CKD

Dry Fine Components

Components for Process Gas

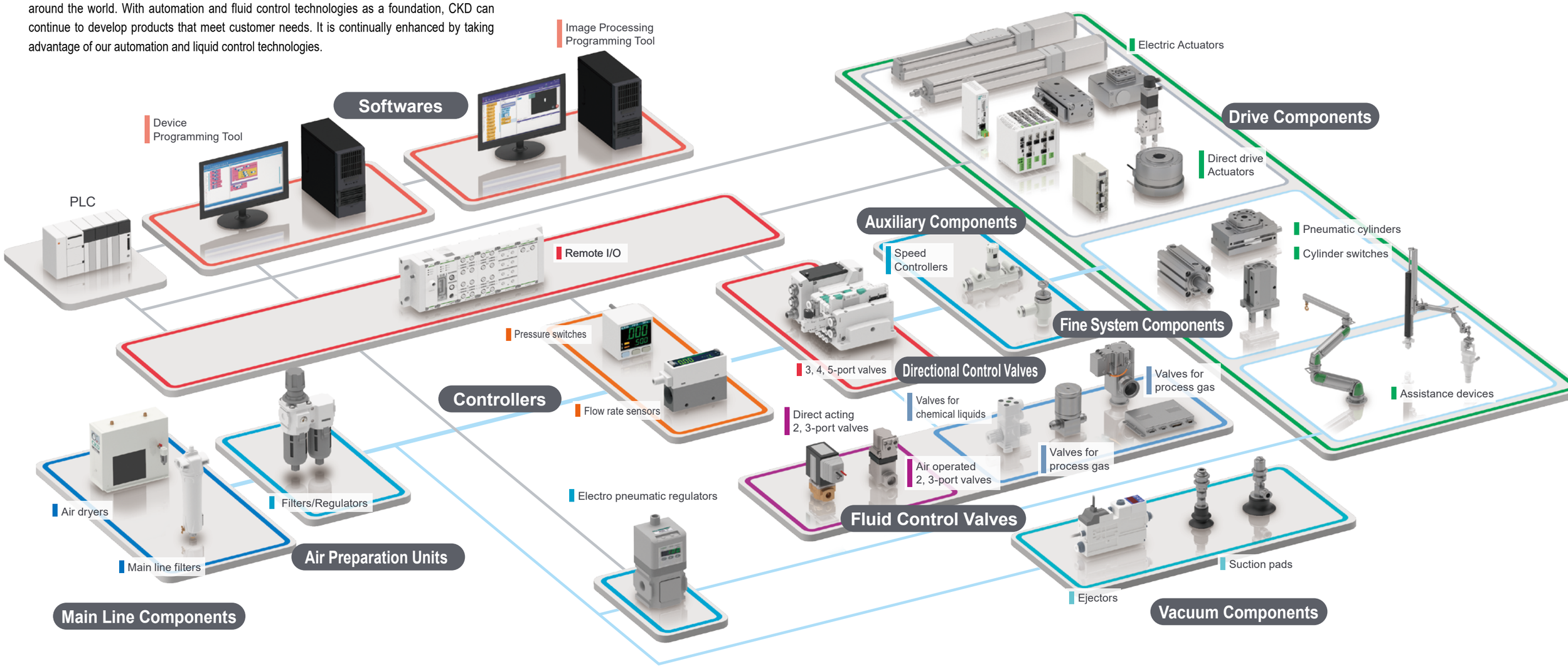
Components for High Vacuum

RJ-016AA

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

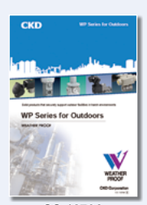
For Food Manufacturing Processes
FP Series

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-001

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 / Vacuum Components

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

RJ-010AA

Fluid Control Valves

Solenoid valves | Air operated valves | Ball valves

RJ-013AA

Wet Fine components

CB-031A

Dry Fine Equipment

components for process gases | High vacuum components

RJ-016AA

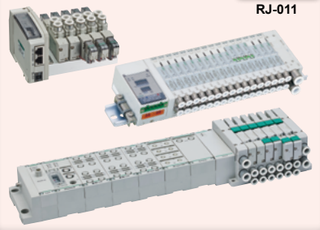
Learn more on the WEB

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

Directional Control Valves (1)

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

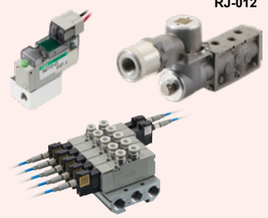
RJ-011



Directional Control Valves (2)

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

RJ-012



Pneumatic Cylinders (1)

Standard

RJ-002AA

Pneumatic Cylinders (2)

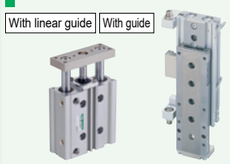
Space saving structures

RJ-003AA

Pneumatic Cylinders (3)

With linear guide | With guide

RJ-004AA



Pneumatic Cylinders (4)

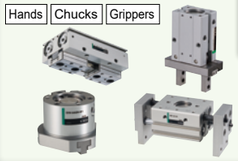
Rodless | With brake | Clamps | Oscillation / Rotation

RJ-005

Pneumatic Cylinders (5)

Hands | Chucks | Grippers

RJ-006AA



Visual Programming Tool for Image Processing

Facilea

CC-1548AA

Facilea AI

CC-1623A

Device Visual Programming Tool

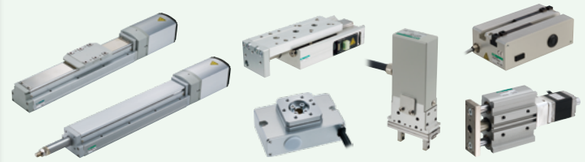
ExiaStudio

CC-1579AA

Electric Actuators

ROBODEX Pulse

RJ-014AA



Electric Actuators

ROBODEX Std.

RJ-015AA

Electric Actuators

ROBODEX Servo

CC-1275AA CC-1436AA

ABSODEX

ABSODEX

CC-1614AA

Pioneering the future of process control.

An optimal fine system for semiconductor and LCD manufacturing processes that use pure water, chemicals, process gas, and vacuum.

Fine Control System

The products we deliver are developed under a process of thorough purification.

Ultra Fine Concept

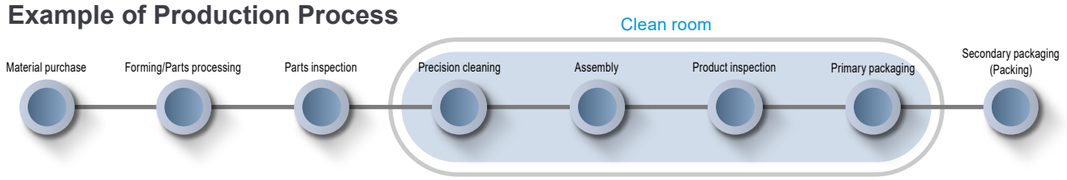
Based on CKD's unique concept of "thorough cleanlineess" in all critical factors of product development from design, evaluation, and methodology to manufacturing, we manage the complete cleanliness of our products.

An integrated quality management system, including parts and products, to ensure high cleanliness.

In-house Production System

We have established a complete, integrated quality management system from processing, assembly, and inspection to packaging, covering not only the final product but also the component level. For cleanliness, a critical point of quality, we have established internal standards for quantitative regulations of impurities such as chemical residues, total organic carbon, and specific oils to ensure unwavering quality.

Example of Production Process



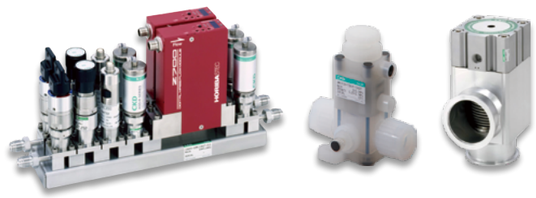
Information on the special website

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

CKD's fine system components support cutting-edge semiconductor processes.

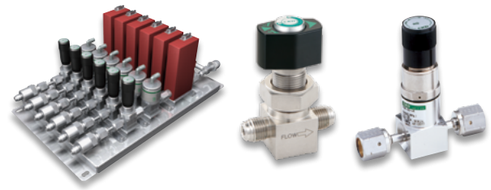
We provide total solutions for chemical, gas, vacuum, and pneumatic control, from facilities for semiconductor device manufacturing to production process equipment.

Providing total solutions for semiconductor manufacturing.
Product Introduction by Front-End Process

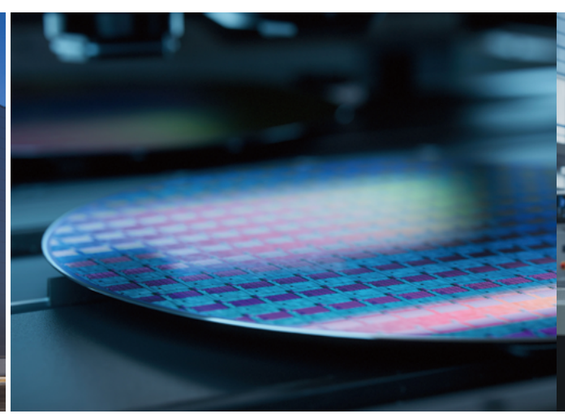


Variations compatible with high pressure and high concentrations.
Product introduction for chemical liquid utility equipment

Flexible response to customer demands and stable supply.
Product introduction for gas utility equipment



Tohoku Plant



Kasugai Plant

Production & Technology Network

We manufacture fine system components at each of our locations.

Kasugai Plant
Kasugai, Aichi, Japan
Chemical
Gas
Vacuum

Hokuriku Plant
Komatsu, Ishikawa
Chemical
Gas
Vacuum

Other plants in Japan:
Komaki Plant, Yokkaichi Plant, Inuyama Plant

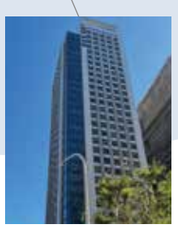
Tohoku Plant
Kurokawa, Miyagi, Japan
Chemical
Gas
Vacuum

Korea Plant
Siheung-si, Gyeonggi-do, Korea
Chemical
Gas
Vacuum

China Plant
Wuxi, Jiangsu, China
Chemical
Gas
Vacuum

United States Technical Center
Santa Clara, CA

Malaysia Plant
Klim, Keda
Chemical
Gas
Vacuum

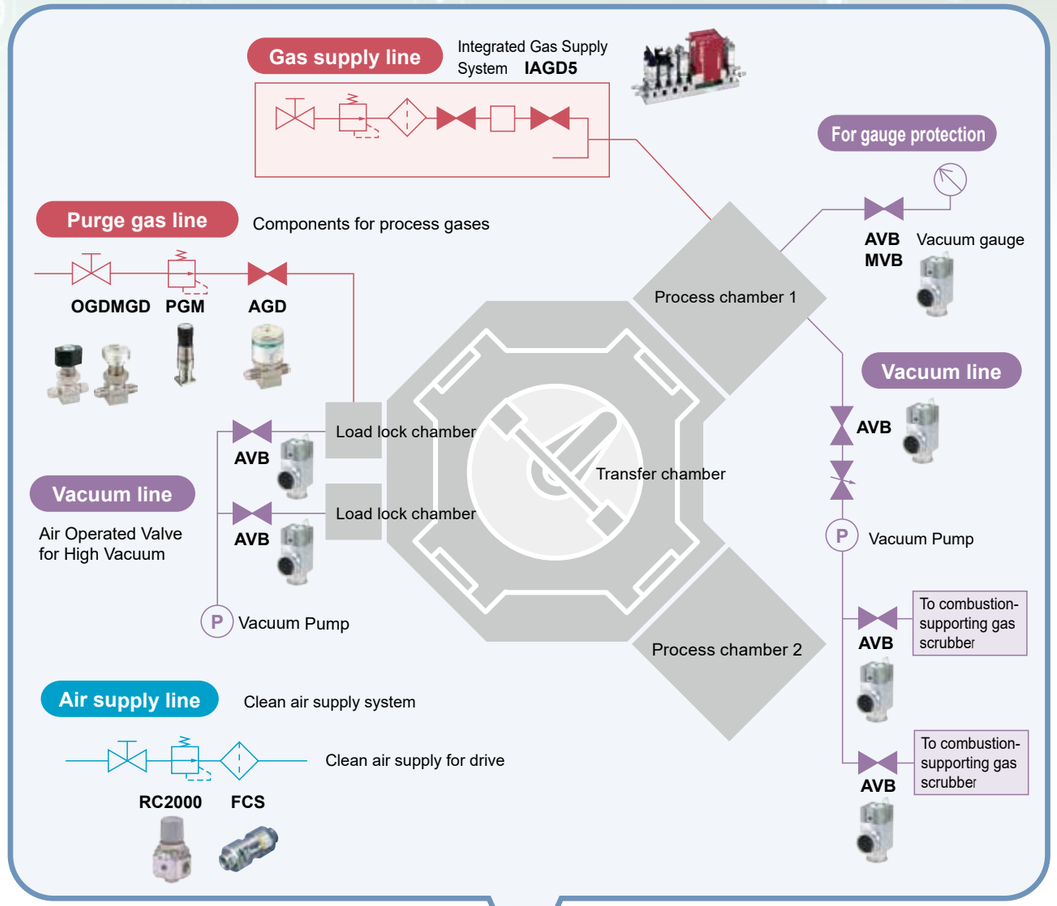


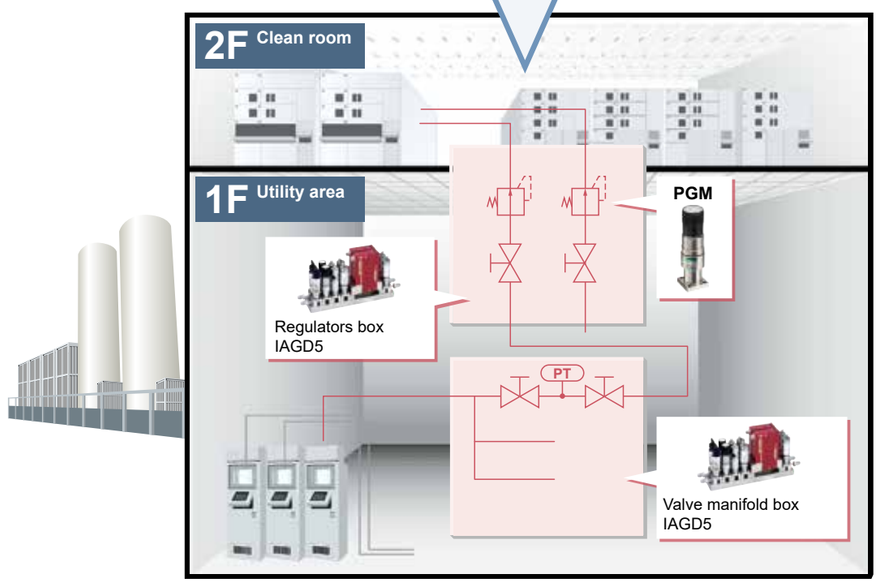
Taiwan Technical Center
Hsinchu

USA Austin Manufacturing
Austin, TX
Chemical
Gas
Vacuum

Example of Dry Fine System Usage

Dry process in a semiconductor manufacturing line





I N D E X

Unit Conversion Table

Posted on the CKD website:
https://www.ckd.co.jp/kiki/en/

Components for Process Gas
>>> P. **1**

Components for High Vacuum
>>> P. **107**

Search by Product Lineup List

You can select by the appearance and product overview of each series.

Components for Process Gas >>> P. 1

Process Gas Valve

Page 3

Model No.	Connection Method	Cv Value	Page
Air Operated Valve			
AGD0□R	1/4" JXR Male Fitting 1/4" JXR Female Fitting	0.1	6
AGD1-□-R	1/4" JXR Male Fitting 1/4" JXR Female Fitting 1/4" Double Ferrule Fitting	0.3	8
AGD2-□-R	3/8" JXR Male Fitting 3/8" JXR Female Fitting 3/8" Double Ferrule Fitting	0.65	
LGD11/12	Equivalent to 1/4" JXR Male Fitting Equivalent to 1/4" JXR Female Fitting 1/4" Double Ferrule Fitting	0.3	46
LGD21/22	Equivalent to 1/2" JXR Male Fitting Equivalent to 1/2" JXR Female Fitting 3/8" Double Ferrule Fitting 1/2" Double Ferrule Fitting	0.7 (3/8": 0.65)	
Manual Valve			
OGD10R	1/4" JXR Male Fitting 1/4" JXR Female Fitting 1/4" Double Ferrule Fitting	0.3	26
OGD20R	3/8" JXR Male Fitting 3/8" JXR Female Fitting 3/8" Double Ferrule Fitting	0.65	
MGD10R	1/4" JXR Male Fitting 1/4" JXR Female Fitting 1/4" Double Ferrule Fitting	0.3	36
MGD20R	3/8" JXR Male Fitting 3/8" JXR Female Fitting 3/8" Double Ferrule Fitting	0.65	
LGD10	Equivalent to 1/4" JXR Male Fitting Equivalent to 1/4" JXR Female Fitting 1/4" Double Ferrule Fitting	0.3	50
LGD20	Equivalent to 1/2" JXR Male Fitting Equivalent to 1/2" JXR Female Fitting 3/8" Double Ferrule Fitting 1/2" Double Ferrule Fitting	0.7	

Process Gas Valve, High Durability Type

Page 55

Model No.	Connection Method	Cv Value	Page
Air Operated Valve			
AGD0□R-HD	1/4" JXR Male Fitting 1/4" JXR Female Fitting	0.1	58
AGD1□R-HD	1/4" JXR Male Fitting 1/4" JXR Female Fitting 1/4" Double Ferrule Fitting	0.3	
AGD1□R-HDF	1/4" JXR Male Fitting 1/4" JXR Female Fitting 1/4" Double Ferrule Fitting	0.3	60
AGD2□R-HDF	3/8" JXR Male Fitting 3/8" JXR Female Fitting 3/8" Double Ferrule Fitting	0.65	
AGD21R-A	3/8" JXR Male Fitting 3/8" JXR Female Fitting 3/8" Double Ferrule Fitting	0.4 *At 200°C, under negative pressure	62

Other Process Gas Components

Page 67

Model No.	Connection Method	Supply fluid pressure (MPa)	Ultimate Vacuum Level (kPa (abs))	Page
Vacuum Generator				
VG	IN 1/4" JXR Male Fitting VAC. 1/4" JXR Female Fitting VENT 3/8" JXR Male Fitting	0.4 to 0.6	13.3 or less	68
Other Valves				
Flow Rate Control Valve	1/4" JXR Male Fitting 1/4" JXR Female Fitting 1/4" Double Ferrule Fitting	-	-	72
Piston type Check Valve	1/4" JXR Male Fitting 1/4" JXR Female Fitting 1/4" Double Ferrule Fitting	-	-	73

Regulator

Page 75

Model No.	Connection Method *	Maximum Operating Pressure (MPa)	Setting Pressure Range (MPa)	Setting Pressure Range (psi)	Page
PGM	1/4" JXR Male Fitting 1/4" JXR Female Fitting 1/4" JXR Male to Female Fitting 1/4" JXR Female to Male Fitting	1.0	-0.07 to 0.21 0 to 0.21 0 to 0.35 0 to 0.7	-10 to 30 0 to 30 0 to 50 0 to 100	78
			0 to 0.42 0 to 0.7	0 to 60 0 to 100	
	3/8" JXR Male Fitting 3/8" JXR Female Fitting 3/8" JXR Male to Female Fitting 3/8" JXR Female to Male Fitting		-0.07 to 0.21 0 to 0.21 0 to 0.42 0 to 0.7	-10 to 30 0 to 30 0 to 60 0 to 100	

*Compatible with various integrated interfaces

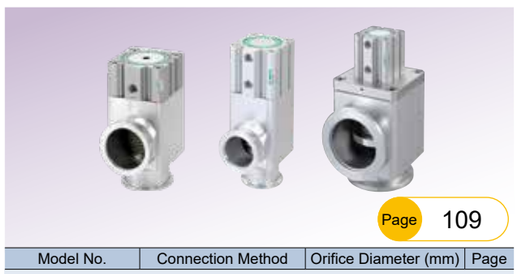
Integrated Gas Supply System

Page 89

Model No.	Connection Method	Cv Value	Page
IAGD5	1.125" W-Seal	0.1/0.26	94

Components for High Vacuum >>> P. 107

Air Operated Valve



Page 109

Model No.	Connection Method	Orifice Diameter (mm)	Page
AVB□□7	Fittings Vacuum clamp NW16, NW25, NW40, NW50, NW63, NW80, NW100, NW160	ø17, ø24, ø39, ø48, ø68, ø80, ø100, ø150	112
AVB□□3	Fittings 1/4" tube, vacuum clamp NW25, NW40, NW50, NW80, NW100	ø5, ø24, ø40, ø50, ø80, ø100	126
AVB21-8T	1/4" Tube	ø5	134

Manual Valve

Page 144

Model No.	Connection Method	Orifice Diameter (mm)	Page
MVB□17	Fittings Vacuum clamp NW16, NW25, NW40, NW50	ø17, ø24, ø39, ø48	144

Vacuum Pressure Control System

Page 149

Model No.	Connection Method	Orifice Diameter (mm)	Page
IAVB	Fittings Vacuum clamp NW16, NW25, NW40, NW50	ø17, ø24, ø43, ø48	152

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

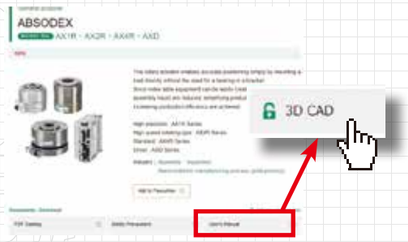
Easy registration in 2 STEPS

Registration complete!

How to download CAD

STEP 1

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



STEP 2.

Select model No.

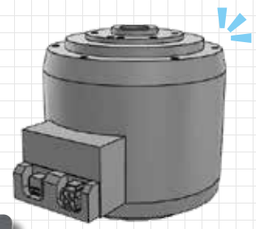
STEP 3

❶ Specify CAD format

❷ Generate CAD data

Download CAD

Download complete!

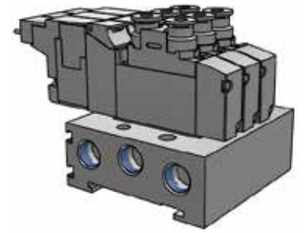


Pneumatic valve manifold specifications and CAD data are easily available on the Web.

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

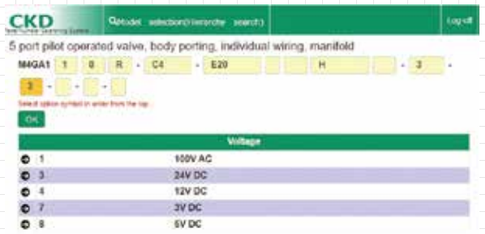
Specifications and download method of CAD data

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

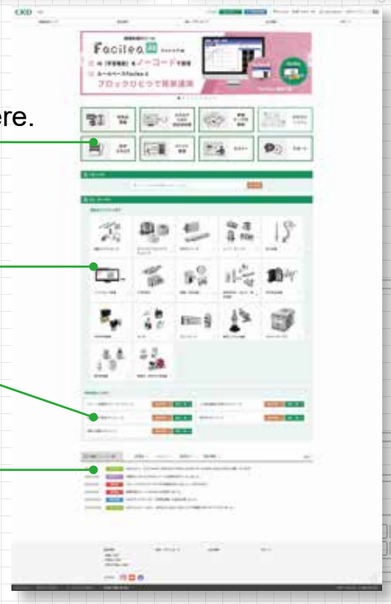
Significantly reduces work time

For details, please contact our nearest sales office.

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

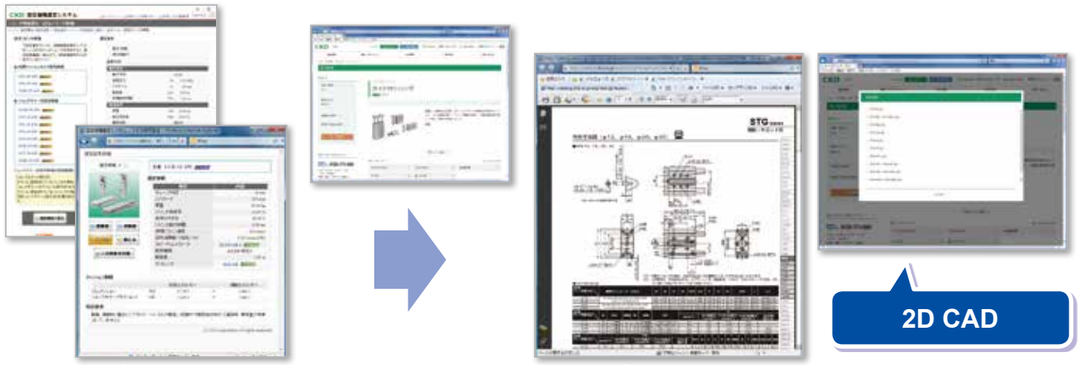
We provide a system that supports the selection of the following items. Please use it when selecting models and designing.

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/

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.)

❶Use 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.
❷Use 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 device design and control, etc.

ISO4414, JIS B 8370 (Pneumatics 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.

❶Inspect and service the machine and devices after confirming safety of all systems related to this product.
❷Note that there may be hot or charged sections even after operation is stopped.
❸When 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 attention to possible water leakage and leakage of electricity.
❹When starting or restarting a machine or device that incorporates pneumatic components, make sure that the systemsafety, such as pop-out prevention measures, is secured.

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

■ The precautions are ranked as “DANGER”, “WARNING” and “CAUTION” in this section

DANGER:	When a dangerous situation may occur if handling is mistaken leading to fatal or serious injuries,and when there is a high degree of emergency to a warning.
WARNING:	If handled incorrectly, a dangerous situation may occur, resulting in death or serious injury.
CAUTION:	When a dangerous situation may occur if handling is mistaken leading to minor injuries or physical damage.

Note that some items described as “CAUTION” may lead to serious results depending on the situation.
Every item provides 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 thecustomer.

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

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.

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.

Contact

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

Components for Process Gas

AGD-R, OGD-R MGD-R, LGD

Process Gas Valve

Overview

This is a core product line of process gas valves featuring a metal diaphragm. They feature machined bodies to support a wide range of needs. (AGD, OGD, MGD)
General-purpose forged bodies are also available. (LGD)

Features

Achieves the industry's lowest internal leakage

1.0×10^{-10} Pa·m^3/s.He or less

Wide variety of options available

3-Port Valve
Dual 3-Port Valve
Reducer Fitting

Manual valves tailored to customer needs

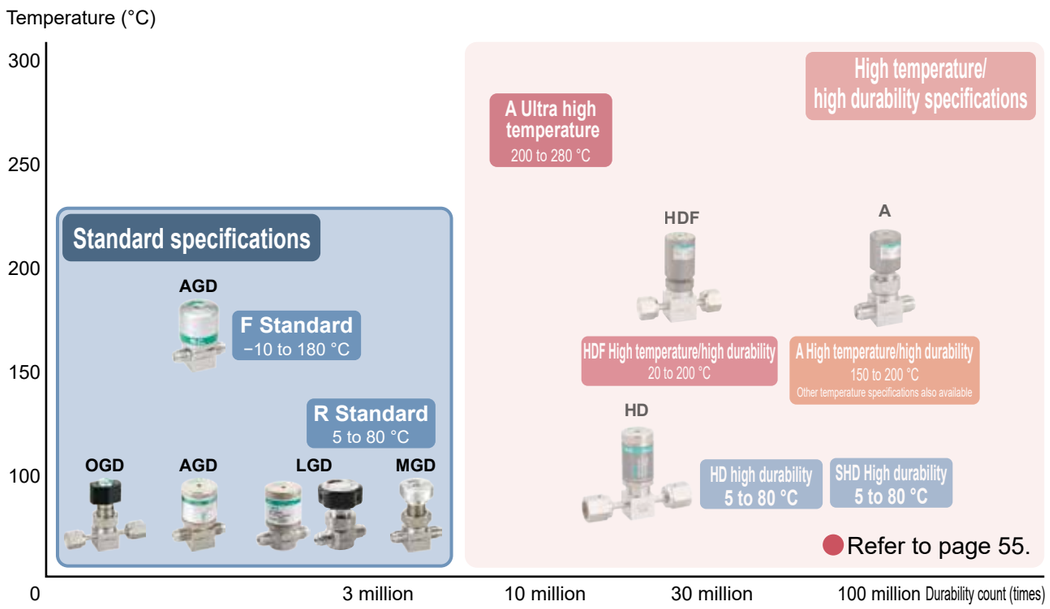
90° turn snap-action type (OGD)
270° turn type (MGD)

CONTENTS

AGD
OGD
MGD
LGD
High Durability
Other Gas Components
Process Gas Valve
PGM Regulator
IAGD Integrated System
AVB
MVB
IAVB Vacu Press Control Sys
High Vacuum Valve
Ending

A wide variety of options based on a highly reliable design

Process Gas Valve Lineup

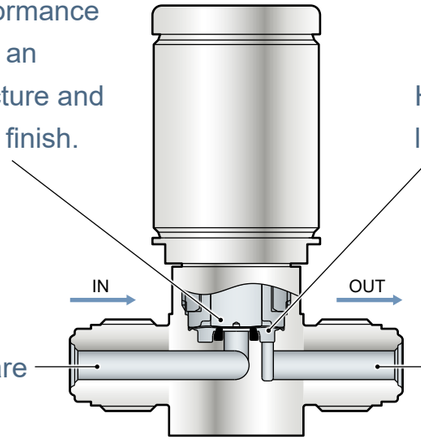


Refer to page 55.

Diaphragm valves born from the pursuit of contamination control

Particle-free performance achieved through an optimal seal structure and improved surface finish.

High corrosion resistance & long life Ni-Co alloy diaphragm



Gas-wetted parts are electropolished.

JXR fittings *1 are standard.

*1: JXR fittings are compatible with VCR fittings.

R Series Lineup

Main Application Examples: **Dry Etching** **Deposition** **Gas Facility**

Series Name	Model No./ Appearance	Features	Connection Method: JXR Male *2	Connection Method: JXR Female *2	Connection Method: Double Ferrule	Cv Value (0 0.1 0.2 0.3 0.4 0.5 0.6 0.7)
AGD-R Series	AGD0□R 	Air Operated Type	1/4"		-	0.1
	AGD1□R AGD2□R 		1/4"		1/4"	0.3
			3/8"		3/8"	0.65
LGD Series	LGD1□ LGD2□ 	Global Model (Economy)	1/4"		1/4"	0.3
			Equivalent to 1/2"		3/8"	0.65
					1/2"	0.7
	LGD10 LGD20 		1/4"		1/4"	0.3
			Equivalent to 1/2"		3/8" 1/2"	0.7
OGD-R Series	OGD□0R 	90-degree turn manual one-action type	1/4"		1/4"	0.3
			3/8"		3/8"	0.65
MGD-R Series	MGD□0R 	270-degree turn manual type	1/4"		1/4"	0.3
			3/8"		3/8"	0.65

*2: JXR fittings are compatible with VCR fittings.

Air Operated Valve for Process Gas

AGD0□R Series

●Metal diaphragm ●Machined body

RoHS

Model No. Notation Method

AGD0 **1** **R** - **4R**

Model No. ❶ Actuation Method ❷ Connection Method

❶Actuation method

Code	Content
1	NC Type (Normally Closed)
2	NO Type (Normally Open)

❷Connection Method

Code	Content
4RM	1/4" JXR Male Fitting
4R	1/4" JXR Female Fitting

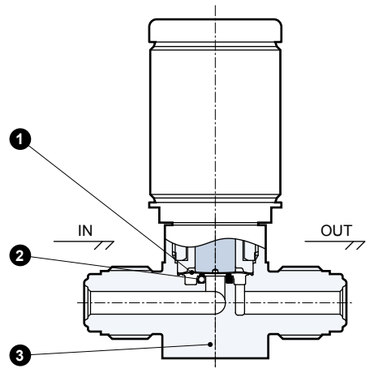
Note) JXR fitting can be connected to VCR fitting.

Specifications

Item	AGD01R	AGD02R
Applicable Fluid	Inert gas / Process gas	
Operating Pressure Pa (abs) - MPa (G)	1.3×10^{-6} to 0.99	
Fluid Temperature °C	5 to 80	
Operating Ambient Temperature °C	5 to 80	
Storage Ambient Temperature °C	-10 to 80	
Valve Seat Leakage Pa·m³/s (He)	1.0×10^{-10} or less	
Valve Seat Leakage Pa·m³/s (He)	2.8×10^{-12} or less	
Cv Value (at 23°C, under pressure)	0.1	
Connection Method	1/4" JXR Male Fitting 1/4" JXR Female Fitting	
Actuation Method	NC Type (Normally Closed)	NO Type (Normally Open)
Operating Pressure MPa	0.4 to 0.6	0.4 to 0.5
Pilot Port	M5	
Weight kg	0.16 *1	
Durability	Proven 3 million cycles *2	

*1: Value for AGD01R-4RM (1/4" JXR male fitting).
*2: Service life when the applicable fluid is an inert gas within the specifications and does not contain solid matter such as reaction products.

Internal Structure Diagram and Materials



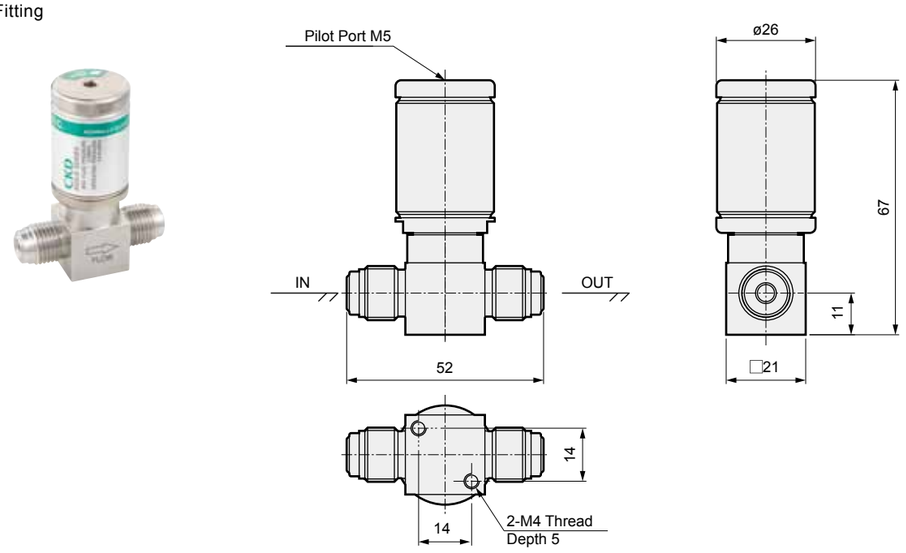
Gas-wetted Materials

Part No.	Part Name	Material
1	Diaphragm	Ni-Co Alloy
2	Valve Seat	PCTFE
3	Body	SUS316L

External Dimensions

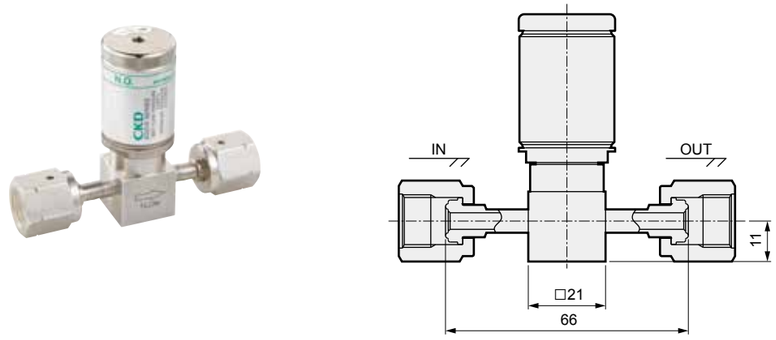
AGD0□R-4RM

●JXR Male Fitting



AGD0□R-4R

●JXR Female Fitting



Air Operated Valve for Process Gas

AGD1□R Series
AGD2□R Series

●Metal diaphragm ●Machined body

RoHS

Model No. Notation Method

AGD1 1 R - 4RM

Model No. ❶ Actuation Method ❷ Connection Method

❶Actuation method

Code	Content
1	NC Type (Normally Closed)
2	NO Type (Normally Open)

❷Connection Method

Code	Content
4RM	1/4" JXR Male Fitting
4R	1/4" JXR Female Fitting
4S	1/4" Double Ferrule Fitting

Note) JXR fitting can be connected to VCR fitting.

AGD2 1 R - 6R

Model No. ❶ Actuation Method ❷ Connection Method

❶Actuation method

Code	Content
1	NC Type (Normally Closed)
2	NO Type (Normally Open)

❷Connection Method

Code	Content
6RM	3/8" JXR Male Fitting
6R	3/8" JXR Female Fitting
6S	3/8" Double Ferrule Fitting

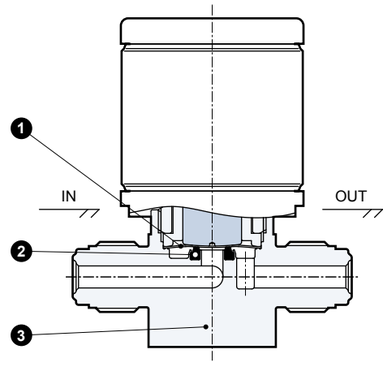
Note) JXR fitting can be connected to VCR fitting.

Specifications

Item	AGD1□□R	AGD2□□R
Applicable Fluid	Inert gas / Process gas	
Operating Pressure Pa (abs) - MPa (G)	1.3×10^{-6} to 0.99	
Fluid Temperature °C	5 to 80	
Operating Ambient Temperature °C	5 to 80	
Storage Ambient Temperature °C	-10 to 80	
Valve Seat Leakage Pa·m³/s (He)	1.0×10^{-10} or less	
Valve Seat Leakage Pa·m³/s (He)	2.8×10^{-12} or less	
Cv Value (at 23°C, under pressure)	0.3	0.65
Connection Method	1/4" JXR Male Fitting 1/4" JXR Female Fitting 1/4" Double Ferrule Fitting	3/8" JXR Male Fitting 3/8" JXR Female Fitting 3/8" Double Ferrule Fitting
Actuation Method	NC Type (Normally Closed) NO Type (Normally Open)	
Operating Pressure MPa	NC: 0.4 to 0.6 NO: 0.4 to 0.5	
Pilot Port	M5	
Weight kg	0.26 *1	0.59 *1
Durability	Proven 3 million cycles *2	

*1: Values for AGD11R-4RM (1/4" JXR male fitting) and AGD21R-6RM (3/8" JXR male fitting).
*2: Service life when the applicable fluid is an inert gas within the specifications and does not contain solid matter such as reaction products.

Internal Structure Diagram and Materials



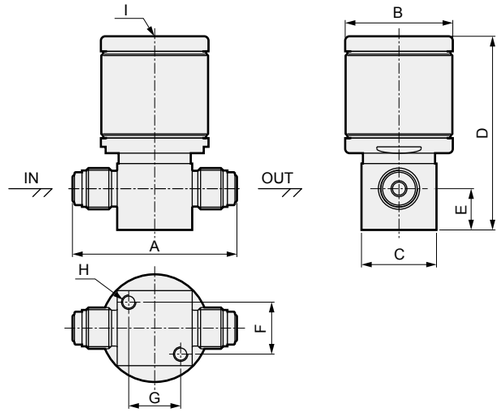
Gas-wetted Materials

Part No.	Part Name	Material
1	Diaphragm	Ni-Co Alloy
2	Valve Seat	PCTFE
3	Body	SUS316L

External Dimensions

AGD1□R-4RM
AGD2□R-6RM

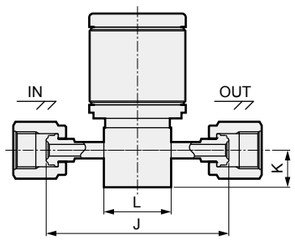
●JXR Male Fitting



Model No.	A	B	C	D	E	F	G	H	I
AGD1□R-4RM	57	ø37	□26	67	14.3	18	18	2-M5 Depth 6	M5
AGD2□R-6RM	76	ø48	□34	88	16	20.2	20.2	2-M5 Depth 8	M5

AGD1□R-4R
AGD2□R-6R

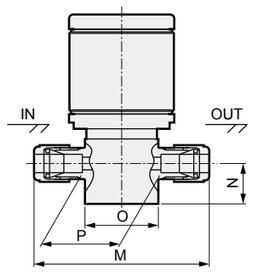
●JXR Female Fitting



Model No.	J	K	L
AGD1□R-4R	70.6	14.3	□26
AGD2□R-6R	83	16	□34

AGD1□R-4S
AGD2□R-6S

●Double Ferrule Fitting



Model No.	M	N	O	P
AGD1□R-4S	62	14.3	□26	27.8
AGD2□R-6S	80	16	□34	44.3

Air Operated Valve for Process Gas

Optional Products

AGD□□R Series

RoHS Special Specifications

Model	Option Details
AGD□□R	Body option (P. 11to21). ●Flow Path Direction ●NC/NO Combination ●Connection Method ●Port Shape Combination

Model No. Notation Method **2-Port Valve, 3-Port Diverter Valve**

AGD 1 1 R - 4 RJ - FFF

Model No. / ❶ Size / ❷ Actuation Method / ❸ Port Size / ❹ Connection Method / ❺ Port Shape Combination

❶ Size

Code	Content
0	1/8"
1	1/4"
2	3/8"

❷ Actuation method

Code	Content
1	NC Type
2	NO Type

❸ Port Size

Code	Content	Model No. AGD0	AGD1	AGD2
4	1/4"	●	●	
6	3/8"			●
8	1/2"			●

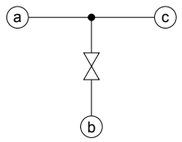
❹ Connection Method: Refer to the options compatibility table.

Code	Content	
RJ	JXR Female Fitting (with bearing)	
R	JXR Female Fitting	
RM	JXR Male Fitting	
W	Automatic Weld Fitting	
S	Double Ferrule Fitting	

❺ Port Shape Combination: Refer to the options compatibility table.

Content			Code
2-Port Valve		IN, OUT Same fitting type	Blank
		IN: Male OUT: Female	MF
		IN: Female OUT: Male	FM
3-Port Diverter Valve		abc Female-Female-Female	FFF
		abc Female-Female-Male	FFM
		abc Female-Male-Male	FMM
		abc Male-Male-Male	MMM
		abc Automatic Weld Fitting	WWW
		abc □/□/□ *1	□□□

*1: Select the following code for □.
F: Female, M: Male, W: Fittings Automatic welding Free combination
*2: For F Female fittings, ❹ the female fitting selected under "Connection Method" will be applied.
*3: For other fitting specifications, please contact our sales office.



❹❺ Options Compatibility Table

❺ Port Shape Combination \ ❹ Connection Method	RJ	R	RM	W	S
Blank	●	●	●	●	●
MF	●	●			
FM	●	●			
FFF	●	●			
FFM	●	●			
FMM	●	●			
MMM			●		
WWW				●	
□□□	●	●	●	●	●

Model No. Notation Method **Dual 3-Port Valve**

AGD 1 1R - Y 11 - 4 RJ - FFF

Model No. / ❶ Size / ❷ Flow Path Direction / ❸ NC/NO Combination / ❹ Port Size / ❺ Connection Method / ❻ Port Shape Combination

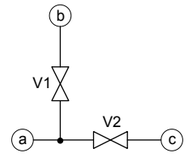
❶ Size

Code	Content
0	1/8"
1	1/4"
2	3/8"

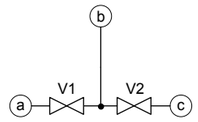
❷ Flow Path Direction

Code	Content
Y	Selector Type
T	Divider Type

Y: Selector Type



T: Divider Type



❸ NC/NO Combination

Code	Content
11	V1: NC, V2: NC
12	V1: NC, V2: NO
21	V1: NO, V2: NC
22	V1: NO, V2: NO

❹ Port Size

Code	Content	Model No. AGD0	AGD1	AGD2
4	1/4"	●	●	
6	3/8"			●

❺ Connection Method: Refer to the options compatibility table.

Code	Content	
RJ	JXR Female Fitting (with bearing)	
R	JXR Female Fitting	
RM	JXR Male Fitting	

❻ Port Shape Combination: Refer to the options compatibility table.

Code	Content
FFF	abc Female-Female-Female
MMM	abc Male-Male-Male
□□□	abc □/□/□ *1

*1: Select the following code for □.
F: Female, M: Male, Free combination

❺❻ Options Compatibility Table

❻ Port Shape Combination \ ❺ Connection Method	RJ	R	RM
FFF	●	●	
MMM			●
□□□	●	●	

AGD0□R 2-Port Valve **Special Specifications**

External Dimensions

AGD0□R-4RJ (1/4" JXR Female Fitting (with bearing) Type)
AGD0□R-4S (1/4" Double Ferrule Fitting Type)
AGD0□R-4W (1/4" Automatic Weld Fitting Type)

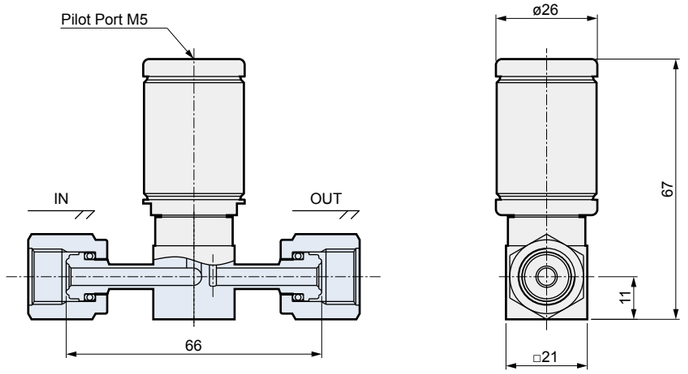


Diagram shows AGD01R-4RJ
Female fitting (with bearing)

Double ferrule fitting: 4S

Weld fitting: 4W

AGD0□R-4RJ-□□ (1/4" JXR Female (with bearing) - Male Combination Type)
AGD0□R-4R-□□ (1/4" JXR Female - Male Combination Type)

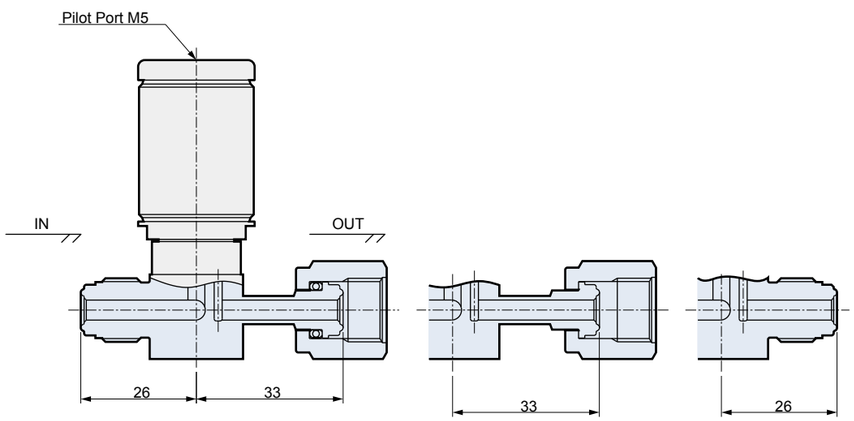


Diagram shows AGD01R-4RJ-MF
Female fitting (with bearing)

Female fitting: 4R

Male fitting: 4RM

AGD0□R 3-Port Diverter Valve **Special Specifications**

External Dimensions

AGD0□R-4RJ-□□□ (1/4" JXR Female Fitting (with bearing) Combination Type)
AGD0□R-4R-□□□ (1/4" JXR Female Fitting Combination Type)
AGD0□R-4RM-MMM (1/4" JXR Male Fitting Type)
AGD0□R-4W-□□□ (1/4" Automatic Weld Fitting Combination Type)

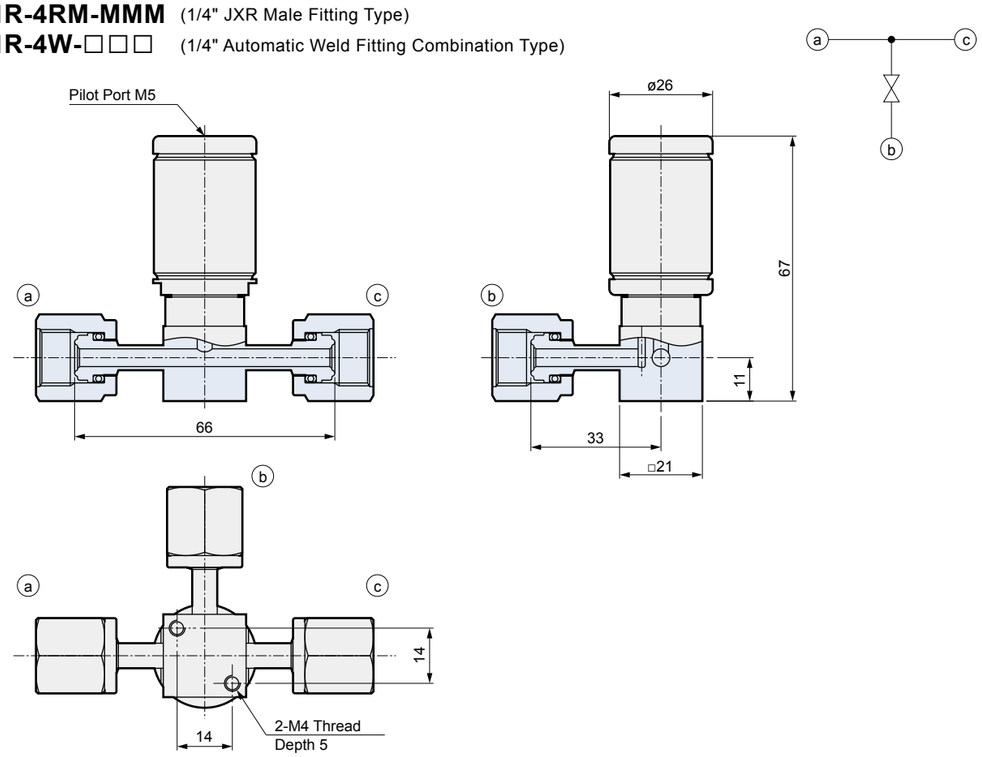
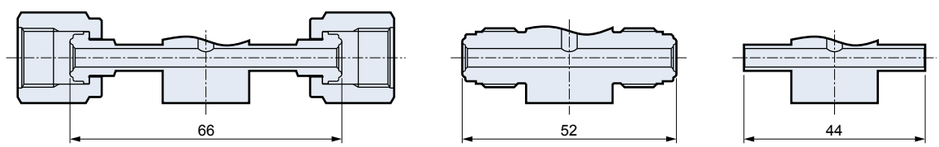


Diagram shows AGD01R-4RJ-FFF
Female fitting (with bearing)

[Main Port]

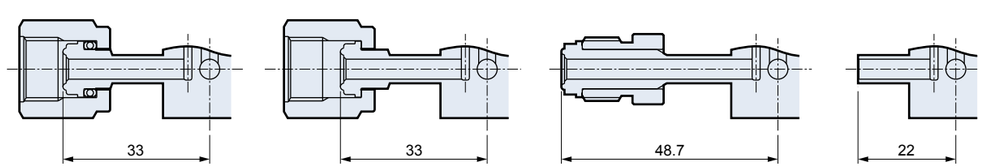


Female fitting: 4R

Male fitting: 4RM

Weld fitting: 4W

[Branch Port]



Female fitting: 4RJ-□F□
(with bearing)

Female fitting: 4R-□F□

Male fitting: -□M□

Weld fitting: -□W□

AGD0□R Dual 3-Port Valve **Special Specifications**

External Dimensions

AGD01R-□□□-4RJ-□□□ (1/4" JXR Female Fitting (with bearing) Combination Type)
AGD01R-□□□-4R-□□□ (1/4" JXR Female Fitting Combination Type)
AGD01R-□□□-4RM-MMM (1/4" JXR Male Fitting Type)

[Y: Selector type]

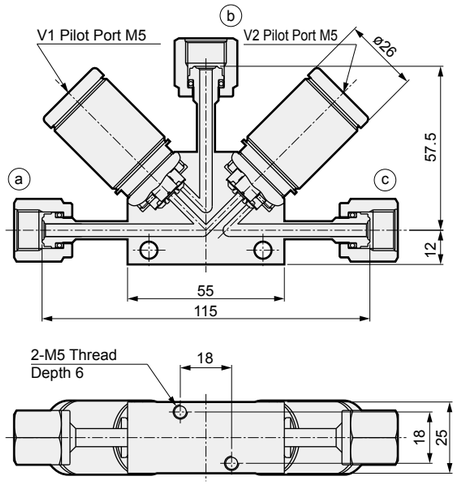
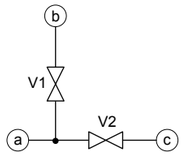


Diagram shows AGD01R-Y11-4RJ-FFF
Female fitting (with bearing)



[T: Divider type]

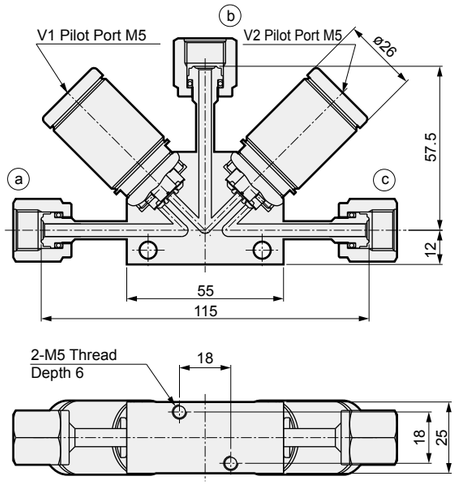
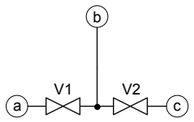
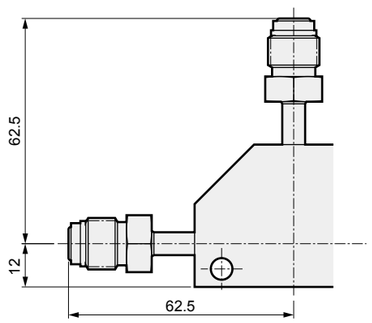


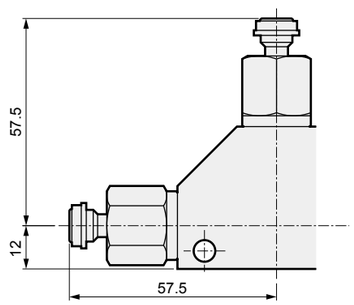
Diagram shows AGD01R-T11-4RJ-FFF
Female fitting (with bearing)



[Other Fitting Dimensions]



Male fitting: 4RM



Female fitting: 4R

AGD1□R 2-Port Valve **Special Specifications**

External Dimensions

AGD1□R-4RJ (1/4" JXR Female Fitting (with bearing) Type)
AGD1□R-4W (1/4" Automatic Weld Fitting Type)

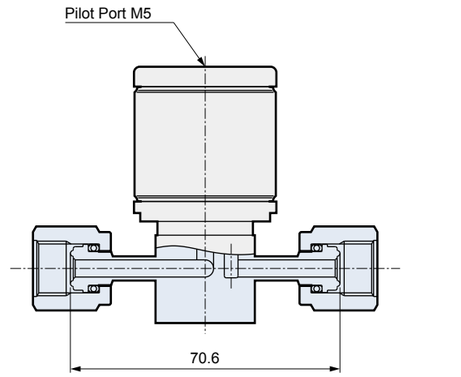
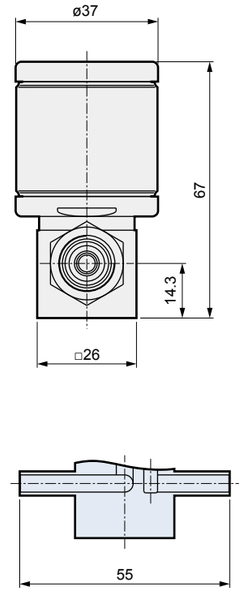


Diagram shows AGD11R-4RJ
Female fitting (with bearing)



Weld fitting: 4W

AGD1□R-4RJ-□□ (1/4" JXR Female Fitting (with bearing) Male Combination Type)
AGD1□R-4R-□□ (1/4" JXR Female - Male Combination Type)

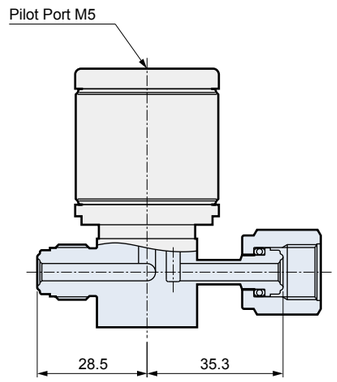
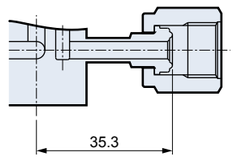
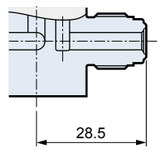


Diagram shows AGD11R-4RJ-MF
Female fitting (with bearing)



Female fitting: 4R



Male fitting: 4RM

AGD1□R 3-Port Diverter Valve **Special Specifications**

External Dimensions

AGD1□R-4RJ-□□□ (1/4" JXR Female Fitting (with bearing) Combination Type)
AGD1□R-4R-□□□ (1/4" JXR Female Fitting Combination Type)
AGD1□R-4RM-MMM (1/4" JXR Male Fitting Type)
AGD1□R-4W-□□□ (1/4" Automatic Weld Fitting Combination Type)

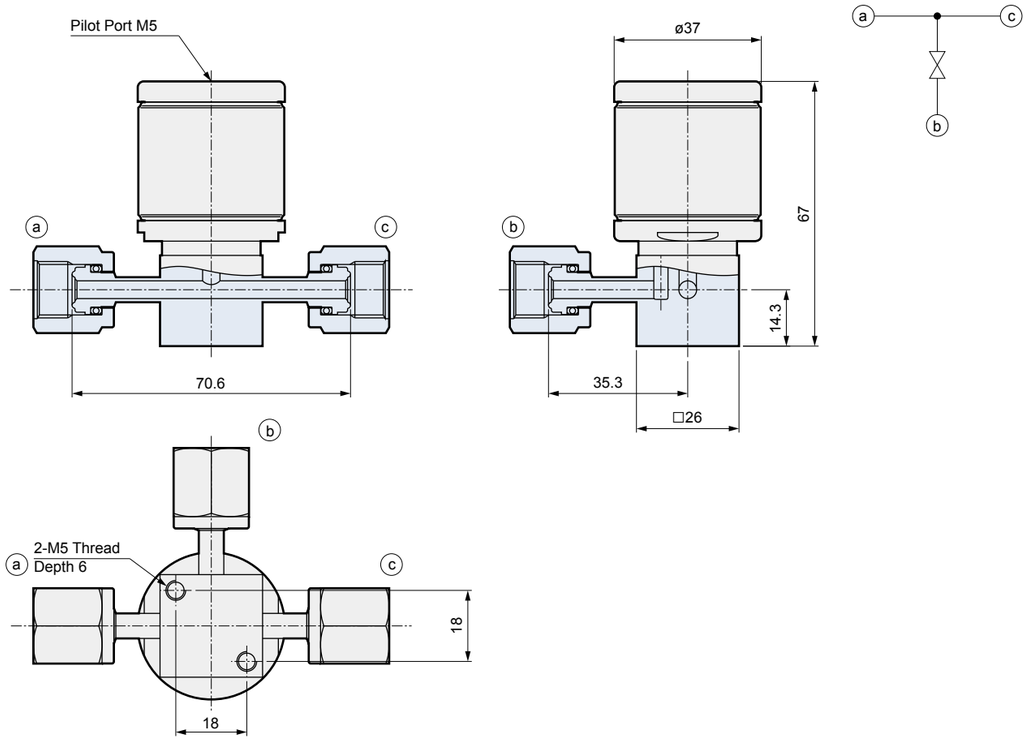
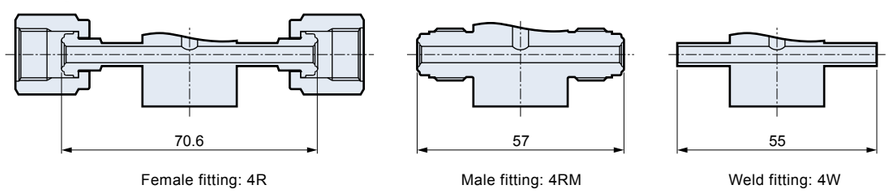


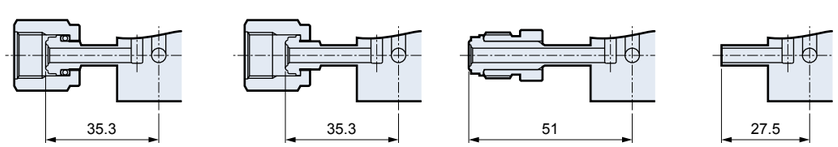
Diagram shows AGD11R-4RJ-FFF
Female fitting (with bearing)

[Main Port]



Female fitting: 4R | Male fitting: 4RM | Weld fitting: 4W

[Branch Port]



Female fitting: 4RJ-□F□ (with bearing) | Female fitting: 4R-□F□ | Male fitting: -□M□ | Weld fitting: -□W□

AGD11R Dual 3-Port Valve **Special Specifications**

External Dimensions

AGD11R-□□□-4RJ-□□□ (1/4" JXR Female Fitting (with bearing) Combination Type)
AGD11R-□□□-4R-□□□ (1/4" JXR Female Fitting Combination Type)
AGD11R-□□□-4RM-MMM (1/4" JXR Male Fitting Type)

[Y: Selector type]

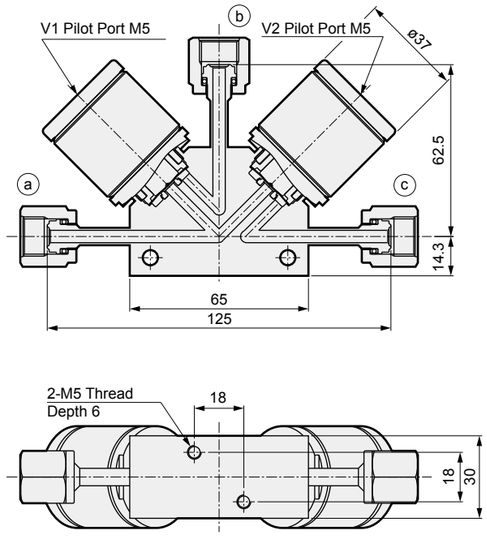
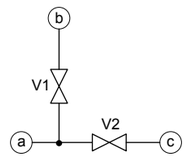


Diagram shows AGD11R-Y11-4RJ-FFF
Female fitting (with bearing)



[T: Divider type]

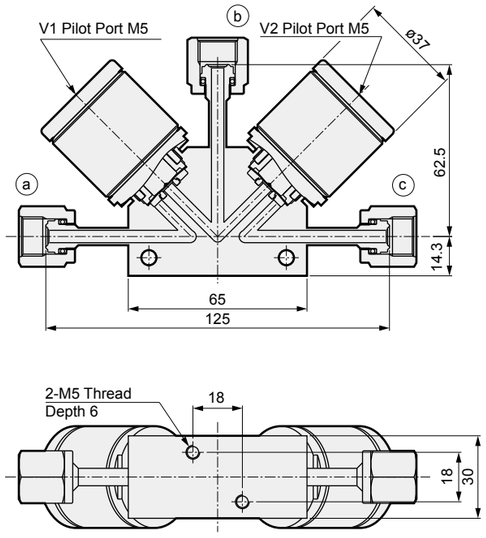
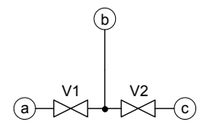
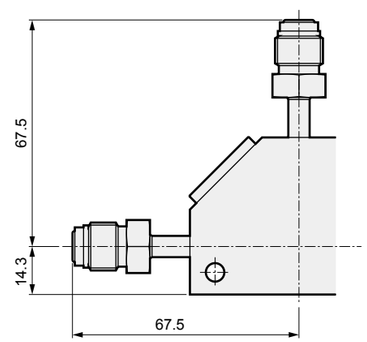


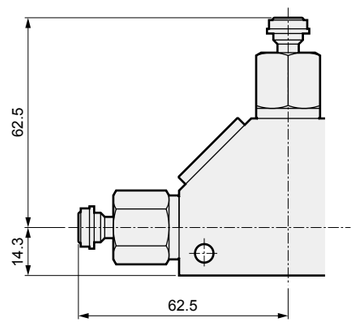
Diagram shows AGD11R-T11-4RJ-FFF
Female fitting (with bearing)



[Other Fitting Dimensions]



Male fitting: 4RM



Female fitting: 4R

AGD2□R 2-Port Valve **Special Specifications**

External Dimensions

AGD2□R-6RJ (3/8" JXR Female Fitting (with bearing) Type)
AGD2□R-6W (3/8" Automatic Weld Fitting Type)
AGD2□R-8S (1/2" Double Ferrule Fitting Type)
AGD2□R-8RM (1/2" JXR Male Fitting Type)
AGD2□R-8R (1/2" JXR Female Fitting Type)
AGD2□R-8RJ (1/2" JXR Female Fitting (with bearing) Type)
AGD2□R-8W (1/2" Automatic Weld Fitting Type)

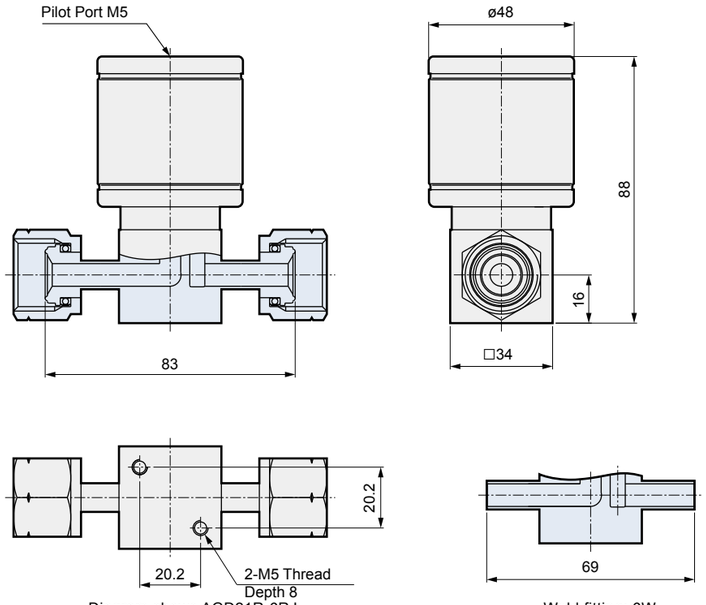
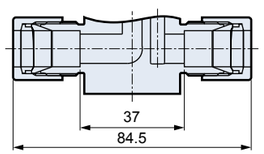
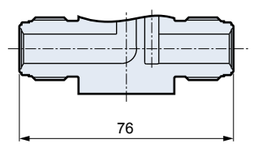


Diagram shows AGD21R-6RJ
Female fitting (with bearing)

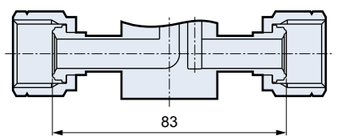
Weld fitting: 6W



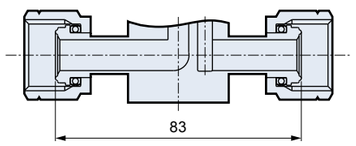
Double ferrule fitting: 8S



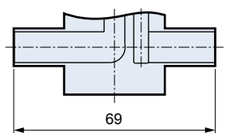
Male fitting: 8RM



Female fitting: 8R



Female fitting: 8RJ
(with bearing)



Weld fitting: 8W

AGD2□R 2-Port Valve **Special Specifications**

External Dimensions

AGD2□R-6RJ-□□ (3/8" JXR Female Fitting (with bearing) Male Combination Type)
AGD2□R-6R-□□ (3/8" JXR Female - Male Combination Type)

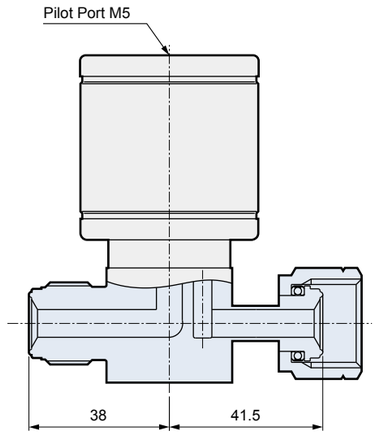
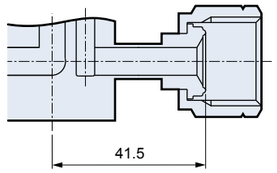
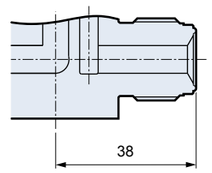


Diagram shows AGD21R-6RJ-MF
Female fitting (with bearing)



Female fitting: 6R



Male fitting: 6RM

AGD2□R-8RJ-□□ (1/2" JXR Female Fitting (with bearing) Male Combination Type)
AGD2□R-8R-□□ (1/2" JXR Female - Male Combination Type)

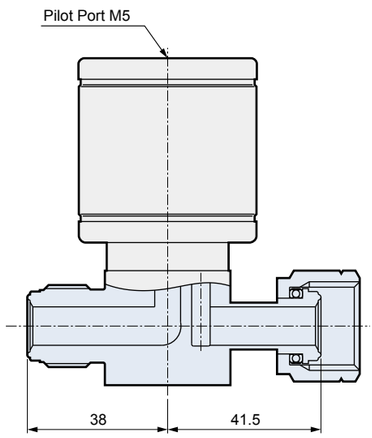
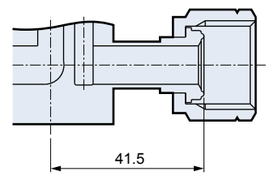
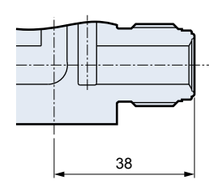


Diagram shows AGD21R-8RJ-MF
Female fitting (with bearing)



Female fitting: 8R



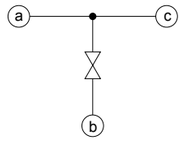
Male fitting: 8RM

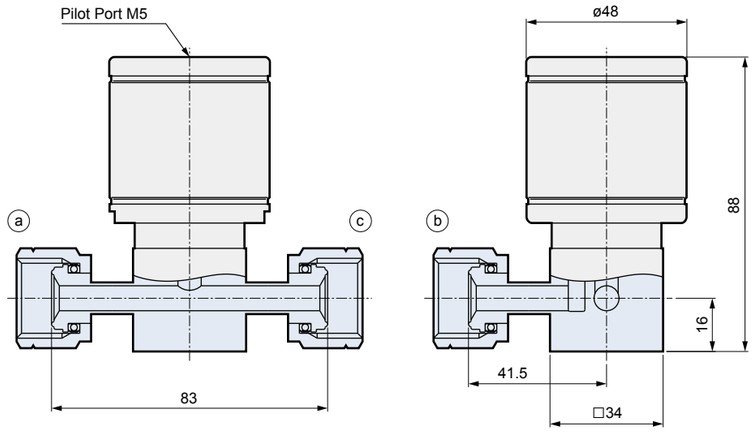
AGD2□R 3-Port Diverter Valve **Special Specifications**

External Dimensions

AGD2□R-6RJ-□□□ (3/8" JXR Female Fitting (with bearing) Combination Type)
AGD2□R-6R-□□□ (3/8" JXR Female Fitting Combination Type)
AGD2□R-6RM-MMM (3/8" JXR Male Fitting Type)
AGD2□R-6W-□□□ (3/8" Automatic Weld Fitting Combination Type)

• 1/2" size also available. The face-to-face dimension is the same as the 3/8" size.





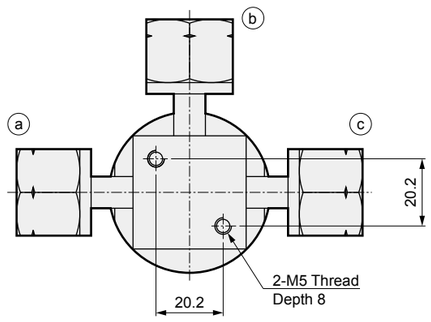
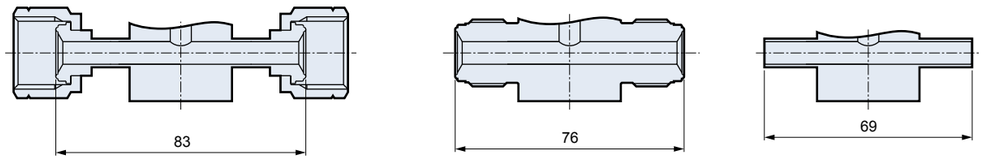


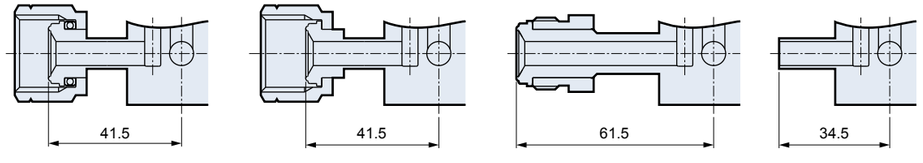
Diagram shows AGD21R-6RJ-FFF
Female fitting (with bearing)

[Main Port]



Female fitting: 6R　　Male fitting: 6RM　　Weld fitting: 6W

[Branch Port]



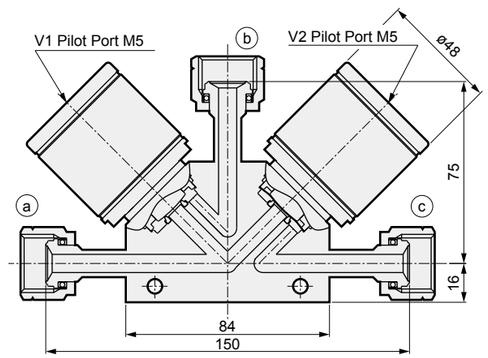
Female fitting: 6RJ-□F□ (with bearing)　　Female fitting: 6R-□F□　　Male fitting: -□M□　　Weld fitting: -□W□

AGD11R Dual 3-Port Valve **Special Specifications**

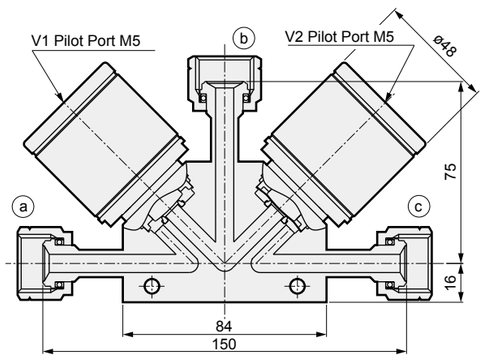
External Dimensions

AGD21R-□□□-6RJ-□□□ (3/8" JXR Female Fitting (with bearing) Combination Type)
AGD21R-□□□-6R-□□□ (3/8" JXR Female Fitting Combination Type)
AGD21R-□□□-6RM-MMM (3/8" JXR Male Fitting Type)

[Y: Selector type]



[T: Divider type]



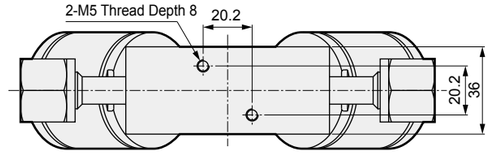


Diagram shows AGD21R-Y11-6RJ-FFF
Female fitting (with bearing)

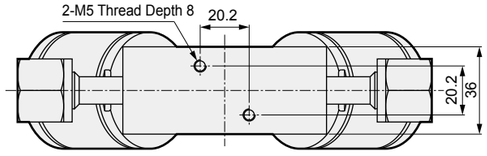
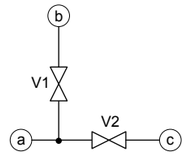
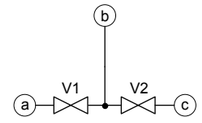
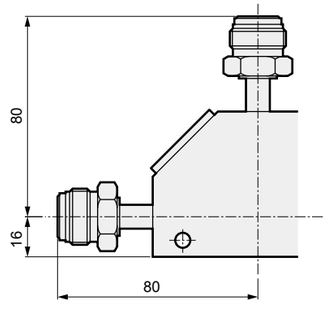


Diagram shows AGD21R-T11-6RJ-FFF
Female fitting (with bearing)

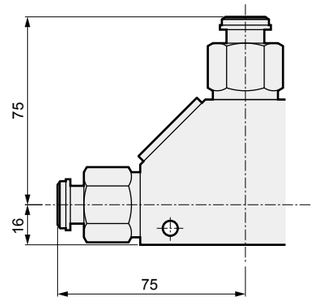




[Other Fitting Dimensions]



Male fitting: 6RM



Female fitting: 6R

Air Operated Valve for Process Gas

Optional Products

AGD Series

Special Specifications

●With valve opening adjustment mechanism

■Flow rate is adjusted when the valve is open by rotating the knob on top of the actuator.

Specifications

Item	AGD0□V	AGD1□V	AGD2□V
Applicable Fluid	Inert gas / Process gas		
Operating Pressure Pa (abs) - MPa (G)	$1.3x10^{-6}$ to 0.5	$1.3x10^{-6}$ to 0.99	
Fluid temperature °C	-10 to 80		
Ambient Temperature °C	-10 to 80		
Valve Seat Leakage Pa·m³/s (He)	$1.3x10^{-9}$ or less		
Valve Seat Leakage Pa·m³/s (He)	$2.8x10^{-12}$ or less		
Cv Value (at 23°C, under pressure)	0.1	0.26	0.6
Connection Method Note)	1/4" JXR Male Fitting 1/4" JXR Female Fitting	1/4" JXR Male Fitting 1/4" JXR Female Fitting 1/4" Double Ferrule Fitting	3/8" JXR Male Fitting 3/8" JXR Female Fitting 3/8" Double Ferrule Fitting
Actuation Method	NC Type (Normally Closed) NO Type (Normally Open)		
Operating Pressure MPa	NC: 0.4 to 0.6 NO: 0.4 to 0.45	NC: 0.4 to 0.6 NO: 0.4 to 0.5	
Pilot Port	M5	Rc1/8	

Note) JXR fitting can be connected to VCR fitting.

●With proximity sensor

■Valve open/close can be detected.
Please contact our sales representative regarding the mounted sensor.

Specifications

Item	AGD0□R	AGD1□R	AGD2□R
Applicable Fluid	Inert gas / Process gas		
Operating Pressure Pa (abs) - MPa (G)	$1.3x10^{-6}$ to 0.99		
Fluid temperature °C	5 to 80 (Proximity sensor section 70°C or less)		
Ambient Temperature °C	5 to 80 (Proximity sensor section 70°C or less)		
Storage Ambient Temperature °C	-10 to 80		
Valve Seat Leakage Pa·m³/s (He)	$1.0x10^{-10}$ or less		
Valve Seat Leakage Pa·m³/s (He)	$2.8x10^{-12}$ or less		
Cv Value (at 23°C, under pressure)	0.1	0.3	0.65
Connection Method Note)	1/4" JXR Male Fitting 1/4" JXR Female Fitting	1/4" JXR Male Fitting 1/4" JXR Female Fitting 1/4" Double Ferrule Fitting	3/8" JXR Male Fitting 3/8" JXR Female Fitting 3/8" Double Ferrule Fitting
Actuation Method	NC Type (Normally Closed) NO Type (Normally Open)		
Operating Pressure MPa	NC: 0.4 to 0.6 NO: 0.4 to 0.5		
Pilot Port	M5		

Note) JXR fitting can be connected to VCR fitting.

●For high temperature fluids

■High temperature fluids up to 180°C can be used.

Specifications

Item	AGD0□V	AGD1□V	AGD2□V
Applicable Fluid	Inert gas / Process gas		
Operating Pressure Pa (abs) - MPa (G)	$1.3x10^{-6}$ to 0.5	$1.3x10^{-6}$ to 0.99	
Fluid temperature °C	-10 to 180		
Ambient Temperature °C	-10 to 80		
Valve Seat Leakage Pa·m³/s (He)	$1.3x10^{-9}$ or less		
Valve Seat Leakage Pa·m³/s (He)	$2.8x10^{-12}$ or less		
Cv Value (at 23°C, under pressure)	0.1	0.26	0.6
Connection Method Note)	1/4" JXR Male Fitting 1/4" JXR Female Fitting	1/4" JXR Male Fitting 1/4" JXR Female Fitting 1/4" Double Ferrule Fitting	3/8" JXR Male Fitting 3/8" JXR Female Fitting 3/8" Double Ferrule Fitting
Actuation Method	NC Type (Normally Closed) NO Type (Normally Open)		
Operating Pressure MPa	NC: 0.4 to 0.6 NO: 0.4 to 0.45	NC: 0.4 to 0.6 NO: 0.4 to 0.5	
Pilot Port	M5	Rc1/8	

Note) JXR fitting can be connected to VCR fitting.

*For details such as model Nos. of optional products, please contact our sales representative.

Components for Process Gas

To Use This Product Safely

Please be sure to read this before use.
For General Precautions refer to Intro 9.

Individual Precautions: Air Operated Valves for Process Gas AGD Series

Design / Selection

1. Confirmation of Specifications

Warning

■This product is not designed to function as a safety valve, such as an emergency shut-off valve. If such a function is required, please implement other reliable safety measures.

■Incorrect equipment selection and handling can cause problems not only in this product, but also to your system. Product selection and handling should be performed after confirming the product specifications and their suitability for the customer's system, at the customer's own responsibility.

■Check the compatibility between the gas contact part materials and working fluid before use.

■Use within the specified fluid temperature and pressure range.

2. Ambient Environment

Caution

■Do not use in atmospheres containing corrosive gases or in locations where substances that may affect the product such as chemicals, salt water, water or steam could make contact. Use within the specified ambient temperature range.

3. Securing Space

Caution

■Secure sufficient space for maintenance and inspection.

4. Piping

Warning

■Foreign materials or burrs in the piping and piping work could damage the valve seat or diaphragm seal, and lead to leaks. Before installing the valve, be sure to remove any debris or burrs and take measures such as installing a primary side filter.

Caution

■Make sure not to use the wrong connecting port when connecting the pipes to the product.

■When piping, do not apply tension, compression, bending or other forces to the valve body from the piping.

■If the tube for piping is bent, it will cause malfunctions; pipe with suitable tube lengths.

■Use the driving solenoid valve connected to the drive unit according to the specifications or applications.

■As for operating air, use air or inert gas passed through a filter with a filtration rating of 5 μm or more.

5. Purging

Caution

■When removing valves using toxic, combustible or corrosive gases, purge with an inert gas such as nitrogen gas before removal.

6. During Use

Warning

■Do not touch heater-equipped products with hands or body. Direct contact may cause burns.

Caution

■Do not use valves as a footing or place any heavy objects on top of the valves.

■Store unused products in a location where they are not exposed to direct sunlight or high temperatures.

For cautions about mounting, installation, adjustment, use, and maintenance, refer to CKD components Product Site (https://www.ckd.co.jp/kiki/jp/) → "Model No." Instruction Manuals

MEMO

AGD
OGD
MGD
LGD
High Durability
Process Gas Valve
Other Gas Components
PGM
Regulator
IAGD
Integrated System
AVB
MVB
High Vacuum Valve
IAVB
Vacu Press Control Sys
Ending

Manual Valve for Process Gas

OGD□0R Series

●Metal Diaphragm ●90° Turn Snap-Action Type

RoHS

Model No. Notation Method

OGD10R - 4RM - K
OGD20R - 6RM - K

❶ Model No. ❷ Connection Method ❸ Handle Color

❷ Connection Method

Code	Content		❶ Model No. OGD10R	❶ Model No. OGD20R
4RM	1/4"	JXR MALE FITTING	●	
4R	1/4"	JXR FEMALE FITTING	●	
4S	1/4"	DOUBLE FERRULE FITTING	●	
6RM	3/8"	JXR MALE FITTING		●
6R	3/8"	JXR FEMALE FITTING		●
6S	3/8"	DOUBLE FERRULE FITTING		●

Note) JXR fitting can be connected to VCR fitting.

❸ Handle Color

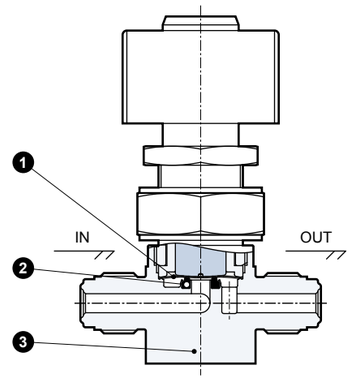
Code	Content	
K	Black	
R	Red	
B	Blue	
Y	Yellow	

Specifications

Item	OGD10R	OGD20R
Applicable Fluid	Inert gas / Process gas	
Operating Pressure Pa (abs) - MPa (G)	1.3×10^{-6} to 0.99	
Fluid Temperature °C	5 to 80	
Operating Ambient Temperature °C	5 to 80	
Storage Ambient Temperature °C	-10 to 80	
Valve Seat Leakage Pa·m³/s (He)	1.0×10^{-10} or less	
Valve Seat Leakage Pa·m³/s (He)	2.8×10^{-12} or less	
Cv Value (at 23°C, under pressure)	0.3	0.65
Connection Method	1/4" JXR Male Fitting 1/4" JXR Female Fitting 1/4" Double Ferrule Fitting	3/8" JXR Male Fitting 3/8" JXR Female Fitting 3/8" Double Ferrule Fitting
Weight kg	0.29 *1	0.67 *1
Durability	Proven 60,000 cycles *2	

*1: Values for OGD10R-4RM (1/4" JXR male fitting) and OGD20R-6RM (3/8" JXR male fitting).
*2: Service life when the applicable fluid is an inert gas within the specifications and does not contain solid matter such as reaction products.

Internal Structure Diagram and Materials



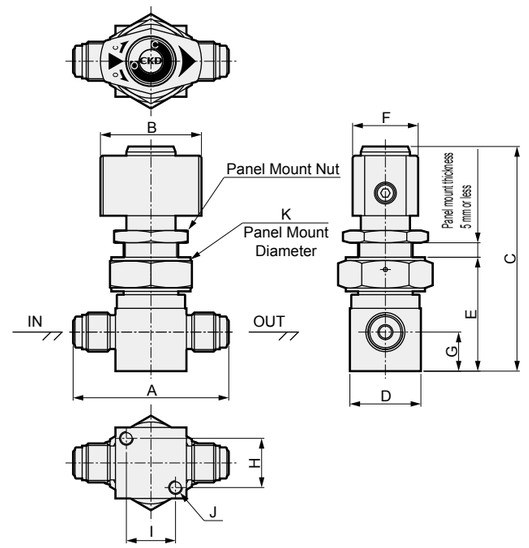
Gas-wetted Materials

Part No.	Part Name	Material
1	Diaphragm	Ni-Co Alloy
2	Valve Seat	PCTFE
3	Body	SUS316L

External Dimensions

OGD10R-4RM-□
OGD20R-6RM-□

●JXR Male Fitting

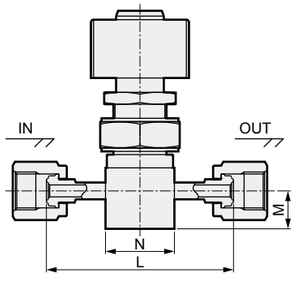


Model No.	A	B	C	D	E	F	G	H	I	J	K
OGD10R-4RM-□	57	37	82	□26	42	24	14.3	18	18	2-M5 Depth 6	ø20.5
OGD20R-6RM-□	76	47	104	□34	57	28	16	20.2	20.2	2-M5 Depth 8	ø26.5

Note) The panel mount nut is not included with the standard product. Products with a panel mount nut are special-order items.

OGD10R-4R-□
OGD20R-6R-□

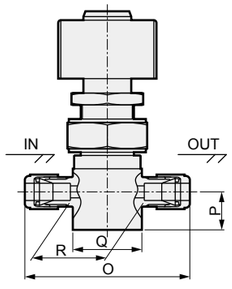
●JXR Female Fitting



Model No.	L	M	N
OGD10R-4R-□	70.6	14.3	□26
OGD20R-6R-□	83	16	□34

OGD10R-4S-□
OGD20R-6S-□

●Double Ferrule Fitting



Model No.	O	P	Q	R
OGD10R-4S-□	62	14.3	□26	27.8
OGD20R-6S-□	80	16	□34	44.3

Manual Valve for Process Gas

Optional Products

OGD□0R Series

RoHS Special Specifications

Model	Option Details
OGD□0R	Body option (29P. to32). ●Connection Method ●Port Shape Combination ●Handle Color 
	Safety specification options (33Page) ●With Locking Mechanism 

Model No. Notation Method

OGD 1 0R - 4 RJ - MF - K

1 Size — Model No.

2 Port Size

3 Connection Method

4 Port Shape Combination

5 Handle Color

1 Size

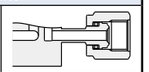
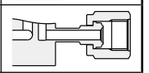
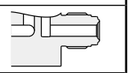
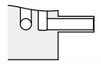
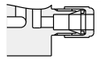
Code	Content
1	1/4"
2	3/8"

2 Port Size

Code	Content	Model No. OGD1	Model No. OGD2
4	1/4"	●	
6	3/8"		●
8	1/2"		●

3 Connection Method

Refer to the options compatibility table.

Code	Content	
RJ	JXR Female Fitting (with bearing)	
R	JXR Female Fitting	
RM	JXR Male Fitting	
W	Automatic Weld Fitting	
S	Double Ferrule Fitting	

4 Port Shape Combination: Refer to the options compatibility table.

Content			Code
2-Port Valve		IN, OUT Same fitting type	Blank
		IN: Male OUT: Female	MF
		IN: Female OUT: Male	FM
3-Port Diverter Valve		abc Female-Female-Female	FFF
		abc Female-Female-Male	FFM
		abc Female-Male-Male	FMM
		abc Male-Male-Male	MMM
		abc Automatic Weld Fitting	WWW
		abc □/□/□ (*1)	□□□

*1:Select the following codes for □. F: Female, M: Male, W: Fittings
Automatic welding Free combination

5 Handle Color

Code	Content	
K	Black	
B	Blue	
Y	Yellow	
R	Red	

3 4 Options Compatibility Table

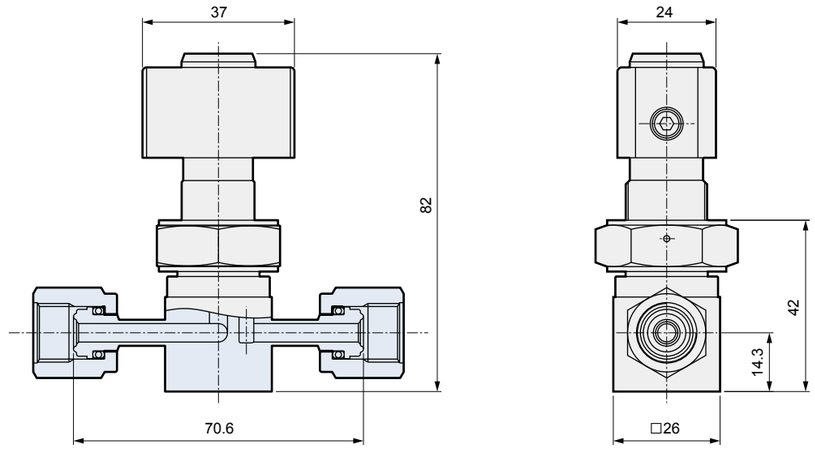
4 Port Shape Combination \ 3 Connection Method	RJ	R	RM	W	S
Blank	●	●	●	●	●
MF	●	●			
FM	●	●			
FFF	●	●			
FFM	●	●			
FMM	●	●			
MMM			●		
WWW				●	
□□□	●	●	●	●	●

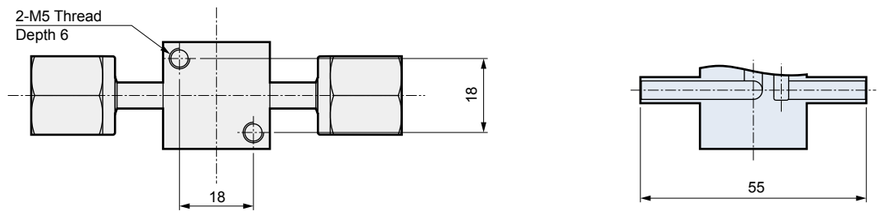
OGD10R 2-Port Valve **Special Specifications**

External Dimensions

OGD10R-4RJ-K (B, Y, R) (1/4" JXR Female Fitting (with bearing) Type)
OGD10R-4W-K (B, Y, R) (1/4" Automatic Weld Fitting Type)

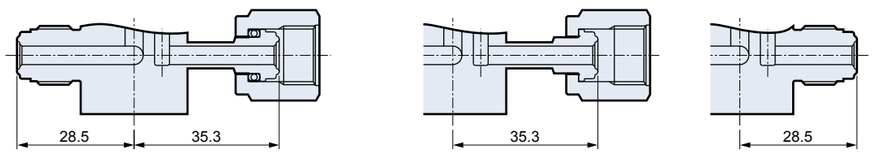
Diagram shows OGD10R-4RJ-K
Female fitting (with bearing)





Weld fitting: 4W

OGD10R-4RJ-□□-K (B, Y, R) (1/4" JXR Female (with bearing) - Male Combination Type)
OGD10R-4R-□□-K (B, Y, R) (1/4" JXR Female - Male Combination Type)



Female fitting (with bearing) | Female fitting: 4R | Male fitting: 4RM

OGD10R 3-Port Diverter Valve **Special Specifications**

External Dimensions

OGD10R-4RJ-□□□-K (B, Y, R) (1/4" JXR Female Fitting (with bearing) Combination Type)
OGD10R-4R-□□□-K (B, Y, R) (1/4" JXR Female Fitting Combination Type)
OGD10R-4RM-MMM-K (B, Y, R) (1/4" JXR Male Fitting Type)
OGD10R-4W-□□□-K (B, Y, R) (1/4" Automatic Weld Fitting Combination Type)

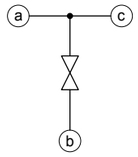
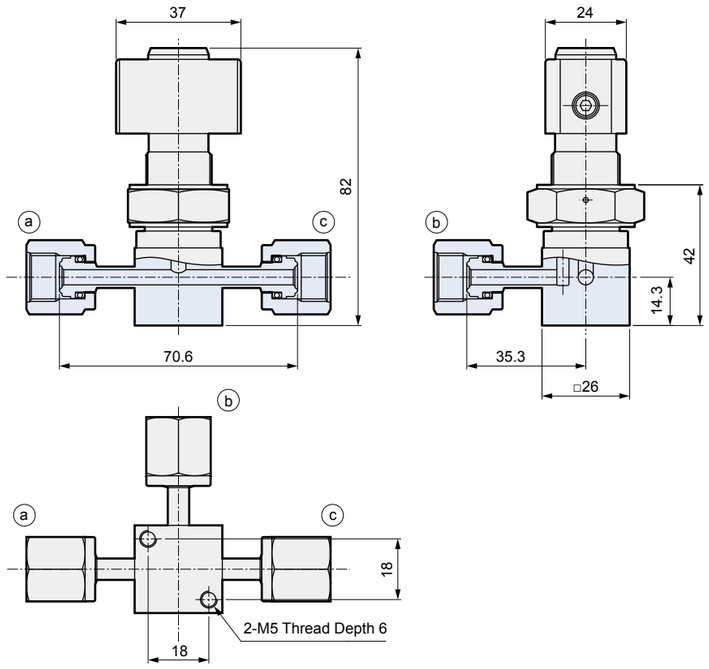
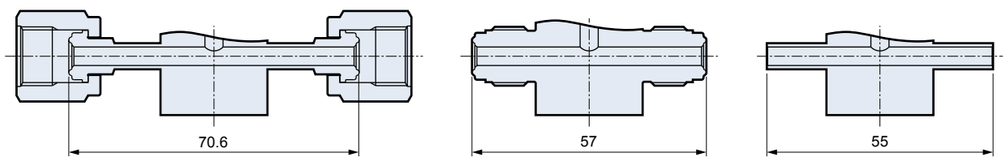


Diagram shows OGD10R-4RJ-FFF-K
Female fitting (with bearing)

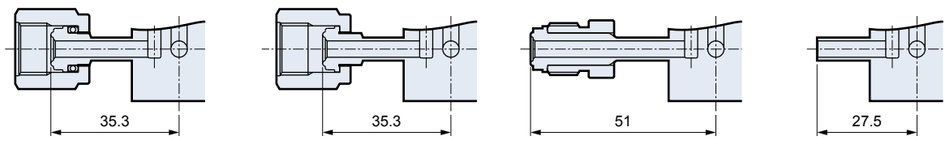


[Main Port]



Female fitting: 4R | Male fitting: 4RM | Weld fitting: 4W

[Branch Port]



Female fitting: 4RJ-□F□ (with bearing) | Female fitting: 4R-□F□ | Male fitting: -□M□ | Weld fitting: -□W□

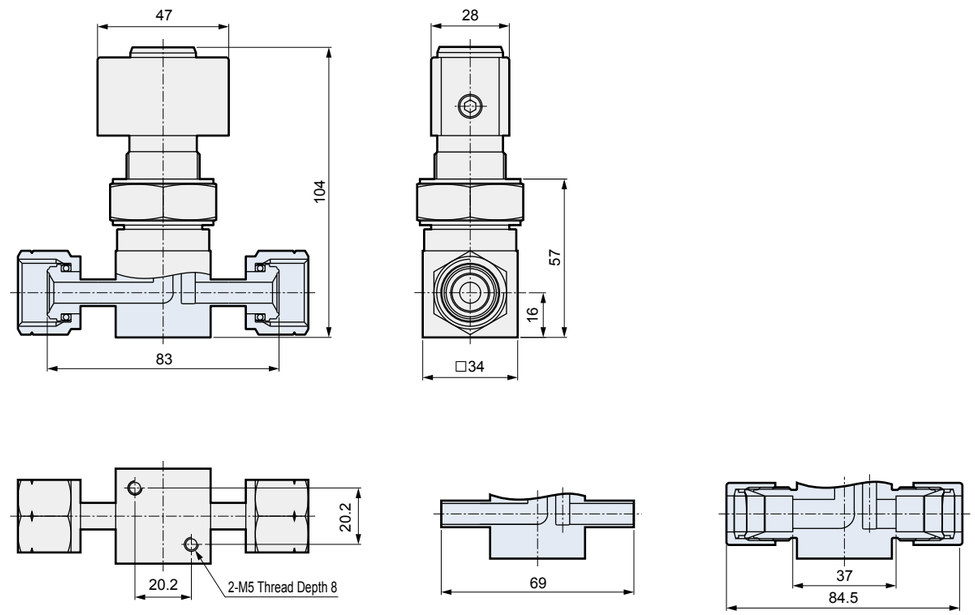
OGD20R 2-Port Valve **Special Specifications**

External Dimensions

OGD20R-6RJ-K (B, Y, R) (3/8" JXR Female Fitting (with bearing) Type)
OGD20R-6W-K (B, Y, R) (3/8" Automatic Weld Fitting Type)

• 1/2" size also available. The face-to-face dimension is the same as the 3/8" size. (Double ferrule fittings are different)

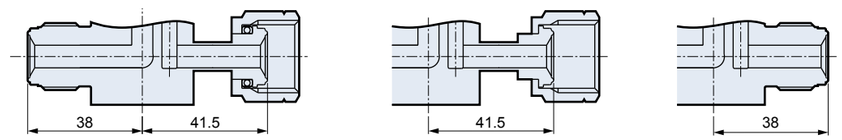
Diagram shows OGD20R-6RJ-K
Female fitting (with bearing)



Weld fitting: 6W | Double ferrule fitting: 8S

OGD20R-6RJ-□□-K (B, Y, R) (3/8" JXR Female (with bearing) - Male Combination Type)
OGD20R-6R-□□-K (B, Y, R) (3/8" JXR Female - Male Combination Type)

• 1/2" size also available. The face-to-face dimension is the same as the 3/8" size.

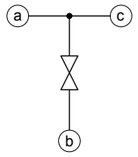


Female fitting: 6RJ (with bearing) | Female fitting: 6R | Male fitting: 6RM

OGD20R 3-Port Diverter Valve Special Specifications

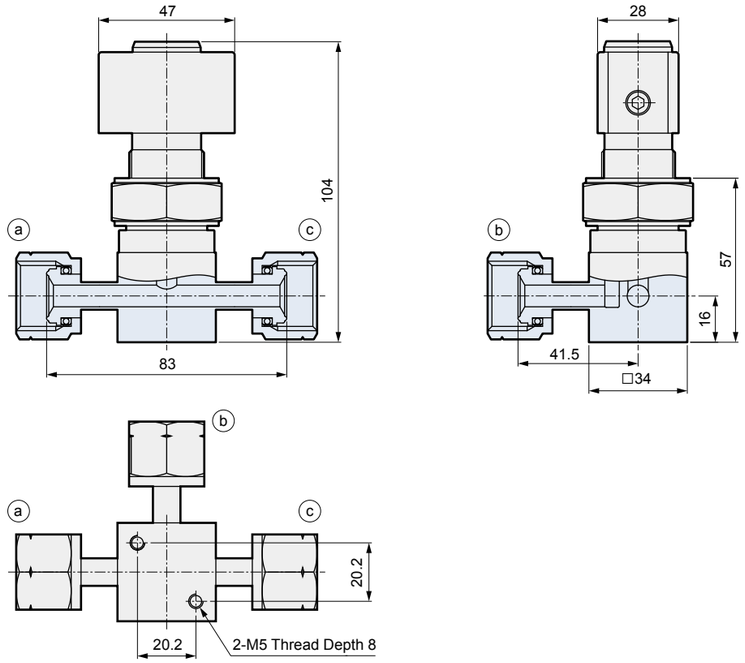
External Dimensions

OGD20R-6RJ-□□□ (3/8" JXR Female Fitting (with bearing) Combination Type)
OGD20R-6R-□□□ (3/8" JXR Female Fitting Combination Type)
OGD20R-6RM-MMM (3/8" JXR Male Fitting Type)
OGD20R-6W-□□□ (3/8" Automatic Weld Fitting Combination Type)

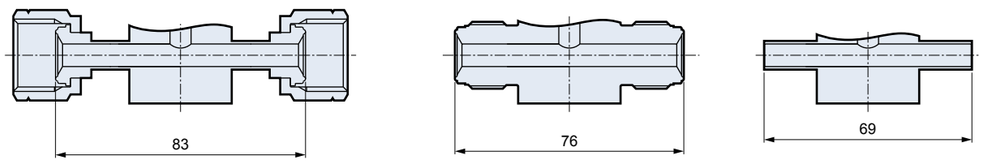


・1/2" size also available. The face-to-face dimension is the same as the 3/8" size.

Diagram shows OGD20R-6RJ-FFF
Female fitting (with bearing)

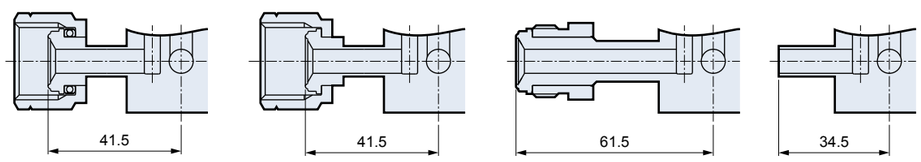


[Main Port]



Female fitting: 6R | Male fitting: 6RM | Weld fitting: 6W

[Branch Port]



Female fitting: 6RJ-□F□ (with bearing) | Female fitting: 6R-□F□ | Male fitting: -□M□ | Weld fitting: -□W□

Manual Valve Safety Specification Options Special Specifications

External View

OGD With Locking Mechanism

■A key can also be included upon request.

*For details such as model numbers, please contact our sales representative.

Components for Process Gas

To Use This Product Safely

Please be sure to read this before use.
For General Precautions refer to Intro 9.

Individual Precautions: Manual Valve for Process Gas, OGD Series

Design / Selection

1. Confirmation of Specifications

Warning

■This product is not designed to function as a safety valve, such as an emergency shut-off valve. If such a function is required, please implement other reliable safety measures.

■Incorrect equipment selection and handling can cause problems not only in this product, but also to your system. Product selection and handling should be performed after confirming the product specifications and their suitability for the customer's system, at the customer's own responsibility.

■Check the compatibility between the gas contact part materials and working fluid before use.

■Use within the specified fluid temperature and pressure range.

2. Ambient Environment

Caution

■Do not use in atmospheres containing corrosive gases or in locations where substances that may affect the product such as chemicals, salt water, water or steam could make contact.
Use within the specified ambient temperature range.

3. Securing Space

Caution

■Secure sufficient space for maintenance and inspection.

4. Piping

Warning

■Foreign materials or burrs in the piping and piping work could damage the valve seat or diaphragm seal, and lead to leaks. Before installing the valve, be sure to remove any debris or burrs and take measures such as installing a primary side filter.

Caution

■Make sure not to use the wrong connecting port when connecting the pipes to the product.

■When piping, do not apply tension, compression, bending or other forces to the valve body from the piping.

■If the tube for piping is bent, it will cause malfunctions; pipe with suitable tube lengths.

5. Purging

Caution

■When removing valves using toxic, combustible or corrosive gases, purge with an inert gas such as nitrogen gas before removal.

6. During Use

Warning

■Do not touch heater-equipped products with hands or body. Direct contact may cause burns.

Caution

■Do not use valves as a footing or place any heavy objects on top of the valves.

■Store unused products in a location where they are not exposed to direct sunlight or high temperatures.

For cautions about mounting, installation, adjustment, use, and maintenance, refer to CKD components Product Site (https://www.ckd.co.jp/kiki/jp/) → "Model No." Instruction Manuals

MEMO

AGD
OGD
MGD
LGD
High Durability
Other Gas Components
Process Gas Valve
PGM
Regulator
IAGD
Integrated System
AVB
MVB
High Vacuum Valve
IAVB
Vacu Press Control Sys
Ending

Manual Valve for Process Gas

MGD□0R Series

●Metal diaphragm ●270° rotation

RoHS

Model No. Notation Method

MGD10R - 4RM
MGD20R - 6RM

❶ Model No. ❷ Connection Method

❷ Connection Method			❶ Model No. MGD10R	❶ Model No. MGD20R
Code	Content			
4RM	1/4"	JXR MALE FITTING	●	
4R	1/4"	JXR FEMALE FITTING	●	
4S	1/4"	DOUBLE FERRULE FITTING	●	
6RM	3/8"	JXR MALE FITTING		●
6R	3/8"	JXR FEMALE FITTING		●
6S	3/8"	DOUBLE FERRULE FITTING		●

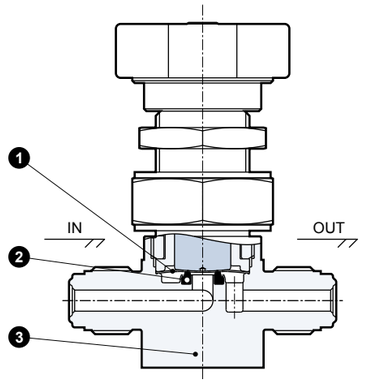
Note) JXR fitting can be connected to VCR fitting.

Specifications

Item	MGD10R	MGD20R
Applicable Fluid	Inert gas / Process gas	
Operating Pressure Pa (abs) - MPa (G)	1.3×10^{-6} to 0.99	
Fluid Temperature °C	5 to 80	
Operating Ambient Temperature °C	5 to 80	
Storage Ambient Temperature °C	-10 to 80	
Valve Seat Leakage Pa·m³/s (He)	1.0×10^{-10} or less	
Valve Seat Leakage Pa·m³/s (He)	2.8×10^{-12} or less	
Cv Value (at 23°C, under pressure)	0.3	0.65
Connection Method	1/4" JXR Male Fitting 1/4" JXR Female Fitting 1/4" Double Ferrule Fitting	3/8" JXR Male Fitting 3/8" JXR Female Fitting 3/8" Double Ferrule Fitting
Weight kg	0.30 *1	0.64 *1
Durability	Proven 60,000 cycles *2	

*1: Values for MGD10R-4RM (1/4" JXR male fitting) and MGD20R-6RM (3/8" JXR male fitting).
*2: Service life when the applicable fluid is an inert gas within the specifications and does not contain solid matter such as reaction products.

Internal Structure Diagram and Materials



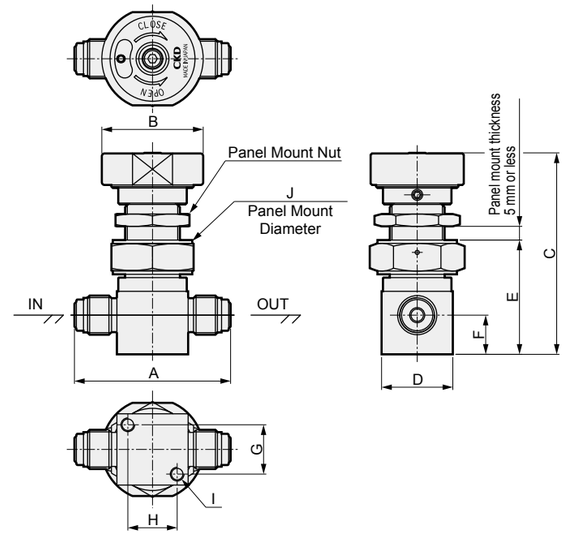
Gas-wetted Materials

Part No.	Part Name	Material
1	Diaphragm	Ni-Co Alloy
2	Valve Seat	PCTFE
3	Body	SUS316L

External Dimensions

MGD10R-4RM
MGD20R-6RM

●JXR Male Fitting

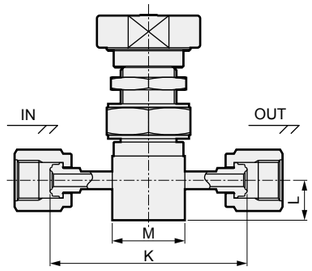


Model No.	A	B	C	D	E	F	G	H	I	J
MGD10R-4RM	57	ø37	74	□26	42	14.3	18	18	2-M5 Depth 6	ø20.5
MGD20R-6RM	76	ø37	86	□34	57	16	20.2	20.2	2-M5 Depth 8	ø20.5

Note) The panel mount nut is not included with the standard product. Products with a panel mount nut are special-order items.

MGD10R-4R
MGD20R-6R

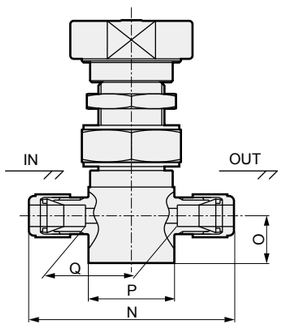
●JXR Female Fitting



Model No.	K	L	M
MGD10R-4R	70.6	14.3	□26
MGD20R-6R	83	16	□34

MGD10R-4S
MGD20R-6S

●Double Ferrule Fitting



Model No.	N	O	P	Q
MGD10R-4S	62	14.3	□26	27.8
MGD20R-6S	80	16	□34	44.3

Manual Valve for Process Gas

Optional Products

MGD□0R Series

RoHS Special Specifications

Model	Option Details
MGD□0R	Body option (39P. to 42). ●Connection Method ●Port Shape Combination ●Handle Color 
	Safety specification options (43Page) ●Double-Action Mechanism 

Model No. Notation Method

MGD 1 0R - 4 RJ - MF - K

1 Size (Model No.) | 2 Port Size | 3 Connection Method | 4 Port Shape Combination | 5 Handle Color

1 Size

Code	Content
1	1/4"
2	3/8"

2 Port Size

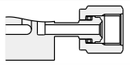
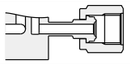
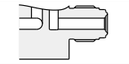
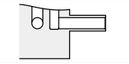
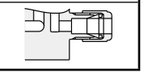
Code	Content	Model No. MGD1	Model No. MGD1
4	1/4"	●	
6	3/8"		●
8	1/2"		●

4 Port Shape Combination: Refer to the options compatibility table.

Content			Code
2-Port Valve		IN, OUT Same fitting type	Blank
		IN: Male OUT: Female	MF
		IN: Female OUT: Male	FM
3-Port Diverter Valve		abc Female-Female-Female	FFF
		abc Female-Female-Male	FFM
		abc Female-Male-Male	FMM
		abc Male-Male-Male	MMM
		abc Automatic Weld Fitting	WWW
		abc □/□/□ (*1)	□□□

*1:Select the following codes for □.
F: Female, M: Male, W: Fittings Automatic welding Free combination

3 Connection Method: Refer to the options compatibility table.

Code	Content	
RJ	JXR Female Fitting (with bearing)	
R	JXR Female Fitting	
RM	JXR Male Fitting	
W	Automatic Weld Fitting	
S	Double Ferrule Fitting	

5 Handle Color

Code	Content	
Blank	Silver	
K	Black	
B	Blue	
Y	Yellow	
R	Red	

3 4 Options Compatibility Table

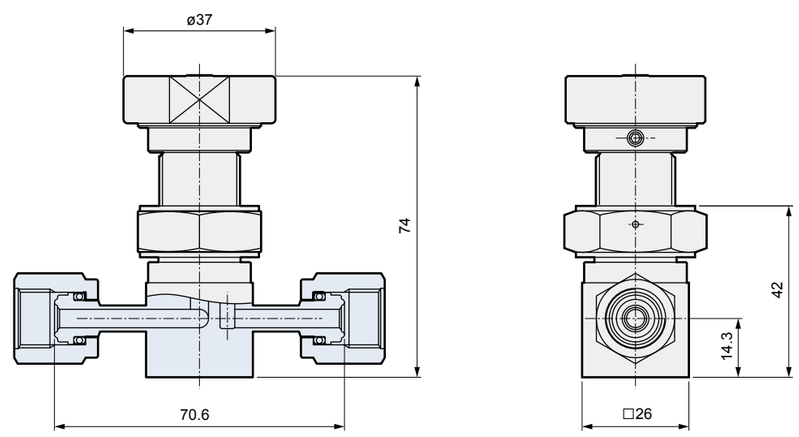
4 Port Shape Combination \ 3 Connection Method	RJ	R	RM	W	S
Blank	●	●	●	●	●
MF	●	●			
FM	●	●			
FFF	●	●			
FFM	●	●			
FMM	●	●			
MMM			●		
WWW				●	
□□□	●	●	●	●	●

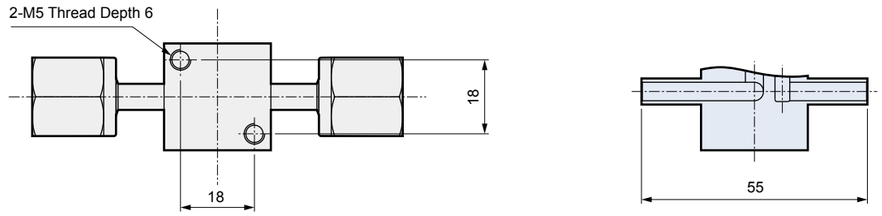
MGD10R 2-Port Valve **Special Specifications**

External Dimensions

MGD10R-4RJ (-K, B, Y, R) (1/4" JXR Female Fitting (with bearing) Type)
MGD10R-4R (-K, B, Y, R) (1/4" JXR Female Fitting Type)
MGD10R-4RM (-K, B, Y, R) (1/4" JXR Male Fitting Type)
MGD10R-4W (-K, B, Y, R) (1/4" Automatic Weld Fitting Type)
MGD10R-4S (-K, B, Y, R) (1/4" Double Ferrule Fitting Type)

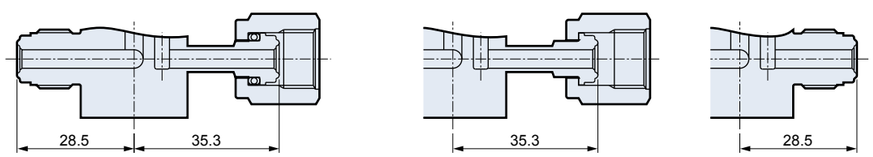
Diagram shows MGD10R-4RJ-K
Female fitting (with bearing)





Weld fitting: 4W

MGD10R-4RJ-□□ (-K, B, Y, R) (1/4" JXR Female (with bearing) - Male Combination Type)
MGD10R-4R-□□ (-K, B, Y, R) (1/4" JXR Female - Male Combination Type)



Female fitting (with bearing) | Female fitting: 4R | Male fitting: 4RM

MGD10R 3-Port Diverter Valve **Special Specifications**

External Dimensions

MGD10R-4RJ-□□□ (-K, B, Y, R) (1/4" JXR Female Fitting (with bearing) Combination Type)
MGD10R-4R-□□□ (-K, B, Y, R) (1/4" JXR Female Fitting Combination Type)
MGD10R-4RM-MMM (-K, B, Y, R) (1/4" JXR Male Fitting Type)
MGD10R-4W-□□□ (-K, B, Y, R) (1/4" Automatic Weld Fitting Combination Type)

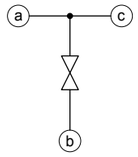
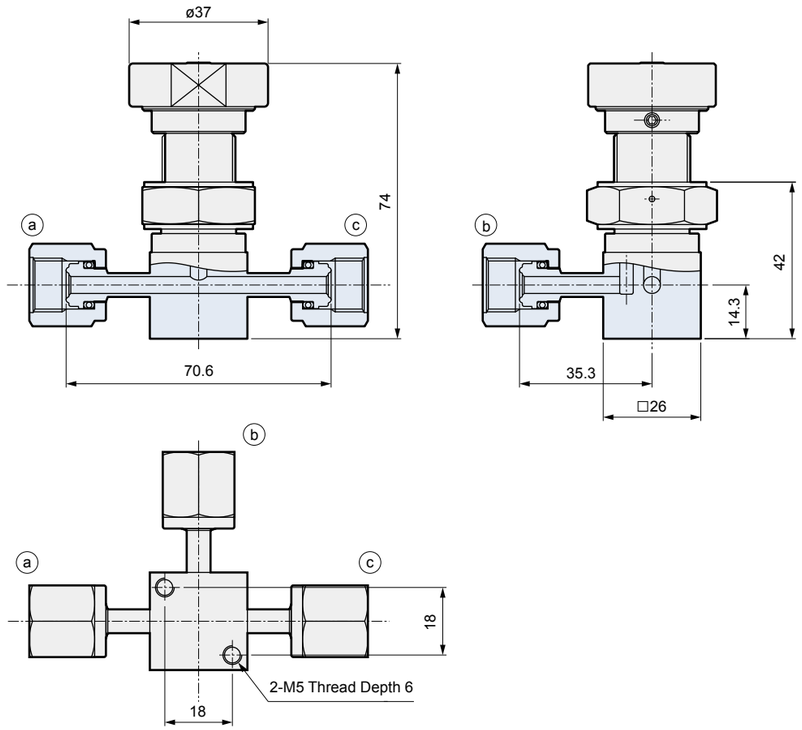
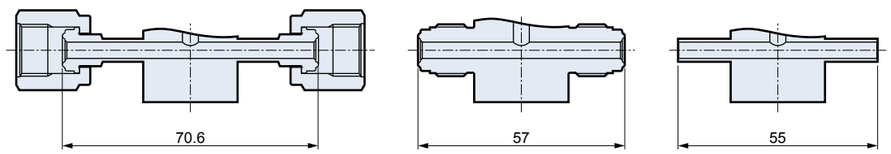


Diagram shows MGD10R-4RJ-FFF-K
Female fitting (with bearing)

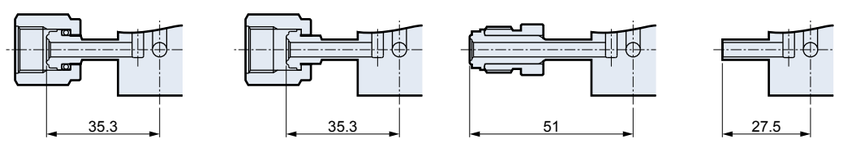


[Main Port]



Female fitting: 4R | Male fitting: 4RM | Weld fitting: 4W

[Branch Port]



Female fitting: 4RJ-□F□ (with bearing) | Female fitting: 4R-□F□ | Male fitting: -□M□ | Weld fitting: -□W□

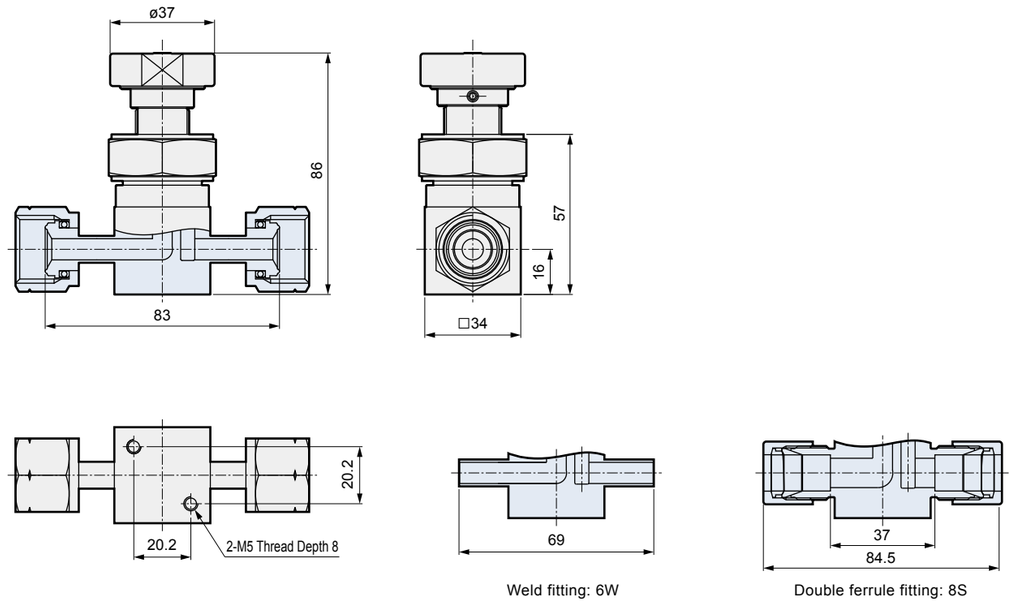
MGD20R 2-Port Valve **Special Specifications**

External Dimensions

MGD20R-6RJ (-K, B, Y, R) (3/8" JXR Female Fitting (with bearing) Type)
MGD20R-6R (-K, B, Y, R) (3/8" JXR Female Fitting Type)
MGD20R-6RM (-K, B, Y, R) (3/8" JXR Male Fitting Type)
MGD20R-6W (-K, B, Y, R) (3/8" Automatic Weld Fitting Type)
MGD20R-6S (-K, B, Y, R) (3/8" Double Ferrule Fitting Type)

• 1/2" size also available. The face-to-face dimension is the same as the 3/8" size. (Double ferrule fittings are different)

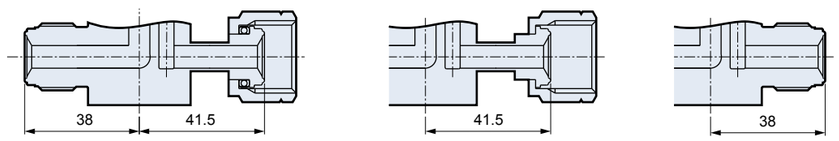
Diagram shows MGD20R-6RJ-K
Female fitting (with bearing)



Weld fitting: 6W | Double ferrule fitting: 8S

MGD20R-6RJ-□□ (-K, B, Y, R) (3/8" JXR Female (with bearing) - Male Combination Type)
MGD20R-6R-□□ (-K, B, Y, R) (3/8" JXR Female - Male Combination Type)

• 1/2" size also available. The face-to-face dimension is the same as the 3/8" size.

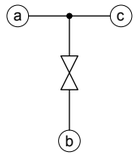


Female fitting: 6RJ (with bearing) | Female fitting: 6R | Male fitting: 6RM

MGD20R 3-Port Diverter Valve Special Specifications

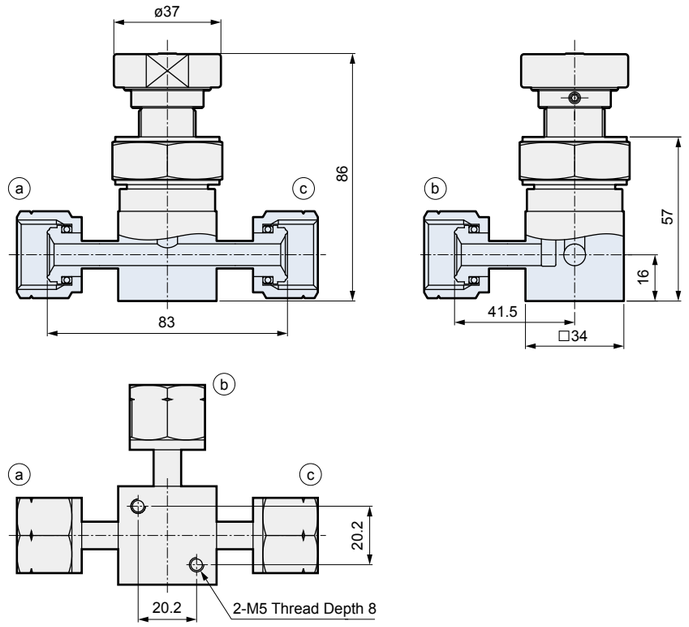
External Dimensions

MGD20R-6RJ-□□□ (3/8" JXR Female Fitting (with bearing) Combination Type)
MGD20R-6R-□□□ (3/8" JXR Female Fitting Combination Type)
MGD20R-6RM-MMM (3/8" JXR Male Fitting Type)
MGD20R-6W-□□□ (3/8" Automatic Weld Fitting Combination Type)

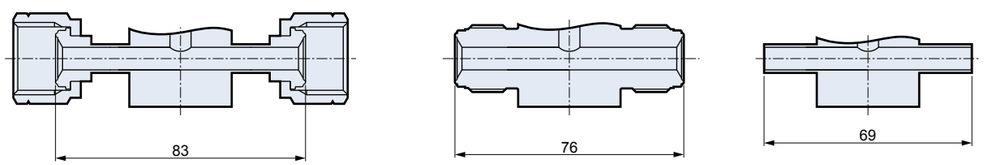


・1/2" size also available. The face-to-face dimension is the same as the 3/8" size.

Diagram shows MGD20R-6RJ-FFF
Female fitting (with bearing)

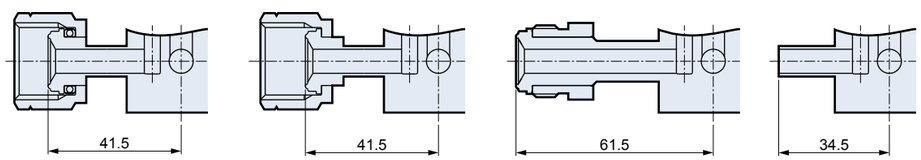


[Main Port]



Female fitting: 6R | Male fitting: 6RM | Weld fitting: 6W

[Branch Port]



Female fitting: 6RJ-□F□ (with bearing) | Female fitting: 6R-□F□ | Male fitting: -□M□ | Weld fitting: -□W□

Manual Valve Safety Specification Options Special Specifications

External View

MGD With Double-Action Mechanism

■Pushing and turning the handle (double-action) prevents erroneous operation.

*For details such as model numbers, please contact our sales representative.

To Use This Product Safely

Please be sure to read this before use.
For General Precautions refer to P. Intro 9.

Individual Precautions: Manual Valve for Process Gas, MGD Series

Design / Selection

1. Confirmation of Specifications

Warning

- This product is not designed to function as a safety valve, such as an emergency shut-off valve. If such a function is required, please implement other reliable safety measures.
- Incorrect equipment selection and handling can cause problems not only in this product, but also to your system. Product selection and handling should be performed after confirming the product specifications and their suitability for the customer's system, at the customer's own responsibility.
- Check the compatibility between the gas contact part materials and working fluid before use.
- Use within the specified fluid temperature and pressure range.

2. Ambient Environment

Caution

- Do not use in atmospheres containing corrosive gases or in locations where substances that may affect the product such as chemicals, salt water, water or steam could make contact. Use within the specified ambient temperature range.

3. Securing Space

Caution

- Secure sufficient space for maintenance and inspection.

4. Piping

Warning

- Foreign materials or burrs in the piping and piping work could damage the valve seat or diaphragm seal, and lead to leaks. Before installing the valve, be sure to remove any debris or burrs and take measures such as installing a primary side filter.

Caution

- Make sure not to use the wrong connecting port when connecting the pipes to the product.
- When piping, do not apply tension, compression, bending or other forces to the valve body from the piping.
- If the tube for piping is bent, it will cause malfunctions; pipe with suitable tube lengths.

5. Purging

Caution

- When removing valves using toxic, combustible or corrosive gases, purge with an inert gas such as nitrogen gas before removal.

6. During Use

Warning

- Do not touch heater-equipped products with hands or body. Direct contact may cause burns.

Caution

- Do not use valves as a footing or place any heavy objects on top of the valves.
- Store unused products in a location where they are not exposed to direct sunlight or high temperatures.

For cautions about mounting, installation, adjustment, use, and maintenance, refer to CKD components Product Site (https://www.ckd.co.jp/kiki/jp/) → "Model No." Instruction Manuals

MEMO

Air Operated Valve for Process Gas

LGD□□ Series

●Metal diaphragm ●Forged body

RoHS

Model No. Notation Method

LGD1 1 - 4RM

- Model No.
- 1 Actuation Method
- 2 Connection Method

1 Actuation method

Code	Content
1	NC Type (Normally Closed)
2	NO Type (Normally Open)

2 Connection Method

Code	Content
4RM	1/4" Male Fitting (JXR Equivalent)
4R	1/4" Female Fitting (JXR Equivalent)
4S	1/4" Double Ferrule Fitting

Note) JXR fitting can be connected to VCR fitting.

LGD2 1 - 8RM

- Model No.
- 1 Actuation Method
- 2 Connection Method

1 Actuation method

Code	Content
1	NC Type (Normally Closed)
2	NO Type (Normally Open)

2 Connection Method

Code	Content
8RM	1/2" Male Fitting (JXR Equivalent)
8R	1/2" Female Fitting (JXR Equivalent)
6S	3/8" Double Ferrule Fitting
8S	1/2" Double Ferrule Fitting

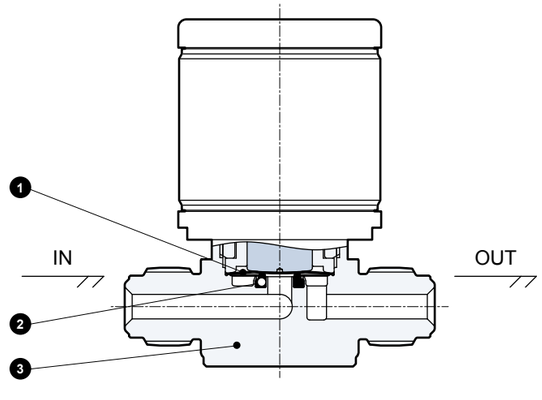
Note) JXR fitting can be connected to VCR fitting.

Specifications

Item	LGD1□	LGD2□
Applicable Fluid	Inert gas / Process gas	
Operating Pressure Pa (abs) - MPa (G)	1.3×10^{-6} to 0.99	
Fluid Temperature °C	5 to 80	
Ambient Temperature °C	5 to 80	
Valve Seat Leakage Pa·m³/sec.He	1.0×10^{-10} or less	
External Leakage Pa·m³/sec.He	1.0×10^{-10} or less	
Cv Value (at 23°C, under pressure)	0.3	3/8": 0.65 1/2": 0.7
Connection Method	1/4" JXR Male Fitting Equivalent 1/4" JXR Female Fitting Equivalent 1/4" Double Ferrule Fitting	1/2" JXR Male Fitting equivalent (compatible with 3/8") 1/2" JXR Female Fitting equivalent (compatible with 3/8") 3/8" Double Ferrule Fitting 1/2" Double Ferrule Fitting
Actuation Method	NC Type (Normally Closed) NO Type (Normally Open)	
Operating Pressure MPa	NC: 0.4 to 0.6 NO: 0.4 to 0.5	
Pilot Port	M5	
Weight *1 kg	0.23	0.57
Durability	Proven 3 million cycles *2	

*1: Weight is for the JXR male fitting equivalent.
*2: Service life when the applicable fluid is an inert gas within the specifications and does not contain solid matter such as reaction products.

Internal Structure Diagram/Material



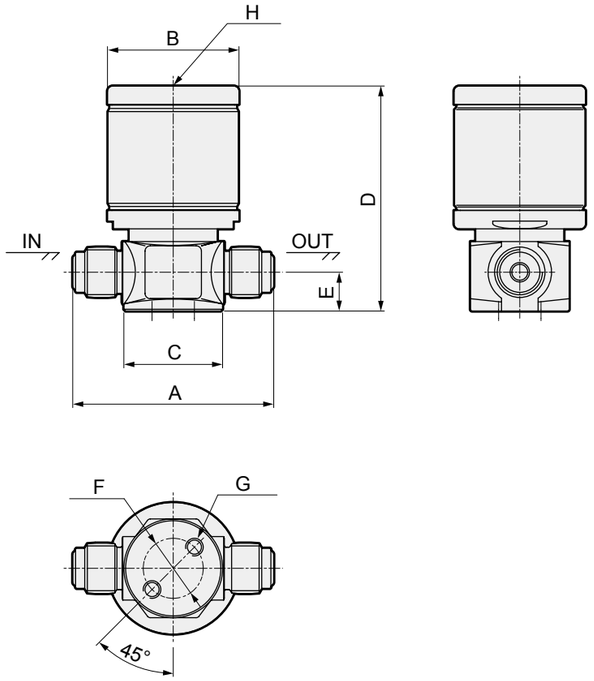
Gas-wetted Materials

Part No.	Part Name	Material
1	Diaphragm	Ni-Co Alloy
2	Valve Seat	PCTFE
3	Body	SUS316L

External Dimensions

LGD□□-□RM

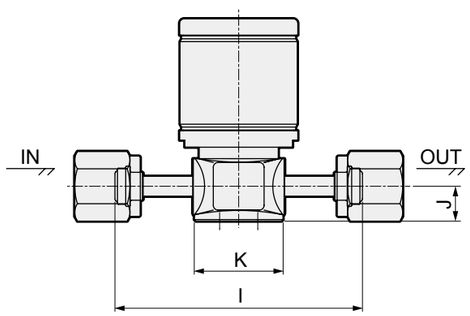
●JXR male Fitting equivalent



Model No.	A	B	C	D	E	F	G	H
LGD1□-4RM	57	ø37	ø28	64	11	ø17	2-M5 Thread Depth 5	M5
LGD2□-8RM	77	ø48.3	ø38	87	16	ø28	2-M5 Thread Depth 6	M5

LGD□□-□R

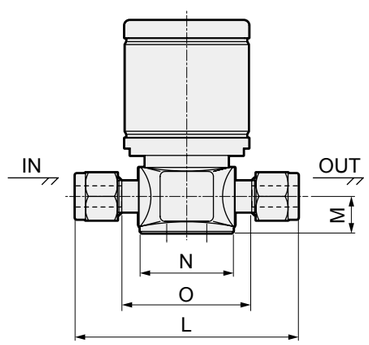
●JXR Female Fitting equivalent



Model No.	I	J	K
LGD1□-4R	78	11	ø28
LGD2□-8R	104.6	16	ø38

LGD□□-□S

●Double Ferrule Fitting



Model No.	L	M	N	O
LGD1□-4S	67	11	ø28	39.1
LGD2□-6S	82.5	16	ø38	48.9
LGD2□-8S	90.2	16	ø38	44.6

MEMO

Manual Valve for Process Gas

LGD□0 Series

●Metal diaphragm ●Forged body
●180° rotation

RoHS

Model No. Notation Method

LGD10 - 4RM

Model No. ❶ Connection Method

LGD20 - 8RM

Model No. ❶ Connection Method

❶Connection Method

Code	Content
4RM	1/4" Male Fitting (JXR Equivalent)
4R	1/4" Female Fitting (JXR Equivalent)
4S	1/4" Double Ferrule Fitting

Note) JXR fitting can be connected to VCR fitting.

❶Connection Method

Code	Content
8RM	1/2" Male Fitting (JXR Equivalent)
8R	1/2" Female Fitting (JXR Equivalent)
6S	3/8" Double Ferrule Fitting
8S	1/2" Double Ferrule Fitting

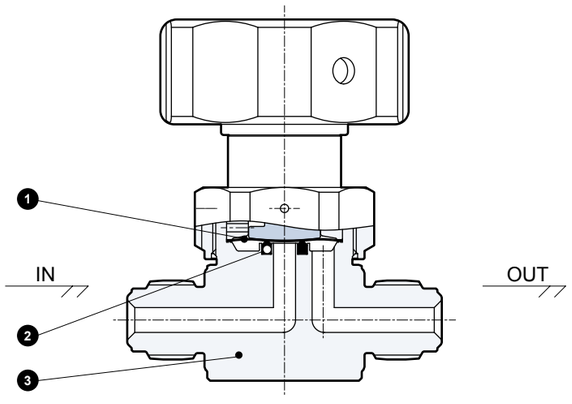
Note) JXR fitting can be connected to VCR fitting.

Specifications

Item	LGD10	LGD20
Applicable Fluid	Inert gas / Process gas	
Operating Pressure Pa(abs)-MPa(G)	1.3×10^{-6} to 0.99	
Fluid Temperature °C	5 to 80	
Ambient Temperature °C	5 to 60	
Valve Seat Leakage Pa·m³/sec.He	1.0×10^{-10} or less	
External Leakage Pa·m³/sec.He	1.0×10^{-10} or less	
Cv Value (at 23°C, under pressure)	0.3	0.7
Connection Method	1/4" JXR Male Fitting Equivalent 1/4" JXR Female Fitting Equivalent 1/4" Double Ferrule Fitting	Equivalent to 1/2" JXR Male Fitting (3/8" compatible) Equivalent to 1/2" JXR Female Fitting (3/8" compatible) 3/8" Double Ferrule Fitting 1/2" Double Ferrule Fitting
Weight *1 kg	0.26	0.57
Durability	Proven 60,000 cycles *2	

*1: Weight is for the JXR male fitting equivalent.
*2: Service life when the applicable fluid is an inert gas within the specifications and does not contain solid matter such as reaction products.

Internal Structure Diagram and Materials



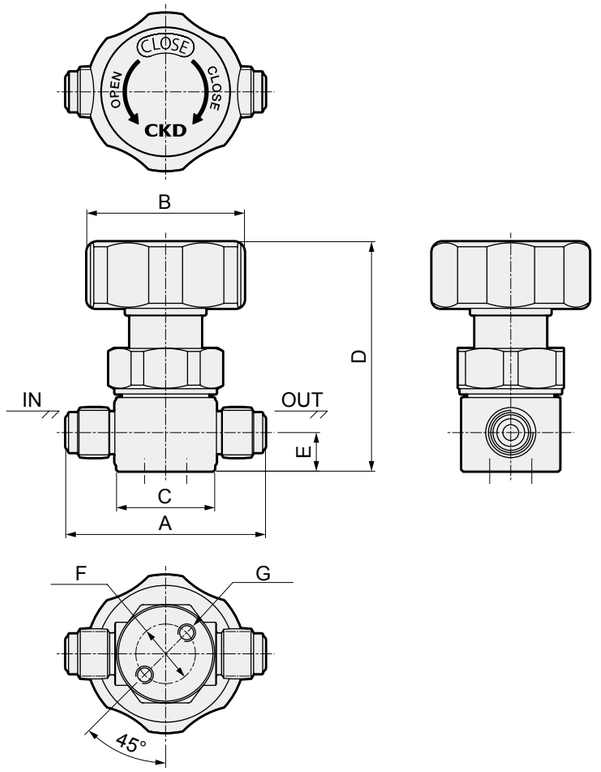
Gas-wetted Materials

Part No.	Part Name	Material
1	Diaphragm	Ni-Co Alloy
2	Valve Seat	PCTFE
3	Body	SUS316L

External Dimensions

LGD□0-□RM

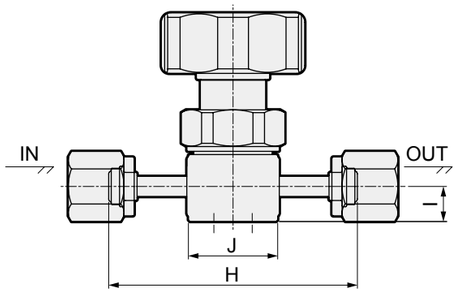
●JXR male Fitting equivalent



Model No.	A	B	C	D	E	F	G
LGD10-4RM	57	ø45	ø28	65	11	ø17	2-M5 Thread Depth 5
LGD20-8RM	77	ø45	ø38	79	16	ø28	2-M5 Thread Depth 6

LGD□0-□R

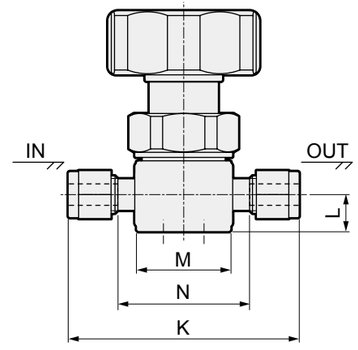
●JXR Female Fitting equivalent



Model No.	H	I	J
LGD10-4R	78	11	ø28
LGD20-8R	104.6	16	ø38

LGD□0-□S

●Double Ferrule Fitting



Model No.	K	L	M	N
LGD10-4S	67	11	ø28	39.1
LGD20-6S	82.5	16	ø38	48.9
LGD20-8S	90.2	16	ø38	44.6

Components for Process Gas

To Use This Product Safely

Please be sure to read this before use.
For General Precautions refer to Intro 9.

Individual Precautions: Process Gas Valve LGD Series

Design / Selection

1. Confirmation of Specifications

Warning

■This product is not designed to function as a safety valve, such as an emergency shut-off valve. If such a function is required, please implement other reliable safety measures.

■Incorrect equipment selection and handling can cause problems not only in this product, but also to your system. Product selection and handling should be performed after confirming the product specifications and their suitability for the customer's system, at the customer's own responsibility.

■Check the compatibility between the gas contact part materials and working fluid before use.

■Use within the specified fluid temperature and pressure range.

2. Ambient Environment

Caution

■Do not use in atmospheres containing corrosive gases or in locations where substances that may affect the product such as chemicals, salt water, water or steam could make contact. Use within the specified ambient temperature range.

3. Securing Space

Caution

■Secure sufficient space for maintenance and inspection.

4. Piping

Warning

■Foreign materials or burrs in the piping and piping work could damage the valve seat or diaphragm seal, and lead to leaks. Before installing the valve, be sure to remove any debris or burrs and take measures such as installing a primary side filter.

Caution

■Make sure not to use the wrong connecting port when connecting the pipes to the product.

■When piping, do not apply tension, compression, bending or other forces to the valve body from the piping.

■If the tube for piping is bent, it will cause malfunctions; pipe with suitable tube lengths.

■Use the driving solenoid valve connected to the drive unit according to the specifications or applications.

■As for operating air, use air or inert gas passed through a filter with a filtration rating of 5 μm or more.

5. Purging

Caution

■When removing valves using toxic, combustible or corrosive gases, purge with an inert gas such as nitrogen gas before removal.

6. During Use

Warning

■Do not touch heater-equipped products with hands or body. Direct contact may cause burns.

Caution

■Do not use valves as a footing or place any heavy objects on top of the valves.

■Store unused products in a location where they are not exposed to direct sunlight or high temperatures.

For cautions about mounting, installation, adjustment, use, and maintenance, refer to CKD components Product Site (https://www.ckd.co.jp/kiki/jp/) → "Model No." Instruction Manuals

MEMO

AGD□□R-HD/-HDF
AGD21R-A

Process Gas Valve, High Durability Type

Overview

This is a process gas valve that meets the high durability demands driven by advancements in miniaturization. Three types are available to meet customer needs.

Features

This high durability valve achieves high-temperature, long-term stable operation.

- ●AGD□□R-HD
  Proven durability of 30 million cycles
- ●AGD□□R-HDF
  Proven durability of 30 million cycles
  200°C Compatible
  Equipped with a stable response actuator
- ●AGD21R-A
  Proven durability of 100 million cycles
  200°C Compatible
  Equipped with a stable response actuator
  Response deviation of ±2 msec after 100 million cycles
  *Proven values

CONTENTS

AGD□□R-HD-HDF
AGD21R-A Series

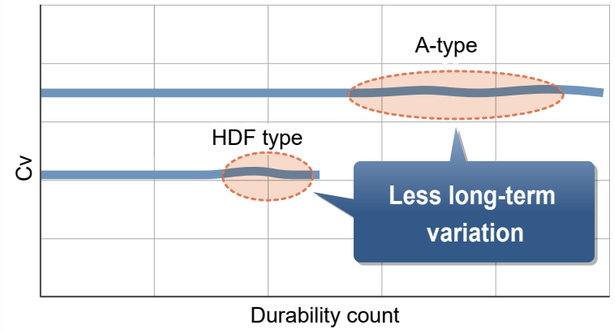
Ideal for ALD processes! High durability valve with excellent high-temperature performance, high Cv, and stable response.

This is a process gas valve with the high durability required by advancements in miniaturization. Four types are available to meet customer needs.

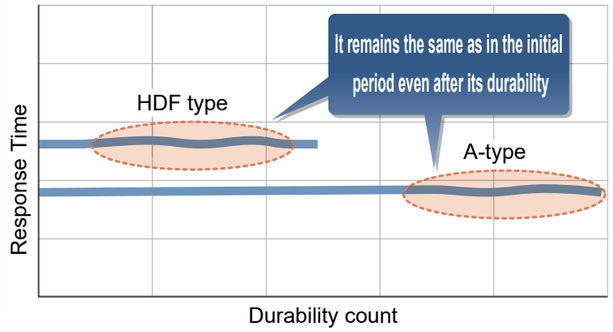
Contributes to process stabilization with long-term stable performance.

Suppressing Cv value variation leads to a stable gas flow supply, contributing to the stabilization of film deposition quality.

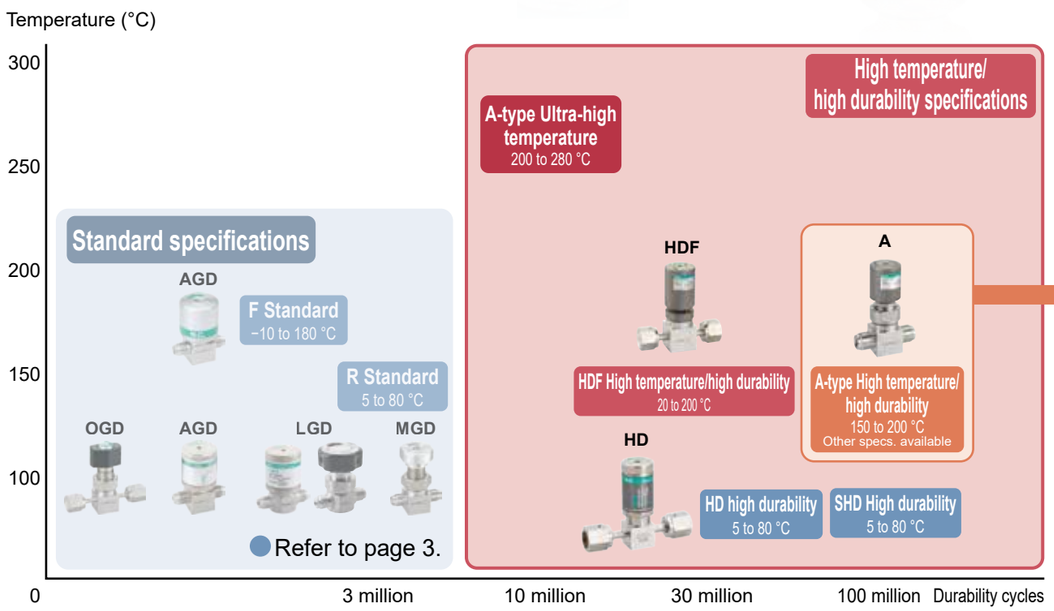
Cv Stability



Response Stability

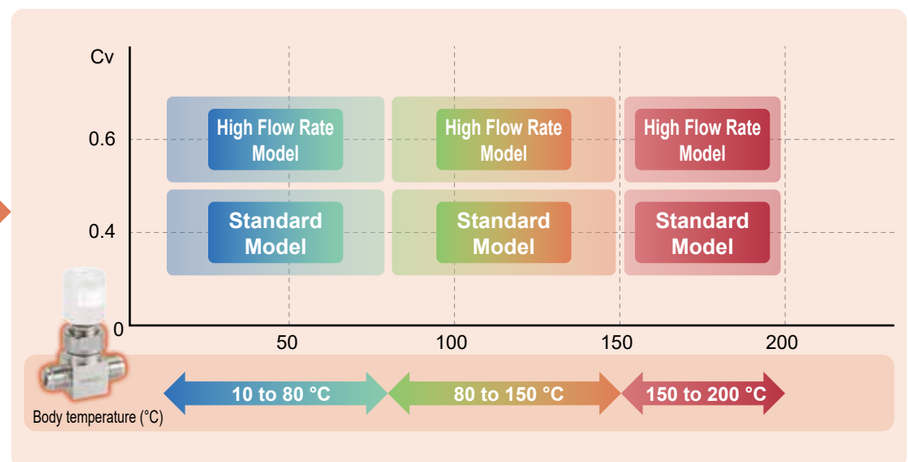


Process Gas Valve Lineup



AGD21R-A Series lineup

*For requirements regarding Cv, contact CKD



Process Gas Valve, High Durability Type

AGD□□R-HD Series

●Normal temperature specifications

Special Specifications

Model No. Notation Method

AGD0 1 R - HD - 4RM

- Model No.
- ❶ Actuation Method
- ❷ Connection Method

❶Actuation method

Code	Content
1	NC Type (Normally Closed)
2	NO Type (Normally Open)

❷Connection Method

Code	Content
4RM	1/4" JXR Male Fitting
4R	1/4" JXR Female Fitting

AGD1 1 R - HD - 4RM

- Model No.
- ❶ Actuation Method
- ❷ Connection Method

❶Actuation method

Code	Content
1	NC Type (Normally Closed)
2	NO Type (Normally Open)

❷Connection Method

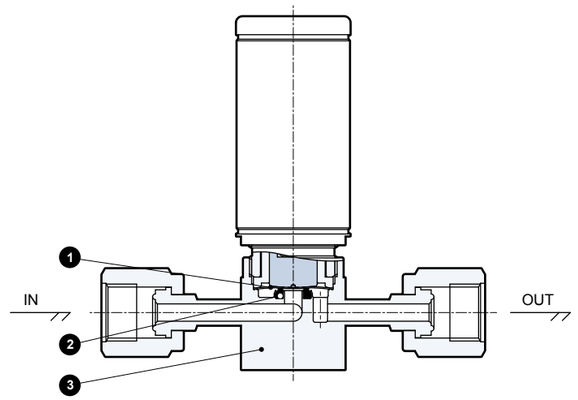
Code	Content
4RM	1/4" JXR Male Fitting
4R	1/4" JXR Female Fitting
4S	1/4" Double Ferrule Fitting

Specifications

Item	AGD0□R-HD	AGD1□R-HD
Applicable Fluid	Inert gas / Process gas	
Operating Pressure Pa (abs) to MPa (G)	1.3×10^{-6} to 0.99	
Fluid temperature °C	5 to 80	
Operating Ambient Temperature °C	5 to 80	
Storage Ambient Temperature °C	-10 to 80	
Valve Seat Leakage Pa·m³/s (He)	1.0×10^{-10} or less 1.3×10^{-9} or less	
External Leakage Pa·m³/s (He)	2.8×10^{-12} or less	
Cv Value (at 23°C, under pressure)	0.1	0.3
Connection Method	1/4" JXR Male Fitting 1/4" JXR Female Fitting	1/4" JXR Male Fitting 1/4" JXR Female Fitting 1/4" Double Ferrule Fitting
Actuation Method	NC Type (Normally Closed) NO Type (Normally Open)	
Operating Pressure MPa	NC: 0.4 to 0.6 NO: 0.4 to 0.5	
Pilot Port	M5	
Weight kg	0.16 *1	0.25 *1
Durability	Results: 30 million cycles or more *2	
Option	Block Valve, with Proximity Sensor (OMRON)	

*1: Values for AGD01R-HD-4RM (1/4" JXR male fitting) and AGD11R-HD-4RM (1/4" JXR male fitting).
*2: Service life when the applicable fluid is an inert gas within the specifications and does not contain solid matter such as reaction products.

Internal Structure Diagram and Materials



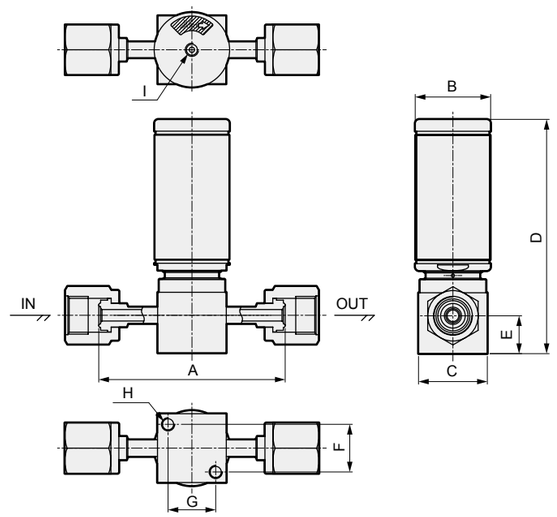
Gas-wetted Materials

Part No.	Part Name	Material
1	Diaphragm	Ni-Co Alloy
2	Valve Seat	PCTFE
3	Body	SUS316L

External Dimensions

AGD□□R-HD-4R

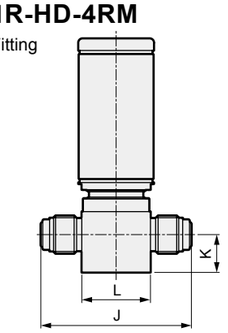
●JXR Female Fitting



Model No.	A	B	C	D	E	F	G	H	I
AGD0□R-HD-4R	66	ø26.2	□21	71	11	14	14	2-M4 Thread Depth 5	M5
AGD1□R-HD-4R	70.6	ø28	□26	89	14.3	18	18	2-M5 Thread Depth 6	M5

AGD□□R-HD-4RM

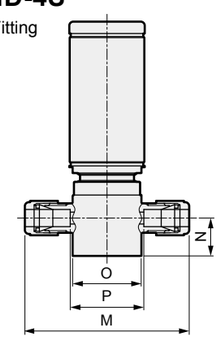
●JXR Male Fitting



Model No.	J	K	L
AGD0□R-HD-4RM	52	11	□21
AGD1□R-HD-4RM	57	14.3	□26

AGD1□R-HD-4S

●Double Ferrule Fitting



Model No.	M	N	O	P
AGD1□R-HD-4S	62	14.3	□26	27.8

Process Gas Valve, High Durability Type

AGD□□R-HDF Series

●High-Temperature Specification

Special Specifications

Model No. Notation Method

AGD1 1 R - HDF - 4RM

- Model No.
- ❶ Actuation Method
- ❷ Connection Method

❶Actuation method

Code	Content
1	NC Type (Normally Closed)
2	NO Type (Normally Open)

❷Connection Method

Code	Content
4RM	1/4" JXR Male Fitting
4R	1/4" JXR Female Fitting
4S	1/4" Double Ferrule Fitting

AGD2 1 R - HDF - 6RM

- Model No.
- ❶ Actuation Method
- ❷ Connection Method

❶Actuation method

Code	Content
1	NC Type (Normally Closed)
2	NO Type (Normally Open)

❷Connection Method

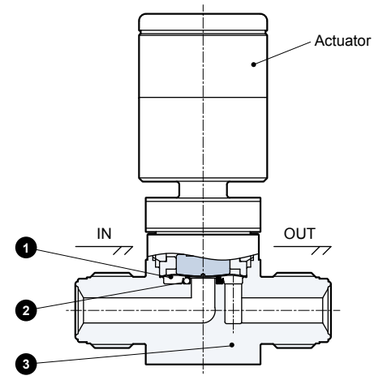
Code	Content
6RM	3/8" JXR Male Fitting
6R	3/8" JXR Female Fitting
6S	3/8" Double Ferrule Fitting

Specifications

Item	AGD1□R-HDF	AGD2□R-HDF
Applicable Fluid	Inert gas / Process gas	
Operating Pressure Pa (abs) to MPa (G)	1.3×10^{-6} to 0.5	
Fluid temperature °C	20 to 200 *1	
Operating Ambient Temperature °C	20 to 150	
Storage Ambient Temperature °C	-10 to 80	
Valve Seat Leakage Pa·m³/s (He)	1.0×10^{-10} or less (at 23°C)	
External Leakage Pa·m³/s (He)	2.8×10^{-12} or less	
Cv Value (at 23°C, under pressure)	0.3	0.65
Connection Method	1/4" JXR Male Fitting 1/4" JXR Female Fitting 1/4" Double Ferrule Fitting	3/8" JXR Male Fitting 3/8" JXR Female Fitting 3/8" Double Ferrule Fitting
Actuation Method	NC Type (Normally Closed) NO Type (Normally Open)	
Operating Pressure MPa	NC: 0.4 to 0.6 NO: 0.4 to 0.5	
Pilot Port	M5	
Weight kg	0.3 *2	0.7 *2
Durability	Results: 30 million cycles or more *3	
Option	With Open/Close Detection Sensor	

*1: Actuator section must be 150°C or less.
*2: Values for AGD11R-HDF-4RM (1/4" JXR male fitting) and AGD21R-HDF-6RM (3/8" JXR male fitting).
*3: Service life when the applicable fluid is an inert gas within the specifications and does not contain solid matter such as reaction products.

Internal Structure Diagram and Materials



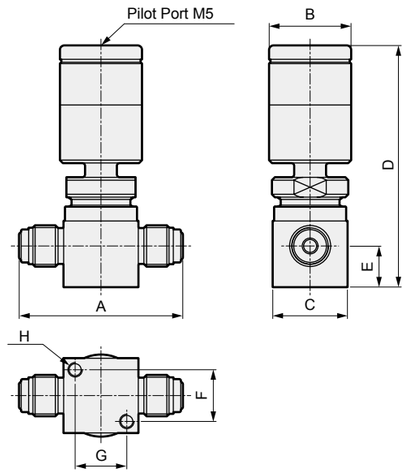
Gas-wetted Materials

Part No.	Part Name	Material
1	Diaphragm	Ni-Co Alloy
2	Valve Seat	PFA
3	Body	SUS316L

External Dimensions

AGD□□R-HDF-□RM

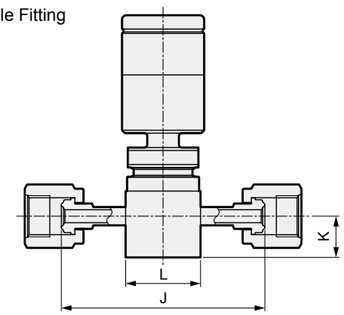
●JXR Male Fitting



Model No.	A	B	C	D	E	F	G	H	I
AGD1□R-HDF-4RM	57	ø28.5	□26	84	14.3	18	18	2-M5 Thread Depth 6	M5
AGD2□R-HDF-6RM	76	ø38	□34	104	16	20.2	20.2	2-M5 Thread Depth 8	M5

AGD□□R-HDF-□R

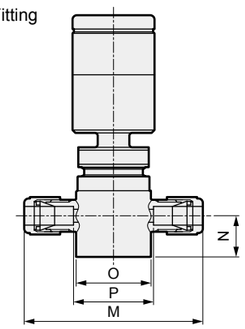
●JXR Female Fitting



Model No.	J	K	L
AGD1□R-HDF-4R	70.6	14.3	□26
AGD2□R-HDF-6R	83	16	□34

AGD□□R-HDF-□S

●Double Ferrule Fitting



Model No.	M	N	O	P
AGD1□R-HDF-4S	62	14.3	□26	27.8
AGD2□R-HDF-6S	80	16	□34	44.3

Process Gas Valve, High Durability Type

AGD21R-A Series

●High temperature limited specifications

RoHS | Special Specifications

Model No. Notation Method

AGD21R - A - 6RM

Model No. | ❶ Connection Method

❶Connection Method

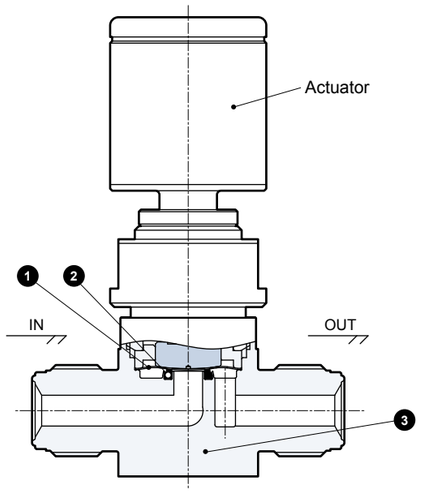
Code	Content
6RM	3/8" JXR Male Fitting
6R	3/8" JXR Female Fitting
6S	3/8" Double Ferrule Fitting

Specifications

Item	AGD21R-A
Applicable Fluid	Inert gas / Process gas
Operating Pressure Pa (abs) - MPa (G)	1.3x10⁻⁶ to 0.5
Fluid temperature °C	150 to 200 *1
Operating Ambient Temperature °C	20 to 150
Storage Ambient Temperature °C	-10 to 80
Valve Seat Leakage Pa·m³/s (He)	1.0x10⁻⁷ or less (at 200°C)
Valve Seat Leakage Pa·m³/s (He)	2.8x10⁻¹² or less
Cv Value (at 200°C, under negative pressure)	0.4 or more
Connection Method	3/8" JXR Male Fitting 3/8" JXR Female Fitting 3/8" Double Ferrule Fitting
Actuation Method	NC Type (Normally Closed)
Operating Pressure MPa	0.4 to 0.6
Pilot Port	M5 *2
Weight kg	0.7
Durability	Results: 100 million cycles *3

*1: Actuator section must be 150°C or less.
*2: Optional ø4 one-touch fitting available
*3: Service life when the applicable fluid is an inert gas within the specifications and does not contain solid matter such as reaction products.

Internal Structure Diagram and Materials



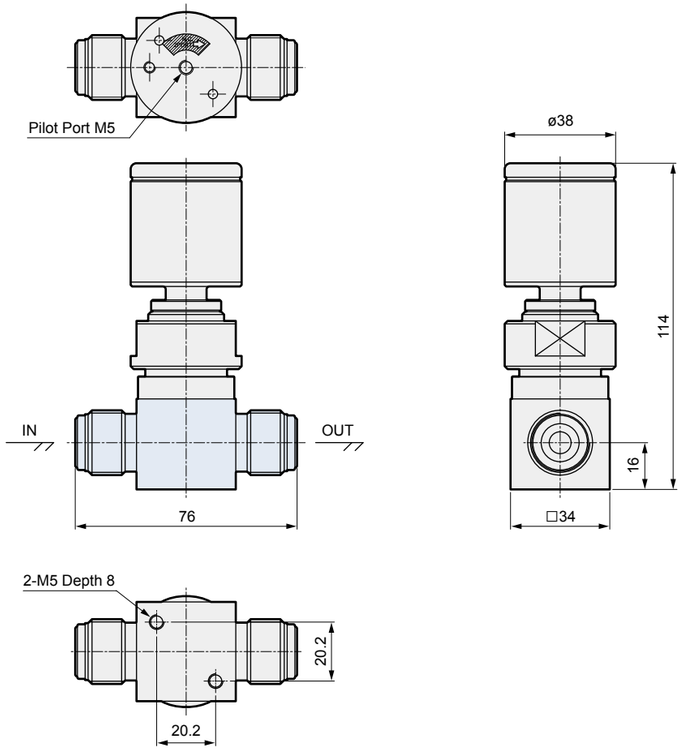
Gas-wetted Materials

Part No.	Part Name	Material
1	Diaphragm	Ni-Co Alloy
2	Valve Seat	PFA
3	Body	SUS316L

External Dimensions

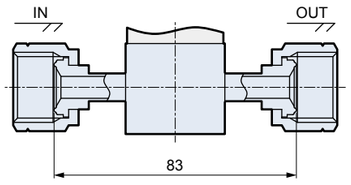
AGD21R-A-6RM

●JXR Male Fitting



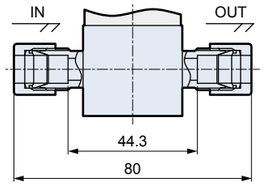
AGD21R-A-6R

●JXR Female Fitting



AGD21R-A-6S

●Double Ferrule Fitting



AGD21R-A Actuator Options

Optional Appearance Diagram

Special Specifications

AGD21R-A with Sensor

■ The sensor provides an output for confirming valve operation during opening and closing.

Fiber Sensor
E3NX-FA Series (OMRON)

To Use This Product Safely

Please be sure to read this before use.
For General Precautions refer to Intro 9.

Individual Precautions: Process Gas Valve High Durability Type AGD□□R-HD/HDF & AGD21R-A Series

Design / Selection

1. Confirmation of Specifications

Warning

■This product is not designed to function as a safety valve, such as an emergency shut-off valve. If such a function is required, please implement other reliable safety measures.

■Incorrect equipment selection and handling can cause problems not only in this product, but also to your system. Product selection and handling should be performed after confirming the product specifications and their suitability for the customer's system, at the customer's own responsibility.

■Check the compatibility between the gas contact part materials and working fluid before use.

■Use within the specified fluid temperature and pressure range.

2. Ambient Environment

Caution

■Do not use in atmospheres containing corrosive gases or in locations where substances that may affect the product such as chemicals, salt water, water or steam could make contact. Use within the specified ambient temperature range.

3. Securing Space

Caution

■Secure sufficient space for maintenance and inspection.

4. Piping

Warning

■Foreign materials or burrs in the piping and piping work could damage the valve seat or diaphragm seal, and lead to leaks. Before installing the valve, be sure to remove any debris or burrs and take measures such as installing a primary side filter.

Caution

■Make sure not to use the wrong connecting port when connecting the pipes to the product.

■When piping, do not apply tension, compression, bending or other forces to the valve body from the piping.

■If the tube for piping is bent, it will cause malfunctions; pipe with suitable tube lengths.

■Use the driving solenoid valve connected to the drive unit according to the specifications or applications.

■As for operating air, use air or inert gas passed through a filter with a filtration rating of 5 μm or more.

5. Purging

Caution

■When removing valves using toxic, combustible or corrosive gases, purge with an inert gas such as nitrogen gas before removal.

6. During Use

Warning

■Do not touch heater-equipped products with hands or body. Direct contact may cause burns.

Caution

■Do not use valves as a footing or place any heavy objects on top of the valves.

■Pay attention to the bending radius of the fiber when installing the product with sensor.

■Store unused products in a location where they are not exposed to direct sunlight or high temperatures.

For cautions about mounting, installation, adjustment, use, and maintenance, refer to CKD components Product Site (https://www.ckd.co.jp/kiki/jp/) → "Model No." Instruction Manuals

MEMO

VG/Flow Control Valve
Piston Type Check Valve

Other Process Gas Components

Overview

Related equipment used in process gas supply and auxiliary facilities.

Features

- Vacuum Generator VG
  High-efficiency nozzle adopted
  ・Energy saving
  ・Resistant to pressure fluctuations
- Flow Control Valve
  Two types available: Cv 0.03 and 0.2
- Piston Type Check Valve
  Kalrez® used for the valve seat

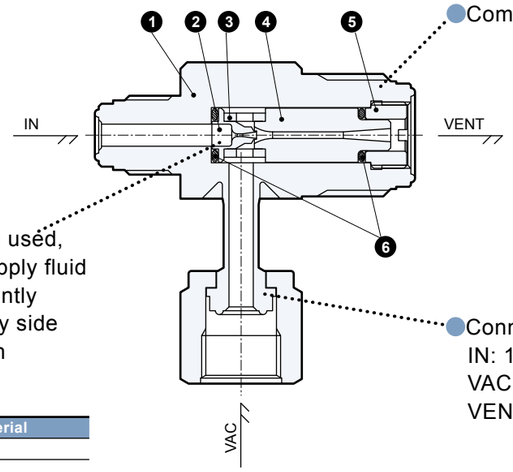
CONTENTS

Vacuum Generator for Process Gas Exhaust

VG Series

RoHS

Energy-saving type vacuum exhaust unit



- Compact Body
- High-efficiency nozzle used,
  1. Consumption of supply fluid is reduced significantly
  2. Resistant to primary side pressure fluctuation
- Connection is JXR fitting
  IN: 1/4" JXR Male Fitting
  VAC.: 1/4" JXR Female Fitting
  VENT: 3/8" JXR Male Fitting

Gas-wetted Materials

Part No.	Part Name	Material
1	Body	SUS316L
2	Nozzle	SUS316L
3	Spacer	SUS316L
4	Diffuser	SUS316L
5	Diffuser Retainer	SUS316L
6	O-ring	FKM or FFKM

Model No. Notation Method

VG - 05 F

- VG: Model No.
- 05: Nozzle Diameter [mm]: ø0.5
- F: 1 O-ring Material

1 O-ring Material

Code	Content
F	FKM
P	FFKM

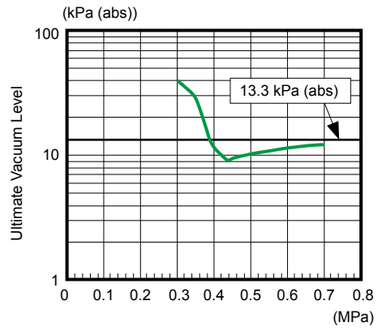
Specifications

Item	VG
Applicable Fluid	Inert gas / Process gas
Fluid Temperature °C	0 to 80
Supply Fluid	Nitrogen, Dry Air
Supply fluid pressure MPa	0.4 to 0.6 (During operation)
Supply Fluid Consumption L/min (ANR)	16 or less *1
Ultimate Vacuum Level kPa (abs)	13.3 or less
Exhaust Flow Rate L/min (ANR)	6 or more *1 *2
External Leakage Pa·m³/sec. (He)	2.8×10^{-12} or less
Proof Pressure MPa	3
Ambient Temperature °C	0 to 80
Connection Method	IN: 1/4" JXR Male Fitting (connectable to VCR fitting) VAC.: 1/4" JXR Female Fitting (connectable to VCR fitting) VENT: 3/8" JXR Male Fitting (connectable to VCR fitting)
Weight kg	0.2

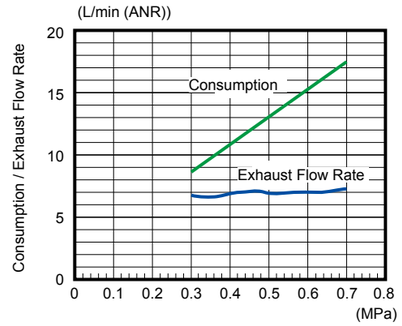
*1: At 0.5 MPa pressure (during operation)
*2: When the applicable fluid is air

Characteristic Curves

●Ultimate Vacuum



●Supply Fluid Consumption / Exhaust Flow Rate

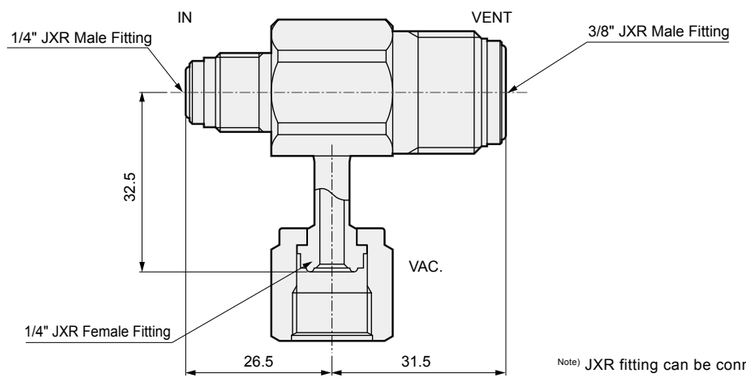


*Based on our company's test data

Note) An unusual noise (popping sound) may occur at a supply pressure slightly below the peak ultimate vacuum of the above characteristics (around 0.4 MPa). When this noise occurs, the characteristics are unstable, and the noise level increases. This may also affect sensors and cause trouble. Please increase the supply pressure within the specified range for use.

External Dimensions

●VG-05□



Note) JXR fitting can be connected to VCR fitting.

Components for Process Gas

To Use This Product Safely

Please be sure to read this before use.
For General Precautions refer to Intro 9.

Individual Precautions: Vacuum Generator for Process Gas Exhaust, VG Series

Design / Selection

1. Confirmation of Specifications

Warning

■Incorrect equipment selection and handling can cause problems not only in this product, but also to your system. Please be sure to confirm the specifications of this product and its compatibility with your system before use.

■Check the compatibility between the gas contact part materials and working fluid before use.

■Use within the specified fluid temperature and pressure range.

2. Ambient Environment

Caution

■Do not use in atmospheres containing corrosive gases or in locations where substances that may affect the product such as chemicals, salt water, water or steam could make contact. Use within the specified ambient temperature range.

3. Mounting

Warning

■Incorrect mounting and piping will result in product trouble, may cause trouble in the user's system, and may result in death or serious injury. The user is responsible for making sure that the operator has read the instruction manual and fully comprehends the system. After mounting, perform a proper functional inspection to ensure it is installed correctly.

Caution

■This product is assembled in class 10 and class 100 cleanrooms after precision cleaning treatment. Open the clean pack inside the packaging in a clean environment immediately before mounting.

■Fittings When mounting the product, touching the gas contact parts (body interior, seal surface) may result in adherence of foreign matter and contamination of high purity gas. Be careful not to touch the gas-wetted parts of this product during mounting.

4. Securing Space

Caution

■Secure sufficient space for installation, removal, piping and wiring work.

■Secure sufficient space for maintenance and inspection.

5. Piping

Warning

■Foreign materials or burrs in the piping and piping work could damage the valve seat or diaphragm seal, and lead to leaks. Before installing the valve, be sure to remove any debris or burrs and take measures such as installing a primary side filter.

Caution

■Make sure not to use the wrong connecting port when connecting the pipes to the product.

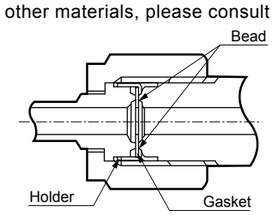
■When piping, do not apply tension, compression, bending or other forces to the valve body from the piping.

■If the tube for piping is bent, it will cause malfunctions; pipe with suitable tube lengths.

■Make sure that there is no Fittings foreign materials, scratches or burrs on the seal section before tightening the tube with the following procedures.

①Fitting Tightening Method

●JXR Fitting (when the gasket material is nickel/SUS316)
Hand-tighten the nut until the gasket contacts the bead surface, then use a tool to tighten it an additional 1/8 turn. (For other materials, please consult with us)



②After tightening the fitting, be sure to perform a leak test to confirm there are no leaks.

6. Baking

Caution

■Baking temperature should be within the specified temperature range of the product. Perform baking with the valve in the fully open state.

7. Purging

Caution

■When removing valves using toxic, combustible or corrosive gases, purge with an inert gas such as nitrogen gas before removal.

8. During Use

Warning

■Use this product within the specifications range.

■Do not touch heater-equipped products with hands or body. Direct contact may cause burns.

Caution

■Do not use valves as a footing or place any heavy objects on top of the valves.

9. Maintenance and Inspection

Warning

■Operate in accordance with the instruction manual.

■Always turn the power OFF and release any fluids or pressure before starting work.

■Fully replace the residual gas with inert gas, etc., before starting work so that it does not affect people or the surrounding components.

■After work, always carry out a leak test, and confirm that there are no leaks.

■Do not disassemble the valve.
If the product is disassembled without authorization and then repaired or reused, it will no longer be covered by the product warranty.

Caution

■Store unused products in a location where they are not exposed to direct sunlight or high temperatures.

Flow Rate Control Valve
Piston Type Check Valve

RoHS Special Specifications

●Flow Rate Control Valve

■Can be adjusted to max. Cv with about 10 turns of the handle

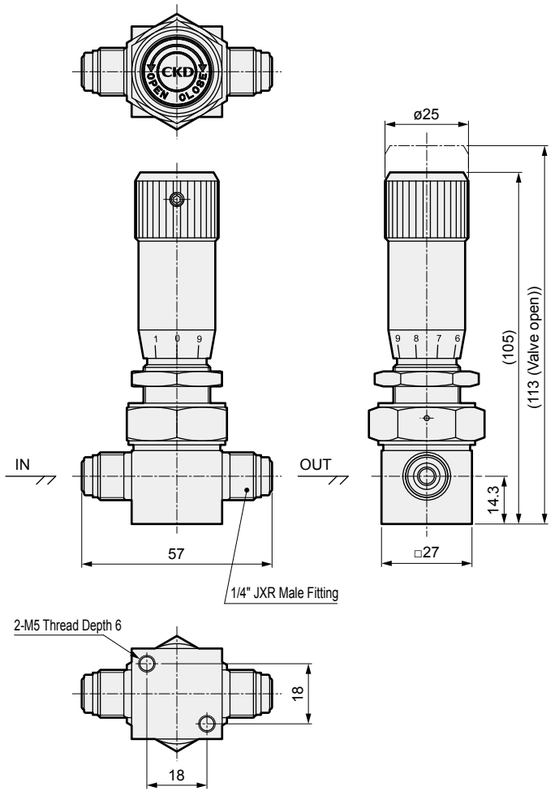
Specifications

Item	GYX-0328	GYX-0292
Applicable Fluid	Inert gas / Process gas	
Operating Pressure Pa (abs) - MPa (G)	$1.3x10^{-6}$ to 0.7	
Fluid temperature °C	-10 to 80	
Ambient Temperature °C	-10 to 80	
Valve Seat Leakage Pa·m³/s (He)	1/100 or less of the max. Cv value	
Valve Seat Leakage Pa·m³/s (He)	$2.8x10^{-12}$ or less	
Cv Value (Adjustment Range)	0.003 to 0.03	0.02 to 0.2
Connection Method Note)	1/4" JXR Male Fitting 1/4" JXR Female Fitting 1/4" Double Ferrule Fitting	

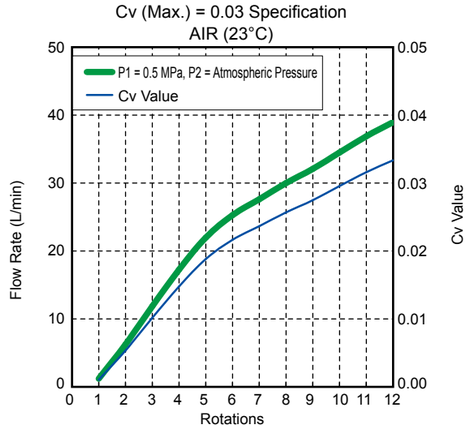
Note) JXR fitting can be connected to VCR fitting.

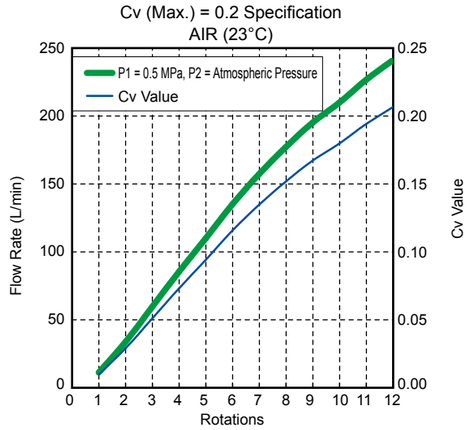
External Dimensions

●GYX-0292



Flow Control Valve Characteristic Data





These data are measured values of the product and are not guaranteed values.
Please use them as a reference when using the product.

●Piston Type Check Valve

■Valve seat material is Kalrez®

Specifications

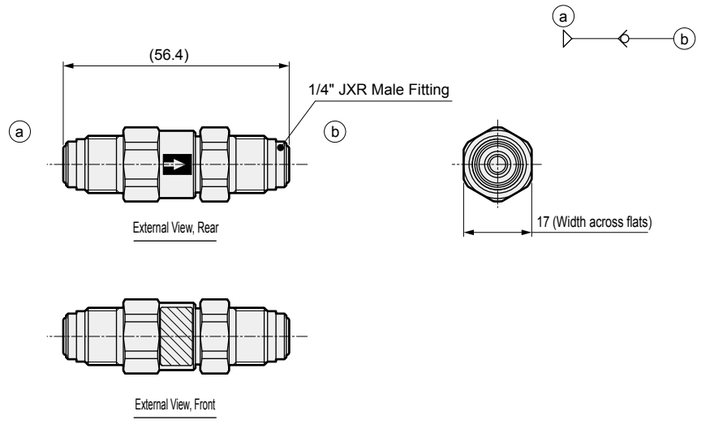
Item	GYX-0129
Applicable Fluid	Inert gas / Process gas
Operating Pressure Pa (abs) - MPa (G)	$1.3x10^{-6}$ to 0.99
Fluid temperature °C	-10 to 80
Ambient Temperature °C	-10 to 80
Valve Seat Leakage Pa·m³/s (He)	$4.7x10^{-8}$ or less
Valve Seat Leakage Pa·m³/s (He)	$2.8x10^{-12}$ or less
Cv Value (Max.)	0.25
Cracking Pressure kPa	2.3
Connection Method Note)	1/4" JXR Male Fitting 1/4" JXR Female Fitting 1/4" Double Ferrule Fitting

Note) JXR fitting can be connected to VCR fitting.

Kalrez® is a registered trademark of DuPont.

External Dimensions

●GYX-0129



PGM

Regulator for Process Gas

Overview

This is a regulator for process gas that uses a metal diaphragm. We meet various needs from single piping to integrated types.

Features

Wide variety of options available

- Negative pressure to 0.7 MPa
- 20 L/min to 200 L/min
- High corrosion resistance specification

Free poppet structure prevents supply pressure creep and enables negative pressure control.

CONTENTS

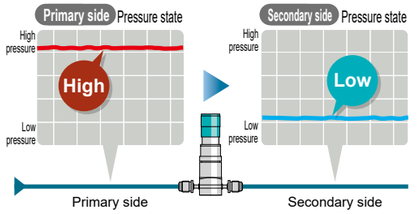
Taking Process Control to a New Dimension

CKD's process gas regulators boast industry-leading sealing performance, hysteresis, and repeatability. Achieves a stable process through high-precision pressure/flow control of the supply gas.

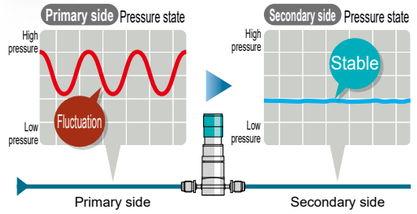
High-precision control of process gases in etching and deposition equipment

Application Example

Pressure control/pressure reduction

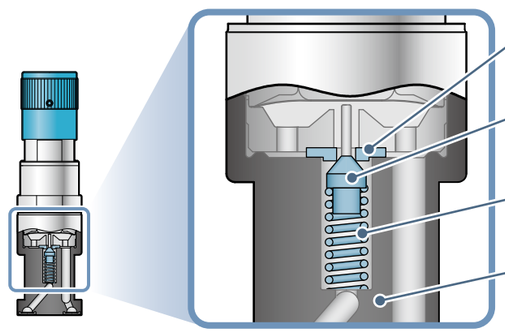


Pressure stabilization



High Corrosion Resistance & High Quality Materials

- High corrosion-resistant material adopted
- Perform electrolytic polishing, ultra-precision machining, and ultra-precision cleaning.



Seat	PFA
Poppet	SUS316L
Spring	SUS316
Body	SUS316L

Change to different high corrosion resistance materials is also possible.

Optimal Design

- Reduced sliding parts to the limit
- Optimized diaphragm structure
- Smooth operation is achieved by optimizing the material

Achieves proven durability of over 3 million cycles with high-spec materials & design.

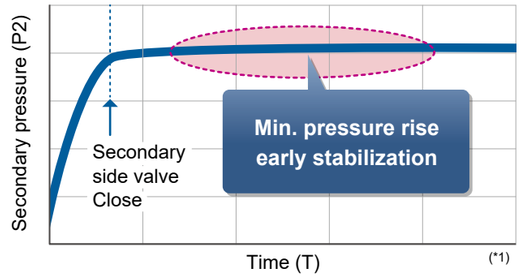
Maintains high controllability and cleanliness even after long-term use.

High Sealing Performance

Contributes to process stabilization

- Optimum design of valve seat and ultra-precise machining
- Prevents leakage (outflow) to the secondary side while the valve is closing

*1. Image of secondary pressure rise assuming valve closing operation to maintain secondary pressure at zero flow.

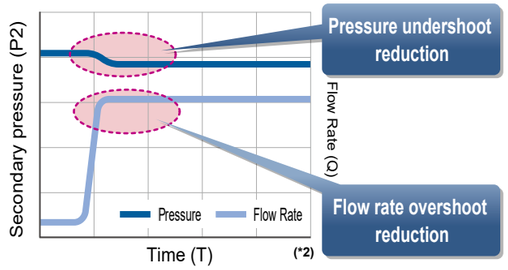


High controllability at minute flow rates

Achieves stable and smooth operation

- Optimized design of valve seat shape
- Stable control even at very small flow rates

*2. Image of pressure fluctuation when controlling at a flow rate of 10 sccm.

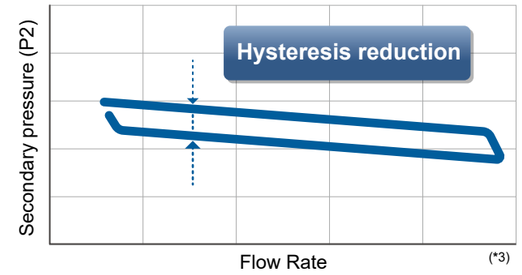


Reduced Hysteresis

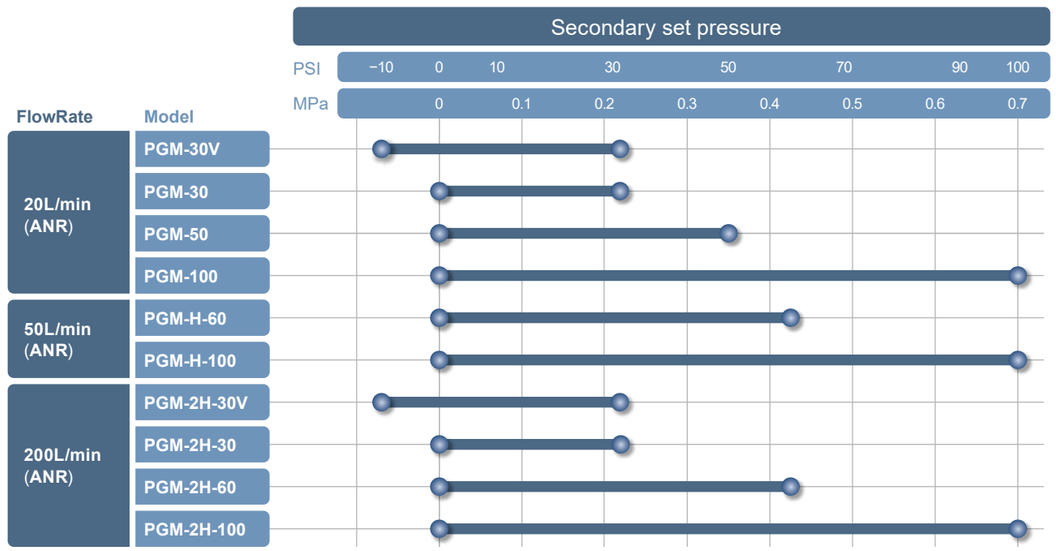
Reliably meets the target pressure.

- High-quality materials
- Ultra-precise machining

*3. Image of secondary pressure fluctuation when flow is increased then decreased.



Extensive Product Lineup



Regulator for Process Gas

PGM Series

RoHS

Model No. Notation Method

PGM - **H** - **60** - **4R** - ( )

- Model No.
- ❷ Secondary Side Setting Pressure
- ❹ Option
- ❶ Flow Rate Series
- ❸ Fitting Type: Connection Method/ Integrated Type: Body size (sealing method)

❷ Secondary Side Setting Pressure

Code	Content	❶ Flow Rate Series: 20 L/min (Blank)	50 L/min (H)	200 L/min (2H)
30V	-0.07 to 0.21 MPa [-10 to 30 psi]	●		●
30	0 to 0.21 MPa [0 to 30 psi]	●		●
50	0 to 0.35 MPa [0 to 50 psi]	●		
60	0 to 0.42 MPa [0 to 60 psi]		●	●
100	0 to 0.7 MPa [0 to 100 psi]	●	●	●

Note) Flow rates are nominal values. Please check the pressure conditions from the flow characteristics graph.

❸ Fitting Type: Connection Method / Integrated Type: Body size (sealing method)

Content			Code	❶ Flow Rate Series: 20 L/min (Blank)	50 L/min (H)	200 L/min (2H)
Fitting Type 	1/4"	JXR Female Fitting	4R	●	●	
		JXR Male Fitting	4RM	●	●	
		JXR Male to Female Fitting	4MF	●	●	
		JXR Female to Male Fitting	4FM	●	●	
	3/8"	JXR Female Fitting	6R			●
		JXR Male Fitting	6RM			●
		JXR Male to Female Fitting	6MF			●
		JXR Female to Male Fitting	6FM			●
Integrated Type 	☐1.125" (1.125" C-Seal)		1	●	●	
	☐1.5" (1.5" C-Seal)		2	●	●	
	☐1.5" (1.5" CS-Seal)		3	●	●	
	☐1.5" (1.5" W-Seal)		4	●	●	
	☐1.125" (1.125" W-Seal)		5	●	●	
	☐1.5" (1.5" High-Flow C-Seal)		6			●
	☐55 mm (3/8" W-Seal)		7			●

❹ Option

Code	Content	
Blank	No Option	
S	Poppet Hastelloy® C-22 Spring: Ni-Co Alloy	❶ Selectable only for "Blank" 20 L/min flow rate series
P	Valve Seat: PI	

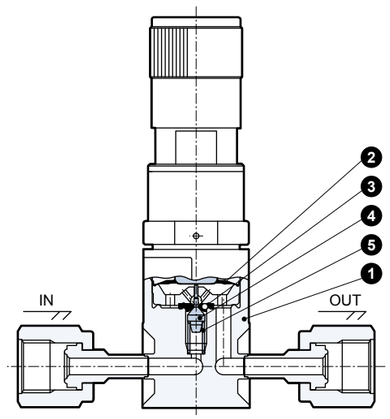
Note) Please inquire about types with gauge ports, anti-mishandling covers, and panel mounts.

Specifications

Item		PGM-	30V	30	50	-	100
		PGM-H-	-	–	-	60	100
		PGM-2H-	30V	30	-	60	100
Applicable Fluid			Inert gas / Process gas				
Max. working pressure	MPa		1.0				
Setting Pressure	MPa		-0.07 to 0.21	0 to 0.21	0 to 0.35	0 to 0.42	0 to 0.7
Fluid temperature	°C		-5 to 40 (2H is 20 to 50) *1				
Valve Seat Leakage	Pa·m³/s (He)		1.0×10^{-8} or less (2 H is 2.0×10^{-8} or less)				
External Leakage	Pa·m³/s (He)		2.8×10^{-12} or less				
Proof Pressure	MPa		1.5				
Ambient Temperature	°C		-5 to 40 (2H is 20 to 50)				
Storage Ambient Temperature	°C		-5 to 60				
Gas-wetted Surface Treatment			Electrolytic polishing specification				
Connection Method			PGM, PGM-H : Integrated system compatible (PGM-☐-1, 2, 3, 4, 5) 1/4″JXR Su (*2) (PGM-☐-4R, 4RM, 4MF, 4FM) PGM-2H- : Integrated System Compatible (PGM-2H-☐-6, 7) 3/8" JXR Fitting (*2) (PGM-2H-☐6R, 6RM, 6MF, 6FM)				
Weight	kg		0.39 (PGM-☐-4) 0.82 (PGM-2H-☐-7)				

*1: Customers desiring high-temperature specifications, please contact our sales office.
*2: JXR fittings are compatible with VCR fittings.

Internal Structure Diagram and Materials



Gas-wetted Materials

Part No.	Part Name	Material
1	Body	SUS316L
2	Diaphragm	Hastelloy® C-22
3	Seat	PFA or PI (Option)
4	Poppet	SUS316L or Hastelloy® C-22 (Option)
5	Spring	SUS316 or Ni-Co Alloy (Option)

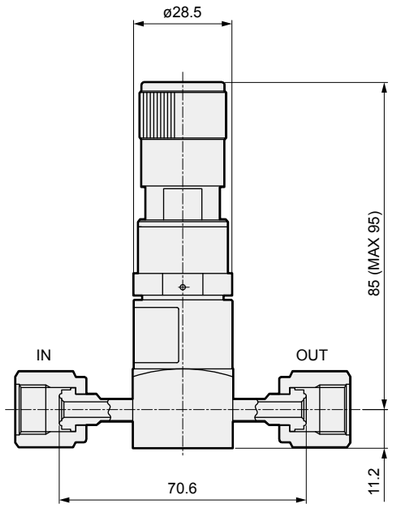
Hastelloy® is a registered trademark of Haynes International, Inc.

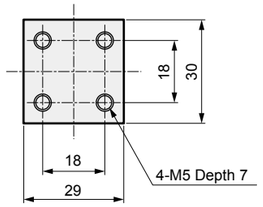
External Dimensions: Fitting Type

Note) Flow direction is indicated by an arrow on the body.

PGM-□-4R

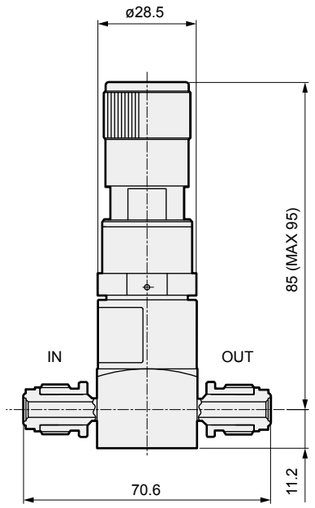
●1/4" JXR Female Fitting

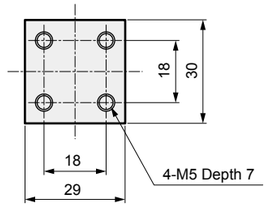




PGM-□-4RM

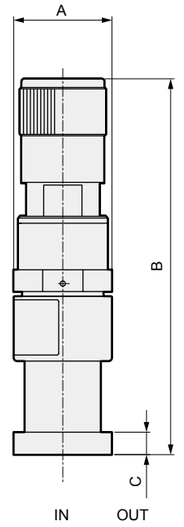
●1/4" JXR Male Fitting





External Dimensions: Integrated Type

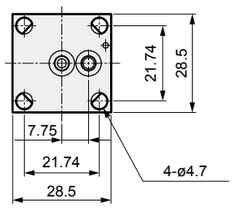
Note) Flow direction is indicated by an arrow on the body.



Model No.		A	B	C
PGM-□-1	1.125" C-Seal	ø28.5	99 (MAX 109)	6.5
PGM-□-2	1.5" C-Seal	ø28.5	104 (MAX 114)	8
PGM-□-3	1.5" CS-Seal	ø28.5	104 (MAX 114)	8
PGM-□-4	1.5" W-Seal	ø28.5	104 (MAX 114)	8
PGM-□-5	1.125" W-Seal	ø28.5	99 (MAX 109)	6.5

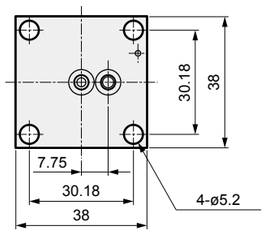
PGM-□-1

●1.125" C-Seal



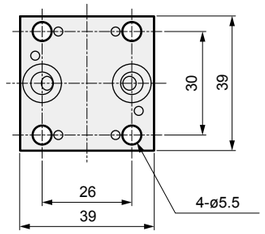
PGM-□-2

●1.5" C-Seal



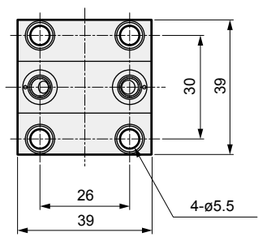
PGM-□-3

●1.5" CS-Seal



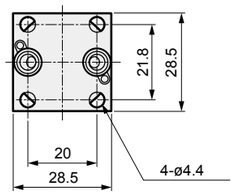
PGM-□-4

●1.5" W-Seal



PGM-□-5

●1.125" W-Seal

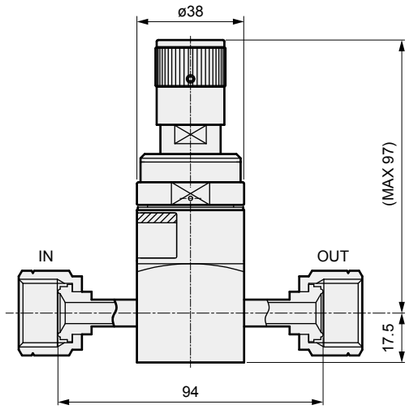


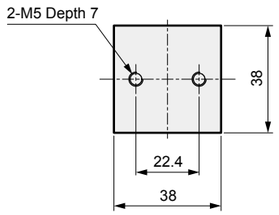
External Dimensions: Fitting Type

Note) Flow direction is indicated by an arrow on the body.

PGM-2H-□-6R

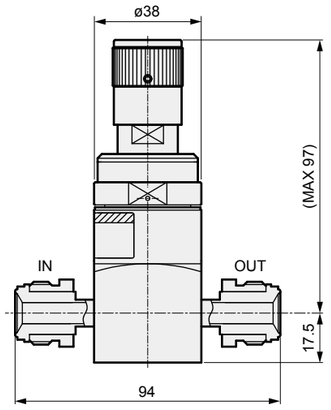
●3/8" JXR Female Fitting

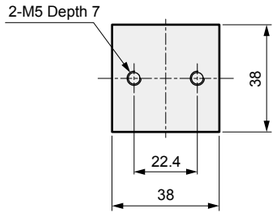




PGM-2H-□-6RM

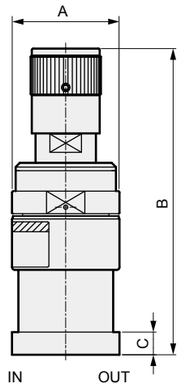
●3/8" JXR Male Fitting





External Dimensions: Integrated Type

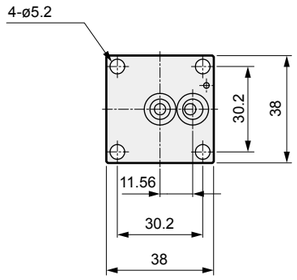
Note) Flow direction is indicated by an arrow on the body.



Model No.		A	B	C
PGM-2H-□-6	1.5" High-Flow C-Seal	ø38	(MAX 108)	8
PGM-2H-□-7	3/8" W-Seal	ø38	(MAX 121)	15

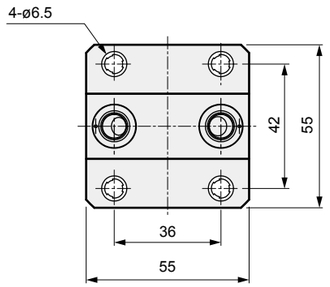
PGM-2H-□-6

●1.5" High-Flow C-Seal



PGM-2H-□-7

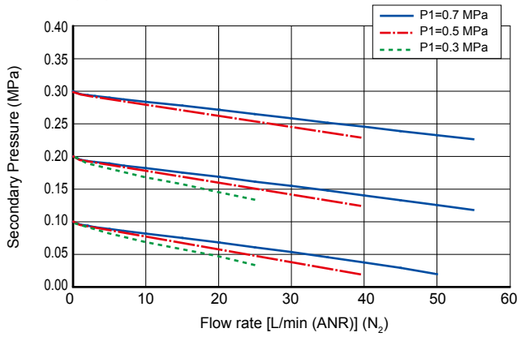
●3/8" W-Seal



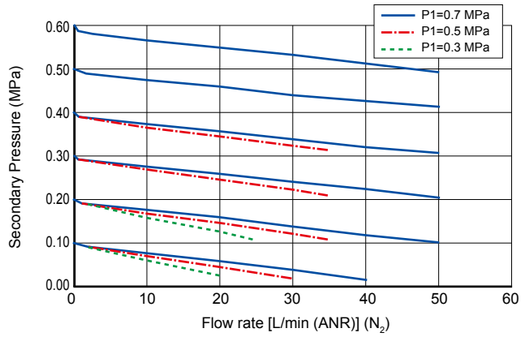
Flow Characteristics

*Based on our company's test data

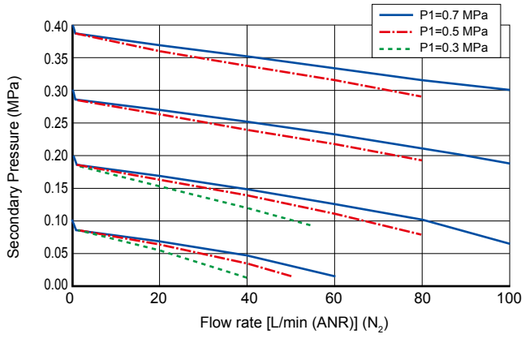
●PGM-30V, 30, 50



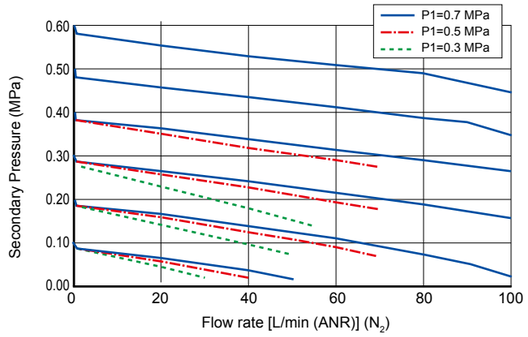
●PGM-100



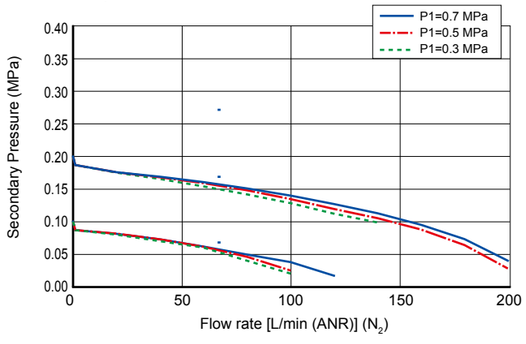
●PGM-H-60



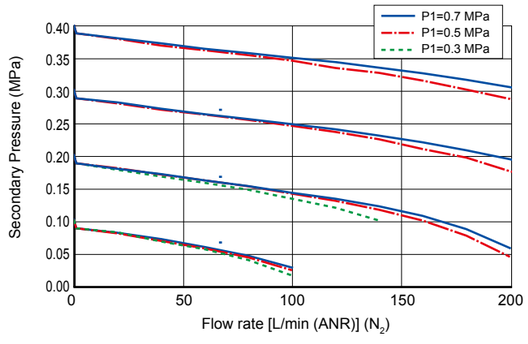
●PGM-H-100



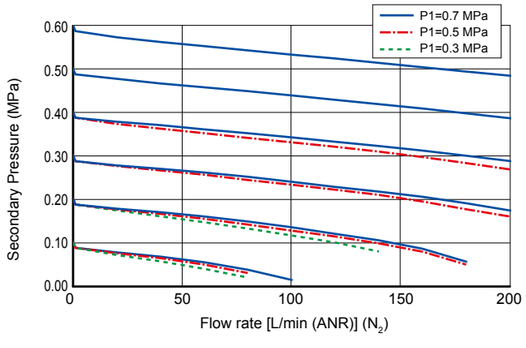
●PGM-2H-30V, 30



●PGM-2H-60



●PGM-2H-100



Regulator for Process Gas

Optional Products

PGM Series

RoHS Special Specifications

●Type with Gauge Port

■Gauge port connection
JXR male, JXR female, and double ferrule fittings can be manufactured.

■Port size 1/4"

●Panel Mount Type

■Panel mount diameter ø31

■Panel thickness 5 mm or less

●Anti-Mishandling Type

■Prevents fluctuations of set pressure due to misoperation.

■Misoperation prevention type has total height 108 mm and diameter ø32.

To Use This Product Safely

Please be sure to read this before use.
For General Precautions refer to Intro 9.

Individual Precautions: Regulator for Process Gas, PGM Series

Design / Selection

1. Confirmation of Specifications

Warning

■This product is not designed to function as a safety valve, such as an emergency shut-off valve. If such a function is required, please implement other reliable safety measures.

■Incorrect equipment selection and handling can cause problems not only in this product, but also to your system. Product selection and handling should be performed after confirming the product specifications and their suitability for the customer's system, at the customer's own responsibility.

■Check the compatibility between the gas contact part materials and working fluid before use.

■Use within the specified fluid temperature and pressure range.

■Refer to the flow characteristics to select an appropriate flow rate series and set pressure model No. The performance may be unstable if the flow rate is extremely small, or if the unit is used in a high flow rate range outside the plot range. Use in a range where the flow characteristics tilt is gradual.

2. Ambient Environment

Caution

■Do not use in atmospheres containing corrosive gases or in locations where substances that may affect the product such as chemicals, salt water, water or steam could make contact. Use within the specified ambient temperature range.

3. Securing Space

Caution

■Secure sufficient space for maintenance and inspection.

4. Piping

Warning

■Foreign materials or burrs in the piping and piping work could damage the valve seat or diaphragm seal, and lead to leaks. Before installing the valve, be sure to remove any debris or burrs and take measures such as installing a primary side filter.

■Output pressure exceeding the Regulators' set pressure could result in damage or faulty operation of the secondary side devices. Be sure to install a safety device.

■When installing, ensure that the piping is performed so that the flow of the fluid is consistent with the direction of the arrow.

Caution

■Make sure not to use the wrong connecting port when connecting the pipes to the product.

■When piping, do not apply tension, compression, bending or other forces to the valve body from the piping.

■If the tube for piping is bent, it will cause malfunctions; pipe with suitable tube lengths.

5. Purging

Caution

■When removing valves using toxic, combustible or corrosive gases, purge with an inert gas such as nitrogen gas before removal.

6. During Use

Caution

■Do not use valves as a footing or place any heavy objects on top of the valves.

■Before supplying gas to this product, completely loosen the pressure adjustment knob in the counterclockwise direction (DEC).

■Open the inlet side supply valve slowly and operate so as to be able to close it immediately if there is abnormal pressure rise or leakage.

■After supplying inlet side pressure, check that there is no outflow.

■Do not use as a residual pressure exhaust valve.

■Outlet pressure may wobble violently with metallic noises during use. (vibration phenomenon) After confirming this phenomenon, immediately close the inlet supply valve and cease use.

■Store unused products in a location where they are not exposed to direct sunlight or high temperatures.

For cautions about mounting, installation, adjustment, use, and maintenance, refer to CKD components Product Site (https://www.ckd.co.jp/kiki/jp/) → "Model No." Instruction Manuals

MEMO

IAGD

Integrated Gas Supply System

Overview

A process gas supply system with improved space-saving and maintainability. We handle everything from design to manufacturing according to the customer's desired flow.

Features

Two sizes available to match flow rate and size (1.125", 1.5")

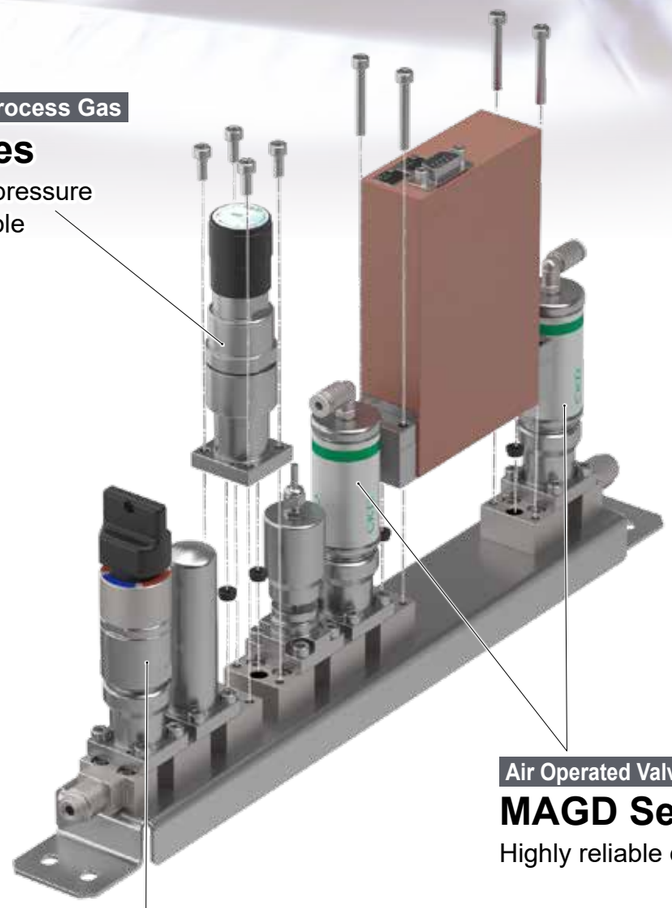
High durability valves available

- MAGD□-R-HD
- MAGD□-HDF
- MAGD□-A

CONTENTS

Integrated type of the highly reliable AGD series

A process gas supply system that has perfected space-saving and maintainability. By creating an optimal layout according to customer requirements, we achieve significant space savings compared to systems configured with welded fittings.



Regulator for Process Gas

PGM Series

High-precision pressure control is possible

Air Operated Valve for Process Gas

MAGD Series

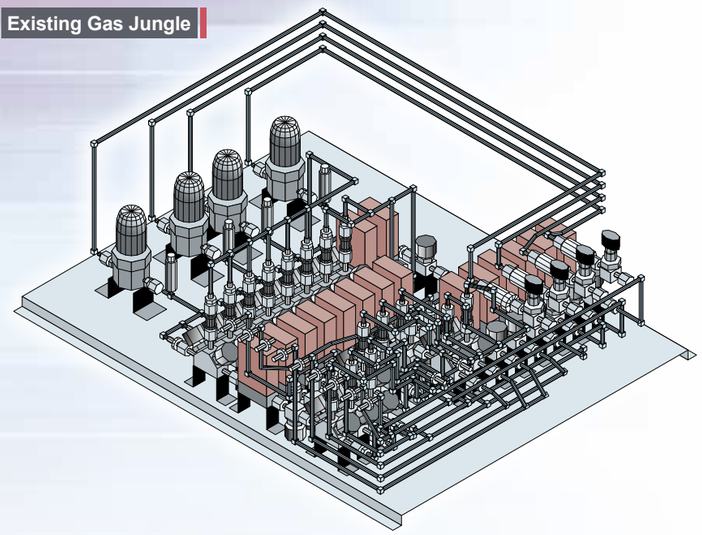
Highly reliable diaphragm design

Manual Valve for Process Gas

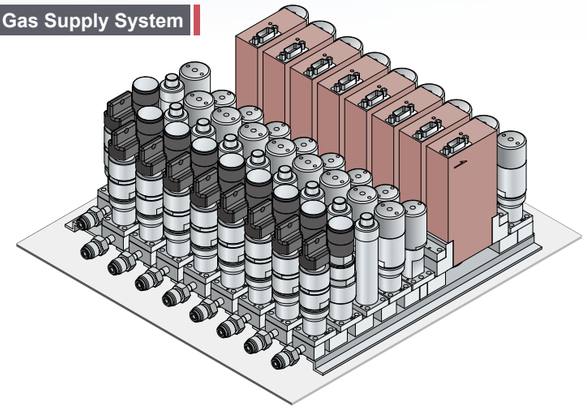
MMGD Series

Long-selling model with a proven track record

Existing Gas Jungle



Integrated Gas Supply System



Reduced Footprint

- 60% less footprint
- Volume 16% compared with conventional models

Improved Workability

- Parts can be attached and detached in one direction from the top of the component parts
- Simplified heating

Improved Reliability

- CS seal/Double seal used

Improved Corrosion Resistance (Contamination-free)

- Welding area reduced by more than 80%

By drastically reducing the number of welds, we have significantly reduced potential sources of contamination compared to conventional systems.

Improved Purge Characteristics

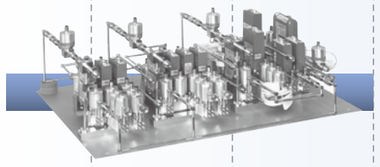
- Construction of a flow path with an extremely small internal volume and dead volume
- Improved purging

Promotion of Standardization

- Implementation of standardization for component parts

History of Integrated Gas Supply Systems

1990 1995 2000 2005 2010 2015 2020 2025

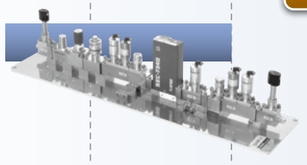


IAGD
CS seal *Discontinued

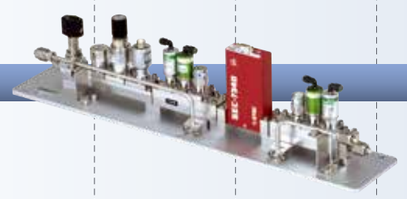
Commercialized ahead of the world
Evolved with miniaturization and higher functionality

1.5 in / 1.125 in SEMI standard compliant

IAGD2
CS seal
*Discontinued

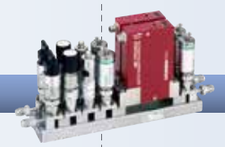


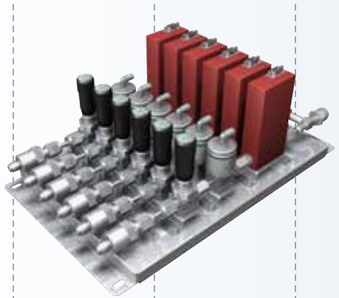
IAGD3
1.5 in CS seal



IAGD4
1.5 in Double seal

IAGD5
1.125 in Double seal





Clean Unit

FICS

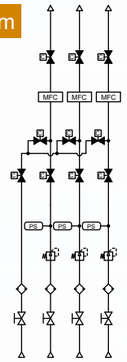
A unit product that combines fine system components and clean equipment.
Please inquire for details.

Production Flow of Integrated Gas Supply System

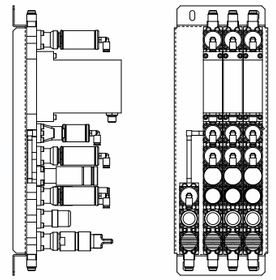
Layout

We create a layout based on the customer's specifications and flow diagram.

Flow Diagram



Layout Diagram

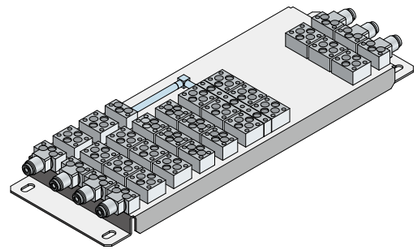


Parts Procurement

Based on customer specifications, we select and arrange the manufacturers and models of the equipment to be used.

Assembly 1

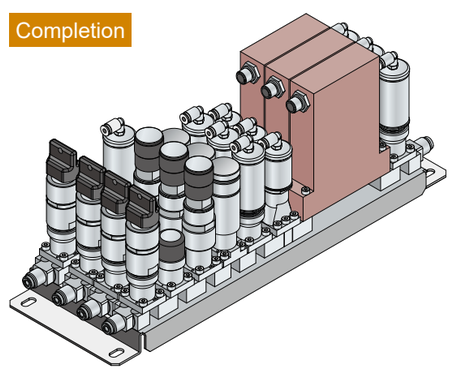
The base block is positioned and mounted using a jig.



Assembly 2

The integrated components are mounted.

Completion



Inspection

Integrated Gas System Series
IAGD

Components for Integrated Gas Supply System
Air Operated Valve for IAGD5 (1.125" size)

MAGD5 Series

Special Specifications

Main Features

Integrated type of the highly reliable AGD series

Model No. Notation Method

MAGD5 - R - 02A - W - 1 2

- MAGD5: Model No.
- 02A: ❶ Valve Shape
- W: 1.125" Double seal (Nominal 6.35)
- 1: ❷ Actuation Method (V1)
- 2: ❸ Actuation Method (V2)

*1: Mounting bolts, gaskets, and air fittings for actuator operation are not included. Please purchase them separately.
*2: Customers who wish to have mounting bolts included, please consult with our sales office.

❶Valve Shape

Content			Code
Cv Value	Valve Shape		
0.1	Single Block	D-type Valve (2-Port)	01D
		X-type Valve (3-Port)	01X
		Y-type Valve (3-Port)	01Y
	Dual Block	A-type Valve (3-Port)	02A
0.26	Single Block	D-type Valve (2-Port)	11D
	Dual Block	A-type Valve (3-Port)	12A

Note) For detailed flow diagrams and interface positions, please refer to P. 95.

❷Actuation Method (V1)

Code	Content
1	NC Type
2	NO Type
3	NC Type (with Proximity Sensor, 2-wire (energized when valve closed))
4	NO Type (with Proximity Sensor, 2-wire (energized when valve open))
5	NC Type (with Proximity Sensor, 2-wire (energized when valve open))
6	NO Type (with Proximity Sensor, 2-wire (energized when valve closed))

Note) Other sensor specifications are available as options.

❸Actuation Method (V2)

Code	Content
1	NC Type
2	NO Type
3	NC Type (with Proximity Sensor, 2-wire (energized when valve closed))
4	NO Type (with Proximity Sensor, 2-wire (energized when valve open))
5	NC Type (with Proximity Sensor, 2-wire (energized when valve open))
6	NO Type (with Proximity Sensor, 2-wire (energized when valve closed))

Note) Other sensor specifications are available as options.

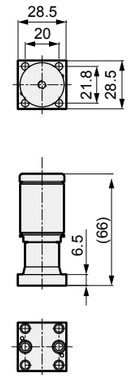
Specifications

Item			MAGD5-R-0□	MAGD5-R-1□
Applicable Fluid			Inert gas / Process gas	
Operating Pressure Pa (abs) to MPa (G)			1.3×10^{-6} to 0.99	1.3×10^{-6} to 0.7
Fluid temperature °C			-10 to 80	
Ambient Temperature °C			-10 to 80	
Valve Seat Leakage Pa·m³/s (He)			1.3×10^{-9} or less	1.0×10^{-10} or less
External Leakage Pa·m³/s (He)			2.8×10^{-12} or less	
Cv Value (at 23°C, under pressure)			0.1	0.26
Connection Method			1.125" Double seal (Nominal 6.35)	
Operating Pressure	MPa	NC	0.4 to 0.6	
		NO	0.4 to 0.5	
Pilot Port			M5	
Material	Body		SUS316L	
	Diaphragm		Ni-Co Alloy	
	Seat		PCTFE	

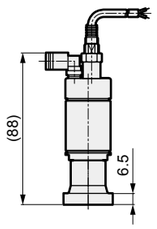
External Dimensions

Single Block

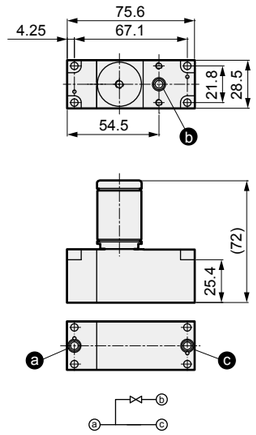
●MAGD5-R-01D



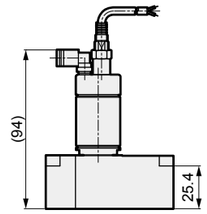
(with Proximity Sensor)



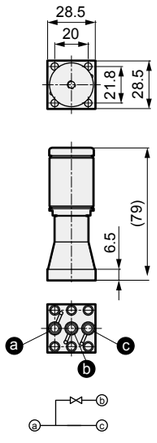
●MAGD5-R-01X



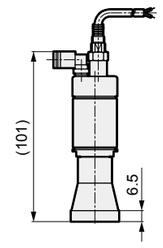
(with Proximity Sensor)



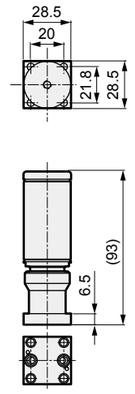
●MAGD5-R-01Y



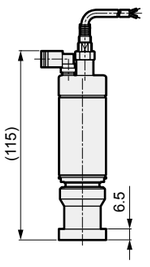
(with Proximity Sensor)



●MAGD5-R-11D

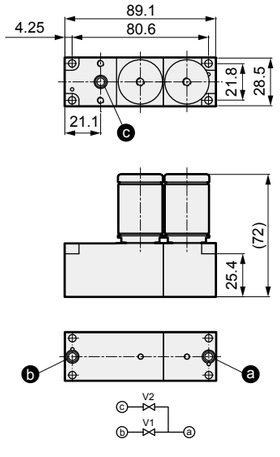


(with Proximity Sensor)

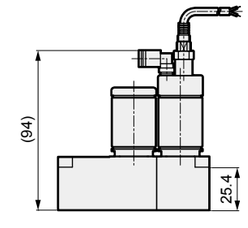


Dual Block

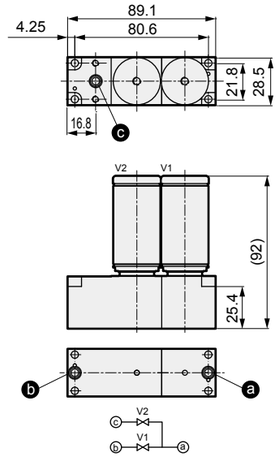
●MAGD5-R-02A



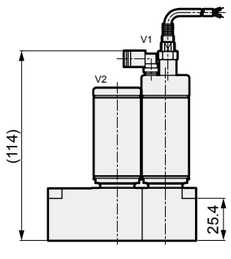
(with Proximity Sensor)



●MAGD5-R-12A



(with Proximity Sensor)



Integrated Gas System Series
IAGD5

Components for Integrated Gas Supply System
High Durability Air Operated Valve
Special Specifications

Main Features

Special coating on the actuator achieves high response stability.

Specifications

Item	MAGD□-R-HD-0□	MAGD□-R-HD-1□
Applicable Fluid	Inert gas / Process gas	
Operating Pressure Pa (abs) to MPa (G)	$1.3x10^{-6}$ to 0.99	
Fluid temperature °C	5 to 80	
Operating Ambient Temperature °C	5 to 80	
Storage Ambient Temperature °C	-10 to 80	
Valve Seat Leakage Pa·m³/s (He)	$1.0x10^{-10}$ or less $1.3x10^{-9}$ or less	
External Leakage Pa·m³/s (He)	$2.8x10^{-12}$ or less	
Cv Value (at 23°C, under pressure)	0.1	0.26
Connection Method	1.125" & 1.5" Double seal	
Operating Pressure MPa	NC 0.4 to 0.6 NO 0.4 to 0.5	
Pilot Port	M5	
Durability	Results: 30 million cycles or more	

Specifications

Item	MAGD□-HDF-1□	MAGD□-HDF-2□
Applicable Fluid	Inert gas / Process gas	
Operating Pressure Pa (abs) to MPa (G)	$1.3x10^{-6}$ to 0.5	
Fluid temperature °C	20 to 200 *1	
Operating Ambient Temperature °C	20 to 150	
Storage Ambient Temperature °C	-10 to 80	
Valve Seat Leakage Pa·m³/s (He)	$1.0x10^{-10}$ or less (at 23°C)	
External Leakage Pa·m³/s (He)	$2.8x10^{-12}$ or less	
Cv Value (at 23°C, under pressure)	0.26	0.65
Connection Method	1.125" & 1.5" Double seal, 3/8" Double seal, 1.5" High-Flow C-Seal	
Operating Pressure MPa	NC 0.4 to 0.6 NO 0.4 to 0.5	
Pilot Port	M5	
Durability	Results: 30 million cycles or more	

*1: Actuator section must be 150°C or less.

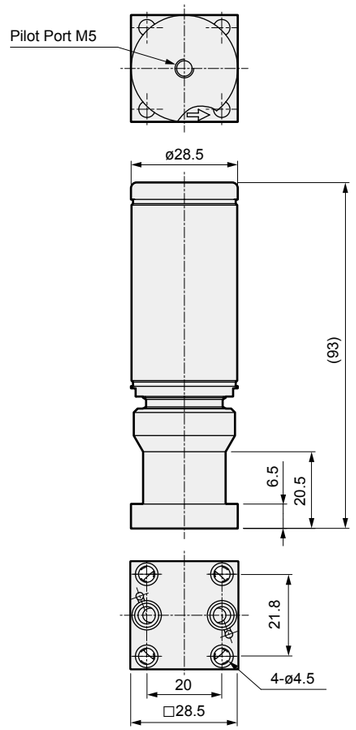
Specifications

Item	MAGD□-A
Applicable Fluid	Inert gas / Process gas
Operating Pressure Pa (abs) - MPa (G)	$1.3x10^{-6}$ to 0.5
Fluid temperature °C	150 to 200 *1
Operating Ambient Temperature °C	20 to 150
Storage Ambient Temperature °C	-10 to 80
Valve Seat Leakage Pa·m³/s (He)	$1.0x10^{-7}$ or less (at 200°C)
Valve Seat Leakage Pa·m³/s (He)	$2.8x10^{-12}$ or less
Cv Value (at 200°C, under negative pressure)	0.4 or more
Connection Method	1.5" Double seal, 3/8" Double seal, 1.5" High-Flow C-Seal
Actuation Method	NC Type (Normally Closed)
Operating Pressure MPa	0.4 to 0.6
Pilot Port	M5
Durability	Results: 100 million cycles or more

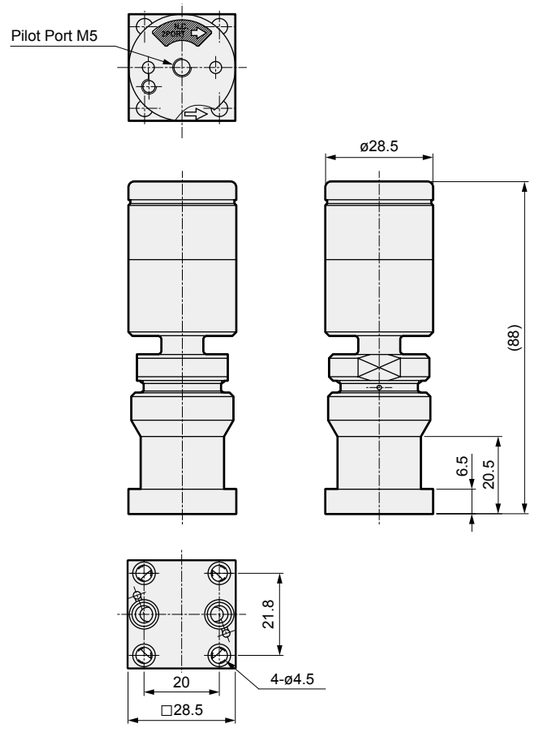
*1: Actuator section must be 150°C or less.

External Dimensions

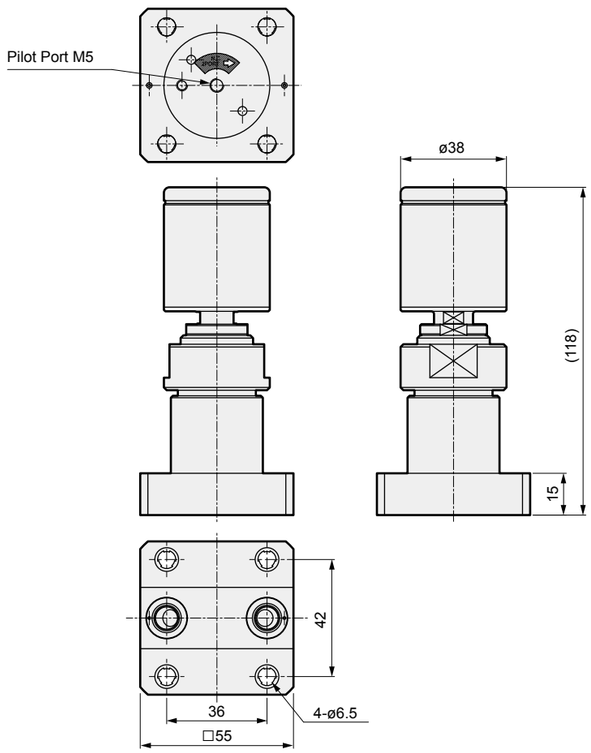
●MAGD5-R-HD-11D



●MAGD5-HDF-11D



●MAGD4-A



Components for Integrated Gas Supply System
Regulator for Process Gas

Special Specifications

Main Features

Industry-leading sealing performance, hysteresis, and repeatability.

Specifications

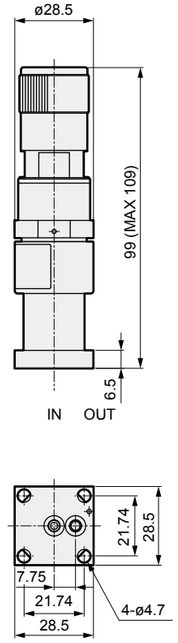
Item						
	PGM-	30V	30	50	-	100
	PGM-H-	-	–	-	60	100
	PGM-2H-	30V	30	-	60	100
Applicable Fluid		Inert gas / Process gas				
Max. working pressure	MPa	1.0				
Setting Pressure	MPa	-0.07 to 0.21	0 to 0.21	0 to 0.35	0 to 0.42	0 to 0.7
Fluid temperature	°C	-5 to 40 (2H is 20 to 50)				
Valve Seat Leakage	Pa·m³/s (He)	$1.0x10^{-8}$ or less (2 H is $2.0x10^{-8}$ or less)				
External Leakage	Pa·m³/s (He)	$2.8x10^{-12}$ or less				
Proof Pressure	MPa	1.5				
Ambient Temperature	°C	-5 to 40 (2H is 20 to 50)				
Storage Ambient Temperature	°C	-5 to 60				
Gas-wetted Surface Treatment		Electrolytic polishing specification				
Connection Method		PGM, PGM-H : Integrated System Compatible (PGM-□-1, 2, 3, 4, 5) PGM-2H- : Integrated System Compatible (PGM-2H-□-6, 7)				
Weight	kg	0.39 (PGM-□-4) 0.82 (PGM-2H-□-7)				

Note) Refer to P. 78 for model No. Notation Method.

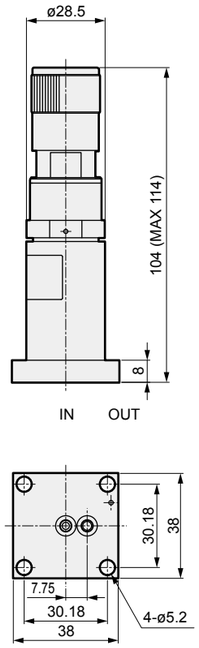
External Dimension Drawings

Note) Flow direction is indicated by an arrow on the body.

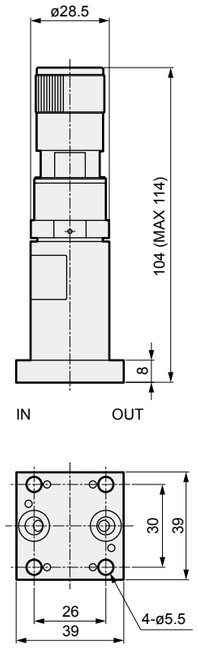
●PGM-□-1
(1.125" C seal)



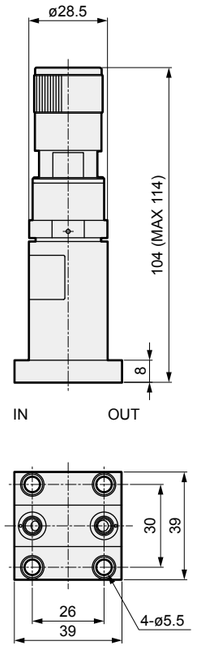
●PGM-□-2
(1.5" C seal)



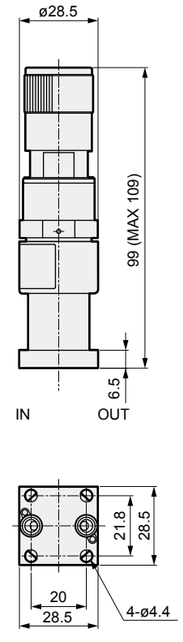
●PGM-□-3
(1.5" CS seal)



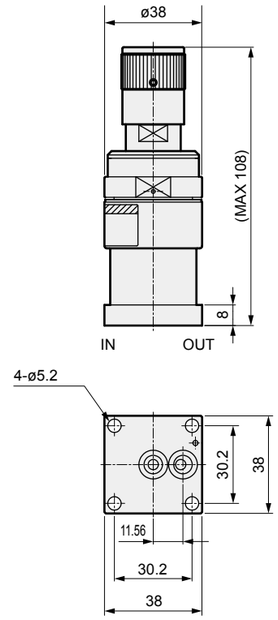
●PGM-□-4
(1.5" W seal)



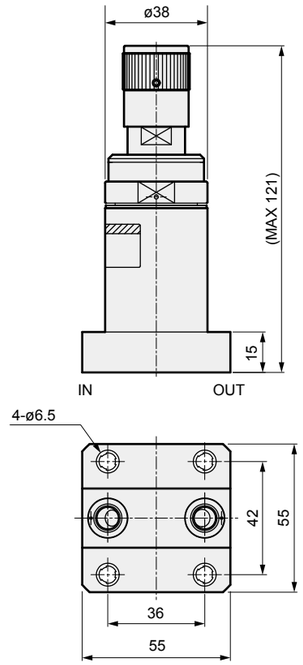
●PGM-□-5
(1.125" Double seal)



●PGM-2H-□-6
(1.5" high flow C seal)



●PGM-2H-□-7
(3/8" W seal)



Integrated Gas System Series
IAGD5

Components for Integrated Gas Supply System
Manual Valve for IAGD5 (1.125" size)

MMGD5 Series

Special Specifications

Model No. Notation Method

MMGD5 - R - 11D - W - D - K

- MMGD5: Model No.
- R: Single Block D-type Valve (2-Port)
- 11D: 1.125" Double seal (Nominal 6.35)
- W: Double-Action Type
- D: ❶ Handle Color
- K: ❶ Handle Color

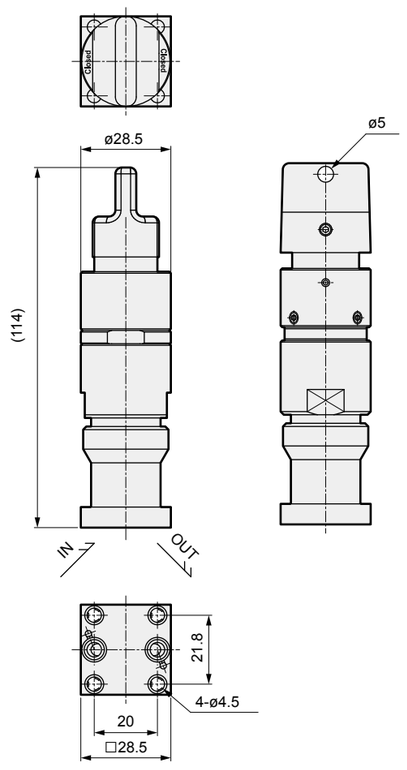
❶Handle Color

Code	Content
K	Black
R	Red
B	Blue
Y	Yellow
GR	Gray
W	White
O	Orange
YG	Yellow-Green

Specifications

Item		MMGD5-R
Applicable Fluid		Inert gas / Process gas
Operating Pressure Pa (abs) to MPa (G)		1.3x10^{-6} to 0.99
Fluid temperature	°C	5 to 80
Ambient Temperature	°C	5 to 80
Valve Seat Leakage	Pa·m³/s (He)	1.0x10^{-10} or less
Valve Seat Leakage	Pa·m³/s (He)	2.8x10^{-12} or less
Cv Value		0.26
Connection Method		1.125" Double seal (Nominal 6.35)
Material	Body	SUS316L
	Diaphragm	Ni-Co Alloy
	Seat	PCTFE

External Dimensions



Integrated Gas System Series
IAGD5

Components for Integrated Gas Supply System
Flow Control Valve for IAGD5 (1.125" size)

MFGD5 Series

Special Specifications

Model No. Notation Method

MFGD5 - 11D - W - 1

- MFGD5: Model No.
- 11D: Single Block D-type Valve (2-Port)
- W: 1.125" Double seal (Nominal 6.35)
- 1: ❶ Cv Value (Adjustment Range)

*1: Mounting bolts and gaskets are not included. Please purchase them separately.
*2: Customers who wish to have mounting bolts included, please consult with our sales office.

❶Cv Value (Adjustment Range)

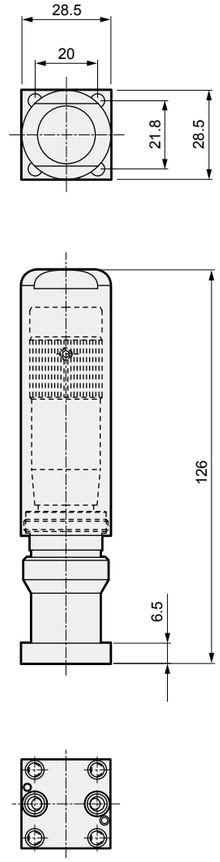
Code	Content
1	0.003 to 0.03
4	0.02 to 0.2

Specifications

Item		MFGD5-11D-W-1	MFGD5-11D-W-4
Applicable Fluid		Inert gas / Process gas	
Operating Pressure Pa (abs) to MPa (G)		1.3x10^{-6} to 0.7	
Fluid temperature	°C	-10 to 80	
Ambient Temperature	°C	-10 to 80	
Valve Seat Leakage		1/100 or less of the max. Cv value	
Valve Seat Leakage	Pa·m³/s (He)	2.8x10^{-12} or less	
Cv Value (Adjustment Range)		0.003 to 0.03	0.02 to 0.2
Connection Method		1.125" Double seal (Nominal 6.35)	
Material	Body	SUS316L	
	Diaphragm	Ni-Co Alloy	

Note) The product comes with a cover.

External Dimensions



Integrated Gas System Series
IAGD5

Components for Integrated Gas Supply System
Check Valve for IAGD5 (1.125" size)

MCGP5 Series

Special Specifications

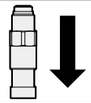
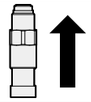
Model No. Notation Method

MCGP5 - **01D-W** - **023** - **KA**

- MCGP5: Model No.
- 01D-W: ❶ Shape
- 023: Cracking Pressure 2.3 kPa
- KA: Seat material: Kalrez®

*1: Mounting bolts and gaskets are not included. Please purchase them separately.
*2: Customers who wish to have mounting bolts included, please consult with our sales office.

❶ Shape

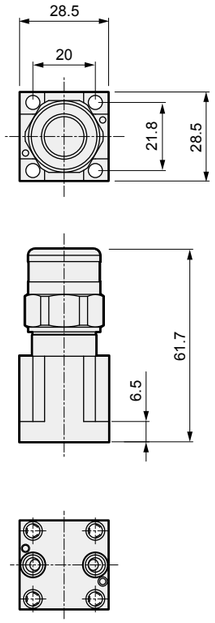
Code	Content		
01D-W	Single Block D-type Valve (2-Port) 1.125" Double seal (Nominal 6.35)		
F1	Flow Direction	From JXR fitting side to Double seal side	
F2		From Double seal side to JXR fitting side	

Specifications

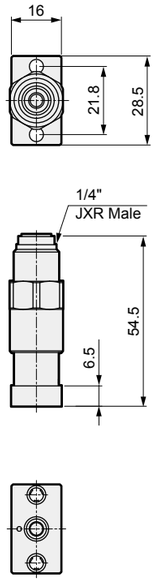
Item		MCGP5-01D	MCGP5-F
Applicable Fluid		Inert gas / Process gas	
Operating Pressure Pa (abs) to MPa (G)		1.3×10^{-6} to 0.7	
Fluid temperature	°C	-10 to 80	
Ambient Temperature	°C	-10 to 80	
Valve Seat Leakage	Pa·m³/s (He)	4.7×10^{-8} or less	
Valve Seat Leakage	Pa·m³/s (He)	2.8×10^{-12} or less	
Cv Value (Max.)		0.25	
Connection Method		1.125" Double seal (Nominal 6.35)	
Material	Body	SUS316L	
	Diaphragm	Kalrez®	
	Spring	SUS316	

External Dimensions

●MCGP5-01D



●MCGP5-F□



Kalrez® is a registered trademark of DuPont.

Integrated Gas System Series
IAGD5

Components for Integrated Gas Supply System
Other Parts for **IAGD5**

Gasket

Name	Model No.
1.125" Double seal Gasket (Nominal 6.35)	IAGD5-UGC-6.35GR

Mounting Bolt for 1.125" Double seal

Name	Model No.	Applicable Parts
Hexagon Socket Head Cap Screw for 1.125" Double seal (M4x10, 1 pc.)	IAGD5-BOLT-M4x10	MAGD5-R-01D MAGD5-R-01Y MAGD5-R-11D MMGD5-1DV2-D MCGP5-01D MCGP5-F□ MFGD5-11D IAGD5-BYPASS IAGD5-BLIND-SW
Hexagon Socket Head Cap Screw for 1.125" Double seal (M4x30, 1 pc.)	IAGD5-BOLT-M4x30	MAGD5-R-01X MAGD5-R-02A FC-PA785CT-BW-TC (Hitachi Metals MFC) FC-PA786CT-BW-TC (Hitachi Metals MFC) DN780□-BW (Hitachi Metals MFC) SEC-Z5□ (HORIBA STEC MFC)

Please inquire for details on applicable parts.

Maintenance Tools

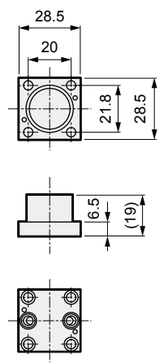
(Torque driver, bit for torque driver, T-handle ball point hex wrench, tweezers (gasket installation tool), scissors, storage box, 1 of each)

Name	Model No.
Maintenance Tool Set	IAGD5-MAINTENANCE3

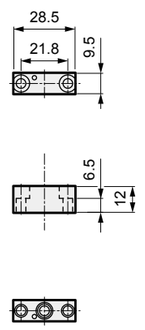
For usage instructions, please refer to the instruction manual.

Top Mount Block

●IAGD5-BYPASS
(for 20 mm pitch between)

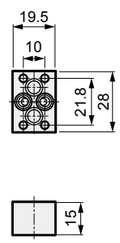


●IAGD5-BLIND-SW

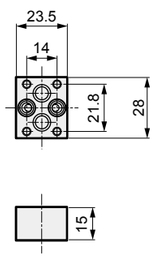


Base Block

●IAGD5-BF-V10-SW
(10 mm between)



●IAGD5-BF-V14-SW
(14.0 mm between)



Components for Process Gas

To Use This Product Safely

Please be sure to read this before use.
For General Precautions refer to Intro 9.

Individual Precautions: Components for Integrated Gas Supply System, IAGD5 Series

Design / Selection

1. Confirmation of Specifications

Warning

■Incorrect equipment selection and handling can cause problems not only in this product, but also to your system. Please be sure to confirm the specifications of this product and its compatibility with your system before use.

■Check the compatibility between the gas contact part materials and working fluid before use.

■Use within the specified fluid temperature and pressure range.

2. Ambient Environment

Caution

■Do not use in atmospheres containing corrosive gases or in locations where substances that may affect the product such as chemicals, salt water, water or steam could make contact. Use within the specified ambient temperature range.

3. Mounting

Warning

■Incorrect mounting and piping will result in product trouble, may cause trouble in the user's system, and may result in death or serious injury. The user is responsible for making sure that the operator has read the instruction manual and fully comprehends the system. After mounting, perform a proper functional inspection to ensure it is installed correctly.

Caution

■This product is assembled in class 10 and class 100 cleanrooms after precision cleaning treatment. Open the clean pack inside the packaging in a clean environment immediately before mounting.

■Fittings When mounting the product, touching the gas contact parts (body interior, seal surface) may result in adherence of foreign matter and contamination of high purity gas. Be careful not to touch the gas-wetted parts of this product during mounting.

4. Securing Space

Caution

■Secure sufficient space for installation, removal, piping and wiring work.

■Secure sufficient space for maintenance and inspection.

5. Piping

Warning

■Foreign materials or burrs in the piping and piping work could damage the valve seat or diaphragm seal, and lead to leaks. Before installing the valve, be sure to remove any debris or burrs and take measures such as installing a primary side filter.

Caution

■Make sure not to use the wrong connecting port when connecting the pipes to the product.

■When piping, do not apply tension, compression, bending or other forces to the valve body from the piping.

■If the tube for piping is bent, it will cause malfunctions; pipe with suitable tube lengths.

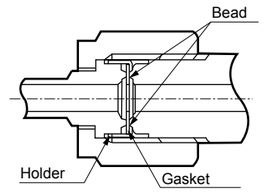
■Use the driving solenoid valve connected to the drive unit according to the specifications or applications.

■As for operating air, use air or inert gas passed through a filter with a filtration rating of 5 μm or more.

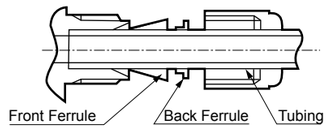
■Make sure that there is no Fittings foreign materials, scratches or burrs on the seal section before tightening the tube with the following procedures.

①Fitting Tightening Method

● JXR Fitting (when the gasket material is nickel/SUS316)
Hand-tighten the nut until the gasket contacts the bead surface, then use a tool to tighten it an additional 1/8 turn. (For other materials, please consult with us)



● Double Ferrule Fitting
Confirm that the front ferrule, back ferrule and nuts are properly attached, and then insert the tube until it contacts the back of the body. Tighten the nuts as far as possible by hand, and then tighten 1 $^{1}/_{4}$ turn with a tool.



②After tightening the fitting, be sure to perform a leak test to confirm there are no leaks.

6. Baking

Caution

■Baking temperature should be within the specified temperature range of the product. Perform baking with the valve in the fully open state.

7. Purging

Caution

■When removing valves using toxic, combustible or corrosive gases, purge with an inert gas such as nitrogen gas before removal.

8. During Use

Warning

■Use this product within the specifications range.

■Do not touch heater-equipped products with hands or body. Direct contact may cause burns.

Caution

■Do not use valves as a footing or place any heavy objects on top of the valves.

9. Maintenance and Inspection

Warning

■Operate in accordance with the instruction manual.

■Always turn the power OFF and release any fluids or pressure before starting work.

■Fully replace the residual gas with inert gas, etc., before starting work so that it does not affect people or the surrounding components.

■After work, always carry out a leak test, and confirm that there are no leaks.

■Do not disassemble the valve.
If the product is disassembled without authorization and then repaired or reused, it will no longer be covered by the product warranty.

Components for High Vacuum

AVB, MVB

Air Operated Valve / Manual Valve for High Vacuum

Overview

High durability achieved with a special structure featuring CKD's original formed bellows. A high vacuum valve with high reliability and ease of use.

Features

High durability with an actual value of 3 million cycles
(Under our specified conditions)

Indicator equipped as standard
(Excluding AVB□37)

Lightweight aluminum body
(AVB, MVB)

CONTENTS

AVB□□7/MVB□17 Series

Provides high reliability, contributing to reduced running costs and improved productivity.

High durability is achieved through a special structure featuring CKD's original formed bellows. Reduces maintenance hours and waste, contributing to improved productivity and a lower environmental footprint.

High-durability bellows used

↓

High durability/long life

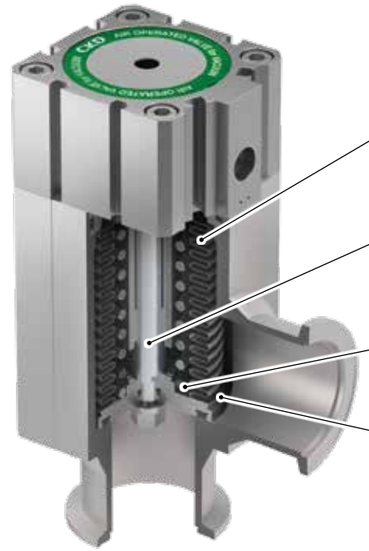
- Reduce waste
- Reduce maintenance
- Stable operation

Lineup

○: High-Temperature Specification

Model No.	Actuation Method	Connection								Indicator
		NW16	NW25	NW40	NW50	NW63	NW80	NW100	NW160	Standard equipment
AVB□17	NC	○	○	○	○	○	●			●
AVB□47	Two-stage		○	○	○	○				●
AVB□37	Double acting	○	○	○	○	○	●	●	●	●
MVB□17	Manual	●	●	●	●					●

High Durability and Long Life



High durability bellows adopted.
Optimal design for each bore size based on stress analysis.

Anti-deflection structure
Guide position is considered to reduce stress concentration.

Prevents O-ring displacement
Demonstrates stable sealing performance and is resistant to sticking.

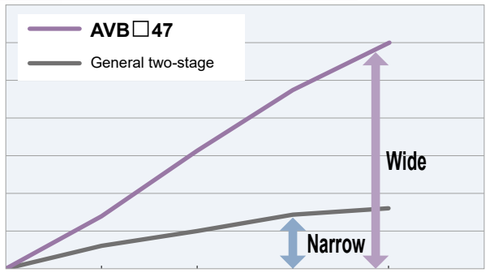
Mitigates impact stress during valve operation.
Cushion structure reduces impact stress.

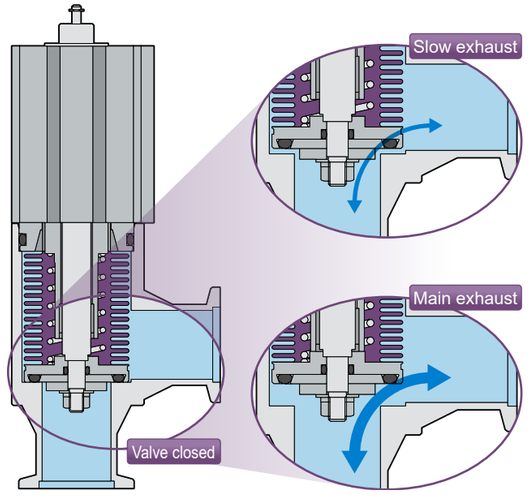
Achieves proven high durability of 3 million cycles*
*Under our specified conditions

2-Stage Slow Exhaust (AVB□47 Series)

A unique 2-stage cylinder structure achieves both main and slow exhaust in the same flow path. Compared to general 2-stage types, it offers a wider exhaust flow investigation range, lighter weight, and longer life.

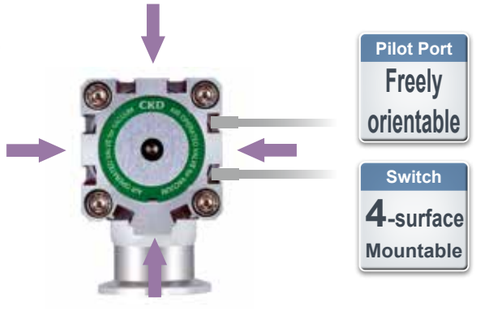
Slow exhaust conductance adjustable range image





Improved Usability

- Reduces weight by adopting an aluminum body
- Increased flexibility in design such as mounting and piping layout
- Improvement of visibility by using an indicator as standard



(Photo shows MVB□17 Series)

Air Operated Valve for High Vacuum, NC Type

AVB□17 Series

●Molded bellows used ●Aluminum body

RoHS

Model No. Notation Method

AVB 4 17 - 40K - [ ] - 4 - D T5H 3 - H

- AVB: Model No.
- ❶ 4: Orifice Diameter
- ❷ 40K: Port Size
- ❸ [ ]: Fluid Temperature
- ❹ 4: Pilot Port Position
- ❺ D: Switch Mounting Position
- ❻ T5H: Switch model No.
- ❼ 3: Switch Lead Wire Length
- ❽ H: No. of Switches

❶Orifice Diameter

Code	Content	
2	ø17	
3	ø24	
4	ø39	
5	ø48	
6	ø68	
7	ø80	Cannot be selected for high-temperature specification.

❷Port Size

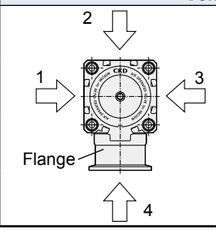
Code	Content	
16K	NW16	AVB217 only
25K	NW25	AVB317 only
40K	NW40	AVB417 only
50K	NW50	AVB517 only
63K	NW63	AVB617 only
80K	NW80	AVB717 only

❸Fluid Temperature

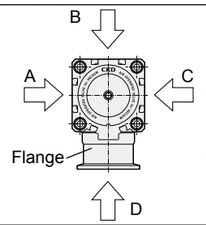
Code	Content
Blank	5 to 60°C (Built-in magnet)
HO	5 to 150°C (No magnet)
HOM	5 to 150°C (Built-in magnet)

Note) When selecting "HOM" with a switch, ❻choose either "ETOH" or "ETOV" for the switch model No.

❹Pilot Port Position

Code	Content
4	 The pilot port position is indicated as 4, 1, 2, or 3 relative to the flange direction when viewed from the top of the valve.
1	
2	
3	

❺Switch Mounting Position

Code	Content
Blank	No Switch
D	 The switch mounting position is indicated as D, A, B, or C relative to the flange direction when viewed from the top of the valve.
A	
B	
C	

❻Switch Model No.

Code	Content		
Blank	No Switch		
T0H	Lead wire straight type	Reed	2-wire
T5H			
T0V	Lead wire L-type		
T5V			
T2H	Lead wire straight type	Solid State	3-wire
T3H			
T2V	Lead wire L-type		2-wire
T3V			3-wire
ETOH	Lead wire straight type	Reed	2-wire
ETOV	Lead wire L-type		

Note) ❶For orifice diameter "2" (ø17) only, switches can be mounted on 3 surfaces. Switches can be mounted on any surface except for the pilot port surface. -The following model Nos. cannot be selected.
AVB217-16K-1-A❻❼-❽
AVB217-16K-2-B❻❼-❽
AVB217-16K-3-C❻❼-❽
AVB217-16K-4-D❻❼-❽

Note) ❸For fluid temperature "H0M," please select either "ET0H" or "ETOV."

❼Switch Lead Wire Length

Code	Content	
Blank	1 m (Standard)	
3	3 m	❻If switch model No. is "ET0H" or "ET0V," this cannot be selected.
5	5 m	

❽No. of Switches (Detection Position)

Code	Content	
H	Valve Open Detection	
R	Valve Closed Detection	❻If switch model No. is "ET0H" or "ET0V," this cannot be selected.
D	Valve Open/Closed Detection	

Specifications

Item	AVB217	AVB317	AVB417	AVB517	AVB617	AVB717
Applicable Fluid	Vacuum and inert gas					
Operating Pressure Pa (abs)	1.3×10^{-6} to 1×10^{5}					
Max. Operating Pressure Differential MPa	0.1					
Valve Seat Leakage Pa·m³/s (He)	1.3×10^{-10} or less					
External Leakage Pa·m³/s (He)	1.3×10^{-11} or less					
Proof Pressure MPa	0.3					
Fluid Temperature °C	5 to 60 (5 to 150) *1					
Ambient Temperature °C	0 to 60 (No freezing)					
Orifice Diameter mm	ø17	ø24	ø39	ø48	ø68	ø80
Conductance *2 L/s	5	13	43	74	166	242
Port Size	NW16	NW25	NW40	NW50	NW63	NW80
Operating Pressure MPa	0.4 to 0.6					
Weight kg	0.4	0.5	1.2	2.0	3.5	6.5

*1: The values in ( ) are for high temperature specifications.
*2: The conductance value is a theoretical calculated value in the molecular flow region and is not an actual measured value.
*3: Vacuum grease is applied to the O-ring of the external seal part.

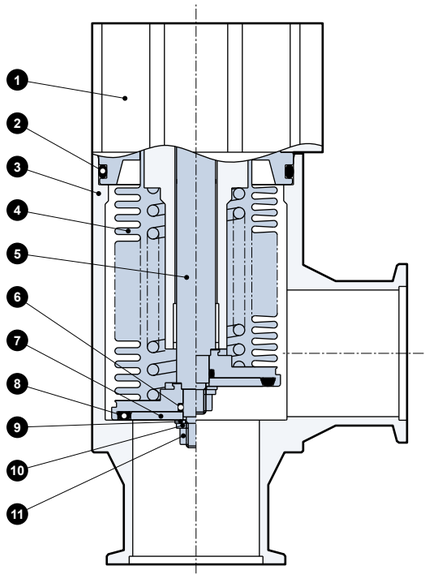
Switch Specifications

Item	Solid State Switch		Reed Switch		
	T2H, T2V	T3H, T3V	T0H, T0V	T5H, T5V	ETOH, ETOV
Application	For Programmable Controller	For Relay, Programmable Controller	For Relay, Programmable Controller	For Programmable Controller, Relay, IC Circuit (No Lamp), Series Connection	For Relay, Programmable Controller
Power Supply Voltage	-	10 to 28 VDC	-	-	-
Load Voltage/Current	10 to 30 VDC, 5 to 20 mA *2	30 VDC or less, 100 mA or less	12/24 VDC 5 to 50 mA 100 VAC 7 to 20 mA	12/24 VDC 50 mA or less 100 VAC 20 mA or less	12/24 VDC 5 to 50 mA 110 VAC 7 to 20 mA
Power Consumption	-	At 24 VDC (ON): 10 mA or less	-	-	-
Internal Voltage Drop	4 V or less	0.5 V or less	3 V or less	0 V	2.4 V or less
Lamp	LED (Lights up when ON)			-	LED (Lights up when ON)
Leakage Current	1 mA or less	10 μA or less	0 mA	0 mA	0 mA
Lead Wire Length *1	Standard 1 m (oil resistant vinyl cabtyre cable 2-conductor 0.2 mm²)	Standard 1 m (oil resistant vinyl cabtyre cable 3-conductor 0.2 mm²)	Standard 1 m (oil resistant vinyl cabtyre cable 2-conductor 0.2 mm²)		Standard 1 m (Heat-resistant fluorine insulated cabtyre cord, 2-core, 0.5 mm²)
Max. Impact Resistance	980 m/s²		294 m/s²		
Insulation Resistance	20 MΩ or more at 500 VDC Megger				100 MΩ or more at 500 VDC Megger
Dielectric Strength	No abnormality when 1000 VAC is applied for 1 minute				
Ambient Temperature	-10 to +60°C				-10 to +150°C
Enclosure	IEC Standard IP67, JIS C0920 (Watertight), Oil-resistant				
Weight	1 m: 18 g 3 m: 49 g 5 m: 80 g				44 g

*1: 3 m and 5 m lead wire lengths are available as options.
*2: The above maximum load current of 20 mA is at 25°C. If the ambient operating temperature of the switch is higher than 25°C, the current will be lower than 20 mA. (5 to 10 mA at 60°C)
*3: For precautions on using other switches, refer to P. 139 to 143.

Internal Structure Diagram and Materials

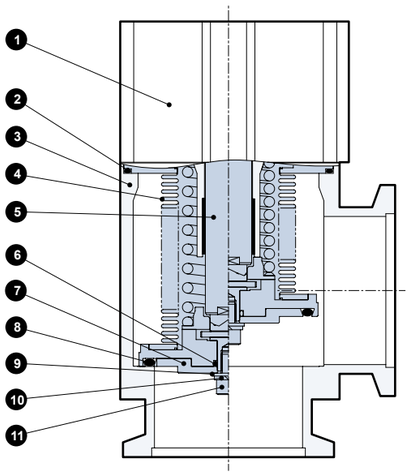
AVB217, AVB317, AVB417, AVB517, AVB617



Part No.	Part Name	Material
1	Cylinder (Built-in Magnet)	-
2	O-ring	FKM Note
3	Body	A6063
4	Bellows	SUS316L
5	Rod	SUS316L
6	O-ring	FKM Note
7	Valve Disc B	SUS316L
8	O-ring	FKM Note
9	Flat Washer	SUS304
10	Spring Washer	SUS304
11	Hex Nut	SUS304

Note) For information on other available O-ring materials, please inquire.

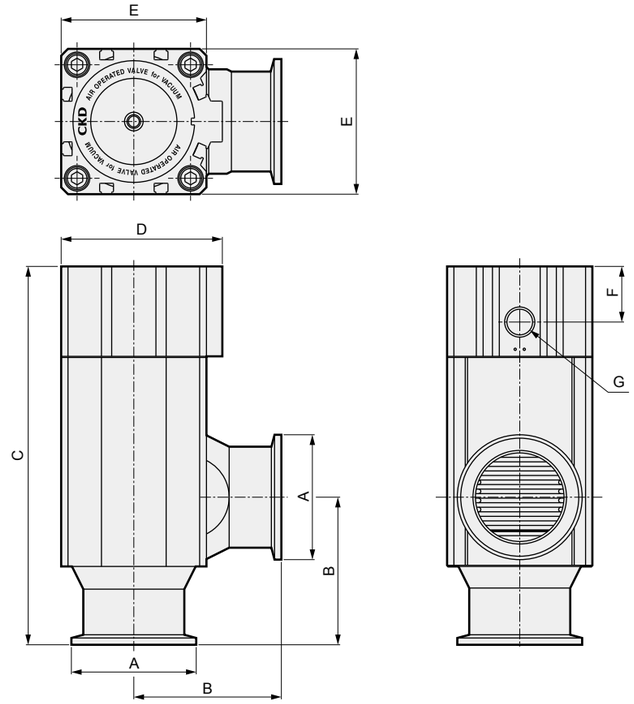
AVB717



Part No.	Part Name	Material
1	Cylinder (Built-in Magnet)	-
2	O-ring	FKM Note
3	Body	A6063
4	Bellows	ASL350
5	Rod	SUS304
6	O-ring	FKM Note
7	Valve Disc B	SUS316L
8	O-ring	FKM Note
9	Flat Washer	SUS304
10	Spring Washer	SUS304
11	Hexagon Socket Head Cap Screw	SUS304

Note) For information on other available O-ring materials, please inquire.

External Dimension Drawings



Model No.	A	B	C	D	E	F	G
AVB217	ø30 (NW16)	40	114	40	40	20	M5
AVB317	ø40 (NW25)	50	127	49.5	45	23	Rc1/8
AVB417	ø55 (NW40)	65	168	71	64	24.5	Rc1/4
AVB517	ø75 (NW50)	70	186	84	77	31	Rc1/4
AVB617	ø87 (NW63)	88	214	104	98	37	Rc1/4
AVB717	ø114 (NW80)	90	235	123.5	117	52.5	Rc1/4

Air Operated Valve for Vacuum, Double Acting Type

AVB□37 Series

●Molded bellows used ●Aluminum body

RoHS

Model No. Notation Method

AVB 4 37 - 40K - ( ) - 4 - D T5H 3 - H

- AVB: Model No.
- 4: ❶ Orifice Diameter
- 37
- 40K: ❷ Port Size
- ( ): ❸ Fluid Temperature
- 4: ❹ Pilot Port Position
- D: ❺ Switch Mounting Position
- T5H: ❻ Switch model No.
- 3: ❼ Switch Lead Wire Length
- H: ❽ No. of Switches

❶Orifice Diameter

Code	Content	
2	ø17	
3	ø24	
4	ø39	
5	ø48	
6	ø68	
7	ø80	Cannot be selected for high-temperature specification.
8	ø100	

❷Port Size

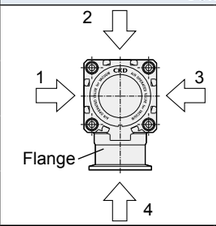
Code	Content	
16K	NW16	AVB237 only
25K	NW25	AVB337 only
40K	NW40	AVB437 only
50K	NW50	AVB537 only
63K	NW63	AVB637 only
80K	NW80	AVB737 only
100K	NW100	AVB837 only

❸Fluid Temperature

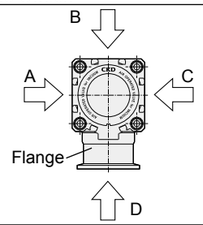
Code	Content
Blank	5 to 60°C (Built-in magnet)
HO	5 to 150°C (No magnet)
HOM	5 to 150°C (Built-in magnet)

Note) When selecting "HOM" with a switch, ❻choose either "ETOH" or "ETOV" for the switch model No.

❹Pilot Port Position

Code	Content
4	 The pilot port position is indicated as 4, 1, 2, or 3 relative to the flange direction when viewed from the top of the valve.
1	
2	
3	

❺Switch Mounting Position

Code	Content
Blank	No Switch
D	 The switch mounting position is indicated as D, A, B, or C relative to the flange direction when viewed from the top of the valve.
A	
B	
C	

Note) ❶For orifice diameter "2" (ø17) only, switches can be mounted on 3 surfaces. Switches can be mounted on any surface except for the pilot port surface. The following model Nos. cannot be selected.
AVB237-16K-1-A❻❼-❽
AVB237-16K-2-B❻❼-❽
AVB237-16K-3-C❻❼-❽
AVB237-16K-4-D❻❼-❽

❻Switch Model No.

Code	Content		
Blank	No Switch		
T0H	Lead wire straight type	Reed	2-wire
T5H			
T0V	Lead wire L-type		
T5V			
T2H	Lead wire straight type	Solid State	3-wire
T3H			
T2V	Lead wire L-type		2-wire
T3V			3-wire
ETOH	Lead wire straight type	Reed	2-wire
ETOV	Lead wire L-type		

Note) ❸For fluid temperature "H0M," please select either "ET0H" or "ETOV."

❼Switch Lead Wire Length

Code	Content	
Blank	1 m (Standard)	
3	3 m	❻If switch model No. is "ET0H" or "ET0V," this cannot be selected.
5	5 m	

❽No. of Switches (Detection Position)

Code	Content	
H	Valve Open Detection	
R	Valve Closed Detection	❻If switch model No. is "ET0H" or "ET0V," this cannot be selected.
D	Valve Open/Closed Detection	

Specifications

Item	AVB237	AVB337	AVB437	AVB537	AVB637	AVB737	AVB837
Applicable Fluid	Vacuum and inert gas						
Operating Pressure Pa (abs)	1.3×10^{-6} to 1×10^{5}						
Max. Operating Pressure Differential MPa	0.1						
Valve Seat Leakage Pa·m³/s (He)	1.3×10^{-10} or less						
External Leakage Pa·m³/s (He)	1.3×10^{-11} or less						
Proof Pressure MPa	0.3						
Fluid Temperature °C	5 to 60 (5 to 150) *1						
Ambient Temperature °C	0 to 60 (No freezing)						
Orifice Diameter mm	ø17	ø24	ø39	ø48	ø68	ø80	ø100
Conductance *2 L/s	5	13	43	74	166	242	372
Port Size	NW16	NW25	NW40	NW50	NW63	NW80	NW100
Operating Pressure MPa	0.4 to 0.6						0.3 to 0.5
Weight kg	0.5	0.7	1.5	2.5	4.2	5.5	13

*1: The values in ( ) are for high temperature specifications.
*2: The conductance value is a theoretical calculated value in the molecular flow region and is not an actual measured value.
*3: Vacuum grease is applied to the O-ring of the external seal part.

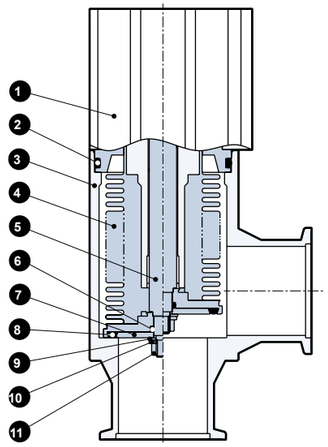
Switch Specifications

Item	Solid State Switch		Reed Switch		
	T2H, T2V	T3H, T3V	T0H, T0V	T5H, T5V	ETOH, ETOV
Application	For Programmable Controller	For Relay, Programmable Controller	For Relay, Programmable Controller	For Programmable Controller, Relay, IC Circuit (No Lamp), Series Connection	For Relay, Programmable Controller
Power Supply Voltage	-	10 to 28 VDC	-	-	-
Load Voltage/Current	10 to 30 VDC, 5 to 20 mA *2	30 VDC or less, 100 mA or less	12/24 VDC 5 to 50 mA 100 VAC 7 to 20 mA	12/24 VDC 50 mA or less 100 VAC 20 mA or less	12/24 VDC 5 to 50 mA 110 VAC 7 to 20 mA
Power Consumption	-	At 24 VDC (ON): 10 mA or less	-	-	-
Internal Voltage Drop	4 V or less	0.5 V or less	3 V or less	0 V	2.4 V or less
Lamp	LED (Lights up when ON)			-	LED (Lights up when ON)
Leakage Current	1 mA or less	10 μA or less	0 mA	0 mA	0 mA
Lead Wire Length *1	Standard 1 m (oil resistant vinyl cabtyre cable 2-conductor 0.2 mm²)	Standard 1 m (oil resistant vinyl cabtyre cable 3-conductor 0.2 mm²)	Standard 1 m (oil resistant vinyl cabtyre cable 2-conductor 0.2 mm²)		Standard 1 m (Heat-resistant fluorine insulated cabtyre cord, 2-core, 0.5 mm²)
Max. Impact Resistance	980m/s²		294m/s²		
Insulation Resistance	20 MΩ or more at 500 VDC Megger				100 MΩ or more at 500 VDC Megger
Dielectric Strength	No abnormality when 1000 VAC is applied for 1 minute				
Ambient Temperature	-10 to +60°C				-10 to +150°C
Enclosure	IEC Standard IP67, JIS C0920 (Watertight), Oil-resistant				
Weight	1 m: 18 g 3 m: 49 g 5 m: 80 g				44 g

*1: 3 m and 5 m lead wire lengths are available as options.
*2: The above maximum load current of 20 mA is at 25°C. If the ambient operating temperature of the switch is higher than 25°C, the current will be lower than 20 mA. (5 to 10 mA at 60°C)
*3: For precautions on using other switches,refer to P. 139 to 143.

Internal Structure Diagram and Materials

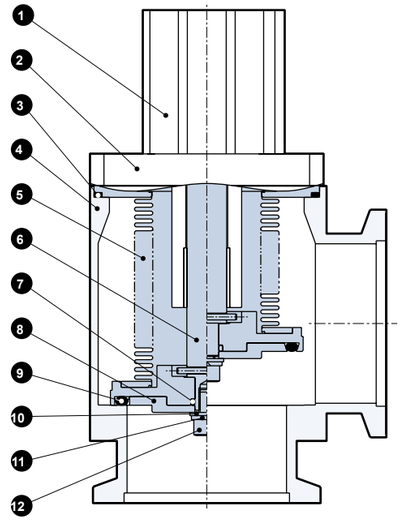
AVB237, AVB337, AVB437, AVB537, AVB637



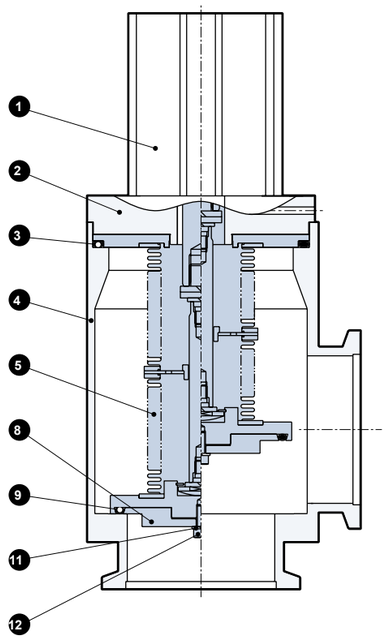
Part No.	Part Name	Material
1	Cylinder (Built-in Magnet)	-
2	O-ring	FKM Note
3	Body	A6063
4	Bellows	SUS316L
5	Rod	SUS304
6	O-ring	FKM Note
7	Valve Disc B	SUS316L
8	O-ring	FKM Note
9	Flat Washer	SUS304
10	Spring Washer	SUS304
11	Hex Nut	SUS304

Note) For information on other available O-ring materials, please inquire.

AVB737



AVB837

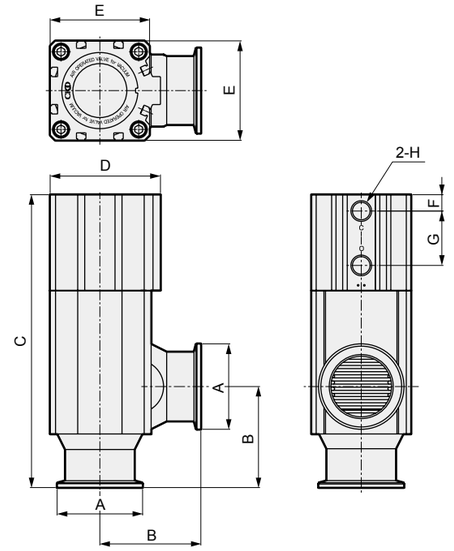


Part No.	Part Name	Material	Part No.	Part Name	Material
1	Cylinder (Built-in Magnet)	-	7	O-ring	FKM Note
2	Cylinder adaptor	AVB737: A5056 AVB837: A5052	8	Valve Disc B	SUS316L
			9	O-ring	FKM Note
3	O-ring	FKM Note	10	Flat Washer	SUS304
4	Body	A6063	11	Spring Washer	SUS304
5	Bellows	ASL350	12	Hexagon Socket Head Cap Screw	SUS304
6	Rod	SUS304			

Note) For information on other available O-ring materials, please inquire.

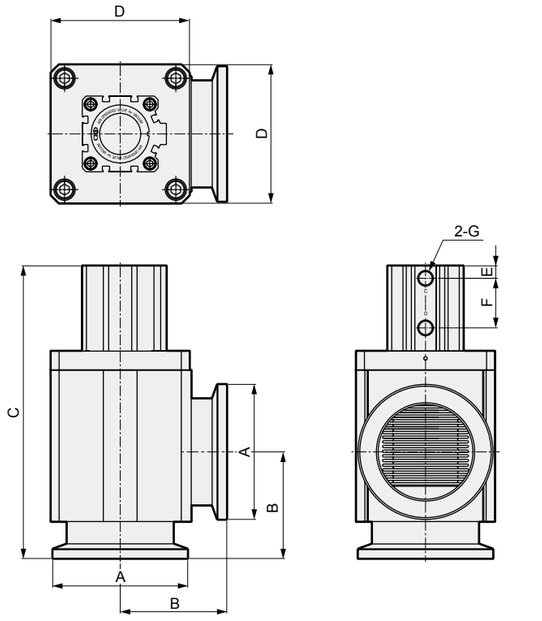
External Dimension Drawings

AVB237, AVB337, AVB437, AVB537, AVB637



Model No.	A	B	C	D	E	F	G	H
AVB237	ø30 (NW16)	40	132.5	40	40	6	32.5	M5
AVB337	ø40 (NW25)	50	144.5	49.5	45	8	32	Rc1/8
AVB437	ø55 (NW40)	65	188	71	64	10.5	35	Rc1/4
AVB537	ø75 (NW50)	70	213	84	77	11	47	Rc1/4
AVB637	ø87 (NW63)	88	245	104	98	13	55	Rc1/4

AVB737, AVB837



Model No.	A	B	C	D	E	F	G
AVB737	ø114 (NW80)	90	247	117	10.5	42	Rc1/4
AVB837	ø134 (NW100)	108	390	154	13	94.5	Rc3/8

Air Operated Valve for Vacuum, 2-Stage

AVB□47 Series

●Molded bellows used ●Aluminum body

RoHS

Model No. Notation Method

AVB 4 47 - 40K - [ ] - 4 - D T5H 3 - H

- AVB: Model No.
- 4: ❶ Orifice Diameter
- 40K: ❷ Port Size
- [ ]: ❸ Fluid Temperature
- 4: ❹ Pilot Port Position
- D: ❺ Switch Mounting Position
- T5H: ❻ Switch model No.
- 3: ❼ Switch Lead Wire Length
- H: ❽ No. of Switches

❶Orifice Diameter

Code	Content
3	ø24
4	ø39
5	ø48
6	ø68

❷ Port Size

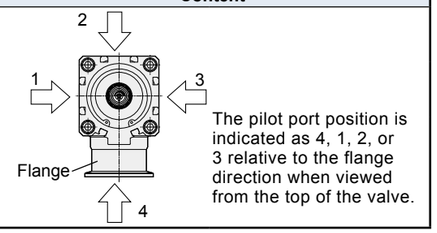
Code	Content	
25K	NW25	AVB347 only
40K	NW40	AVB447 only
50K	NW50	AVB547 only
63K	NW63	AVB647 only

❸Fluid Temperature

Code	Content
Blank	5 to 60°C (Built-in magnet)
HO	5 to 150°C (No magnet)
HOM	5 to 150°C (Built-in magnet)

Note) When selecting "HOM" with a switch, ❻choose either "ETOH" or "ETOV" for the switch model No.

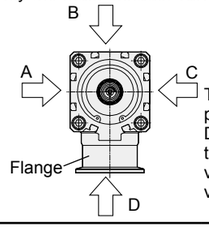
❹Pilot Port Position

Code	Content
4	
1	
2	
3	

The pilot port position is indicated as 4, 1, 2, or 3 relative to the flange direction when viewed from the top of the valve.

❺Switch Mounting Position

Code	Content
Blank	No Switch
D	Only the main exhaust valve can be mounted.
A	
B	
C	



The switch mounting position is indicated as D, A, B, or C relative to the flange direction when viewed from the top of the valve.

❻Switch Model No.

Code	Content		
Blank	No Switch		
T0H	Lead wire straight type	Reed	2-wire
T5H			
T0V	Lead wire L-type		
T5V			
T2H	Lead wire straight type	Solid State	3-wire
T3H			
T2V	Lead wire L-type		2-wire
T3V			3-wire
ETOH	Lead wire straight type	Reed	2-wire
ETOV	Lead wire L-type		

Note) ❸For fluid temperature "H0M," please select either "ET0H" or "ETOV."

❼Switch Lead Wire Length

Code	Content	
Blank	1 m (Standard)	
3	3 m	❻If switch model No. is "ET0H" or "ET0V," this cannot be selected.
5	5 m	

❽No. of Switches (Detection Position)

Code	Content	
H	Valve Open Detection	
R	Valve Closed Detection	❻If switch model No. is "ET0H" or "ET0V," this cannot be selected.
D	Valve Open/ Closed Detection	

Specifications

Item	AVB347	AVB447	AVB547	AVB647
Applicable Fluid	Vacuum and inert gas			
Operating Pressure Pa (abs)	1.3×10^{-6} to 1×10^{5}			
Max. Operating Pressure Differential MPa	0.1			
Valve Seat Leakage Pa·m³/s (He)	1.3×10^{-10} or less			
External Leakage Pa·m³/s (He)	1.3×10^{-11} or less			
Proof Pressure MPa	0.3			
Fluid Temperature °C	5 to 60 (5 to 150) *1			
Ambient Temperature °C	0 to 60 (No freezing)			
Orifice Diameter mm	ø24	ø39	ø48	ø68
Conductance *2 L/s	13	43	74	166
Port Size	NW25	NW40	NW50	NW63
Main Exhaust Operating Pressure MPa	0.4 to 0.6			
Slow Exhaust Operating Pressure MPa	0.4 to 0.6			
Weight kg	0.7	1.6	2.6	4.4

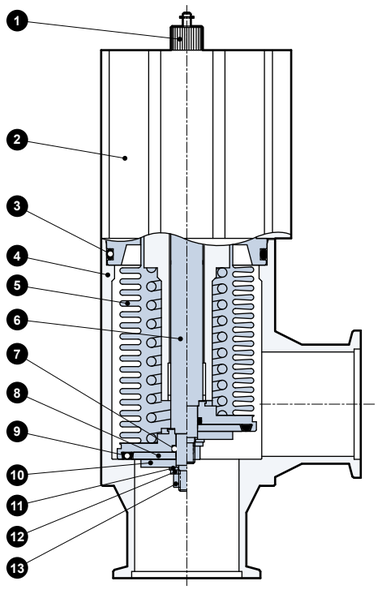
*1: The values in ( ) are for high temperature specifications.
*2: The conductance value is a theoretical calculated value in the molecular flow region and is not an actual measured value.
*3: Vacuum grease is applied to the O-ring of the external seal part.

Switch Specifications

Item	Solid State Switch		Reed Switch		
	T2H, T2V	T3H, T3V	T0H, T0V	T5H, T5V	ETOH, ETOV
Application	For Programmable Controller	For Relay, Programmable Controller	For Relay, Programmable Controller	For Programmable Controller, Relay, IC Circuit (No Lamp), Series Connection	For Relay, Programmable Controller
Power Supply Voltage	-	10 to 28 VDC	-	-	-
Load Voltage/Current	10 to 30 VDC, 5 to 20 mA *2	30 VDC or less, 100 mA or less	12/24 VDC 5 to 50 mA 100 VAC 7 to 20 mA	12/24 VDC 50 mA or less 100 VAC 20 mA or less	12/24 VDC 5 to 50 mA 110 VAC 7 to 20 mA
Power Consumption	-	At 24 VDC (ON): 10 mA or less	-	-	-
Internal Voltage Drop	4 V or less	0.5 V or less	3 V or less	0 V	2.4 V or less
Lamp	LED (Lights up when ON)			-	LED (Lights up when ON)
Leakage Current	1 mA or less	10 μA or less	0 mA	0 mA	0 mA
Lead Wire Length *1	Standard 1 m (oil resistant vinyl cabtyre cable 2-conductor 0.2 mm²)	Standard 1 m (oil resistant vinyl cabtyre cable 3-conductor 0.2 mm²)	Standard 1 m (oil resistant vinyl cabtyre cable 2-conductor 0.2 mm²)		Standard 1 m (Heat-resistant fluorine insulated cabtyre cord, 2-core, 0.5 mm²)
Max. Impact Resistance	980 m/s²		294 m/s²		
Insulation Resistance	20 MΩ or more at 500 VDC Megger				100 MΩ or more at 500 VDC Megger
Dielectric Strength	No abnormality when 1000 VAC is applied for 1 minute				
Ambient Temperature	-10 to +60°C				-10 to +150°C
Enclosure	IEC Standard IP67, JIS C0920 (Watertight), Oil-resistant				
Weight	1 m: 18 g 3 m: 49 g 5 m: 80 g				44 g

*1: 3 m and 5 m lead wire lengths are available as options.
*2: The above maximum load current of 20 mA is at 25°C. If the ambient operating temperature of the switch is higher than 25°C, the current will be lower than 20 mA. (5 to 10 mA at 60°C)
*3: For precautions on using other switches, refer to P. 139 to 143.
*4: The switch can only be mounted on the main exhaust valve.

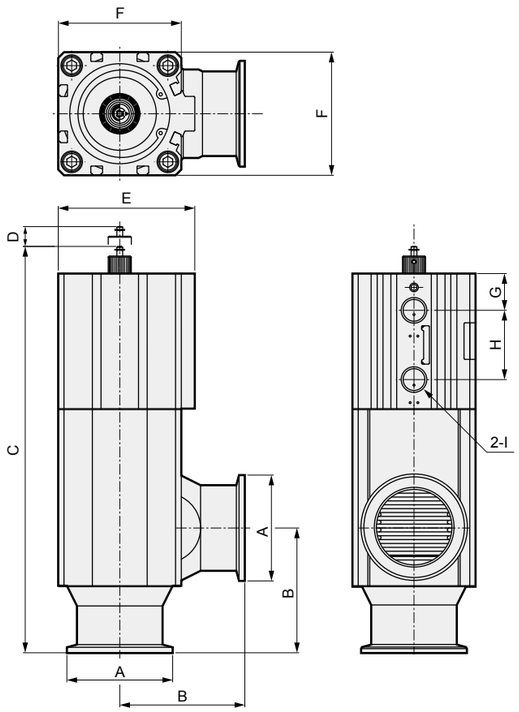
Internal Structure Diagram and Materials



Part No.	Part Name	Material
1	Adjusting Nut	A5056
2	Cylinder (Built-in Magnet)	-
3	O-ring	FKM Note
4	Body	A6063
5	Bellows	SUS316L
6	Rod	SUS304
7	O-ring	FKM Note
8	Valve Disc B	SUS316L
9	O-ring	FKM Note
10	Skirt	SUS304
11	Flat Washer	SUS304
12	Spring Washer	SUS304
13	Hex Nut	SUS304

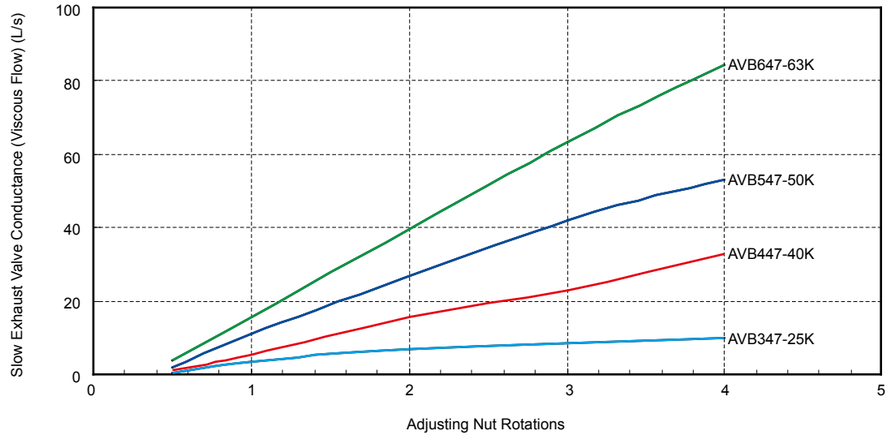
Note) For information on other available O-ring materials, please inquire.

External Dimension Drawings



Model No.	A	B	C	D (max.)	E	F	G	H	I
AVB347	ø40 (NW25)	50	168	7.5	49.5	45	19	31	Rc1/8
AVB447	ø55 (NW40)	65	211	12	71	64	19	35	Rc1/4
AVB547	ø75 (NW50)	70	234	15	84	77	21.5	42.5	Rc1/4
AVB647	ø87 (NW63)	88	263	17	104	98	23.5	49	Rc1/4

Number of adjusting nut rotations x Slow exhaust valve/conductance



AGD
OGD
MGD
LGD
High Durability
Process Gas Valve
Other Gas Components
PGM
Regulator
IAGD
Integrated System
AVB
High Vacuum Valve
MVB
IAVB
Vacu Press Control Sys
Ending

Air Operated Valve for High Vacuum

AVB□□7 Series Special Specification Product

Contact CKD for details.

RoHS Special Specifications

Large Bore Type

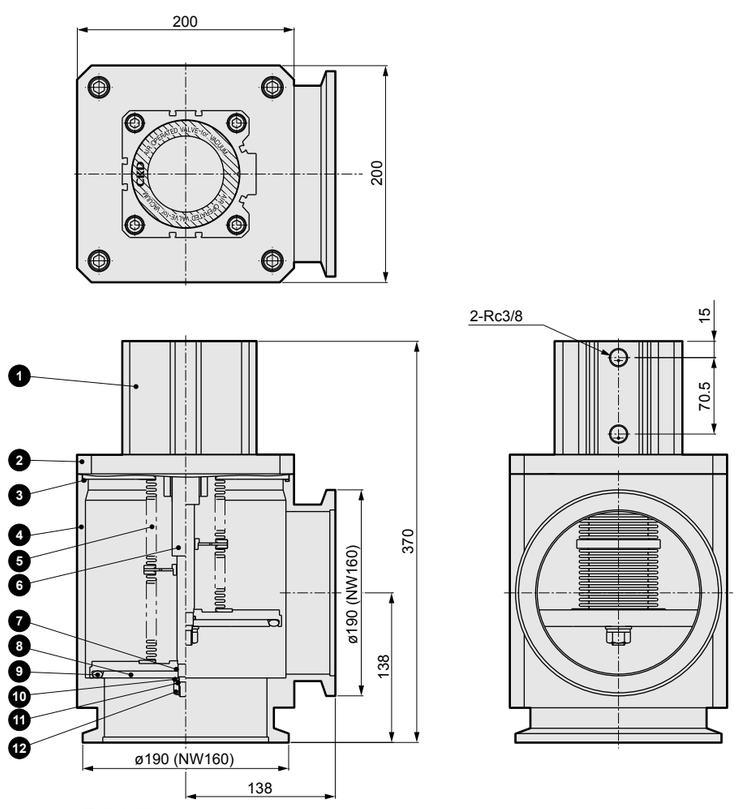
Model No.	Actuation Method	Port Size
AVB937	Double Acting	NW160

Reference specifications

Item	AVB937-X□
Applicable Fluid	Vacuum and inert gas
Operating Pressure Pa (abs)	$1.3x10^{-6}$ to $1x10^{5}$
Max. Operating Pressure Differential MPa	0.1
Valve Seat Leakage Pa·m³/s (He)	$1.3x10^{-10}$ or less
External Leakage Pa·m³/s (He)	$1.3x10^{-11}$ or less
Proof Pressure MPa	0.3
Fluid Temperature °C	5 to 60
Ambient Temperature °C	0 to 60 (No freezing)
Orifice Diameter mm	ø150
Conductance *1 L/s	1,100
Port Size	NW160
Operating Pressure MPa	0.3 to 0.5
Weight kg	18

*1: The conductance value is the theoretical calculation value in the molecular region, and not the actual measured value.

Internal Structure Diagram, Materials, and External Dimensions

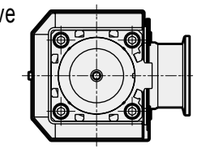


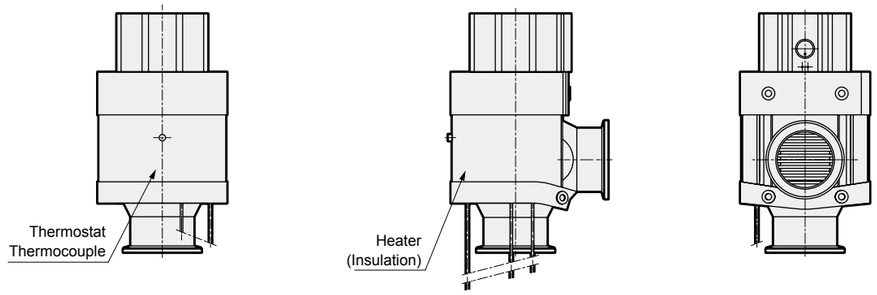
Part No.	Part Name	Material
1	Cylinder (Built-in Magnet)	-
2	Cylinder adaptor	A5056
3	O-ring	FKM Note)
4	Body	A5052
5	Bellows	ASL350
6	Rod	SUS304
7	O-ring	FKM Note)
8	Valve Disc B	SUS304
9	O-ring	FKM Note)
10	Flat Washer	SUS304
11	Spring Washer	SUS304
12	Hex Nut	SUS304

Note) For information on other available O-ring materials, please inquire.

Supports heater for valve heating

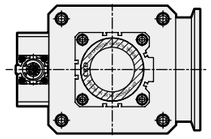
To prevent adhesion of reaction products inside the valve
- Jacketed heater valve
- NW25, NW40, NW50

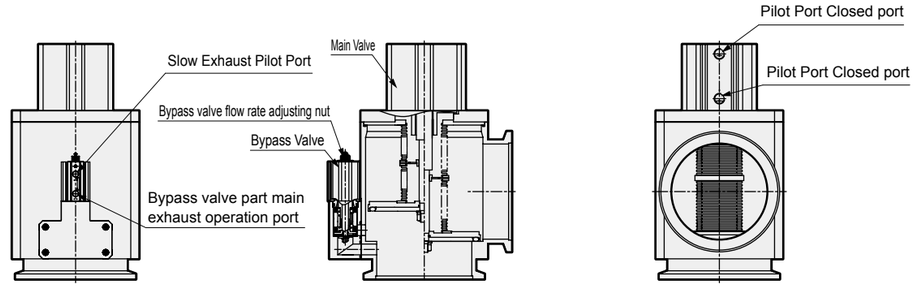




Slow exhaust (external bypass valve) compatible

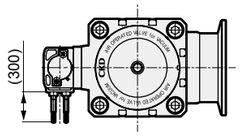
Control exhaust in 2 stages
- NW80, NW100, NW160

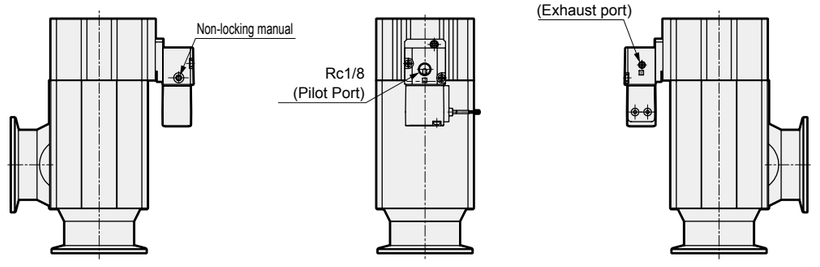




Solenoid Valve

- NW16, NW25, NW40, NW50, NW63, NW80
- NC Type





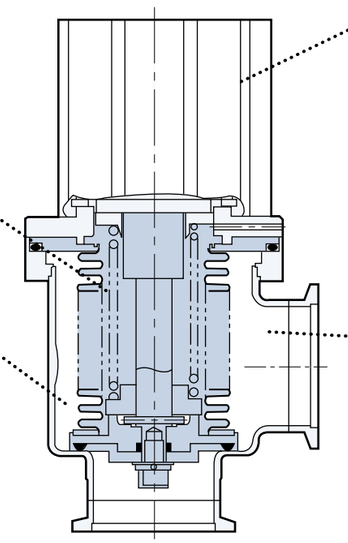
Air Operated Valve for High Vacuum

AVB□□3 Series

●Molded bellows used ●stainless steel body

RoHS

SUS body has been adopted and improved corrosion resistance, allowing use in various processes.



●Miniature switch can be mounted
Reed switch for operation check (proximity, reed) can be connected. (Can be retrofitted)

●Long service life molded bellows
Special stainless steel material (ASL350) used.
Proven 3 million cycles
(Under our specified conditions)

●No gas accumulation
Due to the design of the flow path, there is no dead space for gas accumulation.

●Low dust generation
There are no sliding parts to cause particle generation in the gas contact parts (flow path).

Precautions for Use

To use this product correctly and safely, please be sure to read the following precautions on page 9 of the opening section and on pages 138-143.

●About Applicable Fluids
●Mounting
●Direction when connecting pipes
●Proximity switch, reed switch

Model No. Notation Method

AVB 6 1 3 - 40K - T5H 3 - H

- AVB: Model No.
- 6: ❶ Orifice Diameter
- 1: ❷ Actuation Method
- 3: ❸ Port Size
- 40K: ❹ Switch model No.
- T5H: ❺ Switch Lead Wire Length
- 3: ❻ No. of Switches
- H: ❻ No. of Switches

❶Orifice Diameter

Code	Content
5	ø24
6	ø40
7	ø50
8	ø80

❷Actuation method

Code	Content
1	NC (Normally Closed)
2	NO (Normally Open)
3	Double Acting

❸ Port Size

Code	Content	
25K	NW25	AVB6□3 only
40K	NW40	AVB6□3 only
50K	NW50	AVB7□3 only
80K	NW80	AVB8□3 only

❹Switch Model No.

Code	Content		
Blank	No Switch		
T0H	Lead wire straight type	Reed	2-wire
T5H			
T0V	Lead wire L-type		
T5V			
T2H	Lead wire straight type	Solid State	3-wire
T3H			
T2V	Lead wire L-type		2-wire
T3V			3-wire

❺Switch Lead Wire Length

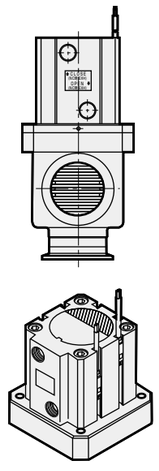
Code	Content
Blank	1 m (Standard)
3	3 m
5	5 m

❻No. of Switches (Detection Position)

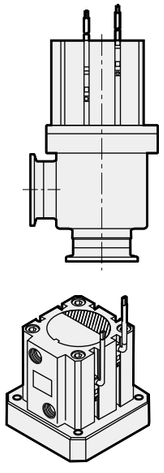
Code	Content
H	Valve Open Detection
R	Valve Closed Detection
D	Valve Open/Closed Detection

External view of switch installation

●T□H type
(lead wire straight)



●T□V type
(lead wire L-shaped)



Specifications

Item		AVB5□3	AVB6□3	AVB7□3	AVB8□3
Applicable Fluid		Vacuum and inert gas			
Working pressure	Pa (abs)	$1.3x10^{-6}$ to $1x10^{5}$			
Max. Operating Pressure Differential	MPa	0.1			
Valve Seat Leakage	Pa·m³/s (He)	$1.3x10^{-10}$ or less			
Valve Seat Leakage	Pa·m³/s (He)	$1.3x10^{-11}$ or less			
Proof Pressure	MPa	0.3			
Fluid temperature	°C	5 to 60			
Ambient Temperature	°C	0 to 60 (no freezing)			
Orifice Diameter	mm	ø24	ø40	ø50	ø80
Stroke	mm	10	20	22	32
Conductance *1	L/s	13	52	80	242
Port Size		NW25	NW40	NW50	NW80
Operating Pressure	MPa	0.4 to 0.6			
Weight	kg NC Type	1.1	1.9	3.6	7.9
	NO Type	1.1	1.9	3.5	7.8
	Double Acting	1.0	1.6	3.2	7.3

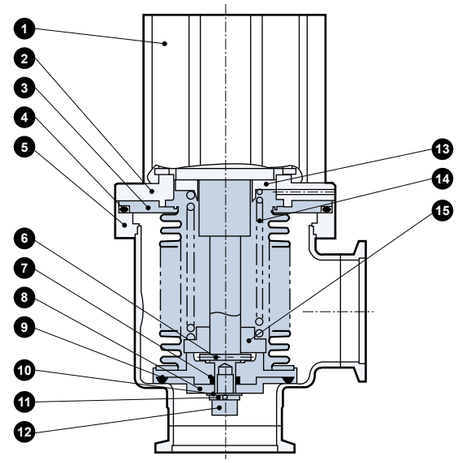
*1: The conductance value is a theoretical calculated value in the molecular flow region and is not an actual measured value.
*2: Vacuum grease is applied to the O-ring of the external seal part.

Switch Specifications

Item	Solid State Switch		Reed Switch	
	T2H, T2V	T3H, T3V	T0H, T0V	T5H, T5V
Application	For Programmable Controller	For Relay, Programmable Controller	For Relay, Programmable Controller	For Programmable Controller, Relay, IC Circuit (No Lamp), Series Connection
Power Supply Voltage	-	10 to 28 VDC	-	-
Load Voltage/Current	10 to 30 VDC, 5 to 20 mA *2	30 VDC or less, 100 mA or less	12/24 VDC5 to 50 mA 100 VAC 7 to 20mA	12/24 VDC 50 mA or less 100 VAC, 20 mA or less
Power Consumption	-	At 24 VDC (ON): 10 mA or less	-	-
Internal Voltage Drop	4 V or less	0.5 V or less	3 V or less	0 V
Lamp	LED (Lights up when ON)			-
Leakage Current	1 mA or less	10 μA or less	0 mA	0 mA
Lead Wire Length *1	Standard 1 m (Oil-resistant vinyl cabtyre cord, 2-core, 0.2 mm²)	Standard 1 m (Oil-resistant vinyl cabtyre cord, 3-core, 0.2 mm²)	Standard 1 m (Oil-resistant vinyl cabtyre cord, 2-core, 0.2 mm²)	
Max. Impact Resistance	980 m/s²		294 m/s²	
Insulation Resistance	20 MΩ or more at 500 VDC Megger			
Dielectric Strength	No abnormality when 1000 VAC is applied for 1 minute			
Ambient Temperature Range	-10 to +60°C			
Enclosure	IEC Standard IP67, JIS C0920 (Watertight), Oil-resistant			
Weight	1 m: 18 g 3 m: 49 g 5 m: 80 g			

*1: 3 m and 5 m lead wire lengths are also available as options.
*2: The above maximum load current of 20 mA is at 25°C. If the ambient operating temperature of the switch is higher than 25°C, the current will be lower than 20 mA. (5 to 10 mA at 60°C)
*3: For precautions on using other switches, refer to P. 139 to 143.

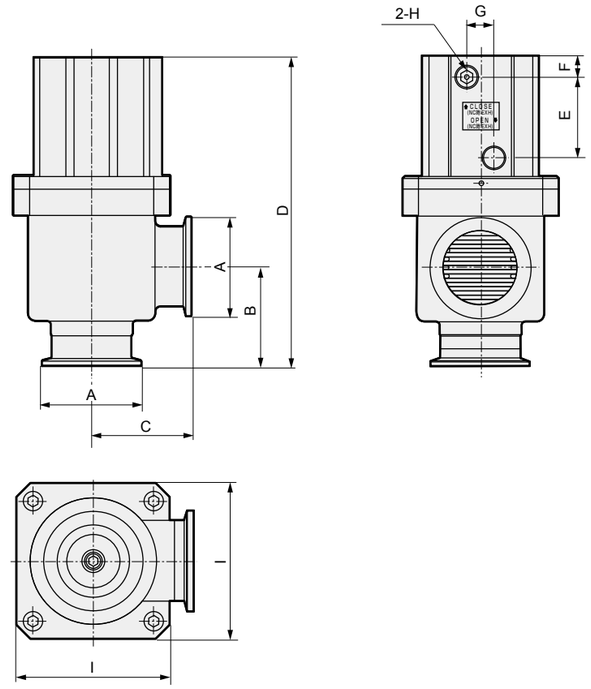
Internal Structure Diagram and Materials



Part No.	Part Name	Material
1	Super Compact Cylinder	-
2	Cylinder adaptor	A5056
3	Bellows assembly	ASL350/SUS316L
4	O-ring	FKM *
5	Body Assembly	SUS316L
6	Parallel Pin	SUS301
7	O-ring	FKM *
8	Valve Disc B	SUS316L
9	O-ring	FKM *
10	Flat Washer	SUS304
11	Spring Washer	SUS304
12	Hexagon Socket Head Cap Screw	SUS304
13	Spring Retainer B	A5056
14	Spring	SWOSC-V (Electrodeposition)
15	Spring Retainer A	A5056

*For information on other available O-ring materials, please inquire.

External Dimension Drawings



The dimensions in ( ) within code D are for NO-type.

Model No.	A	B	C	D	E	F	G	H	I
AVB5□3	ø40 (NW25)	50	50	151.5 (162.5)	37	8	10	Rc1/8	77
AVB6□3	ø55 (NW40)	55	55	170.5 (181.5)	44.5	10.5	15	Rc1/4	86
AVB7□3	ø75 (NW50)	70	70	208	52	11	15	Rc1/4	112
AVB8□3	ø114 (NW80)	90	105	258	64.5	13	15	Rc3/8	137

Air Operated Valve for High Vacuum

AVB□□3 Series Special Specification Product

Contact CKD for details.

RoHS Special Specifications

Slow Exhaust (Built-in Bypass Valve) Compatible

Control exhaust in 2 stages

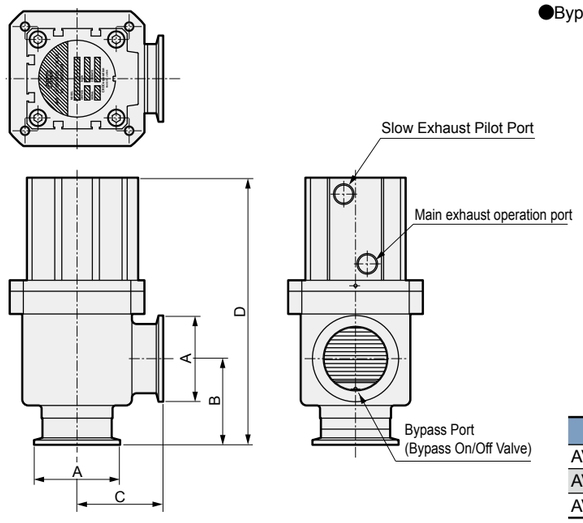
- 1 actuator slow exhaust valve
- NW25, NW40, NW50

Specifications

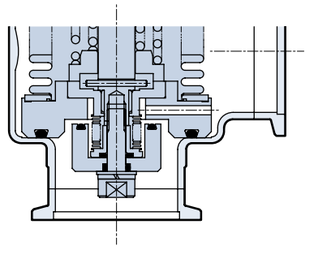
Item		AVB513-X□	AVB613-X□	AVB713-X□
Applicable Fluid		Vacuum and inert gas		
Operating Pressure	Pa (abs)	$1.3x10^{-6}$ to $1x10^{5}$		
Max. Operating Pressure Differential	MPa	0.1		
Valve Seat Leakage	Pa·m³/s (He)	$1.3x10^{-10}$ or less		
External Leakage	Pa·m³/s (He)	$1.3x10^{-11}$ or less		
Proof Pressure	MPa	0.3		
Fluid temperature	°C	5 to 60		
Ambient Temperature	°C	0 to 60 (no freezing)		
Orifice Diameter	mm	ø24	ø40	ø50
Small Flow Orifice Diameter *1	mm	ø1 to 3	ø1 to 3	ø1 to 4
Main Valve Stroke	mm	10	20	22
Small Flow Valve Stroke	mm	2	2	2
Conductance (main valve) *2	L/s	13	52	80
Port Size		NW25	NW40	NW50
Operating Pressure	MPa	0.4 to 0.6		

*1: Please consult with us separately regarding the small flow orifice diameter.
*2: The conductance value is a theoretical calculated value in the molecular flow region and is not an actual measured value.

External Dimension Drawings



●Bypass Valve Section Structure



Model No.	A	B	C	D
AVB513-X□	ø40 (NW25)	50	50	180.5
AVB613-X□	ø55 (NW40)	55	55	177.5
AVB713-X□	ø75 (NW50)	70	70	216.5

Slow exhaust (external bypass valve) compatible

Control exhaust in 2 stages

- 2 actuator (bypass) slow exhaust valve
- NW25, NW40, NW50, NW80

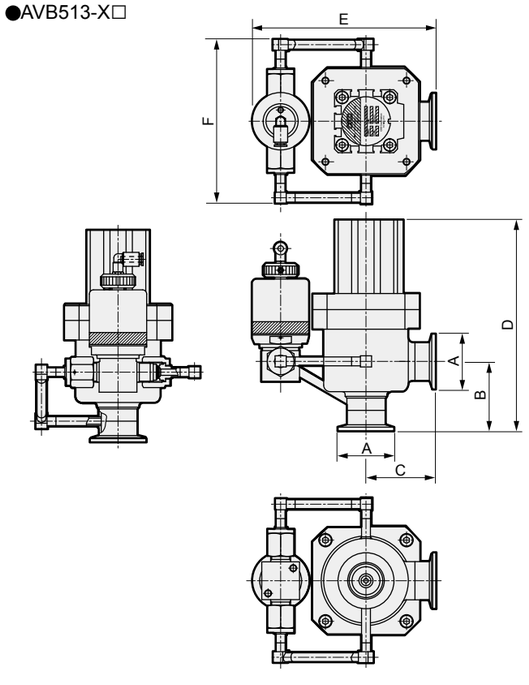
Specifications

Item		AVB513-X□	AVB613-X□	AVB713-X□	AVB813-X□
Applicable Fluid		Vacuum and inert gas			
Operating Pressure	Pa (abs)	$1.3x10^{-6}$ to $1x10^{5}$			
Max. Operating Pressure Differential	MPa	0.1			
Valve Seat Leakage	Pa·m³/s (He)	$1.3x10^{-10}$ or less			
External Leakage	Pa·m³/s (He)	$1.3x10^{-11}$ or less			
Proof Pressure	MPa	0.3			
Fluid temperature	°C	5 to 60			
Ambient Temperature	°C	0 to 60 (no freezing)			
Orifice Diameter (Main Flow Path)	mm	ø24	ø40	ø50	ø80
Stroke (Main Valve)	mm	10	20	22	32
Conductance (main valve) *1	L/s	13	52	80	242
Port Size		NW25	NW40	NW50	NW80
Operating Pressure	MPa	0.4 to 0.6			

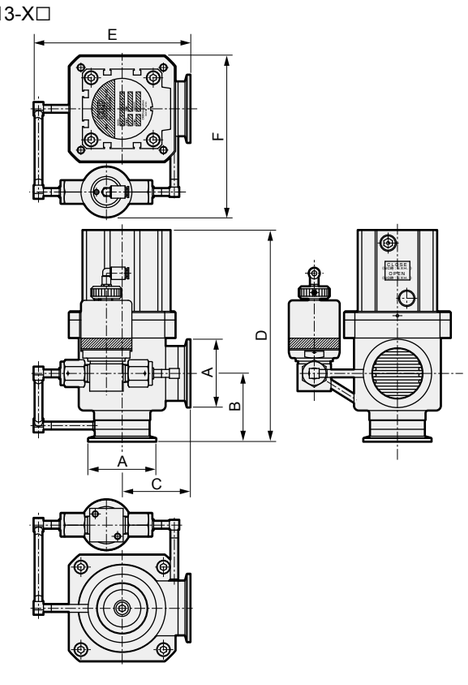
*1: The conductance value is a theoretical calculated value in the molecular flow region and is not an actual measured value.

External Dimension Drawings

●AVB513-X□



●AVB$^{6}_{8}$13-X□



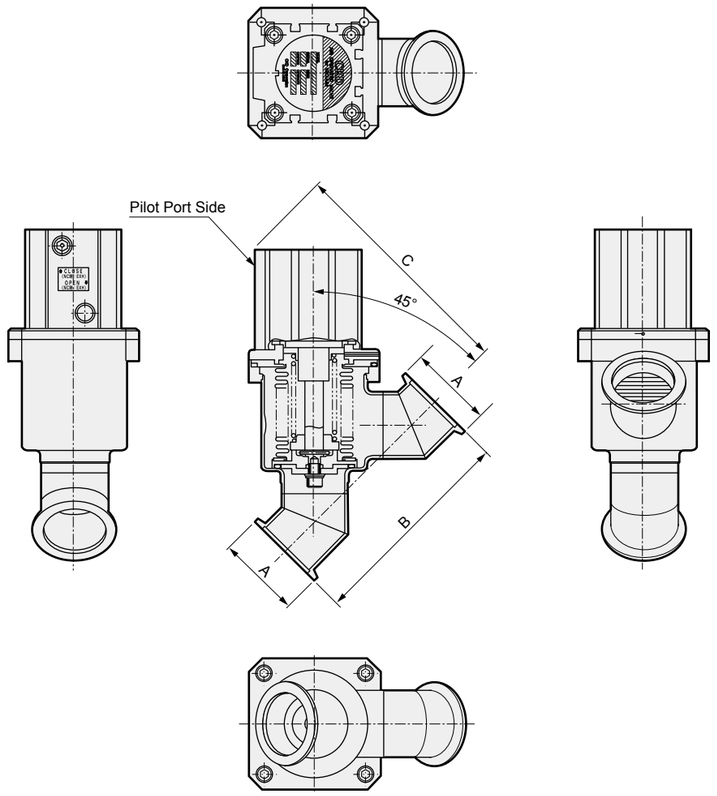
Model No.	A	B	C	D	E	F	Bypass Valve	Bypass Piping
AVB513-X□	ø40 (NW25)	50	50	151.5	131.5	117.5	AGD11V-□	1/4″
AVB613-X□	ø55 (NW40)	55	55	170.5	127	130.5		
AVB713-X□	ø75 (NW50)	70	70	208	165.5	175.5	AGD21V-□	3/8″
AVB813-X□	ø114 (NW80)	90	105	258	191.5	202		

Straight Flange Compatible

Ideal for installing in straight piping sections

- Straight flange valve
- NW25, NW40, NW50, NW80

External Dimension Drawings



Model No.	A	B	C
AVB5□3-X□	ø40 (NW25)	130	130 (138)
AVB6□3-X□	ø55 (NW40)	140	155 (163)
AVB7□3-X□	ø75 (NW50)	210	191
AVB8□3-X□	ø114 (NW80)	250	241

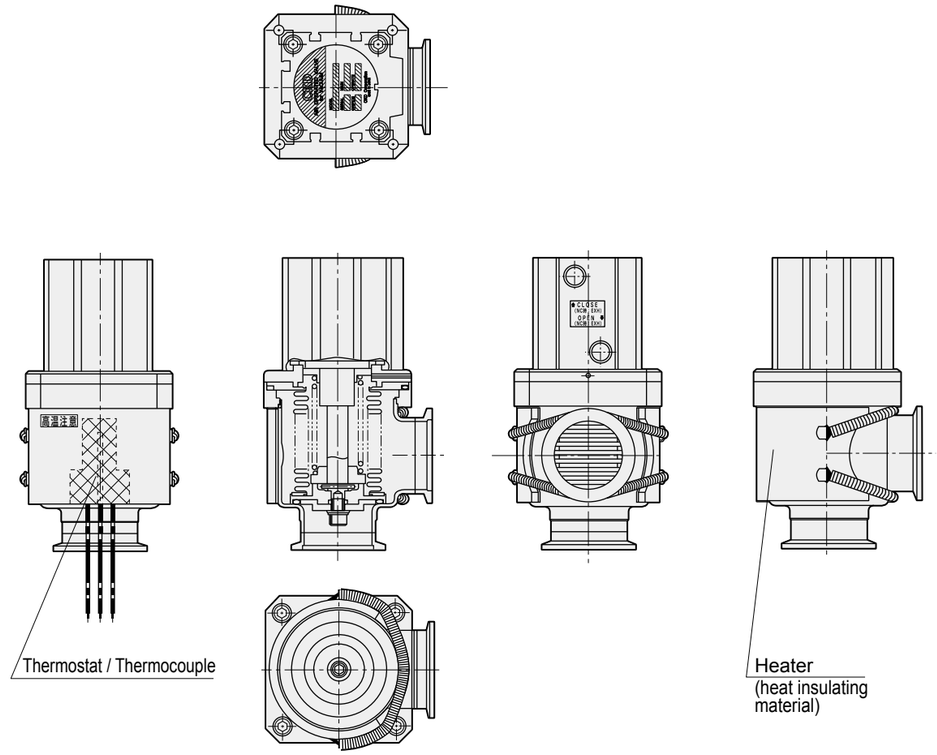
*1: The dimension in ( ) within code C is for the NO type.
*2: The value of C2 changes depending on the orientation of the pilot port.

Supports heater for valve heating

To prevent adhesion of reaction products inside the valve

- The integrated insulation cover prevents burns on contact.
- The thermostat (manual return) prevents abnormal temperature rise.
- The thermocouple enables temperature monitoring and control.
- The heater can be easily attached and detached.

- Jacketed heater valve
- NW25, NW40, NW50, NW80



Air Operated Valve for High Vacuum, NC Type

AVB21-8T Series

●Molded bellows used ●stainless steel body
●1/4" Tube

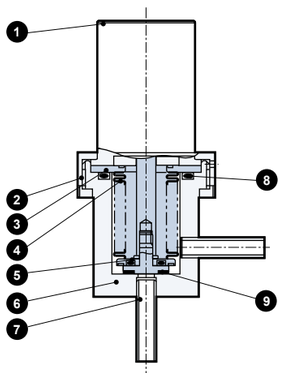
RoHS

Specifications

Item		AVB21-8T
Applicable Fluid		Vacuum and inert gas
Working pressure	Pa (abs)	1.3×10^{-6} to 2.5×10^{5}
Max. Operating Pressure Differential	MPa	0.25
Valve Seat Leakage	Pa·m³/s (He)	1.3×10^{-9} or less
External Leakage	Pa·m³/s (He)	1.3×10^{-9} or less
Proof Pressure	MPa	0.3
Fluid temperature	°C	5 to 60
Ambient Temperature	°C	0 to 60 (no freezing)
Orifice Diameter	mm	5
Stroke	mm	3
Conductance *1	L/s	-
Connection Method		1/4" Tube
Operating Pressure	MPa	0.3 to 0.5
Weight	kg	0.25

*1: The conductance value is a theoretical calculated value in the molecular flow region and is not an actual measured value.

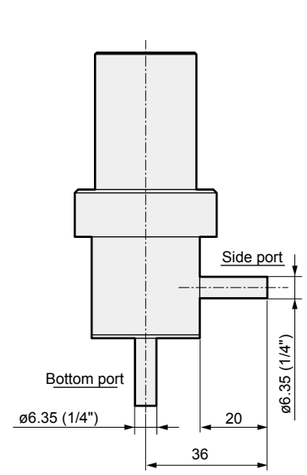
Internal Structure Diagram and Materials

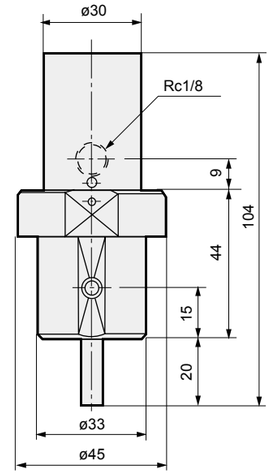


Part No.	Part Name	Material
1	Cylinder	-
2	Ring	C3604
3	Bellows ring	SUS304
4	Bellows	SUS316L
5	Valve Disc B	SUS304
6	Body	SUS304
7	Pipe	SUS304
8	O-ring	FKM Note
9	Valve Disc A	FKM, SUS304

Note) For information on other available O-ring materials, please inquire.

External Dimension Drawings

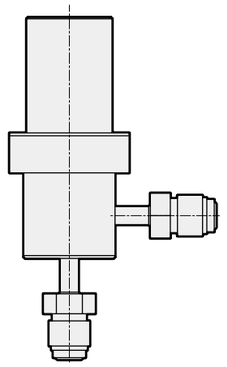


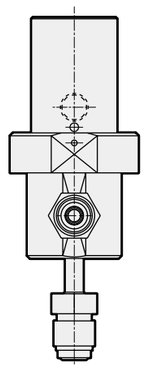


■ Flange compatible

●With fitting

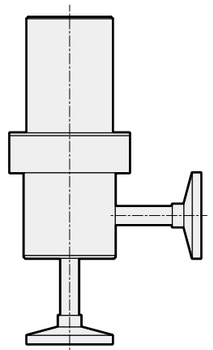
Special Specifications

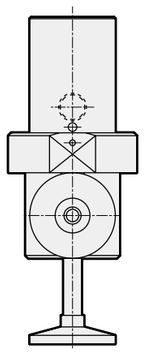




●NW flange

Special Specifications





Air operated valve For high vacuum Large bore size

AVB932 Series Special Specification Product

- Uses double acting
- Molded bellows
- Stainless steel body
- Port size: NW100

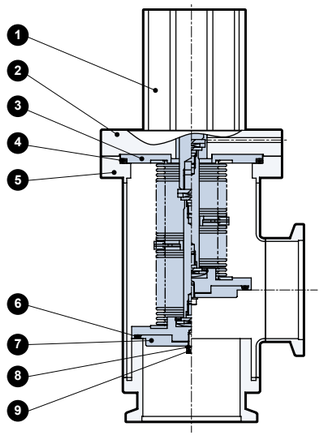
Special Specifications

Specifications

Item		AVB932-X□
Applicable Fluid		Vacuum and inert gas
Working pressure	Pa (abs)	$1.3x10^{-6}$ to $1x10^{5}$
Max. Operating Pressure Differential	MPa	0.1
Valve Seat Leakage	Pa·m³/s (He)	$1.3x10^{-9}$ or less
External Leakage	Pa·m³/s (He)	$1.3x10^{-9}$ or less
Proof Pressure	MPa	0.3
Fluid temperature	°C	5 to 60
Ambient Temperature	°C	0 to 60 (no freezing)
Orifice Diameter	mm	100
Stroke	mm	50
Conductance *1	L/s	372
Port Size		NW100
Operating Pressure	MPa	0.3 to 0.5
Weight	kg	18

*1: The conductance value is a theoretical calculated value in the molecular flow region and is not an actual measured value.

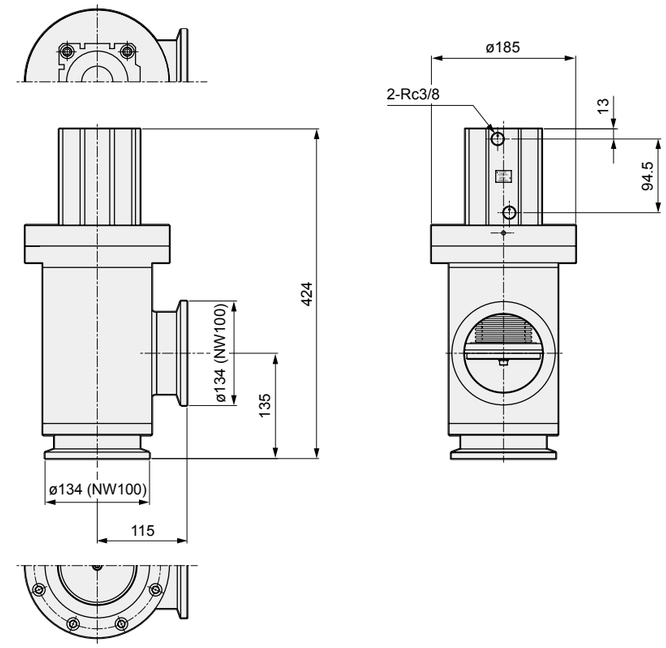
Internal Structure Diagram and Materials



Part No.	Part Name	Material
1	Super Compact Cylinder	-
2	Cylinder adaptor	A5056
3	Bellows assembly	-
4	O-ring	FKM Note
5	Body Assembly	SUS316
6	O-ring	FKM Note
7	Valve Disc B	SUS316
8	Spring Washer	SUS304
9	Hexagon Socket Head Cap Screw	SUSXM7

Note) For information on other available O-ring materials, please inquire.

External Dimension Drawings



Components for High Vacuum

To Use This Product Safely

Be sure to read this before use.
For General Precautions refer to Into 9.

Individual Precautions: Air Operated Valve for High Vacuum, AVB Series

Design / Selection

1. Confirmation of Specifications

Warning

- Incorrect equipment selection and handling can cause problems not only in this product, but also to your system. Please be sure to confirm the specifications of this product and its compatibility with your system before use.
- Check the compatibility between the gas contact part materials and working fluid before use.
- Use within the specified fluid temperature and pressure range.

2. Working fluids

Caution

- This product is designed for controlling vacuum or inert gas. If other fluids (active gas, liquids, solids, etc.) pass through, the product may fail to operate normally or may display decreased performance. Check the compatibility between the gas contact part materials and working fluid before use. If there is a risk of the applicable fluid solidifying, please confirm that there are no issues with its use before using.
- Avoid using fluids that build up crystallization in the piping.

3. Selection

Caution

- When managing valve responsiveness, pay attention to piping size and length and the flow characteristics of the operation solenoid valve.
- The cylinder and bellows interior are directly connected to atmosphere. Do not block the connecting hole between the bellows interior and the atmosphere (2 holes just under the operation port) in use.
- Fittings Select air piping and piping that match the working temperature.

4. Mounting

Caution

- Perform piping so no excessive force is applied to the flange. If heavy objects and mounted components vibrate, fix so that torque is not applied directly to the flange.

● High-Temperature Specification

- When insulating the valve, insulate only the body. Please note that insulating the cylinder may prevent the maintenance of normal operation.

5. Securing Space

Caution

- Secure sufficient space for maintenance and inspection.

6. Piping

Caution

- When piping, do not apply tension, compression, bending or other forces to the valve body from the piping.
- Durability may decrease due to exhaust flow, so we recommend use of the bellows side as the exhaust side except for models with limited vacuum pump connection ports.
  In addition, since durability varies depending on the operating conditions, please confirm sufficiently.

7. During Use

Caution

- Do not use valves as a footing or place any heavy objects on top of the valves.

Cylinder Switch

To Use This Product Safely

Read the precautions listed in the latest "Pneumatic cylinders" (No.RJ-002AA to 006AA) before use.

Design / Selection

Solid State Switch T2H, T2V, T3H, T3V

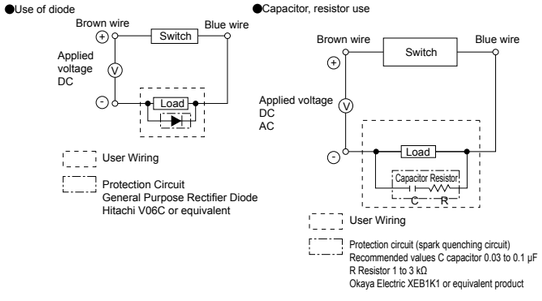
Reed Switch T0H, T5H, T0V, T5V

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 switch does not have an explosive-proof structure. If used in an explosive gas atmosphere, it may cause an explosion disaster, so never use it.
- The lamps used are LEDs. If used continuously at high temperatures, visibility will gradually decrease. As the LED lamp circuit is separated from the switch output circuit, the switch output works normally even if the LED lamp goes out.
- Do not flow overcurrent.
  If overcurrent flows to the switch due to a load short-circuit, etc., the switch will be damaged with a risk of ignition. If necessary, please provide an overcurrent protection circuit such as a fuse on the output line and power supply line.

Caution

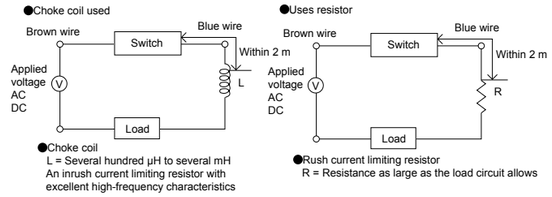
- Please be careful when using in an interlock circuit.
  When using the switch for an interlock signal requiring high reliability, provide a double interlock by installing a mechanical protection function or a sensor other than a switch as a safeguard against failure. In addition, please perform regular inspections and confirm that it operates normally.
- Please pay attention to the contact capacity.
  Do not use a load that exceeds the maximum contact capacity of the switch. It will cause failure. The lamp may not come on if the current is less than the rated current.
- Please pay attention to the contact protection circuit. (Reed switch)
  - When an inductive load (relay or solenoid valve) is connected, a surge voltage is generated when the switch is turned OFF. Provide 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 increases, the wiring capacity will be reached and a rush current will occur, damaging the switch or shortening the service life. Provide a contact protection circuit if the wiring length exceeds Table 1.

Switch	Voltage	Wiring length
T	DC	50 m
T	AC	10m

Table 1

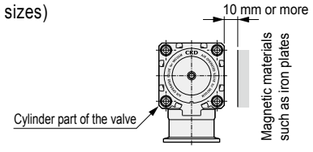


For specifications of contact protection circuits, refer to pneumatic cylinders (Catalog No. RJ-002AA to 006AA).

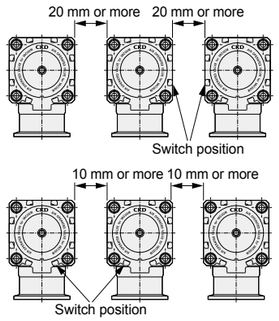
- Avoid using in environments where water is constantly splashing.
  - It may cause malfunction due to insulation failure, etc.
- Avoid using in oily or chemical environments.
  - The switch may be adversely affected (insulation failure, malfunction caused by swelling of the filled resin, hardening of lead wire sheath, etc.) if used in an environment containing oil, coolant, cleaning fluid, or chemicals. Consult with CKD.
- Do not use in environments with large impacts.
  For reed switch, if a strong impact (294 m/s² or more) is applied while in use, a signal may appear momentarily (1 ms or less) or malfunction. It may also be necessary to use a solid state switch depending on the operating environment, so please consult us.
- Do not use in locations where surge sources exist.
  If there are device components (solenoid lifters, high frequency induction furnace, motors, etc.) around the valve with proximity switch that generate a large surge, consider surge protection of the source as it may lead to deterioration or damage of the switch internal circuit element.
- Be careful about the accumulation of iron powder and close proximity to magnetic materials.
  If a large amount of iron chips such as cutting chips or welding spatter accumulate or if magnetic objects (material attracted to magnets) contact the valve with a valve switch, the valve will be demagnetized and valve switch operations may be inhibited.
  - Pay attention to the proximity of valves, etc. When installing more than one valve with switches in parallel, maintain sufficient distance according to the value shown.
  - The switches may malfunction due to mutual magnetic interference.

Caution

- The switch may malfunction if there is a magnetic substance such as a metal plate installed adjacently. Confirm that a distance of at least 10mm is allocated from the surface of the valves. (Common to all bore sizes)



■ The switch may malfunction if valves are installed adjacently. Check that the following distance is allocated from the surface. (Common to all bore sizes)



■ Pay attention to the magnetic environment.

● When installing valves with switch nearby in parallel, or if a magnetic object is very close to the valve with switch, mutual interference may occur and adversely affect detection accuracy.

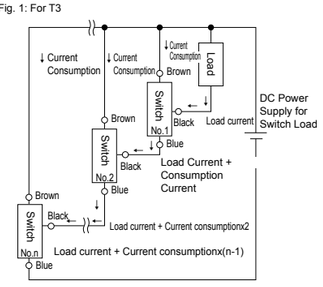
■ Be careful of the internal voltage drop caused by serial connection.

● 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.

● 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. In addition, the current flowing to the switch is the sum of current consumption and load current of the switches connected as in the figure below. Check load specifications and determine the number of connections so as not to exceed the maximum load current of the switch.

● The lamp turns ON only when all switches are ON.

Fig. 1: For T3



■ Pay attention to the leakage current caused by the parallel connection.

● 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. The indicator lamp of the switch may become dim or not light up.

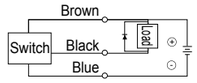
● For 2-wire solid state switches, from when one switch turns ON until it turns OFF, the voltage across the parallel-connected switches drops to the internal voltage drop value when the switch is ON, falling below the load voltage range, so other switches will no longer turn ON. Therefore, check the 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.

■ Output circuit protection

● When an inductive load (relay or solenoid valve) is connected, surge voltage is generated when the switch is turned OFF. Provide the following protection circuit.

T3

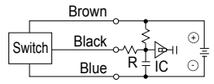


● Diode
D = Hitachi
V06C or equivalent product

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.

T3



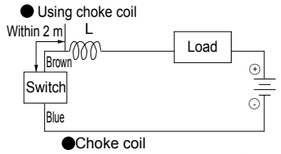
For the resistance R (Ω) at this time, use a value greater than or equal to the following formula.

$\frac{V}{0.05}$ =T3

● If the lead wire length exceeds 10 m, always install a protection circuit as shown in the figure below.

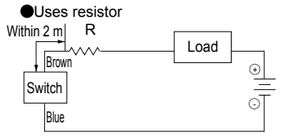
T2

● Using choke coil



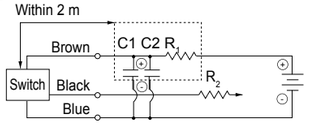
●Choke coil
L = Several hundred μH to several mH
Inrush current limiting resistor with
excellent high-frequency characteristics

●Uses resistor



Rush 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 30 Ω
R_2 = Use a resistor as large as the load side circuit allows.

■ 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.

Reed switch ET0H/ET0V

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 switch does not have an explosive-proof structure. If used in an explosive gas atmosphere, it may cause an explosion disaster, so never use it.

■ The lamps used are LEDs. If used continuously at high temperatures, visibility will gradually decrease. As the LED lamp circuit is separated from the switch output circuit, the switch output works normally even if the LED lamp goes out.

■ Do not flow overcurrent.

If overcurrent flows to the switch due to a load short-circuit, etc., the switch will be damaged with a risk of ignition.
If necessary, please provide an overcurrent protection circuit such as a fuse on the output line and power supply line.

Caution

■ Please be careful when using in an interlock circuit.

When using the switch for an interlock signal requiring high reliability, provide a double interlock by installing a mechanical protection function or a sensor other than a switch as a safeguard against failure.
In addition, please perform regular inspections and confirm that it operates normally.

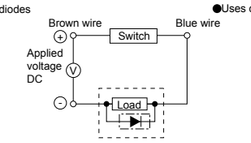
■ Please pay attention to the contact capacity.

Do not use a load that exceeds the maximum contact capacity of the switch. It will cause failure. The lamp may not come on if the current is less than the rated current.

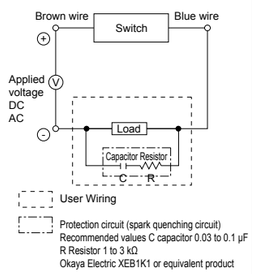
■ Please pay attention to the contact protection circuit.

● When an inductive load (relay or solenoid valve) is connected, a surge voltage is generated when the switch is turned OFF. Provide a contact protection circuit.

●Uses diodes



●Uses capacitors, resistors



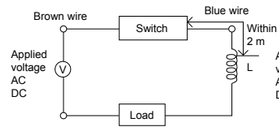
● When connecting and using capacitive loads (capacitors), inrush current will occur when the switch is ON, so always install a contact protection circuit.

● If the wiring increases, the wiring capacity will be reached and a rush current will occur, damaging the switch or shortening the service life. Provide a contact protection circuit if the wiring length exceeds Table 1.

Switch	Voltage	Wiring length
ET0	DC	50 m
ET0	AC	10m

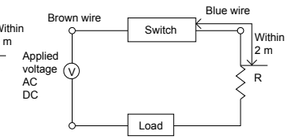
Table 1

●Choke coil used



●Choke coil
L = Several hundred μH to several mH
With excellent high-frequency characteristics

●Uses resistor



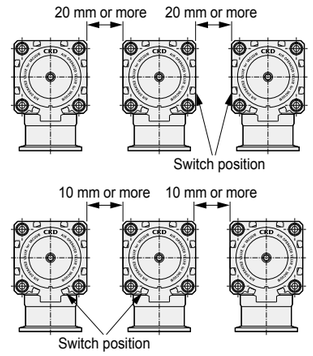
●Inrush Current Limiting Resistor
R = Resistance as large as the load circuit allows

For specifications of contact protection circuits, refer to pneumatic cylinders (Catalog No. RJ-002AA to 006AA).

■ Pay attention to the magnetic environment.

● When installing valves with switch nearby in parallel, or if a magnetic object is very close to the valve with switch, mutual interference may occur and adversely affect detection accuracy.

● If adjacent to a switch other than ET0, it may malfunction at the following distance. Therefore, check the operation before use. (Common to all bore sizes)



■ Be careful of the internal voltage drop caused by serial connection.

● 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.

■ Pay attention to the leakage current caused by the parallel connection.

● 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. The indicator lamp of the switch may become dim or not light up.

During Use

■ 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. The control circuit containing the switch could 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. Pay attention to the following (1), (2) for TO.

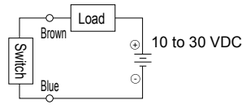
①When used for DC, connect the brown wire on the plus (+) side and the blue wire on the negative (-) side. The switch will function when connected in reverse, but the lamp will not turn ON.

②When connected to an AC relay or programmable controller input, conducting half wave rectification with that circuit may prevent the switch lamp from turning ON. The lamp will come ON when the switch lead's polarity is reversed.

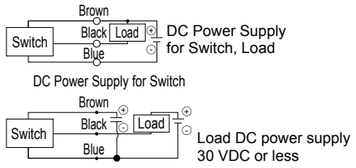
● Solid State Switch

Correctly connect the lead wires based on the color coding in the figure below. Incorrect wiring may cause damage. Please be careful.

●T2



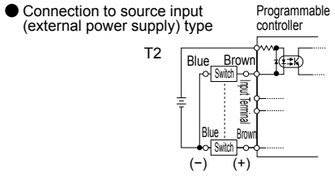
●T3



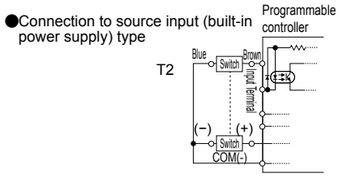
(Connection to Programmable Logic Controller (PLC))

● Connection method varies depending on the type of programmable controller. Connect according to the input specifications.

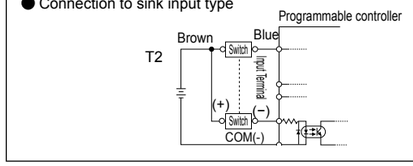
● Connection to source input (external power supply) type



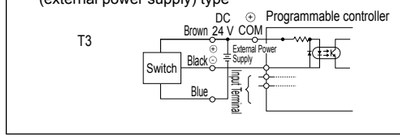
●Connection to source input (built-in power supply) type



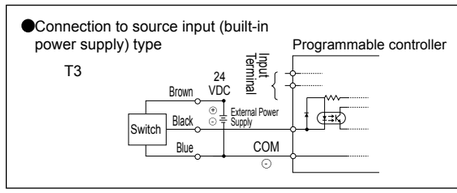
● Connection to sink input type



● Connection to source input (external power supply) type



●Connection to source input (built-in power supply) type



■ Lead wire protection

The lead wire's min. bending radius is 9 mm and over (when fixed). Pay attention to wiring so repeated bending and tensile strain are not applied to the lead wire.

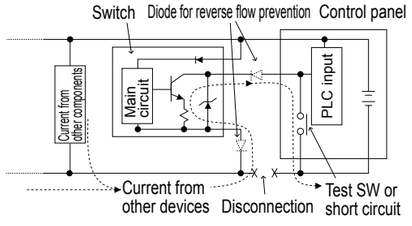
■ Relay

Use the following equivalent relays.

○ Omron・・・・・・・・・・・・・・・・・・・・・MY type
○ Fuji Electric・・・・・・・・・・・・・・・・・・HH5 type
○ Panasonic・・・・・・・・・・・・・・・・・・・HC type

■ Be careful about reverse current due to wire breakage or wiring resistance.

● When other components, including switches, are connected to the same power supply as the switch, and the output cable and power cable's minus side are short-circuited or the power supply's minus side is disconnected to check operation of the input unit from the control panel, reverse current could flow to the switch's output circuit and cause damage.



● To prevent damage due to reverse current, take the following measures.

①Avoid centralizing current at the power cable, especially a negative power cable, and use a wire as thick as possible.

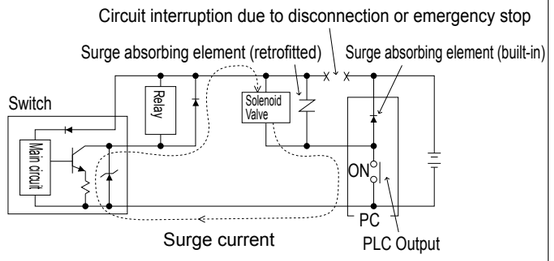
②Limit the number of components connected to the same power supply as the switch.

③Insert a diode in serial with the switch's output cable to prevent reversal of current.

④Insert a diode in serial with the switch's power cable minus side to prevent reversal of current.

■ Be careful about surge current bypass.

● When switch power is shared with an inductive load that generates surges, such as a solenoid valve or relay, if the circuit is cut off while the inductive load is functioning, surge current could enter the output circuit and cause damage depending on where the surge absorber is installed.

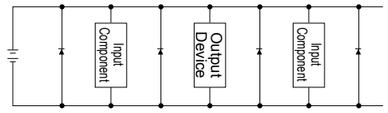


● To prevent damage due to surge current sneak paths, take the following measures.

① Separate the power supply for the output system comprising the inductive load, such as the solenoid valve and relay, and the input system, such as the switch.

② If a separate power supply cannot be used, directly install a surge absorption element for all inductive loads. Consider surge absorbing elements connected to PLCs, etc., as protecting only that equipment.

③ Connect a surge absorber to places on the power wiring shown in the figure below, as a measure against disconnections in unspecified areas.



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.

For cautions about mounting, installation, adjustment, use, and maintenance, refer to CKD components Product Site (https://www.ckd.co.jp/kiki/jp/) → "Model No." Instruction Manuals

Manual Valve for High Vacuum

MVB□17 Series

●Molded bellows used ●Aluminum body

RoHS

Model No. Notation Method

MVB 4 17 - 40K

- MVB: Model No.
- 4: ❶ Orifice Diameter
- 40K: ❷ Port Size

❶ Orifice Diameter

Code	Content
2	ø17
3	ø24
4	ø39
5	ø48

❷ Port Size

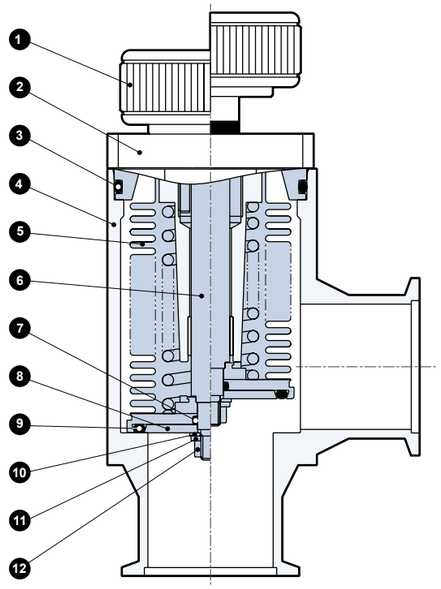
Code	Content	
16K	NW16	MVB217 only
25K	NW25	MVB317 only
40K	NW40	MVB417 only
50K	NW50	MVB517 only

Specifications

Item	MVB217	MVB317	MVB417	MVB517
Applicable Fluid	Vacuum and inert gas			
Working pressure Pa (abs)	1.3×10^{-6} to 1×10^{5}			
Max. Operating Pressure Differential	0.1			
Valve Seat Leakage Pa·m³/s (He)	1.3×10^{-10} or less			
Valve Seat Leakage Pa·m³/s (He)	1.3×10^{-11} or less			
Proof Pressure MPa	0.3			
Fluid temperature °C	5 to 60			
Ambient Temperature °C	0 to 60 (No freezing)			
Orifice Diameter mm	ø17	ø24	ø39	ø48
Conductance *1 L/s	5	13	43	74
Port Size	NW16	NW25	NW40	NW50
Operating torque *2 N·m	0.15 or more	0.25 or more	0.8 or more	1.5 or more
Number of handle rotations	5	7.5	12	15
Weight kg	0.4	0.6	1.4	2.3

*1: The conductance value is a theoretical calculated value in the molecular flow region and is not an actual measured value.
*2: As you turn the handle, the torque eases suddenly near the fully closed position; however, the internal seal uses an integrated spring, so there is no problem with the closing capacity.
*3: Grease for vacuum is applied to the O-rings of outer seal parts.

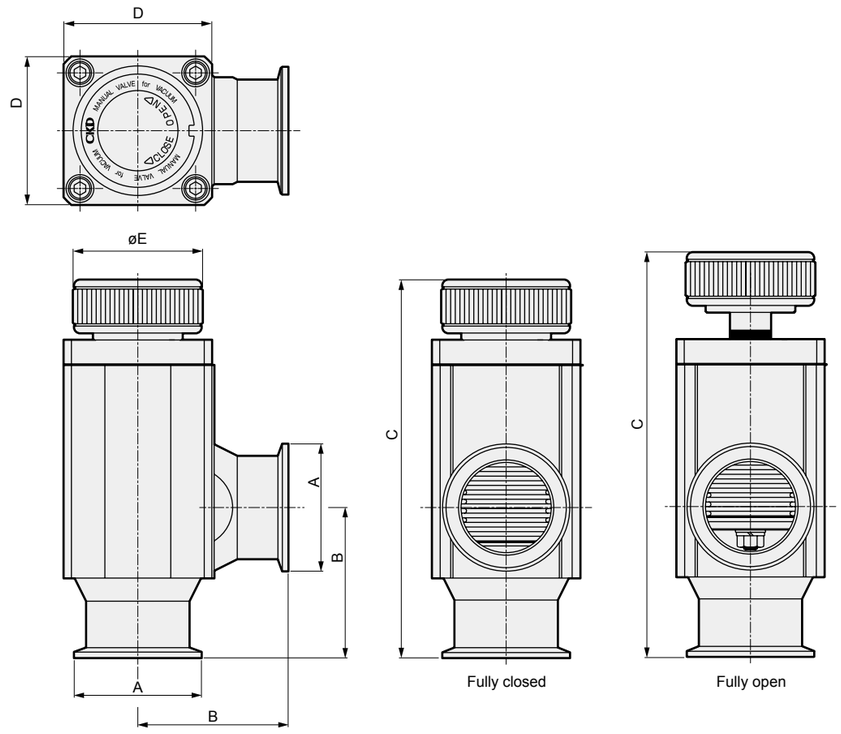
Internal Structure Diagram and Materials



Part No.	Part Name	Material
1	Handle	SUS303 (16K/25K) A5056 (40K/50K)
2	Adapter	A5056
3	O-ring	FKM Note)
4	Body	A6063
5	Bellows assembly	SUS316L
6	Rod	SUS316L
7	O-ring	FKM Note)
8	Valve Disc B	SUS316L
9	O-ring	FKM Note)
10	Flat Washer	SUS304
11	Spring Washer	SUS304
12	Hex Nut	SUS304

Note) For information on other available O-ring materials, please inquire.

External Dimension Drawings



Model No.	A	B	C		D	E
			Fully closed	Fully open		
MVB217	ø30 (NW16)	40	115	121	40	32
MVB317	ø40 (NW25)	50	127	134	45	38
MVB417	ø55 (NW40)	65	164	176	64	56
MVB517	ø75 (NW50)	70	178	193	77	69

To Use This Product Safely

Be sure to read this before use.
For General Precautions refer to Intro 9.

Individual Precautions: Manual valve for high vacuum MVB Series

Design / Selection

1. Confirmation of Specifications

Warning

- Incorrect equipment selection and handling can cause problems not only in this product, but also to your system. Please be sure to confirm the specifications of this product and its compatibility with your system before use.
- Check the compatibility between the gas contact part materials and working fluid before use.
- Use within the specified fluid temperature and pressure range.

2. Working fluids

Caution

- This product is designed for controlling vacuum or inert gas. If other fluids (active gas, liquids, solids, etc.) pass through, the product may fail to operate normally or may display decreased performance. Check the compatibility between the gas contact part materials and working fluid before use. If there is a risk of solidification of the working fluid, confirm that this poses no problems during use.
- Avoid using fluids that build up crystallization in the piping.

3. Selection

Caution

- The bellows interior is directly connected to the atmosphere. Do not block the connecting hole between the bellows interior and the atmosphere (1 hole on the top of the adaptor) in use.

4. Mounting

Caution

- Perform piping so no excessive force is applied to the flange. If heavy objects and mounted components vibrate, fix so that torque is not applied directly to the flange.

5. Securing Space

Caution

- Secure sufficient space for maintenance and inspection.

6. Piping

Caution

- When piping, do not apply tension, compression, bending or other forces to the valve body from the piping.
- Durability may decrease due to exhaust flow, so we recommend use of the bellows side as the exhaust side except for models with limited vacuum pump connection ports. In addition, since durability varies depending on the operating conditions, please confirm sufficiently.

7. During Use

Caution

- Do not use valves as a footing or place any heavy objects on top of the valves.

For cautions about mounting, installation, adjustment, use, and maintenance, refer to CKD components Product Site (https://www.ckd.co.jp/kiki/jp/) → "Model No." Instruction Manuals

MEMO

IAVB

Vacuum Pressure Control System

Overview

While maintaining the reliability of the conventional high vacuum valve, it has achieved pressure control that enables various processes.

Features

Slow exhaust control is possible
Realizes gradual exhaust at a constant rate

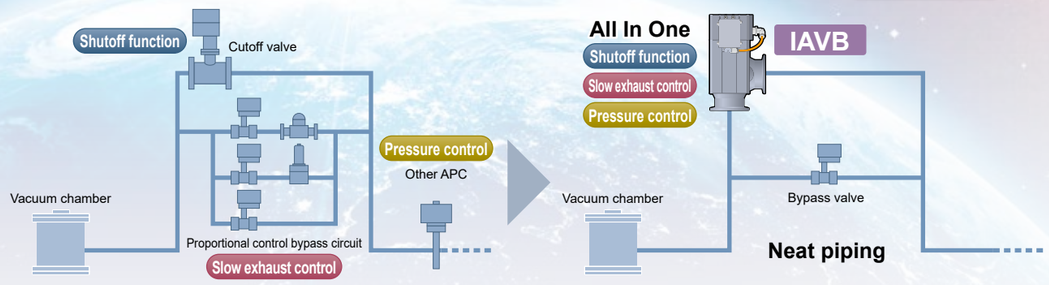
Pressure control is possible
Stable pressure control is possible with proportional control

Fully closed operation available
The poppet valve and O-ring sealant structure enables fully closed operation.

CONTENTS

The best solution for vacuum control

An all-in-one model that enables opening and closing operation, slow exhaust control, and pressure control with a single valve

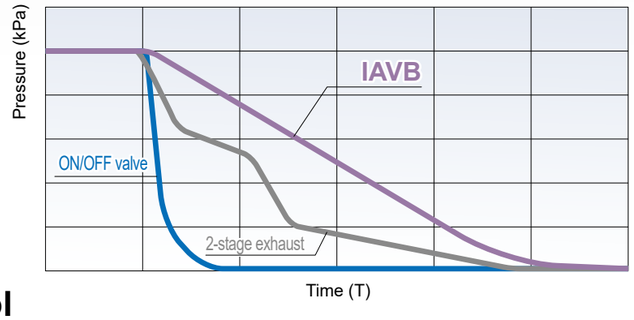


Contributes to the simplification of exhaust system layout

High precision slow exhaust control

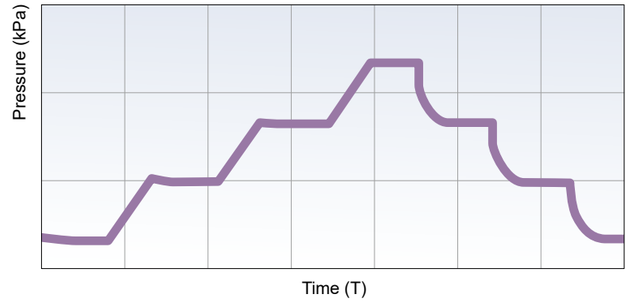
Compared with general ON/OFF vacuum valves and 2-stage exhaust vacuum valves, it enables high precision slow exhaust at an arbitrary rate.

* Slow Exhaust Rate (0.0133 to 2.666 kPa/s)



Stable pressure control

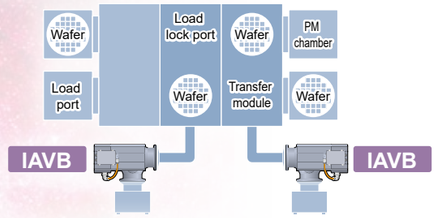
Stable pressure control is possible over a wide range of pressures from atmospheric pressure to vacuum. The desired pressure range is reached and pressure is maintained.



Application Examples

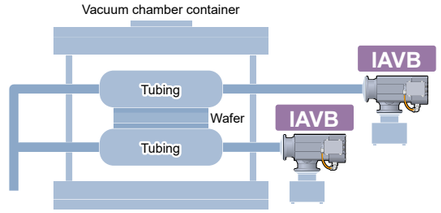
Wafer transport

While the wafer is being transported, the load lock port/transfer module is placed in a vacuum state to prevent contamination.



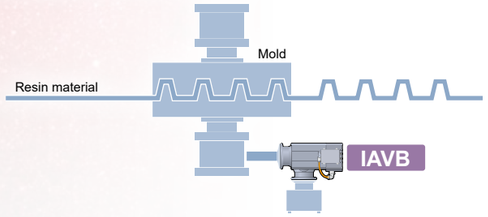
Wafer bonding

The wafer is laminated by expanding the tube in the vacuum chamber.



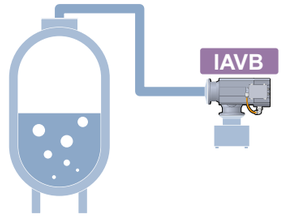
Resin sealed (mold)

The forming die is set in a vacuum state and the workpiece is filled with resin.

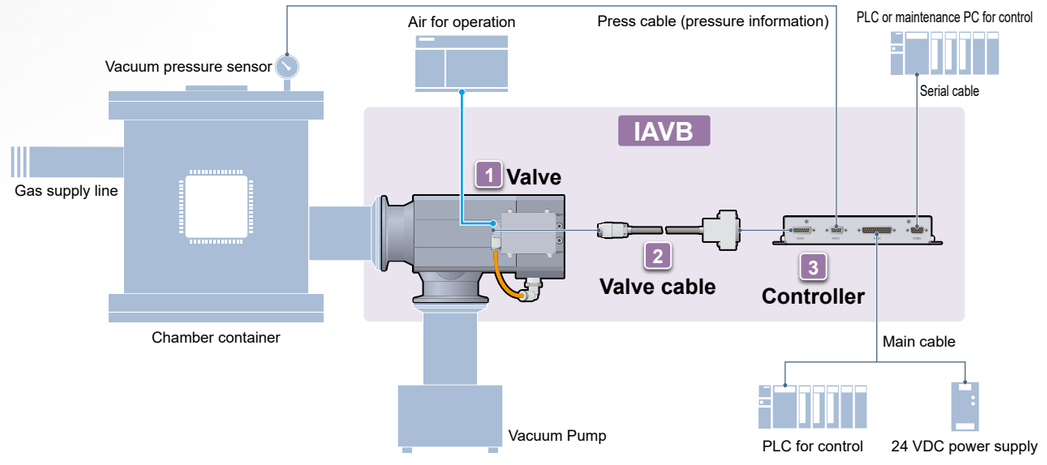


Vacuum deaeration

Removes dissolved gas by vacuuming liquid.



System configuration example (vacuum ON/OFF pressure control of vacuum related devices)



Lineup

Model No.	Connection			
	NW16	NW25	NW40	NW50
IAVB217	●			
IAVB317		●		
IAVB417			●	
IAVB517				●

Vacuum Pressure Control System

IAVB Series

●Molded bellows used ●Aluminum body

RoHS

Model No. Notation Method

IAVB 2 1 7 - 16K - 3

- IAVB: Model No.
- 2: ❶ Orifice Diameter
- 17
- 16K: ❷ Port Size
- 3: ❸ Pilot Port Position

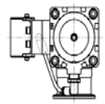
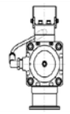
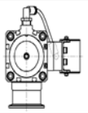
❶Orifice Diameter

Code	Content
2	ø17
3	ø24
4	ø39
5	ø48

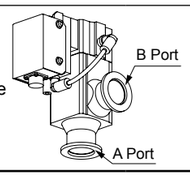
❷ Port Size

Code	Content
16K	NW16 only
25K	NW25 only
40K	NW40 only
50K	NW50 only

❸Pilot Port Position

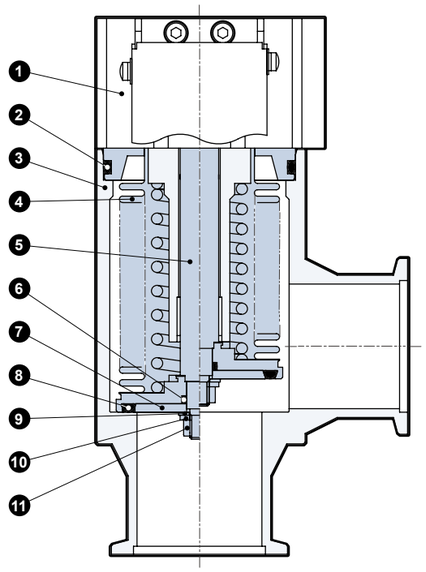
Code	Content
3	 Operating port positions are shown as 3 (standard), 1,2 with respect to the flange direction when viewed from the valve top.
1	
2	

Specifications

Item		IAVB217	IAVB317	IAVB417	IAVB517
Applicable Fluid		Vacuum and inert gas			
Operating Pressure	Pa (abs)	$1.3x10^{-6}$ to $1x10^{5}$			
Max. Operating Pressure Differential	MPa	0.1			
Valve Seat Leakage	Pa·m³/s (He)	$1.3x10^{-10}$ or less			
External Leakage	Pa·m³/s (He)	$1.3x10^{-11}$ or less			
Proof Pressure	MPa	0.3 MPa			
Fluid temperature	°C	5 to 60			
Ambient Temperature	°C	5 to 45			
Orifice Diameter	mm	ø17	ø24	ø39	ø48
Conductance *1	L/s	5	13	43	74
Port Size		NW16	NW25	NW40	NW50
Weight	kg	0.6	0.8	1.6	2.4
Pilot pressure	MPa	0.45 to 0.55 MPa			
Mounting Orientation		Unrestricted			
Connection direction *2		Connect port A to chamber side and port B to vacuum pump side 			

*1: The conductance value is a theoretical calculated value in the molecular flow region and is not an actual measured value.
*2: Avoid reverse connection: while fully open and closed operation will be possible even with reverse connection, the vacuum pressure control will become unstable.
*3: Grease for vacuum is applied to the O-rings of outer seal parts.

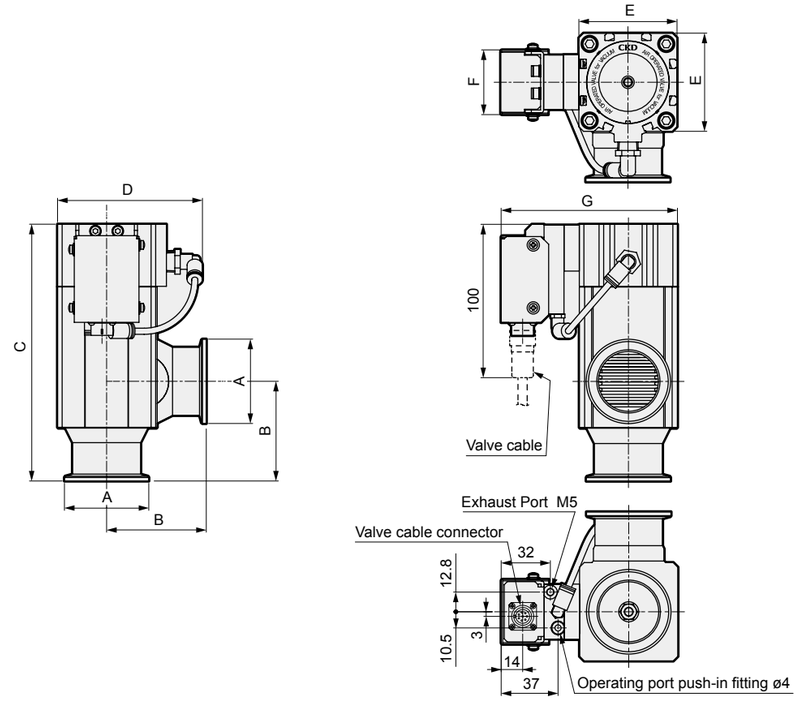
Internal Structure Diagram and Materials



Part No.	Part Name	Material
1	Cylinder (Built-in Magnet)	-
2	O-ring	FKM Note)
3	Body	A6063
4	Bellows	SUS316L
5	Rod	SUS316L
6	O-ring	FKM Note)
7	Valve Disc B	SUS316L
8	O-ring	FKM Note)
9	Flat Washer	SUS304
10	Spring Washer	SUS304
11	Hex Nut	SUS304

Note) Contact CKD for other O-ring material compatibility.

External Dimension Drawings



Model No.	A	B	C	D	E	F	G
IAVB217-16K	ø30 (NW16)	40	114	57	40	43	91
IAVB317-25K	ø40 (NW25)	50	127	71	45	43	96
IAVB417-40K	ø55 (NW40)	65	168	95	64	43	115
IAVB517-50K	ø75 (NW50)	70	186	108	77	43	128

IAVB Controllers

RoHS

Model No. Notation Method

●Controllers Discrete
IAVB-CONT

●Valve cable Discrete
IAVB-VCBL-03

Cable length 3 m

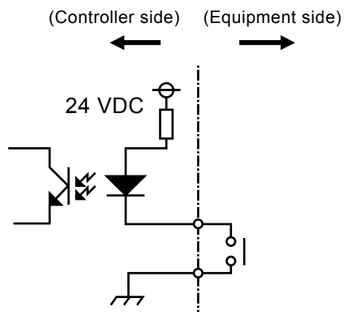
Specifications

Item			IAVB-CONT			
			IAVB217	IAVB317	IAVB417	IAVB517
Power Supply Voltage			DC24V ±10% (Stabilized power supply with ripple factor 1% or less)			
Current Consumption			0.5 A or less (fuse capacity 1 A)			
Ambient Temperature		°C	10 to 40			
External input		Number of input points	2 points			
		Input method	Dry contact input (photo coupler isolation)			
		Input capacity	24 VDC, 10 mA or less			
External output		Number of output points	2 points			
		Output Method	NPN open collector output (photo coupler isolation)			
		Load capacity	30 VDC, 15 mA or less			
		Internal Voltage Drop	1.2 VDC or less			
Analog voltage input		Number of points	2 points			
		System	0 to 10 VDC, 0 to 5 VDC (both input load 20 kΩ)			
Analog voltage output		Number of points	1 point			
		Output	0 to 10 VDC (connecting load 10 kΩ)			
Repeatability			Within ±1% F.S.			
Operation mode			Operation via serial connection or contact input and analog voltage (selection method)			
Communication method			RS-485			
Pressure control count			1ch			

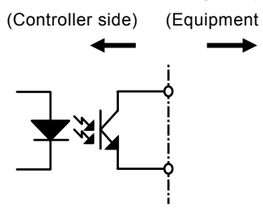
Note) Use a power source with sufficient margin against fuse capacity (current).

Interface circuit

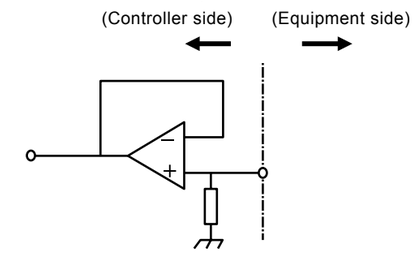
Dry contact input : Photo coupler input
When the contact is closed, about 5 mA flows.



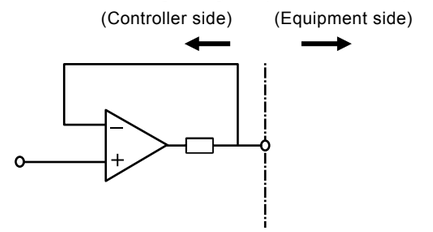
NPN open collector output: Photocoupler output
Load capacity 30 VDC, 15 mA or less
Internal voltage drop, 1.2 VDC or less



Analog voltage input: Follower input
Input load 20 kΩ



Analog voltage output: Follower output
Analog voltage output: Follower output



Connector terminal assignment of controller

1.MAIN (D-SUB 25pin male)

Pin number	Signal name	Input/Output	Remarks
1	Earth terminal	Ground	Grounding
2	(NC)	-	(Connect nothing)
3	Power supply 24 VDC	Power supply input (+)	Power supply (+)
4	(NC)	-	(Connect nothing)
5	(NC)	-	(Connect nothing)
6	(port for CKD inspection)	-	(Connect nothing)
7	Press monitor output (0 to 10 V)	Analog Output	0 to 10 V is equivalent to sensor 0 to 100%
8	Press command value input (0 to 5 V)	Analog Input	0 to 5 V is equivalent to sensor 0 to 100%
9	Valve status output	NPN Output	Photocoupler collector output 2
10	Alarm status output	NPN Output	Photocoupler collector output 1
11	Valve operation input COM	Contact input (-) COM	Contact input (-) COM
12	Valve operation contact 2 input	Contact input (+)	Photocoupler cathode 2
13	AGND	Analog GND	Analog 0 V
14	(NC)	-	(Connect nothing)
15	(NC)	-	(Connect nothing)
16	Power supply GND	Power supply input (-)	Power supply (-)
17	(NC)	-	(Connect nothing)
18	AGND	Analog GND	Analog 0 V
19	(NC)	-	(Connect nothing)
20	AGND	Analog GND	Analog 0 V
21	AGND	Analog GND	Analog 0 V
22	(Spare)	NPN Output	(Photocoupler collector output 3)
23	Status COM	Photocoupler emitter COM	Photocoupler emitter COM
24	Valve operation contact 1 input	Contact input (+)	Photocoupler cathode 1
25	(port for CKD inspection)	-	(Connect nothing)

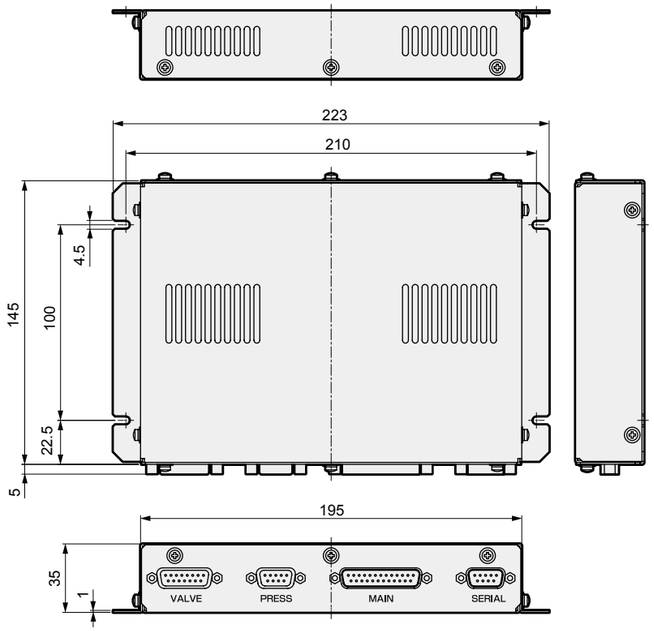
2.PRESS (D-SUB 9pin female)

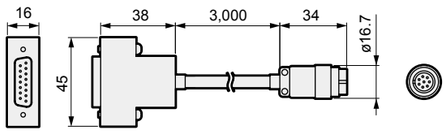
Pin number	Signal name	Input/Output	Remarks
1	(port for CKD inspection)	-	(Connect nothing)
2	(port for CKD inspection)	-	(Connect nothing)
3	Press input (0 to 10 V)	Analog Input	Chamber pressure sensor
4	PRESS GND	Analog GND	Sensor signal GND
5 to 9	(NC)	-	(Connect nothing)

3.SERIAL (D-SUB 9pin female)

Pin number	Signal name	Input/Output	Remarks
1	NC	-	(Connect nothing)
2	NC	-	(Connect nothing)
3	TXD (+)/ RXD (+)	Transmission/Reception (+)	Controller (+) ⇔ host (+)
4	TXD(-)/ RXD(-)	Transmission/Reception (-)	Controller (-) ⇔ host (-)
5	SG	Signal ground	Serial power supply 0 V
6 to 9	(NC)	-	(Connect nothing)

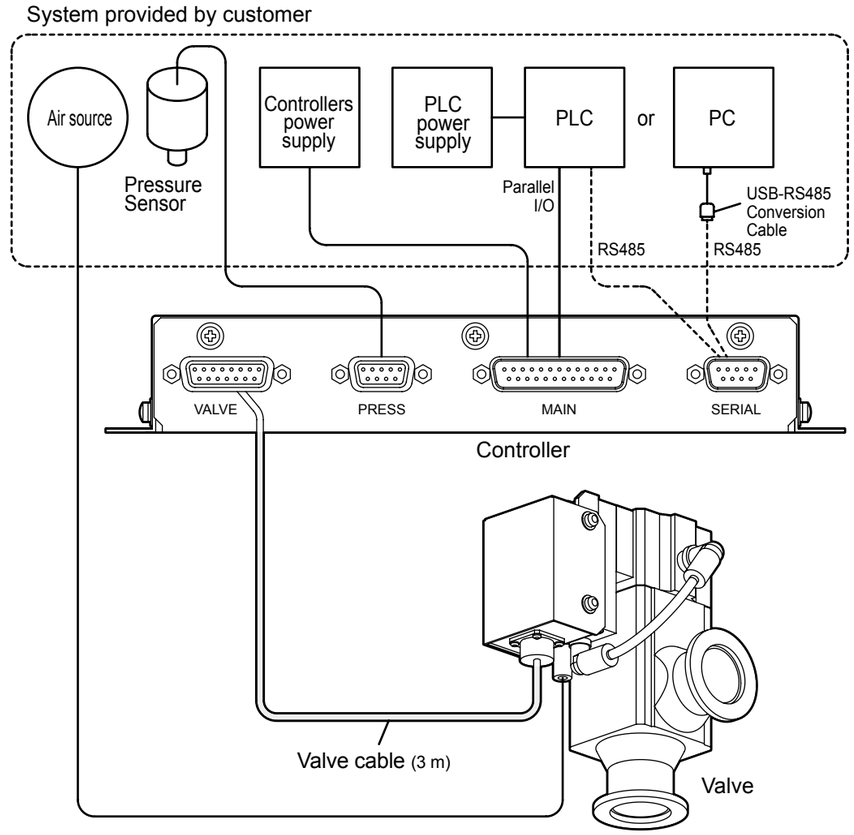
External Dimension Drawings





Valve cable

System configurations table



- For the pressure sensor, a capacitance manometer (0 to 10 V output) is recommended. (For other pressure sensors, consult with CKD.)
- When using a computer, prepare a USB-RS-485 conversion cable.

Parts Configuration

Name	Quantity
Valve	1
Controller	1
Valve cable	1

This product is a system product intended for communication and control with the customer's PLC. The customer is responsible for confirming the compatibility of CKD products with the systems, machines and equipment used. When purchasing a controller, support freeware is included. This software is freeware intended to support rapid startup for customers. Its operation in customer computer environments is not guaranteed.

Maintenance

Perform periodic inspection once or twice a year to ensure optimum use of the valve.

[Inspection Item]

A: Leakage to the valve exterior (external leakage)

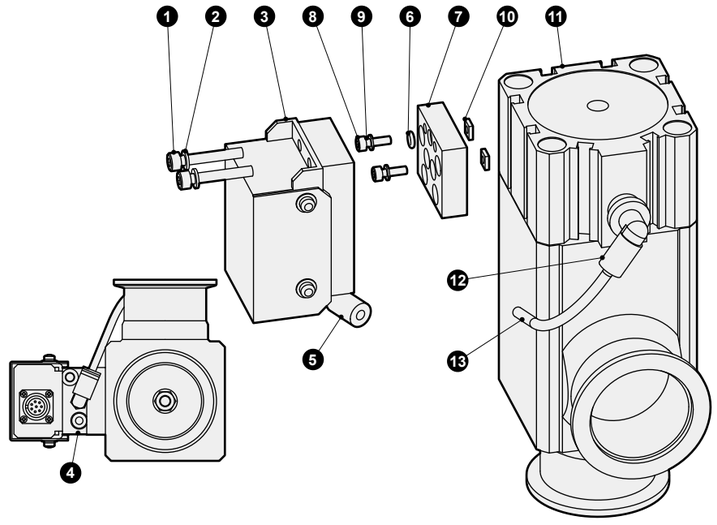
B: Valve seat leakage (internal leakage)

C: Valves should operate smoothly

(Check that the auto-learning completes normally)

D: Loosening of piping and valve screws

E: Packing wear and corrosion



Replacement parts list (maintenance parts)

Part No.	Item	Model No.
③④⑤⑥	Wiring section	IAVB-E
⑥⑪⑫⑬	Vacuum valve	IAVB□17-□□K-□-V

Since the valve replacement cycle differs depending on the working environment and conditions such as PID, periodic inspection is recommended. Consumable parts such as O-ring and wiring parts can be replaced by customers.

MEMO

Vacuum Pressure Control System

To Use This Product Safely

Be sure to read this before use.
For General Precautions refer to Intro 9.

Individual Precautions: Vacuum pressure control system IAVB Series

Design / Selection

1. Confirmation of Specifications

Danger

■Do not use in locations where hazardous materials such as ignitable, flammable, or explosive substances are present. There is a possibility of ignition, fire, or explosion.

■This product is not waterproof. Ensure that the product is free of water droplets and oil droplets. This can cause fire or failure.

■Be sure to use a DC stabilized power supply (24 VDC ±10%). Direct connection to an AC power supply can cause fire, bursting, damage, etc.

Warning

■Incorrect equipment selection and handling can cause problems not only in this product, but also to your system. Please be sure to confirm the specifications of this product and its compatibility with your system before use.

■Design a safety circuit or equipment so that damage to equipment, injury to persons, etc., does not occur when the machine stops in the event of a system failure such as emergency stop or power outage.

■Install indoors with low humidity.
In places exposed to rain or high humidity (over 85% RH, with condensation), there is a risk of electric leakage and fire. Oil drops and oil mist are also strictly prohibited.

■Use and store in accordance with the working/storage temperatures and where there is no condensation.
This can cause abnormal product stoppage or reduced service life. If heat accumulates, ventilate.

■Install in a location free from direct sunlight, dust, and corrosive gas/explosive gas/inflammable gas/combustibles, and away from heat sources. Additionally, chemical resistance has not been considered.
This can cause failure, explosion, or fire.

■Use and store in a location free from strong electromagnetic waves, ultraviolet rays, and radiation.
This can cause malfunction or failure.

Caution

■ While wiring, ensure that inductive noise is not applied and that high-current or strong magnetic field locations or large motor power lines for other devices do not use the same piping and wiring (through multi-core cables, etc.). Also, pay attention to the inverter power supply and wiring section used for robots, etc. (same wiring and piping not possible). Apply frame grounding for the same power supply and always insert a filter at the output section.

■When surge-generating inductive loads or power supplies of product output and solenoid valve/relay, etc., are common, the surge current flows around the output part and may cause damage. Separate the inductive load output system from the output power supply of the product. If a separate power supply cannot be used, connect surge absorbers directly in parallel with all inductive loads.

■ Do not disassemble the product.

■Cable cannot be used for applications involving repeated bending.

■Fix the cable so that it does not move easily. Do not bend the cable at an acute angle when fixing.

2. Working fluids

Caution

■This product is designed for controlling vacuum or inert gas. If other fluids (active gas, liquids, solids, etc.) pass through, the product may fail to operate normally or may display decreased performance. Check the compatibility between the gas contact part materials and working fluid before use. If there is a risk of solidification of the working fluid, confirm that this poses no problems during use.

■Avoid using fluids that build up crystallization in the piping.

3. Mounting

Warning

■Use the supplied cable between the valve and the controller, and install so that excessive force is not applied and it is not scratched. Do not remodel the attached cable (change the length or material) as it may cause malfunction, failure or misoperation.

■When the power supply is cut off (including failures), take sufficient measures to protect workers and equipment.
There is a risk of unexpected accidents.

4. Securing Space

Caution

■Secure sufficient space for maintenance and inspection.

5. Piping

Caution

■The bellows interior is directly connected to the atmosphere. Do not block the connecting hole between the bellows interior and the atmosphere (2 holes just under the operating port) in use.

■When piping, do not apply tension, compression, bending or other forces to the valve body from the piping.

■When executing the auto-learning function, set the valve to its atmospheric pressure state. There is a possibility of misrecognition of the origin.

■Do not bring objects such as rare earth magnets that emit powerful magnetic fields near the product body. It may not be possible to maintain the original accuracy.

■Perform piping so no excessive force is applied to the flange. If heavy objects and mounted components vibrate, fix so that torque is not applied directly to the flange.

For cautions about mounting, installation, adjustment, use, and maintenance, refer to CKD components Product Site (https://www.ckd.co.jp/kiki/jp/) → "Model No." Instruction Manuals

Related Components

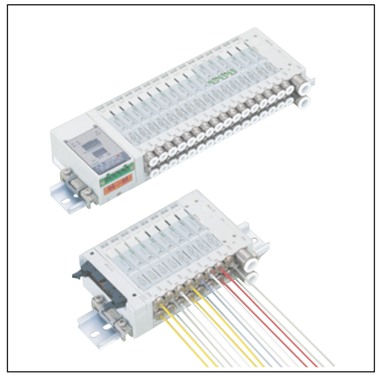
* For detailed specifications and guarantees, refer to CKD components Product Site (https://www.ckd.co.jp/kiki/jp/en/) → "Model No."

Solenoid valve for operation

3, 4-port pilot operated valve, PLC-compatible reduced wiring block manifold

MN3E, MN4E Series

Click!



Application Example: Air operated valve drive, etc.

EtherNet/IP DeviceNet EtherCAT CC-Link

Compact (width of 7 or 10 mm) 3, 4-port valve block manifolds that are highly integrated and offer space-saving with high performance

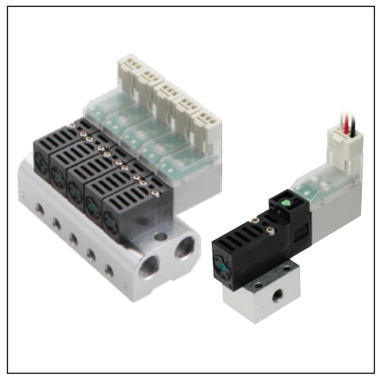
●Compact, Space-saving
Introducing the MN3/4EOO Series of 7 mm valve block width and 7 mm pitch manifold in addition to the MN3/4EO Series of 10 mm valve block width type. Helps to reduce device footprints. Can be installed anywhere. Individual wiring used for increased integration. Environmental Protection
●Environment-friendly
halogen-free lead wires have been adopted for internal wiring. (D-sub-connector T30-type)
●High performance
・12 ms responsivity for balancing ports A and B (Our data value with two 3-port valves integrated)
・Cumbersome wiring work is not required
With connector, wiring is completed at the same time as assembling.
●Diversity
A wide range of electrical connections such as serial transmission corresponding to various connectors and networks are available.
●Energy saving
MN3, 4E0 Series: 0.6 W
MN3, 4E00 Series: 0.4 W
With energy saving type (Option E), it further reduces power consumption.

Solenoid valve for operation

Direct Acting 3-Port Valve

3QRA/B Series

Click!



Application Example: Air operated valve drive, etc.

Realizes large flow rate/high-speed conversion

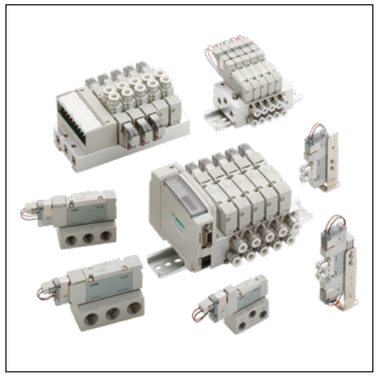
●Contributes to increased speed and optimization of equipment (downsizing and improved maintainability).
Durability 100 million cycles or more (as under CKD-regulated stringent test conditions)
Compact and lightweight 19 g (best weight) 10 mm (W) × 20mm (H) × 46mm (D)
●Enhanced flow rate and response time enable high-speed vacuum/atmosphere release.
Large flow rate C: 0.4 ($dm^3/s \cdot bar$) Large flow rate C: 0.3 ($dm^3/s \cdot bar$) standard
High response 4±1ms/1.5±1ms (ON/OFF)
●Conforms to various applications as standard, All ports from vacuum to positive pressure, Universally pressurizable.
・Ozone resistance (rubber FKM used)
・RoHS command compliant
・Restricted copper materials (air passage, sliding part)

Solenoid valve for operation

Pilot Operated 3, 5-Port Valve

MN4GA/B R Series

Click!



Application Example: Air operated valve drive, etc.

General purpose valves support a wide range of needs

●Safety
The protective cover prevents misoperation of the manual override due to external force, etc. Prevents malfunction of cylinders due to back pressure when using a single acting cylinder.
●Reliability
・Service life of 100 million cycles or more (at 0.5 MPa with clean air)
・Response 12 ms ± 2 ms (Our data for 4G1 Series)
Thanks to the new sliding mechanism, reliability performance such as service life and responsiveness has definitely been upgraded.
●Easy to use
・Upward/Lateral common wiring connector
Just insert top-facing or side-facing. PAT.
●Energy savings: 0.35 W, 0.1 W (Low exoergic/energy saving circuit)
●Diverse options
8 types are available.
●Wide range of communications
Supports ten types of communications.

EtherNet/IP DeviceNet EtherCAT CC-Link IE TSN CC-Link IE Field CC-Link IE Field Basic CC-Link PROFINET PROFIBUS-DP IO-Link

Clean Regulator

Clean Regulator

RC2000 Series

Ideal for pressure control of clean air and nitrogen

Application Example: Purge Air, N_2 pressure adjustment

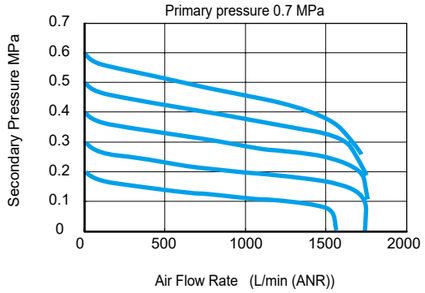
●Oil-free specification
Precision cleaning is performed on the gas contact parts, and the manufacturing processes from assembling to packaging are completed in clean rooms. No grease is used in gas-contacting parts.

●Compact/large flow rate
A large flow rate of 0.8 m^3/min. is realized even with just 50 mm interface. (Flow rate at 0.7 MPa primary pressure, 0.5 MPa set pressure, 0.1 MPa pressure drop)

●Reverse function (when back pressure is not applied)
This function reverses secondary pressure to the primary side when primary pressure is exhausted. This safety-oriented product has no residual pressure on the secondary side.

Flow Characteristics

● RC2000-8-P90



Reference: Clean Regulators list

Model No.	Flow Rate	Cleanness	Gas-wetted Materials	Application
PGM	20 L	○	SUS316L, Hastelloy	Etching, deposition
PGM-H	50 L	○		
PGM-2H	200 L	○		
RC2000	800 L	△	FKM, SUS316	N_2 purge

Flow Rate Sensor

Compact Flow Rate Sensor Rapiflow®

FSM3 Series

Diverse, Highly-functional, Easy to use

Application Example: Purge Air, N_2 flow rate measurement

IO-Link

●Stainless steel body
Because the flow path is not resin, it is ideal for processes where outgassing is a problem. An oxygen-dedicated model is also available (oil-free specifications).
Fittings Fittings You can select from two types of fitting, JXR fitting and double barbed fitting.

●Resin body
Fittings can be selected from four types: push-in elbow, push-in straight, threaded elbow, and threaded straight.

●Common Specifications
Flow Rate Range: Supports up to 1,000 L. Compatible with five types of gases in a single unit, including air, nitrogen, argon, carbon dioxide, and mixed gas. Integrating the needle valve helps save space.

●High precision/high-speed response
Redesigned flow path reduces pressure loss by up to 50% compared to conventional products. The flow direction can be set to forward, bi-direction or reverse direction. Response Time: 50 msec.

●Automation of the entire factory using IO-Link
IO-Link compatibility allows parameter and event data transmission, enabling preventative maintenance. Ideal for leakage inspection and air consumption control.

●Clean-room specifications (option)
Anti-dust generation packaging (P70) and oil-prohibited processing (P80) are available. Usage according to the grade of the device is possible.

Gas Generators

Nitrogen Extraction Unit

NS Series

Easily extracts nitrogen gas from compressed air

Application Example: N_2 extraction

●Install anywhere
Nitrogen-enriched gas is obtained just by supplying compressed air.System components are provided to reduce man-hours, piping and space.

●Power supply not required
Usable even in explosion-proof atmospheres and different voltage regions. Quiet, with no heat generation as there is no drive system.

●Low cost
Running cost is only the cost of electricity for the compressor. There are no ongoing costs such as cylinder management and filling fees.

●Easy maintenance
Stable performance can be maintained because there are no moving parts. Parts replacement is possible without disassembling the piping.

Gas Generators

Inline Oxygen Analyzer

PNA Series

A new kind of sensor that visualizes oxygen concentration

Application Example: Oxygen concentration measurement

●Pressure resistant structure for inline use
Modular structure saves piping space.

●Switch displays between oxygen and inert gas concentrations
The inert gas concentration is clear at a glance.

●Upper/lower limit switch output setting and analog output are available
Alarm generation for concentration changes and condition monitoring are possible.

●With Self-Diagnosis Function
Notifies of detection element abnormalities.

Gas Generators

Portable Air Supply Unit

ASU-S Series [Japan only release]

A compact, all-in-one body.

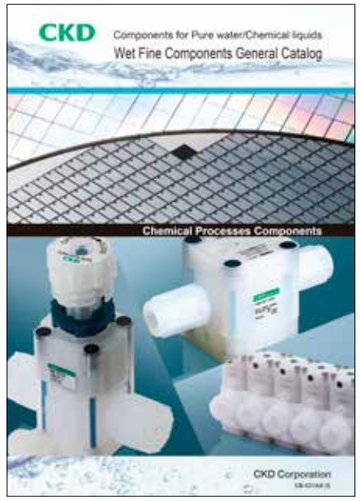
Application Example: Local air supply

●Easy to carry
It is shaped like a carry case, making it easy for anyone to transport it.

●Supplies clean air
The after cooler and centrifuge removes drain and the filter removes foreign matter.

●Continuous use possible
Heat resistance around the pump is increased, enabling long periods of use.

System Lineup



Responding to high-level needs for semiconductor manufacturing process control

Wet-Fine Components General

Catalog No.CB-031AA

- Industry top performance and reliability
- High quality achieved by advanced spec super cleanroom and consistent production system from design to assembly/ packaging
- Variety of versatile fitting variations

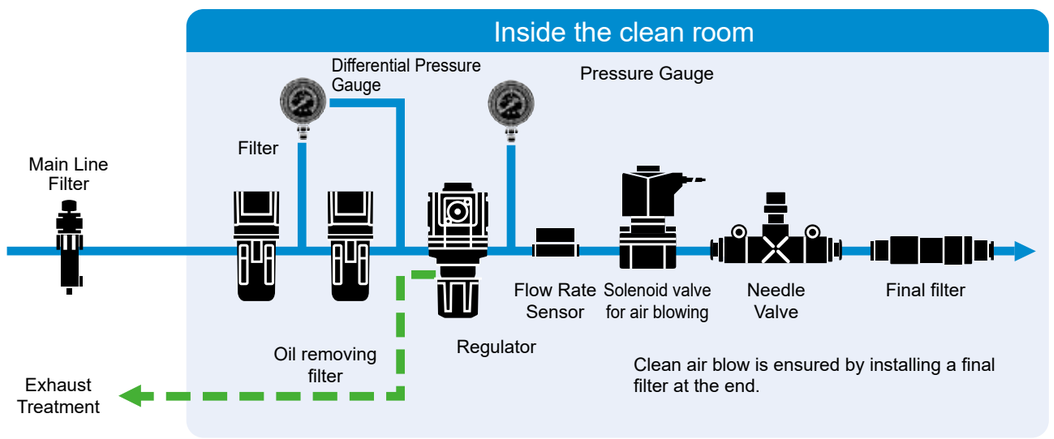
Clean Components System

Catalog No. CB-033SA

Satisfies the various levels of clean room cleanliness in a wide range of industries

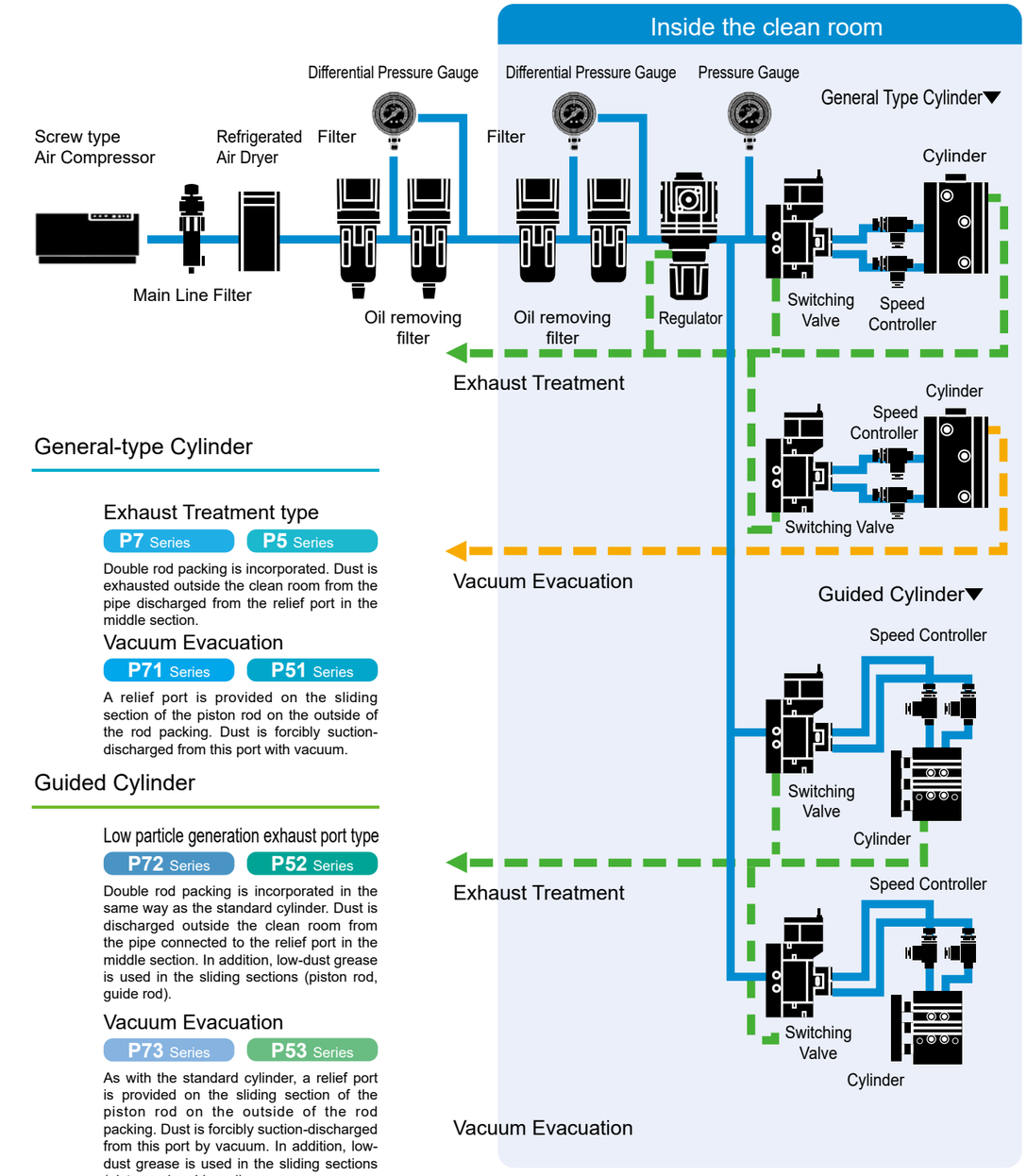
● Reliably producing high-cleanliness air

Clean blow system model circuit



● Zero particle generation with vacuum treatment and exhaust port

Air-driven actuator system circuit structure



General-type Cylinder

Exhaust Treatment type

P7 Series **P5** Series

Double rod packing is incorporated. Dust is exhausted outside the clean room from the pipe discharged from the relief port in the middle section.

Vacuum Evacuation

P71 Series **P51** Series

A relief port is provided on the sliding section of the piston rod on the outside of the rod packing. Dust is forcibly suction-discharged from this port with vacuum.

Guided Cylinder

Low particle generation exhaust port type

P72 Series **P52** Series

Double rod packing is incorporated in the same way as the standard cylinder. Dust is discharged outside the clean room from the pipe connected to the relief port in the middle section. In addition, low-dust grease is used in the sliding sections (piston rod, guide rod).

Vacuum Evacuation

P73 Series **P53** Series

As with the standard cylinder, a relief port is provided on the sliding section of the piston rod on the outside of the rod packing. Dust is forcibly suction-discharged from this port by vacuum. In addition, low-dust grease is used in the sliding sections (piston rod, guide rod).

Standard Compliant Products/ISO

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	Application
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 compliance with the standard makes it easier for customers to obtain CE marking.
EMC Directive (2014/30/EU)	Measures for both the generation of electromagnetic disturbance (EMI/ emission) and the ability to eliminate electromagnetic disturbance (EMS/ immunity)	■ Equipment that generates electromagnetic disturbance or equipment that is affected by electromagnetic disturbance Solenoid valves composed of simple solenoids do not generate electromagnetic disturbance, but ensuring compliance with standards makes CE Marking easier for customers.
Low Voltage Directive (2014/35/EU)	Electrical safety, such as prevention of electric shock	■ 50 VAC to 1000 V and at 75 VDC to 1500 VDC Operating Components
Pressure Equipment Directive (2014/68/EU)	Safety related to the hazards of fluid energy possessed by pressure components	■ When certain conditions are exceeded within pressure equipment
Simple Pressure Vessels Directive (2014/29/EU)	Safety related to vessel leakage and explosion	■ A welded vessel for which the product of the maximum operating pressure and volume (PV/S) exceeds 50 bar-liters Our air tanks (AT type) do not conform, so they cannot be exported to the EU.
RoHS Directive (2011/65/EU)	Restriction of 6 environmentally hazardous substances	■ Electrical/Electronic Equipment
2011/65/EU and (EU) 2015/863	Restriction of 10 environmentally hazardous substances	■ Electrical/Electronic Equipment

The countries to which CE marking applies are EU (European Union) member states, EFTA (European Free Trade Association) member states, and Turkey.

CKD's Compliance with European Standard Compliant Products

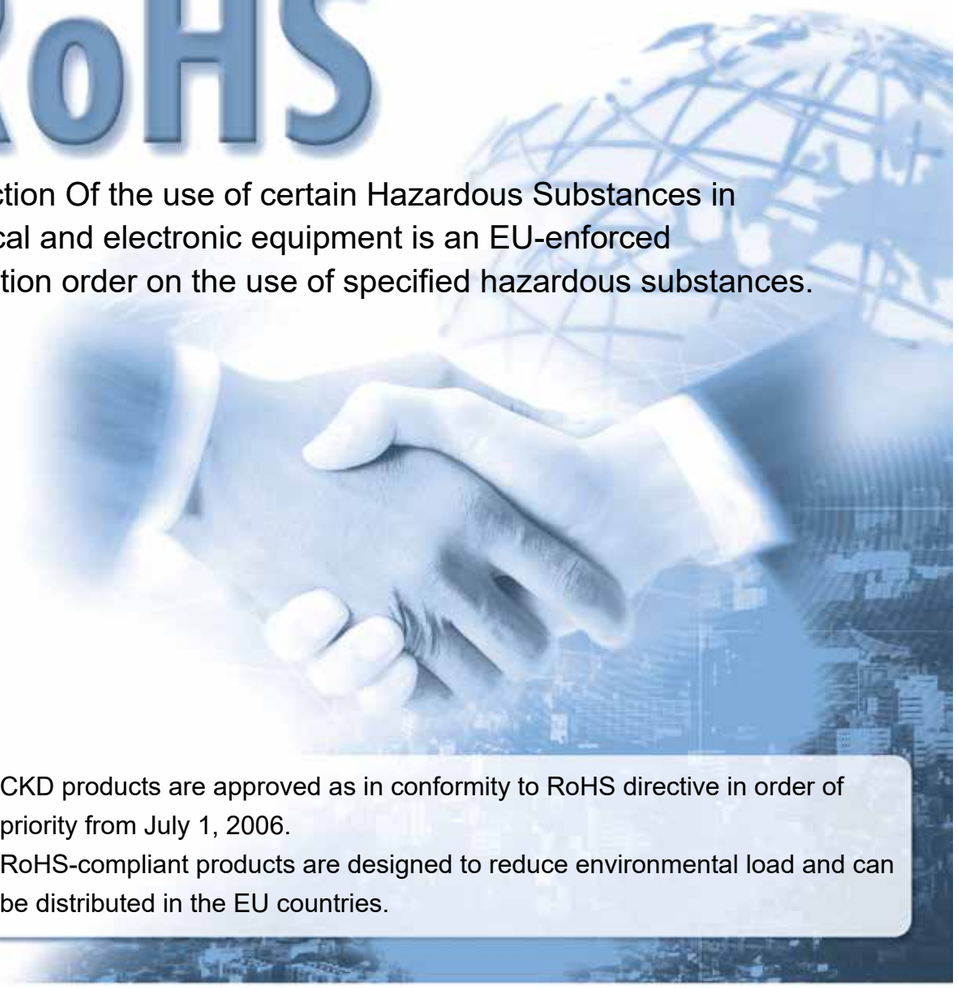
⚠ Compliant products may not be supported depending on the specifications and detailed model number combinations, so please contact our sales representative for details. Please see our website for the latest information.
Home Page Address https://www.ckd.co.jp/en/productinfo/eu/

CKD RoHS Compliance

Developing eco-friendly products is a theme of CKD.

RoHS

Restriction Of the use of certain Hazardous Substances in electrical and electronic equipment is an EU-enforced prohibition order on the use of specified hazardous substances.



- ◆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 the development and sales expansion of environmentally friendly products.
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 CO2 emissions b) Promote resource saving c) Reduce waste d) Reduce environmental pollutants

CKD's Response to RoHS

We have been progressively implementing RoHS compliance for our main equipment products 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 components 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 (PBDEs)

Additional Regulated Substances ((EU) 2015/863)
- Specific Phthalates (DEHP, DBP, BBP, DIBP)

Electrical and electronic equipment containing the above substances in categories 8 and 9 will, in principle, be prohibited from being brought into the EU from July 22, 2021, and categories other than 8 and 9 from July 22, 2019.

ISO9001/ISO14001 Certification Acquisition

Delivering safe quality that is friendly to people, machines, and the environment.

CKD has obtained ISO9001 and ISO14001 certification and has established a quality and environmental management system. With safety, environment, and energy conservation as our most important priorities, we are working company-wide to ensure that we do not cause damage to people, machines, society, or the global environment. We are committed to manufacturing reliable products and ensuring quality.

MEMO

Model No. [Alphabetical Index]

Model No.	Model Name	Catalog No./Page
HS	Fluid Actuated Valve for Gas Combustion System	1024
HSV	Manual Valve/Standard	RJ-012AA

■Listed Page
This is the specification/model number page for models listed in this catalog.

■Listed Catalog No.

RJ-002AA ... Pneumatic Cylinder ①
RJ-003AA ... Pneumatic Cylinder ②
RJ-004AA ... Pneumatic Cylinder ③
RJ-005AA ... Pneumatic Cylinder ④
RJ-006AA ... Pneumatic Cylinder ⑤
RJ-007AA ... Air Preparation, Pressure Control, and Auxiliary Components
RJ-008AA ... Sensors/Controllers
RJ-009AA ... Main Line Equipment/Gas Generators
RJ-010AA ... Precision Components/Vacuum Components
RJ-011AA ... Directional Control Valve ①
RJ-012AA ... Directional Control Valve ②
RJ-013AA ... Fluid Control Valve
RJ-014AA ... Electric Actuator ROBODEX Pluse
RJ-015AA ... Electric Actuator ROBODEX Std.
RJ-016AA ... Dry Fine Equipment
CB-019SAA ... Indexman General
CB-031AA ... Wet Fine Equipment General
CB-054AA ... ABSODEX General
CB-055AA ... Electric Actuator Motorless General
CC-1055AA ... Life Science Equipment
CC-1276AA ... Outdoor Products WP Series
CC-1590AA ... Gas Combustion System
CC-1637AA ... Pharmaceutical Manufacturing Process Equipment
CC-297AA ... Automatic Watering Control Equipment

Others list the single item catalog No. for each series.

■Symbols

(SV)...Single Valve (WR)…Wiring Reduced Manifolds (IM) …Individual Manifold
(MX)...Mixed Manifold (BM)…Block Manifolds (MN)…Manifold

Model No.	Model Name	Catalog No./Page
1		
1219	Micro-mist Separator/Micro Naught Type (For Oil Mist Removal)	RJ-007AA
1238	Micro-mist Separator/Micro Naught Type (For Oil Mist Removal)	RJ-007AA
1326	Heavy Duty Air Filter	RJ-007AA
1126-□-□Y	Submicron Air Filter (For Tar Removal)	RJ-007AA
1126-□-E	Air Filter	RJ-007AA
1138-□-□Y	Submicron Air Filter (For Tar Removal)	RJ-007AA
1138-□-E	Air Filter	RJ-007AA
1226(J)	Micro-mist Separator/Micro Naught Type (For Oil Mist Removal)	RJ-007AA
1226(J)-□-X	Micro-mist Separator/Odor Naught Type (For Odor Removal)	RJ-007AA
1238-□-X	Micro-mist Separator/Odor Naught Type (For Odor Removal)	RJ-007AA
1326-□-□Y	Submicron Air Filter (For Tar Removal)	RJ-007AA
2		
2215	Regulator	RJ-007AA
2216	Regulator	RJ-007AA
2302 to **2304-□C**	Dial Air Regulator	RJ-007AA
2302 to **2304-□C-R**	Remote Control Dial Air Regulator	RJ-007AA
2415	Reverse Regulator (Built-in Check Valve)	RJ-007AA
2415-P11	Reverse Regulator (Built-in Check Valve)/Ozone Resistant	RJ-007AA
2419	Reverse Regulator (Built-in Check Valve)	RJ-007AA
2619	Regulator	RJ-007AA
2QV	Quick Valve with 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**	Explosion-proof Direct Acting 2-Port Solenoid Valve for Dry Air (Multilex)/d2G4	RJ-007AA
A101 to **801-W**	Explosion-proof Direct Acting 2-Port Solenoid Valve (Multilex)/Exd II BT2	RJ-007AA
A1019	Explosion-proof Direct Acting 2-Port Solenoid Valve (Multilex)/Exd II BT4	RJ-007AA
A1338	Direct Acting 2-Port Solenoid Valve for Dry Air (Multilex)	RJ-007AA
A1338-□Y	Direct Acting 2-Port Solenoid Valve Single Unit (Multilex)	RJ-007AA
A2-3400	Explosion-proof Direct Acting 2-Port Solenoid Valve (Multilex)/d2G4	RJ-013AA
A2-5201	Direct Acting 2-Port Solenoid Valve (Multilex)/Large Bore	RJ-013AA
A2-5202	Air Booster	RJ-013AA
A2-5800	Pilot Operated 2-Port Solenoid Valve (Multilex)/Diaphragm Driven	RJ-013AA
A3019	Explosion-proof Pilot Operated 2-Port Solenoid Valve (Multilex)/Diaphragm Driven, d2G4	RJ-007AA
AB21	Explosion-proof Pilot Operated 2-Port Solenoid Valve (Multilex)/Diaphragm Driven, Exd II BT4	RJ-013AA
AB31	Pilot Operated 2-Port Solenoid Valve (Multilex)/Diaphragm Driven	RJ-013AA

Model No. [Alphabetical Index]

Model No. [Alphabetical Index]

Model No. [Alphabetical Index]

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Model No.	Model Name	Catalog No./Page
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	RJ-002AA, 003AA,004AA, 005AA,006AA
R1, 2	Cylinder Switch/1-Color Indicator, Solid State 2-wire	RJ-002AA, 003AA,004AA, 005AA,006AA
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	
R3000 to **8000-G4**	Regulator/Flame Resistant Series	RJ-007AA
R3100 to **8100-G4**	Reverse Regulator/Flame Resistant Series	RJ-007AA
R5	Cylinder Switch/No Indication, Reed 2-wire	RJ-002AA, 003AA,004AA, 005AA,006AA
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	RJ-006AA
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	RJ-006AA
RJB500	Compact Direct Acting Precision Regulator	RJ-007AA
RJF	Rotary Joint	RJ-007AA
RLSH	Gripper for Collaborative Robot Compact Type	RJ-006AA
RM3000, 4000	Regulator/Medium Pressure Series	RJ-007AA
RN3000 to **8000**	Oil-free Regulator	RJ-007AA
RP1000	Precision Regulator	RJ-007AA
RPE1000	Precision Regulator	RJ-007AA
RP2000	Precision Regulator	RJ-007AA
RRC	Selex Rotary/Rack & Pinion Type	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)	RJ-002AA, 003AA,004AA, 005AA,006AA
SKDC	Contact Protection Circuit Box (For DC Circuit)	RJ-002AA, 003AA,004AA, 005AA,006AA
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	RJ-002AA, 003AA,004AA, 005AA,006AA
T0Y	Cylinder Switch/Reed 2-wire for Magnetic Environments	RJ-002AA, 003AA,004AA, 005AA,006AA
T1 V/H	Cylinder Switch/1-Color Indicator, Solid State 2-wire	RJ-002AA, 003AA,004AA, 005AA,006AA
T2 V/H R	Cylinder Switch/Flexible Shielded Cable Type, Solid State 2-wire	RJ-002AA, 003AA,004AA, 005AA,006AA

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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

Dry Fine Components

Catalog No. RJ-016AA

Dry Fine Components / High Purity Gas Control System

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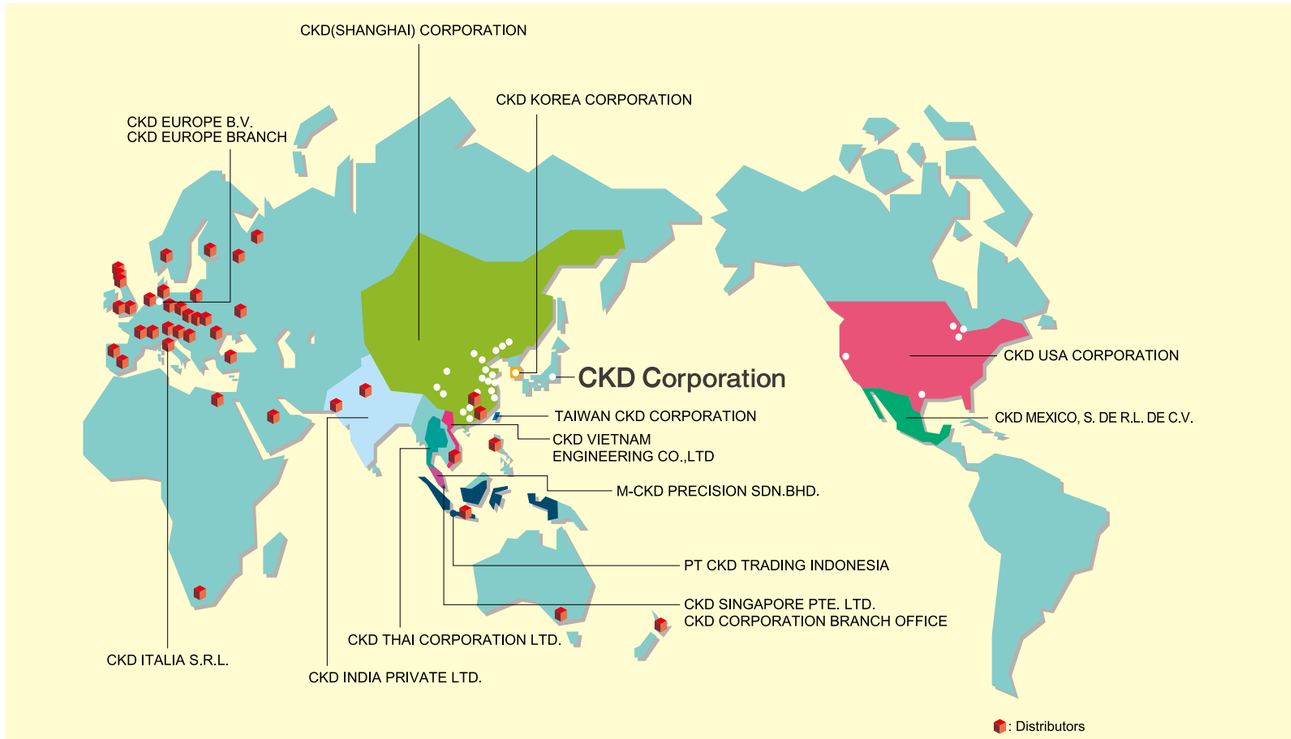

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