CKD



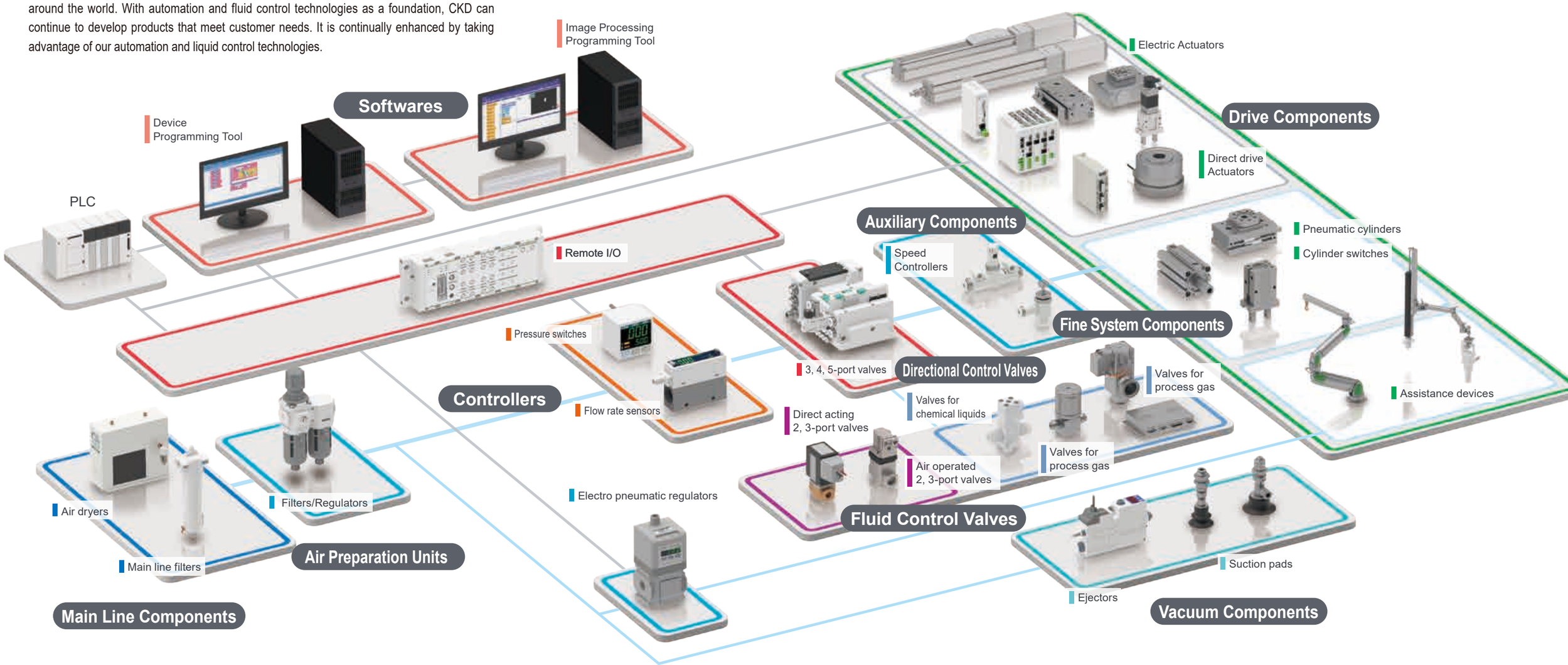
Pneumatic Cylinder ⑤

- Parallel Gripper
- Low Profile Parallel Gripper
- Wide Parallel Gripper
- Pivot Gripper
- 3-Jaw Chuck
- Gripper for Collaborative Robot

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 can continue to develop products that meet customer needs. It is continually enhanced by taking advantage of our automation and liquid 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-1276A

Rechargeable Battery Manufacturing Process P4 Series

Material restrictions
1/5 or less dust generation rate


CC-1226AA

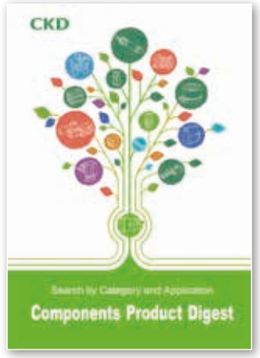
For Clean Components
P5/P7 Series

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-007



Sensors/Controllers

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

RJ-008AA



Precision Components
Vacuum Components

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

RJ-010AA



Fluid Control Valves

Solenoid valve | Air operated valve | Ball valve

RJ-013



Wet Fine System/High Purity Chemical Liquid System

CB-031A

Dry Fine System/High Purity Gas Control System Components

CB-035A



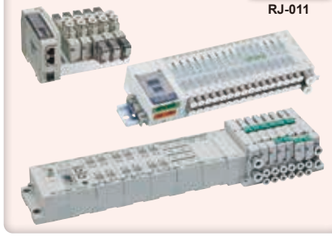
Learn more in the WEB

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

Directional Control Valves (1)

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

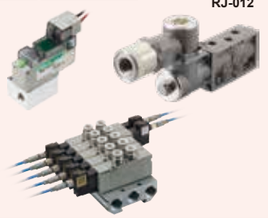
RJ-011



Directional Control Valves (2)

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

RJ-012



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 | Oscillation / Rotation

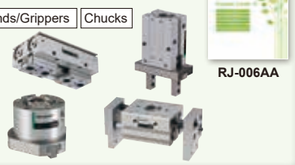
RJ-005



Pneumatic Cylinders (5)

Hands/Grippers | Chucks

RJ-006AA



Visual Programming Tool for Image Processing

Facilea
CC-1548AA

Facilea AI
CC-1623AA

Device Visual Programming Tool

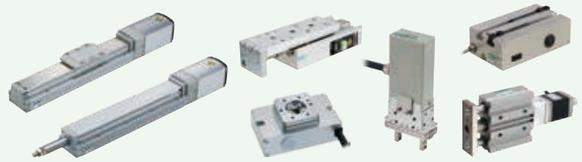
ExiaStudio
CC-1579AA



Electric Actuators

ROBODEX Pulse

RJ-014AA



Electric Actuators

ROBODEX Std.

CB-055A



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 14

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

CAD Data Usage Guide — Intro 17

Website Guide — Intro 19

Model Selection System Guide — Intro 20

⚠ Precautions for Use
●Pneumatic Equipment Notes — Intro 39
●General Notes for Pneumatic Cylinders — Intro 41
* For precautions regarding each product, always read the individual precautions for each model series in the main text.

Technical Data — Intro 22

Flow Characteristics Notation Method — Intro 35

Protective Structure — Intro 37

CE Marking — Ending 6

CKD RoHS Compliance — Ending 8

ISO9001/ISO14001 Certification Acquisition — Ending 10

Index (Alphabetical Index) — Ending 14

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

Hand (Gripper) >>> P. 1
Chuck >>> P. 349
Robot Peripheral Components >>> P. 501
Gripper for Collaborative Robot >>> P. 515
Cylinder Switch >>> P. 573

Product Group	Product Name	Page
 Parallel Gripper >>> P. 2	Linear Slide Gripper (HP Series) LSH-HP	12
	Linear Slide Gripper LSH	86
	Feather Gripper FH100	98
	Ultra Compact Cross Roller Parallel Gripper BSA2	106
	Compact Cross Roller Parallel Gripper BHA	110
	Compact Cross Roller Parallel Gripper with Rubber Cover BHG	118
	Centering Gripper BHE	126
	Linear Guide Gripper LHA	136
	Linear Guide Gripper with Rubber Cover LHAG	146
	Parallel Gripper HAP-1C	154
	Parallel Gripper HAP-2 to 4CS	158
	Cross Roller Parallel Gripper HKP	164
	Horizontal Parallel Gripper HCP	172
	Long Stroke Parallel Gripper HGP	178
 Low Profile Parallel Gripper >>> P. 186	Low Profile Long Stroke Gripper LST-HP	186
	Low Profile Long Stroke Gripper HLF2	216
	Low Profile Parallel Gripper HLA/HLB	224
	Low Profile Parallel Gripper with Rubber Cover HLAG/HLBG	232
	Low Profile Long Stroke Parallel Gripper HLC	240
	Ultra Low Profile Parallel Gripper HLD	248
 Wide Parallel Gripper >>> P. 254	Wide Parallel Gripper HMC-HP1	254
	Compact Wide Parallel Gripper HMF	266
	Cutting Oil Resistant Specification Compact Wide Parallel Gripper HMF-G	276
	With Linear Guide Large Wide Parallel Gripper HMFB	282
	Wide Parallel Gripper HFP	288
 Pivot Gripper >>> P. 294	Feather Gripper FH500	294
	Pivot Gripper HBL	300
	Toggle Gripper HJL	306
	180-degree Opening/Closing Thin Wide Angle Gripper HMD	314
	180-degree Opening/Closing Wide Angle Gripper HDL	322
	180-degree Opening/Closing High Gripping Force Wide Angle Gripper HJD	328
 Mechanical Gripper >>> P. 343	Mechanical Gripper BHA-FC	344
 Chuck >>> P. 349	3-Jaw Chuck CKW-HP	354
	Powerful Chuck CKL2	386
	With Rubber Cover Powerful Chuck CKLG2	398
	Fall Prevention Type Powerful Chuck CKL2-□-HC	406
	High Gripping Force Powerful Chuck CKH2	412
	Bidirectional Powerful Chuck CKLB2	418
	3-Jaw Bearing Chuck CKG	426
	3-Jaw Long Stroke Chuck CK	434
	3-Direction Thin Chuck CKA	440
	Low Profile Chuck CKS	450
	Low Profile Chuck (Hollow Type) CKS-F	460
	Hollow Chuck CKF	468
	Ultra Long Stroke Chuck CKJ	476
 Mechanical Chuck >>> P. 495	Mechanical Chuck CKL2-FC	495
 Robot Peripheral Components >>> P. 501	Auto Gripper Changer CHC	504
 Gripper for Collaborative Robot >>> P. 515	UNIVERSAL ROBOTS Officially Certified Gripper RLSH/RHLF/RCKL-UR	518
	TECHMAN ROBOT Officially Certified Gripper RLSH/RHLF/RCKL-TM	526
	OMRON ROBOT Officially Certified Gripper RLSH/RHLF/RCKL-TM	534
	Gripper compatible with FANUC Robot CRX Series RLSH/RHLF/RCKL-FN	542
	Gripper compatible with YASKAWA MOTOMAN Robot RLSH/RHLF/RCKL-YS	550
	Gripper compatible with JAKA Robot Zu® Series RLSH/RHLF/RCKL-JK	556
	Kawasaki Robot K-AddOn Registered Gripper RLSH/RHLF/RCKL-KW	562
 Cylinder Switch >>> P. 573	M Series/R Series/T Series/K Series F Series/H Series/V Series/E Series	573

Search by Product System List

Products can be selected by series appearance and product overview.

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

Standard, small bore size cylinders **(ø2.5to ø16)**

Pencil shaped compact cylinder



Pencil Shaped Cylinder

SCP□3

Series	Also known as...	Tube Bore (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	Ultra Low Speed Type	
SCPD3-O	Low Speed Type	
SCPD3-D	Double rod type	
SCPD3-Z	With Speed Controller	10, 16
SCP□-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 cylinder

CMK2

Series	Also known as...	Tube Bore (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	Ultra 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 Cylinder

CMA2

Series	Also known as...	Tube Bore (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 cylinder

SCM

Series	Also known as...	Tube Bore (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 Cylinder

SCG

Series	Also known as...	Tube Bore (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...	Tube Bore (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 Catalogs No. RJ-003AA

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

Wide variations and high rigidity



Medium Bore Size Cylinder

SCS2

Series	Also known as...	Tube Bore (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)**

Wide variations/Switch mountable on 4 surfaces compact type



Compact Cylinder

SSD2

Series	Also known as...	Tube Bore (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 Cylinder

SSG

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

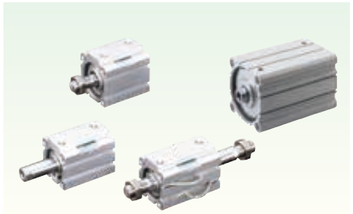
Search by Product System List

Products can be selected by series appearance and product overview.

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

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

Compact type with abundant bore sizes and options



Compact Cylinder

SSD

Series	Also known as...	Tube Bore (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 Cylinder

CAT

Series	Also known as...	Tube Bore (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



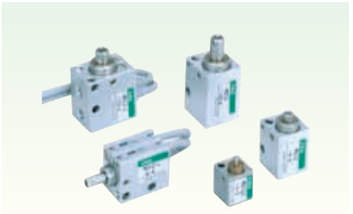
Compact cylinder

SMG

Series	Also known as...	Tube Bore (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 Cylinder

MDC2

Series	Also known as...	Tube Bore (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 Cylinder

MSD

Series	Also known as...	Tube Bore (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

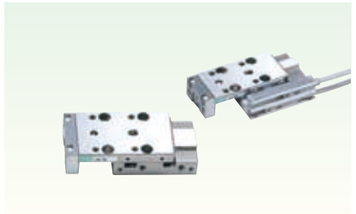
FC□

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

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

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

High precision and rigidity in a compact size



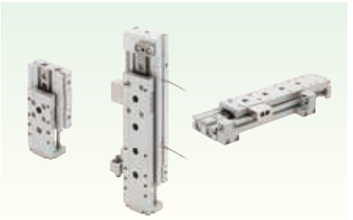
Linear Slide Cylinder

LCM

Series	Also known as...	Tube Bore (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 Cylinder

LCR

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

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

Emphasis on high precision and high rigidity. Easier to use



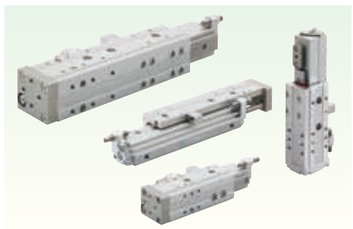
Linear Slide Cylinder

LCG

Series	Also known as...	Tube Bore (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



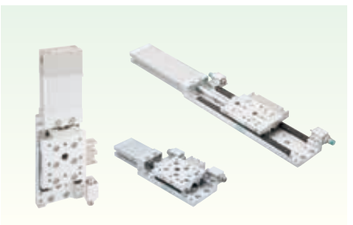
Linear Slide Cylinder

LCW

Series	Also known as...	Tube Bore (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 Cylinder

LCX

Series	Also known as...	Tube Bore (ø)
LCX	Single Rod Type	25, 32
LCX-Q	Drop prevention type	
LCX-□L	Long stroke	
LCX-Q-□L	Drop prevention type/Long stroke	

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

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



Compact Cylinder

MSDG

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

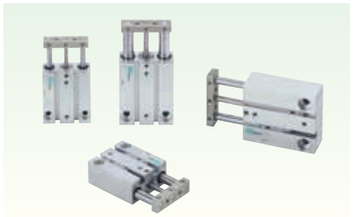
Search by Product System List

Products can be selected by series appearance and product overview.

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

Guided Cylinder **(ø6, ø10)**

Extremely small guided space-saving type



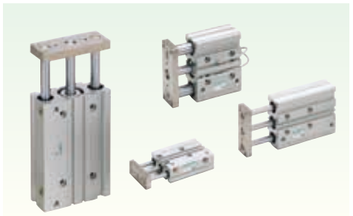
Guided Cylinder

STM

Series	Also known as...	Tube Bore (ø)
STM-M/B	Single Rod Type	6, 10

Guided Cylinder **(ø12 to ø100)**

Environmentally friendly product. Improved load resistance



Guided Cylinder

STG

Series	Also known as...	Tube Bore (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 Cylinder

STS/STL

Series	Also known as...	Tube Bore (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



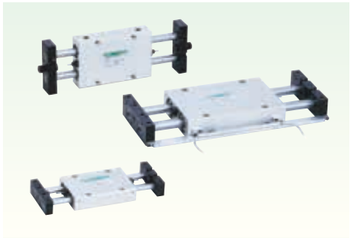
Twin Rod Cylinder

STR2

Series	Also known as...	Tube Bore (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 Cylinder

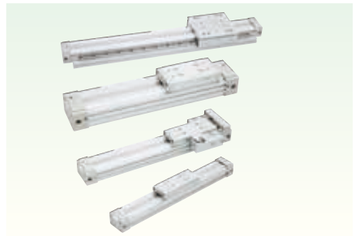
UCA2

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

Rodless Type >>> Pneumatic Cylinder ④ Catalog No. RJ-005AA

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

Abundant bore sizes and variations



Rodless Cylinder

SRL3

Series	Also known as...	Tube Bore (ø)
SRL3	Standard type	Equivalent to 12, 16, 20, 25, 32, 40, 50, 63, 80, 100
SRL3-J	Full Cowl Type	
SRL3-G	With Resin Guide	
SRL3-Q	With Fall Prevention Function	
SRL3-GQ	With resin guide/ With Fall Prevention Function	

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

Integrated high-precision LM guide



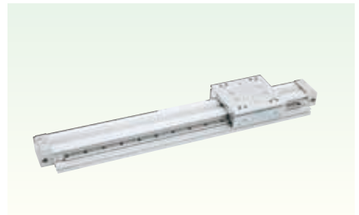
Rodless Cylinder with High-Precision Guide

SRG3

Series	Also known as...	Tube Bore (ø)
SRG3	Standard type	12, 16, Equivalent to 20, 25

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

High-precision LM guide adopted on 2 axes. Rigidity also UP



Rodless Cylinder with High-Precision Guide

SRM3

Series	Also known as...	Tube Bore (ø)
SRM3	Double Acting Type	Equivalent to 25, 32, 40, 63
SRM3-Q	Double Acting Type/Fall Prevention Type	

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

High-precision LM guide integrated into MRL2



Magnet Type Rodless Cylinder High-Precision Guide Type

MRG2

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

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

Type with high-reliability brake



Rodless Cylinder with Brake

SRT3

Series	Also known as...	Tube Bore (ø)
SRT3	Double Acting Type	Equivalent to 12, 16, 20, 25, 32, 42, 50, 63

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

Rodless, further space-saving



Magnet Type Rodless Cylinder

MRL2

Series	Also known as...	Tube Bore (ø)
MRL2	Basic type	6, 10, 16, 20, 25, 32
MRL2-G	Simple Guide Type/1 Piston	
MRL2-W	Simple Guide Type/2 Pistons	
MRL2-F	Ultra Low Speed Type	

Rodless Type/Shuttle Mover **(ø25)**

Rodless with a curve. Flexible layout possible



Shuttle Mover Standard/High Load Type

SM-25

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

Search by Product System List

Products can be selected by series appearance and product overview.

With Brake/With Lock >>> Pneumatic Cylinder ④ Catalog No. RJ-005AA

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

High-performance compact brake for pencil type, etc.



Brake Cylinder (small/medium bore size)

ULK

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

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

Reliable brake equipped on CMK2/CMA2



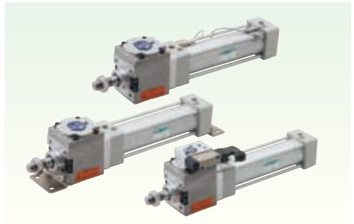
Brake Cylinder (small/medium bore size)

JSK2/JSM2

Series	Also known as...	Tube Bore (ø)
Crimped Type		
JSK2	Single Rod Type	20, 25, 32, 40
JSK2-V	With Valve	
Serviceable Type		
JSM2	Single Rod Type	20, 30, 40
JSM2-V	With Valve	

With Brake/Medium Bore **(ø40 to ø100)**

Reliable brake mechanism equipped on SCG



Tie Rod Cylinder with Brake

JSG

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

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

Brake equipped on reliable robust cylinder



Brake Cylinder (Medium/Large Bore)

JSC3/JSC4

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

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

Fall prevention function equipped on compact SSD



Compact Cylinder with Drop Prevention

USSD

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

With Fall Prevention **(ø25 to ø63)**

Fall prevention function equipped on Flat Cylinder FCD Series



Flat Cylinder with Free Position Drop Prevention

UFCD

Series	Also known as...	Tube Bore (ø)
UFCD-KL	Single rod type · With Cushion	25 to 63

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

Fall prevention possible at any position



Medium Bore Size Cylinder with Free Position Fall Prevention

USC

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

Lock Unit >>> Pneumatic Cylinder ④ Catalog No. RJ-005AA

Light. Slim lock unit

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



Lock Unit

UB

Series	Applicable Shaft Diameter
UB	8, 16

Brake Unit

Only the brake part of the Brake Cylinder is unitized



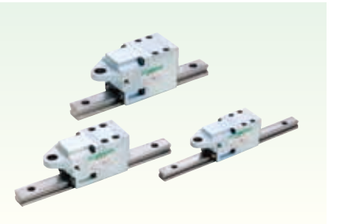
Brake Unit

JSB3

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

Brake for LM Guide

Reliable brake mounted on LM guide



Linear Guide Lock

LMB

Series
LMB

Lock Unit

Compact and high holding for linear guide



Linear Guide Lock

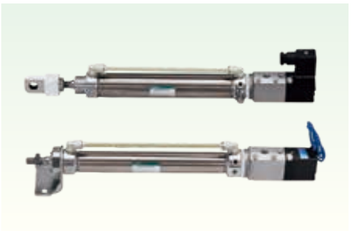
LML

Series
LML

With Valve >>> Pneumatic Cylinder ④ Catalogs No. RJ-005AA

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

High-performance solenoid valve equipped on CMK2 series



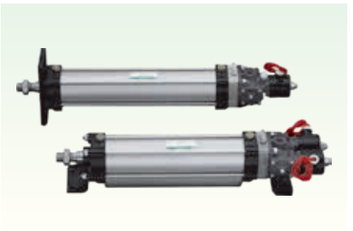
Compact cylinder with valve

CKV2

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

With Valve (ø50, 75, 100)

Boasts long-standing reliability



Cell Cylinder

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

Series	Also known as...	Tube Bore (ø)
CAV2	Double solenoid · Lubricated type	50, 75, 100
COVP2	Single Solenoid/Energize to Extend Type/Lubricated Type	
COVN2	Single Solenoid/Energize to Retract Type/Lubricated Type	
CAV2-N	Double solenoid · Non-Lube Type	
COVP2-N	Single Solenoid/Energize to Extend Type/Non-Lube Type	
COVN2-N	Single Solenoid/Energize to Retract Type/Non-Lube Type	

Other with valve

In addition, the following "Cylinder with Valve" lineup is available.

Product Name	Series	Tube Bore (ø)	Catalog No.
Pencil 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	RJ-005AA
	JSK2-V	20, 25, 32, 40	RJ-005AA
	JSM2-V	20, 25, 32, 40	RJ-005AA
	JSG-V	40, 50, 63, 80, 100	RJ-005AA
	JSC3-V	40, 50, 63, 80, 100	RJ-005AA
Selex Rotary	RV3S V/W RV3D V/W	0.98 to 66.6 (Torque size)	RJ-005AA

Search by Product System List

Products can be selected by series appearance and product overview.

Clamp >>> Pneumatic Cylinder ④ Catalog No. RJ-005AA

Clamp Cylinder **(ø40 to ø80)**

Dedicated clamp cylinder



Clamp Cylinder

CAC4

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

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

Drop prevention function equipped on clamp cylinder



Clamp Cylinder with Fall Prevention

UCAC2

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

Clamp Cylinder **(ø32, ø40)**

Dedicated for clamping, contributes to weight reduction of welding jigs



Lightweight Clamp Cylinder

CAC-N

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

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

Equipped with free position fall prevention function



Lightweight Clamp Cylinder

UCAC-N

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

Rotary Clamp **(ø12 to ø63)**

Simple design for compact clamping



Rotary Clamp Cylinder

RCS2

Series	Also known as...	Tube Bore (ø)
RCS2	Single Rod Type	12 to 63
RCS2-T2	Packing Material Fluoro Rubber	
RCS2-G4	Sputter adhesion prevention type	32 to 63

Rotary Clamp **(ø16 to ø63)**

Ideal for clamping in limited spaces



Rotary Clamp Cylinder

RCC2

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

Pin Clamp Cylinder

Workpiece positioning and clamping possible with one unit



Pin Clamp Cylinder

PCC

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

Special >>> Pneumatic Cylinder ④ Catalog No. RJ-005AA

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

Suction pad equipped on rod end



Compact Cylinder with Vacuum Pad

MVC

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

Stopper Cylinder **(ø20 to ø50)**

Space-saving type with excellent lateral load resistance



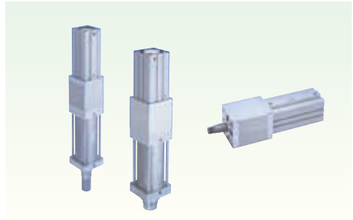
Stopper Cylinder

STK

Series	Also known as...	Tube Bore (ø)
STK	Rod End/Shape: Round Bar Type	20, 32, 40, 50
STK-Y	Single acting, Retracting type, Round bar rod end shape	
STK-Y1	Spring Contained Type/Rod End Shape: Round Bar Type	
STK-M	Rod End Shape: Chamfered Type	
STK-MY	Single Acting/Retracting Type/Rod End Shape: Chamfered Type	
STK-MY1	Spring Contained Type/Rod End Shape: Chamfered Type	
STK-JY	Single Acting/Retracting Type/Rod End Shape: Roller Type	
STK-JY1	Spring-loaded Type, Roller Rod End Shape	

Mechanical Power Cylinder

Achieves high thrust comparable to hydraulic cylinders with only pneumatic source



Mechanical Power Cylinder

MCP

Series	Also known as...	Tube Bore (ø)
MCP-W	Fast Forward + Intensification	For 2t/For 5t
MCP-S	Intensifier Only	

Guideless Cylinder **(ø40 to ø100)**

Non-rotating without guide, excellent lateral load resistance



Guideless Cylinder

GLC

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

Balancer Unit **(ø50 to ø100)**

Lightly supports heavy objects with only air source



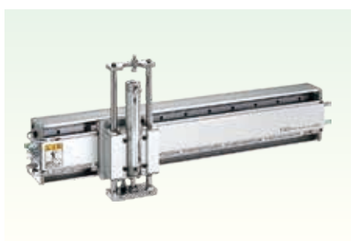
Balancer Unit

BBS

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

Unit Components XZ-Axis Compound Unit

Selectable X-axis (payload), selectable Z-axis.



New Handling System

NHS

Series	Variation Name
NSR	X-axis Module
NHS-H	Z-axis Module (HRL)
NHS-S	Z-axis Module (STL-B)

Search by Product System List

Products can be selected by series appearance and product overview.

Special >>> Pneumatic Cylinder ④ Catalog No. RJ-005AA

Guided Single Axis Unit

Low profile and high rigidity



Hybrid Robot

HRL

Series	Variation Name
HRL-1	Guided Single Axis Unit

With Length Measurement Function/Cylinder/Gripper

Length measurement function equipped on compact cylinder/gripper



Cylinder/Gripper with Linear Norm Sensor

LN

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

High Speed Type >>> Pneumatic Cylinder ④ Catalog No. RJ-005AA

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

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



High Energy Absorption Cylinder

HCM

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

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

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



High Speed Cylinder

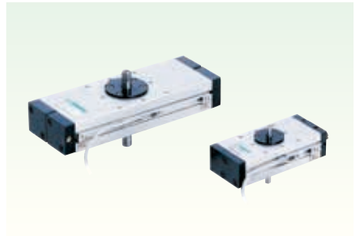
HCA

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

Swinging/Rotating Type >>> Pneumatic Cylinder ④ Catalog No. RJ-005AA

Swinging/Rotating Type 0.7 to 5.6 N·m

Rack & pinion type, compact swinging type



Selex Rotary

RRC

Series	Variation Name	Torque Size
RRC	Rack & Pinion Type	0.7 to 5.6

*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

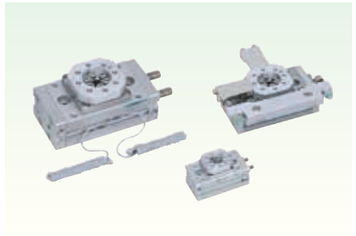


Table Type Rotary Actuator

GRC

Series	Variation Name	Torque Size
GRC	Basic type	0.5 to 8.1
GRC-K	High-Precision Type	1.0 to 8.1
GRC-F	Low speed type	0.5 to 8.1
GRC-KF	High-Precision Type/ Low Speed Type	1.0 to 8.1

*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	Variation Name	Torque Size
Compact		
RV3S	Single Vane Type	0.12 to 3.19
RV3D	Double Vane Type	0.28 to 7.70
RV3S V/W	Single Vane Type/With Valve	0.98 to 3.19
RV3D V/W	Double Vane Type/With Valve	2.11 to 7.70
RV3SA	Angle Adjustable Single Vane Type	0.31 to 3.19
RV3DA	Angle Adjustable Double Vane Type	0.71 to 7.70
Large		
RV3S (Large)	Single Vane Type	4.7 to 102
RV3D (Large)	Double Vane Type	10.1 to 206
RV3S V/W	Single Vane Type with Valve	4.7 to 27.9
RV3D V/W	Double Vane Type with Valve	10.1 to 66.6
RV3SH	Single Vane Type Low Hydraulic Pressure Type	4.7 to 102
RV3DH	Double Vane Type Low Hydraulic Pressure Type	10.1 to 206
RVC	Shock Absorber	

*Torque size (N·m, at 0.5 MPa)

Related Components >>> Pneumatic Cylinder ④ Catalog No. RJ-005AA

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

3 models available to suit application



Shock Absorber

SKL, NCK, SCK, FCK

Series	Variation Name	Absorption Energy
Fixed Type		
SKL	–	0.2 to 3.6
NCK	–	1 to 200
Adjustable Type		
SCK	–	0.049 to 588
FCK-L	Low Speed Type	1.5 to 79.3
FCK-M	Medium Speed Type	1.8 to 720
FCK-H	High Speed Type	

Absorption Energy: J

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

For preventing misalignment when mounting cylinder. 3 types available



Free Joint

FJ

Series
FJ

Simple Type Floating Connector

For preventing misalignment when mounting cylinder. Simple type.



Simple Flow Controller

FK

Series
FK

Search by Product System List

Products can be selected by series appearance and product overview.

Hand (Gripper) >>> Pneumatic Cylinders ⑤ P. 1

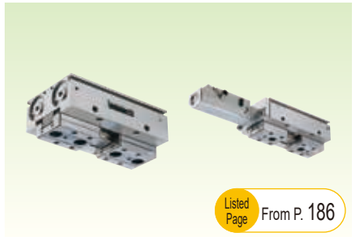
Wide variety available including thin, lightweight, and wide types



Listed Page From P. 12

Parallel Gripper

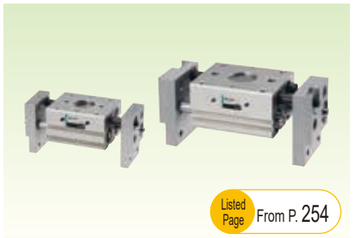
Series	Also known as...	Tube I.D. (ø)	Page
LSH-HP1 LSHL-HP1	Linear Slide Gripper (HP Series)	6 to 32	12
LSHM-HP2	Linear Slide Gripper with Length Measurement Function (HP Series)	10 to 25	48
LSH	Linear Slide Gripper (Standard Type)	10 to 25	86
FH100	Feather Gripper (Mini Parallel Gripper)	10 to 25	98
BSA2	Ultra Compact Cross Roller Parallel Gripper	6	106
BHA	Compact Cross Roller Parallel Gripper	12 to 25	110
BHG	Compact Cross Roller Parallel Gripper with Rubber Cover	12 to 25	118
BHE	Centering Gripper	12 to 32	126
LHA	Linear Guide Gripper	6 to 32	136
LHAG	Linear Guide Gripper with Rubber Cover	12 to 32	146
HAP-1C	Parallel Gripper	15	154
HAP	Parallel Gripper	20 to 40	158
HKP	Cross Roller Parallel Gripper	32 to 80	164
HCP	Horizontal Parallel Gripper	12 to 32	172
HGP	Long Stroke Parallel Gripper	25	178



Listed Page From P. 186

Low Profile Parallel Gripper

Series	Also known as...	Tube I.D. (ø)	Page
LST-HP1	Low Profile Long Stroke Gripper	8x2 to 20x2	186
LSTM-HP2	Low Profile Long Stroke Gripper with Length Measurement Function	12x2 to 20x2	202
HLF2	Long Stroke Low Profile Gripper	8x2 to 20x2	216
HLA/HLB	Low Profile Parallel Gripper	12 to 20	224
HLAG/ HLBG	Low Profile Parallel Gripper with Rubber Cover	12 to 20	232
HLC	Low Profile Long Stroke Parallel Gripper	8x2 to 30x2	240
HLD	Ultra Low Profile Parallel Gripper	8x4 to 20x4	248



Listed Page From P. 254

Wide Parallel Gripper

Series	Also known as...	Tube I.D. (ø)	Page
HMC-HP1	Wide Parallel Gripper	10x2 to 40x2	254
HMF	Compact Wide Parallel Gripper	12x2 to 40x2	266
HMF-G	Cutting Oil Resistant Specification Compact Wide Parallel Gripper	16x2 to 25x2	276
HMFB	Large Wide Parallel Gripper with Linear Guide	25x2 to 40x2	282
HFP	Wide Parallel Gripper	16x2 to 40x2	288



Listed Page From P. 294

Pivot Gripper

Series	Also known as...	Tube I.D. (ø)	Page
FH500	Feather Gripper (Mini Pivot Gripper)	10 to 20	294
HBL	Pivot Gripper	15 to 40	300
HJL	Toggle Gripper	32 to 63	306
HMD	180-degree Opening/Closing Thin Wide Angle Gripper	12 to 25	314
HDL	180-degree Opening/ Closing Wide Angle Gripper	25 to 40	322
HJD	180-degree Opening/Closing High Gripping Force Wide Angle Gripper	32 to 63	328



Listed Page From P. 343

Mechanical Gripper

Series	Variation Name	Cylinder Bore (ø)	Page
BHA-FC	Mechanical Gripper	12 to 32	344

Chuck >>> Pneumatic Cylinders ⑤ P. 349

Compact and powerful. Wide variety available



Listed Page From P. 349

3-Jaw Chuck

Series	Also known as...	Tube I.D. (ø)	Page
CKW-HP1	3-Jaw Chuck	16 to 50	354
CKWL-HP1	3-Jaw Long Stroke Chuck	16 to 40	372
CKL2	Powerful Chuck	16 to 100	386
CKLG2	Powerful Chuck with Rubber Cover	20 to 100	398
CKL2-HC	Drop Prevention Type Powerful Chuck	32 to 80	406
CKH2	High Gripping Force Powerful Chuck	50 to 100	412
CKLB2	2-Direction Powerful Chuck (Parallel Gripper)	20 to 100	418
CKG	3-Jaw Bearing Chuck	16 to 50	426
CK	3-Jaw Long Stroke Chuck	25 to 44	434
CKA	3-Direction Thin Chuck	16 to 100	440
CKS	Low Profile Chuck	8x3 to 32x3	450
CKS-F	Low Profile Chuck (Hollow Type)	16x3 to 50x3	460
CKF	Hollow Chuck	30 to 80	468
CKJ	Ultra Long Stroke Chuck	12x6 to 50x6	476



Listed Page From P. 495

Mechanical Chuck

Series	Variation Name	Cylinder Bore (ø)	Page
CKL2-FC	Mechanical Chuck	20 to 40	496

Robot Peripheral Components

>>> Pneumatic Cylinders ⑤ P. 501



Listed Page From P. 501

Auto Gripper Changer

Series	Variation Name	Page
CHC	Auto Gripper Changer	504

Gripper for Collaborative Robot

>>> Pneumatic Cylinders ⑤ P. 515

Compact and lightweight with high gripping force due to air drive



Listed Page From P. 515

Gripper for Collaborative Robot

Series	Also known as...	Tube I.D. (ø)	Page
RLSH/RHLF/ RCKL-UR	UNIVERSAL ROBOTS Official Certified Gripper	RLSH: ø20 RHLF: ø16x2 RCKL: ø40	518
RLSH/RHLF/ RCKL-TM	OMRON ROBOT Official Certified Gripper		526
RLSH/RHLF/ RCKL-TM	TECHMAN ROBOT Official Certified Gripper		534
RLSH/RHLF/ RCKL-FN	FANUC Robot Gripper compatible with CRX Series		542
RLSH/RHLF/ RCKL-YS	YASKAWA MOTOMAN Robot Gripper compatible with HC10DTP Series		550
RLSH/RHLF/ RCKL-JK	JAKA Robot Gripper compatible with Zu Series		556
RLSH/RHLF/ RCKL-KW	Kawasaki Robot duAro Series K-AddOn Registered Gripper		562

Cylinder Switch

>>> Pneumatic Cylinders ⑤ P. 573

Wide variety available



Listed Page From P. 573

Cylinder Switch

Series	Page
2-Color Indicator Solid State Cylinder Switch	580
Strong Magnetic Field Resistant Cylinder Switch	581
M Series	584
R Series	586
T Series	588
Water-resistant Cylinder Switch	592
Magnetic Field Resistant Cylinder Switch	594
K Series	596
F Series	598
H Series	600
V Series	601
E Series	602

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.

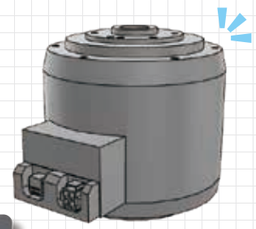
STEP 3

❶ Specify CAD format

❷ Generate CAD data

Download CAD

Download complete!



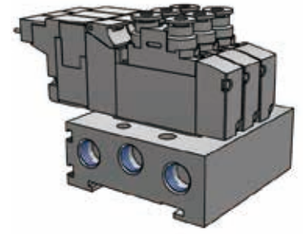
Pneumatic valve manifold specifications and CAD data are easily available on the Web.

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

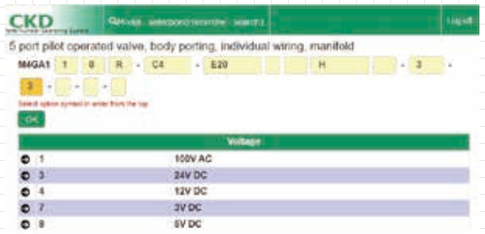
STEP 1

CKD components product TOP page > Product details page >Click "Manifold specifications sheet"



STEP 2.

Select model No.



STEP 3

Create specifications sheet



STEP 4

Download complete!

●For specifications output, Specification output Click

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



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.

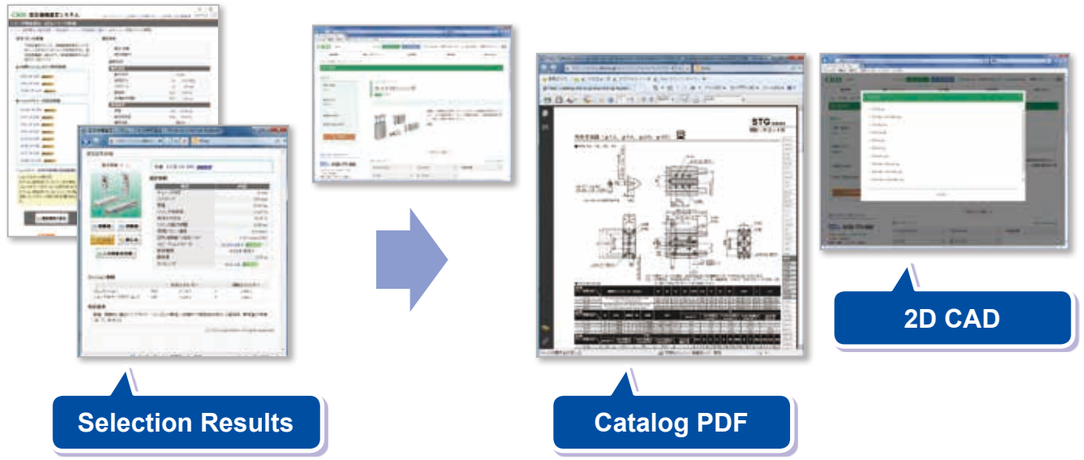
Published on our website

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.

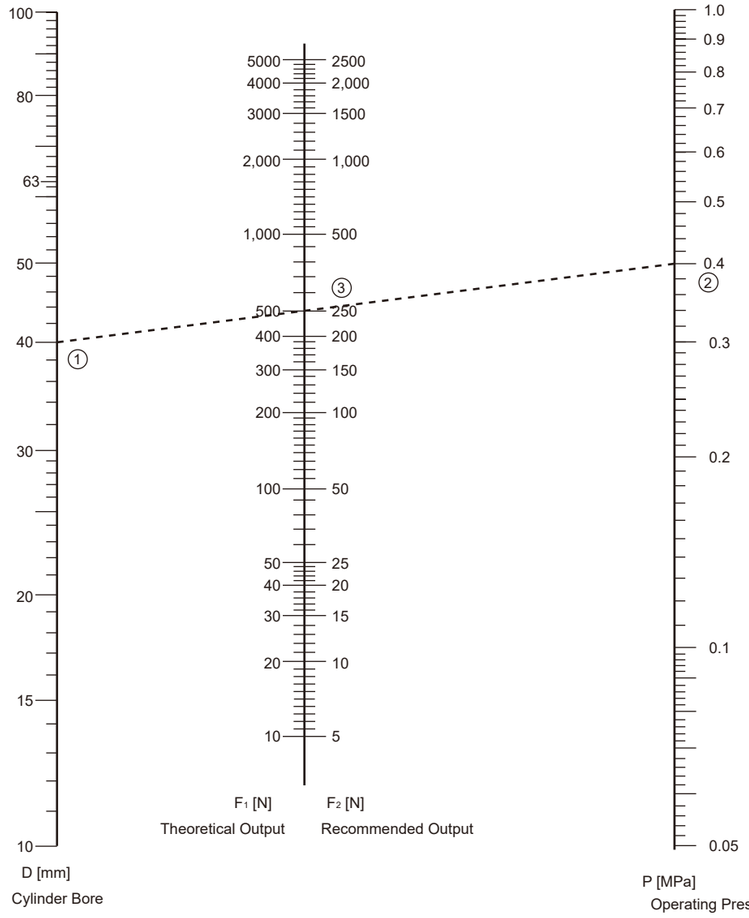
https://www.ckd.co.jp/en/

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.

$$F_1 = \frac{\pi}{4} \times D^2 \cdot P$$

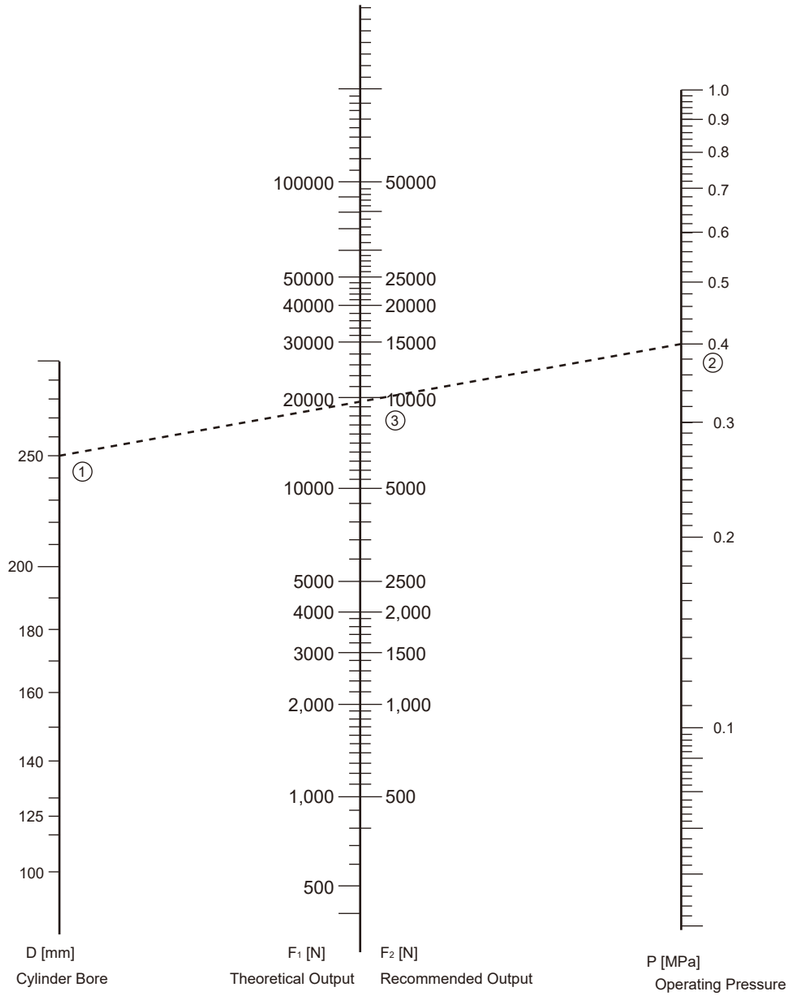
However, F_1: Theoretical output [N]
F_2: Recommended output (at 50% efficiency) [N]
D : Cylinder bore [mm]
P : Operating pressure [MPa]

(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

Cylinder Bore Selection Nomogram

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



This nomogram was created using the following formula.

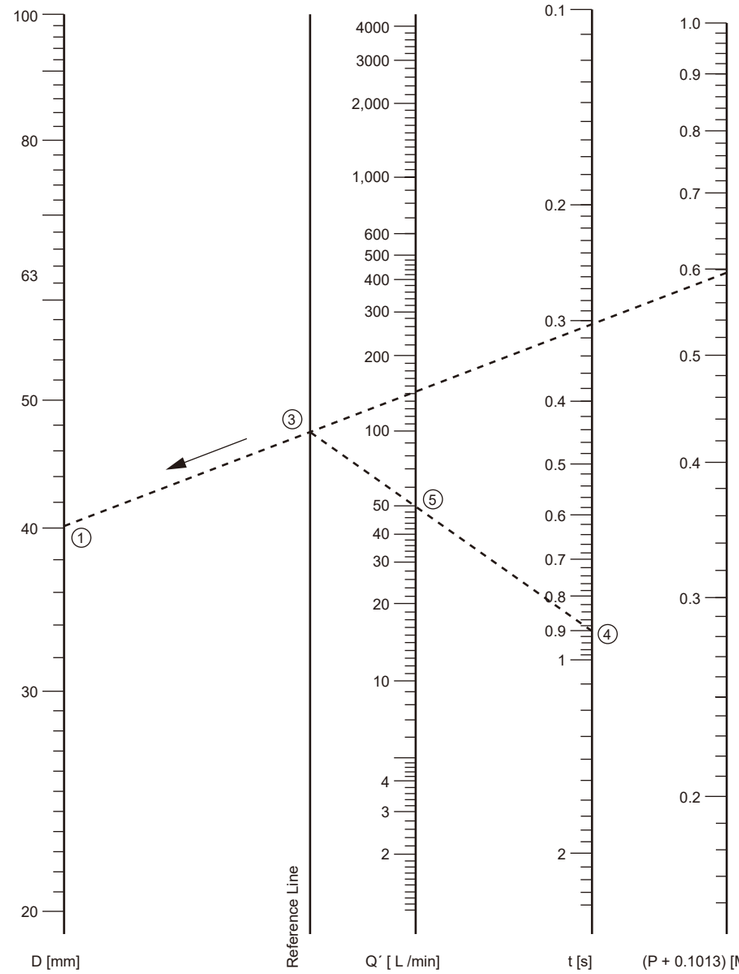
$$F_1 = \frac{\pi}{4} \times D^2 \cdot P$$

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 100 mm or less)

● 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.

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

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

(Ex. 1, fig. 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?

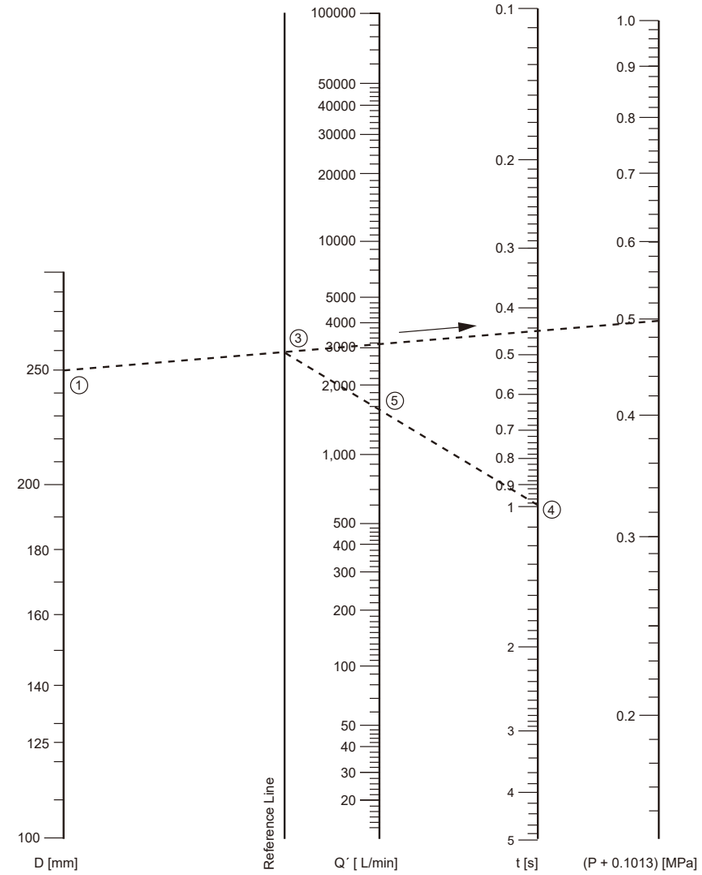
(Answer) Find the point on the relationship line from D and (P + 0.1013), and obtain Q' = 50 (L /min) from the point on the relationship line and t.

(Ex. 2, fig. 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 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 hour is the air consumption due to cylinder operation within a certain period, and it is the air volume consumed inside the cylinder and in the piping between the cylinder and the switching valve. Regardless of cylinder speed, it is different from the required air flow rate during operation.

$Q_T = (Q_1 + Q_2 + (2 \times Q_3)) \times n$ [In case of double acting cylinder]

Q_T : Air consumption per minute [L/min] (ANR)
n : 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)

$$Q_1 = \frac{\pi}{4} \cdot D^2 \times L \times 10^{-6} \times \left(\frac{P + 0.1013}{0.1013}\right)$$

$$Q_2 = \frac{\pi}{4} \cdot (D^2 - d^2) \times L \times 10^{-6} \times \left(\frac{P + 0.1013}{0.1013}\right)$$

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

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 : Operating pressure [MPa] (gauge pressure) (Note: 1 L = 1 dm^3.)

(Ex.) 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

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

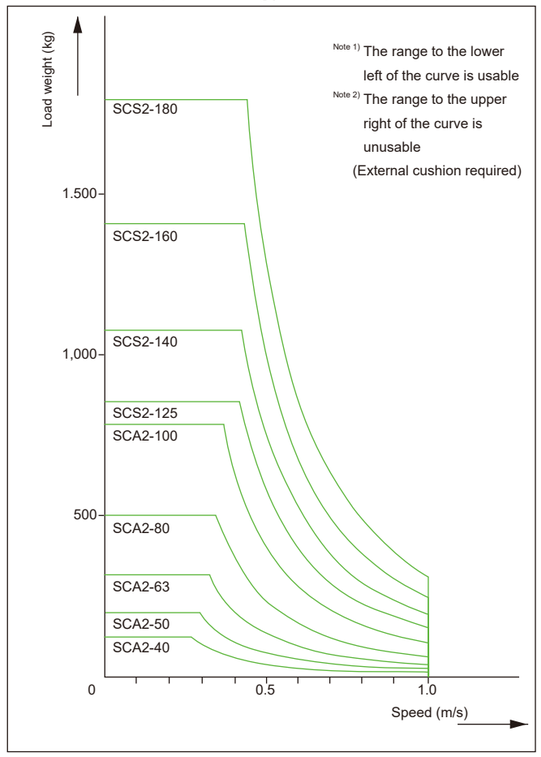
$$Q_2 = \frac{\pi}{4} \times (100^2 - 30^2) \times 800 \times 10^{-6} \times \left(\frac{0.5 + 0.1013}{0.1013}\right) = 33.9$$

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

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

Allowable absorption energy value: With Cushion

Allowable Absorption Energy Value Graph with Cushion



(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.

$um = \frac{L}{T} \times (1 + 1.5xw)$
um : Speed just before entering cushion (m/s)
w : Decimal representation 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.

● Cushion
The purpose of the 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 impacting 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.

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

Absorption Energy Value with Cushion

1.SCA2, JSC3

Tube I.D. (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

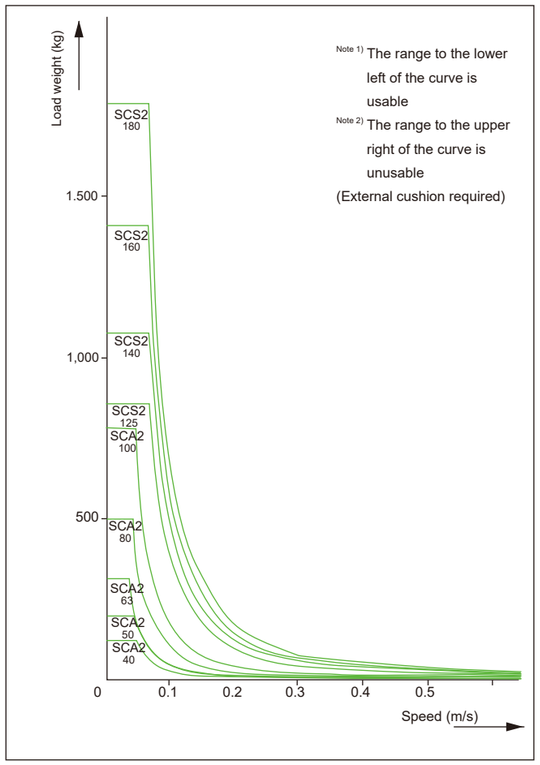
2.SCG, SCM, JSG

Tube I.D. (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

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

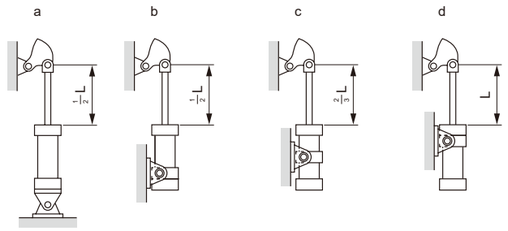
Unit: J

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	–

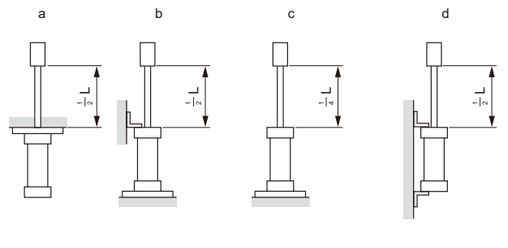
*1 : This is the absorption energy without cushion for cushion codes "R" and "H".

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

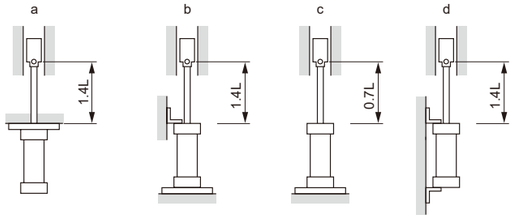
1 For double end pin joint



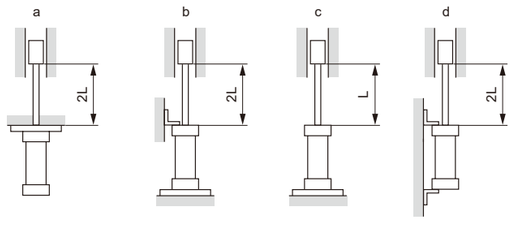
2 Rod end free



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

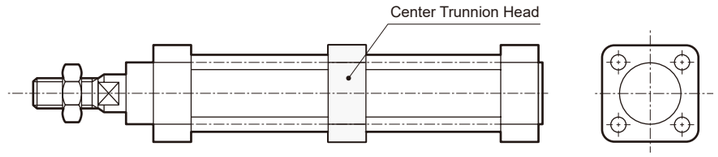
D : Cylinder bore [mm]
F0: Load [N]
L : Max. Stroke [mm]

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

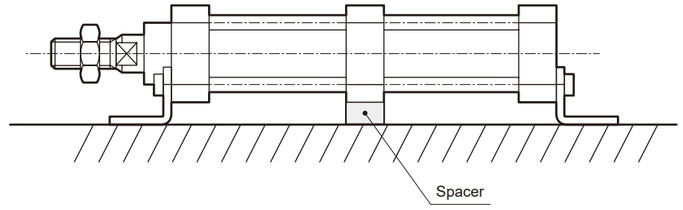
Precautions for Exceeding Max. Stroke

⚠ 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
   It becomes difficult unless used in a state where the internal stopper that brings the piston into contact with the cylinder cover is effective. When using by hitting an external stopper, please refer to the technical data "Relationship between dimensions according to mounting type and maximum stroke (L) (Intro P. 29)".
3. Tie Rod Reinforcement
   A center trunnion head is inserted to prevent the tie rod from deflecting and touching the cylinder tube.

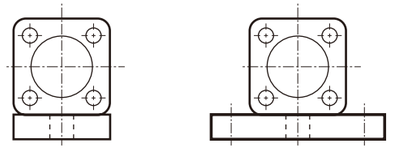


4. Cylinder Tube Deflection Prevention
   When mounted horizontally, tube deflection prevention is necessary.
   Consider deflection prevention using the center trunnion head inserted for tie rod reinforcement.



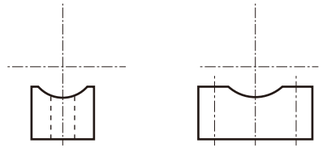
*The spacer in the diagram below is made to order.

Tie Rod Type



A Spacer B Spacer

Tie Rodless Type

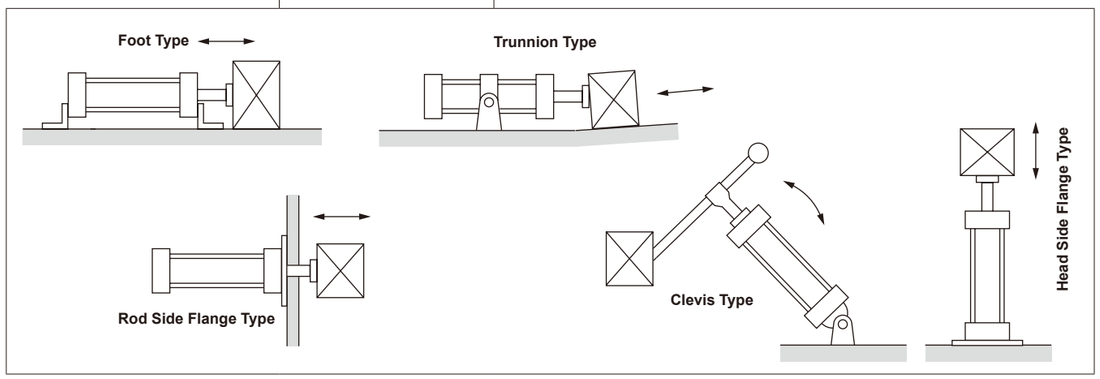


A Spacer B Spacer

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

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 to the maximum 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 categories must be inspected by the Japan Boiler Association.

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

② A cylinder 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: Bore size (mm)
S: Shell 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

Tolerances 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

Tolerances 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 "Pneumatic fluid power - Components using compressible fluids - Methods for testing the 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 (Sizing as per conventional methods is possible with C.)
- Critical Pressure Ratio b: Pressure ratio (downstream pressure / upstream pressure) at which flow becomes choked when smaller than this value (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 to the air tank.

*Choked flow: Flow where upstream pressure is higher than downstream pressure and velocity reaches sonic speed at a certain point in the equipment. The weight flow rate of gas is proportional to the upstream pressure and does not depend on the downstream pressure. (Choked flow)

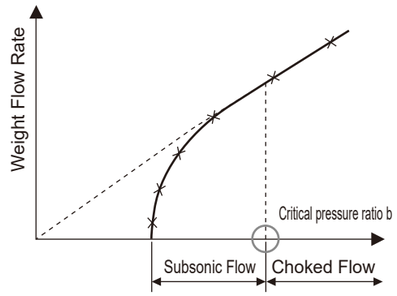


Fig. 1 Weight flow rate characteristics versus upstream pressure

Fig. 1 Weight flow rate characteristics versus upstream pressure

Flow rate calculation formula

It is expressed as follows in practical units.

$\frac{P_2+0.1}{P_1+0.1} \leq b$, choked flow

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

$\frac{P_2+0.1}{P_1+0.1} > b$, subsonic flow

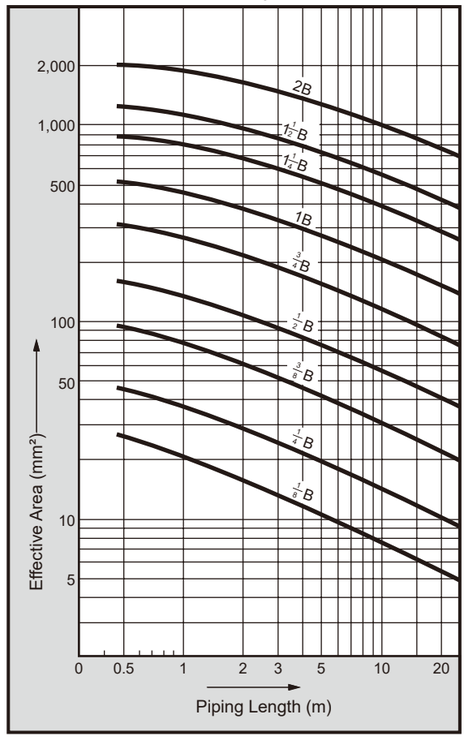
$$Q=600xC(P_1+0.1)\sqrt{1-\left[\frac{\frac{P_2+0.1}{P_1+0.1}-b}{1-b}\right]^2}\sqrt{\frac{293}{273+t}} \quad \text{.....(2)}$$

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]

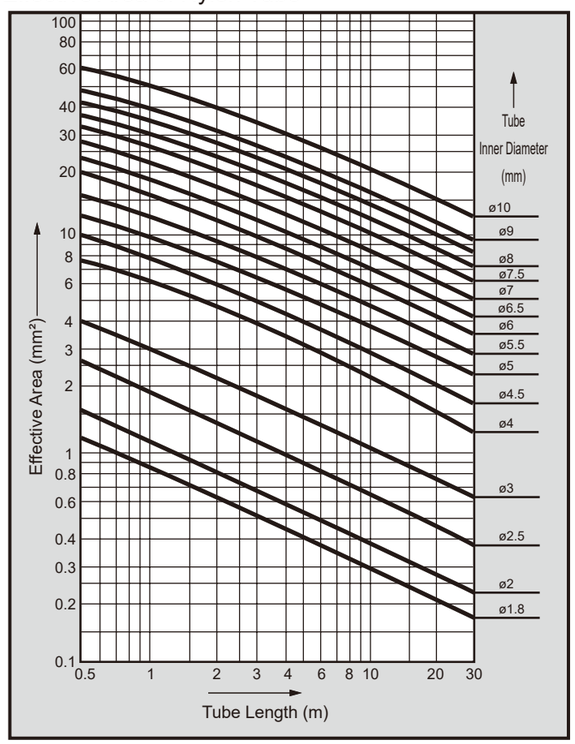
When calculating with the effective area S, substitute the value C obtained by C = S/5 into the above formula.
For subsonic flow, substitute b = 0.5 into equation (2).

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 Dimension	⅛B	¼B	⅜B	½B	¾B	1B	1¼B	1½B
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.

Protective Structure

● Protection Structure

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

■ JIS C 0920 : 2003

IP−□ □

Protection Characteristic Code (International Protection)

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	No ingress of dust inside.

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 (15°)	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 against 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)

Products that require authorization or the range of relevant technology

- List control, which is specified in item 1 to 15
  → Listed in the “Export Trade Control Order Appendix Table 1” or “Foreign Exchange Order Appendix Table”
- Catch-all control restricted by application (item 16)
  → Listed in the “Export Trade Control Order Appendix Table 1” or “Foreign Exchange Order Appendix Table”

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. 628.

During Design / Selection

1. Specification Confirmation

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 at pressures or temperatures outside the specification range, as this 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.
Dimensional tolerances for pneumatic cylinders are 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 fly out.
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 flying out.
When driving a cylinder with an exhaust center type directional control valve, or when starting after exhausting residual pressure in the circuit, if one side of the piston is pressurized from a state where the air in the cylinder is exhausted, the driven object will project at high speed. 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 design a fly-out prevention circuit

■Consider the operating state during an emergency stop.
When a safety device activates and the machine stops due to a system abnormality such as an emergency stop or power outage, design the system so that cylinder operation does not cause injury to personnel or damage to equipment/devices.

■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.

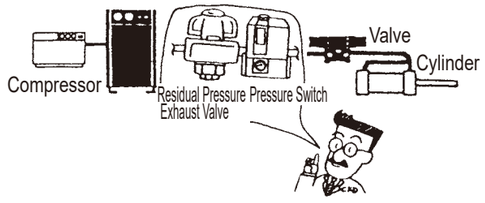
■Take necessary measures in advance to prevent adverse effects on people or things if this product malfunctions.

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. Design by Application

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 a cylinder on a moving object (X-axis module, pallet, etc.), design it considering the inertia, vibration, etc. that occur 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, it is difficult to stop at an accurate and precise position like low hydraulic pressure 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 an environment will 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 or similar protection.
If there is a lot of dust, use a type with a heavy-duty scraper. If liquid scatters, use a cutting oil resistant type.

■If the ambient temperature is 5°C or less, moisture in the circuit may freeze, causing malfunctions such as operational failure, so 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.

■Oil-impregnated bearings are used for some models, 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 operating conditions and model characteristics.

Caution

■Bellows are consumable parts.
Replace as necessary.

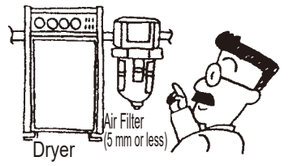
6. Pneumatic Source

Warning

■Use clean, dry compressed air.
Do not use compressed air if it contains chemicals, synthetic oils containing organic solvents, salt, corrosive gases, etc., as this will 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; therefore, please install an air filter with a filtration rating of 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 (non-additive) 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 maximum stroke according to the mounting type.
See End of Volume P. 70.

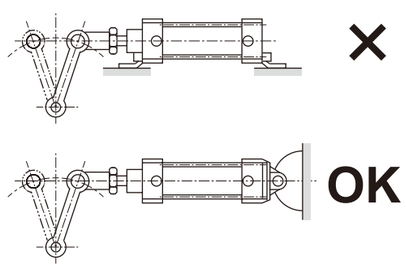
■Cylinders with air cushion experience a speed change at the beginning of movement.
For cylinders with air cushion, speed changes occur when the cushion ring comes off the cushion packing at the beginning of movement.Depending on conditions such as speed controller placement and adjustment, piping diameter, 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.

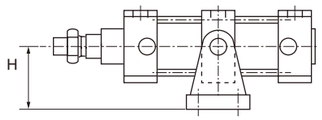
■Do not connect a fixed type cylinder to an arm that performs circular motion. In this case, connect it to an oscillating type cylinder.



■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 clearance 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 for vacuum sweeping. 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. Clearly Stated 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.

During Installation/Mounting/Adjustment

1. Installation

⚠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 size is manufactured with precise tolerances, so even slight deformation can cause malfunction.Scratches or dents on the piston rod sliding part will damage packings and cause air leakage.

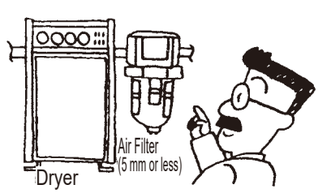
■If the direction of load movement is not parallel to the piston rod axis, twisting may occur in the piston rod and main body (tube), posing a risk of the piston rod flying out. Twisting can also cause seizure, damage, etc. Be sure to align the piston rod axis with the direction of load movement.

■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, to remove rust, foreign matter, and drain, install a filter near the directional control valve (primary side).



■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 malfunction.

■When connecting piping, wrap sealing tape clockwise from a position two or more threads inward from the tip of the threaded part of the pipe.
● 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 by handTighten by hand first, then use a tool for final tightening.

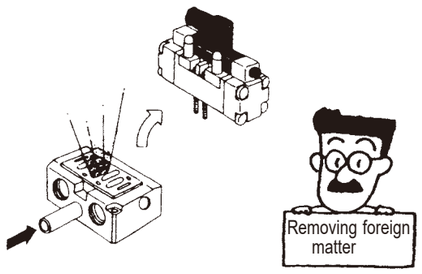


[Reference Value] See instruction manual.

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 fly out. 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 fly out.

■The effectiveness of the cushion with air cushion is adjusted at the time of shipment, but readjust it with the cushion needle according to the load and piston speed when using.
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 driven, do not enter the driving range of the cylinder or put your hands in.

During 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.

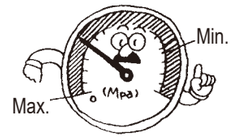
Caution

■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 Supply Compressed Air Pressure Management

- Is the set pressure being supplied?Does the pressure gauge indicate the set pressure while the equipment is operating?



② Pneumatic Filter Management

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

③ Compressed Air Leakage Management at Piping Connections

- 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 Lubricator Management

- 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.).Before applying grease, be sure to remove foreign matter from the sliding surfaces. If the type of grease used is unknown, please contact us.

2. Effect of Fluorine Grease

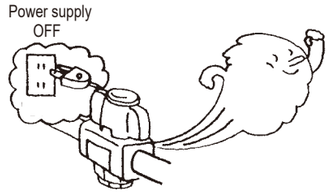
Warning

■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.Please note that if this is done without fixing the piston rod on the load side, the fastening part (threaded 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 fly out 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

Hand (Gripper)



CONTENTS

Series variation 2

Parallel Gripper

- Linear Slide Gripper (LSH-HP) 12
- Linear Slide Gripper (LSH) 86
- Feather Gripper (Mini Parallel Gripper) (FH100) 98
- Ultra Compact Cross Roller Parallel Gripper (BSA2) 106
- Compact Cross Roller Parallel Gripper (BHA) 110
- Compact Cross Roller Parallel Gripper with Rubber Cover (BHG) 118
- Centering Gripper (BHE) 126
- Linear Guide Gripper (LHA) 136
- Linear Guide Gripper with Rubber Cover (LHAG) 146
- Parallel Gripper (HAP-1C) 154
  (HAP-2 to 4CS) 158
- Cross Roller Parallel Gripper (HKP) 164
- Horizontal Parallel Gripper (HCP) 172
- Long Stroke Parallel Gripper (HGP) 178

Low Profile Parallel Gripper

- Low Profile Long Stroke Gripper (LST-HP) 186
- Long Stroke Low Profile Gripper (HLF2) 216
- Low Profile Parallel Gripper (HLA/HLB) 224
- Low profile parallel hand with rubber cover (HLAG/HLBG) 232
- Low Profile Long Stroke Parallel Gripper (HLC) 240
- Ultra low profile parallel hand (HLD) 248

Wide Parallel Gripper

- Wide Parallel Gripper (HMC-HP1) 254
- Compact Wide Parallel Gripper (HMF) 266
- Cutting Oil Resistant Specification Compact Wide Parallel Gripper (HMF-G) 276
- Large Wide Parallel Gripper With Linear Guide (HMFB) 282
- Wide Parallel Gripper (HFP) 288

Pivot Gripper

- Feather Gripper (Mini Pivot Gripper) (FH500) 294
- Pivot Gripper (HBL) 300
- Toggle hand (HJL) 306
- 180-degree Opening/Closing Low Profile Wide Angle Gripper (HMD) 314
- 180-degree Opening/Closing Wide Angle Gripper (HDL) 322
- 180-degree Opening/Closing High Gripping Force Wide Angle Gripper (HJD) 328

Attachment 334

Precautions for Use 336

Mechanical Gripper

- Mechanical Gripper (BHA-FC) 344

Robot Peripheral Components

- Auto Gripper Changer (CHC) 504

System Table Gripper (Parallel Gripper)

	Product Name	Model No.	Finger Movement	Bore size (mm)	Gripping force* (N)	Stroke (mm)	Page
Parallel Gripper	Linear Slide Gripper (High Durability Equipment HP Series)	LSH-HP1 LSHL-HP1		ø6 to ø32	3.3 to 158	4 to 22	12
	Linear Slide Gripper with Length Measurement Function (High Durability Equipment HP Series)	LSHM-HP2		ø10 to ø25	11 to 65	4 to 14	48
	Linear Slide Gripper (Standard Type)	LSH		ø10 to ø25	11 to 65	4 to 14	86
	Feather Gripper (Mini Parallel Gripper)	FH100		ø10 to ø25	6 to 30	8 to 20	98
	Ultra Compact Cross Roller Parallel Gripper	BSA2		ø6	3.5	4	106
	Compact Cross Roller Parallel Gripper	BHA		ø12 to ø25	15 to 80	5 to 15	110
	Compact Cross Roller Parallel Gripper with Rubber Cover	BHG		ø12 to ø25	15 to 80	5 to 15	118
	Centering Gripper	BHE		ø12 to ø32	15 to 125	7 to 22	126
	Linear Guide Gripper	LHA		ø6 to ø32	5.5 to 145	4 to 20	136
	Linear Guide Gripper with Rubber Cover	LHAG		ø12 to ø32	18 to 145	5 to 20	146
	Parallel Gripper	HAP-1C		ø15	18	8	154
	Parallel Gripper	HAP		ø20 to ø40	20 to 100	16 to 41	158
	Cross Roller Parallel Gripper	HKP		ø32 to ø80	160 to 1480	24 to 60	164
	Horizontal Parallel Gripper	HCP		ø12 to ø32	12 to 75	20 to 40	172
	Long Stroke Parallel Gripper	HGP		ø25	17	56	178

*Gripping force is the value at 0.5 MPa air pressure, on the close side. Actual gripping force varies depending on the distance to the gripping point and the angle of the fingers, so please check the page for each product when selecting.

	Product Name	Model No.	Finger Movement	Bore size (mm)	Gripping force* (N)	Stroke (mm)	Page
Low Profile Parallel Gripper	Low Profile Long Stroke Gripper (High Durability Equipment HP Series)	LST-HP1		ø8 x 2 to ø20 x 2	19 to 141	8 to 80	186
	Low Profile Long Stroke Gripper with Length Measuring Function (High Durability Component HP Series)	LSTM-HP2		ø12 x 2 to ø20 x 2	48 to 141	12 to 20	202
	Long Stroke Low Profile Gripper	HLF2		ø8 x 2 to ø20 x 2	20 to 135	12 to 96	216
	Low Profile Parallel Gripper	HLA/ HLB		ø12 to ø20	21 to 70	13 to 25	224
	Low Profile Parallel Gripper with Rubber Cover	HLAG/ HLBG		ø12 to ø20	21 to 70	13 to 25	232
	Low Profile Long Stroke Parallel Gripper	HLC		ø8 x 2 to ø30 x 2	18 to 310	20 to 140	240
	Ultra Low Profile Parallel Gripper	HLD		ø8 x 4 to ø20 x 4	35 to 250	12 to 30	248
Wide Type Parallel Gripper	Wide Parallel Gripper (HP Series)	HMC-HP1		ø10 x 2 to ø40 x 2	14 to 396	20 to 200	254
	Compact Wide Parallel Gripper	HMF		ø12 x 2 to ø40 x 2	32 to 430	20 to 200	266
	Cutting Oil Resistant Specification Compact Wide Parallel Gripper	HMF-G		ø16 x 2 to ø25 x 2	66 to 170	30 to 120	276
	Large Wide Parallel Gripper with Linear Guide	HMFB		ø25 x 2 to ø40 x 2	120 to 310	100 to 200	282
	Wide Parallel Gripper	HFP		ø16 x 2 to ø40 x 2	20 to 255	20 to 60	288
Pivot Gripper	Feather Gripper (Mini Pivot Gripper)	FH500		ø10 to ø20	2 to 15	Opening Angle 20°	294
	Pivot Gripper	HBL		ø15 to ø40	10 to 125	Opening Angle 20°	300
	Toggle Gripper	HJL		ø32 to ø63	250 to 1800	Opening Angle 28°	306
	180-degree Opening/ Closing Thin Wide Angle Gripper	HMD		ø12 to ø25	16 to 120	Opening Angle 184°	314
	180-degree Opening/ Closing Wide Angle Gripper	HDL		ø25 to ø40	10 to 50	Opening Angle 180°	322
	180-degree Opening/Closing High Gripping Force Wide Angle Gripper	HJD		ø32 to ø63	200 to 1250	Opening Angle 184°	328

*Gripping force is the value at 0.5 MPa air pressure, on the close side. Actual gripping force varies depending on the distance to the gripping point and the angle of the fingers, so please check the page for each product when selecting.

LSH-HP1 Series

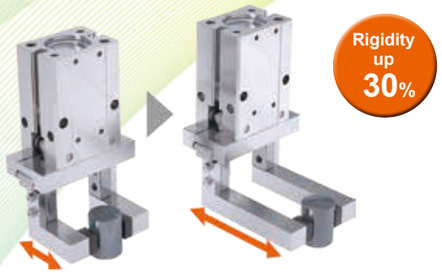
Productivity improvement starts with the Linear Slide Gripper



Improved linear guide performance

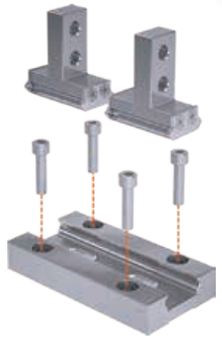
High rigidity **Increased Overhang**

By increasing guide rigidity compared to conventional products, an increase in allowable moment has been achieved.



High precision **Repeatability ±0.01 mm**

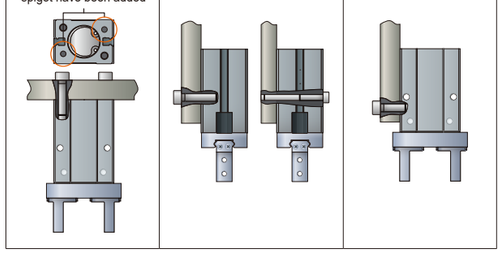
Integrated structure of guide rail and finger achieves high rigidity and high precision.



High design freedom

Mountable from 3 directions

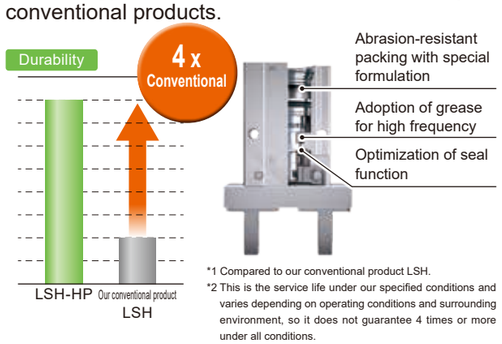
Axial direction (top) mounting	Horizontal mounting	Vertical mounting
Two positioning holes enabling inverted mounting with reference spigot have been added		



Long service life

Durability 4 times conventional ratio *1 *2

Optimized packing part design. Mastering sliding technology, achieved 4 times the durability of conventional products.

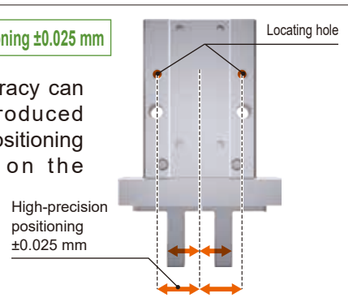


*1 Compared to our conventional product LSH.
*2 This is the service life under our specified conditions and varies depending on operating conditions and surrounding environment, so it does not guarantee 4 times or more under all conditions.

Reduced on-site man-hours

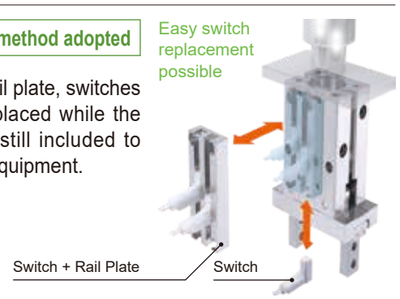
High-precision positioning ±0.025 mm

Centering accuracy can be easily reproduced by adding a "positioning hole" based on the gripping center.



Rail plate method adopted

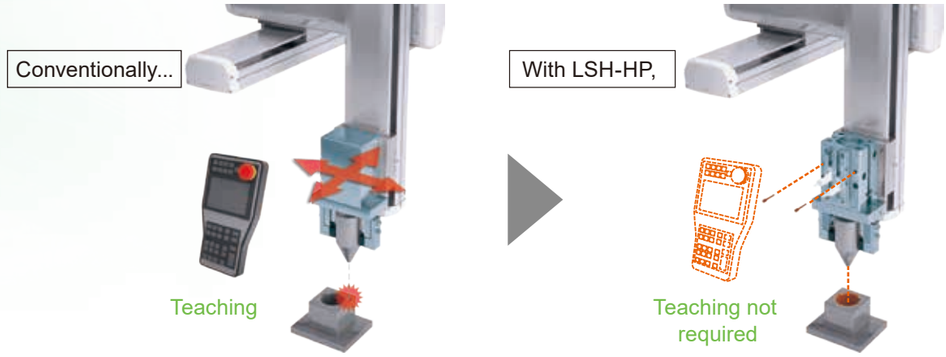
With the rail plate, switches can be replaced while the gripper is still included to the robot/equipment.



Usage examples - Reduction of on-site man-hours -

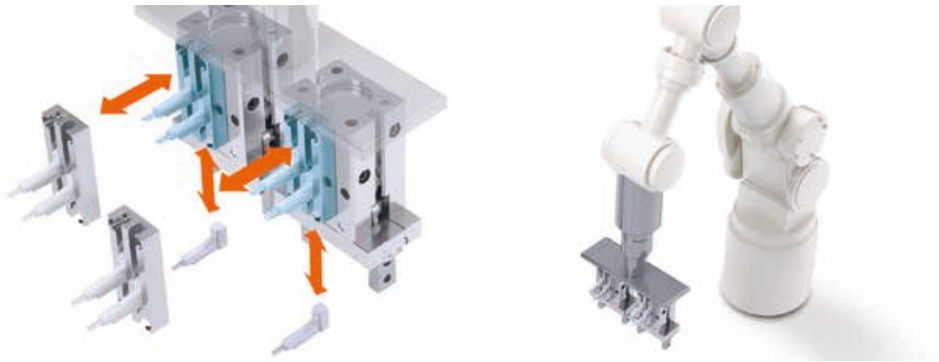
Replacement of main body

Locating holes that guarantee centering accuracy enable highly reproducible mounting without fine adjustment. Contributes to reduction of mounting adjustment man-hours and improvement of reproducibility.



Replacement of switch

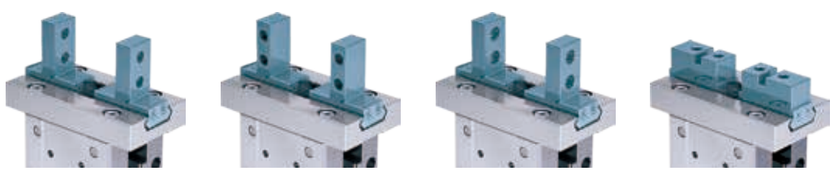
Switches can be replaced without detaching the gripper from the robot or equipment.



Abundant series variations



Standard | With rubber cover | Long stroke | Long stroke + with rubber cover



Basic type opening/closing direction tap | Side tap | Opening/closing direction through hole | Flat

LSHM-HP2 Series

New series combining improved reliability and productivity



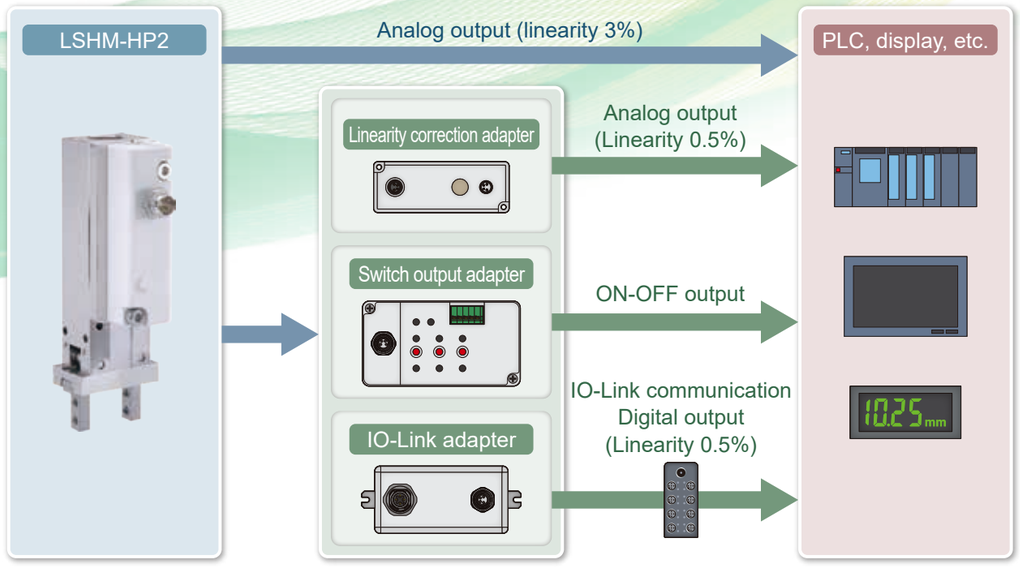
High precision

Repeatability ±0.02 mm

By adopting a new sensor method and integrating it, higher repeatability than ever before has been achieved.

Selectable output format

Various output forms can be selected according to the application.



Integrated structure

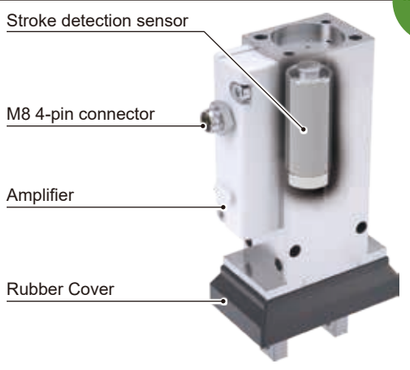
Industry First

Adopts LVDT* method sensor with excellent vibration and shock resistance. By incorporating a displacement sensor into the body and creating an integrated structure, high precision has been achieved.

*LVDT is an abbreviation for Linear Variable Differential Transformer, and is a sensor that converts mechanical displacement into an electrical signal and outputs it.

Environmental Resistance

IP65 equivalent amplifier and rubber cover prevent internal intrusion of chips and water droplets.



Linearity correction adapter

Linearity F.S. ±0.5%

- **With correction adapter: F.S. ±0.5%**
- **Without correction adapter: F.S.±3%**

Adoption of the correction adapter has improved linearity accuracy.



Switch Output Adapter

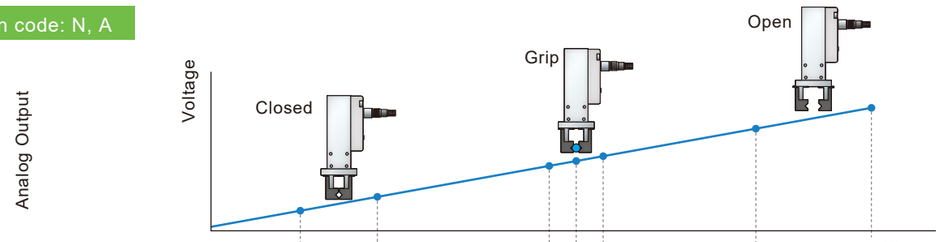
Easy setting

Operating range and output pattern can be easily selected with a rotary switch. Troublesome cylinder switch adjustment work is unnecessary. Also, fine operating ranges can be selected with the high-precision sensor.

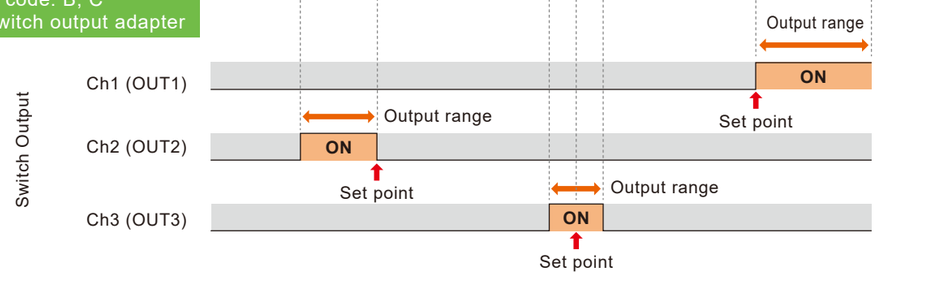


Operation detection image

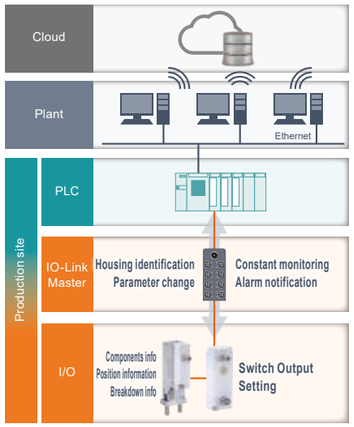
Option code: N, A



Option code: B, C
With switch output adapter



IO-Link Adapter





Constant monitoring by digital data is possible.

Since parameters can be set and changed from the network, remote operation of the equipment is possible.

Model No., serial No., etc. can be confirmed on the network.

Since settings can be copied from the master, troublesome parameter resetting during maintenance is unnecessary.

Device failure and disconnection can be confirmed.

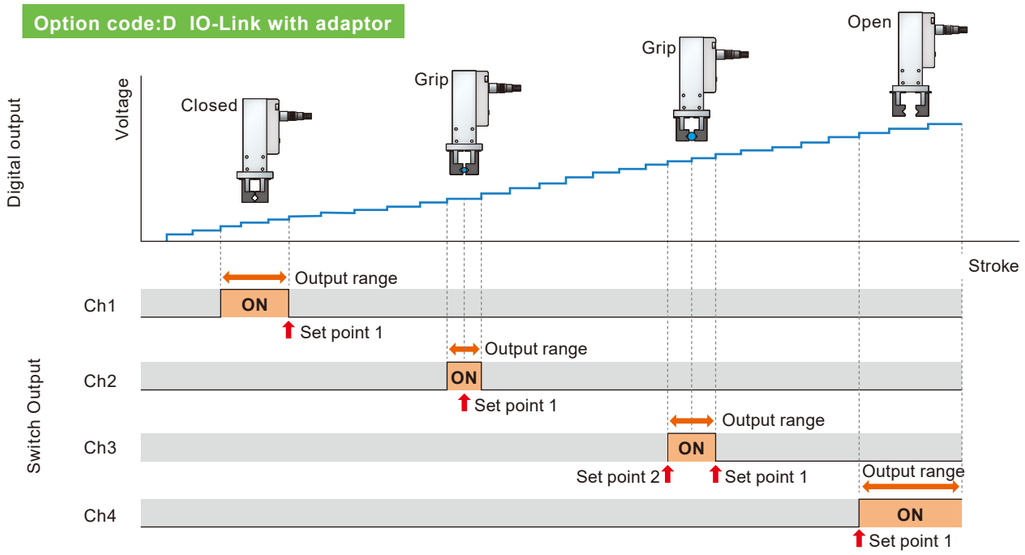
It can also be converted and connected to Ethernet-based networks, enabling IoT of equipment.



IO-Link is a digital communication standard for sensors and actuators in factory sites. (IEC61131-9)
It is possible to transmit parameters and event data that could not be transmitted with analog communication.

Operation detection image

Option code:D IO-Link with adaptor



Abundant series variations


Amplifier Side mounting


Amplifier Front mounting


With rubber cover


Basic type opening/ closing direction tap


Side tap

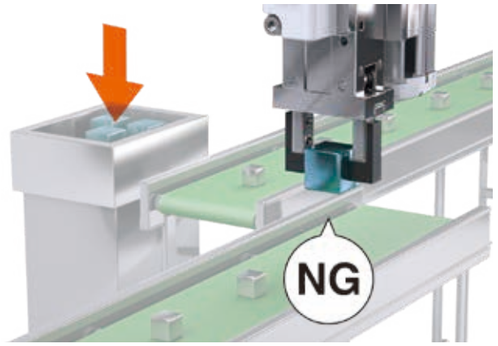

Opening/closing direction through-hole


Flat

Usage Examples

Workpiece non-conforming product judgment

Measures length simultaneously with gripping, enabling omission of inspection man-hours.



Workpiece type judgment

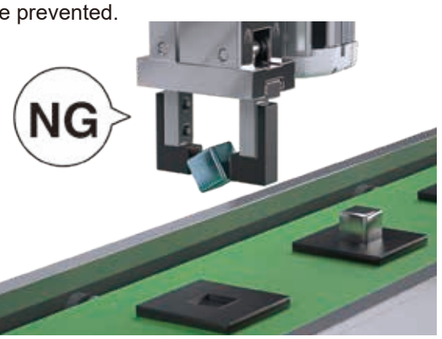
Even minute differences in workpiece type can be judged instantly.



Judging workpiece "C".

Gripping posture judgment

By detecting posture deviation when gripping, contact accidents at the conveyance destination can be prevented.



Minute workpiece gripping/empty gripping judgment

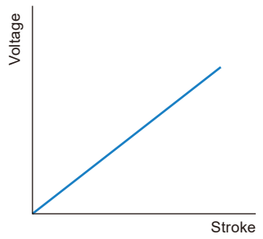
It can be accurately judged whether even a minute workpiece has been gripped or if it was an empty grip.



Elimination of human error

The entire stroke is output in detail, eliminating adjustment defects due to manual work that occurred with conventional switches.

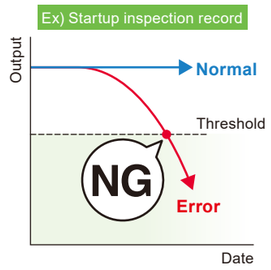




Predictive maintenance

Abnormal wear and deformation of gripping fingers and jigs can be monitored from changes in output, preventing damage to equipment and robots.





Hand (Gripper)
LSH-HP
LSH
FH100
BSA2
BHA
BHG
BHE
LHA
LHAG
HAP-1C
HAP-2 to 4CS
HKP
HCP
HGP
LST-HP
HLF2
HLA/ HLB
HLAG/ HLBG
HLC
HLD
HMC-HP
HMF
HMF-G
HMFB
HFP
FH500
HBL
HJL
HMD
HDL
HJD
Cylinder Switch
Ending

System Table Linear Slide Gripper LSH-HP Series (High Durability Equipment)

	Variation	Model No.	Bore size (mm)	Gripping Force (N) 5 10 50 100 200	Operating Stroke (mm)	Switch Model No.	Page
HP1 Series	Double Acting Type/Single Acting Type Without Rubber Cover 	LSH-A-HP1	ø6		4	F2S F3S F2H/V F3H/V F3PH/V T2H/V T3H/V T2H/VR3 T3PH/V	12
			ø10		4		
			ø16		6		
			ø20		10		
			ø25		14		
			ø32		22		
	Double Acting Type/Single Acting Type With Rubber Cover 	LSH-G-HP1 LSH-F-HP1	ø6		4		22
			ø10		4		
			ø16		6		
			ø20		10		
			ø25		14		
			ø32		22		
	Double Acting Type Long Stroke Without Rubber Cover 	LSHL-A-HP1	ø10		8		32
			ø16		12		
			ø20		18		
			ø25		22		
	Double Acting Type Long Stroke With Rubber Cover 	LSHL-G-HP1 LSHL-F-HP1	ø10		8		40
			ø16		12		
			ø20		18		
HP2 Series	With Length Measurement Function Double Acting Type Without Rubber Cover 	LSHM-A-HP2	ø10		4	–	48
			ø16		6		
			ø20		10		
			ø25		14		
	With Length Measurement Function Double Acting Type With Rubber Cover 	LSHM-G-HP2 LSHM-F-HP2	ø10		4	–	56
			ø16		6		
			ø20		10		
			ø25		14		

*Range of gripping force at 0.5 MPa supply pressure and 20 mm finger length

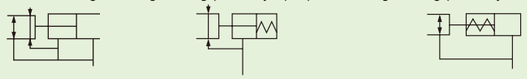


Linear Slide Gripper Double Acting Type/Single Acting Type (High Durability Equipment)

LSH-A-HP1 Series

●Operating Stroke: 4, 6, 10, 14, 22 mm

Double Acting | Single Acting (Normally Open) | Single Acting (Normally Closed)



RoHS

Model No. Notation Method

Without Switch
(Built-in magnet for switch)

LSH - A - 06 D 1 R - N ——— HP1

Model No. | Without Rubber Cover | ❶ | ❷ | ❸ | ❹ | ❺

With Switch
(Built-in magnet for switch)

LSH - A - 06 D 1 R - F2H - D - HP1

Model No. | Without Rubber Cover | ❶Bore size | ❷Actuation method | ❸Finger | ❹Gripping center reference, high-precision positioning hole | ❺Switch Model No. | ❻Number of Switches

❶Bore Size (mm)

Code	Content
06	ø6
10	ø10
16	ø16
20	ø20
25	ø25
32	ø32

❷Actuation method

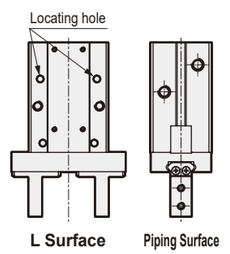
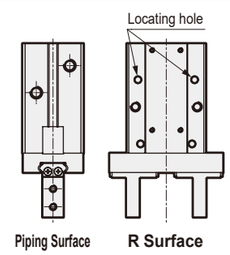
Code	Content
D	Double Acting
S	Single Acting, Normally Open
C	Single Acting, Normally Closed

❸Finger

Code	Content	
1	Basic type	
2	Side tap	
3	Through-hole	
4	Flat	

Note) For details, refer to the outline dimension drawings.

❹Gripping center reference, high-precision positioning hole

Code	Content
N	None
L	
R	

Note) For details, refer to each outline dimension drawing (P. 15 to P. 20) and P. 71.

❺Switch Model No.

Without Switch

Code	Content
Blank	Without switch, F-type switch rail plate included
N	Without switch, without switch rail plate
A	Without switch, T-type switch rail plate included (ø32 only)

With Switch — For switch details, please refer to P. 573. 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 20	-	F2S□	
		3-wire (NPN)	-	30 or less	-	50 or less	-	F3S□	
		2-wire	-	10 to 30	-	5 to 20 N *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-wire	-	10 to 30	-	5 to 20 *2	T2H□	T2V□	
	1-Color Flex-Resistant Lead Wire	2-wire	-	10 to 30	-	5 to 20 *2	T2HR3	T2VR3	 *3
	1-Color	3-wire (NPN)	-	30 or less	-	100 or less	T3H□	T3V□	
		3-wire (PNP)	-		-		T3PH□	T3PV□	

*1: For "□" in the switch model No., enter the code selected from the "*Lead wire length" 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: T-type switch can be selected for ø32 only.
*4: If with switch is selected, a rail plate corresponding to the switch will be included.
*5: For notes on switches, refer to P. 80.
*6: Switches other than the model No.s listed above are also available. (Custom Product) For details, see P. 573.
*7: When mounting a 2-color indicator switch, please consult our sales office.

***Lead wire length**

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

Example) Lead wire length
1 m F2S
3 m F2S3

❻Number of Switches

Code	Content
R	With 1 pc. on Open Side
H	With 1 pc. on Close Side
D	With 2 pcs

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

●Design compatible with rechargeable battery manufacturing process

LSH-・・・・-P4□-HP1

*Please contact us for details.

Switch Single Unit Model No. Notation Method

SW - F2H

❺Switch Model No.

Specifications

Item			LSH-A-HP1					
Bore size		mm	ø6	ø10	ø16	ø20	ø25	ø32
Actuation method			Double Acting Type / Single Acting Type (Normally Open / Normally Closed)					
Operating Fluid			Compressed Air					
Maximum Operating Pressure		MPa	0.7					
Min. operating pressure	MPa	Double Acting Type	0.15	0.2	0.1			
		Single acting type	0.3	0.35	0.25			
Port Size			M3		M5			
Ambient Temperature		°C	-10 to 60 (No freezing)					
Operating Stroke		mm	4		6	10	14	22
Repeatability		mm	±0.01					
Weight kg Double Acting Type (Single Acting Type)	Finger Code: 1,2,3		0.032	0.06	0.135	0.275 (0.28)	0.49 (0.495)	0.73 (0.78)
	Finger Code: 4				0.14	0.28 (0.285)	0.495 (0.5)	0.76 (0.81)
Lubrication			Not Required					

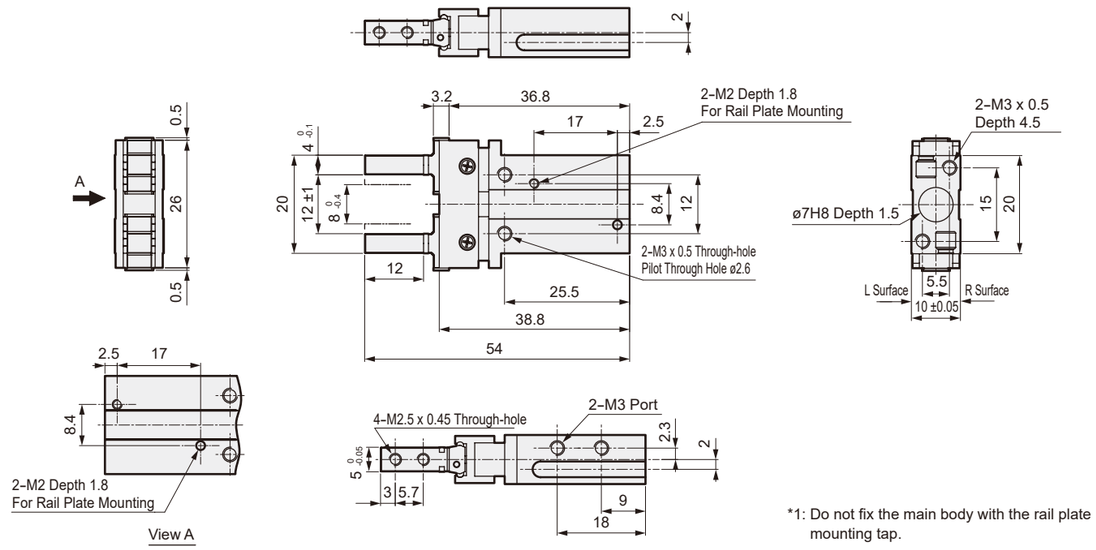
Note) For gripping force performance data, refer to P. 74.

Switch Mounting Availability Table

Model No.	Switch Model No.	Side surface mounting	Rail Mounting
LSH-A06	F2/3□	●	–
	F2/3S	–	●
LSH-A10	F2/3□	●	●
	F2/3S	●	●
LSH-A16	F2/3□	●	●
	F2/3S	●	●
LSH-A20	F2/3□	●	●
	F2/3S	●	●
LSH-A25	F2/3H, PH	–	●
	F2/3 V, PV	●	●
	F2/3S	●	●
LSH-A32	F2/3□	●	●
	F2/3S	●	●
	T2/3□	–	●

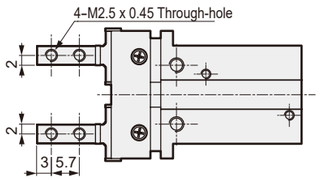
Outline Dimension Drawing (Bore size: ø6)

●LSH-A06□1N

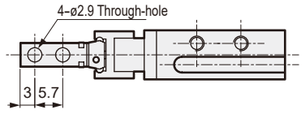


*1: Do not fix the main body with the rail plate mounting tap.

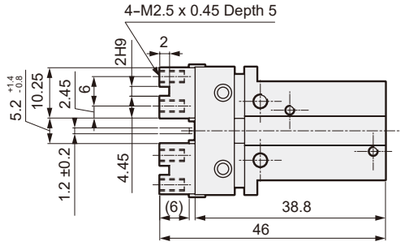
●LSH-A06□N



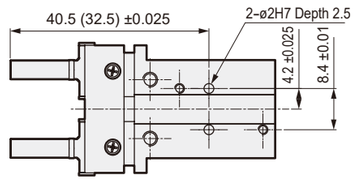
●LSH-A06□N



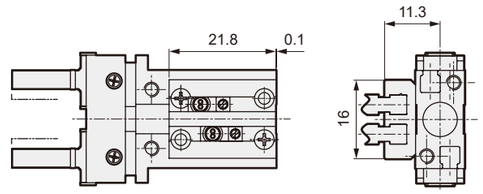
●LSH-A06□N



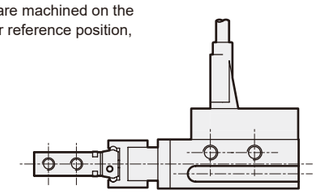
●LSH-A06□□R/L



●With Switch Rail Plate Assembled



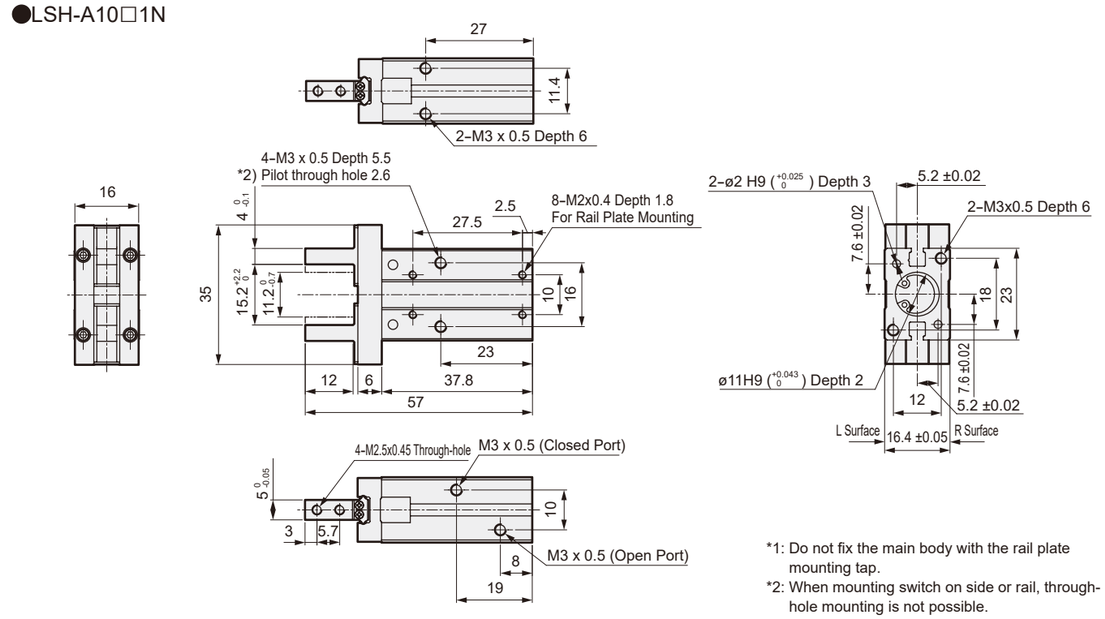
*2: For the LSH-A06□□R, the gripping center reference and high-precision positioning holes are machined on the R side; for the LSH-A06□□L, they are machined on the L side. For reference position, refer to P. 71.
*3: ( ) indicates dimensions for LSH-A06□4.



*4: For notes on cylinder switches, refer to P. 80.
*5: Since fittings interfere with each other, use fittings with an outer diameter of ø9 or less.

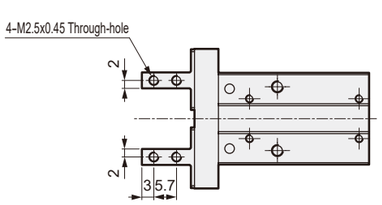
External dimensions diagram (Bore size: ø10)

●LSH-A10□1N

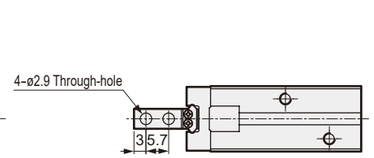


*1: Do not fix the main body with the rail plate mounting tap.
*2: When mounting switch on side or rail, through-hole mounting is not possible.

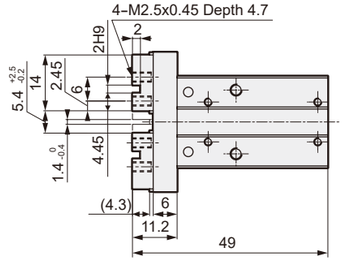
●LSH-A10□2N



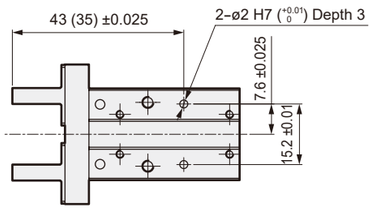
●LSH-A10□3N



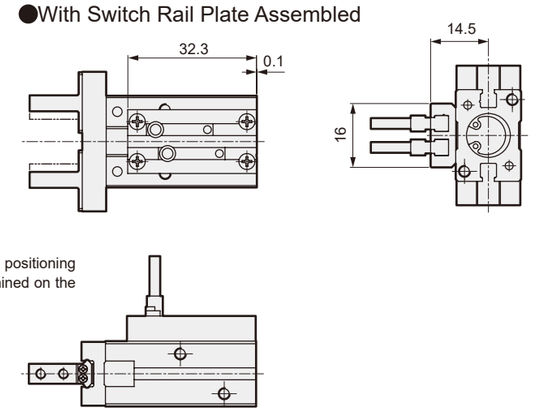
●LSH-A10□4N



●LSH-A10□□R/L



●With Switch Rail Plate Assembled

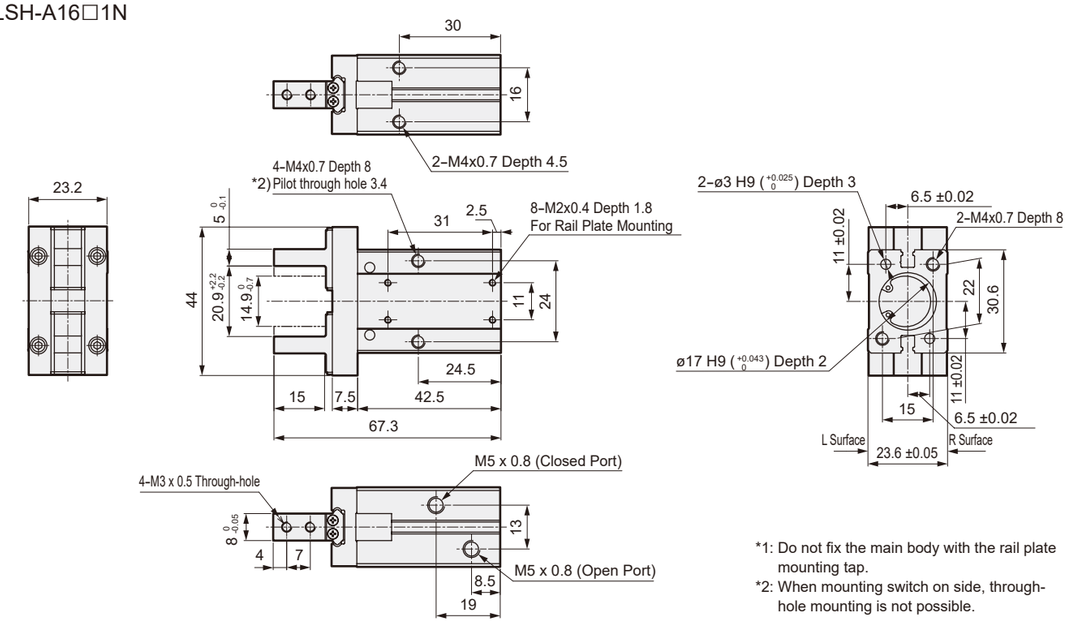


*3: For the LSH-A10□□R, the gripping center reference and high-precision positioning holes are machined on the R side; for the LSH-A10□□L, they are machined on the L side. For reference position, refer to P. 71.
*4: ( ) indicates dimensions for LSH-A10□4.

*5: For notes on cylinder switches, refer to P. 80.

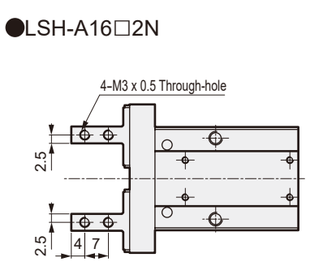
Outline dimension drawing (Bore size: ø16)

●LSH-A16□1N

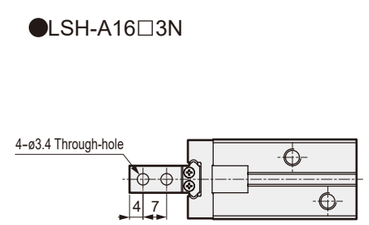


*1: Do not fix the main body with the rail plate mounting tap.
*2: When mounting switch on side, through-hole mounting is not possible.

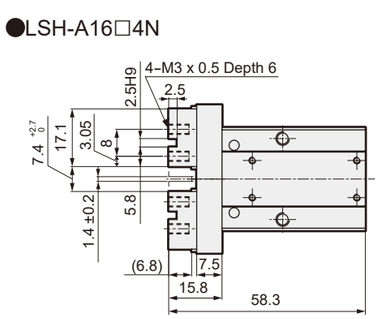
●LSH-A16□2N



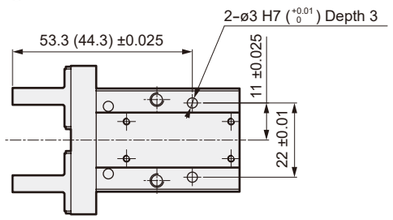
●LSH-A16□3N



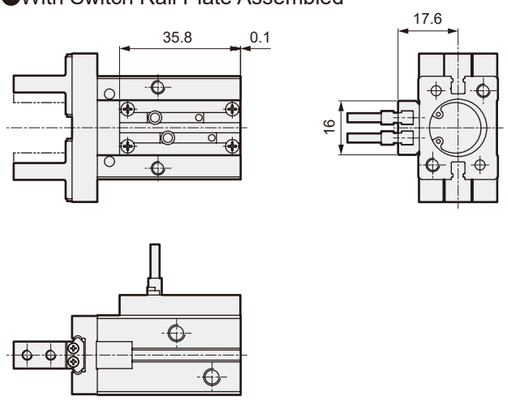
●LSH-A16□4N



●LSH-A16□□R/L



●With Switch Rail Plate Assembled

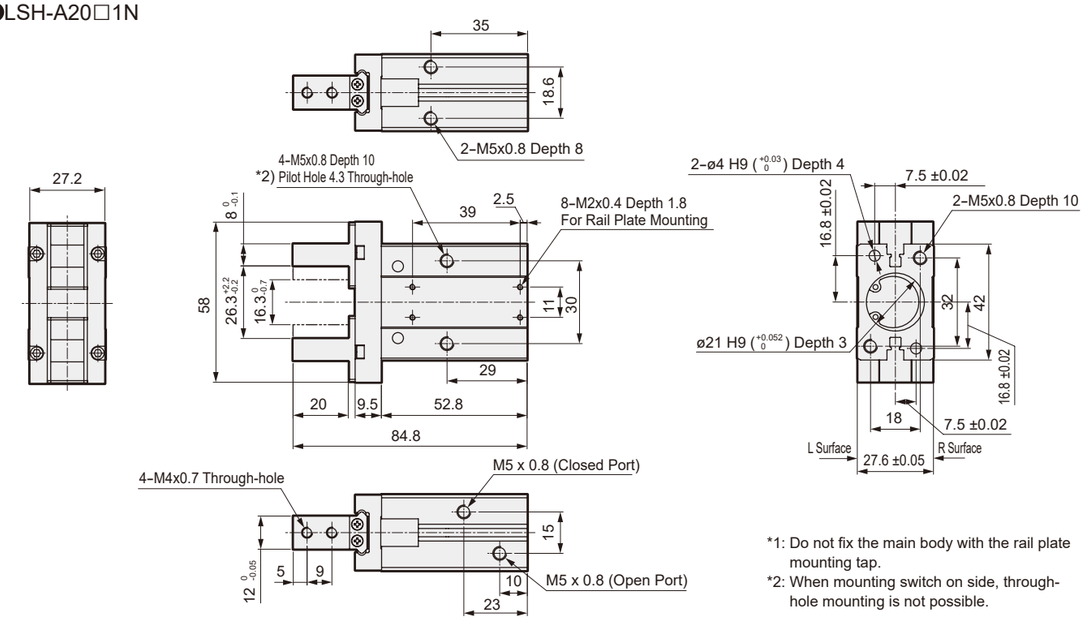


*3: For the LSH-A16□□R, the gripping center reference and high-precision positioning holes are machined on the R side; for the LSH-A16□□L, they are machined on the L side. For reference position, refer to P. 71.
*4: ( ) indicates dimensions for LSH-A16□4.

*5: For notes on cylinder switches, refer to P. 80.

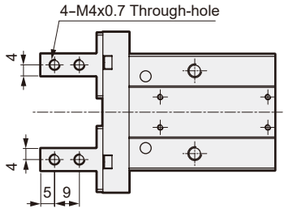
Outline dimension drawing (Bore size: ø20)

●LSH-A20□1N

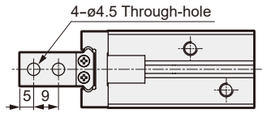


*1: Do not fix the main body with the rail plate mounting tap.
*2: When mounting switch on side, through-hole mounting is not possible.

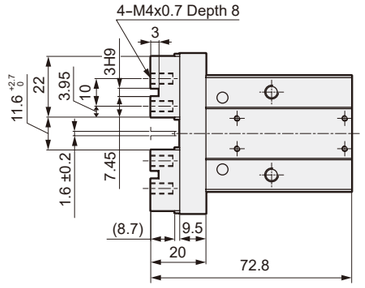
●LSH-A20□2N



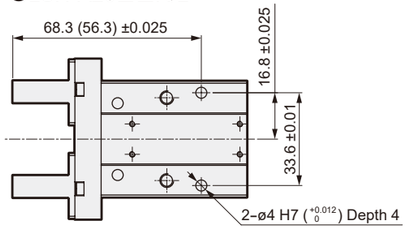
●LSH-A20□3N



●LSH-A20□4N

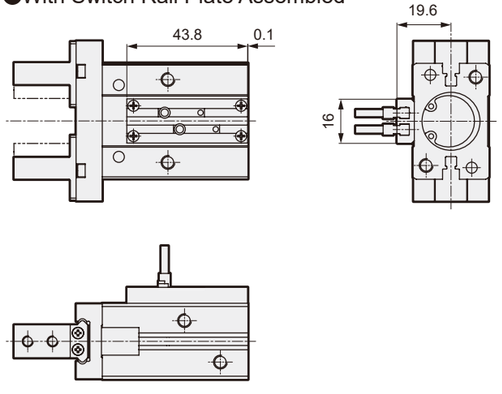


●LSH-A20□□R/L



*3: For the LSH-A20□□R, the gripping center reference and high-precision positioning holes are machined on the R side; for the LSH-A20□□L, they are machined on the L side. For reference position, refer to P. 71.
*4: ( ) indicates dimensions for LSH-A20□4.

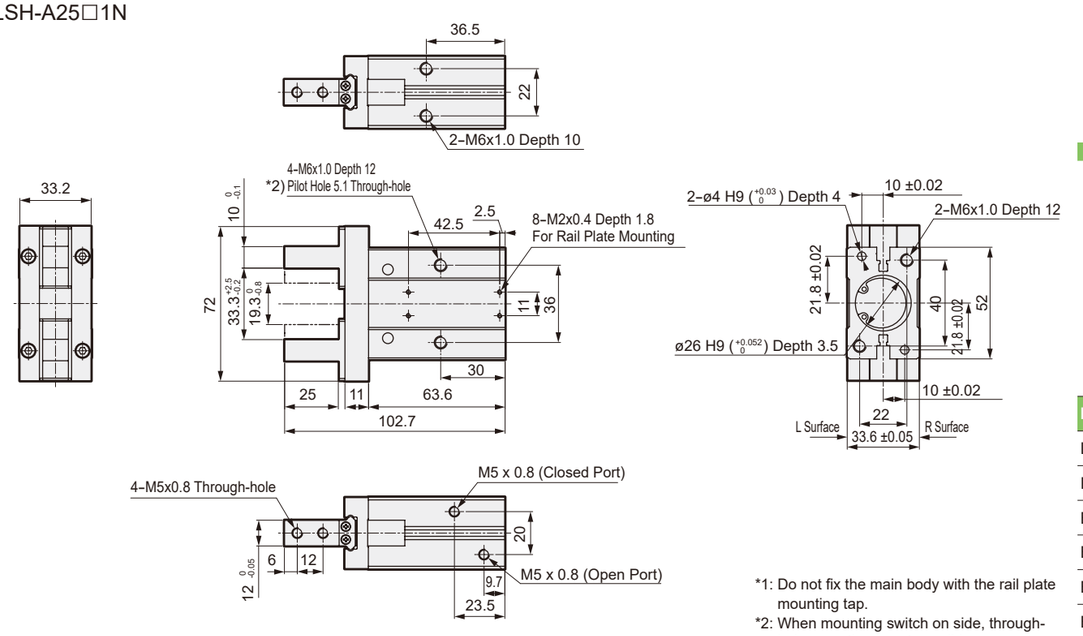
●With Switch Rail Plate Assembled



*5: For notes on cylinder switches, refer to P. 80.

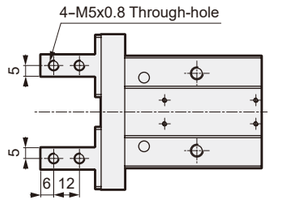
Outline Dimension Drawing (Bore size: ø25)

●LSH-A25□1N

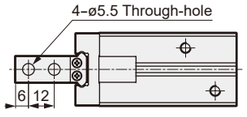


*1: Do not fix the main body with the rail plate mounting tap.
*2: When mounting switch on side, through-hole mounting is not possible.

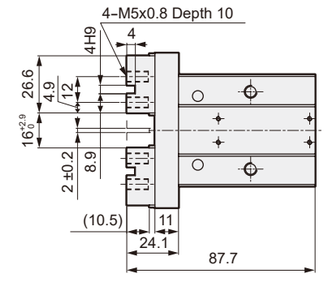
●LSH-A25□2N



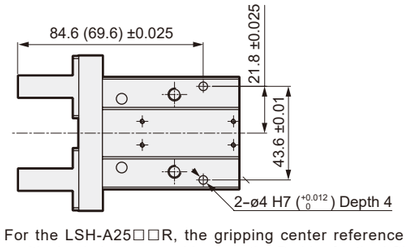
●LSH-A25□3N



●LSH-A25□4N

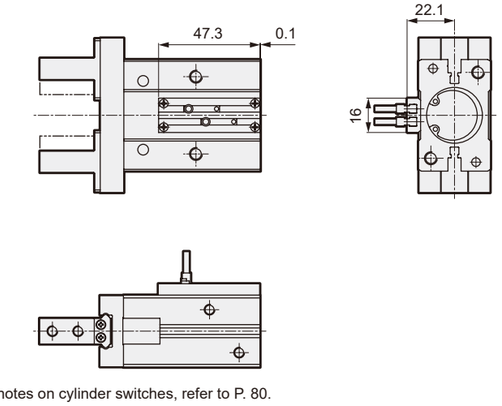


●LSH-A25□□R/L



*3: For the LSH-A25□□R, the gripping center reference and high-precision positioning holes are machined on the R side; for the LSH-A25□□L, they are machined on the L side. For reference position, refer to P. 71.
*4: ( ) indicates dimensions for LSH-A25□4.

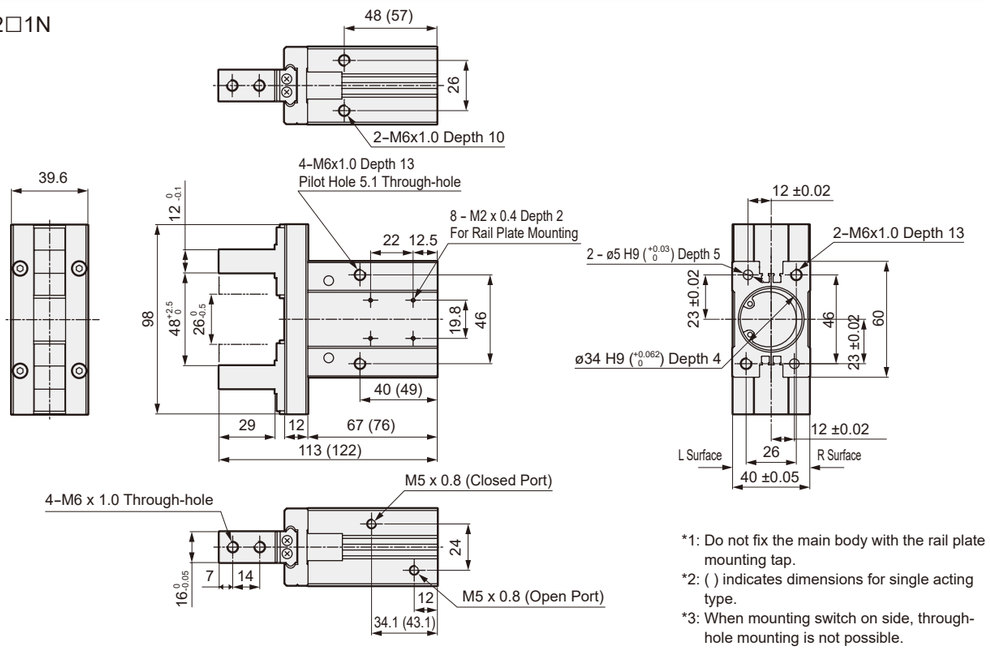
●With Switch Rail Plate Assembled



*5: For notes on cylinder switches, refer to P. 80.

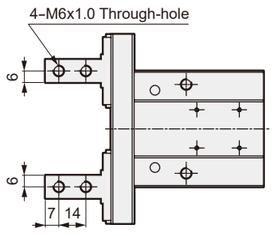
External dimensions diagram (Bore size: ø32)

●LSH-A32□1N

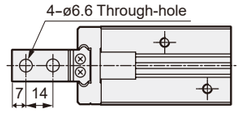


*1: Do not fix the main body with the rail plate mounting tap.
*2: ( ) indicates dimensions for single acting type.
*3: When mounting switch on side, through-hole mounting is not possible.

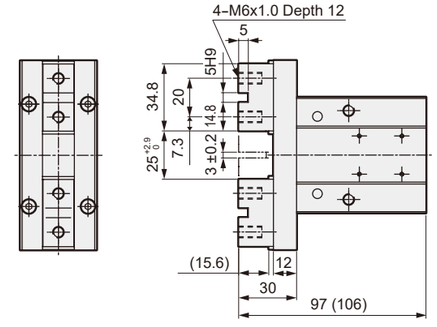
●LSH-A32□2N



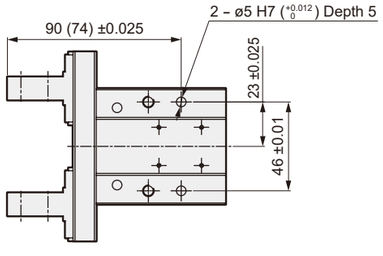
●LSH-A32□3N



●LSH-A32□4N

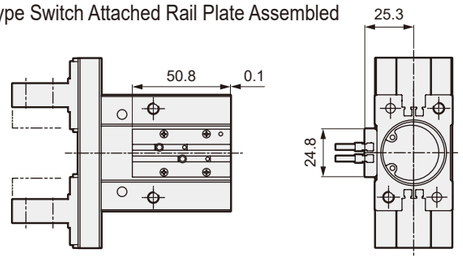


●LSH-A32□□R/L

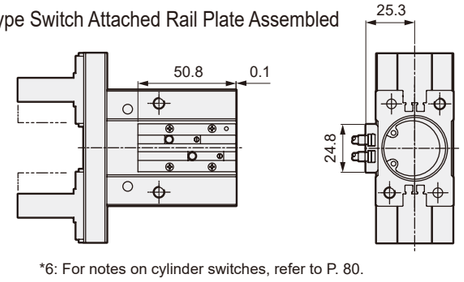


*4: For the LSH-A06□□R, the gripping center reference and high-precision positioning holes are machined on the R side; for the LSH-A06□□L, they are machined on the L side. For reference position, refer to P. 71.
*5: ( ) indicates dimensions for LSH-A32□4.

●F-type Switch Attached Rail Plate Assembled



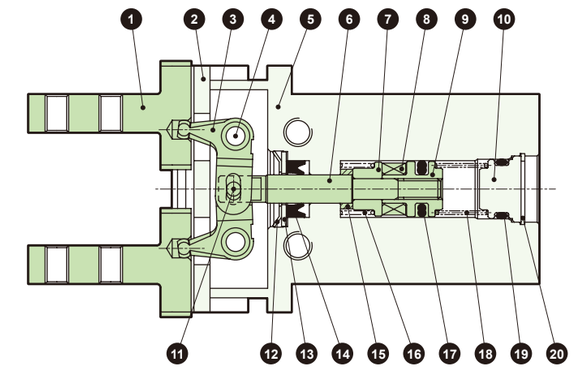
●T-type Switch Attached Rail Plate Assembled



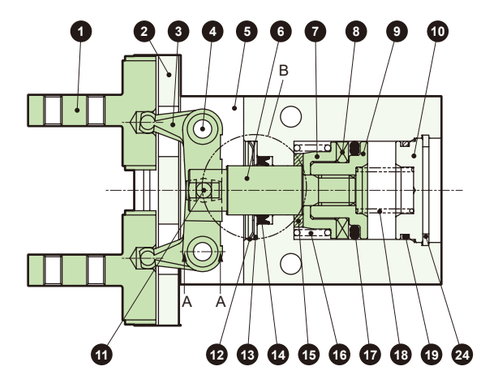
*6: For notes on cylinder switches, refer to P. 80.

Internal Structure Diagram/Material

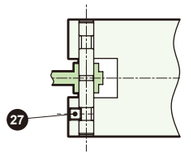
●LSH-A06



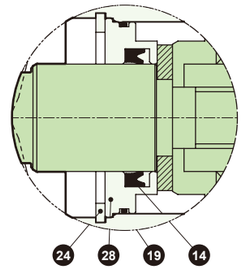
●LSH-A10 to 32



Cross-sectional View A-A (ø10 to 32)



Part B (ø20, 25, 32)



Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Finger	Stainless Steel		16	Coil Spring	Piano Wire	Single Acting C only
2	Linear Guide	Stainless Steel		17	Piston Packing	Nitrile Rubber	
3	Lever	Stainless Steel		18	Coil Spring	Piano Wire	Single Acting S only
4	Pivot Shaft	Steel		19	O-ring	Nitrile Rubber	
5	Cylinder Body	Aluminum Alloy		20	C-type retaining ring	Steel	
6	Piston Rod	Stainless Steel		21	Pan Head Screw	Stainless Steel	
7	Spring Retainer	Aluminum Alloy		22	Plug	Stainless Steel	Single Acting C only
8	Magnet			23	Plug	Stainless Steel	Single Acting S only
9	Piston	Aluminum Alloy		24	C-type retaining ring	Stainless Steel	
10	Head Cover	Aluminum Alloy		25	Hexagon Socket Head Cap Screw	ø10 to ø25: Stainless Steel ø32: Steel	
11	Operating Shaft	Alloy Steel					
12	Retaining ring	Stainless Steel	ø10 to ø16 only	26	Pin	Steel	
13	Cap	Stainless Steel	ø10 to ø16 only	27	Hexagon socket set screw	Stainless Steel	
14	Rod Packing	Nitrile Rubber		28	Rod Metal	Aluminum Alloy	
15	Cushion Rubber	Urethane Rubber					

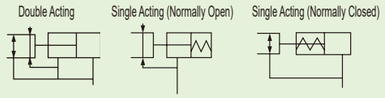
For maintenance parts, please visit the CKD Equipment Product Site (https://www.ckd.co.jp/kiki/en/) → "model No." → Maintenance Parts



Linear Slide Gripper Double Acting/Single Acting Type, With Rubber Cover (High Durability Equipment)

LSH-G, F-HP1 Series

●Operating Stroke: 4, 6, 10, 14, 22 mm



RoHS

Model No. Notation Method

Without Switch
(Built-in magnet for switch)

LSH - G 06 D 1 R - N —— HP1

Model No. ❶ ❷ ❸ ❹ ❺ ❻

With Switch
(Built-in magnet for switch)

LSH - G 06 D 1 R - F2H - D - HP1

Model No. ❶Rubber Cover ❷Bore size ❸Actuation method ❹Finger ❺Gripping center reference, high-precision positioning hole ❻Switch Model No. ❼Number of Switches

❶Rubber Cover

Code	Content
G	Chloroprene rubber
F	Fluoro Rubber

❷Bore Size (mm)

Code	Content
06	ø6
10	ø10
16	ø16
20	ø20
25	ø25
32	ø32

❸Actuation method

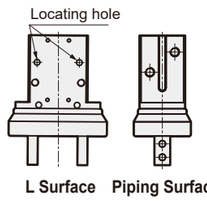
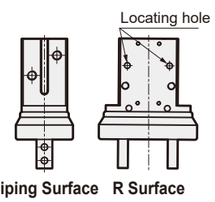
Code	Content
D	Double Acting
S	Single Acting, Normally Open (ø6 to ø25 only)
C	Single Acting, Normally Closed (ø6 to ø25 only)

❹Finger

Code	Content	
1	Basic type	

Note) For details, refer to the outline dimension drawings.

❺Gripping center reference, High-precision positioning hole

Code	Content
N	None
L	 L Surface Piping Surface
R	 Piping Surface R Surface

Note) For details, refer to each outline dimension drawing (P. 25 to P. 30, and P. 71).

❻Switch Model No.

Without Switch

Code	Content
Blank	Without switch, F-type switch rail plate included
N	Without switch, without switch rail plate
A	Without switch, T-type switch rail plate included (ø32 only)

With Switch — For switch details, please refer to P. 573. 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 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-wire	-	10 to 30	-	5 to 20 *2	T2H□	T2V□	
	1-Color Flex-Resistant Lead Wire	2-wire	-	10 to 30	-	5 to 20 *2	T2HR3	T2VR3	 *3
	1-Color	3-wire (NPN)	-	30 or less	-	100 or less	T3H□	T3V□	
		3-wire (PNP)	-		-		T3PH□	T3PV□	

*1: For "□" in the switch model No., enter the code selected from the "*Lead wire length" 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: T-type switch can be selected for ø32 only.
*4: If with switch is selected, a rail plate corresponding to the switch will be included.
*5: For notes on switches, refer to P. 81.
*6: Switches other than the model No.s listed above are also available. (Custom Product) For details, see P. 573.
*7: When mounting a 2-color indicator switch, please consult our sales office.

***Lead wire length**

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

Example) Lead wire length
1m F2S
3m F2S3

❼Number of Switches

Code	Content
R	With 1 pc. on Open Side
H	With 1 pc. on Close Side
D	With 2 pcs

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

●Structure usable in Rechargeable battery manufacturing processes

LSH-G/F - ···· - P4□ - HP1

*Please contact us for details.

Switch Single Unit Model No. Notation Method

SW - F2H

❻Switch Model No.

Specifications

Item		LSH-G / F-HP1					
Bore size	mm	ø6	ø10	ø16	ø20	ø25	ø32
Actuation method		Double Acting Type / Single Acting Type (Normally Open / Normally Closed)					
Operating Fluid		Compressed Air					
Maximum Operating Pressure	MPa	0.7					
Min. Operating Pressure	Double Acting Type	0.15	0.2	0.1			
MPa	Single acting type	0.3	0.35	0.25			–
Port Size		M3		M5			
Ambient Temperature	°C	-10 to 60°C (provided there is no freezing)					
Operating Stroke	mm	4		6	10	14	22
Repeatability	mm	±0.01					
Weight Double Acting Type (Single Acting Type)	kg	0.033	0.07	0.15	0.3 (0.35)	0.53 (0.535)	0.81
Lubrication		Not Required					

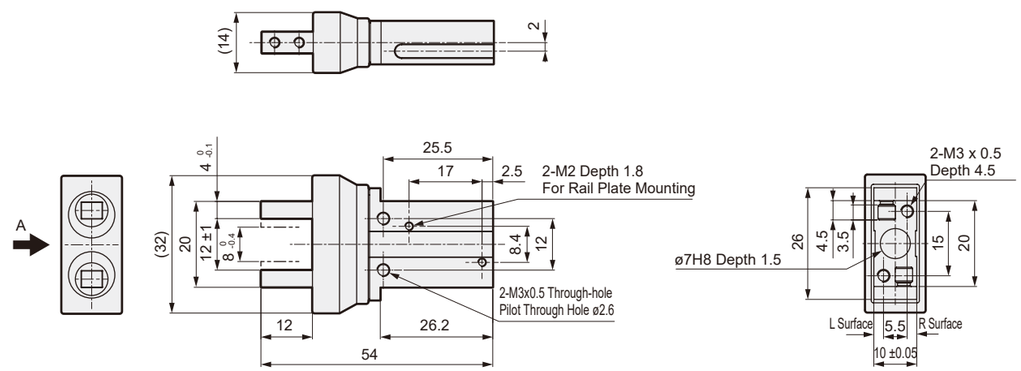
Note) For gripping force performance data, refer to P. 76.

Switch Mounting Availability Table

Model No.	Switch Model No.	Side surface mounting	Rail Mounting
LSH-G/F06	F2/3□	●	–
	F2/3S	–	●
LSH-G/F10	F2/3□	●	●
	F2/3S	●	●
LSH-G/F16	F2/3□	●	●
	F2/3S	●	●
LSH-G/F20	F2/3□	●	●
	F2/3S	●	●
LSH-G/F25	F2/3H, PH, PV	–	●
	F2/3 V	●	●
	F2/3S	●	●
LSH-G/F32	F2/3□	●	●
	F2/3S	●	●
	T2/3□	–	●

Outline Dimension Drawing (Bore size: ø6)

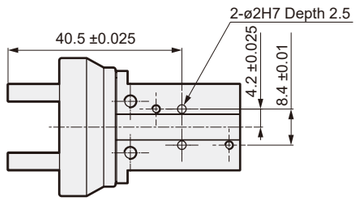
●LSH-G / F06



*1: Do not fix the main body with the rail plate mounting tap.

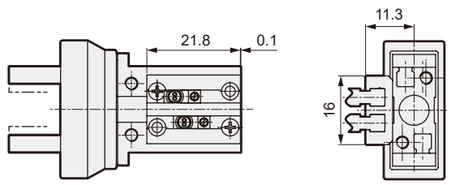
View A

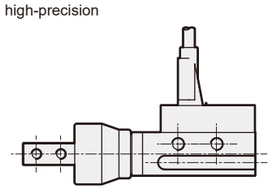
●LSH-G06□1R/L, LSH-F06□1R/L



*2: For LSH-G06□1R, the R surface is machined with gripping center standard, high-precision locating holes. For reference position, refer to P. 71.

●With Switch Rail Plate Assembled

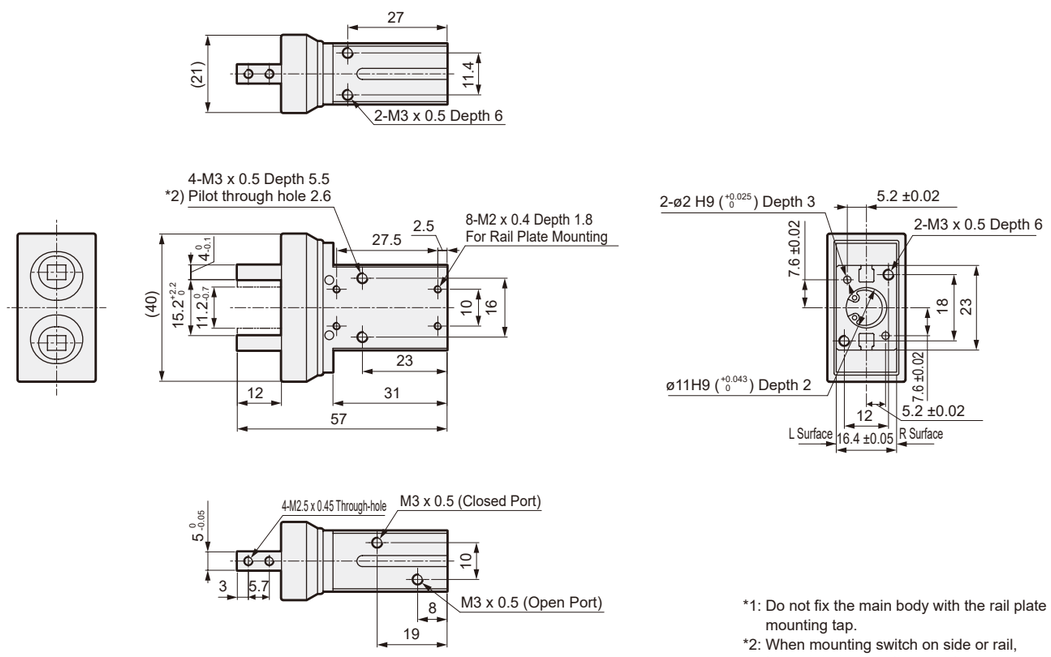




*3: For notes on cylinder switches, refer to P. 81.
*4: Since fittings interfere with each other, use fittings with an outer diameter of ø9 or less.

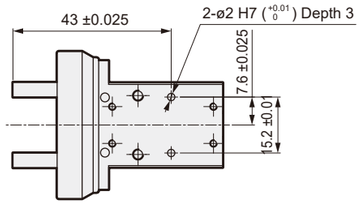
External dimensions diagram (Bore size: ø10)

●LSH-G10, LSH-F10



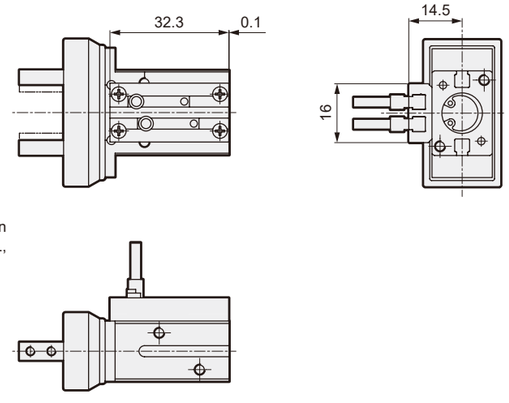
*1: Do not fix the main body with the rail plate mounting tap.
*2: When mounting switch on side or rail, through-hole mounting is not possible.

●LSH-G10□1R/L, LSH-F10□1R/L



*3: For the LSH-G10□1R, the gripping center reference and high-precision positioning holes are machined on the R side; for the LSH-G10□1L, they are machined on the L side. For reference position, refer to P. 71.

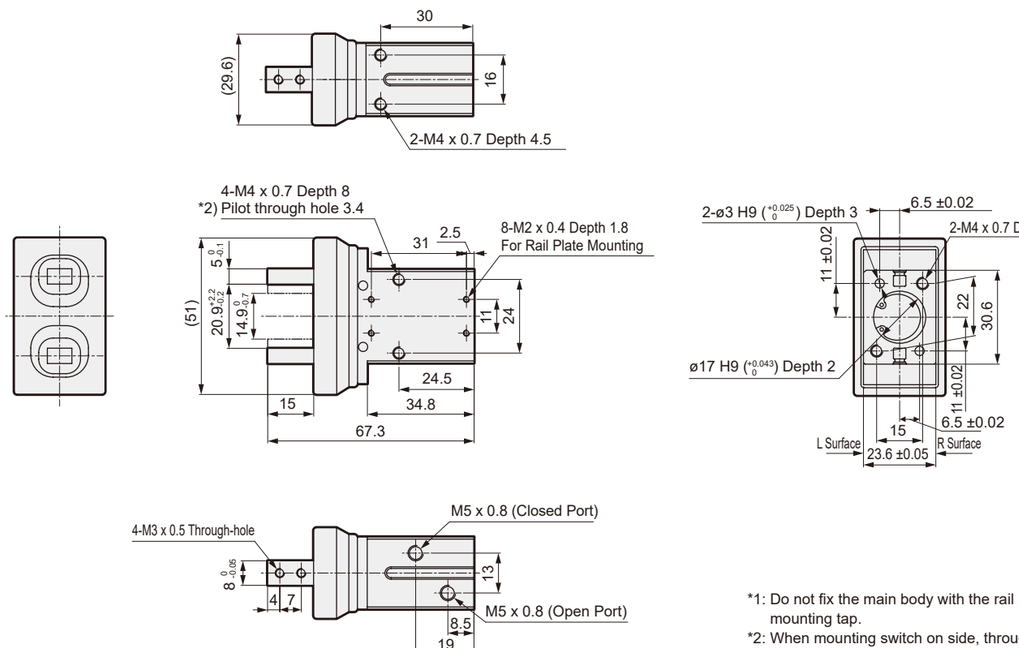
●With Switch Rail Plate Assembled



*4: For notes on cylinder switches, refer to P. 81.

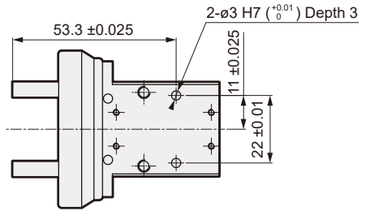
Outline dimension drawing (Bore size: ø16)

●LSH-G16, LSH-F16



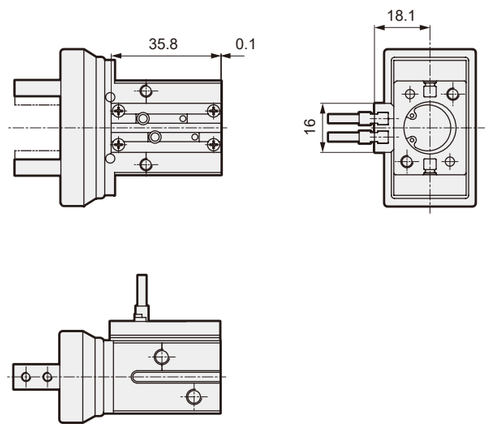
*1: Do not fix the main body with the rail plate mounting tap.
*2: When mounting switch on side, through-hole mounting is not possible.

●LSH-G16□1R/L, LSH-F16□1R/L



*3: For LSH-G16□R, the R surface is machined with gripping center standard, high-precision locating holes. For LSH-G16□L, the L surface is machined. For reference position, refer to P. 71.

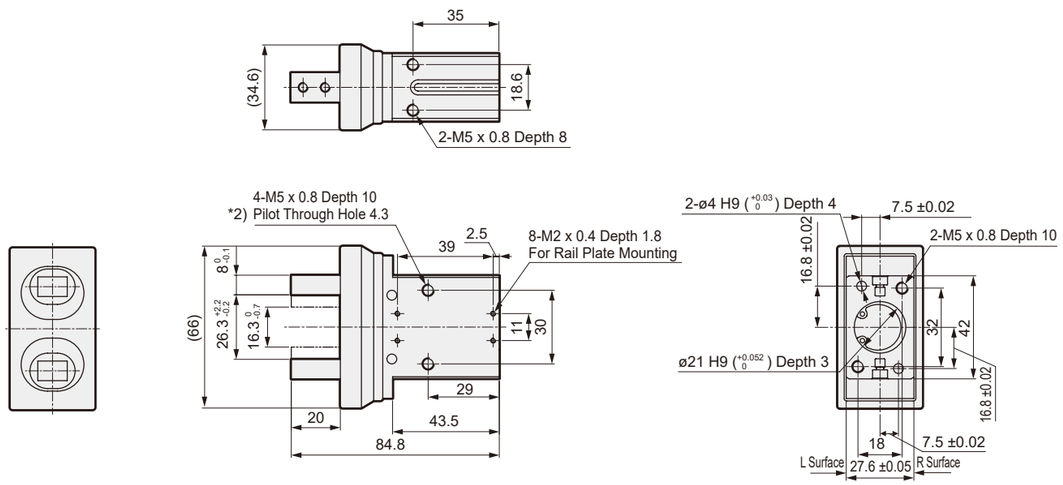
●With Switch Rail Plate Assembled



*4: For notes on cylinder switches, refer to P. 81.

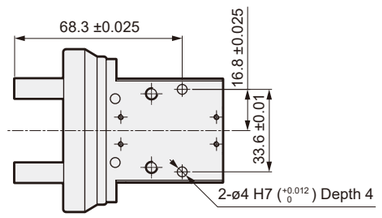
Outline dimension drawing (Bore size: ø20)

●LSH-G20, LSH-F20



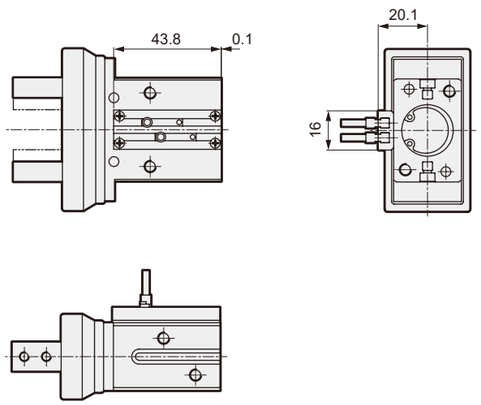
*1: Do not fix the main body with the rail plate mounting tap.
*2: When mounting switch on side, through-hole mounting is not possible.

●LSH-G20□1R/L, LSH-F20□1R/L



*3: For LSH-G20□1R, the R surface is machined with gripping center standard, high-precision locating holes. For LSH-G20□1L, the L surface is machined. For reference position, refer to P. 71.

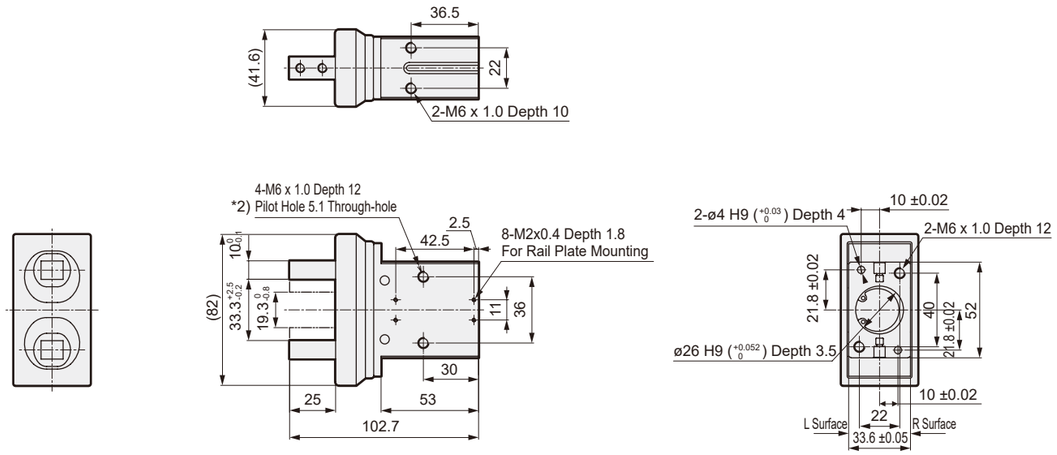
●With Switch Rail Plate Assembled



*4: For notes on cylinder switches, refer to P. 81.

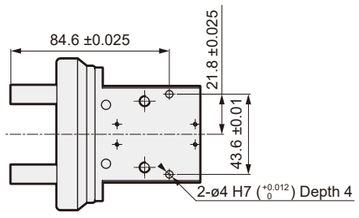
Outline Dimension Drawing (Bore size: ø25)

●LSH-G25, LSH-F25



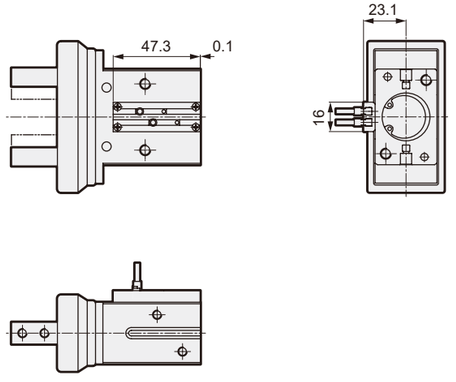
*1: Do not fix the main body with the rail plate mounting tap.
*2: When mounting switch on side, through-hole mounting is not possible.

●LSH-G25□1R/L, LSH-F25□1R/L



*3: For LSH-G25□R, the R surface is machined with gripping center standard, high-precision locating holes. For LSH-G25□L, the L surface is machined. For reference position, refer to P. 71.

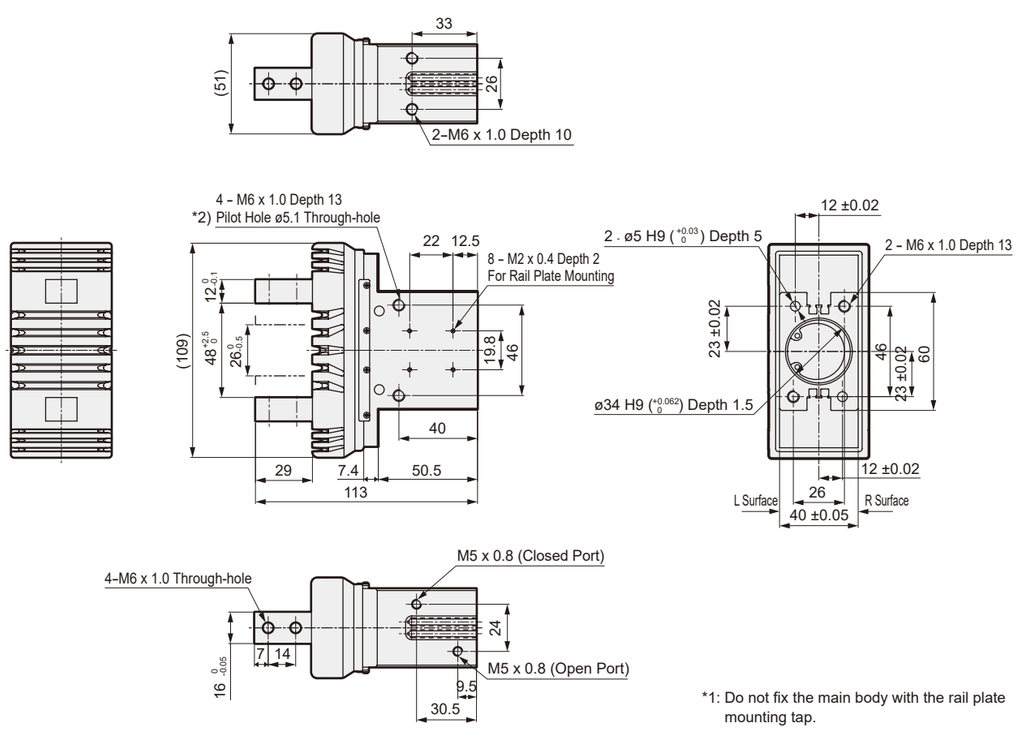
●With Switch Rail Plate Assembled



*4: For notes on cylinder switches, refer to P. 81.

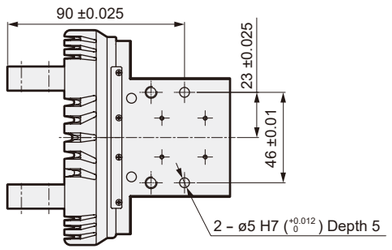
External dimensions diagram (Bore size: ø32)

●LSH-G32, LSH-F32



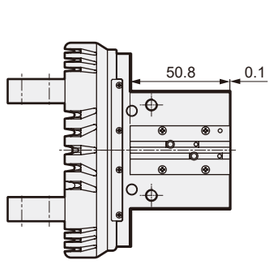
*1: Do not fix the main body with the rail plate mounting tap.

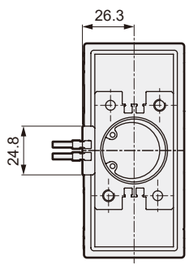
●LSH-G32D1R/L, LSH-F32D1R/L



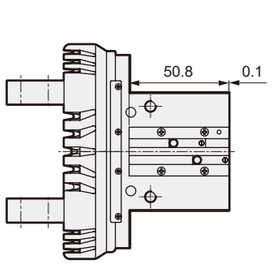
*2: For LSH-G32D1R, the R surface is machined with gripping center standard, high-precision locating holes. For LSH-G32D1L, the L surface is machined. For reference position, refer to P. 71.

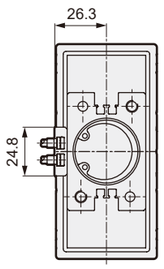
●F-type Switch Attached Rail Plate Assembled





●T-type Switch Attached Rail Plate Assembled

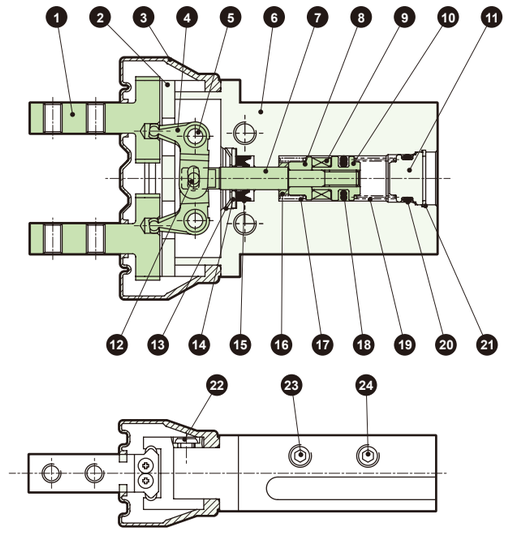




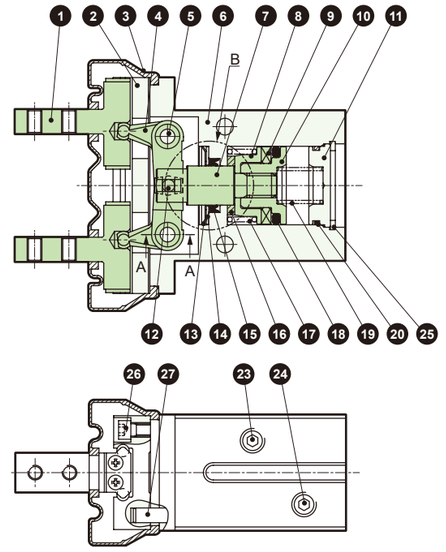
*3: For notes on cylinder switches, refer to P. 81.

Internal Structure Diagram/Material

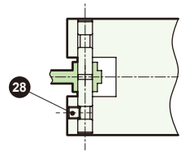
●LSH-G06 / LSH-F06



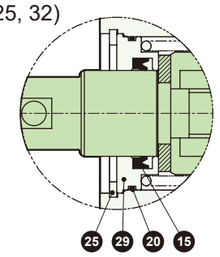
●LSH-G10 to G32 / LSH-F10 to F32



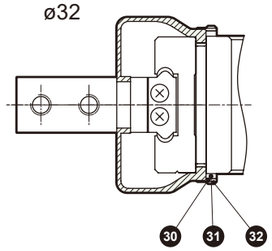
Cross-sectional View A-A (ø10 to 32)



Part B (ø20, 25, 32)



ø32



Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Finger	Stainless Steel		17	Coil Spring	Piano Wire	Single Acting C only
2	Linear Guide	Stainless Steel		18	Piston Packing	Nitrile Rubber	
3	Rubber Cover	LSH-G: Chloroprene rubber LSH-F: Fluoro Rubber		19	Coil Spring	Piano Wire	Single Acting S only
				20	O-ring	Nitrile Rubber	
4	Lever	Stainless Steel		21	C-type retaining ring	Steel	
5	Pivot Shaft	Steel		22	Pan Head Screw	Stainless Steel	
6	Cylinder Body	Aluminum Alloy		23	Plug	Stainless Steel	Single Acting C only
7	Piston Rod	Stainless Steel		24	Plug	Stainless Steel	Single Acting S only
8	Spring Retainer	Aluminum Alloy		25	C-type retaining ring	Stainless Steel	
9	Magnet			26	Hexagon Socket Head Cap Screw	ø10 to ø25: Stainless Steel ø32: Steel	
10	Piston	Aluminum Alloy					
11	Head Cover	Aluminum Alloy		27	Pin	Steel	
12	Operating Shaft	Alloy Steel		28	Hexagon socket set screw	Stainless Steel	
13	Retaining ring	Stainless Steel	ø10 to ø25 only	29	Rod Metal	Aluminum Alloy	
14	Cap	Stainless Steel	ø10 to ø25 only	30	Cover Retainer Plate	Stainless Steel	ø32 only
15	Rod Packing	Nitrile Rubber		31	Cover Spacer	Stainless Steel	ø32 only
16	Cushion Rubber	Urethane Rubber		32	Pan Head Screw	Stainless Steel	ø32 only

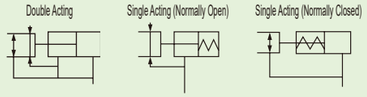
For maintenance parts, refer to the CKD component product site (https://www.ckd.co.jp/kiki/en/) → "Model No." → See "Maintenance Parts"



Linear Slide Gripper Long Stroke Double Acting Type/Single Acting Type

LSHL-A-HP1 Series

●Operating Stroke: 8, 12, 18, 22 mm



RoHS

Model No. Notation Method

Without Switch
(Built-in magnet for switch)

LSHL - A 10 D 1 R - N ——— HP1

Model No. / Without Rubber Cover / ❶ / ❷ / ❸ / ❹ / ❺

With Switch
(Built-in magnet for switch)

LSHL - A 10 D 1 R - F2H - D - HP1

Model No. / Without Rubber Cover / ❷Actuation method / ❹Gripping center reference, high-precision positioning hole / ❻Number of Switches / ❶Bore size / ❸Finger / ❺Switch Model No.

❶Bore Size (mm)

Code	Content
10	ø10
16	ø16
20	ø20
25	ø25

❷Actuation method

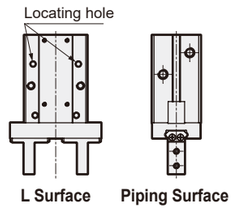
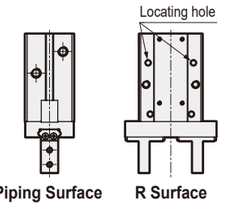
Code	Content
D	Double Acting
S	Single Acting, Normally Open
C	Single Acting, Normally Closed

❸Finger

Code	Content	
1	Basic type	
2	Side tap	
3	Through-hole	
4	Flat	

Note) For details, refer to the outline dimension drawings.

❹Gripping center reference, high-precision positioning hole

Code	Content
N	None
L	
R	

Note) For details, refer to each outline dimension drawing (P. 35 to P. 38, and P. 71).

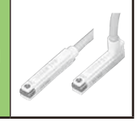
CKD

❺Switch Model No.

Without Switch

Code	Content
Blank	Without Switch, Rail Plate Attached
N	Without Switch, Without Rail Plate

With Switch — For switch details, please refer to P. 573. 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 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□	

1: For "" in the switch model No., enter the code selected from the "*Lead wire length" 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: If with switch is selected, a rail plate will be included.
*4: For notes on switches, refer to P. 82.
*5: Switches other than the model No.s listed above are also available. (Custom Product) For details, see P. 573.
*6: When mounting a 2-color indicator switch, please consult our sales office.

***Lead wire length**

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

Example) Lead wire length
1 m F2S
3 m F2S3

❻Number of Switches

Code	Content
R	With 1 pc. on Open Side
H	With 1 pc. on Close Side
D	With 2 pcs

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

●Design compatible with rechargeable battery manufacturing process

LSHL- •••• -P4□-HP1

*Please contact us for details.

Switch Single Unit Model No. Notation Method

SW - F2H

❺Switch Model No.

CKD

Hand (Gripper)
LSH-HP
LSH
FH100
BSA2
BHA
BHG
BHE
LHA
LHAG
HAP-1C
HAP-2 to 4CS
HKP
HCP
HGP
LST-HP
HLF2
HLA/HLB
HLAG/HLBG
HLC
HLD
HMC-HP
HMF
HMF-G
HMFB
HFP
FH500
HBL
HJL
HMD
HDL
HJD
Cylinder Switch
Ending

Specifications

Item			LSHL-A-HP1			
Bore size		mm	ø10	ø16	ø20	ø25
Actuation method			Double Acting Type / Single Acting Type (Normally Open / Normally Closed)			
Operating Fluid			Compressed Air			
Maximum Operating Pressure		MPa	0.7			
Min. working pressure	MPa	Double Acting Type	0.2	0.1		
		Single acting type	0.35	0.25		
Port Size			M3	M5		
Ambient Temperature		°C	-10 to 60 (No freezing)			
Operating Stroke		mm	8	12	18	22
Repeatability		mm	±0.01			
Weight kg Double Acting Type (Single Acting Type)	Finger Code: 1,2,3		0.065 (0.075)	0.155 (0.165)	0.315 (0.335)	0.54 (0.585)
	Finger Code: 4			0.16 (0.17)	0.32 (0.34)	0.545 (0.59)
Lubrication			Not Required			

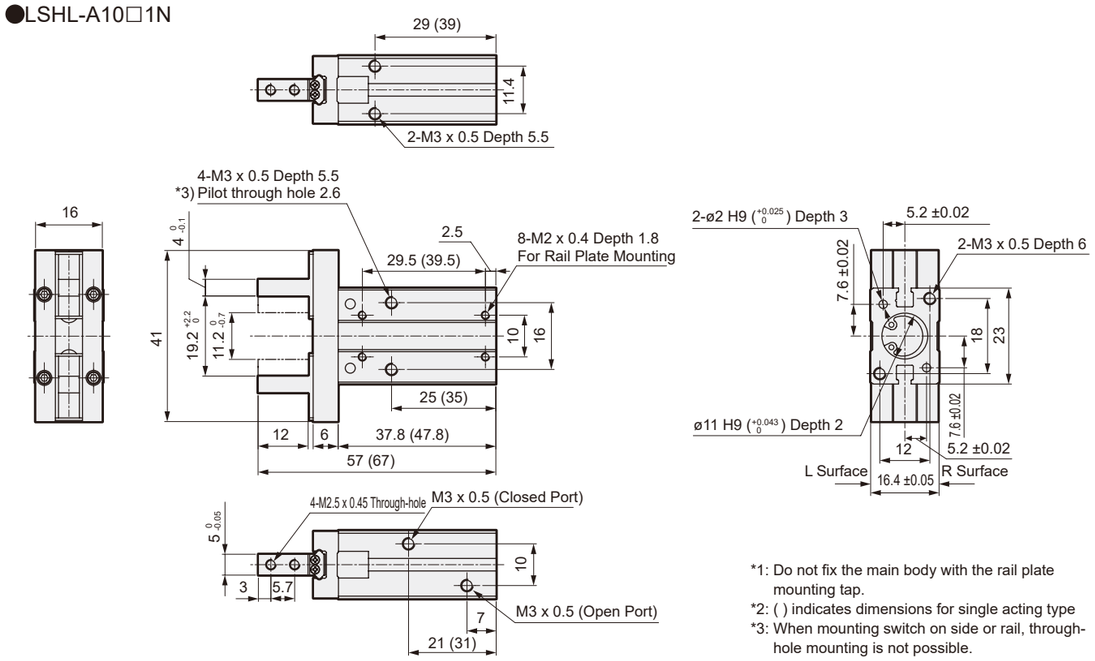
Note) For gripping force performance data, refer to P. 74.

Switch Mounting Availability Table

Model No.	Switch Model No.	Side surface mounting	Rail Mounting
LSHL-A10	F2/3□	●	●
	F2/3S	●	●
LSHL-A16	F2/3□	●	●
	F2/3S	●	●
LSHL-A20	F2/3□	●	●
	F2/3S	●	●
LSHL-A25	F2/3□	●	●
	F2/3S	●	●

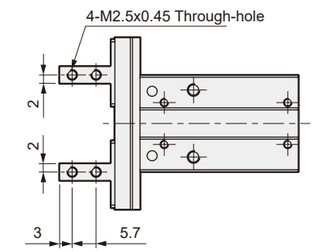
Outline Dimension Drawing (Bore size: ø10)

●LSHL-A10□1N

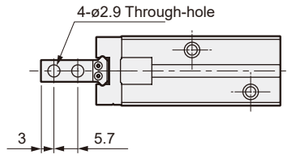


*1: Do not fix the main body with the rail plate mounting tap.
*2: ( ) indicates dimensions for single acting type
*3: When mounting switch on side or rail, through-hole mounting is not possible.

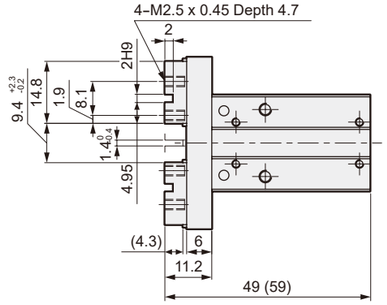
●LSHL-A10□2N



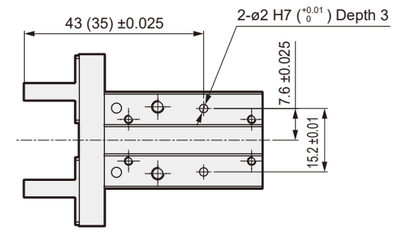
●LSHL-A10□3N



●LSHL-A10□4N

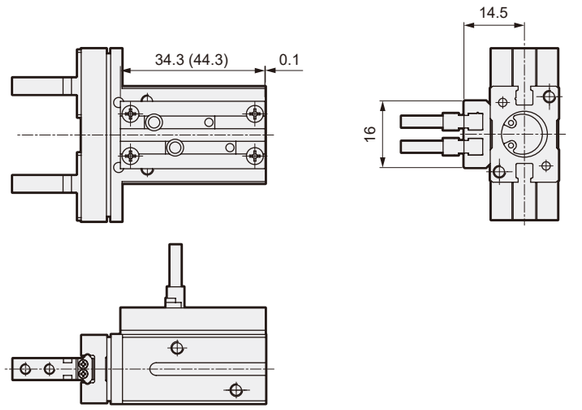


●LSHL-A10□□R/L



*4: For the LSHL-A10D1R, the gripping center reference and high-precision positioning holes are machined on the R side; for the LSHL-A10D1L, they are machined on the L side. For reference position, refer to P. 71.
*5: ( ) indicates dimensions for LSHL-A10□4.

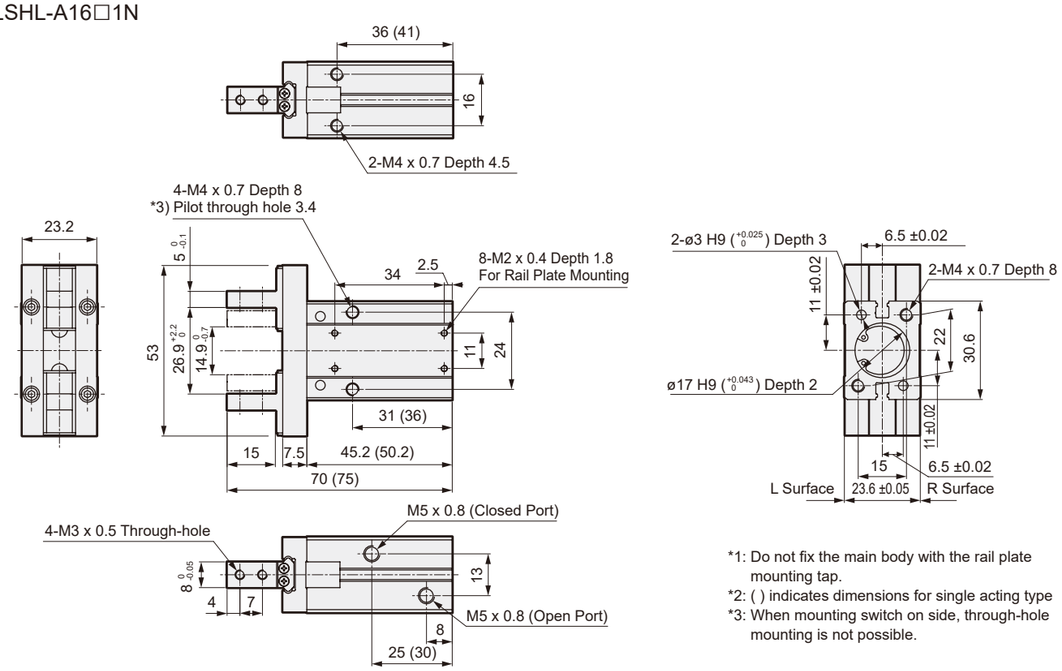
●With Switch Rail Plate Assembled



*6: ( ) indicates dimensions for single acting type.
*7: For notes on cylinder switches, refer to P. 82.

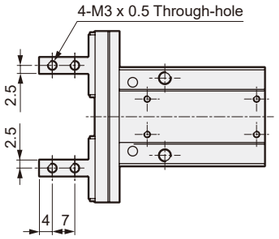
Outline dimension drawing (Bore size: ø16)

●LSHL-A16□1N

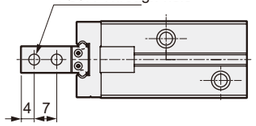


*1: Do not fix the main body with the rail plate mounting tap.
*2: ( ) indicates dimensions for single acting type
*3: When mounting switch on side, through-hole mounting is not possible.

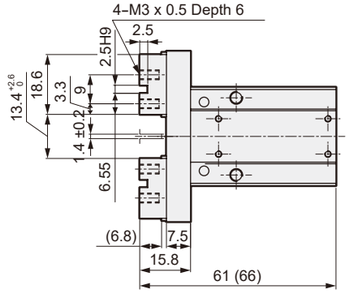
●LSHL-A16□2N



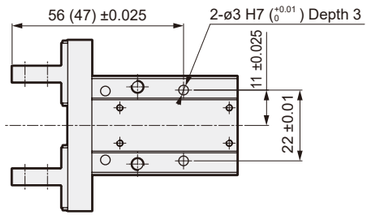
●LSHL-A16□3N



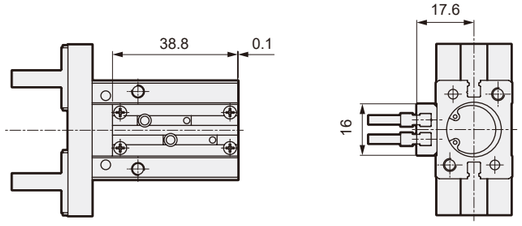
●LSHL-A16□4N

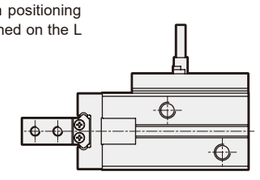


●LSHL-A16□□R/L



●With Switch Rail Plate Assembled



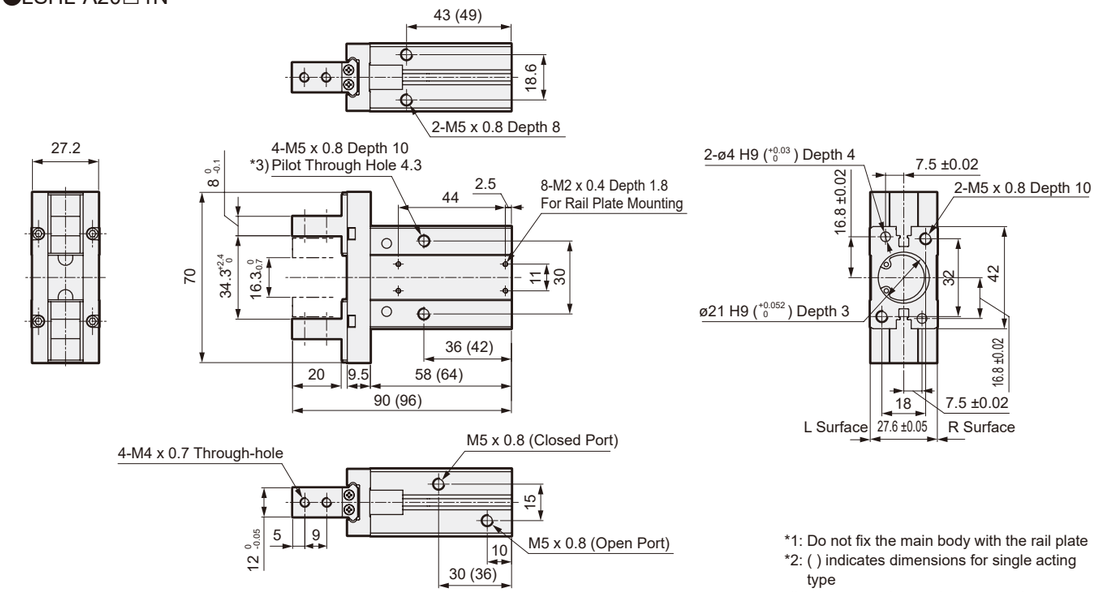


*4: For the LSHL-A16D1R, the gripping center reference and high-precision positioning holes are machined on the R side; for the LSHL-A16D1L, they are machined on the L side. For reference position, refer to P. 71.
*5: ( ) indicates dimensions for LSHL-A16□4.

*6: For notes on cylinder switches, refer to P. 82.

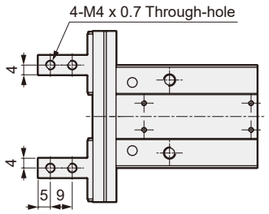
Outline dimension drawing (Bore size: ø20)

●LSHL-A20□1N

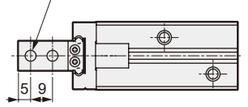


*1: Do not fix the main body with the rail plate
*2: ( ) indicates dimensions for single acting type
*3: When mounting switch on side, through-hole mounting is not possible.

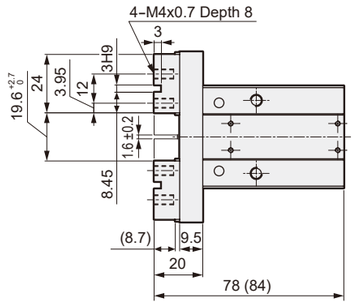
●LSHL-A20□2N



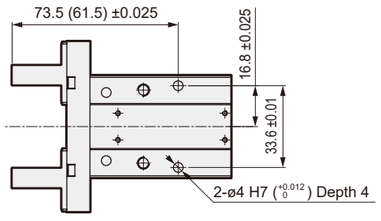
●LSHL-A20□3N



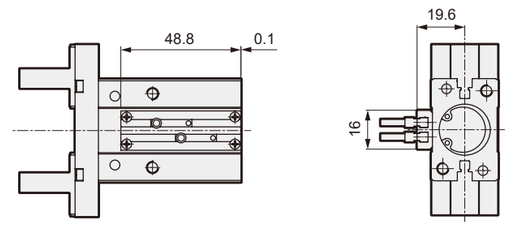
●LSHL-A20□4N

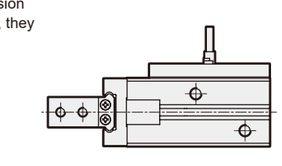


●LSHL-A20□□R/L



●With Switch Rail Plate Assembled



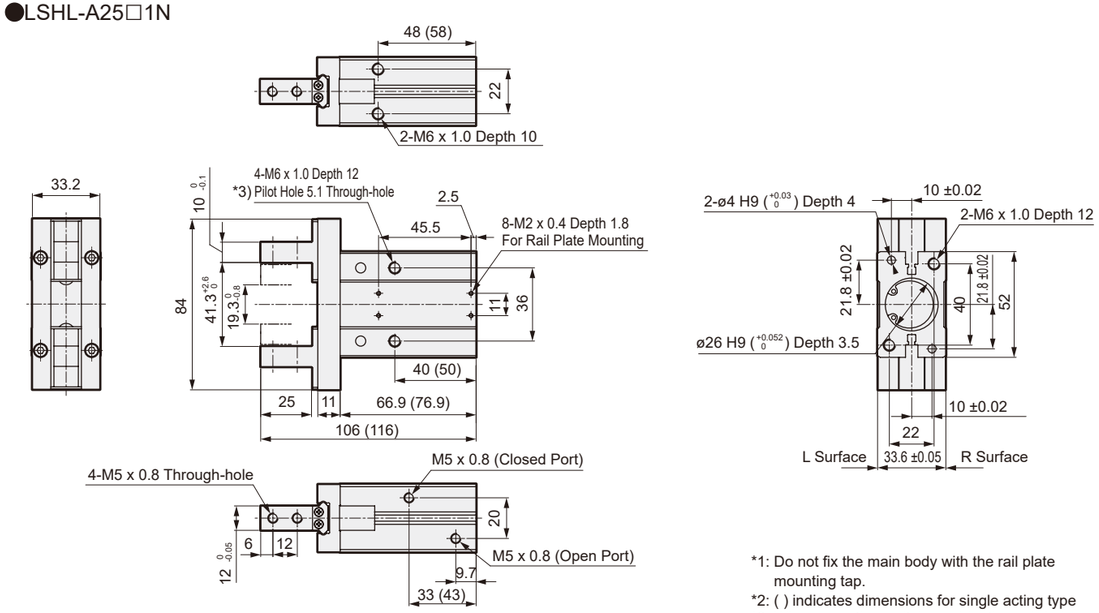


*4: For the LSHL-A20D1R, the gripping center reference and high-precision positioning holes are machined on the R side; for the LSHL-A20D1L, they are machined on the L side. For reference position, refer to P. 71.
*5: ( ) indicates dimensions for LSHL-A20□4.

*6: For notes on cylinder switches, refer to P. 82.

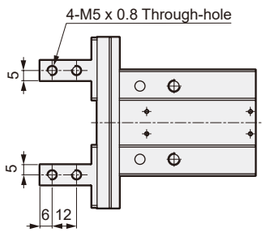
Outline Dimension Drawing (Bore size: ø25)

●LSHL-A25□1N

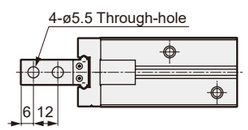


*1: Do not fix the main body with the rail plate mounting tap.
*2: ( ) indicates dimensions for single acting type
*3: When mounting switch on side, through-hole mounting is not possible.

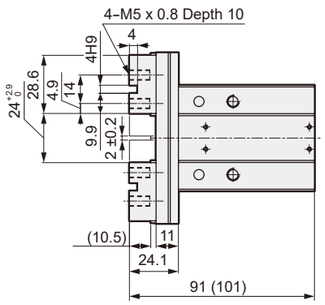
●LSHL-A25□2N



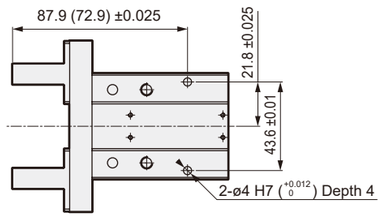
●LSHL-A25□3N



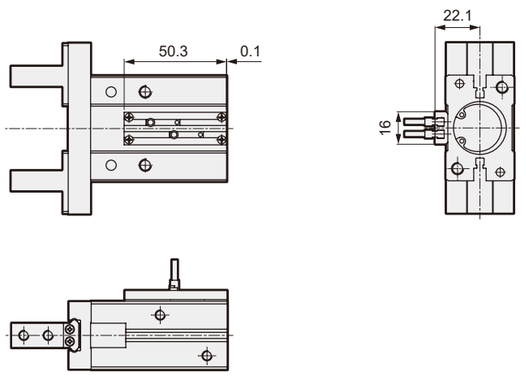
●LSHL-A25□4N



●LSHL-A25□□R/L



●With Switch Rail Plate Assembled

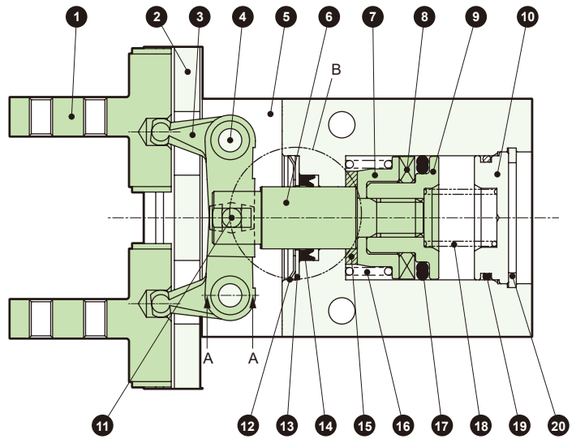


*4: For the LSHL-A25D1R, the gripping center reference and high-precision positioning holes are machined on the R side; for the LSHL-A25D1L, they are machined on the L side. For reference position, refer to P. 71.
*5: ( ) indicates dimensions for LSHL-A25□4.

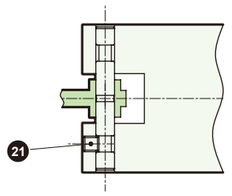
*6: For notes on cylinder switches, refer to P. 82.

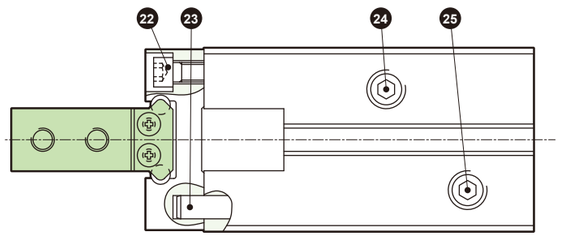
Internal Structure Diagram/Material

●LSHL-A10 to 25

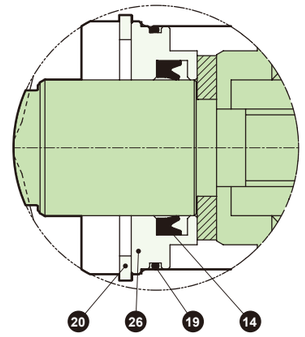


Cross-sectional View A-A (ø10 to 25)





Part B (ø20, 25)



Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Finger	Stainless Steel		14	Rod Packing	Nitrile Rubber	
2	Linear Guide	Stainless Steel		15	Cushion Rubber	Urethane Rubber	
3	Lever	Stainless Steel		16	Coil Spring	Piano Wire	Single Acting C only
4	Pivot Shaft	Steel		17	Piston Packing	Nitrile Rubber	
5	Cylinder Body	Aluminum Alloy		18	Coil Spring	Piano Wire	Single Acting S only
6	Piston Rod	Stainless Steel		19	O-ring	Nitrile Rubber	
7	Spring Retainer	Aluminum Alloy		20	C-type retaining ring	Stainless Steel	
8	Magnet			21	Hexagon socket set screw	Stainless Steel	
9	Piston	Aluminum Alloy		22	Hexagon Socket Head Cap Screw	Stainless Steel	
10	Head Cover	Aluminum Alloy		23	Pin	Steel	
11	Operating Shaft	Alloy Steel		24	Plug	Stainless Steel	Single Acting C only
12	Retaining ring	Stainless Steel	ø10, ø16 only	25	Plug	Stainless Steel	Single Acting S only
13	Cap	Stainless Steel	ø10, ø16 only	26	Rod Metal	Aluminum Alloy	

For maintenance parts, refer to the CKD component product site (https://www.ckd.co.jp/kiki/en/) → "Model No." → See "Maintenance Parts"

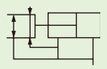


Linear Slide Gripper Long Stroke Double Acting Type, With Rubber Cover (High Durability Equipment)

LSHL-G, F-HP1 Series

●Operating Stroke: 8, 12, 18 mm

Double Acting



RoHS

Model No. Notation Method

Without Switch
(Built-in magnet for switch)

LSHL – G 10 D 1 R – N ——— HP1

Model No. ① ② Operating Method Double Acting ③ ④ ⑤

With Switch
(Built-in magnet for switch)

LSHL – G 10 D 1 R – F2H – D – HP1

Model No. ① Rubber Cover ② Bore size Operating Method Double Acting ③ Finger ④ Gripping center reference, high-precision positioning hole ⑤ Switch Model No. ⑥ Number of Switches

①Rubber Cover

Code	Content
G	Chloroprene rubber
F	Fluoro Rubber

②Bore Size (mm)

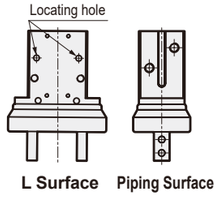
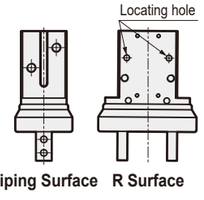
Code	Content
10	ø10
16	ø16
20	ø20

③Finger

Code	Content	
1	Basic type	

Note) For details, refer to the outline dimension drawings.

④Gripping center reference, high-precision positioning hole

Code	Content
N	None
L	 L Surface Piping Surface
R	 Piping Surface R Surface

Note) For details, refer to each outline dimension drawing (P. 43 to P. 45) and P. 71.

⑤Switch Model No.

Without Switch

Code	Content
Blank	Without Switch, Rail Plate Attached
N	Without Switch, Without Rail Plate

With Switch

For switch details, please refer to P. 573. 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 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□	

*1: For "□" in the switch model No., enter the code selected from the "*Lead wire length" 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: If with switch is selected, a rail plate will be included.
*4: For notes on switches, refer to P. 83.
*5: Switches other than the model No.s listed above are also available. (Custom Product) For details, see P. 573.
*6: When mounting a 2-color indicator switch, please consult our sales office.

***Lead wire length**

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

Example) Lead wire length
1 m F2S
3 m F2S3

⑥Number of Switches

Code	Content
R	With 1 pc. on Open Side
H	With 1 pc. on Close Side
D	With 2 pcs.

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

●Design compatible with rechargeable battery manufacturing process

LSHL-G/F– •••• – P4□ –HP1

*Please contact us for details.

Switch Single Unit Model No. Notation Method

SW – F2H

⑤Switch Model No.

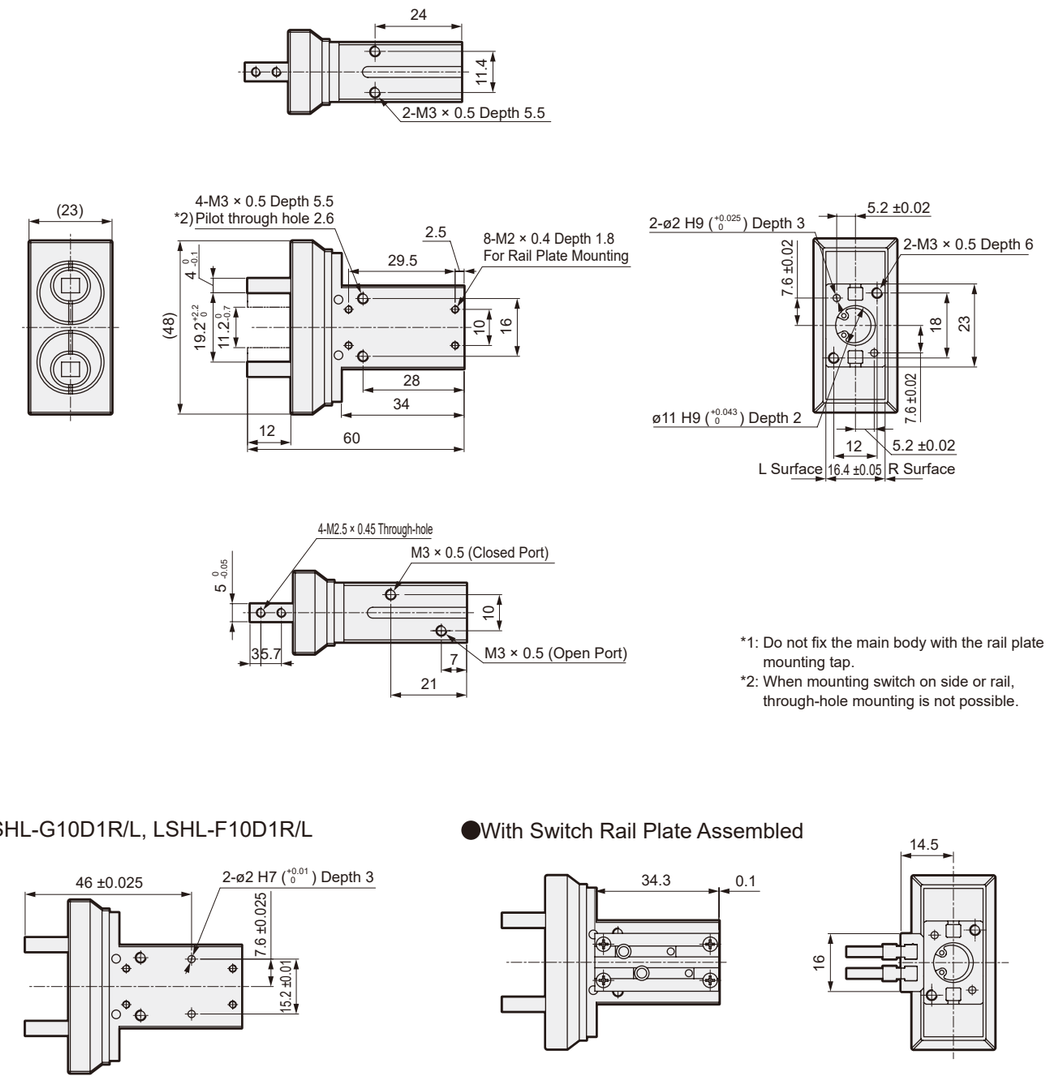
Specifications

Item		LSHL-G, F-HP1		
Bore size	mm	ø10	ø16	ø20
Actuation method		Double Acting Type		
Operating Fluid		Compressed Air		
Maximum Operating Pressure	MPa	0.7		
Min. working pressure	MPa	0.2	0.1	
Port Size		M3	M5	
Ambient Temperature	°C	-10 to 60°C (provided there is no freezing)		
Operating Stroke	mm	8	12	18
Repeatability	mm	±0.01		
Weight	kg	0.09	0.18	0.39
Lubrication		Not Required		

Note) For gripping force performance data, refer to P. 76.

Outline Dimension Drawing (Bore size: ø10)

●LSHL-G10D1N, LSHL-F10D1N

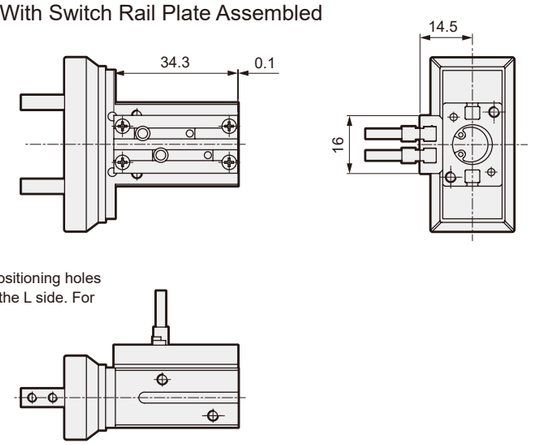


*1: Do not fix the main body with the rail plate mounting tap.
*2: When mounting switch on side or rail, through-hole mounting is not possible.

●LSHL-G10D1R/L, LSHL-F10D1R/L

*3: For the LSHL-G10D1R, the gripping center reference and high-precision positioning holes are machined on the R side; for the LSHL-G10D1L, they are machined on the L side. For reference position, refer to P. 71.

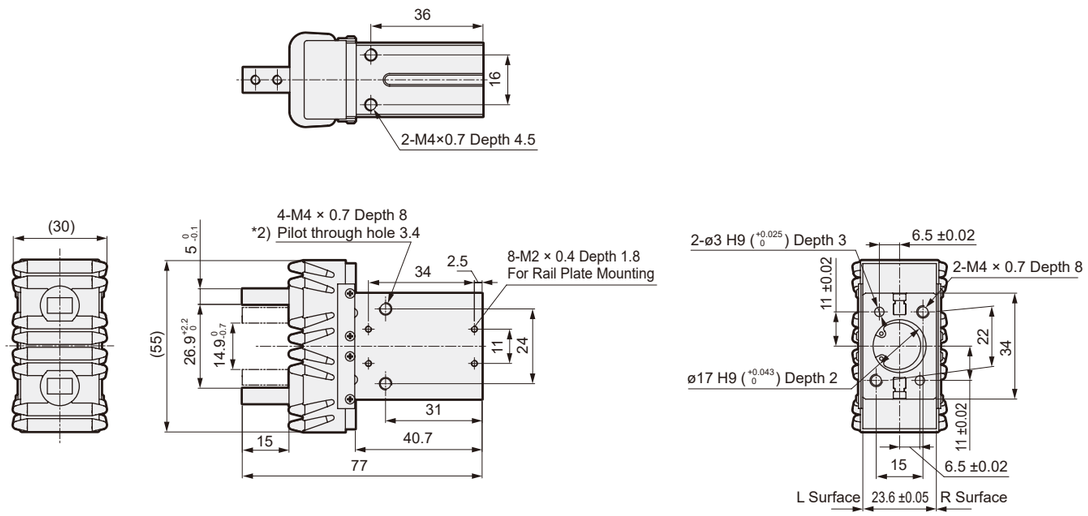
●With Switch Rail Plate Assembled



*4: For notes on cylinder switches, refer to P. 83.

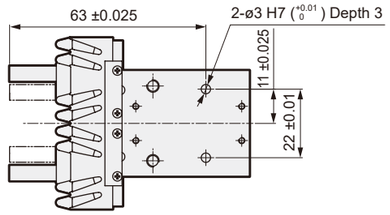
Outline dimension drawing (Bore size: ø16)

●LSHL-G16D1N, LSHL-F16D1N



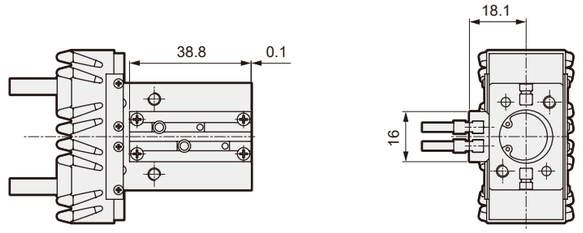
*1: Do not fix the main body with the rail plate mounting tap.
*2: When mounting switch on side, through-hole mounting is not possible.

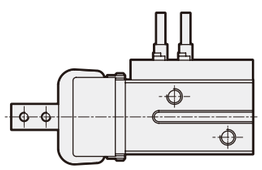
●LSHL-G16D1R/L, LSHL-F16D1R/L



*3: For the LSHL-G16D1R, the gripping center reference and high-precision positioning holes are machined on the R side; for the LSHL-G16D1L, they are machined on the L side. For reference position, refer to P. 71.

●With Switch Rail Plate Assembled

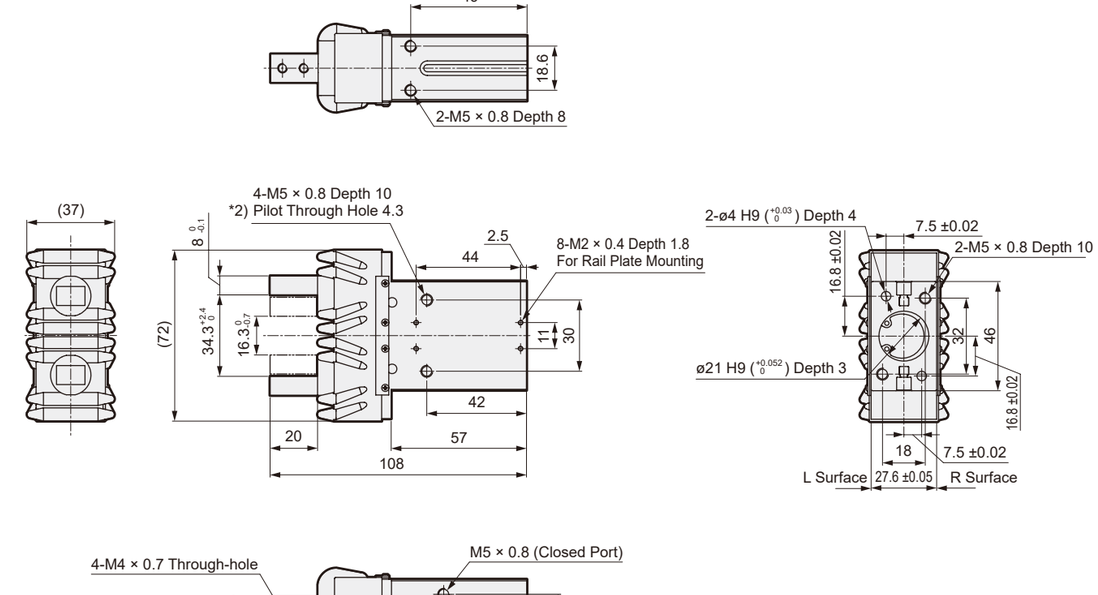




*4: For notes on cylinder switches, refer to P. 83.

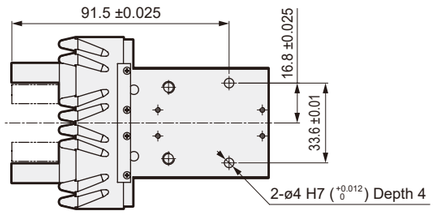
Outline dimension drawing (Bore size: ø20)

●LSHL-G20D1N, LSHL-F20D1N



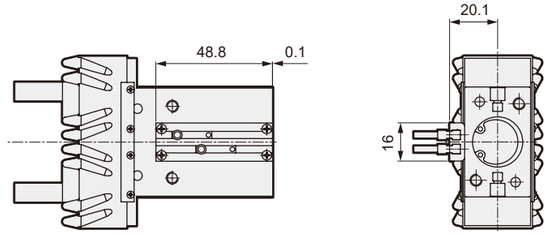
*1: Do not fix the main body with the rail plate
*2: When mounting switch on side, through-hole mounting is not possible.

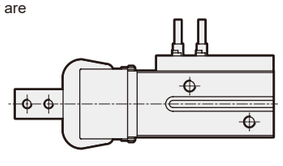
●LSHL-G20D1R/L, LSHL-F20D1R/L



*3: For the LSHL-G16D1R, the gripping center reference and high-precision positioning holes are machined on the R side; for the LSHL-G16D1L, they are machined on the L side. For reference position, refer to P. 71.

●With Switch Rail Plate Assembled

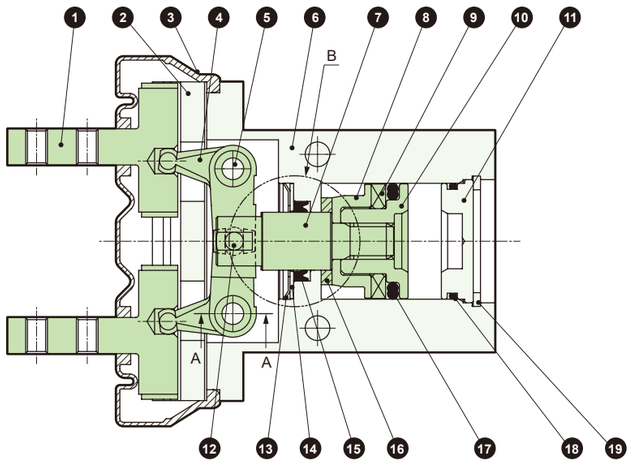




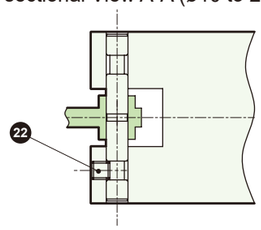
*4: For notes on cylinder switches, refer to P. 83.

Internal Structure Diagram/Material

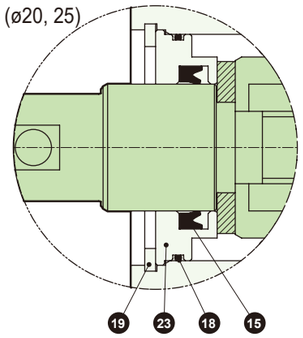
●LSHL-G10 to G20 / LSHL-F10 to F20

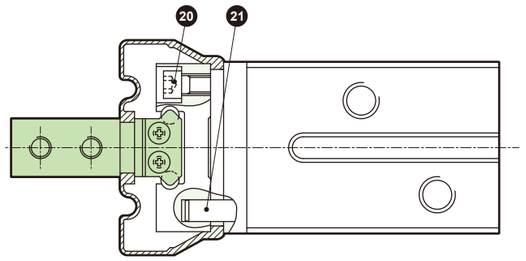


Cross-sectional View A-A (ø10 to 20)



Part B (ø20, 25)





ø16, 20

Part No.	Part Name	Material	Remarks
1	Finger	Stainless Steel	
2	Linear Guide	Stainless Steel	
3	Rubber Cover	LSHL-G: Chloroprene rubber LSHL-F: Fluoro Rubber	
4	Lever	Stainless Steel	
5	Pivot Shaft	Steel	
6	Cylinder Body	Aluminum Alloy	
7	Piston Rod	Stainless Steel	
8	Spring Retainer	Aluminum Alloy	
9	Magnet		
10	Piston	Aluminum Alloy	
11	Head Cover	Aluminum Alloy	
12	Operating Shaft	Alloy Steel	
13	Retaining ring	Stainless Steel	ø10, ø16 only

Part No.	Part Name	Material	Remarks
14	Cap	Stainless Steel	ø10, ø16 only
15	Rod Packing	Nitrile Rubber	
16	Cushion Rubber	Urethane Rubber	
17	Piston Packing	Nitrile Rubber	
18	O-ring	Nitrile Rubber	
19	C-type retaining ring	Stainless Steel	
20	Hexagon Socket Head Cap Screw	Stainless Steel	
21	Pin	Steel	
22	Hexagon socket set screw	Stainless Steel	
23	Rod Metal	Aluminum Alloy	
24	Cover Retainer Plate	Stainless Steel	ø16, ø20 only
25	Cover Spacer	Stainless Steel	ø16, ø20 only
26	Pan Head Screw	Stainless Steel	ø16, ø20 only

For maintenance parts, refer to the CKD component product site (https://www.ckd.co.jp/kiki/en/) → "Model No." → See "Maintenance Parts"

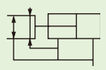
MEMO



With Length Measurement Function Linear Slide Gripper Double Acting Type (High Durability Equipment)

LSHM-A-HP2 Series

●Operating stroke: 4, 6, 10, 14 mm



For suitable detailed model No.s, please see our website.

Model No. Notation Method

LSHM - A 10 D 2 A - N - HP2

- LSHM: Model No.
- A: Without Rubber Cover
- 10: ❶ Bore size
- D: Operating Method Double Acting
- 2: ❷ Finger
- A: ❸ Amplifier Mounting Position / Gripping Center Standard, High-Precision Locating Hole
- N: ❹ Adapter Option
- HP2: Model No.

❶Bore Size (mm)

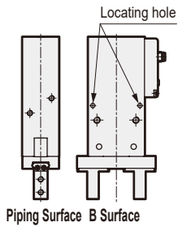
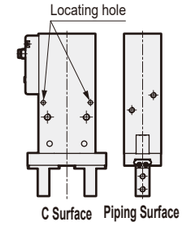
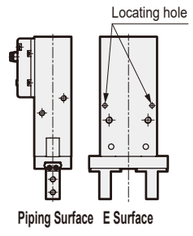
Code	Content
10	ø10
16	ø16
20	ø20
25	ø25

❷Finger

Code	Content	
1	Basic type	
2	Side tap	
3	Through-hole	
4	Flat	

Note) For details, refer to the outline dimension drawings.

❸Amplifier Mounting Position / Gripping Center Standard, High-Precision Locating Hole

Code	Content
A	Amplifier Side / Without Locating Hole
B	Amplifier Side / Below Finger, Piping to the Right, Rear Surface 
C	Amplifier Side / Below Finger, Piping to the Left, Rear Surface 
D	Amplifier Front / Without Locating Hole
E	Amplifier Front / Below Finger, Piping to the Right, Rear Surface 

Note) For details, refer to each outline dimension drawing (P. 50 to P. 53) and P. 71.

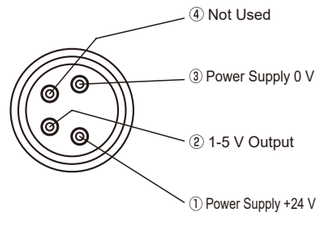
❹Adapter Option

Code	Content
N	Without Adapter
A	Correction Adapter
B	Switch Output Adapter (NPN)
C	Switch Output Adapter (PNP)
D	IO-Link Adapter

Note) shipped included to the product.

Plug Contact Arrangement Diagram

• Without Adapter (N)

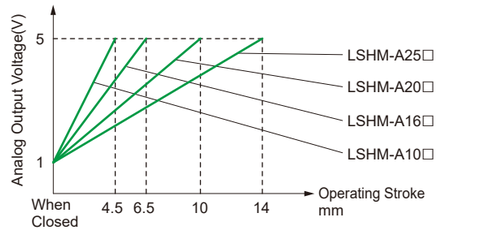


Specifications

Item		LSHM-A-HP2							
Bore size mm		ø10		ø16		ø20		ø25	
Actuation method		Double Acting Type							
Operating Fluid		Compressed Air							
Max. Operating Pressure MPa		0.7							
Min. Working Pressure MPa		0.2		0.1		0.1		0.1	
Port Size		M3		M5		M5		M5	
Operating Stroke mm		4		6		10		14	
Power supply voltage		24 VDC ±10%							
Current consumption		25 mA or less							
Indicator LED		Green LED lights up when power is applied							
Analog Output		Finger Closed 1 V - Open 5 V *1, Connection Load 100 kΩ or more							
Analog Output Linearity	Without Correction Adapter	±3% F.S. or less (Ambient temperature 25°C)							
	With Correction Adapter	±0.5% F.S. or less (Ambient temperature 25°C)							
Repeatability of analog output		±0.02 mm or less (Ambient temperature 25°C, no deformation or wear of actuator/jig)							
Effective Measurement Range mm		4.5		6.5		10		14	
Shock Resistance (Sensor/Amplifier Unit)		294 m/s²							
Vibration Resistance (Sensor/Amplifier Unit)		10 to 55 Hz Double amplitude 1.5 mm, X, Y, Z directions, 2 hours each							
Protection Structure (Sensor/Amplifier Unit)		IEC Standard IP65							
Ambient Temperature, Humidity		10 to 60°C, 85% RH or less							
Amplifier Mounting Position		Side	Front	Side	Front	Side	Front	Side	Front
Weight kg	Finger Code: 1,2,3	0.108	0.120	0.221	0.238	0.437	0.457	0.752	0.773
	Finger Code: 4			0.226	0.243	0.442	0.462	0.782	0.803
Lubrication		Not Required							

*1: For correction adapter, refer to P. 64.
*2: There is an output fluctuation of 1 mV/°C.
*3: For gripping force performance data, refer to P. 74.

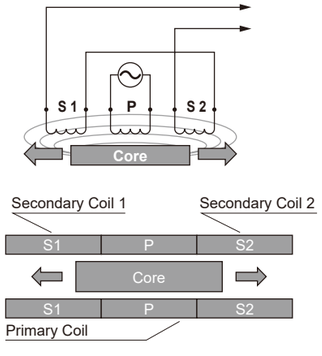
Analog Output Characteristics



* Analog output voltage at shipment is 1 V on the close side and 5 V on the open side with the close port pressurized.

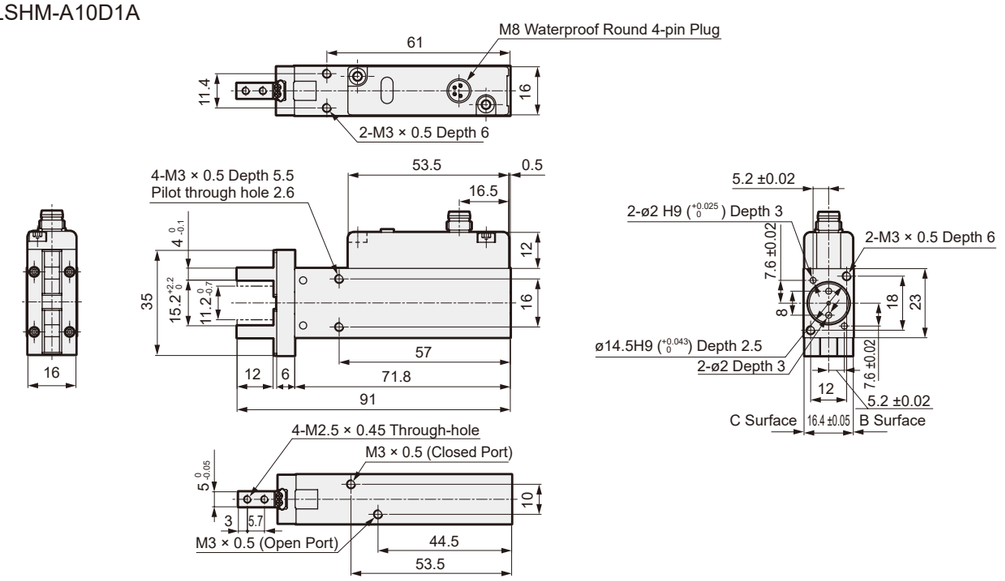
LVDT Type Displacement Sensor Operating Principle

When the primary coil (P) is excited, an induced voltage is generated in the two secondary coils (S1 and S2) by electromagnetic induction. When the gripper is driven, the position of the core changes, creating a difference in the induced voltages of S1 and S2. This difference is used to output the core position as an electrical signal.

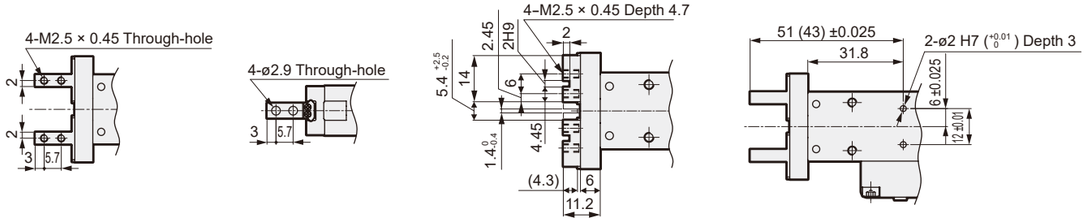


External dimensions diagram (Bore size: ø10)

●LSHM-A10D1A

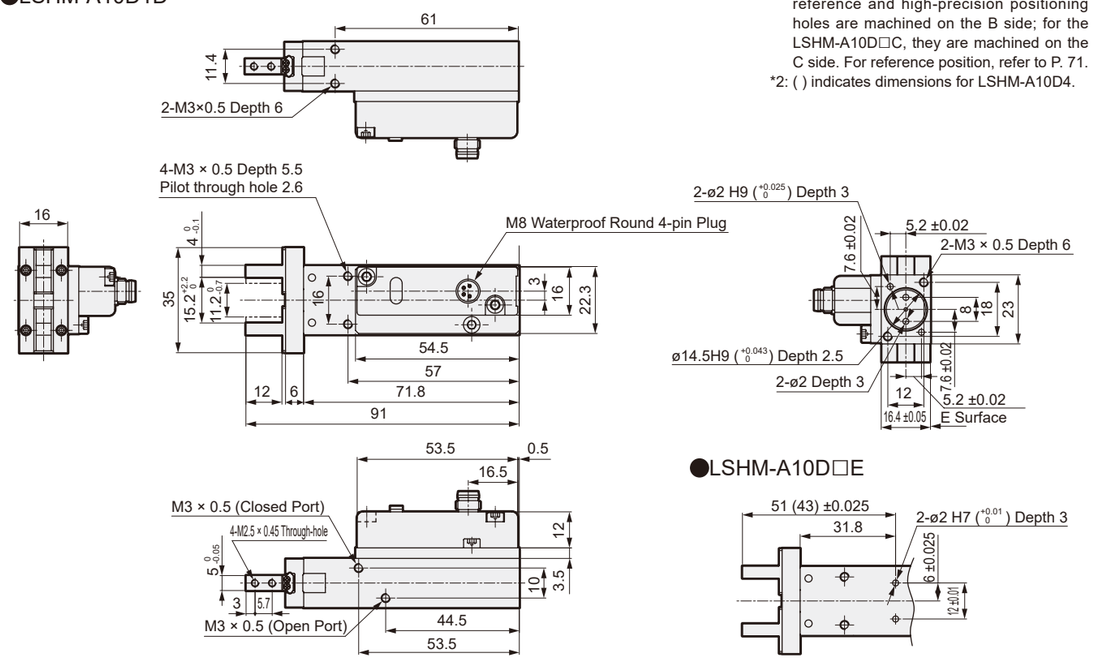


●LSHM-A10D2□ ●LSHM-A10D3□ ●LSHM-A10D4□ ●LSHM-A10D□B/C



*1: For the LSHM-A10D□B, the gripping center reference and high-precision positioning holes are machined on the B side; for the LSHM-A10D□C, they are machined on the C side. For reference position, refer to P. 71.
*2: ( ) indicates dimensions for LSHM-A10D4.

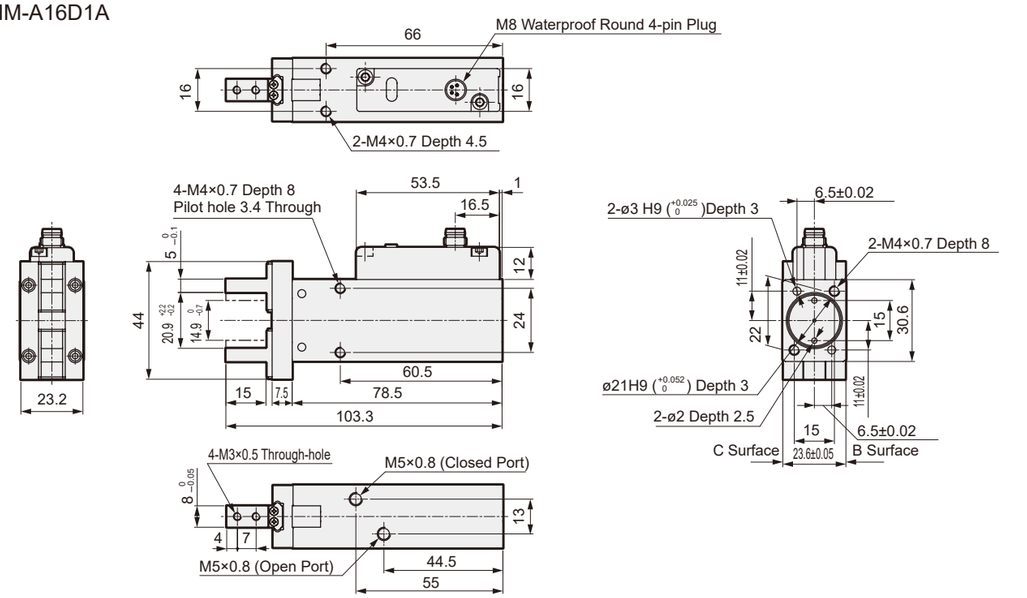
●LSHM-A10D1D



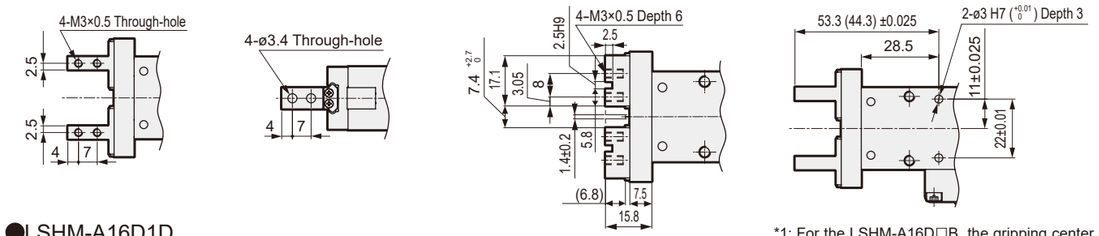
●LSHM-A10D□E

External dimensions diagram (Bore size: ø16)

●LSHM-A16D1A

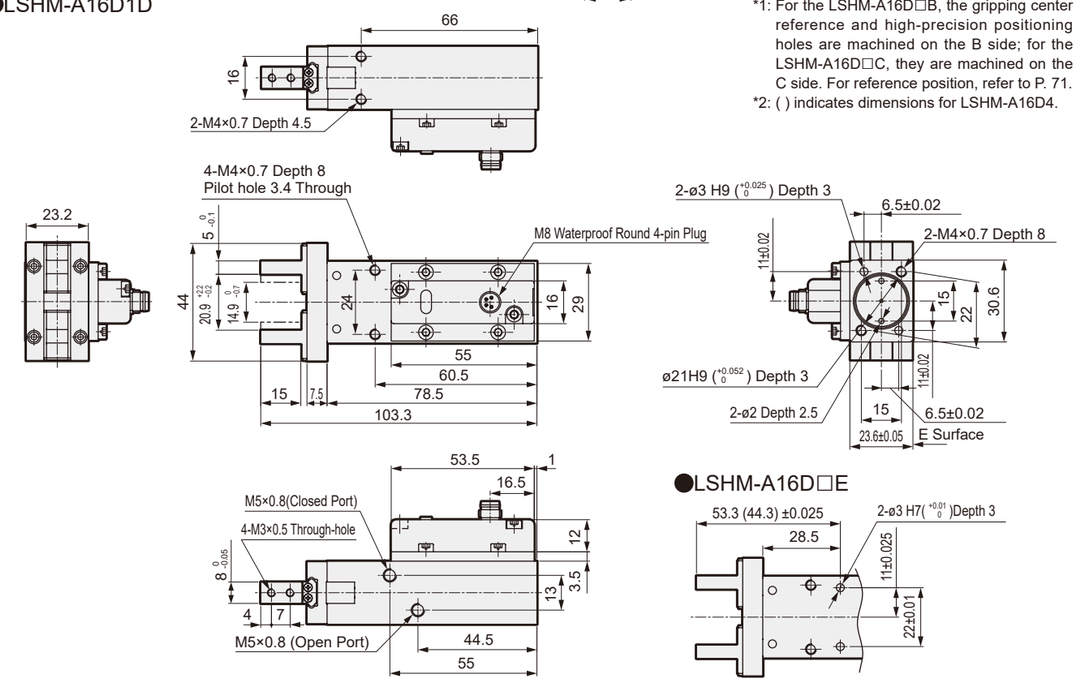


●LSHM-A16D2□ ●LSHM-A16D3□ ●LSHM-A16D4□ ●LSHM-A16D□B/C



*1: For the LSHM-A16D□B, the gripping center reference and high-precision positioning holes are machined on the B side; for the LSHM-A16D□C, they are machined on the C side. For reference position, refer to P. 71.
*2: ( ) indicates dimensions for LSHM-A16D4.

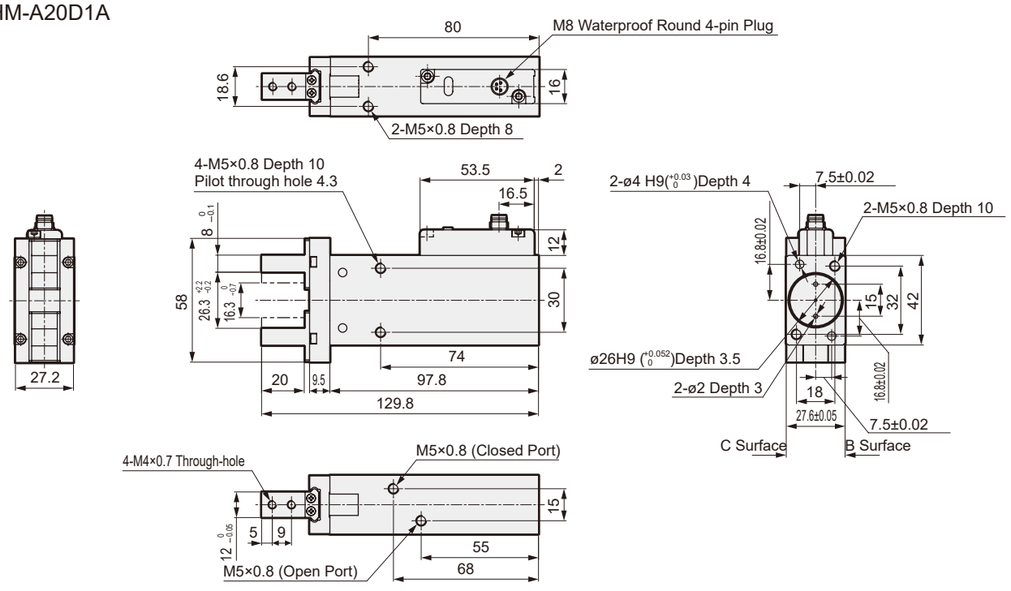
●LSHM-A16D1D



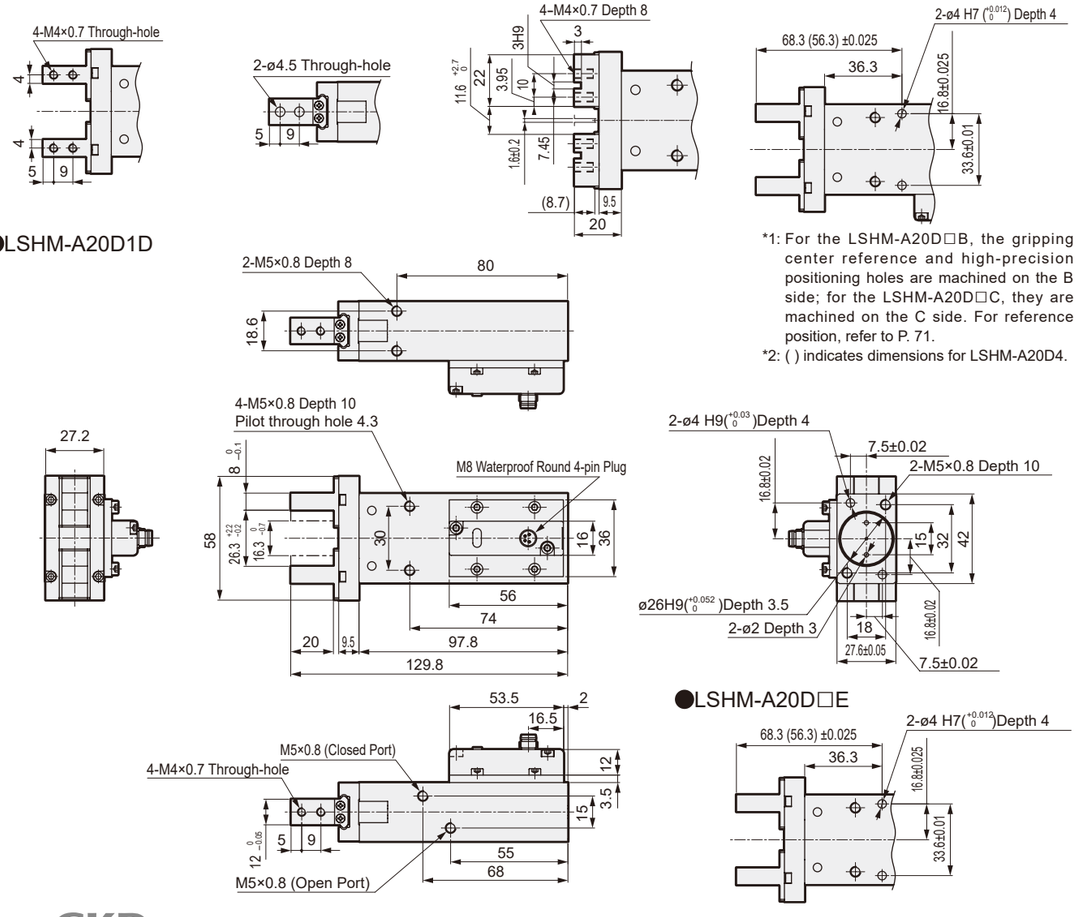
●LSHM-A16D□E

Outline dimension drawing (Bore size: ø20)

●LSHM-A20D1A



●LSHM-A20D2□ ●LSHM-A20D3□ ●LSHM-A20D4□ ●LSHM-A20D□B/C

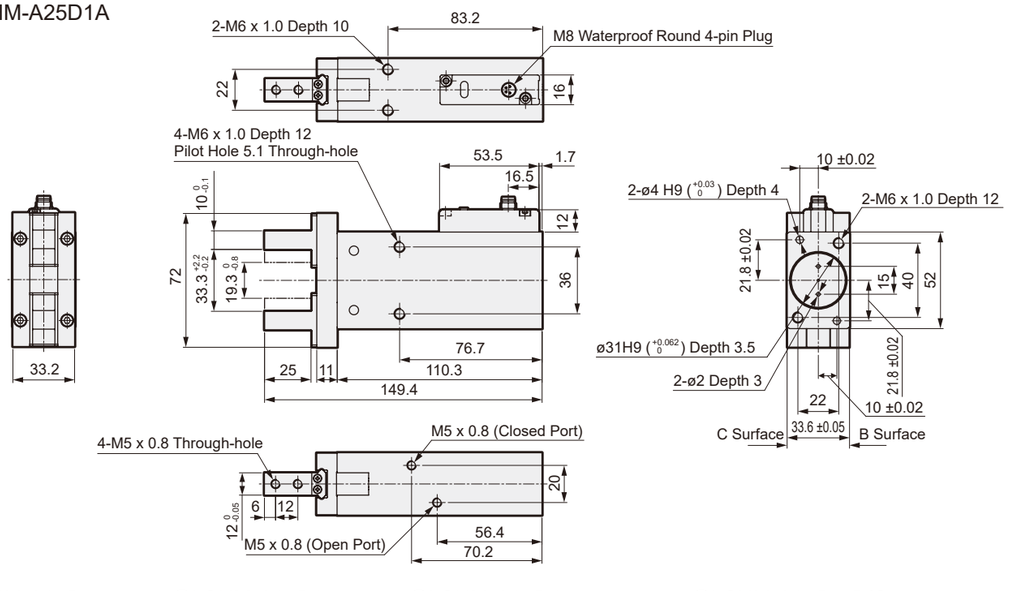


●LSHM-A20D1D

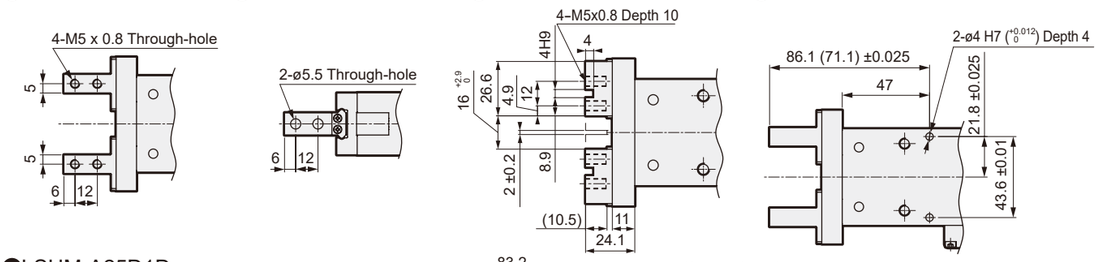
●LSHM-A20D□E

Outline Dimension Drawing (Bore size: ø25)

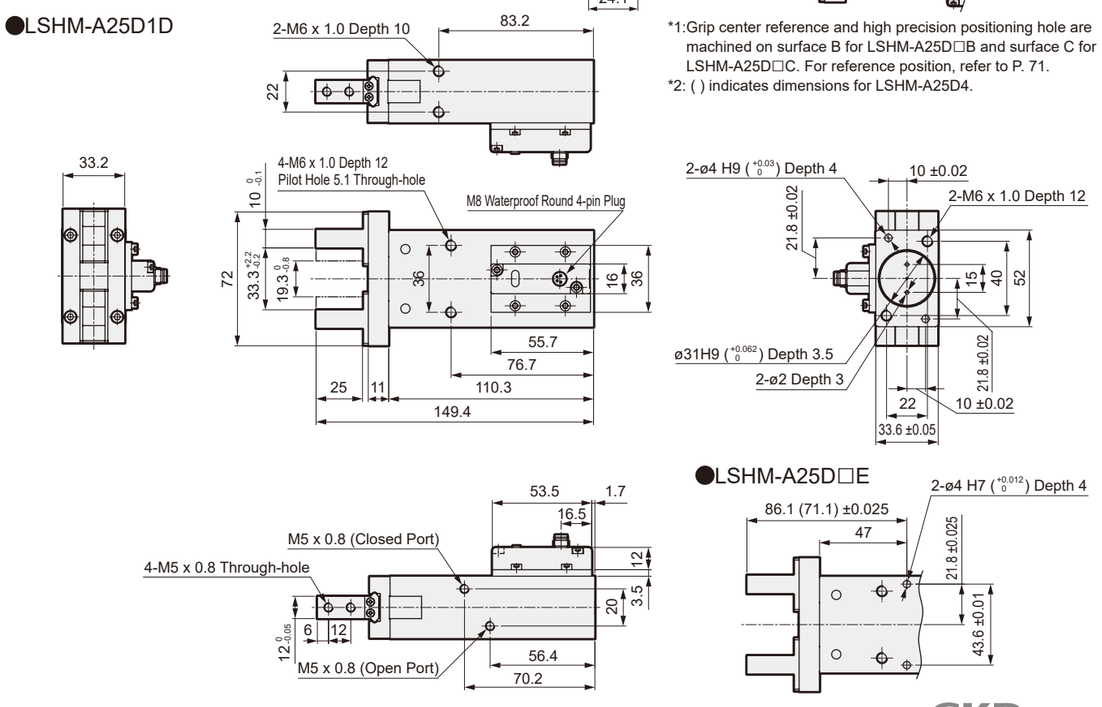
●LSHM-A25D1A



●LSHM-A25D2□ ●LSHM-A20D3□ ●LSHM-A25D4□ ●LSHM-A25D□B/C

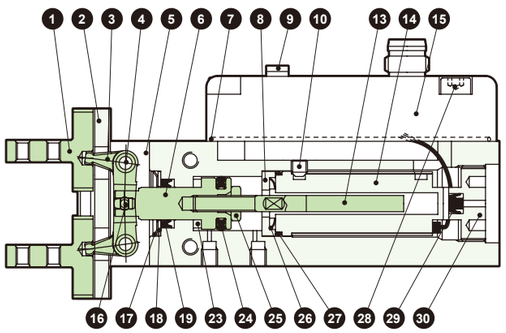


●LSHM-A25D1D

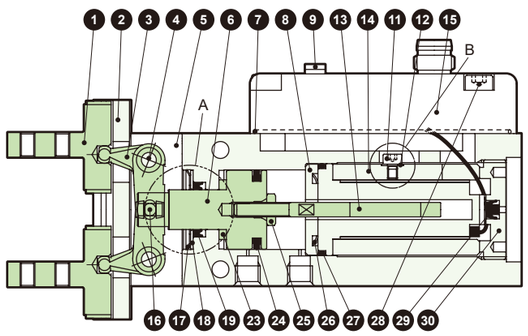


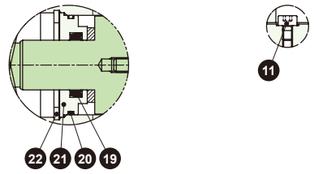
Internal Structure Diagram/Material

●Amplifier Side Mounting
ø10



●Amplifier Side Mounting
ø16 to 25





Part A (ø20, 25)

Part B (ø20, 25)

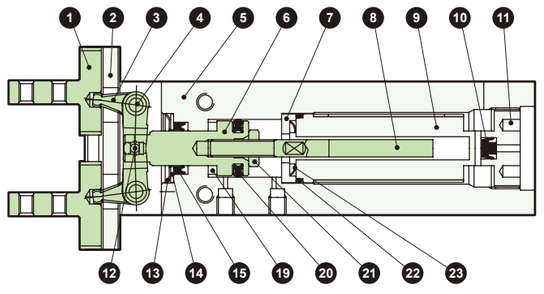
Do not disassemble

Part No.	Part Name	Material	Remarks
1	Finger	Stainless Steel	
2	Linear Guide	Stainless Steel	
3	Lever	Stainless Steel	
4	Pivot Shaft	Steel	
5	Cylinder Body	Aluminum Alloy	
6	Piston Rod	Stainless Steel	
7	Gasket	Nitrile Rubber	
8	Washer Retainer	Aluminum Alloy	
9	Plug	Nitrile Rubber	
10	Hexagon socket set screw	Stainless Steel	
11	Hexagon Socket Head Cap Screw	Stainless Steel	
12	Plain Washer	Stainless Steel	ø16 only
13	Core Shaft	Steel	
14	Sensor Body	–	
15	Amplifier	–	
16	Operating Shaft	Steel	
17	Retaining ring	Stainless Steel	ø10, ø16 only

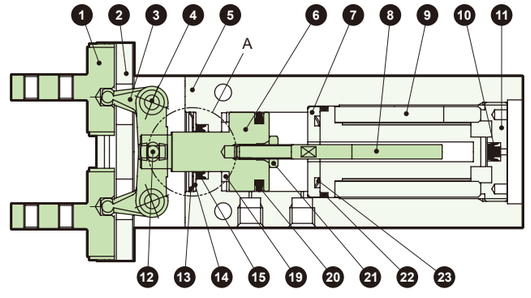
Part No.	Part Name	Material	Remarks
18	Cap	Stainless Steel	ø10, ø16 only
19	Rod Packing	Nitrile Rubber	
20	O-ring	Nitrile Rubber	
21	Rod Metal	Aluminum Alloy	
22	C-type retaining ring	Steel	
23	Cushion Rubber	Urethane Rubber	
24	Piston Packing	Nitrile Rubber	
25	Nut	Stainless Steel	
26	Wave Washer	Stainless Steel	
27	O-ring	Nitrile rubber	
28	Hexagon Socket Head Cap Screw	Stainless Steel	
29	Check Valve	Nitrile Rubber	
30	Head Cover	Aluminum Alloy	
31	Hexagon Socket Head Cap Screw	Stainless Steel	
32	Pin	Steel	
33	Hexagon socket set screw	Stainless Steel	

Internal Structure Diagram/Material

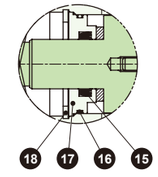
●Amplifier Front Mounting
ø10



●Amplifier Front Mounting
ø16 to 25



Part A (ø20, 25)



Part B (ø20, 25)



Do not disassemble

Part No.	Part Name	Material	Remarks
1	Finger	Stainless Steel	
2	Linear Guide	Stainless Steel	
3	Lever	Stainless Steel	
4	Pivot Shaft	Steel	
5	Cylinder Body	Aluminum Alloy	
6	Piston Rod	Stainless Steel	
7	Washer Retainer	Aluminum Alloy	
8	Core Shaft	Steel	
9	Sensor Body	–	
10	Check Valve	Nitrile Rubber	
11	Head Cover	Aluminum Alloy	
12	Operating Shaft	Steel	
13	Retaining ring	Stainless Steel	ø10, ø16 only
14	Cap	Stainless Steel	ø10, ø16 only
15	Rod Packing	Nitrile Rubber	
16	O-ring	Nitrile Rubber	
17	Rod Metal	Aluminum Alloy	

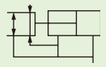
Part No.	Part Name	Material	Remarks
18	C-type retaining ring	Steel	
19	Cushion Rubber	Urethane Rubber	
20	Piston Packing	Nitrile Rubber	
21	Nut	Stainless Steel	
22	O-ring	Nitrile rubber	
23	Wave Washer	Stainless Steel	
24	Gasket	Nitrile Rubber	
25	Hexagon socket set screw	Stainless Steel	
26	Hexagon Socket Head Cap Screw	Stainless Steel	
27	Plug	Nitrile Rubber	
28	Plain Washer	Stainless Steel	ø16 only
29	Amplifier Adapter	Aluminum Alloy	
30	Amplifier	–	
31	Hexagon Socket Head Cap Screw	Stainless Steel	
32	Hexagon Socket Head Cap Screw	Stainless Steel	
33	Pin	Steel	
34	Hexagon socket set screw	Stainless Steel	



Linear Slide Gripper with Length Measurement Function Double Acting Type with Rubber Cover (High Durability)

LSHM-G, LSHM-F-HP2 Series

●Operating stroke: 4, 6, 10, 14 mm



For suitable detailed model No.s, please see our website.

Model No. Notation Method

LSHM - G 10 D 1 A - N - HP2

- LSHM: Model No.
- G: ❶ Rubber Cover
- 10: ❷ Bore size
- D: Actuation method (Double Acting)
- 1: ❸ Finger
- A: ❹ Amplifier Mounting Position / Gripping Center Standard, High-Precision Locating Hole
- N: ❺ Adapter Option

❶Rubber Cover

Code	Content
G	Chloroprene rubber
F	Fluoro Rubber

❷Bore Size (mm)

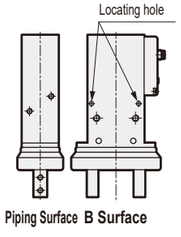
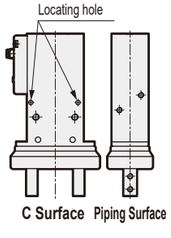
Code	Content
10	ø10
16	ø16
20	ø20
25	ø25

❸Finger

Code	Content	
1	Basic type	

Note) For details, refer to the outline dimension drawings.

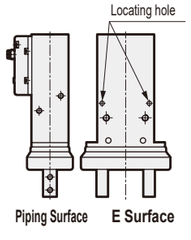
❹Amplifier Mounting Position / Gripping Center Standard, High-Precision Locating Hole

Code	Content
A	Amplifier Side / Without Locating Hole
B	Amplifier Side / Below Finger, Piping to the Right, Rear Surface 
C	Amplifier Side / Below Finger, Piping to the Left, Rear Surface 

❺Adapter Option

Code	Content
N	Without Adapter
A	Correction Adapter
B	Switch Output Adapter (NPN)
C	Switch Output Adapter (PNP)
D	IO-Link Adapter

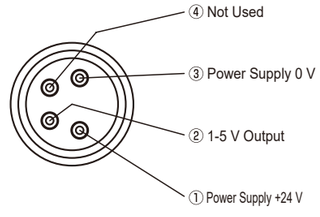
Note) shipped included to the product.

Code	Content
D	Amplifier Front / Without Locating Hole
E	Amplifier Front / Below Finger, Piping to the Right, Rear Surface 

Note) For details, refer to each outline dimension drawing (P. 58 to P. 61) and P. 71.

Plug Contact Arrangement Diagram

• Without Adapter (N)

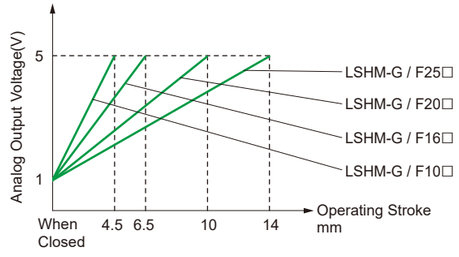


Specifications

Item		LSHM-G / LSHM-F-HP2							
Bore size	mm	ø10		ø16		ø20		ø25	
Actuation method		Double Acting Type							
Operating Fluid		Compressed Air							
Max. Operating Pressure	MPa	0.7							
Min. Working Pressure	MPa	0.2		0.1		0.1		0.1	
Port Size		M3		M5		M5		M5	
Operating Stroke	mm	4		6		10		14	
Power supply voltage		24 VDC ±10%							
Current consumption		25 mA or less							
Indicator LED		Green LED lights up when power is applied							
Analog Output		Finger Closed 1 V - Open 5 V *1, Connection Load 100 kΩ or more							
Analog Output Linearity	Without Correction Adapter	±3% F.S. or less (Ambient temperature 25°C)							
	With Correction Adapter	±0.5% F.S. or less (Ambient temperature 25°C)							
Repeatability of analog output		±0.02 mm or less (Ambient temperature 25°C, no deformation or wear of actuator/jig)							
Effective Measurement Range	mm	4.5		6.5		10		14	
Shock Resistance (Sensor/Amplifier Unit)		294 m/s²							
Vibration Resistance (Sensor/Amplifier Unit)		10 to 55 Hz Double amplitude 1.5 mm, X, Y, Z directions, 2 hours each							
Protection Structure (Sensor/Amplifier Unit)		IEC Standard IP65							
Ambient Temperature, Humidity		10 to 60°C, 85% RH or less							
Amplifier Mounting Position		Side	Front	Side	Front	Side	Front	Side	Front
Weight	kg	0.113	0.125	0.236	0.253	0.462	0.482	0.792	0.813
Lubrication		Not Required							

*1: For correction adapter, refer to P. 64.
*2: There is an output fluctuation of 1 mV/°C.
*3: For gripping force performance data, refer to P. 76.

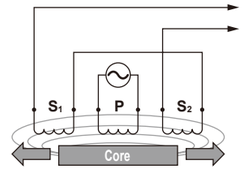
Analog Output Characteristics

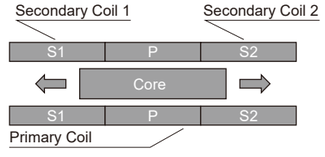


● Analog output voltage at shipment is 1 V on the close side and 5 V on the open side with the close port pressurized.

LVDT Type Displacement Sensor Operating Principle

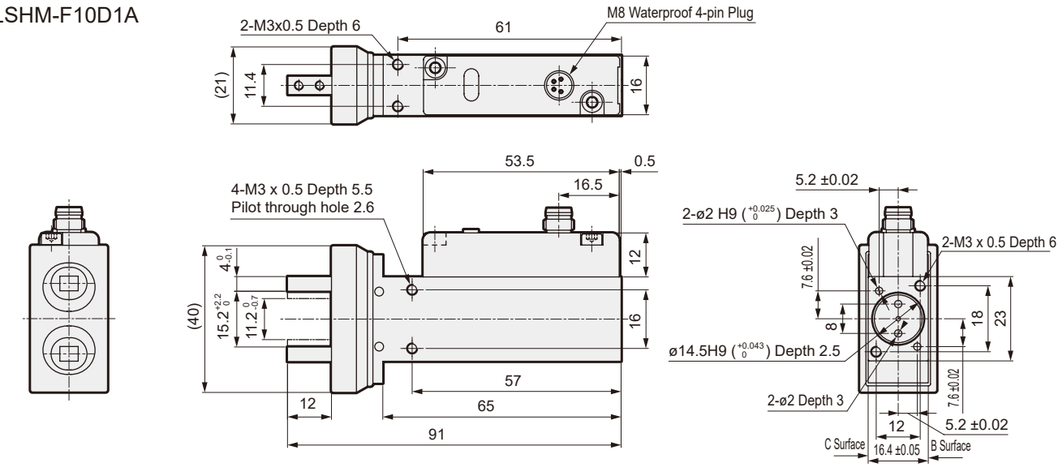
When the primary coil (P) is excited, an induced voltage is generated in the two secondary coils (S1 and S2) by electromagnetic induction. When the gripper is driven, the position of the core changes, creating a difference in the induced voltages of S1 and S2. This difference is used to output the core position as an electrical signal.

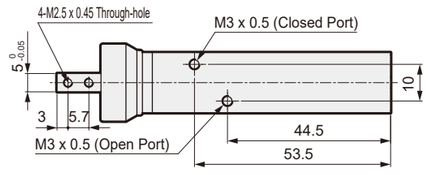




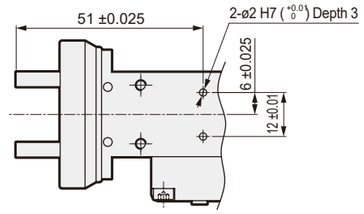
External dimensions diagram (Bore size: ø10)

●LSHM-G10D1A
LSHM-F10D1A



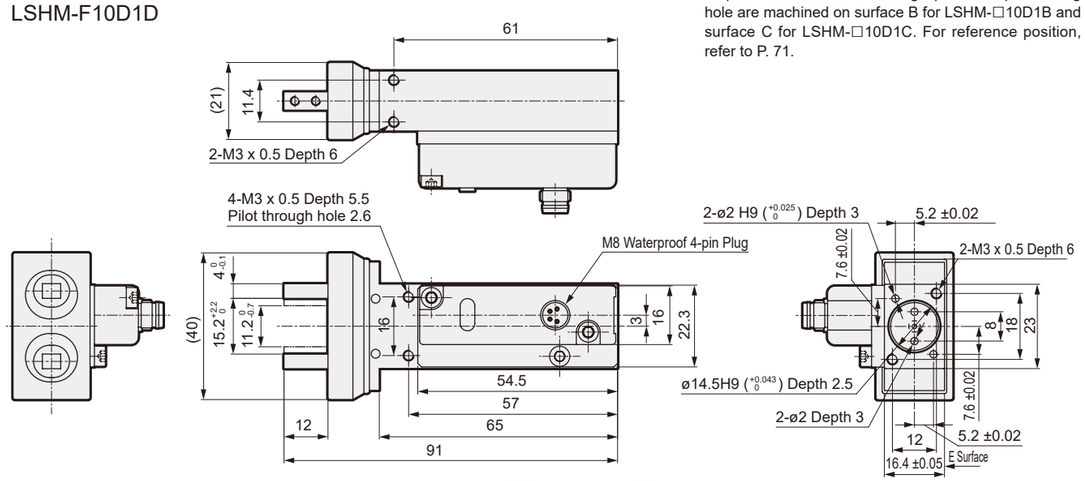


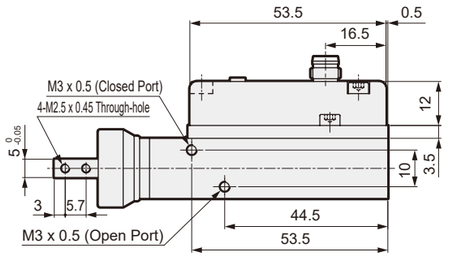
●LSHM-G10D1B/C
LSHM-F10D1B/C



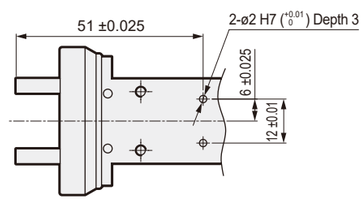
*1: Grip center reference and high precision positioning hole are machined on surface B for LSHM-□10D1B and surface C for LSHM-□10D1C. For reference position, refer to P. 71.

●LSHM-G10D1D
LSHM-F10D1D



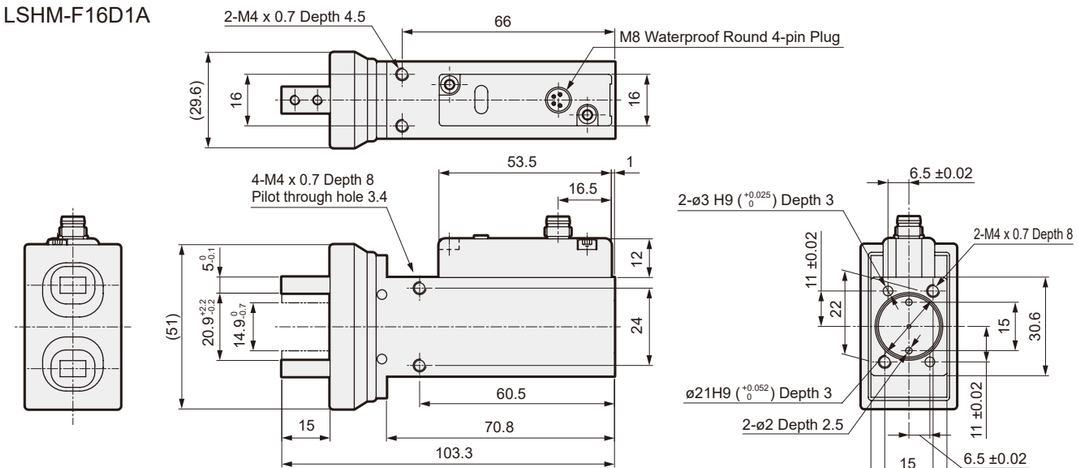


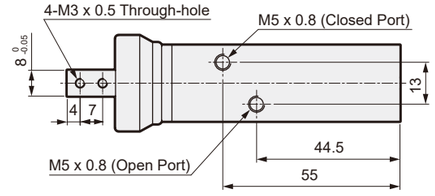
●LSHM-G10D1E
LSHM-F10D1E



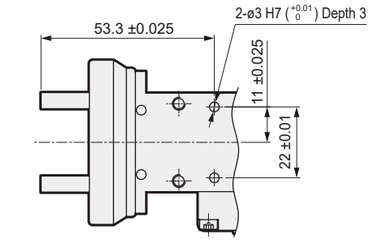
Outline dimension drawing (Bore size: ø16)

●LSHM-G16D1A
LSHM-F16D1A



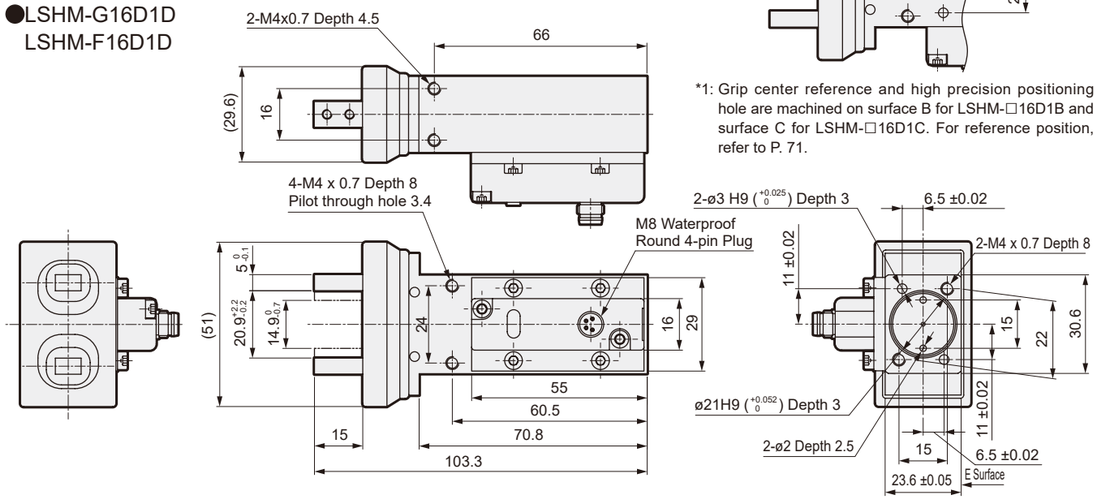


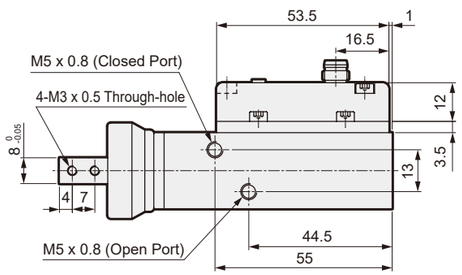
●LSHM-G16D1B/C
LSHM-F16D1B/C



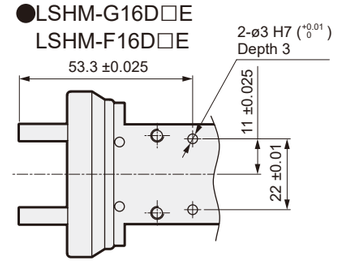
*1: Grip center reference and high precision positioning hole are machined on surface B for LSHM-□16D1B and surface C for LSHM-□16D1C. For reference position, refer to P. 71.

●LSHM-G16D1D
LSHM-F16D1D



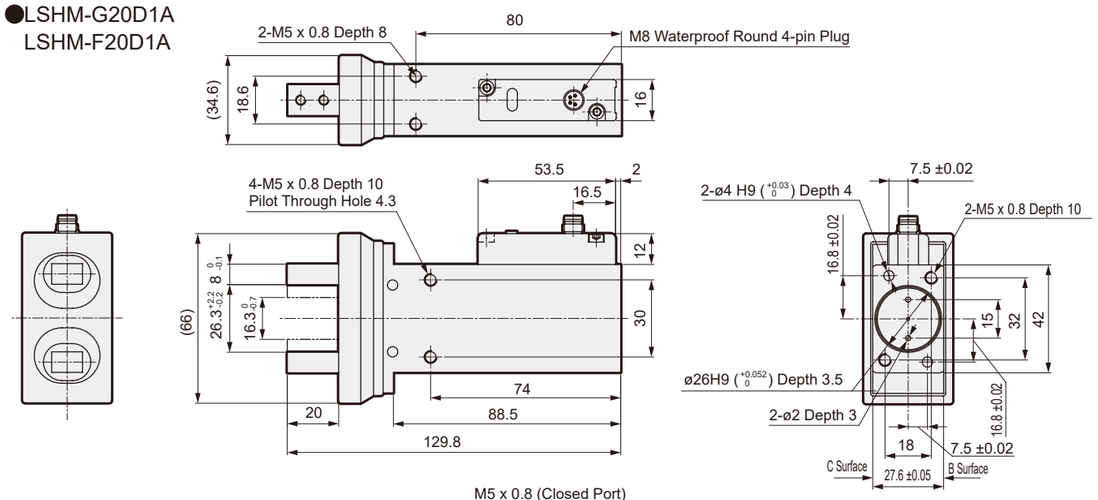


●LSHM-G16D□E
LSHM-F16D□E

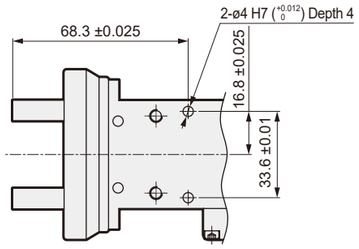


Outline dimension drawing (Bore size: ø20)

●LSHM-G20D1A
LSHM-F20D1A

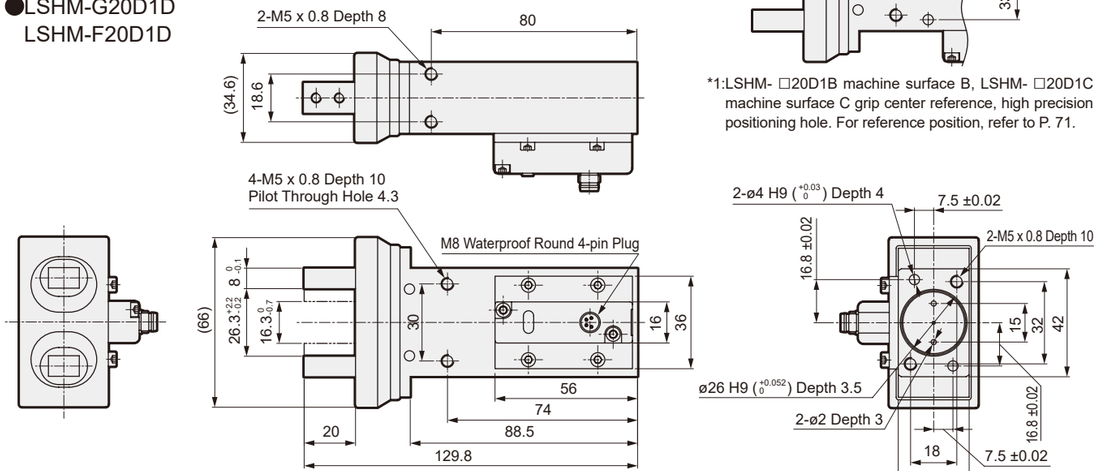


●LSHM-G20D1B/C
LSHM-F20D1B/C

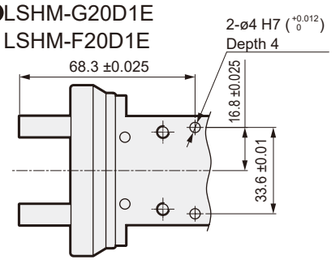


*1:LSHM- □20D1B machine surface B, LSHM- □20D1C machine surface C grip center reference, high precision positioning hole. For reference position, refer to P. 71.

●LSHM-G20D1D
LSHM-F20D1D



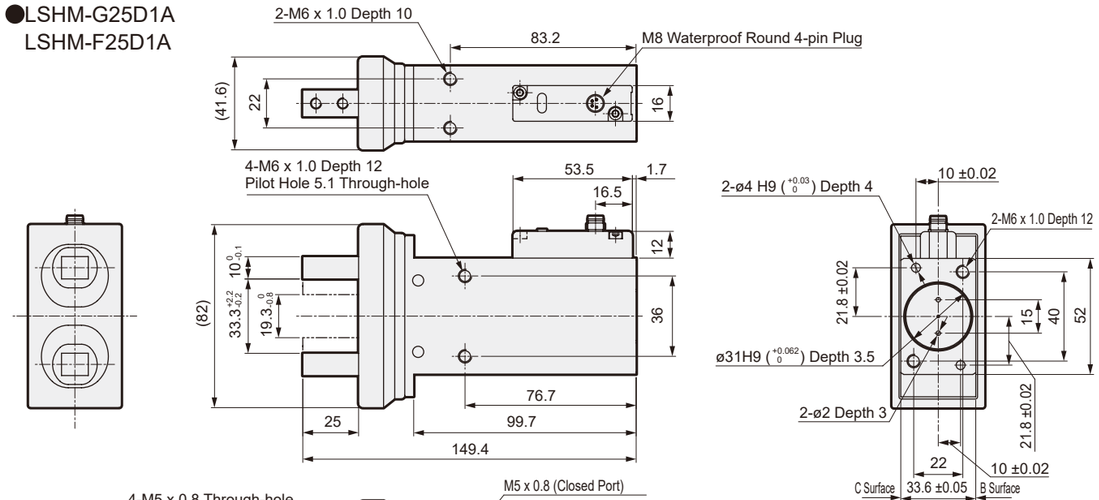
●LSHM-G20D1E
LSHM-F20D1E



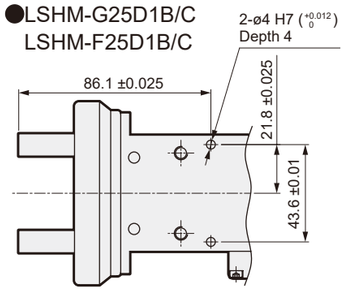
*1:LSHM- □20D1B machine surface B, LSHM- □20D1C machine surface C grip center reference, high precision positioning hole. For reference position, refer to P. 71.

Outline Dimension Drawing (Bore size: ø25)

●LSHM-G25D1A
LSHM-F25D1A

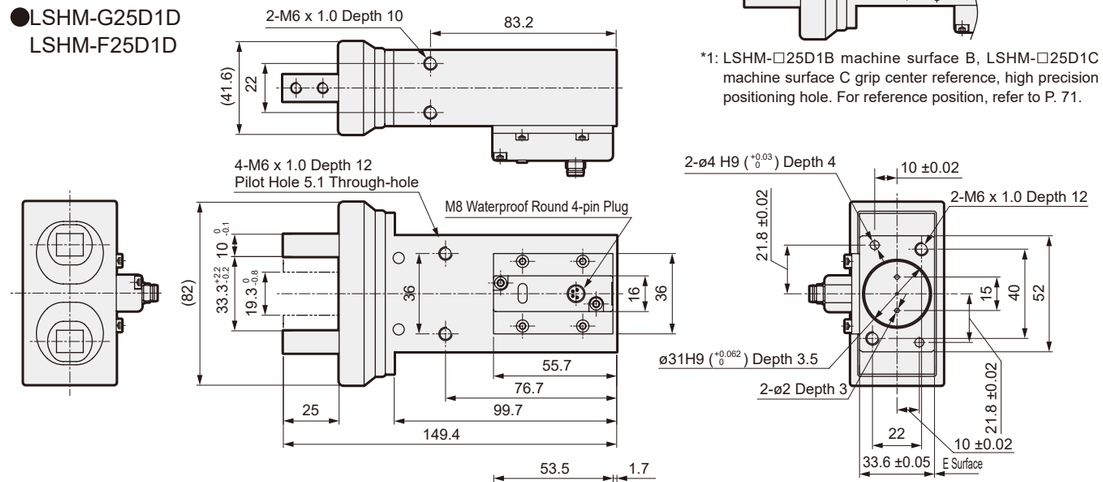


●LSHM-G25D1B/C
LSHM-F25D1B/C

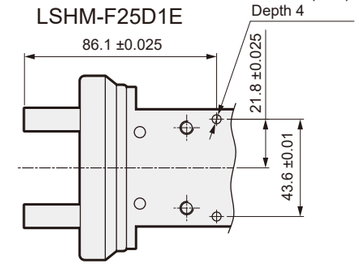


*1: LSHM-□25D1B machine surface B, LSHM-□25D1C machine surface C grip center reference, high precision positioning hole. For reference position, refer to P. 71.

●LSHM-G25D1D
LSHM-F25D1D

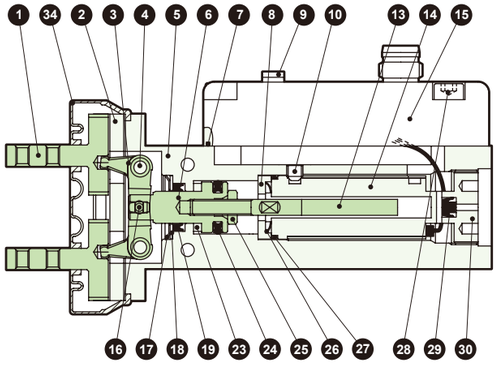


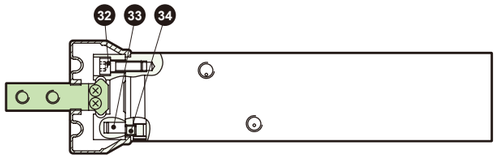
●LSHM-G25D1E
LSHM-F25D1E



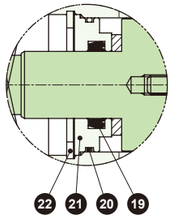
Internal Structure Diagram/Material

●Amplifier Side Mounting (A, B, C)
ø10

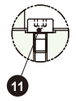




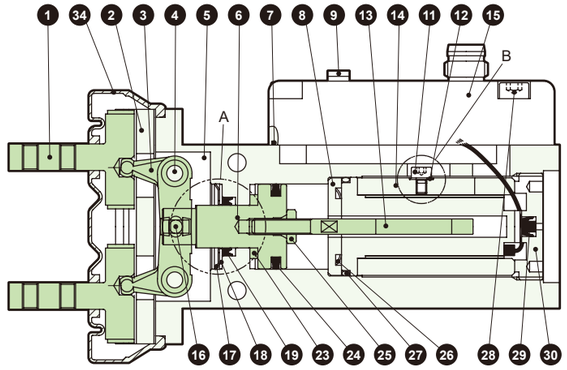
Part A (ø20, 25)

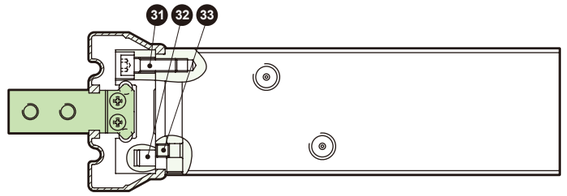


Part B (ø20, 25)



●Amplifier Side Mounting (A, B, C)
ø16 to 25





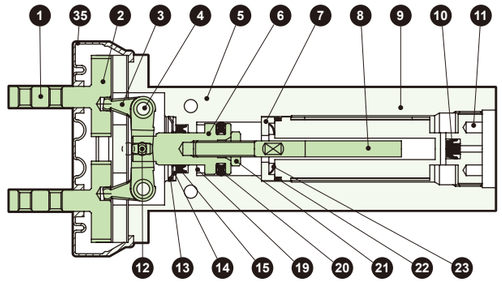
Do not disassemble

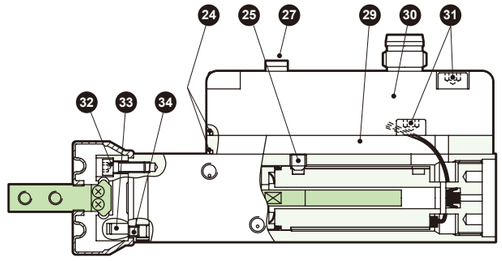
Part No.	Part Name	Material	Remarks
1	Finger	Stainless Steel	
2	Linear Guide	Stainless Steel	
3	Lever	Stainless Steel	
4	Pivot Shaft	Steel	
5	Cylinder Body	Aluminum Alloy	
6	Piston Rod	Stainless Steel	
7	Gasket	Nitrile Rubber	
8	Washer Retainer	Aluminum Alloy	
9	Plug	Nitrile Rubber	
10	Hexagon socket set screw	Stainless Steel	
11	Hexagon Socket Head Cap Screw	Stainless Steel	
12	Plain Washer	Stainless Steel	ø16 only
13	Core Shaft	Steel	
14	Sensor Body		
15	Amplifier		
16	Operating Shaft	Steel	
17	Retaining ring	Stainless Steel	ø10, ø16 only
18	Cap	Stainless Steel	ø10, ø16 only

Part No.	Part Name	Material	Remarks
19	Rod Packing	Nitrile Rubber	
20	O-ring	Nitrile rubber	
21	Rod Metal	Aluminum Alloy	
22	C-type retaining ring	Steel	
23	Cushion Rubber	Urethane Rubber	
24	Piston Packing	Nitrile Rubber	
25	Nut	Stainless Steel	
26	Wave Washer	Stainless Steel	
27	O-ring	Nitrile Rubber	
28	Hexagon Socket Head Cap Screw	Stainless Steel	
29	Check Valve	Nitrile Rubber	
30	Head Cover	Aluminum Alloy	
31	Hexagon Socket Head Cap Screw	Stainless Steel	
32	Pin	Steel	
33	Hexagon socket set screw	Stainless Steel	
34	Rubber Cover	LSHM-G: Chloroprene rubber LSHM-F: Fluoro Rubber	

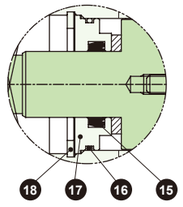
Internal Structure Diagram/Material

●Amplifier Front Mounting (D, E)
ø10





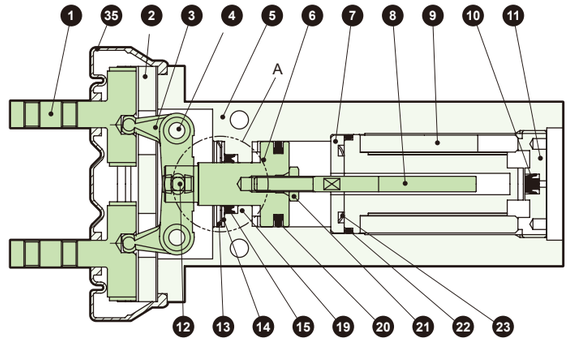
Part A (ø20, 25)

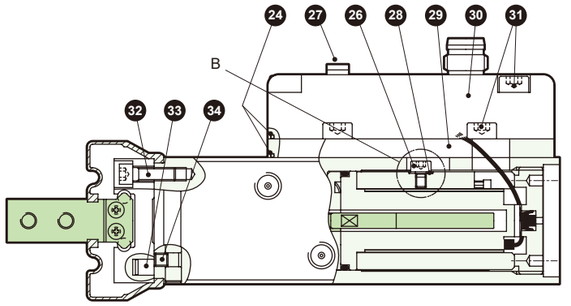


Part B (ø20, 25)



●Amplifier Front Mounting (D, E)
ø16 to 25





Do not disassemble

Part No.	Part Name	Material	Remarks
1	Finger	Stainless Steel	
2	Linear Guide	Stainless Steel	
3	Lever	Stainless Steel	
4	Pivot Shaft	Steel	
5	Cylinder Body	Aluminum Alloy	
6	Piston Rod	Stainless Steel	
7	Washer Retainer	Aluminum Alloy	
8	Core Shaft	Steel	
9	Sensor Body		
10	Check Valve	Nitrile Rubber	
11	Head Cover	Aluminum Alloy	
12	Operating Shaft	Steel	
13	Retaining ring	Stainless Steel	ø10, ø16 only
14	Cap	Stainless Steel	ø10, ø16 only
15	Rod Packing	Nitrile Rubber	
16	O-ring	Nitrile Rubber	
17	Rod Metal	Aluminum Alloy	
18	C-type retaining ring	Steel	

Part No.	Part Name	Material	Remarks
19	Cushion Rubber	Urethane Rubber	
20	Piston Packing	Nitrile Rubber	
21	Nut	Stainless Steel	
22	O-ring	Nitrile Rubber	
23	Wave Washer	Stainless Steel	
24	Gasket	Nitrile Rubber	
25	Hexagon socket set screw	Stainless Steel	
26	Hexagon Socket Head Cap Screw	Stainless Steel	
27	Plug	Nitrile Rubber	
28	Plain Washer	Stainless Steel	ø16 only
29	Amplifier Adapter	Aluminum Alloy	
30	Amplifier		
31	Hexagon Socket Head Cap Screw	Stainless Steel	
32	Hexagon Socket Head Cap Screw	Stainless Steel	
33	Pin	Steel	
34	Hexagon socket set screw	Stainless Steel	
35	Rubber Cover	LSHM-G: Chloroprene rubber LSHM-F: Fluoro Rubber	

Correction Adapter

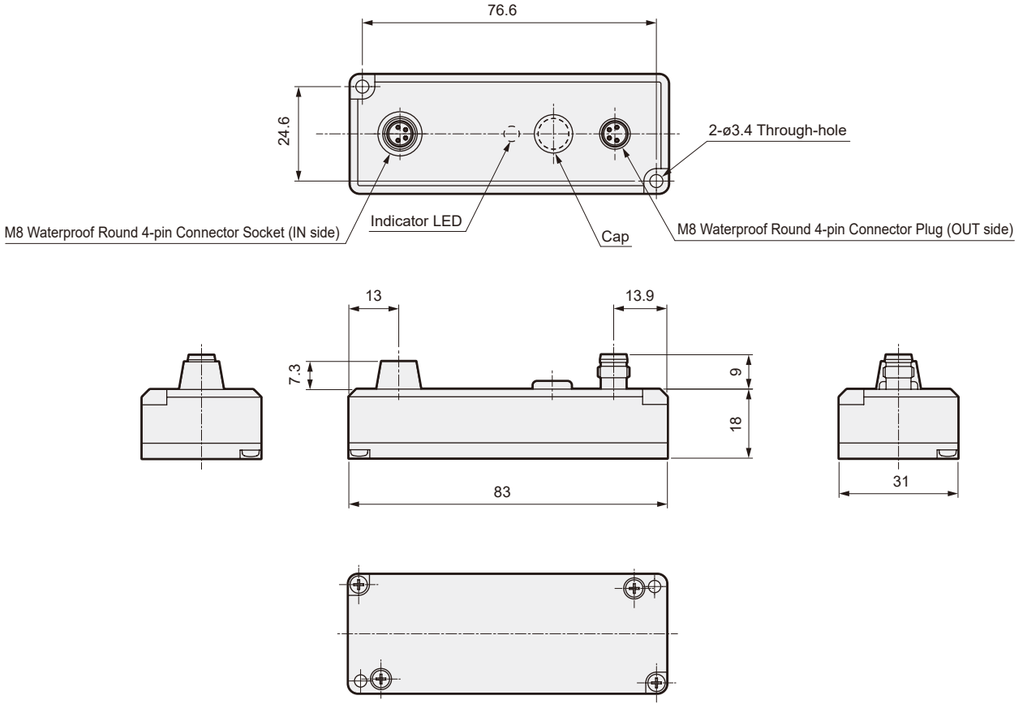
Corrects analog output linearity. Use for applications requiring high-precision linearity.

Specifications

Item	Contents
Power supply voltage	24 VDC ±10%
Current consumption	35 mA or less
Indicator LED	Red LED lights up when power is applied
Analog Input	1 to 5 V (LSHM Series output voltage)
Analog Output	1 to 5 V, connection load 50 kΩ or more
Analog Output Linearity	±0.5% F.S. or less (Ambient temperature 25°C, LSHM Series connection, according to our company's specified measurement method)
Repeatability of analog output	±0.02 mm or less (Ambient temperature 25°C, no deformation or wear of actuator/jig)
Input Connector	M8 Waterproof Round 4-pin Connector Socket
Output Connector	M8 Waterproof Round 4-pin Connector Plug
Shock resistance	294 m/s²
Protection structure	IEC Standard IP65
Ambient Temperature, Humidity	10 to 60°C, 85% RH or less
Mounting method	Direct Mounting
Weight	40 g

Note) Use LSHM and correction adapter in the combination as shipped.

Outline Dimension Drawing



Switch Output Adapter

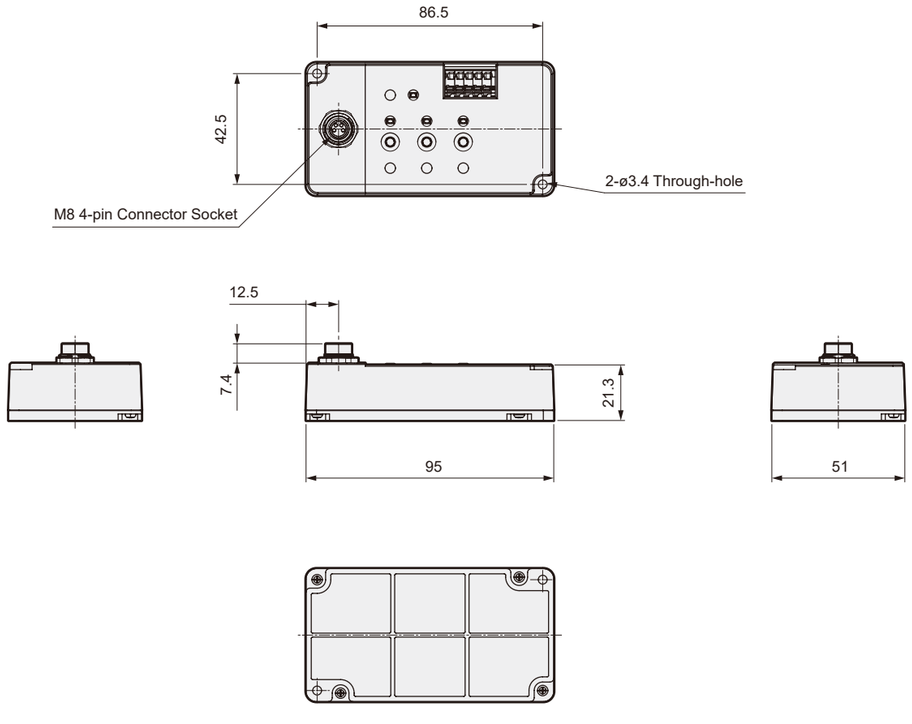
Specifications

Item	Switch Output Adapter (NPN) Option code: B	Switch Output Adapter (PNP) Option code: C
Power supply voltage	24 VDC ±10%	
Current consumption	35 mA or less	
Power Indicator LED	Green LED lights up when power is applied	
Switch indicator light	Red LED lights up when ON	
Number of Switch Outputs	3	
Switch Output (Per 1ch)	NPN: Open Collector Max. Power Supply Voltage: 24 VDC Max. Load Current: 50 mA Internal voltage drop: 1.2 V or less	PNP: Open Collector Max. Power Supply Voltage: 24 VDC Max. Load Current: 50 mA *1 Internal voltage drop: 1.5 V or less
Operating range	0.2 / 0.5 / 1.0 mm *2	
Analog Input	1 to 5 V (LSHM Series output voltage)	
Input Connector	M8 Connector 4-pin (Socket)	
Shock resistance	294 m/s²	
Protection structure	IEC Standard IP40	
Ambient Temperature, Humidity	10 to 60°C, 85% RH or less	
Mounting method	Direct Mounting	
Insulation resistance	20 MΩ or more with 500 VDC megger	
Dielectric strength	No abnormality when 1000 VAC is applied	
Vibration Resistance	10 Hz to 55 Hz, double amplitude 1.5 mm, X, Y, Z, 2 hours each direction	
Weight	65 g	

*1: Ensure the total of all ch is 100 mA or less.

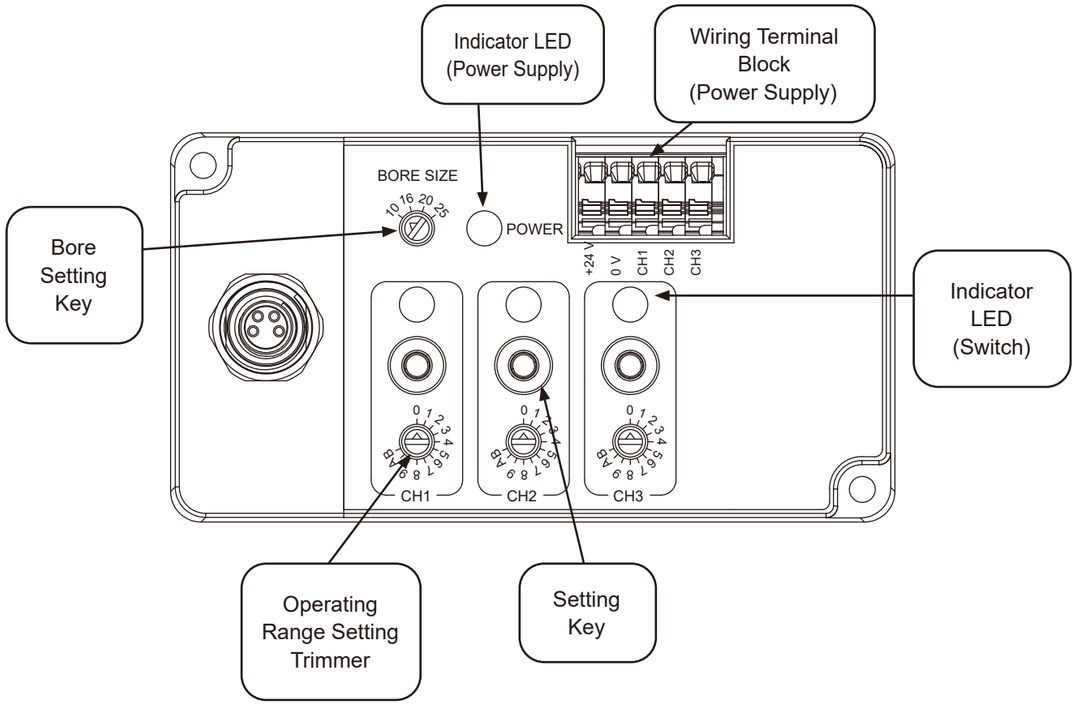
*2: There is a hysteresis of 0.04 mm on one side.

Outline Dimension Drawing



Switch Output Adapter

Operating Part and Each Part

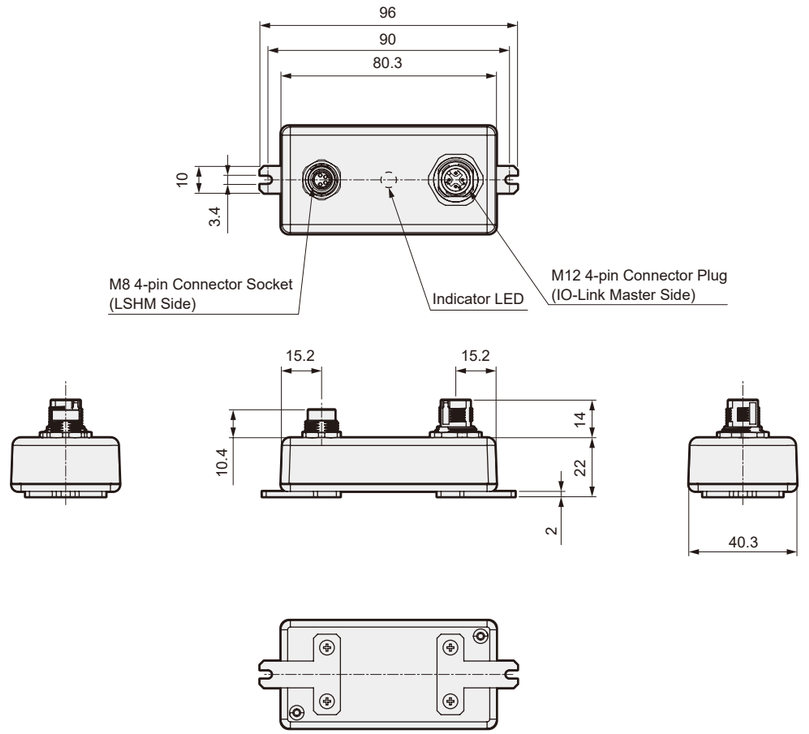


IO-Link Adapter

Specifications

Item	Contents
Power supply voltage	24 VDC ±10%
Current consumption	35 mA or less
Indicator LED	Green LED lights up when power is applied
Analog Input	1 to 5 V (LSHM Series output voltage)
Input Connector	M8 Connector 4-pin (Socket)
Output Connector	M12 Connector 4-pin (Plug)
Non-linearity	±0.5% F.S. or less (Ambient temperature 25°C, LSHM Series connection, according to our company's specified measurement method)
Insulation resistance	20 MΩ or more with 500 VDC megger
Dielectric strength	No abnormality when 1000 VAC is applied
Shock resistance	294 m/s²
Protection structure	IEC Standard IP40
Ambient Temperature, Humidity	10 to 60°C, 85% RH or less
Mounting method	Direct Mounting
Vibration Resistance	10 Hz to 55 Hz, double amplitude 1.5 mm, X, Y, Z, 2 hours each direction
Weight	70 g

Outline Dimension Drawing



IO-Link Communication Specifications

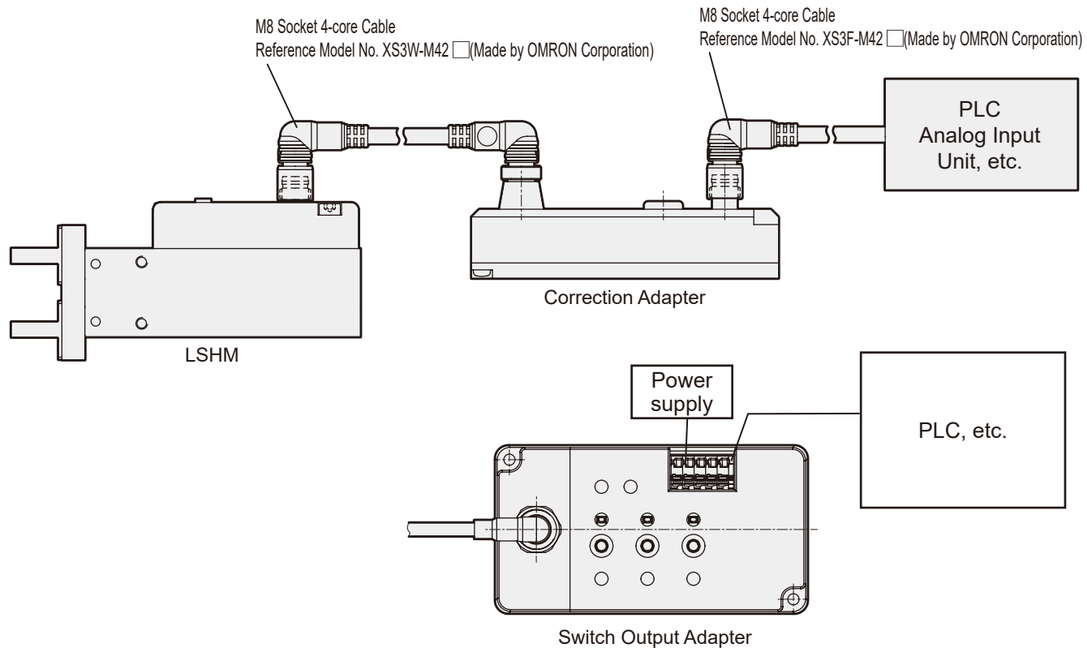
Item	Details
Communication Protocol	IO-Link
Communication Protocol Version	V1.1
Transmission speed	COM3 (230.4 kbps)
Port	Class A
Process Data Length (Input)	4 byte
Process Data Length (Output)	0 byte
Min. Cycle Time	1 ms
Data Storage	1 kbyte
SIO Mode Support	None

Bit	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16
	MSB															LSB
Data Name	Output Voltage															
Data Range	2 byte															
Format	UInteger16															

Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Data Name	Error	Warning	–	–	Switch Output				Unused							
					4	3	2	1								
Data Range	True/False															
Format	Boolean															

Note) IODD file can be downloaded from our homepage.

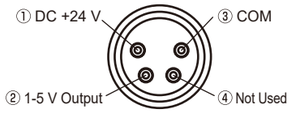
Each Adapter System Configuration



Plug Contact Arrangement Diagram

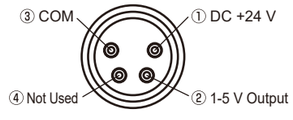
Each Adapter (IN side)

M8 Socket Pin Layout

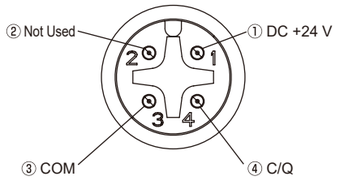


Correction Adapter (OUT side)

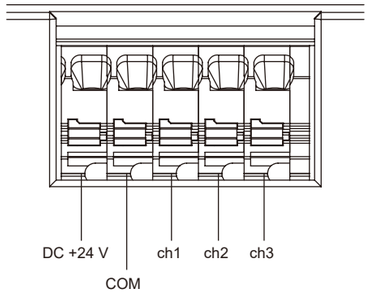
M8 Plug (OUT side) Pin Layout



IO-Link Adapter (OUT side)



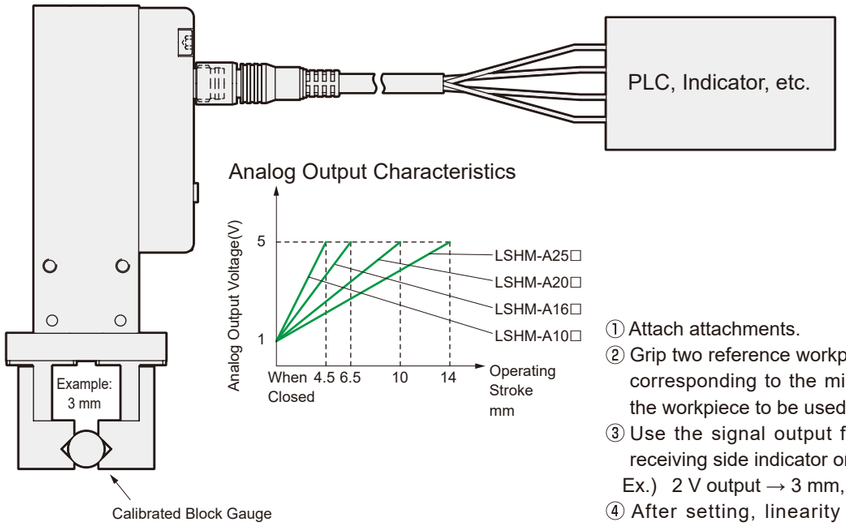
Switch Output Adapter (Terminal Block)



LSHM Series Usage Guide

Method for measuring workpiece using the entire operating stroke

Ex.) Judgment of workpiece type in multi-product production equipment, etc.

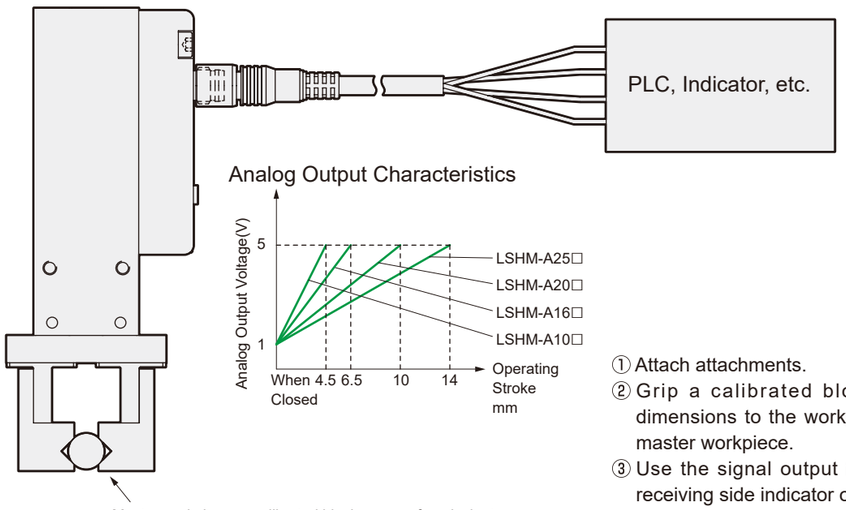


Analog Output Characteristics

① Attach attachments.
② Grip two reference workpieces such as block gauges corresponding to the min. and max. dimensions of the workpiece to be used.
③ Use the signal output from the sensor to set the receiving side indicator or PLC.
Ex.) 2 V output → 3 mm, 4 V output → 8 mm
④ After setting, linearity ±3% F.S. over the entire stroke(With correction adapter option: ±0.5% F.S.) length measurement possible

Method for measuring with even higher precision by limiting the measurement range

Ex.) Confirmation that workpiece dimensions are within tolerance range, confirmation of wear or deformation of attachments or jigs, etc.

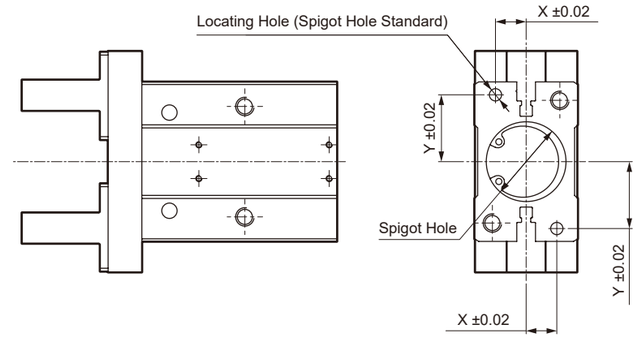


Analog Output Characteristics

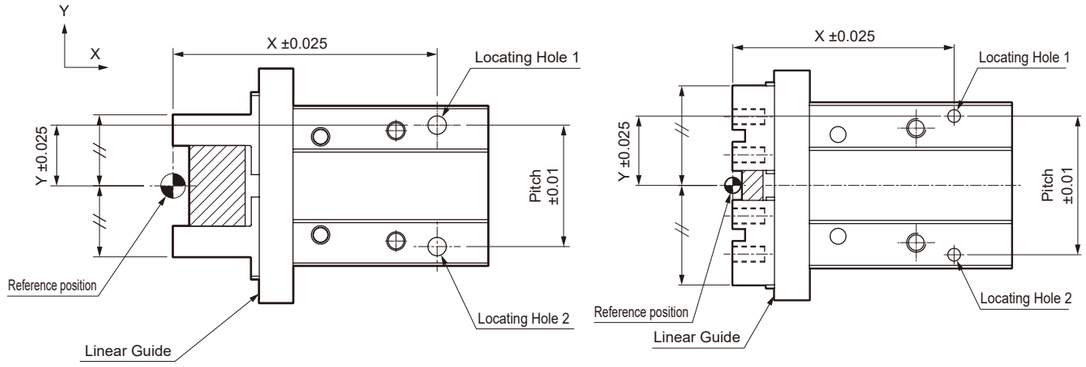
① Attach attachments.
② Grip a calibrated block gauge of equivalent dimensions to the workpiece to be measured, or a master workpiece.
③ Use the signal output from the sensor to set the receiving side indicator or PLC.
Ex.) 2 V output → 3 mm
④ The range of ±0.5 mm centered on the set dimension can be measured with linearity ±0.5% F.S. (reference value without correction adapter).

Reference for Locating Hole Position

●Locating hole on main body end face

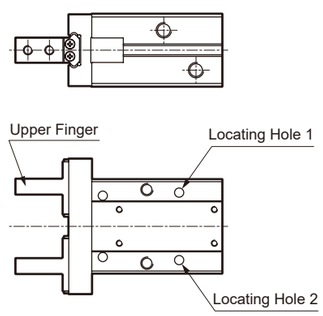


●Gripping center reference, high-precision positioning hole
Positioning can be done with gripping center standard

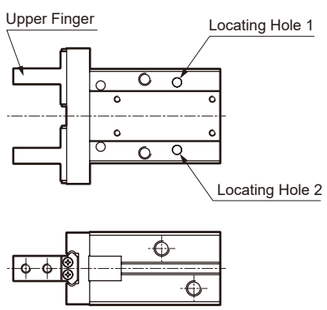


Reference Position of Locating Hole
Gripping the workpiece at mid-stroke, with the finger facing left and the linear guide's linear motion direction as the Y-axis,
X-axis Direction Standard: Upper finger tip
Y-axis Direction Standard: Center of finger outer surface

Ex.) Standard finger left-facing, piping top surface
LSH□-□□□□R



Ex.) Standard finger left-facing, piping bottom surface
LSH□-□□□□L



LSH-HP Selection Guide

STEP-1 Select appropriate model from required gripping force

① Calculation of Required Gripping Force

To transport a workpiece (weight WL), a gripping force FW that satisfies the following formula is required.

$$F_W > \frac{W_L \times g \times K}{n}$$

F_W : Required Gripping Force [N]
n : Number of Fingers = 2
W_L : Workpiece Weight [kg]
g : Gravitational acceleration = 9.8 [m/s²]
K : Conveyance Factor
5 [Holding only]
10 [Normal transport]
20 [Rapid acceleration transport]

About Conveyance Factor K

Calculation Example) When decelerating from a conveyance speed V = 0.75 m/s to stop in 0.1 seconds, with a friction coefficient μ of 0.1 between the workpiece and finger, it is as follows.

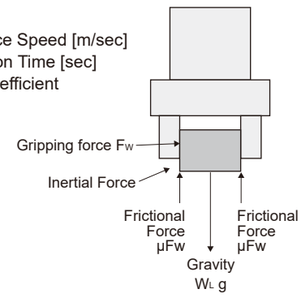
Determine the transport coefficient K from the force applied to the workpiece

V : Conveyance Speed [m/sec]
t : Deceleration Time [sec]
μ : Friction Coefficient

- Inertial force = W_L (V/t)
- Gravity = W_Lg

- Required gripping force $F_W > \frac{W_L(V/t)+W_Lg}{n\mu} = \frac{W_L(V/t+g)}{n\mu} = \frac{17.3\ W_L}{2 \times 0.1} = 86.5\ W_L$

∴ The transport coefficient K at this time is, from the above formula $\frac{V/t + g}{\mu g} = \frac{0.75/0.1 + 9.8}{0.1 \times 9.8} \approx 20$



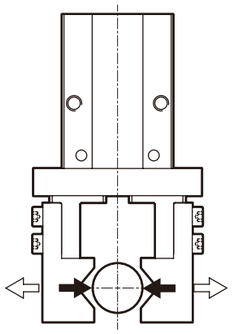
Note) The transport coefficient K needs to allow a margin for impacts during transport, etc. Even if the friction coefficient μ is higher than μ=0.1, set the conveyance factor K to 10 to 20 or more for safety.

② Model selection from required gripping force

Gripping force changes depending on "gripping direction," "attachment length," and "supply pressure." Confirm from the gripping force graph that sufficient gripping force can be obtained under your operating conditions.

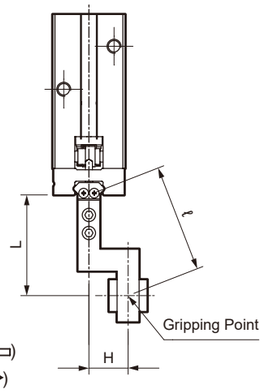
Gripping force graph page	
LSH□-A□□D	74
LSH□-A□□S/C	75
LSH□-G/F□□D	76
LSH□-G/F□□S/C	77

Gripping Direction

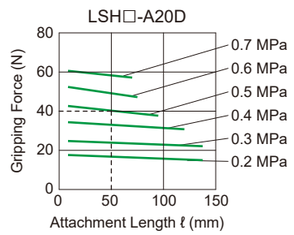


●Opening direction (⇦)
●Closing direction (➡)

Finger Length ℓ



How to Read Gripping Force Graph
(For LSH-A20D Close Direction)

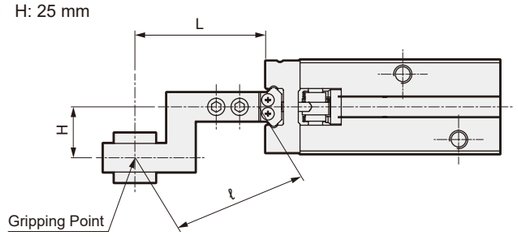


For example, if the supply pressure is 0.5 MPa and the attachment length is 50 mm, the obtainable gripping force will be 40 N.

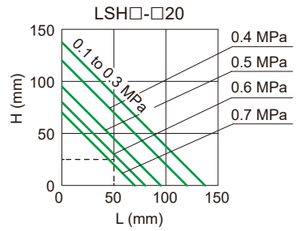
STEP-2 Confirmation of Attachment Shape

Use fingers within the range on P. 78.

Ex) L: 50 mm H: 25 mm



When LSH-A20D is selected, L: 50 mm, H: The intersection of 25 mm is located inside the supply pressure line of 0.5 MPa, so it can be used.



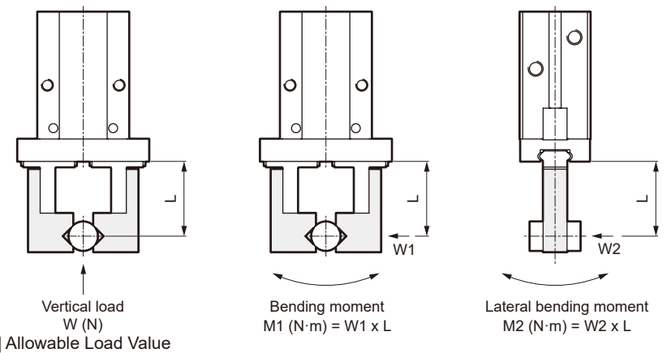
●Use fingers that are as lightweight and short as possible.
If they are long and heavy, the inertial force during opening and closing becomes large, which may cause backlash in the fingers or accelerate wear of the finger sliding parts, adversely affecting the service life.

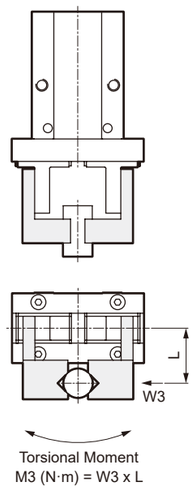
●Even if the finger shape is within the performance data, making it as small as possible will allow the product to be used for a long time. Also, if ℓ is long, there is a risk of gripping errors, dropping during transport, etc., due to unexpected vibrations. As a guideline, use "Cylinder bore x 1.3 / Operating pressure". If ℓ is longer than that, set a higher transport coefficient in STEP-1 (Guideline: Transport coefficient of 20 or more).

●The weight of the fingers affects the service life, so please keep it below the following.
W < 1/4H (1 piece) W : Weight of finger
H : Gripper Product Weight

STEP-3 Confirmation of external force applied to fingers

When external force is applied to the fingers, such as when transporting or inserting a workpiece, use within the range shown in [Table 1].
*When using for transport, consider the impact at the end of the stroke.





[Table 1] Allowable Load Value

Bore size	Vertical load Wmax (N)	Bending moment M1 max (N·m)	Lateral bending moment M2 max (N·m)	Torsional Moment M3 max (N·m)
ø6	15	0.06	0.06 (0.12)	0.06
ø10	75	0.39	0.39 (0.69)	0.39
ø16	147	1.32	1.32 (2.2)	1.32
ø20	265	2.1	2.1 (4.0)	2.1
ø25	343	3.0	3.0 (6.0)	3.0
ø32	490	4.5	4.5 (9.0)	4.5

L: Distance to the point where the load is applied

When multiple external forces are applied, the sum of the external forces (formula below) must be less than 1.

WT = W/Wmax + M1/M1 max + M2/M2 max + M3/M3 max < 1

The lateral bending moment can be used even if it is below the value in ( ), but in that case, use L and H dimensions that are 2/3 or less of the length specified on P. 74.

Calculation Example ①: When conveying workpieces
Model No.: LSH-A20D, attachment (weight m_k: When a workpiece (weight: m=0.8 kg, center of gravity: L=60 mm) is gripped and transported at 0.06 kg with center of gravity: L_k = 30 mm
(g: Gravity acceleration 9.8 m/s², α: Assuming an impact factor of 3 at the end of the stroke)

$M_1 = \alpha \times W_1 \times L = \alpha \times (m_k \times g \times L_k \times 2 + m \times g \times L)$
$= 3 \times (0.06 \times 9.8 \times 30 \times 10^{-3} \times 2 + 0.8 \times 9.8 \times 60 \times 10^{-3}) \approx 1.5$ N·m, which is M1 max = 2.1 N·m or less, so it can be used.

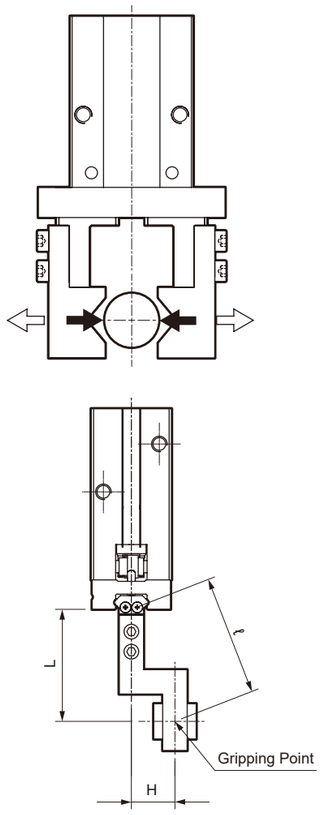
Calculation Example ②: When inserting a workpiece
Model No. : When load W_1:40 N is applied to LSH-A20D, L=40 mm

$M_1 = W_1 \times L = 40 \times 40 \times 10^{-3} = 1.6$ N·m, which is M1max = 2.1 N·m or less, so it can be used.

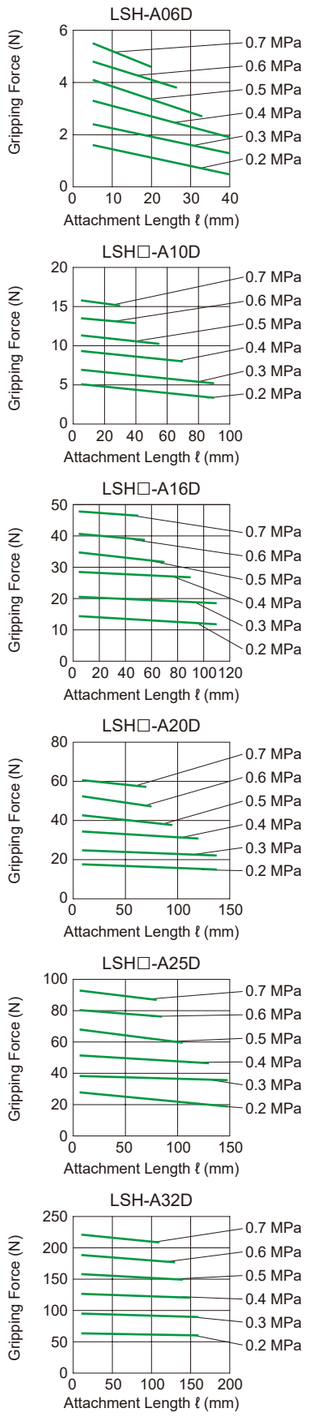
Gripping Force Performance Data LSH-A□□D, LSHL-A□□D, LSHM-A□□D (Double Acting)

- Gripping force represents the thrust (for one finger) in the direction of the arrow shown in the figure.
- Indicates the gripping force acting in the opening and closing directions at the attachment length ℓ when the supply pressure is up to 0.7 MPa.

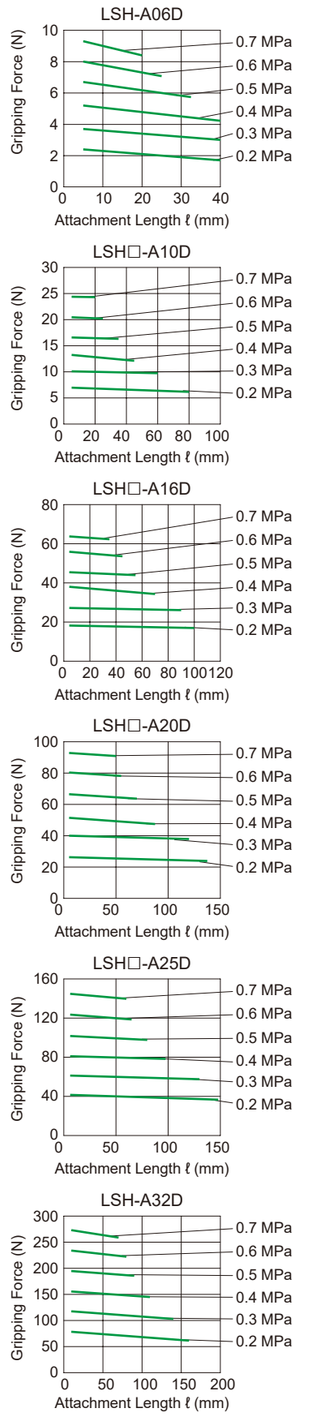
●Opening direction (⇦)
●Closing direction (➡)



Closing direction



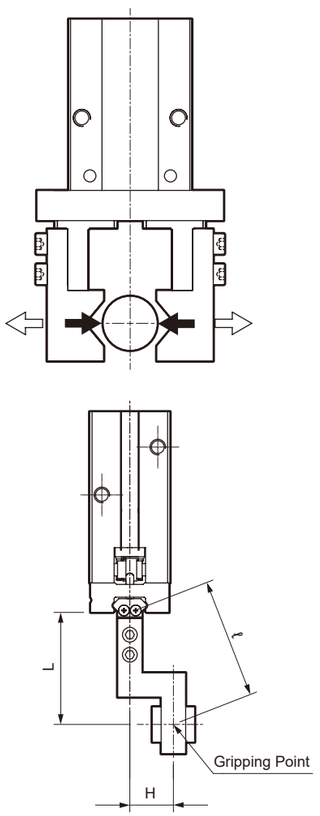
Opening direction



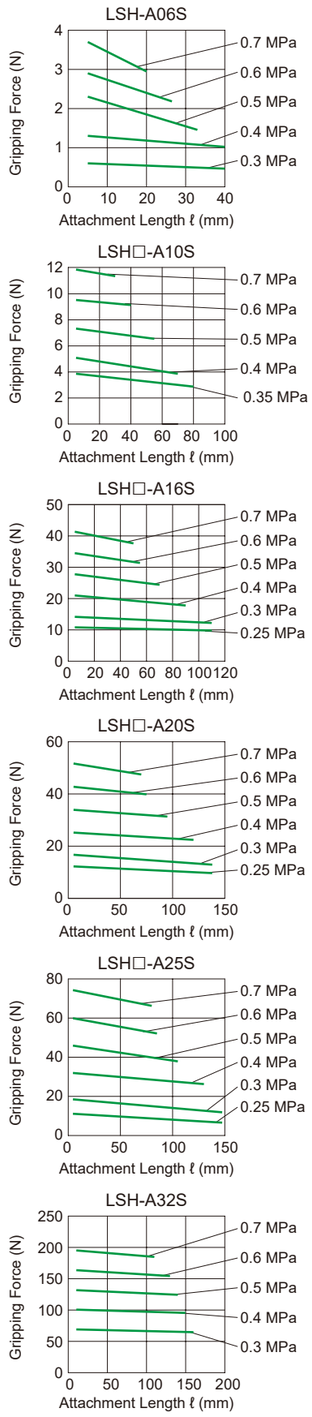
Gripping Force Performance Data LSH-A□□S/C (Single Acting)

- Gripping force represents the thrust (for one finger) in the direction of the arrow shown in the figure.
- Indicates the gripping force acting in the opening and closing directions at the attachment length ℓ when the supply pressure is up to 0.7 MPa.

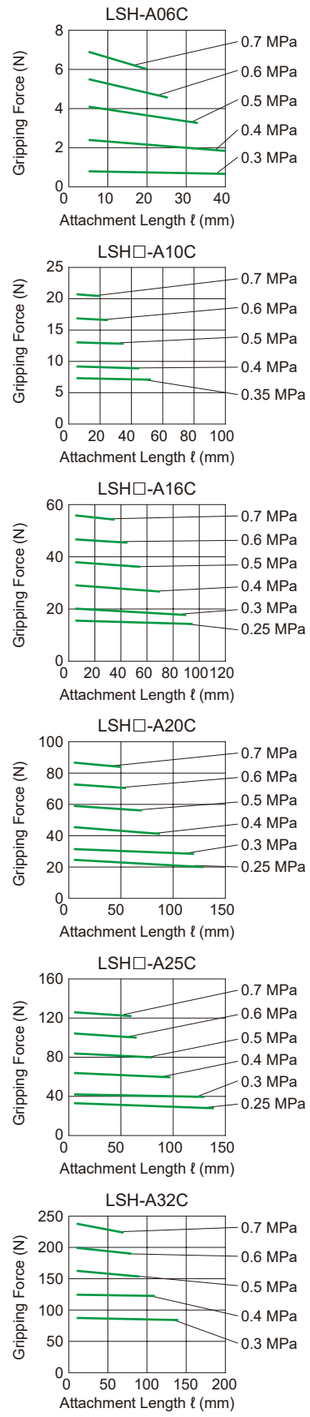
●Opening direction (⇦)
●Closing direction (➡)



Closing direction



Opening direction

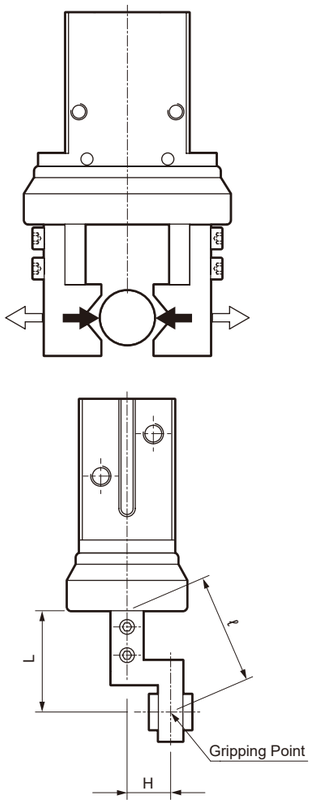


Hand (Gripper)
LSH-HP
LSH
FH100
BSA2
BHA
BHG
BHE
LHA
LHAG
HAP-1C
HAP-2 to 4CS
HKP
HCP
HGP
LST-HP
HLF2
HLA/ HLB
HLAG/ HLBG
HLC
HLD
HMC-HP
HMF
HMF-G
HMFB
HFP
FH500
HBL
HJL
HMD
HDL
HJD
Cylinder Switch
Ending

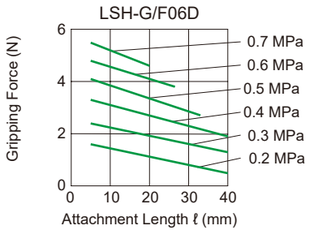
Gripping Force Performance Data LSH-G/F□□D, LSHL-G/F□□D, LSHM-G/F□□D (Double Acting)

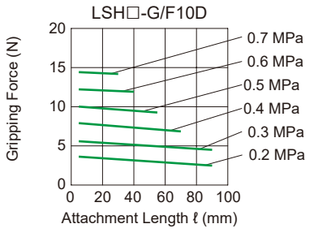
- Gripping force represents the thrust (for one finger) in the direction of the arrow shown in the figure.
- Indicates the gripping force acting in the opening and closing directions at the attachment length ℓ when the supply pressure is up to 0.7 MPa.

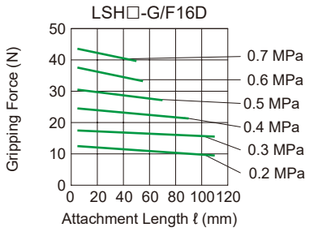
●Opening direction (⇦)
●Closing direction (➡)

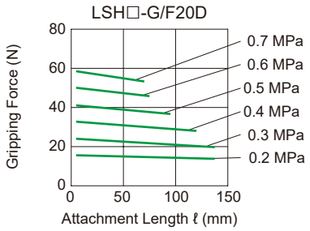


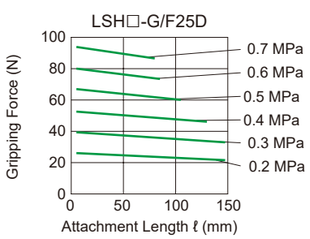
Closing direction

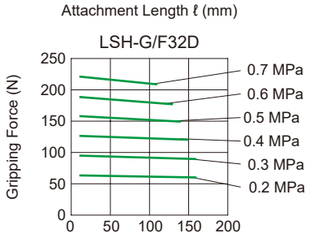




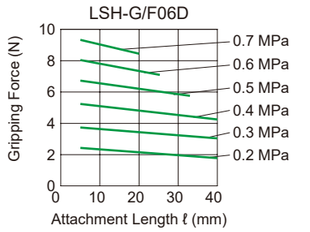


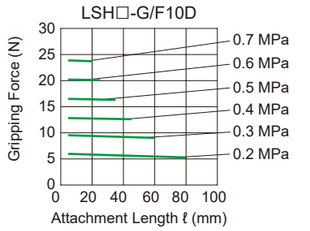


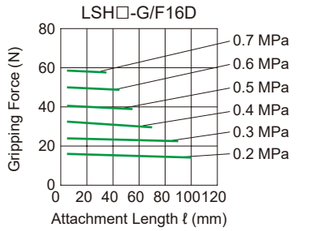


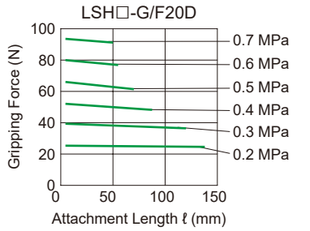


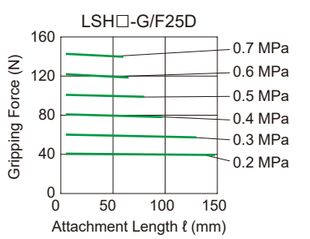
Opening direction

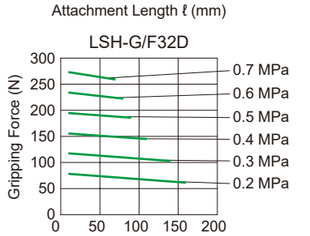








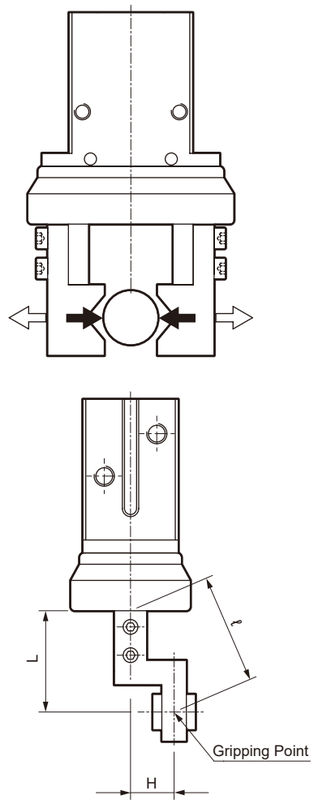




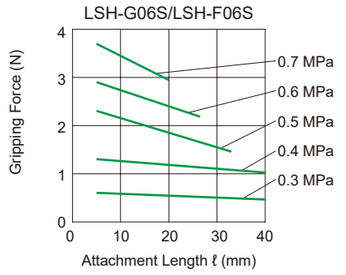
Gripping Force Performance Data LSH-G/F□□S/C (Single Acting)

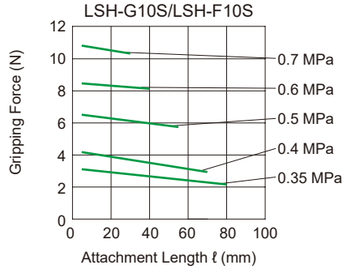
- Gripping force represents the thrust (for one finger) in the direction of the arrow shown in the figure.
- Indicates the gripping force acting in the opening and closing directions at the attachment length ℓ when the supply pressure is up to 0.7 MPa.

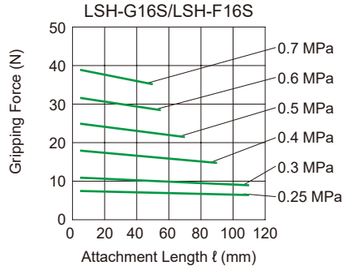
●Opening direction (⇦)
●Closing direction (➡)

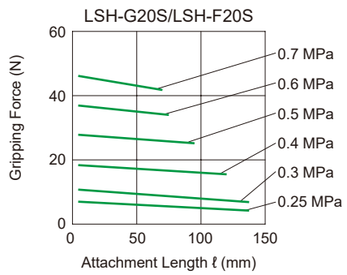


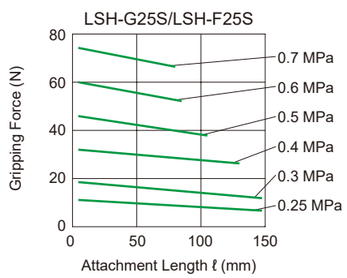
Closing direction



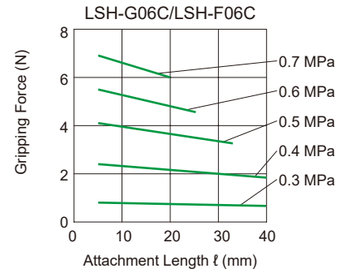


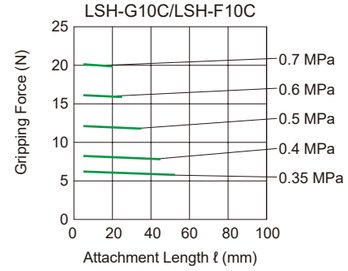


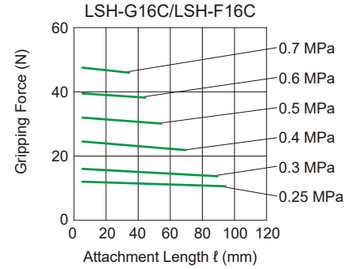


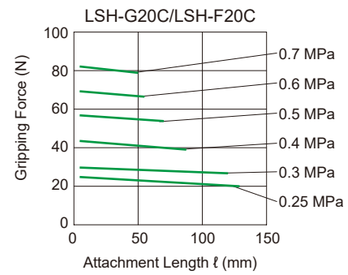


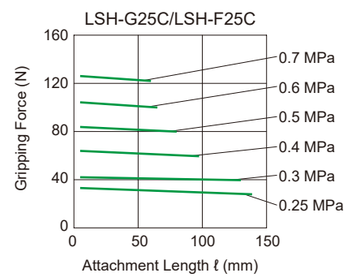
Opening direction







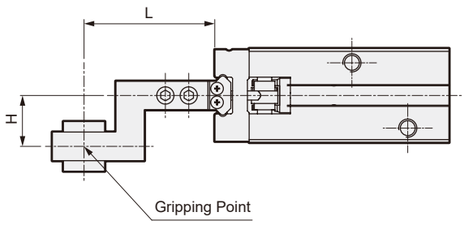




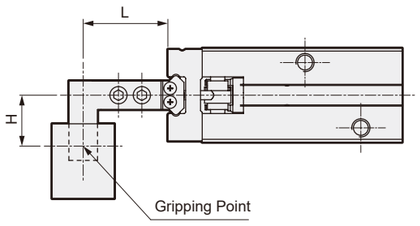
Finger length

When installing L-shaped fingers, use them within the range shown in the figure on the right.

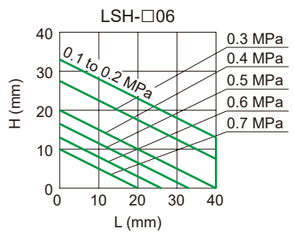
Closing direction

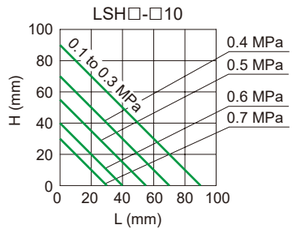


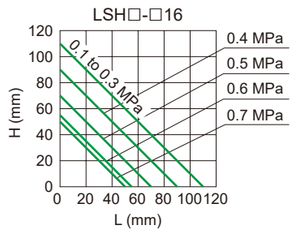
Opening direction

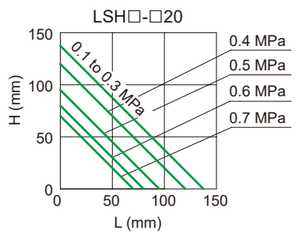


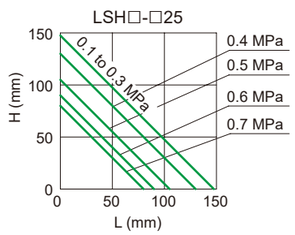
Closing direction

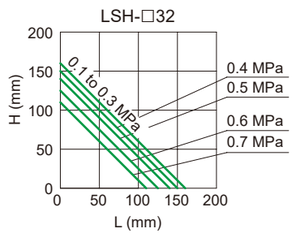




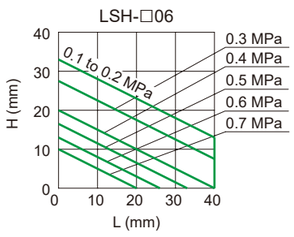


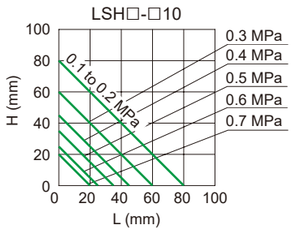


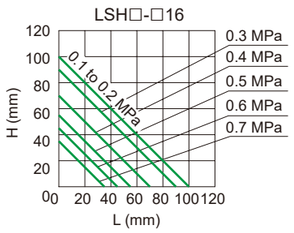


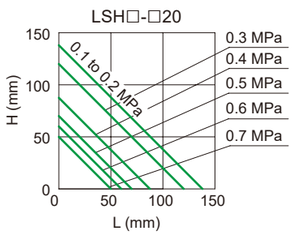


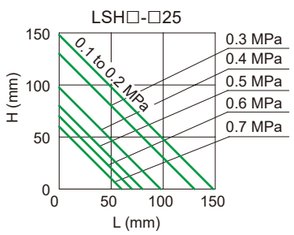
Opening direction

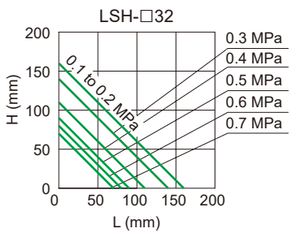












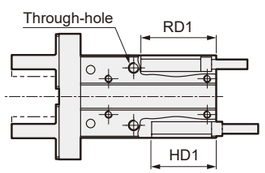
MEMO

Cylinder Switch Precautions

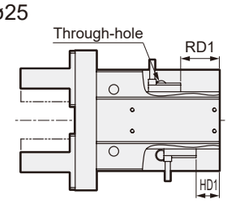
●Switch Mounting Position List

[Side Mounting]

ø6 to 20, 32

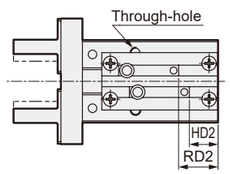


ø25



[Rail Plate Mounting]

ø6 to 32

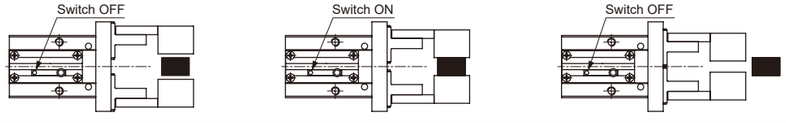
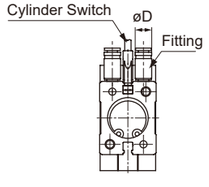


Model No.	Switch Model No.	Side surface mounting		Rail Plate Mounting	
		RD1	HD1	RD2	HD2
LSH-A06□	F2/3□	20.5	18	–	–
	F2/3S	–	–	9.5 (–)	7 (–)
LSH-A10□	F2/3□	21	18	11 (21)	8 (18)
	F2/3S	22	19	10 (22)	7 (19)
LSH-A16□	F2/3□	21	17	11 (21)	7 (17)
	F2/3S	22	18	10 (22)	6 (18)
LSH-A20□	F2/3□	26	20	16 (26)	10 (20)
	F2/3S	27	21	15 (27)	9 (21)
LSH-A25□	F2/3H, PH	–	–	20 (30)	12 (22)
	F2/3 V, PV	20	12	20 (30)	12 (22)
	F2/3S	19	11	19 (31)	11 (23)
LSH-A32D	F2/3□	32.5	20.5	22.5 (32.5)	10.5 (20.5)
	F2/3S	33.5	21.5	21.5 (33.5)	9.5 (21.5)
	T2/3□	–	–	18.5 (36.5)	6.5 (24.5)
LSH-A32S/C	F2/3□	41	29	31 (41)	19 (29)
	F2/3S	42	30	30 (42)	18 (30)
	T2/3□	–	–	27 (45)	15 (33)

Note1) When the lead wire is facing the head side in rail assembly, the dimensions will be as shown in ( ).
Note2) "–" indicates that mounting is not possible.

●Precautions

Please check the precautions for the bore size you will be using from the table below.

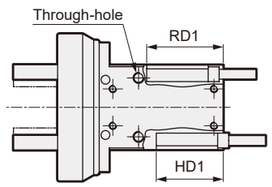
Category	Bore size ø6	ø10	ø16	ø20	ø25	ø32	Precautions
Common Items	●	●	●	●	●	●	• The RD dimension is the highest sensitivity position at the open end position, and the HD dimension is the highest sensitivity position at the closed end position.Please adjust the actual mounting position after confirming the operating status of the switch.
	●	●	●	●	●	●	• Only one switch can be mounted in one switch rail groove.
	●	●	●	●	●	●	• Due to the short opening/closing stroke, only the open or closed state can be detected for each switch. Example: With one switch, the detection shown in the figure below is not possible. ① Open end (workpiece not gripped): Switch OFF ② Workpiece gripped: Switch ON ③ Open end (workpiece not gripped): Switch OFF 
	●	●	●	●	●	●	• Be careful not to get the lead wire caught when opening and closing the fingers.
Side surface mounting	●	●	●	●	–	–	• When using an L-type switch for port side mounting, the fitting and switch may interfere. Keep the fitting outer diameter below the values in the table below. Mounting Position: Port side Switch shape: L-shaped type Bore size (Mounting position) / Fitting outer diameter øD: ø6 (RD) ø5 or less; ø6 (HD) ø6.9 or less; ø10 ø7.4 or less; ø16 ø7.9 or less; ø20 ø11 or less 
	●	●	●	●	–	●	• For straight lead wire type and F3PV switches, the switch and lead wire will protrude from the head side end face. If protrusion is a problem, use F2/3 V, F2/3S, or rail plate mounting.
	–	●	●	●	●	●	• Through-hole mounting is not possible when mounting the switch on the side.
Rail Mounting	–	●	–	–	–	–	• Through-hole mounting is not possible when mounting the switch rail plate.

Cylinder Switch Precautions

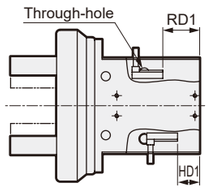
●Switch Mounting Position List

[Side Mounting]

ø6 to 20, 32

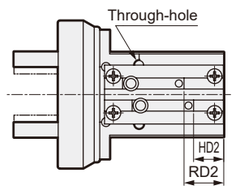


ø25



[Rail Plate Mounting]

ø6 to 32

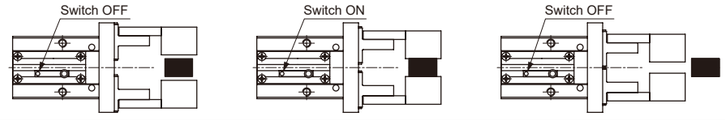
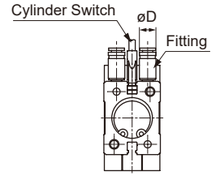


Model No.	Switch Model No.	Side surface mounting		Rail Plate Mounting	
		RD1	HD1	RD2	HD2
LSH-G/F06	F2/3□	20.5	18	–	–
	F2/3S	–	–	9.5 (–)	7 (–)
LSH-G/F10	F2/3□	21	18	11 (21)	8 (18)
	F2/3S	22	19	10 (22)	7 (19)
LSH-G/F16	F2/3□	21	17	11 (21)	7 (17)
	F2/3S	22	18	10 (22)	6 (18)
LSH-G/F20	F2/3□	26	20	16 (26)	10 (20)
	F2/3S	27	21	15 (27)	9 (21)
LSH-G/F25	F2/3□	–	–	20 (30)	12 (22)
	F2/3 V	20	12	20 (30)	12 (22)
	F2/3S	19	11	19 (31)	11 (23)
LSH-G/F32	F2/3□	26	14	16 (26)	4 (14)
	F2/3S	27	15	15 (27)	3 (15)
	T2/3□	–	–	12 (30)	0 (18)

Note1) When the lead wire is facing the head side in rail assembly, the dimensions will be as shown in ( ).
Note2) "–" indicates that mounting is not possible.

●Precautions

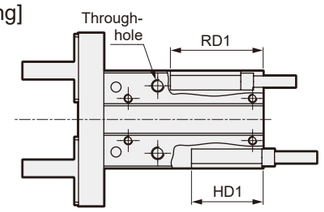
Please check the precautions for the bore size you will be using from the table below.

Category	Bore size ø6	ø10	ø16	ø20	ø25	ø32	Precautions
Common Items	●	●	●	●	●	●	• The RD dimension is the highest sensitivity position at the open end position, and the HD dimension is the highest sensitivity position at the closed end position. Please adjust the actual mounting position after confirming the operating status of the switch.
	●	●	●	●	●	●	• Only one switch can be mounted in one switch rail groove.
	●	●	●	●	●	●	• Due to the short opening/closing stroke, only the open or closed state can be detected for each switch. Example: With one switch, the detection shown in the figure below is not possible. ① Open end (workpiece not gripped): Switch OFF ② Workpiece gripped: Switch ON ③ Open end (workpiece not gripped): Switch OFF 
	●	●	●	●	●	●	• Be careful not to get the lead wire caught when opening and closing the fingers.
Side surface mounting	●	●	●	●	–	–	• When using an L-type switch for port side mounting, the fitting and switch may interfere. Keep the fitting outer diameter below the values in the table below. Mounting Position: Port side Switch shape: L-shaped type Bore size (Mounting position) / Fitting outer diameter øD: ø6 (RD) ø5 or less; ø6 (HD) ø6.9 or less; ø10 ø7.4 or less; ø16 ø7.9 or less; ø20 ø11 or less 
	●	●	●	●	–	●	• For straight lead wire type and F3PV switches, the switch and lead wire will protrude from the head side end face. If protrusion is a problem, use F2/3 V, F2/3S, or rail plate mounting.
	–	–	–	–	–	●	• For F2/3 V switches, the switch protrudes from the head side end face.If protrusion is a problem, use F2/3S or rail plate mounting.
	–	●	●	●	●	–	• Through-hole mounting is not possible when mounting the switch on the side.
Rail Mounting	–	●	–	–	–	–	• Through-hole mounting is not possible when mounting the switch rail plate.

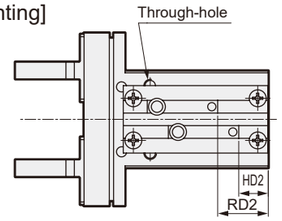
Cylinder Switch Precautions

●Switch Mounting Position List

[Side Mounting]
ø10 to 25



[Rail Plate Mounting]
ø10 to 25

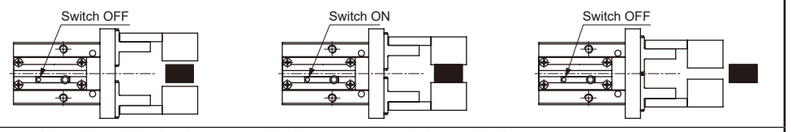
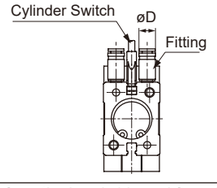


Model No.	Switch Model No.	Side surface mounting		Rail Plate Mounting	
		RD1	HD1	RD2	HD2
LSHL-A10D	F2/3□	22	17	12 (22)	7 (17)
	F2/3S	23	18	11 (23)	6 (18)
LSHL-A16D	F2/3□	24.5	16.5	14.5 (24.5)	6.5 (16.5)
	F2/3S	25.5	17.5	13.5 (25.5)	5.5 (17.5)
LSHL-A20D	F2/3□	30	20	20 (30)	10 (20)
	F2/3S	31	21	19 (31)	9 (21)
LSHL-A25D	F2/3□	33	21.5	23 (33)	11.5 (21.5)
	F2/3S	34	22.5	22 (34)	10.5 (22.5)
LSHL-A10S/C	F2/3□	28	23	18 (28)	13 (23)
	F2/3S	29	24	17 (29)	12 (24)
LSHL-A16S/C	F2/3□	27.5	20	17.5 (27.5)	10 (20)
	F2/3S	28.5	21	16.5 (28.5)	9 (21)
LSHL-A20S/C	F2/3□	33.5	23	23.5 (33.5)	13 (23)
	F2/3S	34.5	24	22.5 (34.5)	12 (24)
LSHL-A25S/C	F2/3□	38.5	27	28.5 (38.5)	17 (27)
	F2/3S	39.5	28	27.5 (39.5)	16 (28)

Note) When the lead wire is facing the head side in rail assembly, the dimensions will be as shown in ( ).

●Precautions

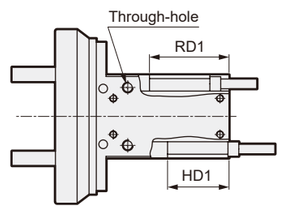
Please check the precautions for the bore size you will be using from the table below.

Category	Bore size ø10	ø16	ø20	ø25	Precautions
Common Items	●	●	●	●	• The RD dimension is the highest sensitivity position at the open end position, and the HD dimension is the highest sensitivity position at the closed end position. Please adjust the actual mounting position after confirming the operating status of the switch.
	●	●	●	●	• Only one switch can be mounted in one switch rail groove.
	●	●	●	●	• Due to the short opening/closing stroke, only the open or closed state can be detected for each switch. Example: With one switch, the detection shown in the figure below is not possible. ① Open end (workpiece not gripped): Switch OFF ② Workpiece gripped: Switch ON ③ Open end (workpiece not gripped): Switch OFF 
	●	●	●	●	• Be careful not to get the lead wire caught when opening and closing the fingers.
Side surface mounting	●	●	●	—	• When using an L-type switch for port side mounting, the fitting and switch may interfere. Keep the fitting outer diameter below the values in the table below. Mounting Position: Port side Switch shape: L-shaped type Bore size / Fitting outer diameter øD: ø10 / ø7.4 or less; ø16 / ø7.9 or less; ø20 / ø11 or less 
	●	●	●	●	• For straight lead wire type switches, the switch and lead wire will protrude from the head side end face. If protrusion is a problem, use F2/3 V, F2/3S, or rail plate mounting.
	●	●	●	—	• For F3PV switches, the switch protrudes from the head side end face. If protrusion is a problem, use F2/3 V, F2/3S, or rail plate mounting.
	●	●	●	●	• Through-hole mounting is not possible when mounting the switch on the side.
Rail Mounting	●	—	—	—	• Through-hole mounting is not possible when mounting the switch rail plate.

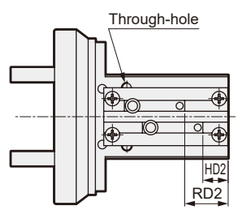
Cylinder Switch Precautions

●Switch Mounting Position List

[Side Mounting]
ø10 to 20



[Rail Plate Mounting]
ø10 to 20

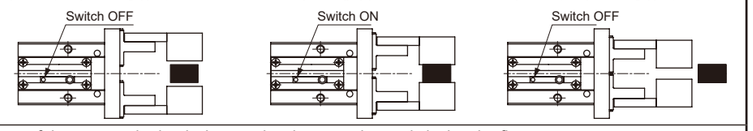
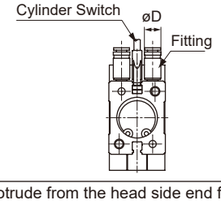


Model No.	Switch Model No.	Side surface mounting		Rail Plate Mounting	
		RD1	HD1	RD2	HD2
LSHL-G/F10	F2/3□	22	17	12 (22)	7 (17)
	F2/3S	23	18	11 (23)	6 (18)
LSHL-G/F16	F2/3□	25	17	15 (25)	7 (17)
	F2/3S	26	18	14 (26)	6 (18)
LSHL-G/F20	F2/3□	35.5	25.5	25.5 (35.5)	15.5 (25.5)
	F2/3S	36.5	26.5	24.5 (36.5)	14.4 (26.5)

Note) When the lead wire is facing the head side in rail assembly, the dimensions will be as shown in ( ).

●Precautions

Please check the precautions for the bore size you will be using from the table below.

Category	Bore size ø10	ø16	ø20	Precautions
Common Items	●	●	●	• The RD dimension is the highest sensitivity position at the open end position, and the HD dimension is the highest sensitivity position at the closed end position. Please adjust the actual mounting position after confirming the operating status of the switch.
	●	●	●	• Only one switch can be mounted in one switch rail groove.
	●	●	●	• Due to the short opening/closing stroke, only the open or closed state can be detected for each switch. Example: With one switch, the detection shown in the figure below is not possible. ① Open end (workpiece not gripped): Switch OFF ② Workpiece gripped: Switch ON ③ Open end (workpiece not gripped): Switch OFF 
	●	●	●	• Be careful not to get the lead wire caught when opening and closing the fingers.
Side surface mounting	●	●	●	• When using an L-type switch for port side mounting, the fitting and switch may interfere. Keep the fitting outer diameter below the values in the table below. Mounting Position: Port side Switch shape: L-shaped type Bore size / Fitting outer diameter øD: ø10 / ø7.4 or less; ø16 / ø7.9 or less; ø20 / ø11 or less 
	●	●	●	• For straight lead wire type switches, the switch and lead wire will protrude from the head side end face. If protrusion is a problem, use F2/3 V, F2/3S, or rail plate mounting.
	●	●	—	• For F3PV switches, the switch protrudes from the head side end face. If protrusion is a problem, use F2/3 V, F2/3S, or rail plate mounting.
	●	●	●	• Through-hole mounting is not possible when mounting the switch on the side.
Rail Mounting	●	—	—	• Through-hole mounting is not possible when mounting the switch rail plate.

Are you damaging important workpieces?



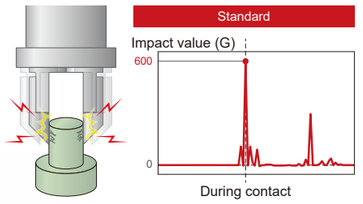
Shockless type gently grips workpieces even at high speeds

Built-in shock absorption mechanism

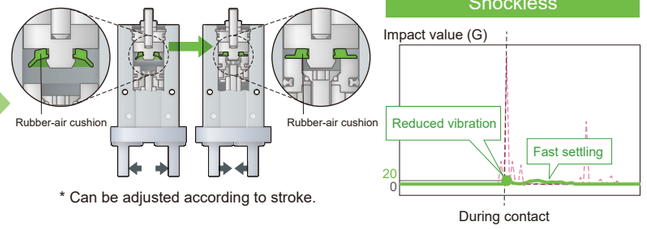
Unique shockless mechanism (optional)

Impact Suppressed to approx. **1/30**

Workpieces are damaged by the impact of the slide gripper.



Gently grips workpieces even at high speeds.



* Can be adjusted according to stroke.

High rigidity/High precision

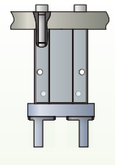
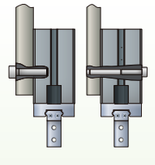
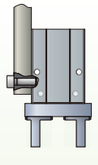
Linear guide adopted

High rigidity and high precision are achieved by the integrated structure of the guide rail and attachments.



High design freedom

Mountable from 3 directions

Axial (upward) mounting	Horizontal installation	Vertical installation
		
With reference spigot	Body thickness tolerance ±0.05 mm	Excellent centering precision

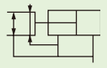


Linear Slide Gripper Double Acting Type

LSH Series

●Operating stroke: 4, 6, 10, 14 mm

Double Acting



RoHS

Model No. Notation Method

Without Switch
(Built-in magnet for switch)

LSH - 16 ——— C

Model No. ❶ ❹

With Switch
(Built-in magnet for switch)

LSH - 16 - F2H - D - C

Model No. ❷Switch Model No. ❹Option

❶Bore size ❸Number of Switches

❶Bore Size (mm)

Code	Content
10	ø10
16	ø16
20	ø20
25	ø25

❷Switch Model No.

For switch details, please refer to P. 573. Switches are included with the product and shipped.

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	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□	

*1: For "□" in the switch model No., enter the code selected from the "*Lead wire length" 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.Becomes 5 to 10 mA at 60 °C.)
*3: Switches other than the model No.s listed above are also available. (Custom Product) For details, see P. 573.

*Lead wire length

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

Example) Lead wire length
1 m F2S
3 m F2S3

❸Number of Switches

Code	Content
R	With 1 pc. on Open Side
H	With 1 pc. on Close Side
D	With 2 pcs

❹ Option

Code	Content
Blank	Standard
C	Shockless (Closed side only)

Switch Single Unit Model No. Notation Method

SW - F2H

❷Switch Model No.

LSH-20, 25 Switch long nut

LSH -SW-L-NUT

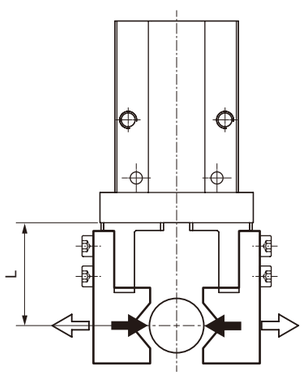
Specifications

Item		LSH			
Bore size mm		ø10	ø16	ø20	ø25
Actuation method		Double Acting Type			
Operating Fluid		Compressed Air			
Maximum Operating Pressure MPa		0.7			
Min. Operating Pressure MPa	Standard	0.2	0.1		
	Shockless	0.3	0.2		
Port Size		M3	M5		
Ambient Temperature °C		-10 to 60 (No freezing)			
Operating Stroke mm		4	6	10	14
Repeatability mm		±0.01			
Weight kg	Standard	0.055	0.125	0.250	0.460
	Shockless	0.063	0.143	0.278	0.502
Lubrication		Not required (When lubricating, use turbine oil Class 1 ISO VG32)			

Gripping Force Performance Data

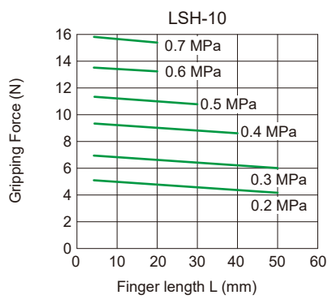
- Gripping force represenwts the thrust (for one finger) in the direction of the arrow shown in the figure.
- Indicates the gripping force acting in the opening and closing directions at finger length L when the supply pressure is 0.2 to 0.7 MPa.

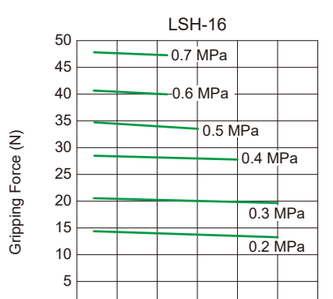
●Opening direction (⇦)
●Closing direction (➡)

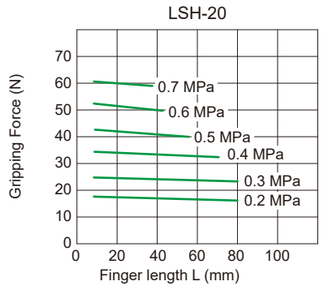


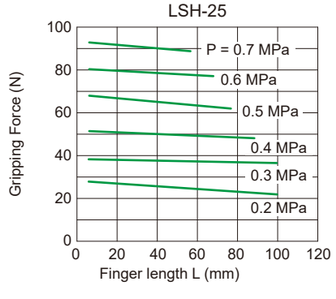
Note) **When selecting, check the design and selection precautions on P. 336.**

Closing direction

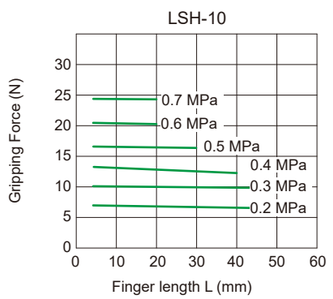


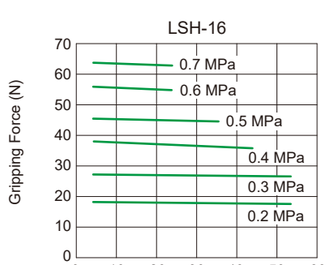


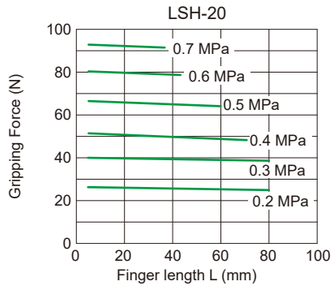


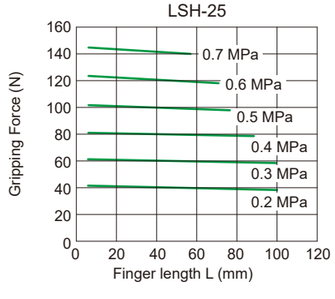


Opening direction





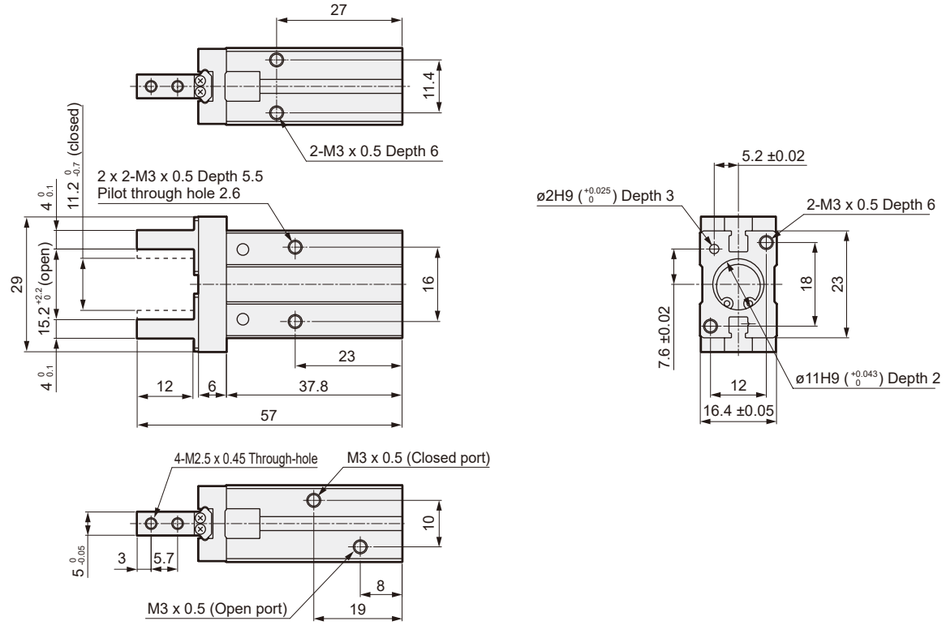




MEMO

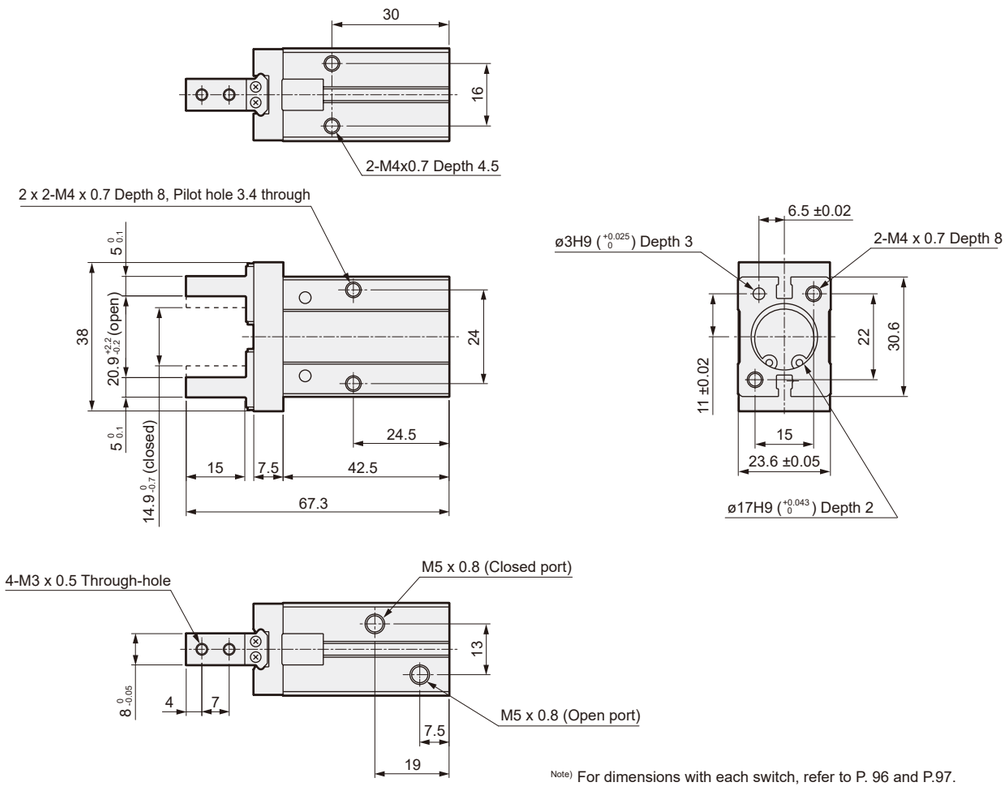
Outline Dimensional Drawing (Bore size: ø10, ø16)

●LSH-10 (Standard Type)



Note) For dimensions with each switch, refer to P. 96 and P.97.

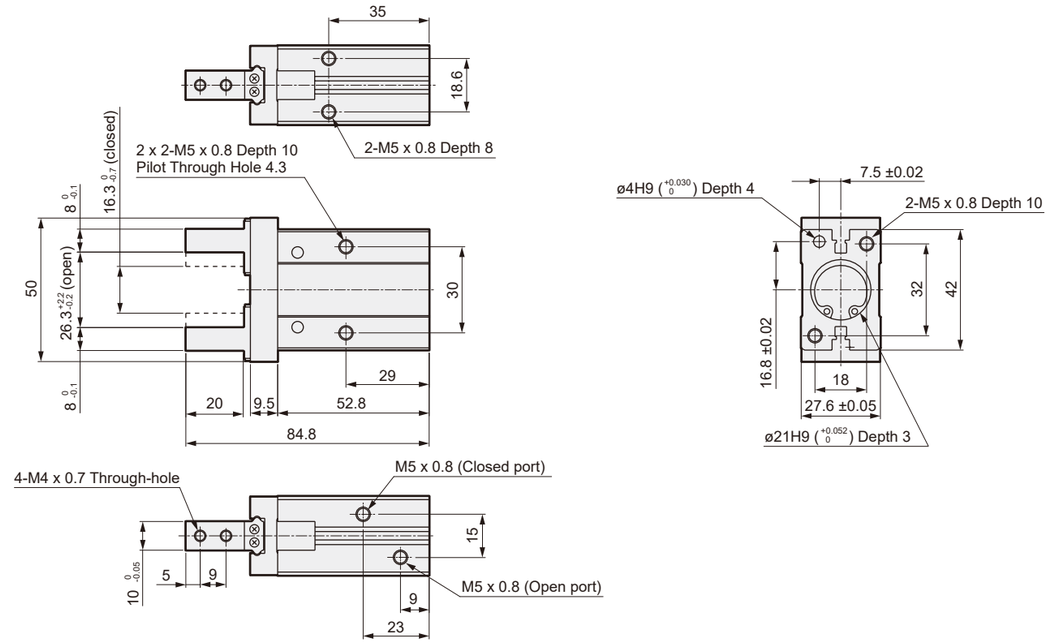
●LSH-16 (Standard Type)



Note) For dimensions with each switch, refer to P. 96 and P.97.

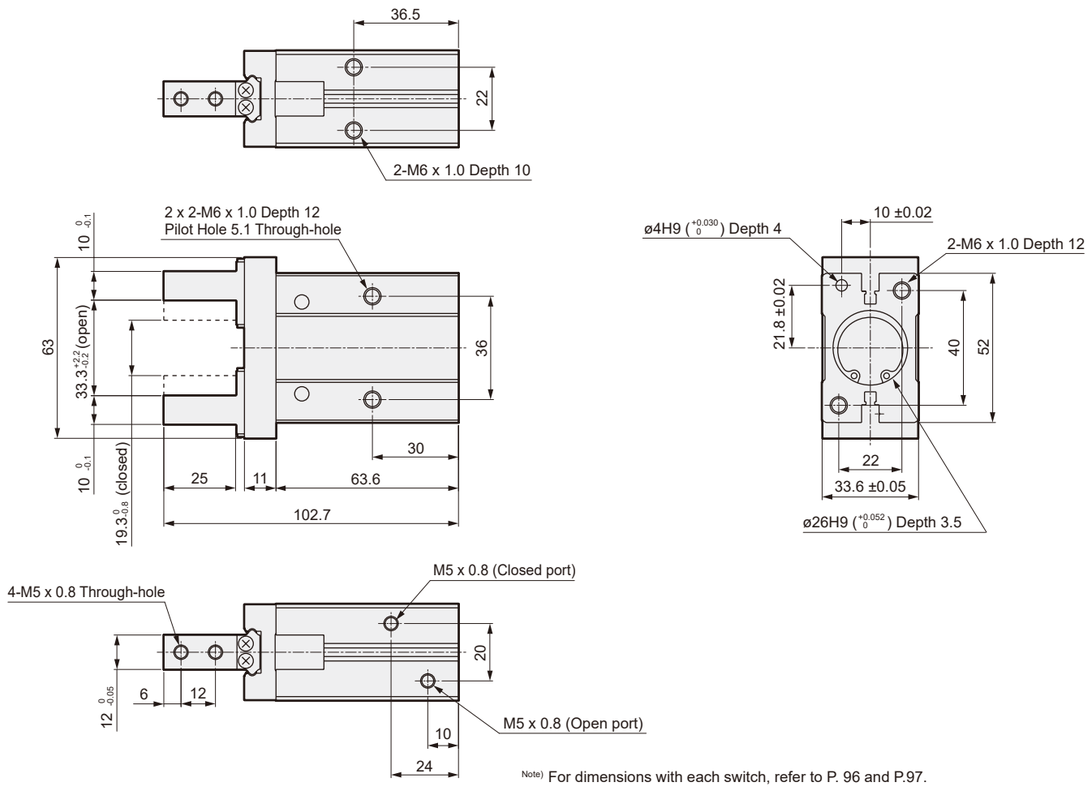
Outline Dimensional Drawing (Bore size: ø20, ø25)

●LSH-20 (Standard Type)



Note) For dimensions with each switch, refer to P. 96 and P.97.

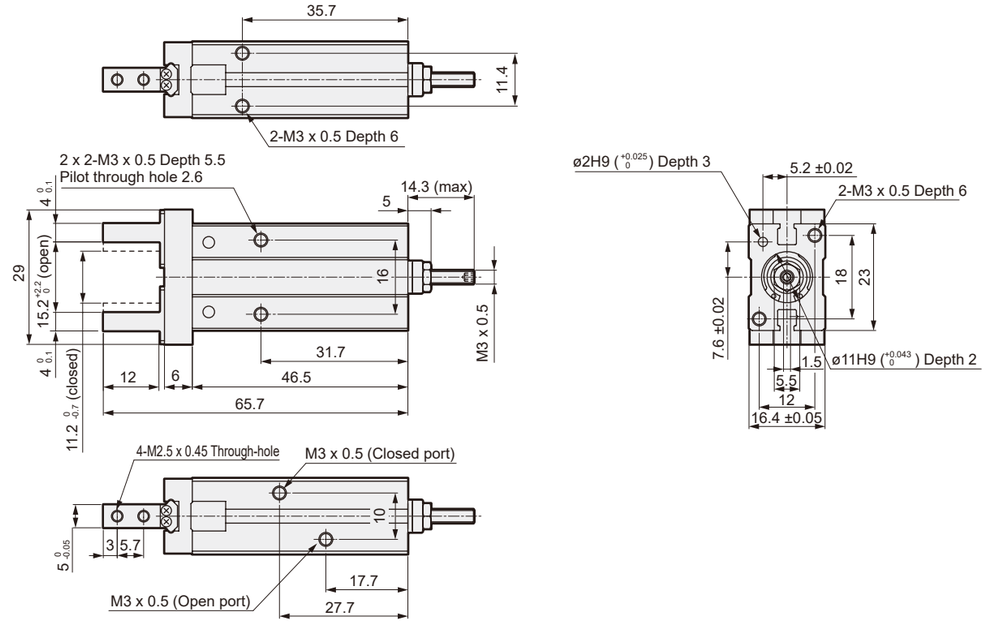
●LSH-25 (Standard Type)



Note) For dimensions with each switch, refer to P. 96 and P.97.

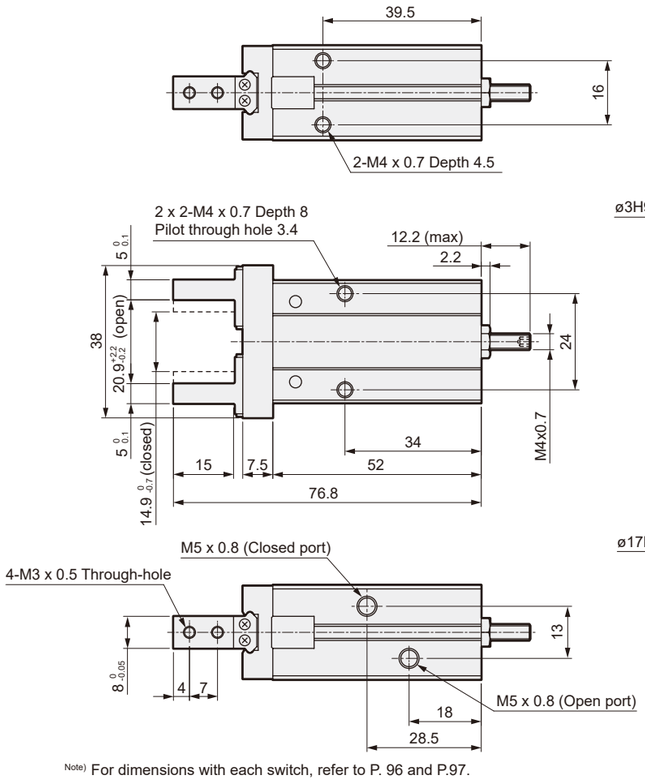
Outline Dimensional Drawing (Bore size: ø10, ø16)

●LSH-10-C (Shockless (Closed side only) Type)



Note) For dimensions with each switch, refer to P. 96 and P.97.

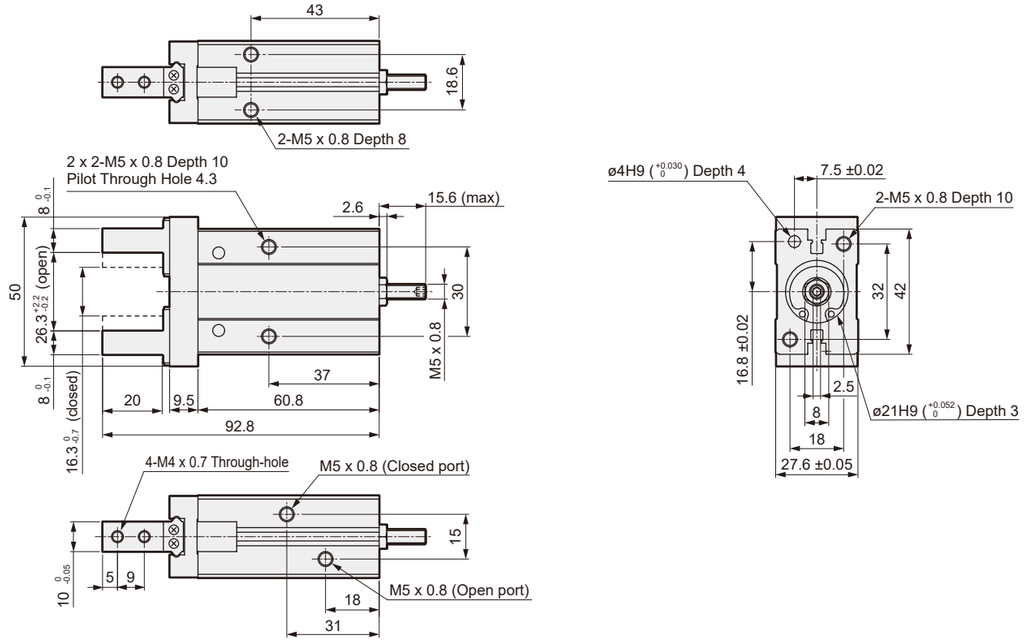
●LSH-16-C (Shockless (Closed side only) Type)



Note) For dimensions with each switch, refer to P. 96 and P.97.

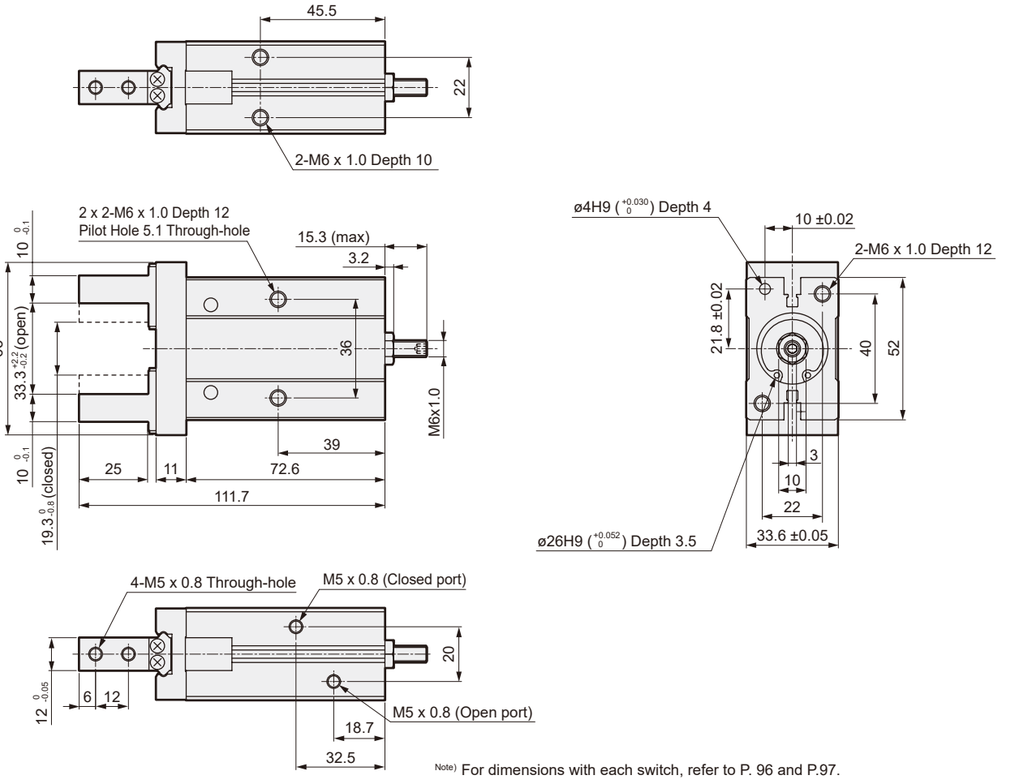
Outline Dimensional Drawing (Bore size: ø20, ø25)

●LSH-20-C (Shockless (Closed side only) Type)



Note) For dimensions with each switch, refer to P. 96 and P.97.

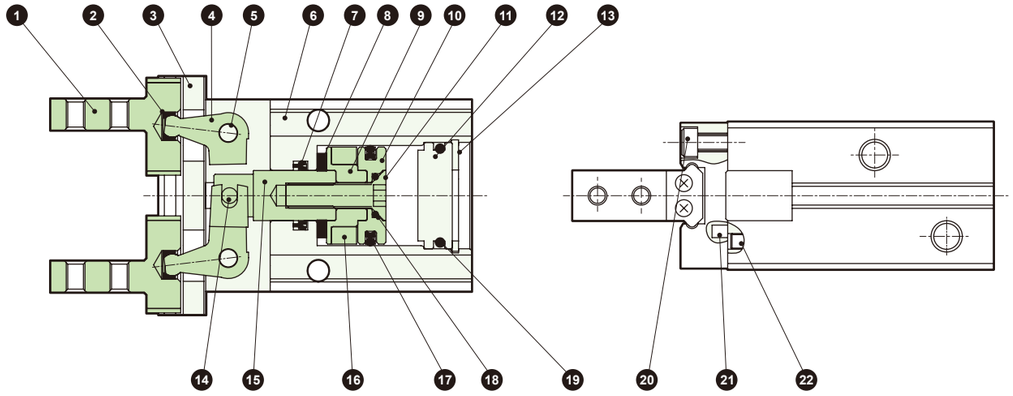
●LSH-25-C (Shockless (Closed side only) Type)



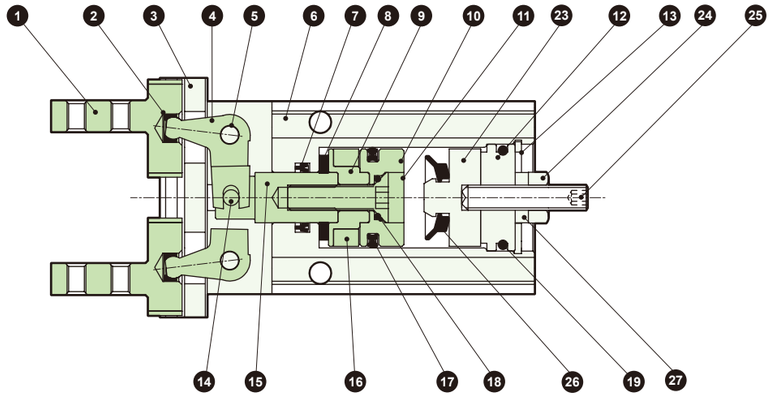
Note) For dimensions with each switch, refer to P. 96 and P.97.

Internal Structure Diagram/Material

●LSH (Standard Type)



●LSH-□-C (Shockless (Closed side only) Type)



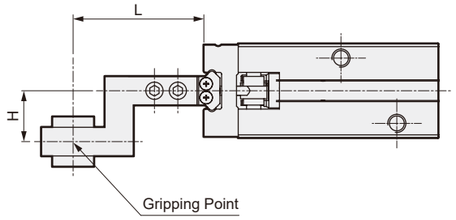
Do not disassemble

Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Finger	Stainless Steel		15	Piston Rod	Stainless Steel	
2	Holder	Alloy Steel		16	Magnet		
3	Linear Guide	Stainless Steel		17	Piston Packing	Nitrile Rubber	
4	Lever	Stainless Steel		18	O-ring	Nitrile Rubber	
5	Pivot Shaft	Alloy Steel		19	O-ring	Nitrile Rubber	
6	Cylinder Body	Aluminum Alloy		20	Hexagon Socket Head Cap Screw	Stainless Steel	
7	Rod Packing	Nitrile Rubber		21	Pin	Alloy Steel	
8	Cushion Rubber	Urethane Rubber		22	Hexagon socket head set screw	Alloy Steel	
9	Spacer	Aluminum Alloy		23	Stopper	Aluminum Alloy	Hard Anodized
10	Piston	Aluminum Alloy		24	Hexagon Nut	Alloy Steel	
11	Hexagon Socket Head Cap Screw	Stainless Steel		25	Hexagon socket head set screw	Alloy Steel	
12	Head Cover	Aluminum Alloy		26	Rubber Air Cushion	Special rubber	
13	C-type retaining ring	Stainless Steel		27	Seal washer	Stainless steel, Nitrile rubber	
14	Operating Shaft	Alloy Steel					

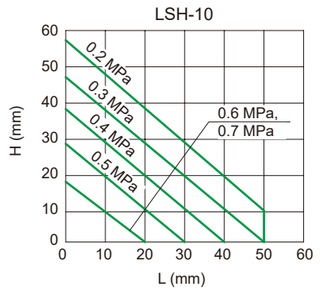
Finger length

When installing L-shaped fingers, use them within the range shown in the figure on the right.

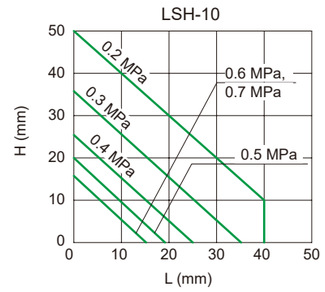
Closing direction



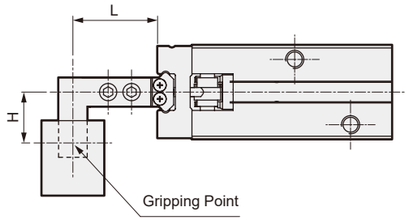
Closing direction

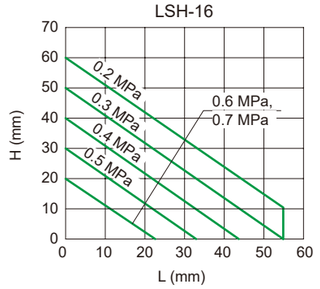


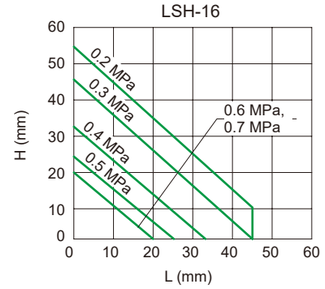
Opening direction

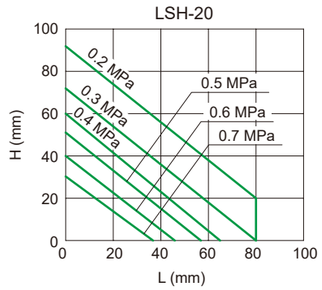


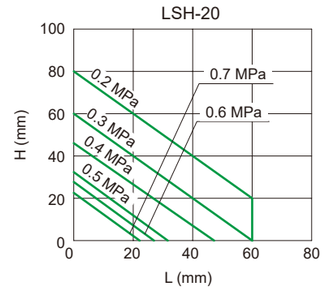
Opening direction

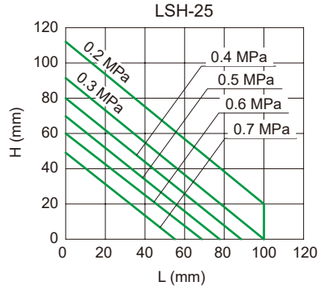


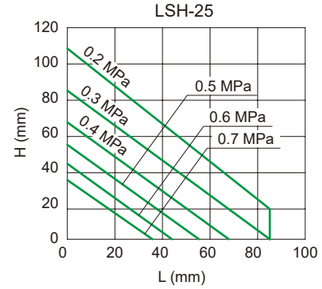








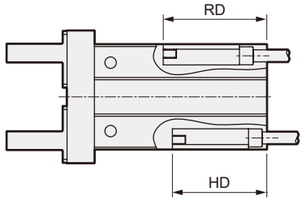




LSH Series Switch Attached Outline Dimensional Drawing

Standard Type

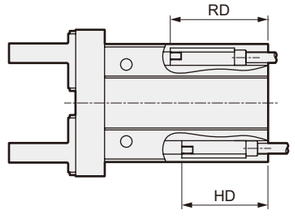
●LSH-10



F2/3□	RD	22.5
	HD	20.5
F2S/F3S	RD	23.5
	HD	21.5

Note1) RD dimension is the max. sensitivity position at open side end position and HD dimension at closed side end position. Please adjust the actual mounting position after confirming the operating status of the switch.
Note2) Switch cannot be mounted when mounting the body with through holes. For details, see P. 340.
Note3) For F□H, the switch lead wire projects from the end face of the head side. If protrusion is a problem, use F□V, F □S.

●LSH-16

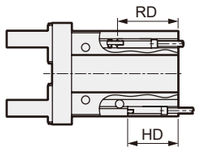


F2/3□	RD	25.5
	HD	22.5
F2S/F3S	RD	26.5
	HD	23.5

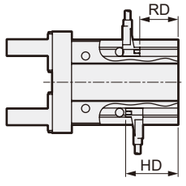
Note1) RD dimension is the max. sensitivity position at open side end position and HD dimension at closed side end position. Please adjust the actual mounting position after confirming the operating status of the switch.
Note2) Switch cannot be mounted when mounting the body with through holes. For details, see P. 340.
Note3) For F□H, the switch lead wire projects from the end face of the head side. If protrusion is a problem, use F□V, F □S.

●LSH-20

With F2H/F3H, F2 V/F3 V switch



With F2S/F3S switch

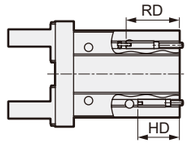


F2/3□	RD	30
	HD	25
F2S/F3S	RD	19
	HD	26

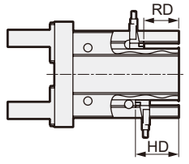
Note1) RD dimension is the max. sensitivity position at open side end position and HD dimension at closed side end position. Please adjust the actual mounting position after confirming the operating status of the switch.
Note2) Switch cannot be mounted when mounting the body with through holes. For details, see P. 340.
Note3) For F□H, the switch lead wire projects from the end face of the head side. If protrusion is a problem, use F□V, F □S.
Note4) When installing the F2/3H or F2/3V switch in a position with RD dimension 27.5 to 30, replace the switch fixing nut with the attached length nut according to the switch mounting guide included with the product.

●LSH-25

With F2H/F3H, F2 V/F3 V switch



With F2S/F3S switch



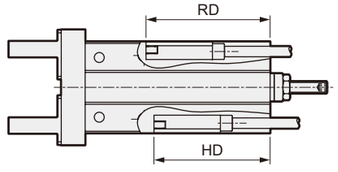
F2/3□	RD	32
	HD	25
F2S/F3S	RD	21
	HD	26

Note1) RD dimension is the max. sensitivity position at open side end position and HD dimension at closed side end position.Please adjust the actual mounting position after confirming the operating status of the switch.
Note2) Switch cannot be mounted when mounting the body with through holes. For details, see P. 340.
Note3) For F□H, the switch lead wire projects from the end face of the head side. If protrusion is a problem, use F□V, F □S.
Note4) When installing the F2/3H or F2/3V switch in a position with RD dimensions 29 to 33, replace the switch fixing nut with the attached length nut according to the switch mounting guide included with the product.

LSH Series Switch Attached Outline Dimensional Drawing

Shockless (Closed side only) Type

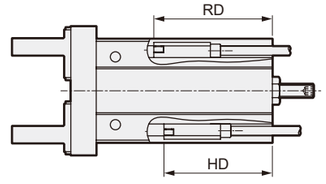
●LSH-10-C



F2/3□	RD	31
	HD	29
F2S/F3S	RD	32
	HD	30

Note1) RD dimension is the max. sensitivity position at open side end position and HD dimension at closed side end position. Please adjust the actual mounting position after confirming the operating status of the switch.
Note2) Switch cannot be mounted when mounting the body with through holes. For details, see P. 340.
Note3) For F□H, the switch lead wire projects from the end face of the head side. If protrusion is a problem, use F□V, F □S.

●LSH-16-C

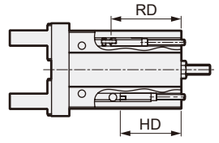


F2/3□	RD	35
	HD	32
F2S/F3S	RD	36
	HD	33

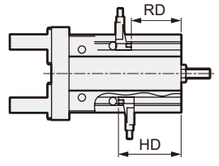
Note1) RD dimension is the max. sensitivity position at open side end position and HD dimension at closed side end position.Please adjust the actual mounting position after confirming the operating status of the switch.
Note2) Switch cannot be mounted when mounting the body with through holes. For details, see P. 340.
Note3) For F□H, the switch lead wire projects from the end face of the head side. If protrusion is a problem, use F□V, F □S.

●LSH-20-C

With F2H/F3H, F2 V/F3 V switch



With F2S/F3S switch

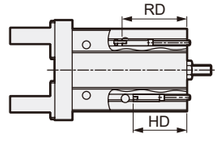


F2/3□	RD	38
	HD	33
F2S/F3S	RD	27
	HD	34

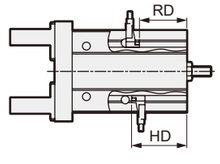
Note1) RD dimension is the max. sensitivity position at open side end position and HD dimension at closed side end position.Please adjust the actual mounting position after confirming the operating status of the switch.
Note2) Switch cannot be mounted when mounting the body with through holes. For details, see P. 340.
Note3) For F□H, the switch lead wire projects from the end face of the head side. If protrusion is a problem, use F□V, F □S.
Note4) When mounting the F2/3H or F2/3V switch to a position with RD dimension 35.5 to 38, replace the switch fixing nut with the attached length nut according to the switch mounting guide included with the product.

●LSH-25-C

With F2H/F3H, F2 V/F3 V switch



With F2S/F3S switch



F2/3□	RD	41
	HD	34
F2S/F3S	RD	30
	HD	35

Note1) RD dimension is the max. sensitivity position at open side end position and HD dimension at closed side end position.Please adjust the actual mounting position after confirming the operating status of the switch.
Note2) Switch cannot be mounted when mounting the body with through holes. For details, see P. 340.
Note3) For F□H, the switch lead wire projects from the end face of the head side. If protrusion is a problem, use F□V, F □S.
Note4) When installing the F2/3H or F2/3V switch in a position with RD dimensions 38 to 42, replace the switch fixing nut with the attached length nut according to the switch mounting guide included with the product.



Feather Gripper (Mini Parallel Gripper) Double Acting Type/Single Acting Type

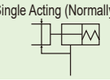
FH100 Series

●Operating stroke: 8, 11, 15, 18, 20 mm

Double Acting



Single Acting (Normally Open)



RoHS

Model No. Notation Method

Without Switch
(Built-in magnet for switch)

FH1 10 - D Y1 ——— B

Model No. ❶ ❷ ❸ ❻

With Switch
(Built-in magnet for switch)

FH1 10 - D Y1 - T2H - R - B

Model No. ❷Actuation method ❹Switch Model No. ❻End mount

❶Bore size ❸Attachment ❺Number of Switches

❶Bore Size (mm)

Code	Content
10	ø10
12	ø12
16	ø16
20	ø20
25	ø25

❷Actuation method

Code	Content
D	Standard (Double Acting Type)
O	Single Acting (Normally Open)
Z	Double Acting Type with Built-in Speed Controller

❸Attachment

Code	Content
Blank	Without attachments
Y1	With attachments: Material (Steel)
Y2	With attachments: Material (MC Nylon)

Note) For the outline dimensions and compatible models of the attachments, refer to P. 334 and 335.
When ordered as an option, it will be shipped pre-assembled with a quantity of 2.

❹Switch Model No.

For switch details, please refer to P. 573.
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 20 *2	T2H□	T2V□	
	1-Color Flex-Resistant Lead Wire	2-wire	-	10 to 30	-	5 to 20 *2	T2HR3	T2VR3	
	1-Color	3-wire (NPN)	-	30 or less	-	100 or less	T3H□	T3V□	
		3-wire (PNP)	-		-		T3PH□	T3PV□	

*1: For "□" in the switch model No., enter the code selected from the "*Lead wire length" 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: Switches other than the model No.s listed above are also available. (Custom Product) For details, see P. 573.

***Lead wire length**

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

Example) Lead wire length
1 m T2H
3 m T2H3
5 m T2H5

❺Number of Switches

Code	Content
R	With 1 pc. on Open Side
D	With 2 pcs

❻End mount

Code	Content
Blank	Without end mount
B	With end mount

Note) For end mount (Model No. B), select the L-shaped lead wire type switch (Model No. T□V). The end mount will be shipped included.

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

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

FH100 - •••• - FP1

End Mount Single Item Model No. Notation Method

FH - B - 10

❶Bore size

Switch Single Unit Model No. Notation Method

SW - T2H

❹Switch Model No.

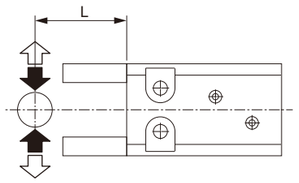
Specifications

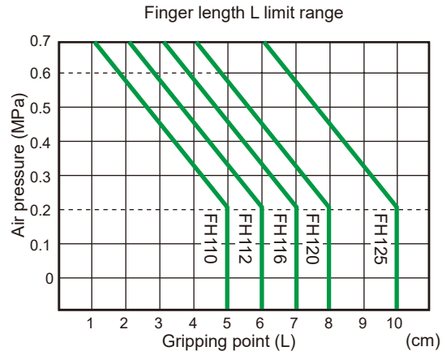
Item	FH100									
	FH110-D	FH112-D	FH116-D	FH120-D	FH125-D	FH110-0	FH112-0	FH116-0	FH120-0	FH125-0
Actuation method	Double Acting Type					Single acting type				
Operating Fluid	Compressed Air									
Max. Working Pressure MPa	0.7									
Min. Operating Pressure MPa	0.15					0.25				
Proof Pressure MPa	1.05									
Ambient Temperature °C	5 to 60									
Port Size	M3 x 0.5		M5 x 0.8			M3 x 0.5		M5 x 0.8		
Operating stroke mm	8	11	15	18	20	8	11	15	18	20
Weight g	51	71	124	176	284	51	71	124	177	286
Repeatability mm	±0.03									
Max. operating frequency cycles/sec	3									
Cushion	Open side rubber cushion									

Gripping Force Performance Data

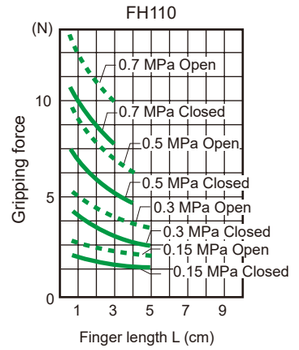
- Gripping force represents the thrust (for one finger) in the direction of the arrow shown in the figure.
- Indicates the gripping force acting in the opening and closing directions at finger length L of the gripper when the supply pressure is 0.15 to 0.7 MPa.

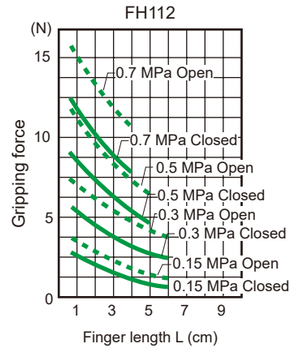
●Open direction (⇦) - - - - (broken line)
●Closing direction (➡) ——— (solid line)

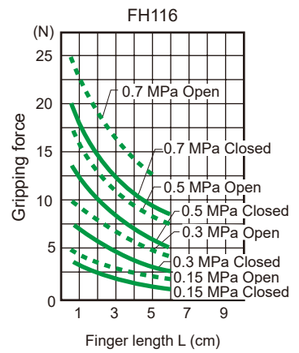


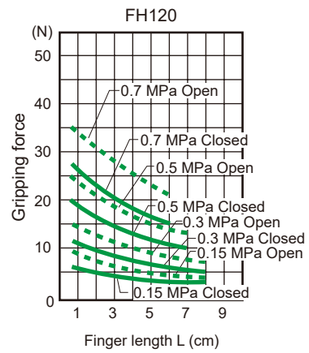


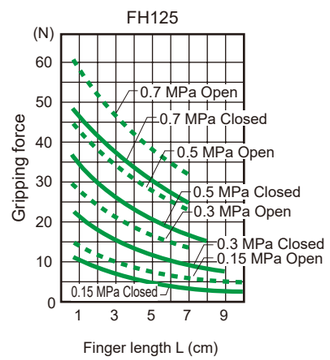
Note) **The closing gripping force of the single acting type is 25 to 30 % lower than that of the double acting type.When selecting, check the design and selection precautions on P. 336.**





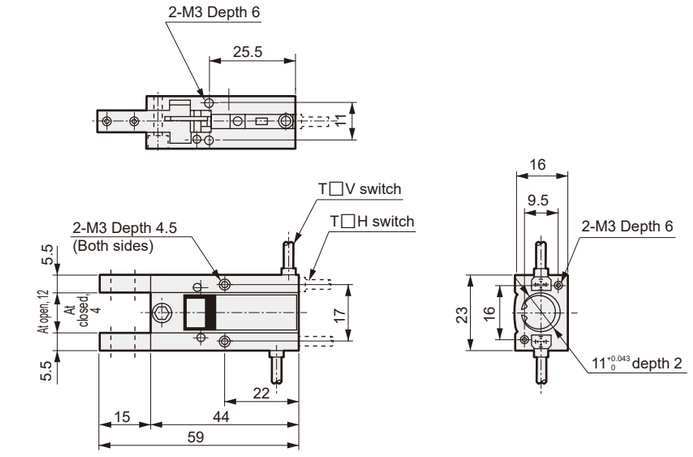




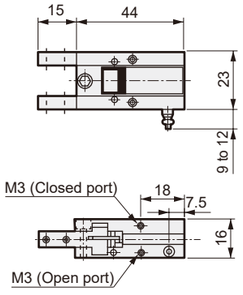


Outline Dimension Drawing

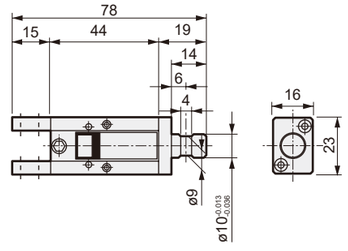
●FH110-D, FH110-O



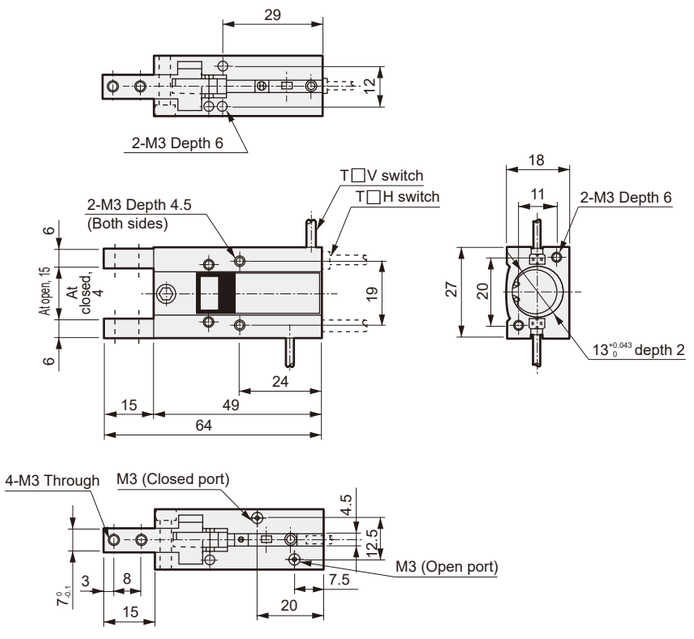
●With Speed Controller (FH110-Z)



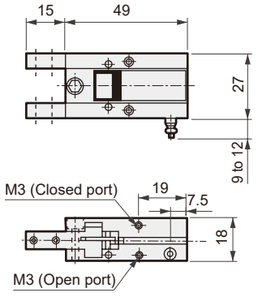
●With end mount



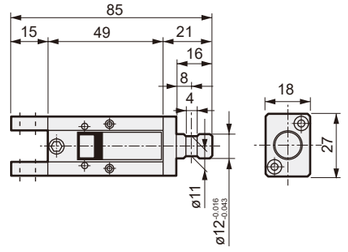
●FH112-D, FH112-O



●With Speed Controller (FH112-Z)

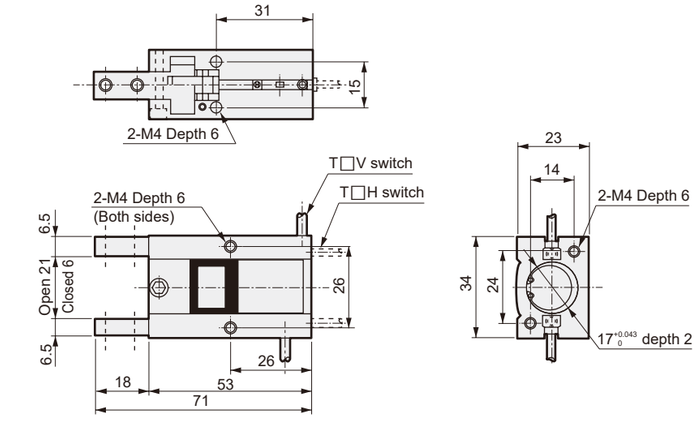


●With end mount

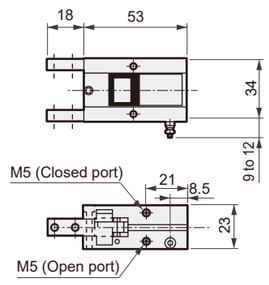


Outline Dimension Drawing

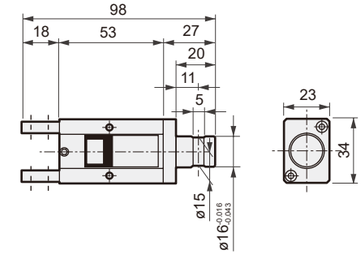
●FH116-D, FH116-O



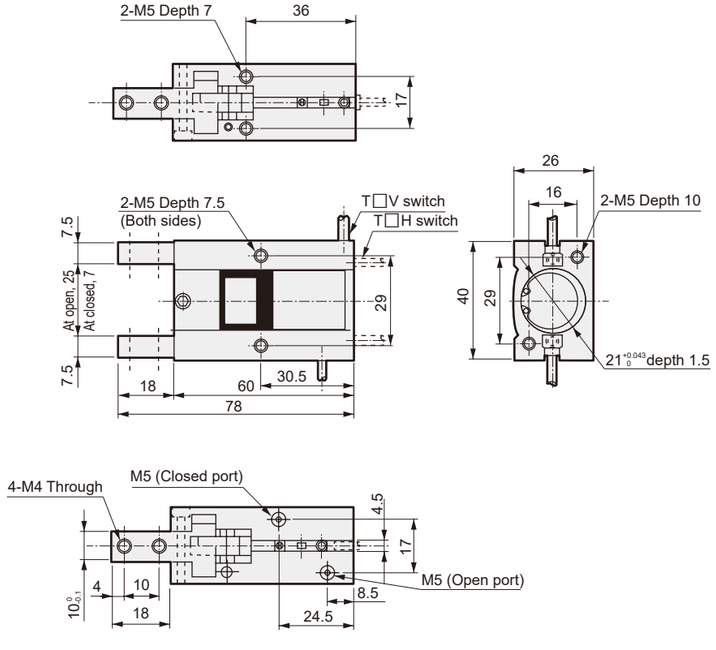
●With Speed Controller (FH116-Z)



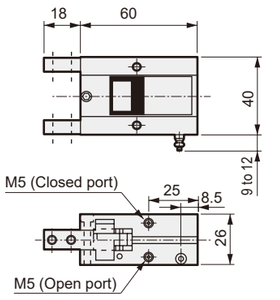
●With end mount



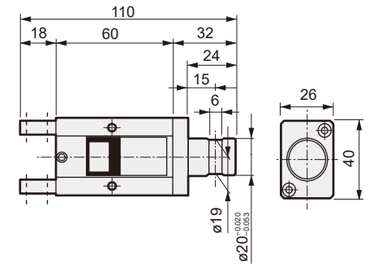
●FH120-D, FH120-O



●With Speed Controller (FH120-Z)

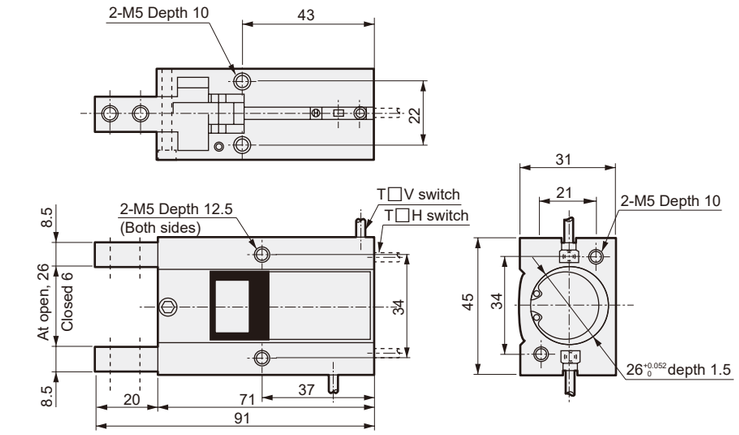


●With end mount

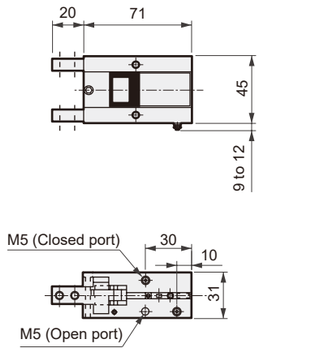


Outline Dimension Drawing

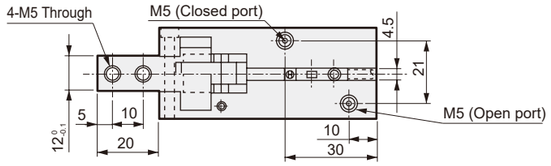
●FH125-D, FH125-O

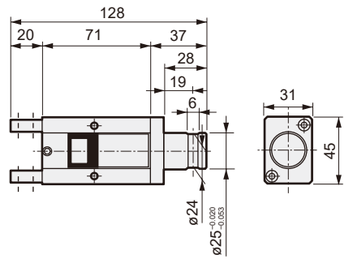


●With Speed Controller (FH125-Z)



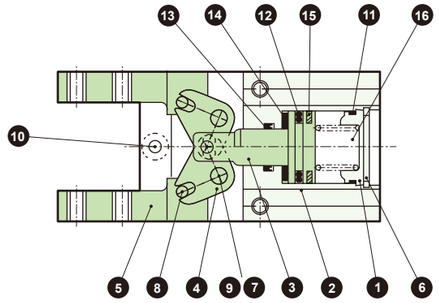
●With end mount



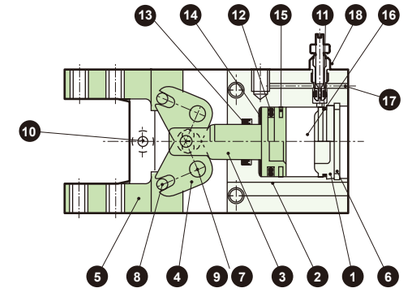


Internal Structure Diagram/Material

●Standard (double acting), O (normally open) type



●With Speed Controller



Do not disassemble

No.	Part Name	Material	Remarks	No.	Part Name	Material	Remarks
1	Cover	Polyacetal Resin		10	Hexagon Socket Head Cap Screw	Alloy Steel	
2	Body	Aluminum Alloy	Lubricated Alumite	11	Gasket	Nitrile Rubber	
3	Piston	Stainless Steel		12	Piston Packing	Nitrile Rubber	
4	Arm	Stainless Steel	Heat treatment	13	Rod Packing	Nitrile Rubber	
5	Finger	Stainless Steel		14	Cushion	Urethane Rubber	
6	Retaining ring	Stainless Steel		15	Magnet		
7	Pivot Shaft	Alloy Steel	Heat treatment	16	Coil Spring	Stainless Steel	O type only
8	Operating Shaft	Alloy Steel	Heat treatment	17	Steel ball	Stainless Steel	
9	Hexagon socket head set screw	Alloy Steel		18	Speed Controller		



Ultra Compact Cross Roller Parallel Gripper Double Acting Type/Single Acting Type

BSA2 Series

●Operating stroke: 4 mm

Double Acting | Single Acting (Normally Open) | Single Acting (Normally Closed)

RoHS

Model No. Notation Method

Without Switch
(Built-in magnet for switch)

BSA2 - 006C - O

Model No. | Bore size | ❶

With Switch
(Built-in magnet for switch)

BSA2 - 006C - O - F2V - D

Model No. | Bore size | ❶Actuation method | ❷Switch Model No. | ❸Number of Switches

❶Actuation method

Code	Content
Blank	Standard (Double Acting Type)
O	Single Acting (Normally Open)
C	Single Acting (Normally Closed)

❷Switch Model No.

For switch details, refer to P. 573.
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 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□**	

*1: For "□" in the switch model No., enter the code selected from the "*Lead wire length" 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: Switches other than the model No.s listed above are also available. (Custom Product) For details, see P. 573.

***Lead wire length**

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

Example) Lead wire length
1 m F2S
3 m F2S3

❸Number of Switches

Code	Content
R	With 1 pc. on Open Side
H	With 1 pc. on Close Side
D	With 2 pcs

Note) When 2 switches are included, the opening/closing stroke is short, so depending on the size of the workpiece, both switches may turn ON. Please be careful.

Switch Single Unit Model No. Notation Method

SW - F2H

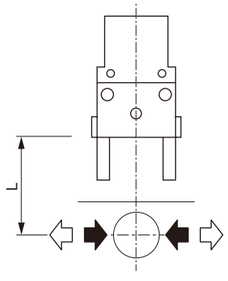
❷Switch Model No.

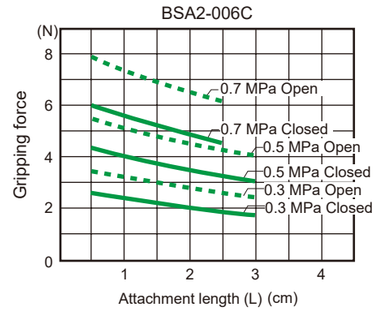
Specifications

Item		BSA2-006C
Bore size	mm	ø6
Actuation method		Double Acting Type/Single Acting Type
Operating Fluid		Compressed Air
Max. Working Pressure	MPa	0.7
Min. Operating Pressure MPa	Double Acting Type	0.15
	Normally Open	0.25
	Normally Closed	
Ambient Temperature	°C	5 to 60
Port Size		M3
Operating stroke	mm	4
Rod diameter	mm	ø3
Internal volume (reciprocating)	cm^3	0.1
Repeatability	mm	±0.01
Weight	kg	0.034
Lubrication		Not required (When lubricating, use turbine oil Class 1 ISO VG32)

Gripping Force Performance Data

• Gripping force represents the thrust (for one finger) in the direction of the arrow shown in the figure.
• The gripping force in the opening/closing directions with attachment length L of hand with a supply pressure of 0.3, 0.5 and 0.7 MPa is shown.
●Opening direction (⇦) - - - -(Dashed line)
●Closing direction (➡) ——(Solid line)

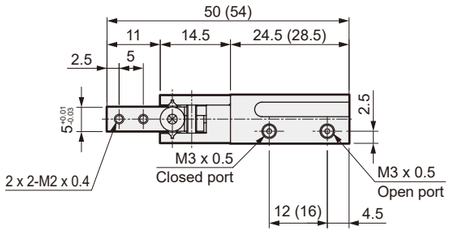


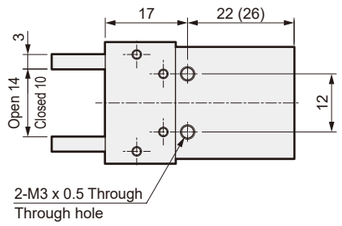


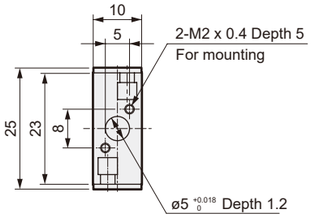
Note) O type gripping force is approx. 20 to 30 % lower in the closing direction compared to the double acting type. C type gripping force is approx. 10 to 20 % lower in the opening direction compared to the double acting type. **When selecting, check the design and selection precautions on P. 336.**

Outline Dimension Drawing

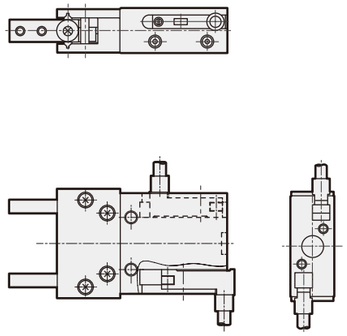
●Dimensions in ( ) are for O [Normally Open] and C [Normally Closed] specifications.



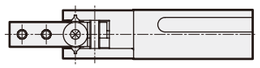




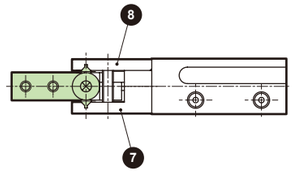
●With Switch

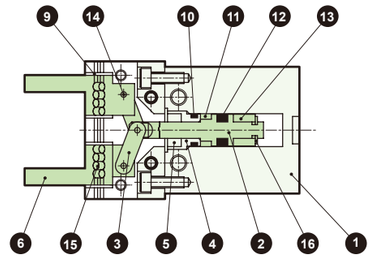


Note) For F□H, F□V, the switch protrudes from the main body head side end face. If protrusion is a problem, use F□S.

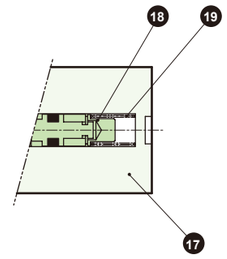


Internal Structure Diagram/Material

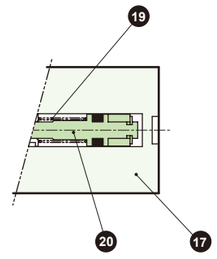




O (Normally Open) Type



C (Normally Closed) Type



Do not disassemble

Part No.	Part Name	Material	Part No.	Part Name	Material
1	Body	Aluminum alloy (Standard type only)	11	Gasket	Nitrile Rubber
2	Piston	Stainless steel (Standard, O type only)	12	Piston Packing	Nitrile Rubber
3	Arm	Stainless Steel	13	Magnet	
4	Piston Guide	Stainless Steel	14	Operating Shaft	Stainless Steel
5	Piston guide retainer	Stainless Steel	15	Cross Roller	Alloy Steel
6	Finger	Steel	16	Retaining ring	Stainless Steel
7	Bearing guide A	Steel	17	O, C body	Aluminum Alloy
8	Bearing guide B	Steel	18	Spring Guide	Stainless Steel
9	Bearing retainer	Stainless Steel	19	O, C coil spring	Stainless Steel
10	Rod Packing	Nitrile Rubber	20	C piston	Stainless Steel

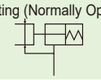


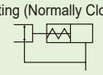
Compact Cross Roller Parallel Gripper Double Acting Type/Single Acting Type

BHA Series

●Operating stroke: 5, 9, 11, 15 mm

Double Acting 

Single Acting (Normally Open) 

Single Acting (Normally Closed) 

RoHS

Model No. Notation Method

Without Switch
(Built-in magnet for switch)

BHA - 01CS1 - O Y1

Model No. ❶ ❷ ❸

With Switch
(Built-in magnet for switch)

BHA - 01CS1 - O Y1 - T2H - R

Model No. ❷Actuation method ❹Switch Model No.
❶Bore size ❸Attachment ❺Number of Switches

❶Bore Size (mm)

Code	Content
01CS1	ø12
03CS1	ø16
04CS1	ø20
05CS1	ø25

❷Actuation method

Code	Content
Blank	Standard (Double Acting Type)
O	Single Acting (Normally Open)
C	Single Acting (Normally Closed)

❸Attachment

Code	Content
Blank	Without attachments
Y1	With attachments: Material (Steel)
Y2	With attachments, Material (MC Nylon)

Note) For the outline dimensions and compatible models of the attachments, refer to P. 334 and 335. When ordered as an option, it will be shipped pre-assembled with a quantity of 2.

❹Switch Model No.

For switch details, please refer to P. 573.
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 20 *2	T2H□	T2V□	
	1-Color Flexible Lead Wire	2-wire	-	10 to 30	-	5 to 20 *2	T2HR3	T2VR3	
	1-Color	3-wire (NPN)	-	30 or less	-	100 or less	T3H□	T3V□	
		3-wire (PNP)	-		-		T3PH□	T3PV□	

*1: For "□" in the switch model No., enter the code selected from the "*Lead wire length" 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: Switches other than the model No.s listed above are also available. (Custom Product) For details, see P. 573.

***Lead wire length**

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

Example) Lead wire length
1 m T2H
3 m T2H3
5 m T2H5

❺Number of Switches

Code	Content
R	With 1 pc. on Open Side
H	With 1 pc. on Close Side
D	With 2 pcs

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

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

BHA- •••• - FP1

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

●Structure usable in rechargeable battery manufacturing processes

BHA- •••• - P4□

*Please contact us for details.

Switch Single Unit Model No. Notation Method

SW - T2H

❹Switch Model No.

* BHA-LN series with length measurement function (with Linear Norm Sensor) is also available. For details, refer to "Pneumatic Cylinder ④ No. RJ-005AA".

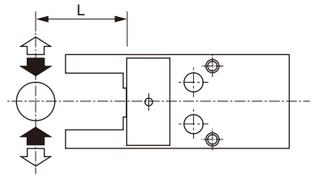
Specifications

Item			BHA-01CS1	BHA-03CS1	BHA-04CS1	BHA-05CS1
Bore size		mm	ø12	ø16	ø20	ø25
Actuation method			Double Acting Type/Single Acting Type			
Operating Fluid			Compressed Air			
Max. Working Pressure		MPa	0.7			
Min. Operating Pressure	Double Acting Type	MPa	0.1			
	Normally Open		0.3			
	Normally Closed					
Ambient Temperature		°C	5 to 60			
Port Size			M3	M5		
Operating stroke		mm	5	9	11	15
Rod diameter		mm	ø6	ø8	ø10	ø12
Internal volume (reciprocating)		cm³	0.32	1.58	2.89	6.32
Repeatability		mm	±0.01			
Weight		kg	0.100	0.145	0.253	0.420
Lubrication			Not required (When lubricating, use turbine oil Class 1 ISO VG32)			

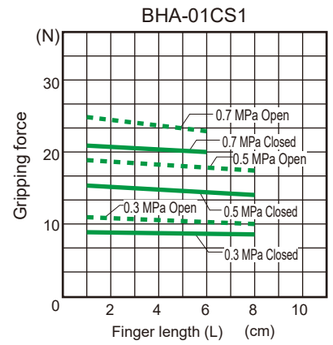
Gripping Force Performance Data

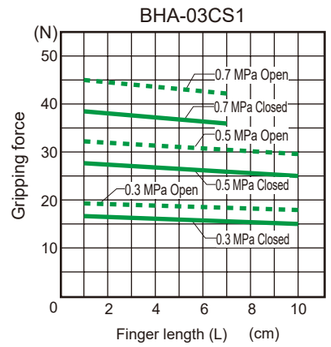
- Gripping force represents the thrust (for one finger) in the direction of the arrow shown in the figure.
- The gripping force in the opening/closing directions with finger length L of hand with a supply pressure of 0.3, 0.5 and 0.7 MPa is shown.

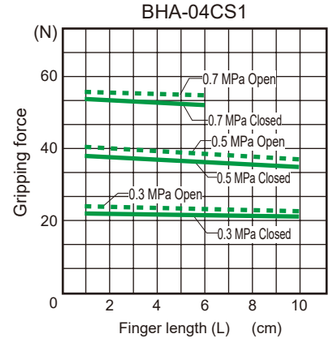
●Opening direction (⇦) - - - -(Dashed line)
●Closing direction (➡) ——(Solid line)

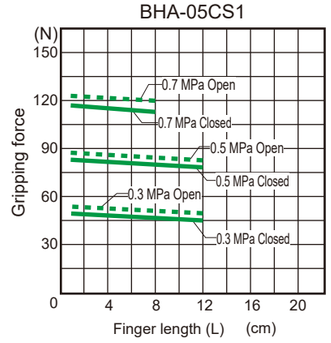


Note) **O type gripping force is approx. 20 to 30 % lower in the closing direction compared to the double acting type. C type gripping force is approx. 10 to 20 % lower in the opening direction compared to the double acting type. When selecting, check the design and selection precautions on P. 336.**





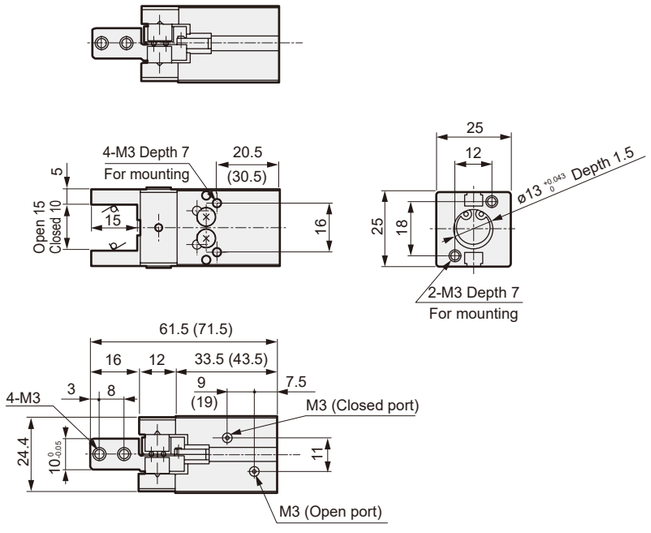




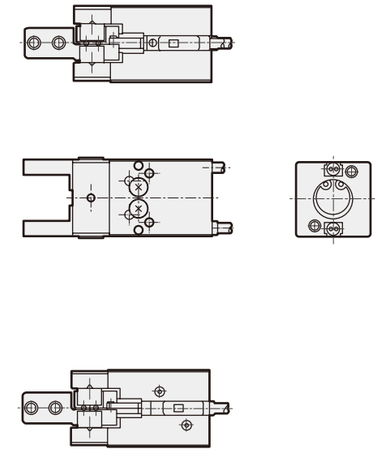
Outline Dimension Drawing

●BHA-01CS1 Standard/O/C

●( ) Dimensions are for C (Normally Closed) type.



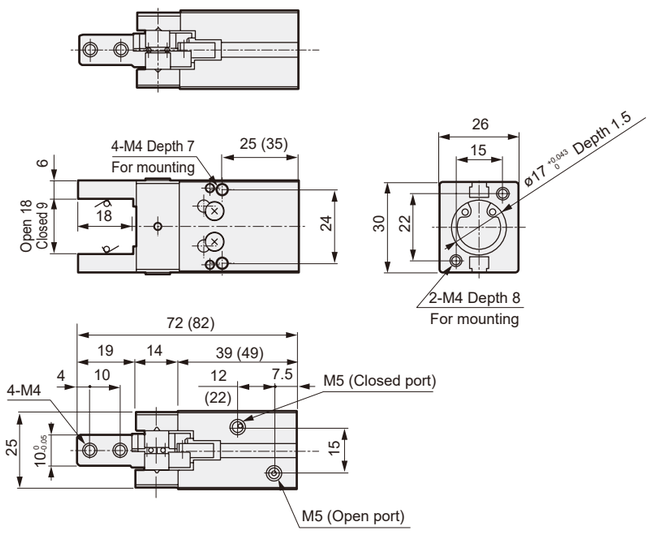
●With Switch



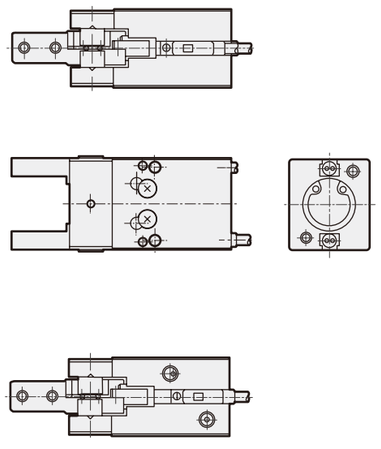
Note) For both T□H, T□V, the switch protrudes from the main body head side end face.

●BHA-03CS1 Standard/O/C

●( ) Dimensions are for C (Normally Closed) type.



● With Switch

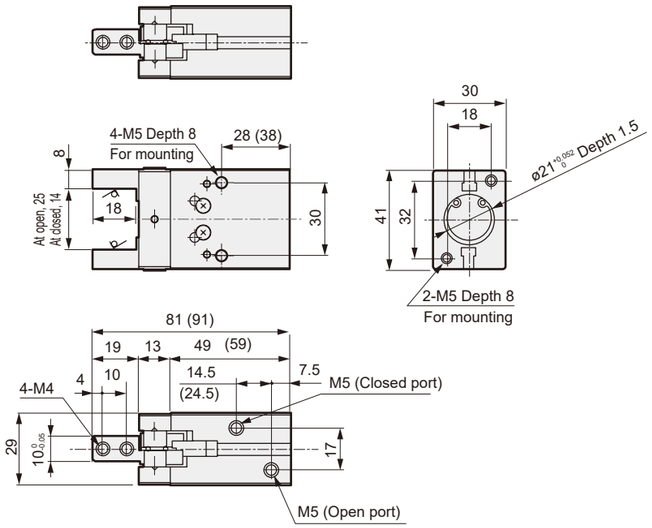


Note) For both T□H, T□V, the switch protrudes from the main body head side end face.

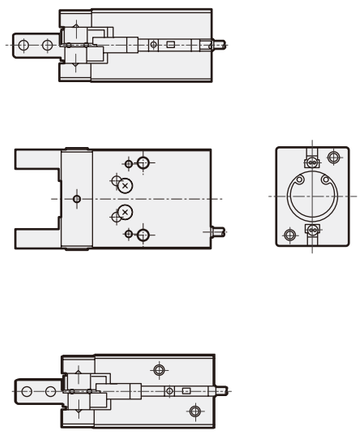
Outline Dimension Drawing

●BHA-04CS1 Standard/O/C

●( ) Dimensions are for C (Normally Closed) type.

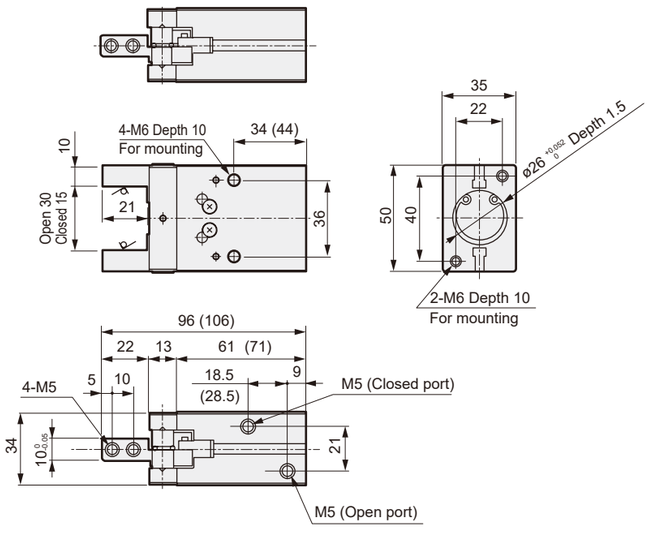


●With Switch

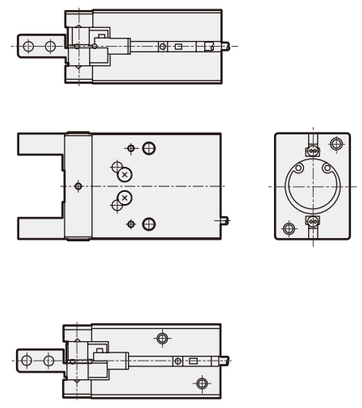


●BHA-05CS1 Standard/O/C

●( ) Dimensions are for C (Normally Closed) type.

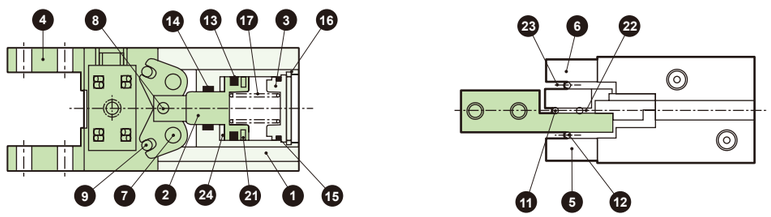


●With Switch

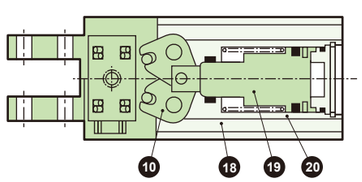


Internal Structure Diagram/Material

●Standard (double acting), O (normally open) type



●C (Normally Closed) Type



Do not disassemble

No.	Part Name	Material	Remarks	No.	Part Name	Material	Remarks
1	Body	Aluminum Alloy		13	Piston Packing	Nitrile Rubber	
2	Piston	Stainless Steel		14	Rod Packing	Nitrile Rubber	
3	Cylinder cover	Polyacetal		15	Cylinder Gasket	Nitrile Rubber	
4	Finger	Steel		16	Retaining ring		
5	Bearing guide A	Steel		17	Coil Spring	Stainless Steel	O type only
6	Bearing guide B	Steel		18	Body	Aluminum Alloy	
7	Pivot Shaft	Steel		19	Piston	Stainless Steel	
8	Actuating shaft A	Steel		20	Coil Spring	Stainless Steel	
9	Actuating shaft B	Steel		21	Magnet		
10	Arm	Steel		22	Retainer A	Stainless Steel	
11	Cross roller A	Alloy Steel		23	Retainer B	Stainless Steel	
12	Cross roller B	Alloy Steel		24	Cushion	Urethane Rubber	

MEMO

Hand (Gripper)
LSH-HP
LSH
FH100
BSA2
BHA
BHG
BHE
LHA
LHAG
HAP-1C
HAP-2 to 4CS
HKP
HCP
HGP
LST-HP
HLF2
HLA/ HLB
HLAG/ HLBG
HLC
HLD
HMC-HP
HMF
HMF-G
HMFB
HFP
FH500
HBL
HJL
HMD
HDL
HJD
Cylinder Switch
Ending



Compact Cross Roller Parallel Gripper with Rubber Cover Double Acting Type/Single Acting Type

BHG Series

●Operating stroke: 5, 9, 11, 15 mm

Double Acting | Single Acting (Normally Open) | Single Acting (Normally Closed)



RoHS

Model No. Notation Method

Without Switch
(Built-in magnet for switch)

BHG - 01CS - O - Y1

Model No. ❶ ❷ ❸

With Switch
(Built-in magnet for switch)

BHG - 01CS - O - Y1 - T2H - R

Model No. ❶Bore size ❷Actuation method ❸Attachment ❹Switch Model No. ❺Number of Switches

❶Bore Size (mm)

Code	Content
01CS	ø12
03CS	ø16
04CS	ø20
05CS	ø25

❷Actuation method

Code	Content
Blank	Standard (Double Acting Type)
O	Single Acting (Normally Open)
C	Single Acting (Normally Closed)

❸Attachment

Code	Content
Blank	Without attachments
Y1	With attachments: Material (Steel)
Y2	With attachments, Material (MC Nylon)

Note) For the outline dimensions and compatible models of the attachments, refer to P. 334 and 335. When ordered as an option, it will be shipped pre-assembled with a quantity of 2.

❹Switch Model No.

For switch details, please refer to P. 573. 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 20 *2	T2H□	T2V□	
	1-Color Flexible Lead Wire	2-wire	-	10 to 30	-	5 to 20 *2	T2HR3	T2VR3	
	1-Color	3-wire (NPN)	-	30 or less	-	100 or less	T3H□	T3V□	
		3-wire (PNP)	-		-		T3PH□	T3PV□	

*1: For "□" in the switch model No., enter the code selected from the "*Lead wire length" table.
*2: The maximum load current value above, 20 mA, is at 2 5°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 model No.s listed above are also available. (Custom Product) For details, see P. 573.

***Lead wire length**

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

Example) Lead wire length
1 m T2H
3 m T2H3
5 m T2H5

❺Number of Switches

Code	Content
R	With 1 pc. on Open Side
H	With 1 pc. on Close Side
D	With 2 pcs

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

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

BHG- •••• -FP1

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

●Structure usable in rechargeable battery manufacturing processes

BHG- •••• -P4□

* Please contact us for details.

Switch Single Unit Model No. Notation Method

SW - T2H

❹Switch Model No.

* BHG-LN series with length measurement function (with Linear Norm Sensor) is also available. For details, refer to "Pneumatic Cylinder ④ No. RJ-005AA".

Hand (Gripper)
LSH-HP
LSH
FH100
BSA2
BHA
BHG
BHE
LHA
LHAG
HAP-1C
HAP-2 to 4CS
HKP
HCP
HGP
LST-HP
HLF2
HLA/HLB
HLAG/HLBG
HLC
HLD
HMC-HP
HMF
HMF-G
HMFB
HFP
FH500
HBL
HJL
HMD
HDL
HJD
Cylinder Switch
Ending

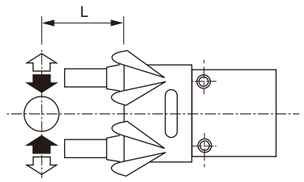
Specifications

Item			BHG-01CS	BHG-03CS	BHG-04CS	BHG-05CS
Bore size		mm	ø12	ø16	ø20	ø25
Actuation method			Double Acting Type/Single Acting Type			
Operating Fluid			Compressed Air			
Max. Working Pressure		MPa	0.7			
Min. Operating Pressure	Double Acting Type	MPa	0.15			
	Normally Open		0.3			
	Normally Closed					
Ambient Temperature		°C	5 to 60			
Port Size			M3	M5		
Operating stroke		mm	5	9	11	15
Rod diameter		mm	ø6	ø8	ø10	ø12
Internal volume (reciprocating)		cm^3	0.32	1.58	2.89	6.32
Repeatability		mm	±0.01			
Weight		kg	0.118	0.165	0.238	0.455
Lubrication			Not required (When lubricating, use turbine oil Class 1 ISO VG32)			

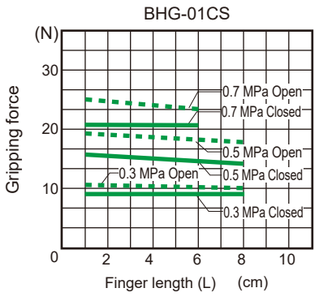
Gripping Force Performance Data

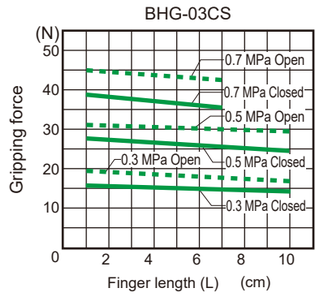
- Gripping force represents the thrust (for one finger) in the direction of the arrow shown in the figure.
- The gripping force in the opening/closing directions with finger length L of hand with a supply pressure of 0.3, 0.5 and 0.7 MPa is shown.

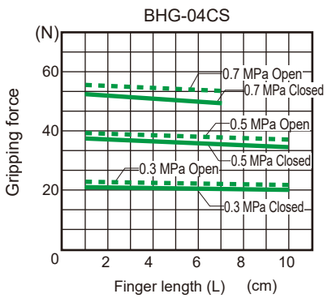
●Opening direction (⇦) - - - -(Dashed line)
●Closing direction (➡) ——(Solid line)

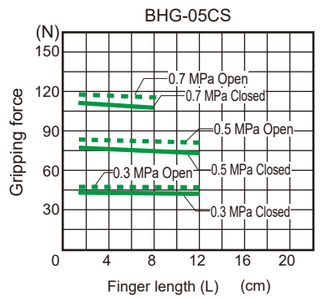


Note) **O type gripping force is approx. 20 to 30 % lower in the closing direction compared to the double acting type. C type gripping force is approx. 10 to 20 % lower in the opening direction compared to the double acting type. When selecting, check the design and selection precautions on P. 336.**





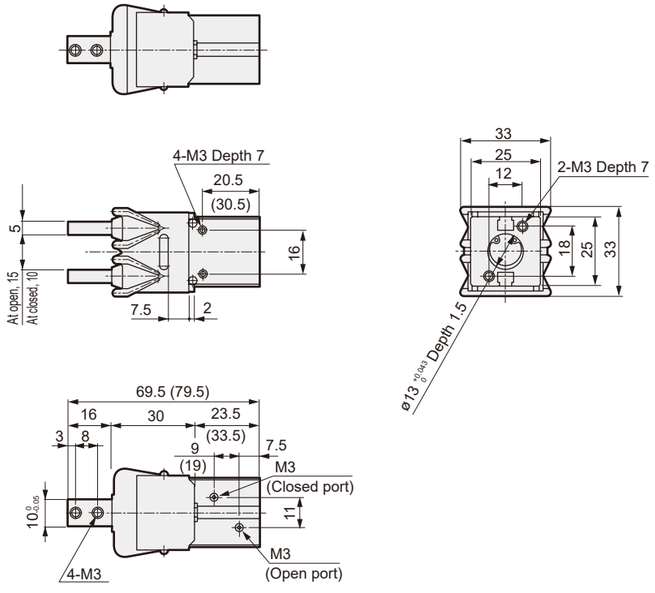




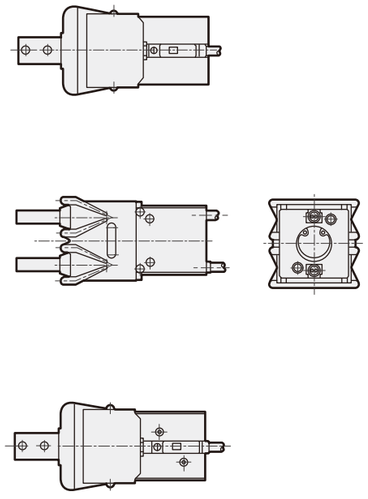
Outline Dimension Drawing

●BHG-01CS Standard/O/C

●Dimensions in ( ) are for C [Normally Closed] specification.



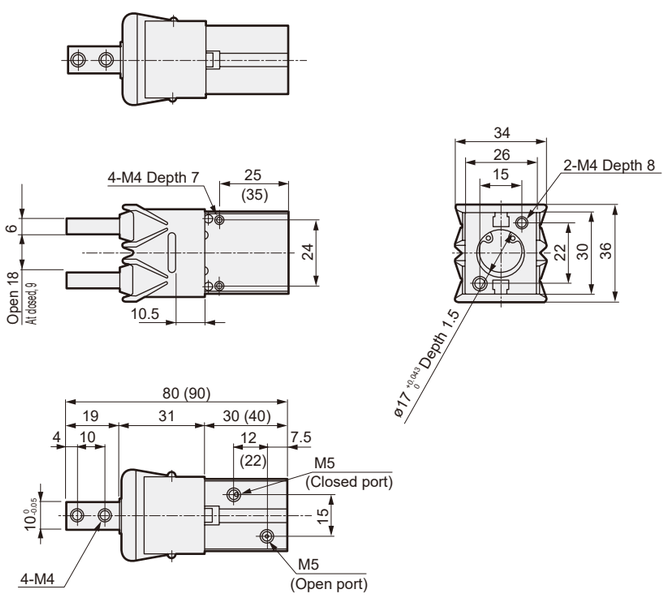
●With Switch



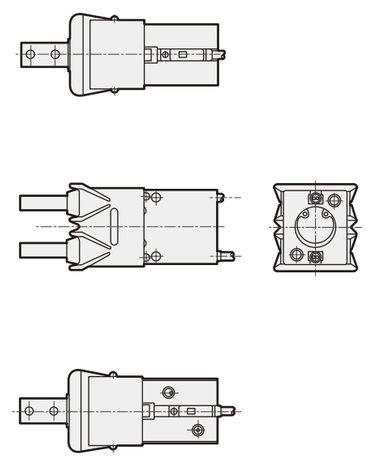
Note: For both T□H, T□V, the switch protrudes from the main body head side end face.

●BHG-03CS Standard/O/C

●( ) Dimensions are for C (Normally Closed) type.



●With Switch

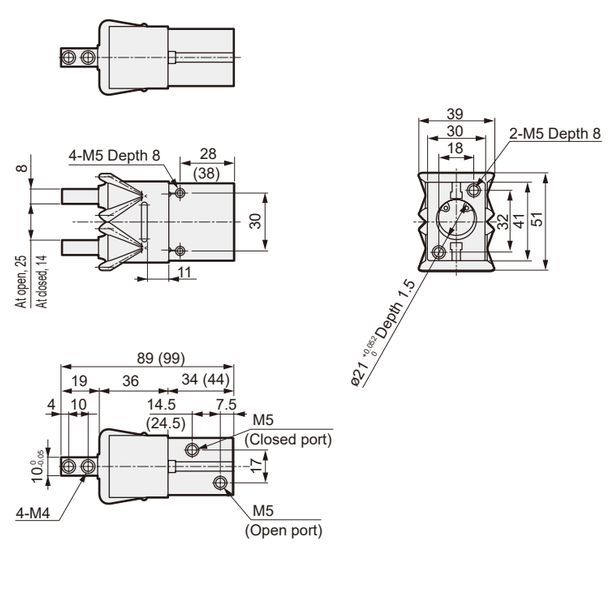


Note: For both T□H, T□V, the switch protrudes from the main body head side end face.

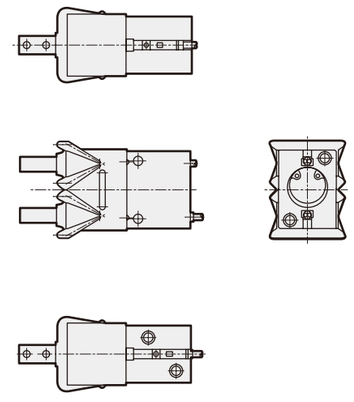
Outline Dimension Drawing

●BHG-04CS Standard/O/C

●( ) Dimensions are for C (Normally Closed) type.

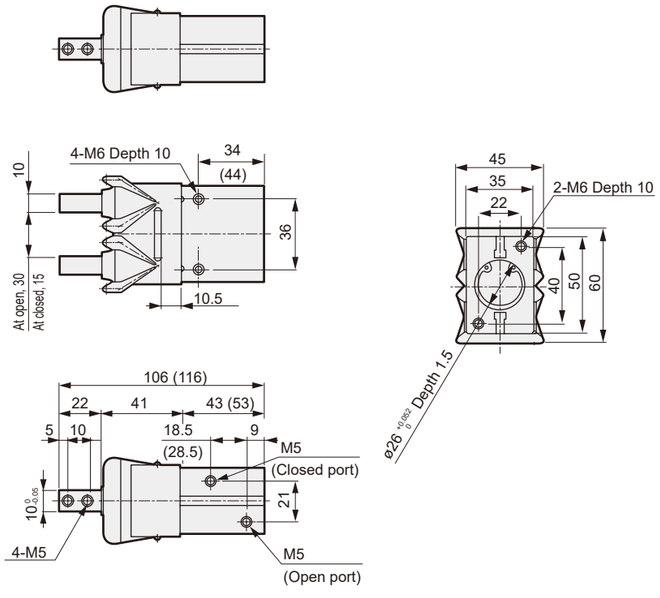


●With Switch

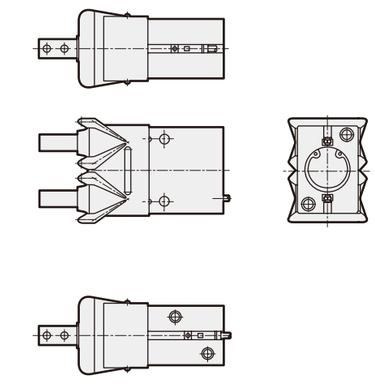


●BHG-05CS Standard/O/C

●( ) Dimensions are for C (Normally Closed) type.

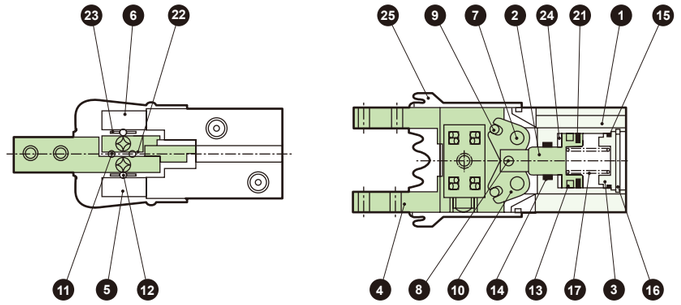


●With Switch

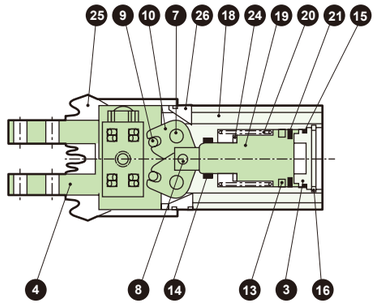


Internal Structure Diagram/Material

●Standard (double acting), O (normally open) type



●C (Normally Closed) Type



Do not disassemble

No.	Part Name	Material	Remarks	No.	Part Name	Material	Remarks
1	Body	Aluminum Alloy		14	Rod Packing	Nitrile Rubber	
2	Piston	Stainless Steel		15	Gasket	Nitrile Rubber	
3	Cover	Polyacetal		16	Retaining ring	Stainless Steel	
4	Finger	Steel		17	Coil Spring	Stainless Steel	O type only
5	Bearing guide A	Steel		18	Body	Aluminum Alloy	
6	Bearing guide B	Steel		19	Piston	Stainless Steel	
7	Pivot Shaft	Steel		20	Coil Spring	Stainless Steel	C type only
8	Actuating shaft A	Steel		21	Magnet		
9	Actuating shaft B	Steel		22	Retainer A	Stainless Steel	
10	Arm	Steel		23	Retainer B	Stainless Steel	
11	Cross roller A	Alloy Steel		24	Cushion	Urethane Rubber	
12	Cross roller B	Alloy Steel		25	Rubber Cover	Nitrile Rubber	
13	Piston Packing	Nitrile Rubber		26	Adapter	Aluminum Alloy	

Rubber cover part model No.

Size	Part Model No.	Part number
01CS	**BHG-01K**	㉕
03CS	**BHG-03K**	
04CS	**BHG-04K**	
05CS	**BHG-05K**	

MEMO



Centering Gripper

BHE Series

●Operating stroke: 7, 10, 14, 16, 22 mm

Double Acting



RoHS

Model No. Notation Method

Without Switch
(Built-in magnet for switch)

BHE – 03CS – D

Model No. ❶ ❷

With Switch
(Built-in magnet for switch)

BHE – 03CS – D – T2H – R

Model No. ❶Bore size ❷ Option ❸Switch Model No. ❹Number of Switches

❶Bore Size (mm)

Code	Content
01CS	ø12
03CS	ø16
04CS	ø20
05CS	ø25
06CS	ø32

❷ Option

Code	Content
Blank	Standard
D	With opening amount adjustment mechanism
E	With closing amount adjustment mechanism
DE	With opening/closing amount adjustment mechanism

❸Switch Model No.

For switch details, please refer to P. 573.
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	
Contact	1-Color	2-wire	-	10 to 30	-	5 to 20 *2	T2H□	T2V□	
Solid State	1-Color Flexible Lead Wire	2-wire	-	10 to 30	-	5 to 20 *2	T2HR3	T2VR3	
Solid State	1-Color	3-wire (NPN)	-	30 or less	-	100 or less	T3H□	T3V□	
Solid State	1-Color	3-wire (PNP)	-	30 or less	-	100 or less	T3PH□	T3PV□	

*1: For "□" in the switch model No., enter the code selected from the "*Lead wire length" 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: Switches other than the model No.s listed above are also available. (Custom Product) For details, see P. 573.

*Lead wire length

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

Example) Lead wire length
1 m T2H
3 m T2H3
5 m T2H5

❹Number of Switches

Code	Content
R	With 1 pc. on Open Side
H	With 1 pc. on Close Side
D	With 2 pcs

Rechargeable Battery Compatible Specification

(Catalog No. CC-1226AA)

●Structure usable in rechargeable battery manufacturing processes

BHE – •••• – P4□

*Please contact us for details.

Switch Single Unit Model No. Notation Method

SW – T2H

❸Switch Model No.

* BHE-LN series with length measurement function (with Linear Norm Sensor) is also available. For details, refer to "Pneumatic Cylinders ④ No. RJ-005AA".

Specifications

Item		BHE-01CS	BHE-03CS	BHE-04CS	BHE-05CS	BHE-06CS
Bore size	mm	ø12	ø16	ø20	ø25	ø32
Operating Fluid		Compressed Air				
Max. Working Pressure	MPa	0.7				
Min. Operating Pressure	MPa	0.2				
Ambient Temperature	°C	5 to 60				
Port Size		M3		M5		
Operating stroke	mm	7	10	14	16	22
Rod diameter	mm	ø6	ø8	ø10	ø12	ø16
Repeatability	mm	±0.01				
Centering accuracy	mm	±0.05 *1, *2				
Weight	kg	0.108	0.154	0.260	0.438	1.040
Lubrication		Not required (When lubricating, use turbine oil Class 1 ISO VG32)				

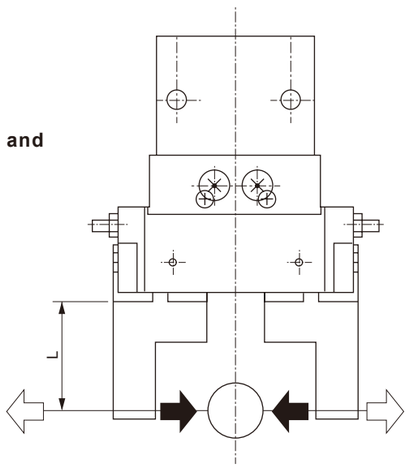
*1 Centering accuracy is based on the spigot center of the gripper end face mounting part.
*2 This is the initial value.

Gripping Force Performance Data

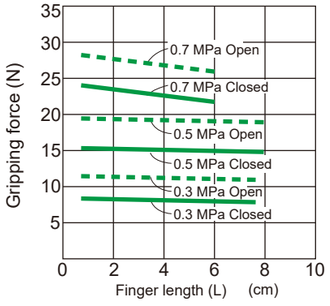
- Gripping force represents the thrust (for one finger) in the direction of the arrow shown in the figure.
- The gripping force in the opening/closing directions with finger length L of hand with a supply pressure of 0.3, 0.5 and 0.7 MPa is shown.

●Open direction (⇦) - - - - (broken line)
●Closing direction (➡) ——— (solid line)

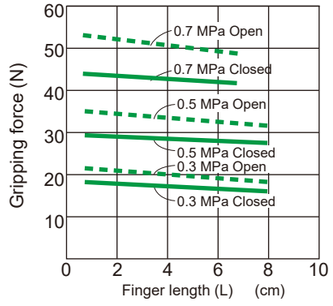
Note) **When selecting, check the design and selection precautions on P. 336.**



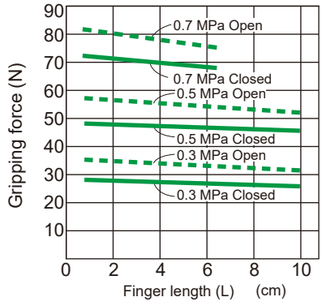
BHE-01CS



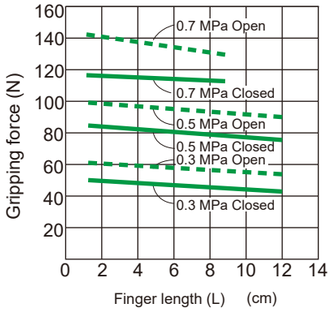
BHE-03CS



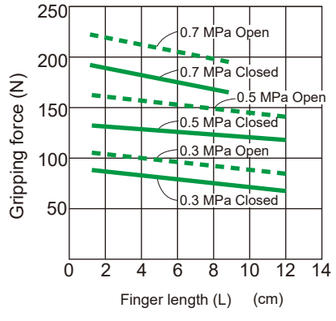
BHE-04CS



BHE-05CS



BHE-06CS

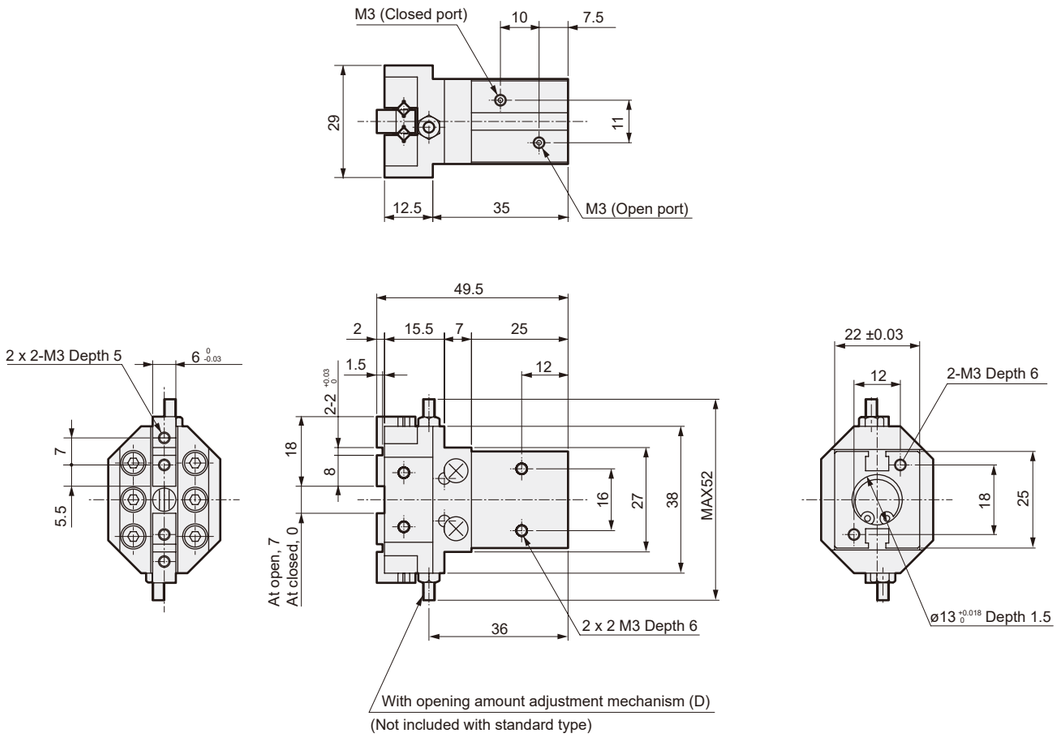


MEMO

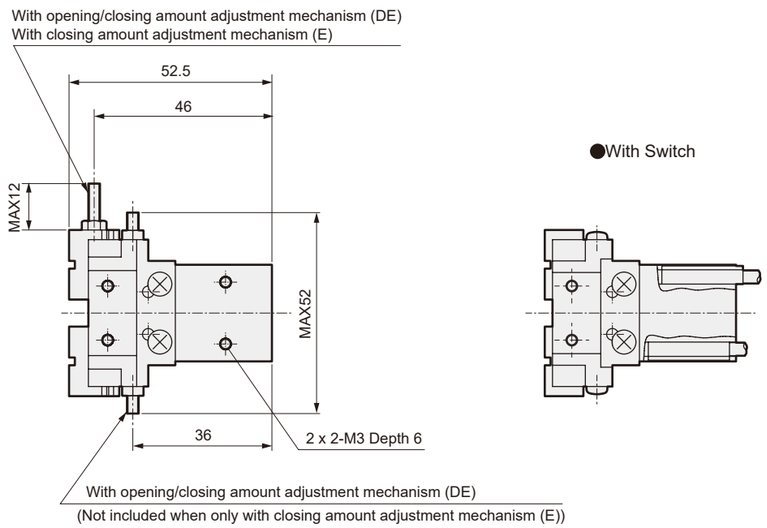
Hand (Gripper)
LSH-HP
LSH
FH100
BSA2
BHA
BHG
BHE
LHA
LHAG
HAP-1C
HAP-2 to 4CS
HKP
HCP
HGP
LST-HP
HLF2
HLA/ HLB
HLAG/ HLBG
HLC
HLD
HMC-HP
HMF
HMF-G
HMFB
HFP
FH500
HBL
HJL
HMD
HDL
HJD
Cylinder Switch
Ending

Outline Dimension Drawing

●BHE-01CS (Standard)
●BHE-01CS-D (With opening amount adjustment mechanism)

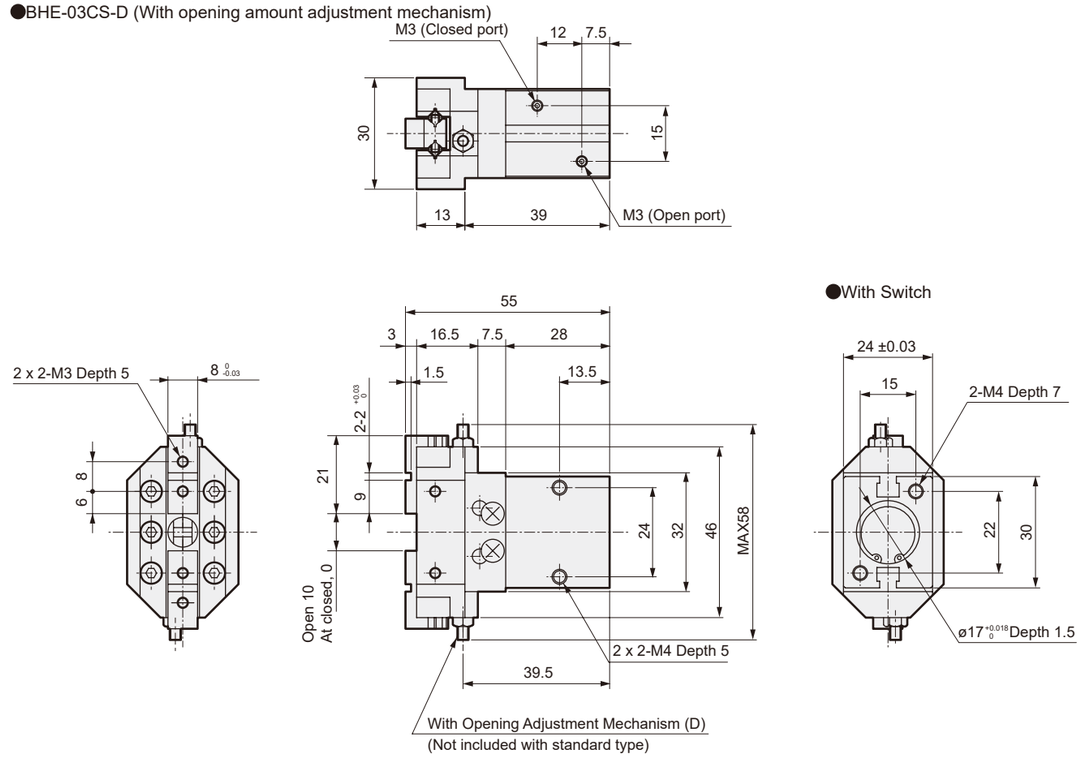


●BHE-01CS-E (With closing amount adjustment mechanism)
●BHE-01CS-DE (With opening/closing amount adjustment mechanism)

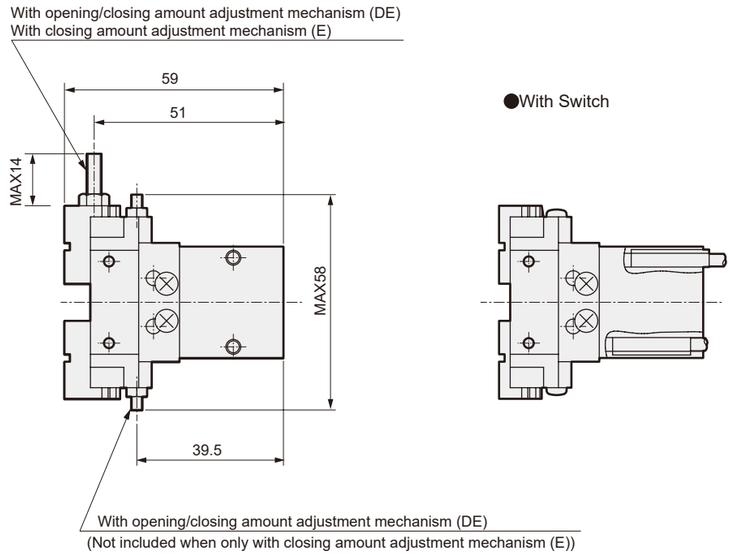


Outline Dimension Drawing

●BHE-03CS (Standard)
●BHE-03CS-D (With opening amount adjustment mechanism)

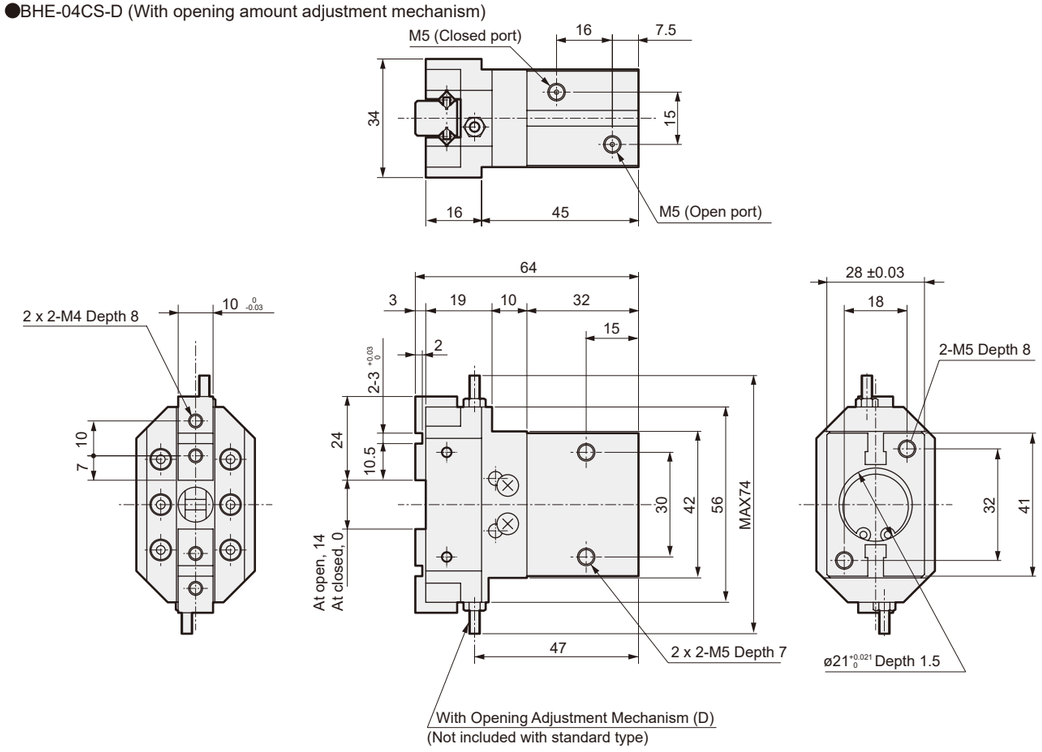


●BHE-03CS-E (With closing amount adjustment mechanism)
●BHE-03CS-DE (With opening/closing amount adjustment mechanism)

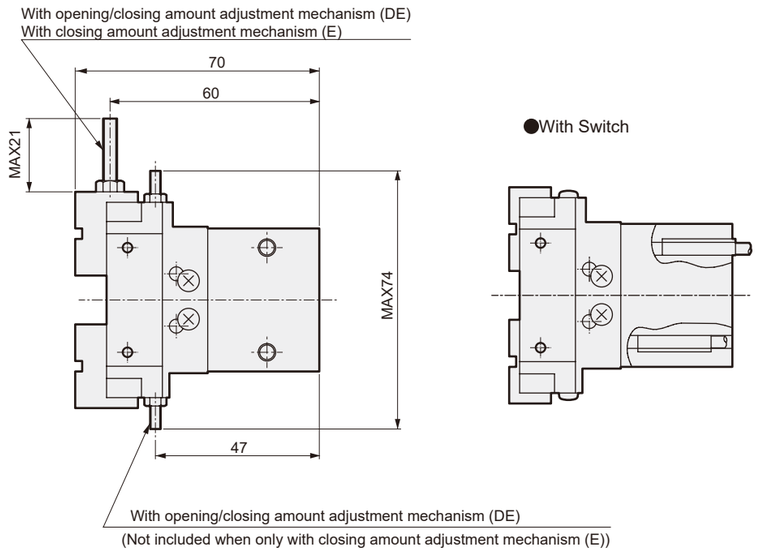


Outline Dimension Drawing

●BHE-04CS (Standard)
●BHE-04CS-D (With opening amount adjustment mechanism)

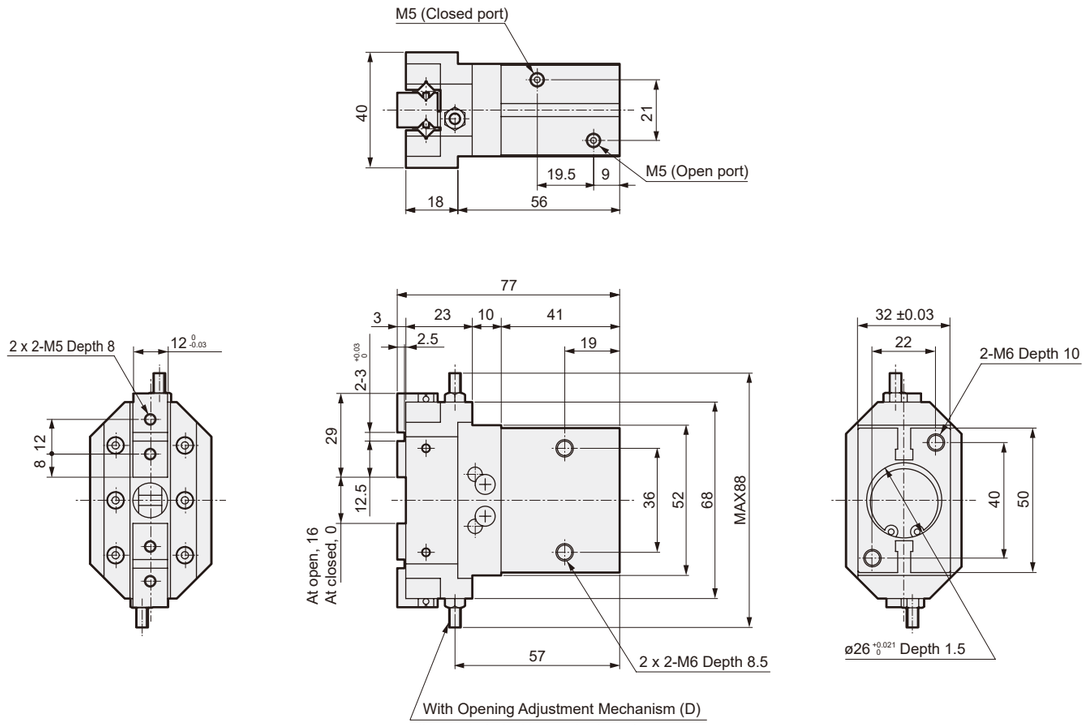


●BHE-04CS-E (With closing amount adjustment mechanism)
●BHE-04CS-DE (With opening/closing amount adjustment mechanism)

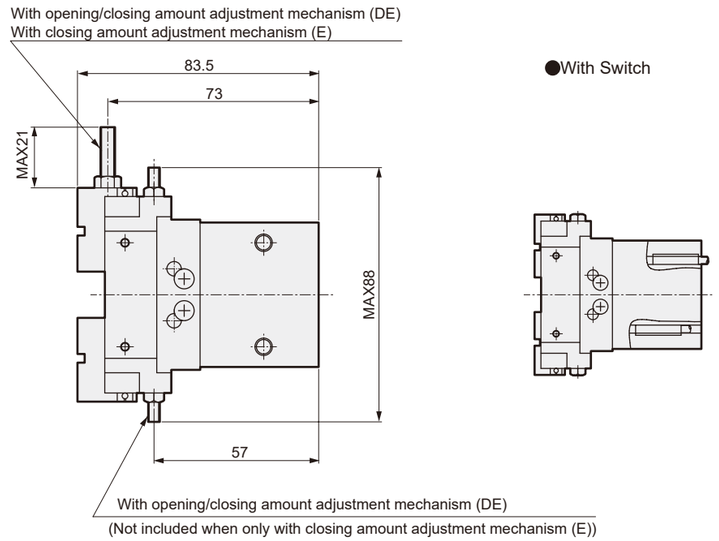


Outline Dimension Drawing

●BHE-05CS (Standard)
●BHE-05CS-D (With opening amount adjustment mechanism)

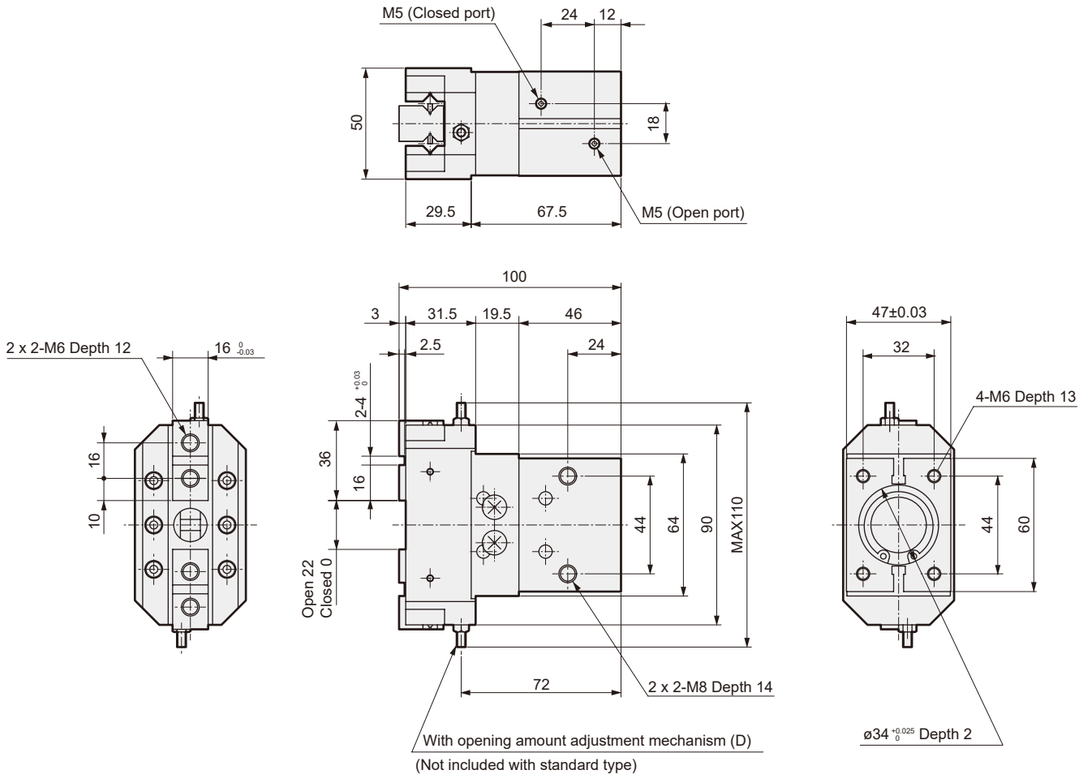


●BHE-05CS-E (With closing amount adjustment mechanism)
●BHE-05CS-DE (With opening/closing amount adjustment mechanism)

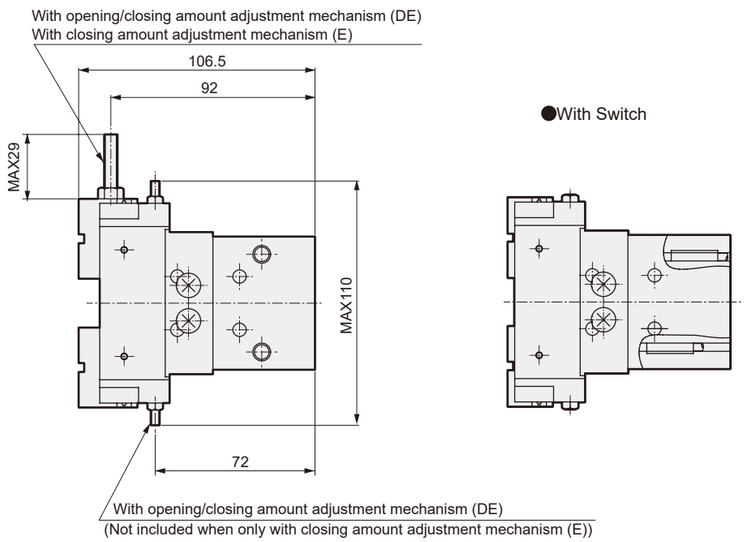


Outline Dimension Drawing

●BHE-06CS (Standard)
●BHE-06CS-D (With opening amount adjustment mechanism)



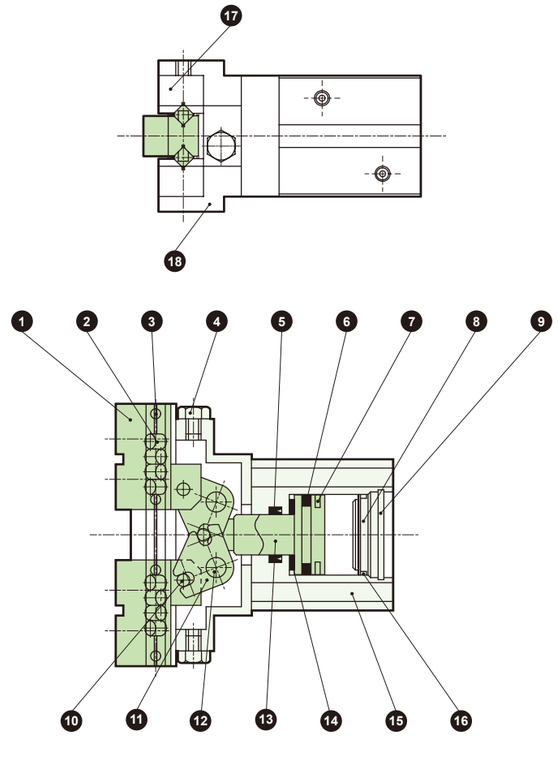
●BHE-06CS-E (With closing amount adjustment mechanism)
●BHE-06CS-DE (With opening/closing amount adjustment mechanism)



●With Switch

Internal Structure Diagram/Material

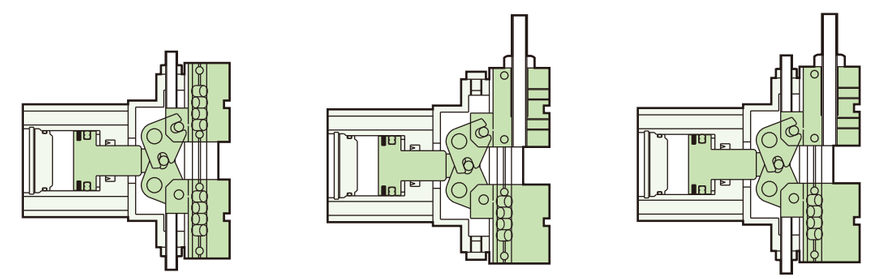
● BHE-01CS to 06CS



Do not disassemble

Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Finger	Stainless Steel		10	Operating Shaft	High carbon chromium bearing steel	
2	Cross Roller	High carbon chromium bearing steel		11	Arm	Stainless Steel	
3	Spring Pin	Stainless Steel		12	Pivot Shaft	High carbon chromium bearing steel	
4	Plug	Copper Alloy		13	Piston	Stainless Steel	
5	Rod Packing	Nitrile Rubber		14	Cushion	Urethane Rubber	
6	Piston Packing	Nitrile Rubber		15	Body	Aluminum Alloy	
7	Magnet			16	Gasket	Nitrile Rubber	
8	Cover	Resin		17	Bearing guide	Stainless Steel	
9	Retaining ring	Stainless Steel		18	Body	Aluminum Alloy	

Option internal structure diagram



Opening amount adjustment mechanism
(Option: D)

Closing amount adjustment mechanism
(Option: E)

Opening/closing amount adjustment mechanism
(Option: DE)



Linear Guide Gripper Double Acting Type/Single Acting Type

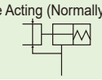
LHA Series

●Operating stroke: 4, 5, 9, 11, 15, 20 mm

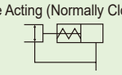
Double Acting



Single Acting (Normally Open)



Single Acting (Normally Closed)



RoHS

Model No. Notation Method

Without Switch
(Built-in magnet for switch)

LHA – 03CS – O

Model No. ❶ ❷

With Switch
(Built-in magnet for switch)

LHA – 03CS – O – T2H – R

Model No. ❷Actuation method ❹Number of Switches

❶Bore size ❸Switch Model No.

❶Bore Size (mm)

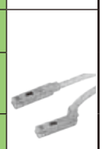
Code	Content
006CS	ø6
01CS	ø12
03CS	ø16
04CS	ø20
05CS	ø25
06CS	ø32

❷Actuation method

Code	Content
Blank	Standard (Double Acting Type)
O	Single Acting (Normally Open)
C	Single Acting (Normally Closed)

❸Switch Model No.

For switch details, please refer to P. 573. 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 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□	
	1-Color	2-wire	-	10 to 30	-	5 to 20 *2	T2H□	T2V□	
	1-Color Flex-Resistant Lead Wire	2-wire	-	10 to 30	-	5 to 20 *2	T2HR3	T2VR3	
	1-Color	3-wire (NPN)	-	30 or less	-	100 or less	T3H□	T3V□	
		3-wire (PNP)	-		-		T3PH□	T3PV□	

*1: For "□" in the switch model No., enter the code selected from the "*Lead wire length" 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: Only the LHA-006CS is provided with the F switch.
*4: Switches other than the model No.s listed above are also available. (Custom Product) For details, see P. 573.

***Lead wire length**

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

*5: The 5 m lead wire cannot be selected for the F switch.

Example) Lead wire length
1 m F2S
3 m F2S3
5 m F2S5

❹Number of Switches

Code	Content
R	With 1 pc. on Open Side
H	With 1 pc. on Close Side
D	With 2 pcs

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

●Design compatible with rechargeable battery manufacturing process

LHA- •••• -P4□

*Please contact us for details.

Switch Single Unit Model No. Notation Method

SW – F2H□

❸Switch Model No.

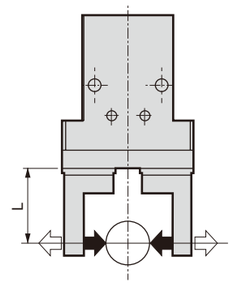
Specifications

Item		LHA-006CS	LHA-01CS	LHA-03CS	LHA-04CS	LHA-05CS	LHA-06CS
Bore size	mm	ø6	ø12	ø16	ø20	ø25	ø32
Actuation method		Double Acting Type/Single Acting Type					
Operating Fluid		Compressed Air					
Max. Working Pressure	MPa	0.7					
Min. Operating Pressure	Double Acting Type	0.15	0.1				
	Single acting type	0.3					
Ambient Temperature	°C	5 to 60					
Port Size		M3		M5			
Operating stroke	mm	4	5	9	11	15	20
Rod diameter	mm	ø3	ø6	ø8	ø10	ø12	ø16
Internal volume (reciprocating)	cm³	0.10	0.32	1.58	2.89	6.32	14.07
Repeatability	mm	±0.01					
Weight	kg	0.04	0.085	0.15	0.36	0.52	0.82
Lubrication		Not required (When lubricating, use turbine oil Class 1 ISO VG32)					

Gripping Force Performance Data

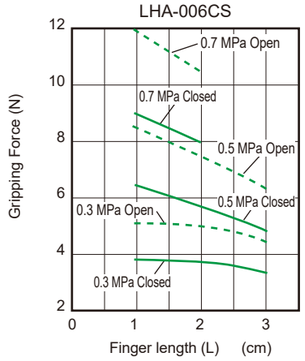
- Gripping force represents the thrust (for one finger) in the direction of the arrow shown in the figure.
- The gripping force in the opening/closing directions with finger length L of hand with a supply pressure of 0.3, 0.5 and 0.7 MPa is shown.

●Opening direction (⇦) - - - -(Dashed line)
●Closing direction (➡) ——(Solid line)

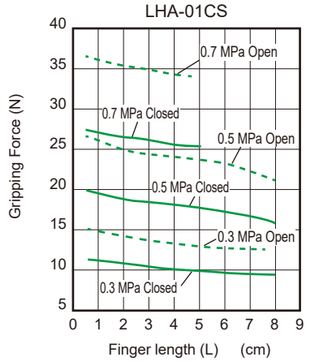


Note) **O type gripping force is approx. 20 to 30 % lower in the closing direction compared to the double acting type. C type gripping force is approx. 10 to 20 % lower in the opening direction compared to the double acting type. When selecting, check the design and selection precautions on P. 336.**

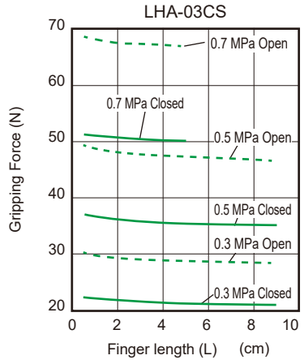
LHA-006CS



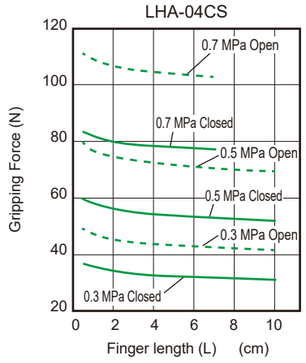
LHA-01CS



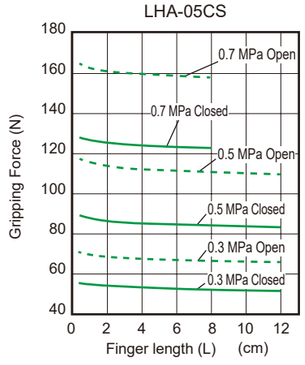
LHA-03CS



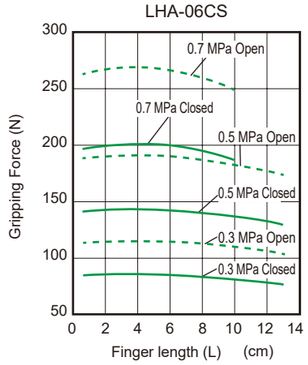
LHA-04CS



LHA-05CS



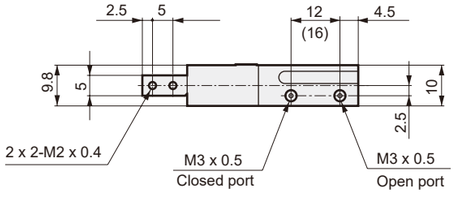
LHA-06CS



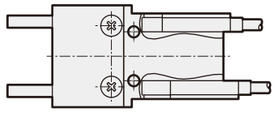
Outline Dimension Drawing

●LHA-006CS Standard/O/C

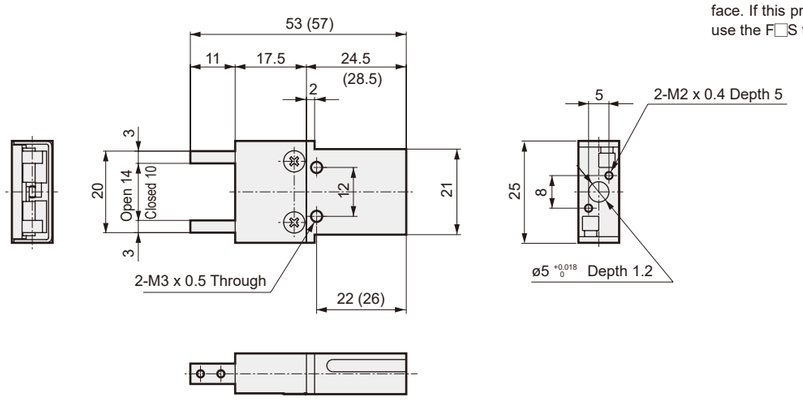
・Dimensions in ( ) are for O (Normally Open) and C (Normally Closed) specifications.



●With Switch

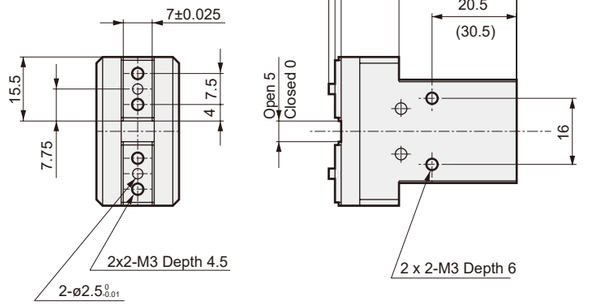


Note) The switches for both the F□H and F□V types project beyond the head-side end face. If this projection is an issue, please use the F□S type.

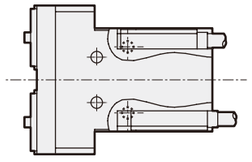


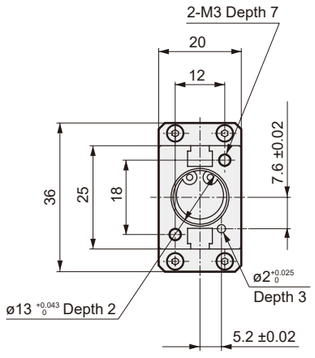
●LHA-01CS Standard/O/C

・Dimensions in ( ) are for C (Normally Closed) specification.



●With Switch

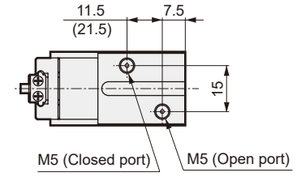




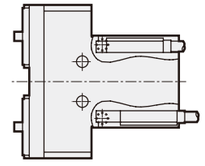
Outline Dimension Drawing

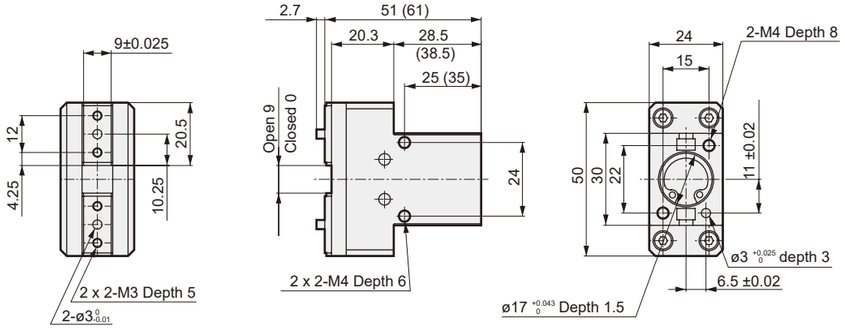
●LHA-03CS Standard/O/C

・Dimensions in ( ) are for C (Normally Closed) specification.



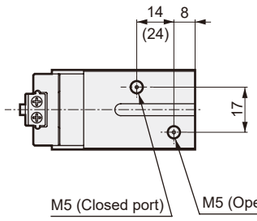
●With Switch



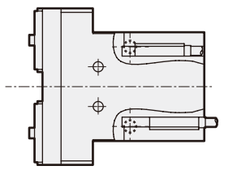


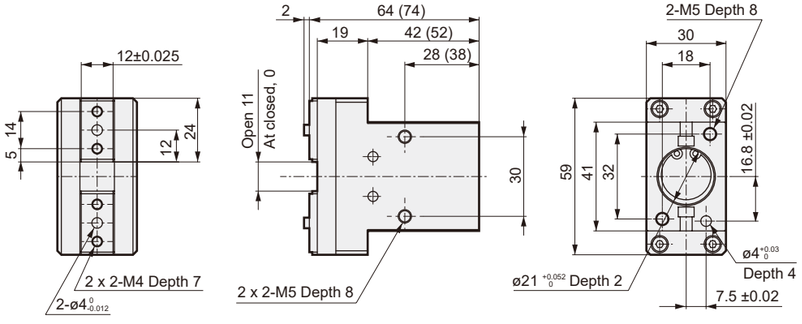
●LHA-04CS Standard/O/C

・Dimensions in ( ) are for C (Normally Closed) specification.



●With Switch



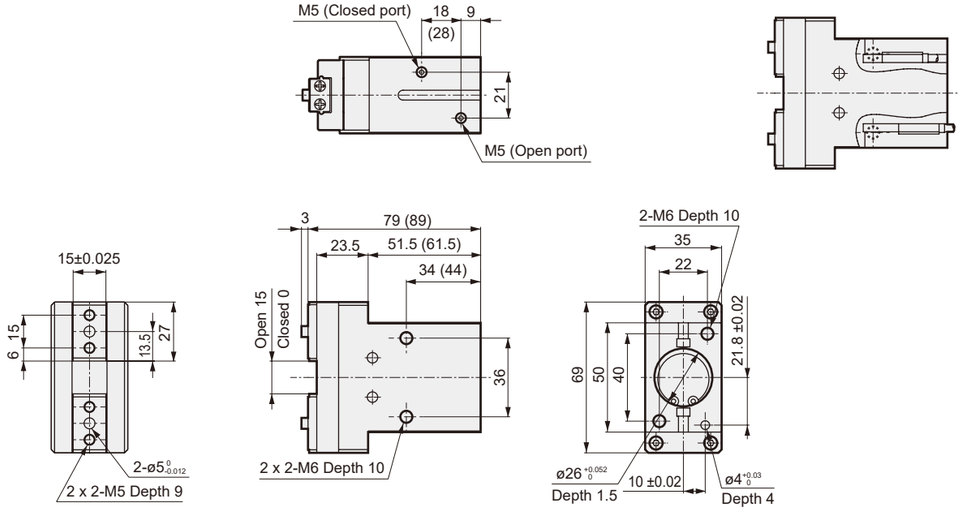


Outline Dimension Drawing

●LHA-05CS Standard/O/C

・Dimensions in ( ) are for C (Normally Closed) specification.

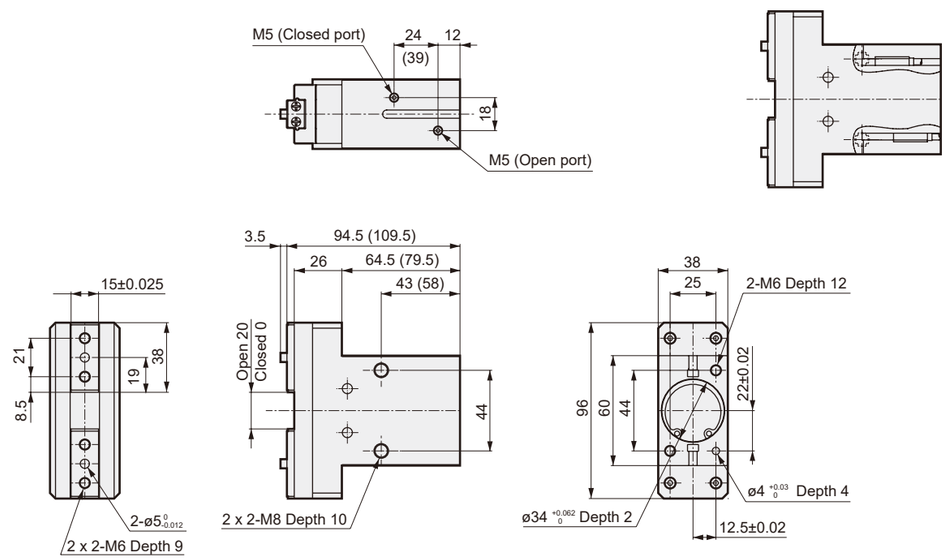
●With Switch



●LHA-06CS Standard/O/C

・Dimensions in ( ) are for O (Normally Open) and C (Normally Closed) specifications.

●With Switch

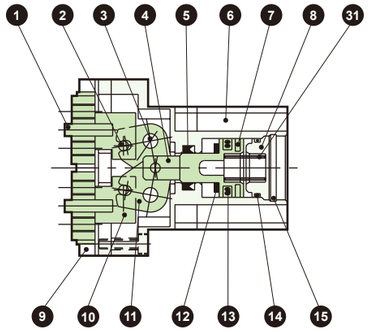


MEMO

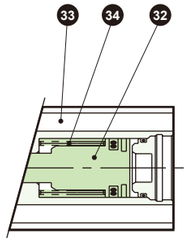
Internal Structure Diagram/Material

●LHA-01CS to 05CS

Standard (Double Acting), 0 (Normally Open) Type

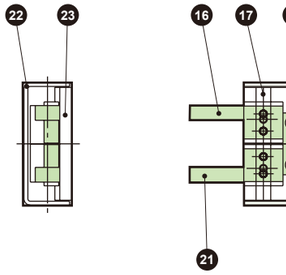


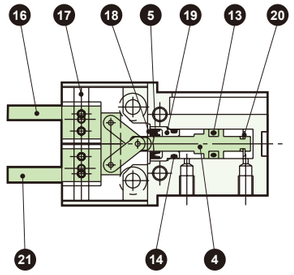
C (Normally Closed) Type



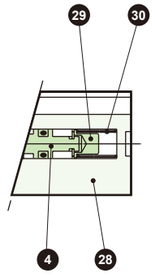
●LHA-006CS

Standard (Double Acting)

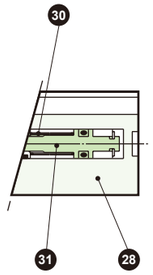




O (Normally Open) Type

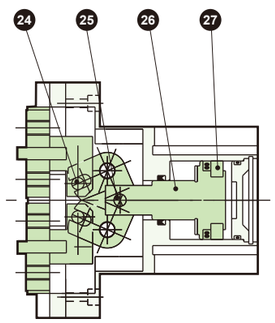


C (Normally Closed) Type

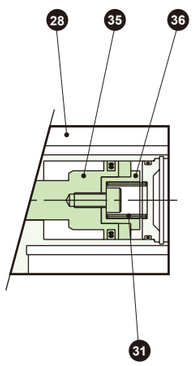


●LHA-06CS

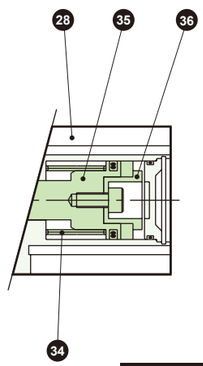
Standard (Double Acting)



C (Normally Open) Type



C (Normally Closed) Type



Do not disassemble

Material

Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Positioning pin	Alloy Steel		19	Piston Guide	Stainless Steel	
2	Operating Shaft	Alloy Steel		20	E-type Retaining Ring	Stainless Steel	
3	Pivot Shaft	Alloy Steel		21	Finger A	Stainless Steel	
4	Piston	Stainless Steel		22	Cover	Stainless Steel	
5	Rod seal	Nitrile Rubber		23	Guide plate	Stainless Steel	
6	Body	Aluminum Alloy		24	Actuating shaft B	Alloy Steel	
7	Half-moon magnet			25	Actuating shaft A	Steel	
8	Cover	Polyacetal		26	Piston	Stainless Steel	
9	Linear Guide			27	Magnet		
10	Master plate	Stainless Steel		28	NO, NC main body	Aluminum Alloy	
11	Arm	Stainless Steel		29	Spring Guide	Stainless Steel	
12	Cushion	Urethane Rubber		30	NO, NC spring	Stainless Steel	
13	Piston seal	Nitrile Rubber		31	NO spring	Stainless Steel	
14	Seal	Nitrile Rubber		32	NC piston	Stainless Steel	
15	C-type retaining ring	Stainless Steel		33	NC main body	Aluminum Alloy	
16	Finger B	Stainless Steel		34	NC spring	Stainless Steel	
17	Linear Guide			35	NO, NC piston A	Stainless Steel	
18	Piston guide retainer	Stainless Steel		36	Piston B	Polyacetal	



Linear Guide Gripper with Rubber Cover Double Acting Type/Single Acting Type

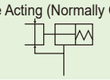
LHAG Series

●Operating stroke: 5, 9, 11, 15, 20 mm

Double Acting



Single Acting (Normally Open)



Single Acting (Normally Closed)



RoHS

Model No. Notation Method

Without Switch
(Built-in magnet for switch)

LHAG – 03CS – O – F

Model No. ❶ ❷ ❸

With Switch
(Built-in magnet for switch)

LHAG – 03CS – O – F – T2H – R

Model No. ❷ Actuation method ❹ Switch Model No.
❶ Bore size ❸ Rubber Cover ❺ Number of Switches

❶Bore Size (mm)

Code	Content
01CS	ø12
03CS	ø16
04CS	ø20
05CS	ø25
06CS	ø32

❷Actuation method

Code	Content
Blank	Standard (Double Acting Type)
O	Single Acting (Normally Open)
C	Single Acting (Normally Closed)

❸Rubber Cover

Code	Content
Blank	Nitrile rubber cover
F	Fluororubber cover
T	Silicone rubber cover

❹Switch Model No.

For switch details, please refer to P. 573.
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 20 *2	T2H□	T2V□	
	1-Color Flexible Lead Wire	2-wire	-	10 to 30	-	5 to 20 *2	T2HR3	T2VR3	
	1-Color	3-wire (NPN)	-	30 or less	-	100 or less	T3H□	T3V□	
		3-wire (PNP)	-		-		T3PH□	T3PV□	

*1: For "□" in the switch model No., enter the code selected from the "*Lead wire length" 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: Switches other than the model No.s listed above are also available. (Custom Product) For details, see P. 573.

*Lead wire length

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

Example) Lead wire length
1 m T2H
3 m T2H3
5 m T2H5

❺Number of Switches

Code	Content
R	With 1 pc. on Open Side
H	With 1 pc. on Close Side
D	With 2 pcs

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

●Design compatible with rechargeable battery manufacturing process

LHAG– •••• – P4□

*Please contact us for details.

Switch Single Unit Model No. Notation Method

SW – T2H

❹Switch Model No.

Specifications

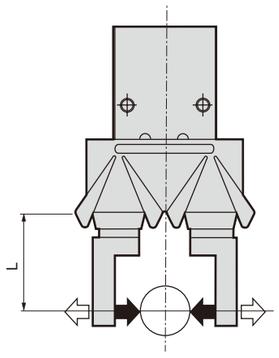
Item		LHAG-01CS	LHAG-03CS	LHAG-04CS	LHAG-05CS	LHAG-06CS
Bore size	mm	ø12	ø16	ø20	ø25	ø32
Actuation method		Double Acting Type/Single Acting Type				
Operating Fluid		Compressed Air				
Max. Working Pressure	MPa	0.7				
Min. Operating Pressure	Double Acting Type MPa	0.2				
	Single acting type MPa	0.3				
Ambient Temperature	°C	5 to 60				
Port Size		M3		M5		
Operating stroke	mm	5	9	11	15	20
Rod diameter	mm	ø6	ø8	ø10	ø12	ø16
Internal volume (reciprocating)	cm³	0.32	1.58	2.89	6.32	14.07
Repeatability	mm	±0.01				
Weight	kg	0.09	0.17	0.37	0.57	0.9
Lubrication		Not required (When lubricating, use turbine oil Class 1 ISO VG32)				

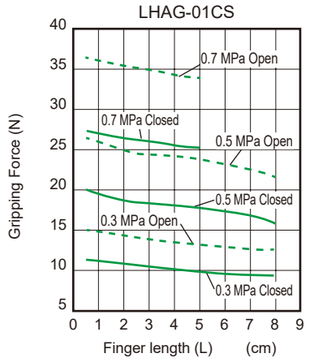
Gripping Force Performance Data

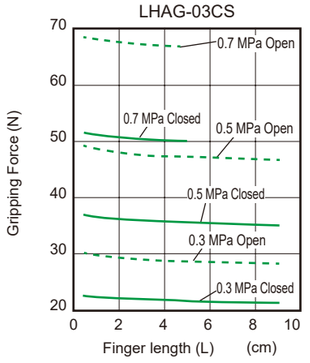
- Gripping force represents the thrust (for one finger) in the direction of the arrow shown in the figure.
- This represents the gripping force acting in the opening and closing directions at a gripper's finger length L when the supply pressure is 0.3, 0.5, and 0.7 MPa.

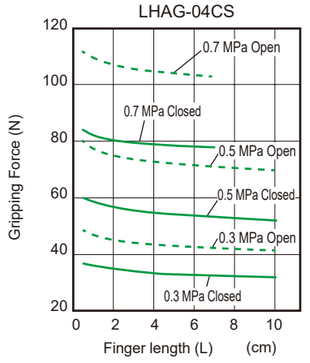
●Open direction (⇦) - - - - - - (broken line)
●Closing direction (➡) —— (solid line)

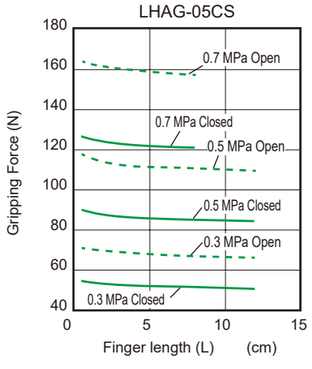
Note) **O type gripping force is approx. 20 to 30% lower in the closing direction compared to the double acting type.**
C type gripping force is approx. 10 to 20% lower in the opening direction compared to the double acting type.
When selecting, check the design and selection precautions on P. 336.

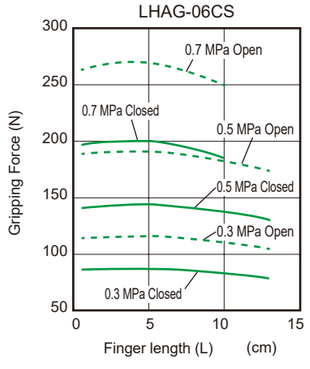












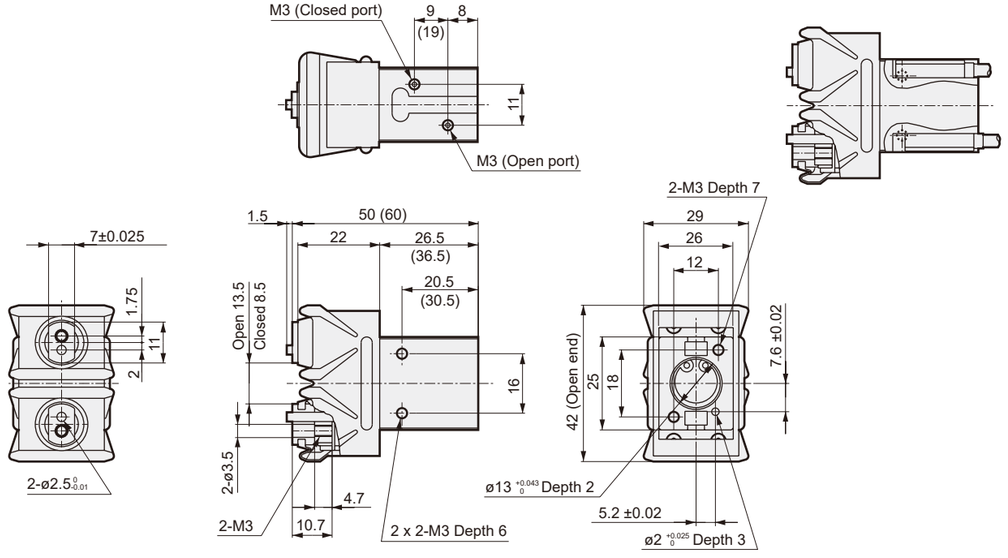
MEMO

Outline Dimension Drawing

●LHAG-01CS Standard/O/C

・Dimensions in ( ) are for C (Normally Closed) specification.

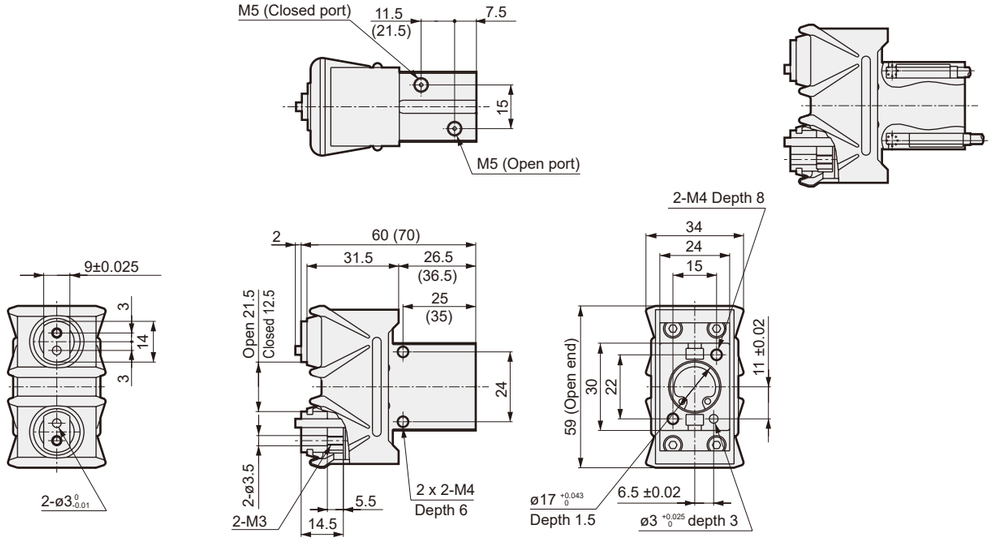
●With Switch



●LHAG-03CS Standard/O/C

・Dimensions in ( ) are for C (Normally Closed) specification.

●With Switch

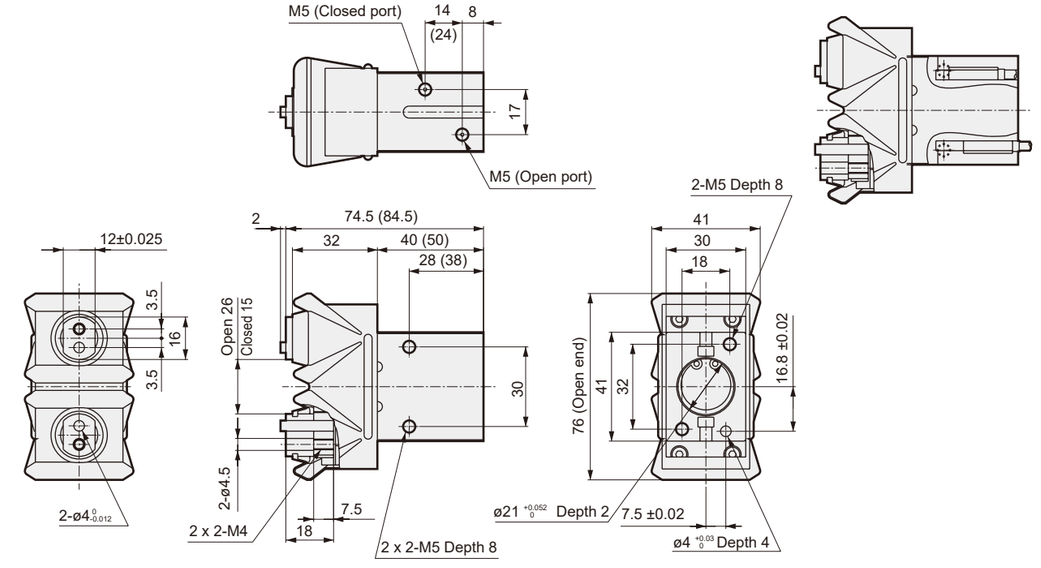


Outline Dimension Drawing

●LHAG-04CS Standard/O/C

・Dimensions in ( ) are for C (Normally Closed) specification.

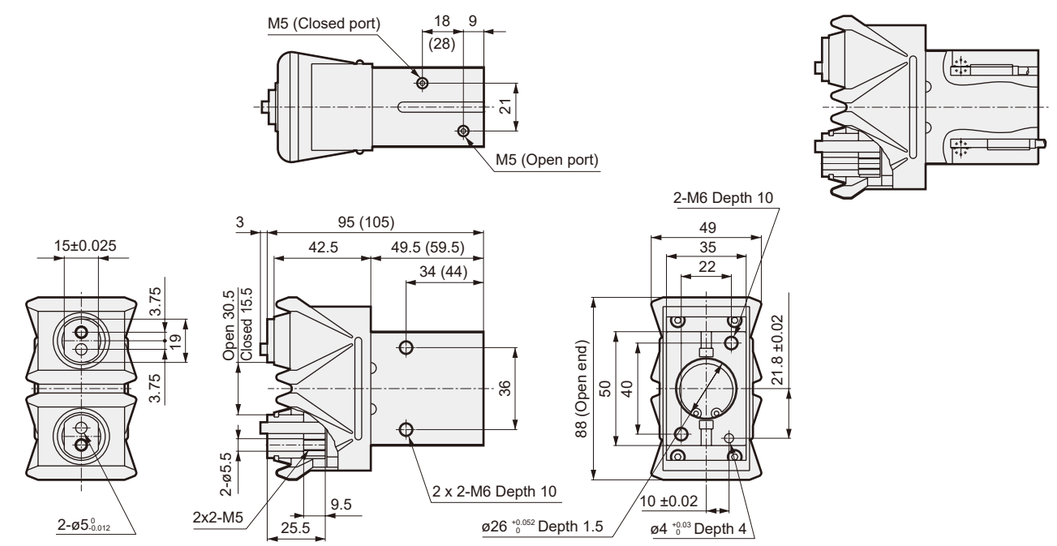
●With Switch



●LHAG-05CS Standard/O/C

・Dimensions in ( ) are for C (Normally Closed) specification.

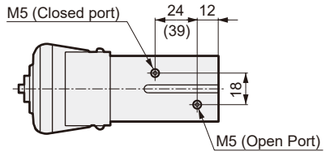
●With Switch



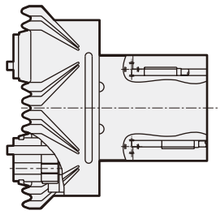
Outline Dimension Drawing

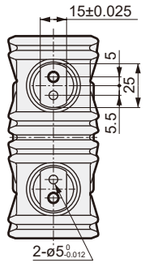
●LHAG-06CS Standard/O/C

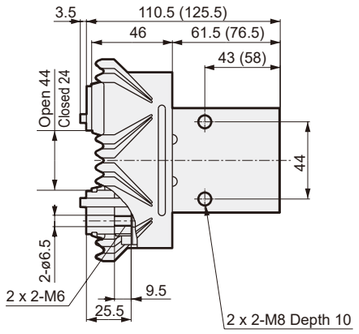
・Dimensions in ( ) are for O (Normally Open) and C (Normally Closed) specifications.

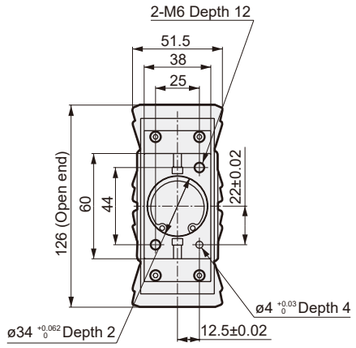


●With Switch





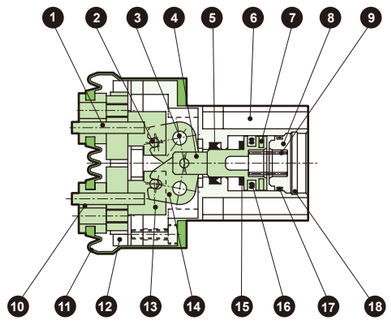




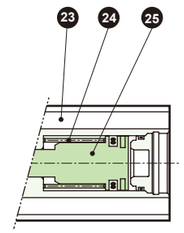
Internal Structure Diagram/Material

●LHAG-01CS to 05CS

Standard (Double Acting), 0 (Normally Open) Type

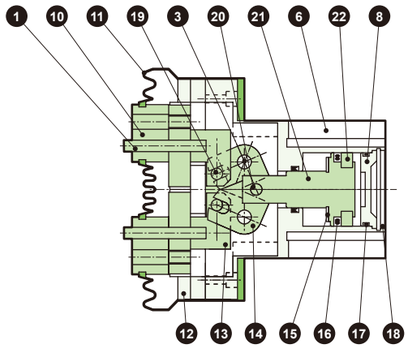


C (Normally Closed) Type

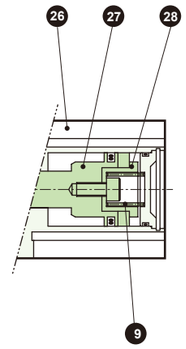


●LHAG-06CS

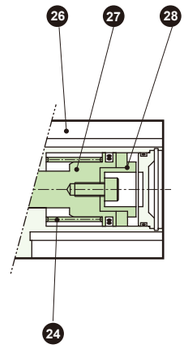
Standard (Double Acting)



O (Normally Open) Type



C (Normally Closed) Type



Do not disassemble

Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Positioning pin	Alloy Steel		15	Cushion	Urethane Rubber	
2	Operating Shaft	Alloy Steel		16	Piston seal	Nitrile Rubber	
3	Pivot Shaft	Alloy Steel		17	Seal	Nitrile Rubber	
4	Piston	Stainless Steel		18	C-type retaining ring	Stainless Steel	
5	Rod seal	Nitrile Rubber		19	Actuating shaft B	Alloy Steel	
6	Body	Aluminum Alloy		20	Actuating shaft A	Steel	
7	Half-moon magnet			21	Piston	Stainless steel, Aluminum alloy	
8	Cover	Polyacetal		22	Magnet		
9	NO coil spring	Stainless Steel	O type only	23	NC main body	Aluminum Alloy	C type only
10	Master finger for rubber cover	Stainless Steel		24	NC coil spring	Stainless Steel	C type only
11	Rubber Cover	Nitrile Rubber		25	NC piston	Stainless Steel	C type only
12	Linear Guide			26	NO, NC body	Aluminum Alloy	O, C type only
13	Master plate	Stainless Steel		27	NO, NC piston A	Stainless Steel	O, C type only
14	Arm	Stainless Steel		28	Piston B	Polyacetal	O, C type only

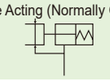


Parallel Gripper Double Acting Type/Single Acting Type

HAP-1C Series

●Operating stroke: 8 mm

Double Acting 

Single Acting (Normally Open) 

Single Acting (Normally Closed) 

RoHS

Model No. Notation Method

HAP - 1C - O Y1

- HAP: Model No.
- 1C: ❶ Bore size Note)
- O: ❷ Actuation method
- Y1: ❸ Attachment

Note) Switches cannot be installed on HAP-1C.

❶ Bore size

Code	Content
1C	ø15

❷ Actuation method

Code	Content
Blank	Standard (Double Acting Type)
O	Single Acting (Normally Open)
C	Single Acting (Normally Closed)

❸ Attachment

Code	Content
Blank	Without attachments
Y1	With attachments: Material (S50C)
Y2	With attachments: Material (MC Nylon)

Note) For the outline dimensions and compatible models of the attachments, refer to P. 334 and 335. When ordered as an option, it will be shipped assembled with a quantity of 2.

Rechargeable Battery Compatible Specification

(Catalog No. CC-1226AA)

●Structure usable in rechargeable battery manufacturing processes

HAP- •••• - P4□

*Please contact us for details.

Specifications

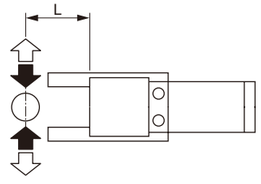
Item		HAP-1C
Bore size	mm	ø15
Actuation method		Double Acting Type/Single Acting Type
Operating Fluid		Compressed Air
Max. Working Pressure	MPa	0.7
Min. Operating Pressure	MPa	0.3
Ambient Temperature	°C	5 to 60
Port Size		M5
Operating stroke	mm	8
Rod diameter	mm	ø8
Internal volume (reciprocating)	cm^3	2.1
Repeatability	mm	±0.03
Weight	kg	0.10
Lubrication		Not required (When lubricating, use turbine oil Class 1 ISO VG32)

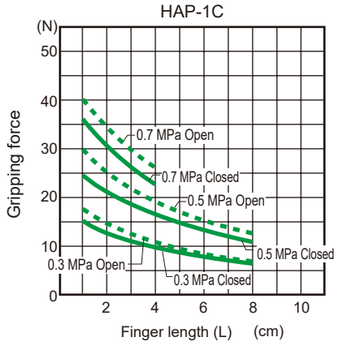
Gripping Force Performance Data

- Gripping force represents the thrust (for one finger) in the direction of the arrow shown in the figure.
- The gripping force in the opening/closing directions with finger length L of hand with a supply pressure of 0.3, 0.5 and 0.7 MPa is shown.

●Open direction (⇦)- - - -(broken line)

●Closing direction (➡)——(solid line)

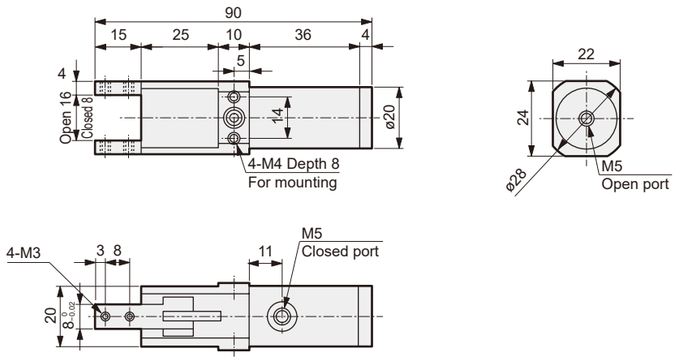




Note)
- **O type gripping force is approx. 20 to 30 % lower in the closing direction compared to the double acting type.**
- **C type gripping force is approx. 10 to 20 % lower in the opening direction compared to the double acting type. When selecting, check the design and selection precautions on P. 336.**

Hand (Gripper)
LSH-HP
LSH
FH100
BSA2
BHA
BHG
BHE
LHA
LHAG
HAP-1C
HAP-2 to 4CS
HKP
HCP
HGP
LST-HP
HLF2
HLA/ HLB
HLAG/ HLBG
HLC
HLD
HMC-HP
HMF
HMF-G
HMFB
HFP
FH500
HBL
HJL
HMD
HDL
HJD
Cylinder Switch
Ending

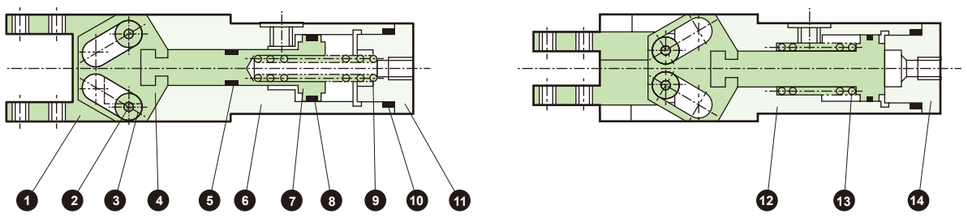
Outline Dimension Drawing



Internal Structure Diagram/Material

● Standard (double acting), O (normally open) type

● C (Normally Closed) Type



Do not disassemble

Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Finger	Alloy Steel		8	Piston Packing	Nitrile Rubber	
2	Pivot Shaft	Alloy Steel		9	Coil Spring	Steel	O type only
3	Bearing	Alloy Steel		10	Gasket	Nitrile rubber	
4	Cam	Stainless Steel		11	Head Cover	Aluminum Alloy	
5	Rod Packing	Nitrile Rubber		12	Body	Aluminum Alloy	
6	Body	Aluminum Alloy		13	Coil Spring	Steel	
7	Piston	Stainless Steel		14	Head Cover	Aluminum Alloy	

MEMO

Hand (Gripper)
LSH-HP
LSH
FH100
BSA2
BHA
BHG
BHE
LHA
LHAG
HAP-1C
HAP-2 to 4CS
HKP
HCP
HGP
LST-HP
HLF2
HLA/ HLB
HLAG/ HLBG
HLC
HLD
HMC-HP
HMF
HMF-G
HMFB
HFP
FH500
HBL
HJL
HMD
HDL
HJD
Cylinder Switch
Ending



Parallel Gripper Double Acting Type/Single Acting Type

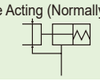
HAP-2 to 4CS Series

●Operating stroke: 16, 26, 41 mm

Double Acting



Single Acting (Normally Open)



Single Acting (Normally Closed)



RoHS

Model No. Notation Method

Without Switch
(Built-in magnet for switch)

HAP - 2CS - O - Y1

Model No. ❶ ❷ ❸

With Switch
(Built-in magnet for switch)

HAP - 2CS - O - Y1 - T2H - R

Model No. ❶Bore size ❷Actuation method ❸Attachment ❹Switch Model No. ❺Number of Switches

❶Bore Size (mm)

Code	Content
2CS	ø20
3CS	ø25
4CS	ø40

❷Actuation method

Code	Content
Blank	Standard (Double Acting Type)
O	Single Acting (Normally Open)
C	Single Acting (Normally Closed)

❸Attachment

Code	Content
Blank	Without attachments
Y1	With attachments: Material (S50C)
Y2	With attachments: Material (MC Nylon)

Note) For the outline dimensions and compatible models of the attachments, refer to P. 334 and 335. When ordered as an option, it will be shipped assembled with a quantity of 2.

❹Switch Model No.

For switch details, please refer to P. 573. 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 20 *2	T2H□	T2V□	
	1-Color Flexible Lead Wire	2-wire	-	10 to 30	-	5 to 20 *2	T2HR3	T2VR3	
	1-Color	3-wire (NPN)	-	30 or less	-	100 or less	T3H□	T3V□	
		3-wire (PNP)	-		-		T3PH□	T3PV□	

*1: For "□" in the switch model No., enter the code selected from the "*Lead wire length" 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: Switches other than the model No.s listed above are also available. (Custom Product) For details, see P. 573.

***Lead wire length**

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

Example) Lead wire length
1 m T2H
3 m T2H3
5 m T2H5

❺Number of Switches

Code	Content
R	With 1 pc. on Open Side
H	With 1 pc. on Close Side
D	With 2 pcs

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

●Structure usable in rechargeable battery manufacturing processes

HAP- •••• - P4□

*Please contact us for details.

Switch Single Unit Model No. Notation Method

●For switch T□H□

●Switch body + Mounting bracket set *1

HAP - T2H

❹Switch Model No.

●Switch body

SW - T2H

❹Switch Model No.

●Mounting bracket set *1

HAP - T

●For switch T□V□

●Switch body + Mounting bracket set *1

HAP - T2V - R

❹Switch Model No.

Code	Content
R	Open side (3CS, 4CS only)
H	Closed side

●Switch body

SW - T2V

❹Switch Model No.

●Mounting bracket set *1

HAP - TV - R

Code	Content
R	Open side (3CS, 4CS only)
H	Closed side

*1 The weight of the switch mounting bracket is 1.5 g.

Hand (Gripper)
LSH-HP
LSH
FH100
BSA2
BHA
BHG
BHE
LHA
LHAG
HAP-1C
HAP-2 to 4CS
HKP
HCP
HGP
LST-HP
HLF2
HLA/HLB
HLAG/HLBG
HLC
HLD
HMC-HP
HMF
HMF-G
HMFB
HFP
FH500
HBL
HJL
HMD
HDL
HJD
Cylinder Switch
Ending

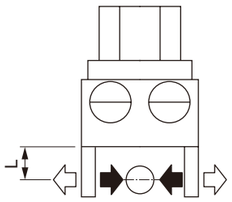
Specifications

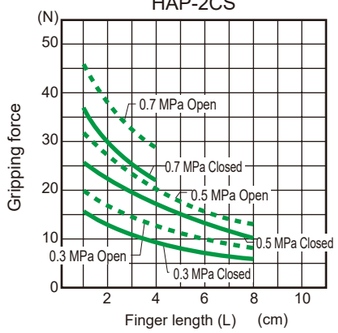
Item		HAP-2CS	HAP-3CS	HAP-4CS
Bore size	mm	ø20	ø25	ø40
Actuation method		Double Acting Type/Single Acting Type		
Operating Fluid		Compressed Air		
Max. Working Pressure	MPa	0.7		
Min. Operating Pressure	MPa	0.3		
Ambient Temperature	°C	5 to 60		
Port Size		M5		Rc1/8
Operating stroke	mm	16	26	41
Rod diameter	mm	ø10	ø14	ø16
Internal volume (reciprocating)	cm³	4.4	10.8	47.4
Repeatability	mm	±0.03		
Weight	kg	0.28	0.58	1.52
Lubrication		Not required (When lubricating, use turbine oil Class 1 ISO VG32)		

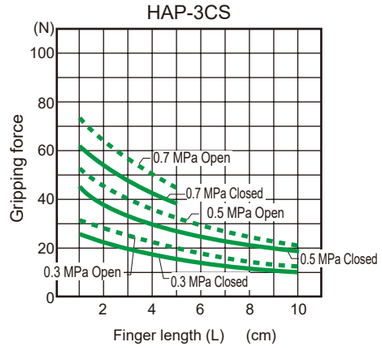
Gripping Force Performance Data

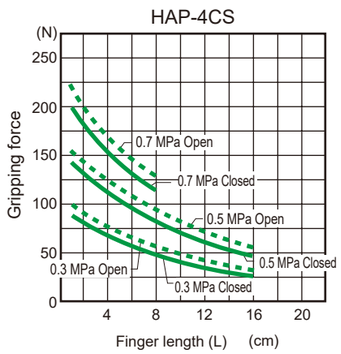
- Gripping force represents the thrust (for one finger) in the direction of the arrow shown in the figure.
- The gripping force in the opening/closing directions with finger length L of hand with a supply pressure of 0.3, 0.5 and 0.7 MPa is shown.

●Open direction (⇦) - - - - - - (broken line)
●Closing direction (➡) ——— (solid line)







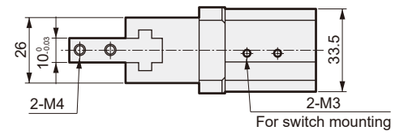


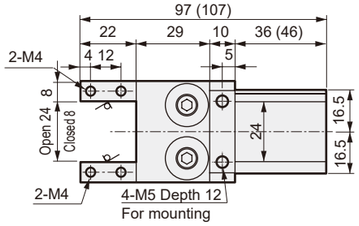
Note) **O type gripping force is approx. 20 to 30 % lower in the closing direction compared to the double acting type. C type gripping force is approx. 10 to 20 % lower in the opening direction compared to the double acting type. When selecting, check the design and selection precautions on P. 336.**

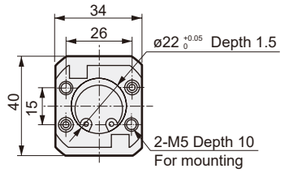
Outline Dimension Drawing

●HAP-2CS Standard/O/C

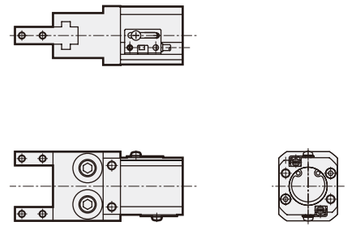
●( ) Dimensions are for C (Normally Closed) type.

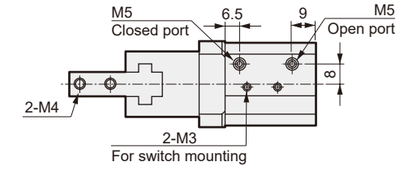






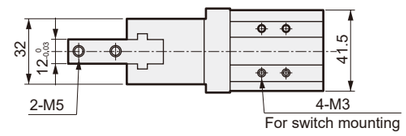
●With Switch

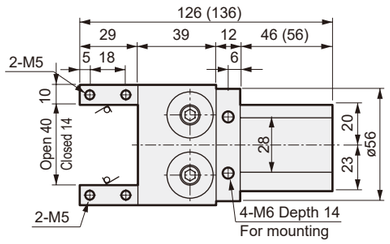


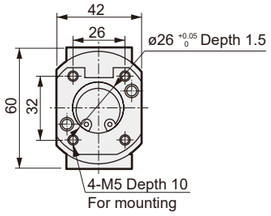


●HAP-3CS Standard/O/C

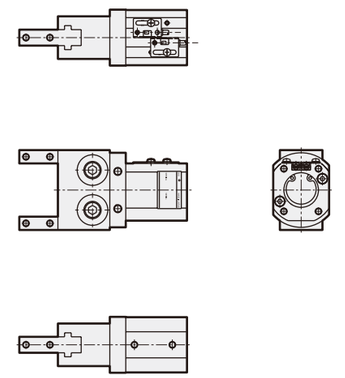
●( ) Dimensions are for C (Normally Closed) type.

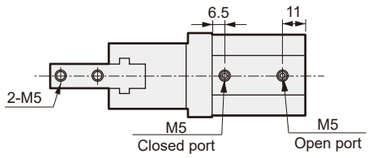






●With Switch

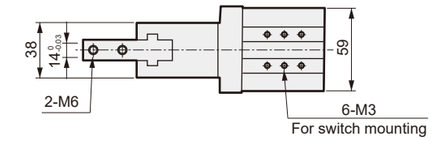


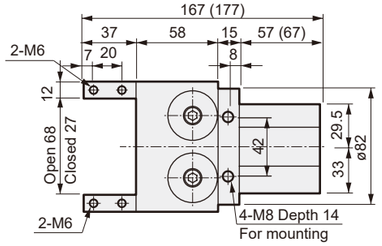


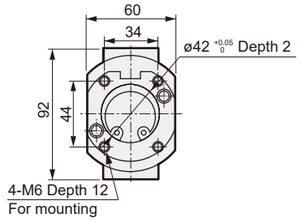
Outline Dimension Drawing

●HAP-4CS Standard/O/C

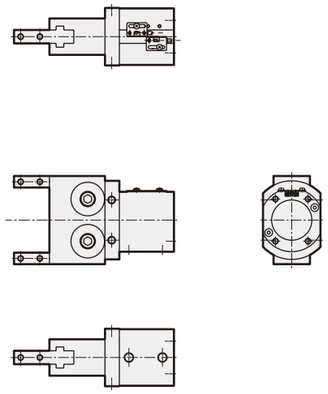
●( ) Dimensions are for C (Normally Closed) type.

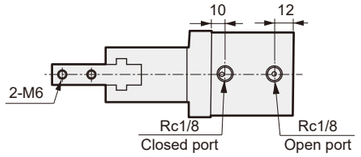






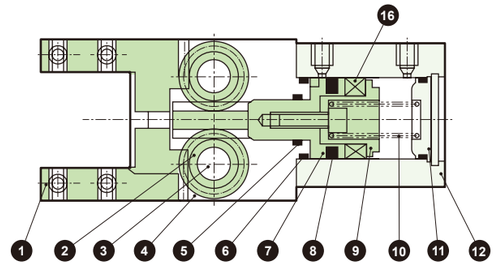
●With Switch



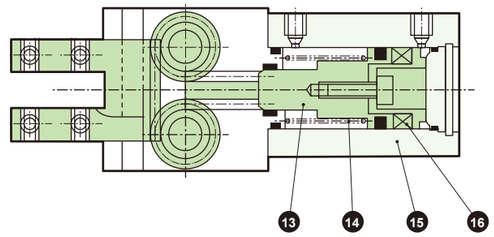


Internal Structure Diagram/Material

●Standard (double acting), O (normally open) type



● C (Normally Closed) Type



Do not disassemble

Part No.	Part Name	Material	Remarks	Part No.	Material	Part Name	Remarks
1	Finger	Steel		9	Piston B	Polyacetal	Standard, O type only
2	Pinion gear	Steel		10	Coil Spring	Stainless Steel	O type only
3	Pinion gear shaft	Steel		11	Cover	Polyacetal	
4	Body	Aluminum Alloy		12	Body	Aluminum Alloy	
5	Rod Packing	Nitrile Rubber		13	Piston	Stainless Steel	C type only
6	Gasket	Nitrile Rubber		14	Coil Spring	Stainless Steel	C type only
7	Piston A	Stainless Steel	Standard, O type only	15	Body	Aluminum Alloy	C type only
8	Piston Packing	Nitrile Rubber		16	Magnet	Plastic	



Cross Roller Parallel Gripper Double Acting Type/Single Acting Type

HKP Series

●Operating stroke: 24, 30, 36, 40, 60 mm

Double Acting



Single Acting (Normally Open)



Single Acting (Normally Closed)

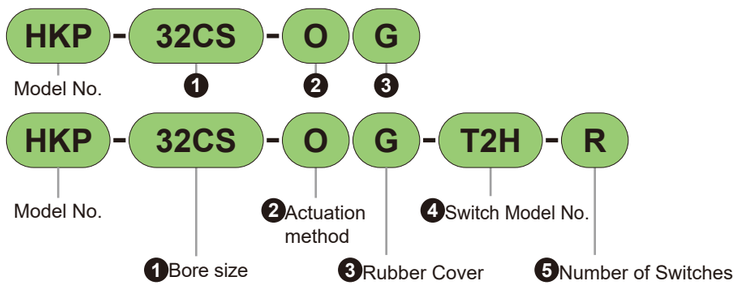


RoHS

Model No. Notation Method

Without Switch
(Built-in magnet for switch)

With Switch
(Built-in magnet for switch)



1 Bore Size (mm)

Code	Content
32CS	ø32
40CS	ø40
50CS	ø50
63CS	ø63
80CS	ø80

2 Actuation method

Code	Content
Blank	Standard (Double Acting Type)
O	Single Acting (Normally Open)
C	Single Acting (Normally Closed)

Note) For 80CS, O, C cannot be selected.

3 Rubber Cover

Code	Content
G	With rubber cover (Nitrile rubber)

Note) For 80CS, with rubber cover (G) cannot be selected.

4 Switch Model No.

For switch details, please refer to P. 573.
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 20 *2	T2H□	T2V□	
	1-Color Flexible Lead Wire	2-wire	-	10 to 30	-	5 to 20 *2	T2HR3	T2VR3	
	1-Color	3-wire (NPN)	-	30 or less	-	100 or less	T3H□	T3V□	
		3-wire (PNP)	-		-		T3PH□	T3PV□	

*1: For "□" in the switch model No., enter the code selected from the "*Lead wire length" 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: Switches other than the model No.s listed above are also available. (Custom Product) For details, see P. 573.

***Lead wire length**

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

Example) Lead wire length
1m T2H
3m T2H3
5m T2H5

5 Number of Switches

Code	Content
R	With 1 pc. on Open Side
H	With 1 pc. on Close Side
D	With 2 pcs

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

●Structure usable in rechargeable battery manufacturing processes

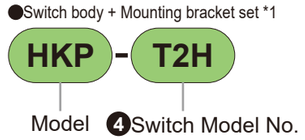
HKP- ••• -P4□

*Please contact us for details.

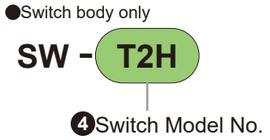
Switch Single Unit Model No. Notation Method

1: For switch T□H□

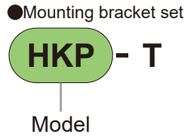
●Switch body + Mounting bracket set *1



●Switch body only

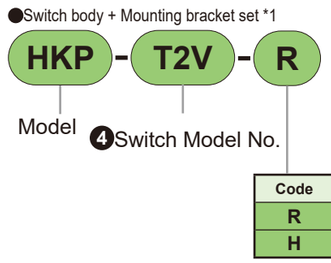


●Mounting bracket set *1



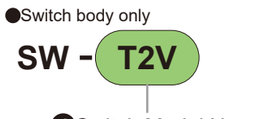
2: For switch T□V□

●Switch body + Mounting bracket set *1

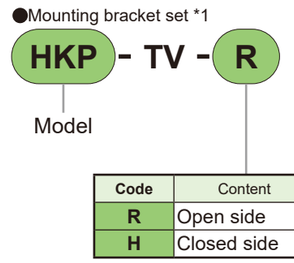


Code	Content
R	Open side
H	Closed side

●Switch body only



●Mounting bracket set *1



Code	Content
R	Open side
H	Closed side

*1: HKP-[50CS, 63CS, 80CS] can be mounted without a mounting bracket. Select "Switch body only".
*2: The weight of the switch mounting bracket is 1.5 g.

Rubber cover part model No.

Size	Part Model No.
32CS	**HKP-32K**
40CS	**HKP-40K**
50CS	**HKP-50K**
63CS	**HKP-63K**

Specifications

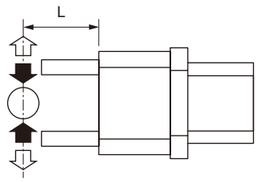
Item			HKP-32CS	HKP-40CS	HKP-50CS	HKP-63CS	HKP-80CS
Bore size		mm	ø32	ø40	ø50	ø63	ø80
Actuation method			Double Acting Type/Single Acting Type				Double Acting Type
Operating Fluid			Compressed Air				
Max. Working Pressure		MPa	0.7				
Min. Operating Pressure MPa *	Double Acting Type		0.1				0.3
	Normally Open		0.3				-
	Normally Closed						
Ambient Temperature		°C	5 to 60				
Port Size			M5	Rc1/8			Rc1/4
Operating stroke		mm	24	30	36	40	60
Rod diameter		mm	ø16	ø20	ø28	ø32	ø16
Internal volume (reciprocating)		cm^3	25.3	49.5	89.4	162.9	354.5
Repeatability		mm	±0.01				
Weight		kg	1.36	1.95	4.2	5.4	10.6
Lubrication			Not required (When lubricating, use turbine oil Class 1 ISO VG32)				

Note) When a rubber cover (option) is attached, the min. working pressure is double acting: 0.15MPa Normally Open/Normally Closed: 0.35 MPa.

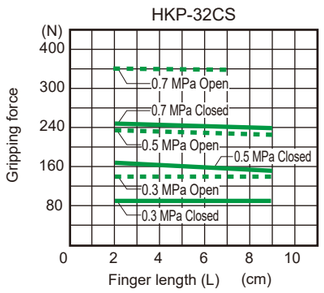
Gripping Force Performance Data

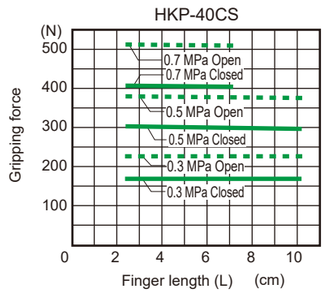
- Gripping force represents the thrust (for one finger) in the direction of the arrow shown in the figure.
- The gripping force in the opening/closing directions with finger length L of hand with a supply pressure of 0.3, 0.5 and 0.7 MPa is shown.

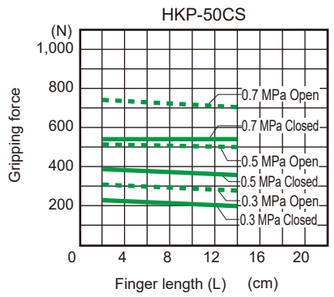
●Open direction (⇦) - - - - - (broken line)
●Closing direction (➡) ——— (solid line)

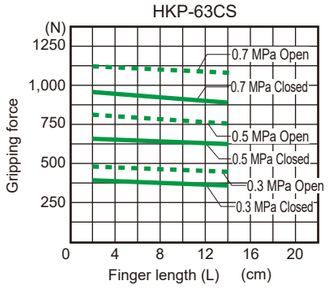


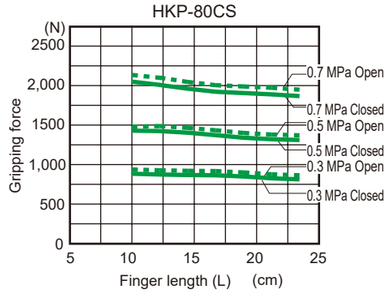
Note) **O type gripping force is approx. 20 to 30 % lower in the closing direction compared to the double acting type. C type gripping force is approx. 10 to 20 % lower in the opening direction compared to the double acting type. When selecting, check the design and selection precautions on P. 336.**









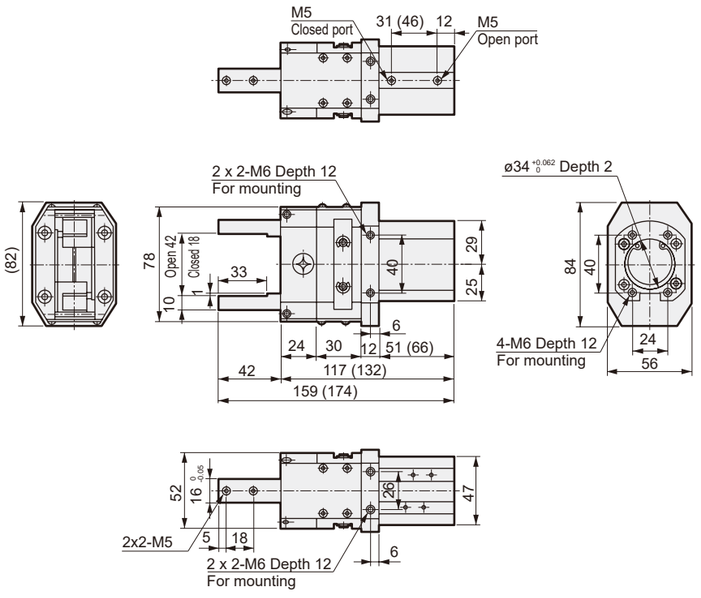


MEMO

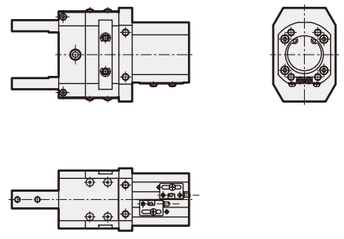
Outline Dimension Drawing

●HKP-32CS Standard/O/C

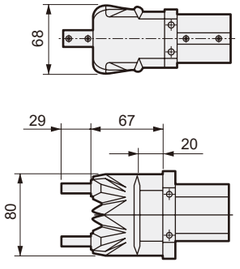
• Dimensions in ( ) are for O [Normally Open] and C [Normally Closed] specifications.



●With Switch

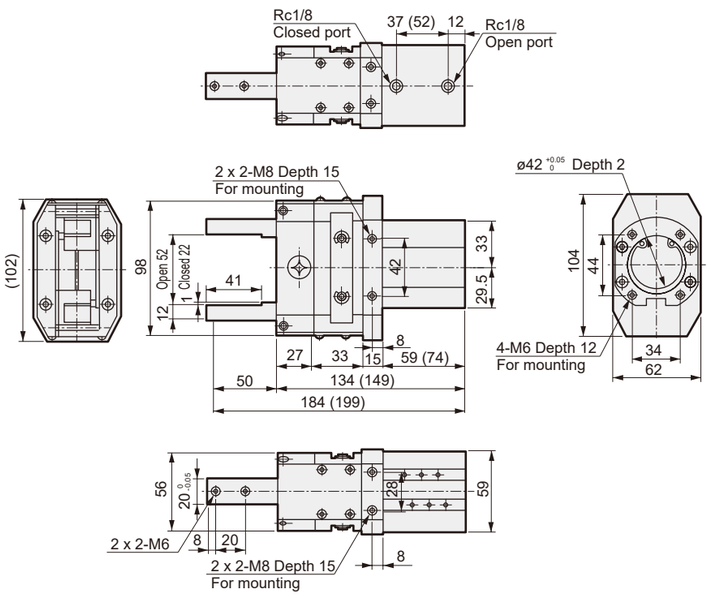


●With rubber cover

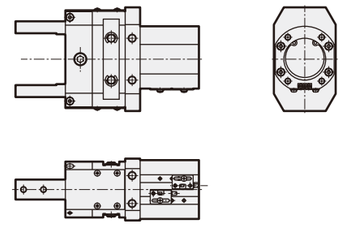


●HKP-40CS Standard/O/C

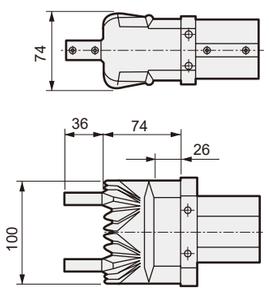
• Dimensions in ( ) are for O [Normally Open] and C [Normally Closed] specifications.



●With Switch



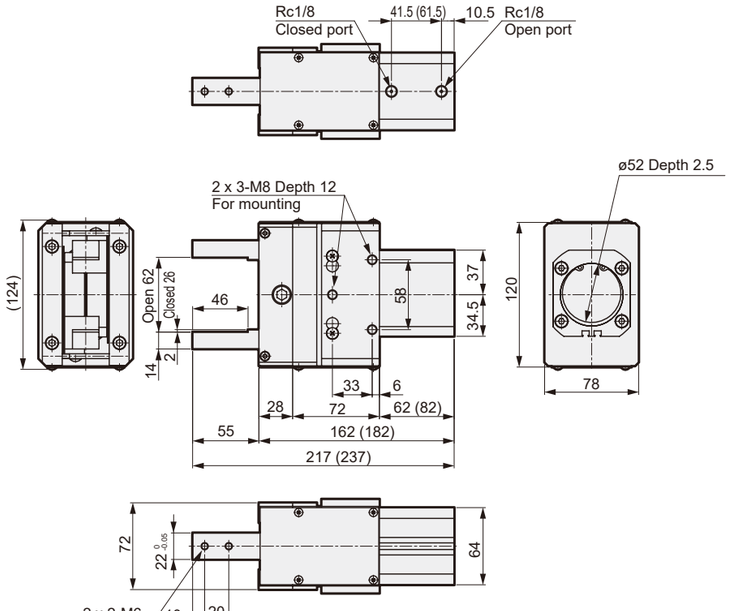
●With rubber cover



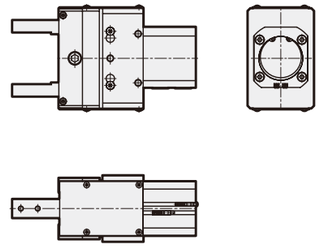
Outline Dimension Drawing

●HKP-50CS Standard/O/C

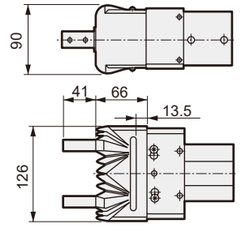
• Dimensions in ( ) are for O [Normally Open] and C [Normally Closed] specifications.



●With Switch

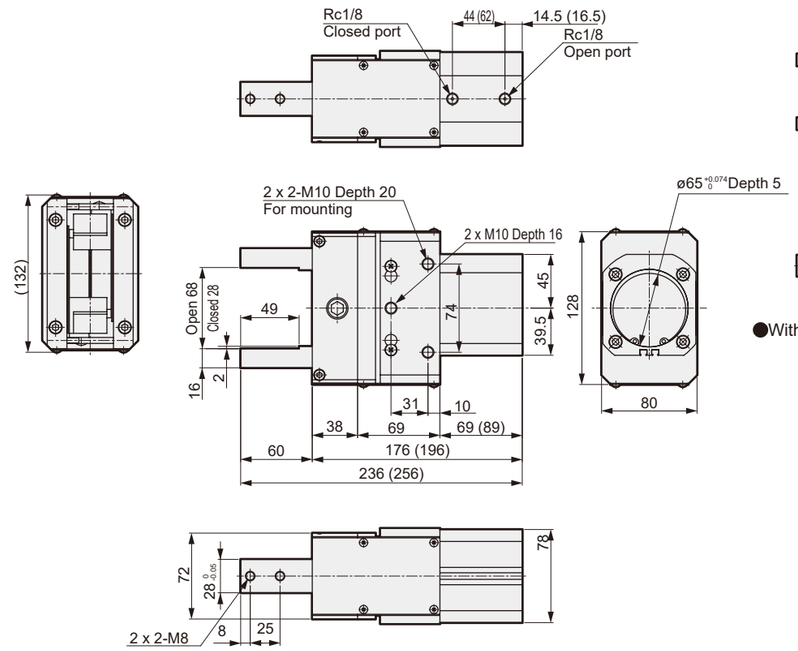


●With rubber cover

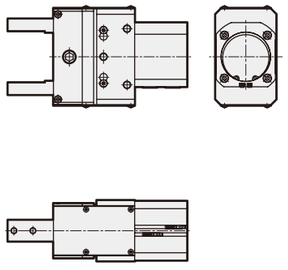


●HKP-63CS Standard/O/C

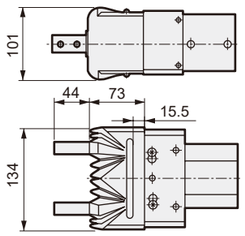
• Dimensions in ( ) are for O [Normally Open] and C [Normally Closed] specifications.



●With Switch

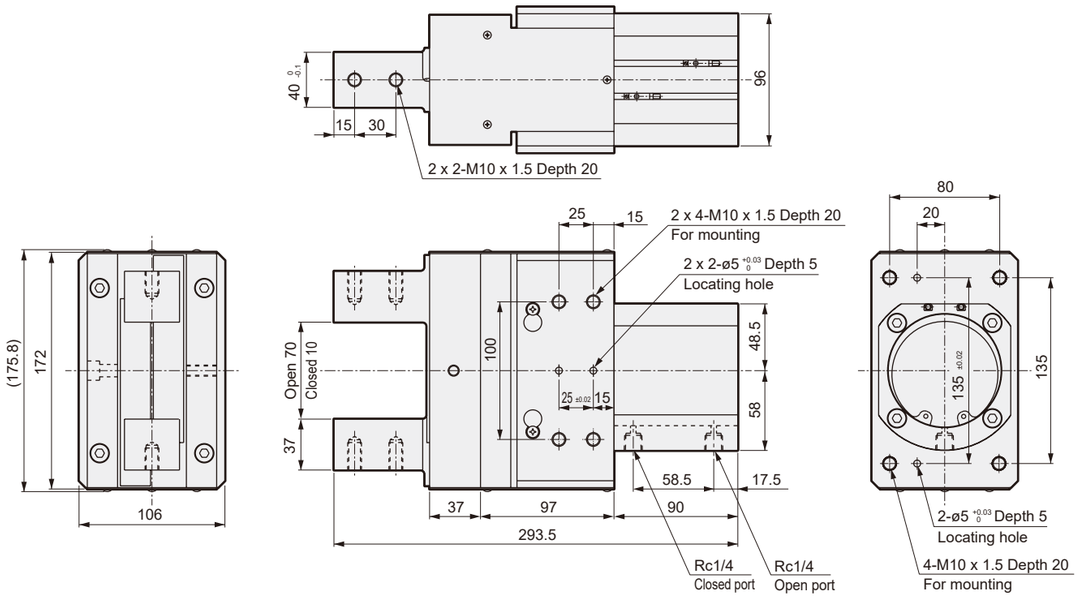


●With rubber cover



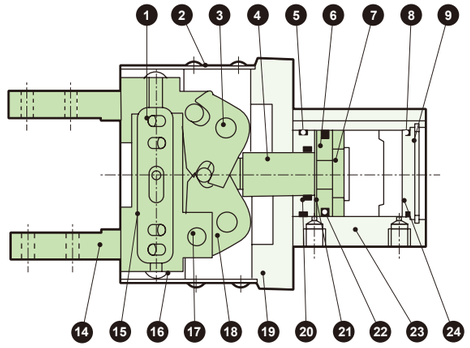
Outline Dimension Drawing

●HKP-80CS Standard

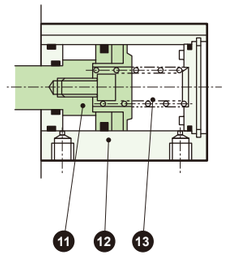


Internal Structure Diagram/Material

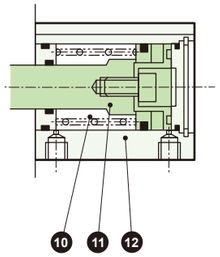
●Standard (Double Acting)



●O (Normally Open) Type



●C (Normally Closed) Type



Do not disassemble

Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Cross Roller	Alloy Steel		13	Coil Spring	Stainless Steel	
2	Side cover	Stainless Steel		14	Finger	Steel	
3	Pivot Shaft	Steel		15	Retainer	Stainless Steel	
4	Piston Rod	Stainless Steel	Standard type only	16	Bearing guide	Steel	
5	Gasket A	Nitrile Rubber		17	Operating Shaft	Steel	
6	Piston A	Aluminum Alloy	Standard type only	18	Arm	Stainless Steel	
7	Piston B	32CS: Polyacetal 40 to 63CS: Stainless Steel 80CS: Aluminum Alloy		19	Adapter	Aluminum Alloy	
				20	Rod Packing	Nitrile Rubber	
8	Gasket B	Nitrile Rubber		21	Cushion	Resin	
9	Retaining ring	Stainless Steel		22	Piston Packing	Nitrile Rubber	
10	Coil Spring	Stainless Steel		23	Body	Aluminum Alloy	Standard type only
11	Piston	Stainless Steel		24	Cover	32CS, 50 to 80CS: Aluminum Alloy 40CS: Polyacetal	
12	Adapter	Aluminum Alloy					



Horizontal Parallel Gripper Double Acting Type

HCP Series

●Operating stroke: 20, 30, 40 mm

Double Acting



RoHS

Model No. Notation Method

Without Switch
(Built-in magnet for switch)

HCP – 2CS – Y1

Model No. ❶ ❷

With Switch
(Built-in magnet for switch)

HCP – 2CS – Y1 – T2H – R

Model No. ❷Attachment ❸Switch Model No. ❹Number of Switches

❶Bore size

❶Bore Size (mm)

Code	Content
2CS	ø12
3CS	ø20
4CS	ø32

❷Attachment

Code	Content
Blank	Without attachments
Y1	With attachments: Material (S50C)
Y2	With attachments: Material (MC Nylon)

Note) For the outline dimensions and compatible models of the attachments, refer to P. 334 and 335. When ordered as an option, it will be shipped pre-assembled with a quantity of 2.

❸Switch Model No.

For switch details, please refer to P. 573. 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 20 *2	T2H□	T2V□	
	1-Color Flexible Lead Wire	2-wire	-	10 to 30	-	5 to 20 *2	T2HR3	T2VR3	
	1-Color	3-wire (NPN)	-	30 or less	-	100 or less	T3H□	T3V□	
		3-wire (PNP)	-		-		T3PH□	T3PV□	

*1: For "□" in the switch model No., enter the code selected from the "*Lead wire length" 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: Switches other than the model No.s listed above are also available. (Custom Product) For details, see P. 573.

***Lead wire length**

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

Example) Lead wire length
1 m T2H
3 m T2H3
5 m T2H5

❹Number of Switches

Code	Content
R	With 1 pc. on Open Side
H	With 1 pc. on Close Side
D	With 2 pcs

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

●Design compatible with rechargeable battery manufacturing process

HCP– •••• – P4□

*Please contact us for details.

Switch Single Unit Model No. Notation Method

●For switch T□H*

・Switch body + Mounting bracket set *1: HCP – T2H
❸Switch Model No.

・Switch body: SW – T2H
❸Switch Model No.

・Mounting bracket set *1: HCP – T

●For switch T□V*

・Switch body + Mounting bracket set *1: HCP – T2V – R
❸Switch Model No.

Code	Content
R	Open side
H	Closed side

・Switch body: SW – T2V
❸Switch Model No.

・Mounting bracket set *1: HCP – TV – R

Code	Content
R	Open side
H	Closed side

*1 The weight of the switch mounting bracket is 1.5 g.

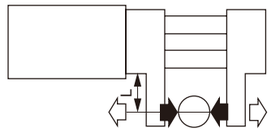
Specifications

Item		HCP-2CS	HCP-3CS	HCP-4CS
Bore size	mm	ø12	ø20	ø32
Actuation method		Double Acting Type		
Operating Fluid		Compressed Air		
Max. Working Pressure	MPa	0.7		
Min. Operating Pressure	MPa	0.3		
Ambient Temperature	°C	5 to 60		
Port Size		M5		Rc1/8
Operating stroke	mm	20	30	40
Rod diameter	mm	ø10	ø12	ø16
Internal volume (reciprocating)	cm³	2.3	9.4	32.1
Repeatability	mm	±0.05		
Weight	kg	0.52	0.98	1.90
Lubrication		Not required (When lubricating, use turbine oil Class 1 ISO VG32)		

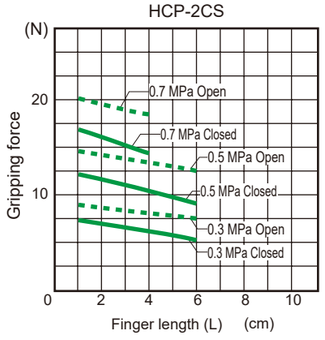
Gripping Force Performance Data

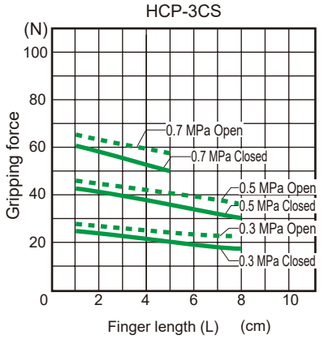
- Gripping force represents the thrust (for one finger) in the direction of the arrow shown in the figure.
- The gripping force in the opening/closing directions with finger length L of hand with a supply pressure of 0.3, 0.5 and 0.7 MPa is shown.

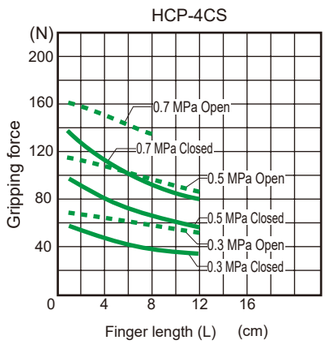
●Open direction (⇦) ------ (broken line)
●Closing directio0n (➡) —— (solid line)



Note) When selecting, check the design and selection precautions on P. 336.

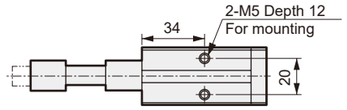


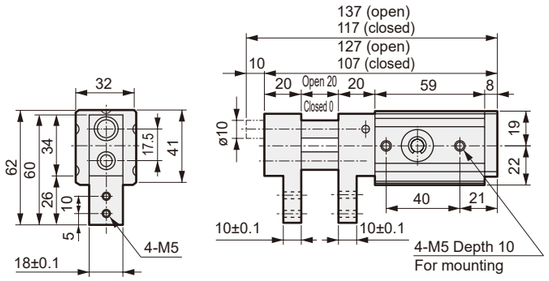


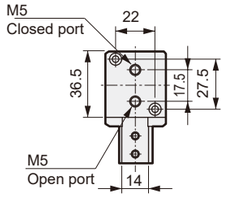


Outline Dimension Drawing

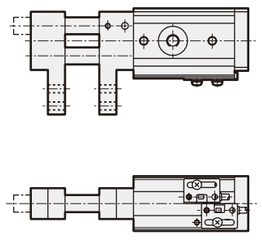
●HCP-2CS Standard

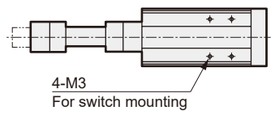




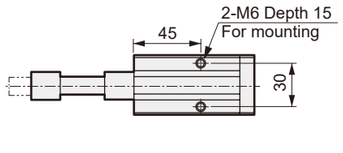


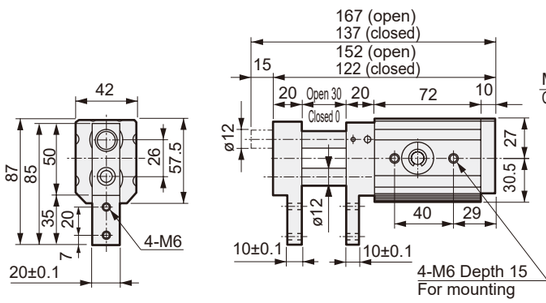
●With Switch

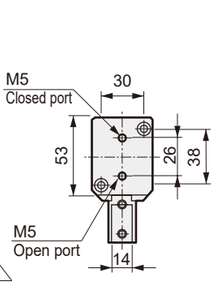




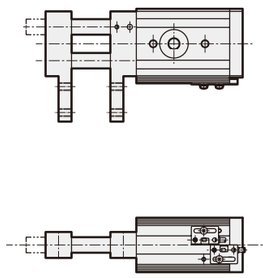
●HCP-3CS Standard

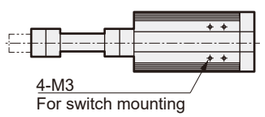






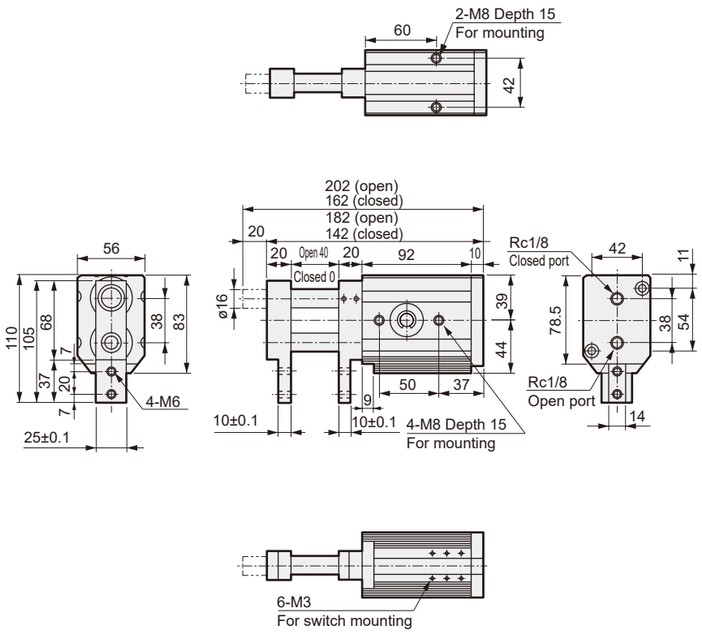
●With Switch



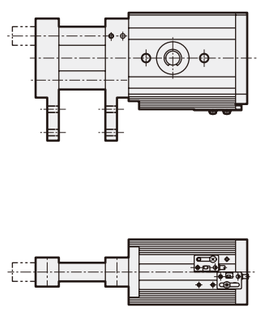


Outline Dimension Drawing

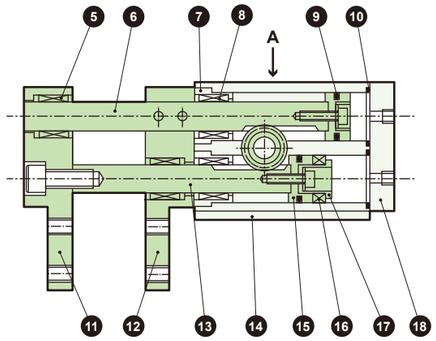
●HCP-4CS Standard

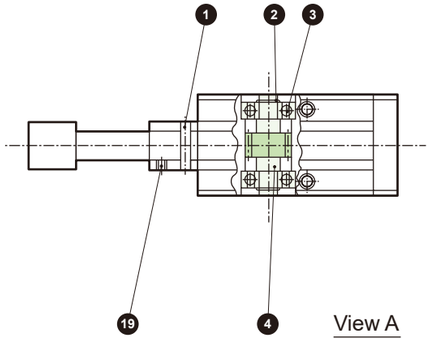


●With Switch



Internal Structure Diagram/Material





Do not disassemble

Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Spring Pin	Steel		11	Finger B	Steel	
2	Grip retaining ring	Steel		12	Finger A	Steel	
3	Bearing	Steel		13	Piston Rod B	Stainless Steel	
4	Pinion gear	Stainless Steel		14	Body	Aluminum Alloy	
5	Needle bearing	Steel		15	Piston A	Aluminum Alloy	
6	Piston Rod A	Stainless Steel		16	Magnet		
7	Rod Cover	Aluminum Alloy		17	Piston B	Polyacetal	
8	Needle bearing	Steel		18	Head Cover	Aluminum Alloy	
9	Piston Packing	Nitrile Rubber		19	Hexagon socket head set screw	Alloy Steel	
10	Gasket	Nitrile Rubber					

Hand (Gripper)
LSH-HP
LSH
FH100
BSA2
BHA
BHG
BHE
LHA
LHAG
HAP-1C
HAP-2 to 4CS
HKP
HCP
HGP
LST-HP
HLF2
HLA/ HLB
HLAG/ HLBG
HLC
HLD
HMC-HP
HMF
HMF-G
HMFB
HFP
FH500
HBL
HJL
HMD
HDL
HJD
Cylinder Switch
Ending



Long Stroke Parallel Gripper Double Acting/Single Acting Types

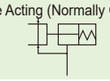
HGP Series

● Operating stroke: 56 mm

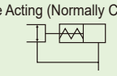
Double Acting



Single Acting (Normally Open)



Single Acting (Normally Closed)



RoHS

Model No. Notation Method

Without Switch
(Built-in magnet for switch)

HGP - 3CS - O

HGP: Model No. / 3CS: ❶ / O: ❷

With Switch
(Built-in magnet for switch)

HGP - 3CS - O - T2H - R

HGP: Model No. / 3CS: ❶ Bore size / O: ❷ Actuation method / T2H: ❸ Switch Model No. / R: ❹ Number of Switches

❶Bore size

Code	Content
3CS	ø25

❷Actuation method

Code	Content
Blank	Standard (Double Acting Type)
O	Single Acting (Normally Open)
C	Single Acting (Normally Closed)

❸Switch Model No.

For switch details, please refer to P. 573. 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 20 *2	T2H□	T2V□	
	1-Color Flexible Lead Wire	2-wire	-	10 to 30	-	5 to 20 *2	T2HR3	T2VR3	
	1-Color	3-wire (NPN)	-	30 or less	-	100 or less	T3H□	T3V□	
		3-wire (PNP)	-		-		T3PH□	T3PV□	

*1: For "□" in the switch model No., enter the code selected from the "*Lead wire length" 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: Switches other than the model No.s listed above are also available. (Custom Product) For details, see P. 573.

***Lead wire length**

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

Example) Lead wire length
1 m T2H
3 m T2H3
5 m T2H5

❹Number of Switches

Code	Content
R	With 1 pc. on Open Side
H	With 1 pc. on Close Side
D	With 2 pcs

Switch Single Unit Model No. Notation Method

●For switch T□H□

・Switch body + Mounting bracket set *1

HGP - T2H

❸Switch Model No.

・Switch body

SW - T2H

❸Switch Model No.

・Mounting bracket set *1

HGP - T

●For switch T□V□

・Switch body + Mounting bracket set *1

HGP - T2V - □

❸Switch Model No.

Code	Content
R	Open side
H	Closed side

・Switch body

SW - T2V

❸Switch Model No.

・Mounting bracket set *1

HGP - TV - □

Code	Content
R	Open side
H	Closed side

*1 The weight of the switch mounting bracket is 1.5 g.

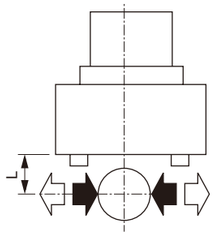
Specifications

Item		HGP-3CS
Bore size	mm	ø25
Actuation method		Double Acting Type/Single Acting Type
Operating Fluid		Compressed Air
Max. Working Pressure	MPa	0.7
Min. Operating Pressure	MPa	0.3
Ambient Temperature	°C	5 to 60
Port Size		M5
Operating stroke	mm	56
Rod diameter	mm	ø10
Internal volume (reciprocating)	cm^3	11.8
Repeatability	mm	±0.03
Weight	kg	0.85
Lubrication		Not required (When lubricating, use turbine oil Class 1 ISO VG32)

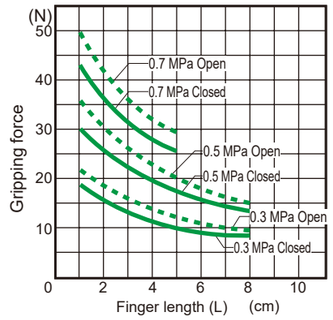
Gripping Force Performance Data

- Gripping force represents the thrust (for one finger) in the direction of the arrow shown in the figure.
- The gripping force in the opening/closing directions with finger length L of hand with a supply pressure of 0.3, 0.5 and 0.7 MPa is shown.

●Open direction (⇦) ------ (broken line)
●Closing direction (➡) —— (solid line)



HGP-3CS



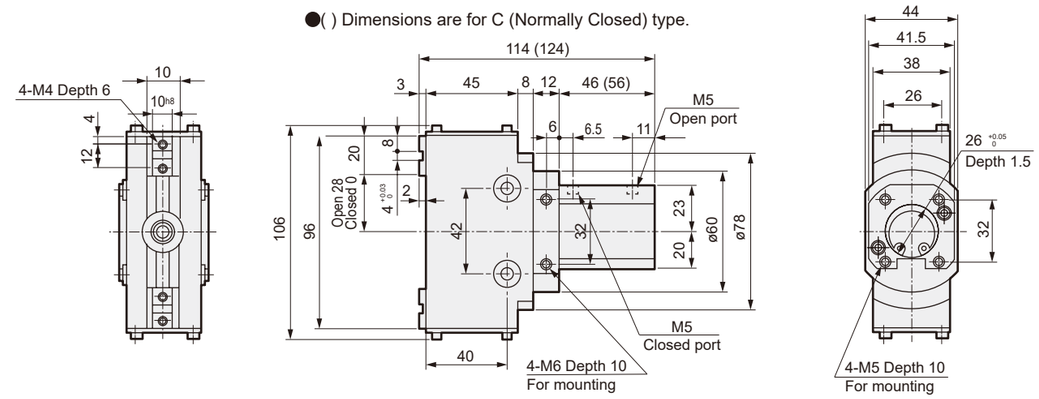
Note) **When selecting, check the design and selection precautions on P. 336.**

Note) O type gripping force is approx. 20 to 30 % lower in the closing direction compared to the double acting type. C type gripping force is approx. 10 to 20 % lower in the opening direction compared to the double acting type.

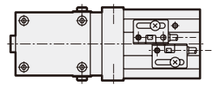
Outline Dimension Drawing

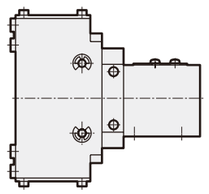
●HGP-3CS Standard/O/C

●( ) Dimensions are for C (Normally Closed) type.



●With Switch

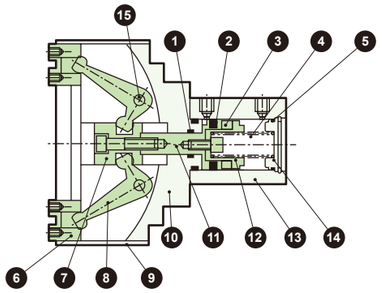




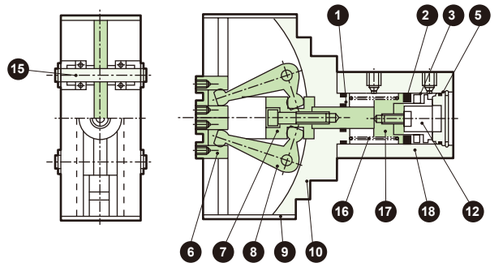


Internal Structure Diagram/Material

●Standard (double acting), O (normally open) type



●C (Normally Closed) Type



Do not disassemble

Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Rod Packing	Nitrile Rubber		10	Adapter	Aluminum Alloy	
2	Piston Packing	Nitrile Rubber		11	Piston A	Stainless Steel	
3	Magnet			12	Piston B	Polyacetal	
4	Coil Spring	Steel	O type only	13	Body	Aluminum Alloy	
5	Cylinder Gasket	Nitrile Rubber		14	Cover	Polyacetal	
6	Finger	Steel		15	Pivot Shaft	Steel	
7	Operating ring	Steel		16	Coil Spring	Stainless Steel	
8	Arm	Steel		17	Piston	Stainless Steel	
9	Side cover	Stainless Steel		18	Cylinder	Aluminum Alloy	

MEMO

Low Profile Long Stroke Gripper

LST-HP1 Series

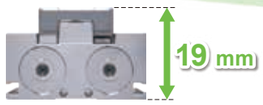
Evolved low profile linear slide gripper pursuing high rigidity, long life, and high precision



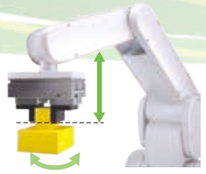
Low profile design with double piston system

Space-saving **Reduced moment of inertia**

Reduced height enables space saving and also contributes to reducing the moment of inertia.



*For LST-08



High gripping force

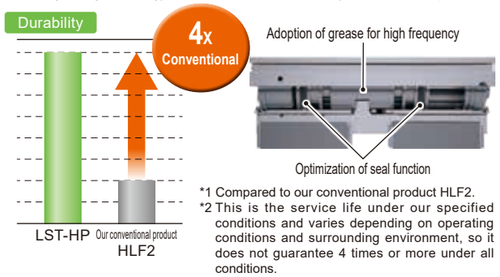
Adopts a double piston system to achieve high gripping force in a compact size.



Long service life

Durability 4 times conventional *1 *2

Mastering sliding technology, achieved 4 times the durability of conventional products.



*1 Compared to our conventional product HLF2.
*2 This is the service life under our specified conditions and varies depending on operating conditions and surrounding environment, so it does not guarantee 4 times or more under all conditions.

Improved linear guide performance

High rigidity | High precision

Overhang amount UP **Repeatability ±0.03 mm**

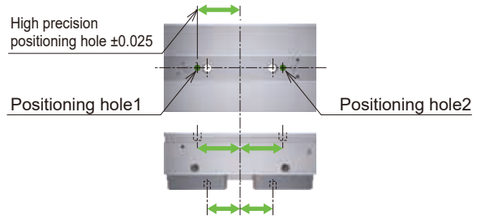
By increasing guide rigidity compared to conventional products, an increase in allowable moment has been achieved.



Reduced on-site man-hours

High-precision positioning hole ±0.025 mm

Centering accuracy can be easily reproduced by adding a "positioning hole" based on the gripping center.



Flexible lead wire switch selectable

A switch using a highly flexible lead wire that is resistant to disconnection even when used in moving parts can be selected.

Usage examples - Reduction of on-site man-hours -

Replacement of main body

Locating holes that guarantee centering accuracy enable highly reproducible mounting without fine adjustment.
Contributes to reduction of mounting adjustment man-hours and improvement of reproducibility.

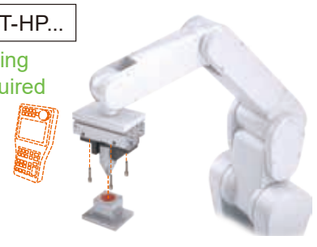
Conventionally...

Teaching



With LST-HP...

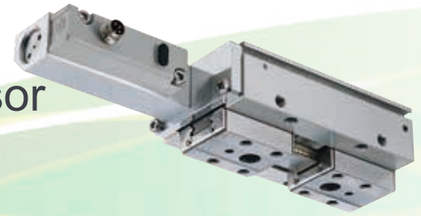
Teaching not required



Low Profile Long Stroke Gripper with Length Measuring Function

LSTM-HP2 Series

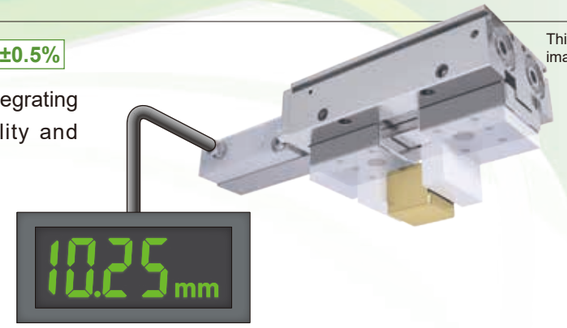
Low profile long stroke parallel gripper with built-in LVDT sensor and length measuring function



High precision

Repeatability ±0.04 mm **Linearity F.S. ±0.5%**

By adopting a new sensor method and integrating it, we have achieved higher repeatability and linearity than ever before.



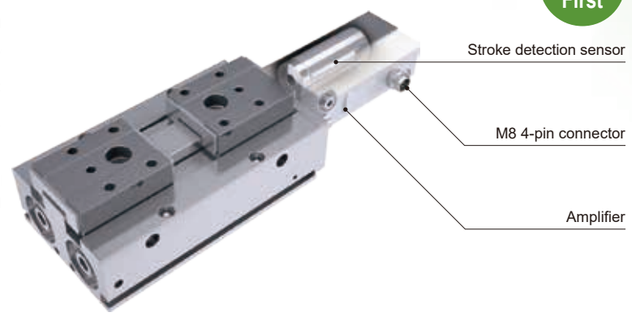
This is an image.

Integrated structure

Industry First

Adopts LVDT* method sensor with excellent vibration and shock resistance. By incorporating a displacement sensor into the body and creating an integrated structure, high precision has been achieved.

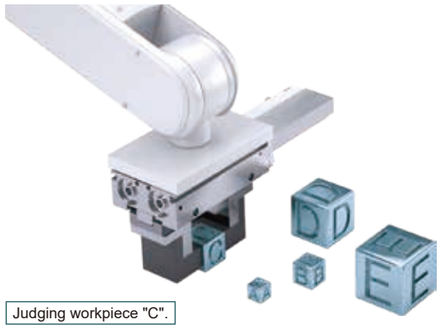
* LVDT is an abbreviation for Linear Variable Differential Transformer, and is a sensor that converts mechanical displacement into an electrical signal and outputs it.



Usage Examples

Workpiece type judgment

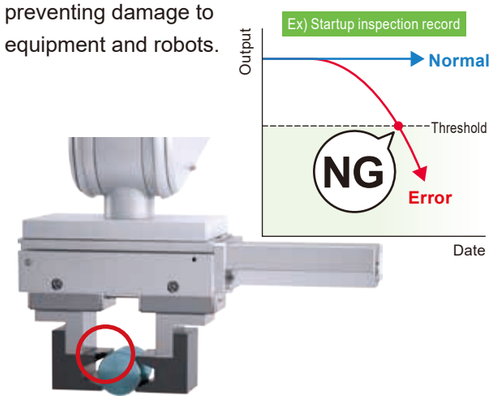
Even minute differences in workpiece type can be judged instantly.



Judging workpiece "C".

Predictive maintenance

Abnormal wear and deformation of gripping fingers and jigs can be monitored from changes in output, preventing damage to equipment and robots.





Low Profile Long Stroke Gripper Double Acting Type (High Durability Equipment)

LST-HP1 Series

●Operating stroke: Short stroke : 8, 12, 16, 20 mm
Middle stroke : 16, 24, 32, 40 mm
Long stroke : 32, 48, 64, 80 mm

Double Acting Type



RoHS

Model No. Notation Method

Without Switch
(Built-in magnet for switch)

LST - 08 - A - 1 - N —— HP1

Model No. ❶ ❷ ❸ ❹

With Switch
(Built-in magnet for switch)

LST - 08 - A - 1 - N - F2H - D - HP1

Model No. ❷Stroke ❹High-precision positioning hole ❻Number of Switches
❶Bore size ❸Port Position ❺Switch Model No.

❶Bore Size (mm)

Code	Content
08	ø8
12	ø12
16	ø16
20	ø20

❷Stroke

Code	Content	Stroke (mm)			
		ø8	ø12	ø16	ø20
A	Short stroke	8	12	16	20
B	Middle stroke	16	24	32	40
C	Long stroke	32	48	64	80

❸Port Position

Code	Content
1	Axial piping
2	Side piping

❹High-precision positioning hole

Code	Content
N	None
A	Available

❺Switch Model No.

For switch details, please refer to P. 573.
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 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□	

*Lead wire length

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

Example) Lead wire length
1 m F2S
3 m F2S3

*1: For "□" in the switch model number, enter the code selected from the "*Lead wire length" 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: Switches other than the model numbers listed above are also available. (Custom Product) For details, see P. 573.
*4: When installing a 2-color indicator switch, please consult our sales office.

❻Number of Switches

Code	Content
R	With 1 pc. on Open Side
H	With 1 pc. on Close Side
D	With 2 pcs

Switch Single Unit Model No. Notation Method

SW - F2H

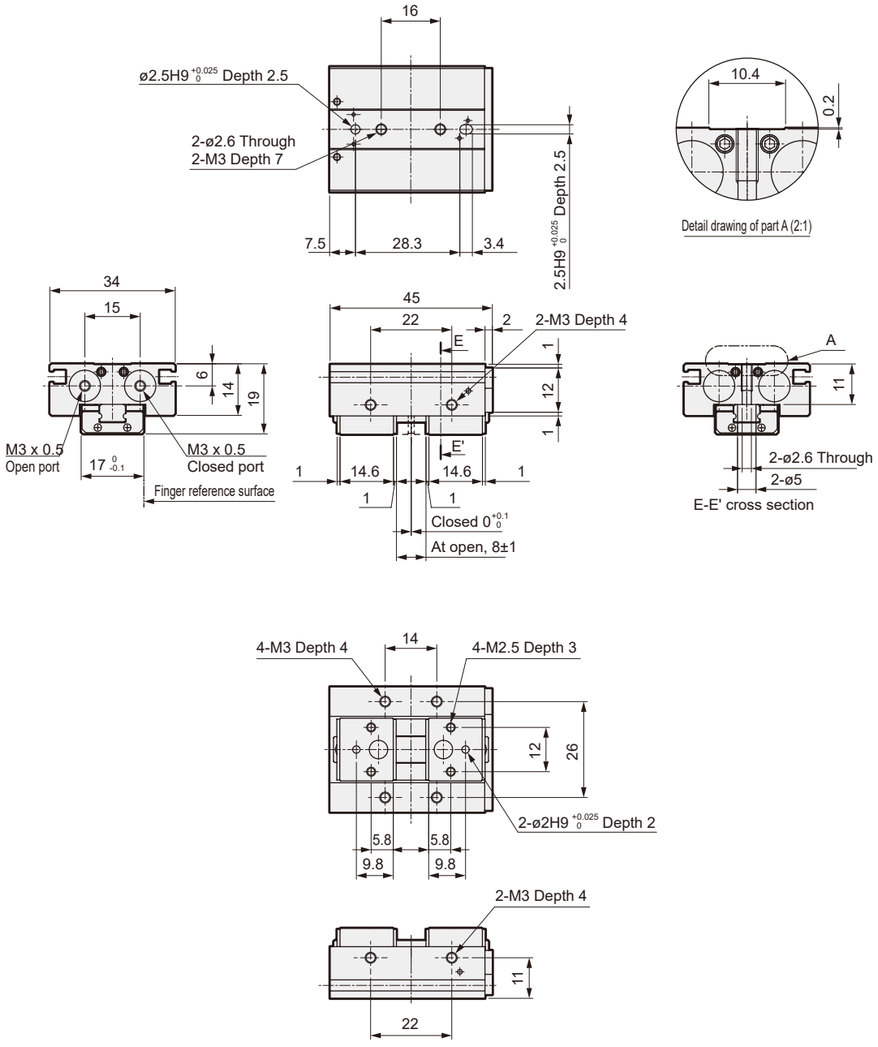
❺Switch Model No.

Specifications

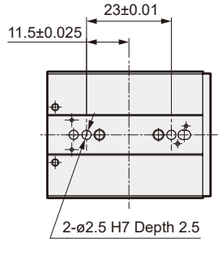
Item	LST-08 A	LST-08 B	LST-08 C	LST-12 A	LST-12 B	LST-12 C	LST-16 A	LST-16 B	LST-16 C	LST-20 A	LST-20 B	LST-20 C
Bore size mm	ø8 x 2			ø12 x 2			ø16 x 2			ø20 x 2		
Actuation method	Double Acting Type											
Operating Fluid	Compressed Air											
Max. Working Pressure MPa	0.7											
Min. Operating Pressure MPa	0.15			0.1								
Ambient Temperature °C	-10 to 60 (No freezing)											
Port Size	M3			M5								
Operating stroke mm	8	16	32	12	24	48	16	32	64	20	40	80
Repeatability mm	±0.03											
Weight kg	0.09	0.12	0.16	0.19	0.24	0.34	0.42	0.54	0.79	0.78	1.03	1.49
Lubrication	Not Required											

Outline Dimensional Drawing (Bore size: ø8 Short stroke)

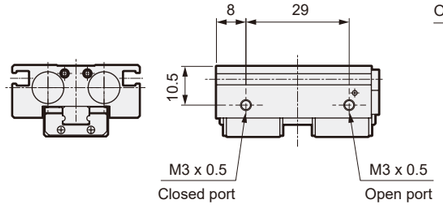
●LST-08A1N



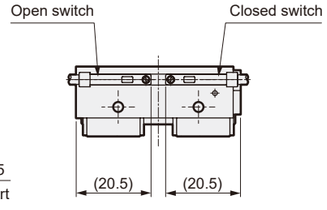
●LST-08A□A



●LST-08A2□

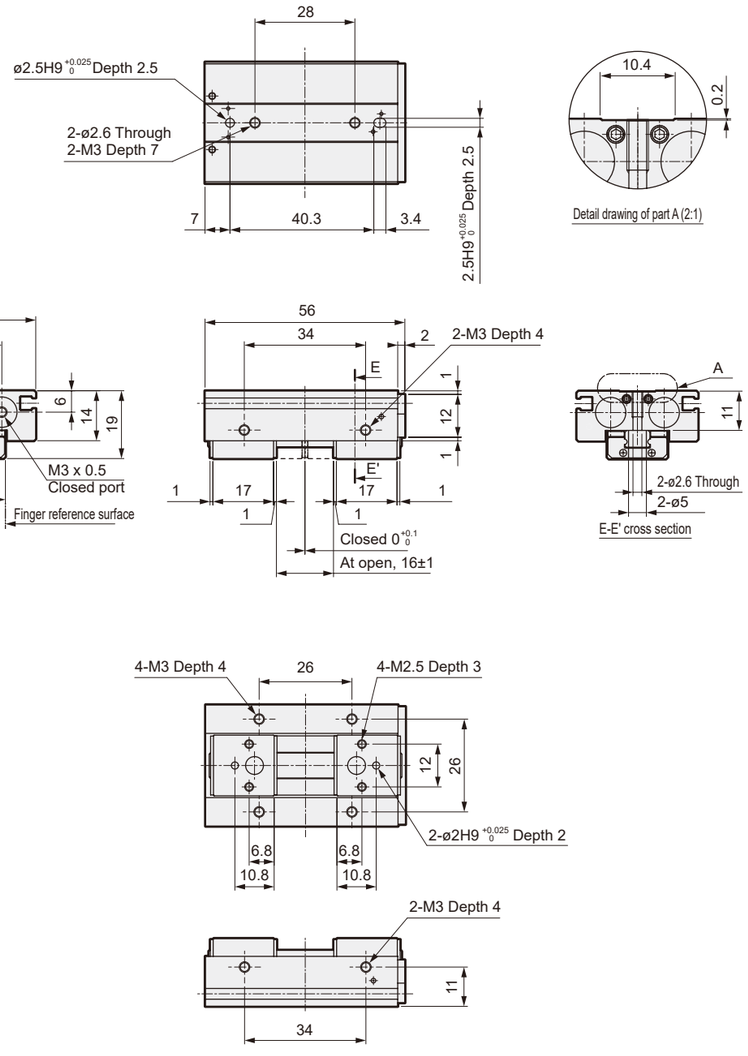


●With Switch

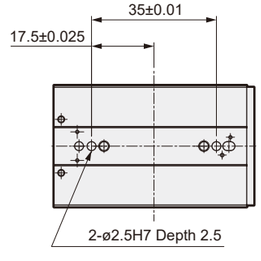


Outline Dimensional Drawing (Bore size: ø8 Middle stroke)

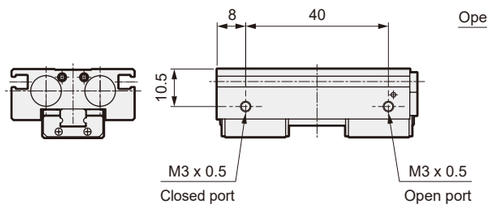
●LST-08B1N



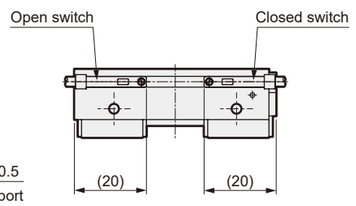
●LST-08B□A



●LST-08B2□

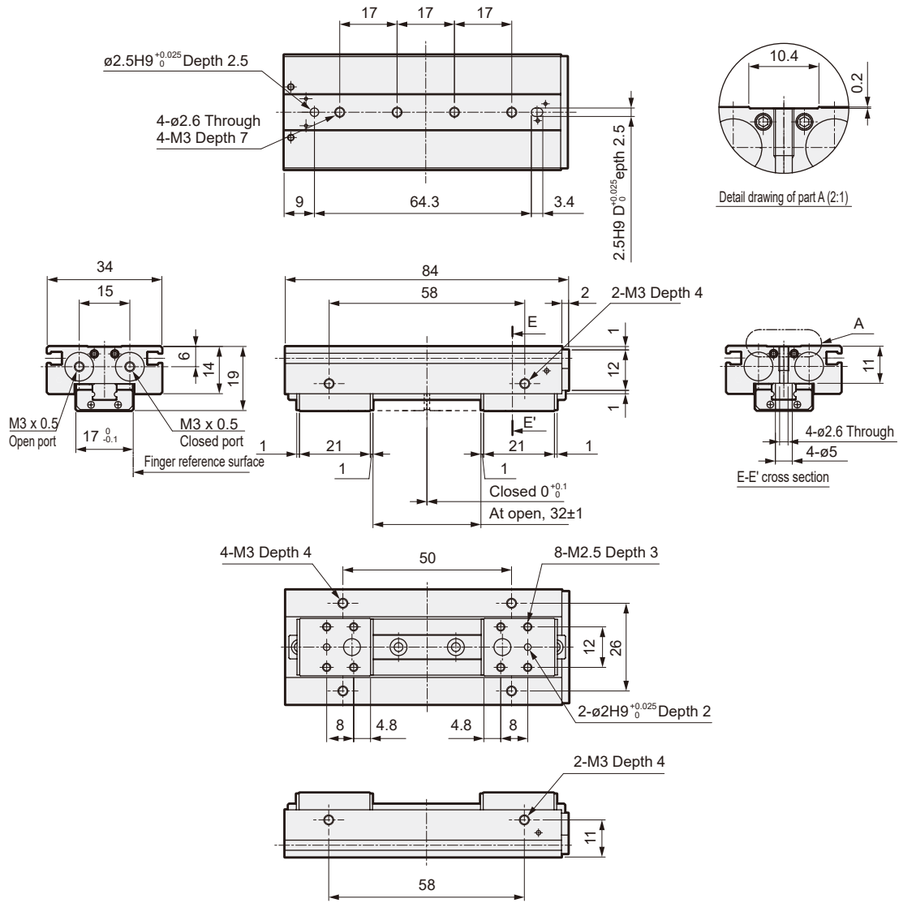


●With Switch

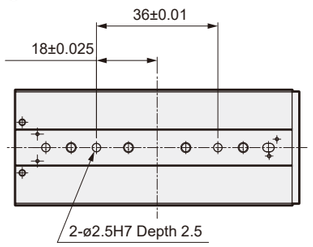


Outline Dimensional Drawing (Bore size: ø8 Long stroke)

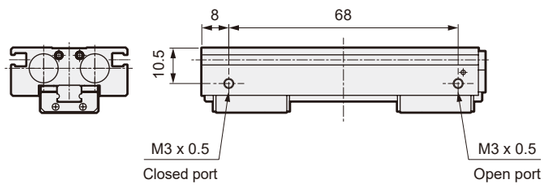
●LST-08C1N



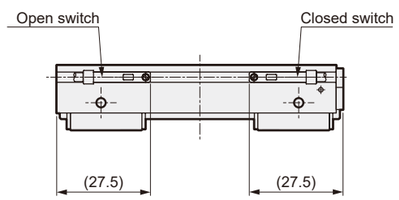
●LST-08C□A



●LST-08C2□

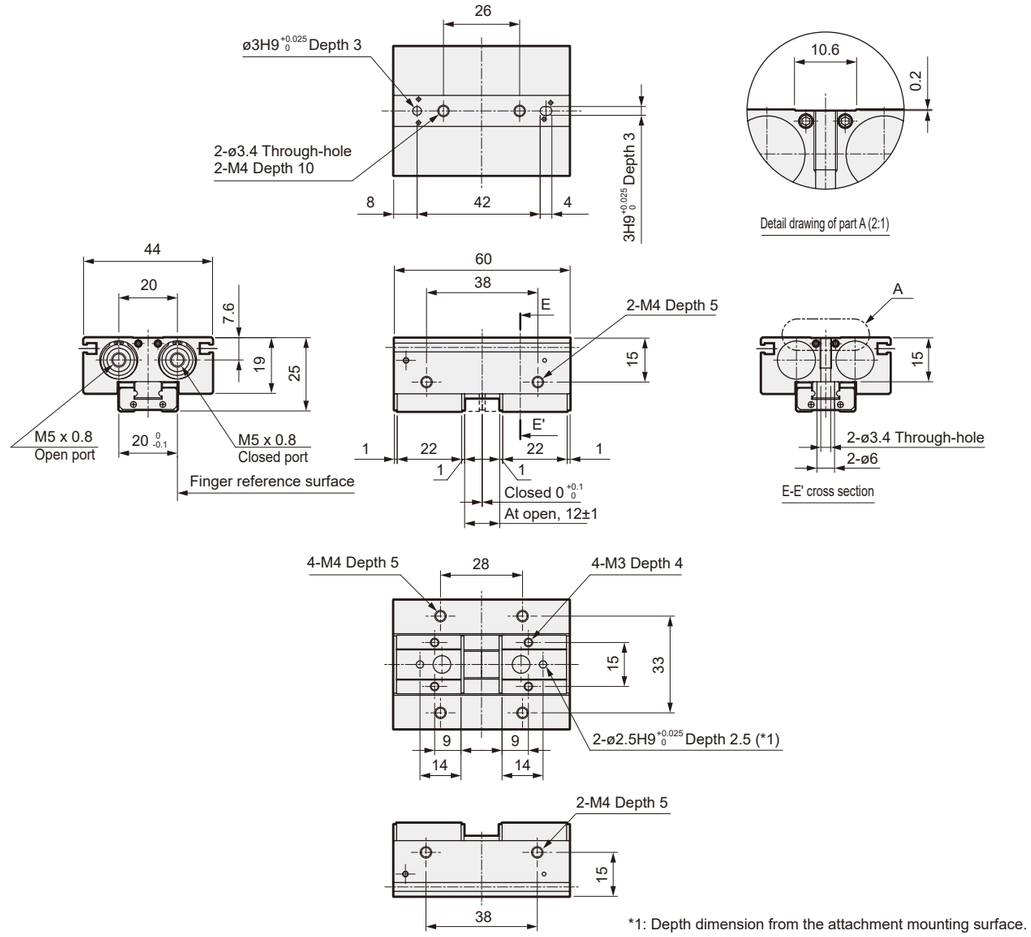


●With Switch



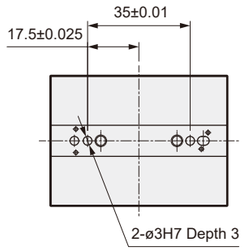
Outline Dimensional Drawing (Bore size: ø12 Short stroke)

●LST-12A1N

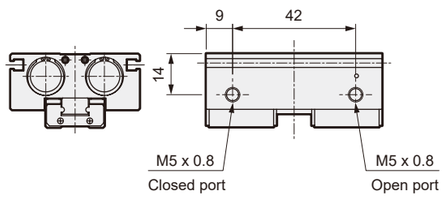


*1: Depth dimension from the attachment mounting surface.

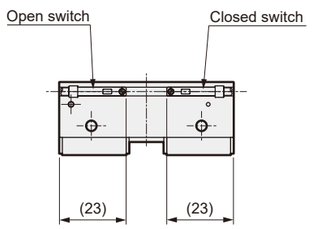
●LST-12A□A



●LST-12A2□

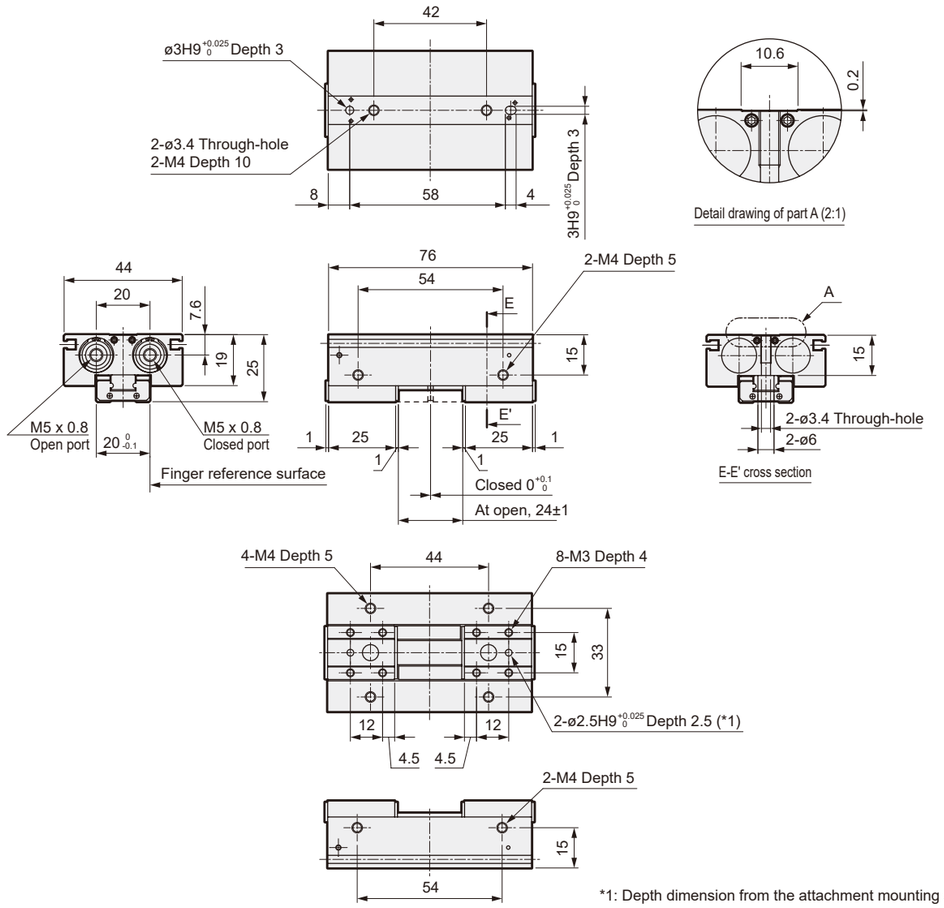


●With Switch



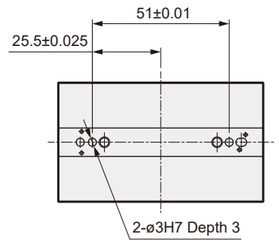
Outline Dimensional Drawing (Bore size: ø12 Middle stroke)

●LST-12B1N

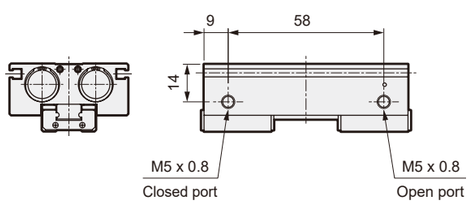


*1: Depth dimension from the attachment mounting surface.

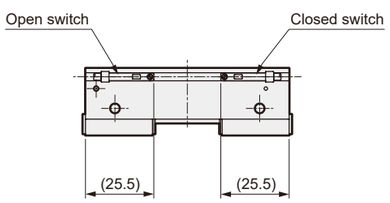
●LST-12B□A



●LST-12B2□

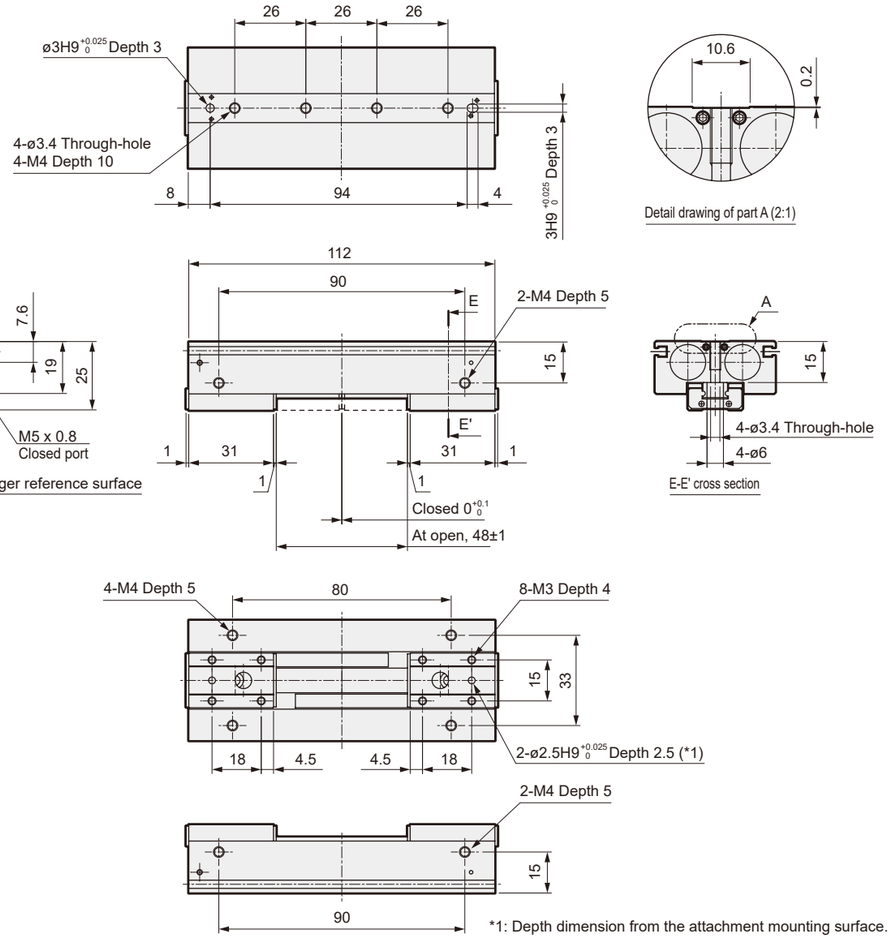


●With Switch



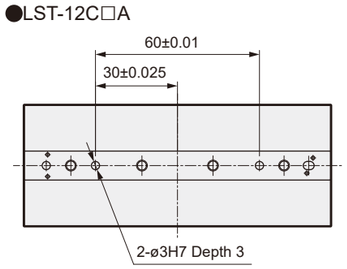
Outline Dimensional Drawing (Bore size: ø12 Long stroke)

●LST-12C1N

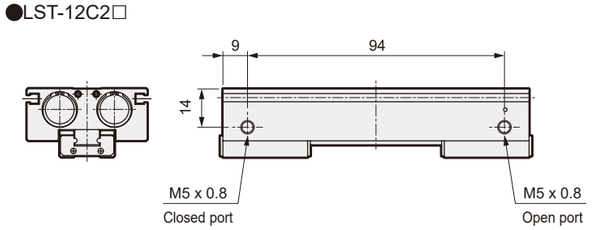


*1: Depth dimension from the attachment mounting surface.

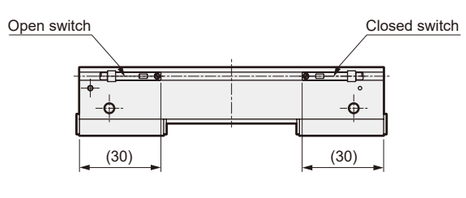
●LST-12C□A



●LST-12C2□

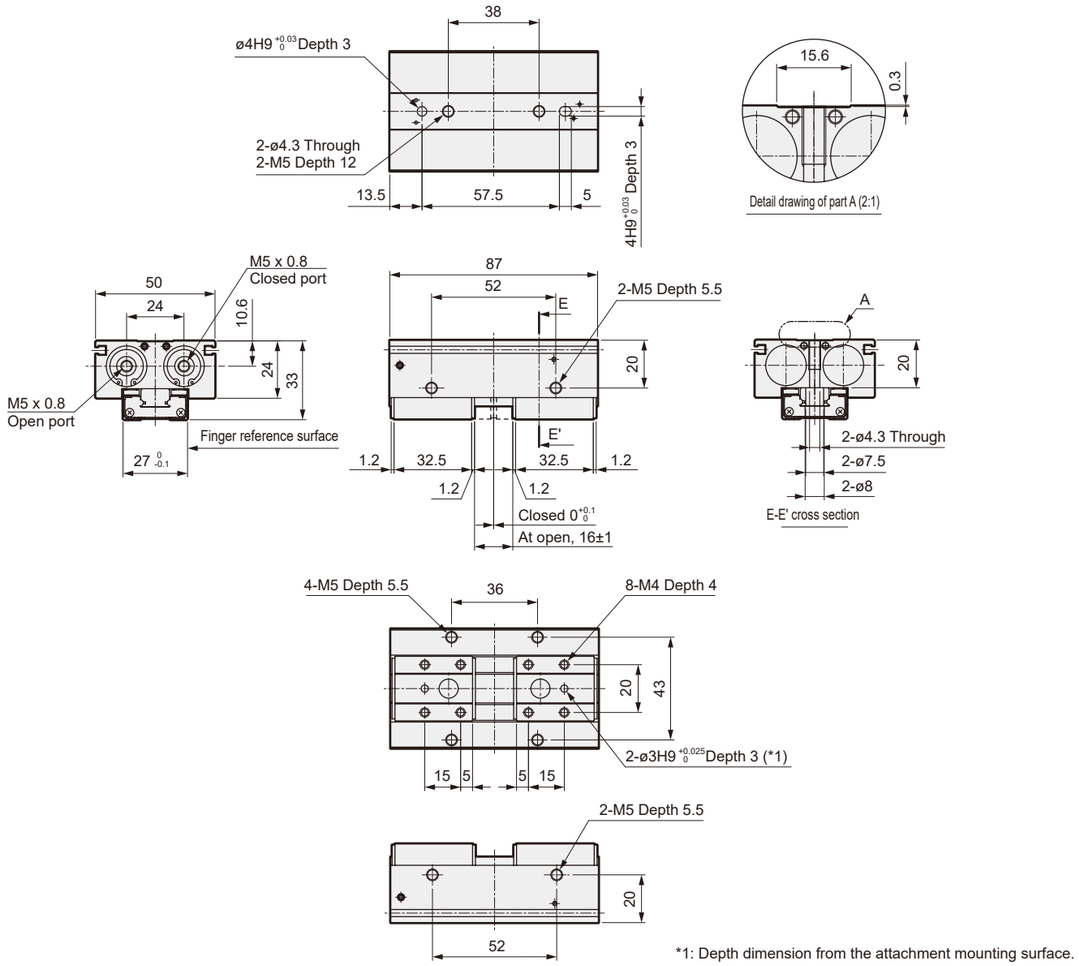


●With Switch



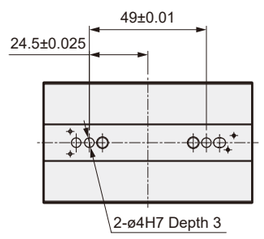
Outline Dimensional Drawing (Bore size: ø16 Short stroke)

●LST-16A1N

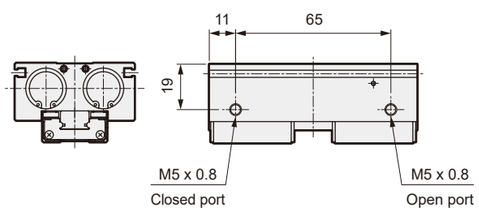


*1: Depth dimension from the attachment mounting surface.

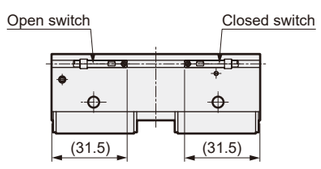
●LST-16A□A



●LST-16A2□

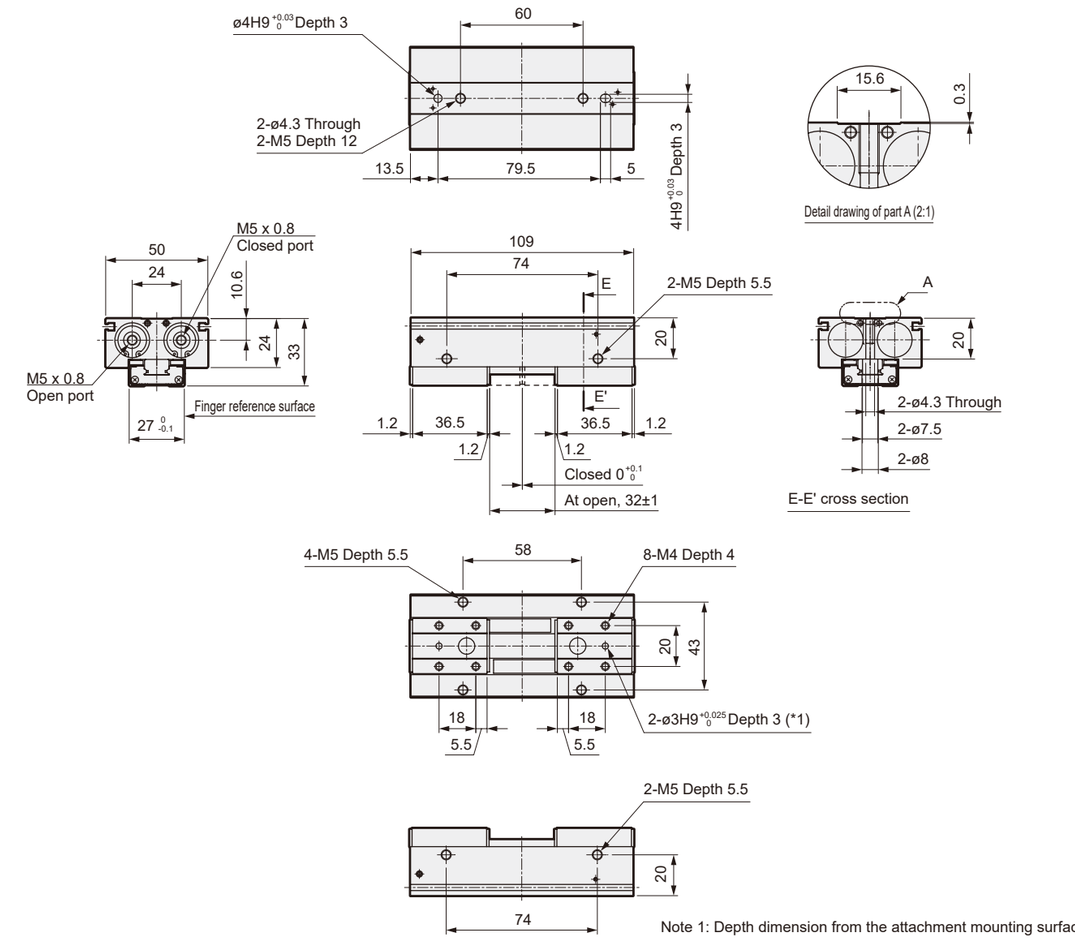


●With Switch



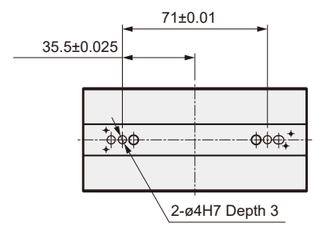
Outline Dimensional Drawing (Bore size: ø16 Middle stroke)

●LST-16B1N

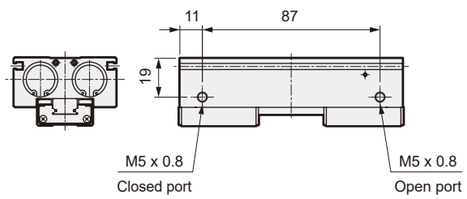


Note 1: Depth dimension from the attachment mounting surface.

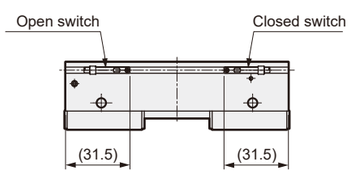
●LST-16B□A



●LST-16B2□

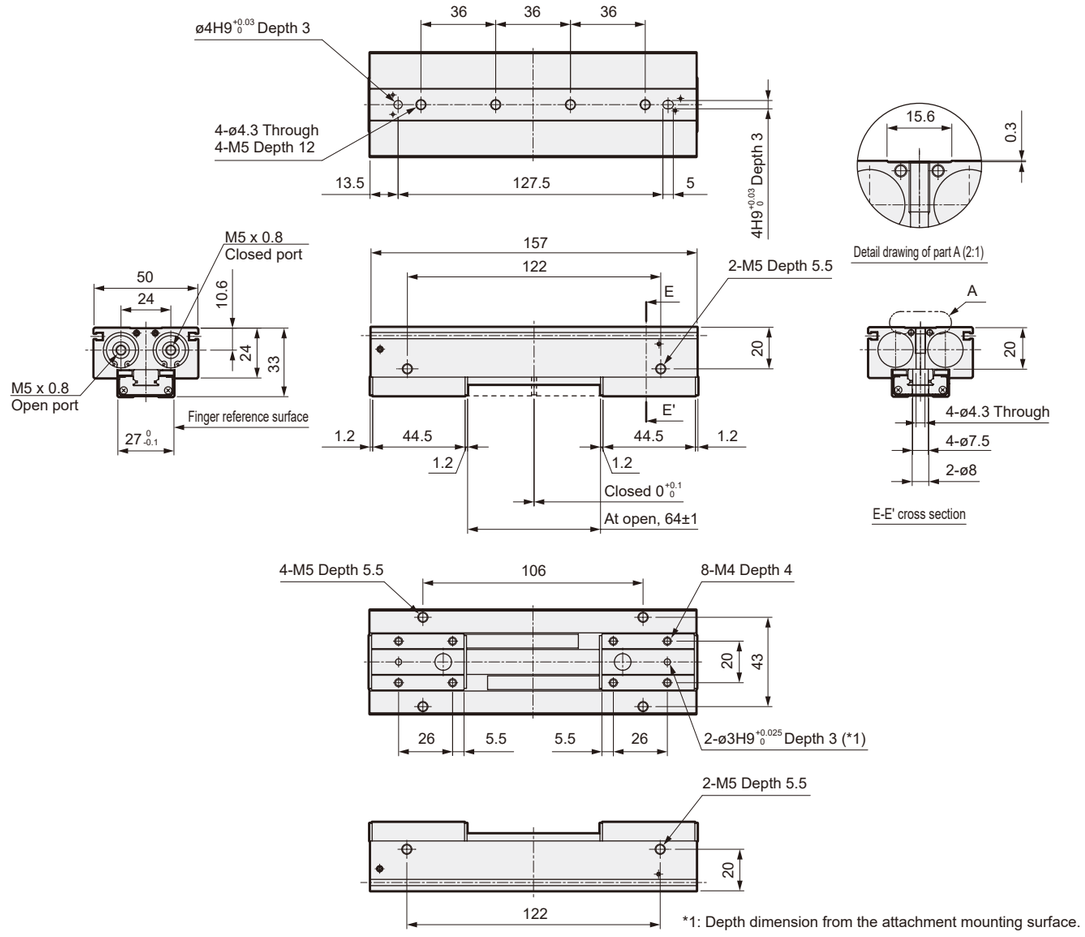


●With Switch



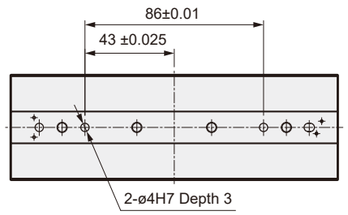
Outline Dimensional Drawing (Bore size: ø16 Long stroke)

●LST-16C1N

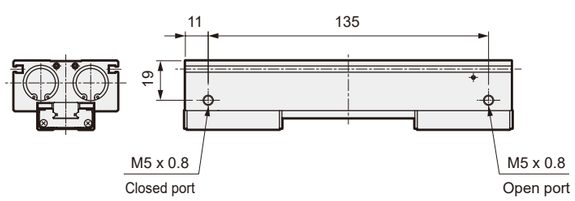


*1: Depth dimension from the attachment mounting surface.

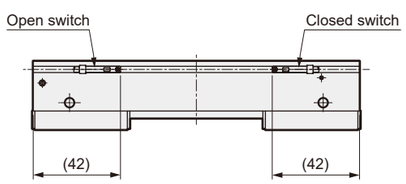
●LST-16C□A



●LST-16C2□

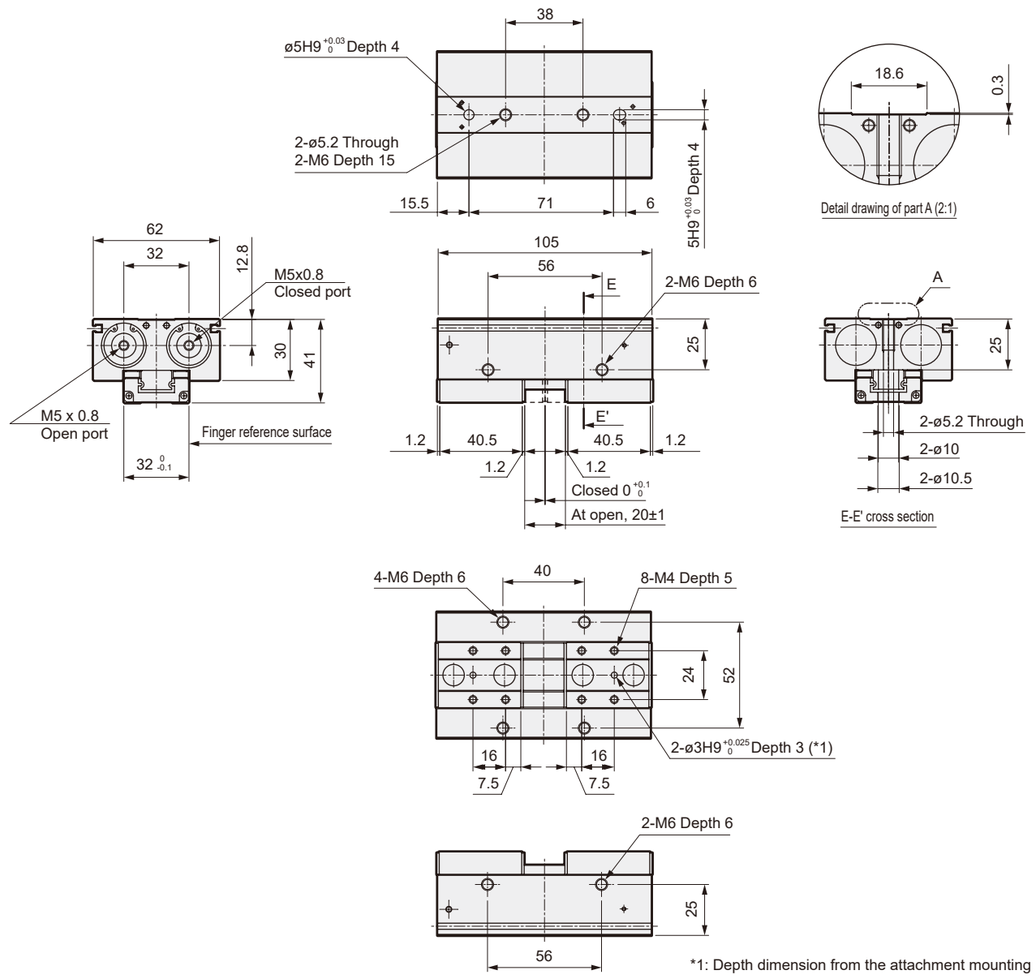


●With Switch



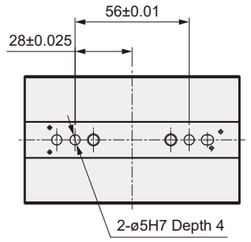
Outline Dimensional Drawing (Bore size: ø20 Short stroke)

●LST-20A1N

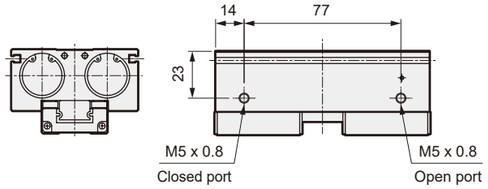


*1: Depth dimension from the attachment mounting surface.

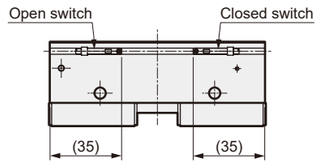
●LST-20A□A



●LST-20A2□

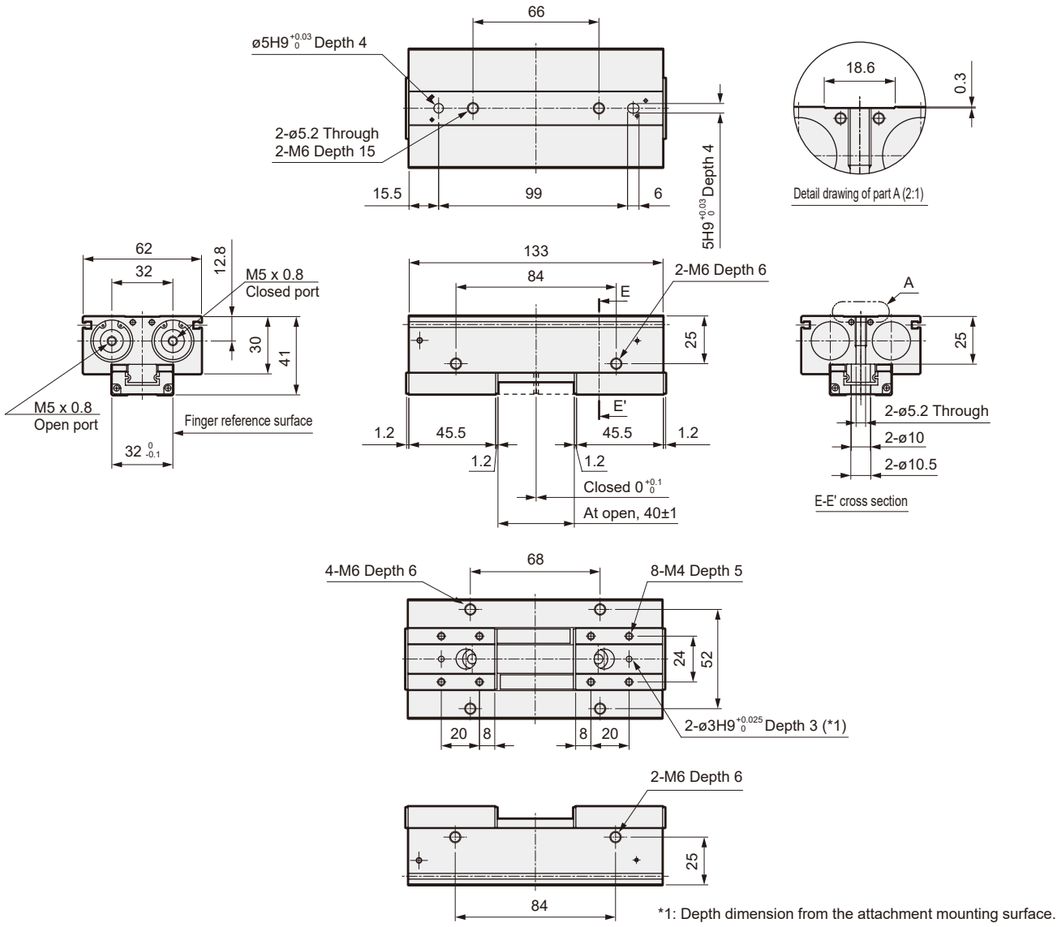


●With Switch



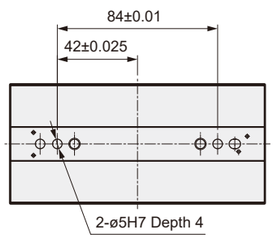
Outline Dimensional Drawing (Bore size: ø20 Middle stroke)

●LST-20B1N

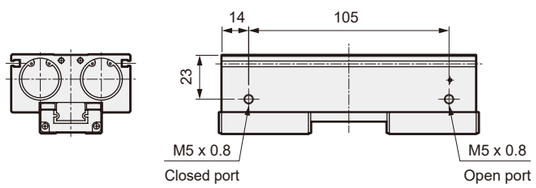


*1: Depth dimension from the attachment mounting surface.

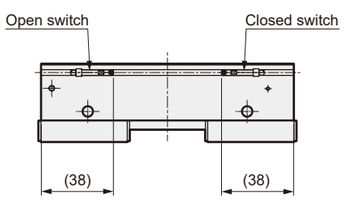
●LST-20B□A



●LST-20B2□

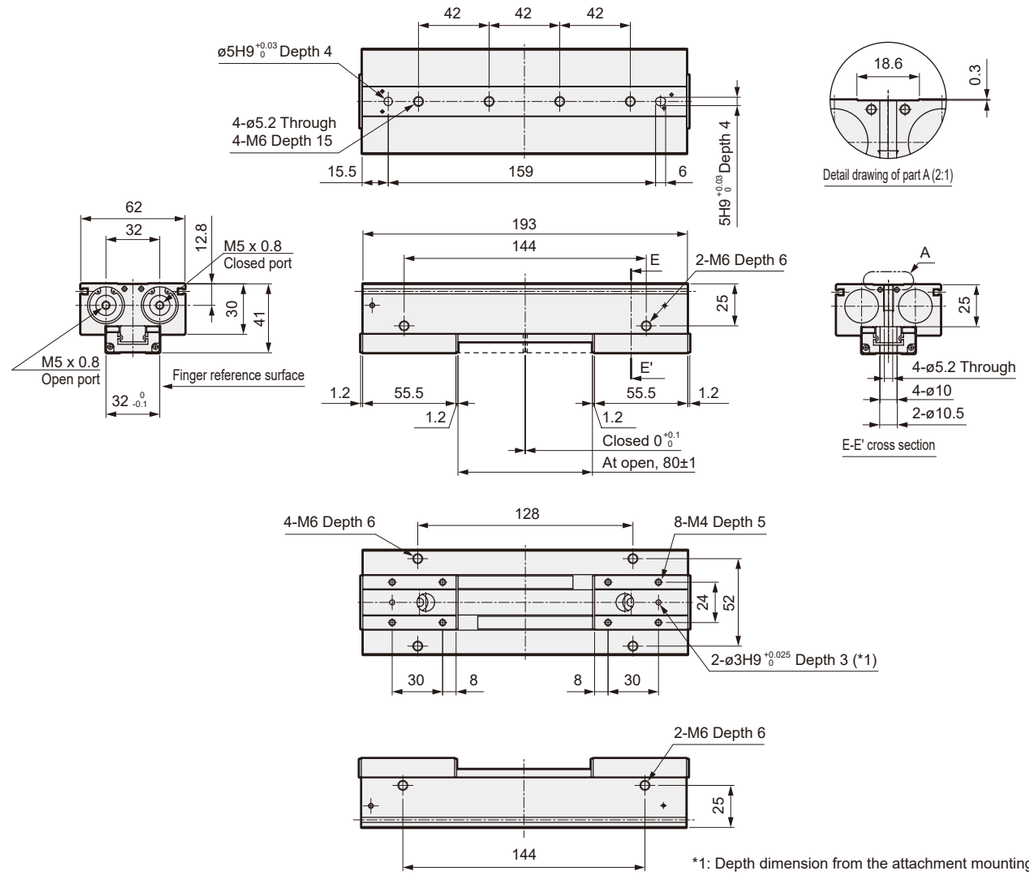


●With Switch



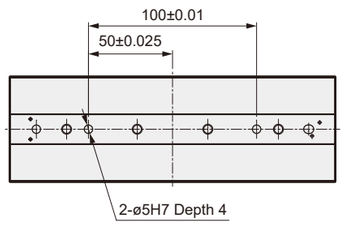
Outline Dimensional Drawing (Bore size: ø20 Long stroke)

●LST-20C1N

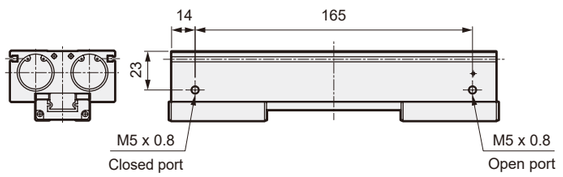


*1: Depth dimension from the attachment mounting surface.

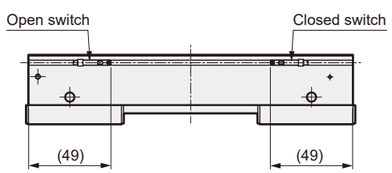
●LST-20C□A



●LST-20C2□

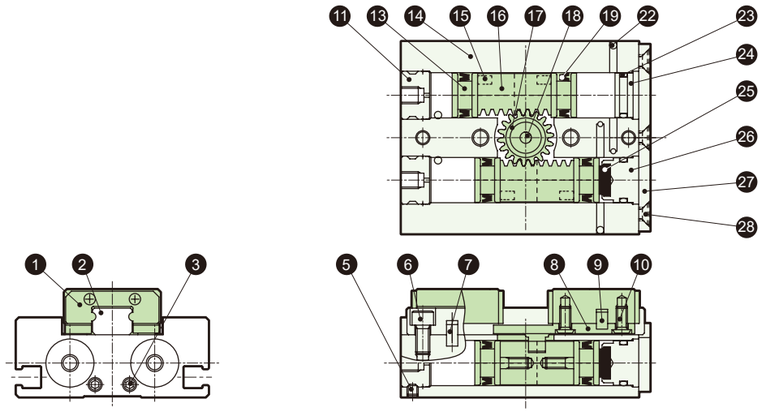


●With Switch

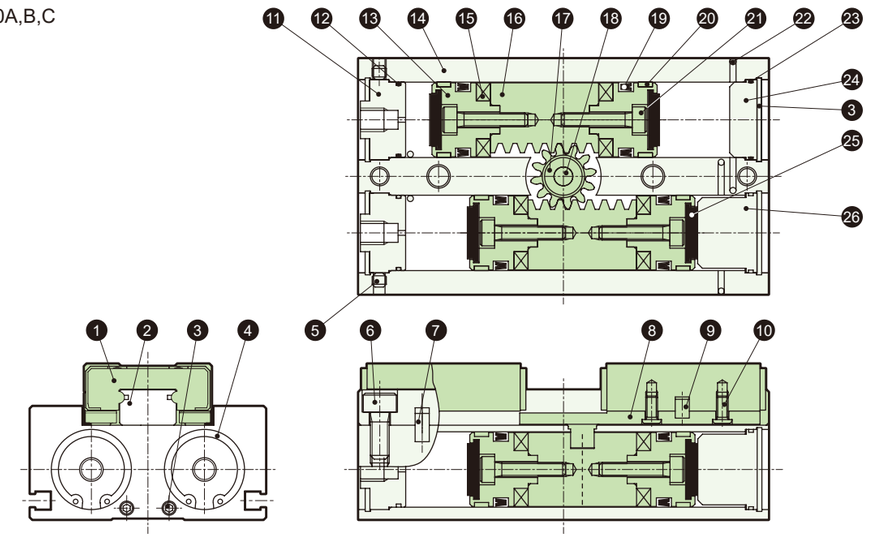


Internal Structure Diagram/Material

●LST-08A,B,C



●LST-12 to 20A,B,C

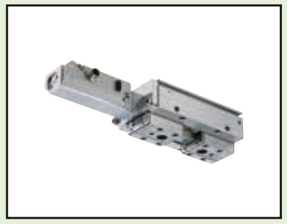


Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Finger	Stainless Steel		14	Body	Aluminum Alloy	Hard Anodized
2	Linear Guide	Stainless Steel		15	Magnet	-	
3	Hexagon socket head set screw	Stainless Steel		16	Rack	Stainless Steel	
4	Round R type retaining ring (ø12)	Steel		17	Pinion	Alloy Steel	
	C type retaining ring (ø16 to ø20)	Steel		18	Pin	Stainless Steel	
5	Hexagon socket head set screw	Stainless Steel		19	Piston Packing	Nitrile Rubber	
6	Hexagon Socket Head Cap Screw	Stainless Steel		20	Wear Ring	Polyacetal	Excludes ø8A,B
7	Pin	Stainless Steel		21	Hexagon Socket Head Cap Screw	Stainless Steel	
8	Rack joint	Stainless Steel		22	Steel ball	Stainless Steel	
9	Pin	Stainless Steel		23	O-ring	Nitrile Rubber	
10	Pan Head Screw	Stainless Steel		24	Cover 1	Aluminum Alloy	Chromate
11	Port cover	Aluminum Alloy	Chromate	25	Cushion Rubber	Urethane Rubber	
12	O-ring	Nitrile Rubber		26	Cover 2	Aluminum Alloy	Chromate
13	Piston	ø8: Stainless steel ø12 to ø20: Aluminum alloy		27	Cover 3	Stainless Steel	ø8 only
				28	Phillips flat head screw	Stainless Steel	ø8 only

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

MEMO

Hand (Gripper)
LSH-HP
LSH
FH100
BSA2
BHA
BHG
BHE
LHA
LHAG
HAP-1C
HAP-2 to 4CS
HKP
HCP
HGP
LST-HP
HLF2
HLA/HLB
HLAG/HLBG
HLC
HLD
HMC-HP
HMF
HMF-G
HMFB
HFP
FH500
HBL
HJL
HMD
HDL
HJD
Cylinder Switch
Ending



Low Profile Long Stroke Gripper with Length Measuring Function (High Durability Equipment)

LSTM-HP2 Series

●Operating stroke: 12, 16, 20 mm

Double Acting



For suitable detailed model numbers, please see our website.

Model No. Notation Method

LSTM - 12 A 1 N - HP2

- Model No.
- ❶ Bore size
- ❷ Stroke
- ❸ Port Position
- ❹ High-precision positioning hole

❶ Bore Size (mm)

Code	Content
12	ø12
16	ø16
20	ø20

❷ Stroke

Code	Content	Stroke (mm)		
		ø12	ø16	ø20
A	Short stroke	12	16	20

❸ Port Position

Code	Content
1	Axial piping

❹ High-precision positioning hole

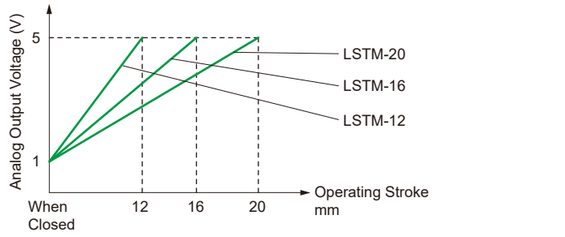
Code	Content
N	None
A	Available

Specifications

Item		LSTM		
Bore size	mm	ø12 x 2	ø16 x 2	ø20 x 2
Actuation method		Double Acting Type		
Operating Fluid		Compressed Air		
Max. Working Pressure	MPa	0.7		
Min. Operating Pressure	MPa	0.1		
Port Size		M5		
Operating stroke	mm	12	16	20
Power supply voltage		24 VDC ±10 %		
Current consumption		25 mA or less		
Indicator LED		Green LED lights up when power is applied		
Analog Output		Finger closed 1 V - open 5 V *1 Connected load 100 kΩ or more		
Analog Output Linearity		±0.5 % F.S. or less (Ambient temperature 25°C)		
Repeatability of analog output		±0.04 mm or less (Ambient temperature 25°C, no deformation or wear of actuator/jig)		
Effective length measurement range	mm	12	16	20
Shock resistance (sensor/amplifier section)		294 m/s²		
Vibration Resistance (Sensor/Amplifier Unit)		10 to 55 Hz Double amplitude 1.5 mm X, Y, Z directions for 2 hours each		
Protection Structure (Sensor/Amplifier Unit)		IEC Standard IP65		
Ambient Temperature, Humidity		10 to 60 °C, 85 %RH or less (However, no freezing)		
Weight	kg	0.26	0.50	0.90
Lubrication		Not Required		

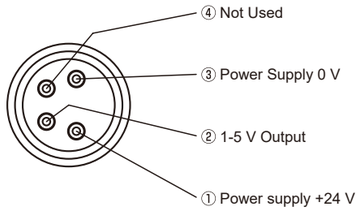
*1: There is an output fluctuation of 1 mV/°C.

Analog Output Characteristics



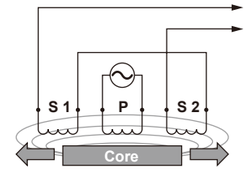
* Analog output voltage at shipment is 1 V on the close side and 5 V on the open side with the close port pressurized.

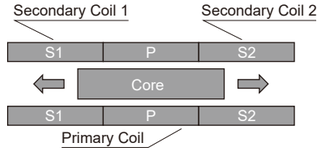
Plug Contact Arrangement Diagram



LVDT Type Displacement Sensor Operating Principle

When the primary coil (P) is excited, an induced voltage is generated in the two secondary coils (S1 and S2) by electromagnetic induction. When the gripper is driven, the position of the core changes, creating a difference in the induced voltages of S1 and S2. This difference is used to output the core position as an electrical signal.

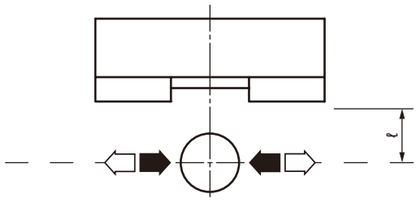


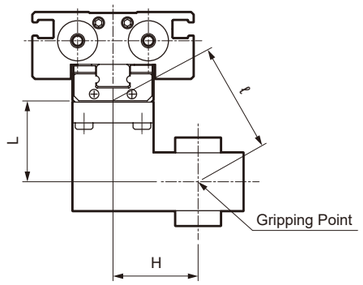


Gripping Force Performance Data

- Gripping force represents the thrust (for one finger) in the direction of the arrow shown in the figure.
- Indicates the gripping force at finger length ℓ of the gripper when the supply pressure is up to 0.7 MPa.

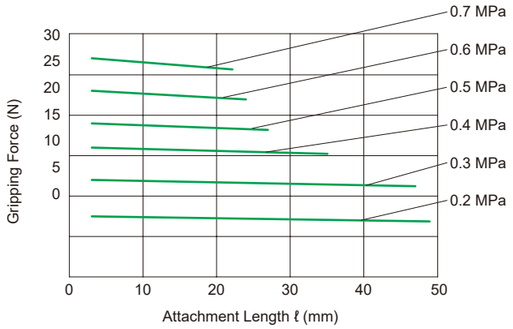
●Opening direction (⇦)
●Closing direction (➡)



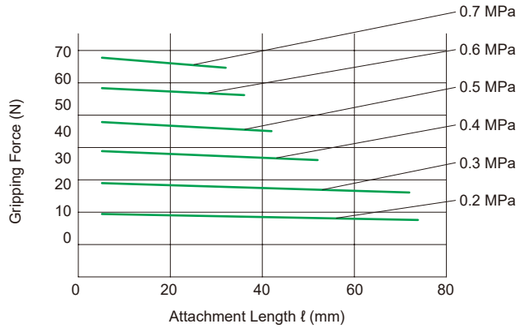


Note) **When selecting, check the design and selection precautions on P. 336.**

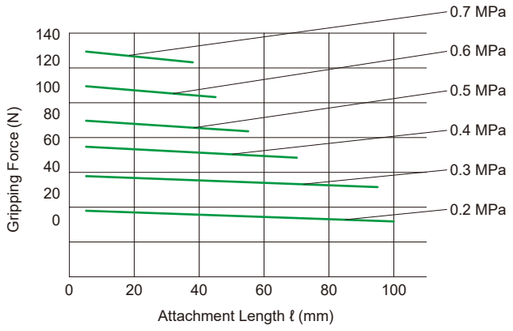
LST-8



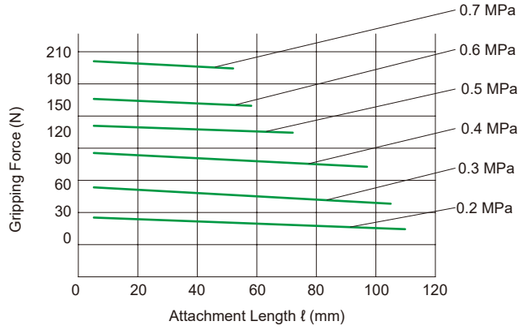
LST□-12



LST□-16



LST□-20

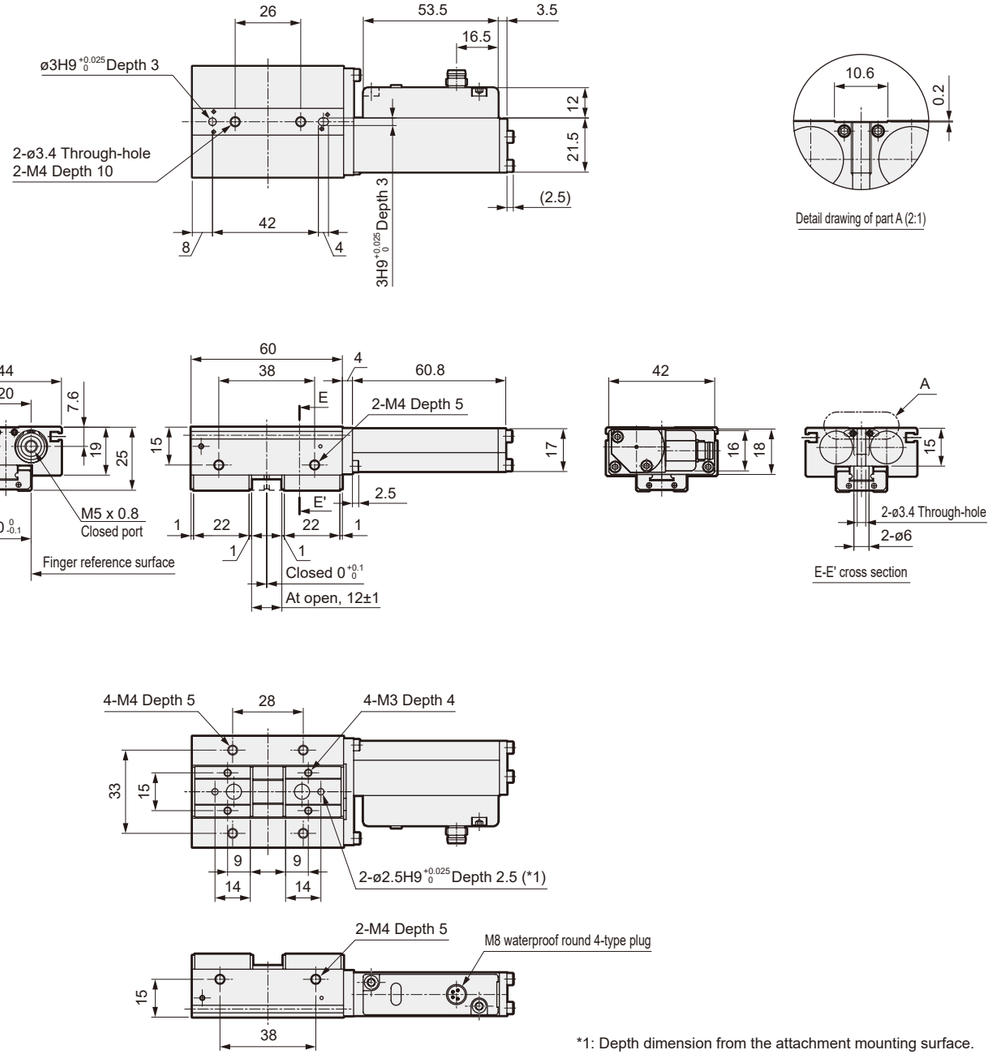


MEMO

Hand (Gripper)
LSH-HP
LSH
FH100
BSA2
BHA
BHG
BHE
LHA
LHAG
HAP-1C
HAP-2 to 4CS
HKP
HCP
HGP
LST-HP
HLF2
HLA/ HLB
HLAG/ HLBG
HLC
HLD
HMC-HP
HMF
HMF-G
HMFB
HFP
FH500
HBL
HJL
HMD
HDL
HJD
Cylinder Switch
Ending

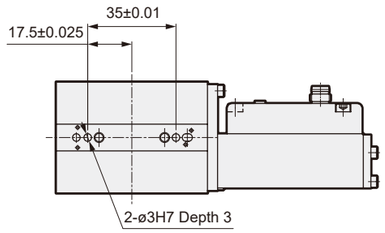
Outline dimension drawing (Bore size: ø12)

●LSTM-12A1N



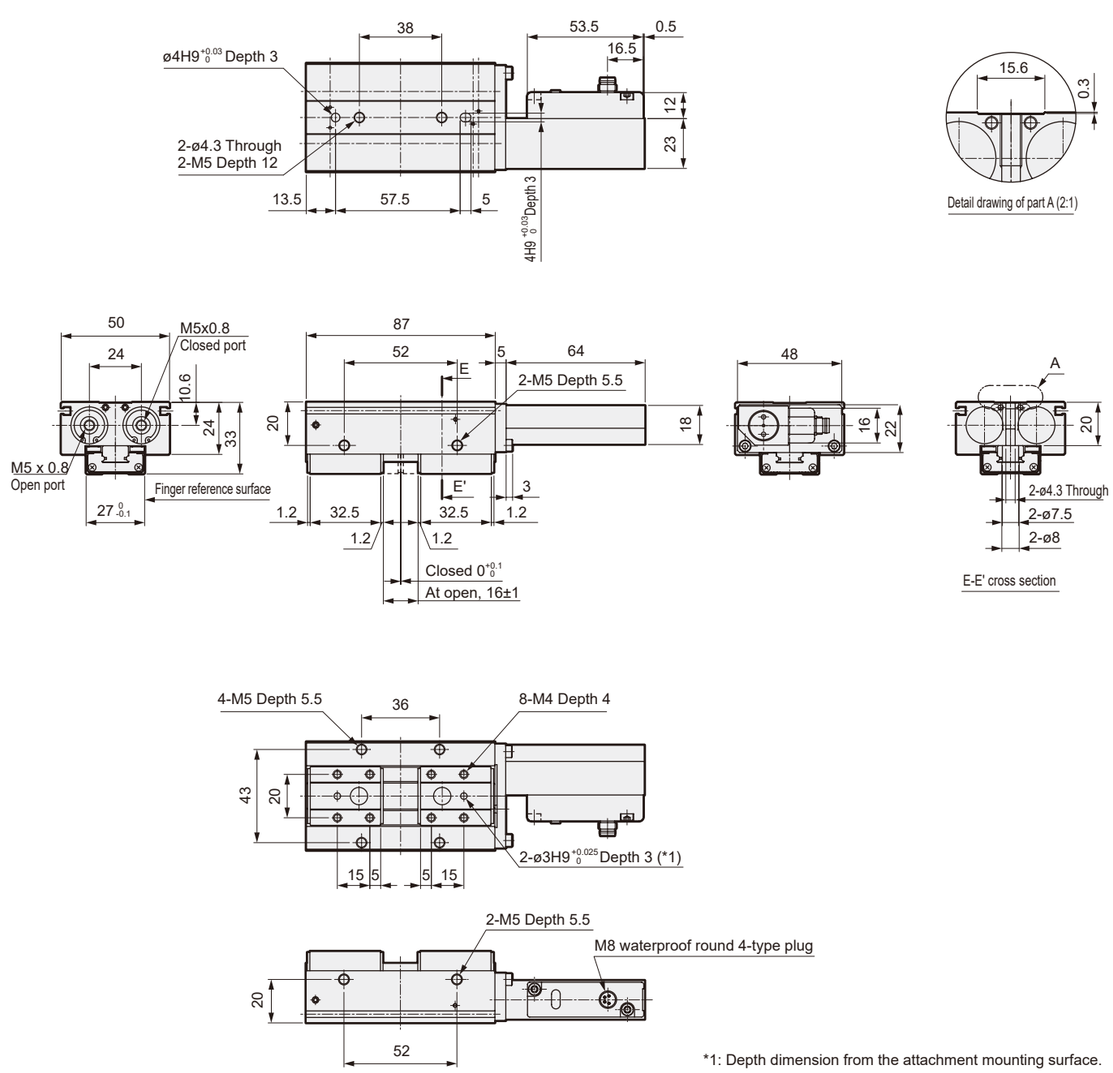
*1: Depth dimension from the attachment mounting surface.

●LSTM-12A1A



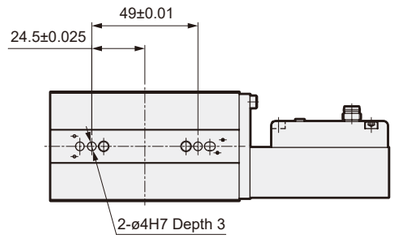
Outline dimension drawing (Bore size: ø16)

●LSTM-16A1N



*1: Depth dimension from the attachment mounting surface.

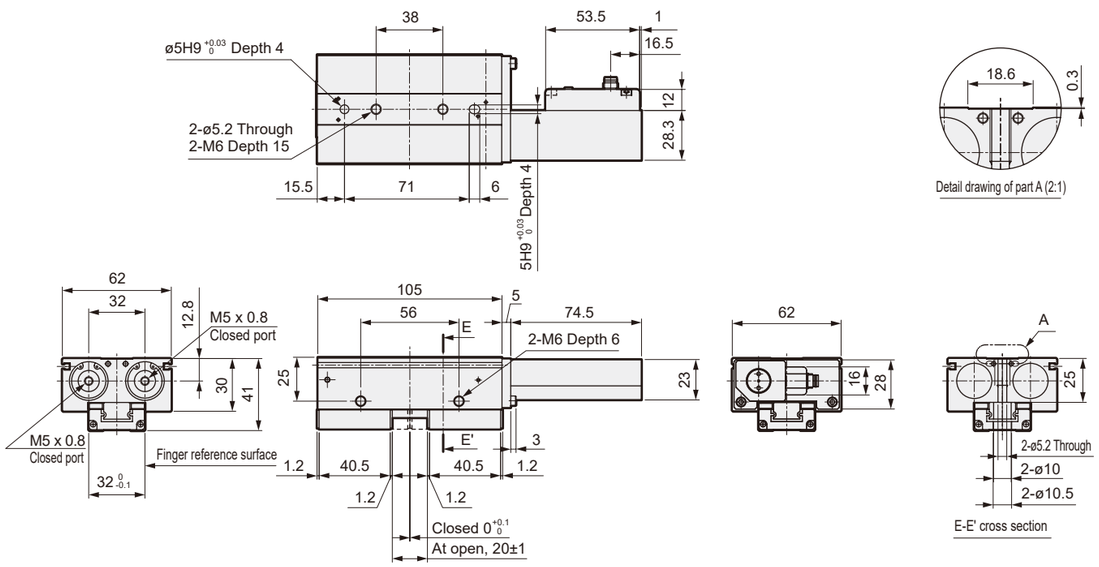
●LSTM-16A1A

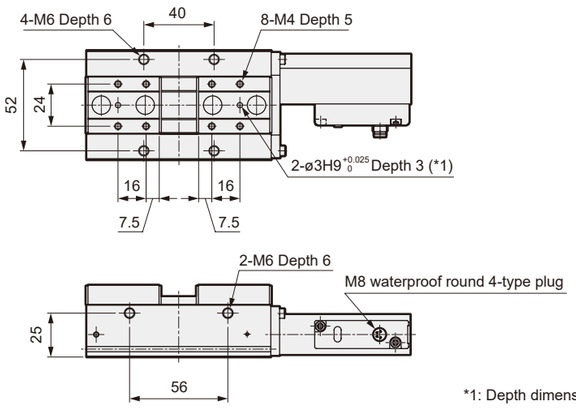


Hand (Gripper)
LSH-HP
LSH
FH100
BSA2
BHA
BHG
BHE
LHA
LHAG
HAP-1C
HAP-2 to 4CS
HKP
HCP
HGP
LST-HP
HLF2
HLA/ HLB
HLAG/ HLBG
HLC
HLD
HMC-HP
HMF
HMF-G
HMFB
HFP
FH500
HBL
HJL
HMD
HDL
HJD
Cylinder Switch
Ending

Outline dimension drawing (Bore size: ø20)

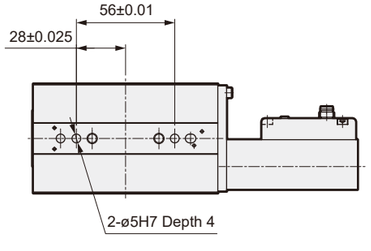
●LSTM-20A1N





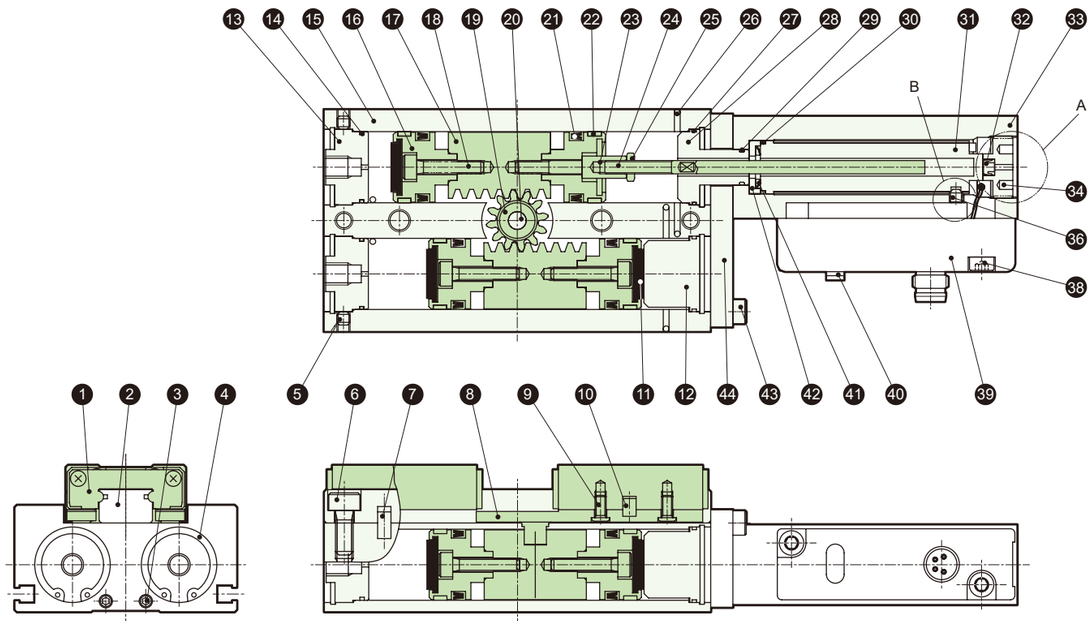
*1: Depth dimension from the attachment mounting surface.

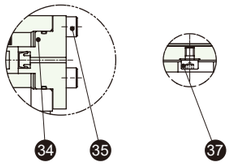
●LSTM-20A1A



Internal Structure Diagram/Material

●LSTM-12 to 20A



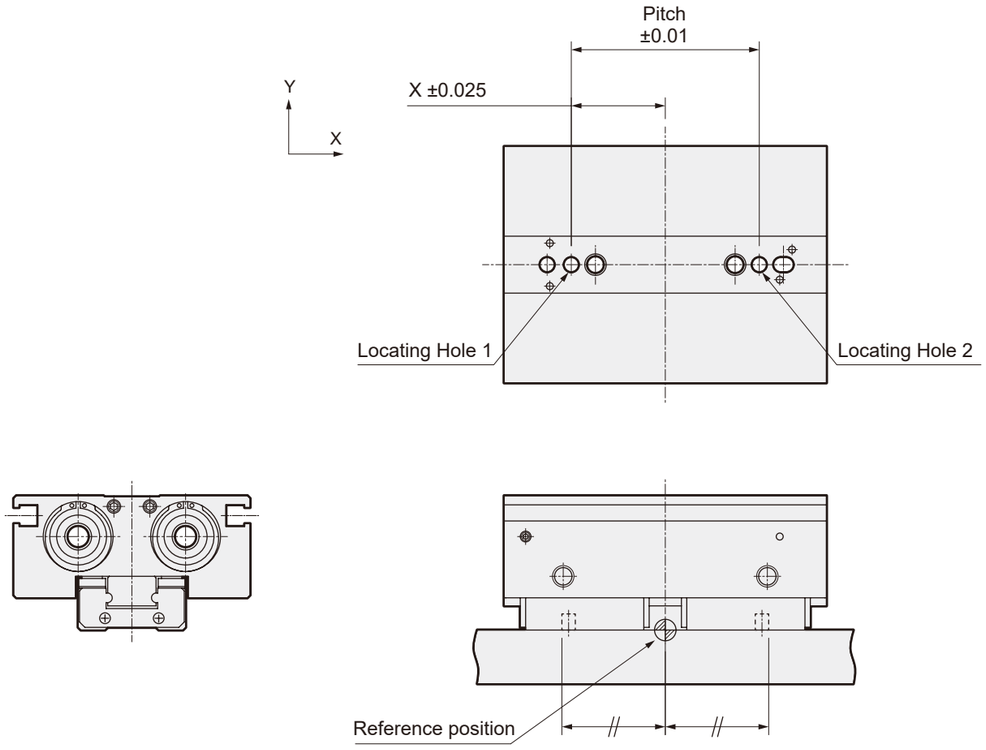


Do not disassemble

Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Finger	Stainless Steel		23	Fixed rod	Stainless Steel	
2	Linear Guide	Stainless Steel		24	Core Shaft	Steel	
3	Hexagon socket head set screw	Stainless Steel		25	Nut	Stainless Steel	
4	Round R type retaining ring (ø12)	Steel		26	Steel ball	Stainless Steel	
	C type retaining ring (ø16 to ø20)	Steel		27	O-ring	Nitrile Rubber	
5	Hexagon socket head set screw	Stainless Steel		28	Cover 2	Aluminum Alloy	Chromate
6	Hexagon Socket Head Cap Screw	Stainless Steel		29	O-ring	Nitrile Rubber	
7	Pin	Stainless Steel		30	O-ring	Nitrile Rubber	
8	Rack joint	Stainless Steel		31	Sensor Body	-	
9	Pan Head Screw	Stainless Steel		32	Check Valve	Nitrile Rubber	
10	Pin	Stainless Steel		33	Sensor adapter	Aluminum Alloy	Chromate
11	Cushion Rubber	Urethane Rubber		34	Head Cover	Chromate	
12	Cover 1	Aluminum Alloy	Chromate	35	Hexagon Socket Head Cap Screw	Stainless Steel	
13	Port cover	Aluminum Alloy	Chromate	36	Hexagon socket head set screw	Stainless Steel	
14	O-ring	Nitrile Rubber		37	Hexagon Socket Head Cap Screw	Stainless Steel	
15	Body	Aluminum Alloy	Hard Anodized	38	Hexagon Socket Head Cap Screw	Stainless Steel	
16	Piston	Aluminum Alloy	Chromate	39	Amplifier	-	
17	Rack	Stainless Steel		40	Plug	Nitrile Rubber	
18	Hexagon Socket Head Cap Screw	Stainless Steel		41	Wave Washer	Stainless Steel	
19	Pinion	Alloy Steel		42	Washer Retainer	Aluminum Alloy	
20	Pin	Stainless Steel		43	Hexagon Socket Head Cap Screw	Stainless Steel	
21	Piston Packing	Nitrile Rubber		44	Mounting plate	Aluminum Alloy	
22	Wear Ring	Polyacetal					

Reference Position of Locating Hole

●Gripping center reference, high-precision positioning hole.
Positioning can be done based on the gripping center.



Reference Position of Locating Hole:
Center of guide positioning hole at intermediate stroke

LST-HP1·LSTM-HP2 Selection Guide

STEP-1 Select appropriate model from required gripping force

① Calculation of Required Gripping Force

To transport a workpiece (weight WL), a gripping force FW that satisfies the following formula is required.

$$F_W > \frac{W_L \times g \times K}{n}$$

F_W : Required Gripping Force [N]
n : Number of Fingers = 2
W_L : Workpiece Weight [kg]
g : Gravitational acceleration = 9.8 [m/s²]
K : Conveyance Factor
5 [Holding only]
10 [Normal transport]
20 [Rapid acceleration transport]

About Conveyance Factor K

Calculation Example) When decelerating from a conveyance speed V = 0.75 m/s to stop in 0.1 seconds, with a friction coefficient μ of 0.1 between the workpiece and finger, it is as follows.

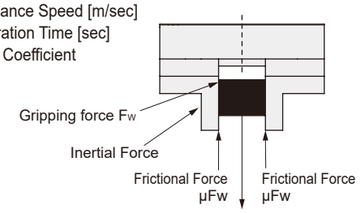
Determine the transport coefficient K from the force applied to the workpiece

V : Conveyance Speed [m/sec]
t : Deceleration Time [sec]
μ : Friction Coefficient

• Inertial force = WL (V/t)
• Gravity = WLg

• Required gripping force $F_W > \frac{W_L(V/t) + W_Lg}{n\mu} = \frac{W_L(V/t + g)}{n\mu} = \frac{17.3\,W_L}{2 \times 0.1} = 86.5\,W_L$

∴ The transport coefficient K at this time is, from the above formula $\frac{V/t + g}{\mu g} = \frac{0.75/0.1 + 9.8}{0.1 \times 9.8} \approx 20$

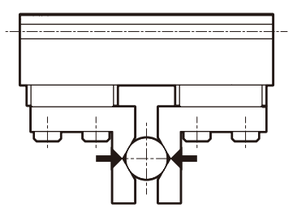


Note) The transport coefficient K needs to allow a margin for impacts during transport, etc. Even if the friction coefficient μ is higher than μ=0.1, set the conveyance factor K to 10 to 20 or more for safety.

② Model selection from required gripping force

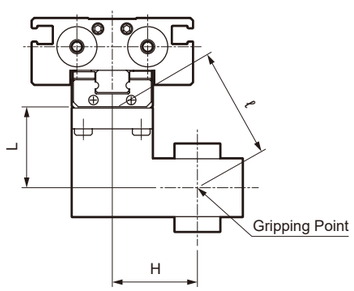
Gripping force changes depending on "gripping direction," "attachment length," and "supply pressure." Confirm from the gripping force graph that sufficient gripping force can be obtained under your operating conditions. For the gripping force graph, refer to P. 204.

Gripping Direction

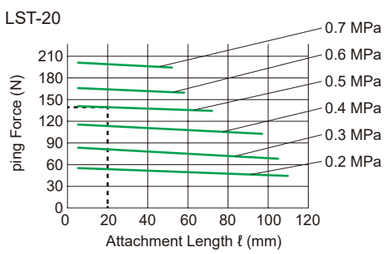


● Closing direction (➡)

Finger Length ℓ



How to Read Gripping Force Graph
(For LST-20)

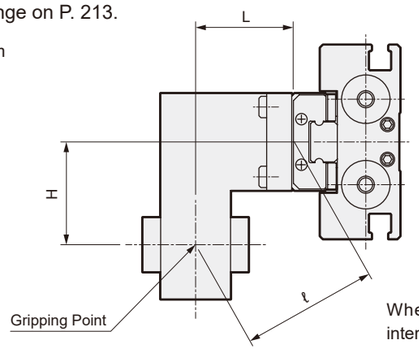


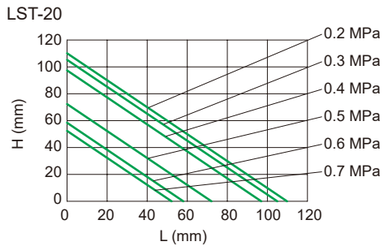
For example, if the supply pressure is 0.5 MPa and the attachment length is 20 mm, the resulting gripping force will be 140 N.

STEP-2 Confirmation of Attachment Shape

Use fingers within the range on P. 213.

Ex) L: 40 mm H: 20 mm





When LST-20 is selected, L: 40mm, H: The intersection of 20 mm is located inside the supply pressure line of 0.5 MPa, so it can be used.

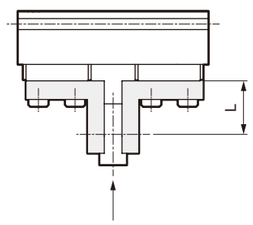
●Use fingers that are as lightweight and short as possible.
If they are long and heavy, the inertial force during opening and closing becomes large, which may cause backlash in the fingers or accelerate wear of the finger sliding parts, adversely affecting the service life.

●Even if the finger shape is within the performance data, making it as small as possible will allow the product to be used for a long time.Also, if ℓ is long, there is a risk of gripping errors, dropping during transport, etc., due to unexpected vibrations. As a guideline, use "Cylinder bore x 1.3 / Operating pressure". If ℓ is longer than that, set a higher transport coefficient in STEP-1 (Guideline: Transport coefficient of 20 or more).

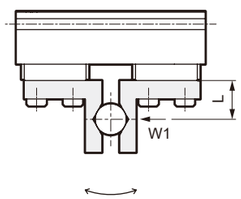
●The weight of the fingers affects the service life, so please keep it below the following.
W < 1/4H (1 piece) W : Weight of finger
H : Gripper Product Weight

STEP-3 Confirmation of external force applied to fingers

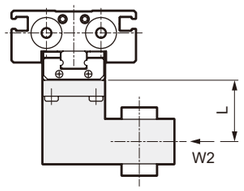
When external force is applied to the fingers, such as when transporting or inserting a workpiece, use within the range shown in [Table 1].
* When using for transport, consider the impact at the end of the stroke.



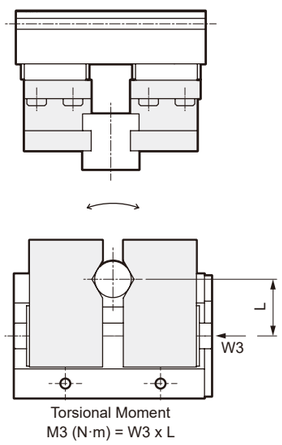
Vertical load
W (N)



Bending moment
M1 (N·m) = W1 x L



Lateral bending moment
M2 (N·m) = W2 x L



Torsional Moment
M3 (N·m) = W3 x L

[Table 1] Allowable Load Value

Bore size	Vertical load Wmax (N)	Bending moment M1 max (N·m)	Lateral bending moment M2 max (N·m)	Torsional Moment M3 max (N·m)
ø8	75	0.34	0.34	0.69
ø12	127	0.88	0.88	1.82
ø16	229	1.8	1.8	3.6
ø20	382	2.6	2.6	5.2

Note) LSTM cannot select ø8.

L: Distance to the point where the load is applied

When multiple external forces are applied, the sum of the external forces (formula below) must be less than 1.

WT = W/Wmax + M1/M1 max + M2/M2 max + M3/M3 max < 1

Calculation Example①: When conveying workpieces
Model No.: LST-16, attachment (weight m_k: When a workpiece (weight: m= 0.8 kg, center of gravity: L= 60 mm) is gripped and transported at 0.06 kg with center of gravity: L_k = 30 mm
(g: Gravity acceleration 9.8m/s^2, α: Assuming an impact factor of 3 at the end of the stroke)

$M_1 = \alpha x W_1 x L = \alpha x (m_k x g x L_k x 2 + m x g x L)$
$= 3 \times (0.06 \times 9.8 \times 30 \times 10^{-3} \times 2 + 0.8 \times 9.8 \times 60 \times 10^{-3}) \approx 1.5$ N·m, which is M1 max = 1.8 N·m or less, so it can be used.

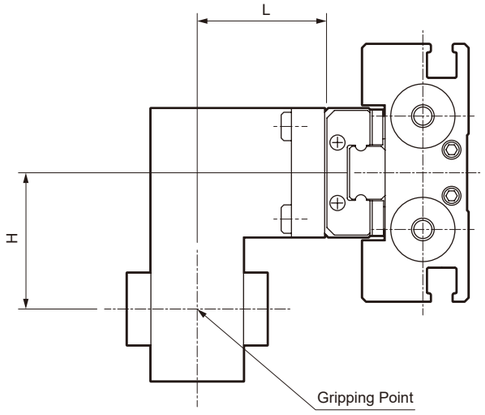
Calculation Example②: When inserting a workpiece
Model No.: When load W_1:40 N is applied to LST-16, L= 40 mm

$M_1 = W_1 \times L = 40 \times 40 \times 10^{-3} = 1.6$ N·m, which is M1 max = 1.8 N·m or less, so it can be used.

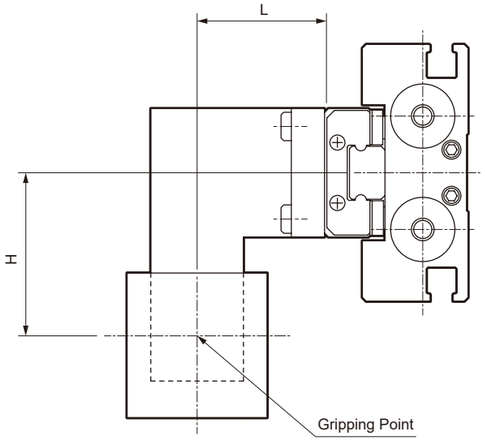
Finger length

When installing L-shaped attachments, use them within the range shown in the figure below.

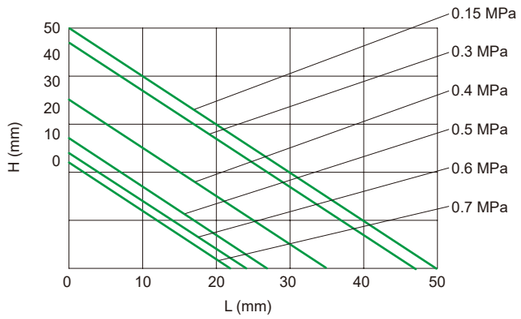
Closing direction



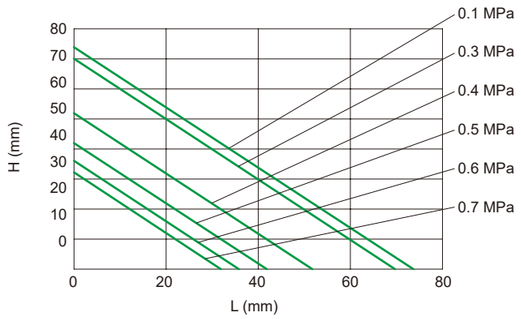
Opening direction



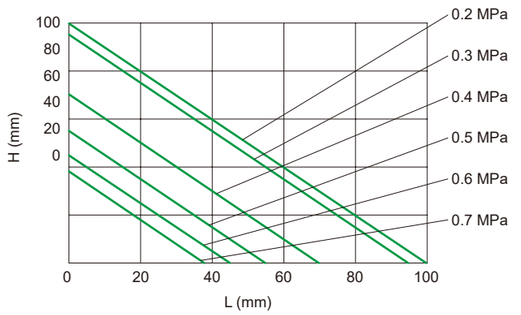
LST-8



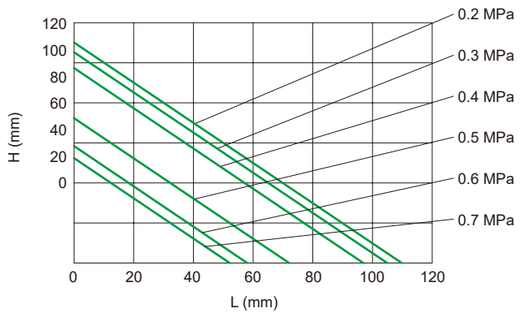
LST□-12



LST□-16

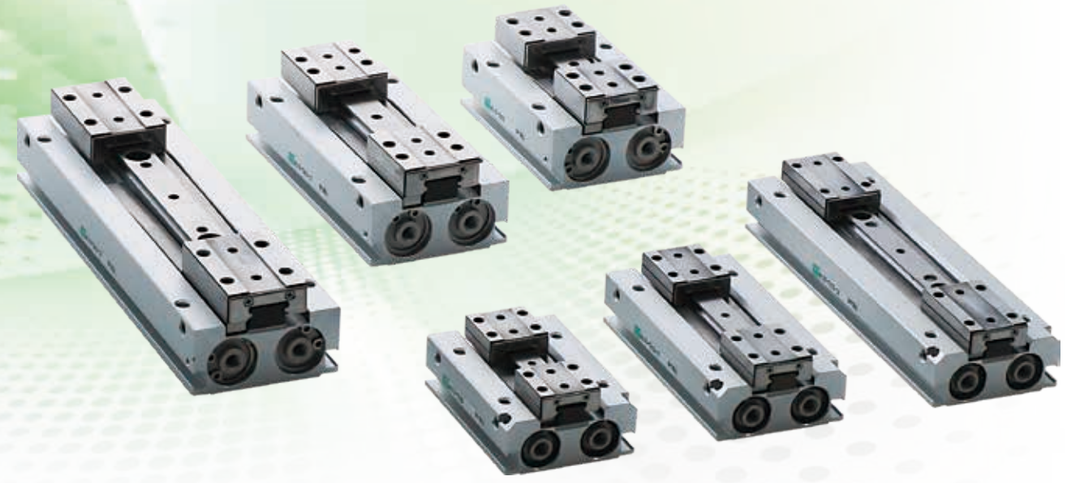


LST□-20



Manufacturing expands



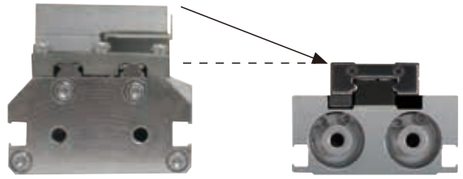


Low Profile, lightweight, high gripping force

Achieved high gripping force with a double piston system while realizing a compact size.

- Height: Max. -32%
- Height: Max. -32%

(Compared to our HLC series)

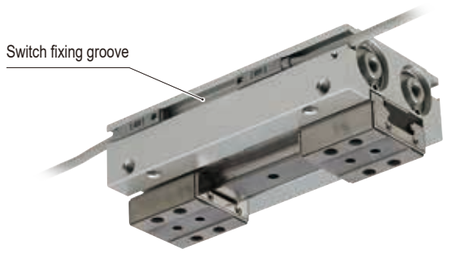


3 selectable strokes

Bore size (mm)	Standard Stroke (mm)	Long stroke 1 (mm)	Long stroke 2 (mm)
ø8 x 2	12	24	48
ø12 x 2	16	32	64
ø16 x 2	20	40	80
ø20 x 2	24	48	96

Flexible lead wire switch selectable

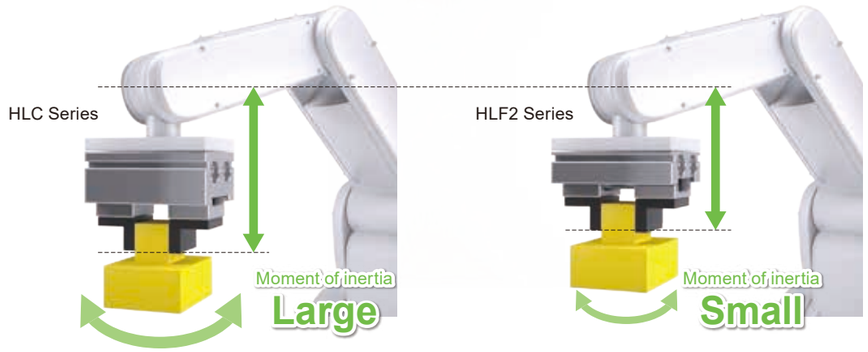
A switch using a highly flexible lead wire that is resistant to disconnection even when used in moving parts can be selected.(Switch model number T2HR3, T2VR3)



Ideal for robot grippers

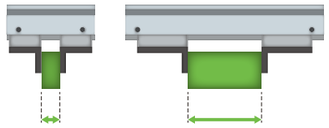
Reduced moment of inertia

Low profile and lightweight, reducing the moment of inertia and a robot's load.



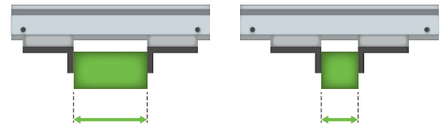
Space-saving

The optimal size can be selected according to the workpiece size.



No tool changer needed

With a long stroke, one gripper can handle a variety of workpieces.





Low Profile Long Stroke Gripper

HLF2 Series

●Operating stroke: Standard 12, 16, 20, 24 mm
Long stroke 1 24, 32, 40, 48 mm
Long stroke 2 48, 64, 80, 96 mm

Double Acting Type



RoHS

Model No. Notation Method

Without Switch
(Built-in magnet for switch)

HLF2 - 12CS - L1

Model No. ① ②

With Switch
(Built-in magnet for switch)

HLF2 - 12CS - L1 - T2H - R

Model No. ① Bore size ② Stroke ③ Switch Model No. ④ Number of Switches

①Bore Size (mm)

Code	Content
08CS	ø8
12CS	ø12
16CS	ø16
20CS	ø20

②Stroke

Code	Content	Stroke (mm)			
		ø8	ø12	ø16	ø20
Blank	Standard	12	16	20	24
L1	Long stroke 1	24	32	40	48
L2	Long stroke 2	48	64	80	96

③Switch Model No.

For switch details, please refer to P. 573.
Switches are included with the product and shipped.

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	1-Color	2-wire	-	10 to 30	-	5 to 20 *2	T2H□	T2V□	
	1-Color Flexible Lead Wire	2-wire	-	10 to 30	-	5 to 20 *2	T2HR3	T2VR3	
	1-Color	3-wire (NPN)	-	30 or less	-	100 or less	T3H□	T3V□	
		3-wire (PNP)	-		-		T3PH□	T3PV□	

*1: For "□" in the switch model number, enter the code selected from the "*Lead wire length" 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: Switches other than the model numbers listed above are also available. (Custom Product) For details, see P. 573.

***Lead wire length**

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

Example) Lead wire length
1 m T2H
3 m T2H3
3 m T2H5

④Number of Switches

Code	Content
R	With 1 pc. on Open Side
H	With 1 pc. on Close Side
D	With 2 pcs

Switch Single Unit Model No. Notation Method

SW - T2H

③ Switch Model No.

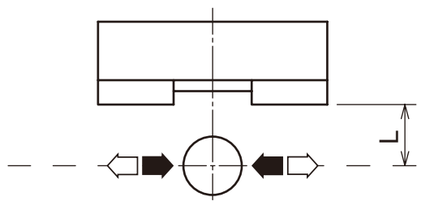
Specifications

Item	HLF2-08CS			HLF2-12CS			HLF2-16CS			HLF2-20CS		
	Blank	L1	L2	Blank	L1	L2	Blank	L1	L2	Blank	L1	L2
Bore size mm	ø8 x 2			ø12 x 2			ø16 x 2			ø20 x 2		
Operating Fluid	Compressed Air											
Max. Working Pressure MPa	0.7											
Min. Operating Pressure MPa	0.2											
Ambient Temperature °C	5 to 60											
Port Size	M3			M5								
Operating stroke mm	12	24	48	16	32	64	20	40	80	24	48	96
Internal volume (reciprocating) cm³	1.2	2.4	4.8	3.6	7.2	14.4	8.0	16.0	32.0	15.1	30.1	60.2
Repeatability mm	±0.03											
Weight kg	0.09	0.12	0.17	0.17	0.24	0.37	0.34	0.48	0.75	0.62	0.84	1.33
Lubrication	Not required (When lubricating, use turbine oil Class 1 ISO VG32)											

Gripping Force Performance Data

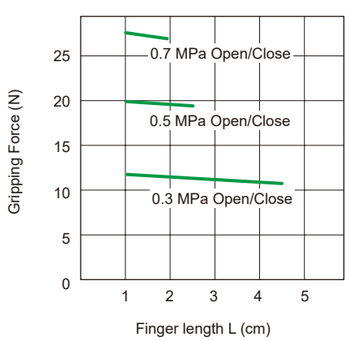
- Gripping force represents the thrust (for one finger) in the direction of the arrow shown in the figure.
- Indicates the gripping force at finger length L of the gripper when the supply pressure is 0.3, 0.5, and 0.7 MPa.

●Opening direction (⇦) Closing direction (⇨) Both

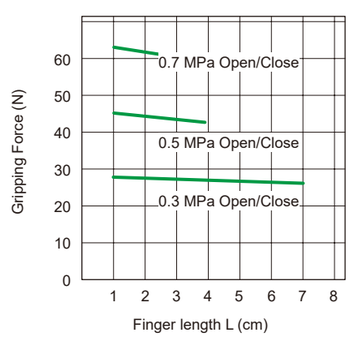


Note) **When selecting, check the design and selection precautions on P. 336.**

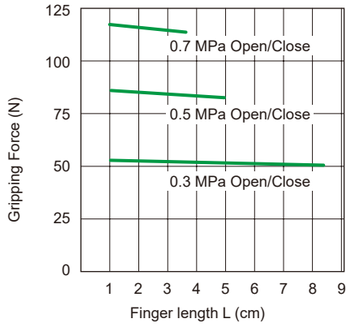
●HLF2-08CS



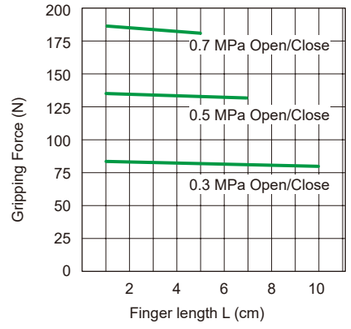
●HLF2-12CS



●HLF2-16CS

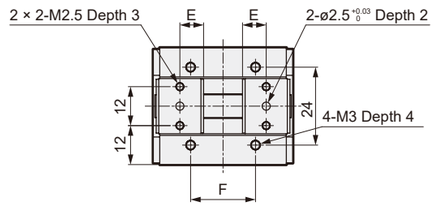


●HLF2-20CS

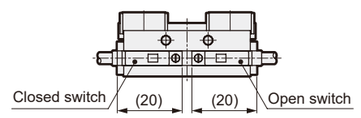


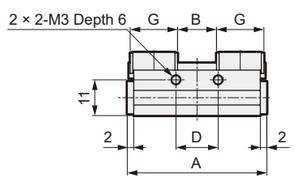
Outline Dimension Drawing

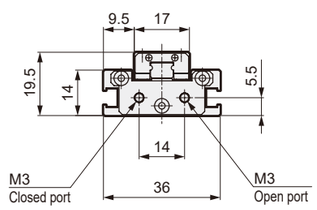
●HLF2-08CS Standard/L1

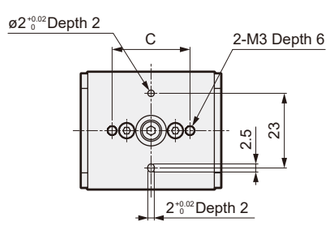


●With Switch



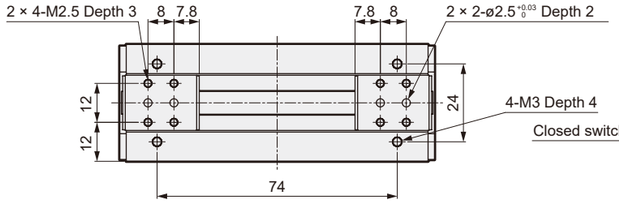




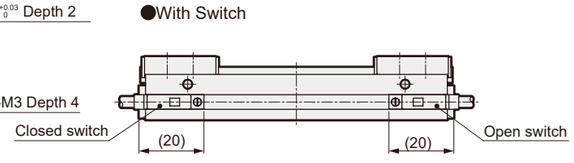


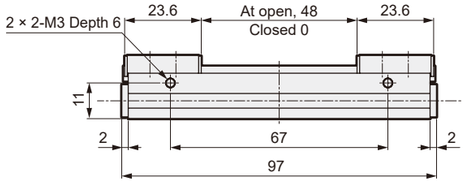
Code	A	B		C	D	E	F	G
		When Open	When Closed					
Standard	43	12	0	24	13	7.3	20	14.6
L1	61	24	0	41	31	8.8	38	17.6

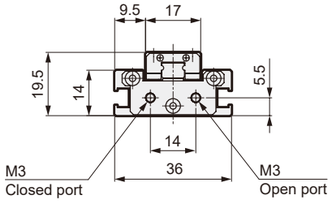
● HLF2-08CS-L2

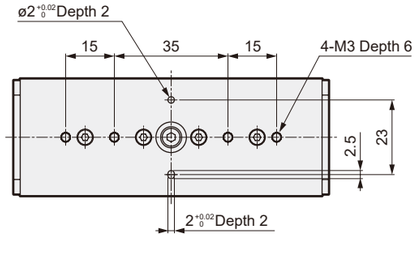


●With Switch



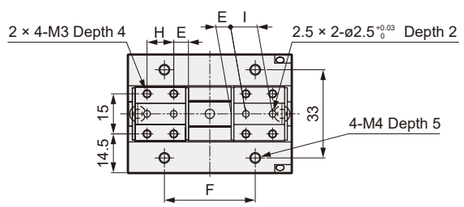




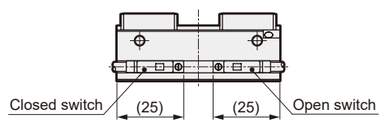


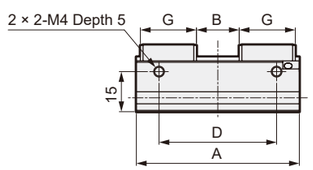
Outline Dimension Drawing

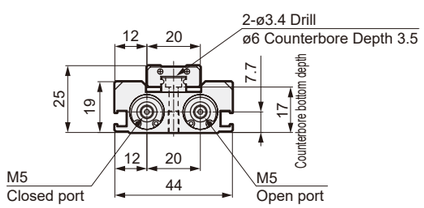
●HLF2-16CS Standard/1

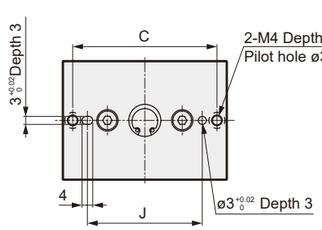


●With Switch



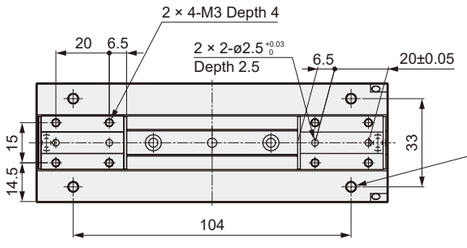




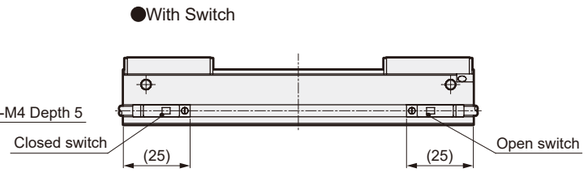


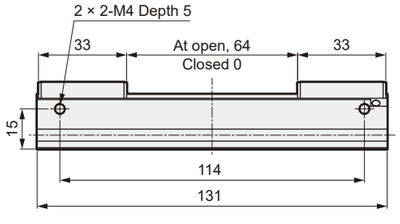
Code	A	B		C	D	E	F	G	H	I	J
		When Open	When Closed								
Standard	61	16	0	54	44	5.5	34	21	10	10 ±0.05	43
L1	83	32	0	76	66	6.5	56	25	12	12 ±0.05	56

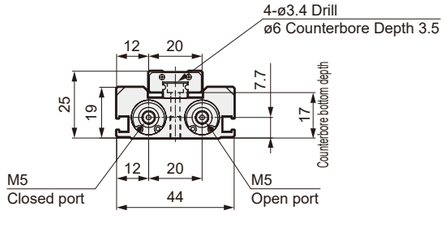
●HLF2-12CS-L2

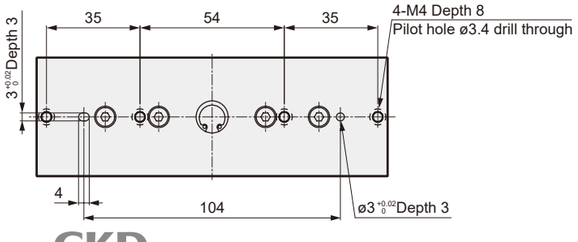


●With Switch



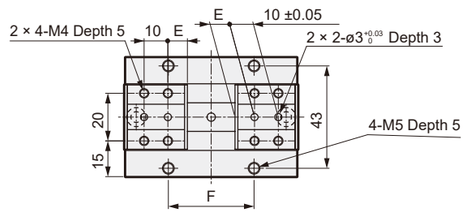




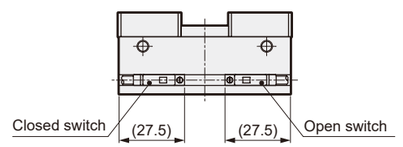


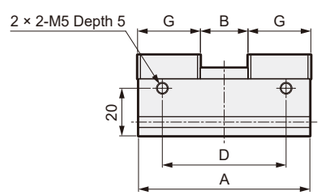
Outline Dimension Drawing

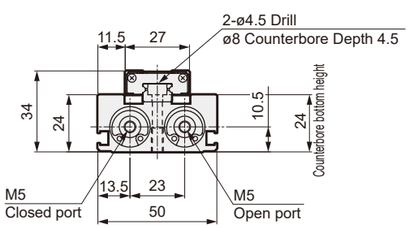
●HLF2-16CS Standard/L1

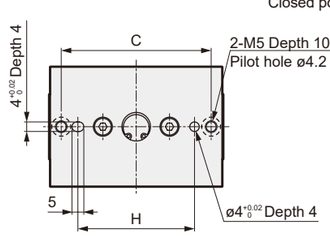


●With Switch



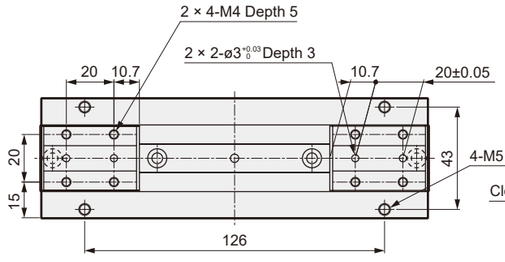




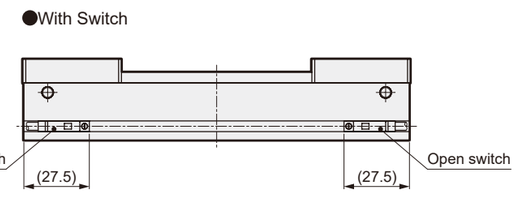


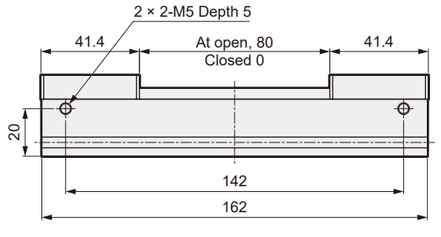
Code	A	B		C	D	E	F	G	H
		When Open	When Closed						
Standard	72	20	0	63	52	8.2	36	26.4	46
L1	102	40	0	93	82	10.7	66	31.4	70

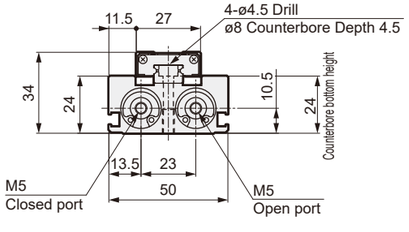
●HLF2-16CS-L2

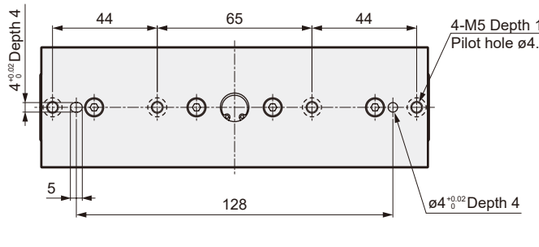


●With Switch



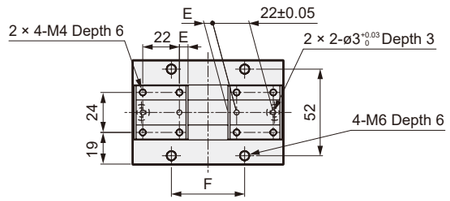




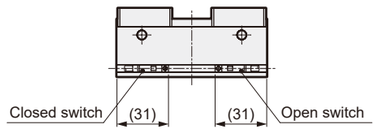


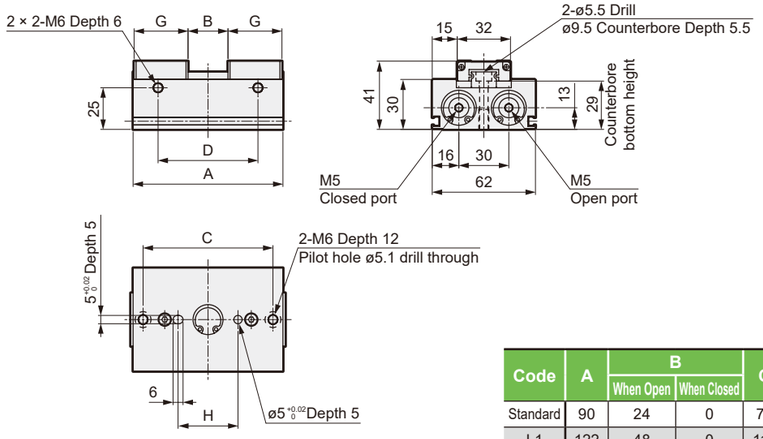
Outline Dimension Drawing

●HLF2-20CS Standard/L1



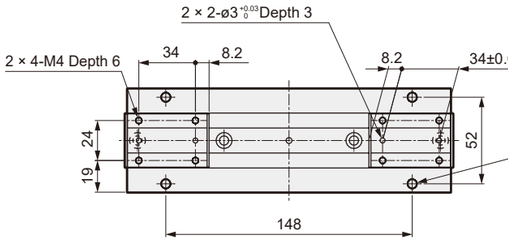
●With Switch



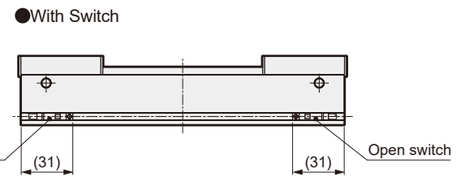


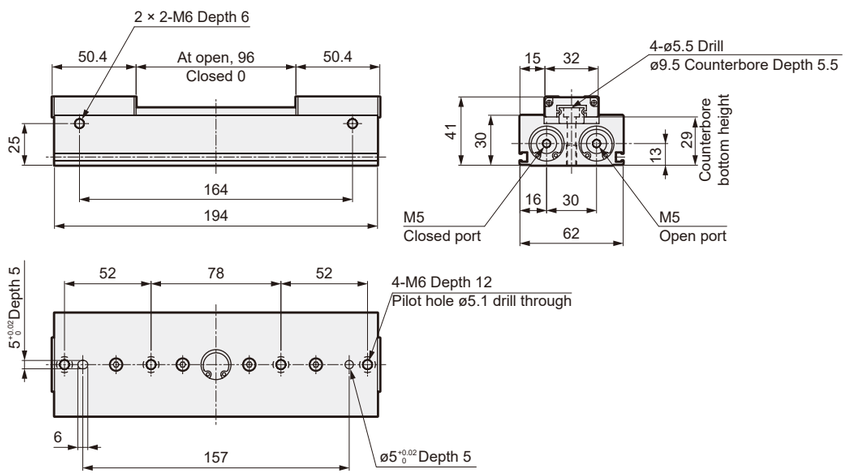
Code	A	B		C	D	E	F	G	H
		When Open	When Closed						
Standard	90	24	0	78	60	5.2	44	32.4	36
L1	122	48	0	110	92	8.2	76	38.4	62

● HLF2-20CS-L2



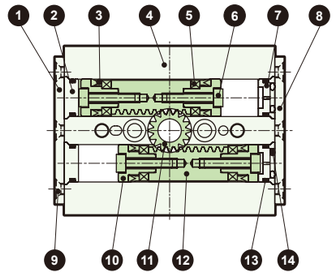
●With Switch



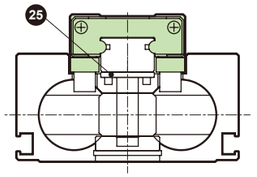


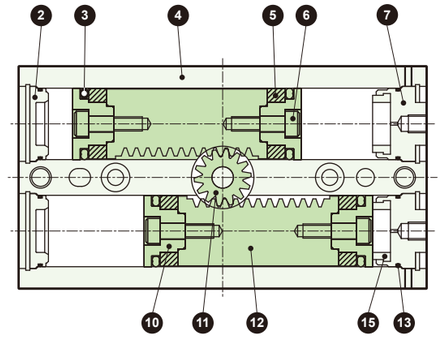
Internal Structure Diagram/Material

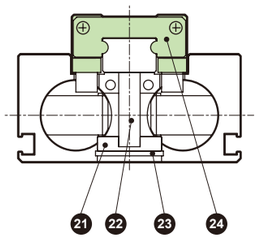
●HLF2-08CS (Standard)
●HLF2-08CS-L1, L2 (Long stroke)

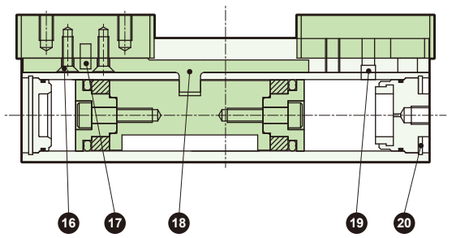


●HLF2-12CS to 20CS (Standard)
●HLF2-12CS to 20CS-L1, L2 (Long stroke)









Do not disassemble

Part No.	Part Name	Material	Remarks
1	Side plate 2	Stainless Steel	
2	Cover	Resin	
3	Piston Packing	Nitrile Rubber	
4	Body	Aluminum Alloy	
5	Magnet		
6	Hexagon Socket Head Cap Screw		
7	Cover port	Aluminum Alloy	
8	Side plate 1	Stainless Steel	
9	Phillips flat head screw		
10	Piston	Resin	
11	Pinion	Stainless Steel	
12	Rack	Stainless Steel	
13	Gasket	Nitrile Rubber	

Part No.	Part Name	Material	Remarks
14	Cover gasket	Nitrile Rubber	
15	Cushion	Resin	
16	Phillips flat head screw		
17	Positioning pin	Bearing Steel	
18	Rack joint	Stainless Steel	
19	Positioning pin	Bearing Steel	
20	C-type retaining ring for hole	Stainless Steel	
21	Center plate	Aluminum Alloy	
22	Pinion shaft	Bearing Steel	
23	C-type retaining ring for hole	Stainless Steel	
24	Linear Guide		
25	Seal plate	Aluminum Alloy	



Low Profile Parallel Gripper (Bushing Guide/Bearing Guide) Double Acting Type

HLA, HLB Series

●Operating stroke: HLA 15, 20, 25 mm
HLB 13, 18, 23 mm

Double Acting



RoHS

Model No. Notation Method

Without Switch
(Built-in magnet for switch)

HLA - 12CS
1 2

With Switch
(Built-in magnet for switch)

HLA - 12CS - K2H - R
1 Model No. 2 Bore size 3 Switch Model No. 4 Number of Switches

1 Model No.

Code	Content
HLA	Bushing guide
HLB	Bearing guide

2 Bore Size (mm)

Code	Content
12CS	ø12
15CS	ø15
20CS	ø20

3 Switch Model No.

For switch details, please refer to P. 573.
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 20 *2	K2H□	K2V□	
Solid State	1-Color	3-wire (NPN)	-	30 or less	-	50 or less	K3H□	K3V□	
Reed	1-Color	2-wire	110	12/24	7 to 20	5 to 50	K0H□	K0V□	
Reed	Indicator LED None	2-wire	110	5/12/24	20 or less	50 or less	K5H□	K5V□	

*1: For "□" in the switch model number, enter the code selected from the "*Lead wire length" 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: Switches other than the model numbers listed above are also available. (Custom Product) For details, see P. 573.

*Lead wire length

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

Example) Lead wire length
1 m K2H
3 m K2H3
5 m K2H5

4 Number of Switches

Code	Content
R	With 1 pc. on Open Side
H	With 1 pc. on Close Side
D	With 2 pcs

Switch Single Unit Model No. Notation Method

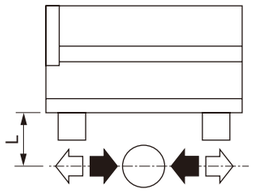
SW - K2H
3 Switch Model No.

Specifications

Item		HLA			HLB		
Size		12CS	15CS	20CS	12CS	15CS	20CS
Bore size	mm	ø12	ø15	ø20	ø12	ø15	ø20
Actuation method		Double Acting Type					
Operating Fluid		Compressed Air					
Max. Working Pressure	MPa	0.7					
Min. Operating Pressure	MPa	0.3			0.1		
Ambient Temperature	°C	5 to 60					
Port Size		M5					
Operating stroke	mm	15	20	25	13	18	23
Internal volume (reciprocating)	cm³	1.69	3.53	7.85	1.47	3.18	7.22
Repeatability	mm	±0.03			±0.01		
Weight	kg	0.152	0.276	0.504	0.214	0.402	0.678
Lubrication		Not required (When lubricating, use turbine oil Class 1 ISO VG32)					

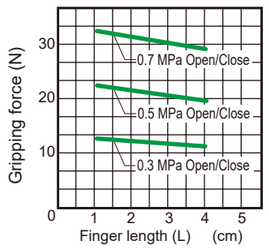
Gripping Force Performance Data

- Gripping force represents the thrust (for one finger) in the direction of the arrow shown in the figure.
- The gripping force in the opening/closing directions with finger length L of hand with a supply pressure of 0.3, 0.5 and 0.7 MPa is shown.
● Opening direction (⇦) Closing direction (➡) Both ——(Solid line)

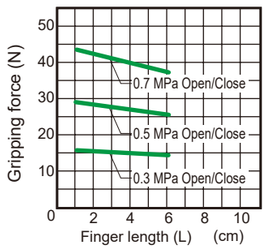


Note: When selecting, check the design and selection precautions on P. 336.

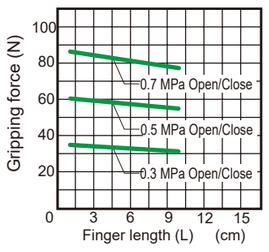
●HLA-12CS



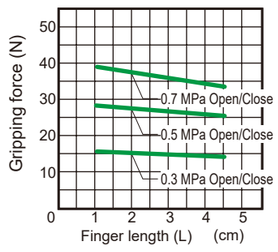
●HLA-15CS



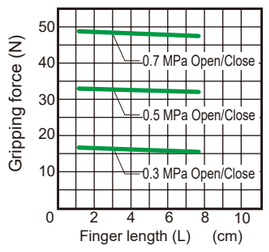
●HLA-20CS



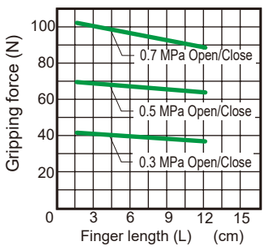
●HLB-12CS



●HLB-15CS

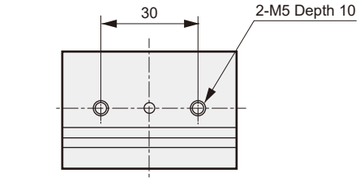


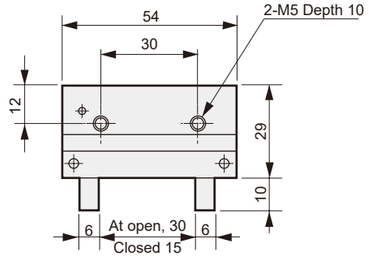
●HLB-20CS



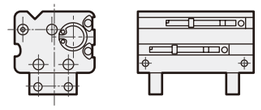
Outline Dimension Drawing

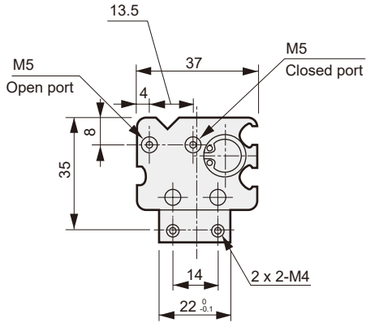
●HLA-12CS Standard



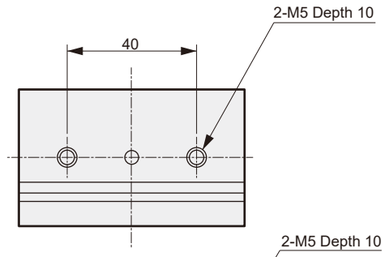


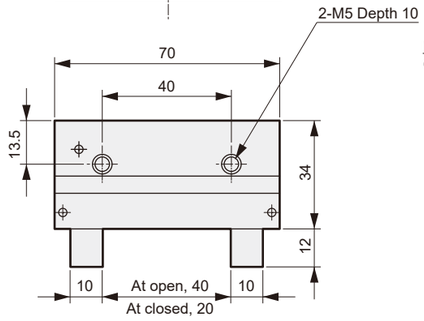
●With Switch



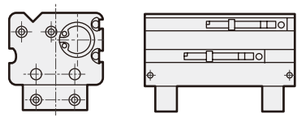


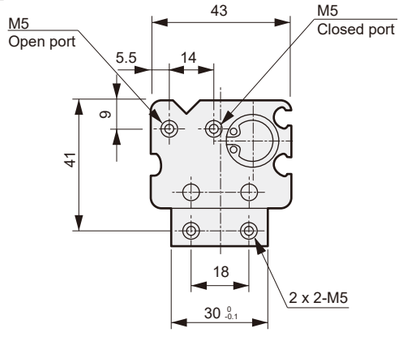
●HLA-15CS Standard





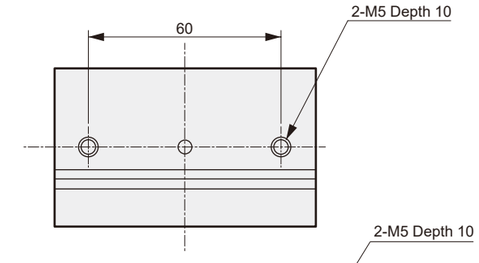
●With Switch

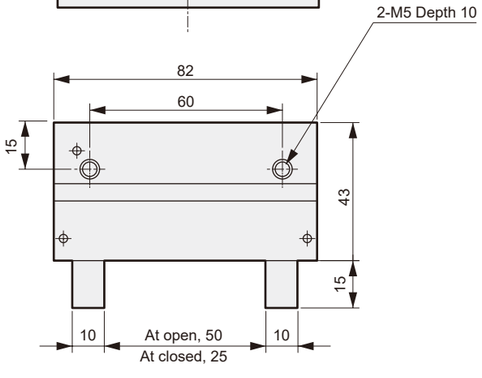




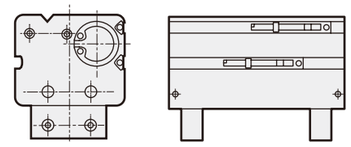
Outline Dimension Drawing

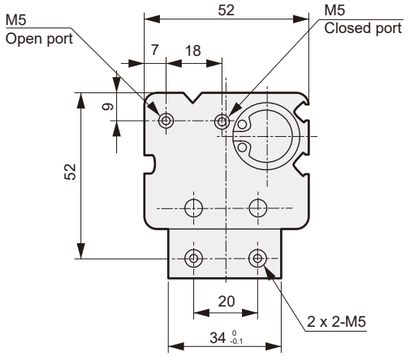
●HLA-20CS Standard





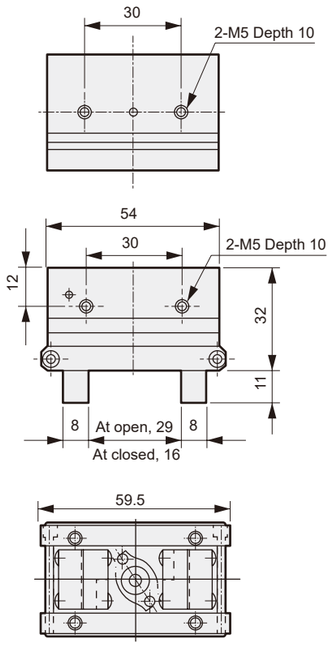
●With Switch



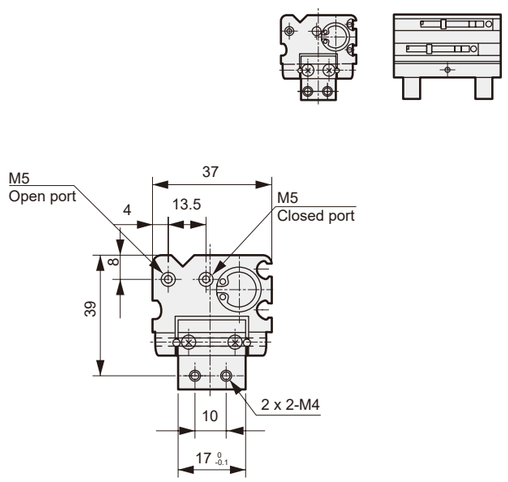


Outline Dimension Drawing

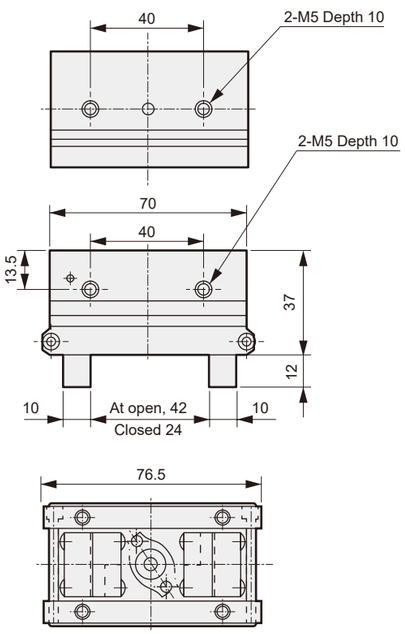
●HLB-12CS Standard



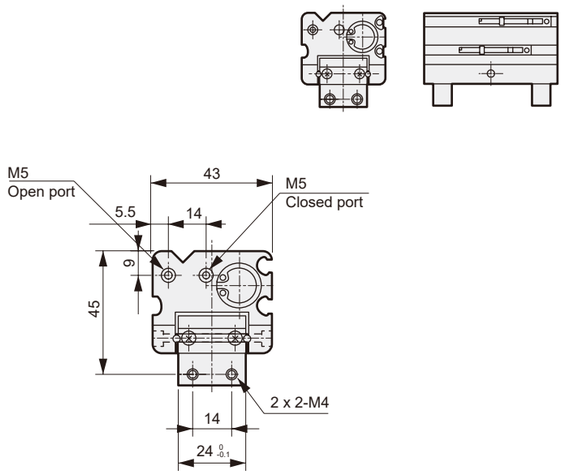
●With Switch



●HLB-15CS Standard

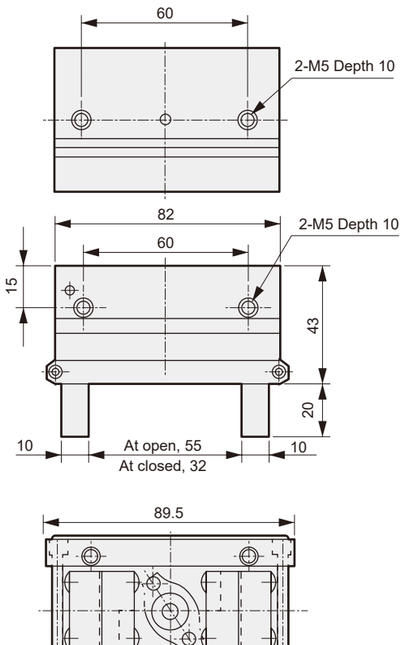


●With Switch

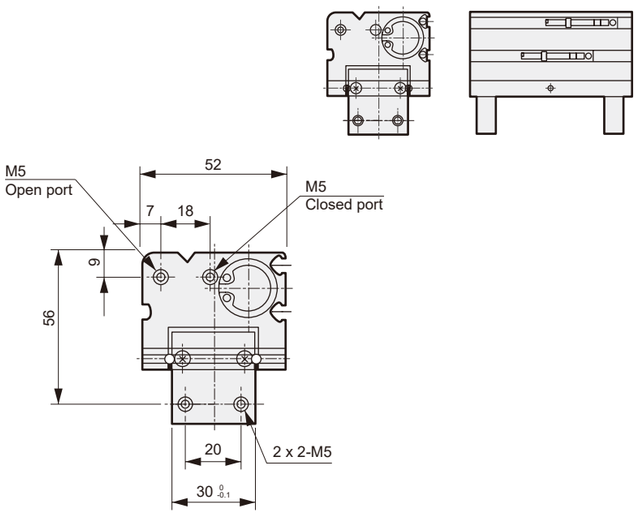


Outline Dimension Drawing

●HLB-20CS Standard

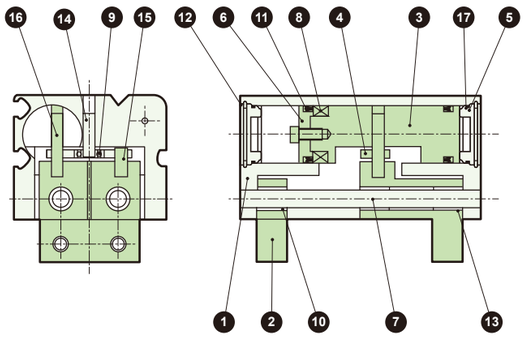


●With Switch

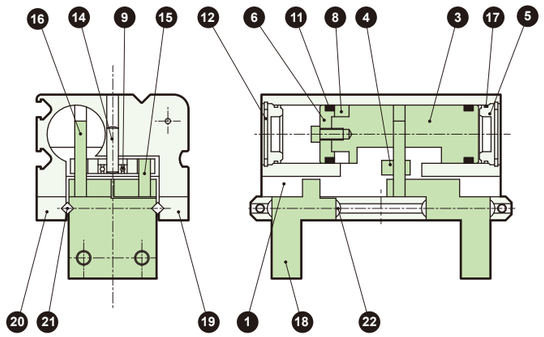


Internal Structure Diagram/Material

●HLA-12CS to 20CS



●HLB-12CS to 20CS



Do not disassemble

No.	Part Name	Material	Remarks	No.	Part Name	Material	Remarks
1	Body	Aluminum Alloy		12	Retaining ring	Stainless Steel	
2	Finger	Aluminum Alloy		13	Bushing	Oil-Impregnated Bearing Alloy	
3	Piston	Stainless Steel		14	Parallel Pin	Steel	
4	Cam	Stainless Steel		15	Needle roller A	Alloy Steel	
5	Cover	Polyacetal		16	Needle roller B	Alloy Steel	
6	Magnet retainer	Aluminum Alloy		17	Gasket	Nitrile Rubber	
7	Guide rod	Alloy Steel		18	Finger	Steel	
8	Magnet			19	Bearing guide A	Steel	
9	Bearing	Alloy Steel		20	Bearing guide B	Steel	
10	Bushing			21	Cross Roller	Alloy Steel	
11	Piston Packing	Nitrile Rubber		22	Truss head screw	Stainless Steel	

MEMO

Hand (Gripper)
LSH-HP
LSH
FH100
BSA2
BHA
BHG
BHE
LHA
LHAG
HAP-1C
HAP-2 to 4CS
HKP
HCP
HGP
LST-HP
HLF2
HLA/HLB
HLAG/HLBG
HLC
HLD
HMC-HP
HMF
HMF-G
HMFB
HFP
FH500
HBL
HJL
HMD
HDL
HJD
Cylinder Switch
Ending



Low Profile Parallel Gripper with Rubber Cover (Bushing Guide/Bearing Guide) Double Acting Type

HLAG, HLBG Series

●Operating stroke: HLAG 15, 20, 25 mm
HLBG 13, 18, 23 mm

Double Acting



RoHS

Model No. Notation Method

Without Switch
(Built-in magnet for switch)

HLAG – 12CS
1 2

With Switch
(Built-in magnet for switch)

HLAG – 12CS – K2H – R

1 Model No.
2 Bore size
3 Switch Model No.
4 Number of Switches

1 Model No.

Code	Content
HLAG	Bushing guide
HLBG	Bearing guide

2 Bore Size (mm)

Code	Content
12CS	ø12
15CS	ø15
20CS	ø20

3 Switch Model No.

For switch details, please refer to P. 573.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 Straight	
Solid State	1-Color	2-wire	-	10 to 30	-	5 to 20 *2	K2H□	
Solid State	1-Color	3-wire (NPN)	-	30 or less	-	50 or less	K3H□	
Reed	1-Color	2-wire	110	12/24	7 to 20	5 to 50	K0H□	
Reed	Indicator LED None	2-wire	110	5/12/24	20 or less	50 or less	K5H□	

*1: For "□" in the switch model number, enter the code selected from the "*Lead wire length" 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: Switches other than the model numbers listed above are also available. (Custom Product) For details, see P. 573.

*Lead wire length

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

Example) Lead wire length
1 m K2H
3 m K2H3
5 m K2H5

4 Number of Switches

Code	Content
R	With 1 pc. on Open Side
H	With 1 pc. on Close Side
D	With 2 pcs

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

●Design compatible with rechargeable battery manufacturing process

HLBG- •••• -P4□

*Please contact us for details.

Switch Single Unit Model No. Notation Method

SW – K2H
3 Switch Model No.

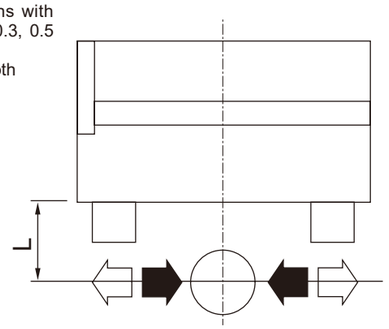
Specifications

Item	HLAG-12CS	HLAG-15CS	HLAG-20CS	HLBG-12CS	HLBG-15CS	HLBG-20CS
Bore size mm	ø12	ø15	ø20	ø12	ø15	ø20
Actuation method	Double Acting Type					
Operating Fluid	Compressed Air					
Max. Working Pressure MPa	0.7					
Min. Operating Pressure MPa	0.3			0.2		
Ambient Temperature °C	5 to 60					
Port Size	M5					
Operating stroke mm	15	20	25	13	18	23
Internal volume (reciprocating) cm³	1.69	3.53	7.85	1.47	3.18	7.22
Repeatability mm	±0.03			±0.01		
Weight kg	0.175	0.305	0.545	0.24	0.42	0.75
Lubrication	Not required (When lubricating, use turbine oil Class 1 ISO VG32)					

Gripping Force Performance Data

- Gripping force represents the thrust (for one finger) in the direction of the arrow shown in the figure.
- The gripping force in the opening/closing directions with finger length L of hand with a supply pressure of 0.3, 0.5 and 0.7 MPa is shown.

●Opening direction (⇦) Closing direction (⇨) Both ——— (Solid line)



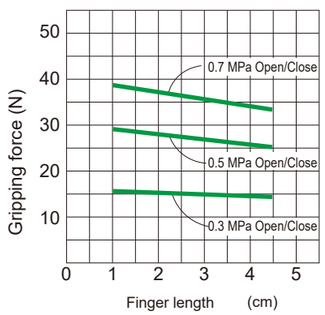
Note) **When selecting, check the design and selection precautions on P. 336.**

●HLAG-12CS

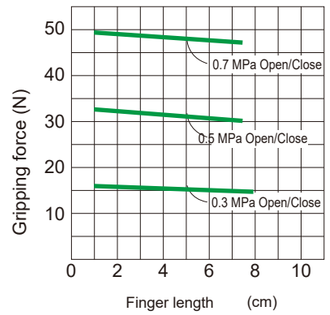
●HLAG-15CS

●HLAG-20CS

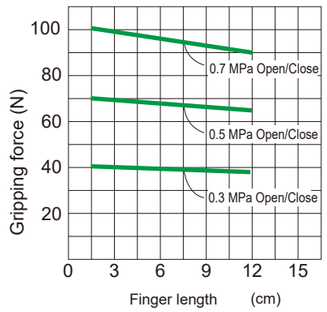
●HLBG-12CS



●HLBG-15CS

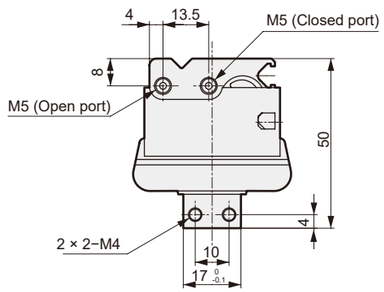


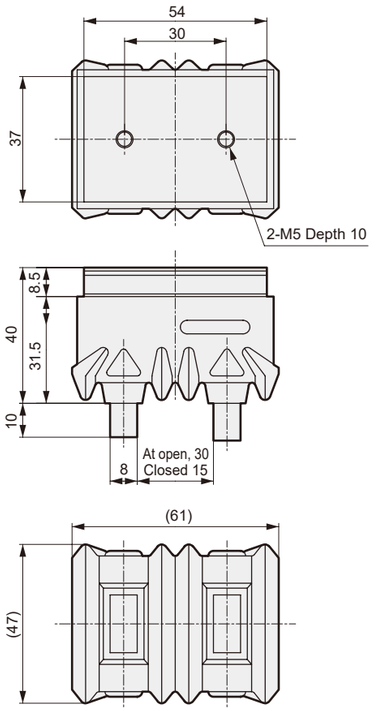
●HLBG-20CS



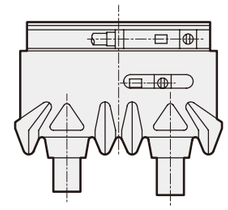
Outline Dimension Drawing

●HLAG-12CS Standard

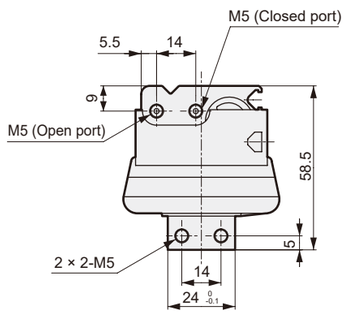


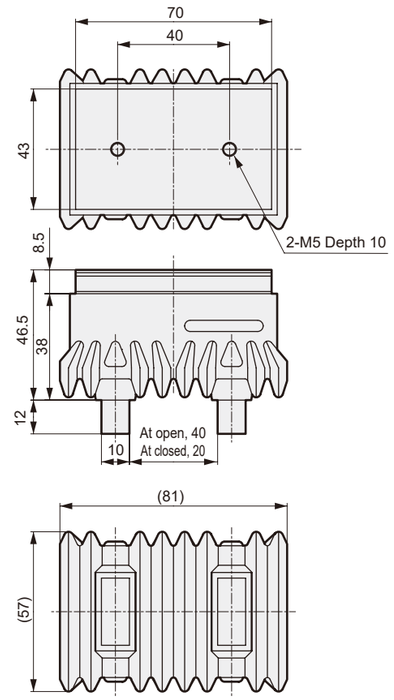


●With Switch

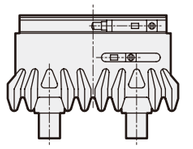


●HLAG-15CS Standard



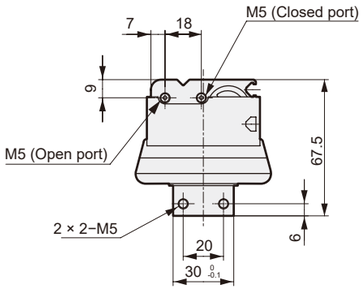


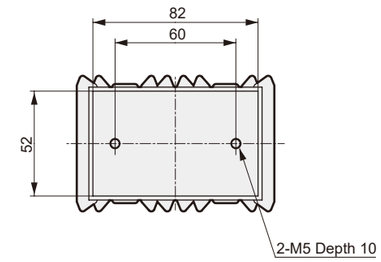
●With Switch

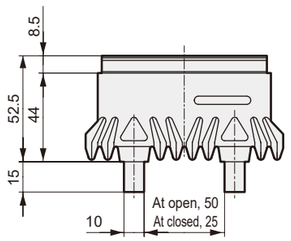


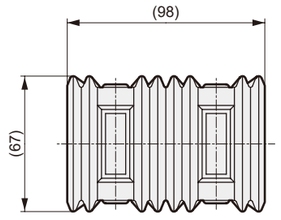
Outline Dimension Drawing

●HLAG-20CS Standard

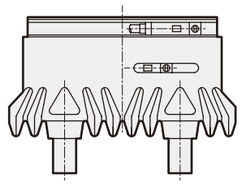






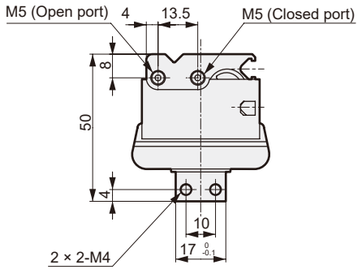


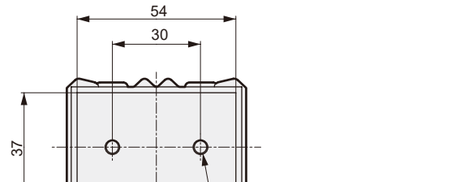
●With Switch

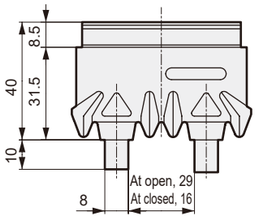


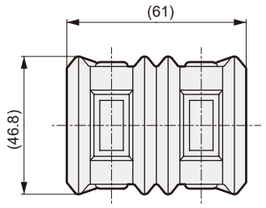
Outline Dimension Drawing

●HLBG-12CS Standard

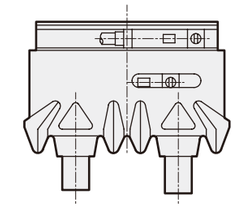




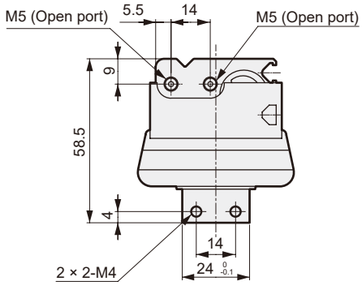


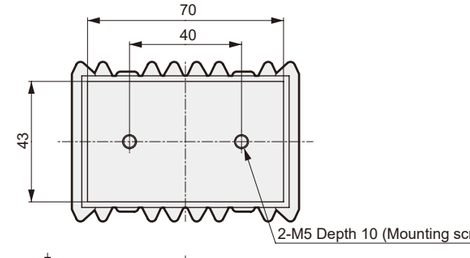


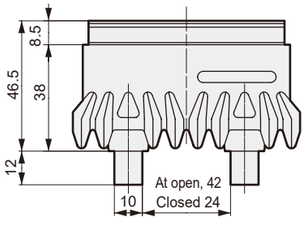
●With Switch

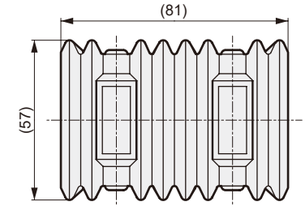


●HLBG-15CS Standard

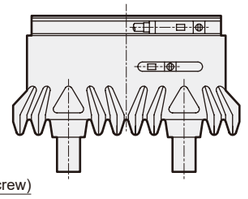






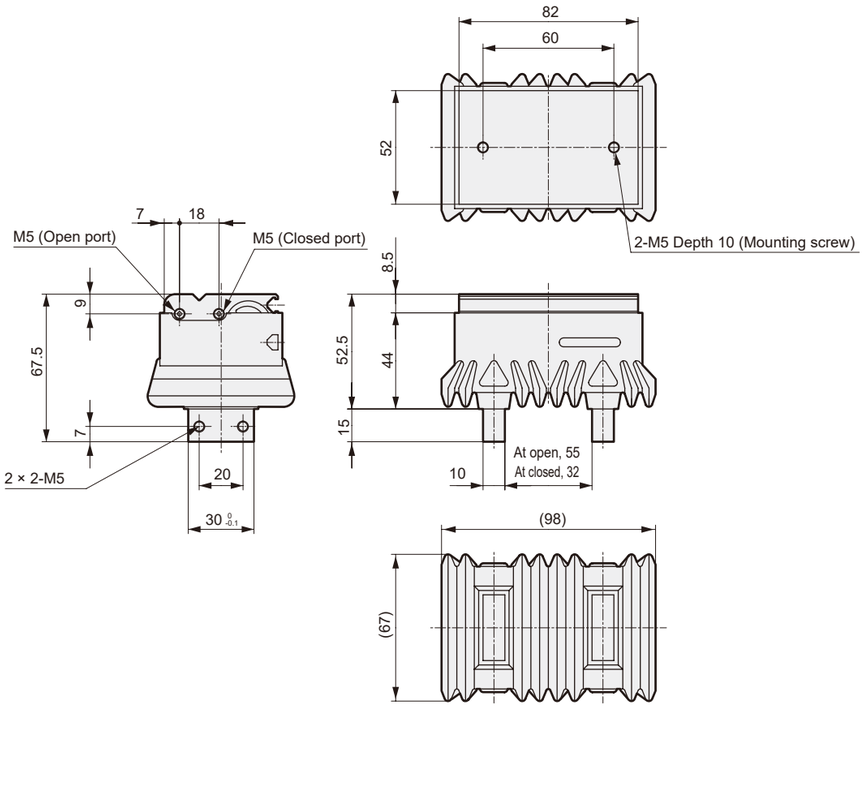


●With Switch

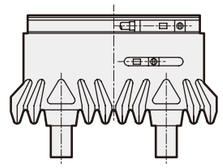


Outline Dimension Drawing

●HLBG-20CS Standard

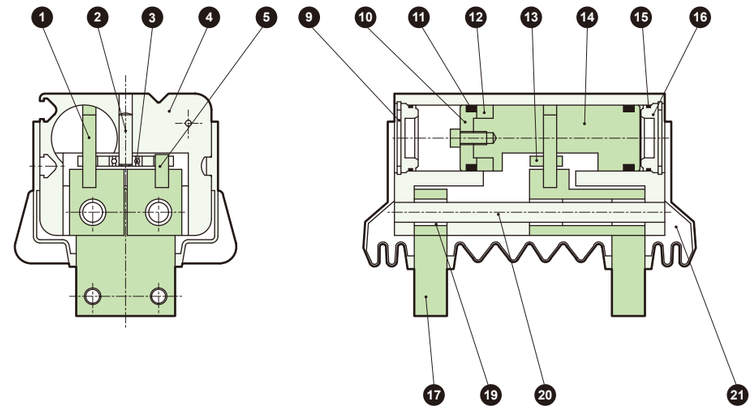


●With Switch

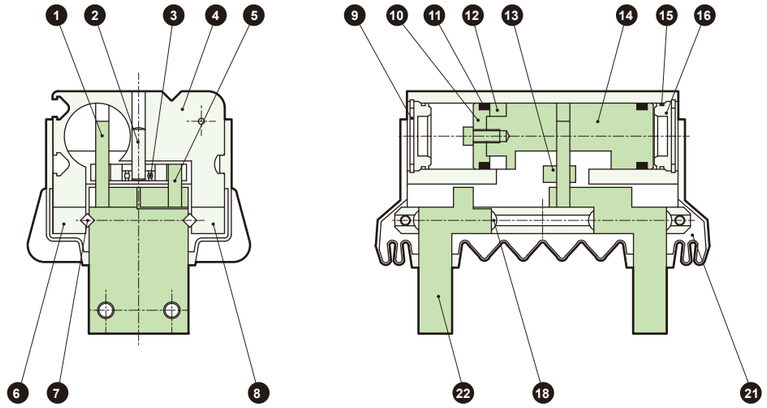


Internal Structure Diagram/Material

●HLAG-12CS to 20CS



●HLBG-12CS to 20CS



Do not disassemble

Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Needle roller B	High carbon chromium bearing steel		12	Magnet		
2	Parallel Pin	Steel		13	Cam	Stainless Steel	
3	Bearing	Alloy Steel		14	Piston	Stainless Steel	
4	Body	Aluminum Alloy		15	Gasket	Nitrile Rubber	
5	Needle roller A	High carbon chromium bearing steel		16	Cover	Resin	
6	Bearing guide B	Steel		17	Finger	Aluminum Alloy	
7	Cross Roller	High carbon chromium bearing steel		18	Truss head screw	Stainless Steel	
8	Bearing guide A	Steel		19	Bushing	Oil-Impregnated Bearing Alloy	
9	Retaining ring	Stainless Steel		20	Guide rod	High carbon chromium bearing steel	
10	Magnet retainer	Aluminum Alloy		21	Rubber Cover	Nitrile Rubber	
11	Piston Packing	Nitrile Rubber		22	Master jaw	Steel	



Low Profile Long Stroke Parallel Gripper Double Acting (Standard/Long stroke 1)

HLC Series

●Operating stroke: Standard Type 20, 30, 40, 50, 60, 70
Long stroke 1 60, 80, 100, 120, 140

Double Acting



RoHS

Model No. Notation Method

Without Switch
(Built-in magnet for switch)

HLC - 20CS - L1

Model No. ❶ ❷

With Switch
(Built-in magnet for switch)

HLC - 20CS - L1 - T2H - R

Model No. ❷Stroke ❸Switch Model No. ❹Number of Switches
❶Bore size

❶Bore Size (mm)

Code	Content
08CS	ø8
12CS	ø12
16CS	ø16
20CS	ø20
25CS	ø25
30CS	ø30

❷Stroke

Code	Content	Stroke (mm)					
		ø8	ø12	ø16	ø20	ø25	ø30
Blank	Standard	20	30	40	50	60	70
L1	Long stroke 1		60	80	100	120	140

❸Switch Model No.

For switch details, please refer to P. 573.
Switches are included with the product and shipped.

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	1-Color	2-wire	-	10 to 30	-	5 to 20 *2	T2H□	T2V□	
	1-Color Flexible Lead Wire	2-wire	-	10 to 30	-	5 to 20 Note 2	T2HR3	T2VR3	
	1-Color	3-wire (NPN)	-	30 or less	-	100 or less	T3H□	T3V□	
		3-wire (PNP)	-		-		T3PH□	T3PV□	

*1: For "□" in the switch model number, enter the code selected from the "*Lead wire length" 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: Switches other than the model numbers listed above are also available. (Custom Product) For details, see P. 573.

***Lead wire length**

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

Example) Lead wire length
1 m T2H
3 m T2H3
5 m T2H5

❹Number of Switches

Code	Content
R	With 1 pc. on Open Side
H	With 1 pc. on Close Side
D	With 2 pcs

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

●Structure usable in rechargeable battery manufacturing processes

HLC- •••• -P4□

*Please contact us for details.

Switch Single Unit Model No. Notation Method

SW - T2H

❸Switch Model No.

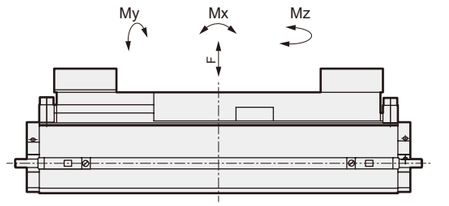
Specifications

Item		HLC										
Size		08CS	12CS		16CS		20CS		25CS		30CS	
		Blank	Blank	L1	Blank	L1	Blank	L1	Blank	L1	Blank	L1
Bore size	mm	ø8 x 2	ø12 x 2		ø16 x 2		ø20 x 2		ø25 x 2		ø30 x 2	
Operating Fluid		Compressed Air										
Max. Working Pressure	MPa	0.7										
Min. Operating Pressure	MPa	0.2										
Ambient Temperature	°C	5 to 60										
Port Size		M3			M5							
Operating Stroke	mm	20	30	60	40	80	50	100	60	120	70	140
Internal volume (reciprocating)	cm³	2.0	6.8	13.6	16.1	32.2	31.4	62.8	58.9	117.8	99	198
Repeatability	mm	±0.01			±0.03							
Weight	kg	0.14	0.29	0.44	0.71	0.85	1.03	1.4	1.62	2.23	2.74	3.69
Lubrication		Not required (When lubricating, use turbine oil Class 1 ISO VG32)										

Allowable Load and Allowable Moment

Allowable Load and Allowable Moment / Model No.	F [N]	Mx [N·m]	Mz [N·m]	My [N·m]
HLC-08CS	102	10	8.5	1.6
HLC-12CS	151	11.9	8.2	4.68
HLC-12CS-L1	151	11.9	8.2	4.68
HLC-16CS	325	27.5	25.6	7.96
HLC-16CS-L1	325	27.5	25.6	10.6
HLC-20CS	306	29.9	27	10.6
HLC-20CS-L1	306	29.9	27	11.2
HLC-25CS	423	105.1	96.4	19.7
HLC-25CS-L1	423	105.1	96.4	19.7
HLC-30CS	694	109.3	116.5	33.3
HLC-30CS-L1	694	109.3	116.5	43.1

Note) The above values are static loads and moments.

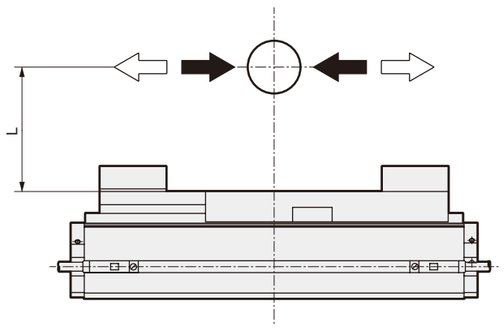


Gripping Force Performance Data

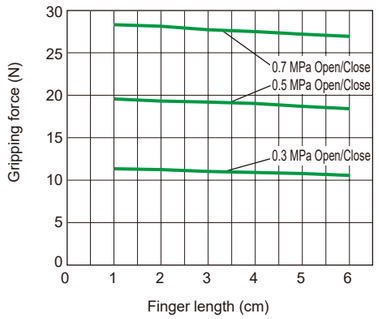
- Gripping force represents the thrust (for one finger) in the direction of the arrow shown in the figure.
- This represents the gripping force at the gripper's finger length L when the supply pressure is 0.3, 0.5, and 0.7 MPa.

●Opening direction (⇦) Closing direction (➡) Both ——— (Solid line)

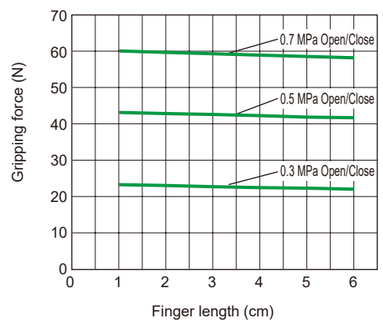
Note) **When selecting, check the design and selection precautions on P. 336.**



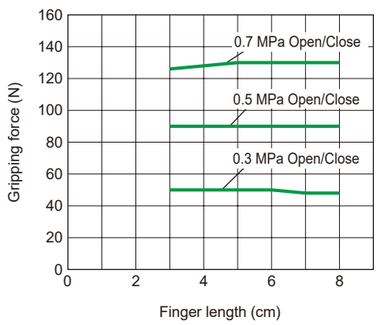
●HLC-08CS



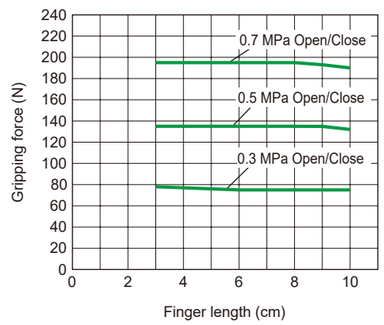
●HLC-12CS



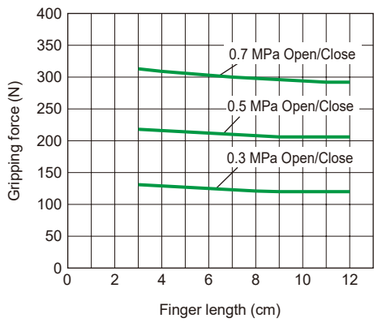
●HLC-16CS



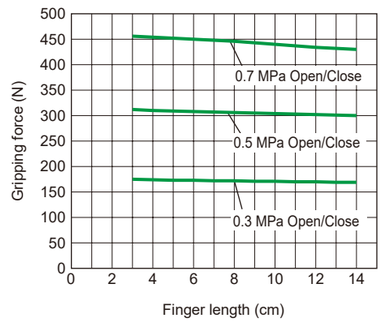
●HLC-20CS



●HLC-25CS



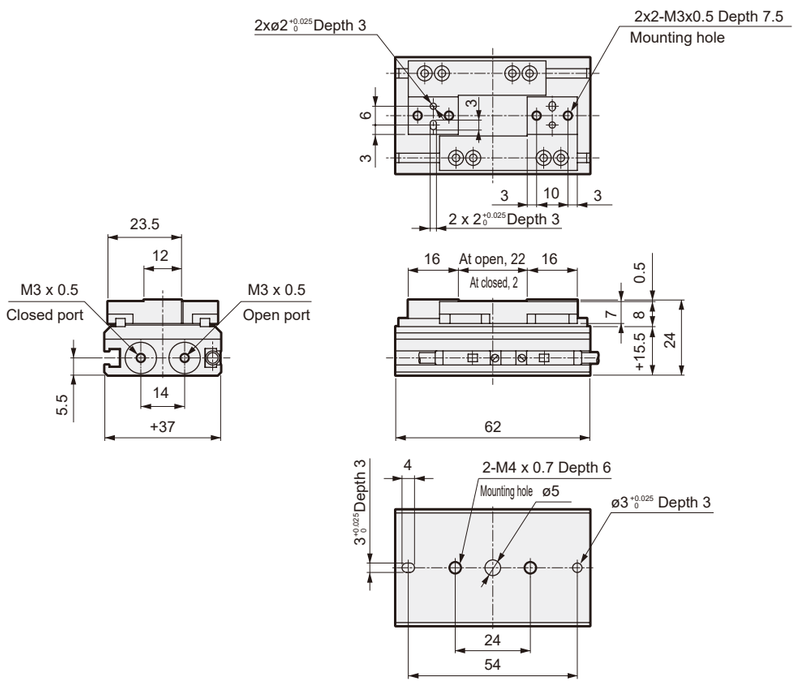
●HLC-30CS



MEMO

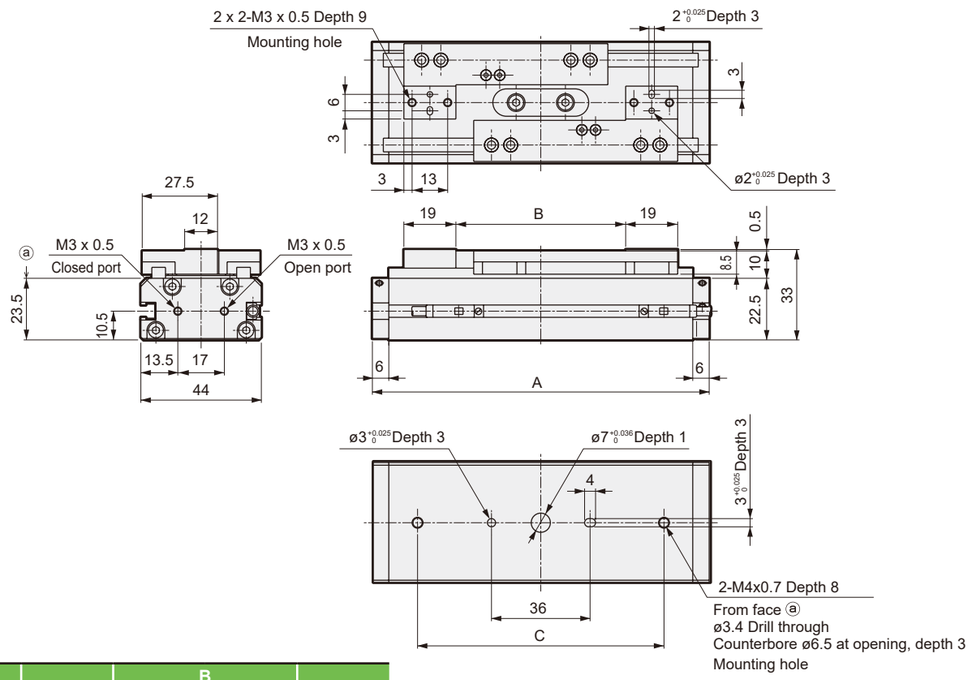
Outline Dimension Drawing

●HLC-08CS Standard



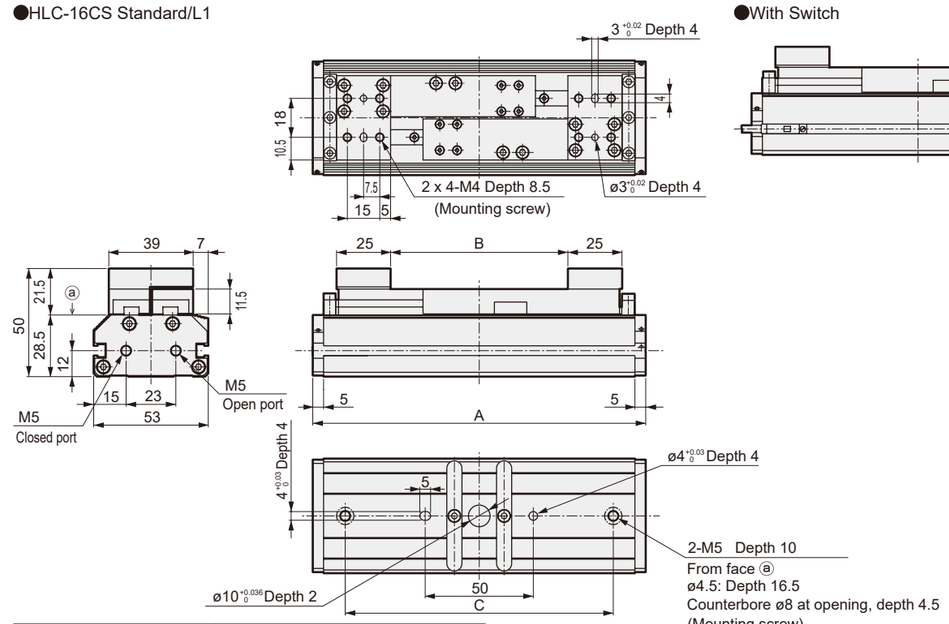
Code	A	B		C
		When Open	When Closed	
Standard	78	32	2	54
L1	123	62	2	90

●HLC-12CS Standard/L1

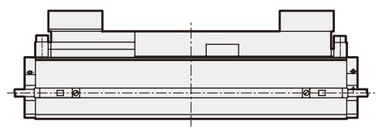


Code	A	B		C
		When Open	When Closed	
Standard	116	42	2	86
L1	154	82	2	124

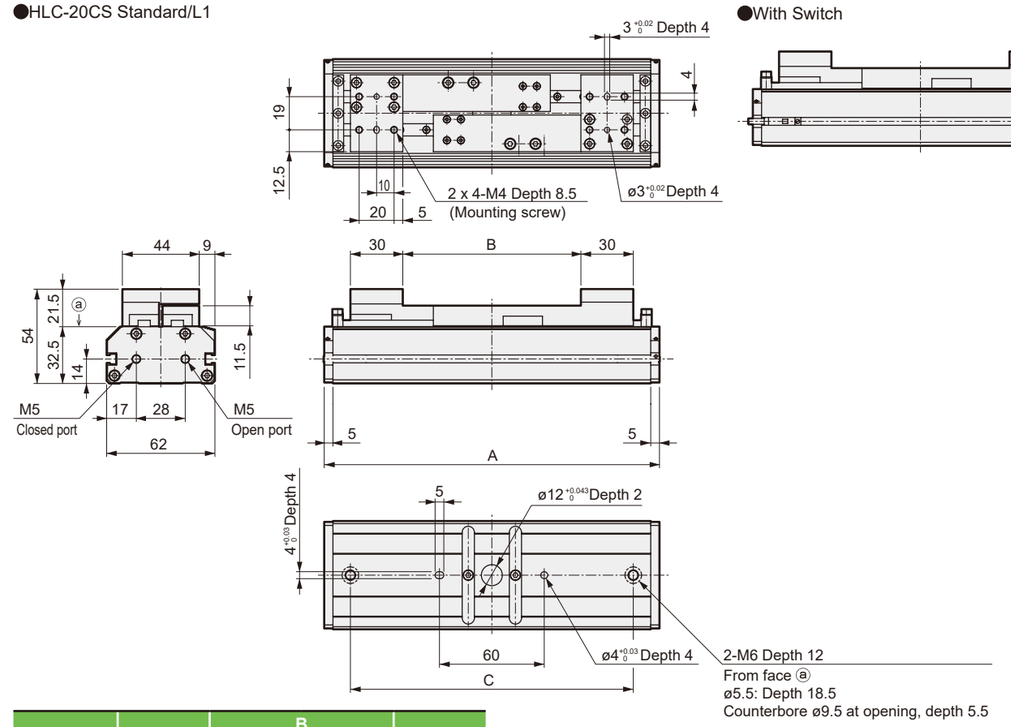
●HLC-16CS Standard/L1



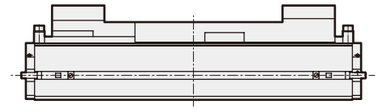
●With Switch



●HLC-20CS Standard/L1



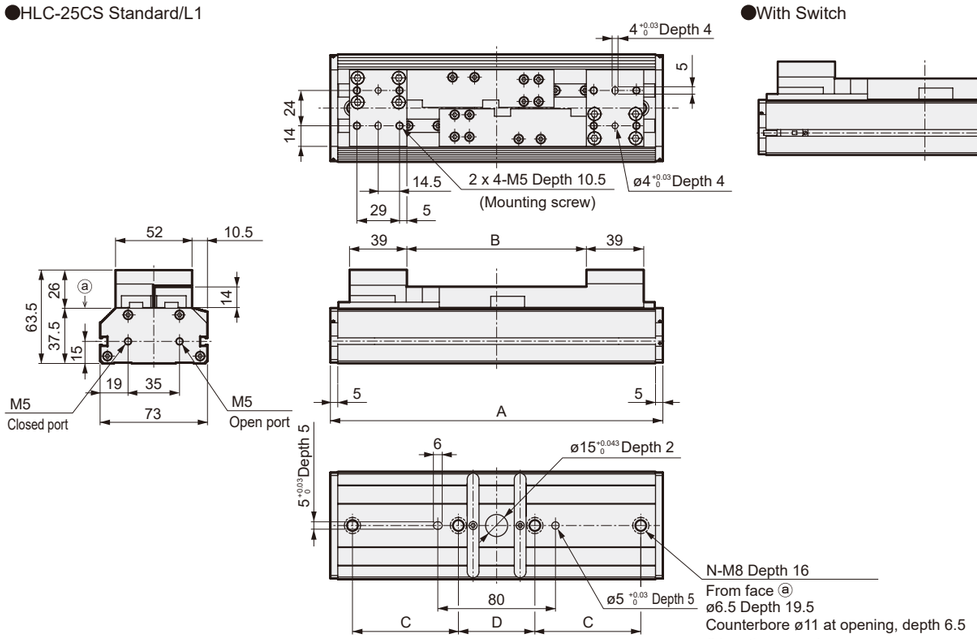
●With Switch



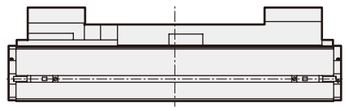
Code	A	B		C
		When Open	When Closed	
Standard	132	52	2	102
L1	192	102	2	162

Outline Dimension Drawing

●HLC-25CS Standard/L1

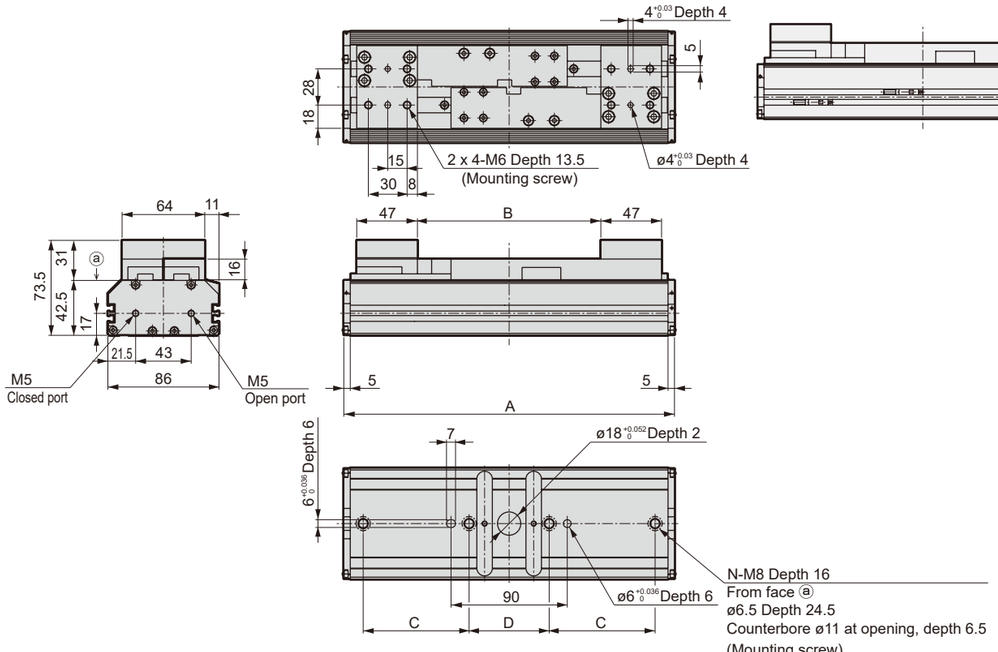


●With Switch

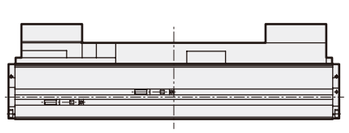


Code	A	B		C	D	N
		When Open	When Closed			
Standard	152	62	2	0	122	2
L1	226	122	2	72	52	4

●HLC-30CS Standard/L1



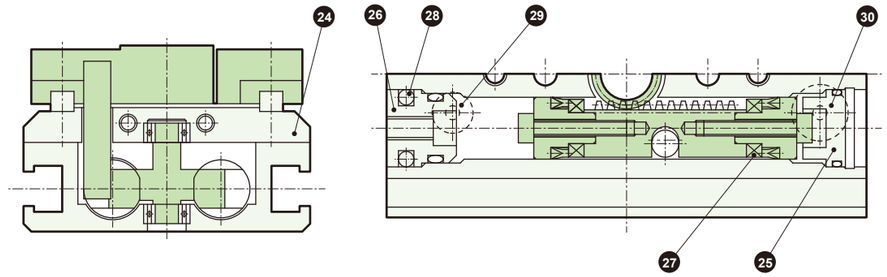
●With Switch



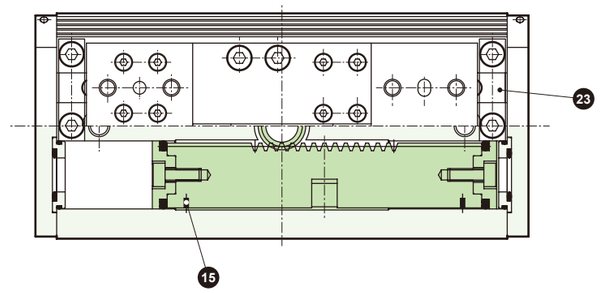
Code	A	B		C	D	N
		When Open	When Closed			
Standard	174	72	2	0	144	2
L1	256	142	2	82	62	4

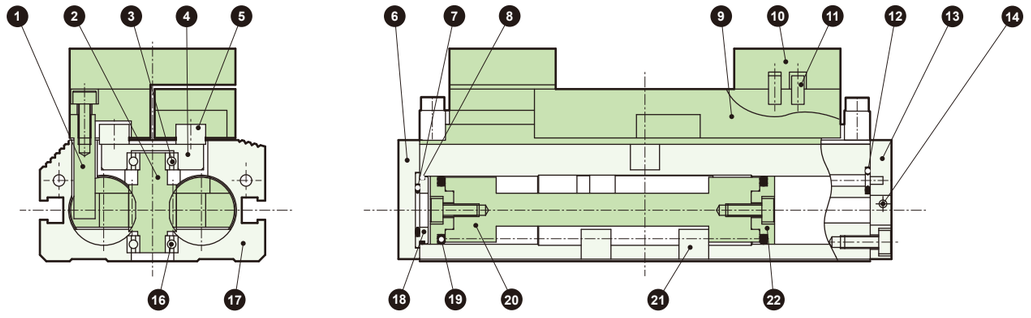
Internal Structure Diagram/Material

●HLC-08CS (Standard)



●HLC-12CS to 30CS (Standard)
●HLC-12CS to 30CS-L1





Do not disassemble

Part No.	Part Name	Material	Remarks
1	Rack joint	Steel	
2	Pinion	Stainless Steel	
3	Bearing		
4	Bearing retainer	Aluminum Alloy	12CS to 30CS only
5	Linear Guide		
6	Side plate 2	Aluminum Alloy	12CS to 30CS only
7	Seal 1	Nitrile Rubber	
8	Seal 2	Nitrile Rubber	
9	LM plate	Aluminum Alloy	
10	Finger	Aluminum Alloy	
11	Positioning pin		
12	Gasket 1	Nitrile Rubber	
13	Side plate 1	Aluminum Alloy	12CS to 30CS only
14	Steel ball	Stainless Steel	
15	Magnet		
16	Bearing		20CS only

Part No.	Part Name	Material	Remarks
17	Body	Aluminum Alloy	
18	Cover 1	Aluminum Alloy	
19	Piston seal	Nitrile Rubber	
20	Rack	Stainless Steel	
21	Key	16CS to 25CS: Carbon steel 30CS: Stainless Steel	16CS to 30CS only
22	Piston	Polyacetal	
23	Reinforcement plate	Stainless Steel	16CS, 20CS only
24	Linear guide mounting base	Aluminum Alloy	
25	Cover 2	Polyacetal	
26	Cover 3	Aluminum Alloy	
27	Magnet		
28	Anti-rotation pin	Stainless Steel	
29	Gasket 2	Nitrile Rubber	
30	Gasket 3	Nitrile Rubber	



Ultra Low Profile Parallel Gripper

HLD Series

●Operating stroke: 12, 16, 20, 30 mm

RoHS

Model No. Notation Method

HLD - 08CS - T2H - R

- HLD — Model No.
- 08CS — 1 Bore size
- T2H — 2 Switch Model No.
- R — 3 Number of Switches

1 Bore Size (mm)

Code	Content
08CS	ø8
12CS	ø12
16CS	ø16
20CS	ø20

2 Switch Model No.

For switch details, please refer to P. 573.
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 20 *2	T2H□	T2V□
	1-Color Flexible Lead Wire	2-wire	-	10 to 30	-	5 to 20 *2	T2HR3	T2VR3
	1-Color	3-wire (NPN)	-	30 or less	-	100 or less	T3H□	T3V□
		3-wire (PNP)	-		-		T3PH□	T3PV□



*1: For "□" in the switch model number, enter the code selected from the "*Lead wire length" 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: Switches other than the model numbers listed above are also available. (Custom Product) For details, see P. 573.

***Lead wire length**

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

Example) Lead wire length
1 m T2H
3 m T2H3
5 m T2H5

3 Number of Switches

Code	Content
R	With 1 pc. on Open Side
H	With 1 pc. on Close Side
D	With 2 pcs

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

●Structure usable in secondary battery manufacturing processes

HLD- ···· -P4□

*Please contact us for details.

Switch Single Unit Model No. Notation Method

SW - T2H

- T2H — 2 Switch Model No.

Specifications

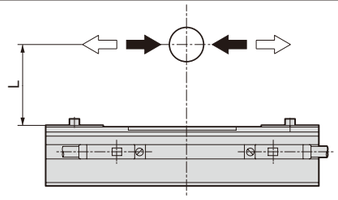
Item	HLD			
Size	08CS	12CS	16CS	20CS
Bore size mm	ø8 x 4	ø12 x 4	ø16 x 4	ø20 x 4
Operating Fluid	Compressed Air			
Max. Working Pressure MPa	0.7			
Min. Operating Pressure MPa	0.2			
Ambient Temperature °C	5 to 60			
Port Size	M3		M5	
Operating Stroke mm	12	16	20	30
Internal volume (reciprocating) cm^3	3.2	7.8	19.8	43.3
Repeatability mm	±0.01			
Weight kg	0.23	0.29	0.62	1.05
Lubrication	Not required (When lubricating, use turbine oil Class 1 ISO VG32)			

Gripping Force Performance Data

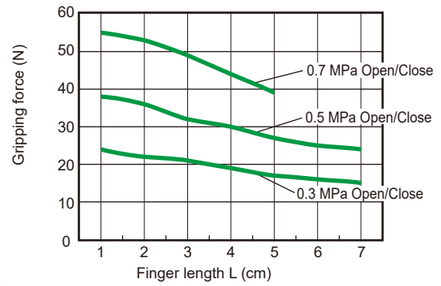
- Gripping force represents the thrust (for one finger) in the direction of the arrow shown in the figure.
- This represents the gripping force at the gripper's finger length L when the supply pressure is 0.3, 0.5, and 0.7 MPa.

●Opening direction (⇦) Closing direction (⇨) Both ——— (Solid line)

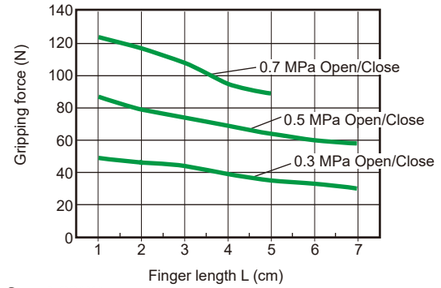
Note) **When selecting, check the design and selection precautions on P. 336.**



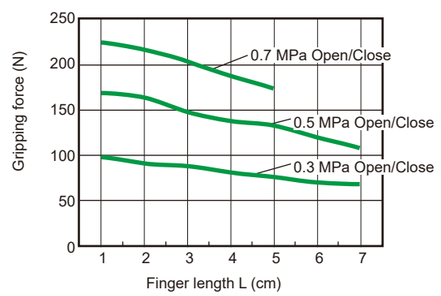
●HLD-08CS



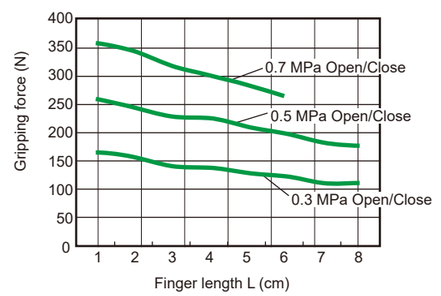
●HLD-12CS



●HLD-16CS

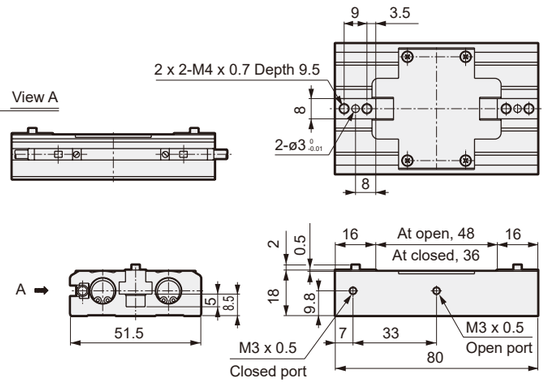


●HLD-20CS

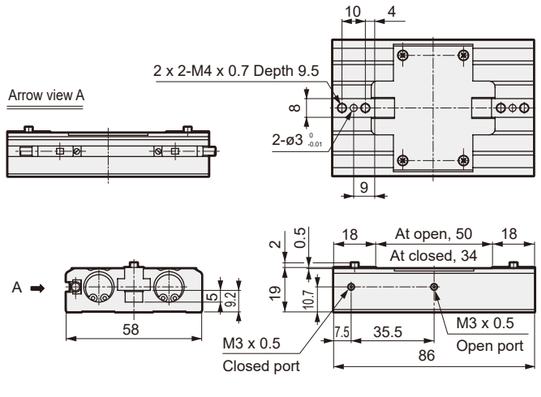


Outline Dimension Drawing

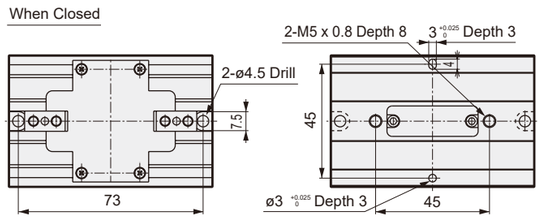
● HLD-08CS



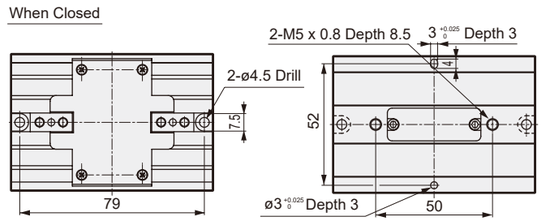
● HLD-12CS



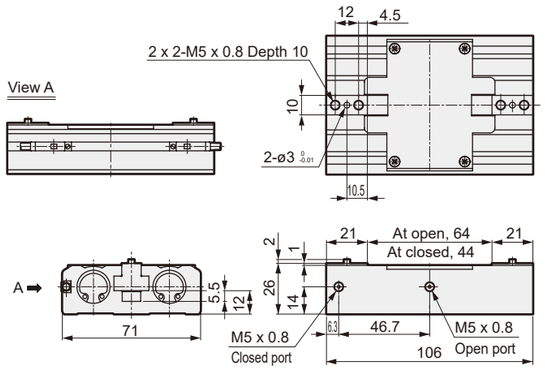
When Closed



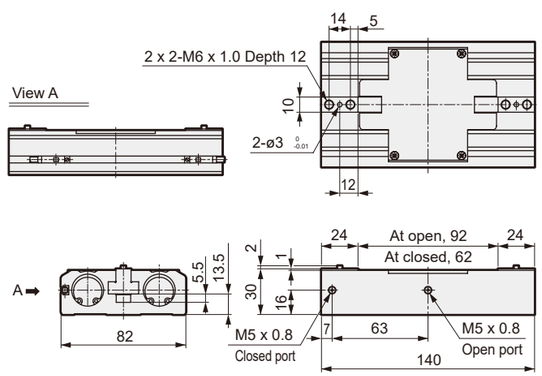
When Closed



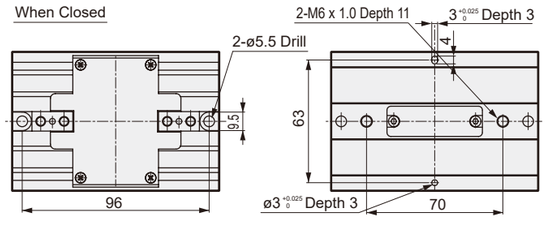
●HLD-16CS

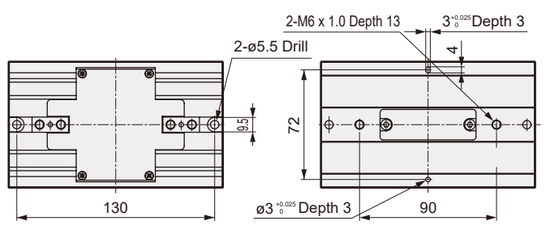


●HLD-20CS

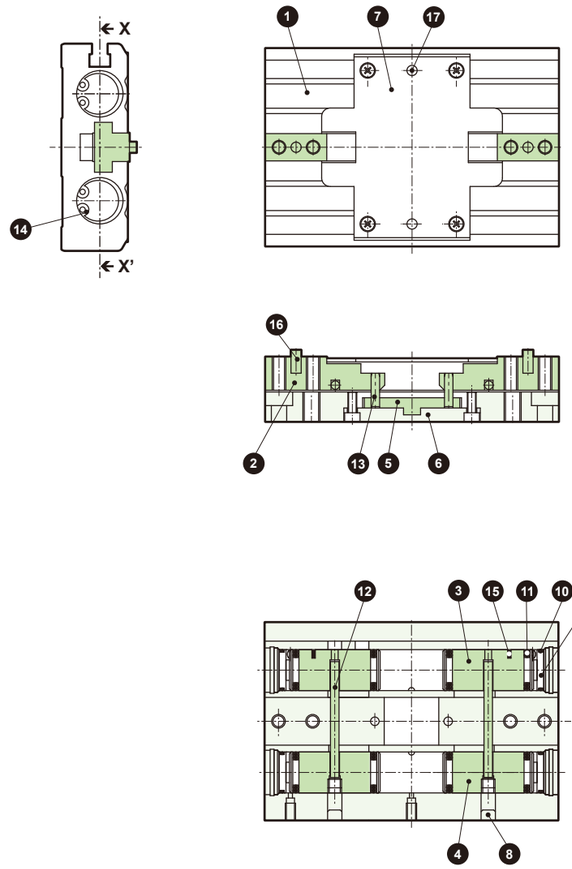


When Closed





Internal Structure Diagram/Material



X to X' Cross-sectional view

Do not disassemble

Part No.	Part Name	Material	Part No.	Part Name	Material
1	Body	Aluminum Alloy	10	Seal	Nitrile Rubber
2	Finger	Steel	11	Piston seal	Nitrile Rubber
3	Piston 1	Aluminum Alloy	12	Actuating shaft A	Alloy Steel
4	Piston 2	Aluminum Alloy	13	Actuating shaft B	Alloy Steel
5	Cam	Steel	14	C-type retaining ring	Stainless Steel
6	Guide block	Aluminum Alloy	15	Magnet	
7	Top cover	Stainless Steel	16	Positioning pin 1	Alloy Steel
8	Cap	Aluminum Alloy	17	Positioning pin 2	Alloy Steel
9	Cover	Aluminum Alloy			

Wide parallel hand

HMC-HP1 Series

Changing "gripping" changes manufacturing

Increased guide rigidity even for wide types
Achieves high rigidity, high precision, and high durability



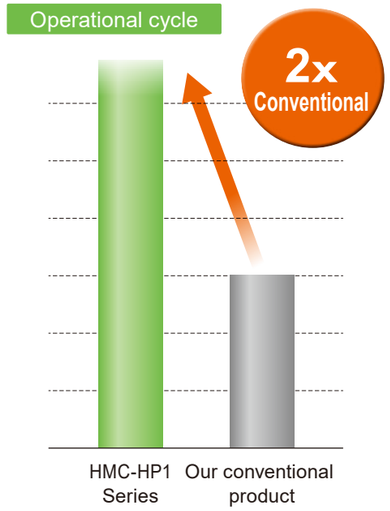
- Significant reduction in minor stoppages
- Significant reduction in replacement frequency
- Significant reduction in replacement time
- Durability of 10 million cycles or more

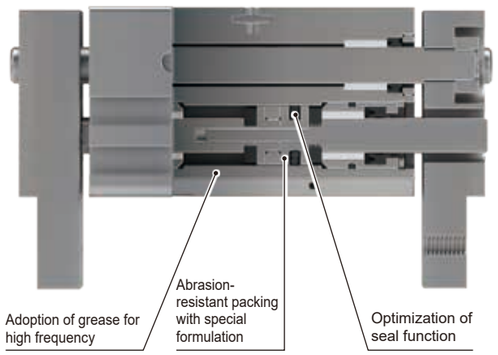
*According to our specified conditions

HP HIGH PRODUCTIVITY

Long service life

Mastering sliding technology, achieving durability more than twice that of conventional products.

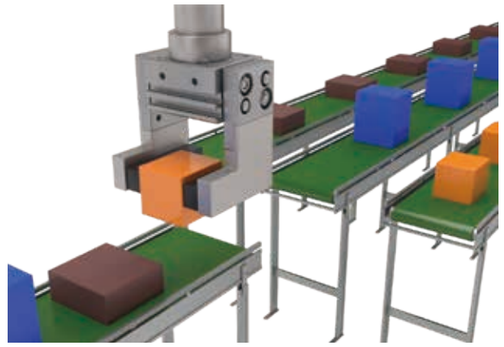




Abundant strokes

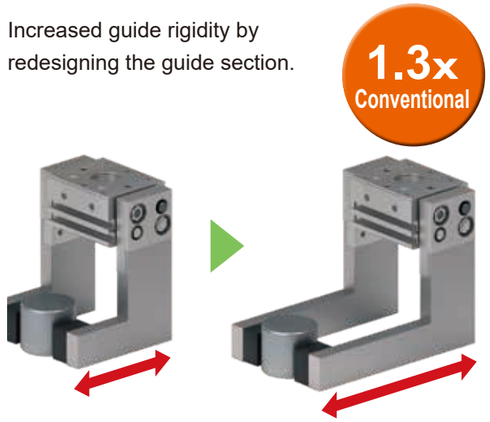
Powerfully grips large and small workpieces with a long stroke.

Stroke Type	Stroke (mm)					
	ø10	ø16	ø20	ø25	ø32	ø40
Short	20	30	40	50	70	100
Middle	40	60	80	100	120	160
Long	60	80	100	120	160	200



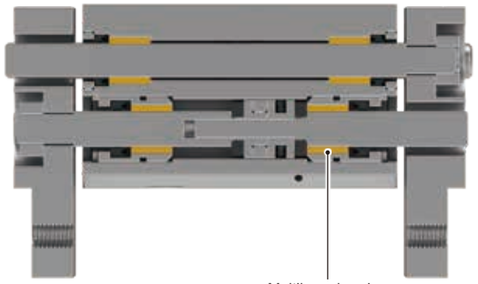
High rigidity

Increased guide rigidity by redesigning the guide section.



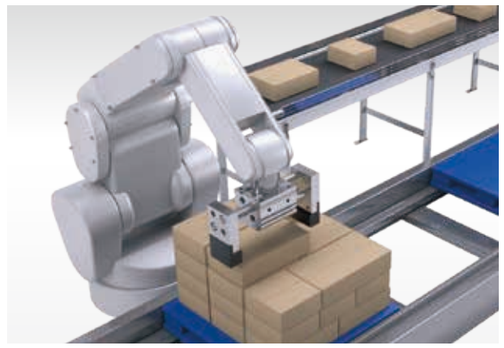
Double bearing structure

Reinforced multilayer bearings that exhibit excellent friction characteristics under high load conditions



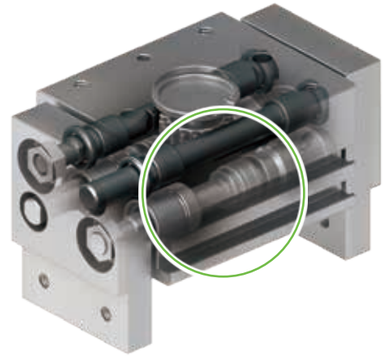
Compatible with gripping large workpieces

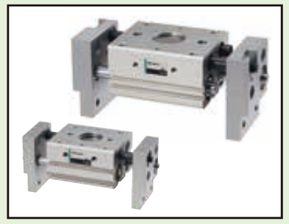
Wide opening ideal for large workpieces.



High gripping force

Adopts a double piston structure. Achieves compact size and high gripping force by directly transmitting cylinder thrust to the fingers.





Wide Parallel Gripper (Standard/Long Stroke)

HMC-HP1 Series

●Operating stroke: Short stroke: 20, 30, 40, 50, 70, 100 mm
Middle stroke: 40, 60, 80, 100, 120, 160 mm
Long stroke: 60, 80, 100, 120, 160, 200 mm

Double Acting



RoHS

Model No. Notation Method

Without Switch
(Built-in magnet for switch)

HMC – 32 – A ——— HP1

Model No. ❶ ❷

With Switch
(Built-in magnet for switch)

HMC – 32 – A – T2H – R – HP1

Model No. ❶Bore size ❷Stroke ❸Switch Model No. ❹Number of Switches

❶Bore Size (mm)

Code	Content
10	ø10
16	ø16
20	ø20
25	ø25
32	ø32
40	ø40

❷Stroke

Code	Content	Stroke (mm)					
		ø10	ø16	ø20	ø25	ø32	ø40
A	Short stroke	20	30	40	50	70	100
B	Middle stroke	40	60	80	100	120	160
C	Long stroke	60	80	100	120	160	200

❸Switch Model No.

For switch details, please refer to P. 573. 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 20	-	5 to 20 *2	T2H□	T2V□
	1-Color Flex-Resistant Lead Wire	2-wire	-	10 to 20	-	5 to 20 *2	T2HR3	T2VR3
	1-Color	3-wire (NPN)	-	30 or less	-	100 or less	T3H□	T3V□
		3-wire (PNP)	-		-		T3PH□	T3PV□



*1: For "□" in the switch model number, enter the code selected from the "*Lead wire length" 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: Switches other than the model numbers listed above are also available. (Custom Product) For details, see P. 573.
*4: When installing a 2-color indicator switch, please consult our sales office.

❹Number of Switches

Code	Content
R	With 1 pc. on Open Side
H	With 1 pc. on Close Side
D	With 2 pcs

*Lead wire length

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

Example) Lead wire length
1 m T2H
3 m T2H3
5 m T2H5

Switch Single Unit Model No. Notation Method

SW – T2H

❸Switch Model No.

Specifications

Item	HMC-10 A	HMC-10 B	HMC-10 C	HMC-16 A	HMC-16 B	HMC-16 C	HMC-20 A	HMC-20 B	HMC-20 C	HMC-25 A	HMC-25 B	HMC-25 C	HMC-32 A	HMC-32 B	HMC-32 C	HMC-40 A	HMC-40 B	HMC-40 C
Bore size mm	ø10 x 2			ø16 x 2			ø20 x 2			ø25 x 2			ø32 x 2			ø40 x 2		
Actuation method	Double Acting Type																	
Operating Fluid	Compressed Air																	
Max. Working Pressure MPa	0.6																	
Min. Operating Pressure MPa	0.15			0.1														
Ambient Temperature °C	-10 to 60 (No freezing)																	
Port Size	M5												Rc1/8					
Operating stroke mm	20	40	60	30	60	80	40	80	100	50	100	120	70	120	160	100	160	200
Rod diameter mm	ø6			ø8			ø10			ø12			ø16			ø20		
Internal volume (reciprocating) cm^3	2.0	4.0	6.0	9.0	18.1	24.1	18.8	37.7	47.1	37.8	75.6	90.7	84.4	145	193	188	302	377
Repeatability mm	±0.1																	
Weight kg	0.28	0.39	0.45	0.53	0.74	0.85	0.98	1.3	1.5	1.6	2.2	3.5	2.9	3.8	4.5	5.3	6.9	8.2
Lubrication	Not Required																	

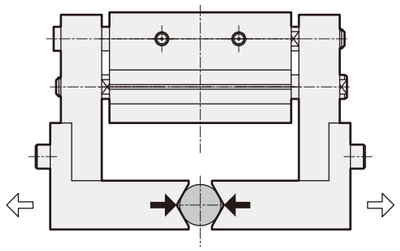
Note) For gripping force, refer to P. 256.

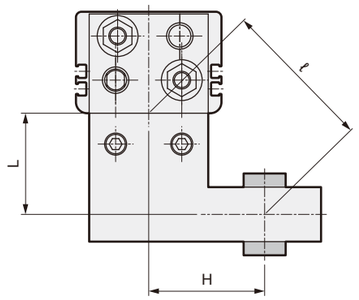
Gripping Force Performance Data

• Gripping force represents the thrust (for one finger) in the direction of the arrow shown in the figure.
• Indicates the gripping force at attachment length ℓ of the gripper when the supply pressure is up to 0.6 MPa.

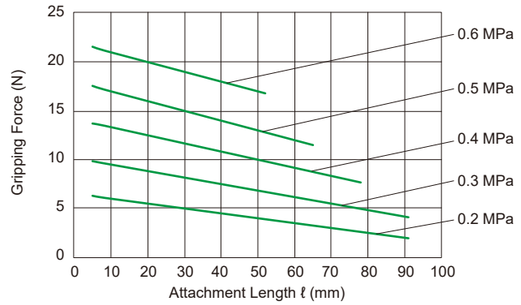
Note) **When selecting, check the design and selection precautions on P. 336.**

●Opening direction (⇦)
●Closing direction (➡)

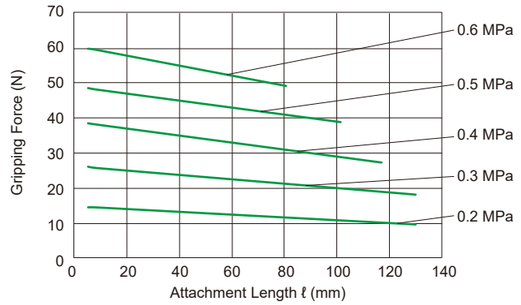




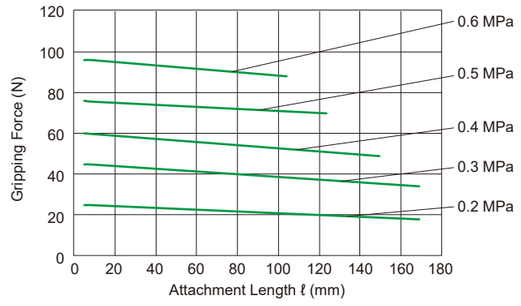
HMC-10



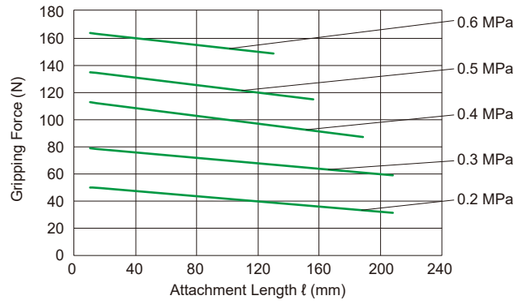
HMC-16



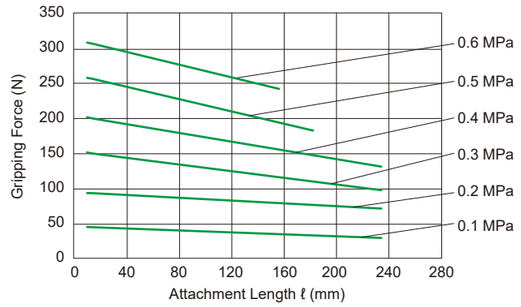
HMC-20



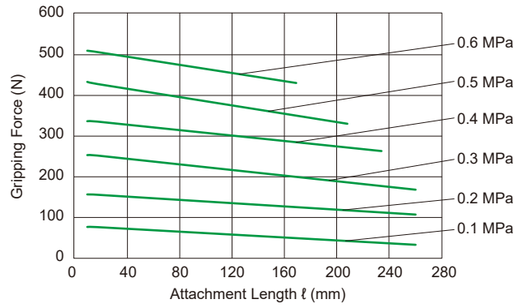
HMC-25



HMC-32

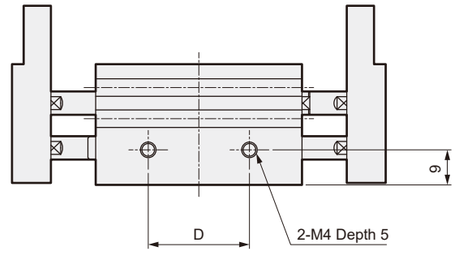


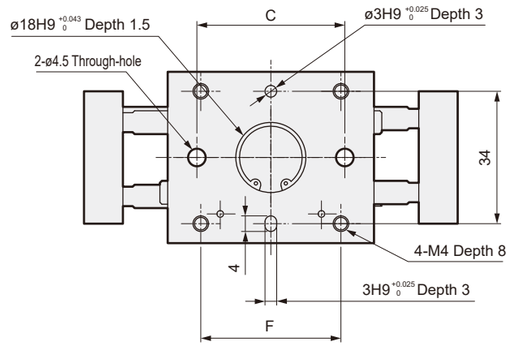
HMC-40

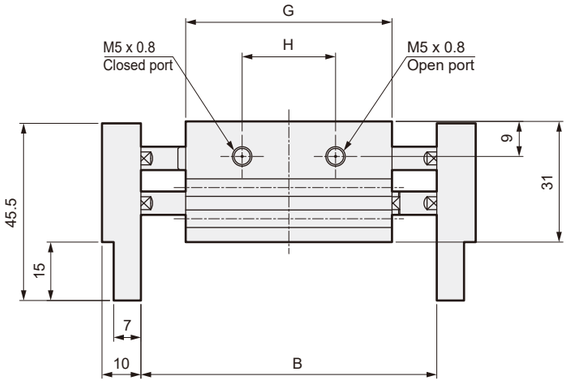


External dimensions diagram (Bore size: ø10)

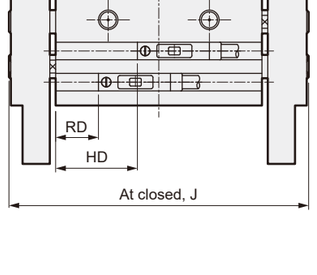
●HMC-10□-HP1

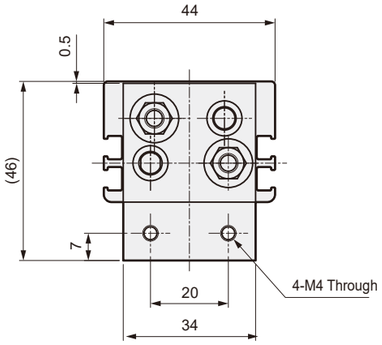






●With Switch

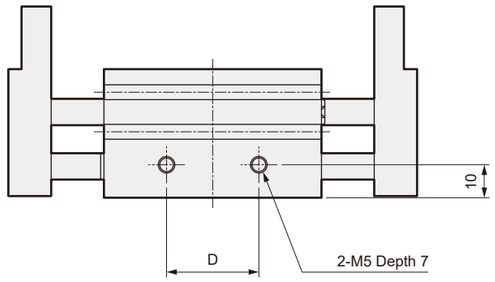




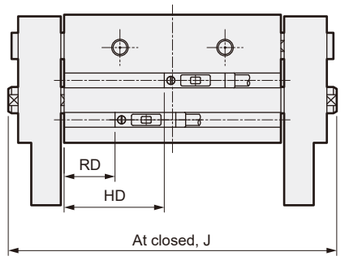
Model No.	B		C	D	F	G	H	J
	When Open	When Closed						
HMC-10A	76	56	38	26	36	53	26	79
HMC-10B	118	78	54	42	52	71	40	115
HMC-10C	156	96	72	60	70	81	50	145

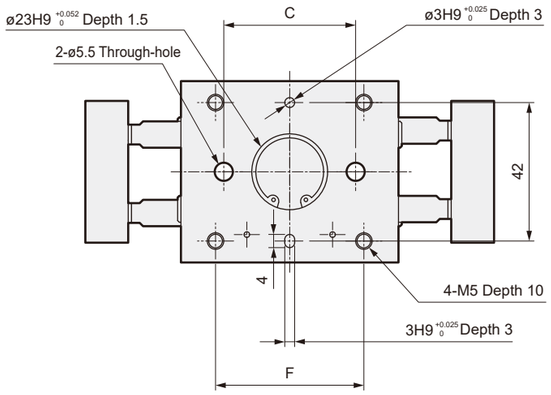
Outline dimension drawing (Bore size: ø16)

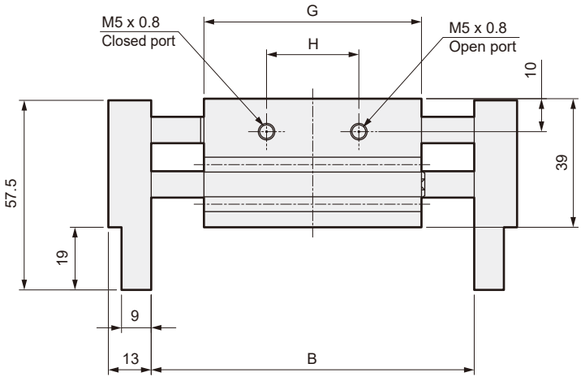
●HMC-16□-HP1

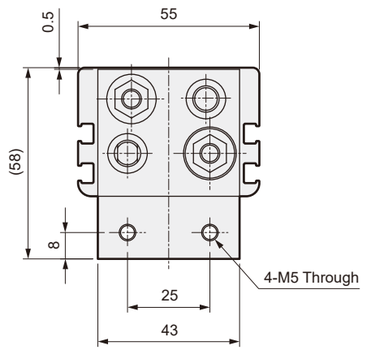


●With Switch





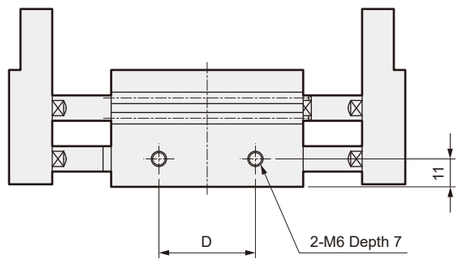




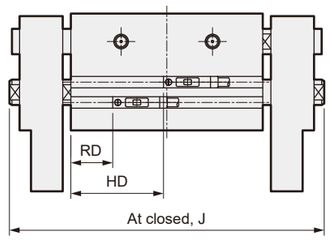
Model No.	B		C	D	F	G	H	J
	When Open	When Closed						
HMC-16A	98	68	40	28	45	66	32	100
HMC-16B	170	110	70	58	75	95	60	159
HMC-16C	210	130	90	78	95	105	70	189

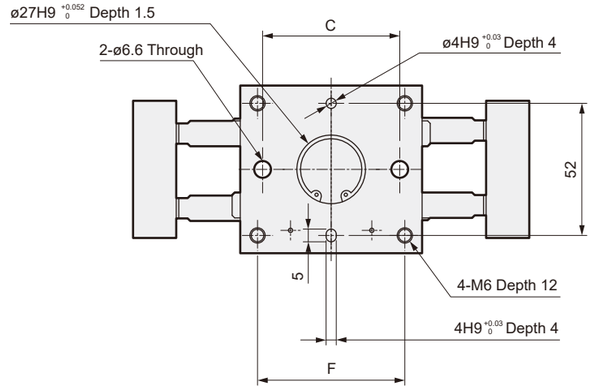
Outline dimension drawing (Bore size: ø20)

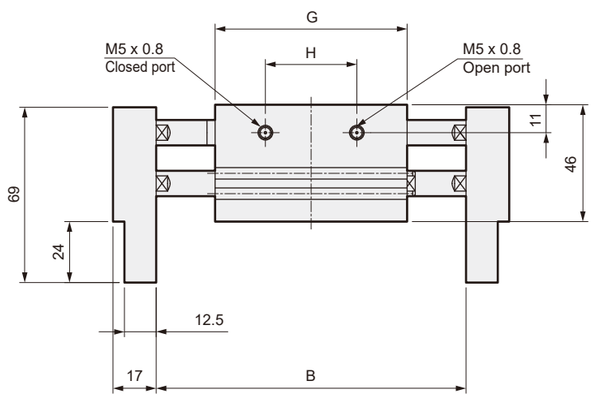
●HMC-20□-HP1

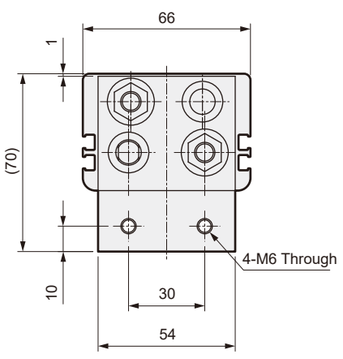


●With Switch





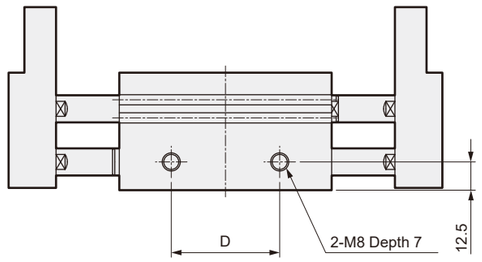




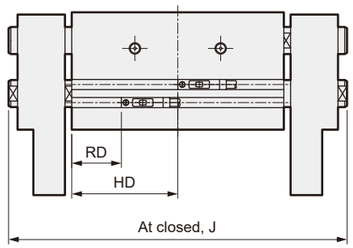
Model No.	B		C	D	F	G	H	J
	When Open	When Closed						
HMC-20A	122	82	54	38	58	75.6	36	124
HMC-20B	222	142	96	80	100	113.6	68	195
HMC-20C	262	162	116	100	120	133.6	78	235

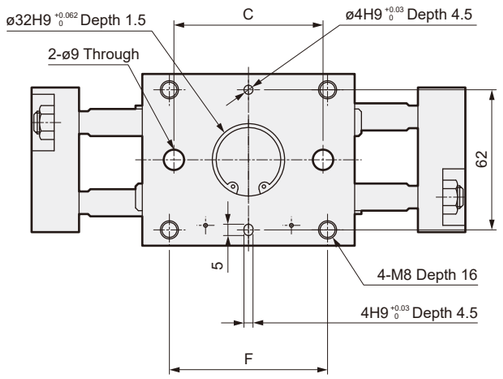
Outline Dimension Drawing (Bore size: ø25)

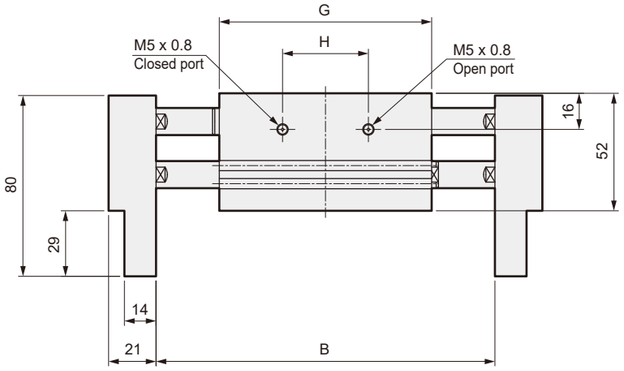
●HMC-25□-HP1

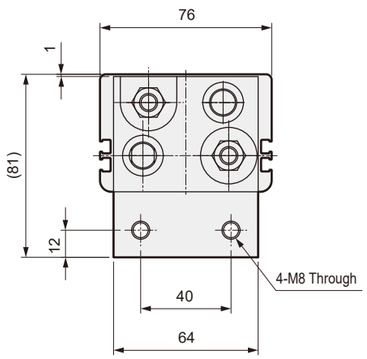


●With Switch





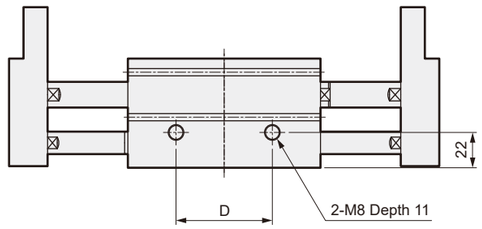




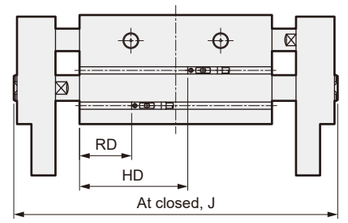
Model No.	B		C	D	F	G	H	J
	When Open	When Closed						
HMC-25A	150	100	66	48	70	94	38	152
HMC-25B	282	182	120	102	124	146	94	254
HMC-25C	320	200	138	120	142	156	104	284

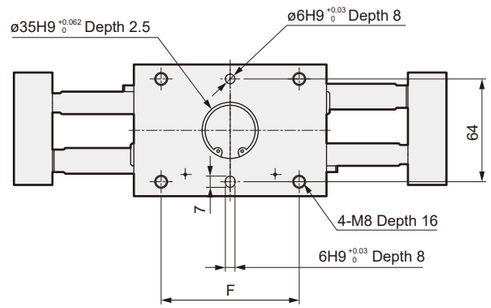
External dimensions diagram (Bore size: ø32)

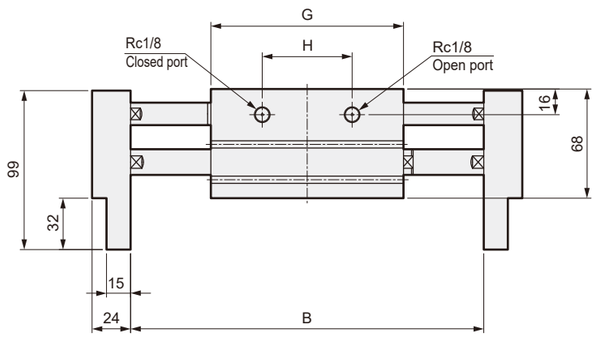
●HMC-32□-HP1

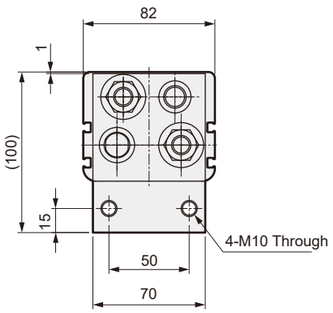


●With Switch





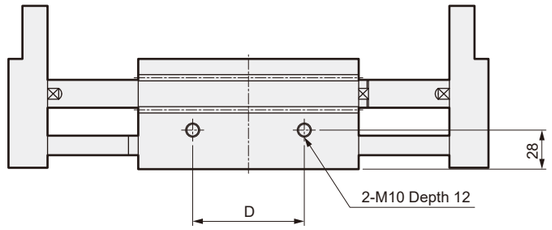




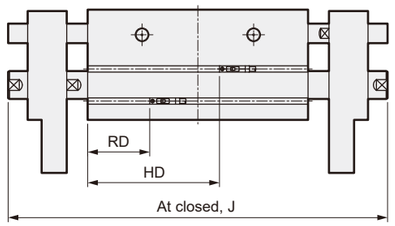
Model No.	B		D	F	G	H	J
	When Open	When Closed					
HMC-32A	220	150	60	86	120	56	202
HMC-32B	318	198	108	134	170	104	310
HMC-32C	402	242	152	178	198	124	362

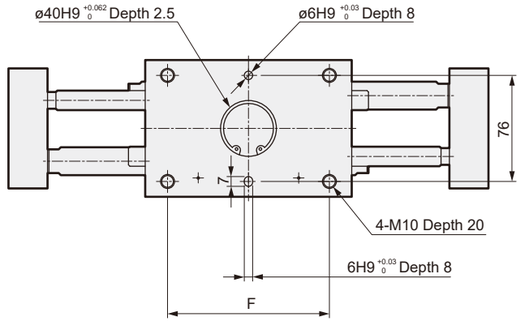
Outline Dimensional Drawing (Bore size: ø40)

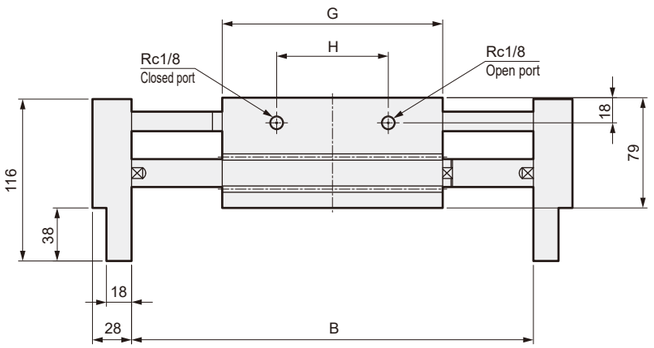
●HMC-40□-HP1

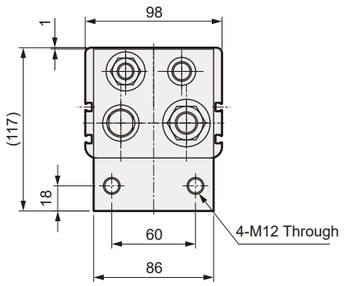


●With Switch





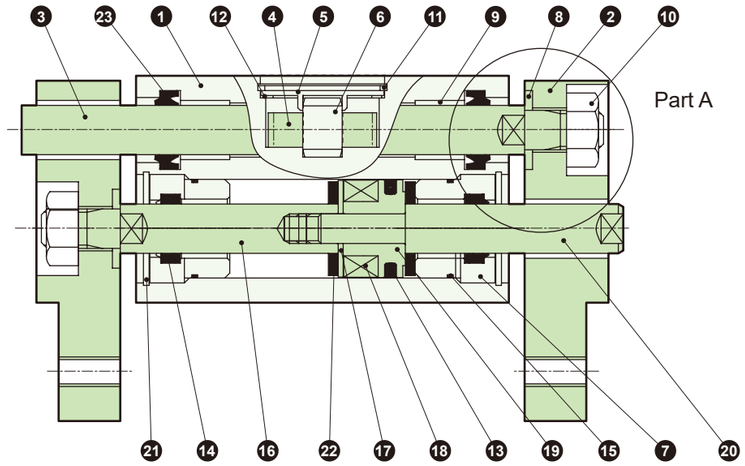


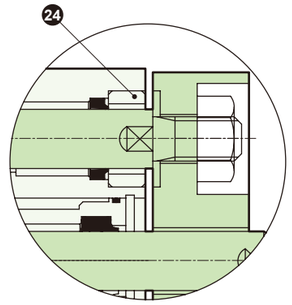


Model No.	B		D	F	G	H	J
	When Open	When Closed					
HMC-40A	288	188	80	116	158	80	272
HMC-40B	406	246	138	174	216	150	390
HMC-40C	486	286	178	214	236	170	450

Internal Structure Diagram/Material

●HMC-10 to 40-HP1





ø10, 16 Part A detail

Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Body	Aluminum Alloy	Hard Anodized	13	Piston Packing	Nitrile Rubber	
2	Finger	Aluminum Alloy	Hard Anodized	14	Rod Packing	Nitrile Rubber	
3	Rack	Alloy Steel		15	Gasket	Nitrile rubber	
4	Pinion	Alloy Steel		16	Piston Rod A	Stainless Steel	
5	Pinion cover	Stainless Steel		17	Spacer	Aluminum alloy	Chromate
6	Pinion shaft	Stainless Steel		18	Magnet		
7	Rod metal A	Aluminum Alloy	Chromate	19	Piston	Aluminum Alloy	Chromate
8	Washer	Steel	ø10 to 25 only	20	Piston Rod B	Stainless Steel	
9	Bearing	Oiles Drymet		21	Round R Type Retaining Ring	Steel	
10	Hexagon Nut	Steel		22	Cushion Rubber	Urethane Rubber	
11	C-type retaining ring	ø10, 16, 25 to 40: Stainless steel ø20: Steel		23	Scraper	Nitrile Rubber	
				24	Rod metal B	Stainless Steel	ø10, ø16 only
12	Wave Washer	Spring steel	Phosphate Coating				

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

HMC-HP1 Selection Guide

STEP-1 Select appropriate model from required gripping force

① Calculation of Required Gripping Force

To transport a workpiece (weight WL), a gripping force FW that satisfies the following formula is required.

$$F_W > \frac{W_L \times g \times K}{n}$$

F_W : Required Gripping Force [N]
n : Number of Fingers = 2
W_L : Workpiece Weight [kg]
g : Gravitational acceleration = 9.8 [m/s²]
K : Conveyance Factor
5 [Holding only]
10 [Normal transport]
20 [Rapid acceleration transport]

About Conveyance Factor K

Calculation Example) When decelerating from a conveyance speed V = 0.75 m/s to stop in 0.1 seconds, with a friction coefficient μ of 0.1 between the workpiece and finger, it is as follows.

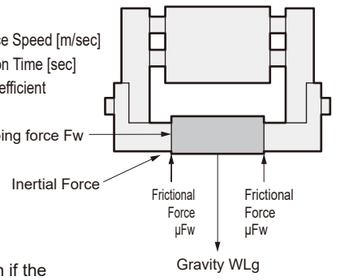
Determine the transport coefficient K from the force applied to the workpiece

V : Conveyance Speed [m/sec]
t : Deceleration Time [sec]
μ : Friction Coefficient

• Inertial force = W_L (V/t)
• Gravity = W_Lg

• Required gripping force $F_W > \frac{W_L(V/t) + W_L g}{n\mu} = \frac{W_L(V/t + g)}{n\mu} = \frac{17.3\,W_L}{2 \times 0.1} = 86.5\,WL$

∴ The transport coefficient K at this time is, from the above formula $\frac{V/t + g}{\mu g} = \frac{0.75/0.1 + 9.8}{0.1 \times 9.8} \approx 20$

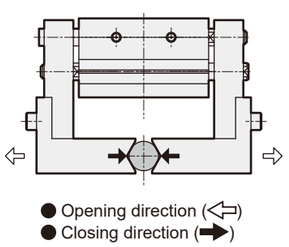


Note) The transport coefficient K needs to allow a margin for impacts during transport, etc. Even if the friction coefficient μ is higher than μ=0.1, set the conveyance factor K to 10 to 20 or more for safety.

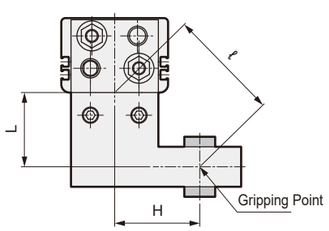
② Model selection from required gripping force

Gripping force changes depending on "gripping direction," "attachment length," and "supply pressure." Confirm from the gripping force graph that sufficient gripping force can be obtained under your operating conditions. For the gripping force graph, refer to P. 256.

Gripping Direction

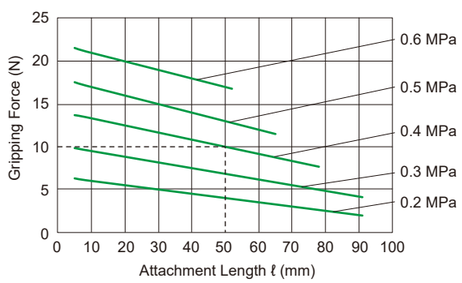


Finger Length L



How to Read Gripping Force Graph

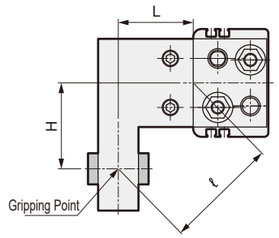
(For HMC-10)



For example, if the supply pressure is 0.4 MPa and the attachment length is 50 mm, the resulting gripping force will be 10 N.

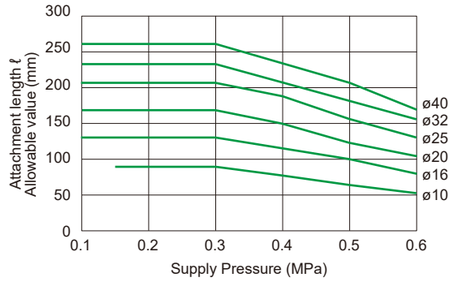
STEP-2 Confirmation of Attachment Shape

Ex) ℓ: 50 mm



Note) **When selecting, check the design and selection precautions on P. 336.**

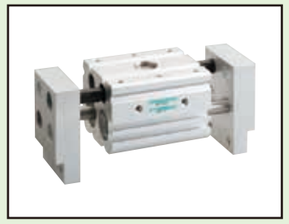
If HMC-10 is selected, the attachment length ℓ: 50 mm is smaller than the value on the ø10 line at a supply pressure of 0.5 MPa, so it can be used.



● Use attachments that are as lightweight and short as possible.
If they are long and heavy, the inertial force during opening and closing becomes large, which may cause backlash in the fingers or accelerate wear of the finger's sliding parts, adversely affecting the service life.

● Even if the attachment shape is within the performance data, making it as small as possible will allow the product to be used for a long time. Also, if ℓ is long, there is a risk of gripping errors, dropping during transport, etc., due to unexpected vibrations. As a guideline, use "Cylinder bore x 1.3 / Operating pressure". If ℓ is longer than that, set a higher transport coefficient in STEP-1 (Guideline: Transport coefficient of 20 or more).

● The weight of the attachment affects the service life, so please keep it below the following.
W < 1/4H (1 piece) W : Weight of attachment
H : Gripper Product Weight



Compact Wide Parallel Gripper (Standard/Long Stroke)

HMF Series

●Operating stroke:

Standard	20, 30, 40, 50, 70, 100 mm
Long stroke 1	60, 80, 100, 120, 160 mm
Long stroke 2	80, 100, 120, 160, 200 mm

Double Acting



RoHS

Model No. Notation Method

Without Switch
(Built-in magnet for switch)

HMF – 32CS – L1

Model No. ❶ ❷

With Switch
(Built-in magnet for switch)

HMF – 32CS – L1 – T2H – R

Model No. ❷Stroke ❹Number of Switches
❶Bore size ❸Switch Model No.

❶Bore Size (mm)

Code	Content
12CS	ø12
16CS	ø16
20CS	ø20
25CS	ø25
32CS	ø32
40CS	ø40

❷Stroke

Code	Content	Stroke (mm)					
		ø12	ø16	ø20	ø25	ø32	ø40
Blank	Standard	20	30	40	50	70	100
L1	Long stroke 1		60	80	100	120	160
L2	Long stroke 2		80	100	120	160	200

Note) For 12CS, long strokes "L1" and "L2" cannot be manufactured.

❸Switch Model No.

For switch details, please refer to P. 573. Switches are included with the product and shipped.

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	1-Color	2-wire	-	10 to 30	-	5 to 20 *2	T2H□	T2V□	
	1-Color Flexible Lead Wire	2-wire	-	10 to 30	-	5 to 20 *2	T2HR3	T2VR3	
	1-Color	3-wire (NPN)	-	30 or less	-	100 or less	T3H□	T3V□	
		3-wire (PNP)	-		-		T3PH□	T3PV□	

*1: For "□" in the switch model number, enter the code selected from the "*Lead wire length" 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: Switches other than the model numbers listed above are also available. (Custom Product) For details, see P. 573.

*Lead wire length

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

Example) Lead wire length
1 m T2H
3 m T2H3
5 m T2H5

❹Number of Switches

Code	Content
R	With 1 pc. on Open Side
H	With 1 pc. on Close Side
D	With 2 pcs

Switch Single Unit Model No. Notation Method

SW – T2H

❸Switch Model No.

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

●Design compatible with rechargeable battery manufacturing process

HMF – •••• – 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

HMF – •••• – FP1

Specifications

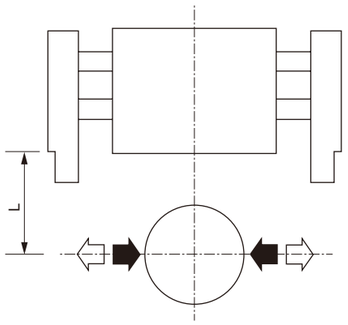
Item	HMF-12CS	HMF-16CS			HMF-20CS			HMF-25CS			HMF-32CS			HMF-40CS		
		Blank	L1	L2	Blank	L1	L2	Blank	L1	L2	Blank	L1	L2	Blank	L1	L2
Bore size mm	ø12 x 2	ø16 x 2			ø20 x 2			ø25 x 2			ø32 x 2			ø40 x 2		
Operating Fluid	Compressed Air															
Max. Working Pressure MPa	0.7															
Min. Operating Pressure MPa	0.3															
Ambient Temperature °C	5 to 60															
Port Size	M5										Rc1/8					
Operating stroke mm	20	30	60	80	40	80	100	50	100	120	70	120	160	100	160	200
Rod diameter mm	ø6	ø8			ø10			ø12			ø16			ø20		
Internal volume (reciprocating) cm³	3.4	9.1	18.1	24.1	18.8	37.6	47.0	37.7	75.4	90.5	84.4	145	193	226	301	377
Repeatability mm	±0.1															
Weight kg	0.31	0.54	0.95	1.12	0.90	1.58	1.77	1.7	2.16	2.3	2.8	3.8	4.8	5.7	7.8	8.8
Lubrication	Not required (When lubricating, use turbine oil Class 1 ISO VG32)															

Gripping Force Performance Data

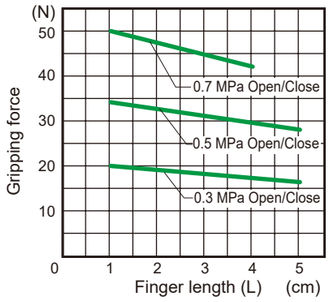
- Gripping force represents the thrust (for one finger) in the direction of the arrow shown in the figure.
- Indicates the gripping force at finger length L of the gripper when the supply pressure is 0.3, 0.5, and 0.7 MPa.

●Opening direction (⇦) Closing direction (⇨) Both ——(Solid line)

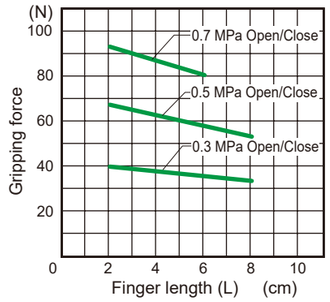
Note: When selecting, check the design and selection precautions on P. 336.



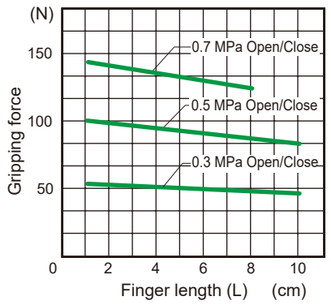
●HMF-12CS



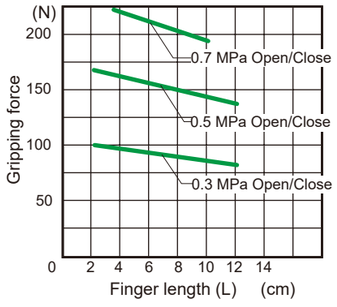
● HMF-16CS



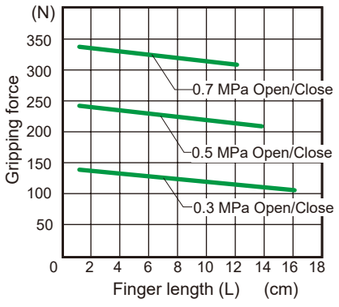
● HMF-20CS



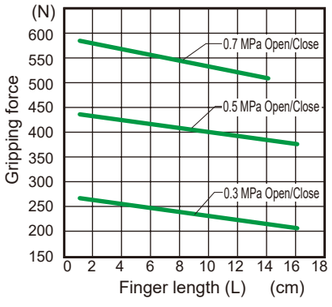
● HMF-25CS



● HMF-32CS

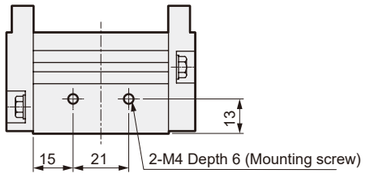


● HMF-40CS

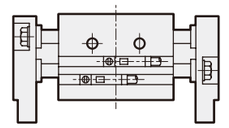


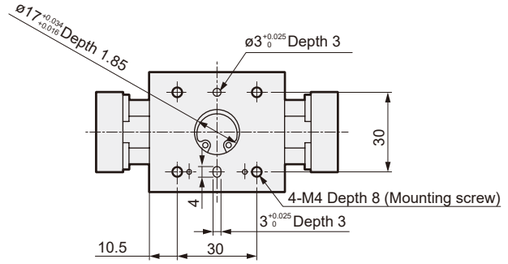
Outline Dimension Drawing

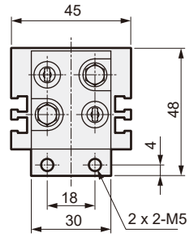
●HMF-12CS Standard

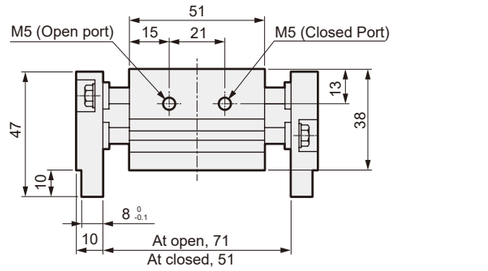


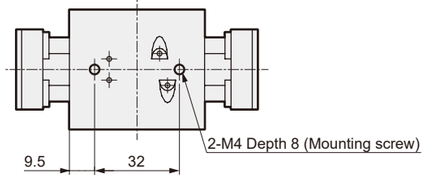
●With Switch







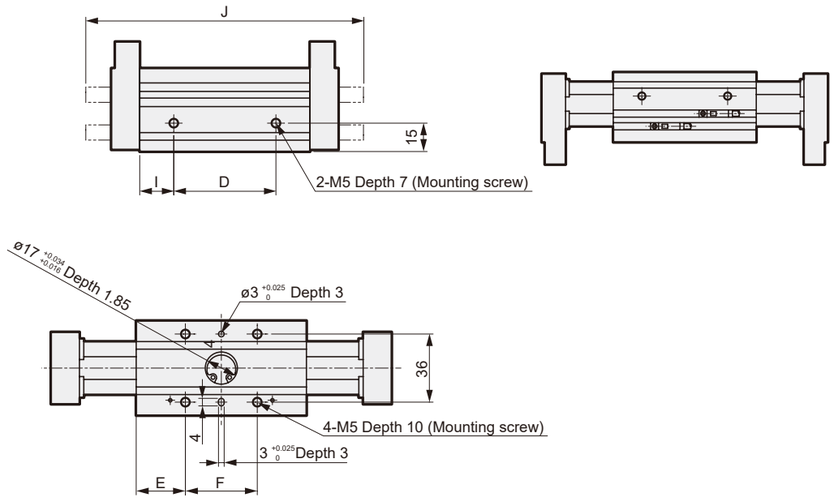




Outline Dimension Drawing

●HMF-16CS Standard/L1/L2

●With Switch

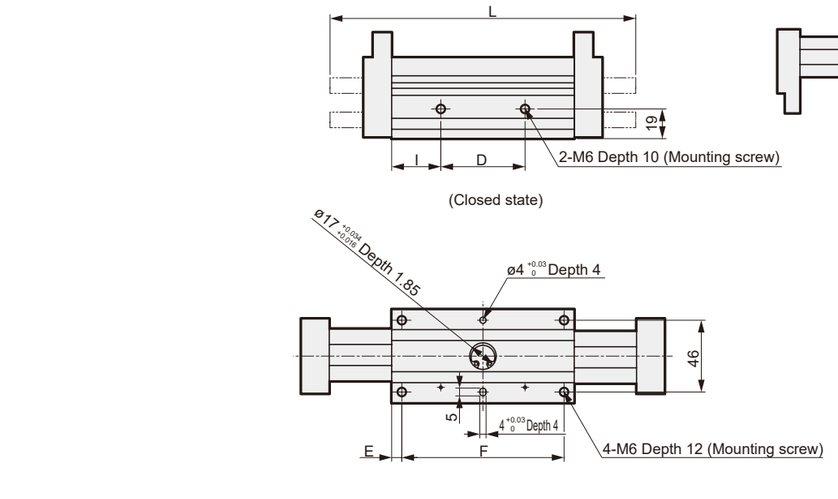


Code	B		C	D	E	F	G	H	I	J
	When Open	When Closed								
Standard (Blank)	90	60	38	28	11	38	60	24	16	–
L1	150	90	68	54	26	38	90	54	18	147
L2	186	106	84	70	26	54	106	70	18	183

Outline Dimension Drawing

●HMF-20CS Standard/L1/L2

●With Switch

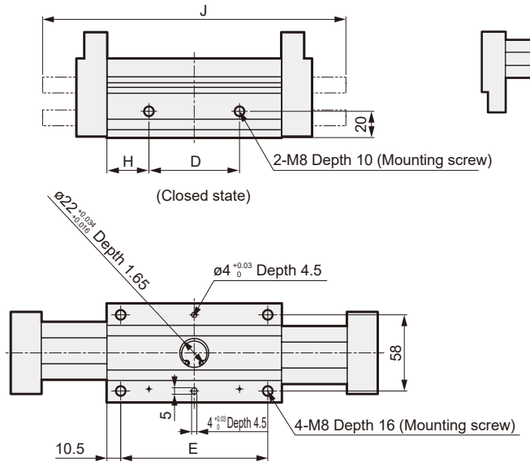


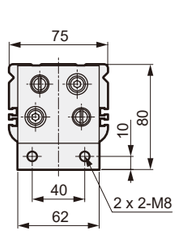
Code	B		C	D	E	F	G	H	I	J	K	L
	When Open	When Closed										
Standard (Blank)	114	74	56	38	9	56	74	34	18	20	9	–
L1	197	117	96	54	6.5	104	117	54	31.5	31.5	10.5	196
L2	233	133	112	70	6.5	120	133	70	31.5	31.5	10.5	232

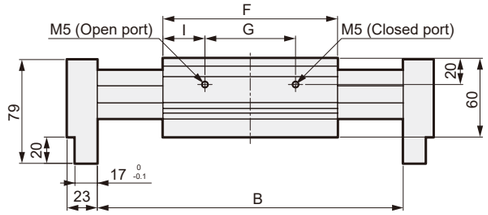
Outline Dimension Drawing

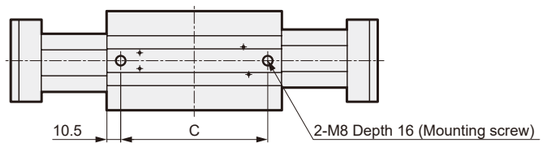
●HMF-25CS Standard/L1/L2

●With Switch







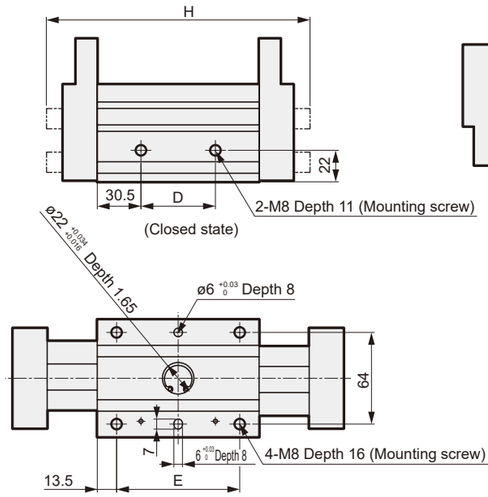


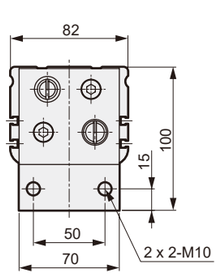
Code	B		C	D	E	F	G	H	I	J
	When Open	When Closed								
Standard (Blank)	141	91	70	48	70	91	41	21.5	25	–
L1	233	133	112	69	112	133	69	32	32	231
L2	271	151	130	87	130	151	87	32	32	269

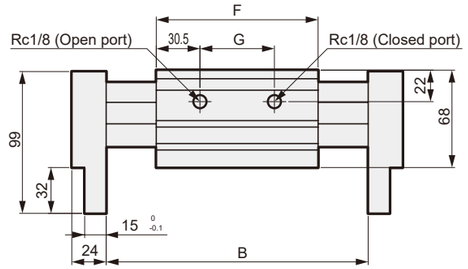
Outline Dimension Drawing

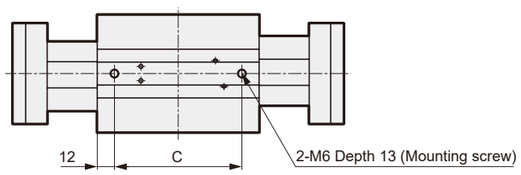
●HMF-32CS Standard/L1/L2

●With Switch





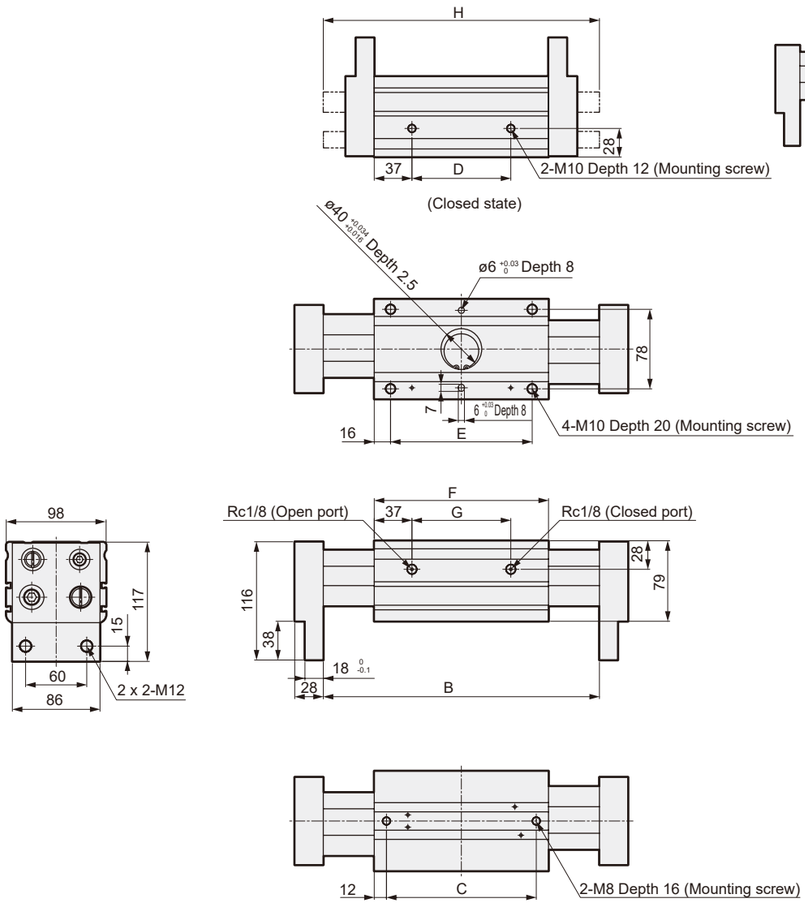




Code	B		C	D	E	F	G	H
	When Open	When Closed						
Standard (Blank)	183	113	89	52	86	113	52	179
L1	274	154	130	93	127	154	93	270
L2	354	194	170	133	167	194	133	350

Outline Dimension Drawing

●HMF-40CS Standard/L1/L2



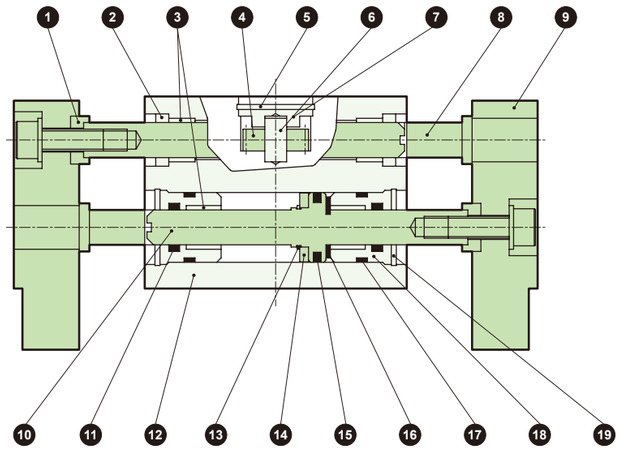
●With Switch



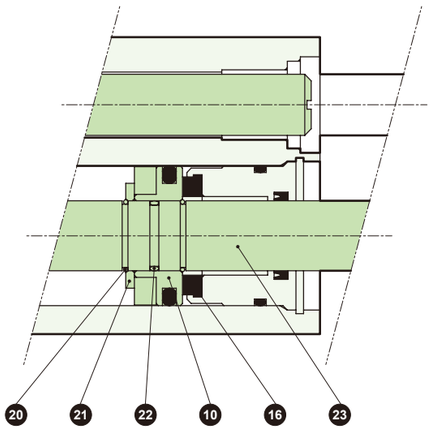
Code	B		C	D	E	F	G	H
	When Open	When Closed						
Standard (Blank)	271	171	147	97	139	171	97	271
L1	361	201	177	127	169	201	127	361
L2	434	234	210	160	202	234	160	434

Internal Structure Diagram/Material

●HMF-12CS to 25CS (Standard)

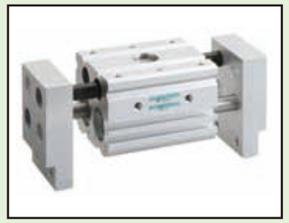


●HMF-32CS, 40CS (Standard)
●HMF-16CS to 40CS-L1, L2 (Long stroke)



Do not disassemble

Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Washer	Steel	12CS, 16CS only	13	Retaining ring	Stainless Steel	
2	Needle bearing seal	Resin, Steel		14	Magnet		
3	Bushing	Oil-Impregnated Bearing Alloy		15	Piston Packing	Nitrile Rubber	
4	Pinion gear	Steel		16	Cushion	Urethane Rubber	
5	Retaining ring	Stainless Steel		17	Gasket	Nitrile Rubber	
6	Pinion gear shaft	Stainless Steel		18	Cover	Aluminum Alloy	
7	Pinion cover	Stainless Steel		19	Retaining ring	Stainless Steel	
8	Guide rod	Stainless Steel		20	Piston fixing spring	Stainless Steel	
9	Finger	Aluminum Alloy		21	Magnet retainer	Stainless Steel	
10	Piston	Stainless Steel		22	O-ring	Nitrile rubber	
11	Rod Packing	Nitrile Rubber		23	Piston Rod	Stainless Steel	
12	Body	Aluminum Alloy					



Compact Wide Parallel Gripper (Standard/Long Stroke) Cutting Oil Resistant Specification

HMF-G Series

●Operating stroke: Standard 30, 40, 50 mm
Long stroke 1 60, 80, 100 mm
Long stroke 2 80, 100, 120 mm

Double Acting



RoHS

Model No. Notation Method

Without Switch
(Built-in magnet for switch)

HMF-G - 20CS - L1

Model No. ❶ ❷

With Switch
(Built-in magnet for switch)

HMF-G - 20CS - L1 - T2YLH - R

Model No. ❶Bore size ❷Stroke ❸Switch Model No. ❹Number of Switches

❶Bore Size (mm)

Code	Content
16CS	ø16
20CS	ø20
25CS	ø25

❷Stroke

Code	Content	Stroke (mm)		
		ø16	ø20	ø25
Blank	Standard	30	40	50
L1	Long stroke 1	60	80	100
L2	Long stroke 2	80	100	120

❸Switch Model No.

For switch details, please refer to P. 573.
Switches are included with the product and shipped.

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	2-wire	-	10 to 30	-	5 to 20	T2YLH□	T2YLV□	
		3-wire (NPN)	-	10 to 28	-	50 or less	T3YLH□	T3YLV□	
	2-Color Improved Water Resistance	2-wire	-	24 ± 10%	-	5 to 20	T2WLH□	T2WLV□	

*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. 573.

*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 T2YLH
3 m T2YLH3
5 m T2YLH3

❹Number of Switches

Code	Content
R	With 1 pc. on Open Side
H	With 1 pc. on Close Side
D	With 2 pcs

Switch Single Unit Model No. Notation Method

SW - T2YLH

❸Switch Model No.

Specifications

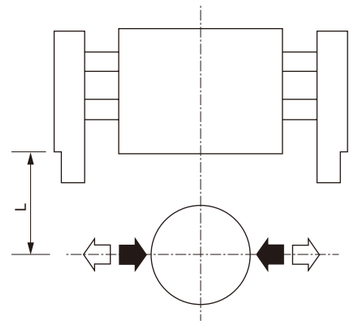
Item	HMF-G-16CS			HMF-G-20CS			HMF-G-25CS		
	Standard	L1	L2	Standard	L1	L2	Standard	L1	L2
Bore size mm	ø16 x 2			ø20 x 2			ø25 x 2		
Operating Fluid	Compressed Air								
Max. Working Pressure MPa	0.7								
Min. Operating Pressure MPa	0.3								
Ambient Temperature °C	5 to 60								
Port Size	M5								
Operating stroke mm	30	60	80	40	80	100	50	100	120
Rod diameter mm	ø8			ø10			ø12		
Internal volume (reciprocating) cm^3	9.1	18.1	24.1	18.8	37.6	47.0	37.7	75.4	90.5
Repeatability mm	±0.1								
Weight kg	0.65	1.06	1.23	1.07	1.75	1.94	2	2.46	2.6
Lubrication	Not required (When lubricating, use turbine oil Class 1 ISO VG32)								

Gripping Force Performance Data

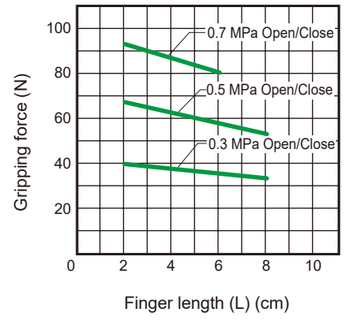
- Gripping force represents the thrust (for one finger) in the direction of the arrow shown in the figure.
- Indicates the gripping force at Finger length L of the gripper when the supply pressure is 0.3, 0.5, and 0.7 MPa.

●Opening direction (⇦) Closing direction (➡) Both ——(Solid line)

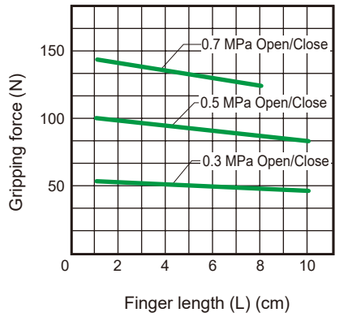
Note) **When selecting, check the design and selection precautions on P. 336.**



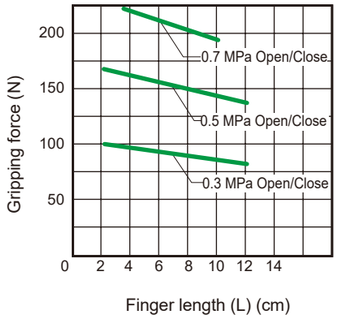
● HMF-G-16CS



● HMF-G-20CS

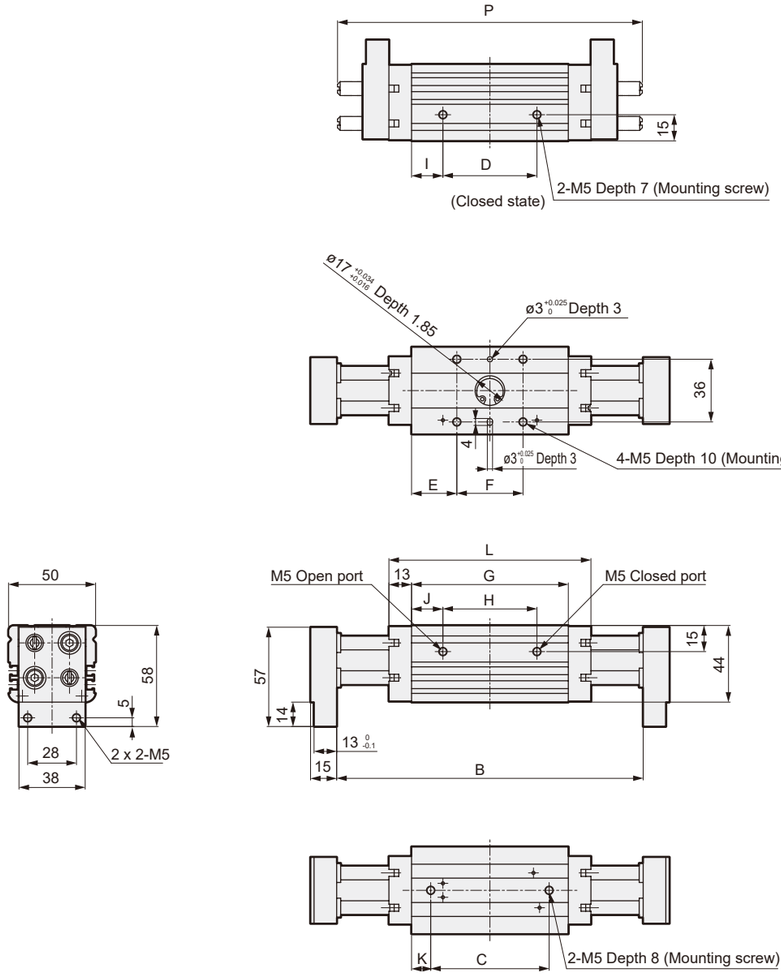


● HMF-G-25CS

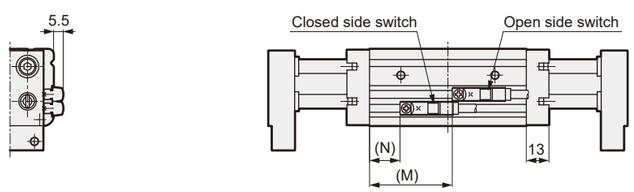


Outline Dimension Drawing

●HMF-G-16CS Standard/L1/L2



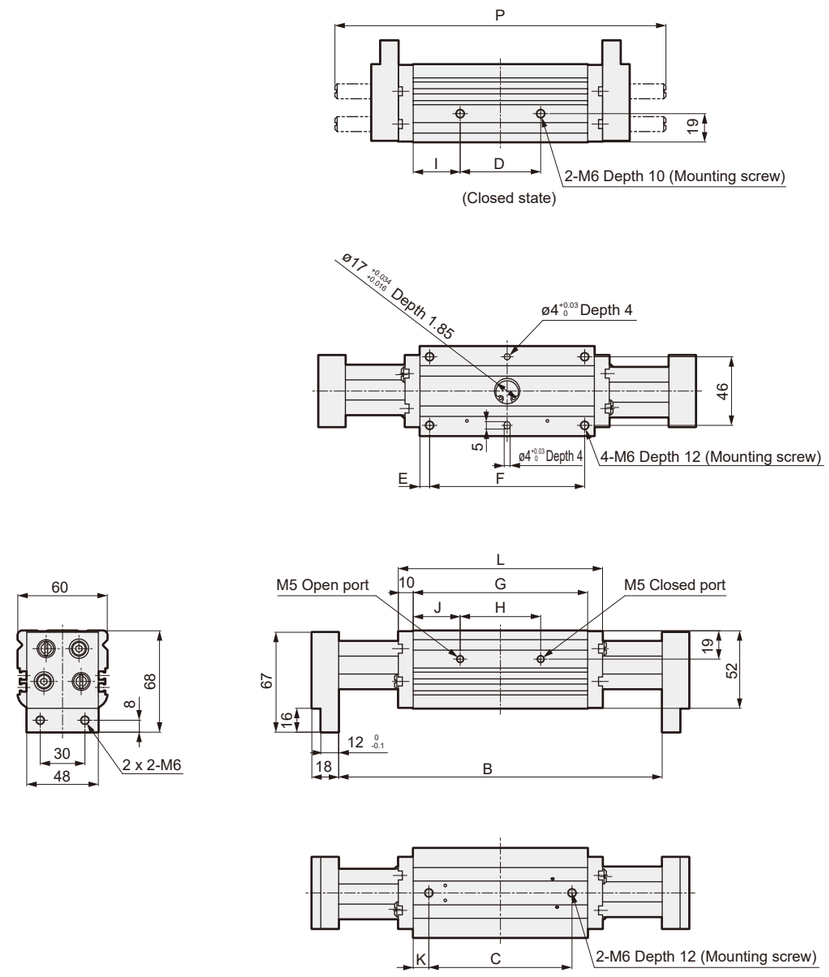
●With Switch



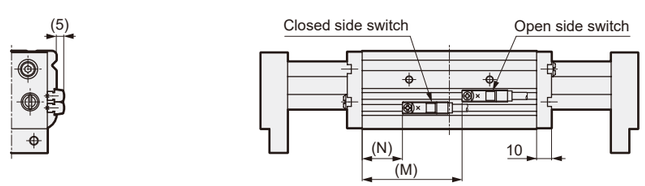
Code	B		C	D	E	F	G	H	I	J	K	L	M	N	P
	When Open	When Closed													
Standard (Blank)	116	86	38	28	11	38	60	24	16	18	11	86	26	11	115
L1	176	116	68	54	26	38	90	54	18	18	11	116	48.5	18.5	175
L2	212	132	84	70	26	54	106	70	18	18	11	132	64.5	24.5	211

Outline Dimension Drawing

●HMF-G-20CS Standard/L1/L2



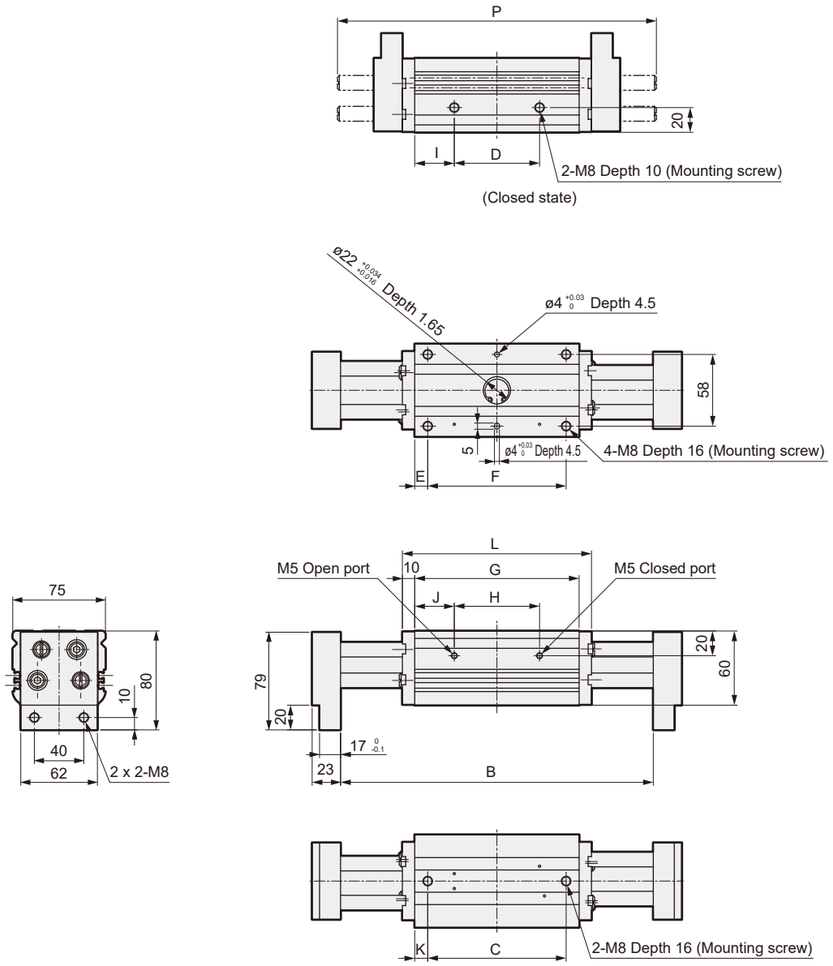
●With Switch



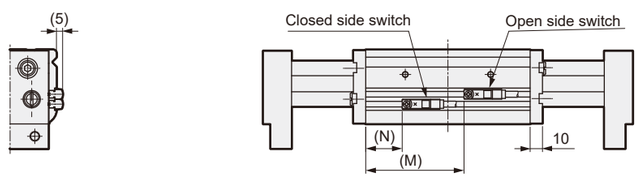
Code	B		C	D	E	F	G	H	I	J	K	L	M	N	P
	When Open	When Closed													
Standard (Blank)	134	94	56	38	9	56	74	34	18	20	9	94	35.5	15.5	139
L1	217	137	96	54	6.5	104	117	54	31.5	31.5	10.5	137	67	27	222
L2	253	153	112	70	6.5	120	133	70	31.5	31.5	10.5	153	83	33	258

Outline Dimension Drawing

●HMF-G-25CS Standard/L1/L2



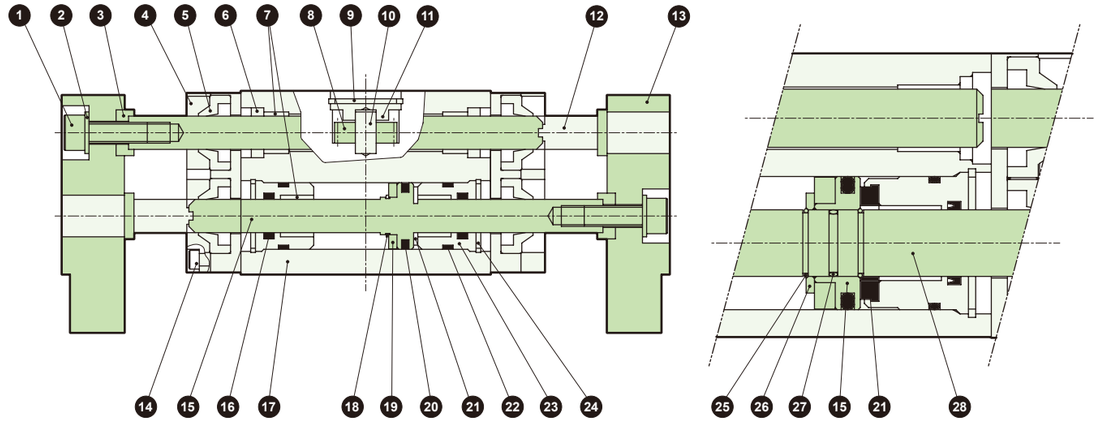
●With Switch



Code	B		C	D	E	F	G	H	I	J	K	L	M	N	P
	When Open	When Closed													
Standard (Blank)	161	111	70	48	10.5	70	91	41	21.5	25	10.5	111	46	21	166
L1	253	153	112	69	10.5	112	133	69	32	32	10.5	153	79.5	29.5	258
L2	291	171	130	87	10.5	130	151	87	32	32	10.5	171	97.5	37.5	296

Internal Structure Diagram/Material

●HMF-G-16CS to 25CS



HMF-G (Standard stroke) HMF-G (L1, L2)

Do not disassemble

Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Hexagon Socket Head Cap Screw	Alloy Steel		15	Piston	Stainless Steel	
2	Plain Washer	Steel		16	Rod Packing	Nitrile Rubber	
3	Washer	Steel	16CS only	17	Body	Aluminum Alloy	
4	Side cover	Aluminum Alloy		18	Retaining ring	Stainless Steel	
5	Scraper	Nitrile Rubber, Steel		19	Magnet		
6	Needle bearing seal	Resin, Steel		20	Piston Packing	Nitrile Rubber	
7	Bushing	Oil-Impregnated Bearing Alloy		21	Cushion	Urethane Rubber	
8	Pinion gear	Steel		22	Gasket	Nitrile Rubber	
9	Retaining ring	Stainless Steel		23	Cover	Aluminum Alloy	
10	Pinion gear shaft	Stainless Steel		24	Retaining ring	Stainless Steel	
11	Pinion cover	Stainless Steel		25	Piston fixing spring	Stainless Steel	
12	Guide rod	Stainless Steel		26	Magnet retainer	Stainless Steel	
13	Finger	Aluminum Alloy		27	O-ring	Nitrile Rubber	
14	Hexagon Socket Head Cap Screw	Alloy Steel		28	Piston Rod	Stainless Steel	



Large Wide Parallel Gripper with Linear Guide (Long stroke 1/Long stroke 2)

HMFB Series

●Operating stroke: Long stroke 1 100, 120, 160 mm
Long stroke 2 120, 160, 200 mm

Double Acting



RoHS

Model No. Notation Method

Without Switch
(Built-in magnet for switch)

HMFB - 25CS - L1

Model No. ❶ ❷

With Switch
(Built-in magnet for switch)

HMFB - 25CS - L1 - T2H - R

Model No. ❷Stroke ❹Number of Switches
❶Bore size ❸Switch Model No.

❶Bore Size (mm)

Code	Content
25CS	ø25
32CS	ø32
40CS	ø40

❷Stroke

Code	Content	Stroke (mm)		
		ø25	ø32	ø40
L1	Long stroke 1	100	120	160
L2	Long stroke 2	120	160	200

❸Switch Model No.

For switch details, please refer to P. 573.
Switches are included with the product and shipped.

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	1-Color	2-wire	-	10 to 30	-	5 to 20 *2	T2H□	T2V□	
	1-Color Flex-Resistant Lead Wire	2-wire	-	10 to 30	-	5 to 20 *2	T2HR3	T2VR3	
	1-Color	3-wire (NPN)	-	30 or less	-	100 or less	T3H□	T3V□	
		3-wire (PNP)	-		-		T3PH□	T3PV□	

*1: For "□" in the switch model number, enter the code selected from the "*Lead wire length" 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: Switches other than the model numbers listed above are also available. (Custom Product) For details, see P. 573.

***Lead wire length**

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

Example) Lead wire length
1 m T2H
3 m T2H3
5 m T2H5

❹Number of Switches

Code	Content
R	With 1 pc. on Open Side
H	With 1 pc. on Close Side
D	With 2 pcs

Switch Single Unit Model No. Notation Method

SW - T2H

❸Switch Model No.

Specifications

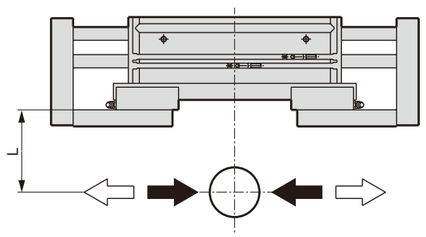
Item		HMFB					
Size		25CS		32CS		40CS	
		L1	L2	L1	L2	L1	L2
Bore size	mm	ø25 x 2		ø32 x 2		ø40 x 2	
Operating Fluid		Compressed Air					
Max. Working Pressure	MPa	0.7					
Min. Operating Pressure	MPa	0.3					
Ambient Temperature	°C	5 to 60					
Port Size		M5		Rc1/8			
Operating stroke	mm	100	120	120	160	160	200
Rod diameter	mm	ø12		ø16		ø20	
Internal volume (reciprocating)	cm³	75.4	90.5	145	193	301	377
Repeatability	mm	±0.1					
Weight	kg	4.06	4.13	5.97	7.2	10.05	11.8
Lubrication		Not required (When lubricating, use turbine oil Class 1 ISO VG32)					

Gripping Force Performance Data

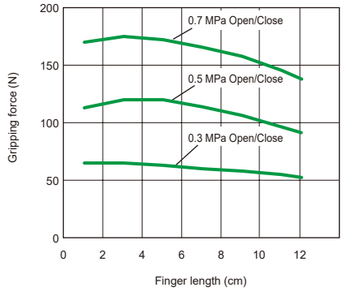
- Gripping force represents the thrust (for one finger) in the direction of the arrow shown in the figure.
- This represents the gripping force at the gripper's finger length L when the supply pressure is 0.3, 0.5, and 0.7 MPa.

●Opening direction (⇦) Closing direction (⇨) Both
———(Solid line)

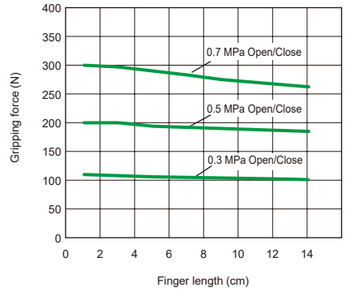
Note: When selecting, check the design and selection precautions on P. 336.



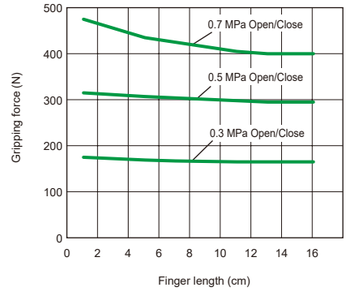
● HMFB-25CS



● HMFB-32CS



● HMFB-40CS

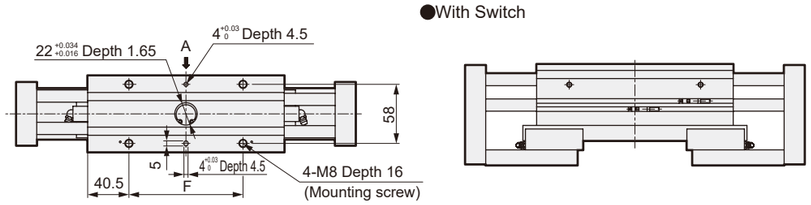


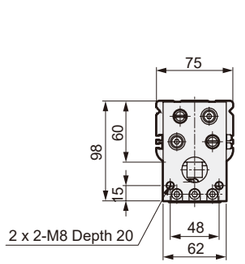
Hand (Gripper)
LSH-HP
LSH
FH100
BSA2
BHA
BHG
BHE
LHA
LHAG
HAP-1C
HAP-2 to 4CS
HKP
HCP
HGP
LST-HP
HLF2
HLA/HLB
HLAG/HLBG
HLC
HLD
HMC-HP
HMF
HMF-G
HMFB
HFP
FH500
HBL
HJL
HMD
HDL
HJD
Cylinder Switch
Ending

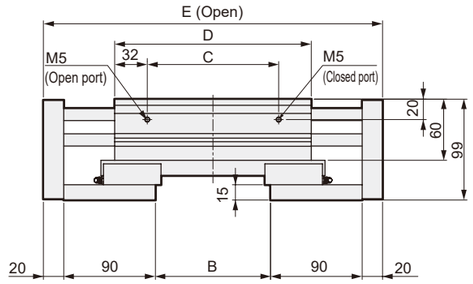
Outline Dimension Drawing

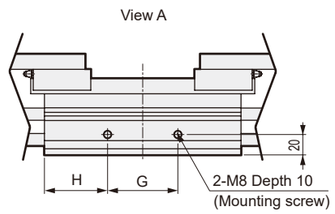
●HMFB-25CS-L1/L2

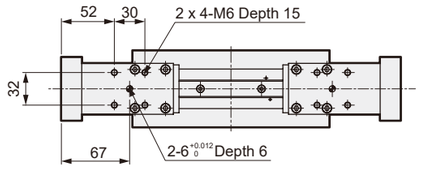
●With Switch









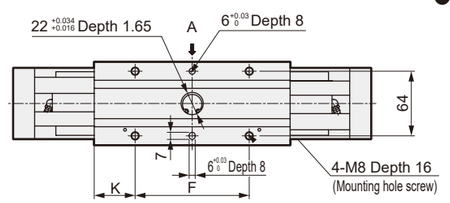


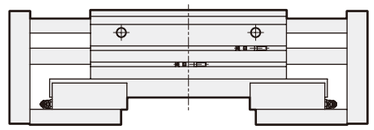
Code	B		C	D	E	F	G	H
	When Open	When Closed						
L1	113	13	129	193	333	112	69	62
L2	131	11	127	191	351	110	87	52

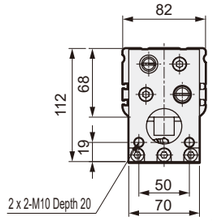
Outline Dimension Drawing

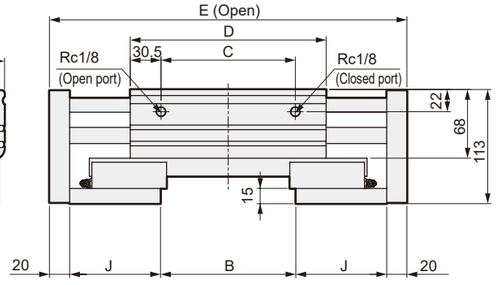
●HMFB-32CS-L1/L2

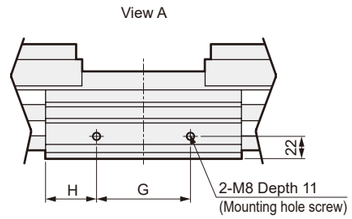
●With Switch

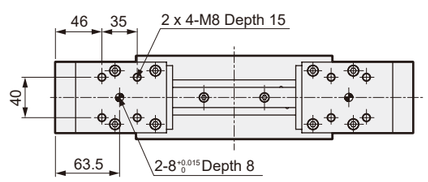








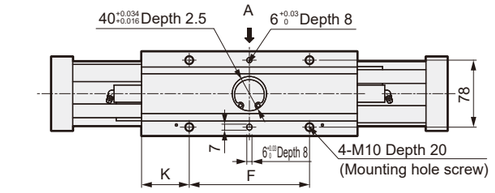




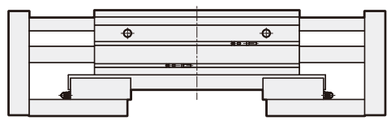
Code	B		C	D	E	F	G	H	J	K
	When Open	When Closed								
L1	134	14	133	194	354	113	93	50.5	90	40.5
L2	174	14	193	254	454	167	133	60.5	120	43.5

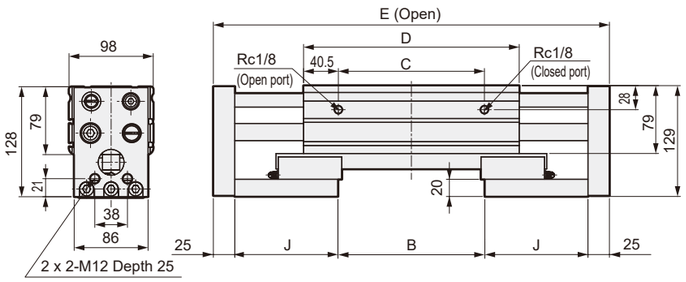
Outline Dimension Drawing

●HMFB-40CS-L1/L2

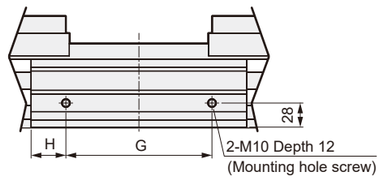


●With Switch





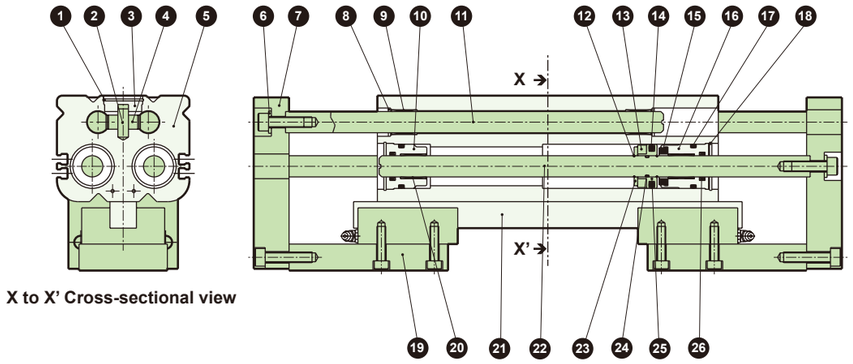
View A



Code	B		C	D	E	F	G	H	J	K
	When Open	When Closed								
L1	171	11	170	251	461	140	170	40.5	120	55.5
L2	214	14	233	314	564	202	160	77	150	56

Internal Structure Diagram/Material

●HMFB-25CS to 40CS-L1
●HMFB-25CS to 40CS-L2



X to X' Cross-sectional view

Do not disassemble

Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	C-type retaining ring	Stainless Steel		14	Packing	Nitrile Rubber	
2	Pinion gear shaft	Stainless Steel		15	Cushion	Urethane Rubber	
3	Pinion cover	Stainless Steel		16	Cover A	Aluminum Alloy	
4	Pinion gear	Steel		17	O-ring	Nitrile Rubber	
5	Body	Aluminum Alloy		18	C-type retaining ring	Stainless Steel	
6	Plain Washer	Stainless Steel	25CS, 40CS only	19	Connection plate	Aluminum Alloy	
7	Finger	Aluminum Alloy		20	Bushing	Oil-Impregnated Bearing Alloy	
8	Bearing seal			21	Linear Guide		
9	Bushing	Oil-Impregnated Bearing Alloy		22	Piston Rod	Stainless Steel	
10	Cover B	Aluminum Alloy		23	Magnet retainer	Stainless Steel	
11	Guide rod	Stainless Steel		24	O-ring	Nitrile Rubber	
12	Piston fixing spring	Stainless Steel		25	Piston	Stainless Steel	
13	Magnet			26	Packing	Nitrile Rubber	



Wide Parallel Gripper Double Acting

HFP Series

●Operating stroke: 20, 30, 40, 60 mm

Double Acting



RoHS

Model No. Notation Method

Without Switch
(Built-in magnet for switch)

HFP – 2CS
Model No. ❶

With Switch
(Built-in magnet for switch)

HFP – 2CS – T2H – R
Model No. ❶Bore size ❷Switch Model No. ❸Number of Switches

❶Bore Size (mm)

Code	Content
2CS	ø16
3CS	ø25
4CS	ø32
5CS	ø40

❷Switch Model No.

For switch details, please refer to P. 573. 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 20 *2	T2H□	T2V□	
	1-Color Flex-Resistant Lead Wire	2-wire	-	10 to 30	-	5 to 20 Note *	T2HR3	T2VR3	
	1-Color	3-wire (NPN)	-	30 or less	-	100 or less	T3H□	T3V□	
		3-wire (PNP)	-		-		T3PH□	T3PV□	

*1: For "□" in the switch model number, enter the code selected from the "*Lead wire length" 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: Switches other than the model numbers listed above are also available. (Custom Product) For details, see P. 573.

❸Number of Switches

Code	Content
R	With 1 pc. on Open Side
H	With 1 pc. on Close Side
D	With 2 pcs

*Lead wire length

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

Example) Lead wire length
1 m T2H
3 m T2H3
5 m T2H5

Switch Single Unit Model No. Notation Method

●For switch T□H□

・Switch body + Mounting bracket set *1

HFP – T2H
❷Switch Model No.

・Switch body

SW – T2H
❷Switch Model No.

・Mounting bracket set *1

HFP – T

●For switch T□V□

・Switch body + Mounting bracket set *1

HFP – T2V – R
❷Switch Model No.

Code	Content
R	Open side
H	Closed side

・Switch body

SW – T2V
❷Switch Model No.

・Mounting bracket set *1

HFP – TV – R

Code	Content
R	Open side
H	Closed side

*1: The weight of the mounting bracket is 1.5 g.

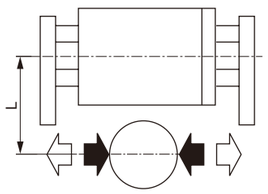
Specifications

Item		HFP			
Size		2CS	3CS	4CS	5CS
Bore size	mm	ø16 x 2	ø25 x 2	ø32 x 2	ø40 x 2
Actuation method		Double Acting			
Operating Fluid		Compressed Air			
Max. Working Pressure	MPa	0.7			
Min. Operating Pressure	MPa	0.3			
Ambient Temperature	°C	5 to 60			
Port Size		M5			Rc1/8
Operating stroke	mm	20	30	40	60
Rod diameter	mm	ø10	ø12	ø15	ø18
Internal volume (reciprocating)	cm³	4.90	22.70	50.2	120.3
Repeatability	mm	±0.03			
Weight	kg	0.59	1.10	2.07	3.90
Lubrication		Not required (When lubricating, use turbine oil Class 1 ISO VG32)			

Gripping Force Performance Data

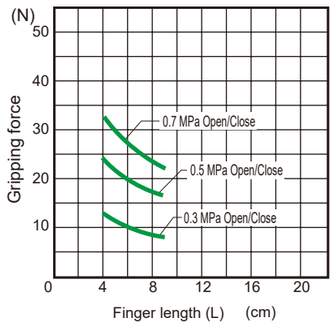
- Gripping force represents the thrust (for one finger) in the direction of the arrow shown in the figure.
- The gripping force in the opening/closing directions with Finger length L of hand with a supply pressure of 0.3, 0.5 and 0.7 MPa is shown.

● Opening direction (⇦) Closing direction (➡) Both ——— (Solid line)

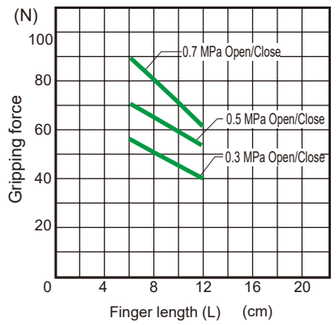


Note) **When selecting, check the design and selection precautions on P. 336.**

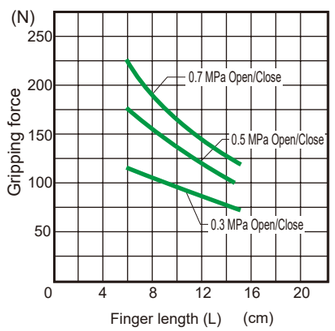
● HFP-2CS



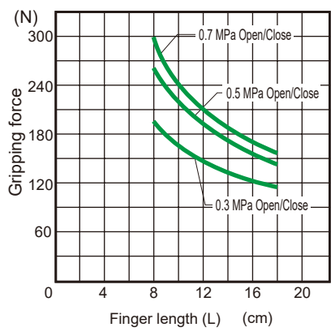
● HFP-3CS



● HFP-4CS

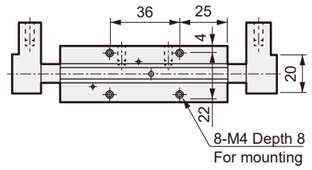


● HFP-5CS

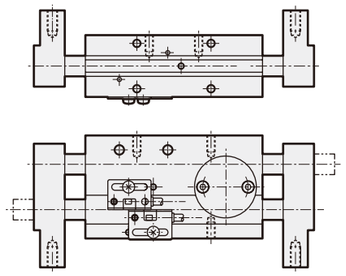


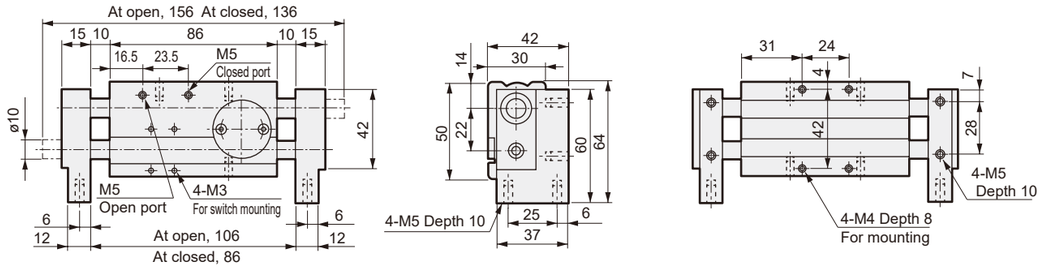
Outline Dimension Drawing

●HFP-2CS Standard

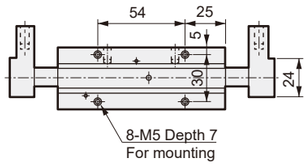


●With Switch

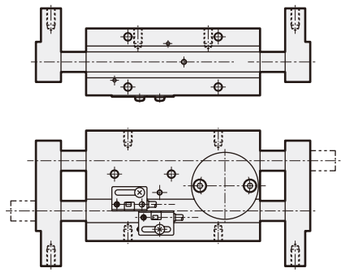


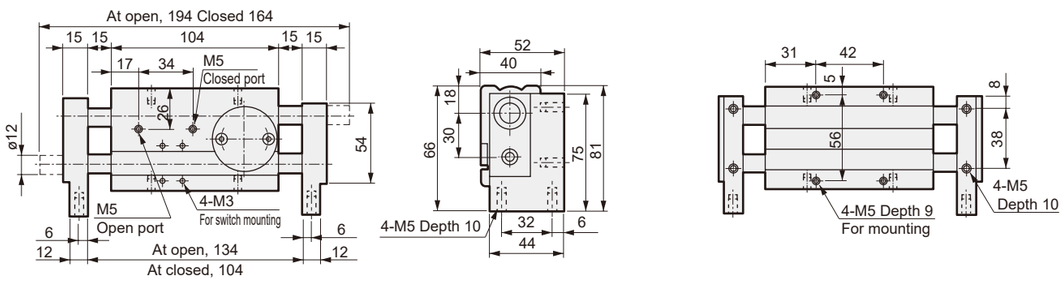


●HFP-3CS Standard



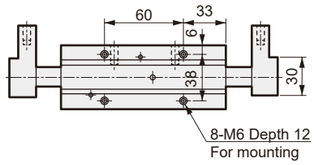
●With Switch



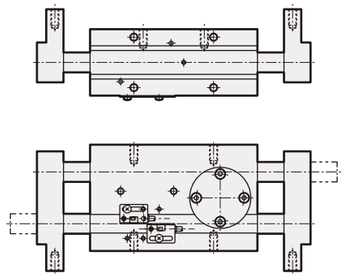


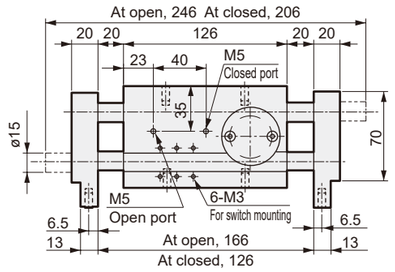
Outline Dimension Drawing

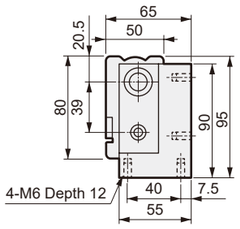
●HFP-4CS Standard

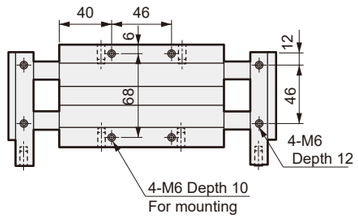


●With Switch

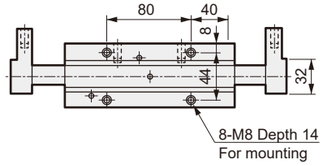




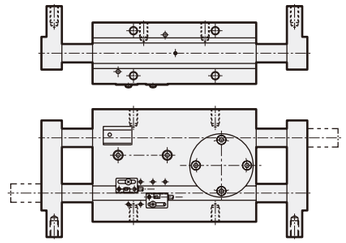


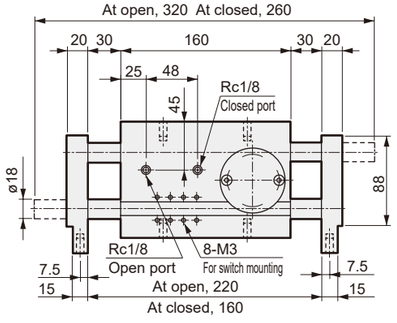


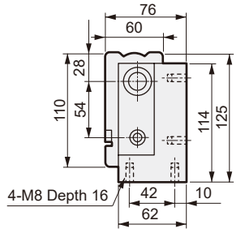
●HFP-5CS Standard

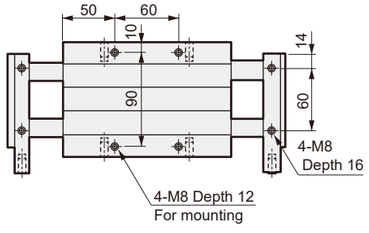


●With Switch



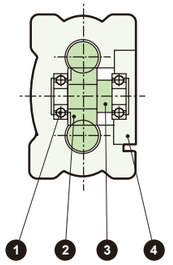


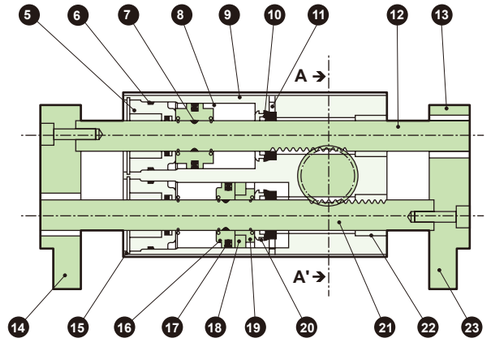




Internal Structure Diagram/Material

A-A' cross-sectional view





Do not disassemble

No.	Part Name	Material	Remarks	No.	Part Name	Material	Remarks
1	Bearing	Alloy Steel		13	Bushing		
2	Pinion gear	Steel		14	Finger A	Aluminum Alloy	
3	Pinion gear shaft	Steel		15	Retaining ring	Stainless Steel	
4	Bearing Cover	Aluminum Alloy		16	Piston A	Aluminum Alloy	
5	Packing housing A	Aluminum Alloy		17	Piston Packing	Nitrile Rubber	
6	Gasket A	Nitrile Rubber		18	Magnet		
7	Piston Gasket	Nitrile Rubber		19	Piston B	Aluminum Alloy	
8	Piston fixing spring	Stainless Steel		20	Gasket B	Nitrile Rubber	
9	Body	Aluminum Alloy		21	Piston Rod B	Stainless Steel	
10	Rod Packing	Nitrile Rubber		22	Bushing		
11	Packing housing B	Aluminum Alloy		23	Finger B	Aluminum Alloy	
12	Piston Rod A	Stainless Steel					



Feather Gripper (Mini Pivot Gripper) Double Acting/Single Acting Type

FH500 Series

●Opening/closing angle: Opening angle 20°, Closing angle -5°

Double Acting



Single Acting (Normally Open)



RoHS

Model No. Notation Method

Without Switch
(Built-in magnet for switch)

FH5 10 - D Y1 ——— B

Model No. ❶ ❷ ❸

With Switch
(Built-in magnet for switch)

FH5 10 - D Y1 - T2V - R - B

Model No. ❷Actuation method ❹Switch Model No. ❻End mount

❶Bore size ❸Attachment ❺Number of Switches

❶Bore Size (mm)

Code	Content
10	ø10
12	ø12
16	ø16
20	ø20

❷Actuation method

Code	Content
D	Double Acting
O	Single Acting Type (Normally Open:)
Z	Double Acting with Built-in Speed Controller

❸Attachment

Code	Content
Blank	Without attachments
Y1	With attachments Material (S50C)
Y2	With attachments Material (MC Nylon)

Note) For the outline dimensions and compatible models of the attachments, refer to P. 334 and 335. When ordered as an option, it will be shipped included with a quantity of 2.

❹Switch Model No.

For switch details, please refer to P. 573.
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 20 *2	T2H□	T2V□	
	1-Color Flex-Resistant Lead Wire	2-wire	-	10 to 30	-	5 to 20 *2	T2HR3	T2VR3	
	1-Color	3-wire (NPN)	-	30 or less	-	100 or less	T3H□	T3V□	
		3-wire (PNP)	-		-		T3PH□	T3PV□	

*1: For "□" in the switch model number, enter the code selected from the "*Lead wire length" 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: Switches other than the model numbers listed above are also available. (Custom Product) For details, see P. 573.

*Lead wire length

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

Example) Lead wire length
1 m T2H
3 m T2H3
5 m T2H5

❺Number of Switches

Code	Content
R	With 1 pc. on Open Side
H	With 1 pc. on Close Side
D	With 2 pcs

❻End mount

	Code	Content
	Blank	Without end mount
Note	B	With end mount

Note: For end mount (Model No. B), select the L-shaped lead wire type switch (Model No. T□V). shipped included to the product.

Food Manufacturing Process Compatible Specification

(Catalog No. CC-1271AA)

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

FT500- •••• - FP1

End Mount Single Item Model No. Notation Method

FH - B - 10

❶Bore size

Switch Single Unit Model No. Notation Method

SW - T2H

❹Switch Model No.

Specifications

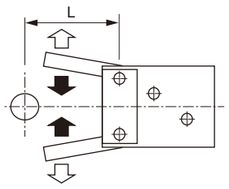
Item	FH500							
	FH510-D	FH512-D	FH516-D	FH520-D	FH510-O	FH512-O	FH516-O	FH520-O
Actuation method	Double Acting				Single acting type			
Operating Fluid	Compressed Air							
Max. Working Pressure MPa	0.7							
Min. Operating Pressure MPa	0.15				0.25			
Proof Pressure MPa	1.05							
Ambient Temperature °C	5 to 60							
Port Size	M3		M5		M3		M5	
Opening/closing angle °	At open, 20° At closed, -5°							
Weight g	43	53	92	135	43	53	92	136
Repeatability mm	±0.03							
Max. operating frequency cycles/sec	3							
Cushion	Open side rubber cushion							
Option	Solid State Switch (2-wire/3-wire) * Closed side speed controller/End mount							

* Built-in speed controller is limited to double acting type.

Gripping Force Performance Data

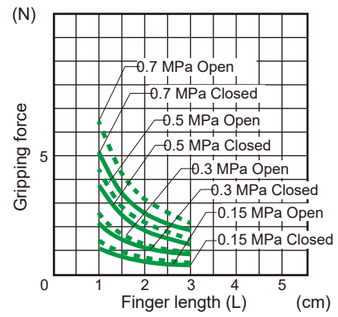
- Gripping force represents the thrust (for one finger) in the direction of the arrow shown in the figure.
- Indicates the gripping force acting in the opening and closing directions at finger length L of the gripper when the supply pressure is 0.15 to 0.7 MPa.

●Open direction (⇦)-----(broken line)
●Closing direction (➡)——(solid line)

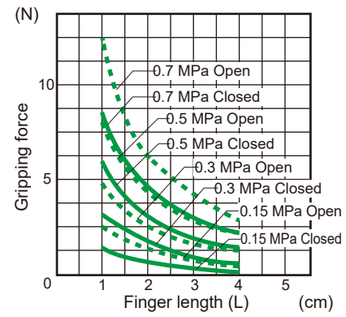


Note) **The closing gripping force of the single acting type is 25 to 30 % lower than that of the double acting type. When selecting, check the design and selection precautions on P. 336.**

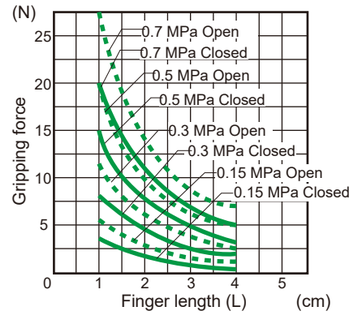
● FH510



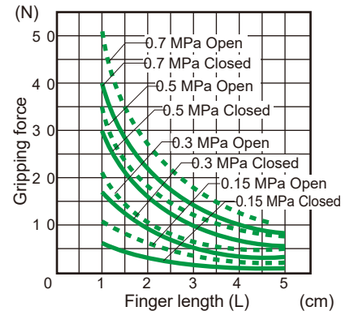
● FH512



● FH516

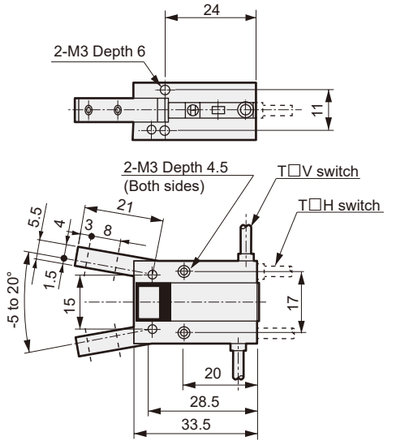


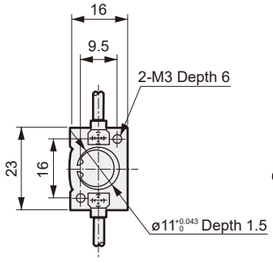
● FH520



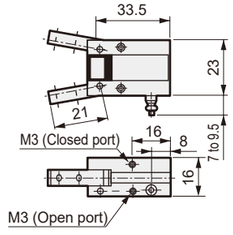
Outline Dimension Drawing

●FH510-D, FH510-O

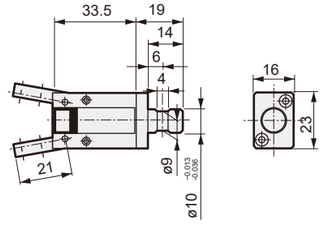




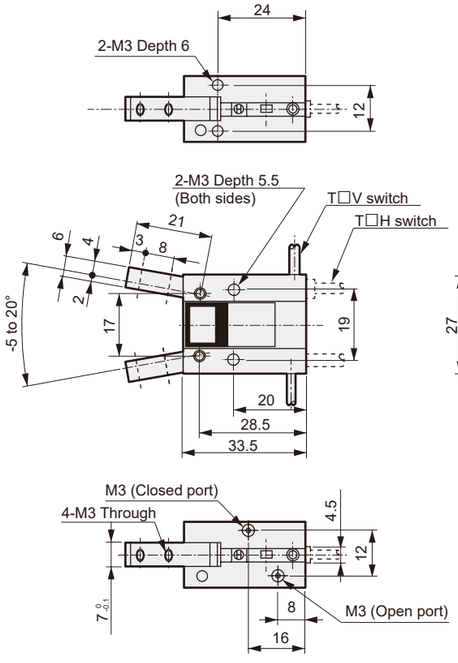
●With Speed Controller (FH510-Z)

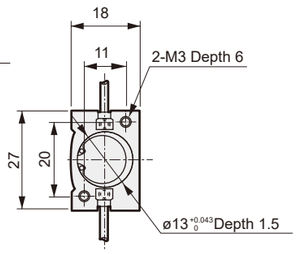


●With end mount (B)

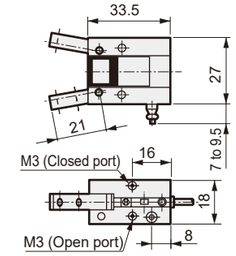


●FH512-D, FH512-O

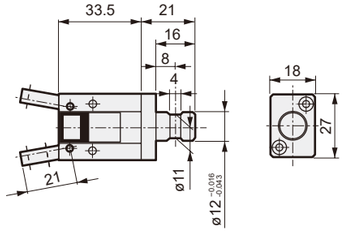




●With Speed Controller (FH512-Z)

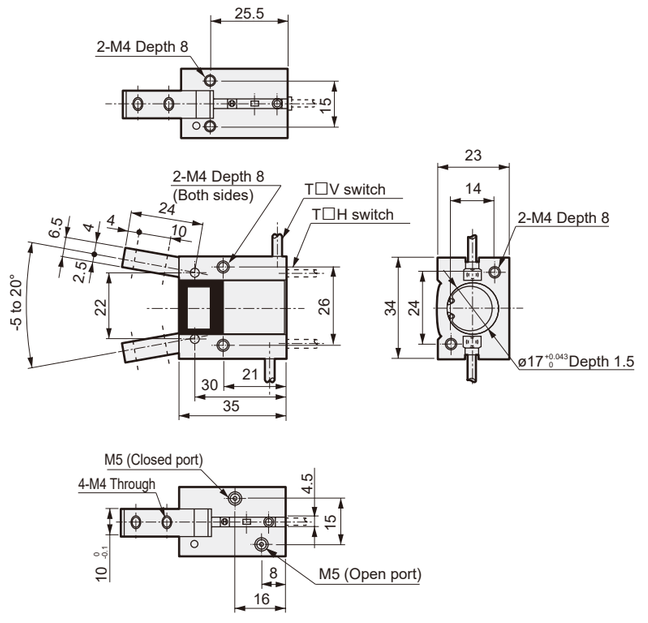


●With end mount (B)

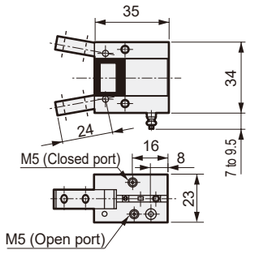


Outline Dimension Drawing

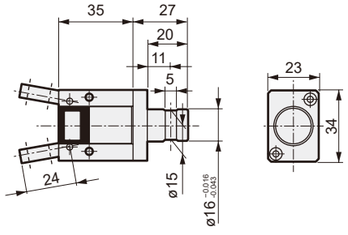
●FH516-D·FH516-O



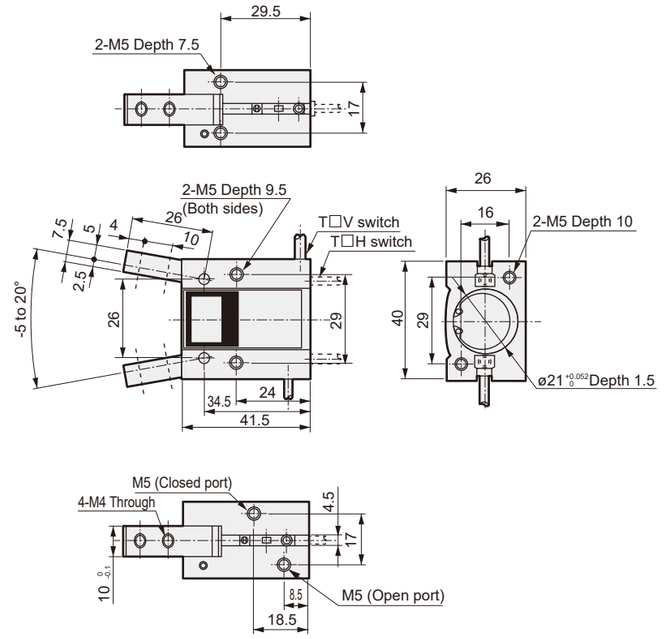
●With Speed Controller (FH516-Z)



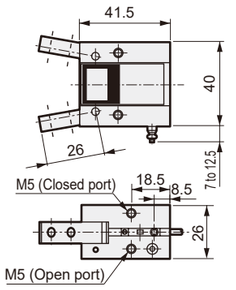
●With end mount (B)



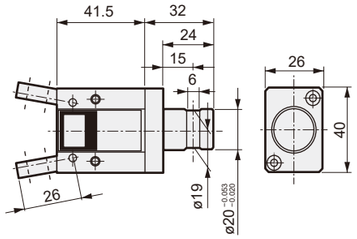
●FH520-D, FH520-O



●With Speed Controller (FH520-Z)

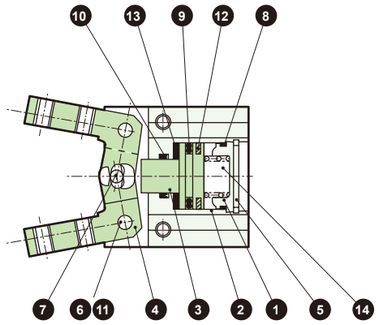


●With end mount (B)

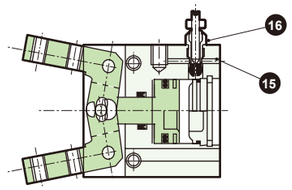


Internal Structure Diagram/Material

●Standard (double acting), O (normally open) type



●With Speed Controller



Do not disassemble

No.	Part Name	Material	Remarks	No.	Part Name	Material	Remarks
1	Cover	Polyacetal		9	Piston Packing	Nitrile Rubber	
2	Body	Aluminum Alloy	Lubricated alumite treatment	10	Rod Packing	Nitrile Rubber	
3	Piston	Stainless Steel		11	Hexagon socket head set screw	Stainless Steel	
4	Finger	Alloy Steel	Heat treatment	12	Magnet		
5	Retaining ring	Stainless Steel		13	Cushion	Urethane Rubber	
6	Pivot Shaft	Alloy Steel	Heat treatment	14	Coil Spring	Stainless Steel	C type only
7	Operating Shaft	Alloy Steel	Heat treatment	15	Steel ball	Stainless Steel	
8	Gasket	Nitrile Rubber		16	Speed Controller		

MEMO

Hand (Gripper)
LSH-HP
LSH
FH100
BSA2
BHA
BHG
BHE
LHA
LHAG
HAP-1C
HAP-2 to 4CS
HKP
HCP
HGP
LST-HP
HLF2
HLA/ HLB
HLAG/ HLBG
HLC
HLD
HMC-HP
HMF
HMF-G
HMFB
HFP
FH500
HBL
HJL
HMD
HDL
HJD
Cylinder Switch
Ending

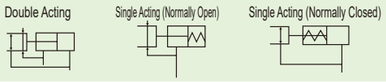


Pivot Gripper Double Acting/Single Acting Type

HBL Series

●Opening/closing angle: −5° to 20°

Double Acting | Single Acting (Normally Open) | Single Acting (Normally Closed)



RoHS

Model No. Notation Method

Without Switch
(Built-in magnet for switch)

HBL - 2CS - O - Y1

Model No. ❶ ❷ ❸

With Switch
(Built-in magnet for switch)

HBL - 2CS - O - Y1 - T2H - R

Model No. ❶Bore size ❷Actuation method ❸Attachment ❹Switch Model No. ❺Number of Switches

❶Bore Size (mm)

Code	Content
1C	ø15
2CS	ø20
3CS	ø25
4CS	ø40

❷Actuation method

Code	Content
Blank	Standard (Double Acting)
O	Single Acting Type (Normally Open:)
C	Single Acting Type (Normally Closed:)

❸Attachment

Code	Content
Blank	Without attachments
Y1	With attachments Material (S50C)
Y2	With attachments Material (MC Nylon)

Note) For the outline dimensions and compatible models of the attachments, refer to P. 334 and 335. When ordered as an option, it will be shipped included with a quantity of 2.

❹Switch Model No.

For switch details, please refer to P. 573.
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 20 *2	T2H□	T2V□	
	1-Color Flex-Resistant Lead Wire	2-wire	-	10 to 30	-	5 to 20 *2	T2HR3	T2VR3	
	1-Color	3-wire (NPN)	-	30 or less	-	100 or less	T3H□	T3V□	
		3-wire (PNP)	-		-		T3PH□	T3PV□	

*1: For "□" in the switch model number, enter the code selected from the "*Lead wire length" 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: Switches other than the model numbers listed above are also available. (Custom Product) For details, see P. 573.
*4: ❶For size "1C", switch mounting cannot be selected.

***Lead wire length**

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

Example) Lead wire length
1 m T2H
3 m T2H3
5 m T2H5

❺Number of Switches

Code	Content
R	With 1 pc. on Open Side
H	With 1 pc. on Close Side
D	With 2 pcs

Switch Single Unit Model No. Notation Method

●For switch T□H□

・Switch body + Mounting bracket set: HBL - T2H (❹Switch Model No.)

・Switch body: SW - T2H (❹Switch Model No.)

・Mounting bracket set: HBL - T

●For switch T□V□

・Switch body + Mounting bracket set: HBL - T2V - R (❹Switch Model No.)

Code	Content
R	Open side
H	Closed side

・Switch body: SW - T2V (❹Switch Model No.)

・Mounting bracket set: HBL - TV - R

Code	Content
R	Open side
H	Closed side

Note1) For 1C, switch mounting is not possible.

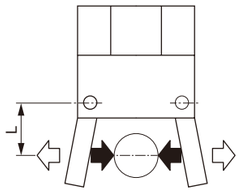
Specifications

Item		HBL			
Size		1C	2CS	3CS	4CS
Bore size	mm	ø15	ø20	ø25	ø40
Actuation method		Double Acting/Single Acting Type			
Operating Fluid		Compressed Air			
Max. Working Pressure	MPa	0.7			
Min. Operating Pressure	MPa	0.3			
Ambient Temperature	°C	5 to 60			
Port Size		M5			Rc1/8
Opening/closing angle	°	-5 to 20			
Rod diameter	mm	ø8	ø10	ø12	ø14
Internal volume (reciprocating)	cm³	0.5	2.2	4.3	14.2
Repeatability	mm	±0.03			
Weight	kg	0.09	0.22	0.39	0.82
Lubrication		Not required (When lubricating, use turbine oil Class 1 ISO VG32)			

Gripping Force Performance Data

- Gripping force represents the thrust (for one finger) in the direction of the arrow shown in the figure.
- The gripping force in the opening/closing directions with Finger length L of hand with a supply pressure of 0.3, 0.5 and 0.7 MPa is shown.

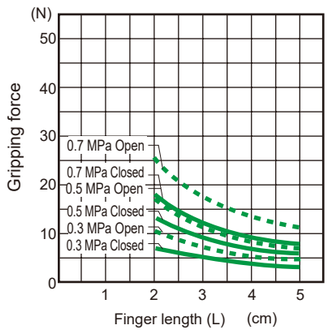
●Open direction (⇦) - - - -(broken line)
●Closing direction (➡)——(solid line)



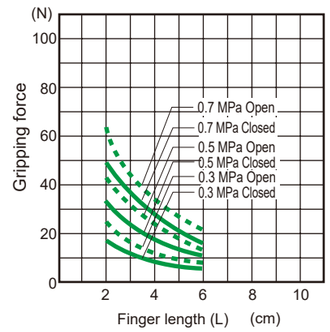
Note) O type gripping force is approx. 20 to 30 % lower in the closing direction compared to the double acting type. C type gripping force is approx. 10 to 20 % lower in the opening direction compared to the double acting type.

When selecting, check the design and selection precautions on P. 336.

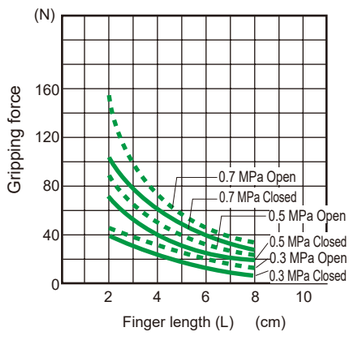
● HBL-1C



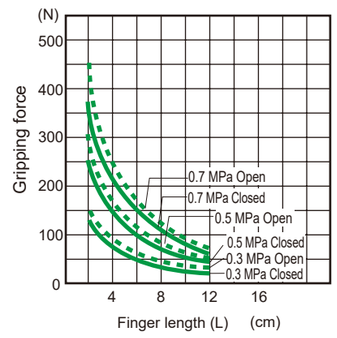
● HBL-2CS



● HBL-3CS

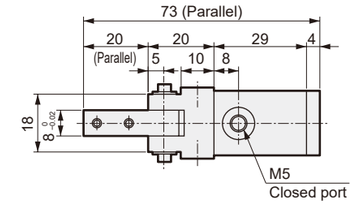


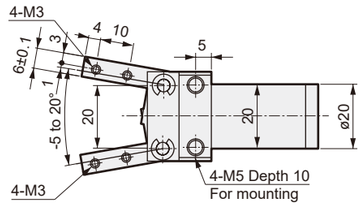
● HBL-4CS

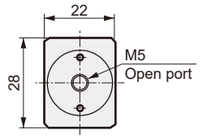


Outline Dimension Drawing

●HBL-1C Standard/O/C

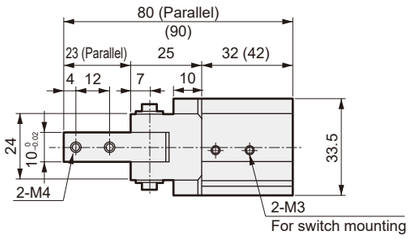


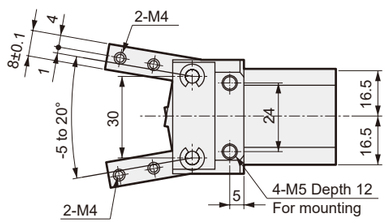


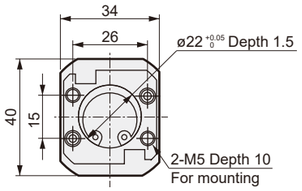


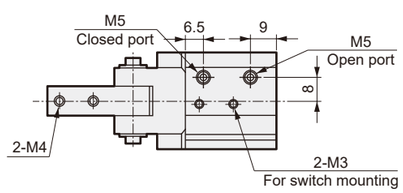
●HBL-2CS Standard/O/C

● Dimensions in ( ) are for C [Normally Closed] specification.

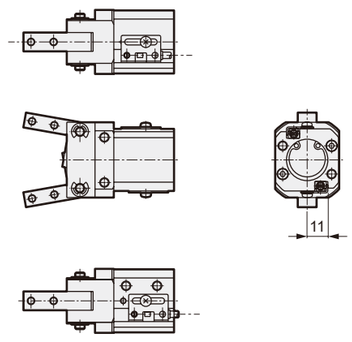








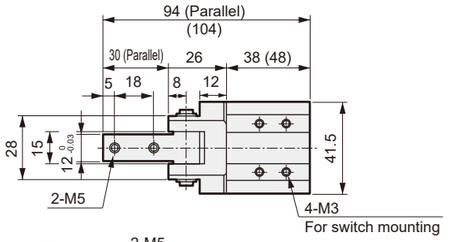
●With Switch

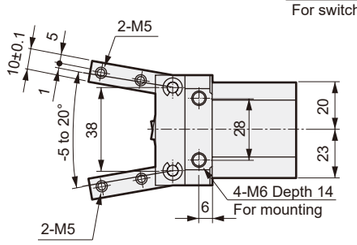


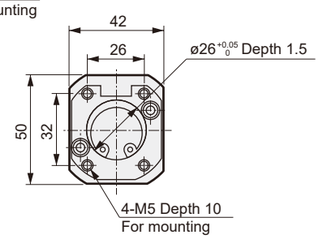
Outline Dimension Drawing

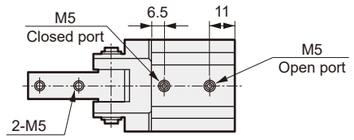
HBL-3CS Standard/O/C

●( ) Dimensions are for C (Normally Closed) type.

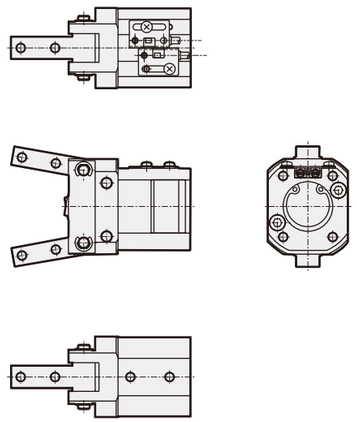






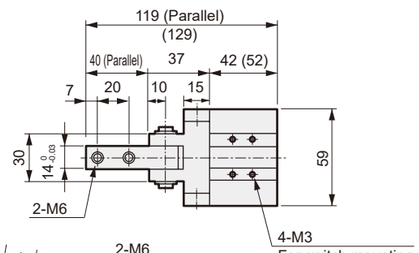


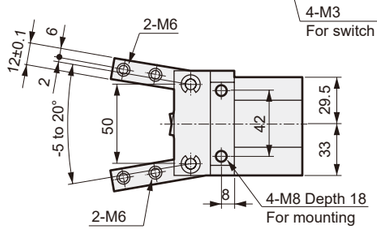
●With Switch

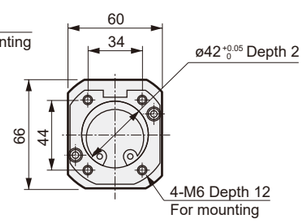


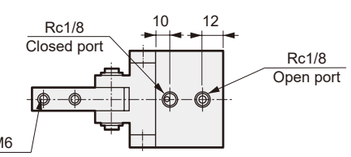
●HBL-4CS Standard/O/C

●( ) Dimensions are for C (Normally Closed) type.

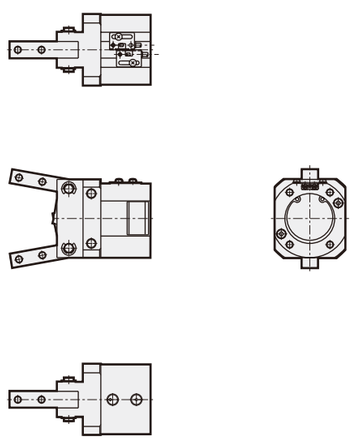






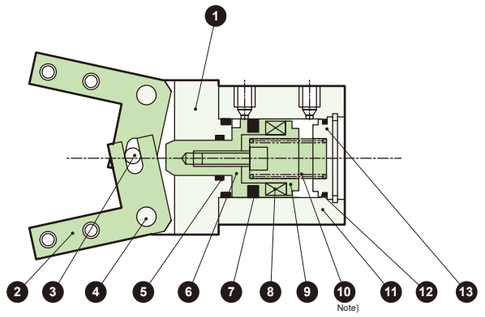


●With Switch

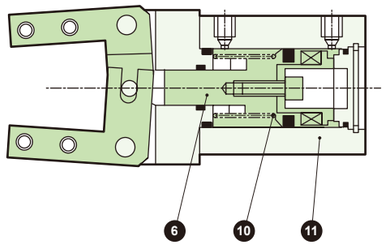


Internal Structure Diagram/Material

●Standard (double acting), O (normally open) type



●C (Normally Closed) Type



Do not disassemble

Note) The standard (double acting) type does not include ⑩ springs.

No.	Part Name	Material	Remarks	No.	Part Name	Material	Remarks
1	Adapter	Aluminum Alloy		9	Piston B	Stainless Steel	1CS only
2	Finger	Steel				Polyacetal	2 to 4CS only
3	Operating Shaft	Steel		10	Coil Spring	Stainless Steel	O type only
4	Pivot Shaft	Steel		11	Body	Aluminum Alloy	
5	Rod Packing	Nitrile Rubber		12	Gasket	Nitrile Rubber	
6	Piston A	Stainless Steel		13	Cover	Aluminum Alloy	1CS only
7	Piston Packing	Nitrile Rubber				Polyacetal	2 to 4CS only
8	Magnet						



Toggle Gripper Double Acting

HJL Series

●Opening/closing angle: −3° to 28°

Double Acting



RoHS

LSH-HP
LSH
FH100
BSA2
BHA
BHG
BHE
LHA
LHAG
HAP-1C
HAP-2 to 4CS
HKP
HCP
HGP
LST-HP
HLF2
HLA/HLB
HLAG/HLBG
HLC
HLD
HMC-HP
HMF
HMF-G
HMFB
HFP
FH500
HBL
HJL
HMD
HDL
HJD
Cylinder Switch
Ending

Model No. Notation Method

Without Switch
(Built-in magnet for switch)

HJL - 40CS

Model No. ❶

With Switch
(Built-in magnet for switch)

HJL - 40CS - T2H - R

Model No. ❶Bore size ❷Switch Model No. ❸Number of Switches

❶Bore Size (mm)

Code	Content
32CS	ø32
40CS	ø40
50CS	ø50
63CS	ø63

❷Switch Model No.

For switch details, please refer to P. 573.
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 20 *2	T2H□	T2V□	
	1-Color Flexible Lead Wire	2-wire	-	10 to 30	-	5 to 20 *2	T2HR3	T2VR3	
	1-Color	3-wire (NPN)	-	30 or less	-	100 or less	T3H□	T3V□	
		3-wire (PNP)	-		-		T3PH□	T3PV□	

*1: For "□" in the switch model number, enter the code selected from the "*Lead wire length" 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: Switches other than the model numbers listed above are also available. (Custom Product) For details, see P. 573.

*** Lead wire length**

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

Example) Lead wire length
1 m T2H
3 m T2H3
5 m T2H5

❸Number of Switches

Code	Content
R	With 1 pc. on Open Side
H	With 1 pc. on Close Side
D	With 2 pcs

Switch Single Unit Model No. Notation Method

●For switch T□H□

・Switch body + Mounting bracket set *1

HJL - T2H

❷Switch Model No.

・Switch body only

SW - T2H

❷Switch Model No.

・Mounting bracket set *1

HJL - T

Mounting bracket

●For switch T□V□

・Switch body + Mounting bracket set *1

HJL - T2V - R

❷Switch Model No.

Code	Content
R	Open side
H	Closed side

・Switch body only

SW - T2V

❷Switch Model No.

・Mounting bracket set *1

HJL - TV - R

Code	Content
R	Open side
H	Closed side

*1: For HJL-[50CS, 63CS], mounting is possible without using mounting brackets. Select "Switch body only".
*2: The weight of the switch mounting bracket is 1.5 g.

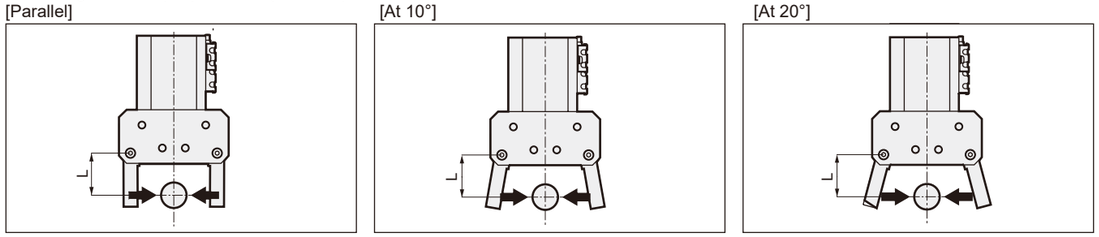
Specifications

Item		HJL			
Size		32CS	40CS	50CS	63CS
Bore size	mm	ø32	ø40	ø50	ø63
Operating Fluid		Compressed Air			
Max. Working Pressure	MPa	0.7			
Min. Operating Pressure	MPa	0.3			
Ambient Temperature	°C	5 to 60			
Port Size		M5	Rc1/8		
Opening/closing angle	°	-3 to 28			
Rod diameter	mm	ø14	ø16	ø20	ø20
Internal volume (reciprocating)	cm^3	21.9	37.0	72.3	118.4
Repeatability	mm	±0.1			
Weight	kg	0.88	1.24	2.11	3.00
Lubrication		Not required (When lubricating, use turbine oil Class 1 ISO VG32)			

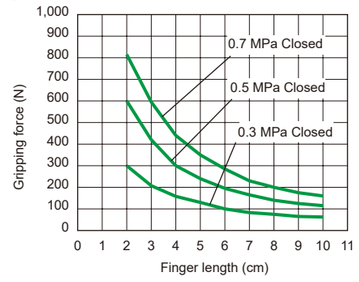
Gripping Force Performance Data

- Gripping force represents the thrust (for one finger) in the direction of the arrow shown in the figure.
- This represents the gripping force at the gripper's finger length L when the supply pressure is 0.3, 0.5, and 0.7 MPa.
  - Closing direction (➡) ———(solid line)

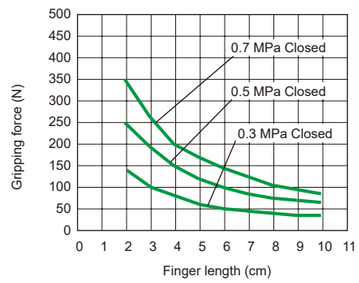
[Parallel] [At 10°] [At 20°]



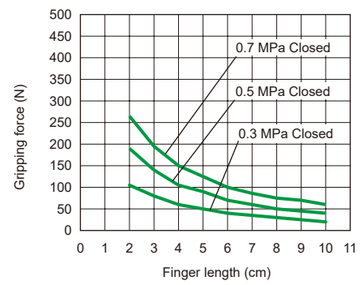
● HJL-32CS



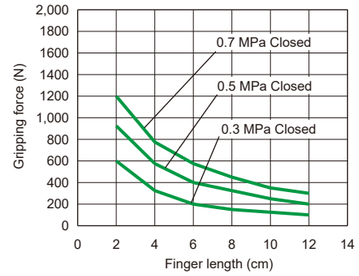
● HJL-32CS



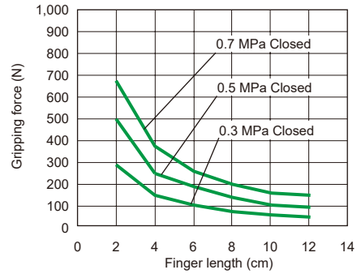
● HJL-32CS



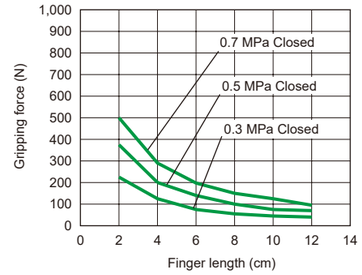
● HJL-40CS



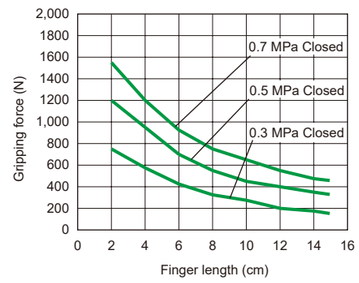
● HJL-40CS



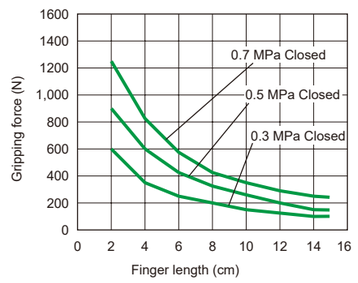
● HJL-40CS



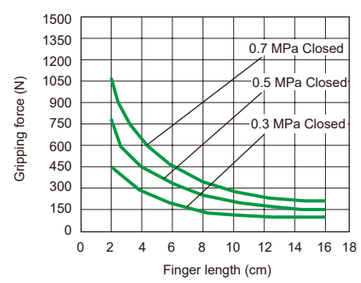
● HJL-50CS



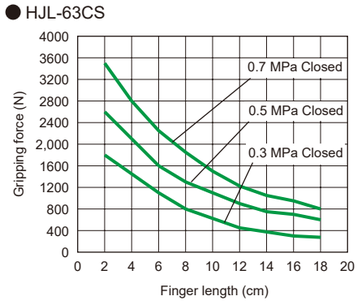
● HJL-50CS



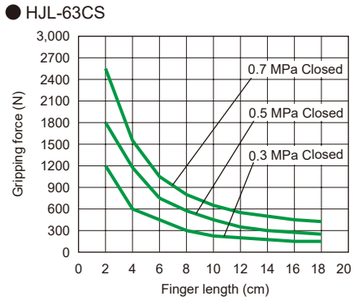
● HJL-50CS



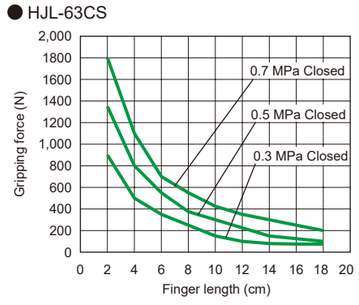
● HJL-63CS



● HJL-63CS



● HJL-63CS

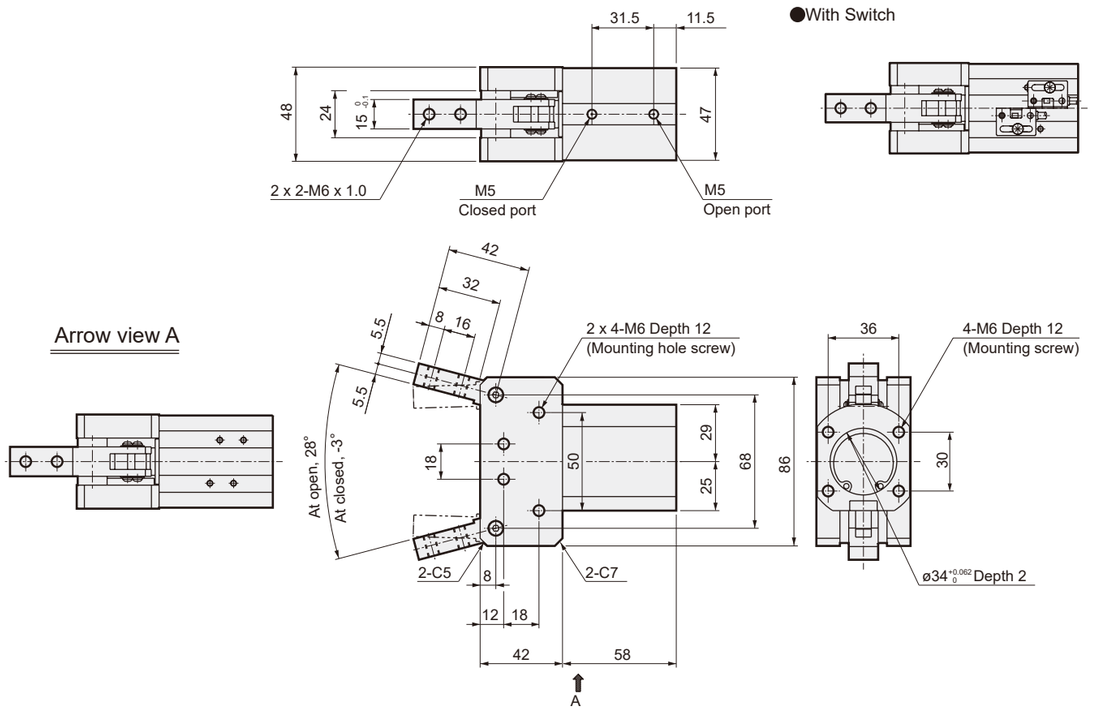


Note) **When selecting, check the design and selection precautions on P. 336.**

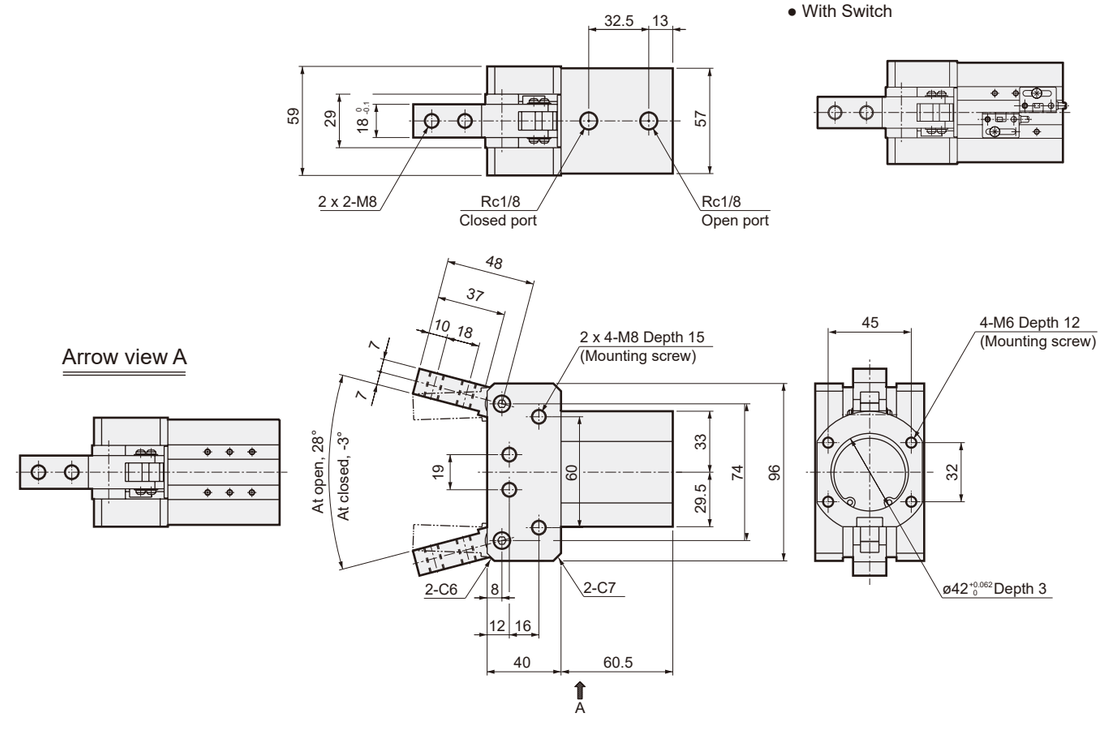
Hand (Gripper)
LSH-HP
LSH
FH100
BSA2
BHA
BHG
BHE
LHA
LHAG
HAP-1C
HAP-2 to 4CS
HKP
HCP
HGP
LST-HP
HLF2
HLA/ HLB
HLAG/ HLBG
HLC
HLD
HMC-HP
HMF
HMF-G
HMFB
HFP
FH500
HBL
HJL
HMD
HDL
HJD
Cylinder Switch
Ending

Outline Dimension Drawing

● HJL-32CS

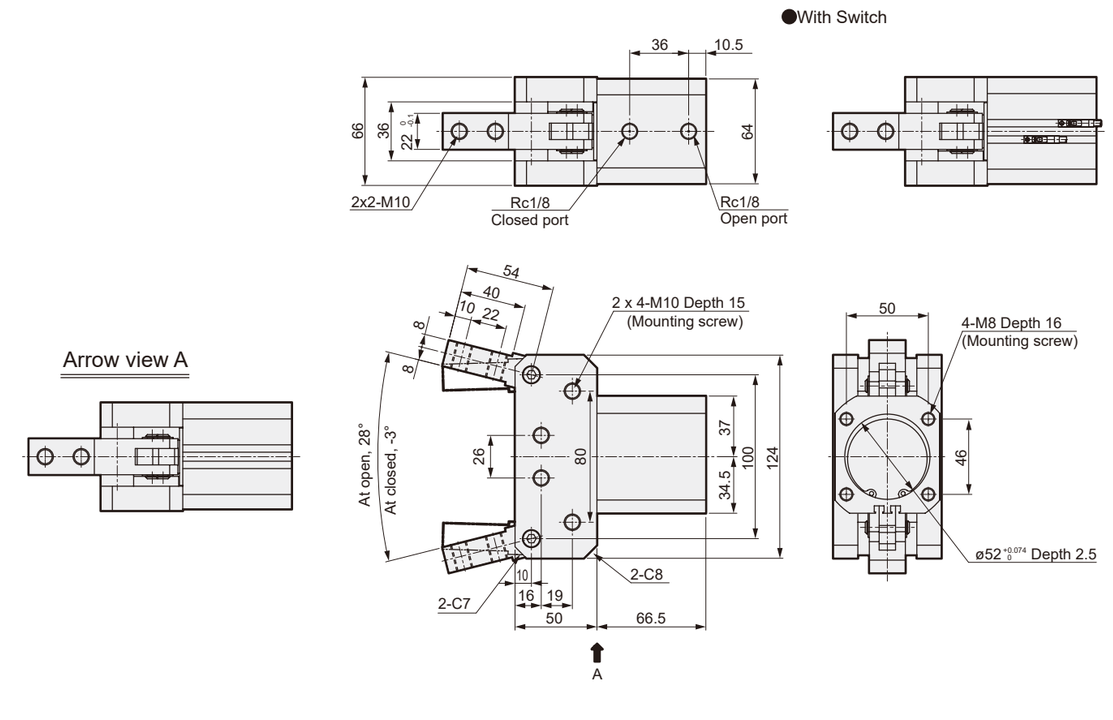


● HJL-40CS

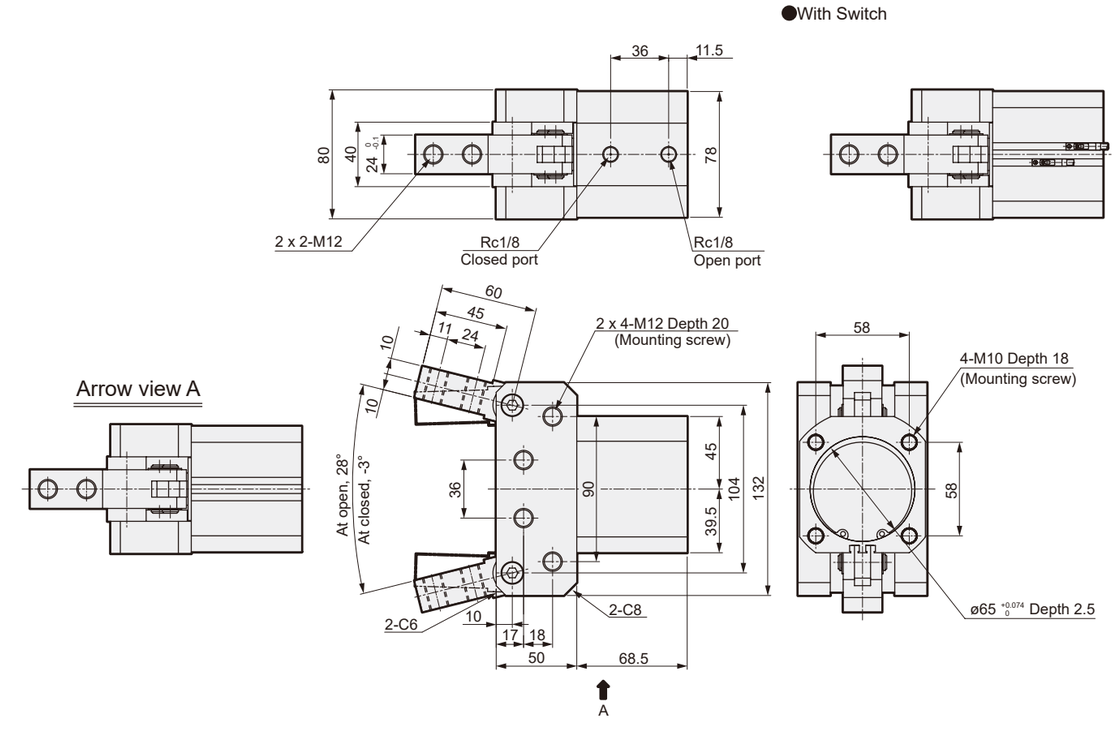


Outline Dimension Drawing

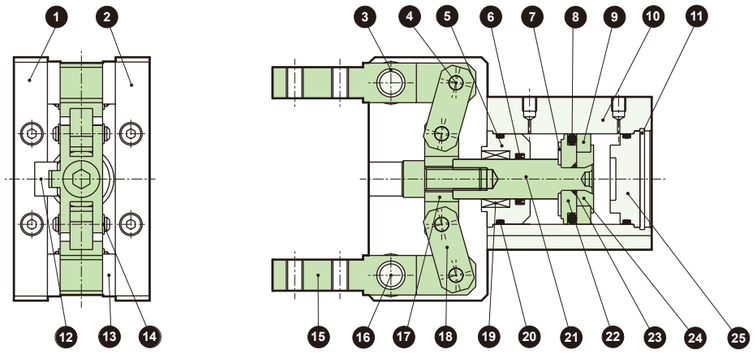
● HJL-50CS



● HJL-63CS



Internal Structure Diagram/Material



Do not disassemble

Part No.	Part Name	Material	Remarks
1	Side plate B	Aluminum Alloy	
2	Side plate A	Aluminum Alloy	
3	Bearing	Oil-Impregnated Bearing Alloy	
4	Operating shaft	Steel	
5	Rod Cover	Aluminum Alloy	
6	Rod Packing	Nitrile Rubber	
7	Cushion	Urethane Rubber	
8	Piston seal	Nitrile Rubber	
9	Magnet		
10	Body	Aluminum Alloy	
11	C-type retaining ring	Stainless Steel	
12	Guide rail	Steel	
13	Collar	Steel	
14	E-type Retaining Ring	Steel	
15	Finger	Steel	
16	Pivot Shaft	Steel	
17	Operation plate	Steel	
18	Link	Steel	
19	Bushing	Copper Alloy	
20	Cylinder seal	Nitrile Rubber	
21	Piston Rod	Stainless Steel	
22	Piston A	Aluminum Alloy	
23	O-ring	Nitrile Rubber	
24	Piston B	Aluminum Alloy	
25	Cover	Aluminum Alloy	

MEMO



180 Degree Opening/Closing Low Profile Wide Angle Gripper Double Acting

HMD Series

●Opening/closing angle: −4° to 184°

Double Acting



RoHS

Model No. Notation Method

Without Switch
(Built-in magnet for switch)

HMD – 16CS

Model No. ❶

With Switch
(Built-in magnet for switch)

HMD – 16CS – T2H – R

Model No. ❷Switch Model No. ❶Bore size ❸Number of Switches

❶Bore Size (mm)

Code	Content
12CS	ø12
16CS	ø16
20CS	ø20
25CS	ø25

❷Switch Model No.

For switch details, please refer to P. 573.
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 20 *2	T2H□	T2V□	
	1-Color Flexible Lead Wire	2-wire	-	10 to 30	-	5 to 20 *2	T2HR3	T2VR3	
	1-Color	3-wire (NPN)	-	30 or less	-	100 or less	T3H□	T3V□	
		3-wire (PNP)	-		-		T3PH□	T3PV□	

*1: For "□" in the switch model number, enter the code selected from the "*Lead wire length" 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: Switches other than the model numbers listed above are also available. (Custom Product) For details, see P. 573.

***Lead wire length**

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

Example) Lead wire length
1 m T2H
3 m T2H3
5 m T2H5

❸Number of Switches

Code	Content
R	With 1 pc. on Open Side
H	With 1 pc. on Close Side
D	With 2 pcs

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

●Design compatible with rechargeable battery manufacturing process

HMD – •••• – P4□

*Please contact us for details.

Switch Single Unit Model No. Notation Method

SW – T2H□

❷Switch Model No.

Specifications

Item		HMD			
Size		12CS	16CS	20CS	25CS
Bore size	mm	ø12	ø16	ø20	ø25
Actuation method		Double Acting			
Operating Fluid		Compressed Air			
Max. Working Pressure	MPa	0.7			
Min. Operating Pressure	MPa	0.3			
Ambient Temperature	°C	5 to 60			
Port Size		M3		M5	
Opening/closing angle	°	-4 to 184			
Rod diameter	mm	ø6		ø8	
Internal volume (reciprocating)	cm³	2.3	5.8	8.7	19.4
Repeatability	mm	±0.2			
Weight	kg	0.074	0.13	0.26	0.38
Lubrication		Not required (When lubricating, use turbine oil Class 1 ISO VG32)			

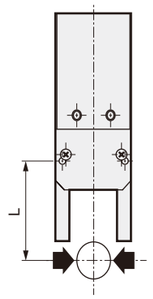
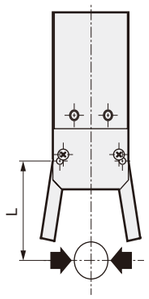
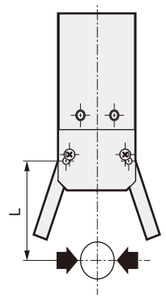
Gripping Force Performance Data

• Gripping force represents the thrust (for one finger) in the direction of the arrow shown in the figure.
• Indicates the gripping force at finger length L of the gripper when the supply pressure is 0.3, 0.5, and 0.7 MPa.

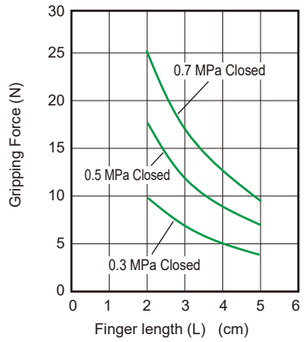
Closing direction (➡) ——— (solid line)

Note: When selecting, check the design and selection precautions on P. 336.

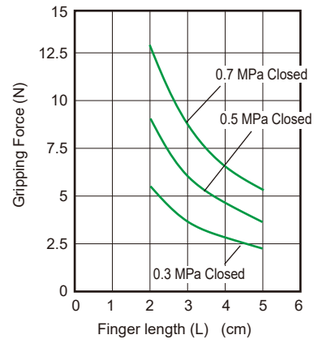
[Parallel] [At 10°] [At 20°]

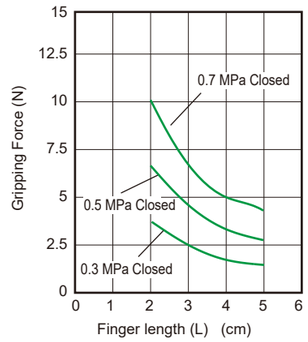
● HMD-12CS



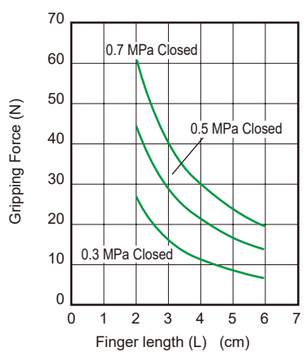
● HMD-12CS



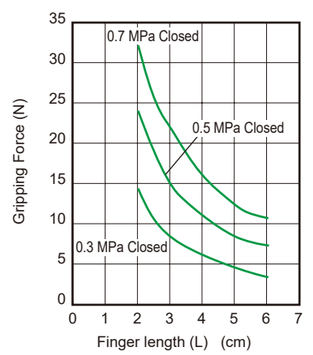
● HMD-12CS



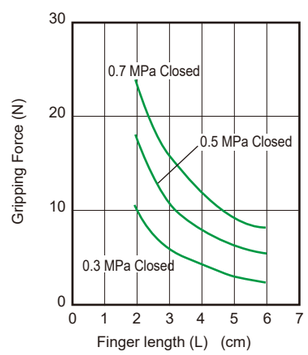
● HMD-16CS



● HMD-16CS

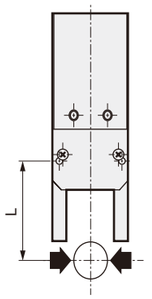
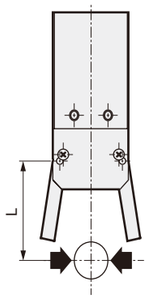
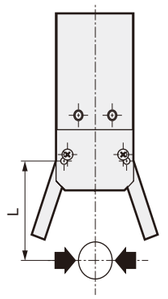


● HMD-16CS

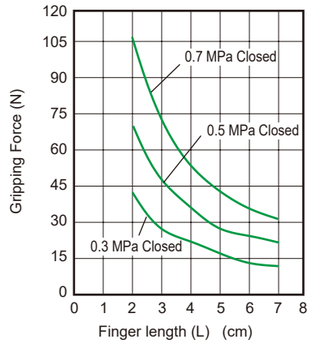


Gripping Force Performance Data

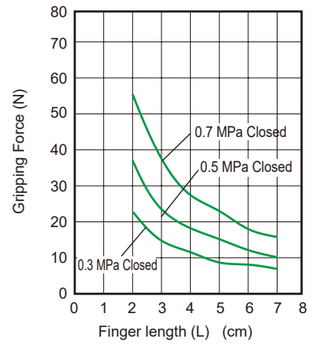
[Parallel] [At 10°] [At 20°]

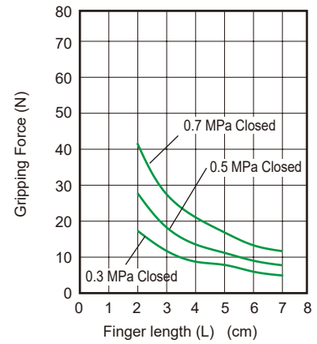
● HMD-20CS



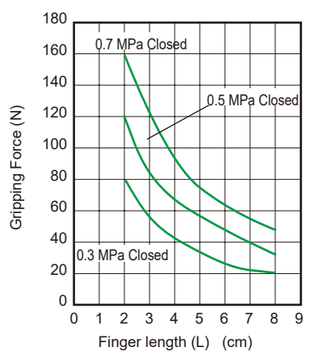
● HMD-20CS



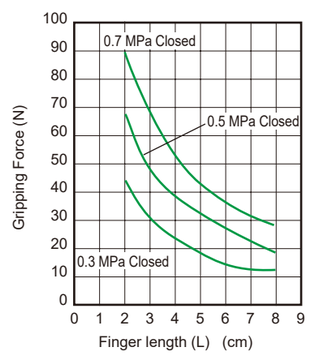
● HMD-20CS



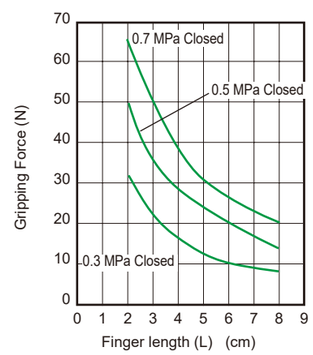
● HMD-25CS



● HMD-25CS

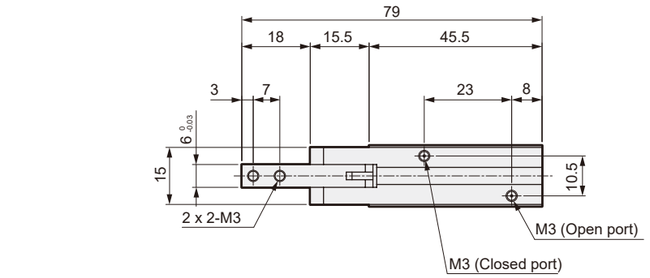


● HMD-25CS

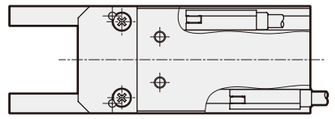


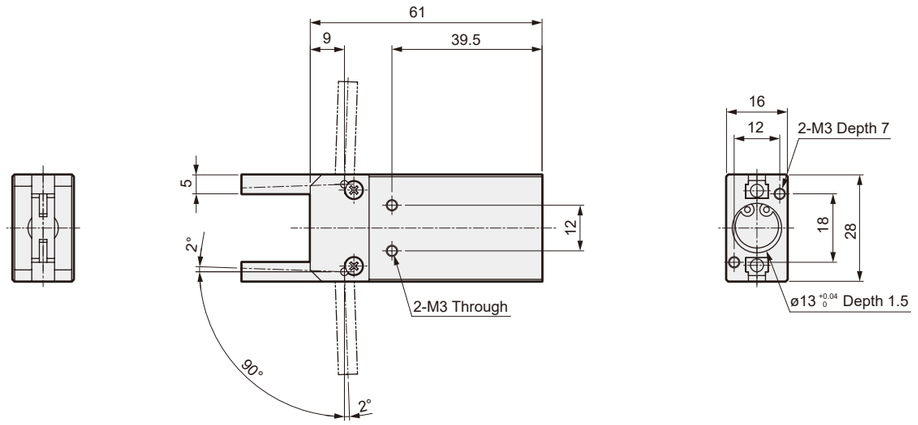
Outline Dimension Drawing

● HMD-12CS

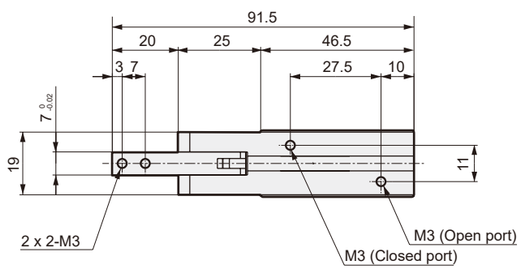


●With Switch

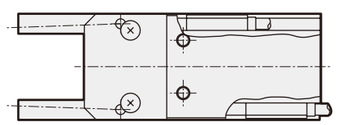


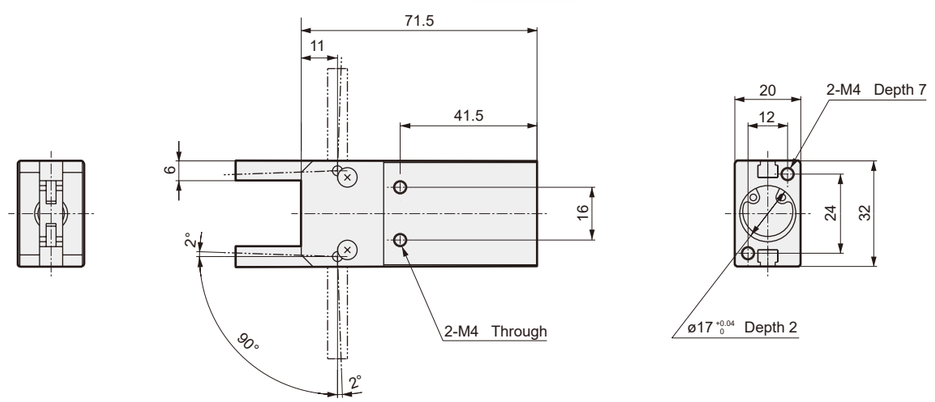


● HMD-16CS



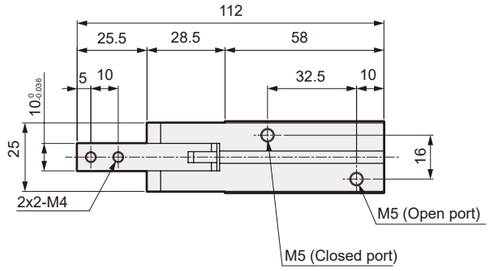
●With Switch



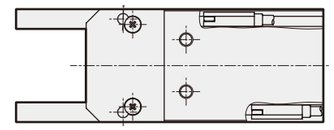


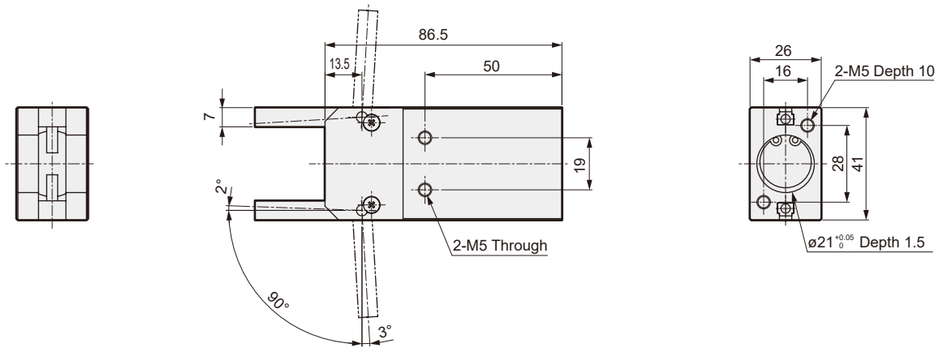
Outline Dimension Drawing

● HMD-20CS

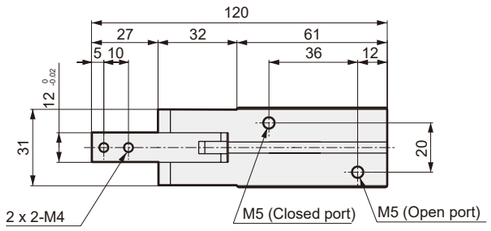


●With Switch

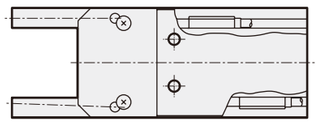


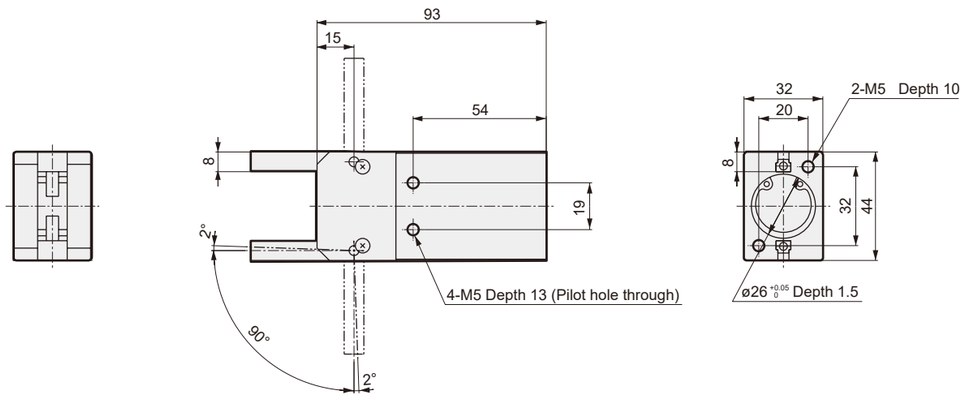


● HMD-25CS



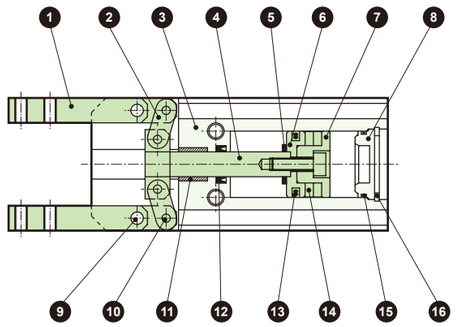
●With Switch





Internal Structure Diagram/Material

● HMD-12CS to 25CS



Do not disassemble

Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Finger	Steel		9	Pivot Shaft	Alloy Steel	
2	Link	Steel		10	Operating Shaft	Alloy Steel	
3	Body	Aluminum Alloy		11	Bushing	Oil-Impregnated Bearing Alloy	
4	Piston A	Stainless Steel		12	Rod seal	Nitrile Rubber	
5	Cushion	Urethane Rubber		13	Piston seal	Nitrile Rubber	
6	Piston B	Copper Alloy		14	Magnet		
7	Piston C	Copper Alloy		15	Seal	Nitrile Rubber	
8	Cover	Polyacetal		16	Retaining ring	Stainless Steel	

MEMO



180 Degree Opening/Closing Wide Angle Gripper Double Acting/Single Acting

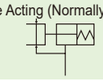
HDL Series

●Opening/closing angle: 0 to 180°

Double Acting



Single Acting (Normally Open)



Single Acting (Normally Closed)



RoHS

Model No. Notation Method

Without Switch
(Built-in magnet for switch)

HDL - 3CS - O

Model No. ❶ ❷

With Switch
(Built-in magnet for switch)

HDL - 3CS - O - T2H - R

Model No. ❷Actuation method ❹Number of Switches
❶Bore size ❸Switch Model No.

❶Bore Size (mm)

Code	Content
3CS	ø25
4CS	ø40

❷Actuation method

Code	Content
Blank	Standard (Double Acting)
O	Single Acting Type (Normally Open:)
C	Single Acting Type (Normally Closed:)

❸Switch Model No.

For switch details, please refer to P. 573.
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 20 *2	T2H□	T2V□	
	1-Color Flexible Lead Wire	2-wire	-	10 to 30	-	5 to 20 *2	T2HR3	T2VR3	
	1-Color	3-wire (NPN)	-	30 or less	-	100 or less	T3H□	T3V□	
		3-wire (PNP)	-		-		T3PH□	T3PV□	

*1: For "□" in the switch model number, enter the code selected from the "*Lead wire length" 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: Switches other than the model numbers listed above are also available. (Custom Product) For details, see P. 573.

❹Number of Switches

Code	Content
R	With 1 pc. on Open Side
H	With 1 pc. on Close Side
D	With 2 pcs

*Lead wire length

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

Example) Lead wire length
1 m T2H
3 m T2H3
5 m T2H5

Switch Single Unit Model No. Notation Method

●For switch T□H□

・Switch body + Mounting bracket set *1

HDL - T2H

❸Switch Model No.

・Switch body

SW - T2H

❸Switch Model No.

・Mounting bracket set *1

HDL - T

●For switch T□V□

・Switch body + Mounting bracket set *1

HDL - T2V - R

❸Switch Model No.

Code	Content
R	Open side
H	Closed side

・Switch body

SW - T2V

❸Switch Model No.

・Mounting bracket set *1

HDL - TV - R

Code	Content
R	Open side
H	Closed side

*1: The weight of the mounting bracket is 1.5 g.

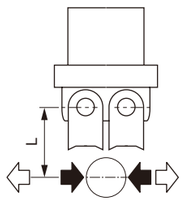
Specifications

Item		HDL	
Size		3CS	4CS
Bore size	mm	ø25	ø40
Actuation method		Double Acting/Single Acting Type	
Operating Fluid		Compressed Air	
Max. Working Pressure	MPa	0.7	
Min. Operating Pressure	MPa	0.3	
Ambient Temperature	°C	5 to 60	
Port Size		M5	Rc1/8
Opening/closing angle	°	0 to 180	
Rod diameter	mm	ø14	ø16
Internal volume (reciprocating)	cm^3	7.8	53.2
Repeatability	mm	±0.2	±0.1
Weight	kg	0.6	2.40
Lubrication		Not required (When lubricating, use turbine oil Class 1 ISO VG32)	

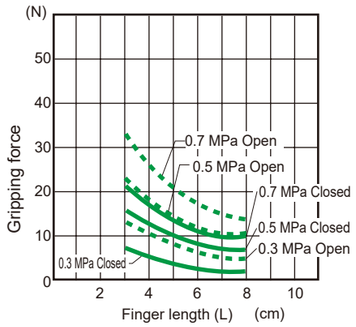
Gripping Force Performance Data

- Gripping force represents the thrust (for one finger) in the direction of the arrow shown in the figure.
- The gripping force in the opening/closing directions with Finger length L of hand with a supply pressure of 0.3, 0.5 and 0.7 MPa is shown.

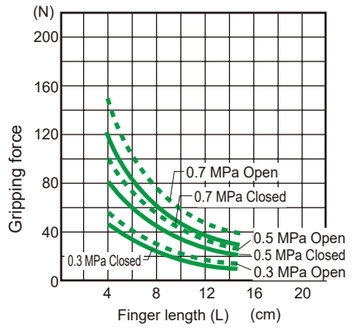
●Open direction (⇦) - - - - - - (broken line)
●Closing direction (➡) ——— (solid line)



● HDL-3CS



● HDL-4CS

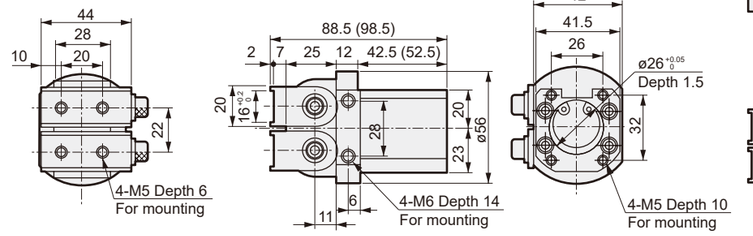


Note) O type gripping force is approx. 20 to 30% lower in the closing direction compared to the double acting type. C type gripping force is approx. 10 to 20% lower in the opening direction compared to the double acting type. **When selecting, check the design and selection precautions on P. 336.**

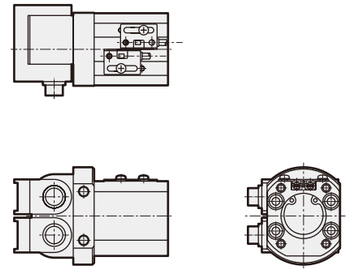
Outline Dimension Drawing

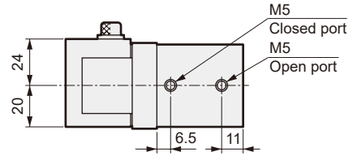
●HDL-3CS Standard/O/C

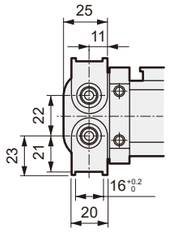
●( ) Dimensions are for C (Normally Closed) type.



●With Switch



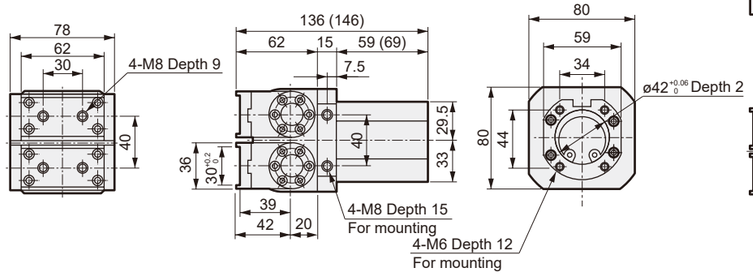




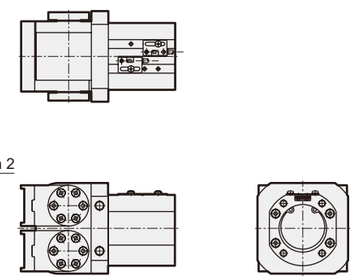
Open state

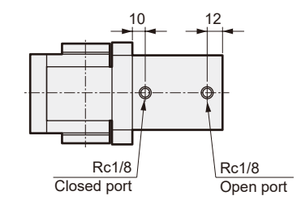
●HDL-4CS Standard/O/C

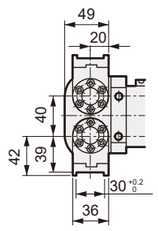
●( ) Dimensions are for C (Normally Closed) type.



●With Switch



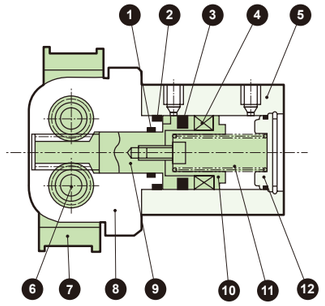




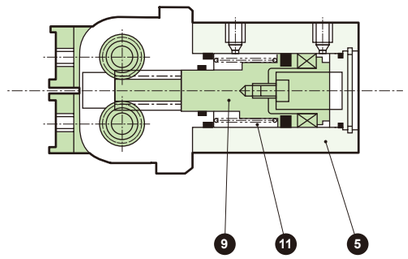
Open state

Internal Structure Diagram/Material

●Standard (double acting), O (normally open) type



●C (Normally Closed) Type



Do not disassemble

No.	Part Name	Material	Remarks	No.	Part Name	Material	Remarks
1	Rod Packing	Nitrile Rubber		7	Finger	Steel	
2	Gasket	Nitrile Rubber		8	Adapter	Aluminum Alloy	
3	Piston Packing	Nitrile Rubber		9	Piston A	Stainless Steel	
4	Magnet			10	Piston B	Polyacetal	
5	Body	Aluminum Alloy		11	Coil Spring	Stainless Steel	C, O type only
6	Pinion gear	Steel		12	Cover	Polyacetal	

MEMO

Hand (Gripper)
LSH-HP
LSH
FH100
BSA2
BHA
BHG
BHE
LHA
LHAG
HAP-1C
HAP-2
to 4CS
HKP
HCP
HGP
LST-HP
HLF2
HLA/ HLB
HLAG/ HLBG
HLC
HLD
HMC-HP
HMF
HMF-G
HMFB
HFP
FH500
HBL
HJL
HMD
HDL
HJD
Cylinder Switch
Ending



180-degree Opening/Closing High Gripping Force Wide Angle Gripper

HJD Series

●Opening/closing angle: -4 to 184°

RoHS

Model No. Notation Method

Without Switch
(Built-in magnet for switch)

HJD – 40CS

Model No.
1

With Switch
(Built-in magnet for switch)

HJD – 40CS – T2H – R

Model No.
2 Switch Model No.
1 Bore size
3 Number of Switches

1 Bore Size (mm)

Code	Content
32CS	ø32
40CS	ø40
50CS	ø50
63CS	ø63

2 Switch Model No.

For switch details, please refer to P. 573.
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 20 Note *	T2H□	T2V□
	1-Color Flex-Resistant Lead Wire	2-wire	-	10 to 30	-	5 to 20 *2	T2HR3	T2VR3
	1-Color	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 *2	T2WH□	T2WV□
		3-wire (NPN)	-	30 or less	-	50 or less	T3WH□	T3WV□



*1: For "□" in the switch model number, enter the code selected from the "*Lead wire length" 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: Switches other than the model numbers listed above are also available. (Custom Product) For details, see P. 573.

3 Number of Switches

Code	Content
R	With 1 pc. on Open Side
H	With 1 pc. on Close Side
D	With 2 pcs

*Lead wire length

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

Example) Lead wire length
1 m T2H
3 m T2H3
5 m T2H5

Switch Single Unit Model No. Notation Method

●For switch T□H□, T□WH□

• Switch body + Mounting bracket set *1

HJD – T2H

2 Switch Model No.

• Switch body only

SW – T2H

2 Switch Model No.

• Mounting bracket set *1

HJD – T

●For switch T□V□, T□WV□

• Switch body + Mounting bracket set *1

HJD – T2V – R

2 Switch Model No.

Code	Content
R	Open side
H	Closed side

• Switch body only

SW – T2V

2 Switch Model No.

• Mounting bracket set *1

HJD – TV – R

Code	Content
R	Open side
H	Closed side

*1: For HJD-[50CS, 63CS], mounting is possible without using mounting brackets. Select "Switch body only".
*2: The weight of the switch mounting bracket is 1.5 g.

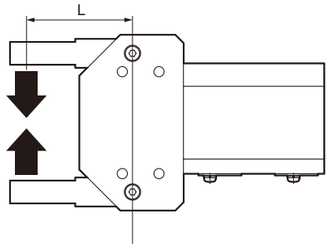
Specifications

Model No.		HJD			
Size		32CS	40CS	50CS	63CS
Bore size	mm	ø32	ø40	ø50	ø63
Operating Fluid		Compressed Air			
Max. Working Pressure	MPa	0.7			
Min. Operating Pressure	MPa	0.3			
Ambient Temperature	°C	5 to 60			
Port Size		M5	Rc1/8		
Open/close angle	°	-4 to 184			
Rod Diameter	mm	ø14	ø16	ø20	ø20
Internal volume (reciprocating)	cm³	46	88.7	180.8	331.5
Repeatability	mm	±0.1			
Weight	kg	1.03	1.58	2.67	3.97
Lubrication		Not required (When lubricating, use turbine oil Class 1 ISO VG32)			

Gripping Force Performance Data

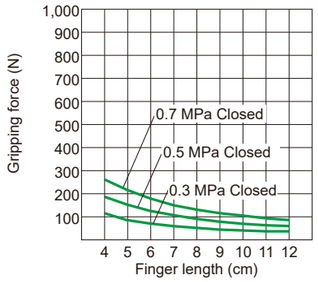
- Gripping force represents the thrust (for one finger) in the direction of the arrow shown in the figure.
- The gripping force in the opening/closing directions with Finger length L of hand with a supply pressure of 0.3, 0.5 and 0.7 MPa is shown.

●Closing direction (⇨)

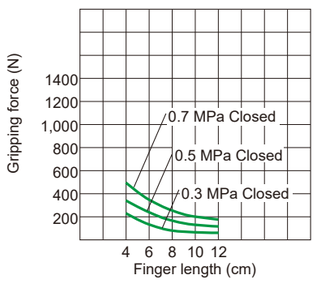


Note) **When selecting, check the design and selection precautions on P. 336.**

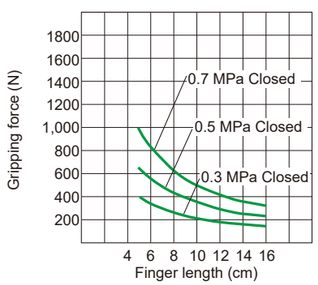
● HJD-32CS



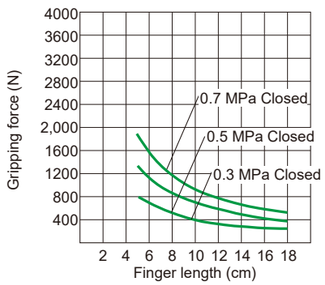
● HJD-40CS



● HJD-50CS

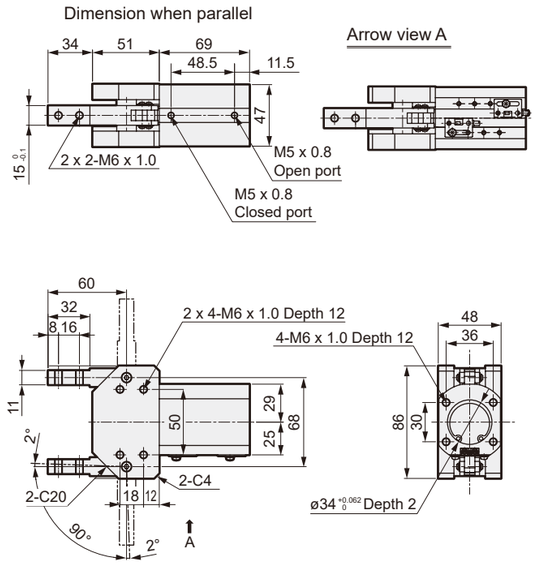


● HJD-63CS

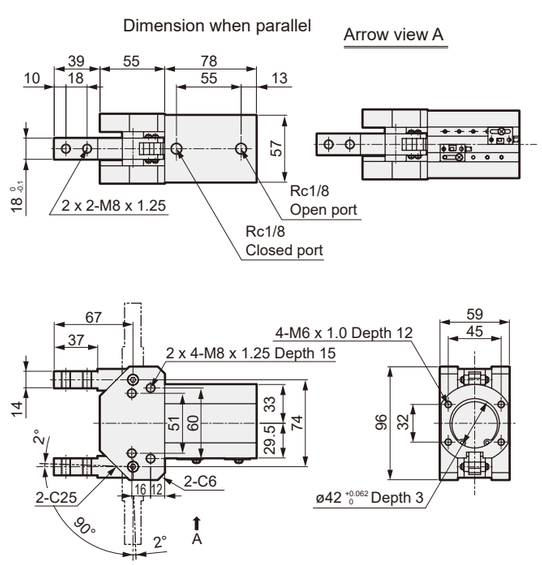


Outline Dimension Drawing

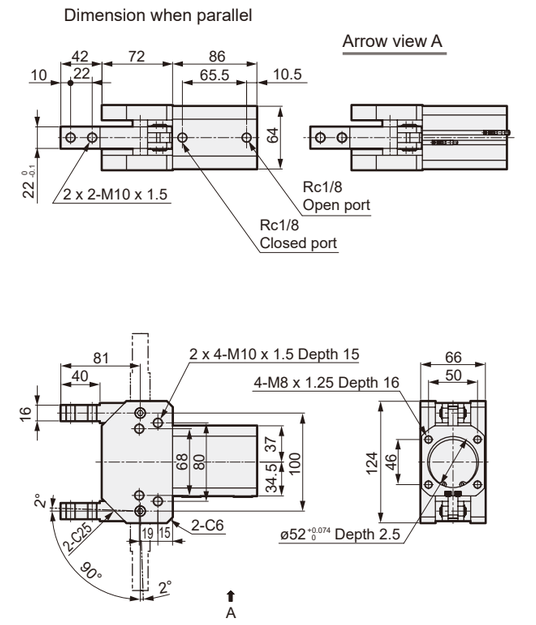
● HJD-32CS



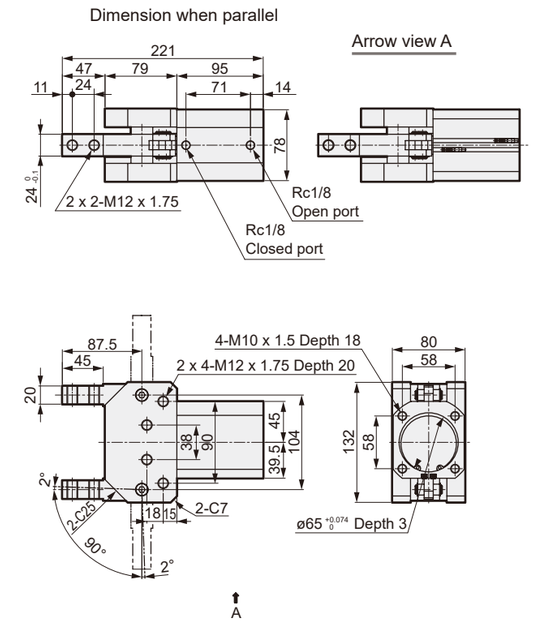
● HJD-40CS



● HJD-50CS

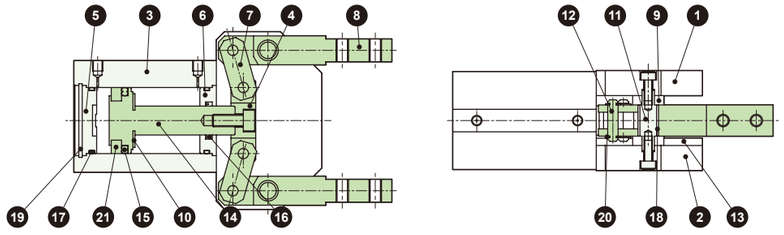


● HJD-63CS

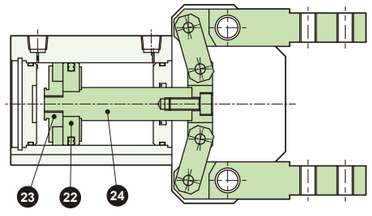


Internal Structure Diagram/Material

● HJD-32CS



●HJD-40CS to 63CS



Do not disassemble

No.	Part Name	Material	No.	Part Name	Material	No.	Part Name	Material
1	Side plate A	Aluminum Alloy	9	Collar	Steel	17	Seal	Nitrile Rubber
2	Side plate B	Aluminum Alloy	10	Cushion	Urethane Rubber	18	Bushing	Oil-Impregnated Bearing Alloy
3	Body	Aluminum Alloy	11	Pivot Shaft	Steel	19	C-type retaining ring	Stainless Steel
4	Operation plate	Steel	12	Operating Shaft	Steel	20	E-type retaining ring	Stainless Steel
5	Cover	Aluminum Alloy	13	Guide rail	Steel	21	Magnet	
6	Rod Cover	Aluminum Alloy	14	Piston	Aluminum alloy, Stainless steel	22	Piston A	Aluminum Alloy
7	Link	Steel	15	Piston seal	Nitrile Rubber	23	Piston B	Stainless Steel
8	Finger	Steel	16	Rod seal	Nitrile Rubber	24	Piston Rod	Stainless Steel

MEMO



Attachment

● Material: Steel, Engineering plastic

RoHS

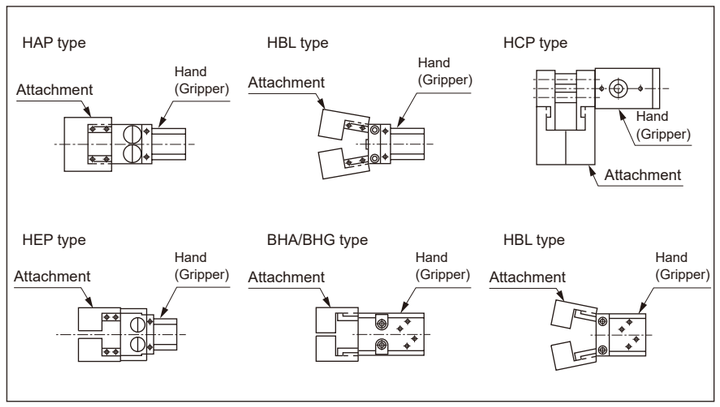
Main features

Attachments are available for all models, which can be machined to match the customer's workpiece.

●Spigot part is pre-processed
The troublesome reference part (spigot part) is pre-processed. Available in a series so you can select according to workpiece shape and dimensions.

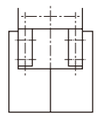
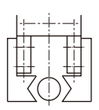
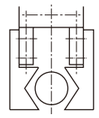
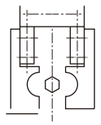
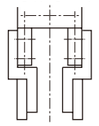
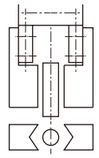
●Two types of attachment materials
Iron (S50C) and engineering plastic (MC nylon) are available so you can select according to the workpiece material and operating conditions.

Models compatible with standard attachments



Attachment usage example

Gripper type usage example

Soft jaw	For small workpieces	For large workpieces	For irregularly shaped workpieces	Vertical gripping (for internal gripping workpieces)	For vertical gripping
					

Model No. Notation Method

(Note: When ordering parts, it will be treated as 1 piece.

BHA - Y1 - 110

❶ Model No. ❷ Material ❸ Attachment number

❶ Model No.

Code	Content
FH	Feather Gripper (FH100/FH500)
HAP	Parallel Gripper
BHA	Compact Cross Roller Parallel Gripper
BHG	With rubber cover Compact Cross Roller Parallel Gripper
HEP	Bearing Parallel Gripper
HCP	Horizontal Parallel Gripper
HBL	Pivot Gripper

❷ Material

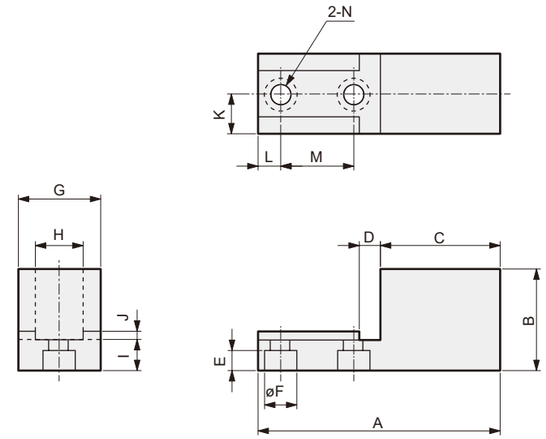
Code	Content
Y1	Material S50C
Y2	Material MC Nylon

❸ Attachment number

Code	Content	Code	Content
110	HAP-1C	210	HEP-5CS
120	HAP-2CS, HBL-2CS	310	FH110, FH510
130	HAP-3CS, HBL-3CS	320	FH112, FH512
140	HAP-4CS, HBL-4CS	330	FH116, FH516
150	HBL-1CS	340	FH120, FH520
160	HCP-2CS	350	FH125
170	HCP-3CS	260	BHA-01CS1, BHG-01CS
180	HCP-4CS	270	BHA-03CS1, BHG-03CS
190	HEP-3.5CS	280	BHA-04CS1, BHG-04CS
200	HEP-4CS	290	BHA-05CS1, BHG-05CS

Outline Dimension Drawing

●110 to 350



*Material
Y1: S50C
Y2: MC Nylon

Attachment No.	Compatible models	*Material	Dimensions (mm) A	B	C	D	E	øF	G	H -0.02	I	J	K	L	M	øN	Weight (g)
110	HAP-1C	Y1	40	17	24.5	4.5	3	6	10	8	5	1.5	5	3.5	8	3.5	39
		Y2		21							9						8
120	HAP-2CS HBL-2CS	Y1	50	26	28	5.5	4	8	20	10	6	2	10	5	12	4.5	135
		Y2		30							10						25
130	HAP-3CS HBL-3CS	Y1	60	33	30.5	6.5	5	9.5	20	12	8	2	10	5.5	18	5.5	194
		Y2															29
140	HAP-4CS HBL-4CS	Y1	80	43	44	7.5	6	11	20	14	10	2	10	8	20	6.5	352
		Y2		50							17						53
150	HBL-1C	Y1	40	19	19	4.5	3	6	12	8	5	1.5	6	4	10	3.5	44
		Y2			21												7
160	HCP-2CS	Y1	60	29	33	9.5	5	9.5	22	18 -0.2 -0.1	9	2	11	11	10	5.5	206
		Y2															31
170	HCP-3CS	Y1	70	35	34	11.5	6	11	25	20 -0.2 -0.1	10	2	12.5	8	20	6.5	303
		Y2															45
180	HCP-4CS	Y1	80	40	42	13	6	11	35	25 -0.2 -0.1	10	2	17.5	10	20	6.5	563
		Y2	78	44							25			14			97
190	HEP-3.5CS	Y1	80	41	50	7.5	5	9.5	20	14	10	2	10	6	18	5.5	360
		Y2		49							18						70
200	HEP-4CS	Y1	120	60	81	11.5	6	11	30	22	13	2	15	8	20	6.5	1245
		Y2		77					32		30		16				270
210	HEP-5CS	Y1	135	60	91	14.5	8	14	30	28	16	2	15	10	25	8.5	1443
		Y2		79					38		35		19				382
310	FH110 FH510	Y1	29.5	15	14	4.5	3	6	12	7	4	1.5	6	3.5	8	3.5	22
		Y2															4
320	FH112 FH512	Y1	29.5	16.5	14	4.5	3	6	12	7	4	1.5	6	3.5	8	3.5	23
		Y2															4
330	FH116 FH516	Y1	39	20	20.5	5.5	4	8	12	10	5	1.5	6	3.5	10	4.5	48
		Y2															8
340	FH120 FH520	Y1	39	22.5	20.5	5.5	4	8	12	10	5	1.5	6	3.5	10	4.5	53
		Y2		25.5							8						10
350	FH125	Y1	48.5	22.5	28.5	6.5	5	9.5	14	12	8	2	7	4.5	10	5.5	105
		Y2		25.5							14						17
260	BHA-01CS1 BHG-01CS	Y1	30	17.5	14.5	4.5	3	6	14	10	5	1.5	7	4	8	3.5	38
		Y2															6
270	BHA-03CS1 BHG-03CS	Y1	40	21	21	5.5	4	8	14	10	6	1.5	7	4.5	10	4.5	61
		Y2		23							8						11
280	BHA-04CS1 BHG-04CS	Y1	40	26.5	21	5.5	4	8	14	10	6	1.5	7	4.5	10	4.5	76
		Y2		29.5							9						12
290	BHA-05CS1 BHG-05CS	Y1	50	33	28.5	6.5	5	9.5	14	10	8	2	7	6	10	5.5	123
		Y2		39							14						23

To Use This Product Safely

Be sure to read this before use.

For general cylinder information, see Intro 39, and for cylinder switches, see P. 628.

Individual Precautions: Hand (Gripper)

During Design / Selection

1. Common

Warning

■ If the moving workpiece poses a risk to personnel or if fingers could be caught in the finger, etc., install a protective cover, etc.

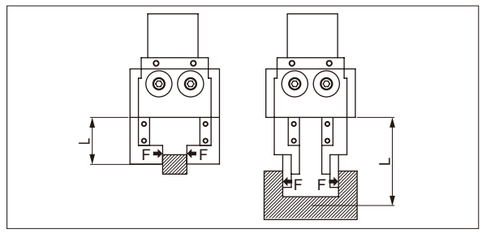
■ If circuit pressure drops due to a service interruption or problems in the air source, gripping force drops and the workpiece could drop. Provide position locking measures, etc., so that personnel are not injured or machines damaged.

■ The position of the high-precision positioning hole is based on the center of the finger, while the main body mounting hole is based on the main body, so misalignment will occur. When mounting using through holes, the pitch may shift depending on the mounting pitch with the customer, so mounting with the gripper chuck body screws is recommended.

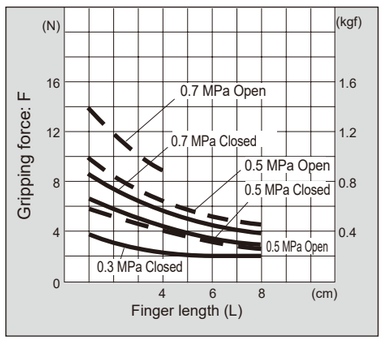
Caution

■ Precautions Regarding Gripping Force

- Gripping force represents the force when gripping a workpiece as shown in the figure below.

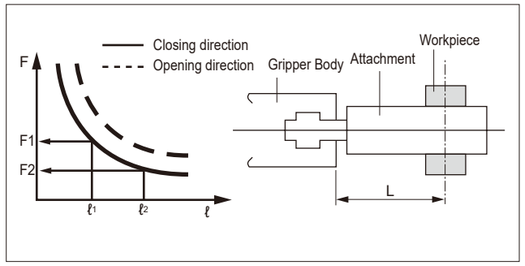


- The performance data shows the gripping force at Finger length L of the gripper at a supply pressure of 0.15 to 0.7 MPa.



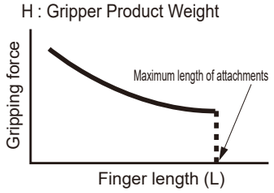
- When determining the gripping force from performance data, if L is the distance to the workpiece's center of gravity when the attachments are manufactured, the gripping force F is as follows
  When L = L1, F = F1
  When L = L2, F = F2 Refer to the lower left figure
  Expressed as.
- For the length when L-shaped attachments are included, select as follows.
  Example: For an L-shape, 30 mm in the finger direction and 30 mm bent at 90 degrees, the attachment length is considered to be 60 mm.
- Use attachments with a length within the values in the gripping force performance data table for each model.
- The maximum length of the attachments should be within the performance data. When transporting a workpiece (weight W_L), use the following as a reference.
  W_L x 9.8 x 5 < (F x N) [Holding only]
  W_L x 9.8 x 10 < (F x N) [Normal transport]
  W_L x 9.8 x 20 < (F x N) [Rapid acceleration transport]

  W_L : Workpiece Weight [kg]
  F : Gripping Force (N)
  N : Number of fingers [Qty.]



■ Use as short and light an attachment as possible.
If they are long and heavy, the inertial force during opening and closing will be large, which may cause play in the fingers or accelerate wear on the finger sliding parts, adversely affecting the service life.

- Keep the length of the attachments within the values in the performance data.
- The weight of the attachments affects the service life. Please keep it at or below the following.
  W < 1/4H (for one attachment) W: Weight of finger
  H : Gripper Product Weight



■ Avoid using only the spring force of the single-acting type to grip workpieces as much as possible. The gripping force will become unstable and may cause malfunction.

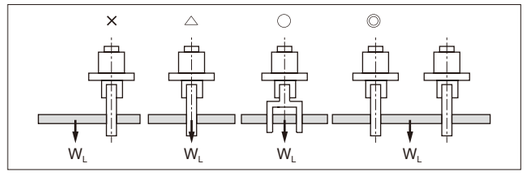
■ For the single-acting type, the spring force is weakest near the stroke end (open end for NO type, closed end for NC type). Due to the structure that operates with spring force, it may not return if operated with a short stroke, so consider the attachment shape to grip the workpiece with sufficient stroke allowance.

■ The rubber cover is a consumable part. Replace as necessary.

■ Usage Environment
In cutting, casting, and welding factories, foreign matter such as cutting fluid, chips, and dust may enter. Prevent these as much as possible with covers, etc. Also, do not use in the following environments.

- Splashing of cutting fluid (because sliding parts are abraded by abrasives or abrasive in the fluid)
- When organic solvents, chemicals, acids, alkalis, kerosene, etc. are contained in the atmosphere
- Exposure to water

■ When gripping long or large workpieces, gripping the center of gravity is a prerequisite for stable gripping, but consider increasing the size or using multiple units to ensure stability.



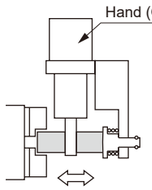
■ Select a model with sufficient gripping force for the workpiece weight.

■ Select a model with sufficient opening/closing width relative to the workpiece size.

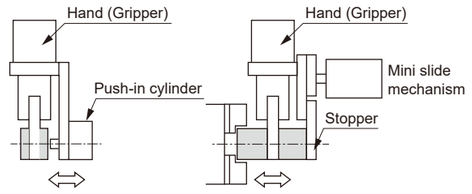
■ When inserting a workpiece directly into a jig with a gripper, design with clearance in mind. The gripper may also be damaged.

Hand (Gripper)

●Pushing against a jig by springing out



●When using a push-in cylinder



Note) Since the workpiece slides on the attachments, there is a risk of significantly reducing the life of the chuck. Sufficient consideration must be given to the shape of the attachments.

■ If the attachment lacks rigidity, deflection may cause the fingers to bind, adversely affecting operation.

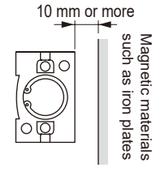
■ For products using finite track linear guides (LSH, LSH-□, LSHL/M-□, LST(M), LHA(G), HLF2), steel balls may become misaligned depending on the operating conditions and individual product, increasing sliding resistance and reducing gripping force. In such cases, by increasing the operating pressure or by inserting a full stroke operation between gripping operations, it can be corrected.

■ Adjust the hand opening/closing speed with a speed controller (optional). If used at high speed, play may occur sooner. Also, the shock during opening and closing may cause the workpiece to vibrate, leading to chucking errors, workpiece insertion errors, or poor repeatability.

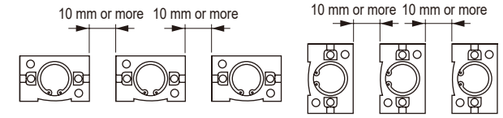
■ Please note that for products using cross rollers (BSA2, BHA, BHG, HKP, BHE), the smoothness of operation may change depending on the usage conditions. (There is no effect on basic performance.)

■ If a lateral or impact load is applied to the finger, it may cause play in the finger or damage. Adjust and check that no external force is applied to the finger.

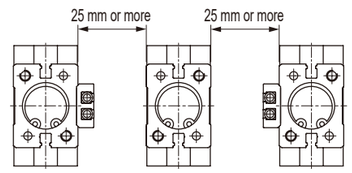
■ If there is a magnetic material such as an iron plate near the cylinder switch, it may cause the cylinder switch to malfunction, so keep a distance of 10 mm or more from the cylinder surface.



■ If cylinders are adjacent, it may cause cylinder switch malfunction, so keep the following distance from the cylinder surface.



[LSH-HP Series]



■ Clamping operations become more accurate when performed as softly and slowly as possible. Also, repeatability becomes stable.

2. Linear Slide Cylinder LSH-HP1 Series

Caution

■ When using small bore/short stroke actuators at high frequency, condensation (water droplets) may form in piping depending on conditions. Take measures to prevent condensation by using a quick exhaust valve, etc.

■ The rubber cover does not guarantee hermeticity. Since gaps may form between the rubber cover, body and finger, contact CKD if this is a problem.

3. LSHM-HP2, LSTM-HP2 Series

Caution

■ Use a stable DC power supply. Do not connect motors, valves, etc., that generate noise to the power supply used in this device.

■ When wiring, ensure that the sensor/amplifier section is not subjected to induced noise by avoiding shared piping or wiring (e.g., multicore cables) with power lines for motors, etc. 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.)

■ If the cable length exceeds 5 m, noise resistance performance may be affected. Please be careful.

■ Wire the connecting cable so that local bending or tensile force is not applied. Also, avoid repeated bending. Do not apply impact load to the lock unit.

■ Do not apply a load of 30 N or more to the M8/M12 connector part.

▪ Cannot be used outdoors or in atmospheres where there is a risk of corrosion.

■ The protection structure of the switch output adapter and IO-Link adapter is equivalent to IP40. Do not install in locations with moisture, salt, dust, or cutting chips.

4. Linear Slide Gripper LSH Series

Caution

■ When installing L-shaped attachments, use them within the range on P. 95.

5. Shockless Type LSH-□-C

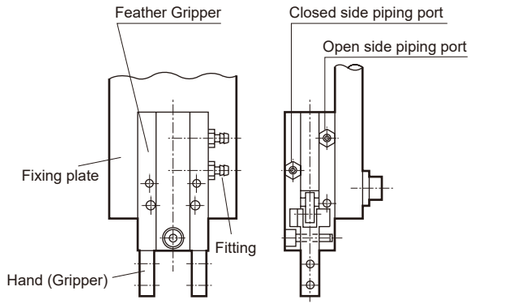
Caution

■ Please note that due to the structure, the closed end position cannot be maintained if the air supply is cut off. When detecting the closed end with a switch, it may be outside the detection range, so measure the switch position while air is pressurized.

6. Feather Gripper FH Series

Caution

■ For the FH series, if there is a restriction in the thickness direction of the main body, the usable piping fittings are limited. Please refer to the fittings below.



Model	FH□10	FH□12	FH□16	FH□20	FH□25
Piping diameter	M3		M5		
Fitting	Model No.	Applicable outer diameter (mm)	Effective cross-sectional area (mm²)	Model No.	Applicable outer diameter (mm)	Effective cross-sectional area (mm²)
Barb Fitting — Straight FTS	FTS4-M3	ø3.2 / ø4	0.4	FTS4-M5	ø3.2 / ø4	2.1
	-	-	-	FTS6-M5	ø6	4.1

7. Wide Parallel Gripper HMC-HP1 Series

Caution

■ When using small bore/short stroke actuators at high frequency, condensation (water droplets) may form in piping depending on conditions. Take measures to prevent condensation by using a quick exhaust valve, etc.

During Use

1. Common

Caution

■ Do not disassemble or modify the body.

■ Periodically replenish grease to the sliding parts of the finger. Periodic replenishment can further extend the service life.

Manufacturer	Model No.
THK	AFF Grease

■ Attachment Mounting Method

When mounting attachments to the fingers, consider the impact on the gripper body, and support and tighten with a wrench, etc., to prevent the fingers from twisting. It is recommended to attach the attachments to the outer surface of the fingers. (The accuracy of the inner surface of the fingers is inferior.)

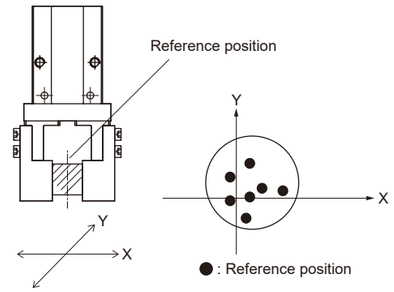
■ Do not retighten or disassemble any screws other than those used by the customer for fixing the main body and attachments. May cause malfunction.

■ Do not make dents or scratches on the body mounting surface and fingers that would impair flatness or perpendicularity.

■ Repeatability

Repeatability here refers to the workpiece positional deviation when clamping/unclamping is repeated under the same conditions (gripper fixed, same workpiece used, etc., see below). Shock during opening/closing may lead to workpiece positional deviation and deterioration of repeatability. Also, be aware that wear or insufficient rigidity of the attachments can also lead to deterioration of accuracy.

Condition
- Workpiece dimensions, shape, weight
- Workpiece transfer position
- Clamping method, length
- Resistance between workpiece and workpiece receiving surface
- Fluctuation of gripping force (air pressure), etc.



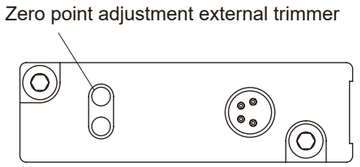
2. LSTM-HP2, LSHM-HP2

Caution

■ The analog output voltage corresponds to the cylinder piston position, and it is conceivable that its value will fluctuate due to deformation/wear of the jig, etc., over the course of use. (In the case of a gripper, backlash in the opening/closing direction of the finger part and deformation/wear of the attachments are contributing factors to variation.) If the analog output voltage fluctuates, make fine adjustments with the zero point adjustment external trimmer as necessary.

Operating Procedure

Remove the attachments, etc., close the fingers, remove the rubber plug included to the zero point adjustment external trimmer, and rotate the trimmer to make fine adjustments so that the output voltage becomes 1 V. Be sure to reattach the rubber plug as it was after operation. At that time, prevent moisture or foreign matter from entering the inside.



■A rubber plug is included to the zero point adjustment external trimmer section to ensure water resistance, so use it with the plug included.

■Do not remove the cap of the correction adapter to ensure water resistance.

■To ensure water resistance, securely tighten the M8 screw part of the cable.

■Repeatability of analog output

Repeatability here refers to the deviation of the analog output when clamping and unclamping are repeated under the same conditions (gripper fixed, same workpiece used, etc., see below), converted to length.

Condition
- Workpiece dimensions, shape, weight
- Workpiece gripping position of attachments
- Clamping method, length
- Resistance at the contact area between attachments and workpiece
- Fluctuation of gripping force (air pressure)

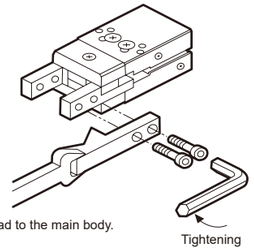
■For LSTM-HP2, when measuring at full scale, use it considering a backlash amount of 0.15 mm.

3. Linear Slide Gripper LSH Series

Caution

■Finger Mounting Method

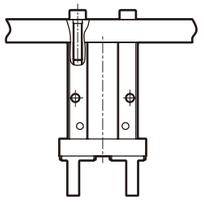
When mounting attachments to the fingers, consider the impact on the gripper body, and support and tighten with a wrench, etc., to prevent the fingers from twisting.



Item	Bolt used	Tightening torque (N·m)
LSH-10	M2.5 x 0.45	0.32
LSH-16	M3 x 0.5	0.59
LSH-20	M4 x 0.7	1.4
LSH-25	M5 x 0.8	2.8

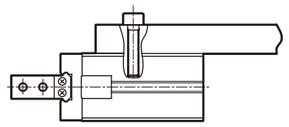
■For main body mounting, refer to the following items.

●Top mounting



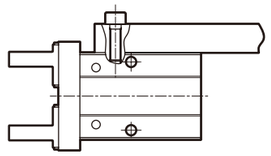
Item	Bolt used	Tightening torque (N·m)	Maximum screw-in depth L (mm)
LSH-10	M3 x 0.5	0.88	6
LSH-16	M4 x 0.7	2.1	8
LSH-20	M5 x 0.8	4.3	10
LSH-25	M6 x 1.0	7.3	12

●Front mounting



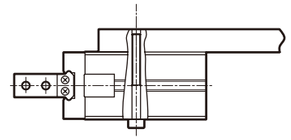
Item	Bolt used	Tightening torque (N·m)	Maximum screw-in depth L (mm)
LSH-10	M3 x 0.5	0.69	5
LSH-16	M4 x 0.7	2.1	8
LSH-20	M5 x 0.8	4.3	10
LSH-25	M6 x 1.0	7.3	12

●Side mounting



Item	Bolt used	Tightening torque (N·m)	Maximum screw-in depth L (mm)
LSH-10	M3 x 0.5	0.88	6
LSH-16	M4 x 0.7	1.6	4.5
LSH-20	M5 x 0.8	3.3	8
LSH-25	M6 x 1.0	5.9	10

●Through-hole mounting



Item	Bolt used	Tightening torque (N·m)
LSH-10	M2.5 x 0.45	0.32
LSH-16	M3 x 0.5	0.88
LSH-20	M4 x 0.7	2.1
LSH-25	M5 x 0.8	4.3

* For types with a switch, through-hole mounting is not possible.

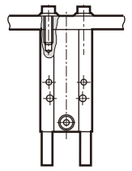
■Do not retighten or disassemble any screws other than those used by the customer for fixing the main body and attachments. May cause malfunction.

4. Feather Gripper FH Series

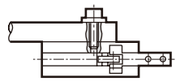
Caution

■For FH series main body mounting, refer to the following items.

●Top mounting



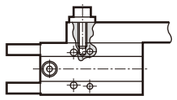
●Front mounting



* For types with a switch, ensure the screw-in amount is below the value in the table below to prevent the bolt tip from pressing the switch.

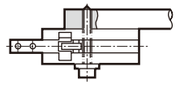
* Ensure the fixing plate does not interfere with the finger fulcrum.

●Side mounting



Model	Bolt size used	Max. screw-in depth (mm)	Recommended tightening torque (N·cm)
FH□10	M3 x 0.5	4.5	70
FH□12	M3 x 0.5	4.5	70
FH□16	M4 x 0.7	6	160
FH□20	M5 x 0.8	7.5	330
FH□25	M5 x 0.8	12	330

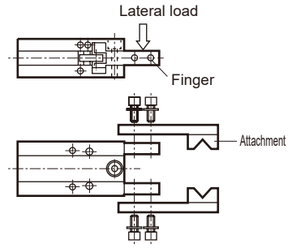
●Using through holes



* For types with a switch, using through holes is not possible.
* Ensure the fixing plate does not interfere with the finger fulcrum.

Model	Bolt size used	Recommended tightening torque (N·cm)
FH□10	M3 x 0.5	32
FH□12	M2.5 x 0.45	32
FH□16	M3 x 0.5	90
FH□20	M4 x 0.7	210
FH□25	M4 x 0.7	210

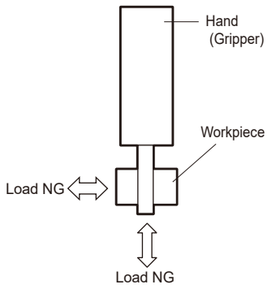
■When attaching the attachment, be careful not to apply a lateral load to the finger.



■When mounting, tighten with the following tightening torque.

Nominal screw size	M3	M4	M5	M6	M8
Recommended tightening torque (N·m)	0.59	1.4	2.8	4.8	12.0

■Do not apply excessive load to the fingers or attachments during workpiece attachment/ detachment or transfer. Scratches or dents may occur on the rolling surface of the finger's linear guide, leading to malfunction.



5. Shockless Type LSH-□-C

Caution

■Due to changes in cushion rigidity from being left for a long time, the stroke may be slightly shorter than the reference value at low pressure settings. Perform a break-in operation by operating it several times or by reciprocating it at a high supply pressure.

■Do not rapidly exhaust the air in the cylinder after operating at low speed outside the catalog specification range. Example Removing piping or couplers, etc.) The rubber air cushion may come off. Please be especially careful as this is more likely to occur when the air pressure is high.

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.

Mechanical Gripper

Overview

Unlike conventional grippers that require air, the Mechanical Gripper BHA-FC series performs opening and closing operations mechanically. Ideal for systems requiring opening/closing operations at the end, such as shuttle movers (SM-25 series).

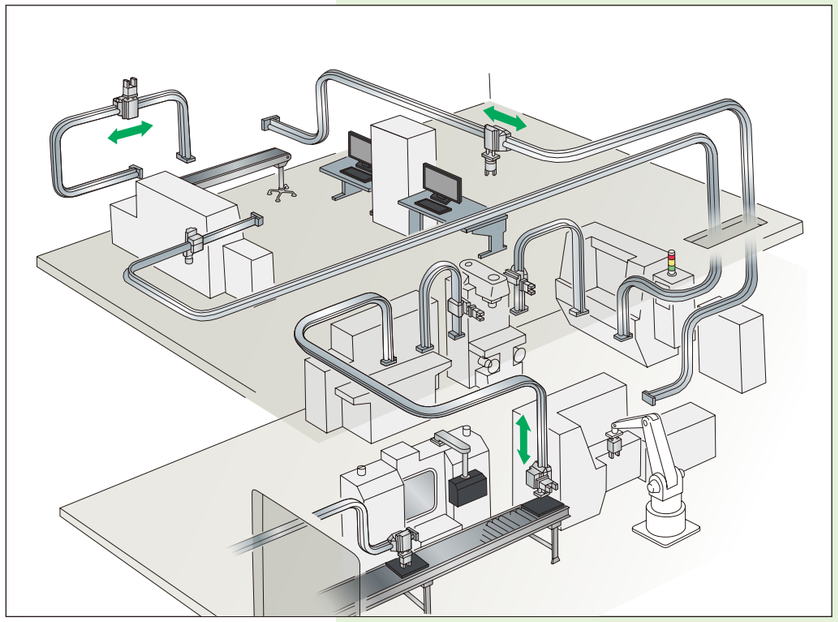
Main features

- Ideal for index tables where air piping cannot be used.
- High gripping force in the closing direction due to springs (BHA type: 12 N to 100 N)
- Opening direction is driven by external force, enabling high-speed operation in combination with cams, etc.



CONTENTS

● Mechanical Gripper (BHA-FC) 344



⚠To use this product safely, be sure to check the precautions for use regarding general cylinders on Intro 39 and Grippers on P. 336 before use.



Mechanical Gripper

BHA-FC Series

● Operating stroke: 5, 9, 11, 15, 20 mm

RoHS

Model No. Notation Method

BHA - 01CS - FC

Model No.

1 Bore size

1 Bore Size (mm)

Code	Content
01CS	ø12
03CS	ø16
04CS	ø20
05CS	ø25
06CS	ø32

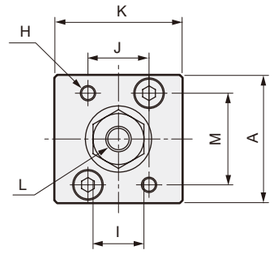
Specifications

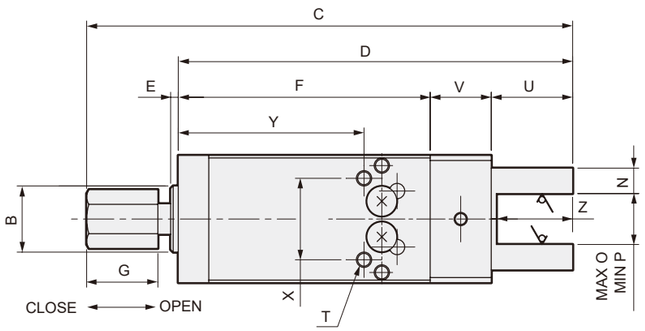
Item		BHA-FC				
Size		01CS	03CS	04CS	05CS	06CS
Cylinder bore	mm	ø12	ø16	ø20	ø25	ø32
Rod diameter	mm	ø6	ø8	ø10	ø12	ø16
Ambient Temperature	°C	5 to 60				
Operating stroke	mm	5	9	11	15	20
Repeatability	mm	±0.01				
Opening side external force	N	60 to 90	120 to 180	185 to 280	230 to 350	400 to 600
Gripping force *3	N	12 to 19	20 to 37	20 to 55	45 to 75	70 to 100
Product Weight	g	142	212	362	594	1342

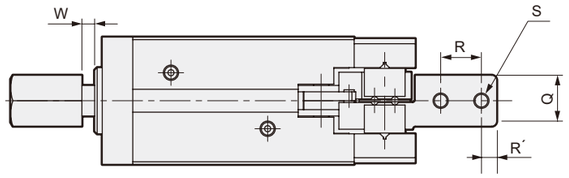
*1: Using in the opening direction will lead to gripper damage, so never do it.
*2: If torque is applied to the stopper rod, internal pistons, etc., may be damaged. When connecting to equipment, be sure to use a wrench on the stopper rod to connect.
*3: Gripping force changes according to stroke position.

Outline Dimension Drawing

●BHA-FC





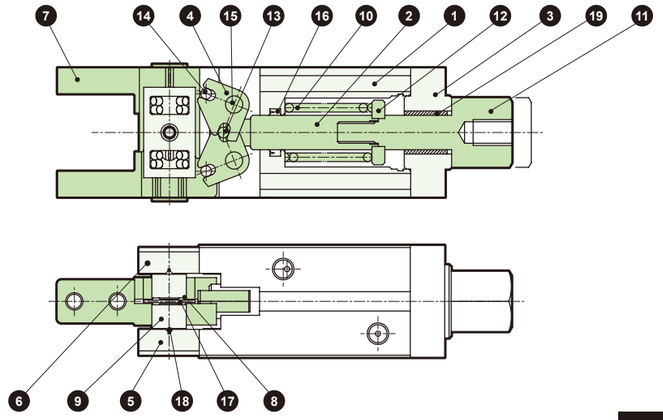


Code / Model No.	A	B	C	D	E	F	G	H	I	J	K	L	M
BHA-01CS-FC	25	ø13	MAX95.5/MIN93	77.5	1.5	49.5	14	2-M3 x 0.5 Depth 6	10	12	25	M5 x 0.8 Depth 8	18
BHA-03CS-FC	30	ø17	MAX110/MIN105.5	90	1.5	57	14	2-M4 x 0.7 Depth 8	14	15	26	M6 x 1.0 Depth 9	22
BHA-04CS-FC	41	ø21	MAX120/MIN114.5	99	1.5	67	14	2-M5 x 0.8 Depth 8	17	18	30	M8 x 1.25 Depth 10	32
BHA-05CS-FC	50	ø26	MAX148/MIN140.5	123	1.5	88	16	2-M6 x 1.0 Depth 12	19	22	35	M8 x 1.25 Depth 12	40
BHA-06CS-FC	60	ø34	MAX199/MIN189	171	2	114	16	2-M6 x 1.0 Depth 12	24	32	47	M10 x 1.5 Depth 15	44

Code / Model No.	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	R´
BHA-01CS-FC	5	15	10	10 $^{0}_{-0.05}$	8	2 x 2-M3 x 0.5	2 x 2-M3 x 0.5 Depth 7	16	12	2.5	16	36.5	15	3
BHA-03CS-FC	6	18	9	10 $^{0}_{-0.05}$	10	2 x 2-M4 x 0.7	2 x 2-M4 x 0.7 Depth 7	19	14	4.5	24	43	18	4
BHA-04CS-FC	8	25	14	10 $^{0}_{-0.05}$	10	2 x 2-M4 x 0.7	2 x 2-M5 x 0.8 Depth 8	19	13	5.5	30	46	18	4
BHA-05CS-FC	10	30	15	10 $^{0}_{-0.05}$	10	2 x 2-M5 x 0.8	2 x 2-M6 x 1.0 Depth 10	22	13	7.5	36	61	21	5
BHA-06CS-FC	10	40	20	16 $^{0}_{-0.05}$	18	2 x 2-M5 x 0.8	2 x 2-M8 x 1.25 Depth 14	36	21	10	44	77	33	5

Internal Structure Diagram/Material

●BHA-FC



Do not disassemble

No.	Part Name	Material	No.	Part Name	Material
1	Body		11	Stopper rod	Stainless Steel
2	Piston Rod	Stainless Steel	12	Washer	Stainless Steel
3	Cover	Aluminum Alloy	13	Pivot Shaft	Steel
4	Arm	Stainless Steel	14	Actuating shaft A	Alloy Steel
5	Bearing guide A	Steel	15	Actuating shaft B	Alloy Steel
6	Bearing guide B	Steel	16	Rod seal	Nitrile Rubber
7	Finger	Steel	17	Cross roller A	Alloy Steel
8	Retainer A	Stainless Steel	18	Cross roller B	Alloy Steel
9	Retainer B	Stainless Steel	19	Bushing	Oil-Impregnated Bearing Alloy
10	Coil Spring	Stainless Steel			

MEMO

Mechanical Gripper
BHA-FC
Cylinder Switch
Ending

Check Valve

Overview

Supports handling with a rich lineup of low profile, lightweight, wide stroke, high-precision types, etc. This is a chuck series that pursues ease of use.



CONTENTS

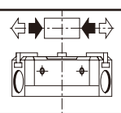
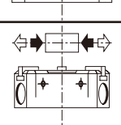
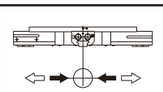
Series variation 350
● 3-Jaw Chuck (CKW-HP1) 354
● Powerful Chuck (CKL2) 386
● Powerful Chuck with Rubber Cover (CKLG2) 398
● Fall Prevention Type Powerful Chuck (CKL2-□-HC) 406
● High Gripping Force Powerful Chuck (CKH2) 412
● Bidirectional Powerful Chuck (CKLB2) 418
● 3-Jaw Bearing Chuck (CKG) 426
● 3-Jaw Long Stroke Chuck (CK) 434
● 3-Jaw Low Profile Chuck (CKA) 440
● Low Profile Chuck (CKS) 450
● Low Profile Chuck (Hollow Type) (CKS-F) 460
● Hollow Chuck (CKF) 468
● Ultra Long Stroke Chuck (CKJ) 476

Attachment 486
⚠ Precautions for Use 490

Mechanical Chuck
● Mechanical Chuck (CKL2-FC) 496

Robot Peripheral Components
● Auto Gripper Changer (CHC) 504

System Table Chuck Series

	Product Name		Model No.	Finger Movement	Bore size (mm)	Gripping force* (N)	Stroke (mm)	Page
3-Jaw Chuck	3-Jaw Chuck		CKW-HP1		ø16 to ø40	14 to 118	4 to 8	354
	Powerful Chuck		CKL2		ø16 to ø100	17 to 680	5 to 40	386
	Powerful Chuck with Rubber Cover		CKLG2		ø20 to ø100	28 to 680	5 to 23	398
	Drop Prevention Type Powerful Chuck		CKL2-HC		ø32 to ø80	75 to 510	8 to 20	406
	High Gripping Force Powerful Chuck		CKH2		ø50 to ø100	290 to 1250	6 to 12	412
	Bidirectional Powerful Chuck (Parallel Gripper)		CKLB2		ø20 to ø100	35 to 1050	5 to 23	418
	3-Jaw Bearing Chuck		CKG		ø16 to ø50	13 to 160	6 to 16	426
	3-Jaw Long Stroke Chuck		CK		ø25 / ø44	15 to 65	20 to 40	434
	3-Way Low Profile Chuck		CKA		ø16 to ø100	4 to 600	6 to 38	440
	Low Profile Chuck		CKS		ø8 × 3 to ø32 × 3	17 to 320	10 to 32	450
	Low Profile Chuck (Hollow Type)		CKS-F		ø16 × 3 to ø50 × 3	75 to 800	16 to 50	460
	Hollow Chuck		CKF		ø30 to ø80	12 to 112	5 to 16	468
	Ultra Long Stroke Chuck		CKJ		ø12 × 6 to ø50 × 6	86 to 1550	40 to 130	476

* Gripping force is the value at 0.5 MPa air pressure, on the close side. Actual gripping force varies depending on the distance to the gripping point and the angle of the fingers, so please check the P. for each product when selecting.

Check Valve
CKW-HP
CKL2
CKLG2
CKL2 -□-HC
CKH2
CKLB2
CKG
CK
CKA
CKS
CKS-F
CKF
CKJ
Cylinder Switch
Ending

3-Jaw Chuck

CKW-HP1 Series

Changing "gripping" changes manufacturing

Increased guide rigidity even for 3-jaw type.
Achieves high rigidity, high precision, and high durability.



- Significant reduction in minor stoppages
- Significant reduction in replacement frequency
- Significant reduction in replacement time
- Durability of 10 million cycles or more

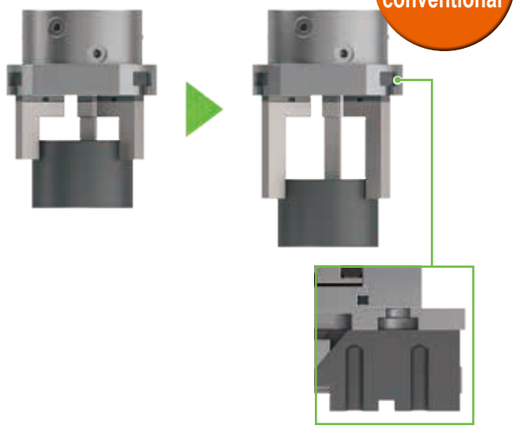
*According to our specified conditions

HP HIGH PRODUCTIVITY

High rigidity

Increased guide rigidity by redesigning the guide section.

1.3x conventional



Rubber cover option

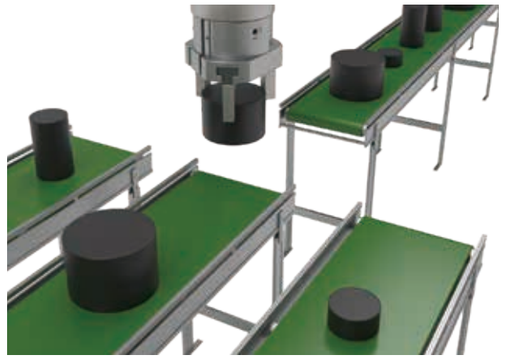


CKW-G-HP1 Chloroprene rubber

CKW-F-HP1 Fluoro Rubber

Long stroke

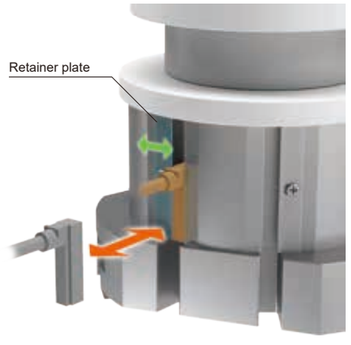
Can grip workpieces of different diameters
* The mounting pitch of the main body is compatible with the standard type.



High maintainability

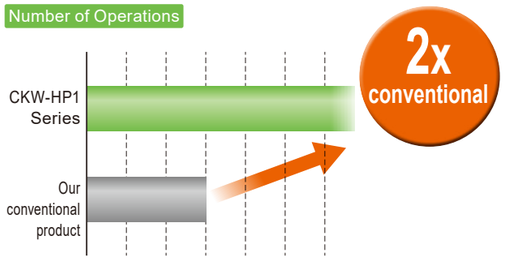
Easy switch replacement

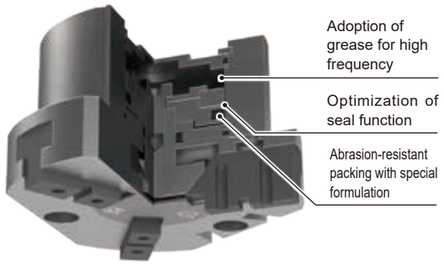
Switch replacement is possible while included to the equipment simply by sliding the retaining plate.



Long service life

Mastering sliding technology, achieving durability more than twice that of conventional products.

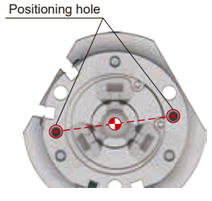




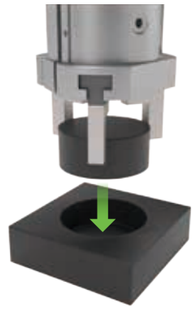
Significant reduction in replacement time

High-precision positioning hole ±0.025 mm

Added "positioning hole" based on gripping center. Contributes to reducing mounting and maintenance man-hours.



Effective for centering cylindrical workpieces.



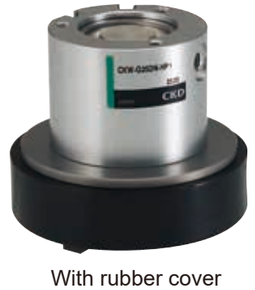
Variation



Long stroke



Standard



With rubber cover



3-Jaw Chuck

CKW-A-HP1 Series

● Operating stroke: 4, 6, 8, 12 mm

Double Acting



RoHS

Model No. Notation Method

Without Switch
(Built-in magnet for switch)

CKW - A 16 D N —— HP1

Model No. | Rubber Cover: None | ❶ Actuation method: Double Acting | ❷

With Switch
(Built-in magnet for switch)

CKW - A 16 D N - F2H - D - HP1

Model No. | ❶ Bore size | ❷ High-precision positioning hole | ❸ Switch Model No. | ❹ Number of Switches

Rubber Cover: None | Actuation method: Double Acting

❶ Bore size (mm)

Code	Content
16	ø16
20	ø20
25	ø25
32	ø32
40	ø40
50	ø50

❷ High-precision positioning hole

For details, refer to P. 380.

Code	Content	
N	None	
A	Available	

❸ Switch Model No.

For switch details, please refer to P. 573.
Switches are included to 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 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□	

*1: For "□" in the switch model number, enter the code selected from the "*Lead wire length" 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: Switches other than the model numbers listed above are also available. (Custom Product) For details, see P. 573.

***Lead wire length**

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

Example) Lead wire length
1 m F2S
3 m F2S3

❹ Number of Switches

Code	Content
R	With 1 pc. on Open Side
H	With 1 pc. on Close Side
D	With 2 pcs

Note) When 2 switches are included, for models with a short operating stroke, both switches may turn ON depending on the size of the workpiece. Please be careful.

Switch Single Unit Model No. Notation Method

SW - F2H

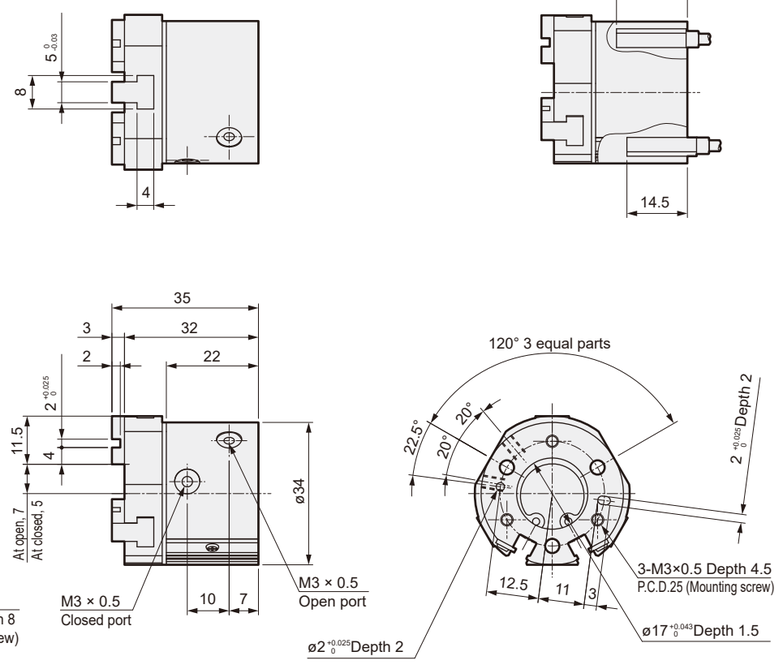
❸ Switch Model No.

Specifications

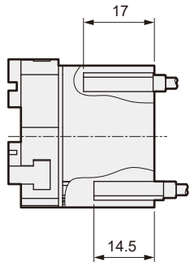
Item		CKW-A-HP1					
Bore size	mm	ø16	ø20	ø25	ø32	ø40	ø50
Actuation method		Double Acting					
Operating Fluid		Compressed Air					
Max. Working Pressure	MPa	0.7					
Min. Operating Pressure	MPa	0.2			0.1		
Ambient Temperature	°C	-10 to 60 (However, no freezing)					
Port Size		M3	M5				
Operating stroke	mm	4		6	8		12
Rod diameter	mm	ø6		ø8	ø10	ø12	ø14
Repeatability	mm	±0.01					
Weight	kg	0.08	0.13	0.17	0.31	0.46	0.65
Lubrication		Not Required					

Outline dimension drawing (Bore size: ø16)

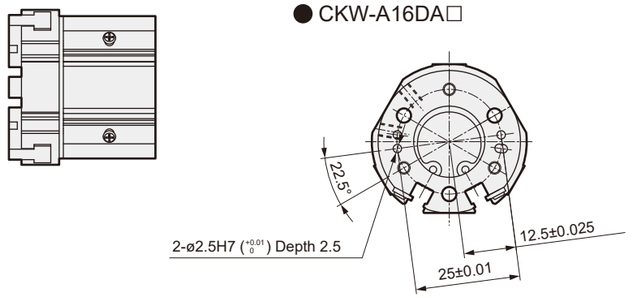
● CKW-A16-HP1



● With Switch

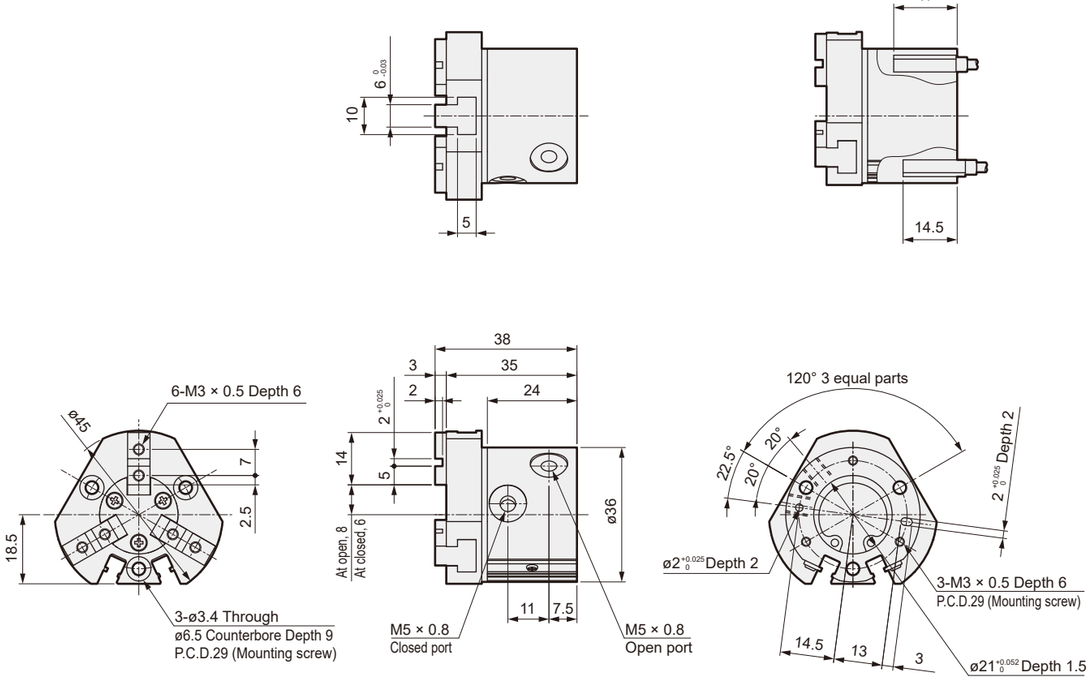


● CKW-A16DA□

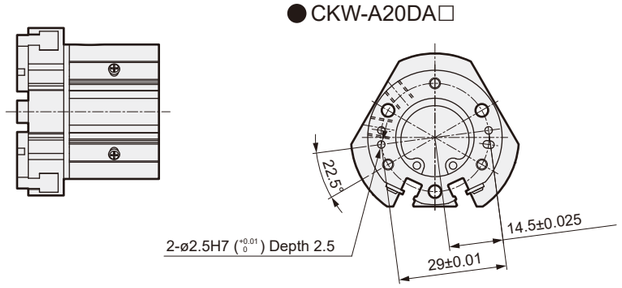


Outline dimension drawing (Bore size: ø20)

● CKW-A20-HP1

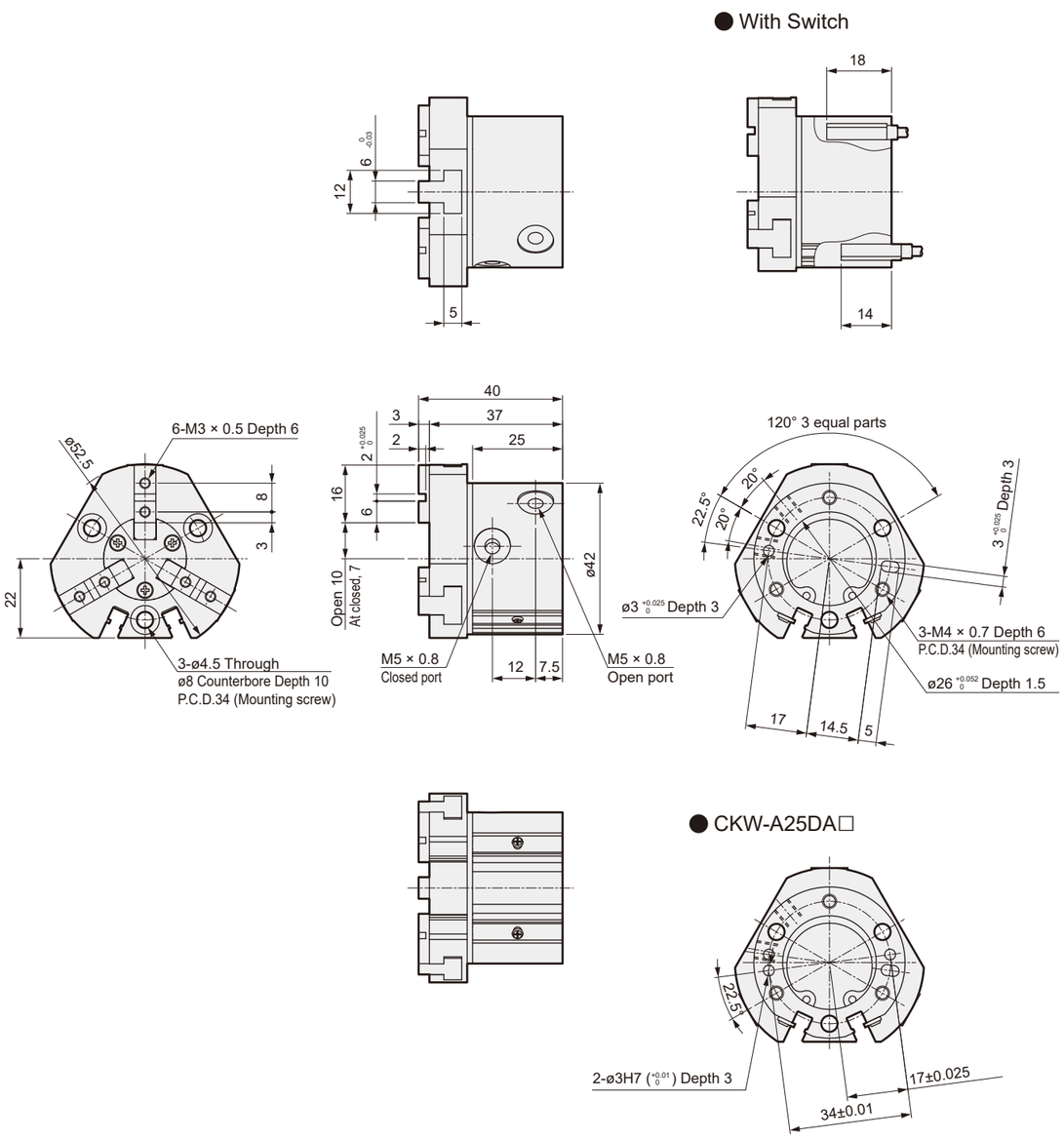


● CKW-A20DA□



Outline Dimension Drawing (Bore size: ø25)

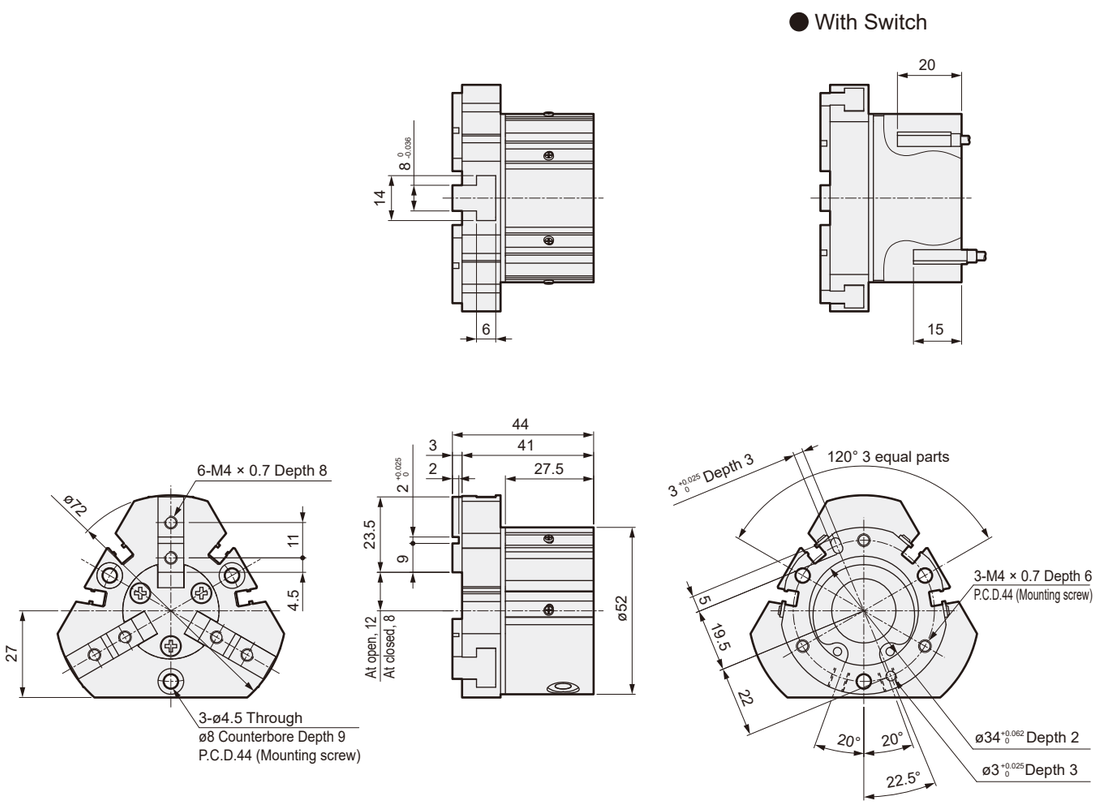
● CKW-A25-HP1



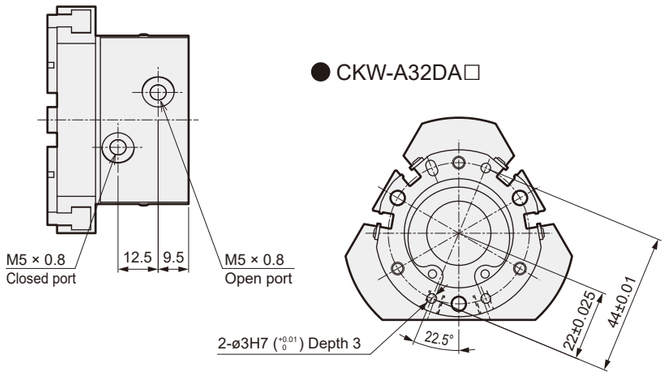
● CKW-A25DA□

External dimensions diagram (Bore size: ø32)

● CKW-A32-HP1



● CKW-A32DA□

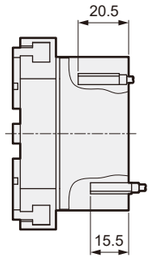


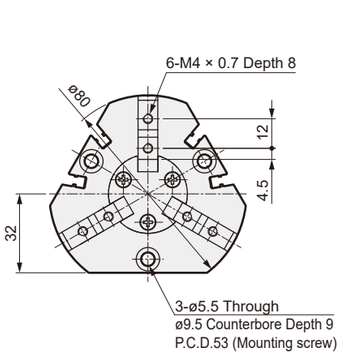
Outline Dimensional Drawing (Bore size: ø40)

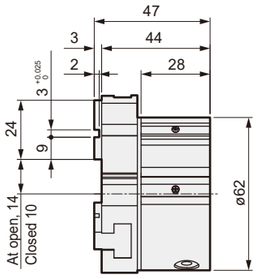
● CKW-A40-HP1

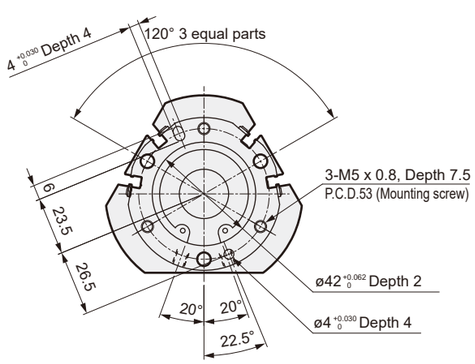
● With Switch



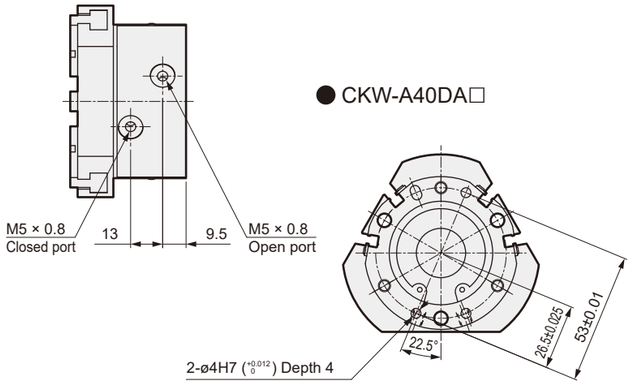








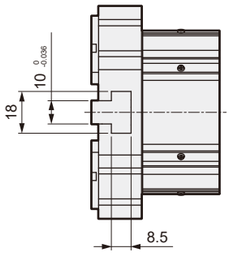
● CKW-A40DA□

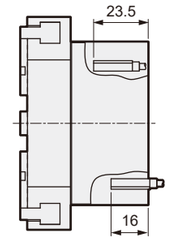


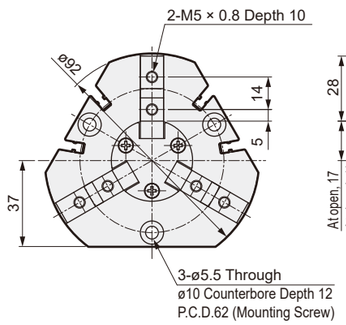
External Dimensions (Bore size: ø50)

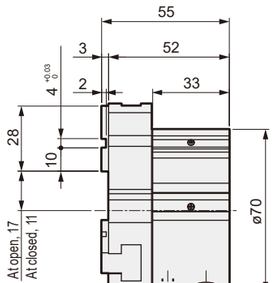
● CKW-A50-HP1

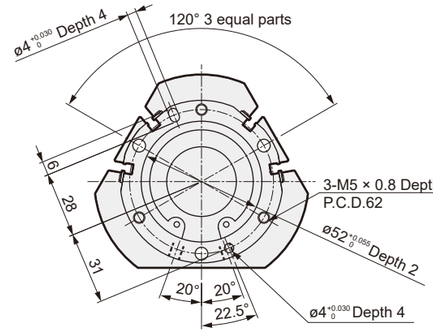
● With Switch



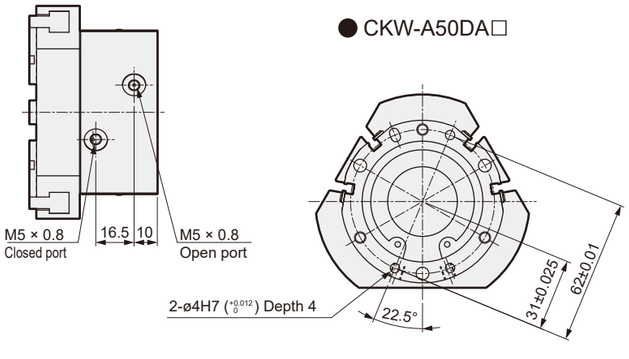






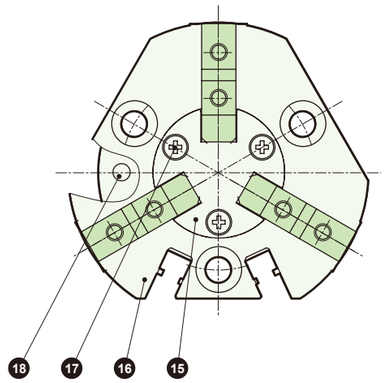


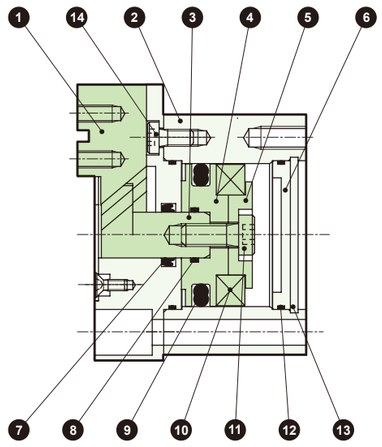
● CKW-A50DA□

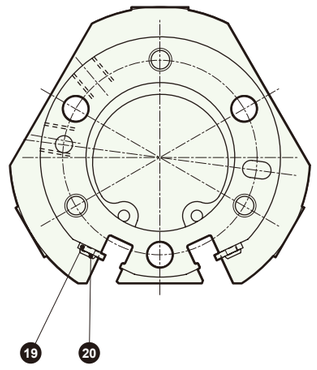


Internal Structure Diagram/Material

● CKW-A16 to 50-HP1







Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Finger	Steel		11	Hexagon Socket Head Cap Screw	Stainless Steel	
2	Body	Aluminum Alloy	Hard Anodized	12	Gasket	Nitrile Rubber	
3	Piston 1	Steel		13	C-type retaining ring	Stainless Steel	
4	Piston 2	Aluminum Alloy	Chromate	14	Hexagon Socket Head Cap Screw	Stainless Steel	
5	Piston 3	Aluminum Alloy	Chromate	15	Cover	Stainless Steel	
6	Bottom plate	Aluminum Alloy	Chromate	16	Adapter	Aluminum Alloy	Hard Anodized
7	Rod Packing	Nitrile Rubber		17	Phillips flat head screw	Stainless Steel	
8	Piston Gasket	Nitrile Rubber		18	Parallel Pin	Stainless steel	
9	Piston Packing	Nitrile Rubber		19	Retaining plate	Stainless Steel	
10	Magnet	–		20	Pan Head Screw	Stainless Steel	

For maintenance parts, refer to the CKD component product site
(https://www.ckd.co.jp/kiki/en/) → "Model No." → See "Maintenance Parts"

MEMO



3-Jaw Chuck with Rubber Cover

CKW-G-HP1, CKW-F-HP1 Series

●Operating stroke: 4, 6, 8 mm

Double Acting



RoHS

Model No. Notation Method

Without Switch
(Built-in magnet for switch)

CKW – G 16 D N ——— HP1

- CKW: Model No.
- G: ❶ Rubber Cover
- 16: ❷ Bore size
- D: Operating Method Double Acting
- N: ❸ High-precision positioning hole
- HP1: ❹ Switch Model No.

With Switch
(Built-in magnet for switch)

CKW – G 16 D N – F2H – D – HP1

- CKW: Model No.
- G: ❶ Rubber Cover
- 16: ❷ Bore size
- D: Operating Method Double Acting
- N: ❸ High-precision positioning hole
- F2H: ❹ Switch Model No.
- D: ❺ Number of Switches
- HP1: ❹ Switch Model No.

❶Rubber Cover

Code	Content
G	Chloroprene rubber
F	Fluoro Rubber

❷Bore size (mm)

Code	Content
16	ø16
20	ø20
25	ø25
32	ø32
40	ø40

❸High-precision positioning hole

For details, refer to P. 380.

Code	Content	
N	None	
A	Available	

❹Switch Model No.

For switch details, please refer to P. 573.
Switches are included to 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 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□	

*1: For "□" in the switch model number, enter the code selected from the "*Lead wire length" 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: Switches other than the model numbers listed above are also available. (Custom Product) For details, see P. 573.

*Lead wire length

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

Example) Lead wire length
1 m F2S
3 m F2S3

❺ Number of Switches

Code	Content
R	With 1 pc. on Open Side
H	With 1 pc. on Close Side
D	With 2 pcs

Note) When 2 switches are included, for models with a short operating stroke, both switches may turn ON depending on the size of the workpiece. Please be careful.

Switch Single Unit Model No. Notation Method

SW – F2H

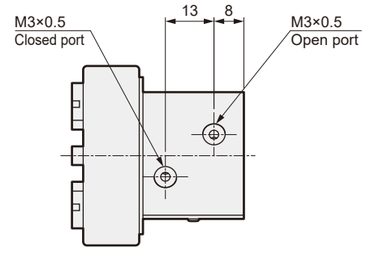
❹Switch Model No.

Specifications

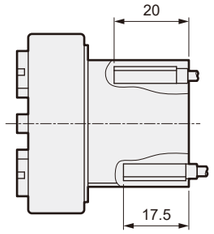
Item		CKW-G-HP1•CKW-F-HP1				
Bore size	mm	ø16	ø20	ø25	ø32	ø40
Actuation method		Double Acting				
Operating Fluid		Compressed Air				
Max. Working Pressure	MPa	0.7				
Min. Operating Pressure	MPa	0.2			0.1	
Ambient Temperature	°C	-10 to 60 (However, no freezing)				
Port Size		M3	M5			
Operating stroke	mm	4		6	8	
Rod diameter	mm	ø6		ø8	ø10	ø12
Repeatability	mm	±0.01				
Weight	kg	0.12	0.19	0.26	0.50	0.65
Lubrication		Not Required				

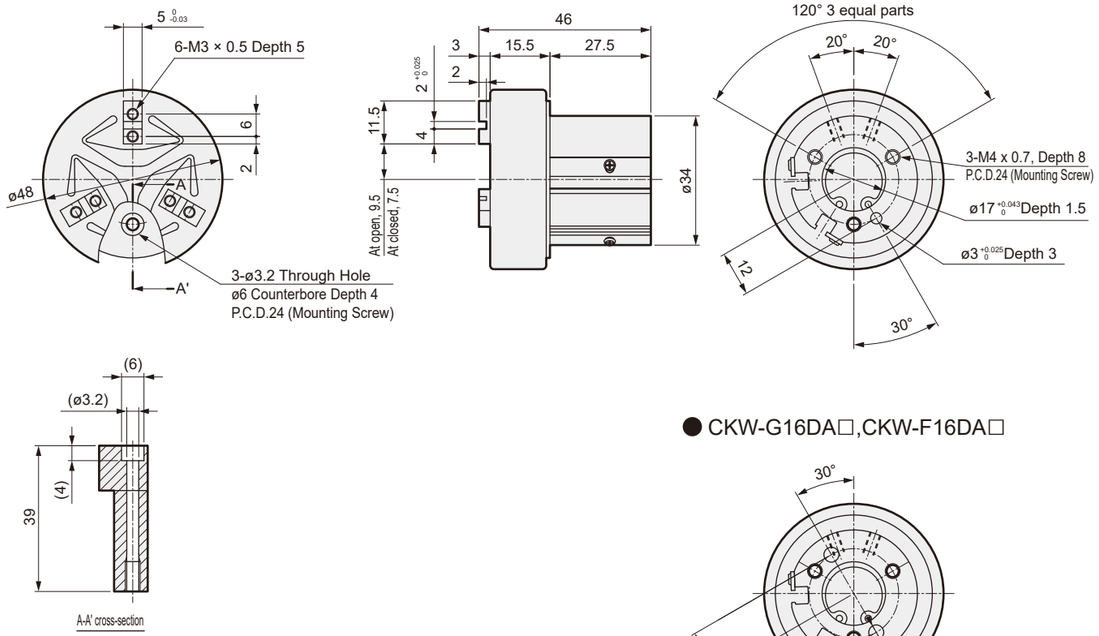
Outline dimension drawing (Bore size: ø16)

● CKW-G16-HP1, CKW-F16-HP1

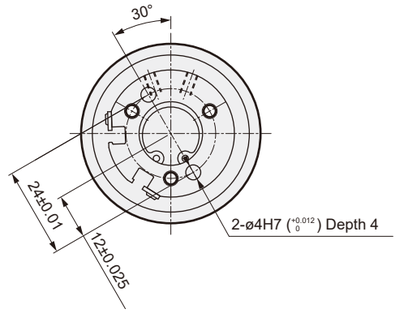


● With Switch



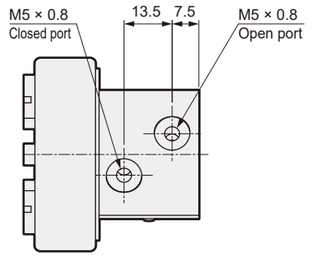


● CKW-G16DA□,CKW-F16DA□

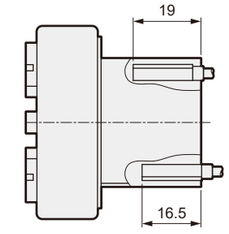


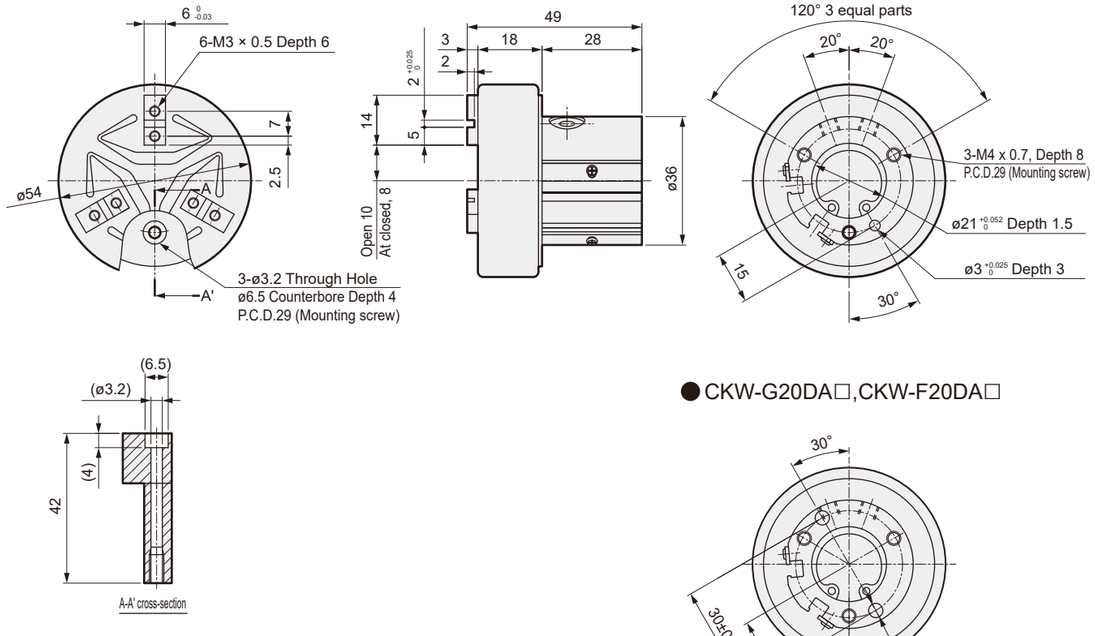
Outline dimension drawing (Bore size: ø20)

● CKW-G20-HP1, CKW-F20-HP1

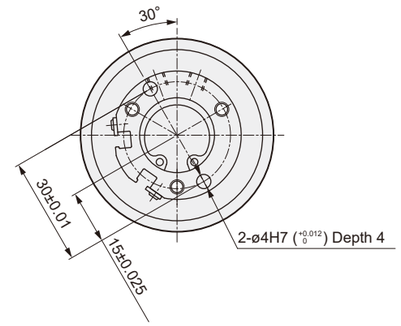


● With Switch



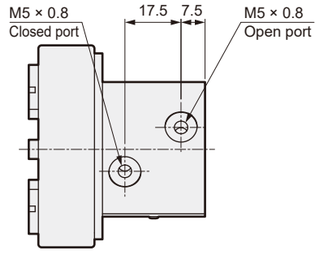


● CKW-G20DA□,CKW-F20DA□

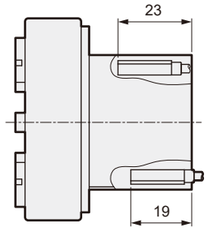


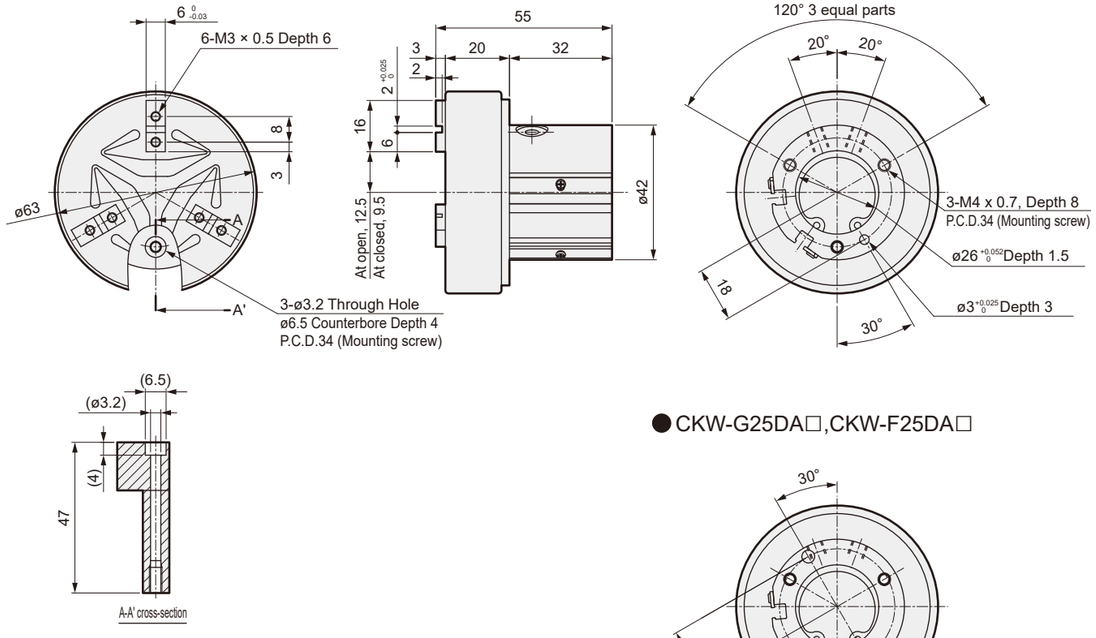
Outline Dimension Drawing (Bore size: ø25)

● CKW-G25-HP1, CKW-F25-HP1

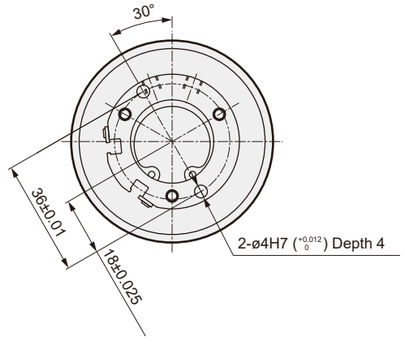


● With Switch



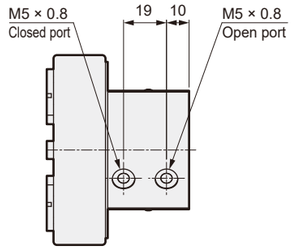


● CKW-G25DA□,CKW-F25DA□

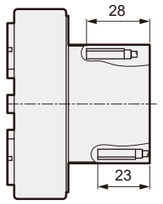


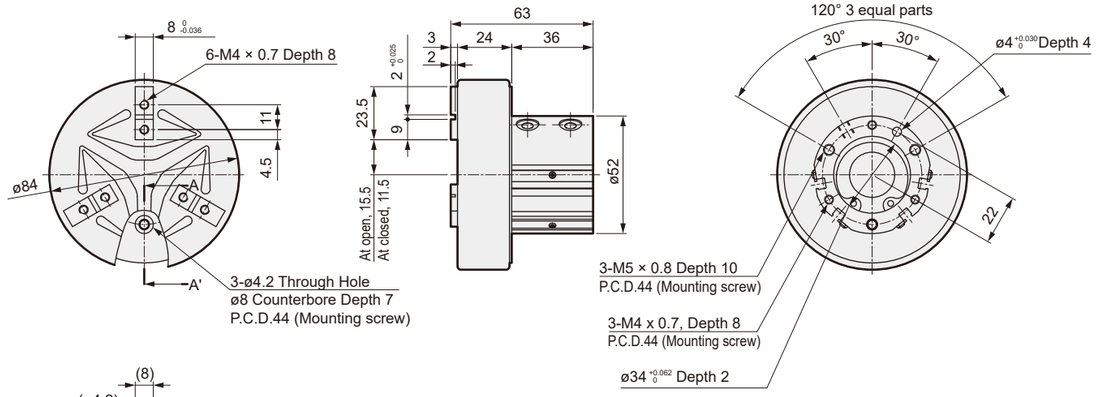
External dimensions diagram (Bore size: ø32)

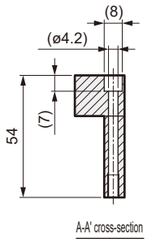
● CKW-G32-HP1, CKW-F32-HP1



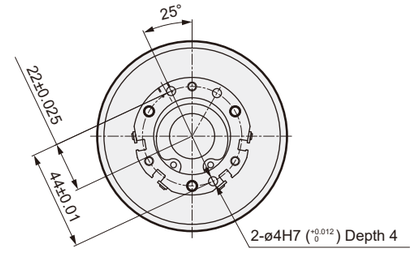
● With Switch





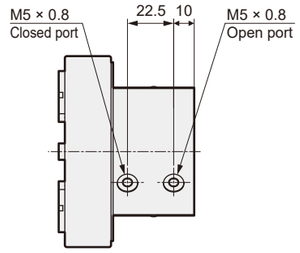


● CKW-G32DA□,CKW-F32DA□

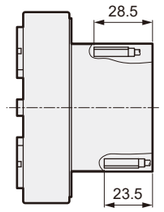


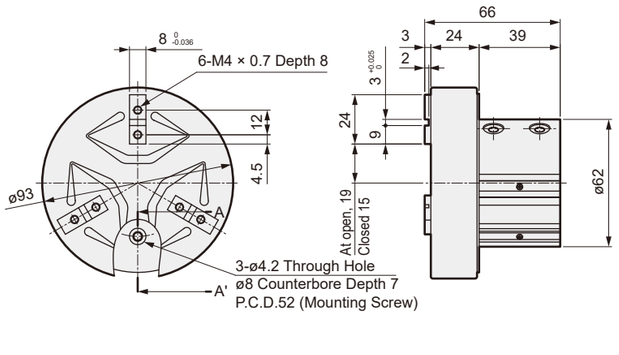
Outline Dimensional Drawing (Bore size: ø40)

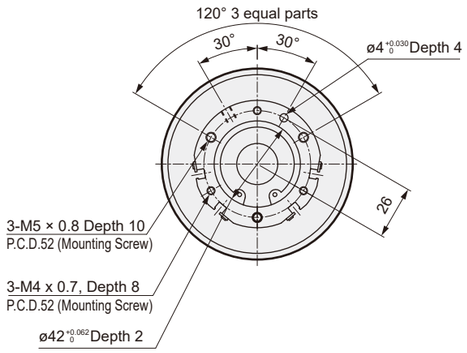
● CKW-G40-HP1, CKW-F40-HP1

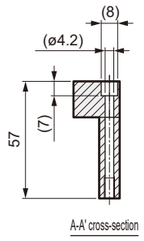


● With Switch

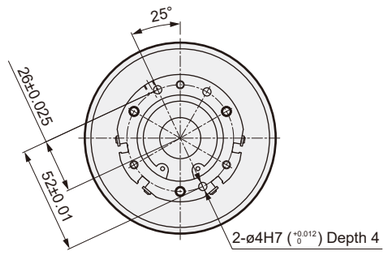






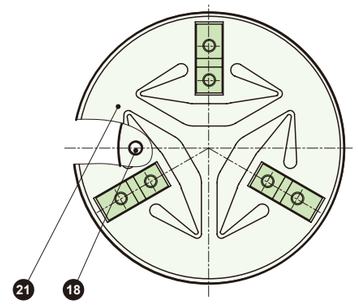


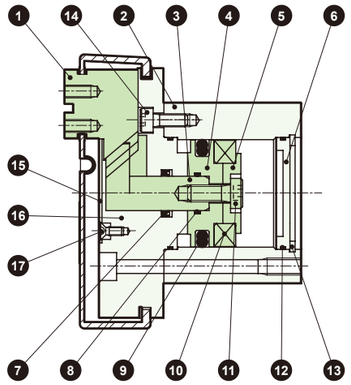
● CKW-G40DA□,CKW-F40DA□

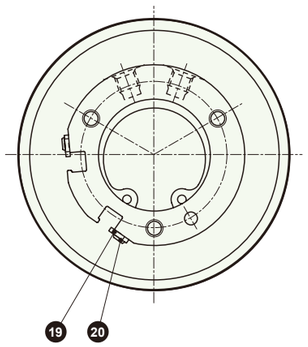


Internal Structure Diagram/Material

● CKW-G16 to 40-HP1,CKW-F16 to 40-HP1







Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Finger	Steel		12	Gasket	Nitrile Rubber	
2	Body	Aluminum Alloy	Hard Anodized	13	C-type retaining ring	Stainless Steel	
3	Piston 1	Steel		14	Hexagon Socket Head Cap Screw	Stainless steel	
4	Piston 2	Aluminum Alloy	Chromate	15	Cover	Stainless Steel	
5	Piston 3	Aluminum Alloy	Chromate	16	Adapter	Aluminum Alloy	Hard Anodized
6	Bottom plate	Aluminum Alloy	Chromate	17	Phillips flat head screw	Stainless Steel	
7	Rod Packing	Nitrile Rubber		18	Parallel Pin	Stainless Steel	
8	Piston Gasket	Nitrile Rubber		19	Retaining plate	Stainless Steel	
9	Piston Packing	Nitrile Rubber		20	Pan Head Screw	Stainless Steel	
10	Magnet	–		21	Rubber Cover	CKW-G: Chloroprene rubber CKW-F: Fluoro Rubber	
11	Hexagon Socket Head Cap Screw	Stainless Steel					

For maintenance parts, refer to the CKD component product site (https://www.ckd.co.jp/kiki/en/) → "Model No." → See "Maintenance Parts"



3-Jaw Long Stroke Chuck

CKWL-A-HP1 Series

●Operating stroke: 10, 12, 16, 20 mm

Double Acting



RoHS

Model No. Notation Method

Without Switch
(Built-in magnet for switch)

CKWL - A 16 D N ——— HP1

Model No. | Without Rubber Cover | ❶ | ❷ Operating Method Double Acting

With Switch
(Built-in magnet for switch)

CKWL - A 16 D N - F2H - D - HP1

Model No. | ❶ Bore size | ❷ High-precision positioning hole | ❹ Number of Switches

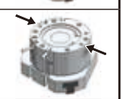
Without rubber cover | Operating Method Double Acting | ❸ Switch Model No.

❶ Bore size (mm)

Code	Content
16	ø16
20	ø20
25	ø25
32	ø32
40	ø40

❷ High-precision positioning hole

For details, refer to P. 380.

Code	Content	
N	None	
A	Available	

❸ Switch Model No.

For switch details, please refer to P. 573.
Switches are included to 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 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□	

*1: For "□" in the switch model number, enter the code selected from the "*Lead wire length" 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: Switches other than the model numbers listed above are also available. (Custom Product) For details, see P. 573.

***Lead wire length**

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

Example) Lead wire length
1 m F2S
3 m F2S3

❹ Number of Switches

Code	Content
R	With 1 pc. on Open Side
H	With 1 pc. on Close Side
D	With 2 pcs

Note) When 2 switches are included, for models with a short operating stroke, both switches may turn ON depending on the size of the workpiece. Please be careful.

Switch Single Unit Model No. Notation Method

SW - F2H

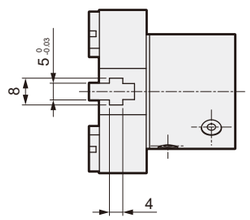
❸ Switch Model No.

Specifications

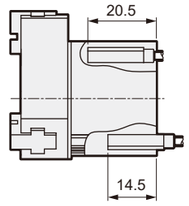
Item		CKWL-A-HP1				
Bore size	mm	ø16	ø20	ø25	ø32	ø40
Actuation method		Double Acting				
Operating Fluid		Compressed Air				
Max. Working Pressure	MPa	0.7				
Min. Operating Pressure	MPa	0.2			0.1	
Ambient Temperature	°C	-10 to 60 (However, no freezing)				
Port Size		M3	M5			
Operating stroke	mm	10		12	16	20
Rod diameter	mm	ø6		ø8	ø10	ø12
Repeatability	mm	±0.01				
Weight	kg	0.13	0.18	0.22	0.46	0.66
Lubrication		Not Required				

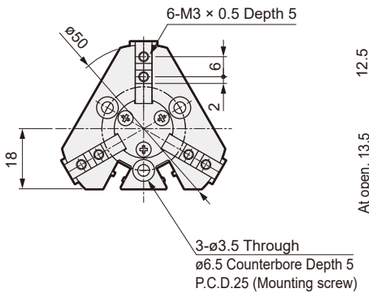
Outline dimension drawing (Bore size: ø16)

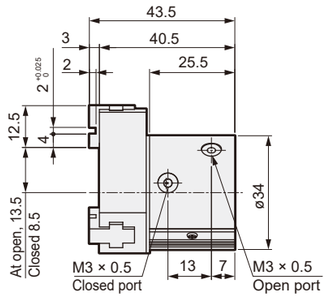
● CKWL-A16-HP1

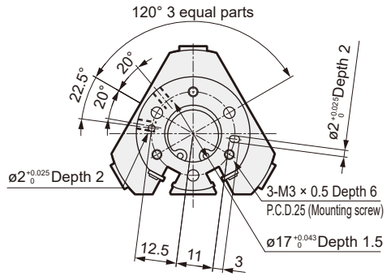


● With Switch

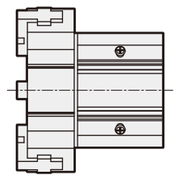


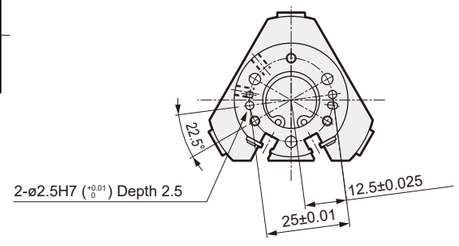






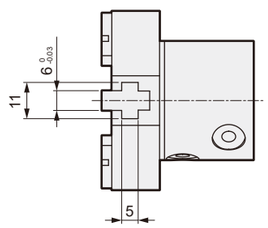
● CKWL-A16DA□



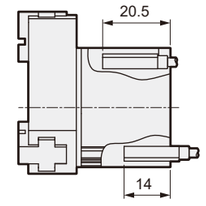


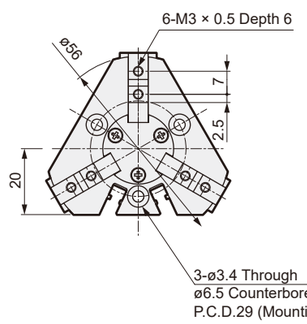
Outline dimension drawing (Bore size: ø20)

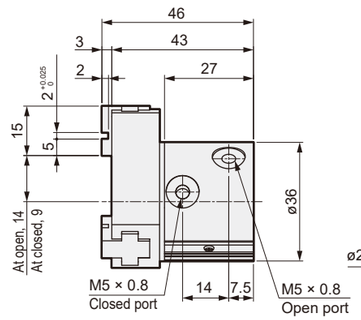
● CKWL-A20-HP1

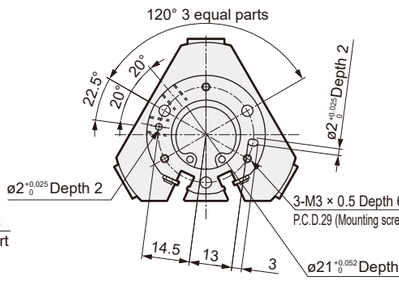


● With Switch

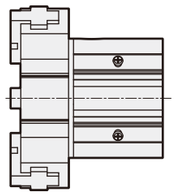


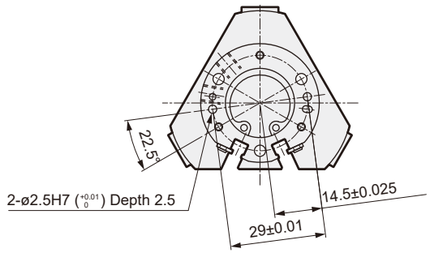






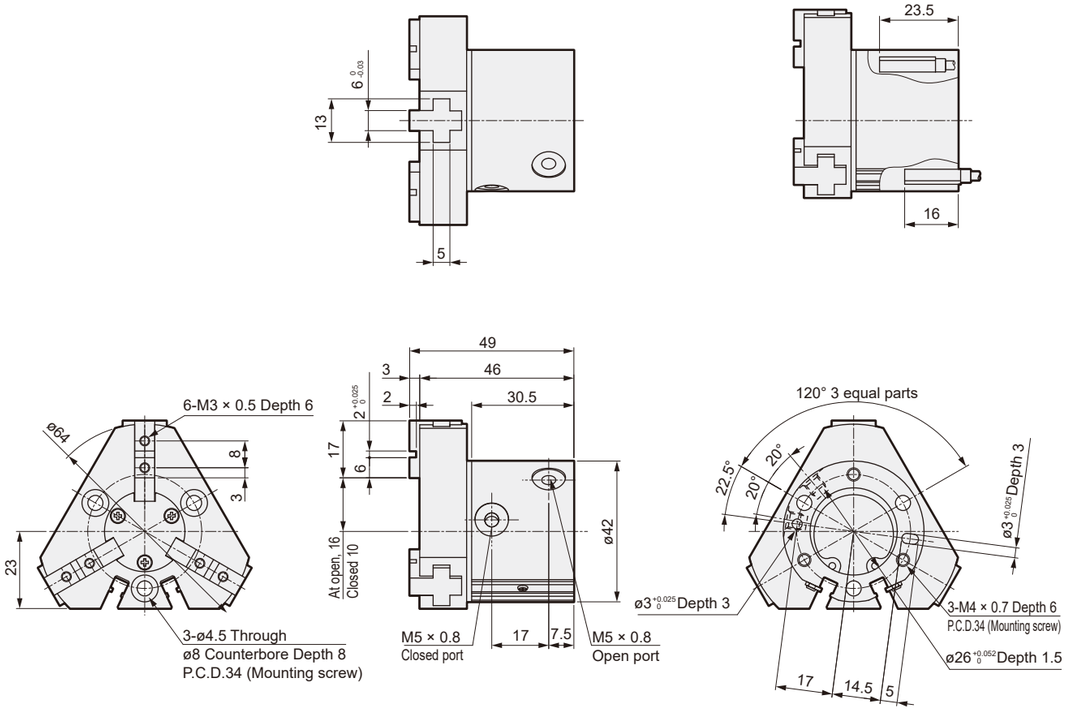
● CKWL-A20DA□



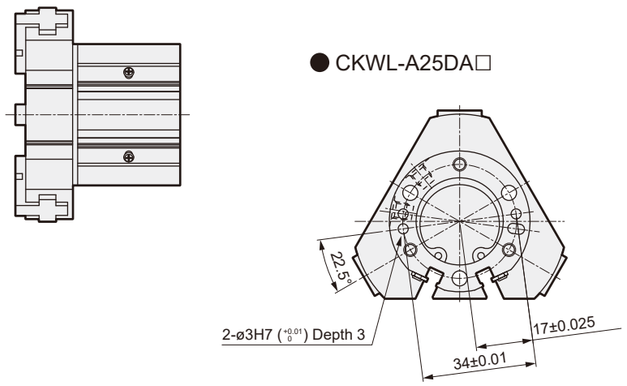


Outline Dimension Drawing (Bore size: ø25)

● CKWL-A25-HP1

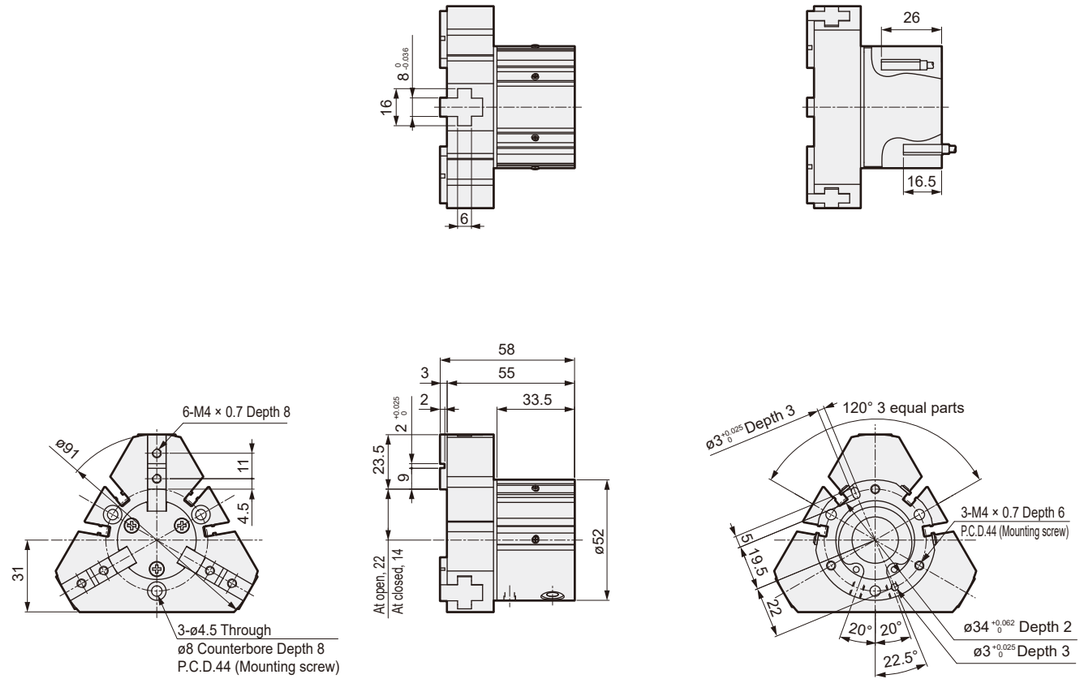


● CKWL-A25DA□

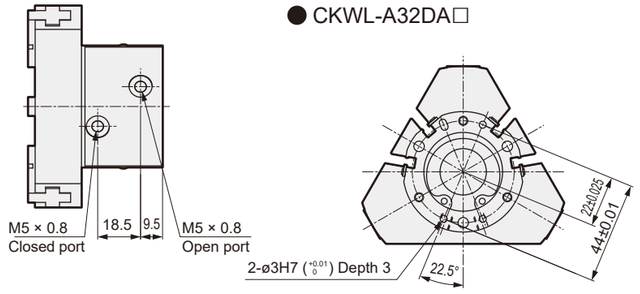


External dimensions diagram (Bore size: ø32)

● CKWL-A32-HP1

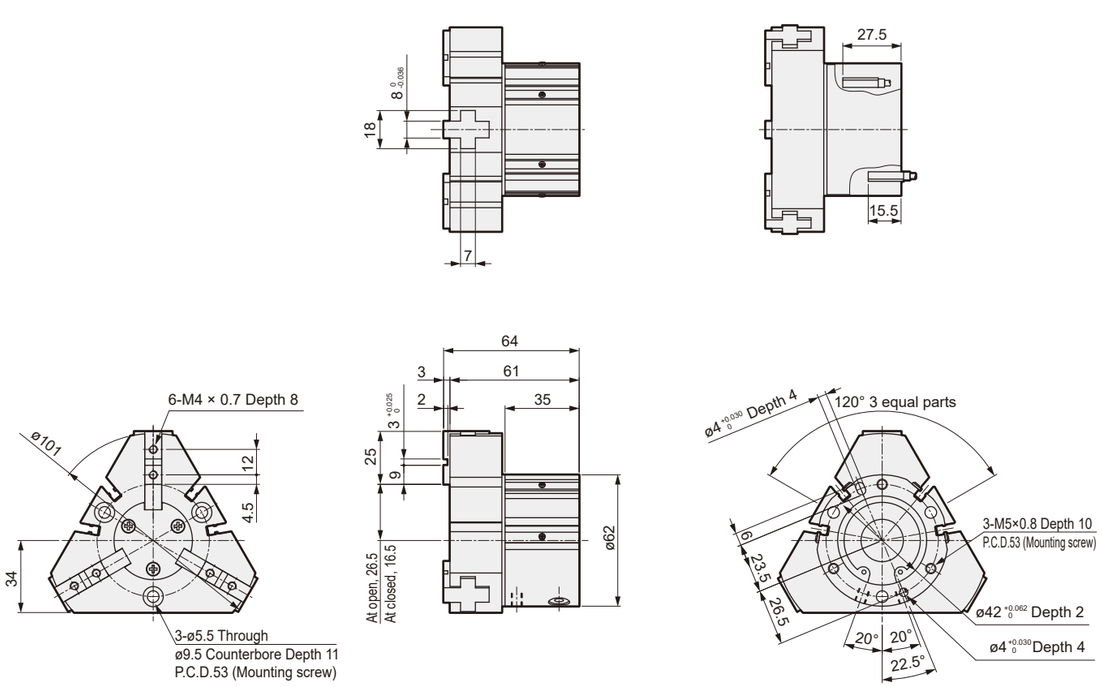


● CKWL-A32DA□

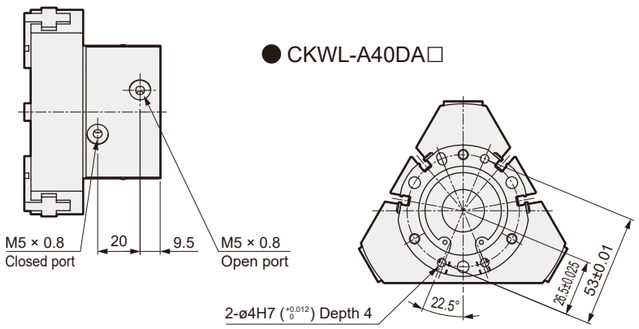


Outline Dimensional Drawing (Bore size: ø40)

● CKWL-A40-HP1

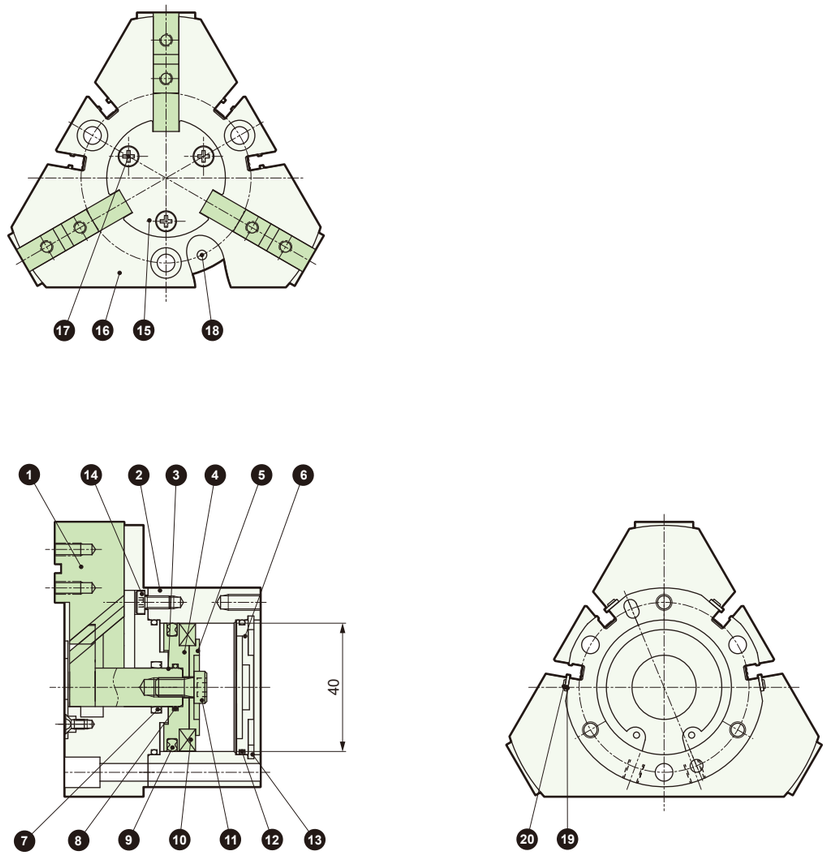


● CKWL-A40DA□



Internal Structure Diagram/Material

● CKWL-A16 to 40-HP1

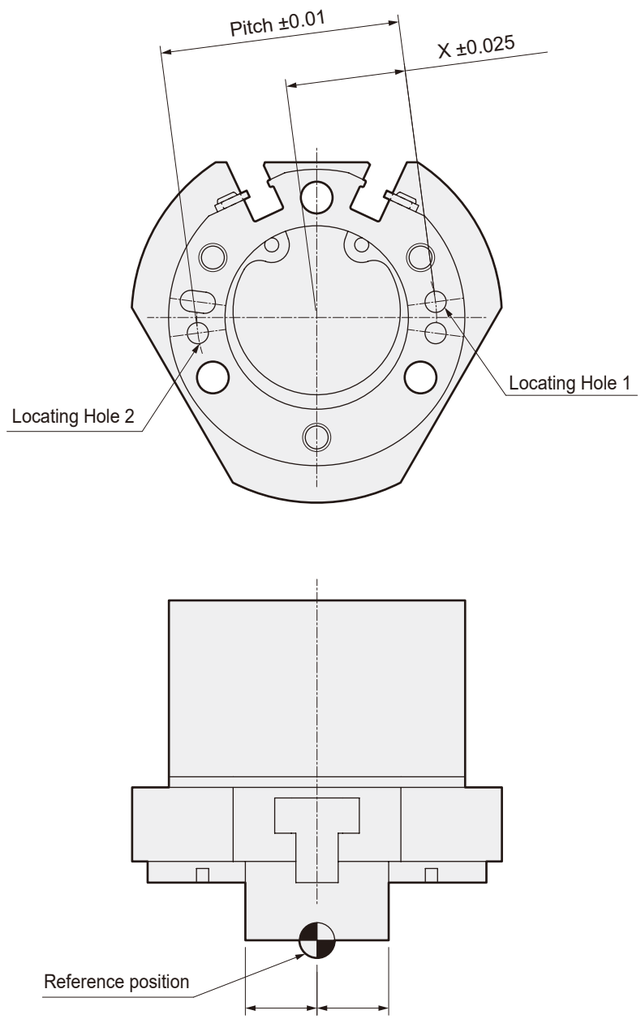


Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Finger	Steel		11	Hexagon Socket Head Cap Screw	Stainless Steel	
2	Body	Aluminum Alloy	Hard Anodized	12	Cylinder Gasket	Nitrile Rubber	
3	Piston 1	Steel		13	C-type retaining ring	Stainless Steel	
4	Piston 2	Aluminum Alloy	Chromate	14	Hexagon Socket Head Cap Screw	Stainless Steel	
5	Piston 3	Aluminum Alloy	Chromate	15	Cover	Stainless Steel	
6	Bottom plate	Aluminum Alloy	Chromate	16	Adapter	Aluminum Alloy	Hard Anodized
7	Rod Packing	Nitrile Rubber		17	Phillips flat head screw	Stainless Steel	
8	Piston Gasket	Nitrile Rubber		18	Parallel Pin	Stainless steel	
9	Piston Packing	Nitrile Rubber		19	Retaining plate	Stainless Steel	
10	Magnet	–		20	Pan Head Screw	Stainless Steel	

For maintenance parts, refer to the CKD component product site (https://www.ckd.co.jp/kiki/en/) → "Model No." → See "Maintenance Parts"

Reference Position of Locating Hole

●Gripping center reference, high-precision positioning hole
Positioning can be done based on the gripping center.



Reference Position of Locating Hole
Center when gripping the inside of the finger at intermediate stroke

MEMO

Check Valve
CKW-HP
CKL2
CKLG2
CKL2 -□-HC
CKH2
CKLB2
CKG
CK
CKA
CKS
CKS-F
CKF
CKJ
Cylinder Switch
Ending

CKW-HP1 Selection Guide

STEP-1 Select appropriate model from required gripping force

① Calculation of Required Gripping Force

To transport a workpiece (weight WL), a gripping force FW that satisfies the following formula is required.

$$F_W > \frac{W_L \times g \times K}{n}$$

F_W : Required Gripping Force [N]
n : Number of attachments = 3
W_L : Workpiece Weight [kg]
g : Gravitational acceleration = 9.8 [m/s²]
K : Conveyance Factor
5 [Holding only]
10 [Normal transport]
20 [Rapid acceleration transport]

About Conveyance Factor K

Calculation Example) When decelerating from a conveyance speed V = 0.75 m/s to stop in 0.1 seconds, with a friction coefficient μ of 0.1 between the workpiece and finger, it is as follows.

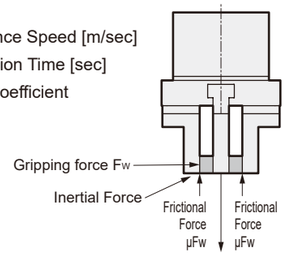
Determine the transport coefficient K from the force applied to the workpiece

V : Conveyance Speed [m/sec]
t : Deceleration Time [sec]
μ : Friction Coefficient

• Inertial force = W_L (V/t)
• Gravity = $W_L g$

• Required gripping force $F_W > \frac{W_L(V/t) + W_L g}{n\mu} = \frac{W_L(V/t + g)}{n\mu} = \frac{17.3\,W_L}{3 \times 0.1} = 57.7\,WL$

∴ The transport coefficient K at this time is, from the above formula $\frac{V/t + g}{\mu g} = \frac{0.75/0.1 + 9.8}{0.1 \times 9.8} \approx 20$

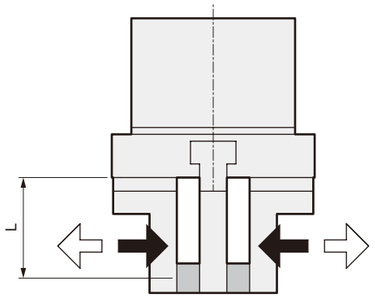


Note) The transport coefficient K needs to allow a margin for impacts during transport, etc. Even if the friction coefficient μ is higher than μ=0.1, set the conveyance factor K to 10 to 20 or more for safety.

② Model selection from required gripping force

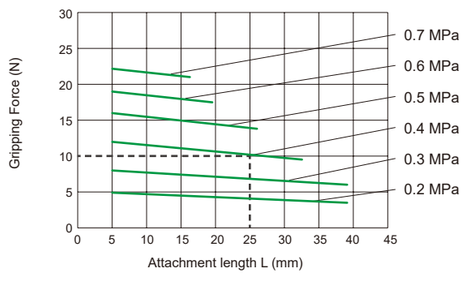
Gripping force changes depending on "gripping direction," "attachment length," and "supply pressure." Confirm from the gripping force graph that sufficient gripping force can be obtained under your operating conditions.
For the gripping force graph, refer to P. 384, 385.

Gripping Direction



●Opening direction (⇦)
●Closing direction (➡)

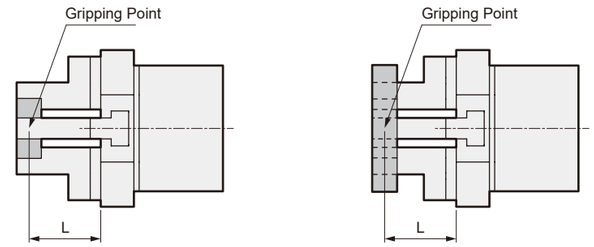
How to Read Gripping Force Graph
(For CKW-A16 outer diameter gripping force)



For example, if the supply pressure is 0.4 MPa and the attachment length is 25 mm, the resulting gripping force will be 10 N.

STEP-2 Confirmation of Attachment Shape

Use the attachment wilow profile the ranges shown on P. 384, 385.



●Use attachments that are as lightweight and short as possible.
If they are long and heavy, the inertial force during opening and closing becomes large, which may cause backlash in the attachments or accelerate wear of the attachment sliding parts, adversely affecting the service life.

●Even if the attachment shape is wilow profile the performance data, making it as small as possible will allow the product to be used for a long time. Also, if L is long, unexpected vibration, etc., could cause erroneous gripping and falling during transport. With "Cylinder diameter ×1.3/working pressure" as a guide, if L is longer than that, set the transport coefficient of STEP-1 to a high value (Guideline: Transport coefficient of 20 or more).

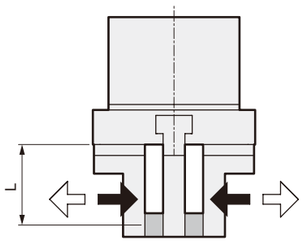
●The weight of the attachments affects the service life, so please keep it below the following.
W < 1/4H (1 piece) W : Weight of attachment
H : Gripper Product Weight

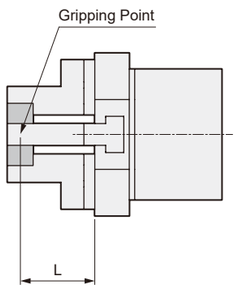
Gripping Force Performance Data CKW-A-HP1, CKWL-A-HP1

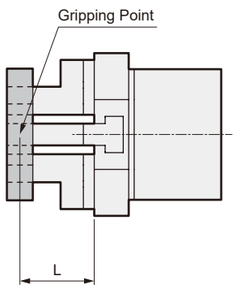
- Gripping force represents the thrust (for one finger) in the direction of the arrow shown in the figure.
- Indicates the gripping force at attachment length L of the gripper when the supply pressure is up to 0.7 MPa.
- Use attachment lengths wilow profile the range below.

●Opening direction (⇦)
●Closing direction (➡)

Note) When selecting, check the design and selection precautions on P. 490.

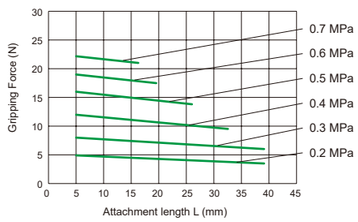




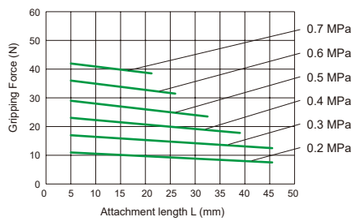


Outer diameter gripping force

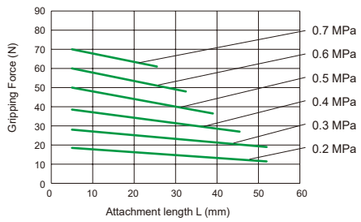
CKW□-A16



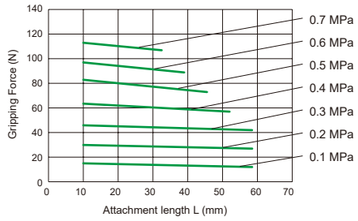
CKW□-A20



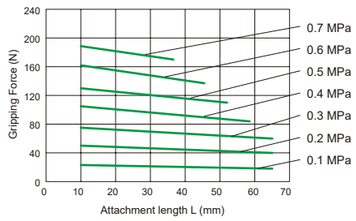
CKW□-A25



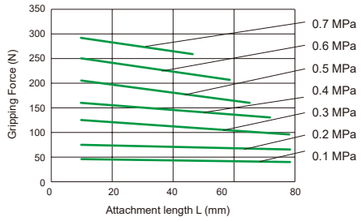
CKW□-A32



CKW□-A40

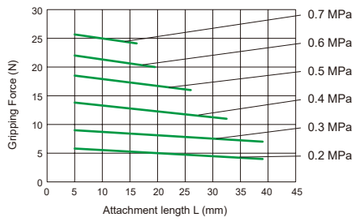


CKW-A50

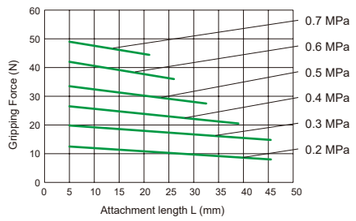


Inner diameter gripping force

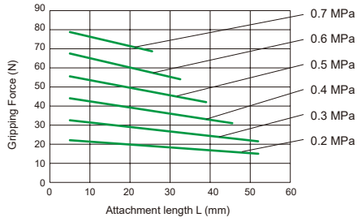
CKW□-A16



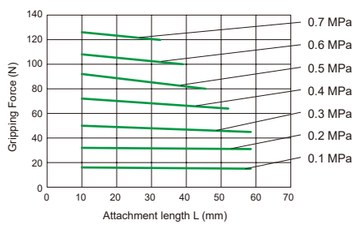
CKW□-A20



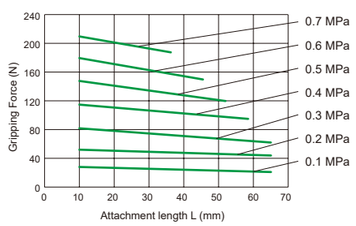
CKW□-A25



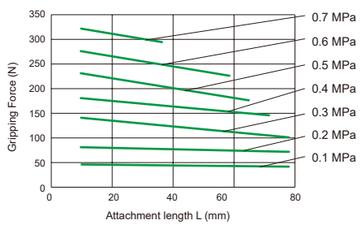
CKW□-A32



CKW□-A40



CKW-A50

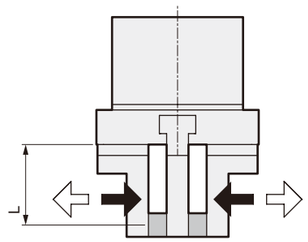


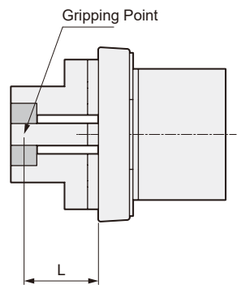
Gripping Force Performance Data CKW-G-HP1, CKW-F-HP1

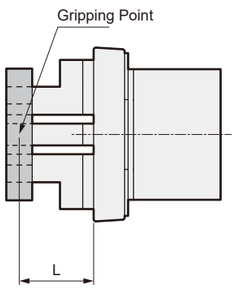
- Gripping force represents the thrust (for one finger) in the direction of the arrow shown in the figure.
- Indicates the gripping force at attachment length L of the gripper when the supply pressure is up to 0.7 MPa.
- Use attachment lengths wilow profile the range below.

●Opening direction (⇦)
●Closing direction (➡)

Note) When selecting, check the design and selection precautions on P. 490.

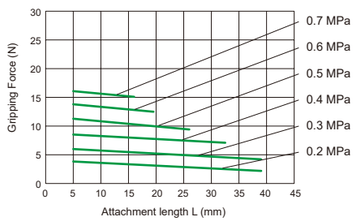




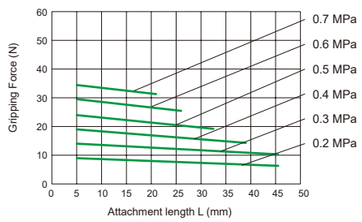


Outer diameter gripping force

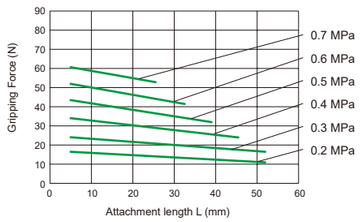
CKW-G/F16



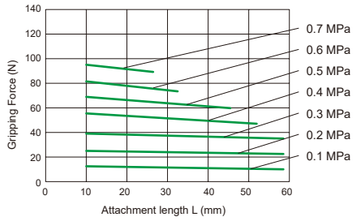
CKW-G/F20



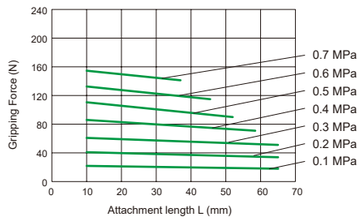
CKW-G/F25



CKW-G/F32

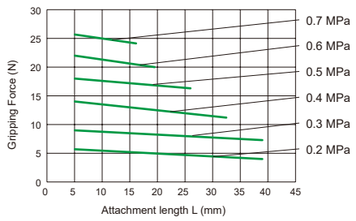


CKW-G/F40

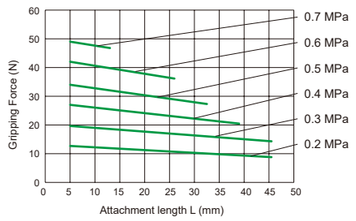


Inner diameter gripping force

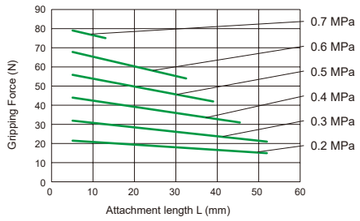
CKW-G/F16



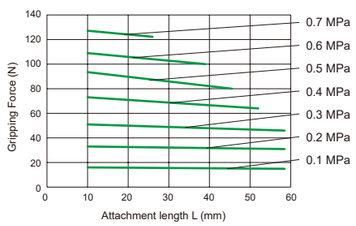
CKW-G/F20



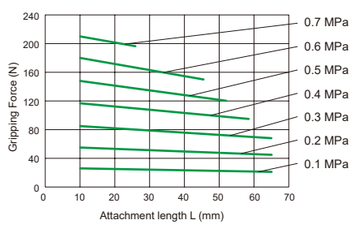
CKW-G/F25



CKW-G/F32



CKW-G/F40





Powerful Chuck

CKL2 Series

●Operating stroke: 5, 6, 8, 10, 12, 16, 20, 23, 30, 40 mm

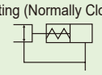
Double Acting



Single Acting (Normally Open)



Single Acting (Normally Closed)



RoHS

Model No. Notation Method

Without Switch
(Built-in magnet for switch)

CKL2 - 20CS - O L1 Y1

Model No. ❶ ❷ ❸ ❹

With Switch
(Built-in magnet for switch)

CKL2 - 20CS - O L1 Y1 - T2H - R

Model No. ❶Bore size ❷Actuation method ❸Stroke ❹Attachment ❺Switch Model No. ❻Number of Switches

❶Bore Size (mm)

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

❷Actuation method

Code	Content
Blank	Standard (Double Acting)
* O	Single Acting Type (Normally Open: Normally open) (ø20 to ø100)
* C	Single Acting Type (Normally Closed: Normally closed) (ø20 to ø100)

* Single acting type (O, C) and ❸long stroke (L1) of stroke cannot be selected simultaneously.

❸Stroke

Code	Content
Blank	Standard (Double Acting)
* L1	Long stroke (ø50 to ø100)

* The single acting type (O, C) ❷Actuation method and long stroke (L1) cannot be selected simultaneously.

❹Attachment

Code	Content
Blank	Without attachments
*1, *2 Y1	With attachments, Material (S50C) (ø20 to ø100)
*1, *2 Y2	With attachments, Material (MC Nylon) (ø20 to ø100)

*1: Attachment is commonly used for internal and external diameter chuck.

***2: Refer to P. 486 for the Dimensions and compatible model of the attachment. When ordered as an option, it will be shipped included with a quantity of 3.**

❺Switch Model No.

For switch details, please refer to P. 573.
Switches are included to 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 wir *1 Straight	Lead wir *1 L-shape	
Solid State	1-Color	2-wire	-	10 to 30	-	5 to 20	F2H□	F2V□	
		3-wire (NPN)	-	30 or less	-	50 or less	F3H□	F3V□	
		2-wire	-	10 to 30	-	5 to 20 *2	T2H□	T2V□	
		3-wire (NPN)	-	30 or less	-	100 or less	T3H□	T3V□	
	1-Color Flexible Lead Wire Type	2-wire	-	10 to 30	-	5 to 20 *2	T2HR3	T2VR3	

*1: For "□" in the switch model number, enter the code selected from the "*Lead wire length" 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: For ❶bore size "16CS", T type switch cannot be selected.
*4: For ❶bore sizes "20CS" to "100CS", F type switch cannot be selected.
*5: Switches other than the switch model numbers are also available. (Custom Product) For details, see P. 573.

*Lead wire length

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

*5: 5 m lead wire cannot be selected for the F switch.

Example) Lead wire length
1 m T2H
3 m T2H3
5 m T2H5

❻Number of Switches

Code	Content
R	With 1 pc. on Open Side
H	With 1 pc. on Close Side
D	With 2 pcs

Note) When 2 switches are included, for models with a short operating stroke, both switches may turn ON depending on the size of the workpiece. Please be careful.

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

●Design compatible with rechargeable battery manufacturing process

CKL2 - •••• - 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

CKL2 - •••• - FP1

Switch Single Unit Model No. Notation Method

SW - T2H

❺Switch Model No.

Specifications

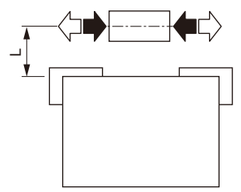
Item		CKL2								
Size		16CS	20CS	25CS	32CS	40CS	50CS	63CS	80CS	100CS
Bore size	mm	ø16	ø20	ø25	ø32	ø40	ø50	ø63	ø80	ø100
Operating Fluid		Compressed Air								
Max. Working Pressure	MPa	0.7								
Min. Operating Pressure	MPa	0.3								
Ambient Temperature	°C	5 to 60								
Port Size		M3	M5						Rc1/8	
Operating stroke *1	mm	5		6	8	10	12 (30)	16 (30)	20 (40)	23 (40)
Rod diameter	mm	ø6		ø8	ø10	ø12	ø14	ø16		ø20
Internal volume (reciprocating)	cm³	1.2	1.8	3.3	7.7	15.6	28.3	60.3	118.2	215.5
Repeatability	mm	±0.01								
Weight	kg	0.07	0.12	0.19	0.26	0.38	0.59 (1.2)	1.02 (1.6)	2.02 (3.2)	3.45 (5.0)
Lubrication		Not required (When lubricating, use turbine oil Class 1 ISO VG32)								

*1 Values in ( ) are for long stroke (option code L1).

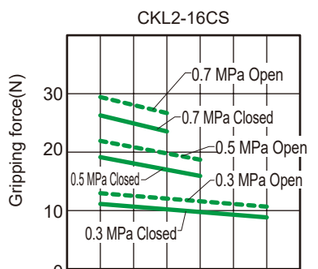
Gripping Force Performance Data

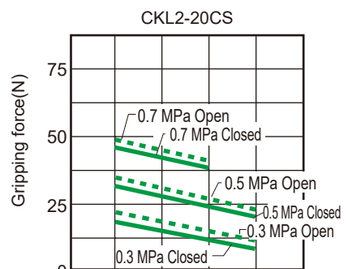
- Gripping force represents the thrust (for one finger) in the direction of the arrow shown in the figure.
- The gripping force in the opening/closing directions with finger length L of hand with a supply pressure of 0.3, 0.5 and 0.7 MPa is shown.

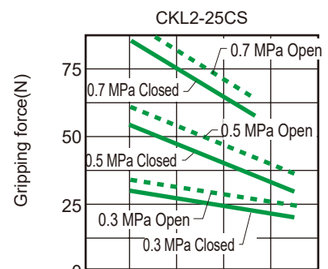
●Open direction (⇦)- - - -(broken line)
●Closing direction (➡)——(solid line)

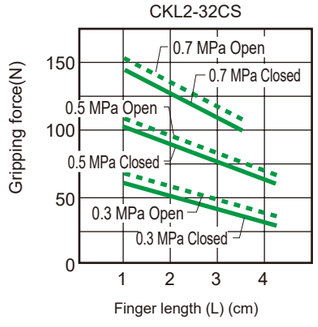


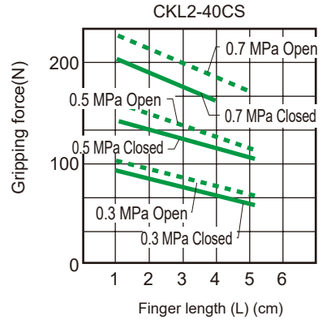
Note) O type gripping force is approx. 20 to 30 % lower in the closing direction compared to the double acting type. C type gripping force is approx. 10 to 20 % lower in the opening direction compared to the double acting type. When selecting, check the design and selection precautions on P. 490.

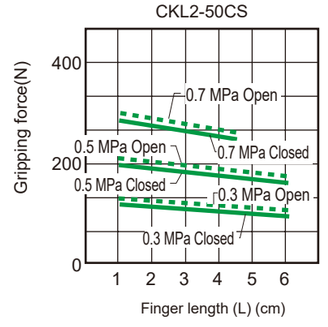


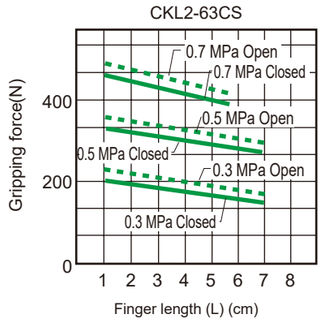


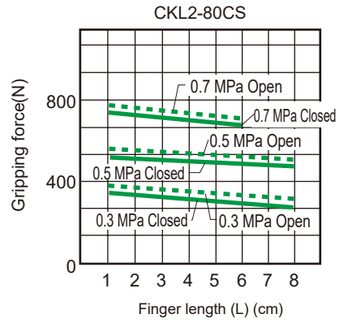


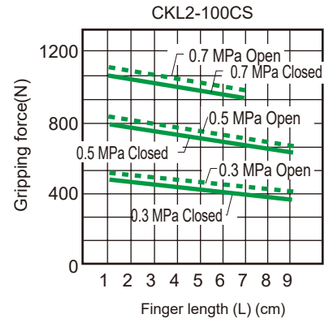






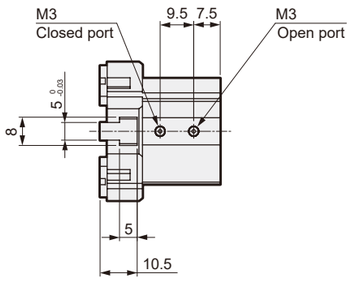




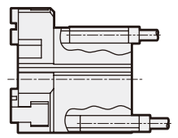


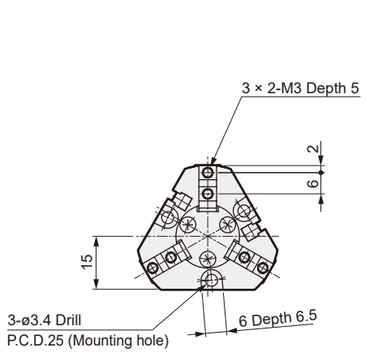
Outline Dimension Drawing

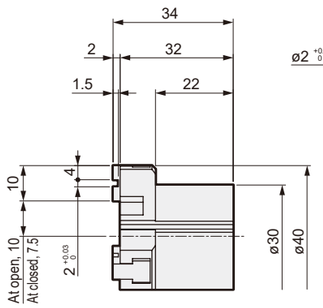
● CKL2-16CS Standard

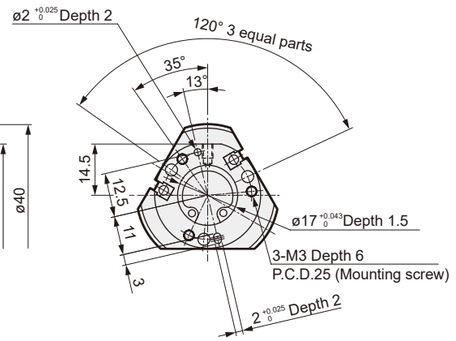


● With Switch



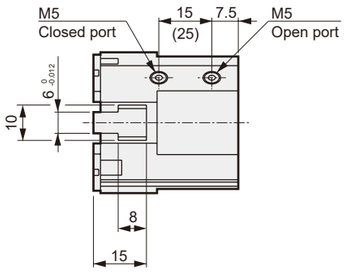




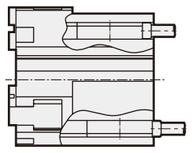


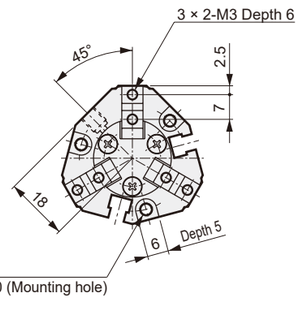
● CKL2-20CS Standard/O/C

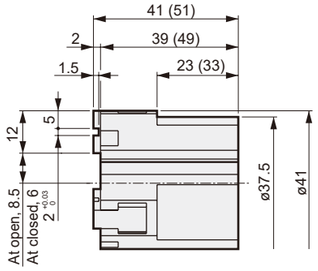
· Dimensions in ( ) are for O [Normally Open] and C [Normally Closed] specifications.

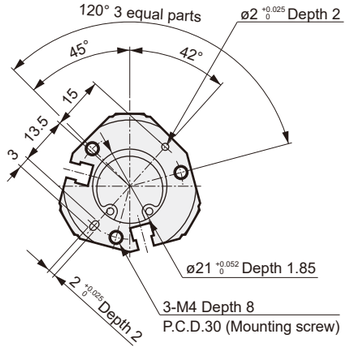


● With Switch





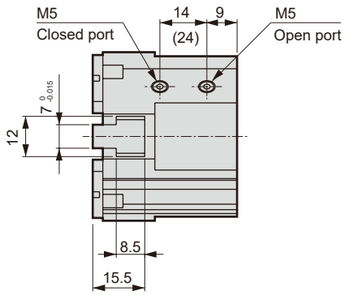




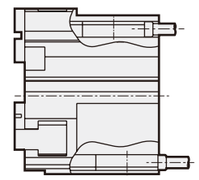
Outline Dimension Drawing

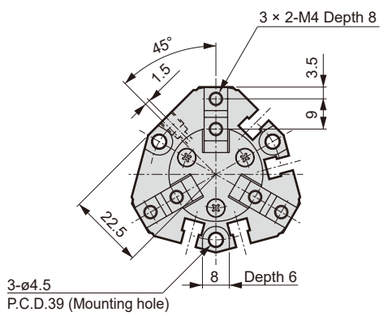
● CKL2-25CS Standard/O/C

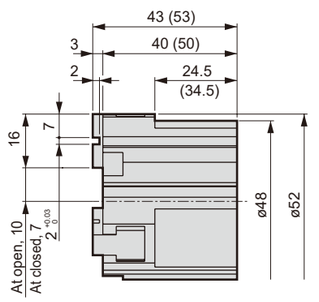
· Dimensions in ( ) are for O [Normally Open] and C [Normally Closed] specifications.

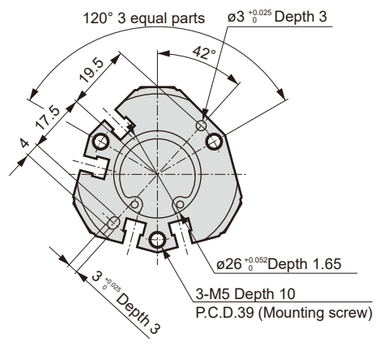


● With Switch



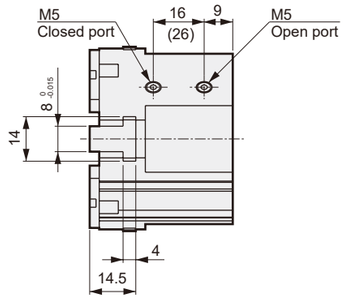




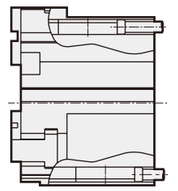


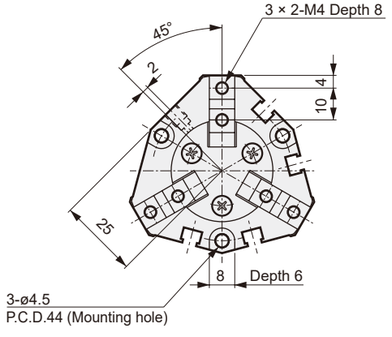
● CKL2-32CS Standard/O/C

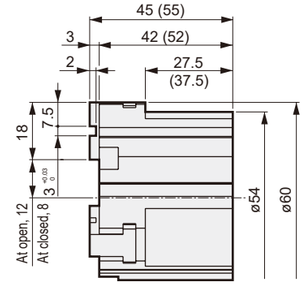
· Dimensions in ( ) are for O [Normally Open] and C [Normally Closed] specifications.

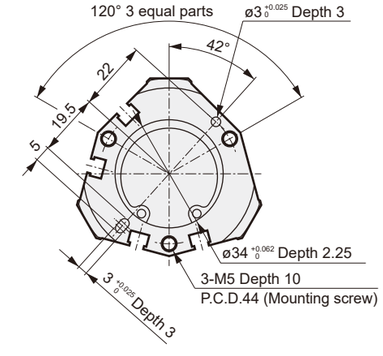


● With Switch





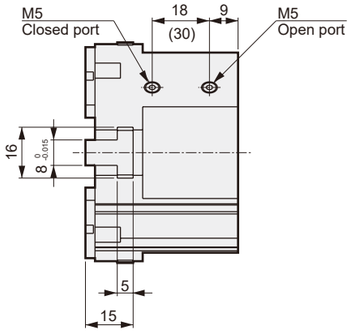




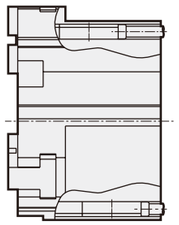
Outline Dimension Drawing

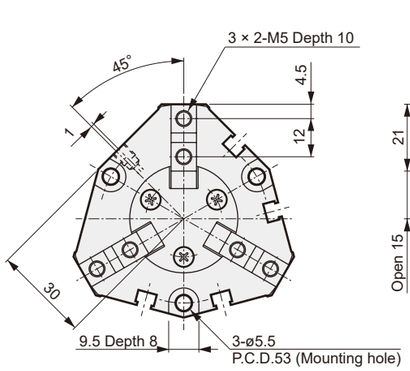
● CKL2-40CS Standard/O/C

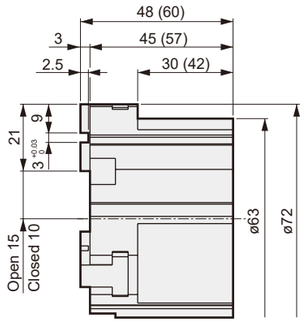
· Dimensions in ( ) are for O [Normally Open] and C [Normally Closed] specifications.

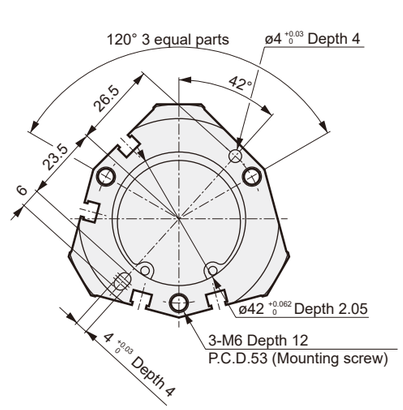


● With Switch





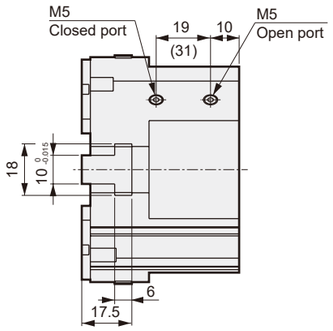




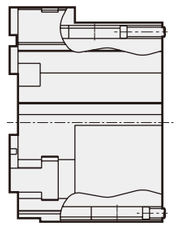
Outline Dimension Drawing

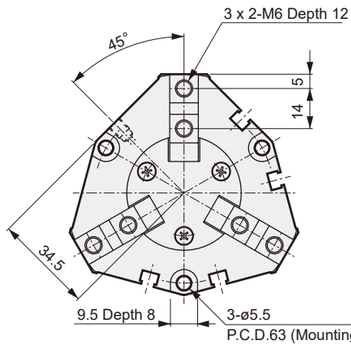
● CKL2-50CS Standard/O/C

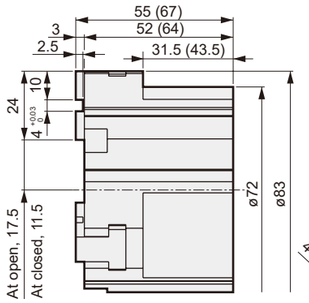
· Dimensions in ( ) are for O [Normally Open] and C [Normally Closed] specifications.

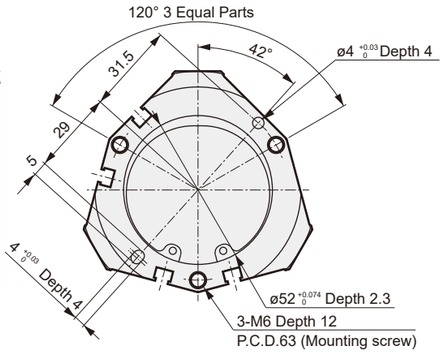


● With Switch

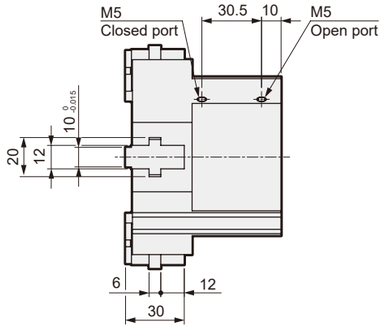




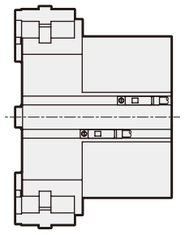


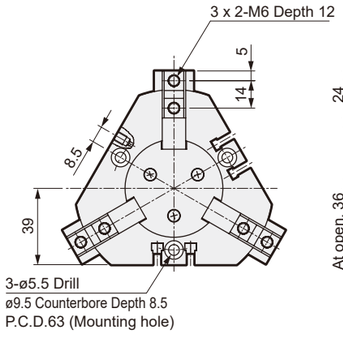


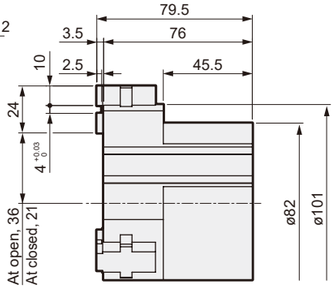
● CKL2-50CS-L1

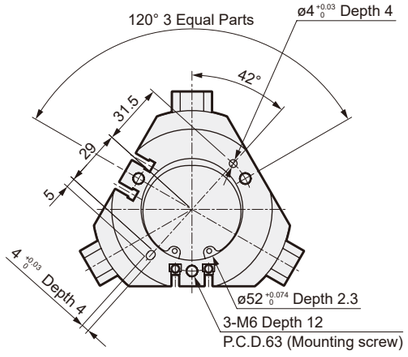


● With Switch





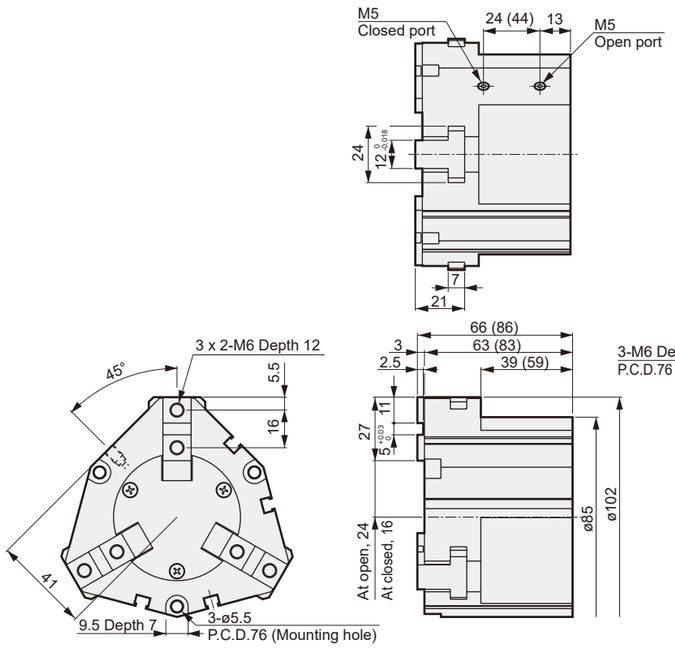


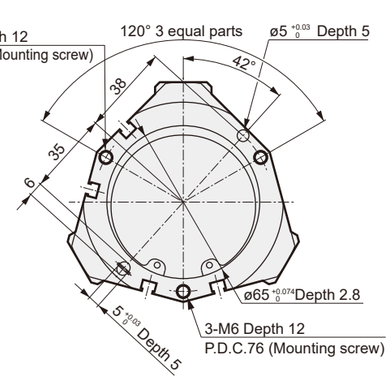


Outline Dimension Drawing

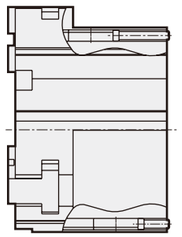
● CKL2-63CS Standard/O/C

· Dimensions in ( ) are for O [Normally Open] and C [Normally Closed] specifications.

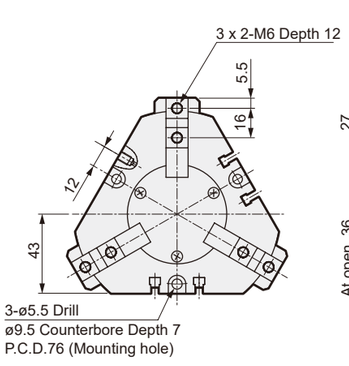


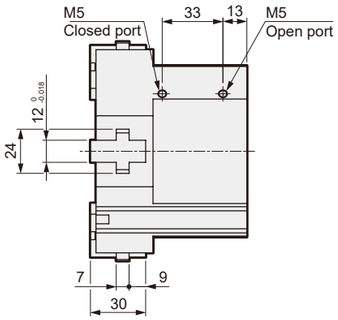


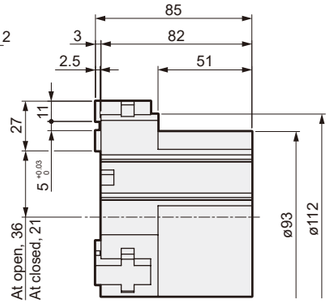
● With Switch

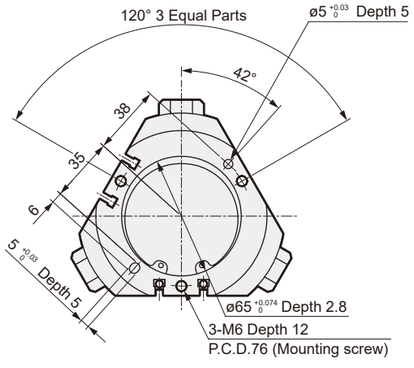


● CKL2-63CS-L1

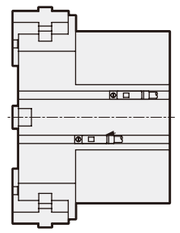








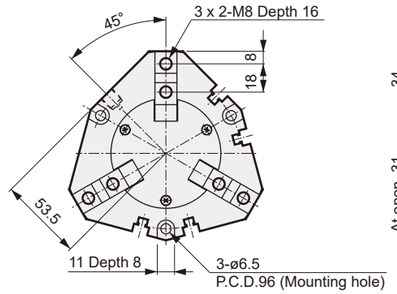
● With Switch

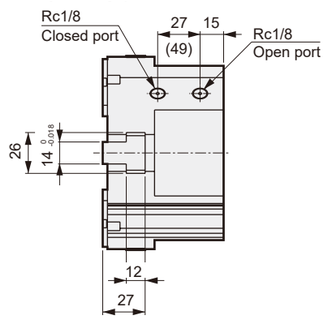


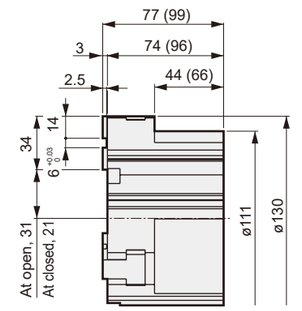
Outline Dimension Drawing

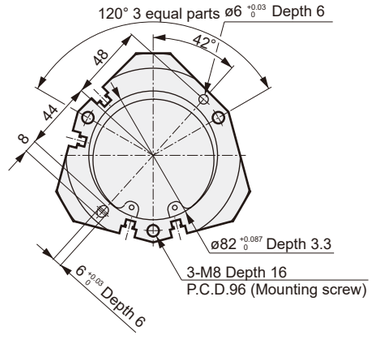
● CKL2-80CS Standard/O/C

· Dimensions in ( ) are for O [Normally Open] and C [Normally Closed] specifications.

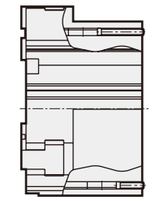




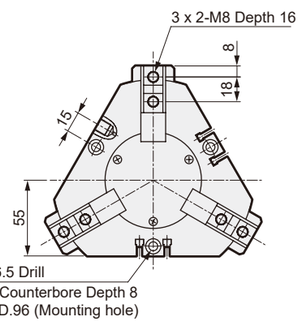


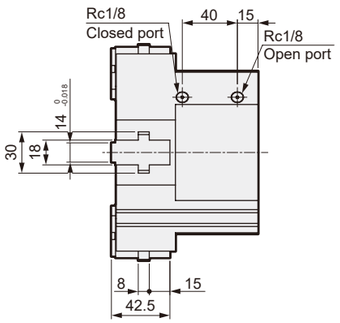


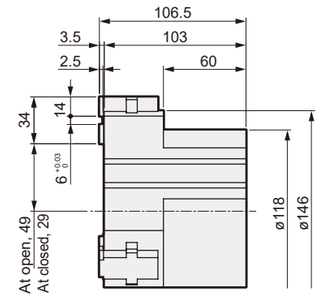
● With Switch

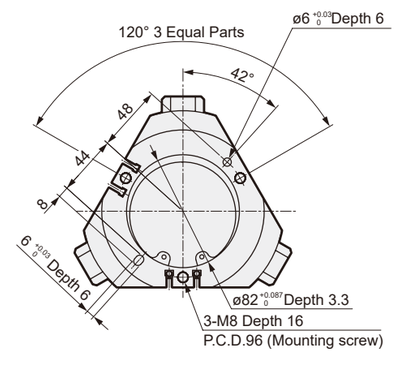


● CKL2-80CS-L1

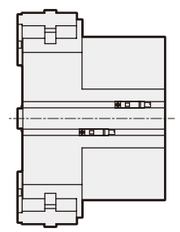








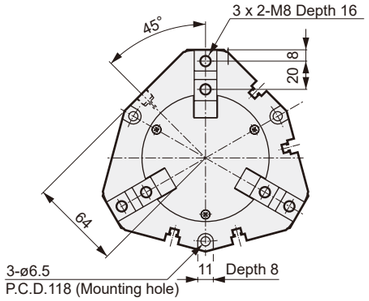
● With Switch

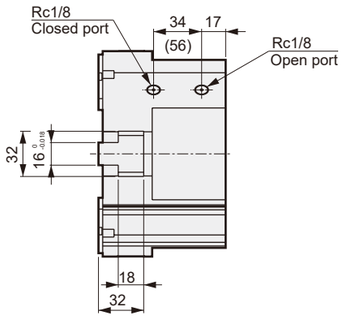


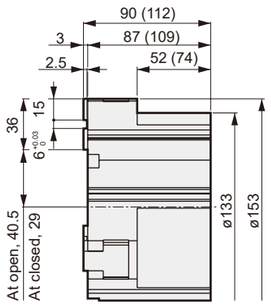
Outline Dimension Drawing

● CKL2-100CS Standard/O/C

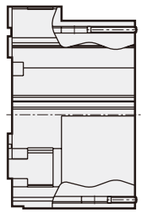
· Dimensions in ( ) are for O [Normally Open] and C [Normally Closed] specifications.

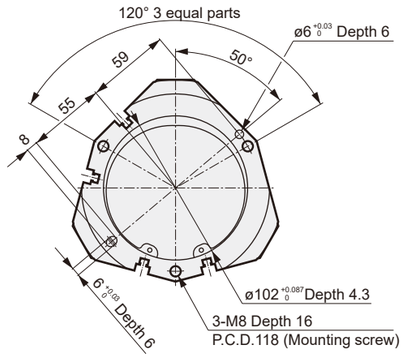




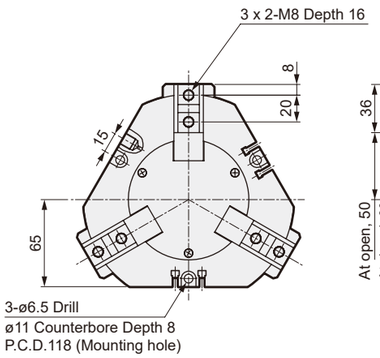


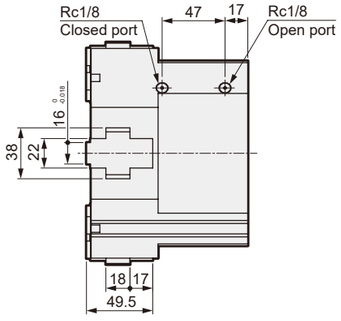
● With Switch

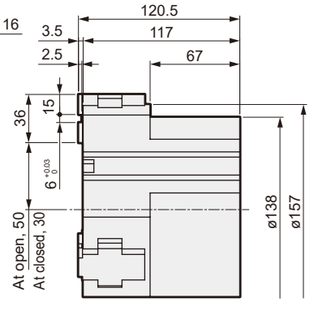




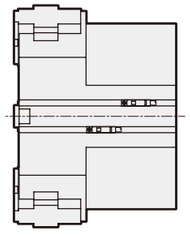
● CKL2-100CS-L1

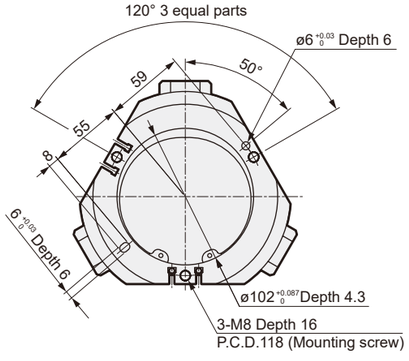






● With Switch

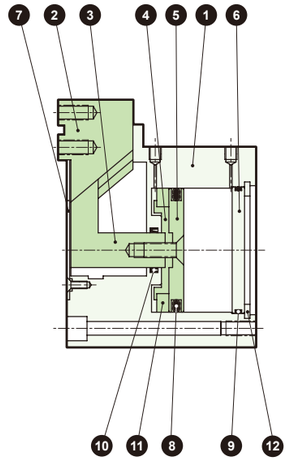




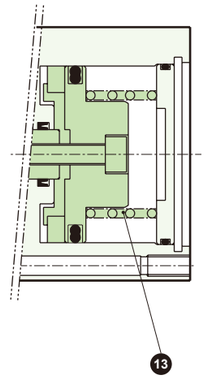
Internal Structure Diagram/Material

● CKL2-16CS to 100CS

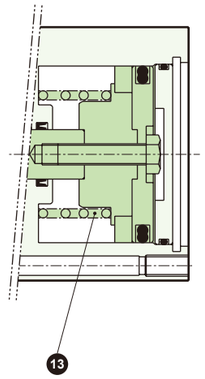
Standard (double acting) type



O (Normally Open) Type



C (Normally Closed) Type



Do not disassemble

Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Body	Aluminum Alloy		8	Piston Packing	Nitrile Rubber	
2	Finger	Steel		9	Gasket	Nitrile Rubber	
3	Piston A	16 to 32CS: Stainless Steel 40 to 100CS: Steel		10	Rod Packing	Nitrile Rubber	
				11	Magnet		
4	Piston B	Aluminum Alloy		12	Retaining ring	16 to 63CS: Stainless Steel 80, 100CS: Steel	
5	Piston C	Aluminum Alloy		13	Coil Spring	Stainless Steel	
6	Cover	Aluminum Alloy					
7	Center cover	Stainless Steel					



Powerful Chuck with Rubber Cover

CKLG2 Series

● Operating stroke: 5, 6, 8, 10, 12, 16, 20, 23 mm

Double Acting | Single Acting (Normally Open) | Single Acting (Normally Closed)

RoHS

Model No. Notation Method

Without Switch
(Built-in magnet for switch)

CKLG2 - 20CS - O Y1

Model No. ❶ ❷ ❸

With Switch
(Built-in magnet for switch)

CKLG2 - 20CS - O Y1 - T2H - R

Model No. ❶ Bore size ❷ Actuation method ❸ Attachment ❹ Switch Model No. ❺ Number of Switches

❶ Bore Size (mm)

Code	Content
20CS	ø20
25CS	ø25
32CS	ø32
40CS	ø40
50CS	ø50
63CS	ø63
80CS	ø80
100CS	ø100

❷ Actuation method

Code	Content
Blank	Standard (Double Acting)
O	Single acting type (Normally open:)
C	Single acting type (Normally closed:)

❸ Attachment

	Code	Content
	Blank	Without attachments
*1, *2	Y1	With attachments Material (S50C)
*1, *2	Y2	With attachments Material (MC Nylon)

*1: Attachment is commonly used for internal and external diameter chuck.
*2: Refer to P. 486 for the Dimensions and compatible model of the attachment. When ordered as an option, it will be shipped included with a quantity of 3.

❹ Switch Model No.

For switch details, please refer to P. 573. Switches are included to 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 20 *2	T2H□	T2V□	
		3-wire (NPN)	-	30 or less	-	100 or less	T3H□	T3V□	
	1-Color Flexible Lead Wire Type	2-wire	-	10 to 30	-	5 to 20 *2	T2HR3	T2VR3	

*1: For "□" in the switch model number, enter the code selected from the "*Lead wire length" table.
*2: 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 switch model numbers are also available. (Custom Product) For details, see P. 573.

***Lead wire length**

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

Example) Lead wire length
1 m T2H
3 m T2H3
5 m T2H5

❺ Number of Switches

	Code	Content
	R	With 1 pc. on Open Side
	H	With 1 pc. on Close Side
*	D	With 2 pcs

* When 2 switches are included, for models with a short operating stroke, both switches may turn ON depending on the size of the workpiece. Please be careful.

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

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

CKLG2 - •••• - FP1

Switch Single Unit Model No. Notation Method

SW - T2H

❹Switch Model No.

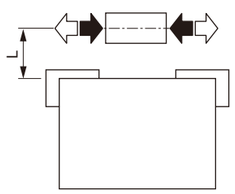
Specifications

Item		CKLG2							
Size		20CS	25CS	32CS	40CS	50CS	63CS	80CS	100CS
Bore size	mm	ø20	ø25	ø32	ø40	ø50	ø63	ø80	ø100
Operating Fluid		Compressed Air							
Max. Working Pressure	MPa	0.7							
Min. Operating Pressure	MPa	0.3							
Ambient Temperature	°C	5 to 60							
Port Size		M5						Rc1/8	
Operating stroke	mm	5	6	8	10	12	16	20	23
Rod diameter	mm	ø6	ø8	ø10	ø12	ø14	ø16		ø20
Internal volume (reciprocating)	cm³	1.8	3.3	7.7	15.6	28.3	60.3	118.2	215.5
Repeatability	mm	±0.01							
Weight kg	Standard	0.14	0.21	0.27	0.40	0.60	1.13	2.02	3.38
	O: Single acting normally open	0.17	0.25	0.33	0.52	0.71	1.30	2.59	4.00
	C: Single acting normally closed	0.17	0.25	0.33	0.52	0.71	1.39	2.71	4.10
Lubrication		Not required (When lubricating, use turbine oil Class 1 ISO VG32)							

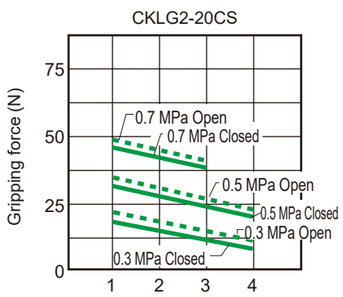
Gripping Force Performance Data

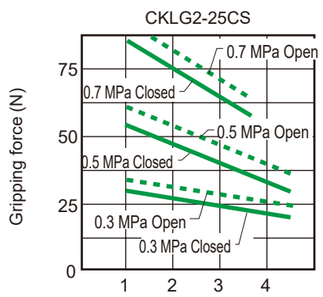
- Gripping force represents the thrust (for one finger) in the direction of the arrow shown in the figure.
- The gripping force in the opening/closing directions with finger length L of hand with a supply pressure of 0.3, 0.5 and 0.7 MPa is shown.

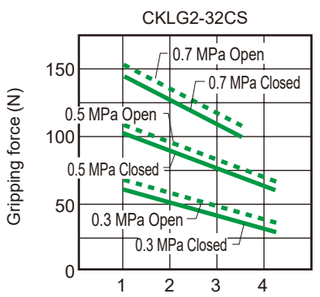
●Opening direction (⇦) - - - -(Dashed line)
●Closing direction (➡) ——(Solid line)

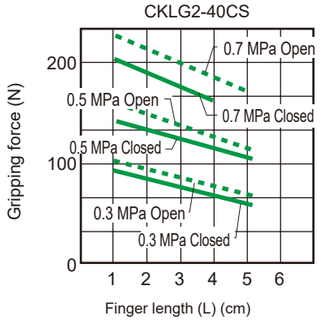


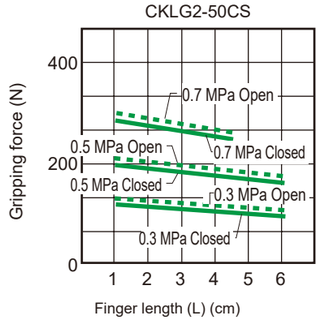
Note) O type gripping force is approx. 20 to 30% lower in the closing direction compared to the double acting type. C type gripping force is approx. 10 to 20 % lower in the opening direction compared to the double acting type. **When selecting, check the design and selection precautions on P. 490.**

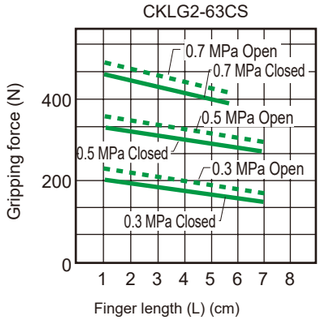


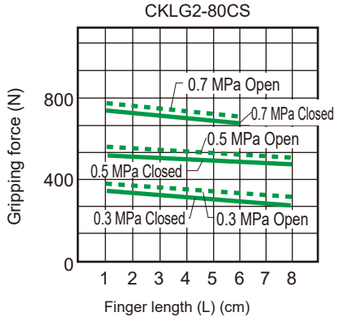


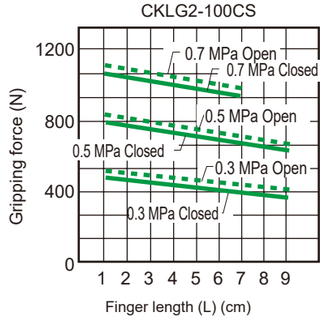








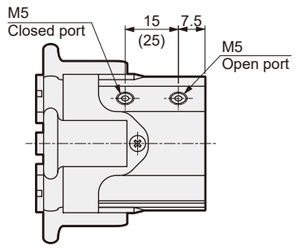


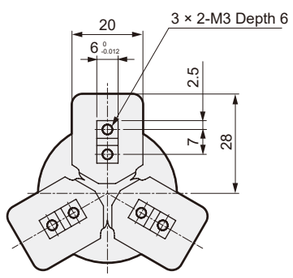


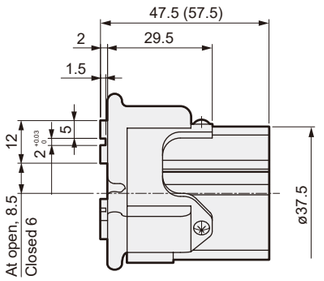
Outline Dimension Drawing

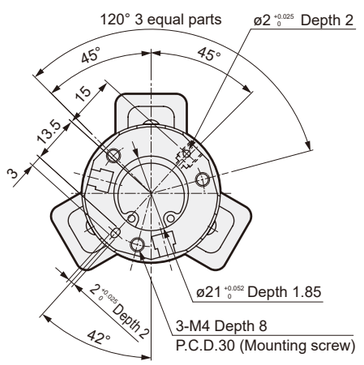
●CKLG2-20CS

· Dimensions in ( ) for O [normally open] and C [normally closed] specifications



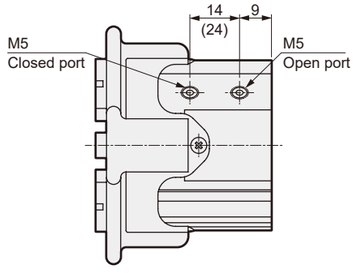


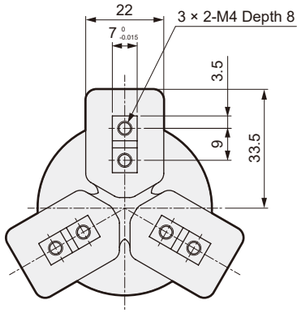


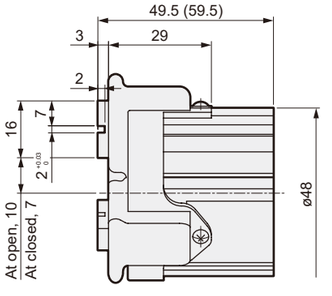


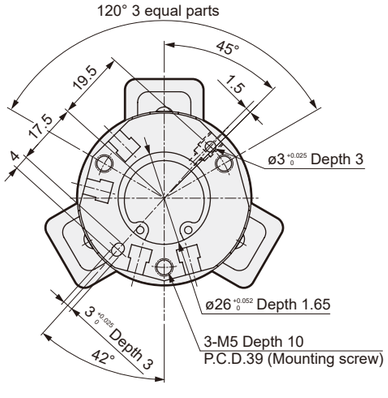
●CKLG2-25CS

· Dimensions in ( ) for O [normally open] and C [normally closed] specifications





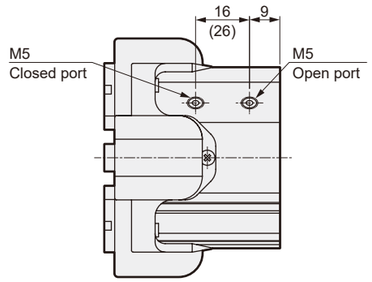


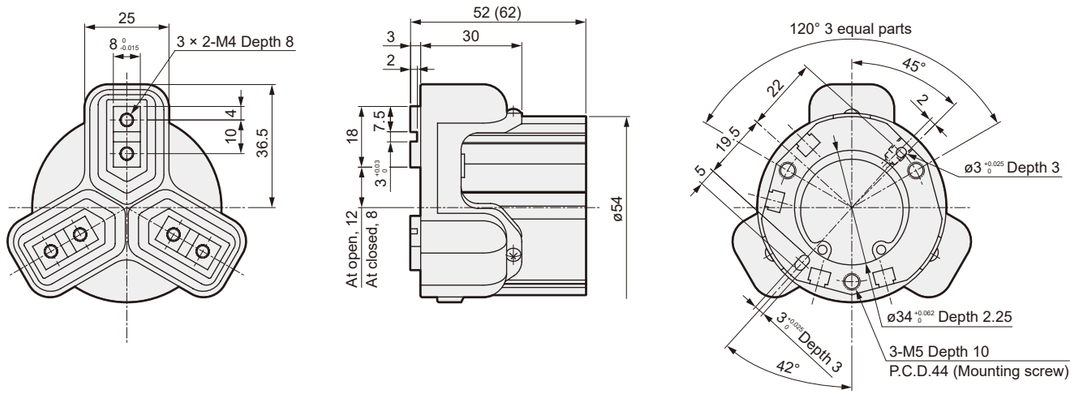


Outline Dimension Drawing

● CKLG2-32CS

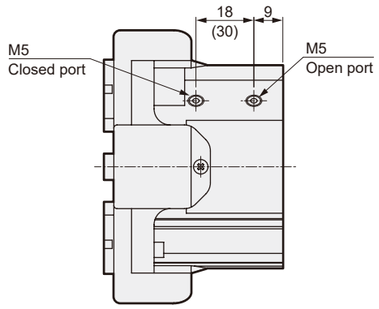
· Dimensions in ( ) for O [normally open] and C [normally closed] specifications

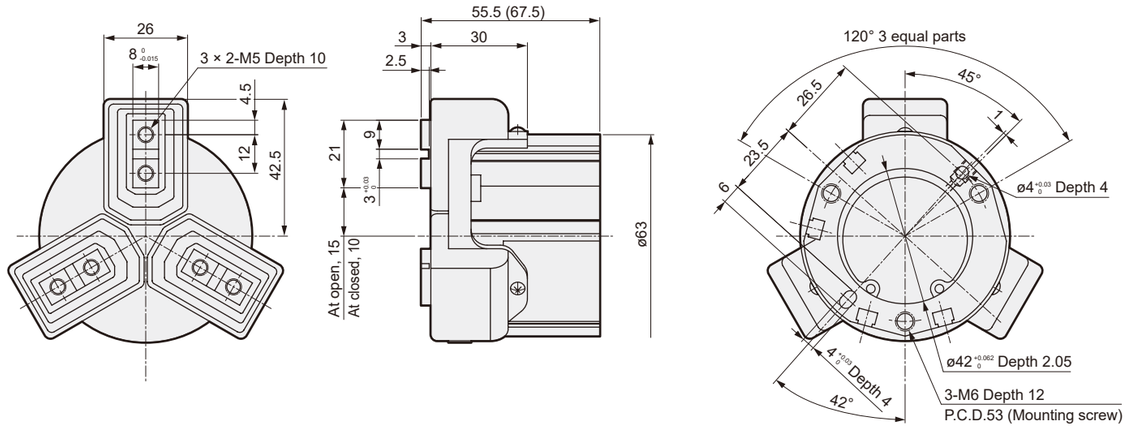




● CKLG2-40CS

· Dimensions in ( ) for O [normally open] and C [normally closed] specifications

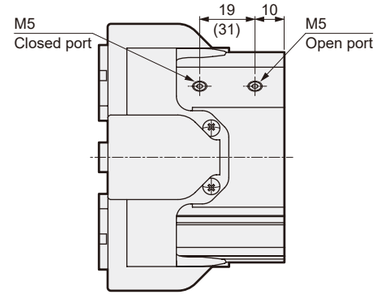


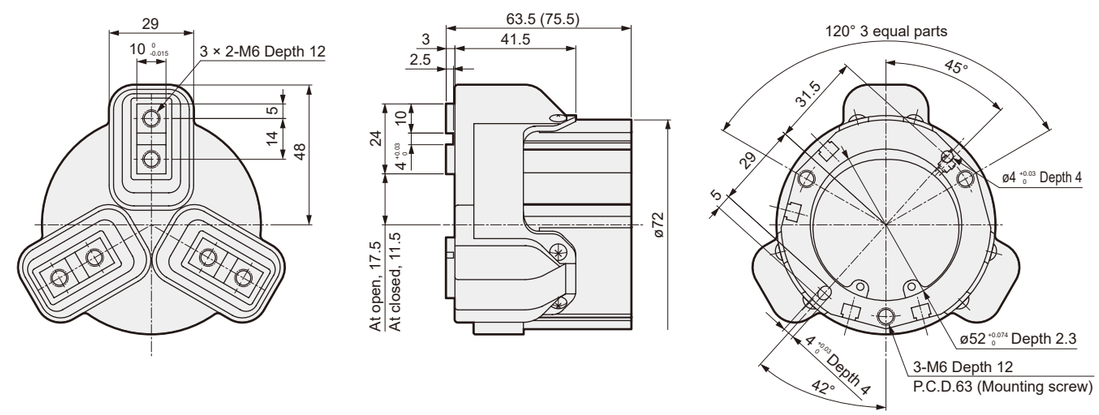


Outline Dimension Drawing

● CKLG2-50CS

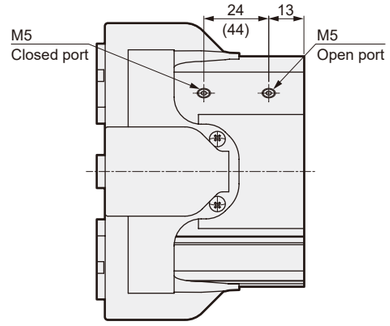
· Dimensions in ( ) for O [normally open] and C [normally closed] specifications

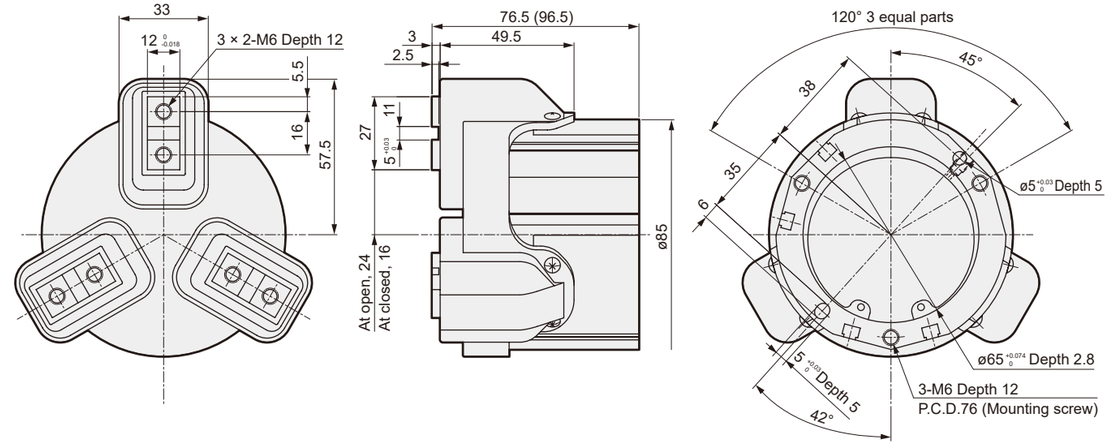




● CKLG2-63CS

· Dimensions in ( ) for O [normally open] and C [normally closed] specifications

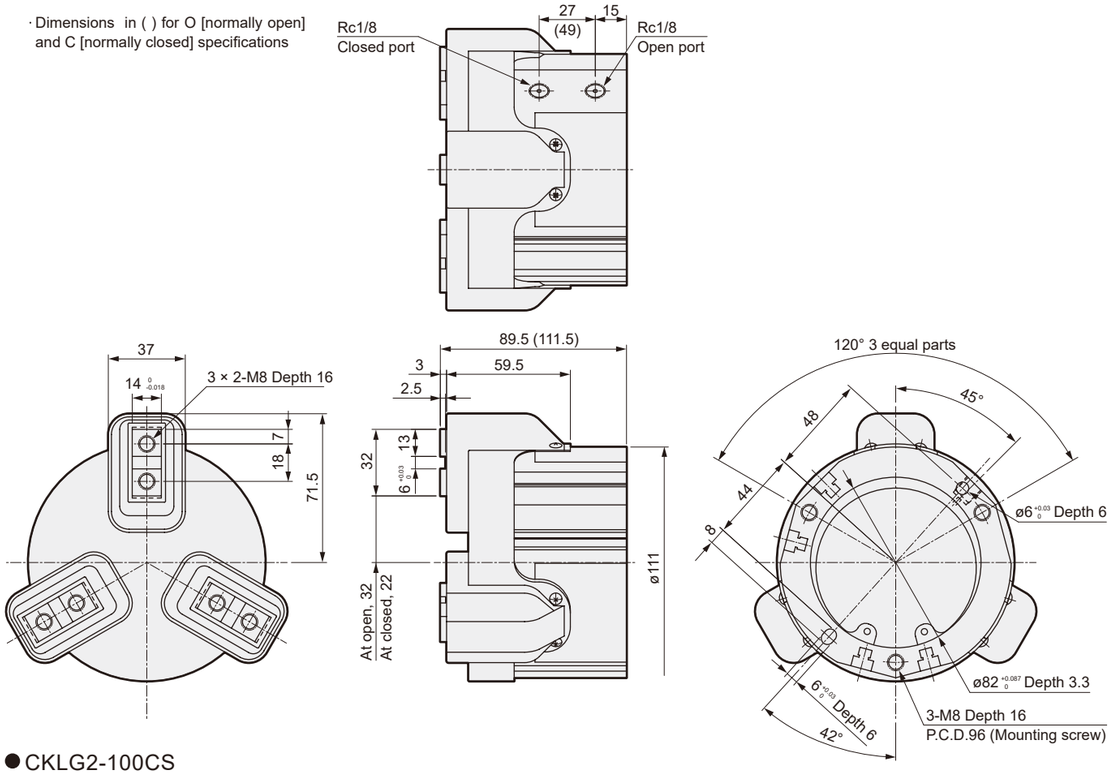




Outline Dimension Drawing

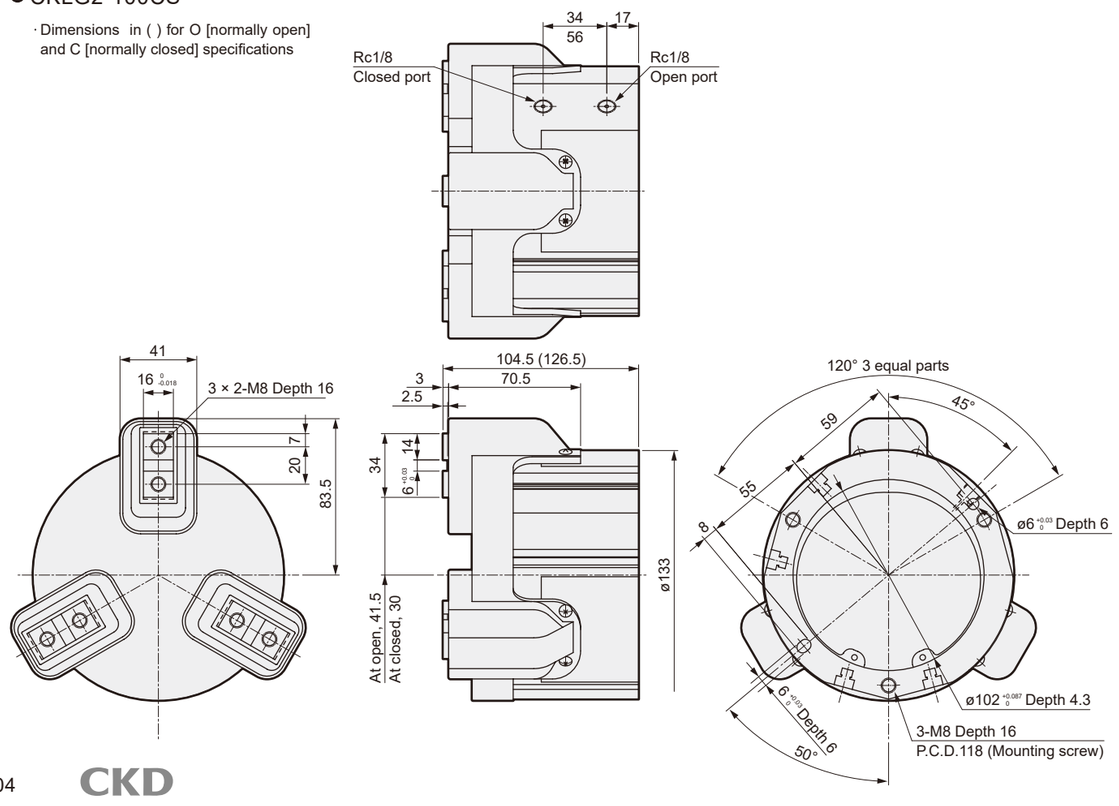
● CKLG2-80CS

· Dimensions in ( ) for O [normally open] and C [normally closed] specifications



● CKLG2-100CS

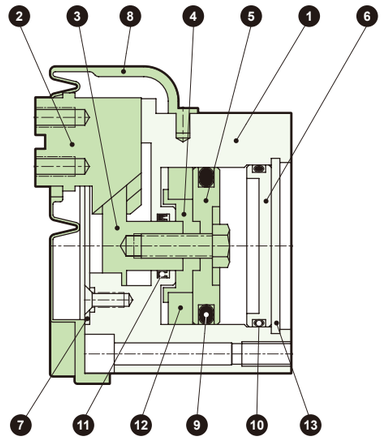
· Dimensions in ( ) for O [normally open] and C [normally closed] specifications



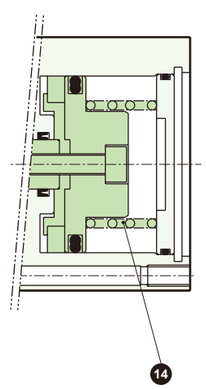
Internal Structure Diagram/Material

● CKLG2-20CS to 100CS

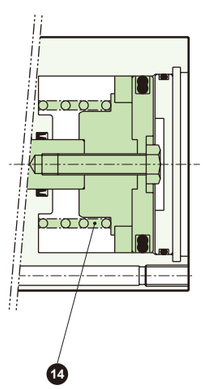
Standard (double acting) type



O (Normally Open) Type



C (Normally Closed) Type



Do not disassemble

Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Body	Aluminum Alloy		8	Rubber Cover	Nitrile Rubber	
2	Finger	Steel		9	Piston Packing	Nitrile Rubber	
3	Piston A	20CS to 32CS: Stainless Steel 40CS to 100CS: Steel		10	Gasket	Nitrile Rubber	
				11	Rod Packing	Nitrile Rubber	
4	Piston B	Aluminum Alloy		12	Magnet		
5	Piston C	Aluminum Alloy		13	C-type retaining ring	20CS to 63CS: Stainless Steel 80CS to 100CS: Steel	
6	Cover	Aluminum Alloy					
7	Center cover	Stainless Steel		14	Coil Spring	Stainless Steel	



Drop Prevention Type Powerful Chuck

CKL2-□-HC Series

●Operating stroke: 8, 10, 12, 16, 20 mm

Single Acting (Normally Closed)



RoHS

Model No. Notation Method

Without Switch
(Built-in magnet for switch)

CKL2 - 32CS - HC - Y1

Model No. ① ②

With Switch
(Built-in magnet for switch)

CKL2 - 32CS - HC - Y1 - T2H - R

Model No. ① Bore size ② Attachment ③ Switch Model No. ④ Number of Switches

① Bore Size (mm)

Code	Content
32CS	ø32
40CS	ø40
50CS	ø50
63CS	ø63
80CS	ø80

② Attachment

	Code	Content
	Blank	Without attachments
*1, *2	Y1	With attachment Material: S45C
*1, *2	Y2	With attachment Material: MC Nylon

*1: Attachments can be used for both internal and external chucking.
*2: For the outline dimensions and compatible models of the attachments, refer to P. 486. When ordered as an option, three pieces are included at shipment.

③ Switch Model No.

For switch details, please refer to P. 573. Switches are included to 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 20 *2	T2H□	T2V□
		3-wire (NPN)	-	30 or less	-	100 or less	T3H□	T3V□
	1-Color Flexible Lead Wire Type	2-wire	-	10 to 30	-	5 to 20 *2	T2HR3	T2VR3



*1: For "□" in the switch model number, enter the code selected from the "*Lead wire length" table.
*2: 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 switch model numbers are also available. (Custom Product) For details, see P. 573.

***Lead wire length**

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

Example) Lead wire length
1 m T2H
3 m T2H3
3 m T2H5

④ Number of Switches

	Code	Content
	R	With 1 pc. on Open Side
	H	With 1 pc. on Close Side
*	D	With 2 pcs

* When 2 switches are included, for models with a short operating stroke, both switches may turn ON depending on the size of the workpiece. Please be careful.

Switch Single Unit Model No. Notation Method

SW - T2H

③ Switch Model No.

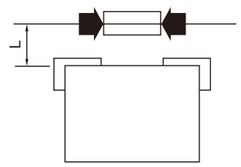
Specifications

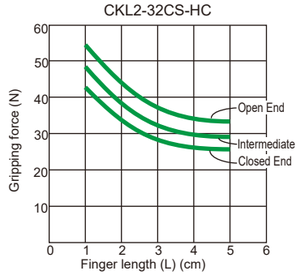
Item		CKL2-32CS-HC	CKL2-40CS-HC	CKL2-50CS-HC	CKL2-63CS-HC	CKL2-80CS-HC
Bore size	mm	ø32	ø40	ø50	ø63	ø80
Operating Fluid		Compressed Air				
Max. Working Pressure	MPa	0.7				
Min. Operating Pressure	MPa	0.4				
Ambient Temperature	°C	5 to 60				
Port Size		M5				Rc1/8
Operating stroke	mm	8	10	12	16	20
Rod diameter	mm	ø10	ø12	ø14	ø16	ø16
Internal volume (reciprocating)	cm^3	7.7	15.6	28.3	60.3	118.2
Repeatability	mm	±0.01				
Weight	kg	0.42	0.60	0.82	1.66	3.20
Lubrication		Not required (When lubricating, use turbine oil Class 1 ISO VG32)				

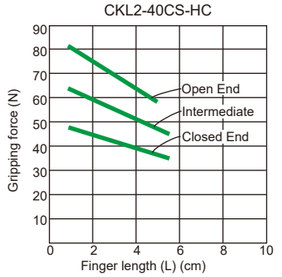
Note 1) Since a spring clamp method is used, use open port only. Never supply air from the closed port. It may cause damage.
Note 2) Do not plug closed port.
Note 3) When used in a harsh environment, dust may be drawn in through a closed port, causing air leakage. In that case, use a filter to prevent contaminants from entering.
Note 4) Since gripping force differs depending on clamp position (open end, intermediate position or closed end) and clamp distance (jaw length), consider safety factors carefully for selection.

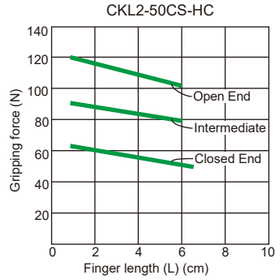
Gripping Force Performance Data

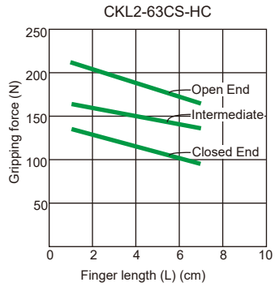
- Gripping force represents the thrust (for one finger) in the direction of the arrow shown in the figure.
- Indicates the gripping force acting in the closing direction at finger length L.
  - Closing direction (➡) ——— (solid line)

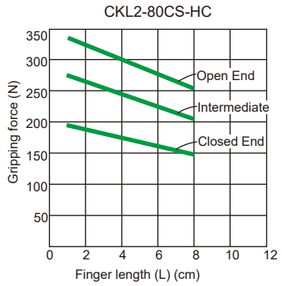








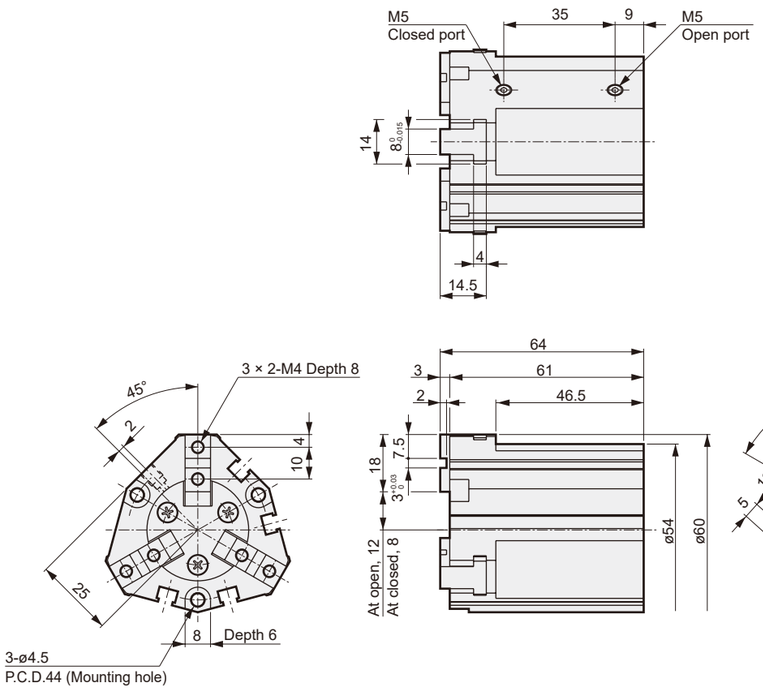




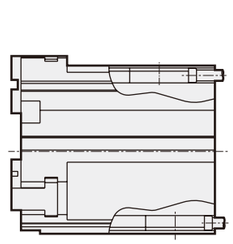
Note) **When selecting, check the design and selection precautions on P. 490.**

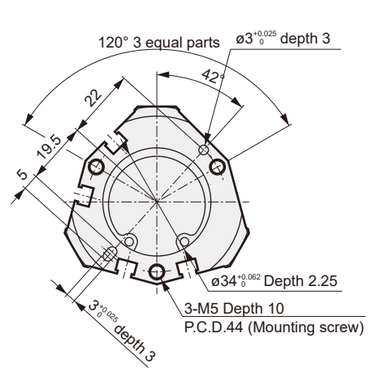
Outline Dimension Drawing

● CKL2-32CS-HC Standard

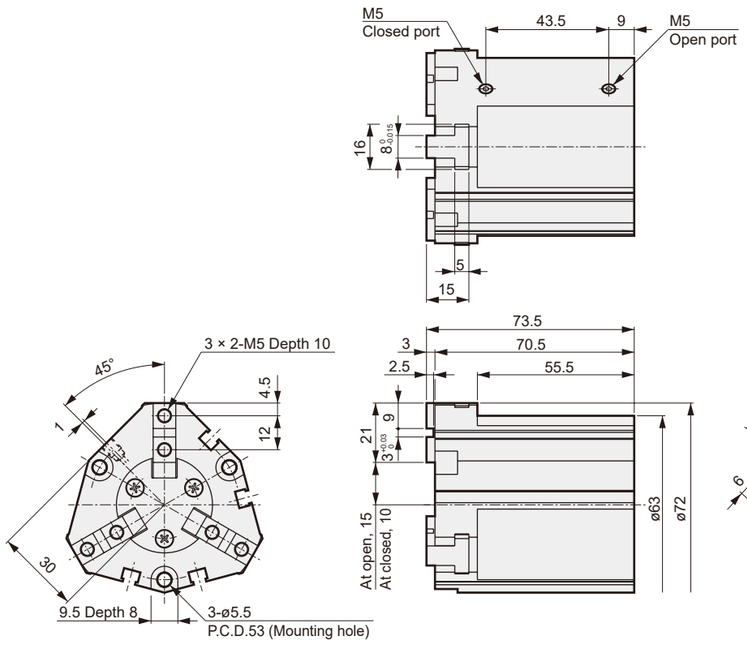


● With Switch

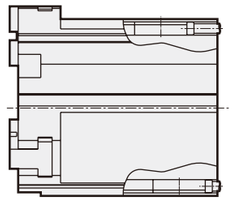


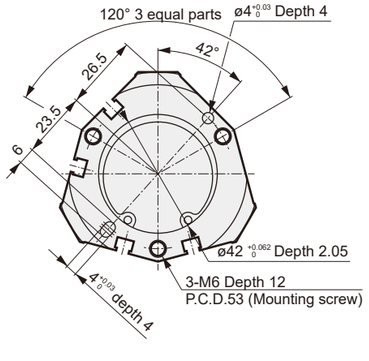


● CKL2-40CS-HC Standard



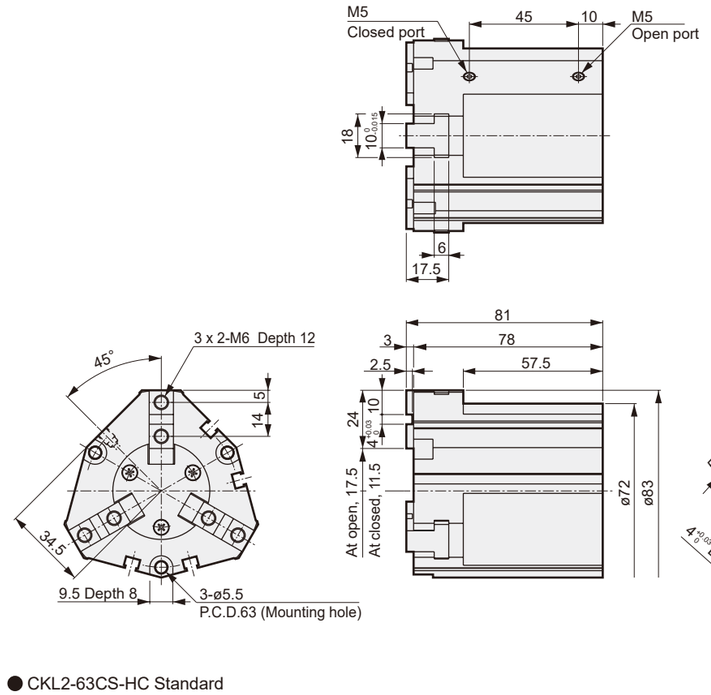
● With Switch



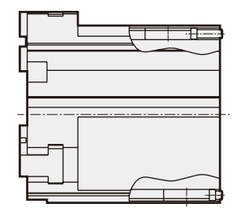


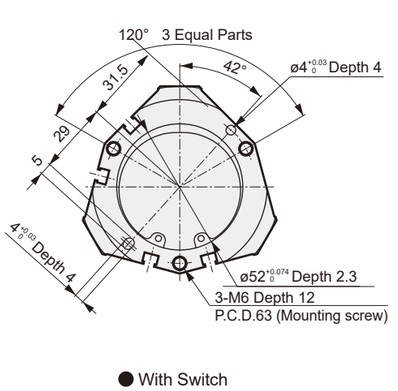
Outline Dimension Drawing

● CKL2-50CS-HC Standard

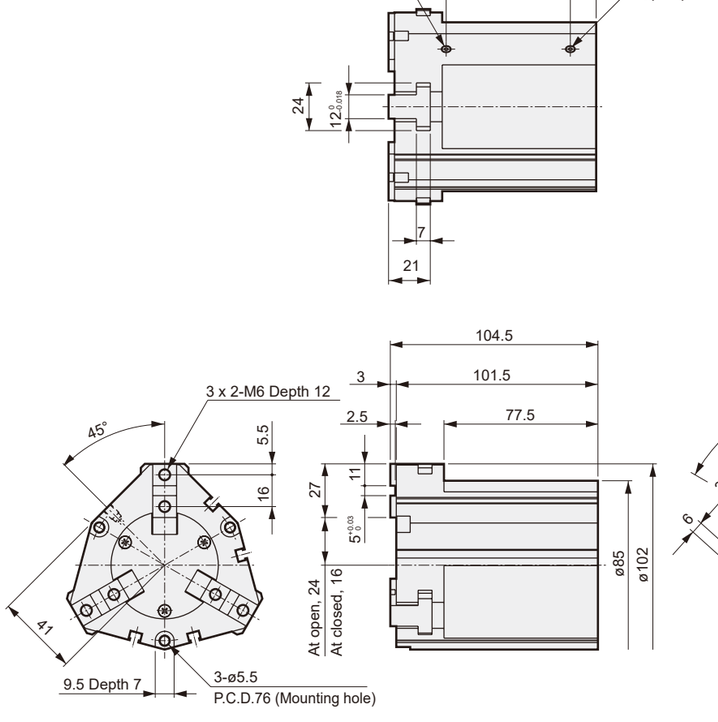


● With Switch

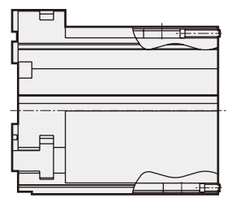


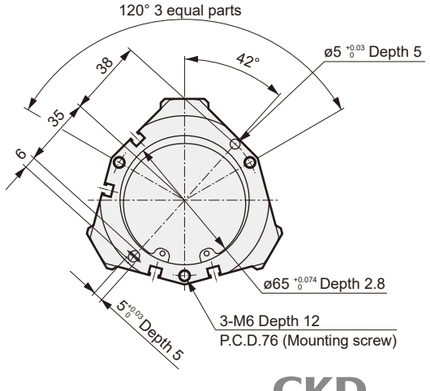


● CKL2-63CS-HC Standard



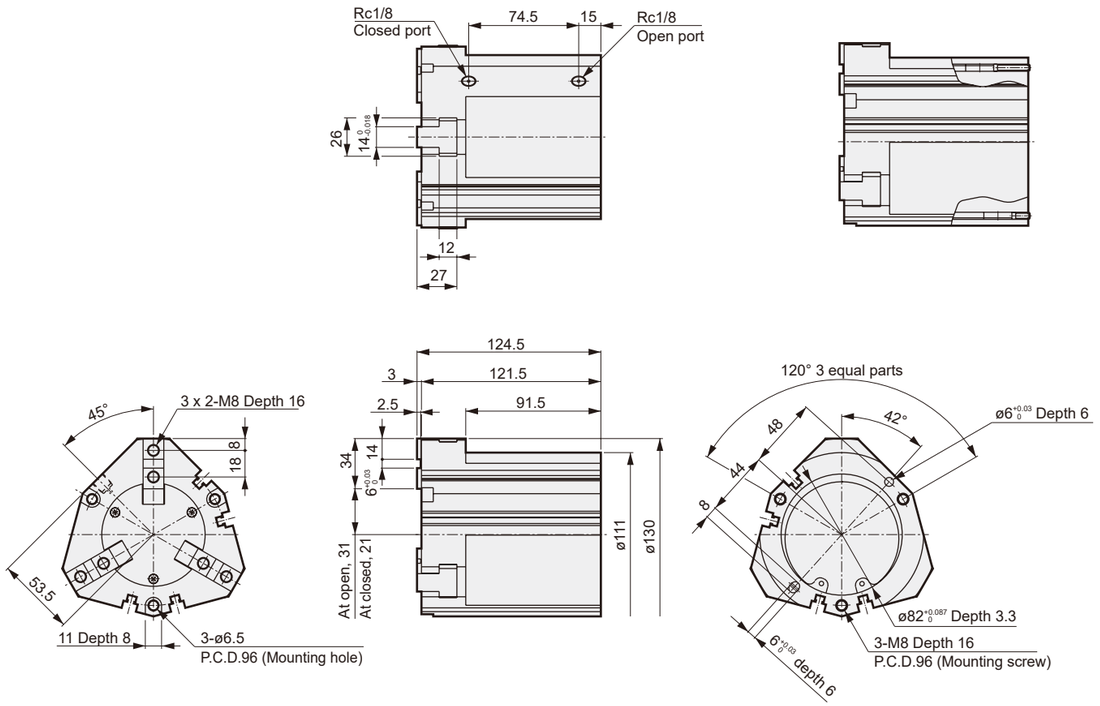
● With Switch





Outline Dimension Drawing

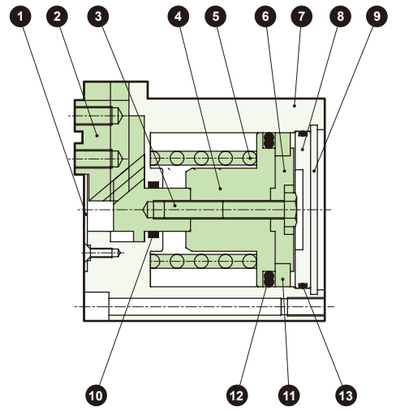
● CKL2-80CS-HC Standard



● With Switch

Internal Structure Diagram/Material

● CKL2-32CS to 80CS-HC



Do not disassemble

Part No.	Part Name	Material	Remarks
1	Center cover	Stainless Steel	
2	Finger	Carbon steel	
3	Piston A	32CS: Stainless Steel 40CS to 80CS: Carbon steel	
4	Piston B	Aluminum Alloy	
5	Coil Spring	Stainless Steel	
6	Piston C	Aluminum Alloy	

Part No.	Part Name	Material	Remarks
7	Body	Aluminum Alloy	
8	Cover	Aluminum Alloy	
9	Retaining ring	32CS: Stainless Steel 40CS～80CS: Steel	
10	Rod Packing	Nitrile Rubber	
11	Magnet		
12	Piston Packing	Nitrile Rubber	
13	Gasket	Nitrile Rubber	



High Gripping Force Powerful Chuck

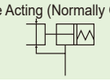
CKH2 Series

●Operating stroke: 6, 8, 10, 12 mm

Double Acting



Single Acting (Normally Open)



Single Acting (Normally Closed)



RoHS

Specifications

Item		CKH2-50CS	CKH2-63CS	CKH2-80CS	CKH2-100CS
Bore size	mm	ø50	ø63	ø80	ø100
Operating Fluid		Compressed Air			
Max. Working Pressure	MPa	0.7			
Min. Operating Pressure	MPa	0.3			
Ambient Temperature	°C	5 to 60			
Port Size		M5		Rc1/8	
Operating stroke	mm	6	8	10	12
Rod diameter	mm	ø14	ø16	ø16	ø20
Internal volume (reciprocating)	cm³	28.3	60.3	118.2	215.5
Repeatability	mm	±0.01			
Weight	kg	0.59	1.02	2.02	3.45
Lubrication		Not required (When lubricating, use turbine oil Class 1 ISO VG32)			

Model No. Notation Method

Without Switch
(Built-in magnet for switch)

CKH2 - 50CS - O - Y1

Model No. ❶ ❷ ❸

With Switch
(Built-in magnet for switch)

CKH2 - 50CS - O - Y1 - T2H - R

Model No. ❶ Bore size ❷ Actuation method ❸ Attachment ❹ Switch Model No. ❺ Number of Switches

❶Bore Size (mm)

Code	Content
50CS	ø50
63CS	ø63
80CS	ø80
100CS	ø100

❷Actuation method

Code	Content
Blank	Standard (Double Acting)
O	Single acting type (Normally open:)
C	Single acting type (Normally closed:)

❸Attachment

	Code	Content
	Blank	Without attachments
*1, *2	Y1	With attachment Material: S45C
*1, *2	Y2	With attachment Material: MC Nylon

*1: Attachment is not available for inner diameter chuck.
*2: Refer to P. 486 for the Dimensions and compatible model of the attachment. When ordered as an option, three are included at shipment.

❹Switch Model No.

For switch details, please refer to P. 573. Switches are included to 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 20 *2	T2H□	T2V□	
		3-wire (NPN)	-	30 or less	-	100 or less	T3H□	T3V□	
	1-Color Flexible Lead Wire Type	2-wire	—	10 to 30	—	5 to 20 *2	T2HR3	T2VR3	

*1: For "□" in the switch model number, enter the code selected from the "*Lead wire length" 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: Switches other than the switch model numbers are also available. (Custom Product) For details, see P. 573.

*Lead wire length

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

Example) Lead wire length
1 m T2H
3 m T2H3
5 m T2H5

❺ Number of Switches

	Code	Content
	R	With 1 pc. on Open Side
	H	With 1 pc. on Close Side
*	D	With 2 pcs

* When 2 switches are included, for models with a short operating stroke, both switches may turn ON depending on the size of the workpiece. Please be careful.

Switch Single Unit Model No. Notation Method

SW - T2H

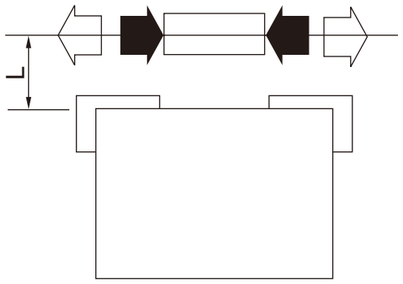
❹Switch Model No.

Gripping Force Performance Data

- Gripping force represents the thrust (for one finger) in the direction of the arrow shown in the figure.
- The gripping force in the opening/closing directions with finger length L of hand with a supply pressure of 0.3, 0.5 and 0.7 MPa is shown.

●Open direction (⇦)- - - -(broken line)
●Closing direction (➡)——(solid line)

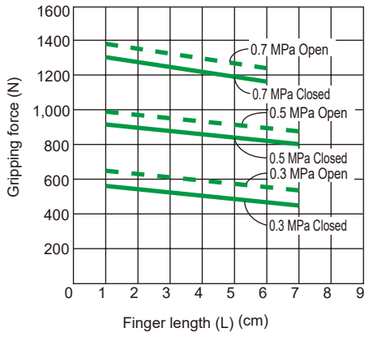
Note) O type gripping force is approx. 20 to 30 % lower in the closing direction compared to the double acting type. C type gripping force is approx. 10 to 20 % lower in the opening direction compared to the double acting type. **When selecting, check the design and selection precautions on P. 490.**



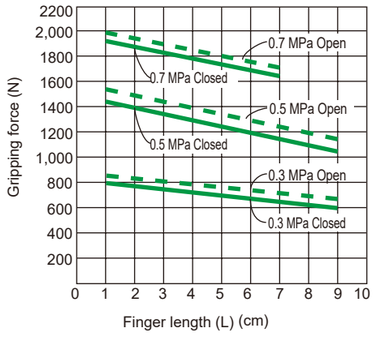
CKH2-50CS

CKH2-63CS

CKH2-80CS

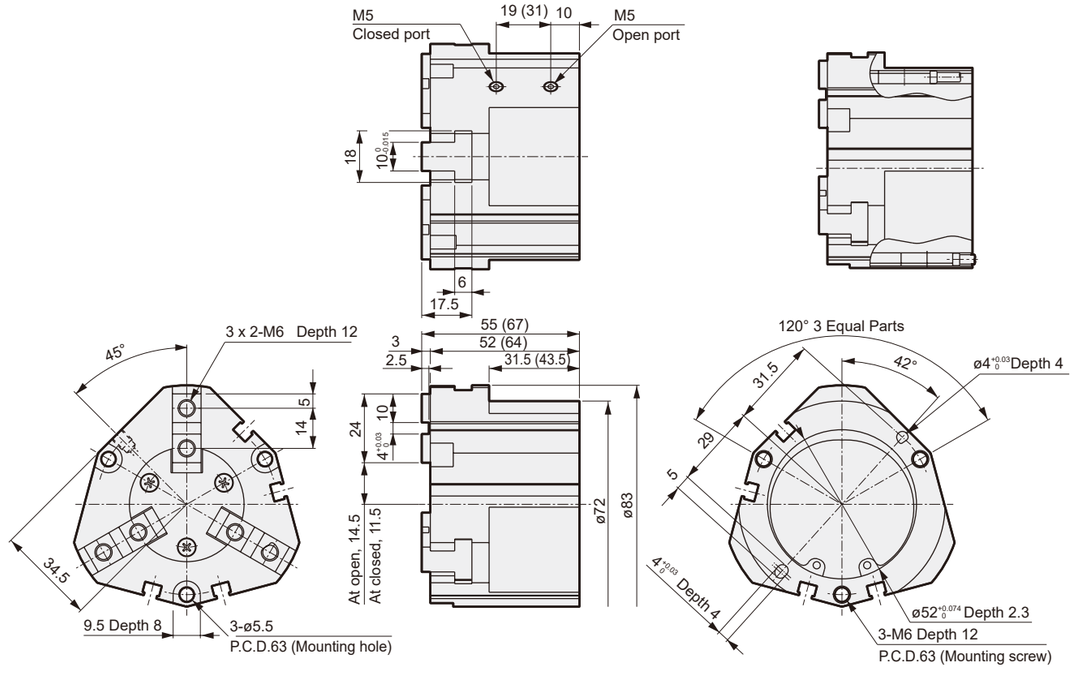


CKH2-100CS



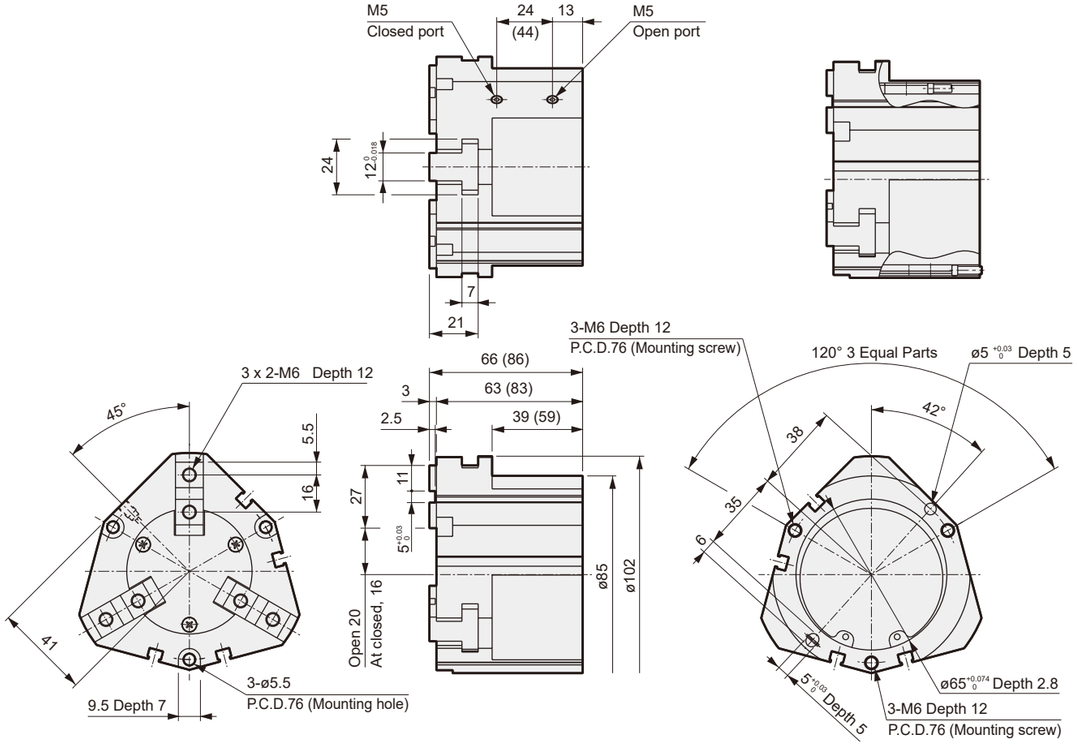
Outline Dimension Drawing

● CKH2-50CS Standard/O/C
· Dimensions in ( ) are for O [Normally Open] and C [Normally Closed] specifications.



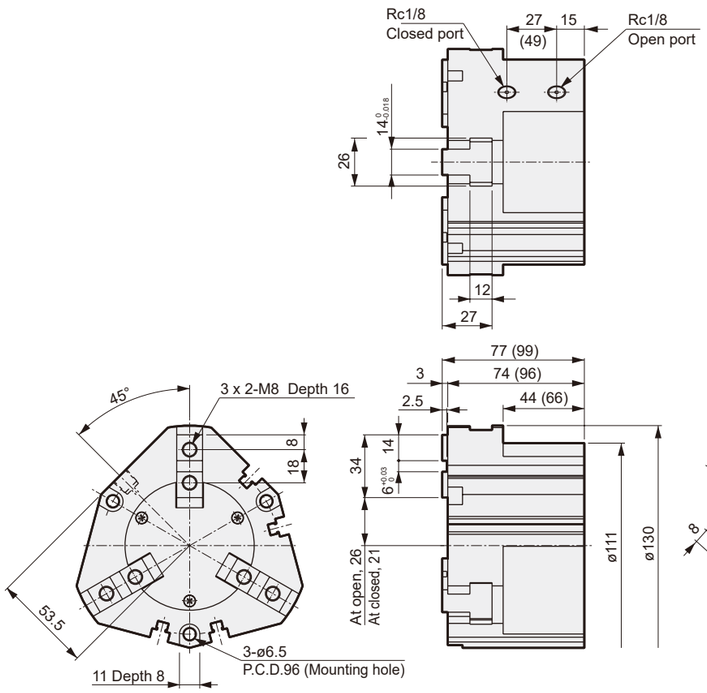
● With Switch

● CKH2-63CS Standard/O/C
· Dimensions in ( ) are for O [Normally Open] and C [Normally Closed] specifications.

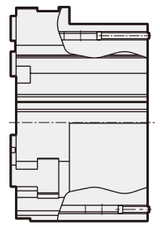


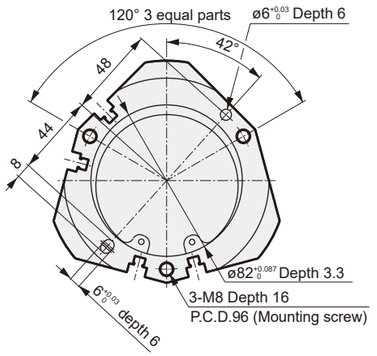
Outline Dimension Drawing

● CKH2-80CS Standard/O/C
· Dimensions in ( ) are for O [Normally Open] and C [Normally Closed] specifications.



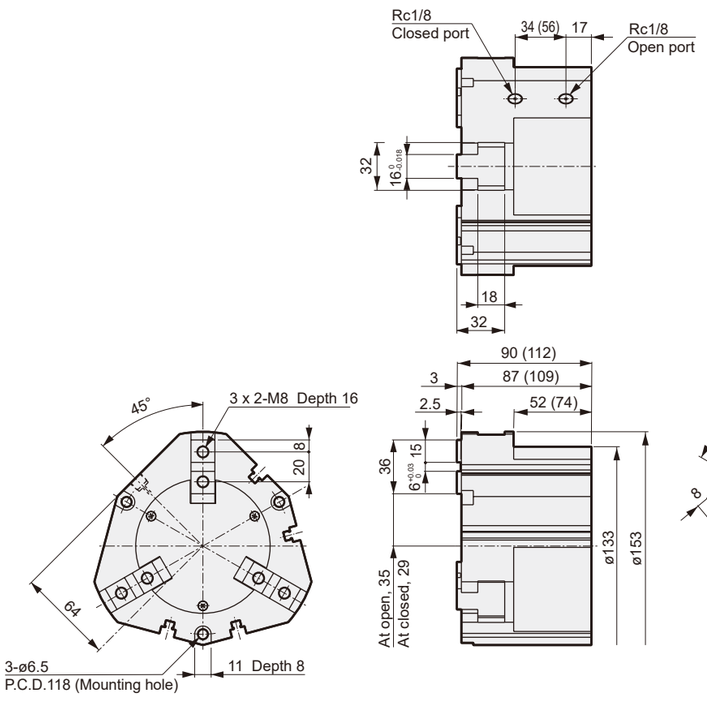
●With Switch

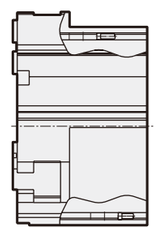


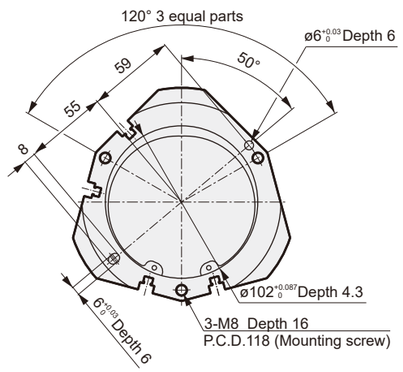


● With Switch

●CKH2-100CS Standard/O/C
· Dimensions in ( ) are for O [Normally Open] and C [Normally Closed] specifications.



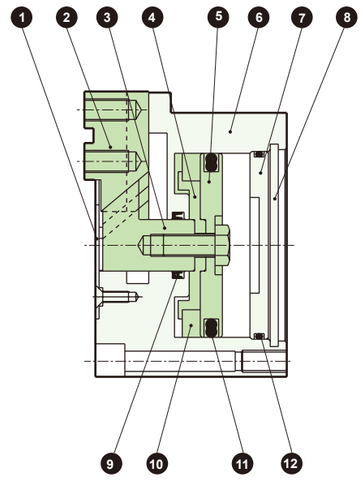




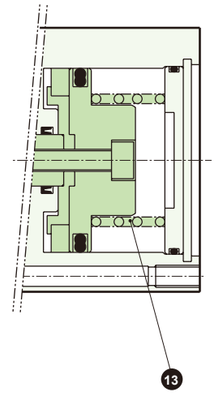
Internal Structure Diagram/Material

● CKH2-50CS to 100CS

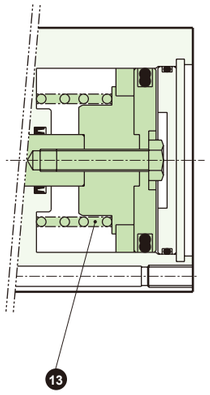
Standard (double acting) type



O (normally open) type



C (normally closed) type



Do not disassemble

Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Center cover	Stainless Steel		8	C-type retaining ring	50CS, 60CS: Stainless Steel 80CS, 100CS: Steel	
2	Finger	Steel					
3	Piston A	Steel		9	Rod seal	Nitrile Rubber	
4	Piston B	Aluminum Alloy		10	Magnet		
5	Piston C	Aluminum alloy		11	Piston seal	Nitrile Rubber	
6	Body	Aluminum Alloy		12	Seal	Nitrile Rubber	
7	Cover	Aluminum Alloy		13	Coil Spring	Stainless Steel	O, C only



Bidirectional Powerful Chuck

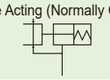
CKLB2 Series

●Operating stroke: 5, 6, 8, 10, 12, 16, 20, 23 mm

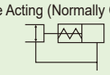
Double Acting



Single Acting (Normally Open)



Single Acting (Normally Closed)



RoHS

Model No. Notation Method

Without Switch
(Built-in magnet for switch)

CKLB2 - 20CS - O - Y1

Model No. ❶ ❷ ❸

With Switch
(Built-in magnet for switch)

CKLB2 - 20CS - O - Y1 - T2H - R

Model No. ❶Bore size ❷Actuation method ❸Attachment ❹Switch Model No. ❺Number of Switches

❶Bore Size (mm)

Code	Content
20CS	ø20
25CS	ø25
32CS	ø32
40CS	ø40
50CS	ø50
63CS	ø63
80CS	ø80
100CS	ø100

❷Actuation method

Code	Content
Blank	Standard (Double Acting)
O	Single acting type (Normally open:)
C	Single acting type (Normally closed:)

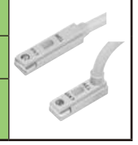
❸Attachment

	Code	Content
	Blank	Without attachments
*1, *2	Y1	With attachment Material: S45C
*1, *2	Y2	With attachment Material: MC Nylon

*1: Attachments can be used for both internal and external chucking.
*2: Refer to P. 486 for the Dimensions and compatible model of the attachment. When ordered as an option, it will be shipped included with a quantity of 2.

❹Switch Model No.

For switch details, please refer to P. 573. Switches are included to 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 20 *2	T2H□	T2V□	
		3-wire (NPN)	-	30 or less	-	100 or less	T3H□	T3V□	
	1-Color Flexible Lead Wire Type	2-wire	-	10 to 30	-	5 to 20 *2	T2HR3	T2VR3	

*1: For "□" in the switch model number, enter the code selected from the "*Lead wire length" 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: Switches other than the switch model numbers are also available. (Custom Product) For details, see P. 573.

*** Lead wire length**

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

Example) Lead wire length
1 m T2H
3 m T2H3
5 m T2H5

❺Number of Switches

	Code	Content
	R	With 1 pc. on Open Side
	H	With 1 pc. on Close Side
*	D	With 2 pcs

* When 2 switches are included, for models with a short operating stroke, both switches may turn ON depending on the size of the workpiece. Please be careful.

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

●Design compatible with rechargeable battery manufacturing process

CKLB2 - •••• - P4□

* Please contact us for details.

Switch Single Unit Model No. Notation Method

SW T2H

❹Switch Model No.

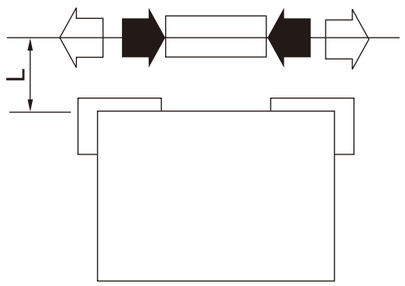
Specifications

Item		CKLB2-20CS	CKLB2-25CS	CKLB2-32CS	CKLB2-40CS	CKLB2-50CS	CKLB2-63CS	CKLB2-80CS	CKLB2-100CS
Bore size	mm	ø20	ø25	ø32	ø40	ø50	ø63	ø80	ø100
Operating Fluid		Compressed Air							
Max. Working Pressure	MPa	0.7							
Min. Operating Pressure	MPa	0.3							
Ambient Temperature	°C	5 to 60							
Port Size		M5						Rc1/8	
Operating stroke	mm	5	6	8	10	12	16	20	23
Rod diameter	mm	ø6	ø8	ø10	ø12	ø14	ø16	ø16	ø20
Internal volume (reciprocating)	cm^3	1.8	3.3	7.7	15.6	28.3	60.3	118.2	215.5
Repeatability	mm	±0.01							
Weight	kg	0.13	0.20	0.32	0.38	0.58	1.00	2.00	3.53
Lubrication		Not required (When lubricating, use turbine oil Class 1 ISO VG32)							

Gripping Force Performance Data

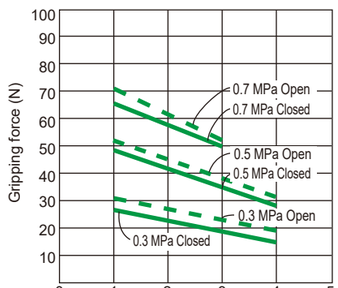
- Gripping force represents the thrust (for one finger) in the direction of the arrow shown in the figure.
- The gripping force in the opening/closing directions with finger length L of hand with a supply pressure of 0.3, 0.5 and 0.7 MPa is shown.

●Opening direction (⇦) - - -(Dashed line)
●Closing direction (➡) ——(Solid line)

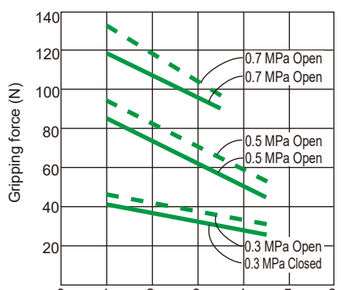


Note) O type gripping force is approx. 20 to 30 % lower in the closing direction compared to the double acting type. C type gripping force is approx. 10 to 30 % lower in the opening direction compared to the double acting type. **When selecting, check the design and selection precautions on P. 490.**

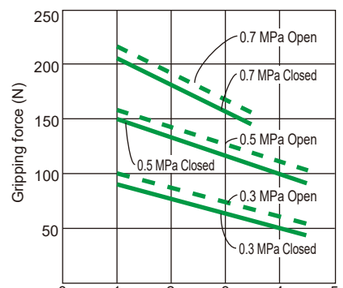
CKLB2-20CS



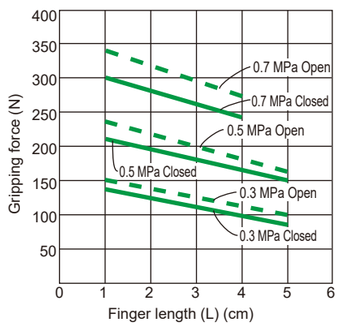
CKLB2-25CS



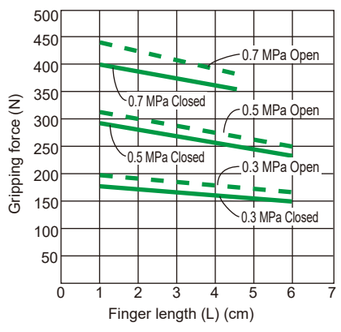
CKLB2-32CS



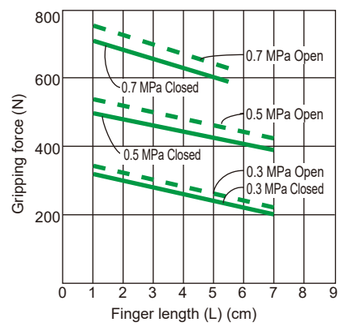
CKLB2-40CS



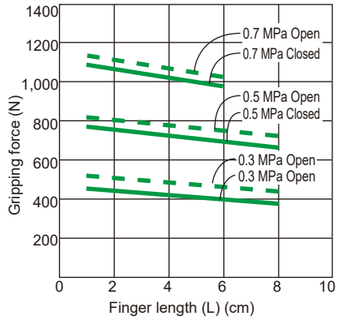
CKLB2-50CS



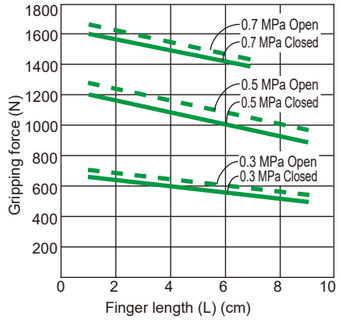
CKLB2-63CS



CKLB2-80CS

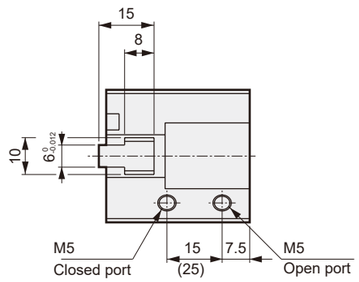


CKLB2-100CS

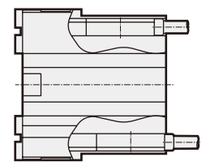


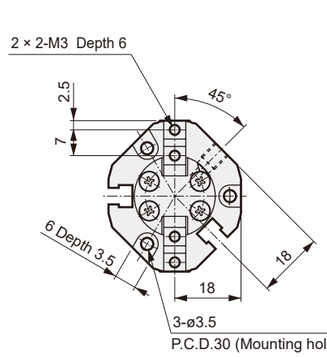
Outline Dimension Drawing

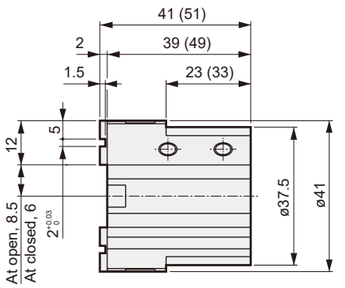
● CKLB2-20CS Standard/O/C
· Dimensions in ( ) are for O [Normally Open] and C [Normally Closed] specifications.

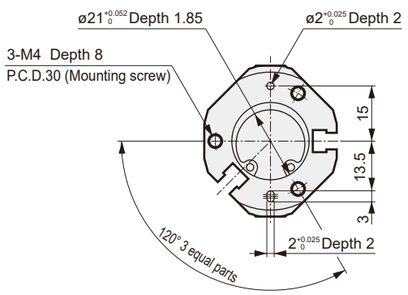


● With Switch

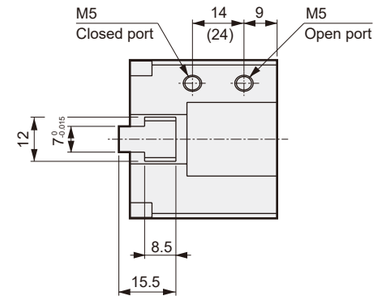




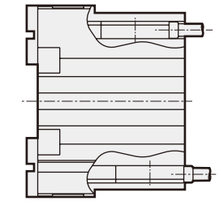


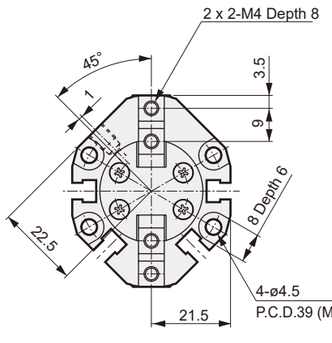


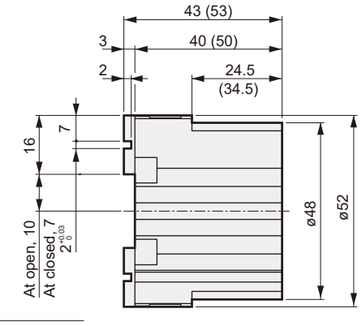
● CKLB2-25CS Standard/O/C
· Dimensions in ( ) are for O [Normally Open] and C [Normally Closed] specifications.

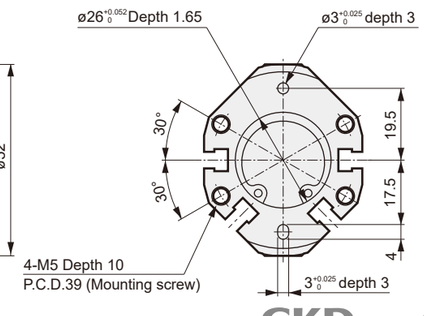


● With Switch







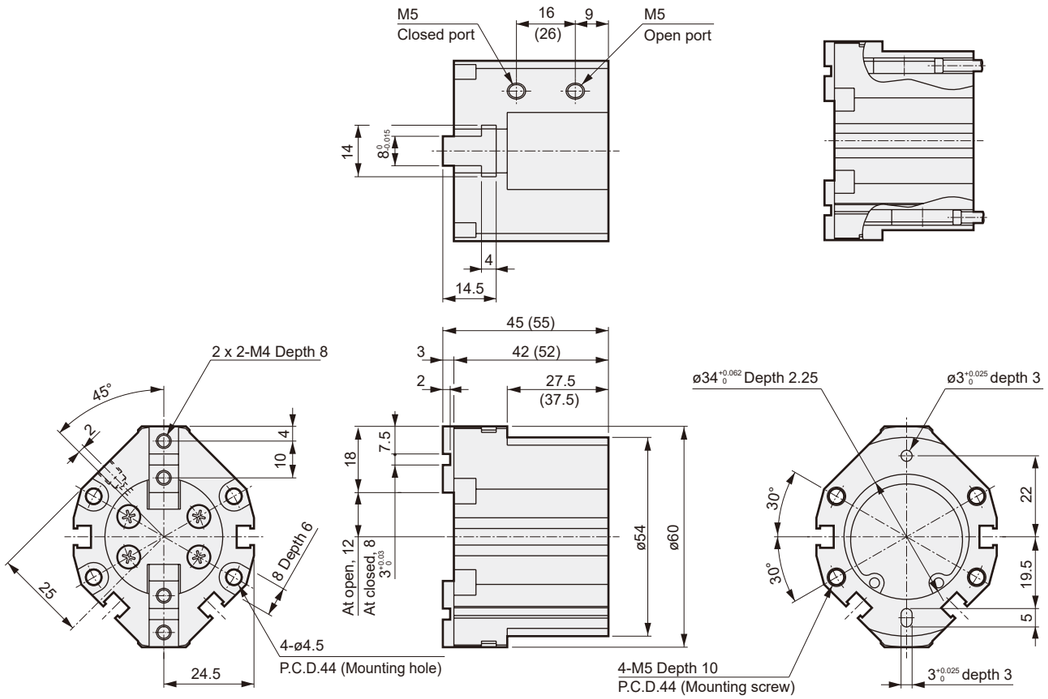


Outline Dimension Drawing

●CKLB2-32CS Standard/O/C

· Dimensions in ( ) are for O [Normally Open] and C [Normally Closed] specifications.

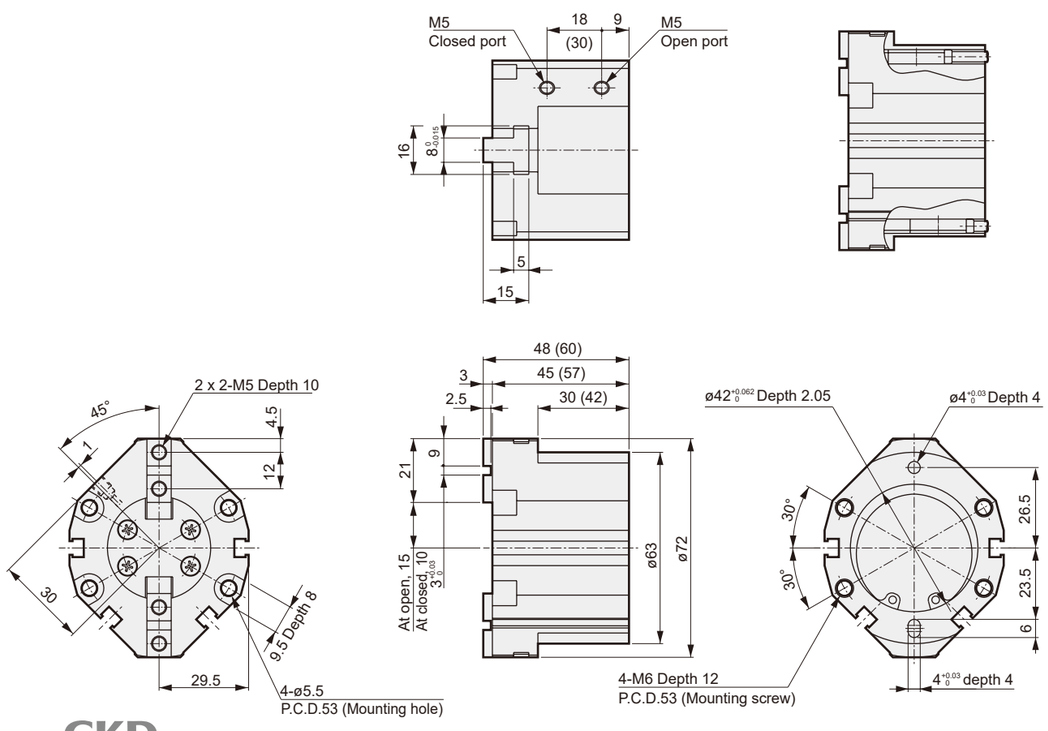
●With Switch



●CKLB2-40CS Standard/O/C

· Dimensions in ( ) are for O [Normally Open] and C [Normally Closed] specifications.

● With Switch

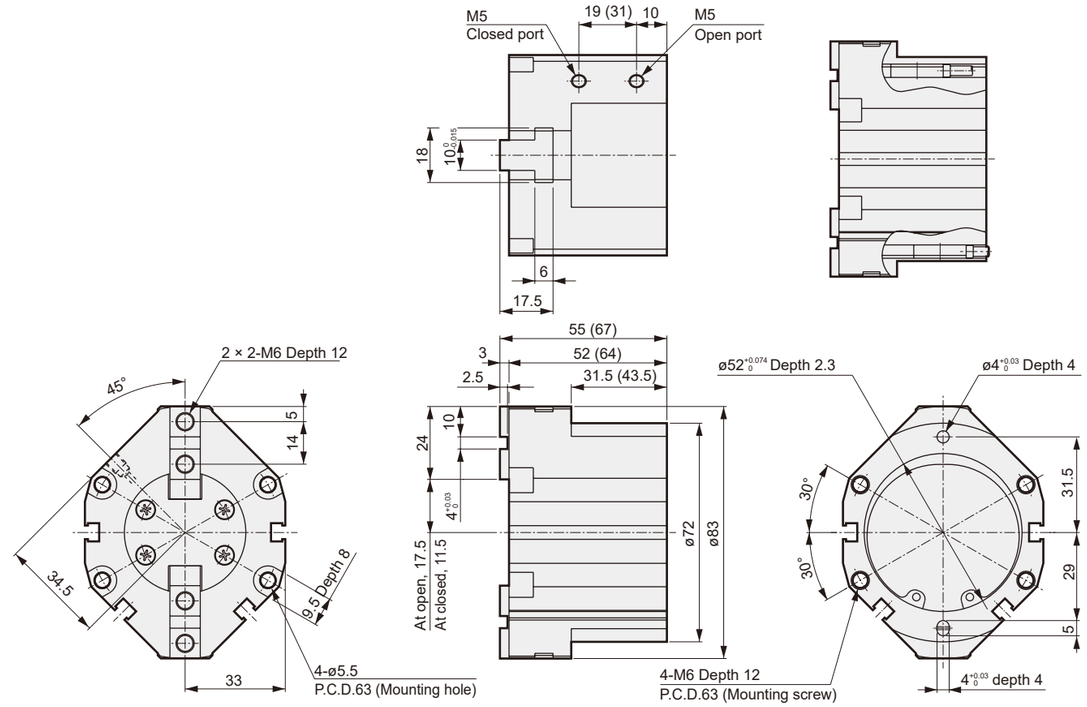


Outline Dimension Drawing

●CKLB2-50CS Standard/O/C

· Dimensions in ( ) are for O [Normally Open] and C [Normally Closed] specifications.

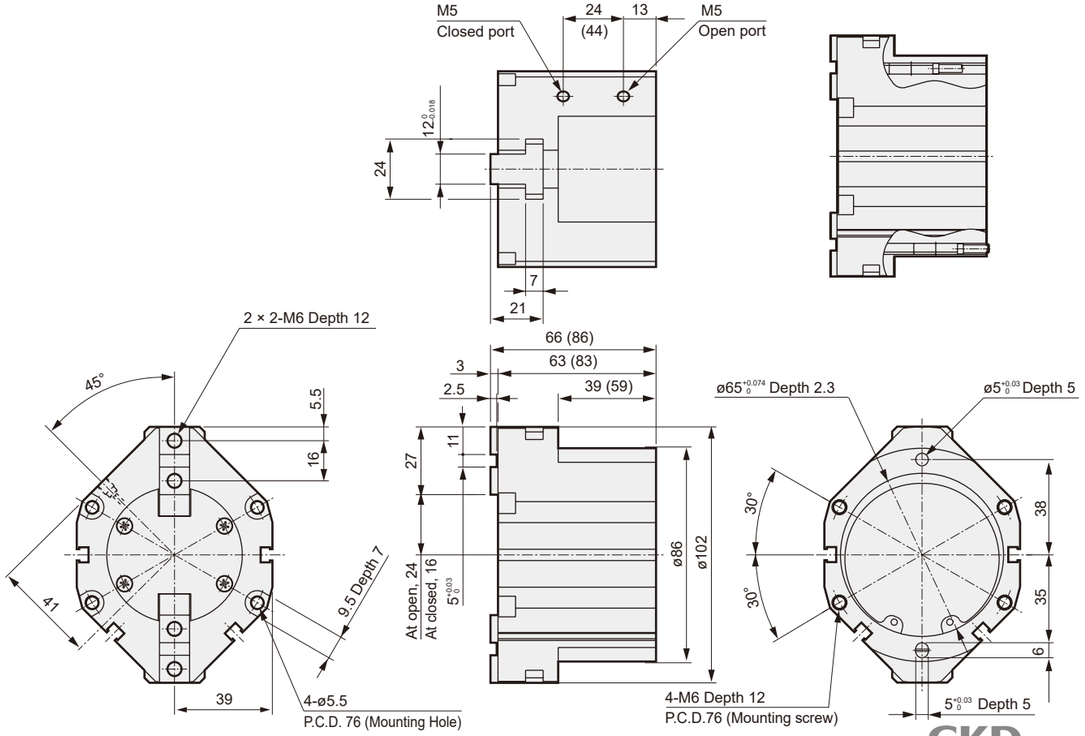
●With Switch



● CKLB2-63CS Standard/O/C

· Dimensions in ( ) are for O [Normally Open] and C [Normally Closed] specifications.

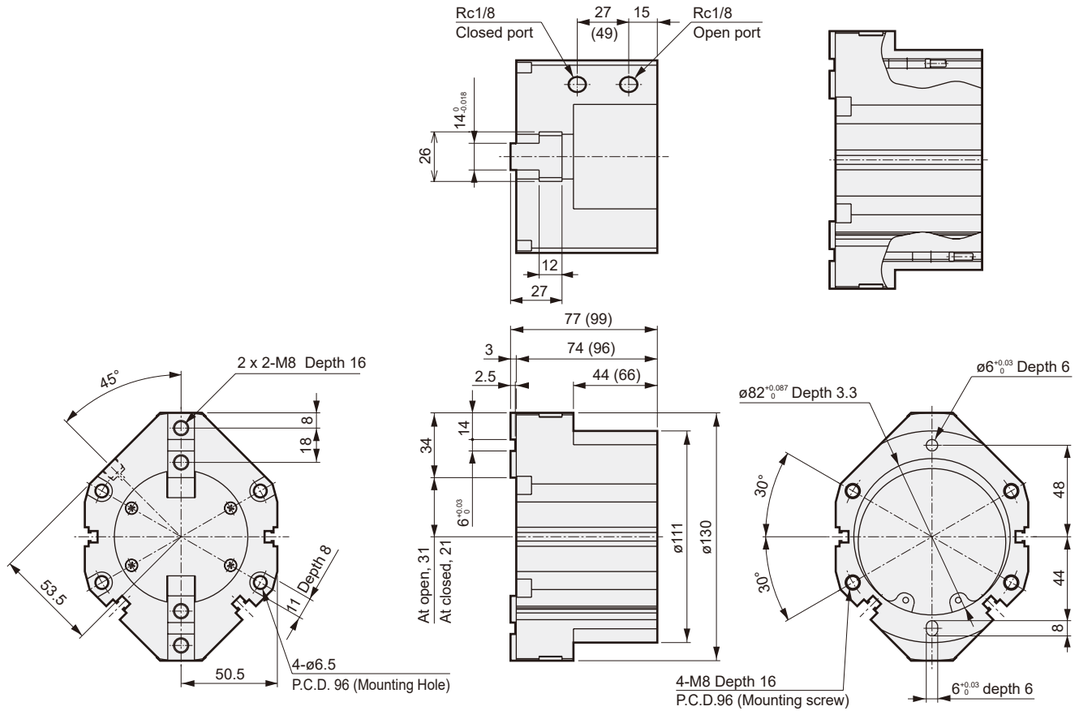
● With Switch



Outline Dimension Drawing

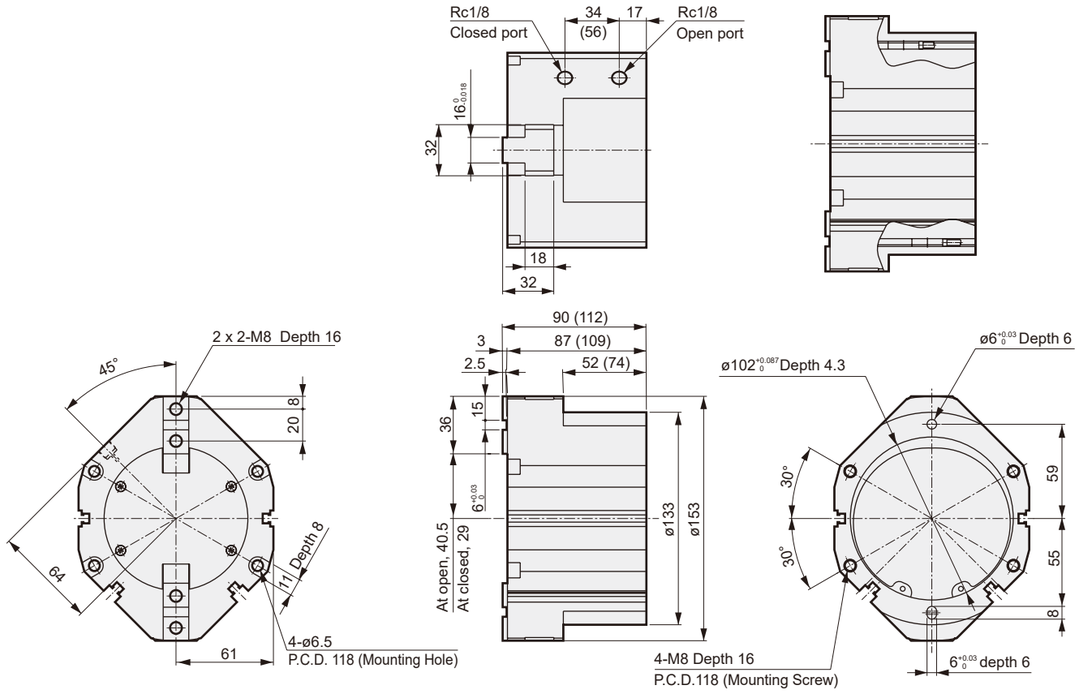
● CKLB2-80CS Standard/O/C
· Dimensions in ( ) are for O [Normally Open] and C [Normally Closed] specifications.

● With Switch



● CKLB2-100CS Standard/O/C
· Dimensions in ( ) are for O [Normally Open] and C [Normally Closed] specifications.

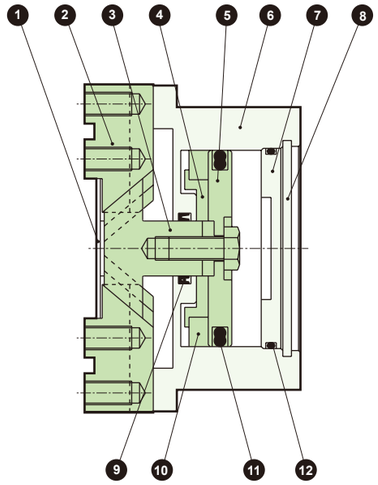
● With Switch



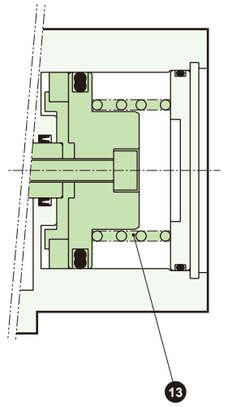
Internal Structure Diagram/Material

● CKLB2-20CS to 100CS

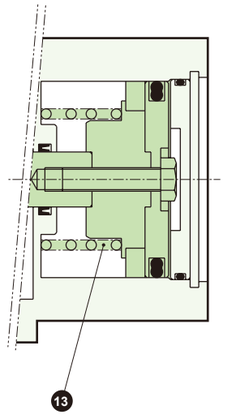
Standard (double acting) type



O (normally open) type



C (normally closed) type



Do not disassemble

Part No.	Part Name	Material	Remarks
1	Center cover	Stainless Steel	
2	Finger	Steel	
3	Piston A	20CS to 32CS: Stainless steel 40CS to 100CS: Carbon steel	
4	Piston B	Aluminum Alloy	
5	Piston C	Aluminum Alloy	
6	Body	Aluminum Alloy	

Part No.	Part Name	Material	Remarks
7	Cover	Aluminum Alloy	
8	Retaining ring	20CS to 63CS: Stainless Steel 80CS, 100CS: Steel	
9	Rod Packing	Nitrile Rubber	
10	Magnet		
11	Piston Packing	Nitrile Rubber	
12	Gasket	Nitrile Rubber	
13	Coil Spring	Stainless Steel	O, C only



3-Jaw Bearing Chuck, Double Acting/Single Acting

CKG Series

●Operating stroke: 6, 8, 11, 16 mm

Double Acting | Single Acting (Normally Open) | Single Acting (Normally Closed)

RoHS

Model No. Notation Method

Without Switch
(Built-in magnet for switch)

CKG – 16CS – O G Y11

Model No. ① ② ③ ④

With Switch
(Built-in magnet for switch)

CKG – 16CS – O G Y11 – T2H – R

Model No. ① Bore size ② Actuation method ③ Rubber Cover ④ Attachment ⑤ Switch Model No. ⑥ Number of Switches

① Bore Size (mm)

Code	Content
16CS	ø16
25CS	ø25
32CS	ø32
40CS	ø40
50CS	ø50

② Actuation method

Code	Content
Blank	Standard (Double Acting)
O	Single acting type (Normally open:)
C	Single acting type (Normally closed:)

③ Rubber Cover

Code	Content
Blank	Without Rubber Cover
G	With Rubber Cover (Nitrile Rubber)

④ Attachment

Code	Content
Blank	Without attachments
Y11	With attachments Material (S50C) For Outer Diameter Chuck (attachment No.: 510 to 540, 710)
Y12	With attachments Material (S50C)vFor Inner Diameter Chuck (attachment No.: 610 to 630) (ø25 to ø40 only)
Y21	With attachments Material (MC Nylon) For Outer Diameter Chuck (attachment No.: 510 to 540, 710)
Y22	With attachments Material (MC Nylon) For Inner Diameter Chuck (attachment No.: 610 to 630) (ø25 to ø40 only)

Note) For the outline dimensions and compatible models of the attachments, refer to P. 486. When ordered as an option, it will be shipped included with a quantity of 3.

⑤ Switch Model No.

For switch details, please refer to P. 573. Switches are included to 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 20 *2	T2H□	T2V□	
		3-wire (NPN)	-	30 or less	-	100 or less	T3H□	T3V□	
	1-Color Flexible Lead Wire Type	2-wire	-	10 to 30	-	5 to 20 *2	T2HR3	T2VR3	

*Lead wire length

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

Example) Lead wire length
1m T2H
3m T2H3
5m T2H5

*1: For "□" in the switch model No., enter the code selected from the "□Lead wire length" table.
*2: 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 switch model numbers are also available. (Custom Product) For details, see P. 573.

⑥ Number of Switches

Code	Content
R	With 1 pc. on Open Side
H	With 1 pc. on Close Side
D	With 2 pcs

Note) When 2 switches are included, for models with a short operating stroke, both switches may turn ON depending on the size of the workpiece. Please be careful.

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

●Design compatible with rechargeable battery manufacturing process

CKG – •••• – 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

CKG – •••• – FP1

Switch Single Unit Model No. Notation Method

CKG-16CS to 50CS
[T-type Switch]

SW – T2H

⑤ Switch Model No.

CKG-50CS

●For switch T□H□

[Switch Body + Mounting Bracket Kit] *1

CKG – T2H

⑤ Switch Model No.

[Mounting Bracket Kit] *1

CKG – T

●For switch T□V□

[Switch Body + Mounting Bracket Kit] *1

CKG – T2V – R

⑤ Switch Model No.

Code	Content
R	Open side
H	Closed side

[Mounting Bracket Kit] *1

CKG – TV – R

Code	Content
R	Open side
H	Closed side

*1: The weight of the mounting bracket is 1.5 g.

Specifications

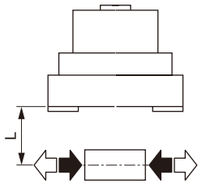
Item			CKG				
Size			16CS	25CS	32CS	40CS	50CS
Bore size		mm	ø16	ø25	ø32	ø40	ø50
Actuation method			Double Acting/Single Acting Type				
Operating Fluid			Compressed Air				
Max. Working Pressure		MPa	0.7				
Min. working pressure *	Double Acting	MPa	0.1				
	Normally Open		0.3				
	Normally Closed						
Ambient Temperature		°C	5 to 60				
Port Size			M5				
Operating stroke		mm	6		8	11	16
Rod diameter		mm	ø9	ø10	ø14	ø18	ø20
Internal volume (reciprocating)		cm³	1.0	2.2	5.1	10.1	36.1
Repeatability		mm	±0.01				
Weight		kg	0.24	0.47	0.80	1.4	2.3
Lubrication			Not required (When lubricating, use turbine oil Class 1 ISO VG32)				

* When a rubber cover (option) is attached, min. working pressure is 16CS: 0.2MPa, 25CS to 50CS: 0.15 MPa.

Gripping Force Performance Data

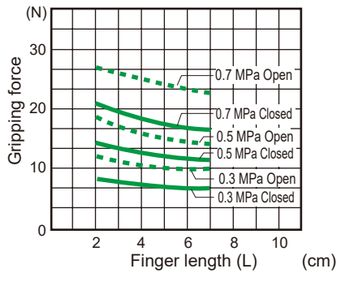
- Gripping force represents the thrust (for one finger) in the direction of the arrow shown in the figure.
- The gripping force in the opening/closing directions with finger length L of hand with a supply pressure of 0.3, 0.5 and 0.7 MPa is shown.

●Open direction (⇦)- - - - - - - (broken line)
●Closing direction (➡)—— (solid line)

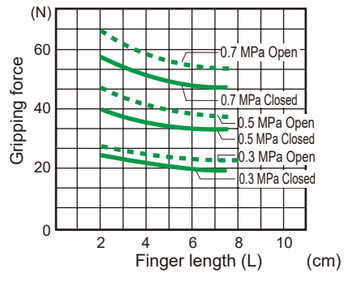


Note) O type gripping force is approx. 20 to 30 % lower in the closing direction compared to the double acting type. C type gripping force is approx. 10 to 20 % lower in the opening direction compared to the double acting type.
When selecting, check the design and selection precautions on P. 490.

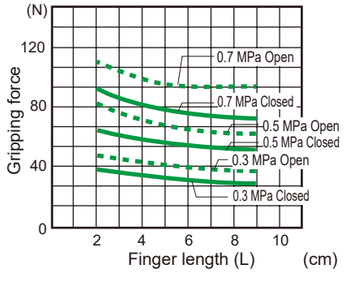
CKG-16CS



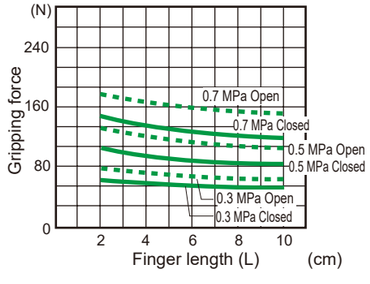
CKG-25CS



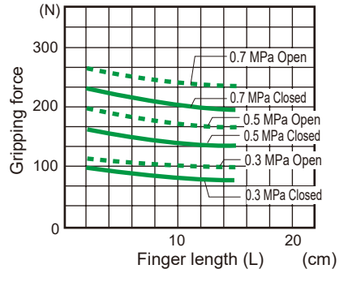
CKG-32CS



CKG-40CS



CKG-50CS



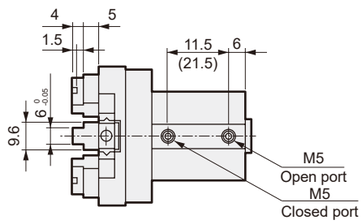
MEMO

Check Valve
CKW-HP
CKL2
CKLG2
CKL2 -□-HC
CKH2
CKLB2
CKG
CK
CKA
CKS
CKS-F
CKF
CKJ
Cylinder Switch
Ending

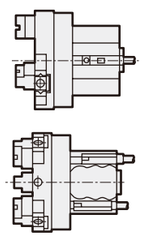
Outline Dimension Drawing

● CKG-16CS Standard/O/C

· Dimensions in ( ) are for O [Normally Open] and C [Normally Closed] specifications.

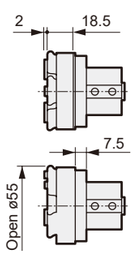


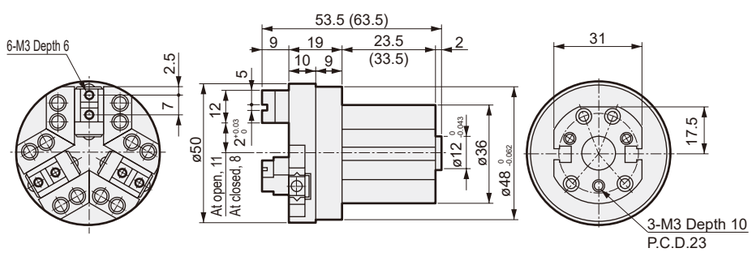
● With Switch



Note) For both T□H, T□V, the switch protrudes from the main body head side end face.

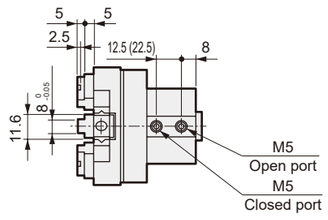
● With rubber cover



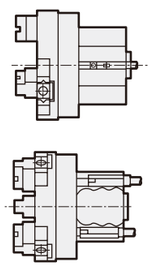


● CKG-25CS Standard/O/C

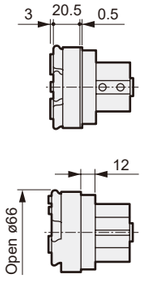
· Dimensions in ( ) are for O [Normally Open] and C [Normally Closed] specifications.

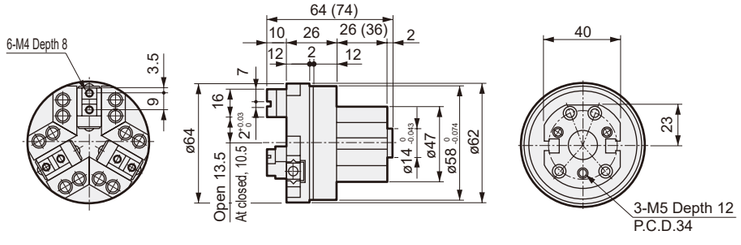


● With Switch



● With rubber cover

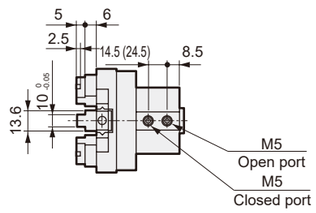




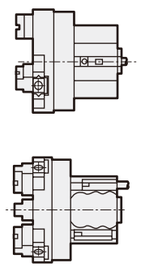
Outline Dimension Drawing

● CKG-32CS Standard/O/C

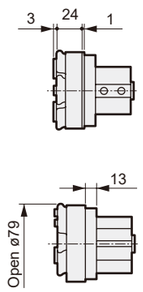
· Dimensions in ( ) are for O [Normally Open] and C [Normally Closed] specifications.

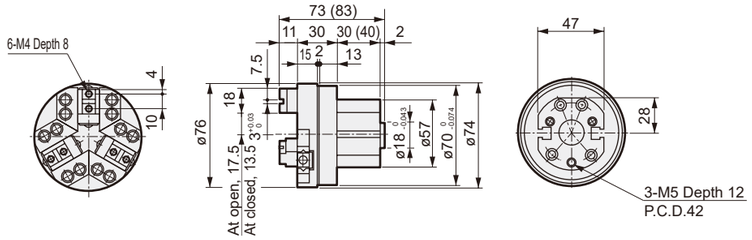


● With Switch



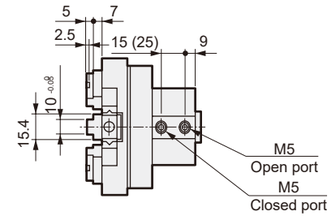
● With rubber cover



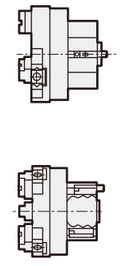


● CKG-40CS Standard/O/C

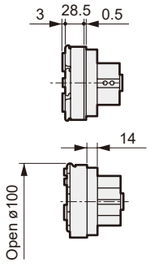
· Dimensions in ( ) are for O [Normally Open] and C [Normally Closed] specifications.

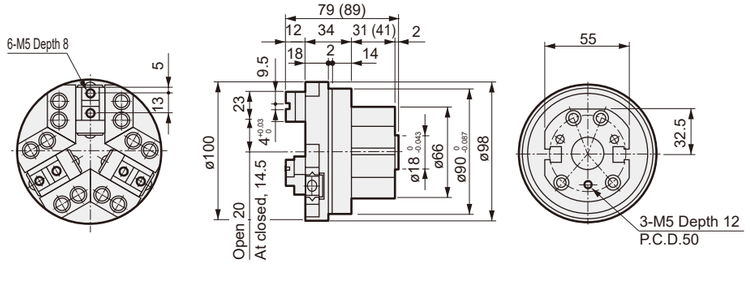


● With Switch



● With rubber cover

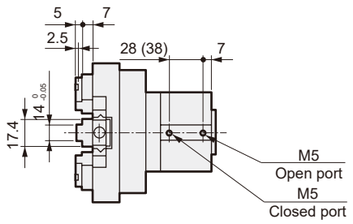




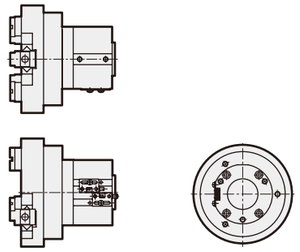
Outline Dimension Drawing

● CKG-50CS Standard/O/C

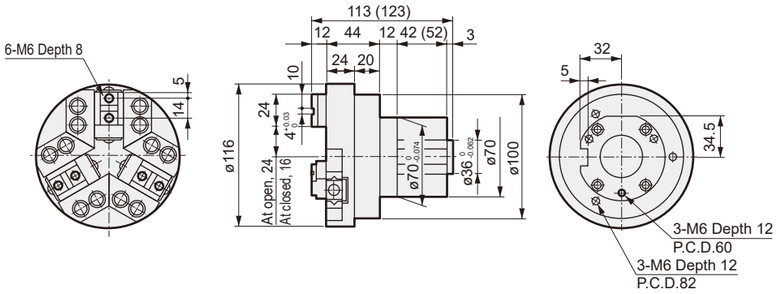
· Dimensions in ( ) are for O [Normally Open] and C [Normally Closed] specifications.



●With Switch



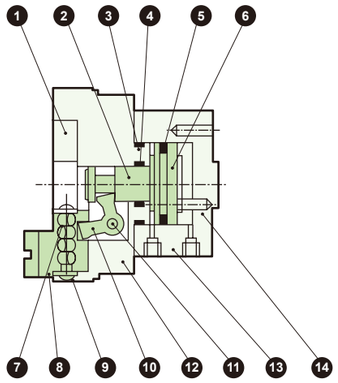
● With rubber cover



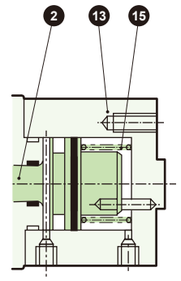
Internal Structure Diagram/Material

● CKG-16CS to 40CS

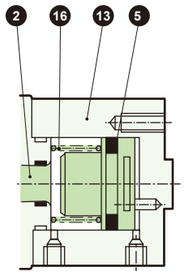
• Standard type



• O (normally open) type

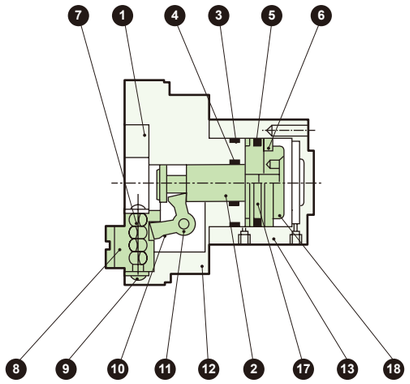


• C (normally closed) type

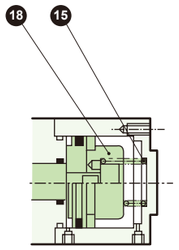


● CKG-50CS

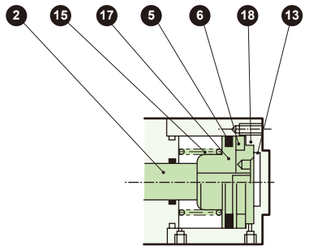
• Standard type



• O (normally open) type



• C (normally closed) type



Do not disassemble

Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Bearing guide	Steel		10	Arm	Steel	
2	Piston A	Stainless Steel		11	Pivot Shaft	Steel	
3	Gasket	Nitrile Rubber		12	Adapter	Aluminum Alloy	
4	Rod Packing	Nitrile Rubber		13	Body	Aluminum Alloy	
5	Piston Packing	Nitrile Rubber		14	Non-Rotating	Stainless Steel	
6	Magnet			15	Coil Spring	Stainless Steel	O type only
7	Cross Roller	Alloy Steel		16	Coil Spring	Stainless Steel	C type only
8	Finger	Steel		17	Piston B	Stainless Steel	
9	Bearing Retainer	Steel		18	Piston C	Stainless Steel	



3-Jaw Long Stroke Chuck Double Acting/Single Acting

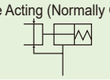
CK Series

●Operating stroke: 20, 40 mm

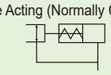
Double Acting



Single Acting (Normally Open)



Single Acting (Normally Closed)



RoHS

Model No. Notation Method

Without Switch
(Built-in magnet for switch)

CK - 1CS - O - Y1

Model No. ❶ ❷ ❸

With Switch
(Built-in magnet for switch)

CK - 1CS - O - Y1 - T3H - R

Model No. ❷ Actuation method ❹ Switch Model No.
❶ Bore size ❸ Attachment ❺ Number of Switches

❶ Bore Size (mm)

Code	Content
1CS	ø25
1.5CS	ø44
2CS	ø44

❷ Actuation method

Code	Content
Blank	Standard (Double Acting)
O	Single Acting Type (Normally Open:)
C	Single Acting Type (Normally Closed:)

❸ Attachment

Code	Content
Blank	Without attachments
Y1	With attachments Material (S50C)
Y2	With attachments Material (MC Nylon)

Note) For the outline dimensions and compatible models of the attachments, refer to P. 486. When ordered as an option, it will be shipped included with a quantity of 3.

❹ Switch Model No.

For switch details, please refer to P. 573. Switches are included to 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 20 *2	T2H□	T2V□
		3-wire (NPN)	-	30 or less	-	100 or less	T3H□	T3V□
	1-Color Flexible Lead Wire Type	2-wire	—	10 to 30	—	5 to 20 *2	T2HR3	T2VR3



*1: For "□" in the switch model number, enter the code selected from the "*Lead wire length" 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: Switches other than the switch model numbers are also available. (Custom Product) For details, see P. 573.

***Lead wire length**

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

Example) Lead wire length
1 m T2H
3 m T2H3
5 m T2H5

❺ Number of Switches

	Code	Content
	R	With 1 pc. on Open Side
	H	With 1 pc. on Close Side
*	D	With 2 pcs

* When 2 switches are included, for models with a short operating stroke, both switches may turn ON depending on the size of the workpiece. Please be careful.

Switch Single Unit Model No. Notation Method

SW - T2H

❹ Switch Model No.

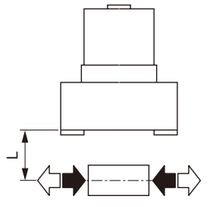
Specifications

Item		CK		
Size		1CS	1.5CS	2CS
Bore size	mm	ø25	ø44	
Actuation method		Double Acting/Single Acting Type		
Operating Fluid		Compressed Air		
Max. Working Pressure	MPa	0.7		
Min. Operating Pressure	MPa	0.3		
Ambient Temperature	°C	5 to 60		
Port Size		M5	Rc1/8	
Operating stroke	mm	20		40
Rod diameter	mm	ø12	ø16	
Internal volume (reciprocating)	cm³	7.9	26.4	52.8
Repeatability	mm	±0.03		
Weight	kg	0.85	1.90	2.90
Lubrication		Not required (When lubricating, use turbine oil Class 1 ISO VG32)		

Gripping Force Performance Data

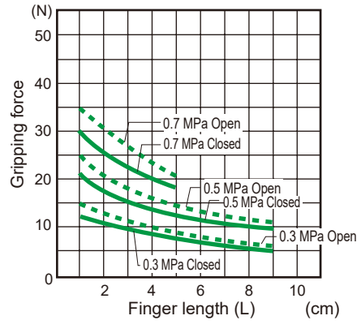
- Gripping force represents the thrust (for one finger) in the direction of the arrow shown in the figure.
- The gripping power in the opening/closing directions with finger length L of hand with a supply pressure of 0.3, 0.5 and 0.7 MPa is shown.

●Open direction (⇦)- - - -(broken line)
●Closing direction (➡)——(solid line)

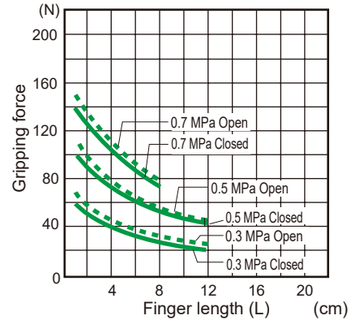


Note) O type gripping force is approx. 20 to 30 % lower in the closing direction compared to the double acting type. C type gripping force is approx. 10 to 20 % lower in the opening direction compared to the double acting type. When selecting, check the design and selection precautions on P. 490.

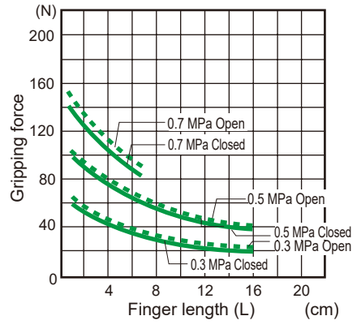
CK-1CS



CK-1.5CS



CK-2CS

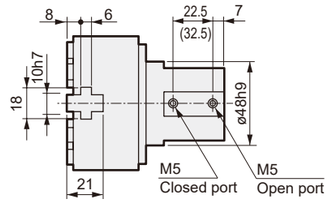


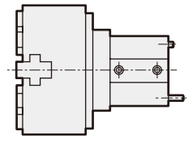
Outline Dimension Drawing

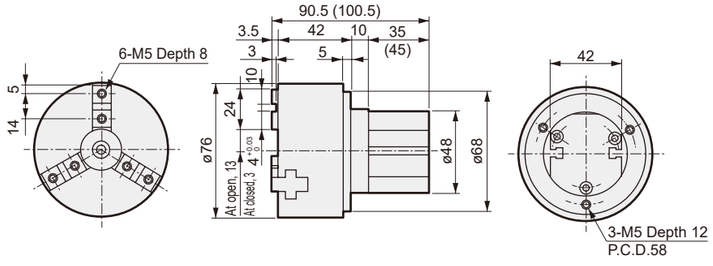
● CK-1CS Standard/O/C

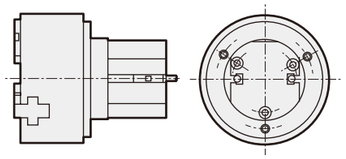
● ( ) Dimensions are for C (Normally Closed) type.

● With Switch





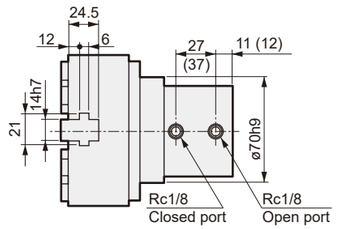


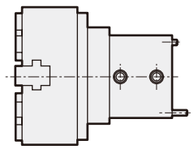


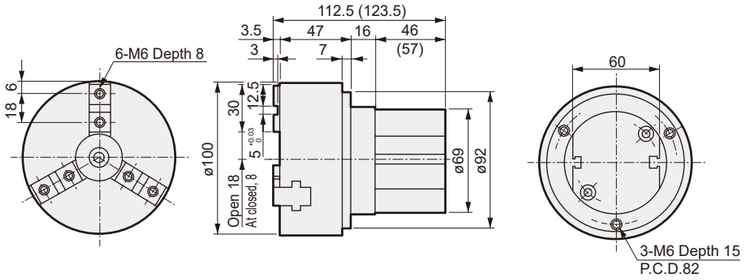
● CK-1.5CS Standard/O/C

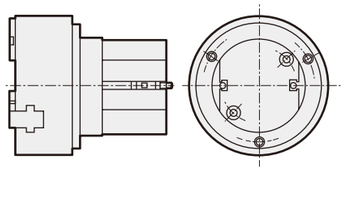
● ( ) Dimensions are for C (Normally Closed) type.

● With Switch







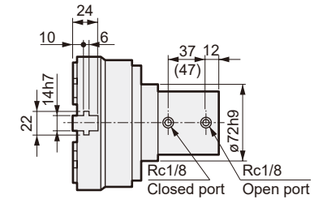


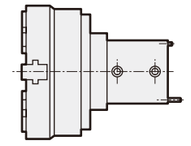
Outline Dimension Drawing

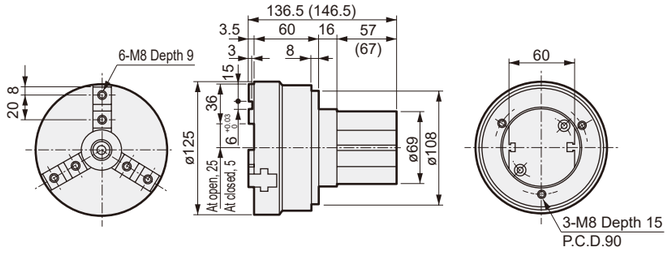
● CK-2CS Standard/O/C

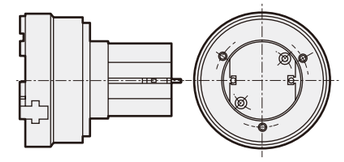
● ( ) Dimensions are for C (Normally Closed) type.

● With Switch



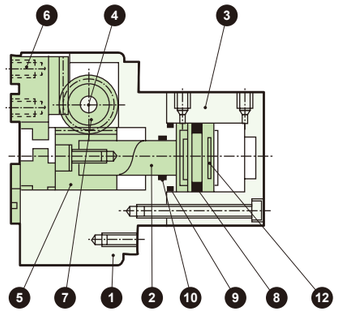




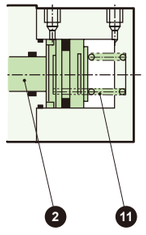


Internal Structure Diagram/Material

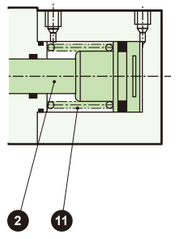
● Standard (double acting) type



● O (Normally Open) Type



● C (Normally Closed) Type



Do not disassemble

Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Adapter	Aluminum Alloy		7	Pinion gear	Steel	
2	Piston	Steel		8	Piston Packing	Nitrile Rubber	
3	Body	Aluminum Alloy		9	Gasket	Nitrile rubber	
4	Pinion gear shaft	Steel		10	Rod Packing	Nitrile Rubber	
5	Rack	Steel		11	Coil Spring	Stainless Steel	O, C only
6	Finger	Steel		12	Magnet		Nickel Plating

MEMO



3-Jaw Low Profile Chuck Double Acting/Single Acting

CKA Series

●Operating stroke: 5, 6, 7, 9, 20, 25, 30, 38 mm

Double Acting | Single Acting (Normally Open) | Single Acting (Normally Closed)

RoHS

Model No. Notation Method

Without Switch
(Built-in magnet for switch)

CKA – 15CS – O – Y11

Model No. ❶ ❷ ❸

With Switch
(Built-in magnet for switch)

CKA – 15CS – O – Y11 – T2H – R

Model No. ❷ Actuation method ❹ Switch Model No.
❶ Bore size ❸ Attachment ❺ Number of Switches

❶ Bore Size (mm)

Code	Content
15CS	ø16
20CS	ø25
25CS	ø32
30CS	ø40
40CS	ø50
50CS	ø63
60CS	ø80
70CS	ø100

❷ Actuation method

Code	Content
Blank	Standard (Double Acting)
O	Single acting type (Normally open:)
C	Single acting type (Normally closed:)

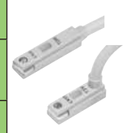
❸ Attachment

Code	Content
Blank	Without attachments
Y11	With attachments Material (S50C) For Outer Diameter Chuck (attachment No.: 510 to 540, 710 to 770) (15CS, 50CS to 70CS only)
Y12	With attachments Material (S50C) For Inner Diameter Chuck (attachment No.: 610 to 630) (20CS to 40CS only)
Y21	With attachments Material (MC Nylon) For Outer Diameter Chuck (attachment No.: 510 to 540, 710 to 770) (15CS, 50CS to 70CS only)
Y22	With attachments Material (MC Nylon) For Inner Diameter Chuck (attachment No.: 610 to 630) (20CS to 40CS only)

Note) Refer to pages 486, 487 for the external dimensions and compatible models of the attachments. When ordered as an option, it will be shipped included with a quantity of 3.

❹ Switch Model No.

For switch details, please refer to P. 573. Switches are included to 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 20 *2	T2H□	T2V□	
		3-wire (NPN)	-	30 or less	-	100 or less	T3H□	T3V□	
	1-Color Flexible Lead Wire Type	2-wire	-	10 to 30	-	5 to 20 *2	T2HR3	T2VR3	

*1: For "□" in the switch model number, enter the code selected from the "*Lead wire length" table.
*2: 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: For ❶Bore sizes "50CS" to "70CS", the switch groove shape is different, so a mounting bracket is required when ordering the switch separately.
*4: Switches other than the switch model numbers are also available. (Custom Product) For details, see P. 573.

***Lead wire length**

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

Example) Lead wire length
1 m T2H
3 m T2H3
5 m T2H5

❺ Number of Switches

Code	Content
R	With 1 pc. on Open Side
H	With 1 pc. on Close Side
* D	With 2 pcs

* When 2 switches are included, for models with a short operating stroke, both switches may turn ON depending on the size of the workpiece. Please be careful.

Switch Single Unit Model No. Notation Method

CKA-15CS to 40CS

[T-type Switch]

SW – T2H

❹ Switch Model No.

CKA-50CS to 70CS

● For switch T□H□

[Switch Body + Mounting Bracket Kit] *1

CKA – T2H

❹ Switch Model No.

[Mounting Bracket Kit] *1

CKA – T

● For switch T□V□

[Switch Body + Mounting Bracket Kit] *1

CKA – T2V – R

❹ Switch Model No.

Code	Content
R	Open side
H	Closed side

[Mounting Bracket Kit] *1

CKA – TV – R

Code	Content
R	Open side
H	Closed side

*1 The weight of the mounting bracket is 1.5 g.

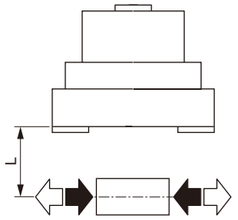
Specifications

Item		CKA							
Size		15CS	20CS	25CS	30CS	40CS	50CS	60CS	70CS
Bore size	mm	ø16	ø25	ø32	ø40	ø50	ø63	ø80	ø100
Actuation		Double Acting/Single Acting Type							
Operating Fluid		Compressed Air							
Max. Working Pressure	MPa	0.7							
Min. Operating Pressure	MPa	0.3							
Ambient Temperature	°C	5 to 60							
Port Size		M5						Rc1/8	
Operating stroke	mm	6	5	7	9	20	25	30	38
Rod diameter	mm	ø9	ø10	ø14	ø18	ø20		ø24	ø28
Internal volume (reciprocating)	cm³	1.0	2.2	5.1	10.1	36.1	76.9	148.8	294.0
Repeatability	mm	±0.03							
Weight	kg	0.11	0.25	0.42	0.61	1.41	2.6	4.5	6.4
Lubrication		Not required (When lubricating, use turbine oil Class 1 ISO VG32)							

Gripping Force Performance Data

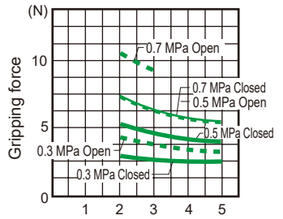
- Gripping force represents the thrust (for one finger) in the direction of the arrow shown in the figure.
- Indicates the gripping force for one finger of the hand with finger length L acting in the opening or closing directions when supplied with 0.3, 0.5, or 0.7 MPa pressure.

●Open direction (⇦)- - - -(broken line)
●Closing direction (➡)——(solid line)

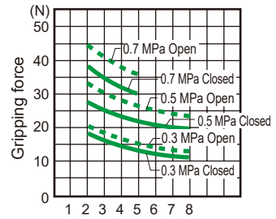


Note) O type gripping force is approx. 20 to 30 % lower in the closing direction compared to the double acting type. C type gripping force is approx. 10 to 20 % lower in the opening direction vcompared to the double acting type. When selecting, check the design and selection precautions on P. 490.

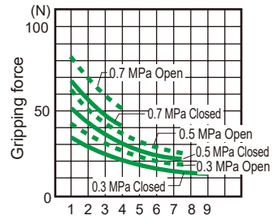
CKA-15CS



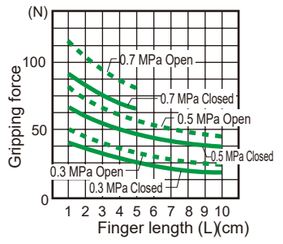
CKA-20CS



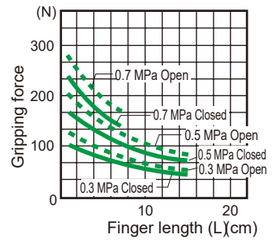
CKA-25CS



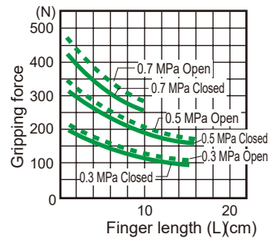
CKA-30CS



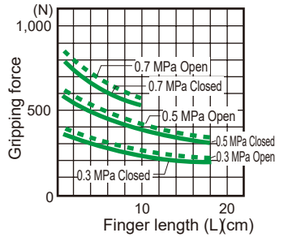
CKA-40CS



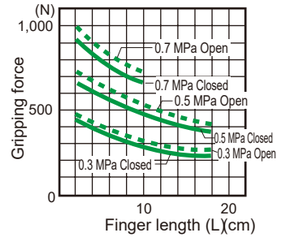
CKA-50CS



CKA-60CS



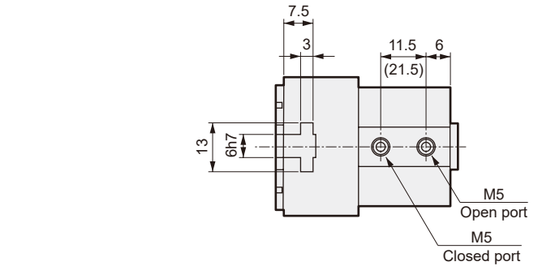
CKA-70CS



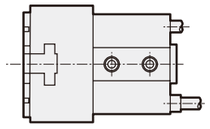
Outline Dimension Drawing

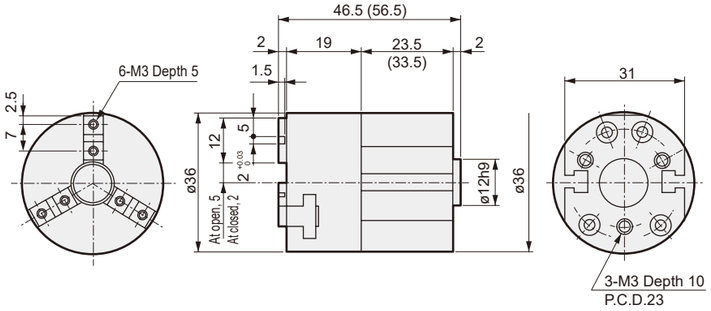
● CKA-15CS Standard/O/C

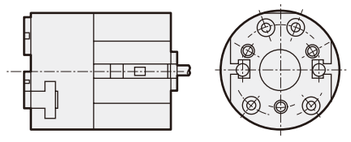
● ( ) Dimensions are for O (Normally Open) and C (Normally Closed) types.



● With Switch



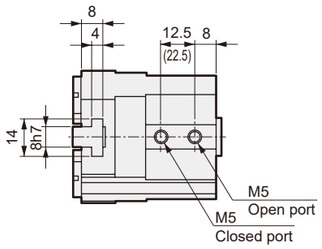




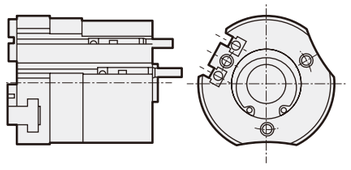
Note) For both T□H, T□V, the switch protrudes from the main body head side end face.

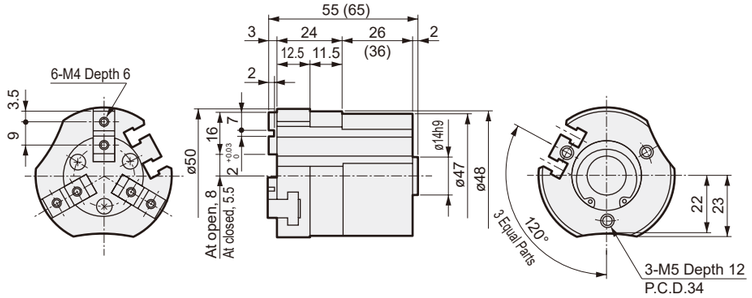
● CKA-20CS Standard/O/C

● ( ) Dimensions are for O (Normally Open) and C (Normally Closed) types.



● With Switch

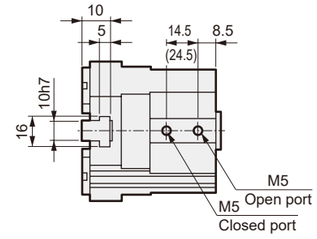




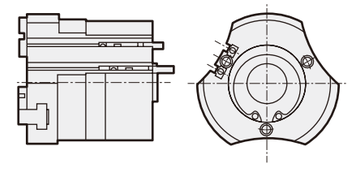
Outline Dimension Drawing

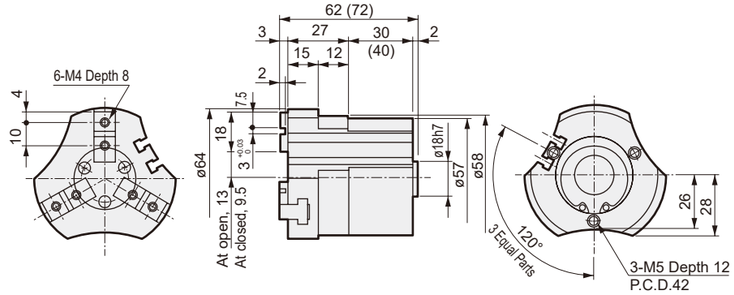
● CKA-25CS Standard/O/C

● ( ) Dimensions are for O (Normally Open) and C (Normally Closed) types.



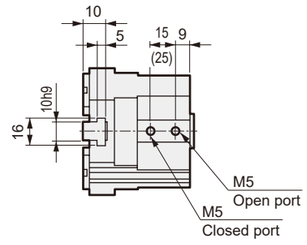
● With Switch



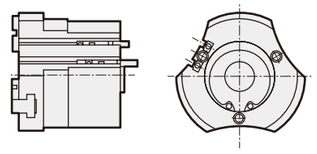


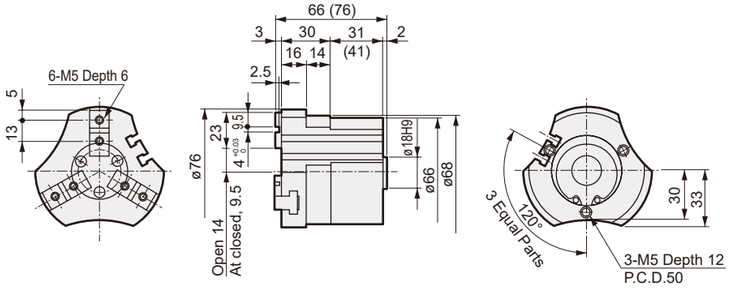
● CKA-30CS Standard/O/C

● ( ) Dimensions are for O (Normally Open) and C (Normally Closed) types.



● With Switch



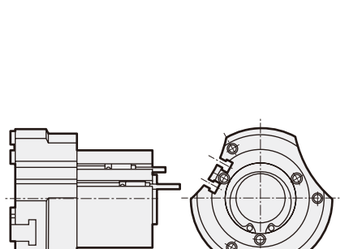


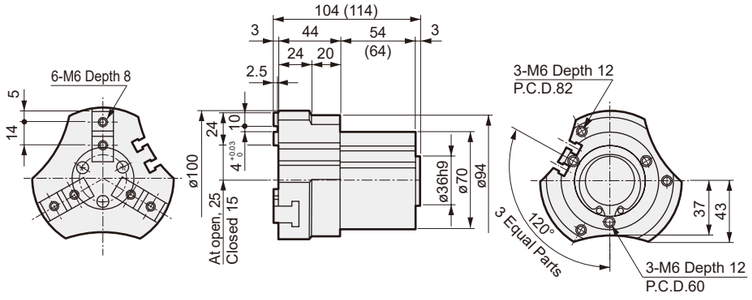
Outline Dimension Drawing

● CKA-40CS Standard/O/C

● ( ) Dimensions are for O (Normally Open) and C (Normally Closed) types.

●With Switch

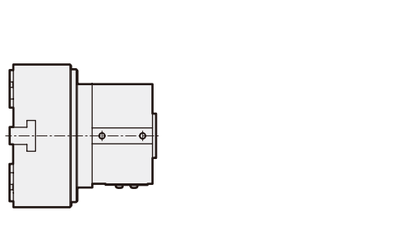


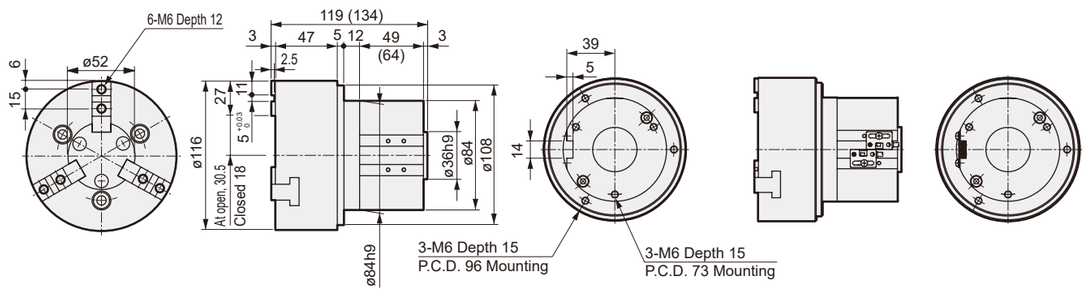


● CKA-50CS Standard/O/C

● ( ) Dimensions are for (Normally Closed) type.

● With Switch



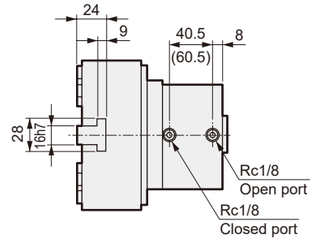


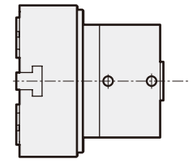
Outline Dimension Drawing

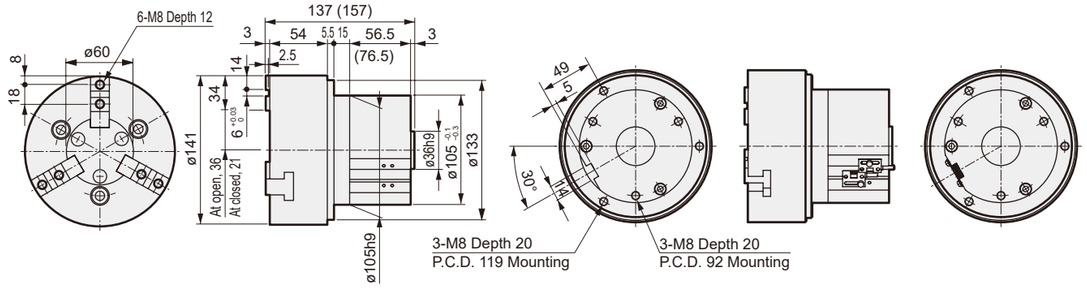
● CKA-60CS Standard/O/C

● ( ) Dimensions are for C (Normally Closed) type.

● With Switch



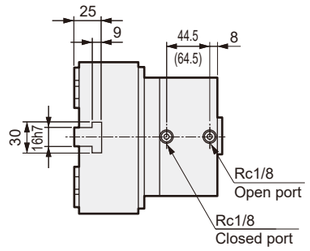


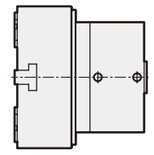


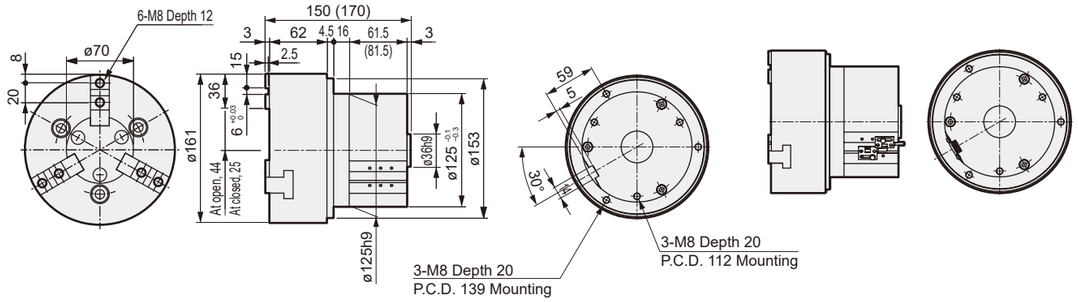
● CKA-70CS Standard/O/C

● ( ) Dimensions are for C (Normally Closed) type.

● With Switch



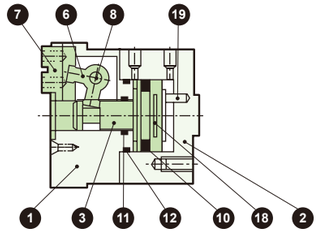




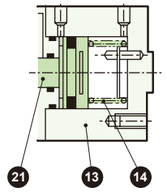
Internal Structure Diagram/Material

● CKA-15CS

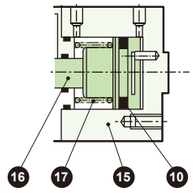
Standard (double acting) type



O (Normally Open) Type

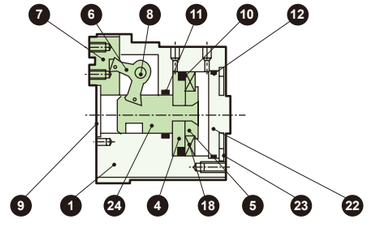


C (Normally Closed) Type

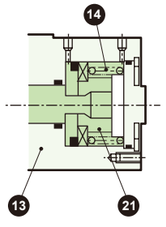


●CKA-20CS to 40CS

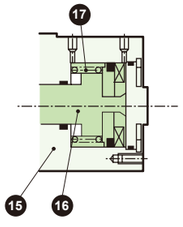
Standard (double acting) type



O (Normally Open) Type

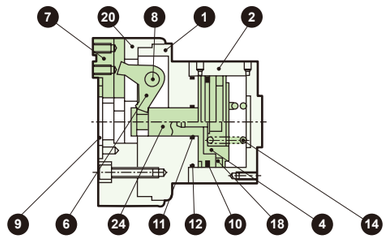


C (Normally Closed) Type

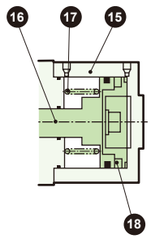


●CKA-50CS to 70CS

Standard (double acting), O (normally open) type



C (Normally Closed) Type



Do not disassemble

Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Adapter	Aluminum Alloy		13	O Body	Aluminum Alloy	
2	Body	Aluminum Alloy		14	O Spring	Steel	O type only
3	Piston A	Stainless Steel		15	C Body	Aluminum Alloy	
4	Piston B	Aluminum Alloy		16	C Piston Rod	Stainless Steel	
5	Piston C	Aluminum Alloy		17	C Spring	Steel	
6	Arm	Steel		18	Magnet	Plastic magnet	
7	Finger	Steel		19	Anti-rotation pin	Stainless Steel	
8	Pivot Shaft	Steel		20	Cover	Aluminum Alloy	
9	Center cover	Stainless Steel		21	O Piston B	Stainless Steel	
10	Piston Packing	Nitrile Rubber		22	Cover	Aluminum Alloy	
11	Rod Packing	Nitrile Rubber		23	Retaining ring	Stainless Steel	
12	Gasket	Nitrile Rubber		24	Piston	Aluminum Alloy	

Note) Structure varies somewhat depending on model.

MEMO



Low Profile Chuck

CKS Series

●Operating stroke: 10, 12, 16, 20, 28, 32 mm

Double Acting



RoHS

Model No. Notation Method

Without Switch
(Built-in magnet for switch)

CKS – 16CS – W Y1

Model No. ❶ ❷ ❸

With Switch
(Built-in magnet for switch)

CKS – 16CS – W Y1 – T2H – R

Model No. ❷ Option ❹ Switch Model No.
❶ Bore size ❸ Attachment ❺ Number of Switches

❶ Bore Size (mm)

Code	Content	
08CS	Opening direction	ø6
	Closing direction	ø8
12CS	Opening direction	ø10
	Closing direction	ø12
16CS	Opening direction	ø12
	Closing direction	ø16
20CS	Opening direction	ø16
	Closing direction	ø20
25CS	Opening direction	ø20
	Closing direction	ø25
32CS	Opening direction	ø25
	Closing direction	ø32

❷ Option

Code	Content
Blank	None
W	With Feather Key

❸ Attachment

Code	Content
Blank	Without attachments
Y1	With attachment Material: S50C
Y2	With attachment Material: MC Nylon

Note) For the outline dimensions and compatible models of the attachments, refer to P. 486. When ordered as an option, it will be shipped included with a quantity of 3.

❹ Switch Model No.

For switch details, please refer to P. 573. Switches are included to 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 20 *2	T2H□	T2V□	
		3-wire (NPN)	-	30 or less	-	100 or less	T3H□	T3V□	

*1: For "□" in the switch model number, enter the code selected from the "*Lead wire length" table.
*2: 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 switch model numbers are also available. (Custom Product) For details, see P. 573.

***Lead wire length**

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

Example) Lead wire length
1 m T2H
3 m T2H3
5 m T2H5

❺ Number of Switches

Code	Content
R	With 1 pc. on Open Side
H	With 1 pc. on Close Side
* D	With 2 pcs

* When 2 switches are included, for models with a short operating stroke, both switches may turn ON depending on the size of the workpiece. Please be careful.

Switch Single Unit Model No. Notation Method

SW – T2H

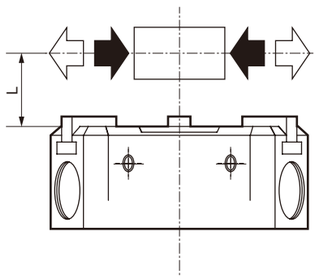
❹ Switch Model No.

Specifications

Item		CKS					
Size		08CS	12CS	16CS	20CS	25CS	32CS
Actuation method		Double Acting					
Operating Fluid		Compressed Air					
Max. Working Pressure	MPa	0.7					
Min. Operating Pressure	MPa	0.2					
Ambient Temperature	°C	5 to 60					
Port Size		M5					
Operating stroke	mm	10	12	16	20	28	32
Bore size	Opening direction	ø6x3	ø10x3	ø12x3	ø16x3	ø20x3	ø25x3
	Closing direction	ø8x3	ø12x3	ø16x3	ø20x3	ø25x3	ø32 × 3
Internal volume (reciprocating)	cm³	1.2	3.5	7.6	15.5	33.8	62.2
Repeatability	mm	±0.01					
Weight	kg	0.16	0.26	0.40	0.63	1.14	1.8
Lubrication		Not required (When lubricating, use turbine oil Class 1 ISO VG32)					

Gripping Force Performance Datav

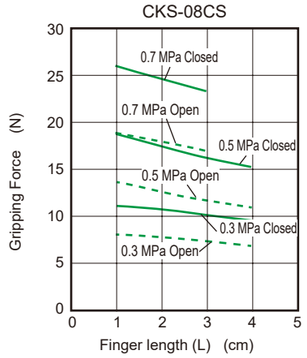
- Gripping force represents the thrust (for one finger) in the direction of the arrow shown in the figure.
- This represents the gripping force acting in the opening and closing directions at a gripper's finger length L when the supply pressure is 0.3, 0.5, and 0.7 MPa.



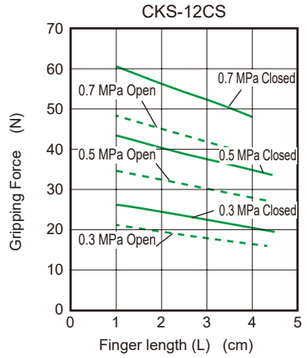
●Open direction (⇦)- - - - - -(broken line)
●Closing direction (➡)——(solid line)

Note) When selecting, check the design and selection precautions on P. 490.

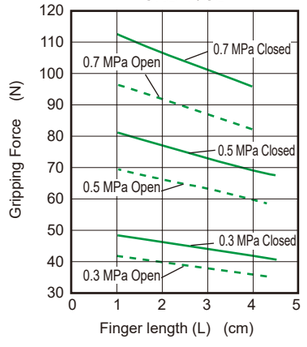
CKS-08CS



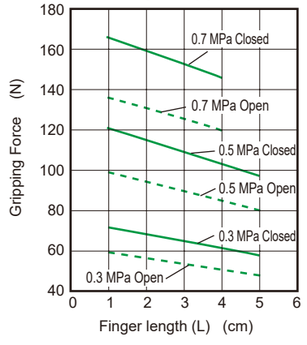
CKS-12CS



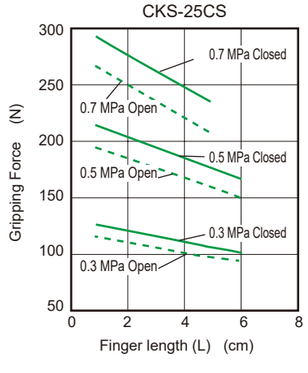
CKS-16CS



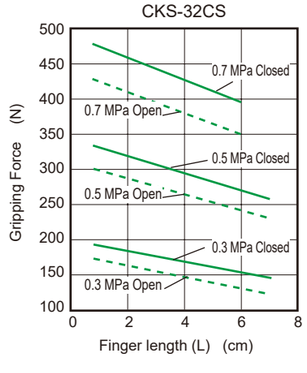
CKS-20CS



CKS-25CS

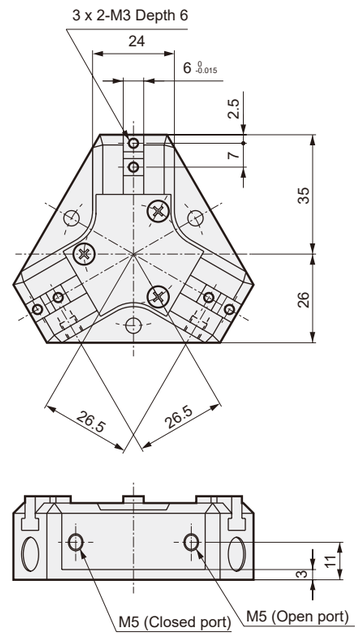


CKS-32CS

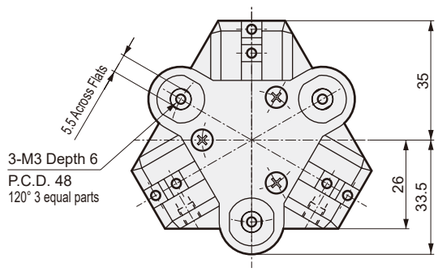


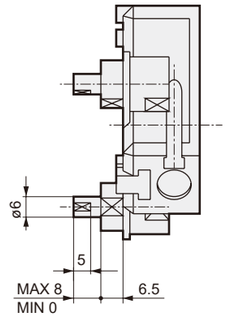
Outline Dimension Drawing

● CKS-08CS Standard

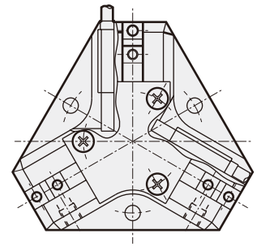


● CKS-08CS-W (With Feather Key) (Spring Force (3 pcs) 2.1 to 4.8N)



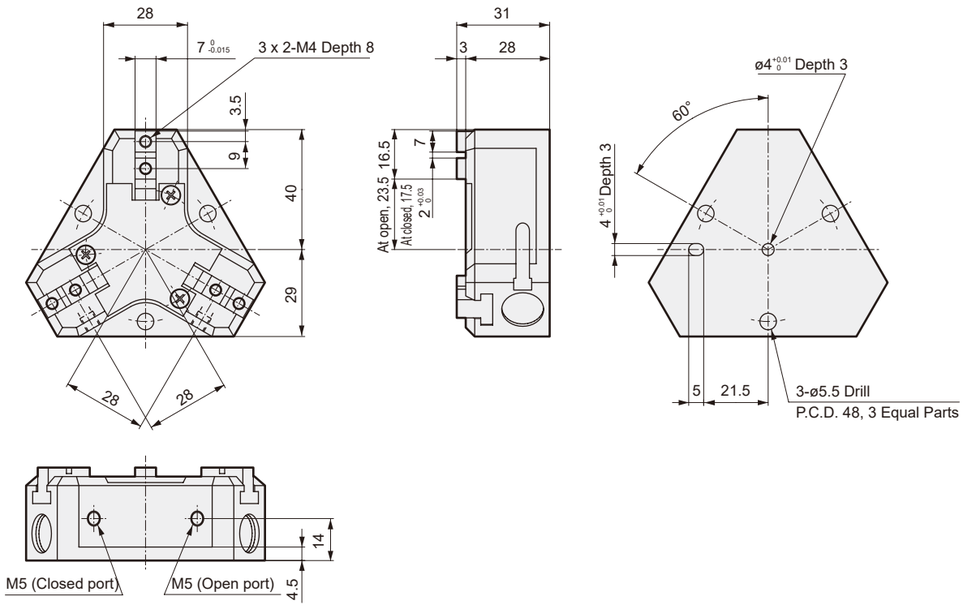


● With Switch



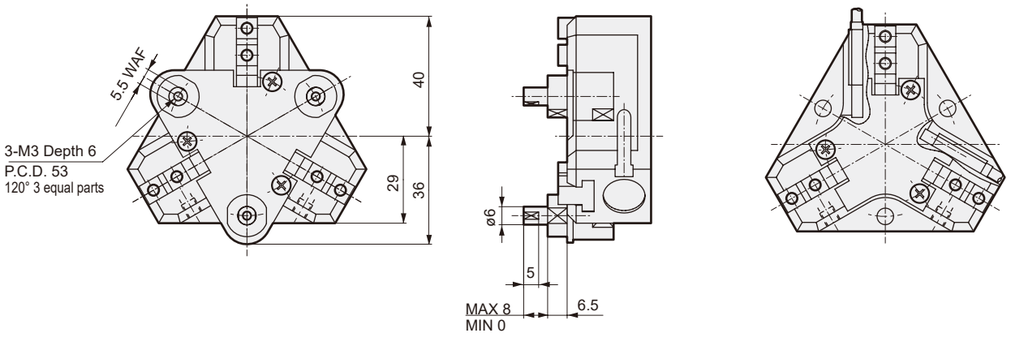
Outline Dimension Drawing

● CKS-12CS Standard



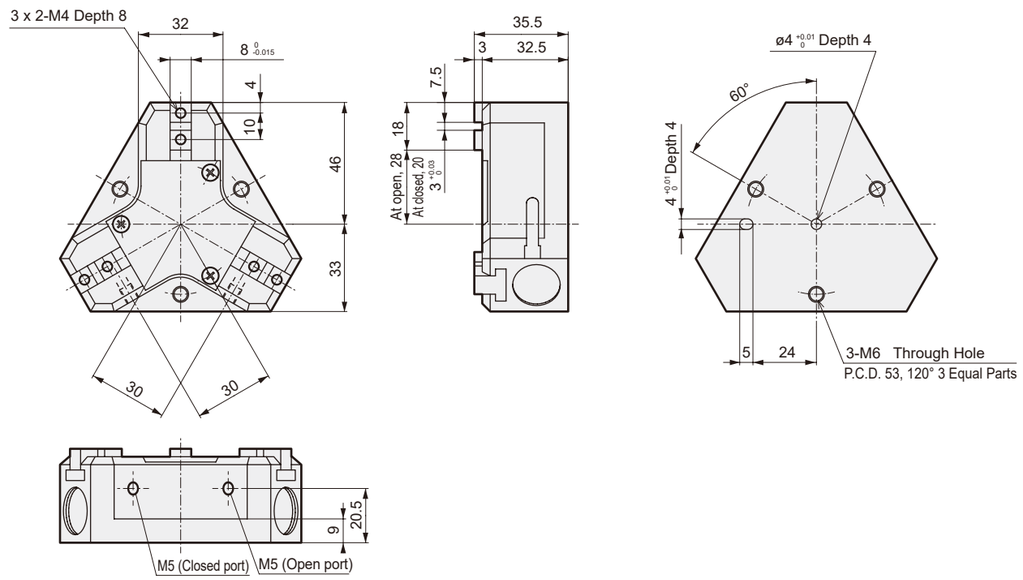
● CKS-12CS-W (With Feather Key) (Spring Force (3 pcs) 4.5 to 11.4N)

● With Switch



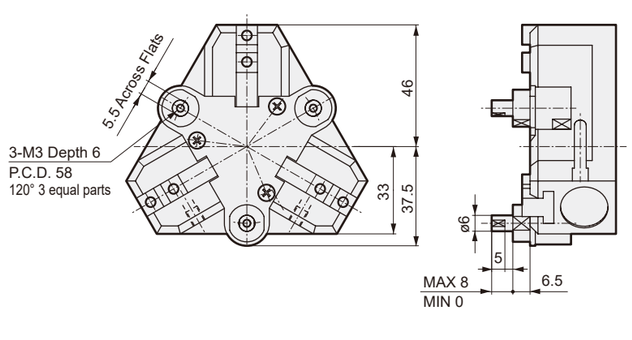
Outline Dimension Drawing

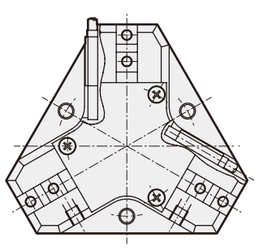
● CKS-16CS Standard



● CKS-16CS-W (With Feather Key) (Spring Force (3 pcs) 7.2 to 19N)

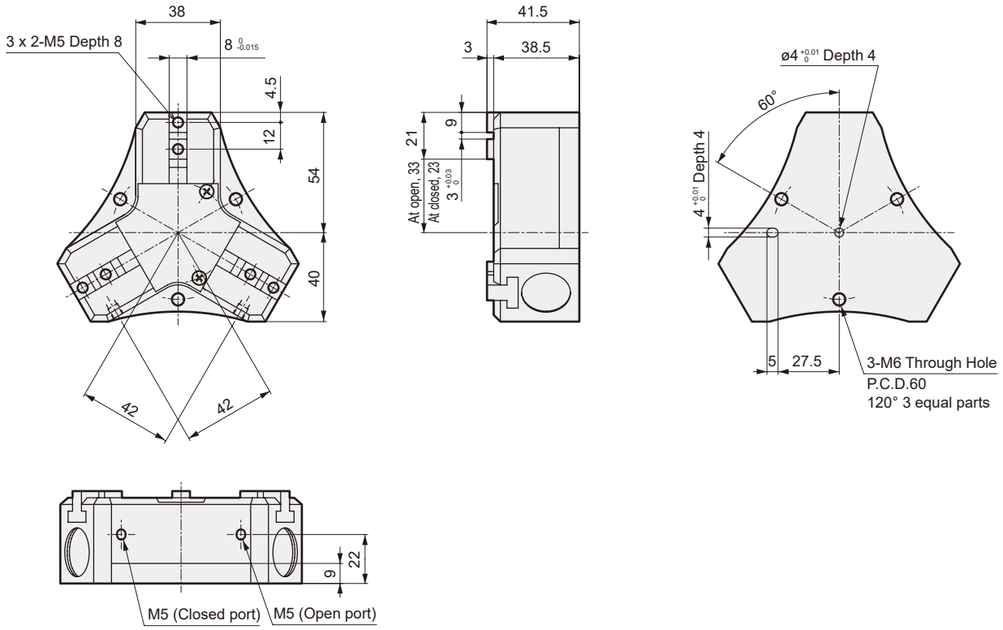
● With Switch



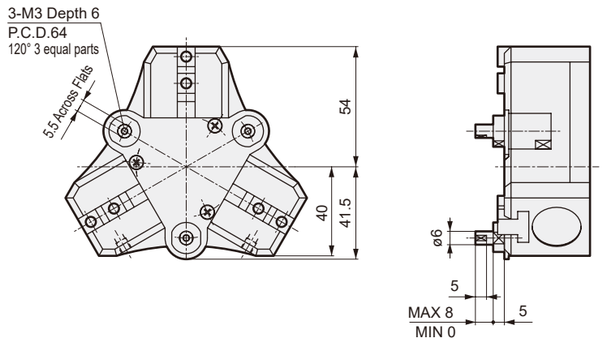


Outline Dimension Drawing

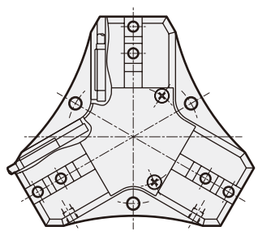
● CKS-20CS Standard



● CKS-20CS-W (With Feather Key) (Spring Force (3 pcs) 7.5 to 28N)

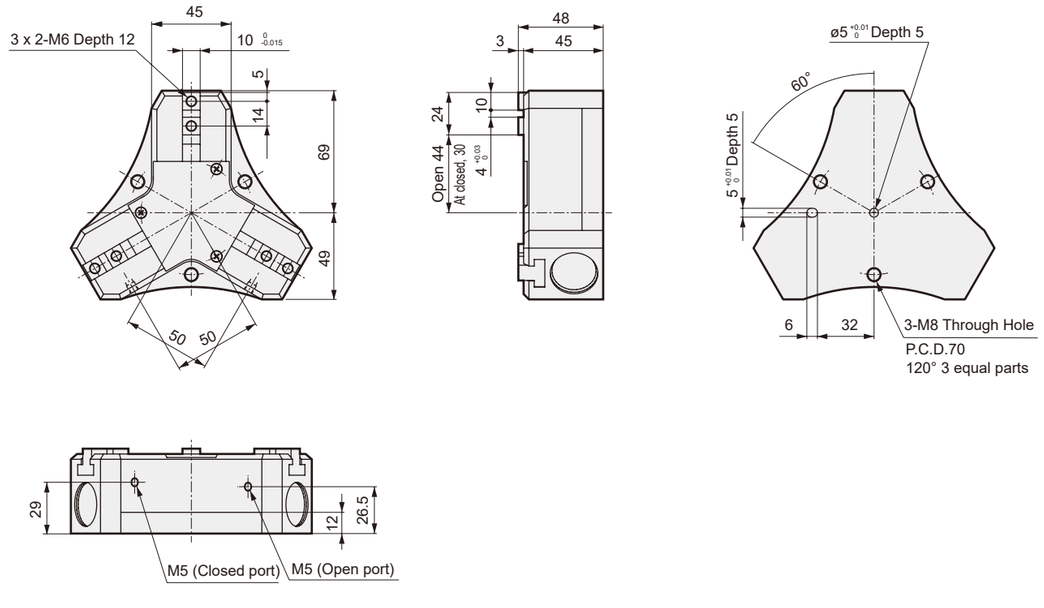


● With Switch

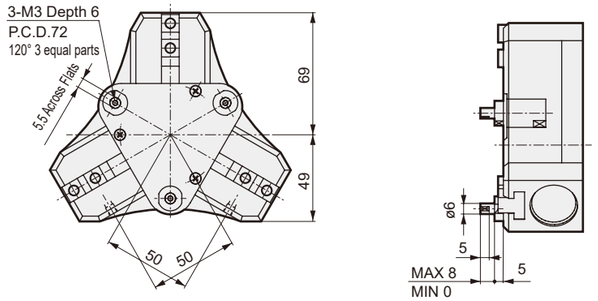


Outline Dimension Drawing

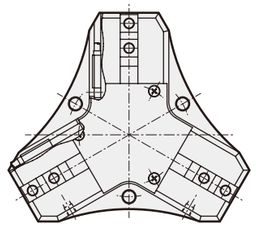
● CKS-25CS Standard



● CKS-25CS-W (With Feather Key) (Spring Force (3 pcs) 15 to 39N)

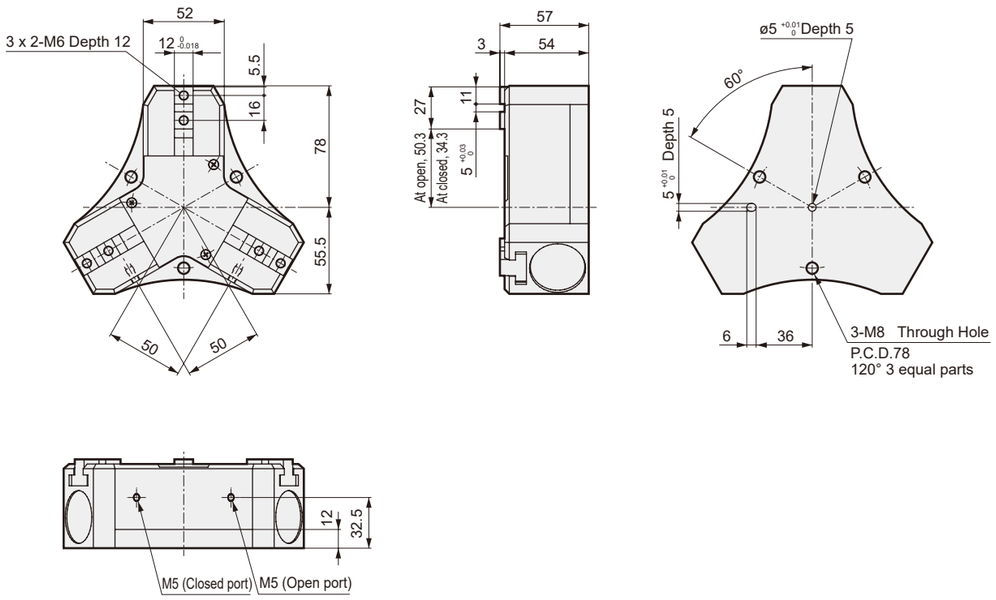


● With Switch

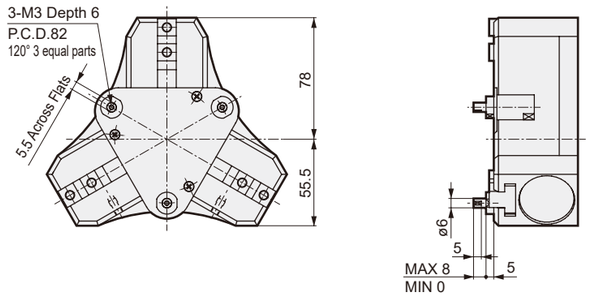


Outline Dimension Drawing

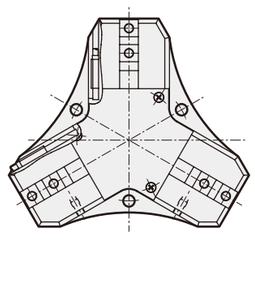
● CKS-32CS Standard



● CKS-32CS-W (With Feather Key) (Spring Force (3 pcs) 26 to 67N)

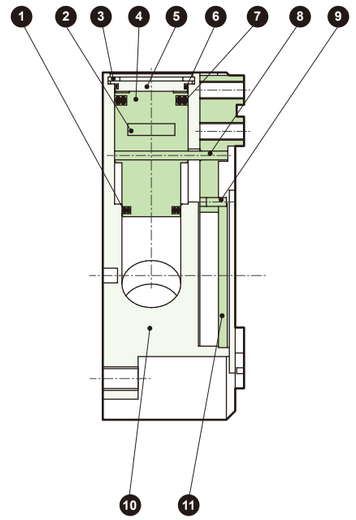


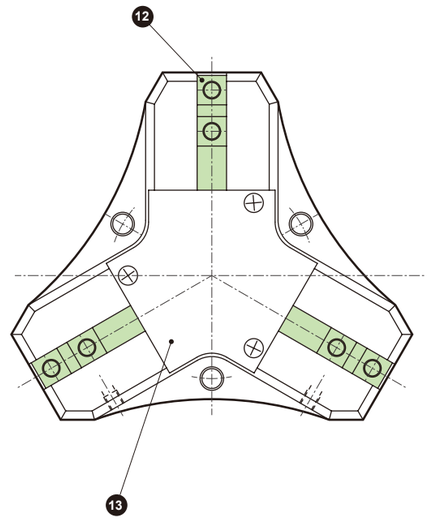
● With Switch



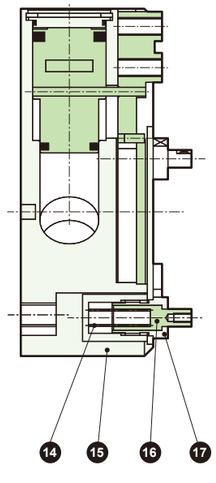
Internal Structure Diagram/Material

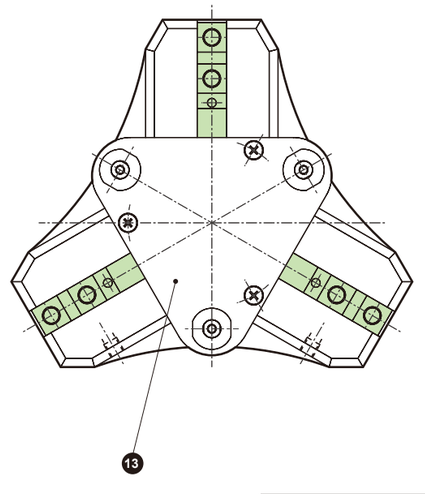
● CKS Standard





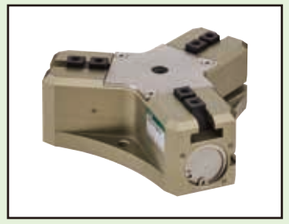
● W (With Feather Key)





Do not disassemble

Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Piston Seal B	Nitrile Rubber		10	Body	Aluminum Alloy	
2	Magnet			11	Link	Steel	
3	C-type retaining ring	Stainless Steel		12	Finger	Steel	
4	Piston	Aluminum Alloy		13	Center cover	Stainless Steel	
5	Cover	Aluminum Alloy		14	Coil Spring	Steel	
6	Seal	Nitrile Rubber		15	Case	Stainless Steel	
7	Piston Seal A	Nitrile Rubber		16	Pin	Stainless Steel	
8	Actuating shaft A	Alloy Steel		17	Nut	Stainless Steel	
9	Actuating shaft B	Alloy Steel					



Low Profile Chuck (Hollow Type)

CKS-F Series

●Operating stroke: 16, 20, 28, 32, 50 mm

Double Acting



RoHS

Specifications

Item		CKS-F				
Size		16CS	20CS	25CS	32CS	50CS
Actuation method		Double Acting				
Operating Fluid		Compressed Air				
Max. Working Pressure	MPa	0.7				
Min. Operating Pressure	MPa	0.2				
Ambient Temperature	°C	5 to 60				
Port Size		M5				
Operating stroke	mm	16	20	28	32	50
Bore size	Opening direction	ø12 x 3	ø16x3	ø20 x 3	ø25 x 3	ø40 x 3
	Closing direction	ø16 x 3	ø20 x 3	ø25 x 3	ø32 × 3	ø50 × 3
Internal volume (reciprocating)	cm³	7.6	15.5	33.8	62.2	242
Repeatability	mm	±0.01				
Weight	kg	0.40	0.63	1.14	1.8	5.76
Lubrication		Not required (When lubricating, use turbine oil Class 1 ISO VG32)				

Model No. Notation Method

Without Switch
(Built-in magnet for switch)

CKS-F - 16CS - Y1

Model No. ❶ ❷

With Switch
(Built-in magnet for switch)

CKS-F - 16CS - Y1 - T2H - R

Model No. ❷ Attachment ❹ Number of Switches ❶ Bore size ❸ Switch Model No.

❶ Bore Size (mm)

Code	Content	
16CS	Opening direction	ø12
	Closing direction	ø16
20CS	Opening direction	ø16
	Closing direction	ø20
25CS	Opening direction	ø20
	Closing direction	ø25
32CS	Opening direction	ø25
	Closing direction	ø32
50CS	Opening direction	ø40
	Closing direction	ø50

❷ Attachment

Code	Content
Blank	Without attachments
Y1	With attachment Material: S50C (16CS to 32CS only)
Y2	With attachment Material: MC nylon (16CS to 32CS only)

* Refer to P. 486, 487 for the external dimensions and compatible models of the attachments. When ordered as an option, it will be shipped included with a quantity of 3.

❸ Switch model Nos.

Refer to P. 573 for switch details. Switches are included to 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 20 Note 2	T2H□	T2V□	
		3-wire (NPN)	-	30 or less	-	100 or less	T3H□	T3V□	

*1: For "□" in the switch model number, enter the code selected from the "*Lead wire length" table.
*2: 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 switch model numbers are also available. (Custom Product) For details, see P. 573.

***Lead wire length**

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

Example) Lead wire length
1 m T2H
3 m T2H3
5 m T2H5

❹ Number of Switches

Code	Content
R	With 1 pc. on Open Side
H	With 1 pc. on Close Side
* D	With 2 pcs

* When 2 switches are included, for models with a short operating stroke, both switches may turn ON depending on the size of the workpiece. Please be careful.

Switch Single Unit Model No. Notation Method

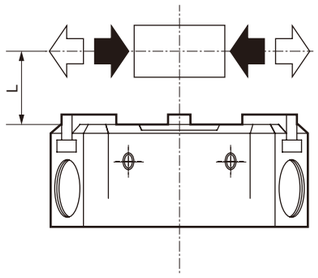
SW - T2H

❸ Switch Model No.

Gripping Force Performance Data

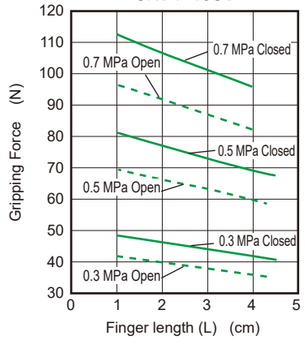
- Gripping force represents the thrust (for one finger) in the direction of the arrow shown in the figure.
- Indicates the gripping force for one jaw of the hand with finger length L acting in the opening or closing directions when supplied with 0.3, 0.5, or 0.7 MPa pressure.

●Open direction (⇦)------(broken line)
●Closing direction (➡)——(solid line)

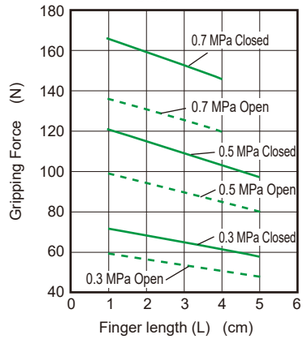


Note) When selecting, check the design and selection precautions on P. 490.

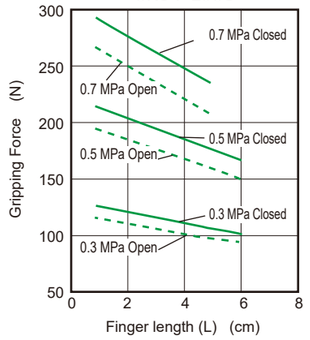
CKS-F-16CS



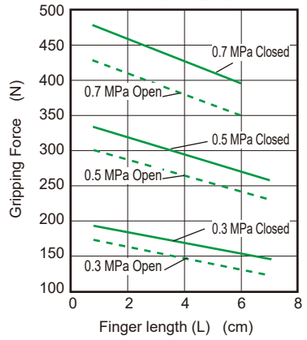
CKS-F-20CS



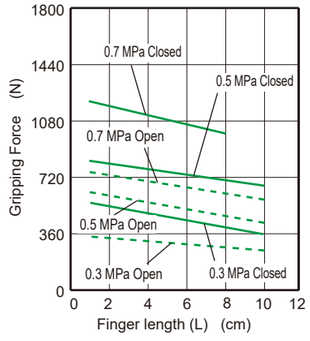
CKS-F-25CS



CKS-F-32CS



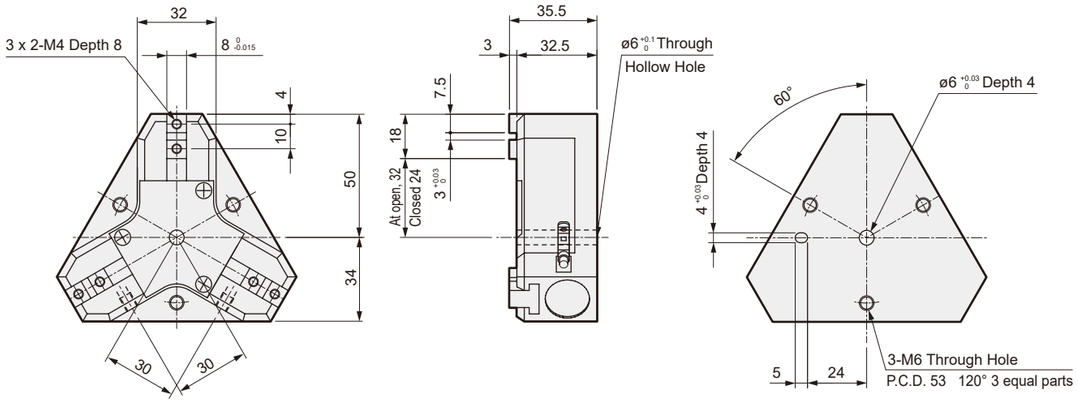
CKS-F-50CS

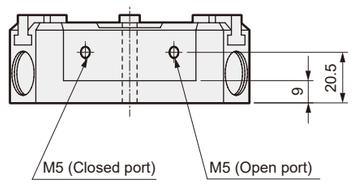


MEMO

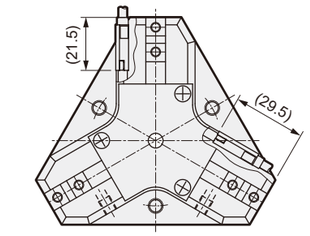
Outline Dimension Drawing

● CKS-F-16CS

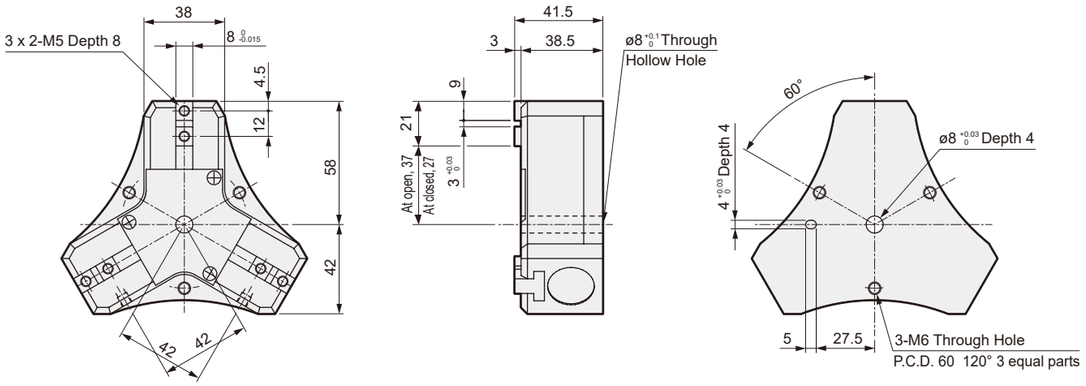


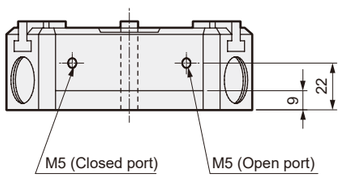


● With Switch

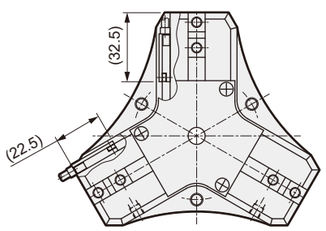


● CKS-F-20CS



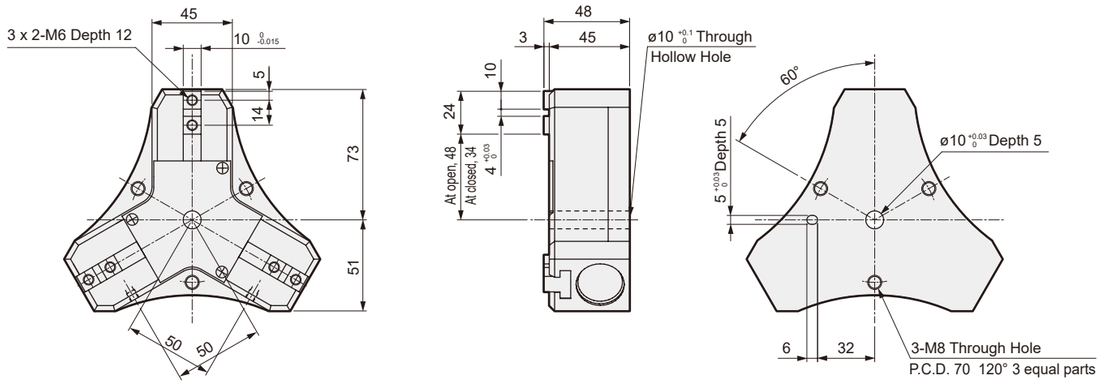


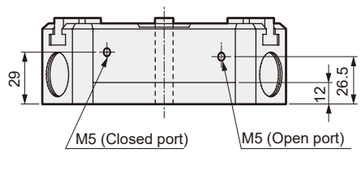
● With Switch



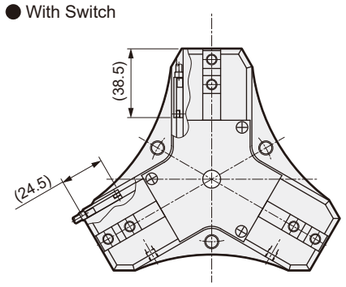
Outline Dimension Drawing

● CKS-F-25CS

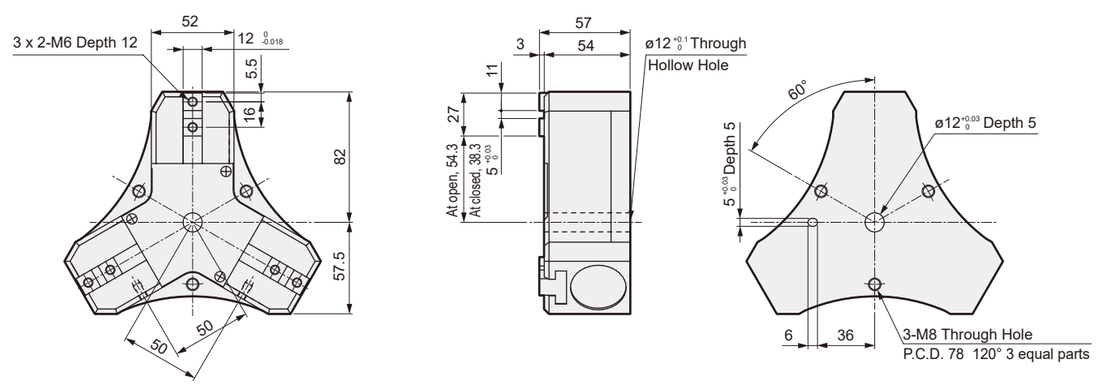


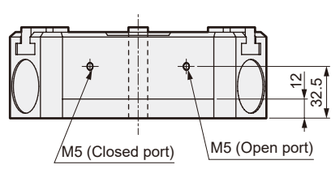


● With Switch

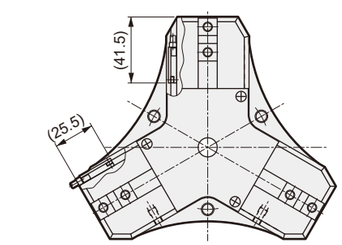


● CKS-F-32CS



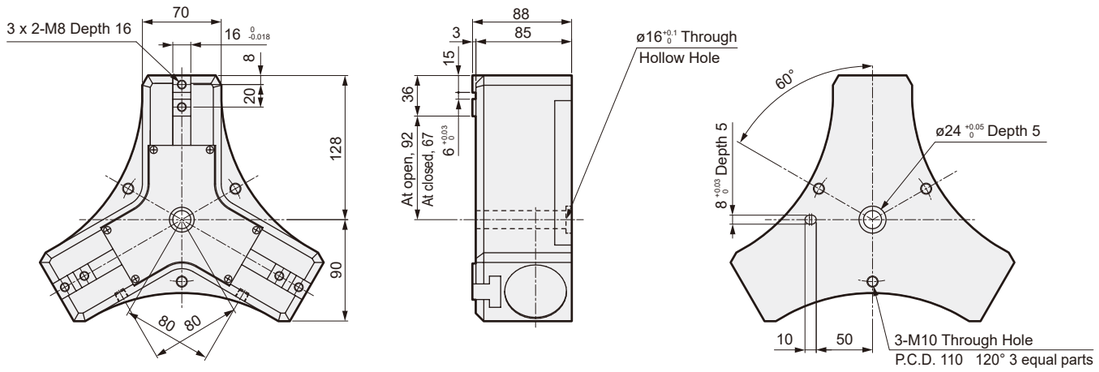


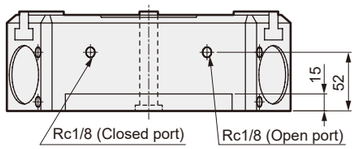
● With Switch



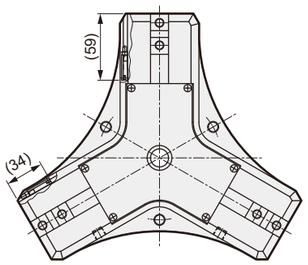
Outline Dimension Drawing

● CKS-F-50CS



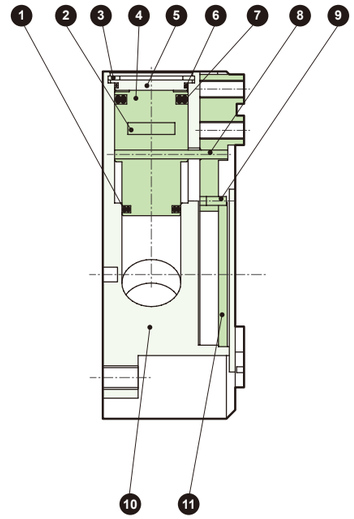


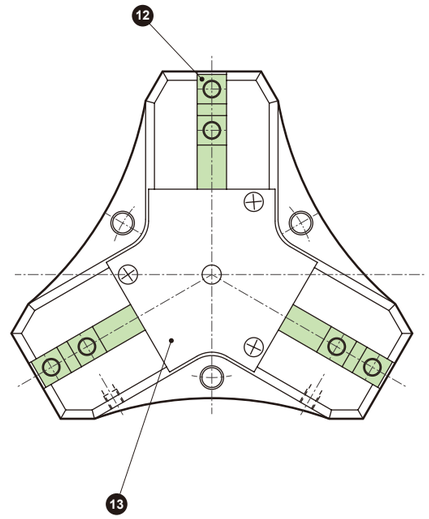
● With Switch



Internal Structure Diagram/Material

● CKS-F-16CS to 50CS





Do not disassemble

Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Piston Seal B	Nitrile Rubber		8	Actuating shaft A	Alloy Steel	
2	Magnet			9	Actuating shaft B	Alloy Steel	
3	C-type retaining ring	Stainless Steel		10	Body	Aluminum Alloy	
4	Piston	Aluminum Alloy		11	Link	Steel	
5	Cover	Aluminum Alloy		12	Finger	Steel	
6	Seal	Nitrile Rubber		13	Center cover	Stainless Steel	
7	Piston Seal A	Nitrile Rubber					



Hollow Chuck Double Acting/Single Acting

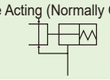
CKF Series

●Operating stroke: 5, 7, 8, 16 mm

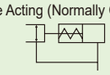
Double Acting



Single Acting (Normally Open)



Single Acting (Normally Closed)



RoHS

Model No. Notation Method

Without Switch
(Built-in magnet for switch)

CKF - 15CS - O - Y11

Model No. ❶ ❷ ❸

With Switch
(Built-in magnet for switch)

CKF - 15CS - O - Y11 - T2H - R

Model No. ❷ Actuation method ❸ Attachment ❹ Switch Model No. ❺ Number of Switches ❶ Bore size

❶ Bore Size (mm)

Code	Content
15CS	ø30
20CS	ø40
25CS	ø40
30CS	ø50
40CS	ø80

❷ Actuation method

Code	Content
Blank	Standard (Double Acting)
O	Single acting type (Normally open:)
C	Single acting type (Normally closed:)

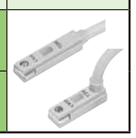
❸ Attachment

Code	Content
Blank	Without attachments
Y11	With attachments Material (S50C) For Outer Diameter Chuck (Attachment number: 510 to 540, 710)
Y12	With attachments Material (S50C) For Inner Diameter Chuck (Attachment number: 610 to 630) (20CS to 30CS)
Y21	With attachments Material (MC Nylon) For Outer Diameter Chuck (Attachment number: 510 to 540, 710)
Y22	With attachments Material (MC Nylon) For Inner Diameter Chuck (Attachment number: 610 to 630) (20CS to 30CS)

* Refer to P. 486, 487 for the external dimensions and compatible models of the attachments. When ordered as an option, it will be shipped included with a quantity of 3.

❹ Switch model Nos.

Refer to P. 573 for switch details. Switches are included to 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 20 *2	T2H□	T2V□	
		3-wire (NPN)	-	30 or less	-	100 or less	T3H□	T3V□	

*1: For "□" in the switch model number, enter the code selected from the "*Lead wire length" table.
*2: 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 switch model numbers are also available. (Custom Product) For details, see P. 573.

***Lead wire length**

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

Example) Lead wire length
1 m T2H
3 m T2H3
5 m T2H5

❺ Number of Switches

Code	Content
R	With 1 pc. on Open Side
H	With 1 pc. on Close Side
* D	With 2 pcs

* When 2 switches are included, for models with a short operating stroke, both switches may turn ON depending on the size of the workpiece. Please be careful.

Switch Single Unit Model No. Notation Method

CKF-15CS to 25CS
[T-type Switch]

SW - T2H

❹ Switch Model No.

CKF-30CS, 40CS
●For switch T□H□
[Switch Body + Mounting Bracket Kit] *1

CKF - T2H

❹ Switch Model No.

[Mounting Bracket Kit] *1

CKF - T

●For switch T□V□
[Switch Body + Mounting Bracket Kit] *1

CKF - T2V - R

❹ Switch Model No.

Code	Content
R	Open side
H	Closed side

[Mounting Bracket Kit] *1

CKF - TV - R

Code	Content
R	Open side
H	Closed side

*1 The weight of the mounting bracket is 1.5 g.

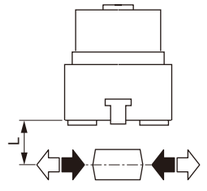
Specifications

Item		CKF				
Size		15CS	20CS	25CS	30CS	40CS
Bore size	mm	ø30	ø40		ø50	ø80
Actuation method		Double Acting/Single Acting Type				
Operating Fluid		Compressed Air				
Max. Working Pressure	MPa	0.7				
Min. Operating Pressure	MPa	0.3				
Ambient Temperature	°C	5 to 60				
Port Size		M5				
Operating stroke	mm	5		7	8	16
Rod diameter	mm	ø16	ø24		ø28	ø34
Internal volume (reciprocating)	cm³	2.5	5.2	7.3	13.3	73.2
Hollow Hole Diameter	mm	ø5.5	ø8.4	ø10.4	ø12	ø16
Repeatability	mm	±0.03				
Weight	kg	0.29	0.43	0.63	1.2	2.3
Lubrication		Not required (When lubricating, use turbine oil Class 1 ISO VG32)				

Gripping Force Performance Data

- Gripping force represents the thrust (for one finger) in the direction of the arrow shown in the figure.
- The gripping force in the opening/closing directions with finger length L of hand with a supply pressure of 0.3, 0.5 and 0.7 MPa is shown.

●Open direction (⇦)- - - -(broken line)
●Closing direction (➡)——(solid line)



Note) O type gripping force is approx. 20 to 30 % lower in the closing direction compared to the double acting type. C type gripping force is approx. 10 to 20 % lower in the opening direction compared to the double acting type.

When selecting, check the design and selection precautions on P. 490.

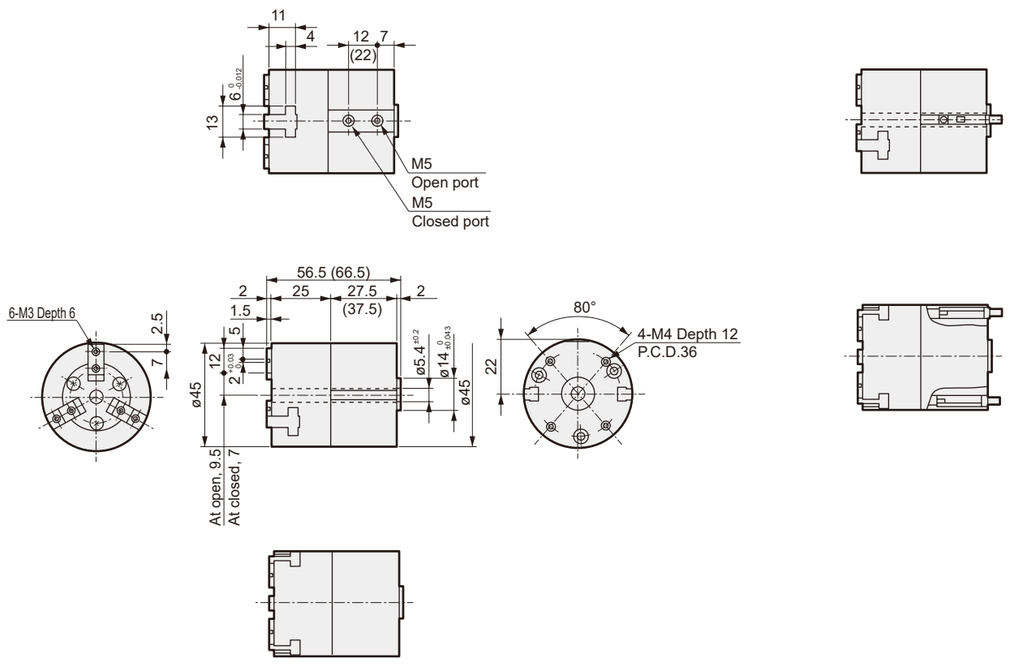
MEMO

Outline Dimension Drawing

● CKF-15CS Standard/O/C

· Dimensions in ( ) are for O [Normally Open] and C [Normally Closed] specifications.

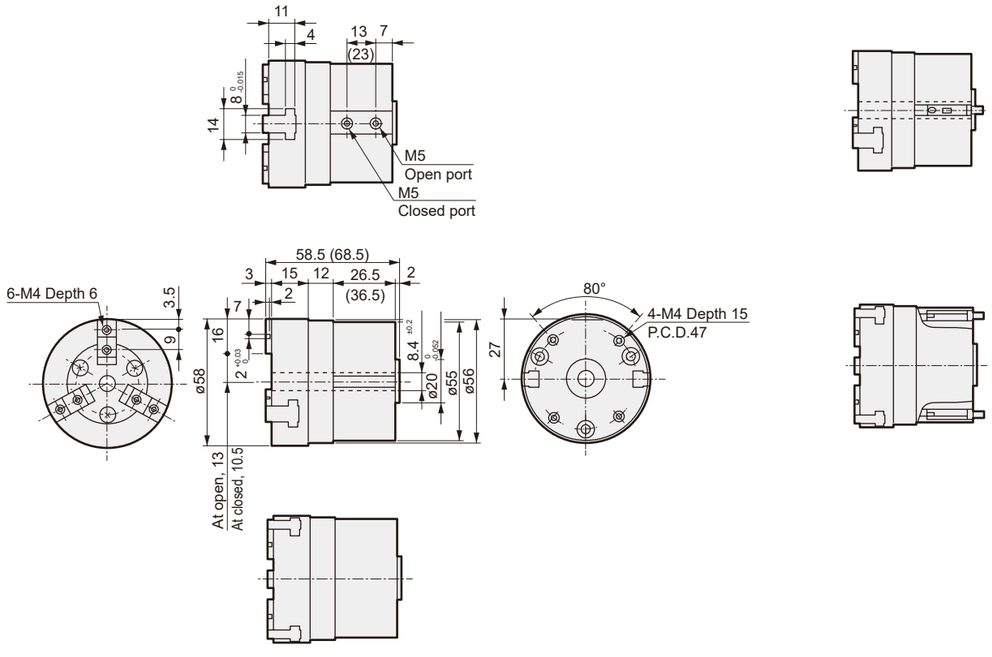
● With Switch



● CKF-20CS Standard/O/C

· Dimensions in ( ) are for O [Normally Open] and C [Normally Closed] specifications.

● With Switch

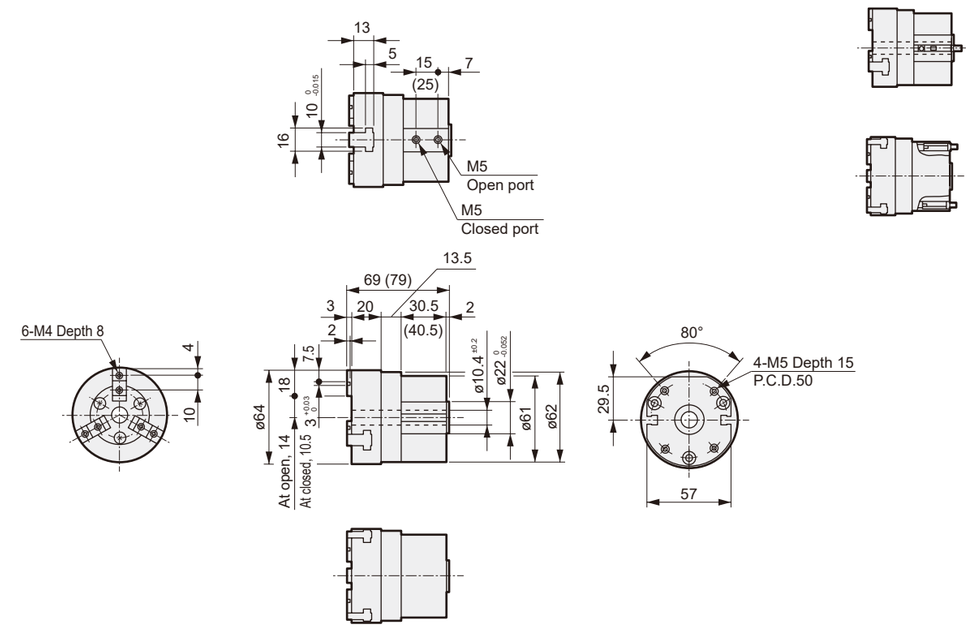


Outline Dimension Drawing

● CKF-25CS Standard/O/C

· Dimensions in ( ) are for O [Normally Open] and C [Normally Closed] specifications.

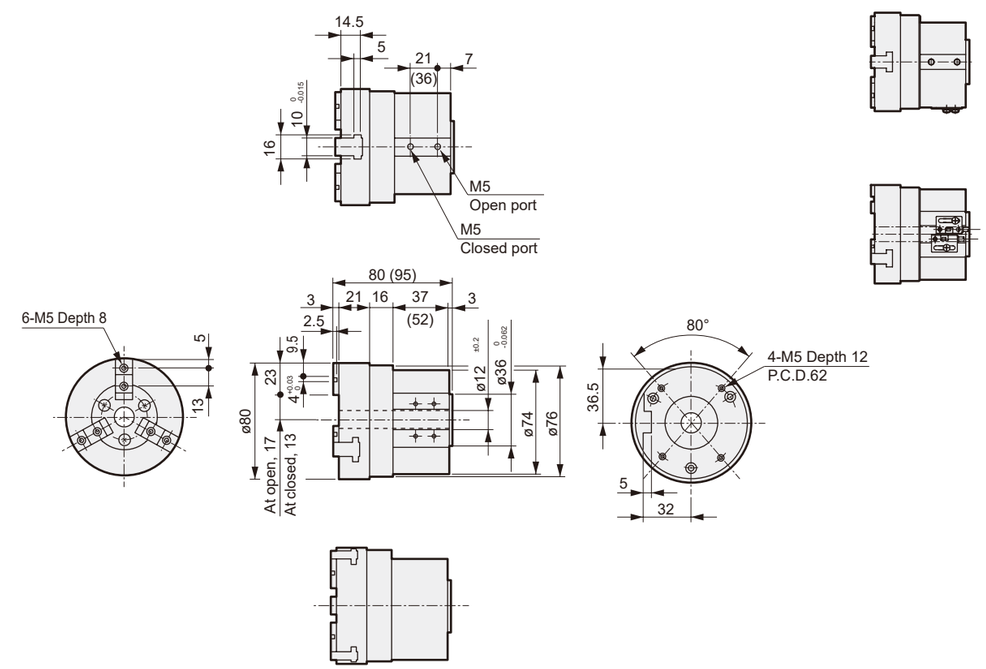
● With Switch



● CKF-30CS Standard/O/C

· Dimensions in ( ) are for O [Normally Open] and C [Normally Closed] specifications.

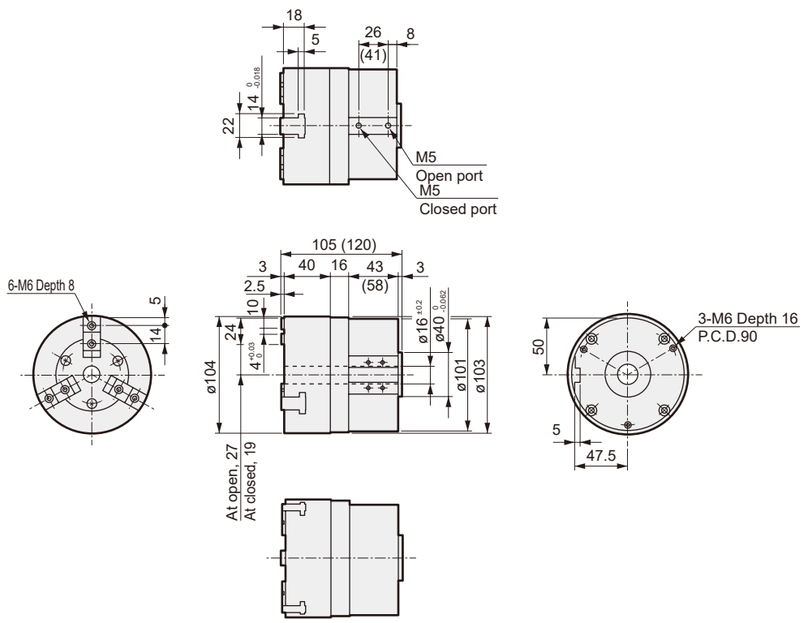
● With Switch



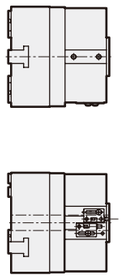
Outline Dimension Drawing

● CKF-40CS Standard/O/C

· Dimensions in ( ) are for O [Normally Open] and C [Normally Closed] specifications.

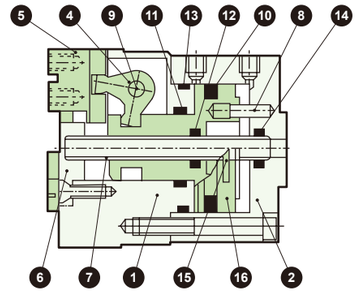


● With Switch

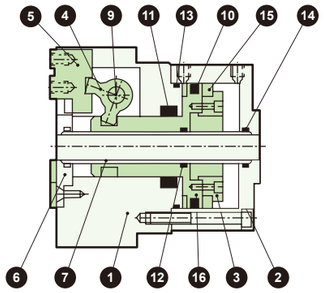


Internal Structure Diagram/Material

● CKF-15CS to 25CS



● CKF-30CS to 40CS



Do not disassemble

Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Adapter	Aluminum Alloy		9	Pivot Shaft	Steel	
2	Body	Aluminum Alloy		10	Piston Packing	Nitrile Rubber	
3	Piston B	Stainless Steel		11	Rod Packing	Nitrile Rubber	
4	Arm	Steel		12	Guide Rod Packing	Nitrile Rubber	
5	Finger	Steel		13	Gasket	Nitrile Rubber	
6	Center cover	Aluminum Alloy		14	Pipe Fixing Gasket	Nitrile Rubber	
7	Guide Pipe	Stainless Steel		15	Magnet		
8	Anti-rotation pin	Stainless Steel		16	Piston A	Stainless Steel	



Ultra Long Stroke Chuck Double Acting (Standard/Short Stroke)

CKJ Series

●Operating stroke: Standard 80, 130 mm
Short Stroke 40, 65 mm

Double Acting



RoHS

Model No. Notation Method

Without Switch
(Built-in magnet for switch)

CKJ - 16CS - S1

Model No. ❶ ❷

With Switch
(Built-in magnet for switch)

CKJ - 16CS - S1 - T2H - R

Model No. ❷ Stroke ❸ Switch Model No. ❹ Number of Switches
❶ Bore size

❶ Bore Size (mm)

Code	Content
16CS	ø12
40CS	ø32
63CS	ø50

❷ Stroke

Code	Content
Blank	Standard
S1	Short stroke

❸ Switch model Nos.

Refer to P. 573 for switch details. Switches are included to 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 20 Note 2	T2H□	T2V□	
		3-wire (NPN)	-	30 or less	-	100 or less	T3H□	T3V□	
	1-Color Flexible Lead Wire Type	2-wire	-	10 to 30	-	5 to 20 Note 2	T2HR3	T2VR3	

*1: For "□" in the switch model number, enter the code selected from the "*Lead wire length" table.
*2: 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 switch model numbers are also available. (Custom Product) For details, see P. 573.

***Lead wire length**

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

Example) Lead wire length
1 m T2H
3 m T2H3
5 m T2H5

❹ Number of Switches

	Code	Content
	R	With 1 pc. on Open Side
	H	With 1 pc. on Close Side
*	D	With 2 pcs

* When 2 switches are included, for models with a short operating stroke, both switches may turn ON depending on the size of the workpiece. Please be careful.

Switch Single Unit Model No. Notation Method

SW - T2H

❸ Switch Model No.

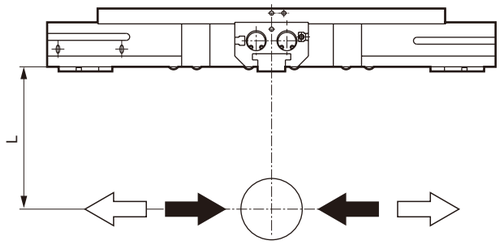
Specifications

Item		CKJ					
Size		16CS		40CS		63CS	
		Standard	S1	Standard	S1	Standard	S1
Bore size	mm	ø12 x 6		ø32 x 6		ø50 × 6	
Operating Fluid		Compressed Air					
Max. Working Pressure	MPa	0.7					
Min. Operating Pressure	MPa	0.3					
Ambient Temperature	°C	5 to 60					
Port Size		M5				Rc1/8	
Operating stroke	mm	80	40	80	40	130	65
Rod diameter	mm	ø6		ø12		ø14	
Internal volume (reciprocating)	cm³	47.4	24.0	358.8	179.4	1471.2	735.6
Repeatability	mm	±0.1					
Weight	kg	2.38	1.35	5.6	4.2	18.5	13
Lubrication		Not required (When lubricating, use turbine oil Class 1 ISO VG32)					

Gripping Force Performance Data

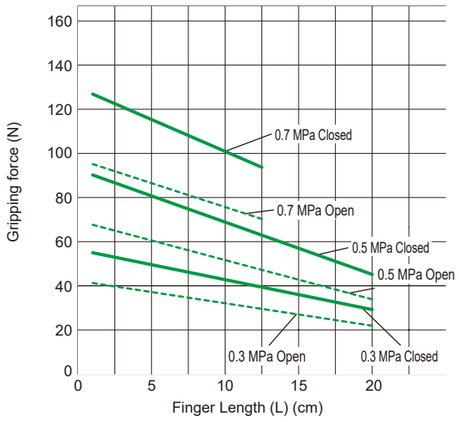
- Gripping force represents the thrust (for one finger) in the direction of the arrow shown in the figure.
- This represents the gripping force at the gripper's finger length L when the supply pressure is 0.3, 0.5, and 0.7 MPa.

●Open direction (⇦)--------(broken line)
●Closing direction (➡)——(solid line)

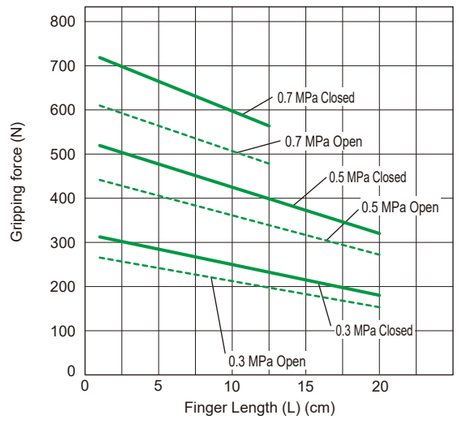


Note) When selecting, check the design and selection precautions on P. 490.

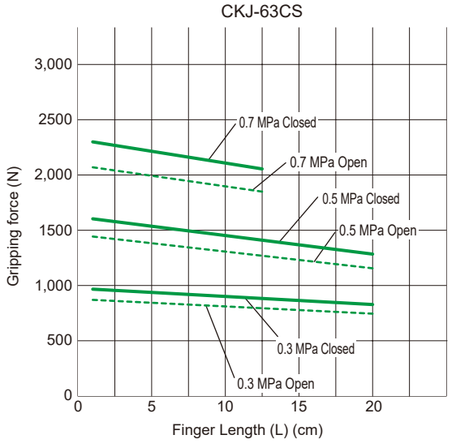
CKJ-16CS



CKJ-40CS

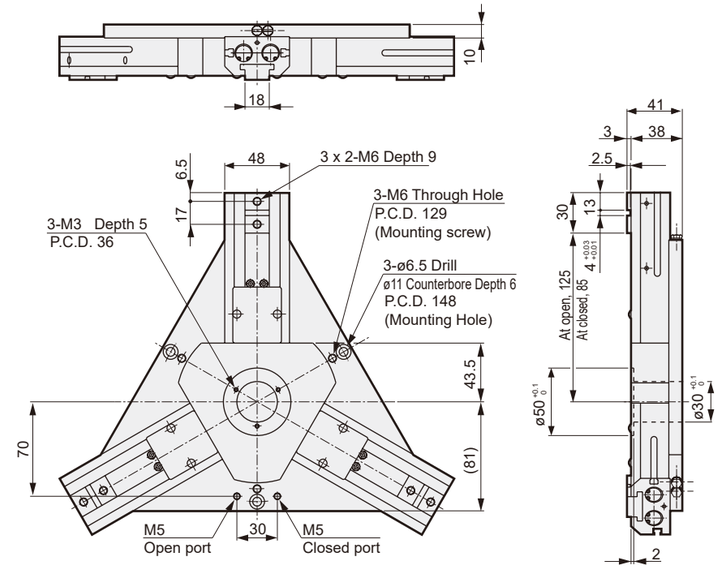


CKJ-63CS

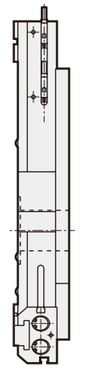


Outline Dimension Drawing

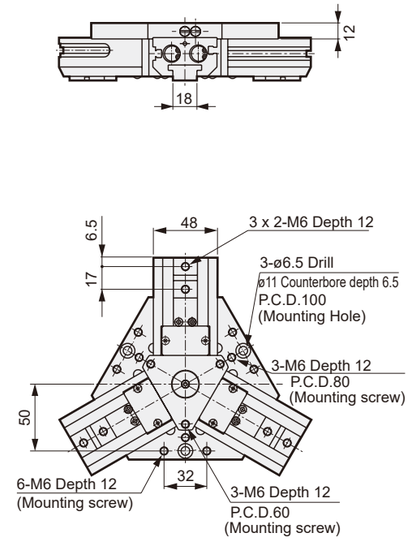
● CKJ-16CS Standard



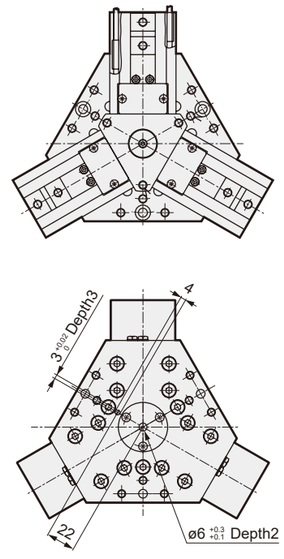
● With Switch



● CKJ-16CS-S1

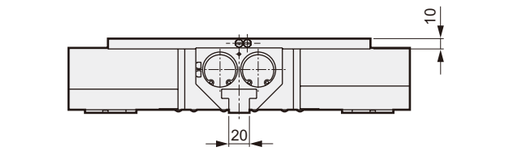


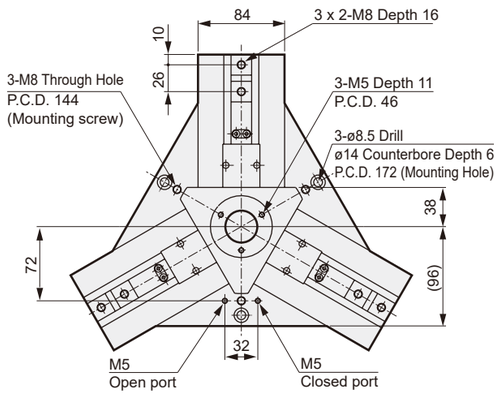
● With Switch

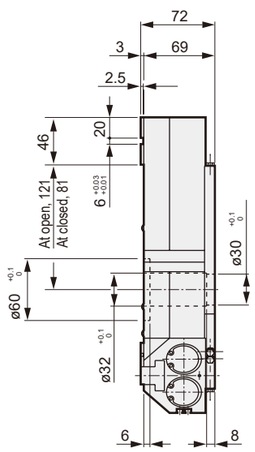


Outline Dimension Drawing

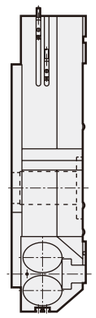
● CKJ-40CS Standard



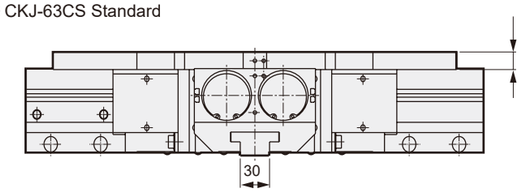


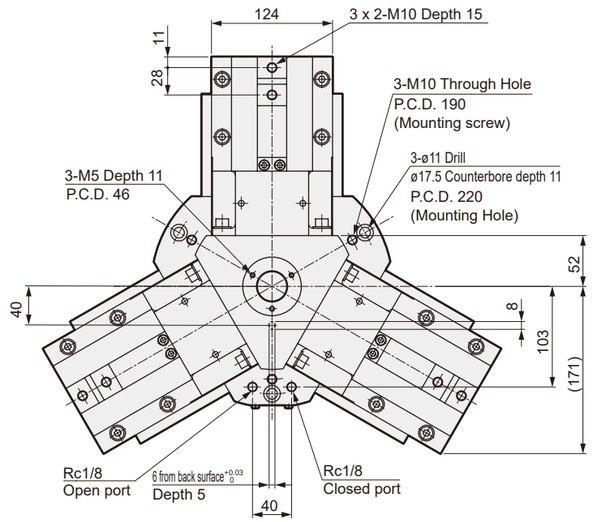


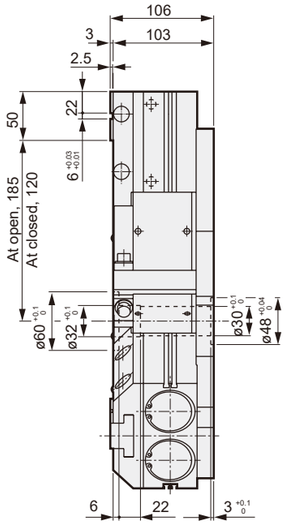
● With Switch



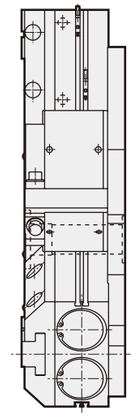
● CKJ-63CS Standard



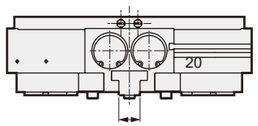


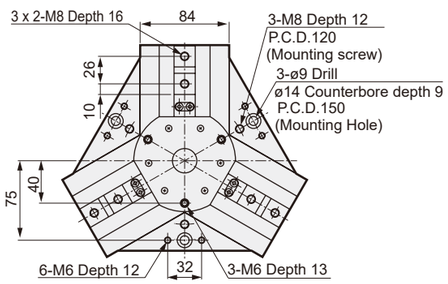


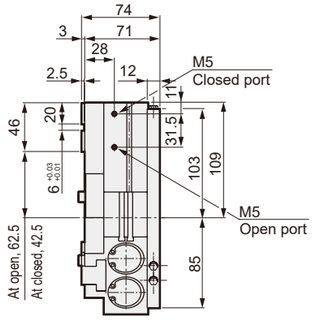
● With Switch

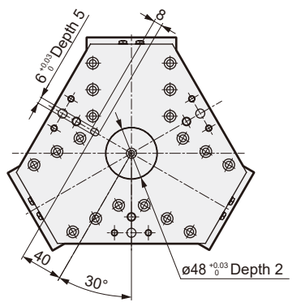


● CKJ-40CS-S1

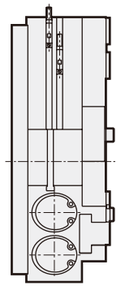




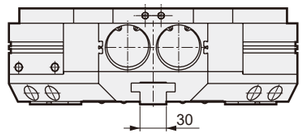


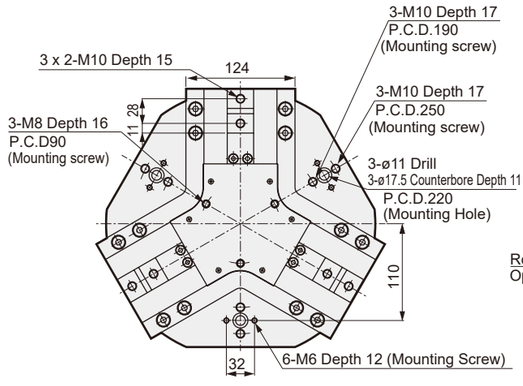


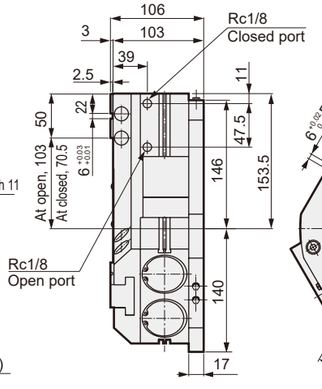
● With Switch

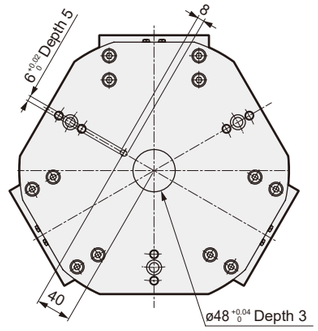


● CKJ-63CS-S1

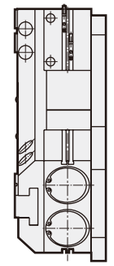








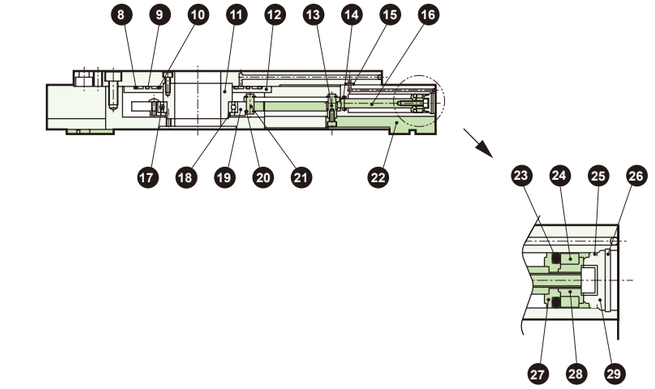
● With Switch



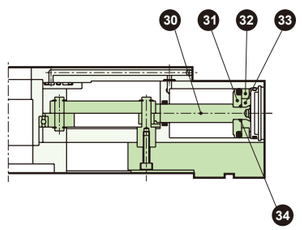
CKJ Series
Outline Dimension Drawing
Check Valve
CKW-HP
CKL2
CKLG2
CKL2 -□-HC
CKH2
CKLB2
CKG
CK
CKA
CKS
CKS-F
CKF
CKJ
Cylinder Switch
Ending

Internal Structure Diagram/Material

● CKJ-16CS



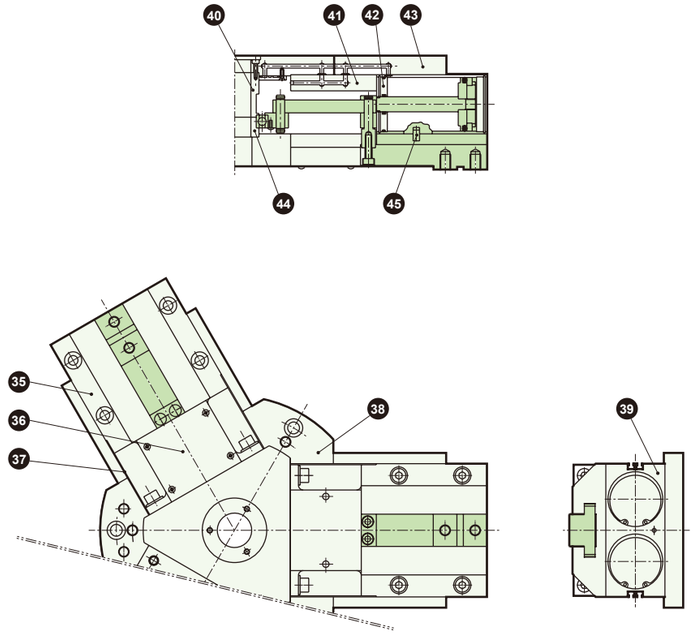
● CKJ-40CS



Do not disassemble

Internal Structure Diagram/Material

● CKJ-63CS

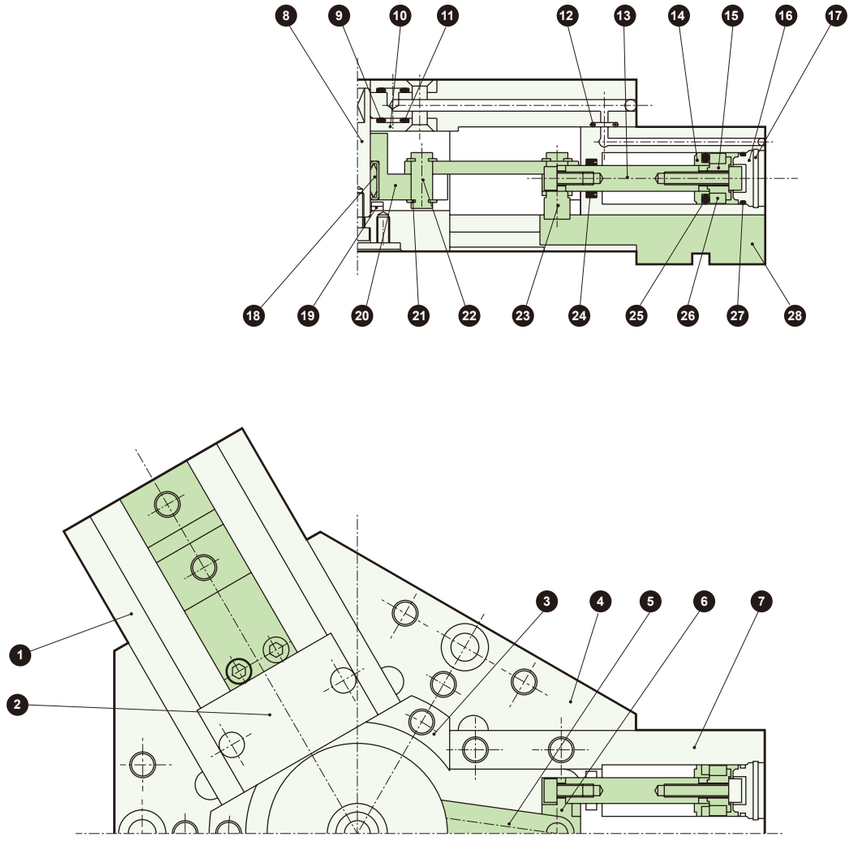


Do not disassemble

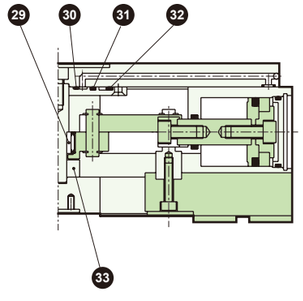
Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Adapter B	Aluminum Alloy		24	Magnet		
2	Cover	Stainless Steel		25	Cylinder seal	Nitrile Rubber	
3	Center Block	Aluminum Alloy		26	C-type retaining ring	Steel	
4	Base	Aluminum Alloy		27	Piston A	Aluminum Alloy	
5	Link	16CS, 40CS: Stainless Steel 63CS: Steel		28	Piston B	16CS, 40CS: Aluminum Alloy 63CS: Stainless Steel	
6	Connection Block	16CS, 40CS: Stainless Steel 63CS: Steel		29	Cover	16CS, 40CS: Polyacetal 63CS: Aluminum Alloy	
7	Adapter A	Aluminum Alloy		30	Piston Rod	Stainless Steel	
8	O-ring	Nitrile Rubber		31	Piston A	Aluminum Alloy	
9	O-ring	Nitrile Rubber		32	Magnet		
10	O-ring	Nitrile Rubber		33	Piston B	Aluminum Alloy	
11	Hollow Ring	Aluminum Alloy		34	O-ring	Nitrile Rubber	
12	Piping Plate	Aluminum Alloy		35	Body	Aluminum Alloy	
13	Actuating Pin	16CS, 40CS: Stainless Steel 63CS: Steel		36	Front Cover	Stainless Steel	
14	Rod seal	Nitrile Rubber		37	Side cover	Stainless Steel	
15	O-ring	Nitrile Rubber		38	Base 1	Aluminum Alloy	
16	Piston Rod	Stainless Steel		39	Body	Aluminum Alloy	
17	Bearing			40	Hollow Ring 1	Aluminum Alloy	
18	Collar	Steel		41	Base 3	Aluminum Alloy	
19	Link Ring	Aluminum Alloy		42	Rod Cover	Aluminum Alloy	
20	E-type Retaining Ring	Steel		43	Base 2	Aluminum Alloy	
21	Pivot Shaft	16CS, 40CS: Stainless Steel 63CS: Steel		44	Hollow Ring 2	Aluminum Alloy	
22	Finger	Steel		45	Parallel Pin	Stainless Steel	
23	Piston seal	Nitrile Rubber					

Internal Structure Diagram/Material

● CKJ-16CS-S1



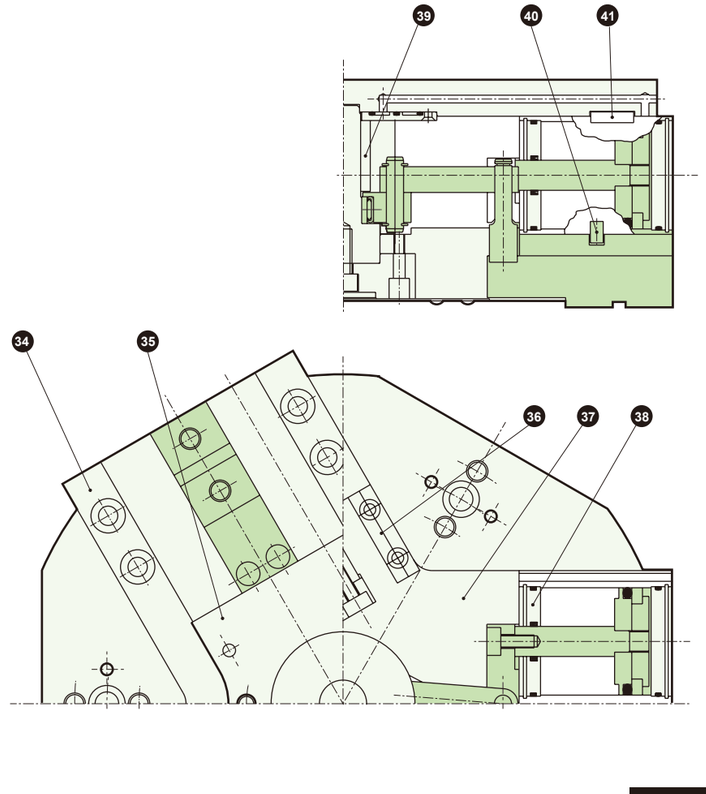
● CKJ-40CS-S1



Do not disassemble

Internal Structure Diagram/Material

● CKJ-63CS-S1



Do not disassemble

Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Finger Cover B	Aluminum Alloy		19	Washer		
2	Cover	Stainless Steel		20	Link Ring	Aluminum Alloy	
3	Center Block	16CS, 40CS: Aluminum Alloy 63CS: Steel		21	E-type Retaining Ring	Steel	
4	Base	Aluminum Alloy		22	Pivot Shaft	16CS, 40CS: Stainless Steel 63CS: Carbon steel	
5	Link	16CS, 40CS: Stainless Steel 63CS: Steel		23	Actuating Pin	16CS, 40CS: Stainless Steel 63CS: Carbon steel	
6	Connection Block	16CS, 40CS: Stainless Steel 63CS: Carbon steel		24	Rod seal	Nitrile Rubber	
				25	Piston seal	Nitrile Rubber	
7	Finger Cover A	Aluminum Alloy		26	Magnet		
8	Shaft	16CS, 40CS: Steel 63CS: Aluminum Alloy		27	Seal	Nitrile Rubber	
				28	Finger	Steel	
9	O-ring	Nitrile Rubber		29	Inner Ring		
10	Piping Plate	Aluminum Alloy		30	O-ring	Nitrile Rubber	
11	O-ring	Nitrile Rubber		31	O-ring	Nitrile Rubber	
12	O-ring	Nitrile Rubber		32	O-ring	Nitrile Rubber	
13	Piston Rod	Stainless Steel		33	Collar	Polyacetal	
14	Piston A	Aluminum Alloy		34	Body	Aluminum Alloy	
15	Piston B	16CS, 40CS: Aluminum Alloy 63CS: Stainless Steel		35	Front Cover	Stainless Steel	
				36	Side cover	Aluminum Alloy	
16	Cylinder cover	16CS, 40CS: Polyacetal 63CS: Aluminum Alloy		37	Body	Aluminum Alloy	
				38	Rod Cover	Aluminum Alloy	
17	C-type retaining ring	Steel		39	Metal Collar	Steel	
18	Needle Roller Bearing			40	Parallel Pin	Stainless Steel	
				41	Parallel Key	Steel	



Attachment

●Material: Steel, Engineering plastic

RoHS

Main features

Attachments are available for all models, which can be machined to match the customer's workpiece.

●Spigot part is pre-processed

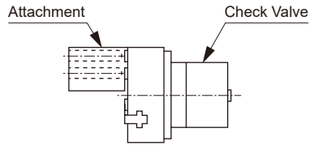
The troublesome reference part (spigot part) is pre-processed. Available in a series so you can select according to workpiece shape and dimensions.

●Two types of attachment materials

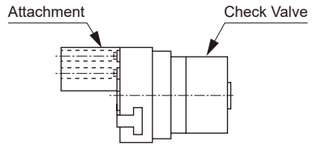
Iron (S50C) and engineering plastic (MC nylon) are available so you can select according to the workpiece material and operating conditions.

Models compatible with standard attachments

CK type



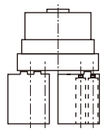
CKA/CKG type



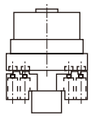
Attachment usage example

Chuck Type Application Examples

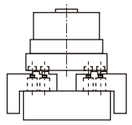
Soft jaw



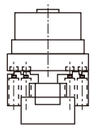
For small workpieces



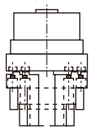
For large workpieces



For both large and small workpieces

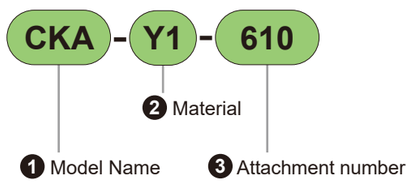


For Internal Gripping of Both Large and Small Workpieces



Model No. Notation Method

Note) When ordering parts, it will be treated as 1 piece.



1 Model Name

Code	Content
CKG	3-Jaw Bearing Chuck
CK	3-Jaw Long Stroke Chuck
CKA	3-Jaw Low Profile Chuck
CKF	Hollow Chuck

2 Material

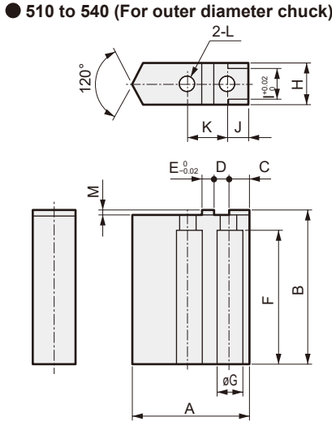
Code	Content
Y1	S50C
Y2	MC Nylon

3 Attachment number

Code	Compatible models
510	CKG-16CS,CKA-15CS,CKF-15CS
520	CKG-25CS,CKA-20CS,CKF-20CS
530	CKG-32CS,CKA-25CS,CKF-25CS
540	CKG-40CS,CKA-30CS,CKF-30CS
610	CKG-25CS,CKA-20CS,CKF-20CS
620	CKG-32CS,CKA-25CS,CKF-25CS
630	CKG-40CS,CKA-30CS,CKF-30CS
710	CKG-50CS,CKA-40CS,CKF-40CS
720	CK-1CS
730	CK-1.5CS
740	CK-2CS
750	CKA-50CS
760	CKA-60CS
770	CKA-70CS

Outline Dimension Drawing

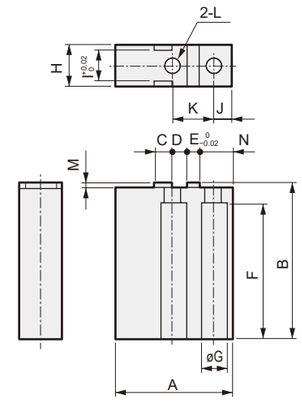
● **510 to 540 (For outer diameter chuck)**



*1 Y1: Material S50C
*2 Y2: Material MC nylon

Code		A	B	C	D	E	F	øG	H	I	J	K	øL	M	Weight (g)	
Attachment number	Compatible models														Y1 *1	Y1 *2
510	CKA-15CS CKG-16CS CKF-15CS	17.5	25	3.5	2.5	2	20	6	8	6	3.5	7	3.5	1	17	5
520	CKA-20CS CKG-25CS CKF-20CS	24	30	4.5	3.5	2	24.5	8	12	8	4.5	9	4.5	1.5	45	11
530	CKA-25CS CKG-32CS CKF-25CS	31	40	4.5	3.5	3	34.5	8	14	10	4.5	10	4.5	1.5	103	21
540	CKA-30CS CKG-40CS CKF-30CS	37	50	6	4.5	4	43	9.5	14	10	6	13	5.5	2	136	30

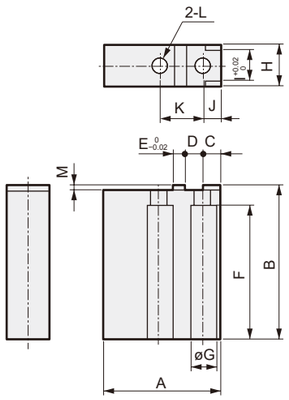
● **610 to 630 (For inner diameter chuck)**



*1 Y1: Material S50C
*2 Y2: Material MC nylon

Code		A	B	C	D	E	F	øG	H	I	J	K	øL	M	N	Weight (g)	
Attachment number	Compatible models															Y1 *1	Y1 *2
610	CKA-20CS CKG-25CS CKF-20CS	30	30	4.5	3.5	2	24.5	8	12	8	4.5	9	4.5	1.5	8	65	10
620	CKA-25CS CKG-32CS CKF-25CS	35	40	4.5	3.5	3	3+4.5	8	14	10	4.5	10	4.5	1.5	8	126	19
630	CKA-30CS CKG-40CS CKF-30CS	45	50	6	4.5	4	43	9.5	14	10	6	13	5.5	2	10.5	188	28

● **710 to 770**



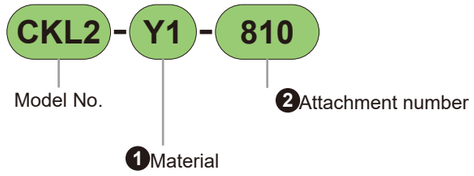
*1 Y1: Material S50C
*2 Y2: Material MC nylon

Code		A	B	C	D	E	F	øG	H	I	J	K	øL	M	Weight (g)	
Attachment number	Compatible models														Y1 *1	Y1 *2
710	CKA-40CS CKG-50CS CKF-40CS	44.5	60	6	5	4	52	11	18	14	6	14	6.5	2	285	43
720	CK-1CS	33.5	50	6	5	4	43	9.5	14	10	6	14	5.5	2	128	19
730	CK-1.5CS	43.5	65	7	6.5	5	56	11	18	14	7	18	6.5	2	302	45
740	CK-2CS	55.5	80	8	7	6	71	14	19	14	8	20	8.5	2	471	70
750	CKA-50CS	51.5	70	6	5	5	58	11	18	14	6	15	6.5	2	402	62
760	CKA-60CS	64	80	8	6	6	68	14	20	16	8	18	9	2	608	94
770	CKA-70CS	74	100	8	7	6	88	14	20	16	8	20	9	2	913	140

Attachment Model No. Notation Method and External Dimension Drawing

Model No. Notation Method

Note) When ordering parts, it will be treated as 1 piece.



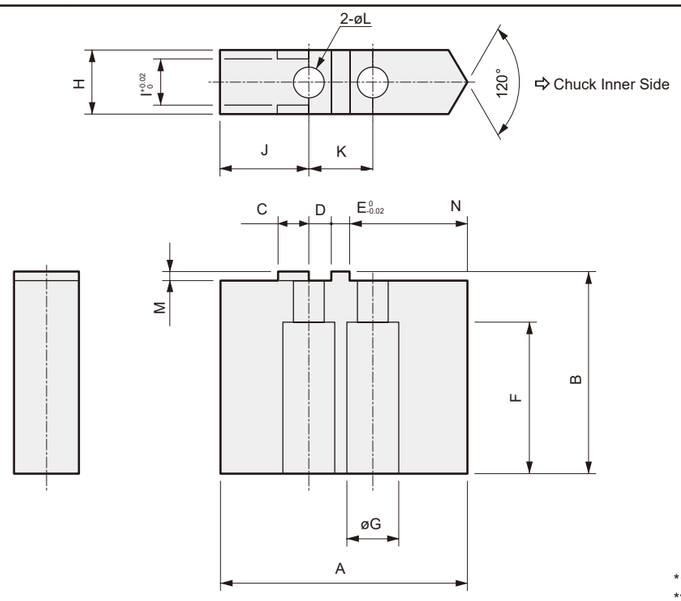
1 Material

Code	Content
Y1	S50C
Y2	MC Nylon

2 Attachment number

Code	Compatible models
810	CKL2-20CS,CKLG2-20CS,CKLB2-20CS
820	CKL2-25CS,CKLG2-25CS,CKLB2-25CS
830	CKL2-32CS,CKLG2-32CS,CKLB2-32CS
840	CKL2-40CS,CKLG2-40CS,CKLB2-40CS
850	CKL2-50CS,CKLG2-50CS,CKH2-50CS,CKLB2-50CS
860	CKL2-63CS,CKLG2-63CS,CKH2-63CS,CKLB2-63CS
870	CKL2-80CS,CKLG2-80CS,CKH2-80CS,CKLB2-80CS
880	CKL2-100CS,CKLG2-100CS,CKH2-100CS,CKLB2-100CS

Outline Dimension Drawing



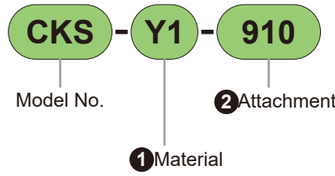
*1 Y1: Material S50C
*2 Y2: Material MC nylon

Code / Attachment number	A	B	C	D	E	F	øG	H	I	J	K	øL	M	N	Weight (g) Y1 *1	Weight (g) Y2 *2
810	29.5	29	3.5	2.5	2	23	6.5	10	6	12	7	3.5	1	13	64	10
820	34.5	33.5	4.5	3.5	2	24	8	10	7	12.5	9	4.5	1.5	16.5	86	13
830	39.5	33.5	4.5	3.5	3	24	8	12	8	14	10	4.5	1.5	19	118	18
840	49.5	39	6	4.5	3	31	9	12	8	18.5	12	5.5	2	23.5	171	26
850	54.5	44	6	5	4	33	11	14	10	18.5	14	6.5	2	27	250	37
860	69.5	49	8	5.5	5	38	11	16	12	24.5	16	6.5	2	34.5	408	61
870	84.5	59	10	6	6	47	14	18	14	28	18	9	2	44.5	676	101
880	99.5	64	10	7	6	52	14	20	16	31.5	20	9	2	55	962	144

Attachment Model No. Notation Method and External Dimension Drawing

Model No. Notation Method

Note) When ordering parts, it will be treated as 1 piece.



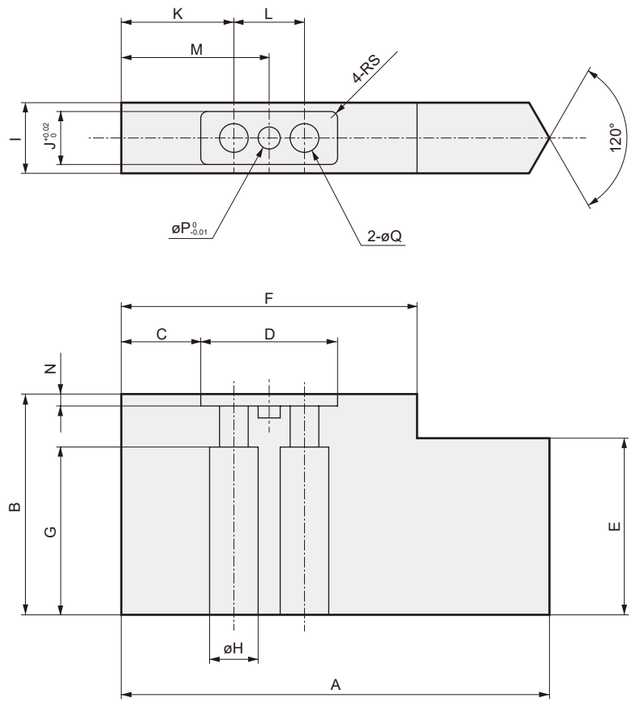
1 Material

Code	Content
Y1	S50C
Y2	MC Nylon

2 Attachment number

Code	Compatible models
910	CKS-08CS
920	CKS-12CS
930	CKS-16CS,CKS-F-16CS
940	CKS-20CS,CKS-F-20CS
950	CKS-25CS,CKS-F-25CS
960	CKS-32CS,CKS-F-32CS

Outline Dimension Drawing



*1 Y1: Material S50C
*2 Y2: Material MC nylon

Code / Attachment number	Compatible Models	A	B	C	D	E	F	G	H	I	J	K	L	M	N	P	Q	S	Weight (g) Y1 *1	Weight (g) Y2 *2
910	CKS-08CS	42.5	30	6.5	15	20	27.5	23	6.5	10	6	10.5	7	14	1.7	2	3.5	1	74	12
920	CKS-12CS	48	35	7.5	19	25	34	27	8	11	7	12.5	9	17	2.7	2	4.5	1	108	17
930	CKS-16CS,CKS-F-16CS	56.5	35	9.5	21	25	40.5	27	8	12	8	15	10	20	2.7	3	4.5	1	145	23
940	CKS-20CS,CKS-F-20CS	66.5	40	11	25	30	48	32	9.5	12	8	17.5	12	23.5	2.7	3	5.5	1.5	192	31
950	CKS-25CS,CKS-F-25CS	85.5	45	16	28	35	60	33	11	14	10	23	14	30	2.7	4	6.5	1.5	335	53
960	CKS-32CS,CKS-F-32CS	97	50	18	31	40	67	38	11	16	12	25.5	16	33.5	2.7	5	6.5	1.5	500	79

To Use This Product Safely

Be sure to read this before use.
For general cylinder information, see Intro 39, and for cylinder switches, see P. 628.

Individual Precautions: Check Valve

During Design / Selection

Warning

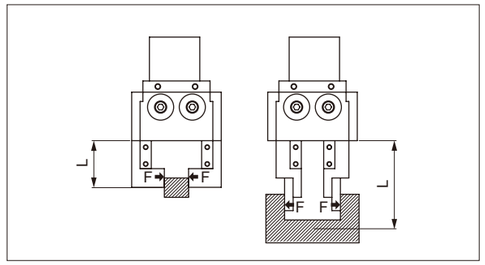
■If there is a risk that the moving workpiece may pose a danger to the human body, or a risk of fingers being pinched in the finger part, please implement safety measures such as installing a protective cover.

■If circuit pressure drops due to a service interruption or problems in the air source, gripping force drops and the workpiece could drop. Provide position locking measures, etc., so that personnel are not injured or machines damaged.

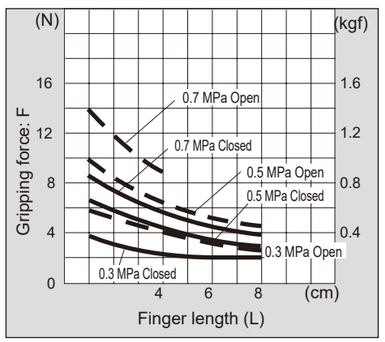
Caution

■Precautions Regarding Gripping Force

● Gripping force represents the force when gripping a workpiece as shown in the figure below.



● Performance data indicates the gripping force at hand finger length L at a supply pressure of 0.15 to 0.7 MPa.



● When determining the gripping force from performance data, if L is the distance to the workpiece's center of gravity when the attachments are manufactured, the gripping force F is as follows

When = 1, then F = F1

When = 2, then F = F2 Refer to the drawing below.

Expressed as.

● For the length when L-shaped attachments are included, select as follows.

Example: For an L-shape, 30 mm in the finger direction and 30 mm bent at 90 degrees, the attachment length is considered to be 60 mm.

● Use attachments with a length wilow profile the values in the gripping force performance data table for each model.

● The maximum length of the attachments should be wilow profile the performance data.

● When transporting a workpiece (weight W_L), use the following as a reference.

W_L x 9.8 x 5 < (F x N) [Holding only]

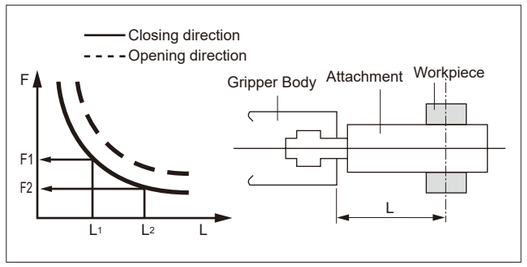
W_L x 9.8 x 10 < (F x N) [Normal transport]

W_L x 9.8 x 20 < (F x N) [Rapid acceleration transport]

W_L : Workpiece Weight [kg]

F : Gripping Force (N)

N : Number of fingers [Qty.]



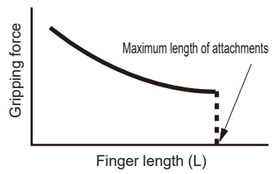
■Use as short and light an attachment as possible. If they are long and heavy, the inertial force during opening and closing will be large, which may cause play in the fingers or accelerate wear on the finger sliding parts, adversely affecting the service life.

● Keep the length of the attachments wilow profile the values in the performance data.

● The weight of the attachments affects the service life. Please keep it at or below the following.

W < 1/4H (1 piece) W : Weight of finger

H : Gripper Product Weight



■Avoid using only the spring force of the single-acting type to grip workpieces as much as possible.The gripping force will become unstable and may cause malfunction.

■For the single-acting type, the spring force is weakest near the stroke end (open end for NO type, closed end for NC type). Due to the structure that operates with spring force, it may not return if operated with a short stroke, so consider the attachment shape to grip the workpiece with sufficient stroke allowance.

■Usage Environment

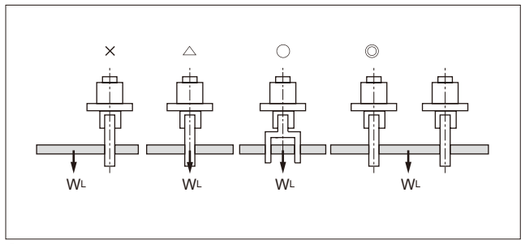
In cutting, casting, and welding factories, foreign matter such as cutting fluid, chips, and dust may enter. Prevent these as much as possible with covers, etc. Also, do not use in the following environments.

● Splashing of cutting fluid (because sliding parts are abraded by abrasives or abrasive in the fluid)

● When organic solvents, chemicals, acids, alkalis, kerosene, etc. are contained in the atmosphere

● Exposure to water

■When gripping long or large workpieces, gripping the center of gravity is a prerequisite for stable gripping, but consider increasing the size or using multiple units to ensure stability.



◎: Excellent, ○: Good, △: Conditiona, ×: Not Applicable

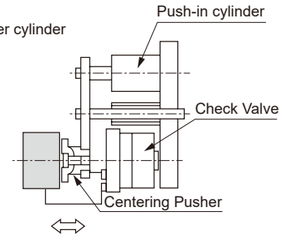
■Select a model with sufficient gripping force for the workpiece weight.

■Select a model with sufficient opening/closing width relative to the workpiece size.

■If directly inserting the workpiece into the jig with the hand, consider clearance during design to avoid damaging the hand. The hand may be damaged.

Check Valve

When using a pusher cylinder



Note) The workpiece is slid along the top of the attachment, so chuck life could drop markedly. Sufficient consideration must be given to the shape of the attachments.

■If the attachment rigidity is insufficient, deflection may cause the finger to jam and adversely affect operation.

■Adjust the hand opening/closing speed with a speed controller (optional). If used at high speed, play may occur sooner. Also, the shock during opening and closing may cause the workpiece to vibrate, leading to chucking errors, workpiece insertion errors, or poor repeatability.

■When using small bore/short stroke actuators at high frequency, condensation (water droplets) may form in piping depending on conditions. Take measures to prevent condensation by using a quick exhaust valve, etc.

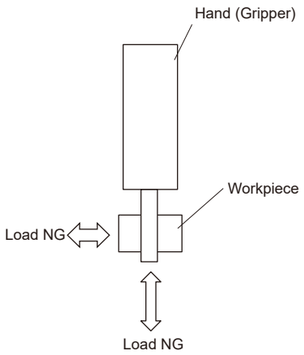
■The rubber cover does not guarantee hermeticity. Since gaps may form between the rubber cover, body and finger, contact CKD if this is a problem.cv

During Use

1. Common

Caution

■ Do not apply excessive load to the fingers or attachments during workpiece attachment/detachment or transfer. Scratches or dents on the finger may cause malfunction.



■ If a lateral or impact load is applied to the finger, it may cause play in the finger or damage. Adjust and check that no external force is applied to the finger.

■ Clamping operations become more accurate when performed as softly and slowly as possible. Also, repeatability becomes stable.

■ Periodically replenish grease to the sliding parts of the finger. Periodic replenishment can further extend the service life.

■ When attaching the attachment, be careful not to apply a lateral load to the finger.

■ Tighten with the following torques when mounting.

Nominal screw size	M3	M4	M5	M6	M8
Recommended tightening torque (N·m)	0.59	1.4	2.8	4.8	12.0

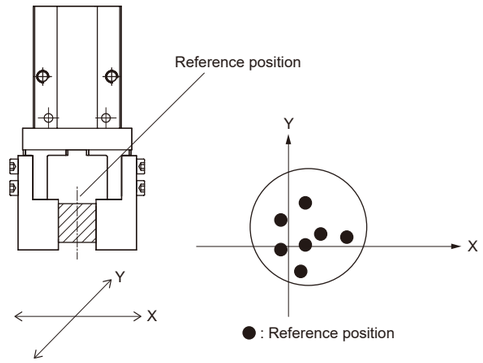
■ Do not disassemble or modify the body.

■ The rubber cover is a consumable part. Replace as necessary.

■ Repeatability

Repeatability refers to the deviation in the finger stop position when clamping/unclamping is repeated under the same conditions (hand fixed, same attachment used, etc. – see below). Shock during opening/closing may lead to workpiece positional deviation and deterioration of repeatability. Also, be aware that wear or insufficient rigidity of the attachments can also lead to deterioration of accuracy.

Condition
· Attachment dimensions, shape, weight
· Workpiece gripping position of attachments
· Clamping method, length
· Resistance at the contact area between attachments and workpieceShockless opening/closing with a speed controller
· Fluctuation of gripping force (air pressure), etc.



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

Mechanical Chuck

Overview

The CKL2-FC series mechanical chuck differs from conventional air-powered chucks by performing opening/closing operations mechanically. Ideal for systems requiring opening/ closing operations at the end, such as shuttle movers (SM-25 series).

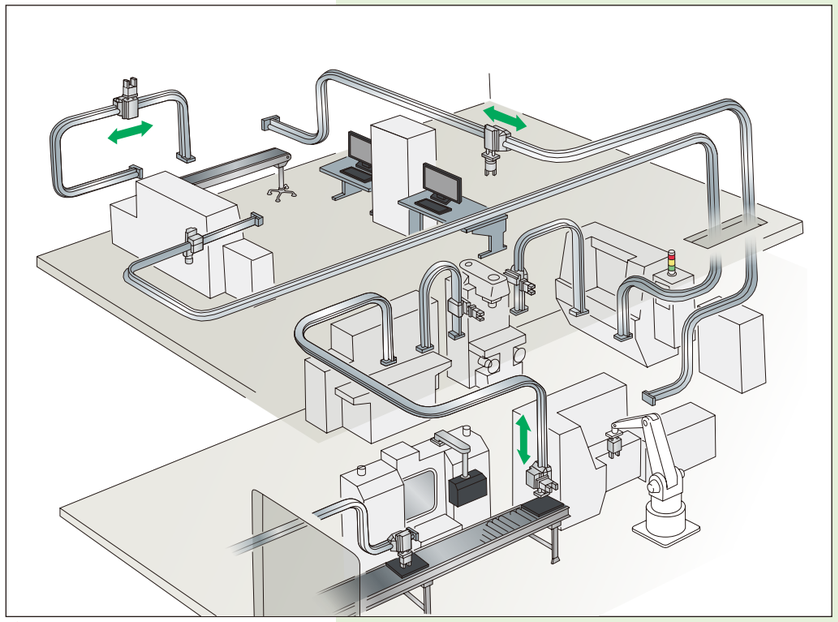
Main features

- Ideal for index tables where air piping cannot be used.
- Closed direction has higher gripping force due to springs (CKL2 type: 20 N to 150 N)
- Opening direction is driven by external force, enabling high-speed operation in combination with cams, etc.



CONTENTS

● Mechanical Chuck (CKL2-FC) 496



⚠To use this product safely, read the general precautions for cylinders on Intro 39 and for chucks on P. 490 before use.



Mechanical Chuck

CKL2-FC Series

●Operating stroke: 5, 6, 8, 10 mm

RoHS

Model No. Notation Method

CKL2 - 20CS - FC

Model No.

❶Bore size

❶Bore Size (mm)

Code	Content
20CS	ø20
25CS	ø25
32CS	ø32
40CS	ø40

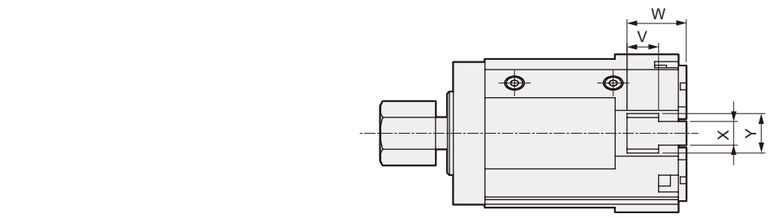
Specifications

Item		CKL2-FC			
Size		20CS	25CS	32CS	40CS
Cylinder bore	mm	ø20	ø25	ø32	ø40
Rod diameter	mm	ø6	ø8	ø10	ø12
Ambient Temperature	°C	5 to 60			
Operating stroke	mm	5	6	8	10
Repeatability	mm	±0.01			
Opening side external force	N	165 to 250	280 to 420	485 to 730	710 to 1050
Gripping force *2	N	20 to 33	33 to 53	50 to 105	83 to 150
Product Weight	g	202	320	433	834

*1: Use in the opening direction will damage the hand. Never use it in this way.
*2: Gripping force changes according to stroke position.

Outline Dimension Drawing

● CKL2-FC

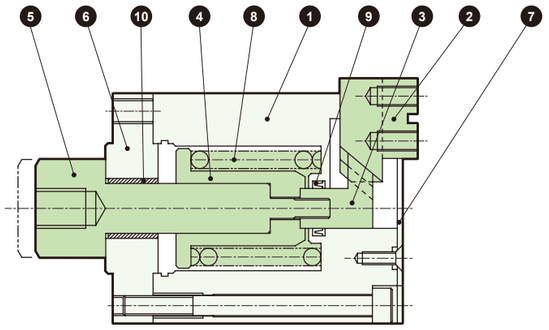


Code / Model No.	A	AA'	B	C MAX	C MIN	D	E	F	H	I	J	K	L
CKL2-20CS-FC	ø36	3-M4 x 0.7, Depth 8	ø21 $^{0}_{-0.052}$	77.5	74.5	57	1.5	14	M6 × 1.0 Depth 9	14	30	8.5	6
CKL2-25CS-FC	ø46	3-M5 x 0.8, Depth 8	ø26 $^{0}_{-0.052}$	80.1	76.5	58	1.5	14	M8 × 1.25 Depth 10	17	39	10	7
CKL2-32CS-FC	ø52	3-M5 x 0.8, Depth 10	ø34 $^{0}_{-0.062}$	93	88	67	2	16	M8 × 1.25 Depth 12	19	44	12	8
CKL2-40CS-FC	ø62	3-M6 x 1.0, Depth 12	ø42 $^{0}_{-0.062}$	118	111.5	90.5	2	16	M10 × 1.5 Depth 15	24	53	15	10

Code / Model No.	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	O'
CKL2-20CS-FC	12	5	2	2	17	31	7	2.5	3 x 2-M3 x 0.5 Depth 6	8	15	6 $^{0}_{-0.012}$	10	3	1.5
CKL2-25CS-FC	16	7	2	3	21	39	9	3.5	3 x 2-M4 x 0.7 Depth 8	8.5	15.5	7 $^{0}_{-0.015}$	12	3.6	2
CKL2-32CS-FC	18	7.5	3	3	24	44	10	4	3 x 2-M4 x 0.7 Depth 8	4	14.5	8 $^{0}_{-0.015}$	14	5	2
CKL2-40CS-FC	21	9	3	3	29	53	12	4.5	3 x 2-M5 x 0.8 Depth 10	5	15	8 $^{0}_{-0.015}$	16	6.5	2.5

Internal Structure Diagram/Material

● CKL2-FC



Do not disassemble

Part No.	Part Name	Material	Part No.	Part Name	Material
1	Body	Aluminum Alloy	6	Cover	Aluminum Alloy
2	Finger	Steel	7	Center cover	Stainless Steel
3	Piston A	20CS to 32CS: Stainless Steel 40CS : Steel	8	Spring	Stainless Steel
			9	Rod seal	Nitrile Rubber
4	Piston	Aluminum Alloy	10	Bushing	Oil-Impregnated Bearing Alloy
5	Stopper rod	Stainless Steel			

MEMO

Robot Peripheral Components



CONTENTS

● Auto Gripper Changer (CHC) 504
⚠ Precautions for Use 513

Auto hand changer **CHC Series**

Automatic exchange unit for robot end-of-arm tooling that greatly reduces changeover time

Attach the body side to the robot, prepare tool adapter sides according to the number of workpieces, and attach tools such as hand chucks. When the body side and tool adapter side are connected, air ports and electrodes (optional) are also connected, eliminating the need to change air piping or electrical wiring during changeover. Since the changer can be included/detached simply by switching the connection air, automatic exchange is possible, greatly reducing changeover time.



Body　　Tool Adapter



Automatically exchange hand chucks according to the workpiece

Maintains high rigidity

The connecting force between the body and adapter is high, achieving high rigidity.

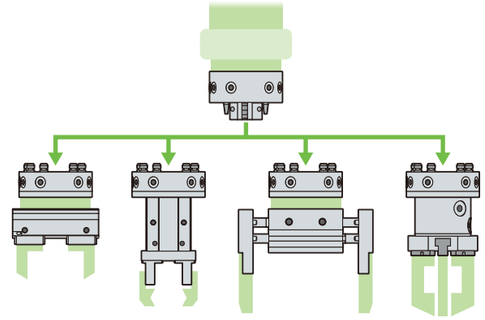
Equipped with a drop prevention mechanism

Even if the drive source is cut off, the tool is prevented from falling.

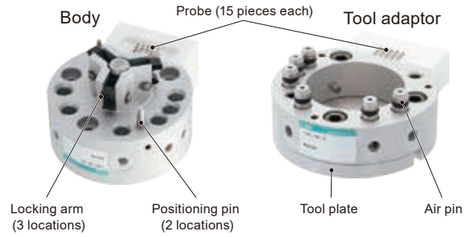
Options can be selected

Options with highly reliable electrode blocks or with check valves are available.

Image of connecting to hand chuck



Interface structure



Operation Overview

Connection Preparation

When air is supplied to the connection release port of the body, the piston moves to the cylinder cover side and the arm tilts in the direction of the arrow.

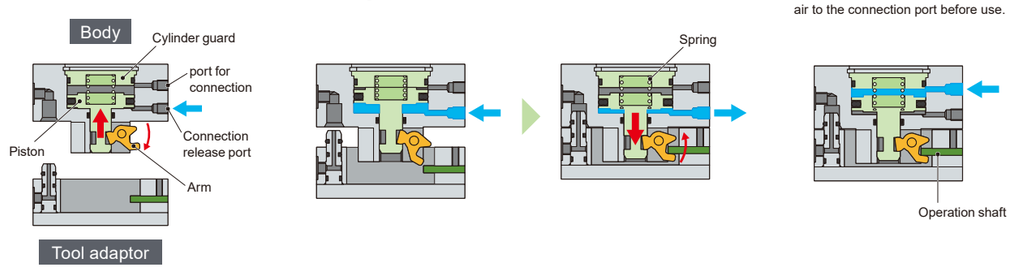
During Connection Operation

Fit the body into the tool adapter.
When air is exhausted from the connection release port, the spring force pushes the piston out and the arm returns to its original state.

Connection Maintained

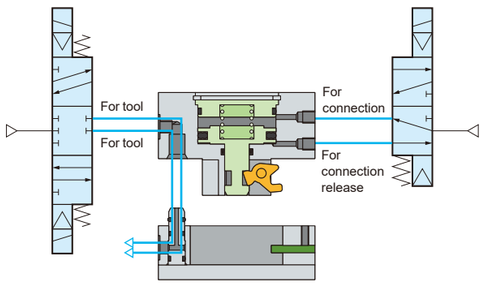
The arm is held by catching on the operating shaft.
(Drop prevention structure)

* When external force is applied, supply air to the connection port before use.

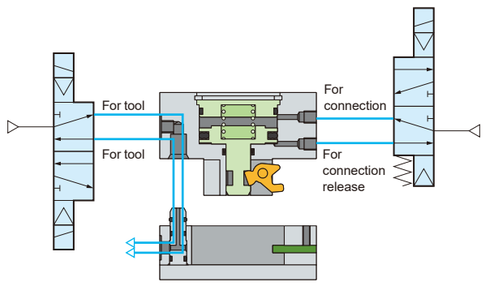


Circuit Example

Recommended circuit



Recommended circuit when check valve option (B) is selected





Auto Gripper Changer

CHC Series

● Connected axial force: 78, 245, 676, 1087 N

RoHS

[Overview]

The CHC series auto gripper changer is an automatic exchange unit for robot end-of-arm tooling. Attach the body side to the robot, prepare tool adapter sides according to the number of workpieces, and attach tools such as hand chucks. When the body side and tool adapter side are connected, air ports and electrodes (optional) are also connected, eliminating the need to change air piping or electrical wiring during changeover. Since the changer can be included/detached simply by switching the connection air, automatic exchange is possible, greatly reducing changeover time.

[Main Features]

● High connecting force between body and adapter maintains high rigidity
● Equipped with a drop prevention mechanism that prevents the tool from falling even if the drive source is cut off
● Abundant options such as D-sub connectors are available

Model No. Notation Method

・CHC Body Side

CHC - 5 R - D1

Model No. / Parts: Body side only / ❶ Payload / ❷ Option

❶ Payload (kg)

Code	Content
1	1 kg
5	5 kg
10	10 kg
20	20 kg

❷ Option

Code	Content
Blank	Standard
D1	Electrode block Solder type
Note) D3	Electrode block D-sub connector (socket)
Note) B	Check Valve

Note) ❶Payload "1" cannot be selected.

・Tool adapter side

CHC - 5 H - D

Model No. / Parts: Tool adapter side only / ❶ Payload / ❷ Option

❶ Payload (kg)

Code	Content
1	1 kg
5	5 kg
10	10 kg
20	20 kg

❷ Option

Code	Content
Blank	Standard
D	Electrode block Solder type
Note) D3	Electrode block D-sub connector (socket)

Note) ❶Payload "1" cannot be selected.

Electrode Block Single Item Model No.

*If adding an electrode block later, order the parts below.

Part Name	Payload: kg	Model No.	Content
Body Side Electrode Block	1	CHC-1RS-D1	Solder type
	5	CHC-5RS-D1	Solder type
		CHC-5RS-D3	D-sub connector (socket)
	10	CHC-10RS-D1	Solder type
		CHC-10RS-D3	D-sub connector (socket)
	20	CHC-20RS-D1	Solder type
		CHC-20RS-D3	D-sub connector (socket)
Tool Adapter Side Electrode Block	1	CHC-1HS-D	Solder type
	5	CHC-5HS-D	Solder type
		CHC-5HS-D3	D-sub connector (socket)
	10	CHC-10HS-D	Solder type
		CHC-10HS-D3	D-sub connector (socket)
	20	CHC-20HS-D	Solder type
		CHC-20HS-D3	D-sub connector (socket)

Specifications

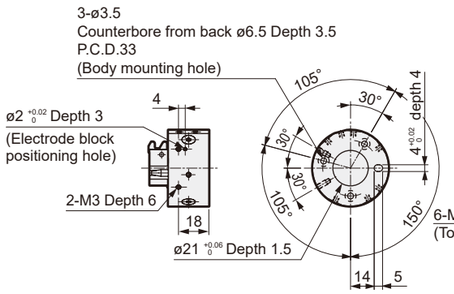
Item			CHC			
Payload		kg	1	5	10	20
External Dimensions		mm	ø45	ø64	ø78	ø88
Overall Length when Connected		mm	36	43	49	56
Operating Fluid			Compressed Air			
Max. Working Pressure		MPa	0.7			
Min. Operating Pressure		MPa	0.3			
Ambient Temperature		°C	5 to 60			
Repeatability		mm	±0.01			
Connection Axial Force		N	78	245	676	1087
Moment when Connected		N·m	3.1	11.8	34.3	76.6
Torque when Connected		N·m	8.6	12.8	16	18.9
Weight		kg	0.187	0.35	0.65	0.9
Connection Port Diameter			M3	M5		
Air Interface	Number of Ports *1		6			
	Port Connection Diameter		M3	M5		
Electrical Interface *2	Contact		15 pins, contact probe type			
	Contact Capacity		2 A/pin			
	Wire Connection		D1/D: Specifications with solder D3:D-sub-connector (15-pin)			

*1: Usable pressure range -100 kPa to 0.7 MPa, however, vacuum cannot be maintained.
*2: The electrode block for the electrical interface can be retrofitted.

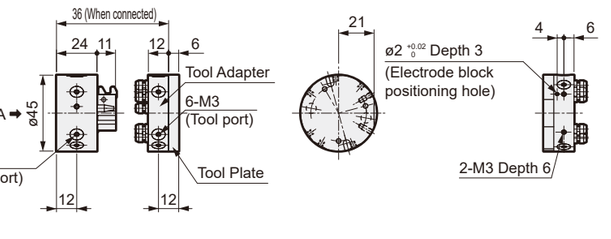
External Dimensions (CHC-1)

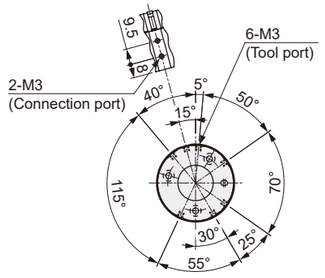
● CHC-1

・Body side CHC-1R



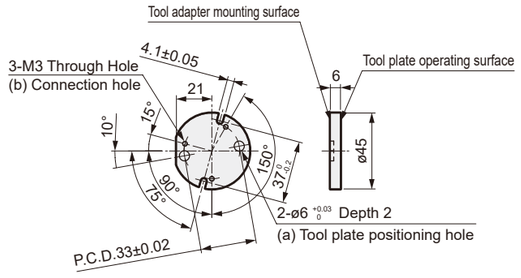
・Tool adapter side CHC-1H





Piping Port Layout (Arrow view A)

Tool Plate Drawing

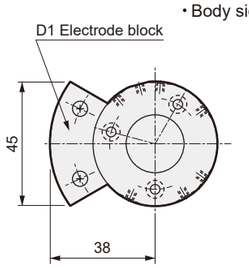


Note1) When attaching a hand, etc., to the tool adapter side, remove the tool plate and perform additional machining on the tool plate operating surface before attaching. Avoid machining on (a) tool plate positioning hole and (b) connecting hole. If mounting on a different tool plate, drill (a) and (b) holes on the plate.
Note2) Holes (a) and (b) in the tool plate are for fixing the tool adapter and cannot be used.

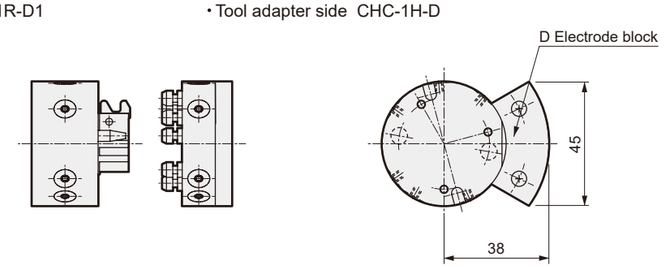
Outer Dimensions Diagram with Option

● With Electrode Block

・Body side CHC-1R-D1



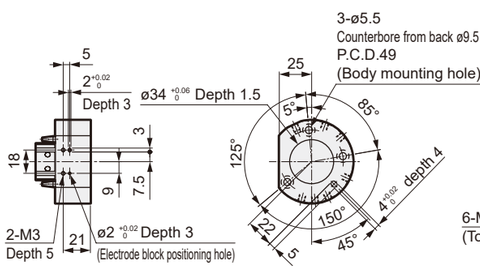
・Tool adapter side CHC-1H-D



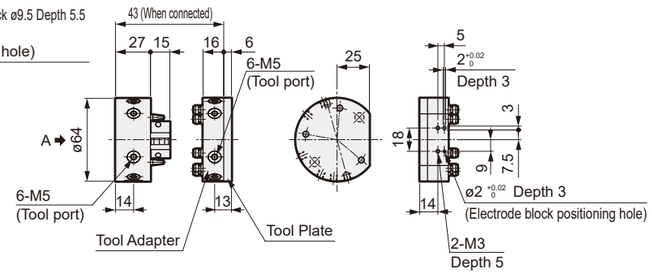
External Dimensions (CHC-5)

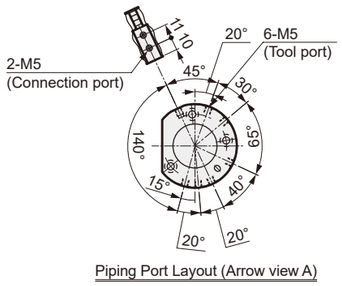
● CHC-5

• Body side CHC-5R



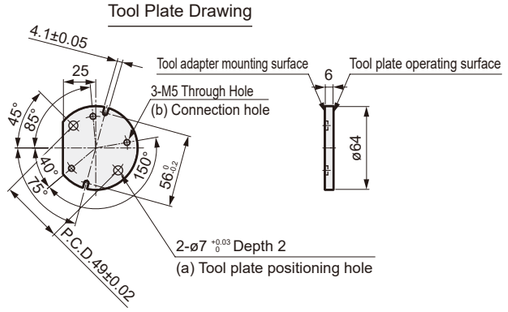
• Tool adapter side CHC-5H





Piping Port Layout (Arrow view A)

Tool Plate Drawing



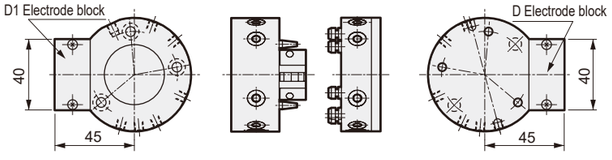
Note1) When attaching a hand, etc., to the tool adapter side, remove the tool plate and perform additional machining on the tool plate operating surface before attaching. Avoid machining on (a) tool plate positioning hole and (b) connecting hole. If mounting on a different tool plate, drill (a) and (b) holes on the plate.

Note2) Holes (a) and (b) in the tool plate are for fixing the tool adapter and cannot be used.

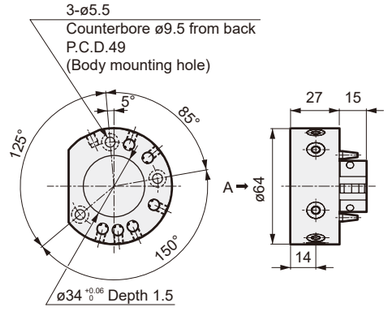
Outer Dimensions Diagram with Option

● With Electrode Block

• Body side CHC-5R-D1 • Tool adapter side CHC-5H-D

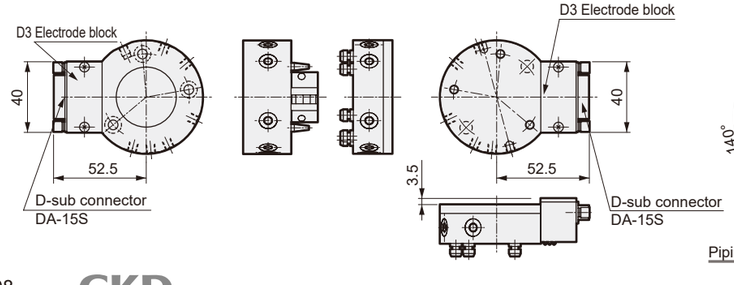


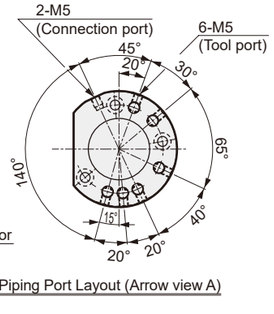
● With Check Valve CHC-5R-B



● With electrode block D-sub connector (socket)

• Body side CHC-5R-D3 • Tool adapter side CHC-5H-D3



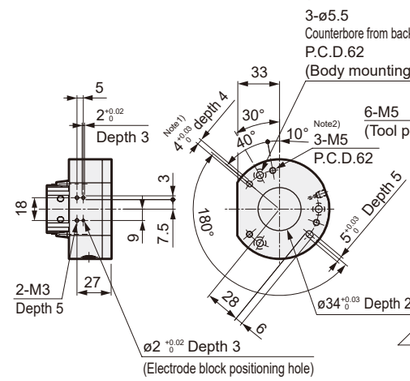


Piping Port Layout (Arrow view A)

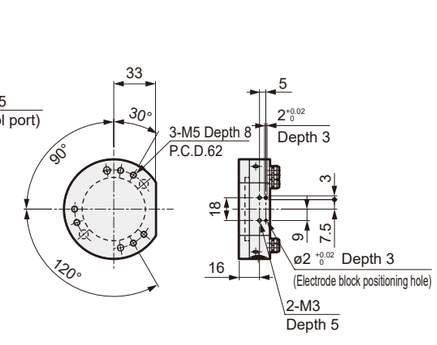
External Dimensions (CHC-10)

● CHC-10

• Body side CHC-10R

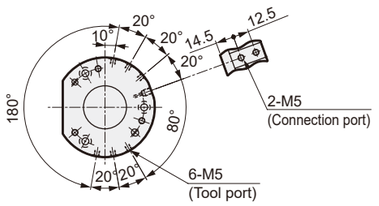


• Tool adapter side CHC-10H



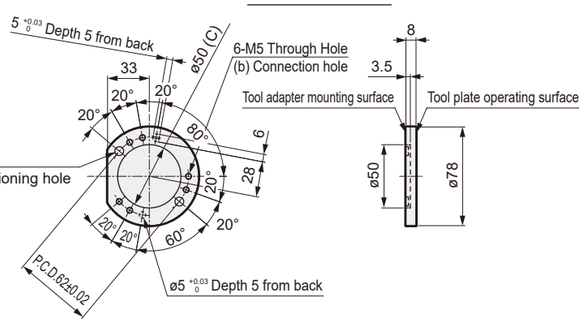
Note1) Cannot be used as it indicates the internal shape.

Note2) This cannot be used because the body and cylinder cover are connected. The holes (a), (b), and (c) on the tool plate will also be unusable.



Piping Port Layout (Arrow view A)

Tool Plate Drawing

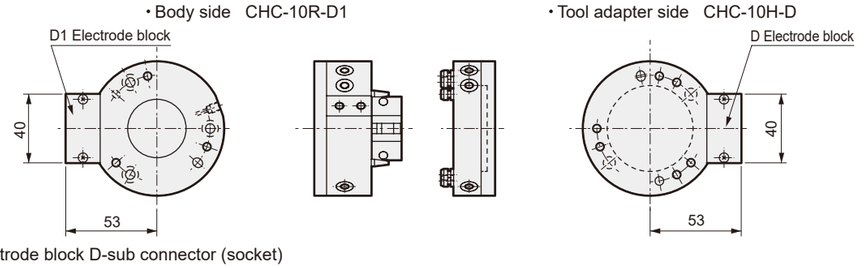


Note) If attaching a hand to the tool adaptor side, remove the tool plate and machine the tool plate application surface before attaching the hand. Avoid machining on (a) tool plate positioning hole and (b) connecting hole. In addition, (c) is a necessary space for operation of the arm when the body side grasps the tool adaptor unit. When attaching a different tool plate, create holes (a), (b), and (c) in that plate.

Outer Dimensions Diagram with Option

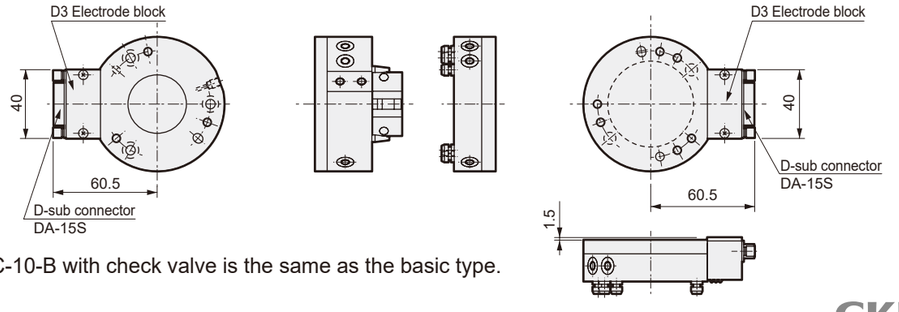
● With Electrode Block

• Body side CHC-10R-D1 • Tool adapter side CHC-10H-D



● With electrode block D-sub connector (socket)

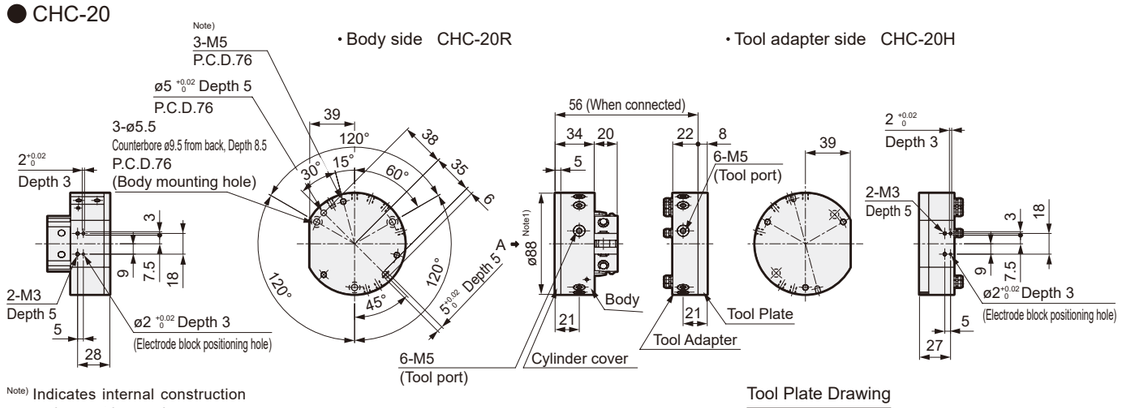
• Body side CHC-10R-D3 • Tool adapter side CHC-10H-D3



Note) CHC-10-B with check valve is the same as the basic type.

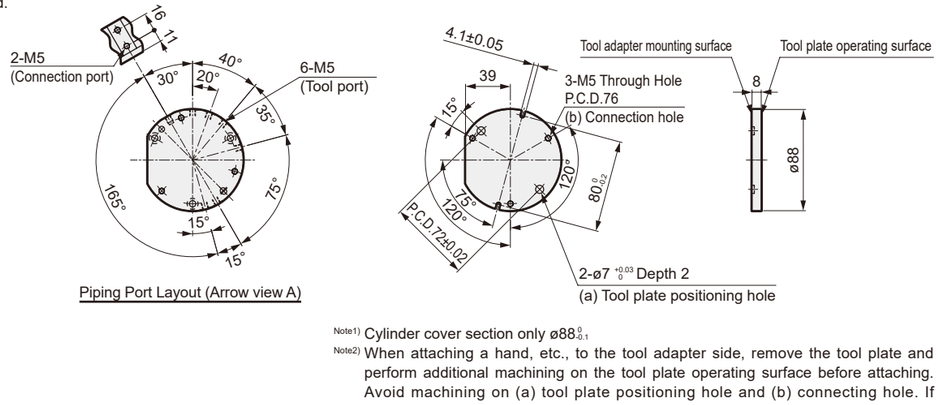
External Dimensions (CHC-20)

● CHC-20



Note) Indicates internal construction and cannot be used.

Tool Plate Drawing



Note1) Cylinder cover section only $\phi 88^{0}_{-0.1}$

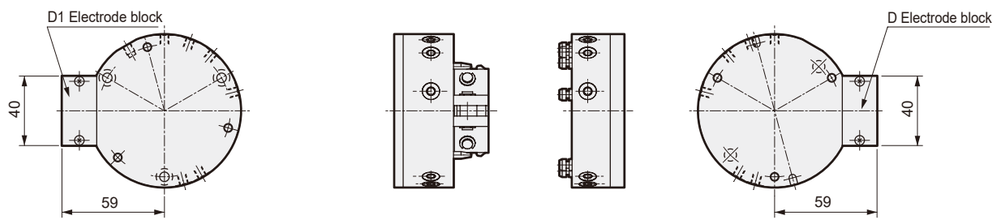
Note2) When attaching a hand, etc., to the tool adapter side, remove the tool plate and perform additional machining on the tool plate operating surface before attaching. Avoid machining on (a) tool plate positioning hole and (b) connecting hole. If mounting on a different tool plate, drill (a) and (b) holes on the plate.

Note3) Holes (a) and (b) in the tool plate are for fixing the tool adapter and cannot be used.

Outer Dimensions Diagram with Option

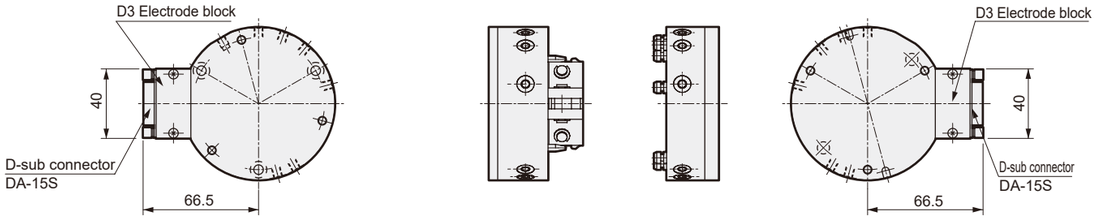
● With Electrode Block

• Body side CHC-20R-D1 • Tool adapter side CHC-20H-D



● With electrode block D-sub connector (socket)

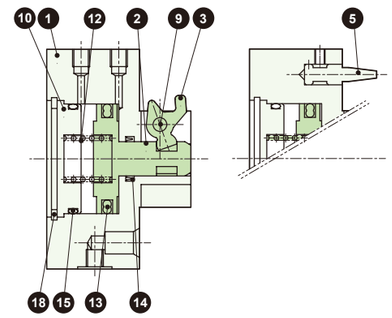
• Body side CHC-20R-D3 • Tool adapter side CHC-20H-D3



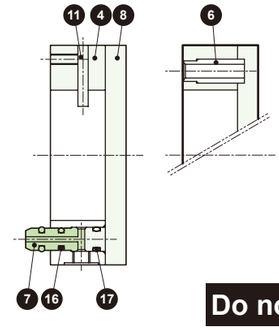
Note) CHC-20-B with check valve is the same as the basic type.

Internal Structure Diagram/Material

● CHC-1 to 20R (body side)



● CHC-1 to 20H (tool adaptor side)

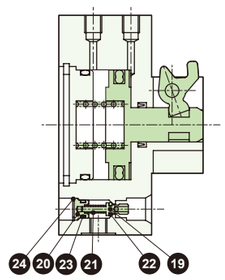


Do not disassemble

Part No.	Part Name	Material	Part No.	Part Name	Material
1	Body	Aluminum Alloy	10	Cover	Aluminum Alloy
2	Piston	Stainless Steel	11	Operating Shaft	Alloy Steel
3	Arm	Stainless Steel	12	Coil Spring	Stainless Steel
4	Tool Adapter	Aluminum Alloy	13	Piston seal	Nitrile Rubber
5	Positioning pin	Stainless Steel	14	Rod seal	Nitrile Rubber
6	Positioning hole	Stainless Steel	15	Cylinder seal	Nitrile Rubber
7	Air Bin	Stainless Steel	16	Air Pin Seal	Nitrile Rubber
8	Tool Plate	Aluminum Alloy	17	Air Pin Seal	Nitrile Rubber
9	Pivot Shaft	Steel	18	C-type retaining ring	Stainless steel (1R, 5R only)

Internal Structure Diagram/Material with Options

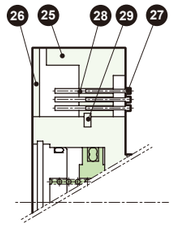
● Body side with check valve
CHC-5 to 20R-B



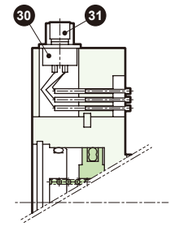
Part No.	Part Name	Material
19	Spool	Stainless Steel
20	Spool Retainer	Aluminum Alloy
21	Spring	Stainless Steel
22	Check valve seal 1	Nitrile Rubber
23	Check valve seal 2	Nitrile Rubber
24	C-type retaining ring	Stainless Steel

Note) Check valve cannot be retrofitted.

● Body side/with electrode block
CHC-1 to 20R-D1

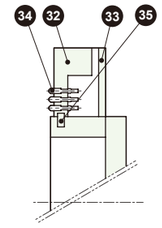


CHC-5 to 20R-D3

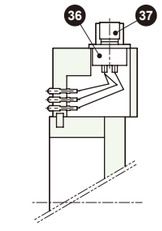


Part No.	Part Name	Material
25	Electrode Base	Resin
26	Base Cover	Resin
27	Probe	
28	Receptacle	
29	Positioning pin	Alloy Steel
30	D-sub connector	
31	Mating fixing base	

● Tool adaptor side/with electrode block
CHC-1 to 20H-D



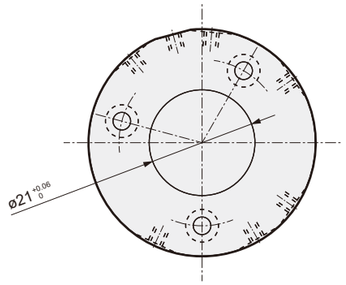
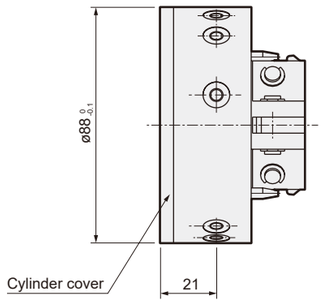
CHC-5 to 20H-D3



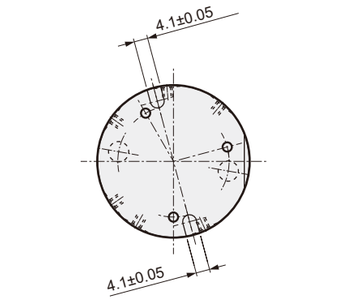
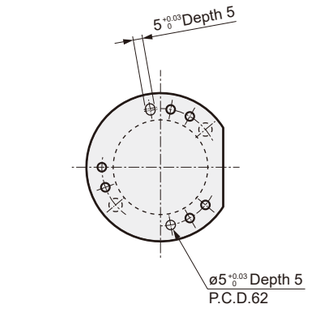
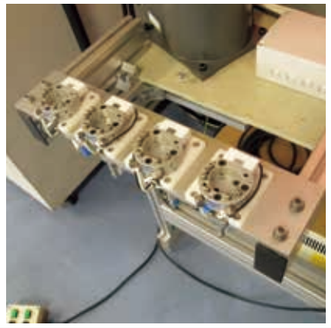
Part No.	Part Name	Material
32	Electrode Base	Resin
33	Base Cover	Resin
34	Electrode Pin	
35	Positioning pin	Alloy Steel
36	D-sub connector	
37	Mating fixing base	

Positioning (Customer's machine - body side, Tool adapter side - Customer's temporary jig)

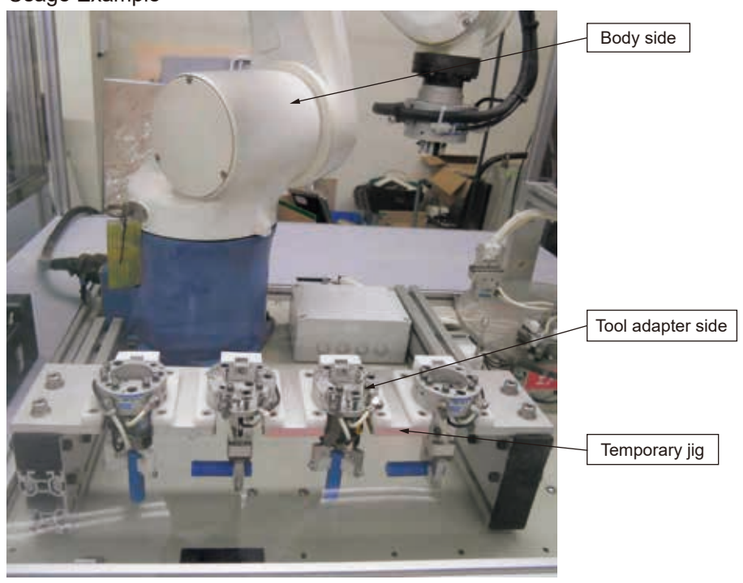
Body side

CHC-1 CHC-5 CHC-10	CHC-20	Usage Example
		
Positioning is done by the pilot bore of ø21 +0.06 0 in the drawing. (The above diagram is for CHC-1.)	Positioning is done by the outer circumference of ø88 0 -0.1 in the drawing.	Attach to the body side using the positioning location in the left drawing.

Tool adapter side

CHC-1 CHC-5 CHC-20	CHC-10	Usage Example
		
Positioning is done by the notch of ø4.1±0.05 in the drawing. (The above diagram is for CHC-1.)	Positioning is done by the elongated hole of ø5 +0.03 0 Depth 5 and the hole of ø5 +0.03 0 Depth 5 P.C.D. 62 in the drawing.	Create a positioning pin on the temporary jig and position with the hole on the tool adapter side in the left drawing.

Usage Example



Pneumatic Equipment

To Use This Product Safely

Be sure to read this before use.
For general cylinder information, see Intro 39, and for cylinder switches, see P. 628.

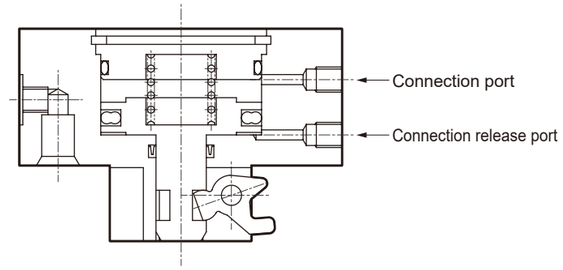
Individual Precautions: Auto Hand Changer CHC Series

During Design / Selection

Caution

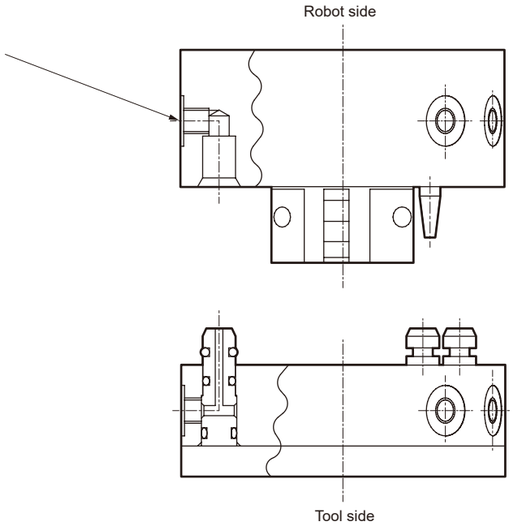
■Piping for body side connection port

The spring is for drop prevention and cannot be used to support external force. When external force is applied during connection, such as during equipment operation, supply air to the connection port before use.



■Compressed air supply to tool port

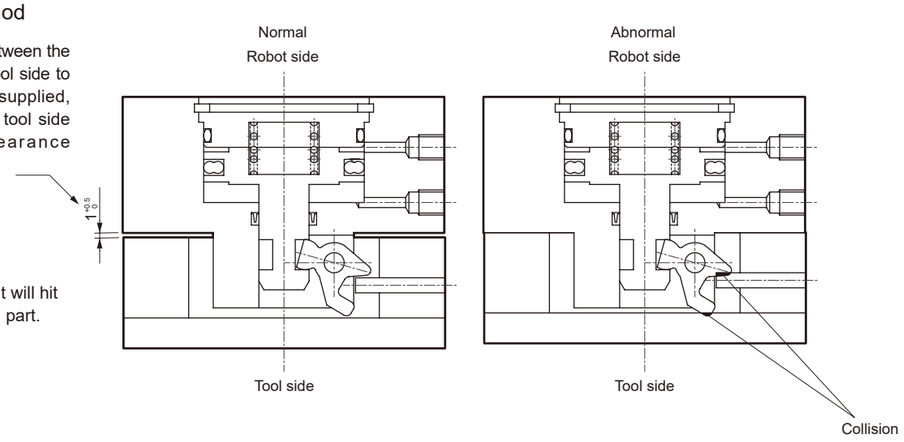
Since the tool port is in an open state, use a 3-position all-port block type directional control valve. Do not supply compressed air when separated.



■Connection Method

Set the clearance between the robot side and the tool side to 1 mm. When air is supplied, the arm pulls in the tool side and the 1 mm clearance disappears.

If it is 1 mm or less, it will hit the tool side ejecting part.



Gripper for Collaborative Robot



CONTENTS

● UNIVERSAL ROBOTS Official Certified Gripper (RLSH/RHLF/RCKL-UR) 518
● TECHMAN ROBOT Official Certified Gripper (RLSH/RHLF/RCKL-TM) 526
● OMRON ROBOT Official Certified Gripper (RLSH/RHLF/RCKL-TM) 534
● FANUC Robot CRX Series Compatible Gripper (RLSH/RHLF/RCKL-FN) 542
● YASKAWA MOTOMAN Robot Compatible Gripper (RLSH/RHLF/RCKL-YS) 550
● JAKA Robot Zu ® Series Compatible Gripper (RLSH/RHLF/RCKL-JK) 556
● Kawasaki Robot K-AddOn Registered Gripper (RLSH/RHLF/RCKL-KW) 562
⚠ Precautions for Use 570

Grippers for Collaborative Robots
RLSH/RHLF/RCKL Series

Collaborative human-robot design

Green Energy
Grippers for collaborative robots are manufactured with 100% natural energy. (Based on Green Power Certificates)

[2020 Good Design Award Winner]



360° visible indicator lamp

Round shape without protrusionss or sharp edges

The fingers can be opened and closed by switching the directional control valve*, and the gripping force can be easily set by adjusting the regulator.

*Option

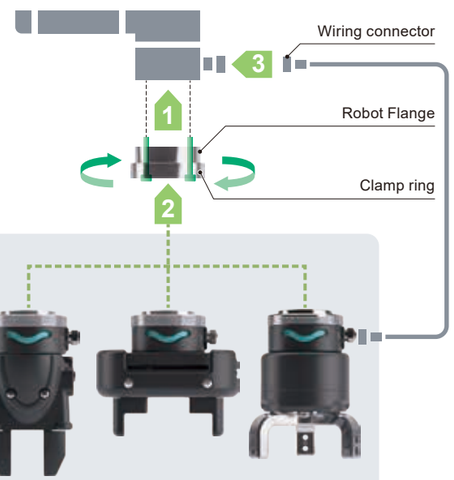
The gripping speed can be easily adjusted with the speed adjustment knob

Achieves high gripping force while being lightweight due to its air drive

Can be mounted on the robot in only 2 minutes

1. Attach the dedicated flange to the robot
2. Turn the clamp ring to mount the gripper
3. Join the wiring connectors

Installation complete!



Replace grippers without tools

- Through the adoption of a robot flange common to the entire series, changeover can be done simply by replacing the gripper.
- The gripper can be replaced without tools. Just turn the clamp ring by hand.

Highly Compatible Pneumatic Grippers for Collaborative Robots

RLSH/RHLF/RCKL Series grippers for collaborative robots are air-driven, making them compact and lightweight, yet with high gripping force. Easy setup supports the introduction of collaborative robots for all customers.

Lineup of three models selectable according to application



RLSH Series
Compact
Stroke : 18 mm
Gripping force : 42 N*
Weight : 0.8 kg



Compact body that does not interfere with robot's trajectory



RHLF Series
Long Stroke
Stroke : 32 mm
Gripping force : 85 N*
Weight : 1.0 kg



Long stroke with reduced height and thin profile



RCKL Series
3-way Fingers
Stroke : 10 mm
Gripping force : 125 N*
Weight : 1.1 kg



3-Finger gripper ideal for cylindrical and round workpieces

*At 0.5 MPa supply pressure, jaw length (ℓ) = 20 mm, and at stroke center.

Supported Collaborative robots manufacturers

UNIVERSAL ROBOTS Certified	TECHMAN ROBOTS Certified	OMRON ROBOTS Certified	FANUC Robot Compatible
R□□□-UR Series	R□□□-TM Series	R□□□-TM Series	R□□□-FN Series
P.518	P.526	P.534	P.542

YASKAWA Robot Compatible	JAKA Robot Compatible	Kawasaki Robot Compatible
R□□□-YS Series	R□□□-JK Series	R□□□-KW Series
P.550	P.556	P.562



UNIVERSAL ROBOTS Official Certified Gripper Compact Type

RLSH-UR Series

With Speed Controller, Cylinder Switch
Connection Port Diameter: ø4 One-touch Fitting

For suitable detailed model No.s, please see our website.

Model No. Notation Method

RLSH – A20D1N – L1 – F Y2V – UR

- RLSH: Model No.
- F: ① Robot Flange
- Y2V: ② Accessories
- UR: UNIVERSAL ROBOTS Certified

① Robot Flange

Code	Content
Blank	No Robot Flange
F	With Robot Flange Note)

Note) Robot flange mounting bolt, USB memory included

② Accessories

Code	Content	
Blank	No Attachments	
Y2	Attachment for testing	*1
V	Directional Control Valve, Tube	*2

*1 Made of resin, so use for gripping tests. (Weight is 25 g per piece)
*2 The directional control valve is a ø4 one-touch fitting (air supply port, A/B port) with silencer (R1/R2 port) and mounting plate. Tubes are ø4 outer diameter, 2.5 m length x 2 pieces.

Specifications

Item		RLSH
Bore size	mm	ø20
Actuation method		Double Acting Type
Operating Fluid		Compressed Air
Max. Operating Pressure	MPa	0.7
Min. Working Pressure	MPa	0.1
Port Size		ø4 One-touch Fitting
Ambient Temperature	°C	0 to 50
Operating Stroke	mm	18
Repeatability	mm	±0.01
Weight	kg	0.8
Indicator LED		Blue/Green
Cylinder Switch		With F2H (Yellow LED ON when lit)

Note) For attachments manufactured to match workpieces, refer to P. 568.

[Switch Specifications]

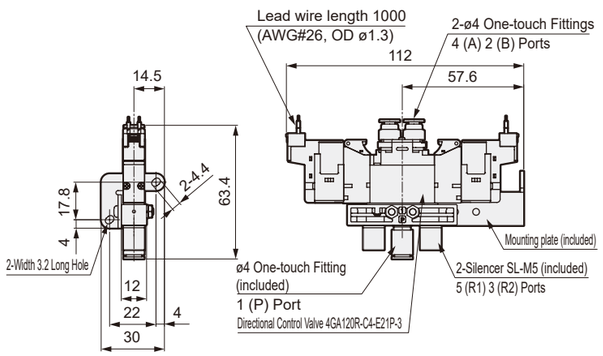
Item	Solid state 2-wire type	
	F2H	T2H
Applications	For programmable controller only	
Load Voltage/Current	10 to 30 VDC, 5 to 20 mA	
Leakage current	1 mA or less	
Shock resistance	980 m/s²	
Weight g	10	18

[Directional Control Valve (V) Specifications]

Item		4GA120R-C4-E21P-FLA28482-3-ST
Valve Type and Operation Method		Pilot Operated Soft Spool Valve
Switching Position Classification		2-position double solenoid
Max. Operating Pressure	MPa	0.7
Min. Working Pressure	MPa	0.2
Ambient Temperature	°C	-5 to 55 (No freezing)
Fluid Temperature	°C	5 to 55
Manual Override		Non-lock/Lock Common Type
Response Time	ms	9
Flow Characteristics C [dm³/ (s·bar)], b		P → A/B: C=1.2, b=0.47 A/B→R1/R2: C=0.72, b=0.37
Rated voltage	V	24 VDC
Voltage Fluctuation Range		±10%
Holding Current	A	0.017
Power Consumption	W	0.40
Surge Suppressor		Built-in
Indicator		Built-in Lamp

For other specification products, please refer to "Directional Control Valve ① (No.RJ-011AA)".

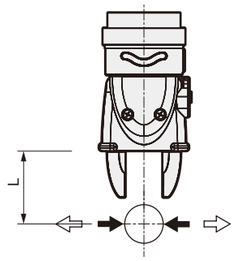
Outline Dimension Drawing

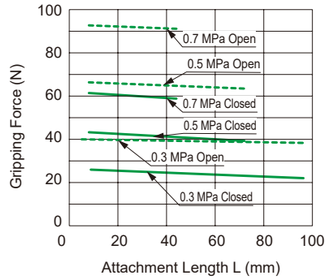


Gripping Force Performance Data

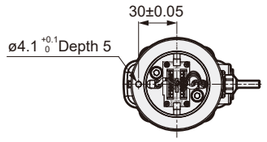
- Gripping force represents the thrust (for one finger) in the direction of the arrow shown in the figure.
- This represents the gripping force acting in the opening and closing directions at a gripper's attachment length L when the supply pressure is 0.3, 0.5, and 0.7 MPa.

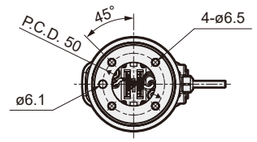
Open direction (⇦) ---------- (broken line)
Closing direction (➡) ———— (solid line)

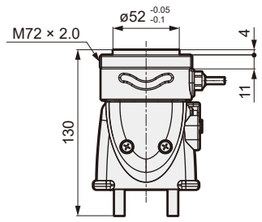


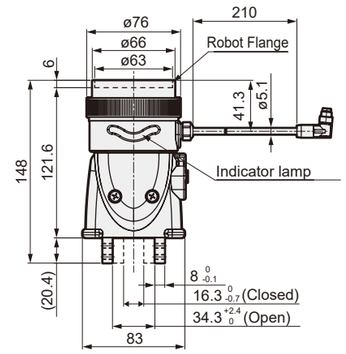


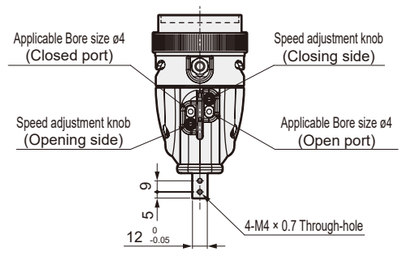
Outline Dimension Drawing



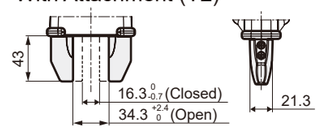








With Attachment (Y2)





UNIVERSAL ROBOTS Official Certified Gripper Long Stroke Type

RHLF-UR Series

With Speed Controller, Cylinder Switch
Connection Port Diameter: ø4 One-touch Fitting

For suitable detailed model No.s, please see our website.

Model No. Notation Method

RHLF – 16CS – F (1) Y2V (2) – UR

- RHLF: Model No.
- 1 F: Robot Flange
- 2 Y2V: Accessories
- UR: UNIVERSAL ROBOTS Certified

1 Robot Flange

Code	Content
Blank	No Robot Flange
F	With Robot Flange Note)

Note) Robot flange mounting bolt, USB memory included

2 Accessories

Code	Content
Blank	No Attachments
Y2	Attachment for testing *1
V	Directional Control Valve • Tube *2

*1 Made of resin, so use for gripping tests. (Weight is 25 g per piece)
*2 The directional control valve is a ø4 one-touch fitting (air supply port, A/B port) with silencer (R1/R2 port) and mounting plate. Tubes are ø4 outer diameter, 2.5 m length x 2 pieces.

Specifications

Item		RHLF
Bore size	mm	ø16 × 2
Actuation method		Double Acting Type
Operating Fluid		Compressed Air
Max. Operating Pressure	MPa	0.7
Min. Working Pressure	MPa	0.2
Port Size		ø4 One-touch Fitting
Ambient Temperature	°C	5 to 50
Operating Stroke	mm	32
Repeatability	mm	±0.03
Weight	kg	1.0
Indicator LED		Blue/Green
Cylinder Switch		With T2H (Red LED ON when lit)

Note) For attachments manufactured to match workpieces, refer to P. 568.

[Switch Specifications]

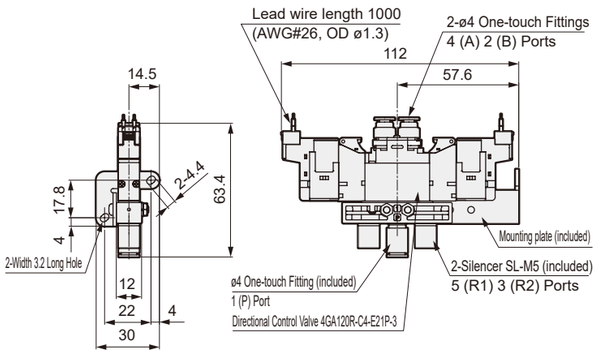
Item		Solid state 2-wire type	
		F2H	T2H
Applications		For programmable controller only	
Load Voltage/Current		10 to 30 VDC, 5 to 20 mA	
Leakage current		1 mA or less	
Shock resistance		980 m/s²	
Weight	g	10	18

[Directional Control Valve (V) Specifications]

Item		4GA120R-C4-E21P-FLA28482-3-ST
Valve Type and Operation Method		Pilot Operated Soft Spool Valve
Switching Position Classification		2-position double solenoid
Max. Operating Pressure	MPa	0.7
Min. Working Pressure	MPa	0.2
Ambient Temperature	°C	-5 to 55 (No freezing)
Fluid Temperature	°C	5 to 55
Manual Override		Non-lock/Lock Common Type
Response Time	ms	9
Flow Characteristics C [dm³/ (s·bar)], b		P → A/B C=1.2, b=0.47 A/B→R1/R2: C=0.72, b=0.37
Rated voltage	V	24 VDC
Voltage Fluctuation Range		±10%
Holding Current	A	0.017
Power Consumption	W	0.40
Surge Suppressor		Built-in
Indicator		Built-in Lamp

For other specification products, please refer to "Directional Control Valve ① (No.RJ-011AA)".

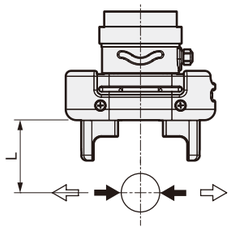
Outline Dimension Drawing

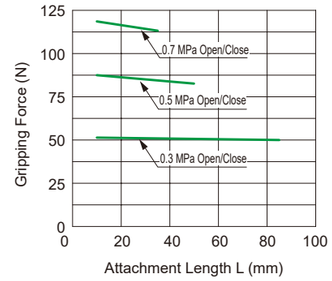


Gripping Force Performance Data

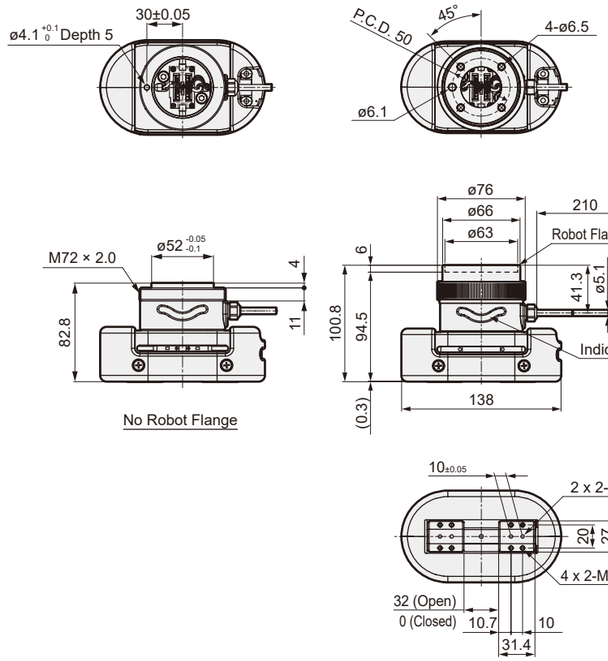
- Gripping force represents the thrust (for one finger) in the direction of the arrow shown in the figure.
- This represents the gripping force acting in the opening and closing directions at a gripper's attachment length L when the supply pressure is 0.3, 0.5, and 0.7 MPa.

Open direction (⇦), closed direction (➡) ——(solid line)





Outline Dimension Drawing





UNIVERSAL ROBOTS Official Certified Gripper 3-Finger Type

RCKL-UR Series

With Speed Controller, Cylinder Switch
Connection Port Diameter: ø4 One-touch Fitting

For suitable detailed model No.s, please see our website.

Model No. Notation Method

RCKL – 40CS – F – Y3V – UR

- RCKL: Model No.
- F: ① Robot Flange
- Y3V: ② Accessories
- UR: UNIVERSAL ROBOTS Certified

① Robot Flange

Code	Content
Blank	No Robot Flange
F	With Robot Flange Note)

Note) Robot flange mounting bolt, USB memory included

② Accessories

Code	Content
Blank	No Attachments
Y3	Attachment *1
V	Directional Control Valve, Tube *2

*1 Material is aluminum alloy. (Weight is 50 g per piece)
*2 The directional control valve is a ø4 one-touch fitting (air supply port, A/B port) with silencer (R1/R2 port) and mounting plate. Tubes are ø4 outer diameter, 2.5 m length x 2 pieces.

Specifications

Item		RCKL
Bore size	mm	ø40
Actuation method		Double Acting Type
Operating Fluid		Compressed Air
Max. Operating Pressure	MPa	0.7
Min. Working Pressure	MPa	0.3
Port Size		ø4 One-touch Fitting
Ambient Temperature	°C	5 to 50
Operating Stroke	mm	10
Repeatability	mm	±0.01
Weight	kg	1.1
Indicator LED		Blue/Green
Cylinder Switch		With T2H (Red LED ON when lit)

Note) For attachments manufactured to match workpieces, refer to P. 568.

[Switch Specifications]

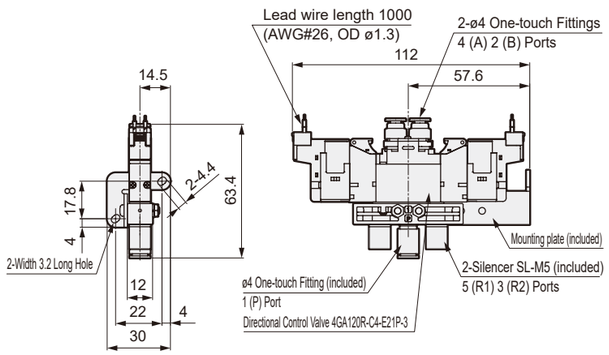
Item		Solid state 2-wire type	
		F2H	T2H
Applications		For programmable controller only	
Load Voltage/Current		10 to 30 VDC, 5 to 20 mA	
Leakage current		1 mA or less	
Shock resistance		980 m/s²	
Weight	g	10	18

[Directional Control Valve (V) Specifications]

Item		4GA120R-C4-E21P-FLA28482-3-ST
Valve Type and Operation Method		Pilot Operated Soft Spool Valve
Switching Position Classification		2-position double solenoid
Max. Operating Pressure	MPa	0.7
Min. Working Pressure	MPa	0.2
Ambient Temperature	°C	-5 to 55 (No freezing)
Fluid Temperature	°C	5 to 55
Manual Override		Non-lock/Lock Common Type
Response Time	ms	9
Flow Characteristics C [dm³/ (s·bar)], b		P → A/B: C=1.2, b=0.47 A/B→R1/R2: C=0.72, b=0.37
Rated voltage	V	24 VDC
Voltage Fluctuation Range		±10%
Holding Current	A	0.017
Power Consumption	W	0.40
Surge Suppressor		Built-in
Indicator		Built-in Lamp

For other specification products, please refer to "Directional Control Valve ① (No.RJ-011AA)".

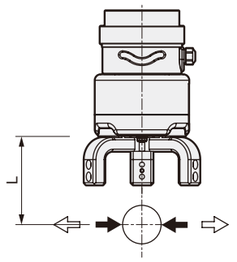
Outline Dimension Drawing

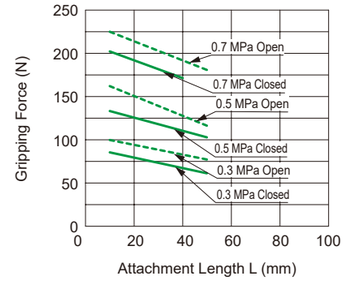


Gripping Force Performance Data

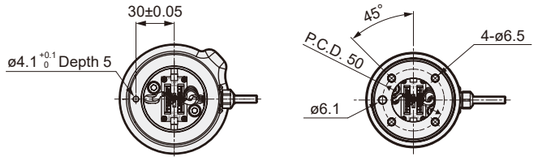
- Gripping force represents the thrust (for one finger) in the direction of the arrow shown in the figure.
- This represents the gripping force acting in the opening and closing directions at a gripper's attachment length L when the supply pressure is 0.3, 0.5, and 0.7 MPa.

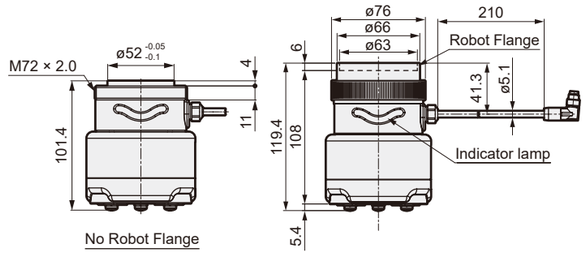
Open direction (⇦) ---------- (broken line)
Closing direction (➡) ———— (solid line)

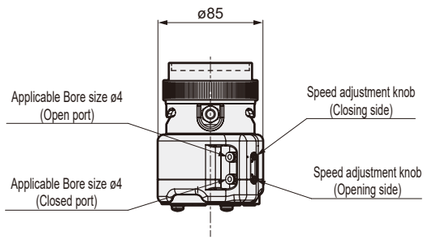


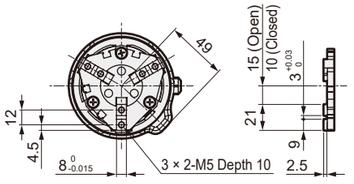


Outline Dimension Drawing

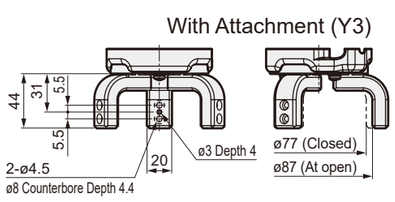








With Attachment (Y3)



Attached Software "CKD Pneumatic Gripper" Operation Method

This is an overview of how to operate the *dedicated software "CKD Pneumatic Gripper" included with this product. Refer to the UR Robot Manual and this product's Instruction Manual for details.

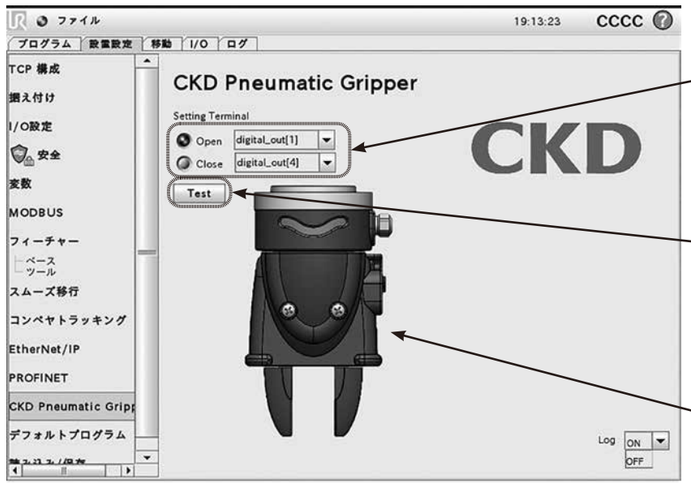
* When option "F" is selected

Software Installation

Insert the included USB memory into the robot controller, navigate to the robot controller's "Setup Robot" screen, then sequentially select "URCaps" and "CKD Pneumatic Gripper", and press the "Restart" button to begin installation.

Setup Screen

Set the digital I/O of the directional control valve for opening/closing the gripper. Since the actual opening/closing status can be checked on the graphic display, it is easy to confirm if the signal is not reversed. Use a double solenoid 2-position valve for the directional control valve to prevent workpiece drop when the signal is interrupted.



Directional Control Valve Digital I/O Setting

Set the digital I/O for the directional control valve to actuate OPEN and CLOSE respectively.

Test Button

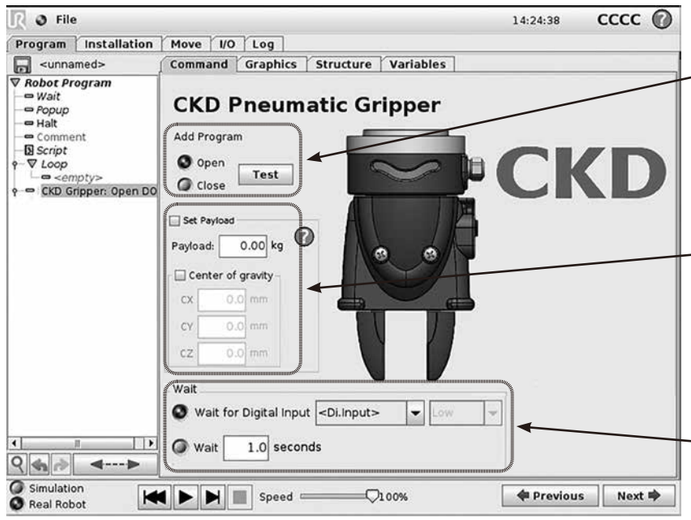
Check OPEN/CLOSE operation to confirm correct I/O settings.

Graphic Display

Displays the gripper's OPEN/CLOSE status and the operating status of the built-in cylinder switch with color changes.

Program Registration Screen

This screen registers gripper operation commands in the robot program.
Enter gripper actuation direction, Payload (total weight of gripper, attachment, and workpiece), center of gravity coordinates (Payload center of gravity position), and conditions for proceeding to the next operation.



Operation Direction Selection Button

Select the operation direction with the OPEN/CLOSE checkbox. Confirm operation with the test button.

Total Weight and Center of Gravity Position Setting

For "Payload", enter the total weight of the gripper, attachment, and workpiece. For "Center of gravity", enter the center of gravity position of the total weight in XYZ coordinates.

Operation Condition Setting

Set conditions for proceeding to the next operation after gripper actuation. If waiting for an input signal, select the signal number; if setting a timer, enter the waiting time.

MEMO

Gripper for Collaborative Robot
Cylinder Switch
Ending



TECHMAN ROBOTS Official Certified Gripper Compact Type (TECHMAN)

RLSH-TM Series

With Speed Controller, Cylinder Switch
Connection Port Diameter: ø4 One-touch Fitting

For suitable detailed model No.s, please see our website.

Model No. Notation Method

RLSH – A20D1N – L1 – F Y2V – TM

- RLSH: Model No.
- F: ① Robot Flange
- Y2V: ② Accessories
- TM: TM Robot Certified

① Robot Flange

Code	Content
Blank	No Robot Flange
F	With Robot Flange Note)

Note) Robot flange mounting bolts included

② Accessories

Code	Content
Blank	No Attachments
Y2	Attachment for testing *1
V	Directional Control Valve, Tube *2

*1 Made of resin, so use for gripping tests. (Weight is 25 g per piece)
*2 The directional control valve is a ø4 one-touch fitting (air supply port, A/B port) with silencer (R1/R2 port) and mounting plate. Tubes are ø4 outer diameter, 2.5 m length x 2 pieces.

Specifications

Item		RLSH
Bore size	mm	ø20
Actuation method		Double Acting Type
Operating Fluid		Compressed Air
Max. Operating Pressure	MPa	0.7
Min. Working Pressure	MPa	0.1
Port Size		ø4 One-touch Fitting
Ambient Temperature	°C	0 to 50
Operating Stroke	mm	18
Repeatability	mm	±0.01
Weight	kg	0.8
Indicator LED		Blue/Green
Cylinder Switch		With F2H (Yellow LED ON when lit)

Note) For attachments manufactured to match workpieces, refer to P. 568.

[Switch Specifications]

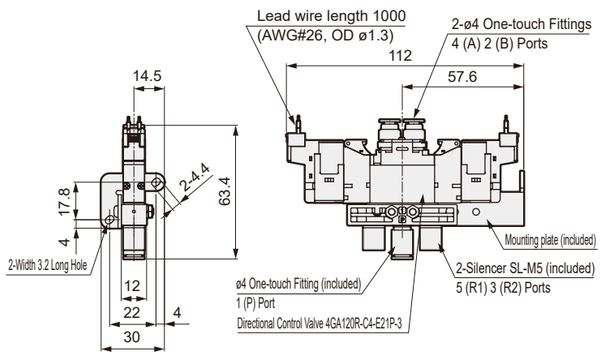
Item	Solid state 2-wire type	
	F2H	T2H
Applications	For programmable controller only	
Load Voltage/Current	10 to 30 VDC, 5 to 20 mA	
Leakage current	1 mA or less	
Shock resistance	980 m/s²	
Weight g	10	18

[Directional Control Valve (V) Specifications]

Item	4GA120R-C4-E21P-FLA28482-3-ST
Valve Type and Operation Method	Pilot Operated Soft Spool Valve
Switching Position Classification	2-position double solenoid
Max. Operating Pressure MPa	0.7
Min. Working Pressure MPa	0.2
Ambient Temperature °C	-5 to 55 (No freezing)
Fluid Temperature °C	5 to 55
Manual Override	Non-lock/Lock Common Type
Response Time ms	9
Flow Characteristics C [dm³/ (s·bar)], b	P → A/B: C=1.2, b=0.47 A/B→R1/R2: C=0.72, b=0.37
Rated voltage V	24 VDC
Voltage Fluctuation Range	±10%
Holding Current A	0.017
Power Consumption W	0.40
Surge Suppressor	Built-in
Indicator	Built-in Lamp

For other specification products, please refer to "Directional Control Valve ① (No.RJ-011AA)".

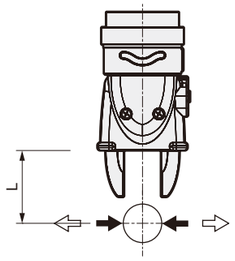
Outline Dimension Drawing

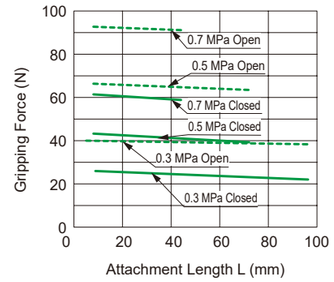


Gripping Force Performance Data

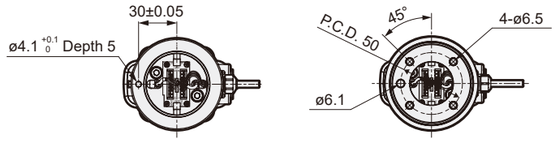
- Gripping force represents the thrust (for one finger) in the direction of the arrow shown in the figure.
- This represents the gripping force acting in the opening and closing directions at a gripper's attachment length L when the supply pressure is 0.3, 0.5, and 0.7 MPa.

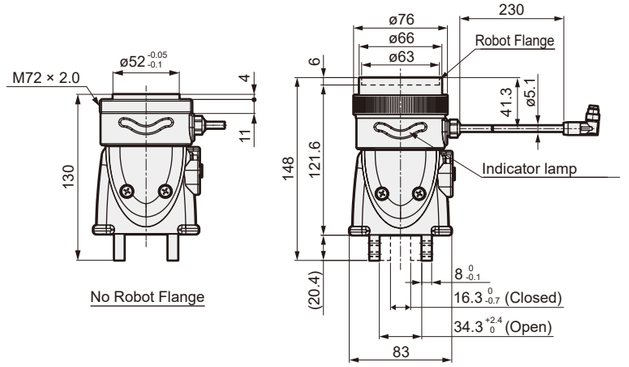
Open direction (⇦) ---------- (broken line)
Closing direction (➡) ———— (solid line)

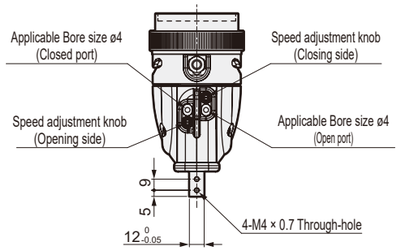




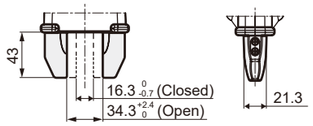
Outline Dimension Drawing







With Attachment (Y2)





TECHMAN ROBOTS Official Certified Gripper Long Stroke Type (TECHMAN)

RHLF-TM Series

With Speed Controller, Cylinder Switch
Connection Port Diameter: ø4 One-touch Fitting

For suitable detailed model No.s, please see our website.

Model No. Notation Method

RHLF – 16CS – F Y2V – TM

- RHLF: Model No.
- F: ① Robot Flange
- Y2V: ② Accessories
- TM: TM Robot Certified

①Robot Flange

Code	Content
Blank	No Robot Flange
F	With Robot Flange Note)

Note) Robot flange mounting bolts included

②Accessories

Code	Content
Blank	No Attachments
Y2	Attachment for testing *1
V	Directional Control Valve • Tube *2

*1 Made of resin, so use for gripping tests. (Weight is 30 g per piece)
*2 The directional control valve is a ø4 one-touch fitting (air supply port, A/B port) with silencer (R1/R2 port) and mounting plate. Tubes are ø4 outer diameter, 2.5 m length x 2 pieces.

Specifications

Item		RHLF
Bore size	mm	ø16 × 2
Actuation method		Double Acting Type
Operating Fluid		Compressed Air
Max. Operating Pressure	MPa	0.7
Min. Working Pressure	MPa	0.2
Port Size		ø4 One-touch Fitting
Ambient Temperature	°C	5 to 50
Operating Stroke	mm	32
Repeatability	mm	±0.03
Weight	kg	1.0
Indicator LED		Blue/Green
Cylinder Switch		With T2H (Red LED ON when lit)

Note) For attachments manufactured to match workpieces, refer to P. 568.

[Switch Specifications]

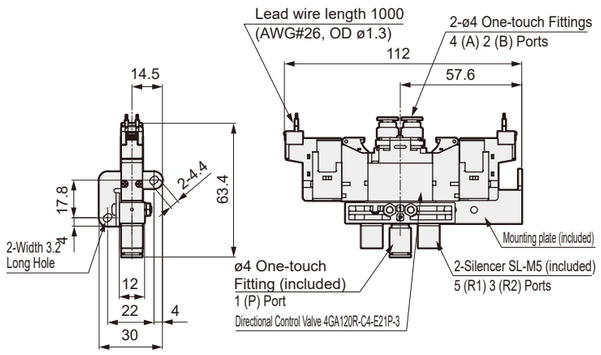
Item		Solid state 2-wire type	
		F2H	T2H
Applications		For programmable controller only	
Load Voltage/Current		10 to 30 VDC, 5 to 20 mA	
Leakage current		1 mA or less	
Shock resistance		980 m/s²	
Weight	g	10	18

[Directional Control Valve (V) Specifications]

Item		4GA120R-C4-E21P-FLA28482-3-ST
Valve Type and Operation Method		Pilot Operated Soft Spool Valve
Switching Position Classification		2-position double solenoid
Max. Operating Pressure	MPa	0.7
Min. Working Pressure	MPa	0.2
Ambient Temperature	°C	-5 to 55 (No freezing)
Fluid Temperature	°C	5 to 55
Manual Override		Non-lock/Lock Common Type
Response Time	ms	9
Flow Characteristics C [dm³/ (s·bar)], b		P → A/B: C=1.2, b=0.47 A/B→R1/R2: C=0.72, b=0.37
Rated voltage	V	24 VDC
Voltage Fluctuation Range		±10%
Holding Current	A	0.017
Power Consumption	W	0.40
Surge Suppressor		Built-in
Indicator		Built-in Lamp

For other specification products, please refer to "Directional Control Valve ① (No.RJ-011AA)".

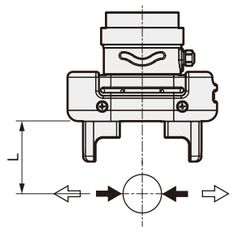
Outline Dimension Drawing

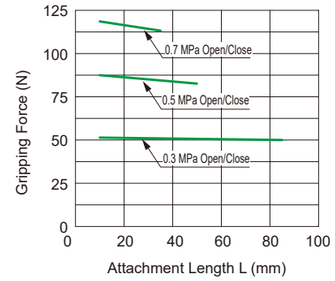


Gripping Force Performance Data

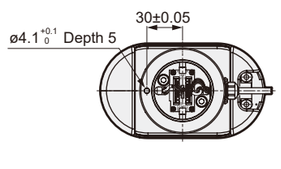
- Gripping force represents the thrust (for one finger) in the direction of the arrow shown in the figure.
- This represents the gripping force acting in the opening and closing directions at a gripper's attachment length L when the supply pressure is 0.3, 0.5, and 0.7 MPa.

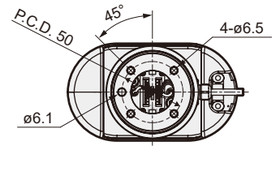
Open direction (⇦), closed direction (➡) ——— (solid line)

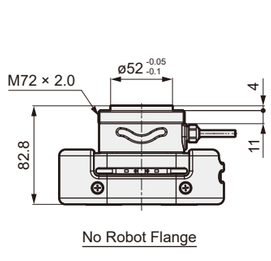


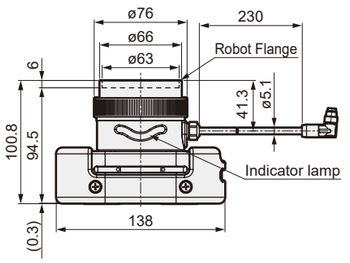


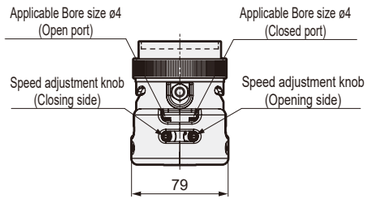
Outline Dimension Drawing

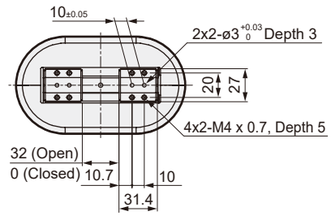


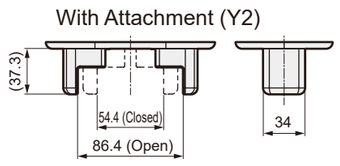














TECHMAN ROBOTS Official Certified Gripper 3-Finger Type (TECHMAN)

RCKL-TM Series

With Speed Controller, Cylinder Switch
Connection Port Diameter: ø4 One-touch Fitting

For suitable detailed model No.s, please see our website.

Model No. Notation Method

RCKL – 40CS – F – Y3V – TM

- RCKL: Model No.
- F: ① Robot Flange
- Y3V: ② Accessories
- TM: TM Robot Certified

① Robot Flange

Code	Content
Blank	No Robot Flange
F	With Robot Flange Note)

Note) Robot flange mounting bolts included

② Accessories

Code	Content
Blank	No Attachments
Y3	Attachment *1
V	Directional Control Valve • Tube *2

*1 Material is aluminum alloy. (Weight is 50 g per piece)
*2 The directional control valve is a ø4 one-touch fitting (air supply port, A/B port) with silencer (R1/R2 port) and mounting plate. Tubes are ø4 outer diameter, 2.5 m length x 2 pieces.

Specifications

Item		RCKL
Bore size	mm	ø40
Actuation method		Double Acting Type
Operating Fluid		Compressed Air
Max. Operating Pressure	MPa	0.7
Min. Working Pressure	MPa	0.3
Port Size		ø4 One-touch Fitting
Ambient Temperature	°C	5 to 50
Operating Stroke	mm	10
Repeatability	mm	±0.01
Weight	kg	1.1
Indicator LED		Blue/Green
Cylinder Switch		With T2H (Red LED ON when lit)

Note) For attachments manufactured to match workpieces, refer to P. 568.

[Switch Specifications]

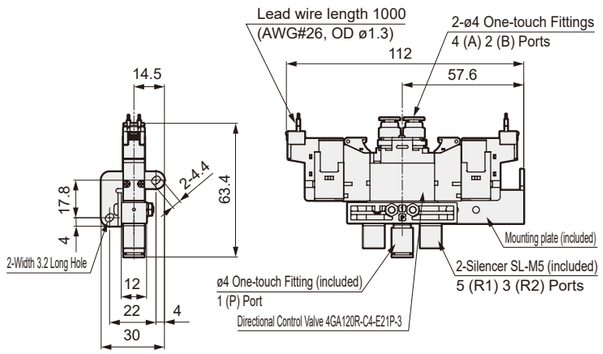
Item		Solid state 2-wire type	
		F2H	T2H
Applications		For programmable controller only	
Load Voltage/Current		10 to 30 VDC, 5 to 20 mA	
Leakage current		1 mA or less	
Shock resistance		980 m/s²	
Weight	g	10	18

[Directional Control Valve (V) Specifications]

Item		4GA120R-C4-E21P-FLA28482-3-ST
Valve Type and Operation Method		Pilot Operated Soft Spool Valve
Switching Position Classification		2-position double solenoid
Max. Operating Pressure	MPa	0.7
Min. Working Pressure	MPa	0.2
Ambient Temperature	°C	-5 to 55 (No freezing)
Fluid Temperature	°C	5 to 55
Manual Override		Non-lock/Lock Common Type
Response Time	ms	9
Flow Characteristics C [dm³/ (s·bar)], b		P → A/B: C=1.2, b=0.47 A/B→R1/R2: C=0.72, b=0.37
Rated voltage	V	24 VDC
Voltage Fluctuation Range		±10%
Holding Current	A	0.017
Power Consumption	W	0.40
Surge Suppressor		Built-in
Indicator		Built-in Lamp

For other specification products, please refer to "Directional Control Valve ① (No.RJ-011AA)".

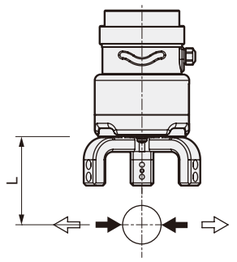
Outline Dimension Drawing

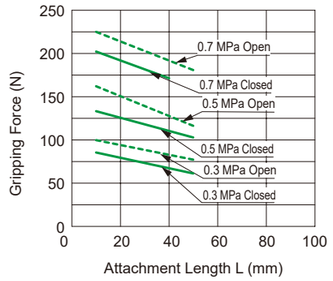


Gripping Force Performance Data

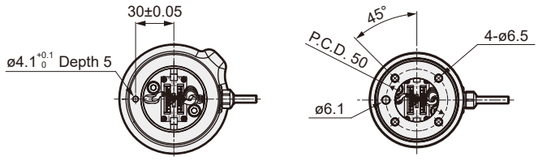
- Gripping force represents the thrust (for one finger) in the direction of the arrow shown in the figure.
- This represents the gripping force acting in the opening and closing directions at a gripper's attachment length L when the supply pressure is 0.3, 0.5, and 0.7 MPa.

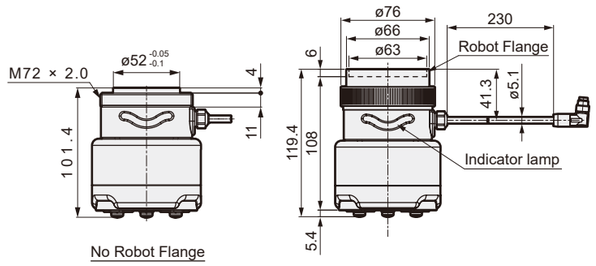
Open direction (⇦) ---------- (broken line)
Closing direction (➡) ———— (solid line)

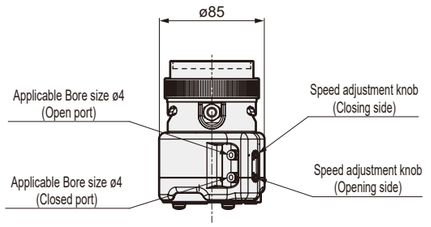


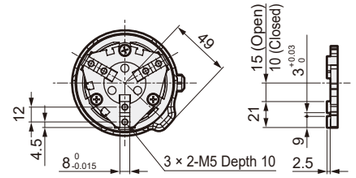


Outline Dimension Drawing

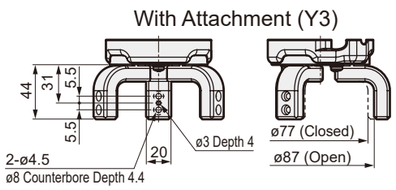








With Attachment (Y3)



Software "CKD Pneumatic Gripper" Operation Method

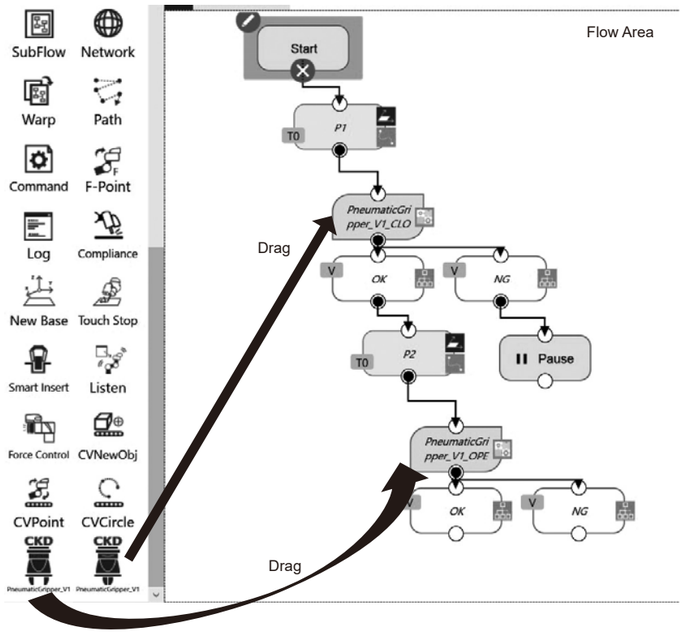
This is an overview of how to operate the dedicated software "CKD Pneumatic Gripper" for this product. For details, please refer to the robot manual and this product's instruction manual.

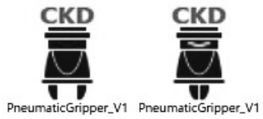
Software Installation

Download the Plug & Play software package from the CKD website (https://www.ckd.co.jp/en/) and import the files according to the instruction manual.

Program Screen

The gripper's opening/closing directions are displayed as icons. Drag icons to the flow editing area to set digital I/O.



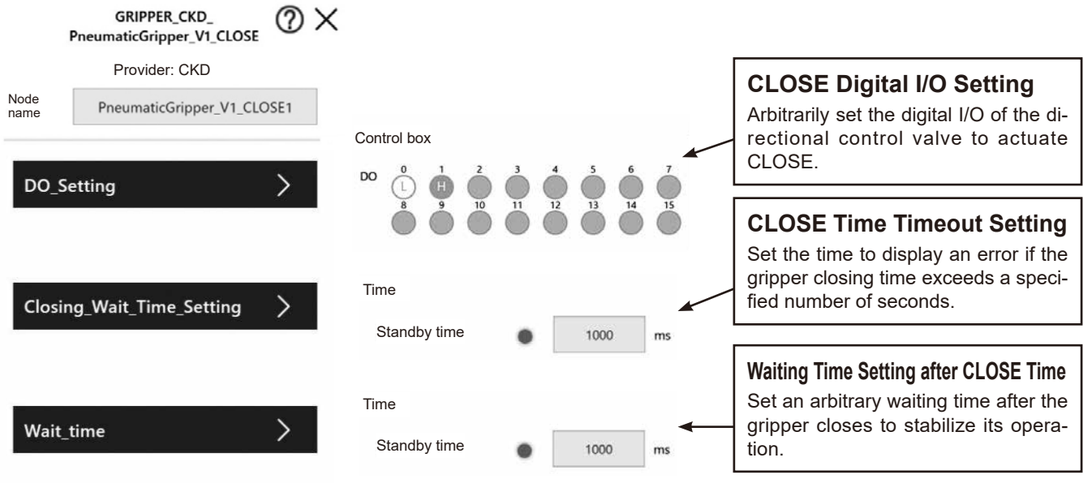


Graphic Display

Displays the gripper's OPEN/CLOSE status and the operating status of the built-in cylinder switch with color changes.

Node Screen

Set the directional control valve's digital I/O, gripper open/close timeout, and waiting time after workpiece gripping.



CLOSE Digital I/O Setting

Arbitrarily set the digital I/O of the directional control valve to actuate CLOSE.

CLOSE Time Timeout Setting

Set the time to display an error if the gripper closing time exceeds a specified number of seconds.

Waiting Time Setting after CLOSE Time

Set an arbitrary waiting time after the gripper closes to stabilize its operation.

*Settings are the same for OPEN.

MEMO

Gripper for Collaborative Robot
Cylinder Switch
Ending



OMRON ROBOT Official Certified Gripper Compact Type (OMRON)

RLSH-TM Series

With Speed Controller, Cylinder Switch
Connection Port Diameter: ø4 One-touch Fitting

For suitable detailed model No.s, please see our website.

Model No. Notation Method

RLSH – **A20D1N** – **L1** – **F** **Y2V** – **TM**

- RLSH: Model No.
- A20D1N: Cylinder
- L1: Switch
- F: ❶ Robot Flange
- Y2V: ❷ Accessories
- TM: OMRON Robot Certified

❶ Robot Flange

Code	Content
Blank	No Robot Flange
F	With Robot Flange Note)

Note) Robot flange mounting bolts included

❷ Accessories

Code	Content
Blank	No Attachments
Y2	Attachment for testing *1
V	Directional Control Valve, Tube *2

*1 Made of resin, so use for gripping tests. (Weight is 25 g per piece)
*2 The directional control valve is a ø4 one-touch fitting (air supply port, A/B port) with silencer (R1/R2 port) and mounting plate. Tubes are ø4 outer diameter, 2.5 m length x 2 pieces.

Specifications

Item		RLSH
Bore size	mm	ø20
Actuation method		Double Acting Type
Operating Fluid		Compressed Air
Max. Operating Pressure	MPa	0.7
Min. Working Pressure	MPa	0.1
Port Size		ø4 One-touch Fitting
Ambient Temperature	°C	0 to 50
Operating Stroke	mm	18
Repeatability	mm	±0.01
Weight	kg	0.8
Indicator LED		Blue/Green
Cylinder Switch		With F2H (Yellow LED ON when lit)

Note) For attachments manufactured to match workpieces, refer to P. 568.

[Switch Specifications]

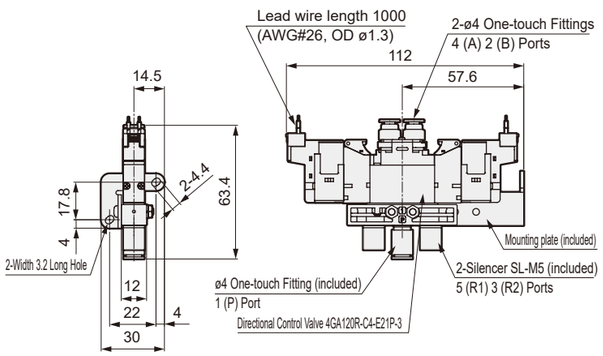
Item	Solid state 2-wire type	
	F2H	T2H
Applications	For programmable controller only	
Load Voltage/Current	10 to 30 VDC, 5 to 20 mA	
Leakage current	1 mA or less	
Shock resistance	980 m/s²	
Weight g	10	18

[Directional Control Valve (V) Specifications]

Item		4GA120R-C4-E21P-FLA28482-3-ST
Valve Type and Operation Method		Pilot Operated Soft Spool Valve
Switching Position Classification		2-position double solenoid
Max. Operating Pressure	MPa	0.7
Min. Working Pressure	MPa	0.2
Ambient Temperature	°C	-5 to 55 (No freezing)
Fluid Temperature	°C	5 to 55
Manual Override		Non-lock/Lock Common Type
Response Time	ms	9
Flow Characteristics C [dm³/ (s·bar)], b		P → A/B: C=1.2, b=0.47 A/B→R1/R2: C=0.72, b=0.37
Rated voltage	V	24 VDC
Voltage Fluctuation Range		±10%
Holding Current	A	0.017
Power Consumption	W	0.40
Surge Suppressor		Built-in
Indicator		Built-in Lamp

For other specification products, please refer to "Directional Control Valve ① (No.RJ-011AA)".

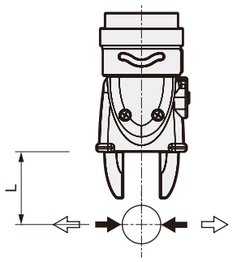
Outline Dimension Drawing

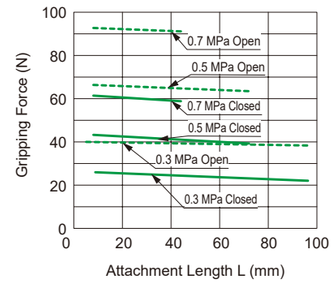


Gripping Force Performance Data

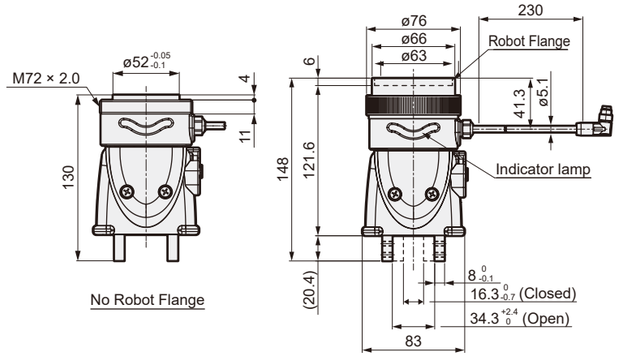
- Gripping force represents the thrust (for one finger) in the direction of the arrow shown in the figure.
- This represents the gripping force acting in the opening and closing directions at a gripper's attachment length L when the supply pressure is 0.3, 0.5, and 0.7 MPa.

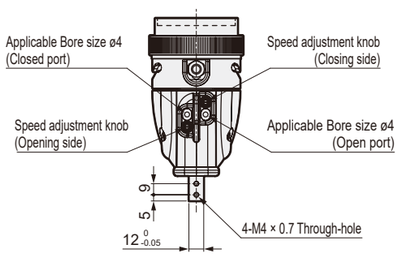
Open direction (⇦) ---------- (broken line)
Closing direction (➡) ———— (solid line)



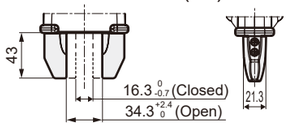


Outline Dimension Drawing





With Attachment (Y2)





OMRON ROBOT Official Certified Gripper Long Stroke Type (OMRON)

RHLF-TM Series

With Speed Controller, Cylinder Switch
Connection Port Diameter: ø4 One-touch Fitting

For suitable detailed model No.s, please see our website.

Model No. Notation Method

RHLF – 16CS – F Y2V – TM

- RHLF: Model No.
- F: ① Robot Flange
- Y2V: ② Accessories
- TM: OMRON Robot Certified

① Robot Flange

Code	Content
Blank	No Robot Flange
F	With Robot Flange Note)

Note) Robot flange mounting bolts ncluded

② Accessories

Code	Content	
Blank	No Attachments	
Y2	Attachment for testing	*1
V	Directional Control Valve • Tube	*2

*1 Made of resin, so use for gripping tests. (Weight is 30 g per piece)
*2 The directional control valve is a ø4 one-touch fitting (air supply port, A/B port) with silencer (R1/R2 port) and mounting plate. Tubes are ø4 outer diameter, 2.5 m length x 2 pieces.

Specifications

Item		RHLF
Bore size	mm	ø16 × 2
Actuation method		Double Acting Type
Operating Fluid		Compressed Air
Max. Operating Pressure	MPa	0.7
Min. Working Pressure	MPa	0.2
Port Size		ø4 One-touch Fitting
Ambient Temperature	°C	5 to 50
Operating Stroke	mm	32
Repeatability	mm	±0.03
Weight	kg	1.0
Indicator LED		Blue/Green
Cylinder Switch		With T2H (Red LED ON when lit)

Note) For attachments manufactured to match workpieces, refer to P. 568.

[Switch Specifications]

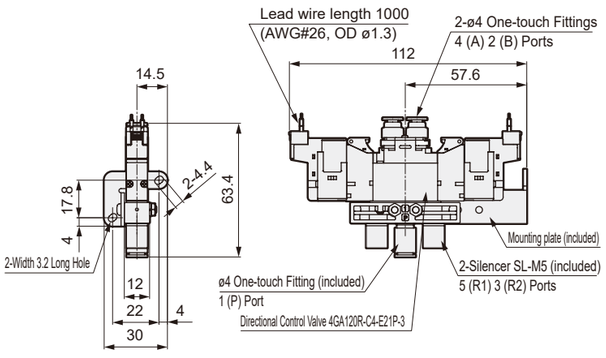
Item		Solid state 2-wire type	
		F2H	T2H
Applications		For programmable controller only	
Load Voltage/Current		10 to 30 VDC, 5 to 20 mA	
Leakage current		1 mA or less	
Shock resistance		980 m/s²	
Weight	g	10	18

[Directional Control Valve (V) Specifications]

Item		4GA120R-C4-E21P-FLA28482-3-ST
Valve Type and Operation Method		Pilot Operated Soft Spool Valve
Switching Position Classification		2-position double solenoid
Max. Operating Pressure	MPa	0.7
Min. Working Pressure	MPa	0.2
Ambient Temperature	°C	-5 to 55 (No freezing)
Fluid Temperature	°C	5 to 55
Manual Override		Non-lock/Lock Common Type
Response Time	ms	9
Flow Characteristics C [dm³/ (s·bar)], b		P → A/B: C=1.2, b=0.47 A/B→R1/R2: C=0.72, b=0.37
Rated voltage	V	24 VDC
Voltage Fluctuation Range		±10%
Holding Current	A	0.017
Power Consumption	W	0.40
Surge Suppressor		Built-in
Indicator		Built-in Lamp

For other specification products, please refer to "Directional Control Valve ① (No.RJ-011AA)".

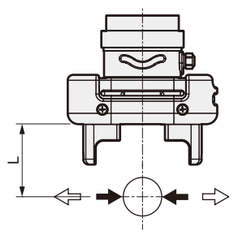
Outline Dimension Drawing

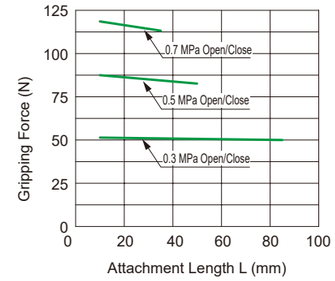


Gripping Force Performance Data

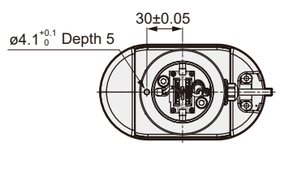
- Gripping force represents the thrust (for one finger) in the direction of the arrow shown in the figure.
- This represents the gripping force acting in the opening and closing directions at a gripper's attachment length L when the supply pressure is 0.3, 0.5, and 0.7 MPa.

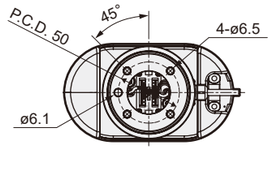
Open direction (⇦), closed direction (➡) ——— (solid line)

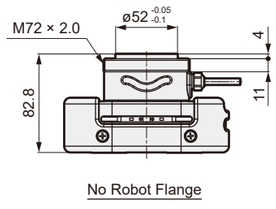


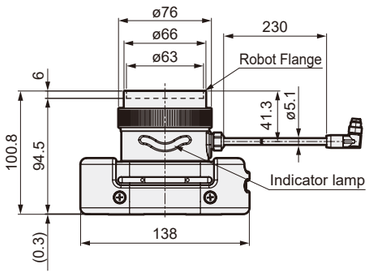


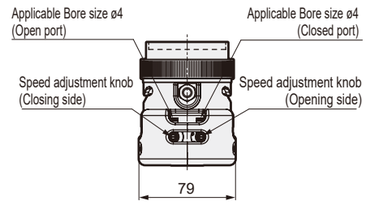
Outline Dimension Drawing

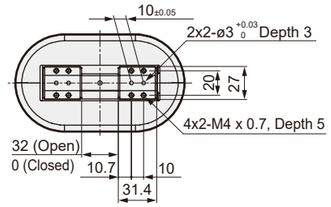


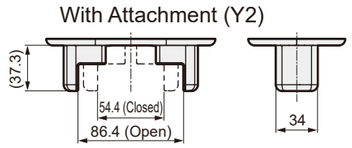














OMRON ROBOT Official Certified Gripper 3-Finger Type (OMRON)

RCKL-TM Series

With Speed Controller, Cylinder Switch
Connection Port Diameter: ø4 One-touch Fitting

For suitable detailed model No.s, please see our website.

Model No. Notation Method

RCKL – 40CS – F – Y3V – TM

- RCKL: Model No.
- F: ① Robot Flange
- Y3V: ② Accessories
- TM: OMRON Robot Certified

① Robot Flange

Code	Content
Blank	No Robot Flange
F	With Robot Flange Note)

Note) Robot flange mounting bolts included

② Accessories

Code	Content	
Blank	No Attachments	
Y3	Attachment	*1
V	Directional Control Valve, Tube	*2

*1 Material is aluminum alloy. (Weight is 50 g per piece)
*2 The directional control valve is a ø4 one-touch fitting (air supply port, A/B port) with silencer (R1/R2 port) and mounting plate. Tubes are ø4 outer diameter, 2.5 m length x 2 pieces.

Specifications

Item		RCKL
Bore size	mm	ø40
Actuation method		Double Acting Type
Operating Fluid		Compressed Air
Max. Operating Pressure	MPa	0.7
Min. Working Pressure	MPa	0.3
Port Size		ø4 One-touch Fitting
Ambient Temperature	°C	5 to 50
Operating Stroke	mm	10
Repeatability	mm	±0.01
Weight	kg	1.1
Indicator LED		Blue/Green
Cylinder Switch		With T2H (Red LED ON when lit)

Note) For attachments manufactured to match workpieces, refer to P. 568.

[Switch Specifications]

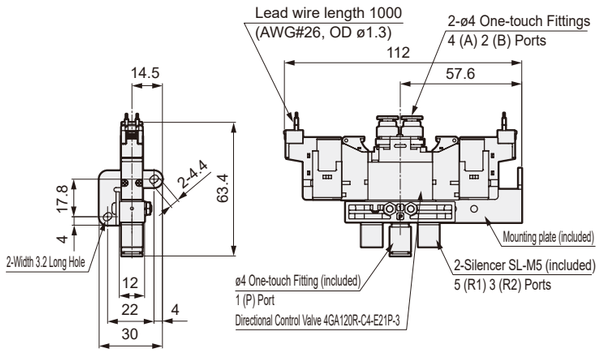
Item		Solid state 2-wire type	
		F2H	T2H
Applications		For programmable controller only	
Load Voltage/Current		10 to 30 VDC, 5 to 20 mA	
Leakage current		1 mA or less	
Shock resistance		980 m/s²	
Weight	g	10	18

[Directional Control Valve (V) Specifications]

Item		4GA120R-C4-E21P-FLA28482-3-ST
Valve Type and Operation Method		Pilot Operated Soft Spool Valve
Switching Position Classification		2-position double solenoid
Max. Operating Pressure	MPa	0.7
Min. Working Pressure	MPa	0.2
Ambient Temperature	°C	-5 to 55 (No freezing)
Fluid Temperature	°C	5 to 55
Manual Override		Non-lock/Lock Common Type
Response Time	ms	9
Flow Characteristics C [dm³/ (s·bar)], b		P → A/B: C=1.2, b=0.47 A/B→R1/R2: C=0.72, b=0.37
Rated voltage	V	24 VDC
Voltage Fluctuation Range		±10%
Holding Current	A	0.017
Power Consumption	W	0.40
Surge Suppressor		Built-in
Indicator		Built-in Lamp

For other specification products, please refer to "Directional Control Valve ① (No.RJ-011AA)".

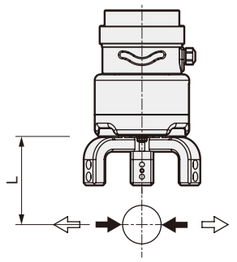
Outline Dimension Drawing

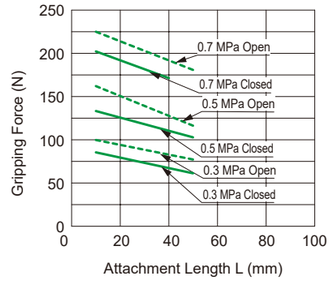


Gripping Force Performance Data

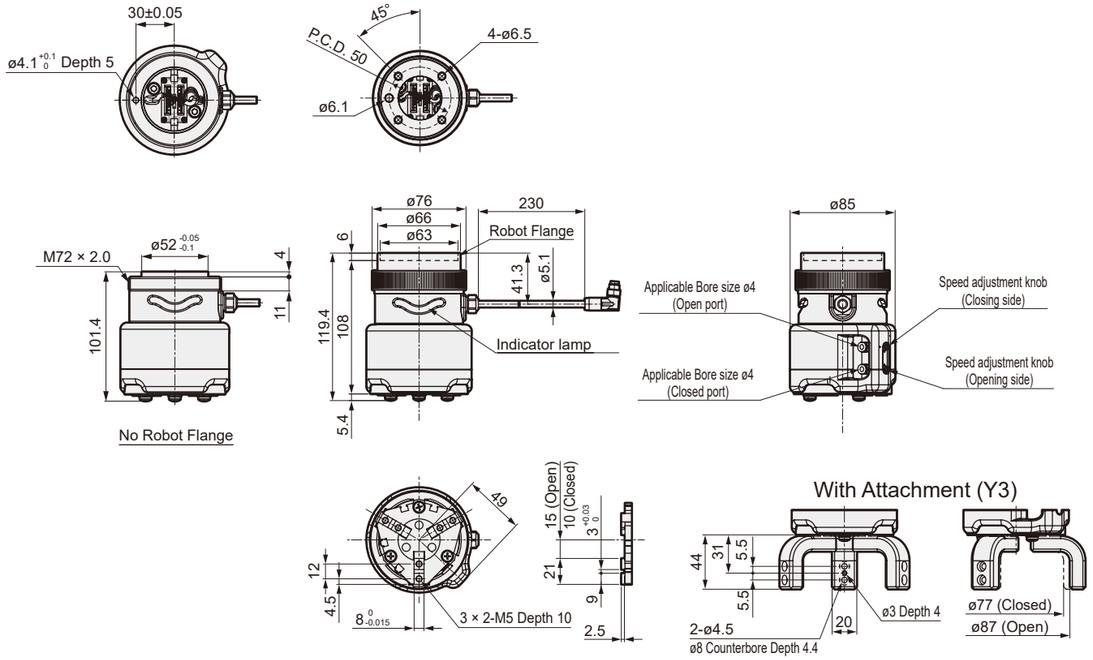
- Gripping force represents the thrust (for one finger) in the direction of the arrow shown in the figure.
- This represents the gripping force acting in the opening and closing directions at a gripper's attachment length L when the supply pressure is 0.3, 0.5, and 0.7 MPa.

Open direction (⇦) ---------- (broken line)
Closing direction (➡) ---------- (solid line)





Outline Dimension Drawing



Software "CKD Pneumatic Gripper" Operation Method

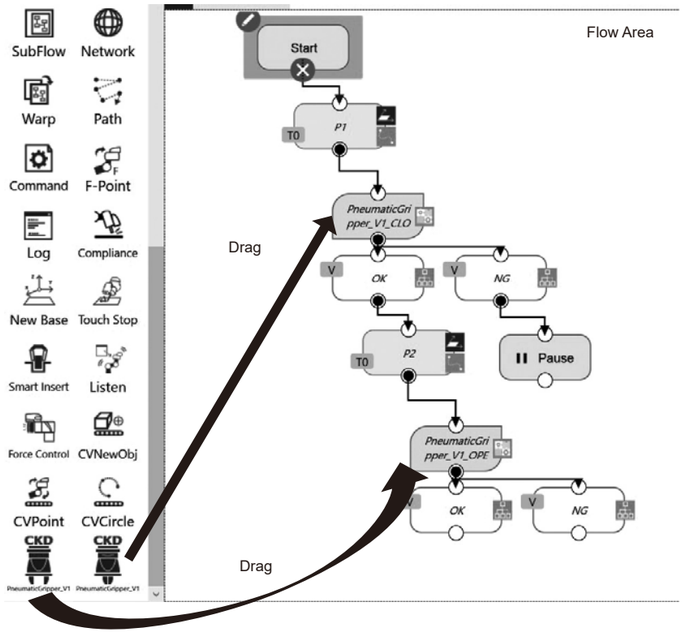
This is an overview of how to operate the dedicated software "CKD Pneumatic Gripper" for this product. For details, please refer to the robot manual and this product's instruction manual.

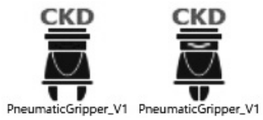
Software Installation

Download the Plug & Play software package from Omron's website (https://www.omron.co.jp) or CKD's website (https://www.ckd.co.jp/en/) and import the files according to the instruction manual.

Program Screen

The gripper's opening/closing directions are displayed as icons. Drag icons to the flow editing area to set digital I/O.



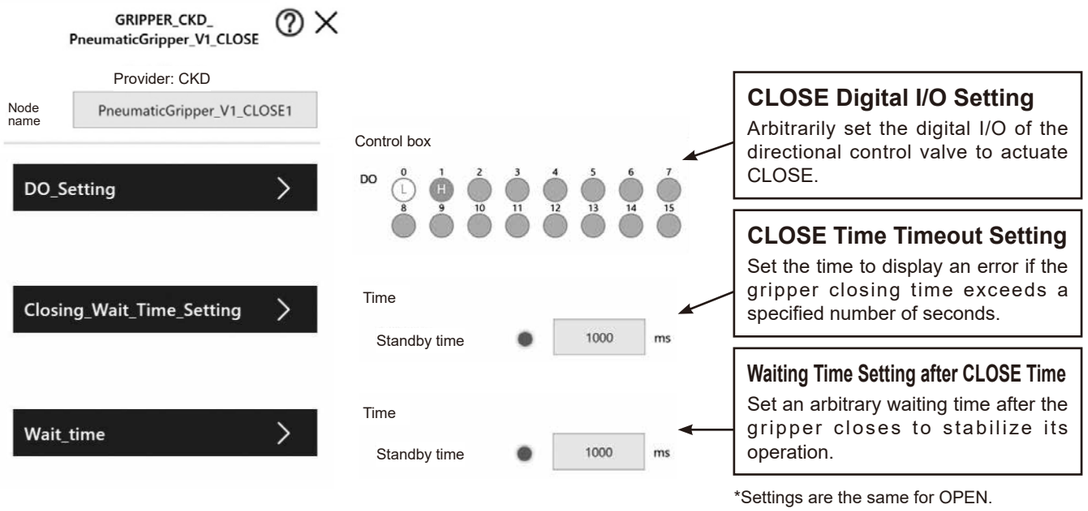


Graphic Display

Displays the gripper's OPEN/CLOSE status and the operating status of the built-in cylinder switch with color changes.

Node Screen

Set the directional control valve's digital I/O, gripper open/close timeout, and waiting time after workpiece gripping.



CLOSE Digital I/O Setting

Arbitrarily set the digital I/O of the directional control valve to actuate CLOSE.

CLOSE Time Timeout Setting

Set the time to display an error if the gripper closing time exceeds a specified number of seconds.

Waiting Time Setting after CLOSE Time

Set an arbitrary waiting time after the gripper closes to stabilize its operation.

*Settings are the same for OPEN.

MEMO

Gripper for Collaborative Robot
Cylinder Switch
Ending



FANUC Robot CRX Series Compatible Gripper Compact Type

RLSH-FN Series

With Speed Controller, Cylinder Switch
Connection Port Diameter: ø4 One-touch Fitting

For suitable detailed model No.s, please see our website.

Model No. Notation Method

RLSH – **A20D1N** – **L1** – **F** **Y2V** – **Fn**

- RLSH: Model No.
- F: ❶ Robot Flange
- Y2V: ❷ Accessories
- Fn: FANUC Robot CRX Series Compatible

❶Robot Flange

Code	Content
Blank	No Robot Flange
F	With Robot Flange Note)

Note) Robot flange mounting bolts included

❷Accessories

Code	Content	
Blank	No Attachments	
Y2	Attachment for testing	*1
V	Directional Control Valve • Tube	*2

*1 Made of resin, so use for gripping tests. (Weight is 25 g per piece)
*2 The directional control valve is a ø4 one-touch fitting (air supply port, A/B port) with silencer (R1/R2 port) and mounting plate. Tubes are ø4 outer diameter, 2.5 m length x 2 pieces.

Specifications

Item		RLSH
Bore size	mm	ø20
Actuation method		Double Acting Type
Operating Fluid		Compressed Air
Max. Operating Pressure	MPa	0.7
Min. Working Pressure	MPa	0.1
Port Size		ø4 One-touch Fitting
Ambient Temperature	°C	0 to 50
Operating Stroke	mm	18
Repeatability	mm	±0.01
Weight	kg	0.8
Indicator LED		Blue/Green
Cylinder Switch		With F2H (Yellow LED ON when lit)

Note) For attachments manufactured to match workpieces, refer to P. 568.

[Switch Specifications]

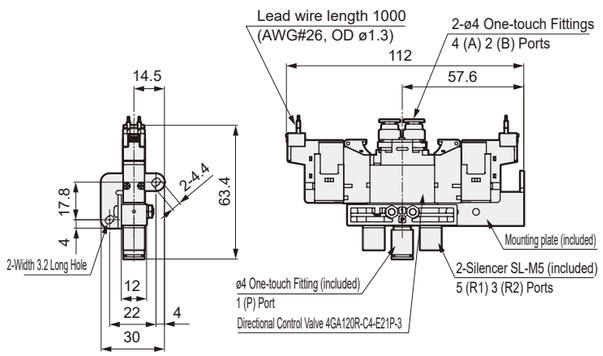
Item	Solid state 2-wire type	
	F2H	T2H
Applications	For programmable controller only	
Load Voltage/Current	10 to 30 VDC, 5 to 20 mA	
Leakage current	1 mA or less	
Shock resistance	980 m/s²	
Weight g	10	18

[Directional Control Valve (V) Specifications]

Item		4GA120R-C4-E21P-FLA28482-3-ST
Valve Type and Operation Method		Pilot Operated Soft Spool Valve
Switching Position Classification		2-position double solenoid
Max. Operating Pressure	MPa	0.7
Min. Working Pressure	MPa	0.2
Ambient Temperature	°C	-5 to 55 (No freezing)
Fluid Temperature	°C	5 to 55
Manual Override		Non-lock/Lock Common Type
Response Time	ms	9
Flow Characteristics C [dm³/ (s·bar)], b		P → A/B: C=1.2, b=0.47 A/B→R1/R2: C=0.72, b=0.37
Rated voltage	V	24 VDC
Voltage Fluctuation Range		±10%
Holding Current	A	0.017
Power Consumption	W	0.40
Surge Suppressor		Built-in
Indicator		Built-in Lamp

For other specification products, please refer to "Directional Control Valve ① (No.RJ-011AA)".

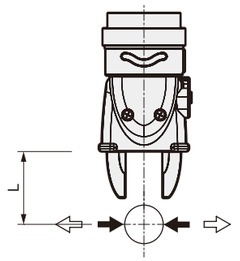
Outline Dimension Drawing

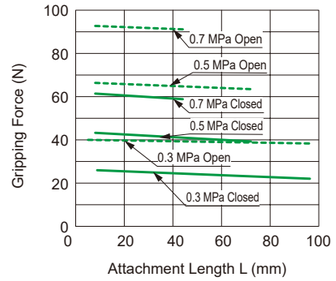


Gripping Force Performance Data

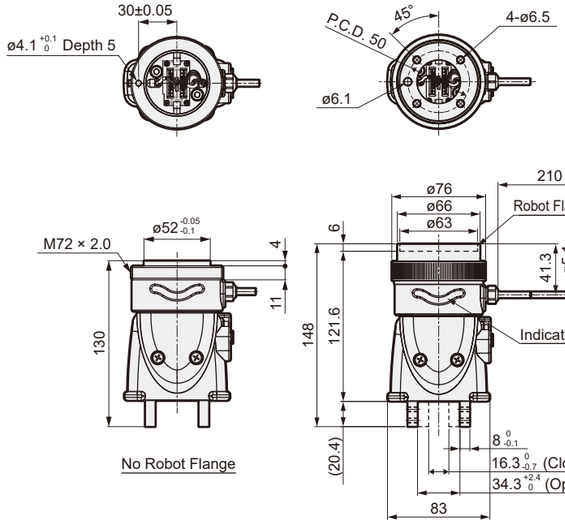
- Gripping force represents the thrust (for one finger) in the direction of the arrow shown in the figure.
- This represents the gripping force acting in the opening and closing directions at a gripper's attachment length L when the supply pressure is 0.3, 0.5, and 0.7 MPa.

Open direction (⇦) ---------- (broken line)
Closing direction (➡) ———— (solid line)

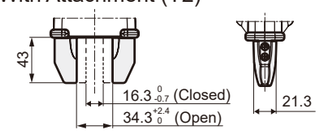




Outline Dimension Drawing



With Attachment (Y2)





FANUC Robot CRX Series Compatible Gripper Long Stroke Type

RHLF-FN Series

With Speed Controller, Cylinder Switch
Connection Port Diameter: ø4 One-touch Fitting

For suitable detailed model No.s, please see our website.

Model No. Notation Method

RHLF – 16CS – F – Y2V – Fn

- RHLF: Model No.
- F: ❶ Robot Flange
- Y2V: ❷ Accessories
- Fn: FANUC Robot CRX Series Compatible

❶Robot Flange

Code	Content
Blank	No Robot Flange
F	With Robot Flange Note)

Note) Robot flange mounting bolts included

❷Accessories

Code	Content	
Blank	No Attachments	
Y2	Attachment for testing	*1
V	Directional Control Valve • Tube	*2

*1 Made of resin, so use for gripping tests. (Weight is 25 g per piece)
*2 The directional control valve is a ø4 one-touch fitting (air supply port, A/B port) with silencer (R1/R2 port) and mounting plate. Tubes are ø4 outer diameter, 2.5 m length x 2 pieces.

Specifications

Item		RHLF
Bore size	mm	ø16 × 2
Actuation method		Double Acting Type
Operating Fluid		Compressed Air
Max. Operating Pressure	MPa	0.7
Min. Working Pressure	MPa	0.2
Port Size		ø4 One-touch Fitting
Ambient Temperature	°C	5 to 50
Operating Stroke	mm	32
Repeatability	mm	±0.03
Weight	kg	1.0
Indicator LED		Blue/Green
Cylinder Switch		With T2H (Red LED ON when lit)

Note) For attachments manufactured to match workpieces, refer to P. 568.

[Switch Specifications]

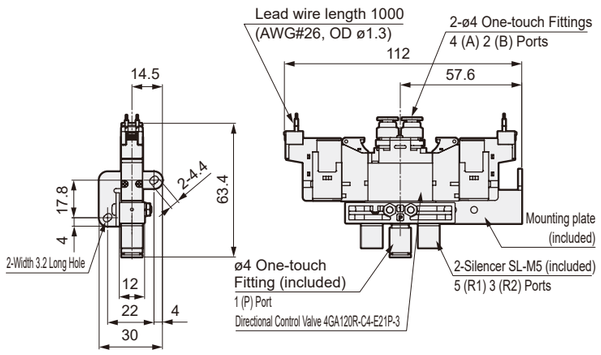
Item		Solid state 2-wire type	
		F2H	T2H
Applications		For programmable controller only	
Load Voltage/Current		10 to 30 VDC, 5 to 20 mA	
Leakage current		1 mA or less	
Shock resistance		980 m/s²	
Weight	g	10	18

[Directional Control Valve (V) Specifications]

Item		4GA120R-C4-E21P-FLA28482-3-ST
Valve Type and Operation Method		Pilot Operated Soft Spool Valve
Switching Position Classification		2-position double solenoid
Max. Operating Pressure	MPa	0.7
Min. Working Pressure	MPa	0.2
Ambient Temperature	°C	-5 to 55 (No freezing)
Fluid Temperature	°C	5 to 55
Manual Override		Non-lock/Lock Common Type
Response Time	ms	9
Flow Characteristics C [dm³/ (s·bar)], b		P → A/B: C=1.2, b=0.47 A/B→R1/R2: C=0.72, b=0.37
Rated voltage	V	24 VDC
Voltage Fluctuation Range		±10%
Holding Current	A	0.017
Power Consumption	W	0.40
Surge Suppressor		Built-in
Indicator		Built-in Lamp

For other specification products, please refer to "Directional Control Valve ① (No.RJ-011AA)".

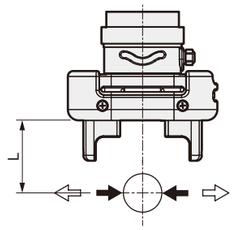
Outline Dimension Drawing

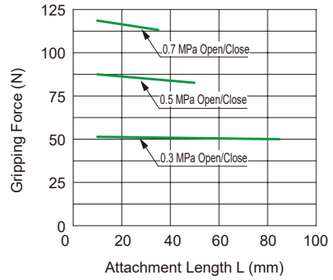


Gripping Force Performance Data

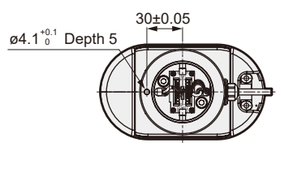
- Gripping force represents the thrust (for one finger) in the direction of the arrow shown in the figure.
- This represents the gripping force acting in the opening and closing directions at a gripper's attachment length L when the supply pressure is 0.3, 0.5, and 0.7 MPa.

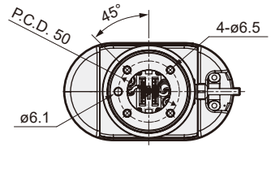
Open direction (⇦), closed direction (➡) ——— (solid line)

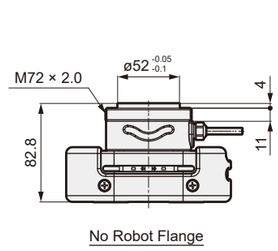


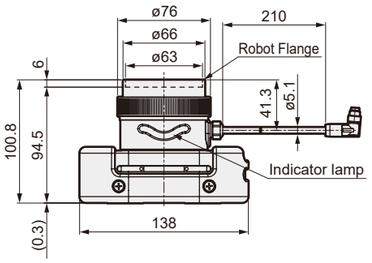


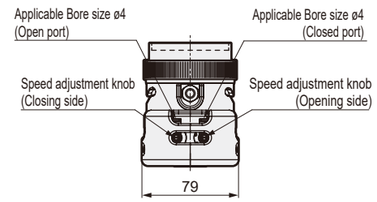
Outline Dimension Drawing

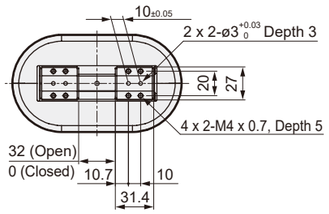




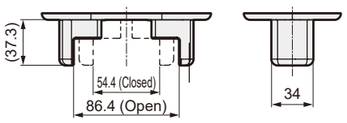








With Attachment (Y2)





FANUC Robot CRX Series Compatible Gripper 3-Finger Type

RCKL-FN Series

With Speed Controller, Cylinder Switch
Connection Port Diameter: ø4 One-touch Fitting

For suitable detailed model No.s, please see our website.

Model No. Notation Method

RCKL – 40CS – **F** **Y3V** – Fn

- RCKL: Model No.
- F: ① Robot Flange
- Y3V: ② Accessories
- Fn: FANUC Robot CRX Series Compatible

① Robot Flange

Code	Content
Blank	No Robot Flange
F	With Robot Flange

Note) Robot flange mounting bolts included

② Accessories

Code	Content	
Blank	No Attachments	
Y3	Attachment	*1
V	Directional Control Valve • Tube	*2

*1 Material is aluminum alloy. (Weight is 50 g per piece)
*2 The directional control valve is a ø4 one-touch fitting (air supply port, A/B port) with silencer (R1/R2 port) and mounting plate. Tubes are ø4 outer diameter, 2.5 m length x 2 pieces.

Specifications

Item		RCKL
Bore size	mm	ø40
Actuation method		Double Acting Type
Operating Fluid		Compressed Air
Max. Operating Pressure	MPa	0.7
Min. Working Pressure	MPa	0.3
Port Size		ø4 One-touch Fitting
Ambient Temperature	°C	5 to 50
Operating Stroke	mm	10
Repeatability	mm	±0.01
Weight	kg	1.1
Indicator LED		Blue/Green
Cylinder Switch		With T2H (Red LED ON when lit)

Note) For attachments manufactured to match workpieces, refer to P. 568.

[Switch Specifications]

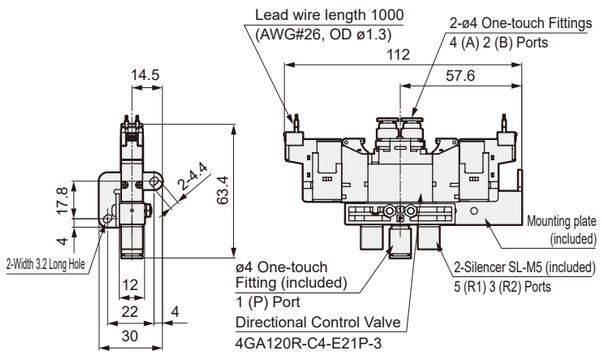
Item		Solid state 2-wire type	
		F2H	T2H
Applications		For programmable controller only	
Load Voltage/Current		10 to 30 VDC, 5 to 20 mA	
Leakage current		1 mA or less	
Shock resistance		980 m/s²	
Weight	g	10	18

[Directional Control Valve (V) Specifications]

Item		4GA120R-C4-E21P-FLA28482-3-ST
Valve Type and Operation Method		Pilot Operated Soft Spool Valve
Switching Position Classification		2-position double solenoid
Max. Operating Pressure	MPa	0.7
Min. Working Pressure	MPa	0.2
Ambient Temperature	°C	-5 to 55 (No freezing)
Fluid Temperature	°C	5 to 55
Manual Override		Non-lock/Lock Common Type
Response Time	ms	9
Flow Characteristics C [dm³/ (s·bar)], b		P → A/B: C=1.2, b=0.47 A/B→R1/R2: C=0.72, b=0.37
Rated voltage	V	24 VDC
Voltage Fluctuation Range		±10%
Holding Current	A	0.017
Power Consumption	W	0.40
Surge Suppressor		Built-in
Indicator		Built-in Lamp

For other specification products, please refer to "Directional Control Valve ① (No.RJ-011AA)".

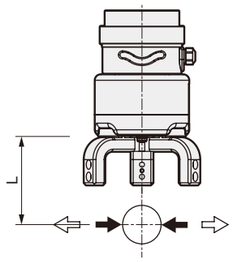
Outline Dimension Drawing

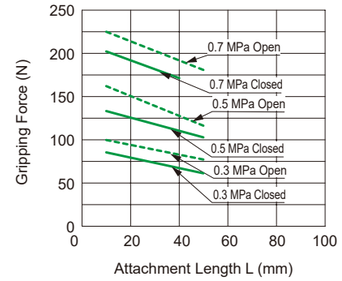


Gripping Force Performance Data

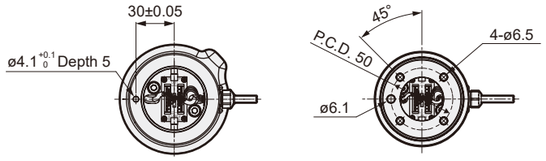
- Gripping force represents the thrust (for one finger) in the direction of the arrow shown in the figure.
- This represents the gripping force acting in the opening and closing directions at a gripper's attachment length L when the supply pressure is 0.3, 0.5, and 0.7 MPa.

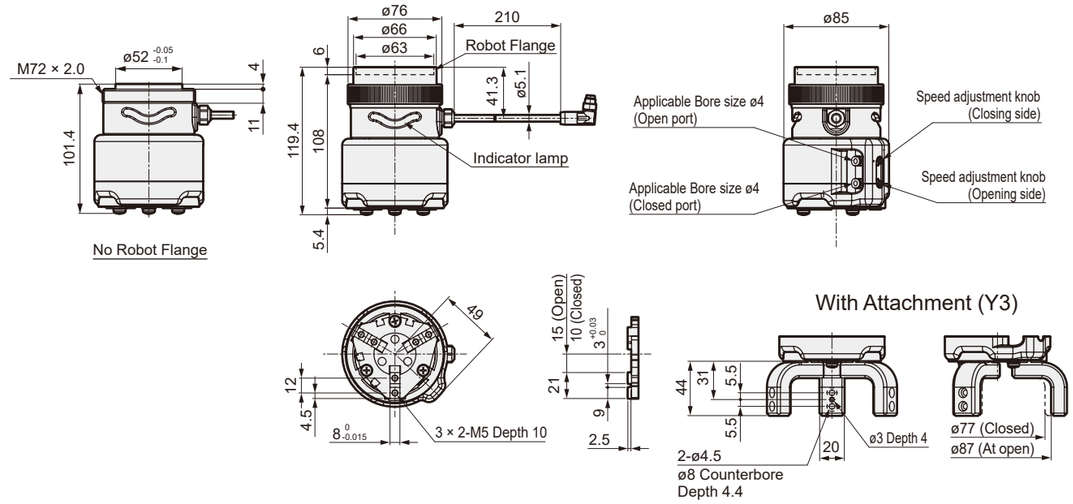
Open direction (⇦) ---------- (broken line)
Closing direction (➡) ———— (solid line)





Outline Dimension Drawing





Software "CKD Pneumatic Gripper" Operation Method

This is an overview of how to operate the dedicated software "CKD Pneumatic Gripper" for this product. For details, please refer to the robot manual and this product's instruction manual.

Software Installation

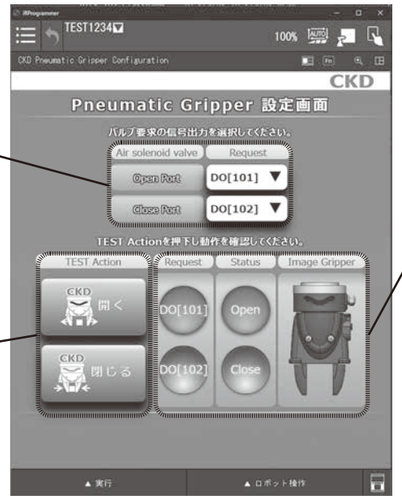
Download the Plug & Play software package dedicated for FANUC Robot CRX series from CKD's website (https://www.ckd.co.jp/en/) and install the files according to the instruction manual.

Installation Settings Screen

Set the digital I/O of the directional control valve for opening/closing the gripper. Since the actual opening/closing status can be checked on the graphic display, it is easy to confirm if the signal is not reversed. Use a 2-position double solenoid directional control valve to prevent workpiece drop when the signal is interrupted.

Directional Control Valve Digital I/O Setting
Set the digital I/O for the directional control valve to actuate OPEN and CLOSE respectively.

Test Button
Check OPEN/CLOSE operation to confirm correct I/O settings.

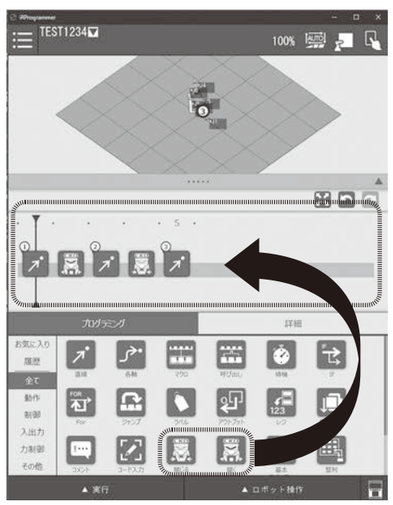


Graphic Display
Displays the gripper's OPEN/CLOSE status and the operating status of the built-in cylinder switch with color changes.

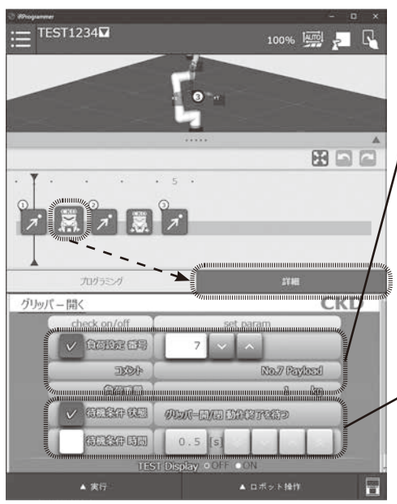
Program Screen

Drag & drop command icons to create robot programs. Detailed program settings are possible for each icon.

Program Creation



Detailed Parameter Settings



Load Setting
Load setting is possible after gripper operation. Specify the load number registered in the robot body, and set the total weight, center of gravity position, and inertia combination.

Waiting Conditions
Set conditions for proceeding to the next operation after gripper actuation. Gripper Operation End and "Time" can be specified as waiting conditions.

MEMO



YASKAWA MOTOMAN Robot Compatible Gripper Compact Type

RLSH-YS Series

With Speed Controller, Cylinder Switch
Connection Port Diameter: ø4 One-touch Fitting

For suitable detailed model No.s, please see our website.

Model No. Notation Method

RLSH – **A20D1N** – **L1** – **F** **Y2V** – **YS**

- RLSH: Model No.
- A20D1N: Cylinder Switch
- L1: Ending
- F: ❶ Robot Flange
- Y2V: ❷ Accessories
- YS: YASKAWA Robot Compatible with HC10DTP Series

❶Robot Flange

Code	Content
Blank	No Robot Flange
F	With Robot Flange Note)

Note) Robot flange mounting bolts included

❷Accessories

Code	Content	
Blank	No Attachments	
Y2	Attachment for testing	*1
V	Directional Control Valve • Tube	*2

*1 Made of resin, so use for gripping tests. (Weight is 25 g per piece)
*2 The directional control valve is a ø4 one-touch fitting (air supply port, A/B port) with silencer (R1/R2 port) and mounting plate. Tubes are ø4 outer diameter, 2.5 m length x 2 pieces.

Specifications

Item		RLSH
Bore size	mm	ø20
Actuation method		Double Acting Type
Operating Fluid		Compressed Air
Max. Operating Pressure	MPa	0.7
Min. Working Pressure	MPa	0.1
Port Size		ø4 One-touch Fitting
Ambient Temperature	°C	0 to 50
Operating Stroke	mm	18
Repeatability	mm	±0.01
Weight	kg	0.8
Indicator LED		Blue/Green
Cylinder Switch		With F2H (Yellow LED ON when lit)

Note) For attachments manufactured to match workpieces, refer to P. 568.

[Switch Specifications]

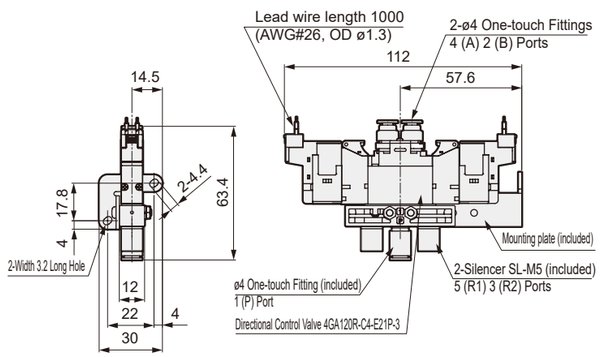
Item		Solid state 2-wire type	
		F2H	T2H
Applications		For programmable controller only	
Load Voltage/Current		10 to 30 VDC, 5 to 20 mA	
Leakage current		1 mA or less	
Shock resistance		980 m/s²	
Weight	g	10	18

[Directional Control Valve (V) Specifications]

Item		4GA120R-C4-E21P-FLA28482-3-ST
Valve Type and Operation Method		Pilot Operated Soft Spool Valve
Switching Position Classification		2-position double solenoid
Max. Operating Pressure	MPa	0.7
Min. Working Pressure	MPa	0.2
Ambient Temperature	°C	-5 to 55 (No freezing)
Fluid Temperature	°C	5 to 55
Manual Override		Non-lock/Lock Common Type
Response Time	ms	9
Flow Characteristics C [dm³/ (s·bar)], b		P → A/B: C=1.2, b=0.47 A/B→R1/R2: C=0.72, b=0.37
Rated voltage	V	24 VDC
Voltage Fluctuation Range		±10%
Holding Current	A	0.017
Power Consumption	W	0.40
Surge Suppressor		Built-in
Indicator		Built-in Lamp

For other specification products, please refer to "Directional Control Valve ① (No.RJ-011AA)".

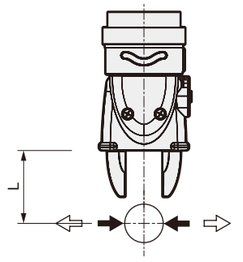
Outline Dimension Drawing

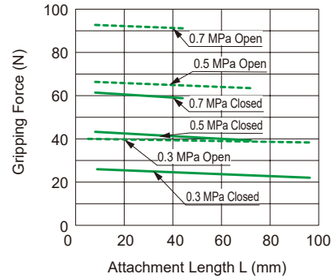


Gripping Force Performance Data

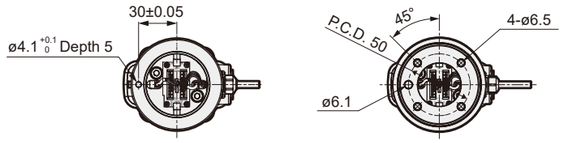
- Gripping force represents the thrust (for one finger) in the direction of the arrow shown in the figure.
- This represents the gripping force acting in the opening and closing directions at a gripper's attachment length L when the supply pressure is 0.3, 0.5, and 0.7 MPa.

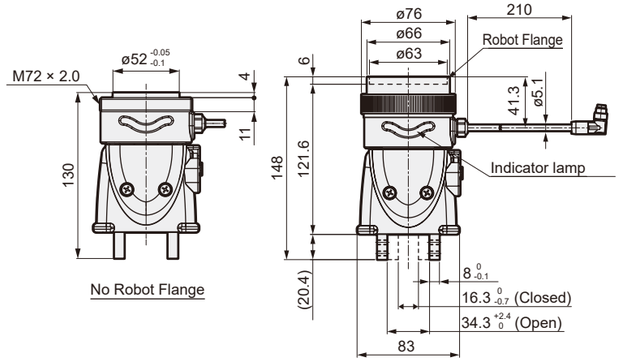
Open direction (⇦) ---------- (broken line)
Closing direction (➡) ———— (solid line)

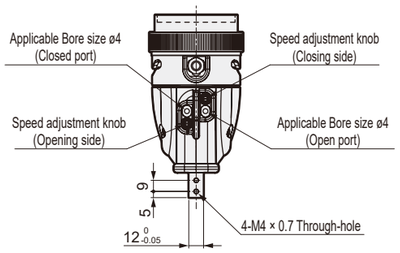




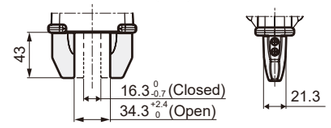
Outline Dimension Drawing







With Attachment (Y2)





YASKAWA MOTOMAN Robot Compatible Gripper Long Stroke Type

RHLF-YS Series

With Speed Controller, Cylinder Switch
Connection Port Diameter: ø4 One-touch Fitting

For suitable detailed model No.s, please see our website.

Model No. Notation Method

RHLF – 16CS – F Y2V – YS

- RHLF: Model No.
- F: ① Robot Flange
- Y2V: ② Accessories
- YS: YASKAWA Robot Compatible with HC10DTP Series

① Robot Flange

Code	Content
Blank	No Robot Flange
F	With Robot Flange Note)

Note) Robot flange mounting bolts included

② Accessories

Code	Content
Blank	No Attachments
Y2	Attachment for testing *1
V	Directional Control Valve • Tube *2

*1 Made of resin, so use for gripping tests. (Weight is 30 g per piece)
*2 The directional control valve is a ø4 one-touch fitting (air supply port, A/B port) with silencer (R1/R2 port) and mounting plate. Tubes are ø4 outer diameter, 2.5 m length x 2 pieces.

Specifications

Item		RHLF
Bore size	mm	ø16 × 2
Actuation method		Double Acting Type
Operating Fluid		Compressed Air
Max. Operating Pressure	MPa	0.7
Min. Working Pressure	MPa	0.2
Port Size		ø4 One-touch Fitting
Ambient Temperature	°C	5 to 50
Operating Stroke	mm	32
Repeatability	mm	±0.03
Weight	kg	1.0
Indicator LED		Blue/Green
Cylinder Switch		With T2H (Red LED ON when lit)

Note) For attachments manufactured to match workpieces, refer to P. 568.

[Switch Specifications]

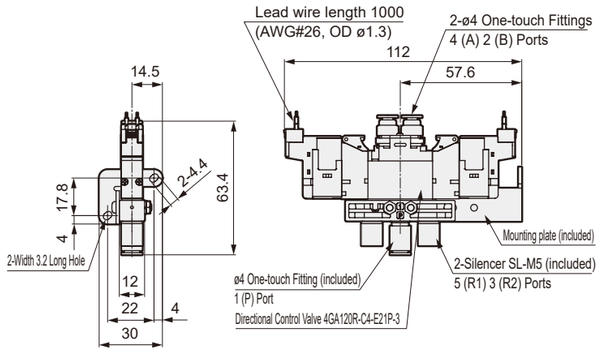
Item		Solid state 2-wire type	
		F2H	T2H
Applications		For programmable controller only	
Load Voltage/Current		10 to 30 VDC, 5 to 20 mA	
Leakage current		1 mA or less	
Shock resistance		980 m/s²	
Weight	g	10	18

[Directional Control Valve (V) Specifications]

Item		4GA120R-C4-E21P-FLA28482-3-ST
Valve Type and Operation Method		Pilot Operated Soft Spool Valve
Switching Position Classification		2-position double solenoid
Max. Operating Pressure	MPa	0.7
Min. Working Pressure	MPa	0.2
Ambient Temperature	°C	-5 to 55 (No freezing)
Fluid Temperature	°C	5 to 55
Manual Override		Non-lock/Lock Common Type
Response Time	ms	9
Flow Characteristics C [dm³/ (s·bar)], b		P → A/B: C=1.2, b=0.47 A/B→R1/R2: C=0.72, b=0.37
Rated voltage	V	24 VDC
Voltage Fluctuation Range		±10%
Holding Current	A	0.017
Power Consumption	W	0.40
Surge Suppressor		Built-in
Indicator		Built-in Lamp

For other specification products, please refer to "Directional Control Valve ① (No.RJ-011AA)".

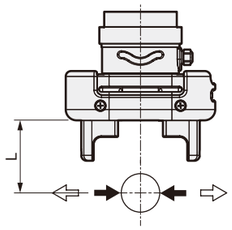
Outline Dimension Drawing

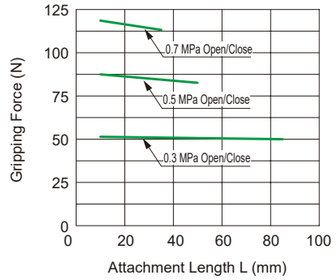


Gripping Force Performance Data

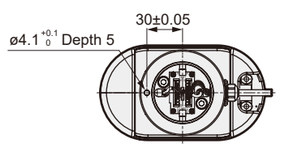
- Gripping force represents the thrust (for one finger) in the direction of the arrow shown in the figure.
- This represents the gripping force acting in the opening and closing directions at a gripper's attachment length L when the supply pressure is 0.3, 0.5, and 0.7 MPa.

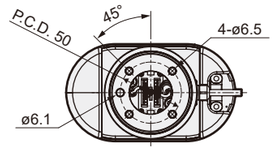
Open direction (⇦), closed direction (➡) ——— (solid line)

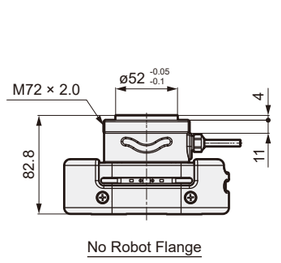


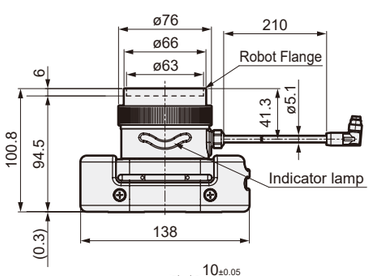


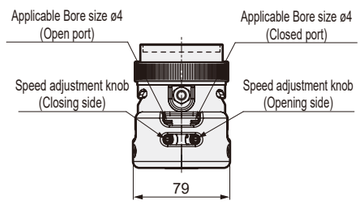
Outline Dimension Drawing

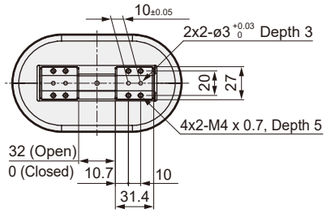




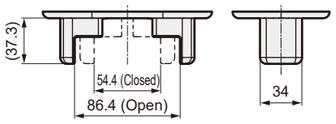








With Attachment (Y2)





YASKAWA MOTOMAN Robot Compatible Gripper 3-Finger Type

RCKL-YS Series

With Speed Controller, Cylinder Switch
Connection Port Diameter: ø4 One-touch Fitting

For suitable detailed model No.s, please see our website.

Model No. Notation Method

RCKL – 40CS – F Y3V – YS

- RCKL: Model No.
- F: ① Robot Flange
- Y3V: ② Accessories
- YS: YASKAWA Robot Compatible with HC10DTP Series

① Robot Flange

Code	Content
Blank	No Robot Flange
F	With Robot Flange Note)

Note) Robot flange mounting bolts included

② Accessories

Code	Content
Blank	No Attachments
Y2	Attachment *1
V	Directional Control Valve • Tube *2

*1 Material is aluminum alloy. (Weight is 50 g per piece)
*2 The directional control valve is a ø4 one-touch fitting (air supply port, A/B port) with silencer (R1/R2 port) and mounting plate. Tubes are ø4 outer diameter, 2.5 m length x 2 pieces.

Specifications

Item		RCKL
Bore size	mm	ø40
Actuation method		Double Acting Type
Operating Fluid		Compressed Air
Max. Operating Pressure	MPa	0.7
Min. Working Pressure	MPa	0.3
Port Size		ø4 One-touch Fitting
Ambient Temperature	°C	5 to 50
Operating Stroke	mm	10
Repeatability	mm	±0.01
Weight	kg	1.1
Indicator LED		Blue/Green
Cylinder Switch		With T2H (Red LED ON when lit)

Note) For attachments manufactured to match workpieces, refer to P. 568.

[Switch Specifications]

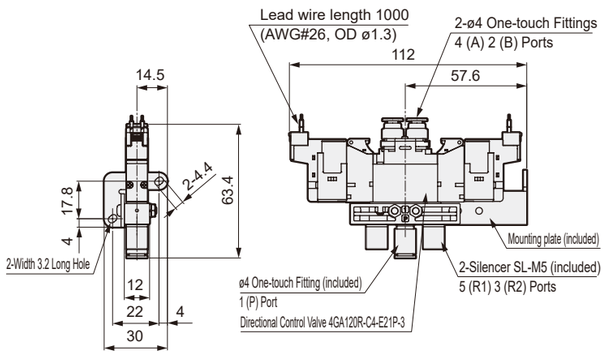
Item		Solid state 2-wire type	
		F2H	T2H
Applications		For programmable controller only	
Load Voltage/Current		10 to 30 VDC, 5 to 20 mA	
Leakage current		1 mA or less	
Shock resistance		980 m/s²	
Weight	g	10	18

[Directional Control Valve (V) Specifications]

Item		4GA120R-C4-E21P-FLA28482-3-ST
Valve Type and Operation Method		Pilot Operated Soft Spool Valve
Switching Position Classification		2-position double solenoid
Max. Operating Pressure	MPa	0.7
Min. Working Pressure	MPa	0.2
Ambient Temperature	°C	-5 to 55 (No freezing)
Fluid Temperature	°C	5 to 55
Manual Override		Non-lock/Lock Common Type
Response Time	ms	9
Flow Characteristics C [dm³/ (s·bar)], b		P → A/B: C=1.2, b=0.47 A/B→R1/R2: C=0.72, b=0.37
Rated voltage	V	24 VDC
Voltage Fluctuation Range		±10%
Holding Current	A	0.017
Power Consumption	W	0.40
Surge Suppressor		Built-in
Indicator		Built-in Lamp

For other specification products, please refer to "Directional Control Valve ① (No.RJ-011AA)".

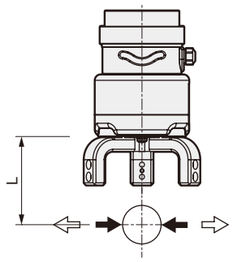
Outline Dimension Drawing

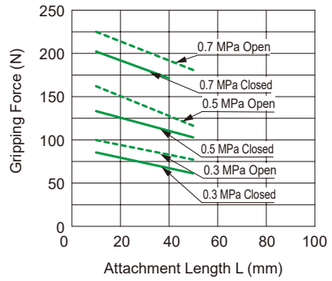


Gripping Force Performance Data

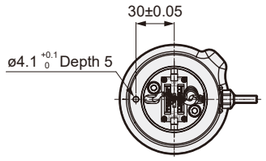
- Gripping force represents the thrust (for one finger) in the direction of the arrow shown in the figure.
- This represents the gripping force acting in the opening and closing directions at a gripper's attachment length L when the supply pressure is 0.3, 0.5, and 0.7 MPa.

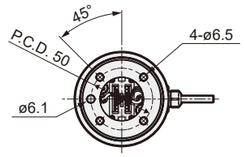
Open direction (⇦) ---------- (broken line)
Closing direction (➡) ———— (solid line)

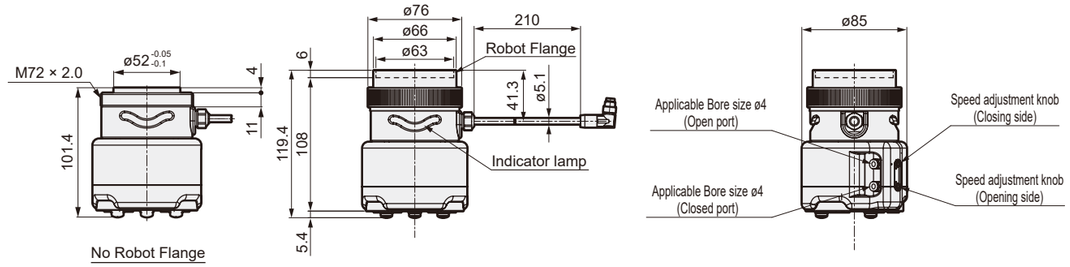


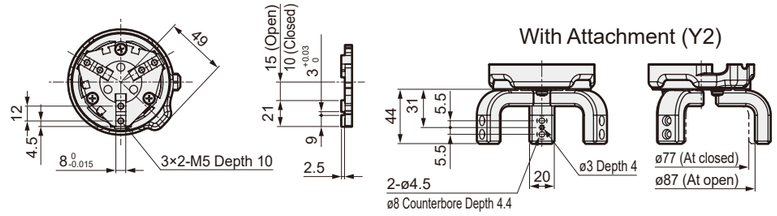


Outline Dimension Drawing











JAKA Robot Zu ® Series Compatible Gripper Compact Type

RLSH-JK Series

With Speed Controller, Cylinder Switch
Connection Port Diameter: ø4 One-touch Fitting

For suitable detailed model No.s, please see our website.

Model No. Notation Method

RLSH – **A20D1N** – **L1** – **F** **Y2V** – **JK**

- RLSH: Model No.
- F: ❶ Robot Flange
- Y2V: ❷ Accessories
- JK: JAKA Robot Compatible with Zu series

❶Robot Flange

Code	Content
Blank	No Robot Flange
F	With Robot Flange

Note) Robot flange mounting bolts included

❷Accessories

Code	Content	
Blank	No Attachments	
Y2	Attachment for testing	*1
V	Directional Control Valve • Tube	*2

*1 Made of resin, so use for gripping tests. (Weight is 25 g per piece)
*2 The directional control valve is a ø4 one-touch fitting (air supply port, A/B port) with silencer (R1/R2 port) and mounting plate. Tubes are ø4 outer diameter, 2.5 m length x 2 pieces.

Specifications

Item		RLSH
Bore size	mm	ø20
Actuation method		Double Acting Type
Operating Fluid		Compressed Air
Max. Operating Pressure	MPa	0.7
Min. Working Pressure	MPa	0.1
Port Size		ø4 One-touch Fitting
Ambient Temperature	°C	0 to 50
Operating Stroke	mm	18
Repeatability	mm	±0.01
Weight	kg	0.8
Indicator LED		Blue/Green
Cylinder Switch		With F2H (Yellow LED ON when lit)

Note) For attachments manufactured to match workpieces, refer to P. 568.

[Switch Specifications]

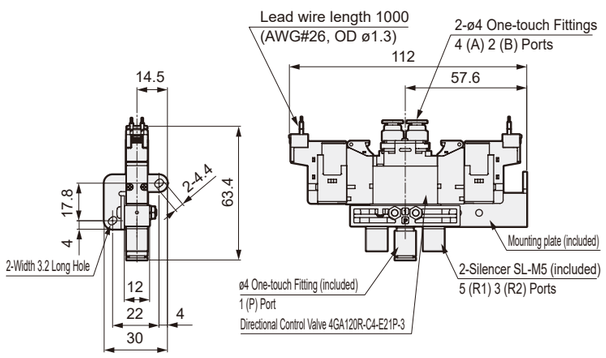
Item	Solid state 2-wire type	
	F2H	T2H
Applications	For programmable controller only	
Load Voltage/Current	10 to 30 VDC, 5 to 20 mA	
Leakage current	1 mA or less	
Shock resistance	980 m/s²	
Weight g	10	18

[Directional Control Valve (V) Specifications]

Item	4GA120R-C4-E21P-FLA28482-3-ST
Valve Type and Operation Method	Pilot Operated Soft Spool Valve
Switching Position Classification	2-position double solenoid
Max. Operating Pressure MPa	0.7
Min. Working Pressure MPa	0.2
Ambient Temperature °C	-5 to 55 (No freezing)
Fluid Temperature °C	5 to 55
Manual Override	Non-lock/Lock Common Type
Response Time ms	9
Flow Characteristics C [dm³/ (s·bar)], b	P → A/B: C=1.2, b=0.47 A/B→R1/R2: C=0.72, b=0.37
Rated voltage V	24 VDC
Voltage Fluctuation Range	±10%
Holding Current A	0.017
Power Consumption W	0.40
Surge Suppressor	Built-in
Indicator	Built-in Lamp

For other specification products, please refer to "Directional Control Valve ① (No.RJ-011AA)". Please refer to the weight listed in the switch specifications.

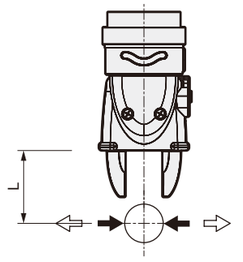
Outline Dimension Drawing

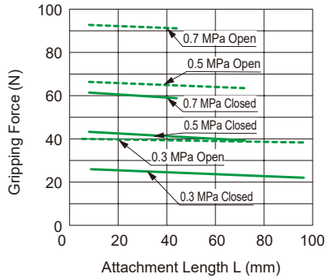


Gripping Force Performance Data

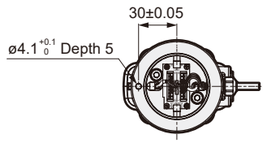
- Gripping force represents the thrust (for one finger) in the direction of the arrow shown in the figure.
- This represents the gripping force acting in the opening and closing directions at a gripper's attachment length L when the supply pressure is 0.3, 0.5, and 0.7 MPa.

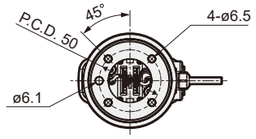
Open direction (⇦) ---------- (broken line)
Closing direction (➡) ———— (solid line)

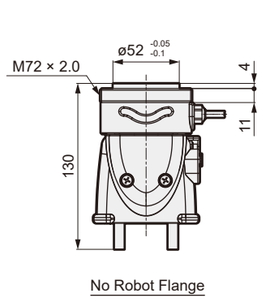




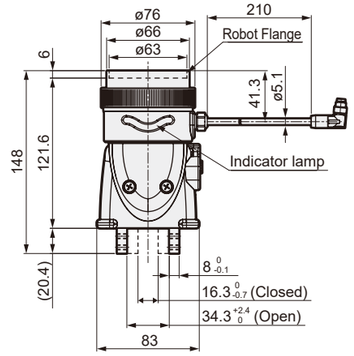
Outline Dimension Drawing

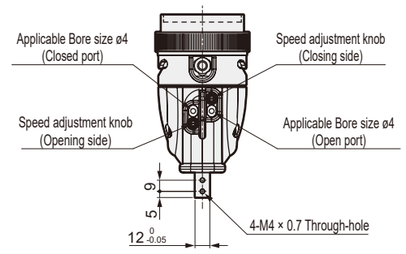




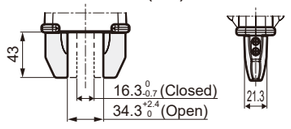


No Robot Flange





With Attachment (Y2)





JAKA Robot Zu ® Series Compatible Gripper Long Stroke Type

RHLF-JK Series

With Speed Controller, Cylinder Switch
Connection Port Diameter: ø4 One-touch Fitting

For suitable detailed model No.s, please see our website.

Model No. Notation Method

RHLF – 16CS – F (1) Y2V (2) – JK

- RHLF: Model No.
- F: Robot Flange
- Y2V: Accessories
- JK: JAKA Robot Compatible with Zu series

1 Robot Flange

Code	Content
Blank	No Robot Flange
F	With Robot Flange

Note) Robot flange mounting bolts included

2 Accessories

Code	Content	
Blank	No Attachments	
Y2	Attachment for testing	*1
V	Directional Control Valve • Tube	*2

*1 Made of resin, so use for gripping tests. (Weight is 30 g per piece)
*2 The directional control valve is a ø4 one-touch fitting (air supply port, A/B port) with silencer (R1/R2 port) and mounting plate. Tubes are ø4 outer diameter, 2.5 m length x 2 pieces.

Specifications

Item		RHLF
Bore size	mm	ø16 × 2
Actuation method		Double Acting Type
Operating Fluid		Compressed Air
Max. Operating Pressure	MPa	0.7
Min. Working Pressure	MPa	0.2
Port Size		ø4 One-touch Fitting
Ambient Temperature	°C	5 to 50
Operating Stroke	mm	32
Repeatability	mm	±0.03
Weight	kg	1.0
Indicator LED		Blue/Green
Cylinder Switch		With T2H (Red LED ON when lit)

Note) For attachments manufactured to match)workpieces, refer to P. 568.

[Switch Specifications]

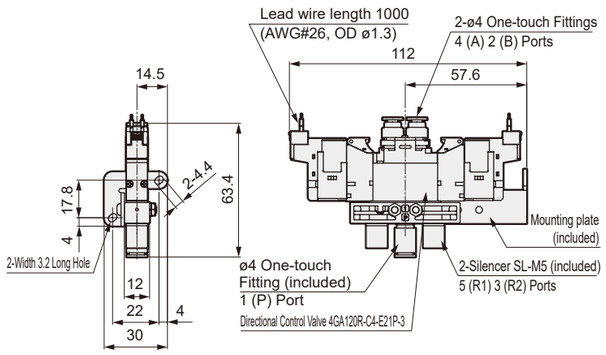
Item	Solid state 2-wire type	
	F2H	T2H
Applications	For programmable controller only	
Load Voltage/Current	10 to 30 VDC, 5 to 20 mA	
Leakage current	1 mA or less	
Shock resistance	980 m/s²	
Weight g	10	18

[Directional Control Valve (V) Specifications]

Item	4GA120R-C4-E21P-FLA28482-3-ST
Valve Type and Operation Method	Pilot Operated Soft Spool Valve
Switching Position Classification	2-position double solenoid
Max. Operating Pressure MPa	0.7
Min. Working Pressure MPa	0.2
Ambient Temperature °C	-5 to 55 (No freezing)
Fluid Temperature °C	5 to 55
Manual Override	Non-lock/Lock Common Type
Response Time ms	9
Flow Characteristics C [dm³/ (s·bar)], b	P → A/B: C=1.2, b=0.47 A/B→R1/R2: C=0.72, b=0.37
Rated voltage V	24 VDC
Voltage Fluctuation Range	±10%
Holding Current A	0.017
Power Consumption W	0.40
Surge Suppressor	Built-in
Indicator	Built-in Lamp

For other specification products, please refer to "Directional Control Valve ① (No.RJ-011AA)". Please refer to the weight listed in the switch specifications.

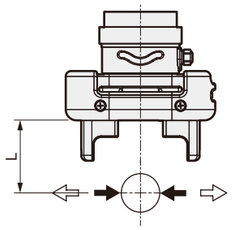
Outline Dimension Drawing

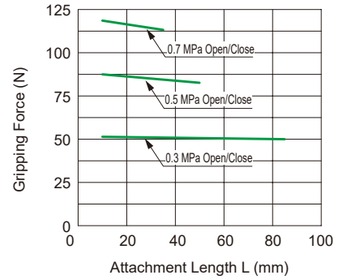


Gripping Force Performance Data

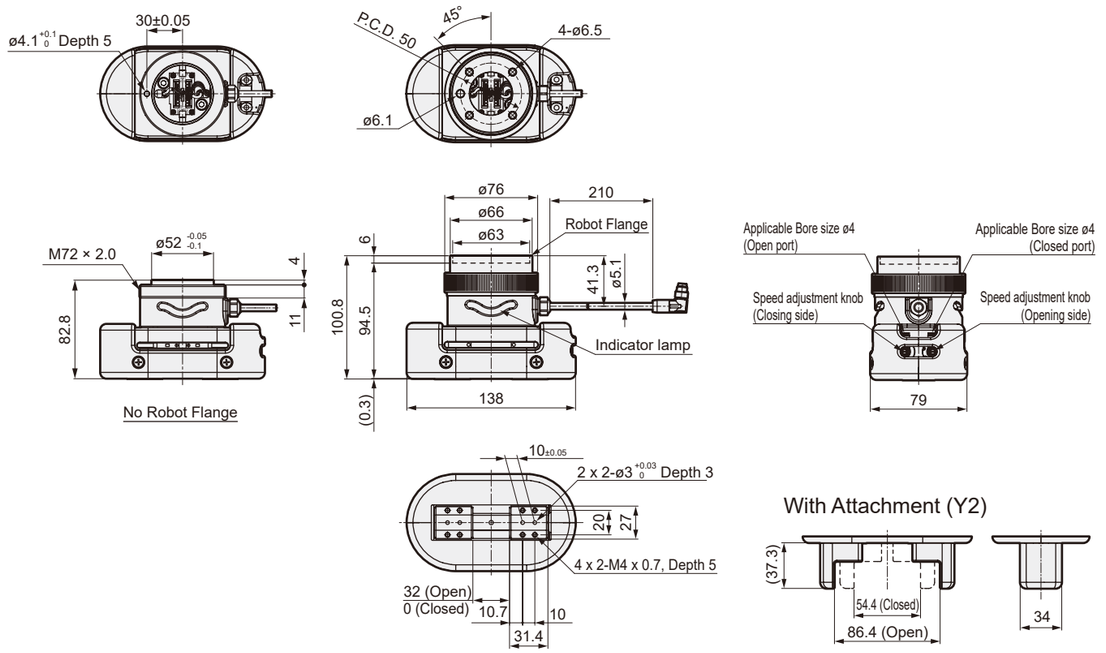
- Gripping force represents the thrust (for one finger) in the direction of the arrow shown in the figure.
- This represents the gripping force acting in the opening and closing directions at a gripper's attachment length L when the supply pressure is 0.3, 0.5, and 0.7 MPa.

Open direction (⇦), closed direction (➡) ——— (solid line)





Outline Dimension Drawing





JAKA Robot Zu ® Series Compatible Gripper 3-Finger Type

RCKL-JK Series

With Speed Controller, Cylinder Switch

Connection Port Diameter: ø4 One-touch Fitting

For suitable detailed model No.s, please see our website.

Model No. Notation Method

RCKL – 40CS – F – Y3V – JK

- RCKL: Model No.
- F: ① Robot Flange
- Y3V: ② Accessories
- JK: JAKA Robot Compatible with Zu series

① Robot Flange

Code	Content
Blank	No Robot Flange
F	With Robot Flange Note)

Note) Robot flange mounting bolts included

② Accessories

Code	Content
Blank	No Attachments
Y2	Attachment (Custom Product) *1
V	Directional Control Valve • Tube *2

*1 Material is aluminum alloy. (Weight is 50 g per piece)

*2 The directional control valve is a ø4 one-touch fitting (air supply port, A/B port) with silencer (R1/R2 port) and mounting plate. Tubes are ø4 outer diameter, 2.5 m length x 2 pieces.

Specifications

Item		RCKL
Bore size	mm	ø40
Actuation method		Double Acting Type
Operating Fluid		Compressed Air
Max. Operating Pressure	MPa	0.7
Min. Working Pressure	MPa	0.3
Port Size		ø4 One-touch Fitting
Ambient Temperature	°C	5 to 50
Operating Stroke	mm	10
Repeatability	mm	±0.01
Weight	kg	1.1
Indicator LED		Blue/Green
Cylinder Switch		With T2H (Red LED ON when lit)

Note) For attachments manufactured to match workpieces, refer to P. 568.

[Switch Specifications]

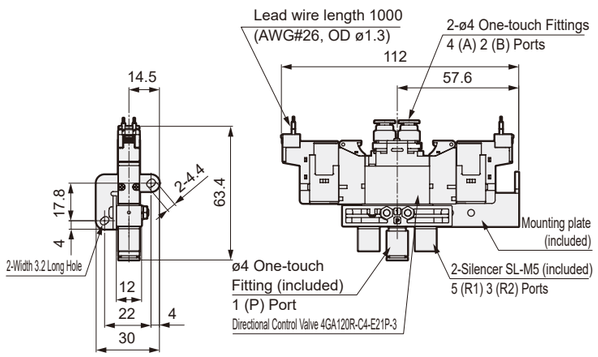
Item		Solid state 2-wire type	
		F2H	T2H
Applications		For programmable controller only	
Load Voltage/Current		10 to 30 VDC, 5 to 20 mA	
Leakage current		1 mA or less	
Shock resistance		980 m/s²	
Weight	g	10	18

[Directional Control Valve (V) Specifications]

Item		4GA120R-C4-E21P-FLA28482-3-ST
Valve Type and Operation Method		Pilot Operated Soft Spool Valve
Switching Position Classification		2-position double solenoid
Max. Operating Pressure	MPa	0.7
Min. Working Pressure	MPa	0.2
Ambient Temperature	°C	-5 to 55 (No freezing)
Fluid Temperature	°C	5 to 55
Manual Override		Non-lock/Lock Common Type
Response Time	ms	9
Flow Characteristics C [dm³/ (s·bar)], b		P → A/B: C=1.2, b=0.47 A/B→R1/R2: C=0.72, b=0.37
Rated voltage	V	24 VDC
Voltage Fluctuation Range		±10%
Holding Current	A	0.017
Power Consumption	W	0.40
Surge Suppressor		Built-in
Indicator		Built-in Lamp

For other specification products, please refer to "Directional Control Valve ① (No.RJ-011AA)".

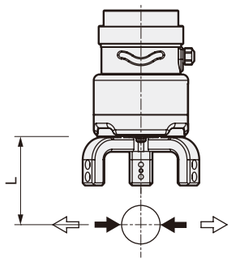
Outline Dimension Drawing

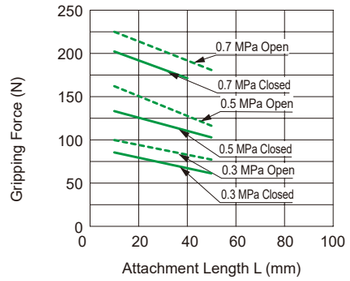


Gripping Force Performance Data

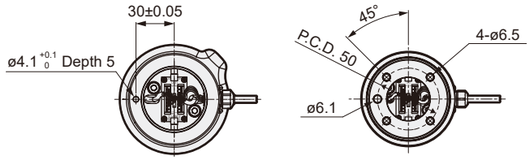
- Gripping force represents the thrust (for one finger) in the direction of the arrow shown in the figure.
- This represents the gripping force acting in the opening and closing directions at a gripper's attachment length L when the supply pressure is 0.3, 0.5, and 0.7 MPa.

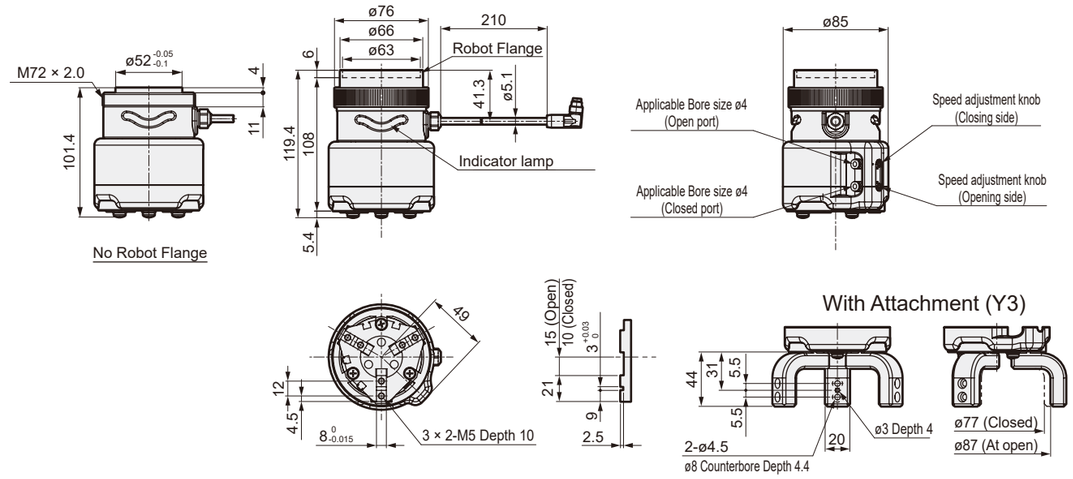
Open direction (⇦) ---------- (broken line)
Closing direction (➡) ———— (solid line)





Outline Dimension Drawing







Kawasaki Robot K-AddOn Registered Gripper Compact Type

RLSH-KW Series

With Speed Controller, Cylinder Switch
Connection Port Diameter: ø4 One-touch Fitting

For suitable detailed model No.s, please see our website.

Model No. Notation Method

RLSH – **A20D1N** – **L1** – **F** **Y2V** – **KW**

- RLSH: Model No.
- F: ❶ Robot Flange
- Y2V: ❷ Accessories
- KW: K-AddOn Registered Products

❶Robot Flange

Code	Content
Blank	No Robot Flange
F	With Robot Flange Note)

Note) Robot flange mounting bolts included

❷Accessories

Code	Content	
Blank	No Attachments	
Y2	Attachment for testing	*1
V	Directional Control Valve • Tube	*2

*1 Made of resin, so use for gripping tests. (Weight is 25 g per piece)
*2 The directional control valve is a ø4 one-touch fitting (air supply port, A/B port) with silencer (R1/R2 port) and mounting plate. Tubes are ø4 outer diameter, 2.5 m length x 2 pieces.

Specifications

Item		RLSH
Bore size	mm	ø20
Actuation method		Double Acting Type
Operating Fluid		Compressed Air
Max. Operating Pressure	MPa	0.7
Min. Working Pressure	MPa	0.1
Port Size		ø4 One-touch Fitting
Ambient Temperature	°C	0 to 50
Operating Stroke	mm	18
Repeatability	mm	±0.01
Weight	kg	0.8
Indicator LED		Blue/Green
Cylinder Switch		With F2H (Yellow LED ON when lit)

Note) For attachments manufactured to match workpieces, refer to P. 568.

[Switch Specifications]

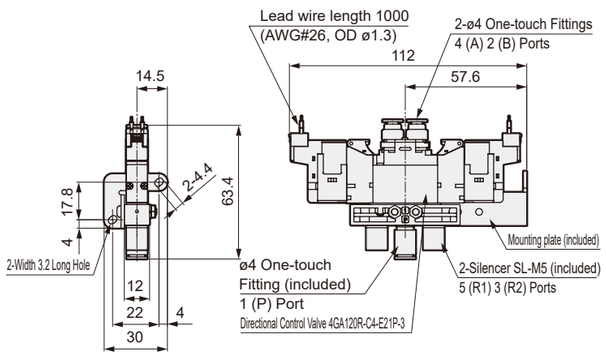
Item		Solid state 2-wire type	
		F2H	T2H
Applications		For programmable controller only	
Load Voltage/Current		10 to 30 VDC, 5 to 20 mA	
Leakage current		1 mA or less	
Shock resistance		980 m/s²	
Weight	g	10	18

[Directional Control Valve (V) Specifications]

Item		4GA120R-C4-E21P-FLA28482-3-ST
Valve Type and Operation Method		Pilot Operated Soft Spool Valve
Switching Position Classification		2-position double solenoid
Max. Operating Pressure	MPa	0.7
Min. Working Pressure	MPa	0.2
Ambient Temperature	°C	-5 to 55 (No freezing)
Fluid Temperature	°C	5 to 55
Manual Override		Non-lock/Lock Common Type
Response Time	ms	9
Flow Characteristics C [dm³/ (s·bar)], b		P → A/B: C=1.2, b=0.47 A/B→R1/R2: C=0.72, b=0.37
Rated voltage	V	24 VDC
Voltage Fluctuation Range		±10%
Holding Current	A	0.017
Power Consumption	W	0.40
Surge Suppressor		Built-in
Indicator		Built-in Lamp

For other specification products, please refer to "Directional Control Valve ① (No.RJ-011AA)".

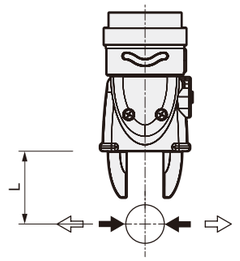
Outline Dimension Drawing

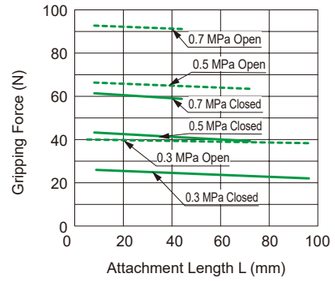


Gripping Force Performance Data

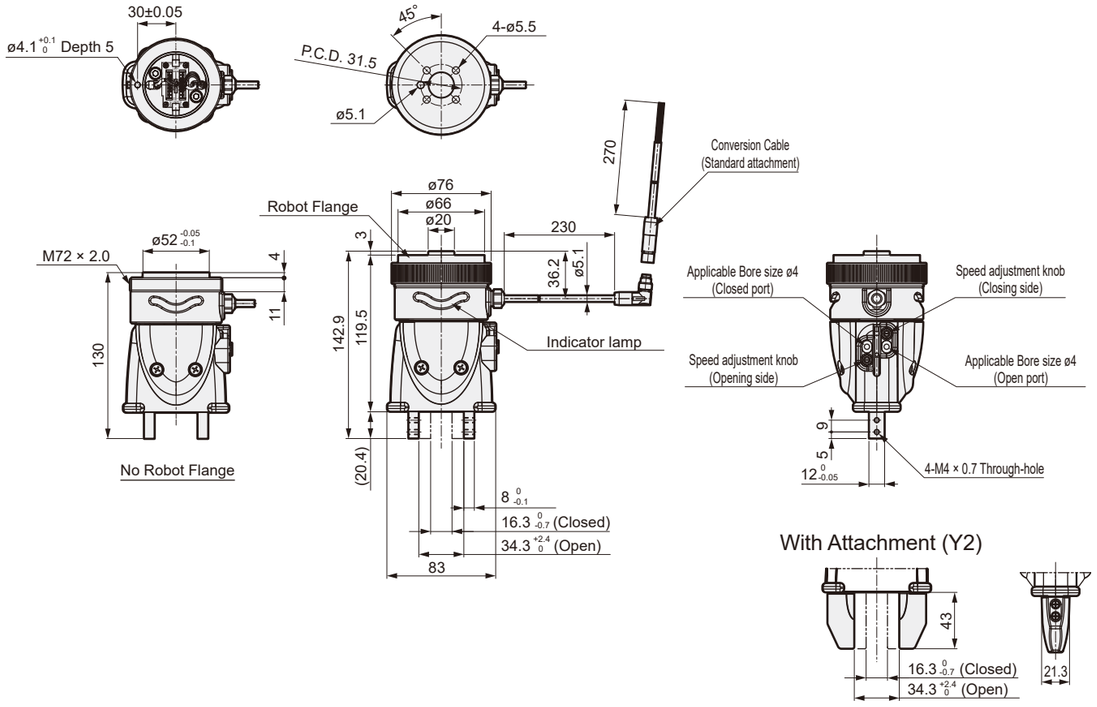
- Gripping force represents the thrust (for one finger) in the direction of the arrow shown in the figure.
- This represents the gripping force acting in the opening and closing directions at a gripper's attachment length L when the supply pressure is 0.3, 0.5, and 0.7 MPa.

Open direction (⇦) ---------- (broken line)
Closing direction (➡) ———— (solid line)





Outline Dimension Drawing



With Attachment (Y2)



Kawasaki Robot K-AddOn Registered Gripper Long Stroke Type

RHLF-KW Series

With Speed Controller, Cylinder Switch
Connection Port Diameter: ø4 One-touch Fitting

For suitable detailed model No.s, please see our website.

Model No. Notation Method

RHLF – 16CS – **F** **Y2V** – **KW**

- RHLF: Model No.
- F: ① Robot Flange
- Y2V: ② Accessories
- KW: K-AddOn Registered Products

① Robot Flange

Code	Content
Blank	No Robot Flange
F	With Robot Flange Note)

Note) Robot flange mounting bolts included

② Accessories

Code	Content	
Blank	No Attachments	
Y2	Attachment for testing	*1
V	Directional Control Valve • Tube	*2

*1 Made of resin, so use for gripping tests. (Weight is 30 g per piece)
*2 The directional control valve is a ø4 one-touch fitting (air supply port, A/B port) with silencer (R1/R2 port) and mounting plate. Tubes are ø4 outer diameter, 2.5 m length x 2 pieces.

Specifications

Item		RHLF
Bore size	mm	ø16 × 2
Actuation method		Double Acting Type
Operating Fluid		Compressed Air
Max. Operating Pressure	MPa	0.7
Min. Working Pressure	MPa	0.2
Port Size		ø4 One-touch Fitting
Ambient Temperature	°C	5 to 50
Operating Stroke	mm	32
Repeatability	mm	±0.03
Weight	kg	1.0
Indicator LED		Blue/Green
Cylinder Switch		With T2H (Red LED ON when lit)

Note) For attachments manufactured to match workpieces, refer to P. 568.

[Switch Specifications]

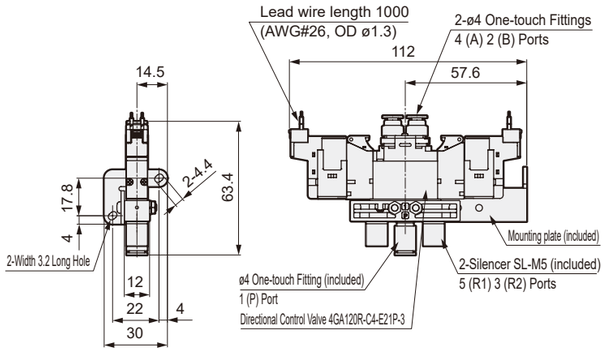
Item		Solid state 2-wire type	
		F2H	T2H
Applications		For programmable controller only	
Load Voltage/Current		10 to 30 VDC, 5 to 20 mA	
Leakage current		1 mA or less	
Shock resistance		980 m/s²	
Weight	g	10	18

[Directional Control Valve (V) Specifications]

Item		4GA120R-C4-E21P-FLA28482-3-ST
Valve Type and Operation Method		Pilot Operated Soft Spool Valve
Switching Position Classification		2-position double solenoid
Max. Operating Pressure	MPa	0.7
Min. Working Pressure	MPa	0.2
Ambient Temperature	°C	-5 to 55 (No freezing)
Fluid Temperature	°C	5 to 55
Manual Override		Non-lock/Lock Common Type
Response Time	ms	9
Flow Characteristics C [dm³/ (s·bar)], b		P → A/B: C=1.2, b=0.47 A/B→R1/R2: C=0.72, b=0.37
Rated voltage	V	24 VDC
Voltage Fluctuation Range		±10%
Holding Current	A	0.017
Power Consumption	W	0.40
Surge Suppressor		Built-in
Indicator		Built-in Lamp

For other specification products, please refer to "Directional Control Valve ① (No.RJ-011AA)".

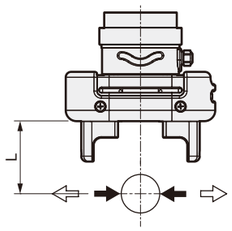
Outline Dimension Drawing

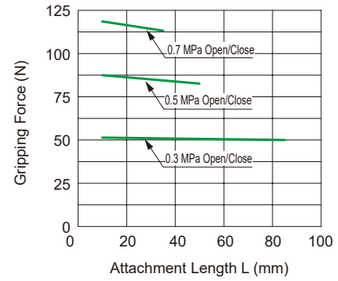


Gripping Force Performance Data

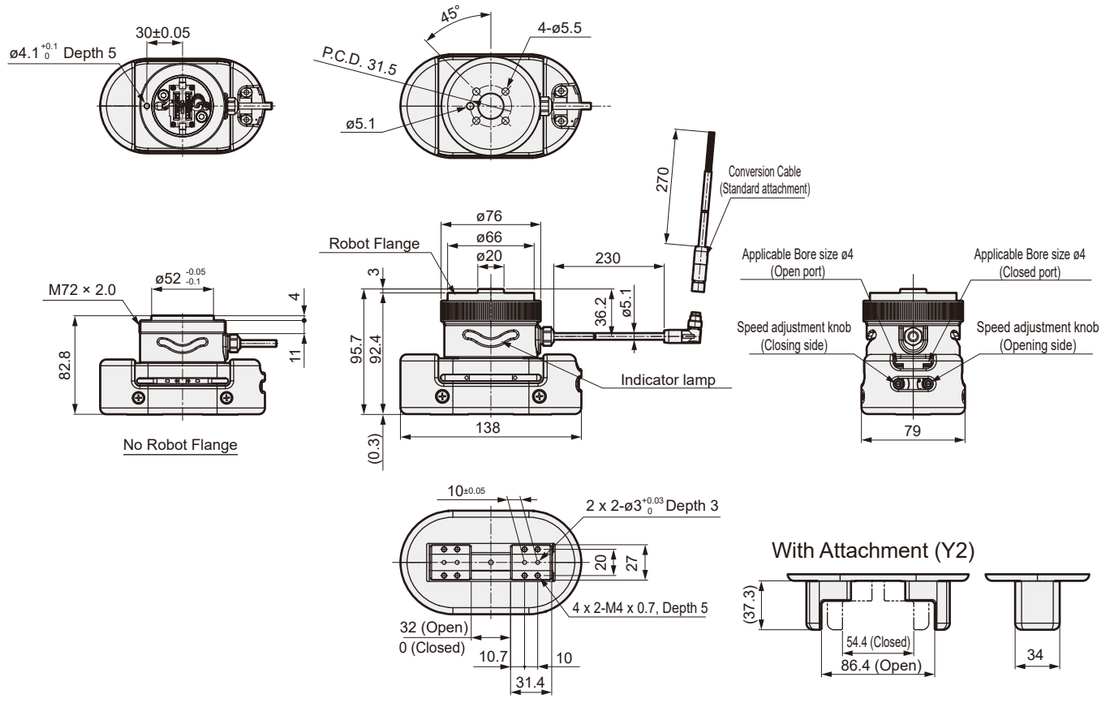
- Gripping force represents the thrust (for one finger) in the direction of the arrow shown in the figure.
- This represents the gripping force acting in the opening and closing directions at a gripper's attachment length L when the supply pressure is 0.3, 0.5, and 0.7 MPa.

Open direction (⇦), closed direction (➡) ——— (solid line)





Outline Dimension Drawing





Kawasaki Robot K-AddOn Registered Gripper 3-Finger Type

RCKL-KW Series

With Speed Controller, Cylinder Switch

Connection Port Diameter: ø4 One-touch Fitting

For suitable detailed model No.s, please see our website.

Model No. Notation Method

RCKL – 40CS – F – Y3V – KW

- RCKL: Model No.
- F: ① Robot Flange
- Y3V: ② Accessories
- KW: K-AddOn Registered Products

① Robot Flange

Code	Content
Blank	No Robot Flange
F	With Robot Flange Note)

Note) Robot flange mounting bolts included

② Accessories

Code	Content	
Blank	No Attachments	
Y3	Attachment	*1
V	Directional Control Valve • Tube	*2

*1 Material is aluminum alloy. (Weight is 50 g per piece)

*2 The directional control valve is a ø4 one-touch fitting (air supply port, A/B port) with silencer (R1/R2 port) and mounting plate. Tubes are ø4 outer diameter, 2.5 m length x 2 pieces.

Specifications

Item		RCKL
Bore size	mm	ø40
Actuation method		Double Acting Type
Operating Fluid		Compressed Air
Max. Operating Pressure	MPa	0.7
Min. Working Pressure	MPa	0.3
Port Size		ø4 One-touch Fitting
Ambient Temperature	°C	5 to 50
Operating Stroke	mm	10
Repeatability	mm	±0.01
Weight	kg	1.1
Indicator LED		Blue/Green
Cylinder Switch		With T2H (Red LED ON when lit)

Note) For attachments manufactured to match workpieces, refer to P. 568.

[Switch Specifications]

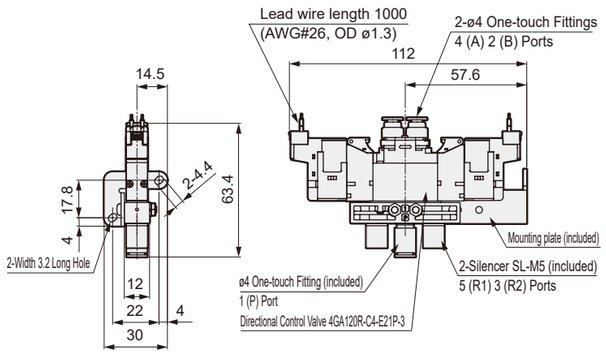
Item		Solid state 2-wire type	
		F2H	T2H
Applications		For programmable controller only	
Load Voltage/Current		10 to 30 VDC, 5 to 20 mA	
Leakage current		1 mA or less	
Shock resistance		980 m/s²	
Weight	g	10	18

[Directional Control Valve (V) Specifications]

Item		4GA120R-C4-E21P-FLA28482-3-ST
Valve Type and Operation Method		Pilot Operated Soft Spool Valve
Switching Position Classification		2-position double solenoid
Max. Operating Pressure	MPa	0.7
Min. Working Pressure	MPa	0.2
Ambient Temperature	°C	-5 to 55 (No freezing)
Fluid Temperature	°C	5 to 55
Manual Override		Non-lock/Lock Common Type
Response Time	ms	9
Flow Characteristics C [dm³/ (s·bar)], b		P → A/B: C=1.2, b=0.47 A/B→R1/R2: C=0.72, b=0.37
Rated voltage	V	24 VDC
Voltage Fluctuation Range		±10%
Holding Current	A	0.017
Power Consumption	W	0.40
Surge Suppressor		Built-in
Indicator		Built-in Lamp

For other specification products, please refer to "Directional Control Valve ① (No.RJ-011AA)".

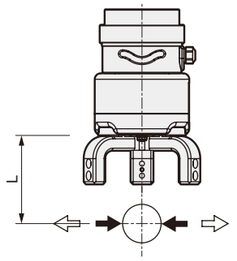
Outline Dimension Drawing

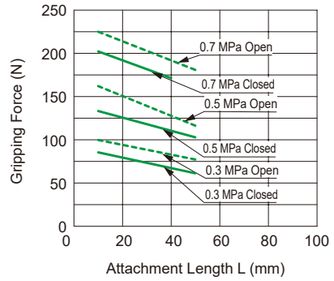


Gripping Force Performance Data

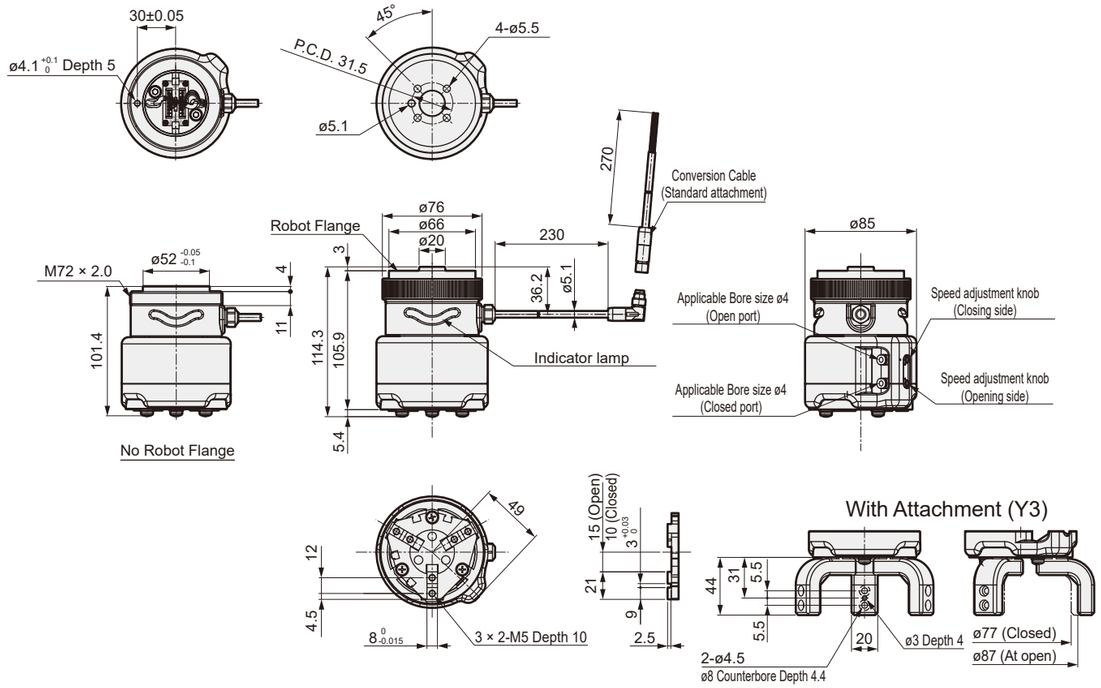
- Gripping force represents the thrust (for one finger) in the direction of the arrow shown in the figure.
- This represents the gripping force acting in the opening and closing directions at a gripper's attachment length L when the supply pressure is 0.3, 0.5, and 0.7 MPa.

Open direction (⇦) ---------- (broken line)
Closing direction (➡) ———— (solid line)





Outline Dimension Drawing



Gripper for Collaborative Robot

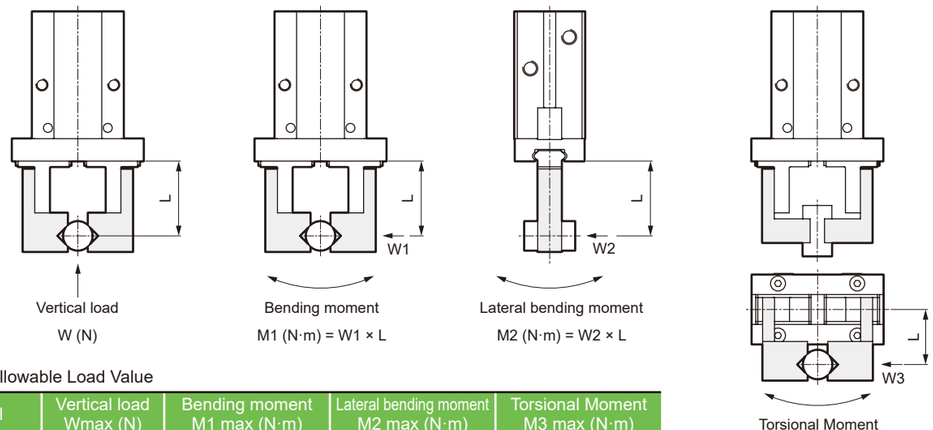
About Attachments

- Use attachments that are as lightweight and short as possible. If they are long and heavy, the inertial force during opening and closing will be large, which may cause play in the fingers or accelerate wear on the finger sliding parts, adversely affecting the service life.
- When attaching L-shaped attachments, select the length as shown below. Example: For an L-shape, 30 mm in the finger direction and 30 mm bent at 90 degrees, the attachment length is considered to be 60 mm.
- The length of the attachment must be within the gripping force performance data.
- The weight of the attachment affects its lifespan, so follow the table below.

Model	Weight per attachment W
RLSH	W < 80 g
RHLF	W < 100 g
RCKL	W < 95 g

About External Forces on Fingers

When external force is applied to the fingers, such as when transporting or inserting a workpiece, use within the range shown in [Table 1]. (* When used in transport, consider the impact at the end.)



L: Distance to the point where the load is applied

[Table 1] Allowable Load Value

Model	Vertical load Wmax (N)	Bending moment M1 max (N·m)	Lateral bending moment M2 max (N·m)	Torsional Moment M3 max (N·m)
RLSH	198	1.8	3.6	1.8
RHLF	164	0.94	2	1.1

• Example of external force calculation on fingers

Calculation Example①: When conveying workpieces
Model No.: RLSH-A20D1N, attachment (weight m_k: When a workpiece (weight: m=0.8 kg, center of gravity: L=60 mm) is gripped and transported at 0.07 kg with center of gravity: L_k = 30 mm (g: Gravity acceleration 9.8 m/s^2, α: Assuming an impact factor of 3 at the end of the stroke)

$M_1=\alpha\times W_1\times L=\alpha\times (m_k\times g\times L_k\times 2+m\times g\times L)$

$= 3 \times (0.07 \times 9.8 \times 30 \times 10^{-3} \times 2 + 0.7 \times 9.8 \times 40 \times 10^{-3}) \approx 0.95$ N·m, and M1 max = 1.8 N·m or less, so it can be used.

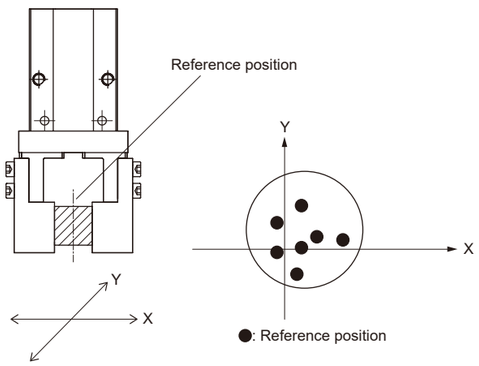
Calculation Example②: When inserting a workpiece
Model No.: When load W_1:30 N is applied to RLSH-A20D1N, L=40mm

$M_1 = W_1 \times L = 30 \times 40 \times 10^{-3} = 1.2$ N·m, and M1 max = 1.8 N·m or less, so it can be used.

Repeatability

Repeatability here refers to the workpiece position deviation when clamping and unclamping are repeated under the same conditions (gripper fixed, same workpiece used, etc., see right).

Condition
- Workpiece dimensions, shape, weight
- Workpiece transfer position
- Clamping method, length
- Resistance between workpiece and workpiece receiving surface
- Fluctuation of gripping force (air pressure), etc.



MEMO

Pneumatic Components

To Use This Product Safely

Be sure to read this before use.
For cylinders in general, refer to P. 39 of the introduction; for hand chucks in general, refer to P. 336, 490; and for cylinder switches, refer to P. 628.

Laws and Regulations Related to Robot Safety

Please read the following standards thoroughly before use.

ISO10218, JIS B 8433 (Robots and Robotic Devices)
ISO/TS 15066 (Robots and Robotic Devices)

Individual Precautions: Gripper for Collaborative Robot

During Design / Selection

Warning

■ If there is a risk that the moving workpiece may pose a danger to the human body, or a risk of fingers being pinched by the attachments, please implement safety measures such as installing a protective cover.

■ If circuit pressure drops due to a service interruption or problems in the air source, gripping power drops and the workpiece could drop. Provide position locking measures, etc., so that personnel are not injured or machines damaged.

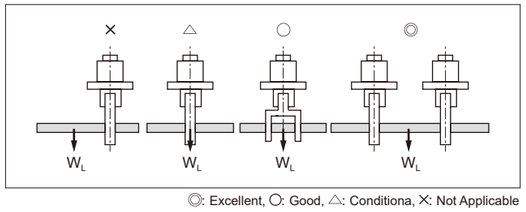
Caution

■ Usage Environment

In cutting, casting, and welding factories, foreign matter such as cutting fluid, chips, and dust may enter. Prevent these as much as possible with covers, etc.Also, do not use in the following environments.

- Exposure to cutting fluid (due to abrasives or abrasive powder in the fluid abrading the sliding parts)
- When organic solvents, chemicals, acids, alkalis, kerosene, etc. are contained in the atmosphere
- Exposure to water

■ When gripping long or large workpieces, gripping the center of gravity is a prerequisite for stable gripping, but consider increasing the size or using multiple units to ensure stability.



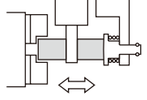
◎: Excellent, ○: Good, △: Conditiona, ×: Not Applicable

■ Select a model with sufficient gripping force for the workpiece weight.

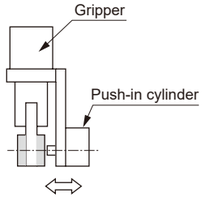
■ Select a model with sufficient opening/closing width relative to the workpiece size.

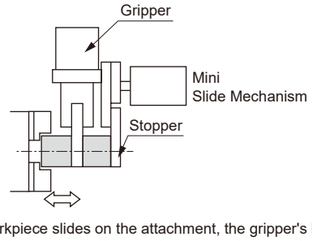
■ When directly inserting a workpiece into a jig with the gripper, design with clearance in mind. The gripper may be damaged.

● Pushing against a jig by springing out



● When using a push-in cylinder





Note) If the workpiece slides on the attachment, the gripper's lifespan may be significantly reduced. Sufficient consideration must be given to the shape of the attachments.

Individual Precautions

■ If the attachment lacks rigidity, deflection may cause the fingers to bind, adversely affecting operation.

■ Adjust the gripper opening/closing speed using the speed controller. If used at high speed, play may occur sooner. Also, the workpiece may vibrate due to the impact of opening and closing, which may result in gripper errors, workpiece insertion failures, or poor repeatability.

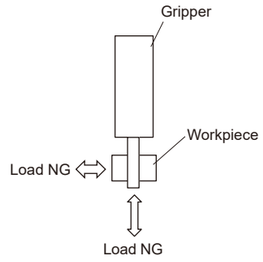
■ When using small bore/short stroke actuators at high frequency, condensation (water droplets) may form in piping depending on conditions. Take measures to prevent condensation by using a quick exhaust valve, etc.

■ To prevent workpiece drop when the signal is interrupted, use a 2-position double solenoid directional control valve.

During Use

Caution

■ Do not apply excessive load to the fingers or attachments during workpiece attachment/detachment or transfer. Scratches or dents may occur on the rolling surface of the finger's linear guide, leading to malfunction.



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

Cylinder Switch



About switch single item model No.

The single item model No. 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 Table	574
Cylinder with Switch System Table	576
2-Color Indicator Solid State Cylinder Switch	580
Cylinder Switch for Strong Magnetic Fields	581
● M Series	584
● R Series	586
● T Series	588
● Improved Water Resistance Cylinder Switch	592
● Magnetic Environment Cylinder Switch	594
● K Series	596
● F Series	598
● H Series	600
● V Series	601
● E Series	602
● Contact Protection Circuit Box	603
● Cylinder switch with connector	604
Series Options	606
Operating Principle / Switch Mounting Position	607
Operating Range and Hysteresis of Each Cylinder with Switch	608
Selection Chart	618
Failures and Countermeasures	620
⚠ Precautions for Use	628
Switch Mounting Method	634
Mounting Method for Terminal Box	637

Cylinder Switch

Solid state switch

Main item	Sub-item	M Series				R Series					T Series											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
Wiring method	Grommet	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Terminal box					●	●	●	●	●																							
	Connector											○		○	○	○	○	○	○		○		○					○					
Number of wires	2-wire	●	●			●	●	●			●	●	●	●	●	●					●	●	●				●	●	●				
	3-wire			●	●				●	●							●	●	●	●				●	●	●				●	●	●	●
With indicator lamp	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		●		●			●		●				●	●	●			●	●	●		●			●	●			●			
Operating voltage *1	5 VDC			●					●	●																						
	10 to 30 VDC (28 V)	●	●		●		●	●				●	●		●	●	●	●	●	●		●	●	●	●	●		●	●	●		●	
	24 VDC													●	●						●						●						
	30 VDC or less			●	●				●	●							●	●	●	●				●	●	●				●	●	●	●
	100 / 110 VAC					●					●																						
	200 / 220 VAC					●					●																						
Applications	Programmable Controller	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	IC circuit			●	●				●	●																							
	Relay			●	●	●			●	●					●	●	●	●	●	●				●	●	●				●	●	●	●
	Large capacity relay																																

Reed switch

Main item	Sub-item	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
		M0	M5	R0	R4	R5	R6	T0	T5	T8	TOY	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	Programmable Controller	●	●	●		●	●	●	●	●	●	●	●	●	●		●	●	●
	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 No.

Model No. notation

SW - T2 H 5

①Switch model No. ③Lead wire length

②Lead wire extraction direction

Notation Example: SW-T2H5

①Switch model No.

2M	VW2M	3M	VW3M	1R	2R	Y2R	3R	Y3R	1T	2T	J2T	W2T	LW2T	LY2T	3T	P3T	W3T	LY3T	DY2T	2K	Y2K
●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Note) Please refer to the table above.

②Lead wire extraction direction

Code	H	V	V, S
Outlet direction	Straight	L-shape	L-shape
Appearance			 FDS, T2WLV only

③Lead wire length

Blank (1 m), **3** (3 m), 5 (5 m)

*Selectable depending on model

As the length differs, refer to the catalog specifications for details.

Cylinder switch (Cylinder system with switch)

Solid state switch

Cylinder Model		Tube 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: 2M	M Series: VW2M	M Series: 3M	M Series: VW3M	R Series: 1R	R Series: 2R	R Series: Y2R	R Series: 3R	R Series: Y3R	T Series: 1T	T Series: 2T	T Series: J2T	T Series: W2T	T Series: LW2T	T Series: LY2T (Improved Water Resistance)	T Series: 3T (For Cutting Oil)	T Series: P3T	T Series: W3T	T Series: LY3T (For Cutting Oil)	T Series: DY2T (For AC Magnetic Field)	K Series: 2K	K Series: Y2K	K Series: 3K	K Series: P3K	K Series: Y3K	F Series: 2F	F Series: Y2F	F Series: S2F	F Series: 3F	F Series: Y3F	F Series: P3F	F Series: S3F
General-type	SCP(Note3)	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		●			●										●	●		●	●		●	●	●	▲											
Space-saving Type	SSD2	ø12 to ø200			●		●										●	●		●	●	▲	●	●	●	▲	●					●	●	●	●	●	●	●
	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		Tube 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	M Series: M5	R Series: R0	R Series: R4	R Series: R5	R Series: R6	T Series: T0	T Series: T5	T Series: T8	T Series: T0Y (For magnetized enviornment)	K Series: K0	K Series: K5	F Series: F0	H Series: H0 (For strong magnetic field)	H Series: H0Y (For strong magnetic field)	E Series: E0 (Heat resistant)	E Series: ET0 (Heat resistant)
General-type	SCP(Note3)	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		●			●							●	●	●	▲							
Space-saving Type	SSD2	ø12 to ø200			●		●							●	●	●	▲							▲
	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

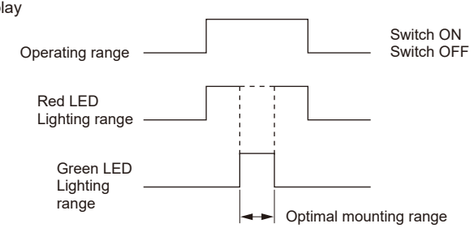
Reed switch

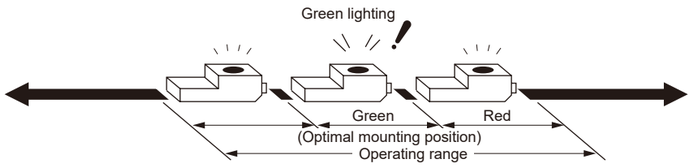
Cylinder Model		Bore size	Mounting method: Band	Mounting method: Tie Rod	Mounting method: Rail	Presence/absence of magnet in main body: Standard equipment	Presence/absence of magnet in main body: Option	M Series: M0	M Series: M5	R Series: R0	R Series: R4	R Series: R5	R Series: R6	T Series: T0	T Series: T5	T Series: T8	T Series: T0Y (For magnetic environment)	K Series: K0	K Series: K5	F Series: F0	H Series: H0 (For strong magnetic field)	H Series: H0Y (For strong magnetic field)	E Series: E0 (Heat resistant)	E Series: ET0 (Heat resistant)	Solid state switch: M Series 2M	3M	VW2M	VW3M	R Series 1R	2R	Y2R	3R	Y3R	T Series 1T	2T	J2T	W2T	LW2T	LY2T	3T	P3T	W3T	LY3T	DY2T	K Series 2K	Y2K	3K	P3K	Y3K	F Series 2F	Y2F	S2F	3F	Y3F	P3F	S3F
With Brake	ULK	ø20 to ø40	●			●								●	●	●																●	●	●	●	●		●	●	●														
With Brake	JSK2	ø20 to ø40	●			●								●	●	●																●	●	●	●	●		●	●	●														
With Brake	JSM2	ø20 to ø40	●			●								●	●	●																●	●	●	●	●		●	●	●														
With Brake	JSG	ø40 to ø100		●		●								●	●	●	▲															●	●	●	●	●		●	●	●		●												
With Brake	JSC3	ø40 to ø100		●		●								●	●	●	▲				▲	▲										●		●	●	●		●	●	●		●												
With Brake	JSC4	ø125 to ø100		●			●							●	●	●	▲															●	●	●	●	●		●	●	●		●												
With lock	USSD	ø20 to ø100			●		●							●	●	●	▲															●	●	●	●	●		●	●	●		●												
With lock	UFCD-KL	ø25 to ø63			●	●																										●	●	●	●															
With lock	USC	ø40 to ø100		●		●								●	●	●					▲	▲										●	●	●	●	●		●	●	●		●												
With Valve	CKV2	ø20 to ø40	●			●								●	●	●																●	●	●	●	●		●	●	●														
With Valve	CAV2, COV2	ø50 to ø100		●		●								●	●	●																●	●	●	●	●		●	●	●		●												
Clamp Cylinder	CAC4	ø40 to ø80	●	●		●								●	●	●	▲				▲											●	●	●	●	●		●	●	●		●												
Clamp Cylinder	UCAC2	ø50, ø63	●	●		●								●	●	●	▲				▲	▲										●	●	●	●	●		●	●	●		●												
Clamp Cylinder	CAC-N	ø32, ø40	●	●		●								●	●	●	▲															●	●	●	●	●		●	●	●		●												
Clamp Cylinder	UCAC-N	ø32, ø40, ø63	●	●		●								●	●	●	▲															●	●	●	●	●		●	●	●		●												
Clamp Cylinder	RCS2	ø12 to ø63			●	●								●	●	●	▲															●	●	●	●	●		●	●	●		●	●	●	●	●	●	●						
Clamp Cylinder	RCC2	ø16 to ø63			●	●								●	●		▲																●	●	●	●		●	●	●		●	●	●	●	●	●	●						
Special cylinder	MVC	ø6, ø10			●	●														●												●	●	●	●	●		●	●	●		●	●	●	●	●	●	●						
Special cylinder	STK	ø20 to ø50			●	●								●	●	●	▲															●	●	●	●	●		●	●	●		●												
Special cylinder	MCP	Actual thrust For 2t, 5t		●	●	●								●	●	●																●	●	●	●	●		●	●	●														
Special cylinder	GLC	ø40 to ø100		●		●				●	●	●	●								▲																																		
High Speed Type	HCM	ø20 to ø63			●	●								●	●	●	▲															●	●	●	●	●		●	●	●		●												
High Speed Type	HCA	ø20 to ø100	●			●				●	●	●	●																			●	●	●	●	●		●	●	●		●												
Swinging/ Rotating Type	RRC	Size 8, 32, 63			●	●								●	●	●																●	●	●	●	●		●	●	●														
Swinging/ Rotating Type	GRC	Size 5 to 80			●	●																										●	●	●	●	●		●	●	●		●												
Swinging/ Rotating Type	RV3□	Size 50 to 800					●	●	●					●	●	●	▲															●		●	●	●		●	●	●		●												
Gripper/Chuck			Catalog name [No]					Refer to Pneumatic Cylinder ⑤ [RJ-006AA].																	Refer to Pneumatic Cylinder ⑤ [RJ-006AA].																		

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.

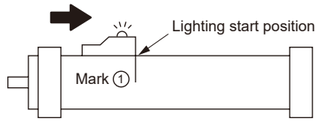
● Highly reliable

This is an extremely reliable switch due to the adoption of a unique hybrid IC equipped with a magnetoresistive element.

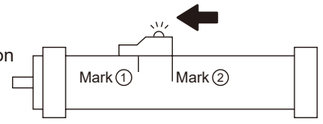
● Cylinder/Switch Setting Comparison

[Conventional] → [2-color indicator type switch]

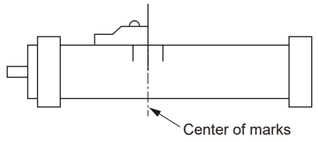
① Move the switch from one direction and mark the lighting start position.



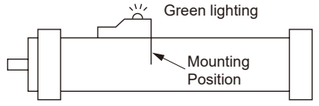
② Similarly move from the opposite direction and mark the lighting start position.



③ Align the end face of the switch with the center of the two marks and fix it.

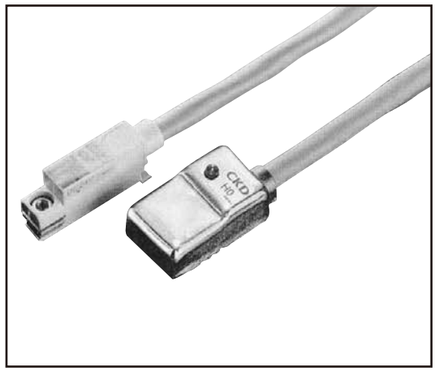


① Move the switch in one direction only and fix it at the position where it lights up green.



2-color indicator type switch is
① Quick mounting
② Easy mounting
③ No setting errors

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)

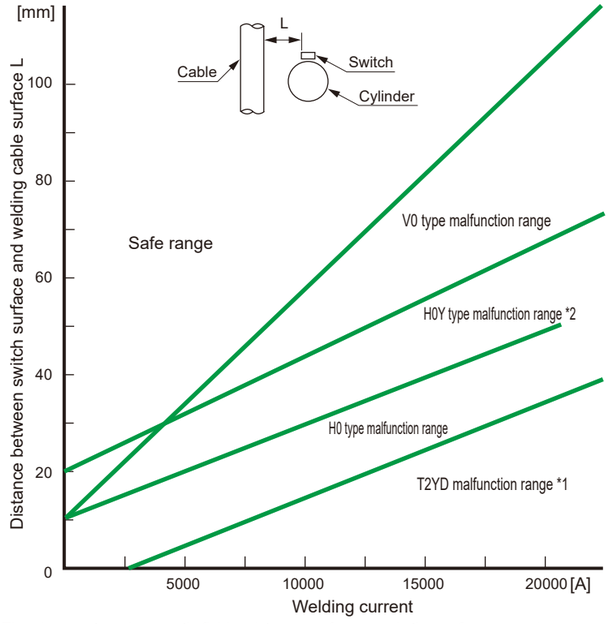
Non-polarity achieved with built-in diode bridge. Eliminates the hassle of checking positive and negative polarity, preventing connection errors.

●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
(For V0 switch with detection stroke of 30 mm or more)



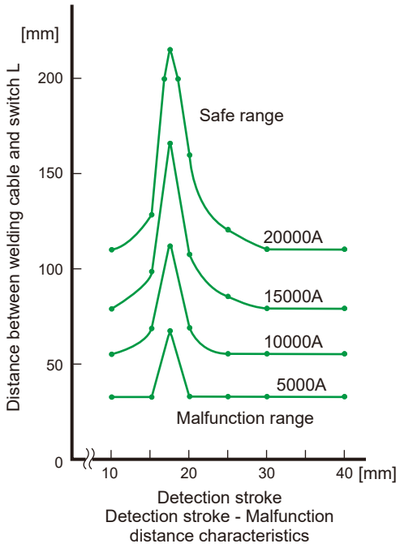
The above external magnetic field resistance performance is the performance when the switch is mounted within the range of "maximum sensitivity position ±1 mm" for H0, "maximum sensitivity position ±1.5 mm" for V0, and "optimal mounting range" for H0Y, so be sure to mount the switch within this range. 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.

② SSD detection stroke - Malfunction distance characteristics (V0 Switch)

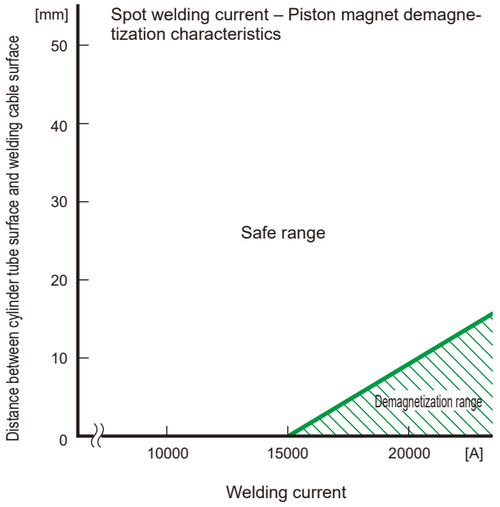


Detection stroke - Malfunction distance characteristics

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.

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

M Series	Application Cylinder	FC□, RV3□, SRL3, SRG3, SRT3, UFCD



M□V



M□H

Specifications

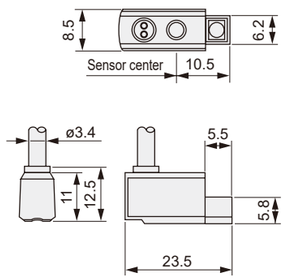
Item	Solid state 2-wire type		Solid state 3-wire type		
	M2V, M2H	M2WV (2-color indicator type)	M3H/V (NPN output type)	M3PH/V (PNP output type)	M3WV (2-color indicator type)
Applications	For programmable controller only		For programmable controller, relay, IC circuit, small solenoid valve		
Output method	–		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 mm²)		1 m (Oil-resistant vinyl cabtyre cord 3-core 0.15 mm²)		
Shock resistance	980 m/s²				
Insulation resistance	100 MΩ or more with 500 VDC megger				
Dielectric strength	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 mm²)			
Shock resistance	294 m/s²			
Insulation resistance	100 MΩ or more with 500 VDC megger			
Dielectric strength	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			

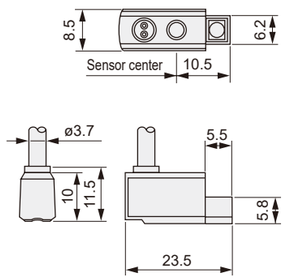
*1: M□H can be used for SRL3, SRG3, SRT3.
*2: For switch model No.s that can be mounted on the cylinder, please refer to the P. for each cylinder model.
*3: Please consult us separately for cylinder switches with connectors.
*4: Internal resistance 0.5 Ω or less
*5: For contact protection measures, see P. 628.

Outline Dimension Drawing

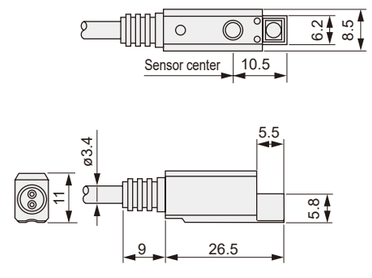
●M□V Series (L-shaped lead wire type)



●M□W series (2-color indicator type, L-shaped lead wire type)

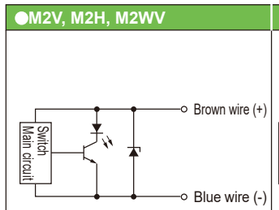


●M□H Series (Straight lead wire type)

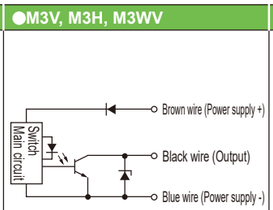


Switch internal circuit diagram

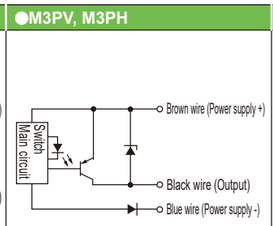
●M2V, M2H, M2WV



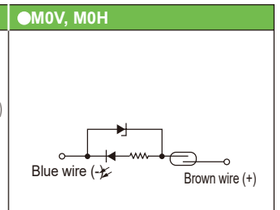
●M3V, M3H, M3WV



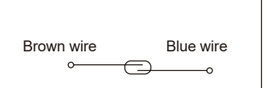
●M3PV, M3PH



●M0V, M0H



●M5V, M5H



R Series	Application 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 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				
Dielectric strength	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 mm²)								
Shock resistance	294 m/s²								
Insulation resistance	20 MΩ or more with 500 VDC megger								
Dielectric strength	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								

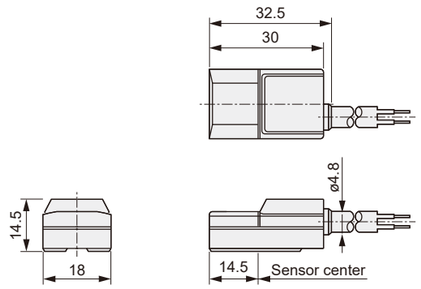
*1: Internal resistance 10Ω or less

*2: For contact protection measures, see P. 628.

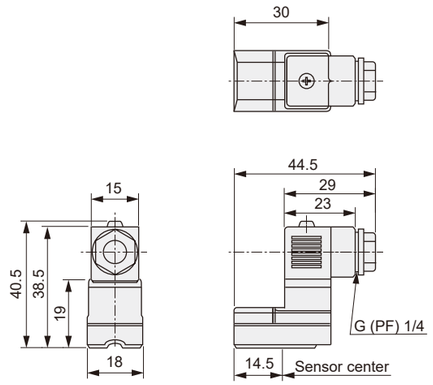
External dimension diagram / Switch internal circuit diagram

Outline Dimension Drawing

● R Series (Grommet Type)

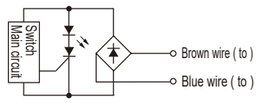


● R Series (Terminal box R□B type)

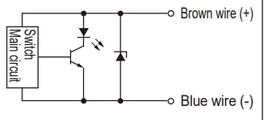


Switch internal circuit diagram

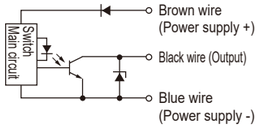
● R1



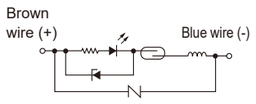
● R2/R2Y



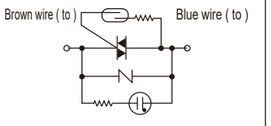
● R3/R3Y



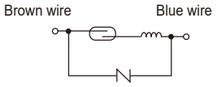
● R0



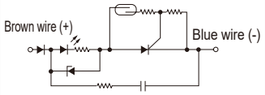
● R4



● R5



● R6



T Series	Application 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	Check Valve			

(Excluding T1, T8)



T□H/T□WH



T□V/T□WV



T1H



T1V



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	–	–				At 24 VDC 10 mA or less	At 24 VDC 10 mA or less	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 (Flexible, 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	20 MΩ or more with 500 VDC megger	20 MΩ or more with 500 VDC megger		20 MΩ or more with 500 VDC megger
Dielectric strength	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		
Dielectric strength	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. 628.

T Series	For AC Magnetic Field	Application 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 Products)
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 x 2 cores) *2	1 m (Flame-resistant cabtyre cord ø6, 0.5 mm² x 2 cores) *2	0.3 m (Flame-resistant with M12 cable connector Vinyl cabtyre cord, AWG20, 2-core)
Insulation resistance	100 MΩ or more with 500 VDC megger		
Dielectric strength	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	Application 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



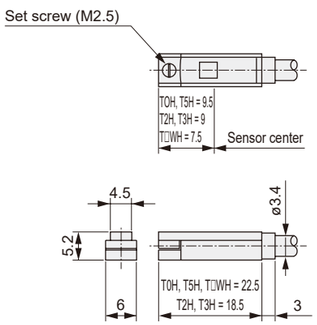
T□YLH

Specifications

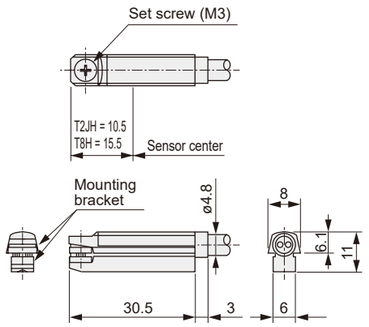
Item	Solid state 2-wire type	Solid state 3-wire type
	T2YLH, T2YLV	T3YLH, T3YLV
Applications	For programmable controller only	Programmable controller, Relay
Output method	–	NPN output
Power supply voltage	–	10 to 28 VDC
Load voltage	10 to 30 VDC	30 VDC or less
Load current	5 to 20 mA	50 mA or less
Current 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	
Dielectric strength	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	

Outline Dimension Drawing

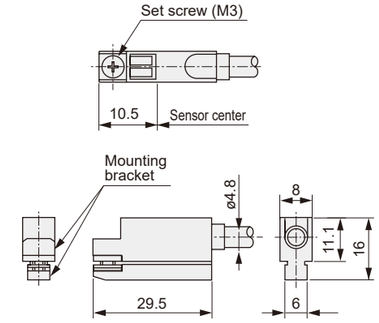
● T□H, T□WH Series
(Straight lead wire type)



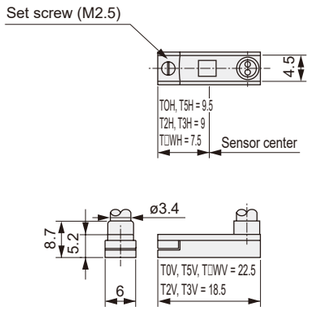
● T2JH, T8H Series
(Straight lead wire type)



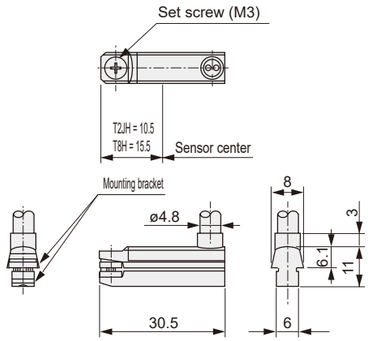
● T1H Series
(Straight lead wire type)



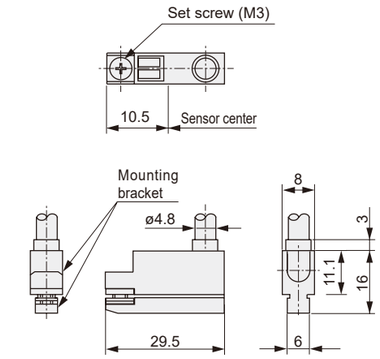
● T□V, T□WV Series
(L-shaped lead wire type)



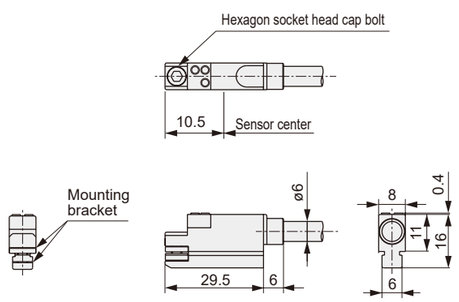
● T2JV, T8V Series
(L-shaped lead wire type)



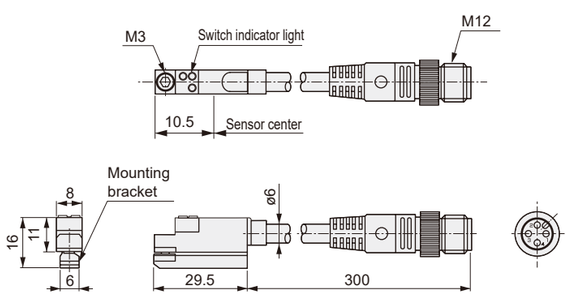
● T1V Series
(L-shaped lead wire type)



● T2YD (AC magnetic field switch)

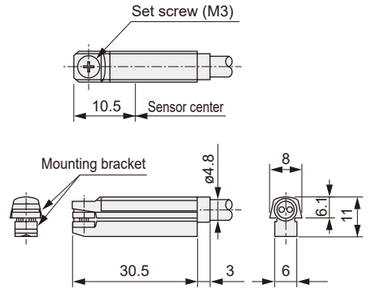


● T2YDU (Switch for AC magnetic field with M12 cell connector)

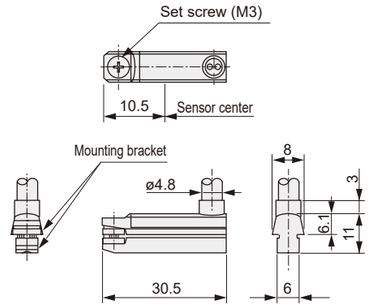


Outline Dimension Drawing

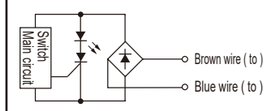
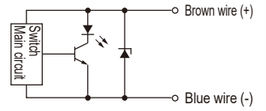
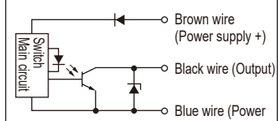
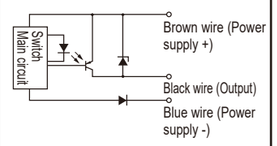
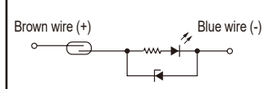
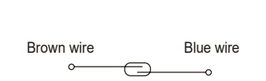
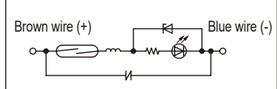
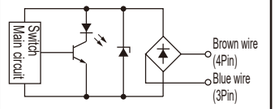
● T□YLH Series
(Straight lead wire type)



● 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	Application 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 mm²)	0.3 m (PUR cord with M8 connector)
Insulation resistance	20 MΩ or more with 500 VDC megger	
Dielectric strength	No abnormality when 1000 VAC is applied for 1 minute	
Shock resistance	980 m/s²	
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 No. Notation Method

●Water-resistant Cylinder Switch

SW - T2WL H W

1 Lead Wire Extraction Direction
2 Lead wire length, connector specification

1 Lead Wire Extraction Direction

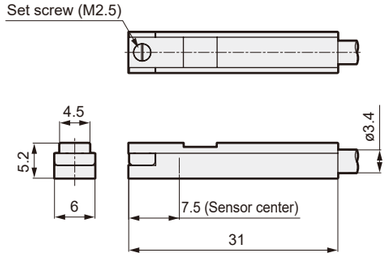
Code	Content
H	Straight lead wire type
V	L-shaped lead wire type

2 Lead wire length, connector specification

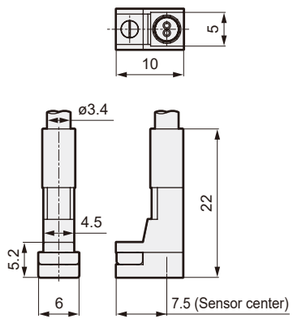
Code	Content
Blank	1 m lead wire
3	3 m lead wire
5	5 m lead wire
W	M8 connector, 1PIN (+) 4PIN (-)

Outline Dimension Drawing

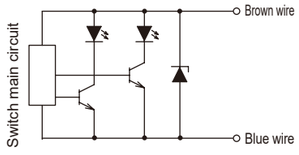
●T2WLH Series (Straight lead wire type)



●T2WLV Series (L-shaped lead wire type)



Switch internal circuit diagram



Cylinder Switch

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

Cylinder Switch

T Series	Magnetized environment	Application 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



TOY

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 cable 2-conductor 0.2 **mm²**)	1 m (flame-resistant cabtyre cable 2 conductor 0.2 **mm²**) UL acquired wire	1 m (flame-resistant vinyl cabtyre cable 2-conductor 0.2 **mm²**)
Insulation resistance	20 MΩ or more with 500 VDC megger		
Dielectric strength	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)		
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 No. Notation Method

●Magnetic Field Resistant Cylinder Switch

SW- T0Y L M K

1 Lead wire type
2 Lead wire length, connector specification
3 Option

1 Lead wire type

Code	Content
Blank	Oil-resistant vinyl cabtyre cord
L	UL wire
T	Spatter-resistant wire

2 Lead wire length, connector specification

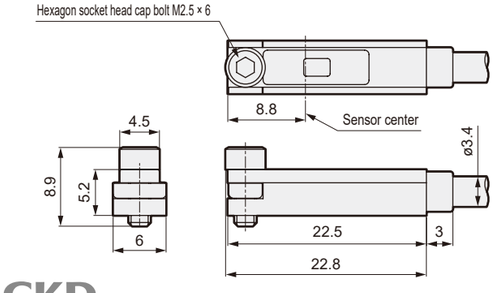
Code	Content
Blank	1 m lead wire
3	3 m lead wire
5	5 m lead wire
B	M12 connector (4PIN specification), 3-4PIN no polarity, 0.3 m lead wire
M	M12 connector (4PIN specification), 1-4PIN no polarity, 0.3 m lead wire
F	M8 connector (3PIN specification), 1-4PIN no polarity, 0.3 m lead wire

Note) For connector specification "F", only lead wire type "L" can be selected.

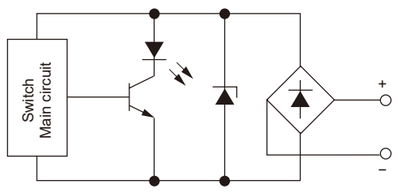
3 Option

Code	Content
Blank	No option
K	With spatter adhesion prevention cover

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	Application 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
Dielectric strength	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			
Dielectric strength	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			

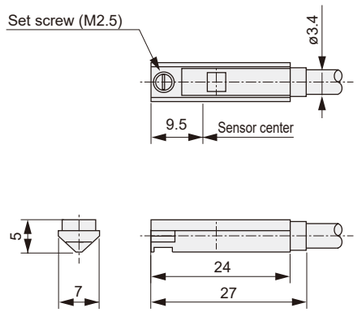
*1: Max. load current of K2H, K2V: 25 °C. If the switch operating ambient temperature is higher than 25 °C, it will be lower than 20 mA. (It will be 5 to 10 mA at 60°C.)
*2: Internal resistance 0.5Ω or less
*3: For contact protection measures, see P. 628.

Cylinder Switch

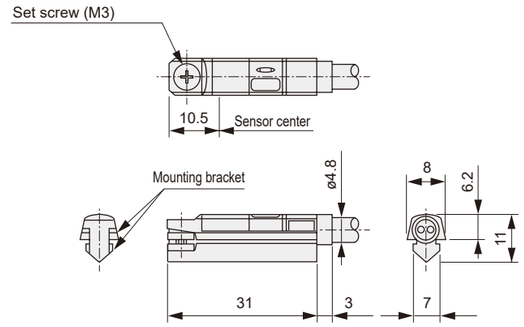
External dimension diagram / Switch internal circuit diagram

Outline Dimension Drawing

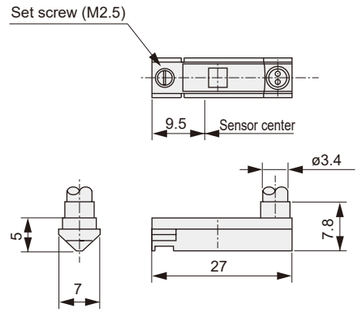
● K□H Series (Straight lead wire type)



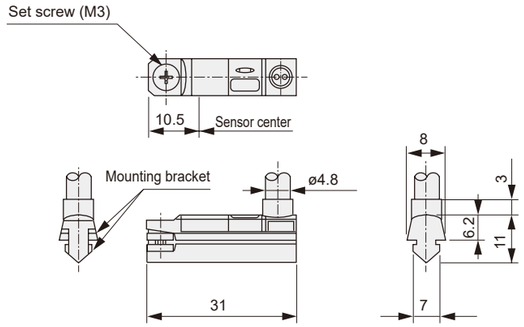
● K□YH Series
(2-color indicator type, Straight lead wire type)



● K□V Series (L-shaped lead wire type)

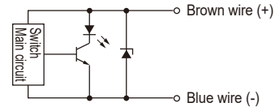


● K□YV Series
(2-color indicator type, L-shaped lead wire type)

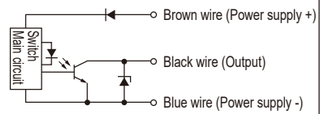


Switch internal circuit diagram

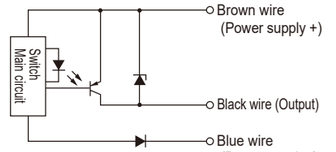
● K2H, K2V, K2YH, K2YV



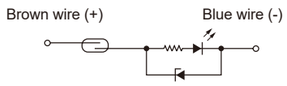
● K3H, K3V, K3YH, K3YV



● K3PH, K3PV



● K0H, K0V



● K5H, K5V



Cylinder Switch

F Series	Application Cylinder	CKL2, LCG, LCM, LCR, MDC2, MSD, MSDG-L, MVC, RCS2, SSD2, STM, Gripper (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

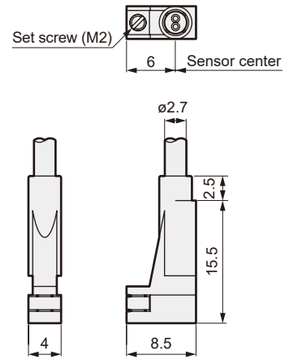
Specifications

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					
Dielectric strength	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		

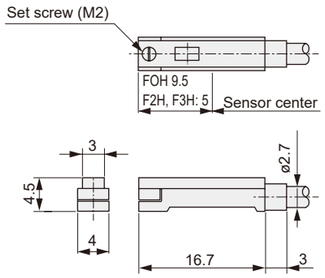
*1 The maximum load current for F2H and F2 V is 20 mA at 25°C. If the switch operating ambient temperature is higher than 25°C, it will be lower than 20 mA. (It will be 5 to 10 mA at 60°C.)
*2: For F2S and F3S, when mounting two switches in one groove for both-end detection, please mount them so that 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. 628.
*5: Flexible lead wires are used.

Outline Dimension Drawing

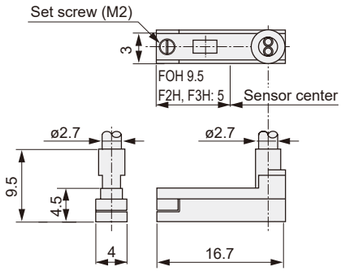
●F□S series (Lead wire vertical extraction short stroke detection type)



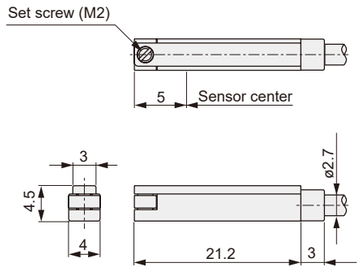
●F□H series (Straight lead wire type)



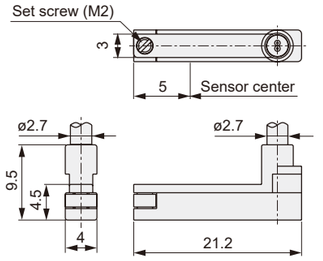
●F□V series (L-shaped lead wire type)



●F□YH / F3PH series (Straight lead wire type)

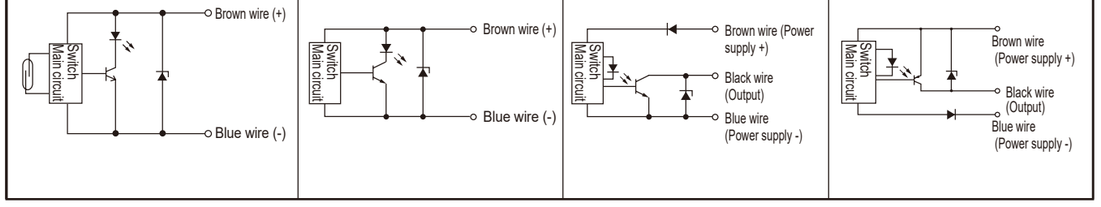


●F□YV / F3PV series (L-shaped lead wire type)



Switch internal circuit diagram

● F0H / F0 V	●F2S / F2H / F2 V / F2YH / F2YV	● F3S / F3H / F3 V / F3YH / F3YV	● F3PH / F3PV



H Series	For strong magnetic fields	Application Cylinder	CAC4-L2, GLC-L2, JSC3-L2, SCA2-L2, SHC-L2, UCAC2-L2, USC-L2



H0



H0Y

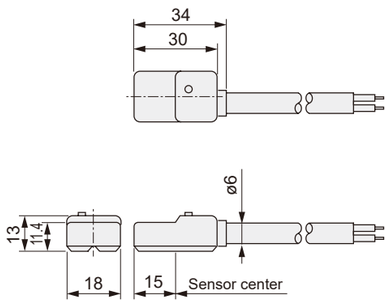
Specifications

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		
Dielectric strength	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		

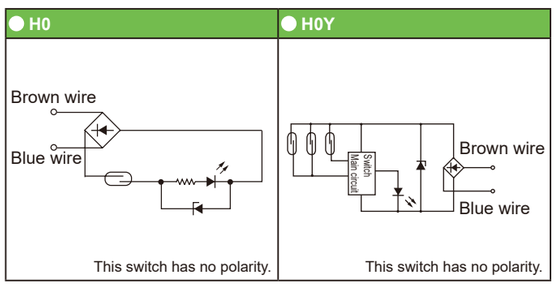
*1: For contact protection measures, see P. 628.

Outline Dimension Drawing

●H series (For strong magnetic field resistance)



Switch internal circuit diagram



V Series	For small strong magnetic field resistance	Application Cylinder	SSD-L4, SSD2-L4, USSD-L4



VO

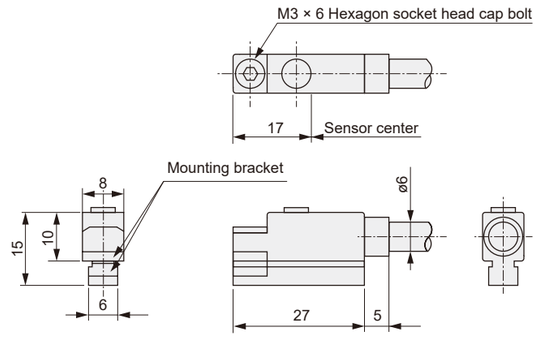
Specifications

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	
Dielectric strength	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	

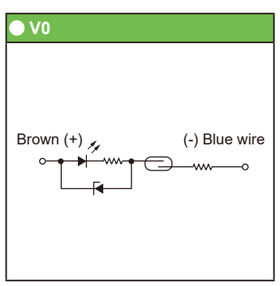
*1: For contact protection measures, see P. 628.

Outline Dimension Drawing

● V series (For strong magnetic field resistance)



Switch internal circuit diagram



E Series	Heat resistant	Application Cylinder	SCA2-L2T (E0) SSD-T1L (ET0) SSD2-T1L (ET0)

(EO is not subject to CE, UKCA)



EO



ETO

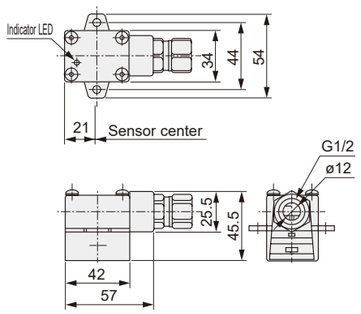
Specifications

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				
Dielectric strength	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 *	None				
Weight	164 g			44 g	

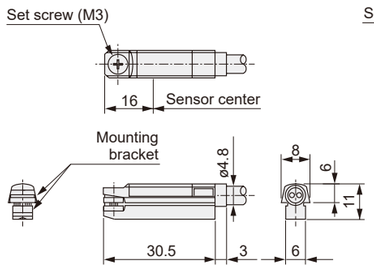
* For contact protection measures, refer to P. 628.

Outline Dimension Drawing

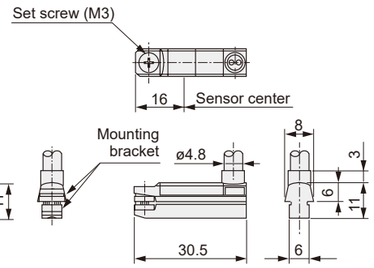
● E Series



● ET0H series (Straight lead wire type)

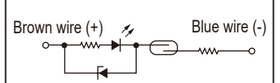


● ET0V series (L-shaped lead wire type)



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		
Dielectric strength	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 Method

SW-SKAC

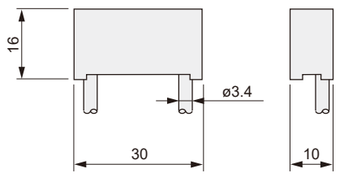
❶ Contact protection circuit

❶ Contact protection circuit

Code	Content
SKAC	For AC circuit
SKDC	For DC circuit

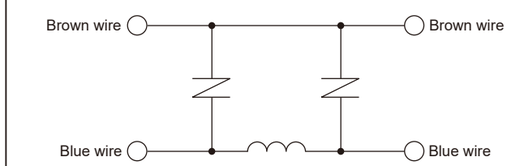
Outline Dimension Drawing

●SKAC/SKDC series



Internal circuit diagram

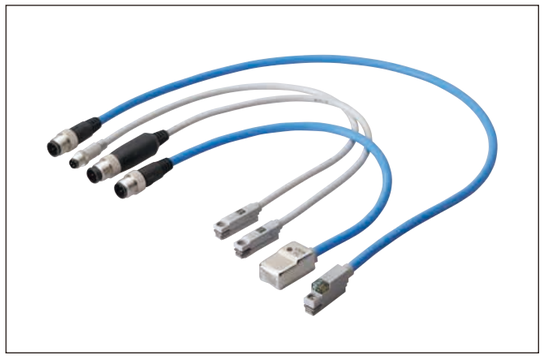
● SKAC/SKDC



* There is no polarity on the input or output side, and either can be connected to the switch side.

* 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 No. Notation Method

*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								

*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: Applicable only to T0H□□

●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(+) 3PIN(-) 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				

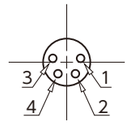
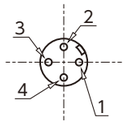
*6: The switch specifications for the cylinder are the same as the lead wire type. For details, refer to P. 588 to 602.

Connector pin assignment

Series	Connector pin assignment					
	Code	Connector type	1PIN	2PIN	3PIN	4PIN
2-wire type	F	M8	-	-	(−)	(+)
	M	M12	(+)	-	-	(−)
	U		-	-	(±)	(±)
Exclusively for strong magnetic field AC magnetic field	M, G, W		(±)	-	-	(±)
	U, B *1		-	-	(±)	(±)
3-wire type	F	M8	(+)	-	(−)	(OUT)

*1: Only SW-V0U has polarity (4PIN (+), 3PIN (-)).

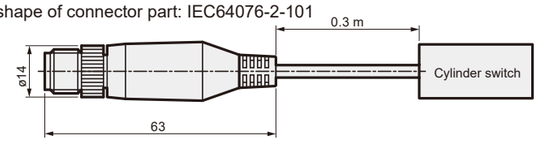
Connector specifications

Item	M8	M12
Pin assignment		
Shock resistance	294 m/s²	
Protection structure	IP67	
Insulation resistance	100 MΩ with 500 VDC megger	
Dielectric strength	1000 VAC for 1 minute (Between contacts and between contact housing) Leakage current 1 mA or less	

Outline Dimension Drawing

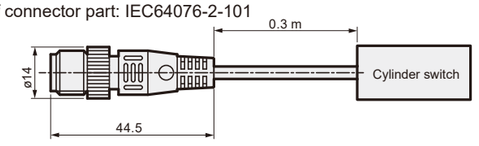
① M12 connector (Only for 2-wire cylinder switch connector type, PIN assignment code "U")

Standard for external shape of connector part: IEC64076-2-101



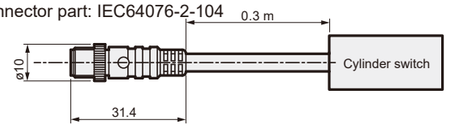
②M12 connector (M12 connectors other than ①)

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 external dimensions, refer to P. 588 to 602.

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.
*Some cylinders have limited mountable switches. Please refer to the P. for each cylinder for details.

T-type cylinder switch for cutting oil resistance
T2YLH/V, T3YLH/V



Overview

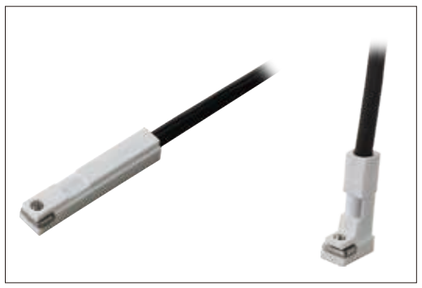
This is a cylinder switch designed to prevent cutting oil used for machine tools in machining sites, etc., from entering the inside of the switch.

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% down compared to conventional), Lightweight (46% down 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
TOY

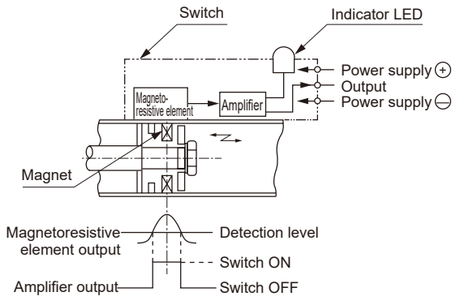


Features

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

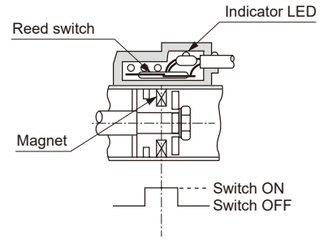
Operating Principle

Solid state switch



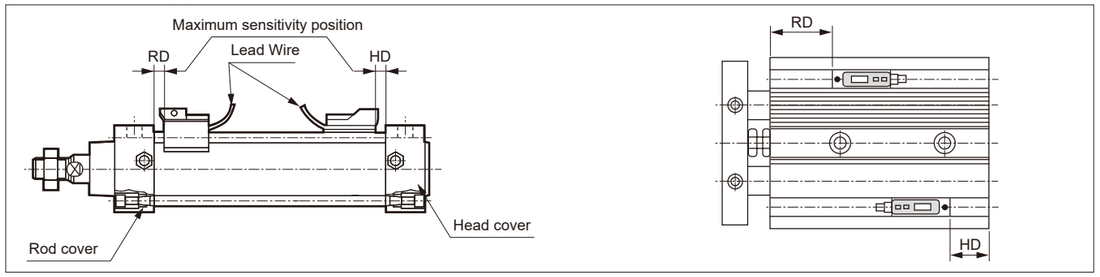
When the piston magnet approaches, a change occurs in the magnetic field, and the output voltage of the magnetoresistive element changes as shown in the figure. By amplifying this signal, a switching output as shown in the figure can be obtained.

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.

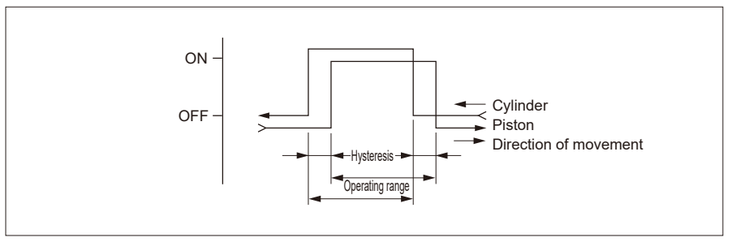
Switch mounting position



● 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 Stroke Intermediate 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 where it moves in the opposite 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 further moves 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 Shaped Cylinder	●Applicable switches: Solid state switches (T2□,T3□,T2W□,T3W□,T2WL□), Reed switches (T0□,T5□)						
SCP(Note3)	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	
Small bore size 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	
Round shaped 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	
Medium Bore Size 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 HOY 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)	
Large Bore Size 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	
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	
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	
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		
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	
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	
Compact 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□, T2WL□, T2YD, 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□, T2WL□, T2YD, 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□, T2WL□, 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□, T2WL□, 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□, T2WL□, 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	
Compact Cylinder with Drop Prevention	● Applicable Switch: Solid state switches (T2□,T3□,T2W□,T3W□,T2WL□,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 Drop 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	
Medium Bore Size Cylinder with Free Position Fall Prevention	● Applicable Switch: Solid state switches (T2□,T3□,T2W□,T3W□,T2WL□,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	
Medium Bore Size 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□,T3P□,T2W□,T3W□,T2WL□,T1□), 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□,T3P□,T2W□,T3W□,T2WL□,T1□), 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□,T3P□,T2W□,T3W□,T2WL□,T1□), 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						
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	
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	
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 switch (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			14.5 to 21.5	
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□, T2WL□, 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□, T2W□, T3W□, 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□, T2W□, T3W□, 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°	

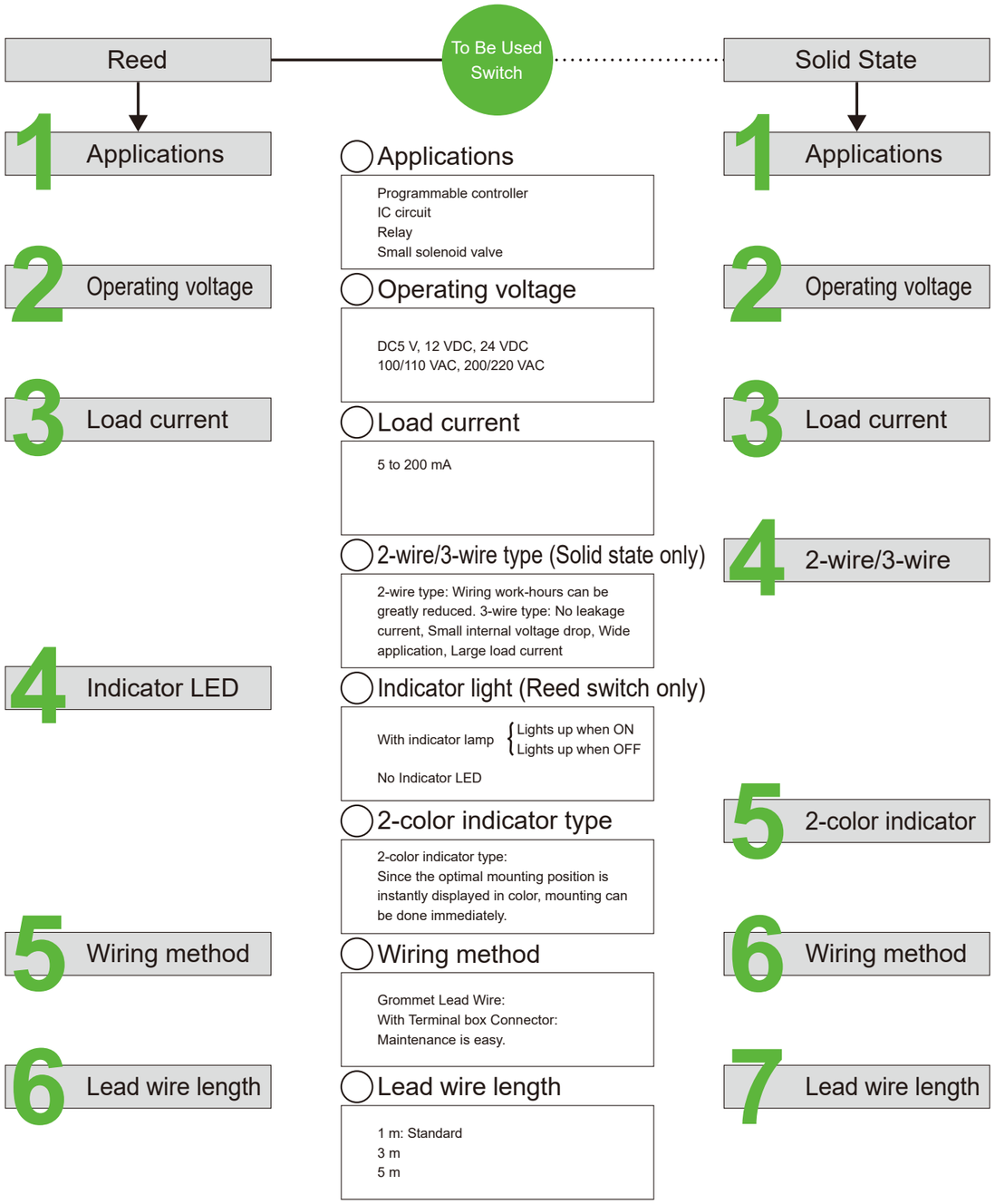
Cylinder Switch

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. 628)	Internal circuit damage of the switch	① Wiring for cylinder switch replacement and protection circuit (Refer to P. 628, 630)
	Surge voltage is generated due to connection of inductive load (relay, solenoid valve)	Internal circuit damage of the switch	① Wiring for cylinder switch replacement and protection circuit (Refer to P. 628, 630)
	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 has entered the lead wire junction box Water or oil has splashed onto 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 □ type 3 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. 629)	
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

* Does not malfunction due to leakage current of solid state switch
Please select a programmable controller, relay, etc.
* Regarding the input specifications of the load, please check the model No. and
Please 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 *Load ・Programmable Controller ・Relay ・Other	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. 628)	Internal circuit damage of the switch	① Wiring for cylinder switch replacement and protection circuit (Refer to P. 628, 630)
	Surge voltage is generated due to connection of inductive load (relay, valve)	Internal circuit damage of the switch	① Wiring for cylinder switch replacement and protection circuit (Refer to P. 628, 630)
	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 has entered the lead wire junction box Water or oil has splashed onto 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

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
		Generation of internal voltage drop due to series connection (Refer to catalog P. 629)	
	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

During 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.

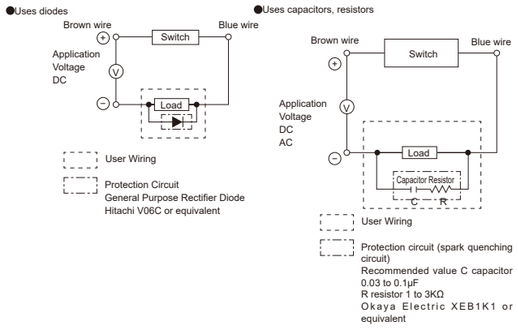
⚠Caution

■Be careful when using for interlock circuits.
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. Also, inspect regularly and confirm that it operates normally.

■Pay attention to contact capacity.
Do not use a load that exceeds the voltage and current of the switch specifications. This will cause a malfunction.

■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.



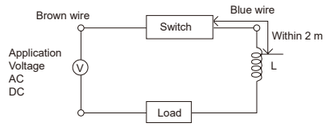
●When connecting and using capacitive loads (capacitors), inrush current will occur when the switch is ON, so always install a contact protection circuit.

●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, ETO type	DC	50 m
M, T, K, H, V, ETO type	AC	10 m
RO, 5, 6, EO type	DC	100 m
RO, 5, EO type	AC	10 m
R4 type	AC	50 m

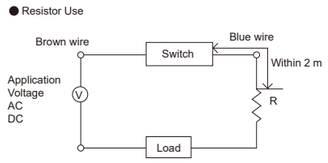
Table 1

● 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. 603.

■Avoid using in environments where water is constantly splashing.

●May cause 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.

●For cutting oil resistant cylinder switches, refer to the "Cutting Oil Resistant Pneumatic Equipment Guide" (No. CC-N-375), which is available separately.

■Do not use in environments with large impacts.
For reed switches, if a large impact (294 m/s² or more) is applied during use, there is a possibility of malfunction where the contact momentarily (1 ms or less) connects or disconnects. Depending on the usage environment, a solid state switch may be required, 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 two 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. (HO, HOY, T2YD)
If a magnetic body moves very close to the cylinder, they may interfere with each other and affect 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

$$V\ (\mathrm{mm/s}) = \frac{\text{Cylinder Switch Operating Range (mm)}}{\text{Load Operating Time (s)}}.$$

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.

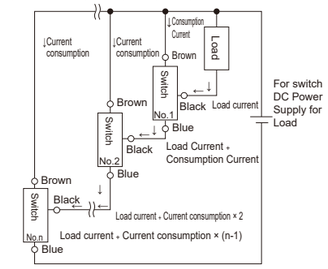
●When connecting multiple 2-wire switches in series, the voltage drop across the switches is the sum of the voltage drops of all connected switches. The voltage applied to the load side will be the power supply voltage minus the voltage drop across the switches. Check the load specifications before deciding 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.

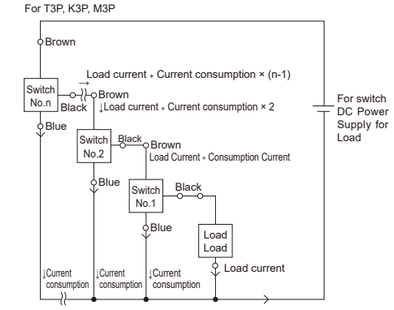
●When connecting multiple 3-wire solid-state switches in series, the voltage drop across the switches is the sum of the voltage drops of all connected switches, similar to the 2-wire type. Also, the current flowing through the switches will be the sum of the current consumption of the connected switches 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.

Fig. 1: For 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.

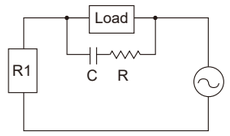
●For 3-wire solid-state switches, the leakage current is very small (10μA or less), so there is no problem in normal use.

●The indicator lamp of the switch may become dim or not light up.

■ Output Circuit Protection (Solid State Switch)

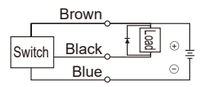
● When connecting and using inductive loads (relays, solenoid valves, etc.), surge voltage will occur when the switch is OFF, so always install a protection circuit as shown in the figure below.

R1



●Capacitor
C = 0.03 to 0.1μF
●Resistor
R = 1 to 3KΩ
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)



For the resistance R (Ω) at this time, use a value greater than or equal to the following formula.

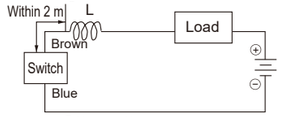
$\frac{V}{0.15}$ =R (Ω) (R3(Y), M3(W))

$\frac{V}{0.05}$ =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.

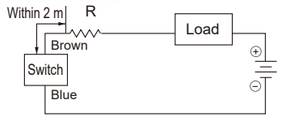
R1, R2(Y), M2(W), T2(Y/J), K2(Y), F2

● Using choke coil



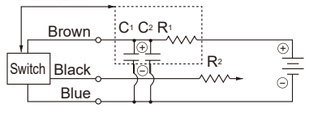
●Choke Coil
L = Several hundred μH to several mH
With excellent high-frequency characteristics

●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 50μF
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, pay attention to ① and ② below.

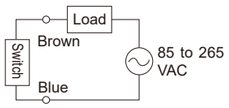
①When using for DC, connect so that the brown wire is the + side and the blue wire is the - side. If connected in reverse, the switch will operate, but the indicator light will not turn on. (HO has no polarity.)

②When connecting to an AC relay or programmable controller input, if those circuits perform half-wave rectification, the indicator light may not illuminate. In that case, reversing the polarity of the switch lead wire connection will turn on the indicator light.

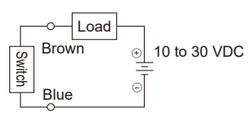
●Solid state switch

Connect correctly according to the lead wire color coding in the diagram on the right. Incorrect wiring may cause damage. Please be careful.

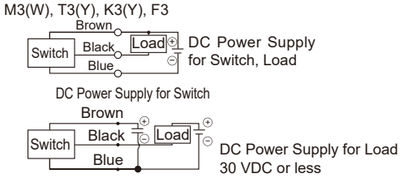
● R1



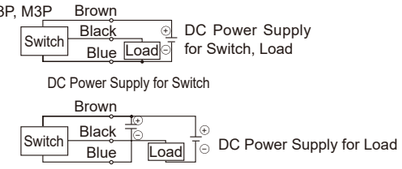
● R2(Y), M2(W), T2(Y), T2J, K2(Y), F2 (T2YD has no polarity)



●R3(Y), M3(W), T3(Y), K3(Y), F3



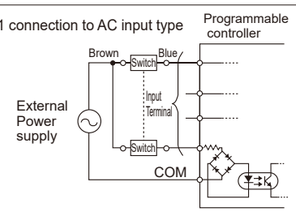
●T3P, K3P, M3P



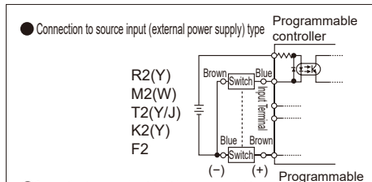
(Connection to Programmable Logic Controller (PLC))

●Connection method varies depending on the type of programmable controller. Connect according to the input specifications.

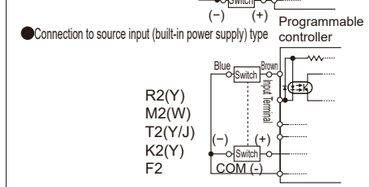
● R1 connection to AC input type



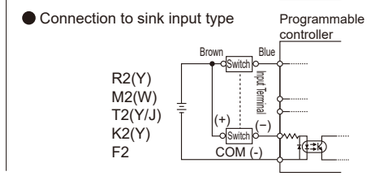
● Connection to source input (external power supply) type



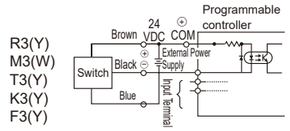
●Connection to source input (built-in power supply) type



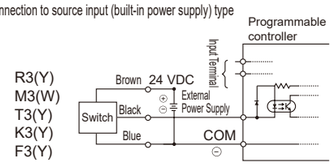
● Connection to sink input type



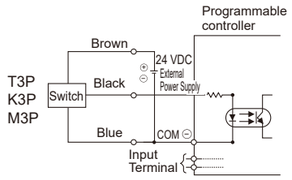
● Connection to source input (external power supply) type



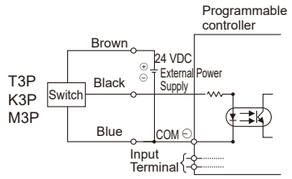
●Connection to source input (built-in power supply) type



●Example of connection to sink input (external power supply) type



●Example of connection to sink input (built-in power supply) type



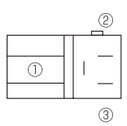
■Set the switch to the center of its operating range.

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, movement method, tightening torque, etc., refer to P. 634 to 636.)

■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

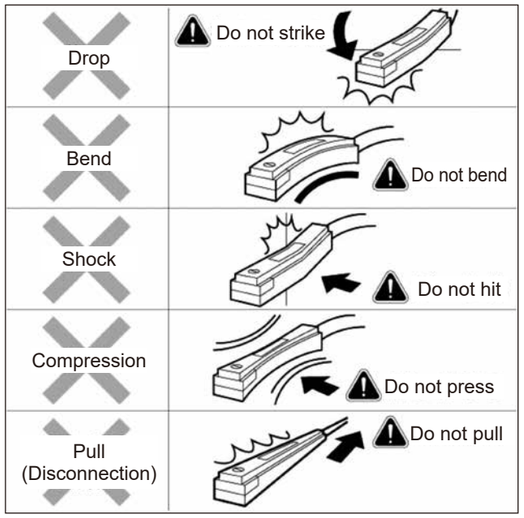
Use the following equivalent relays.

○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

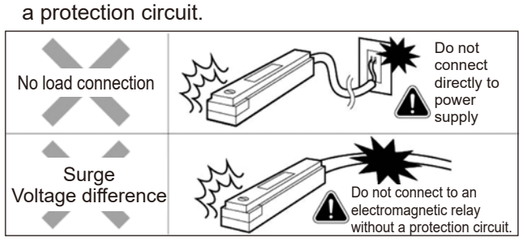


2. Notes on "Overcurrent/Overvoltage"

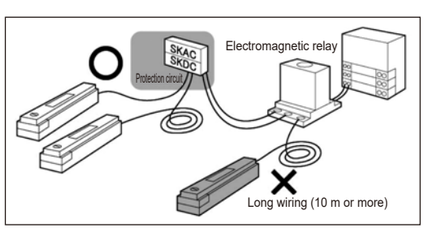
⚠Caution

■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."



⚠Warning

■Do not flow overcurrent.

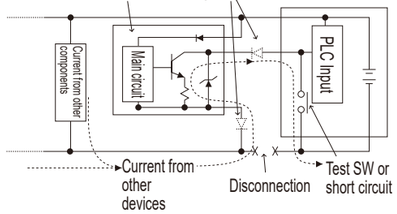
If overcurrent flows through the cylinder switch due to a load short circuit, etc., not only will the cylinder switch be damaged, but there is also a risk of fire. If necessary, install an overcurrent protection circuit such as a fuse on the output and power lines.

⚠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 negative power supply wire, or if the negative 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.

Cylinder switch Reverse current prevention diode Control panel

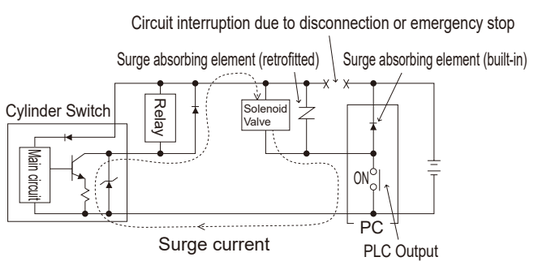


●To prevent damage due to reverse current, take the following measures.

①Avoid concentrating current on the power lines, especially the - side power line, and make the wiring as thick as possible.
②Limit the equipment connected to the same power supply as the cylinder switch.
③Insert a diode in series with the cylinder switch output line to prevent reverse current flow.
④Connect a diode in series to the negative (-) side of the cylinder switch power line to prevent reverse current.

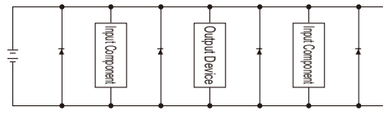
■Be careful about surge current bypass.

● 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.

①Separate the power supplies for the output system with inductive loads such as solenoid valves and relays, and the input system such as cylinder switches.
②If 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.
③Furthermore, 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.



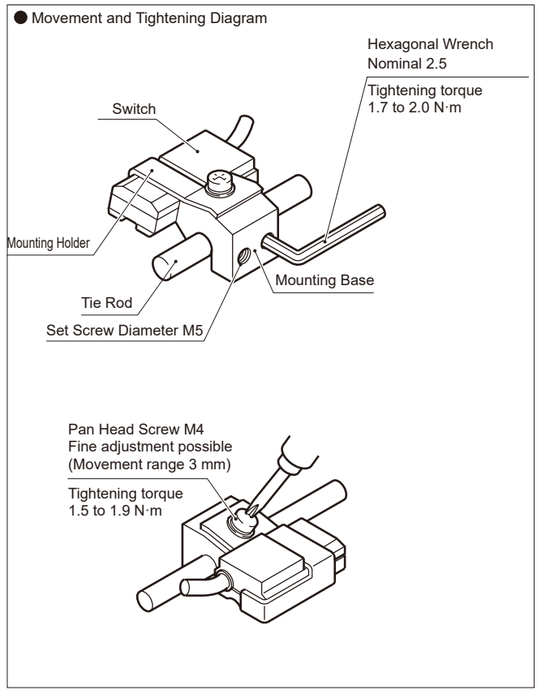
Furthermore, if equipment is connected with connectors, disconnecting the connector while power is on may cause the output circuit to be damaged due to the above phenomenon. Always turn off the power before connecting or disconnecting connectors.

⚠Caution: Switch Mounting Method

Tie Rod Mount Type

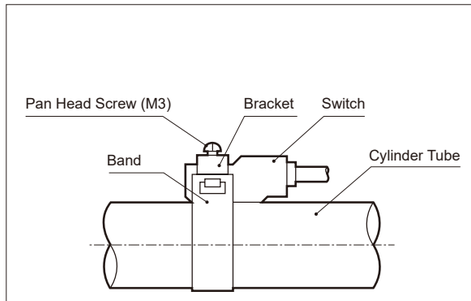
Loosening the set screws (2 screws) for fixing the mounting base by 1/2 to 3/4 turn allows axial movement without detachment. For fixing after adjustment, lightly press the holder so that the switch is fixed to the tube, and then tighten the set screws. Tightening torque is 1.7 to 2.0 N·m. As a guide, 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.

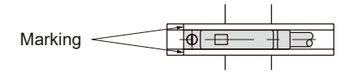


Band Mount Type

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 when finely adjusting the position of the 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.

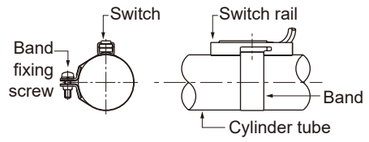


② When moving the switch position in the circumferential direction

●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

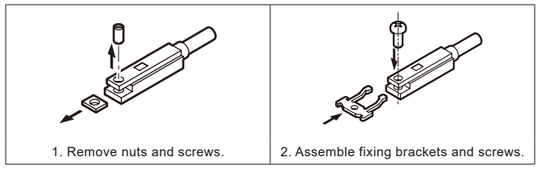
●Loosen the band fixing screw, move the switch rail and band along the cylinder tube, and tighten them at the specified position. Tightening torque is 0.8 to 1.0 N·m.



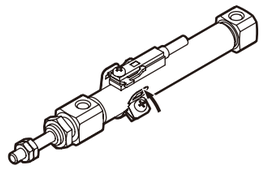
Band Mount Type

Install T-type switches as shown in the diagram below.

When using standard T-type switch (SW-T□)



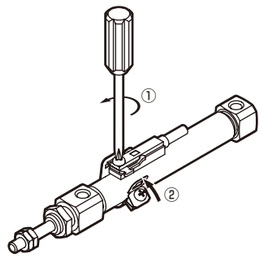
① Insert the square hole of the band into the fixing bracket and attach it to the cylinder.



●If it is difficult to install, follow the steps below.

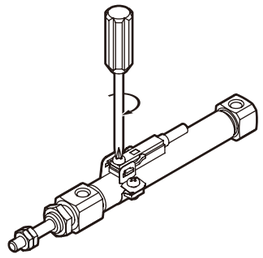
① Loosen the screw on the switch side.

② Insert the square hole of the band into the fixing bracket.



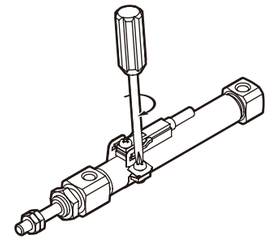
② Tighten the screw on the switch side.

Tightening torque: 0.1 to 0.15 N·m



③ Tighten the screw on the band side.

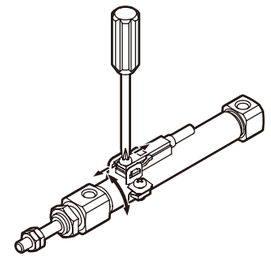
Tightening torque: 0.1 to 0.15 N·m



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.

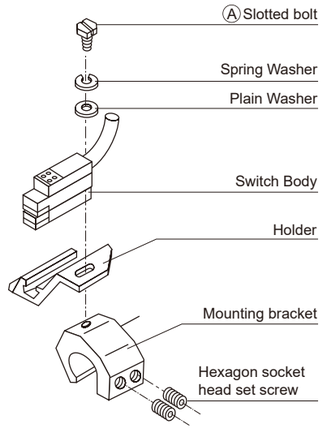
T2YD Tie Rod Mount Type

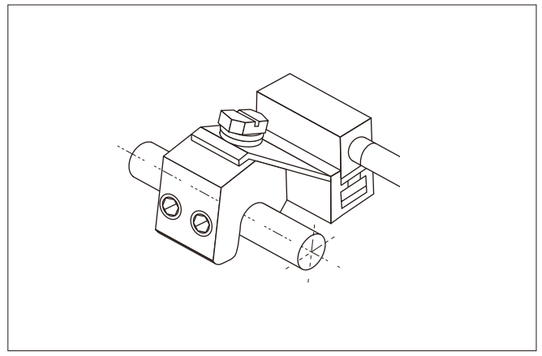
① Fine adjustment

Loosen the slotted hex bolt Ⓐ, 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 Ⓐ and set screws, move the entire mounting bracket to the specified position, and then tighten the slotted bolt Ⓐ. 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 : 100m or more
  24 VDC : 50m or more
  100 VAC : 20m or more
  200 VAC : 10m or more
- When there are other factors that cause overvoltage or overcurrent

For details on the contact protection circuit, refer to P. 603.

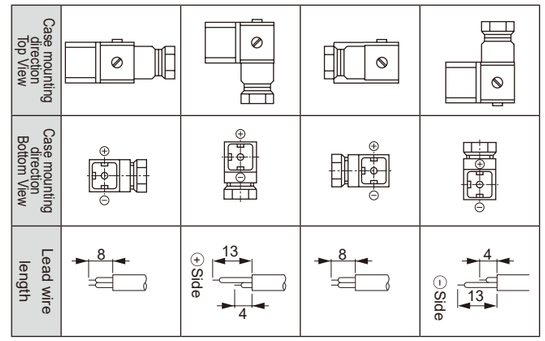
Mounting method to R□B terminal box

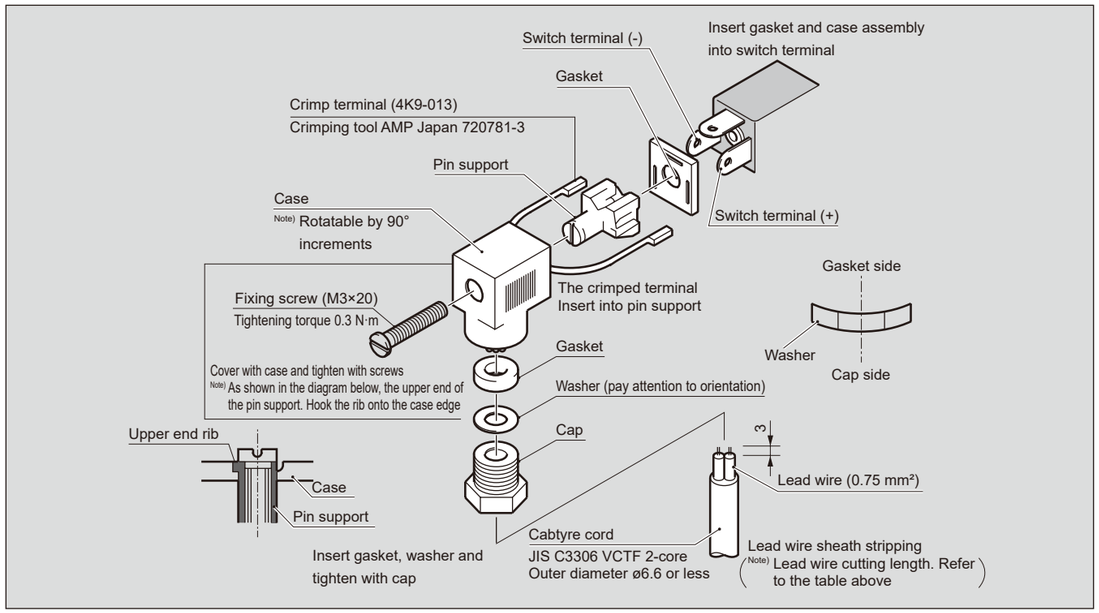
Connection to the R□B terminal box should be done according to the following procedure, referring to the diagram below.

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

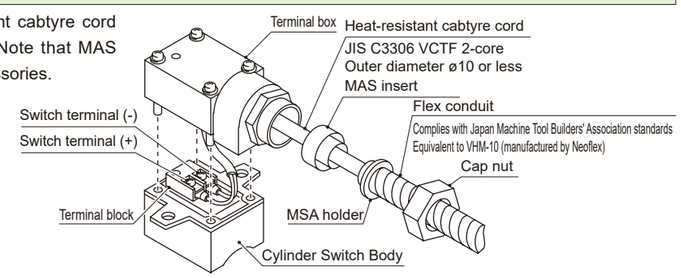
The lead wire cutting length varies depending on the case mounting direction. Please refer to the table below. For 3-wire type, please consult us.





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 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.

Product guide

	Page
Booster (B)	Ending 2
Air-Hydro Booster (AHB)	Ending 2
Celcon Cylinder / Celcon Hydro Cylinder	Ending 3

● 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 cm³ (min-max)	High-pressure Discharge Volume cm³ (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.
- ●Hydraulic pressure can be adjusted steplessly just by adjusting the pneumatic pressure.
- ●Constant oil temperature Oil temperature does not rise and stable actuation is ensured.
- ●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

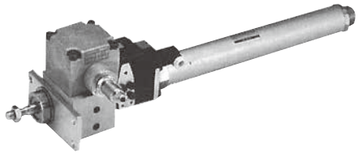
Model No.	Actuation method	Bore size mm	Standard Stroke (mm)	Max. Stroke mm	Mounting type		Connection Port Rc: Cylinder part	Connection Port Rc: Brake Part	Maximum operating pressure MPa: Cylinder part	Maximum operating pressure MPa: Brake Part	Min. Operating Pressure MPa: Cylinder part	Min. Operating 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	700	Rod Side Flange Type	FA		1/4				
		80	150		Head Side Flange Type	FB	1/2	3/8				
		100	200	800	Single Clevis Type	CA						
		125	300		Double Clevis Type	CB		1/2		1.0	0.1	
		140	400		Intermediate Trunnion Type	TC	3/4					
		160	500		Rod Side Flange Type	TA						
		180		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	700	Rod Side Flange Type	FA						
		80	150		Head Side Flange Type	FB	1/2					
		100	200	800	Single Clevis Type	CA						
			300		Double Clevis Type	CB						
			400		Intermediate Trunnion Type	TC						
			500		Rod Side Flange Type	TA						
					Head Side Flange Type	TB						

Overview

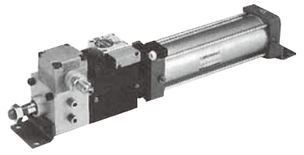
The CKD Celcon Cylinder is an actuator equipped with a position detection sensor. Its operating principle is that a controller (sold separately) receives pulse signals for the travel distance oscillated from the actuator, compares them with the program input, and freely controls intermediate stops and directional changes. It is an FMS-oriented cylinder with excellent accuracy and flexible control.

Main features

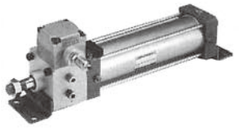
- ●Stop Position
  Since it has a built-in position detection sensor, it can be stopped intermediately at any position.
- ●Excellent Stopping Accuracy
  The stopping accuracy is excellent, at ±1.0 mm or less at a cylinder speed of 300 mm/s. (at no load).
- ●When the pneumatic source and power supply are OFF (such as during a power outage or accident), the piston rod is locked and operates on the safe side.
- ●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 6

RoHS Compliance Ending 8

ISO9001/ISO14001
Certification Acquisition Ending 10

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)	Electromagnetic Interference Generation (EMI emission) and electromagnetic interference elimination performance countermeasures (EMS immunity)	■ Components that generate electromagnetic interference or components affected by electromagnetic interference 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)	Safety concerning electricity, such as electric shock	■ 50 to 1000 VAC and at 75 to 1500 VDC Devices operating
Pressure Equipment Directive (2014/68/EU)	Safety concerning the dangers of fluid energy in pressure components	■ When certain conditions are exceeded within pressure equipment
Simple pressure Vessels Directive (2014/29/EU)	Safety regarding leakage and explosion of containers	■ Welded vessels for which the product of the maximum allowable pressure and volume (PV·S) is greater than 50 bar·L. 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 subject to CE Marking 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 acquired International Standard ISO9001 and ISO14001 certification and structured a quality and environment management system. With safety, environment, and energy conservation as our most important priorities, we are working company-wide to promote safe product and quality creation friendly to users, machines, society, and the global environment.




ISO 9001
マネジメントシステム登録証

JGA


ISO 14001
マネジメントシステム登録証

JGA

MEMO

MEMO

Model No. [Alphabetical Index]

Model No.	Model Name	Catog 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 P. 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
CB-019SAA ... Indexman General
CB-031AA ... Wet Fine Equipment General
CB-035AA ... Dry Fine Equipment General Catalog
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.

■Codes

(SV)…Single Unit Valve (WR)…Wiring-saving Manifold (IM)…Individual Wiring Manifold
(MX)…Mix Manifold (BM)…Block Manifold (MN)…Manifold

Model No.	Model Name	Catog 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 (Deodorizer)	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 One-touch 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 One-touch 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/Direct 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-ZAA	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
AB41E4-ZAA	Explosion-proof Direct Acting 2-Port Solenoid Valve for Dry Air (Multilex)/d2G4	RJ-013AA

Model No. [Alphabetical Index]

Model No.	Model Name	Catalog No./Page
A		
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-ZAA	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-ZAA	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 2
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 2
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	RJ-005AA
BBS-O	Balancer Unit Fixed Pressure Adjustment Type	RJ-005AA
BHA	Compact Cross Roller Parallel Gripper	110
BHA-FC	Mechanical Gripper	344

Model No. [Alphabetical Index]

Model No.	Model Name	Catalog No./Page
B		
BHA-LN	Gripper with Linear Norm Sensor/Cross Roller Parallel Gripper with Sensor	RJ-005AA
BHE	Centering Gripper	126
BHE-LN	Gripper with Linear Norm Sensor/Centering Gripper with Sensor	RJ-005AA
BHG	Compact Cross Roller Parallel Gripper with Rubber Cover	118
BHG-LN	Gripper with Linear Norm Sensor/Cross Roller Parallel Gripper with Rubber Cover and Sensor	RJ-005AA
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	106
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 Type	RJ-005AA
CAC-N32/40	Lightweight Clamp Cylinder/ Double Acting, Single Rod Type	RJ-005AA
CAT	Cartridge Cylinder/Single Acting, Push Type	RJ-003AA
CAU30	Clean Air Unit	RJ-007AA
CAV2	Cell Cylinder/With Valve, Double Acting, Lubricated Type	RJ-005AA
CAW	Compact Arm	CC-1613AA
CCH	Check Valve for Liquids	RJ-013AA
CCN	Check Valve for Liquids (Nozzle Type)	RJ-013AA
CG	Air Fiber One-touch 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	504
CHG	Air Operated Ball Valve 3-Port (Compact Rotary Valve)	RJ-013AA
CHL	Check Valve with One-touch Fitting	RJ-007AA
CHV2	Check Valve	RJ-007AA
CK	3-Jaw Long Stroke Chuck	434
CKA	3-Jaw Low Profile Chuck	440
CKF	Hollow Chuck	468
CKG	3-Jaw Bearing Chuck	426
CKH2	High Gripping Force Powerful Chuck	412
CKJ	Ultra Long Stroke Chuck	476
CKL2	Powerful Chuck	386
CKL2-FC	Mechanical Chuck	495
CKLB2	Bidirectional Powerful Chuck	418
CKS	Low Profile Chuck	450
CKV2	Compact cylinder with valve/ With Valve, Double Acting, Single Rod Type	RJ-005AA
CKW-HP1	3-Jaw Chuck	354
CKWL-HP1	3-Jaw Chuck	372
CMA2	Small Bore Size Cylinder/ Double Acting, Single Rod Type	RJ-002AA
CMK2	Small Bore Size Cylinder/ Double Acting, Single Rod Type	RJ-002AA
COV(Note2)	Cell Cylinder/With Valve, Double Acting, Lubricated Type	RJ-005AA
CPD	Electronic Pressure Switch for Coolant (with Digital Display)	RJ-008AA
CPE	Mechanical Pressure Switch for Coolant (Low Pressure Type)	RJ-008AA
CSB	Air Operated Ball Valve 2-Port for Steam (Compact Rotary Valve)	RJ-013AA
CSBF	Air Operated Ball Valve 2-Port for Steam (Compact Rotary Valve)	RJ-013AA
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	602
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 One-touch 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	598
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

Model No. [Alphabetical Index]

Model No.	Model Name	Catalog No./Page
F		
F2S, F3S	Cylinder Switch/1-Color Indicator, Solid State 2/3-wire	598
F2, 3V/H	Cylinder Switch/1-Color Indicator, Solid State 2/3-wire	598
F3PH/V	Cylinder Switch/PNP Output Type Solid State 3-wire	598
F2, 3Y V/H	Cylinder Switch/2-Color Indicator, Solid State 2/3-wire	598
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 Type	RJ-003AA
FCH	Flat Cylinder Compact Demi/ Single Acting, Retracting Type	RJ-003AA
FCK	Shock Absorber, Adjustable Type	RJ-005AA
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
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)	98
FH500	Feather Gripper (Mini Pivot Gripper)	294
FJ	Free Joint	RJ-005AA
FK	Simple Flow Controller	RJ-005AA
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 G Series 3-Finger Gripper Type	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 One-touch Fittings for Compressed Air	RJ-013AA
GFM	Float Star	RJ-010AA
GHV	Gas Combination Valve	CC-1590AA
GLC	Guideless Cylinder/Double Acting Type	RJ-005AA
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	RJ-005AA
GRV	Medium Pressure Gas Combination Valve	CC-1590AA
GSSD2	Electric Actuator with Motor G Series Rod Type	RJ-014AA
GSTG	Electric Actuator with Motor G Series Guided Type	RJ-014AA
GSTK	Electric Actuator with Motor G Series Stopper Type	RJ-014AA
GSTL	Electric Actuator with Motor G Series Guided Type	RJ-014AA

Model No. [Alphabetical Index]

Model No.	Model Name	Catalog No./Page
G		
GSTS	Electric Actuator with Motor 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	600
H0Y	Cylinder Switch/2-Color Indicator, Reed	600
HAP-1C	Parallel Gripper	154
HAP-2 to 4CS	Parallel Gripper	158
HB	High Corrosion Resistance Direct Acting 2-Port Solenoid Valve	RJ-013AA
HBL	Pivot Gripper	300
HCA	High Speed Cylinder/Double Acting, Single Rod Type	RJ-005AA
HCM	High Energy Absorption Cylinder/Double Acting, Single Rod Type	RJ-005AA
HCP	Horizontal Parallel Gripper	172
HD-0.5 to 9	Desiccant Air Dryer/Compact Heatless Dryer	RJ-009AA
HDL	Wide Angle Gripper	322
HFP	Wide Parallel Gripper	288
HGP	Long Stroke Parallel Gripper	178
HJL	Toggle Gripper	306
HK1	Fluid Actuated Valve for Gas Combustion System	CC-1590AA
HKP	Cross Roller Parallel Gripper	164
HLA	Low Profile Parallel Gripper	224
HLB	Low Profile Parallel Gripper	224
HLC	Low Profile Long Stroke Parallel Gripper	240
HLD	Ultra Low Profile Parallel Gripper	248
HLF2	Low Profile Long Stroke Gripper	216
HMD	Low Profile Wide Angle Gripper	314
HMC-HP1	Wide Parallel Gripper	254
HMF	Compact Wide Parallel Gripper	266
HMFB	Large Wide Parallel Gripper with LM Guide	282
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	Ⓢ Manual Valve/Miniature	RJ-012AA
HMVE	Ⓢ 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	RJ-005AA
HS	Fluid Actuated Valve for Gas Combustion System	CC-1590AA
HSV	Ⓢ Manual Valve/Standard	RJ-012AA
HSVE	Ⓢ 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	RJ-005AA
JSC3(-N) JSC4(-N)	Brake Cylinder (Medium/ Large Bore)/Double Acting, Single Rod Type	RJ-005AA
JSG	Tie Rod Cylinder with Brake/ Double Acting, Single Rod Type	RJ-005AA
JSK2	Brake Cylinder (Small Bore ø20 to 40, Crimped Type)/ Double Acting Type	RJ-005AA
JSM2	Brake Cylinder (Small Bore ø20 to 40, Serviceable Type)/ Double Acting Type	RJ-005AA
K		
K0V/H	Cylinder Switch/1-Color Indicator, Reed 2-wire	596
K2, 3 V/H	Cylinder Switch/1-Color Indicator, Solid State 2/3-wire	596
K2, 3Y V/H	Cylinder Switch/2-Color Indicator, Solid State 2/3-wire	596
K3P V/H	Cylinder Switch/PNP Output Type, Solid State 3-wire	596
K5V/H	Cylinder Switch/No Indication, Reed 2-wire	596
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 Type	RJ-004AA
LCM	Linear Slide Cylinder/Double Acting, Single Rod Type	RJ-004AA
LCR	Linear Slide Cylinder/Double Acting, Single Rod Type	RJ-004AA
LCW	Linear Slide Cylinder/Double Acting, Single Rod Type	RJ-004AA
LCX	Linear Slide Cylinder/Double Acting, Single Rod Type	RJ-004AA
LFC-KL	Lifter Cylinder	CC-902AA
LGD	Air Operated Valve for Process Gas	CB-035AA
LHA	Linear Guide Gripper	136
LHAG	Linear Guide Gripper with Rubber Cover	146
LMB	Linear Guide Lock	RJ-005AA
LML	Linear Guide Lock	RJ-005AA
LN	Cylinder with Linear Norm Sensor/Sensor, Amplifier, Indicator	RJ-005AA
LSH	Linear Slide Gripper	86
LSH-HP1	Linear Slide Gripper	12
LSHL-HP1	Linear Slide Gripper	32
LSHM-HP2	Linear Slide Gripper with Length Measurement Function	48
LST-HP1	Low Profile Long Stroke Gripper	186
LSTM-HP2	Low Profile Long Stroke Gripper with Length Measurement Function	202
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	584
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	584
M2, 3WV	Cylinder Switch/2-Color Indicator, Solid State 2/3-wire	584
M3GA1/2/3	Ⓜ Pilot Operated 3-Port Valve/Direct Piping	RJ-011AA
M3GA1/2/3	Ⓥ Pilot Operated 3-Port Valve/Direct Piping	RJ-011AA
M3GA1/2/3	Air Operated 3-Port Valve (Master Valve)/Direct Piping	RJ-012AA
M3GB1/2	Ⓜ Pilot Operated 3-Port Valve Dual Unit/Base Piping	RJ-011AA
M3GB1/2	Ⓥ Pilot Operated 3-Port Valve Dual Unit/Base Piping	RJ-011AA
M3GD1/2/3	Ⓜ Pilot Operated 3-Port Valve/Direct Piping	RJ-011AA
M3GD1/2/3	Ⓥ Pilot Operated 3-Port Valve/Direct Piping	RJ-011AA
M3GD1/2□ 0EJ	Ⓜ Intrinsically Safe Explosion-proof Pilot Operated 3-Port Valve/Direct Piping	RJ-012AA
M3GD1/2□ 0EX	Ⓜ Intrinsically Safe Explosion-proof Pilot Operated 3-Port Valve/Direct Piping	RJ-012AA
M3GE1/2	Ⓜ Pilot Operated 3-Port Valve Dual Unit/Base Piping	RJ-011AA
M3GE1/2	Ⓥ Pilot Operated 3-Port Valve Dual Unit/Base Piping	RJ-011AA
M3GE1/2□ 0EJ	Ⓜ Intrinsically Safe Explosion-proof Pilot Operated 3-Port Valve/Base Piping	RJ-012AA
M3GE1/2□ 0EX	Ⓜ Intrinsically Safe Explosion-proof Pilot Operated 3-Port Valve/Base Piping	RJ-012AA
M3KA1	Ⓜ Pilot Operated 3-Port Valve/Direct Piping	RJ-012AA
M3KA1	Ⓜ Air Operated 3-Port Valve (Master Valve)/Direct Piping	RJ-012AA
M3MA0	Ⓜ Direct Acting 3-Port Valve/ Direct Piping	RJ-012AA
M3MB0	Ⓜ 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	584
M3PA1/2	Ⓜ Direct Acting 3-Port Valve/ Direct Piping	RJ-012AA
M3PB1/2	Ⓜ Direct Acting 3-Port Valve/ Sub-plate Piping	RJ-012AA

Model No. [Alphabetical Index]

Model No.	Model Name	Catalog No./Page
M		
M3QB1	Ⓜ Direct Acting 3-Port Valve/ Sub-plate Piping	RJ-012AA
M3QE1	Ⓜ Direct Acting 3-Port Valve/ Sub-plate Piping	RJ-012AA
M3QZ1	Ⓜ Direct Acting 3-Port Valve/ Sub-plate Piping	RJ-012AA
M3QRA	Ⓜ Direct Acting 3-Port Valve/ Direct Piping	RJ-012AA
M3QRB	Ⓜ Direct Acting 3-Port Valve/ Sub-plate Piping	RJ-012AA
M4F0/1/2/3	Ⓜ Pilot Operated 5-Port Valve/Direct Piping	RJ-012AA
M4F0/1/2/3	Ⓜ Air Operated 5-Port Valve (Master Valve)/Direct Piping	RJ-012AA
M4F3□□ 0EX	Ⓜ Explosion-proof Pilot Operated 5-Port Valve/Direct Piping	RJ-012AA
M4F3□0E	Ⓜ Explosion-proof Pilot Operated 5-Port Valve/Direct Piping	RJ-012AA
M4F4/5/6/7	Ⓜ 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	Ⓜ Explosion-proof Pilot Operated 5-Port Valve/ Sub-plate Piping	RJ-012AA
M4F4/5/6/7□ 0E	Ⓜ Explosion-proof Pilot Operated 5-Port Valve/ Sub-plate Piping	RJ-012AA
M4GA1/2/3	Ⓜ Pilot Operated 5-Port Valve/Direct Piping	RJ-011AA
M4GA1/2/3	Ⓦ Pilot Operated 5-Port Valve/Direct Piping	RJ-011AA
M4GA1/2/3	Air Operated 5-Port Valve (Master Valve)/Direct Piping	RJ-012AA
M4GA4	Ⓜ Pilot Operated 5-Port Valve/Direct Piping	RJ-011AA
M4GA4	Ⓦ Pilot Operated 5-Port Valve/Direct Piping	RJ-011AA
M4GB1/2/3	Ⓜ Pilot Operated 5-Port Valve/Base Piping	RJ-011AA
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	584
MAB1/ MAG1	Metal-free 2-Port Solenoid Valve	CC-1055AA
MAVL	Large Mechanical Valve/ Detector	RJ-007AA
MCP	Mechanical Power Cylinder	RJ-005AA
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	RJ-005AA
MRL2	Magnet Type Rodless Cylinder/Basic Type	RJ-005AA
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	RJ-005AA
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

Model No. [Alphabetical Index]

Model No.	Model Name	Catalog No./Page
M		
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□	(BM)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	RJ-005AA
NHS-H	New Handling System/Z-axis Module HRL	RJ-005AA
NHS-S	New Handling System/Z-axis Module STL-B	RJ-005AA
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	RJ-005AA
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 Type Mechanical Compact Pressure Switch	RJ-007AA
P4000-W	Mechanical Pressure Switch/ Standard White Series	RJ-007AA
P4100-W	Reed Switch Type Mechanical Compact Pressure Switch	RJ-007AA
P512□	(SV)Pilot Operated 2-Port Valve/Pilot Type	RJ-012AA
P513□	(SV)Pilot Operated 3-Port Valve/Pilot Type	RJ-012AA
P5142	(SV)Pilot Operated 5-Port Valve/Pilot Type	RJ-012AA
P8100-W	Reed Switch Type Mechanical Compact Pressure Switch	RJ-007AA
PAW	Powerful Arm	CC-1418AA
PCC	Pin Clamp Cylinder Double Acting, Single Rod Type	RJ-005AA
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 One-touch 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	(SV)Pilot Operated 5-Port ISO Compliant Valve/I/O Connector Type/ISO Size ①	RJ-012AA
PV5G	(SV)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	586
R1, 2	Cylinder Switch/1-Color Indicator, Solid State 2-wire	586
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	586
R3000 to 8000-G4	Regulator/Flame Resistant Series	RJ-007AA

Model No. [Alphabetical Index]

Model No.	Model Name	Catalog No./Page
R		
R3100 to 8100-G4	Reverse Regulator/Flame Resistant Series	RJ-007AA
R5	Cylinder Switch/No Indication, Reed 2-wire	586
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 Type	RJ-005AA
RCKL	Gripper for Collaborative Robot 3-Jaw Type	515
RCS2	Rotary Clamp Cylinder (Single Guide Type) Double Acting, Single Rod Type	RJ-005AA
RG	One-touch Fitting for Air Fiber (Flame Resistant Type)	RJ-007AA
RHLF	Gripper for Collaborative Robot Long Stroke Type	515
RJB500	Compact Direct Acting Precision Regulator	RJ-007AA
RJF	Rotary Joint	RJ-007AA
RLSH	Gripper for Collaborative Robot Compact Type	515
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	RJ-005AA
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	RJ-005AA
RVC	Shock Absorber	RJ-005AA
S		
SAB□□	Air Operated 2-Port Valve (Cylinder Valve)	RJ-013AA
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 One-touch Fitting	RJ-007AA
SC3W	Speed Controller/Elbow Type with One-touch Fitting	RJ-007AA
SCA2	Medium Bore Size Cylinder (Medium Bore ø40 to 100)/ Double Acting, Single Rod Type	RJ-002AA
SCD	Speed Controller/Ultra Compact In-Out Type	RJ-007AA
SCD2	Speed Controller/In-Out Line Type with One-touch Fitting	RJ-007AA
SCG	Tie Rod Cylinder/Double Acting, Single Rod Type	RJ-002AA
SCK	Shock Absorber, Adjustable Type	RJ-005AA
SCL2	Speed Controller/Line Type with One-touch Fitting	RJ-007AA
SCL2-N	Needle Valve/Line Type with One-touch Fitting	RJ-007AA
SCM	Round shaped cylinder/ Double Acting, Single Rod Type	RJ-002AA
SC-M3/ M5(-F)	Speed Controller/Ultra Compact	RJ-007AA
SCPD3	Pencil Shaped Cylinder/ Double Acting, Single Rod Type	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	Medium Bore Size Cylinder (Large Bore ø125 to 250)/ Double Acting, Single Rod Type, 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/Germ-removing Filter	RJ-007AA
SFS10	Germ-removing Filter/Inline Type	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)	603
SKDC	Contact Protection Circuit Box (For DC Circuit)	603
SKH	Shockless Valve	RJ-012AA
SKL	Shock Absorber	RJ-005AA
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	RJ-005AA
SMG	Compact Cylinder/Double Acting, Single Rod Type	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	Thin 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	RJ-005AA
SRL3	Rodless Cylinder/Double Acting Type	RJ-005AA
SRM3	High Precision Guided Rodless Cylinder (Double Guide)/Double Acting Type	RJ-005AA
SRT3	Rodless Cylinder with Brake/ Double Acting Type	RJ-005AA
SSD	Compact Cylinder/Double Acting, Single Rod Type	RJ-003AA
SSD2	Compact Cylinder/Double Acting, Single Rod Type	RJ-003AA
SSD-LN	With Linear Norm Sensor	RJ-005AA
SSG	Guided Compact Cylinder/ Double Acting, Single Rod Type	RJ-003AA
STG	Guided Cylinder/Double Acting, Single Rod Type	RJ-004AA
STK	Stopper Cylinder/Double Acting, Round Rod End Type	RJ-005AA
STL-□	Guided Cylinder (Long Stroke Type)/Double Acting, Single Rod Type	RJ-004AA
STM-M/B	Guided Cylinder/Double Acting, Single Rod Type	RJ-004AA
STR2	Twin Rod Cylinder/Double Acting, Single Rod Type	RJ-004AA
STS-□	Guided Cylinder (Short Stroke Type)/Double Acting, Single Rod Type	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	588
T0Y	Cylinder Switch/Reed 2-wire for Magnetic Environments	594
T1 V/H	Cylinder Switch/1-Color Indicator, Solid State 2-wire	588
T2 V/H R	Cylinder Switch/Flexible Shielded Cable Type, Solid State 2-wire	588
T2, 3 V/H/C	Cylinder Switch/1-Color Indicator, Solid State 2/3-wire	588
T2, 3YL V/H	Cylinder Switch/Solid State 2/3-wire for Cutting Oil	589
T2J V/H	Cylinder Switch/Off-delay Type, Solid State 2-wire	588
T2YD(T)	Cylinder Switch/Solid State 2-wire for Strong Magnetic Fields	589
T2WL V/H	Cylinder Switch/Improved Water Resistance, Solid State 2-wire	592
T3P V/H	Cylinder Switch/PNP Output Type, Solid State 3-wire	588
T5V/H/C	Cylinder Switch/No Indication, Reed 2-wire	588
T8 V/H	Cylinder Switch/1-Color Indicator, Reed 2-wire	588
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

Model No. [Alphabetical Index]

Model No.	Model Name	Catalog No./Page
U		
U	Urethane Tubing	RJ-007AA
UB	Lock Unit	RJ-005AA
UCA2	Unit Cylinder/Double Acting, Single Rod, Plain Bearing Type	RJ-004AA
UCAC2	Clamp Cylinder with Fall Prevention/Double Acting, Single Rod Type	RJ-005AA
UCAC-N32/40	Lightweight Clamp Cylinder/ With Fall Prevention, Double Acting, Single Rod Type	RJ-005AA
UFCD	Flat Cylinder with Free Position Fall Prevention/ Double Acting, Single Rod Type	RJ-005AA
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 Type	RJ-005AA
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 One-touch 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 One-touch 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 Type	RJ-005AA
USG□	Compact Direct Acting 3-Port Solenoid Valve	RJ-013AA
USSD	Compact Cylinder with Drop Prevention/Double Acting, Single Rod Type	RJ-005AA
UTLPS	Tool Breakage Detection Switch/Unit	RJ-008AA
V		
V0	Cylinder Switch/Compact Reed 2-wire for Strong Magnetic Fields	601
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
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
VSFB	Ejector System/20 mm Width Single Unit Dedicated Type	RJ-010AA
VSFJ	Ejector System/Solenoid Valve Direct Mount Type	RJ-010AA
VSFU	Ejector System/20 mm Width General Type	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 Cylinders ⑤ Hand Chuck ——— Catalog No.RJ-006AA

Date of issue: November 12, 2024 1st edition

Publisher **CKD Corporation**
2-250 Ouji, Komaki, Aichi 485-8551, Japan
https: //www.ckd.co.jp/en/

© CKD Corporation 2025 Printed in Japan
All rights reserved.
Specifications and appearance published in this catalog are subject to change without notice for improvement.

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.

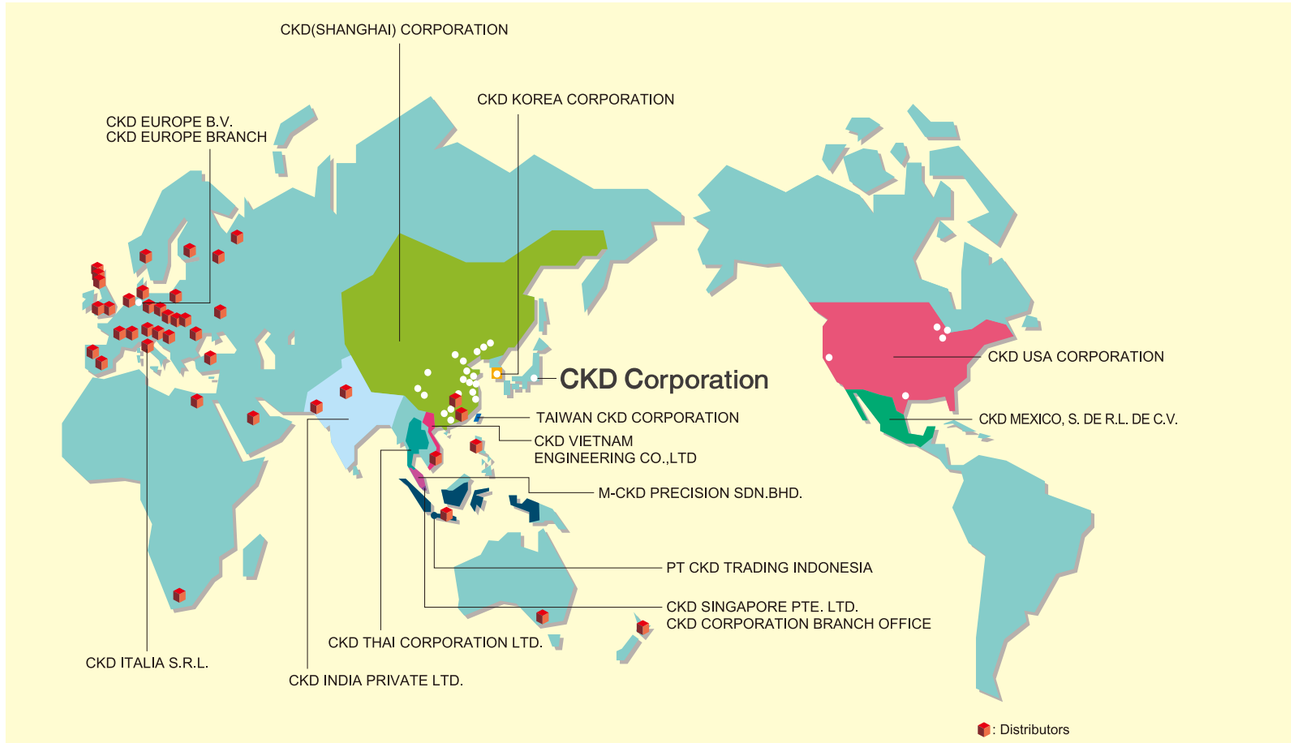
THIS WARRANTY IS THE ONLY AUTHORIZED CKD WARRANTY AND IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING ANY IMPILIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, notwithstanding any disclosure to CKD of the use to which the product is to be put. The Buyer's **SOLE AND 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)
- 厦門支店(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 Cylinder ⑤

- Parallel Gripper
- Low Profile Parallel Gripper
- Wide Parallel Gripper
- Pivot Gripper
- 3-Jaw Chuck
- Gripper for Collaborative Robot

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