopper	f. Cylinder Upper Limit Stopper
Usage Example			
Kinetic Energy E_1 (J)	$E_1=\frac{1}{2}\cdot M\cdot V^2$	$E_1=\frac{1}{2}\cdot M\cdot V^2$	$E_1=\frac{1}{2}\cdot M\cdot V^2$
Thrust/Self-generated Energy E_2 (J)	$E_2=M\cdot g\cdot S$	$E_2=(M\cdot g+F)\cdot S$	$E_2=(F-M\cdot g)\cdot S$
Total Absorption Energy E (J)	$E = E_1+E_2$	$E = E_1+E_2$	$E = E_1+E_2$
Equivalent Weight Me (kg)	$Me=\frac{2\cdot E}{V^2}(V=\sqrt{2\cdot g\cdot H})$	$Me=\frac{2\cdot E}{V^2}$	$Me=\frac{2\cdot E}{V^2}$
Absorption Energy per Hour Et (J/h)	$E_t=60\cdot E\cdot n$	$E_t=60\cdot E\cdot n$	$E_t=60\cdot E\cdot n$

	Inclined Impact		
	g. Free Fall	h. When there is cylinder thrust	i. When there is cylinder thrust
Usage Example			
Kinetic Energy E_1 (J)	$E_1=\frac{1}{2}\cdot M\cdot V^2$	$E_1=\frac{1}{2}\cdot M\cdot V^2$	$E_1=\frac{1}{2}\cdot M\cdot V^2$
Thrust/Self-generated Energy E_2 (J)	$E_2=M\cdot g\cdot S\cdot\sin\theta$	$E_2=(M\cdot g\cdot\sin\theta+F)\cdot S$	$E_2=(F-M\cdot g\cdot\sin\theta)\cdot S$
Total Absorption Energy E (J)	$E = E_1+E_2$	$E = E_1+E_2$	$E = E_1+E_2$
Equivalent Weight Me (kg)	$Me=\frac{2\cdot E}{V^2}(V=\sqrt{2\cdot g\cdot L\cdot\sin\theta})$	$Me=\frac{2\cdot E}{V^2}$	$Me=\frac{2\cdot E}{V^2}$
Absorption Energy per Hour Et (J/h)	$E_t=60\cdot E\cdot n$	$E_t=60\cdot E\cdot n$	$E_t=60\cdot E\cdot n$

	Oscillating Impact		Rotational Impact
	j. Free Fall	k. When there is torque from motor, etc.	l. When there is torque from motor, etc.
Usage Example			
Kinetic Energy E_1 (J)	$E_1=M\cdot g\cdot H$	$E_1=\frac{J\cdot\omega^2}{2}$ or $\frac{1}{2}\cdot M\cdot V^2$	$E_1=\frac{J\cdot\omega^2}{2}=\frac{M\cdot D^2\cdot\omega^2}{16}$
Thrust/Self-generated Energy E_2 (J)	$E_2=\frac{r}{R}\cdot M\cdot g\cdot S$	$E_2=\frac{T}{R}\cdot S$	$E_2=\frac{T}{R}\cdot S$
Total Absorption Energy E (J)	$E = E_1+E_2$	$E = E_1+E_2$	$E = E_1+E_2$
Equivalent Weight Me (kg)	$Me=\frac{2\cdot E}{V^2}(V=\frac{R}{r}\sqrt{\frac{3\cdot g\cdot H}{2}})$	$Me=\frac{2\cdot E}{V^2}(V=\omega\cdot R)$	$Me=\frac{2\cdot E}{V^2}(V=\omega\cdot R,\omega=\frac{2\pi N}{60})$
Absorption Energy per Hour Et (J/h)	$E_t=60\cdot E\cdot n$	$E_t=60\cdot E\cdot n$	$E_t=60\cdot E\cdot n$

Shock Absorber Model Selection Guide

1 Clarify the equipment impact

- Horizontal Motion
  - a. Simple Horizontal Impact
  - b. Collision with cylinder thrust
  - c. Collision with drive force of motor
- Vertical Motion
  - d. Collision due to free fall
  - e. Collision with cylinder thrust (downward)
  - f. Collision with cylinder thrust (upward)
- Inclined Motion
  - g. Collision due to free sliding
  - h. Collision with cylinder thrust (downward)
  - i. Collision with cylinder thrust (upward)
- Oscillating/Rotational Motion
  - j. Collision due to free oscillating fall
  - k. Collision with motor torque, etc., (oscillation)
  - l. Collision with motor torque, etc., (rotation)

*1: Refer to "Impact Pattern Diagram Examples."

2 Clarify conditions/items necessary for energy calculation

Horizontal Impact

Code	Operating Conditions	Unit
M	Impact Material Weight	kg
V	Collision speed	m/s
F	Pushing Force	N
n	Repetition Frequency	cycles/min
t	Ambient Temperature	°C
RT	Return time	s

Inclined Impact

Code	Operating Conditions	Unit
M	Impact Material Weight	kg
V	Collision speed	m/s
F	Pushing Force	N
n	Repetition Frequency	cycles/min
t	Ambient Temperature	°C
RT	Return time	s
L	Impact Object Travel Distance	m
θ	Inclination Angle	deg

Vertical Impact

Code	Operating Conditions	Unit
M	Impact Material Weight	kg
V	Collision speed	m/s
F	Pushing Force	N
n	Repetition Frequency	cycles/min
t	Ambient Temperature	°C
RT	Return time	s
H	Fall Height	m

Vibrational/Rotational Impact

Code	Operating Conditions	Unit
M	Impact Material Weight	kg
V	Collision speed	m/s
T	Torque	N·m
n	Repetition Frequency	cycles/min
t	Ambient Temperature	°C
RT	Return time	s
ω	Angular Velocity	rad/s
J	Moment of inertia	$kg\cdot m^2$
R	Distance from Center of Rotation to Impact Point	m
r	Distance from Center of Rotation to Center of Gravity	m
α·β	Inclination Angle	deg
H	Fall Height	m
D	Diameter of Rotating Body	m

3 Calculation of kinetic energy E_1 according to "Impact Pattern Diagram Examples"

Calculate kinetic energy E_1 according to "Example of colliding pattern" (P. 1422) .

$$E=\frac{1}{2}M\cdot V^2=\frac{1}{2}\times 15\times 1.42^2$$
$$= 15.1\ J$$

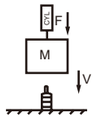
4 Select temporary stroke from temporary selection graph

Fig. 1 (P. 1425) and select the temporary stroke.

S'=30

Selection Examples

Clarify the equipment impact pattern.

	Vertical Impact
	e. Cylinder Lower Limit Stopper
Usage Example	
Kinetic Energy E_1 (J)	$E_1=\frac{1}{2}\cdot M\cdot V^2$
Thrust/Gravity Energy E_2 (J)	$E_2=(Mg+F)\cdot S$
Total Absorption Energy E (J)	$E = E_1+E_2$
Equivalent Weight Me (kg)	$Me=\frac{2\cdot E}{V^2}$
Absorption Energy per Hour Et (J/h)	$E_t=60\cdot E\cdot n$

Colliding object weight	: M=15 kg
Colliding speed	: V=1.42 m/s
Pushing force	: F=245.5 N
Frequency	: n=10 cycles/Min
Ambient Temperature	: t=23°C
Return time	: Rt=2s (time up to re-collision)

5 Calculation of absorption energy E according to "Impact Pattern Diagram Examples"

- Calculate thrust/self-weight energy E_2 according to "Example of colliding pattern". S (FCK stroke) in the calculation formula is calculated with the temporary stroke S' selected in item 4. Calculate absorption energy E according to "Impact Pattern Diagram Examples."

6 Shock Absorber Temporary Selection

- Select orifice type according to energy ratio (thrust/self-weight energy, kinetic energy) and colliding speed on Fig. 2 (P. 1425) , then select a model provisionally according to calculated absorbed energy E.

*1: Allowable energy absorption may vary depending on colliding speed. Please refer to P. 1426, 1427.

7 Recalculation of absorption energy E with temporarily set model

- Calculate absorbed energy E_2 according to "Example of colliding pattern". S (FCK stroke) during calculation is calculated with the stroke of the model selected in item 6.
- Calculate absorption energy E according to "Impact Pattern Diagram Examples."

8 Calculation of Energy per Hour Et

- Calculate energy per hour Et according to "Example of colliding pattern".

9 Confirmation of Equivalent Weight M

- Calculate equivalent weight M according to "Example of colliding pattern".

10 Selection Confirmation

- If calculated absorbed energy, energy per hour, equivalent weight, frequency of usage, Ambient Temperature and return time are in accordance with specifications of the selected Shock Absorbers, there is no problem. If outside the specification range, select a shock absorber one rank larger than the previously selected model and recalculate.

*1: The specified equivalent weight depends on the speed. For details, refer to P. 1426, 1427.

Selection Examples

$E_2 = (M \cdot g + F) \cdot S = (15 \times 9.8 + 245.5) \times 0.03 = 11.8J$

$E = E_1 + E_2 = 15.1 + 11.8 = 26.9J$

$\frac{E_2}{E_1} = \frac{11.8}{15.1} = 0.8$

From models with E=26.9 or more
Temporarily select multi-hole orifice (FCK-H-3)

$E_2 = (15 \times 9.8 + 245.5) \times 0.016 = 6.28\ J$
$E = 15.1 + 6.28 = 21.4\ J$

$Et = 60 \cdot E \cdot n = 60 \times 21.4 \times 10 = 1284\ J/h$

$Me = \frac{2E}{V^2} = \frac{2 \times 21.4}{1.42^2} = 21.2\ kg$

		Calculated Value	FCK-H-3 Specification Value	Judgment
E	J	21.4	29.4 or less	OK
Et	J/h	1284	20580 or less	OK
Me	kg	21.2	29 or less	OK
n	cycles/min	10	60 or less	OK
t	°C	23	-5 to 70	OK
Rt	S	2	0.5 or more	OK

[Note]
The impact speed used in shock absorber selection calculation is the speed immediately before impact with the shock absorber. It is different from the cylinder average speed (cylinder stroke / travel time) . When performing selection calculation, calculate or actually measure the speed immediately before impact, or use a value 1.5 to 2 times the average speed.

Figure 1. Temporary Selection Graph

Determine temporary stroke S' from kinetic energy E_1.

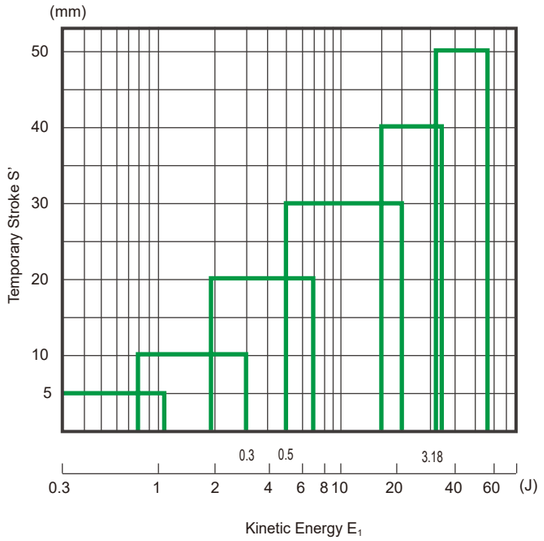
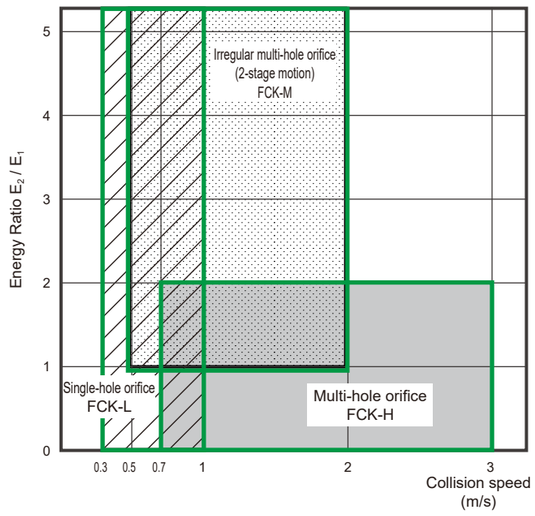


Figure 2. Energy Ratio (Thrust/Self-weight Energy E_2 / Inertial Energy E_1)

Select orifice type from this figure



Absorption Characteristic Structure

Displacement-dependent Orifice	Constant Orifice	Single-hole Orifice Structure	FCK-L	Single-hole orifice structures include a dashpot structure utilizing the clearance between the piston and cylinder tube, a single tube structure with an orifice in the piston, and a double tube type single-hole orifice structure (adjustable type) , all of which exhibit similar resistance force characteristics. Here, the single tube structure will be explained as a representative. It is structured so that a piston slides inside an oil-filled cylinder tube, and a single-hole orifice is provided in the piston. Since the orifice area is constant over the entire stroke, the absorption characteristic is such that the resistance force immediately after impact is large, and as the stroke progresses and the speed decreases, the resistance force also decreases, as shown in the right figure.
		Multi-hole Orifice Structure	FCK-H	It has a double structure of an outer tube and an inner tube, and the piston slides on the inner wall of the inner tube. This inner tube is provided with multiple orifices along the stroke direction. As the stroke progresses and the speed decreases, the orifice area decreases stepwise, so the resistance force fluctuates in a ripple pattern, but the Max resistance force can be kept low. Also, it is easy to match the absorption characteristics to individual impact conditions by designing the orifice.
		Multi-hole Irregular Orifice Structure	FCK-M	Structurally, it is basically the same as the multi-hole orifice above, but by changing the orifice, energy absorption according to the purpose can be performed instead of constant damping force. For example, the orifice adopted in the FCK-M series is designed to absorb kinetic energy in the first half of the stroke and perform speed control in the latter half. Therefore, it ideally absorbs energy against cylinder thrust.

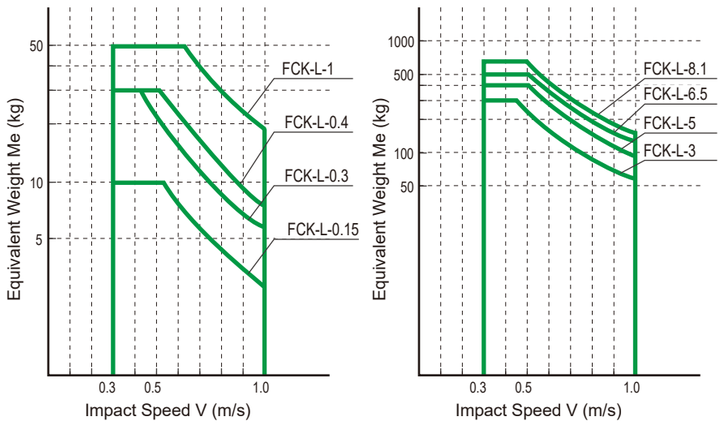
Equivalent Weight/Impact Speed Characteristic Graph

Equivalent Weight:
Weight converted by assuming all cylinder thrust and weight weight as inertial energy.

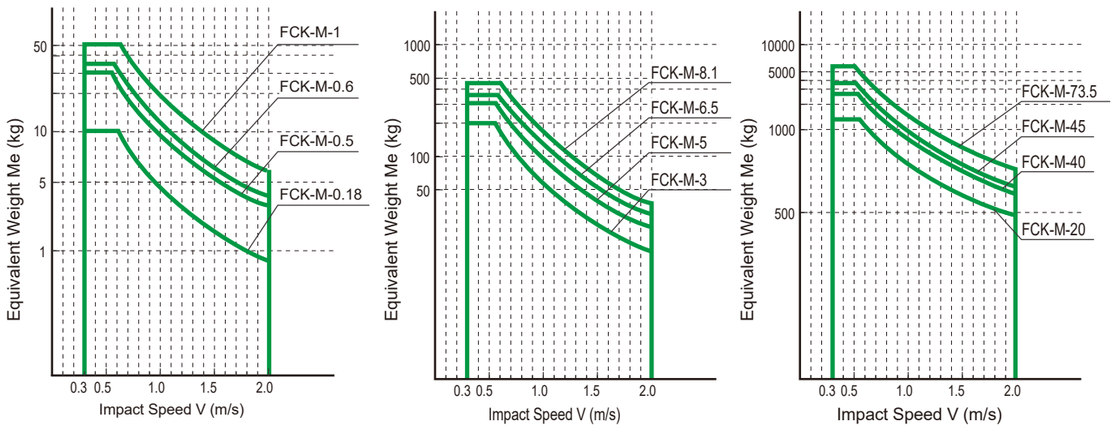
$$\frac{1}{2}MV^2+F\cdot S=E=MeV^2$$

M: Impact Material Weight
F: Cylinder thrust or weight self-weight
Me Equivalent Weight

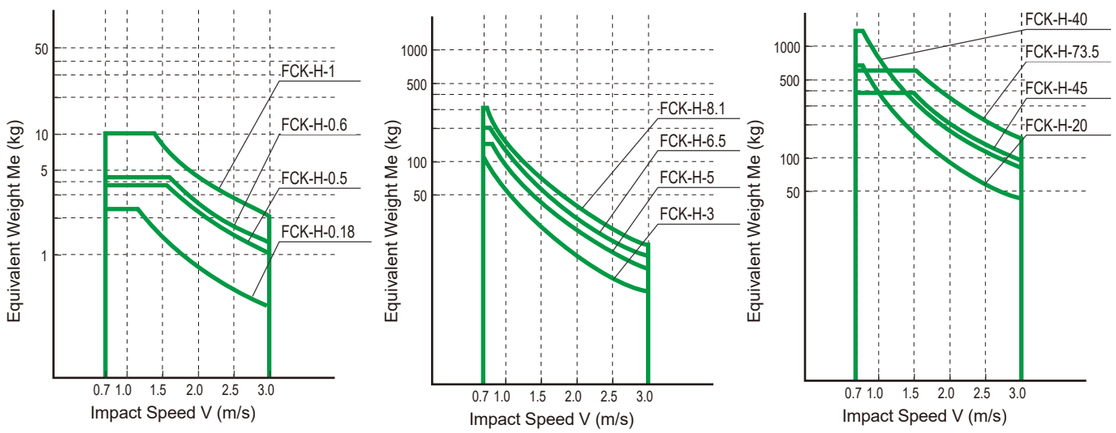
Single-hole Orifice (FCK-L)



Multi-hole Irregular Orifice (FCK-M)

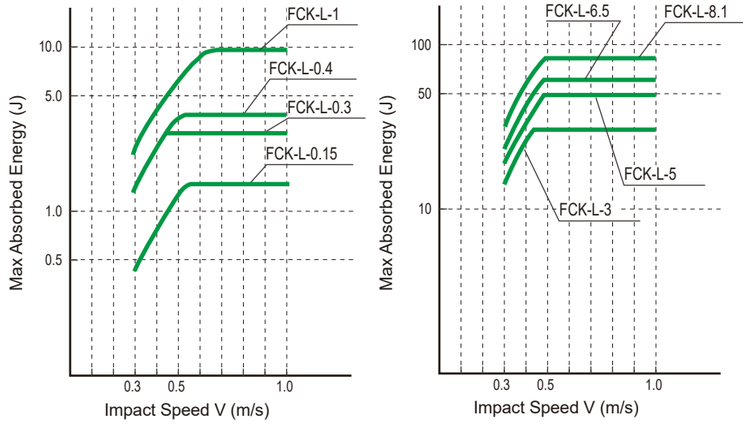


Multi-hole Orifice (FCK-H)

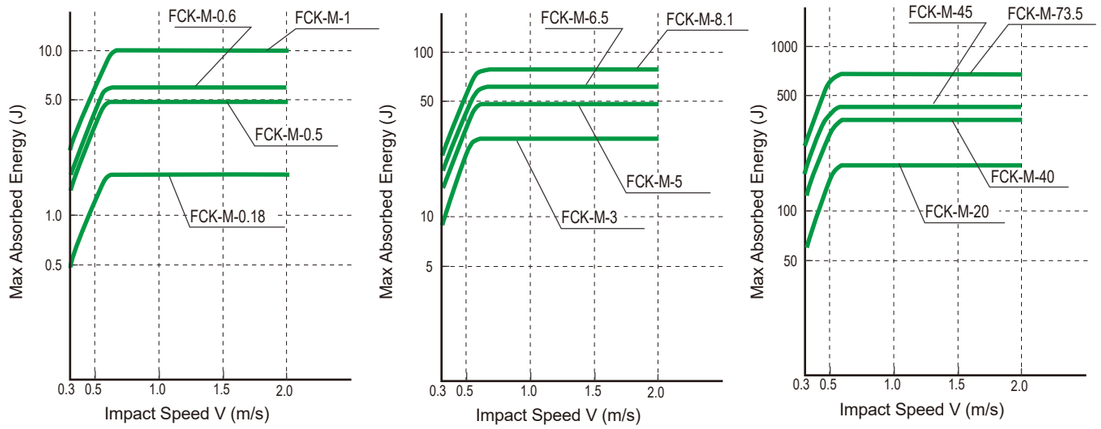


Absorption Energy/Impact Speed Characteristic Graph

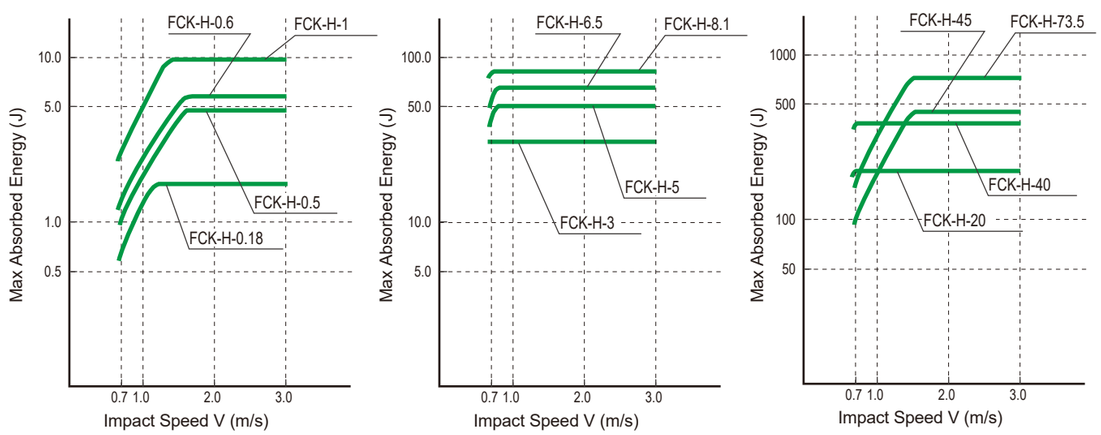
Single-hole Orifice (FCK-L)



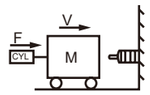
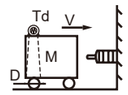
Multi-hole Irregular Orifice (FCK-M)

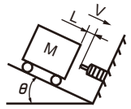
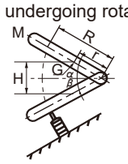


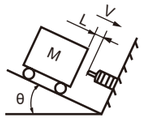
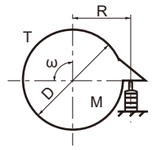
Multi-hole Orifice (FCK-H)



Selection Calculation Example

	Selection Example 1	Selection Example 2
1. Applications	Horizontal impact with cylinder thrust  Cylinder Bore = ø40 Pressure = 0.5 MPa	Horizontal impact with motor driving force  Motor Starting Torque Td = 0.196 N·m Cart Wheel Diameter D = 50 mm Cart Reduction Ratio K = 10
2. Colliding conditions	M = 30 kg V = 0.6 m/s F = 628.3 N $(F=\frac{\pi}{4}\times40^2\times0.5=628.4\ N)$ n = 20 cycles/min t = 23°C Rt=3S	M = 150 kg V = 0.785 m/s F = 78.4 N $(F=2\cdot\frac{K}{D}\cdot Td=2\times\frac{10}{0.05}\times0.196=78.4\ N)$ n = 5 cycles/min t = 23°C Rt=2S
3.Kinetic energy E_1	$E_1=\frac{1}{2}MV^2=\frac{1}{2}\times30\times0.6^2=5.4J$	$E_1=\frac{1}{2}MV^2=\frac{1}{2}\times150\times0.785^2=46.2J$
4. Temporary stroke S'	From Figure 1, S' = 20 mm	From Figure 1, S' = 50 mm
5. Thrust/self-weight energy E_2 Absorbed energy E	$E_2=F\cdot S=628.3\times0.02=12.57$ J $E=E_1+E_2=5.4+12.57=17.97$ J	$E_2=2\cdot\frac{K}{D}\cdot Td\cdot S=2\times\frac{10}{0.05}\times0.196\times0.05$ $=3.92$ J $E=E_1+E_2=46.2+3.92=50.12$ J
6. Temporary selection	$\frac{E_2}{E_1}=\frac{12.57}{5.4}=2.3$ Temporarily select multi-hole irregular orifice (FCK-M-3)	$\frac{E_2}{E_1}=\frac{3.92}{46.2}=0.08$ Temporarily select multi-hole orifice (FCK-H-6.5)
7. Recalculation of absorbed energy	$E_2=F\cdot S=628.3\times0.016=10.05$ J $E=E_1+E_2=15.45$ J	$E_2=2\cdot\frac{K}{D}\cdot Td\cdot S=2\times\frac{10}{0.05}\times0.196\times0.04$ $=3.14$ J $E=E_1+E_2=49.34$ J
8. Energy per hour Et	$Et = 60\cdot E\cdot n = 60\times15.45\times20 = 18540$ J/h	$Et = 60\times E\cdot n = 60\times49.34\times5 = 14802$ J/h
9. Equivalent weight Me	$Me=\frac{2E}{V^2}=85.8$ kg	$Me=\frac{2E}{V^2}=\frac{2\times49.34}{0.785^2}=160$ kg
10. Confirmation	E, Et, Me, n, t, Rt all OK Decided on FCK-M-3	E, Et, Me, n, t, Rt all OK Decided on FCK-H-6.5

Selection Example 3	Selection Example 4
Cart falling down a slope  L = 1 m θ = 2°	Object undergoing rotational free fall  α = 15° β = 5°
M = 100 kg V = 0.83 m/s $(V=\sqrt{2\cdot g\cdot L\cdot\sin\theta}=\sqrt{2\times9.8\times1\times\sin2°}=0.83$ m/s) n = 10 cycles/min t = 23°C Rt=5S	M = 2 kg R = 0.5 m H = 0.1 m r = 0.3 m $(V=\frac{R}{r}\sqrt{\frac{3\cdot g\cdot H}{2}}=\frac{0.5}{0.3}\sqrt{\frac{3\times9.8\times0.1}{2}}=2.02$ m/s) n = 50 cycles/min t = 20°C Rt=0.6S
$E_1=\frac{1}{2}\cdot M\cdot V^2=\frac{1}{2}\times100\times0.83^2=34.4$ J	$E_1=M\cdot g\cdot H=2\times9.8\times0.1=1.96$ J
From Figure 1, S' = 50 mm	From Figure 1, S' = 10 mm
$E_2=M\cdot g\cdot S\cdot\sin\theta=100\times9.8\times0.05\times\sin2°=1.71$ J $E=E_1+E_2=34.4+1.71=36.1$ J	$E_2=\frac{r}{R}\cdot M\cdot g\cdot S\cdot\cos\beta=\frac{r}{R}\times2\times9.8\times0.01\times\cos5°C=0.11$ J $E=E_1+E_2=1.96+0.11=2.07$J
$\frac{E_2}{E_1}=\frac{1.71}{34.4}=0.05$ Temporarily select multi-hole orifice (FCK-H-5)	$\frac{E_2}{E_1}=\frac{0.11}{1.96}=0.06$ Temporarily select multi-hole orifice (FCK-H-0.5)
$E_2=M\cdot g\cdot S\cdot\sin\theta=100\times9.8\times0.03\times\sin2°=1.03$ J $E=E_1+E_2=35.4$ J	$E_2=\frac{r}{R}\cdot M\cdot g\cdot S\cdot\cos\beta=0.11$J $E=E_1+E_2=1.96+0.11=2.07$J
$Et = 60\cdot E\cdot n = 60\times35.4\times10 = 21240$ J/h	$Et = 60\cdot E\cdot n = 60\times2.07\times50 = 6210$ J/h
$Me=\frac{2E}{V^2}=\frac{2\times35.4}{0.83^2}=102.7$ kg	$Me=\frac{2E}{V^2}=\frac{2\times2.07}{2.02^2}=1.0$ kg
E, Et, Me, n, t, Rt all OK Decided on FCK-H-5	E, Me, n, t, Rt are OK. However, since Et is over, recalculate with one size larger FCK-H-0.6.

Selection Example 5	Selection Example 6
Object rolling down a slope  L = 0.45 m θ = 5°	Horizontal rotational impact with torque applied 
M = 1.0 kg V = 0.88 m/s (V = $\sqrt{2 \cdot g \cdot L \cdot \sin\theta}$ = $\sqrt{2 \times 9.8 \times 0.45 \times \sin 5°}$ = 0.88 m/s) n = 15 cycles/min t = 23°C Rt=2S	J=204.1 kgm^2 ω = 0.6 rad/s R = 1.25 m n = 10 cycles/min T = 68.6 N·m t = 20°C Rt = 3s
$E_1=\frac{1}{2}\cdot M\cdot V^2=\frac{1}{2}\times 1.0\times 0.88^2=0.387$ J	$E_1=\frac{J\cdot\omega^2}{2}=\frac{204.1\times 0.6^2}{2}=36.7$ J
From Figure 1, S' = 5 mm	From Figure 1, S' = 50 mm
$E_2=M\cdot g\cdot S\cdot\sin\theta=1\times 9.8\times 0.005\times\sin 5°=0.004$ J $E=E_1+E_2=0.387+0.004=0.391$ J	$E_2=\frac{T}{R}\cdot S=\frac{68.6}{1.25}\times 0.05=2.74$ J $E=E_1+E_2=36.7+2.74=39.44$ J
$\frac{E_2}{E_1}=\frac{0.004}{0.387}=0.01$ Temporarily select single-hole orifice (FCK-L-0.15)	$\frac{E_2}{E_1}=\frac{2.74}{36.7}=0.07$ V = ω·R = 0.6×1.25 = 0.75 m/s Temporarily select multi-hole orifice (FCK-H-5)
$E_2=M\cdot g\cdot S\cdot\sin\theta=1\times 9.8\times 0.008\times\sin 5°=0.007$ J $E=E_1+E_2=0.394$ J	$E_2=\frac{T}{R}\cdot S=\frac{68.6}{1.25}\times 0.03=1.65$ J $E=E_1+E_2=38.6$ J
Et = 60·E·n = 60×0.394×15 = 354.6 J/h	Et = 60·E·n = 60×38.6×10 = 23160 J/h
$Me=\frac{2E}{V^2}=\frac{2\times 0.394}{0.88^2}=1.02$ kg	$Me=\frac{2E}{V^2}=\frac{2\times 38.6}{0.75^2}=137.2$ kg
E, Et, Me, n, t, Rt all OK Decided on FCK-L-0.15	E, Et, Me, n, t, Rt are OK. Decided on FCK-H-5.

MEMO

Related Equipment
SKL
NCK
SCK
FCK
FJ
FK
Cylinder Switch
Ending

To Use This Product Safely

Be sure to read this before use. For general cylinders, See Intro 41, and Ending 1512 for cylinder switches

Individual Precautions: Shock absorber SKL, NCK, SCK, FCK Series

Design / Selection

1. Common

Warning

■Use the product in the range of conditions specified for the product.
If Max energy absorption in specifications is exceeded, damage or operation faults may occur. Note that the performance listed in the specifications cannot be exhibited if the products are not used with their full stroke.

CAUTION

■Confirm before use that the product will withstand the working environment.
- Use in conditions exceeding the Ambient Temperature range will negatively affect durability.
- Do not use in an environment (vacuum, high pressure) other than atmospheric pressure.

■Be careful of splattering due to damage of the cap.
- If used outside the specifications, the cap may be damaged and cause injuries due to the device flying apart.
- Either install a cover to prevent splatter or stand away in a position where safety can be ensured while the master unit is in operation.
- Do not use this product in clean rooms. May cause contamination of the clean room.

■Confirm the colliding conditions.
- Before use, obtain the colliding speed, colliding object weight, thrust applied to the shock absorber and the number of collisions per minute.

① Also necessary for selection calculation. If the impact speed is below the specification range, resistance force is less likely to be generated and energy absorption is small, so the effect of using a shock absorber cannot be expected much.

② This product cannot be used in cases where the number of collisions per minute will exceed the Max frequency.

■Check that the surface of the colliding object contacted by the Piston Rod is hard enough.
- For types without cap, a high surface compression load will be applied to the contact surface of the Piston Rod of the colliding object. The contact surface should have high hardness (Hardness HRC35 or more).

■Pay attention to the colliding object's return force.
- When using this product for conveyor drives, etc., it may be pressed back by internal spring force after energy is absorbed. Refer to the return spring force section of the specifications for return force.

■Do not use 2 or more Shock Absorbers in a parallel arrangement as it will be difficult to synchronize the motion thereof. Use one shock absorber with large absorption energy.

■Use an external stopper or the optional stopper nut at the final stop position of the colliding object so impact is not applied to the body. If impact force is applied to the main body, it will cause a decrease in durability and return failure. Confirm before use that the product will withstand the working environment.

■The Max repetition frequency will differ depending on the Ambient Temperature.

■Values given in specification items are for room temperature (20°C). Please note that specification values change with Ambient Temperature.

During Use

1. Common

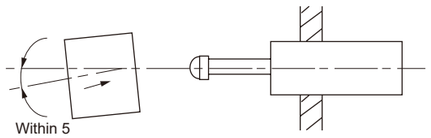
Danger

■Do not use this product near fire or in devices or machines having an Ambient Temperature exceeding specifications.
Flammable oil is used, so there is a risk of fire.

■Do not place in fire.
If thrown into fire, oil is sealed inside, so there is a risk of explosion or ignition.

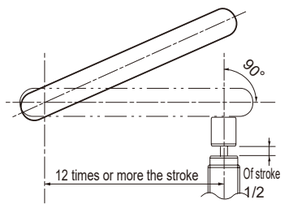
Warning

■Do not apply an eccentric load at a deflection angle of ±A° or more from the center line of the Piston Rod.
- Collision of a load at a deflection angle of ±A° or more may cause defective return due to the Piston Rod becoming bent or deterioration of performance due to eccentric wear of the sliding portions. When using at a deflection angle exceeding ± A°, use the optional deflection angle adapter. Becomes usable up to ±10°. (FCK Series)



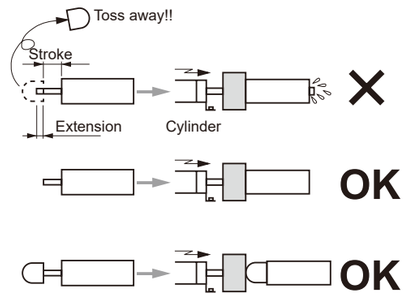
	SKL/FCK	NCK/SCK
A	2.5°	5°

- When using rotary motion collision, set the distance from the center of the colliding object's rotation to the shock absorber installation position at 12-fold or more of the shock absorber stroke (3-fold or more when using a deflection angle adaptor). Install so contact is at a right angle at a position half of the stroke.



■Use with mounting parts of insufficient strength is prohibited.
- Operating the unit with mounting parts of insufficient strength may cause damage to the master unit or lead to injuries.
- As for mounting part strength, be sure to maintain the Max load × safety factor. (Refer to the Max load. Or, contact CKD.)

■Do not remove the cap of capped Shock Absorbers.
- As the Piston Rod has been extended in order to mount the cap, use with the cap removed will cause damage to the bottom portion.



■A guide is required if the colliding object vibrates.
If the impacting object has vibration, etc., and a force perpendicular to the axis acts on the Piston Rod, provide a solid guide for the impacting object.

■When there is the risk of static electricity building up in an explosive environment
Perform grounding for discharge, and never use shock absorbing surface materials that produce sparks.

■Dumping into fire is prohibited.
- Since the oil is sealed, this product has a risk of injury as it may explode or ignite if placed in fire.
- Dispose of the oil according to prescribed methods for processing waste oil.

■Do not apply a separate external load with a colliding object which has been stopped at the end of its stroke. The impact of an external load may be applied, causing damage.

■Turn device power OFF and confirm the machine is stopped before installing, removing, or adjusting the stroke.

■Disassembly is prohibited.
- Do not disassemble the unit, as doing so may be dangerous.

CAUTION

■Make sure the tightening torque of the installation nut is in accordance with the following table.

● The shock absorber may be damaged if nut tightening torque exceeds the upper limit below. If you want to securely fix the nut, implement loosening prevention measures such as adhesive separately.

(SKL Series)

Thread Diameter (mm)	M8×0.75	M10×1	M12×1
Nut Tightening Torque (N·m)	1.2 to 2.0	3 to 4	5 to 6

(NCK Series)

Thread Diameter (mm)	M8×0.75	M10×1	M12×1	M14×1.5	M20×1.5
Nut Tightening Torque (N·m)	1.2 to 2.0	3 to 4	5 to 6	7.5 to 10	22 to 30

Thread Diameter (mm)	M25x1.5	M27x1.5
Nut Tightening Torque (N·m)	55 to 70	100 to 130

(SCK Series)

Thread Diameter (mm)	M10×1	M12×1	M16x1	M20×1	M25x1.5
Nut Tightening Torque (N·m)	3.4	5.4	14.2	70.8	421.7 to 588.4

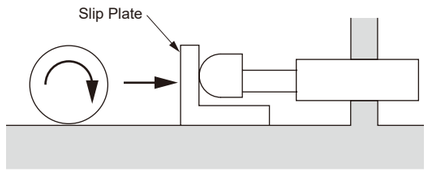
Thread Diameter (mm)	M30×1.5	M40x1.5	M45×1.5
Nut Tightening Torque (N·m)	149.1 to 196.1	274.6 to 353.0	421.7 to 588.4

(FCK Series)

Thread Diameter (mm)	M10×1	M12×1	M14×1.5	M16×1.5	M20×1.5
Nut Tightening Torque (N·m)	5.9 to 7.8	5.9 to 7.8	8.3 to 9.8	11.8 to 14.7	29.4 to 35.3

Thread Diameter (mm)	M25x1.5 M25×2	M27x1.5 M27×3	M30×1.5	M36x1.5	M42×1.5
Nut Tightening Torque (N·m)	49.0 to 61.0	58.9 to 73.5	78.4 to 98.0	98.0 to 122.5	392.0 to 490.0

■If the rotating objects or if deformation or wear is generated between the shock absorber and the colliding object, place protective material before the collision surface to prevent deformation and wear.



■Do not damage the Piston Rod sliding section or the damper case thread O.D. section.

Do not hit, grip, or strongly bite Set Screws, etc., into the Piston Rod sliding part and outer tube outer diameter threaded part, causing scratches or dents. Scratches or dents on the Piston Rod sliding part will lead to damage to packings, causing oil leakage and malfunction. Also, scratches or dents on the outer tube outer diameter threaded part may prevent mounting on a frame, or cause a malfunction due to deformation of internal components.

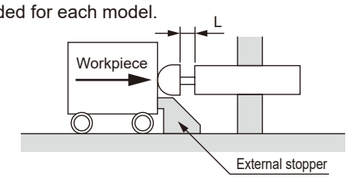
■Do not use in conditions where oil mist or water drops may contact the rod surface, or in areas with high levels of wear powder. Normal energy absorption may not occur, leading to defects.

■Use without an external stopper is prohibited.

● Operation without an external stopper may damage the main body due to bottoming.

● Operate the unit upon installing an external stopper at the position decided for each model.

	L
NCK	0.5 mm
SCK	2 to 3 mm
FCK	1 mm



■Installation with other than the tightening torque value is prohibited.

● Installation with other than the tightening torque value may lead to damage of the master unit.

● Do not fix with screws that do not match the mounting holes. There is a risk of product detachment or damage.

■Be careful of detachment of the snap ring.

● If used outside the specifications, the internal pressure of the inner tube in the shock absorber may rise abnormally, causing the snap ring to come off. This may cause inner parts to pop out and cause injury.

● Do not go near the Shock Absorbers during operation.

■If the device is stored with the rod pushed in, the performance of the air chamber may drop. Do not store with the rod pushed in.

■Adjust the adjustable, and use at the optimum position.

■Make sure that the Piston Rod and the tube outer diameter threading are not scratched.

● The sealant will become scratched, which may lead to decreased durability or defective return.

■Careless oil dumping is prohibited.

● Careless disposal of the oil in the Shock Absorbers will pollute the environment.

● Dispose of the oil according to prescribed methods for processing waste oil.

■Be careful of irregular vibrations as well as noises due to vibrations.

● If collision or vibration increases abnormally, product life may be expired. Continuing to use it as is will cause damage to the installed equipment.

2. FCK Series Adjustment Method

CAUTION

■To adjust the shock absorber, first set the adjusting knob to "2", and allow it to collide while observing the conditions. Then rotate in the direction of "1" or "3" to optimize.

● After setting the scale to the optimum position, tighten the lock screw before starting use. If used without tightening the lock screw, the adjustment position will shift, making optimal absorption impossible. (However, FCK-L-0.15, FCK-$^{H}_{M}$-0.18, FCK-L-0.3,FCK-$^{H}_{M}$-0.5 has no lock screw mechanism.)

● Protect the Shock Absorbers with an external stopper or a stopper nut while making adjustments.

*Adjusting knob 1 → 2 → 3 means absorption energy Low → Medium → High.

● As there are slight variances between individual products, adjust each product to determine the most appropriate adjustment positions.

● The recommended tightening torque for the lock screw is as follows.

FCK-□-0.4, 0.6 0.09±0.01 N·m
FCK-□-1 0.3±0.02 N·m
FCK-□-3 and absorber outer diameter thread size M2O and higher models 0.7±0.03 N·m

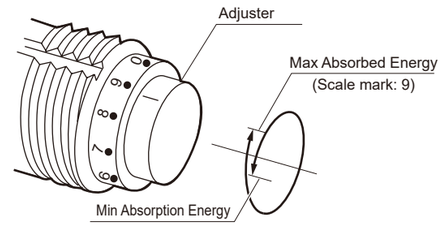
3. SCK Series Adjustment Method

CAUTION

Products SCK-□□-0.3 or more have an adjuster, so adjust according to the following procedure. The adjuster rotates more than one full turn, so when adjusting the adjuster, be sure to first turn it clockwise to the stop end (Max absorption energy on the scale), and then adjust by turning it counterclockwise. The adjuster is designed to lock its position with a detent as an anti-rotation mechanism, so be sure to apply impact force at a position where the detent is engaged.

*1. The Max energy absorption is attained when the adjuster is turned clockwise to 9, while the Min energy absorption is attained when the adjuster is turned counterclockwise by slightly more than one rotation. Min energy may vary per product. Forcibly turning the adjuster may cause it to lock or break, so please be careful.

*2. If the adjuster is not set to the appropriate scale, operation time may be long, or it may stop midway.



For precautions during mounting, installation, adjustment, use, and maintenance, refer to "During Use" in this catalog and the CKD Components Product website (https://www.ckd.co.jp/kiki/en/) -> "Model No." -> Instruction Manual.

Free Joint

Absorbs misalignment and lack of parallelism between driven body and cylinder

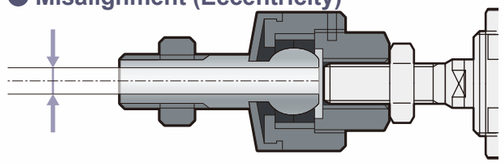
Effect

- Prevents rod metal from being snagged.
- Packing damage prevention.
- Easy assembly centering.
- Prevents chattering of cylinders.
- Low pressure actuation.
- Prevents reduction in thrust.

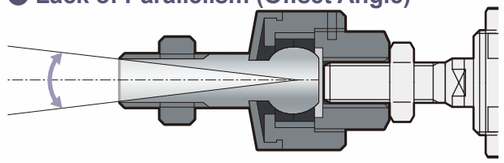
Functional Explanation

Lateral load is the biggest weak point of pneumatic cylinders. When using a cylinder, it is necessary to create a state where no lateral load is applied to the Piston Rod so that the direction of motion of the Piston Rod is on the same line as the direction of motion of the load. This product is an important part that absorbs misalignment (eccentricity) and lack of parallelism (offset angle) between the driven body and the cylinder, reducing lateral load.

● Misalignment (Eccentricity)



● Lack of Parallelism (Offset Angle)

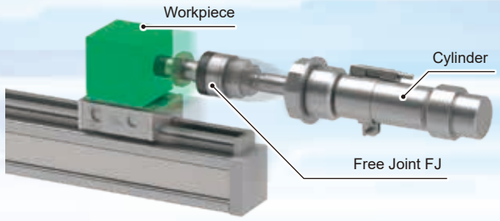


Free Joint FJ Series

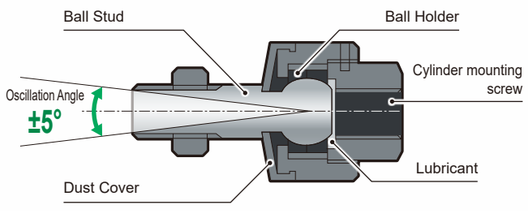
Applicable Cylinder Bore ø20 to ø200

This is the most versatile floating joint that transmits the high thrust of a cylinder using a ball joint system.

Easy alignment of centers and parallelism



Filled with lubricant, no lubrication required
Compatible with high tensile/compressive forces
Oscillation Angle ±5°
With Dust Cover



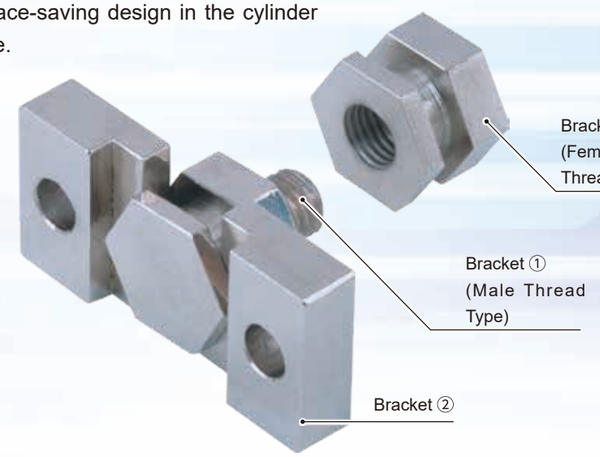
3 mounting types standardized

Basic type　Foot type　Flange Type

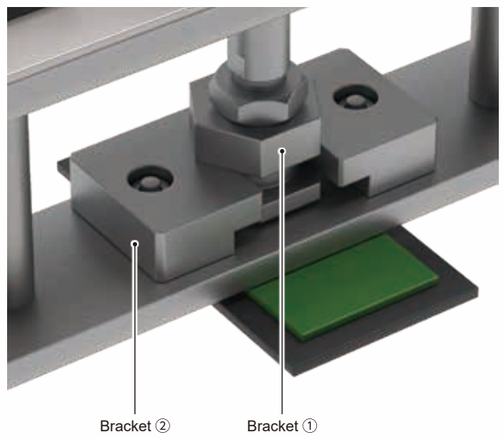
Simple Flow Controller FK Series

Applicable Cylinder Bore ø6 to ø100

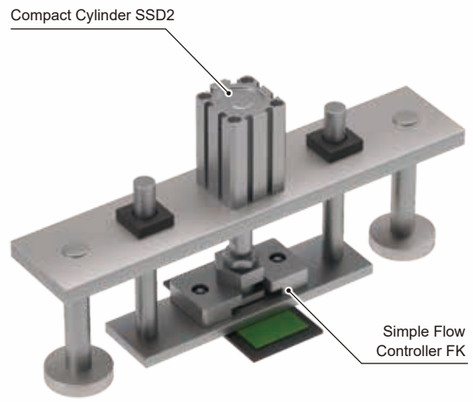
Due to its thin shape, space-saving design in the cylinder stroke direction is possible.



Easy alignment of centers and parallelism



Matching with Compact Cylinder



Mountable in a short time

FJ
Free Joint

CONTENTS

Product Introduction 1436
Series variation 1440
● Free Joint (FJ) 1442
⚠ Precautions for Use 1448

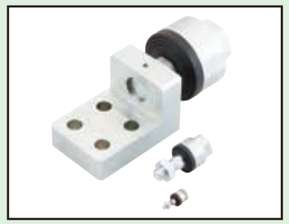
Variation Table

Free Joint
FJ Series

●: Standard, ◎: Option, ○: Custom Products, : Not available

Variation	Model No.	Thread size								Thread size											Page
		M3×0.5	M4×0.7	M5x0.8	M6×1.0	M8×1.0	M8×1.25	M10×1.25		M12×1.25	M12×1.5	M14×1.5	M16×1.5	M18×1.5	M22×1.5	M26×1.5	M30×1.5	M36x1.5	M40x1.5	M45×1.5	
Basic type	FJ-0	●	●	●	●	●	●	●		◎	●	●	●	●	●	●	●	○	○	○	1442
Foot type	FJ-L					●	●	●		◎	●	●	●	●	●	●	●	○	○	○	1442
Flange Type	FJ-F					●	●	●		◎	●	●	●	●	●	●	●	○	○	○	1442

Related Equipment
SKL
NCK
SCK
FCK
FJ
FK
Cylinder Switch
Ending



Free Joint

FJ Series

● Compatible cylinder diameter: ø20 to ø200

RoHS

Model Number Notation

FJ - 0 - 3

Model No. / ❷Nominal Thread Diameter×Pitch / ❶Mounting

❶Mounting

Code	Content
0	Basic type
L	Foot type
F	Flange Type

Rechargeable Battery Compatible Specification (Catalog No. CC-1226AA)

●Design compatible with rechargeable battery manufacturing process

FJ - . . . . - P4*

* Please contact us for details.

Food Manufacturing Process Compatible Specification (Catalog No. CC-1271AA)

●Uses food grade grease that can be used in food manufacturing processes

FJ - . . . . - FP1

❷Nominal Thread Diameter×Pitch

Code	Content	Mounting		
		O	L	F
3	M3×0.5	●		
4	M4×0.7	●		
5	M5x0.8	●		
6	M6×1.0	●		
8	M8×1.0	●	●	●
8-1.25	M8×1.25	●	●	●
10	M10×1.25	●	●	●
12-1.25	M12×1.25	●	●	●
12	M12×1.5	●	●	●
14	M14×1.5	●	●	●
16	M16×1.5	●	●	●
18	M18×1.5	●	●	●
22	M22×1.5	●	●	●
26	M26×1.5	●	●	●
30	M30×1.5	●	●	●
36	M36x1.5	●	●	●
40	M40x1.5	●	●	●
45	M45×1.5	●	●	●

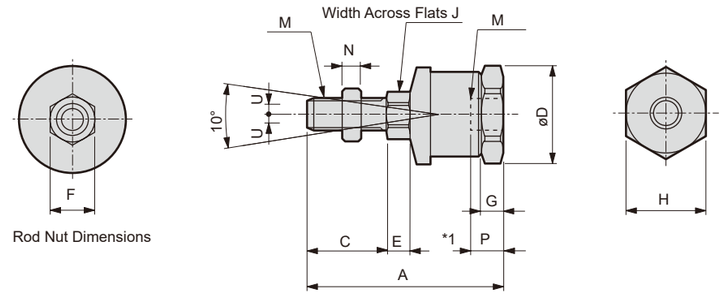
Specifications

Item / Model No.	Nominal Thread Diameter×Pitch	Max Operating Tensile/Compressive Force (kN) *1 Basic type	Flange Type	Foot type	Allowable Misalignment (mm)	Oscillation Angle	Ambient Temperature
FJ-□- 3	M3×0.5	0.019	——	——	0.5	±5°	-10 to 60°C (provided there is no freezing)
4	M4×0.7	0.053	——	——	0.5		
5	M5x0.8	0.121	——	——	0.5		
6	M6×1.0	1.08	——	——	0.75		
8	M8×1.0	1.08	1.08	1.08	0.75		
8-1.25	M8×1.25	1.08	1.08	1.08	0.75		
10	M10×1.25	2.45	2.45	2.45	0.75		
12-1.25	M12×1.25	2.45	2.45	2.45	0.75		
12	M12×1.5	2.45	2.45	2.45	0.75		
14	M14×1.5	5.88	5.88	5.88	1.0		
16	M16×1.5	10.8	10.8	10.8	1.5		
18	M18×1.5	10.8	10.8	10.8	1.5		
22	M22×1.5	17.6	17.6	17.6	2.0		
26	M26×1.5	27.5	27.5	27.5	3.0		
30	M30×1.5	60.8	60.8	60.8	3.0		
36	M36x1.5	87.3	87.3	87.3	4.0		
40	M40x1.5	87.3	87.3	87.3	4.0		
45	M45×1.5	108	108	108	4.0		

*1: Max operating tensile/compressive force indicates static load.
*2: FJ-8-1.25 and FJ-12-1.25 are optional items. FJ-36, 40, 45 are custom products.

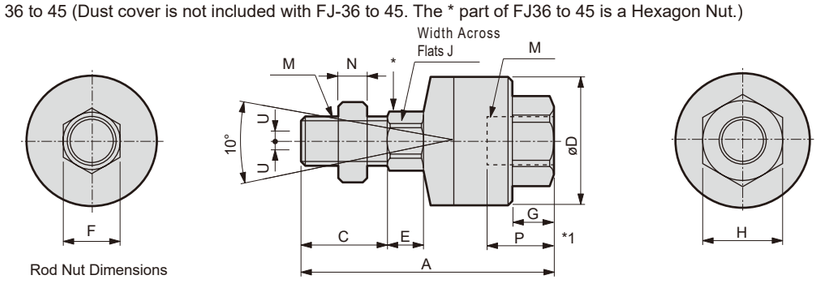
External Dimensions: Basic type

●FJ-0-3 to 5



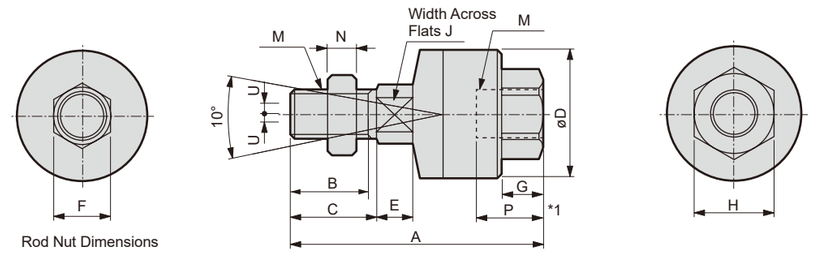
Rod Nut Dimensions

● FJ-0-6, 8, 10, 36 to 45 (Dust cover is not included with FJ-36 to 45. The * part of FJ36 to 45 is a Hexagon Nut.)



Rod Nut Dimensions

● FJ-0-12 to 30 (Dust cover is not included with FJ-30)



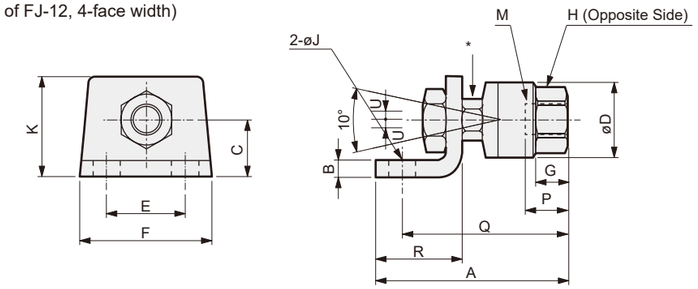
Rod Nut Dimensions

*1: For FJ-□-3 to 5, strictly observe the screw-in dimension (P).

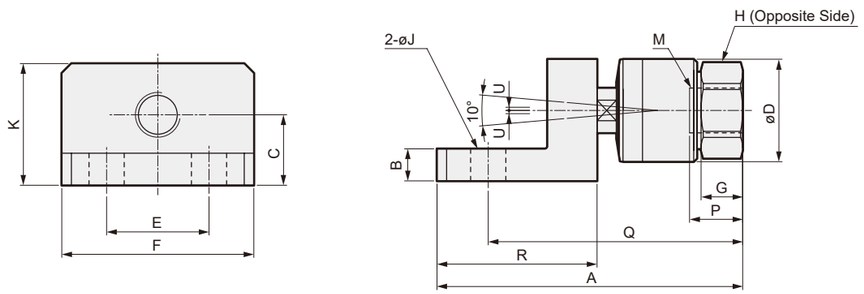
Model No.	Main Applicable Cylinders	M Nominal Diameter	M Pitch	A	B	C	D	E	F	G	H	J	N	P *1	Allowable Misalignment U	Max. Operating Tensile/ Compressive Force KN	Weight (kg)
FJ-O- 3	SCPD3-6 / SMG-6	3	0.5	23	——	8.3	12	2.5	5.5	2.5	11	5.5	1.8	4	0.5	0.019	0.012
4	SCPD3-10 / SMG-10	4	0.7	26	——	10	12	3.5	7	2.5	11	5.5	2.4	3.7	0.5	0.053	0.012
5	SCPD3-16 / SSD / SSD2-12-N / SMG-16	5	0.8	31.6	——	12	15.5	4	8	3.5	14	7	3.2	5.2	0.5	0.121	0.022
6	SSD / SSD2-16-N / SMG-20	6	1.0	45.4	——	15.8	21	4	10	9	17	10	3.6	12	0.75	1.08	0.057
8	CMA2 / CMK2 / CKV2-20 / JSK2 / JSM2-20	8	1.0	48.4	——	18.8	21	4	13	9	17	10	5	12	0.75	1.08	0.061
8-1.25	SMG-25 / SSD / SSD2-20-N / SCM-20	8	1.25	48.4	——	18.8	21	4	13	9	17	10	5	12	0.75	1.08	0.061
10	CMA2-30 / SMG-32 / CMK2 / SCG / CKV2-25, 32 / FCD-25-N / SSD / SSD2-25-N / SCM-25, 32 / JSK2-25, 32 / JSM2-30	10	1.25	56.2	——	22	24	7	17	10	19	12	6	12	0.75	2.45	0.092
12	CMA2 / CMK2 / CKV2-40 / JSK2 / JSM2-40	12	1.5	58	20.5	23	27	6	19	10	21	12	7	11.8	0.75	2.45	0.12
12-1.25	–	12	1.25	58	20.5	23	27	6	19	10	21	12	7	11.8	0.75	2.45	0.12
14	SCG-40 / SCA2-40 / FCD-32, 40-N SSD / SSD2-32, 40-N / SCM-40 / JSC3-40	14	1.5	68.5	20	22	32	7	22	13	27	14	8	16.5	1.0	5.88	0.22
16	CAV2-50 COV2-50	16	1.5	84.2	26	29	43	11	24	14	27	16	10	16.9	1.5	10.8	0.4
18	SCG-50, 63 / SCA2-50, 63 / FCD-50, 63-N / SSD / SSD2-50, 63-N / SCM-50, 63 / JSC3-50, 63	18	1.5	84.2	26	29	43	11	27	14	27	18	11	16.9	1.5	10.8	0.41
22	SCG-80 / SCA2-80 / SSD / SSD2-80-N / SCM-80 / JSC3-80	22	1.5	102.5	31	34	53	14	32	17	32	22	13	17.2	2.0	17.6	0.75
26	SCG-100 / SCA2-100 / SSD / SSD2-100-N / SCM-100 / JSC3-100	26	1.5	121.6	39	42	69	15	41	20	41	26	16	20.8	3.0	27.5	1.5
30	SCS2-125, 140 / JSC4-125, 140	30	1.5	145.2	47	50	90	16	46	21	46	30	18	26	3.0	60.8	3.1
36	SCS2-160 / JSC4-160	36	1.5	163.5	——	57	108	16	55	22	55	55	21	25	4.0	87.3	4.6
40	SCS2-180 / JSC4-180	40	1.5	170.5	——	64	108	16	60	22	55	60	24	25	4.0	87.3	4.7
45	SCS2-200	45	1.5	199.5	——	72	118	18	70	24	60	70	27	35	4.0	108	7.0

External Dimensions: Foot type

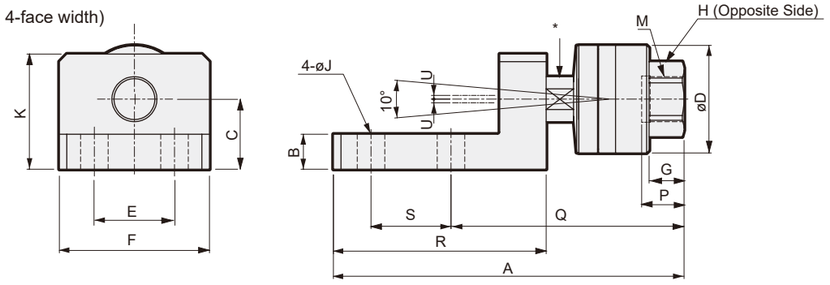
●FJ-L-8 to 12 (* part of FJ-12, 4-face width)



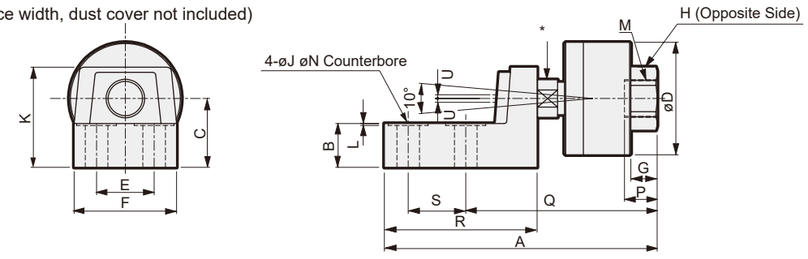
●FJ-L-14



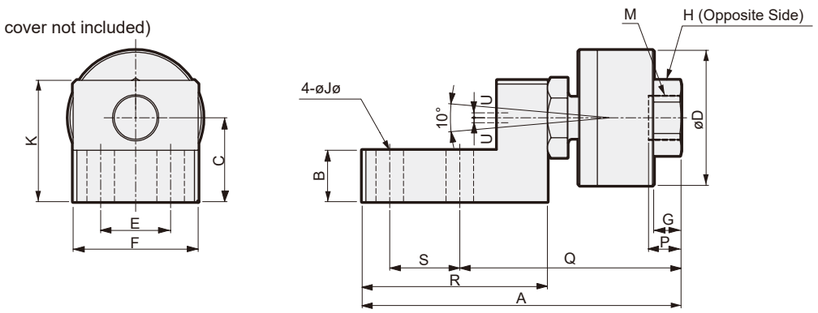
●FJ-L-16 to 26 (* part, 4-face width)



●FJ-L-30 (* part, 4-face width, dust cover not included)



●FJ-L-36 to 45 (Dust cover not included)

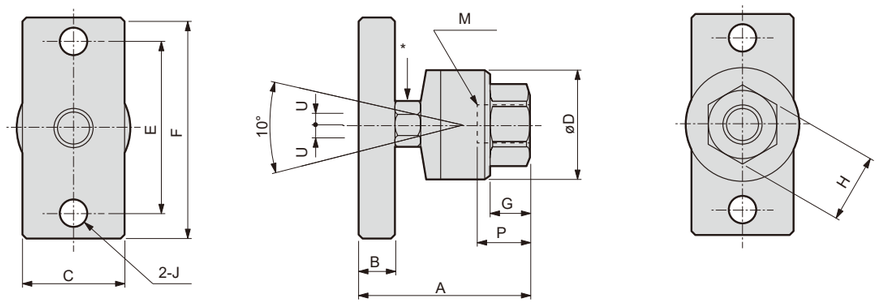


External Dimensions: Foot type

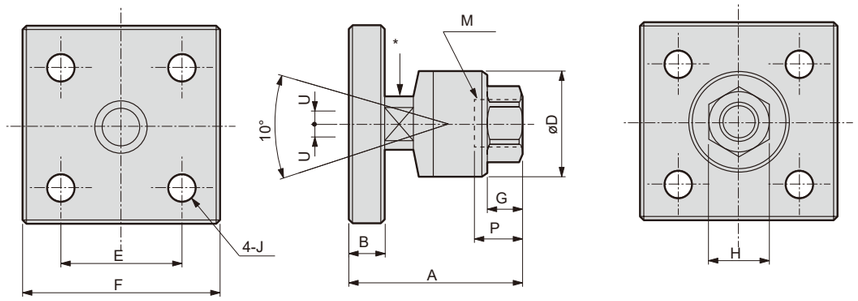
Model No.	Main Applicable Cylinders	M		A	B	C	D	E	F	G	H	J	K	L	N	P	Q	R	S	Allowable Misalignment	Max Operating Tensile/ Compressive Force kN	Weight (kg)
		Nominal Diameter	Pitch																	U		
FJ-L-8	CMA2 / CMK2 / CKV-20 / JSK2 / JSM2-20	8	1.0	54.6	3.2	15	21	26	44	9	17	9	25	-	-	12	45.6	25	-	0.75	1.08	0.1
8-1.25	SMG-25 / SSD / SSD2-20-N / SCM-20	8	1.25	54.6	3.2	15	21	26	44	9	17	9	25	-	-	12	45.6	25	-	0.75	1.08	0.1
10	CMA2-30 / SMG-32 / CMK2 / SCG / CKV2-25, 32 / FCD-25-N / SSD / SSD2-25-N / SCM-25, 32 / JSK2-25, 32 / JSM2-30	10	1.25	64.5	5	19	24	26	44	10	19	9	32	-	-	12	54.5	30	-	0.75	2.45	0.18
12	CMA2 / CMK2 / CKV2-40 / JSK2 / JSM2-40	12	1.5	64.6	5	19	27	26	44	10	21	9	32	-	-	11.8	54.6	30	-	0.75	2.45	0.19
12-1.25	–	12	1.25	64.6	5	19	27	26	44	10	21	9	32	-	-	11.8	54.6	30	-	0.75	2.45	0.19
14	SCG-40 / SCA2-40 / FCD-32, 40-N / SSD / SSD2-32, 40-N / SCM-40 / JSC3-40	14	1.5	95.5	10	22	32	32	60	13	27	11	38	-	-	16.6	79.5	50	-	1.0	5.88	0.43
16	CAV2-50 COV2-50	16	1.5	140.1	14	28	43	32	60	14	27	11	46	-	-	16.9	93.1	85	32	1.5	10.8	0.4
18	SCG-50, 63 / SCA2-50, 63 / FCD-50, 63-N / SSD / SSD2-50, 63-N / SCM-50, 63 / JSC3-50, 63	18	1.5	140.1	14	28	43	32	60	14	27	11	46	-	-	16.9	93.1	85	32	1.5	10.8	1.1
22	SCG-80 / SSD / SSD2-80-N / SCA2-80 / SCM-80 / JSC3-80	22	1.5	163.5	19	35	53	36	68	17	32	14	55	-	-	17.2	110.5	95	36	2.0	17.6	2.1
26	SCG-100 / SCA2-100 / SSD / SSD2-100-N / SCM-100 / JSC3-100	26	1.5	179.6	24	42	69	36	68	20	41	14	64	-	-	20.8	126.6	100	36	3.0	27.5	2.9
30	SCS2-125, 140 / JSC4-125, 140	30	1.5	217.2	35	55	90	46	82	21	46	18	80	1.5	32	26	152.2	122	46	3.0	60.8	5.6
36	SCS2-160 / JSC4-160	36	1.5	254.5	41	67	108	56	100	22	55	22	97	-	-	25	177	148	56	4.0	87.3	8.9
40	SCS2-180 / JSC4-180	40	1.5	254.5	41	67	108	56	100	22	55	22	97	-	-	25	177	148	56	4.0	87.3	8.8
45	SCS2-200	45	1.5	294	41	70	118	66	125	24	60	26	103	-	-	35	203	166	66	4.0	108	13.2

External Dimensions: Flange Type

● FJ-F-8 to 14 (Width across flats for * parts of FJ-12 and 14)



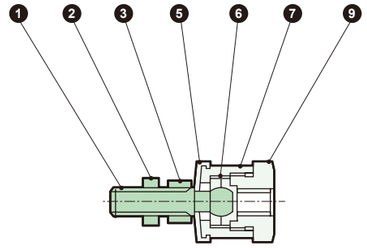
● FJ-F-16 to 45 (Hex nut for * parts of FJ-36, 40, 45)



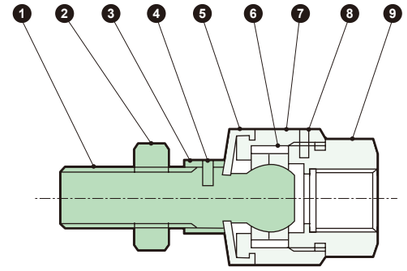
Model No.	Main Applicable Cylinders	M		A	B	C	D	E	F	G	H	J	P	Allowable Misalignment U	Max Operating Tensile/Compressive Force KN	Weight (kg)
		Nominal Diameter	Pitch													
FJ-F- 8	CMA2 / CMK2 / CKV-20 / JSK2 / JSM2-20	8	1.0	35.6	6	19	21	40	52	9	17	6.6	12	0.75	1.08	0.11
8-1.25	SMG-25 / SSD / SSD2-20-N / SCM-20	8	1.25	35.6	6	19	21	40	52	9	17	6.6	12	0.75	1.08	0.11
10	CMA2-30 / SMG-32 / CMK2 / SCG / CKV2-25, 32 / FCD-25-N / SSD / SSD2-25-N / SCM-25, 32 / JSK2-25, 32 / JSM2-30	10	1.25	43.2	9	25	24	44	56	10	19	6.6	12	0.75	2.45	0.18
12	CMA2 / CMK2 / CKV2-40 / JSK2 / JSM2-40	12	1.5	43.6	9	25	27	44	56	10	21	6.6	11.8	0.75	2.45	0.19
12-1.25	–	12	1.25	43.6	9	25	27	44	56	10	21	6.6	11.8	0.75	2.45	0.19
14	SCG-40 / SCA2-40 / FCD-32, 40-N / SSD / SSD2-32, 40-N / SCM-40 / JSC3-40	14	1.5	57.5	12	32	32	60	80	13	27	11	16.5	1.0	5.88	0.56
16	CAV2-50 / COV2-50	16	1.5	71.2	16	——	43	50	75	14	27	11	16.9	1.5	10.8	1.1
18	SCG-50, 63 / SCA2-50, 63 / FCD-50, 63-N / SSD / SSD2-50, 63-N / SCM-50, 63 / JSC3-50, 63	18	1.5	71.2	16	——	43	50	75	14	27	11	16.9	1.5	10.8	1.1
22	SCG-80 / SCA2-80 / SSD / SSD2-80-N / SCM-80 / JSC3-80	22	1.5	87.5	19	——	53	62	100	17	32	14	17.2	2.0	17.6	1.9
26	SCG-100 / SCA2-100 / SSD / SSD2-100-N / SCM-100 / JSC3-100	26	1.5	101.6	22	——	69	70	100	20	41	14	20.8	3.0	27.5	2.8
30	SCS2-125, 140 / JSC4-125, 140	30	1.5	120.2	25	——	90	90	125	21	46	18	26	3.0	60.8	5.6
36	SCS2-160 / JSC4-160	36	1.5	135	29	——	108	114	150	22	55	22	25	4.0	87.3	9.4
40	SCS2-180 / JSC4-180	40	1.5	135	29	——	108	114	150	22	55	22	25	4.0	87.3	9.3
45	SCS2-200	45	1.5	159	32	——	118	132	175	24	60	26	35	4.0	108	13.4

Internal Structure Diagram/Material

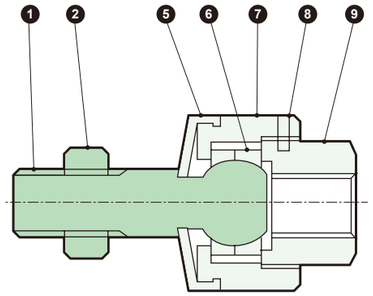
● FJ-O-3 to 5



● FJ-O-6, 8, 10
FJ-O-36 to 45



● FJ-12 to 30



Do not disassemble

No.	Part Name	Material	Treatment	No.	Part Name	Material	Treatment
1	Ball Stud	Alloy Steel	Trivalent chromate	8	Spring pin	Steel	Black Oxide
2	Rod Nut	Steel	Trivalent chromate	9	Socket	Brass (FJ-3 to 5)	Electroless Nickel Plating
3	Stud Nut	Steel	Trivalent chromate			Steel (FJ-6 to 45)	Trivalent chromate
4	Spring pin	Steel	Black Oxide	-	Foot	Steel (FJ-8, 10, 12)	Trivalent chromate
5	Dust Cover	Nitrile Rubber	——			Cast Iron (FJ-14 to 30)	Trivalent chromate
6	Ball Holder	Steel (FJ-3 to 5)	Electroless Nickel Plating			Steel (FJ-36 to 45)	Trivalent chromate
		Alloy Steel (FJ-6 to 45)	Trivalent chromate	-	Flange	Steel	Trivalent chromate
7	Case	Copper Alloy (FJ-3 to 5)	Electroless Nickel Plating				
		Steel (FJ-6 to 45)	Trivalent chromate				

*1: Spring pin of ❹ is not included with FJ-6, 8, 10.
*2: Dust cover of ❺ is not included with FJ-30 or more.

To Use This Product Safely

Be sure to read this before use. For general cylinder information, see Intro 41, and for cylinder switches, see P. 1512.

Individual Precautions: Free Joint FJ Series

During Use

Warning

■When screwing the male thread of a rod onto the female thread of a socket or case, check that it does not hit the bottom.

If used with the rod bottomed out, the ball stud will not float and will not operate normally. As a guideline, the appropriate screw-in Depth into the female thread is 1 to 2 turns back from the bottomed-out position. For FJ-3 to 5, strictly observe the screw-in dimension (P).

■Do not apply excessive torque such as tightening torque to the stud nut. When assembling the ball stud to the equipment, apply tightening torque only to the rod nut. Also, when removing the ball stud from the equipment, loosen the rod nut to remove.

■When connecting the object being driven and the cylinder rod with a Floating Fittings, securely fix the components by fastening the screws with a tightening torque that is appropriate for the thread size. Furthermore, if loosening is a concern during use, take measures to prevent loosening such as pinning or applying adhesive.

In the unlikely event that the connection part loosens and detaches, it may cause runaway or falling of the driven body, leading to equipment damage or injury.

■The thread part (ball stud) can be turned but is not a rotary fitting. Do not use this for rotary purposes.

For precautions during mounting, installation, adjustment, use, and maintenance, refer to "During Use" in this catalog and the CKD Components Product website (https://www.ckd.co.jp/kiki/en/) -> "Model No." -> Instruction Manual.

MEMO

Related Equipment
SKL
NCK
SCK
FCK
FJ
FK
Cylinder Switch
Ending

FK

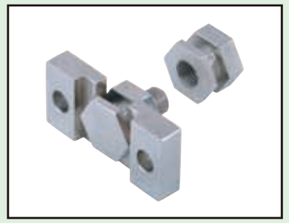
Simple Flow Controller

CONTENTS

Series variation	1451
● Simple Flow Controller (FK)	1452
⚠ Precautions for Use	1455

●: Standard, □: Not Available

Variation	Model No.	Thread Size															Page
		M3 x 0.5	M4 x 0.7	M5 x 0.8	M6 x 1.0	M8 x 1.0	M8 x 1.25	M10 x 1.25	M10 x 1.5	M12 x 1.5	M14 x 1.5	M16 x 1.5	M16 x 2.0	M18 x 1.5	M20 x 2.5	M22 x 1.5	M26 x 1.5	
Male Thread Type	FK-□-N	●	●	●	●		●		●				●		●			1452
Female Thread Type	FK	●	●	●	●	●	●	●		●	●	●		●		●	●	



Simple Flow Controller

FK Series

● Compatible cylinder Bore Size: ø6 to ø100

RoHS

Model Number Notation

●Simple Flow Controller

FK - M3-N

Model No. ❶ Thread Size

❶ Thread Size

Code	Content	
M3-N	M3×0.5	Male Thread Type
M4-N	M4×0.7	
M5-N	M5x0.8	
M6-N	M6×1.0	
M8-N	M8×1.25	
M10-N	M10×1.5	
M16-N	M16×2.0	
M20-N	M20×2.5	
M3	M3×0.5	Female Thread Type
M4	M4×0.7	
M5	M5×0.8	
M6	M6×1.0	
M8×1.0	M8×1.0	
M8×1.25	M8×1.25	
M10	M10×1.25	
M12	M12×1.5	
M14	M14×1.5	
M16	M16×1.5	
M18	M18×1.5	
M22	M22×1.5	
M26	M26×1.5	

Rechargeable Battery Compatible Specification (Catalog No. CC-1226AA)

●Design compatible with rechargeable battery manufacturing process

FK - . . . . - P40

* Please contact us for details.

Specifications

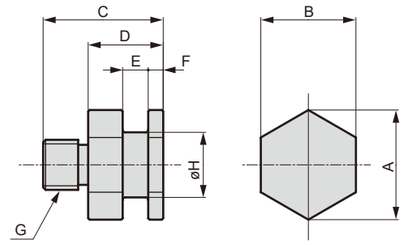
Model No.		Allowable Load *1 (N)	Allowable Misalignment (mm)	Backlash in Thrust Direction (mm)
Male thread	Female Thread			
FK-M3-N	FK-M3	63	±0.3	0.1 to 0.3
FK-M4-N	FK-M4	110		
FK-M5-N	FK-M5	179		
FK-M6-N	FK-M6	253		
FK-M8-N	FK-M8×1.0	462		
——	FK-M8×1.25	462		
FK-M10-N	FK-M10	734		
——	FK-M12	1069		
——	FK-M14	1466		
FK-M16-N	FK-M16	2003	±0.7	
——	FK-M18	2448		
FK-M20-N	——	3130		
——	FK-M22	3896		
——	FK-M26	6219		

*1: Allowable load indicates static load.

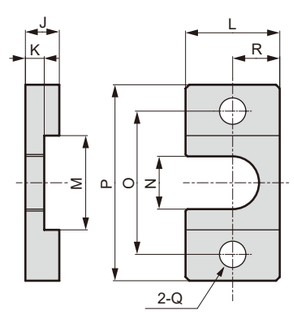
Dimensional Drawings

Material: Steel
Surface Treatment: Nickel Plating

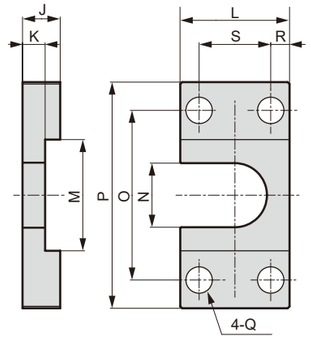
●Bracket (1)



●Bracket (2)



M3 to M16



M20

Bracket (1)

Model No.	Applicable Cylinder	A	B	C	D	E	F	G	H	Weight g
FK-M3-N	SSD / SSD2-12	11.6	10	15	10	$3.1^{+0.1}_{0}$	2	M3×0.5	6	5.3
FK-M4-N	SSD / SSD2-16	11.6	10	15.5	10	$3.1^{+0.1}_{0}$	2	M4×0.7	6	5.5
FK-M5-N	SSD / SSD2-20, FCD-25	13.9	12	16.5	10	$3.1^{+0.1}_{0}$	2	M5x0.8	8	8.3
FK-M6-N	SSD / SSD2-25, FCD-32	13.9	12	19	10	$3.1^{+0.1}_{0}$	2	M6×1.0	8	8.9
FK-M8-N	SSD / SSD2-32, 40, FCD-40, 50	21.9	19	23	15	$5.1^{+0.1}_{0}$	3	M8×1.25	13	30.8
FK-M10-N	SSD / SSD2-50, 63, FCD-63	21.9	19	24	15	$5.1^{+0.1}_{0}$	3	M10×1.5	13	32.7
FK-M16-N	SSD / SSD2-80	37	32	31	20	$7.1^{+0.1}_{0}$	4	M16×2.0	23	122.5
FK-M20-N	SSD / SSD2-100	53.1	46	43	28	$12.1^{+0.1}_{0}$	7	M20×2.5	32	333

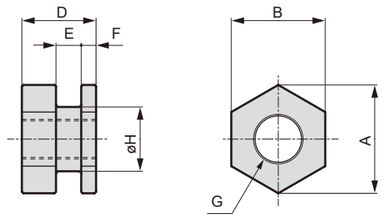
Bracket (2)

Model No.	Applicable Cylinder	J	K	L	M	N	O	P	Q	R	S	Weight g
FK-M3-N	SSD / SSD2-12	6	$3^{0}_{-0.1}$	16	14	7	24	34	4.5	8	-	16
FK-M4-N	SSD / SSD2-16	6	$3^{0}_{-0.1}$	16	14	7	24	34	4.5	8	-	16
FK-M5-N	SSD / SSD2-20, FCD-25	6	$3^{0}_{-0.1}$	19	16	9	26	36	4.5	9.5	-	19.6
FK-M6-N	SSD / SSD2-25, FCD-32	6	$3^{0}_{-0.1}$	19	16	9	26	36	4.5	9.5	-	19.6
FK-M8-N	SSD / SSD2-32, 40, FCD-40, 50	9	$5^{0}_{-0.1}$	25	25	14	38	52	7	12.5	-	54.5
FK-M10-N	SSD / SSD2-50, 63, FCD-63	9	$5^{0}_{-0.1}$	25	25	14	38	52	7	12.5	-	54.5
FK-M16-N	SSD / SSD2-80	12	$7^{0}_{-0.1}$	44	42	25	62	85	11	22	-	216
FK-M20-N	SSD / SSD2-100	22	$12^{0}_{-0.1}$	65	59	34	90	120	14	13.5	38	788

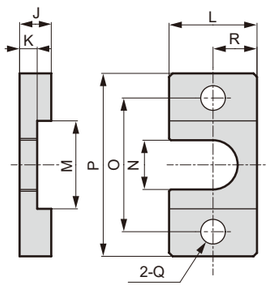
Dimensional Drawings

Material: Steel
Surface Treatment: Nickel Plating

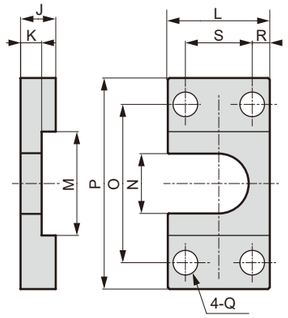
●Bracket (1)



●Bracket (2)



M3 to M18



M22 to M26

Bracket (1)

Model No.	Applicable Cylinder	A	B	D	E	F	G	H	Weight g
FK-M3	SCPD3-6, CAT-6, SMG-6	11.6	10	10	$3.1^{+0.1}_{0}$	2	M3×0.5	6	4.6
FK-M4	SCPD3-10, CAT-10, SMG-10	11.6	10	10	$3.1^{+0.1}_{0}$	2	M4×0.7	6	4.1
FK-M5	SCPD3-16, CAT-15, SMG-16 SSD-12-N	13.9	12	10	$3.1^{+0.1}_{0}$	2	M5x0.8	8	6.2
FK-M6	SMG-20, SSD/SSD2-16-N	13.9	12	10	$3.1^{+0.1}_{0}$	2	M6×1.0	8	5.7
FK-M8×1.0	CMK2-20, CMA2-20, JSK2-20, JSM2-20	21.9	19	15	$5.1^{+0.1}_{0}$	3	M8×1.0	13	23
FK-M8×1.25	SMG-25, SSD/SSD2-20-N, SCM-20	21.9	19	15	$5.1^{+0.1}_{0}$	3	M8×1.25	13	23.4
FK-M10	CMK2-25, 32, CMA2-30, SMG-32, SSD/SSD2-25-N, SCG-32, SCM-25, 32, FCD-25-N, JSK2-25, 32, JSM2-30	21.9	19	15	$5.1^{+0.1}_{0}$	3	M10×1.25	13	20.2
FK-M12	CMK2-40, CMA2-40, JSK2-40, JSM2-40	27.7	24	15	$5.1^{+0.1}_{0}$	3	M12×1.5	18	35.7
FK-M14	SCA2-40, SSD/SSD2-32, 40-N, SCG-40, SCM-40, FCD-32, 40-N, JSC3-40	27.7	24	15	$5.1^{+0.1}_{0}$	3	M14×1.5	18	31.2
FK-M16	CAV2-50	37	32	20	$7.1^{+0.1}_{0}$	4	M16×1.5	23	81.3
FK-M18	SCA2-50, 63, SSD/SSD2-50, 63-N, SCM-50, 63, SCG-50, 63, FCD-50, 63-N, JSC3-50, 63	37	32	20	$7.1^{+0.1}_{0}$	4	M18×1.5	23	73.1
FK-M22	SCA2-80, SSD/SSD2-80-N, JSC3-80, SCG-80, SCM-80, CAV2-75, 100	53.1	46	28	$12.1^{+0.1}_{0}$	7	M22×1.5	32	226
FK-M26	SCA2-100, SSD/SSD2-100-N, SCM-100, JSC3-100, SCG-100	53.1	46	28	$12.1^{+0.1}_{0}$	7	M26×1.5	32	193

Bracket (2)

Model No.	Applicable Cylinder	J	K	L	M	N	O	P	Q	R	S	Weight g
FK-M3	SCPD3-6, CAT-6, SMG-6	6	$3^{0}_{-0.1}$	16	14	7	24	34	4.5	8	-	16
FK-M4	SCPD3-10, CAT-10, SMG-10	6	$3^{0}_{-0.1}$	16	14	7	24	34	4.5	8	-	16
FK-M5	SCPD3-16, CAT-15, SMG-16 SSD/SSD2-12-N	6	$3^{0}_{-0.1}$	19	16	9	26	36	4.5	9.5	-	19.6
FK-M6	SMG-20, SSD/SSD2-16-N	6	$3^{0}_{-0.1}$	19	16	9	26	36	4.5	9.5	-	19.6
FK-M8×1.0	CMK2-20, CMA2-20, JSK2-20, JSM2-20	9	$5^{0}_{-0.1}$	25	25	14	38	52	7	12.5	-	54.5
FK-M8×1.25	SMG-25, SSD/SSD2-20-N, SCM-20	9	$5^{0}_{-0.1}$	25	25	14	38	52	7	12.5	-	54.5
FK-M10	CMK2-25, 32, CMA2-30, SMG-32, SSD/SSD2-25-N, SCG-32, SCM-25, 32, FCD-25-N, JSK2-25, 32, JSM2-30	9	$5^{0}_{-0.1}$	25	25	14	38	52	7	12.5	-	54.5
FK-M12	CMK2-40, CMA2-40	9	$5^{0}_{-0.1}$	32	32	19	50	70	9	16	-	94.5
FK-M14	SCA2-40, SSD/SSD2-32, 40-N, SCG-40, SCM-40, FCD-32, 40-N, JSC3-40	9	$5^{0}_{-0.1}$	32	32	19	50	70	9	16	-	94.5
FK-M16	CAV2-50	12	$7^{0}_{-0.1}$	44	42	25	62	85	11	22	-	216
FK-M18	SCA2-50, 63, SSD/SSD2-50, 63-N, SCM-50, 63, SCG-50, 63, FCD-50, 63-N, JSC3-50, 63	12	$7^{0}_{-0.1}$	44	42	25	62	85	11	22	-	216
FK-M22	SCA2-80, SSD/SSD2-80-N, JSC3-80, SCG-80, SCM-80, CAV2-75, 100	22	$12^{0}_{-0.1}$	65	59	34	90	120	14	13.5	38	788
FK-M26	SCA2-100, SSD/SSD2-100-N, SCM-100, JSC3-100, SCG-100	22	$12^{0}_{-0.1}$	65	59	34	90	120	14	13.5	38	788

Pneumatic Components

To Use This Product Safely

Be sure to read this before use. For general cylinder information, see Intro 41, and for cylinder switches, see P. 1512.

Individual Precautions: Simple Joint FK Series

At Design / Setting

CAUTION

■If used with a load exceeding the allowable load, the product may be damaged or may malfunction. Use with a load less than the allowable load.

For precautions regarding mounting, installation, adjustment, operation, and maintenance, please refer to the CKD Equipment Product Site (https: //www.ckd.co.jp/kiki/en/) → 'model No.' → Instruction Manual.

Related Equipment
SKL
NCK
SCK
FCK
FJ
FK
Cylinder Switch
Ending

Cylinder Switch

About Switch Single Unit Model No.

The single item model number of the switch is as follows.

SW – Switch Model No.

For the lead wire outlet direction, straight type (H) and L-shaped type (V) are available.

CONTENTS

Cylinder Switch System Chart	1458
Cylinder with Switch System Chart	1460
2-Color Indicator Solid State Cylinder Switch	1464
Cylinder Switch for Strong Magnetic Fields	1465
● M Series	1468
● R Series	1470
● T Series	1472
● Improved Water Resistance Cylinder Switch	1476
● Magnetic environment cylinder switch	1478
● K Series	1480
● F Series	1482
● H Series	1484
● V Series	1485
● E Series	1486
● Contact Protection Circuit Box	1487
● Cylinder Switch with Connector	1488
Series Options	1489
Operating Principle / Switch Mounting Position	1491
Operating Range and Hysteresis of Each Cylinder with Switch	1492
Selection Chart	1502
Failures and Countermeasures	1504
⚠ Precautions for Use	1512
Switch Mounting Method	1518
Mounting Method for Terminal Box	1521

Cylinder Switch

Solid state switch

	M Series				R Series					T Series											K Series					F Series						
														Improved Water Resistance	For Cutting Oil			For Cutting Oil	For AC Magnetic Field												
Sub-item	M2	M2WV	M3	M3WV	R1	R2	R2Y	R3	R3Y	T1	T2	T2J	T2W	T2WL	T2YL	T3	T3P	T3W	T3YL	T2YD	K2	K2Y	K3	K3P	K3Y	F2	F2Y	F2S	F3	F3Y	F3P	F3S
Grommet	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Terminal box					●	●	●	●	●																							
Connector											○		○	○	○	○	○	○		○		○					○					
2-wire	●	●			●	●	●			●	●	●	●	●	●					●	●	●				●	●	●				
3-wire			●	●				●	●							●	●	●	●				●	●	●				●	●	●	●
LED	Red	Red/Green	Red	Red/Green	Red	Red	Red/Green	Red	Red/Green	Red	Red	Red	Red/Green	Red/Green	Red/Green	Red	Yellow	Red/Green	Red/Green	Red/Green	Red	Red/Green	Red	Yellow	Red/Green	Yellow	Red/Green	Red	Yellow	Red/Green	Yellow	Red
Neon lamp (Lights up when OFF)																															
No indicator etc.																															
2-color indicator type		●		●			●		●				●	●	●			●	●	●		●			●		●					
5 VDC			●					●	●														●	●					●			●
10 to 30 VDC (28 V)	●	●		●		●	●				●	●				●	●	●	●	●							●	●	●			
24 VDC													●	●						●						●						
30 VDC or less			●	●				●	●							●	●	●	●				●	●	●				●	●	●	●
100/110 VAC					●					●																						
200/220 VAC					●					●																						
PLC	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
IC circuit			●	●				●	●							●	●	●	●				●	●	●				●	●	●	●
Relay			●	●	●			●	●	●						●	●	●	●				●	●	●				●	●	●	●
Large capacity relay																																

Reed switch

	M Series		R Series				T Series				K Series		F Series	H Series		E Series		V Series
										For magnetized environment				For strong magnetic field		Heat resistant		For small magnetic field
Main item	Sub-item	M0	M5	R0	R4	R5	R6	T0	T5	T8	T0Y	K0	K5	F0	H0	H0Y	E0	ET0	V0
Wiring method	Grommet	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●
	Terminal box			●	●	●	●										●		
	Connector							○			○				○	○			○
Number of wires	2-wire	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	3-wire																		
With indicator lamp	LED	Red		Red			Red	Red		Red	Red/Green	Red		Yellow	Green	Red/Green	Red	Yellow	Red
	Neon lamp (Lights up when OFF)				●														
	No indicator etc.		●			●			●				●						
	2-color indicator type										●					●			
Operating voltage *1	5 VDC		●			●			●				●						
	10 to 30 VDC (28 V)																		
	24 VDC	●	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●
	30 VDC or less																		
	100/110 VAC	●	●	●	●	●		●	●	●		●	●		●		●	●	●
	200/220 VAC			●	●	●				●							●		
Applications	PLC	●	●	●		●	●	●	●	●	●	●	●	●	●		●	●	●
	IC circuit		●			●			●				●						
	Relay	●	●	●		●		●	●	●		●	●		●		●	●	●
	Large capacity relay				●														

● : Standard equipment, ○: Custom specification product (Selectable connector types vary depending on the model, so check the catalog for details.)

About switch single item model number

Model No. notation

Notation Example: SW-T2H5

SW - **T2** **H** **5**

①Switch model No. ③Lead wire length

②Lead wire extraction direction

①Switch model No.

M2	M2WV	M3	M3WV	R1	R2	R2Y	R3	R3Y	T1	T2	T2J	T2W	T2WL	T2YL	T3	T3P	T3W	T3YL	T2YD	K2	K2Y
●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Note: Please refer to the table above.

②Lead wire extraction direction

Code	H	V	V, S
Outlet direction	Straight	L-shape	L-shape
Appearance			*F□S, T2WLV only

③Lead wire length

Blank (1 m), **3** (3 m), **5** (5 m)

* The selectable length varies depending on the model, so please check the catalog specifications for details.

Cylinder switch (Cylinder system with switch)

Solid state switch

Cylinder model		Bore Size	Mounting method: Band	Mounting method: Tie Rod	Mounting method: Rail	Presence/absence of magnet in main body: Standard equipment	Presence/absence of magnet in main body: Option	M Series: M2	M2WV	M3	M3WV	R Series: R1	R2	R2Y	R3	R3Y	T Series: T1	T2	T2J	T2W	T2WL	T2YL	T3	T3P	T3W	T3YL	T2YD	K Series: K2	K2Y	K3	K3P	K3Y	F Series: F2	F2Y	F2S	F3	F3Y	F3P	F3S
General-type	SCP□3	ø6 to ø16	●				●											●		●	●		●	●	●														
	CMK2	ø20 to ø40	●			●											●	●	●	●	●	▲	●	●	●	▲													
	CMA2	ø20 to ø40	●			●											●	●	●	●	●		●	●	●	▲													
	SCM	ø20 to ø100	●		●	●											●	●	●	●	●		●	●	●	▲	●												
	SCG	ø40 to ø100		●		●											●	●	●	●	●	▲	●	●	●	▲	●												
	SCA2	ø40 to ø100		●		●											●	●	●	●	●	▲	●	●	●	▲	●												
	SCA2-V	ø40 to ø100		●		●											●	●		●	●		●	●			●												
	SCS2	ø125 to ø250		●			●										●	●	●	●			●	●	●	▲													
	SSD2	ø12 to ø200			●		●										●	●	●	●			●	●	●	▲						●	●	●	●	●	●	●	▲
Space-saving Type	SSG	ø12 to ø100			●		●										●	●	●	●			●	●	●	▲						●	●	●	●	●	●	●	
	SSD	ø12 to ø160			●		●										●	●	●	●		▲	●	●	●	▲	●					●	●	●	●	●	●	●	▲
	MDC2	ø4 to ø10			●		●																									●	●	●	●	●	●	●	
	SMG	ø6 to ø32			●		●																					●	●	●	●	●							
	MSD	ø6 to ø16			●		●																									●	●	●	●	●	●	●	
	FC□	ø25 to ø63			●		●	●	●	●	●																												
With Linear Guide	LCM	ø4.5 to ø8			●		●																									●	●	●	●	●	●	●	
	LCR	ø6 to ø25			●	●												●		●	●		●	●	●							●	●	●	●	●	●	●	
	LCG	ø6 to ø25			●	●												●		●	●		●	●	●							●	●	●	●	●	●	●	
	LCW	ø12 to ø20			●	●												●		●			●	●	●							●	●	●	●	●	●	●	
	LCX	ø25 to ø32			●	●												●		●	●		●	●	●														
	MSDG-L	ø6 to ø16			●	●																										●	●	●	●	●	●	●	
Guided	STM	ø6 to ø10			●	●																										●	●	●	●	●	●	●	
	STG	ø12 to ø100			●	●											●	●		●	●	▲	●	●	●	▲	●												
	STS/L	ø8 to ø100			●	●											●	●		●	●	▲	●	●	●	▲	●												
	STR2	ø6 to ø32			●	●																						●	●	●	●	●							
	UCA2	ø10 to ø32			●		●											●					●																
Rodless Type	SRL3	ø10 to ø100			●	●														●	●				●														
	SRG3	ø12 to ø25			●		●													●	●				●														
	SRM3	ø25 to ø63			●		●													●	●				●														
	SRT3	ø32 to ø63			●	●														●	●				●														
	MRL2	ø6 to ø20			●		●																																
	MRG2	ø10 to ø25			●	●																																	

Reed switch

Cylinder model		Bore Size	Mounting method: Band	Mounting method: Tie Rod	Mounting method: Rail	Presence/absence of magnet in main body: Standard equipment	Presence/absence of magnet in main body: Option	M Series: M0	M5	R Series: R0	R4	R5	R6	T Series: T0	T5	T8	T0Y	K Series: K0	K5	F Series: F0	H Series: H0	H0Y	E Series: E0	ET0
General-type	SCP□3	ø6 to ø16	●				●							●	●									
	CMK2	ø20 to ø40	●			●								●	●	●	▲							
	CMA2	ø20 to ø40	●			●								●	●	●								
	SCM	ø20 to ø100	●		●	●								●	●	●	▲							
	SCG	ø40 to ø100		●		●								●	●	●	▲							
	SCA2	ø40 to ø100		●		●								●	●	●	▲				▲	▲	▲	
	SCA2-V	ø40 to ø100		●		●								●	●									
	SCS2	ø125 to ø250		●			●							●	●	●	▲							
	SSD2	ø12 to ø200			●		●							●	●	●	▲							▲
Space-saving Type	SSG	ø12 to ø100			●		●							●	●	●	▲							
	SSD	ø12 to ø160			●		●							●	●	●	▲							▲
	MDC2	ø4 to ø10			●		●													●				
	SMG	ø6 to ø32			●		●											●	●					
	MSD	ø6 to ø16			●		●													●				
	FC□	ø25 to ø63			●		●	●	●															
With Linear Guide	LCM	ø4.5 to ø8			●		●																	
	LCR	ø6 to ø25			●	●								●	●									
	LCG	ø6 to ø25			●	●								●	●									
	LCW	ø12 to ø20			●	●								●	●									
	LCX	ø25 to ø32			●	●								●	●									
	MSDG-L	ø6 to ø16			●	●														●				
Guided	STM	ø6 to ø10			●	●																		
	STG	ø12 to ø100			●	●								●	●	●	▲							
	STS/L	ø8 to ø100			●	●								●	●	●	▲							
	STR2	ø6 to ø32			●	●												●	●					
	UCA2	ø10 to ø32			●		●							●	●									
Rodless Type	SRL3	ø10 to ø100			●	●		●	●															
	SRG3	ø12 to ø25			●		●	●	●															
	SRM3	ø25 to ø63			●		●							●	●	●								
	SRT3	ø32 to ø63			●	●		●	●															
	MRL2	ø6 to ø20			●		●																	
	MRG2	ø10 to ø25			●	●								●	●									

●: Standard Product ▲: Mountable depending on conditions
Varies depending on conditions such as variation and tube inner diameter. Please check the product specifications for details.

Cylinder switch (Cylinder system with switch)

Solid state switch

M Series				R Series					T Series (Improved Water Resistance / For Cutting Oil / For Cutting Oil / For AC Magnetic Field)										K Series					F Series						
M2	M2WV	M3	M3WV	R1	R2	R2Y	R3	R3Y	T1	T2	T2J	T2W	T2WL	T2YL	T3	T3P	T3W	T3YL	T2YD	K2	K2Y	K3	K3P	K3Y	F2	F2Y	F2S	F3	F3Y	F3P	F3S
									●	●	●	●	●		●	●	●													
									●	●	●	●	●		●	●	●													
									●	●	●	●	●		●	●	●													
									●	●	●	●	●		●	●	●		●											
									●		●	●	●		●	●	●		●											
									●	●	●	●	●		●	●	●		●											
									●	●	●	●	●		●	●	●		●											
●	●	●	●																										
									●	●	●	●	●		●	●	●		●											
									●	●	●	●	●		●	●	●													
									●	●	●	●	●		●	●	●													
									●	●	●	●	●		●	●	●		●											
									●	●	●	●	●		●	●	●		●					●	●	●	●	●	●	●
										●	●	●	●						●						●	●	●	●	●	●	●
									●	●	●	●	●		●	●	●		●											
									●	●	●	●			●	●	●		●											
									●	●	●	●	●		●	●	●		●											
									●	●	●	●	●		●	●	●		●											
										●	●	●	●						●											
									●	●	●	●			●	●	●													
				●	●		●													●										
									●	●	●	●	●		●	●	●		●											
				●	●	●	●	●																						
									●	●	●	●			●	●	●													
									●	●	●	●	●		●	●	●													
●		●											●																	
Please refer to Pneumatic Cylinder ⑤ [RJ-006AA].																														

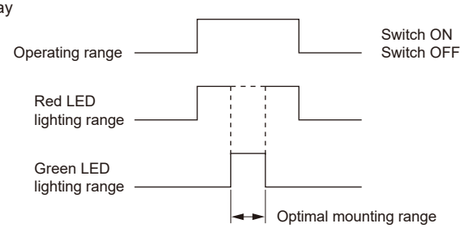
Reed switch

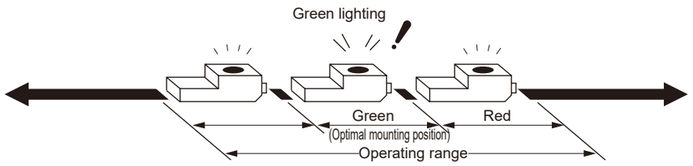
Cylinder model		Bore Size	Mounting method: Band	Mounting method: Tie Rod	Mounting method: Rail	Presence/absence of magnet in main body: Standard equipment	Presence/absence of magnet in main body: Option	M Series		R Series				T Series				K Series		F Series	H Series		E Series	
																	For magnetized environment				For strong magnetic field		Heat resistant	
								M0	M5	R0	R4	R5	R6	T0	T5	T8	T0Y	K0	K5	F0	H0	H0Y	E0	ET0
With Brake	ULK	ø20 to ø40	●			●								●	●	●								
	JSK2	ø20 to ø40	●			●								●	●	●								
	JSM2	ø20 to ø40	●			●								●	●	●								
	JSG	ø40 to ø100		●		●								●	●	●	▲							
	JSC3	ø40 to ø100		●		●								●	●	●	▲				▲	▲		
	JSC4	ø125 to ø100		●			●							●	●	●	▲							
With lock	USSD	ø20 to ø100			●		●							●	●	●	▲							
	UFCD-KL	ø25 to ø63			●	●																		
	USC	ø40 to ø100		●		●								●	●	●					▲	▲		
With Valve	CKV2	ø20 to ø40	●			●								●	●	●								
	CAV2, COV2	ø50 to ø100		●		●								●	●	●								
Clamp Cylinder	CAC4	ø40 to ø80	●	●		●								●	●	●	▲				▲			
	UCAC2	ø50, ø63	●	●		●								●	●	●	▲				▲	▲		
	CAC-N	ø32, ø40	●	●		●								●	●	●	▲							
	UCAC-N	ø32, ø40, ø63	●	●		●								●	●	●	▲							
	RCS2	ø12 to ø63			●	●								●	●	●	▲							
	RCC2	ø16 to ø63			●	●								●	●		▲							
Special cylinder	MVC	ø6, ø10			●	●														●				
	STK	ø20 to ø50			●	●								●	●	●	▲							
	MCP	Actual thrust For 2t, 5t		●	●	●								●	●	●								
	GLC	ø40 to ø100		●		●				●	●	●	●								▲			
High Speed Type	HCM	ø20 to ø63			●	●								●	●	●	▲							
	HCA	ø20 to ø100	●			●				●	●	●	●											
Swinging/ Rotating Type	RRC	Size 8, 32, 63			●	●								●	●	●								
	GRC	Size 5 to 80			●	●																		
	RV3□	Size 50 to 800					●	●	●															
Gripper/Chuck			Catalog name [No]					Please refer to Pneumatic Cylinder ⑤ [RJ-006AA].																

●: Standard Product, ▲: Mountable depending on conditions
Varies depending on conditions such as variation and tube inner diameter. Please check the product specifications for details.

2-Color Indicator Solid State Cylinder Switch

● Lamp Display





Overview

Conventionally, position detection switches for pneumatic cylinders required troublesome mounting and adjustment work due to their operating range and hysteresis. The 2-color indicator type solid state cylinder switch lights up green at the optimal mounting position and red in the normal operating range, instantly displaying the optimal mounting position. Therefore, it not only eliminates the time and hassle involved in switch adjustment, but also reduces setting errors to zero, allowing for the construction of highly reliable equipment.

Main features

● Easy to mount and adjust

Since the green display position is the optimal mounting position, mounting and adjusting the switch is extremely easy.

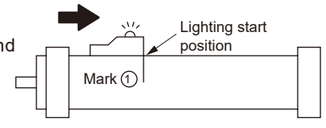
● Highly reliable

This is an extremely reliable switch due to the adoption of a unique hybrid IC equipped with a magnetoresistive element.

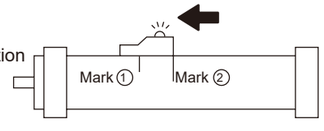
●Cylinder/Switch Setting Comparison

[Conventional] ⟶ [2-color indicator type switch]

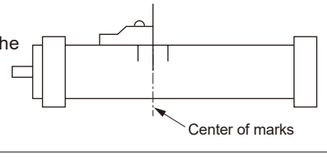
① Move the switch from one direction and mark the lighting start position.



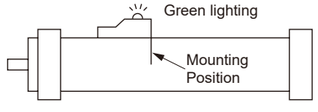
② Similarly move from the opposite direction and mark the lighting start position.



③ Align the end face of the switch with the center of the two marks and fix it.



① Move the switch in one direction only and fix it at the position where it lights up green.



2-color indicator type switch is
① Quick mounting
② Easy mounting
③ No setting errors

Cylinder Switch

Strong magnetic field resistant cylinder switch

Overview

This is a cylinder switch that can be used in environments where strong magnetic fields are generated, such as around spot welding machines and magnetizing equipment in automobile factories.

Main features

● Easy to mount/position (V0, T2YD)

Adopts rail mounting method. Can be mounted with a single screw, and position adjustment is also easy.

● Uses heat-resistant material

The main body is made of metal (H0, H0Y) and self-extinguishing resin UL94-V0 (V0, T2YD), and flame-retardant lead wires are used (optional for T2YD). Prevents combustion and melting of the main body and lead wires due to spatter.

● No polarity (H0, T2YD, H0Y)

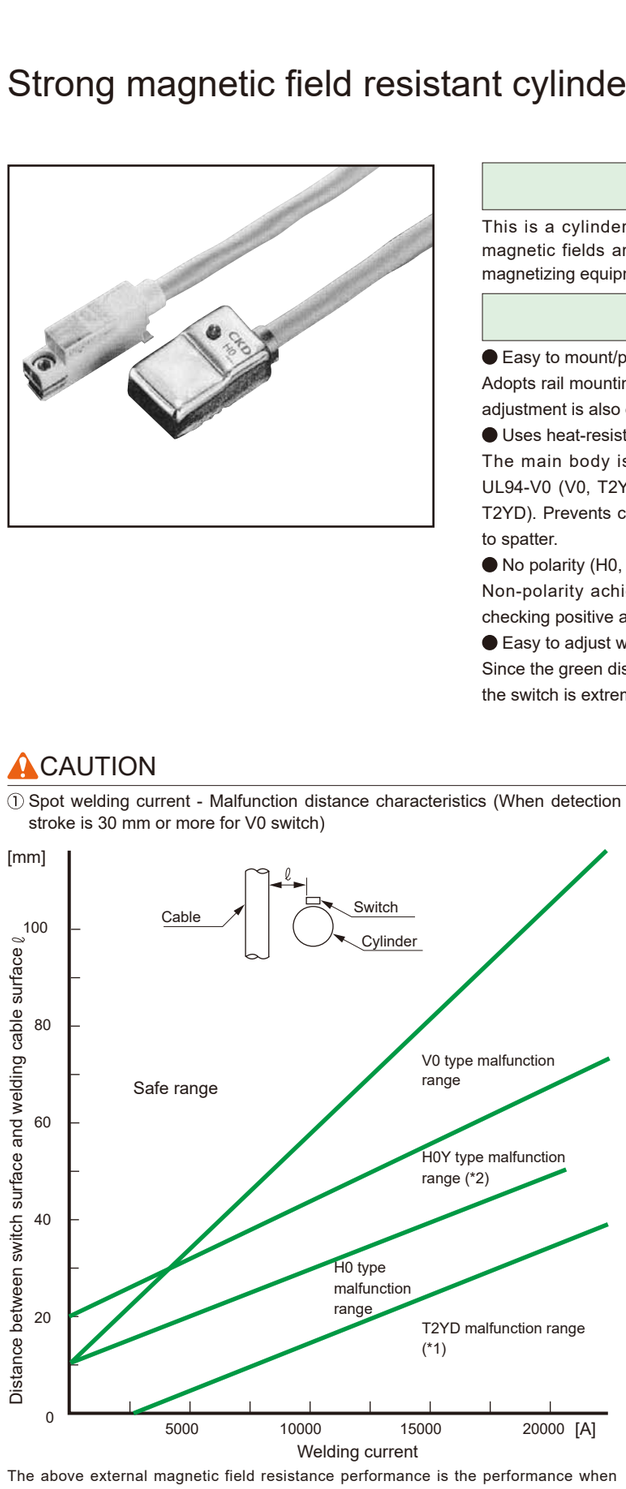
Non-polarity achieved with built-in diode bridge. Eliminates the hassle of checking positive and negative polarity, preventing connection errors.

● Easy to adjust with 2-color indicator (T2YD, H0Y)

Since the green display is the optimal mounting position, mounting and adjusting the switch is extremely easy.

⚠CAUTION

① Spot welding current - Malfunction distance characteristics (When detection stroke is 30 mm or more for V0 switch)



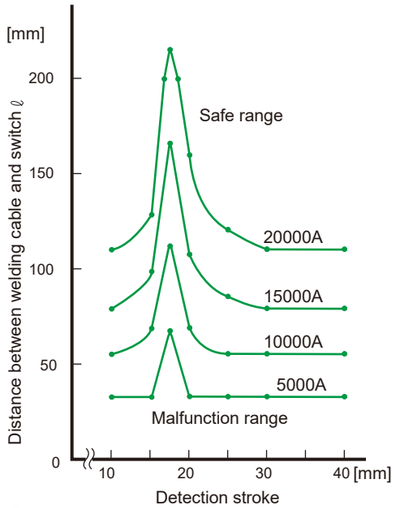
The above external magnetic field resistance performance is the performance when the switch is mounted within the range of "maximum sensitivity position ±1 mm" for H0, "maximum sensitivity position ±1.5 mm" for V0, and "optimal mounting range" for H0Y, so be sure to mount the switch within this range. Do not pass welding current while the cylinder piston is moving. If there are two or more welding cables and they are energized simultaneously, the magnetic flux will increase due to the synergistic effect of the cables, so please consult us. Also, it cannot be used if the switch enters the loop of the cable.

*1: Indicates malfunctions caused by demagnetization of the cylinder's piston magnet due to the welding magnetic field.

*2: Malfunction of H0Y refers to output malfunction.

*3: T2YD is a switch exclusively for AC magnetic fields.

②SSD detection stroke - malfunction distance characteristics (V0 switch)

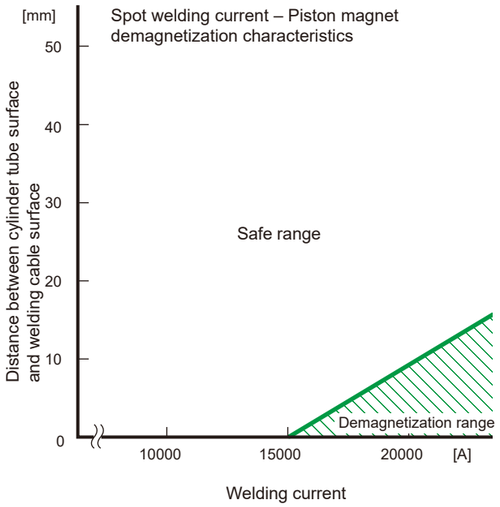


Detection stroke - Malfunction distance characteristics

If used with a detection stroke of less than 30 mm, please maintain the distance shown in the figure above between the welding cable and the switch.

Cylinder Switch

③ H type cylinder switch
Magnet performance near spot welding



Demagnetization occurs when an AC magnetic field is applied to the magnet. The magnet of the H-type switch equipped cylinder has countermeasures and will not demagnetize up to 15,000 A, but if it exceeds 15,000 A, please maintain the distance shown in the figure above between the cylinder tube surface and the welding cable surface.

MEMO

Cylinder Switch

M Series	Applicable Cylinder	FC◇, RV3◇, SRL3, SRG3, SRT3, UFCD

M◇V

M◇H

Specifications

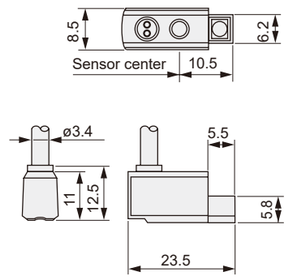
Item	Solid state 2-wire type		Solid state 3-wire type		
	M2V, M2H	M2WV (2-color indicator type)	M3H/V (NPN output type)	M3PH/V (PNP output type)	M3WV (2-color indicator type)
Applications	For programmable controller only		For programmable controller, relay, IC circuit, small solenoid valve		
Output method	–		NPN output	PNP output	NPN output
Power supply voltage	–		4.5 to 28 VDC		10 to 28 VDC
Load voltage	10 to 30 VDC		30 VDC or less		
Load current	5 to 30 mA		100 mA or less		
Current consumption	–		10 mA or less at 24 VDC	10 mA or less at 24 VDC	15 mA or less at 24 VDC
Internal voltage drop	4 V or less		0.5 V or less		
Indicator LED	Red LED (Lights up when ON)	Red/Green LED (Lights up when ON)	Red LED (Lights up when ON)	Yellow LED (Lights up when ON)	Red/Green LED (Lights up when ON)
Leakage current	1 mA or less		10 μA or less	0.05 mA or less	10 μA or less
Lead Wire Length	1 m (Oil-resistant vinyl cabtyre cord, 2-core, 0.2 mm^2)		1 m (Oil-resistant vinyl cabtyre cord, 3-core, 0.15 mm^2)		
Shock Resistance	980 m/s^2				
Insulation resistance	100 MΩ or more with 500 VDC megger				
Withstand Voltage	No abnormality when 1000 VAC is applied for 1 minute				
Ambient Temperature	-10 to +60°C				
Protection structure	IEC standard IP67, JIS C0920 (Immersible type)				
Weight	1 m: 22 g 3 m: 57 g 5 m: 93 g		1 m: 22 g 3 m: 57 g 5 m: 93 g		

Item	Reed 2-wire type			
	M0V, M0H		M5V, M5H	
Applications	For programmable controller, relay		For programmable controller, relay, IC circuit (no indicator light), series connection	
Power supply voltage	–			
Load voltage	12/24 VDC	110 VAC	5/12/24 VDC	110 VAC
Load current	5 to 50 mA	7 to 20 mA	50 mA or less	20 mA or less
Current consumption	–			
Internal voltage drop	3 V or less (In case of DC, when load current is 30 mA)		0.1 V or less (*4)	
Indicator LED	Red LED (Lights up when ON)		No Indicator LED	
Leakage current	0 mA			
Lead Wire Length	1 m (Oil-resistant vinyl cabtyre cord, 2-core, 0.2 mm^2)			
Shock Resistance	294 m/s^2			
Insulation resistance	100 MΩ or more with 500 VDC megger			
Withstand Voltage	No abnormality when 1000 VAC is applied for 1 minute			
Ambient Temperature	-10 to +60°C			
Protection structure	IEC standard IP67, JIS C0920 (Immersible type)			
Contact protection circuit *5	None			
Weight	1 m: 22 g 3 m: 57 g 5 m: 93 g			

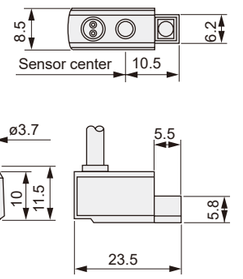
*1: M□H can be used for SRL3, SRG3, SRT3.
*2: For switch model numbers that can be mounted on the cylinder, please refer to the P. for each cylinder model.
*3: Please consult us separately for cylinder switches with connectors.
*4: Internal resistance 0.5 Ω or less
***5: For contact protection measures, see P. 1487.**

Dimensional Drawings

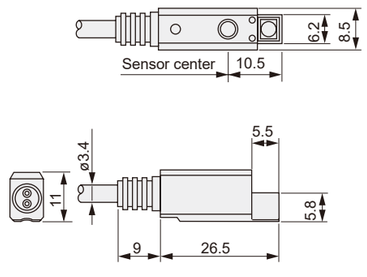
●M□V Series (L-shaped lead wire type)



● M□W series (2-color indicator type, L-shaped lead wire type)

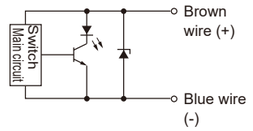


●M□H Series (Straight lead wire type)

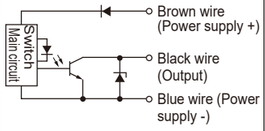


Switch internal circuit diagram

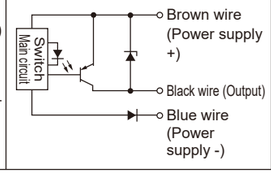
●M2V, M2H, M2WV



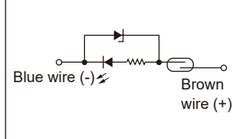
●M3V, M3H, M3WV



●M3PV, M3PH



●M0V, M0H



●M5V, M5H

R Series	Applicable Cylinder	GLC, HCA, MFC, SHC

(Excluding R1, R4)

R◇, R◇Y

R◇B

Specifications

Item	Solid state 2-wire type			Solid state 3-wire type	
	R1, R1K	R2, R2K	R2Y, R2YK (2-color indicator type)	R3, R3K	R3Y, R3YK (2-color indicator type)
Applications	Programmable controller, Relay, Small solenoid valve	For programmable controller only		For programmable controller, relay, IC circuit, solenoid valve	
Output method	–			NPN output	
Power supply voltage	–	–		4.5 to 28 VDC	
Load voltage	85 to 265 VAC	10 to 30 VDC		30 VDC or less	30 VDC or less
Load current	5 to 100 mA	5 to 30 mA		200 mA or less	100 mA or less
Current consumption	–	–		At 24 VDC (When ON)	
				10 mA or less	16 mA or less
Internal voltage drop	10% or less of load voltage	4 V or less		0.5 V or less at 150 mA	0.5 V or less
Indicator LED	Red LED (Lights up when ON)		Red/Green LED (Lights up when ON)	Red LED (Lights up when ON)	Red/Green LED (Lights up when ON)
Leakage current	1 mA or less at 100 VAC, 2 mA or less at 200 VAC	1 mA or less		10 μA or less	
Lead Wire Length	1 m (Oil-resistant vinyl cabtyre cord, 2-core, 0.3 mm^2)			1 m (Oil-resistant vinyl cabtyre cord, 3-core, 0.2 mm^2)	
Shock Resistance	980 m/s^2				
Insulation resistance	20 MΩ or more with 500 VDC megger				
Withstand Voltage	No abnormality when 1500 VAC is applied for 1 minute	No abnormality when 1000 VAC is applied for 1 minute			
Ambient Temperature	-10 to +60°C				
Protection structure	Grommet type is IEC standard IP67, JIS C0920 (Immersible type)				
Option	With terminal box R□B (Not waterproof)				
Weight	1 m: 42 g 3 m: 100 g 5 m: 158 g		1 m: 56 g 3 m: 114 g 5 m: 172 g	1 m: 42 g 3 m: 100 g 5 m: 158 g	1 m: 56 g 3 m: 114 g 5 m: 172 g

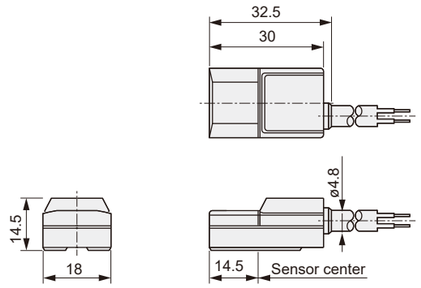
Item	Reed 2-wire type										
	R0			R4		R5			R6		
Applications	For relay, programmable controller			For high capacity relay, solenoid valve		For programmable controller, relay, IC circuit (no indicator light), series connection			For programmable controller only (With DC self-holding function)		
Power supply voltage	–			–		–			–		
Load voltage	12/24 VDC	110 VAC	220 VAC	110 VAC	220 VAC	5/12/24 VDC	110 VAC	220 VAC	24 VDC ±10%		
Load current	5 to 50 mA	7 to 20 mA	7 to 10 mA	20 to 200 mA	10 to 200 mA	50 mA or less	20 mA or less	10 mA or less	5 to 50 mA		
Current consumption	–			–		–			–		
Internal voltage drop	3.0 V or less			2 V or less		0.5 V or less (*1)			5 V or less		
Indicator LED	Red LED (Lights up when ON)			Neon lamp OFF (Lights up when OFF)		None			Red LED (Lights up when ON)		
Leakage current	0 mA			1 mA or less		0 mA			0.1 mA or less		
Lead Wire Length	1 m (Oil-resistant vinyl cabtyre cord, 2-core, 0.3 mm^2)										
Shock Resistance	294 m/s^2										
Insulation resistance	20 MΩ or more with 500 VDC megger										
Withstand Voltage	No abnormality when 1500 VAC is applied for 1 minute										
Ambient Temperature	-10 to +60°C										
Protection structure	Grommet type is IEC standard IP67, JIS C0920 (Immersible type)										
Contact protection circuit *2	Yes								None		
Option	With terminal box R□B (Not waterproof)										
Weight	1 m: 42 g 3 m: 100 g 5 m: 158 g										

*1: Internal resistance 10 Ω or less
*2: For contact protection measures, see P. 1487.

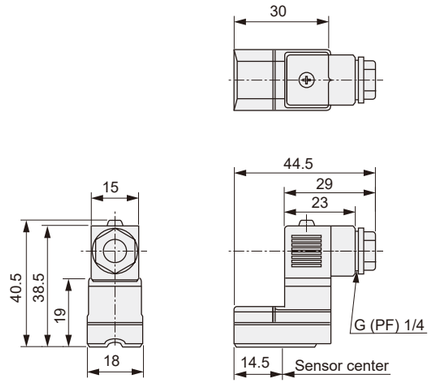
External dimension diagram / Switch internal circuit diagram

Dimensional Drawings

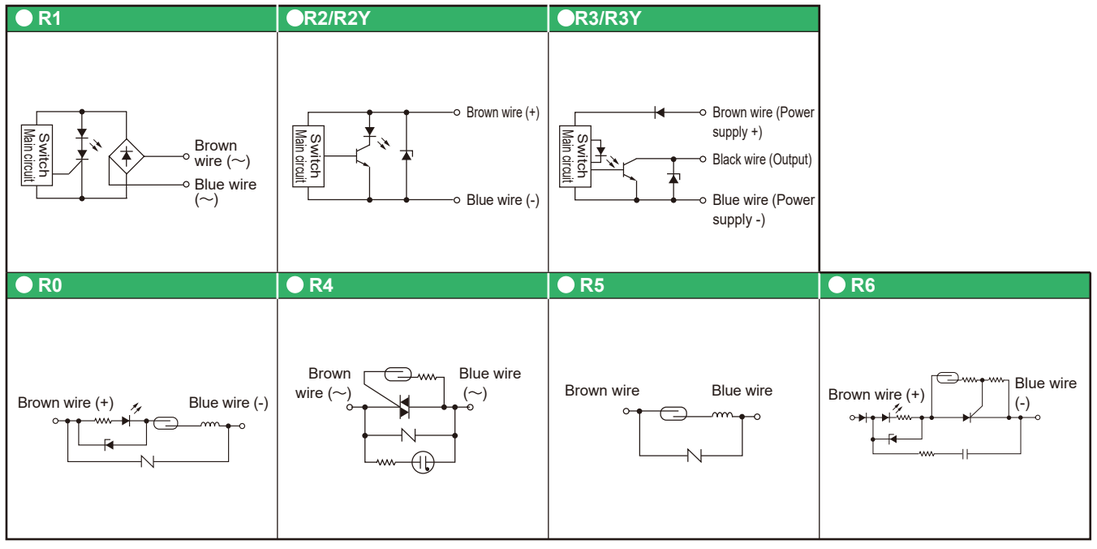
●R Series (Grommet Type)



●R Series (Terminal box R□B type)

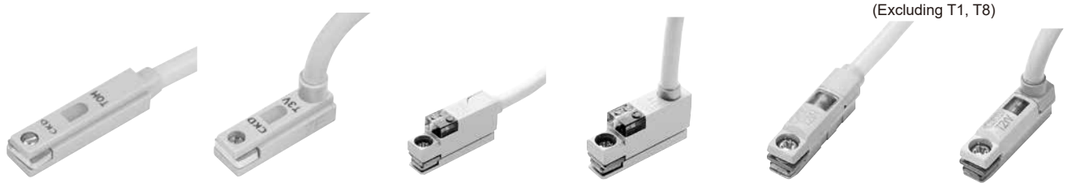


Switch internal circuit diagram



T Series	Applicable Cylinder													
		CAC4	CKV2	CMA2	CMK2	HCM	JSC3	JSC4	JSG	JSK2	JSM2	LCG	LCR	LCW
		LCX	MRG2	MRL2	RCS2	RCC2	RRC	SCA2	SCG	SCM	SCP□3	SCS2	SRM3	SSD
		SSD2	SSG	STG	STS/STL	STK	UCA2	UCAC2	ULK	Gripper	Chuck			

(Excluding T1, T8)



T□H/T□WH　T□V/T□WV　T1H　T1 V　T8H/T2JH　T8V/T2JV

Specifications

Item	Solid state 2-wire type					Solid state 3-wire type		
	T1H, T1 V	T2H, T2V	T2HR3, T2VR3 (Flexible lead wire type)	T2JH, T2JV (Off-delay type)	T2WH, T2WV (2-color indicator type)	T3H, T3V	T3PH, T3PV (PNP output type)	T3WH, T3WV (2-color indicator type)
Applications	For programmable controller, relay, small solenoid valve	For programmable controller only				For programmable controller, relay		
Output method	–					NPN output	PNP output	NPN output
Power supply voltage	–					10 to 28 VDC		
Load voltage	85 to 265 VAC	10 to 30 VDC			24 VDC ±10%	30 VDC or less		
Load current	5 to 100 mA	5 to 20 mA (*1)				100 mA or less		50 mA or less
Current consumption	–	–				10 mA or less at 24 VDC	10 mA or less at 24 VDC	10 mA or less at 24 VDC
Internal voltage drop	10% or less of load voltage	4 V or less				0.5 V or less		
Off-delay time	–			200 ±50 ms	–	–		
Indicator LED	Red LED (Lights up when ON)				Red/Green LED (Lights up when ON)	Red LED (Lights up when ON)	Yellow LED (Lights up when ON)	Red/Green LED (Lights up when ON)
Leakage current	1 mA or less at 100 VAC, 2 mA or less at 200 VAC	1 mA or less				10 μA or less		
Lead wire length *6	1 m (Oil-resistant vinyl cabtyre cord, 2-core, 0.3 mm²)	1 m (Oil-resistant vinyl cabtyre cord, 2-core, 0.2 mm²)	3 m (Flex-resistant, oil-resistant vinyl cabtyre cord, 2-core, 0.2 mm²)	1 m (Oil-resistant vinyl cabtyre cord, 2-core, 0.3 mm²)	1 m (Oil-resistant vinyl cabtyre cord, 2-core, 0.2 mm²)	1 m (Oil-resistant vinyl cabtyre cord, 3-core, 0.2 mm²)		1 m (Oil-resistant vinyl cabtyre cord, 3-core, 0.2 mm²)
Shock Resistance	980 m/s²							
Insulation resistance	100 MΩ or more with 500 VDC megger	20 MΩ or more with 500 VDC megger		100 MΩ or more with 500 VDC megger	At 500 VDC Megger 20 MΩ or more	20 MΩ or more with 500 VDC megger		20 MΩ or more with 500 VDC megger
Withstand Voltage	No abnormality when 1500 VAC is applied for 1 minute	No abnormality when 1000 VAC is applied for 1 minute						
Ambient Temperature	-10 to +60°C							
Protection structure	IEC standard IP67, JIS C0920 (Immersible type)							
Weight	1 m: 33 g 3 m: 87 g 5 m: 142 g	1 m: 18 g 3 m: 49 g 5 m: 80 g		1 m: 33 g 3 m: 87 g 5 m: 142 g	1 m: 18 g 3 m: 49 g 5 m: 80 g	1 m: 18 g 3 m: 49 g 5 m: 80 g		1 m: 18 g 3 m: 49 g 5 m: 80 g

Item	Reed 2-wire type						
	T0H, T0V		T5H, T5V		T8H, T8V		
Applications	For programmable controller, relay		For programmable controller, relay, IC circuit (no indicator light), series connection		For programmable controller, relay		
Power supply voltage	–						
Load voltage	12/24 VDC	110 VAC	5/12/24 VDC	110 VAC	12/24 VDC	110 VAC	220 VAC
Load current	5 to 50 mA	7 to 20 mA	50 mA or less	20 mA or less	5 to 50 mA	7 to 20 mA	7 to 10 mA
Current consumption	–						
Internal voltage drop	3 V or less (In case of DC, when load current is 30 mA)		0.1 V or less (*4)		4 V or less		
Indicator LED	Red LED (Lights up when ON)		No Indicator LED		Red LED (Lights up when ON)		
Leakage current	0 mA						
Lead Wire Length	1 m (Oil-resistant vinyl cabtyre cord, 2-core, 0.2 mm²)				1 m (Oil-resistant vinyl cabtyre cord, 2-core, 0.3 mm²)		
Shock Resistance	294 m/s²						
Insulation resistance	20 MΩ or more with 500 VDC megger				100 MΩ or more with 500 VDC megger		
Withstand Voltage	No abnormality when 1000 VAC is applied for 1 minute				No abnormality when 1500 VAC is applied for 1 minute		
Ambient Temperature	-10 to +60°C						
Protection structure	IEC standard IP67, JIS C0920 (Immersible type)						
Contact protection circuit *5	None				Yes		
Weight	1 m: 18 g 3 m: 49 g 5 m: 80 g				1 m: 33 g 3 m: 87 g 5 m: 142 g		

*1: Max load current for T2H, T2V, T2HR3, T2VR3: 20 mA, is at 25°C. If the switch operating Ambient Temperature is higher than 25°C, it will be lower than 20 mA. (It will be 5 to 10 mA at 60°C.)
*2: For T2JH and T2JV switches, when mounting on SRL3 (ø32 to ø100), MRL2, LCR, UCAC2, or gripper/chuck, it will be handled as a custom product.
*3: Some cylinders have limited mountable switches. Please refer to the P. for each cylinder for details.
*4: Internal resistance 0.5 Ω or less.　*5: For contact protection measures, see P. 1487.

Cylinder Switch

T Series	For AC Magnetic Field	Applicable Cylinder								
		CAC4	JSC3	JSC4	JSG	RCC2	RCS2	SCA2	SCG	
		SCM	SCS2	SRG3	SRL3	SRM3	SRT3	SSD	SSD2	
		SSG	STG	STS/STL	UCAC2	USC	USSD			

T2YD

Specifications

Item	Solid state 2-wire type		
	T2YD	T2YDT	T2YDU (Custom product)
Applications	For programmable controller only		
Indicator LED	Red/Green LED (Lights up when ON)		
Load voltage	24 VDC ±10%		
Load current	5 to 20 mA		
Internal voltage drop	6 V or less		
Leakage current	1.0 mA or less		
Output delay time *1 (ON-delay, OFF-delay)	60 ms or less		
Lead Wire Length	1 m (Oil-resistant vinyl cabtyre cord ø6, 0.5 mm²×2-core) *2	1 m (Flame-resistant cabtyre cord ø6, 0.5 mm²×2-core) *2	0.3 m (Flame-retardant vinyl cabtyre cord with M12 cable connector, AWG20, 2-core)
Insulation resistance	100 MΩ or more with 500 VDC megger		
Withstand Voltage	No abnormality when 1000 VAC is applied for 1 minute		
Shock Resistance	980 m/s²		
Ambient Temperature	-10 to +60°C		
Protection structure	JIS C0920 (Immersible type), IEC standard IP67		
Weight	1 m: 61 g 3 m: 166 g 5 m: 272 g		35

*1: Indicates the time from when the magnetic sensor detects the piston magnet until the switch output occurs.
*2: 3 m and 5 m lead wire lengths are available as options.
*3: Since AC magnetic field switches (T2YD□) are for AC welding machines, the strong magnetic field resistance performance cannot be obtained with DC welding machines.

T Series	For Cutting Oil	Applicable Cylinder	
		CMK2-G2/3 HRL-G2/3 SCA2-G2/3 SCG-G2/3	
		SSD-G2/3 SSD2-G2/3 STG-G2/3 STS/STL-G2/3	

T□YLH

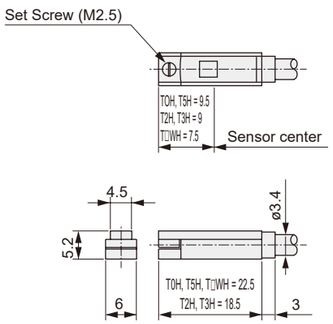
Specifications

Item	Solid state 2-wire type	Solid state 3-wire type
	T2YLH, T2YLV	T3YLH, T3YLV
Applications	For programmable controller only	Programmable controller, Relay
Output method	–	NPN output
Power supply voltage	–	10 to 28 VDC
Load voltage	10 to 30 VDC	30 VDC or less
Load current	5 to 20 mA	50 mA or less
Current consumption	–	10 mA or less at 24 VDC (When ON)
Internal voltage drop	4 V or less	0.5 V or less
Leakage current	1 mA or less	10 μA or less
Indicator LED	Red/Green LED (Lights up when ON)	
Lead Wire	Oil-resistant vinyl cabtyre cord 0.3 mm², 2-core 1 m	Oil-resistant vinyl cabtyre cord 0.2 mm², 3-core 1 m
Insulation resistance	100 MΩ or more with 500 VDC megger	
Withstand Voltage	No abnormality when 1000 VAC is applied for 1 minute	
Shock Resistance	980 m/s²	
Hysteresis	1.5 mm or less	
Ambient Temperature	-10 to +60°C	
Protection structure	IEC standard IP67, JIS C0920 (Immersible type), Oil resistant (PCB coating)	
Weight	1 m: 33 g 3 m: 87 g 5 m: 142 g	

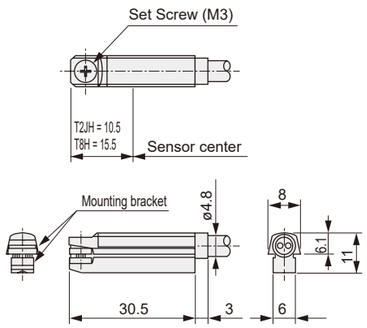
Cylinder Switch

Dimensional Drawings

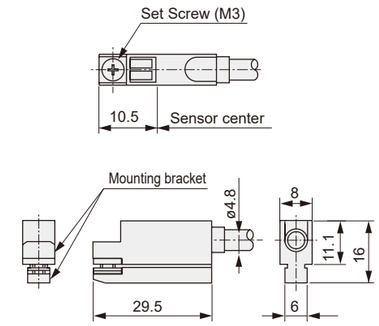
●T□H, T□WH Series
(Straight lead wire type)



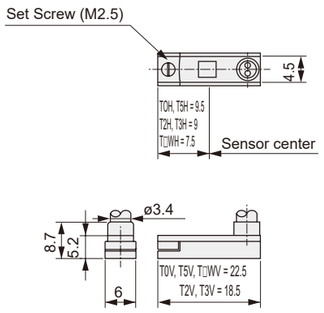
●T2JH, T8H Series
(Straight lead wire type)



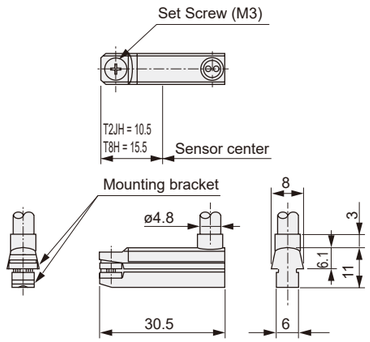
●T1H Series
(Straight lead wire type)



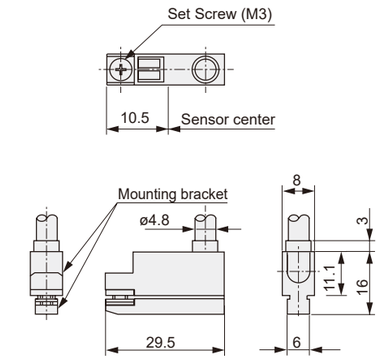
●T□V, T□WV Series
(L-shaped lead wire type)



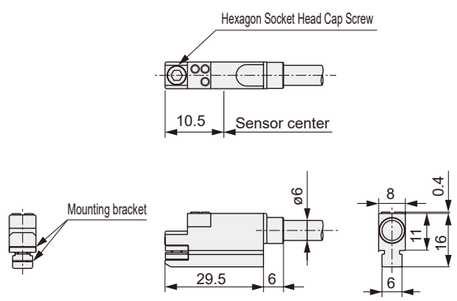
●T2JV, T8V Series
(L-shaped lead wire type)



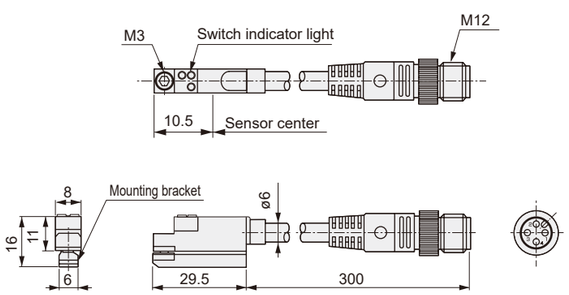
●T1 V Series
(L-shaped lead wire type)



●T2YD (AC magnetic field switch)

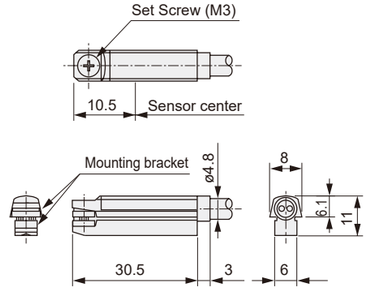


●T2YDU (Switch for AC magnetic field with M12 cable connector)

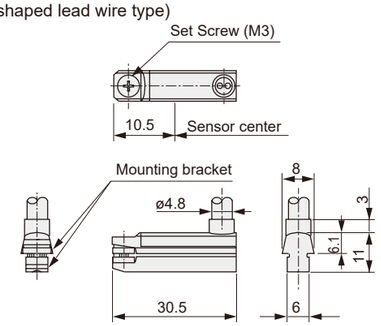


Dimensional Drawings

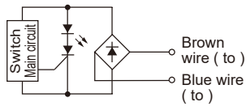
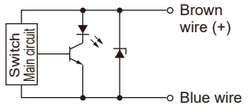
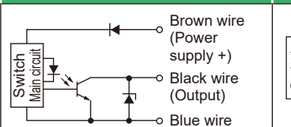
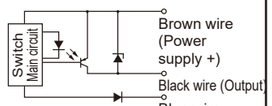
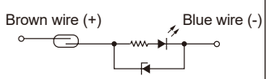
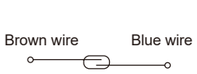
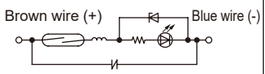
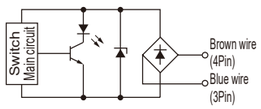
●T□YLH Series
(Straight lead wire type)



●T□YLV Series
(L-shaped lead wire type)



Switch internal circuit diagram

●T1H, T1V	● T2H, T2V, T2WH, T2WV, T2JH / T2JV / T2YLH / T2YLV	● T3H, T3V, T3WH, T3WV, T3YLH / T3YLV	●T3PH, T3PV
			
●T0H, T0V	**●T5H, T5V**	**●T8H, T8V**	**●T2YD, T2YDT, T2YDU**
			 This switch has no polarity. Values in ( ) are pin assignments for T2YDU. However, Pin 1 and Pin 2 are N.C. (Not Connected).

T Series	Improved Water Resistance	Applicable Cylinder										
			SCP□3	CMK2	CMA2	SCM	SCG	SCA2	SCS2	CKV2	COV□2	CAV2	SSD2
			SSG	SSD	STK	SRL3	SRG3	SRM3	SRT3	MRL2	MRG2	LCR	LCG
			LCX	STG	STS/L	HCM	CAC4	CAC-N	RCS2	RCC2	MCP	RRC	GRC

T2WLH

T2WLV

Specifications

Item	Solid state 2-wire type	
	T2WLH, T2WLV	T2WLHW, T2WLVW
Applications	For programmable controller only	
Load voltage	24 VDC ±10%	
Load current	5 to 20 mA	
Internal voltage drop	4 V or less	
Leakage current	1 mA or less	
Indicator LED	Red/Green LED (Lights up when ON)	
Lead Wire Length	1 m (PUR cord, 2-core, 0.2 mm^2)	0.3 m (PUR cord with M8 connector)
Insulation resistance	20 MΩ or more with 500 VDC megger	
Withstand Voltage	No abnormality when 1000 VAC is applied for 1 minute	
Shock Resistance	980 m/s^2	
Ambient Temperature	-10 to +60°C	
Protection structure	IEC standard IP67 JIS C0920 (Immersible type)	
Weight	1 m: 18 g 3 m: 49 g 5 m: 80 g	11 g

*1: Cannot be mounted on drop prevention type.
*2: For switch mountability, refer to the next page.

Model Number Notation

●Water-resistant Cylinder Switch

SW - T2WL H W

1 Lead Wire Extraction Direction

2 Lead wire length, connector specification

1 Lead Wire Extraction Direction

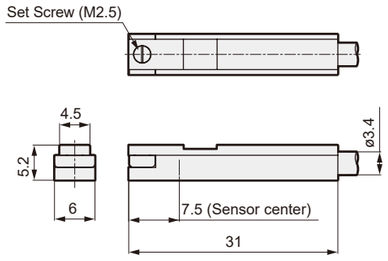
Code	Content
H	Straight lead wire type
V	Lead wire L-type

2 Lead wire length, connector specification

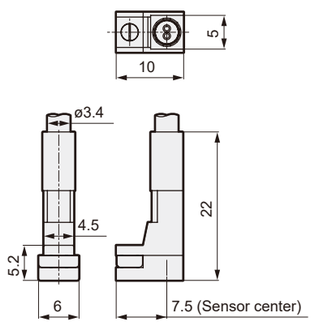
Code	Content
Blank	1 m lead wire
3	3 m lead wire
5	5 m lead wire
W	M8 connector, 1PIN (+) 4PIN (-)

Outline Dimension Drawing

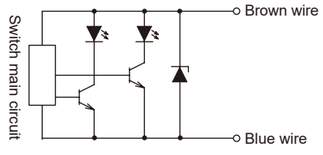
●T2WLH Series (Straight lead wire type)



●T2WLV Series (L-shaped lead wire type)



Switch internal circuit diagram



Switch applicable model list

Applicable Model		Bore Size
Pencil Shaped Cylinder	SCP□3	ø6 to 16
Tight Cylinder	CMK2	ø20 to 40
Small Bore Size Cylinder	CMA2	ø20 to 40
Round shaped cylinder	SCM	ø20 to 100
Tie Rod Cylinder	SCG	ø32 to 100
Medium Bore Size Cylinder	SCA2	ø40 to 100
Large Bore Size Cylinder	SCS2	ø125 to 250
Compact cylinder with valve	CKV2	ø20 to 40
Cell Cylinder	COV□2	ø50 to 100
Cell Cylinder	CAV2	ø50 to 100
Compact Cylinder	SSD2	ø12 to 100
Guided Compact Cylinder	SSG	ø12 to 100
Compact Cylinder	SSD	ø12 to 160
Stopper Cylinder	STK	ø20 to 50
Rodless Cylinder	SRL3	ø12 to 100
Rodless Cylinder with High-Precision Guide	SRG3	ø12 to 25
Rodless Cylinder with High-Precision Guide	SRM3	ø25 to 63
Rodless Cylinder with Brake	SRT3	ø12 to 63
Super rodless cylinder with magnet	MRL2	ø6 to 32
Super rodless cylinder with magnet, high precision guide type	MRG2	ø50 to 700
Linear Slide Cylinder	LCR	ø16 to 25
Linear Slide Cylinder	LCG	ø16
Low Profile Linear Slide Cylinder	LCX	ø25, 32
Guided Cylinder	STG	ø12 to 100
Guided Cylinder	STS/L	ø8 to 100
High Energy Absorption Cylinder	HCM	ø20 to 63
Clamp Cylinder	CAC4	ø40 to 80
Lightweight Clamp Cylinder	CAC-N	N32, N40
Rotary Clamp Cylinder	RCS2	ø12 to 63
Rotary Clamp Cylinder	RCC2	ø16 to 63
Mechanical Power Cylinder	MCP	Size 2t, 5t
Selex Rotary	RRC	Size 8 to 63
Table Type Rotary Actuator	GRC	Size 5 to 80

T Series	Magnetized environment	Applicable Cylinder							
			CMK2	SCM	SCG	SCA2	SCS2	SSD2	SSG	SSD
			STK	STG	STS/L	JSG	JSC3	JSC4	USSD	HCM
			CAC4	UCAC2	CAC-N	UCAC-N32		RCS2	RCC2	PCC

T0Y

Specifications

Item	Reed 2-wire type		
	T0Y	T0YL	T0YT
Applications	For programmable controller only		
Switch polarity	No polarity		
Load voltage	24 VDC ±10%		
Load current	5 to 20 mA		
Internal voltage drop	4.5 V or less		
Leakage current	0.5 mA or less		
Indicator LED	Red/Green LED (Lights up when ON)		
Lead wire length	1 m (Oil-resistant vinyl cabtyre cord 2-core 0.2 mm^2)	1 m (Flame resistant cabtyre cord 2-conductor 0.2 mm^2) UL acquired wire	1 m (Flame-resistant vinyl cabtyre cord 2-core 0.2 mm^2)
Insulation resistance	20 MΩ or more with 500 VDC megger		
Withstand Voltage	No abnormality when 1000 VAC is applied for 1 minute		
Shock Resistance	294 m/s^2		
Ambient Temperature	-10 to +60°C		
Protection structure	IEC standard IP67 JIS C0920 (Immersible type)		
Contact protection circuit	None		
Weight	1 m: 18 g 3 m: 49 g 5 m: 80 g		
Weight of connector only	M12: Connector code B/M: 10 g M8: Connector code F: 4 g		

Note: For switch mountability, please refer to the next page.

Model Number Notation

● Magnetized environment cylinder switch

SW - T0Y L M K

❶ Lead wire type ❸ Option

❷ Lead wire length, connector specification

❶ Lead wire type

Code	Content
Blank	Oil-resistant vinyl cabtyre cord
L	UL wire
T	Spatter-resistant wire

❸ Option

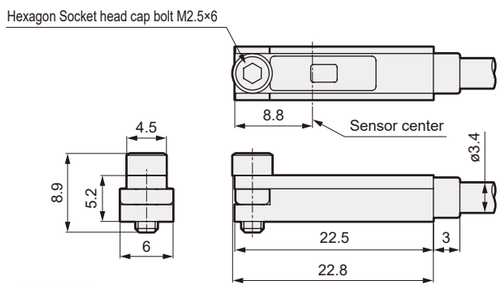
Code	Content
Blank	No option
K	With spatter adhesion prevention cover

❷ Lead wire length, connector specification

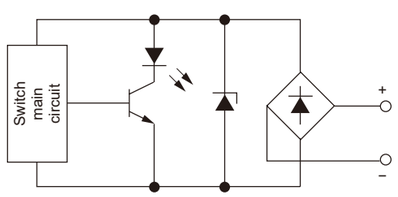
Code	Content
Blank	1 m lead wire
3	3 m lead wire
5	5 m lead wire
B	M12 connector (4PIN specification), 3-4PIN no polarity, 0.3 m lead wire
M	M12 connector (4PIN specification), 1-4PIN no polarity, 0.3 m lead wire
F	M8 connector (3PIN specification), 1-4PIN no polarity, 0.3 m lead wire

Note: For connector specification "F", only lead wire type "L" can be selected.

Outline Dimension Drawing



Switch internal circuit diagram



Switch applicable model list

Applicable Model		Bore Size
Small Bore Size cylinder	CMK2	ø32, ø40
Round shaped cylinder	SCM	ø32 to 100
Tie Rod Cylinder	SCG	ø40 to 100
Medium Bore Size Cylinder	SCA2	ø40 to 100
Large Bore Size Cylinder	SCS2	ø125 to 250
Compact Cylinder	SSD2	ø32 to 200
Guided Compact Cylinder	SSG	ø32 to 100
Compact Cylinder	SSD	ø32 to 160
Stopper Cylinder	STK	ø32 to 50
Guided Cylinder	STG	ø32 to 80
Guided Cylinder	STS/L	ø32 to 100
Tie Rod Cylinder with Brake	JSG	ø40 to 100
Cell top cylinder (Medium bore)	JSC3	ø40 to 100
Cell top cylinder (Large bore)	JSC4	ø125 to 180
Compact Cylinder with Drop Prevention	USSD	ø40 to 63
High Energy Absorption Cylinder	HCM	ø32 to 63
Clamp Cylinder	CAC4	ø40 to 80
Clamp Cylinder with Fall Prevention	UCAC2	ø50, ø63
Lightweight Clamp Cylinder	CAC-N	ø32, ø40
Lightweight Clamp Cylinder	UCAC-N32	ø32, ø40
Rotary Clamp Cylinder	RCS2	ø32 to 63
Rotary Clamp Cylinder	RCC2	ø32 to 63
Pin Clamp Cylinder	PCC	(ø50)

K Series	Applicable Cylinder	SMG STR2

K□H
K3PH

K□V
K3PV

K□YH

K□YV

Specifications

Item	Solid state 2-wire type		Solid state 3-wire type		
	K2H, K2 V	K2YH, K2YV	K3H/V (NPN output type)	K3PH/V (PNP output type)	K3YH/V (2-color indicator type)
Applications	For programmable controller only		For programmable controller, relay		
Output method	–		NPN output	PNP output	NPN output
Power supply voltage	–		10 to 28 VDC		
Load voltage	10 to 30 VDC		30 VDC or less		
Load current	5 to 20 mA (*1)		50 mA or less		
Current consumption	–		10 mA or less at 24 VDC	10 mA or less at 24 VDC	10 mA or less at 24 VDC
Internal voltage drop	4 V or less		0.5 V or less		
Indicator LED	Red LED (Lights up when ON)	Red/Green LED (Lights up when ON)	Red LED (Lights up when ON)	Yellow LED (Lights up when ON)	Red/Green LED (Lights up when ON)
Leakage current	1 mA or less		10 μA or less		
Lead Wire Length	1 m (Oil-resistant vinyl cabtyre cord, 2-core, 0.2 mm²)	1 m (Oil-resistant vinyl cabtyre cord, 2-core, 0.3 mm²)	1 m (Oil-resistant vinyl cabtyre cord, 3-core, 0.2 mm²)		1 m (Oil-resistant vinyl cabtyre cord, 3-core, 0.2 mm²)
Shock Resistance	980 m/s²				
Insulation resistance	20 MΩ or more with 500 VDC megger	100 MΩ or more with 500 VDC megger	20 MΩ or more with 500 VDC megger		100 MΩ or more with 500 VDC megger
Withstand Voltage	No abnormality when 1000 VAC is applied for 1 minute				
Ambient Temperature	-10 to +60°C				
Protection structure	IEC standard IP67, JIS C0920 (Immersible type)				
Weight	1 m: 18 g 3 m: 49 g 5 m: 80 g	1 m: 31 g 3 m: 85 g 5 m: 139 g	1 m: 18 g 3 m: 49 g 5 m: 80 g		1 m: 31 g 3 m: 85 g 5 m: 142 g

Item	Reed 2-wire type			
	K0H, K0 V		K5H, K5 V	
Applications	For programmable controller, relay		For programmable controller, relay, IC circuit (no indicator light), series connection	
Power supply voltage	–			
Load voltage	12/24 VDC	110 VAC	5/12/24 VDC	110 VAC
Load current	5 to 50 mA	7 to 20 mA	50 mA or less	20 mA or less
Current consumption	–			
Internal voltage drop	3 V or less (In case of DC, when load current is 30 mA)		0.1 V or less (*2)	
Indicator LED	Red LED (Lights up when ON)		–	
Leakage current	0 mA			
Lead Wire Length	1 m (Oil-resistant vinyl cabtyre cord, 2-core, 0.2 mm²)			
Shock Resistance	294 m/s²			
Insulation resistance	20 MΩ or more with 500 VDC megger			
Withstand Voltage	No abnormality when 1000 VAC is applied for 1 minute			
Ambient Temperature	-10 to +60°C			
Protection structure	IEC standard IP67, JIS C0920 (Immersible type)			
Contact protection circuit *3	None			
Weight	1 m: 18 g 3 m: 49 g 5 m: 80 g			

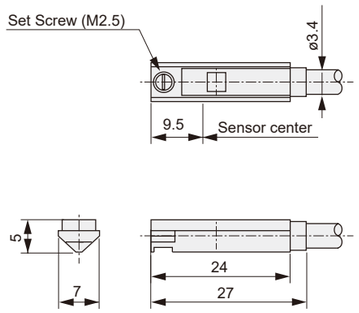
*1: Max load current of K2H, K2V: 25°C. If the switch operating Ambient Temperature is higher than 25°C, it will be lower than 20 mA. (It will be 5 to 10 mA at 60°C.)
*2: Internal resistance 0.5Ω or less
*3: For contact protection measures, see P. 1487.

Cylinder Switch

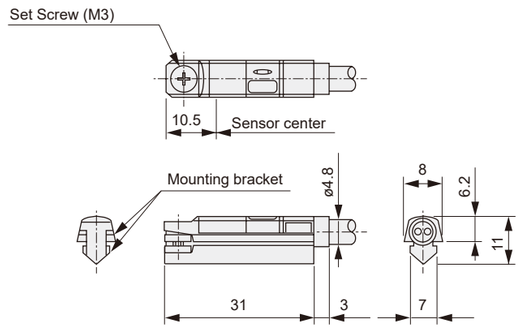
External dimension diagram / Switch internal circuit diagram

Dimensional Drawings

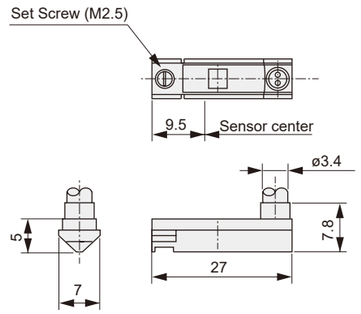
●K□H Series (Straight lead wire type)



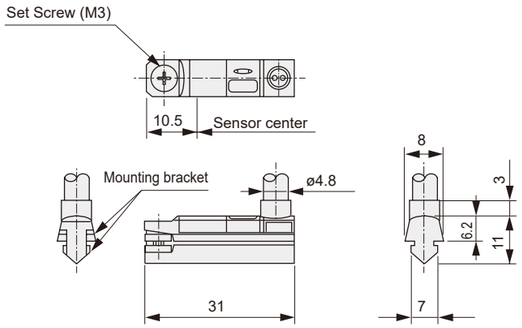
● K□YH Series (2-color display, lead wire straight)



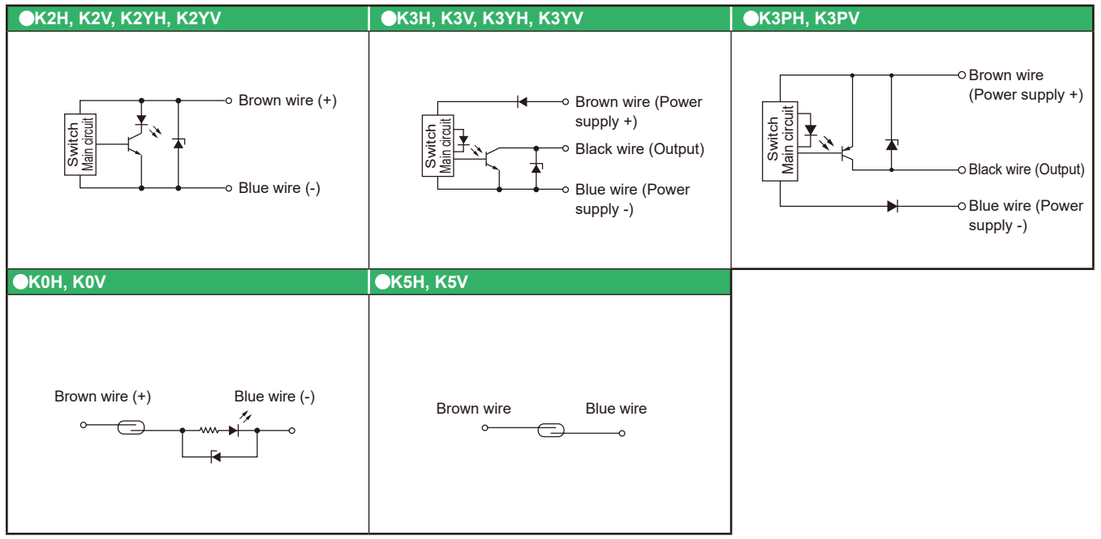
●K□V Series (L-shaped lead wire type)



● K□YV Series (2-color display, radial lead wire)



Switch internal circuit diagram



Cylinder Switch

F Series	Application Cylinder	CKL2 LCG LCM LCR MDC2 MSD MSDG-L MVC RCS2 SSD2 STM Hand (LSH BSA2 LHA)

Flexible lead wires are used as standard.

*Some Bore Sizes cannot be combined.

F□S

F□V

F□H

F□YV
F3PV

F□YH
F3PH

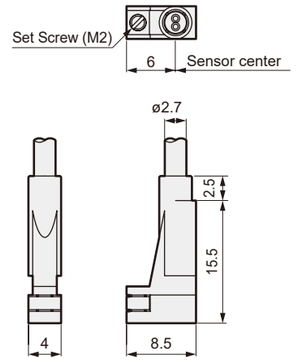
Specifications

Item	Reed 2-wire type	Solid state 2-wire type		Solid state 3-wire type		
	F0H/V	F2H/V, F2S	F2YH, F2YV	F3H/V, F3S	F3PH/V	F3YH, F3YV
Applications	For programmable controller only			For programmable controller, relay		
Output method	–			NPN output	PNP output	NPN output
Power supply voltage	–			10 to 28 VDC	4.5 to 28 VDC	10 to 28 VDC
Load voltage	24 VDC ±10%	10 to 30 VDC	24 VDC ±10%	30 VDC or less		
Load current	5 to 20 mA (*1)			50 mA or less		
Current consumption	–			10 mA or less at 24 VDC		
Internal voltage drop	4 V or less			0.5 V or less	0.5 V or less at 30 mA	0.5 V or less
Indicator LED	Yellow LED (Lights up when ON) *3		Red/Green LED (Lights up when ON)	Yellow LED *3 (Lights up when ON)	Yellow LED (Lights up when ON)	Red/Green LED (Lights up when ON)
Leakage current	1 mA or less			10 μA or less		
Lead Wire Length	1 m (Flexible, oil-resistant vinyl cabtyre cord 2-core 0.15 mm²)			1 m (Flexible, oil-resistant vinyl cabtyre cord 3-core 0.15 mm²)		
Shock Resistance	294 m/s²	980 m/s²				
Insulation resistance	20 MΩ or more with 500 VDC megger					
Withstand Voltage	No abnormality when 1000 VAC is applied for 1 minute					
Ambient Temperature	-10 to +60°C					
Protection structure	IEC standard IP67, JIS C0920 (Immersible type)					
Contact protection circuit *4	None	–				
Weight	1 m: 10 g 3 m: 29 g			1 m: 10 g 3 m: 29 g		

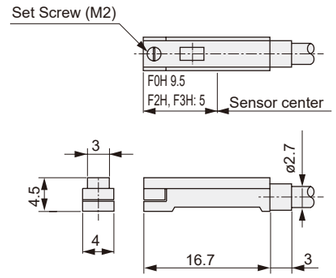
*1: The maximum load current for F2H and F2 V is 20 mA at 25°C. If the switch operating Ambient Temperature is higher than 25°C, it will be lower than 20 mA. (It will be 5 to 10 mA at 60°C.)
*2: For F2S and F3S, when mounting two switches in one groove for both-end detection, please mount them so that the Set Screw parts of each switch face outward.
*3: The indicator light for F2S and F3S is red.
*4: For contact protection measures, see P. 1487.
*5: Flexible lead wires are used.

Dimensional Drawings

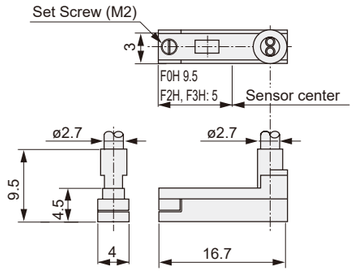
●F□S series (Lead wire vertical extraction short stroke detection type)



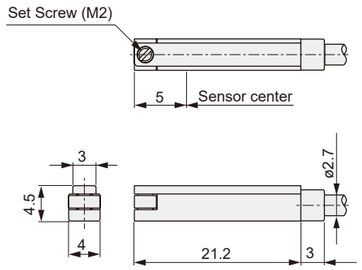
●F□H series (Straight lead wire type)



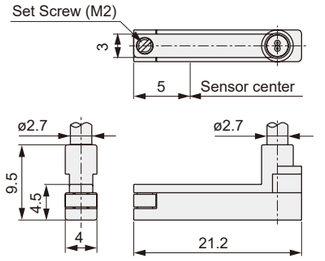
●F□V series (L-shaped lead wire type)



●F□YH / F3PH series (Straight lead wire type)

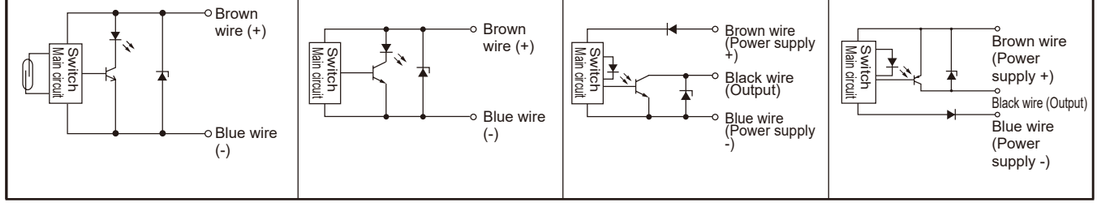


●F□YV / F3PV series (L-shaped lead wire type)



Switch internal circuit diagram

● F0H / F0V	● F2S / F2H / F2 V / F2YH / F2YV	● F3S / F3H / F3 V / F3YH / F3YV	● F3PH / F3PV



H Series	For strong magnetic field	Applicable Cylinder	CAC4-L2, GLC-L2, JSC3-L2, SCA2-L2, SHC-L2, UCAC2-L2, USC-L2

H0

H0Y

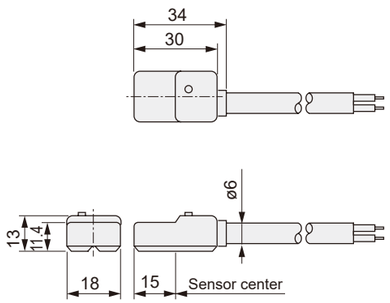
Specifications

Item	Reed 2-wire type		
	H0		H0Y (2-color indicator type)
Applications	For programmable controller, relay		For programmable controller only
Load voltage	12/24 VDC	110 VAC	24 VDC ±10%
Load current	5 to 50 mA	7 to 20 mA	5 to 20 mA
Internal voltage drop	5 V or less		6 V or less
Indicator LED	Green LED (Lights up when ON)		Red/Green LED (Lights up when ON)
Leakage current	0 mA		10 μA or less
Lead Wire Length	1 m (Flame-retardant cabtyre cord 2-core 0.5 mm²)		
Insulation resistance	100 MΩ or more with 500 VDC megger		
Withstand Voltage	No abnormality when 1000 VAC is applied for 1 minute		
Shock Resistance	294 m/s²		
Ambient Temperature range	-10 to +60°C		
Protection structure	IEC standard IP67, JIS C0920 (Immersible type), Oil resistant		
Contact protection circuit *1	None		
Weight	1 m: 76 g 3 m: 181 g 5 m: 289 g		

*1: For contact protection measures, see P. 1487.

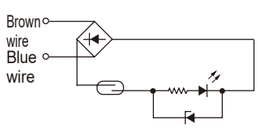
Dimensional Drawings

● H series (For strong magnetic field resistance)



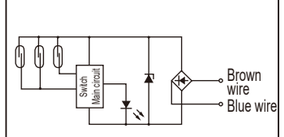
Switch internal circuit diagram

● H0



This switch has no polarity.

● H0Y



This switch has no polarity.

Cylinder Switch

Specifications / External dimension diagram / Switch internal circuit diagram

V Series	For small strong magnetic field resistance	Applicable Cylinder	SSD-L4, SSD2-L4, USSD-L4

V0

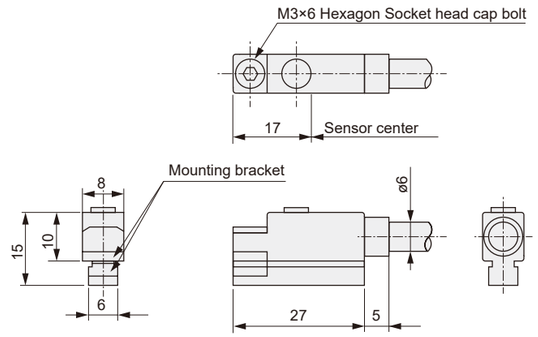
Specifications

Item	Reed 2-wire type	
	V0	
Applications	For relay, programmable controller	
Load voltage	24 VDC	110 VAC
Load current	5 to 50 mA	7 to 20 mA
Internal voltage drop	3.0 V or less (When load current is 40 mA)	
Indicator LED	LED (Lights up when ON)	
Leakage current	0 mA	
Lead Wire Length	1 m (Flame-retardant cabtyre cord 2-core 0.5 mm²)	
Insulation resistance	100 MΩ or more with 500 VDC megger	
Withstand Voltage	No abnormality when 1000 VAC is applied for 1 minute	
Shock Resistance	294 m/s²	
Ambient Temperature	-10 to +60°C	
Protection structure	IEC standard IP67, JIS C0920 (Immersible type), Oil resistant	
Contact protection circuit *1	None	
Weight	1 m: 63 g 3 m: 170 g 5 m: 277 m	

*1: For contact protection measures, see P. 1487.

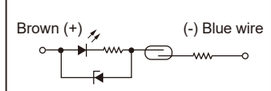
Dimensional Drawings

● V series (For strong magnetic field resistance)



Switch internal circuit diagram

● V0



Cylinder Switch

E Series	Heat resistant	Application Cylinder	SCA2-L2T (E0) SSD-T1L (ET0) SSD2-T1L (ET0)

(EO is not subject to CE, UKCA)

E0

ET0

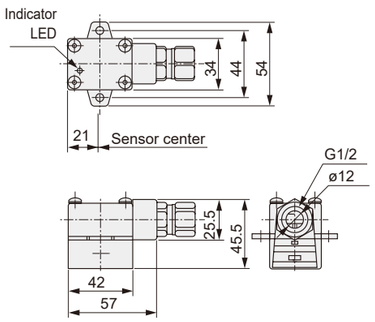
Specifications

Item	Reed 2-wire type				
	E0			ET0	
Applications	For relay, programmable controller				
Load voltage	12/24 VDC	110 VAC	220 VAC	12/24 VDC	110 VAC
Load current	5 to 50 mA	7 to 20 mA	7 to 10 mA	5 to 50 mA	7 to 20 mA
Internal voltage drop	4 V or less			3.0 V or less	
Leakage current	0 mA				
Indicator LED	Red LED (Lights up when ON)			Yellow LED (Lights up when ON)	
Conduit thread	G1/2			–	
Lead wire length	–			1 m (Heat-resistant fluorine insulated cabtyre cord 2-core 0.5 mm²)	
Insulation resistance	100 MΩ or more with 500 VDC megger				
Withstand Voltage	No abnormality when 1500 VAC is applied for 1 minute			No abnormality when 1000 VAC is applied for 1 minute	
Shock Resistance	294 m/s²				
Ambient Temperature	-10 to +120°C			-10 to +150°C	
Protection structure	IEC standard IP67, JIS C0920 (Immersible type), Oil resistant				
Contact protection circuit Note	None				
Weight	164 g			44 g	

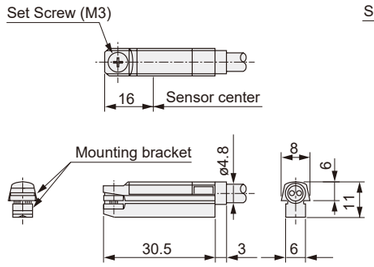
Note: For contact protection measures, refer to P. 1487.

Dimensional Drawings

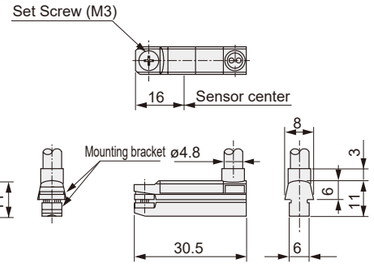
● E Series



● ET0H series (Straight lead wire type)

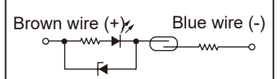


●ET0V series (L-shaped lead wire type)

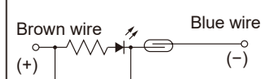


Switch internal circuit diagram

● E0



● ET0H



Contact Protection Circuit Box	SKAC, SKDC

Specifications

Item	For AC circuit		For DC circuit
	SKAC		SKDC
Load voltage	100/110 VAC	200/220 VAC	24 VDC
Load current	20 mA or less	10 mA or less	50 mA or less
Lead Wire Length	1 m (Oil-resistant vinyl cabtyre cord 2-core, 0.2 mm²)		
Shock Resistance	980 m/s²		
Insulation resistance	100 MΩ or more with 500 VDC megger		
Withstand Voltage	No abnormality when 1500 VAC is applied for 1 minute		
Ambient Temperature	-10 to +60°C		
Protection structure	IEC standard IP67, JIS C0920 (Immersible type), Oil resistant		

Model No. Notation

SW-SKAC

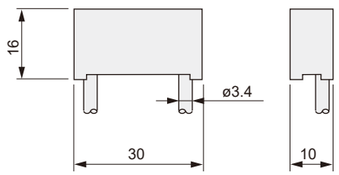
❶ Contact protection circuit

❶ Contact protection circuit

Code	Content
SKAC	For AC circuit
SKDC	For DC circuit

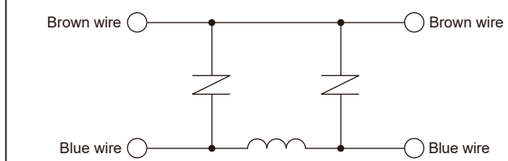
Outline Dimension Drawing

●SKAC/SKDC series



Internal circuit diagram

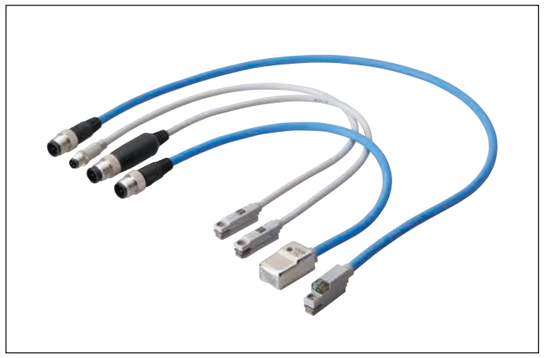
● SKAC/SKDC



*: There is no polarity on the input or output side, and either can be connected to the switch side.

Note: SKAC is exclusively for AC circuits, and SKDC is exclusively for DC circuits.

Cylinder Switch with Connector



Adopts highly versatile M8 and M12 connectors

- Compliant with Standard No. NECA4202, IEC947-5-2
- Reduction of wiring man-hours, Easy maintenance
- Protection structure is IP67
- Spatter adhesion prevention protective cover available

●For T0H

●For T2YD

Model Number Notation

*This is a custom order product.

●2-wire Cylinder Switch

SW - T0 (1) H (2) F (3) K (4)

❶ Model	❷ Lead Wire Exit Direction		❸ Connector Type, PIN Arrangement		Lead Wire Length		❹ Options *3	
T0	H	Straight type	F	M8 connector 4PIN (+) 3PIN (-) *1	Blank	0.3 m	K	Spatter adhesion prevention protective cover
T2	V	L-shaped type	M	M12 connector 1PIN (+) 4PIN (-)				
T2W			U	M12 connector 3,4PIN no polarity *2				
T2YL								
K2Y								
F2Y								

*3: Applicable only to T0H□□

*1: Compatible only with T0, T2, T2W
*2: T2YL is not compatible. Please note that the "internal voltage drop" will be 1 V higher than the specification value described in the catalog.

●3-wire Cylinder Switch

SW - T3 (1) H (2) F (3)

❶ Model	❷ Lead Wire Exit Direction		❸ Connector Type		Lead Wire Length	
T3	H	Straight type	F	M8 1PIN (+) 3-pin (-) 4PIN: (OUT)	Blank	0.3 m
T3P	V	L-shaped type				
T3W						

●Cylinder switch for strong magnetic fields

SW - H0 (1) M (2)

❶ Model	❷ Connector Types		Lead Wire Length	
H0	M	M12 connector 1,4PIN no polarity *4	Blank	0.3 m
H0Y	U	M12 connector 3,4PIN no polarity *5		
V0				

*4: Compatible only with H0, H0Y
*5: V0 only 4PIN (+) 3-pin (-)

●AC Magnetic Field Specific Cylinder Switch

SW - T2YD (1) G (2) K (3)

❶ Model	❷ Connector Types		Lead Wire Length		❸ Options	
T2YD	G	Spatter-resistant lead wire M12 connector 1,4PIN no polarity	Blank	0.3 m	K	Spatter adhesion prevention protective cover
	B	Spatter-resistant lead wire M12 connector 3,4PIN no polarity				
	U	Flame-retardant lead wire UL wire M12 connector 3,4PIN non-polar				
	W	Flame-retardant lead wire UL wire M12 connector 1,4PIN non-polar				

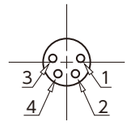
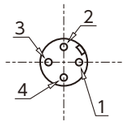
*6: The switch specifications for the cylinder are the same as the lead wire type. For details, refer to P. 1472 to 1485.

Connector pin assignment

Series	Connector pin assignment					
	Code	Connector type	1PIN	2PIN	3PIN	4PIN
2-wire type	F	M8	-	-	(−)	(+)
	M	M12	(+)	-	-	(−)
	U		-	-	(±)	(±)
For strong magnetic field Exclusively for AC magnetic fields	M, G, W		(±)	-	-	(±)
	U, B *1		-	-	(±)	(±)
3-wire type	F	M8	(+)	-	(−)	(OUT)

*1: Only SW-V0U has polarity (4PIN (+), 3PIN (-)).

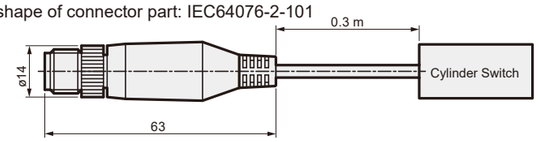
Connector specifications

Item	M8	M12
Pin assignment		
Shock Resistance	294 m/s²	
Enclosure	IP67	
Insulation resistance	100 MΩ with 500 VDC megger	
Withstand Voltage	1000 VAC for 1 minute (Between contacts and between contact housing) Leakage current 1 mA or less	

Outline Dimension Drawing

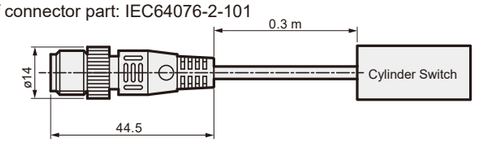
① M12 connector (Only for 2-wire cylinder switch connector type, PIN assignment code "U")

Standard for external shape of connector part: IEC64076-2-101



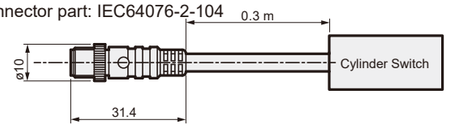
② M12 connector (M12 connectors other than ①)

Standard for external shape of connector part: IEC64076-2-101



③ M8 connector (Applicable to all models)

Standard for external shape of connector part: IEC64076-2-104



*For cylinder switch outline dimension drawings, refer to P. 1472 to 1485.

T-type cylinder switch with off-delay timer
T2JH/T2JV

Overview

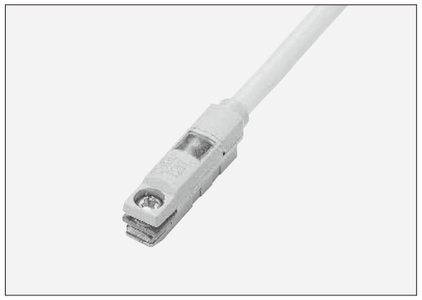
Optimal for high-speed intermediate detection of cylinders.
Ensures reliable PC input by providing an off-delay timer.

Features

· Eliminates PC input problems that tend to occur during high-speed intermediate detection of cylinders.
· Off-delay timer is 200 ±50 ms
· Can be mounted on Rodless Cylinder SRL3.
· Wide variety of mountable cylinders.

*If ordered with cylinder mounting, it will be a custom order product.
*Depending on the cylinder, mountable switches may be limited. Please refer to the P. for each cylinder for details.

T-type cylinder switch for cutting oil resistance
T2YLH/V, T3YLH/V



Overview

This is a cylinder switch designed to prevent cutting oil used for machine tools in machining sites, etc., from entering the inside of the switch.

Features

· Oil resistance improved by applying a coating agent to the board. Can be used even in environments where cutting oil splashes.
· Wide variety of mountable cylinders

*If ordered with cylinder mounting, it will be a custom order product.

Water-resistant Cylinder Switch
T2WLH/V

Features

Product with improved water (coolant) resistance
· Water (coolant) resistance performance: 6 times or more compared to conventional products
· Space saving (70% reduction compared to conventional), weight reduction (46% reduction compared to conventional)
· Compatible with existing switch SW-T2YL
· Reduction of wiring space (Can be stored in T-slot)
· Protection structure IP67

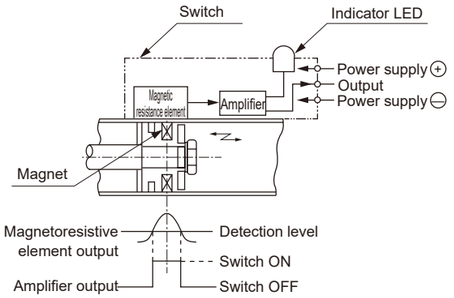
Magnetic Field Resistant Cylinder Switch
T0Y

Features

Product with improved reliability in magnetized environments (Optimal for DC welding processes)
· Space saving (70% down compared to conventional products)
· Power saving (50% down compared to conventional products)
· Compatible with existing switch SW-T2YD (excluding some models and bores)
· Wide range of variations (cable material, connectors, spatter adhesion prevention cover)
· Protection structure IP67

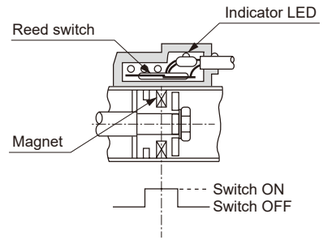
Operating Principle

Solid state switch



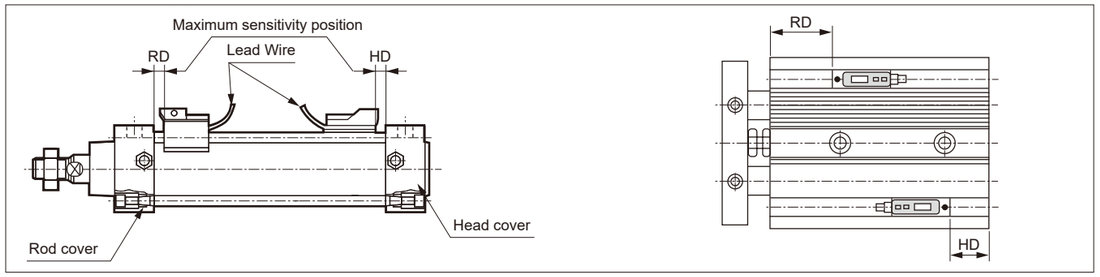
When the piston magnet approaches, a change occurs in the magnetic field, and the output voltage of the magnetoresistive element changes as shown in the figure. By amplifying this signal, a switching output as shown in the figure can be obtained.

Reed switch



When the piston magnet approaches, a magnetic field is generated, the opposing contacts of the reed switch are magnetized, an attractive force is generated, and the contacts close.

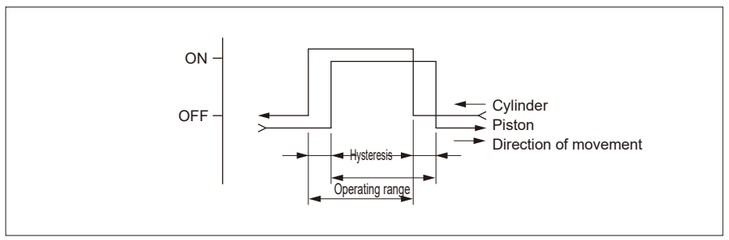
Switch mounting position



● When mounting at stroke end
To operate the switch at the maximum sensitivity position, please mount it at the RD dimension on the rod side and the HD dimension on the head side, respectively. Note that the HD and RD dimensions vary depending on the cylinder. Please refer to the external dimension diagram for each cylinder. Also, please mount the switch with the lead wire facing inward as shown in the figure above.

● When mounting at intermediate stroke position
When detecting in the middle of the stroke, fix the piston at the stopping position and move the switch back and forth over the piston to find the position where the switch first turns ON. The midpoint between those two positions is the maximum sensitivity position at that piston position, and becomes the mounting position.

● About circumferential direction mounting
Varies depending on the mounting bracket. The band method has no restrictions in the circumferential direction. For the tie-rod method, rotation in 90°increments is possible. For rail type, circumferential rotation is not possible.



Hysteresis

● This is the distance from the position where the piston moves and the switch turns ON, to when it moves in the reverse direction and turns OFF. If the piston stops during this time, the switch operation becomes unstable and susceptible to external influences. Please be careful.

Operating range

● This refers to the range from when the piston moves and the switch turns ON, to when it moves further in the same direction and turns OFF. The center of the operating range is the maximum sensitivity position. If this position is set as the piston stop position, it will be less susceptible to disturbances and the switch operation will also be stable.

Operating range and hysteresis of each cylinder model with switch

(Unit: mm)

Model No.	Bore Size (mm)	Solid state switch				Reed switch	
		Operating range		Hysteresis		Operating range	Hysteresis
		1-color type	2-color type	1-color type	2-color type		
Pencil Cylinder	● Applicable switches: Solid state switches (T2□,T3□,T2W□,T3W□,T2WL□), Reed switches (T0□,T5□)						
SCP□3	ø6	1.5 to 4	2.5 to 5	1.5 or less	1.0 or less	4 to 6	3 or less
	ø10	1.5 to 5.5	2.5 to 6			3.5 to 7	
	ø16	2 to 6	2.5 to 6			3.5 to 7.5	
Tight Cylinder	● Applicable switches: Solid state switches (T2□, T3□, T3P□, T2J□, T2W□, T3W□, T2WL□, T1□), Reed switches (T0□, T5□, T8□)						
CMK2	ø20	2.5 to 5.5	3.5 to 7.5	1.5 or less	1.0 or less	6.5 to 11	3 or less
	ø25	2.5 to 5.5	3.5 to 7.5			7.5 to 12	
	ø32	2.5 to 6	3.5 to 8			6.5 to 11.5	
	ø40	3 to 7	4 to 9			7.5 to 13.5	
Small Bore Size Cylinder	● Applicable switches: Solid state switches (T2□, T3□, T3P□, T2J□, T2W□, T3W□, T2WL□, T1□), Reed switches (T0□, T5□, T8□)						
CMA2	ø20	3 to 6	5 to 6.5	1.5 or less	1.0 or less	8.5 to 12	3 or less
	ø30	3 to 5.5	6 to 7			8 to 13	
	ø40	2.5 to 5.5	5.5 to 7.5			8.5 to 12.5	
Super Micro Cylinder	● Applicable Switch: Solid state switches (T2□, T3□, T3P□, T2J□, T2W□, T3W□, T2WL□, T2YD, T1□), Reed switches (T0□, T5□, T8□)						
SCM	ø20	3 to 8	4.5 to 9	1.5 or less	1.0 or less	6 to 14	3 or less
	ø25	3 to 9	5 to 9			5 to 14	
	ø32	3 to 8	5 to 9			5 to 12	
	ø40	3 to 9	5.5 to 9.5			6 to 14	
	ø50	3 to 9	6 to 10			6 to 14	
	ø63	3 to 9	6 to 10.5			7 to 15	
	ø80	4 to 10	6.5 to 11			7 to 15	
	ø100	4 to 10	7 to 11.5			9 to 15	
Tie Rod Cylinder	● Applicable switches: Solid state switches (T2□, T3□, T3P□, T2J□, T2W□, T3W□, T2WL□, T2YD, T1□), Reed switches (T0□, T5□, T8□)						
SCG	ø32	2 to 7	6 to 9	1.5 or less	1.0 or less	6 to 11	3 or less
	ø40	2 to 7	6.5 to 9			7 to 12	
	ø50	2 to 7	7 to 10			7.5 to 12	
	ø63	2 to 7.5	7 to 10			8.5 to 13	
	ø80	2.5 to 8	7.5 to 10.5			9 to 13.5	
	ø100	2.5 to 8	8 to 11			9 to 14	
Selex Cylinder	● Applicable switches: Solid state switches (T2□, T3□, T3P□, T2J□, T2W□, T3W□, T2WL□, T2YD, T1□), Reed switches (T0□, T5□, T8□)						
SCA2	ø40	2 to 7	3 to 10	1.5 or less	1.0 or less	5 to 12.5	3 or less
	ø50	2 to 7.5	3 to 10			5.5 to 13.5	
	ø63	2.5 to 7.5	3.5 to 10.5			5.5 to 14	
	ø80	3 to 8	4 to 11.5			6.5 to 14.5	
	ø100	3 to 8.5	4 to 11.5			6.5 to 15.5	
Medium Bore Size Cylinder	● Applicable Switch: Reed switch for strong magnetic field (H0□)					*( ) indicates H0Y value.	
SCA2-L2	ø40	-		-	-	4 to 7.5 (10.5 to 13.5)	3 or less
	ø50					4 to 7.5 (11 to 14)	
	ø63					5 to 8 (11.5 to 14.5)	
	ø80					5 to 8 (10.5 to 14.5)	
	ø100					5 to 8 (10.5 to 14.5)	
Selex Cylinder	● Applicable switches: Solid state switches (T2□, T3□, T3P□, T2J□, T2W□, T3W□, T2WL□, T2YD, T1□), Reed switches (T0□, T5□, T8□)						
SCS2	ø125	7.5 to 14	14 to 21	1.5 or less	1.0 or less	11 to 16	3 or less
	ø140	7.5 to 14	18 to 26				
	ø160	7.5 to 14	18 to 26				
	ø180	7.5 to 14	18 to 26				
	ø200	7.5 to 14	18 to 26				

Operating range and hysteresis of each cylinder model with switch

(Unit: mm)

Model No.	Bore Size (mm)	Solid state switch				Reed switch	
		Operating range		Hysteresis		Operating range	Hysteresis
		1-color type	2-color type	1-color type	2-color type		
Tie Rod Cylinder	● Applicable switches: Solid state switches (T2□, T3□, T3P□, T2J□, T2W□, T3W□, T2WL□, T1□), Reed switches (T0□, T5□, T8□)						
CKV2	ø20	2.5 to 5.5	3.5 to 7.5	1.5 or less	1.0 or less	6.5 to 11	3 or less
	ø25	2.5 to 5.5	3.5 to 7.5			7.5 to 12	
	ø32	2.5 to 6	3.5 to 8			6.5 to 11.5	
	ø40	3 to 7	4 to 9			7.5 to 13.5	
Tie Rod Cylinder	● Applicable switches: Solid state switches (T2□, T3□, T3P□, T2J□, T2W□, T3W□, T2WL□, T2YD, T1□), Reed switches (T0□, T5□, T8□)						
CAV2-L COVP2-L COVN2-L	ø50	3.8 to 6.7	4 to 6	0.8 or less	0.7 or less	7.7 to 8.3	1 or less
	ø75	3.8 to 6.7	4 to 6			7.7 to 8.3	
	ø100	3.8 to 6.7	4 to 6			7.7 to 8.3	
Super Compact Cylinder	● Applicable switches: Solid state switches (T2□, T3□, T3P□, T2J□, T2W□, T3W□, T2WL□, T2YD, T1□), Reed switches (T0□, T5□, T8□)						
SSD2	ø12	1.5 to 5.5	3 to 6	1.5 or less	1.0 or less	5 to 8	3 or less
	ø16	1.5 to 4.5	3 to 7			4 to 9	
	ø20	3 to 8	4.5 to 8			6 to 14	
	ø25	3 to 9	4.5 to 8			5 to 14	
	ø32	3 to 8	4.5 to 8			5 to 12	
	ø40	3 to 9	5 to 8.5			6 to 14	
	ø50	3 to 9	5.5 to 9.5			6 to 14	
	ø63	3 to 9	5.5 to 9.5			7 to 15	
	ø80	4 to 10	6 to 10			7 to 15	
	ø100	4 to 10	6 to 10			9 to 15	
	ø125	4 to 10	8 to 10			9 to 15	
	ø140	4 to 10	8 to 10			9 to 15	
	ø160	4 to 10	8 to 10			9 to 15	
Super Compact Cylinder	● Applicable switches: Reed switch (ET0□)						
SSD2-T1L	ø16	-		-	-	8 to 11.5	3 or less
	ø20					9 to 13.5	
	ø25					9.5 to 14	
	ø32					9 to 13	
	ø40					9 to 14	
	ø50					11 to 16	
	ø63					13 to 18	
Super Compact Cylinder	● Applicable Switch: Solid state switches (T2□, T3□, T3P□, T2J□, T2W□, T3W□, T2WL□, T2YD, T1□), Reed switches (T0□, T5□, T8□)						
SSG	ø12	1.5 to 5.5	3 to 6	1.5 or less	1.0 or less	5 to 8	3 or less
	ø16	1.5 to 4.5	3 to 7			4 to 9	
	ø20	3 to 8	4.5 to 8			6 to 14	
	ø25	3 to 9	4.5 to 8			5 to 14	
	ø32	3 to 8	4.5 to 8			5 to 12	
	ø40	3 to 9	5 to 8.5			6 to 14	
	ø50	3 to 9	5.5 to 9.5			7 to 15	
	ø63	3 to 9	5.5 to 9.5			7 to 15	
	ø80	4 to 10	6 to 10			9 to 15	
	ø100	4 to 10	6 to 10			9 to 15	

Operating range and hysteresis of each cylinder model with switch

(Unit: mm)

Model No.	Bore Size (mm)	Solid state switch				Reed switch	
		Operating range		Hysteresis		Operating range	Hysteresis
		1-color type	2-color type	1-color type	2-color type		
Super Compact Cylinder	● Applicable switches: Solid state switches (T2□, T3□, T3P□, T2J□, T2W□, T3W□, T2WL□, T2YD, T1□), Reed switches (T0□, T5□, T8□)						
SSD	ø12	1.5 to 5.5	3 to 6	1.5 or less	1.0 or less	5 to 8	3 or less
	ø16	1.5 to 4.5	3 to 7			4 to 9	
	ø20	3 to 8	4.5 to 8			6 to 14	
	ø25	3 to 9	4.5 to 8			5 to 14	
	ø32	3 to 8	4.5 to 8			5 to 12	
	ø40	3 to 9	5 to 8.5			6 to 14	
	ø50	3 to 9	5.5 to 9.5			6 to 14	
	ø63	3 to 9	5.5 to 9.5			7 to 15	
	ø80	4 to 10	6 to 10			7 to 15	
	ø100	4 to 10	6 to 10			9 to 15	
	ø125	4 to 10	8 to 10			9 to 15	
	ø140	4 to 10	8 to 10			9 to 15	
	ø160	4 to 10	8 to 10			9 to 15	
Super Compact Cylinder	● Applicable switches: Reed switch (ET0□)						
SSD-T1L	ø16	-		-	-	8 to 11.5	3 or less
	ø20					9 to 13.5	
	ø25					9.5 to 14	
	ø32					9 to 13	
	ø40					9 to 14	
	ø50					11 to 16	
	ø63					13 to 18	
Small Direct Cylinder	● Applicable switches: Solid state switches (F2□, F3□), Reed switch (F0□)						
MDC2	ø6	1.5 to 3.5	-	1.0 or less	-	3.5 to 6.0	1.0 or less
	ø8						
	ø10						
MDC2-X	ø6	2.0 to 3.5	-	1.0 or less	-	5.5 to 7.5	1.0 or less
	ø8						
	ø10						
MDC2-Y	ø6	1.5 to 3.5	-	1.0 or less	-	4.5 to 6.0	1.0 or less
	ø8						
	ø10						
Compact direct cylinder with vacuum pad	● Applicable switches: Solid state switches (F2□, F3□), Reed switch (F0□)						
MVC	ø6	1.5 to 3.5	-	1.0 or less	-	3.5 to 6.0	1.0 or less
	ø10					4.5 to 6.0	
Super Mount Cylinder	● Applicable switches: Solid state switches (K2□, K3□, K3P□, K2Y□, K3Y□), Reed switches (K0□, K5□)						
SMG	ø6	1.5 to 7	3.5 to 7.5	2 or less	1.5 or less	3 to 9.5	3 or less
	ø10	1.5 to 7	3.5 to 7.5			3.5 to 9.5	
	ø16	1.5 to 7	4.5 to 8.5			4 to 11	
	ø20	2.5 to 9	5 to 9			5 to 12.5	
	ø25	3.5 to 11	5.5 to 9.5			6.5 to 14	
	ø32	3.5 to 11.5	1.5 to 10.5			5.5 to 14	
Compact Cylinder	● Applicable switches: Solid state switches (F2□, F3□), Reed switch (F0□)						
MSD-□L **MSDG-L**	ø6	1.5 to 3.0	-	1.0 or less	-	5 to 6	1.0 or less
	ø8	1.5 to 3.5	-			5.5 to 6.5	
	ø12	1.5 to 3.5	-			5.5 to 7.5	
	ø16	1.5 to 3.5	-			4.5 to 7	

Operating range and hysteresis of each cylinder model with switch

(Unit: mm)

Model No.	Bore Size (mm)	Solid state switch				Reed switch	
		Operating range		Hysteresis		Operating range	Hysteresis
		1-color type	2-color type	1-color type	2-color type		
Flat Cylinder Compact Demi	● Applicable switches: Applicable switches: Solid state switches (M2V,M3V,M3PV,M2WV,M3WV), Reed switches (M0V,M5V)						
FCS-L	ø25	9 to 12	6 to 11	1.5 or less	1.0 or less	7 to 8.5	3 or less
	ø32	9 to 12	6 to 11			7 to 8.5	
	ø40	8.5 to 12	6 to 11			7 to 8.5	
	ø50	8 to 12	6 to 11			6.5 to 8.5	
	ø63	8 to 12	6 to 11			6.5 to 8.5	
FCH-L **FCD-L** **FCD-DL** **FCD-KL**	ø25	6 to 12	5 to 11	1.5 or less	1.0 or less	7 to 12	3 or less
	ø32	6 to 12	5 to 11			7 to 12	
	ø40	6 to 12	5 to 11			7 to 12	
	ø50	6 to 12	5 to 11			7 to 12	
	ø63	6 to 12	5 to 11			7 to 12	
Stopper Cylinder	● Applicable switches: Solid state switches (T2□, T3□, T3P□, T2J□, T2W□, T3W□, T2WL□, T1□), Reed switches (T0□, T5□, T8□)						
STK	ø20	3 to 8	4.5 to 8	1.5 or less	1.5 or less	6 to 14	3 or less
	ø32	3 to 8	4.5 to 8			5 to 12	
	ø40	3 to 9	5 to 8.5			6 to 14	
	ø50	3 to 9	5.5 to 9.5			6 to 14	
Brake Cylinder	● Applicable switches: Solid state switches (T2□, T3□, T3P□, T2J□, T2W□, T3W□, T2WL□, T2YD, T1□), Reed switches (T0□, T5□, T8□)						
ULK	ø20	2.5 to 5.5	3.5 to 7.5	1.5 or less	1.0 or less	6.5 to 11	3 or less
	ø25	2.5 to 5.5	3.5 to 7.5			7.5 to 12	
	ø32	2.5 to 6	3.5 to 8			6.5 to 11.5	
	ø40	3 to 7	4 to 9			7.5 to 13.5	
Brake Cylinder	● Applicable switches: Solid state switches (T2□, T3□, T3P□, T2J□, T2W□, T3W□, T1□), Reed switches (T0□, T5□, T8□)						
JSK2	ø20	2.5 to 5.5	3.5 to 7.5	1.5 or less	1.0 or less	6.5 to 11	3 or less
	ø25	2.5 to 5.5	3.5 to 7.5			7.5 to 12	
	ø32	2.5 to 6	3.5 to 8			6.5 to 11.5	
	ø40	3 to 7	4 to 9			7.5 to 13.5	
Brake Cylinder	● Applicable switches: Solid state switches (T2□, T3□, T3P□, T2J□, T2W□, T3W□, T1□), Reed switches (T0□, T5□, T8□)						
JSM2	ø20	3 to 6	5 to 6.5	1.5 or less	1.0 or less	8.5 to 12	3 or less
	ø30	3 to 5.5	6 to 7			8 to 13	
	ø40	2.5 to 5.5	5.5 to 7.5			8.5 to 12.5	
Tie Rod Cylinder with Brake	● Applicable switches: Solid state switches (T2□, T3□, T3P□, T2J□, T2W□, T3W□, T2YD, T1□), Reed switches (T0□, T5□, T8□)						
JSG	ø32	2 to 7	6 to 9	1.5 or less	1.0 or less	6 to 11	3 or less
	ø40	2 to 7	6.5 to 9			7 to 12	
	ø50	2 to 7	7 to 10			7.5 to 12	
	ø63	2 to 7.5	7 to 10			8.5 to 13	
	ø80	2.5 to 8	7.5 to 10.5			9 to 13.5	
	ø100	2.5 to 8	8 to 11			9 to 14	

Operating range and hysteresis of each cylinder model with switch

(Unit: mm)

Model No.	Bore Size (mm)	Solid state switch				Reed switch	
		Operating range		Hysteresis		Operating range	Hysteresis
		1-color type	2-color type	1-color type	2-color type		
Brake Cylinder	● Applicable switches: Solid state switches (T2□, T3□, T3P□, T2J□, T2W□, T3W□, T2YD, T1□), Reed switches (T0□, T5□, T8□)						
JSC3 (Medium bore)	ø40	2 to 7	3 to 10	1.5 or less	1.0 or less	5 to 12.5	3 or less
	ø50	2 to 7.5	3 to 10			5.5 to 13.5	
	ø63	2.5 to 7.5	3.5 to 10.5			5.5 to 14	
	ø80	3 to 8	4 to 11.5			6.5 to 14.5	
	ø100	3 to 8.5	4 to 11.5			6.5 to 15.5	
Brake Cylinder	● Applicable switches: Reed switch for strong magnetic field (H0□)					*( ) indicates H0Y value.	
JSC3-L2 (Medium bore)	ø40	-		-		4 to 7.5 (10.5 to 13.5)	3 or less
	ø50					4 to 7.5(11 to 14)	
	ø63					5 to 8 (11.5 to 14.5)	
	ø80					5 to 8 (10.5 to 14.5)	
	ø100					5 to 8 (10.5 to 14.5)	
Brake Cylinder	● Applicable switches: Solid state switches (T2□, T3□, T3P□, T2J□, T2W□, T3W□, T2YD, T1□), Reed switches (T0□, T5□, T8□)						
JSC4 (Large bore)	ø125	7.5 to 14	14 to 21	1.5 or less	1.0 or less	11 to 16	3 or less
	ø140	7.5 to 14	18 to 26			11 to 16	
	ø160	7.5 to 14	18 to 26			11 to 16	
	ø200	7.5 to 14	18 to 26			11 to 16	
Super Compact Cylinder with Fall Prevention	● Applicable Switch: Solid state switches (T2□, T3□, T3P□, T2J□, T2W□, T3W□, T2YD, T1□), Reed switches (T0□, T5□, T8□)						
USSD	ø20	3 to 8	4.5 to 8	1.5 or less	1.0 or less	6 to 14	3 or less
	ø25	3 to 9	4.5 to 8			5 to 14	
	ø32	3 to 8	4.5 to 8			5 to 12	
	ø40	3 to 9	5 to 8.5			6 to 14	
	ø50	3 to 9	5.5 to 9.5			6 to 14	
	ø63	3 to 9	5.5 to 9.5			7 to 15	
Flat Cylinder with Free Position Fall Prevention	● Applicable Switch: Solid state switches (M2□, M3□, M3P□, M2W□, M3W□), Reed switches (M0□, M5□)						
UFCD	ø25	6 to 12	5 to 11	1.5 or less	1.0 or less	7 to 12	3 or less
	ø32	6 to 12	5 to 11			7 to 12	
	ø40	6 to 12	5 to 11			7 to 12	
	ø50	6 to 12	5 to 11			7 to 12	
	ø63	6 to 12	5 to 11			7 to 12	
Selex Cylinder with Free Position Fall Prevention	● Applicable Switch: Solid state switches (T2□, T3□, T3P□, T2J□, T2W□, T3W□, T2YD, T1□), Reed switches (T0□, T5□, T8□)						
USC	ø40	2 to 7	3 to 10	1.5 or less	1.0 or less	5 to 12.5	3 or less
	ø50	2 to 7.5	3 to 10			5.5 to 13.5	
	ø63	2.5 to 7.5	3.5 to 10.5			5.5 to 14	
	ø80	3 to 8	4 to 11.5			6.5 to 14.5	
	ø100	3 to 8.5	4 to 11.5			6.5 to 15.5	
Selex Cylinder with Free Position Fall Prevention	● Applicable Switch: Reed switch for strong magnetic field (H0□)					*( ) indicates H0Y value.	
USC-L2	ø40	-		-	-	4 to 7.5 (10.5 to 13.5)	3 or less
	ø50					4 to 7.5 (11 to 14)	
	ø63					5 to 8 (11.5 to 14.5)	
	ø80					5 to 8 (10.5 to 14.5)	
	ø100					5 to 8 (10.5 to 14.5)	
Guided Cylinder	● Applicable switches: Proximity switch (F2□, F3□, F2Y□, F3Y□)						
STM	ø10	2.5 to 4.5	2.5 to 5.5	1.5 or less	1.5 or less	-	-
	ø16	2.5 to 4.5	2.5 to 5.5				

Operating range and hysteresis of each cylinder model with switch

(Unit: mm)

Model No.	Bore Size (mm)	Solid state switch				Reed switch	
		Operating range		Hysteresis		Operating range	Hysteresis
		1-color type	2-color type	1-color type	2-color type		
Guided Cylinder	● Applicable switches: Solid state switches (T2□, T3□, T3P□, T2J□, T2W□, T3W□, T2WL□, T2YD, T1□), Reed switches (T0□, T5□, T8□)						
STG	ø12	1.5 to 4.5	4 to 6	1.5 or less	1.5 or less	6 to 10	3 or less
	ø16	1.5 to 4.5	4 to 6			4 to 9	
	ø20	3 to 8	5 to 8.5			6 to 14	
	ø25	3 to 9	5 to 8.5			5 to 14	
	ø32	3 to 9	5 to 9			5 to 12	
	ø40	3 to 9	6 to 10			6 to 14	
	ø50	3 to 9	6 to 10			6 to 14	
	ø63	3 to 9	6 to 10			7 to 15	
	ø80	4 to 10	7 to 10			7 to 15	
Guided Cylinder	● Applicable switches: Solid state switches (T2□, T3□, T3P□, T2J□, T2W□, T3W□, T2WL□, T2YD, T1□), Reed switches (T0□, T5□, T8□)						
STS/L	ø8	1.5 to 3.5	4 to 6	1.5 or less	1.5 or less	5 to 9	3 or less
	ø12	1.5 to 4.5	4 to 6			6 to 10	
	ø16	1.5 to 4.5	4 to 6			4 to 9	
	ø20	3 to 8	5 to 8.5			6 to 14	
	ø25	3 to 9	5 to 8.5			5 to 14	
	ø32	3 to 8	5 to 9			5 to 12	
	ø40	3 to 9	6 to 10			6 to 14	
	ø50	3 to 9	6 to 10			6 to 14	
	ø63	3 to 9	6 to 10			7 to 15	
	ø80	4 to 10	7 to 10			7 to 15	
	ø100	2 to 9	7 to 10			7 to 15	
Linear Slide Cylinder	● Applicable switches: Proximity switch (F2□, F3□, F2Y□, F3Y□)						
LCW	ø12	3.5 to 6.5	4.5 to 6.5	1.0 or less	1.0 or less	-	-
Linear Slide Cylinder	● Applicable switches: Solid state switches (T2□,T3□,T2W□,T3W□), Reed switches (T0□,T5□)						
LCW	ø16	3 to 5	4 to 5.5	1.0 or less	1.0 or less	6.5 to 9.5	3.0 or less
	ø20	4.5 to 6.5	5.5 to 6.5			8 to 12	
Linear Slide Cylinder	● Applicable switches: Proximity switch (F2□, F3□, F2Y□, F3Y□)						
LCR	ø6	2 to 4	2.5 to 5.5	1.0 or less	1.0 or less	-	-
	ø8		3.5 to 6				
	ø12		3 to 4.5				
Linear Slide Cylinder	● Applicable switches: Solid state switches (T2□,T3□,T2W□,T3W□,T2WL□), Reed switches (T0□,T5□)						
LCR	ø16	2 to 4	3 to 4.5	1.0 or less	1.0 or less	5 to 9	1.0 or less
	ø20	2 to 5.5	4 to 5.5			6.5 to 11	
	ø25	2.5 to 6	3.5 to 6			8 to 12	
Linear Slide Cylinder	● Applicable switches: Proximity switch (F2□, F3□, F2Y□, F3Y□)						
LCG	ø6	2 to 4	2.5 to 5.5	1.0 or less	1.0 or less	-	-
	ø8		3.5 to 6				
	ø12		3 to 4.5				
Linear Slide Cylinder	● Applicable switches: Solid state switches (T2□,T3□,T2W□,T3W□,T2WL□), Reed switches (T0□,T5□)						
LCG	ø16	2 to 4	3 to 4.5	1.0 or less	1.0 or less	5 to 9	1.0 or less
	ø20	2 to 5.5	4 to 5.5			6.5 to 11	
	ø25	2.5 to 6	3.5 to 6			8 to 12	
Linear Slide Cylinder	● Applicable switches: Solid state switches (T2□,T3□,T2W□,T3W□,T2WL□), Reed switches (T0□,T5□)						
LCX	ø25	0.5 to 6	1.0 to 5.5	2 or less	2 or less	2 to 10.5	3.5 or less
	ø32	1.0 to 5.5	0.5 to 5.0			1 to 11	

Operating range and hysteresis of each cylinder model with switch

(Unit: mm)

Model No.	Bore Size (mm)	Solid state switch				Reed switch	
		Operating range		Hysteresis		Operating range	Hysteresis
		1-color type	2-color type	1-color type	2-color type		
Linear Slide Cylinder	● Applicable switches: Proximity switch (F2□, F3□, F2Y□, F3Y□)						
LCM	ø4.5	1 to 3	2 to 4	1.0 or less	1.0 or less	-	-
	ø6						
	ø8						
Super Twin Rod Cylinder	● Applicable switches: Solid state switches (K2□, K3□, K3P□, K2Y□, K3Y□), Reed switches (K0□, K5□)						
STR2	ø6	1 to 6	4 to 7.5	2.0 or less	1.5 or less	4 to 9 (STR2-M)	3.0 or less
	ø10	1 to 5.5	4 to 7.5			4 to 9 (STR2-M)	
	ø16	1.5 to 7.5	4.5 to 9			5 to 12.5	
	ø20	3 to 9	5.5 to 10			6.5 to 14.5	
	ø25	3.5 to 10.5	6.5 to 10.5			8 to 14.5	
	ø32	-	-			-	
Unit Cylinder	● Applicable switches: Solid state switches (T2□,T3□), Reed switches (T0□,T5□)						
UCA2-□L	ø10	1.5 to 4	-	1.5 or less	-	4.5 to 8	3.0 or less
	ø16						
	ø25						
	ø32						
High Energy Absorption Cylinder	● Applicable switches: Solid state switches (T2□, T3□, T3P□, T2J□, T2W□, T3W□, T2WL□, T2YD, T1□), Reed switches (T0□, T5□, T8□)						
HCM	ø20	3 to 8	4.5 to 9	1.5 or less	1.0 or less	6 to 14	3 or less
	ø25	3 to 9	5 to 9			5 to 14	
	ø32	3 to 8	5 to 9			5 to 12	
	ø40	3 to 9	5.5 to 9.5			6 to 14	
	ø50	3 to 9	6 to 10			6 to 14	
	ø63	3 to 9	6 to 10.5			7 to 15	
High Speed Cylinder	● Applicable switches: Solid state switches (R1, R2, R3, R2Y, R3Y), Reed switches (R0, R4, R5, R6)						
HCA	ø20	6 to 14	11 to 18	1.5 or less	1.0 or less	7 to 14	3.0 or less
	ø25	6 to 14	11 to 18			8 to 13	
	ø32	6 to 14	11 to 18			9 to 14	
	ø50	6 to 14	11 to 18			9 to 14	
Super Rodless Cylinder	● Applicable switches: Solid state switches (M2□, M3□, M3P□, M2WV, M3WV), Reed switches (M0□, M5□)						
SRL3	ø12	4 to 13	4 to 12	1.5 or less	1.0 or less	3 to 11	3.0 or less
	ø16	4 to 13	4 to 12	1.5 or less	1.0 or less	3 to 11	
	ø20	4 to 13	4 to 12	1.5 or less	1.0 or less	3 to 11	
	ø25	9.5 to 15.5	9 to 14	2.0 or less	1.5 or less	8.5 to 13.5	3.5 or less
	ø32	7.5 to 15	8 to 14	2.0 or less	1.5 or less	7 to 13.5	
	ø40	11.5 to 17.5	10 to 16.5	2.0 or less	1.5 or less	10 to 16	
	ø50	11 to 24	17 to 27	2.5 or less	1.5 or less	17 to 27	3.0 or less
	ø63	11 to 24	17 to 27	2.5 or less	1.5 or less	17 to 27	
	ø80	26.5 to 45.5	16.5 to 40	5.0 or less	3.0 or less	20.5 to 41	
	ø100	25.5 to 40.5	21.5 to 36	3.0 or less	2.5 or less	24 to 37	
Super Rodless Cylinder	● Applicable switches: Proximity switch (T2W□, T3W□, T2WL□, T2YD)						
SRL3	ø12	-	2 to 7	-	1.0 or less	-	-
	ø16	-	2 to 7				
	ø20	-	3 to 8	-	1.5 or less		
	ø25	-	3 to 10				
	ø32	-	3 to 10				
	ø40	-	4 to 11				
	ø50	-	9 to 16				
	ø63	-	9 to 16				
	ø80	-	10 to 24	-	2.0 or less		
	ø100	-	10 to 24				

Operating range and hysteresis of each cylinder model with switch

(Unit: mm)

Model No.	Bore Size (mm)	Solid state switch				Reed switch	
		Operating range		Hysteresis		Operating range	Hysteresis
		1-color type	2-color type	1-color type	2-color type		
Rodless Cylinder with High-Precision Guide	● Applicable Switch: Solid state switches (M2□, M3□, M3P□, M2WV, M3WV), Reed switches (M0□, M5□)						
SRG3	ø12	4 to 13	4 to 12	1.5 or less	1.0 or less	3 to 11	3.0 or less
	ø16	4 to 13	4 to 12			3 to 11	
	ø20	9.5 to 15.5	9 to 14	2.0 or less	1.5 or less	3 to 11	
	ø25	9.5 to 15.5	9 to 14			8.5 to 13.5	3.5 or less
Rodless Cylinder with High-Precision Guide	● Applicable switches: Proximity switch (T2W□, T3W□, T2WL□, T2YD)						
SRG3	ø12	-	2 to 7	-	1.0 or less	-	-
	ø16	-	2 to 7				
	ø20	-	3 to 8	-	1.5 or less		
	ø25	-	3 to 10				
Rodless Cylinder with High-Precision Guide	● Applicable Switch: Solid state switches (T2WL□,T2W□,T3W□,T2YD), Reed switches (T0□, T5□, T8□)						
SRM3	ø25	-	6 to 9	-	1.0 or less	5.5 to 11	2.0 or less
	ø32	-	6.5 to 9			5.5 to 10	
	ø40	-	7.5 to 10.5			5.5 to 9	
	ø63	-	8 to 11			5.5 to 10	
Rodless Cylinder with Brake	● Applicable switches: Solid state switches (M2□, M3□, M3P□, M2WV, M3WV), Reed switches (M0□, M5□)						
SRT3	ø12	4 to 13	4 to 12	1.5 or less	1.0 or less	3 to 11	3.0 or less
	ø16	4 to 13	4 to 12			3 to 11	
	ø20	4 to 13	4 to 12			3 to 11	
	ø25	9.5 to 15.5	9 to 14	2.0 or less	1.5 or less	8.5 to 13.5	3.5 or less
	ø32	7.5 to 15	8 to 14			7 to 13.5	
	ø40	11.5 to 17.5	10 to 16.5			10 to 16	
	ø50	16.5 to 24	14 to 21			14.5 to 21.5	
	ø63	16 to 24	14 to 21			14 to 21.5	
Super Rodless Cylinder	● Applicable switches: Proximity switch (T2W□, T3W□, T2WL□, T2YD)						
SRT3	ø12	-	2 to 7	-	1.0 or less	-	-
	ø16	-	2 to 7				
	ø20	-	3 to 8	-	1.5 or less		
	ø25	-	3 to 10				
	ø32	-	3 to 10				
	ø40	-	4 to 11				
	ø50	-	9 to 16				
	ø63	-	9 to 16				
Magnet Type Rodless Cylinder	● Applicable switches: Solid State Switch (T2□, T3□, T3P□, T2W□, T3W□, T2WL□, T1□)						
MRL2	ø6	2 to 5	5.5 to 6.5	1.0 or less	1.0 or less	-	-
	ø10	2.5 to 5.5	6 to 7.5				
	ø16	2 to 5	5.5 to 7				
	ø20	2 to 5	6 to 5.5				
	ø25	2 to 5	6 to 5.5				
	ø32	2 to 4.5	5.5 to 6.5				
Magnet type super rodless cylinder high precision guide	● Applicable switches: Solid state switches (T2□,T3□,T3P□,T2W□,T3W□,T2WL□,T1□), Reed switches (T0□,T5□)						
MRG2	ø10	2 to 4.5	5.5 to 7	0.5 or less	0.5 or less	6.5 to 7.5	1 or less
	ø16	2 to 5	6 to 7.5			7 to 8	2 or less
	ø25	2 to 5	6 to 7			7.5 to 8	2 or less

Operating range and hysteresis of each cylinder model with switch

(Unit: mm)

Model No.	Bore Size (mm)	Solid state switch				Reed switch	
		Operating range		Hysteresis		Operating range	Hysteresis
		1-color type	2-color type	1-color type	2-color type		
Clamp Cylinder	● Applicable switches: Solid state switches (T2□, T3□, T3P□, T2J□, T2W□, T3W□, T2WL□, T2YD, T1□), Reed switches (T0□, T5□, T8□)						
CAC4	ø40	2 to 6.5	5.7 to 6.5	1.5 or less	1.0 or less	6.7 to 10.8	3 or less
	ø50	2.5 to 6.0	5.9 to 6.8			7.8 to 11.3	
	ø63	2.5 to 6	6.1 to 6.8			8.2 to 11.4	
	ø80	3 to 7	7.7 to 8.5			9 to 10.9	
Clamp Cylinder	● Applicable switches: Reed switch for strong magnetic field (H0□)						
CAC4-L2	ø40	-		-	-	6.7 to 10.8	3 or less
	ø50					7.8 to 11.3	
	ø63					8.2 to 11.4	
	ø80					6.6 to 7.5	
Clamp Cylinder	● Applicable switches: Solid state switches (T2□, T3□, T3P□, T2J□, T2W□, T3W□, T2YD, T1□), Reed switches (T0□, T5□, T8□)						
UCAC2	ø50	2.5 to 6.0	5.9 to 6.8	1.5 or less	1.0 or less	7.8 to 11.3	3 or less
	ø63	2.5 to 6.5	6.1 to 6.8			8.2 to 11.4	
Clamp Cylinder	● Applicable switches: Reed switch for strong magnetic field (H0□)						
UCAC2-L2	ø50	-		-	-	7.8 to 11.3	3 or less
	ø63					8.2 to 11.4	
Lightweight Clamp Cylinder	● Applicable switches: Solid state switches (T2□, T3□, T3P□, T2J□, T2WL□, T2YD, T1□), Reed switches (T0□, T5□, T8□)						
CAC	ø32	2.5 to 6	3.5 to 8	1.5 or less	1.0 or less	6.5 to 11.5	3 or less
	ø40	3 to 7	4 to 9			7.5 to 13.5	
Lightweight clamp cylinder with fall prevention	● Applicable switches: Solid state switches (T2□, T3□, T3P□, T2J□, T2YD, T1□), Reed switches (T0□, T5□, T8□)						
UCAC	ø32	2.5 to 6	3.5 to 8	1.5 or less	1.0 or less	6.5 to 11.5	3 or less
	ø40	3 to 7	4 to 9			7.5 to 13.5	
Rotary clamp cylinder	● Applicable switches: Solid state switches (T2□, T3□, T3P□, T2J□, T2WL□, T2YD, T1□), Reed switches (T0□, T5□, T8□)						
RCS2	ø12	1.5 to 5.5	3 to 6	1.5 or less	1.0 or less	5 to 8	3 or less
	ø16	1.5 to 4.5	3 to 7			4 to 9	
	ø20	3 to 8	4.5 to 8			6 to 14	
	ø25	3 to 9	4.5 to 8			5 to 14	
	ø32	3 to 8	4.5 to 8			5 to 12	
	ø40	3 to 9	5 to 8.5			6 to 14	
	ø50	3 to 9	5.5 to 9.5			6 to 14	
	ø63	3 to 9	5.5 to 9.5			7 to 15	
Rotary clamp cylinder	● Applicable switches: Solid state switches (T2□,T3□,T3P□,T2W□,T3W□,T2WL□,T2YD), Reed switches (T0□,T5□)						
RCC2	ø16	2 to 5	3 to 7	1.5 or less	1.0 or less	4 to 9	3 or less
	ø20	3 to 8	4.5 to 8			6 to 14	
	ø25	3 to 9	4.5 to 8			5 to 14	
	ø32	3 to 8	4.5 to 8			5 to 12	
	ø40	3 to 9	5 to 8.5			6 to 14	
	ø50	3 to 9	5.5 to 9.5			6 to 14	
	ø63	3 to 9	5.5 to 9.5			7 to 15	
Rotary clamp cylinder	● Applicable switches: Solid state switches (T2□,T3□,T2W□,T3W□), Reed switches (T0□,T5□)						
RCS	ø16	2 to 5	3 to 7	1.5 or less	1.0 or less	4 to 9	3 or less

Operating range and hysteresis of each cylinder model with switch

Model No.	Bore Size (mm)	Solid state switch				Reed switch	
		Operating range		Hysteresis		Operating range	Hysteresis
		1-color type	2-color type	1-color type	2-color type		
Mechanical Power Cylinder	● Applicable switches: Solid state switches (T2□, T3□, T3P□, T2J□, T2W□, T3W□, T2WL□, T1□), Reed switches (T0□, T5□, T8□)						
MCP-S	2t	4 to 10	6 to 10	1.5 or less	1.0 or less	7 to 15	3 or less
	5t	4 to 10	8 to 10			9 to 15	
MCP-W (Fast feed part)	2t	3.5 to 6.0	4.6 to 9.2	1.5 or less	1.0 or less	7.6 to 12.8	3 or less
	5t	4.0 to 8	5.5 to 11.9			8.9 to 14.1	
Guideless Cylinder	● Applicable switches: Solid state switches (R1, R2, R3, R2Y, R3Y), Reed switches (R0, R4, R5, R6)						
GLC	ø40	7 to 17		1.5 or less		11.5 to 16.5	3.0 or less
	ø50	9 to 17				13 to 18	
	ø63	10 to 18				15 to 20	
	ø80	8 to 19				15 to 20	
	ø100	11 to 20.5				13.5 to 19	
Guideless Cylinder	● Applicable switches: Reed switch (H0)						
GLC-L2	ø40	-		-		4 to 9	3.0 or less
	ø50					4 to 9	
	ø63					4 to 10	
	ø80					5 to 11	
	ø100					5 to 11	
Selex Rotary	● Applicable switches: Solid state switches (T2□,T3□,T2W□,T3W□,T2WL□,T1□), Reed switches (T0□, T5□, T8□)						
RRC	8	15° to 60°	20° to 70°	-	-	70° to 90°	-
	32	10° to 30°	10° to 30°			30° to 40°	
	63	10° to 30°	10° to 30°			30° to 40°	
Table Type Rotary Actuator	● Applicable switches: Proximity switch (T2□,T3□,T2W□,T3W□,T2WL□,T1□)						
GRC	5	10° to 35°	30° to 40°	-	-	-	-
	10	5° to 30°	20° to 30°				
	20	10° to 35°	25° to 35°				
	30	5° to 25°	15° to 25°				
	50	5° to 25°	15° to 25°				
	80	5° to 25°	15° to 25°				
Compact Selex Rotary	● Applicable switches: Proximity switch (SR-□)						
RV3□	3	15° ±7°	-	3° or less	-	-	-
	10	15° ±7°	-				
	20	15° ±7°	-				
	30	15° ±7°	-				
Compact Selex Rotary	● Applicable switches: Proximity switch (FR-□)						
RV3□	3	23° ±7°	-	2° or less	-	-	-
	10	23° ±7°	-				
	20	23° ±7°	-				
	30	23° ±7°	-				
Large Selex Rotary	● Applicable switches: Applicable switches: Solid state switches (M2V,M3V,M3PV), Reed switches (M0V,M5V)						
RV3□	50	Approx. 40°	-	-		Approx. 25°	-
	150	Approx. 25°	-			Approx. 15°	
	300	Approx. 25°	-			Approx. 15°	
	800	Approx. 25°	-			Approx. 15°	

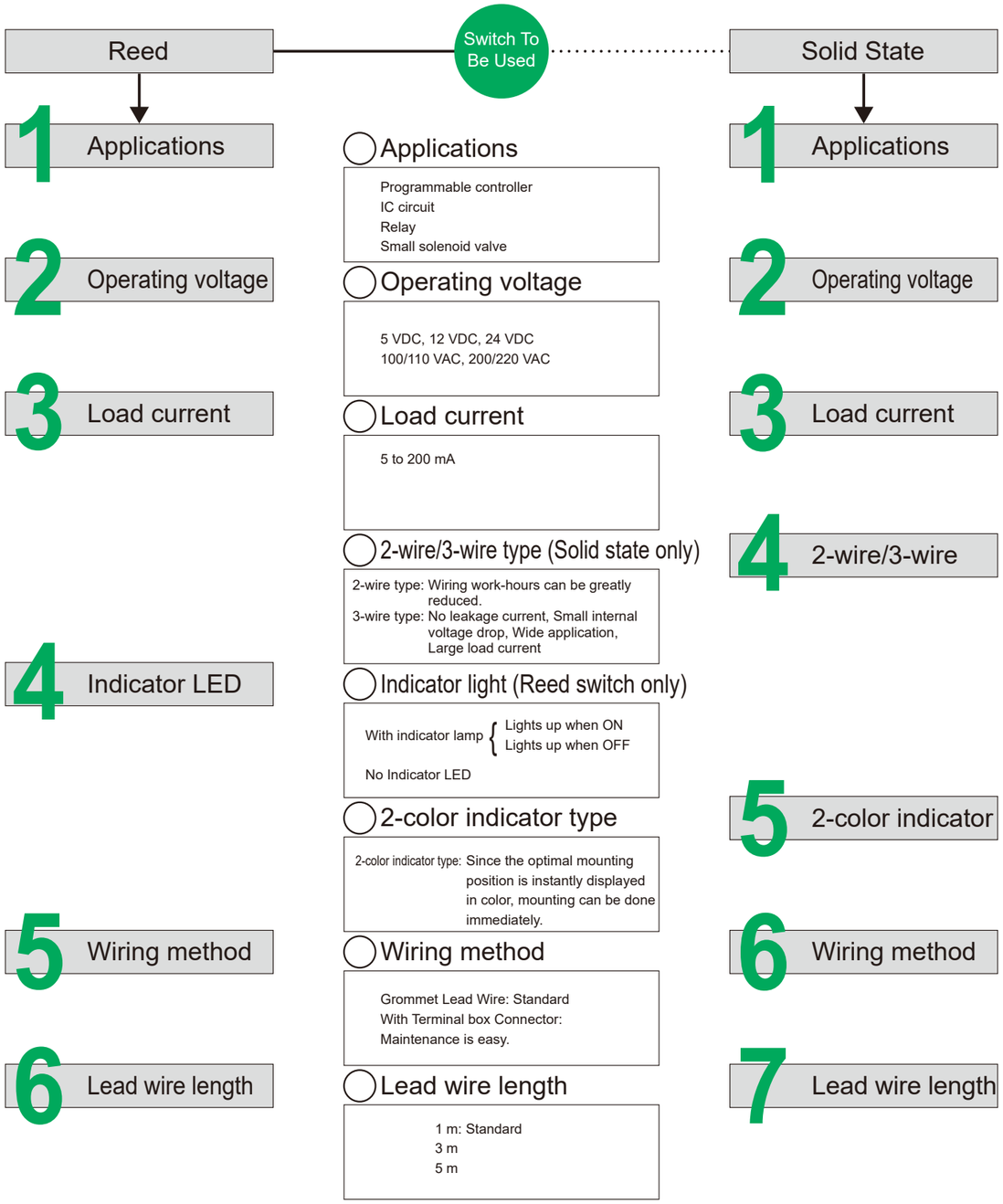
Cylinder Switch

Selection method

When selecting a cylinder switch, first check whether it is a reed type or solid state type, and then select the appropriate switch according to the order of the selection chart below.

MEMO

Cylinder switch selection chart



Troubleshooting and countermeasures in case of failure [Cylinder switch] ①

Malfunction phenomenon	Cause	Factor	Countermeasure
Remains ON, remains outputting *Load · Programmable controller · Relay · Other	Load was short-circuited	Internal circuit damage of the switch	① Replace the cylinder switch and reselect one where the maximum rating of the cylinder switch matches the rating of the load
	Load current exceeding the catalog value was applied		
	Load voltage or power supply voltage exceeding the catalog value was applied		
	Wiring is incorrect	Malfunction due to incorrect wiring	① Correct the wiring
		Internal circuit damage due to incorrect wiring (AC, DC, polarity, etc.)	① Replace the cylinder switch and correct the wiring
	Wiring length is long (Refer to catalog P. 1512)	Internal circuit damage of the switch	① Replace the cylinder switch and wire the protection circuit (Refer to catalog P. 1512, 1514)
	Surge voltage is generated due to connection of inductive load (relay, solenoid valve)	Internal circuit damage of the switch	① Replace the cylinder switch and wire the protection circuit (Refer to catalog P. 1512, 1514)
	In solid state switches, there are noise sources such as servo motors or robots in the same facility	Noise is being applied	① Add a noise filter or replace with a reed switch
	Power lines and signal lines are wired together		② Separate power lines and signal lines
	Using the same power supply as the noise source		③ Separate power supplies
	The mounting position of the cylinder switch does not match the piston stop position	Position adjustment is incorrect	① Readjust the position
		Mounting position is misaligned due to loose screws	① Tighten within the specified tightening torque range
		Cylinder switch mounting direction is reversed	① Correct to the normal orientation
	Ambient Temperature is -10°C or less	The magnetic force of the piston magnet built into the cylinder has become stronger	① Raise the Ambient Temperature to -10°C or higher
	Water, oil, etc., splashed on the cylinder switch	Water or oil infiltrated the cylinder switch, causing internal circuit destruction	① Replace the standard cylinder switch with a cutting oil resistant specification T□YL (T-type switch only) ② Replace the cylinder switch and install a shielding plate, etc. to prevent excessive splashing of water or oil
	Water or oil infiltrated the lead wire junction box; water or oil splashed on the load terminal part.	Malfunction due to infiltration of water/oil	① Install a shielding plate to prevent water or oil from splashing on the junction box, or place it inside a waterproof box
	There are objects that generate magnetic fields in the vicinity · Spot welder · Magnetizing equipment, etc.	Cylinder switch is reacting to external magnetic field	① Change to a strong magnetic field cylinder switch (Cylinder Body also needs to be changed for strong magnetic field) ② Prevent magnetic field from being applied a Move the source of the magnetic field away b Install a shielding plate made of magnetic material between the source of the magnetic field ③ Apply magnetic shielding
	There are magnetic materials in the vicinity	There are iron bolts in the vicinity	① Replace with Stainless Steel bolts ② Move the cylinder switch to a mounting surface away from iron bolts
		There are magnetic materials around the cylinder switch	① Move the cylinder switch away from the magnetic material to the catalog recommended distance ② Move the cylinder switch to a mounting surface away from magnetic materials ③ Change the material of the magnetic body to a non-magnetic material such as Stainless Steel, aluminum, or copper
		Iron powder has accumulated around the cylinder switch	① Remove iron powder
	External force was applied to the cylinder switch	Internal circuit damage of the switch	① Replace the cylinder switch and prevent external force from being applied to the cylinder switch

Troubleshooting and countermeasures in case of failure [Cylinder switch] ②

Malfunction phenomenon	Cause	Factor	Countermeasure
Cylinder switch turns ON-OFF, but the load remains ON	The relationship between the leakage current of the cylinder switch and the input specification of the load is Leakage current > OFF current.	Load is reacting to leakage current	① Change the cylinder switch from □2 type to □0 type or □3 type ② Change to a load with a larger OFF current value ③ Wire a bleeder resistor
		Leakage current is increasing due to parallel connection (Refer to catalog P. 1513)	
Output turns ON-OFF normally, but the indicator light does not turn on	Wiring polarity (plus, minus) is reversed (Only when using reed switch □0 with DC)	Malfunction due to incorrect wiring	① Correct to normal wiring

* Select a programmable controller or relay that does not malfunction due to the leakage current of the solid state switch.
* For the input specifications of the load, please check the model number and contact each manufacturer or our company.

Troubleshooting and countermeasures in case of failure [Cylinder switch] ③

Malfunction phenomenon	Cause	Factor	Countermeasure
Cylinder switch does not turn ON Does not output Load does not respond	Applied voltage is incorrect	Internal circuit damage of the switch	① Replace the cylinder switch and change to the regular voltage ② Replace with a cylinder switch of the regular voltage
	Load was short-circuited	Internal circuit damage of the switch	① Replace the cylinder switch and reselect one where the maximum rating of the cylinder switch matches the rating of the load
	Load current exceeding the catalog value was applied		
	Load voltage or power supply voltage exceeding the catalog value was applied		
	Wiring is incorrect	Switch is not operating due to incorrect wiring	① Correct the wiring
		Internal circuit damage due to incorrect wiring (AC, DC, polarity, etc.)	① Replace the cylinder switch and correct the wiring
	Excessive bending was applied to the lead wire	Lead wire breakage	① Replace the cylinder switch and ensure a sufficient bending radius (9 mm or more) for the lead wire to prevent excessive bending at one point ② Change the cylinder switch to T2□R with flexible cable specification (T-type switch only)
	Excessive pulling force was applied to the lead wire	Lead wire breakage	① Replace the cylinder switch and take measures to prevent excessive pulling force
	Wiring length is long (Refer to catalog P. 1512)	Internal circuit damage of the switch	① Replace the cylinder switch and wire the protection circuit (Refer to catalog P. 1512, 1514)
	Surge voltage is generated due to connection of inductive load (relay, valve)	Internal circuit damage of the switch	① Replace the cylinder switch and wire the protection circuit (Refer to catalog P. 1512, 1514)
	In solid state switches, there are noise sources such as servo motors or robots in the same facility	Noise is being applied	① Add a noise filter or replace with a reed switch
	Power lines and signal lines are wired together		② Separate power lines and signal lines
	Using the same power supply as the noise source		③ Separate power supplies
	The mounting position of the cylinder switch does not match the piston stop position	Position adjustment is incorrect	① Readjust the position
		Mounting position is misaligned due to loose screws	① Tighten within the specified tightening torque range
		Cylinder switch mounting direction is reversed	① Correct to the normal orientation
	Ambient Temperature exceeds 60°C	The magnetic force of the piston magnet built into the cylinder has weakened	① Lower the Ambient Temperature to 60°C or less ② Replace with a heat-resistant cylinder switch (Limited models: Refer to catalog)
	Water, oil, etc. splashed on the cylinder switch	Water or oil infiltrated the cylinder switch, causing internal circuit destruction	① Replace the standard cylinder switch with a cutting oil resistant specification T□YL (T-type switch only) ② Replace the cylinder switch and install a shielding plate, etc. to prevent excessive splashing of water or oil
	Water or oil infiltrated the lead wire junction box; water or oil splashed on the load terminal part.	Internal circuit abnormality due to infiltration of water/oil	① Install a shielding plate to prevent water or oil from splashing on the junction box, or place it inside a waterproof box
	There are objects that generate magnetic fields in the vicinity · Spot welder · Magnetizing equipment, etc.	Cylinder switch does not react due to the influence of the surrounding magnetic field	① Change to a strong magnetic field cylinder switch (Cylinder Body also needs to be changed for strong magnetic field) ② Prevent magnetic field from being applied a Move the source of the magnetic field away b Install a shielding plate made of magnetic material between the source of the magnetic field ③ Apply magnetic shielding
	There are magnetic materials in the vicinity	There are iron bolts in the vicinity	① Replace with Stainless Steel bolts ② Move the cylinder switch to a mounting surface away from iron bolts
		There are magnetic materials around the cylinder switch	① Move the cylinder switch away from the magnetic material to the catalog recommended distance ② Move the cylinder switch to a mounting surface away from magnetic materials ③ Change the material of the magnetic body to a non-magnetic material such as Stainless Steel, aluminum, or copper
		Iron powder has accumulated around the cylinder switch	① Remove iron powder
	External force was applied to the cylinder switch	Internal circuit damage of the switch	① Replace the cylinder switch and prevent external force from being applied to the cylinder switch

*Load
· Programmable controller
· Relay
· Other

Troubleshooting and countermeasures in case of failure [Cylinder switch] ④

Malfunction phenomenon	Cause	Factor	Countermeasure
The cylinder switch indicator light turns ON, but the load does not operate	The relationship between the voltage drop of the cylinder SW and the input specification of the load is (Power supply voltage - Internal voltage drop) < Minimum operating voltage.	Load and cylinder switch do not match	① Replace the cylinder switch with a model with a smaller internal voltage drop value ☐2 type → ☐0 type → ☐3 type → ☐5 type ② Replace the load with one that has a smaller minimum operating voltage
		Internal voltage drop caused by serial connection (Refer to catalog P. 1513)	
	In the case of 3-wire type, the input specifications (source input, sink input) of the programmable controller (PLC) do not match	Does not accept cylinder switch signal	① Source input --- Select NPN output ☐3 type (NPN output is standard type) ② Sink input --- Select PNP output ☐3P type (Only for T, K, M, F type switches) ③ Change the cylinder switch to a 2-wire type
	The output of the cylinder switch is used in the middle of the air cylinder stroke	Cylinder speed is fast and load does not react	① Change to T2J with OFF-delay specification (T-type switch only) ② Connect multiple cylinder switches in parallel to widen the operating range. ③ Connect a sensor controller, etc. between the cylinder SW and the load and change to a signal time suitable for the load performance Example: Omron S3D2 ④ Slow down the cylinder speed

To Use This Product Safely

Be sure to read this before use.

Individual Precautions: Cylinder Switch

Design / Selection

⚠Warning

■ Using outside the specified range of application, load current, voltage, temperature, impact, environment, etc. may cause damage or malfunction. Therefore, use correctly within the specified range.

■ Never use in an explosive gas atmosphere. The cylinder switch does not have an explosion-proof structure. If used in an explosive gas atmosphere, it may cause an explosion disaster, so never use it.

⚠CAUTION

■ Please be careful when using in an interlock circuit.

When using a cylinder switch for an interlock signal that requires high reliability, please implement a double interlock system, such as providing a mechanical protection function in case of failure, or using another switch (sensor) in addition to the cylinder switch. In addition, please perform regular inspections and confirm that it operates normally.

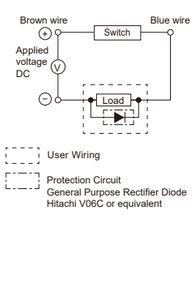
■ Please pay attention to the contact capacity.

Do not use a load that exceeds the voltage and current of the switch specifications. This will cause a malfunction.

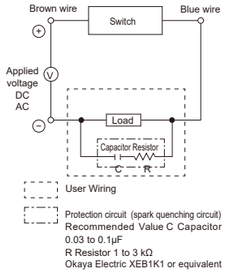
■ Please pay attention to the contact protection circuit. (Reed switch)

● When connecting and using inductive loads (relays, solenoid valves, etc.), surge voltage will occur when the switch is OFF, so always install a contact protection circuit.

●Diode Use



● Capacitor, using resistor



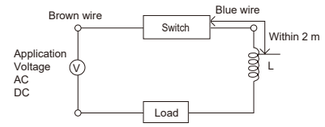
● When connecting and using capacitive loads (capacitors), inrush current will occur when the switch is ON, so always install a contact protection circuit.

● If the wiring becomes long, it becomes a wiring capacitance, and inrush current occurs, causing damage to the switch or reduction in lifespan. Therefore, if the wiring length exceeds Table 1, install a contact protection circuit. When T8 is used with 200 VAC, the usable wiring length will be shorter, so please consult us.

Switch	Voltage	Wiring length
M, T, K, H, V, F, ET0 type	DC	50 m
M, T, K, H, V, ET0 type	AC	10 m
R0, 5, 6, E0 type	DC	100 m
R0, 5, E0 type	AC	10 m
R4 type	AC	50 m

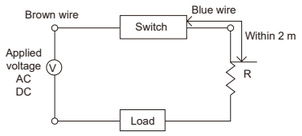
Table 1

● Choke Coil Use



●Choke Coil
L = Several hundred μH to several mH
With excellent high-frequency characteristics

● Resistor Use



●Inrush current limiting resistor
R = Resistance as large as the load circuit allows

For specifications of the contact protection circuit, see P. 1487.

■ Avoid using in environments where water is constantly splashing.

● It may cause a malfunction due to insulation failure, etc.

■ Avoid using in oily or chemical environments.

● Using in environments with various oils, coolants, cleaning solutions, or chemicals may adversely affect the cylinder switch (insulation failure, malfunction due to swelling of potting resin, hardening of lead wire coating, etc.), so please consult us.

● Coolant proof cylinder switch is available separately. Guide to pneumatic components compatible with coolants" (No. CC-N-375) is available for details.

■ Do not use in environments with large impacts.

For reed switches, if a large impact (294 m/s^2 or more) is applied during use, there is a possibility of malfunction where the contact momentarily (1 ms or less) connects or disconnects. It may also be necessary to use a solid state switch depending on the operating environment, so please consult us.

■ Do not use in locations where surge sources exist.

If there is equipment that generates large surges (electromagnetic lifters, high-frequency induction furnaces, motors, etc.) around the cylinder with a solid state switch, it may cause deterioration or damage to the switch internal circuit elements, so consider surge countermeasures at the source.

■ Be careful about the accumulation of iron powder and close proximity to magnetic materials.

If a large amount of iron powder such as cutting chips or welding spatter accumulates around a cylinder with a cylinder switch, or if a magnetic material (something attracted to a magnet) is in close contact, the magnetic force within the cylinder may be lost, potentially causing the cylinder switch to stop operating. Please be careful.

■ Pay attention to the proximity of cylinders, etc.

● When using 2 or more cylinders with switches in close proximity and parallel, use them at the allowable cylinder tube spacing indicated for each cylinder series. The switches may malfunction due to mutual magnetic interference.

■ Pay attention to the magnetic environment.

● In environments with strong magnetic fields or large currents (large magnets, spot welding machines, etc.), use strong magnetic field resistant switches. (H0,H0Y,T2YD) When a magnetic material moves very close to the cylinder, mutual interference may occur, potentially affecting detection accuracy.

■ At the stroke intermediate position, pay attention to the ON time of the cylinder switch.

● If the cylinder switch is set at the stroke intermediate position and the load is driven when the piston passes, if the speed is too high, the cylinder switch will operate, but the operating time will be short, and the load may not be able to respond completely, so please be careful. The maximum detectable piston speed is

$$V\ (\text{mm/s}) = \frac{\text{Cylinder Switch Operating Range (mm)}}{\text{Load Operating Time (s)}}.$$

If the piston speed is high, please use an off-delay output type cylinder switch T2JH/V (limited to compatible models).

■ Be careful with series connection methods.

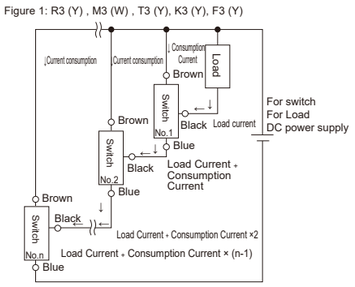
● When connecting multiple 2-wire switches in series, the voltage drop across the switches is the sum of the voltage drops of all connected switches. The voltage applied to the load side will be the power supply voltage minus the voltage drop across the switches. Check the load specifications before deciding on the number of units to connect.

● If 2-wire solid-state switches are connected in series, there is a possibility of malfunction, so please contact us. Use with reed switches is recommended.

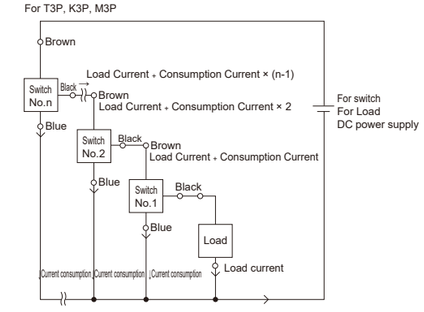
● When connecting multiple 3-wire solid-state switches in series, the voltage drop across the switches is the sum of the voltage drops of all connected switches, similar to the 2-wire type. Also, the current flowing through the switches will be the sum of the current consumption of the connected switches and the load current, as shown in the upper right diagram. Check the load specifications to ensure the maximum load current of the switch is not exceeded before deciding on the number of units to connect.

● The indicator lamp will only light up when all switches are ON.

Figure 1: R3 (Y) , M3 (W) , T3 (Y), K3 (Y), F3 (Y)



For T3P, K3P, M3P



■ Be careful with parallel connection methods.

● When connecting multiple 2-wire switches in parallel, the leakage current increases by the number of connected units. Therefore, confirm the load specifications and decide the number of connected units.

● For 2-wire solid-state switches, from the time one switch turns ON until it turns OFF, the voltage across the terminals of parallel-connected switches drops to the internal voltage drop value when the switch is ON, falling below the load voltage range, so other switches will not turn ON. Therefore, check the input specifications of the connected load, such as a programmable controller, before use.

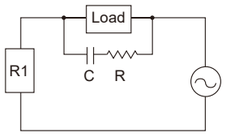
● For 3-wire solid-state switches, the leakage current is very small (10 μA or less), so there is no problem in normal use.

● The indicator lamp of the switch may become dim or not light up.

■ Output Circuit Protection (Solid State Switch)

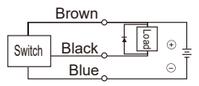
● When connecting and using inductive loads (relays, solenoid valves, etc.), surge voltage will occur when the switch is OFF, so always install a protection circuit as shown in the figure below.

R1



●Capacitor
C = 0.03 to 0.1 μF
●Resistor
R = 1 to 3 kΩ
Okaya Electric
XEB1K1 or equivalent

R3 (Y), M3 (W), T3 (Y), K3 (Y), F3 (Y)

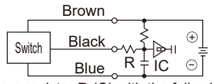


●Diode
D = Hitachi
V06C or equivalent

Example of using a surge absorber with an inductive load.

● When connecting and using capacitive loads (capacitors), inrush current will occur when the switch is ON, so always install a protection circuit as shown in the figure below.

R3 (Y), M3 (W), T3 (Y), K3 (Y), F3 (Y)



Use a resistor R (Ω) with the following formula or more at this time.

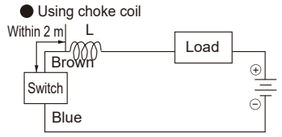
$\frac{V}{0.15}$ =R (Ω) (R3 (Y), M3 (W))

$\frac{V}{0.05}$ =R (Ω) (T3 (Y), K3 (Y), F3 (Y))

● If the lead wire length exceeds 10 m, always install a protection circuit as shown in the figure below.

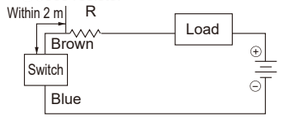
R1, R2 (Y), M2 (W), T2 (Y/J), K2 (Y), F2

● Using choke coil



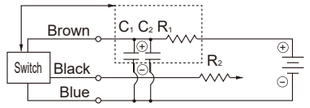
● Choke Coil
L = Several hundred μH to several mH
With excellent high-frequency characteristics

●Uses resistor



● Inrush Current Limiting Resistor
R = Resistance as large as the load circuit allows

●Uses resistor
Within 2 m



Power Supply Noise Absorption Circuit
C_1 = 20 to 50 μF
Electrolytic capacitor (withstand voltage 50 V or more)
C_2 = 0.01 to 0.1μF
Ceramic capacitor
Inrush Current Limiting Resistor
R_1 = 20 to 30Ω
R_2 = Use a resistor as large as the load side circuit allows.

■ Be careful about the lifespan of reed switches.

● The lifespan of reed switches varies depending on usage conditions, but is generally several million cycles. If the equipment used operates continuously day and night or at high frequency, the contact life region will be reached in a short period, so use solid state switches without contact parts.

■ If special quality and reliability are required, such as when using with a customer-dedicated circuit board, a proximity switch is recommended. In addition, please be sure to thoroughly check the compatibility judgment by yourself.

During Use

⚠ CAUTION

■ Do not drop or strike.

When handling, do not drop, strike, or apply excessive impact (reed switch 294 m/s² or more, solid state switch 980 m/s² or more). Even if the switch case body is not damaged, the switch internals may be damaged, potentially leading to malfunction.

■ Do not carry the cylinder by the switch's lead wire.

This can not only cause lead wire breakage, but also apply stress to the inside of the switch, potentially damaging internal switch elements. Absolutely do not do this.

■ Do not use the same wiring as power lines or high-voltage lines.

Avoid parallel wiring or using the same conduit as power lines/high-voltage lines; use separate wiring. Control circuits including cylinder switches may malfunction due to noise.

■ Do not short-circuit the load.

If turned ON in a load short-circuited state, overcurrent will flow and the switch will be instantaneously damaged.

■ Be careful when connecting lead wires.

Turn off the power to the equipment on the connected electrical circuit side before performing wiring work. Working with the power on can cause electric shock or accidents due to unexpected operation.

●Reed switch

Do not connect the switch lead wires directly to the power supply; always connect a load in series. Also, for RO, MO, TO, KO, EO, FO, ETO, please also pay attention to ① and ② below.

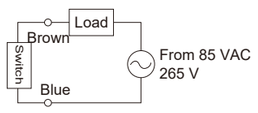
①When using for DC, connect so that the brown wire is the+side and the blue wire is the - side. If connected in reverse, the switch will operate, but the indicator light will not turn on. (HO has no polarity.)

②When connecting to an AC relay or programmable controller input, if those circuits perform half-wave rectification, the indicator light may not light up. In that case, reversing the polarity of the switch lead wire connection will turn on the indicator light.

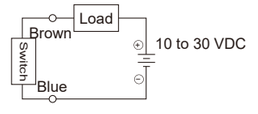
●Solid state switch

Connect correctly according to the lead wire color coding in the diagram on the right. Incorrect wiring may cause damage. Please be careful.

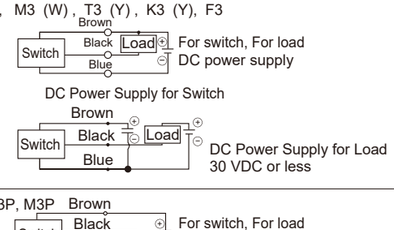
● R1



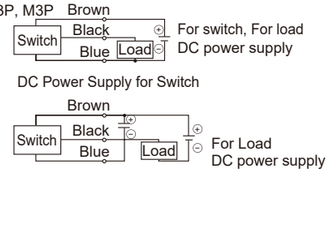
● R2 (Y), M2 (W), T2 (Y), T2J, K2 (Y), F2 (T2YD has no polarity)



● R3 (Y), M3 (W), T3 (Y), K3 (Y), F3



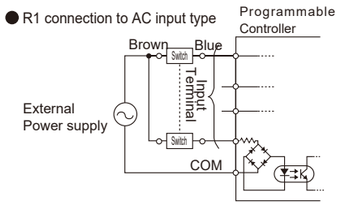
● T3P, K3P, M3P



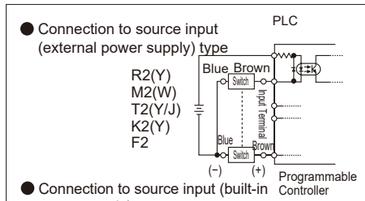
(Connection to Programmable Logic Controller (PLC))

● Connection method varies depending on the type of programmable controller. Connect according to the input specifications.

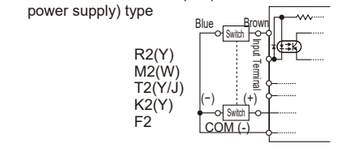
● R1 connection to AC input type



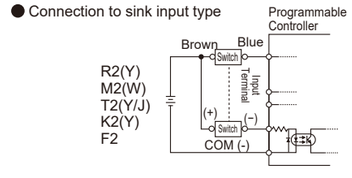
● Connection to source input (external power supply) type



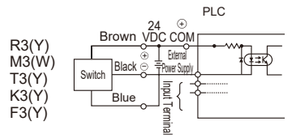
● Connection to source input (built-in power supply) type



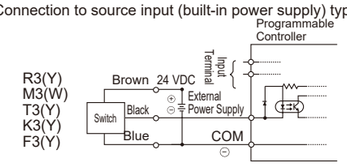
● Connection to sink input type



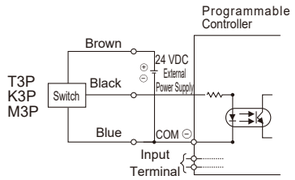
● Connection to source input (external power supply) type



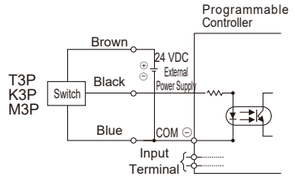
●Connection to source input (built-in power supply) type



●Example of connection to sink input (external power supply) type



● Example of connection to sink input (built-in power supply) type



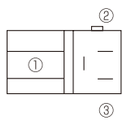
■Set the switch to the center of its operating range.

Adjust the mounting position of the cylinder switch so that the piston stops at the center of the operating range (the range where it is ON). (The mounting position described in the catalog indicates the optimal position at the stroke end.) If set to the end of the operating range (near the ON/OFF boundary line), operation may become unstable.

■Install the switch while adhering to the tightening torque.

If tightened beyond the maximum tightening torque, the Set Screw, mounting bracket, switch, etc., may be damaged. Also, if tightened below the minimum tightening torque, the switch mounting position may shift. (For switch mounting method, moving method, tightening torque, etc., please refer to P. 1518 to 1520.)

■Be careful with terminal box type wiring.



Model \ Terminal	①	②	③
R0 (DC), R2, R2Y, R6		+	−
R0 (AC), R1, R4, R5		±	±
R3, R3Y	OUT	+	−

■Lead wire protection

The minimum bending radius of the lead wire should be 9 mm or more (when fixed). Ensure that repeated bending stress and tensile force are not applied to the lead wire during wiring. For moving parts, please connect and use T2H/VR3 cylinder switch with flex-resistant lead wire specification for higher flexibility (limited to compatible models).

■Relay

Use the following equivalent relays.

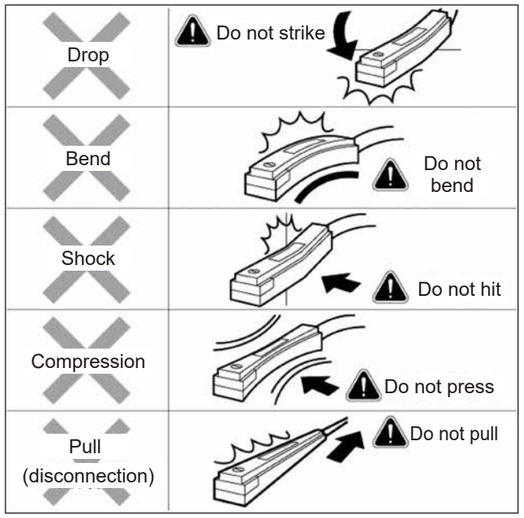
○Omron.....MY type
○Fuji Electric .....HH5 type
○Tokyo Denki .....MPM type
○Panasonic ..... HC type

1. Notes on "External Force"

⚠CAUTION

■Especially for reed switch types, the reed switch (glass tube) may be damaged or its sensitivity may decrease.

Example: T0□ T5□ T8□ type

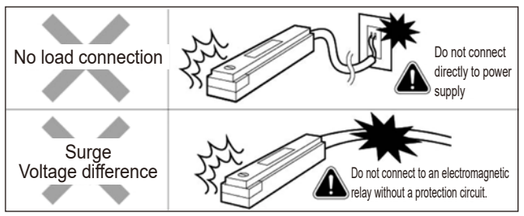


2. Notes on "Overcurrent/Overvoltage"

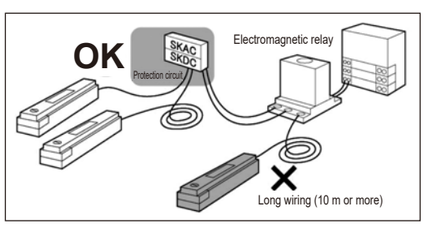
⚠CAUTION

■Do not connect directly to the power supply.

■Do not connect to an electromagnetic relay without a protection circuit.



■For electromagnetic relays and long wiring, install a "protection circuit."



During Use

⚠Warning

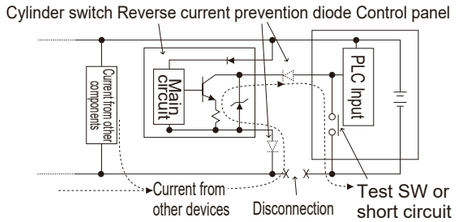
■Do not flow overcurrent.

If overcurrent flows through the cylinder switch due to a load short circuit, etc., not only will the cylinder switch be damaged, but there is also a risk of fire. If necessary, please provide an overcurrent protection circuit such as a fuse on the output line and power supply line.

⚠CAUTION

■Be careful about reverse current due to wire breakage or wiring resistance.

● If other devices, including cylinder switches, are connected to the same power supply as the cylinder switch, shorting the output wire and the - power supply wire, or if the - power supply wire is disconnected, reverse current may flow into the cylinder switch's output circuit, causing damage. This is done to confirm the operation of the control panel's input device.

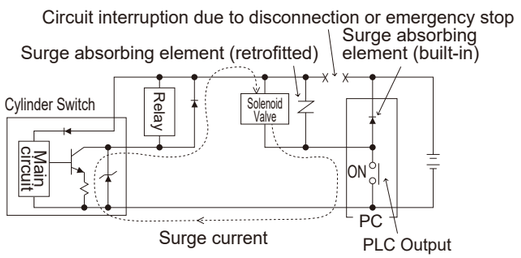


● To prevent damage due to reverse current, take the following measures.

① Avoid concentrating current on the power lines, especially the - side power line, and make the wiring as thick as possible.
② Limit the equipment connected to the same power supply as the cylinder switch.
③ Insert a diode in series with the cylinder switch output line to prevent reverse current flow.
④ Connect a diode in series to the negative (-) side of the cylinder switch power line to prevent reverse current.

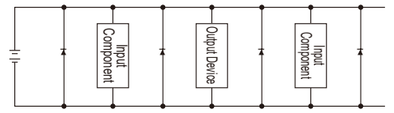
■Be careful about surge current bypass.

● If the power supply for inductive loads that generate surges, such as cylinder switches and solenoid valves/ relays, is shared, and the circuit is interrupted while the inductive load is operating, surge current may flow into the output circuit and cause damage, depending on the mounting position of the surge absorption element.



● To prevent damage from surge current bypass, take the following measures.

① Separate the power supplies for the output system with inductive loads such as solenoid valves and relays, and the input system such as cylinder switches.
② If separate power supplies cannot be used, directly install surge absorbing elements for all inductive loads. Consider surge absorbing elements connected to PLCs, etc., as protecting only that equipment.
③ Furthermore, connect surge absorbing elements at various points in the power supply wiring as shown in the diagram below to prepare for disconnection at unspecified locations.



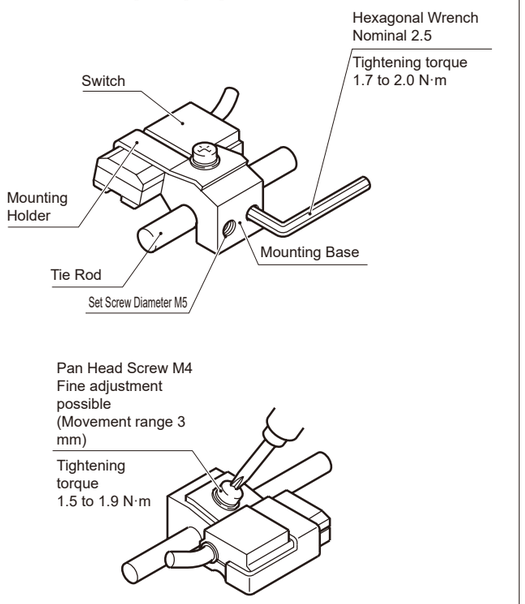
Furthermore, if equipment is connected with connectors, disconnecting the connector while power is on may cause the output circuit to be damaged due to the above phenomenon. Always turn off the power before connecting or disconnecting connectors.

⚠Caution: Switch Mounting Method

Tie Rod Mount Type

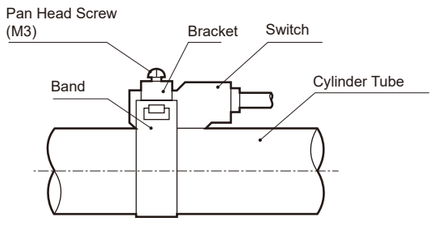
Loosening the Set Screws (2 screws) for fixing the mounting base by 1/2 to 3/4 turn allows axial movement without detachment. For fixing after adjustment, lightly press the holder so that the switch is fixed to the tube, and then tighten the Set Screws. Tightening torque is 1.7 to 2.0 N·m. As a guide, it is sufficient if the hex wrench begins to deflect.

● Movement and Tightening Diagram



Band Mount Type

Loosen the tightening screw (Pan Head Screw), move the switch body and band along the cylinder tube, and tighten at the specified position. For fine adjustment, fix the band position and move only the switch body. Tightening torque is 0.5 to 0.7 N·m. The tightening torque for HCA ø80, ø100 is 1.0 to 1.5 N·m.

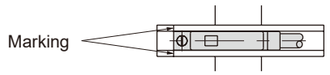


Band Mount Type

① When moving the switch position in the stroke direction

● The 1-color indicator switch can be finely adjusted by about ±3 mm from the mounting position at the time of shipment. If the adjustment range exceeds ±3 mm, or if fine-tuning the position of a 2-color indicator switch, move the band position.

● The switch rail has a marking 4 mm from the end face of the rail. Use this as a guide for the mounting position when replacing the switch. The marking on the switch rail is set to the switch's highest sensitivity position at the time of factory shipment. If the type of switch changes or if the band is moved, the maximum sensitivity position will change, so adjust the position each time.

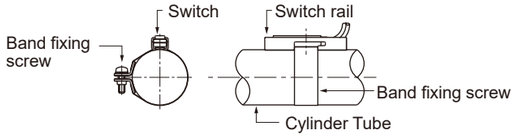


② When moving the switch position in the circumferential direction

● Loosen the band fixing screw, move the switch rail circumferentially, and tighten it at the specified position. Tightening torque is 0.8 to 1.0 N·m.

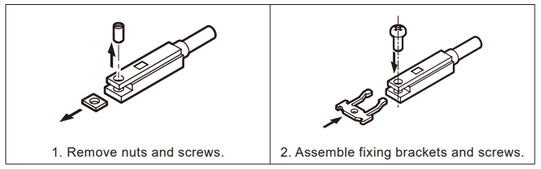
③ When moving the band position

● Loosen the band fixing screw, move the switch rail and band along the cylinder tube, and tighten them at the specified position. Tightening torque is 0.8 to 1.0 N·m.

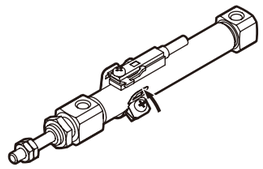


Band Mount Type

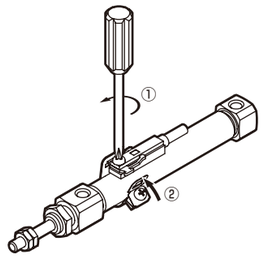
Install T-type switches as shown in the diagram below.
When using standard T-type switch (SW-T□)



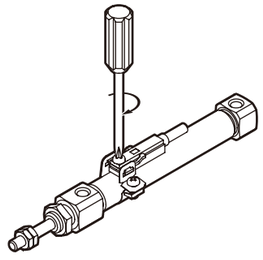
① Insert the square hole of the band into the fixing bracket and attach it to the cylinder.



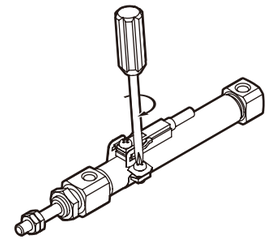
● If it is difficult to install, follow the steps below.
① Loosen the screw on the switch side.
② Insert the square hole of the band into the fixing bracket.



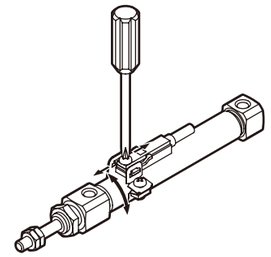
② Tighten the screw on the switch side. Tightening torque: 0.1 to 0.15 N·m



③ Tighten the screw on the band side.
Tightening torque: 0.1 to 0.15 N·m



④ For switch mounting position adjustment
Loosen the screw on the switch side, adjust the position, and tighten the screw to fix it at the optimal position. Tightening torque: 0.1 to 0.15 N·m



Switch Groove Mount Type

Loosen the tightening screw (Set Screw), move the switch body along the switch groove, and tighten at the specified position. For T2, T2W, T3, T3W, T0, T5, K2, K3, K0, K5, use a flat-blade screwdriver (watchmaker's screwdriver, precision screwdriver, etc.) with a grip diameter of 5 to 6 mm, tip width of 2.4 mm or less, and thickness of 0.3 mm or less to tighten the switch fixing screw with a tightening torque of 0.1 to 0.2 N·m. For T□C, T2J, T2Y, T3Y, K2Y, K3Y, T2YD, T1, T8, T2YL, T3YL, ET0, tighten with a torque of 0.5 to 0.7 N·m. For F2□, F3□, F2Y□, F3Y□, tighten with a torque of 0.03 to 0.08 N·m.

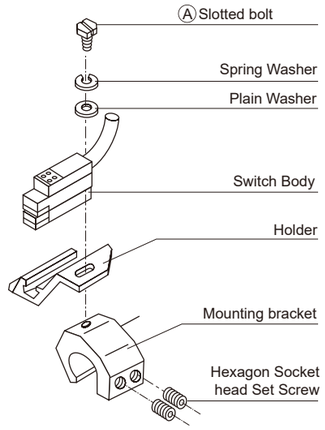
T2YD Tie Rod Mount Type

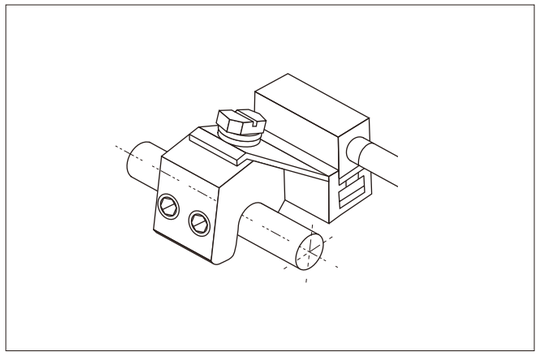
① Fine adjustment

Loosen the slotted hex bolt (A), move only the switch body, and tighten it at the specified position. Tightening torque is 0.5 to 0.7 N·m.

② Coarse adjustment

Loosen all slotted bolts (A) and Set Screws, move the entire mounting bracket to the specified position, and then tighten the slotted bolt (A). Tightening torque is 0.5 to 0.7 N·m. Then tighten the Set Screws. Tightening torque is 1.7 to 2.0 N·m.





Caution

Contact protection circuit (SKAC, SKDC)

If you are using a reed switch and the circuit configuration with the load falls under the following, the contact life may be reduced (may remain ON). Connect a contact protection circuit within 2 m of the switch.

- When the operating load is an inductive load (relays, valves, etc. (coil-driven loads)) or a capacitive load (programmable controllers, etc. (loads containing capacitors))
- When the lead wire wiring length is as follows
  - 12 VDC : 100 m or more
  - 24 VDC : 50 m or more
  - 100 VAC : 20 m or more
  - 200 VAC : 10 m or more
- When there are other factors that cause overvoltage or overcurrent

For details on the contact protection circuit, refer to P. 1487.

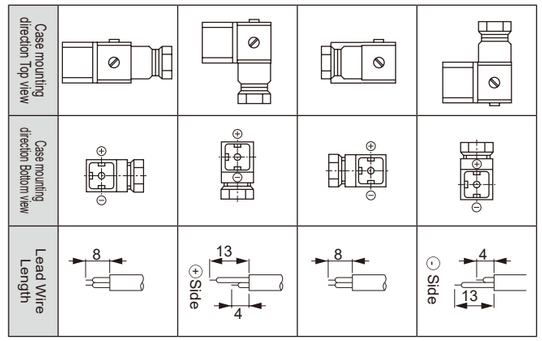
Mounting method to R□B terminal box

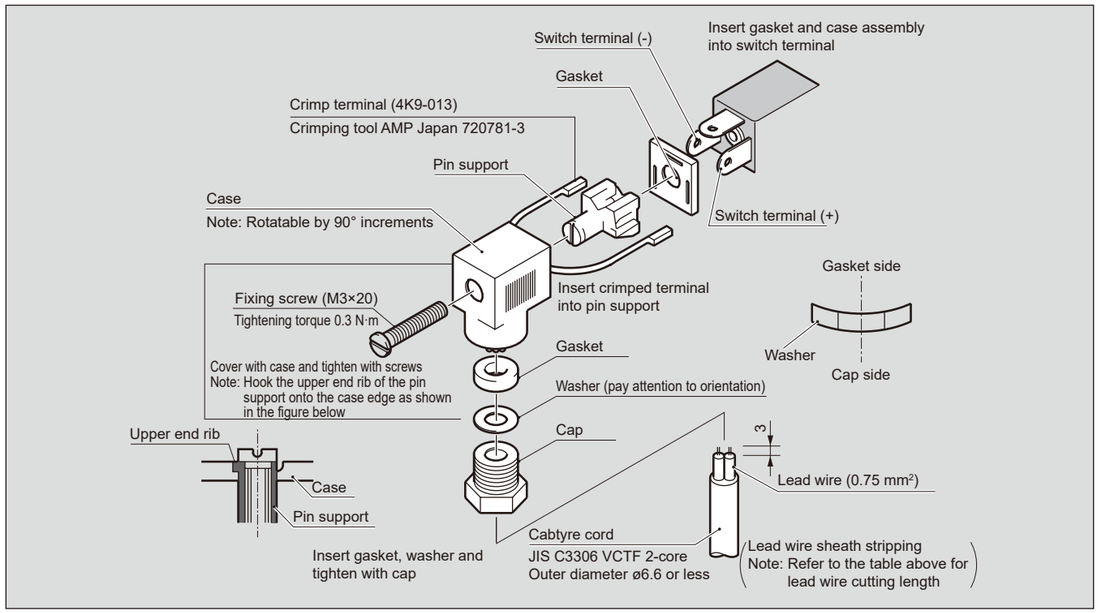
Connection to the R□B terminal box should be done according to the following procedure, referring to the diagram below.

① After completely removing the fixing screws, pull the terminal box out from the switch.
② From the top of the case, push out the pin support to separate the case and pin support.
③ Remove the cap, and take out the washer and gasket.
④ Determine the lead wire exit direction of the terminal box.
⑤ Referring to the top view of the case mounting direction, cut the lead wire to match the exit direction, and strip the seal/sheath.
⑥ Crimp the included terminal.
⑦ Pass the lead wire through the cap, washer, gasket, and case in that order, paying attention to the orientation. Pass the lead wire through the case and pull it out with needle-nose pliers.
⑧ While inserting the terminal into the pin support, push it into the case, paying attention to the orientation. Push until the upper end rib of the pin support comes out to the top surface of the case.
⑨ Insert the fixing screws into the case/pin support.
⑩ Insert the gasket and washer into the case and tighten with the cap.
⑪ Insert the case into the switch terminal and fix it with the fixing screws.

●Lead wire cutting length

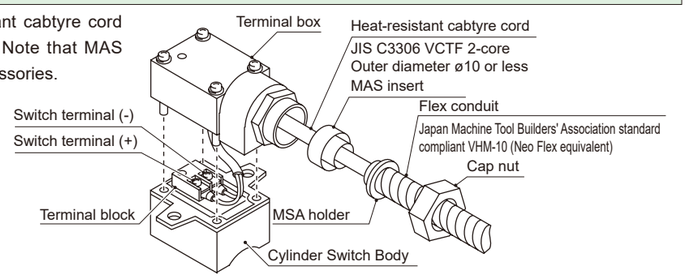
The lead wire cutting length varies depending on the case mounting direction. Refer to the table below. For 3-wire type, please consult us.





Mounting method to E0 terminal box

For wiring to the terminal box, prepare heat-resistant cabtyre cord and flex conduit, and refer to the diagram below. Note that MAS insert, MAS holder, and cap nut are included as accessories.



For precautions during mounting, installation, adjustment, use, and maintenance, refer to "During Use" in this catalog and the CKD Components Product website (https://www.ckd.co.jp/kiki/en/) -> "Model No." -> Instruction Manual.

Clevis dimension list

Page

Single Knuckle Dimension List (by Model Type) — Ending 2

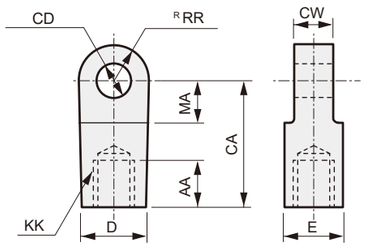
Single Knuckle Dimension List (by Thread Diameter) — Ending 4

Double Knuckle Dimension List (by Model Type) — Ending 6

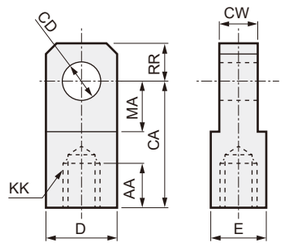
Double Knuckle Dimension List (by Thread Diameter) — Ending 8

Single Knuckle

Pad Shape Code: A



Pad Shape Code: B



Model	Shape Code	Model No.	Applicable Bore Size (ø)	AA	CA	CD	CW	D	E	KK	MA	RR
CMK2	B	M1-I-20	20	14	30	10 H10	8 -0.1 -0.2	19	19	M8 × 1.0	13	10
		M1-I-30	25, 32	14	36	12 H10	10 -0.1 -0.2	25	19	M10 × 1.25	16	12
		M1-I-40	40	14	36	12 H10	10 -0.1 -0.2	25	19	M12 × 1.5	16	12
CMA2	B	M1-I-20	20	14	30	10 H10	8 -0.1 -0.2	19	19	M8 × 1.0	13	10
		M1-I-30	30	14	36	12 H10	10 -0.1 -0.2	25	19	M10 × 1.25	16	12
		M1-I-40	40	14	36	12 H10	10 -0.1 -0.2	25	19	M12 × 1.5	16	12
CKV2	B	M1-I-20	20	14	30	10 H10	8 -0.1 -0.2	19	19	M8 × 1.0	13	10
		M1-I-30	25, 32	14	36	12 H10	10 -0.1 -0.2	25	19	M10 × 1.25	16	12
		M1-I-40	40	14	36	12 H10	10 -0.1 -0.2	25	19	M12 × 1.5	16	12
CAV2 COV2	A	CAV2-50-I	50	25	50	14 H10	20 0 -0.3	26	26	M16 × 1.5	20	15
		CAV2-75-I	75.100	30	65	20 H10	28 0 -0.3	38	35	M22 × 1.5	28	22.5
HCA	B	M1-I-20	20	14	30	10 H10	8 -0.1 -0.2	19	19	M8 × 1.0	13	10
		M1-I-30	25, 32	14	36	12 H10	10 -0.1 -0.2	25	19	M10 × 1.25	16	12
	A	S1-I-40	40	20	50	12 H10	18 -0.1 -0.4	(27)	27	M14 × 1.5	21	16
		S1-I-50	50	21	50	12 H10	18 -0.1 -0.4	(27)	27	M18 × 1.5	21	16
		S1-I-63	63	21	50	14 H10	20 -0.1 -0.4	(27)	27	M18 × 1.5	21	16
		S1-I-80	80	30	70	20 H10	28 -0.1 -0.4	(46)	41	M22 × 1.5	30	25
		S1-I-100	100	30	70	20 H10	28 -0.1 -0.4	(46)	41	M26 × 1.5	30	25
JSG	B	SCG-I-40	40	19	40	10 H10	14 -0.1 -0.3	ø22	ø22	M14 × 1.5	19	10
		SCG-I-50	50, 63	24	50	14 H10	20 -0.1 -0.3	ø28	ø28	M18 × 1.5	24	14
		SCG-I-80	80	26	60	22 H10	30 -0.1 -0.3	ø40	ø40	M22 × 1.5	34	20
		SCG-I-100	100	26	60	22 H10	30 -0.1 -0.3	ø40	ø40	M26 × 1.5	34	20
JSM2	B	M1-I-20	20	14	30	10 H10	8 -0.1 -0.2	19	19	M8 × 1.0	13	10
		M1-I-30	30	14	36	12 H10	10 -0.1 -0.2	25	19	M10 × 1.25	16	12
		M1-I-40	40	14	36	12 H10	10 -0.1 -0.2	25	19	M12 × 1.5	16	12
JSK2	B	M1-I-20	20	14	30	10 H10	8 -0.1 -0.2	19	19	M8 × 1.0	13	10
		M1-I-30	25, 32	14	36	12 H10	10 -0.1 -0.2	25	19	M10 × 1.25	16	12
		M1-I-40	40	14	36	12 H10	10 -0.1 -0.2	25	19	M12 × 1.5	16	12
JSC3	A	S1-I-40	40	20	50	12 H10	18 -0.1 -0.4	(27)	27	M14 × 1.5	21	16
		S1-I-50	50	21	50	12 H10	18 -0.1 -0.4	(27)	27	M18 × 1.5	21	16
		S1-I-63	63	21	50	14 H10	20 -0.1 -0.4	(27)	27	M18 × 1.5	21	16
		S1-I-80	80	30	70	20 H10	28 -0.1 -0.4	(46)	41	M22 × 1.5	30	25
		S1-I-100	100	30	70	20 H10	28 -0.1 -0.4	(46)	41	M26 × 1.5	30	25
JSC4	B	SCS2-125-I	125	50	85	25 H10	32 -0.1 -0.4	ø55	ø55	M30 × 1.5	32	27.5
		SCS2-140-I	140	50	90	28 H10	36 -0.1 -0.4	ø60	ø60	M30 × 1.5	35	30
		SCS2-160-I	160	60	105	32 H10	40 -0.1 -0.4	ø70	ø70	M36 × 1.5	40	35
		SCS2-180-I	180	65	115	40 H10	50 -0.1 -0.4	ø85	ø85	M40 × 1.5	47.5	42.5
SCP□3	B	P2-I-10	10	8	21	3.2 H10	3.1 0 -0.1	12	12	M4	9	7
		P2-I-16	16	8	25	5 H10	6.4 0 -0.1	12	12	M5	14	7

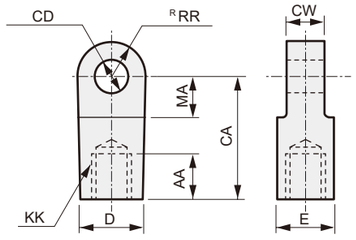
Note: The A and B figures are a guide only. For details, refer to the accessories and dimensions diagrams of each model.

Single Knuckle

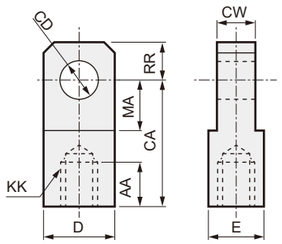
Model	Shape Code	Model No.	Applicable Bore Size (ø)	AA	CA	CD	CW	D	E	KK	MA	RR
SCA2	A	S1-I-40	40	20	50	12 H10	18 -0.1 -0.4	(27)	27	M14 × 1.5	21	16
		S1-I-50	50	21	50	12 H10	18 -0.1 -0.4	(27)	27	M18 × 1.5	21	16
		S1-I-63	63	21	50	14 H10	20 -0.1 -0.4	(27)	27	M18 × 1.5	21	16
		S1-I-80	80	30	70	20 H10	28 -0.1 -0.4	(46)	41	M22 × 1.5	30	25
		S1-I-100	100	30	70	20 H10	28 -0.1 -0.4	(46)	41	M26 × 1.5	30	25
SCG	B	SCG-I-32	32	14	30	10 H10	14 -0.1 -0.3	ø20	ø20	M10 × 1.25	16	10
		SCG-I-40	40	19	40	10 H10	14 -0.1 -0.3	ø22	ø22	M14 × 1.5	19	10
		SCG-I-50	50, 63	24	50	14 H10	20 -0.1 -0.3	ø28	ø28	M18 × 1.5	24	14
		SCG-I-80	80	26	60	22 H10	30 -0.1 -0.3	ø40	ø40	M22 × 1.5	34	20
		SCG-I-100	100	26	60	22 H10	30 -0.1 -0.3	ø40	ø40	M26 × 1.5	34	20
SCS2	B	SCS2-125-I	125	50	85	25 H10	32 -0.1 -0.4	ø55	ø55	M30 × 1.5	32	27.5
		SCS2-140-I	140	50	90	28 H10	36 -0.1 -0.4	ø60	ø60	M30 × 1.5	35	30
		SCS2-160-I	160	60	105	32 H10	40 -0.1 -0.4	ø70	ø70	M36 × 1.5	40	35
		SCS2-180-I	180	65	115	40 H10	50 -0.1 -0.4	ø85	ø85	M40 × 1.5	47.5	42.5
		SCS2-200-I	200	75	125	40 H10	50 -0.1 -0.4	ø85	ø85	M45 × 1.5	47.5	42.5
		SCS2-250-I	250	88	150	50 H10	63 -0.1 -0.4	ø105	ø105	M56 × 2	57.5	52.5
SCM	B	SCM-I-20	20	8.5	25	8 H10	8 -0.2 -0.4	16	16	M8	11.5	9
		SCM-I-25	25, 32	10.5	30	10 H10	10 -0.2 -0.4	20	20	M10 × 1.25	14	11
	A	SCM-I-40	40	14	30	10 H10	18 -0.3 -0.5	22	22	M14 × 1.5	14	12
		SCM-I-50	50, 63	18	40	14 H10	22 -0.3 -0.5	28	28	M18 × 1.5	20	16
		SCM-I-80	80	21	50	18 H10	28 -0.3 -0.5	38	38	M22 × 1.5	27	21
		SCM-I-100	100	21	55	22 H10	32 -0.3 -0.5	44	44	M26 × 1.5	31	24
SSD2	B	SSD2-I-12	12	6	16	5 H10	5 -0.2 -0.4	10	10	M5 × 0.8	7	5.5
		SSD2-I-16	16	8	25	5 H10	6.5 -0.2 -0.4	12	12	M6×1	14	7
		SSD2-I-20	20	8.5	25	8 H10	8 -0.2 -0.4	16	16	M8 × 1.25	11.5	9
		SSD2-I-25	25	10.5	30	10 H10	10 -0.2 -0.4	20	20	M10 × 1.25	14	11
	A	SSD2-I-32	32, 40	14	30	10 H10	18 -0.3 -0.5	ø22	ø22	M14 × 1.5	14	12
		SSD2-I-50	50, 63	18	40	14 H10	22 -0.3 -0.5	ø28	ø28	M18 × 1.5	20	16
		SSD2-I-80	80	21	50	18 H10	28 -0.3 -0.5	ø38	ø38	M22 × 1.5	27	21
		SSD2-I-100	100	21	55	22 H10	32 -0.3 -0.5	ø44	ø44	M26 × 1.5	31	24
SSD	B	P2-I-16	12	8	25	5 H10	6.4 0 -0.1	12	12	M5	14	10
	A	SSD-I-16	16	8	25	5 H10	6.5 -0.1 -0.2	12	12	M6	14	10
	B	SSD-I-20	20	13.5	30	10 H10	8 -0.1 -0.2	19	19	M8	13	10
		M1-I-30	25	14	36	12 H10	10 -0.1 -0.2	25	19	M10 × 1.25	16	12
		SSD-I-32	32	15	36	12 H10	10 -0.1 -0.2	25	19	M14	16	12
	A	SSD-I-40	40	20	50	12 H10	18 -0.1 -0.4	27	27	M14 × 1.5	21	16
		SSD-I-50	50	21	50	12 H10	18 -0.1 -0.4	27	27	M18 × 1.5	21	16
		SSD-I-63	63	21	50	14 H10	20 -0.1 -0.4	(27)	27	M18 × 1.5	21	16
		SSD-I-80	80	30	70	20 H10	28 -0.1 -0.4	46	41	M22 × 1.5	30	25
		SSD-I-100	100	30	70	20 H10	28 -0.1 -0.4	46	41	M26 × 1.5	30	25
	B	SCS-125-I	125, 140	50	85	25 H10	32 -0.1 -0.4	55	55	M30 × 1.5	32	27.5
		SCS-160-I	160	60	105	32 H10	40 -0.1 -0.4	70	70	M36 × 1.5	40	35
ULK	B	M1-I-20	20	14	30	10 H10	8 -0.1 -0.2	19	19	M8 × 1.0	13	10
		M1-I-30	25, 32	14	36	12 H10	10 -0.1 -0.2	25	19	M10 × 1.25	16	12
		M1-I-40	40	14	36	12 H10	10 -0.1 -0.2	25	19	M12 × 1.5	16	12

Single Knuckle (by thread size)

Pad Shape Code: A



Pad Shape Code: B



Thread size KK	Model No.	Pad Shape Code	Applicable Model	Applicable Bore Size (ø)	AA	CA	CD	CW	D	E	MA	RR
M4	P2-I-10	B	SCP□3	10	8	21	3.2 H10	3.1 0 -0.1	12	12	9	7
M5	P2-I-16	B	SCP□3	16	8	25	5 H10	6.4 0 -0.1	12	12	14	7
			SSD	12								
	SSD2-I-12	B	SSD2	12	6	16	5 H10	5 -0.2 -0.4	10	10	7	5.5
M6	SSD-I-16	A	SSD	16	8	25	5 H10	6.5 -0.1 -0.2	12	12	14	10
	SSD2-I-16	B	SSD2	16	8	25	5 H10	6.5 -0.2 -0.4	12	12	14	7
M8 × 1.0	M1-I-20	B	CKV2, CMA2, CMK2 HCA, JSK2, JSM2 ULK	20	14	30	10 H10	8 -0.1 -0.2	19	19	13	10
M8	SCM-I-20	B	SCM	20	8.5	25	8 H10	8 -0.2 -0.4	16	16	11.5	9
	SSD-I-20	B	SSD	20	13.5	30	10 H10	8 -0.1 -0.2	19	19	13	10
	SSD2-I-20	B	SSD2	20	8.5	25	8 H10	8 -0.2 -0.4	16	16	11.5	9
M10 × 1.25	SCG-I-32	B	SCG	32	14	30	10 H10	14 -0.1 -0.3	ø20	ø20	16	10
	M1-I-30	B	CMA2, CMK2, HCA JSK2, JSM2, ULK, SSD	25, 30, 32	14	36	12 H10	10 -0.1 -0.2	25	19	16	12
	SCM-I-25	B	SCM	25, 32	10.5	30	10 H10	10 -0.2 -0.4	20	20	14	11
	SSD2-I-25	B	SSD2	25	10.5	30	10 H10	10 -0.2 -0.4	20	20	14	11
M12 × 1.5	M1-I-40	B	CKV2, CMA2, CMK2 JSK2, JSM2, ULK	40	14	36	12 H10	10 -0.1 -0.2	25	19	16	12
M14 × 1.5	SCG-I-40	B	SCG, JSG	40	19	40	10 H10	14 -0.1 -0.3	ø22	ø22	19	10
	SSD2-I-32	A	SSD2	32, 40	14	30	10 H10	18 -0.3 -0.5	ø22	ø22	14	12
	S1-I-40	A	HCA, JSC3 SCA2, SSD	40	20	50	12 H10	18 -0.1 -0.4	(27)	27	21	16
	SCM-I-40	A	SCM	40	14	30	10 H10	18 -0.3 -0.5	22	22	14	12
M14	SSD-I-32	B	SSD	32	15	36	12	10 -0.1 -0.2	25	19	16	12
M16 × 1.5	CAV2-50-I	A	CAV2, COV2	50	25	50	14 H10	20 0 -0.3	26	26	20	15
M18 × 1.5	SCG-I-50	B	SCG, JSG	50, 63	24	50	14 H10	20 -0.1 -0.3	ø28	ø28	24	14
	SSD2-I-50	A	SSD2	50, 63	18	40	14 H10	22 -0.3 -0.5	ø28	ø28	20	16
	S1-I-50	A	HCA, JSC3, SCA2	50	21	50	12 H10	18 -0.1 -0.4	(27)	27	21	16
	SSD-I-50		SSD									
	S1-I-63	A	HCA, JSC3, SCA2	63	21	50	14 H10	20 -0.1 -0.4	(27)	27	21	16
	SSD-I-63		SSD									
	SCM-I-50	A	SCM	50, 63	18	40	14 H10	22 -0.3 -0.5	28	28	20	16
M22 × 1.5	SCG-I-80	B	SCG, JSG	80	26	60	22 H10	30 -0.1 -0.3	ø40	ø40	34	20
	CAV2-75-I	A	CAV2, COV2	75.100	30	65	20 H10	28 0 -0.3	38	35	28	22.5
	S1-I-80	A	HCA, JSC3, SCA2	80	30	70	20 H10	28 -0.1 -0.4	(46)	41	30	25
	SSD-I-80		SSD									
	SCM-I-80	A	SCM	80	21	50	18 H10	28 -0.3 -0.5	38	38	27	21
	SSD2-I-80	A	SSD2	80	21	50	18 H10	28 -0.3 -0.5	ø38	ø38	27	21
M26 × 1.5	SCG-I-100	B	SCG, JSG	100	26	60	22 H10	30 -0.1 -0.3	ø40	ø40	34	20
	S1-I-100	A	HCA, JSC3, SCA2	100	30	70	20 H10	28 -0.1 -0.4	(46)	41	30	25
	SSD-I-100		SSD									
	SCM-I-100	A	SCM	100	21	55	22 H10	32 -0.3 -0.5	44	44	31	24

Note: The A and B figures are a guide only. For details, refer to the accessories and dimensions diagrams of each model.

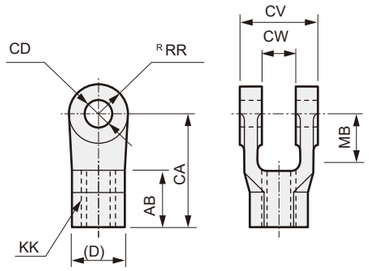
Single Knuckle (by thread size)

Thread size KK	Model No.	Pad Shape Code	Applicable Model	Applicable Bore Size (ø)	AA	CA	CD	CW	D	E	MA	RR
M26 × 1.5	SSD2-I-100	A	SSD2	100	21	55	22 H10	32 -0.3 -0.5	ø44	ø44	31	24
M30 × 1.5	SCS2-125-I	B	JSC4, SCS2	125	50	85	25 H10	32 -0.1 -0.4	ø55	ø55	32	27.5
			SSD	125, 140								
	SCS2-140-I	B	JSC4, SCS2	140	50	90	28 H10	36 -0.1 -0.4	ø60	ø60	35	30
M36 × 1.5	SCS2-160-I	B	JSC4, SCS2, SSD	160	60	105	32 H10	40 -0.1 -0.4	ø70	ø70	40	35
M40 × 1.5	SCS2-180-I	B	JSC4, SCS2	180	65	115	40 H10	50 -0.1 -0.4	ø85	ø85	47.5	42.5
M45 × 1.5	SCS2-200-I	B	SCS2	200	75	125	40 H10	50 -0.1 -0.4	ø85	ø85	47.5	42.5
M56 × 2	SCS2-250-I	B	SCS2	250	88	150	50 H10	63 -0.1 -0.4	ø105	ø105	57.5	52.5

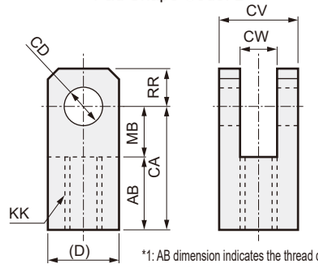
Note: The A and B figures are a guide only. For details, refer to the accessories and dimensions diagrams of each model.

Double Knuckle (by series)

Pad Shape Code: A



Pad Shape Code: B



*1: AB dimension indicates the thread depth.
*2: The MB dimension represents the CW dimension effective length.

Model	Shape Code	Model No.	Applicable Bore Size (ø)	AB	CA	CW	CD	Cv	D	KK	MB	RR
CMK2	B	M1-Y-20	20	17	30	8 $^{+0.3}_{+0.1}$	10 H10	19	19	M8 × 1.0	13	10
		M1-Y-30	25, 32	20	36	10 $^{+0.3}_{+0.1}$	12 H10	25	25	M10 × 1.25	16	12
		M1-Y-40	40	20	36	10 $^{+0.3}_{+0.1}$	12 H10	25	25	M12 × 1.5	16	12
CMA2	B	M1-Y-20	20	17	30	8 $^{+0.3}_{+0.1}$	10 H10	19	19	M8 × 1.0	13	10
		M1-Y-30	30	20	36	10 $^{+0.3}_{+0.1}$	12 H10	25	25	M10 × 1.25	16	12
		M1-Y-40	40	20	36	10 $^{+0.3}_{+0.1}$	12 H10	25	25	M12 × 1.5	16	12
CKV2	B	M1-Y-20	20	17	30	8 $^{+0.3}_{+0.1}$	10 H10	19	19	M8 × 1.0	13	10
		M1-Y-30	25, 32	20	36	10 $^{+0.3}_{+0.1}$	12 H10	25	25	M10 × 1.25	16	12
		M1-Y-40	40	20	36	10 $^{+0.3}_{+0.1}$	12 H10	25	25	M12 × 1.5	16	12
CAV2 COV2	A	CAV2-50-Y	50	25	50	20 $^{+0.3}_{0}$	14 H10	42	(23)	M16 × 1.5	18	15
		CAV2-75-Y	75.100	30	65	28 $^{+0.3}_{0}$	20 H10	60	(35)	M22 × 1.5	28	22.5
HCA	B	M1-Y-20	20	17	30	8 $^{+0.3}_{+0.1}$	10 H10	19	19	M8 × 1.0	13	10
		M1-Y-30	25, 32	20	36	10 $^{+0.3}_{+0.1}$	12 H10	25	25	M10 × 1.25	16	12
	A	S1-Y-40	40	24	50	18 $^{+0.4}_{+0.1}$	12 H10	36	(27)	M14 × 1.5	19	16
		S1-Y-50	50	24	50	18 $^{+0.4}_{+0.1}$	12 H10	36	(27)	M18 × 1.5	19	16
		S1-Y-63	63	24	50	20 $^{+0.4}_{+0.1}$	14 H10	40	(27)	M18 × 1.5	19	16
		S1-Y-80	80	35	70	28 $^{+0.4}_{+0.1}$	20 H10	56	(41)	M22 × 1.5	30	25
		S1-Y-100	100	35	70	28 $^{+0.4}_{+0.1}$	20 H10	56	(41)	M26 × 1.5	30	25
JSG	A	SCG-Y-40	40	21	40	14 $^{+0.3}_{+0.1}$	10 H10	28	(22)	M14 × 1.5	19	11
		SCG-Y-50	50, 63	26	50	20 $^{+0.3}_{+0.1}$	14 H10	40	(28)	M18 × 1.5	24	14
		SCG-Y-80	80	31	65	30 $^{+0.3}_{+0.1}$	22 H10	60	(40)	M22 × 1.5	34	20
		SCG-Y-100	100	31	65	30 $^{+0.3}_{+0.1}$	22 H10	60	(40)	M26 × 1.5	34	20
JSM2	B	M1-Y-20	20	17	30	8 $^{+0.3}_{+0.1}$	10 H10	19	19	M8 × 1.0	13	10
		M1-Y-30	30	20	36	10 $^{+0.3}_{+0.1}$	12 H10	25	25	M10 × 1.25	16	12
		M1-Y-40	40	20	36	10 $^{+0.3}_{+0.1}$	12 H10	25	25	M12 × 1.5	16	12
JSK2	B	M1-Y-20	20	17	30	8 $^{+0.3}_{+0.1}$	10 H10	19	19	M8 × 1.0	13	10
		M1-Y-30	25, 32	20	36	10 $^{+0.3}_{+0.1}$	12 H10	25	25	M10 × 1.25	16	12
		M1-Y-40	40	20	36	10 $^{+0.3}_{+0.1}$	12 H10	25	25	M12 × 1.5	16	12
JSC3	A	S1-Y-40	40	24	50	18 $^{+0.4}_{+0.1}$	12 H10	36	(27)	M14 × 1.5	19	16
		S1-Y-50	50	24	50	18 $^{+0.4}_{+0.1}$	12 H10	36	(27)	M18 × 1.5	19	16
		S1-Y-63	63	24	50	20 $^{+0.4}_{+0.1}$	14 H10	40	(27)	M18 × 1.5	19	16
		S1-Y-80	80	35	70	28 $^{+0.4}_{+0.1}$	20 H10	56	(41)	M22 × 1.5	30	25
		S1-Y-100	100	35	70	28 $^{+0.4}_{+0.1}$	20 H10	56	(41)	M26 × 1.5	30	25
JSC4	A	SCS2-125-Y	125	50	85	32 $^{+0.4}_{+0.1}$	25 H10	64	(46)	M30 × 1.5	35	27.5
		SCS2-140-Y	140	50	90	36 $^{+0.4}_{+0.1}$	28 H10	72	(46)	M30 × 1.5	40	30
		SCS2-160-Y	160	60	105	40 $^{+0.4}_{+0.1}$	32 H10	80	(55)	M36 × 1.5	45	35
		SCS2-180-Y	180	65	115	50 $^{+0.4}_{+0.1}$	40 H10	100	(60)	M40 × 1.5	50	42.5
SCP□3	B	P2-Y-10	10	8	21	3.2 $^{+0.2}_{+0.1}$	3.2 H10	12	12	M4	10	7
		P2-Y-16	16	11	21	6.5 $^{+0.2}_{+0.1}$	5 H10	12	12	M5	10	7

Note: The A and B figures are a guide only. For details, refer to the accessories and dimensions diagrams of each model.

Ending

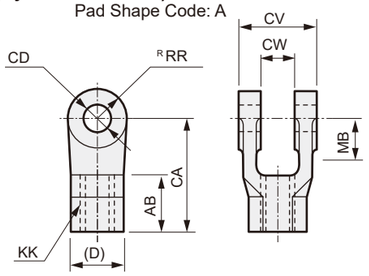
Double Knuckle (by series)

Model	Shape Code	Model No.	Applicable Bore Size (ø)	AB	CA	CW	CD	Cv	D	KK	MB	RR
SCG	A	SCG-Y-32	32	14	30	14 $^{+0.3}_{+0.1}$	10 H10	28	(20)	M10 × 1.25	16	10
		SCG-Y-40	40	21	40	14 $^{+0.3}_{+0.1}$	10 H10	28	(22)	M14 × 1.5	19	11
		SCG-Y-50	50, 63	26	50	20 $^{+0.3}_{+0.1}$	14 H10	40	(28)	M18 × 1.5	24	14
		SCG-Y-80	80	31	65	30 $^{+0.3}_{+0.1}$	22 H10	60	(40)	M22 × 1.5	34	20
		SCG-Y-100	100	31	65	30 $^{+0.3}_{+0.1}$	22 H10	60	(40)	M26 × 1.5	34	20
SCA2	A	S1-Y-40	40	24	50	18 $^{+0.4}_{+0.1}$	12 H10	36	(27)	M14 × 1.5	19	16
		S1-Y-50	50	24	50	18 $^{+0.4}_{+0.1}$	12 H10	36	(27)	M18 × 1.5	19	16
		S1-Y-63	63	24	50	20 $^{+0.4}_{+0.1}$	14 H10	40	(27)	M18 × 1.5	19	16
		S1-Y-80	80	35	70	28 $^{+0.4}_{+0.1}$	20 H10	56	(41)	M22 × 1.5	30	25
		S1-Y-100	100	35	70	28 $^{+0.4}_{+0.1}$	20 H10	56	(41)	M26 × 1.5	30	25
SCS2	A	SCS2-125-Y	125	50	85	32 $^{+0.4}_{+0.1}$	25 H10	64	(46)	M30 × 1.5	35	27.5
		SCS2-140-Y	140	50	90	36 $^{+0.4}_{+0.1}$	28 H10	72	(46)	M30 × 1.5	40	30
		SCS2-160-Y	160	60	105	40 $^{+0.4}_{+0.1}$	32 H10	80	(55)	M36 × 1.5	45	35
		SCS2-180-Y	180	65	115	50 $^{+0.4}_{+0.1}$	40 H10	100	(60)	M40 × 1.5	50	42.5
		SCS2-200-Y	200	75	125	50 $^{+0.4}_{+0.1}$	40 H10	100	(70)	M45 × 1.5	50	42.5
		SCS2-250-Y	250	88	150	63 $^{+0.4}_{+0.1}$	50 H10	126	(85)	M56 × 2	62	52.5
SCM	B	SCM-Y-20	20	13.5	25	8 $^{+0.4}_{+0.2}$	8 H10	16	16	M8	11.5	9
		SCM-Y-25	25, 32	16	30	10 $^{+0.4}_{+0.2}$	10 H10	20	20	M10 × 1.25	14	11
	A	SCM-Y-40	40	16	30	18 $^{+0.5}_{+0.3}$	10 H10	36	22	M14 × 1.5	14	12
		SCM-Y-50	50, 63	20	40	22 $^{+0.5}_{+0.3}$	14 H10	44	28	M18 × 1.5	20	16
		SCM-Y-80	80	23	50	28 $^{+0.5}_{+0.3}$	18 H10	56	38	M22 × 1.5	27	21
		SCM-Y-100	100	24	55	32 $^{+0.5}_{+0.3}$	22 H10	64	44	M26 × 1.5	31	24
SSD	B	P2-Y-16	12	11	21	6.5 $^{+0.2}_{+0.1}$	5 H10	12	12	M5	10	7
	A	SSD-Y-16	16	11	21	6.5 $^{+0.2}_{+0.1}$	5 H10	12	12	M6	10	10
	B	SSD-Y-20	20	17	30	8 $^{+0.3}_{+0.1}$	10 H10	19	19	M8	13	10
		M1-Y-30	25	20	36	10 $^{+0.3}_{+0.1}$	12 H10	25	25	M10 × 1.25	16	12
		SSD-Y-32	32	15	36	10 $^{+0.3}_{+0.1}$	12 H10	25	25	M14	16	12
	A	SSD-Y-40	40	24	50	18 $^{+0.4}_{+0.1}$	12 H10	36	(27)	M14 × 1.5	19	16
		SSD-Y-50	50	24	50	18 $^{+0.4}_{+0.1}$	12 H10	36	(27)	M18 × 1.5	19	16
		SSD-Y-63	63	24	50	20 $^{+0.4}_{+0.1}$	14 H10	40	(27)	M18 × 1.5	19	16
		SSD-Y-80	80	35	70	28 $^{+0.4}_{+0.1}$	20 H10	56	(41)	M22 × 1.5	30	25
		SSD-Y-100	100	35	70	28 $^{+0.4}_{+0.1}$	20 H10	56	(41)	M26 × 1.5	30	25
	B	SCS2-125-Y	125, 140	50	85	32 $^{+0.4}_{+0.1}$	25 H10	64	(46)	M30 × 1.5	35	27.5
		SCS2-160-Y	160	60	105	40 $^{+0.4}_{+0.1}$	32 H10	80	(55)	M36 × 1.5	45	35
SSD2	B	SSD2-Y-12	12	6	16	5 $^{+0.4}_{+0.2}$	5 H10	10	10	M5 × 0.8	7	5.5
		SSD2-Y-16	16	11	21	6.5 $^{+0.4}_{+0.2}$	5 H10	12	12	M6×1	10	7
		SSD2-Y-20	20	13.5	25	8 $^{+0.4}_{+0.2}$	8 H10	16	16	M8 × 1.25	11.5	9
		SSD2-Y-25	25	16	30	10 $^{+0.4}_{+0.2}$	10 H10	20	20	M10 × 1.25	14	11
	A	SSD2-Y-32	32, 40	16	30	18 $^{+0.5}_{+0.3}$	10 H10	36	ø22	M14 × 1.5	14	12
		SSD2-Y-50	50, 63	20	40	22 $^{+0.5}_{+0.3}$	14 H10	44	ø28	M18 × 1.5	20	16
		SSD2-Y-80	80	23	50	28 $^{+0.5}_{+0.3}$	18 H10	56	ø38	M22 × 1.5	27	21
		SSD2-Y-100	100	24	55	32 $^{+0.5}_{+0.3}$	22 H10	64	ø44	M26 × 1.5	31	24
ULK	B	M1-Y-20	20	17	30	8 $^{+0.3}_{+0.1}$	10 H10	19	19	M8 × 1.0	13	10
		M1-Y-30	25, 32	20	36	10 $^{+0.3}_{+0.1}$	12 H10	25	25	M10 × 1.25	16	12
		M1-Y-40	40	20	36	10 $^{+0.3}_{+0.1}$	12 H10	25	25	M12 × 1.5	16	12

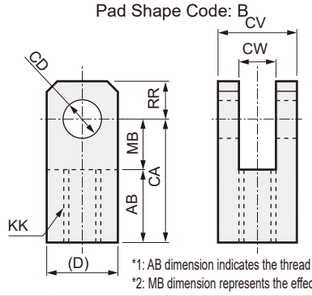
Ending

Double-knuckle (by thread size)

Pad Shape Code: A



Pad Shape Code: B



*1: AB dimension indicates the thread depth.
*2: MB dimension represents the effective length of CW dimension.

Thread size KK	Model No.	Shape Code	Compatible model	Applicable Bore (ø)	AB	CA	CW	CD	Cv	D	MB	RR
M4	P2-Y-10	B	SCP□3	10	8	21	3.2 $^{+0.2}_{0}$	3.2 ^{H10}	12	12	10	7
M5	P2-Y-16	B	SCP□3	16	11	21	6.5 $^{+0.2}_{0}$	5 ^{H10}	12	12	10	7
			SSD	12								
	SSD2-Y-12	B	SSD2	12	6	16	5 $^{+0.4}_{+0.2}$	5 ^{H10}	10	10	7	5.5
M6	SSD-Y-16	A	SSD	16	11	21	6.5 $^{+0.2}_{+0.1}$	5	12	12	10	10
	SSD2-Y-16	B	SSD2	16	11	21	6.5 $^{+0.4}_{+0.2}$	5 ^{H10}	12	12	10	7
M8 × 1.0	M1-Y-20	B	CKV2, CMA2, CMK2 HCA, JSK2, JSM2 ULK	20	17	30	8 $^{+0.3}_{+0.1}$	10 ^{H10}	19	19	13	10
M8	SCM-Y-20	B	SCM	20	13.5	25	8 $^{+0.4}_{+0.2}$	8 ^{H10}	16	16	11.5	9
	SSD-Y-20	B	SSD	20	17	30	8 $^{+0.3}_{+0.1}$	10	19	19	13	10
M8 × 1.25	SSD2-Y-20	B	SSD2	20	13.5	25	8 $^{+0.4}_{+0.2}$	8 ^{H10}	16	16	11.5	9
M10 × 1.25	SCG-Y-32	A	SCG	32	14	30	14 $^{+0.3}_{+0.1}$	10 ^{H10}	28	(20)	16	10
	M1-Y-30	B	CKV2, CMA2, CMK2 HCA, JSK2, JSM2 ULK, SSD	25, 30, 32	20	36	10 $^{+0.3}_{+0.1}$	12 ^{H10}	25	25	16	12
	SCM-Y-25	B	SCM	25, 32	16	30	10 $^{+0.4}_{+0.2}$	10 ^{H10}	20	20	14	11
	SSD2-Y-25	B	SSD2	25	16	30	10 $^{+0.4}_{+0.2}$	10 ^{H10}	20	20	14	11
M12 × 1.5	M1-Y-40	B	CKV2, CMA2, CMK2 JSK2, JSM2, ULK	40	20	36	10 $^{+0.3}_{+0.1}$	12 ^{H10}	25	25	16	12
M14 × 1.5	SCG-Y-40	A	SCG, JSG	40	21	40	14 $^{+0.3}_{+0.1}$	10 ^{H10}	28	(22)	19	11
	S1-Y-40	A	HCA, JSC3 SCA2, SSD	40	24	50	18 $^{+0.4}_{+0.1}$	12 ^{H10}	36	(27)	19	16
	SCM-Y-40	A	SCM	40	16	30	18 $^{+0.5}_{+0.3}$	10 ^{H10}	36	22	14	12
M14	SSD-Y-32	B	SSD	32	15	36	10 $^{+0.3}_{+0.1}$	12	25	25	16	12
M14 × 1.5	SSD2-Y-32	A	SSD2	32, 40	16	30	18 $^{+0.5}_{+0.3}$	10 ^{H10}	36	ø22	14	12
M16 × 1.5	CAV2-50-Y	A	CAV2, COV	50	25	50	20 $^{+0.3}_{0}$	14 ^{H10}	42	(23)	18	15
M18 × 1.5	SCG-Y-50	A	SCG, JSG	50, 63	26	50	20 $^{+0.3}_{+0.1}$	14 ^{H10}	40	(28)	24	14
	S1-Y-50	A	HCA, JSC3, SCA2	50	24	50	18 $^{+0.4}_{+0.1}$	12 ^{H10}	36	(27)	19	16
	SSD-Y-50		SSD									
	S1-Y-63	A	HCA, JSC3, SCA2	63	24	50	20 $^{+0.4}_{+0.1}$	14 ^{H10}	40	(27)	19	16
	SSD-Y-63		SSD									
	SCM-Y-50	A	SCM	50, 63	20	40	22 $^{+0.5}_{+0.3}$	14 ^{H10}	44	28	20	16
	SSD2-Y-50	A	SSD2	50, 63	20	40	22 $^{+0.5}_{+0.3}$	14 ^{H10}	44	ø28	20	16
M22 × 1.5	SCG-Y-80	A	SCG, JSG	80	31	65	30 $^{+0.3}_{+0.1}$	22 ^{H10}	60	(40)	34	20
	CAV2-75-Y	A	CAV2, COV2	75.100	30	65	28 $^{+0.3}_{0}$	20 ^{H10}	60	(35)	28	22.5
	S1-Y-80	A	HCA, JSC3, SCA2	80	35	70	28 $^{+0.4}_{+0.1}$	20 ^{H10}	56	(41)	30	25
	SSD-Y-80		SSD									
	SCM-Y-80	A	SCM	80	23	50	28 $^{+0.5}_{+0.3}$	18 ^{H10}	56	38	27	21
	SSD2-Y-80	A	SSD2	80	23	50	28 $^{+0.5}_{+0.3}$	18 ^{H10}	56	ø38	27	21
M26 × 1.5	SCG-Y-100	A	SCG, JSG	100	31	65	30 $^{+0.3}_{+0.1}$	22 ^{H10}	60	(40)	34	20
	S1-Y-100	A	HCA, JSC3, SCA2	100	35	70	28 $^{+0.4}_{+0.1}$	20 ^{H10}	56	(41)	30	25
	SSD-Y-100		SSD									
	SCM-Y-100	A	SCM	100	24	55	32 $^{+0.5}_{+0.3}$	22 ^{H10}	64	44	31	24

Note: The A and B figures are a guide only. For details, refer to the accessories and dimensions diagrams of each model.

Double-knuckle (by thread size)

Thread size KK	Model No.	Shape Code	Compatible model	Applicable Bore (ø)	AB	CA	CW	CD	Cv	D	MB	RR
M26 × 1.5	SSD2-Y-100	A	SSD2	100	24	55	32 $^{+0.5}_{+0.3}$	22 ^{H10}	64	ø44	31	24
M30 × 1.5	SCS2-125-Y	A	JSC4, SCS2	125	50	85	32 $^{+0.4}_{+0.1}$	25 $^{+0.084}_{0}$	64	(46)	35	27.5
			SSD	125, 140								
	SCS2-140-Y	A	JSC4, SCS2	140	50	90	36 $^{+0.4}_{+0.1}$	28 $^{+0.084}_{0}$	72	(46)	40	30
M36 × 1.5	SCS2-160-Y	A	JSC4, SCS2, SSD	160	60	105	40 $^{+0.4}_{+0.1}$	32 $^{+0.100}_{0}$	80	(55)	45	35
M40 × 1.5	SCS2-180-Y	A	JSC4, SCS2	180	65	115	50 $^{+0.4}_{+0.1}$	40 $^{+0.100}_{0}$	100	(60)	50	42.5
M45 × 1.5	SCS2-200-Y	A	SCS2	200	75	125	50 $^{+0.4}_{+0.1}$	40 $^{+0.100}_{0}$	100	(70)	50	42.5
M56 × 2	SCS2-250-Y	A	SCS2	250	88	150	63 $^{+0.4}_{+0.1}$	50 $^{+0.100}_{0}$	126	(85)	62	52.5

Note: The A and B figures are a guide only. For details, refer to the accessories and dimensions diagrams of each model.

Ending

Custom Products

Page

■ Rod End Shape Modification

Model No. Notation Method — Ending 12

• Rod End Female Thread (with Undercut) "N1" — Ending 13

• Rod End Female Thread "N11" — Ending 14

• Rod End No Thread "N12" — Ending 15

• Rod End Male Thread "N13" — Ending 16

• Rod End Spherical Radius "N14" — Ending 17

• Rod End Male Thread (with Undercut) "N15" — Ending 18

• Rod End Single Knuckle Shape "N2" — Ending 19

• Rod End Double Knuckle Shape "N21" — Ending 20

• Rod End with Groove "N3" — Ending 21

• Rod End with Groove and Spherical Radius "N31" — Ending 22

■ Rod End Shape Modification (N□□)

For detailed specifications, dimensions, price, and delivery, please contact us.

Model No. Notation

SCM - 00 - 40 B - 200 - N13 A23 WF25

Model No.

Applicable Model

Model No.	Name
SCG	Tie Rod Cylinder
JSG	Tie Rod Cylinder with Brake
SCP□3	Pencil Shaped Cylinder
CMK2	Small Bore Size cylinder
SCA2	Medium Bore Size Cylinder
SCS2	Medium Bore Size Cylinder
SCP□3-V	Ultra Compact Cell Cylinder
MDC2	Small Direct Cylinder
SSD	Compact Cylinder
SCM	Round shaped cylinder
ULK	Brake Cylinder
JSC3/JSC4	Brake Cylinder
FC□	Flat Cylinder Compact Demi

Model No.

Please refer to the model number notation method for each model.

Rod End Patterns

Code	Contents
N1	Rod End Female Thread (with Undercut)
N11	Rod End female thread
N12	Rod End without thread
N14	Rod End Spherical Radius
N13	Rod End male thread
N15	Rod End Male Thread (with Undercut)
N2	Rod End Single Knuckle Shape
N21	Rod End Double Clevis Shape
N3	Rod End with Groove
N31	Rod End with Groove and Spherical Radius

Custom dimension

Refer to the external dimensions list.

* Please enter only when different from the basic dimensions.

Precautions for Changing Rod End Shape

1. Depending on the specified dimensions, the same strength as the standard product may not be guaranteed.
2. Please leave dimensions, tolerances, and finishes not specified on the drawing to CKD's discretion.

Notes for model No. Selection

1. When it is necessary to change some dimensions, enter the pattern code followed by the dimension code, then the specified dimension.
2. When specifying multiple items, specify them in order from the left dimension code in the outline dimension table.
   (Example) Model No.-N13KKM18×1.5A40WF20
3. If a thread size is specified, the Rod End nut is not included.
4. The basic dimensions for N11 are the same as the dimensions for the female thread specification of each model.
   The basic dimensions for N13 are the same as the dimensions for the male thread specification of each model.
   If specified dimensions are not required for both N11 and N13, follow the model number notation method for each model.

	(Incorrect)		(Correct)	
(Example)	SCM-00-40B-200-N13	->	SCM-00-40B-200	(Code not required as N13 is standard)
	SSD-50-50-N11	->	SSD-50-50	(Code not required as N11 is standard)
	SSD-50-50-N13	->	SSD-50-50-N	(Because "N" exists as the female thread code)

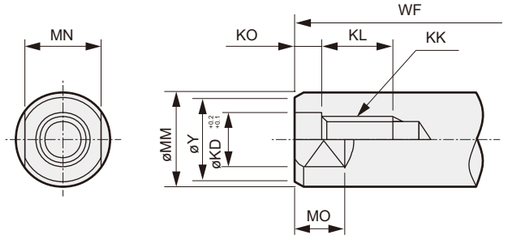
For models that do not have a code for male or female threads in their model number notation method, follow the Rod End patterns on this page.

5. Even when there are accessories, etc., enter the codes after the Rod End pattern at the very end of the model number.

	(Incorrect)		(Correct)
(Example)	SSD-50-50-N13KKM8-CB	->	SSD-50-50-CB-N13KKM8

6. This custom model number is for ordering purposes and may differ from the official model number.
7. For double rod types and back-to-back types, please consult with us separately regarding the model number notation.

Outline Dimension Drawing



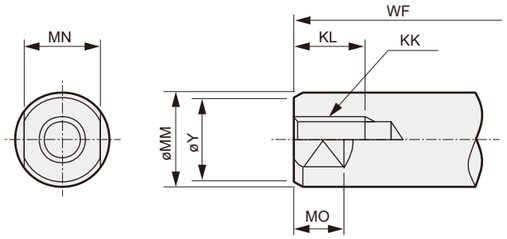
When manufacturing with the dimensions in the dimension table, please specify pattern code "N1". When it is necessary to change some dimensions, enter the pattern code followed by the dimension code, then the specified dimension.
(Example) SCM-00-40B-200-N1WF25
WF standard dimension is 20, but this is available at 25. When specifying multiple items, specify them in order from the left code.

*1: CMK2-G2/G3 dimensions are shown in ( ).
*2: For CMA2-E, use the dimensions shown in parentheses.
*3: For SSD-G2, G3, KG2, and KG3, use the dimensions shown in parentheses.
*4: For SSD, the WF dimension is different when LB2 or FA is selected. Please consult us separately.
*5: For SCM-LD, use the dimensions shown in parentheses.

Series	Bore Size	øMM	KK	øKD	KO	KL	øY	MN	MO	WF
CMK2	20	10	M5 × 0.8	5	2.5	10	8	8	5	24
CKV2	25	12	M6×1	6	3	10	10	10	5	23 (28)
ULK	32	12	M6×1	6	3	10	10	10	5	23 (28)
*1	40	14	M8 × 1.25	8	4	14	12	12	6	23 (28)
CMA2	20	10	M5 × 0.8	5	2.5	10	8	8	5	24 (11)
JSM2	30	12	M6×1	6	3	10	10	10	5	23 (7)
*2	40	14	M8 × 1.25	8	4	14	12	12	6	23 (6)
SCG	32	12	M6×1	6	3	10	10	10	5	25
SCG	40	16	M8 × 1.25	8	4	14	14	14	6	21
JSG	50	20	M10×1.5	10	5	16	18	17	8	23
	63	20	M10×1.5	10	5	16	18	17	8	23
	80	25	M12×1.75	12	5.5	18	22	22	11	32
	100	30	M16×2	16	6	24	27	27	13	32
SCA2	40	16	M8 × 1.25	8	4	14	14	14	8	33.5
	50	20	M10×1.5	10	5	16	18	17	8	37
	63	20	M10×1.5	10	5	16	18	17	8	35
	80	25	M12×1.75	12	5.5	18	22	22	11	48
	100	30	M16×2	16	6	24	27	27	13	53
SCS2	125	32	M18×2.5	18	7.5	26	29	27	14	65
	140	32	M18×2.5	18	7.5	26	29	27	14	67
	160	40	M20×2.5	20	7.5	28	36	36	15	71
	180	45	M22×2.5	22	7.5	30	41	41	17	78
	200	50	M24×3	24	9	32	46	46	20	88
	250	60	M30×3.5	30	10.5	36	56	55	22	94
JSC3	40	16	M8 × 1.25	8	4	14	14	14	8	30
	50	20	M10×1.5	10	5	16	18	17	8	34
	63	20	M10×1.5	10	5	16	18	17	8	30
	80	25	M12×1.75	12	5.5	18	22	22	11	43.5
	100	30	M16×2	16	6	24	27	27	13	48
JSC4	125	35	M18×2.5	18	7.5	26	32	30	14	55
	140	35	M18×2.5	18	7.5	26	32	30	14	57
	160	40	M20×2.5	20	7.5	28	36	36	16	71.5
	180	45	M22×2.5	22	7.5	30	41	41	18	78.5
SSD	12	6	M3×0.5	3	2	6	5	5	3.5	3.5
*3	16	8	M4×0.7	4	2.5	8	7	6	3.5	3.5 (8.5)
*4	20	10	M5 × 0.8	5	2.5	7	8	8	4.5	4.5 (9.5)
	25	12	M6×1	6	3	12	10	10	5	5 (10)
	32	16	M8 × 1.25	8	4	13	14	14	7	7 (12)
	40	16	M8 × 1.25	8	4	13	14	14	7	7 (12)
	50	20	M10 × 1.5	10	4.5	15	18	17	8	8 (13)
	63	20	M10 × 1.5	10	4.5	15	18	17	8	8 (13)
	80	25	M16 × 2	16	6	21	22	22	10	10 (15)
	100	30	M20 × 2.5	20	7.5	27	27	27	12	12 (17)
	125	35	M22 x 2.5	22	7.5	30	33	30	11	16
	140	35	M22 x 2.5	22	7.5	30	33	30	11	16
	160	40	M24 x 3	24	9	33	38	36	14	17
FCD	25	12	M5 × 0.8	5	2.5	9	10	10	5	5
	32	16	M6×1	6	3	11	14	14	7	7
	40	16	M8 × 1.25	8	4	13	14	14	7	8
	50	20	M8 × 1.25	8	4	13	18	17	8	9.5
	63	20	M10 × 1.5	10	5	15	18	17	8	9.5
SCM	20	8	M4×0.7	4	2.5	8	7	6	4	17 (9)
*5	25	10	M5 × 0.8	5	2.5	10	8	8	5	18 (10)
	32	12	M6×1	6	3	10	10	10	5.5	18 (10)
	40	16	M8 × 1.25	8	4	14	14	14	6	20 (9)
	50	20	M10 × 1.5	10	5	16	18	17	8	23 (10)
	63	20	M10 × 1.5	10	5	16	18	17	8	23 (10)
	80	25	M12 × 1.75	12	5.5	18	22	22	11	31
	100	30	M16 × 2	16	6	24	27	27	13	31

Rod End Female Thread (Pattern Code "N11")

Outline Dimension Drawing



*1: The Y dimension may change slightly.

When manufacturing with the dimensions in the dimension table, please specify pattern code "N11". When it is necessary to change some dimensions, enter the pattern code followed by the dimension code, then the specified dimension.

(Example) SCM-00-40B-200-N11WF25

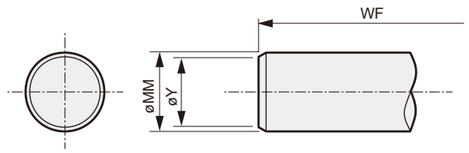
WF standard dimension is 20, but this is available at 25.

*2: CMK2-G2/G3 dimensions are shown in ( ).
*3: For CMA2-E, use the dimensions shown in parentheses.
*4: SSD-G2/G3/KG2/KG3 are the dimensions in ( ).
*5: For SSD, the WF dimension is different when LB2 or FA is selected. Please consult us separately.
*6: For SCM-LD, use the dimensions shown in parentheses.
*7: "WF" is not listed in the MDC2 catalog. The dimension labeled (O) should be taken as "WF".

Series	Bore Size	øMM	KK	KL	øY	MN	MO	WF
CMK2 CKV2 ULK *2	20	10	M5 × 0.8	10	8	8	5	24
	25	12	M6×1	10	10	10	5	23 (28)
	32	12	M6×1	10	10	10	5	23 (28)
	40	14	M8 × 1.25	14	12	12	6	23 (28)
CMA2 JSM2 *3	20	10	M5 × 0.8	10	8	8	5	24 (11)
	30	12	M6×1	10	10	10	5	23 (7)
	40	14	M8 × 1.25	14	12	12	6	23 (6)
SCG	32	12	M6×1	10	10	10	5	25
SCG JSG	40	16	M8 × 1.25	14	14	14	6	21
	50	20	M10 × 1.5	16	18	17	8	23
	63	20	M10 × 1.5	16	18	17	8	23
	80	25	M12 × 1.75	18	22	22	11	32
	100	30	M16 × 2	24	27	27	13	32
SCA2	40	16	M8 × 1.25	14	14	14	8	33.5
	50	20	M10 × 1.5	16	18	17	8	37
	63	20	M10 × 1.5	16	18	17	8	35
	80	25	M12 × 1.75	18	22	22	11	48
	100	30	M16 × 2	24	27	27	13	53
SCS2	125	32	M18 × 2.5	26	29	27	14	65
	140	32	M18 × 2.5	26	29	27	14	67
	160	40	M20 × 2.5	28	36	36	15	71
	180	45	M22 x 2.5	30	41	41	17	78
	200	50	M24 x 3	32	46	46	20	88
	250	60	M30×3.5	36	56	55	22	94
JSC3	40	16	M8 × 1.25	14	14	14	8	30
	50	20	M10 × 1.5	16	18	17	8	34
	63	20	M10 × 1.5	16	18	17	8	30
	80	25	M12 × 1.75	18	22	22	11	43.5
	100	30	M16 × 2	24	27	27	13	48
JSC4	125	35	M18 × 2.5	26	32	30	14	55
	140	35	M18 × 2.5	26	32	30	14	57
	160	40	M20 × 2.5	28	36	36	16	71.5
	180	45	M22 x 2.5	30	41	41	18	78.5
SSD *4 *5	12	6	M3×0.5	6	5	5	3.5	3.5
	16	8	M4×0.7	8	7	6	3.5	3.5 (8.5)
	20	10	M5 × 0.8	7	8	8	4.5	4.5 (9.5)
	25	12	M6×1	12	10	10	5	5 (10)
	32	16	M8 × 1.25	13	14	14	7	7 (12)
	40	16	M8 × 1.25	13	14	14	7	7 (12)
	50	20	M10 × 1.5	15	18	17	8	8 (13)
	63	20	M10 × 1.5	15	18	17	8	8 (13)
	80	25	M16 × 2	21	22	22	10	10 (15)
	100	30	M20 × 2.5	27	27	27	12	12 (17)
	125	35	M22 x 2.5	30	33	30	11	16
	140	35	M22 x 2.5	30	33	30	11	16
	160	40	M24 x 3	33	38	36	14	17
FCD	25	12	M5 × 0.8	9	10	10	5	5
	32	16	M6×1	11	14	14	7	7
	40	16	M8 × 1.25	13	14	14	7	8
	50	20	M8 × 1.25	13	18	17	8	9.5
	63	20	M10 × 1.5	15	18	17	8	9.5
SCM *6	20	8	M4×0.7	8	7	6	4	17 (9)
	25	10	M5 × 0.8	10	8	8	5	18 (10)
	32	12	M6×1	10	10	10	5.5	18 (10)
	40	16	M8 × 1.25	14	14	14	6	20 (9)
	50	20	M10 × 1.5	16	18	17	8	23 (10)
	63	20	M10 × 1.5	16	18	17	8	23 (10)
	80	25	M12 × 1.75	18	22	22	11	31
	100	30	M16 × 2	24	27	27	13	31
MDC2 *7	6	4	M2.5×0.45	4	3.5	3.5	2.5	3
	8	5	M3×0.5	5	4.5	4.5	2.5	3
	10	6	M3×0.5	5	5	5	2.5	3

Rod End No Thread (Pattern Code "N12")

Outline Dimension Drawing



*1: "WF" is not listed in the SCP*3 catalog. The "13 mm" dimension should be taken as "WF".
*2: CMK2-G2/G3 dimensions are shown in ( ).
*3: For CMA2-E, use the dimensions shown in parentheses.
*4: This pattern cannot be specified for SSD-KU, SCM-U, or SCA2-U (low-friction cylinders).
*5: The same applies to SCP*3-V.
*6: For SSD-G2, G3, KG2, and KG3, use the dimensions shown in parentheses.
*7: For SSD, the WF dimension is different when LB2 or FA is selected. Please consult us separately.
*8: For SCM-LD, use the dimensions shown in parentheses.
*9: "WF" is not listed in the MDC2 catalog. The dimension labeled (O) should be taken as "WF".

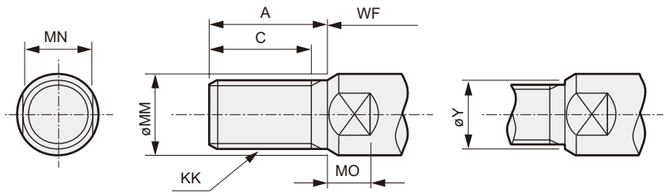
When manufacturing with the dimensions in the dimension table, please specify pattern code "N12". When it is necessary to change some dimensions, enter the pattern code followed by the dimension code, then the specified dimension.

Example
SCM-00-40B-200-N12WF25
WF standard dimension is 20, but this is available at 25.

Series	Bore Size	øMM	øY	WF
SCP□3 *1	6	3	2.5	13
	10	4	3.5	13
	16	5	4.5	13
CMK2	20	10	8	24
CKV2	25	12	10	23 (28)
ULK	32	12	10	23 (28)
*2	40	14	12	23 (28)
CMA2	20	10	8	24 (11)
JSM2	30	12	10	23 (7)
*3	40	14	12	23 (6)
SCG	32	12	10	25
SSG	40	16	14	21
	50	20	18	23
	63	20	18	23
	80	25	22	32
	100	30	27	32
SCA2	40	16	14	33.5
*4	50	20	18	37
	63	20	18	35
	80	25	22	48
	100	30	27	53
SCS2	125	32	29	65
	140	32	29	67
	160	40	36	71
	180	45	41	78
	200	50	46	88
	250	60	56	94
JSC3	40	16	14	30
	50	20	18	34
	63	20	18	30
	80	25	22	43.5
	100	30	27	48
JSC4	125	35	32	55
	140	35	32	57
	160	40	36	71.5
	180	45	41	78.5
SCP□3-V *5	10	4	3.5	13
	16	5	4.5	13
SSD *4 *6 *7	12	6	5	3.5
	16	8	7	3.5 (8.5)
	20	10	8	4.5 (9.5)
	25	12	10	5 (10)
	32	16	14	7 (12)
	40	16	14	7 (12)
	50	20	18	8 (13)
	63	20	18	8 (13)
	80	25	22	10 (15)
	100	30	27	12 (17)
	125	35	33	16
	140	35	33	16
	160	40	38	17
FCD	25	12	10	5
	32	16	14	7
	40	16	14	8
	50	20	18	9.5
	63	20	18	9.5
SCM *4 *8	20	8	7	17 (9)
	25	10	8	18 (10)
	32	12	10	18 (10)
	40	16	14	20 (9)
	50	20	18	23 (10)
	63	20	18	23 (10)
	80	25	22	31
	100	30	27	31
MDC2 *9	4	2	1.5	3
	6	4	3.5	3
	8	5	4.5	3
	10	6	5	3

Rod End Male Thread (Pattern Code "N13")

Outline Dimension Drawing



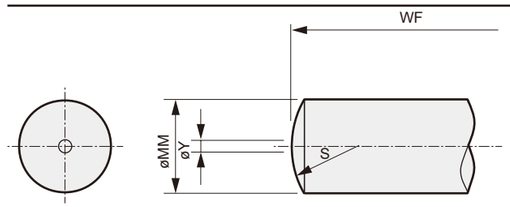
*1: "WF" is not listed in the SCP□3 catalog. The "13 mm" dimension should be taken as "WF".
*2: CMK2-G2/G3 dimensions are shown in ( ).
*3: For CMA2-E, use the dimensions shown in parentheses.
*4: The same applies to SCP□3-V.
*5: For SSD-G2, G3, KG2, and KG3, use the dimensions shown in parentheses.
*6: For SSD, the WF dimension is different when LB2 or FA is selected.Please consult us separately.
*7: For SCM-LD, use the dimensions shown in parentheses.
*8: If a thread size is specified, the Rod End nut is not included. Additionally, the Y dimension may change slightly.

When manufacturing with the dimensions in the dimension table, please specify pattern code "N13". When it is necessary to change some dimensions, enter the pattern code “N13” followed by the dimension code, then the specified dimension.
(Example) SCM-00-40B-200-N13A23WF27
The standard WF dimension is 20, but it will be manufactured as 27. The standard A dimension is 30, but it will be manufactured as 23. If the C dimension is not specified, it will be manufactured with the standard (A-C) dimensional difference.

Series	Bore Size	øMM	KK	C	A	øY	MN	MO	WF
SCP□3 *1	6	3	M3×0.5	15	–	–	–	–	13
	10	4	M4×0.7	15	–	–	–	–	13
	16	5	M5 × 0.8	15	–	–	–	–	13
CMK2 CKV2 ULK *2	20	10	M8 x 1	18	20	8	8	5	24
	25	12	M10 × 1.25	20	23	10	10	5	23 (28)
	32	12	M10 × 1.25	20	23	10	10	5	23 (28)
	40	14	M12 × 1.5	22	25	12	12	6	23 (28)
CMA2 JSM2 *3	20	10	M8 x 1	18	20	8	8	5	24 (11)
	30	12	M10 × 1.25	20	23	10	10	5	23 (7)
	40	14	M12 × 1.5	22	25	12	12	6	23 (6)
SCG	32	12	M10 × 1.25	19.5	22	10	10	5.5	25
SCG JSG	40	16	M14 × 1.5	27	30	14	14	6	21
	50	20	M18 × 1.5	32	35	18	17	8	23
	63	20	M18 × 1.5	32	35	18	17	8	23
	80	25	M22 × 1.5	37	40	22	22	11	32
	100	30	M26 × 1.5	37	40	26	27	13	32
SCA2	40	16	M14 × 1.5	20	22	14	14	8	33.5
	50	20	M18 × 1.5	26	28	18	17	8	37
	63	20	M18 × 1.5	26	28	18	17	8	35
	80	25	M22 × 1.5	34	36	22	22	11	48
	100	30	M26 × 1.5	43	45	26	27	13	53
SCS2	125	32	M30 × 1.5	47	50	30	27	14	65
	140	32	M30 × 1.5	47	50	30	27	14	67
	160	40	M36 × 1.5	53	56	36	36	15	71
	180	45	M40 × 1.5	60	63	40	41	17	78
	200	50	M45 × 1.5	69	72	45	46	20	88
	250	60	M56 × 2	84	88	56	55	22	94
JSC3	40	16	M14 × 1.5	20	22	14	14	8	30
	50	20	M18 × 1.5	26	28	18	17	8	34
	63	20	M18 × 1.5	26	28	18	17	8	30
	80	25	M22 × 1.5	34	36	22	22	11	43.5
	100	30	M26 × 1.5	43	45	26	27	13	48
JSC4	125	35	M30 × 1.5	47	50	30	30	14	55
	140	35	M30 × 1.5	47	50	30	30	14	57
	160	40	M36 × 1.5	53	56	36	36	16	71.5
	180	45	M40 × 1.5	60	63	40	41	18	78.5
SCP□3-V *4	10	4	M4×0.7	15	–	–	–	–	13
	16	5	M5 × 0.8	15	–	–	–	–	13
SSD *5 *6	12	6	M5 × 0.8	9	10.5	5	5	3.5	3.5
	16	8	M6×1	10	12	6	6	3.5	3.5 (8.5)
	20	10	M8 × 1.25	12	14	8	8	4.5	4.5 (9.5)
	25	12	M10 × 1.25	15	17.5	10	10	5	5 (10)
	32	16	M14 × 1.5	20.5	23.5	14	14	5	5 (10)
	40	16	M14 × 1.5	20.5	23.5	14	14	5	5 (10)
	50	20	M18 × 1.5	26	28.5	18	17	5	5 (10)
	63	20	M18 × 1.5	26	28.5	18	17	5	5 (10)
	80	25	M22 × 1.5	32.5	35.5	22	22	8	8 (13)
	100	30	M26 × 1.5	32.5	35.5	26	27	8	8 (13)
	125	35	M30 × 1.5	42	45	30	30	11	13
	140	35	M30 × 1.5	42	45	30	30	11	13
	160	40	M36 × 1.5	47	50	36	36	11	14
FCD	25	12	M10 × 1.25	20	22	10	10	4	5
	32	16	M14 × 1.5	20	22	14	14	6	7
	40	16	M14 × 1.5	20	22	14	14	6	7
	50	20	M18 × 1.5	26	28	18	17	8	8
	63	20	M18 × 1.5	26	28	18	17	8	8
SCM *7	20	8	M8 × 1.25	16	18	–	6	4	17 (9)
	25	10	M10 × 1.25	20	22	–	8	5	18 (10)
	32	12	M10 × 1.25	20	22	10	10	5.5	18 (10)
	40	16	M14 × 1.5	27	30	14	14	6	20 (9)
	50	20	M18 × 1.5	32	35	18	17	8	23 (10)
	63	20	M18 × 1.5	32	35	18	17	8	23 (10)
	80	25	M22 × 1.5	37	40	22	22	11	31
	100	30	M26 × 1.5	37	40	26	27	13	31
MDC2 *8	6	4	M3×0.5	6	8	3.5	3.5	2.5	3
	8	5	M4×0.7	7	9	4.5	4.5	2.5	3
	10	6	M5 × 0.8	9	11	5	5	2.5	3

Rod End Spherical Radius (Pattern Code "N14")

Outline Dimension Drawing



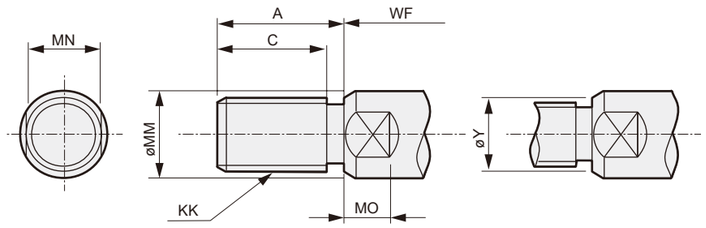
*1: "WF" is not listed in the SCP□3 and SCP□3-V catalogs. The "13 mm" dimension should be taken as "WF".
*2: CMK2-G2/G3 dimensions are shown in ( ).
*3: This pattern cannot be specified for SSD-KU, SCM-U, or SCA2-U (low-friction cylinders).

When manufacturing with the dimensions in the dimension table, please specify pattern code "N14". When it is necessary to change some dimensions, enter the pattern code followed by the dimension code, then the specified dimension.
(Example) SCM-00-40B-200-N14WF25
WF standard dimension is 20, but this is available at 25.
*4: SSD-G2/G3/KG2/KG3 are the dimensions in ( ).
*5: For SSD, the WF dimension is different when LB2 or FA is selected. Please consult us separately.
*6: For SCM-LD, use the dimensions shown in parentheses.

Series	Bore Size	øMM	øY	S	WF
SCP□3 *1	6	3	0.3	3	13
	10	4	0.3	4	13
	16	5	0.3	5	13
CMK2 CKV2 ULK *2	20	10	0.5	10	24
	25	12	0.5	12	23 (28)
	32	12	0.5	12	23 (28)
	40	14	0.5	14	23 (28)
SCG	32	12	0.5	12	25
SCG JSG	40	16	1	16	21
	50	20	1	20	23
	63	20	1	20	23
	80	25	1	25	32
	100	30	1	30	32
SCA2 *3	40	16	1	16	33.5
	50	20	1	20	37
	63	20	1	20	35
	80	25	1	25	48
	100	30	1	30	53
SCS2	125	32	2	32	65
	140	32	2	32	67
	160	40	2	40	71
	180	45	2	45	78
	200	50	2	50	88
	250	60	2	60	94
JSC3	40	16	1	16	30
	50	20	1	20	34
	63	20	1	20	30
	80	25	1	25	43.5
	100	30	1	30	48
JSC4	125	35	2	35	55
	140	35	2	35	57
	160	40	2	40	71.5
	180	45	2	45	78.5
SCP□3-V *1	10	4	0.3	4	13
	16	5	0.3	5	13
SSD *3 *4 *5	12	6	0.5	6	3.5
	16	8	0.5	8	3.5 (8.5)
	20	10	0.5	10	4.5 (9.5)
	25	12	0.5	12	5 (10)
	32	16	1	16	7 (12)
	40	16	1	16	7 (12)
	50	20	1	20	8 (13)
	63	20	1	20	8 (13)
	80	25	1	25	10 (15)
	100	30	1	30	12 (17)
	125	35	2	35	16
	140	35	2	35	16
	160	40	2	40	17
SCM *3 *6	20	8	0.5	8	17 (9)
	25	10	0.5	10	18 (10)
	32	12	0.5	12	18 (10)
	40	16	1	16	20 (9)
	50	20	1	20	23 (10)
	63	20	1	20	23 (10)
	80	25	1	25	31
	100	30	1	30	31

Rod End Male Thread (with Undercut) (Pattern Code "N15")

Outline Dimension Drawing



*1: If a thread size is specified, the Rod End nut is not included. Additionally, the Y dimension may change slightly.

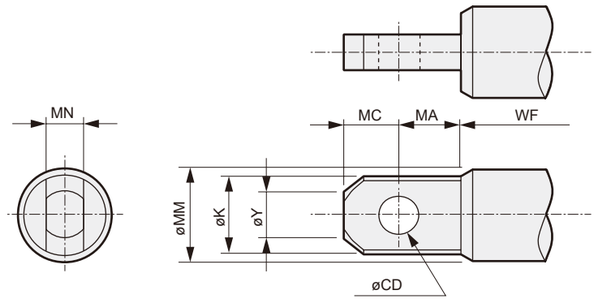
When manufacturing with the dimensions in the dimension table, please specify pattern code "N15".
When it is necessary to change some dimensions, enter the pattern code followed by the dimension code, then the specified dimension.
(Example) SCM-00-40B-200-N15C20A23
The standard C dimension is 27, but it will be manufactured as 20. The standard A dimension is 30, but it will be manufactured as 23. If the C dimension is not specified, it will be manufactured with the standard (A-C) dimensional difference.

*2: CMK2-G2/G3 dimensions are shown in ( ).
*3: For CMA2-E, use the dimensions shown in parentheses.
*4: SSD-G2/G3/KG2/KG3 are the dimensions in ( ).
*5: For SSD, the WF dimension is different when LB2 or FA is selected. Please consult us separately.
*6: For SCM-LD, use the dimensions shown in parentheses.

Series	Bore Size	øMM	KK	C	A	øY	MN	MO	WF
CMK2 CKV2 ULK *2	20	10	M8 x 1	18	20	8	8	5	24
	25	12	M10 × 1.25	20	23	10	10	5	23 (28)
	32	12	M10 × 1.25	20	23	10	10	5	23 (28)
	40	14	M12 × 1.5	22	25	12	12	6	23 (28)
CMA2 JSM2 *3	20	10	M8 x 1	18	20	8	8	5	24 (11)
	30	12	M10 × 1.25	20	23	10	10	5	23 (7)
	40	14	M12 × 1.5	22	25	12	12	6	23 (6)
SCG	32	12	M10 × 1.25	19.5	22	10	10	5	25
SCG JSG	40	16	M14 × 1.5	27	30	14	14	6	21
	50	20	M18 × 1.5	32	35	18	17	8	23
	63	20	M18 × 1.5	32	35	18	17	8	23
	80	25	M22 × 1.5	37	40	22	22	11	32
	100	30	M26 × 1.5	37	40	26	27	13	32
SCA2	40	16	M14 × 1.5	20	22	14	14	8	33.5
	50	20	M18 × 1.5	26	28	18	17	8	37
	63	20	M18 × 1.5	26	28	18	17	8	35
	80	25	M22 × 1.5	34	36	22	22	11	48
	100	30	M26 × 1.5	43	45	26	27	13	53
SCS2	125	32	M30 × 1.5	47	50	30	27	14	65
	140	32	M30 × 1.5	47	50	30	27	14	67
	160	40	M36 × 1.5	53	56	36	36	15	71
	180	45	M40 × 1.5	60	63	40	41	17	78
	200	50	M45 × 1.5	69	72	45	46	20	88
	250	60	M56 × 2	84	88	56	55	22	94
JSC3	40	16	M14 × 1.5	20	22	14	14	8	30
	50	20	M18 × 1.5	26	28	18	17	8	34
	63	20	M18 × 1.5	26	28	18	17	8	30
	80	25	M22 × 1.5	34	36	22	22	11	43.5
	100	30	M26 × 1.5	43	45	26	27	13	48
JSC4	125	35	M30 × 1.5	47	50	30	30	14	55
	140	35	M30 × 1.5	47	50	30	30	14	57
	160	40	M36 × 1.5	53	56	36	36	16	71.5
	180	45	M40 × 1.5	60	63	40	41	18	78.5
SSD *4 *5	12	6	M5 × 0.8	9	10.5	5	5	3.5	3.5
	16	8	M6×1	10	12	6	6	3.5	3.5 (8.5)
	20	10	M8 × 1.25	12	14	8	8	4.5	4.5 (9.5)
	25	12	M10 × 1.25	15	17.5	10	10	5	5 (10)
	32	16	M14 × 1.5	20.5	23.5	14	14	5	5 (10)
	40	16	M14 × 1.5	20.5	23.5	14	14	5	5 (10)
	50	20	M18 × 1.5	26	28.5	18	17	5	5 (10)
	63	20	M18 × 1.5	26	28.5	18	17	5	5 (10)
	80	25	M22 × 1.5	32.5	35.5	22	22	8	8 (13)
	100	30	M26 × 1.5	32.5	35.5	26	27	8	8 (13)
	125	35	M30 × 1.5	42	45	30	30	11	13
	140	35	M30 × 1.5	42	45	30	30	11	13
	160	40	M36 × 1.5	47	50	36	36	11	14
FCD	25	12	M10 × 1.25	20	22	10	10	4	5
	32	16	M14 × 1.5	20	22	14	14	6	7
	40	16	M14 × 1.5	20	22	14	14	6	7
	50	20	M18 × 1.5	26	28	18	17	8	8
	63	20	M18 × 1.5	26	28	18	17	8	8
SCM *6	20	8	–	–	–	–	–	–	–
	25	10	–	–	–	–	–	–	–
	32	12	M10 × 1.25	20	22	10	10	5.5	18 (10)
	40	16	M14 × 1.5	27	30	14	14	6	20 (9)
	50	20	M18 × 1.5	32	35	18	17	8	23 (10)
	63	20	M18 × 1.5	32	35	18	17	8	23 (10)
	80	25	M22 × 1.5	37	40	22	22	11	31
	100	30	M26 × 1.5	37	40	26	27	13	31

Rod End Single Knuckle Shape (Pattern Code "N2")

Outline Dimension Drawing



Angle Tolerance

Code	Dimension	Angle Tolerance
CD	The tolerance shown to the right is applied uniformly regardless of the dimensions. When manufacturing with the dimensions in the dimension table, please specify pattern code "N2".	H10
MN	10 or less	-0.1 -0.2
	Over 10 30 or less	-0.1 −0.3
	Over 30 80 or less	-0.1 -0.4

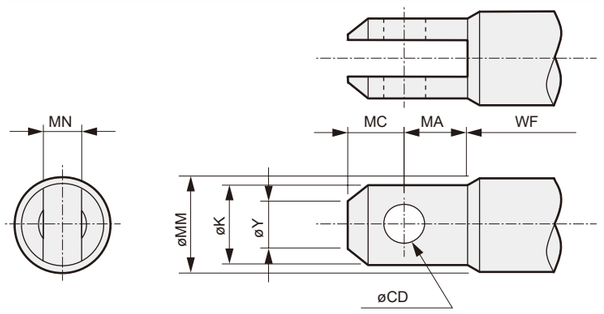
When manufacturing with the dimensions in the dimension table, please specify pattern code "N2". When it is necessary to change some dimensions, enter the pattern code followed by the dimension code, then the specified dimension.
(Example) SCM-00-40B-200-N2CD5MA7.5
The standard dimension for CD is 6, but it will be manufactured as 5.
The standard dimension for MA is 9, but it will be manufactured as 7.5.

*1: CMK2-G2/G3 dimensions are shown in ( ).
*2: For SSD-G2, G3, KG2, and KG3, use the dimensions shown in parentheses.
*3: For SSD, the WF dimension is different when LB2 or FA is selected. Please consult us separately.
*4: For SCM-LD, use the dimensions shown in parentheses.

Series	Bore Size	øMM	øCD	MN	MA	MC	øY	øK	WF
CMK2 CKV2 ULK *1	20	10	4	4	6	4	5.4	9	24
	25	12	5	5	7.5	5	6.6	11	23 (28)
	32	12	5	5	7.5	5	6.6	11	23 (28)
	40	14	6	6	9	6	7.8	13	23 (28)
SCG	32	12	5	5	7.5	5	6.6	11	25
SCG JSG	40	16	6	6	9	6	9	15	21
	50	20	8	8	12	8	11.4	19	23
	63	20	8	8	12	8	11.4	19	23
	80	25	10	10	15	10	14.4	24	32
	100	30	12	12	18	12	17.4	29	32
SCA2	40	16	6	6	9	6	9	15	33.5
	50	20	8	8	12	8	11.4	19	37
	63	20	8	8	12	8	11.4	19	35
	80	25	10	10	15	10	14.4	24	48
	100	30	12	12	18	12	17.4	29	53
SCS2	125	32	14	14	21	14	19.8	30	65
	140	32	14	14	21	14	19.8	30	67
	160	40	16	16	24	16	22.8	38	71
	180	45	18	18	27	18	25.8	43	78
	200	50	20	20	30	20	28.8	48	88
	250	60	24	24	36	24	34.8	58	94
JSC3	40	16	6	6	9	6	9	15	30
	50	20	8	8	12	8	11.4	19	34
	63	20	8	8	12	8	11.4	19	30
	80	25	10	10	15	10	14.4	24	43.5
	100	30	12	12	18	12	17.4	29	48
JSC4	125	35	14	14	21	14	19.8	33	55
	140	35	14	14	21	14	19.8	33	57
	160	40	16	16	24	16	22.8	38	71.5
	180	45	18	18	27	18	25.8	43	78.5
SSD *2 *3	12	6	–	–	–	–	–	–	–
	16	8	–	–	–	–	–	–	–
	20	10	4	4	6	4	5.4	9	4.5 (9.5)
	25	12	5	5	7.5	5	6.6	11	5 (10)
	32	16	6	6	9	6	9	15	5 (10)
	40	16	6	6	9	6	9	15	5 (10)
	50	20	8	8	12	8	11.4	19	5 (10)
	63	20	8	8	12	8	11.4	19	5(13)
	80	25	10	10	15	10	14.4	24	8 (13)
	100	30	12	12	18	12	17.4	29	8 (13)
	125	35	14	14	21	14	19.8	33	13
	140	35	14	14	21	14	19.8	33	13
	160	40	16	16	24	16	22.8	38	14
SCM *4	20	8	–	–	–	–	–	–	–
	25	10	4	4	6	4	5.4	9	18 (10)
	32	12	5	5	7.5	5	6.6	11	18 (10)
	40	16	6	6	9	6	9	15	20 (9)
	50	20	8	8	12	8	11.4	19	23 (10)
	63	20	8	8	12	8	11.4	19	23 (10)
	80	25	10	10	15	10	14.4	24	31
	100	30	12	12	18	12	17.4	29	31

Rod End Double Knuckle Shape (Pattern Code "N21")

Outline Dimension Drawing



Angle Tolerance

Code	Dimension	Angle Tolerance
CD	The tolerance shown to the right is applied uniformly regardless of the dimensions.	H10
MN	10 or less	+0.2 +0.1
	Over 10 to 30 or Less	+0.3 +0.1
	Over 30 to 80 or Less	+0.4 +0.1

When manufacturing with the dimensions in the dimension table, please specify pattern code "N21". When it is necessary to change some dimensions, enter the pattern code followed by the dimension code, then the specified dimension.

(Example) SCM-00-40B-200-N21CD5MA7.5

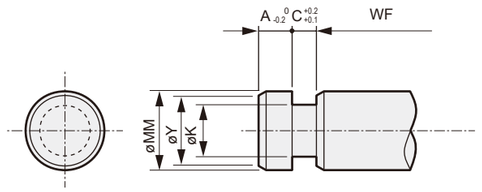
The standard dimension for CD is 6, but it will be manufactured as 5. The standard dimension for MA is 9, but it will be manufactured as 7.5.

*1: CMK2-G2/G3 dimensions are shown in ( ).
*2: For SSD-G2, G3, KG2, and KG3, use the dimensions shown in parentheses.
*3: For SSD, the WF dimension is different when LB2 or FA is selected. Please consult us separately.
*4: For SCM-LD, use the dimensions shown in parentheses.

Series	Bore Size	øMM	øCD	MN	MA	MC	øY	øK	WF
CMK2 CKV2 ULK *1	20	10	4	4	6	4	5.4	9	24
	25	12	5	5	7.5	5	6.6	11	23 (28)
	32	12	5	5	7.5	5	6.6	11	23 (28)
	40	14	6	6	9	6	7.8	13	23 (28)
SCG	32	12	5	5	7.5	5	6.6	11	25
SCG JSG	40	16	6	6	9	6	9	15	21
	50	20	8	8	12	8	11.4	19	23
	63	20	8	8	12	8	11.4	19	23
	80	25	10	10	15	10	14.4	24	32
	100	30	12	12	18	12	17.4	29	32
SCA2	40	16	6	6	9	6	9	15	33.5
	50	20	8	8	12	8	11.4	19	37
	63	20	8	8	12	8	11.4	19	35
	80	25	10	10	15	10	14.4	24	48
	100	30	12	12	18	12	17.4	29	53
SCS2	125	32	14	14	21	14	19.8	30	65
	140	32	14	14	21	14	19.8	30	67
	160	40	16	16	24	16	22.8	38	71
	180	45	18	18	27	18	25.8	43	78
	200	50	20	20	30	20	28.8	48	88
	250	60	24	24	36	24	34.8	58	94
JSC3	40	16	6	6	9	6	9	15	30
	50	20	8	8	12	8	11.4	19	34
	63	20	8	8	12	8	11.4	19	30
	80	25	10	10	15	10	14.4	24	43.5
	100	30	12	12	18	12	17.4	29	48
JSC4	125	35	14	14	21	14	19.8	33	55
	140	35	14	14	21	14	19.8	33	57
	160	40	16	16	24	16	22.8	38	71.5
	180	45	18	18	27	18	25.8	43	78.5
SSD *2 *3	12	6	–	–	–	–	–	–	–
	16	8	–	–	–	–	–	–	–
	20	10	4	4	6	4	5.4	9	4.5 (9.5)
	25	12	5	5	7.5	5	6.6	11	5 (10)
	32	16	6	6	9	6	9	15	5 (10)
	40	16	6	6	9	6	9	15	5 (10)
	50	20	8	8	12	8	11.4	19	5 (10)
	63	20	8	8	12	8	11.4	19	5 (10)
	80	25	10	10	15	10	14.4	24	8 (13)
	100	30	12	12	18	12	17.4	29	8 (13)
	125	35	14	14	21	14	19.8	33	13
	140	35	14	14	21	14	19.8	33	13
	160	40	16	16	24	16	22.8	38	14
SCM *4	20	8	–	–	–	–	–	–	–
	25	10	4	4	6	4	5.4	9	18 (10)
	32	12	5	5	7.5	5	6.6	1	18 (10)
	40	16	6	6	9	6	9	15	20 (9)
	50	20	8	8	12	8	11.4	19	23 (10)
	63	20	8	8	12	8	11.4	19	23 (10)
	80	25	10	10	15	10	14.4	24	31
	100	30	12	12	18	12	17.4	29	31

Rod End with Groove (Pattern Code "N3")

Outline Dimension Drawing



When manufacturing with the dimensions in the dimension table, please specify pattern code "N3".
When it is necessary to change some dimensions, enter the pattern code followed by the dimension code, then the specified dimension.

(Example) SCM-00-40B-200-N3WF25

WF standard dimension is 20, but this is available at 25.

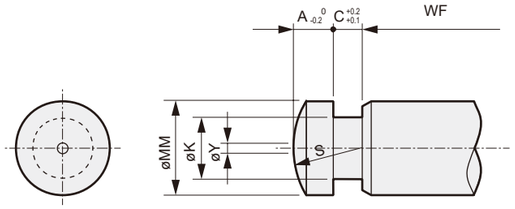
*1: CMK2-G2/G3 dimensions are shown in ( ).
*2: For SSD-G2, G3, KG2, and KG3, use the dimensions shown in parentheses.
*3: For SSD, the WF dimension is different when LB2 or FA is selected. Please consult us separately.
*4: For SCM-LD, use the dimensions shown in parentheses.

Series	Bore Size	øMM	øK	C	A	øY	WF
CMK2 CKV2 ULK *1	20	10	6	4	4	8	24
	25	12	7.2	4.8	4.8	10	23 (28)
	32	12	7.2	4.8	4.8	10	23 (28)
	40	14	8.4	5.6	5.6	12	23 (28)
SCG	32	12	7.2	4.8	4.8	10	25
SCG JSG	40	16	9.6	6.4	6.4	14	21
	50	20	12	8	8	18	23
	63	20	12	8	8	18	23
	80	25	15	10	10	22	32
	100	30	18	12	12	27	32
SCA2	40	16	9.6	6.4	6.4	14	33.5
	50	20	12	8	8	18	37
	63	20	12	8	8	18	35
	80	25	15	10	10	22	48
	100	30	18	12	12	27	53
SCS2	125	32	21	14	14	29	65
	140	32	21	14	14	29	67
	160	40	24	16	16	36	71
	180	45	27	18	18	41	78
	200	50	30	20	20	46	88
	250	60	36	22	22	56	94
JSC3	40	16	9.6	6.4	6.4	14	30
	50	20	12	8	8	18	34
	63	20	12	8	8	18	30
	80	25	15	10	10	22	43.5
	100	30	18	12	12	27	48
JSC4	125	35	21	14	14	32	55
	140	35	21	14	14	32	57
	160	40	24	16	16	36	71.5
	180	45	27	18	18	41	78.5
SSD *2 *3	12	6	–	–	–	–	–
	16	8	–	–	–	–	–
	20	10	6	4	4	8	4.5 (9.5)
	25	12	7.2	4.8	4.8	10	5 (10)
	32	16	9.6	6.4	6.4	14	7 (12)
	40	16	9.6	6.4	6.4	14	7 (12)
	50	20	12	8	8	18	8 (13)
	63	20	12	8	8	18	8 (13)
	80	25	15	10	10	22	10 (15)
	100	30	18	12	12	27	12 (17)
	125	35	21	14	14	33	16
	140	35	21	14	14	33	16
	160	40	24	16	16	38	17
SCM *4	20	8	–	–	–	–	–
	25	10	6	4	4	8	18 (10)
	32	12	7.2	4.8	4.8	10	18 (10)
	40	16	9.6	6.4	6.4	14	20 (9)
	50	20	12	8	8	18	23 (10)
	63	20	12	8	8	18	23 (10)
	80	25	15	10	10	22	31
	100	30	18	12	12	27	31

Custom

Rod End with Groove and Spherical Radius (Pattern Code "N31")

Outline Dimension Drawing



When manufacturing with the dimensions in the dimension table, please specify pattern code "N31".
When it is necessary to change some dimensions, enter the pattern code followed by the dimension code, then the specified dimension.
(Example) SCM-00-40B-200-N31WF25
WF standard dimension is 20, but this is available at 25.
*1: CMK2-G2/G3 dimensions are shown in ( ).
*2: For SSD-G2, G3, KG2, and KG3, use the dimensions shown in parentheses.
*3: For SSD, the WF dimension is different when LB2 or FA is selected. Please consult us separately.
*4: For SCM-LD, use the dimensions shown in parentheses.

Series	Bore Size	øMM	øK	C	A	S	øY	WF
CMK2	20	10	6	4	4	10	0.5	24
CKV2	25	12	7.2	4.8	4.8	12	0.5	23 (28)
ULK	32	12	7.2	4.8	4.8	12	0.5	23 (28)
*1	40	14	8.4	5.6	5.6	14	0.5	23 (28)
SCG	32	12	7.2	4.8	4.8	12	0.5	25
SCG	40	16	9.6	6.4	6.4	16	1	21
JSG	50	20	12	8	8	20	1	23
	63	20	12	8	8	20	1	23
	80	25	15	10	10	25	1	32
	100	30	18	12	12	30	1	32
SCA2	40	16	9.6	6.4	6.4	16	1	33.5
	50	20	12	8	8	20	1	37
	63	20	12	8	8	20	1	35
	80	25	15	10	10	25	1	48
	100	30	18	12	12	30	1	53
SCS2	125	32	21	14	14	32	1	65
	140	32	21	14	14	32	2	67
	160	40	24	16	16	40	2	71
	180	45	27	18	18	45	2	78
	200	50	30	20	20	50	2	88
	250	60	36	22	22	60	2	94
JSC3	40	16	9.6	6.4	6.4	16	1	30
	50	20	12	8	8	20	1	34
	63	20	12	8	8	20	1	30
	80	25	15	10	10	25	1	43.5
	100	30	18	12	12	30	1	48
JSC4	125	35	21	14	14	35	1	55
	140	35	21	14	14	35	2	57
	160	40	24	16	16	40	2	71.5
	180	45	27	18	18	45	2	78.5
SSD	12	6	–	–	–	–	–	–
*2	16	8	–	–	–	–	–	–
*3	20	10	6	4	4	10	0.5	4.5 (9.5)
	25	12	7.2	4.8	4.8	12	0.5	5 (10)
	32	16	9.6	6.4	6.4	16	1	7 (12)
	40	16	9.6	6.4	6.4	16	1	7 (12)
	50	20	12	8	8	20	1	8 (13)
	63	20	12	8	8	20	1	8 (13)
	80	25	15	10	10	25	1	10 (15)
	100	30	18	12	12	30	1	12 (17)
	125	35	21	14	14	35	2	16
	140	35	21	14	14	35	2	16
	160	40	24	16	16	40	2	17
SCM	20	8	–	–	–	–	–	–
*4	25	10	6	4	4	10	0.5	18 (10)
	32	12	7.2	4.8	4.8	12	0.5	18 (10)
	40	16	9.6	6.4	6.4	16	1	20 (9)
	50	20	12	8	8	20	1	23 (10)
	63	20	12	8	8	20	1	23 (10)
	80	25	15	10	10	25	1	31
	100	30	18	12	12	30	1	31

MEMO

Product guide

	Page
Booster (B)	Ending 26
Air-Hydro Booster (AHB)	Ending 26
Celcon Cylinder / Celcon Hydro Cylinder	Ending 27

Booster (High hydraulic pressure can be obtained using only pneumatic pressure)

Model No.	Bore Size mm	Pneumatic Pipe Connection Port Rc	Boosting ratio	Pressure Generated at 0.5 MPa	Discharge Oil Volume (cc)	Hydraulic Piping Connection Port Rc	Cushion
B-80-11	100	1/2	11.0	55	80	1/4	None
B-120-25	160		25.8	128	120		
B-160-25	160		25.8	128	160		

● B Series

RoHS

Air-Hydro Booster

Model No.	Bore Size mm	Max working pressure MPa	Min Operating Pressure MPa	Boosting ratio	Generated Hydraulic Pressure (at 0.5 MPa) MPa	Fast-feed Discharge Volume cm^3 (min-max)	High-pressure Discharge Volume cm^3 (min-max)
AHB	50	1.0	0.2	1:13	65	90 to 360	7 to 28
				1:25	125	94 to 366	3.5 to 14
	100			1:4	20	294 to 1,176	95 to 380
				1:16	80	370 to 1,480	22 to 88
				1:30	150		11 to 44
	160			1:4	20	750 to 3,000	240 to 960
				1:16	80	940 to 3,760	60 to 240
				1:28	140	950 to 3,800	33 to 132

RoHS

Overview

An air-hydro booster is a booster device that converts pneumatic pressure, which is the operating source, into hydraulic pressure several to several tens of times higher using a built-in intensifier with hydraulic fluid. It is particularly convenient as it allows for a two-stage discharge: a low-pressure, large oil volume discharge for fast-feed, and a high-pressure, small oil volume discharge for intensified feed. With a low-cost pneumatic source, it can achieve automation requiring high hydraulic pressure, such as for marking, caulking, and pressing.

Main features

●Converts pneumatic pressure to high hydraulic pressure
High hydraulic pressure can be obtained using only pneumatic pressure.

●Stepless pressure adjustment
Hydraulic pressure can be adjusted steplessly just by adjusting the pneumatic pressure.

●No rise in oil temperature
Since there is no rise in oil temperature, stable operation can be obtained.

●Can switch between fast-feed and intensified feed.
Two-stage discharge for fast-feed and intensified feed can be easily performed with an air directional valve.

●Low air consumption.
For the same output, air consumption is 1/8.

Celcon Cylinder / Celcon Hydro Cylinder

Model No.	Actuation method	Bore Size mm	Standard Stroke (mm)	Max Stroke mm	Mounting type		Connection Port Rc: Cylinder part	Connection Port Rc: Brake Part	Max Operating Pressure MPa: Cylinder part	Max Operating Pressure MPa: Brake Part	Min Operating Pressure MPa: Cylinder part	Min Operating Pressure MPa: Brake Part
JCC2 JCC2-H	Double Acting	20	20.50	700	Basic type	00	1/8	M5×0.8	0.7	0.6	0.15	0.35
		30	75		Axial Foot Type	LB		1/8				
		40	100		Rod Side Flange Type	FA						
			150		Single Clevis Type	CA						
			200		Head Side Flange Type	TB						
JCC3 JCC3-H	Double Acting	40	50	600	Basic type	00	1/4	1/8	1.0	0.7	0.05	0.3
		50	75		Axial Foot Type	LB	3/8					
		63	100		Rod Side Flange Type	FA		1/4				
		80		700	Head Side Flange Type	FB						
		100	150		Single Clevis Type	CA	1/2	3/8				
		125	200	800	Double Clevis Type	CB						
		140	300		Intermediate Trunnion Type	TC		1/2				
		160	400		Rod Side Flange Type	TA	3/4			1.0	0.1	
		180	500	900	Head Side Flange Type	TB						
PCU2	Double Acting	40	50	600	Basic type	00	1/4		0.2		1.0	
		50	75		Axial Foot Type	LB	3/8					
		63	100		Rod Side Flange Type	FA						
		80		700	Head Side Flange Type	FB	1/2					
		100	150		Single Clevis Type	CA						
			200	800	Double Clevis Type	CB						
			300		Intermediate Trunnion Type	TC						
			400		Rod Side Flange Type	TA						
			500		Head Side Flange Type	TB						

Overview

The CKD Celcon Cylinder is an actuator equipped with a position detection sensor. Its operating principle is that a controller (sold separately) receives pulse signals for the travel distance oscillated from the actuator, compares them with the program input, and freely controls intermediate stops and directional changes. It is an FMS-oriented cylinder with excellent accuracy and flexible control.

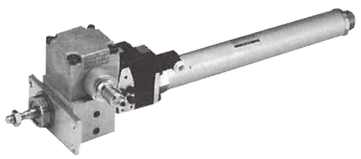
Main features

●Stop Position
Since it has a built-in position detection sensor, it can be stopped intermediately at any position.

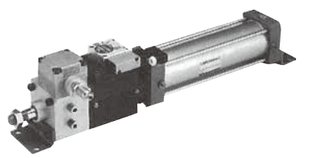
●**Excellent Stopping Accuracy**
The stopping accuracy is excellent, at ±1.0 mm or less at a cylinder speed of 300 mm/s. (at no load).

●High Safety
When the pneumatic source and power supply are OFF (such as during a power outage or accident), the Piston Rod is locked and operates on the safe side.

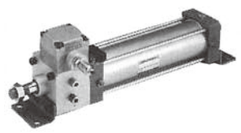
●Strong Holding Force
It has a holding force approximately twice the cylinder thrust (at 0.4 MPa). (JCC3: ø40 to ø180)



JCC2-FA-30



JCC3-LB-63B



PCU2-LB-63B

Standard-Compliant Products, ISO

Listed Page

CE Marking Ending 30

RoHS Compliance Ending 32

ISO9001/ISO14001 Certification Acquisition Ending 34

CE Marking

CKD offers a variety of European standard compliant equipment to support customers in achieving CE Marking for their machinery products.

CE : Displayed on European standard compliant products

What is CE Marking?

- CE Marking is a mark that proves a product conforms to the essential requirements of all applicable EC directives.
- CE marking is a product passport within the EU, and products displaying the CE marking can be freely circulated within the EU.
- Machinery exported to the EU is required to comply with the Machinery Directive, EMC Directive, Low Voltage Directive, etc., but since CE marking is, in principle, mandatory for final products that flow directly to the market, marking on built-in components is not originally required. However, if built-in components (CKD equipment products) are certified for European standards, it makes CE Marking easier for the final product (your machinery product).

Content of Each EC Directive

CKD's main products, such as solenoid valves, sensors, and ABSODEX, are required to conform to the following directives, and many models are European standard compliant.

Directive	Requirements	Applicable
Machinery Directive (2006/42/EC)	Essential safety requirements for machinery	■ Machinery with drive parts Equipment such as solenoid valves are not subject to this, but ensuring compliance with standards makes CE Marking easier for customers.
EMC Directive (2014/30/EU)	Measures for both the generation of electromagnetic disturbance (EMI/emission) and the ability to eliminate electromagnetic disturbance (EMS/immunity)	■ Equipment that generates electromagnetic disturbance or equipment that is affected by electromagnetic disturbance Solenoid valves composed of simple solenoids do not generate electromagnetic disturbance, but ensuring compliance with standards makes CE Marking easier for customers.
Low Voltage Directive (2014/35/EU)	Electrical safety regarding electric shock, etc.	■ Components operating at 50 VAC to 1000 VAC and 75 VDC to 1500 VDC
Simple Pressure Vessels Directive (2014/29/EU)	Safety regarding leakage and explosion of containers	■ Welded containers where the product of maximum Operating Pressure and volume (PV·S) exceeds 50 bar-liters Our air tanks (AT type) do not conform, so they cannot be exported to the EU.
RoHS Directive (2011/65/EU)	Restriction of 6 environmentally hazardous substances	■ Electrical/Electronic Equipment
2011/65/EU and (EU) 2015/863	Restriction of 10 environmentally hazardous substances	■ Electrical/Electronic Equipment

The countries to which CE marking applies are EU (European Union) member states, EFTA (European Free Trade Association) member states, and Turkey.

CKD's Compliance with European Standard Compliant Products

⚠Compliant products may not be available depending on the specification and detailed model number combination; for details, please contact our sales representative. For the latest information, please visit our website.
Home Page Address https://www.ckd.co.jp/en/productinfo/eu/

CKD RoHS Compliance

At CKD, our theme is the development of environmentally friendly products.

RoHS

RoHS is the abbreviation for Restriction Of the use of certain Hazardous Substances in electrical and electronic equipment. This is the directive prohibiting use of certain hazardous substances issued by the EU.

- ◆CKD products are approved as in conformity to RoHS directive in order of priority from July 1, 2006.
- ◆RoHS-compliant products are designed to reduce environmental load and can be distributed in the EU countries.

Environmental Policy

Based on the CKD Environmental Policy established in 2001, our company is engaged in environmental management system activities company-wide to protect the global environment.

CKD's Environmental Policy

1. Promote development and sales of low environmental load
2. Clarify and comply with the requirements of environmental laws and regulations, and promote the realization of carbon neutrality and the prevention of environmental pollution.
   a) Reduce CO_2 emissions b) Promote resource conservation
   c) Reduce waste d) Reduce environmental pollutants

Response to RoHS of CKD

For our main equipment products, we have been progressively implementing RoHS compliance since July 2006. This catalog indicates RoHS-compliant products with the "RoHS-compliant" mark.

(Note) For the latest compliance status, please check our website.

Technical Data

RoHSDirective

(Directive 2011/65/EU of 27 January 2003 on the restriction of the use of certain hazardous substances in electrical and electronic equipment)

This directive assimilates laws related to limiting the use of hazardous substances in electrical and electronics components set forth by each EU member state, contributes to the protection of human health, and provides sufficient means for processing and recycling waste electrical and electric products.

1 Scope of Application

1. Large household electrical appliances
2. Small appliances
3. IT Components and Telecommunications Components
4. Civilian Components
5. Lighting Components
6. Electric tools
7. Toys, leisure goods and sports components
8. Medical components, in-vitro diagnostics components
9. Monitoring and control components, industrial monitoring and control equipment
10. Vending machines
11. Other electrical and electronic equipment not falling into the above categories

Our components products mainly correspond to category 9, industrial monitoring and control equipment. (Some medical devices in Category 8 and non-applicable products also exist)

2 Directive Contents

Regulated substances (2011/65/EU)
- Lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBBs)
- Polybrominated diphenyl ethers (PBDE)

Additional regulated substances ((EU) 2015/863)
- Specific phthalates (DEHP, DBP, BBP, DIBP)

Electrical and electronic equipment containing the above substances, products in Categories 8 and 9, will not be able to be brought into the EU from July 22, 2021, and other categories from July 22, 2019, in principle.

Regarding ISO9001/ISO14001 Certification Acquisition

We deliver reliable quality that is gentle to people, machines, and the environment.

CKD has obtained ISO 9001 and ISO 14001 certification and established a quality and environmental management system. With safety, the environment, and energy saving as our primary themes, our entire company is dedicated to creating safe, reliable products and quality that pose no harm to people, machinery, society, or the global environment.

ISO 9001
マネジメントシステム登録証
CKD株式会社
JGA

ISO 14001
マネジメントシステム登録証
CKD株式会社
JGA

MEMO

MEMO

Ending

MEMO

MEMO

MEMO

MEMO

Ending

Model No. [Alphabetical Index]

Model No.	Model Name	Catalog No./Page
HS	Fluid Actuated Valve for Gas Combustion System	1024
HSV	(SV) Manual Valve/Standard	RJ-012AA

■Listed Page
This is the specification/model number page for models listed in this catalog.

■Listed Catalog No.

RJ-002AA ... Pneumatic Cylinder ①
RJ-003AA ... Pneumatic Cylinder ②
RJ-004AA ... Pneumatic Cylinder ③
RJ-005AA ... Pneumatic Cylinder ④
RJ-006AA ... Pneumatic Cylinder ⑤
RJ-007AA ... Air Preparation, Pressure Control, and Auxiliary Components
RJ-008AA ... Sensors/Controllers
RJ-009AA ... Main Line Equipment/Gas Generators
RJ-010AA ... Precision Components/Vacuum Components
RJ-011AA ... Directional Control Valve ①
RJ-012AA ... Directional Control Valve ②
RJ-013AA ... Fluid Control Valve
RJ-014AA ... Electric Actuator ROBODEX Pluse
RJ-015AA ... Electric Actuator ROBODEX Std.
RJ-016AA ... Dry Fine Equipment
CB-019SAA ... Indexman General
CB-031AA ... Wet Fine Equipment General
CB-054AA ... ABSODEX General
CB-055AA ... Electric Actuator Motorless General
CC-1055AA ... Life Science Equipment
CC-1276AA ... Outdoor Products WP Series
CC-1590AA ... Gas Combustion System
CC-1637AA ... Pharmaceutical Manufacturing Process Equipment
CC-297AA ... Automatic Watering Control Equipment

Others list the single item catalog No. for each series.

■Symbols
(SV)...Single Valve (WR)…Wiring Reduced Manifolds (IM) …Individual Manifold
(MX)...Mixed Manifold (BM)…Block Manifolds (MN)…Manifold

Model No.	Model Name	Catalog No./Page
1		
1219	Micro-mist Separator/Micro Naught Type (For Oil Mist Removal)	RJ-007AA
1238	Micro-mist Separator/Micro Naught Type (For Oil Mist Removal)	RJ-007AA
1326	Heavy Duty Air Filter	RJ-007AA
1126-□-□Y	Submicron Air Filter (For Tar Removal)	RJ-007AA
1126-□-E	Air Filter	RJ-007AA
1138-□-□Y	Submicron Air Filter (For Tar Removal)	RJ-007AA
1138-□-E	Air Filter	RJ-007AA
1226(J)	Micro-mist Separator/Micro Naught Type (For Oil Mist Removal)	RJ-007AA
1226(J)-□-X	Micro-mist Separator/Odor Naught Type (For Odor Removal)	RJ-007AA
1238-□-X	Micro-mist Separator/Odor Naught Type (For Odor Removal)	RJ-007AA
1326-□-□Y	Submicron Air Filter (For Tar Removal)	RJ-007AA
2		
2215	Regulator	RJ-007AA
2216	Regulator	RJ-007AA
2302 to 2304-□C	Dial Air Regulator	RJ-007AA
2302 to 2304-□C-R	Remote Control Dial Air Regulator	RJ-007AA
2415	Reverse Regulator (Built-in Check Valve)	RJ-007AA
2415-P11	Reverse Regulator (Built-in Check Valve)/Ozone Resistant	RJ-007AA
2419	Reverse Regulator (Built-in Check Valve)	RJ-007AA
2619	Regulator	RJ-007AA
2QV	Quick Valve with Push-in Fitting	RJ-007AA
3		
3003E to 3005E	Lubricator/Economist Type	RJ-007AA
3003E-□C-V	Lubricator/Auto Fill Type	RJ-007AA
3GA1/2/3	(SV)Pilot Operated 3-Port Valve/Direct Piping	RJ-012AA
3GA1/2/3	(SV)Air Operated 3-Port Valve (Master Valve)/Direct Piping	RJ-012AA
3GB1/2	(SV)Pilot Operated 3-Port Valve Dual Unit/Base Piping	RJ-012AA
3GD1/2/3	(SV)Pilot Operated 3-Port Valve/Direct Piping	RJ-012AA
3GD1/2□0EJ	(SV)Intrinsically Safe Explosion-proof Pilot Operated 3-Port Valve/Direct Piping	RJ-012AA
3GD1/2□0EX	(SV)Intrinsically Safe Explosion-proof Pilot Operated 3-Port Valve/Direct Piping	RJ-012AA
3GE1/2	(SV)Pilot Operated 3-Port Valve Dual Unit/Base Piping	RJ-012AA
3GE1/2□0EJ	(SV)Intrinsically Safe Explosion-proof Pilot Operated 3-Port Valve/Base Piping	RJ-012AA
3GE1/2□0EX	(SV)Intrinsically Safe Explosion-proof Pilot Operated 3-Port Valve/Base Piping	RJ-012AA
3KA1	(SV)Pilot Operated 3-Port Valve/Direct Piping	RJ-012AA
3KA1	(SV)Air Operated 3-Port Valve (Master Valve)/Direct Piping	RJ-012AA
3MA0	(SV)Direct Acting 3-Port Valve/Direct Piping	RJ-012AA
3MB0	(SV)Direct Acting 3-Port Valve/Sub-plate Piping	RJ-012AA
3PA1/2	(SV)Direct Acting 3-Port Valve/Direct Piping	RJ-012AA
3PB1/2	(SV)Direct Acting 3-Port Valve/Sub-plate Piping	RJ-012AA
3QB1	(SV)Direct Acting 3-Port Valve/Sub-plate Piping	RJ-012AA
3QE1	(SV)Direct Acting 3-Port Valve/Sub-plate Piping	RJ-012AA
3QRA1	(SV)Direct Acting 3-Port Valve/Direct Piping	RJ-012AA
3QRB1	(SV)Direct Acting 3-Port Valve/Sub-plate Piping	RJ-012AA
3QV	Quick Valve with Push-in Fitting	RJ-007AA
4		
4001, 4002	Desiccant Air Dryer/Manual Air Dryer	RJ-009AA
4F0/1/2/3	(SV)Pilot Operated 5-Port Valve/Direct Piping	RJ-012AA
4F0/1/2/3	(SV)Air Operated 5-Port Valve (Master Valve)/Direct Piping	RJ-012AA
4F2/3	(SV)Pilot Operated 5-Port Valve Outdoor Specification	CC-1276AA
4F3□□0EX	(SV)Explosion-proof Pilot Operated 5-Port Valve/Direct Piping	RJ-012AA
4F3□□0E	(SV)Explosion-proof Pilot Operated 5-Port Valve/Direct Piping	RJ-012AA
4F4/5/6/7	(SV)Pilot Operated 5-Port Valve/Sub-plate Piping	RJ-012AA
4F4/5/6/7	Air Operated 5-Port Valve (Master Valve)/Sub-plate Piping	RJ-012AA
4F4/5/6/7□□0EX	(SV)Explosion-proof Pilot Operated 5-Port Valve/Sub-plate Piping	RJ-012AA
4F4/5/6/7□□0E	(SV)Explosion-proof Pilot Operated 5-Port Valve/Sub-plate Piping	RJ-012AA
4GA1/2/3	(SV)Pilot Operated 5-Port Valve/Direct Piping	RJ-011AA
4GA1/2/3	(SV)Air Operated 5-Port Valve (Master Valve)/Direct Piping	RJ-012AA
4GA4	(SV)Pilot Operated 5-Port Valve/Direct Piping	RJ-011AA
4GB1/2/3	(SV)Pilot Operated 5-Port Valve/Base Piping	RJ-011AA
4GB1/2/3	(SV)Air Operated 5-Port Valve (Master Valve)/Base Piping	RJ-012AA
4GB4	(SV)Pilot Operated 5-Port Valve/Base Piping	RJ-011AA
4GD1/2/3	(SV)Pilot Operated 5-Port Valve/Direct Piping	RJ-011AA
4GD1/2/3/4□0EJ	(SV)Intrinsically Safe Explosion-proof Pilot Operated 5-Port Valve/Direct Piping	RJ-012AA
4GD1/2/3/4□0EX	(SV)Intrinsically Safe Explosion-proof Pilot Operated 5-Port Valve/Direct Piping	RJ-012AA
4GE1/2/3	(SV)Pilot Operated 5-Port Valve/Base Piping	RJ-011AA
4GE1/2/3/4□0EJ	(SV)Intrinsically Safe Explosion-proof Pilot Operated 5-Port Valve/Base Piping	RJ-012AA
4GE1/2/3/4□0EX	(SV)Intrinsically Safe Explosion-proof Pilot Operated 5-Port Valve/Base Piping	RJ-012AA
4KA1/2/3/4	(SV)Pilot Operated 5-Port Valve Direct Piping	RJ-012AA
4KA1/2/3/4	(SV)Air Operated 5-Port Valve (Master Valve)/Direct Piping	RJ-012AA
4KB1/2/3/4	(SV)Pilot Operated 5-Port Valve/Sub-plate Piping	RJ-012AA
4KB1/2/3/4	(SV)Air Operated 4, 5-Port Valve (Master Valve)/Sub-plate Piping	RJ-012AA
4SA0	(SV)Pilot Operated 5-Port Valve/Direct Piping	RJ-011AA
4SB0	(SV)Pilot Operated 5-Port Valve/Sub-plate Piping	RJ-011AA
5		
5100-4C	Heavy Duty Drain	RJ-009AA
6		
6119-2C	Moisture Indicator	RJ-009AA
A		
A100 to 800-W	Piping Adapter/Standard White Series	RJ-007AA
A101 to 801-W	L-type Piping Adapter/Standard White Series	RJ-007AA
A1019	Air Filter	RJ-007AA
A1338	Heavy Duty Air Filter	RJ-007AA
A1338-□Y	Submicron Air Filter (For Tar Removal)	RJ-007AA
A2-3400	Cryogenic 2-Port Solenoid Valve	RJ-013AA
A2-5201	Direct Acting 2-Port Solenoid Valve (For High Frequency Operation)	RJ-013AA
A2-5202	Pilot Operated 2-Port Solenoid Valve (For High Frequency Operation)	RJ-013AA
A2-5800	Cryogenic 2-Port Solenoid Valve	RJ-013AA
A3019	Lubricator/Economist Type	RJ-007AA
AB21	Direct Acting 2-Port Solenoid Valve (Multilex)	RJ-013AA
AB31	Direct Acting 2-Port Solenoid Valve Single Unit (Multilex)	RJ-013AA
AB31-Z	Direct Acting 2-Port Solenoid Valve for Dry Air (Multilex)	RJ-013AA
AB41	Direct Acting 2-Port Solenoid Valve Single Unit (Multilex)	RJ-013AA
AB41E2	Explosion-proof Direct Acting 2-Port Solenoid Valve (Multilex)/d2G2	RJ-013AA
AB41E4	Explosion-proof Direct Acting 2-Port Solenoid Valve (Multilex)/d2G4	RJ-013AA

Model No. [Alphabetical Index]

Model No.	Model Name	Catalog No./Page
A		
AB41E4-Z	Explosion-proof Direct Acting 2-Port Solenoid Valve for Dry Air (Multilex)/d2G4	RJ-013AA
AB41EX2	Explosion-proof Direct Acting 2-Port Solenoid Valve (Multilex)/Exd II BT2	RJ-013AA
AB41EX4	Explosion-proof Direct Acting 2-Port Solenoid Valve (Multilex)/Exd II BT4	RJ-013AA
AB41-Z	Direct Acting 2-Port Solenoid Valve for Dry Air (Multilex)	RJ-013AA
AB42	Direct Acting 2-Port Solenoid Valve Single Unit (Multilex)	RJ-013AA
AB42E4	Explosion-proof Direct Acting 2-Port Solenoid Valve (Multilex)/d2G4	RJ-013AA
AB71	Direct Acting 2-Port Solenoid Valve (Multilex)/Large Bore	RJ-013AA
ABP	Air Booster	RJ-007AA
AD11	Pilot Operated 2-Port Solenoid Valve (Multilex)/ Diaphragm Driven	RJ-013AA
AD11E4	Explosion-proof Pilot Operated 2-Port Solenoid Valve (Multilex)/Diaphragm Driven, d2G4	RJ-013AA
AD11EX4	Explosion-proof Pilot Operated 2-Port Solenoid Valve (Multilex)/Diaphragm Driven, Exd II BT4	RJ-013AA
AD12	Pilot Operated 2-Port Solenoid Valve (Multilex)/ Diaphragm Driven	RJ-013AA
AD12E4	Explosion-proof Pilot Operated 2-Port Solenoid Valve (Multilex)/Diaphragm Driven, d2G4	RJ-013AA
AD21	Pilot Operated 2-Port Solenoid Valve (Multilex)/ Diaphragm Driven	RJ-013AA
AD21E4	Explosion-proof Pilot Operated 2-Port Solenoid Valve (Multilex)/Diaphragm Driven, d2G4	RJ-013AA
AD21EX4	Explosion-proof Pilot Operated 2-Port Solenoid Valve (Multilex)/Diaphragm Driven, Exd II BT4	RJ-013AA
AD22	Pilot Operated 2-Port Solenoid Valve (Multilex)/ Diaphragm Driven	RJ-013AA
AD22E4	Explosion-proof Pilot Operated 2-Port Solenoid Valve (Multilex)/Diaphragm Driven, d2G4	RJ-013AA
ADK11	Pilot Kick Operated 2-Port Solenoid Valve (Multilex)/ Diaphragm Driven	RJ-013AA
ADK11E4	Explosion-proof Pilot Kick Operated 2-Port Solenoid Valve (Multilex)/Diaphragm Driven, d2G4	RJ-013AA
ADK11EX4	Explosion-proof Pilot Operated 2-Port Solenoid Valve (Multilex)/Diaphragm Driven, Exd II BT4	RJ-013AA
ADK11-Z	Pilot Kick Operated 2-Port Solenoid Valve for Dry Air (Multilex)	RJ-013AA
ADK12	Pilot Kick Operated 2-Port Solenoid Valve (Multilex)/ Diaphragm Driven	RJ-013AA
ADK12E4	Explosion-proof Pilot Kick Operated 2-Port Solenoid Valve (Multilex)/Diaphragm Driven, d2G4	RJ-013AA
ADK21	Pilot Kick Operated 2-Port Solenoid Valve (Multilex)/ Diaphragm Driven	RJ-013AA
AES (Facilea)	Image Processing Visual Programming Tool	CC-1548AA
AES (Facilea AI)	Image Processing AI Tool	CC-1623AA
AESM (ExiaStudio)	Device Visual Programming Tool	CC-1579AA
AF2	Medium Size Main Line Filter	RJ-009AA
AF30□□	Large Size Main Line Filter (Standard Type)	RJ-009AA
AF40□□	Medium Size Main Line Filter (For Oil-Free)	RJ-009AA
AF50□□	Large Size Main Line Filter (For Oil-Free)	RJ-009AA
AFB-RB	Active Fine Buffer	RJ-010AA
AG3□-Z	Direct Acting 3-Port Solenoid Valve for Dry Air (Multilex)	RJ-013AA
AG3□	Direct Acting 3-Port Solenoid Valve Single Unit (Multilex)	RJ-013AA
AG4□E4-Z	Explosion-proof Direct Acting 3-Port Solenoid Valve for Dry Air (Multilex)/d2G4	RJ-013AA
AG4□-Z	Direct Acting 3-Port Solenoid Valve for Dry Air (Multilex)	RJ-013AA
AG41	Direct Acting 3-Port Solenoid Valve Single Unit (Multilex)	RJ-013AA
AG41E4	Explosion-proof Direct Acting 3-Port Solenoid Valve (Multilex)/d2G4	RJ-013AA
AG41EX4	Explosion-proof Direct Acting 3-Port Solenoid Valve (Multilex)/Exd II BT4	RJ-013AA
AG43	Direct Acting 3-Port Solenoid Valve Single Unit (Multilex)	RJ-013AA
AG43E4	Explosion-proof Direct Acting 3-Port Solenoid Valve (Multilex)/d2G4	RJ-013AA
AG43EX4	Explosion-proof Direct Acting 3-Port Solenoid Valve (Multilex)/Exd II BT4	RJ-013AA
AG44	Direct Acting 3-Port Solenoid Valve Single Unit (Multilex)	RJ-013AA
AG44E4	Explosion-proof Direct Acting 3-Port Solenoid Valve (Multilex)/d2G4	RJ-013AA
AG44EX4	Explosion-proof Direct Acting 3-Port Solenoid Valve (Multilex)/Exd II BT4	RJ-013AA
AGD	Air Operated Valve for Process Gas	CB-035AA
AHB	Air-Hydro Booster	Ending 26
AL	Air Lamp/Logic Valve	RJ-007AA
AM4F0	Ⓜ Pilot Operated 5-Port Valve/Direct Piping	RJ-012AA
AMD	Air Operated Valve for Chemicals (2-Port)	CB-031AA
AMDS	Air Operated Valve for Chemicals/Integrated Suck-back Type	CB-031AA
AMG	Air Operated Valve for Chemicals (3-Port)	CB-031AA
AMS	Suck-back Valve for Chemicals	CB-031AA
AP11	Pilot Operated 2-Port Solenoid Valve (Multilex)/ Piston Driven	RJ-013AA
AP11E2	Explosion-proof Pilot Operated 2-Port Solenoid Valve (Multilex)/Piston Driven, d2G2	RJ-013AA
AP11E4	Explosion-proof Pilot Operated 2-Port Solenoid Valve (Multilex)/Piston Driven, d2G4	RJ-013AA
AP11EX2	Explosion-proof Pilot Operated 2-Port Solenoid Valve (Multilex)/Piston Driven, Exd II BT2	RJ-013AA
AP11EX4	Explosion-proof Pilot Operated 2-Port Solenoid Valve (Multilex)/Piston Driven, Exd II BT4	RJ-013AA
AP12	Pilot Operated 2-Port Solenoid Valve (Multilex)/ Piston Driven	RJ-013AA
AP12E2	Explosion-proof Pilot Operated 2-Port Solenoid Valve (Multilex)/Piston Driven, d2G2	RJ-013AA
AP12E4	Explosion-proof Pilot Operated 2-Port Solenoid Valve (Multilex)/Piston Driven, d2G4	RJ-013AA
AP21	Pilot Operated 2-Port Solenoid Valve (Multilex)/ Piston Driven	RJ-013AA
AP21E2	Explosion-proof Pilot Operated 2-Port Solenoid Valve (Multilex)/Piston Driven, d2G2	RJ-013AA
AP21EX2	Explosion-proof Pilot Operated 2-Port Solenoid Valve (Multilex)/Piston Driven/ Exd II BT2	RJ-013AA
AP21E4	Explosion-proof Pilot Operated 2-Port Solenoid Valve (Multilex)/Piston Driven, d2G4	RJ-013AA
AP21EX4	Explosion-proof Pilot Operated 2-Port Solenoid Valve (Multilex)/Piston Driven, Exd II BT4	RJ-013AA
AP22	Pilot Operated 2-Port Solenoid Valve (Multilex)/ Piston Driven	RJ-013AA
AP22E2	Explosion-proof Pilot Operated 2-Port Solenoid Valve (Multilex)/Piston Driven, d2G2	RJ-013AA
AP22E4	Explosion-proof Pilot Operated 2-Port Solenoid Valve (Multilex)/ Piston Driven, d2G4	RJ-013AA
APE	Mechanical Pressure Switch	RJ-007AA
APK11	Pilot Kick Operated 2-Port Solenoid Valve (Multilex)/ Piston Driven	RJ-013AA
APK21	Pilot Kick Operated 2-Port Solenoid Valve (Multilex)/ Piston Driven	RJ-013AA
APS	Compact Mechanical Pressure Switch	RJ-007AA
ASU	Portable Air Supply Unit	CC-1363AA
AT	Air Tank	RJ-007AA
AVB	Air Operated Valve for High Vacuum	CB-035AA
AX1000T, 2000T, 4000T	Direct Drive Actuator ABSODEX	CB-054AA
AX1R, 2R, 4R	Direct Drive Actuator ABSODEX	CC-1614AA
AX6000M	Direct Drive Actuator ABSODEX	CB-054AA
AX9000TS, TH, MU	Driver for ABSODEX	CB-054AA
AXD	Driver for ABSODEX	CC-1614AA
AZ	Tube Cutter	RJ-007AA
B		
B	Booster	Ending 26
B□P51□	Ⓜ Pilot Operated 2, 3, 5-Port Valve/Metal Base	RJ-012AA
B110 to 820-W	Bracket/For Selex F.R.L/ Standard White Series	RJ-007AA
B2019	Regulator	RJ-007AA
B2019-P11	Regulator/Ozone Resistant	RJ-007AA
B513□	Ⓢⓥ Pilot Operated 3-Port Valve/Sub-base Type	RJ-012AA
B5142	Ⓢⓥ Pilot Operated 5-Port Valve/Sub-base Type	RJ-012AA
B6061	Relief Valve	RJ-007AA
B7019	F.R. Unit	RJ-007AA
BBS-A	Balancer Unit Automatic Pressure Adjustment Type	1038
BBS-O	Balancer Unit Fixed Pressure Adjustment Type	1054
BHA	Compact Cross Roller Parallel Gripper	RJ-006AA
BHA-FC	Mechanical Gripper	RJ-006AA
BHA-LN	Gripper with Linear Norm Sensor/Cross Roller Parallel Gripper with Sensor	1150
BHE	Centering Gripper	RJ-006AA
BHE-LN	Gripper with Linear Norm Sensor/Centering Gripper with Sensor	1150
BHG	Compact Cross Roller Parallel Gripper with Rubber Cover	RJ-006AA

Model No. [Alphabetical Index]

Model No.	Model Name	Catalog No./Page
B		
BHG-LN	Gripper with Linear Norm Sensor/Cross Roller Parallel Gripper with Rubber Cover and Sensor	1150
BN	Air Blow Nozzle General Type	RJ-007AA
BNB	Air Blow Nozzle Blower Specification	RJ-007AA
BNE-F	Air Blow Nozzle Flat Type	RJ-007AA
BNE-R	Air Blow Nozzle Round Type	RJ-007AA
BSA2	Ultra Compact Cross Roller Parallel Gripper	RJ-006AA
BW7019	Filter Regulator/Outdoor Series	CC-1276AA
C		
C1000 to 8000-P6	F.R.L. Combination/Copper Ion Restricted (No copper/PTFE Specification)	RJ-007AA
C1000 to 8000-W	F.R.L. Combination/ Standard White Series	RJ-007AA
C1010 to 8010-W	W.L. Combination/ Standard White Series	RJ-007AA
C1020 to 8020-W	F.R. Combination/ Standard White Series	RJ-007AA
C1030 to 8030-W	F.M.R. Combination/ Standard White Series	RJ-007AA
C1040 to 8040-W	W.M. Combination/ Standard White Series	RJ-007AA
C1050 to 8050-W	R.M. Combination/ Standard White Series	RJ-007AA
C1060 to 8060-W	F.M. Combination/ Standard White Series	RJ-007AA
C25N-B	Governor for Medium Pressure Gas	CC-1590AA
C3070 to 8070-W	F.F.M. Combination/ Standard White Series	RJ-007AA
CAC4	Clamp Cylinder/ Double Acting, Single Rod	742
CAC-N32/40	Lightweight Clamp Cylinder/ Double Acting, Single Rod	792
CAT	Cartridge Cylinder/ Single Acting, Push Type	RJ-003AA
CAU30	Clean Air Unit	RJ-007AA
CAV2	Cell Cylinder/ With Valve, Double Acting, Lubricated Type	694
CAW	Compact Arm	CC-1613AA
CCH	Check Valve for Liquids	RJ-013AA
CCN	Check Valve for Liquids (Nozzle Type)	RJ-013AA
CG	Air Fiber Push-in Fitting (Clean Type)	RJ-007AA
CHB	Air Operated Ball Valve 2-Port (Compact Rotary Valve)	RJ-013AA
CHBF	Air Operated Ball Valve 2-Port (Compact Rotary Valve)/Full Bore	RJ-013AA
CHC	Auto Gripper Changer	RJ-006AA
CHG	Air Operated Ball Valve 3-Port (Compact Rotary Valve)	RJ-013AA
CHL	Check Valve with Push-in Fitting	RJ-007AA
CHV2	Check Valve	RJ-007AA
CK	3-Jaw Long Stroke Chuck	RJ-006AA
CKA	3-Jaw Thin Chuck	RJ-006AA
CKF	Hollow Chuck	RJ-006AA
CKG	3-Jaw Bearing Chuck	RJ-006AA
CKH2	High Gripping Force Powerful Chuck	RJ-006AA
CKJ	Ultra Long Stroke Chuck	RJ-006AA
CKL2	Powerful Chuck	RJ-006AA
CKL2-FC	Mechanical Chuck	RJ-006AA
CKLB2	Bidirectional Powerful Chuck	RJ-006AA
CKS	Low Profile Chuck	RJ-006AA
CKV2	Compact cylinder with valve/With Valve, Double Acting, Single Rod	660
CKW-HP1	3-Jaw Chuck	RJ-006AA
CKWL-HP1	3-Jaw Chuck	RJ-006AA
CMA2	Small Bore Size Cylinder/Double Acting, Single Rod	RJ-002AA
CMK2	Small Bore Size Cylinder/Double Acting, Single Rod	RJ-002AA
COV□2	Cell Cylinder/With Valve, Double Acting, Lubricated Type	694
CPD	Electronic Pressure Switch for Coolant (with Digital Display)	
CPE	Mechanical Pressure Switch for Coolant (Low Pressure Type)	
CSB	Air Operated Ball Valve 2-Port for Steam (Compact Rotary Valve)	
CSBF	Air Operated Ball Valve 2-Port for Steam (Compact Rotary Valve)	
CV3E	Low Pressure Air Operated 3-Port Valve (Coolant Valve)	RJ-013AA
CVE2, CVE22	Air Operated 2-Port Valve (Coolant Valve)	RJ-013AA
CVE3	Air Operated 3-Port Valve (Coolant Valve)	RJ-013AA
CVS3E	Low Pressure Air Operated 3-Port Valve (Coolant Valve)/ Solenoid Valve Mounted Type	RJ-013AA
CVSE2, CVSE22	Air Operated 2-Port Valve (Coolant Valve)/Solenoid Valve Mounted Type	RJ-013AA
CVSE3	Air Operated 3-Port Valve (Coolant Valve)/Solenoid Valve Mounted Type	RJ-013AA
CXU	Air Unit	RJ-007AA
D		
D101 to 801-W	Distributor/For Selex F.R.L/ Standard White Series	RJ-007AA
DB1000, 3000	Super Drain	RJ-009AA
DBS1006	Drain Sensor	RJ-009AA
DCKW	Electric Actuator with Motor D Series 3-Finger Gripper Type	RJ-014AA
DLSH	Electric Actuator with Motor D Series 2-Finger Gripper Type	RJ-014AA
DMSDG	Electric Actuator with Motor D Series Compact Guided Type	RJ-014AA
DSC	Speed Controller with Dial	RJ-007AA
DSG	Solenoid Valve for Gas Combustion System	CC-1590AA
DSG-W	Solenoid Valve for Gas Combustion System	CC-1590AA
DSSD2	Electric Actuator with Motor D Series Rod Type	RJ-014AA
DSTG	Electric Actuator with Motor D Series Guided Type	RJ-014AA
DSTK	Electric Actuator with Motor D Series Stopper Type	RJ-014AA
DSTL	Electric Actuator with Motor D Series Guided Type	RJ-014AA
DSTS	Electric Actuator with Motor D Series Guided Type	RJ-014AA
DT3000, 3010-W	Snap Drain	RJ-009AA
DT4000, 4010-W	Snap Drain	RJ-009AA
DVL	Needle Valve with Dial	RJ-007AA
E		
E0, ET0	Cylinder Switch/Heat Resistant, Reed 2-wire	1486
ECS	Electric Actuator Motorless Specification Slider Type	CB-055AA
ETS	Electric Actuator Motorless Specification Slider Type	CB-055AA
EBS-L	Electric Actuator with Motor Specification Slider Type	CB-055AA
EBS-G, -M	Electric Actuator with Motor Specification Slider Type	RJ-014AA
EBR-L	Electric Actuator Motorless Specification	CB-055AA
EBR-G, -M	Electric Actuator with Motor Specification Slider Type	RJ-014AA
ECG	For Electric Actuator Single Axis Controller	RJ-014AA
ECMG	For Electric Actuator Multi Axis Controller	RJ-014AA
ECR	For Electric Actuator Single Axis Controller	RJ-014AA
ECV	Electric Actuator with Motor Specification Slider Type	CB-055AA
EH	Air Fiber Clean Type (For Push-in Fittings)	RJ-007AA
EKS-L	Electric Actuator with Motor Specification Slider Type	CB-055AA
EKS-M	Electric Actuator with Motor Specification Slider Type	CC-1457AA
EMB21, 41, 51	Metal-free 2-Port Solenoid Valve	RJ-013AA
EJSG	Electric Actuator with Motor Specification Slider Type	RJ-014AA
ESC4	For Electric Actuator Single Axis Controller	RJ-014AA
ESM	Electric Shuttle Mover	CC-1259AA
ETS	Electric Actuator Motorless Specification Slider Type	CB-055AA
ETV	Electric Actuator Motorless Specification Slider Type	CB-055AA
EV2100V, 2109V	Electro-Pneumatic Regulator/ Solenoid Valve Type Vacuum Compatible	RJ-007AA
EVR	Electro-Pneumatic Regulator/ Solenoid Valve Type Medium Flow	RJ-007AA
EVB□17	Electric Vacuum Valve	CB-035AA
EVD	Digital Electro-Pneumatic Regulator	RJ-007AA
EVL	Low Pressure Electro-Pneumatic Regulator	RJ-007AA
EVS2	Electro-Pneumatic Regulator/ Solenoid Valve Type Compact	RJ-007AA
EVT	Low Profile Electro-Pneumatic Regulator/Single Unit	RJ-007AA
EXA	Pilot Operated 2-Port Solenoid Valve for Compressed Air	RJ-013AA
ExiaStudio (AESM)	Device Visual Programming Tool	CC-1579AA
F		
F□	Soft nylon tube	RJ-007AA
F0V/H	Cylinder Switch/1-Color Indicator, Reed 2-wire	1482
F1000 to 8000-P6	Air Filter/Copper Ion Restricted (No copper/PTFE Specification)	RJ-007AA
F1000 to 8000-W	Air Filter/Standard White Series	RJ-007AA
F2S, F3S	Cylinder Switch/1-Color Indicator, Solid State 2/3-wire	1482
F2, 3V/H	Cylinder Switch/1-Color Indicator, Solid State 2/3-wire	1482
F3PH/V	Cylinder Switch/PNP Output Type Solid State 3-wire	1482
F2, 3Y V/H	Cylinder Switch/2-Color Indicator, Solid State 2/3-wire	1482
F3000 to 8000-G4	Air Filter/Flame Resistant Series	RJ-007AA
FA□	Ultra Compact Joint/Adjustable Socket	RJ-007AA
FA331 to 831	Exhaust Cleaner	RJ-007AA
FAC	Clean Exhaust Filter	RJ-007AA
Facilea (AES)	Image Processing Visual Programming Tool	CC-1548AA
Facilea AI (AES)	Image Processing AI Tool	CC-1623AA
FAW	Flex Arm	CC-1615AA
FBS	Ultra Compact Joint/Bushing	RJ-007AA
FBU2	Fine Buffer	RJ-010AA
FC□	Ultra Compact Joint/Clamp Fitting	RJ-007AA
FCD	Flat Cylinder Compact Demi/ Double Acting, Single Rod	RJ-003AA
FCH	Flat Cylinder Compact Demi/ Single Acting, Retracting Type	RJ-003AA
FCK	Shock Absorber, Adjustable Type	1414
FCM	Compact Flow Controller Rapiflow	RJ-008AA
FCS	Flat Cylinder Compact Demi/ Single Acting, Push Type	RJ-003AA
FCS1000	Inline Clean Filter	RJ-007AA
FCS500	Inline Clean Filter	RJ-007AA
FFB	Direct Acting 2-Port Solenoid Valve Multi-fit	RJ-013AA

Model No. [Alphabetical Index]

Model No.	Model Name	Catalog No./Page
F		
FFBM	Direct Acting 2-Port Solenoid Valve Multi-fit	RJ-013AA
FFG	Direct Acting 3-Port Solenoid Valve Multi-fit	RJ-013AA
FFGM	Direct Acting 3-Port Solenoid Valve Multi-fit	RJ-013AA
FFLD	Electric Actuator with Motor F Series 2-Finger Gripper Type (Built-in Controller)	RJ-014AA
FGRC	Electric Actuator with Motor F Series Rotary Type	RJ-014AA
FGS	Ultra Compact Joint/Gasket	RJ-007AA
FH100	Feather Gripper (Mini Parallel Gripper)	RJ-006AA
FH500	Feather Gripper (Mini Pivot Gripper)	RJ-006AA
FJ	Free Joint	1442
FK	Simple Flow Controller	1452
FLCR	Electric Actuator with Motor F Series Table Type	RJ-014AA
FLS	Ultra Compact Joint/Extension	RJ-007AA
FLSH	Electric Actuator with Motor F Series 2-Finger Gripper Type	RJ-014AA
FM□	Ultra Compact Joint/Manifold	RJ-007AA
FM3000 to 8000	Air Filter/Medium Pressure Series	RJ-007AA
FMD	Flow Control Valve	CB-031AA
FMS	Metering Valve with Silencer	RJ-007AA
FNS	Ultra Compact Joint/Double Nipple	RJ-007AA
FPL	Ultra Compact Joint/Plug	RJ-007AA
FPV	Block Valve	RJ-007AA
FS□	Ultra Compact Joint/Socket	RJ-007AA
FSL100	Inline Filter	RJ-007AA
FSL200	Inline Filter	RJ-007AA
FSL500	Inline Filter	RJ-007AA
FSM2-D	Compact Flow Sensor Rapiflow	RJ-008AA
FSM3	Compact Flow Sensor Rapiflow	RJ-008AA
FSM-V	Ultra Compact Flow Sensor Rapiflow	RJ-008AA
FSM-V-D	Separate Display Unit Rapiflow	RJ-008AA
FSM-VFM	Compact Flow Sensor/Inline Filter	RJ-008AA
FSM-X	Ultra Compact Flow Switch Rapiflow	RJ-008AA
FT□	Ultra Compact Joint/Barb Fitting	RJ-007AA
FWD	Compact Pilot Operated Solenoid Valve for Water	RJ-013AA
FWS	Ultra Compact Joint/Partition Wall	RJ-007AA
FW4000, 8000	Air Filter/Outdoor Series	CC-1276AA
FX	Drain Separator	RJ-007AA
G		
G29D	Ultra Compact Pressure Gauge	RJ-007AA
G39D	Round Pressure Gauge	RJ-007AA
G401-W	Thin Pressure Gauge	RJ-007AA
G40D	Pressure Gauge with Safety Mark	RJ-007AA
G45D	Pressure Gauge with Limit Mark	RJ-007AA
G49D, 59D	General Purpose Pressure Gauge	RJ-007AA
G49D, 59D-P6	Pressure Gauge/Copper Ion Restricted (No copper/PTFE Specification)	RJ-007AA
G52D	Pressure Gauge with Switch	RJ-007AA
G53D	Pressure Gauge for Panel Mount	RJ-007AA
GA400	Differential Pressure Gauge	RJ-007AA
GAB312/352	Direct Acting 2-Port Solenoid Valve Manifold/Actuator (Multilex)	RJ-013AA
GAB312/352-Z	Direct Acting 2-Port Solenoid Valve for Dry Air Manifold/ Actuator (Multilex)	RJ-013AA
GAB412	Direct Acting 2-Port Solenoid Valve Manifold/Actuator (Multilex)	RJ-013AA
GAB412-Z	Direct Acting 2-Port Solenoid Valve for Dry Air Manifold/ Actuator (Multilex)	RJ-013AA
GAB422	Direct Acting 2-Port Solenoid Valve Manifold/Actuator (Multilex)	RJ-013AA
GAB452	Direct Acting 2-Port Solenoid Valve Manifold/Actuator (Multilex)	RJ-013AA
GAB452-Z	Direct Acting 2-Port Solenoid Valve for Dry Air Manifold/ Actuator (Multilex)	RJ-013AA
GAG31□	Direct Acting 3-Port Solenoid Valve Manifold/Actuator (Multilex)	RJ-013AA
GAG31□-Z	Direct Acting 3-Port Solenoid Valve for Dry Air Manifold/ Actuator (Multilex)	RJ-013AA
GAG33□	Direct Acting 3-Port Solenoid Valve Manifold/Actuator (Multilex)	RJ-013AA
GAG33□-Z	Direct Acting 3-Port Solenoid Valve for Dry Air Manifold/ Actuator (Multilex)	RJ-013AA
GAG34□	Direct Acting 3-Port Solenoid Valve Actuator (Multilex)	RJ-013AA
GAG34□-Z	Direct Acting 3-Port Solenoid Valve for Dry Air Actuator (Multilex)	RJ-013AA
GAG35□	Direct Acting 3-Port Solenoid Valve Manifold/Actuator (Multilex)	RJ-013AA
GAG35□-Z	Direct Acting 3-Port Solenoid Valve for Dry Air Manifold/ Actuator (Multilex)	RJ-013AA
GAG41□	Direct Acting 3-Port Solenoid Valve Manifold/Actuator (Multilex)	RJ-013AA
GAG41□-Z	Direct Acting 3-Port Solenoid Valve for Dry Air Manifold/ Actuator (Multilex)	RJ-013AA
GAG43□	Direct Acting 3-Port Solenoid Valve Manifold/Actuator (Multilex)	RJ-013AA
GAG43□-Z	Direct Acting 3-Port Solenoid Valve for Dry Air Manifold/ Actuator (Multilex)	RJ-013AA
GAG44□	Direct Acting 3-Port Solenoid Valve Actuator (Multilex)	RJ-013AA
GAG44□-Z	Direct Acting 3-Port Solenoid Valve for Dry Air Actuator (Multilex)	RJ-013AA
GAG45□	Direct Acting 3-Port Solenoid Valve Manifold/Actuator (Multilex)	RJ-013AA
GAG45□-Z	Direct Acting 3-Port Solenoid Valve for Dry Air Manifold/ Actuator (Multilex)	RJ-013AA
GAMD	Air Operated Valve for Chemicals (Manifold/Branch Valve)	CB-031AA
GCKW	Electric Actuator with Motor Specification G Series 3-Finger Gripper	RJ-014AA
GCVE2	Modular Coolant Valve Air Operated Type	RJ-013AA
GCVSE2	Modular Coolant Valve Solenoid Valve Mounted Type	RJ-013AA
GEXA	Pilot Operated 2-Port Solenoid Valve Manifold with Push-in Fittings for Compressed Air	RJ-013AA
GFM	Float Star	RJ-010AA
GHV	Gas Combination Valve	CC-1590AA
GLC	Guideless Cylinder/Double Acting Type	1018
GMF1	Ⓜ Pilot Operated 5-Port ISO Compliant Valve/DIN Terminal Box Type/ISO Size ①	RJ-012AA
GMF1	Ⓜ Pilot Operated 5-Port ISO Compliant Valve/I/O Connector Type/ISO Size ①	RJ-012AA
GMF2	Ⓜ Pilot Operated 5-Port ISO Compliant Valve/DIN Terminal Box Type/ISO Size ②	RJ-012AA
GMF2	Ⓜ Pilot Operated 5-Port ISO Compliant Valve/I/O Connector Type/ISO Size ②	RJ-012AA
GMFZ	Ⓜ Pilot Operated 5-Port ISO Compliant Valve/DIN Terminal Box Type/ISO Size ① & ②	RJ-012AA
GMFZ	Ⓜ Pilot Operated 5-Port ISO Compliant Valve/I/O Connector Type/ISO Size ① & ②	RJ-012AA
GMMD	Manual Valve Manifold for Chemicals	CB-031AA
GNAB□	Air Operated 2-Port Valve Manifold (Compact Cylinder Valve)	RJ-013AA
GNAD□	Diaphragm Cylinder Valve Manifold	RJ-013AA
GPS2	Seating Confirmation Switch/ Single Unit	RJ-008AA
GPS3	Digital Gap Switch/Single Unit	RJ-008AA
GRC	Table Type Rotary Actuator/ Basic Type	1248
GRV	Medium Pressure Gas Combination Valve	CC-1590AA
GSSD2	Electric Actuator with Motor Specification G Series Rod Type	RJ-014AA
GSTG	Electric Actuator with Motor Specification G Series Guided Type	RJ-014AA
GSTK	Electric Actuator with Motor Specification G Series Stopper Type	RJ-014AA
GSTL	Electric Actuator with Motor Specification G Series Guided Type	RJ-014AA
GSTS	Electric Actuator with Motor Specification G Series Guided Type	RJ-014AA
GSV	Solenoid Valve for Automatic Watering Control	CC-297AA
GSV2	Solenoid Valve for Automatic Watering Control	CC-297AA
GT9000	Refrigerated Air Dryer/	RJ-009AA
GW49D	Outdoor Pressure Gauge	CC-1276AA
GW	New Joint	RJ-007AA
GX3200D	Refrigerated Air Dryer/ Compact For Equipment Installation, Standard Inlet Air (35°C) Type	RJ-009AA
GX5200D	Refrigerated Air Dryer/ Compact For Direct Compressor Connection, High Inlet Air (55°C) Type	RJ-009AA
H		
H0	Cylinder Switch/1-Color Indicator, Reed	1484
H0Y	Cylinder Switch/2-Color Indicator, Reed	1484
HAP-1C	Parallel Gripper	RJ-006AA
HAP-2 to 4CS	Parallel Gripper	RJ-006AA
HB	High Corrosion Resistance Direct Acting 2-Port Solenoid Valve	RJ-013AA
HBL	Pivot Gripper	RJ-006AA
HCA	High Speed Cylinder/Double Acting, Single Rod Type	1206
HCM	High Energy Absorption Cylinder/Double Acting, Single Rod Type	1186
HCP	Horizontal Parallel Gripper	RJ-006AA

Model No. [Alphabetical Index]

Model No.	Model Name	Catalog No./Page
H		
HD-0.5 to 9	Desiccant Air Dryer/Compact Heatless Dryer	RJ-009AA
HDL	Wide Angle Gripper	RJ-006AA
HFP	Wide Parallel Gripper	RJ-006AA
HGP	Long Stroke Parallel Gripper	RJ-006AA
HJL	Toggle Gripper	RJ-006AA
HK1	Fluid Actuated Valve for Gas Combustion System	CC-1590AA
HKP	Cross Roller Parallel Gripper	RJ-006AA
HLA	Low Profile Parallel Gripper	RJ-006AA
HLB	Low Profile Parallel Gripper	RJ-006AA
HLC	Low Profile Long Stroke Parallel Gripper	RJ-006AA
HLD	Ultra Thin Parallel Gripper	RJ-006AA
HLF2	Low Profile Long Stroke Gripper	RJ-006AA
HMD	Low Profile Wide Angle Gripper	RJ-006AA
HMC-HP1	Wide Parallel Gripper	RJ-006AA
HMF	Compact Wide Parallel Gripper	RJ-006AA
HMFB	Large Wide Parallel Gripper with LM Guide	RJ-006AA
HMTB1	Metal-free Compact Lever Type 2-Port Solenoid Valve for Medical Equipment	CC-1055AA
HMTG1	Metal-free Compact Lever Type 3-Port Solenoid Valve for Medical Equipment	CC-1055AA
HMV	(SV)Manual Valve/Miniature	RJ-012AA
HMVE	(SV)Manual Valve/Miniature	RJ-012AA
HNB1	Compact Direct Acting 2-Port Solenoid Valve	RJ-013AA
HNG1	Compact Direct Acting 3-Port Solenoid Valve	RJ-013AA
HO	Worm Reducer	CC-1601AA
HPS	Adhesion Confirmation Switch/Single Unit	RJ-008AA
HRL-1	Hybrid Robot/Single Axis Unit Element for Pneumatic Robot	1120
HS	Fluid Actuated Valve for Gas Combustion System	CC-1590AA
HSV	(SV)Manual Valve/Standard	RJ-012AA
HSVE	(SV)Manual Valve/Standard	RJ-012AA
HVB□12	High Vacuum Solenoid Valve	RJ-013AA
HVL12	Delayed Vacuum Solenoid Valve	RJ-013AA
HYA	Fine Pinch Valve	CC-1055AA
HYN	Direct Acting 2, 3-Port Valve (Fine Pinch Valve)	CC-1055AA
I		
IAGD□	Integrated Gas Supply System	CB-035AA
IAVB	Vacuum Pressure Control System	CB-035AA
J		
J100 to 800-W	Joiner/For Selex F.R.L/Standard White Series	RJ-007AA
JL	Fitting (Elbow Joint)	RJ-007AA
JSB3	Brake Unit	628
JSC3(-N) **JSC4(-N)**	Brake Cylinder (Medium/Large Bore)/Double Acting, Single Rod	422
JSG	Tie Rod Cylinder with Brake/ Double Acting, Single Rod	376
JSK2	Brake Cylinder (Small Bore ø20 to 40, Crimped Type)/Double Acting Type	324
JSM2	Brake Cylinder (Small Bore ø20 to 40, Serviceable Type)/Double Acting Type	344
K		
K0V/H	Cylinder Switch/ 1-Color Indicator, Reed 2-wire	1480
K2, 3 V/H	Cylinder Switch/ 1-Color Indicator, Solid State 2/3-wire	1480
K2, 3Y V/H	Cylinder Switch/ 2-Color Indicator, Solid State 2/3-wire	1480
K3P V/H	Cylinder Switch/ PNP Output Type, Solid State 3-wire	1480
K5V/H	Cylinder Switch/ No Indication, Reed 2-wire	1480
K60570	F.R.L. Kit	RJ-007AA
KBX	Electric Actuator with Motor Specification Slider Type Rod Type R-Axis Type	CC-1275AA
KCA	Controller	CC-1275AA
KHE	SCARA Robot	CC-1436AA
KHL	SCARA Robot	CC-1436AA
KML	Fine Level Switch	CB-031AA
KX	Coiling Tube	RJ-007AA
KZV3	Pilot Operated 2-Port Solenoid Valve	RJ-013AA
L		
L1000 to 8000-W	Lubricator/Copper Ion Restricted (No copper/PTFE Specification)	RJ-007AA
L1000 to 8000-W	Lubricator/Standard White Series	RJ-007AA
LAD	Diaphragm Cylinder Valve	RJ-013AA
LBC	Air Bearing Actuator	RJ-010AA
LCG	Linear Slide Cylinder/ Double Acting, Single Rod	RJ-004AA
LCM	Linear Slide Cylinder/ Double Acting, Single Rod	RJ-004AA
LCR	Linear Slide Cylinder/ Double Acting, Single Rod	RJ-004AA
LCW	Linear Slide Cylinder/ Double Acting, Single Rod	RJ-004AA
LCX	Linear Slide Cylinder/ Double Acting, Single Rod	RJ-004AA
LFC-KL	Lifter Cylinder	CC-902AA
LGD	Air Operated Valve for Process Gas	CB-035AA
LHA	Linear Guide Gripper	RJ-006AA
LHAG	Linear Guide Gripper with Rubber Cover	RJ-006AA
LMB	Linear Guide Lock	636
LML	Linear Guide Lock	643
LN	Cylinder with Linear Norm Sensor/Sensor, Amplifier, Indicator	1144
LSH	Linear Slide Gripper	RJ-006AA
LSH-HP1	Linear Slide Gripper	RJ-006AA
LSHL-HP1	Linear Slide Gripper	RJ-006AA
LSHM-HP2	Linear Slide Gripper with Length Measurement Function	RJ-006AA
LST-HP1	Low Profile Long Stroke Gripper	RJ-006AA
LSTM-HP2	Low Profile Long Stroke Gripper with Length Measurement Function	RJ-006AA
LW4000/LW8000	Lubricator Outdoor Series	CC-1276AA
LYX	Air Operated Valve for Chemicals	CB-031AA
M		
M0V/H	Cylinder Switch/1-Color Indicator, Reed 2-wire	1468
M1000 to 8000-P6	Oil Mist Filter/Copper Ion Restricted (No copper/PTFE Specification)	RJ-007AA
M1000 to 8000-W	Oil Mist Filter/Standard White Series	RJ-007AA
M2, 3V/H	Cylinder Switch/1-Color Indicator, Solid State 2/3-wire	1468
M2, 3WV	Cylinder Switch/2-Color Indicator, Solid State 2/3-wire	1468
M3GA1/2/3	(M)Pilot Operated 3-Port Valve/Direct Piping	RJ-011AA
M3GA1/2/3	(VR)Pilot Operated 3-Port Valve/Direct Piping	RJ-011AA
M3GA1/2/3	(MN)Air Operated 3-Port Valve (Master Valve)/Direct Piping	RJ-012AA
M3GB1/2	(M)Pilot Operated 3-Port Valve Dual Unit/Base Piping	RJ-011AA
M3GB1/2	(VR)Pilot Operated 3-Port Valve Dual Unit/Base Piping	RJ-011AA
M3GD1/2/3	(M)Pilot Operated 3-Port Valve/Direct Piping	RJ-011AA
M3GD1/2/3	(VR)Pilot Operated 3-Port Valve/Direct Piping	RJ-011AA
M3GD1/2□0EJ	(M)Intrinsically Safe Explosion-proof Pilot Operated 3-Port Valve/Direct Piping	RJ-012AA
M3GD1/2□0EX	(M)Intrinsically Safe Explosion-proof Pilot Operated 3-Port Valve/Direct Piping	RJ-012AA
M3GE1/2	(M)Pilot Operated 3-Port Valve Dual Unit/Base Piping	RJ-011AA
M3GE1/2	(VR)Pilot Operated 3-Port Valve Dual Unit/Base Piping	RJ-011AA
M3GE1/2□0EJ	(M)Intrinsically Safe Explosion-proof Pilot Operated 3-Port Valve/Base Piping	RJ-012AA
M3GE1/2□0EX	(M)Intrinsically Safe Explosion-proof Pilot Operated 3-Port Valve/Base Piping	RJ-012AA
M3KA1	(M)Pilot Operated 3-Port Valve/Direct Piping	RJ-012AA
M3KA1	(MN)Air Operated 3-Port Valve (Master Valve)/Direct Piping	RJ-012AA
M3MA0	(M)Direct Acting 3-Port Valve/ Direct Piping	RJ-012AA
M3MB0	(M)Direct Acting 3-Port Valve/ Sub-plate Piping	RJ-012AA
M3P V/H	Cylinder Switch/1-Color Indicator, PNP Output Type, Solid State 3-wire	1468
M3PA1/2	(M)Direct Acting 3-Port Valve/ Direct Piping	RJ-012AA
M3PB1/2	(M)Direct Acting 3-Port Valve/ Sub-plate Piping	RJ-012AA
M3QB1	(M)Direct Acting 3-Port Valve/ Sub-plate Piping	RJ-012AA
M3QE1	(M)Direct Acting 3-Port Valve/ Sub-plate Piping	RJ-012AA
M3QZ1	(M)Direct Acting 3-Port Valve/ Sub-plate Piping	RJ-012AA
M3QRA	(M)Direct Acting 3-Port Valve/ Direct Piping	RJ-012AA
M3QRB	(M)Direct Acting 3-Port Valve/ Sub-plate Piping	RJ-012AA
M4F0/1/2/3	(M)Pilot Operated 5-Port Valve/Direct Piping	RJ-012AA
M4F0/1/2/3	(MN)Air Operated 5-Port Valve (Master Valve)/Direct Piping	RJ-012AA
M4F3□□0EX	(M)Explosion-proof Pilot Operated 5-Port Valve/Direct Piping	RJ-012AA
M4F3□0E	(M)Explosion-proof Pilot Operated 5-Port Valve/Direct Piping	RJ-012AA
M4F4/5/6/7	(M)Pilot Operated 5-Port Valve/Sub-plate Piping	RJ-012AA
M4F4/5/6/7	Air Operated 5-Port Valve (Master Valve)/Sub-plate Piping	RJ-012AA
M4F4/5/6/7□0EX	(M)Explosion-proof Pilot Operated 5-Port Valve/ Sub-plate Piping	RJ-012AA
M4F4/5/6/7□0E	(M)Explosion-proof Pilot Operated 5-Port Valve/ Sub-plate Piping	RJ-012AA
M4GA1/2/3	(M)Pilot Operated 5-Port Valve/Direct Piping	RJ-011AA
M4GA1/2/3	(VR)Pilot Operated 5-Port Valve/Direct Piping	RJ-011AA
M4GA1/2/3	(MN)Air Operated 5-Port Valve (Master Valve)/Direct Piping	RJ-012AA
M4GA4	(M)Pilot Operated 5-Port Valve/Direct Piping	RJ-011AA
M4GA4	(VR)Pilot Operated 5-Port Valve/Direct Piping	RJ-011AA
M4GB1/2/3	(M)Pilot Operated 5-Port Valve/Base Piping	RJ-011AA

Model No. [Alphabetical Index]

Model No.	Model Name	Catalog No./Page
M		
M4GB1/2/3	ⓌⓇPilot Operated 5-Port Valve/Base Piping	RJ-011AA
M4GB1/2/3	ⓂⓃAir Operated 5-Port Valve (Master Valve)/Base Piping	RJ-012AA
M4GB4	ⓂPilot Operated 5-Port Valve/Base Piping	RJ-011AA
M4GB4	ⓌⓇPilot Operated 5-Port Valve/Base Piping	RJ-011AA
M4GD1/2/3	ⓂPilot Operated 5-Port Valve/Direct Piping	RJ-011AA
M4GD1/2/3	ⓌⓇPilot Operated 5-Port Valve/Direct Piping	RJ-011AA
M4GD1/2/3/4□0EJ	ⓂIntrinsically Safe Explosion-proof Pilot Operated 5-Port Valve/Direct Piping	RJ-012AA
M4GD1/2/3/4□0EX	ⓂIntrinsically Safe Explosion-proof Pilot Operated 5-Port Valve/Direct Piping	RJ-012AA
M4GE1/2/3	ⓂPilot Operated 5-Port Valve/Base Piping	RJ-011AA
M4GE1/2/3	ⓌⓇPilot Operated 5-Port Valve/Base Piping	RJ-011AA
M4GE1/2/3/4□0EJ	ⓂIntrinsically Safe Explosion-proof Pilot Operated 5-Port Valve/Base Piping	RJ-012AA
M4GE1/2/3/4□0EX	ⓂIntrinsically Safe Explosion-proof Pilot Operated 5-Port Valve/Base Piping	RJ-012AA
M4KA1/2/3/4	ⓂPilot Operated 5-Port Valve/Direct Piping	RJ-012AA
M4KA1/2/3/4	ⓂⓃAir Operated 5-Port Valve (Master Valve)/Direct Piping	RJ-012AA
M4KB1/2/3/4	ⓂPilot Operated 4, 5-Port Valve/Sub-plate Piping	RJ-012AA
M4KB1/2/3/4	ⓂⓃAir Operated 4, 5-Port Valve (Master Valve)/Sub-plate Piping	RJ-012AA
M4SA0	ⓂPilot Operated 5-Port Valve/Direct Piping	RJ-011AA
M4SB0	ⓂPilot Operated 5-Port Valve/Sub-plate Piping	RJ-011AA
M4SB0	ⓌⓇPilot Operated 5-Port Valve/Sub-plate Piping	RJ-011AA
M512□	ⓈⓋPilot Operated 2-Port Valve/Direct Type	RJ-012AA
M513□	ⓈⓋPilot Operated 3-Port Valve/Direct Type	RJ-012AA
M5V/H	Cylinder Switch/No Indication, Reed 2-wire	1468
MAB1/MAG1	Metal-free 2-Port Solenoid Valve	CC-1055AA
MAVL	Large Mechanical Valve/Detector	RJ-007AA
MCP	Mechanical Power Cylinder	996
MD	Multi Monitor	RJ-008AA
MDC2	Compact Direct Cylinder/Double Acting, Single Rod Type	RJ-003AA
MDV	Compact Direct Cylinder	CC-905AA
MEB2/MEG2	Metal-free 2-Port Solenoid Valve	CC-1055AA
MEVT	Low Profile Electro-Pneumatic Regulator/Wiring-saving Manifold Type	RJ-007AA
MGD	Manual Valve for Process Gas	CB-035AA
MGPS2	Seating Confirmation Switch/Manifold	RJ-008AA
MGPS3	Digital Gap Switch/Manifold	RJ-008AA
MHB4	Miniature Electric Ball Valve 2-Port (Motor Valve)	RJ-013AA
MHG4	Miniature Electric Ball Valve 3-Port (Motor Valve)	RJ-013AA
MHPS	Adhesion Confirmation Switch/Manifold	RJ-008AA
MJB3	Metal-free Direct Acting 2-Port Solenoid Valve	CC-1055AA
MJL□	Compression Joint/Elbow Type	RJ-007AA
MJN□	Compression Joint/Sleeve	RJ-007AA
MJS□	Compression Joint/Straight Type	RJ-007AA
MJT□	Compression Joint/Tee Type	RJ-007AA
MJU□	Compression Joint/Insert Ring	RJ-007AA
MKB3	Metal-free 2-Port Solenoid Valve	CC-1055AA
MKML	Fine Level Switch Manifold	CB-031AA
MM	Medium Mechanical Valve/Detector	RJ-007AA
MM3000 to 8000	Oil Mist Filter/Medium Pressure Series	RJ-007AA
MMD	Manual Valve for Chemicals	CB-031AA
MN3E0	ⓌⓇPilot Operated 3, 4-Port Valve	RJ-011AA
MN3E00	ⓌⓇPilot Operated 3, 4-Port Valve	RJ-011AA
MN3GA1/2	Ⓘⓜ, ⒷⓂPilot Operated 3-Port Valve/Direct Piping	RJ-011AA
MN3GA1/2	ⓌⓇ, ⒷⓂPilot Operated 3-Port Valve/Direct Piping	RJ-011AA
MN3GAX12	ⓌⓇ, ⓂⓍPilot Operated 3-Port Valve/Direct Piping	RJ-011AA
MN3GB1/2	Ⓘⓜ, ⒷⓂPilot Operated 3-Port Valve Dual Unit/Base Piping	RJ-011AA
MN3GB1/2	ⓌⓇ, ⒷⓂPilot Operated 3-Port Valve Dual Unit/Base Piping	RJ-011AA
MN3GD1/2	Ⓘⓜ, ⒷⓂPilot Operated 3-Port Valve/Direct Piping	RJ-011AA
MN3GD1/2	ⓌⓇ, ⒷⓂPilot Operated 3-Port Valve/Direct Piping	RJ-011AA
MN3GDX12	ⓌⓇ, ⓂⓍPilot Operated 3-Port Valve/Direct Piping	RJ-011AA
MN3GE1/2	Ⓘⓜ, ⒷⓂPilot Operated 3-Port Valve Dual Unit/Base Piping	RJ-011AA
MN3GE1/2	ⓌⓇ, ⒷⓂPilot Operated 3-Port Valve Dual Unit/Base Piping	RJ-011AA
MN3Q	ⓌⓇDirect Acting 3-Port Valve	RJ-012AA
MN4E0	ⓌⓇPilot Operated 3, 4-Port Valve	RJ-011AA
MN4E00	ⓌⓇPilot Operated 3, 4-Port Valve	RJ-011AA
MN4EX0	ⓌⓇ/ⓂⓍPilot Operated 4-Port Valve	RJ-011AA
MN4GA1/2	Ⓘⓜ/ⒷⓂPilot Operated 5-Port Valve/Direct Piping	RJ-011AA
MN4GA1/2	ⓌⓇ/ⒷⓂPilot Operated 5-Port Valve/Direct Piping	RJ-011AA
MN4GAX12	ⓌⓇ/ⓂⓍPilot Operated 5-Port Valve/Direct Piping	RJ-011AA
MN4GB1/2	Ⓘⓜ/ⒷⓂPilot Operated 5-Port Valve/Base Piping	RJ-011AA
MN4GB1/2	ⓌⓇ/ⒷⓂPilot Operated 5-Port Valve/Base Piping	RJ-011AA
MN4GBX12	ⓌⓇ/ⓂⓍPilot Operated 5-Port Valve/Base Piping	RJ-011AA
MN4GD1/2	Ⓘⓜ/ⒷⓂPilot Operated 5-Port Valve/Direct Piping	RJ-011AA
MN4GD1/2	ⓌⓇ/ⒷⓂPilot Operated 5-Port Valve/Direct Piping	RJ-011AA
MN4GDX12	ⓌⓇ/ⓂⓍPilot Operated 5-Port Valve/Direct Piping	RJ-011AA
MN4GE1/2	Ⓘⓜ/ⒷⓂPilot Operated 5-Port Valve/Base Piping	RJ-011AA
MN4GE1/2	ⓌⓇ/ⒷⓂPilot Operated 5-Port Valve/Base Piping	RJ-011AA
MN4GEX12	ⓌⓇ/ⓂⓍPilot Operated 5-Port Valve/Base Piping	RJ-011AA
MN4KB1/2	ⒷⓂPilot Operated 5-Port Valve/Sub-plate Piping	RJ-012AA
MNRB500	Block Manifold Regulator	RJ-007AA
MNRB500-P11	Block Manifold Regulator/Ozone Resistant	RJ-007AA
MNRJB500	Block Manifold Compact Direct Acting Precision Regulator	RJ-007AA
MNV	Flow Control Valve	CB-031AA
MR10R	Metal-free Compact 2, 3-Port Solenoid Valve	CC-1055AA
MR16	Metal-free Compact 2, 3-Port Solenoid Valve	CC-1055AA
MRG2	Magnet Type Rodless Cylinder/Double Acting Type	242
MRL2	Magnet Type Rodless Cylinder/Basic Type	212
MS	Compact Mechanical Valve/Detector	RJ-007AA
MSB1□	Electric Ball Valve 2-Port for Steam (Motor Valve)	RJ-013AA
MSD	Compact Cylinder/Double Acting, Single Rod Type	RJ-003AA
MSDG-L	Compact Cylinder/Double Acting, Guided Type, with Switch	RJ-004AA
MTLPS	Tool Breakage Detection Switch/Manifold	RJ-008AA
MV3QRA	3QR Negative Pressure Switching Unit Direct Piping	RJ-012AA
MV3QRB	3QR Negative Pressure Switching Unit Sub-plate Piping	RJ-012AA
MXKML	Fine Level Switch Manifold	CB-031AA
MVB	Manual Valve for High Vacuum	CB-035AA
MVC	Compact Cylinder with Vacuum Pad/Double Acting, Single Rod Type	908
MW3GA2	ⓂPilot Operated 3-Port Valve/Direct Piping	RJ-011AA
MW3GA2	ⓌⓇPilot Operated 3-Port Valve/Direct Piping	RJ-011AA
MW4GA2	ⓂPilot Operated 5-Port Valve/Direct Piping	RJ-011AA
MW4GA2	ⓌⓇPilot Operated 5-Port Valve/Direct Piping	RJ-011AA
MW4GB2	ⓂPilot Operated 5-Port Valve/Base Side Piping	RJ-011AA
MW4GB2	ⓌⓇPilot Operated 5-Port Valve/Base Side Piping	RJ-011AA
MW4GB4	ⓂPilot Operated 5-Port Valve/Base Side Piping	RJ-011AA
MW4GB4	ⓌⓇPilot Operated 5-Port Valve/Base Side Piping	RJ-011AA
MW4GZ2	ⓂPilot Operated 5-Port Valve/Base Bottom Piping	RJ-011AA
MW4GZ2	ⓌⓇPilot Operated 5-Port Valve/Base Bottom Piping	RJ-011AA
MW4GZ4	ⓂPilot Operated 5-Port Valve/Base Bottom Piping	RJ-011AA
MW4GZ4	ⓌⓇPilot Operated 5-Port Valve/Base Bottom Piping	RJ-011AA
MW4000, 8000	Oil Mist Filter/Outdoor Series Outdoor Series	CC-1276AA
MWD	Wear Type Diaphragm Valve	CC-1637AA
MX1000 to 8000-W	High Performance Oil Mist Filter/Standard White Series	RJ-007AA
MXB1□	Electric Ball Valve 2-Port (Motor Valve)	RJ-013AA
MXB1D-N	Electric Oil-free Ball Valve 2-Port (Motor Valve)	RJ-013AA
MXB1F	Electric Ball Valve 2-Port (Motor Valve)/Full Bore	RJ-013AA
MXB1-N	Electric Oil-free Ball Valve 2-Port (Motor Valve)	RJ-013AA
MXBC2	Proportional Control Electric Ball Valve 2-Port (Motor Valve)	RJ-013AA
MXG1□	Electric Ball Valve 3-Port (Motor Valve)	RJ-013AA
MXG1D-N	Electric Oil-free Ball Valve 3-Port (Motor Valve)	RJ-013AA
MXG1-N	Electric Oil-free Ball Valve 3-Port (Motor Valve)	RJ-013AA
MXGC2	Proportional Control Electric Ball Valve 3-Port (Motor Valve)	RJ-013AA
MYB□	Metal-free 2-Port Solenoid Valve	CC-1055AA
MYG□	Metal-free 3-Port Solenoid Valve	CC-1055AA
N		
N□P51□	ⒷⓂPilot Operated 2, 3, 5-Port Valve/Block Manifold	RJ-012AA
NAB□	Air Operated 2-Port Valve Single Unit (Compact Cylinder Valve)	RJ-013AA
NAD□	Diaphragm Cylinder Valve	RJ-013AA
NAP11	Air Operated 3-Port Valve	RJ-012AA
NCK	Shock Absorber, Fixed Type	1392

Ending

Ending

Model No. [Alphabetical Index]

Model No.	Model Name	Catalog No./Page
N		
NHS-H	New Handling System/Z-axis Module HRL	1088
NHS-S	New Handling System/Z-axis Module STL-B	1100
NP13R/14R	Internal Pilot Operated 3-Port Valve Solenoid Valve Mounted Type	RJ-012AA
NPV2	Direct Air Pressure Automatic Pinch Valve	RJ-013AA
NS	Nitrogen Extraction Unit/Unit Type	RJ-009AA
NSU	Nitrogen Extraction Unit/System Type	RJ-009AA
NSR	New Handling System/X-axis Module	1076
NU	New Urethane Tubing	RJ-007AA
NVP11R	Air Operated 3-Port Valve/Solenoid Valve Mounted Type	RJ-012AA
NX4	ABSODEX	CC-1456AA
NXD	Driver	CC-1456AA
O		
OGD	Manual Valve for Process Gas	CB-035AA
OMC2	Sequential Controller for Pulse Jet Valve (Pulse Jet Controller)	RJ-013AA
P		
P1100-W	Reed Switch, Contact Type Compact Mechanical Pressure Switch	RJ-007AA
P4000-W	Mechanical Pressure Switch/Standard White Series	RJ-007AA
P4100-W	Reed Switch, Contact Type Compact Mechanical Pressure Switch	RJ-007AA
P512□	ⓈⓋPilot Operated 2-Port Valve/Pilot Type	RJ-012AA
P513□	ⓈⓋPilot Operated 3-Port Valve/Pilot Type	RJ-012AA
P5142	ⓈⓋPilot Operated 5-Port Valve/Pilot Type	RJ-012AA
P8100-W	Reed Switch, Contact Type Compact Mechanical Pressure Switch	RJ-007AA
PAW	Powerful Arm	CC-1418AA
PCC	Pin Clamp Cylinder Double Acting, Single Rod Type	878
PCIS/PCOS	Parallel cam unit	CB-019SAA
PD2	Pilot Operated 2-Port Air Operated Valve for Dust Collector	RJ-013AA
PD3	Pilot Operated 2-Port Air Operated Valve for Dust Collector	RJ-013AA
PDV2	Pilot Operated 2-Port Valve with Solenoid for Dust Collector	RJ-013AA
PDV3	Pilot Operated 2-Port Valve with Solenoid for Dust Collector	RJ-013AA
PDVE4	Explosion-proof 2-Port Solenoid Valve for Dust Collector (Explosion-proof Pulse Jet Valve)	RJ-013AA
PE	Pressure Switch/Logic Valve	RJ-007AA
PFD	Flow Sensor for Compressed Air/Separate Display Type Flurex	RJ-008AA
PG	Air Fiber Push-in Fitting (Standard Type)	RJ-007AA
PGM	Regulator for Process Gas	CB-035AA
PG-P2-B	Blank Plug	RJ-007AA
PJVB	Box Type Manifold Solenoid Valve for Operation (2-Port Solenoid Valve for Pulse Jet Control)	RJ-013AA
PKA	Pilot Kick Operated 2-Port Solenoid Valve for Air	RJ-013AA
PKS	Pilot Kick Operated 2-Port Solenoid Valve for Steam	RJ-013AA
PKW	Pilot Kick Operated 2-Port Solenoid Valve for Water	RJ-013AA
PLE-B12	Side Block/Integrated Type	RJ-007AA
PLJ-C12	YES Element/Relay Type	RJ-007AA
PLK-A11	OR Element/Line Type	RJ-007AA
PLK-B12	OR Element/Integrated Type	RJ-007AA
PLK-C12	OR Element/Relay Type	RJ-007AA
PLL-A11	AND Element/Line Type	RJ-007AA
PLL-B12	AND Element/Integrated Type	RJ-007AA
PLL-C12	AND Element/Relay Type	RJ-007AA
PLM	Memory Element/Relay Type	RJ-007AA
PLN-B12	NOT Element/Integrated Type	RJ-007AA
PLN-C12	NOT Element/Relay Type	RJ-007AA
PLN-D12	Threshold Element/Relay Type	RJ-007AA
PMM	Fine Regulator	CB-031AA
PMP	Fine Regulator	CB-031AA
PNA	Oxygen Concentration Meter	RJ-009AA
PPD3	Electronic Pressure Switch/Sensor/Amplifier Integrated Type with Display	RJ-008AA
PPD3-S	Electronic Pressure Switch, Stainless Steel Diaphragm Sensor Type/Sensor/Amplifier Integrated Type with Display	RJ-008AA
PPE	Electronic Compact Pressure Switch/Sensor/Amplifier Integrated Type without Display	RJ-008AA
PPE-□A	Electronic Compact Pressure Switch/Sensor/Amplifier Integrated Type without Display, Analog Output Type	RJ-008AA
PPEV-□A	Electronic Compact Pressure Switch/Sensor/Amplifier Integrated Type without Display, Analog Output Type	RJ-008AA
PPG-D	Electronic Pressure Sensor with Digital Display	RJ-008AA
PPLX	Linear Pick & Place Unit	CB-019SAA
PPR	Electronic Pressure Sensor with Digital Display	RJ-008AA
PPX	Digital Pressure Sensor	RJ-008AA
PRD	Amplifier/Elements and Sensors	RJ-007AA
PRE-A12	Pressure Switch/Relay Type	RJ-007AA
PRF-A2	Booster/Elements and Sensors	RJ-007AA
PRS-A12	Solenoid Valve/Relay Type	RJ-007AA
PRT	Timer/Relay Type	RJ-007AA
PSD	Sequencer Branch Block	RJ-007AA
PSE	Sequencer Input/Output Block	RJ-007AA
PSL	Sequencer AND Element	RJ-007AA
PSM	Sequencer Element	RJ-007AA
PSV	Sequencer Sub-base V-Type	RJ-007AA
PTN2	Dedicated Fitting for Air Fiber	RJ-007AA
PV5	ⓈⓋPilot Operated 5-Port ISO Compliant Valve/I/O Connector Type/ISO Size ①	RJ-012AA
PV5G	ⓈⓋPilot Operated 5-Port ISO Compliant Valve/DIN Terminal Box Type/ISO Size ①	RJ-012AA
PV5S-0	ISO Compliant Master Valve	RJ-012AA
PVP	Precision Suction Plate	RJ-010AA
PVS	Pilot Operated 2-Port Solenoid Valve	RJ-013AA
PWS	Threshold Sensor	RJ-007AA
PXB-B3	Push Button Switch/Switch Body/Separate Type	RJ-007AA
PXC-K	Limit Switch	RJ-007AA
PXC-M	Miniature Limit Switch	RJ-007AA
PXC-M	Compact Limit Switch	RJ-007AA
PXD	Proximity Sensor/Elements and Sensors	RJ-007AA
PXF	Limit Sensor/Elements and Sensors	RJ-007AA
PXV	Air Lamp	RJ-007AA
PYM	Fine Regulator	CB-031AA
PZM	Mounting Bracket/Line Type	RJ-007AA
PZU	Sub-base/Input Block/Relay Type Sub-base	RJ-007AA
Q		
QEL	Quick Exhaust Valve	RJ-007AA
QEV2	Quick Exhaust Valve	RJ-007AA
R		
R0, 3, 4, 6	Cylinder Switch/1-Color Indicator, Reed 2-wire	1470
R1, 2	Cylinder Switch/1-Color Indicator, Solid State 2-wire	1470
R1000 to 8000-P11	Regulator/Ozone Resistant	RJ-007AA
R1000 to 8000-P6	Regulator/Copper Ion Restricted (No copper/PTFE Specification)	RJ-007AA
R1000 to 8000-W	Regulator/Standard White Series	RJ-007AA
R1100 to 8100-P11	Reverse Regulator/Ozone Resistant	RJ-007AA
R1100 to 8100-P6	Reverse Regulator/Copper Ion Restricted (No copper/PTFE Specification)	RJ-007AA
R1100 to R8100-W	Reverse Regulator/Standard White Series	RJ-007AA
R2, 3Y	Cylinder Switch/2-Color Indicator, Solid State 2/3-wire	1470
R3000 to 8000-G4	Regulator/Flame Resistant Series	RJ-007AA
R3100 to 8100-G4	Reverse Regulator/Flame Resistant Series	RJ-007AA
R5	Cylinder Switch/No Indication, Reed 2-wire	1470
RA800	Compact Regulator/Compact Piston Type	RJ-007AA
RB500	Compact Regulator	RJ-007AA
RB500-P11	Compact Regulator/Ozone Resistant	RJ-007AA
RC2000	Clean Regulator	RJ-007AA
RCC2	Rotary Clamp Cylinder Double Acting, Single Rod	846
RCKL	Gripper for Collaborative Robot 3-Jaw Type	RJ-006AA
RCS2	Rotary Clamp Cylinder (Single Guide Type) Double Acting, Single Rod	816
RG	Push-in Fitting for Air Fiber (Flame Resistant Type)	RJ-007AA
RHLF	Gripper for Collaborative Robot Long Stroke Type	RJ-006AA
RJB500	Compact Direct Acting Precision Regulator	RJ-007AA
RJF	Rotary Joint	RJ-007AA
RLSH	Gripper for Collaborative Robot Compact Type	RJ-006AA
RM3000, 4000	Regulator/Medium Pressure Series	RJ-007AA
RN3000 to 8000	Oil-free Regulator	RJ-007AA
RP1000	Precision Regulator	RJ-007AA
RPE1000	Precision Regulator	RJ-007AA
RP2000	Precision Regulator	RJ-007AA
RRC	Selex Rotary/Rack & Pinion Type	1230
RS-6	Rain Sensor for Automatic Watering Control	CC-297AA
RSC	Automatic Watering Controller	CC-297AA
RSV	Solenoid Valve for Automatic Watering Control	CC-297AA
RT	Remote I/O	RJ-011AA
RTD-3A	Air Timer/Logic Valve	RJ-007AA
RW4000, 8000	Regulator/Outdoor Series Outdoor Series	CC-1276AA
RV3□	Selex Rotary/Vane Type	1288
RVC	Shock Absorber	1350
S		
SAB□□	Air Operated 2-Port Valve (Cylinder Valve)	RJ-013AA

Model No. [Alphabetical Index]

Model No.	Model Name	Catalog No./Page
S		
SAL	Compact Air Lamp/Logic Valve	RJ-007AA
SC1	Speed Controller/Medium Bore Type	RJ-007AA
SC-20A to 50A	Speed Controller/Large Bore Type	RJ-007AA
SC3P	Speed Controller/Stainless Steel Corrosion Resistant Type	RJ-007AA
SC3R	Speed Controller/Direct Port Connection, Elbow Type	RJ-007AA
SC3U	Speed Controller/Universal Type with Push-in Fitting	RJ-007AA
SC3W	Speed Controller/Elbow Type with Push-in Fitting	RJ-007AA
SCA2	Medium Bore Size Cylinder (ø40 to 100)/Double Acting, Single Rod	RJ-002AA
SCD	Speed Controller/Ultra Compact In-Out Type	RJ-007AA
SCD2	Speed Controller/In-Out Line Type with Push-in Fitting	RJ-007AA
SCG	Tie Rod Cylinder/Double Acting, Single Rod	RJ-002AA
SCK	Shock Absorber, Adjustable Type	1404
SCL2	Speed Controller/Line Type with Push-in Fitting	RJ-007AA
SCL2-N	Needle Valve/Line Type with Push-in Fitting	RJ-007AA
SCM	Round shaped cylinder/ Double Acting, Single Rod	RJ-002AA
SC-M3/M5(-F)	Speed Controller/ Ultra Compact	RJ-007AA
SCPD3	Pencil Shaped Cylinder/ Double Acting, Single Rod	RJ-002AA
SCPH3	Pencil Shaped Cylinder/ Single Acting, Retracting Type	RJ-002AA
SCPS	Pencil Shaped Cylinder/ Single Acting, Push Type	RJ-002AA
SCPS3	Pencil Shaped Cylinder/ Single Acting, Push Type	RJ-002AA
SCS2	Large Bore Size Cylinder (ø125 to 250)/ Double Acting, Single Rod, Lubricated Type	RJ-002AA
SD301, 302D	Membrane Air Dryer/Single Unit	RJ-009AA
SD301, 302E	Membrane Air Dryer/Single Unit	RJ-009AA
SD3015 to 3075	Membrane Air Dryer/Single Unit	RJ-009AA
SD401, 402D	Membrane Air Dryer/Single Unit	RJ-009AA
SD401, 402E	Membrane Air Dryer/Single Unit	RJ-009AA
SD4050 to 4100	Membrane Air Dryer/Single Unit	RJ-009AA
SDM4050 to 4100	Membrane Air Dryer/Super Dryer Modular Series (Large Size)	RJ-009AA
SFC□	Antibacterial/ bacteria-removing Filter	RJ-007AA
SFS10	bacteria-removing Filter/Inline	RJ-007AA
SFR/SFRT	Super Fan Rotary	CC-984AA
SFX	Siloxane/Ozone Remover	RJ-007AA
SHD	Desiccant Air Dryer/ Medium/ Large Heatless Dryer	RJ-009AA
SHV2	Shuttle Valve	RJ-007AA
SKAC	Contact Protection Circuit Box (For AC Circuit)	1487
SKDC	Contact Protection Circuit Box (For DC Circuit)	1487
SKH	Shockless Valve	RJ-012AA
SKL	Shock Absorber	1386
SL	Silencer/Metal Body Type	RJ-007AA
SLM	Silencer/Ultra Compact Type	RJ-007AA
SLW	Silencer/ Small Bore, Resin Body Type	RJ-007AA
SM-25	Shuttle Mover Standard Type/ High Load Type	264
SMG	Compact Cylinder/Double Acting, Single Rod	RJ-003AA
SMW	Metering Valve with Silencer	RJ-007AA
SMW2	Metering Valve with Silencer	RJ-007AA
SNP	3-Port Solenoid Valve with Spool Position Detection Function	RJ-007AA
SNS	Residual Pressure Exhaust Valve with Spool Position Detection Function	RJ-007AA
SP	Low Profile Pilot Operated 2-Port Solenoid Valve for Compressed Air	RJ-013AA
SPD	Poppet Type Diaphragm Valve	CC-1637AA
SPK	Pilot Kick Operated 2-Port Solenoid Valve for Steam	RJ-013AA
SR	Flame Resistant Tubing	RJ-007AA
SRG3	High Precision Guided Rodless Cylinder (Single Guide)/Double Acting Type	116
SRL3	Rodless Cylinder/Double Acting Type	10
SRM3	High Precision Guided Rodless Cylinder (Double Guide)/Double Acting Type	146
SRT3	Rodless Cylinder with Brake/ Double Acting Type	178
SSD	Compact Cylinder/Double Acting, Single Rod	RJ-003AA
SSD2	Compact Cylinder/Double Acting, Single Rod	RJ-003AA
SSD-LN	With Linear Norm Sensor	1144
SSG	Guided Compact Cylinder/ Double Acting, Single Rod	RJ-003AA
STG	Guided Cylinder/Double Acting, Single Rod	RJ-004AA
STK	Stopper Cylinder/Double Acting, Round Rod End Type	924
STL-□	Guided Cylinder (Long Stroke Type)/Double Acting, Single Rod	RJ-004AA
STM-M/B	Guided Cylinder/Double Acting, Single Rod	RJ-004AA
STR2-□	Twin Rod Cylinder/Double Acting, Single Rod	RJ-004AA
STS-□	Guided Cylinder (Short Stroke Type)/Double Acting, Single Rod	RJ-004AA
SU301, 302D	Membrane Air Dryer/Unit	RJ-009AA
SU301, 302E	Membrane Air Dryer/Unit	RJ-009AA
SU3015 to 3075	Membrane Air Dryer/Unit	RJ-009AA
SU401, 402D	Membrane Air Dryer/Unit	RJ-009AA
SU401, 402E	Membrane Air Dryer/Unit	RJ-009AA
SU4050, 4100	Membrane Air Dryer/Unit	RJ-009AA
SVB□□	Air Operated 2-Port Valve Solenoid Valve Mounted Type (Cylinder Valve)	RJ-013AA
SWD	Wear Type Diaphragm Valve	CC-1637AA
T		
T0V/H/C	Cylinder Switch/1-Color Indicator, Reed 2-wire	1472
T0Y	Cylinder Switch/Reed 2-wire for Magnetic Environments	1478
T1 V/H	Cylinder Switch/1-Color Indicator, Solid State 2-wire	1472
T2 V/H R	Cylinder Switch/Flexible Shielded Cable Type, Solid State 2-wire	1472
T2, 3 V/H/C	Cylinder Switch/1-Color Indicator, Solid State 2/3-wire	1472
T2, 3YL V/H	Cylinder Switch/Solid State 2/3-wire for Cutting Oil	1473
T2J V/H	Cylinder Switch/Off-delay Type, Solid State 2-wire	1472
T2YD(T)	Cylinder Switch/Solid State 2-wire for Strong Magnetic Fields	1473
T2WL V/H	Cylinder Switch/Improved Water Resistance, Solid State 2-wire	1476
T3P V/H	Cylinder Switch/PNP Output Type, Solid State 3-wire	1472
T5V/H/C	Cylinder Switch/No Indication, Reed 2-wire	1472
T8 V/H	Cylinder Switch/1-Color Indicator, Reed 2-wire	1472
TAC-25	Medium Pressure Gas Safety Shutoff Control System	CC-1590AA
TGX	Torque Guard	CC-1601AA
TLPS	Tool Breakage Detection Switch/Single Unit	RJ-008AA
TSF	Torque Saver	CC-1601AA
TVG	Plug-in Block Manifold	RJ-011AA
U		
U	Urethane Tubing	RJ-007AA
UB	Lock Unit	620
UCA2	Unit Cylinder/Double Acting, Single Rod, Plain Bearing Type	RJ-004AA
UCAC2	Clamp Cylinder with Fall Prevention/Double Acting, Single Rod	772
UCAC-N32/40	Lightweight Clamp Cylinder/ With Fall Prevention, Double Acting, Single Rod	798
UFCD	Flat Cylinder with Free Position Fall Prevention/ Double Acting, Single Rod	566
UGPS2	Seating Confirmation Switch/ Unit	RJ-008AA
UGPS3	Digital Gap Switch/Unit	RJ-008AA
UHPS	Adhesion Confirmation Switch/Unit	RJ-008AA
ULK	Brake Cylinder/Double Acting, Single Rod	296
UMB1	High Corrosion Resistance Ultra Compact Direct Acting 2-Port Solenoid Valve for Medical Equipment	CC-1055AA
UMG1	High Corrosion Resistance Ultra Compact Direct Acting 3-Port Solenoid Valve for Medical Equipment	CC-1055AA
UP	Air Fiber Antistatic Type (For Push-in Fittings)	RJ-007AA
UP-□□-F1/F2	Antistatic Tubing	RJ-007AA
UP-9102-20-□-F1	Air Fiber Antistatic Type	RJ-007AA
UP-9102-SR	Flame Resistant Air Fiber (For Push-in Fittings)	RJ-007AA
US	Compact Direct Acting 2, 3-Port Solenoid Valve (Resin Body Type)	RJ-013AA
USB□	Compact Direct Acting 2-Port Solenoid Valve	RJ-013AA
USC	Medium Bore Size Cylinder with Free Position Fall Prevention/Double Acting, Single Rod	588
USG□	Compact Direct Acting 3-Port Solenoid Valve	RJ-013AA
USSD	Compact Cylinder with Drop Prevention/Double Acting, Single Rod	514
UTLPS	Tool Breakage Detection Switch/Unit	RJ-008AA
V		
V0	Cylinder Switch/Compact Reed 2-wire for Strong Magnetic Fields	1485
V1000, 3000-W	Residual Pressure Exhaust Valve/Standard White Series	RJ-007AA
V3010, 6010-W	Residual Pressure Exhaust Valve with Keyhole, Keyhole, OSA Compliant	RJ-007AA
V3301, 3321-W	Slow Start Valve	RJ-007AA
VFA1000 to 4000	Vacuum Filter	RJ-010AA
VG	Vacuum Generator	CB-035AA
VG41D	Vacuum Pressure Gauge with Limit Mark	RJ-007AA
VLA	Solenoid Valve for Gas Combustion System	CC-1590AA
VLM	Shutoff Valve for Medium Pressure Gas Safety Shutoff Control	CC-1590AA
VNA	Solenoid Valve for Gas Combustion System	CC-1590AA

Model No. [Alphabetical Index]

Model No.	Model Name	Catalog No./Page
V		
VNA-R/RH	Solenoid Valve for Gas Combustion System	CC-1590AA
VNM	Shutoff Valve for Medium Pressure Gas Safety Shutoff Control	CC-1590AA
VNM-25-K	Safety Shutoff Valve (Fire Safety Enhanced Specification)	CC-1590AA
VNR	Solenoid Valve for Gas Combustion System (Normally Closed when energized)	CC-1590AA
VRA2000	Vacuum Regulator	RJ-010AA
VSB	Ejector System/Square Type	RJ-010AA
VSC	Ejector System/ Pad Direct Mount Type	RJ-010AA
VSECV	Vacuum Related Equipment/ Fall Prevention Valve	RJ-010AA
VSFB	Vacuum Related Equipment/ Large Capacity Union Type Vacuum Filter	RJ-010AA
VSFJ	Vacuum Related Equipment/ Compact Socket Type Vacuum Filter	RJ-010AA
VSFU	Vacuum Related Equipment/ Compact Union Type Vacuum Filter	RJ-010AA
VSG	Ejector System/20 mm Width Single Unit Dedicated Type	RJ-010AA
VSH	Ejector System/Solenoid Valve Direct Mount Type	RJ-010AA
VSJ/VSJM	Ejector System/20 mm Width General Type	RJ-010AA
VSJP/VSJPM	Vacuum Pump System/20 mm Width General Type	RJ-010AA
VSK/VSKM	Ejector System/16 mm Width General Type	RJ-010AA
VSLF	Vacuum Related Equipment/ Vacuum Break Unit	RJ-010AA
VSN/VSNM	Ejector System/10.3 mm Width General Type	RJ-010AA
VSNP/VSNPM	Vacuum Pump System/10.3 mm Width General Type	RJ-010AA
VSP	Suction Pad	RJ-010AA
VSQ	Ejector System/31.5 mm Width Single Unit Dedicated Type	RJ-010AA
VSQP	Vacuum Pump System/31.5 mm Width General Type	RJ-010AA
VSRVV	Vacuum Related Equipment/ Compact Vacuum Regulator	RJ-010AA
VST	Vacuum Related Equipment/ Air Tweezers	RJ-010AA
VSU	Ejector System/ Pipe Type	RJ-010AA
VSUS	Vacuum Related Equipment/ Vacuum Pressure Switch	RJ-010AA
VSX/VSXM	Ejector System/10.5 mm Width General Type	RJ-010AA
VSXP/ VSXPM	Vacuum Pump System/10.5 mm Width General Type	RJ-010AA
VSY	Ejector System/Vacuum Break Function Type	RJ-010AA
VSZM	Ejector System/11 mm Pitch Manifold Dedicated Type	RJ-010AA
VSZPM	Vacuum Pump System/11 mm Pitch Manifold Dedicated Type	RJ-010AA
W		
W1000 to 8100-P11	Filter Regulator/Ozone Resistant	RJ-007AA
W1000 to 8000-P6	Filter Regulator/Copper Ion Restricted (No copper/PTFE Specification)	RJ-007AA
W1000 to 8000-W	Filter Regulator/Standard White Series	RJ-007AA
W1100 to 8100-P11	Reverse Filter Regulator/ Ozone Resistant	RJ-007AA
W1100 to 8100-P6	Reverse Filter Regulator/ Copper Ion Restricted (No copper/PTFE Specification)	RJ-007AA
W1100 to 8100-W	Reverse Filter Regulator/ Standard White Series	RJ-007AA
W2P513□	Ⓢ Pilot Operated 5-Port Valve/Double Type	RJ-012AA
W3000 to 8000-G4	Filter Regulator/Flame Resistant Series	RJ-007AA
W3100 to 8100-G4	Reverse Filter Regulator/ Flame Resistant Series	RJ-007AA
W4GB2	Ⓢ Pilot Operated 3, 5-Port Valve/Base Piping	RJ-011AA
W4GB4	Ⓢ Pilot Operated 5-Port Valve/Base Side Piping	RJ-011AA
W4GZ4	Ⓢ Pilot Operated 5-Port Valve/Base Bottom Piping	RJ-011AA
WB500	Compact Filter Regulator	RJ-007AA
WFC	Capacitance Electromagnetic Flow Sensor	RJ-008AA
WFK2	Karman Vortex Type Liquid Flow Sensor Flurex	RJ-008AA
WFK3000	Karman Vortex Type Water Flow Sensor Flurex	RJ-008AA
WR1 / 2	Regulator for Water	RJ-007AA
WW4000, 8000	Filter Regulator/Outdoor Series Outdoor Series	CC-1276AA
WXU	Water Manifold Unit	RJ-008AA
Y		
YS	Y-type Strainer	RJ-013AA
Z		
ZB4-B	Switch Head	RJ-007AA
ZCK	Rotary Type Head Lever Actuator	RJ-007AA
ZRS	Roller Gear Cam Unit	CC-1601AA
ZSP	New Joint Stainless Steel Type	RJ-007AA
ZW	New Joint Stainless Steel Type	RJ-007AA

Products by Application

-FP□	For Food Manufacturing Process	CC-1271AA
-HP□	High Durability Equipment	CC-1421AA
-P4□	For Rechargeable Battery Manufacturing Process	CC-1226AA
-P5□	For Clean Components	CB-033SAA
-P6	Copper Ion Restricted (No copper/PTFE Specification)	RJ-001AA
-P7□	For Clean Components	CB-033SAA
-P8□	For Clean Components, Oil-free Treatment	CB-033SAA
-P9□	For Clean Components, Oil-free Treatment	CB-033SAA
-P11	Ozone Resistant	RJ-001AA
-P12	Oil-free Compatible	RJ-001AA
-W□	For Outdoor Use	CC-1276AA

Pneumatic Cylinder ④

Catalog No. RJ-005AA

Rodless, with Brake, Clamp, Oscillating, Rotary

Date of issue: November 15, 2024　1st Ed.

Publisher　**CKD Corporation**
2-250 Ouji, Komaki, Aichi 485-8551, Japan
https: //www.ckd.co.jp/en/

©**CKD Corporation** 2026 Printed in Japan
Reproduction Prohibited
Specifications and appearance published in this catalog are subject to change without notice for improvement.

VEGETABLE OIL INK Uses environmentally friendly “Vegetable Oil Ink”.

CKD WARRANTY

Subject to the conditions below, CKD Corporation ("CKD") warrants the first end user (the "Buyer") that CKD's products are free from defects in material and workmanship.

"Warranty Period" is one (1) year from the first delivery to the customer.

CKD will, at CKD's option, either repair or replace a defective product, including lowest transportation costs but not including installation or any other similar charges, provided that (1) the buyer notifies CKD in writing of the claimed defect within one year from the date Buyer received the product, (2) provides a complete explanation of the defect, the application of the product, and such other information concerning use of the product as CKD may request, and (3) returns the product to CKD in accordance with CKD's specific written instructions and authorization obtained from CKD prior to return of the product, and CKD's inspection confirms that the product was defective.

This warranty applies only if the product was used and applied correctly under normal operating conditions and good engineering practice; was installed, operated and maintained in accordance with all instructions issued or published by CKD; was used within stated pressure, media and operating limitations published by CKD and in effect on the date of shipment; and was not subject to abuse, misuse or unauthorized modification.

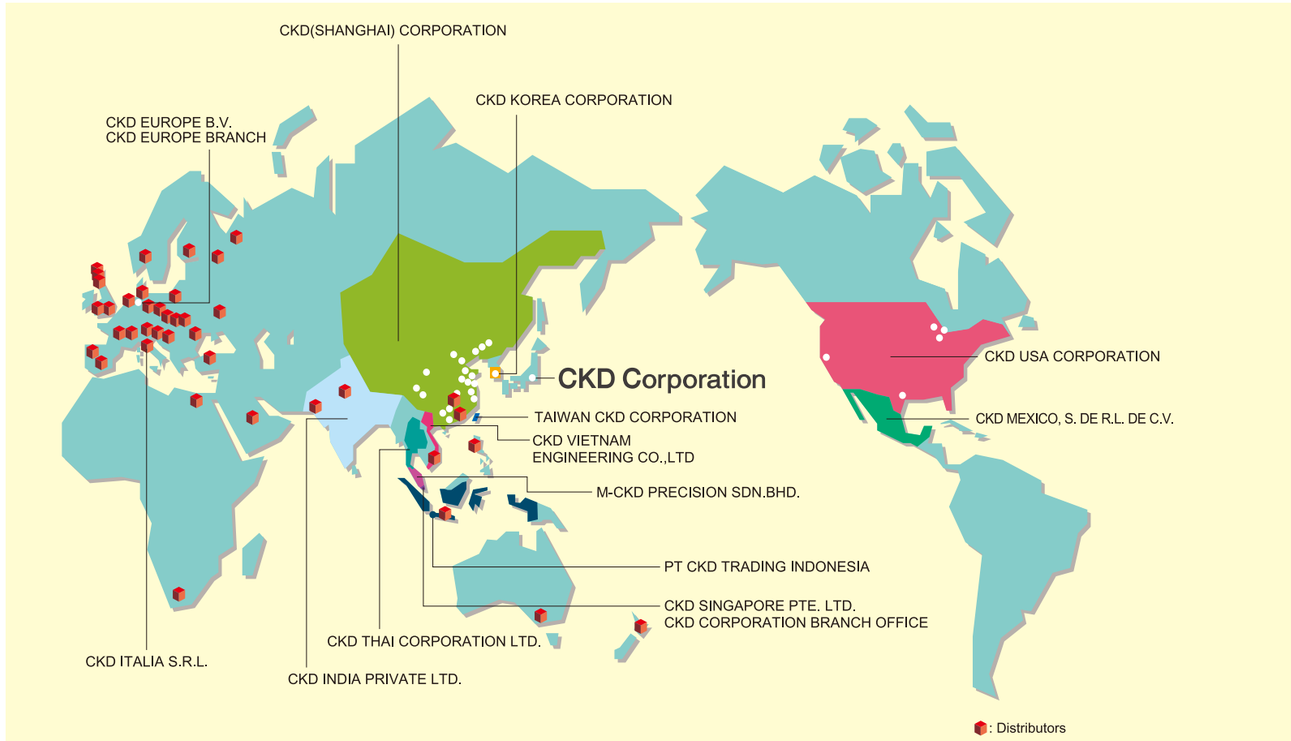
THIS WARRANTY IS THE ONLY AUTHORIZED CKD WARRANTY AND IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING ANY IMPILIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, notwithstanding any disclosure to CKD of the use to which the product is to be put. The Buyer's **SOLE AND EXCLUSIVE REMEDY** on any claim of any kind for any loss or damage arising out of the manufacture, sale, delivery or use of CKD's products shall be for the repair or replacement of any defective products as provided herein.

IN NO EVENT SHALL CKD BE LIABLE FOR BUSINESS INTERRUPTIONS, LOSS OF PROFITS, PERSONAL INJURY, COSTS OF DELAY OR FOR ANY OTHER SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL LOSSES, COSTS OR DAMAGES. There are no warranties, expressed or implied, made by CKD other than the warranty against defects in material and workmanship set forth above, and CKD neither assumes nor authorizes any other person or firm to assume for it any other obligations or liability.

CKD shall not be liable for any trouble, malfunction and damages of CKD products caused, directly or indirectly, by disaster or any other causes not attributable to CKD's responsibility. CKD also shall not be responsible for any trouble, malfunction and damages of CKD Products caused by the lack or malfunction of safety circuit or structure or function that should be commonly equipped in the Buyer's equipment in which the CKD products were used.

CKD MAINTAINS A POLICY OF ONGOING PRODUCT DEVELOPMENT AND INPROVEMENT. WE THEREFORE RESERVE THE RIGHT TO CHANGE DIMENSIONS, SPECIFICATIONS AND DESIGN WITHOUT NOTICE.

WORLD-NETWORK



CKD Corporation

Website https://www.ckd.co.jp/en/

□ 2-250 Ouji, Komaki City, Aichi 485-8551, Japan
□ PHONE +81-568-74-1338 FAX +81-568-74-1165

ASIA

喜開理(上海)機器有限公司
CKD(SHANGHAI)CORP.
- 本社/上海徐匯支店(SALES HEADQUARTERS / SHANGHAI XUHUI BRANCH OFFICE)
  Room 612, 6th Floor, Yuanzhongkeyan Building, No. 1905 Hongmei Road, Xuhui District, Shanghai 200233, China
  PHONE +86-21-61911888 / 60906048
- 上海浦東支店(SHANGHAI PUDONG BRANCH OFFICE)
- 寧波支店(NINGBO BRANCH OFFICE)
- 杭州支店(HANGZHOU BRANCH OFFICE)
- 無錫支店(WUXI BRANCH OFFICE)
- 昆山支店(KUNSHAN BRANCH OFFICE)
- 蘇州支店(SUZHOU BRANCH OFFICE)
- 常州支店(CHANGZHOU BRANCH OFFICE)
- 南京支店(NANJING BRANCH OFFICE)
- 合肥支店(HEFEI BRANCH OFFICE)
- 成都支店(CHENGDU BRANCH OFFICE)
- 武漢支店(WUHAN BRANCH OFFICE)
- 鄭州支店(ZHENGZHOU BRANCH OFFICE)
- 長沙支店(CHANGSHA BRANCH OFFICE)
- 重慶支店(CHONGQING BRANCH OFFICE)
- 西安支店(XIAN BRANCH OFFICE)
- 広州支店(GUANGZHOU BRANCH OFFICE)
- 深圳支店(SHENZHEN BRANCH OFFICE)
- 東莞支店(DONGGUAN BRANCH OFFICE)
- 廈門支店(XIAMEN BRANCH OFFICE)
- 福州支店(FUZHOU BRANCH OFFICE)
- 惠州支店(HUIZHOU BRANCH OFFICE)
- 瀋陽支店(SHENYANG BRANCH OFFICE)
- 大連支店(DALIAN BRANCH OFFICE)
- 北京支店(BEIJING BRANCH OFFICE)
- 天津支店(TIANJIN BRANCH OFFICE)
- 青島支店(QINGDAO BRANCH OFFICE)
- 済南支店(JINAN BRANCH OFFICE)

CKD INDIA PRIVATE LTD.
- HEADQUARTERS
  Unit No. 607, 6th Floor, Welldone Tech Park, Sector 48, Sohna Road, Gurgaon-122018, Haryana, India
  PHONE +91-124-418-8212
- BANGALORE OFFICE
- PUNE OFFICE
- CHENNAI OFFICE
- MUMBAI OFFICE
- HYDERABAD OFFICE

PT CKD TRADING INDONESIA
- HEAD OFFICE
  Menara Bidakara 2, 18th Floor, Jl. Jend. Gatot Subroto Kav. 71-73, Pancoran, Jakarta 12870, Indonesia
  PHONE +62-21-2938-6601 FAX +62-21-2906-9470
- MEDAN OFFICE
- BEKASI OFFICE
- KARAWANG OFFICE
- SEMARANG OFFICE
- SURABAYA OFFICE

CKD KOREA CORP.
- HEADQUARTERS
  (3rd Floor), 44, Sinsu-ro, Mapo-gu, Seoul 04088, Korea
  PHONE +82-2-783-5201~5203 FAX +82-2-783-5204
- 水原事務所(SUWON OFFICE)
- 天安事務所(CHEONAN OFFICE)
- 蔚山事務所(ULSAN OFFICE)

M-CKD PRECISION SDN.BHD.
- HEAD OFFICE
  Lot No.6,Jalan Modal 23/2, Seksyen 23, Kawasan MIEL, Fasa 8, 40300 Shah Alam,Selangor Darul Ehsan, Malaysia
  PHONE +60-3-5541-1468 FAX +60-3-5541-1533
- JOHOR BAHRU BRANCH OFFICE
- PENANG BRANCH OFFICE

CKD SINGAPORE PTE. LTD.
No.33 Tannery Lane #04-01 Hoesteel Industrial Building, Singapore 347789, Singapore
PHONE +65-67442623 FAX +65-67442486

CKD CORP. BRANCH OFFICE(ASEAN RHQ)
No.33 Tannery Lane #04-01 Hoesteel Industrial Building, Singapore 347789, Singapore
PHONE +65-67447260

CKD THAI CORP. LTD.
- HEADQUARTERS
  44, Smooth Life Tower, 19th Floor, Unit 1902, North Sathorn Road, Silom, Bangrak, Bangkok 10500, Thailand
  PHONE +66-2-267-6300 FAX +66-2-267-6304-5
- NAVANAKORN OFFICE
- EASTERN SEABOARD OFFICE
- LAMPHUN OFFICE
- KORAT OFFICE
- AMATANAKORN OFFICE
- PRACHINBURI OFFICE
- SARABURI OFFICE

台湾喜開理股份有限公司
TAIWAN CKD CORP.
- HEADQUARTERS
  16F-3, No. 7, Sec. 3, New Taipei Blvd., Xinzhuang Dist., New Taipei City 242, Taiwan
  PHONE +886-2-8522-8198 FAX +886-2-8522-8128
- 新竹営業所(HSINCHU OFFICE)
- 台中営業所(TAICHUNG OFFICE)
- 台南営業所(TAINAN OFFICE)
- 高雄営業所(KAOHSIUNG OFFICE)

CKD VIETNAM ENGINEERING CO.,LTD.
- HEADQUARTERS
  18th Floor, CMC Tower, Duy Tan Street, Cau Giay District, Hanoi, Vietnam
  PHONE +84-24-3795-7631 FAX +84-24-3795-7637
- HO CHI MINH OFFICE

EUROPE

CKD EUROPE B.V.
- HEADQUARTERS
  Beechavenue 125A, 1119 RB Schiphol-Rijk, the Netherlands
  PHONE +31-23-554-1490
- CKD EUROPE GERMANY OFFICE
- CKD EUROPE UK
- CKD EUROPE CZECH O.Z.

CKD CORP. EUROPE BRANCH(EUROPE RHQ)
Beechavenue 125A, 1119 RB Schiphol-Rijk, the Netherlands
PHONE +31-23-554-1490

CKD ITALIA S.R.L.
- HEADQUARTERS
  Via di Fibbiana 15 Calenzano (FI) CAP 50041, Italy
  PHONE +39 0558825359 FAX +39 0558827376
- MILANO OFFICE

NORTH AMERICA & LATIN AMERICA

CKD MEXICO, S. DE R.L. DE C.V.
Cerrada la Noria No. 200 Int. A-01, Querétaro Park II, Parque Industrial Querétaro, Santa Rosa Jáuregui, Querétaro, C.P. 76220, México
PHONE +52-442-161-0624

CKD USA CORP.
- HEADQUARTERS
  1605 Penny Lane, Schaumburg, IL 60173, USA
  PHONE +1-847-648-4400 FAX +1-847-565-4923
- LEXINGTON OFFICE
- SAN JOSE OFFICE/ TECHNICAL CENTER
- AUSTIN OFFICE

Pneumatic Cylinders ④

Rodless

With Brake

Clamp

Swivel / Rotary

CKD Corporation

https://www.ckd.co.jp/en/