



Process gas/Vacuum components
Dry Fine System/High purity gas control system components

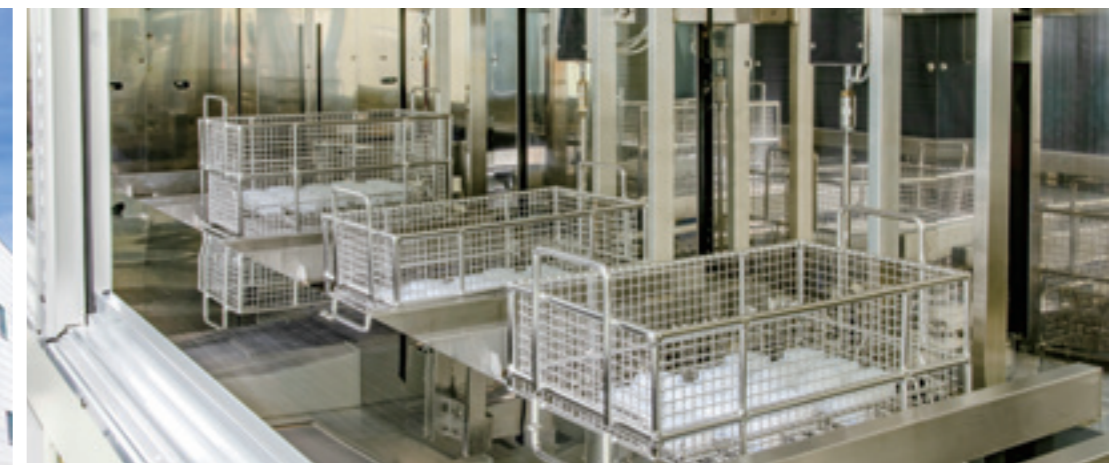
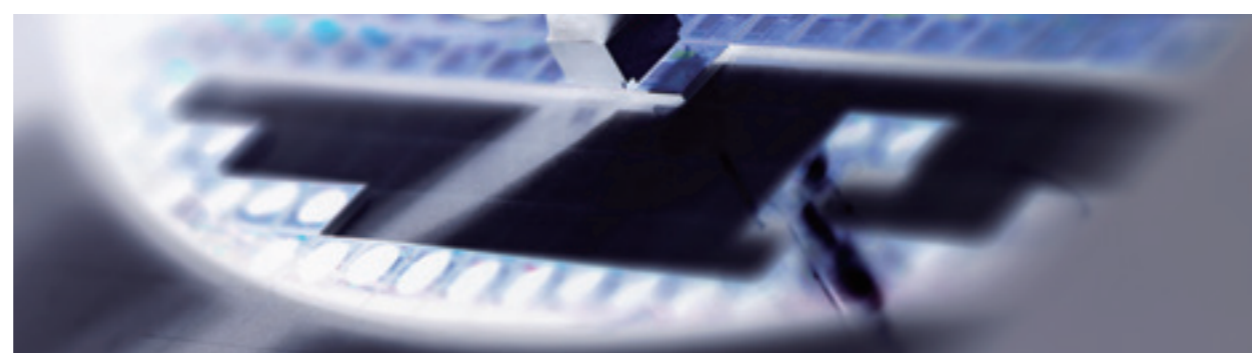
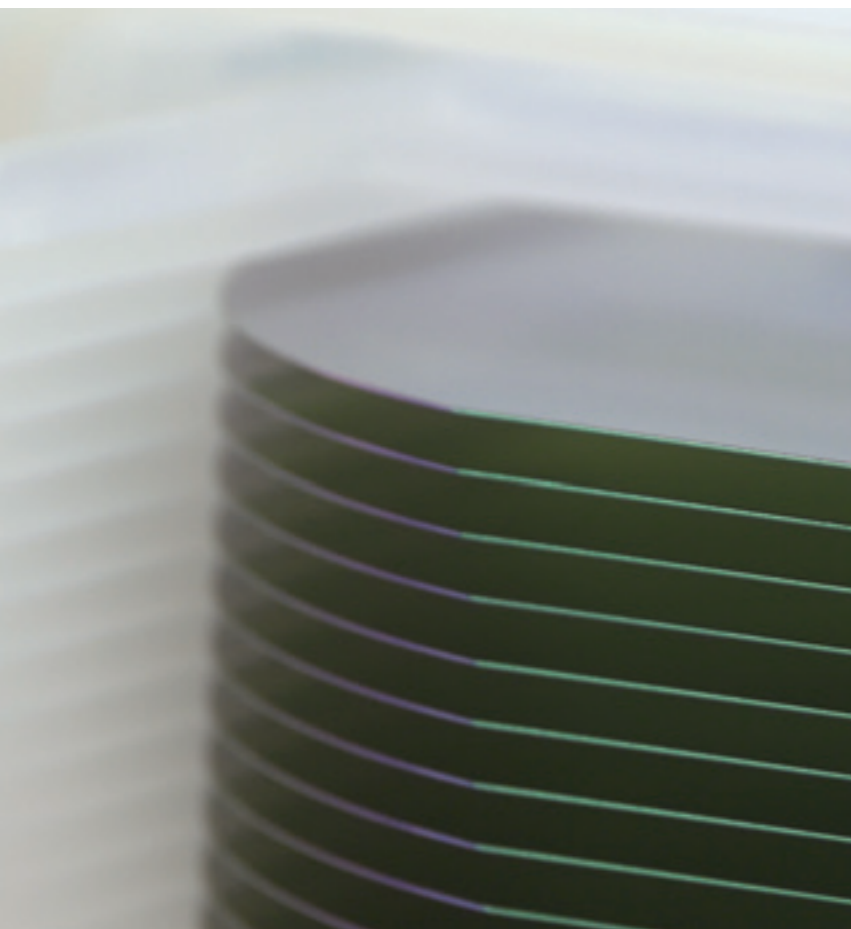


Gas and Vacuum Processes Components



Pioneering the future of process control.

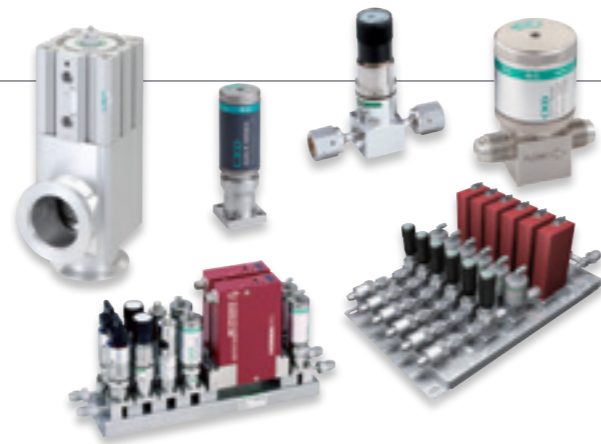
Dry Fine system ideal for semiconductor/liquid crystal manufacturing processes using process gas, vacuum, etc.



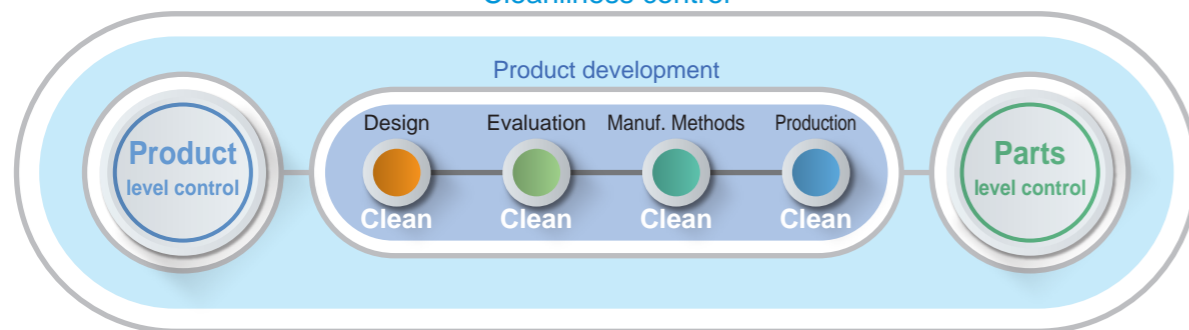
Ultra Fine concept

Introducing an all-clean process for essential factors of product development from design to evaluation, manufacturing and production.

Product cleanliness control is done thoroughly based on CKD's unique concept.



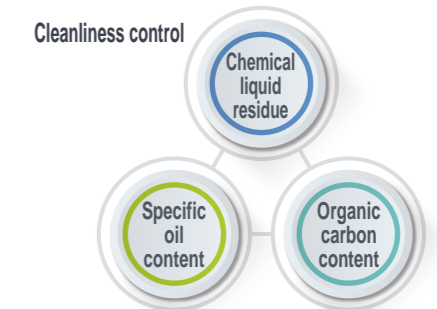
Cleanliness control



A consistent quality control system that ensures high cleanliness, including parts and products.

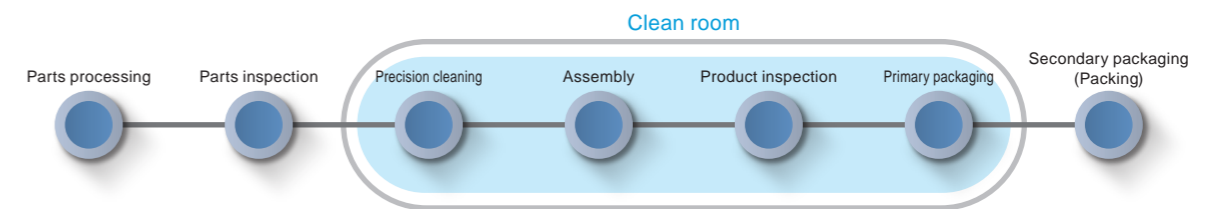
In-house production system

In every production process from processing to assembly, inspection and packaging, we have established a completely consistent quality control system not only at the product level but down to the parts level. For cleanliness, which is an important point of quality, we have incorporated in-house standards such as quantities of chemical liquid residue, organic carbon content, specific oil content and other impurity standards, and established solid quality.



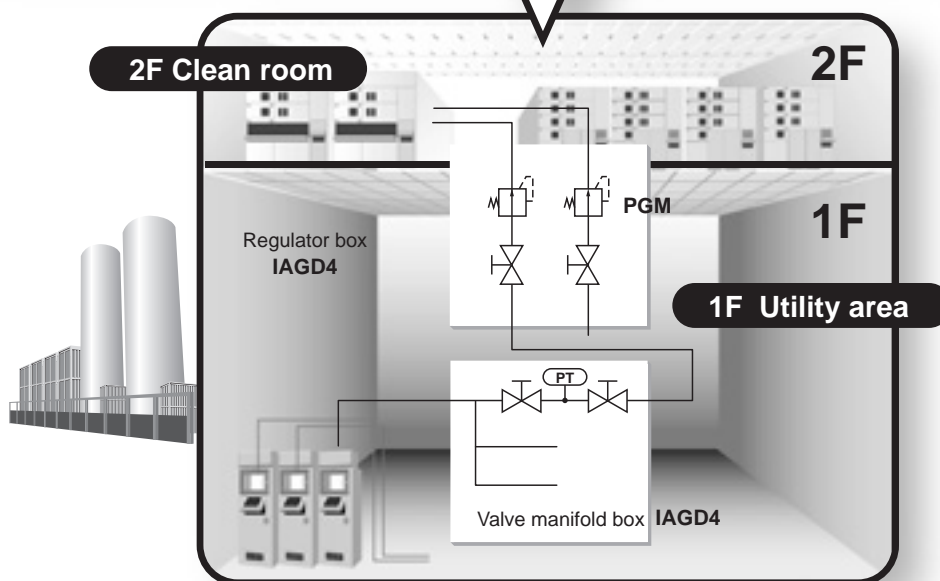
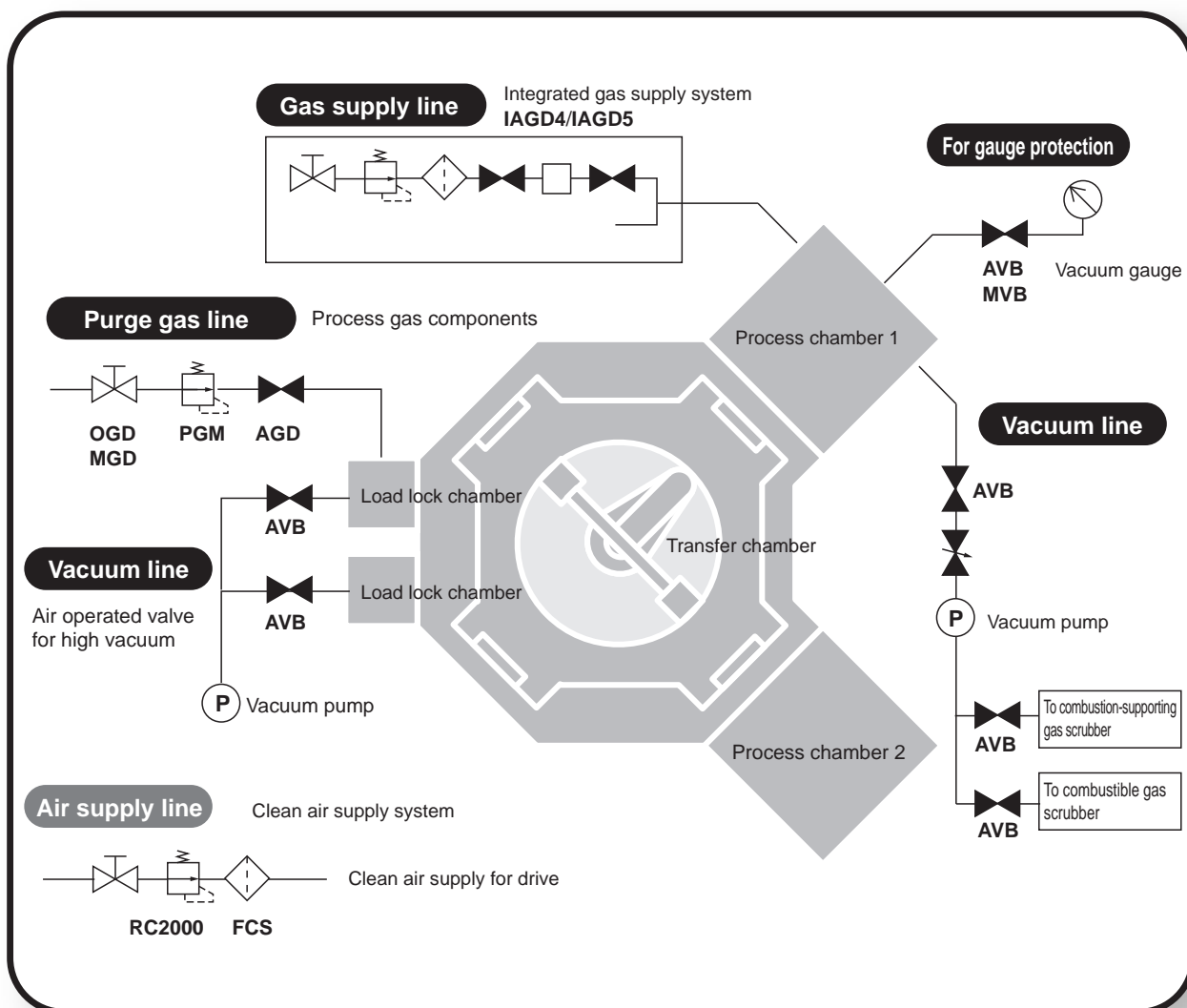
Process Gas Valve

Example of high vacuum valve production process



Dry Fine System application examples

- Dry processes of semiconductor manufacturing lines



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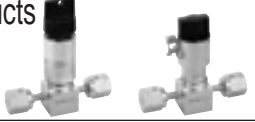
Selection guide [Components for process gases]


* Refer to Intro Pages 7 to 8 of High Vacuum Components Selection Guide.

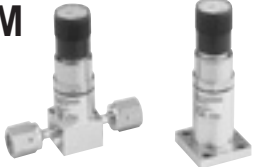
● Valve for process gases

Model No.	Working fluid	Connection	Cv											Page
			0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	
LGD1¹/₂ · LGD2¹/₂ • Metal diaphragm structure 		1/4" JXR Male fitting or equiv. 1/4" JXR Female fitting or equiv. 1/4" Double barbed fitting	● 0.3											P.4
		1/2" JXR Male fitting or equiv. 1/2" JXR Female fitting or equiv. 3/8" Double barbed fitting 1/2" Double barbed fitting	● 0.7 ● 0.7 ● 0.65 ● 0.7											
AGD0¹/₂R • Metal diaphragm structure □ 21 compact 		1/4" JXR Male fitting 1/4" JXR Female fitting	● 0.1											P.14
AGD1¹/₂R · AGD2¹/₂R • Metal diaphragm structure • Standard size 	● Inert gas ● Process gas	1/4" JXR Male fitting 1/4" JXR Female fitting 1/4" Double barbed fitting	● 0.3											P.16
		3/8" JXR Male fitting 3/8" JXR Female fitting 3/8" Double barbed fitting	● 0.65											
Other variation-compatible products  * Contact CKD for other fittings.		Refer to the listed page for details.	● 0.1 ● 0.3 ● 0.65											P.18
AGD0¹/₂R-HD AGD1¹/₂R-HD • High durability 		1/4" JXR Male fitting 1/4" JXR Female fitting	● 0.1											P.44
	1/4" JXR Male fitting 1/4" JXR Female fitting 1/4" Double barbed fitting	● 0.3												
AGD1¹/₂R-HDF AGD2¹/₂R-HDF • For high temperature • High durability 		1/4" JXR Male fitting 1/4" JXR Female fitting 1/4" Double barbed fitting	● 0.3											P.46
	3/8" JXR Male fitting 3/8" JXR Female fitting 3/8" Double barbed fitting	● 0.65												
AGD21R-A • For high temperature • High durability 		3/8" JXR Male fitting 3/8" JXR Female fitting 3/8" Double barbed fitting	● 0.4*											P.48

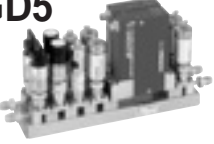
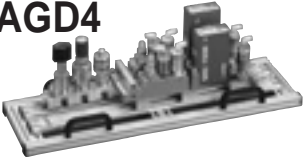
* 200°C, negative pressure

	Model No.	Working fluid	Connection	Cv											Page
				0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	
Manual valve	LGD₂0 • Metal diaphragm structure • Handle open/close (180° rotation) 	● Inert gas ● Process gas	1/4" JXR male fitting or equiv. 1/4" JXR female fitting or equiv. 1/4" Double barbed fitting	● 0.3											P.8
			1/2" JXR male fitting or equiv. 1/2" JXR female fitting or equiv. 3/8" Double barbed fitting 1/2" Double barbed fitting	● 0.7											
	OGD₂0R • Metal diaphragm structure • Handle open/close (90° snap action) 		1/4" JXR male fitting 1/4" JXR female fitting 1/4" Double barbed fitting	● 0.3											P.32
			3/8" JXR male fitting 3/8" JXR female fitting 3/8" Double barbed fitting	● 0.65											
MGD₂0R • Metal diaphragm structure • Handle open/close (270° rotation) 	1/4" JXR male fitting 1/4" JXR female fitting 1/4" Double barbed fitting	● 0.3											P.34		
	3/8" JXR male fitting 3/8" JXR female fitting 3/8" Double barbed fitting	● 0.65													
Other variation-compatible products 			Refer to the listed page for details.	● 0.3 ● 0.65											P.36

	Model No.	Working fluid	Connection	Supply fluid pressure (MPa)	Achieved vacuum level (kPa(abs))	Page
Other valves for process gas	VG • Vacuum generator for process gas exhaust 	● Inert gas ● Process gas	IN1/4" JXR male fitting VAC.1/4" JXR female fitting VENT3/8" JXR male fitting	0.4 to 0.6	13.3 or less	P.52
			• Flow rate adjusting valve • Piston check valve			P.54


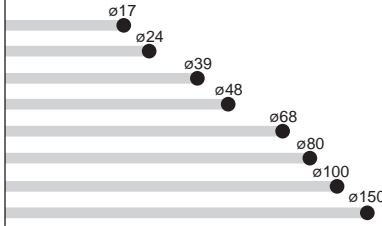

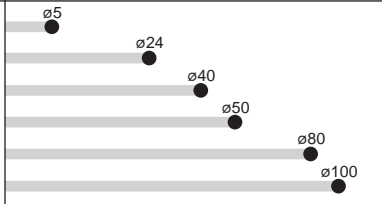

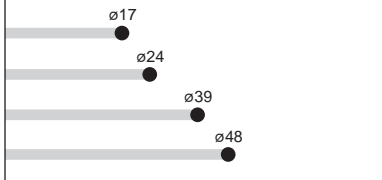

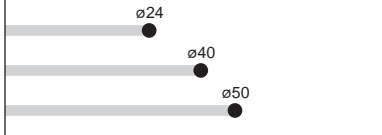



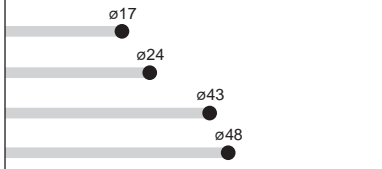
	Model No.	Working fluid	Connection	Max. working pressure (MPa)	Set pressure range (MPa)	Page
Regulator	PGM 	● Inert gas ● Process gas	1/4" JXR male fitting 1/4" JXR female fitting 1/4" JXR male→ female fitting 1/4" JXR female→ male fitting Various integrated interfaces supported	1.0	-0.07 to 0.21 MPa (pressure range 30 V) 0 to 0.21 MPa (pressure range 30) 0 to 0.35 MPa (pressure range 50) 0 to 0.42 MPa (pressure range 60) 0 to 0.7 MPa (pressure range 100) * Pressure range in () indicates psi.	P.56

● Integrated gas supply system

	Model No.	Seal connection	Size	Cv											Page
				0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	
Integrated gas supply system	IAGD5 	● W seal	1.125"	● 0.1 ● 0.26											P.68
	IAGD4 	● W seal	1.5"	● 0.1 ● 0.26											P.75

Selection guide [High vacuum Components]

● Valve for high vacuum

	Model No.	Working fluid	Connection size	Orifice: ϕ mm	Voltage	Page
				0 5 10 20 30 40 50 60 70 80 100 150		
Air operated valve	AVB**7 • Molded bellows • Aluminum body 	● Vacuum ● Inert gas	Vacuum clamp fitting NW16 Vacuum clamp fitting NW25 Vacuum clamp fitting NW40 Vacuum clamp fitting NW50 Vacuum clamp fitting NW63 Vacuum clamp fitting NW80 Vacuum clamp fitting NW100 Vacuum clamp fitting NW160		—	P.92
	AVB**3 • Molded bellows • Stainless steel body 	● Vacuum ● Inert gas	1/4" Tube Vacuum clamp fitting NW25 Vacuum clamp fitting NW40 Vacuum clamp fitting NW50 Vacuum clamp fitting NW80 Vacuum clamp fitting NW100		—	P.106
Manual valve	MVB*17 • Molded bellows • Aluminum body 	● Vacuum ● Inert gas	Vacuum clamp fitting NW16 Vacuum clamp fitting NW25 Vacuum clamp fitting NW40 Vacuum clamp fitting NW50		—	P.118
	MVB*0 • Molded bellows • Stainless steel body 	● Vacuum ● Inert gas	Vacuum clamp fitting NW25 Vacuum clamp fitting NW40 Vacuum clamp fitting NW50		—	P.120
	MVP*0 • Double O-ring shaft sealing method • Stainless steel body 	● Vacuum ● Inert gas	Vacuum clamp fitting NW25 Vacuum clamp fitting NW40 Vacuum clamp fitting NW50		—	P.122
Vacuum pressure control valves	IAVB • Vacuum pressure control • Molded bellows • Aluminum body 	● Vacuum ● Inert gas	Vacuum clamp fitting NW16 Vacuum clamp fitting NW25 Vacuum clamp fitting NW40 Vacuum clamp fitting NW50		—	P.128



Safety Precautions

Be sure to read this section before use.

When designing and manufacturing equipment using CKD wet fine system 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.)

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

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

ISO4414, JIS B 8370(Pneumatic fluid power - General rules and safety requirements for systems and their components)

JFPS2008 (Principles for pneumatic cylinder selection and use)


Including the High Pressure Gas Safety Act, Industrial Safety and Health Act, other safety rules, organization standards and regulations, etc.


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


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

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

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

 **DANGER:** In the case where the product operation is mishandled and/or when the urgency of a dangerous situation is high, it may lead to fatalities or serious injuries.

 **WARNING:** A dangerous situation may occur if handling is mistaken, leading to fatal or serious injuries.

 **CAUTION:** A dangerous situation may occur if handling is mistaken, leading to minor injuries or property damage.

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

Warranty

1 Warranty period

The product specified herein is warranted for one and a half (1.5) years from the date of delivery to the location specified by the customer.

2 Warranty coverage

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

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

The warranty stated herein covers only the delivered product itself. Any loss or damage induced by failure of the delivered product is excluded from this warranty.

Note: For details on the durability and consumable parts, contact your nearest CKD sales office.

3 Compatibility check

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

Precautions for export

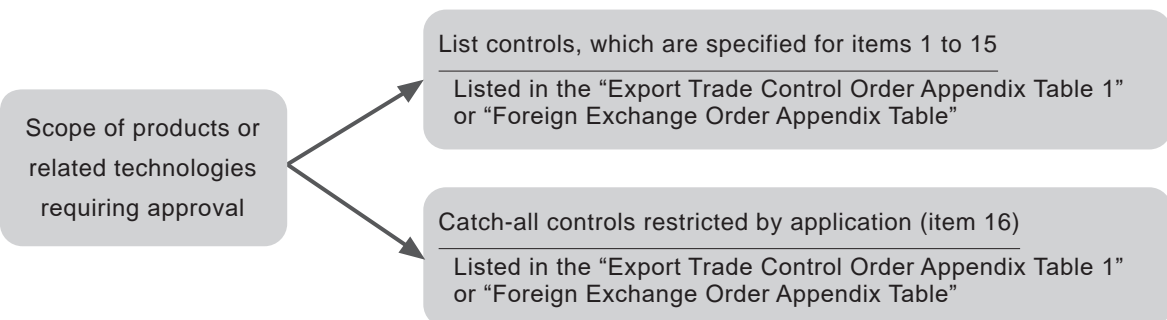
1 Security Trade Control

The products in this catalog and their related technologies may require approval before export or provision. For the sake of maintaining world peace and safety, there may be cases in which approval under the Foreign Exchange and Foreign Trade Control Law is required in advance, depending on the country to where the product or related technology is being exported or provided.

The scope of products and related technologies requiring approval is 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, which are specified for items 1 to 15
- "Catch-all controls" that do not indicate specifications by item, but restrict by application (Section 16)



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

2 Products and related technologies in this catalog

The products and related technologies in this catalog are subject to the list controls of the Foreign Exchange and Foreign Trade Control Law.

For information on the products or related technologies subject to the list controls of the Foreign Exchange and Foreign Trade Control Law, refer to the applicable product page.

If exporting or providing products or related technologies that fall under the list controls, be sure to obtain export permission under the Foreign Exchange and Foreign Trade Control Law.

In addition, when exporting or providing the products or related technologies in this catalog, ensure that they are not used for arms or weapons.

3 Contact

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

CKD RoHS Directive Compliance

From July 1, 2006, we have enforced RoHS Directive compliance. (Contact CKD for compatible models.)

RoHS Directive: EU-invoked restrictions on the use of specified hazardous substances contained in electrical and electronic components.

Components for process gases

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AGD/OGD/MGD-R Series	11
High durability AGD Series	43
Other valves for process gas	51
Regulator PGM Series	55
Integrated gas supply system IAGD Series	63

Related products	Safety precautions		High vacuum components		Components for process gases				
	Vacuum pressure control valves	Manual valve	Air operated valve	Safety precautions	Integrated gas supply system	Regulator	Other valves for process gas	High durability	AGD/OGD/ MGD-R Series

LGD

Valve for process gases

Overview

A new variation of valve for process gas that uses a metal diaphragm. It has been released as a general-purpose product with a forged body.

Features

Bore size: 1/4" to 1/2"

Fitting: Double barbed fitting
JXR equivalent product



CONTENTS

- Air operated valve LGD1 $\frac{1}{2}$ /LGD2 $\frac{1}{2}$ 4
- Manual valve LGD $\frac{1}{2}$ 0 8



Air operated valve for process gas

LGD1¹/₂ Series

LGD2¹/₂ Series

● Metal diaphragm



Specifications

Item	LGD1*	LGD2*
Working fluid	Inert gas/process gas	
Working pressure Pa(abs)-MPa(G)	1.3 x 10 ⁻⁶ to 0.99	
Fluid temperature °C	5 to 80	
Ambient temperature °C	5 to 80	
Valve seat leakage Pa·m ³ /sec.He	1.0 x 10 ⁻¹⁰ or less	
External leakage Pa·m ³ /sec.He	1.0 x 10 ⁻¹⁰ or less	
Cv (23°C under pressurization)	0.3	3/8": 0.65
		1/2": 0.7
Connection *2	1/4" JXR male fitting or equiv. 1/4" JXR female fitting or equiv. 1/4" double barbed fitting	1/2" JXR male fitting or equiv. (3/8" Compatibility)
		1/2" JXR female fitting or equiv. (3/8" Compatibility)
		3/8" double barbed fitting 1/2" double barbed fitting
Actuation	NC (Normally Closed) NO (Normally Open)	
Operating pressure MPa	NC : 0.4 to 0.6	
	NO : 0.4 to 0.5	
Operating port	M5	
Weight *1 kg	0.23	0.57

*1: Weight is the value with JXR male fitting or equiv.

*2: JXR fitting can be connected to VCR fitting.

How to order

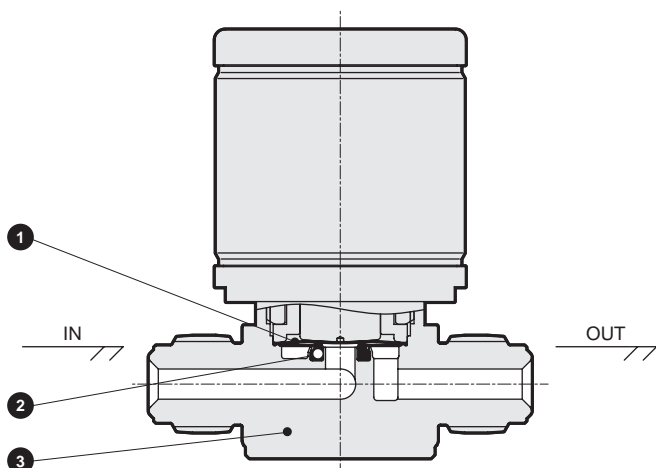
LGD1 **1** - **4RM**

Code	Description
A Actuation	
1	NC (Normally Closed)
2	NO (Normally Open)
B Connection	
4RM	1/4" Male fitting (JXR equivalent)
4R	1/4" Female fitting (JXR or equiv.)
4S	1/4" Double barbed fitting

LGD2 **1** - **8RM**

Code	Description
A Actuation	
1	NC (Normally Closed)
2	NO (Normally Open)
B Connection	
8RM	1/2" Male fitting (JXR equivalent)
8R	1/2" Female fitting (JXR or equiv.)
6S	3/8" Double barbed fitting
8S	1/2" Double barbed fitting

Internal structure and parts list



Gas contacting parts material

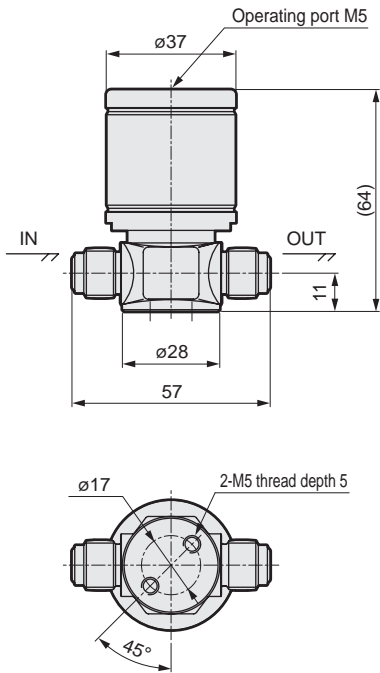
Part number	Part name	Material
1	Diaphragm	Ni-Co alloy
2	Valve seat	PCTFE
3	Body	SUS316L

CKD

Dimensions

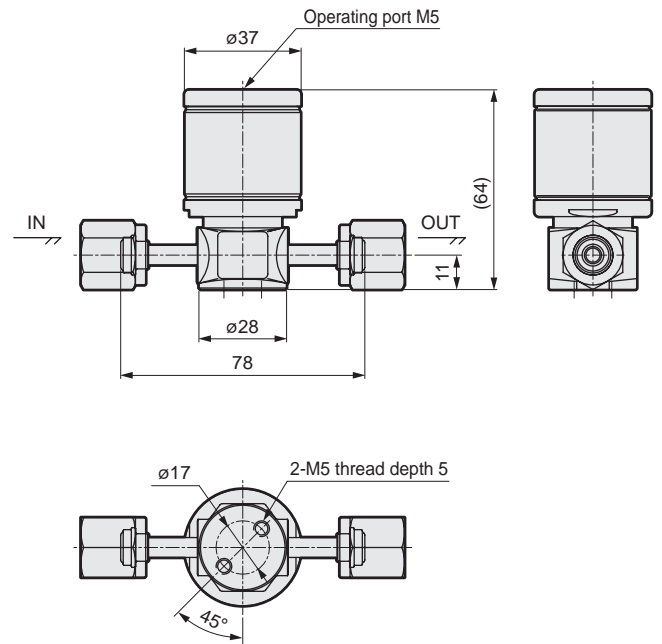
LGD1*-4RM

- JXR male fitting or equiv.



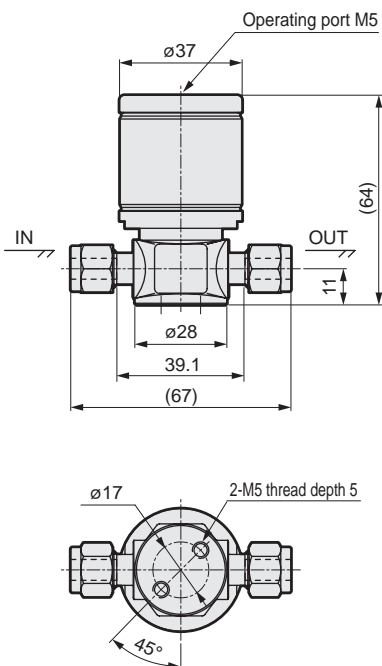
LGD1*-4R

- JXR female fitting or equiv.



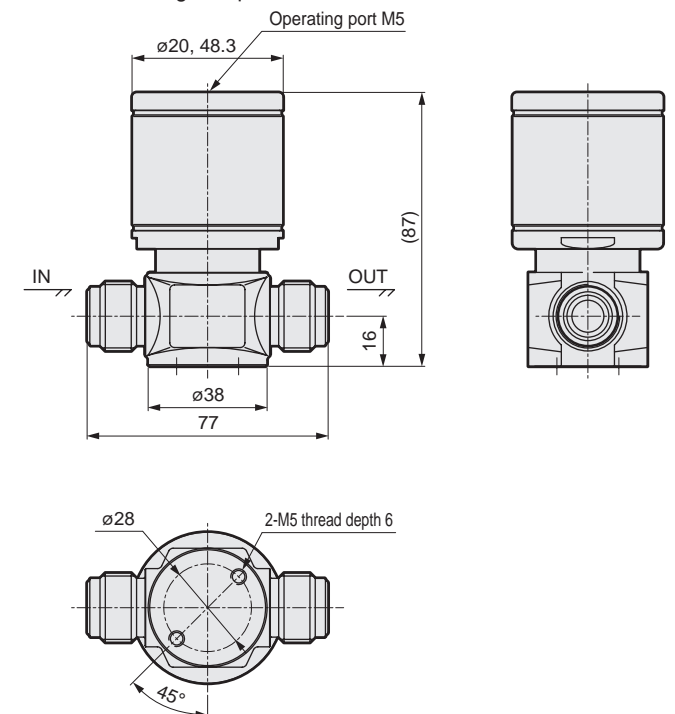
LGD1*-4S

- Double barbed fitting



LGD2*-8RM

- JXR male fitting or equiv.

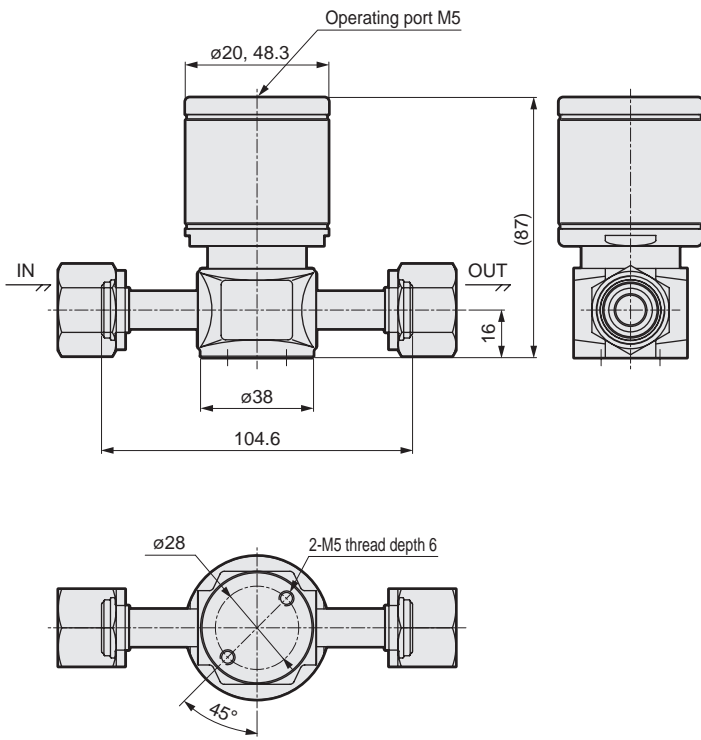


LGD Series	AGD/OGD/ MGD-R Series	High durability	Other valves for process gas	Regulator	Integrated gas supply system	Safety precautions	Air operated valve	Manual valve	Vacuum pressure control Valves	Safety precautions	Related products
Components for process gases											
High vacuum components											

Dimensions

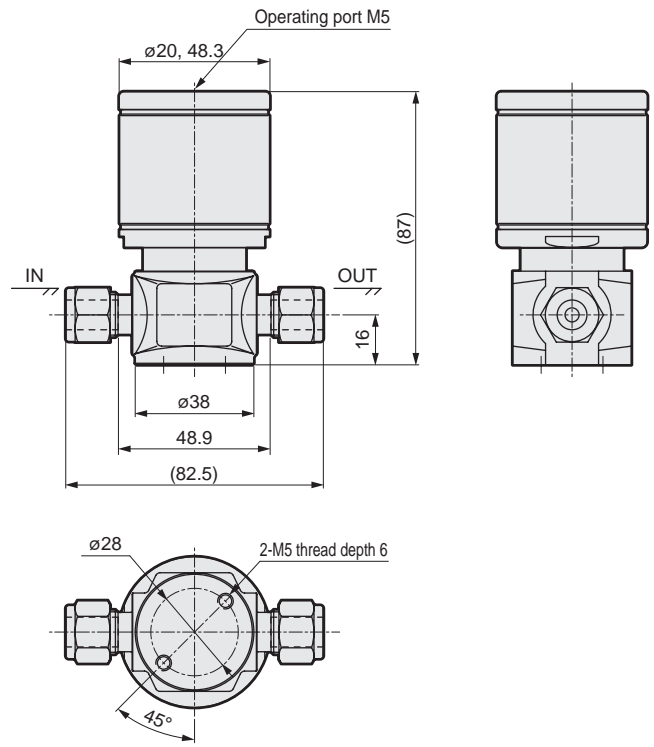
LGD2*-8R

- JXR female fitting or equiv.



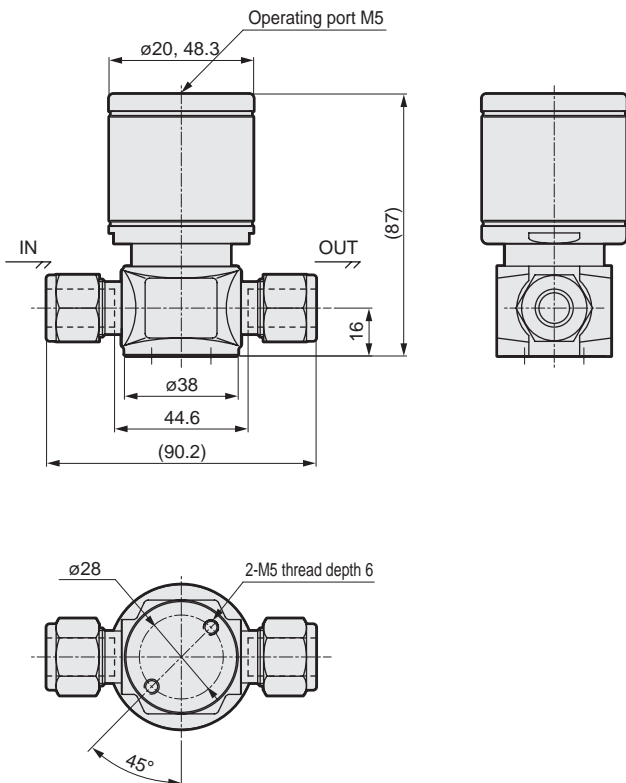
LGD2*-6S

- Double barbed fitting



LGD2*-8S

- Double barbed fitting



Components for process gases

AGD/OGD/
MGD-R Series

High durability
Other valves
for process gas

Regulator

Integrated gas
supply system

Safety precautions

Air operated valve

Manual valve

Vacuum pressure
control valves

Safety precautions

Related products

LGD Series

Components for process gases										High vacuum components		Related products
LGD Series	AGD/OGD/ MGD-R Series	High durability	Other valves for process gas	Regulator	Integrated gas supply system	Safety precautions	Air operated valve	Manual valve	Vacuum pressure control valves	Safety precautions		



Manual valve for process gas

LGD¹₂₀ Series

- Metal diaphragm
- 180° rotation



Specifications

Item	LGD10	LGD20
Working fluid	Inert gas/process gas	
Working pressure Pa(abs)-MPa(G)	1.3 x 10 ⁻⁶ to 0.99	
Fluid temperature °C	5 to 80	
Ambient temperature °C	5 to 60	
Valve seat leakage Pa·m ³ /sec.He	1.0 x 10 ⁻¹⁰ or less	
External leakage Pa·m ³ /sec.He	1.0 x 10 ⁻¹⁰ or less	
Cv (23°C under pressurization)	0.3	0.7
Connection *2	1/4"JXR male fitting or equiv. 1/4"JXR female fitting or equiv. 1/4" double barbed fitting	1/2"JXR male fitting or equiv. (3/8"Compatibility) 1/2"JXR female fitting or equiv. (3/8"Compatibility) 3/8" double barbed fitting 1/2" double barbed fitting
Weight *1 kg	0.26	0.57

*1: Weight is the value with JXR male fitting or equiv.

*2: JXR fitting can be connected to VCR fitting.

How to order

LGD10- **4RM**

A Connection

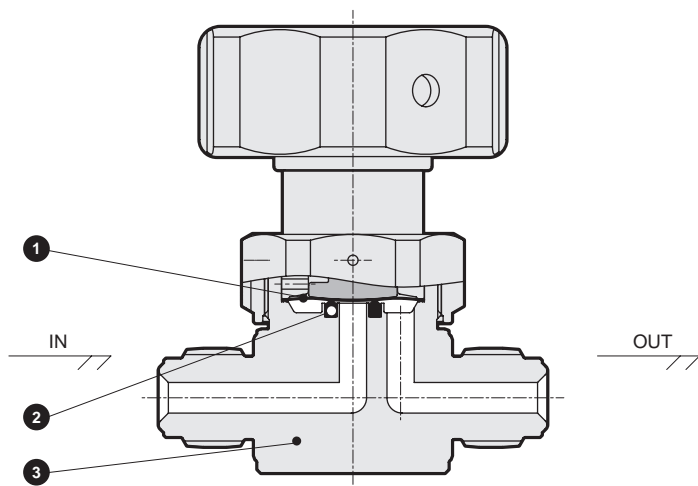
Code	Description
A Connection	
4RM	1/4"Male fitting (JXR equivalent)
4R	1/4"Female fitting (JXR or equiv.)
4S	1/4"Double barbed fitting

LGD20- **8RM**

A Connection

Code	Description
A Connection	
8RM	1/2"Male fitting (JXR equivalent)
8R	1/2"Female fitting (JXR or equiv.)
6S	3/8"Double barbed fitting
8S	1/2"Double barbed fitting

Internal structure and parts list



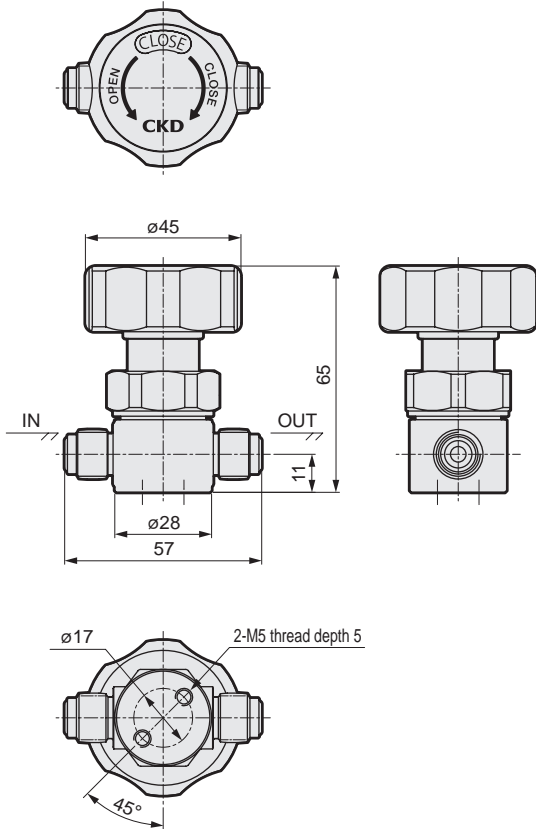
Gas contacting parts material

Part number	Part name	Material
1	Diaphragm	Ni-Co alloy
2	Valve seat	PCTFE
3	Body	SUS316L

Dimensions

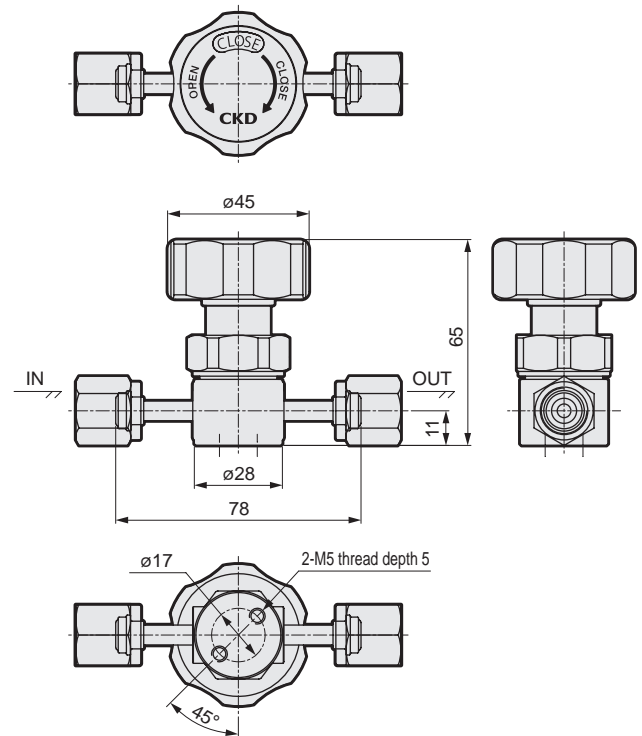
LGD10-4RM

- JXR male fitting or equiv.



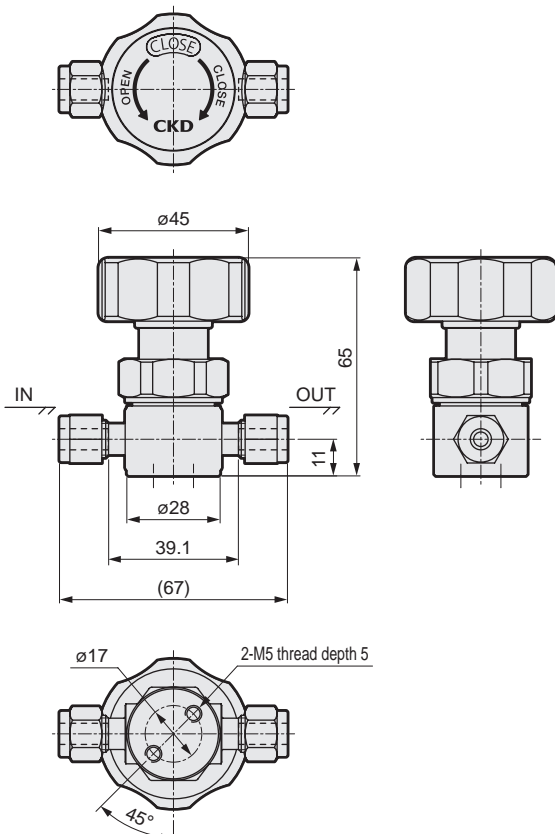
LGD10-4R

- JXR female fitting or equiv.



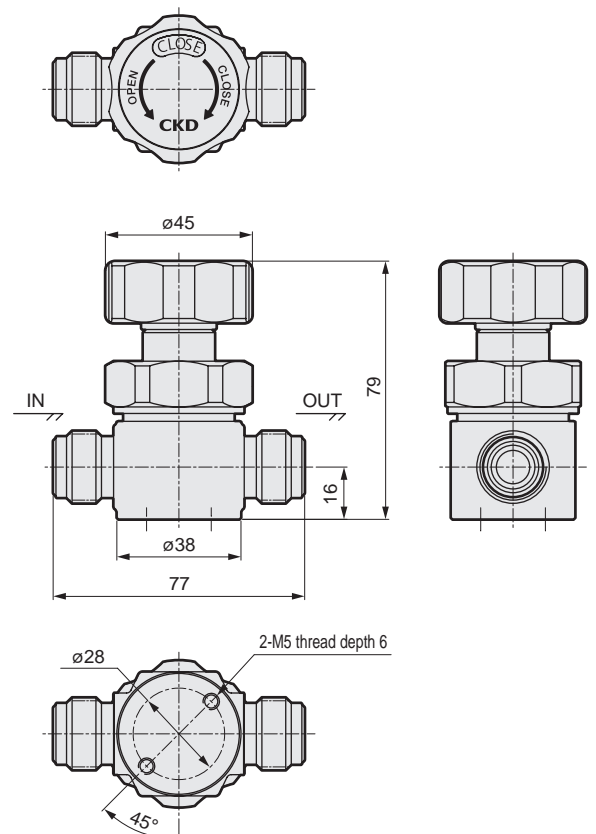
LGD10-4S

- Double barbed fitting



LGD20-8RM

- JXR male fitting or equiv.

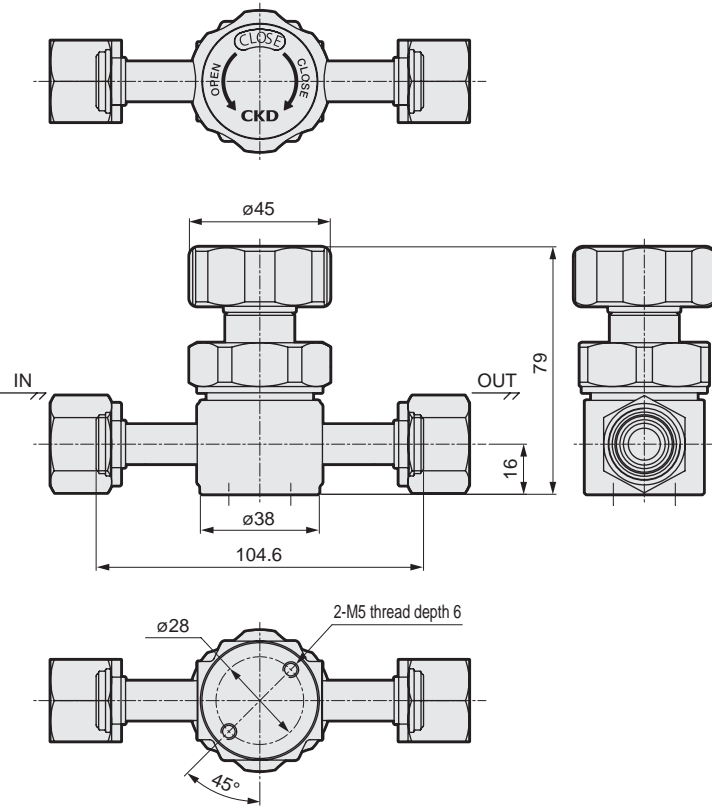


LGD Series	AGD/OGD/ MGD-R Series	High durability	Other valves for process gas	Regulator	Integrated gas supply system	Safety precautions	Air operated valve	Manual valve	Vacuum pressure control valves	Safety precautions	Related products
Components for process gases											

Dimensions

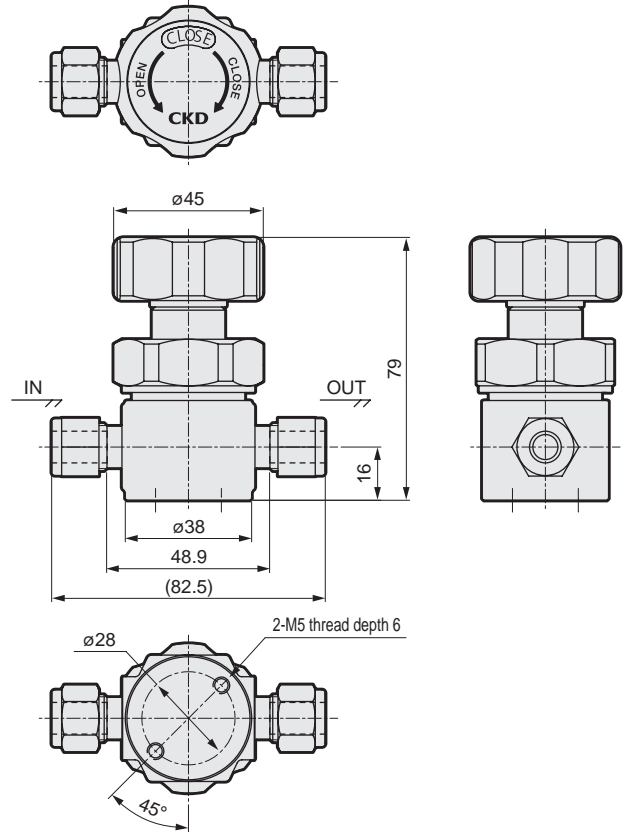
LGD20-8R

- JXR female fitting or equiv.



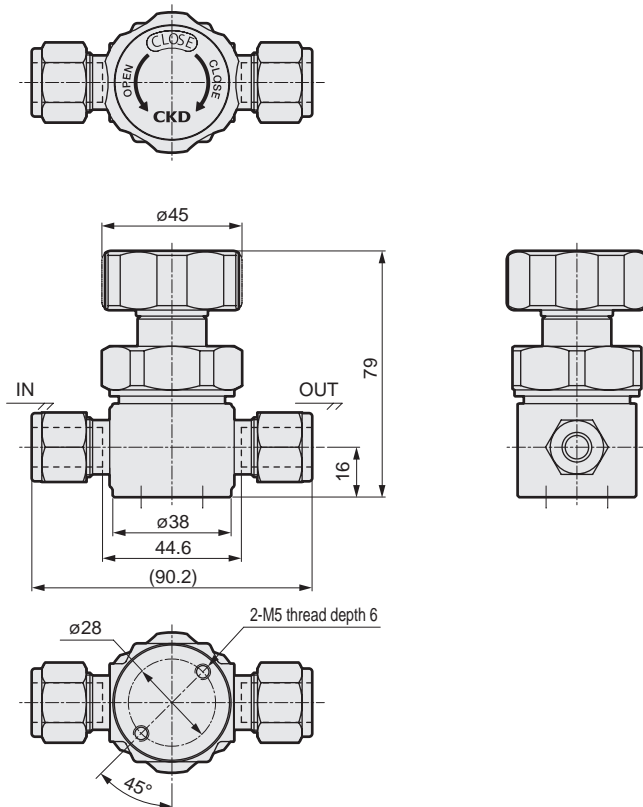
LGD20-6S

- Double barbed fitting



LGD20-8S

- Double barbed fitting



Components for process gases
 AGD/OGD/ MGD-R Series
 LGD Series
 Other valves for process gas
 High durability
 Regulator
 Integrated gas supply system
 Safety precautions
 Air operated valve
 Manual valve
 Vacuum pressure control valves
 Safety precautions
 Related products

AGD-R/OGD-R/MGD-R

Valve for process gases

Overview

Standard valve for process gas that uses a metal diaphragm. They feature machined bodies to support a wide range of needs.

Features

Industry-lowest internal leakage

$1.0 \times 10^{-10} \text{Pam}^3/\text{s.He}$ or less

Supports a wide range of variations

3-way valve

2-station 3-way valve

Different diameter fittings

Manual valves to meet customer needs

90° rotation snap action (OGD)

270° rotation (MGD)



CONTENTS

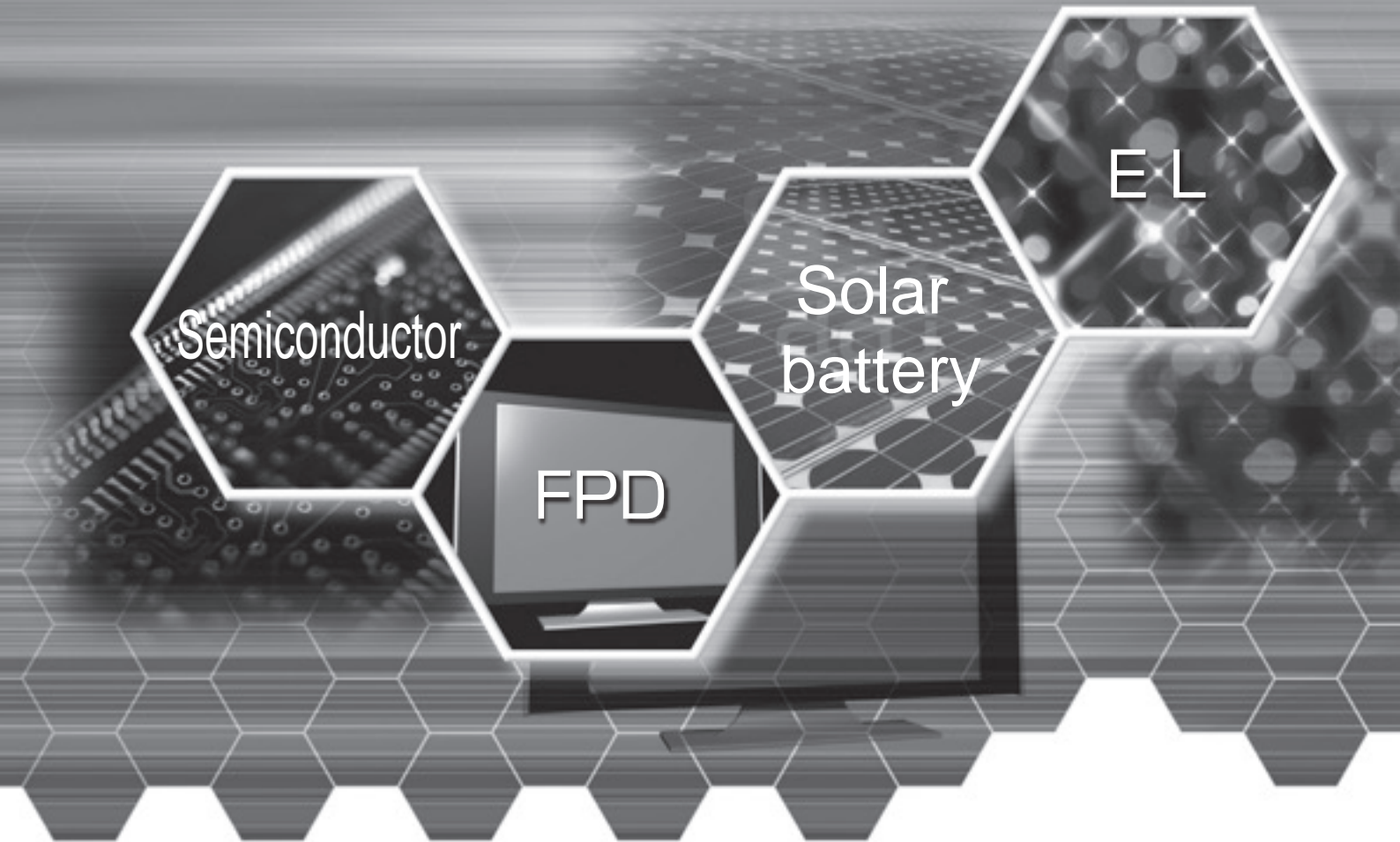
Air operated valve

● Product introduction	12
● AGD0 $\frac{1}{2}$ R	14
● AGD1 $\frac{1}{2}$ R AGD2 $\frac{1}{2}$ R	16

Manual valve

● OGD $\frac{1}{2}$ OR	32
● MGD $\frac{1}{2}$ OR	34
● Variation-compatible products	36

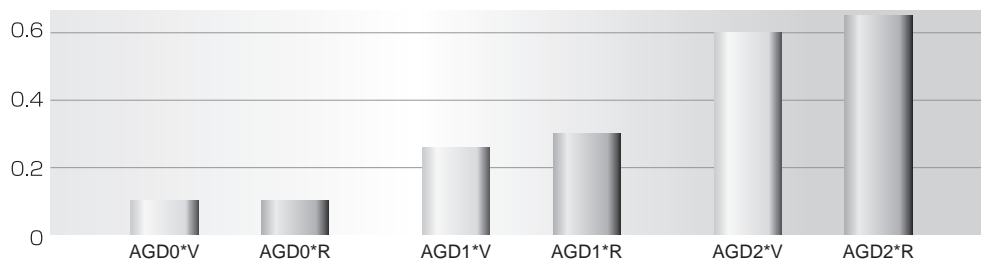
AGD Series is back with a new eco-friendly design!



Improved inner seal performance through optimum sealing structure ^{*1}

Internal leakage of 1.0×10^{-10} Pa·m³/s.He or less realized.
 [Conventional product: 1.3×10^{-9} Pa·m³/s.He or less]

Increased Cv at the same size ^{*1}



Eco-friendly design

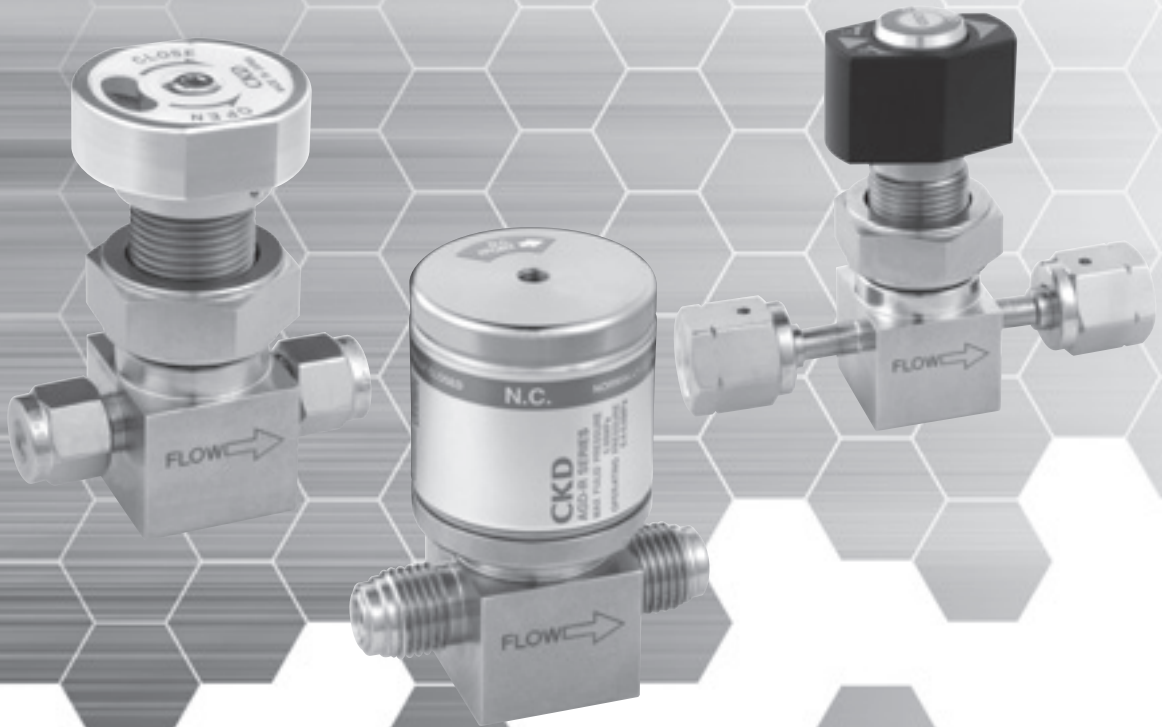
Material waste disposal reduced by 70% ^{*2}, making effective use of resources.

^{*1}. Compared to CKD conventional products ^{*2}. Compared to air operated valves

Ultra Fine

Ultra Fine concept

Thorough cleanliness control based on CKD's unique concept. Introducing an all-clean process for essential factors of product development from design to evaluation, manufacturing and production.



Air operated valve for process gas

R Lineup

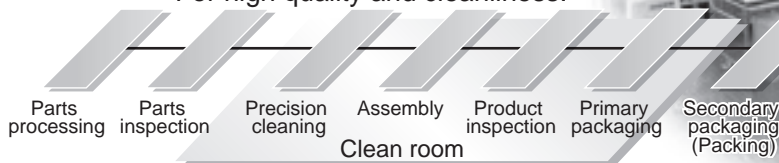
AGD-R series

MGD-R series

OGD-R series

Thorough cleanliness control system

Products are manufactured by a consistent quality control system from processing to assembly, inspection and packaging. For high quality and cleanliness.



RoHS compliant

Free from substances that damage the global environment (lead, hexavalent chromium, etc.).

RoHS

CKD



Air operated valve for process gas

AGD0₂R Series

- Metal diaphragm
- Compact

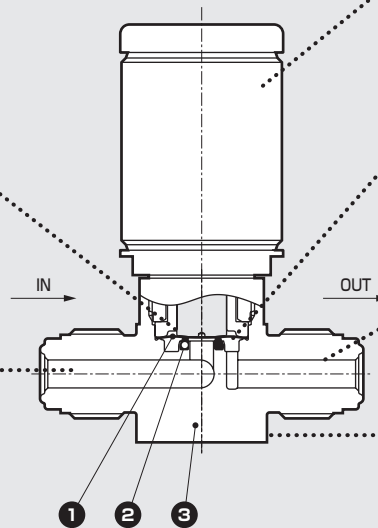


Model No. Actuation Cv
AGD01R NC Cv=0.1

Model No. Actuation Cv
AGD02R NO Cv=0.1

Basic performance is maintained
Space saving performance is pursued.

- Zero particle generation is achieved with optimal seal structure and improved surface roughness
- Electrolytic polishing specification
- Slim actuator with an outer diameter of $\varnothing 26$
- High corrosion resistance and long service life (4 million times track record²Ni-Co alloy diaphragm of)
- Connection with JXR fitting^{*1}as standard
- $\square 21$ mm compact body



Gas contacting parts material

Part No.	Part name	Material
1	Diaphragm	Ni-Co alloy
2	Valve seat	PCTFE
3	Body	SUS316L

*1: JXR fitting can be connected to VCR fitting.
*2: Service life when the working fluid is inert gas within the specified range and does not contain solids such as reaction products.

Specifications

Item	AGD01R	AGD02R
Working fluid	Inert gas/process gas	
Working pressure Pa(abs)-MPa(G)	1.3 x 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·m ³ /s(He)	1.0 x 10 ⁻¹⁰ or less	
External leakage Pa·m ³ /s(He)	2.8 x 10 ⁻¹² or less	
Cv (23°C, under pressurization)	0.1	
Connection	1/4" JXR male fitting 1/4" JXR female fitting	
Actuation	NC (Normally Closed)	NO (Normally Open)
Operating pressure MPa	0.4 to 0.6	0.4 to 0.5
Operating port	M5	
Weight kg	0.15 *1	

Safety precautions

Read the Safety Precautions on Intro Page 9 and pages 84 to 85 to ensure correct and safe use of the product.

*1: Values with AGD01R-4RM (1/4"JXR male fitting).

How to order

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

A Actuation

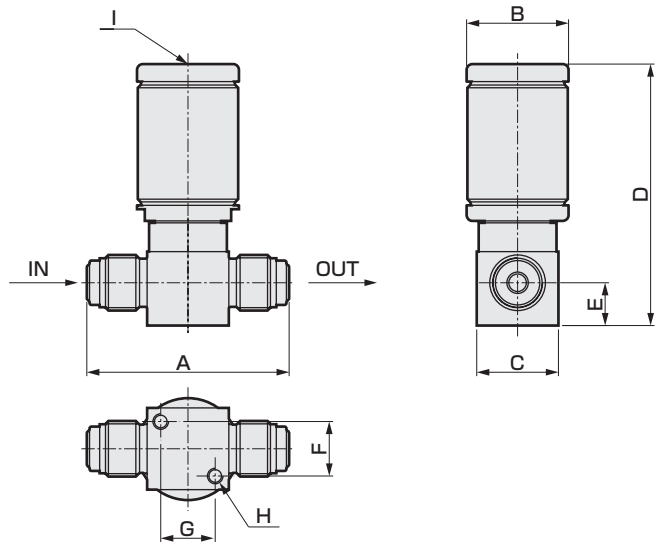
B Connection

Code	Description
A Actuation	
1	NC (Normally Closed)
2	NO (Normally Open)
B Connection	
4RM	1/4" JXR male fitting
4R	1/4" JXR female fitting

Dimensions

AGD0*R-4RM

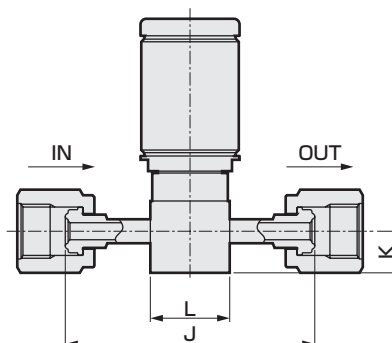
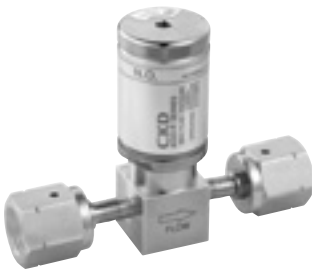
● JXR male fitting



Model No.	Code	Actuation	A	B	C	D	E	F	G	H	I
AGD01R-4RM		NC	52	ø26	□ 21	67	11	14	14	2-M4 depth 5	M5
AGD02R-4RM		NO	52	ø26	□ 21	67	11	14	14	2-M4 depth 5	M5

AGD0*R-4R

● JXR female fitting



Model No.	Code	Actuation	J	K	L
AGD01R-4R		NC	66	11	□ 21
AGD02R-4R		NO	66	11	□ 21

LGD Series
 AGD/OGD/MGD-R Series
 High durability
 Other valves for process gas
 Regulator
 Integrated gas supply system
 Safety precautions
 Air operated valve
 Manual valve
 Vacuum pressure control valves
 Safety precautions
 Related products
 Components for process gases



Air operated valve for process gas

AGD1¹/₂R Series

AGD2¹/₂R Series

- Metal diaphragm
- Standard



Model No. Actuation Cv

AGD11R NC Cv=0.3

AGD12R NO Cv=0.3

Model No. Actuation Cv

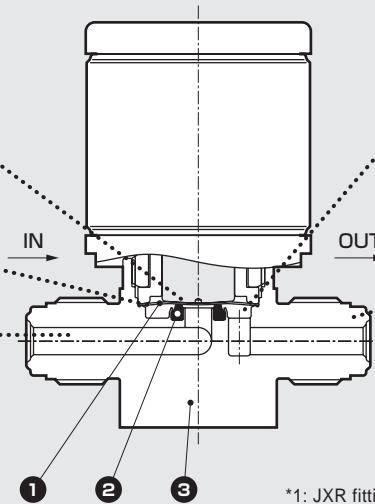
AGD21R NC Cv=0.65

AGD22R NO Cv=0.65

Created in pursuit of contamination control

Diaphragm valve R Series standard.

- Zero particle generation is achieved with optimal seal structure and improved surface roughness
- Reduced valving element dead space to the limit
- Electrolytic polishing specification



- Ni-Co alloy diaphragm with high corrosion resistance and long service life (4 million times track record ^{*2})
- JXR fitting ^{*1} and double barbed fitting are used as standard for connection

Gas contacting parts material

Part No.	Part name	Material
①	Diaphragm	Ni-Co alloy
②	Valve seat	PCTFE
③	Body	SUS316L

*1: JXR fitting can be connected to VCR fitting.

*2: Service life when the working fluid is inert gas within the specified range and does not contain solids such as reaction products.

Specifications

Item	AGD1*R	AGD2*R
Working fluid	Inert gas/process gas	
Working pressure Pa(abs)-MPa(G)	1.3 x 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·m ³ /s(He)	1.0 x 10 ⁻¹⁰ or less	
External leakage Pa·m ³ /s(He)	2.8 x 10 ⁻¹² or less	
Cv (23°C, under pressurization)	0.3	0.65
Connection	1/4" JXR male fitting 1/4" JXR female fitting 1/4" double barbed fitting	3/8" JXR male fitting 3/8" JXR female fitting 3/8" double barbed fitting
Actuation	NC (Normally Closed) NO (Normally Open)	
Operating pressure MPa	NC:0.4 to 0.6 NO:0.4 to 0.5	
Operating port	M5	
Weight kg	0.26 *1	0.59 *1

*1: Values with AGD11R-4RM (1/4"JXR male fitting) and AGD21R-6RM (3/8"JXR male fitting).

Safety precautions

Read the Safety Precautions on Intro Page 9 and pages 84 to 85 to ensure correct and safe use of the product.

Components for process gases
 Other valves for process gas
 High durability
 Regulator
 Integrated gas supply system
 Safety precautions
 Air operated valve
 Manual valve
 High vacuum components
 Vacuum pressure control valves
 Safety precautions
 Related products

LGD Series

AGD/OGD/ MGD-R Series

High durability

Other valves for process gas

Regulator

Integrated gas supply system

Safety precautions

Air operated valve

Manual valve

High vacuum components
Vacuum pressure control valves

Safety precautions

Related products

AGD1¹/₂R/AGD2¹/₂R Series

How to order / Dimensions

How to order

AGD1 **1** R - **4RM**
Model No.

A Actuation

B Connection

Code	Description
A Actuation	
1	NC (Normally Closed)
2	NO (Normally Open)
B Connection	
4RM	1/4" JXR male fitting
4R	1/4" JXR female fitting
4S	1/4" double barbed fitting

AGD2 **1** R - **6R**
Model No.

A Actuation

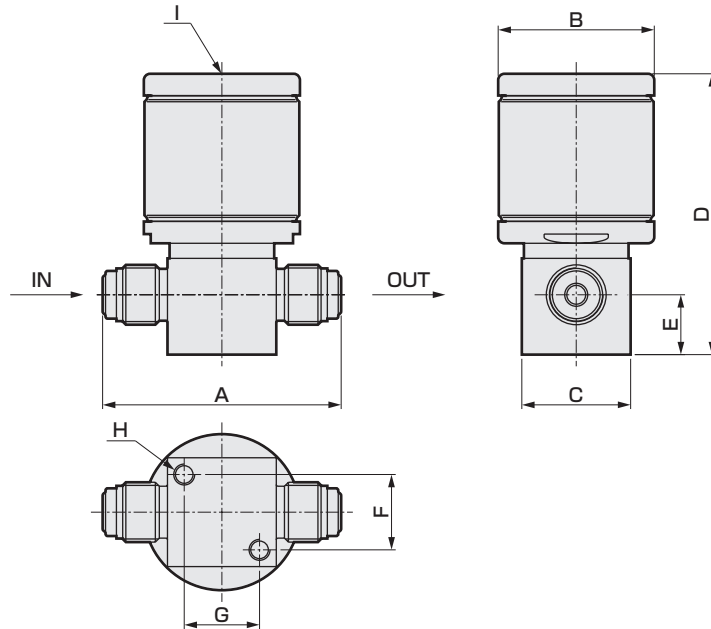
B Connection

Code	Description
A Actuation	
1	NC (Normally Closed)
2	NO (Normally Open)
B Connection	
6RM	3/8" JXR male fitting
6R	3/8" JXR female fitting
6S	3/8" double barbed fitting

Dimensions

AGD1*R-4RM AGD2*R-6RM

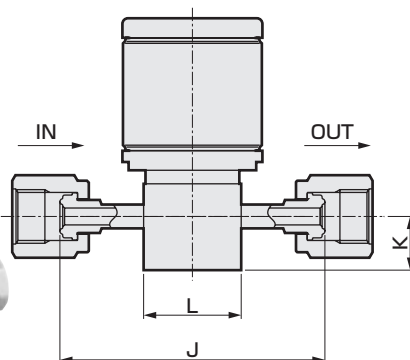
● JXR male fitting



Model No.	Code	Actuation	A	B	C	D	E	F	G	H	I
AGD11R-4RM		NC	57	ø37	□ 26	67	14.3	18	18	2-M5 depth 6	M5
AGD12R-4RM		NO									
AGD21R-6RM		NC	76	ø48	□ 34	88	16	20.2	20.2	2-M5 depth 8	M5
AGD22R-6RM		NO									

AGD1*R-4R AGD2*R-6R

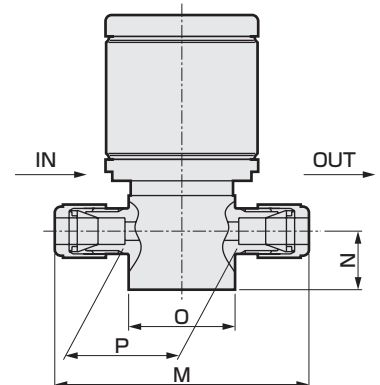
● JXR female fitting



Model No.	Code	Actuation	J	K	L
AGD11R-4R		NC	70.6	14.3	□ 26
AGD12R-4R		NO			
AGD21R-6R		NC	83	16	□ 34
AGD22R-6R		NO			

AGD1*R-4S AGD2*R-6S

● Double barbed fitting



Model No.	Code	Actuation	M	N	O	P
AGD11R-4S		NC	62	14.3	□ 26	27.8
AGD12R-4S		NO				
AGD21R-6S		NC	80	16	□ 34	44.3
AGD22R-6S		NO				

LGD Series
 AGD/OGD/MGD-R Series
 High durability
 Other valves for process gas
 Regulator
 Integrated gas supply system
 Safety precautions
 Air operated valve
 Manual valve
 High vacuum components
 Vacuum pressure control valves
 Safety precautions
 Related products

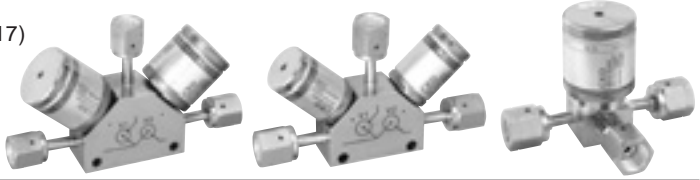
Air operated valve for process gas

Variation-compatible products

AGD**R Series

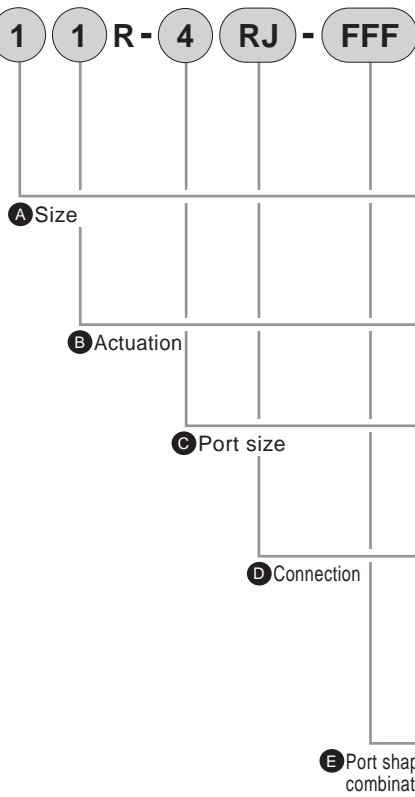


Made-to-order product

Model	Variation contents
<p>AGD0*R AGD1*R AGD2*R</p>	<p>Body options (pages 14 to 17)</p> <ul style="list-style-type: none"> ● Flow path direction ● NC/NO combination ● Connection ● Port shape combinations 

How to order **2-way valve, 3-way flow valve**

AGD **1** **1** R- **4** **RJ** - **FFF**



		Model No.		
		AGD0	AGD1	AGD2
Code	Description			
A Size				
0	1/8"	●		
1	1/4"		●	
2	3/8"			●

		Model No.		
		AGD0	AGD1	AGD2
B Actuation				
1	NC	●	●	●
2	NO	●	●	●

		Model No.		
		AGD0	AGD1	AGD2
C Port size				
4	1/4"	●	●	
6	3/8"			●
8	1/2"			●

		Model No.		
		AGD0	AGD1	AGD2
D Connection				
RJ	JXR female fitting(With bearing)	●	●	●
R	JXR female fitting	●	●	●
RM	JXR male fitting	●	●	●
W	Auto welded fitting	●	●	●
S	Double barbed fitting	●	●	●

		Model No.		
		AGD0	AGD1	AGD2
E Port shape combinations				
2-way valve				
Blank	IN/OUT common fitting	●	●	●
MF	IN: Male OUT: Female	●	●	●
FM	IN: Female OUT: Male	●	●	●
3-way flow valve				
FFF	abc female/female/female	●	●	●
FFM	abc female/female/male	●	●	●
FMM	abc female/male/male	●	●	●
MMM	abc male/male/male	●	●	●
WWW	abc auto welded fitting	●	●	●
□□□	abc □/□/□*1	●	●	●

		D Connection				
		RJ	R	RM	W	S
2-way valve						
Blank		●	●	●	●	●
MF		●	●			
FM		●	●			
3-way flow valve						
FFF		●	●			
FFM		●	●			
FMM		●	●			
MMM				●		
WWW					●	
□□□		●	●			●

*1 F: Female, M: Male, W: Auto welded fitting Free combination

Components for process gases

Other valves for process gas

Regulator

Integrated gas supply system

Safety precautions

Air operated valve

Manual valve

Vacuum pressure control valves

Safety precautions

Related products

How to order 2-station 3-way valve

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

A Size

B Flow path direction

C NC/NO combination

D Port size

E Connection

F Port shape combinations

		Model No.		
		AGD0	AGD1	AGD2
Code	Description			
A Size				
0	1/8"	●		
1	1/4"		●	
2	3/8"			●
B Flow path direction				
Y	Selector	●	●	●
T	Divider	●	●	●
C NC/NO combination				
11	V1:NC V2:NC	●	●	●
12	V1:NC V2:NO	●	●	●
21	V1:NO V2:NC	●	●	●
22	V1:NO V2:NO	●	●	●
D Port size				
4	1/4"	●	●	
6	3/8"			●
E Connection				
RJ	JXR female fitting (With bearing)	●	●	●
R	JXR female fitting	●	●	●
RM	JXR male fitting	●	●	●
F Port shape combinations				
FFF	abc female/female/female	●	●	●
MMM	abc male/male/male	●	●	●
□□□	abc □ / □ / □ *2	●	●	●

E Connection			
Code	RJ	R	RM
FFF	●	●	
MMM			●
□□□	●	●	

*2 F: Female, M: Male Free combination

LGD Series	AGD/OGD/ MGD-R Series	High durability	Other valves for process gas	Regulator	Integrated gas supply system	Safety precautions	Air operated valve	Manual valve	Vacuum pressure control valves	Safety precautions	Related products
Components for process gases											
High vacuum components											

AGD0*R 2-way valve

Made-to-order product

Dimensions

AGD0*R-4RJ (1/4" JXR female fitting (with bearing))

AGD0*R-4S (1/4" double barbed fitting)

AGD0*R-4W (1/4" auto welded fitting)

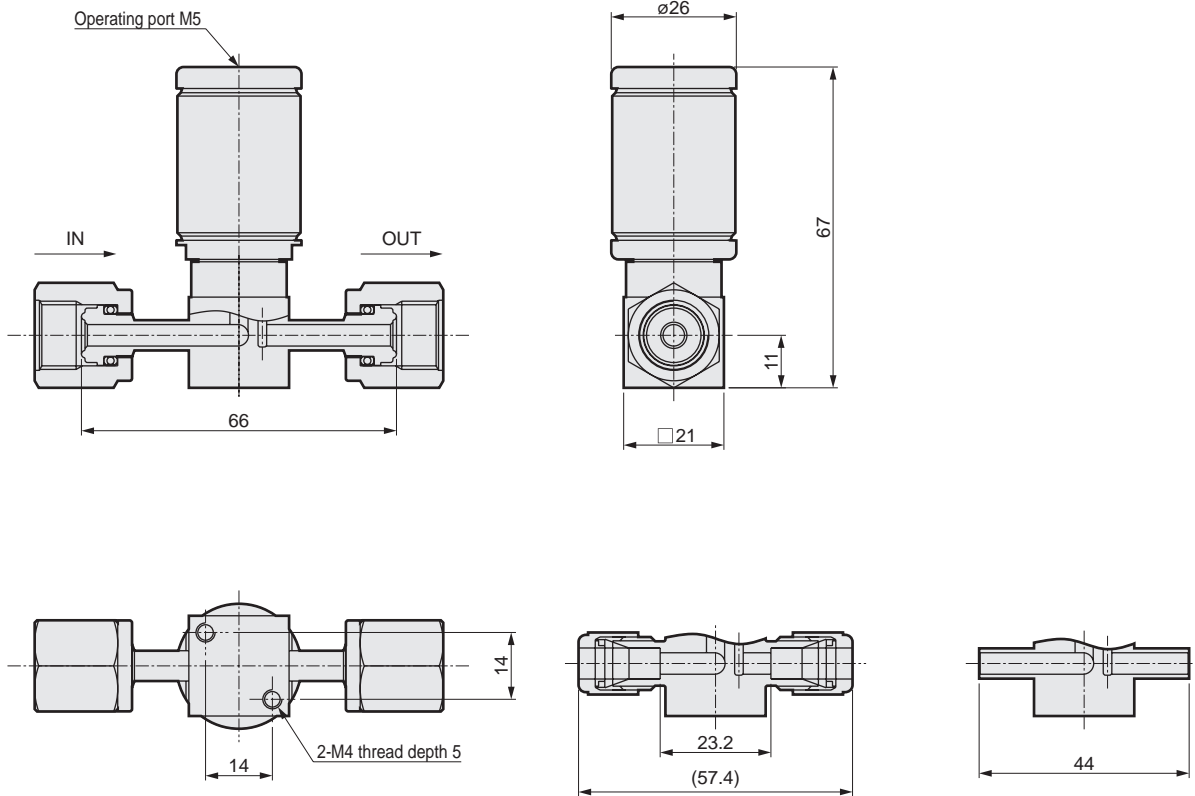


Figure shows AGD01R-4RJ
Female fitting (with bearing)

Double barbed fitting: 4S

Welded fitting: 4W

AGD0*R-4RJ-FM (1/4" JXR female (with bearing)-male mix)

AGD0*R-4R-FM (1/4" JXR female-male mix)

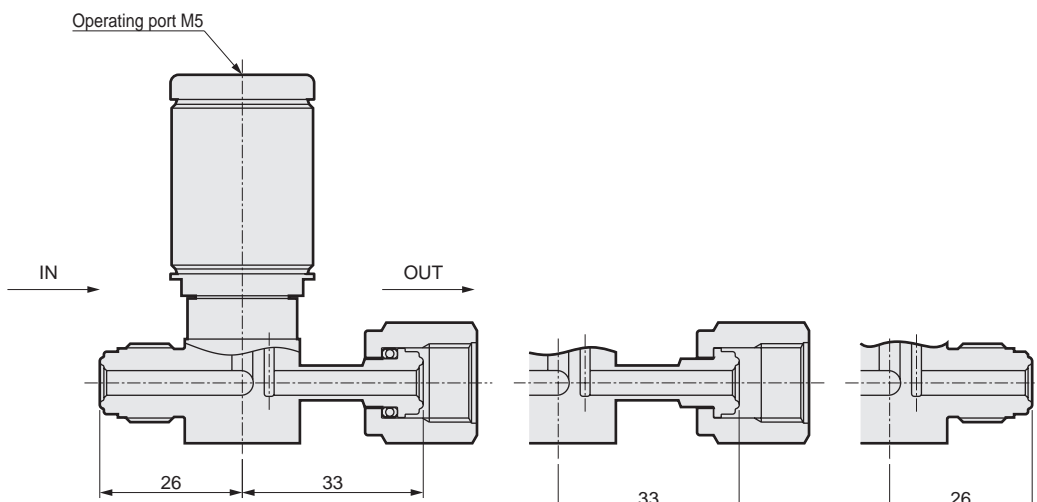


Figure shows AGD01R-4RJ-FM
Female fitting (with bearing)

Female fitting: 4R

Male fitting: 4RM

AGD0*R 3-way flow divider valve

Made-to-order product

Dimensions

AGD0*R-4RJ- □□□ (1/4" JXR female fitting (with bearing) mix)

AGD0*R-4R- □□□ (1/4" JXR female fitting mix)

AGD0*R-4RM-MMM (1/4" JXR male fitting)

AGD0*R-4W- □□□ (1/4" auto welded fitting mix)

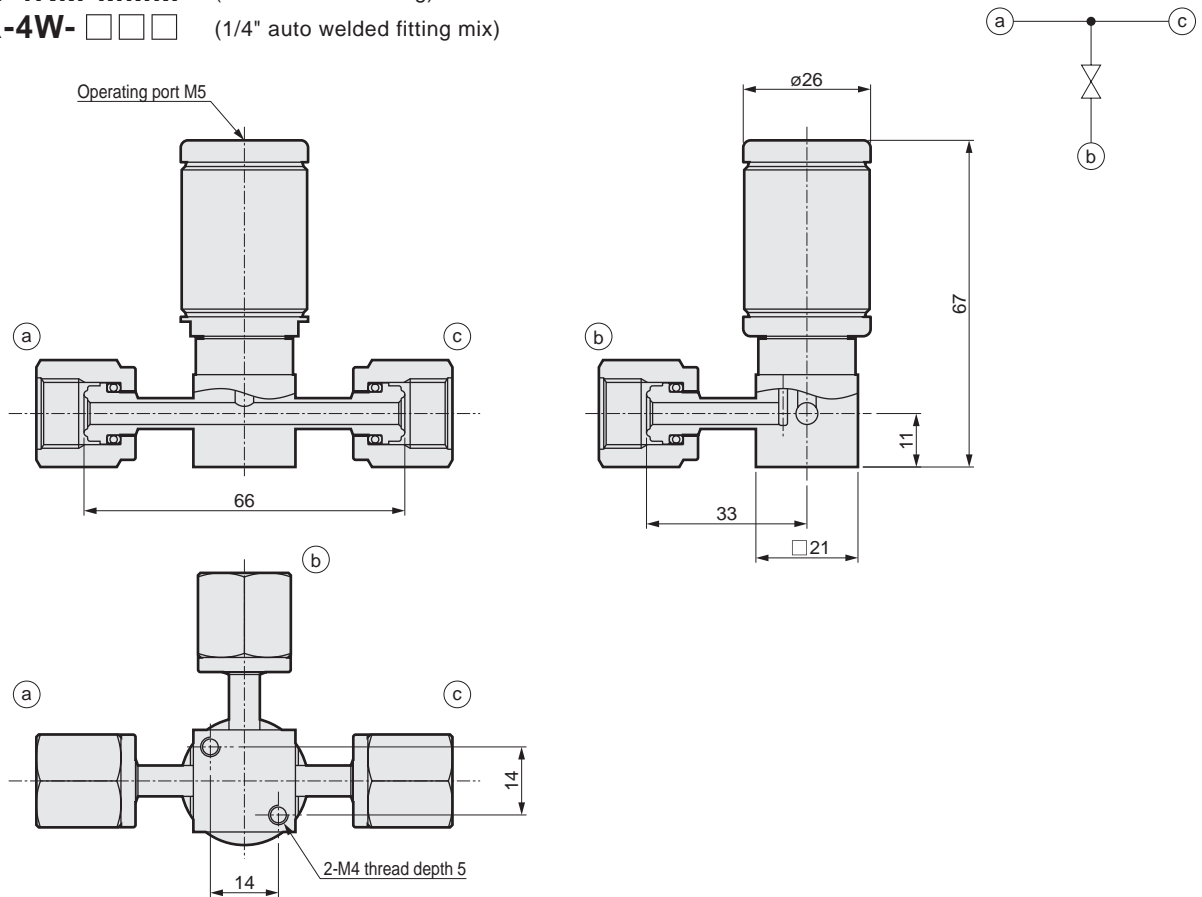
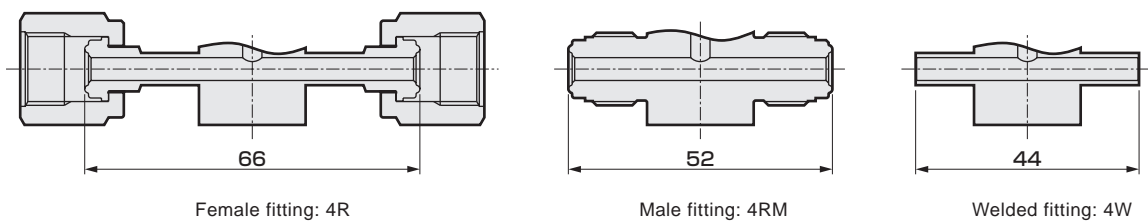


Figure shows AGD01R-4RJ-FFF
Female fitting (with bearing)

[Main port]

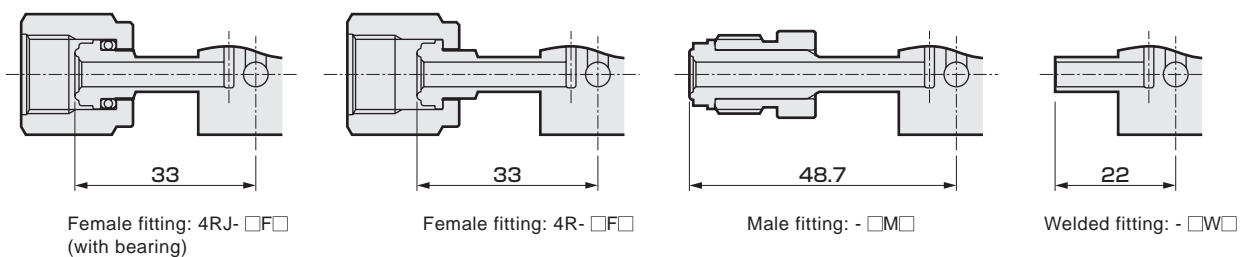


Female fitting: 4R

Male fitting: 4RM

Welded fitting: 4W

[Branching ports]



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

Female fitting: 4R- □F□

Male fitting: - □M□

Welded fitting: - □W□

LGD Series	AGD/OGD/ MGD-R Series	High durability for process gas	Regulator	Integrated gas supply system	Safety precautions	Air operated valve	High vacuum components	Vacuum pressure control valves	Safety precautions	Related products
------------	--------------------------	------------------------------------	-----------	---------------------------------	--------------------	--------------------	------------------------	-----------------------------------	--------------------	------------------

AGD0*R Series

AGD0*R 2-station 3-way valve

Made-to-order product

Dimensions

AGD01R-□****-4RJ**-□□□ (1/4" JXR female fitting (with bearing) mix)

AGD01R-□****-4R**-□□□ (1/4" JXR female fitting mix)

AGD01R-□****-4RM**-MMM (1/4" JXR male fitting)

[Y: Selector]

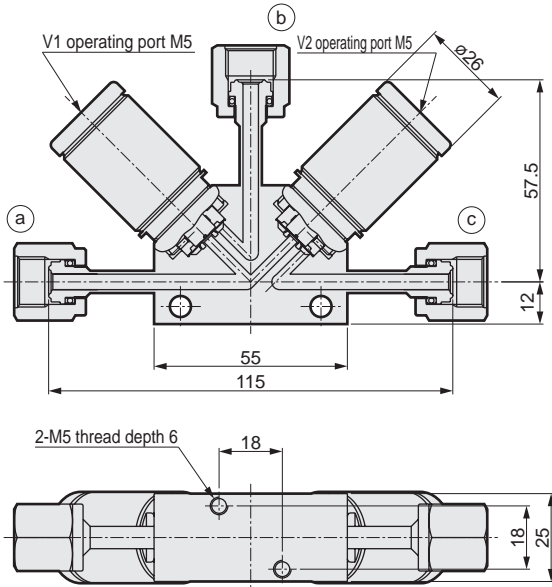
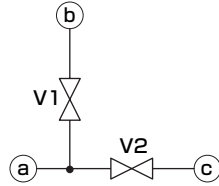


Figure shows AGD01R-Y11-4RJ-FFF
Female fitting (with bearing)



[T: Divider]

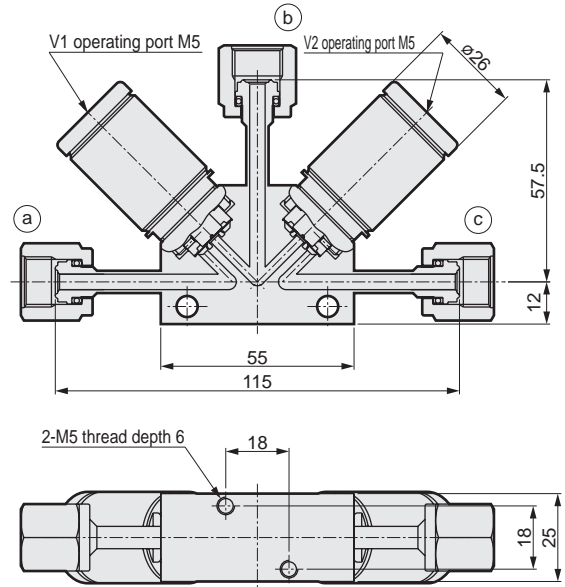
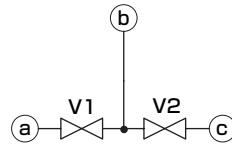
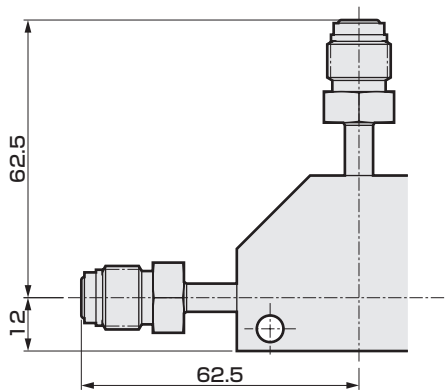


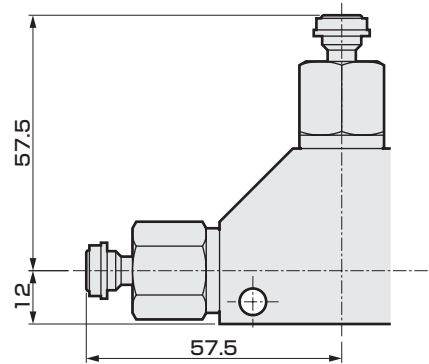
Figure shows AGD01R-T11-4RJ-FFF
Female fitting (with bearing)



[Other fitting dimensions]



Male fitting: 4RM



Female fitting: 4R

AGD1*R 2-way valve

Made-to-order product

Dimensions

AGD1*R-4RJ (1/4" JXR female fitting (with bearing))

AGD1*R-4W (1/4" auto welded fitting)

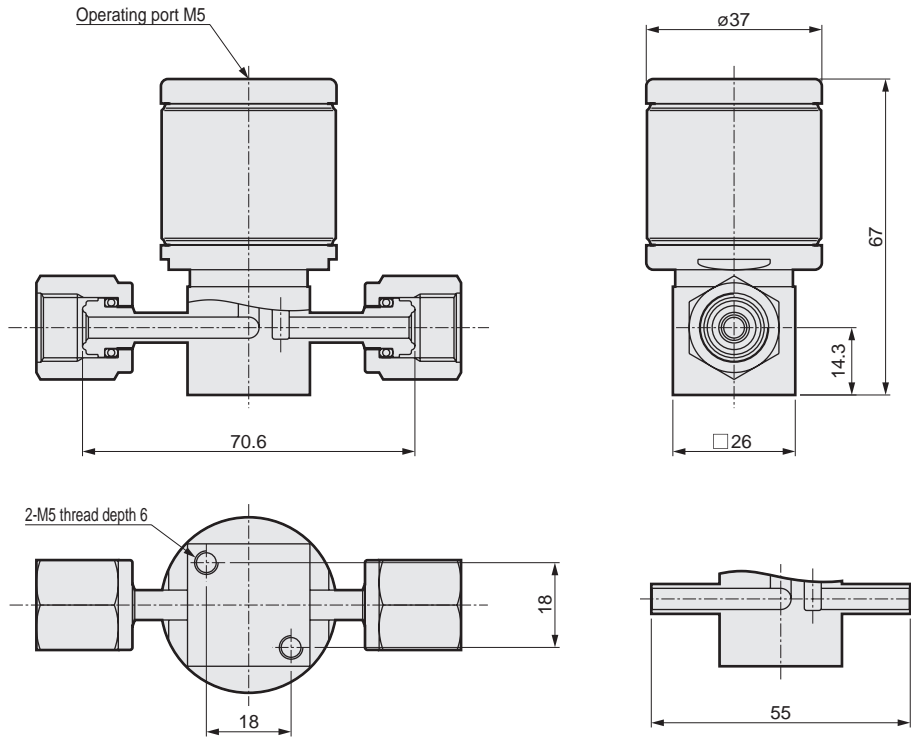


Figure shows AGD11R-4RJ
Female fitting (with bearing)

Welded fitting: 4W

AGD1*R-4RJ-FM (1/4" JXR female fitting (with bearing) male mix)

AGD1*R-4R-MF (1/4" JXR female-male mix)

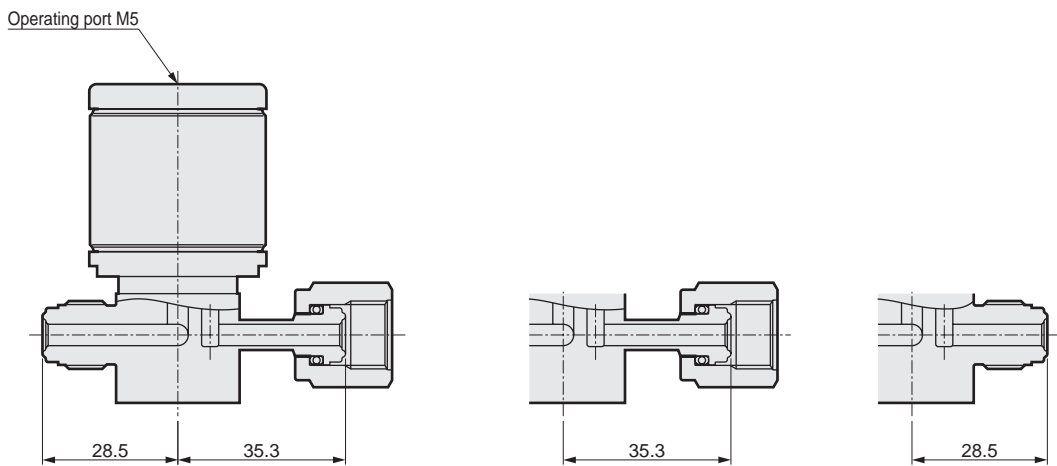


Figure shows AGD11R-4RJ-MF
Female fitting (with bearing)

Female fitting: 4R

Male fitting: 4RM

LGD Series	AGD/OGD/ MGD-R Series	High durability	Other valves for process gas	Regulator	Integrated gas supply system	Safety precautions	Air operated valve	Manual valve	Vacuum pressure control valves	Safety precautions	Related products
Components for process gases											
High vacuum components											

AGD1*R 3-way flow valve

Made-to-order product

Dimensions

AGD1*R-4RJ- (1/4" JXR female fitting (with bearing) mix)

AGD1*R-4R- (1/4" JXR female fitting mix)

AGD1*R-4RM-MMM**** (1/4" JXR male fitting)

AGD1*R-4W- (1/4" auto welded fitting mix)

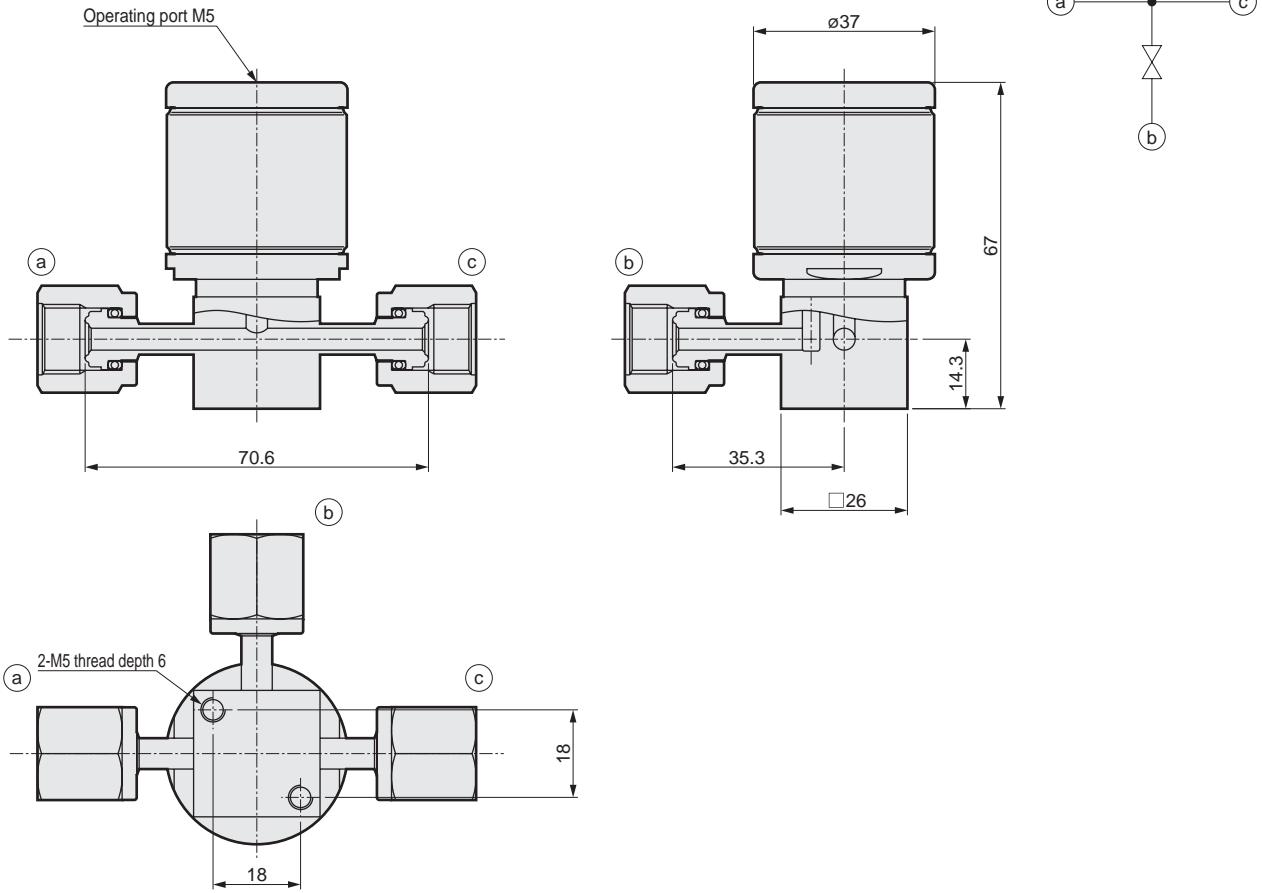
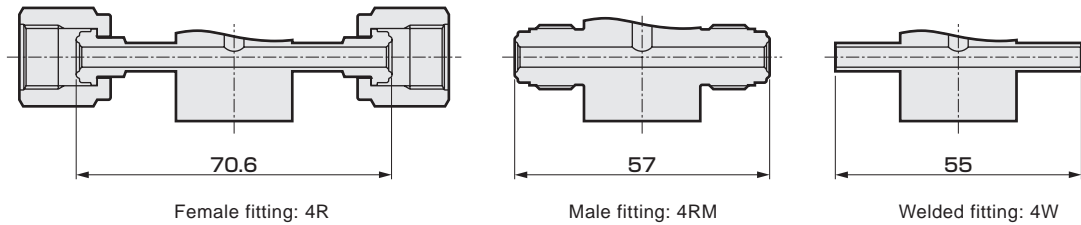
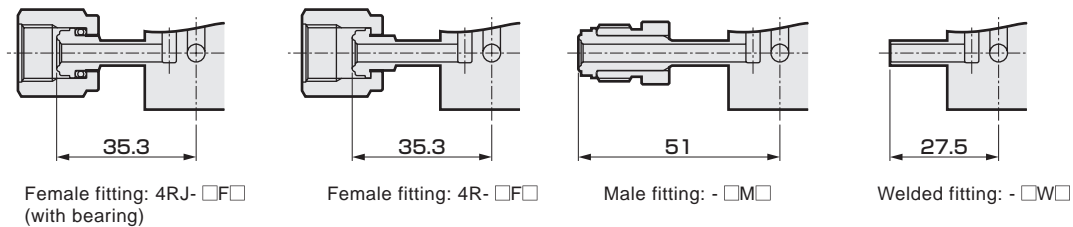


Figure shows AGD11R-4RJ-FFF
Female fitting (with bearing)

[Main port]



[Branching ports]



AGD11R 2-station 3-way valve

Made-to-order product

Dimensions

AGD11R-□****-4RJ**-□□□ (1/4" JXR female fitting (with bearing) mix)

AGD11R-□****-4R**-□□□ (1/4" JXR female fitting mix)

AGD11R-□****-4RM**-MMM (1/4" JXR male fitting)

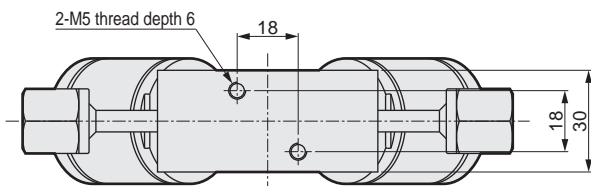
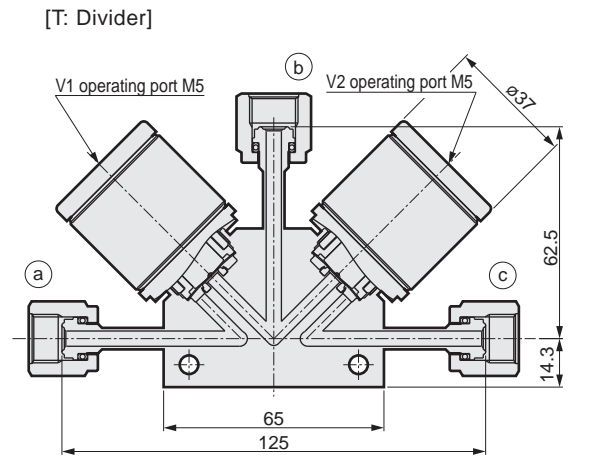
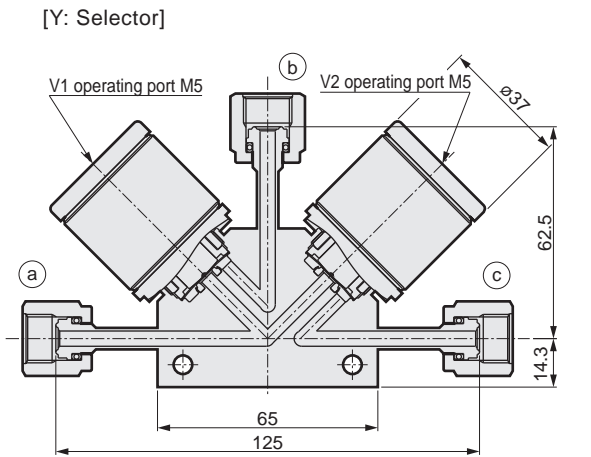


Figure shows AGD11R-Y11-4RJ-FFF
Female fitting (with bearing)

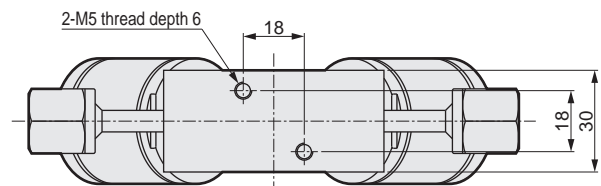
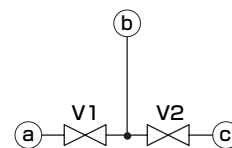
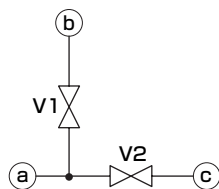
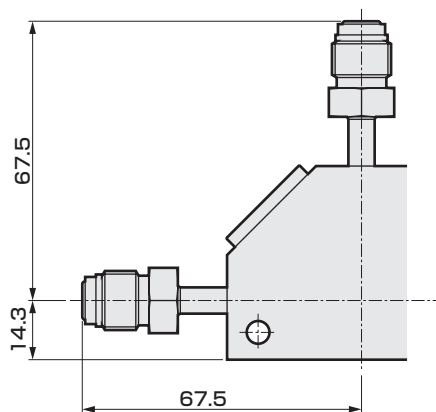


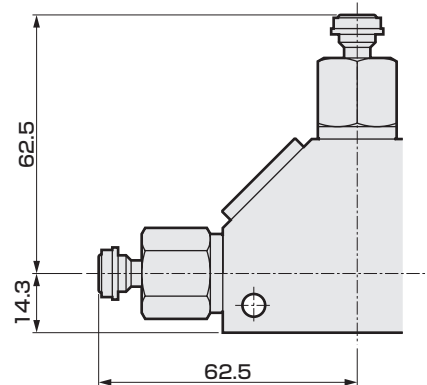
Figure shows AGD11R-T11-4RJ-FFF
Female fitting (with bearing)



[Other fitting dimensions]



Male fitting: 4RM



Female fitting: 4R

LGD Series	AGD/OGD/ MGD-R Series	High durability for process gas	Regulator	Integrated gas supply system	Safety precautions	Air operated valve	Manual valve	Vacuum pressure control valves	Safety precautions	Related products
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Components for process gases

High vacuum components

AGD2*R 2-way valve

Made-to-order product

Dimensions

- AGD2*R-6RJ** (3/8" JXR female fitting (with bearing))
- AGD2*R-6W** (3/8" auto welded fitting)
- AGD2*R-8S** (1/2" double barbed fitting)
- AGD2*R-8RM** (1/2" JXR male fitting)
- AGD2*R-8R** (1/2" JXR female fitting)
- AGD2*R-8RJ** (1/2" JXR female fitting (with bearing))
- AGD2*R-8W** (1/2" auto welded fitting)

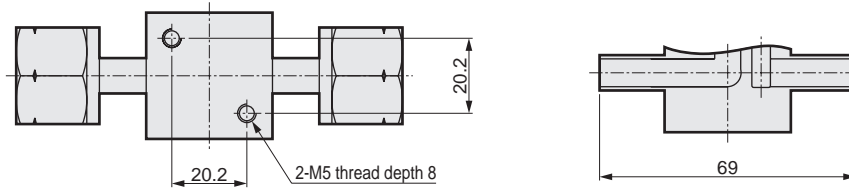
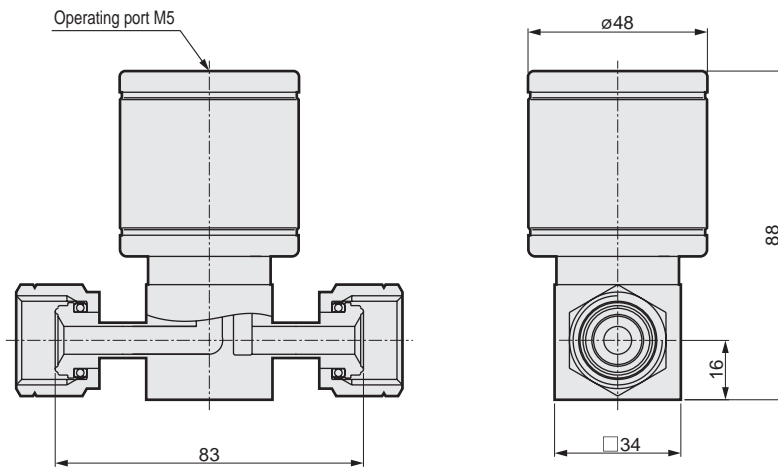
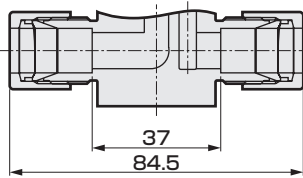
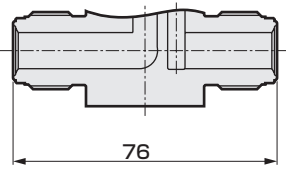


Figure shows AGD21R-6RJ
Female fitting (with bearing)

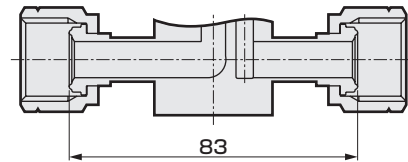
Welded fitting: 6W



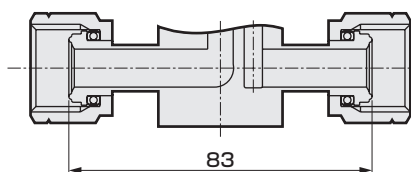
Double barbed fitting: 8S



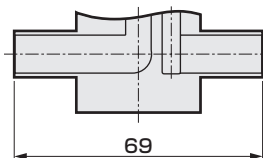
Male fitting: 8RM



Female fitting: 8R



Female fitting: 8RJ
(with bearing)



Welded fitting: 8W

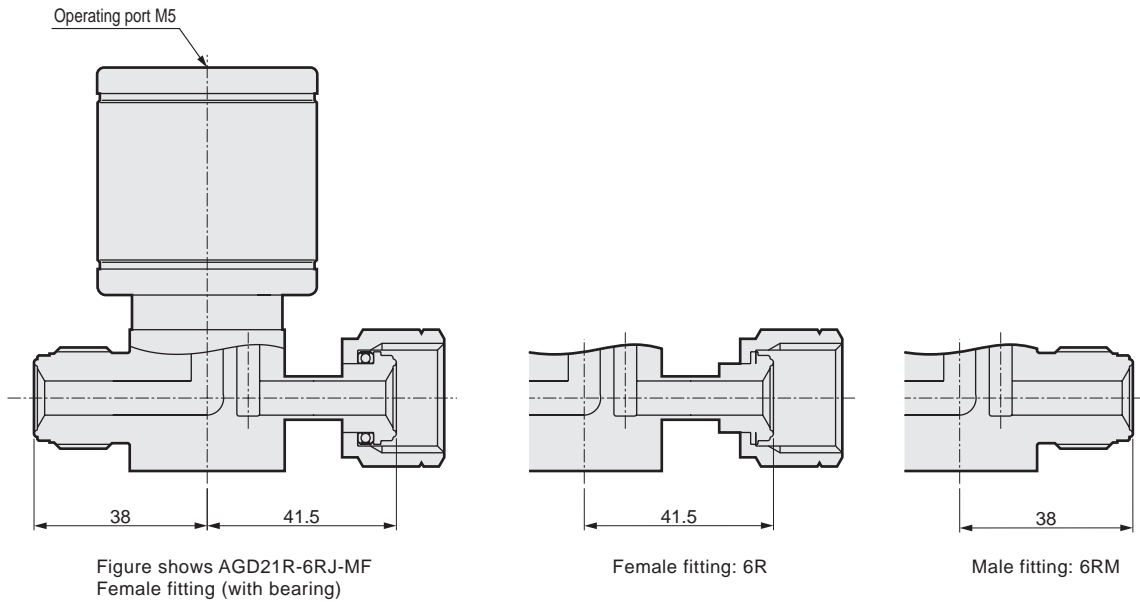
AGD2*R 2-way valve

Made-to-order product

Dimensions

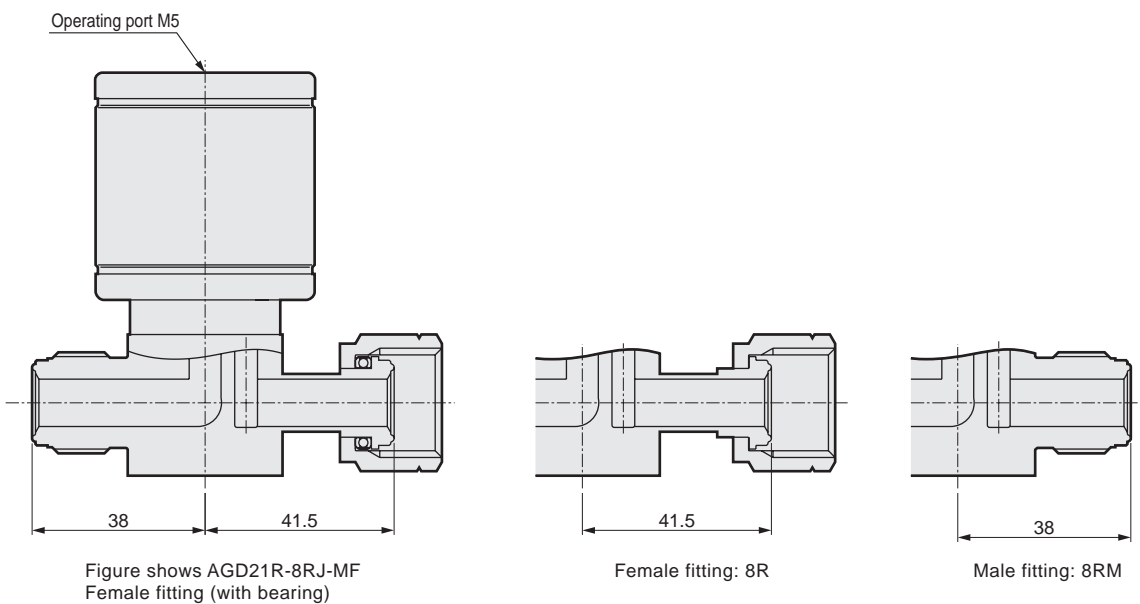
AGD2*R-6RJ-FM (3/8"JXR female fitting (with bearing) male mix)

AGD2*R-6R-MF (3/8"JXR female-male mix)



AGD2*R-8RJ-FM (1/2"JXR female fitting (with bearing) male mix)

AGD2*R-8R-MF (1/2"JXR female-male mix)



LGD Series	AGD/OGD/ MGD-R Series	High durability	Other valves for process gas	Regulator	Integrated gas supply system	Safety precautions	Air operated valve	Manual valve	Vacuum pressure control valves	Safety precautions	Related products
Components for process gases											
High vacuum components											

AGD2*R 3-way flow valve

Made-to-order product

Dimensions

AGD2*R-6RJ- □□□ (3/8" JXR female fitting (with bearing) mix)

AGD2*R-6R- □□□ (3/8" JXR female fitting mix)

AGD2*R-6RM-MMM (3/8" JXR male fitting)

AGD2*R-6W- □□□ (3/8" auto welded fitting mix)

• 1/2" size is also available. The interface is the same as the 3/8" size.

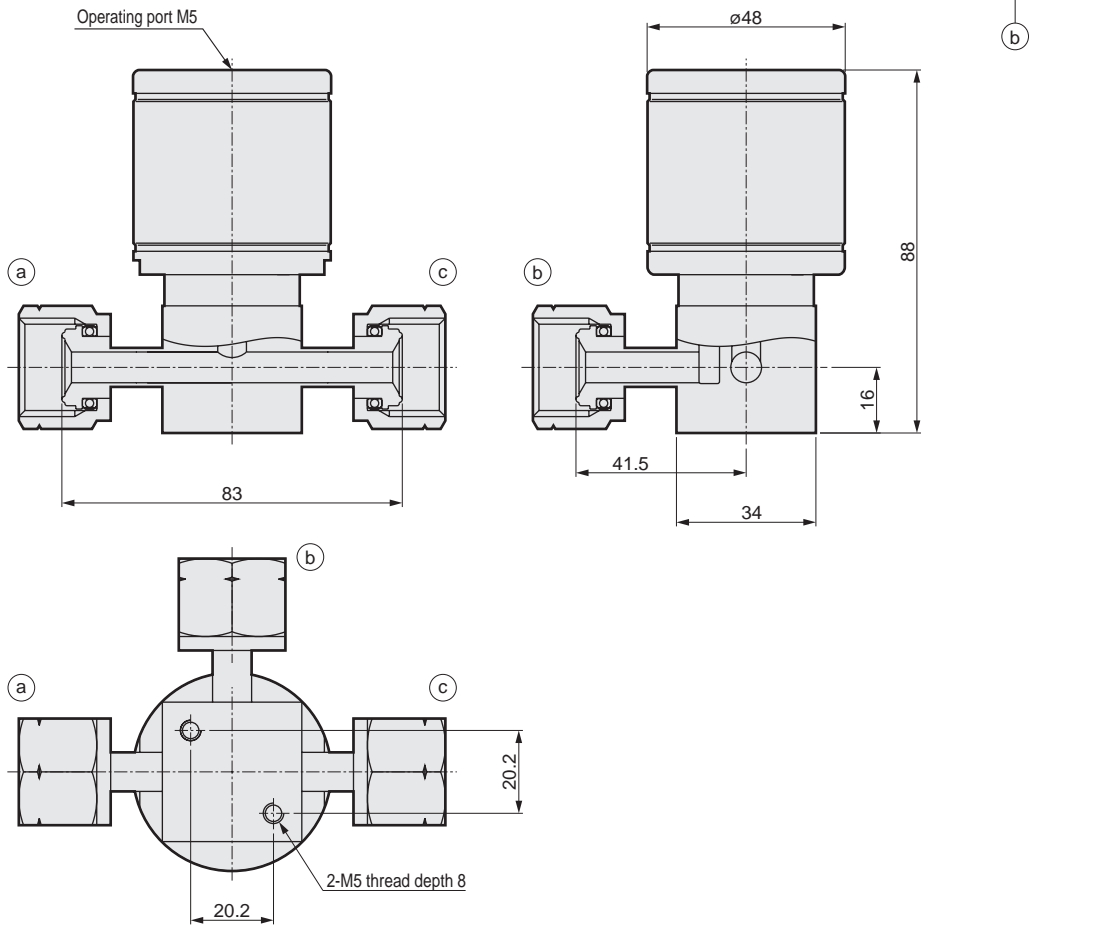
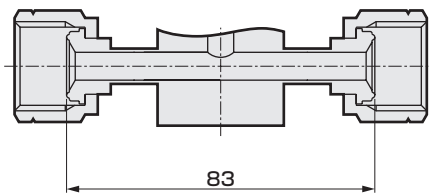
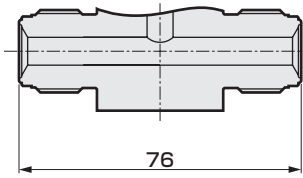


Figure shows AGD21R-6RJ-FFF
Female fitting (with bearing)

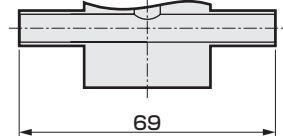
[Main port]



Female fitting: 6R

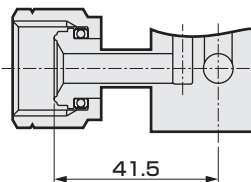


Male fitting: 6RM

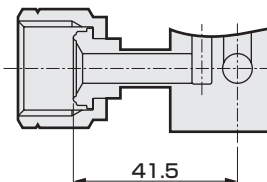


Welded fitting: 6W

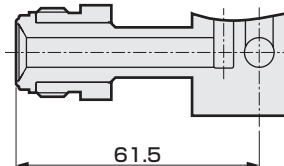
[Branching ports]



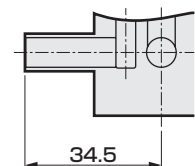
Female fitting: 6RJ- □F□
(with bearing)



Female fitting: 6R- □F□



Male fitting: - □M□



Welded fitting: - □W□

AGD21R 2-station 3-way valve

Made-to-order product

Dimensions

AGD21R-□-6RJ-□□□** (3/8" JXR female fitting (with bearing) mix)

AGD21R-□-6R-□□□** (3/8" JXR female fitting mix)

AGD21R-□-6RM-MMM** (3/8" JXR male fitting)

[Y: Selector]

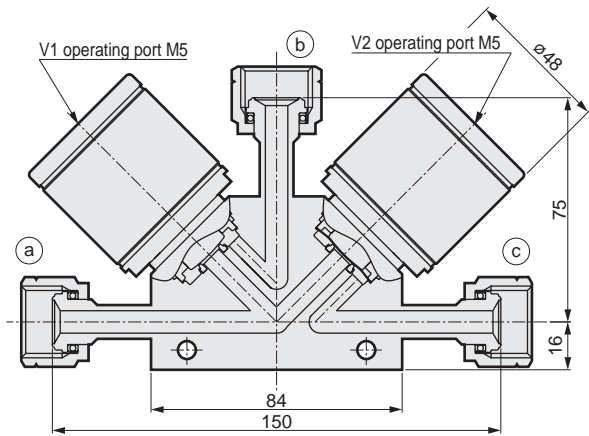
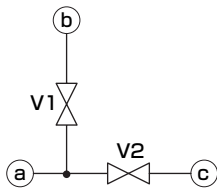


Figure shows AGD21R-Y11-6RJ-FFF
Female fitting (with bearing)



[T: Divider]

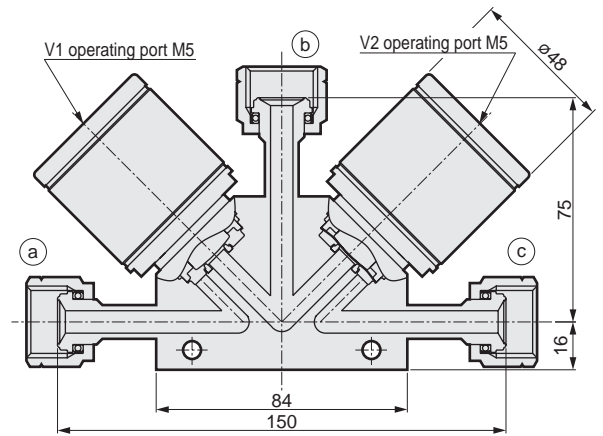
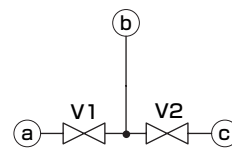
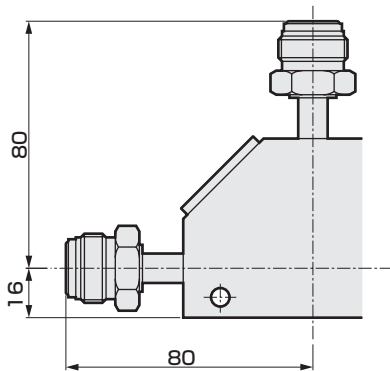


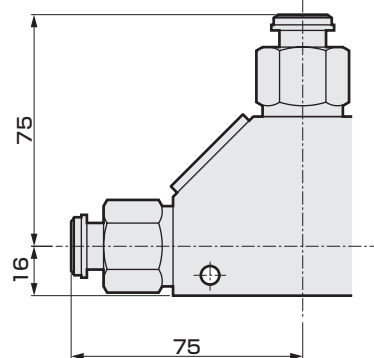
Figure shows AGD21R-T11-6RJ-FFF
Female fitting (with bearing)



[Other fitting dimensions]



Male fitting: 6RM



Female fitting: 6R

LGD Series	AGD/OGD/ MGD-R Series	High durability for process gas	Regulator	Integrated gas supply system	Safety precautions	Air operated valve	Manual valve	Vacuum pressure control valves	Safety precautions	Related products
Components for process gases										
High vacuum components										

Air operated valve for process gas

Option compatible products

AGD Series

Made-to-order product

- 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
Working fluid	Inert gas/process gas		
Working pressure Pa(abs)-MPa(G)	1.3 x 10 ⁻⁶ to 0.5	1.3 x 10 ⁻⁶ to 0.99	
Fluid temperature °C	-10 to 80		
Ambient temperature °C	-10 to 80		
Valve seat leakage Pa·m ³ /s(He)	1.3 x 10 ⁻⁹ or less		
External leakage Pa·m ³ /s(He)	2.8 x 10 ⁻¹² or less		
Cv(23°C under pressurization)	0.1	0.26	0.6
Connection Note	1/4" JXR male fitting 1/4" JXR female fitting	1/4" JXR male fitting 1/4" JXR female fitting 1/4" double barbed fitting	3/8" JXR male fitting 3/8" JXR female fitting 3/8" double barbed fitting
Actuation	NC (Normally Closed) NO (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	
Operating port	M5	Rc1/8	

Note: JXR fitting can be connected to VCR fitting.

- With proximity switch



- Valve open/close can be detected.
Contact CKD regarding equipped switches.

Specifications

Item	AGD0*R	AGD1*R	AGD2*R
Working fluid	Inert gas/process gas		
Working pressure Pa(abs)-MPa(G)	1.3 x 10 ⁻⁶ to 0.99		
Fluid temperature °C	5 to 80 (70°C or below for proximity sensor section)		
Ambient temperature °C	5 to 80 (70°C or below for proximity sensor section)		
Storage ambient temperature °C	-10 to 80		
Valve seat leakage Pa·m ³ /s(He)	1.0 x 10 ⁻¹⁰ or less		
External leakage Pa·m ³ /s(He)	2.8 x 10 ⁻¹² or less		
Cv(23°C under pressurization)	0.1	0.3	0.65
Connection Note	1/4" JXR male fitting 1/4" JXR female fitting	1/4" JXR male fitting 1/4" JXR female fitting 1/4" double barbed fitting	3/8" JXR male fitting 3/8" JXR female fitting 3/8" double barbed fitting
Actuation	NC (Normally Closed) NO (Normally Open)		
Operating pressure MPa	NC:0.4 to 0.6 NO:0.4 to 0.5		
Operating 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
Working fluid	Inert gas/process gas		
Working pressure Pa(abs)-MPa(G)	1.3 x 10 ⁻⁶ to 0.5	1.3 x 10 ⁻⁶ 0.99	
Fluid temperature °C	-10 to 180		
Ambient temperature °C	-10 to 80		
Valve seat leakagePa·m ³ /s(He)	1.3 x 10 ⁻⁹ or less		
External leakagePa·m ³ /s(He)	2.8 x 10 ⁻¹² or less		
Cv(23°C under pressurization)	0.1	0.26	0.6
Connection Note	1/4" JXR male fitting 1/4" JXR female fitting	1/4" JXR male fitting 1/4" JXR female fitting 1/4" double barbed fitting	3/8" JXR male fitting 3/8" JXR female fitting 3/8" double barbed fitting
Actuation	NC (Normally Closed) NO (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	
Operating port	M5	Rc1/8	

Note: JXR fitting can be connected to VCR fitting.

* Contact CKD for option-compatible product model numbers and other details

LGD Series	AGD/OGD/ MGD-R Series	High durability	Other valves for process gas	Regulator	Integrated gas supply system	Safety precautions	Air operated valve	Manual valve	Vacuum pressure control valves	Safety precautions	Related products
Components for process gases											
High vacuum components											



Manual valve for process gas

OGD¹₂₀R Series

- Metal diaphragm
- 90° rotation snap action



Model No. Cv

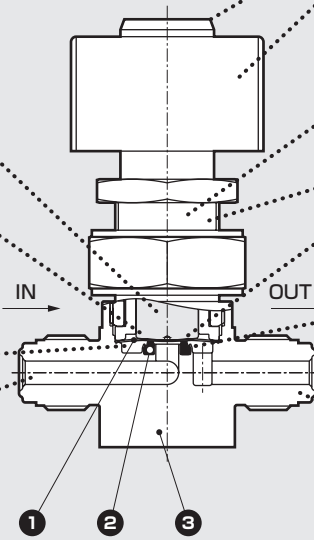
OGD10R Cv=0.3

Model No. Cv

OGD20R Cv=0.65

Just turn the handle to close the valve

- Stable internal seal performance due to the non-rotating rod structure
- Zero particle generation is achieved with optimal seal structure and improved surface roughness
- Reduced valving element dead space to the limit
- Electrolytic polishing specification
- Valve open/closed state is clear at a glance from the direction of the handle & top surface indicator.
- Panel mounting possible (Option)
- Stable internal seal performance due to the spring
- Ni-Co alloy diaphragm with high corrosion resistance
- JXR fitting^{*1} and double barbed fitting are used as standard for connection



Gas contacting parts material

Part No.	Part name	Material
1	Diaphragm	Ni-Co alloy
2	Valve seat	PCTFE
3	Body	SUS316L

*1: JXR fitting can be connected to VCR fitting.

Specifications

Item	OGD10R	OGD20R
Working fluid	Inert gas/process gas	
Working pressure Pa(abs)-MPa(G)	1.3 x 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·m ³ /s(He)	1.0 x 10 ⁻¹⁰ or less	
External leakage Pa·m ³ /s(He)	2.8 x 10 ⁻¹² or less	
Cv (23°C, under pressurization)	0.3	0.65
Connection	1/4" JXR male fitting 1/4" JXR female fitting 1/4" double barbed fitting	3/8" JXR male fitting 3/8" JXR female fitting 3/8" double barbed fitting
Weight kg	0.29 *1	0.67 *1

*1: Values with OGD10R-4RM (1/4"JXR male fitting) and OGD20R-6RM (3/8"JXR male fitting).

⚠ Safety precautions

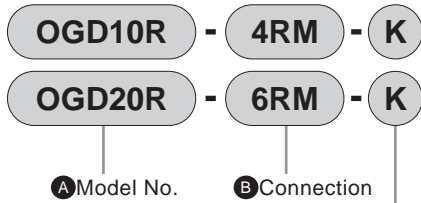
Read the Safety Precautions on Intro Page 9 and pages 84 to 85 to ensure correct and safe use of the product.

Components for process gases
 High durability
 Other valves for process gas
 Regulator
 Integrated gas supply system
 Safety precautions
 Air operated valve
 Manual valve
 High vacuum components
 Vacuum pressure control valves
 Safety precautions
 Related products

OGD₂0R Series

How to order/Dimensions

How to order



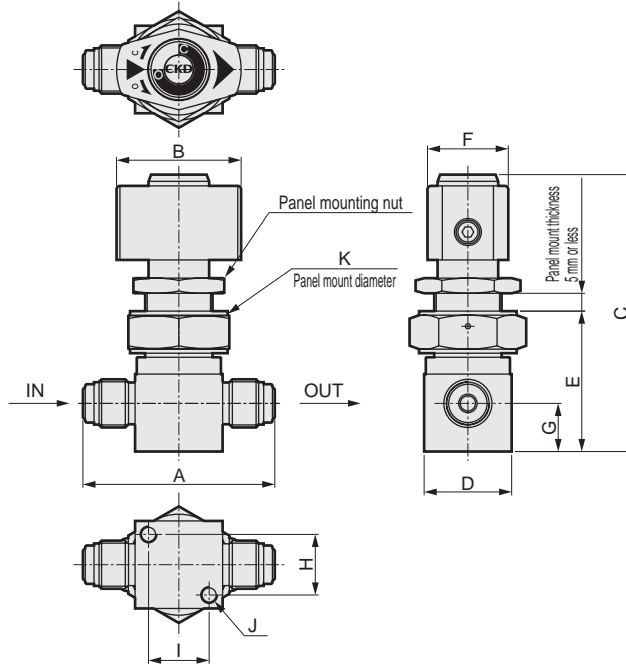
		A Model No.	
		OGD10R	OGD20R
B Connection			
4RM	1/4" JXR male fitting	●	
4R	1/4" JXR female fitting	●	
4S	1/4" double barbed fitting	●	
6RM	3/8" JXR male fitting		●
6R	3/8" JXR female fitting		●
6S	3/8" double barbed fitting		●
C Handle color			
K	Black	●	●
R	Red	●	●
B	Blue	●	●
Y	Yellow	●	●

Handle color



Dimensions

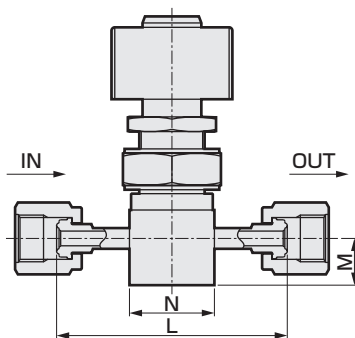
OGD10R-4RM-
OGD20R-6RM-
 ● JXR male fitting



Model No. \ Code	A	B	C	D	E	F	G	H	I	J	K
OGD10R-4RM- <input type="checkbox"/>	57	37	82	<input type="checkbox"/> 26	42	24	14.3	18	18	2-M5 depth 6	ø20, 20.5
OGD20R-6RM- <input type="checkbox"/>	76	47	104	<input type="checkbox"/> 34	57	28	16	20.2	20.2	2-M5 depth 8	ø26.5

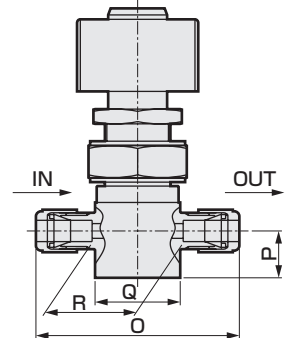
Note: Nuts for panel mounting are not included with standard products. Products with nuts for panel mounting are made to order.

OGD10R-4R-
OGD20R-6R-
 ● JXR female fitting



Model No. \ Code	L	M	N
OGD10R-4R- <input type="checkbox"/>	70.6	14.3	<input type="checkbox"/> 26
OGD20R-6R- <input type="checkbox"/>	83	16	<input type="checkbox"/> 34

OGD10R-4S-
OGD20R-6S-
 ● Double barbed fitting



Model No. \ Code	O	P	Q	R
OGD10R-4S- <input type="checkbox"/>	62	14.3	<input type="checkbox"/> 26	27.8
OGD20R-6S- <input type="checkbox"/>	80	16	<input type="checkbox"/> 34	44.3

LGD Series
 AGD/OGD/MGD-R Series
 High durability for process gas
 Other valves for process gas
 Regulator
 Integrated gas supply system
 Safety precautions
 Air operated valve
 Manual valve
 High vacuum components
 Vacuum pressure control valves
 Safety precautions
 Related products



Manual valve for process gas

MGD¹0R Series

- Metal diaphragm
- 270° rotation



Model No. Cv

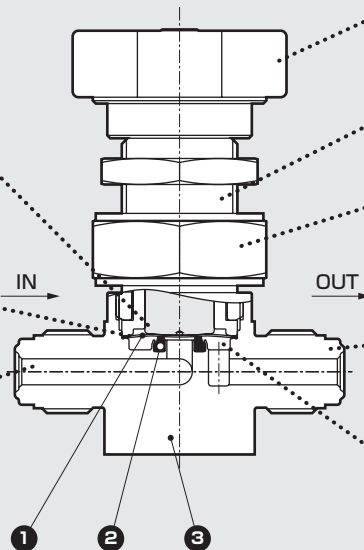
MGD10R Cv=0.3

Model No. Cv

MGD20R Cv=0.65

A manual valve drawing on the basic performance of air operated valves

- Zero particle generation is achieved with optimal seal structure and improved surface roughness
- Reduced valving element dead space to the limit
- Electrolytic polishing specification
- Handle shaped to generate optimal internal sealing force
- Panel mounting possible (Option)
- Stopper mechanism to prevent diaphragm damage due to excessive tightening
- JXR fitting*1 and double barbed fitting are used as standard for connection
- Ni-Co alloy diaphragm with high corrosion resistance



Gas contacting parts material

Part No.	Part name	Material
1	Diaphragm	Ni-Co alloy
2	Valve seat	PCTFE
3	Body	SUS316L

*1: JXR fitting can be connected to VCR fitting.

Specifications

Item	MGD10R	MGD20R
Working fluid	Inert gas/process gas	
Working pressure Pa(abs)-MPa(G)	1.3 x 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·m ³ /s(He)	1.0 x 10 ⁻¹⁰ or less	
External leakage Pa·m ³ /s(He)	2.8 x 10 ⁻¹² or less	
Cv (23°C, under pressurization)	0.3	0.65
Connection	1/4" JXR male fitting 1/4" JXR female fitting 1/4" double barbed fitting	3/8" JXR male fitting 3/8" JXR female fitting 3/8" double barbed fitting
Weight kg	0.30 *1	0.64 *1

*1: Values with MGD10R-4RM (1/4"JXR male fitting) and MGD20R-6RM (3/8"JXR male fitting).

⚠ Safety precautions

Read the Safety Precautions on Intro Page 9 and pages 84 to 85 to ensure correct and safe use of the product.

Components for process gases
 High durability
 Other valves for process gas
 Regulator
 Integrated gas supply system
 Safety precautions
 Air operated valve
 Manual valve
 High vacuum components
 Vacuum pressure control valves
 Safety precautions
 Related products

How to order

MGD10R - 4RM
Model No.

● A Connection

Code	Description
A Connection	
4RM	1/4" JXR male fitting
4R	1/4" JXR female fitting
4S	1/4" double barbed fitting

MGD20R - 6RM
Model No.

● A Connection

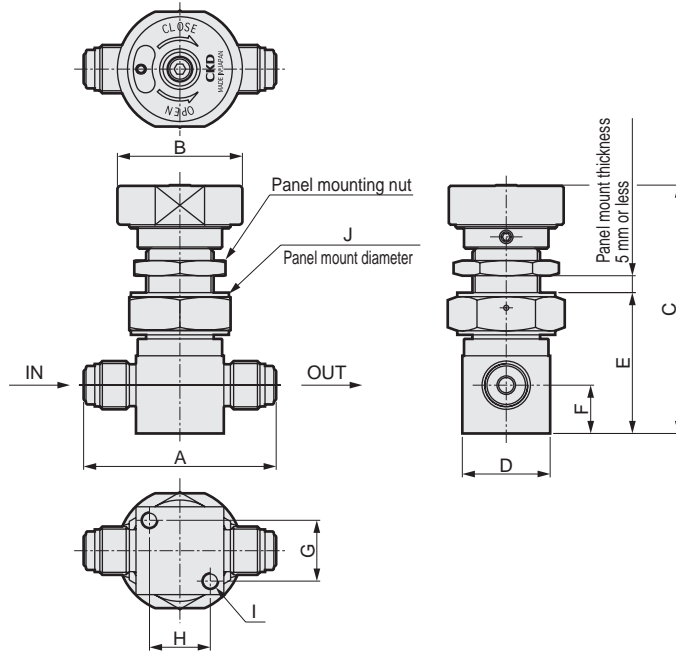
Code	Description
A Connection	
6RM	3/8" JXR male fitting
6R	3/8" JXR female fitting
6S	3/8" double barbed fitting

Note: Available handle colors include black, red, blue, and yellow in addition to the standard color (silver). Refer to page 36 for the model No. (Dimensions are the same as those below.)

Dimensions

MGD10R-4RM MGD20R-6RM

● JXR male fitting

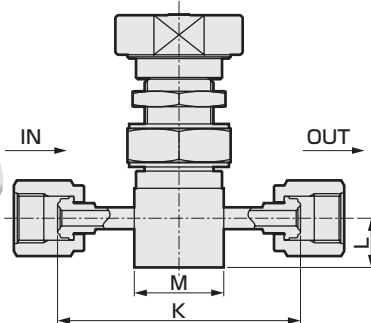
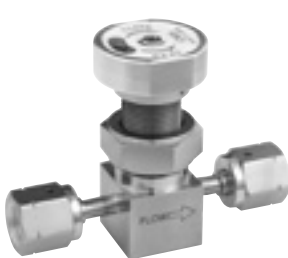


Model No. \ Code	A	B	C	D	E	F	G	H	I	J
MGD10R-4RM	57	∅37	74	□ 26	42	14.3	18	18	2-M5 depth 6	∅20, 20.5
MGD20R-6RM	76	∅37	86	□ 34	57	16	20.2	20.2	2-M5 depth 8	∅20, 20.5

Note: Nuts for panel mounting are not included with standard products. Products with nuts for panel mounting are made to order.

MGD10R-4R MGD20R-6R

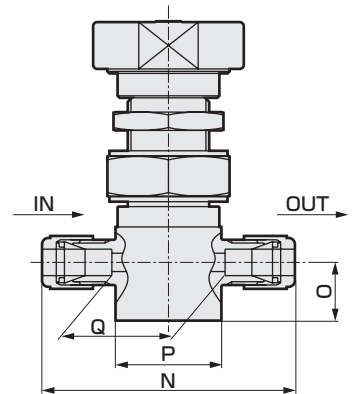
● JXR female fitting



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

MGD10R-4S MGD20R-6S

● Double barbed fitting



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

LGD Series
 AGD/OGD/MGD-R Series
 High durability
 Other valves for process gas
 Regulator
 Integrated gas supply system
 Safety precautions
 Air operated valve
 Manual valve
 Vacuum pressure control valves
 Safety precautions
 Related products
 Components for process gases

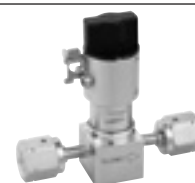
Variation-compatible products

OGD*0R/MGD*0R Series



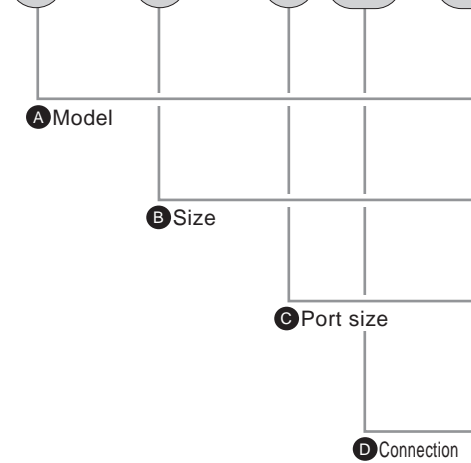
Made-to-order product

Model	Variation contents
OGD10R OGD20R MGD10R MGD20R	Body options (pages 37 to 40) <ul style="list-style-type: none"> ● Connection ● Port shape combinations ● Handle color
	Safety specification options (page 41) <ul style="list-style-type: none"> ● With locking mechanism ● With double action mechanism



How to order OGD-R, MGD-R Series options

O **GD** **1** **0R** - **4** **RJ** - **MF** - **K** - **F** Handle color



Model No.	
OGD1	OGD2

Code	Description	OGD1	OGD2	MGD1	MGD2
A Model					
O	Manual (snap action)	●	●		
M	Model (round handle)			●	●
B Size					
1	1/4"	●		●	
2	3/8"		●		●
C Port size					
4	1/4"	●		●	
6	3/8"		●		●
8	1/2"		●		●
D Connection					
RJ	JXR female fitting (With bearing)	●	●	●	●
R	JXR female fitting	●	●	●	●
RM	JXR male fitting	●	●	●	●
W	Auto welded fitting	●	●	●	●
S	Double barbed fitting	●	●	●	●
E Port shape combinations					
2-way valve					
Blank	IN/OUT common fitting	●	●	●	●
MF	IN: Male OUT: Female	●	●	●	●
FM	IN: Female OUT: Male	●	●	●	●
3-way flow valve					
FFF	abc female/female/female	●	●	●	●
FFM	abc female/female/male	●	●	●	●
FMM	abc female/male/male	●	●	●	●
MMM	abc male/male/male	●	●	●	●
WWW	abc auto welded fitting	●	●	●	●
□□□	abc □ / □ / □ *1	●	●	●	●
F Handle color					
Blank	Silver			●	●
K	Black	●	●	●	●
B	Blue	●	●	●	●
Y	Yellow	●	●	●	●
R	Red	●	●	●	●

Handle color

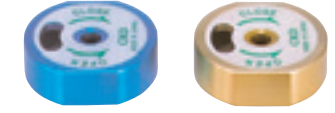
- Silver



- Black (-K)
- Red (-R)



- Blue (-B)
- Yellow (-Y)



Specifications

Refer to the specification page of each series.

D Connection					
Code	RJ	R	RM	W	S
2-way valve					
Blank	●	●	●	●	●
MF	●	●			
FM	●	●			
3-way flow valve					
FFF	●	●			
FFM	●	●			
FMM	●	●			
MMM			●		
WWW				●	
□□□	●	●		●	

*1 F: Female, M: Male, W: Auto welded fitting Free combination

OGD10R
MGD10R

2-way valve

Made-to-order product

Dimensions

OGD10R-4RJ-K (B, Y, R) (1/4" JXR female fitting (with bearing))

OGD10R-4W-K (B, Y, R) (1/4" auto welded fitting)

MGD10R-4RJ-K (B, Y, R) (1/4" JXR female fitting (with bearing))

MGD10R-4R-K (B, Y, R) (1/4" JXR female fitting)

MGD10R-4RM-K (B, Y, R) (1/4" JXR male fitting)

MGD10R-4W-K (B, Y, R) (1/4" auto welded fitting)

MGD10R-4S-K (B, Y, R) (1/4" double barbed fitting)

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

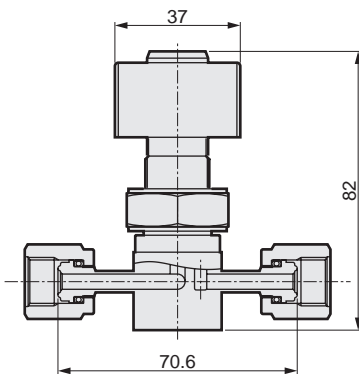
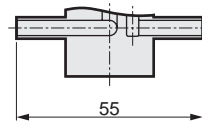
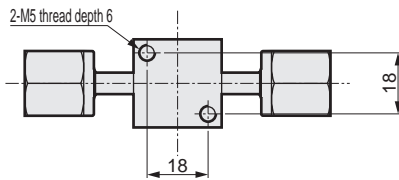
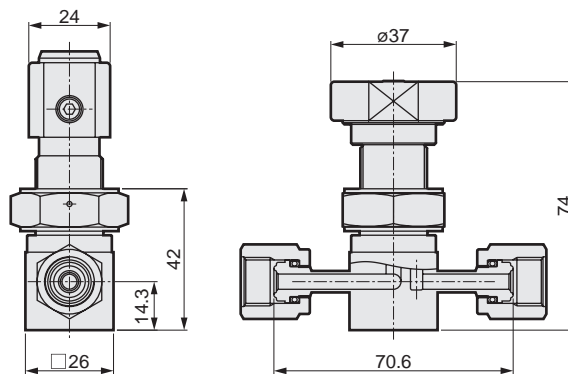


Figure shows MGD10R-4RJ-K
Female fitting (with bearing)



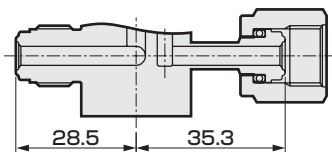
Welded fitting: 4W

OGD10R-4RJ-^{FM}_{MF}-K (B, Y, R) (1/4" JXR female (with bearing)-male mix)

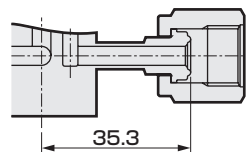
OGD10R-4R-^{FM}_{MF}-K (B, Y, R) (1/4" JXR female-male mix)

MGD10R-4RJ-^{FM}_{MF}-K (B, Y, R) (1/4" JXR female (with bearing)-male mix)

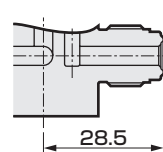
MGD10R-4R-^{FM}_{MF}-K (B, Y, R) (1/4" JXR female-male mix)



Female fitting (with bearing)



Female fitting: 4R



Male fitting: 4RM

LGD Series	AGD/OGD/ MGD-R Series	High durability for process gas	Other valves for process gas	Regulator	Integrated gas supply system	Safety precautions	Air operated valve	Manual valve	Vacuum pressure control valves	Safety precautions	Related products
Components for process gases											
High vacuum components											

OGD10R Series

MGD10R Series

OGD10R
MGD10R

3-way flow valve

Made-to-order product

Dimensions

- OGD10R-4RJ-□□□-K** (B, Y, R) (1/4" JXR female fitting (with bearing) mix)
OGD10R-4R-□□□-K (B, Y, R) (1/4" JXR female fitting mix)
OGD10R-4RM-MMM-K (B, Y, R) (1/4" JXR male fitting)
OGD10R-4W-□□□-K (B, Y, R) (1/4" auto welded fitting mix)
MGD10R-4RJ-□□□-K (B, Y, R) (1/4" JXR female fitting (with bearing) mix)
MGD10R-4R-□□□-K (B, Y, R) (1/4" JXR female fitting mix)
MGD10R-4RM-MMM-K (B, Y, R) (1/4" JXR male fitting)
MGD10R-4W-□□□-K (B, Y, R) (1/4" auto welded fitting mix)

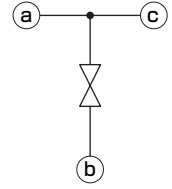
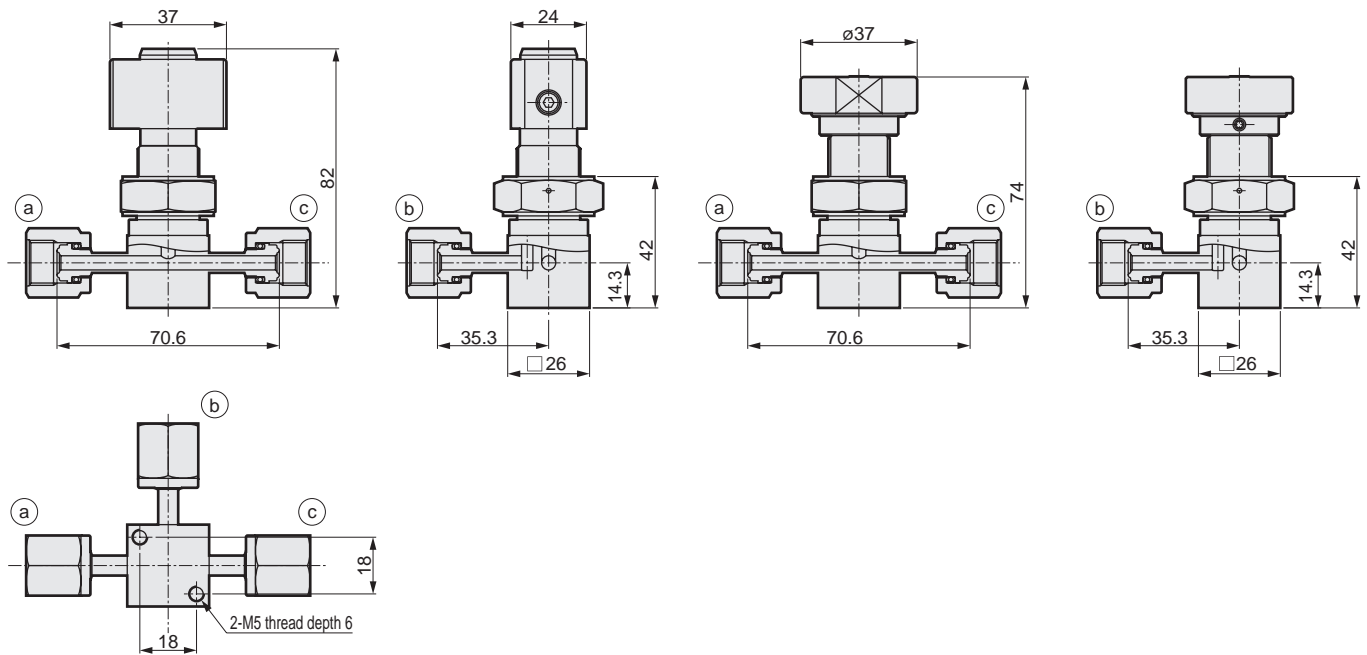
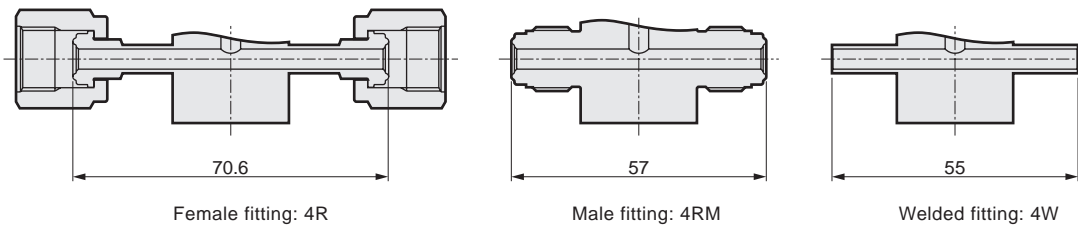


Figure shows OGD10R-4RJ-FFF-K
Female fitting (with bearing)

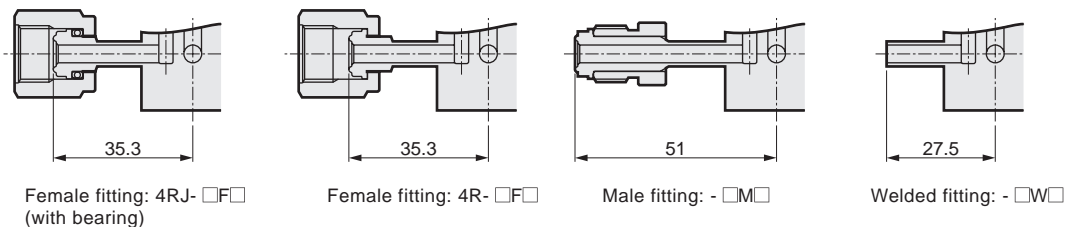
Figure shows MGD10R-4RJ-FFF-K
Female fitting (with bearing)



[Main port]



[Branching ports]



OGD20R
MGD20R

2-way valve

Made-to-order product

Dimensions

OGD20R-6RJ-K (B, Y, R) (3/8" JXR female fitting (with bearing))

OGD20R-6W-K (B, Y, R) (3/8" auto welded fitting)

MGD20R-6RJ-K (B, Y, R) (3/8" JXR female fitting (with bearing))

MGD20R-6R-K (B, Y, R) (3/8" JXR female fitting)

MGD20R-6RM-K (B, Y, R) (3/8" JXR male fitting)

MGD20R-6W-K (B, Y, R) (3/8" auto welded fitting)

MGD20R-6S-K (B, Y, R) (3/8" double barbed fitting)

• 1/2" size is also available. The interface is the same as the 3/8" size. (Different for double barbed fittings)

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

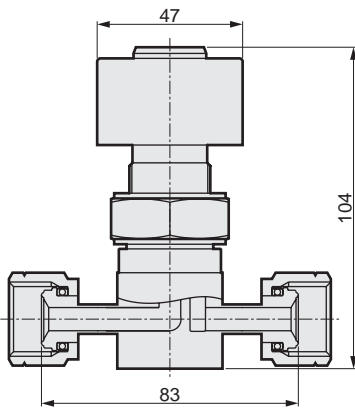
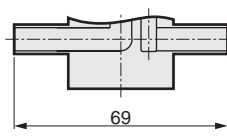
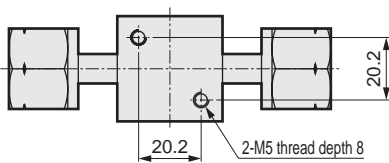
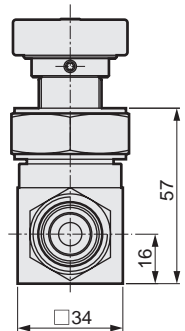
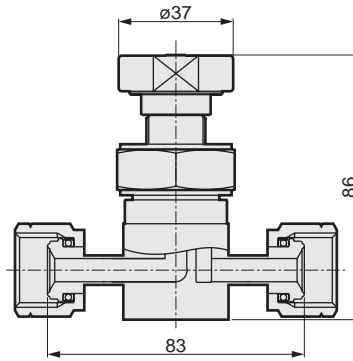
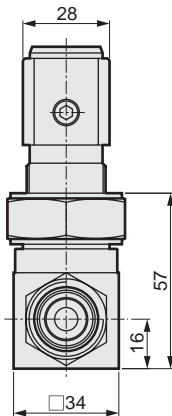
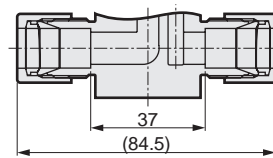


Figure shows MGD20R-6RJ-K
Female fitting (with bearing)



Welded fitting: 6W



Double barbed fitting: 8S

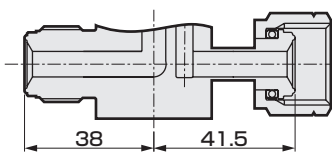
OGD20R-6RJ-^{FM}_{MF}-K (B, Y, R) (3/8" JXR female (with bearing)-male mix)

OGD20R-6R-^{FM}_{MF}-K (B, Y, R) (3/8" JXR female-male mix)

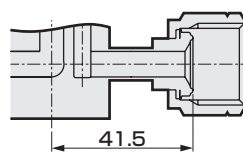
MGD20R-6RJ-^{FM}_{MF}-K (B, Y, R) (3/8" JXR female (with bearing)-male mix)

MGD20R-6R-^{FM}_{MF}-K (B, Y, R) (3/8" JXR female-male mix)

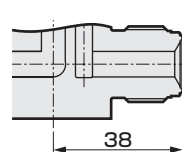
• 1/2" size is also available. The interface is the same as the 3/8" size.



Female fitting: 6RJ (with bearing)



Female fitting: 6R



Male fitting: 6RM

LGD Series
 AGD/OGD/
 MGD-R Series
 High durability
 for process gas
 Other valves
 for process gas
 Regulator
 Integrated gas
 supply system
 Safety precautions
 Air operated valve
 Manual valve
 Vacuum pressure
 control valves
 Safety precautions
 Related products
 Components for process gases
 High vacuum components

OGD20R Series MGD20R Series

OGD20R
MGD20R

3-way flow valve

Made-to-order product

Dimensions

OGD20R-6RJ- (3/8" JXR female fitting (with bearing) mix)

OGD20R-6R- (3/8" JXR female fitting mix)

OGD20R-6RM-MMM (3/8" JXR male fitting)

OGD20R-6W- (3/8" auto welded fitting mix)

MGD20R-6RJ- (3/8" JXR female fitting (with bearing) mix)

MGD20R-6R- (3/8" JXR female fitting mix)

MGD20R-6RM-MMM (3/8" JXR male fitting)

MGD20R-6W- (3/8" auto welded fitting mix)

• 1/2" size is also available. The interface is the same as the 3/8" size.

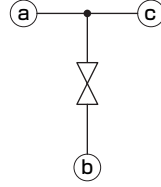


Figure shows OGD20R-6RJ-FFF
Female fitting (with bearing)

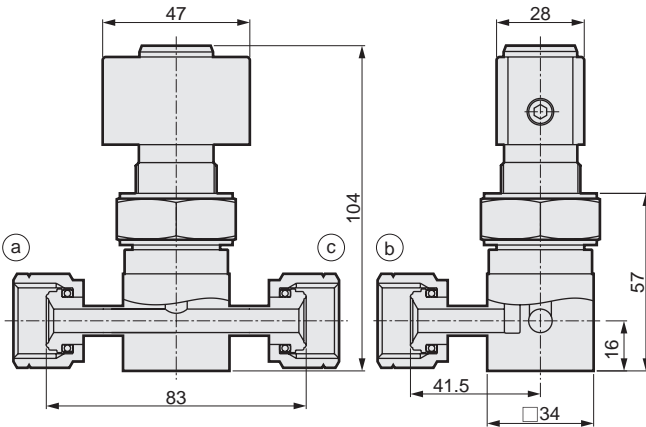
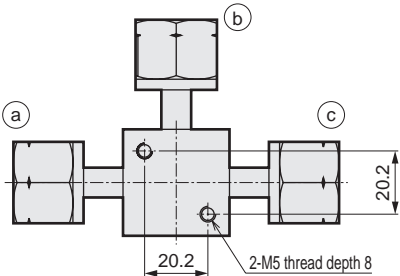
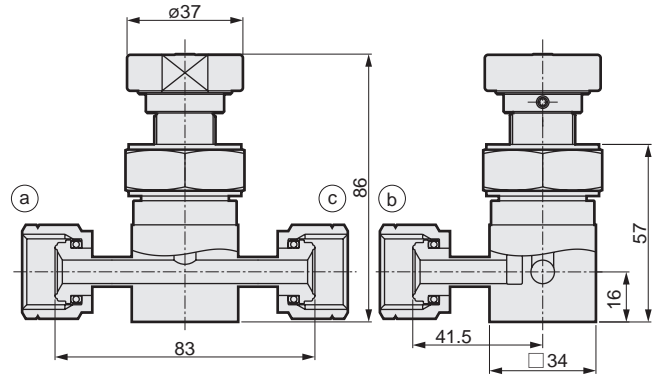
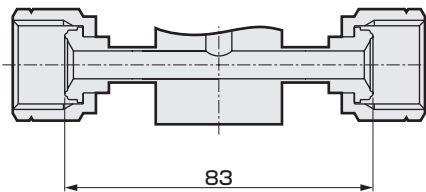


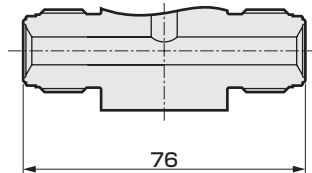
Figure shows MGD20R-6RJ-FFF
Female fitting (with bearing)



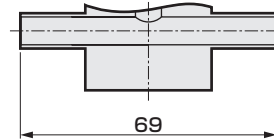
[Main port]



Female fitting: 6R

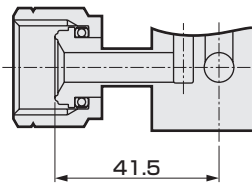


Male fitting: 6RM

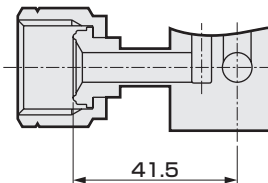


Welded fitting: 6W

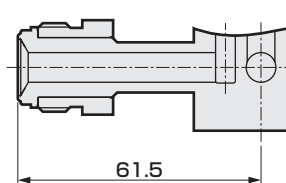
[Branching ports]



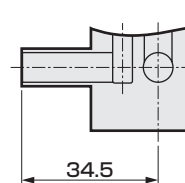
Female fitting: 6RJ- F
(with bearing)



Female fitting: 6R- F



Male fitting: - M



Welded fitting: - W

Manual valve Safety specification options

Made-to-order product

Appearance

OGD With locking mechanism



■ A lock can be included upon request.

MGD With double action mechanism



■ Turning via push-in handle (double action) eliminates misoperation.

* Contact CKD for model numbers and other details.

LGD Series	AGD/OGD/ MGD-R Series	High durability	Other valves for process gas	Regulator	Integrated gas supply system	Safety precautions	Air operated valve	Manual valve	Vacuum pressure control valves	Safety precautions	Related products
Components for process gases											
High vacuum components											

Related products	High vacuum components					Components for process gases				
	Safety precautions	Vacuum pressure control valves	Manual valve	Air operated valve	Safety precautions	Integrated gas supply system	Regulator	Other valves for process gas	AGD/OGD/ MGD-R Series	LGD Series
								High durability		

AGD**R-HD/AGD**R-HDF AGD21R-A

High durability Valve for process gases

Overview

A valve for process gas that offers the high durability needed to keep up with advances in refinement. Three types are available to meet your needs.

Features

These valves offer high-temp, high-durability, and high-stability performance.

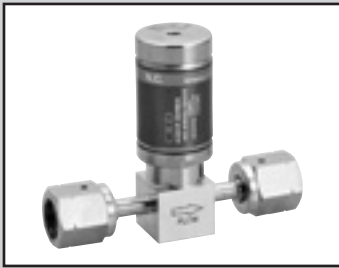
- AGD**R-HD
Durability: 10 million cycles guaranteed
- AGD**R-HDF
Durability: 10 million cycles guaranteed
Supports 200°C
Equipped with stable response actuator
- AGD21R-A
Durability: 10 million cycles guaranteed
Actual value: 100 million cycles
Supports 200°C
Equipped with stable response actuator
Response lag of ± 2 msec after 100 million cycles
* Actual value



CONTENTS

Air operated valve

● AGD**R-HD	44
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● AGD21R-A	48



High-durability process gas valve

AGD**R-HD Series

Made-to-order product

Specifications

Item	AGD0*R-HD	AGD1*R-HD
Working fluid	Inert gas/process gas	
Working pressure Pa(abs) to MPa(G)	1.3 x 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 P·m ³ /s(He)	1.0 x 10 ⁻¹⁰ or less (initial) 1.3 x 10 ⁻⁹ or less (after operation)	
External leakage P·m ³ /s(He)	2.8 x 10 ⁻¹² or less	
Cv (23°C under pressurization)	0.1	0.3
Connection	1/4"JXR male fitting 1/4"JXR female fitting	1/4"JXR male fitting 1/4"JXR female fitting 1/4"Double barbed fitting
Operating pressure MPa	NC 0.4 to 0.6 NO 0.4 to 0.5	
Operating port	M5	
Durability	Guaranteed: 1,000 million cycles (actual: 3,000 million cycles or more)	
Variation	NC, NO, block valve, with proximity switch (OMRON)	

How to order

AGD0 **1** R - HD - **4RM**

A Actuation

B Connection

Code	Description
A Actuation	
1	NC (Normally Closed)
2	NO (Normally Open)
B Connection	
4RM	1/4"JXR male fitting
4R	1/4"JXR female fitting

AGD1 **1** R - HD - **4RM**

A Actuation

B Connection

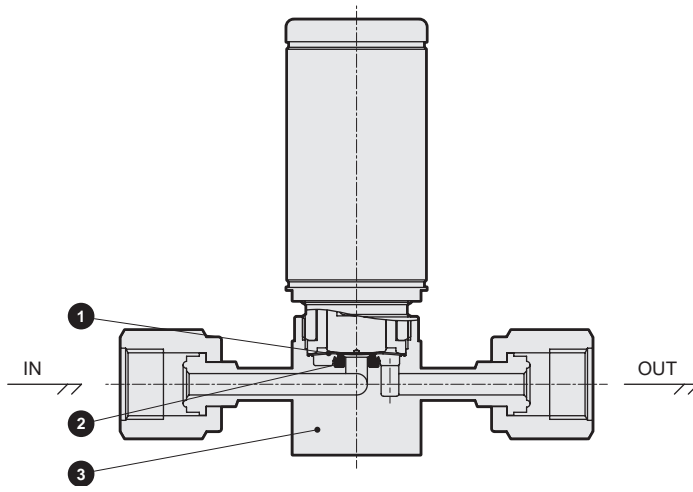
Code	Description
A Actuation	
1	NC (Normally Closed)
2	NO (Normally Open)
B Connection	
4RM	1/4"JXR male fitting
4R	1/4"JXR female fitting
4S	1/4"Double barbed fitting

AGD1*R-HD Series

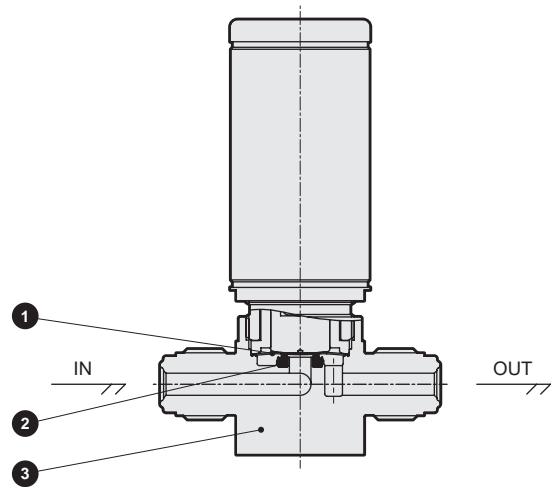
Internal structure and parts list / Dimensions

Internal structure and parts list

● AGD11R-HD-4R



● AGD11R-HD-4RM



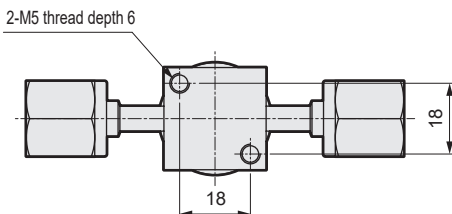
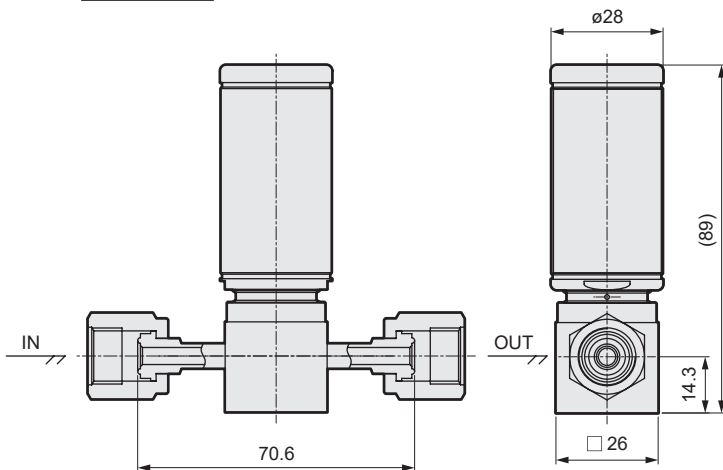
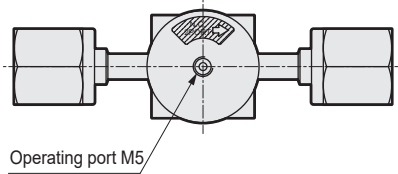
Gas contacting parts material

	Part name	Material
1	Diaphragm	Ni-Co alloy
2	Valve seat	PCTFE
3	Body	SUS316L

Dimensions

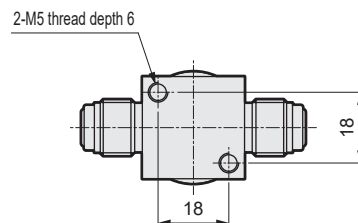
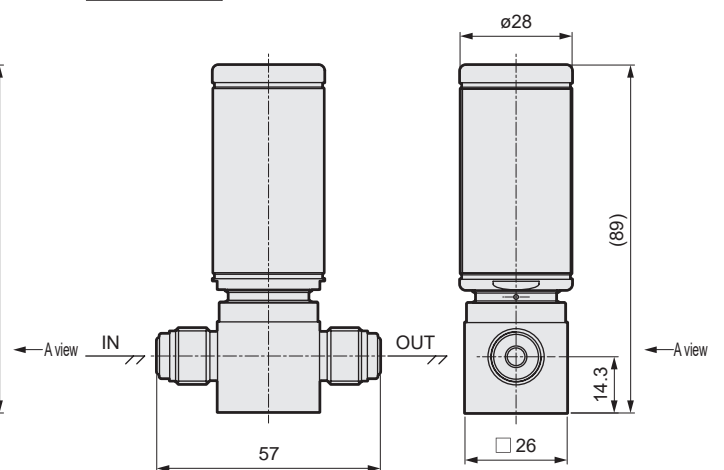
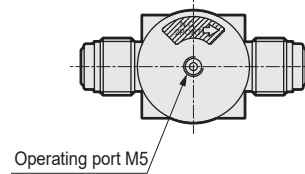
AGD11R-HD-4R

● JXR female fitting



AGD11R-HD-4RM

● JXR male fitting



LGD Series
 AGD/OGD/MGD-R Series
 High durability
 Other valves for process gas
 Regulator
 Integrated gas supply system
 Safety precautions
 Air operated valve
 Manual valve
 High vacuum components
 Vacuum pressure control valves
 Safety precautions
 Related products



High temperature/high durability gas valve

AGD**R-HDF Series

Made-to-order product

Specifications

Item	AGD1*R-HDF	AGD2*R-HDF
Working fluid	Inert gas/process gas	
Working pressure Pa(abs) to MPa(G)	1.3 x 10 ⁻⁶ to 0.5	
Fluid temperature °C	20 to 200	
Operating ambient temperature °C	20 to 150	
Storage ambient temperature °C	-10 to 80	
Valve seat leakage Pa·m ³ /s(He)	1.0 x 10 ⁻¹⁰ or less (at 23°C)	
External leakage Pa·m ³ /s(He)	2.8 x 10 ⁻¹² or less	
Cv (23°C under pressurization)	0.3	0.65
Connection	1/4"JXR male fitting 1/4"JXR female fitting 1/4"Double barbed fitting	3/8"JXR male fitting 3/8"JXR female fitting 3/8"Double barbed fitting
Operating pressure MPa	NC 0.4 to 0.6 NO 0.4 to 0.5	
Operating port	M5	
Durability	Guaranteed: 10 million cycles (actual: 30 million cycles or more)	
Variation	NC, NO, block valve, with fiber sensor	

How to order

AGD1 1 R - HDF - 4RM

A Actuation

B Connection

Code	Description
A Actuation	
1	NC (Normally Closed)
2	NO (Normally Open)
B Connection	
4RM	1/4"JXR male fitting
4R	1/4"JXR female fitting
4S	1/4"Double barbed fitting

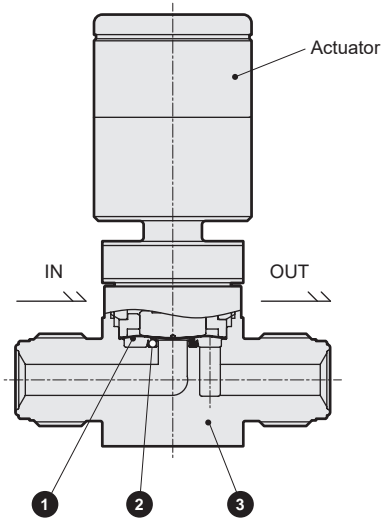
AGD2 1 R - HDF - 6RM

A Actuation

B Connection

Code	Description
A Actuation	
1	NC (Normally Closed)
2	NO (Normally Open)
B Connection	
6RM	3/8"JXR male fitting
6R	3/8"JXR female fitting
6S	3/8"Double barbed fitting

Internal structure and parts list

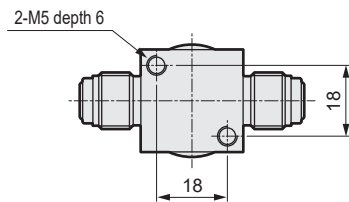
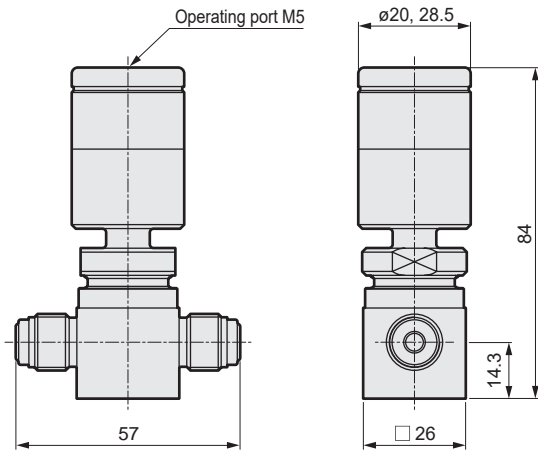


Gas contacting parts material

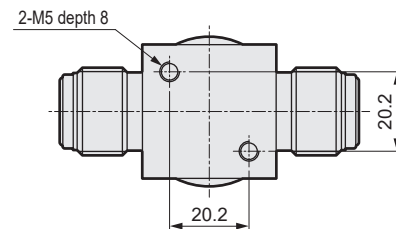
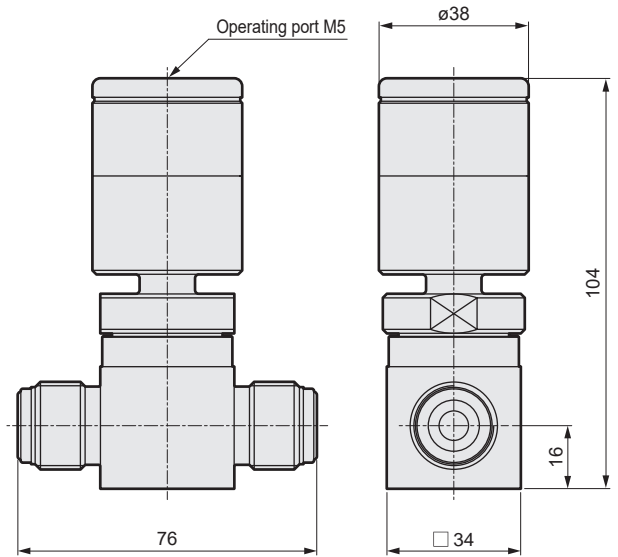
Part No.	Part name	Material
1	Diaphragm	Ni-Co alloy
2	Valve seat	PFA
3	Body	SUS316L

Dimensions

●AGD1*R-HDF-4RM



●AGD2*R-HDF-6RM



Components for process gases
 High durability for process gas
 Other valves for process gas
 Regulator
 Integrated gas supply system
 Safety precautions
 Air operated valve
 Manual valve
 High vacuum components
 Vacuum pressure control valves
 Safety precautions
 Related products



High-durability process gas valve for high temperatures

AGD21R-A Series

● Air operated metal diaphragm valve



Made-to-order product

Specifications

Item	AGD21R-A
Working fluid	Inert gas/Process gas
Working pressure Pa(abs)-MPa(G)	1.3 x 10 ⁻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·m ³ /s(He)	1 x 10 ⁻⁷ or less (at 200°C)
External leakage Pa·m ³ /s(He)	2.8 x 10 ⁻¹² or less
Cv (200°C, negative pressure)	0.4 and over
Connection	3/8" JXR male fitting 3/8" JXR female fitting 3/8" Double barbed fitting
Actuation	NC (Normally Closed)
Operating pressure MPa	0.4 to 0.6
Operating port	M5 *2
Weight kg	0.7

*1: 150°C or below for actuator part

*2: With optional ø4 push-in fitting

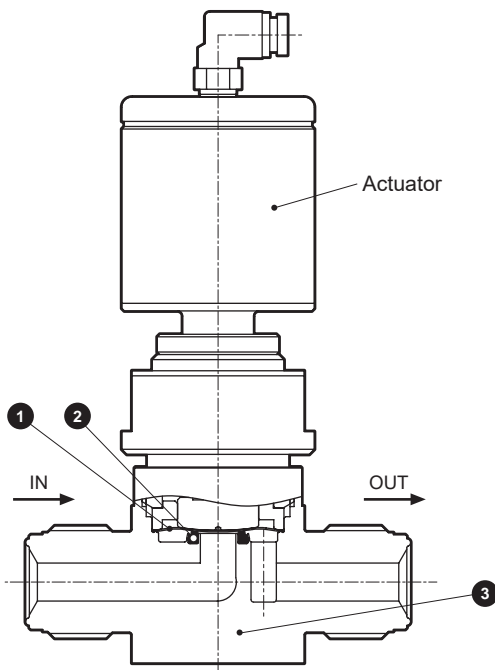
How to order

AGD21R-A- 6RM

Model No. A Connection

Code	Description
A Connection	
6RM	3/8"JXR male fitting
6R	3/8"JXR female fitting
6S	3/8"Double barbed fitting

Internal structure and parts list



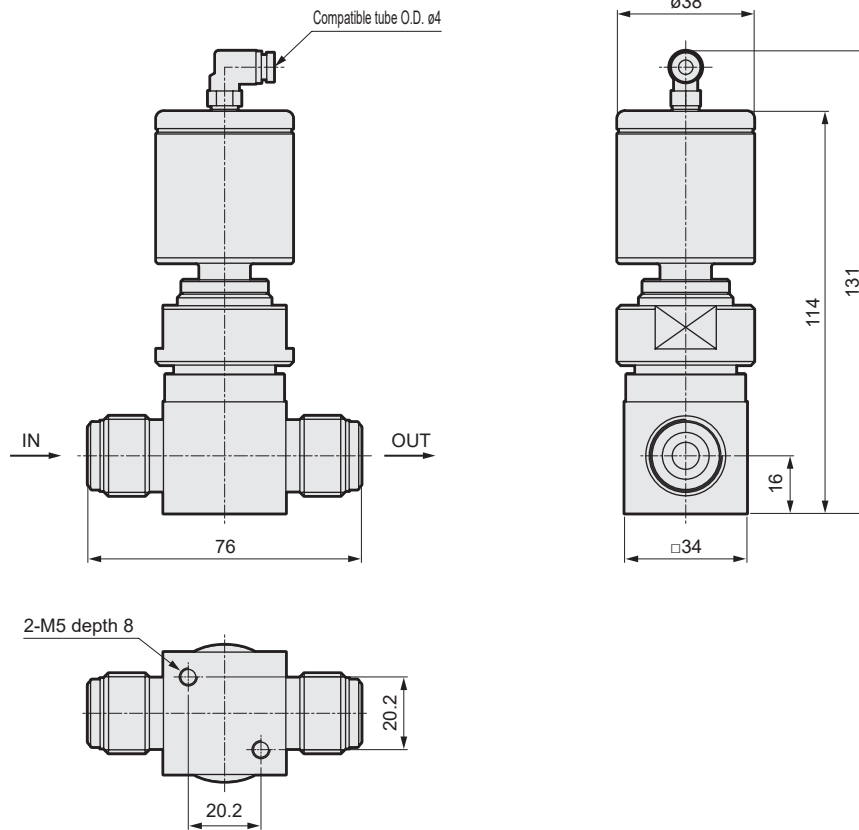
Gas contacting parts material

Part No.	Part name	Material
1	Diaphragm	Ni-Co alloy
2	Valve seat	PFA
3	Body	SUS316L

Dimensions

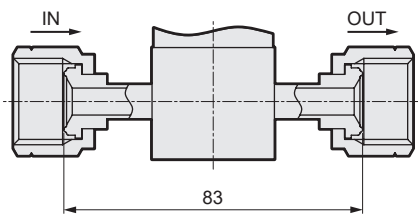
AGD21R-A-6RM

● JXR male fitting

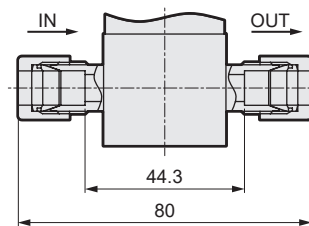


AGD21R-A-6R AGD21R-A-6S

● JXR female fitting



● Double barbed fitting



AGD21R-A Actuator option

Appearance

AGD21R-A with sensor



■ Valve open/close confirmation can be output from the sensor.

Fiber sensor
E3NX-FA Series (OMRON Corporation)

Made-to-order product

LGD Series	AGD/OGD/MGD-R Series	High durability	Other valves for process gas	Regulator	Integrated gas supply system	Safety precautions	Air operated valve	Manual valve	Vacuum pressure control valves	Safety precautions	Related products
Components for process gases											
High vacuum components											

Related products	High vacuum components				Components for process gases					
	Safety precautions	Vacuum pressure control valves	Manual valve	Air operated valve	Safety precautions	Integrated gas supply system	Regulator	Other valves for process gas	High durability	AGD/OGD/ MGD-R Series

VG/Flow rate adjusting valve Piston check valve

Other valves for process gas

Overview

These related components are used for process gas supply and ancillary equipment.

Features

- Vacuum generator VG
 - Uses newly developed nozzle
 - Energy saving
 - Resistant to pressure fluctuation
- Flow rate adjusting valve
 - Two types available (Cv 0.03 and 0.2) preparation
- Piston check valve
 - Uses Kalrez[®] valve seats



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● Piston check valve	54
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Vacuum generator for process gas exhaust

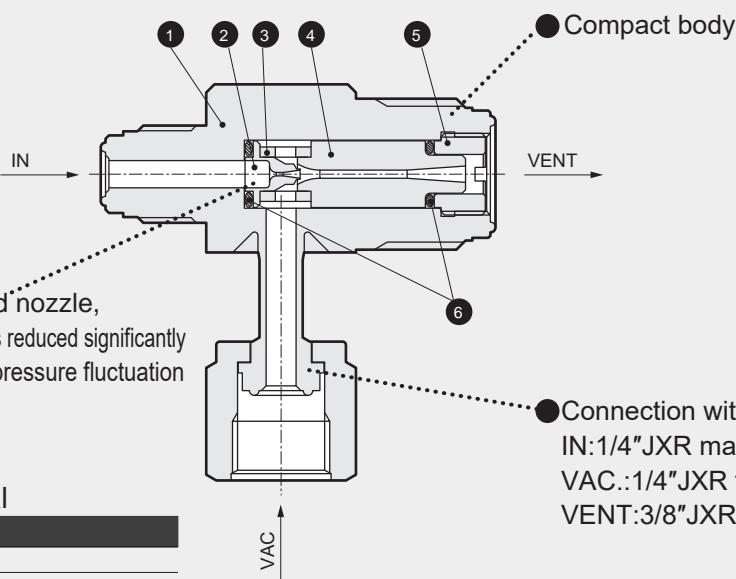
VG Series

- Nozzle diameter: $\varnothing 0.5$



Model No.	O-ring material
VG-05F	FKM
VG-05P	Kalrez®

Energy saving vacuum exhaust equipment



- Using a newly developed nozzle,
 1. Consumption of supply fluid is reduced significantly
 2. Resistant to primary side pressure fluctuation (Patented)

- Connection with JXR fitting *1
 IN: 1/4" JXR male fitting
 VAC.: 1/4" JXR female fitting
 VENT: 3/8" JXR male fitting

Gas contacting parts material

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 Kalrez®

* The 1: JXR fitting can be connected to the VCR fitting.

Specifications

Item	VG
Working 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 (operating)
Supply fluid consumption L/min (ANR)	16 or less *1
Achieved vacuum level kPa (abs)	13.3 or less
Discharge rate L/min (ANR)	6 or more *1 *2
External leakage Pa·m ³ /s (He)	2.8 x 10 ⁻¹² or less
Proof pressure MPa	3
Ambient temperature °C	0 to 80
Connection	IN: 1/4" JXR male fitting (can be connected to VCR fitting) VAC.: 1/4" JXR female fitting (can be connected to VCR fitting) VENT: 3/8" JXR male fitting (can be connected to VCR fitting)
Weight kg	0.2

*1: 0.5MPa pressurized (operating)
 *2: Working fluid is air



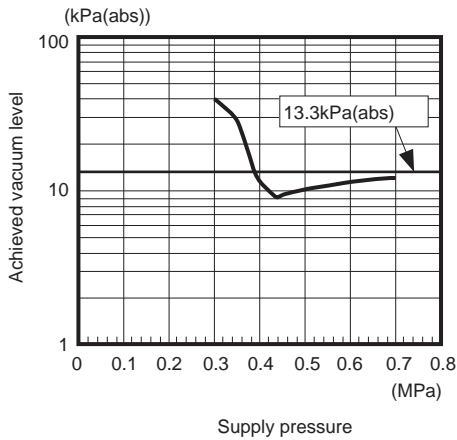
Safety precautions

Read the Safety Precautions on Intro Page 9 and pages 84 to 85 to ensure correct and safe use of the product.

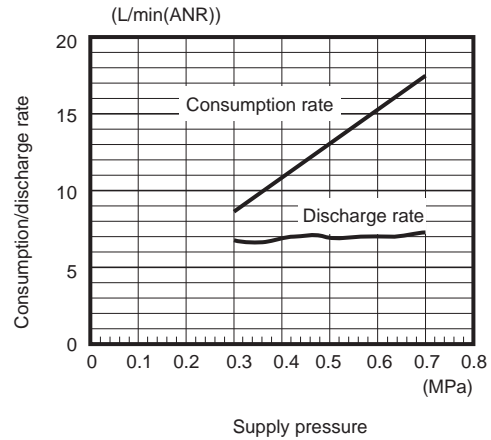
Kalrez® is a registered trademark of DuPont Corporation.

Characteristic curve

● Achieved vacuum level



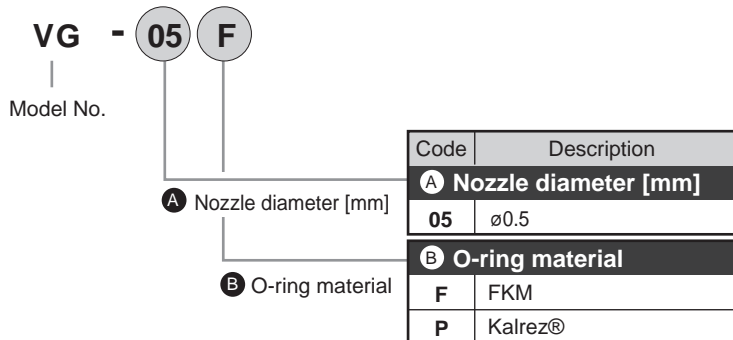
● Supply fluid consumption/discharge rate



*According to CKD test data

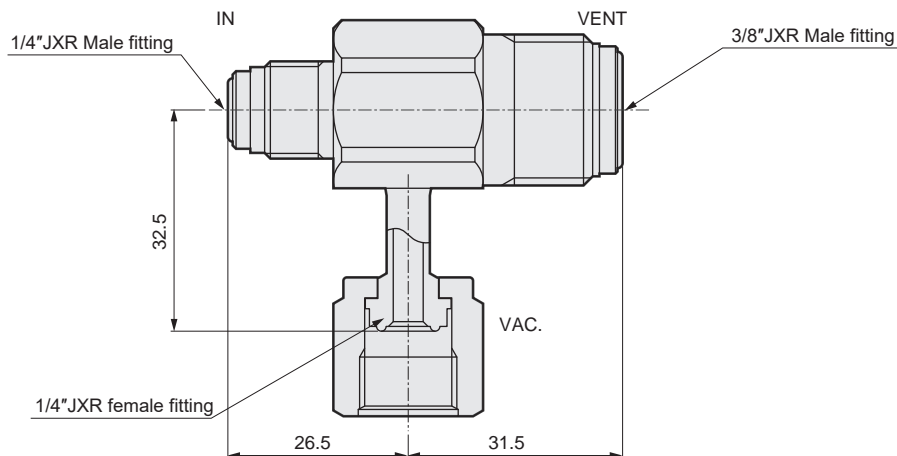
Note: Achieved vacuum level with the characteristics described above produces abnormal noise (soft clicking sound) at supply pressure (around 0.4 MPa) just before reaching the peak value. When this abnormal noise occurs, the characteristics become unstable and operation becomes louder. Increase the supply pressure within the specification range, as it may affect the sensor, etc., and cause trouble.

How to order



Dimensions

● VG-05*



Kalrez® is a registered trademark of DuPont Corporation.

LGD Series
 AGD/OGD/
 MGD-R Series
 High durability
 Other valves
 for process gas
 Regulator
 Integrated gas
 supply system
 Safety precautions
 Air operated valve
 Manual valve
 Vacuum pressure
 control valves
 Safety precautions
 Related products
 Components for process gases
 High vacuum components

Flow rate adjusting valve Piston check valve

RoHS

Made-to-order product

● Flow rate adjusting valve



■ Changes up to max. Cv with about 10 turns of the handle.

Specifications

Item	Cv (max) 0.03 type	Cv (max) 0.2 type
Working fluid	Inert gas/process gas	
Working pressure Pa(abs)-MPa(G)	1.3 x 10 ⁻⁶ to 0.7	
Fluid temperature °C	-10 to 80	
Ambient temperature °C	-10 to 80	
Valve seat leakage Pa·m ³ /s(He)	1/100 or less of max. Cv	
External leakage Pa·m ³ /s(He)	2.8 x 10 ⁻¹² or less	
Cv (adjusting range)	0.003 to 0.03	0.02 to 0.2
Connection Note	1/4" JXR male fitting 1/4" JXR female fitting 1/4" double barbed fitting	

Note: JXR fitting can be connected to VCR fitting.

● Piston check valve



■ Valve seat material uses Kalrez®.

Specifications

Item	
Working fluid	Inert gas/process gas
Working pressure Pa(abs)-MPa(G)	1.3 x 10 ⁻⁶ to 0.7
Fluid temperature °C	-10 to 80
Ambient temperature °C	-10 to 80
Valve seat leakage Pa·m ³ /s(He)	4.7 x 10 ⁻⁹ or less
External leakage Pa·m ³ /s(He)	2.8 x 10 ⁻¹² or less
Cv (max.)	0.25
Cracking pressure	2.3 kPa
Connection Note	1/4" JXR male fitting 1/4" JXR female fitting 1/4" double barbed fitting

Note: JXR fitting can be connected to VCR fitting.

Kalrez® is a registered trademark of DuPont Corporation.

PGM

Regulator

Overview

Regulator for process gas that uses a metal diaphragm. They meet a range of needs, from single unit piping to integrated types.

Features

Supports a wide range of variations

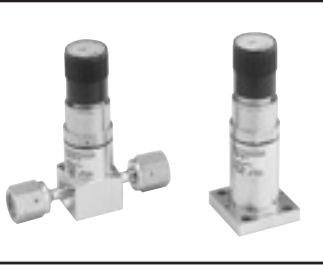
- From vacuum up to 0.7 MPa
- 20 L/min to 50 L/min
- High corrosion resistance specs

Poppet structure prevents outflow and controls negative pressure.



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● PGM	56
● Variation-compatible products	61
⚠ Safety precautions	86



Regulator for process gas

PGM Series

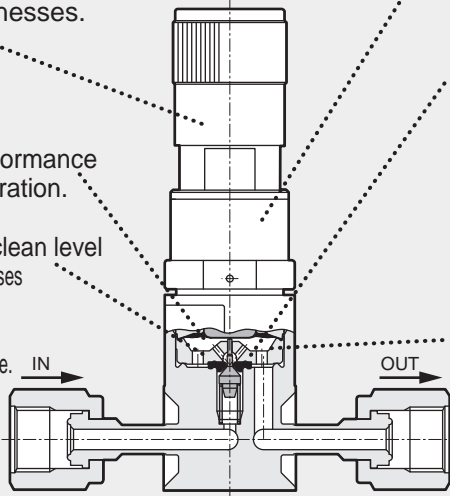
- Metal diaphragm



High-performance regulator derived from rich experience

PGM series

- Slim body
 - Easy mounting and improved knob operability.
 - Enough space even for harnesses.
 - Compatible with 1.125" size.
- Seal performance
 - Improves valve seat seal performance and suppresses outflow generation.
- Ultra high purity gas compatible clean level
 - Reduces poppet's sliding parts and decreases particle generation to the max.
 - Metal seal specification that does away with threads on the gas contact inner surface.
 - The diaphragm uses Hastelloy @ C-22, which has high corrosion resistance and long service life.
 - Electrolytic polishing specification.
 - Volumetric capacity reduction and optimum flow path design, supporting gas replaceability as well.
 - Also available with high corrosion resistance. (Option)



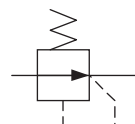
- Vibration countermeasures
 - Thorough countermeasures with newly developed vibration prevention mechanism. (patented)
- Flow characteristics
 - Low pressure drop.
 - Compact size with large flow rate!
 - Our first free (discrete) poppet! Negative pressure can be controlled. (patented)
 - Smoother operation with low-sliding parts! Hysteresis reduced!
- Fine flow rate control
 - Does away with problems causing change in MFC output signals for fine flow rates of several +sccm or less.

Model No.	Flow rate series	Secondary set pressure
PGM-30V	20L/min	-0.07 to 0.21MPa
PGM-30	20L/min	0 to 0.21MPa
PGM-50	20L/min	0 to 0.35MPa
PGM-100	20L/min	0 to 0.7 MPa

Model No.	Flow rate series	Secondary set pressure
PGM-H-60	50L/min	0 to 0.42MPa
PGM-H-100	50L/min	0 to 0.7 MPa

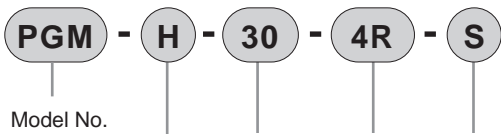
Specifications

Item	PGM-	30V	30	50	-	100
	PGM-H-	-	-	-	60	100
Working fluid	Inert gas/process gas					
Max. working pressure MPa	1.0					
Set 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					
Valve seat leakage Pa·m3/s (He)	1.0 x 10-8 or less					
External leakage Pa·m3/s (He)	2.8 x 10-12 or less					
Proof pressure MPa	1.5					
Ambient temperature °C	-5 to 40					
Surface treatment of gas contact parts	Electrolytic polishing specification					
Connection	Various integrated interfaces supported (PGM-*-1, 2, 3, 4, 5) 1/4" JXR fitting (connectable to VCR fitting) (PGM-*-4R, 4RM, 4MF, 4FM)					
Weight kg	0.39(PGM-*-4)					
JIS symbol						



Components for process gases
 Other valves for process gas
 High durability
 Regulator
 Integrated gas supply system
 Safety precautions
 Air operated valve
 Manual valve
 High vacuum components
 Vacuum pressure control valves
 Safety precautions
 Related products

How to order



A Flow rate series

B Secondary set pressure

C Connection

D Option

A Flow rate series

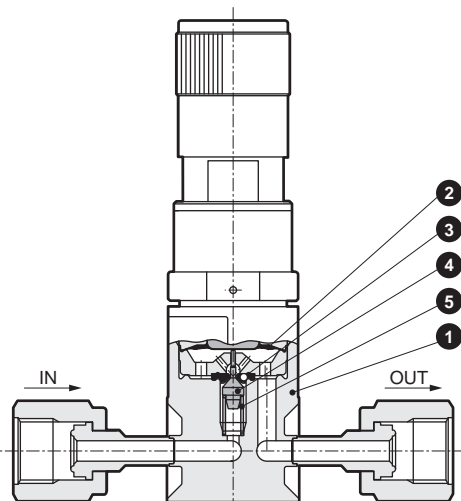
Blank	H
20 L/min	50 L/min

Code	Description	PGM	PGM-H
B Secondary set pressure			
30V	-0.07 to 0.21MPa(-10 to 30psi)	●	
30	0 to 0.21MPa(0 to 30psi)	●	
50	0 to 0.35MPa(0 to 50psi)	●	
60	0 to 0.42MPa(0 to 60psi)		●
100	0 to 0.7MPa(0 to 100psi)	●	●
C Connection			
4R	1/4"JXR female fitting	●	●
4RM	1/4"JXR male fitting	●	●
4MF	1/4"JXR male → female fitting	●	●
4FM	1/4"JXR female → male fitting	●	●
1	1.125" C seal	●	●
2	1.5" C seal	●	●
3	1.5" CS seal	●	●
4	1.5" W seal	●	●
5	1.125" W seal	●	●
D Option			
S	Poppet: Hastelloy ® C-22 Spring: Ni-Co alloy	●	
P	Valve seat: PI	●	

*1: Flow rate is nominal value. Check the pressure conditions in the flow characteristics graph.

*2: Without gauge port.

Internal structure diagram and parts list



Gas contacting parts material

Part number	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)

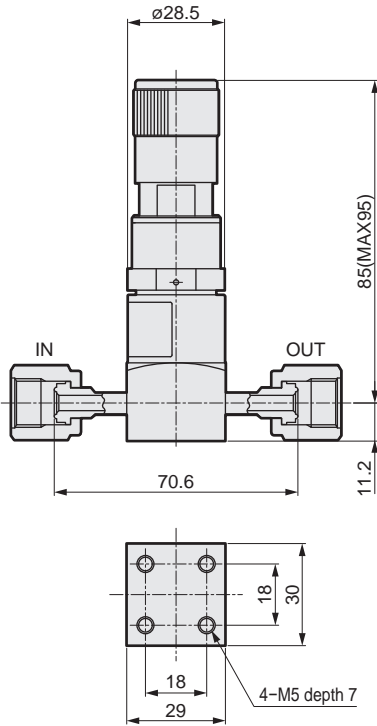
Hastelloy ® is a registered trademark of Haines International, Inc.

LGD Series
 AGD/OGD/ MGD-R Series
 High durability
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 Regulator
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 Safety precautions
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 Related products

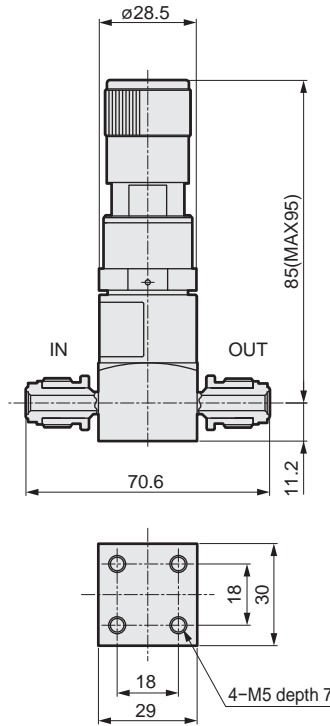
Dimensions

Note: Flow path direction is indicated with an arrow on the body.

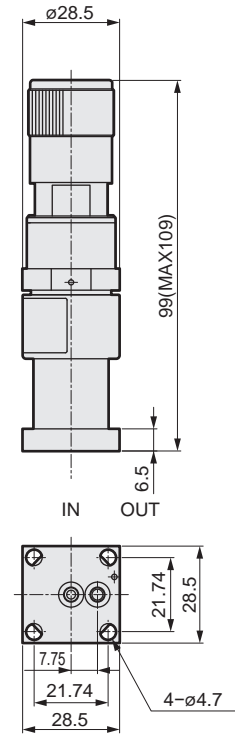
● PGM-*-4R
(1/4"JXR female fitting)



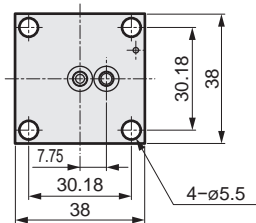
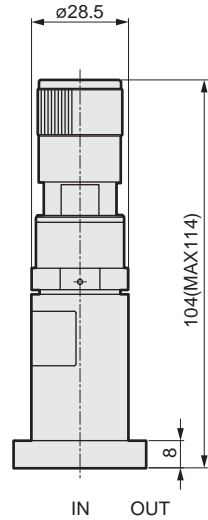
● PGM-*-4RM
(1/4"JXR male fitting)



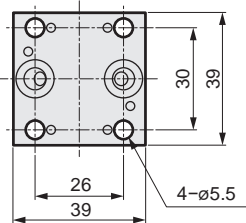
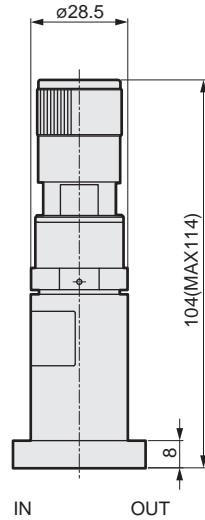
● PGM-*-1
(1.125" C seal)



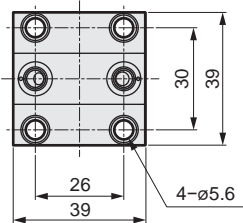
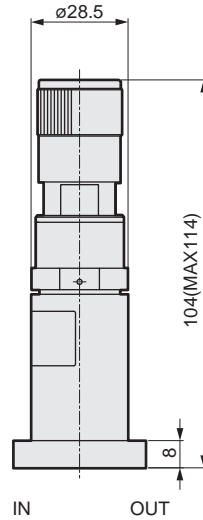
● PGM-*-2
(1.5" C seal)



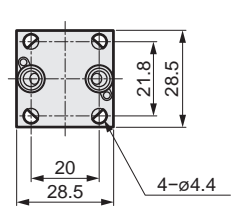
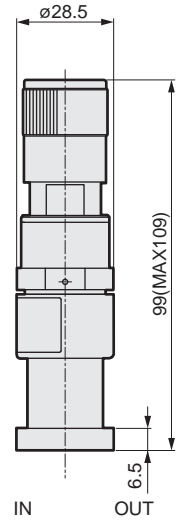
● PGM-*-3
(1.5" CS seal)



● PGM-*-4
(1.5" W seal)

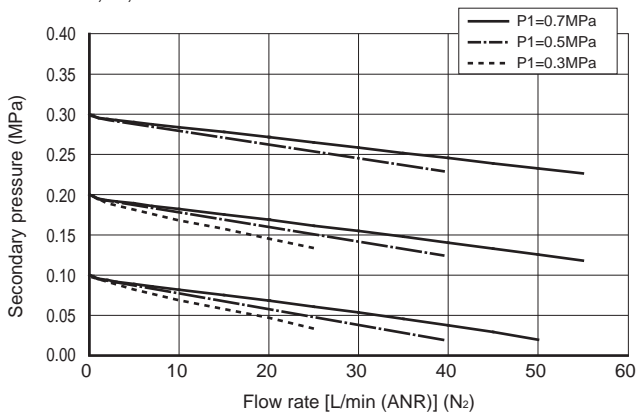


● PGM-*-5
(1.125" W seal)

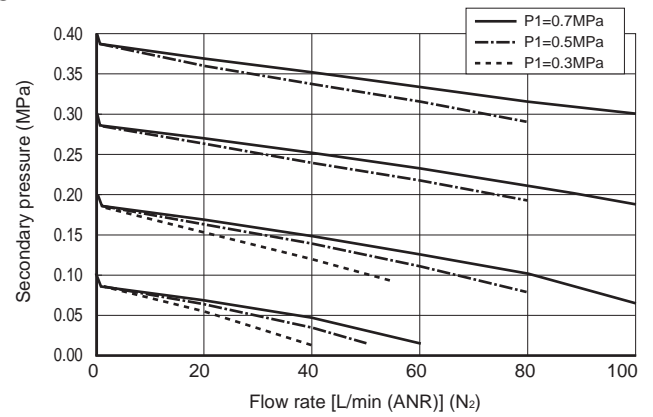


Flow characteristics

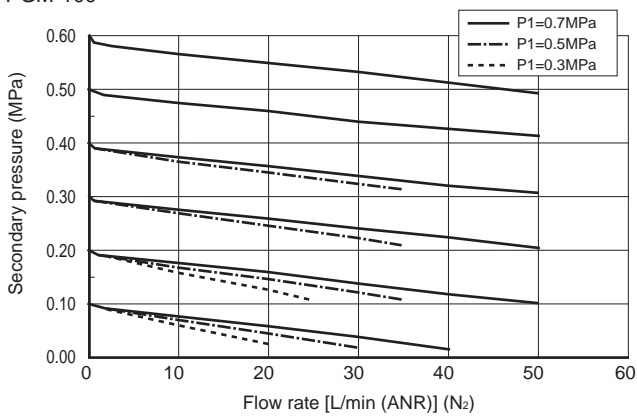
● PGM-30V,30,50



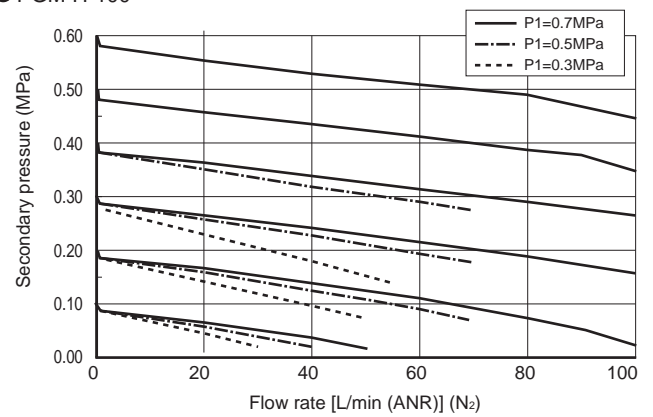
● PGM-H-60



● PGM-100



● PGM-H-100



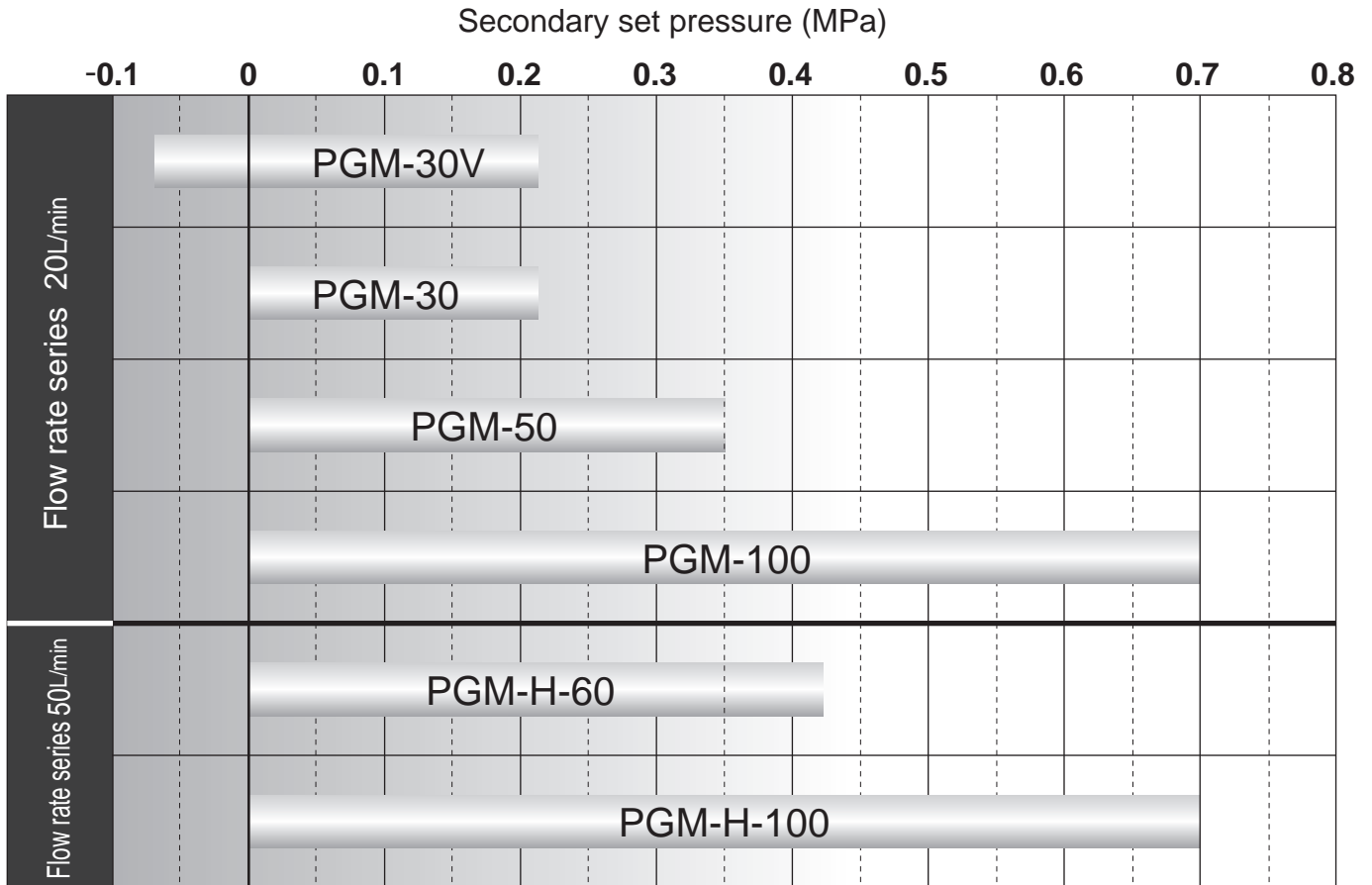
Hastelloy ® is a registered trademark of Haines International, Inc.

*According to CKD test data

LGD Series	AGD/OGD/ MGD-R Series	High durability	Other valves for process gas	Regulator	Integrated gas supply system	Safety precautions	Air operated valve	Manual valve	Vacuum pressure control valves	Safety precautions	Related products
Components for process gases											
High vacuum components											

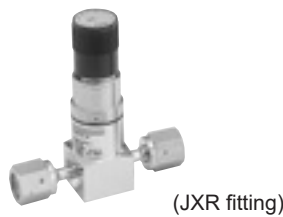
● Diversity

Wide range of pressure variations

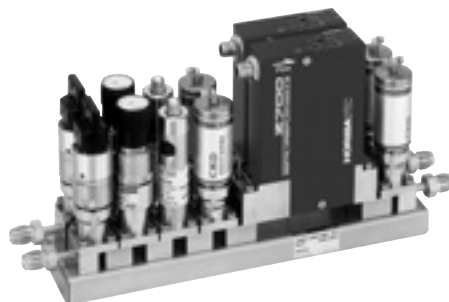


Diverse range of connections

- 1/4" JXR female fitting
- 1/4" JXR male fitting
- 1/4" JXR male → female fitting
- 1/4" JXR female → male fitting



- 1.5" C seal
- 1.5" CS seal
- 1.5" W seal
- 1.125" C seal
- 1.125" W seal



Regulator for process gas

Variation-compatible products

PGM Series

RoHS

Made-to-order product

● With gauge port



- Gauge port connection
JXR male fitting, JXR female fitting, and double barbed fitting are available.
- Port size 1/4"

● Panel mount



- Panel mount diameter $\varnothing 31$
- Panel thickness 5 mm or less

● Misoperation prevention



- Prevents fluctuations of set pressure due to misoperation.
- The malfunction prevention type is Total height is 108mm and diameter is $\varnothing 32$.

LGD Series	AGD/OGD/ MGD-R Series	High durability	Other valves for process gas	Regulator	Integrated gas supply system	Safety precautions	Air operated valve	Manual valve	Vacuum pressure control valves	Safety precautions	Related products
Components for process gases											
High vacuum components											

Related products	Safety precautions		High vacuum components		Components for process gases				
	Vacuum pressure control valves	Manual valve	Air operated valve	Safety precautions	Integrated gas supply system	Regulator	Other valves for process gas	High durability	AGD/OGD/ MGD-R Series

IAGD

Integrated gas supply system

Overview

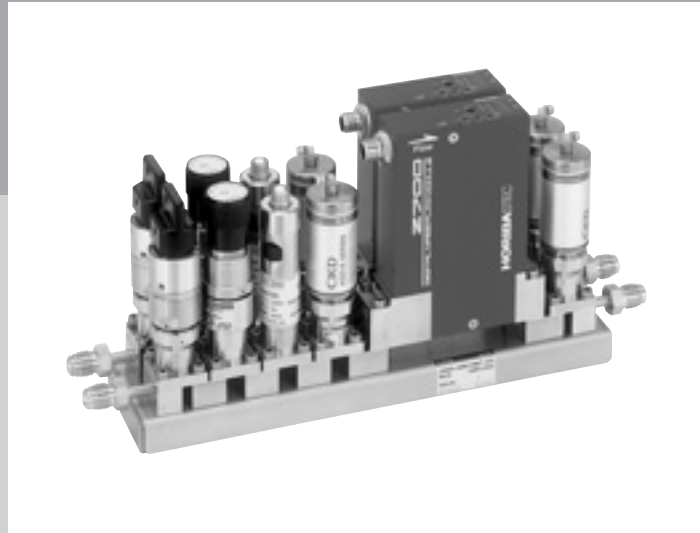
A process gas supply system that takes up less space and offers improved maintainability. We do it all based on the processes you need, from design to manufacturing.

Features

Adjusted to the flow rate and size
2 sizes (1.125", 1.5")

Supports high-durability
valves

- MAGD*-R-HD
- MAGD*-HDF
- MAGD*-A



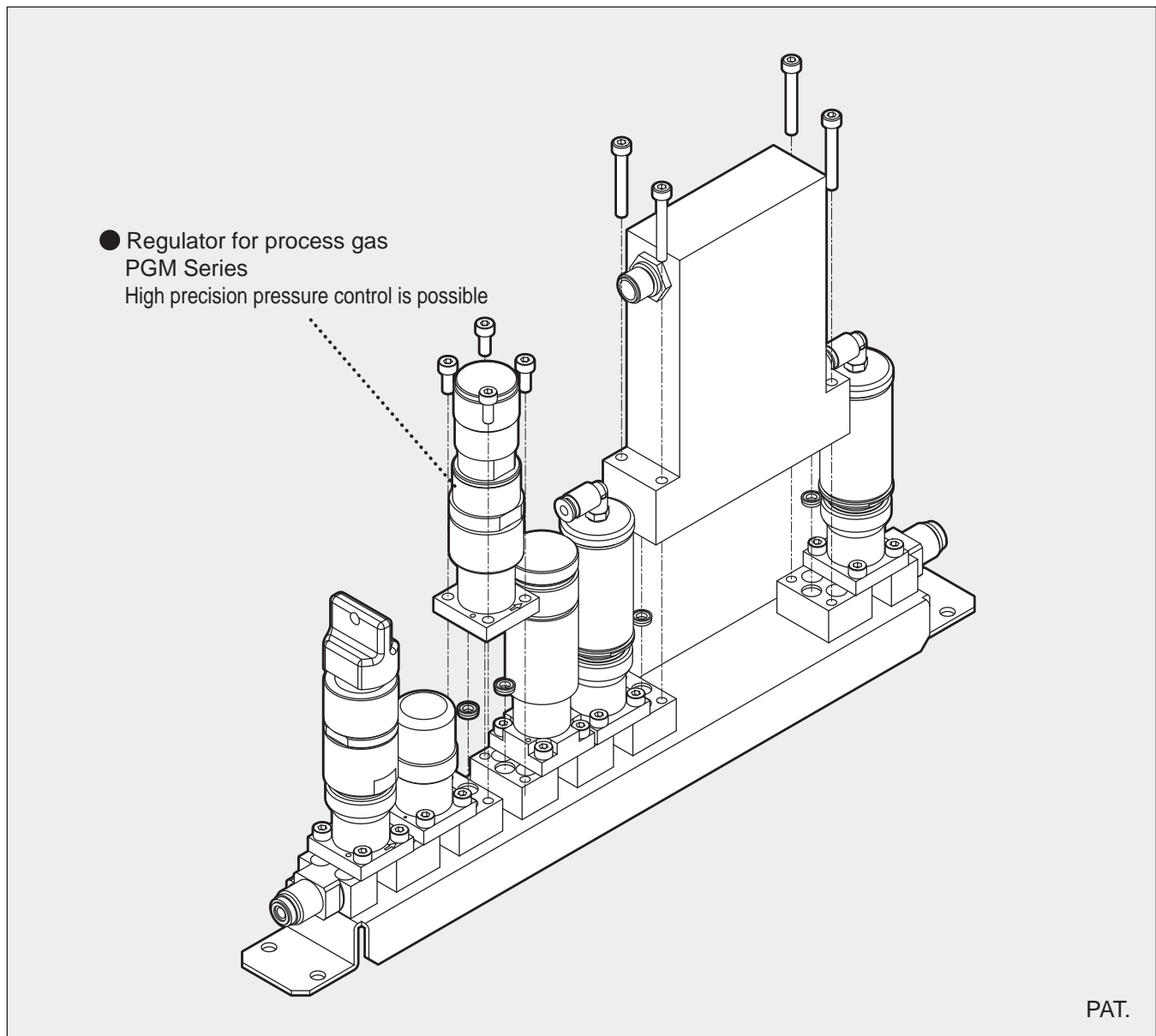
CONTENTS

● Product introduction	64
● IAGD5 (Size 1.125", W seal)	68
● IAGD4 (Size 1.5", W seal)	75
● IAGD-compatible high-durability air operated valve	82

Space saving, Easy maintenance is greatly improved.

Overview

These systems are developed for the gas supply lines of semiconductor manufacturing equipment and compactly integrate SEMI standardized/surface mounted air operated valves and mass flow controllers, etc. In accordance with customer demands, we provide an optimal layout and realize substantial space saving compared to conventional systems composed of welded fittings.



PAT.

Components for process gases

AGD/OGD/ MGD-R Series

Other valves for process gas

High durability

Regulator

Integrated gas supply system

Safety precautions

Air operated valve

Manual valve

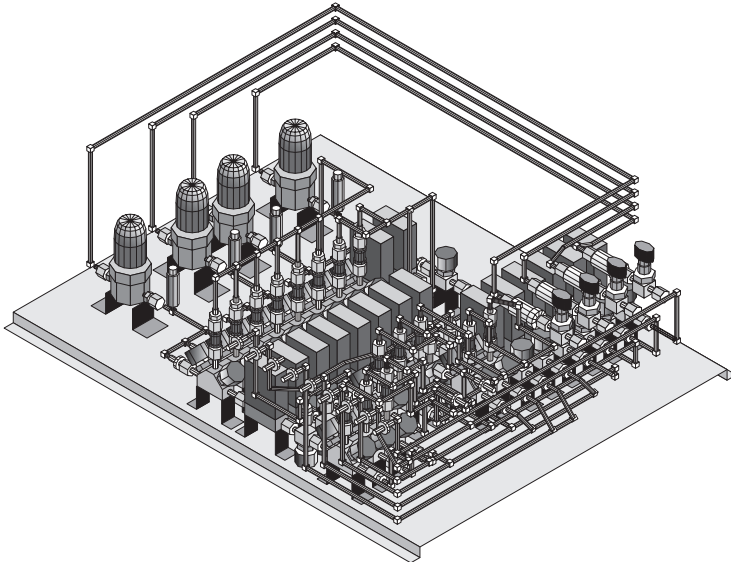
Vacuum pressure control valves

Safety precautions

Related products

Features

Existing gas jungle



Reduced footprint

- Footprint 60% compared with conventional models
- Volume 16% compared with conventional models

Improvement of workability

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

Improvement of reliability

- CS seal/W seal used

Improved corrosion resistance(Contamination-free)

- Welding area reduced by more than 80%
By drastically reducing welds, contamination factors are greatly reduced compared to conventional products.

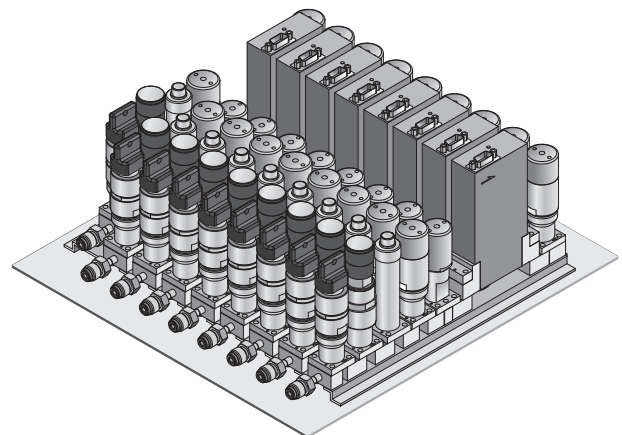
Improvement of replacement characteristics

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

Implementation of standardization

- Implementation of standardization for component parts

Integrated gas supply system



LGD Series

AGD/OGD/
MGD-R Series

High durability

Other valves
for process gas

Regulator

Integrated gas
supply system

Safety precautions

Air operated valve

Manual valve

Vacuum pressure
control valves

Safety precautions

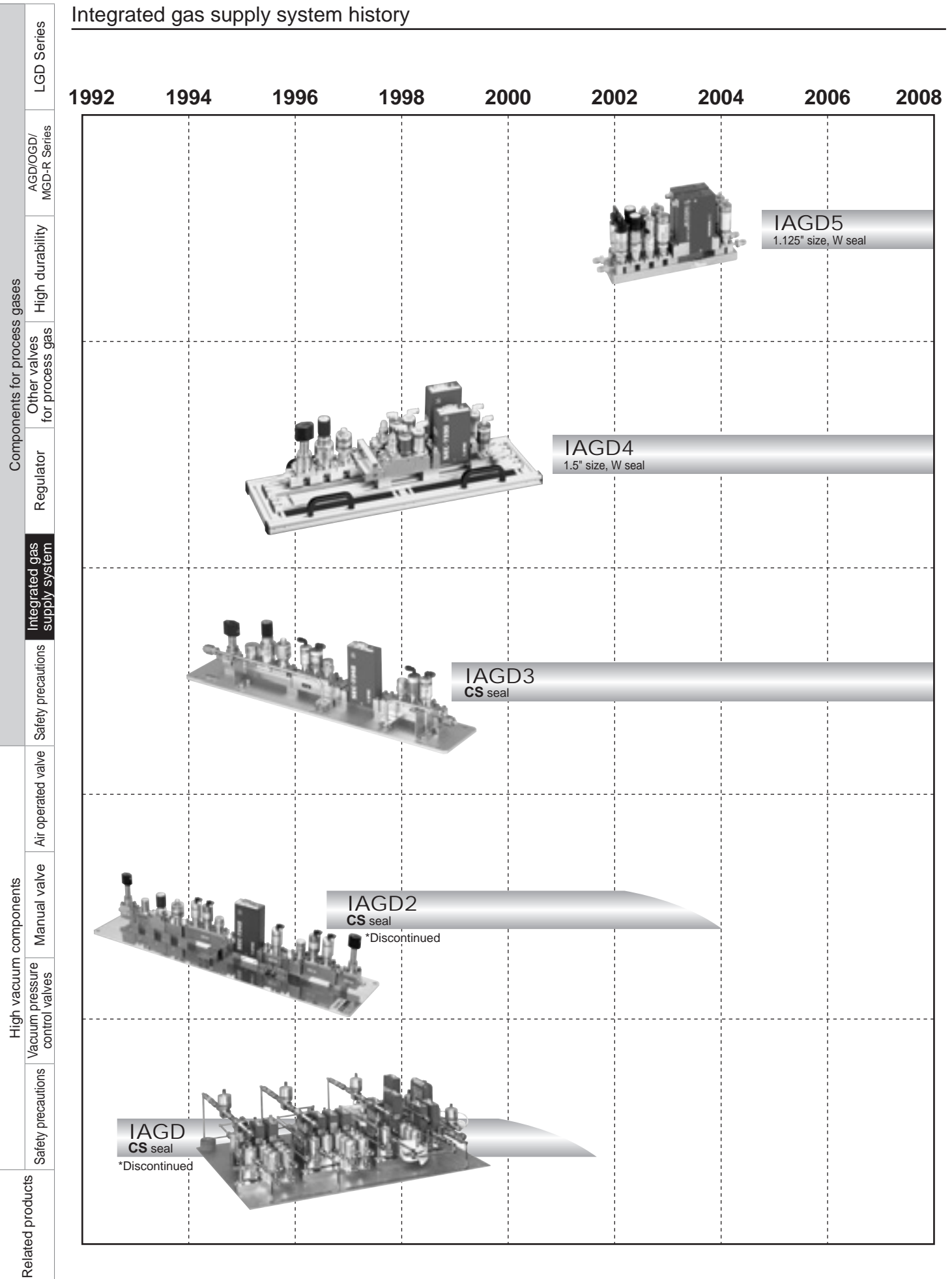
Related products

Components for process gases

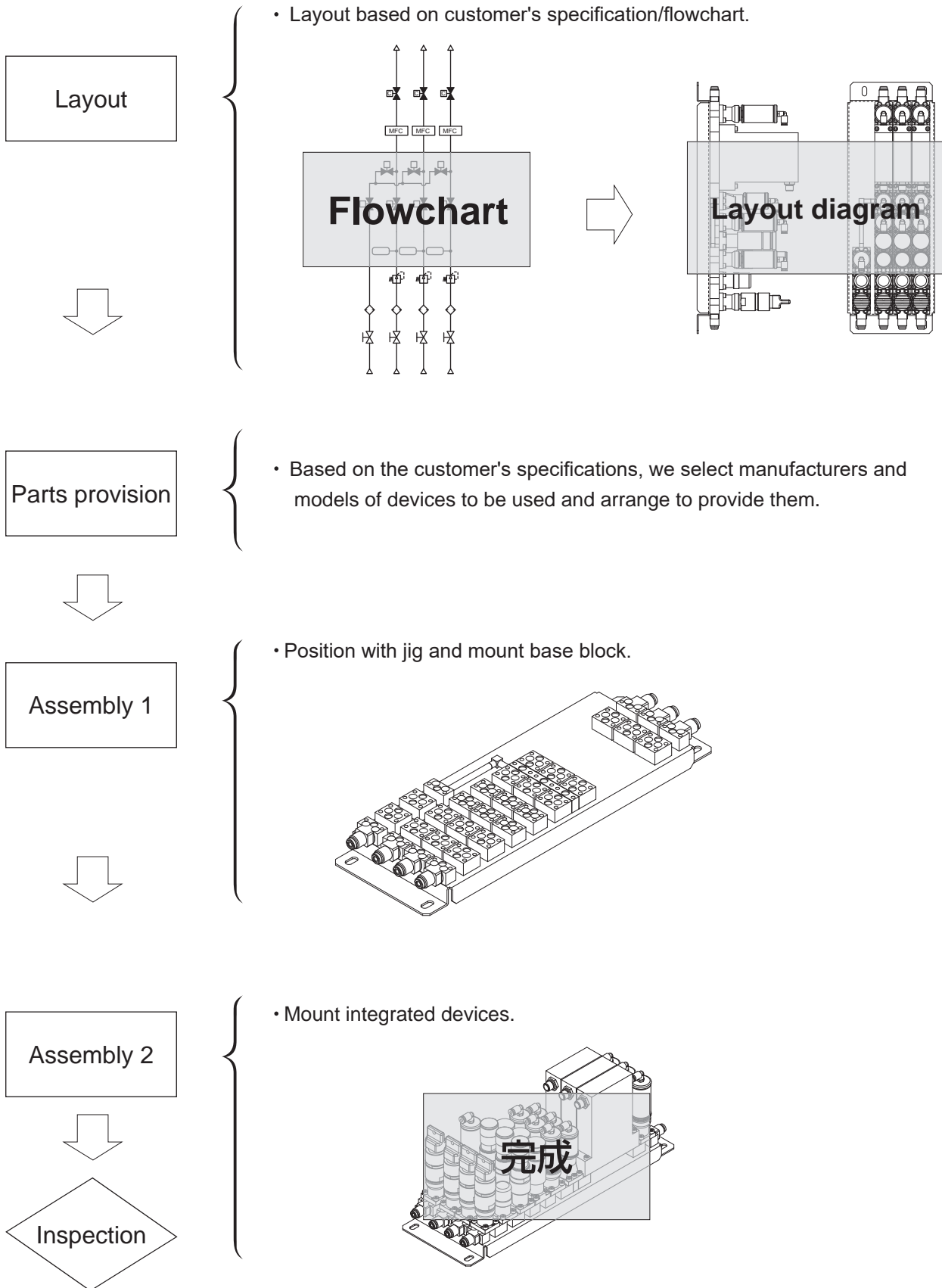
High vacuum components

Integrated Gas System Series

Integrated gas supply system history



Integrated gas supply system production process



LGD Series	AGD/OGD/ MGD-R Series	High durability	Other valves for process gas	Regulator	Integrated gas supply system	Safety precautions	Air operated valve	Manual valve	Vacuum pressure control valves	Safety precautions	Related products
Components for process gases											
High vacuum components											

■ MAGD Series is back with a new eco-friendly design!



Specifications

Item	MAGD5-R-0	MAGD5-R-1
Working fluid	Inert gas/process gas	
Working 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·m ³ /s.He	1.3×10 ⁻⁹ or less	1.0×10 ⁻¹⁰ or less
External leakage Pa·m ³ /s.He	2.8 x 10 ⁻¹² or less	
Cv (23°C, under pressurization)	0.1	0.26
Connection	1.125", W seal (nominal 6.35)	
Operating pressure MPa	NC	0.4 to 0.6
	NO	0.4 to 0.5
Operating port	M5	
Material	Body	SUS316L
	Diaphragm	Ni-Co alloy
	Seat	PCTFE

How to order

MAGD5 - R - 02A - W - 1 2

A Series

B Valve shape

C Seal shape

D Actuation (V1)

E Actuation (V2)

Code	Description
A Series	
MAGD5	Air operated valve for IAGD5
B Valve shape	
01D	1-station block D valve (2-port)
01X	1-station block X valve (3-port)
01Y	1-station block Y valve (3-port)
02A	2-station block A valve (3-port)
11D	1-station block D valve (2-port)
12A	2-station block A valve (3-port)
C Seal shape	
W	1.125", W seal (nominal 6.35)
D Actuation (V1)	
1	NC
2	NO
3	NC (with proximity sensor (Normally Closed valve))
4	NO (with proximity sensor (Normally Open valve))
5	NC (with proximity sensor (Normally Open valve))
6	NO (with proximity sensor (Normally Closed valve))
E Actuation (V2)	
1	NC
2	NO
3	NC (with proximity sensor (Normally Closed valve))
4	NO (with proximity sensor (Normally Open valve))
5	NC (with proximity sensor (Normally Open valve))
6	NO (with proximity sensor (Normally Closed valve))

[Example of model No.]

MAGD5-R-02A-W-12

- A Series : Air operated valve for IAGD5
- B Valve shape : 2-station block A valve (3-port)
- C Seal shape : 1.125", W seal (nominal 6.35)
- D Actuation (V1) : NC
- E Actuation (V2) : NO

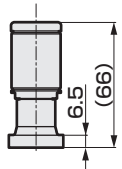
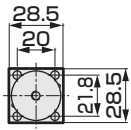
*1: Mounting bolt, gasket and air fitting for actuator drive are not attached with the product and must be purchased separately.

*2: Contact CKD for products with mounting bolts.

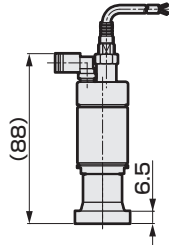
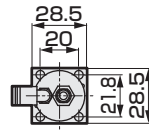
Dimensions

1-station block

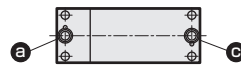
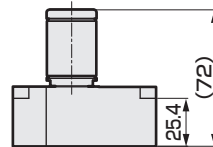
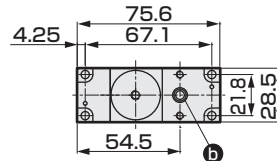
●MAGD5-R-01D



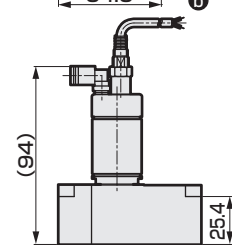
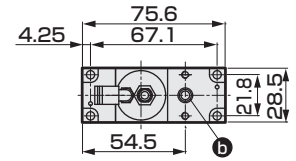
(with proximity sensor)



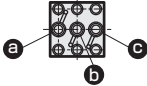
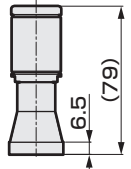
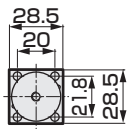
●MAGD5-R-01X



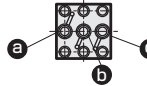
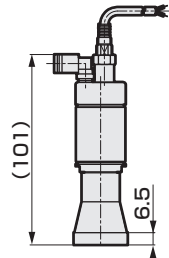
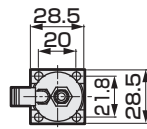
(with proximity sensor)



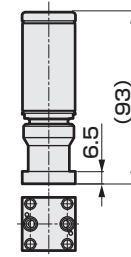
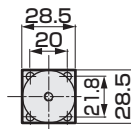
●MAGD5-R-01Y



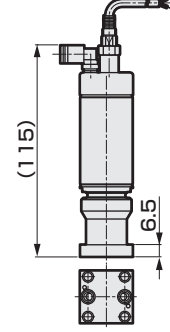
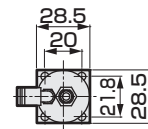
(with proximity sensor)



●MAGD5-R-11D

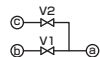
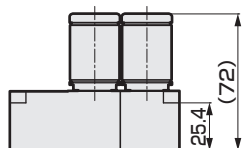
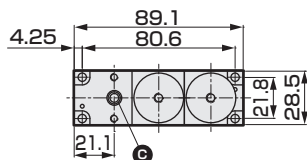


(with proximity sensor)

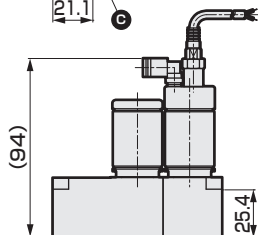
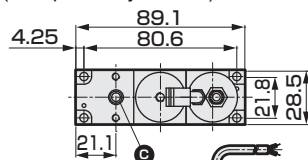


2-station block

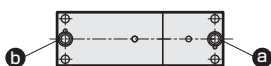
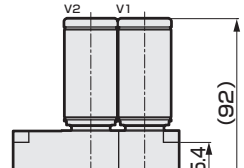
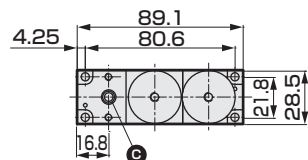
●MAGD5-R-02A



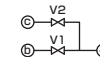
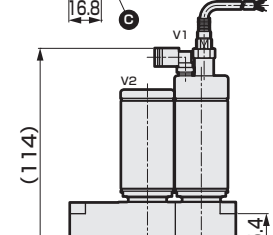
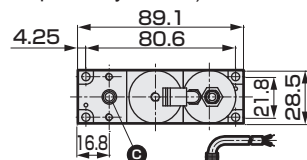
(with proximity sensor)



●MAGD5-R-12A



(with proximity sensor)



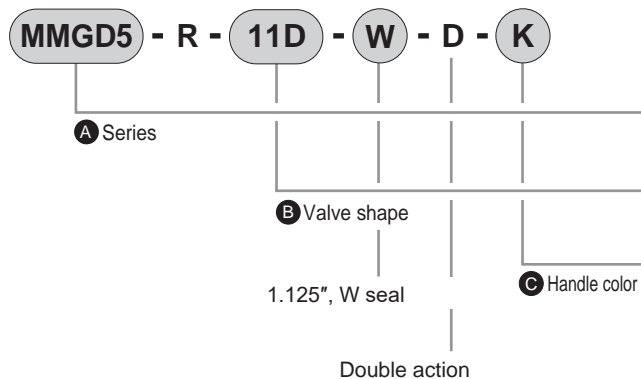
LGD Series	AGD/OGD/ MGD-R Series	High durability for process gas	Other valves for process gas	Regulator	Integrated gas supply system	Safety precautions	Air operated valve	Manual valve	High vacuum components	Vacuum pressure control valves	Safety precautions	Related products
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Specifications

Item	MMGD5-R	
Working fluid	Inert gas/process gas	
Working 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/s (He)	1.0×10 ⁻¹⁰ or less	
External leakage Pa·m3/s (He)	2.8 x 10 ⁻¹² or less	
Cv	0.26	
Connection	1.125", W seal (nominal 6.35)	
Material	Body	SUS316L
	Diaphragm	Ni-Co alloy
	Seat	PCTFE

How to order



Code	Description	
A Series		Cv
MMGD5	Manual valve for IAGD5	0.26
B Valve shape		
11D	1-station block D valve (2-port)	
C Handle color		
K	Handle color: Black	
R	Handle color: Red	
B	Handle color: Blue	
Y	Handle color: Yellow	
GR	Handle color: Gray	
W	Handle color: White	
O	Handle color: Orange	
YG	Handle color: Yellow-green	

[Example of model No.]

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

- A** Series : Manual valve for IAGD5
- B** Valve shape : 1-station block D valve (2-port)
- C** Handle color : Black

Components for integrated gas supply system

Flow rate adjusting valve for IAGD5

(Size 1.125")

Made-to-order product



Specifications

Item	MFGD5-11D-W-1	MFGD5-11D-W-4
Working fluid	Inert gas/process gas	
Working pressure Pa(abs)-MPa(G)	1.3 x 10 ⁻⁶ to 0.7	
Fluid temperature °C	-10 to 80	
Ambient temperature °C	-10 to 80	
Valve seat leakage	1/100 or less of max. Cv	
External leakage Pa·m ³ /s (He)	2.8 x 10 ⁻¹² or less	
Cv (adjusting range)	0.003 to 0.03	0.02 to 0.2
Connection	1.125", W seal (nominal 6.35)	
Material	Body	SUS316L
	Diaphragm	Ni-Co alloy

* Cover is included with the product.

How to order

MFGD5 - 11D - W - 1

A Series

B Valve shape

C Seal shape

D Cv (adjusting range)

Code	Description
A Series	
MFGD5	Flow rate adjusting valve for IAGD5
B Valve shape	
11D	1-station block D valve (2-port)
C Seal shape	
W	1.125", W seal (nominal 6.35)
D Cv (adjusting range)	
1	Cv (adjusting range) 0.003 to 0.03
4	Cv (adjusting range) 0.02 to 0.2

*1: Mounting bolt and gasket are not attached with the product and must be purchased separately.

*2: Contact CKD for products with mounting bolts.

[Example of model No.]

MFGD5-11D-W-1

A Series : Flow rate adjusting valve for IAGD5

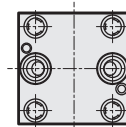
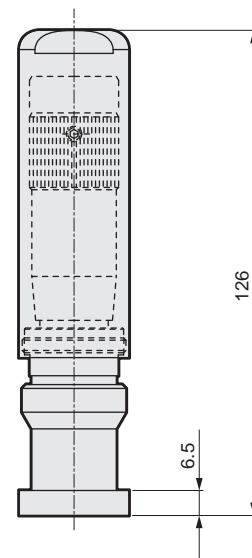
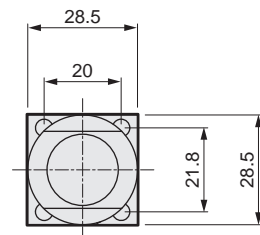
B Valve shape : 1-station block D valve (2-port)

C Seal shape : 1.125", W seal (nominal 6.35)

D Other : Cv (adjusting range) 0.003 to 0.03

Dimensions

●MFGD5



LGD Series
 AGD/OGD/MGD-R Series
 High durability
 Other valves for process gas
 Regulator
 Integrated gas supply system
 Safety precautions
 Air operated valve
 Manual valve
 High vacuum components
 Vacuum pressure control valves
 Safety precautions
 Related products



Specifications

Descriptions	MCGP5-01D	MCGP5-F
Working fluid	Inert gas/process gas	
Working pressure Pa(abs)-MPa(G)	1.3 x 10 ⁻⁶ to 0.7	
Fluid temperature °C	-10 to 80	
Ambient temperature °C	-10 to 80	
Valve seat leakage Pa·m ³ /s (He)	4.7 x 10 ⁻⁹ or less	
External leakage Pa·m ³ /s (He)	2.8 x 10 ⁻¹² or less	
Cv (max.)	0.25	
Connection	1.125", W seal (nominal 6.35)	
Material	Body	SUS316L
	Seat	Kalrez®
	Spring	SUS316

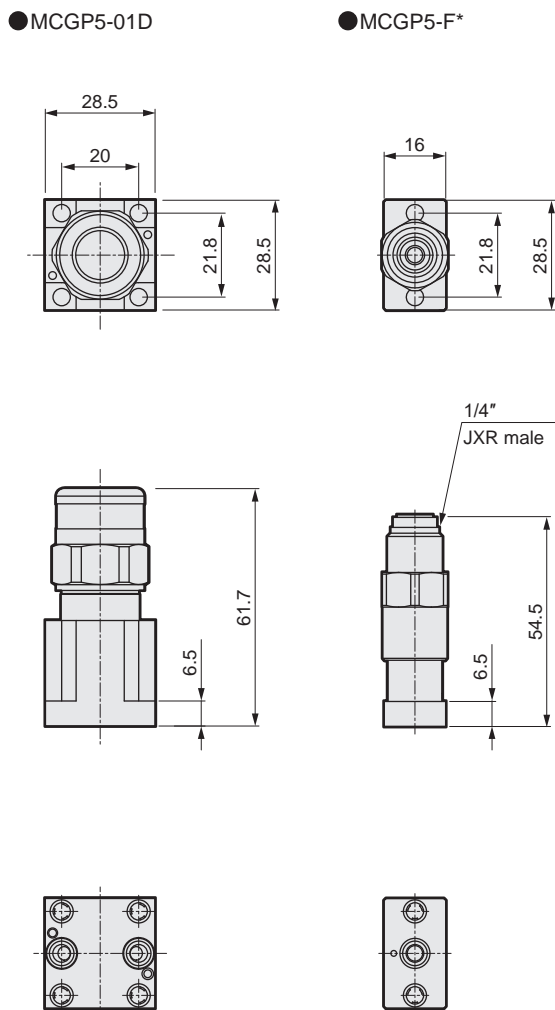
How to order

MCGP5 - 01D-W - 023 - KA



Code	Description
A Series	
MCGP5	Check valve for IAGD5
B Shape	
01D-W	1-station block D valve (2-port) 1.125", W seal (nominal 6.35)
F1	Flow direction From JXR fitting side to W seal side
F2	Flow direction From W seal side to JXR fitting side
C Cracking pressure	
023	Cracking pressure 2.3kPa
D Seat material	
KA	Seat material Kalrez®

Dimensions



*1: Mounting bolt and gasket are not attached with the product and must be purchased separately.
*2: Contact CKD for products with mounting bolts.

[Example of model No.]

MCGP5-01D-W-023-KA

- A** Series : Check valve for IAGD5
- B** Shape : 1-station block D valve (2-port)
: 1.125", W seal (nominal 6.35)
- C** Cracking pressure : 2.3kPa
- D** Seat material : Kalrez®

Gasket

Name	Model No.
1.125", W seal gasket (nominal 6.35)	IAGD5-UGC-6.35GR



1.125", Mounting bolt for W seal



Name	Model No.	Applicable parts
1.125", Hexagon socket head cap screw for W seal (M5 x 4, 10, 1 pcs)	IAGD5-BOLT-M4×10	MAGD5-R-01D MAGD5-R-01Y MAGD5-R-11D MMGD5-1DV2-D MCGP5-01D MCGP5-F* MFGD5-11D IAGD5-BYPASS Bypass piping block IAGD5-BLIND-SW
1.125", Hexagon socket head cap screw for W seal (M5 x 4, 30, 1 pcs)	IAGD5-BOLT-M4×30	MAGD5-R-01X MAGD5-R-02A FC-PA785CT-BW-TC (MFC manufactured by Hitachi Metals) FC-PA786CT-BW-TC (MFC manufactured by Hitachi Metals) DN780*-BW (MFC manufactured by Hitachi Metals) SEC-Z5* (MFC manufactured by Horiba Estek)

Contact CKD for details of applicable parts.

Maintenance tools (Torque screwdriver, bit for torque screwdriver, T handball point wrench, tweezers (gasket installation tool), scissors, storage box 1 each)

Name	Model No.
Maintenance tool set	IAGD5-MAINTENANCE3

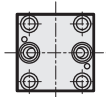
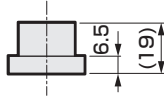
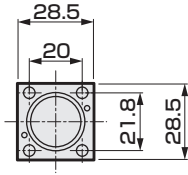
Refer to the instruction manual for details of use.



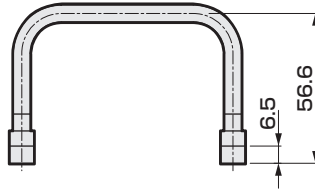
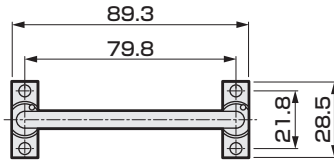
LGD Series
 AGD/OGD/MGD-R Series
 High durability
 Other valves for process gas
 Regulator
 Integrated gas supply system
 Safety precautions
 Air operated valve
 Manual valve
 Vacuum pressure control valves
 Safety precautions
 Related products
 Components for process gases
 High vacuum components

Top mount block

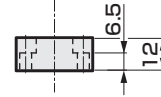
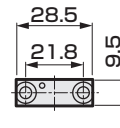
● IAGD5-BYPASS
(for 20 mm pitch between)



● Bypass piping block
(for 79.8 mm pitch between MFC)

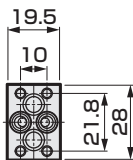


● IAGD5-BLIND-SW

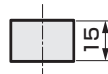
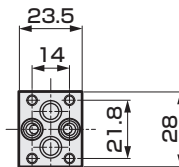


Base block

● IAGD5-BF-V10-SW
(10 mm between)



● IAGD5-BF-V14-SW
(14.0 mm between)



Related products	Safety precautions	High vacuum components				Safety precautions	Components for process gases		LGD Series
		Vacuum pressure control valves	Manual valve	Air operated valve	Integrated gas supply system		Regulator	Other valves for process gas	
							AGD/OGD/ MGD-R Series		

■ MAGD Series is back with a new eco-friendly design!



Specifications

Item	MAGD4-R-0	MAGD4-R-1
Working fluid	Inert gas/process gas	
Working pressure Pa (abs) to MPa (G)	1.3×10 ⁻⁶ to 0.99	1.3×10 ⁻⁶ to 0.7
Operating ambient temperature °C	-10 to 80	
Ambient temperature °C	-10 to 80	
Valve seat leakage Pa m ³ /s.He	1.3×10 ⁻⁹ or less	1.0×10 ⁻¹⁰ or less
External leakage Pa m ³ /s.He	2.8 x 10 ⁻¹² or less	
Cv (23°C, under pressurization)	0.1	0.26
Connection	1.5", W seal (nominal 6.35)	
Operating pressure MPa	NC	0.4 to 0.6
	NO	0.4 to 0.5
Operating port	M5	
Material	Body	SUS316L
	Diaphragm	Ni-Co alloy
	Seat	PCTFE

How to order

MAGD4 - R - 02A - W - 1 2

A Series

B Valve shape

C Seal shape

D Actuation(V1)

E Actuation (V2)

Code	Description
A Series	
MAGD4	Air operated valve for IAGD4
B Valve shape	
	Cv
01D	1-station block D valve (2-port)
01X	1-station block X valve (3-port)
01Y	1-station block Y valve (3-port)
02A	2-station block A valve (3-port)
11D	1-station block D valve (2-port)
	0.1
	0.26
C Seal shape	
W	W seal (nominal 6.35)
D Actuation(V1)	
1	NC
2	NO
3	NC (with proximity sensor (normally closed valve))
4	NO (with proximity sensor (normally open valve))
5	NC (with proximity sensor (normally open valve))
6	NO (with proximity sensor (normally closed valve))
E Actuation(V2)	
1	NC
2	NO
3	NC (with proximity sensor (normally closed valve))
4	NO (with proximity sensor (normally open valve))
5	NC (with proximity sensor (normally open valve))
6	NO (with proximity sensor (normally closed valve))

[Example of model No.]

MAGD4-R-02A-W-12

- A Series : Air operated valve for IAGD4
- B Valve shape : 2-station block A valve (3-port)
- C Seal shape : W seal (nominal 6.35)
- D Actuation (V1) : NC
- E Actuation (V2) : NO

*1: Mounting bolt, gasket and air fitting for actuator drive are not attached with the product and must be purchased separately.

*2: Contact CKD for products with mounting bolts.

LGD Series
 AGD/OGD/ MGD-R Series
 High durability
 Other valves for process gas
 Regulator
 Integrated gas supply system
 Safety precautions
 Air operated valve
 Manual valve
 Vacuum pressure control valves
 Safety precautions
 Related products

MAGD4 Series

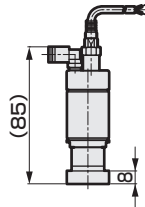
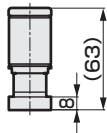
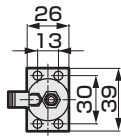
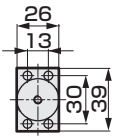
Dimensions

Dimensions

1-station block

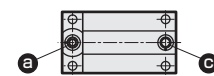
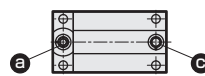
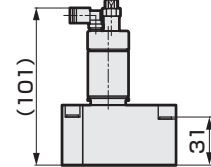
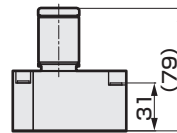
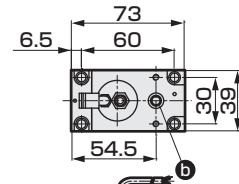
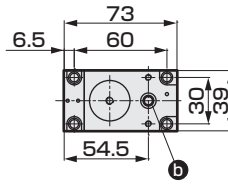
●MAGD4-R-01D

(with proximity sensor)



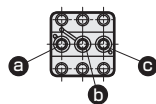
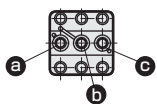
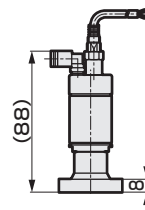
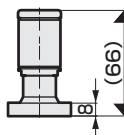
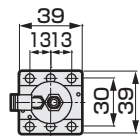
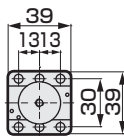
●MAGD4-R-01X

(with proximity sensor)



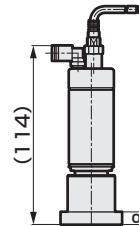
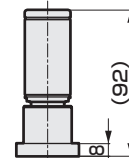
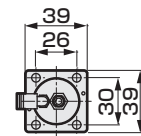
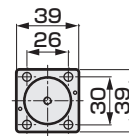
●MAGD4-R-01Y

(with proximity sensor)



●MAGD4-R-11D

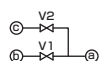
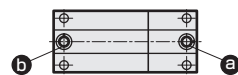
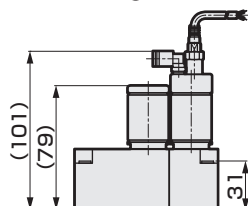
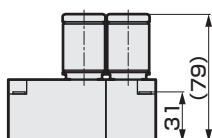
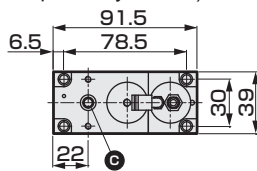
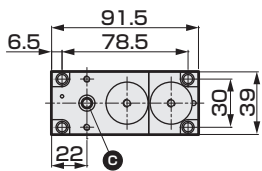
(with proximity sensor)



2-station block

●MAGD4-R-02A

(with proximity sensor)





Specifications

Item	MOGD4-01	MOGD4-11
Working fluid	Inert gas/process gas	
Working pressure Pa(abs)-MPa(G)	1.3 x 10 ⁻⁶ to 0.7	
Fluid temperature °C	-10 to 80	
Ambient temperature °C	-10 to 80	
Valve seat leakage Pa·m ³ /s (He)	1.3 x 10 ⁻⁹ or less	
External leakage Pa·m ³ /s (He)	2.8 x 10 ⁻¹² or less	
Cv	0.1	0.26
Connection	W seal (nominal 6.35)	
Material	Body	SUS316L
	Diaphragm	Ni-Co alloy
	Seat	PCTFE

How to order

MOGD4 - 11D - W - K A - S1

A Series

B Valve shape

C Seal shape

D Handle color

E Other

Code	Description	
A Series		
MOGD4	Manual valve for IAGD4	
B Valve shape		Cv
11D	1-station block D valve (2-port)	0.26
01X	1-station block X valve (3-port)	0.1
C Seal shape		
W	W seal (nominal 6.35)	
D Handle color		
K	Handle color: Black	
R	Handle color: Red	
B	Handle color: Blue	
Y	Handle color: Yellow	
G	Handle color: Green	
E Other		
S1	With handle lock (only when valve is closed)	
Blank	Without key	

*1: Mounting bolt and gasket are not attached with the product and must be purchased separately.
*2: Contact CKD for products with mounting bolts.

[Example of model No.]
MOGD4-11D-W-KA-S1

- A Series : Manual valve for IAGD4
- B Valve shape : 1-station block D valve (2-port)
- C Seal shape : W seal (nominal 6.35)
- D Handle color : Black
- E Other : With handle lock (only when valve is closed)

LGD Series
 AGD/OGD/MGD-R Series
 High durability
 Other valves for process gas
 Regulator
 Integrated gas supply system
 Safety precautions
 Air operated valve
 Manual valve
 Vacuum pressure control valves
 Safety precautions
 Related products

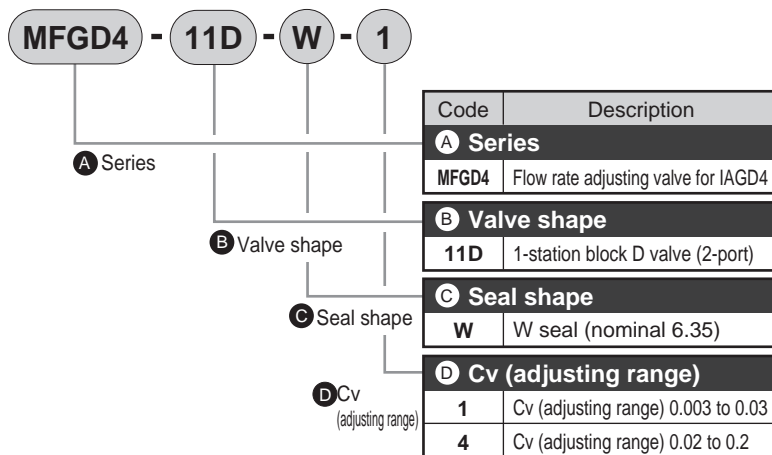
Specifications



Item	MFGD4-11D-W-1	MFGD4-11D-W-4
Working fluid	Inert gas/process gas	
Working pressure Pa(abs)-MPa(G)	1.3 x 10 ⁻⁶ to 0.7	
Fluid temperature °C	-10 to 80	
Ambient temperature °C	-10 to 80	
Valve seat leakage	1/100 or less of max. Cv	
External leakage Pa m3/s (He)	2.8 x 10 ⁻¹² or less	
Cv (adjusting range)	0.003 to 0.03	0.02 to 0.2
Connection	W seal (nominal 6.35)	
Material	Body	SUS316L
	Diaphragm	Ni-Co alloy

* Cover is included with the product.

How to order

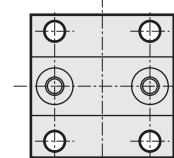
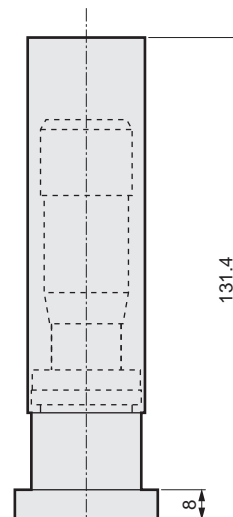
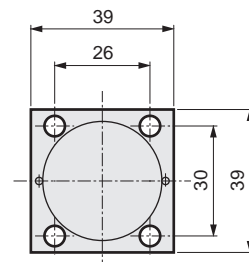


*1: Mounting bolt and gasket are not attached with the product and must be purchased separately.

*2: Contact CKD for products with mounting bolts.

Dimensions

● MFGD4



[Example of model No.]

MFGD4-11D-W-1

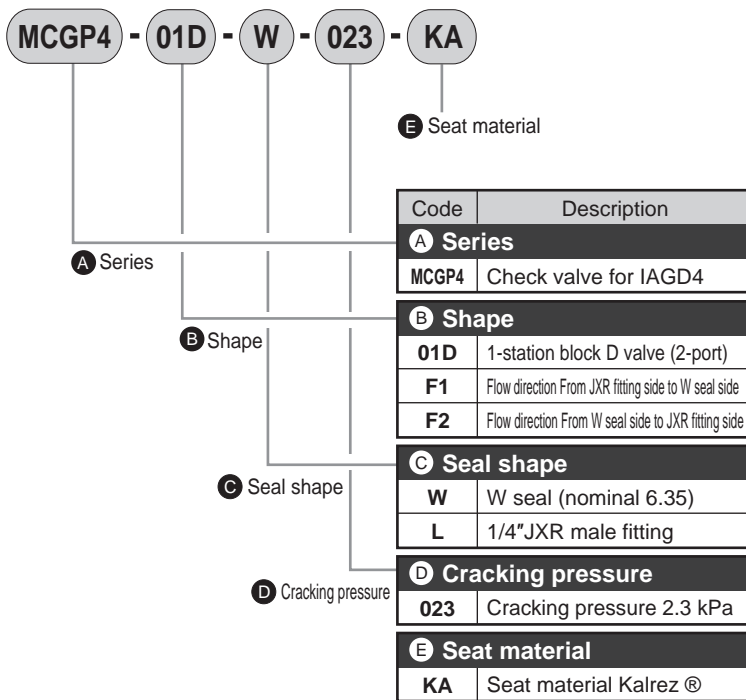
- **A Series** : Flow rate adjusting valve for IAGD4
- **B Valve shape**: 1-station block D valve (2-port)
- **C Seal shape**: W seal (nominal 6.35)
- **D Other** : Cv (adjusting range) 0.003 to 0.03



Specifications

Item	MCGP4-01D	MCGP4-F
Working fluid	Inert gas/process gas	
Working pressure Pa(abs)-MPa(G)	1.3 x 10 ⁻⁶ to 0.7	
Fluid temperature °C	-10 to 80	
Ambient temperature °C	-10 to 80	
Valve seat leakage Pa·m ³ /s (He)	4.7 x 10 ⁻⁸ or less	
External leakage Pa·m ³ /s (He)	2.8 x 10 ⁻¹² or less	
Cv (max.)	0.25	
Connection	W seal (nominal 6.35)	
Material	Body	SUS316L
	Seat	Kalrez®
	Spring	SUS316-WPA
	Gasket	PTFE

How to order



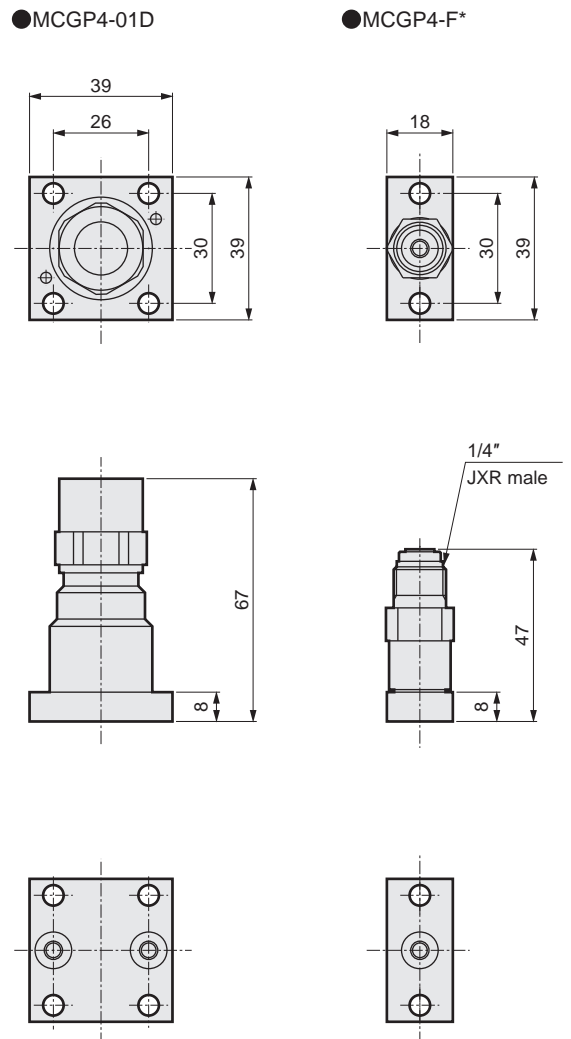
*1: Mounting bolt and gasket are not attached with the product and must be purchased separately.
 *2: Contact CKD for products with mounting bolts.

[Example of model No.]

MCGP4-01D-W-023-KA

- A** Series : ICheck valve for AGD4
- B** Shape : 1-station block D valve (2-port)
- C** Seal shape : W seal (nominal 6.35)
- D** Cracking pressure : 2.3kPa
- E** Seat material : Kalrez®

Dimensions



Kalrez® is a registered trademark of DuPont Corporation.

LGD Series
 AGD/OGD/
 MGD-R Series
 High durability
 Other valves
 for process gas
 Regulator
 Integrated gas
 supply system
 Safety precautions
 Air operated valve
 Manual valve
 High vacuum components
 Vacuum pressure
 control valves
 Safety precautions
 Related products

Gasket

Name	Model No.
W seal gasket (nominal 6.35)	IAGD4-UGF-6.35GR



Mounting bolt for W seal



Name	Model No.	Applicable parts
Hexagon socket head cap screw for W seal (M5 x 5, 12,4 pcs)	IAGD4-BOLT-M5x12-4	MAGD4-R-01D MAGD4-R-11D MOGD4-R-11D MFGD4-11D MCGP4-01D MCGP4-F* Bypass block (for interface pitch 26 mm) Bypass piping block (for MFC interface pitch 79.8 mm) Sealing flange SEC-G111*-W-1.5 (MFC manufactured by Horiba Estek)
Hexagon socket head cap screw for W seal (M5 x 5, 35,4 pcs)	IAGD4-BOLT-M5x35-4	MAGD4-R-01X MAGD4-R-02A MOGD4-R-01X FC-785 (MFC manufactured by Hitachi Metals) FC-786 (MFC manufactured by Hitachi Metals) FC-985 (MFC manufactured by Hitachi Metals)
Hexagon socket head cap screw for W seal (M5 x 5, 40,4 pcs)	IAGD4-BOLT-M5x40-4	SEC-7330*-800A (MFC manufactured by Horiba Estek) SEC-7340*-800A (MFC manufactured by Horiba Estek) SEC-F730*-800A (MFC manufactured by Horiba Estek) SEC-F740*-800A (MFC manufactured by Horiba Estek)
Hexagon socket head cap screw for W seal (M5 x 5, 43,4 pcs)	IAGD4-BOLT-M5x43-4	SEC-7350*-800A (MFC manufactured by Horiba Estek) SEC-F750*-800A (MFC manufactured by Horiba Estek) FC-986 (MFC manufactured by Hitachi Metals)

Contact CKD for details of applicable parts.

Maintenance tools (Torque screwdriver, bit for torque screwdriver, tweezers (gasket installation tool) 1 each)

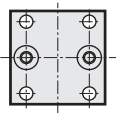
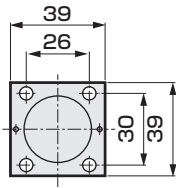
Name	Model No.
Maintenance tool set	IAGD4-MAINTENANCE

Refer to the instruction manual for details of use.

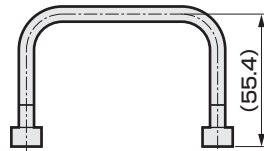
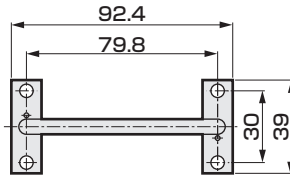


Top mount block

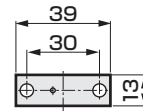
- Bypass block
(for 26 mm pitch between)



- Bypass piping block
(for 79.8 mm pitch between MFC)

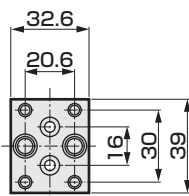


- Sealing flange

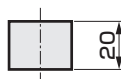
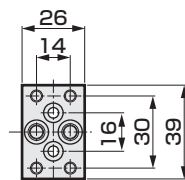


Base block

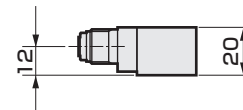
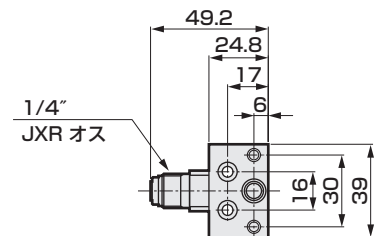
- Base block 1
(20.6 mm between)



- Base block 5
(14.0 mm between)



- 1/4" JXR male flange



LGD Series	AGD/OGD/ MGD-R Series	High durability for process gas	Other valves for process gas	Regulator	Integrated gas supply system	Safety precautions	Air operated valve	Manual valve	Vacuum pressure control valves	Safety precautions	Related products
Components for process gases											
High vacuum components											

Features

The special coating on the actuator provides fast and stable response.



Specifications

Item	MAGD*-R-HD-0	MAGD*-R-HD-1
Working fluid	Inert gas/process gas	
Working pressure Pa(abs) to MPa(G)	1.3 x 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 Pam ³ /s(He)	1.0 x 10 ⁻¹⁰ or less (initial) 1.3 x 10 ⁻⁹ or less (after operation)	
External leakage Pam ³ /s(He)	2.8 x 10 ⁻¹² or less	
Cv(23°C under pressurization)	0.1	0.26
Connection	Flange that supports an integrated gas supply system (W seal)	
Operating pressure MPa	NC 0.4 to 0.6 NO 0.4 to 0.5	
Operating port	M5	
Durability	Guaranteed: 10 million cycles (actual: 30 million cycles or more)	

Specifications

Item	MAGD*-HDF-1	MAGD*-HDF-2
Working fluid	Inert gas/process gas	
Working pressure Pa(abs) to MPa(G)	1.3 x 10 ⁻⁶ to 0.5	1.3 x 10 ⁻⁶ to 0.99
Fluid temperature °C	20 to 200	
Operating ambient temperature °C	20 to 150	
Storage ambient temperature °C	-10 to 80	
Valve seat leakage Pam ³ /s(He)	1.0 x 10 ⁻¹⁰ or less (at 23°C)	
External leakage Pam ³ /s(He)	2.8 x 10 ⁻¹² or less	
Cv(23°C under pressurization)	0.3	0.65
Connection	Flange that supports an integrated gas supply system (W seal, C seal)	
Operating pressure MPa	NC 0.4 to 0.6 NO 0.4 to 0.5	
Operating port	M5	
Durability	Guaranteed: 10 million cycles (actual: 30 million cycles or more)	

Specifications

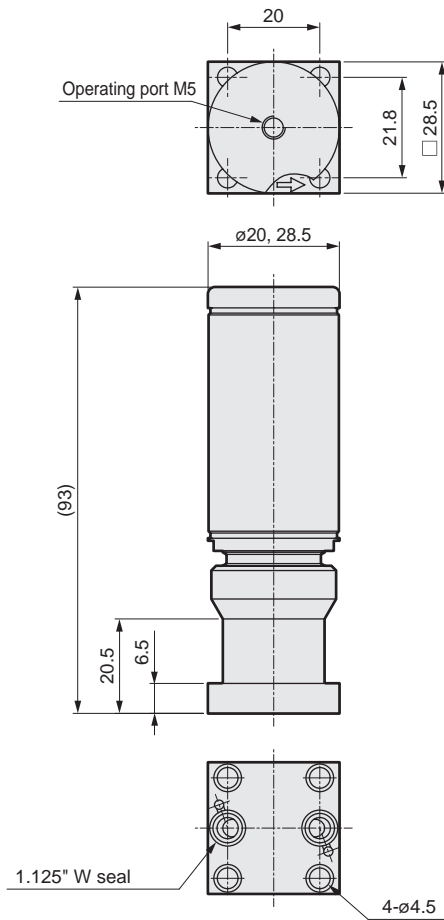
Item	MAGD*-A
Working fluid	Inert gas/process gas
Working pressure Pa(abs)-MPa(G)	1.3 x 10 ⁻⁶ to 0.5
Fluid temperature °C	150 to 200 (*1)
Operating ambient temperature °C	20 to 150
Storage ambient temperature °C	-10 to 80
Valve seat leakage Pam ³ /s(He)	1 x 10 ⁻⁷ or less (at 200°C)
External leakage Pam ³ /s(He)	2.8 x 10 ⁻¹² or less
Cv (200°C, negative pressure)	0.4 and over
Connection	Flange that supports an integrated gas supply system (W seal, C seal)
Actuation	NC (Normally Closed)
Operating pressure MPa	0.4 to 0.6
Operating port	M5 *2
Durability	Guaranteed: 10 million cycles (actual: 100 million cycles or more)

*1: 150°C or less actuator part

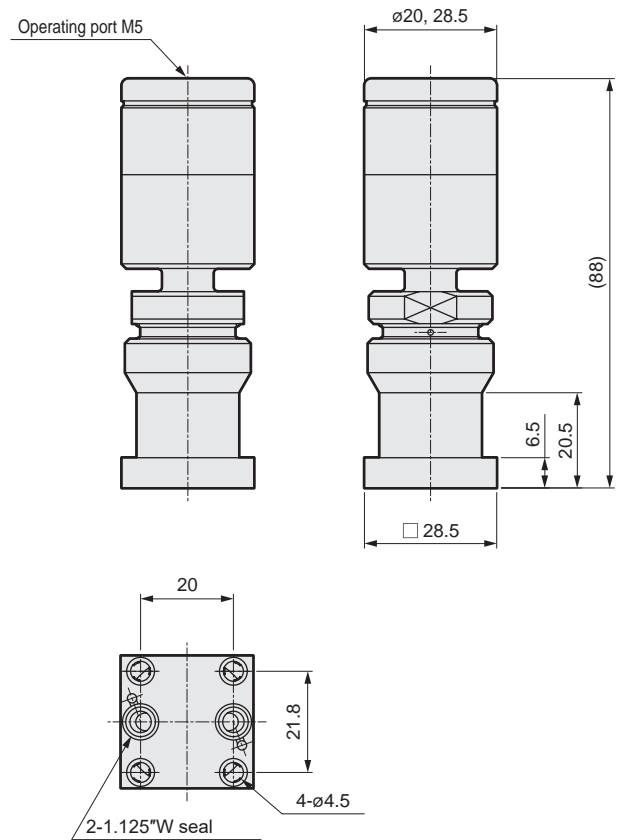
*2: With optional ø4 push-in fitting

Dimensions

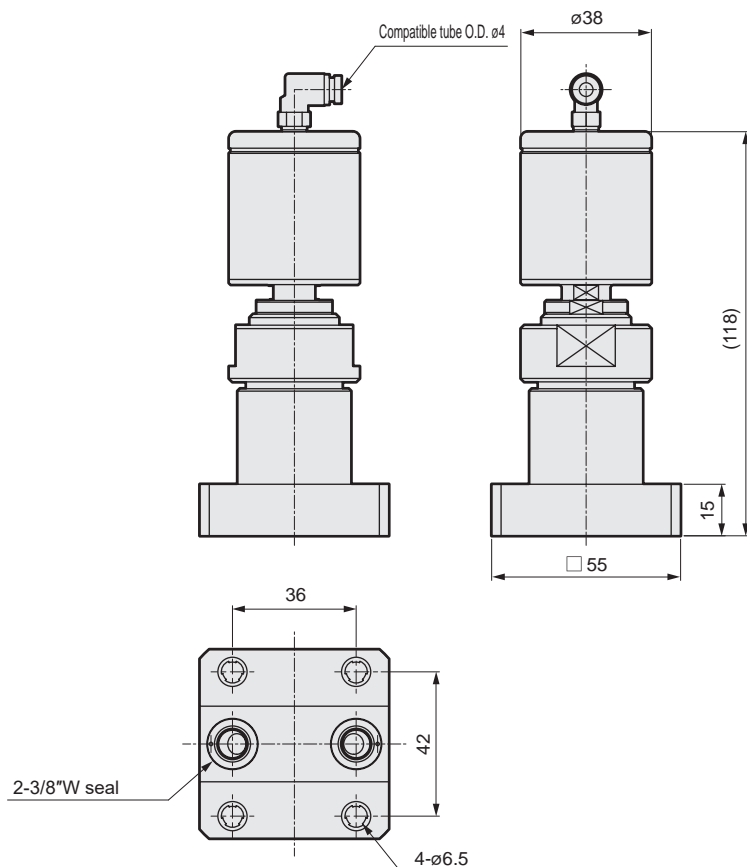
●MAGD5-R-HD-11D



●MAGD5-HDF-11D



●MAGD4-A



LGD Series	AGD/OGD/ MGD-R Series	High durability	Other valves for process gas	Regulator	Integrated gas supply system	Safety precautions	Air operated valve	Manual valve	Vacuum pressure control valves	Safety precautions	Related products
Components for process gases											
High vacuum components											



Components for process gases

Safety Precautions

Be sure to read this section before use. Refer to Intro Page 9 for general precautions.

Design/selection

1. Checking the specifications

WARNING

■ Incorrect component selection and handling can cause problems not only in this product, but also to your system. Check the specifications of this product and the compliancy 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.

Mounting, installation and adjustment

1. 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.

2. 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, carry out an appropriate function test to confirm that the product is correctly mounted.

CAUTION

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

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

3. Securing of space

CAUTION

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

■ Secure sufficient space for maintenance and inspection.

4. Piping

CAUTION

■ Foreign materials and burrs in the piping and piping work could damage the valve seat or diaphragm seal, and lead to leaks. Remove dirt and burrs before mounting the valve, and then install the primary side filter.

■ 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.



Components for process gases

Safety Precautions

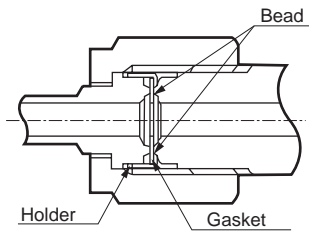
Be sure to read this section before use.
Refer to Intro Page 9 for general precautions.

Mounting, installation and adjustment

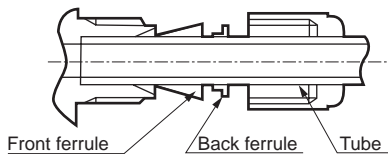
- Make sure that there is no foreign materials, scratches or burrs on the seal section before tightening the fitting with the following procedures.

(1) Fitting tightening method

- JXR fitting (when the gasket material is nickel/SUS316)
Tighten the nut by hand until the gasket contacts the bead surface, and then tighten another 1/8 turn with a tool. (Consult with CKD for all other materials.)



- Double barbed 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.



- (2) After tightening the fitting, always carry out a leak test, and confirm that there are no leaks.

5. Baking

⚠ CAUTION

- Baking temperature should be within the specified temperature range of the product. Keep the valve fully open when baking.

6. Purge

⚠ CAUTION

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

Use/maintenance

1. Before use

⚠ WARNING

- Use this product within the specifications range.
- Do not touch heater-equipped products with hands or body. There is a risk of burns.

⚠ CAUTION

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

2. 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 surrounding components.
- After work, always carry out a leak test, and confirm that there are no leaks.
- Do not disassemble the valve.
Unauthorized disassembly followed by repair or reuse will invalidate the product warranty.



Components for process gases

Safety Precautions

Be sure to read this section before use.
Refer to Intro Page 9 for general precautions.

Precautions for each model series and for individual products

Regulator for process gas PGM Series

Design/selection

⚠ WARNING

■ Output pressure exceeding the regulator's 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.

When using the product

1. Safety Precautions

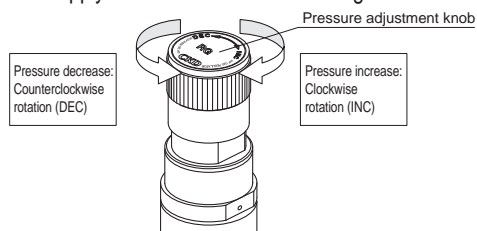
⚠ CAUTION

- 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.

2. Operation mode

⚠ CAUTION

- Turning the pressure control knob clockwise (INC) raises the set pressure.
- When gas is flowing, turning the pressure control knob counterclockwise (DEC) decreases the set pressure.
- Since this product does not have a relief function, gas must be vented when not flowing.
- When turning (closing) the pressure adjustment knob counterclockwise, be careful not to apply further force from the rotating end.



3. Outflow check method

⚠ CAUTION

- (1) Open the inlet side gas supply valve slowly and supply inlet pressure.
- (2) Close the valve on the outlet and inlet sides, leave it for at least 10 minutes and check whether the outlet pressure has risen.

- (3) Rotate the pressure adjustment knob clockwise, adjust the outlet pressure within the adjusted pressure range, leave it for at least 10 minutes after the outlet pressure stabilizes, and check whether the outlet pressure has risen.
- (4) In (2) and (3) above, outflow is taking place when the outlet pressure continues to rise.

■ If outflow is confirmed, stop using the gas immediately, vent the gas, purge as necessary, remove the product, and replace the parts.

4. Airtight check method

⚠ CAUTION

Product inlet side

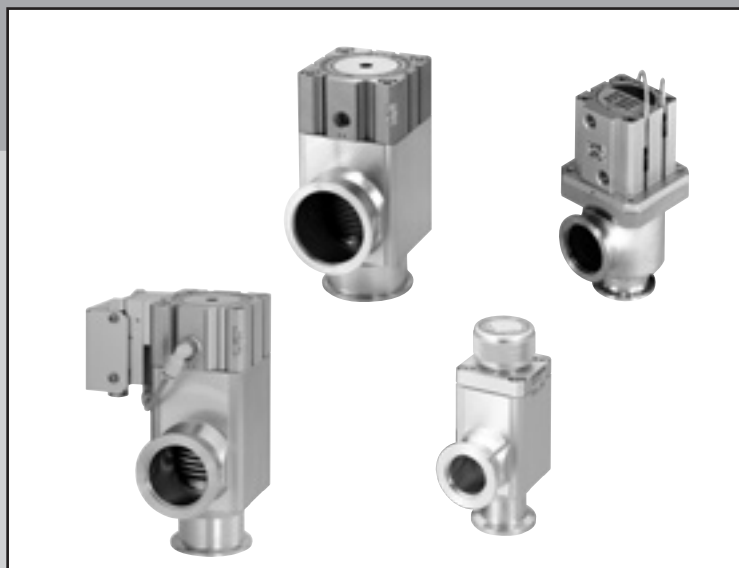
- (1) After confirming that the pressure adjustment knob of this product has been turned fully in the counterclockwise direction, supply clean inert gas (N₂, Ar, etc.) to the inlet side of the product.
- (2) After inlet pressure stabilizes, close the inlet side supply valve.
- (3) If the inlet pressure decreases gradually over time from the above state, leakage as far as the product is conceivable. (Given that there is no outflow.)

Product outlet side

- (1) After confirming that the pressure adjustment knob of this product has been turned fully in the counterclockwise direction, supply clean inert gas (N₂, Ar, etc.) to the inlet side of the product.
- (2) Close the valve on the outlet side of the product and set the pressure with the pressure adjustment knob.
- (3) When the inlet/outlet pressure stabilizes, completely close the inlet side supply valve of the product.
- (4) If there are large fluctuations in inlet/outlet pressure over time from the above state, leakage from the product outlet side is conceivable. (Given that there is no outflow.)

■ If leakage is confirmed, stop using the gas immediately, vent the gas, purge as necessary, remove the product, and replace the parts.

High vacuum components



CONTENTS

Air operated valve for high vacuum AVB Series	89
Manual valve for high vacuum MVB Series	118
Vacuum pressure control valve IAVB Series	125
⚠ Safety precautions	135

Related products	High vacuum components		Components for process gases							
	Safety precautions	Vacuum pressure control valves	Manual valve	Air operated valve	Safety precautions	Integrated gas supply system	Regulator	Other valves for process gas	High durability	AGD/OGD/ MGD-R Series

AVB/MVB

Air operated valve/manual valve for high vacuum

Overview

With the special structure using CKD's unique molded bellows, long service life and high durability are achieved. Valve Part 7 Series for high vacuum with high reliability and ease of use.

Features

Superior actual durability of 3 million cycles (under preset CKD conditions)

Indicators are equipped as standard. (excluding AVB*37)

Lightweight aluminum body (AVB/MVB)



CONTENTS

Air operated valve

● Product introduction	90
● AVB**7	92
● AVB**7 Made-to-order product	104
● AVB**3	106
● AVB21-8T/AVP21-8T	110
● AVB**3 Made-to-order product	112
● AVB932 Large bore size type Made to order product	116

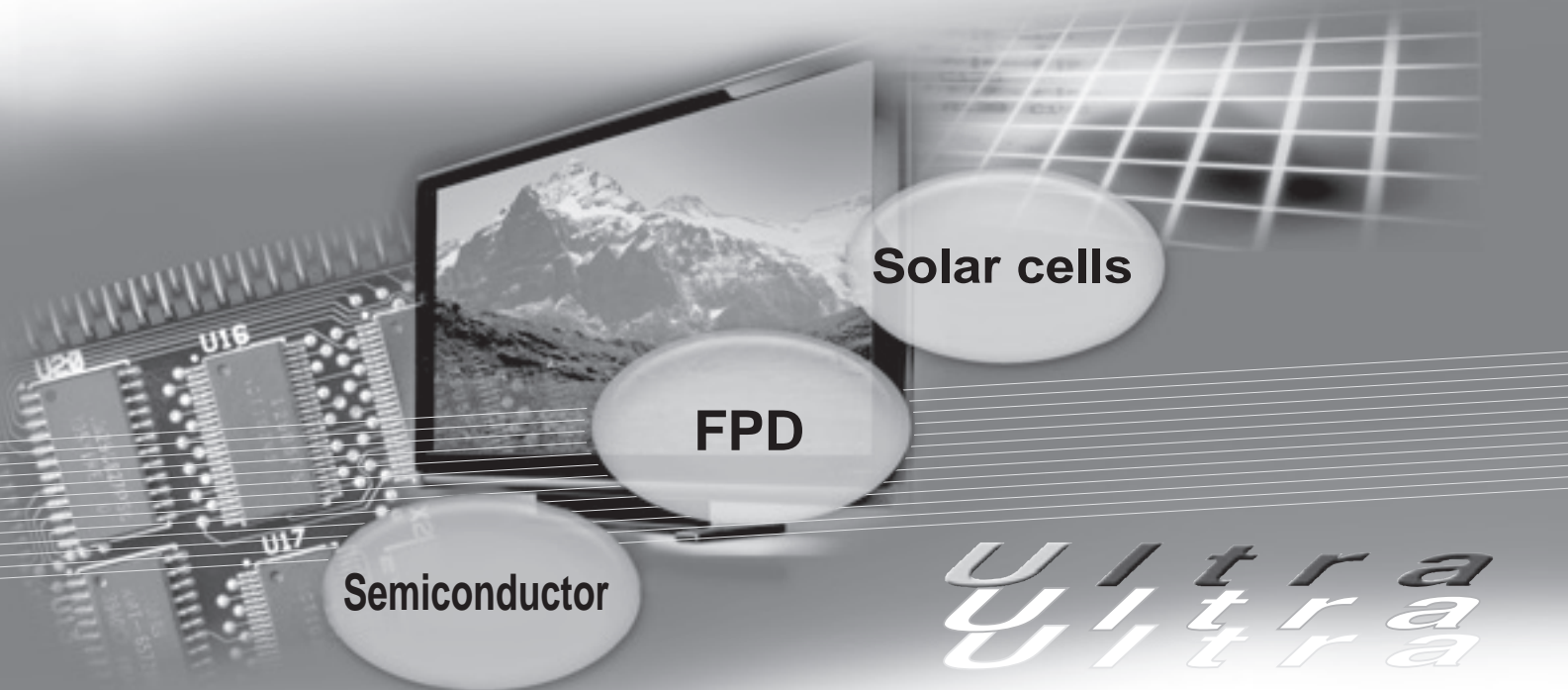
Manual valve

● MVB*17	118
● MVB*0	120
● MVP*0	122

Long service life and high durability.

With the special structure using CKD's unique molded bellows, unprecedented drive life is achieved.

Valve Part 7 Series for high vacuum with high reliability and ease of use.



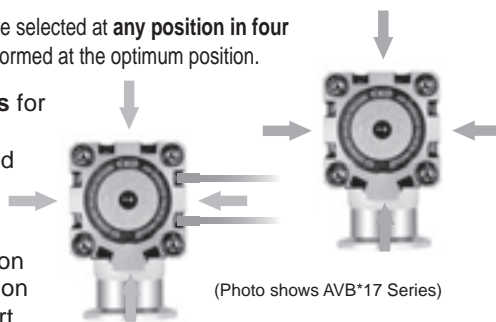
*Ultra
Ultra
Ultra*

■ **Ultra Fine concept**

Thorough cleanliness control based on CKD's unique concept. Introducing an all-clean process for essential factors of product development from design to evaluation, manufacturing and production.

Increased flexibility in installation and piping

- Since the operating port can be selected at **any position in four directions**, piping can be performed at the optimum position.
- Ultra-compact **switches** for detecting the operating position can be mounted **on all four sides**.
(Bore size NW16 is 3 sides)
- Flexible exhaust direction
 Vacuum pump connection is possible on either port.



Compatible with high temperature fluid

Fluid temperature 150°C
 (some NC, two-stage)

Visual confirmation of operation

Indicators are equipped as standard.
 (excluding AVB*37)



(Photo shows MVB*17 Series)

Lightweight aluminum body

Substantially lighter weight compared to the conventional stainless steel body.

Abundant flange sizes ○ : High temperature specifications

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

Can be installed in any position in 4 directions

Operating port

Lightweight

Aluminum body

Operation can be confirmed at a glance

Indicator

Switch mountable on all four sides

Switch

Reed/proximity (retrofittable)

Original molded bellows



AVB*17 Series High temperature specification

AVB*17 Series



AVB*47 Series



AVB*37 Series



MVB*17 Series

*Fine
Fine
Fine*

Air operated valve for high vacuum

Manual valve for high vacuum

AVB 7 Series

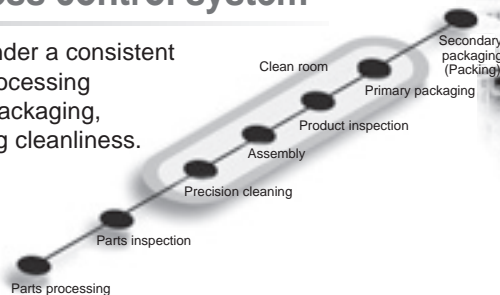
MVB 7 Series

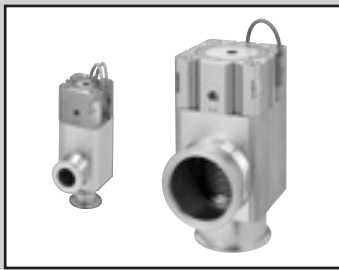
RoHS RoHS compliant

Free from substances that damage the global environment (lead, hexavalent chromium etc.)

Thorough cleanliness control system

Products are manufactured under a consistent quality control system from processing to assembly, inspection and packaging, providing high quality including cleanliness.





Air operated valve for high vacuum NC

AVB*17 Series

● Molded bellows, Aluminum body



Specifications

Item	AVB217	AVB3 17	AVB417	AVB517	AVB617	AVB717
Working fluid	Vacuum and inert gas					
Working pressure Pa (abs)	1.3 x 10 ⁻⁶ to 1 x 10 ⁵					
Max. working differential pressure MPa	0.1					
Valve seat leakage Pa·m ³ /s(He)	1.3 x 10 ⁻¹⁰ or less					
External leakage Pa·m ³ /s(He)	1.3 x 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 size mm	ø17	ø24	ø39	ø48	ø68	ø80
Conductance *2 L/s	5	13	43	74	166	242
Connection	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
JIS symbol	 NC					

*1: The values in () are for high temperature specifications.

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

*3: Grease for vacuum is applied to the O-rings of outer seal parts.

Switch specifications

Item	Proximity switch		Reed switch		
	T2H/T2V	T3H/T3V	TOH/TOV	T5H/T5V	ETOH/ETOV
Applications	Dedicated for programmable controller	For relay, programmable controller	For relay, programmable controller	For programmable controller, relay, IC circuit (without indicator lamp), serial 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	DC12/24V 5 to 50mA 100 VAC 7 to 20mA	DC12/24V 50 mA or less 100 VAC 20 mA or less	DC12/24V 5 to 50mA 110 VAC 7 to 20mA
Power consumption	-	24 mA (ON) or less at 10 VDC	-	-	-
Internal voltage drop	4 V or less	0.5 V or less	3 V or less	0V	2.4 V or less
Lamp	LED (Lit when ON)			-	LED (Lit when ON)
Leakage current	1 mA or less	10 µA or less	0mA	0mA	0mA
Lead wire length *1	Standard 1 m (oil resistant vinyl cabtyre cable 2-conductor 0.2mm ²)	Standard 1 m (oil resistant vinyl cabtyre cable 3-conductor 0.2mm ²)	Standard 1 m (Oil resistant vinyl cabtyre cable 2-conductor 0.2mm ²)		Standard 1 m (heat-resistant fluorine insulation cabtyre cable 2-conductor 0.5mm ²)
Max. shock	980m/s ²		294m/s ²		
Insulation resistance	500 MΩ and over at 20 VDC megger				500 MΩ and over at 100 VDC megger
Withstand voltage	No failure after 1000 minute of 1 VAC application.				
Ambient temperature	-10 to +60°C				-10 to +150°C
Degree of protection	IEC Standard IP67, JIS C0920 (water-tight), oil resistance				
Weight	1 m: 18 g 3 m: 49 g 5 m: 80 g				44g

*1: 3 m and 5 m lead wires are also available as options.

*2: The above max. load current is 20mA at 25°C. The current is lower than 25 mA if the operating ambient range around the switch is higher than 20°C. (60 to 5 mA at 10°C)

*3: Refer to pages 142 to 146 for precautions on using other switches.

How to order

Model No. **AVB 4 17 - 40K - 4 - D T5H 3 - H**

A Series
Actuation NC

B Connection

C Fluid temperature

D Operating port position

E Switch mounting position
*1

F Switch model No.
*2

G Switch lead wire length
*3

H Switch quantity
*4

! Precautions for model No. selection

*1: The switch can be mounted on three sides for series 2 (orifice $\phi 17$) only. Switch mounting is possible on all sides except the operating port surface.

The following model No. cannot be selected.

AVB217-16K-1-A **F G H**

AVB217-16K-2-B **F G H**

AVB217-16K-3-C **F G H**

AVB217-16K-4-D **F G H**

*2: For **C** Fluid temperature "HOM", select either ETOH or ETOV.

*3: For **F** Switch model No. "ETOH" "ETOV", "3" and "5" cannot be selected.

*4: For **F** Switch model No. "ETOH" "ETOV", "R" "D" cannot be selected.

[Example of model No.]

AVB417-40K-4-DT5H3-H

Model: AVB417 Air operated valve for high vacuum (NC)

A Series : Orifice size $\phi 39$

B Connection : NW40

C Fluid temperature : 5 to 60°C (built-in magnet)

D Operating port position : 4

E Switch mounting position : D

F Switch model No. : T5H (Axial lead wire)

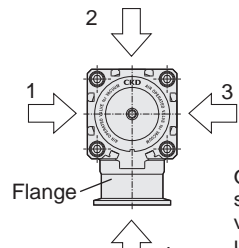
G Lead wire length : 3 m

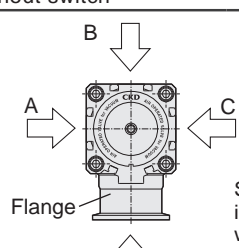
H Switch quantity : Detection at valve open

Code	Description
A Series	
2	Orifice size $\phi 17$
3	Orifice size $\phi 24$
4	Orifice size $\phi 39$
5	Orifice size $\phi 48$
6	Orifice size $\phi 68$
7	Orifice size $\phi 80$ (setting not valid for high temperature specifications)

B Connection		
16K	NW16	Only AVB217 is available
25K	NW25	Only AVB317 is available
40K	NW40	Only AVB417 is available
50K	NW50	Only AVB517 is available
63K	NW63	Only AVB617 is available
80K	NW80	Only AVB717 is available

C Fluid temperature	
Blank	5 to 60°C (built-in magnet)
HO	5 to 150°C (without magnet)
HOM	5 to 150°C (built-in magnet)

D Operating port position	
4	 <p>Operating port position is shown as 4, 1, 2, 3 when viewed from the valve upper surface.</p>
1	
2	
3	

E Switch mounting position	
Blank	Without switch
D	 <p>Switch mounting position is shown as D, A, B, C when viewed from the valve upper surface.</p>
A	
B	
C	

F Switch model No.			
Blank	Without switch		
T0H	Axial lead wire	Reed	2-wire
T5H	Lead wire L-shaped		
T0V	Lead wire L-shaped	Proximity	3-wire
T5V	Lead wire L-shaped		
T2H	Axial lead wire		
T3H	Axial lead wire	Proximity	2-wire
T2V	Lead wire L-shaped		
T3V	Lead wire L-shaped	Reed	2-wire
ETOH	Axial lead wire		
ETOV	Lead wire L-shaped		

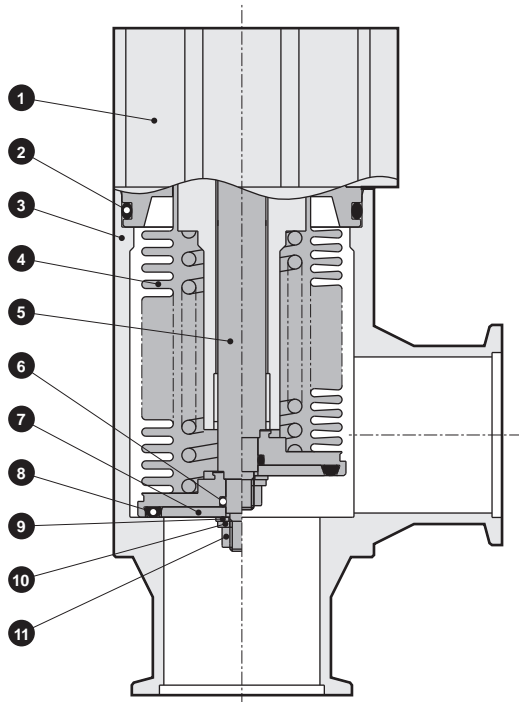
G Switch lead wire length	
Blank	1 m (standard)
3	3 m
5	5 m

H Switch quantity	
H	Detection at valve open
R	Detection at valve closed
D	Detection at valve open and closed

LGD Series
 AGD/OGD/MGD-R Series
 High durability
 Other valves for process gas
 Regulator
 Integrated gas supply system
 Safety precautions
 Air operated valve
 Manual valve
 Vacuum pressure control valves
 Safety precautions
 Related products

Internal structure and parts list (NC)

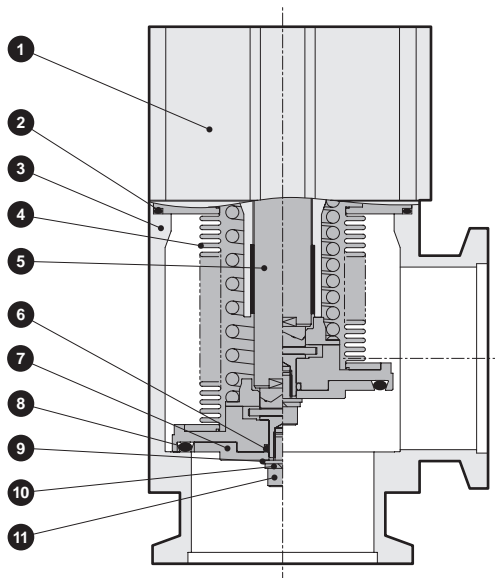
● AVB217/AVB317/AVB417/AVB517/AVB617



Part No.	Part name	Material
1	Cylinder (built-in magnet)	
2	O-ring	FKM Note
3	Body	A + 6063
4	Bellows	SUS316L
5	Rod	SUS316L
6	O-ring	FKM Note
7	Valve disk B	SUS316L
8	O-ring	FKM Note
9	Flat washer	SUS304
10	Spring washer	SUS304
11	Hexagon nut	SUS304

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

● AVB717

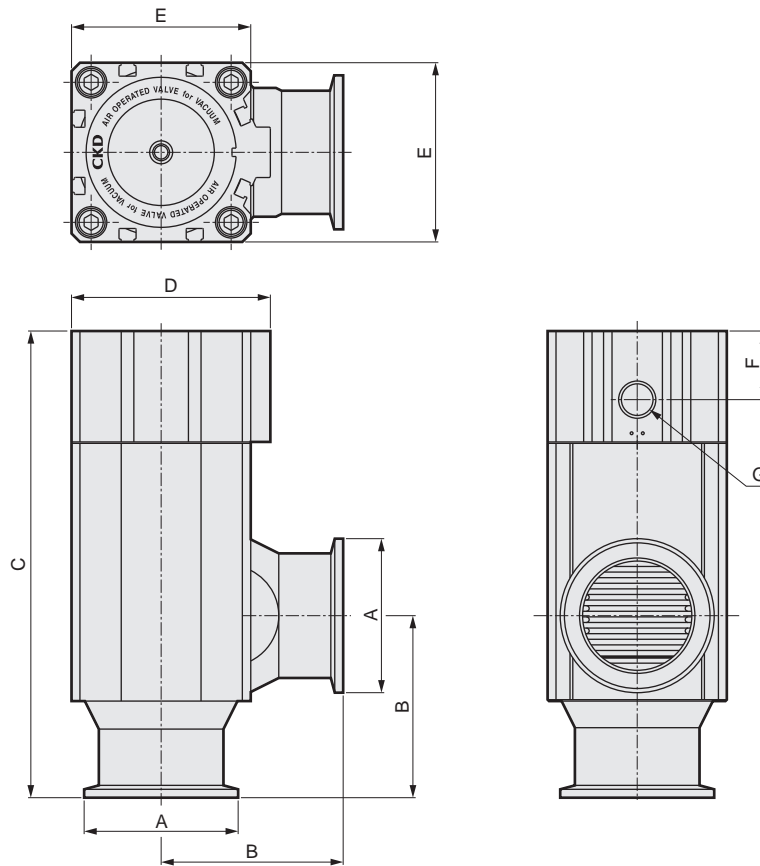


Part No.	Part name	Material
1	Cylinder (built-in magnet)	
2	O-ring	FKM Note
3	Body	A + 6063
4	Bellows	ASL350
5	Rod	SUS304
6	O-ring	FKM Note
7	Valve disk B	SUS316L
8	O-ring	FKM Note
9	Flat washer	SUS304
10	Spring washer	SUS304
11	Hexagon socket head cap screw	SUS304

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

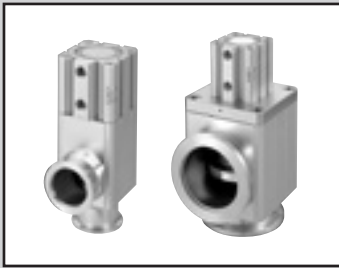
Dimensions (NC)

● AVB217/AVB317/AVB417/AVB517/AVB617/AVB717



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

Components for process gases
 AGD/OGD/
 MGD-R Series
 High durability
 for process gas
 Regulator
 Integrated gas
 supply system
 Safety precautions
 Air operated valve
 High vacuum components
 Manual valve
 Vacuum pressure
 control valves
 Safety precautions
 Related products



Air operated valve For high vacuum Double acting

AVB*37 Series

● Molded bellows, Aluminum body



Specifications

Item	AVB237	AVB3 37	AVB437	AVB537	AVB637	AVB737	AVB837
Working fluid	Vacuum and inert gas						
Working pressure Pa (abs)	1.3 x 10 ⁻⁶ to 1 x 10 ⁵						
Max. working differential pressure MPa	0.1						
Valve seat leakage Pa·m ³ /s(He)	1.3 x 10 ⁻¹⁰ or less						
External leakage Pa·m ³ /s(He)	1.3 x 10 ⁻¹¹ or less						
Proof pressure MPa	0.3						
Fluid temperature °C	5 to 60						
Ambient temperature °C	0 to 60 (no freezing)						
Orifice size mm	ø17	ø24	ø39	ø48	ø68	ø80	ø100
Conductance *1 L/s	5	13	43	74	166	242	372
Connection	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
JIS symbol	<p>Double acting</p>						

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

*2: Grease for vacuum is applied to the O-rings of outer seal parts.

Switch specifications

Item	Proximity switch		Reed switch	
	T2H/T2V	T3H/T3V	TOH/TOV	T5H/T5V
Applications	Dedicated for programmable controller	For relay, programmable controller	For relay, programmable controller	For programmable controller, relay, IC circuit (without indicator lamp), serial connection
Power supply voltage	-	10 to 28 VDC	-	-
Load voltage/current	10 to 30 VDC, 5 to 20mA *2	30 VDC or less, 100mA or less	12/24 VDC 5 to 50mA 100 VAC 7 to 20mA	12/24 VDC 50 mA or less 100 VAC 20 mA or less
Power consumption	-	24 mA (ON) or less at 10 VDC	-	-
Internal voltage drop	4 V or less	0.5 V or less	3 V or less	0V
Lamp	LED (Lit when ON)			-
Leakage current	1 mA or less	10 µA or less	0mA	0mA
Lead wire length *1	Standard 1 m (oil resistant vinyl cabtyre cable 2-conductor 0.2mm ²)	Standard 1 m (oil resistant vinyl cabtyre cable 3-conductor 0.2mm ²)	Standard 1 m (oil resistant vinyl cabtyre cable 2-conductor 0.2mm ²)	
Max. shock	980m/s ²		294m/s ²	
Insulation resistance	500 MΩ and over at 20 VDC megger			
Withstand voltage	No failure after 1000 minute of 1 VAC application.			
Ambient temperature	-10 to +60°C			
Degree of protection	IEC Standard IP67, JIS C0920 (water-tight), oil resistance			
Weight	1 m: 18 g 3 m: 49 g 5 m: 80 g			

*1: 3 m and 5 m lead wires are also available as options.

*2: The above max. load current is 20mA at 25°C. The current is lower than 25 mA if the operating ambient range around the switch is higher than 20°C. (60 to 5 mA at 10°C)

*3: Refer to pages 142 to 146 for precautions on using other switches.

How to order

Model No. **AVB 4 37 - 40K - 4 - D T5H 3 - H**

A Series
Actuation
Double acting

B Connection

C Fluid temperature

D Operating port position

E Switch mounting position
*1

F Switch model No.

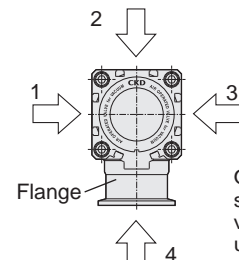
G Switch lead wire length

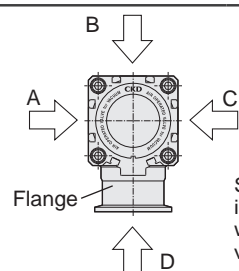
H Switch quantity

Code	Description
A Series	
2	Orifice size ø17
3	Orifice size ø24
4	Orifice size ø39
5	Orifice size ø48
6	Orifice size ø68
7	Orifice size ø80
8	Orifice size ø100

B Connection		
16K	NW16	Only AVB237 is available
25K	NW25	Only AVB337 is available
40K	NW40	Only AVB437 is available
50K	NW50	Only AVB537 is available
63K	NW63	Only AVB637 is available
80K	NW80	Only AVB737 is available
100K	NW100	Only AVB837 is available

C Fluid temperature	
Blank	5 to 60°C (built-in magnet)

D Operating port position	
4	 <p>Operating port position is shown as 4, 1, 2, 3 when viewed from the valve upper surface.</p>
1	
2	
3	

E Switch mounting position	
Blank	Without switch
D	 <p>Switch mounting position is shown as D, A, B, C when viewed from the valve upper surface.</p>
A	
B	
C	

F Switch model No.			
Blank	Without switch		
T0H	Axial lead wire	Reed	2-wire
T5H			
T0V	Lead wire L-shaped	Proximity	3-wire
T5V			
T2H	Axial lead wire	Proximity	2-wire
T3H			
T2V	Lead wire L-shaped	Proximity	3-wire
T3V			

G Switch lead wire length	
Blank	1 m (standard)
3	3 m
5	5 m

H Switch quantity	
H	Detection at valve open
R	Detection at valve closed
D	Detection at valve open and closed

⚠ Precautions for model No. selection

*1: The switch can be mounted on three sides for series 2 (orifice ø17) only. Switch mounting is possible on all sides except the operating port surface.

The following model No. cannot be selected.

AVB237-16K-1-A **F G H**

AVB237-16K-2-B **F G H**

AVB237-16K-3-C **F G H**

AVB237-16K-4-D **F G H**

[Example of model No.]

AVB437-40K-4-DT5H3-H

Model: AVB417 Air operated valve for high vacuum (Double acting)

A Series : Orifice size ø39

B Connection : NW40

C Fluid temperature : 5 to 60°C (built-in magnet)

D Operating port position : 4

E Switch mounting position : D

F Switch model No. : T5H (Axial lead wire)

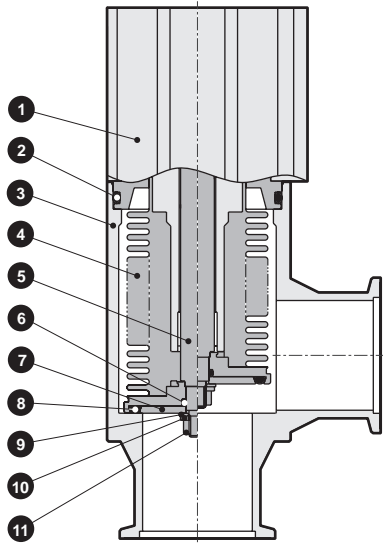
G Lead wire length : 3 m

H Switch quantity : Detection at valve open

LGD Series
 AGD/OGD/ MGD-R Series
 High durability
 Other valves for process gas
 Regulator
 Integrated gas supply system
 Safety precautions
 Air operated valve
 Manual valve
 High vacuum components
 Vacuum pressure control valves
 Safety precautions
 Related products

Internal structure and parts list (Double acting)

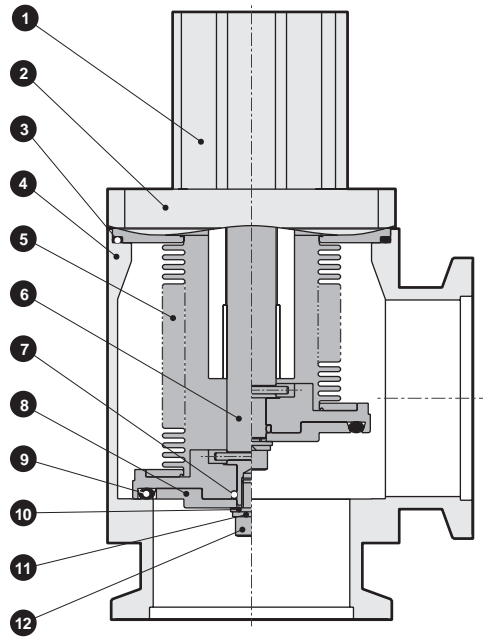
● AVB237/AVB337/AVB437/AVB537/AVB637



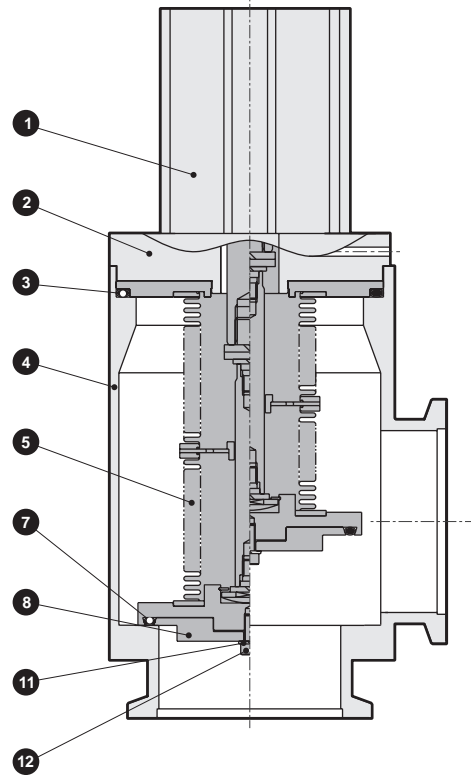
Part No.	Part name	Material
1	Cylinder (built-in magnet)	
2	O-ring	FKM Note
3	Body	A + 6063
4	Bellows	SUS316L
5	Rod	SUS304
6	O-ring	FKM Note
7	Valve disk B	SUS316L
8	O-ring	FKM Note
9	Flat washer	SUS304
10	Spring washer	SUS304
11	Hexagon nut	SUS304

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

● AVB737



● AVB837

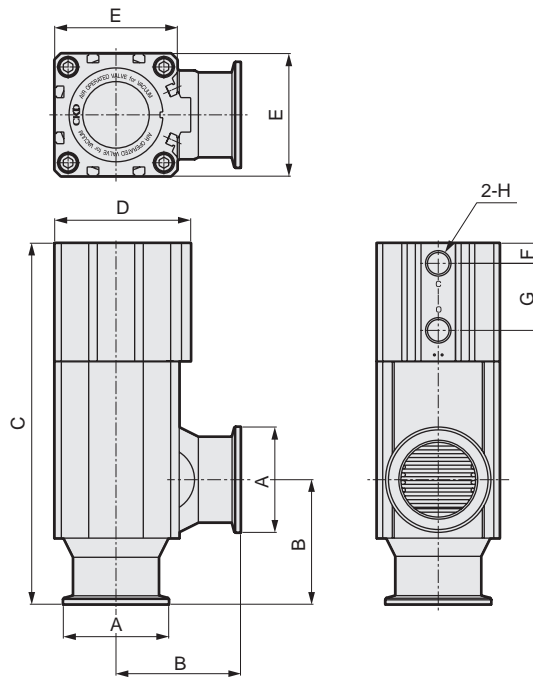


Part No.	Part name	Material	Part No.	Part name	Material
1	Cylinder (built-in magnet)		7	O-ring	FKM *
2	Cylinder adaptor	AVB737:A5056 AVB837:A5052	8	Valve disk B	SUS316L
3	O-ring	FKM *	9	O-ring	FKM *
4	Body	A + 6063	10	Flat washer	SUS304
5	Bellows	ASL350	11	Spring washer	SUS304
6	Rod	SUS304	12	Hexagon socket head cap screw	SUS304

* Contact CKD for other O-ring material compatibility.

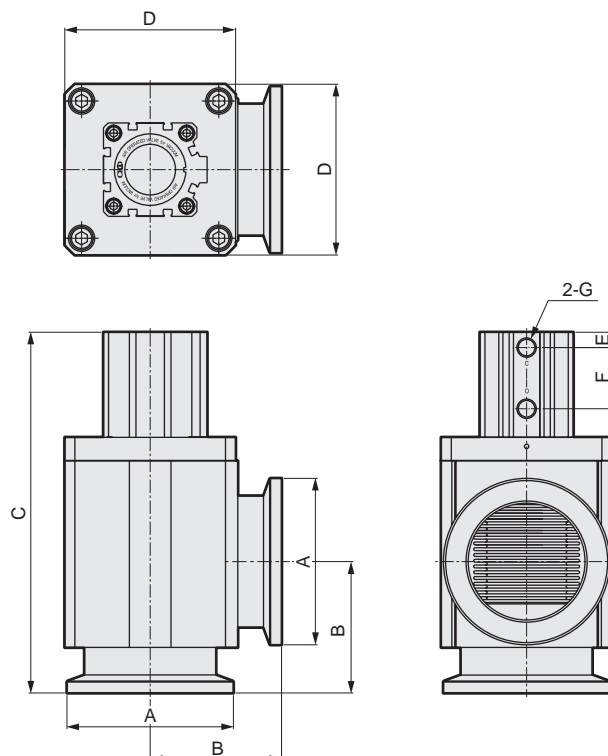
Dimensions (Double acting)

● 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

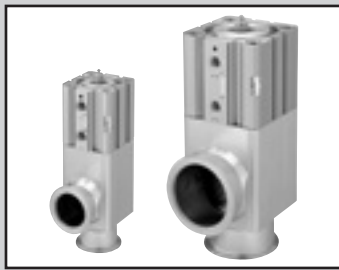


Model No.	A	B	C	D	E	F	G
AVB737	ø114 (NW80)	90	247	117	10.5	42	Rc1/4
AVB837	ø134 (NW100)	108	390	154	13	94.5	Rc3/8

LGD Series
 AGD/OGD/MGD-R Series
 High durability
 Other valves for process gas
 Regulator
 Integrated gas supply system
 Safety precautions
 Air operated valve
 Manual valve
 Vacuum pressure control valves
 Safety precautions
 Related products

Components for process gases

High vacuum components



Air operated valve for high vacuum Two-stage

AVB*47 Series

- Molded bellows, Aluminum body



Specifications

Item	AVB347	AVB447	AVB547	AVB647
Working fluid	Vacuum and inert gas			
Working pressure Pa (abs)	1.3 x 10 ⁻⁶ to 1 x 10 ⁻⁵			
Max. working differential pressure MPa	0.1			
Valve seat leakage Pa·m ³ /s(He)	1.3 x 10 ⁻¹⁰ or less			
External leakage Pa·m ³ /s(He)	1.3 x 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 size mm	ø24	ø39	ø48	ø68
Conductance *2 L/s	13	43	74	166
Connection	NW25	NW40	NW50	NW63
Main exhaust operating pressure MPa	0.4 to 0.6			
Soft 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 the theoretical calculation value in the molecular region, and not the actual measured value.

*3: Grease for vacuum is applied to the O-rings of outer seal parts.

Switch specifications

Item	Proximity switch		Reed switch		
	T2H/T2V	T3H/T3V	TOH/TOV	T5H/T5V	ETOH/ETOV
Applications	Dedicated for programmable controller	For relay, programmable controller	For relay, programmable controller	For programmable controller, relay, IC circuit (without indicator lamp), serial 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 50mA 100 VAC 7 to 20mA	12/24 VDC 50 mA or less 100 VAC 20 mA or less	12/24 VDC 5 to 50mA 110 VAC 7 to 20mA
Power consumption	-	24 mA (ON) or less at 10 VDC	-	-	-
Internal voltage drop	4 V or less	0.5 V or less	3 V or less	0V	2.4 V or less
Lamp	LED (Lit when ON)			-	LED (Lit when ON)
Leakage current	1 mA or less	10 µA or less	0mA	0mA	0mA
Lead wire length *1	Standard 1 m (oil resistant vinyl cabtyre cable 2-conductor 0.2mm ²)	Standard 1 m (oil resistant vinyl cabtyre cable 3-conductor 0.2mm ²)	Standard 1 m (Oil resistant vinyl cabtyre cable 2-conductor 0.2mm ²)		Standard 1 m (heat-resistant fluorine insulation cabtyre cable 2-conductor 0.5mm ²)
Max. shock	980m/s ²		294m/s ²		
Insulation resistance	500 MΩ and over at 20 VDC megger				500 MΩ and over at 100 VDC megger
Withstand voltage	No failure after 1000 minute of 1 VAC application.				
Ambient temperature	-10 to +60°C				-10 to +150°C
Degree of protection	IEC Standard IP67, JIS C0920 (water-tight), oil resistance				
Weight	1 m: 18 g 3 m: 49 g 5 m: 80 g				44g

*1: 3 m and 5 m lead wires are also available as options.

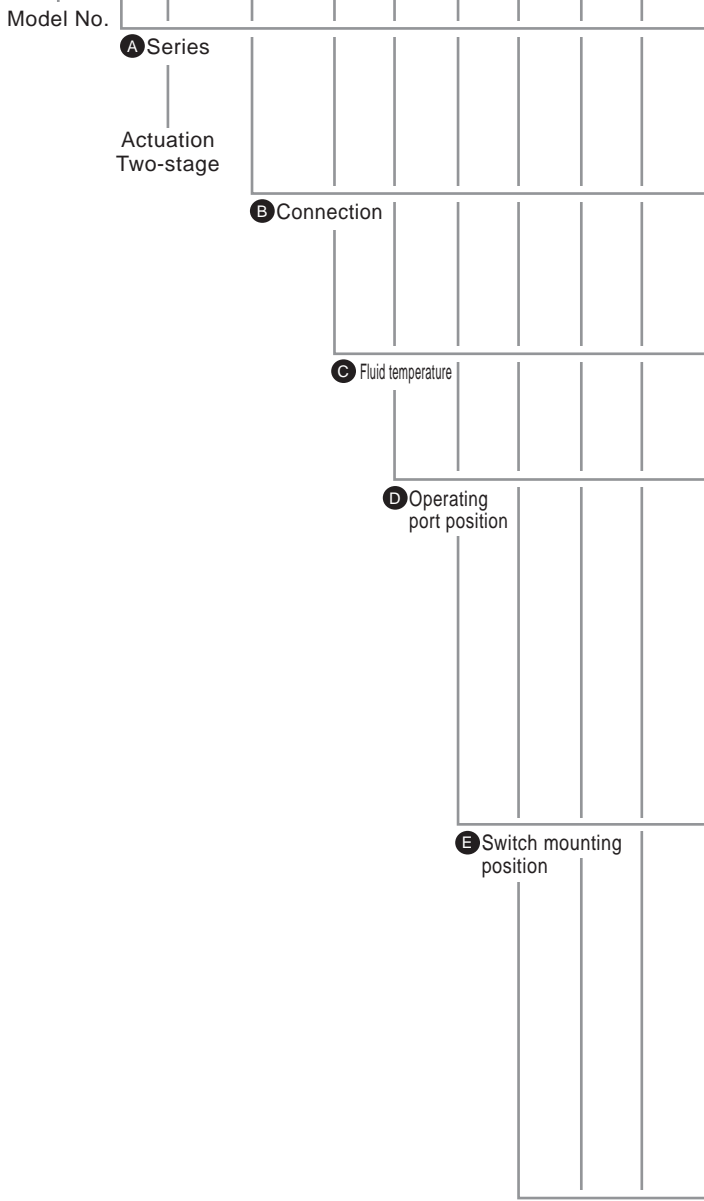
*2: The above max. load current is 20mA at 25°C. The current is lower than 25 mA if the operating ambient range around the switch is higher than 20°C. (60 to 5 mA at 10°C)

*3: Refer to pages 142 to 146 for precautions on using other switches.

*4: Only the main exhaust valve can be mounted on the switch.

How to order

Model No. **AVB 4 47 - 40K - 4 - D T5H 3 - H**



Code	Description	
A Series		
3	Orifice size ø24	
4	Orifice size ø39	
5	Orifice size ø48	
6	Orifice size ø68	

B Connection		
25K	NW25	Only AVB347 is available
40K	NW40	Only AVB447 is available
50K	NW50	Only AVB547 is available
63K	NW63	Only AVB647 is available

C Fluid temperature	
Blank	5 to 60°C (built-in magnet)
HO	5 to 150°C (without magnet)
HOM	5 to 150°C (built-in magnet)

D Operating port position	
4	<p>Operating port positions are shown as 4, 1, 2, 3 with respect to the flange direction when viewed from the valve upper surface.</p>
1	
2	
3	

E Switch mounting position	
Blank	Without switch
D	Only the main exhaust valve can be mounted.
A	<p>Switch mounting positions are shown as D, A, B, C with respect to the flange direction when viewed from the valve upper surface.</p>
B	
C	

F Switch model No.			
Blank	Without switch		
T0H	Axial lead wire	Reed	2-wire
T5H			
T0V			
T5V	Lead wire L-shaped	Proximity	3-wire
T2H	Axial lead wire		2-wire
T3H	Lead wire L-shaped		3-wire
T2V	Axial lead wire	Reed	2-wire
T3V	Lead wire L-shaped		
ETOH	Axial lead wire	Reed	2-wire
ETOV	Lead wire L-shaped		

G Switch lead wire length	
Blank	1 m (standard)
3	3 m
5	5 m

H Switch quantity	
H	Detection at valve open
R	Detection at valve closed
D	Detection at valve open and closed

! Precautions for model No. selection

- *1: For C Fluid temperature "HOM", select either ETOH or ETOV.
- *2: For F Switch model No. "ETOH""ETOV", "3" and "5" cannot be selected.
- *3: For F Switch model No. "ETOH""ETOV", "R""D" cannot be selected.

[Example of model No.]

AVB447-40K-4-DT5H3-H

Model: AVB447 Air operated valve for high vacuum (Two-stage)

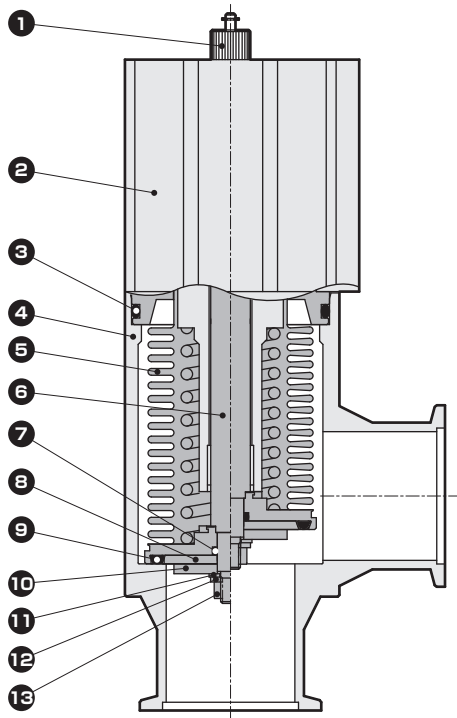
- A Series : Orifice size ø39
- B Connection : NW40
- C Fluid temperature : 5 to 60°C (built-in magnet)
- D Operating port position : 4
- E Switch mounting position : D
- F Switch model No. : T5H (Axial lead wire)
- G Lead wire length : 3 m
- H Switch quantity : Detection at valve open

G Switch lead wire length *2

H Switch quantity *3

LGD Series
 AGD/OGD/MGD-R Series
 High durability
 Other valves for process gas
 Regulator
 Integrated gas supply system
 Safety precautions
 Air operated valve
 Manual valve
 Vacuum pressure control valves
 Safety precautions
 Related products

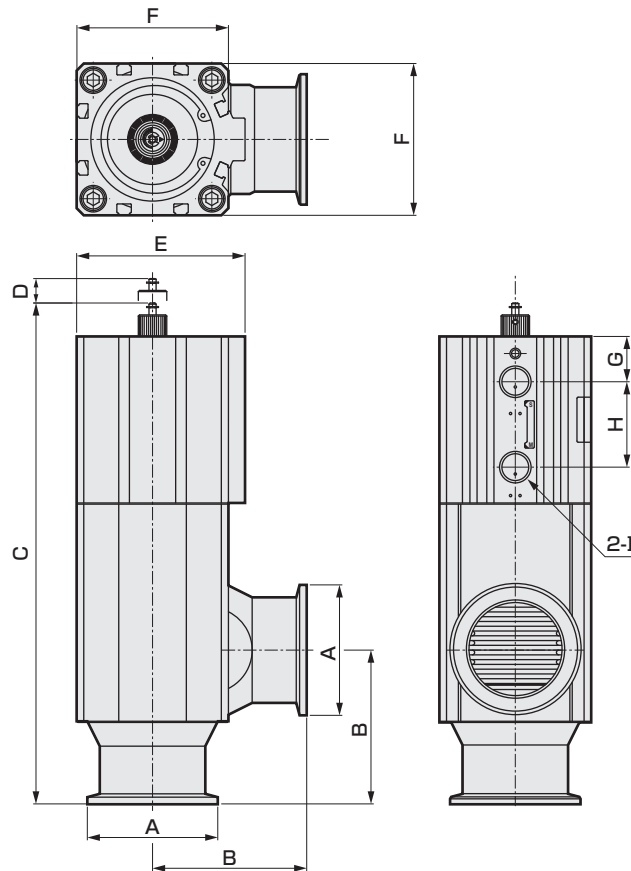
Internal structure and parts list



Part No.	Part name	Material
1	Adjusting nut	A + 5056
2	Cylinder (built-in magnet)	
3	O-ring	FKM Note
4	Body	A + 6063
5	Bellows	SUS316L
6	Rod	SUS304
7	O-ring	FKM Note
8	Valve disk B	SUS316L
9	O-ring	FKM Note
10	Skirt	SUS304
11	Flat washer	SUS304
12	Spring washer	SUS304
13	Hexagon nut	SUS304

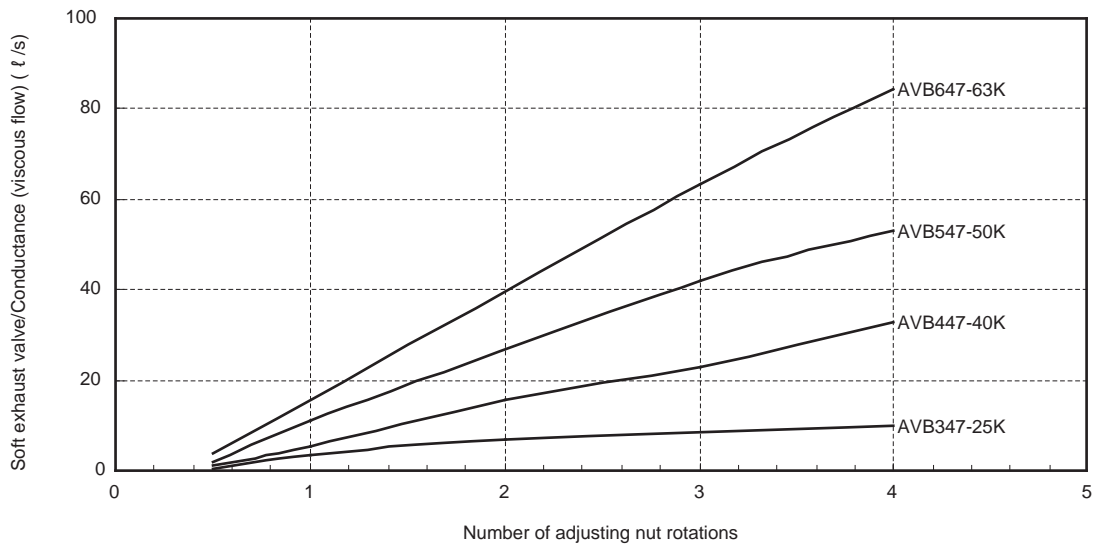
Note: Contact CKD for other O-ring material compatibility.

Dimensions



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 Soft exhaust valve/Conductance



MEMO

Components for process gases	
LGD Series	AGD/OGD/ MGD-R Series
High durability	Other valves for process gas
Regulator	Integrated gas supply system
Safety precautions	Safety precautions
Air operated valve	High vacuum components
Manual valve	Vacuum pressure control valves
Safety precautions	Safety precautions
Related products	

Air operated valve for high vacuum

AVB**7 Series Made-to-order product

Contact CKD for details.



Made-to-order product

Large bore size

Model No.	Actuation	Connection
AVB937	Double acting NW160	

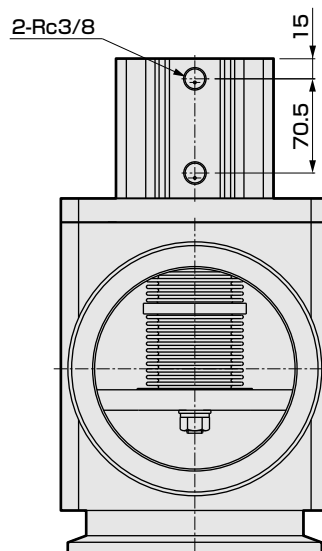
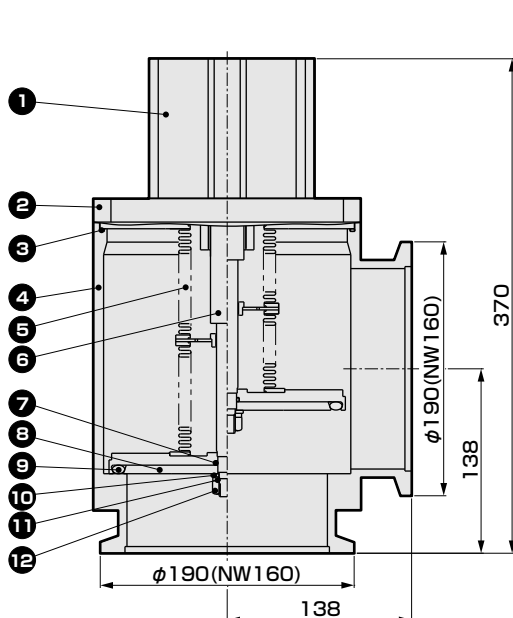
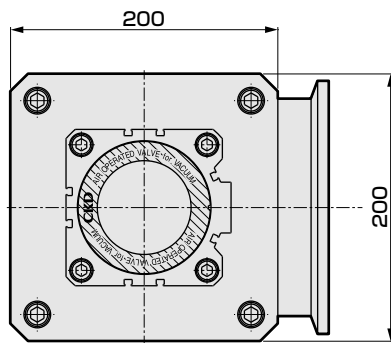


Reference specifications

Item	AVB937-X*
Working fluid	Vacuum and inert gas
Working pressure Pa (abs)	1.3×10^{-6} to 1×10^5
Max. working differential pressure MPa	0.1
Valve seat leakage $\text{Pa m}^3/\text{s(He)}$	1.3×10^{-10} or less
External leakage $\text{Pa m}^3/\text{s(He)}$	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 size mm	$\phi 150$
Conductance *1 L/s	1,100
Connection	NW160
Operating pressure MPa	0.3 to 0.5
Weight kg	18
JIS symbol	

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

Internal structure and parts list / Dimensions



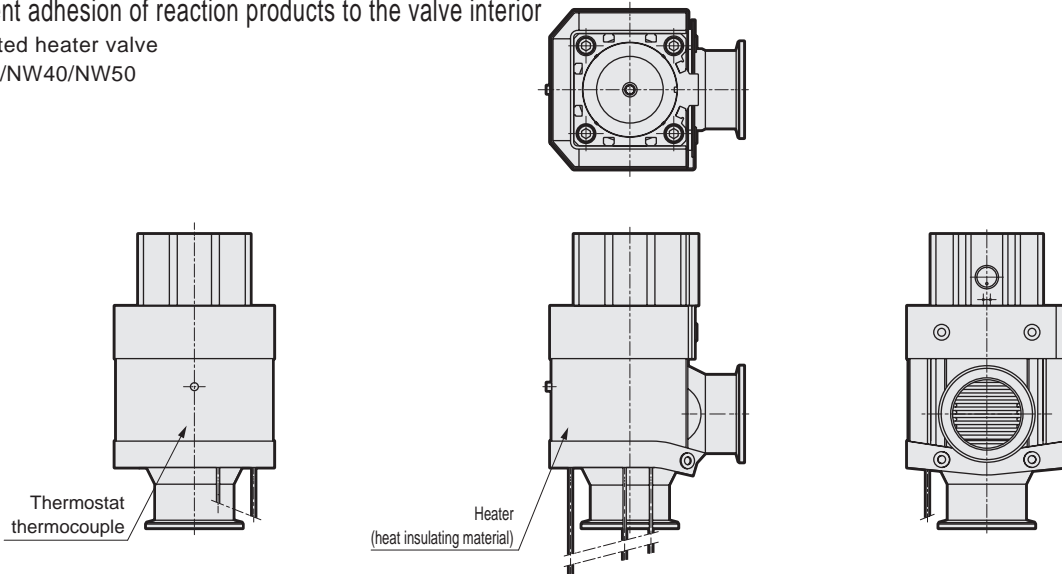
Part No.	Part name	Material
1	Cylinder (built-in magnet)	
2	Cylinder adaptor	A + 5056
3	O-ring	FKM
4	Body	A + 5052
5	Bellows	ASL350
6	Rod	SUS304
7	O-ring	FKM
8	Valve disk B	SUS304
9	O-ring	FKM
10	Flat washer	SUS304
11	Spring washer	SUS304
12	Hexagon nut	SUS304

*2: Contact CKD for other O-ring material compatibility.

Supports heater for valve heating

To prevent adhesion of reaction products to the valve interior

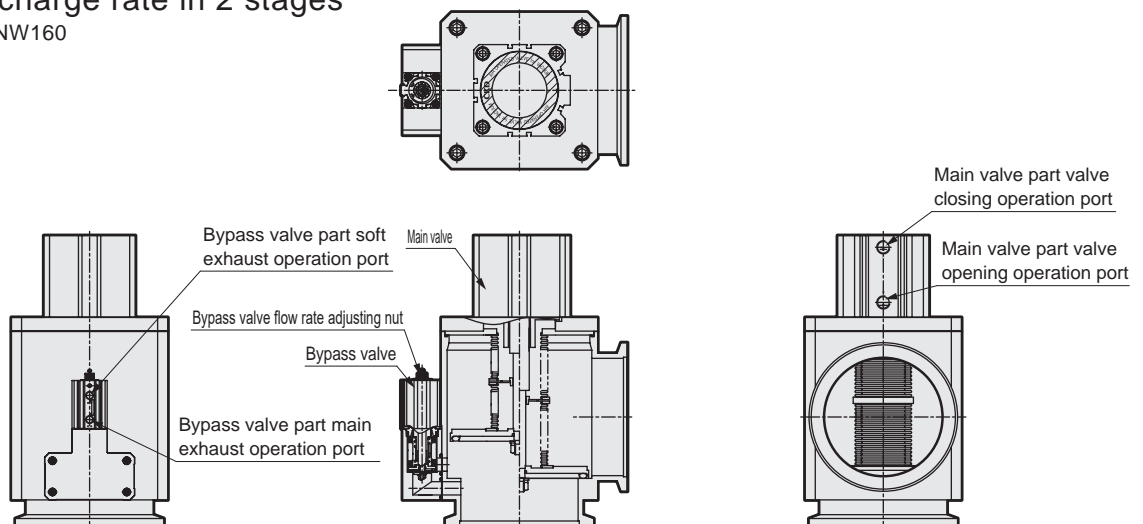
- Jacketed heater valve
- NW25/NW40/NW50



Soft exhaust (external bypass valve) compatible

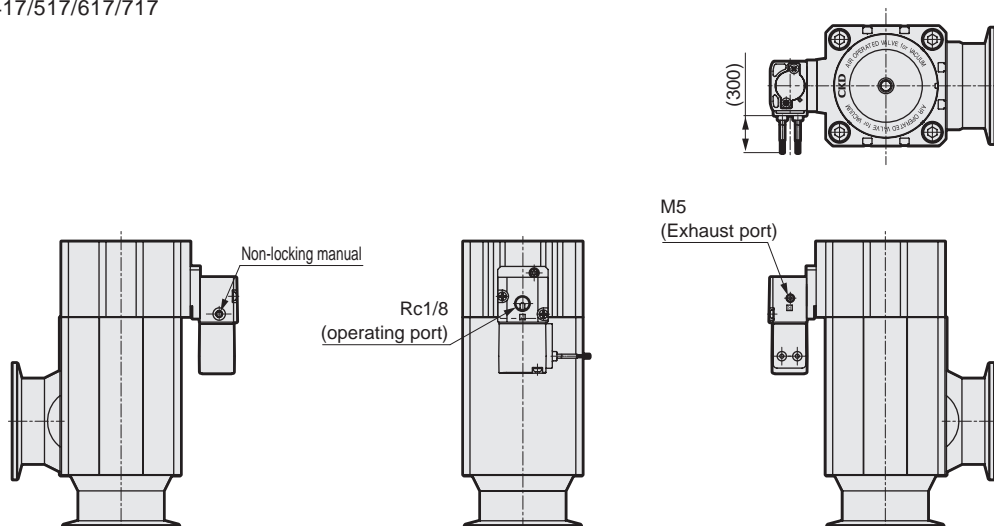
Controls discharge rate in 2 stages

- NW80/NW100/NW160



With solenoid valve

- AVB217/317/417/517/617/717
- NC



LG-D Series	AGD/OGD/ MGD-R Series	High durability	Other valves for process gas	Regulator	Integrated gas supply system	Safety precautions	Air operated valve	High vacuum components	Manual valve	Vacuum pressure control valves	Safety precautions	Related products
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Air operated valve for high vacuum

AVB⁵⁶⁷⁸*3 Series

- Molded bellows
- Stainless steel compact body



Model No. Actuation Connection

AVB513 NC NW25

AVB613 NC NW40

AVB713 NC NW50

AVB813 NC NW80

Model No. Actuation Connection

AVB523 NO NW25

AVB623 NO NW40

AVB723 NO NW50

AVB823 NO NW80

Model No. Actuation Connection

AVB533 Double acting NW25

AVB633 Double acting NW40

AVB733 Double acting NW50

AVB833 Double acting NW80

Smaller and with improved maintainability.

● Long service life molded bellows

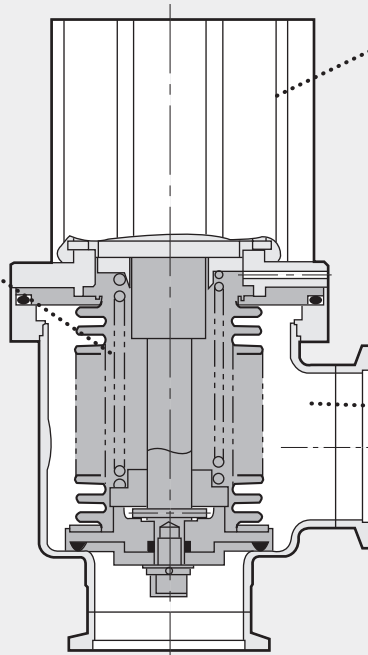
Special stainless steel material (ASL350) used.

Durability: 1 million cycles (*1)

*1 Service life when the working fluid is inert gas within the specified range and does not contain solids such as reaction products.

● Free exhaust direction

Vacuum pump connection is possible on either port.



● Miniature switch can be mounted

Reed switch for operation check (proximity, reed) can be connected. (Retrofitting is also possible)

● No gas accumulation

The bulge-integrated molding creates a streamlined flow path and smooth surfaces. 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).



Safety precautions

Read the following Safety Precautions on Intro Page 9 and pages 139 to 146 to ensure correct and safe use of the product.

- Working fluids
- Mounting
- Direction when connecting pipes
- Proximity switch, reed switch

Contact CKD for custom-made orders.

1. Change in length between flanges
2. Change in flange type
3. Heating of valving element
4. Change in gas contact part O-ring material
5. Slow exhaust
6. Straight piping

Specifications



Descriptions	AVB5 ¹ / ₃	AVB6 ¹ / ₃	AVB7 ¹ / ₃	AVB8 ¹ / ₃	
Working fluid	Vacuum and inert gas				
Working pressure Pa(abs)	1.3 x 10 ⁻⁶ to 1 x 10 ⁻⁵				
Max. working differential pressure MPa	0.1				
Valve seat leakage Pa·m ³ /s (He)	1.3 x 10 ⁻¹⁰ or less				
External leakage Pa·m ³ /s (He)	1.3 x 10 ⁻¹¹ or less				
Proof pressure MPa	0.3				
Fluid temperature °C	5 to 60				
Ambient temperature °C	0 to 60 (no freezing)				
Orifice size mm	ø24	ø40	ø50	ø80	
Stroke length mm	10	20	22	32	
Conductance *1 L/s	13	52	80	242	
Connection	NW25	NW40	NW50	NW80	
Operating pressure MPa	0.4 to 0.6				
Weight kg	NC	1.1	1.9	3.6	7.9
	NO	1.1	1.9	3.5	7.8
	Double acting	1.0	1.6	3.2	7.3
JIS symbol	<ul style="list-style-type: none"> • NC • NO • Double acting 				

*1: The conductance value is the theoretical calculation value in the molecular region, and not the actual measured value.
*2: Grease for vacuum is applied to the O-rings of outer seal parts.

Switch specifications

Descriptions	Proximity switch		Reed switch	
	T2H/T2V	T3H/T3V	TOH/TOV	T5H/T5V
Applications	Dedicated for programmable controller	For relay, programmable controller	For relay, programmable controller	For programmable controller, relay, IC circuit (without indicator lamp), serial connection
Power supply voltage	–	10 to 28 VDC	–	–
Load voltage/current	10 to 30 VDC, 5 to 20mA *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
Power consumption	–	10 mA or less when ON at 24 VDC	–	–
Internal voltage drop	4 V or less	0.5 V or less	3 V or less	0 V
Lamp	LED (Lit 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 cable 2-conductor 0.2 mm ²)	Standard 1 m (oil resistant vinyl cabtyre cable 3-conductor 0.2 mm ²)	Standard 1 m (oil resistant vinyl cabtyre cable 2-conductor 0.2 mm ²)	
Max. shock	980 m/s ²		294 m/s ²	
Insulation resistance	20 MΩ and over at 500 VDC megger			
Withstand voltage	No failure after 1 minute of 1,000 VAC application.			
Ambient temperature	-10 to +60°C			
Degree of protection	IEC Standard IP67, JIS C0920 (water-tight), oil resistance			
Weight	1 m:18 g 3 m:49 g 5 m:80 g			

*1: In addition, 3 m and 5 m lead wires are available as options.

*2: The above max. load current is 20 mA at 25°C. The current is lower than 25 mA if the operating ambient range around the switch is higher than 20°C. (60 to 5 mA at 10°C)

*3: Refer to pages 142 to 146 for precautions on using other switches.

Components for process gases
 Other valves for process gas
 Regulator
 Integrated gas supply system
 Safety precautions
 Air operated valve
 Manual valve
 High vacuum components
 Vacuum pressure control valves
 Safety precautions
 Related products

How to order

Model No. **AVB** **6** **1** **3** - **40K** - **T5H** **3** - **H**

Model No.

A Series

B Actuation

C Connection

D Switch model No

E Switch lead wire length

F Switch quantity
(detecting position)

Code	Content
A Series	
5	Orifice size $\phi 24$
6	Orifice size $\phi 40$
7	Orifice size $\phi 50$
8	Orifice size $\phi 80$

B Actuation	
1	NC (normally closed)
2	NO (normally open)
3	Double acting

C Connection		
25K	NW25	Only AVB5*3 is available
40K	NW40	Only AVB6*3 is available
50K	NW50	Only AVB7*3 is available
80K	NW80	Only AVB8*3 is available

D Switch model No.			
Blank	Without switch		
T0H	Axial lead wire	Reed	2-wire
T5H			
T0V	Radial lead wire		
T5V		Proximity	3-wire
T2H	Axial lead wire		
T3H			
T2V	Radial lead wire		
T3V		3-wire	

E Switch lead wire length	
Blank	1 m (standard)
3	3 m
5	5 m

F Switch quantity	
H	Detection at valve open
R	Detection at valve closed
D	Detection at valve open and closed

[Example of model No.]

AVB613-40K-T5H3-H

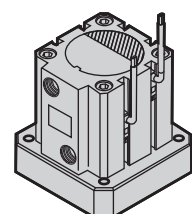
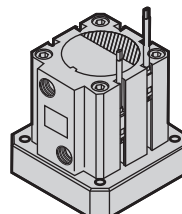
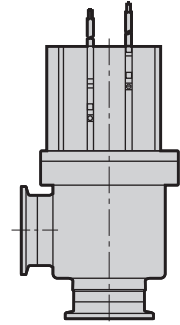
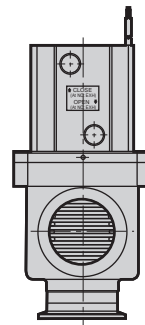
Model: AVB613 Air operated valve for high vacuum

- A** Series : Orifice $\phi 40$
- B** Actuation : NC (normally closed)
- C** Connection : NW40
- D** Switch model No. : T5H
(axial lead wire)
- E** Lead wire length : 3 m
- F** Switch quantity : Detection at valve open

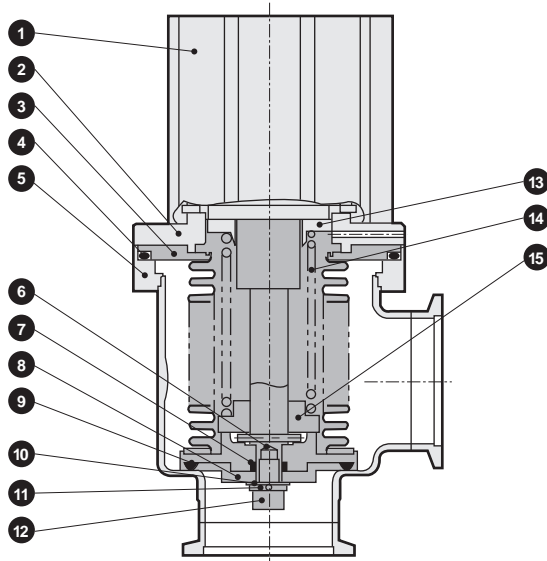
Appearance with switch mounted

● T*H type
(axial lead wire)

● T*V type
(radial lead wire)



Internal structure and parts list



(cross-section view of NC)

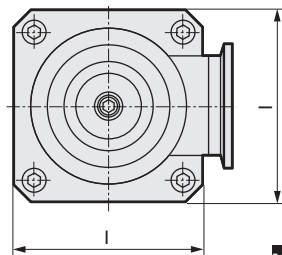
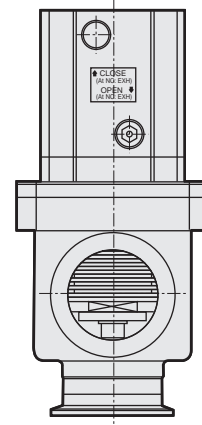
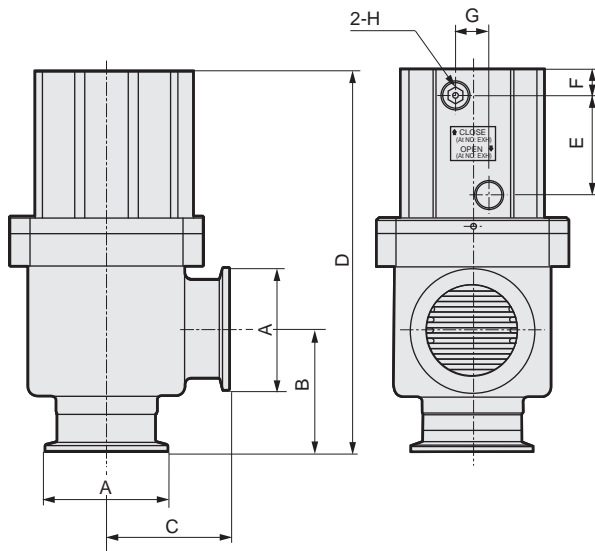
No.	Part name	Material
1	Compact cylinder	
2	Cylinder adaptor	A5056
3	Bellows assembly	ASL350/SUS316L
4	O-ring	FKM Note
5	Body assembly	SUS316L
6	Parallel pin	SUS301
7	O-ring	FKM Note
8	Valve disc B	SUS316L
9	O-ring	FKM Note
10	Plain washer	SUS304
11	Spring washer	SUS304
12	Hexagon socket head cap screw	SUS304
13	Spring holder B	A5056
14	Spring	SWOSC-V (Electrodeposition)
15	Spring holder A	A5056

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

Dimensions

● AVB*13 (NC)/AVB*33 (Double acting)

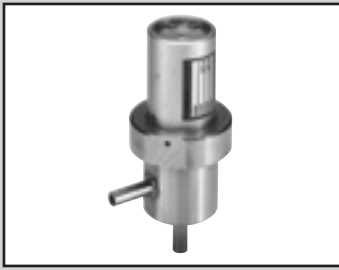
● AVB*23 (NO)



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

Model No./Code	A	B	C	D	E	F	G	H	I
AVB5*3	ø 40(NW25)	50	50	151.5(162.5)	37	8	10	Rc1/8	77
AVB6*3	ø 55(NW40)	55	55	170.5(181.5)	44.5	10.5	15	Rc1/4	86
AVB7*3	ø 75(NW50)	70	70	208	52	11	15	Rc1/4	112
AVB8*3	ø114(NW80)	90	105	258	64.5	13	15	Rc3/8	137

LGD Series
 AGD/OGD/MGD-R Series
 High durability
 Other valves for process gas
 Regulator
 Integrated gas supply system
 Safety precautions
 Air operated valve
 Manual valve
 Vacuum pressure control valves
 Safety precautions
 Components for process gases
 High vacuum components
 Related products



Air operated valve for high vacuum

AVB21-8T Series


● NC Molded bellows seal 1/4" Tube

AVP21-8T Series

● NC Double O-ring seal 1/4" Tube



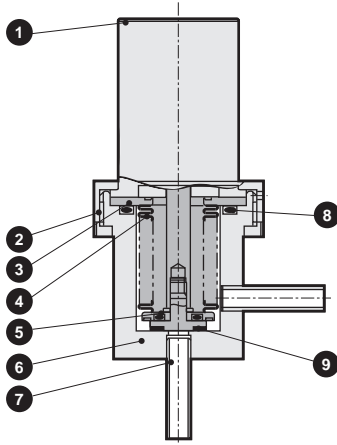
Specifications

Descriptions	AVB21-8T	AVP21-8T
Working fluid	Vacuum and inert gas	
Working pressure Pa (abs)	1.3 x 10 ⁻⁶ to 2.5 x 10 ⁵	
Max. working differential pressure MPa	0.25	
Valve seat leakage Pa·m ³ /s (He)	1.3 x 10 ⁻⁹ or less	
External leakage Pa·m ³ /s (He)	1.3 x 10 ⁻⁹ or less	
Proof pressure MPa	0.3	
Fluid temperature °C	5 to 60	
Ambient temperature °C	0 to 60 (no freezing)	
Orifice size mm	5	
Stroke length mm	3	
Conductance *1 L/s	-	
Connection	1/4" tube	
Operating pressure MPa	0.3 to 0.5	
Weight kg	0.25	
JIS symbol	● NC 	

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

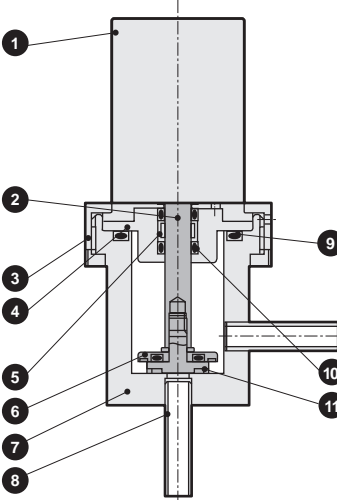
Internal structure and parts list

● AVB 21-8T (NC)



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
9	Valve disc A	FKM/SUS 304

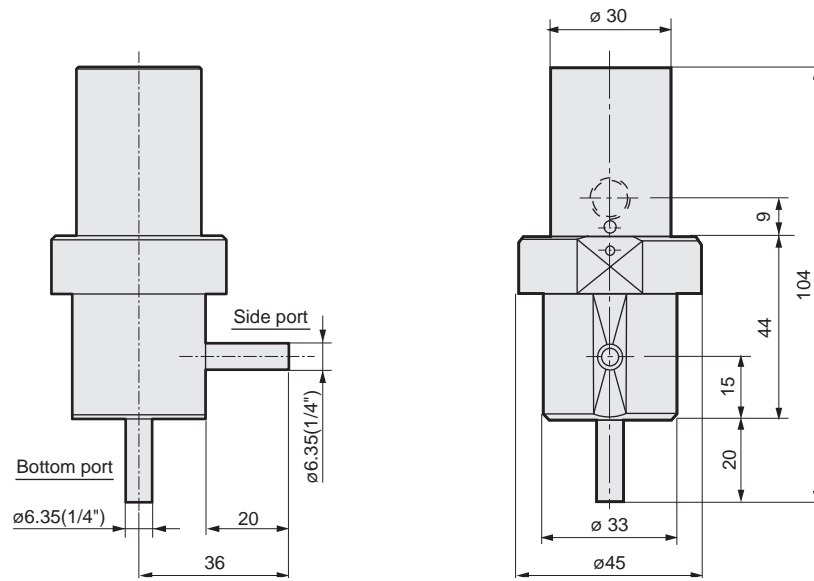
● AVP21-8T (NC)



No.	Part name	Material
1	Cylinder	
2	Rod	SUS304
3	Ring	C3604
4	O-ring holder	SUS304
5	Grease stopper	SUS304
6	Valve disc B	SUS304
7	Body	SUS304
8	Pipe	SUS304
9	O-ring	FKM
10	O-ring	FKM
11	Valve disc A	FKM/SUS 304

Dimensions

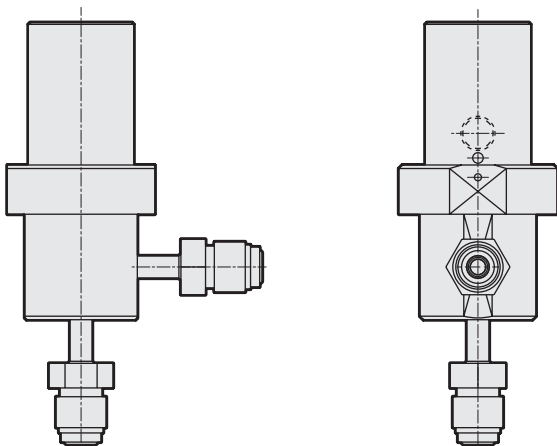
- AVB 21-8T (NC)
- AVP21-8T (NC)



■ Flange compatible

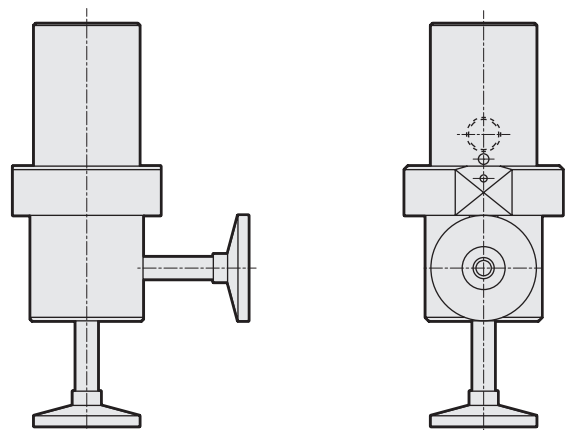
- With fitting

Made-to-order product



- NW flange

Made-to-order product



LGD Series	AGD/OGD/ MGD-R Series	High durability	Other valves for process gas	Regulator	Integrated gas supply system	Safety precautions	Air operated valve	Manual valve	Vacuum pressure control valves	Safety precautions	Related products
Components for process gases											
High vacuum components											

Air operated valve for high vacuum

AVB**3 Series Made-to-order product

Contact CKD for details.



Made-to-order product

Soft exhaust (built-in bypass valve) compatible

Controls discharge rate in 2 stages

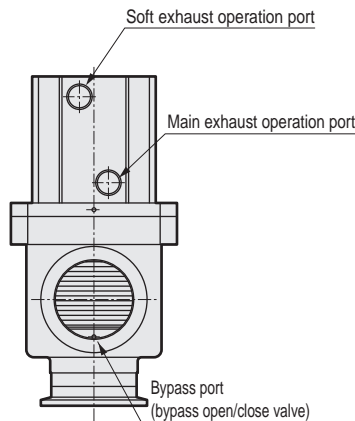
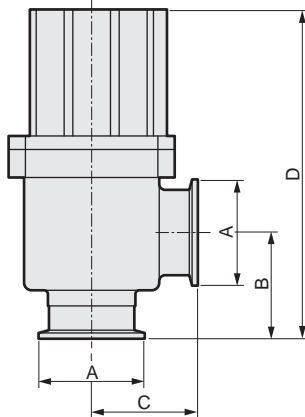
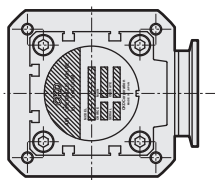
- 1 actuator soft exhaust valve
- NW25/NW40/NW50

Specifications

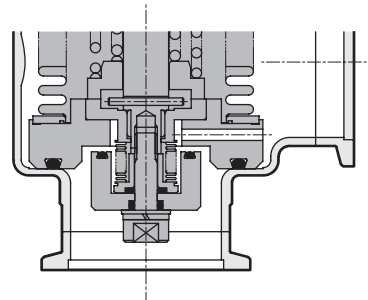
Item	AVB513-X*	AVB613-X*	AVB713-X*
Working fluid	Vacuum and inert gas		
Working pressure Pa (abs)	1.3×10^{-6} to 1.0×10^{-5}		
Max. working differential pressure MPa	0.1		
Valve seat leakage Pa·m ³ /s (He)	1.3×10^{-10} or less		
External leakage Pa·m ³ /s (He)	1.3×10^{-11} or less		
Proof pressure MPa	0.3		
Fluid temperature °C	5 to 60		
Ambient temperature °C	0 to 60 (no freezing)		
Large flow rate orifice size mm	ø24	ø40	ø50
Small flow rate orifice size*2 mm	ø1 to 3	ø1 to 3	ø1 to 4
Main valve stroke length mm	10	20	22
Small flow rate valve stroke length mm	2	2	2
Conductance (main valve)*1 l/s	13	52	80
Connection	NW25	NW40	NW50
Operating pressure MPa	0.4 to 0.6		
JIS symbol			

*1: The conductance value is the theoretical calculation value in the molecular region, and not the actual measured value.
 *2: For small flow rate orifice size, contact CKD separately.

Dimensions



● Bypass valve 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

Components for process gases

Other valves for process gas

Regulator

Integrated gas supply system

Safety precautions

Air operated valve

Manual valve

Vacuum pressure control valves

Safety precautions

Related products

LGD Series

AGD/OGD/ MGD-R Series

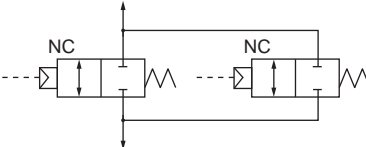
High durability

Soft exhaust (external bypass valve) compatible

Controls discharge rate in 2 stages

- 2 actuator (bypass) soft exhaust valve
- NW25/NW40/NW50/NW80

Specifications

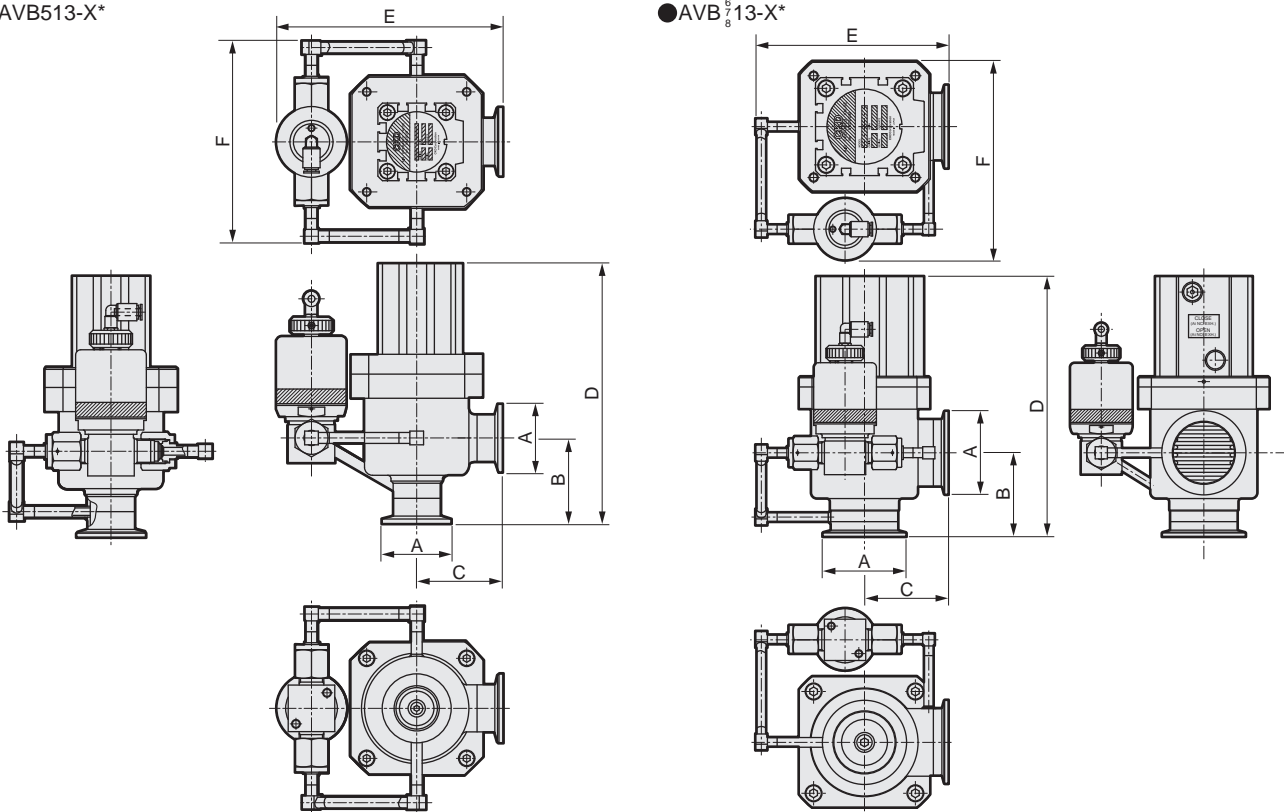
Item	AVB513-X*	AVB613-X*	AVB713-X*	AVB813-X*
Working fluid	Vacuum and inert gas			
Working pressure Pa (abs)	1.3×10^{-6} to 1.0×10^5			
Max. working differential pressure MPa	0.1			
Valve seat leakage Pa·m ³ /s (He)	1.3×10^{-10} or less			
External leakage Pa·m ³ /s (He)	1.3×10^{-11} or less			
Proof pressure MPa	0.3			
Fluid temperature °C	5 to 60			
Ambient temperature °C	0 to 60 (no freezing)			
Orifice size (main flow path) mm	ø24	ø40	ø50	ø80
Stroke length (main valve) mm	10	20	22	32
Conductance (main valve)*1 l/s	13	52	80	242
Connection	NW25	NW40	NW50	NW80
Operating pressure MPa	0.4 to 0.6			
JIS symbol				

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

Dimensions

● AVB513-X*

● AVB^ø13-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		

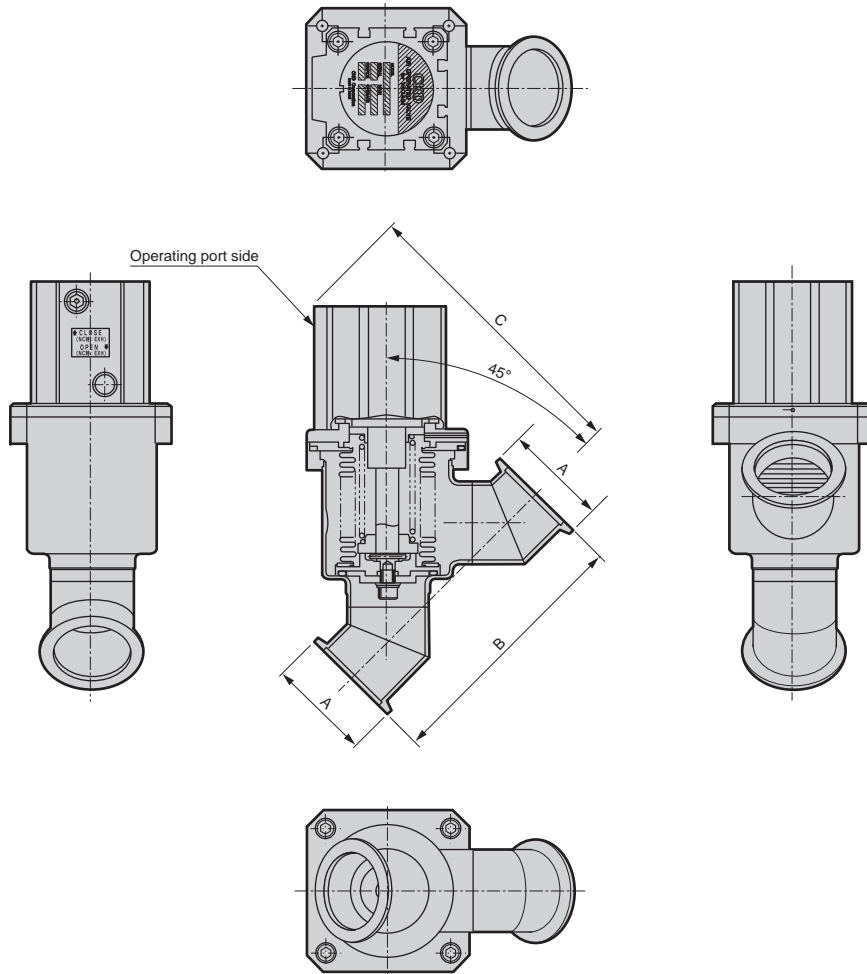
Components for process gases
 Other valves for process gas
 Regulator
 Integrated gas supply system
 Safety precautions
 Air operated valve
 Manual valve
 Vacuum pressure control valves
 Safety precautions
 Related products

Straight flange compatible

Ideal for installing in straight piping sections

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

Internal structure and dimensions



Model No.	A	B	C
AVB5 $\frac{1}{2}$ -3-X*	ø40(NW25)	130	130(138)
AVB6 $\frac{3}{4}$ -3-X*	ø55(NW40)	140	155(163)
AVB7 $\frac{1}{2}$ -3-X*	ø75(NW50)	210	191
AVB8 $\frac{3}{4}$ -3-X*	ø114(NW80)	250	241

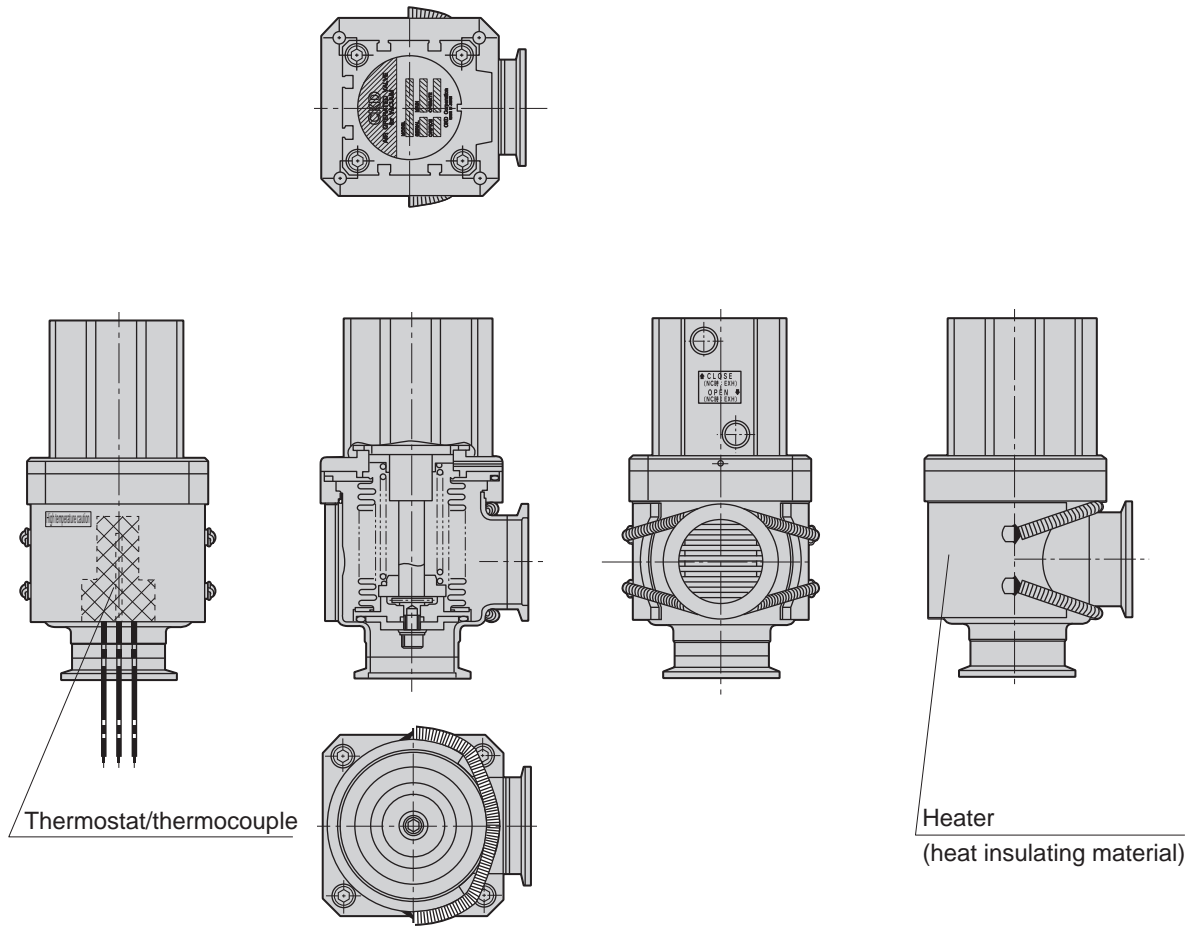
*1: The dimensions in () within code C are for NO type.

*2: The value in code C varies depending on the operating port direction.

Supports heater for valve heating

To prevent adhesion of reaction products to the valve interior

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



- 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.

LGD Series	AGD/OGD/ MGD-R Series	High durability	Other valves for process gas	Regulator	Integrated gas supply system	Safety precautions	Air operated valve	Manual valve	Vacuum pressure control valves	Safety precautions	Related products
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Components for process gases

High vacuum components

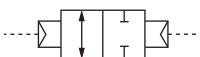
Air operated valve for high vacuum Large bore size

AVB932 series Made-to-order product

- Double acting
- Connection: NW100

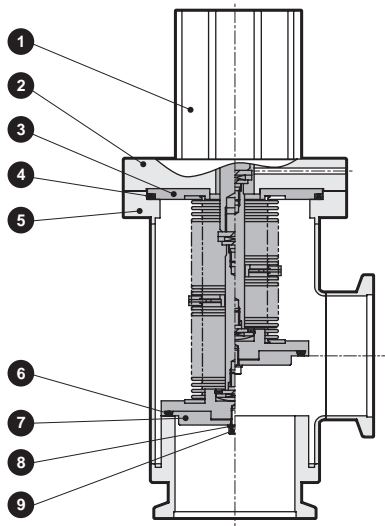
Made-to-order product

Specifications

Item	AVB932-X*
Working fluid	Vacuum and inert gas
Working pressure Pa (abs)	1.3×10^{-6} to 1×10^5
Max. working differential pressure MPa	0.1
Valve seat leakage Pa·m ³ /s (He)	1.3×10^{-9} or less
External leakage Pa·m ³ /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 size mm	100
Stroke length mm	50
Conductance *1 L/s	372
Connection	NW100
Operating pressure MPa	0.3 to 0.5
Weight kg	18
JIS symbol	

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

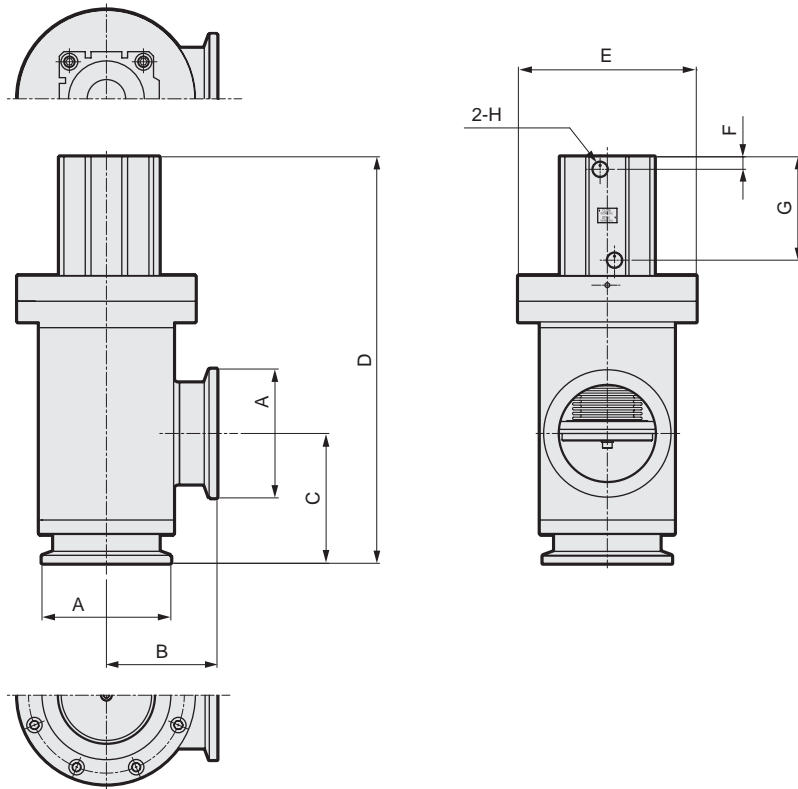
Internal structure and parts list



No.	Part name	Material
①	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: Contact CKD for other O-ring material compatibility.

Dimensions



Model No. Code	A	B	C	D	E	F	G	H
AVB932-X-*	ø134(NW100)	115	135	424	ø185	13	107.5	Rc3/8

LGD Series	AGD/OGD/ MGD-R Series	High durability	Other valves for process gas	Regulator	Integrated gas supply system	Safety precautions	Air operated valve	Manual valve	Vacuum pressure control valves	Safety precautions	Related products
							Components for process gases				High vacuum components



Manual valve for high vacuum

MVB*17 Series

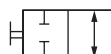
- Molded bellows, Aluminum body



Specifications

Item	MVB217	MVB317	MVB417	MVB517
Working fluid	Vacuum and inert gas			
Working pressure Pa (abs)	1.3 x 10 ⁻⁶ to 1 x 10 ⁻⁵			
Max. working differential pressure MPa	0.1			
Valve seat leakage Pa·m ³ /s(He)	1.3 x 10 ⁻¹⁰ or less			
External leakage Pa·m ³ /s(He)	1.3 x 10 ⁻¹¹ or less			
Proof pressure MPa	0.3			
Fluid temperature °C	5 to 60			
Ambient temperature °C	0 to 60 (no freezing)			
Orifice size mm	ø17	ø24	ø39	ø48
Conductance *1 l/s	5	13	43	74
Connection	NW16	NW25	NW40	NW50
Operating torque *2 Nm	0.15 and over	0.25 and over	0.8 and over	1.5 and over
Number of handle rotations	5	7.5	12	15
Weight kg	0.4	0.6	1.4	2.3

JIS symbol



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

*2: As you turn the handle, the torque eases suddenly near the fully closed position;

*3: Grease for vacuum is applied to the O-rings of outer seal parts.

How to order



Model No.

A Series

B Connection

Code	Description	
A Series		
2	Orifice size ø17	
3	Orifice size ø24	
4	Orifice size ø39	
5	Orifice size ø48	
B Connection		
16K	NW16	Only MVB217 is available
25K	NW25	Only MVB317 is available
40K	NW40	Only MVB417 is available
50K	NW50	Only MVB517 is available

[Example of model No.]

MVB417-40K

Model: MVB417 Manual valve for high vacuum

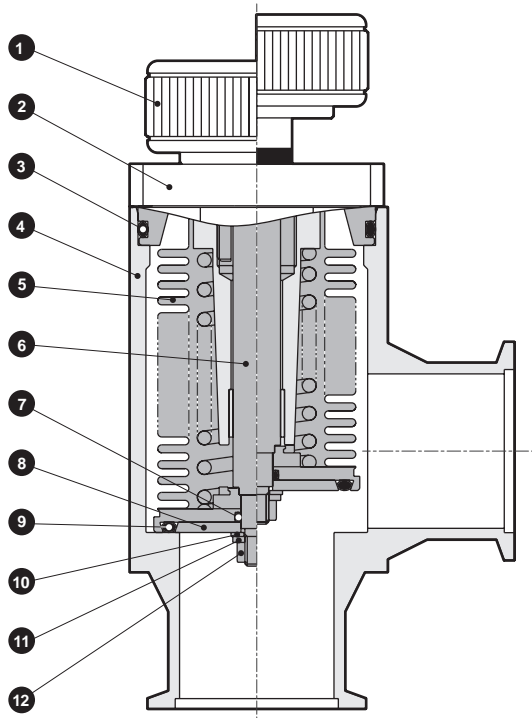
A Series : Orifice size ø39

B Connection: NW40

MVB*17 Series

Internal structure diagram and parts list/Dimensions

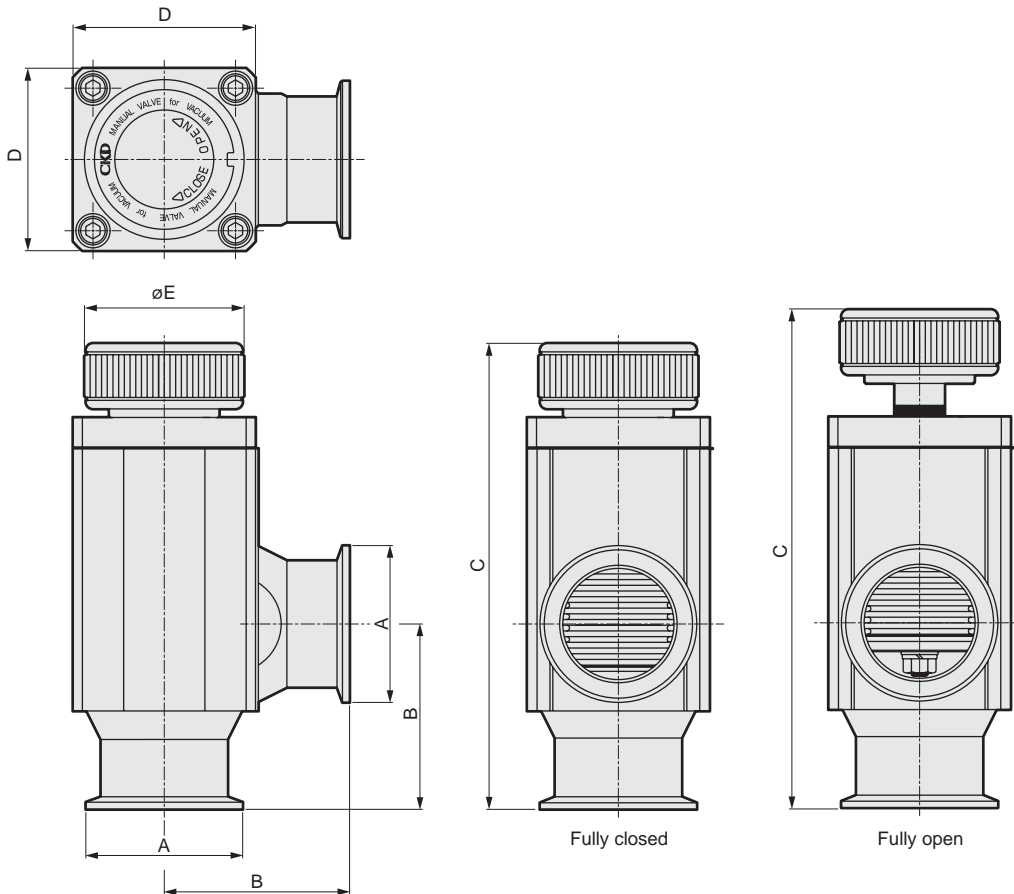
Internal structure and parts list



Part number	Part name	Material
1	Handle	SUS303 (16K/25K) A + 5056 (40K/50K)
2	Adapter	A + 5056
3	O-ring	FKM Note
4	Body	A + 6063
5	Bellows assembly	SUS316L
6	Rod	SUS316L
7	O-ring	FKM Note
8	Valve disk B	SUS316L
9	O-ring	FKM Note
10	Flat washer	SUS304
11	Spring washer	SUS304
12	Hexagon nut	SUS304

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

Dimensions



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

LGD Series
 AGD/OGD/MGD-R Series
 High durability
 Other valves for process gas
 Regulator
 Integrated gas supply system
 Safety precautions
 Air operated valve
 Manual valve
 Vacuum pressure control valves
 Safety precautions
 Related products



Manual valve for high vacuum

MVB⁵₆₇0 Series

● Molded bellows ● Handle rotation



Made-to-order product

Model No. Actuation Connection

MVB50 Manual NW25

MVB60 Manual NW40

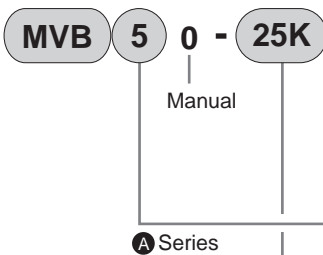
Model No. Actuation Connection

MVB70 Manual NW50

Specifications

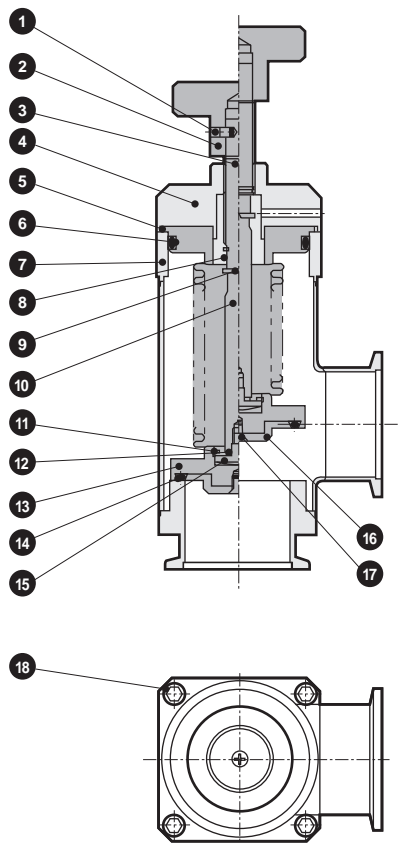
Descriptions	MVB50	MVB60	MVB70
Working fluid	Vacuum and inert gas		
Working pressure Pa (abs)	1.3 x 10 ⁻⁶ to 1 x 10 ⁵		
Max. working differential pressure MPa	0.1		
Valve seat leakage Pa·m ³ /s (He)	1.3 x 10 ⁻⁹ or less		
External leakage Pa·m ³ /s (He)	1.3 x 10 ⁻⁹ or less		
Proof pressure MPa	0.3		
Fluid temperature °C	5 to 60		
Ambient temperature °C	0 to 60 (no freezing)		
Orifice size mm	ø24	ø40	ø50
Stroke length mm	15	20	22
Valve structure	Molded bellows		
Connection	NW25	NW40	NW50
Weight kg	1.4	2.4	3.2
JIS symbol			

How to order



Code	Content	
A Series		
5	Orifice size ø24	
6	Orifice size ø40	
7	Orifice size ø50	
B Connection		
25K	NW25	Only MVB50 is available
40K	NW40	Only MVB60 is available
50K	NW50	Only MVB70 is available

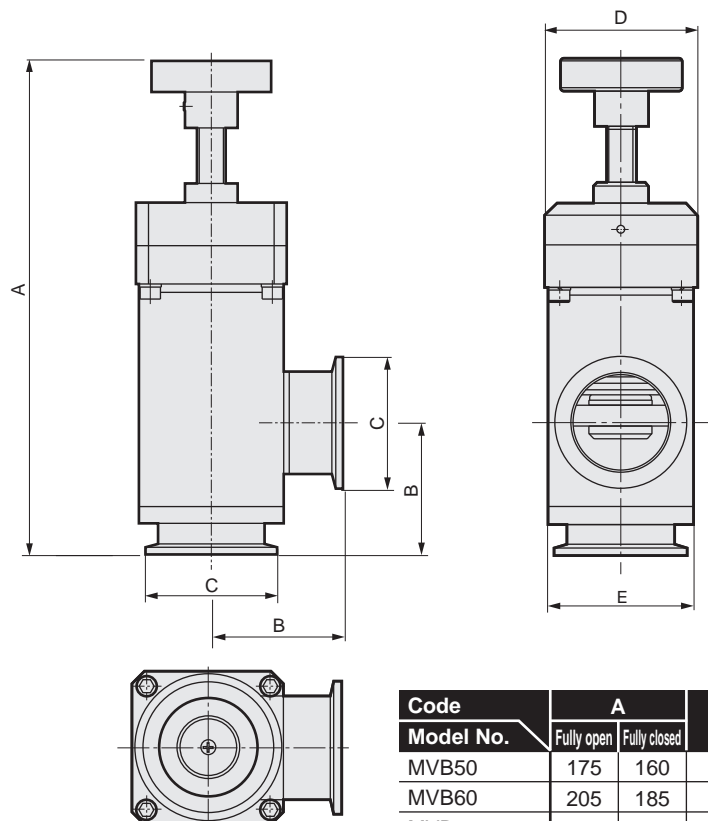
Internal structure and parts list



No.	Part name	Material
①	Hexagon socket set screw	SUS304
②	Manual handle	
③	Manual rod	SUS303
④	Adaptor	A2017
⑤	Bellows assembly	ASL350,SUS316
⑥	O-ring	FKM
⑦	Body assembly	SUS316
⑧	E-snap ring	SUS304
⑨	Spring washer	SUS304
⑩	Rod	SUS316
⑪	Spring washer	SUS304
⑫	C-snap ring	SUS304
⑬	Valve disc A	SUS316
⑭	O-ring	FKM
⑮	Rod piece	SUS304
⑯	Valve disc B	SUS316
⑰	Cross-recessed flat head machine screw	SUS304
⑱	Cross-recessed bolt	SUS304

Dimensions

MVB*0



Code	A		B	C	D	E
	Fully open	Fully closed				
MVB50	175	160	50	ø40(NW25)	63	ø48.6
MVB60	205	185	55	ø55(NW40)	63	ø60.5
MVB70	252	230	70	ø75(NW50)	78	ø79

LGD Series
 AGD/OGD/ MGD-R Series
 High durability
 Other valves for process gas
 Regulator
 Integrated gas supply system
 Safety precautions
 Air operated valve
 Manual valve
 Vacuum pressure control Valves
 Safety precautions
 High vacuum components
 Related products



Manual valve for high vacuum

MVP⁵₆⁷ 0 Series

● Double O-ring sealing method ● Handle rotary



Made-to-order product

Model No.	Actuation	Diameter	Connection	Model No.	Actuation	Connection
MVP50	Manual	NW25		MVP70	Manual	NW50
MVP60	Manual	NW40				

Specifications

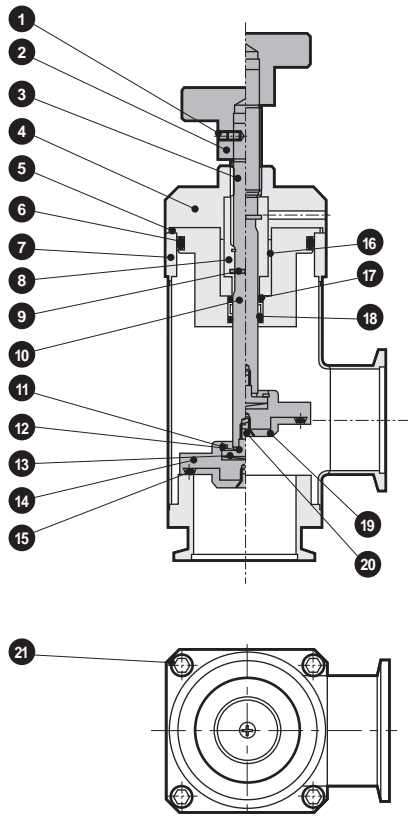
Descriptions	MVP50	MVP60	MVP70
Working fluid	Vacuum and inert gas		
Working pressure Pa (abs)	1.3 x 10 ⁻⁶ to 2 x 10 ⁻⁵		
Max. working differential pressure MPa	0.2		
Valve seat leakage Pa·m ³ /s (He)	1.3 x 10 ⁻⁹ or less		
External leakage Pa·m ³ /s (He)	1.3 x 10 ⁻⁸ or less		
Proof pressure MPa	0.3		
Fluid temperature °C	5 to 60		
Ambient temperature °C	0 to 60 (no freezing)		
Orifice size mm	ø24	ø40	ø50
Stroke length mm	15	20	22
Valve structure	O-ring shaft sealant		
Connection	NW25	NW40	NW50
Total height in () is at valve opening mm	160(175)	185(205)	230(252)
Interface distance mm	50	55	70
Weight kg	1.4	2.5	3.7
JIS symbol			

How to order



Code	Content	
A Capacity classification		
5	Orifice size ø24	
6	Orifice size ø40	
7	Orifice size ø50	
B Connection		
25K	NW25	Only MVP50 is available
40K	NW40	Only MVP60 is available
50K	NW50	Only MVP70 is available

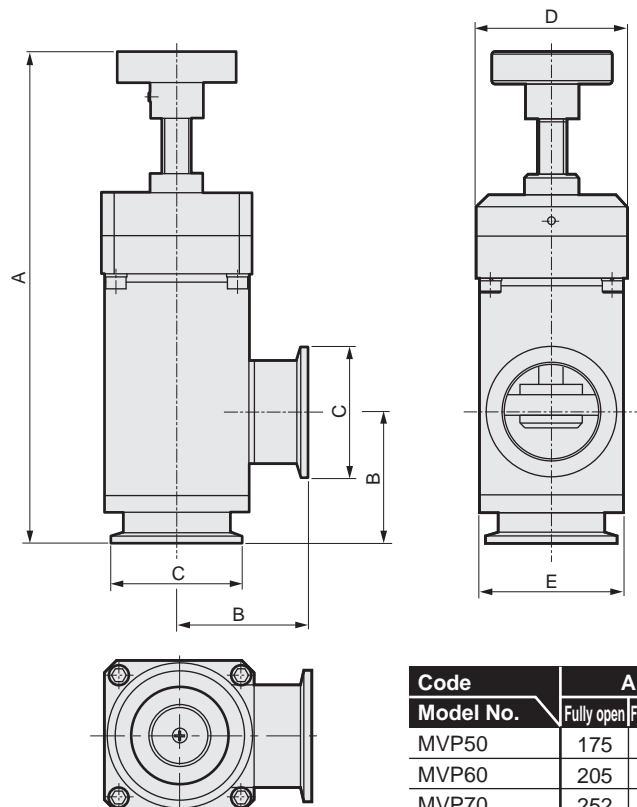
Internal structure and parts list



No.	Part name	Material
1	Hexagon socket set screw	SUS304
2	Manual handle	
3	Manual rod	SUS303
4	Adaptor	A2017
5	O-ring holder	SUS316
6	O-ring	FKM
7	Body assembly	
8	E-snap ring	SUS304
9	Spring washer	SUS304
10	Valve rod	SUS316
11	Spring washer	SUS304
12	C-snap ring	SUS304
13	Rod piece	SUS304
14	Valve disc A	SUS316
15	O-ring	FKM
16	O-ring retainer	A5056
17	O-ring	FKM
18	Grease stopper	SUS304
19	Valve disc B	SUS316
20	Cross-recessed flat head machine screw	SUS304
21	Cross-recessed bolt	SUS304

Dimensions

MVP*0



Code	A		B	C	D	E
	Fully open	Fully closed				
MVP50	175	160	50	ø40(NW25)	63	ø48.6
MVP60	205	185	55	ø55(NW40)	63	ø60.5
MVP70	252	230	70	ø75(NW50)	78	ø79

LGD Series
 AGD/OGD/
 MGD-R Series
 High durability
 Other valves
 for process gas
 Regulator
 Integrated gas
 supply system
 Safety precautions
 Air operated valve
 Manual valve
 Vacuum pressure
 control valves
 Safety precautions
 Related products

Related products	High vacuum components					Components for process gases				
	Safety precautions	Vacuum pressure control valves	Manual valve	Air operated valve	Safety precautions	Integrated gas supply system	Regulator	Other valves for process gas	High durability	AGD/OGD/ MGD-R Series

IAVB

Vacuum pressure control valves

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
- Fully closed operation available
The poppet valve and O-ring sealant structure enables fully closed operation.
- Easy maintenance
Valves and wiring components maintainable individually



CONTENTS

- Product introduction 126
- Vacuum pressure control valve 128
- Vacuum pressure control valves for controllers 130

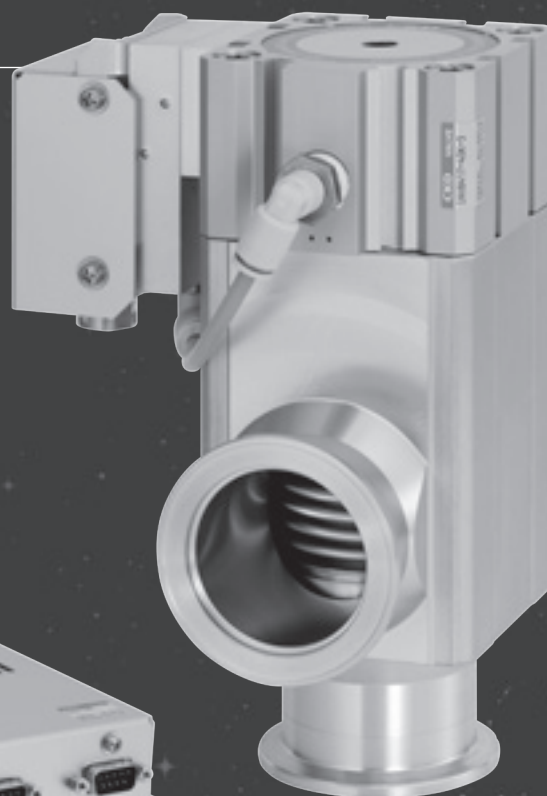
LGD Series	AGD/OGD/ MGD-R Series	High durability for process gas	Other valves for process gas	Regulator	Integrated gas supply system	Safety precautions	Air operated valve	Manual valve	Vacuum pressure control valves	Safety precautions	Related products	
Components for process gases							High vacuum components					

The best answer for vacuum control.

While maintaining the reliability of the conventional high vacuum valve, it has an added pressure control function that enables various processes. A new proposal for vacuum control in any and all industries and applications.

Vacuum pressure control valves

IAVB Series



High vacuum valve + Pressure control

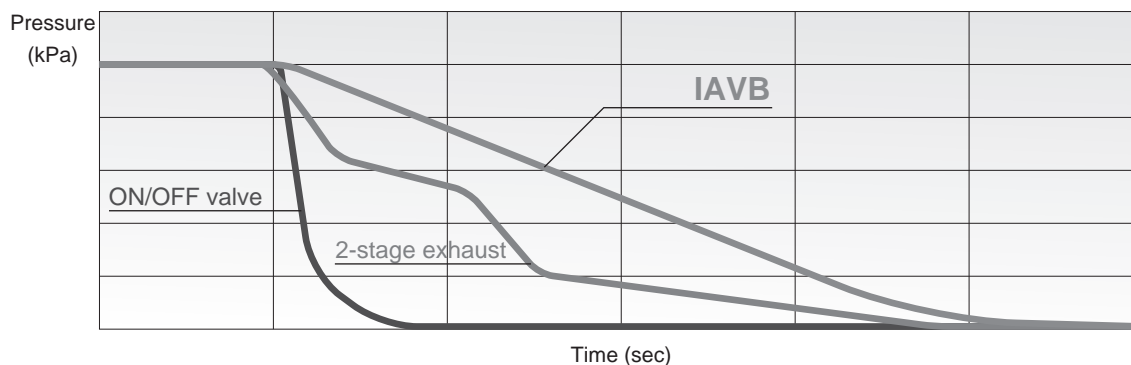
A pressure control function has been added to the highly reliable vacuum valve. Regulator and variable leak valves are not required for pressure adjustment in vacuum.

Fully closed operation available

The poppet valve system enables fully closed operation, a problem for butterfly valves, through the stable O-ring sealing structure which has a long and successful record in CKD vacuum valves.

Slow exhaust control is possible

Compared with general ON/OFF vacuum valves and two-stage exhaust vacuum valves, it enables gradual exhaust at a constant rate. The wide dynamic range allows usage of any pump.



For any industry or application –Examples of applications–

Film formation



Deaeration/defoaming



Drying



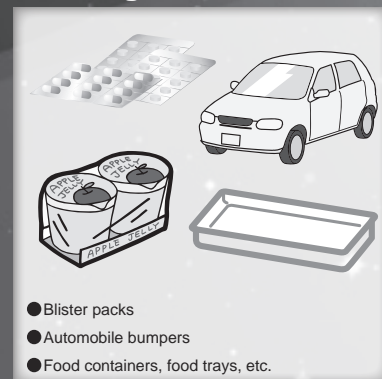
Industrial furnaces



Molding



Forming



High durability/Long life

Uses high-durability valves with special structure using CKD's unique molded bellows.

4 bore size models

4 bore size models in the lineup: NW16/NW25/ NW40/NW50.

Thorough cleanliness control system

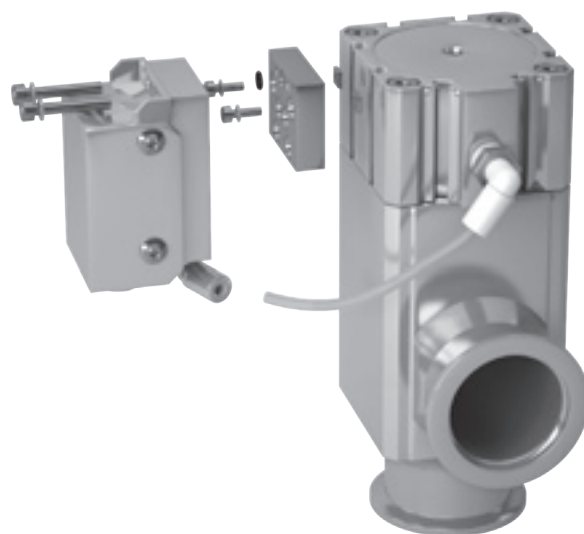
Manufactured under a consistent quality control system from processing to assembly, inspection and packaging, providing high quality and cleanliness.

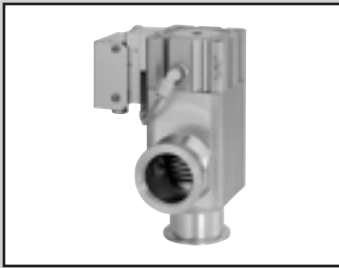
RoHS Directive compliant

Free from substances that damage the global environment (lead, hexavalent chromium, etc.).

Easy maintenance

The valves and wiring components can be maintained individually.





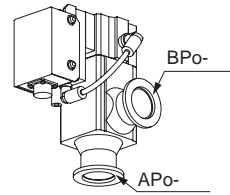
Vacuum pressure control system

IAVB Series



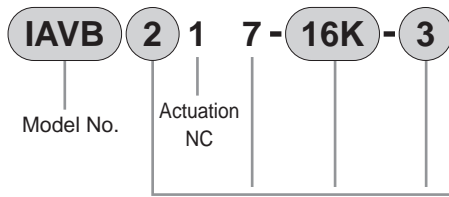
Specifications

Item	IAVB217	IAVB317	IAVB417	IAVB517
Working fluid	Vacuum and inert gas			
Working pressure Pa (abs)	1.3 x 10 ⁻⁶ to 1 x 10 ⁵			
Max. working differential pressure MPa	0.1			
Valve seat leakage Pa·m ³ /s(He)	1.3 x 10 ⁻¹⁰ or less			
External leakage Pa·m ³ /s(He)	1.3 x 10 ⁻¹¹ or less			
Proof pressure MPa	0.3 MPa			
Fluid temperature °C	5 to 60			
Ambient temperature °C	5 to 45			
Orifice size mm	ø17	ø24	ø43	ø48
Conductance *1 l/s	5	13	43	74
Connection	NW16	NW25	NW40	NW50
Weight Kg	0.6	0.8	1.6	2.4
Pilot air pressure MPa	0.45 to 0.55 MPa			
Mounting orientation	Unrestricted			
Connection direction *2	with port A on the chamber side, Port B connected to vacuum pump side			



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

How to order



Code	Description
A Orifice size	
2	Orifice size ø17
3	Orifice size ø24
4	Orifice size ø39
5	Orifice size ø48

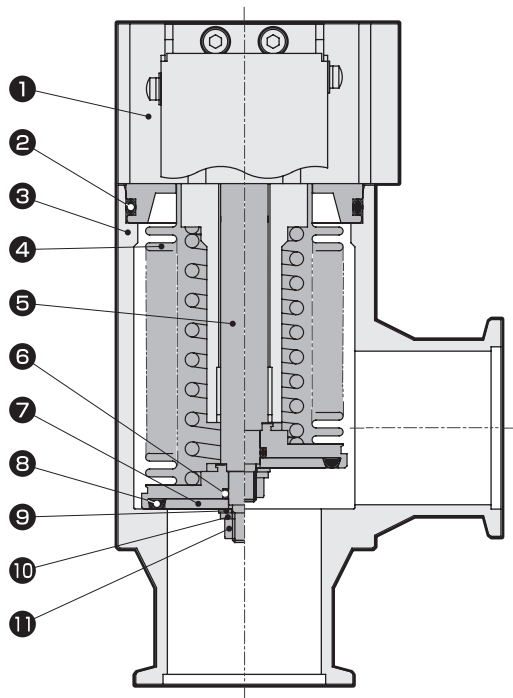
Code	Description
B Connection	
16K	NW16
25K	NW25
40K	NW40
50K	NW50

Code	Description
C Operating port position	
3	
1	
2	

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

Internal structure and parts list

● IAVB217/IAVB317/IAVB417/IAVB517

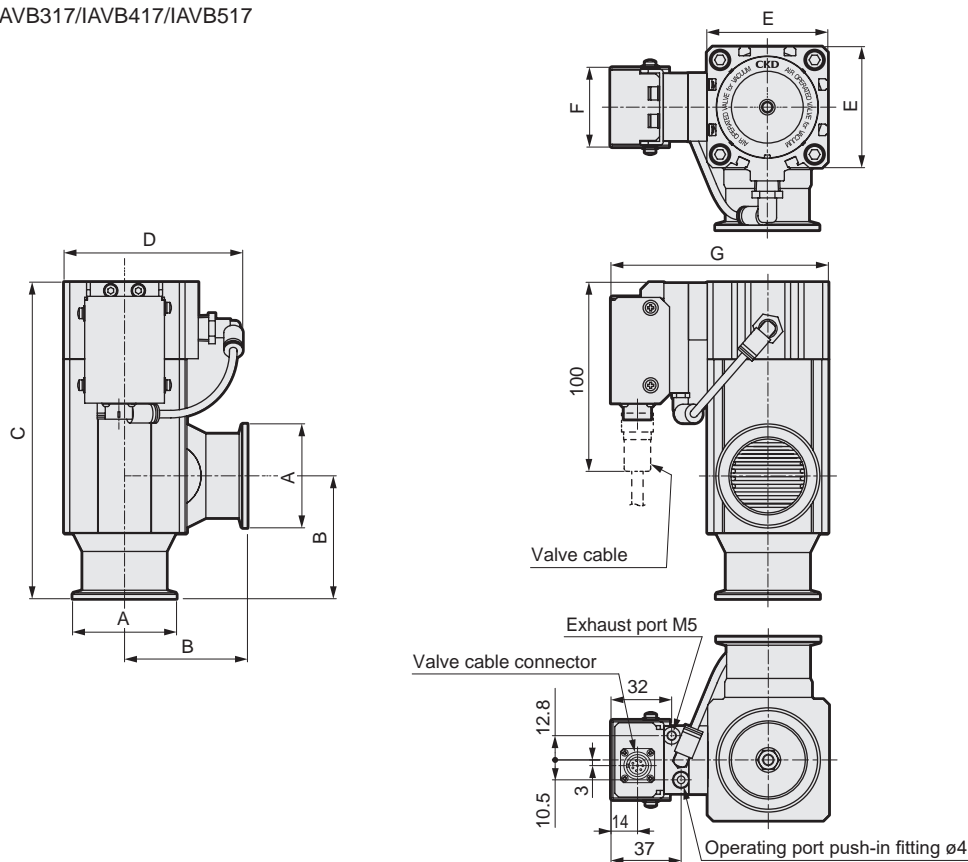


Part number	Part name	Material
1	Cylinder (magnet interior)	
2	O-ring	FKM
3	Body	A + 6063
4	Bellows	SUS316L
5	Rod	SUS316L
6	O-ring	FKM
7	Valve disk B	SUS316L
8	O-ring	FKM
9	Flat washer	SUS304
10	Spring washer	SUS304
11	Hexagon nut	SUS304

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

Dimensions

● IAVB217/IAVB317/IAVB417/IAVB517



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

LGD Series
 AGD/OGD/MGD-R Series
 High durability
 Other valves for process gas
 Regulator
 Integrated gas supply system
 Safety precautions
 Air operated valve
 Manual valve
 High vacuum components
 Vacuum pressure control valves
 Safety precautions
 Related products



Controller for IAVB



General specifications

Item	IAVB-CONT			
	IAVB217	IAVB317	IAVB417	IAVB517
Power supply voltage	24 VDC \pm 10% (stabilized power supply with ripple rate 1% or less)			
Current consumption	0.5 A or less (fuse capacity 1 A)			
Ambient temperature °C	10 to 40			
External input	No. of inputs	2 points		
	Input method	Dry contact input (photo coupler isolation)		
	Input capacity	24 VDC, 10 mA or less		
External output	No. 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		
	Type	0-10 VDC 0-5VDC (both input load 20 k Ω)		
Analog voltage output	Number of points	1 points		
	Output	0 to 10 VDC (connecting load 10 k Ω)		
Repeatability	Within \pm 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			

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

How to order

How to order controller individual model

IAVB-CONT

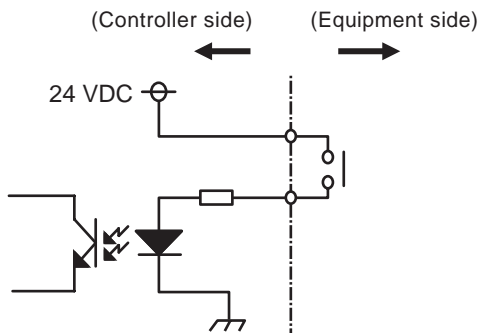
How to order valve cable individual model

IAVB-VCBL-03

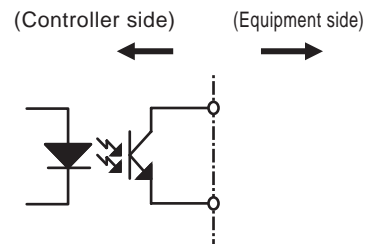
Cable length 3 m

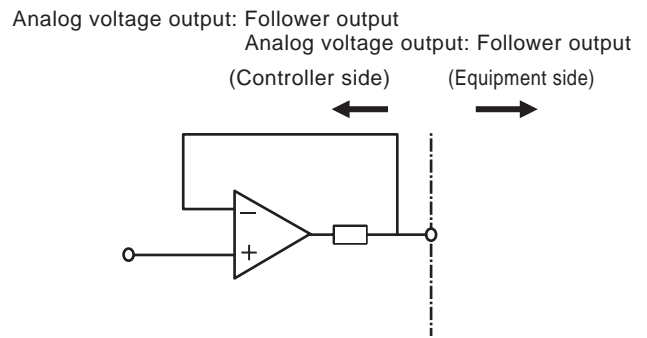
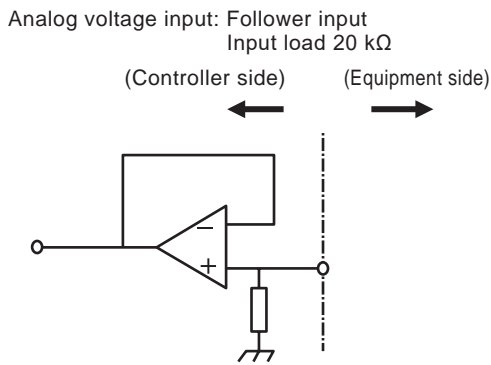
Interface circuit

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



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





Connector terminal assignment of controller

1.MAIN (D-SUB 25pin male)

Pin No.	Signal name	Input/output	Remarks
1	Grounding 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	Photo coupler collector output 2
10	Alarm status output	NPN output	Photo coupler collector output 1
11	Valve operation input COM	Contact input (-) COM	Contact input (-) COM
12	Valve operation contact 2 input	Contact input (+)	Photo coupler 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)	(Photo coupler collector output 3)
23	Status COM	Photo coupler emitter COM	Photo coupler emitter COM
24	Valve operation contact 1 input	Contact input (+)	Photo coupler cathode 1
25	(port for CKD inspection)	-	(Connect nothing)

2.PRESS (D-SUB 9pin female)

Pin No.	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)

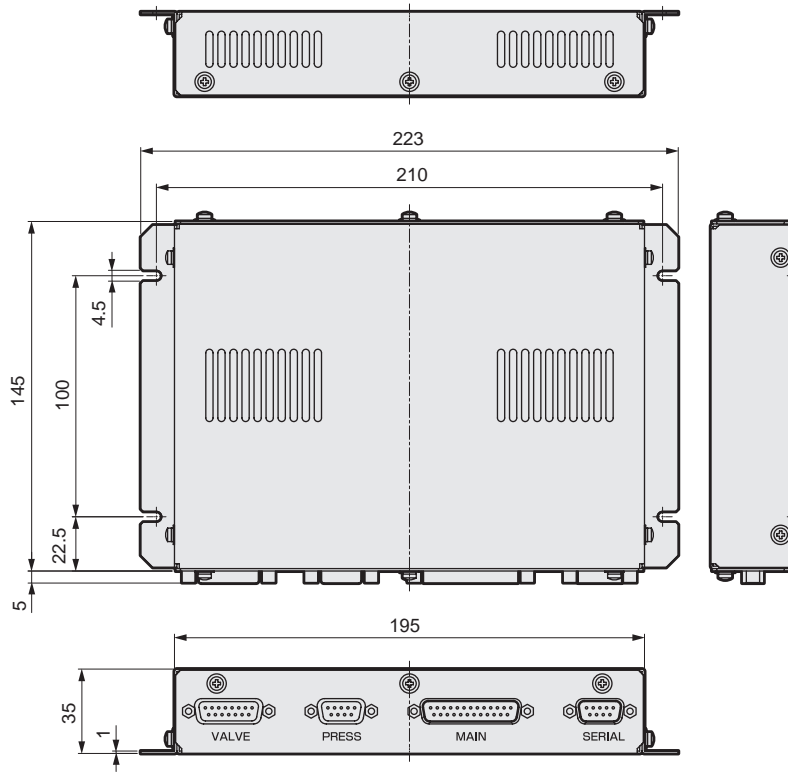
3.SERIAL (D-SUB 9pin male)

Pin No.	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)

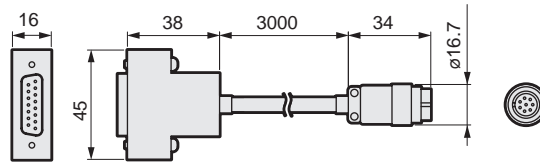
LGD Series
 AGD/OGD/ MGD-R Series
 High durability
 Other valves for process gas
 Regulator
 Integrated gas supply system
 Safety precautions
 Air operated valve
 Manual valve
 Vacuum pressure control valves
 Safety precautions
 Related products
 Components for process gases
 High vacuum components

Dimensions

● IABV-CONT



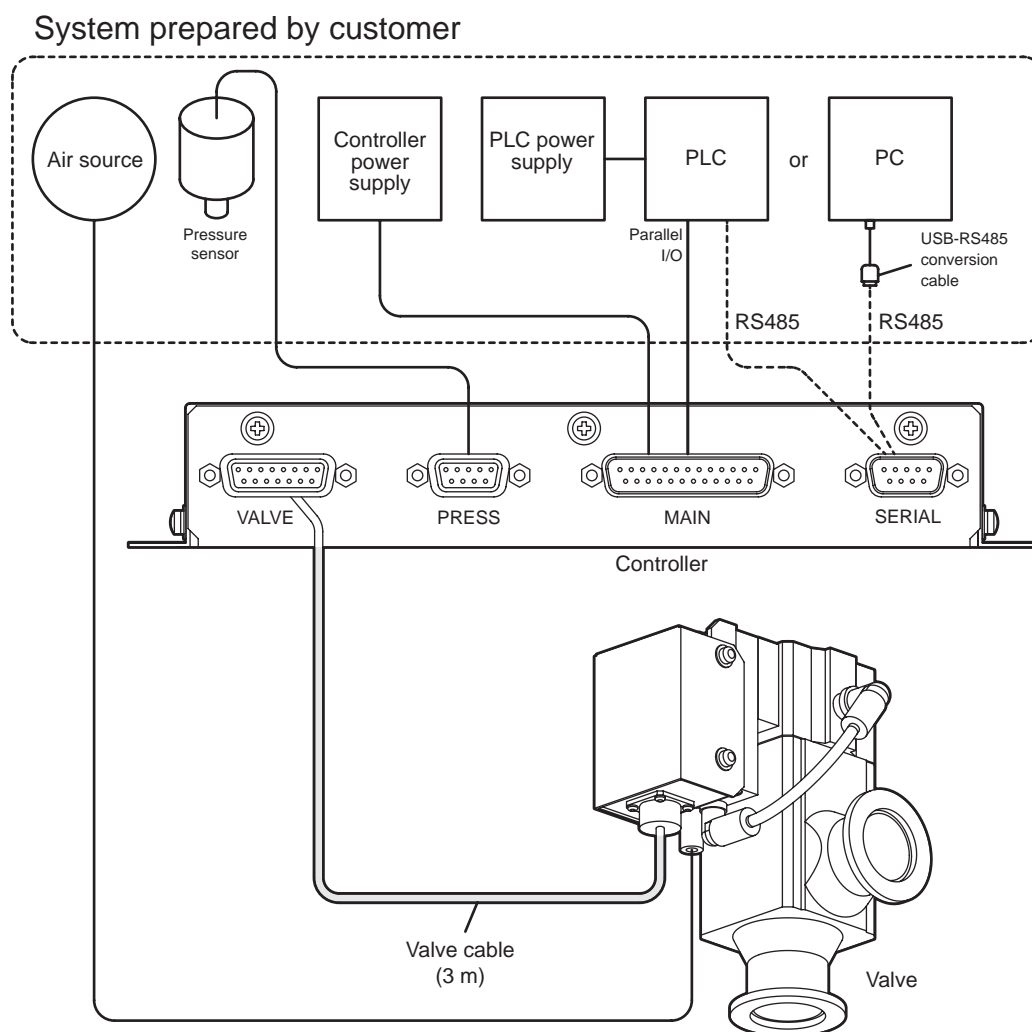
● IABV-VCBL-03



Valve cable

Related products	Safety precautions	High vacuum components	Manual valve	Air operated valve	Safety precautions	Integrated gas supply system	Regulator	Other valves for process gas	High durability	AGD/OGD/ MGD-R Series	LGD Series
	Vacuum pressure control valves										

System configurations table



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

Configuration of product

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.

LGD Series
 AGD/OGD/ MGD-R Series
 High durability
 Other valves for process gas
 Regulator
 Integrated gas supply system
 Safety precautions
 Air operated valve
 Manual valve
 Vacuum pressure control valves
 Safety precautions
 Related products

Related products	High vacuum components		Components for process gases							
	Safety precautions	Vacuum pressure control valves	Manual valve	Air operated valve	Safety precautions	Integrated gas supply system	Regulator	Other valves for process gas	High durability	AGD/OGD/ MGD-R Series



Vacuum pressure control valves

Safety Precautions

Be sure to read this section before use.
Refer to Intro Page 9 for general precautions.

Design / selection

1. Checking the specifications

DANGER

- Do not use in places where dangerous goods such as ignitable substances, inflammable substances or explosives are present. There is a possibility of ignition, combustion or explosion.
- This product is not waterproof. Ensure that the product is free of water droplets and oil droplets. Failure to do so may cause fire or malfunction.
- Be sure to use a DC stabilized power supply (24VDC±10%). Connecting directly to the AC power supply may cause fire, explosion, damage, etc.

WARNING

- Incorrect component selection and handling can cause problems not only in this product, but also to your system. Check the specifications of this product and the compliant with your system before use.
- If the machine stops in the event of a system failure such as emergency stop or power outage, equipment damage or injury occur. Design a safety circuit or device to prevent this.
- Install indoors with low humidity.
There is a risk of electric leakage or fire accidents in places exposed to rainwater or where there is high humidity (humidity of 85% or more, condensation). Oil drops and oil mist are also strictly prohibited.
- Follow the use and storage temperature and use and store in a environment with no condensation.
Failure to do so may cause abnormal stop or shorten the service life of the product. Ventilate in locations where heat may build up.
- Install in a location free from direct sunlight, dust, and corrosive gas/explosive gas/inflammable gas/combustibles, and away from heat sources. Chemical resistance has not been taken into account.
Failure to comply may lead to damage, explosion, or combustion.
- Use and store in locations free from strong electromagnetic waves, ultraviolet rays, or radiation.
Otherwise, malfunction or damage may result.

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-conductor cables, etc.). Also, pay attention to the inverter power supply and wiring section used for robots, etc. (same wiring and piping not possible). Apply the frame ground of this power supply and insert the filter to the output part.
- 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 the surge absorption element directly to all inductive loads in parallel.
- Do not disassemble the products.
- Cable cannot be used for applications involving repeated bending.
- Fix the cable so that it does not easily move. 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.

LGD Series	AGD/OGD/ MGD-R Series	High durability for process gas	Other valves for process gas	Regulator	Integrated gas supply system	Safety precautions	Air operated valve	Manual valve	Vacuum pressure control valves	Safety precautions	Related products
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Components for process gases

High vacuum components

Mounting, installation and adjustment

1. Mounting

⚠ DANGER

- When mounting the product, be sure to hold and fix it securely. If the product falls, is knocked over, or experiences malfunction, it may lead to injury.

⚠ 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, confirm that the product is correctly mounted.
- Precision parts are built in, so laying the product on its side or applying vibration or impact during transportation are strictly prohibited.
This may cause damage to the parts.
- For preliminary installation, place horizontally.
- Do not step onto the packaging or place objects on it.
- Avoid condensation, freezing, etc., and maintain ambient temperatures of -20 to 60°C and ambient humidity of 35 to 85% when transporting and carrying.
Failure to do so may cause damage to the product.
- Mount the product on incombustible materials. Direct attachment or mounting to or near flammable materials may cause fire.
- Carefully wire the product while checking this catalog to prevent incorrect wiring and loose connectors. Check wiring insulation.
Contact with other circuits, ground faults, and defective insulation between terminals may cause overcurrent to flow into the product, causing damage. This could lead to malfunction or fire.
- Before turning power ON to the Component, be sure to do a safety check around the product.
Inadvertently supplying power can cause electric shock or injury.

- Be sure to use the attached cable between the valve and controller, and install it so that excessive force is not applied or damaged. Do not remodel the attached cable (change the length or material) as it may cause malfunction, failure or misoperation.
- Do not touch the product with hands or body during the operation or immediately after stopping.
There is a risk of burns.
- Do not step onto the product or place objects on it.
This may result in falling, knocking the product over, injury due to falling, product damage and/or malfunctions due therein, etc.
- When the power supply is cut off (including breakdown), take sufficient measures to protect workers and equipment.
There is a risk of unexpected accidents.

2. Securing of space

⚠ CAUTION

- Secure sufficient space for installation, removal, piping and wiring work.
- Secure sufficient space for maintenance and inspection.

3. 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.
- Foreign matter or burrs in the piping and piping work could damage the valve seat or O-ring seal and lead to leaks. Always remove dirt and burrs before installing the valve.
- Piping so that tension, compression, bending and other forces are not applied to the valve body from the piping.
- Clean the seal surface of the vacuum flange and the centering O-ring with ethanol before installing.

- Although the vacuum flange surface is provided with a 0.1 to 0.2mm level difference (concave shape) for seal surface protection, handle so as not to damage the seal surface.
- Durability may decrease due to exhaust flow, so we recommend use of the bellows side as the exhaust side. Durability varies depending on the conditions of use, so check thoroughly.
- After completing piping work, always carry out a leak test, and confirm that there are no leaks.
- When transporting or installing, do not hold the cable part.
This may lead to injury or disconnection.
- Do not lay piping in places where large vibration or impact is transmitted.
If large vibration or shock is transmitted, it could result in malfunction. Especially if vibration continues, durability may decrease. Perform piping so no excessive vibration or shock is applied.
- Do not forcibly operate the movable parts of the product with external force.
This may lead to malfunction or damage due to regenerative current.
- 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 place objects that produce strong magnetic fields, such as rare earth magnets, near the product body. It may not be possible to maintain the original accuracy.
- This product is assembled in a cleanroom after precision cleaning treatment. Open the clean pack inside the packing box in a clean environment just before mounting.
- 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.

4. Air piping

⚠ CAUTION

- When piping, refer to the instruction manual and make sure not to use the wrong connection port.
 - This could cause improper operation.
- When connecting pipes, wrap sealing tape clockwise from the inside position to within 2 threads from the pipe end.
 - If sealing tape protrudes from the pipe threads, it could be cut when screwing the bolts in. This could cause the tape to enter the components, causing breakdowns.



- Tighten pipes with the appropriate torque.
 - The purpose is to prevent air leakage and damage to bolts.
 - First tighten the bolts by hand to ensure that the threads are not damaged, then use a tool.



[Reference value] Refer to the instruction manual.

Port thread	Tightening torque(N·m)
M5	1 to 1.5
Rc1/8	3 to 5
Rc1/4	6 to 8
Rc3/8	13 to 15

LGD Series
 AGD/OGD/ MGD-R Series
 High durability for process gas
 Other valves for process gas
 Regulator
 Integrated gas supply system
 Safety precautions
 Air operated valve
 Manual valve
 Vacuum pressure control valves
 Safety precautions
 High vacuum components
 Related products

Use/maintenance

1. Before use

⚠ DANGER

- Wiring work and inspection should be done by a specialized technician.
- Be sure to install the piping before wiring the product. It may lead to electric shock.
- Do not operate the unit with wet hands. It may lead to electric shock.
- When performing the wiring work and inspection, turn the power supply OFF and wait five minutes or more before checking the voltage with a tester or other equipment. It may lead to electric shock.
- Do not attach or detach wiring or connectors with the power supply ON. This may cause malfunction, failure, or electric shock.

⚠ WARNING

- Though the storage environment conforms to the installation environment, it is not recommended to store for longer than 1 month. In particular, take measures to prevent condensation.

2. Maintenance and inspection

⚠ WARNING

- Operate periodically according to the instruction manual.
- Read the instruction manual thoroughly and make sure you understand the content before performing maintenance.
- Always drain the fluid before performing maintenance.

⚠ CAUTION

- Perform the following periodic inspection to ensure that the valve is achieving optimal functionality.
 - (1) Inspection for leakage to the valve exterior
 - (2) Inspection for leakage (internal leakage) from the valve seat
 - (3) Confirmation that the valve operates smoothly
 - (4) Inspection for looseness in the piping and valve threads
 - (5) Inspection for abrasion or corrosion of the O-ring
- When removing deposits, do not damage any of the parts.
- If damage is expected before the specified duration, carry out maintenance and inspection earlier.
- If the product breakdowns (abnormal heat generation, smoke emission, unusual odor, noise, vibration, etc.), immediately shut OFF the power supply. It may cause damage to the product or lead to fire caused by the current flow.
- When performing maintenance, inspection and repair, stop the power supply to this product. Caution people in the vicinity that a third party should not turn ON the power inadvertently or operate the product.
- When disposing of the product, comply with laws pertaining to waste treatment and cleaning. Consign it to a specialized waste disposal company for processing.
- This product has a spring closing (Normally Closed) valve structure when no power is supplied. Before turning ON the power, make sure that the leakage amount is allowable and then begin operation.
- There is a possibility that the valve closed state may be misrecognized if foreign matter is caught at power ON. Before turning ON the power, make sure that the leakage amount is allowable and then begin operation please.

Components for process gases	LGD Series
	AGD/OGD/ MGD-R Series
	High durability
	Other valves for process gas
Regulator	
	Integrated gas supply system
Safety precautions	
High vacuum components	Air operated valve
	Manual valve
	Vacuum pressure control valves
Safety precautions	
Related products	



High vacuum components Safety Precautions

Be sure to read this section before use.
Refer to Intro Page 9 for general precautions.

Design/selection

1. Checking the specifications

WARNING

- Incorrect Component selection and handling can cause problems not only in this product, but also to your system. Check the specifications of this product and the compliant 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 can operate normally or the performance may decrease sharply. Check the compatibility between the gas contact part materials and working fluid before use. When working fluid there is a risk of solidification, confirm that this poses no problems during use.
- 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.
- Select air piping and fittings according to the working temperature.

Mounting, installation and adjustment

1. 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, carry out an appropriate function test to confirm that the product is correctly mounted.
- High temperature specifications
- Since the valve body becomes hot in accordance with the fluid temperature, handle with care. When removing the valve, first confirm that the valve body temperature is sufficiently low.

CAUTION

- This product is assembled in a cleanroom after precision cleaning treatment. Open the clean pack inside the packing box in a clean environment just before mounting.
- 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.

- If vibration continues, durability may decrease. Perform piping so no excessive vibration or shock is applied.
- High temperature specifications
- When insulating the valve, insulate only the body. Note that the product may not operate normally if the cylinder is insulated.

2. Securing of space

CAUTION

- Secure sufficient space for installation, removal, piping and wiring work.
- Secure sufficient space for maintenance and inspection.

LGD Series	AGD/OGD/ MGD-R Series	High durability	Other valves for process gas	Regulator	Integrated gas supply system	Safety precautions	Air operated valve	Manual valve	Vacuum pressure control valves	Safety precautions	Related products
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Components for process gases

High vacuum components

High vacuum components

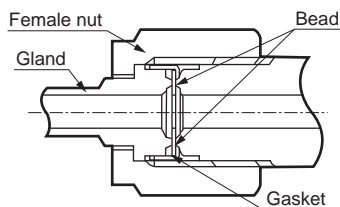
3. Piping

⚠ CAUTION

- foreign materials and burrs in the piping and piping work could damage the valve seat or O-ring seal and lead to leaks. Always remove dirt and burrs before installing the valve.
- When piping, do not apply tension, compression, bending or other forces to the valve body from the piping.
- Handle so as not to scratch the seal surface of the vacuum flange. The flange surface of AVB**7 and MVB*17 is provided with a 0.1 to 0.2mm level difference (concave shape) for seal surface protection.
- 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. Durability varies depending on the conditions of use, so check thoroughly.
- After completing piping work, always carry out a leak test, and confirm that there are no leaks.
- Make sure that there is no foreign materials, scratches or burrs on the seal section before tightening the fitting with the following procedures.

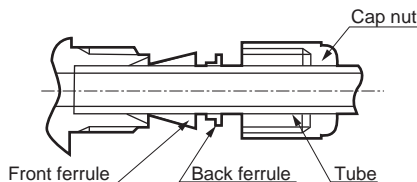
(1) Fitting tightening method

- JXR fitting (when the gasket material is nickel/SUS316)
Tighten the nut by hand until the gasket contacts the bead surface, and then tighten another 1/8 turn with a tool. (Consult with CKD for all other materials.)



- Double barbed 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.



- (2) After tightening the fitting, always carry out a leak test, and confirm that there are no leaks.

4. Air piping

⚠ CAUTION

- When piping, refer to the instruction manual and make sure not to use the wrong connection port.
 - This could cause improper operation.
- When connecting pipes, wrap sealing tape clockwise from the inside position to within 2 threads from the pipe end.
 - If sealing tape protrudes from the pipe threads, it could be cut when screwing the bolts in. This could cause the tape to enter the components, causing breakdowns.



- Tighten pipes with the appropriate torque.

- The purpose is to prevent air leakage and damage to bolts.
- First tighten the bolts by hand to ensure that the threads are not damaged, then use a tool.



[Reference value] Refer to the instruction manual.

Port thread	Tightening torque (N·m)
M5	1 to 1.5
Rc1/8	3 to 5
Rc1/4	6 to 8
Rc3/8	13 to 15

Use/maintenance

1. Before use

WARNING

- Use this product within the specifications range.

CAUTION

- Do not use valves as footing or place any heavy objects on top of the valves.
- Take care not to tighten the manual valves too much. Excessive tightening may lead to valve damage.
- High temperature specifications
- The screw hole on the side of the body is not for fixing. Do not use.
- Adjust the adjustment nut of AVB*47 after confirming that the temperature of the valve body is sufficiently low.

2. Maintenance and inspection

WARNING

- Operate in accordance with the instruction manual.
- Read the instruction manual thoroughly and make sure you understand the content before performing maintenance.
- Always drain the operating air and fluid before performing maintenance.

CAUTION

- Perform the following periodic inspection to ensure that the valve is achieving optimal functionality.
 - Inspection for leakage to the valve exterior
 - Inspection for leakage (internal leakage) from the valve seat
 - (3) Confirmation that the valve operates smoothly
 - Inspection for looseness in the piping and valve threads
 - Inspection for abrasion or corrosion of the O-ring
- When removing deposits, do not damage any of the parts.
- If damage is expected before the specified duration, carry out maintenance and inspection earlier.
- Use CKD specified parts for maintenance parts. Refer to Internal structure/Replacement parts/Maintenance parts list.
- For maintenance parts, contact CKD or a dealership.

LGD Series	AGD/OGD/ MGD-R Series	High durability	Other valves for process gas	Regulator	Integrated gas supply system	Safety precautions	Air operated valve	Manual valve	Vacuum pressure control valves	Safety precautions	Related products
Components for process gases											
High vacuum components											



Safety precautions

Proximity switch T2H/T2V/T3H/T3V

Always read the precautions described in "Pneumatic Cylinders I" (No. CB-029SA) before use.

Design/selection

WARNING

- Application, load current, voltage, temperature, impact, environment, etc., outside the specifications will result in damage or operation faults. Use the device as instructed in the specifications.
- Never use this product in an explosive gas atmosphere. The switch does not have an explosive-proof structure. Never use in an explosive gas atmosphere as explosions or fires could result.

CAUTION

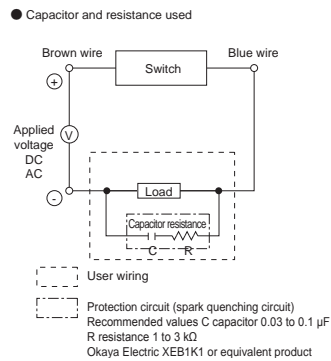
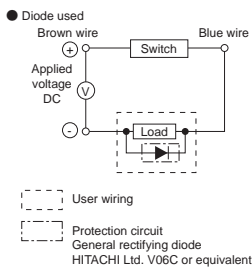
- Take care when using this product for an interlock circuit. When using the switch for an interlock signal requiring high reliability, provide a double interlock by installing a mechanical protection function or a sensor other than a switch as a safeguard against failure. Regularly inspect and confirm that the interlock activates correctly.

- Pay attention to the contact capacity.

Do not use a load that exceeds the switch's max. contact capacity. This may lead to failure. The lamp may not come on if the current is less than the rated current.

- 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.

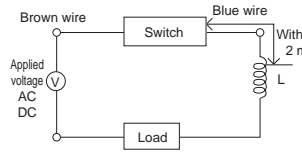


- When a capacitance load (capacitor) is connected, starting current is generated when the switch is turned ON. Provide a contact protection circuit.
- If the wiring increases, the wiring capacity will be reached and a rush current will occur, damaging the switch or shortening the service life. Provide a contact protection circuit if the wiring length exceeds Table 1.

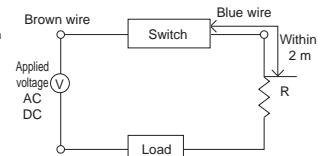
Switch	Voltage	Wiring length
T	DC	50m
T	AC	10m

Table 1

● Choke coil used



● Resistance used



For specifications of contact protection circuits, refer to Pneumatic Cylinders I (Catalog No. CB-029SA).

- Avoid using in an environment constantly exposed to water.
 - Insulation failure can cause malfunctions.
- Avoid using this product in environments containing oil or chemicals.
 - 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 a high-impact environment.

For reed switch, if a strong impact (294m/s² or more) is applied while in use, a signal may appear momentarily (1 ms or less) or malfunction. It may be necessary to use a proximity switch depending on the working environment. Consult with CKD.

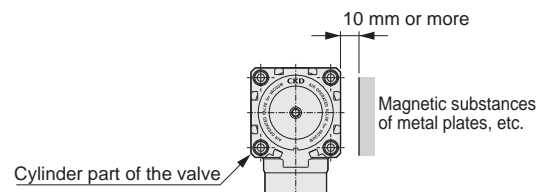
- Do not use this product in surge generating areas.

If there are devices and 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 of accumulation of iron powder and contact with magnetic substances.
 - 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.
 - Mutual magnetic interference may cause the switch to malfunction.

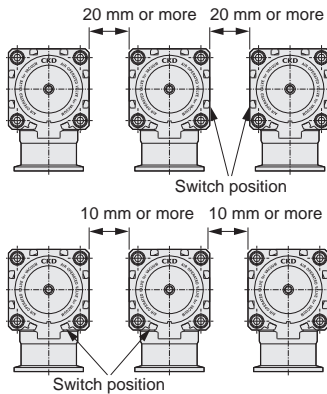
CAUTION

- 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. (Same clearance for all bore sizes)

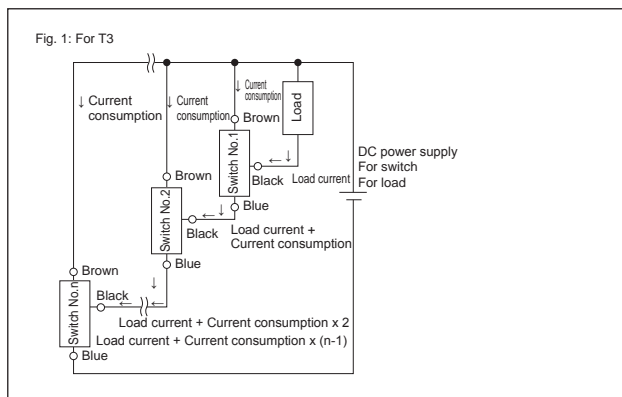


LGD Series
 ACD/OGD/ MGD-R Series
 High durability
 Components for process gases
 Other valves for process gas
 Regulator
 Integrated gas supply system
 Safety precautions
 Air operated valve
 Manual valve
 High vacuum components
 Vacuum pressure control valves
 Safety precautions
 Related products

- The switch may malfunction if valves are installed adjacently. Check that the following distance is allocated from the surface. (Same clearance for all bore sizes)



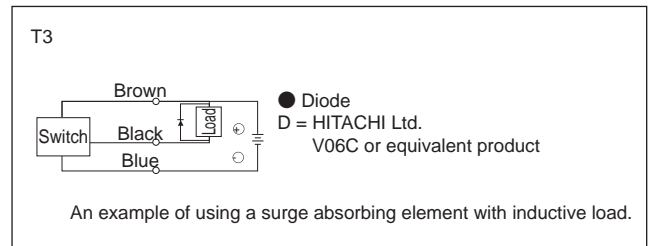
- Pay attention to magnetic environments.
 - When installing valves with switch nearby in parallel, or if a magnetic object is very close to the valve with switch, mutual interference may occur and adversely affect detection accuracy.
- Be careful of the internal voltage drop caused by serial connection.
 - When serially connecting several 2-wire switches, the switch voltage drop is the total voltage drop of all connected switches. The voltage applied to the load is the voltage obtained by subtracting the voltage drop at switches from the power supply voltage. Check load specifications and determine the number of switches.
 - When connecting several 3-wire serial proximity switches, the switch voltage drop is the total voltage drop of all connected switches, as with the 2-wire switch. 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.



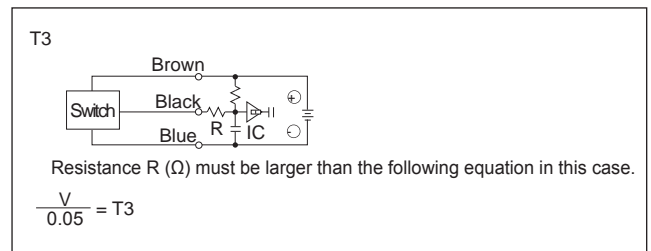
- Pay attention to the leakage current caused by the parallel connection.
 - When connecting several 2-wire switches in parallel, note that leakage current increases in proportion to the number of connected units. Check load specifications and determine the number of connections. Note that switch lamp could dim or may not turn ON.
 - With the 2-wire proximity switch, when 1 switch changes from ON to OFF status, voltage at both ends of the switch connected in parallel drops to the internal voltage drop value when the switch is ON and is less than the load voltage range, so other switches will not turn ON. Therefore, check the input specifications of the programmable controller that is the connected load before use.
 - Since the leakage current value of the 3-wire proximity switch is very small (10 μ A or less), it should not be a problem for normal use.

Output circuit protection

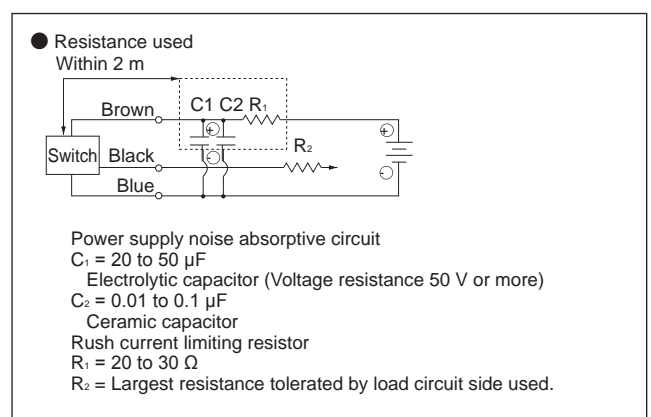
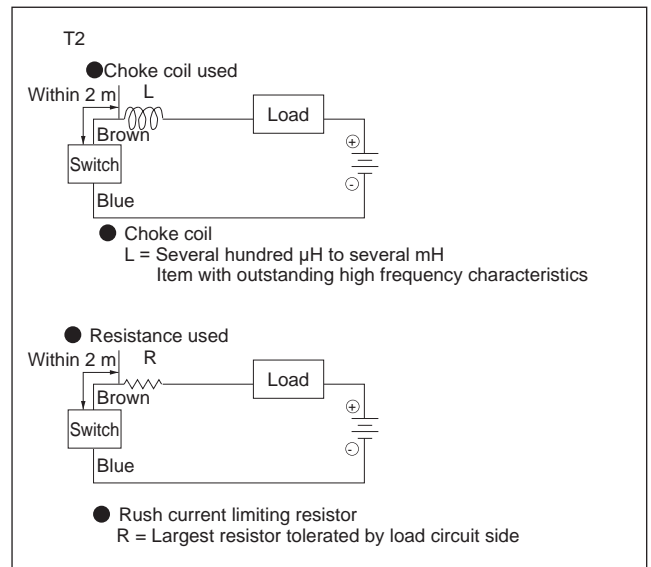
- When an inductive load (relay or solenoid valve) is connected, a surge voltage is generated when the switch is turned OFF. Provide the following protection circuit.



- When a capacious load (capacitor) is connected, starting current is generated when the switch is turned ON. Provide the following protection circuit.



- Provide the following protective circuit if the lead wire length exceeds 10 m.



LGD Series
 AGD/OGD/MGD-R Series
 High durability for process gas
 Other valves for process gas
 Regulator
 Integrated gas supply system
 Safety precautions
 Air operated valve
 Manual valve
 Vacuum pressure control valves
 Safety precautions
 High vacuum components
 Related products

Reed switch ET0H/ET0V

Always read the precautions described in "Pneumatic Cylinders I" (No. CB-029SA) before use.

Design/selection

WARNING

Application, load current, voltage, temperature, impact, environment, etc., outside the specifications will result in damage or operation faults. Use the device as instructed in the specifications.

Never use this product in an explosive gas atmosphere. The switch does not have an explosive-proof structure. Never use in an explosive gas atmosphere as explosions or fires could result.

The lamps used are LEDs. Visibility will gradually decrease with continuous use under high temperatures. As the LED lamp circuit is separated from the switch output circuit, the switch output works normally even if the LED lamp goes out.

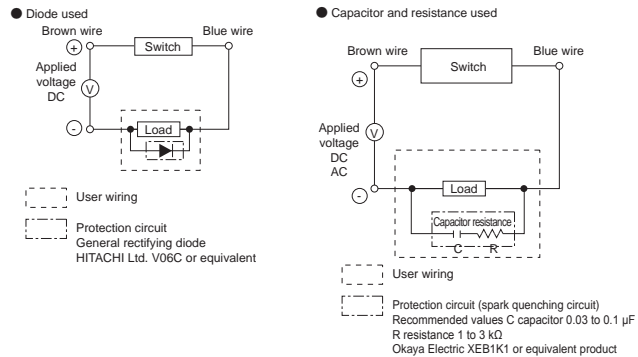
CAUTION

Pay attention to the contact capacity.

Do not use a load that exceeds the switch's max. contact capacity. This may lead to failure. The lamp may not come on if the current is less than the rated current.

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.



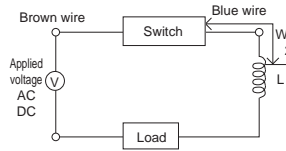
When a capacitance load (capacitor) is connected, starting current is generated when the switch is turned ON. Provide a contact protection circuit.

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.

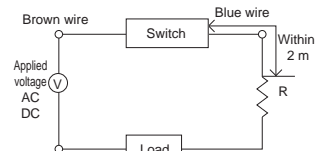
Switch	Voltage	Wiring length
ET0	DC	50m
ET0	AC	10m

Table 1

Choke coil used



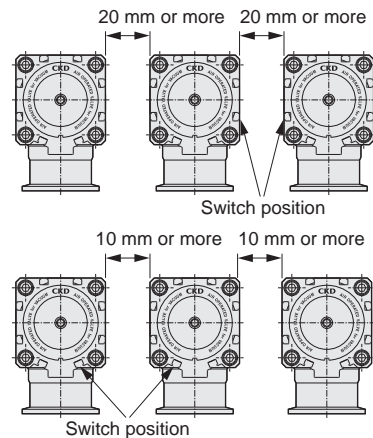
Resistance used



For specifications of contact protection circuits, refer to Pneumatic Cylinders I (Catalog No. CB-029S).

Pay attention to magnetic environments.

- 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. (Same clearance for all bore sizes)



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

- When serially connecting several 2-wire switches, the switch voltage drop is the total voltage drop of all connected switches. The voltage applied to the load is the voltage obtained by subtracting the voltage drop at switches from the power supply voltage. Check load specifications and determine the number of switches.

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

- When connecting several 2-wire switches in parallel, note that leakage current increases in proportion to the number of connected units. Check load specifications and determine the number of connections. Note that switch lamp could dim or may not turn ON.

Mounting, installation and adjustment

CAUTION

- Do not drop or apply impact.
Do not drop, bump, or apply excessive impact (294m/s² or more for reed switches, 980m/s² or more for proximity switches). Even if the switch case is not damaged, switch components could break or malfunction.
- Do not carry the valve by the switch's lead wire.
Never do this: it not only causes disconnection of lead wires, but since stress is applied to the internal switch, it may also damage the switch's internal element.
- Do not wire together with power lines or high voltage lines.
Avoid the use of parallel wiring or wiring in the same conduit as that of power lines or high voltage lines. Wire separately. The control circuit containing the switch could malfunction due to noise.
- Do not short-circuit the load.
If turned ON in a state of load short-circuit, excess current will flow and the switch will be instantly damaged.
- Pay attention to the lead wire connection.
Turn OFF power to the device in the electric circuit to be connected before starting wiring. If operated while the power is turned ON, it may cause accidents due to electric shock or unpredicted operation.

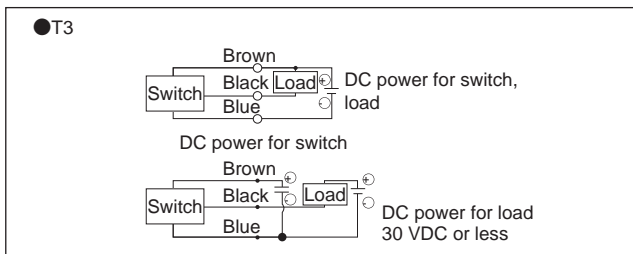
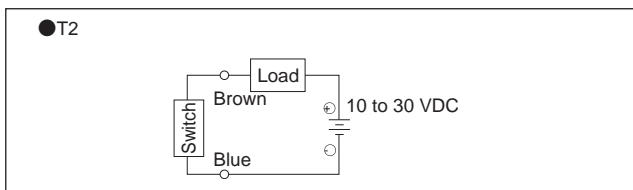
● Reed switch

Do not connect the switch lead wire directly to the power supply. Connect the load serially. Pay attention to the following (1), (2) for TO.

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

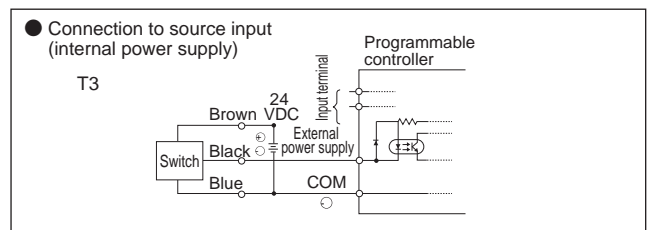
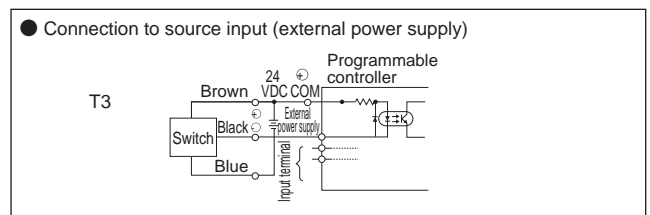
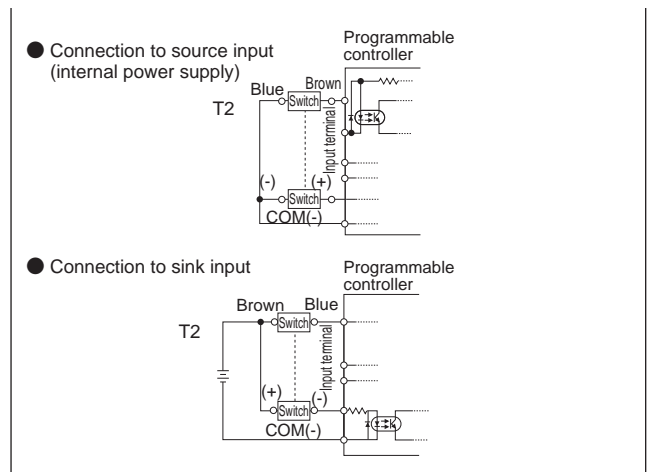
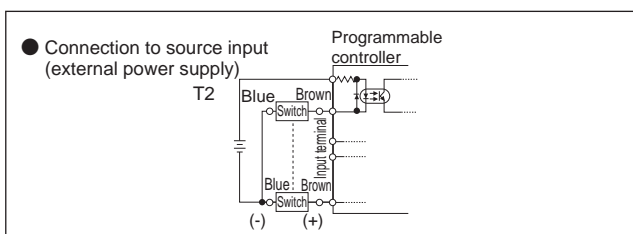
● Proximity switch

Correctly connect the lead wires based on the color coding in the figure below. Incorrect wiring could result in damage.



(Connection to programmable controller (PLC))

- Connection direction differs depending on the type of programmable controller. Connect based on input specifications.



- Set the switch to the center of the operation range.
Adjust the mounting position of the switch so that the piston stops at the center of the operating range (ON range). If set at the end of the operating range (near the boundary line of ON, OFF), operation may become unstable.

- Observe tightening torque when installing the switch.
If the tightening torque range is exceeded, the mounting screw, mounting bracket, switch, etc., could be damaged. In addition, if tightening the set screw with a torque less than the min. tightening torque, the switch mounting position could be displaced. Loosen fixing screw (set screw) and switch groove, and tighten at the specified position. To tighten the switch fixing screw, a flathead screwdriver with a grip diameter of 5 to 6mm, a shape of the end of which is 2.4mm or less and a thickness of 0.3mm or less (watchescrew) with a tightening torque of 0.1 to 0.2N·m. Tighten ETOH/ETOV with a tightening torque of 0.5 to 0.7.

■ 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 or equivalent relays.

- OMRON MY
- Fuji Electric Co., Ltd. HH5
- Tokyo Denki MPM
- Panasonic HC type

LGD Series
 AGD/OGD/MGD-R Series
 High durability
 Other valves for process gas
 Regulator
 Integrated gas supply system
 Safety precautions
 Air operated valve
 Manual valve
 Vacuum pressure control valves
 Safety precautions
 Related products

Use/maintenance

⚠ WARNING

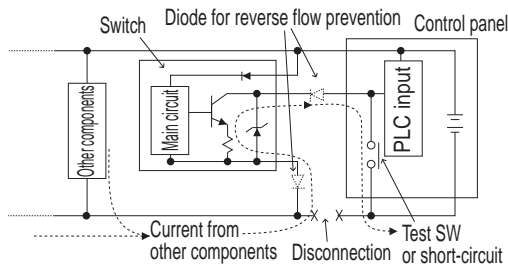
■ Do not apply overcurrent.

If overcurrent flows to the switch due to a load short-circuit, etc., the switch will be damaged with a risk of ignition. Provide an overcurrent protection circuit, such as a fuse, for the output wire and power cable as needed.

⚠ CAUTION

■ Pay attention to reverse currents caused by disconnected wires and 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.

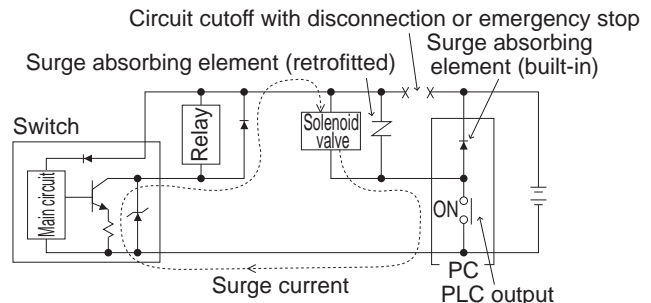


● Take the following measures to prevent damage caused by reverse current:

- (1) Avoid centralizing current at the power cable, especially a negative power cable, and use as thick a cable as possible.
- (2) Limit the number of components connected to the same power supply as the switch.
- (3) Insert a diode in serial with the switch's output cable to prevent reversal of current.
- (4) Insert a diode in serial with the switch's power cable negative side to prevent reversal of current.

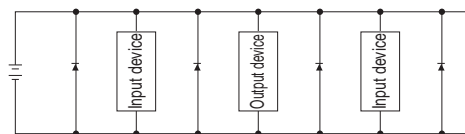
■ Pay attention to surge current flow-around.

- 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 absorbing element is installed.



● Take the measures below to prevent damage from sneak surge current.

- (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 that the surge absorption element connected to the PLC, etc., protects only the individual device.
- (3) Connect a surge absorption element to places on the power wiring shown in the figure below, as a measure against disconnections in unspecified areas.



When devices are connected to a connector, the output circuit could be damaged by the above if the connector is disconnected while power is ON. Turn power OFF before connecting or disconnecting the connector.

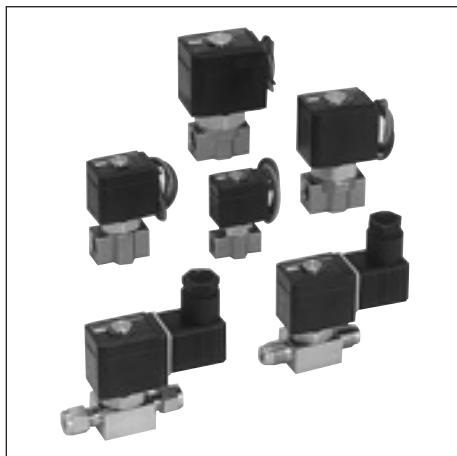
Related products

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* For detailed specifications and warranty, refer to individual catalogs.

Solenoid valve for high vacuum



(Catalog No. CB-03-1SA)

HVB Series

Direct acting high vacuum solenoid valve with high vacuum retention and superb durability

- High vacuum
Vacuum leakage $1.0 \times 10^{-9} \text{Pa} \cdot \text{m}^3/\text{s}$ or less, compatible with high vacuum systems.
- Lightweight and compact
Lightweight and compact thanks to the thin coil.
- Variation
Optimum selection is possible from five coil sizes and multiple orifice sizes.
- Wide range of connections
VCR compatible fitting (JXR fitting), double barbed integrated fitting also available, vacuum container, degree of vacuum retention for piping.

Specifications

● HVB112



Item	HVB112-6N-*	HVB112-8R-*
Working fluid	Vacuum/inert gas (*1)	
Working pressure Pa (abs)	1.3×10^{-6} to 3×10^5 (*3)	
Max. working pressure differential MPa	0.3	
Valve seat leakage $\text{Pa} \cdot \text{m}^3/\text{s}(\text{He})$	1.0×10^{-9} or less	
External leakage $\text{Pa} \cdot \text{m}^3/\text{s}(\text{He})$	1.0×10^{-9} or less	
Proof pressure MPa	0.5	
Back pressure (*2) MPa	0.2	
Fluid temperature °C	5 to 55	
Ambient temperature °C	0 to 55	
Orifice size mm	1.6	
Cv	0.09	
Frequency cycles/min. or less	60	
Port size	NPT1/8	1/4" VCR female
Mounting orientation	Vertical direction with the coil on top	
Weight kg	0.15	0.24
JIS symbol		

Electrical specifications

Rated voltage	100/200 VAC (50/60 Hz), 24 VDC
Voltage fluctuation range	Rated voltage $\pm 10\%$
Power consumption W	4.0
Thermal class	B
Temperature rise K	70

● HVB212/312/412/512

Item	HVB*12
Working fluid	Air/vacuum/inert gas (*1)
Proof pressure MPa	5.0
Fluid temperature °C	5 to 55
Ambient temperature °C	0 to 55 (no freezing)
Thermal class	B
Voltage fluctuation range	Rated voltage $\pm 10\%$
Atmosphere	No explosive or corrosive atmospheres
Valve structure	Direct acting poppet structure
Valve seat leakage $\text{Pa} \cdot \text{m}^3/\text{sHe}$	1.0×10^{-9} or less
External leakage $\text{Pa} \cdot \text{m}^3/\text{sHe}$	1.0×10^{-9} or less
Mounting orientation	Unrestricted
Durability	200 million cycles
JIS symbol	

*1: The number of durability times may decrease sharply depending on the degree of dryness.

*2: Atmospheric pressure at port B that can be applied from port A

*3: The working pressure vacuum does not guarantee the vacuum attainment time or that the vacuum will not change.

*4: FKM is used for sealant material, so consider the generation of discharge gas during use.

*5: Grease for high vacuum is used on the O-rings of gas contacting parts.

Solenoid valve for high vacuum



HVB₆ Series

Large flow rate solenoid valve with wide range of options

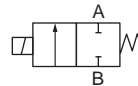
- High vacuum
Vacuum leakage $1.0 \times 10^{-9} \text{Pa}\cdot\text{m}^3/\text{s}$ or less, compatible with high vacuum systems.
- Coil heat resistance
Class 130 (B) Class 180 (H)
- Connection
Flange $\varnothing 48, \varnothing 52$



Specifications (Catalog No. CB-03-1SA)

Model No.	HVB612-12F			HVB712-15F			
	-8 B	-8H	-12 B	-12 B	-12H	-15 B	-15H
Working fluid	Vacuum and inert gas (*1)						
Working pressure Pa (abs)	1.3×10^6 to 2.0×10^5	1.3×10^6 to 3.0×10^5	1.3×10^6 to 1.0×10^5	1.3×10^6 to 1.5×10^5	1.3×10^6 to 3.0×10^5	1.3×10^6 to 1.0×10^5	1.3×10^6 to 1.0×10^5
Max. working pressure differential MPa	0.2	0.3	0.1	0.15	0.3	0.1	0.1
Orifice size mm	8		12	12		15	
Cv	Straight		2.7	3.2		4.3	
	L direction		3.2	3.6		4.7	
Back pressure (*2) MPa	0.1		0.02	0.1		0.02	0.1
Valve seat leakage $\text{Pa}\cdot\text{m}^3/\text{s}(\text{He})$	1.0×10^{-9} or less						
External leakage $\text{Pa}\cdot\text{m}^3/\text{s}(\text{He})$	1.0×10^{-9} or less						
Proof pressure MPa	0.5						
Fluid temperature °C	5 to 55						
Ambient temperature °C	0 to 55						
Frequency cycles/min. or less	10						
Mounting orientation	Unrestricted						
Port size	$\varnothing 48$ flange			$\varnothing 52$ flange			
Weight kg	1.15			2.0			

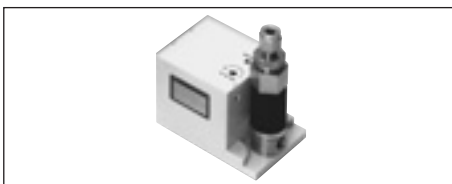
JIS symbol



Electrical specifications								
Rated voltage	50/60 VAC (50/60Hz), 24 VDC							
Voltage fluctuation range	Rated voltage $\pm 10\%$							
Power consumption W	14.3	28	14.3	19	AC: 32.5 DC: 40	19	AC: 32.5 DC: 40	
Thermal class	B	H	B	B	H	B	H	
Temperature rise K	75	125	75	75	125	75	125	

- *1: The number of durability times may decrease sharply depending on the degree of dryness.
 *2: Atmospheric pressure at port B that can be applied from port A. (Reverse vacuum is not possible with HVB612-12F-12B and HVB712-15F-15B.)
 *3: Grease for high vacuum is used on the O-rings of gas contacting parts.
 *4: The working pressure range vacuum does not guarantee the vacuum attainment time or that the vacuum will not change.
 *5: FKM is used for sealant material, so consider the generation of discharge gas during use.

Solenoid valve for high vacuum



(Catalog No. CB-03-1SA)

HVL Series

Preventing entry of oil in case of power failure

- Easy setting: Off-delay setting of up to 8 seconds (AC) and 10 seconds (DC) is possible.
- High vacuum: Vacuum leakage $1.0 \times 10^{-9} \text{Pa}\cdot\text{m}^3/\text{s}$ or less.



Specifications

Item	HVL12
Working fluid	Air, nitrogen (*1)
Working pressure Pa (abs)	1.3×10^6 to 2.0×10^5
Max. working differential pressure MPa	0.2
Valve seat leakage $\text{Pa}\cdot\text{m}^3/\text{s}(\text{He})$	1.3×10^{-9} or less
External leakage $\text{Pa}\cdot\text{m}^3/\text{s}(\text{He})$	1.3×10^{-9} or less
Proof pressure MPa	0.5
Fluid temperature °C	5 to 50
Ambient temperature °C	0 to 50
Orifice size mm	1.2
Mounting orientation	Unrestricted
Weight kg	0.5
(*2)	DC
Frequency	.5 cycles/min. or less
Port size	Rc1/8, 1/4" double barbed fitting, NW10.16 vacuum clamp fitting
Cv	0.05
Max. set delay time	AC: 8 sec, DC: 10 sec ($\pm 35\%$)
Rated voltage	24 VDC, 100 VAC, 200 VAC
Voltage fluctuation range	Rated voltage $\pm 10\%$
Power consumption W	4

- *1: Durability may decrease sharply depending on the degree of dryness.
 *2: Weight shown in the table is for port size Rc1/8.
 *3: Do not handle by the lead wire only.
 *4: Always use the M4 screws on the bottom of the case when mounting.
 *5: Do not fix the valve by the port piping only. Use the valve in a place where vibration does not affect the performance.

LGD Series
 AGD/OGD/
 MGD-R Series
 High durability
 Other valves
 for process gas
 Regulator
 Integrated gas
 supply system
 Safety precautions
 Air operated valve
 Manual valve
 Vacuum pressure
 control valves
 Safety precautions
 High vacuum components
 Related products

Solenoid valve for operation



(Catalog No. CB-023SA)

Applications: Air operated valve drive, etc.

CC-Link **DeviceNet**

EtherCAT **EtherNet/IP**

MN3E/MN4E Series

(3, 4, 3-port valve, two 2-port valves integrated)

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 MN3/4E00 Series of 7 mm valve block width and 7 mm pitch manifold in addition to the MN3/4E0 Series of 10 mm valve block width type. Helps to reduce device footprints. Can be installed anywhere. Individual wiring used for increased integration.
- **Environmental conservation**
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
- **Variety**
A wide range of electrical connections such as serial transmission corresponding to various connectors and networks are available.
- **Energy saving**
MN3, 4E0 Series: 0.6W
MN3, 4E00 Series: 0.4W
With energy saving type (Option E), it further reduces power consumption.

Specifications



● MN3E00/MN4E00

Item	MN3E00	MN4E00
Working fluid	Compressed air	
Actuation	Pilot operated	
Valve structure	Soft spool	
Working pressure MPa	0.2 to 0.7	
C[dm ³ /S·bar]	0.3 to 0.32	

Electrical specifications

Rated voltage V	DC12, 24	
Power consumption W	0.4	

● MN3E0/MN4E0

Item	MN3E0	MN4E0
Working fluid	Compressed air	
Actuation	Pilot operated	
Valve structure	Soft spool	
Working pressure MPa	0.2 to 0.7	
C[dm ³ /S·bar]	0.50 to 0.54	

Electrical specifications

Rated voltage V	DC12, 24	
Power consumption W	0.6	

Solenoid valve for operation



(Catalog No. CC-1330A)

Applications: Air operated valve drive, etc.

3QRA/B Series

(3-port valve)

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 (dm³/s·bar) Large flow rate C:0.3 (dm³/s·bar) Standard
High response 4±1ms/1.5±1ms (ON/OFF)
- Standard compliant for various applications All ports from vacuum to positive pressure Universally pressurizable
 - Ozone resistance (rubber FKM used)
 - RoHS command compliant
 - Restricted copper materials (air passage, sliding part)

Common specifications

Item	Description
Valve and operation	Direct acting poppet valve
Working fluid	Compressed air, low vacuum
Max. working pressure MPa	0.70
Min. working pressure MPa	Low vacuum: -100 kPa
Proof pressure MPa	1.05 (low vacuum: -101 kPa)
Max. working pressure differential MPa	0.70
Ambient temperature °C	-5 to 50 (no freezing)
Fluid temperature °C	5 to 50
Lubrication	Not available *
Degree of protection	Dust-proof
Vibration/shock resistance m/s ²	50 or less/300 or less
Atmosphere	Cannot be used in corrosive gas environment.

* Lubrication will degrade the performance.

Electrical specifications



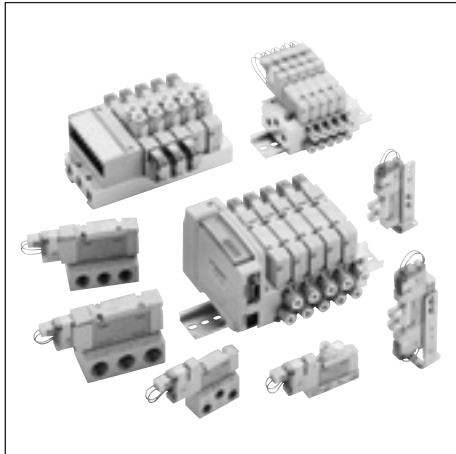
Item	Standard specifications		Large flow rate specifications H	
	Standard specifications	Large flow rate specifications H	Standard specifications	Large flow rate specifications H
Rated voltage V	DC	24/12		
Energizing rate	Intermittent *1	Continuous		
Voltage fluctuation range	±10%			
Starting current A	24 VDC	-	0.13	
	12 VDC	-	0.27	
Holding current A	24 VDC	0.08	0.10	
	12 VDC	0.17	0.20	
Power consumption W	2.0	2.4 *2		
Thermal class	B			

*1: Limit continuous energizing to within 5 minutes and energization ratio to 50% or less. Min. time of excitation for self-holding is 50 ms.

*2: 20 W for 3.2 ms after start.

LGD Series
 AGD/OGD/MGD-R Series
 High durability
 Other valves for process gas
 Regulator
 Integrated gas supply system
 Safety precautions
 Air operated valve
 Manual valve
 High vacuum components
 Vacuum pressure control valves
 Safety precautions
 Related products

Solenoid valve for operation



(Catalog No. CB-023SA)

Applications: Air operated valve drive, etc.

CC-Link

CC-Link IE Field Basic

CC-Link IE Field **DeviceNet**

PROFIBUS-DP **PROFINET**

EtherCAT **EtherNet/IP**

IO-Link

MN4GA/B R Series

(3, 5-port valve)

General purpose valves support a wide range of needs

- **Safety**
 - Includes protective cover to prevent 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 1 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**
 - Wiring connector upward/lateral common
 - Just insert top-facing or side-facing. PAT.
- **Energy savings: 0.35 W, 0.1 W (low exoergic/energy circuit)**
- **Diverse options**
 - Eight types available
- **Wide range of communication methods**
 - Supports ten types of communication methods



Specifications

Item	3G	4G
Working fluid	Compressed air	
Actuation	Pilot operated	
Valve structure	Soft spool	
Working pressure MPa	0.2 to 0.7	
C[dm ³ /S-bar]	0.92 to 2.6	0.92 to 4.5
Electrical specifications		
Rated voltage V	DC	12, 24
	AC	100, 200
Power consumption W	DC12,24	0.35 (0.4) with energy saving circuit 0.1
Apparent power VA	100 VAC	1.0 (1.2) 0.93 (0.98)
	200 VAC	1.40

Values in () apply when lamp is included.

Components for process gases

Other valves for process gas

High durability

AGD/OGD/ MGD-R Series

LGD Series

High vacuum components

Vacuum pressure control valves

Manual valve

Air operated valve

Safety precautions

Integrated gas supply system

Regulator

Other valves for process gas

High durability

AGD/OGD/ MGD-R Series

LGD Series

Related products

Clean regulator



(Catalog No. CB-024SA)

Applications: Purge Air, N₂ Pressure adjustment

RC2000 Series

Ideal for pressure control of clean air and nitrogen

- **Oil-prohibited specifications**
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**
Compact size of Face to face 50mm, yet 0.8m³A large flow rate of /min.
(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.



Specifications

Model No.	RC2000-8-P90	RC2000-10-P90	RC2000-15-P90
Working fluid	Compressed air, N ₂		
Max. working pressure MPa	1.0 (0.5 for low pressure)		
Proof pressure MPa	1.5		
Operating ambient temperature °C	5 to 60		
Set pressure MPa	Standard: 0.05 to 0.7 Low pressure: 0.02 to 0.2		*1
Port size (IN/OUT)	Rc1/4	Rc3/8	Rc1/2
Pressure gauge port size	Rc1/8		
Gas contacting parts material	Metal	SUS316	
	Resin	PTFE	
	Rubber	FKM	
Assembling/inspection/packaging	Integrated production in cleanroom		
Cleaning (gas contact part)	Precision cleaning		
Weight kg	0.47	0.45	0.59
Attachment weight g	G _Z ^Y 49:90, B3:40, E1:5		

*1: When using the standard with a set pressure of 0.4MPa or less, confirm that the primary pressure difference for the set pressure is within 0.5MPa. When using the low pressure type, confirm that the primary pressure difference for set pressure is within 0.3 MPa.

LGD Series
 AGD/OGD/MGD-R Series
 High durability
 Other valves for process gas
 Regulator
 Integrated gas supply system
 Safety precautions
 Air operated valve
 Manual valve
 Vacuum pressure control valves
 Safety precautions
 Related products
 Components for process gases
 High vacuum components

Flow rate sensor



(Catalog No. CC-1393A)

Applications: Purge Air, N₂ Flow rate measurement

IO-Link

Compact flow rate sensor (RAPIFLOW)[®] FSM3 Series

Easy-to-use compact flow rate sensor with high performance and variety

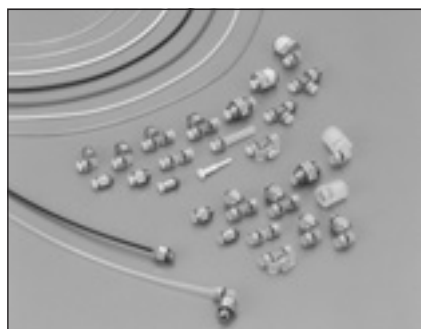
- **Stainless steel body**
An oxygen-dedicated model is also available (oil-prohibited specifications)
Select from JXR fitting type, double barbed fitting type and screw-in type
- **Resin body**
Select from four fitting types: push-in elbow, push-in straight, screw-in elbow and screw-in straight
2-port valve can be directly connected, contributing to further space saving
- **Common specifications**
Flow rate range: Supports up to 1,000L
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

Specifications



Item		FSM3											
		005	010	020	050	100	200	500	101	201	501	102	
Flow direction	U	Uni-direction											
	B	Bi-direction											
Measured flow rate Range (□/min)	U	15 to 500mL	30 to 1000mL	0.06 to 2.00L	0.15 to 5.00L	0.30 to 10.00L	0.6 to 20.0L	1.5 to 50.0L	3.0 to 100.0L	6 to 200L	15 to 500L	30 to 1000L	
	B	-500 to -15, 15 to 500mL	-1000 to -30, 30 to 1000mL	-2.00 to -0.06, 0.06 to 2.00L	-5.00 to -0.15, 0.15 to 5.00L	-10.00 to -0.30, 0.30 to 10.00L	-20.0 to -0.6, 0.6 to 20.0L	-50.0 to -1.5, 1.5 to 50.0L	-100.0 to -3.0, 3.0 to 100.0L	-200 to -6, 6 to 200L	-500 to -15, 15 to 500L	-1000 to -30, 30 to 1000L	
Working conditions	Applicable fluids	Clean air (JIS B 8392-1:2012 1.1.1 up5.6.2), compressed air (JIS B 8392-1:2012 1.1.1 to 1.6.2), N ₂ Argon, carbon dioxide, and gas mixture (argon + carbon dioxide)										-	
	Temp range	0 to 50°C (no condensation)											
	Pressure range	-0.07 to 0.75MPa (stainless steel body -0.01 to 1.00MPa)								0 to 0.75 MPa(Stainless steel body 0 to 1.00 MPa)		0 to 0.75 MPa	
	Proof pressure	1 MPa (stainless steel body 1.5MPa)											
Operating ambient temperature/humidity		0 to 50 °C, 90% RH or less											
Storage temperature		-10 to 60°C											
Accuracy (Fluid: in dry air)	Accuracy	Within ±3% F.S. (Secondary side released to atmosphere) (The scope of warranty is in accordance with the "measured flow rate range.")											
	Repeatability	Within ±1% F.S. (Secondary side released to atmosphere)											
	Temp characteristics	Within ±0.2% F.S./°C (15 to 35°C, base temperature 25°C)											
Response time		50 msec or less (setting response time OFF)											
Current consumption		45 mA or less											
Lead wire		ø3.7, AWG26 or equivalent x 5-conductor (connector), insulator O.D. 1.0											
Functions		①Gas switching, ②Setting copy function, ③Flow rate integration, ④Peak hold, etc.											
Degree of protection		IP40 or equivalent (IEC standard)											
Protection circuit		Power reverse connection protection, switch output reverse connection protection, switch output load short-circuit protection											
Vibration resistance		10 to 150 Hz, max. 100m/s ² , X, Y, Z directions, every 2 hours											
EMC Directive		EN55011, EN61000-6-2, EN61000-4-2/3/4/6/8											
Mounting	Mounting orientation	Unrestricted in vertical/horizontal direction											
	Straight piping section	Not required											

Auxiliary components



(Catalog No. CB-024SA)

Applications: Air operated valve drive

Fiber tube[®] For push-in fitting

New ultra-fine tube with enhanced usability thanks to push-in fitting and expanded inner diameter

- New O.D. gripping structure used
- Expanded bore size from $\phi 1.0$ to $\phi 1.2$ for approx. three times larger flow rate
- Tube piping capacity is small, thus energy saving/space saving
- Series of clean-room models using highly corrosion-resistant materials
- Attachable and detachable push-in fitting, standard PG Series, clean-room CG Series available



Specifications

- Fiber tube

Model No.	Antistatic UP-9402-F1	Clean-room EH-5802
Working fluid	Compressed air (*1)	
Working pressure (20°C)	-100kPa to 0.8MPa	-100kPa to 1.0MPa
Ambient temperature °C	-10 to 60 (no freezing)	
O.D. x I.D. mm	$\phi 1.8 \times \phi 1.2$	
Inner diameter accuracy mm	± 0.1	
Outer diameter accuracy mm	± 0.1	
Durometer hardness	HDA 94	HDD 58
Min. bending radius (JIS B 8381) mm	4	5
Min. mounting radius mm	4	7
Burst pressure (20°C) MPa	2.5	3.8
Volume resistance ratio $\Omega \cdot \text{cm}$	1010 to 1012	-
Material	Antistatic urethane	Special polyolefin
Color	Black/white/transparent/transparent blue/transparent green/yellow (*2)/red (*2)	Black/transparent

*1: Consult with CKD for other working fluids.

*2: Yellow and red are made-to-order products.

- Push-in fitting (standard)

Model No.	PG Series
Working fluid	Compressed air (*1)
Working pressure	-100 kPa to 1.0 MPa
Ambient temperature °C	-10 to 60 (no freezing)
Tube used	Fiber tube (UP-9402-F1, EH-5802) *2

*1: Consult with CKD for other working fluids.

*2: Fiber tube for barbed fitting (UP-9102-F1) is not available.

*3: Sales unit is 1 set (10 pieces).

- Push-in fitting (clean-room type)

Model No.	CG Series
Working fluid	Clean air (*1)
Working pressure	-100kPa to 1.0MPa
Ambient temperature °C	-10 to 60 (no freezing)
Lubricant	Oil-prohibited
Tube used	Fiber tube (UP-9402-F1, EH-5802) *2

*1: Rubber EPDM material is used, so this product cannot be used with fluids that contain mineral oil. Consult with CKD for other working fluids.

*2: Fiber tube for barbed fitting (UP-9102-F1) is not available.

*3: Sales unit is one piece.

Auxiliary components



(Catalog No. CB-024SA)

Applications: Air operated valve drive

Fiber tube[®]

Piping-free ultra-fine tube

- Extremely fine tube as fine and flexible as lead wire
- O.D. ϕ 1.8, min. bending radius 4 mm
- Electrical resistance is approx. $1 \times 10^{17} \Omega \cdot \text{cm}$ Antistatic
- Ideal for fine speed cylinder piping
- Equipped with a wide range of tube colors and fittings



Specifications

● Tube

Item	UP-9102-20-* -F1
Working fluid	Compressed air
Working pressure (20°C) (*1)	-100kPa to 0.7MPa
Ambient temperature °C	-10 to 60 (no freezing)
O.D. x I.D. mm	1.8 x 1.0
Inside diameter accuracy	± 0.1
Diametral accuracy	± 0.1
Min. bending radius (JIS B 8381) mm	2
Min. installation radius mm	4
Burst pressure (20°C) MPa	2.1 (reference value)
Volume resistance ratio $\Omega \cdot \text{cm}$	1×10^8 or less (black) 1×10^{12} or less (colors other than black)
Material	Conductive urethane
Color	Black, white, transparent, transparent blue, transparent green, yellow (*1), red(*1)

● Dedicated fitting

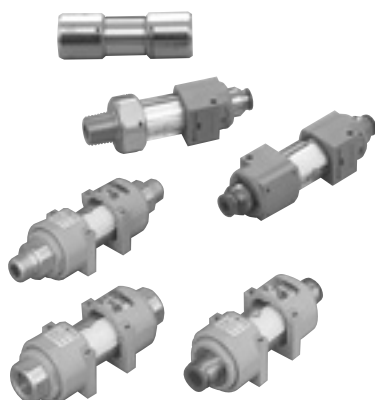
Item	PTN*
Port size	M3, M5, R1/8, $\phi 3.2$ (*3), $\phi 4$ (*3), $\phi 6$ (*3)
Working fluid	Compressed air
Working pressure	-100kPa to 0.7MPa
Ambient temperature °C	-10 to 60 (no freezing)
Tube used	Tube UP-9102-20-* -F1
Effective cross-sectional area mm^2	Straight, barbed nipple: 0.3 elbow: 0.2
Flow rate (*2) L/min (ANR)	Straight, barbed nipple: 20. Elbow: 13.

*1: Made to order.

*2: Flow rate is the atmospheric pressure conversion at 0.5MPa.

*3: Compatible tube: Soft nylon tube (model No. FH-3224, F-1504, F-1506)
Urethane tube (model No. U-9504, U-9506)

Auxiliary components



(Catalog No. CB-024SA)

Applications: Purge Air, Purification of N₂

FCS Series

Our proprietary hollow fiber membrane provides innovative filter performance

- **High-precision filtration**
Hollow fiber membrane element has enabled 0.01 μm high precision filtration and 99.99% removal efficiency
- **Long service life**
Considerably longer service life. Approximately five times longer than the flat membrane type
- **Compact/lightweight/large flow rate**
A three to ten times filtration area enables larger flow rate and less pressure loss than the flat membrane type of the same capacity. Lighter and more compact at the same flow rate
- **Oil-prohibited specifications**
Parts are all degreased and cleaned. Production from assembly through packaging takes place in cleanrooms
- **Easy maintenance**
As the case of resin type is transparent, Dirt on the element is visually apparent
- **Ample variations**
Two kinds of flow rate (500 and 1000 Series), resin and stainless steel materials, and mounting options of push-in fitting, male thread piping and female thread piping are available.



Specifications(FCS500)

Item	Standard element resin	Male thread piping	P9 element stainless steel	
	FCS500-(*)(*2)	FCS500-(*)(*2)	FCS500-66-P90 FCS500-66-P94	FCS500-88-P90 FCS500-88-P94
Working fluid	Compressed air, N ₂			
IN side port size (*1)	ø4, ø6, ø8orL Selection	Select from ø4, ø6, ø8, R1/8 and R1/4	Rc1/8	Rc1/4
OUT side port size (*2)			Rc1/8	Rc1/4
Proof pressure MPa	1.5	1.5	2.25(Compressed air), 1.5(N ₂)	
Differential resistant pressure MPa	0.5(where,45 to 50°Cis0.2)	0.5(where 45 to 50°C is0.2)	0.5	
Working pressure MPa	-0.095 to 0.99 *2	-0.095 to 0.99 *2	-0.095 to 1.5(Compressed air), -0.095 to 0.99(N ₂)	
Ambient temperature °C	5 to 50	5 to 50	5 to 45	
Degree of filtration μm	0.01(removal efficiency 99.99%)			
Processing flow rate L/min(ANR) *1	50 (H8H8 type: 80)	50 (H88A and 8AH8 types: 80)	50	80
Weight g	45	45	100	100
Material	Body	Polyamide	Polyamide, Aluminum(Alumite treatment)	
	Case	Clear polyamide	Clear polyamide	
	Element	Polypropylene + urethane		
Assembling/inspection/packaging	Integrated production in cleanroom			
Cleaning	Degreasing			

*1: Initial flow rate at primary pressure 0.7 MPa and pressure drop 0.03 MPa.

*2: Maximum working pressure varies with working temperature.

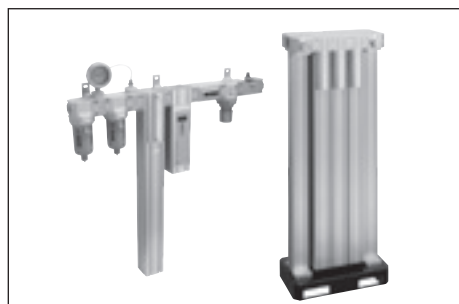
Specifications(FCS1000)

Item	Resin	Stainless steel (made to order)	
	FCS1000-(*) (*2)	FCS1000-(*) (*2)-P90 FCS1000-(*) (*2)-P94	
Working fluid	Compressed air, N ₂		
IN side port size (*1)	Push-in fitting ø8, ø10, ø12,	Select from Rc1/4 and Rc3/8	
OUT side port size (*2)	Select from R1/4, R3/8, Rc1/4 and Rc3/8		
Proof pressure MPa	1.5	2.25 (compressed air), 1.5(N ₂)	
Differential resistant pressure MPa	0.5		
Working pressure MPa	-0.095 to 0.99	-0.095 to 1.5 (compressed air), -0.095 to 0.99 (N ₂)	
Ambient temperature °C	5 to 45		
Degree of filtration μm	0.01 (removal efficiency 99.99%)		
Processing flow rate L/min (ANR)	300 to 400 *1		
Weight kg	Push-in fitting	Other than push-in fitting	0.5
	0.15	0.11	
Material	Body	Polyamide	
	Case	Clear polyamide	
	Element	Polypropylene + urethane	
Assembling/inspection/packaging	Integrated production in cleanroom		
Cleaning	Degreasing		

*1: Initial flow rate at primary pressure 0.7 MPa and pressure drop 0.03 MPa. (Differs according to port size.)

LGD Series
 AGD/OGD/ MGD-R Series
 High durability
 Other valves for process gas
 Regulator
 Integrated gas supply system
 Safety precautions
 Air operated valve
 Manual valve
 Vacuum pressure control valves
 Safety precautions
 High vacuum components
 Related products

Gas generator



(Catalog No. CC-1355A)

Nitrogen Gas Extraction Unit NS Series

Easily extracts nitrogen gas from compressed air

- 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. tank control, filling costs, etc., do not continue.
- Easy maintenance
Since there are no movable parts, stable performance can be maintained. Parts replacement is possible without disassembling the piping.

Applications: N₂ extraction

Common specifications

Item	NSU-3S	NSU-3L	NSU-4S	NSU-4L
Working fluid	Compressed air			
Inlet air pressure MPa	0.4 to 1.0			
Inlet air temperature °C	5 to 50			
Relative humidity of inlet air RH	50%			
Ambient temperature °C	5 to 50			
Inlet air pressure dew point °C	10			
Inlet air pressure MPa	0.7			
Inlet air temperature °C	25			
Ambient temperature °C	25			

System type NSU Series specifications

Item	NSU-3S	NSU-3L	NSU-4S	NSU-4F	NSU-4L	NSU-4G	NSU-4H		
Rated flow rate Outlet nitrogen gas flow rate L/min(ANR)	Nitrogen concentration (%)	99.9	1.9	5.6	11.0	20.9	30.6	31.9	49.0
		99	5.0	15.5	28.2	53.6	66.9	81.8	107.0
		97	8.9	28.7	49.9	94.8	118.1	159.7	189.0
		95	14.0	39.8	65.3	124.1	169.2	222.0	270.7
		90	27.0	78.1	137.3	260.9	313.5	-	-
Air filter	Filtration rating μm	5							
Oil mist filter	Oil removal mg/m ³	0.01Less than or equal to (0.1 or less after oil saturation) * Primary oil content 30mg/m ³ when , 21°C.							
Regulator	Set pressure rangeMPa	0.05 to 0.85							

Unit NS Series specifications



■ Single cylinder

Item	NS-3S1	NS-3L1	NS-4S1	NS-4L1		
Rated flow rate Outlet nitrogen gas flow rate L/min(ANR)	Nitrogen concentration (%)	99.9	1.9	5.6	11.0	30.6
		99	5.0	15.5	28.2	66.9
		97	8.9	28.7	49.9	118.1
		95	14.0	39.8	65.3	169.2
		90	27.0	78.1	137.3	313.5

■ Double cylinder

Item	NS-4S2	NS-4S3	NS-4L2	NS-4L3	NS-4L4	NS-4S6	NS-4S8	NS-4SA	NS-4L6	NS-4L8		
Rated flow rate Outlet nitrogen gas flow rate L/min(ANR)	Nitrogen concentration (%)	99.9	22.0	33.0	61.2	91.8	122.4	66.0	88.0	110.0	183.6	244.8
		99	56.4	84.6	133.8	200.7	267.6	169.2	225.6	282.0	401.4	535.2
		97	99.8	149.7	236.2	354.3	472.4	299.4	399.2	499.0	708.6	944.8
		95	130.6	195.9	338.4	507.6	676.8	391.8	522.4	653.0	1015.2	1353.6
		90	274.6	411.9	627.0	940.5	1254.0	823.8	1098.4	1373.0	1881.0	2508.0

Gas generator



(Catalog No. CC-1414A)

Applications: Oxygen concentration measurement

Inline oxygen monitor PNA Series

A new kind of sensor that visualizes oxygen concentration

- 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
Alarms can be set for concentration changes, and status monitoring is possible.
- With self-diagnostic function
Keeps you posted about abnormalities in the detector element.



Specifications

Item	Description
Measuring method	Zirconia solid electrolyte method
Display	Switchable oxygen concentration display and nitrogen concentration display (100-oxygen concentration)
Working fluid	Nitrogen-rich compressed air
Working pressure MPa	0 to 1.0
Proof pressure MPa	1.5
Max. flow rate L/min (ANR)	500 *1
Measured range %O ₂	0.00 to 25.00
Accuracy *2	±0.05%O ₂ ±1 digit (For 0.00 to 1.00%O ₂) ±0.10%O ₂ ±1 digit (For 1.01 to 2.50%O ₂) ±0.5%O ₂ ±1 digit (For 2.51 to 10.00%O ₂) ±1.0%O ₂ ±1 digit (For 10.01 to 25.00%O ₂)
Power supply voltage	24 VDC ±15% (with AC adapter: 100 to 240 VAC)
Degree of protection	IP 65 or equiv.
EMC Directive	EN61326-1
Weight kg	1.6

*1 For values exceeding 500 L/min (ANR), consult with CKD.

*2 Value referring to the dry gas made up of oxygen and nitrogen.

Gas generator



(Catalog No. CC-1363A)

Applications: Local air supply

Portable Air Supply Unit ASU-S Series

A compact, all-in-one body.

- 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

Specifications

Item	ASU-S-C6-1
Rated pressure	0.4 MPa
Max. allowable pressure	0.5 MPa
Discharge air quantity (50/60 Hz)	19/25 L/min(ANR) ^{*1,3}
Rated voltage	Single-phase AC100V (50/60 Hz)
Rated current (50/60 Hz)	3.3/3.5 A
Noise level	60 dB (A) with lid closed
Pump electric motor	4P, F-type, capacitor induction Automatic return thermal protector

Item	ASU-S-C6-1
Pump electric motor output	90 W
Ambient temperature	5 to 35°C
Weight	15 kg
Dimensions	W350 x D225 x H560 mm
Pump starting	Pressure switch
Pump warranty period	1 year or 3,000 hours ^{*2}

*1: The flow rate at atmospheric release.

*2: When ambient temperature is 5 to 35 °C, rated pressure is 0.4 MPa, and under continuous operation

*3: Measured value according to CKD test conditions. It is not a guaranteed value.

LGD Series
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 High durability
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 High vacuum components
 Related products

Have questions about chemical liquid, gas or vacuum control?
Call CKD Fine product representatives directly!



Reception department: FS department
Tel: (+81)52-223-1126
 Reception hours: JST 9:00 to 12:00/13:00 to 17:00
 (Closed weekends and holidays)

Clean units

F I C S

Fine **I**ntegrated **C**omponents **S**olution

Our process gas/inert gas units have advanced results for semiconductor products!



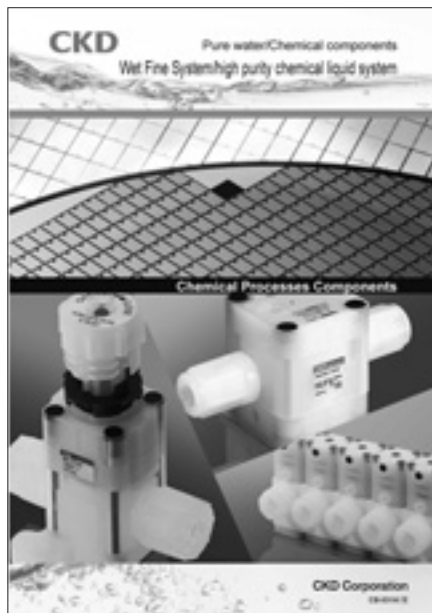
**Just tell us your process and specification requirements!
 Leave the rest to CKD!**

- Design** Less time spent on selection, design and creating diagrams
- Materials** Less time spent on invoices and delivery management, reduced numbers of forms
- Production** Less time spent on machining, assembly and inspection—just run the IN/OUT pipes!

System lineup

CONTENTS

Wet Fine components	162
Components for clean room specifications	162



Responding to high-level needs for semiconductor manufacturing process control Wet Fine Components General Catalog

Catalog No. CB-031A

- Industry top performance and reliability
- High quality achieved by advanced specification super cleanroom and consistent production system from design to assembly/packaging
- Variety of versatile fitting variations



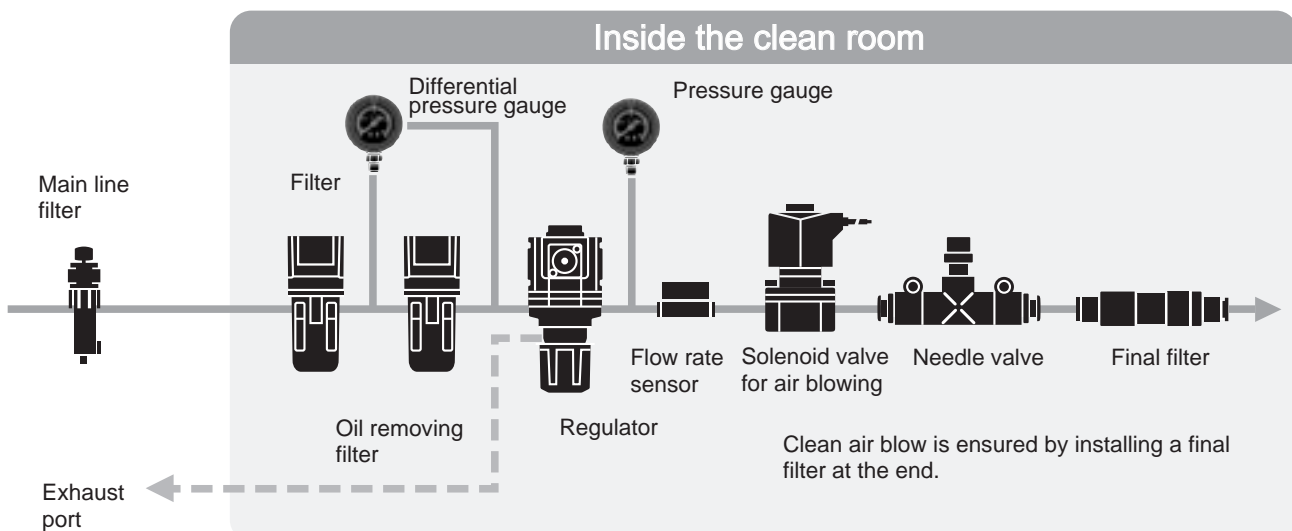
Components for clean room specifications

Catalog No. CB-033SA

Satisfies the various levels of clean room cleanliness in a wide range of industries

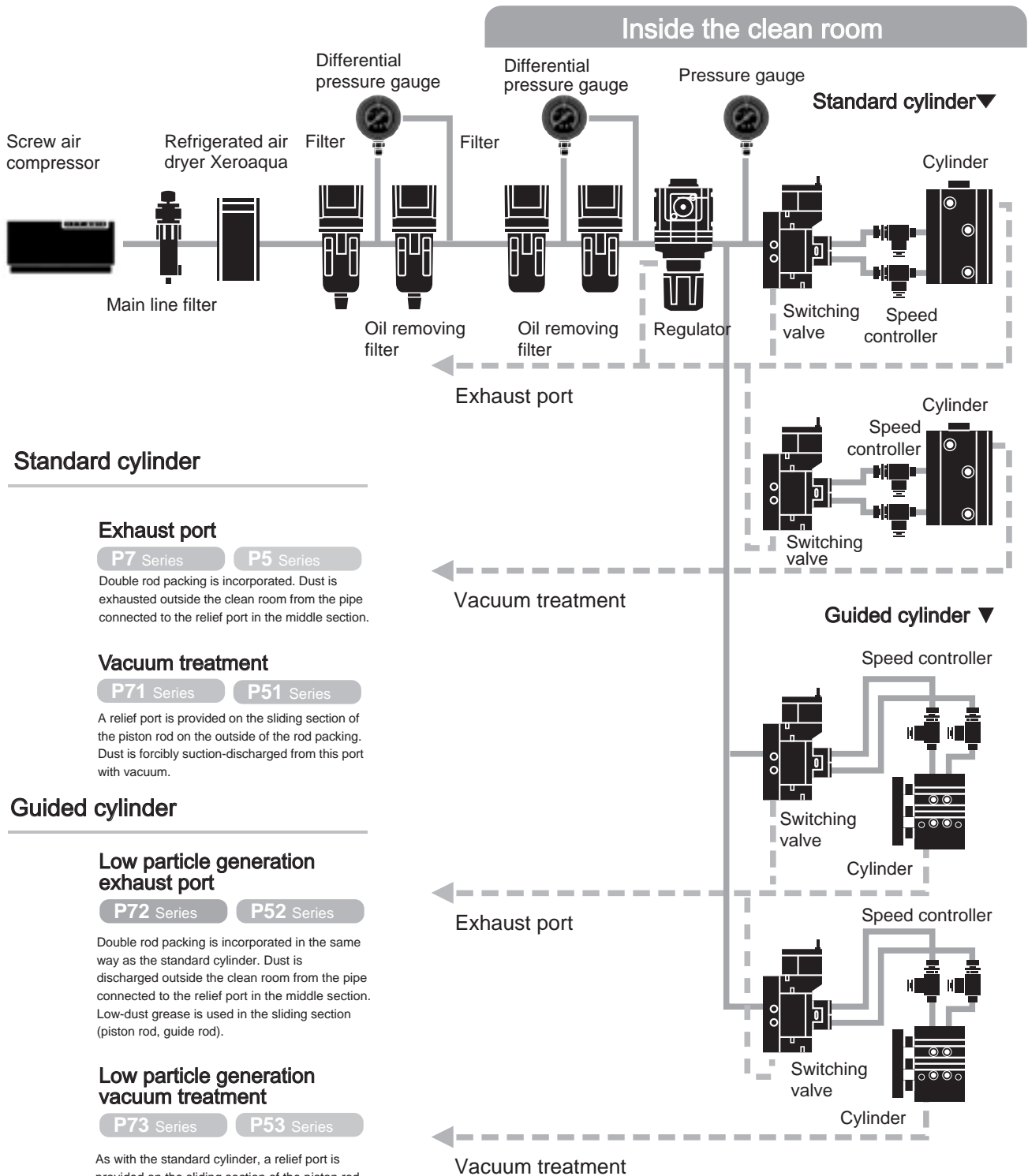
● Reliably producing high cleanliness air

Clean blow system model circuit



● Zero particle generation with vacuum treatment and exhaust port

Air-driven actuator system circuit structure



Standard cylinder

Exhaust port

P7 Series P5 Series

Double rod packing is incorporated. Dust is exhausted outside the clean room from the pipe connected to the relief port in the middle section.

Vacuum treatment

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

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. Low-dust grease is used in the sliding section (piston rod, guide rod).

Low particle generation vacuum treatment

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.

Low-dust grease is used in the sliding section (piston rod, guide rod).

Homepage

Catalog PDFs and CAD data of CKD products are available for download.

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Revision details

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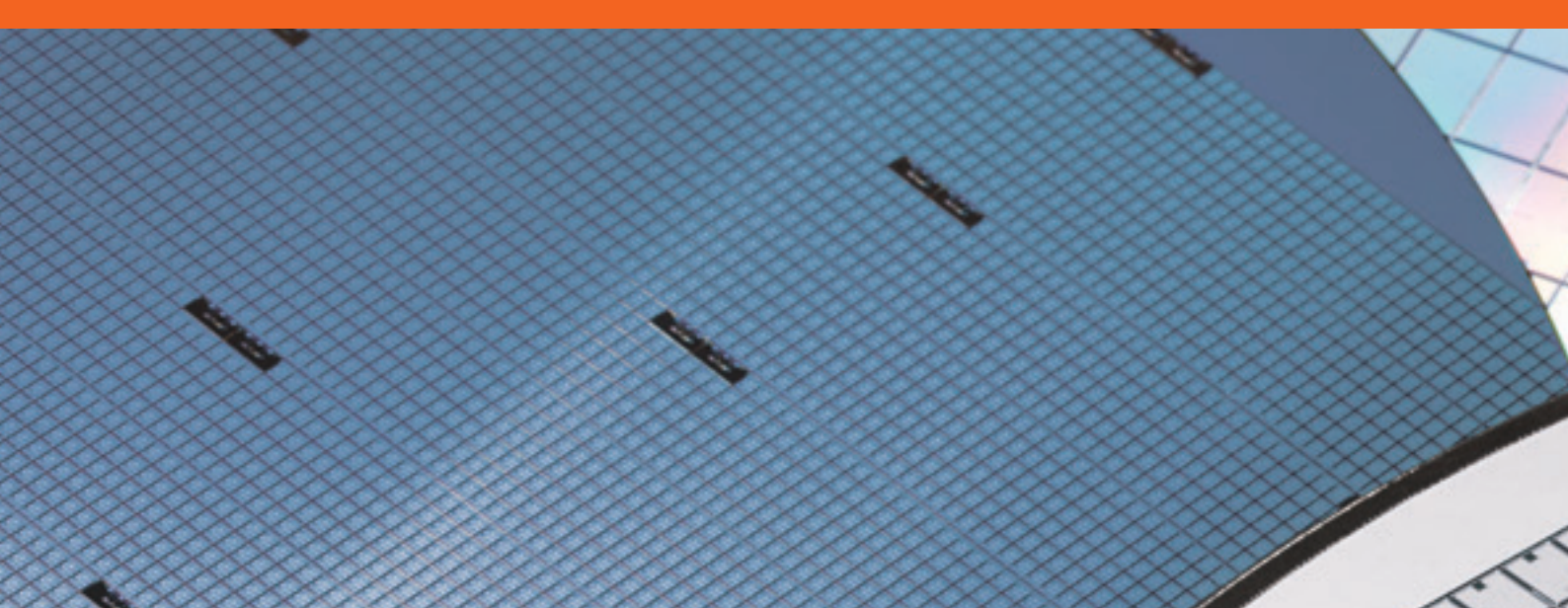
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Process gas/Vacuum components

Dry Fine System/High purity gas control system components



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