CKD

Process gas component/vacuum component

High Purity Gas Control System Component General Catalog

DRY FINE SYSTEM

CKD Corporation
CB-035A 5

Opening Up the Future for Process Control.

Ultra-Fine **Philosophy** is the Concept

Product cleanness is comprehensively controlled conducted under CKD's original UF philosophy: Incorporate comprehensive cleanness for all factors indispensable to product development, including design, evaluation, manufacturing methods, and actual manufacture.

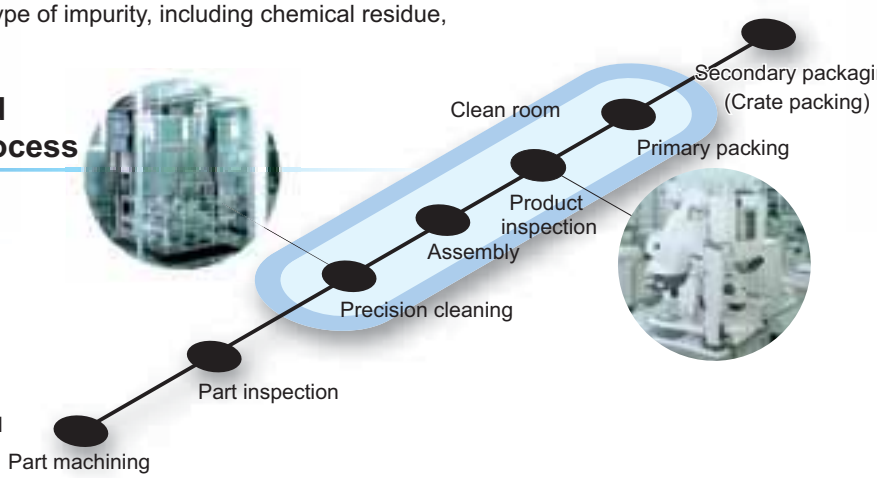
High-purity gas control system optimum for semiconductor and liquid crystal manufacturing processes using process gas, vacuums, etc.

Consistent quality control, including parts and products, to ensure complete cleanness.

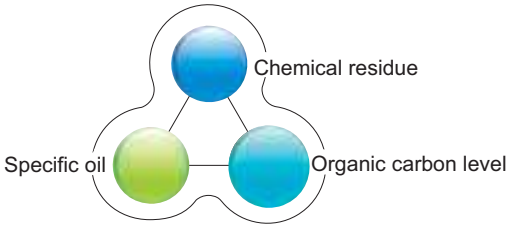
CKD production

CKD incorporates comprehensive consistent quality control for all production stages from machining and assembly to inspection and packaging. This covers all levels including products and parts. Cleanness is important to quality, so we have established reliable quality by establishing company-wide quantitative standards for each type of impurity, including chemical residue, organic carbon levels, and specific oils.

Example of process gas valve and high vacuum valve production process

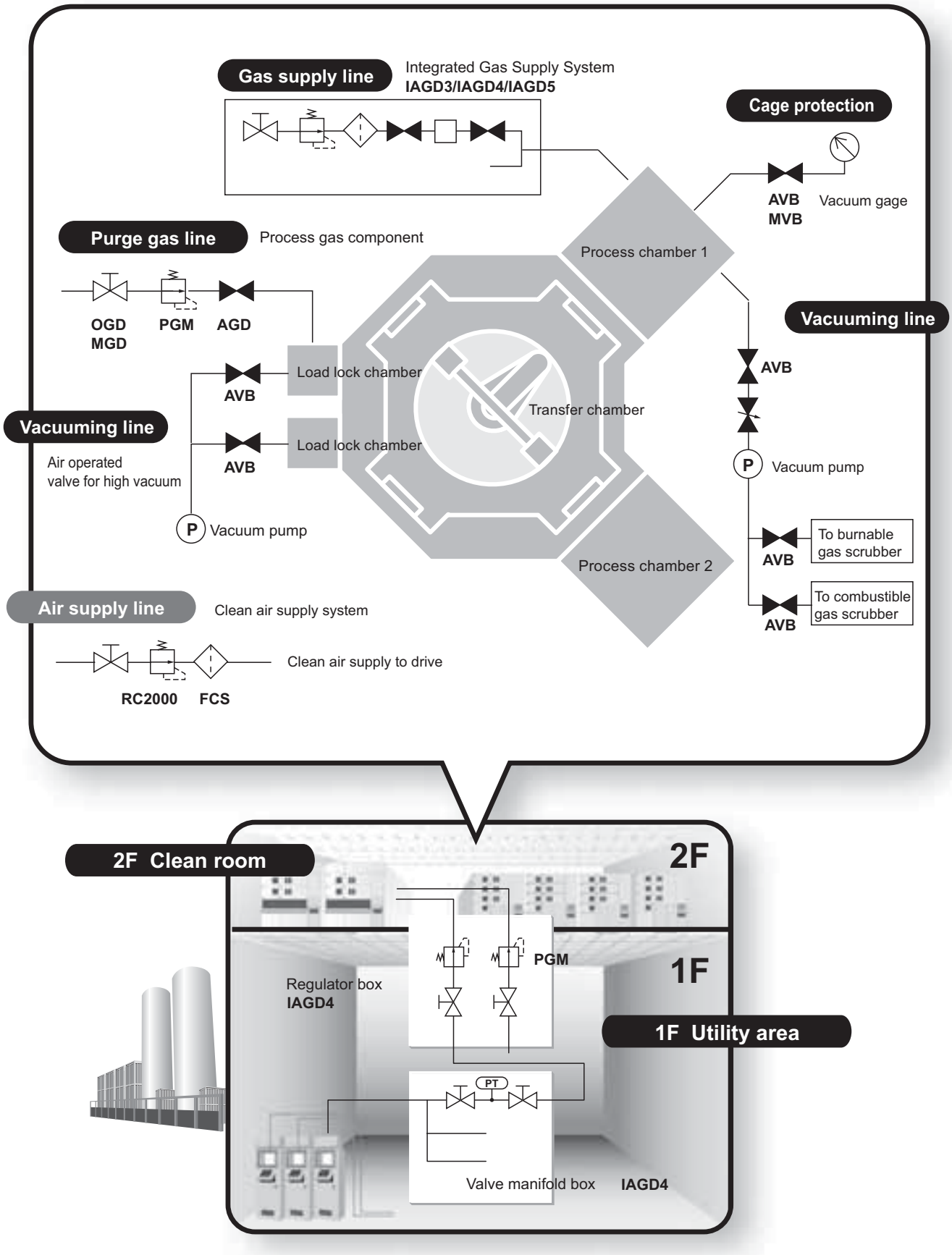


Cleanliness control



Example of high purity gas control system use

●High purity process in semiconductor manufacturing line



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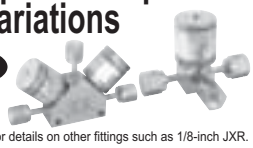
High purity gas control systems

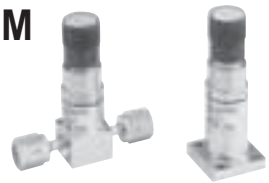
Selection guide <<Process Gas Components>>

∗Refer to Intro 7 to 8 in the introduction for the high vacuum component selection guide.

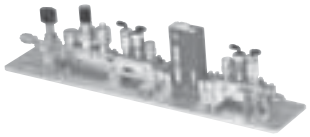
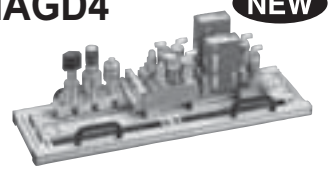
●Process gas valve

	Model no.	Type/classification working fluid	Connection	Cv flow factor (0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0)	Page
Air operated valve	**AGD0$\frac{1}{2}$R** ・ Air operated valve ・ Metal diaphragm structure ・ □21 compact type NEW 	●Pneumatic operated 2-port valve ●Normally closed ●Normally open ●Inert gas ●Process gas	1/4" JXR male fitting 1/4" JXR female fitting	0.1	P. 6
	AGD1$\frac{1}{2}$R/AGD2$\frac{1}{2}$R ・ Air operated valve ・ Metal diaphragm structure ・ Standard size NEW 		1/4" JXR male fitting 1/4" JXR female fitting 1/4" double barbed fitting	0.3	P. 10
			3/8" JXR male fitting 3/8" JXR female fitting 3/8" double barbed fitting	0.65	
	Other parts compatible with variations NEW  ∗Contact CKD for details on other fittings such as 1/8-inch JXR.		Refer to the page indicated for details.	0.1 0.3 0.65	P. 12
Manual valve	**OGD$\frac{1}{2}$0R** ・ Manual valve ・ Metal diaphragm structure ・ Handle open/close (90° snap action) NEW 	●Manual 2 port valve ●Inert gas ●Process gas	1/4" JXR male fitting 1/4" JXR female fitting 1/4" double barbed fitting	0.3	P. 26
			3/8" JXR male fitting 3/8" JXR female fitting 3/8" double barbed fitting	0.65	
	MGD$\frac{1}{2}$0R ・ Manual valve ・ Metal diaphragm structure ・ Handle open/close (270° rotation) NEW 		1/4" JXR male fitting 1/4" JXR female fitting 1/4" double barbed fitting	0.3	P. 28
			3/8" JXR male fitting 3/8" JXR female fitting 3/8" double barbed fitting	0.65	
	Other parts compatible with variations NEW 		Refer to the page indicated for details.	0.3 0.65	P. 30

	Model no.	Working fluid	Connection	Supply fluid pressure (MPa)	Ultimate vacuum (kPa (abs))	Page
Other process gas valves	**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. 36
	・ Diaphragm type extremely small flow rate adjustment valve ・ Piston structure check valve					P. 38

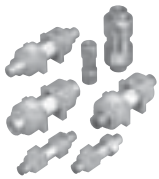
	Model no.	Working fluid	Connection	Max. working pressure (MPa)	Set pressure range (MPa)	Page
Regulator	**PGM** 	●Inert gas ●Process gas	1/4" JXR male fitting 1/4" JXR female fitting 1/4" JXR male→female fitting 1/4" JXR female→male fitting Various integrated valve interfaces	1.0	∗ −0.07 to 0.21MPa (pressure range 30V) 0 to 0.21MPa (pressure range 30) 0 to 0.35MPa (pressure range 50) 0 to 0.42MPa (pressure range 60) 0 to 0.7MPa (pressure range 100) ∗The pressure range in parentheses is psi.	P. 44

●Integrated Gas Supply System

	Model no.	Seal connection method	Size	Cv flow factor 0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0	Page
Integrated Gas Supply System	**IAGD3** 	●CS seal	1.5 inches	0.1 0.26	P. 54
	IAGD4 NEW 	●W seal	1.5 inches	0.1 0.26	P. 62
	IAGD5 NEW 	●W seal	1.125 inches	0.1 0.26	P. 72

・ SEMI F86, F87 (1.125-inch size, C seal) compatible air operated valves and manual valves are also available. (Page 82)

●Other gas components

	Model no.	Working fluid	Port size	Working pressure range (MPa)	Filtration rating	Page
Clean filter	**FCS500/FCS1000** ・ Inline clean filter 	●Compressed air ●Nitrogen	ø4 to ø12 R1/8 to R3/8 Rc1/8 to Rc3/8	・ Resin type -0.095 to 0.99 MPa ・ Stainless steel type −0.095 to 1.5 MPa (compressed air) -0.095 to 0.99 MPa (nitrogen)	0.01 µm (Removal effect 99.99%)	FCS500 P. 86 FCS1000 P. 90
	Model no.	**Working fluid**	**Port size**	**Max. working pressure (MPa)**	**Set pressure range (MPa)**	**Page**
Clean regulator	**RC2000** 	●Nitrogen ●Compressed air	Rc1/4 Rc3/8 Rc1/2	1.0 (0.5 for low pressure)	0.05 to 0.7 (Standard) 0.02 to 0.2 (Low pressure)	P. 96

Selection guide <<High vacuum Components>>

∗Refer to Intro 5 and 6 in the introduction for the process gas component selection guide.

●Valve for high vacuum

	Model no.	Type/classification working fluid	Port size	Orifice: ø mm (0 5 10 20 30 40 50 60 70 80 100)	Voltage	Page
Air operated valve	**AVB**7** NEW ・Air-operated valve for high vacuum ・Formed bellows ・Aluminum body type 	●Pneumatic operated 2-port valve ●Normally closed ●Double acting ●Two stage type ●High temperature specification ●Vacuum ●Inert gas	Clamp flange for vacuum NW16 Clamp flange for vacuum NW25 Clamp flange for vacuum NW40 Clamp flange for vacuum NW50 Clamp flange for vacuum NW63 Clamp flange for vacuum NW80 Clamp flange for vacuum NW100	ø17 ø24 ø39 ø48 ø68 ø80 ø100	—	P. 116
	AVB3** ・Air-operated valve for high vacuum ・Formed bellows ・Stainless steel body compact type 	●Pneumatic operated 2-port valve ●Normally closed ●Normally open ●Double acting ●Vacuum ●Inert gas	Clamp flange for vacuum NW25 Clamp flange for vacuum NW40 Clamp flange for vacuum NW50 Clamp flange for vacuum NW80	ø24 ø40 ø50 ø80	—	P. 128
	AVB2** ・Air-operated valve for high vacuum ・Formed bellows 		1/4″ Tube Clamp flange for vacuum NW25 Clamp flange for vacuum NW40 Clamp flange for vacuum NW50 Clamp flange for vacuum NW80	ø5 ø24 ø40 ø50 ø80	—	P. 136
	AVB3 Custom order**		Clamp flange for vacuum NW25 Clamp flange for vacuum NW40 Clamp flange for vacuum NW50 Clamp flange for vacuum NW80 Clamp flange for vacuum NW100	ø24 ø40 ø50 ø80 ø100	—	P. 132
	AVP2** ・Air-operated valve for high vacuum ・Double O-ring shaft sealing type 		1/4″ Tube Clamp flange for vacuum NW25 Clamp flange for vacuum NW40 Clamp flange for vacuum NW50 Clamp flange for vacuum NW80	ø5 ø24 ø40 ø50 ø80	—	P. 144
Manual valve	**MVB∗17** NEW ・Manual valve for high vacuum ・Formed bellows ・Aluminum body type 	●Manual 2 port valve ●Vacuum ●Inert gas	Clamp flange for vacuum NW16 Clamp flange for vacuum NW25 Clamp flange for vacuum NW40 Clamp flange for vacuum NW50	ø17 ø24 ø39 ø48	—	P. 150
	MVB∗0 ・Manual valve for high vacuum ・Formed bellows ・Handle rotation 	●Manual 2 port valve ●Vacuum ●Inert gas	Clamp flange for vacuum NW25 Clamp flange for vacuum NW40 Clamp flange for vacuum NW50	ø24 ø40 ø50	—	P. 152
	MVP∗0 ・Manual valve for high vacuum ・Double O-ring shaft sealing type ・Handle rotation 					P. 154
Electric vacuum valve	**EVB∗17** NEW ・Electric vacuum valve ・Formed bellows ・Aluminum body type 	●Multi stage control vacuum valve ●Vacuum ●Inert gas	Clamp flange for vacuum NW25 Clamp flange for vacuum NW40 Clamp flange for vacuum NW50	ø24 ø39 ø48	—	P. 156

	Model no.		Type/classification working fluid	Port size	Orifice: ø mm (0 5 10 20 30 40 50 60 70 80 100)	Voltage	Page
High vacuum solenoid valve	**HVB212** ・ High vacuum solenoid valve		●Direct acting 2 port solenoid valve ●Normally closed ●Vacuum ●Inert gas	1/4" JXR male fitting 1/4" double barbed fitting NPT1/8	ø1 ø2	100VAC 200VAC 12VDC 24VDC	P. 166
	HVB312 ・ High vacuum solenoid valve			1/4" JXR male fitting 1/4" double barbed fitting NPT1/8, 1/4	ø2 ø3		P. 166
	HVB412 ・ High vacuum solenoid valve			1/4", 3/8"JXR male fitting 1/4", 3/8" double barbed fitting NPT1/4, 3/8	ø3 ø4.5 ø6		P. 166
	HVB512 ・ High vacuum solenoid valve			1/4", 3/8"JXR male fitting 1/4", 3/8" double barbed fitting NPT1/4, 3/8	ø4.5 ø6		P. 166
	HVB112 ・ High vacuum solenoid valve ・ Miniature			NPT1/8 1/4" VCR female fitting	ø1.6	100VAC 200VAC 24VDC	P. 172
	HVB41 ・ High vacuum solenoid valve			NPT1/4 1/4" VCR female fitting	ø5		P. 174
	HVB$^{6}_{7}$12 ・ High vacuum solenoid valve			ϕ48 Flange ϕ52 Flange	ø8 ø12 ø15		P. 176
	HVL$^{1}_{4}$2 ・ Vacuum delay solenoid valve		●Direct acting 2 port solenoid valve ●Normally open ●Air ●Nitrogen	Rc1/8 1/4" double barbed fitting Clamp flange for vacuum NW10 Clamp flange for vacuum NW16	ø1.2 ø3	100VAC 200VAC 24VDC	P. 180

Safety Precautions

Always read this section before use.

When designing and manufacturing a device using CKD products, the manufacturer is obligated to check that device safety mechanism, pneumatic control circuit, or water control circuit and the system operated by electrical control that controls the devices is secured.
It is important to select, use, handle, and maintain the product appropriately to ensure that the CKD product is used safely.
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 in handling.

2 Use this product in accordance with specifications.

This product must be used within its stated specifications. Do not attempt to modify oradditionally machine the product. This product is intended for use as a general-purpose industrial device or part. It is not intended for use outdoors or for use under the following conditions or environment.
(Note that this product can be used when CKD is consulted prior to use and the customer consents to CKD product specifications. The customer must provide safety measures to avoid risks in the event of problems.)
(1) Use for special applications including nuclear energy, railway, aircraft, marine vessel, vehicle, medicinal devices, devices or applications coming into contact with beverages or foodstuffs, amusement devices, emergency shutoff circuits, press machine, brake circuits, or for safeguard.
(2) Use for applications where life or assets could be adversely affected, and special safety measures are required.

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

ISO 4414, JIS B 8370 (pneumatic system rules)
JFPS 2008 (Principles for pneumatic cylinder selection and use)
Including High Pressure Gas Maintenance Law, Occupational Safety and Sanitation Laws, other safety rules, body 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 the entire system 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 warnings and cautions on the pages below to prevent accidents.

■ The safety cautions are ranked as "DANGER", "WARNING" and "CAUTION" in this section.

⚠ DANGER: When a dangerous situation may occur if handling is mistaken leading to fatal or serious injuries, or when there is a high degree of emergency to a warning.

⚠ WARNING: When a dangerous situation may occur if handling is mistaken leading to fatal or serious injuries.

⚠ CAUTION: When a dangerous situation may occur if handling is mistaken leading to minor injuries or physical damage.

Note that some items described as “CAUTION” may lead to serious results depending on the situation.
In any case, important information that must be observed is explained.

Disclaimer

1 Warranty period

“Warranty period" is 18 months from the first delivery to the customer.

2 Scope of warranty

In case any defect attributable to CKD is found during the warranty period, CKD shall, at its own discretion, repair the defect or replace the relevant product in whole or in part, without charge.

Note that the following faults are excluded from the scope of warranty:
(1) Product abuse/misuse contrary to conditions/environment recommended in its catalogs/specifications
(2) Failure caused by other than the delivered product
(3) Use other than original design purposes
(4) Third-party repair/modification
(5) Faults caused by reasons that are unforeseble with technology put into practial use at the time of delivery
(6) Failure attributable to force majeure

In no event shall CKD be liable for business interruptions, loss of profits, personal injury, costs of delay or for any other special, indirect, incidental or consequential losses, costs or damages.

3 Compatibility confirmation

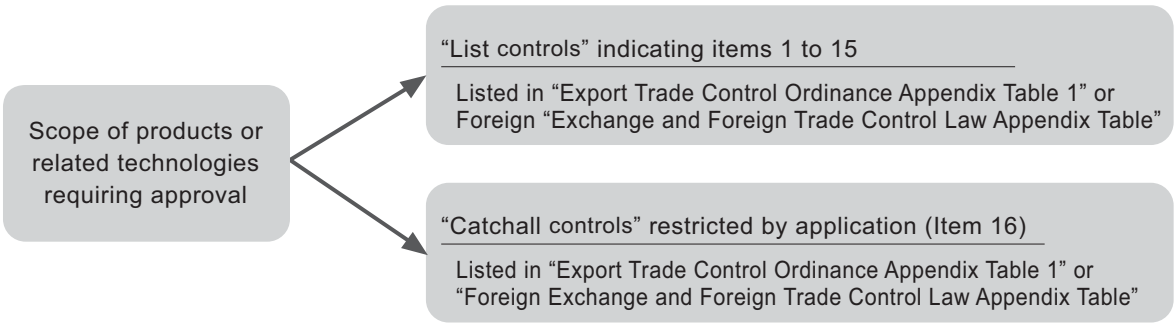
In no event shall CKD be liable for merchantability or fitness for a particular purpose, notwithstanding any disclosure to CKD of the use to which the product is to be put.

Precautions in Export

1 Security Trade Control

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

- “List controls” indicating items 1 to 15 for each section
- “Catchall controls” that do not specify specifications by item, but restrict by application (Item 16)



Application for Approval:

The application is received by the Ministry of Economy, Trade, and Industry, Security Trade Control Review Section or local bureaus of the Ministry of Economy, Trade, and Industry.

2 Produces and related technology listed in this catalog

Products and related technology listed in this catalog are subject to the Catch-all Provisions of the Foreign Exchange and Foreign Trade Act.
When export or providing products or related technology listed in this catalog, pay sufficient attention to 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 technology.

CKD's RoHS compliance

CKD has complied with RoHS since July 1, 2006. (Contact us regarding applicable models.)
RoHS directive: Limitations on the use of specific toxic substances contained in electronic components implemented by EU.

Components for process gas

CONTENTS

Components for process gas

Safety precautions

Always read this section before starting use.
Refer to Intro 9 for the general cautions.

Design and selection

1. Confirming specifications

⚠ WARNING

- Incorrect selection and handling of devices may cause problems with this product and problems in the user's system. Confirm that the regulator specifications and the user's system are compatible before use.
- Confirm the compatibility of materials used for wetted area and the fluid used.
- Use the product within the fluid temperature and working pressure range in specifications.

Installation and adjustment

1. Working environment

⚠ CAUTION

- Do not use this product in a corrosive gas environment, or where the product may be subject to chemicals, salt water, water, steam, etc.
  Use this product within the ambient temperature range given in specifications.

2. Installation

⚠ WARNING

- Incorrect installation and piping will cause product problems, may cause problems in the user's system, and may cause death or serious injury. The user is responsible for ensuring that the operator has read the instruction manual and fully understands the system.
  After installation, conduct an appropriate function test to confirm that the product is correctly installed.

⚠ CAUTION

- This product is processed with ultra-precise cleaning, and is assembled in a Class 10 super clean room.
  Open the clean pack in the package box in a clean environment immediately before installation.

- If wetted areas (inside the body or on the fitting seal surface) are touched when the regulator is installed, impurities may adhere or the highly purified gas may be contaminated. Do not touch wetted areas of the regulator during installation.

3. Ensuring space

⚠ CAUTION

- Ensure sufficient space for installation, removal, piping and wiring work.

- Ensure sufficient space for maintenance and inspection.

4. Piping

⚠ CAUTION

- If dirt or burrs from pipes or from areas in which piping is taking place, the valve seat or diaphragm seal may be damaged; causing leakage. Carefully remove any dirt or burrs before installing the valve, and then insert the filter on primary side.

- Check that the connection port is correct when piping the product.

- Pipe the product so that the pipe tension, compression, bending, etc., are not applied to the valve body.

- Operation may fail if the piped tube is bent. Check that piping matches the required length.

- Select the solenoid valve for the drive connected to the drive section to match specifications and application.

- Use air or inert gas passed through a 5 μm or higher filtration capacity filter for operation air.

Components for process gas

Safety precautions

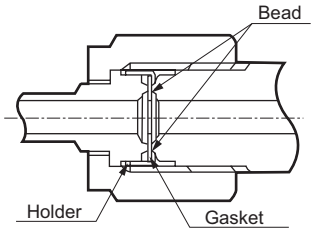
Always read this section before starting use.
Refer to Intro 9 for the general cautions.

Installation and adjustment

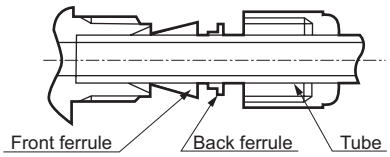
■Check that no dirt, scratches, or burrs get on the seal before tightening the fitting in the following procedures:

(1) Tightening the fitting

● JXR fitting (gasket material is nickel/SUS316)
Screw in the nut manually until the gasket contacts the bead section, and then tighten another 1/8 turn using a tool. (Contact CKD if other materials are to be used.)



● Double barbed fitting
Check that the front ferrule, back ferrule and nut are properly attached, and then insert the tube until it contacts the back of the product. After tightening the nut manually, tighten another $1^{1}/_{4}$ turn with a tool.



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

5. Baking

⚠ CAUTION

■Keep the baking temperature within the product's specified temperature range.
Fully open the valve when baking.

6. Purging

⚠ CAUTION

■When removing a valve that has been used for toxic, combustible or corrosive gas, fully purge the product with inert gas such as nitrogen gas.

During use and maintenance

1. Using this product

⚠ WARNING

■Always use this product within the specified range.

■Take care not to touch products with heaters with hands or body parts. Direct contact may cause burns.

⚠ CAUTION

■Do not step on valves, etc., or place heavy objects on them.

2. Maintenance/inspection

⚠ WARNING

■Always carry out the work as specified in the instruction manual.

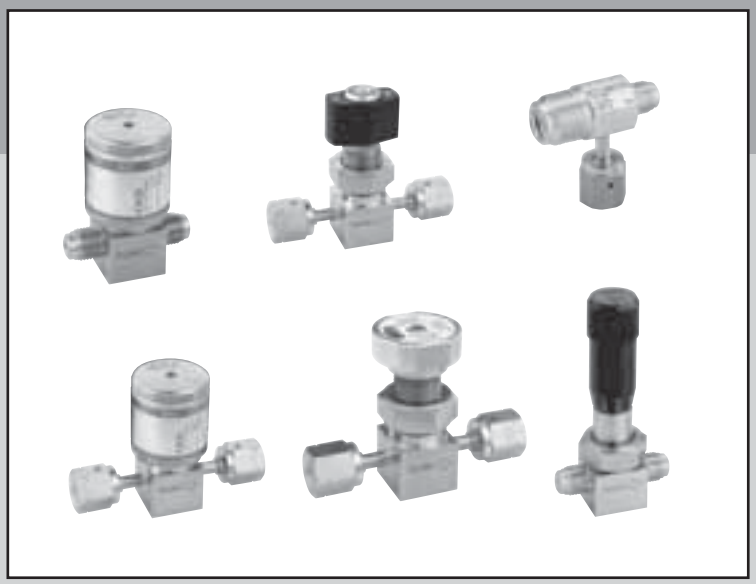
■Always turn off the power and release any fluids or pressure before starting work.

■Completely purge the product with inert gas, etc., so that the residual gas does not adversely affect the workers or devices in the area.

■When work is completed, always carry out a leak inspection and confirm that there are no leaks.

■Do not disassemble the process gas valve.
The product warranty does not apply to a repaired and reused valve which has been disassembled without consent from CKD.

Process gas valve



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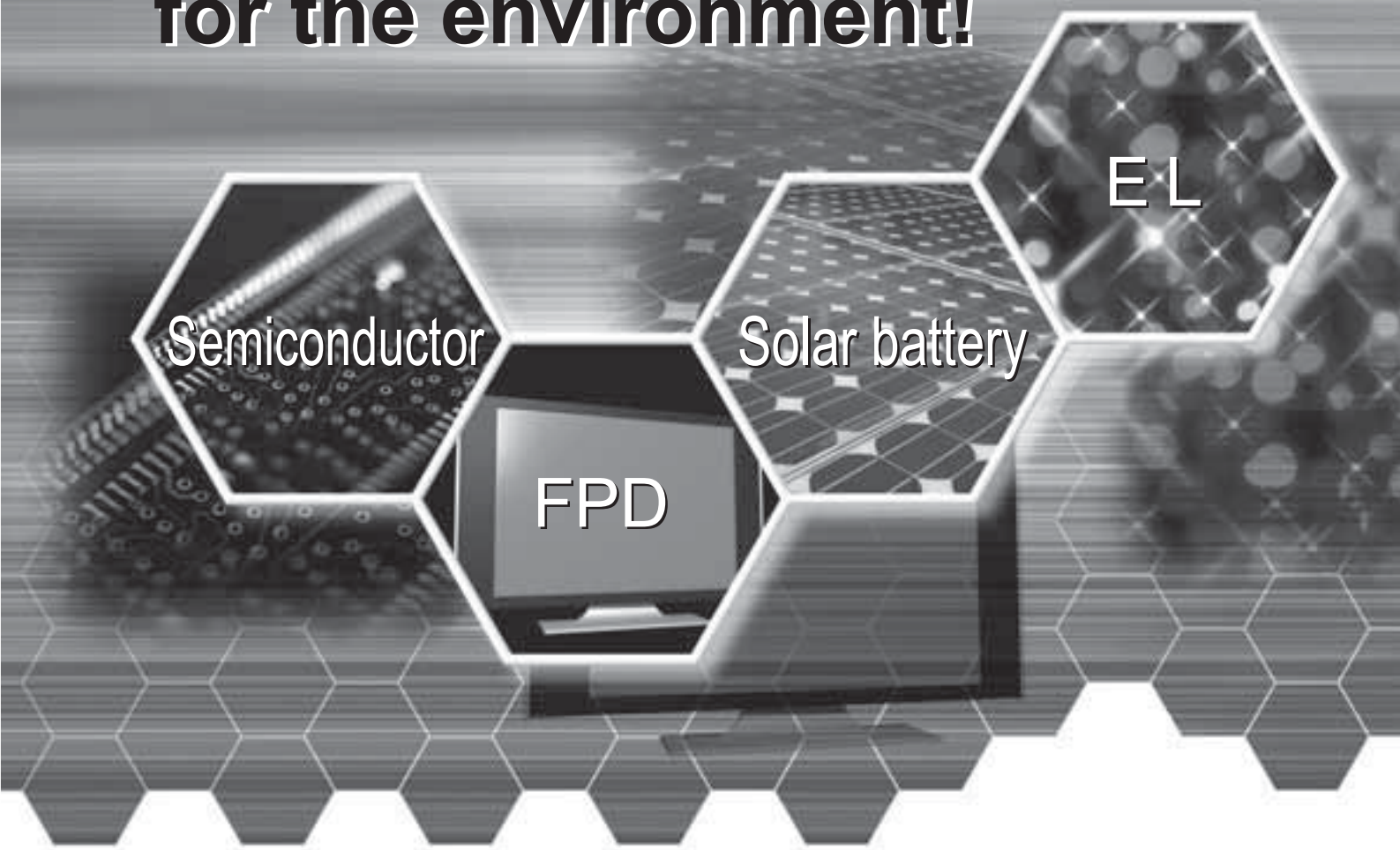
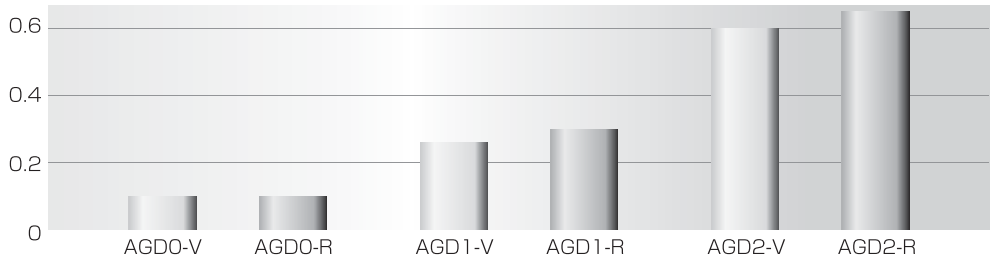
AGD series - Newly redesigned with care for the environment!



Optimal seal structure for improved inner seal performance *1

Achieved internal leakage of 1.0×10^{-10} Pa•m^3/s.He or less.
<Previous model's leakage was 1.3×10^{-9} Pa•m^3/s.He or less>

Same size but with increased Cv flow factor *1



Environmentally friendly design

Material waste reduced by 70%*2. Get the most out of your material.

*1. CKD comparison *2. Air operated valve comparison

Ultra Fine Ultra-fine concept

CKD's unique UF concept that implements complete cleanness in all critical areas for product development starting with design, evaluation, manufacturing methods, to manufacturing for total cleanness control of products.

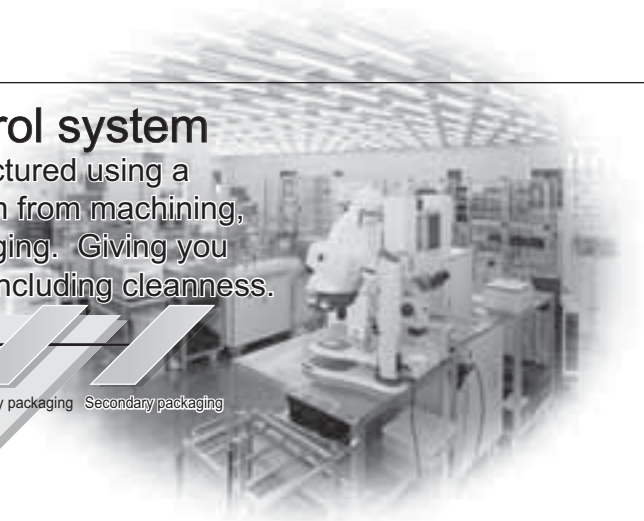
Air operated valve for process gas

R series lineup

AGD-R series
MGD-R series
OGD-R series

Total cleanness control system

This product has been manufactured using a seamless quality control system from machining, assembly, inspection, to packaging. Giving you the highest quality in all areas including cleanness.



RoHS compliant

Substances harmful to the environment have been eliminated, including lead and hexavalent chrome.

RoHS

Air operated valve for process gas

AGD0$\frac{1}{2}$R Series

●Metal diaphragm ●Compact type

Model no.	Actuation	Cv flow factor	Model no.	Actuation	Cv flow factor
AGD01R	NC	Cv = 0.1	AGD02R	NO	Cv = 0.1

Saving space while maintaining basic operations

●Slim design actuator with ø26 diameter actuator

●High corrosion resistance and long life Ni-Co alloy diaphragm (4 million cycles achieved *2)

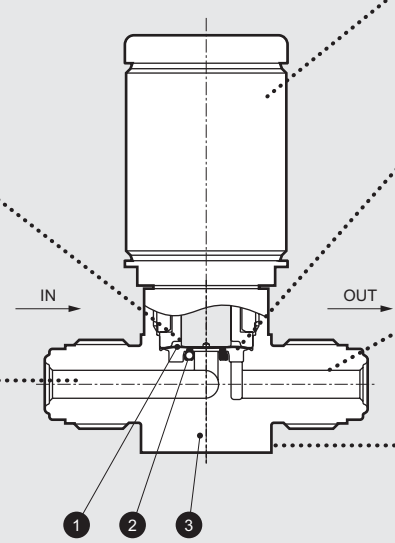
●JXR fitting provided as*1 standard for connections

●□21 mm compact body

●Continuous use possible up to 80°C

●Particle is hardly generated, realized with optimum seal structure and improved surface roughness.

●Electropolished finish specifications



Materials for wetted areas

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

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

*2: Lifetime when working media is inert gas, which does not contain solids such as reaction products, within a specified range.

Specifications

Descriptions	AGD01R	AGD02R
Working fluid	Inert gas/process gas	
Fluid pressure range Pa (abs) - MPa (G)	1.3×10^{-6} to 0.99	
Fluid temperature °C	5 to 80	
Ambient temperature °C	5 to 80	
Storage temperature °C	-10 to 80	
Valve seat leakage Pa·m^3/s (He)	1.0×10^{-10} or less	
External leakage Pa·m^3/s (He)	2.8×10^{-12} or less	
Cv flow factor (23°C, under pressure)	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
Operation port	M5	
Weight kg	0.15 Note 1	

Note 1: Value for AGD01V-4RM (1/4-inch JXR male fitting).

⚠ Safety precautions

Always read page 9 in the introduction and pages 2 to 3 to ensure correct and safe use of this product.

How to order

AGD0 1 R - 4R

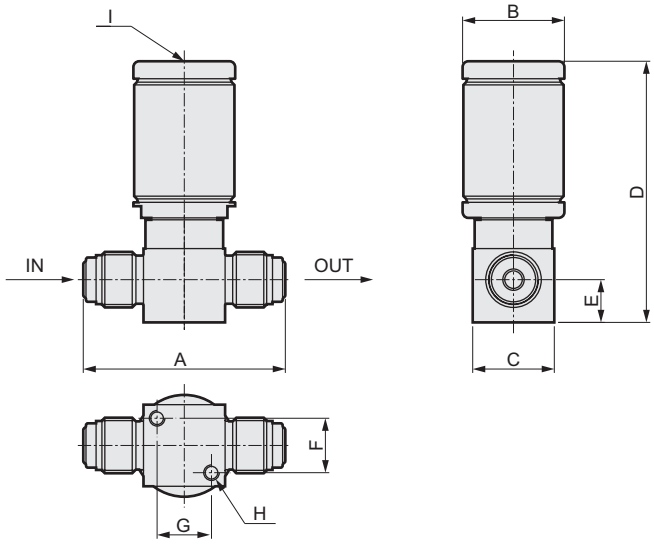
- 1 → Ⓐ Actuation
- 4R → Ⓑ Connection

Symbol	Descriptions
Ⓐ Actuation	
1	NC (normally closed)
2	NO (normally open)
Ⓑ Connection	
4RM	1/4" JXR male fitting
4R	1/4" JXR female fitting

Dimensions

AGD0∗R-4RM

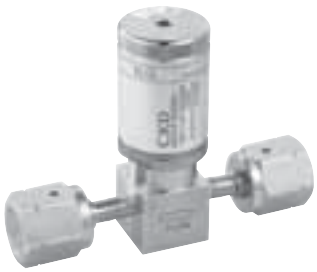
●JXR male fitting

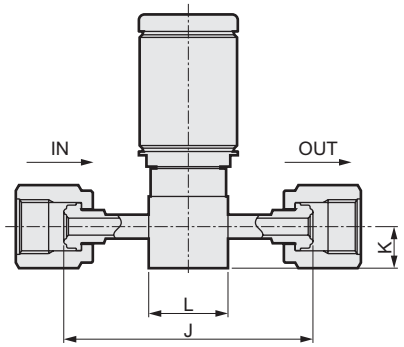


Model no. \ Symbol	Actuation	A	B	C	D	E	F	G	H	I
AGD01R-4RM	NC	52	ø26	□21	67	11	14	14	2-M4 depth 5	M5
AGD02R-4RM	NO	52	ø26	□21	67	11	14	14	2-M4 depth 5	M5

AGD0∗R-4R

●JXR female fitting





Model no. \ Symbol	Actuation	J	K	L
AGD01R-4R	NC	66	11	□21
AGD02R-4R	NO	66	11	□21

Air operated valve for process gas

AGD1$\frac{1}{2}$R Series
AGD2$\frac{1}{2}$R Series

●Metal diaphragm ●Standard type

Model no.	Actuation	Cv flow factor	Model no.	Actuation	Cv flow factor
AGD11R	NC	Cv = 0.3	AGD21R	NC	Cv = 0.65
AGD12R	NO	Cv = 0.3	AGD22R	NO	Cv = 0.65

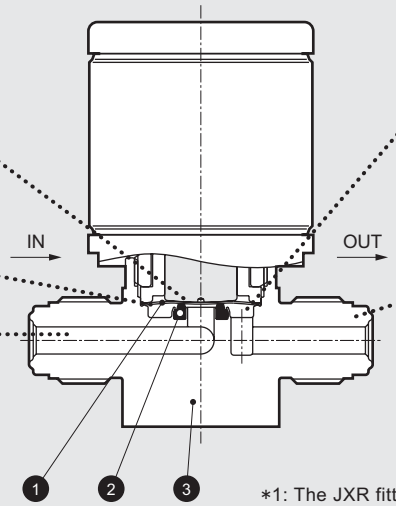
Developed from the pursuit of contamination control. Diaphragm valve R series standard type.

●Continuous use up to 80°C

●Particle is hardly generated, realized with optimum seal structure and improved surface roughness.

●Valve dead space minimized

●Electropolished finish specifications



●High corrosion resistance and long life Ni-Co alloy diaphragm (4 million cycles achieved *2)

●Connection with JXR fitting *1 and double barbed fittings is standard

Materials for wetted areas

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

*1: The JXR fitting can be connected to the VCR fitting.
*2: Lifetime when working media is inert gas, which does not contain solids such as reaction products, within specified range.

Specifications

Descriptions	AGD1*R	AGD2*R
Working fluid	Inert gas/process gas	
Fluid pressure range Pa (abs) - MPa (G)	1.3×10^{-6} to 0.99	
Fluid temperature °C	5 to 80	
Ambient temperature °C	5 to 80	
Storage temperature °C	-10 to 80	
Valve seat leakage Pa·m^3/s (He)	1.0×10^{-10} or less	
External leakage Pa·m^3/s (He)	2.8×10^{-12} or less	
Cv flow factor (23°C, under pressure)	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)	NC (normally closed) NO (normally open)
Operating pressure MPa	NC: 0.4 to 0.6 NO: 0.4 to 0.5	NC: 0.4 to 0.6 NO: 0.4 to 0.5
Operation port	M5	
Weight kg	0.26 Note 1	0.59 Note 1

Note 1: Value for AGD11R-4RM (1/4-inch JXR male fitting) and AGD21R-6RM (3/8-inch JXR male fitting).

Safety precautions

Always read page 9 in the introduction and pages 2 to 3 to ensure correct and safe use of this product.

How to order

AGD1 1 R- 4RM

Model no.

Ⓐ Actuation

Ⓑ Connection

Symbol	Descriptions
Ⓐ Actuation	
1	NC (normally closed)
2	NO (normally open)
Ⓑ 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.

Ⓐ Actuation

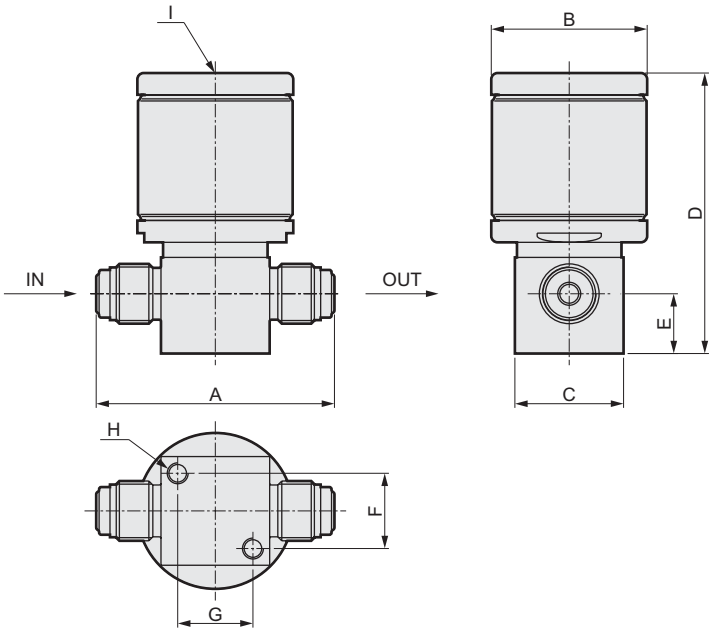
Ⓑ Connection

Symbol	Descriptions
Ⓐ Actuation	
1	NC (normally closed)
2	NO (normally open)
Ⓑ 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

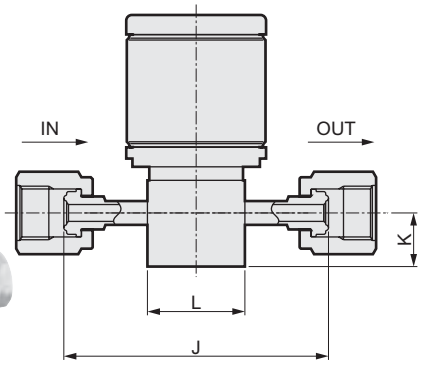
●JXR male fitting



Model no. \ Symbol	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

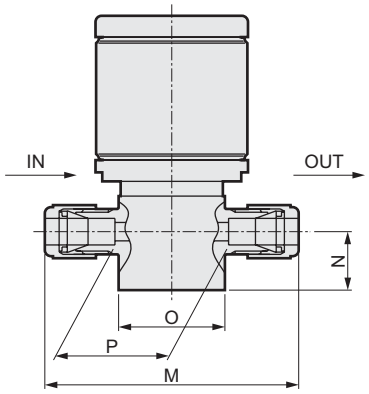
●JXR female fitting



Model no. \ Symbol	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. \ Symbol	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				

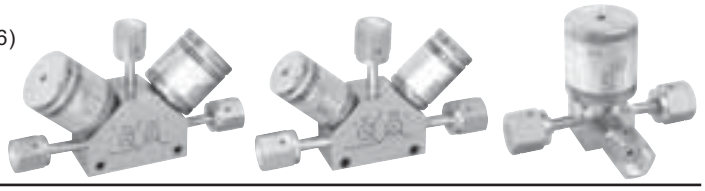
Air operated valve for process gas

Parts compatible with variations

AGD**R Series

RoHS Custom order

Model	Variation description
AGD0*R **AGD1*R** **AGD2*R**	Body options (pages 5 to 16) ●Flow path direction ●NC/NO combination ●Connection ●Port shape combination



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

AGD (1) (1) R - (4) (RJ) - (FFF)

Symbol	Descriptions	Model no. AGD0	AGD1	AGD2
Ⓐ Size				
0	1/8"	●		
1	1/4"		●	
2	3/8"			●
Ⓑ Actuation				
1	NC	●	●	●
2	NO	●	●	●
Ⓒ Port size				
4	1/4"	●	●	
6	3/8"			●
8	1/2"			●
Ⓓ Connection				
RJ	JXR female fitting (with bearing)	●	●	●
R	JXR female fitting	●	●	●
RM	JXR male fitting	●	●	●
W	Automatic welded fitting	●	●	●
S	Double barbed fitting	●	●	●
Ⓔ Port shape combination				
2 way valve				
Blank	IN, OUT Same fitting type	●	●	●
MF	IN: Male OUT: Female	●	●	●
FM	IN: Female OUT: Male	●	●	●
3-way separate flow valve				
FFF	abc Female/Female/Female	●	●	●
FFM	abc Female/Female/Male	●	●	●
FMM	abc Female/Male/Male	●	●	●
MMM	abc Male/Male/Male	●	●	●
WWW	abc Automatic welded fitting	●	●	●
□□□	abc □/□/□ Note 1	●	●	●

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

Note 1: F: Female, M: Male, W: Automatic weld fitting combinations as needed

How to order **2-station 3-way valve**

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

Ⓕ Port shape combination
Ⓐ Size
Ⓑ Flow path direction
Ⓒ NC/NO combination
Ⓓ Port size
Ⓔ Connection

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

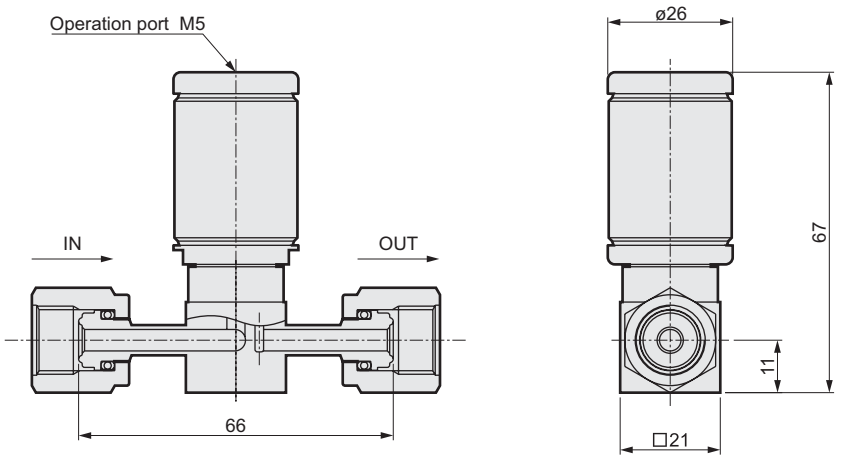
Symbol	Ⓔ Connection RJ	R	RM
FFF	●	●	
MMM			●
□□□	●	●	

Note 2 F: Female, M: Male, combinations as needed

AGD0∗R 2way valve **Custom order**

Dimensions

AGD0∗R-4RJ (1/4" JXR female fitting (with bearing) type)
AGD0∗R-4S (1/4" double barbed fitting type)
AGD0∗R-4W (1/4" automatic welded joint type)



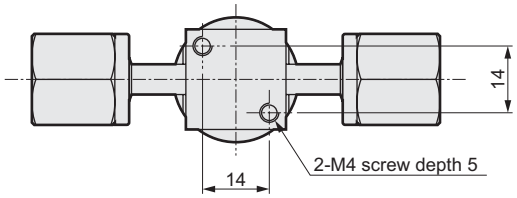
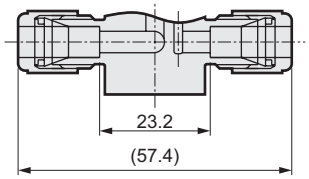
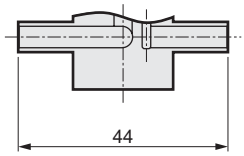


Figure shows AGD01R-4RJ
Female fitting (with bearing)



Double barbed fitting type: 4S



Welded fitting: 4W

AGD0∗R-4RJ- FM MF (1/4" JXR female (with bearing) - male combination type)
AGD0∗R-4R- FM MF (1/4" JXR female - male combination type)

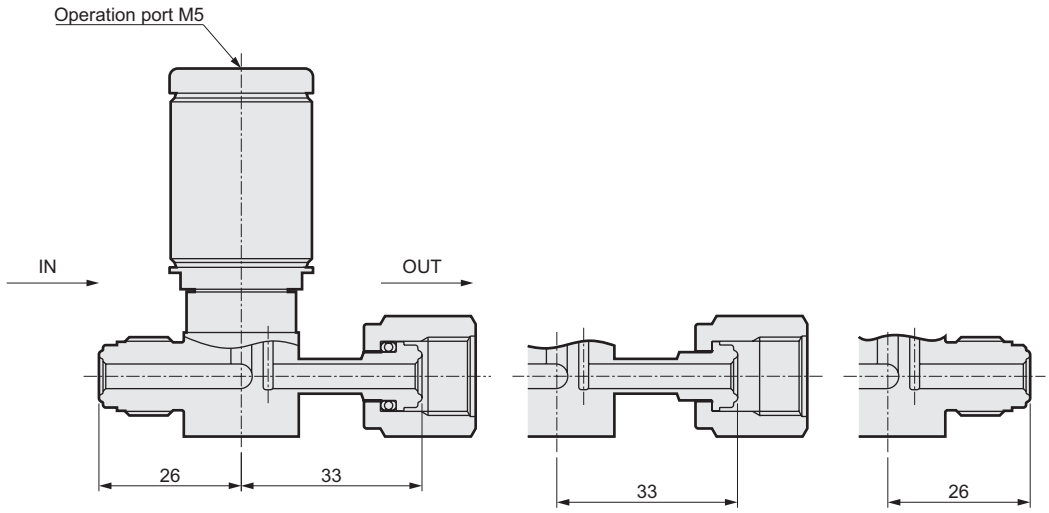


Figure shows AGD01R-4RJ-MF
Female fitting (with bearing)

Female fitting: 4R

Male fitting: 4RM

AGD0∗R 3 way separate flow valve **Custom order**

Dimensions

AGD0∗R-4RJ-□□□ (1/4" JXR female fitting (with bearing) combination type)
AGD0∗R-4R-□□□ (1/4" JXR female fitting combination type)
AGD0∗R-4RM-MMM (1/4" JXR male fitting type)
AGD0∗R-4W-□□□ (1/4" automatic welded joint combination type)

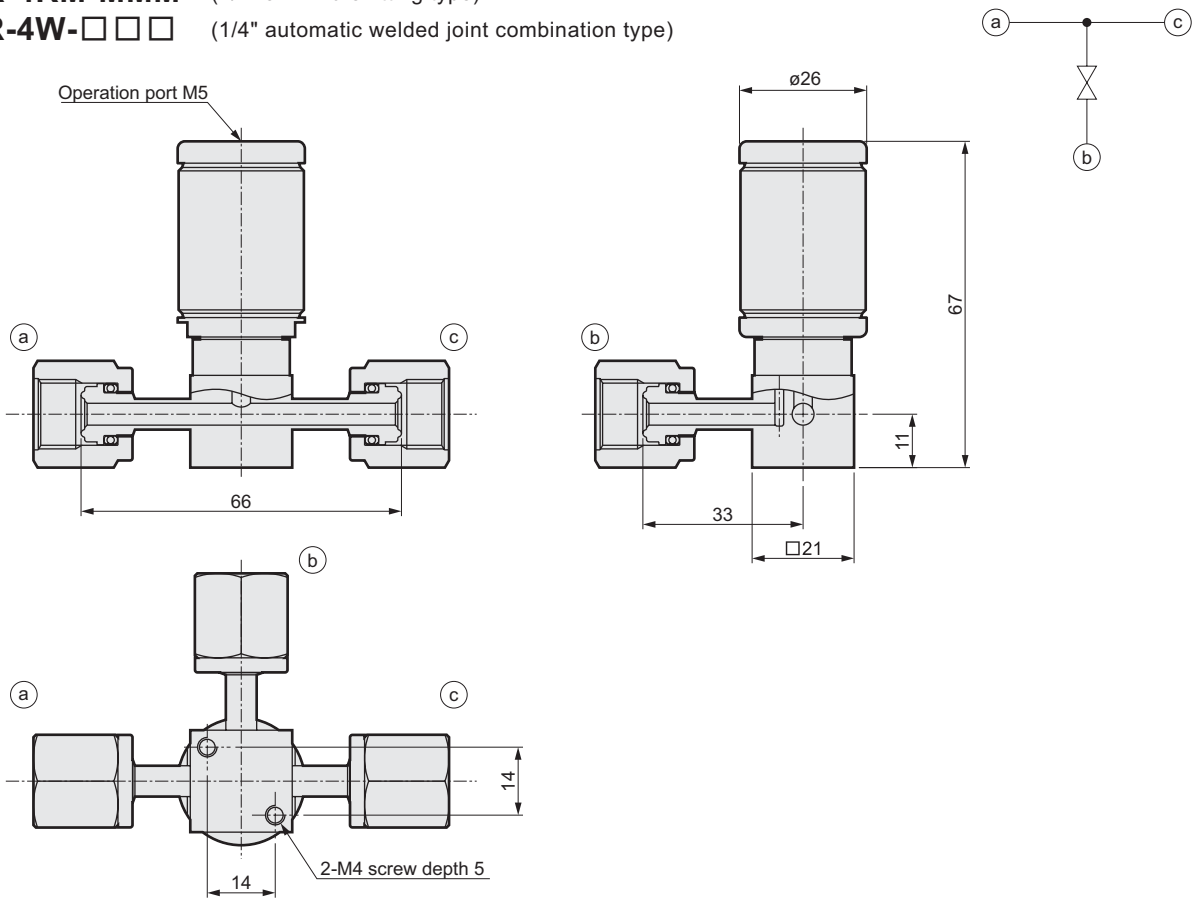
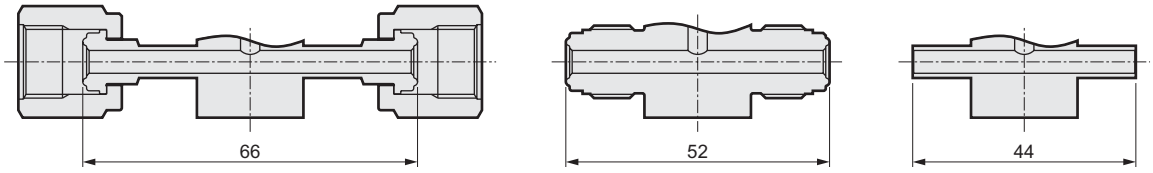


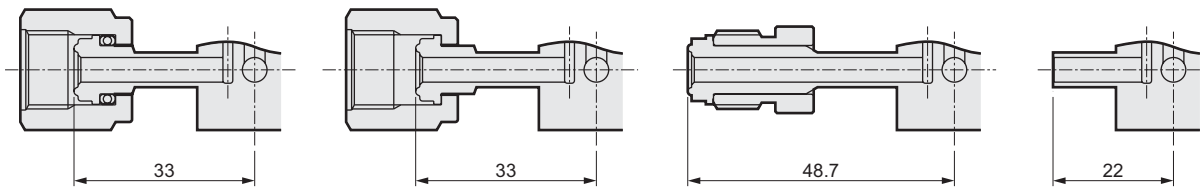
Figure shows AGD01R-4RJ-FFF
Female fitting (with bearing)

<Main port>



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

<Branch port>



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

AGD0*R 2-station 3-way valve **Custom order**

Dimensions

AGD01R-□-4RJ-□□□** (1/4" JXR female fitting (with bearing) combination type)
AGD01R-□-4R-□□□** (1/4" JXR female fitting combination type)
AGD01R-□-4RM-MMM** (1/4" JXR male fitting type)

<Y: Selector type>

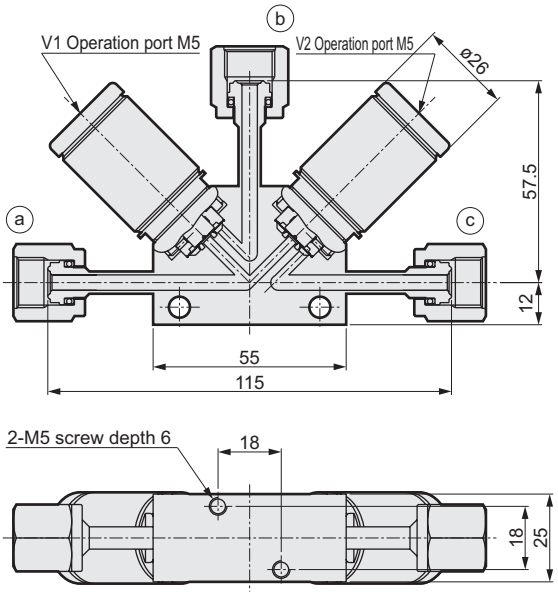
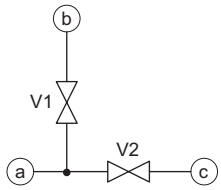


Figure shows AGD01R-Y11-4RJ-FFF
Female fitting (with bearing)



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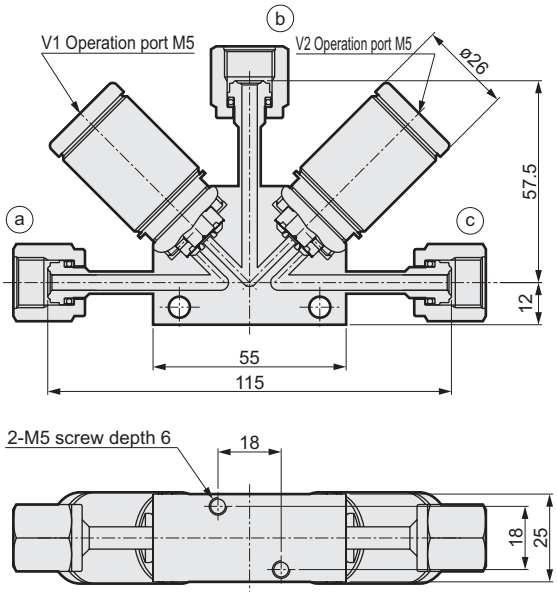
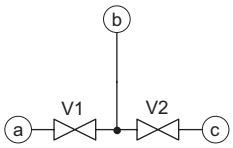
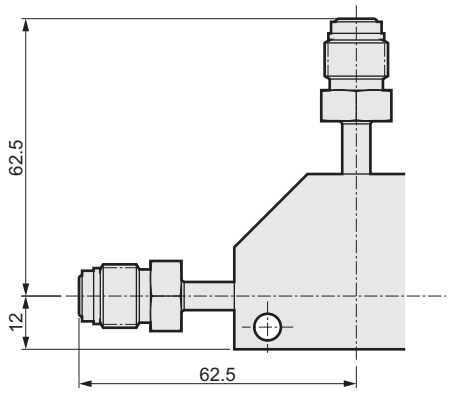


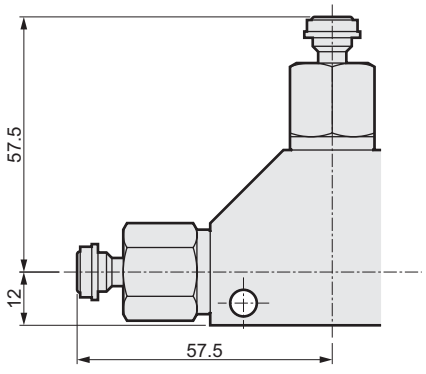
Figure shows AGD01R-T11-4RJ-FFF
Female fitting (with bearing)



<Other fitting dimension>



Male fitting: 4RM



Female fitting: 4R

AGD1∗R 2way valve **Custom order**

Dimensions

AGD1∗R-4RJ (1/4" JXR female fitting (with bearing) type)
AGD1∗R-4W (1/4" automatic welded fitting type)

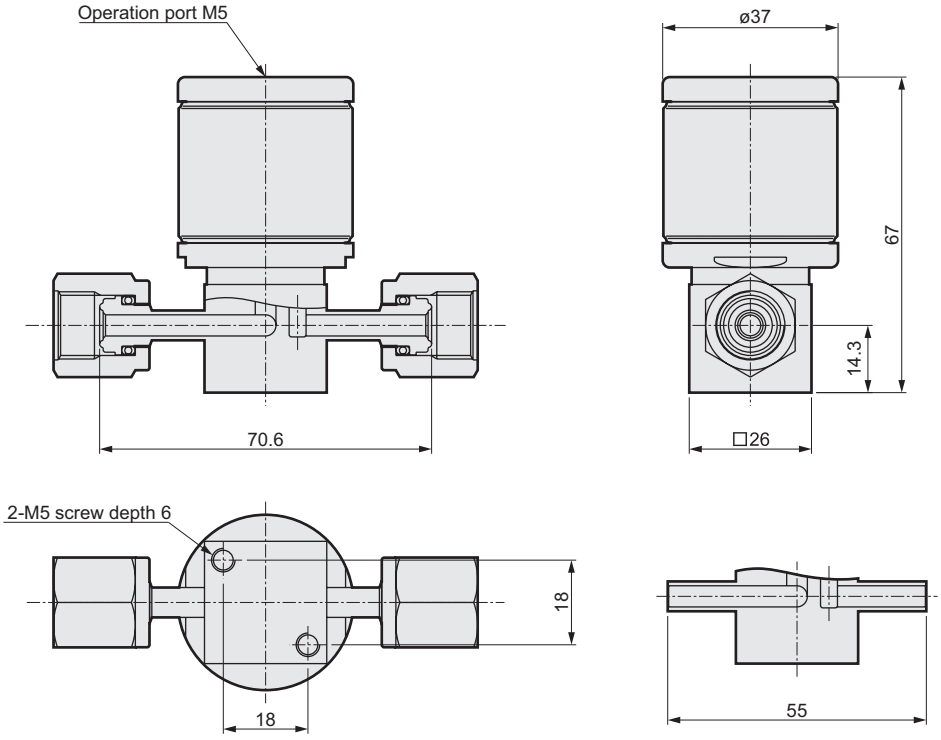


Figure shows AGD11R-4RJ
Female fitting (with bearing)

Welded fitting: 4W

AGD1∗R-4RJ-$^{FM}_{MF}$ (1/4" JXR female fitting (with bearing) male combination type)
AGD1∗R-4R-$^{FM}_{MF}$ (1/4" JXR female - male combination type)

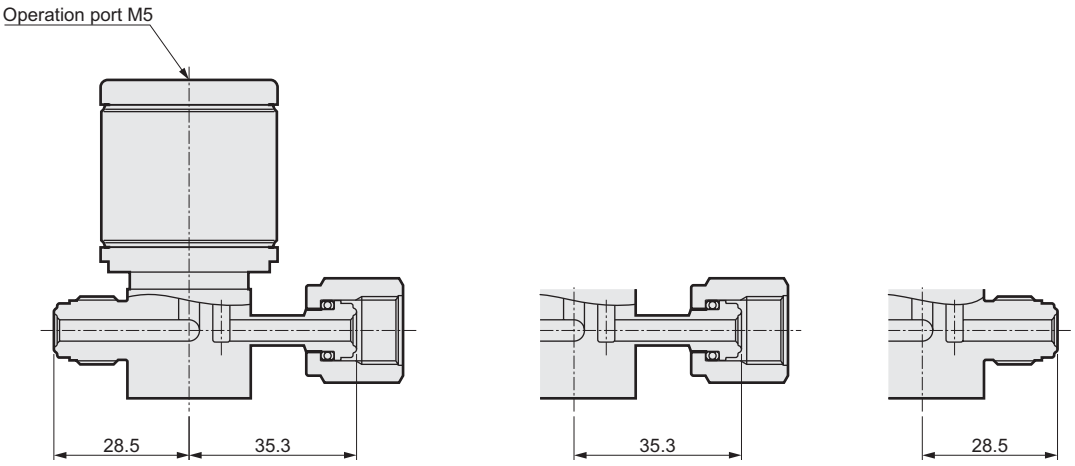


Figure shows AGD11R-4RJ-MF
Female fitting (with bearing)

Female fitting: 4R

Male fitting: 4RM

AGD1∗R 3 way separate flow valve **Custom order**

Dimensions

AGD1∗R-4RJ-□□□ (1/4" JXR female fitting (with bearing) combination type)
AGD1∗R-4R-□□□ (1/4" JXR female fitting combination type)
AGD1∗R-4RM-MMM (1/4" JXR male fitting type)
AGD1∗R-4W-□□□ (1/4" automatic welded fitting combination type)

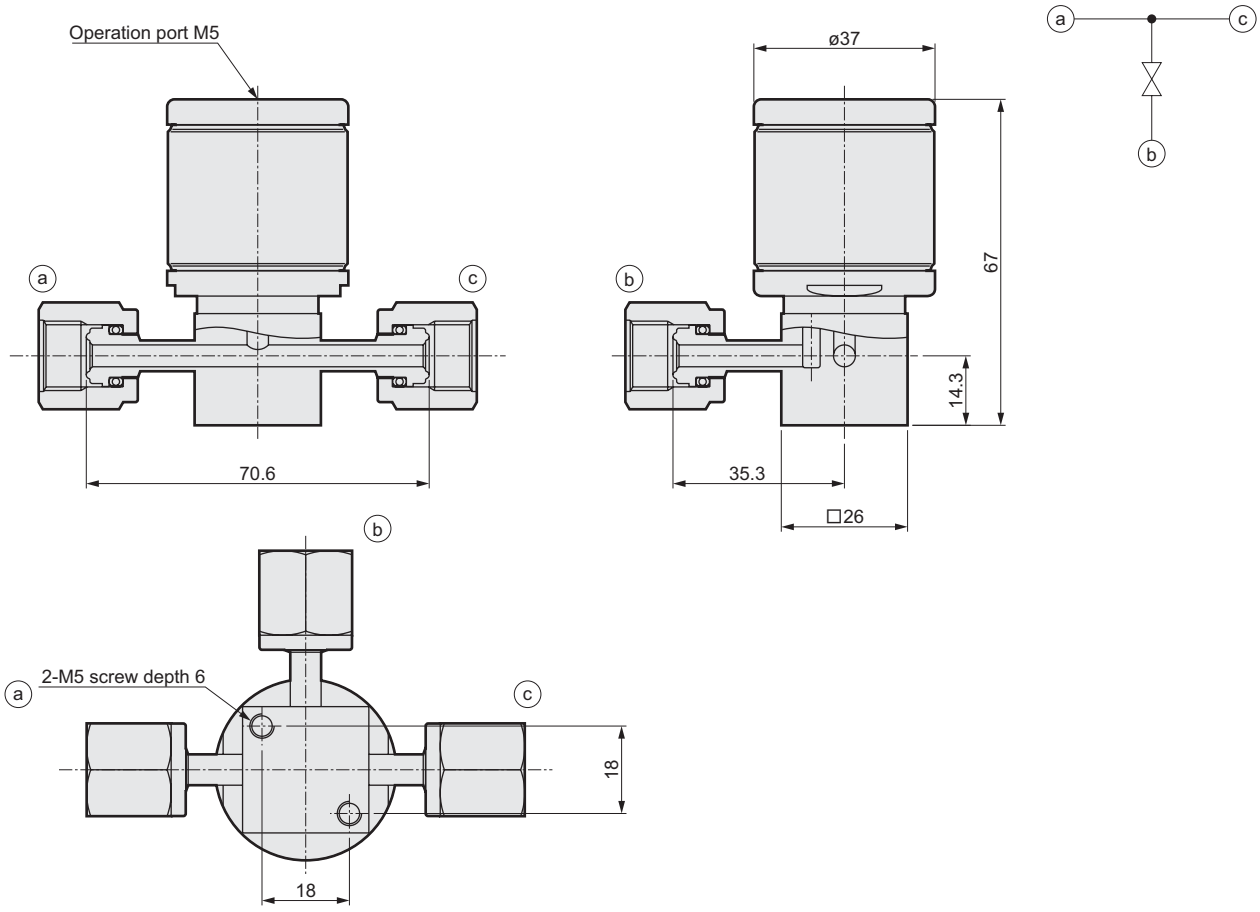
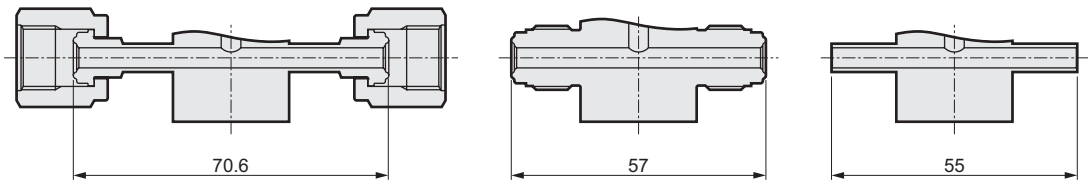


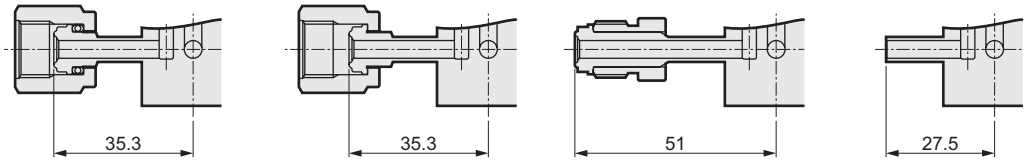
Figure shows AGD11R-4RJ-FFF
Female fitting (with bearing)

<Main port>



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

<Branch port>



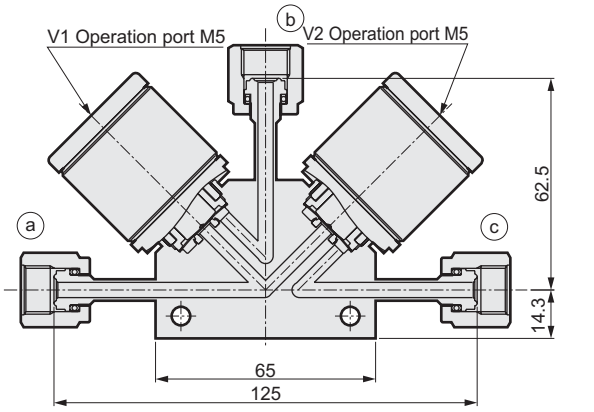
Female fitting: 4RJ-□F□ (with bearing) | Female fitting: 4R-□F□ | Male fitting: -□M□ | Welded fitting: -□W□

AGD11R 2 station 3 way valve **Custom order**

Dimensions

AGD11R-□-4RJ-□□□** (1/4" JXR female fitting (with bearing) combination type)
AGD11R-□-4R-□□□** (1/4" JXR female fitting combination type)
AGD11R-□-4RM-MMM** (1/4" JXR male fitting type)

<Y: Selector type>



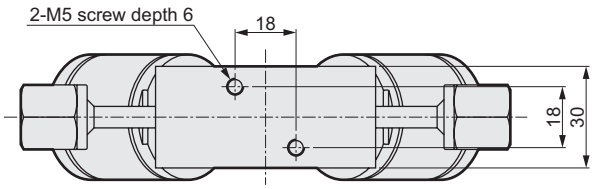
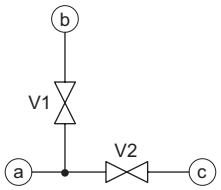


Figure shows AGD11R-Y11-4RJ-FFF
Female fitting (with bearing)



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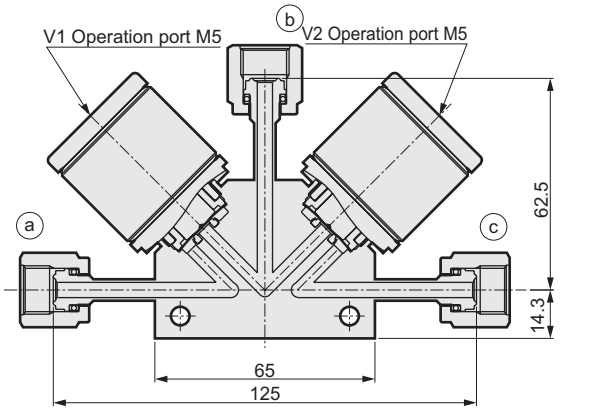


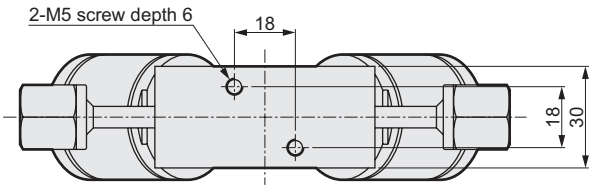
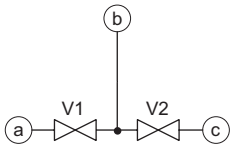
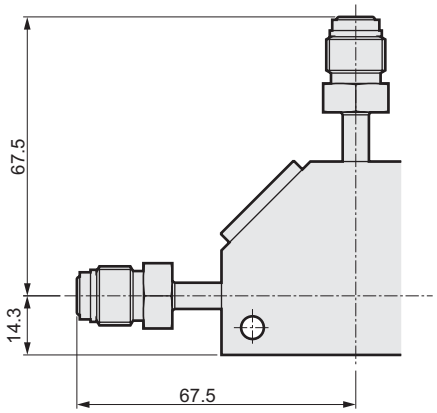


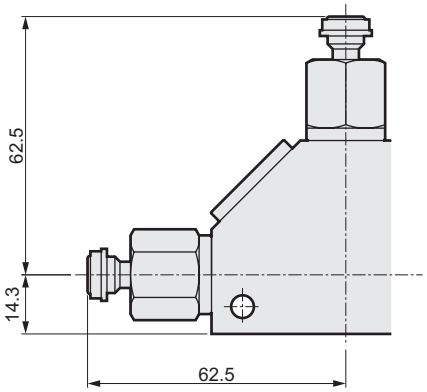
Figure shows AGD11R-T11-4RJ-FFF
Female fitting (with bearing)



<Other fitting dimension>



Male fitting: 4RM



Female fitting: 4R

AGD2*R 2way valve **Custom order**

Dimensions

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

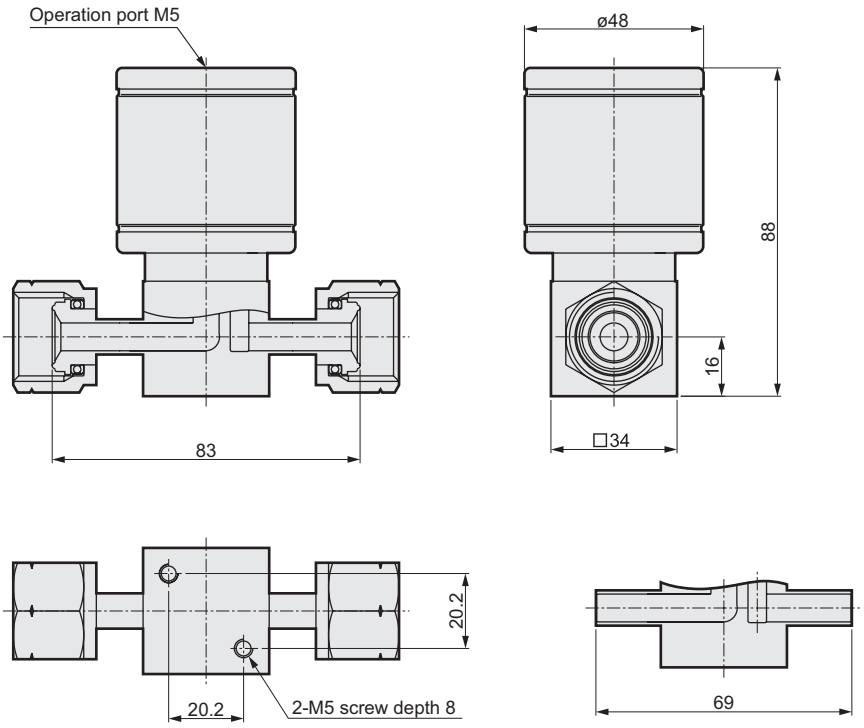
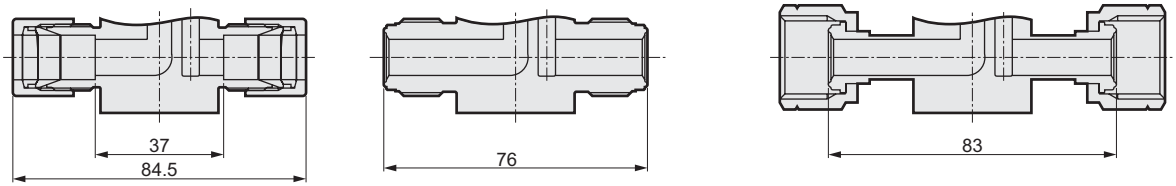


Figure shows AGD21R-6RJ
Female fitting (with bearing)

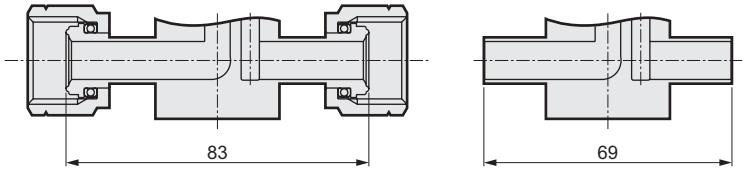
Welded fitting: 6W



Double barbed fitting type: 8S

Male fitting: 8RM

Female fitting: 8R



Female fitting: 8RJ
(with bearing)

Welded fitting: 8W

AGD2∗R 2way valve **Custom order**

Dimensions

AGD2∗R-6RJ-$^{FM}_{MF}$ (3/8" JXR female fitting (with bearing) male combination type)
AGD2∗R-6R-$^{FM}_{MF}$ (3/8" JXR female - male combination type)

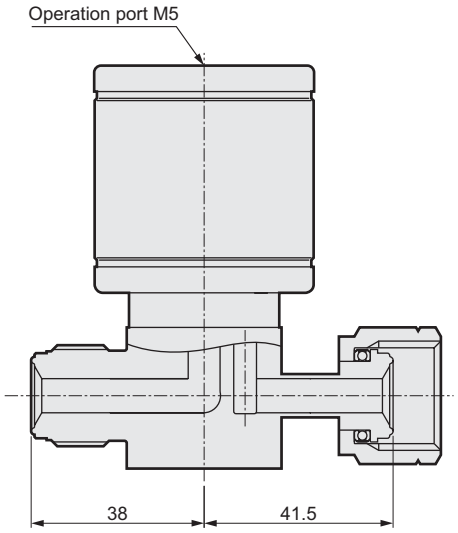
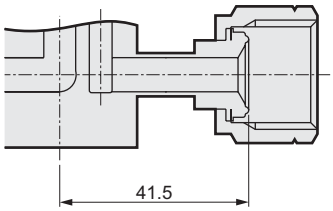
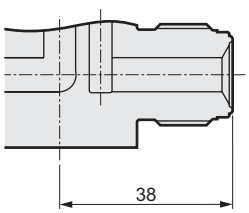


Figure shows AGD21R-6RJ-MF
Female fitting (with bearing)



Female fitting: 6R



Male fitting: 6RM

AGD2∗R-8RJ-$^{FM}_{MF}$ (1/2" JXR female fitting (with bearing) male combination type)
AGD2∗R-8R-$^{FM}_{MF}$ (1/2" JXR female - male combination type)

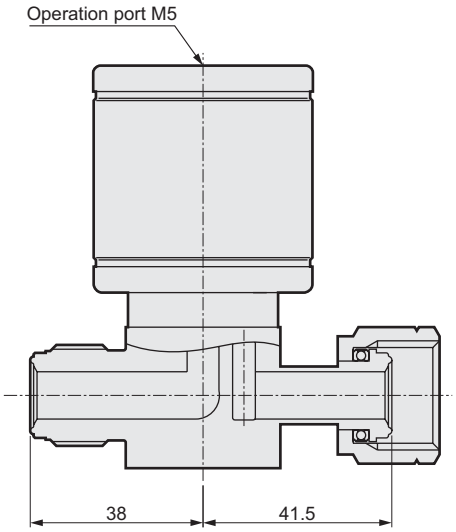
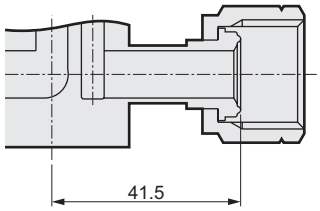
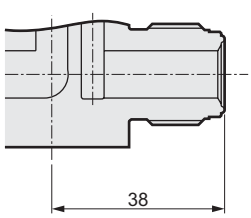


Figure shows AGD21R-8RJ-MF
Female fitting (with bearing)



Female fitting: 8R



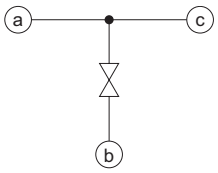
Male fitting: 8RM

AGD2∗R 3 way separate flow valve **Custom order**

Dimensions

AGD2∗R-6RJ-□□□ (3/8" JXR female fitting (with bearing) combination type)
AGD2∗R-6R-□□□ (3/8" JXR female fitting combination type)
AGD2∗R-6RM-MMM (3/8" JXR male fitting type)
AGD2∗R-6W-□□□ (3/8" automatic welding fitting combination type)

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



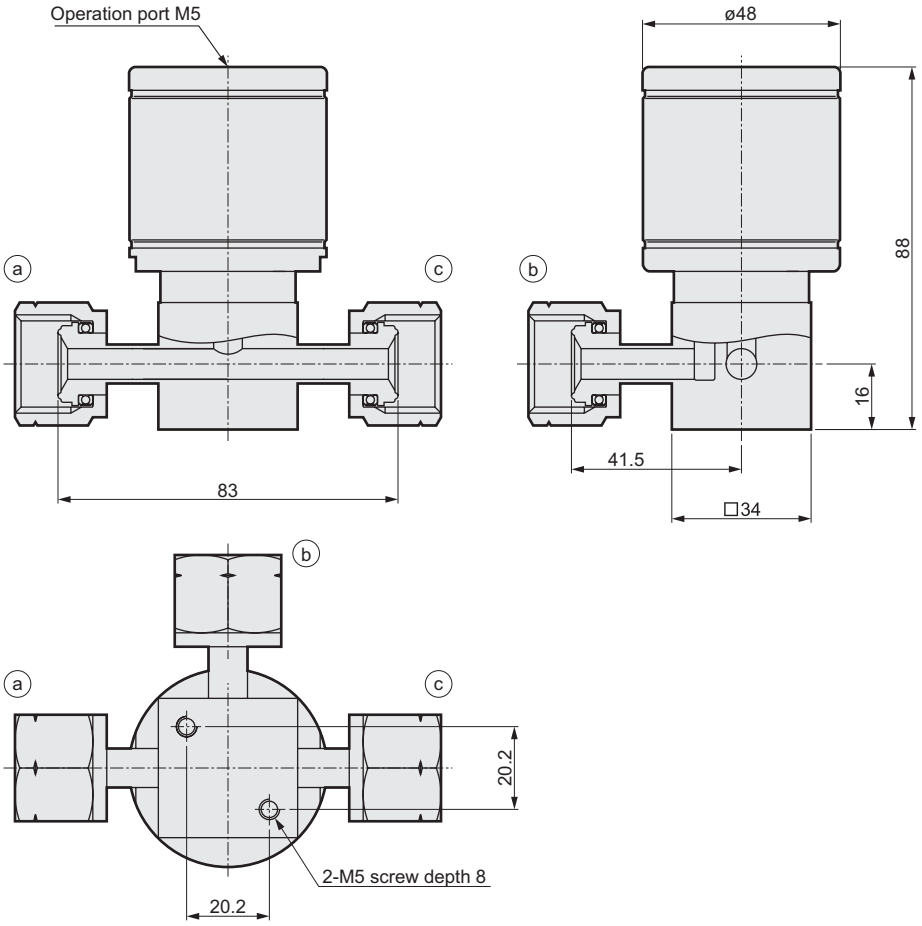
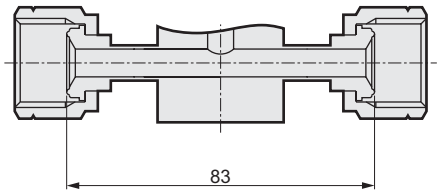
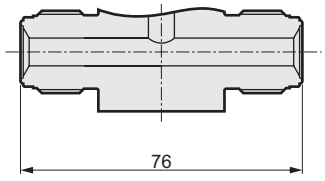


Figure shows AGD21R-6RJ-FFF
Female fitting (with bearing)

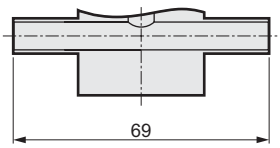
<Main port>



Female fitting: 6R

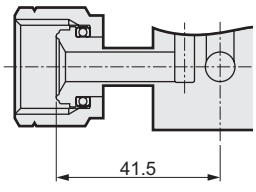


Male fitting: 6RM

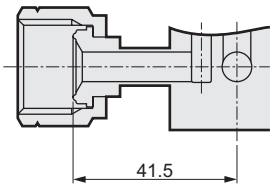


Welded fitting: 6W

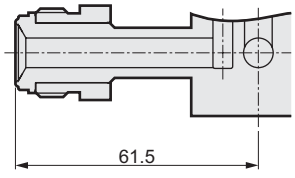
<Branch port>



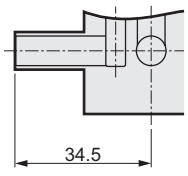
Female fitting: 6RJ-□F□
(with bearing)



Female fitting: 6R-□F□



Male fitting: -□M□



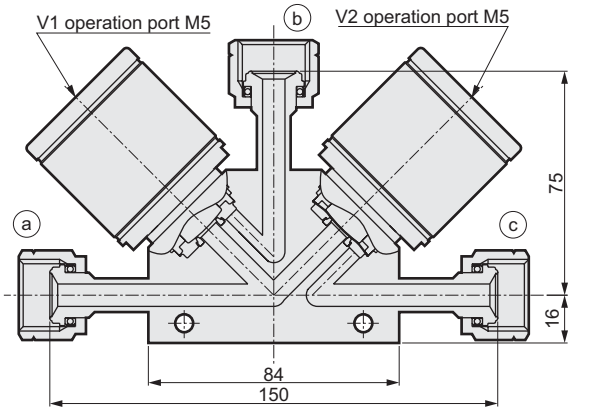
Welded fitting: -□W□

AGD21R 2 station 3 way valve **Custom order**

Dimensions

AGD21R-□-6RJ-□□□** (3/8" JXR female fitting (with bearing) combination type)
AGD21R-□-6R-□□□** (3/8" JXR female fitting combination type)
AGD21R-□-6RM-MMM** (3/8" JXR male fitting type)

<Y: Selector type>



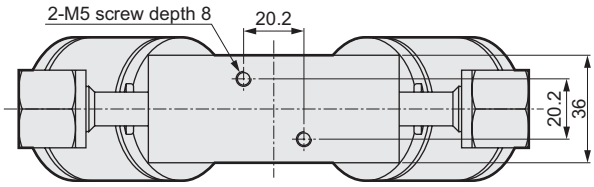
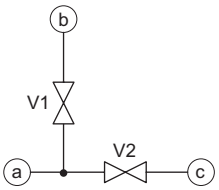


Figure shows AGD21R-Y11-6RJ-FFF
Female fitting (with bearing)



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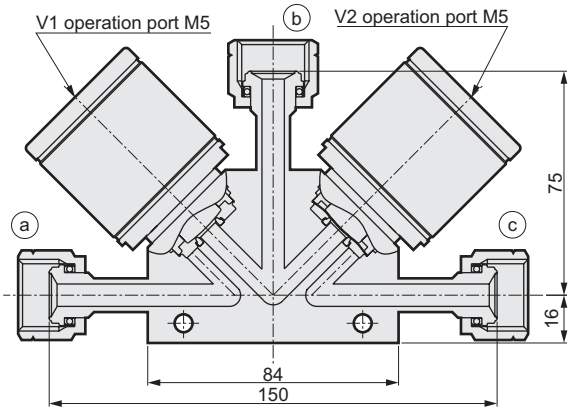


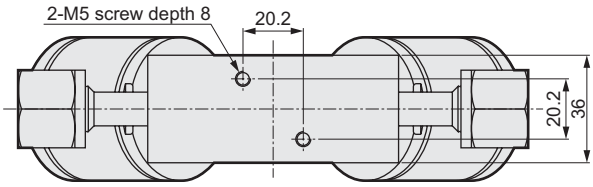
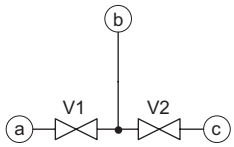
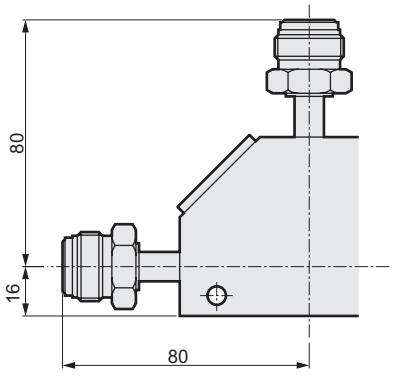


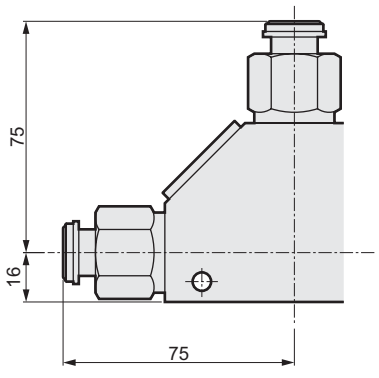
Figure shows AGD21R-T11-6RJ-FFF
Female fitting (with bearing)



<Other fitting dimension>



Male fitting: 6RM



Female fitting: 6R

Air operated valve for process gas

Parts compatible with options

AGD Series

Custom order

● With valve opening adjusting mechanism

■ The flow rate of opening valve is adjustable

■ Adjust the flow by turning the knob on the actuator

● Equipped with proximity switch

■ Confirmation of valve operation status by out put signal.

■ The detection timing according to your needs
(valve open output or valve closed output)

∗ Please contact our sales department regarding compatibility of other switches.

● For high temperature fluid

■ For high temperature fluids up to 180℃

■ PFA valve seat material

∗ Please contact our sales department regarding model numbers and details for parts compatible with options.

Manual valve for process gas

OGD$^{1}_{2}$0R Series

●Metal diaphragm ●90° rotation snap action type

Model no.	Cv flow factor	Model no.	Cv flow factor
OGD10R	Cv = 0.3	OGD20R	Cv = 0.65

Can close the valve by turning the handle a little

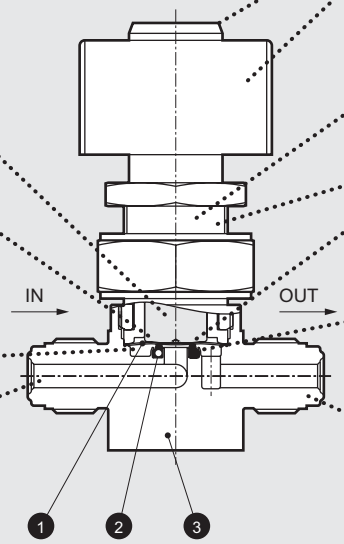
●Continuous use possible up to 80℃

●Built so the rod does not turn, enabling stable inner seal performance

●Particle is hardly generated, realized with optimum seal structure and improved surface roughness.

●Valve dead space minimized

●Electropolished finish specifications



●Handle position and top indicator indicate whether the valve is open or closed

●Panel installation possible (Option)

●Inner seal performance stabilized with spring

●Corrosion-proof Ni-Co alloy Diaphragm

●Connection with JXR fitting*1 and double barbed fittings are standard

Materials for wetted areas

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

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

Specifications

Descriptions	OGD10R	OGD20R
Working fluid	Inert gas/process gas	
Fluid pressure range Pa (abs) - MPa (G)	1.3×10^{-6} to 0.99	
Fluid temperature ℃	5 to 80	
Ambient temperature ℃	5 to 80	
Storage temperature ℃	-10 to 80	
Valve seat leakage Pa・m^3/s (He)	1.0×10^{-10} or less	
External leakage Pa・m^3/s (He)	2.8×10^{-12} or less	
Cv flow factor (23℃, under pressure)	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	0.35 Note 1	0.70 Note 1

Note 1: Value for OGD10R-4RM (1/4-inch JXR male fitting) and OGD20V-6RM (3/8-inch JXR male fitting).

⚠ Safety precautions

Always read page 9 in the introduction and pages 2 to 3 to ensure correct and safe use of this product.

How to order

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

Ⓐ Model no. Ⓑ Connection Ⓒ Handle color

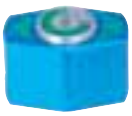
Symbol	Descriptions	Ⓐ Model no. OGD10R	Ⓐ Model no. OGD20R
Ⓑ Connection			
4RM	1/4" JXR male fitting	●	
4R	1/4" JXR female fitting	●	
4S	1/4" double barbed fitting	●	
6RM	3/8" JXR male fitting		●
6R	3/8" JXR female fitting		●
6S	3/8" double barbed fitting		●
Ⓒ Handle color			
K	Black	●	●
R	Red	●	●
B	Blue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

Handle color

●Black (-K)

●Red (-R)

●Blue (-B)

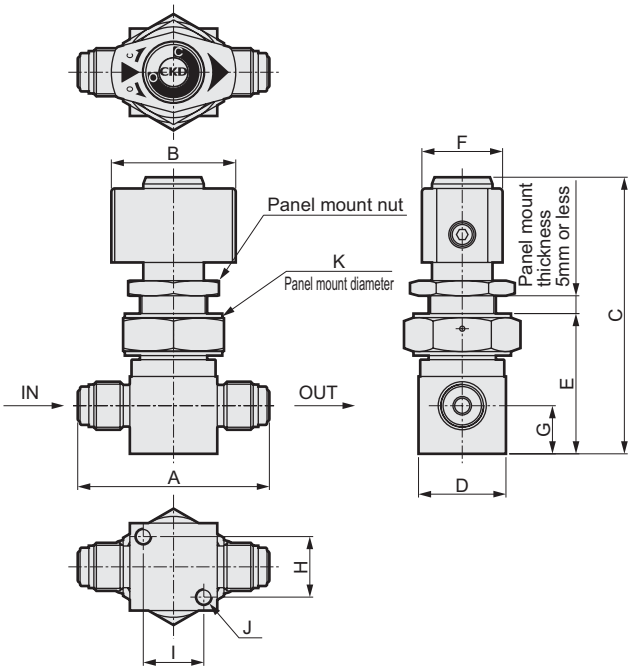


●Yellow (-Y)

Dimensions

OGD10R-4RM-☐
OGD20R-6RM-☐

●JXR male joint

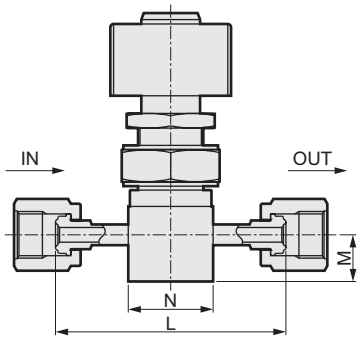


Model no. \ Symbol	A	B	C	D	E	F	G	H	I	J	K
OGD10R-4RM-☐	57	37	82	☐26	42	24	14.3	18	18	2-M5 depth 6	ø20.5
OGD20R-6RM-☐	76	47	104	☐34	57	28	16	20.2	20.2	2-M5 depth 8	ø26.5

Note: Panel mount nut is not included in standard products.Products with panel mount nut are custom order products.

OGD10R-4R-☐
OGD20R-6R-☐

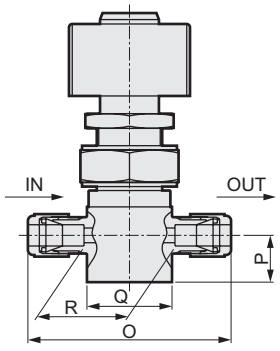
●JXR female fitting



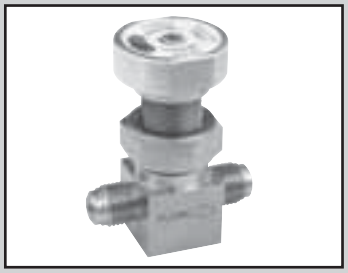
Model no. \ Symbol	L	M	N
OGD10R-4R-☐	70.6	14.3	☐26
OGD20R-6R-☐	83	16	☐34

OGD10R-4S-☐
OGD20R-6S-☐

●Double barbed fitting



Model no. \ Symbol	O	P	Q	R
OGD10R-4S-☐	62	14.3	☐26	27.8
OGD20R-6S-☐	80	16	☐34	44.3



Manual valve for process gas

MGD$\frac{1}{2}$0R Series

●Metal diaphragm ●270°rotation type

RoHS CAD

Model no.	Cv flow factor	Model no.	Cv flow factor
MGD10R	Cv = 0.3	MGD20R	Cv = 0.65

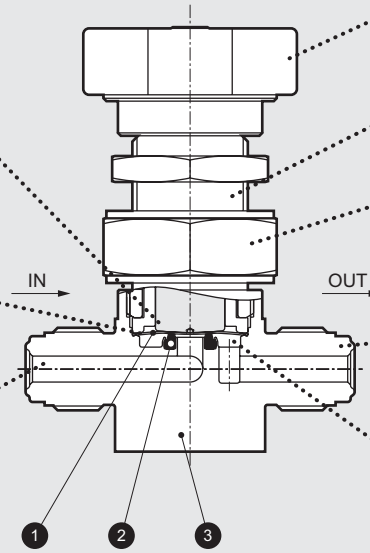
Manual valve incorporating basic air-operated valve performance

●Continuous use possible up to 80℃

●Particle is hardly generated, realized with optimum seal structure and improved surface roughness.

●Valve dead space minimized

●Electropolished finish specifications



●Handle shape ensures optimum inner sealing

●Panel installation possible (Option)

●Equipped with stopper mechanism to prevent diaphragm damage from excessive tightening.

●Connection with JXR fitting*1 and double barbed fittings are standard

●Corrosion-proof Ni-Co alloy Diaphragm

Materials for wetted areas

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

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

Specifications

Descriptions	MGD10R	MGD20R
Working fluid	Inert gas/process gas	
Fluid pressure range Pa (abs) -MPa (G)	1.3×10^{-6} to 0.99	
Fluid temperature ℃	5 to 80	
Ambient temperature ℃	5 to 80	
Storage temperature ℃	-10 to 80	
Valve seat leakage Pa・m³/s (He)	1.0×10^{-10} or less	
External leakage Pa・m³/s (He)	2.8×10^{-12} or less	
Cv flow factor (23℃, under pressure)	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 Note 1	0.64 Note 1

Note 1: Value for MGD10R-4RM (1/4-inch JXR male fitting) and MGD20R-6RM (3/8-inch JXR male fitting).

Safety precautions

Always read page 9 in the introduction and pages 2 to 3 to ensure correct and safe use of this product.

How to order

MGD10R-4RM

Model no.

Ⓐ Connection

Symbol	Descriptions
Ⓐ Connection	
4RM	1/4" JXR male fitting
4R	1/4" JXR female fitting
4S	1/4" double barbed fitting

MGD20R-6RM

Model no.

Ⓐ Connection

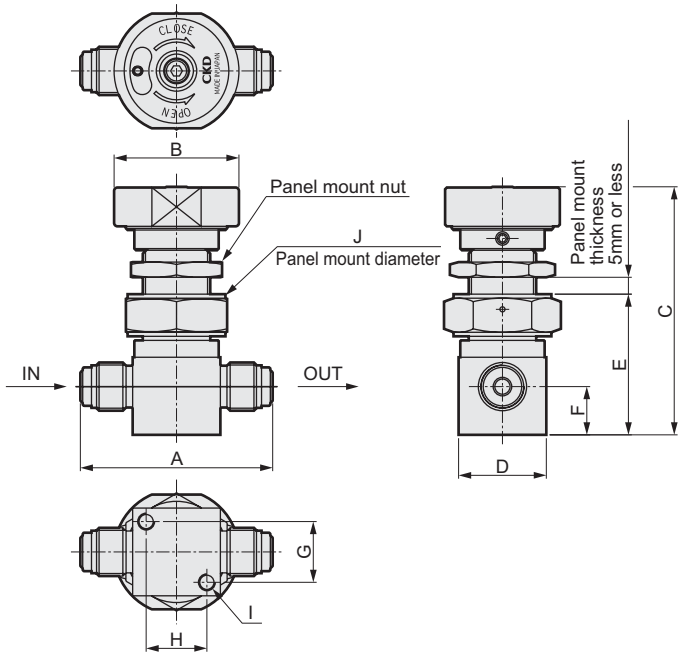
Symbol	Descriptions
Ⓐ Connection	
6RM	3/8" JXR male fitting
6R	3/8" JXR female fitting
6S	3/8" double barbed fitting

Note: The handle comes in standard silver and black, red, blue and yellow are also available.
Refer to Page 21 for the model no. (Dimensions are the same as following.)

Dimensions

MGD10R-4RM
MGD20R-6RM

●JXR male fitting

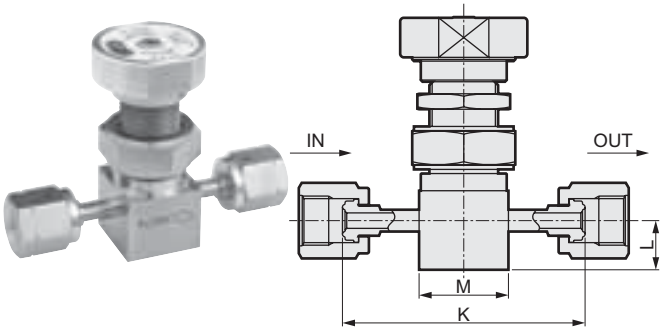


Model no. \ Symbol	A	B	C	D	E	F	G	H	I	J
MGD10R-4RM	57	ø37	74	□26	42	14.3	18	18	2-M5 depth 6	ø20.5
MGD20R-6RM	76	ø37	86	□34	57	16	20.2	20.2	2-M5 depth 8	ø20.5

Note: Panel mount nut is not included in standard products. Products with panel mount nut are custom order products.

MGD10R-4R
MGD20R-6R

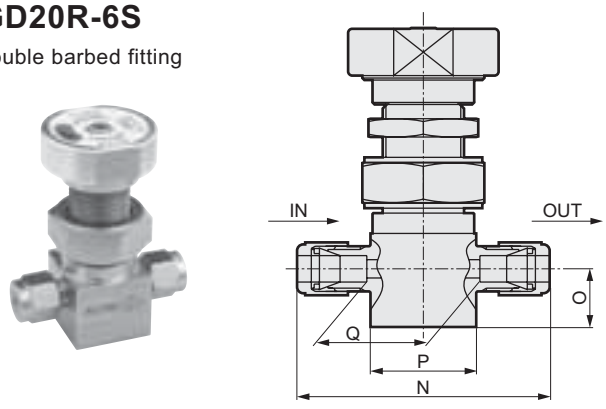
●JXR female fitting



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

MGD10R-4S
MGD20R-6S

●Double barbed fitting



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

Manual valve for process gas

Parts compatible with variations

OGD*0R/MGD*0R Series

RoHS **Custom order**

Model	Variation description
OGD10R **OGD20R** **MGD10R** **MGD20R**	Body options (pages 21 to 25) ●Connection ●Port shape combination ●Handle color 
	Safety specification options (page 26) ●Locking mechanism ●Double action mechanism  

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

O GD 1 0R- 4 RJ - MF - K

- A Model
- B Size
- C Port size
- D Connection
- E Port shape combination
- F Handle color

Symbol	Descriptions	Model no. OGD1	OGD2	MGD1	MGD2
A Model					
O	Manual (snap action)	●	●		
M	Manual (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	Automatic welded fitting	●	●	●	●
S	double barbed fitting	●	●	●	●
E Port shape combination					
2 way valve					
Blank	IN, OUT Same fitting type	●	●	●	●
MF	IN: Male OUT: Female	●	●	●	●
FM	IN: Female OUT: Male	●	●	●	●
3-way separate flow valve					
FFF	abc Female/Female/Female	●	●	●	●
FFM	abc Female/Female/Male	●	●	●	●
FMM	abc Female/Male/Male	●	●	●	●
MMM	abc Male/Male/Male	●	●	●	●
WWW	abc Automatic welded fitting	●	●	●	●
□□□	abc □/□/□ Note 1	●	●	●	●
F Handle color					
K	Black	●	●	●	●
B	Blue	●	●	●	●
Y	Yellow	●	●	●	●
R	Red	●	●	●	●

D Connection

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

Note 1 F: Female, M: Male, W: Automatic weld fitting combinations as needed

Handle color

●Black (-K) 

●Red (-R) 

●Blue (-B) 

●Yellow (-Y) 

Specifications

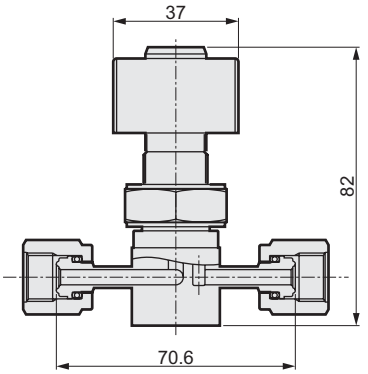
Refer to specification pages for each series.

OGD10R MGD10R **2 way valve** **Custom order**

Dimensions

OGD10R-4RJ-K (B, Y, R) (1/4" JXR female fitting (with bearing) type)
OGD10R-4W-K (B, Y, R) (1/4" automatic welded joint type)
MGD10R-4RJ-K (B, Y, R) (1/4" JXR female fitting (with bearing) type)
MGD10R-4R-K (B, Y, R) (1/4" JXR male fitting type)
MGD10R-4RM-K (B, Y, R) (1/4" JXR male fitting type)
MGD10R-4W-K (B, Y, R) (1/4" automatic welded joint type)
MGD10R-4S-K (B, Y, R) (1/4" double barbed fitting type)

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



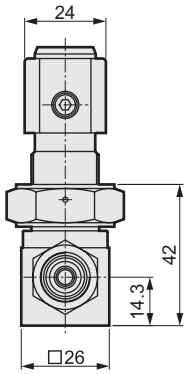
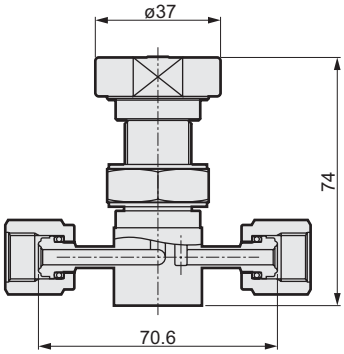
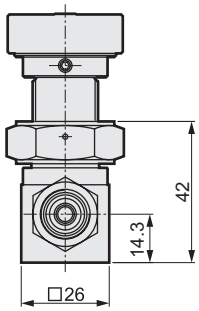
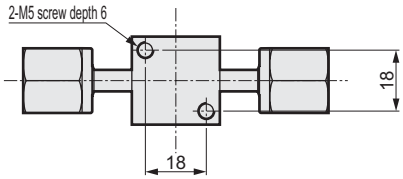
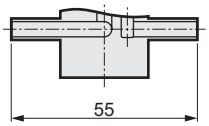


Figure shows MGD10R-4RJ-K
Female fitting (with bearing)



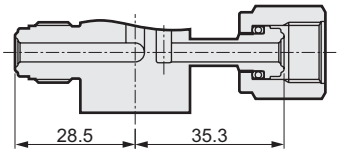




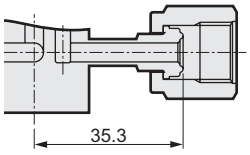


Welded fitting: 4W

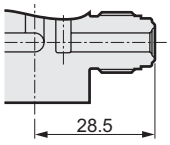
OGD10R-4RJ-$\frac{FM}{MF}$-K (B, Y, R) (1/4" JXR female (with bearing) - male combination type)
OGD10R-4R-$\frac{FM}{MF}$-K (B, Y, R) (1/4" JXR female - male combination type)
MGD10R-4RJ-$\frac{FM}{MF}$-K (B, Y, R) (1/4" JXR female (with bearing) - male combination type)
MGD10R-4R-$\frac{FM}{MF}$-K (B, Y, R) (1/4" JXR female - male combination type)



Female fitting (with bearing)



Female fitting: 4R



Male fitting: 4RM

OGD10R MGD10R 3-way separate flow valve **Custom order**

Dimensions

OGD10R-4RJ-☐☐☐-K (B, Y, R) (1/4" JXR female fitting (with bearing) combination type)
OGD10R-4R-☐☐☐-K (B, Y, R) (1/4" JXR female fitting combination type)
OGD10R-4RM-MMM-K (B, Y, R) (1/4" JXR male fitting type)
OGD10R-4W-☐☐☐-K (B, Y, R) (1/4" automatic welded fitting combination type)
MGD10R-4RJ-☐☐☐-K (B, Y, R) (1/4" JXR female fitting (with bearing) combination type)
MGD10R-4R-☐☐☐-K (B, Y, R) (1/4" JXR female fitting combination type)
MGD10R-4RM-MMM-K (B, Y, R) (1/4" JXR male fitting type)
MGD10R-4W-☐☐☐-K (B, Y, R) (1/4" automatic welded fitting combination type)

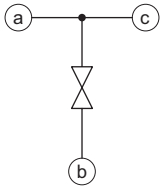


Figure shows OGD10R-4RJ-FFF-K
Female fitting (with bearing)

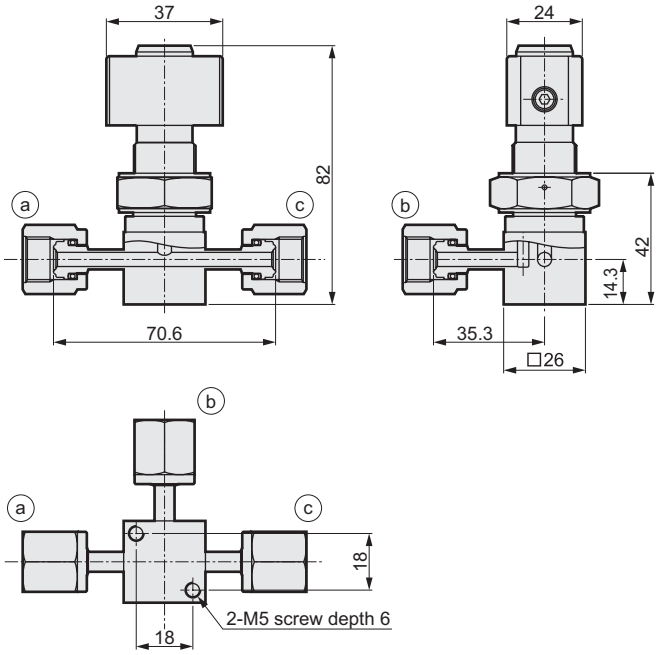
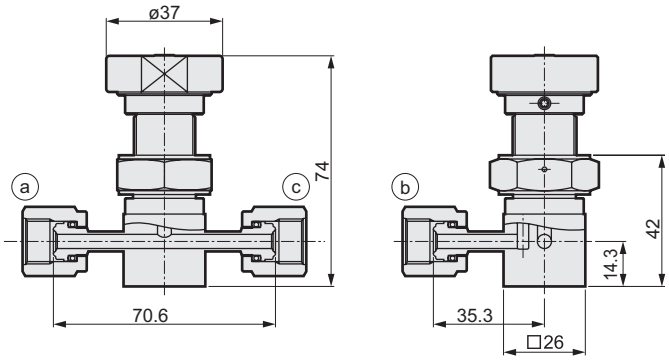
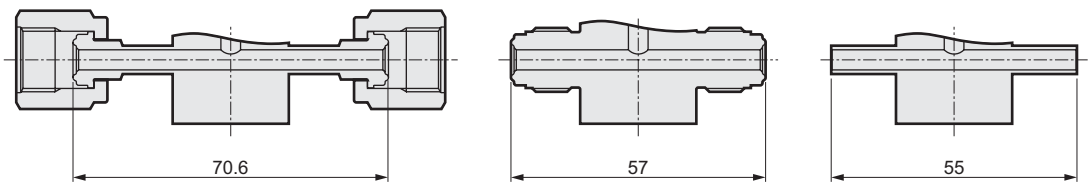


Figure shows MGD10R-4RJ-FFF-K
Female fitting (with bearing)

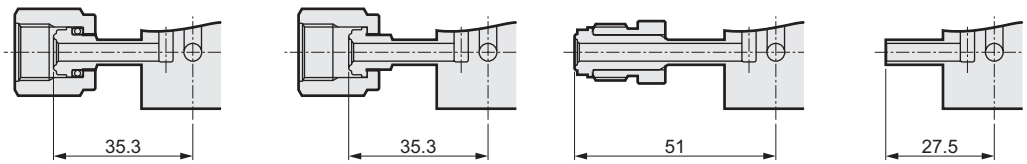


<Main port>



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

<Branch port>



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

OGD20R MGD20R **2 way valve** **Custom order**

Dimensions

OGD20R-6RJ-K (B, Y, R) (3/8" JXR female fitting (with bearing) type)
OGD20R-6W-K (B, Y, R) (3/8" automatic welded fitting combination type)
MGD20R-6RJ-K (B, Y, R) (3/8" JXR female fitting (with bearing) type)
MGD20R-6R-K (B, Y, R) (3/8" JXR male fitting type)
MGD20R-6RM-K (B, Y, R) (3/8" JXR male fitting type)
MGD20R-6W-K (B, Y, R) (3/8" automatic welded fitting combination type)
MGD20R-6S-K (B, Y, R) (3/8" double barbed fitting type)

・1/2" size also available. The face-to-face distance is the same as the 3/8-inch size. (double barbed fitting will differ)

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

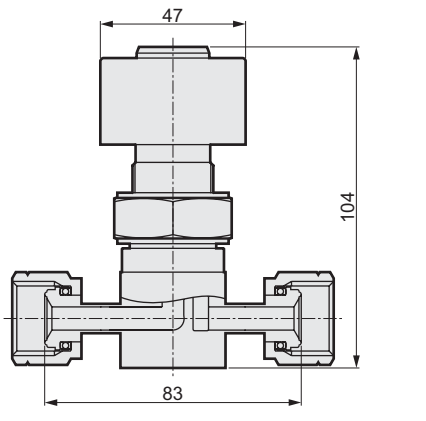
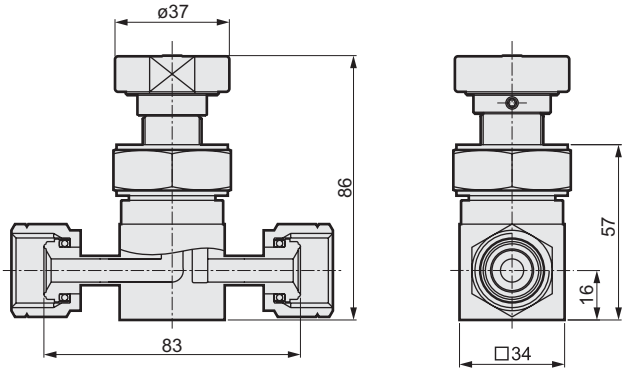
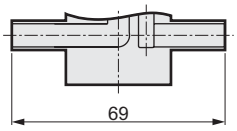
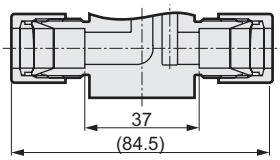


Figure shows MGD20R-6RJ-K
Female fitting (with bearing)





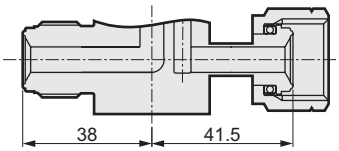
Welded fitting: 6W



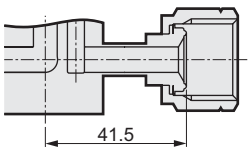
Double barbed fitting type: 8S

OGD20R-6RJ-$\frac{FM}{MF}$-K (B, Y, R) (3/8" JXR female (with bearing) - male combination type)
OGD20R-6R-$\frac{FM}{MF}$-K (B, Y, R) (3/8" JXR female - male combination type)
MGD20R-6RJ-$\frac{FM}{MF}$-K (B, Y, R) (3/8" JXR female (with bearing) - male combination type)
MGD20R-6R-$\frac{FM}{MF}$-K (B, Y, R) (3/8" JXR female - male combination type)

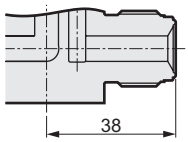
・1/2" size also available. The face-to-face distance is the same as the 3/8-inch size.



Female fitting: 6RJ (with bearing)



Female fitting: 6R

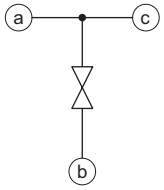


Male fitting: 6RM

OGD20R MGD20R 3-way separate flow valve **Custom order**

Dimensions

OGD20R-6RJ-☐☐☐ (3/8" JXR female fitting (with bearing) combination type)
OGD20R-6R-☐☐☐ (3/8" JXR female fitting combination type)
OGD20R-6RM-MMM (3/8" JXR male fitting type)
OGD20R-6W-☐☐☐ (3/8" automatic welded fitting combination type)
MGD20R-6RJ-☐☐☐ (3/8" JXR female fitting (with bearing) combination type)
MGD20R-6R-☐☐☐ (3/8" JXR female fitting combination type)
MGD20R-6RM-MMM (3/8" JXR male fitting type)
MGD20R-6W-☐☐☐ (3/8" automatic welded fitting combination type)



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

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

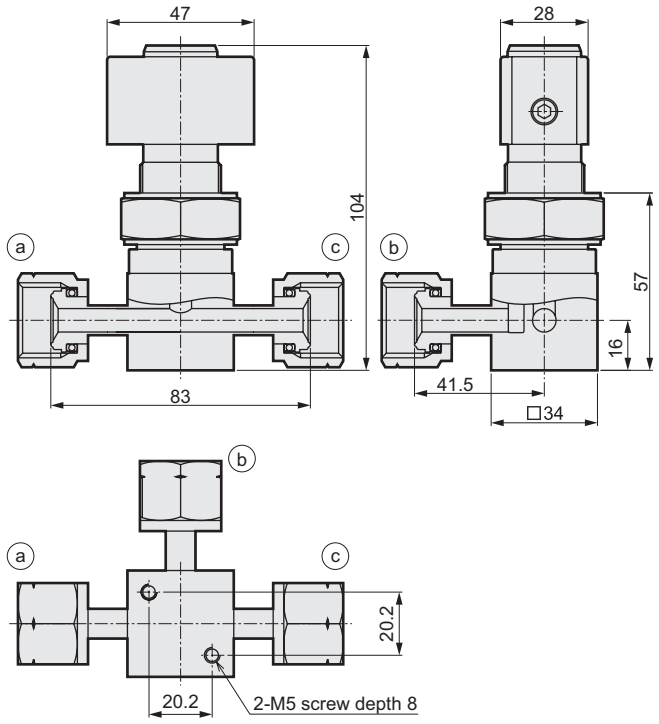
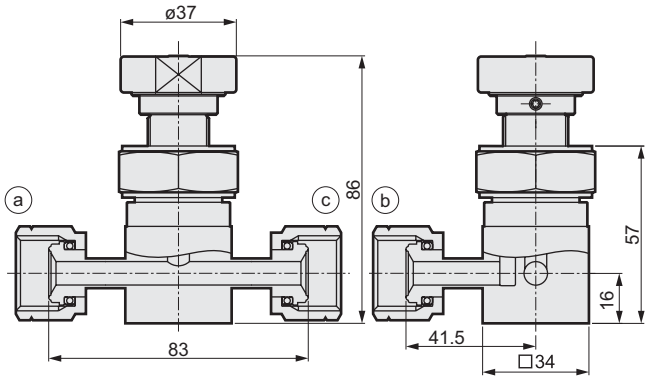
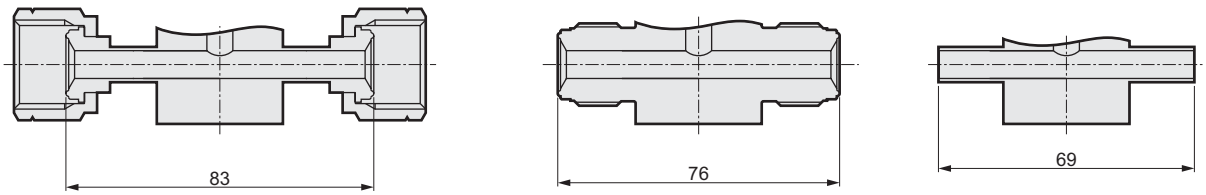


Figure shows MGD20R-6RJ-FFF
Female fitting (with bearing)

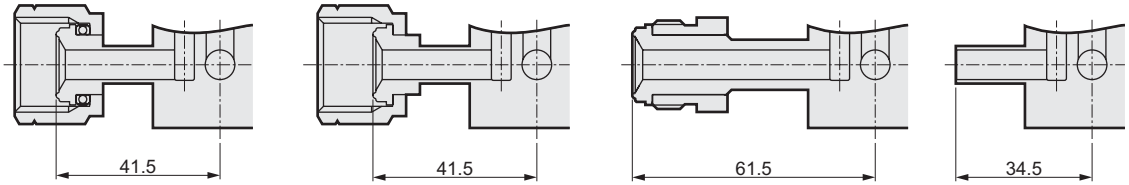


<Main port>



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

<Branch port>



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

MGD safety specification option **Custom order**

Outline drawing

MGD Double action mechanism
MGD Locking mechanism

■Malfunctions are eliminated by pushing and turning the handle (double action).

■Malfunctions are prevented by locking with padlock, wire, etc. when the valve is closed.

∗Please contact our sales department regarding model numbers and details.

Vacuum generator for process gas exhaust

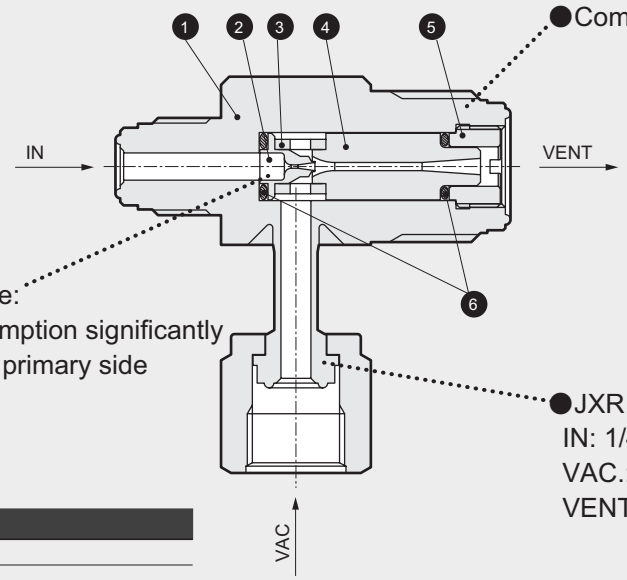
VG Series

●Nozzle diameter: ø0.5

RoHS

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

Energy saving evacuation system



●Compact body

●Newly developed nozzle:
1. Reduces fluid consumption significantly
2. Strong resistance to primary side pressure fluctuation (patent registered)

●JXR fitting connection ∗1
IN: 1/4" JXR male fitting
VAC.: 1/4" JXR female fitting
VENT: 3/8" JXR male fitting

Materials for wetted areas

No.	Part name	Material
1	Body	SUS316L
2	Nozzle	SUS316L
3	Spacer	SUS316L
4	Diffuser	SUS316L
5	Diffuser holder	SUS316L
6	O ring	FKM or Kalrez®

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

Specifications

Descriptions	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 (during operation)
Supply fluid consumption ℓ/min (ANR)	16 or less ∗1
Ultimate vacuum kPa (abs)	13.3 or less
Discharge rate ℓ/min (ANR)	6 ∗1 ∗2
External leakage Pa·m³/s (He)	2.8×10^{-12} or less
Withstanding pressure MPa	3
Ambient temperature °C	0 to 80
Port size	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: 0.5 MPa when pressurized (during operation)
∗2: When working fluid is air

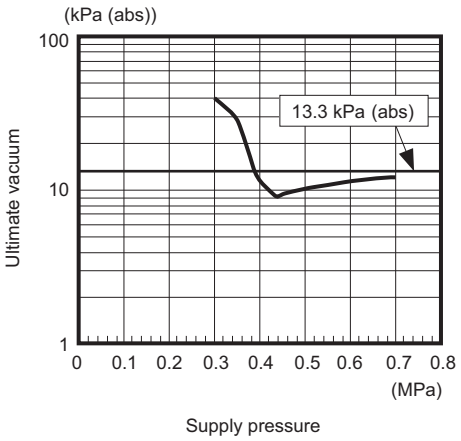
⚠ Safety precautions

Always read page 9 in the introduction and pages 2 to 3 to ensure correct and safe use of this product.

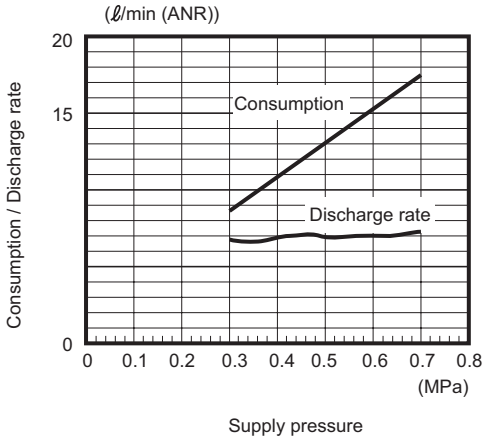
Kalrez® is a registered trademark of DuPont.

Characteristic curve

●Ultimate vacuum



●Supply fluid consumption and discharge rate



Note: You may hear abnormal (sputtering) sounds just prior to the above characteristic's ultimate vacuum peak value (near 0.4 MPa). This abnormal sound indicates unstable characteristics and the noise will increase. It may affect the sensors and cause problems. Therefore, use by raising the supply pressure within the specified level.

How to order

VG - 05 F

Model no.

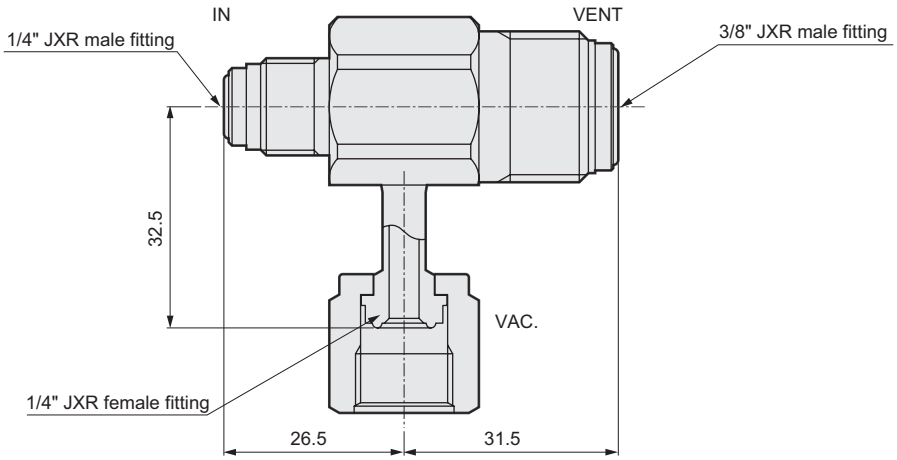
Ⓐ Nozzle diameter [mm]

Ⓑ O ring material

Symbol	Descriptions
Ⓐ Nozzle diameter [mm]	
05	ø0.5
Ⓑ O ring material	
F	FKM
P	Kalrez®

Dimensions

●VG-05∗



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Diaphragm type extremely small flow rate adjustment valve
Piston structure check valve

RoHS Custom order

●Diaphragm type extremely small flow rate adjustment valve

■Wetted areas are all metal
Body (SUS316L)
Diaphragm (Ni-Co alloy)

■Maximum Cv flow factor Two type of 0.03 and 0.2

■Flow reaches the maximum Cv flow factor when the handle is turned 10 times.

■Connection
JXR male fitting, JXR female fitting, and double-barbed fitting are available.

●Piston structure check valve

■Karlez®valve seat material

■SUS316L for wetted areas

■Cracking pressure 2.3 kPa.

■Connection
JXR male fitting and double-barbed fitting are available.

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Regulator for process gas

CONTENTS

Components for process gas

Safety precautions

Always read this section before starting use.
Refer to Intro 9 for the general cautions.

Individual series precautions

Regulator for process gas PGM series

Design and selection

⚠ WARNING

■Install a safety device where an output pressure exceeding the regulator's set pressure valve could result in damage or faulty operation of secondary side devices.

■Pipe so that fluid flows in the direction of the arrow.

During use

1. Precautions for use

⚠ CAUTION

■Completely loosen the pressure adjustment knob counterclockwise (DEC) before supplying gas to the regulator.

■Slowly open the supply valve inlet so that it can be closed immediately if any abnormal pressure rise or leak occurs.

■After supplying inlet pressure, check that no outlets leak.

■Do not use as a shutoff valve.

■During use, along with a metallic noise, the outlet pressure may oscillate violently. (Vibration) If this occurs, close the inlet supply valve immediately and stop use.

2. Operation methods

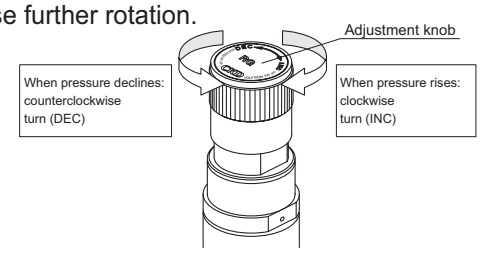
⚠ CAUTION

■Set pressure will increase the pressure adjustment knob is turned clockwise (INC).

■If the knob is turned counterclockwise (DEC) while gas is flowing, set pressure drops.

■This product does not have a relief function, so venting is needed when gas is not flowing.

■When turning the adjustment knob counterclockwise, make sure not to add force to the round end that will cause further rotation.



3. Checking for outlet leaks

⚠ CAUTION

(1) Open the inlet gas supply valve slowly to supply inlet pressure.

(2) Close outlet and inlet valves and wait for at least ten minutes. Check whether outlet pressure rises.

(3) Turn the pressure adjustment knob clockwise and adjust outlet pressure to within the adjustment pressure range. Wait at least ten minutes after outlet pressure stabilizes and check whether outlet pressure rises.

(4) If outlet pressure continues to rise in steps (2) and (3), an outlet leak exists.

■If an outlet leak is found, discontinue use immediately. Bleed the gas, purge the regulator and then remove and replace it.

4. Checking for air-tightness

⚠ CAUTION

Regulator inlet

(1) Confirm that the regulator pressure adjustment knob is turned completely counterclockwise, and then supply clean inert gas (N2, Ar, etc.) to the regulator inlet.

(2) Completely close the regulator inlet supply valve after inlet pressure stabilizes.

(3) If inlet pressure gradually drops from the above state (after time has passed), a leak may exist in the regulator outlet.
(Note that this applies when no outlet leak exists.)

Regulator outlet

(1) Confirm that the regulator pressure adjustment knob is turned completely counterclockwise, and then supply clean inert gas (N2, Ar, etc.) to the regulator inlet.

(2) Close the regulator's outlet valve and set the pressure with the pressure adjustment knob.

(3) Completely close the regulator inlet supply valve after inlet and outlet pressure stabilizes.

(4) If inlet and outlet pressure both fluctuate greatly from the above state (after time has passed), a leak may exist in the regulator outlet.
(Note that this applies when no outlet leak exists.)

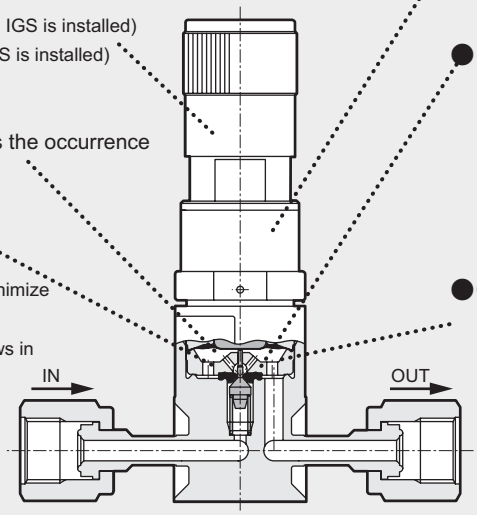
■If an outlet leak is found, discontinue use immediately. Bleed the gas, purge the regulator, and then remove and replace.

High performance regulator incorporates CKD's vast experience
PGM series

●Slim body
- Easy to install, improved knob operability
- Sufficient space for harnesses, etc. (when IGS is installed)
- Compatible with 1.125-inch size (when IGS is installed)

●Sealing performance
- Improved valve seat sealing reduces the occurrence of outlet leaks

●Clean level compatible with ultra-high-purity gas
- Poppet sliding sections are reduced to minimize particle generation to the lowest limit
- Metal seal specifications apply to all screws in wetted areas
- Long-life, highly corrosion resistant Hastelloy C-22 used for diaphragm
- Electropolished finish specifications
- Reduced internal capacity and optimum flow path design with gas purging taken into consideration
- High anticorrosion grades are also available! (Optional)



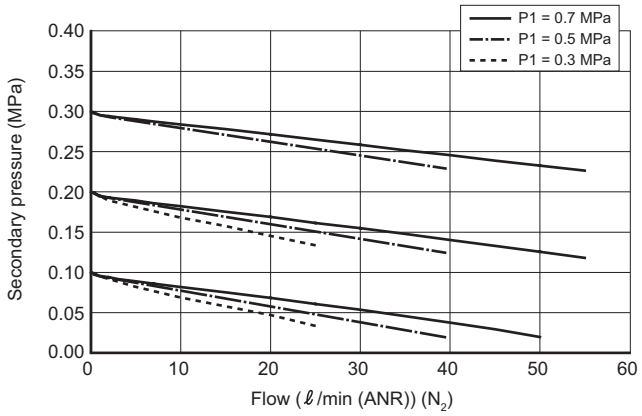
●Vibration measures
- New vibration prevention mechanism guards against vibration (patented)

●Flow characteristics
- Small pressure drop
- Large flow achieved despite its compact size!
- Negative pressure control achieved
  A first for free poppet types! (patented)
- Low sliding section material ensures smooth operation! Reduces hysteresis!

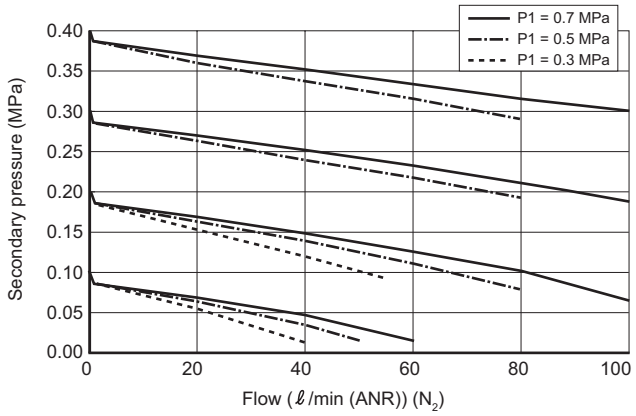
●Controls extremely small flow
- Problems due to changes in the MFC output signal for extremely small flows less than several + sccm have been resolved

Flow characteristics

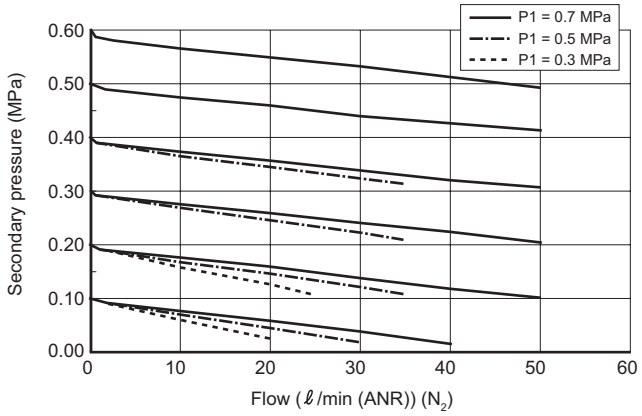
●PGM-30V, 30, 50



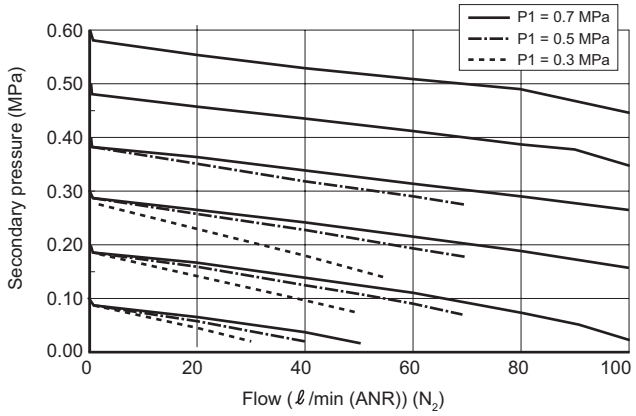
●PGM-H-60



●PGM-100



●PGM-H-100



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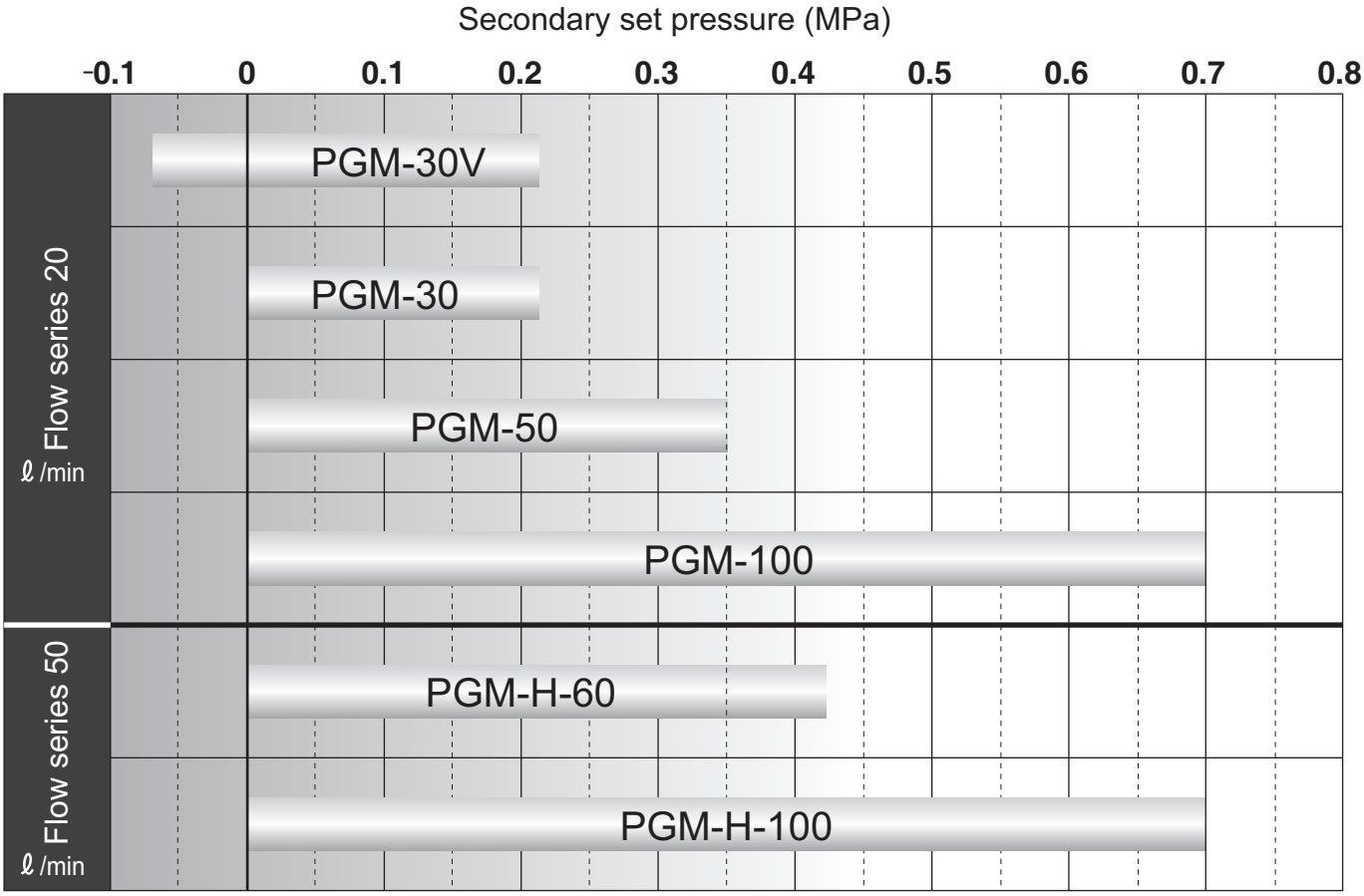
● Variety

Great variety of pressure range variations

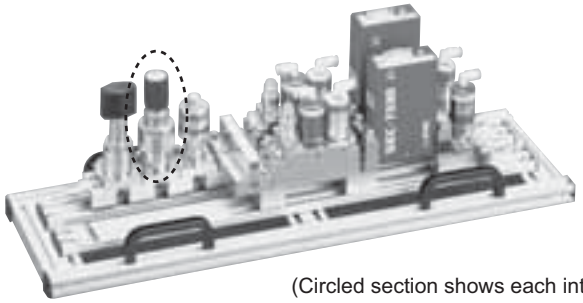


Diverse connection variations

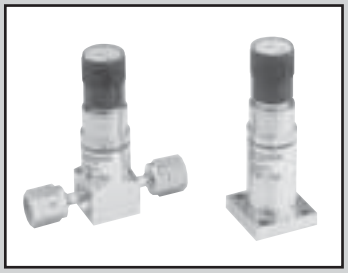
1/4" JXR female fitting
1/4" JXR male fitting
1/4" JXR male → female fitting
1/4" JXR female → male fitting

(JXR fitting type)

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



(Circled section shows each integrated valve interface)



Regulator for process gas

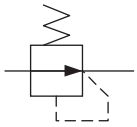
PGM Series

●Metal diaphragm

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

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

Specifications

Descriptions	PGM-	30V	30	50	–	100
	PGM-H-	–	–	–	60	100
Working fluid		Inert gas/process gas				
Primary max. working pressure MPa		1.0				
Secondary set pressure MPa		-0.07 to 0.21	0 to 0.21	0 to 0.35	0 to 0.42	0 to 0.7
Working fluid temperature ℃		-5 to 40				
Valve seat leakage Pa·m³/s (He)		1×10^{-8} or less				
External leakage Pa·m³/s (He)		2.8×10^{-12} or less				
Withstanding pressure MPa		1.5				
Ambient temperature ℃		-5 to 40				
Wetted area surface treatment		Electropolished finish specifications				
Connection		Various integrated valve (IGS) interface (PGM-∗-1, 2, 3, 4, 5)				
		1/4" JXR fitting (can be connected to VCR fitting) (PGM-∗-4R, 4RM, 4MF, 4FM)				
Weight kg		0.39 (PGM-∗-4)				
JIS symbol						

Flow characteristics Refer to page 42.

Safety precautions

Always read page 9 in the introduction and page 41 to ensure correct and safe use of this product.

How to order

PGM - H - 30 - 4R - S

Model no.

Ⓐ Flow series

Ⓑ Secondary set pressure

Ⓒ Connection

Ⓓ Option

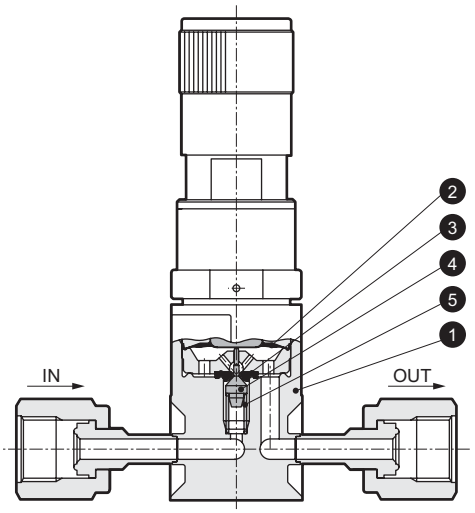
Ⓐ Flow series	Blank	H
	20 ℓ/min	50 ℓ/min

Symbol	Descriptions	PGM	PGM-H
Ⓑ Secondary set pressure			
30V	-0.07 to 0.21 MPa {-10 to 30 psi}	●	
30	0 to 0.21 MPa {0 to 30 psi}	●	
50	0 to 0.35 MPa {0 to 50 psi}	●	
60	0 to 0.42 MPa {0 to 60 psi}		●
100	0 to 0.7 MPa {0 to 100 psi}	●	●
Ⓒ 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″ CS seal	●	●
3	1.5″ W seal	●	●
4	1.5″ W seal	●	●
5	1.125″ C seal	●	●
Ⓓ Option			
S	Poppet: Hastelloy®C-22 Spring: Ni-Co alloy	●	
P	Valve seat: PI	●	

∗1: Listed flows are nominal.
Confirm pressure conditions with the flow characteristics graph.

∗2: There is no gauge port.

Internal structure and parts list



Materials for wetted areas

No.	Part name	Material
1	Body	SUS316L
2	Diaphragm	Hastelloy®C-22
3	Sheet	PFA or PI (option)
4	Poppet	SUS316L or Hastelloy®C-22 (option)
5	Spring	SUS316L or Ni-Co alloy (option)

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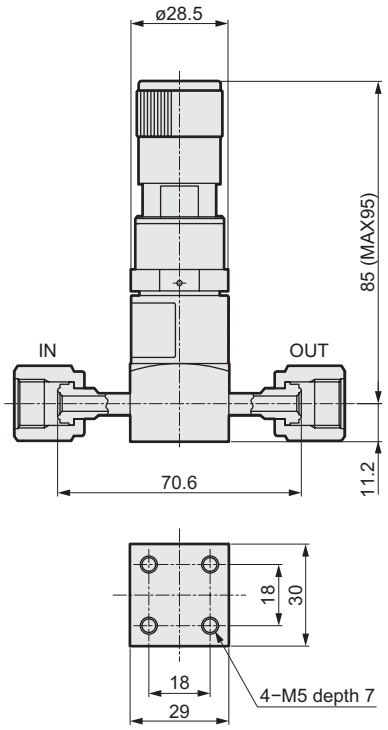
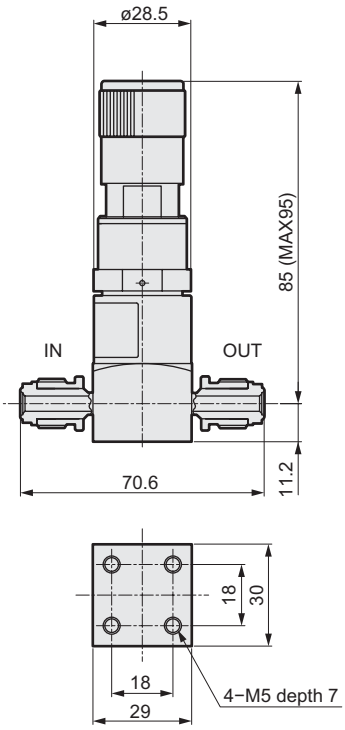
Dimensions

Note: The flow path direction is indicated on the body with arrows.

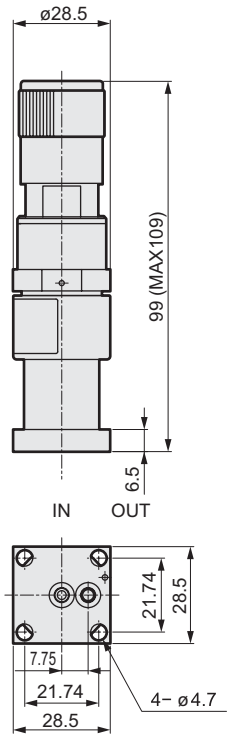
●PGM-∗-4R
(1/4" JXR female fitting)



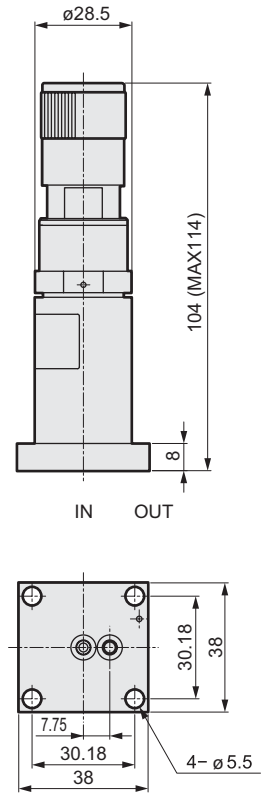
●PGM-∗-4RM
(1/4" JXR male fitting)



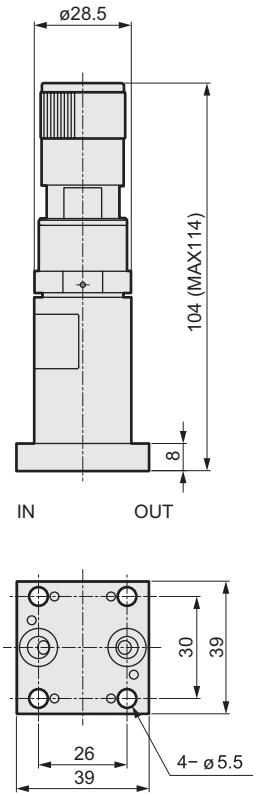
●PGM-∗-1
(1.125" C seal)



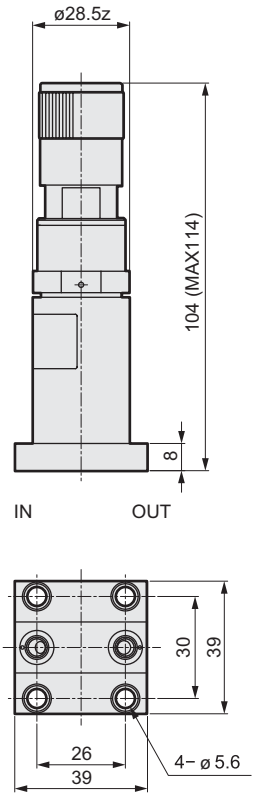
●PGM-∗-2
(1.5" C seal)



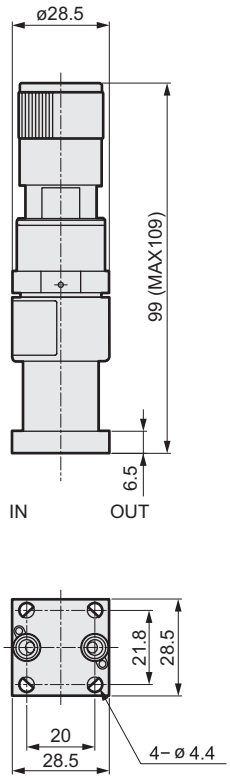
●PGM-∗-3
(1.5" CS seal)



●PGM-∗-4
(1.5" W seal)



●PGM-∗-5
(1.125" W seal)



Parts compatible with variations

PGM Series

RoHS Custom order

● With gauge port type

■Gauge port connection method
JXR male fitting, JXR female fitting, and double-barbed fitting are available.

■1/4" port diameter

● Panel mount type

■Panel mount diameter ø31

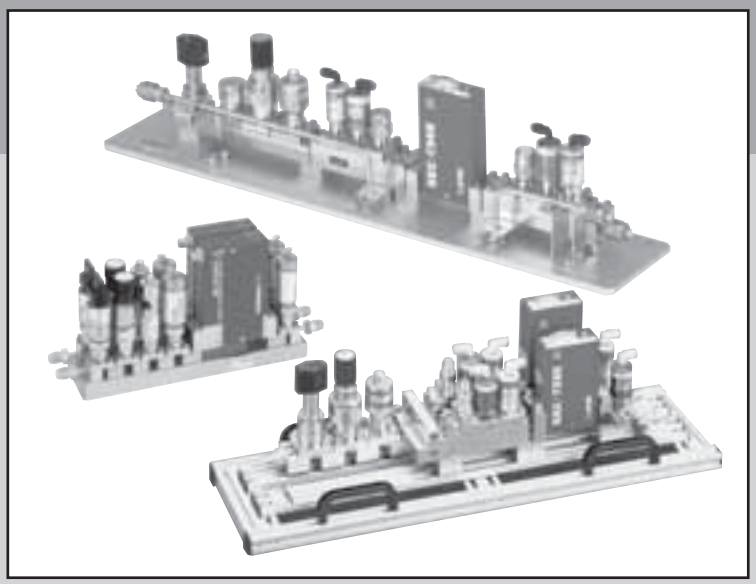
■Panel thickness 5 mm or less

● Incorrect operation prevention type

■Prevents fluctuation of set pressure due to incorrect operation.

■Total height 108 mm and diameter ø32.

Integrated Gas Supply System



CONTENTS

Integrated Gas Supply System

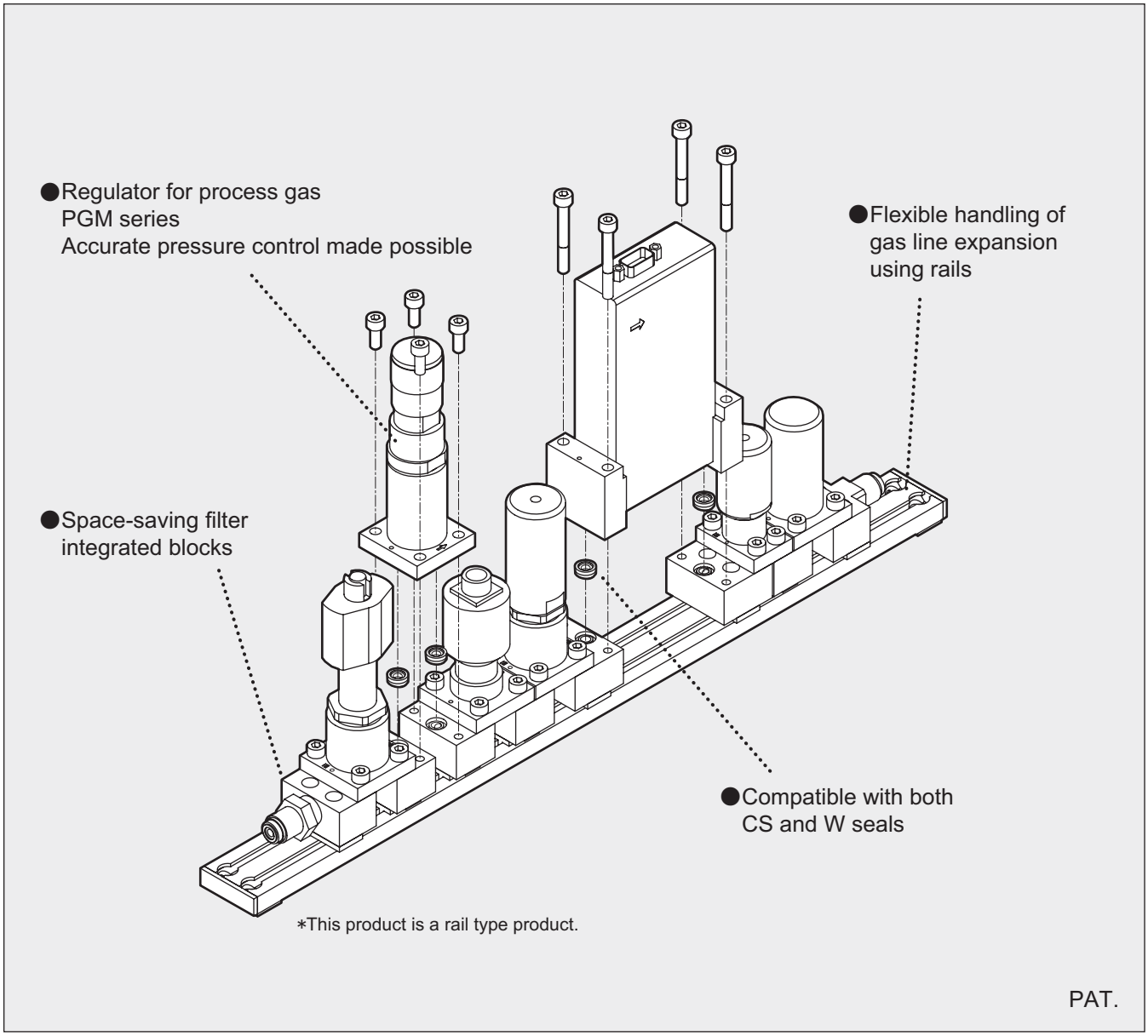
IAGD3/IAGD4/IAGD5 Series

Custom order

Greatly improved space saving and maintenance.

Overview

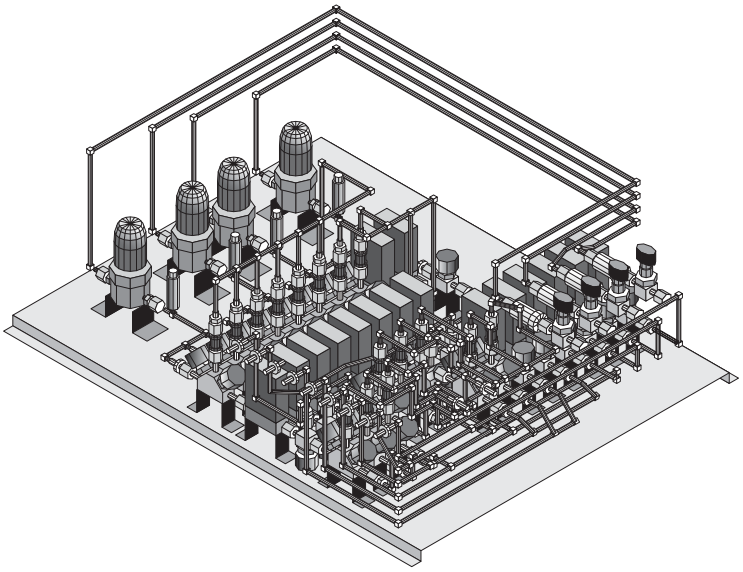
This system was developed for use in the gas supply line of semiconductor manufacturing equipment.
Surface mount type air-operated valves and mass flow controllers standardized by SEMI are integrated compactly.
We offer optimal layout according to your requested flow and achieve significant space-saving compared to previous models structured with welded fittings.



PAT.

Features

Existing gas jungle



Footprint reduction

- Footprint 60% of conventional
- Volume 16% of conventional

Improved workability

- Components can be attached and removed from the top
- With the rail model, gasline expansion is handled.
- Simplified heating

Improved reliability

- CS seal/W seal used

Increase corrosion resistance (Contamination hardly generated)

- Welded areas reduced by more than 80%
  Conventional causes of contamination are greatly reduced by reducing welded areas.

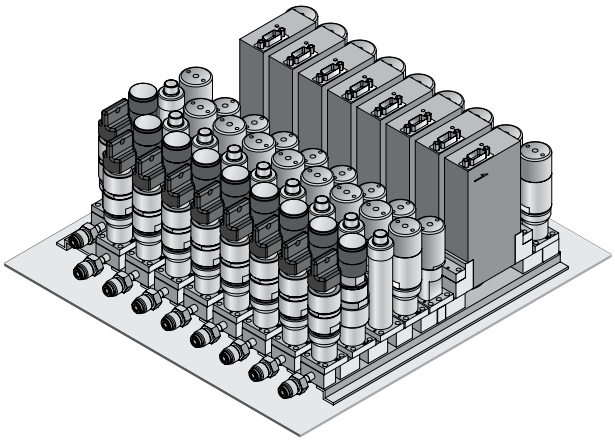
Improved replacement features

- The flow path is configured with little internal volume and dead volume.
- Improved purging

Standardization

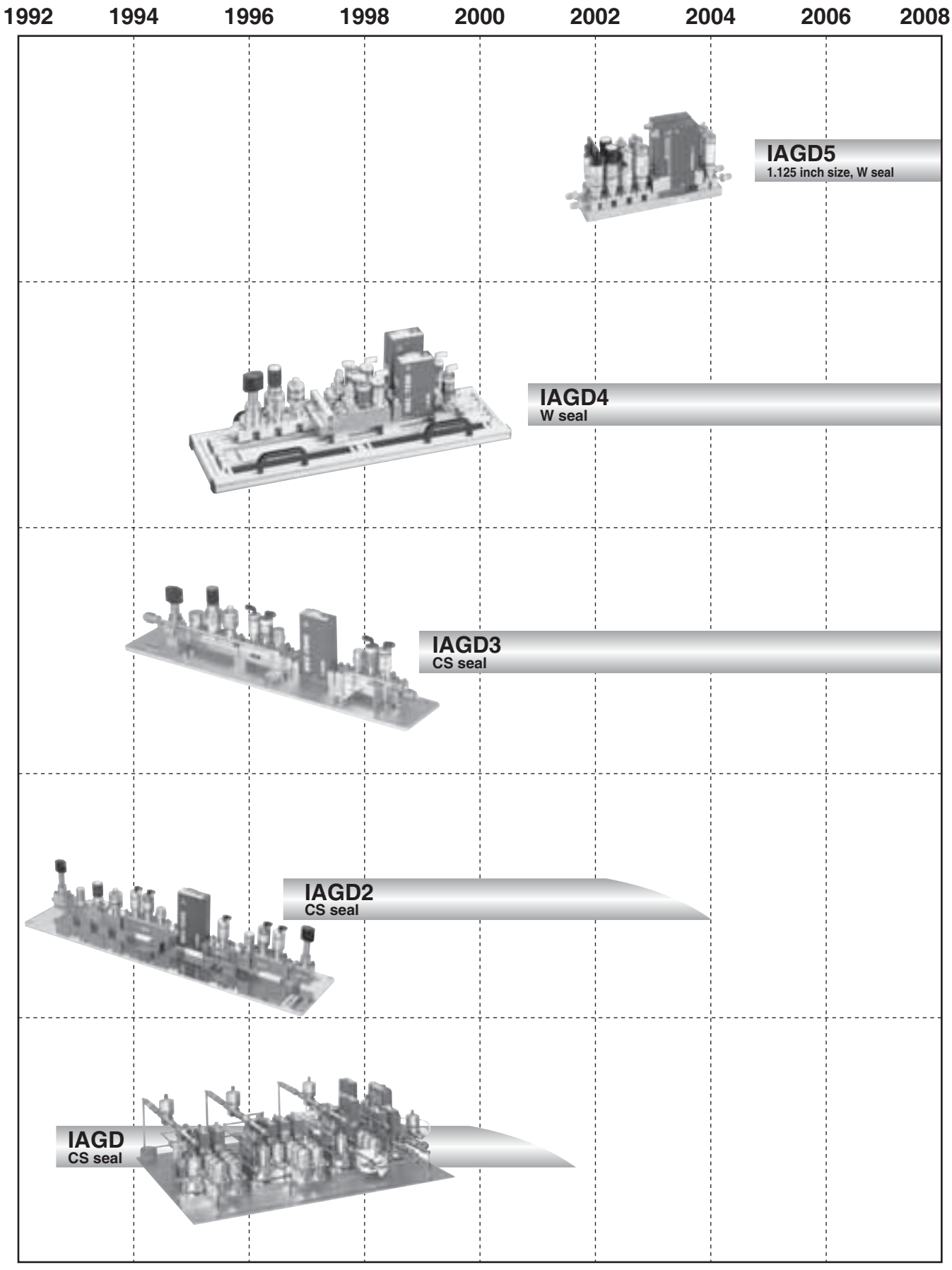
- Promoting component standardization

Integrated Gas Supply System



Integrated Gas System Series

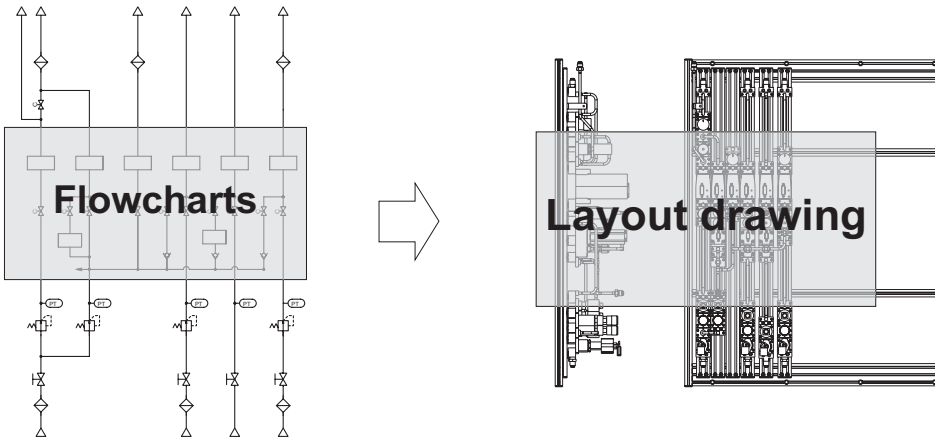
Integrated Gas Supply System History



Integrated gas supply system manufacturing flow

Layout

· Layout is based on user specifications and flowcharts.

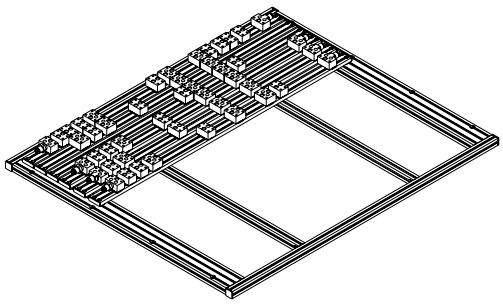


Parts preparation

· Device manufacturers and models are selected and prepared based on the user's specifications.

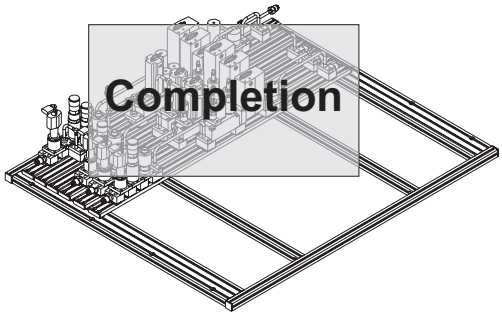
Assembly 1

· Jigs are used for positioning and base blocks will be installed.



Assembly 2

· Integrated devices are installed.



Inspection

Integrated Gas System Series

IAGD3

Components for integrated gas supply system

Air operated valve for IAGD3

Custom order

Specifications

Descriptions		MAGD3-0	MAGD3-1
Working fluid		Inert gas/process gas	
Working pressure range Pa (abs)-MPa (G)		1.3×10^{-6} to 0.7	
Fluid temperature ℃		-10 to 80	
Ambient temperature ℃		-10 to 80	
Valve seat leakage Pa·m³/s (He)		1.3×10^{-9}	
External leakage Pa·m³/s (He)		2.8×10^{-12}	
Cv value		0.1	0.26
Connection		CS seal (nominal 6.35)	
Operating pressure MPa	NC	0.4 to 0.6	
	NO	0.4 to 0.5	
Operating pressure connection port		M5	
Material	Body	SUS316L	
	Diaphragm	Ni-Co alloy	
	Sheet	PCTFE	

How to order

MAGD3 - 04A - 1 1 2 C - A

Ⓐ Series

Ⓑ Valve shape

Ⓒ Actuation (V1)

Ⓓ Actuation (V2)

Ⓔ Actuation (V3)

Ⓕ Check valve

Ⓖ Pressurizing direction

Note 1: Selection Ⓖ pressurizing direction only when using Ⓑ valve shape 03 A or 04 A.

Note 2: Installation bolts, gasket, actuator, and drive air fitting are not included. Please purchase them separately.

Note 3: Contact with our sales office if an air fitting for actuator drive is required.

<Example of model number>

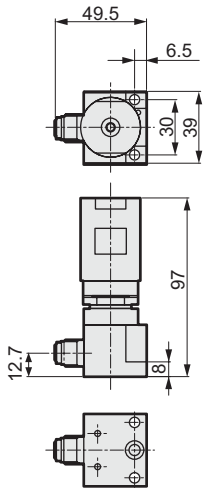
MAGD3-03A-12C-A

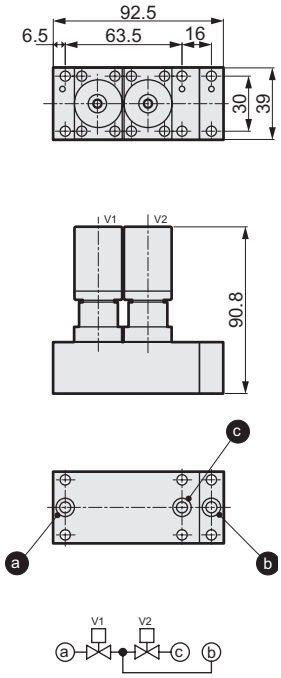
Ⓐ Serise : Air operated valve for IAGD3
Ⓑ Valve shape : 1/8 inch size 3 station block A type valve (3-port)
Ⓒ Actuation (V1) : NC
Ⓓ Actuation (V2) : NO
Ⓔ Actuation (V3) : No V3
Ⓕ With check valve
Ⓖ Pressurizing direction: ⓐ port pressurizing (for MFC primary side)

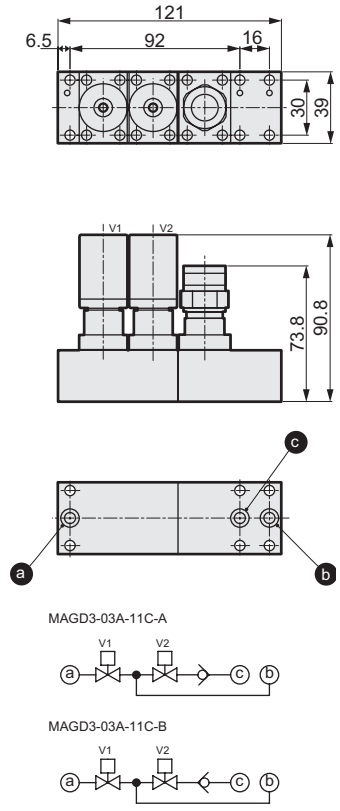
Symbol	Descriptions	Cv value
Ⓐ Series		
MAGD3	Air operated valve for IAGD3	
Ⓑ Valve shape		**Cv value**
02A	2-station block A type valve (3-port)	0.1
03A	3-station block A type valve (3-port)	
04A	4-station block A type valve (4-port)	
11C	1-station block C type valve (2-port)	0.26
11D	1-station block D type valve (2-port)	
11F	1-station block F type valve (3-port)	
Ⓒ Actuation (V1)		
1	NC	
2	NO	
3	NC (with proximity sensor (energized when valve closed))	
4	NO (with proximity sensor (energized when valve opened))	
Ⓓ Actuation (V2)		
1	NC	
2	NO	
3	NC (with proximity sensor (energized when valve closed))	
4	NO (with proximity sensor (energized when valve opened))	
Ⓔ Actuation (V3)		
1	NC	
2	NO	
Blank	No V3	
Ⓕ Check valve		
C	Check valve	
Ⓖ Pressurizing direction		
A	ⓐ port pressurizing (for MFC primary side)	
B	ⓑ port pressurizing (for MFC secondary side)	

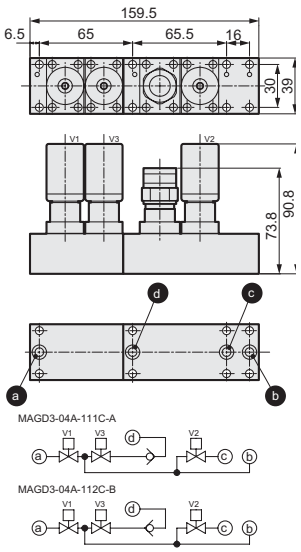
Dimensions

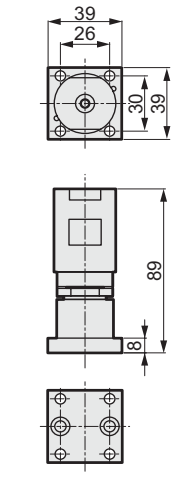
1-station block	2-station block	3-station block	4-station block
● MAGD3-11C	● MAGD3-02A-1 ∗	● MAGD3-03A-11C	● MAGD3-04A-11 ∗C
● MAGD3-11D	● MAGD3-02A-3 ∗	● MAGD3-03A-3 ∗C-A	● MAGD3-04A-31 ∗C-A
● MAGD3-11F			● MAGD3-04A-132C-A

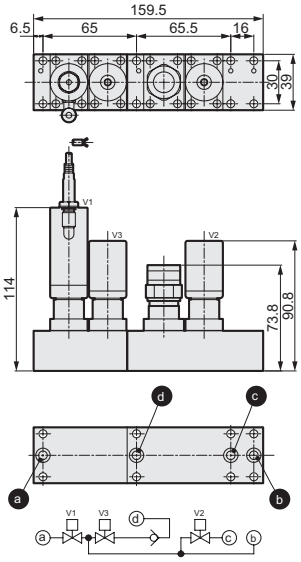


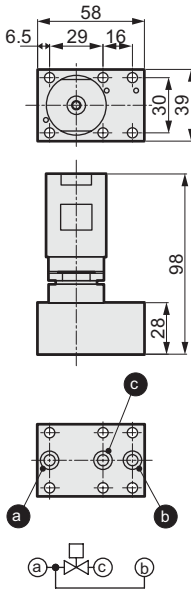


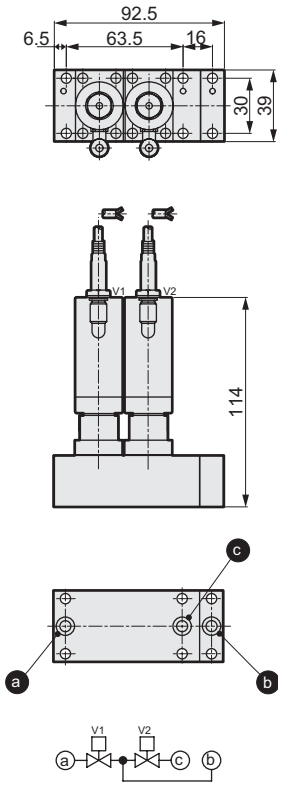


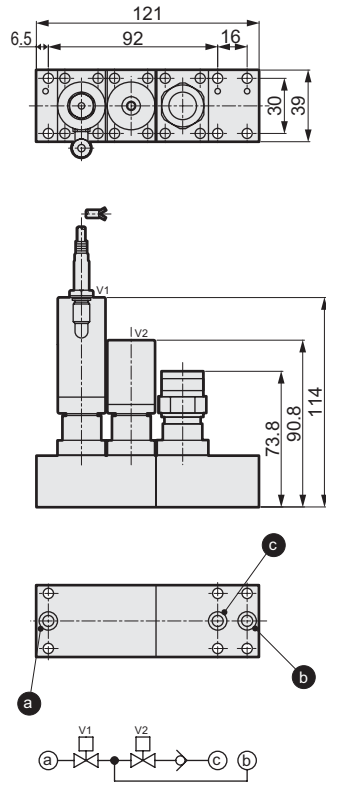




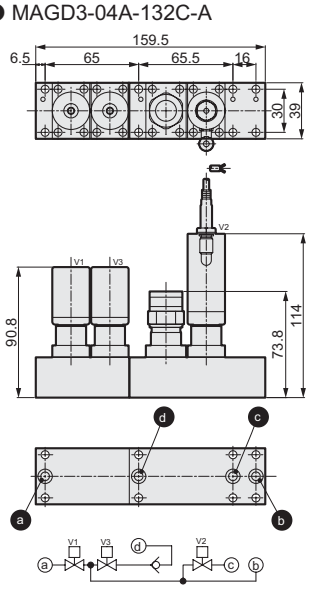








The check valve direction is reversed for MAGD3-03A-3∗ C-B.



Components for integrated gas supply system

Manual valve for IAGD3

Custom order

Specifications

Descriptions		MOGD3-11
Working fluid		Inert gas/process gas
Working pressure range Pa (abs)-MPa (G)		1.3×10^{-6} to 0.7
Fluid temperature ℃		-10 to 80
Ambient temperature ℃		-10 to 80
Valve seat leakage Pa·m³/s (He)		1.3×10^{-9}
External leakage Pa·m³/s (He)		2.8×10^{-12}
Cv value		0.26
Connection		CS seal (nominal 6.35)
Material	Body	SUS316L
	Diaphragm	Ni-Co alloy
	Sheet	PCTFE

How to order

MOGD3 - 11C - K A - S1

- A Series
- B Valve shape
- C Handle color
- D Pressurizing direction
- E Other

Symbol	Descriptions
A Series	
MOGD3	Manual valve for IAGD3
B Valve shape	
11C	1-station block C type valve (2-port)
11D	1-station block D type valve (2-port)
C Handle color	
K	Handle color Black
R	Handle color Red
B	Handle color Blue
Y	Handle color Yellow
G	Handle color Green
D Pressurizing direction	
A	ⓐ Port pressurizing
B	ⓑ Port pressurizing
E Other	
S1	With handle lock (only when valve is closed)
Blank	No key

Note 1: Installation bolts and gasket are not included.
Please purchase them separately.

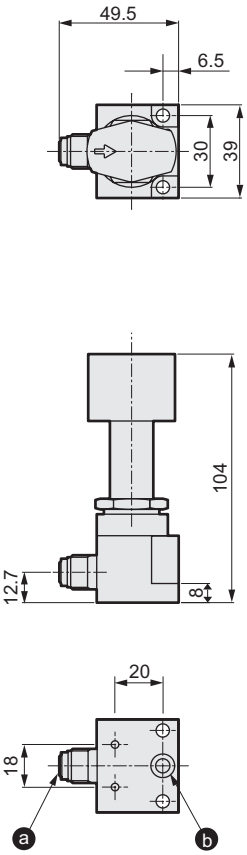
<Example of model number>

MOGD3-11C-KA-S1

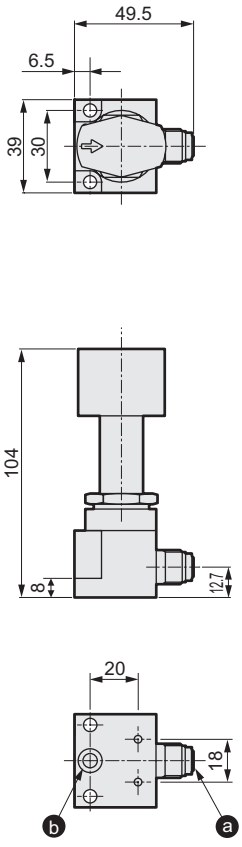
- A Series : Manual valve for IAGD3
- B Valve shape : 1-station block C type valve (2-port)
- C Handle color : Black
- D Pressurizing direction : ⓐ port pressurizing
- E Other : With handle lock (only when valve is closed)

Dimensions

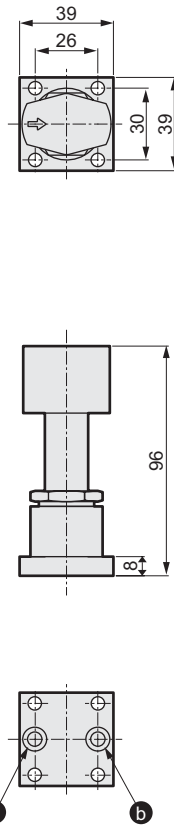
● MOGD3-11C- ∗A



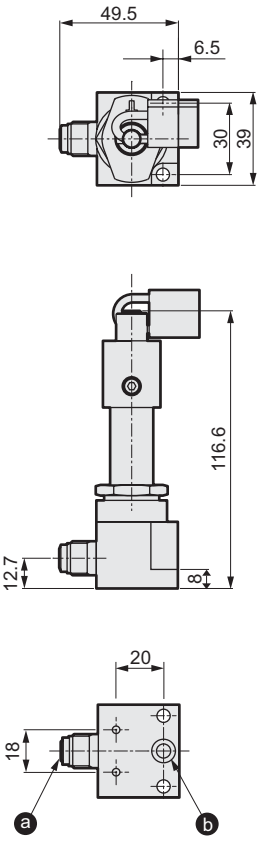
● MOGD3-11C- ∗B



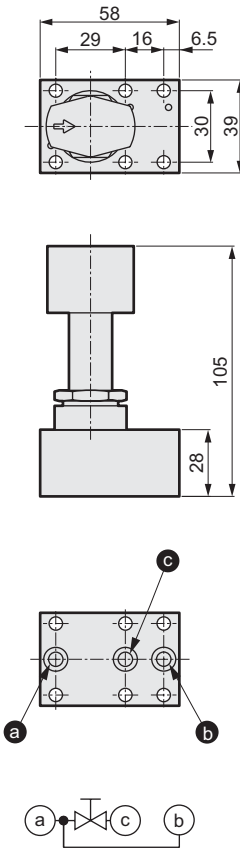
● MOGD3-11D- ∗A



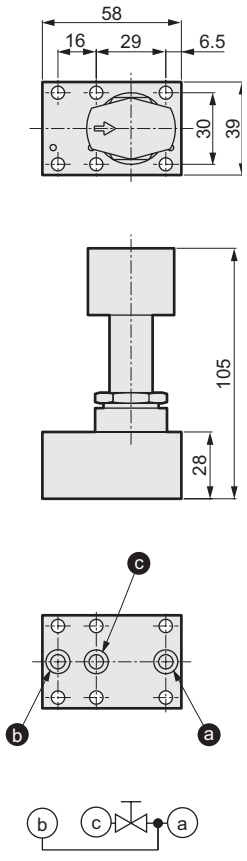
● MOGD3-11C-KA-S1



● MOGD3-11F- ∗A



● MOGD3-11F- ∗B



Components for integrated gas supply system

Flow control adjustment valve for IAGD3

Custom order

Specifications

Descriptions		MFGD3-11D-1	MFGD3-11D-4
Working fluid		Inert gas/process gas	
Working pressure range Pa (abs)-MPa (G)		1.3×10^{-6} to 0.7	
Fluid temperature ℃		-10 to 80	
Ambient temperature ℃		-10 to 80	
Valve seat leakage Pa·m³/s (He)		1/100 or less of maximum Cv flow factor	
External leakage Pa·m³/s (He)		2.8×10^{-12}	
Cv flow factor (adjusting range)		0.003 to 0.03	0.02 to 0.2
Connection		CS seal (nominal 6.35)	
Material	Body	SUS316L	
	Diaphragm	Ni-Co alloy	

*The product has a cover.

How to order

MFGD3 - 11D - 1

- Ⓐ Series
- Ⓑ Valve shape
- Ⓒ Cv flow factor (adjusting range)

Symbol	Descriptions
Ⓐ Series	
MFGD3	low adjusting valve for IAGD3
Ⓑ Valve shape	
11D	1-station block D type valve (2-port)
Ⓒ Cv flow factor (adjusting range)	
1	Cv flow factor (adjusting range) 0.003 to 0.03
4	Cv flow factor (adjusting range) 0.02 to 0.2

Note 1: Installation bolts and gasket are not included. Please purchase them separately.

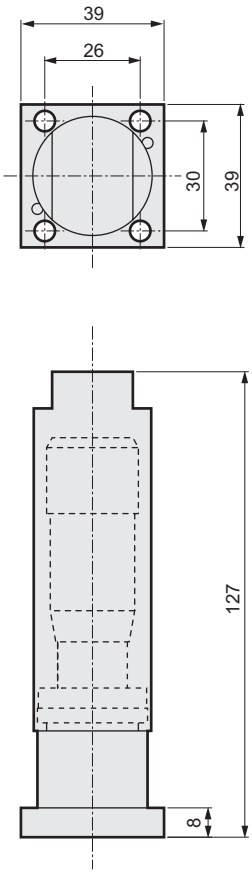
<Example of model number>

MFGD3-11D-1

Ⓐ Series : Flow adjusting valve for IAGD3
Ⓑ Valve shape : 1-station block D type valve (2-port)
Ⓒ Cv flow factor (adjusting range) : 0.003 to 0.03

Dimensions

●MFGD3-11D



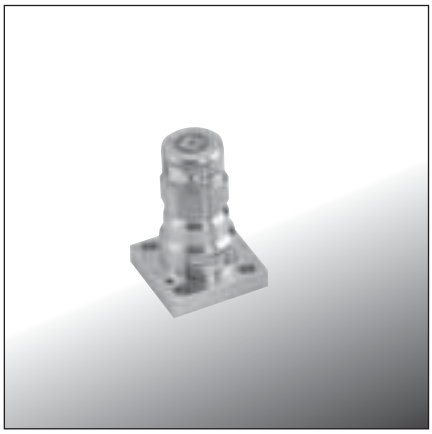
Integrated Gas System Series

IAGD3

Components for integrated gas supply system

Check valve for IAGD3

Custom order



Specifications

Descriptions		MCGP3-01D
Working fluid		Inert gas/process gas
Fluid pressure range Pa (abs)-MPa (G)		1.3×10^{-6} to 0.7
Fluid temperature ℃		-10 to 80
Ambient temperature ℃		-10 to 80
Valve seat leakage Pa·m³/s(He)		4.7×10^{-8}
External leakage Pa·m³/s(He)		2.8×10^{-12}
Cv flow factor (max.)		0.25
Connection		CS seal (nominal 6.35)
Material	Body	SUS316L
	Sheet	Kalrez®
	Spring	SUS316
	Gasket	PTFE

How to order

MCGP3 - 01D - 023 - KA

- A Series
- B Shape (1-station block valve D type Valve (2-port))
- C Cranking pressure (2.3 kPa)
- D Seat material (Kalrez®)

Note 1: Installation bolts and gasket are not included. Please purchase them separately.

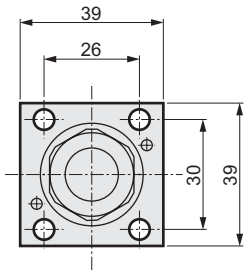
<Example of model number>

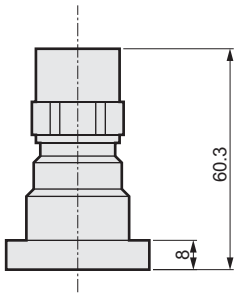
MCGP3-01D-023-KA

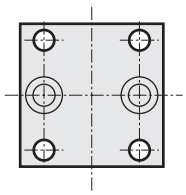
- A Series : Check valve for IAGD3
- B Shape : 1-station block D type valve (2-port)
- C Cranking pressure : 2.3 kPa
- D Seat material : Kalrez®

Dimensions

●MCGP3-01D-023-KA







Kalrez® is a registered trademark of DuPont.

Components for integrated gas supply system

Other components for IAGD3

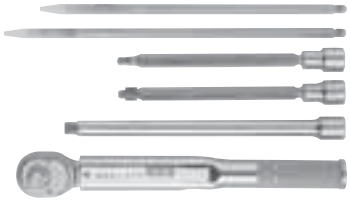
Gasket set (2 hexagon socket head cap bolts, 1 C-ring, 1 gasket retainer)

Material
C ring : SUS316L, SUS304-WPB (Non-watted areas)
Gasket retainer : SUS304
Hexagon socket head cap bolt : SCM435 (Special treatment)

Name	Model no.	Applicable parts
Gasket set (Bolt length 16 mm)	IAGD3-SEAL	MAGD3-11C MAGD3-11D MOGD3-11C MOGD3-11D MFGD3-11D MCGP3
Gasket set (Bolt length 20mm)	IAGD3-SEAL-L20	
Gasket set (Bolt length 30mm)	IAGD3-SEAL-L30	
Gasket set (Bolt length 35mm)	IAGD3-SEAL-L35	MAGD3-11F MAGD3-02A MOGD3-03A MOGD3-04A Bypass block (for 26 mm pitch between surfaces) Bypass piping block (for 79.8 mm pitch between MFC surfaces) Sealing flange SEC-7330*-*-792B(STEC MFC) SEC-7340*-*-792B(STEC MFC) SEC-F730*-*-792B(STEC MFC) SEC-F740*-*-792B(STEC MFC) SEC-4400-792B(STEC MFC) FC-785X*B (Hitachi Metals MFC) FC-795*T-B (Hitachi Metals MFC) FC-D985*T-B1 (Hitachi Metals MFC) FC-D985*Y-B1 (Hitachi Metals MFC) FC-985*T-B1 (Hitachi Metals MFC) FC-985*Y-B1 (Hitachi Metals MFC)
Gasket set (Bolt length 40mm)	IAGD3-SEAL-L40	FC-2979 (Celerity MFC) SEC-7350*-*-792B(STEC MFC) SEC-7355*-*-792B(STEC MFC) SEC-F750*-*-792B(STEC MFC)
Gasket set (Bolt length 45mm)	IAGD3-SEAL-L45	FC-785*T-B (Hitachi Metals MFC) FC-785*Y-B (Hitachi Metals MFC) FC-786*T-B (Hitachi Metals MFC) FC-786*Y-B (Hitachi Metals MFC) FC-796*T-B1 (Hitachi Metals MFC) FC-D986*Y-B1 (Hitachi Metals MFC) FC-986*T-B1 (Hitachi Metals MFC) FC-986*Y-B1 (Hitachi Metals MFC)

Note 1: The required number of gasket sets is determined by the number of CS seals.
Note 2: Contact CKD for details on applicable parts.

Maintenance tool (1 each: Installer set, torque wrench, hexagon wrench bit with magnet, hexagon wrench ball bit and extension bar)

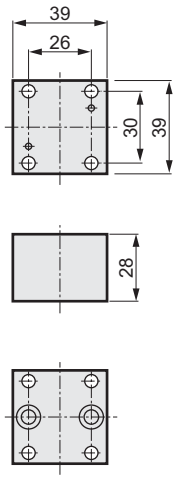


Name	Model no.
Maintenance tool set	IAGD3-MAINTENANCE

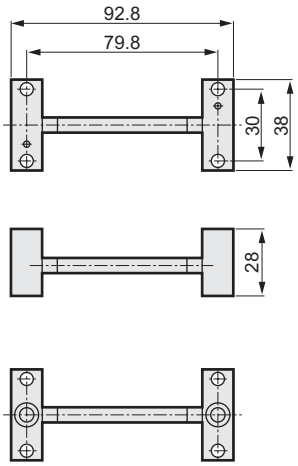
See the Instruction Manual for details on use.

Top mount block

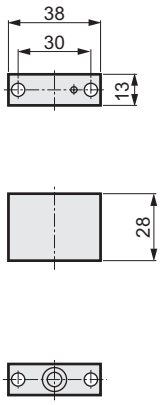
● Bypass block
(for 26 mm pitch between surfaces)



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

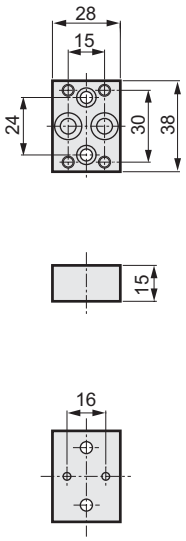


● Sealing flange

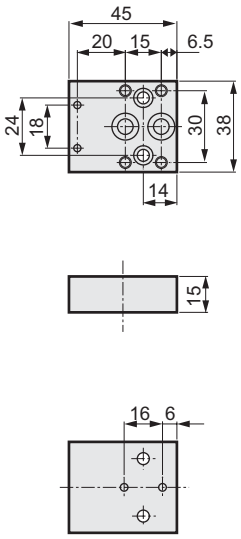


Base block

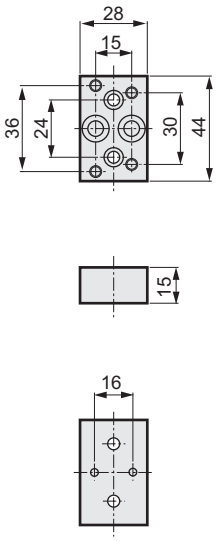
● Mount base B-1



● Mount base E-5



● Mount base F-1



Components for integrated gas supply system

Air operated valve for IAGD4

Custom order

NEW

■MAGD series - Newly redesigned with the environment in mind

*See page 68 for previous model

Specifications

Descriptions		MAGD4-R-0	MAGD4-R-1
Working fluid		Inert gas/process gas	
Working pressure range Pa (abs)-MPa (G)		1.3×10^{-6} to 0.99	1.3×10^{-6} to 0.7
Fluid temperature ℃		-10 to 80	
Ambient temperature ℃		-10 to 80	
Valve seat leakage Pa·m³/s.He		1.3×10^{-9} or less	1.0×10^{-10} or less
External leakage Pa·m³/s.He		2.8×10^{-12} or less	
Cv flow factor (23℃, under pressure)		0.1	0.26
Connection		1.5 inch W seal (nominal 6.35)	
Operating pressure MPa	NC	0.4 to 0.6	
	NO	0.4 to 0.5	
Control port		M5	
Material	Body	SUS316L	
	Diaphragm	Ni-Co alloy	
	Sheet	PCTFE	

How to order

MAGD4 - R - 02A - W - 1 2

- A Series
- B Valve shape
- C Seal shape
- D Actuation (V1)
- E Actuation (V2)

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

<Example of model number>

MAGD4-R-02A-W-12

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

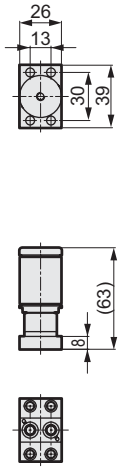
Note 1: Installation bolts, gasket, actuator and drive air fitting are not included. Please purchase them separately.

Note 2: Contact with our sales office if a type with installation bolts is required.

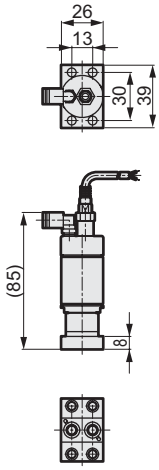
Dimensions

1-station block

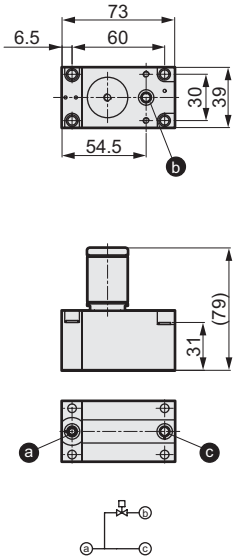
● MAGD4-R-01D



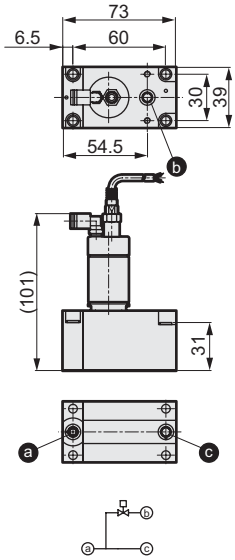
(With proximity sensor)



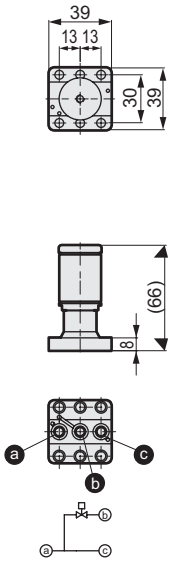
● MAGD4-R-01X



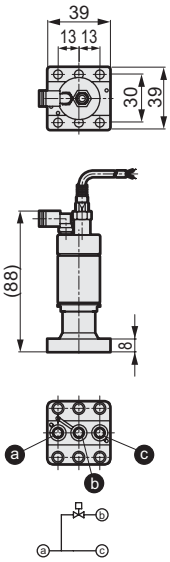
(With proximity sensor)



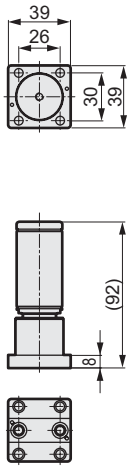
● MAGD4-R-01Y



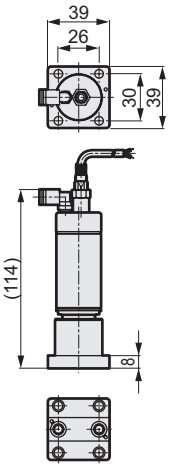
(With proximity sensor)



● MAGD4A-R-11D

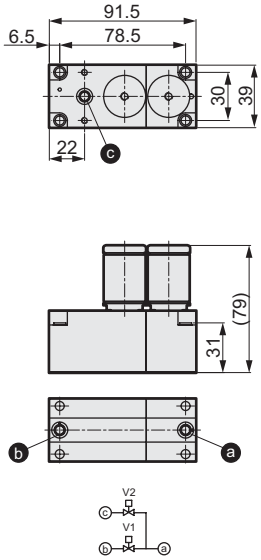


(With proximity sensor)

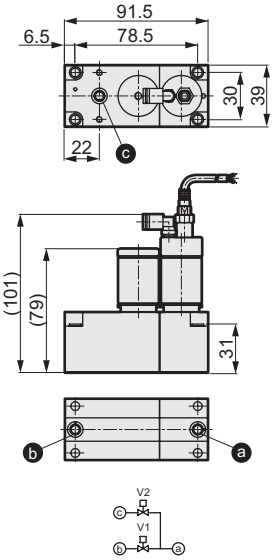


2-station block

● MAGD4-R-02A



(With proximity sensor)



Integrated Gas System Series

IAGD4

Components for integrated gas supply system

Flow control adjustment valve for IAGD4

Custom order

Specifications

Descriptions		MFGD4-11D-W-1	MFGD4-11D-W-4
Working fluid		Inert gas/process gas	
Working pressure range Pa (abs)-MPa (G)		1.3×10^{-6} to 0.7	
Fluid temperature ℃		-10 to 80	
Ambient temperature ℃		-10 to 80	
Valve seat leakage Pa·m³/s(He)		1/100 or less of maximum Cv flow factor	
External leakage Pa·m³/s(He)		2.8×10^{-12}	
Cv flow factor (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	

*The product has a cover.

How to order

MFGD4 - 11D - W - 1

- A Series
- B Valve shape
- C Seal shape
- D Cv flow factor (adjusting range)

Symbol	Descriptions
A Series	
MFGD4	Flow adjusting valve for IAGD4
B Valve shape	
11D	Shape: 1-station block D type valve (2-port)
C Seal shape	
W	Seal shape: W seal (nominal 6.35)
D Cv flow factor (adjusting range)	
1	Cv flow factor (adjusting range) 0.003 to 0.03
4	Cv flow factor (adjusting range) 0.02 to 0.2

Note 1: Installation bolts and gasket are not included. Please purchase them separately.
Note 2: Contact with our sales office if a type with installation bolts is required.

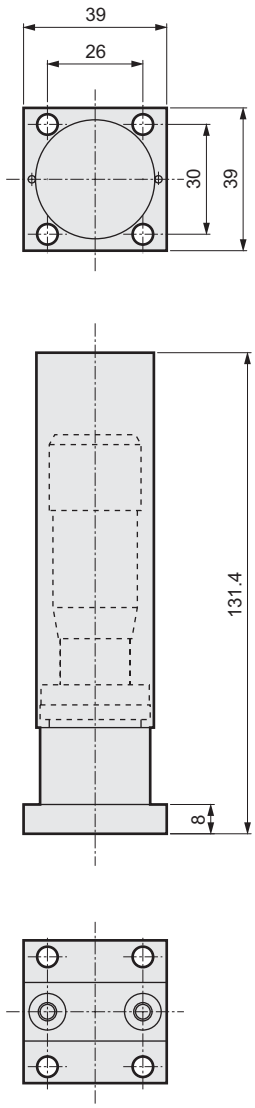
<Example of model number>

MFGD4-11D-W-1

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

Dimensions

●MFGD4

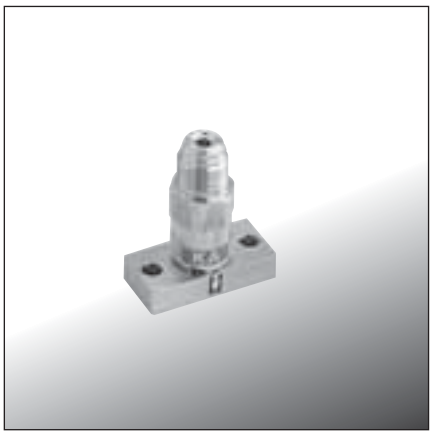


Integrated Gas System Series
IAGD4

Components for integrated gas supply system

Check valve for IAGD4

Custom order



Specifications

Descriptions		MCGP4-01D	MCGP4-F
Working fluid		Inert gas/process gas	
Working pressure range Pa (abs)-MPa (G)		1.3×10^{-6} to 0.7	
Fluid temperature ℃		-10 to 80	
Ambient temperature ℃		-10 to 80	
Valve seat leakage Pa·m³/s(He)		4.7×10^{-8}	
External leakage Pa·m³/s(He)		2.8×10^{-12}	
Cv flow factor (max.)		0.25	
Connection		W seal (nominal 6.35)	
Material	Body	SUS316L	
	Sheet	Kalrez®	
	Spring	SUS316-WPA	
	Gasket	PTFE	

How to order

MCGP4 - 01D - W - 023 - KA

- A Series
- B Shape
- C Seal shape
- D Cranking pressure
- E Seat material

Symbol	Descriptions
A Series	
MCGP4	Check valve for IAGD4
B Shape	
01D	1-station block D type valve (2-port)
F1	Flow direction JXR fitting side to W seal side
F2	Flow direction W seal side to JXR fitting side
C Seal shape	
W	W seal (nominal 6.35)
L	1/4 inch JXR male fitting
D Cranking pressure	
023	Cranking pressure 2.3 kPa
E Seat material	
KA	Seat material Kalrez®

Note 1: Installation bolts and gasket are not included. Please purchase them separately.
Note 2: Contact with our sales office if a type with installation bolts is required.

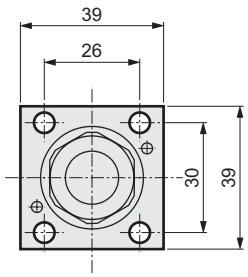
<Example of model number>

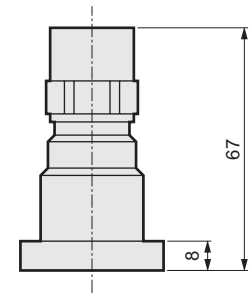
MCGP4-01D-W-023-KA

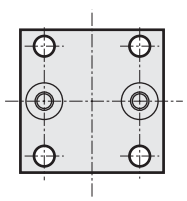
- A Series : Check valve for IAGD4
- B Shape : 1-station block D type valve (2-port)
- C Seal shape : W seal (nominal 6.35)
- D Cranking pressure : 2.3 kPa
- E Seat material : Kalrez®

Dimensions

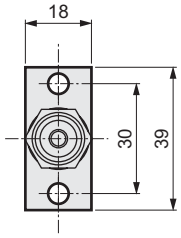
●MCGP4-01D

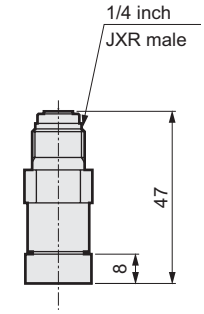


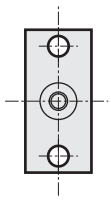




●MCGP4-F∗







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Components for integrated gas supply system
Other components for IAGD4

Gasket

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

W seal mounting bolt

Name	Model no.	Applicable parts
Hexagon socket head cap bolt for W seal (M5 × 12, 4 pieces)	IAGD4-BOLT-M5 × 12-4	MAGD4-01D MAGD4A-11D MOGD4-11D MFGD4-11D MCGP4-01D MCGP4-F∗ Bypass block (for 26 mm pitch between surfaces) Bypass piping block (for 79.8 mm pitch between MFC surfaces) Sealing flange SEC-G111∗-W-1.5 (STEC MFC)
Hexagon socket head cap bolt for W seal (M5 × 35, 4 pieces)	IAGD4-BOLT-M5 × 35-4	MAGD4-01X MAGD4-02A MOGD4-01X FC-785 (Hitachi Metals MFC) FC-786 (Hitachi Metals MFC) FC-985 (Hitachi Metals MFC)
Hexagon socket head cap bolt for W seal (M5 × 40, 4 pieces)	IAGD4-BOLT-M5 × 40-4	SEC-7330∗-800A (STEC MFC) SEC-7340∗-800A (STEC MFC) SEC-F730∗-800A (STEC MFC) SEC-F740∗-800A (STEC MFC)
Hexagon socket head cap bolt for W seal (M5 × 43, 4 pieces)	IAGD4-BOLT-M5 × 43-4	SEC-7350∗-800A (STEC MFC) SEC-F750∗-800A (STEC MFC) FC-986 (Hitachi Metals MFC)

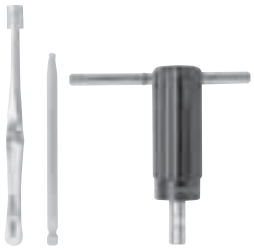
Contact CKD for details on applicable parts.

Maintenance tool

Maintenance tools (1 each: torque driver, torque driver bit, tweezers (gasket mounting tool))

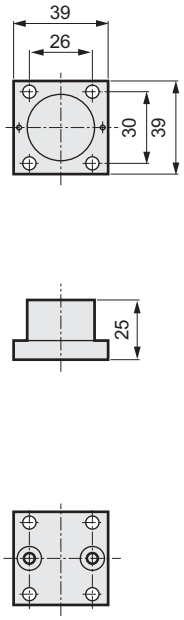
Name	Model no.
Maintenance tool set	IAGD4-MAINTENANCE

See the Instruction Manual for details on use.

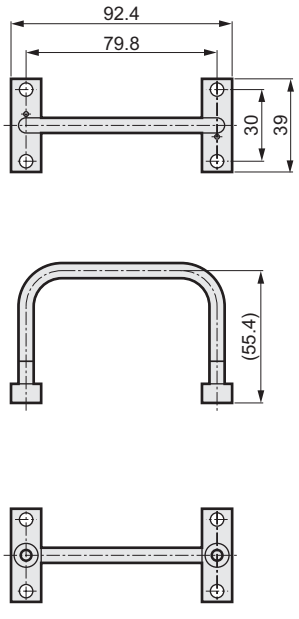


Top mount block

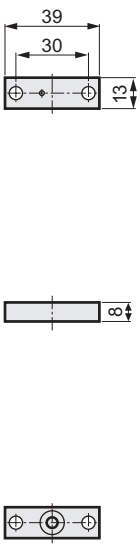
● Bypass block
(for 26 mm pitch between surfaces)



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

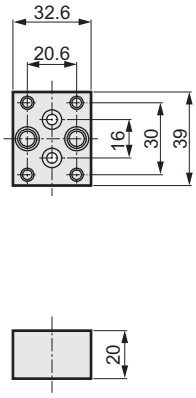


● Sealing flange

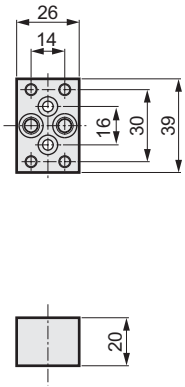


Base block

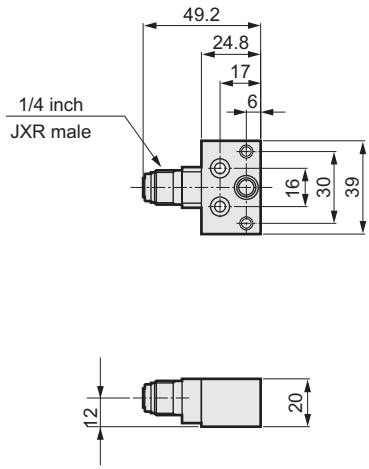
● Base block 1
(20.6 mm between surfaces)



● Base block 5
(14.0 mm between surfaces)



● 1/4 inch JXR male flange



Components for integrated gas supply system

Air operated valve for IAGD4

Custom order

Specifications

Descriptions		MAGD4-0	MAGD4-1
Working fluid		Inert gas/process gas	
Working pressure range Pa (abs)-MPa (G)		1.3×10^{-6} to 0.7	
Fluid temperature ℃		-10 to 80	
Ambient temperature ℃		-10 to 80	
Valve seat leakage Pa·m³/s (He)		1.3×10^{-9}	
External leakage Pa·m³/s (He)		2.8×10^{-12}	
Cv flow factor		0.1	0.26
Connection		W seal (nominal 6.35)	
Operating pressure MPa	NC	0.4 to 0.6	
	NO	0.4 to 0.5	
Operating pressure connection port		M5	
Material	Body	SUS316L	
	Diaphragm	Ni-Co alloy	
	Sheet	PCTFE	

How to order

MAGD4 - 02A - W - 1 2

Ⓐ Series
Ⓑ Valve shape
Ⓒ Seal shape
Ⓓ Actuation (V1)
Ⓔ Actuation (V2)

Symbol	Descriptions	Cv value
Ⓐ Series		
MAGD4	Air operated valve for IAGD4	
MAGD4A	Air operated valve for IAGD4 (Upgraded version type, for MAGD4A-11D only)	
Ⓑ Valve shape		
01D	1-station block D type valve (2-port)	0.1
01X	1-station block X type valve (3-port)	
01Y	1-station block Y type valve (3-port)	
02A	2-station block A type valve (3-port)	
11D	1-station block D type valve (2-port)	0.26
Ⓒ Seal shape		
W	W seal (nominal 6.35)	
Ⓓ Actuation (V1)		
1	NC	
2	NO	
3	NC (with proximity sensor (energized when valve closed))	
4	NO (with proximity sensor (energized when valve opened))	
5	NC (with proximity sensor (energized when valve opened))	
6	NO (with proximity sensor (energized when valve closed))	
Ⓔ Actuation (V2)		
1	NC	
2	NO	
3	NC (with proximity sensor (energized when valve closed))	
4	NO (with proximity sensor (energized when valve opened))	
5	NC (with proximity sensor (energized when valve opened))	
6	NO (with proximity sensor (energized when valve closed))	

<Example of model number>

MAGD4-02A-W-12

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

Note 1: Installation bolts, gasket, actuator and drive air fitting are not included. Please purchase them separately.
Note 2: Contact with the CKD Sales Office if a type with installation bolts is required.

Components for integrated gas supply system

Manual valve for IAGD4

Custom order

Specifications

Descriptions		MOGD4-01	MOGD4-11
Working fluid		Inert gas/process gas	
Working pressure range Pa (abs)-MPa (G)		1.3×10^{-6} to 0.7	
Fluid temperature ℃		-10 to 80	
Ambient temperature ℃		-10 to 80	
Valve seat leakage Pa·m³/s (He)		1.3×10^{-9}	
External leakage Pa·m³/s (He)		2.8×10^{-12}	
Cv flow factor		0.1	0.26
Connection		W seal (nominal 6.35)	
Material	Body	SUS316L	
	Diaphragm	Ni-Co alloy	
	Sheet	PCTFE	

How to order

MOGD4 - 11D - W - K A - S1

Ⓐ Series
Ⓑ Valve shape
Ⓒ Seal shape
Ⓓ Handle color
Ⓔ Other

Symbol	Descriptions	
Ⓐ Series		
MOGD4	Manual valve for IAGD4	
Ⓑ Valve shape		Cv value
11D	1-station block D type valve (2-port)	0.26
01X	1-station block X type valve (3-port)	0.1
Ⓒ Seal shape		
W	W seal (nominal 6.35)	
Ⓓ Handle color		
K	Handle color Black	
R	Handle color Red	
B	Handle color Blue	
Y	Handle color Yellow	
G	Handle color Green	
Ⓔ Other		
S1	With handle lock (only when valve is closed)	
Blank	No key	

Note 1: Installation bolts and gasket are not included.
Please purchase them separately.
Note 2: Contact with our sales office if a type with installation bolts is required.

<Example of model number>

MOGD4-11D-W-KA-S1

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

MEMO

Integrated Gas System Series

IAGD5

Components for integrated gas supply system

Air operated valve for IAGD5 (1.125 inch size)

Custom order

NEW

■MAGD series - Newly redesigned with the environment in mind

∗See page 78 for previous model

Specifications

Descriptions		MAGD5-R-0	MAGD5-R-1
Working fluid		Inert gas/process gas	
Fluid pressure range Pa (abs)-MPa (G)		1.3×10^{-6} to 0.99	1.3×10^{-6} to 0.7
Fluid temperature ℃		-10 to 80	
Ambient temperature ℃		-10 to 80	
Valve seat leakage Pa·m³/s.He		1.3×10^{-9} or less	1.0×10^{-10} or less
External leakage Pa·m³/s.He		2.8×10^{-12} or less	
Cv flow factor (23℃, under pressure)		0.1	0.26
Connection		1.125 inch, W seal (nominal 6.35)	
Operating pressure MPa	NC	0.4 to 0.6	
	NO	0.4 to 0.5	
Control port		M5	
Material	Body	SUS316L	
	Diaphragm	Ni-Co alloy	
	Sheet	PCTFE	

How to order

MAGD5 - R - 02A - W - 1 2

- A Series
- B Valve shape
- C Seal shape
- D Actuation (V1)
- E Actuation (V2)

Symbol	Descriptions
A Series	
MAGD5	Air operated valve for IAGD5

B Valve shape		Cv value
01D	1-station block D type valve (2-port)	0.1
01X	1-station block X type valve (3-port)	
01Y	1-station block Y type valve (3-port)	
02A	2-station block A type valve (3-port)	
11D	1-station block D type valve (2-port)	0.26
12A	2-station block A type valve (3-port)	

C Seal shape	
W	1.125 inch, W seal (nominal 6.35)

D Actuation (V1)	
1	NC
2	NO
3	NC (with proximity sensor (energized when valve closed))
4	NO (with proximity sensor (energized when valve opened))
5	NC (with proximity sensor (energized when valve opened))
6	NO (with proximity sensor (energized when valve closed))

E Actuation (V2)	
1	NC
2	NO
3	NC (with proximity sensor (energized when valve closed))
4	NO (with proximity sensor (energized when valve opened))
5	NC (with proximity sensor (energized when valve opened))
6	NO (with proximity sensor (energized when valve closed))

Example of model number>

MAGD5-R-02A-W-12

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

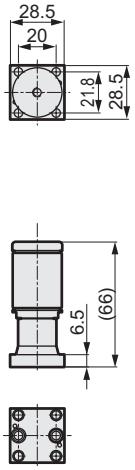
Note 1: Installation bolts, gasket, actuator and drive air fitting are not included. Please purchase them separately.

Note 2: Contact with our sales office if a type with installation bolts is required.

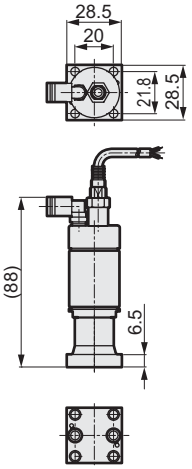
Dimensions

1-station block

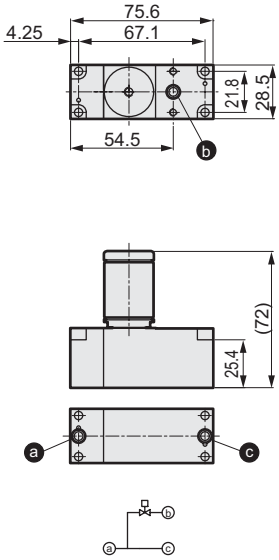
● MAGD5-R-01D



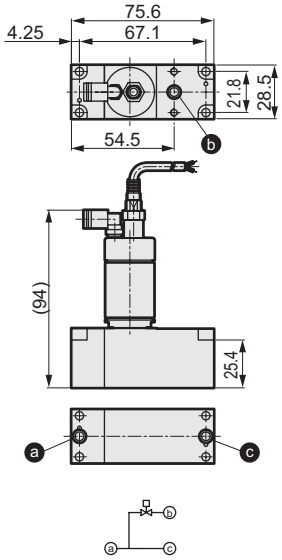
(With proximity sensor)



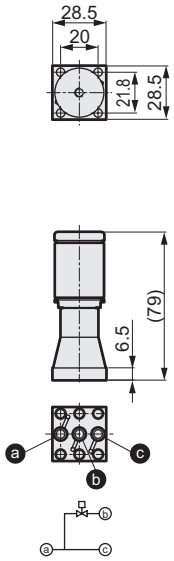
● MAGD5-R-01X



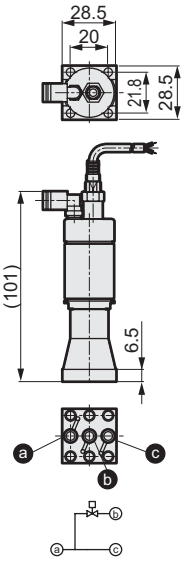
(With proximity sensor)



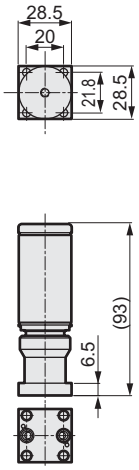
● MAGD5-R-01Y



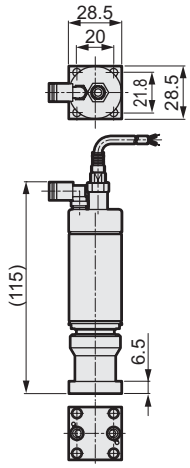
(With proximity sensor)



● MAGD5-R-11D

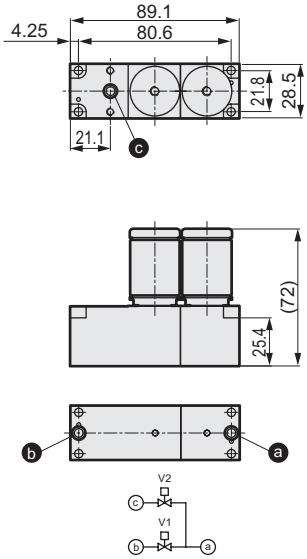


(With proximity sensor)

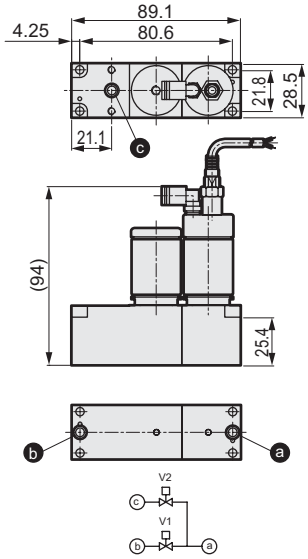


2-station block

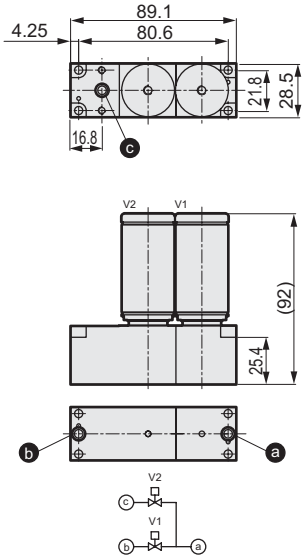
● MAGD5-R-02A



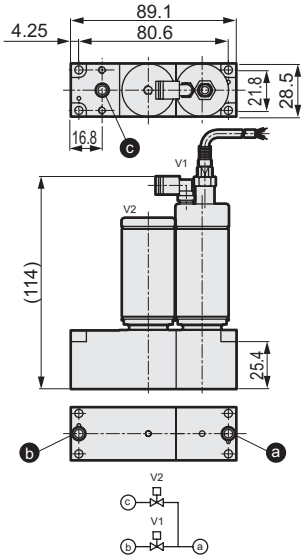
(With proximity sensor)



● MAGD5-R-12A



(With proximity sensor)



Components for integrated gas supply system

Flow control adjustment valve for IAGD5 (1.125 inch size)

Custom order

Specifications

Descriptions		MFGD5-11D-W-1	MFGD5-11D-W-4
Working fluid		Inert gas/process gas	
Working pressure range Pa (abs)-MPa (G)		1.3×10^{-6} to 0.7	
Fluid temperature ℃		-10 to 80	
Ambient temperature ℃		-10 to 80	
Valve seat leakage Pa·m³/s (He)		1/100 or less of maximum Cv flow factor	
External leakage Pa·m³/s (He)		2.8×10^{-12}	
Cv flow factor (adjusting range)		0.003 to 0.03	0.02 to 0.2
Connection		1.125 inch, W seal (nominal 6.35)	
Material	Body	SUS316L	
	Diaphragm	Ni-Co alloy	

*The product has a cover.

How to order

MFGD5 - 11D - W - 1

- A Series
- B Valve shape
- C Seal shape
- D Cv flow factor (adjusting range)

Symbol	Descriptions
A Series	
MFGD5	Flow control adjustment valve for IAGD5
B Valve shape	
11D	1-station block D type valve (2-port)
C Seal shape	
W	1.125 inch, W seal (nominal 6.35)
D Cv flow factor (adjusting range)	
1	Cv flow factor (adjusting range) 0.003 to 0.03
4	Cv flow factor (adjusting range) 0.02 to 0.2

Note 1: Installation bolts and gasket are not included. Please purchase them separately.
Note 2: Contact with our sales office if a type with installation bolts is required.

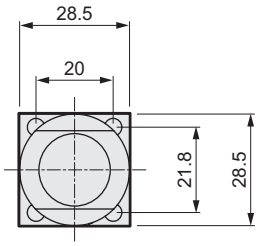
<Example of model number>

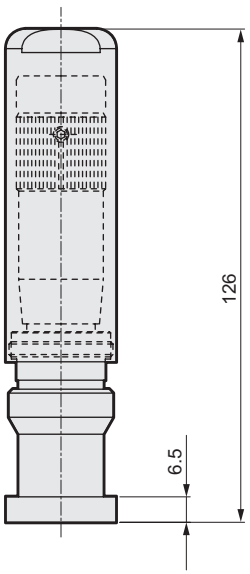
MFGD5-11D-W-1

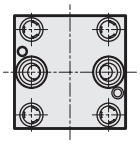
- A Series : Flow control adjustment valve for IAGD5
- B Valve shape : 1-station block D type valve (2-port)
- C Seal shape : 1.125 inch, W seal (nominal 6.35)
- D Other : Cv flow factor (adjusting range) 0.003 to 0.03

Dimensions

●MFGD5







Integrated Gas System Series

IAGD5

Components for integrated gas supply system

Check valve for IAGD5 (1.125 inch size) Custom order

Specifications

Descriptions		MCGP5-01D	MCGP5-F
Working fluid		Inert gas/process gas	
Working pressure range Pa (abs)-MPa (G)		1.3×10^{-6} to 0.7	
Fluid temperature ℃		-10 to 80	
Ambient temperature ℃		-10 to 80	
Valve seat leakage Pa·m³/s (He)		4.7×10^{-8}	
External leakage Pa·m³/s (He)		2.8×10^{-12}	
Cv flow factor (max.)		0.25	
Connection		1.125 inch, W seal (nominal 6.35)	
Material	Body	SUS316L	
	Sheet	Kalrez®	
	Spring	SUS316	

How to order

MCGP5 - 01D - W - 023 - KA

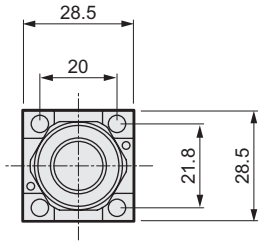
- A Series
- B Shape
- C Seal shape
- D Cranking pressure
- E Seat material

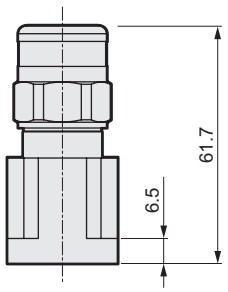
Symbol	Descriptions
A Series	
MCGP5	Check valve for IAGD5
B Shape	
01D	1-station block D type valve (2-port)
F1	Flow direction JXR fitting side to W seal side
F2	Flow direction W seal side to JXR fitting side
C Seal shape	
W	1.125 inch, W seal (nominal 6.35)
L	1/4 inch JXR male fitting
D Cranking pressure	
023	Cranking pressure 2.3 kPa
E Seat material	
KA	Seat material Kalrez®

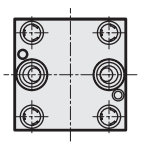
Note 1: Installation bolts and gasket are not included. Please purchase them separately.
Note 2: Contact with our sales office if a type with installation bolts is required.

Dimensions

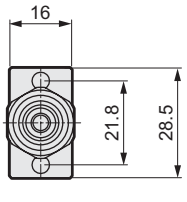
●MCGP5-01D

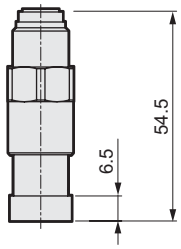


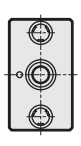




●MCGP5-F∗







<Example of model number>

MCGP5-01D-W-023-KA

- A Series : Check valve for IAGD5
- B Shape : 1-station block D type valve (2-port)
- C Seal shape : 1.125 inch, W seal (nominal 6.35)
- D Cranking pressure : 2.3 kPa
- E Seat material : Kalrez®

Kalrez® is a registered trademark of DuPont.

Components for integrated gas supply system
Other components for IAGD5

Gasket

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

1.125 inch mounting bolt for W seal

Name	Model no.	Applicable parts
1.125 inch Hexagon socket head cap bolt for W seal (M4 × 10, 4 pieces)	IAGD5-BOLT-M4 × 10-4	MAGD5-01D MAGD5-01Y MAGD5-11D MMGD5-1DV2-D MCGP5-01D MCGP5-F∗ MFGD5-11D IAGD5-BYPASS Bypass piping block IAGD5-BLIND-SW
1.125 inch Hexagon socket head cap bolt for W seal (M4 × 30, 4 pieces)	IAGD5-BOLT-M4 × 30-4	MAGD5-01X MAGD5-02A FC-PA785CT-BW-TC (Hitachi Metals MFC) FC-PA786CT-BW-TC (Hitachi Metals MFC) DN780∗-BW (Hitachi Metals MFC) SEC-Z5∗ (STEC MFC)

Contact CKD for details on applicable parts.

Maintenance tool

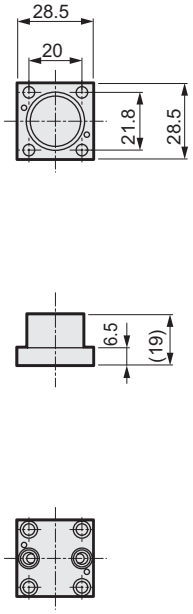
(1 each: torque driver, torque driver bit, T-type hand ball point wrench, tweezers (gasket mounting tool), scissors, storage box)

Name	Model no.
Maintenance tool set	IAGD5-MAINTENANCE3

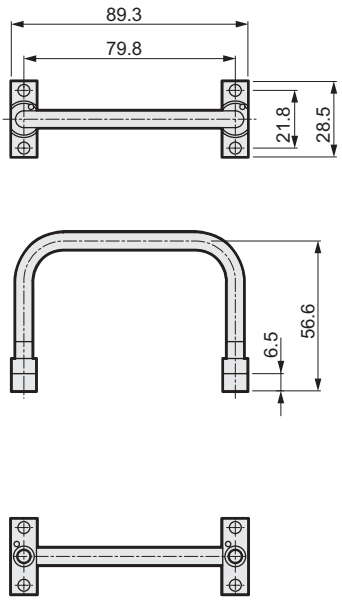
See the Instruction Manual for details on use.

Top mount block

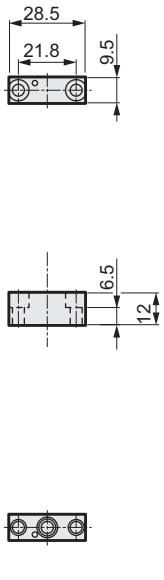
● IAGD5-BYPASS
(for 20 mm pitch between surfaces)



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

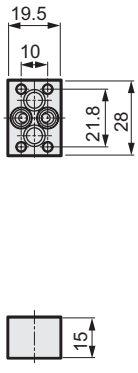


● IAGD5-BLIND-SW

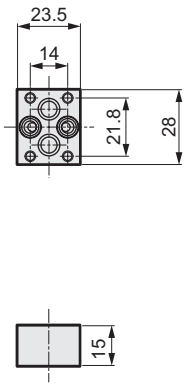


Base block

● IAGD5-BF-V10-SW
(10 mm between surfaces)



● IAGD5-BF-V14-SW
(14.0 mm between surfaces)



Components for integrated gas supply system

Air operated valve for IAGD5 (1.125 inch size)

Custom order

Specifications

Descriptions		MAGD5-0	MAGD5-1
Working fluid		Inert gas/process gas	
Fluid pressure range Pa (abs)-MPa (G)		1.3×10^{-6} to 0.7	
Fluid temperature ℃		-10 to 80	
Ambient temperature ℃		-10 to 80	
Valve seat leakage Pa·m³/s(He)		1.3×10^{-9}	
External leakage Pa·m³/s(He)		2.8×10^{-12}	
Cv flow factor		0.1	0.26
Connection		1.125 inch, W seal (nominal 6.35)	
Operating pressure MPa	NC	0.4 to 0.6	
	NO	0.4 to 0.5	
Operating pressure connection port		M5	
Material	Body	SUS316L	
	Diaphragm	Ni-Co alloy	
	Sheet	PCTFE	

How to order

MAGD5 - 02A - W - 1 2

- A Series
- B Valve shape
- C Seal shape
- D Actuation (V1)
- E Actuation (V2)

Symbol	Descriptions	
A Series		
MAGD5	Air operated valve for IAGD5	
B Valve shape		**Cv value**
01D	1-station block D type valve (2-port)	0.1
01X	1-station block X type valve (3-port)	
01Y	1-station block Y type valve (3-port)	
02A	2-station block A type valve (3-port)	
11D	1-station block D type valve (2-port)	0.26
C Seal shape		
W	1.125 inch, W seal (nominal 6.35)	
D Actuation (V1)		
1	NC	
2	NO	
3	NC (with proximity sensor (energized when valve closed))	
4	NO (with proximity sensor (energized when valve opened))	
5	NC (with proximity sensor (energized when valve opened))	
6	NO (with proximity sensor (energized when valve closed))	
E Actuation (V2)		
1	NC	
2	NO	
3	NC (with proximity sensor (energized when valve closed))	
4	NO (with proximity sensor (energized when valve opened))	
5	NC (with proximity sensor (energized when valve opened))	
6	NO (with proximity sensor (energized when valve closed))	

Note 1: Installation bolts, gasket, actuator and drive air fitting are not included. Please purchase them separately.
Note 2: Contact with our sales office if a type with installation bolts is required.

<Example of model number>

MAGD5-02A-W-12

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

Integrated Gas System Series
IAGD5

Components for integrated gas supply system

Manual valve for IAGD5 (1.125 inch size)

Custom order

Specifications

Descriptions		MMGD5-1
Working fluid		Inert gas/process gas
Working pressure range Pa (abs)-MPa (G)		1.3×10^{-6} to 0.7
Fluid temperature ℃		-10 to 80
Ambient temperature ℃		-10 to 80
Valve seat leakage Pa·m³/s (He)		1.3×10^{-9}
External leakage Pa·m³/s (He)		2.8×10^{-12}
Cv value		0.26
Connection		1.125 inch, W seal (nominal 6.35)
Material	Body	SUS316L
	Diaphragm	Ni-Co alloy
	Sheet	PCTFE

How to order

MMGD5 - 11D - W - K A - S1

- Ⓐ Series
- Ⓑ Valve shape
- Ⓒ Seal shape
- Ⓓ Handle color
- Ⓔ Other

Symbol	Descriptions	Cv value
Ⓐ Series		
MMGD5	Manual valve for IAGD5	
Ⓑ Valve shape		**Cv value**
11D	1-station block D type valve (2-port)	0.26
Ⓒ Seal shape		
W	1.125 inch, W seal (nominal 6.35)	
Ⓓ Handle color		
K	Handle color Black	
Ⓔ Other		
S1	With handle lock (only when valve is closed)	
Blank	No key	

Example of model number>
MMGD5-11D-W-KA-S1

- Ⓐ Series : Manual valve for IAGD5
- Ⓑ Valve shape : 1-station block D type valve (2-port)
- Ⓒ Seal shape : 1.125 inch, W seal (nominal 6.35)
- Ⓓ Handle color : Black
- Ⓔ Other : With handle lock (only when valve is closed)

Double action type (push handle to turn)

MMGD5 - 1DV2 - D - K

- Ⓐ Series
- Ⓑ Actuator
- Ⓒ Valve shape
- Ⓓ Handle color

Symbol	Descriptions	Cv value
Ⓐ Series		
MMGD5	Manual valve for IAGD5	
Ⓑ Actuator		
1DV2	Double action mechanism	
Ⓒ Valve shape		**Cv value**
D	1-station block D type valve (2-port)	0.26
Ⓓ Handle color		
K	Handle color Black	
R	Handle color Red	
B	Handle color Blue	
Y	Handle color Yellow	
GR	Handle color Grey	
W	Handle color White	
O	Handle color Orange	
YG	Handle color Yellow-green	

Example of model number>
MMGD5-1DV2-D-K

- Ⓐ Series : Manual valve for IAGD5
- Ⓑ Actuator : Double action mechanism
- Ⓒ Valve shape : 1-station block D type valve (2-port)
- Ⓓ Handle color : Black

Note 1: Installation bolts and gasket are not included.
Please purchase them separately.
Note 2: Contact with our sales office if a type with installation bolts is required.
Note 3: For types with key holes and keys please use products that we recommend.

MEMO

Integrated Gas System Series

Components for integrated gas supply system

SEMI F86, F87 (1.125-inch size, C seal) compatible valve

Custom order

NEW

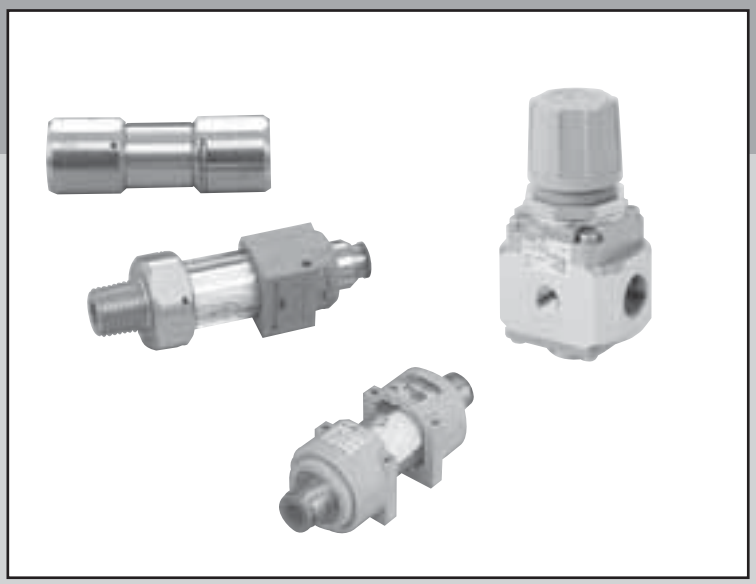
Specifications

Descriptions	MAGD•MMGD
Working fluid	Inert gas/process gas
Working pressure range Pa (abs)-MPa (G)	1.3×10^{-6} to 0.86
Fluid temperature °C	-40 to 80
Ambient temperature °C	-40 to 80
Valve seat leakage Pa·m³/s.He	1.0×10^{-10} or less
External leakage Pa·m³/s.He	2.8×10^{-12} or less
Wetted area surface treatment	Electropolished finish specifications
Connection	SEMI F86 and F87 compatible

Features

- Cv = 0.3 realized with 1.125 inch compact body
- Outstanding valve sealing
- Push-in fitting for 1/8-inch tubing integrated in actuator operation port. (Air operated valve)
- LOTO mechanism integrated to prevent incorrect operation (Manual valve)

Other gas components



CONTENTS

Other gas components

Safety precautions

Always read this section before starting use.

Inline clean filter FCS Series

Design and selection

⚠WARNING

■Use within the product's specific specification range.

■Do not use this product in atmosphere containing organic solvents or chemicals, etc., or where these may come in contact with the product.
Failure to observe this may damage the polyamide housing. Use stainless steel in these environments.

■This product is for industrial use. Do not use in devices or circuits for medical equipment or devices that affect human life.

⚠CAUTION

■Confirm the working circuit and working fluid.
Install a dryer, air filter, or oil mist filter on the primary side to remove any moisture and oil and to prevent filter performance decrement.

■Do not exceed the maximum working pressure or maximum pressure difference.
Failure to observe this may damage the product or element membrane.

■Do not let fluids exceed the maximum flow.
Failure to observe this may lower the filtering efficiency or element membrane.

■This device cannot be used as an absolute filter.
Filtration is 99.99% within specified conditions.

■Do not use in conditions where the IN and OUT pressure difference exceeds 0.1 MPa.
Sudden air supply to the filter (such as secondary side atmospheric release air blow) can cause a decrease in removal ratio.In such cases install a metering valve on the IN side of the filter and make sure the pressure difference is 0.1 MPa or less.

Installation and adjustment

⚠CAUTION

■Open the product in a clean room.
This product is packaged inside a clean room.We recommend stylistically opening the packaging inside a clean room and just before starting the piping process.

■Avoid sunlight when installing this product.

■Flush and clean pipes before use.
Any dirt or foreign matter in piping decreases product performance.

■Check that foreign matter does not enter when screwing in pipes or fittings.
Check that pipe thread debris or sealing agent does not enter when screwing in pipes or fittings. Any dirt or foreign matter in piping decreases product performance.

■Confirm the flow direction indicated by the arrow and connect the product correctly.
Service life will be reduced if installed in the opposite direction.

■Sufficient maintenance space
Ensure sufficient space for maintenance and inspection.

■Conduct piping procedure so there is no excessive force on the product.
Check that force such as pulling, compression, bending, or external force from the tube is not applied to the product when piping or installing.

■Use appropriate piped tubing.
Use CKD soft nylon or urethane tubing.
Contact CKD regarding the use of fluorine resin tubing, etc.

■Insert piping tubing securely into the push-in fitting before use.

■Avoid installing where vibration or impact is present.

■When piping, use the width across flats of fittings.
When connecting R thread or Rc thread piping, place a wrench across the connection's width across flats, then pipe. Avoid securing in any other area.

■Tighten pipes with the appropriate torque.

Set screw	Tightening torque N·m
M5	1 to 1.5
Rc1/8, R1/8	3 to 5
Rc1/4, R1/4	6 to 8
Rc3/8, R3/8	13 to 15

■When supplying air pressure after connection of piping has been completed, make sure there is no sudden pressure supplied.
The connected pipe may be dislocated and piped tubing may come off.

■As for the IN/OUT both-sided male thread piping, make sure there is no lateral load or bending torque during installation piping.
This can cause leakage.

■If there is abundant drainage
Install air dryer and drain separator in front of the air filter. Excessive drainage from the compressor, high humidity and high temperature air can lead to shorter service life and corrosion.

■If using a water lubricated compressor circuit
Use caution so that substances such as chlorine-type substances do not mix with the compressed air.

During use and maintenance

⚠CAUTION

■Performance may decrease if the filter element is clogged. Regularly inspect and replace the element.

■Perform regular inspections to detect deterioration such as cracks and scratches in the transparent resin.
Cracks, scratches, and other deterioration may result in damage. Replace with a new part or SUS.

■Do not disassemble or modify the product.

■Stop the fluid supply and confirm that there is no residual pressure before maintenance.

■Read instructions and precautions included with the product before use or maintenance.

■Check that vibration, impact, and external force caused by vibrating tubing is not applied to the product during use.

Other gas components

Safety precautions

Always read this section before starting use.
Refer to Into page 9 for general precautions.

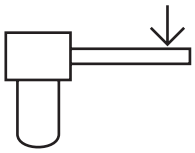
Clean regulator RC2000 Series

Design and selection

⚠WARNING

- Use within the product's specific specification range.
- Make sure to install a safety device in areas where outlet pressure that exceeds the regulator's set pressure can cause damage or malfunction of peripherals.
- This product is for industrial use. Do not use in devices or circuits for medical equipment or devices that affect human life.
- Consult us in case regulators cannot be used in the secondary side seal circuit and balance circuit.
- Piping load torque

	Rc1/8, Rc1/4	Rc3/8, Rc1/2, Rc3/4	Rc1 or more
Max. torque N·m	15	50	100



Make sure there is no piping load or torque on the body and piping section.

⚠ CAUTION

- Confirm the working circuit and working fluid.
  Malfunctions may result if fluids containing solids or not specified fluids flow. Connect a filter to the primary side of the product to prevent the entry of solid matter.
- The line may vibrate depending on work and piping conditions.
  If vibration occur, lower the primary pressure.
- When primary pressure is purged, secondary pressure will enter the primary side.
  If the secondary fluid flow to the primary side and other equipments have problem, provide a circuit that maintains the pressure.
- Make sure the regulator's secondary set pressure range is 85% or less of the primary side.Pressure drop may become significant.

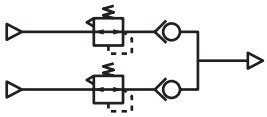
Installation

⚠CAUTION

- Open the product in a clean room.
  This product is packed in a double layer in a clean room. Open the first layer, and take the product into the clean room. Open the second layer just before piping.
- Flush and clean pipes before use.
  Any dirt or foreign matter in piping decreases product performance.
- Check that foreign matter does not enter when screwing in pipes or fittings.
  Check that pipe thread debris or sealing agent does not enter when screwing in pipes or fittings. Any dirt or foreign matter in piping decreases product performance.
- Confirm the flow direction indicated by the arrow and connect the product correctly.
  It will not function correctly if installed in the reverse direction.
- Tighten pipes with the appropriate torque. (Right table is recommended torque)

Connection screw	Tightening torque N·m
M5	1.0 to 1.5
Rc1/8	3 to 5
Rc1/4	6 to 8
Rc3/8	13 to 15
Rc1/2	16 to 18

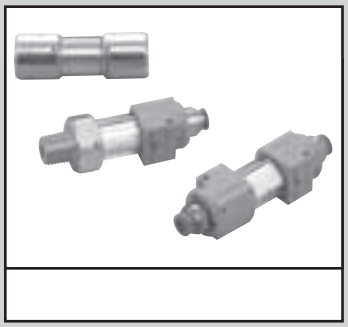
- Sufficient maintenance space
  Ensure sufficient space for maintenance and inspection.
- Plug in the pressure gauge connection port using the pressure gauge and pipe plug.
- Avoid installing where vibration or impact is present.
- If nuts for panel installation are loosened, the nuts function as a jack making it easier to remove the knob.When installing the knob, always install nuts first.
- If there is abundant drainage
  Install air dryer and drain separator in front of the air filter. Excessive drainage from the compressor, high humidity and high temperature air can lead to shorter service life and corrosion.
- If using a water lubricated compressor circuit
  Use caution so that substances such as chlorine-type substances do not mix with the compressed air.
- If using regulators aligned as below (parallel), don't use the OUT side of the closed circuit.If a closed circuit is required, make sure to install check valves on the OUT side of each regulator.



During use and maintenance

⚠CAUTION

- Stop the fluid supply and confirm that there is no residual pressure before maintenance.
- Release the lock before adjusting pressure.
  Operating the pressure adjustment knob while locked may result in damage.
- Adjust pressure in the direction of pressure rise.
  Pressure cannot be set correctly if adjusted downward.
- Non-relief pressure cannot be reduced unless secondary pressure is consuming pressure.
- Read instructions and precautions included with the product before use or maintenance.



Inline clean filter

FCS500 Series

●Port size: Rc1/8, Rc1/4, R1/8, R1/4
Push-in fitting ø4, ø6, ø8

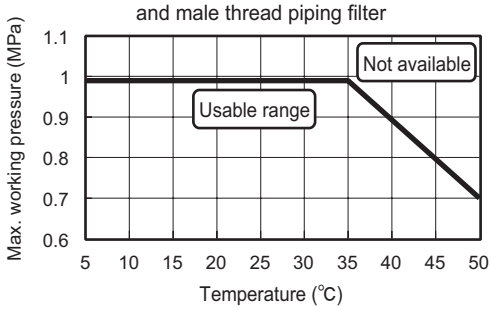
RoHS CAD

Specifications

Descriptions		Standard element resin type	Male thread pipe type	P9 element stainless steel type	
		FCS500- (∗1) (∗2)	FCS500- (∗1) (∗2)	FCS500-66-P90 FCS500-66-P94	FCS500-88-P90 FCS500-88-P94
Working fluid		Compressed air, nitrogen			
IN side diameter (∗1)		Select from ø4, ø6, ø8	Select from ø4, ø6, ø8, R1/8, R1/4	Rc1/8	Rc1/4
OUT side diameter (∗2)				Rc1/8	Rc1/4
Withstanding pressure MPa		1.5	1.5	2.25 (compressed air), 1.5 (nitrogen)	
Withstanding differential pressure MPa		0.5 (0.2 for 45 to 50°C)	0.5 (0.2 for 45 to 50°C)	0.5	
Working pressure range MPa		−0.095 to 0.99 Note 2	−0.095 to 0.99 Note 2	−0.095 to 1.5 (compressed air), −0.095 to 0.99 (nitrogen)	
Working temperature range ℃		5 to 50	5 to 50	5 to 45	
Filtration rating μm		0.01 (Removal ratio 99.99%)			
Treating flow rate ℓ/min (ANR) Note 1		50 (80% for H8H8 type)	50 (80% for H88A and 8AH8 types)	50	80
Product weight g		45	45	100	100
Material	Body	Polyamide	Polyamide, aluminum (alumite treated)	Stainless steel	
	Case	Transparent polyamide	Transparent polyamide	Stainless steel	
	Element	Polypropylene + urethane			
Assembly, Inspection, Packaging		Integrated manufacture in clean room			
Cleaning		Degreasing and cleaning			
JIS symbol					

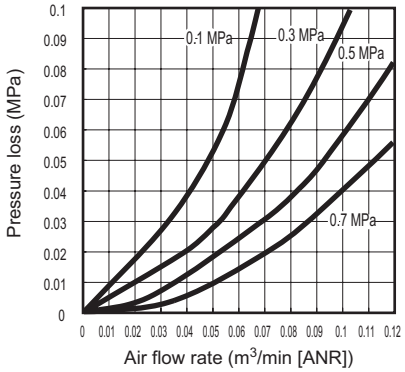
Note 1: Initial flow at 0.7 MPa primary pressure and 0.03 MPa pressure decrease.
Note 2: Max. working pressure will change depending on working temperature.
Check the maximum with the graph showing the relationship of the working temperature and maximum working pressure.

Relationship of working temperature
and maximum working pressure for the resin element
and male thread piping filter

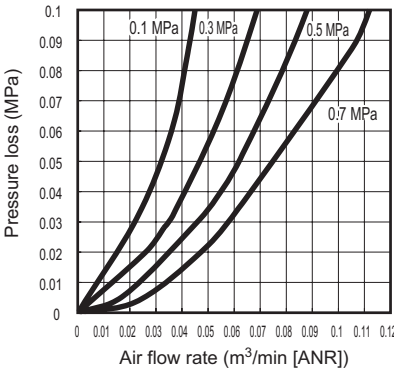


Flow characteristics

●FCS500-H8H8 ●FCS500-H88A ●FCS500-8AH8
●FCS500-88-P90/P94



●FCS500-H4H4 ●FCS500-H6H6 ●FCS500-H46A
●FCS500-66-P90/P94 (product that include ø4, ø6 fittings and R1/8, Rc1/8 connections)



How to order

●Resin type

FCS500 - H4 H4

- FCS500: Model no. (Clean room specifications) (Oil-prohibited specifications)
- Ⓐ IN side port size
- Ⓑ OUT side port size

Ⓐ IN side port size	
H4	ø4
H6	ø6
H8	ø8
6A	R1/8
8A	R1/4

Ⓑ OUT side port size	
H4	ø4
H6	ø6
H8	ø8
6A	R1/8
8A	R1/4

Note 1: Product comes with 2 sets of installation screw (M 2.5 × 25) and 2 spring washers.
(These are not included when 6A or 8A is selected for the IN or OUT connection bore size.)

Note 2: As for the IN/OUT both-sided male thread piping, make sure there is no lateral load or bending torque during installation piping.

●Stainless steel type

FCS500 - 88 - B - P90

- FCS500: Model no. (Clean room specifications) (Oil-prohibited specifications)
- Ⓐ Port size
- Ⓑ Attached
- Ⓒ Clean room specifications

Ⓐ Port size	
66	IN side/OUT side port size Rc1/8
88	IN side/OUT side port size Rc1/4

Ⓑ Attached	
Blank	None
B	Bracket, set screw

Ⓒ Clean room specifications		
	Structure/treatment	Material restriction
P90	Use of stainless steel Oil treatment prohibited	–
P94	Use of stainless steel Oil treatment prohibited	Copper-based, silicon-based, halogen-based (Fluorine, chlorine, oxalic) unacceptable.

Note: "P94" is customer order product.

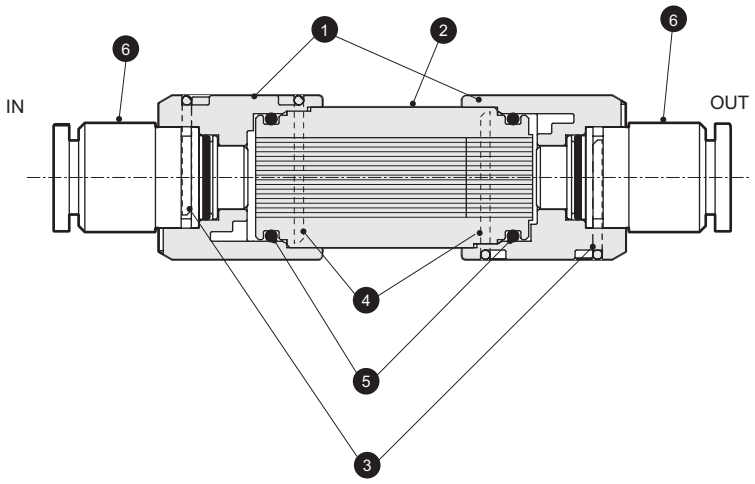
●Bracket discrete model No.

FCS500-B

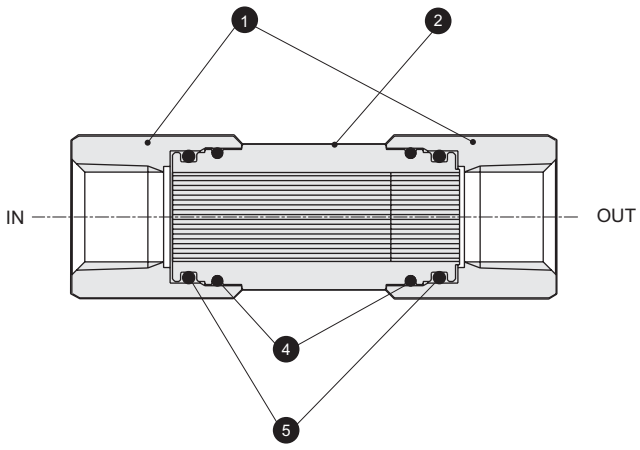
(One bracket, 2 set screws (M4 × 6))

Internal structure and parts list

●Resin type



●Stainless steel type

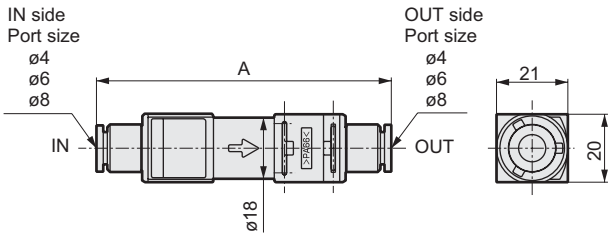


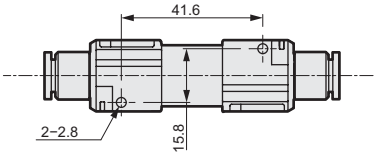
●Parts list

No.	Part name		Standard element resin type	Male thread pipe type	P9 ∗ element stainless steel type
1	Body		Polyamide	Polyamide Aluminum (alumite treated)	Stainless steel
2	Element	Housing	Transparent polyamide	Transparent polyamide	Stainless steel
		Filter	Polypropylene	Polypropylene	Polypropylene
		Potting material	Urethane	Urethane	Urethane
3	Pin		Stainless steel		
4	Pin		Stainless steel		
5	O ring		Fluoro rubber		Fluoro rubber (for clean room specifications P9(Nitrile rubber (for specifications P94)
6	Cartridge fitting		Brass (nickeling) Nitrile rubber		—

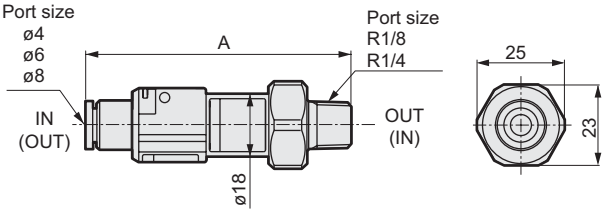
Dimensions

●Resin type
Port size
IN side (Cartridge fitting) − OUT side (Cartridge fitting)

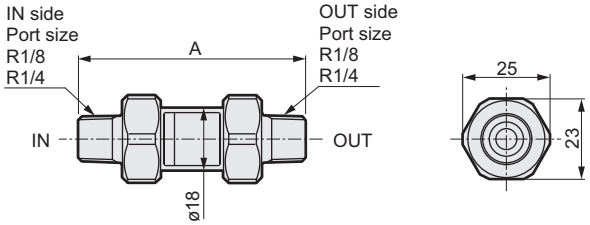




●Male thread pipe type
Port size
Cartridge fitting − Male thread

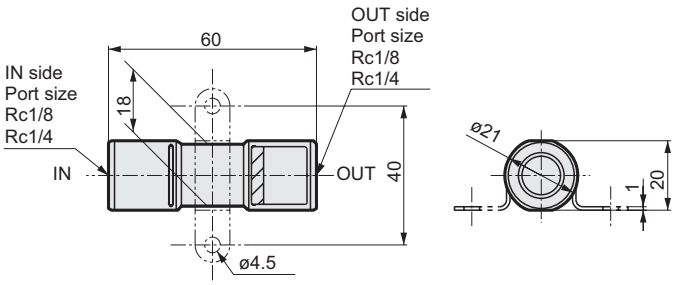


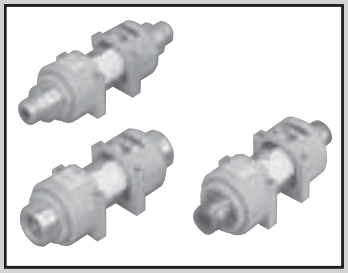
Port size
Male thread − Male thread



Model no.	FCS500 (standard element, resin type/male thread pipe type)													
Port size Model No.	H4H4	H4H6 H6H4	H4H8 H8H4	H46A 6AH4	H48A H86A 6AH8 8AH4	6A6A	6A8A 8A6A	H6H6	H6H8 H8H6	H66A 6AH6	H68A 8AH6	8A8A	8AH8 H88A	H8H8
A dimensions	80.5	83	84	69.5	73	58.5	62	85	86	72	75	65	76	87

●Stainless steel type





Inline clean filter

FCS1000 Series

●Port size: Rc1/4, Rc3/8, R1/4, R3/8
Push-in fitting ø8, ø10, ø12

RoHS CAD

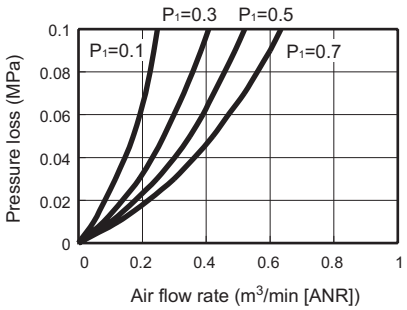
Specifications

Descriptions		Resin type	Stainless type (Custom order)
		FCS1000-(∗1) (∗2)	FCS1000-(∗1) (∗2)-P90 FCS1000-(∗1) (∗2)-P94
Working fluid		Compressed air, nitrogen	
IN side diameter (*1)		Push-in fitting ø8, ø10, ø12, Select from R1/4, R3/8, Rc1/4, Rc3/8	Select from Rc1/4, Rc3/8
OUT side diameter (*2)			
Withstanding pressure MPa		1.5	2.25 (compressed air), 1.5 (nitrogen)
Withstanding differential pressure MPa		0.5	
Working pressure range MPa		−0.095 to 0.99	−0.095 to 1.5 (compressed air), −0.095 to 0.99 (nitrogen)
Working temperature range ℃		5 to 45	
Filtration rating μm		0.01 (Removal ratio 99.99%)	
Treating flow rate ℓ/min (ANR)		300 to 400 Note 1	
Material	Body	Polyamide	Stainless steel
	Case	Transparent polyamide	Stainless steel
	Element	Polypropylene + urethane	
Assembly/inspection/packing		Integrated manufacture in clean room	
Cleaning		Degreasing and cleaning	
JIS symbol			

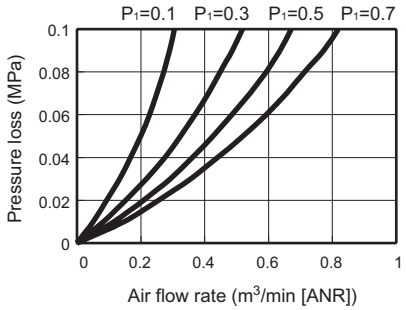
Note 1: Initial flow at 0.7 MPa primary pressure and 0.03 MPa pressure decrease. (It will change by port size.)

Flow characteristics

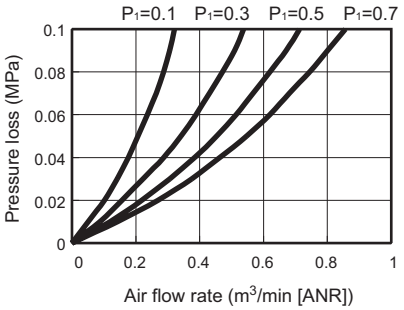
●FCS1000-H8H8
●FCS1000-8A8A



●FCS1000-H10H10
●FCS1000-10A10A
●FCS1000-88
●FCS1000-88-P90·P94



●FCS1000-H12H12
●FCS1000-1010
●FCS1000-1010-P90·P94



How to order

●Resin type

FCS1000 - H8 H8

Model no. (Clean room specifications) (Oil-prohibited specifications)

Ⓐ IN side port size

Ⓑ OUT side port size

Ⓐ IN side port size	
H8	ø8
H10	ø10
H12	ø12
8A	R1/4
10A	R3/8
8	Rc1/4
10	Rc3/8

Ⓑ OUT side port size	
H8	ø8
H10	ø10
H12	ø12
8A	R1/4
10A	R3/8
8	Rc1/4
10	Rc3/8

Note 1: Two of each of the following is included with the product: installation threads (M3 × 40), flat washers, and spring washers.

●Stainless type (Custom order)

FCS1000 - 8 8 - P90

Model no. (Clean room specifications) (Oil-prohibited specifications)

Ⓐ IN side port size

Ⓑ OUT side port size

Ⓒ Clean room specifications

Ⓐ IN side port size	
8	Rc1/4
10	Rc3/8

Ⓑ OUT side port size	
8	Rc1/4
10	Rc3/8

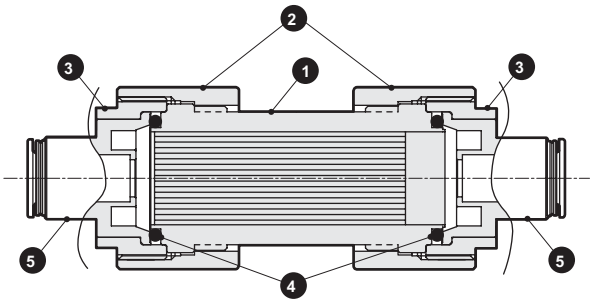
Ⓒ Clean room specifications		
	Structure/treatment	Material restriction
P90	Use of stainless steel Oil treatment prohibited	–
P94	Use of stainless steel Oil treatment prohibited	Copper-based, silicon-based, halogen-based (Fluorine, chlorine, oxalic) unacceptable.

●Replacement element individual item model no. (Element 1 pc, O-ring 2 pcs)

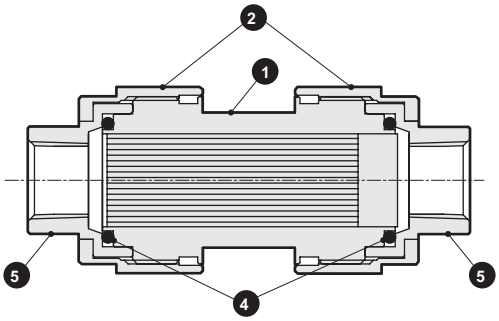
- For Resin type : **FCS1000-E**
- Stainless steel type
  - For P90 : **FCS1000-E-P90** (Custom order)
  - For P94 : **FCS1000-E-P94** (Custom order)

Internal structure and parts list

●Resin type



●Stainless steel type

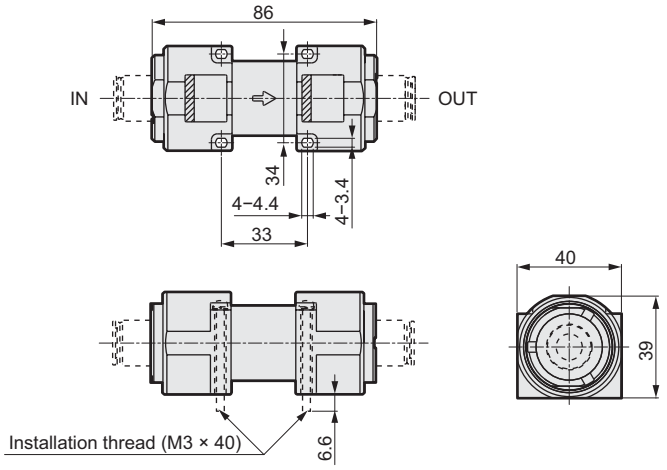


●Parts list

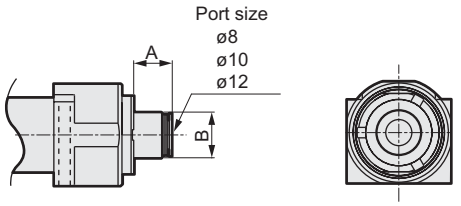
No.	Part name		Resin type	Stainless steel type
1	Element	Housing	Transparent polyamide	Stainless steel
		Filter	Polypropylene	
		Potting material	Urethane	
2	Body		Polyamide	Stainless steel
3	Plug		Polyamide	–
4	O ring		Fluoro rubber	Fluoro rubber (for clean room specifications P90) Nitrile rubber (for clean room specifications P94)
5	Cartridge fitting (Port size ø8, ø10, ø12)		Brass (nickeling) Nitrile rubber	–
	Adaptor (Port size Rc1/4, Rc3/8, R1/4, R3/8)		Aluminum (Alumite treatment)	Stainless steel

Dimensions

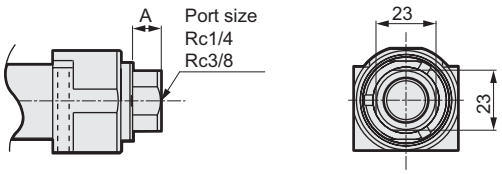
●Resin type



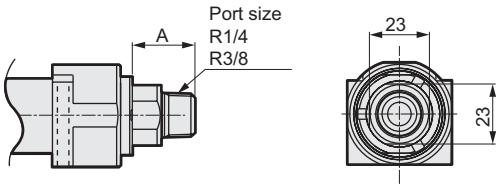
• Push-in fitting (ø8, ø10, ø12)



• Rc thread (Rc1/4, Rc3/8)

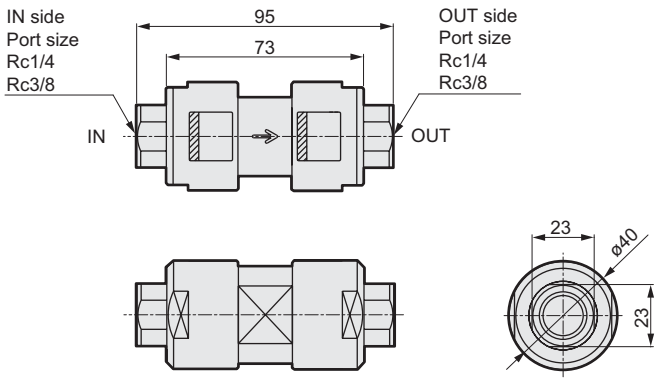


• R thread (Rc1/4, Rc3/8)



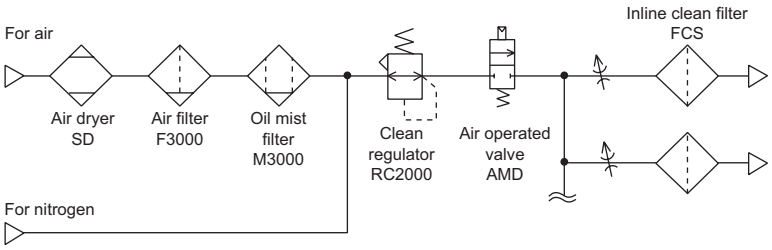
Connection model no.	Port size	A	B
H8	ø8 Push-in fitting	12	ø17.5
H10	ø10 Push-in fitting	14.5	ø17.5
H12	ø12 Push-in fitting	16	ø19.5
8A	R1/4	24	−
10A	R3/8	24	−
8	Rc1/4	11	−
10	Rc3/8	11	−

●Stainless steel type

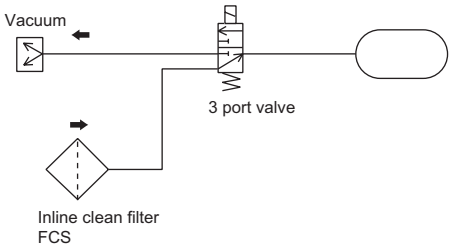


Example of applications and working circuits

●Application 1. Use as a precision filtration filter to filter air and N_2 gas and provide clean air.

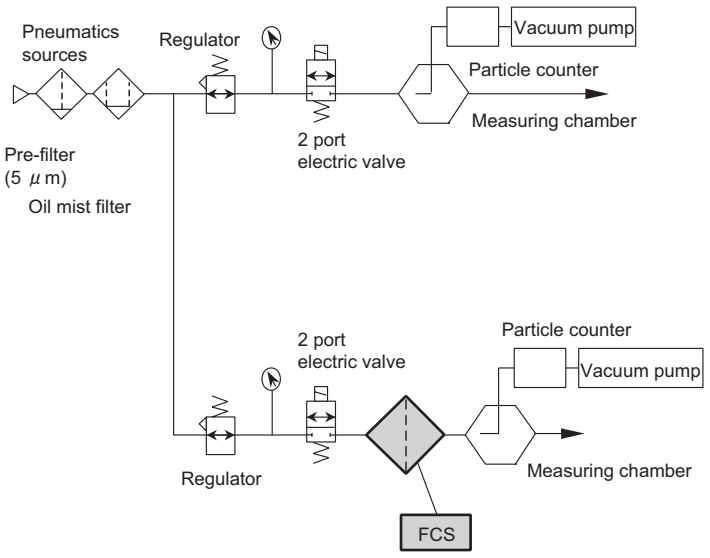


●Application 2. Use a vacuum break filter to flush the vacuum break circuit and provide clean air.

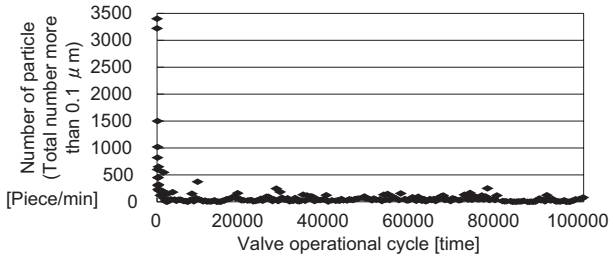


∗ See the catalogs below for products listed on working circuits.
[Pneumatic, Vacuum and Auxiliary Components]
(Catalog No.CB-024SA)
[High Purity Chemical Liquid System Component]
(Catalog No.CB-031A)

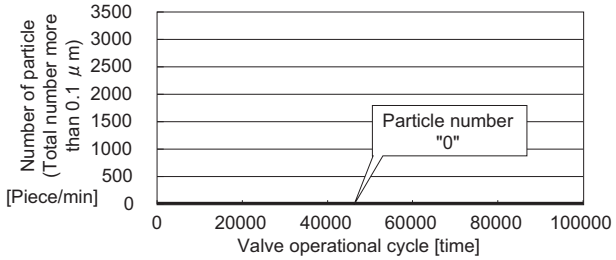
Particle occurrence data



■Particle occurrence is generated at the regulator and 2-port solenoid valve, etc.



■Particles generated at the regulator and 2-port solenoid valve, etc., are removed by FCS.



Custom order

These products are custom-made. Contact the CKD Sales Office for details.

FCS500 Integrated connection type

■This integrated connection has no sealed members and is perfect for leakage testers.
■Flow rate : 10ℓ/min (ANR) ∗1
■Port size : R1/8

FCS500 large flow rate type

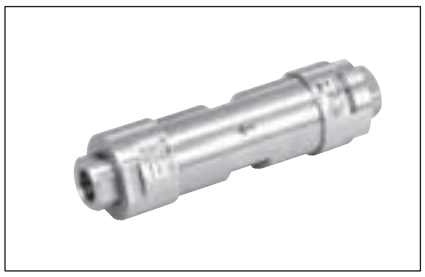
■FCS500 series with increased flow rate specifications
■Flow rate : 100 to 120ℓ/min (ANR) ∗1
■Port size : ø6, ø8 type push in fitting, R1/8, R1/4

FCS500 L type fitting type

■Elbow type push-in fitting reduces space when piping.
■Flow rate : 50 to 80ℓ/min (ANR) ∗1
■Port size : ø4, ø6, ø8L type push in fitting

FCS1000 stainless steel large flow rate type

■Flow rate : 450ℓ/min (ANR) ∗1
■Port size : Rc1/4, Rc3/8



∗1 Initial flow at 0.7 MPa primary pressure and 0.03 MPa pressure decrease.
Contact the CKD Sales Office for other connections and bore sizes.

FCS Large flow rate large bore size type

■Flow rate : 2000ℓ/min (ANR) and over ∗2
■Port size : Rc1
■Body material : Aluminum (alumite treated)

∗2 Initial flow at 0.7 MPa primary pressure and 0.03 MPa pressure decrease.
Contact the CKD Sales Office for other connections and bore sizes.

Clean regulator

RC2000 Series

●Port size: Rc1/4, Rc3/8, Rc1/2

Overview

The RC2000 Series has oil-prohibited specifications and a stainless steel body, making it suitable for controlling the pressure of clean air and nitrogen used in semiconductor manufacturing and liquid crystal equipment. It is also suitable for air (N_2) exhaust because it is compact and accommodates a large flow.

Features

●Oil-prohibited specifications

The product is precision cleaned (wetted areas) and manufactured using integrated production in a clean room, from assembly to packaging. No grease is used in wetted areas.

●Compact/large flow rate

A large flow of 0.8 m^3/min achieved through its compact size of 50 mm (face to face).

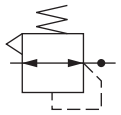
(Flow rate at 0.7 MPa primary pressure, 0.5 MPa set pressure, 0.1 MPa pressure drop)

●Equipped w/ reverse mechanism (when back pressure is not applied)

Secondary pressure is reversed to the primary side when primary pressure is purged.

This safety-oriented product leaves no pressure on the secondary side.

Specifications

Model no.		RC2000-8-P90	RC2000-10-P90	RC2000-15-P90
Working fluid		Compressed air, nitrogen		
Max. working pressure MPa		1.0 (0.5 for low pressure)		
Withstanding pressure MPa		1.5		
Working temperature range °C		5 to 60		
Set pressure range MPa		Standard : 0.05 to 0.7 Note 1 Low pressure : 0.02 to 0.2		
Port size (IN/OUT)		Rc1/4	Rc3/8	Rc1/2
Pressure gauge connection port size		Rc1/8		
Product weight kg		0.47	0.45	0.59
Materials for wetted areas	Metal	SUS316		
	Resin	PTFE		
	Rubber	FKM		
Assembly/inspection/packing		Integrated manufacture in clean room		
Cleaning (wet areas)		Precision cleaning		
JIS symbol				

Note 1: When using the standard type with a set pressure of 0.4 MPa or less, use only with a pressure difference (of the primary pressure against the set pressure) of within 0.5 MPa. When using the low pressure type, use only with a pressure difference (of the primary pressure against the set pressure) of within 0.3 MPa.

How to order

RC2000 - 8 - LN - GY49B3E1 - P90

(A) (B) (C) (D)

Model no. (Clean room specifications) (Oil-prohibited specifications)

(A) Port size	
8	Rc1/4
10	Rc3/8
15	Rc1/2
	(Custom order)

(B) Option		Note 1
Pressure range Note 2	Blank	0.05 to 0.7 MPa
	L	0.02 to 0.2 MPa
Relief mechanism	Blank	Relief type
	N	No relief type

(C) Attachment (attached) Note1, 3	
Blank	No attachment
GY49	Pressure gauge (G49D-6-□-P94)
GZ49	Pressure gauge (G49D-6-□-P90)
B3	L type bracket
E1	Fitting (exhaust treatment type)

(D) Clean room specifications	
	Treatment
P90	Use of stainless steel Oil treatment prohibited

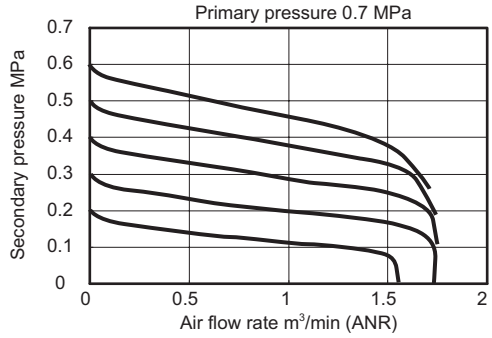
Note 1: When selecting multiple options or attachments, list the model number symbol in order starting from the top. If option or attachment is blank, delete the hyphen "-". (Example: RC2000-8-P90)

Note 2: If "blank" is selected for the pressure range, the 1.0 MPa pressure gauge (pressure gauge model: G49D-6-P10-P9∗) will be used. If "L" is selected for the pressure range, the 0.2 MPA pressure gauge (pressure gauge model: G49D-6-P02-P9∗) is used.

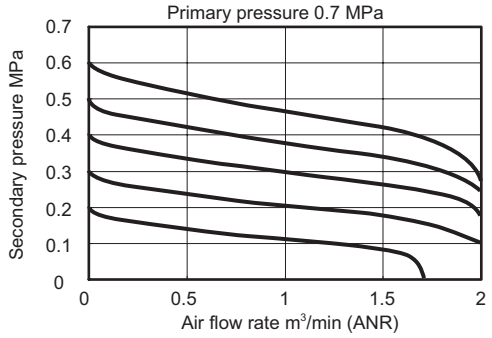
Note 3: Two pipe plugs (R1/8) are included with the product. However, if a pressure gauge is selected as an attachment, only one plug is included.

Flow characteristics

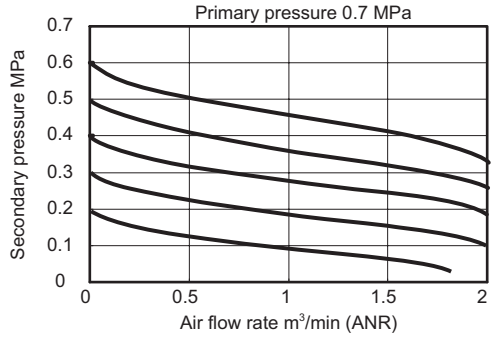
●RC2000-8-P90



●RC2000-10-P90

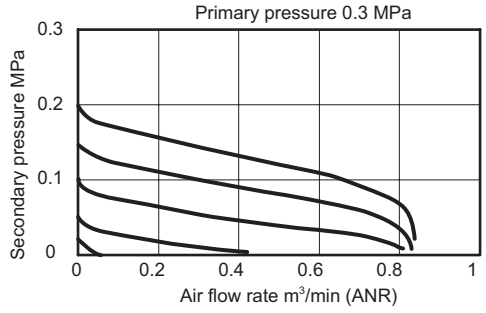


●RC2000-15-P90

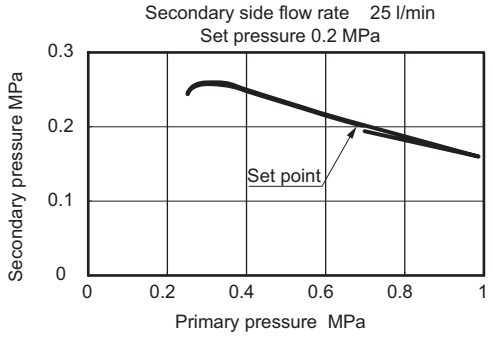


Flow characteristics (low pressure)

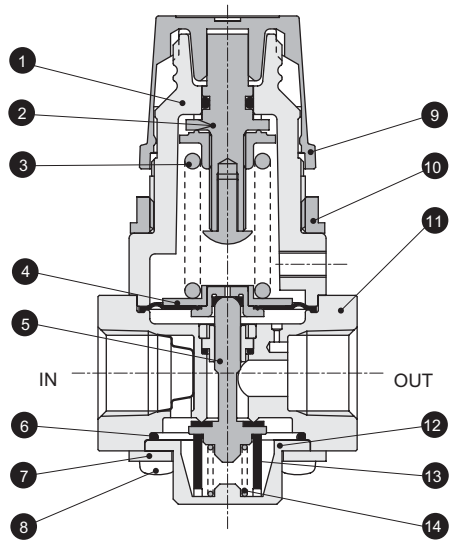
●RC2000-∗-L-P90



Pressure characteristics



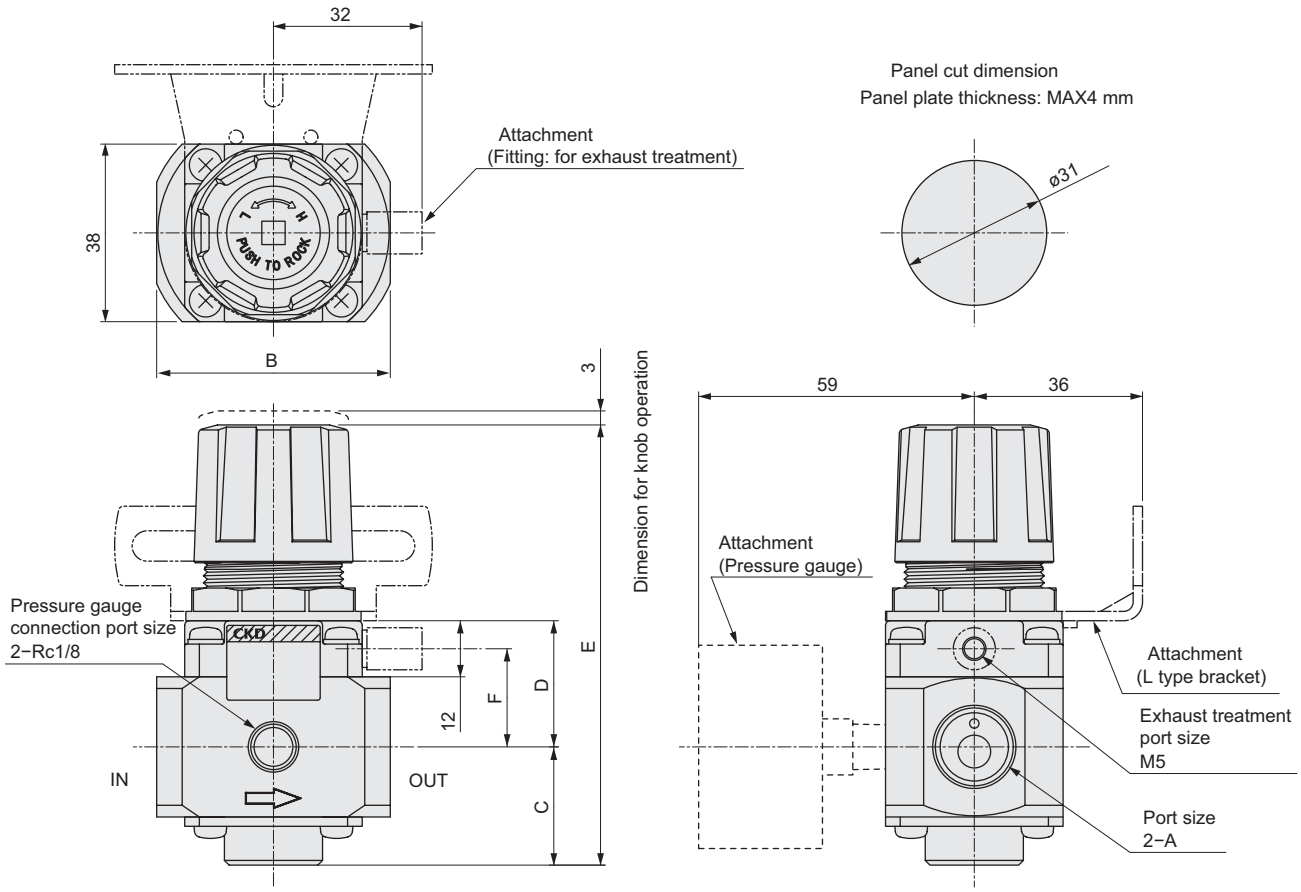
Internal structure and parts list



No.	Part name	Material (treatment)
1	Cover	PA66
2	Pressure adjusting screw assembly	Steel, SUS, FKM, POM
3	Spring	Steel
4	Diaphragm	SUS316, FKM, SUS303
5	Valve	SUS316, FKM
6	O ring	FKM
7	Plate	SUS304
8	Screw	Steel (nickel plating)
9	Knob	POM
10	Mounting nut	Zinc die-casting (nickel plating)
11	Body	SUS316, FKM, PTFE
12	Bottom cap	SUS316
13	Bottom rubber	FKM
14	Spring	SUS316

∗ Mesh filters are installed on the IN side of RC2000-8-P90 and RC2000-10-P90.

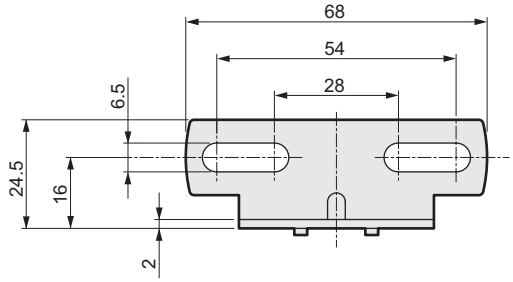
Dimensions



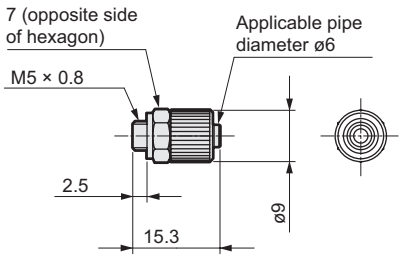
Model no.	A	B	C	D	E	F
RC2000-8	Rc1/4	50	25.5	27	95	21
RC2000-10	Rc3/8					
RC2000-15	Rc1/2	58	27.5	29	99	23

Attachment

●L type bracket (-B3)
Part model no.: RC2000-B3



●Fitting (-E1)
Part model no.: RC2000-E1



Model no.	RC2000-E1
Working fluid	Compressed air, nitrogen
Fluid temperature ℃	5 to 60
Ambient temperature ℃	5 to 60
Applicable tube	Urethane tube

Item	Material (treatment)
Metal part	Brass (nickeling)
Rubber part	NBR

Pressure gauge

Specifications

Model no.		G49D-P9∗
Working fluid		Compressed air, nitrogen
Fluid temperature	℃	5 to 60
Ambient temperature	℃	5 to 60
Accuracy	Note 1	Full scale ±3% (during 5-35℃)
Shape		DT type (rear screw, root section square)
Display section diameter		ø43
Material	Bourdon tube	SUS316
	Stock	SCS14 (SUS316 equivalent)
	Housing	Steel (chrome plated)
	Lens	Glass
Pressure range	MPa	0 to 0.2 0 to 1.0
Port size	R	1/8
Weight	g	90

Note 1: Temperature at which display accuracy is assured is 20±15℃.

How to order

G49D - 6 - P02 - P90

Ⓐ Model no.	
G49D	Pressure gauge

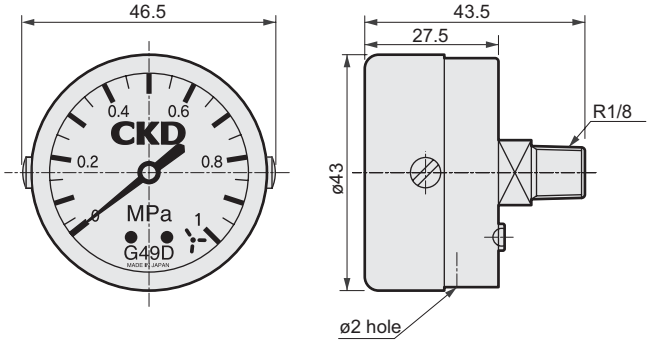
Ⓑ Port size	
6	R1/8

Ⓒ Pressure display (MPa)	
P02	0 to 0.2
P10	0 to 1.0

Ⓓ Clean room specifications				
	Material	Oil-prohibited specifications	Assembly	Packaging
P90	Stainless steel	Oil-prohibited, water-prohibited	Clean assembly	Clean assembly
P94	Stainless steel	Oil-prohibited, water-prohibited	General environment	Clean assembly

P94 has material restriction deeming copper-based, silicon-based, halogen-based (fluorine, chlorine, bromine) materials unacceptable.

Dimensions



Custom order

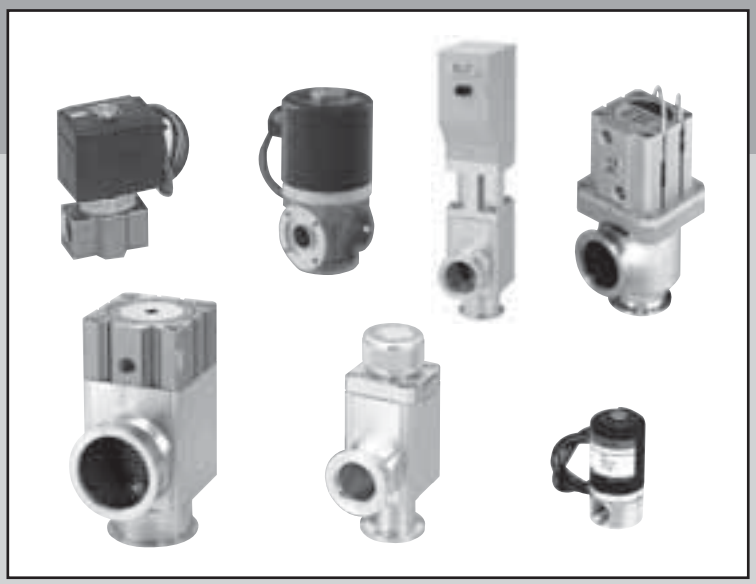
Below type is available with custom order. Contact the CKD Sales Office for details.

RC Large flow rate large bore size type

■Flow rate : 3000ℓ/min (ANR) ∗1
■Port size : Rc3/4, Rc1

∗1 Flow rate at 0.7 MPa primary pressure, 0.5 MPa set pressure, 0.1 MPa pressure drop

High vacuum components



CONTENTS

High vacuum components

Safety precautions

Always read this section before starting use.
Refer to Intro 9 for the general cautions.

Design and selection

1. Confirming specifications

⚠ WARNING

- Incorrect selection and handling of devices may cause problems with this product and problems in the user's system. Confirm that the regulator specifications and the user's system are compatible before use.
- Confirm the compatibility of materials used for wetted area and the fluid used.
- Use the product within the fluid temperature and working pressure range in specifications.

2. Working media

⚠ CAUTION

- This product is designed to control vacuum or inert gas. Using other fluids (active gas, liquids, solids, etc.) may disrupt the product's operation or performance could drop. Confirm the compatibility of materials used for wetted area and the fluid used. If the working fluid could solidify, check that no problems in use exist before starting.
- Avoid using fluids causing crystals to accumulate in piping.

3. Selection

⚠ CAUTION

- When controlling the valve's responsiveness, check port size and length, as well as flow rate characteristics of the operation solenoid valve for control.
- The inside of the cylinder and the bellows are directly connected to the atmosphere. Make sure there is no blockages in the connection holes (2 holes just below the control port) connecting the bellows to the atmosphere.
- Use air piping and fittings suitable for working temperature.

Installation and adjustment

1. Installation

⚠ WARNING

- Incorrect installation and piping will cause product problems, may cause problems in the user's system, and may cause death or serious injury. The user is responsible for ensuring that the operator has read the instruction manual and fully understands the system.
  After installation, conduct an appropriate function test to confirm that the product is correctly installed.

● High temperature specification

- Handle with care as the valve body will become hot due to the fluid temperature. Make sure that the valve body's temperature has cooled sufficiently before removing the valve.

⚠ CAUTION

- This product is assembled in a clean room after precision cleaning.
  Open the clean pack in the package box in a clean environment immediately before installation.
- Pipe the valve so that excessive force is not applied to the flange. Fix heavy objects or mounted parts that vibrate so that the torque is not directly applied to the flange.
- Durability could drop if this product is used where there is continuous vibration. Pipe the product so that excessive vibration and impact are not applied.

● High temperature specification

- When thermally insulating the valve, only insulate the body. If the cylinder is insulated, proper operation may not be maintainable. Therefore, please use caution.

2. Direction when connecting piping (for some models)

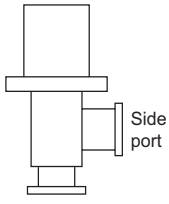
⚠ CAUTION

● The vacuum valve is basically designed so all ports can be used as connection ports to the vacuum pump. However, with some models (below), the port for connection to the vacuum pump is limited to one direction.

<Table 1> Models with limited vacuum pump connection port

Model	Vacuum pump connection port
AVP712-50K	Bottom port (Refer to fig.1)
AVB812-80K	Bottom port (Refer to fig.1)
AVP812-80K	Bottom port (Refer to fig.1)
HVB612-12F-12B	A port
HVB712-15F-15B	A port

<Fig. 1>



If connecting the models in the above table to a port that it is not designated to;problems such as defective sealing or malfunction may occur.

3. Ensuring space

⚠ CAUTION

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

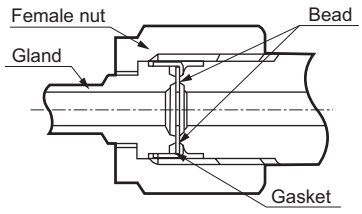
4. Piping

⚠ CAUTION

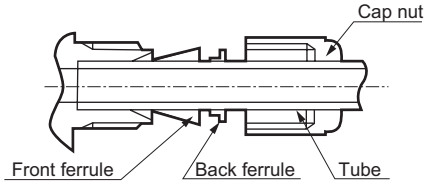
- If dirt or burrs get on pipes or in the areas during piping, the valve seat or O-ring may be damaged;and cause leaks from the valve seat. Carefully remove any dirt or burrs before installing the valve.
- Pipe the product so that the pipe tension, compression, and bending, etc., are not applied to the valve body.
- Handle with care so that the vacuum flange seal surface is not damaged. AVB**7, MBV*17, EVB flange surfaces have a 0.1-0.2 mm step (concave shape) for seal surface protection.
- Durability may decrease depending on the exhaust flow. Therefore, we recommend that you use the bellows side as the exhaust side (except for models with limited vacuum pump connection port).
  Please perform sufficient checks, as durability will vary depending on working conditions.
- When work is completed, always carry out a leak inspection and confirm that there are no leaks.
- Check that no dirt, scratches, or burrs get on the seal before tightening the fitting in the following procedures:

(1)Tightening the fitting

- When the gasket material of JXR fitting is nickel or SUS316, screw in the nut manually until the gasket contacts the bead section, and then tighten another 1/8 turn using a tool. (Contact CKD if other materials are to be used.)



- Double barbed fitting
  Check that the front ferrule, back ferrule, and nut are properly attached, and then insert the tube until it contacts the back of the product. After tightening the nut manually, tighten another 1¼ turn with a tool.



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

5. Solenoid valve

⚠ CAUTION

- High-temperature warning during energizing solenoid valve's coil
  - Coil section of solenoid valves (HVB/HVL) will generate heat when energized. Models using the H Class specification coil (some HVB models) become especially hot when energized. Beware of direct contact, it may cause burns.
- Precautions for wiring solenoid valve
  (1) As a reference, use a lead wire with nominal cross-section area of 0.5 mm^2 or larger. Check that no excessive force is applied to leads.
  (2) Use with in allowable voltage range. Use exceeding the allowable voltage range may cause malfunctions or coil damage.
  (3) Provide an appropriate circuit breaker (such as a fuse) on the control circuit side to protect electrical equipment.
  (4) Using a switching circuit that does not generate contact chattering improves solenoid valve durability.
  (5) If the electric circuit is not susceptible to the solenoid surge, provide measures such as inserting a surge absorber parallel to the solenoid.

6. Air piping

⚠ CAUTION

- Refer to the instruction manual and pipe connection ports correctly.
  - Failure to observe this could lead to operation faults.
- When connecting pipes, wrap sealing tape in the clockwise from threads starting 2 pitches inside from the end of piping threads.
  - If sealing tape protrudes from pipe threads, it could be cut when screwed in. This could cause the tape to enter and lead to faults.

- Tighten pipes with the appropriate torque.
  - Pipes must be connected with the appropriate torque to prevent air leakages and screw damage.
  - First tighten the screw by hand to prevent damage to screw threads, then use a tool.

[Reference value] Please refer to the instruction manual.

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

During use and maintenance

1. Using this product

⚠ WARNING

- Always use this product within the specified range.

⚠ CAUTION

- Do not step on valves, etc., or place heavy objects on them.
- Do not over tighten the manual valve. Over tightening can cause damage to the valve.

● High temperature specification

- Screw hole on the surface of the body side is not for securing. Please do not use.
- When using the AVB∗47 adjusting nut, make sure the valve body has cooled sufficiently before adjusting.

2. Maintenance/inspection

⚠ WARNING

- Always carry out the work as specified in the instruction manual.
- Read instructions and precautions included with the product before use or maintenance.
- Make sure to remove the operating air and fluid before maintenance.

⚠ CAUTION

- Conduct the periodic inspections below to ensure optimal performance of the valve.
  (1) Confirm that there are no leaks outside of the valve.
  (2) Confirm that there are no leaks from the valve seat (internal leaks).
  (3) Confirm that valve operation is smooth.
  (4) Confirm that no pipes or valve screws are loose.
  (5) Confirm that the O-ring is not worn or corroded.
- Be careful not to damage any parts when removing deposits.
- If damage is anticipated before designated durability, perform maintenance and inspections as soon as possible.
- Please use CKD's specified parts for maintenance parts. Refer to the structural drawing/repair parts/ maintenance parts list.
- Please contact CKD or the nearest distributor regarding maintenance parts.

3. Solenoid valve

⚠ CAUTION

- Precaution regarding solenoid valve electric wiring connection electric shock
  ● If electric wiring connection parts (bare live parts) of the solenoid valve (HVB/HVL) are touched, electric shock can occur.
  Always disconnect the power supply before starting disassembly inspection.
  Do not touch the live parts with wet hands.

Safety precautions

Proximity switch/T2H/T2V/T3H/T3V

Please make sure to read the safety precautions in "Pneumatic cylinder I" (No. CB-029SA) before use.

Design and selection

⚠ WARNING

- Application, load current, voltage, temperature, impact, environment, etc., exceeding the specifications will result in damage or operation faults. Use the device as instructed in specifications.
- Do not use this product in flammable atmosphere. Switch doesn't have explosion proof structure. Never use in any atmosphere with explosive gas as it can lead to explosions.

⚠ CAUTION

- Check when using for an interlock circuit.

  When using the cylinder switch for an interlock signal, requiring high reliability, provide mechanical protection or use a double interlock, installing a switch (sensor) other than the cylinder switch as protection against faults. Execute inspection regularly to check that the normal operation is done.

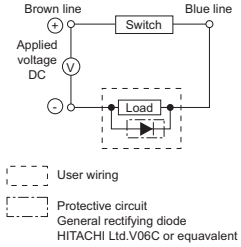
- Check the contact capacity.

  Do not use a load that exceeds the switch's maximum contact capacity. It can cause failure. The switch may not light if the load is less than the rated current value.

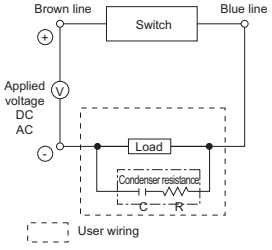
- Check the contact capacity.

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

●Diode use



●When using condenser, resistor

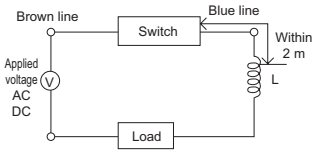


  - Provide a protection circuit when connecting a capacitive load (capacitor), because rush current will occurs when the switch is turned ON.
  - When the wiring length increases, wiring capacity is reached and rush current is generated. This can damage switch or reduce lifetime. Provide a contact protection circuit if the wiring length exceeds values in Table 1.

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

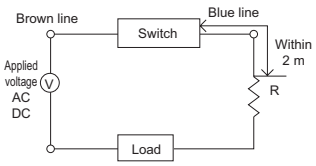
Talbe 1

●Using choke coils



●Choke coils
L = several hundred H to several mH
Outstanding high-frequency characteristics

●Using resistors



●Rush current limiting resistor
R = Largest resistance that load circuit can tolerate

Refer to supplement page 29 of the Pneumatic Cylinders catalog (CB-029SA) for contact protecting circuit specifications.

- Avoid using in an environment exposed to water.
  - Operation faults could occur due to insulation faults.
- Avoid use in environments containing oil or chemicals.
  - The switch could be adversely affected (insulation fault, malfunction caused by swelling of filled resin, hardening of lead sheath, etc.) if used in an environment containing oil, coolant, cleaning fluid, or chemicals. Contact with CKD about such an environment.
- Do not use in a high-impact environment.

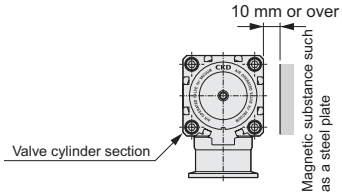
  When using the reed switch, an impact of 294 m/s^2 or more applied during use could output a signal for an instant (1 ms or less), or could turn it OFF. It may be necessary to use a proximity switch depending on the working environment. Contact with CKD.
- Do not use where surge is generated.

  If there is a device (magnetic lifter, high-frequency induction furnace, motor, etc.) that generates a large surge near the valve with a proximity switch, circuit elements in the switch could deteriorate or be damaged. Take measures against the surge-generating source.
- Check the accumulation of iron chips and contact of magnetic material.

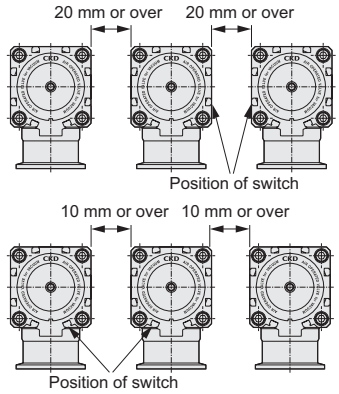
  If a large amount of iron chips, such as cutting chips or welding spatter accumulate or if magnetic objects (material attracted to magnets) are present around the valve with switch, the magnetic force in the valve is lost, and the switch's operations may be inhibited.
  - Note the proximity of valves. When using more than two valves with switches adjacently in parallel, observe the indicated allowable spacing.
  - Switches could malfunction because of bidirectional magnetic interference.

⚠ CAUTION

- Sources of magnetism such as steel plates near the switch could cause the valve to malfunction. Keep at least 10 mm away from the valve.
  (Same for all bore sizes)



■ If valves are adjacent, the switch could malfunction. Check that following distance is maintained between valve surfaces.
(Same for all bore sizes)



■ Check the magnetic environment.

● When installing valves with switches adjacently in parallel or if magnetic material moves near valves with switches, mutual interference may occur and affect detection accuracy.

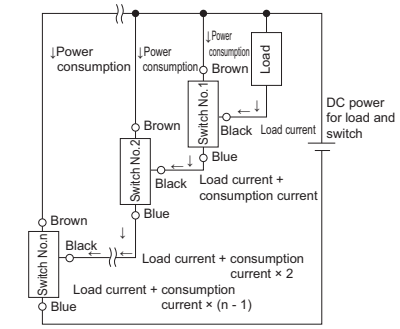
■ Check internal voltage drops caused by serial connections.

● When connecting several 2-wire type switches in serial, 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 voltage. Check load specifications and determine the number of switches to be connected.

● When connecting several 3-wire serial proximity switches, the switch's voltage drop is the total voltage drop of all connected switches, as with the 2-wire switch. The current that flows to the switch is the total of the connected switch's current consumption and load current, as shown below. Check load specifications and determine the number of switches to be connected so that the maximum switch load current is not exceeded.

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

Drg. 1 When it is T3



■ Please use caution to ensure that no current leaks from parallel connections.

● 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 switches to be connected. Note that switch light could dim or may not turn ON.

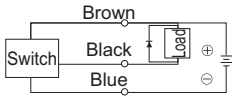
● With the 2-wire proximity switch, when 1 switch is changing from ON to OFF status, voltage at both ends of the switch connected in parallel drops to the internal voltage drop value at switch ON and is less than the load voltage range and other switches will not turn ON. Check input specifications of the programmable controller, which is the connection load, before starting use.

● The 3-wire proximity switch has an extremely small leakage current (10 μA or less), so there is no problem to use under normal conditions.

■ Output circuit protection

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

T3

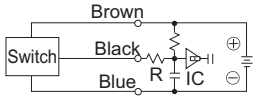


●Diode
D = HITACHI Ltd.V06C
or equavalent product

Example with surge absorbing element combined with inductive load.

● When a capacious load (capacitor) is connected, rush current is generated when the switch is turned ON. Provide the following protective circuit.

T3



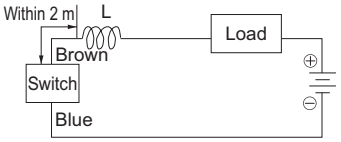
Resistance R (Ω) must be larger than the following equation in this case.

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

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

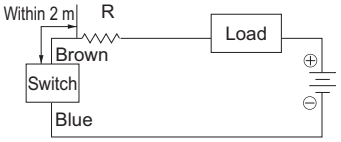
T2

●Using choke coils



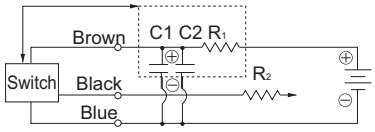
●Choke coils
L = several hundred μH to several mH
Outstanding high-frequency characteristics

●Using resistors



●Rush current limiting resistor
R = Largest resistance that load circuit can tolerate

●Using resistors
Within 2 m



Electric power noise absorptive circuit
C_1 = 20 to 50 μF
Electrolytic condenser (over 50 V withstanding pressure)
C_2 = 0.01 to 0.1 μF
Ceramic condenser
Rush current limiting resistor
R_1 = 20 to 30 Ω
R_2 = Use as much resistance as the load-side circuit allows.

Reed switch ETOH/ETOV

Please make sure to read the safety precautions in "Pneumatic cylinder I" (No. CB-029SA) before use.

Design and selection

⚠ WARNING

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

■Do not use this product in flammable atmosphere. Switch is not explosion proof structure. Never use in any atmosphere with explosive gas as it can lead to explosions.

■LED is used for the lamp. Visibility will slowly decline if used continuously under high temperature. Even if the LED turns off, the switch output will operate properly as it has a separate circuit structure system.

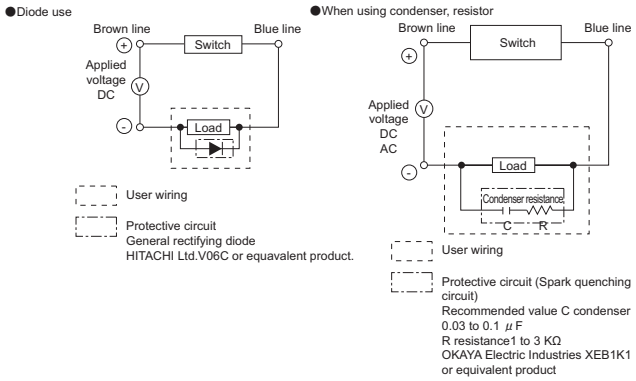
⚠ CAUTION

■Check the contact protection circuit.

Do not use a load that exceeds the switch's maximum contact capacity. It can cause failure. The switch may not light if the load is less than the rated current value.

■Check the contact protection circuit.

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

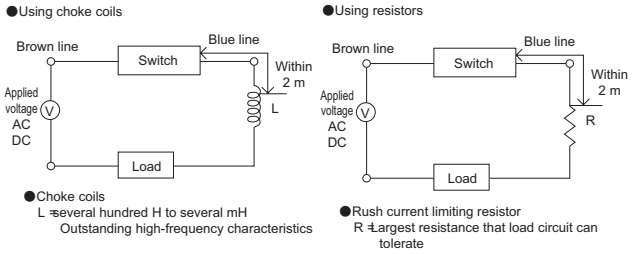


● Provide the contact protection circuit when connecting a capacious load (condenser), because rush current will be generated when the switch is turned ON.

● When the wiring length increases, wiring capacity is reached and rush current is generated. This can damage switch or reduce lifetime. Provide a contact protection circuit if the wiring length exceeds values in Table 1.

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

Talbe 1

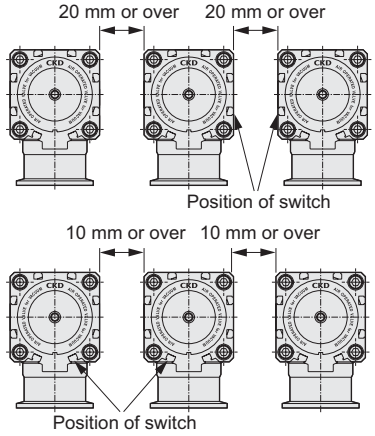


Refer to supplement page 29 of the Pneumatic Cylinders catalog (CB-029S) for contact protecting circuit specifications.

■Check the magnetic environment.

● When installing valves with switches adjacently in parallel or if magnetic material moves near valves with switches, mutual interference may occur and affect detection accuracy.

● When adjoining switches other than ET0 types, usage in the below distances can cause malfunction. Accordingly, confirm its operation before use. (Same for all bore sizes)



■Check internal voltage drops caused by serial connections.

● When connecting several 2-wire type switches in serial, 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 voltage. Check load specifications and determine the number of switches to be connected.

■Please use caution against leaking current from parallel connections.

● 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 switches to be connected. Note that switch light could dim or may not turn ON.

Installation and adjustment

⚠ CAUTION

■ Do not drop or bump the product

Do not drop, bump, or apply excessive impact (294 m/s^2 or more for reed switches, 980 m/s^2 or more for proximity switches). Even if the switch case does not break, switch components could break or malfunction.

■ Do not carry the valve by the switch's lead wire.

Do not carry the valve by the switch's lead wire because the wire could disconnect, and stress on the switch could damage switch components.

■ Do not wire with a power cable or high voltage cable.

Avoid wiring in parallel with or in the same conduit as a power cable or high voltage cable. Wire separately. Control circuit (including switch) can malfunction due to noise.

■ Do not short-circuit the load.

If turned ON while the load is short-circuited, an overcurrent will flow, and the switch will be damaged instantly.

■ Use caution with regards to lead wire connections.

Turn OFF power to the device in the electric circuit to be connected before starting wiring. Conducting work with power ON could result in accidents from electric shock or unpredictable operation.

● Reed switch

Connect the switch's lead wire in parallel to the load instead of directly to power. For TO, use caution regarding "1", "2" below.

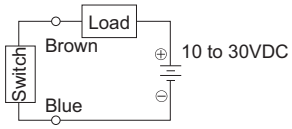
(1) When used for DC, connect so that the brown wire is on the plus (+) side and the blue wire on the negative (-) side.
The switch will function when connected in reverse, but the light will not turn ON.

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

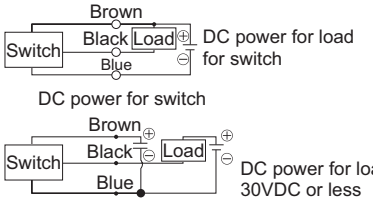
● Proximity switch

Connect the lead wires in the following diagram correctly according to color codes. Incorrect wiring could result in damage.

●T2



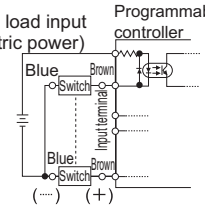
●T3



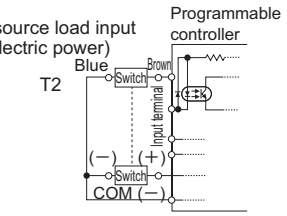
Connection to programmable controller(PLC)

● Connection differs with the type of programmable controller used. Connect based on input specifications.

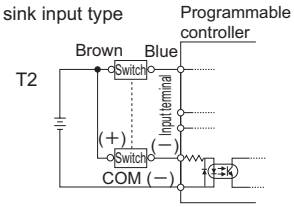
●Connection to source load input type (w/external electric power)



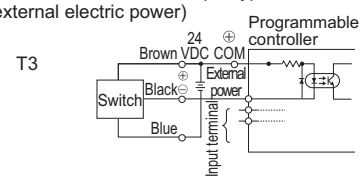
●Connection to source load input type (internal electric power)



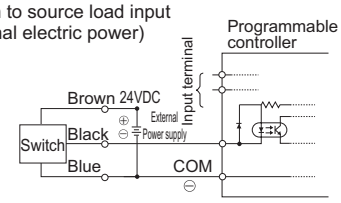
●Connection to sink input type



●Connection to source load input type (w/external electric power)



●Connection to source load input type (internal electric power)



■ Set the switch to the center of the operation range.

Adjust the switch installation position so that the piston stops at the center of the operating range (range while power is ON). Operation may become unstable if set at the end of the operating range (near the ON, OFF borderline).

■ Observe tightening torque when installing the switch.

If the tightening torque range is exceeded, the set screw, bracket, switch, etc., could be damaged.
If installed with a tightening torque less than that designated, the switch installation position could deviate.
Loosen the tightening screw (set screw), and move the switch along the switch groove. Tighten at the required position.
Tighten the switch fixing screw using a flat-tipped screwdriver 5 to 6 mm in grip diameter, 2.4 mm or less in end width, and 0.3 mm or less in thickness (precision screwdriver, or one for clocks) with a tightening torque of 0.1 to 0.2 N•m. Tighten ETOH and ETOV with a tightening torque of 0.5 to 0.7 N•m.

■ Protection for lead wire

Lead wire's minimum curve radius shall be 9 mm or over (while secured). Use care when wiring so that there is no repeated bending stress or tension.

■ Relay

Use the following or equivalent relays.

○ OMRON ····· MY type
○ Electric ····· HH5 type
○ Tokyo Electric Company ····· MPM type
○ MATSUSHITA ELECTRIC WORKS LTD. ·· HC type

During use and maintenance

⚠ WARNING

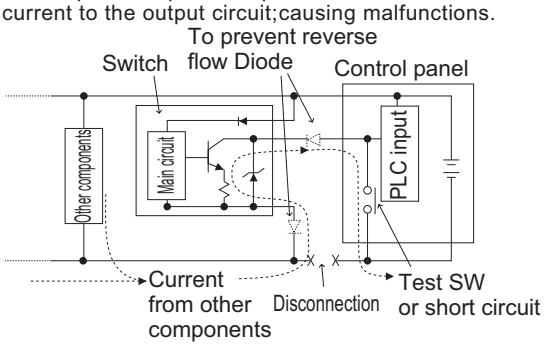
■ Please do not use/apply over current.

If overcurrent flows to the cylinder switch because of a load short-circuit, etc., the switch will be damaged and could ignite. Install overcurrent protection circuits such as fuses in output wires and power supply wires as needed.

⚠ CAUTION

■ Use caution regarding reverse electrical current caused by disconnection and wiring resistance.

● When other components (including switches) are connected to the same power supply as the switch, short circuiting the output wire and power supply wire side or disconnecting the power supply wire side to check the control panel's input unit operation can send reverse current to the output circuit;causing malfunctions.

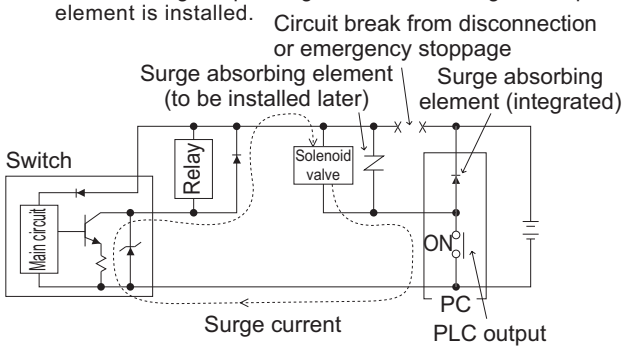


● To prevent malfunction from reverse currents, take countermeasures such as the following.

(1) Avoid centralizing current at the power cable, especially a negative power cable, and use as thick a wire as possible.
(2) Limit components connected to the same power source as the switch.
(3) Prevent reverse current by inserting diode in a series on the switch output wire.
(4) Insert a diode serially with the switch power cable negative side to prevent reversal of current.

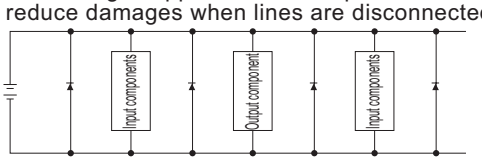
■ Pay attention to leading of surge current

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



● To prevent malfunction from surge current leading, take countermeasures such as those listed below.

(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 you cannot separate the power source, install a direct surge absorption element for all inductive loads. Note that the surge absorption element connected to the PLC, etc., protects only that device.
(3) Connect surge suppressors to the points as following to reduce damages when lines are disconnected.

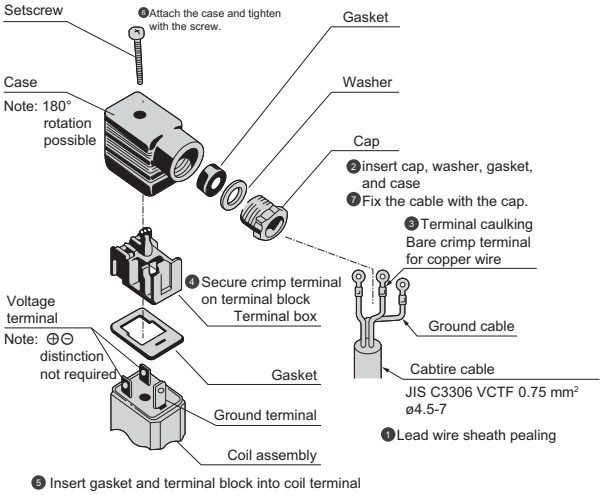


When devices are connected to a connector, the output circuit could be damaged by the above if the connector is disconnected while power is ON. Turn power OFF before connecting or disconnecting the connector.

How to wire the terminal box

■DIN terminal box (Pg9), DIN terminal box w/lamp (Pg9)

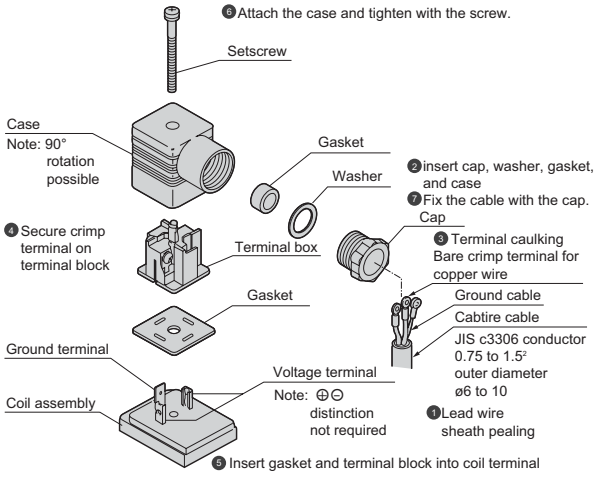
(1) Use the following cabtire cable.
• Cable outer diameter: ø4.5 to ø7 • Nominal section area: 0.75 mm²
(2) Insert the crimp terminal for copper wires into the cabtire cable's lead wire, and crimp the terminal with the designated tool. M3 terminal screws are used with the terminal box.
(3) Tighten screws with the following tightening torque.
• Screw tightening torque0.5Nm
• Terminal screw tightening torque0.5Nm



∗ The orientation of the cable lead out port is changed by taking out the terminal box from the case, rotating it by 180°, then replacing the terminal box into the case.

■DIN terminal box (Pg11), DIN terminal box w/lamp (Pg11)

(1) Use the following cabtire cable.
• Cable outer diameter: ø6 to ø10 • Nominal section area: 0.5 to 1.5 mm²
(2) Insert the crimp terminal for copper wires into the cabtire cable's lead wire, and crimp the terminal with the designated tool. M3 terminal screws are used with the terminal box.
(3) Tighten screws with the following tightening torque.
• Screw tightening torque0.5Nm
• Terminal screw tightening torque0.5Nm



∗ The orientation of the cable lead out port is changed by taking out the terminal box from the case, rotating it by 90°, then replacing the terminal box into the case.

Electric vacuum valve

Safety precautions

Always read this section before starting use.
Refer to Into page 9 for general precautions.

Design and selection

1. Confirming specifications

⚠DANGER

- Do not use where there are dangerous items such as ignitable items, inflammable items, and explosive items.
  It can cause ignition, flames, and explosion.
- This product has not been water-proofed. Make sure there is no water or oil contact.
  It can cause fire and failure.
- Make sure to use DC stabilized power supply for motor or motor control, and output circuit power supplies.
  Connecting directly to AC power supply can result in fire, rupture, damage, etc.

⚠WARNING

- Incorrect selection and handling of devices may cause problems with this product and problems in the user's system. Confirm that the regulator specifications and the user's system are compatible before use.
- Design the safety circuit or device so that there is no damage to the device or injuries to people when the machine stops due abnormal conditions (such as emergency stoppage and power outage).
- Install indoors in an area with low humidity.
  Installing in areas where the rainwater can contact the product or with high humidity (85 humidity or more, areas with dew condensation) can lead to electricity leakage, fires, and similar accidents. Oil droplets and oil mist are also strictly prohibited.
- Use and store in condition without dew condensation while obeying usage and storage temperatures.
  It can cause emergency stoppage, service life decline, etc. Ventilate if heat builds up.
- Install in areas without direct sunlight, dust particles, heating elements, corrosive gas, explosive gas, flammable gas, and combustibles. Consideration has not been taken regarding chemical resistance.
  It can cause failure, explosion, or ignition.
- Use and store in areas without strong electromagnetic waves, ultraviolet rays, or radiation.
  It can cause malfunction or failure.

⚠CAUTION

- When wiring, in order to avoid induction noise being applied;do not pipe or wire with areas where large electric currents or strong magnetic fields can occur, or with large type motor power lines of those other than this unit. Use caution regarding inverter power supply and wiring sections used in robots, etc. Install a frame ground for same power source and make sure to insert a filter into output sections.
- If this product's output section and inductive loads that can generate surges (such as solenoid valves and relays) use a common power source, surge current can lead into output sections;causing damage. Therefore, separate inductive load outputs and this product's output power. If you cannot separate the power source, connect a surge absorbing element to all inductive loads directly and use a parallel configuration.
- Do not disassemble the product.
- Cables cannot be used in applications with repeated bending.
- Secure cables so that they cannot be moved easily. When securing, do not bend cables in sharp angles.

2. Working media

⚠CAUTION

- This product is designed to control vacuum or inert gas. Using other fluids (active gas, liquids, solids, etc.) may disrupt the product's operation or performance could drop. Confirm the compatibility of materials used for wetted area and the fluid used. If the working fluid could solidify, check that no problems in use exist before starting.
- Avoid using fluids causing crystals to accumulate in piping.

Installation and adjustment

1. Installation

⚠DANGER

■ When installing the product, make sure to perform reliable holding and securing. Injuries can be caused by overturning, falling, abnormal operation, etc. of the product.

⚠WARNING

■ Incorrect installation and piping will cause product problems, may cause problems in the user's system, and may cause death or serious injury. The user is responsible for ensuring that the operator has read the instruction manual and fully understands the system. After installation, check to make sure it is properly installed.

■ Overturning, vibration, and impact during transport is dangerous due to precision parts in the product.
It can cause damage to parts.

■ If placing at a temporary location, make sure it is horizontal.

■ Do not get on top of packaging and do not place items on top of the product.

■ Ambient temperature and ambient humidity during transport shall be -20-60℃ and 35-85%, respectively. Make sure there is no dew condensation or freezing.
It can cause product failure.

■ Install the product on nonflammables. Installation directly or near flammable items can cause fire.

■ Make sure to perform D class grounding construction (ground resistance 100Ω or less) for the product.
Electricity leakage can cause electric shock, malfunctions, etc.

■ Securely perform wiring of this product without incorrect wiring or loose connectors while following this catalog. Check wiring insulation.
Contact with other circuits, ground fault, and defective terminal insulation can lead to overcurrent flowing into the product;causing damage. It can cause abnormal operation and fire.

■ Make sure to perform safety checks of the area surrounding the instrument before turning on the product's power. Immediately turn off the power if the indicator light indicates abnormality upon turning on the power.
Supplying the power carelessly can cause electric shock, injury, etc.

■ Valves and controllers are adjusted during assembly for shipping. Always use valves and controllers with the same name plate display details as a set. Changing the grouping/pairing can cause abnormal operation.

■ Always use the cable included for the cable between the valve and controller. Install so that there is no excess force applied or possibility of scratches. Do not modify the enclosed cable (change the length or material) because this could cause malfunction or faults.

■ Make sure hands and body parts do not contact the product during operation or immediately after stoppage.
There is risk of burn injuries.

■ Do not place objects, or step on this product.
It can cause falling accidents, overturning of the product, injury due to dropping, product damage, malfunction due to damage, etc.

■ If power is shutdown (including shutdown due to failure), take sufficient countermeasures to protect workers and devices.
It can lead to unforeseen accidents.

2. Ensuring space

⚠CAUTION

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

■ Ensure sufficient space for maintenance and inspection.

3. Piping

⚠CAUTION

■ The inside of the bellows are directly connected to the atmosphere. Make sure there is no blockage in the connection hole (1 hole on the upper part of the body) connecting the inside of the bellows to the atmosphere.

■ If foreign substance or burrs get on pipes or from areas in which piping is taking place, the valve seat or O-ring may be damaged;causing leakage. Carefully remove any dirt or burrs before installing the valve.

■ Pipe the product so that the pipe tension, compression, and bending, etc., are not applied to the valve body.

■ Clean the vacuum flange's seal face and the center ring's O ring with ethanol, etc., before installing.

- There is a 0.1 to 0.2 mm step (indentation) on the vacuum flange to protect the seal. Handle this part carefully so that the seal face is not scratched, etc.
- Durability could drop because of exhaust flow, so the bellows should be used as the exhaust side.
  Please perform sufficient checks, as durability will vary depending on working conditions.
- When piping work is completed, always carry out a leak inspection and confirm that there are no leaks.
- During transfer or installation, do not hold the cable section.
  It may causes injury or disconnection
- Do not pipe to areas with major vibration or impact.
  Major vibration or impact can cause malfunction. Especially, durability could drop if this product is used where there is continuous vibration. Pipe the product so that excessive vibration and impact are not applied.
- Do not operate product's movable sections forcibly by external force.
  Regenerative current may lead to malfunction or damage.
- When origin is returning, do not put external force on the valve. It may misrecognize the origin.
- Do not place strong magnetic fields such as rare earth magnets near the product's body. It may not be able to maintain expected accuracy.
- To prevent chattering malfunctions, the external I/F input area recognizes when the input signal status is 50 msec or more.
- This product is assembled in a clean room after precision cleaning.
  Open the clean pack in the package box in a clean environment immediately before installation.
- Pipe the valve so that excessive force is not applied to the flange. Fix heavy objects or mounted parts that vibrate so that torque is not directly applied to the flange.

During use and maintenance

1. Using this product

⚠DANGER

- Wiring and inspection shall be conducted by specialized engineers.
- Perform wiring of the product after piping.
  This could lead to electric shock.
- Do not work with wet hands.
  This could lead to electric shock.
- Conduct wiring and inspection after more than 5 minutes has exceeded since turning the power off and after checking the voltage with a tester, etc.
  It could lead to electric shock.
- Do not install/remove wiring or connector-type items while the power is on.
  There is danger of malfunction, failure, and electric shock.

⚠WARNING

- Storage environment conforms to the installation environment, however, long-term storage for more than 1 month is not recommended. Please especially take measures to prevent dew condensation.

2. Maintenance/inspection

⚠WARNING

- Always carry out the work regularly as specified in the instruction manual.
- Read instructions and precautions included with the product before use or maintenance.
- Always turn the power OFF and release any fluids before starting maintenance.

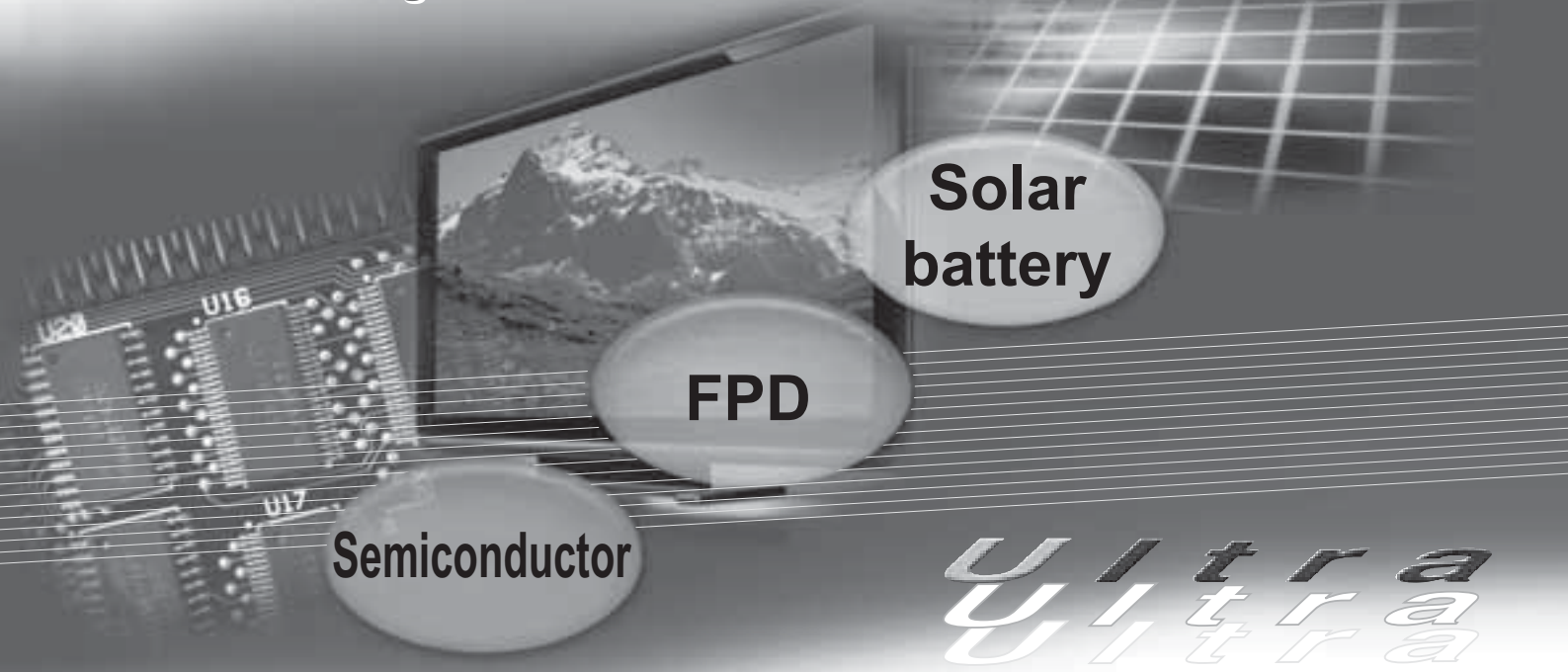
⚠CAUTION

- Conduct the periodic inspections below to ensure optimal performance of the valve.
  (1) Confirm that there are no leaks outside of the valve.
  (2) Confirm that there are no leaks from the valve seat (internal leaks).
  (3) Confirm that valve operation is smooth.
  (4) Confirm that no pipes or valve screws are loose.
  (5) Confirm that the O-ring is not worn or corroded.
- Be careful not to damage any parts when removing deposits.
- If damage is anticipated before designated durability, perform maintenance and inspections as soon as possible.
- Product service life may decline from very small and repeated opening/closing of the valve. We recommend fully opening the valve periodically.
- Shutdown the power immediately in case of product failure (abnormal heat, smoke, smell, sound, vibrations, etc.) It can cause product damage and fire due to continuous electrical current flow.
- When conducting maintenance, inspection, and repairs;always do so after turning off the power supply to this product. Use caution for surroundings to prevent a third person from accidentally turning on the power or operating.
- Comply with laws regarding waste disposal and cleaning when disposing of this product. Dispose of the product by subcontracting to waste treatment professionals, etc.
- When without power supply, this product's valve is structured to be closed by a spring (normal close). Before turning on the power, check to make sure that the leakage amount is a tolerable amount;then start operation.
- When the power is turned on, false recognition of closed valve may occur due to foreign matter being caught, etc. Before turning on the power, check to make sure that the leakage amount is a tolerable amount;then start operation.
  After turning ON the power, check to make sure opening misfunction does not occur by setting the degree of opening to the maximum.
- This product's integrated control board, a condenser is connected between the same circuit and metal body to prevent static electricity damage. Therefore, do not conduct withstanding voltage tests or insulation resistance tests on devices that have this product connected. Conducting such tests can damage this product. If necessary to conduct such tests for the device, please first remove/detach this product.

Long service life, high durability.

Unprecedented drive life achieved through a special structure that employs CKD's original formed bellows.
Highly reliable and easy-to-use high vacuum control valve part 7 series.

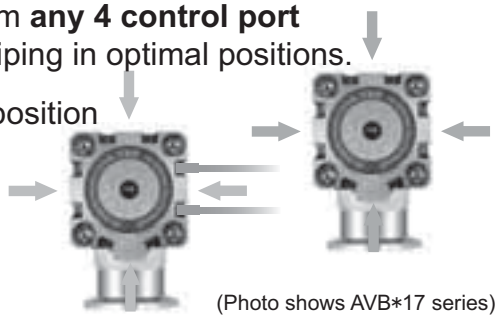
Double acting and manual models added to the series!



Ultra Ultra

Increased positioning and piping flexibility

- Option to choose from **any 4 control port positions** enables piping in optimal positions.
- Miniature operating position detection **switches** can be installed in **all 4 positions**.
  (Port size NW16 is 3-sided)



(Photo shows AVB*17 series)

Ultra-fine concept

CKD's unique UF concept implements complete cleanness in all critical areas for product development from design, evaluation, manufacturing methods, to manufacturing for total cleanness control of products.

Installation compatibility

Installation method is ISO21358 compliant.

Visually check operation

Indicator provided as standard.

(Photo shows MVB*17 series)

Weight reduced with aluminum body

Significant weight reduction achieved compared to conventional stainless steel body.

A wide variety of flange sizes

Model no.	Actuation	Connection							Indicator
		NW16	NW25	NW40	NW50	NW63	NW80	NW100	Standard equipment
AVB * 17	NC	●	●	●	●	●	●		●
AVB * 47	Two stage type	●	●	●	●	●	●		●
AVB * 37	Double acting	●	●	●	●	●	●	●	●
MVB * 17	Manual	●	●	●	●				●

Installation possible in any 4 directions

Operation port

Light weight
with aluminum body

Check operation with just one look

Indicator

Switches can be installed on all 4 sides

Switch

Reed/proximity switch (can be installed later)

Uniquely formed bellows

AVB*17 series

New

New

AVB*47 series | AVB*37 series | MVB*17 series

Fine

AVB 7 Series

Air operated valve for high vacuum

New

MVB 7 Series

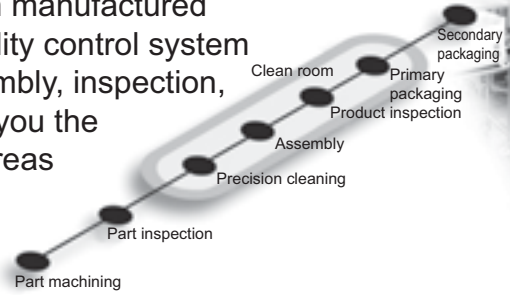
Manual valve for high vacuum

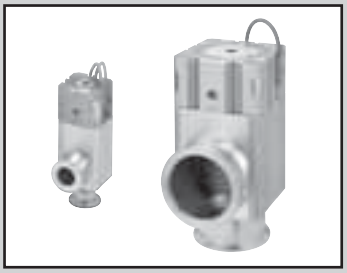
RoHS **RoHS compliant**

Substances harmful to the environment, including lead and hexavalent chrome, have been eliminated.

Total cleanness control system

This product has been manufactured using a seamless quality control system from machining, assembly, inspection, to packaging. Giving you the highest quality in all areas including cleanness.



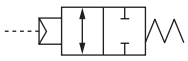


NC type air-operated valve for high vacuum

AVB*17 Series

● Formed bellows aluminum body type

Specifications

Descriptions	AVB217	AVB317	AVB417	AVB517	AVB617	AVB717
Working fluid	Vacuum and inert gas					
Working pressure range Pa (abs)	1.3×10^{-6} to 1×10^{5}					
Maximum working differential pressure MPa	0.1					
Valve seat leakage Pa·m³/s (He)	1.3×10^{-10} or less					
External leakage Pa·m³/s (He)	1.3×10^{-11} or less					
Withstanding pressure MPa	0.3					
Fluid temperature ℃	5 to 60 (5 to 150) Note 1					
Ambient temperature ℃	0 to 60 (no freezing)					
Orifice mm	ø17	ø24	ø39	ø48	ø68	ø80
Conductance Note 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					

Note 1: Inside the parentheses "( )" indicate high temperature specification types.
Note 2: The conductance is the theoretical calculation value at the molecular flow range, and is not the actual measurement value.

Switch specifications

Descriptions	Proximity switch		Reed switch		
	T2H/T2V	T3H/T3V	TOH/TOV	T5H/T5V	ETOH/ETOV
Applications	Programmable controller	Relay, programmable controller	Relay, programmable controller	Programmable controller, relay, IC circuit (w/o lamp), Serial connection	Relay, programmable controller
Power voltage	-	10 to 28 VDC	-	-	-
Load voltage/current	10 to 30VDC, 5 to 20 mA Note 4	30VDC or less, 100 mA or less	12/24VDC 5 to 50 mA 100VAC 7 to 20 mA	12/24VDC 50 mA or less 100VAC 20 mA or less	12/24VDC 5 to 50 mA 110VAC 7 to 20 mA
Power consumption	-	10 mA or less at 24VDC (ON)	-	-	-
Internal voltage drop	4 V or less	0.5 V or less	3 V or less	0 V	3 V or less
Light	LED (ON lighting)			-	LED (ON lighting)
Leakage current	1 mA or less	10 μA or less	0 mA	0 mA	0 mA
Lead wire length Note 3	Standard 1 m (oil-resistant vinyl cabtire cord 2-conductor 0.2 mm²)	Standard 1 m (oil-resistant vinyl cabtire cord 3-conductor 0.2 mm²)	Standard 1 m (oil resistant vinyl round code 2-conductor 0.2 mm²)		Standard 1 m (heat-resistant fluorine insulation cabtire cord 2-conductor 0.5 mm²)
Maximum impact	980 m/s²		294 m/s²		
Insulation resistance	20 MΩ and over when measured with a 500VDC megger				100 MΩ and over when measured with a 500VDC megger
Withstand voltage	No abnormal condition when 1000VAC applied for 1 min				
Ambient temperature range	-10 to +60℃				-10 to +150℃
Protective structure	IEC Standard IP67, JIS CO920 (water-tight type), oil-resistant				

Note 3: 3 m and 5 m lead wire lengths are also available.
Note 4: Above-mentioned load current's maximum value 20 mA is for 25℃.
The current will be lower than 20 mA if ambient temperature around the switch is higher than 25℃. (5-10mA at 60˚C)
Note 5: For other safety precautions regarding switch usage, refer to pages 105 to 109.

How to order

AVB 4 17 - 40K - ○ - 4 - D T5H 3 - H

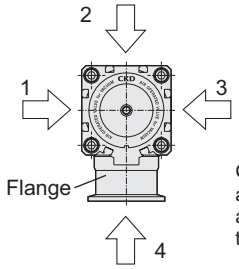
Model no.
Ⓐ Series
Actuation
NC
Ⓑ Connection
Ⓒ Fluid temperature
Ⓓ Operation port position
Ⓔ Switch installation position Note 1
Ⓕ Switch model No. Note 2
Ⓖ Switch lead wire length Note 3
Ⓗ Switch quantity Note 4

Symbol	Descriptions
Ⓐ Series	
2	Orifice ø17
3	Orifice ø24
4	Orifice ø39
5	Orifice ø48
6	Orifice ø68
7	Orifice ø80 (Cannot be selected with high temperature spec)

Ⓑ Connection		
16K	NW16	Available for AVB217 only
25K	NW25	Available for AVB317 only
40K	NW40	Available for AVB417 only
50K	NW50	Available for AVB517 only
63K	NW63	Available for AVB617 only
80K	NW80	Available for AVB717 only

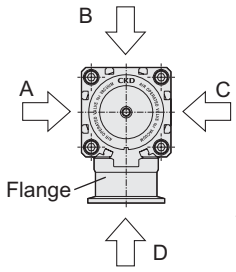
Ⓒ Fluid temperature	
Blank	5 to 60℃ (magnet integrated)
HO	5 to 150℃ (without magnet)
HOM	5 to 150℃ (magnet integrated)

Ⓓ Operation port position

4	
1	
2	
3	

Operation port positions are displayed (4, 1, 2, 3) as viewed from the valve's top surface.

Ⓔ Switch installation position

Blank	Without switch
D	
A	
B	
C	

Switch installation positions are displayed (D, A, B, C) as viewed from the valve's top surface.

Ⓕ Switch model No.

Blank	Without switch		
T0H	Axial lead wire	Reed	2 wire
T5H			
T0V	Radial lead wire		
T5V			
T2H	Axial lead wire	Proximity	3 wire
T3H			
T2V	Radial lead wire		2 wire
T3V			3 wire
ETOH	Axial lead wire	Reed	2 wire
ETOV	Radial lead wire		

Ⓖ Switch lead wire length

Blank	1 m (standard)
3	3 m
5	5 m

Ⓗ Switch quantity

H	Detect when valve is open
R	Detect when valve is closed
D	Detect when valve is open/closed

Note on model no. selection

Note 1: Only Series 2 (ø17 orifice) has 3-sided switch installation. Switch installation is possible on all surfaces excluding the control port side. Not available for the models below
AVB217-16K-1-AⒻⒼ-Ⓗ
AVB217-16K-2-BⒻⒼ-Ⓗ
AVB217-16K-3-CⒻⒼ-Ⓗ
AVB217-16K-4-DⒻⒼ-Ⓗ
Note 2: Ⓒ If fluid temperature is "HOM", select either ETOH or ETOV.
Note 3: Ⓕ "3" and "5" are not available for switch model no. "ETOH", "ETOV".
Note 4: Ⓕ "R" and "D" are not available for switch model no. "ETOH", "ETOV".

<Example of model number>

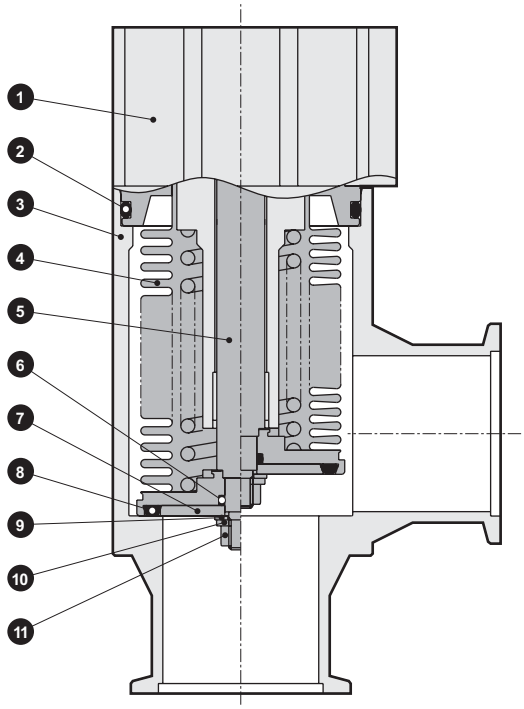
AVB417-40K-4-DT5H3-H

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

ⒶSeries	: Orifice ø39
ⒷConnection	: NW40
ⒸFluid temperature	: 5 to 60℃ (magnet integrated)
ⒹOperation port position	: 4
ⒺSwitch installation position	: D
ⒻSwitch model No.	: T5H (Axial lead wire)
ⒼLead wire length	: 3 m
ⒽSwitch quantity	: Detect when valve is open

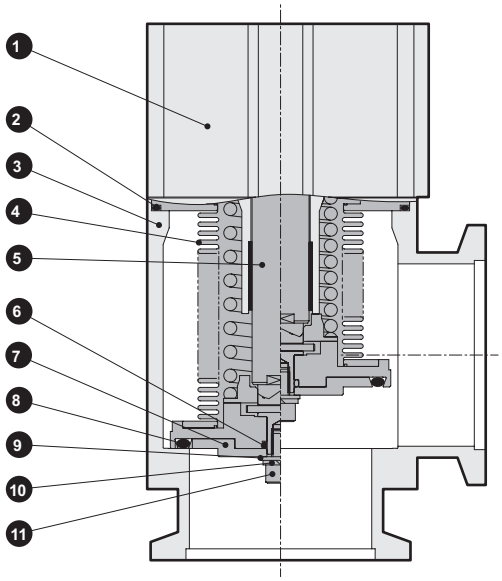
Internal structure and parts list (NC type)

● AVB217/AVB317/AVB417/AVB517/AVB617



No.	Part name	Material
1	Cylinder (magnet integrated)	
2	O ring	FKM
3	Body	A6063
4	Bellows	SUS316L
5	Rod	SUS316L
6	O ring	FKM
7	Valve disk B	SUS316L
8	O ring	FKM
9	Plain washer	SUS304
10	Spring washer	SUS304
11	Hexagon nut	SUS304

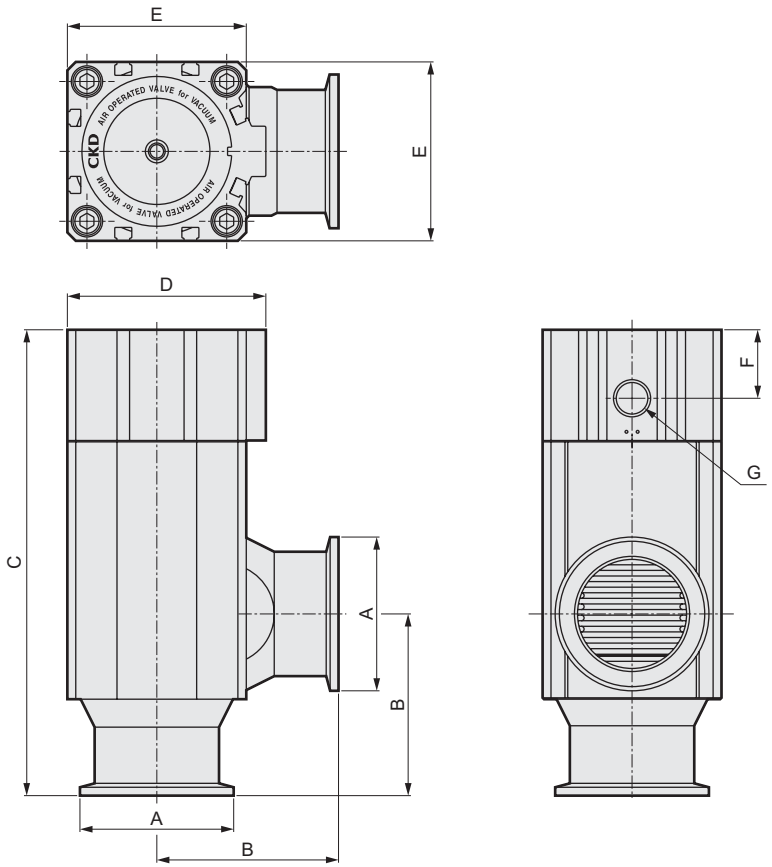
● AVB717



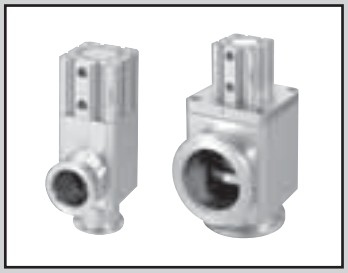
No.	Part name	Material
1	Cylinder (magnet integrated)	
2	O ring	FKM
3	Body	A6063
4	Bellows	ASL350
5	Rod	SUS304
6	O ring	FKM
7	Valve disk B	SUS316L
8	O ring	FKM
9	Plain washer	SUS304
10	Spring washer	SUS304
11	Hexagon socket bolt	SUS304

Dimensions (NC type)

● 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

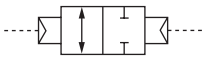


Air-operated valve for high vacuum (double-acting type)

AVB*37 Series

● Formed bellows aluminum body type

Specifications

Descriptions	AVB237	AVB337	AVB437	AVB537	AVB637	AVB737	AVB837
Working fluid	Vacuum and inert gas						
Working pressure range Pa (abs)	1.3×10^{-6} to 1×10^{5}						
Maximum working differential pressure MPa	0.1						
Valve seat leakage Pa·m³/s (He)	1.3×10^{-10} or less						
External leakage Pa·m³/s (He)	1.3×10^{-11} or less						
Withstanding pressure MPa	0.3						
Fluid temperature ℃	5 to 60						
Ambient temperature ℃	0 to 60 (no freezing)						
Orifice mm	ø17	ø24	ø39	ø48	ø68	ø80	ø100
Conductance Note 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	 Double acting						

Note 1: The conductance is the theoretical calculation value at the molecular flow range, and is not the actual measurement value.

Switch specifications

Descriptions	Proximity switch		Reed switch	
	T2H/T2V	T3H/T3V	TOH/TOV	T5H/T5V
Applications	Programmable controller	Relay, programmable controller	Relay, programmable controller	Programmable controller, relay, IC circuit (w/o lamp), Serial connection
Power voltage	-	10 to 28VDC	-	-
Load voltage/current	10 to 30VDC, 5 to 20 mA Note 3	30 VDC or less, 100 mA or less	12/24VDC 5 to 50 mA 100VAC 7 to 20 mA	12/24VDC 50 mA or less 100VAC 20 mA or less
Power consumption	-	10 mA or less at 24VDC (ON)	-	-
Internal voltage drop	4 V or less	0.5 V or less	3 V or less	0 V
Light	LED (ON lighting)			-
Leakage current	1 mA or less	10 μA or less	0 mA	0 mA
Lead wire length Note 2	Standard 1 m (oil-resistant vinyl cabtire cord 2-conductor 0.2 mm²)	Standard 1 m (oil-resistant vinyl cabtire cord 3-conductor 0.2 mm²)	Standard 1 m (oil resistant vinyl round code 2-conductor 0.2 mm²)	
Maximum impact	980 m/s²		294 m/s²	
Insulation resistance	20 M Ω and over when measured with a 500VDC megger			
Withstand voltage	No abnormal condition when 1000VAC applied for 1 min			
Ambient temperature range	-10 to +60℃			
Protective structure	IEC Standard IP67, JIS CO920 (water-tight type), oil-resistant			

Note 2: 3 m and 5 m lead wire lengths are also available.
Note 3: Above-mentioned load current's maximum value 20 mA is for 25℃.
The current will be lower than 20 mA if ambient temperature around the switch is higher than 25℃. (5-10 mA at 60℃)
Note 4: For other safety precautions regarding switch usage, refer to pages 105 to 109.

How to order

AVB 4 37 - 40K - ○ - 4 - D T5H 3 - H

Model no.

Ⓐ Series

Actuation
Double acting

Ⓑ Connection

Ⓒ Fluid temperature

Ⓓ Operation port position

Ⓔ Switch installation position
Note 1

Ⓕ Switch model no.

Ⓖ Switch lead wire length

Ⓗ Switch quantity

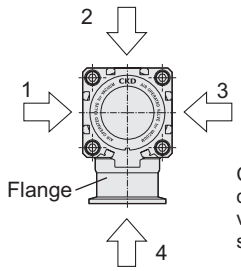
Symbol	Descriptions
Ⓐ Series	
2	Orifice ø17
3	Orifice ø24
4	Orifice ø39
5	Orifice ø48
6	Orifice ø68
7	Orifice ø68
8	Orifice ø100

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

Ⓒ Fluid temperature	
Blank	5 to 60℃ (magnet integrated)

Ⓓ Operation port position

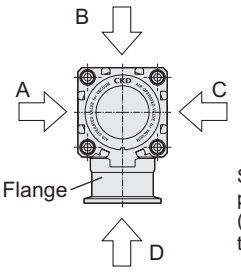
4
1
2
3



Control port positions are displayed (4, 1, 2, 3) as viewed from the valve's top surface.

Ⓔ Switch installation position

Blank	Without switch
D	
A	
B	
C	



Switch installation positions are displayed (D, A, B, C) as viewed from the valve's top surface.

Ⓕ Switch model no.

Blank	Without switch		
T0H	Axial lead wire	Reed	2 wire
T5H			
T0V	Radial lead wire		
T5V			
T2H	Axial lead wire	Proximity	3 wire
T3H			
T2V	Radial lead wire		2 wire
T3V			3 wire

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

Ⓗ Switch quantity	
H	Detect when valve is open
R	Detect when valve is closed
D	Detect when valve is open/closed

⚠ Note on model no. selection

Note 1: Only Series 2 (ø17 orifice) has 3-sided switch installation.Switch installation is possible on all surfaces excluding the control port side.
Not available for the models below
AVB237-16K-1-AⒻⒼ-Ⓗ
AVB237-16K-2-BⒻⒼ-Ⓗ
AVB237-16K-3-CⒻⒼ-Ⓗ
AVB237-16K-4-DⒻⒼ-Ⓗ

<Example of model number>

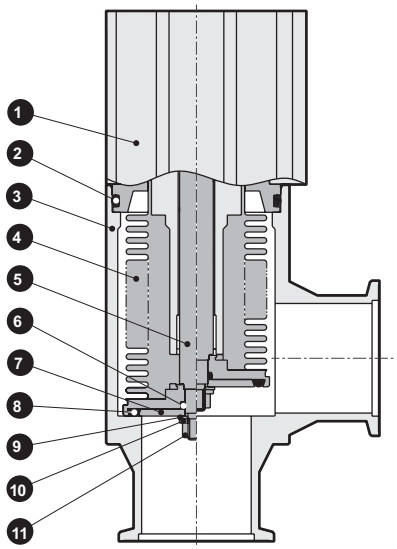
AVB437-40K-4-DT5H3-H

Model: AVB417 Air-operated valve for high vacuum (double-acting type)

Ⓐ Series : Orifice ø39
Ⓑ Connection : NW40
Ⓒ Fluid temperature : 5 to 60℃ (magnet integrated)
Ⓓ Control port position : 4
Ⓔ Switch installation position : D
Ⓕ Switch model no. : T5H (Axial lead wire)
Ⓖ Lead wire length : 3 m
Ⓗ Switch quantity : Detect when valve is open

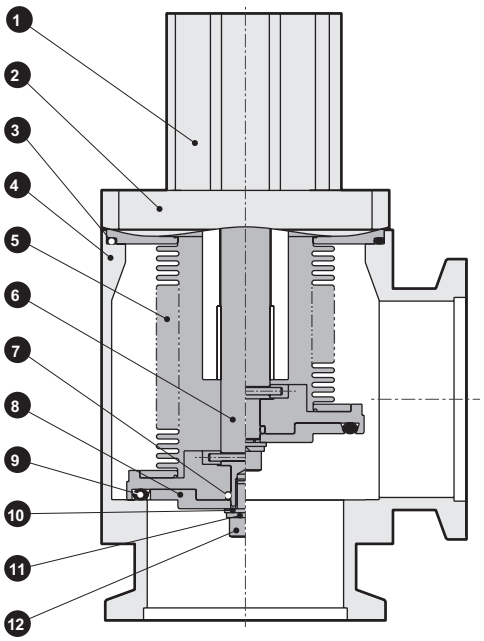
Internal structure and parts list (double-acting type)

● AVB237/AVB337/AVB437/AVB537/AVB637

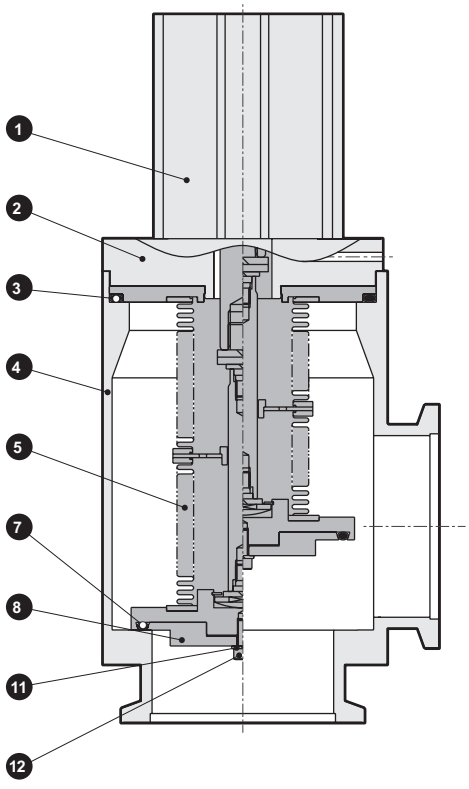


No.	Part name	Material
1	Cylinder (magnet integrated)	
2	O ring	FKM
3	Body	A6063
4	Bellows	SUS316L
5	Rod	SUS304
6	O ring	FKM
7	Valve disk B	SUS316L
8	O ring	FKM
9	Plain washer	SUS304
10	Spring washer	SUS304
11	Hexagon nut	SUS304

● AVB737



● AVB837

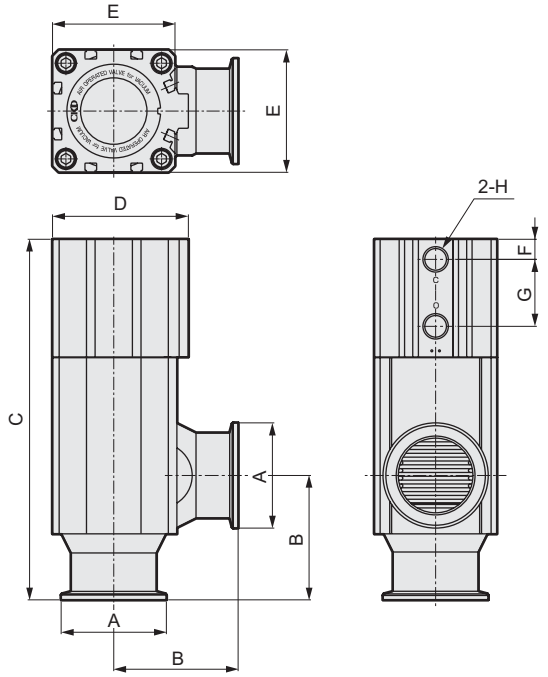


No.	Part name	Material
1	Cylinder (magnet integrated)	
2	Cylinder adapter	AVB737: A5056 AVB837: A5052
3	O ring	FKM
4	Body	A6063
5	Bellows	ASL350
6	Rod	SUS304

No.	Part name	Material
7	O ring	FKM
8	Valve disk B	SUS316L
9	O ring	FKM
10	Plain washer	SUS304
11	Spring washer	SUS304
12	Hexagon socket bolt	SUS304

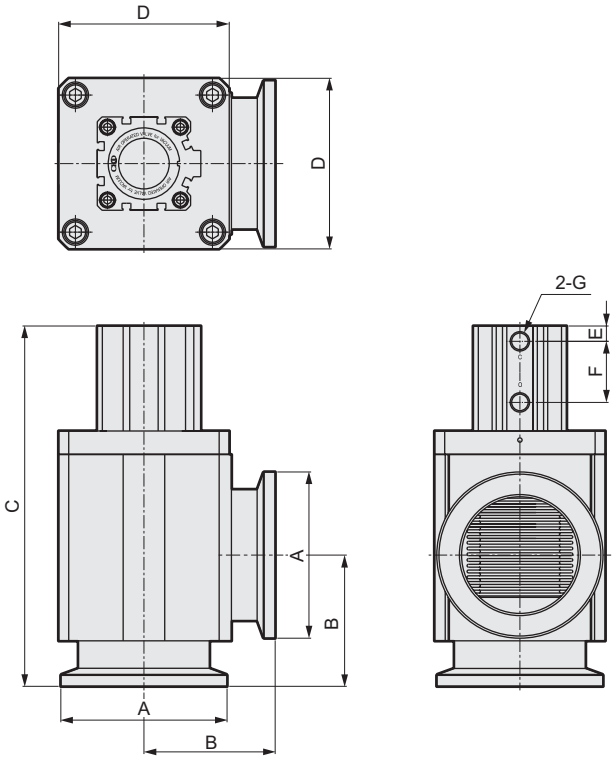
Dimensions (double-acting type)

● AVB237/AVB337/AVB437/AVB537/AVB637

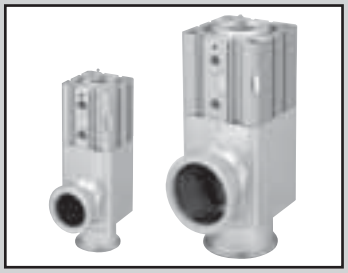


Model no.	A	B	C	D	E	F	G	H
AVB237	ø30 (NW16)	40	132.5	40	40	6	32.5	M5
AVB337	ø40 (NW25)	50	144.5	49.5	45	8	32	Rc1/8
AVB437	ø55 (NW40)	65	188	71	64	10.5	35	Rc1/4
AVB537	ø75 (NW50)	70	213	84	77	11	47	Rc1/4
AVB637	ø87 (NW63)	88	245	104	98	13	55	Rc1/4

● AVB737/AVB837



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



Air operated valve for high vacuum two stage type

AVB*47 Series

● Formed bellows aluminum body type

Specifications

Descriptions		AVB347	AVB447	AVB547	AVB647
Working fluid		Vacuum and inert gas			
Working pressure range	Pa (abs)	1.3×10^{-6} to 1×10^{5}			
Maximum working differential pressure	MPa	0.1			
Valve seat leakage	Pa·m³/s (He)	1.3×10^{-10} or less			
External leakage	Pa·m³/s (He)	1.3×10^{-11} or less			
Withstanding pressure	MPa	0.3			
Fluid temperature	℃	5 to 60 (5 to 150) Note 1			
Ambient temperature	℃	0 to 60 (no freezing)			
Orifice	mm	ø24	ø39	ø48	ø68
Conductance Note 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

Note 1: High temperature specification types are indicated in the parentheses "( )".
Note 2: The conductance is the theoretical calculation value at the molecular flow range, and is not the actual measurement value.

Switch specifications

Descriptions	Proximity switch		Reed switch		
	T2H/T2V	T3H/T3V	TOH/TOV	T5H/T5V	ETOH/ETOV
Applications	Programmable controller	Relay, programmable controller	Relay, programmable controller	Programmable controller, relay, IC circuit (w/o lamp), Serial connection	Relay, programmable controller
Power voltage	-	10 to 28VDC	-	-	-
Load voltage/current	10 to 30VDC, 5 to 20 mA Note 4	30VDC or less, 100 mA or less	12/24VDC 5 to 50 mA 100VAC 7 to 20 mA	12/24VDC 50 mA or less 100VAC 20 mA or less	12/24VDC 5 to 50 mA 110VAC 7 to 20 mA
Power consumption	-	10 mA or less at 24VDC (ON)	-	-	-
Internal voltage drop	4 V or less	0.5 V or less	3 V or less	0 V	3 V or less
Light	LED (ON lighting)			-	LED (ON lighting)
Leakage current	1 mA or less	10 μA or less	0 mA	0 mA	0 mA
Lead wire length Note 3	Standard 1 m (oil-resistant vinyl cabtire cord 2-conductor 0.2mm²)	Standard 1 m (oil-resistant vinyl cabtire cord 3-conductor 0.2mm²)	Standard 1 m (oil resistant vinyl round code 2-conductor 0.2 mm²)		Standard 1 m (heat-resistant fluorine insulation cabtire cord 2-conductor 0.5 mm²)
Maximum impact	980 m/s²		294 m/s²		
Insulation resistance	20 MΩ and over when measured with a 500VDC megger				100 MΩ and over when measured with a 500VDC megger
Withstand voltage	No abnormal condition when 1000VAC applied for 1 min				
Ambient temperature range	-10 to +60℃				-10 to +150℃
Protective structure	IEC Standard IP67, JIS CO920 (water-tight type), oil-resistant				

Note 3: 3 m and 5 m lead wire lengths are also available.
Note 4: Above-mentioned load current's maximum value 20 mA is for 25℃. The current will be lower than 20 mA if ambient temperature around the switch is higher than 25℃. (5-10 mA at 60℃)
Note 5: For other safety precautions regarding switch usage, refer to pages 105-109.
Note 6: Switch can be installed only on exhaust valve.

How to order

AVB 4 47- 40K - ○ - 4 - D T5H 3 - H

Model no.

Ⓐ Series

Actuation
Two stage type

Ⓑ Connection

Ⓒ Fluid temperature

Ⓓ Operation port position

Ⓔ Switch installation position

Ⓕ Switch model no.
Note 1

Ⓖ Switch lead wire length
Note 2

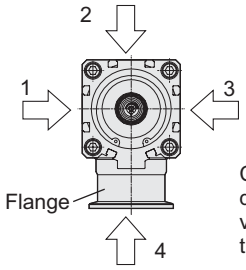
Ⓗ Switch quantity
Note 3

Symbol	Descriptions
Ⓐ Series	
3	Orifice ø24
4	Orifice ø39
5	Orifice ø48
6	Orifice ø68

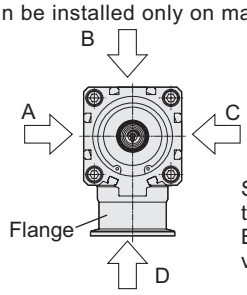
Ⓑ Connection		
25K	NW25	Available for AVB347 only
40K	NW40	Available for AVB447 only
50K	NW50	Available for AVB547 only
63K	NW63	Available for AVB647 only

Ⓒ Fluid temperature	
Blank	5 to 60℃ (magnet integrated)
HO	5 to 150℃ (without magnet)
HOM	5 to 150℃ (magnet integrated)

Ⓓ Operation port position

4	 Control port positions are displayed (4, 1, 2, 3) as viewed from the valve's top surface.
1	
2	
3	

Ⓔ Switch installation position

Blank	Without switch
D	Can be installed only on main exhaust valve.
A	 Switch installation positions are displayed (D, A, B, C) as viewed from the valve's top surface.
B	
C	

Ⓕ Switch model no.

Blank	Without switch		
T0H	Axial lead wire	Reed	2 wire
T5H			
T0V	Radial lead wire		
T5V			
T2H	Axial lead wire	Proximity	3 wire
T3H			
T2V	Radial lead wire		2 wire
T3V			3 wire
ETOH	Axial lead wire	Reed	2 wire
ETOV	Radial lead wire		

Ⓖ Switch lead wire length

Blank	1 m (standard)
3	3 m
5	5 m

Ⓗ Switch quantity

H	Detect when valve is open
R	Detect when valve is closed
D	Detect when valve is open/closed

Note on model no. selection

Note 1: Ⓒ If fluid temperature is "HOM", select either ETOH or ETOV.
Note 2: Ⓕ "3" and "5" are not available for switch model no. "ETOH", "ETOV".
Note 3: Ⓕ "R" and "D" are not available for switch model no. "ETOH", "ETOV".

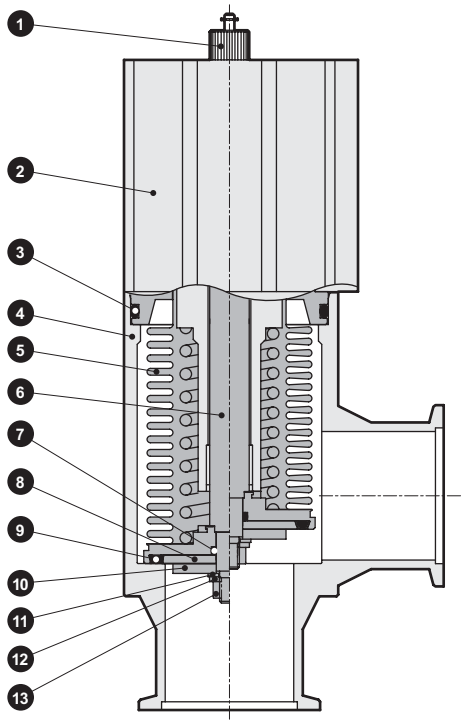
<Example of model number>

AVB447-40K-4-DT5H3-H

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

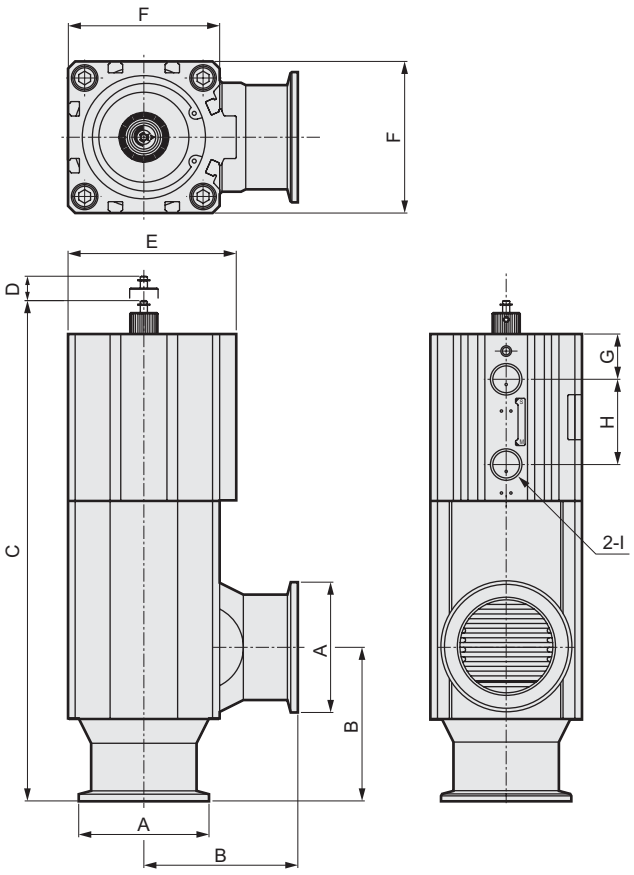
Ⓐ Series	: Orifice ø39
Ⓑ Connection	: NW40
Ⓒ Fluid temperature	: 5 to 60℃ (magnet integrated)
Ⓓ Control port position	: 4
Ⓔ Switch installation position	: D
Ⓕ Switch model no.	: T5H (Axial lead wire)
Ⓖ Lead wire length	: 3 m
Ⓗ Switch quantity	: Detect when valve is open

Internal structure and parts list



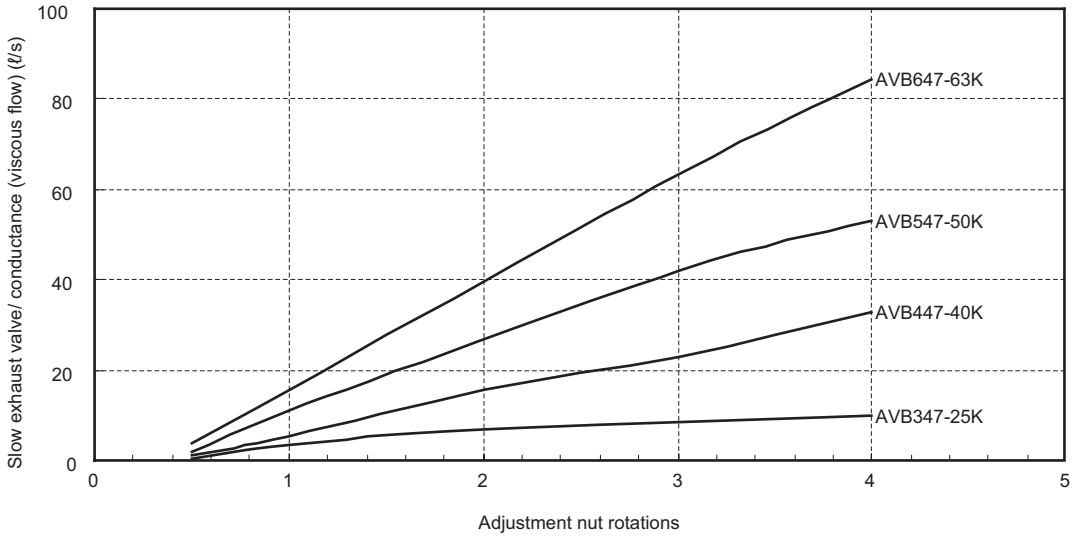
No.	Part name	Material
1	Adjustment nut	A5056
2	Cylinder (magnet integrated)	
3	O ring	FKM
4	Body	A6063
5	Bellows	SUS316L
6	Rod	SUS304
7	O ring	FKM
8	Valve disk B	SUS316L
9	O ring	FKM
10	Skirt	SUS304
11	Plain washer	SUS304
12	Spring washer	SUS304
13	Hexagon nut	SUS304

Dimensions

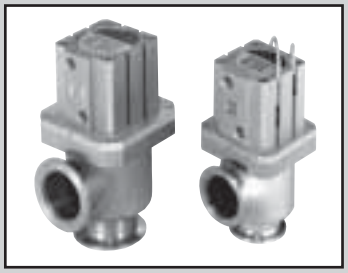


Model no.	A	B	C	D (Maximum)	E	F	G	H	I
AVB347	ø40 (NW25)	50	168	7.5	49.5	45	19	31	Rc1/8
AVB447	ø55 (NW40)	65	211	12	71	64	19	35	Rc1/4
AVB547	ø75 (NW50)	70	234	15	84	77	21.5	42.5	Rc1/4
AVB647	ø87 (NW63)	88	263	17	104	98	23.5	49	Rc1/4

Adjustment nut rotations x slow exhaust valve/conductance



MEMO



Air operated valve for high vacuum

AVB 5 6 7 8 *3 Series

● Formed bellows ● Stainless steel body compact type

Model no.	Actuation	Orifice
AVB513	NC	ø24
AVB613	NC	ø40
AVB713	NC	ø50
AVB813	NC	ø80

Model no.	Actuation	Orifice
AVB523	NO	ø24
AVB623	NO	ø40
AVB723	NO	ø50
AVB823	NO	ø80

Model no.	Actuation	Orifice
AVB533	Double acting	ø24
AVB633	Double acting	ø40
AVB733	Double acting	ø50
AVB833	Double acting	ø80

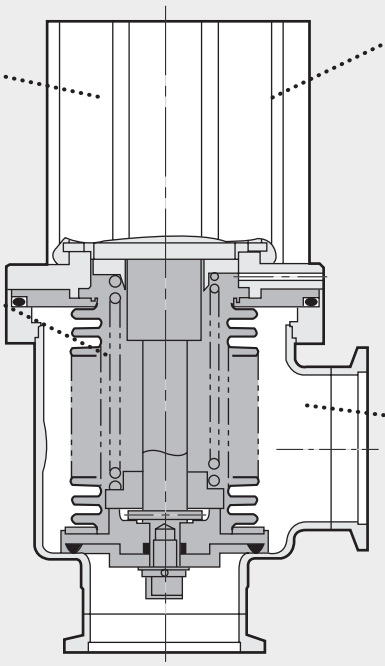
Now even more compact with improved maintainability.

●Overall height reduced by 25%
More compact and space-saving compared to AVB**2

●Long-life formed bellows
Special stainless steel material (ASL350) provided.
Durability: 1 million cycles (*1)

*1 Life when working media is inert gas within specified range, which does not contain solids such as reaction products.

●Usable with back pressure (choose any exhaust direction)
The vacuum pump can be connected to either port.



●Mountable miniature switch
Reed switch (reed/proximity) for checking operation can be connected.
(can be installed later)

●No gas traps
Integrally molded blister provides a streamlined smooth flow path and smooth surface. There is no dead space where gas may get trapped.

●Low dust generation
Wetted areas (flow path) have no sliding sections that may generate particles.

Safety precautions

Always read page 9 in the introduction and the precautions on page 102 to 109 to ensure correct and safe use of this product.

- Working media
- Installation
- Direction when connecting piping
- Proximity switch, reed switch

Contact CKD regarding these custom orders.

1. Different flange surface length
2. Different flange types
3. Valve heating
4. Different O-ring materials for wetted areas
5. Slow exhaust
6. Straight piping

Specifications

Descriptions		AVB5 1 2 3 3	AVB6 1 2 3 3	AVB7 1 2 3 3	AVB8 1 2 3 3
Working fluid		Vacuum and inert gas			
Working pressure range Pa (abs)		1.3×10^{-6} to 1×10^{5}			
Maximum working differential pressure MPa		0.1			
Valve seat leakage $Pa \cdot m^3/s$ (He)		1.3×10^{-9} or less			
External leakage $Pa \cdot m^3/s$ (He)		1.3×10^{-9} or less			
Withstanding pressure MPa		0.3			
Fluid temperature ℃		5 to 60			
Ambient temperature ℃		0 to 60 (No freezing)			
Orifice mm		ø24	ø40	ø50	ø80
Stroke length mm		10	20	22	32
Conductance Note 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		●NC	●NO	●Double acting	

Note 1: The conductance is the theoretical calculation value at the molecular flow range, and is not the actual measurement value.

Switch specifications

Descriptions	Proximity switch		Reed switch	
	T2H/T2V	T3H/T3V	TOH/TOV	T5H/T5V
Applications	Programmable controller	Relay, programmable controller	Relay, programmable controller	Programmable controller, relay, IC circuit (w/o lamp), Serial connection
Power voltage	–	DC10 to 28V	–	–
Load voltage/current	10 to 30VDC, 5 to 20 mA Note 3	30VDC or less, 100 mA or less	12/24VDC 5 to 50 mA 100VAC 7 to 20 mA	12/24VDC 50 mA or less 100VAC 20 mA or less
Power consumption	–	10 mA or less at 24VDC (ON)	–	–
Internal voltage drop	4 V or less	0.5 V or less	3 V or less	0 V
Light	LED (ON lighting)			–
Leakage current	1 mA or less	10 μA or less	0 mA	0 mA
Lead wire length Note 2	Standard 1 m (oil-resistant vinyl cabtire cord 2-conductor 0.2 mm^2)	Standard 1 m (oil-resistant vinyl cabtire cord 2-conductor 0.2 mm^2)	Standard 1 m (oil-resistant vinyl cabtire cord 2-conductor 0.2 mm^2)	
Maximum impact	980 m/s^2		294 m/s^2	
Insulation resistance	20 M Ω and over when measured with a 500VDC megger			
Withstand voltage	No abnormal condition when 1000VAC applied for 1 min			
Ambient temperature range	-10 to +60℃			
Protective structure	IEC standards IP67, JIS C0920 (water-tight type), oil resistance			

Note 2: 3 m and 5 m lead wire lengths are available.
Note 3: Above-mentioned load current's maximum value 20 mA is for 25 ˚C. The current will be lower than 20 mA if ambient temperature around the switch is higher than 25˚C. (5-10 mA at 60˚C)
Note 4: For other safety precautions regarding switch usage, refer to pages 105-109.

How to order

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

Model no.

Ⓐ Series

Ⓑ Actuation

Ⓒ Connection

Ⓓ Switch model no.

Ⓔ Switch lead wire length

Ⓕ Switch quantity (detecting position)

Symbol	Descriptions		
Ⓐ Series			
5	Orifice ø24		
6	Orifice ø40		
7	Orifice ø50		
8	Orifice ø80		
Ⓑ Actuation			
1	NC (normally closed)		
2	NO (normally open)		
3	Double acting		
Ⓒ 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	
Ⓓ Switch model no.			
Blank	Without switch		
T0H	Axial lead wire	Reed	2 wire
T5H			
T0V	Radial lead wire		
T5V			
T2H	Axial lead wire	Proximity	3 wire
T3H			
T2V	Radial lead wire		2 wire
T3V			3 wire
Ⓔ Switch lead wire length			
Blank	1 m (standard)		
3	3 m		
5	5 m		
Ⓕ Switch quantity			
H	Detect when valve is open		
R	Detect when valve is closed		
D	Detect when valve is open/closed		

<Example of model number>

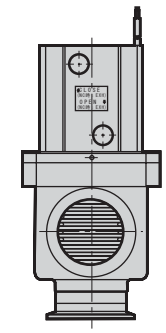
AVB613-40K-T5H3-H

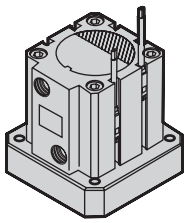
Model: AVP613 Air operated valve for high vacuum

ⒶSeries	: Orifice ø40
ⒷActuation	: NC (normally closed)
ⒸConnection	: NW40
ⒹSwitch type	: T5H (axial lead wire)
ⒺLead wire length	: 3 m
ⒻSwitch quantity	: Detect when valve is open

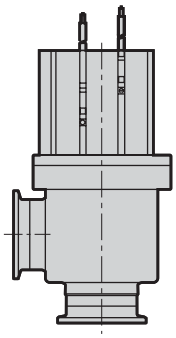
Appearance with switch installed

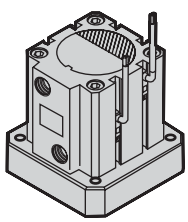
●T∗H type
(Axial lead wire)



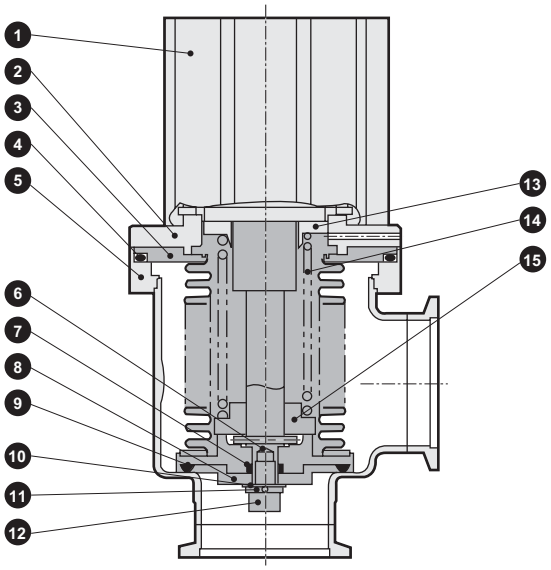


●T∗V type
(Radial lead wire)





Internal structure and parts list



(Sectional view of NC)

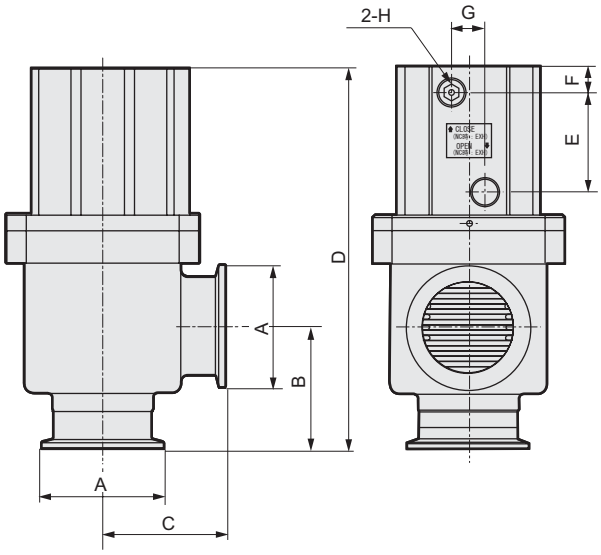
No.	Part name	Material
1	Super compact cylinder	
2	Cylinder adapter	A5056
3	Bellows assembly	ASL350/SUS316L
4	O ring	FKM
5	Body assembly	SUS316L
6	Parallel pin	SUS301
7	O ring	FKM
8	Valve disk B	SUS316L
9	O ring	FKM
10	Plain washer	SUS304
11	Spring washer	SUS304
12	Hexagon socket bolt	SUS304
13	Spring holder B	A5056
14	Spring	SWOSC-V (Electrode position coating)
15	Spring holder A	A5056

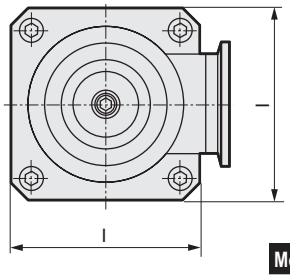
Dimensions

Switch model No.

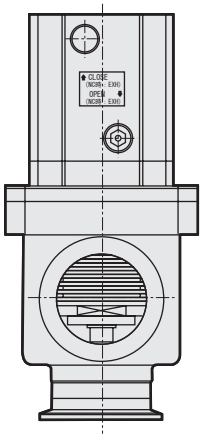
AVB∗∗3-∗K-** (∗ ∗ ∗)

●NC type Double acting





●NO



Dimensions in parentheses ( )"under symbol D are for NO type.

Model no. \ Symbol	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

Air operated valve for high vacuum

AVB**3 Series Custom order

Contact the CKD Sales Office for details.

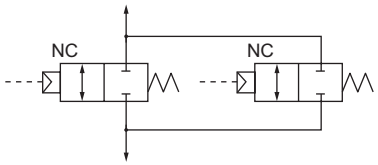
RoHS Custom order

Slow exhaust (internal bypass valve) compatible

Control exhaust rates in two steps

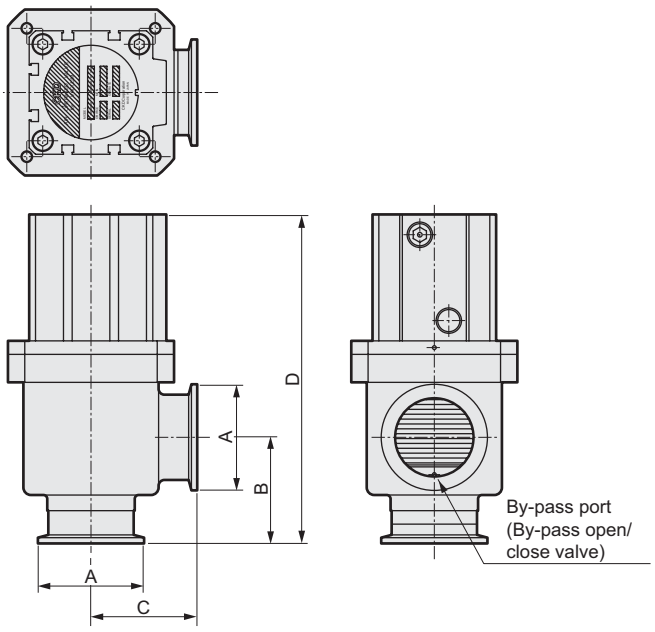
- 1-actuator slow exhaust valve
- NW25/NW40/NW50

Specifications

Descriptions	AVB513-X*	AVB613-X*	AVB713-X*
Working fluid	Vacuum and inert gas		
Working pressure range Pa (abs)	1.3×10^{-6} to 1.0×10^{5}		
Maximum working differential pressure MPa	0.1		
Valve seat leakage Pa·m³/s (He)	1.3×10^{-9} or less		
External leakage Pa·m³/s (He)	1.3×10^{-9} or less		
Withstanding pressure MPa	0.3		
Fluid temperature ℃	5 to 60		
Ambient temperature ℃	0 to 60 (No freezing)		
Large flow orifice mm	ø24	ø40	ø50
Small flow orifice Note 3 mm	ø1 to 3	ø1 to 3	ø1 to 4
Main valve stroke mm	10	20	22
Small flow valve stroke mm	2	2	2
Conductance (main valve) Note 1 ℓ/s	13	52	80
Connection	NW25	NW40	NW50
Operating pressure MPa	0.4 to 0.6		
JIS symbol			

Note 1: The conductance is the theoretical calculation value at the molecular flow range, and is not the actual measurement value.
Note 2: Contact CKD for details on specifications for the switch.
Note 3: Contact CKD for details on small flow orifice diameters.

Dimensions



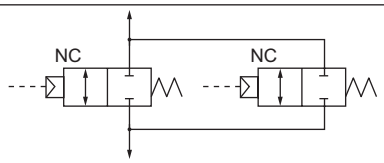
Model no.	A	B	C	D
AVB513-X*	ø40 (NW25)	50	50	180.5
AVB613-X*	ø55 (NW40)	55	55	177.5
AVB713-X*	ø75 (NW50)	70	70	216.5

Slow exhaust (external bypass valve) compatible

Control exhaust rates in two steps

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

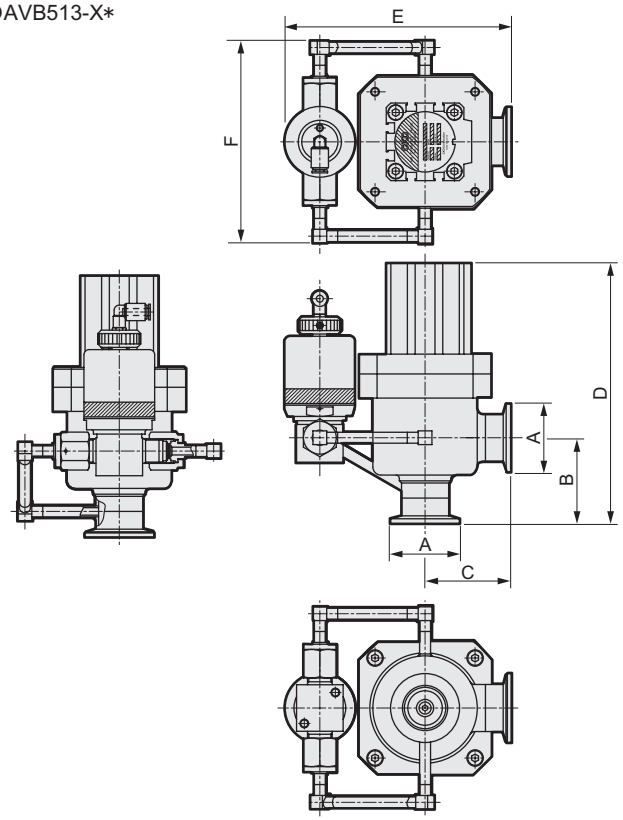
Specifications

Descriptions	AVB513-X*	AVB613-X*	AVB713-X*	AVB813-X*
Working fluid	Vacuum and inert gas			
Working pressure range Pa (abs)	1.3×10^{-6} to 1.0×10^{5}			
Maximum working differential pressure MPa	0.1			
Valve seat leakage Pa·m³/s (He)	1.3×10^{-9} or less			
External leakage Pa·m³/s (He)	1.3×10^{-9} or less			
Withstanding pressure MPa	0.3			
Fluid temperature ℃	5 to 60			
Ambient temperature ℃	0 to 60 (No freezing)			
Orifice (main flow path) mm	ø24	ø40	ø50	ø80
Stroke (main valve) mm	10	20	22	32
Conductance (main valve) Note 1 ℓ/s	13	52	80	242
Connection	NW25	NW40	NW50	NW80
Operating pressure MPa	0.4 to 0.6			
JIS symbol				

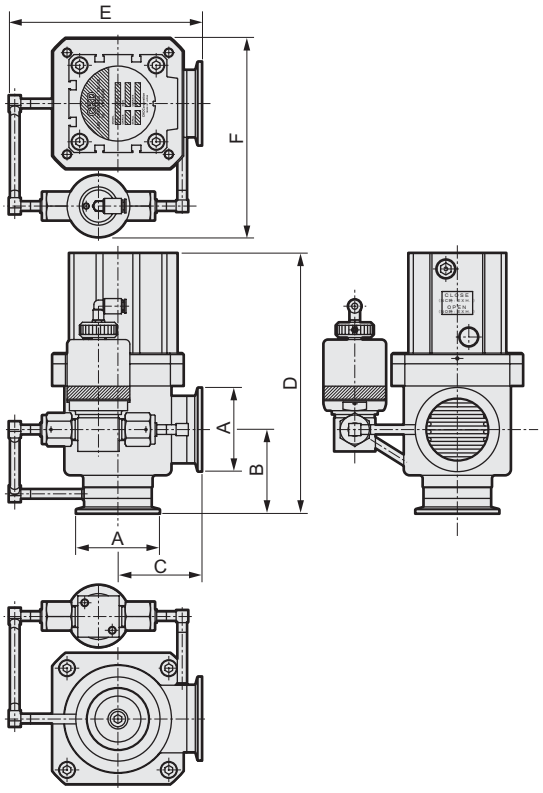
Note 1: The conductance is the theoretical calculation value at the molecular flow range, and is not the actual measurement value.
Note 2: Contact CKD for details on main valve switch specifications.
Note 3: Bypass valve with flow control function is available.

Dimensions

●AVB513-X*



●AVB$^{6}_{7}$13-X*



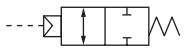
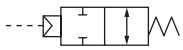
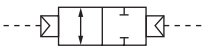
Model no.	A	B	C	D	E	F	Bypass valve	By-pass piping
AVB513-X*	ø40 (NW25)	50	50	151.5	131.5	117.5	AGD11V-☐	1/4"
AVB613-X*	ø55 (NW40)	55	55	170.5	127	130.5		
AVB713-X*	ø75 (NW50)	70	70	208	165.5	175.5	AGD21V-☐	3/8"
AVB813-X*	ø114 (NW80)	90	105	258	191.5	202		

Straight flange compatible

Ideal for installation on straight piping sections

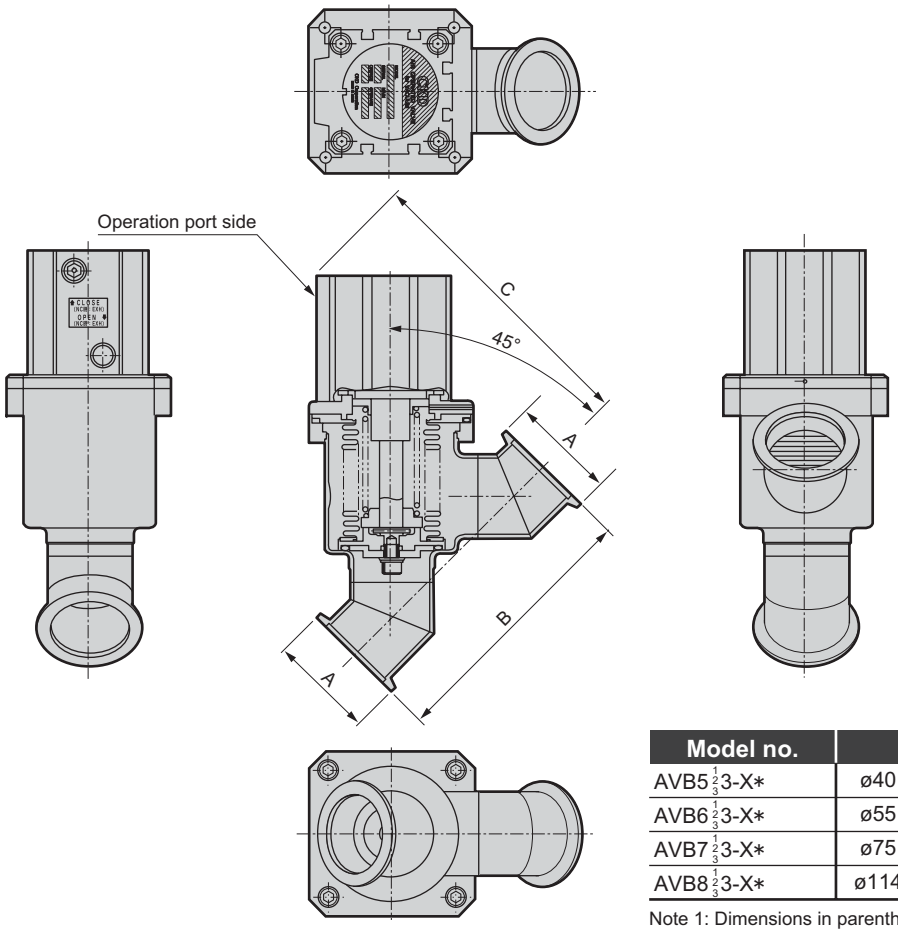
- Straight flange valve
- NW25/NW40/NW50/NW80

Specifications

Descriptions	AVB5 1/3 3-X*	AVB6 1/3 3-X*	AVB7 1/3 3-X*	AVB8 1/3 3-X*
Working fluid	Vacuum and inert gas			
Working pressure range Pa (abs)	1.3×10^{-6} to 1.0×10^{5}			
Maximum working differential pressure MPa	0.1			
Valve seat leakage Pa·m³/s (He)	1.3×10^{-9} or less			
External leakage Pa·m³/s (He)	1.3×10^{-9} or less			
Withstanding pressure MPa	0.3			
Fluid temperature ℃	5 to 60			
Ambient temperature ℃	0 to 60 (No freezing)			
Orifice mm	ø24	ø40	ø50	ø80
Stroke length mm	10	20	22	32
Conductance Note 1 ℓ /s	13	52	80	242
Connection	NW25	NW40	NW50	NW80
Operating pressure MPa	0.4 to 0.6			
JIS symbol	NC 	NO 	Double acting 	

Note 1: The conductance is the theoretical calculation value at the molecular flow range, and is not the actual measurement value.
Note 2: Contact CKD for details on specifications for the switch.

Dimensions



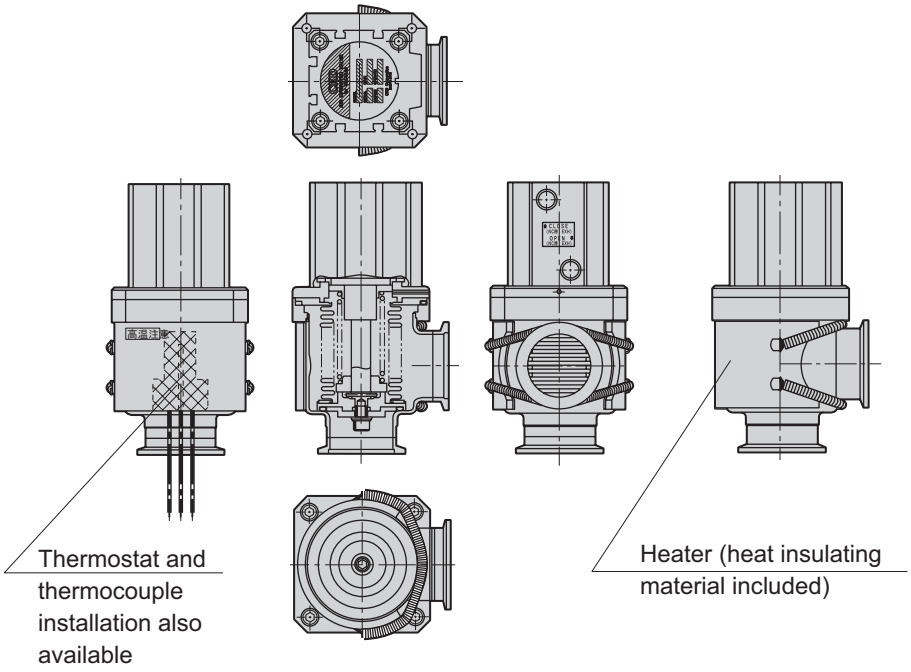
Model no.	A	B	C
AVB5 1/3 3-X*	ø40 (NW25)	130	130 (138)
AVB6 1/3 3-X*	ø55 (NW40)	140	155 (163)
AVB7 1/3 3-X*	ø75 (NW50)	210	191
AVB8 1/3 3-X*	ø114 (NW80)	250	241

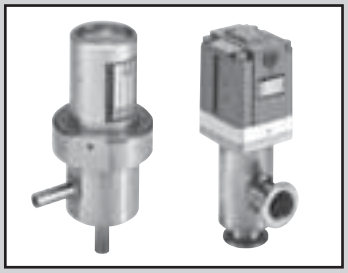
Note 1: Dimensions in parentheses under symbol C are for NO.
Note 2: Values under "C" will change according to operation port direction.

Valve heater compatible

Prevent reaction products from adhering to the valve

●Jacket heater valve
●NW25/NW40/NW50/NW80





Air operated valve for high vacuum

AVB 5/6/7/8 *2 Series

● Formed bellows

RoHS CAD

Model no.	Actuation	Orifice
AVB512	NC	ø24
AVB612	NC	ø40
AVB712	NC	ø50
AVB812	NC	ø80
AVB21	NC	ø 5

Model no.	Actuation	Orifice
AVB522	NO	ø24
AVB622	NO	ø40
AVB722	NO	ø50
AVB822	NO	ø80

Model no.	Actuation	Orifice
AVB532	Double acting	ø24
AVB632	Double acting	ø40
AVB732	Double acting	ø50
AVB832	Double acting	ø80

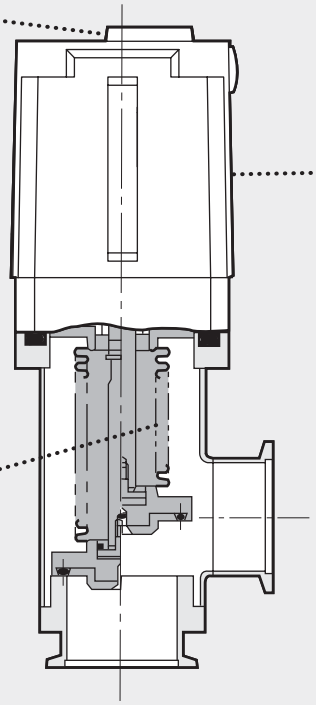
Long service life and low particle occurrence type

●Pilot-operated solenoid valve installable

●Long-life formed bellows
Special stainless steel material (ASL350) provided.
Durability: 1 million cycles (*1)

*1 Life when working media is inert gas within specified range, which does not contain solids such as reaction products.

●Low dust generation
Wetted areas (flow path) have no sliding sections that may generate particles.



●Usable with back pressure (choose any exhaust direction)
The vacuum pump can be connected to either port. (AVB812 excluded)

●Miniature switch mountable
A reed switch (proximity) can be connected to confirm the operation.

Future of AVB21

●Ideal for leak valves

●Ultra-compact with 5 mm orifice

Safety precautions

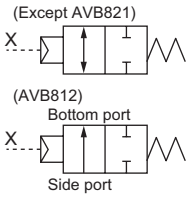
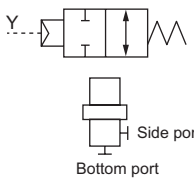
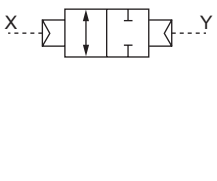
Always read page 9 in the introduction and the precautions on page 102 to 109 to ensure correct and safe use of this product.

- Working media
- Installation
- Direction when connecting piping
- Proximity switch, reed switch


AVB21-8T


AVB**2-*K

Specifications

Descriptions	AVB21-8T	AVB5 1 2 3 2	AVB6 1 2 3 2	AVB7 1 2 3 2	AVB8 1 2 3 2 (Custom order)
Working fluid	Vacuum and inert gas				
Working pressure range Pa (abs)	1.3×10^{-6} to 2.5×10^{5}	1.3×10^{-6} to 1×10^{5}			
Maximum working differential pressure MPa	0.25	0.1			0.1 (Back pressure not available for NC type)
Valve seat leakage Pa·m³/s (He)	1.3×10^{-9} or less				
External leakage Pa·m³/s (He)	1.3×10^{-9} or less				
Withstanding pressure MPa	0.3				
Fluid temperature ℃	5 to 60				
Ambient temperature ℃	0 to 60 (No freezing)				
Orifice mm	5	24	40	50	80
Stroke length mm	3	15	20	22	32
Conductance Note 1 ℓ/s	–	13	52	80	242
Connection	1/4″ tube	NW25	NW40	NW50	NW80
Operating pressure MPa	0.3 to 0.5				
Weight kg	0.25	1.4	2.5	3.3	9.9
JIS symbol	●NC (Except AVB821)  (AVB812) Bottom port Side port	●NO  Side port Bottom port		●Double acting 	

Note 1: The conductance is the theoretical calculation value at the molecular flow range, and is not the actual measurement value.

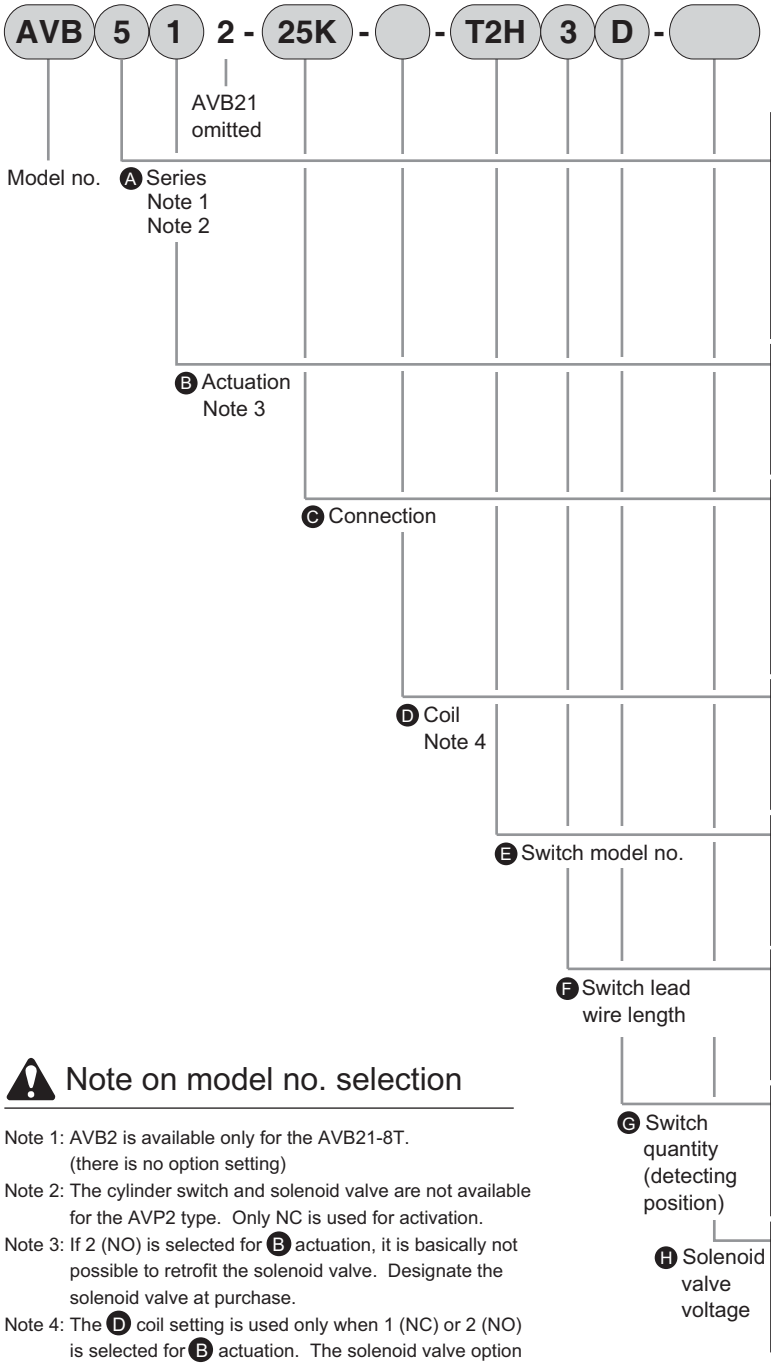
Electric specifications		
Rated voltage		100VAC (50/6 0Hz), 110VAC (60 Hz), 200VAC (50/60 Hz), 220VAC (60 Hz), 24VDC
Apparent power	Holding	3.9 VA (50 Hz), 3.1 VA (60 Hz)
	Starting	9.2 VA (50 Hz), 7.9 VA (60 Hz)
Power consumption	AC	2.0 W (50 Hz), 1.7 W (60 Hz)
	DC	4.0 W
Heat proof class		B

Switch specifications

Descriptions	Proximity switch	
	T2H	T3H
Applications	Programmable controller	Programmable controller, relay, IC circuit, small solenoid valve
Power voltage	–	10 to 28VDC
Load voltage/current	10 to 30VDC, 5 to 20 mA Note 3	30VDC, 150 mA or less
Power consumption	–	10 mA or less at 24VDC (when ON)
Internal voltage drop	4 V or less	0.5 V or less
Light	LED (ON lighting)	
Leakage current	1 mA or less	10 μA or less
Lead wire length Note 2	Standard 1 m (oil-resistant vinyl cabtire cord 2-conductor 0.2 mm2)	Standard 1 m (oil-resistant vinyl cabtire cord 3-conductor 0.2 mm²)
Maximum impact	980 m/s²	
Insulation resistance	20 M omega and over when measured with a 500VDC megger	
Withstand voltage	No abnormal condition when 1000VAC applied for 1 min	
Ambient temperature range	-10 to +60℃	
Protective structure	IEC standards IP67, JIS C0920 (water-tight type), oil resistance	

Note 1: 3 m and 5 m lead wire lengths are available.
Note 2: Above-mentioned load currents maximum value 20 mA is for 25 ˚C
The current will be lower than 20 mA if ambient temperature around the switch is higher than 25˚C.
(5-10 mA at 60˚C)
Note 4: For other safety precautions regarding switch usage, refer to pages 105-109.

How to order



Symbol	Descriptions		
A Series			
2	1/4″		
5	25A		
6	40A		
7	50A		
8	80A (Custom order)		
B Actuation			
1	NC (normally closed)		
2	NO (normally open)		
3	Double acting		
C Connection			
8T	1/4″ tube	Only AVB21 is available	
25K	NW25	Only AVB5*2 is available	
40K	NW40	Only AVB6*2 is available	
50K	NW50	Only AVB7*2 is available	
80K	NW80	Only AVB8*2 is available	
D Coil			
Blank	Without solenoid valve		
2C	Grommet coil		
2G	DIN terminal box		
E Switch model no.			
Blank	Without switch		
T2H	Axial lead wire	Proximity	2 wire
T3H			3 wire
F Switch lead wire length			
Blank	1 m (standard)		
3	3 m		
5	5 m		
G Switch quantity (detecting position)			
H	Detect when valve is open		
R	Detect when valve is closed		
D	Detect when valve is open/closed		
H Solenoid valve voltage			
AC100V	100VAC (50/60Hz), 110VAC (60Hz)		
AC200V	200VAC (50/60Hz), 220VAC (60Hz)		
DC24V	24VDC		

Note on model no. selection

Note 1: AVB2 is available only for the AVB21-8T.
(there is no option setting)

Note 2: The cylinder switch and solenoid valve are not available for the AVP2 type. Only NC is used for activation.

Note 3: If 2 (NO) is selected for B actuation, it is basically not possible to retrofit the solenoid valve. Designate the solenoid valve at purchase.

Note 4: The D coil setting is used only when 1 (NC) or 2 (NO) is selected for B actuation. The solenoid valve option is not used for a double-acting valve.

<Example of model number>

AVB512-25K-T2H3D

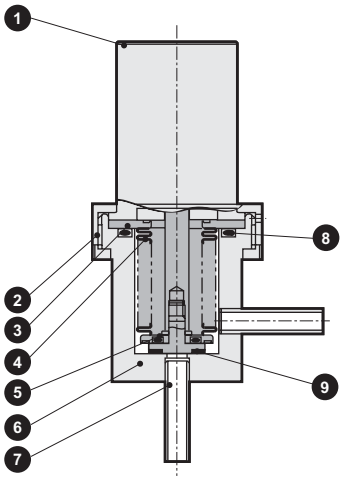
Model: AVB512 Air-operated valve for high vacuum

A Series : 25A
B Actuation : NC (Normally closed)
C Connection : NW25
D Coil : Without solenoid valve
E Switch model no. : T2H (Axial lead wire)
F Lead wire length : 3 m
G Switch quantity : Detect when valve is open

Internal structure and parts list

AVB21-8T

●NC

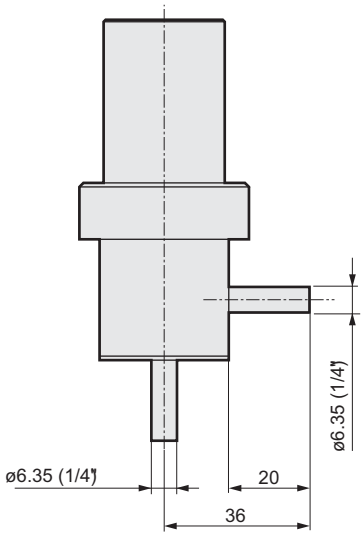


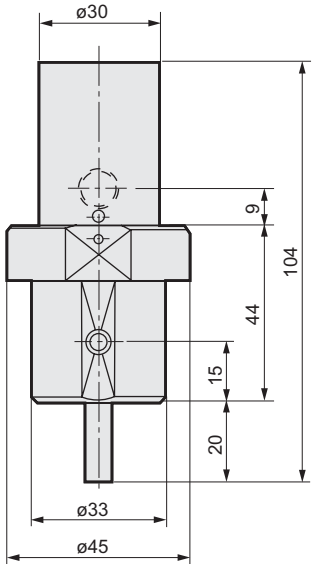
No.	Part name	Material
1	Cylinder	
2	Ring	C3604
3	Bellows ring	SUS304
4	Bellows	SUS316L
5	Valve disk B	SUS304
6	Body	SUS304
7	Pipe	SUS304
8	O-ring	FKM
9	Valve disk A	FKM/SUS304

Dimensions

AVB21-8T

●NC



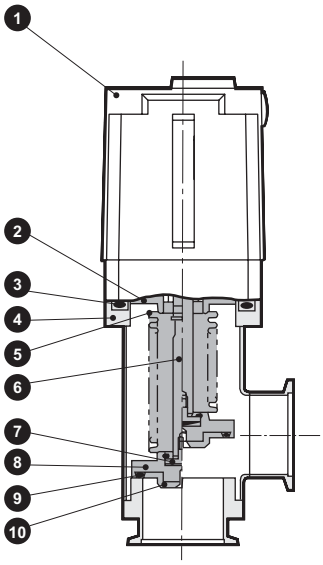


Internal structure and parts list

AVB**2-*K

●NC/NO/Double acting

(The drawing below shows the sectional view of NC.)



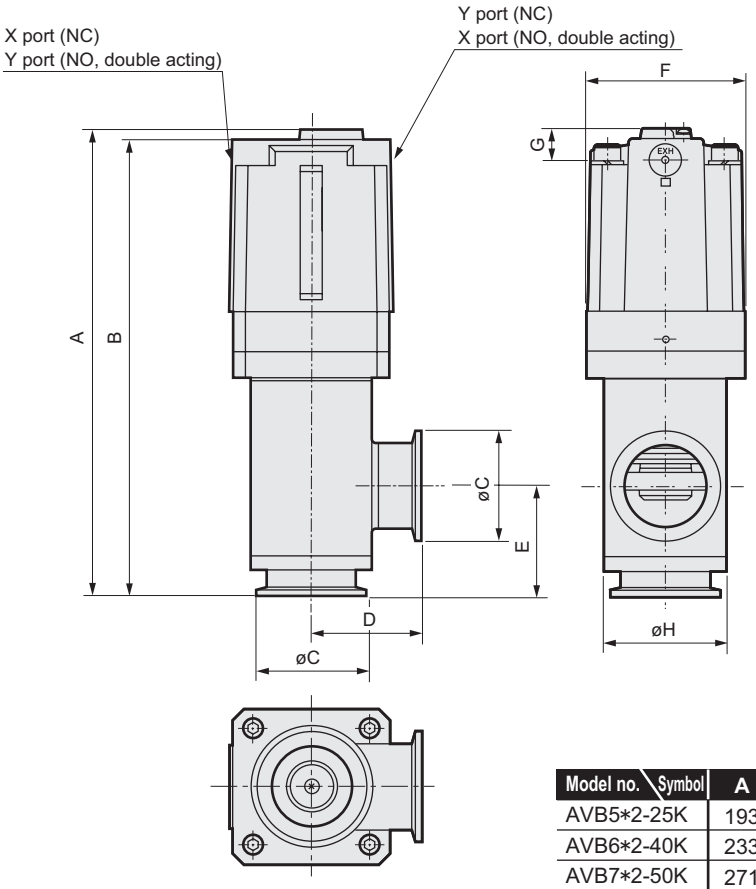
No.	Part name	Material
❶	Cylinder (magnet integrated)	
❷	Bellows adaptor	SUS316
❸	O-ring (*1)	FKM
❹	Body	SUS316
❺	Formed bellows	ASL350
❻	Rod	SUS316
❼	Rod piece	SUS304
❽	Valve disk A	SUS316
❾	O-ring	FKM
❿	Valve disk B	SUS316

*1 External seal structure of AVB7 and AVB8 vary slightly. (O-ring seal area corresponding to drawing ❸ on the left)

Dimensions

AVB**2-*K

●NC/NO/Double acting



●The appearance and dimensions of the options (pilot-operated solenoid valve, cylinder switch) are available upon request.
The solenoid valve option is not used for a double-acting valve.

Model no. \ Symbol	A	B	øC	D	E	F	G	øH
AVB5*2-25K	193	188	40 (NW25)	50	50	63	15	48.6
AVB6*2-40K	233	228	55 (NW40)	55	55	78	15.5	60.5
AVB7*2-50K	271	266	75 (NW50)	70	70	78	15.5	76.3
AVB8*2-80K	359	354	114 (NW80)	95	98	115	15.5	118

MEMO

Air operated valve for high vacuum

AVB**2 Series Custom order

Contact the CKD Sales Office for details.

Custom order

Large bore size type

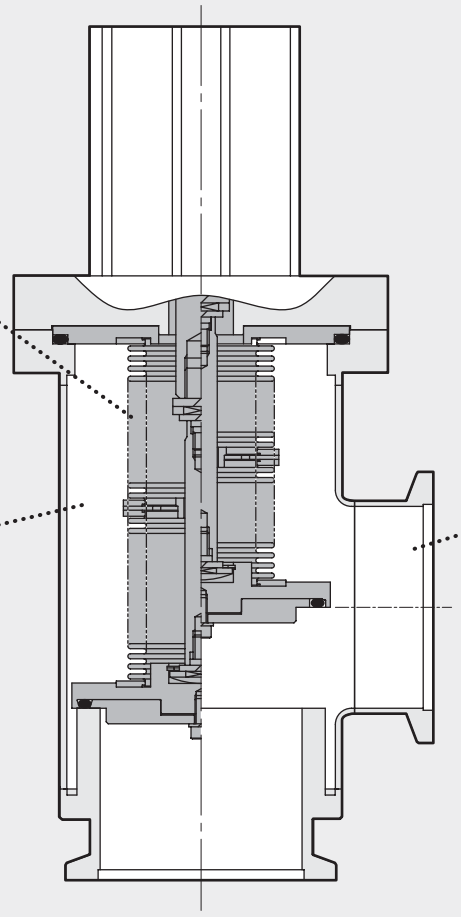
Model no.	Actuation	Orifice
AVB932	Double acting	ø100

Large bore size type

●Long-life formed bellows
Special stainless steel material (ASL650) provided.
Durability: 1 million cycles (∗1)

∗1 Life when working media is inert gas within specified range, which does not contain solids such as reaction products.

●Low dust generation
Wetted areas (flow path) have no sliding parts that may generate particles.



●Usable with back pressure (choose any exhaust direction)
The vacuum pump can be connected to either port.

Specifications

Descriptions	AVB932-X0070
Working fluid	Vacuum and inert gas
Working pressure range Pa (abs)	1.3×10^{-6} to 1×10^{5}
Maximum working differential pressure MPa	0.1
Valve seat leakage Pa·m³/s (He)	1.3×10^{-9} or less
External leakage Pa·m³/s (He)	1.3×10^{-9} or less
Withstanding pressure MPa	0.3
Fluid temperature ℃	5 to 60
Ambient temperature ℃	0 to 60 (no freezing)
Orifice mm	100
Stroke length at 0 o'clock mm	50
Conductance Note 1 ℓ/s	372
Connection	NW100
Operating pressure MPa	0.3 to 0.5
Weight kg	18
JIS symbol	

Note1: The conductance is the theoretical calculation value at the molecular flow range, and is not the actual measurement value.
Note2: Contact CKD for details on specifications for the switch.

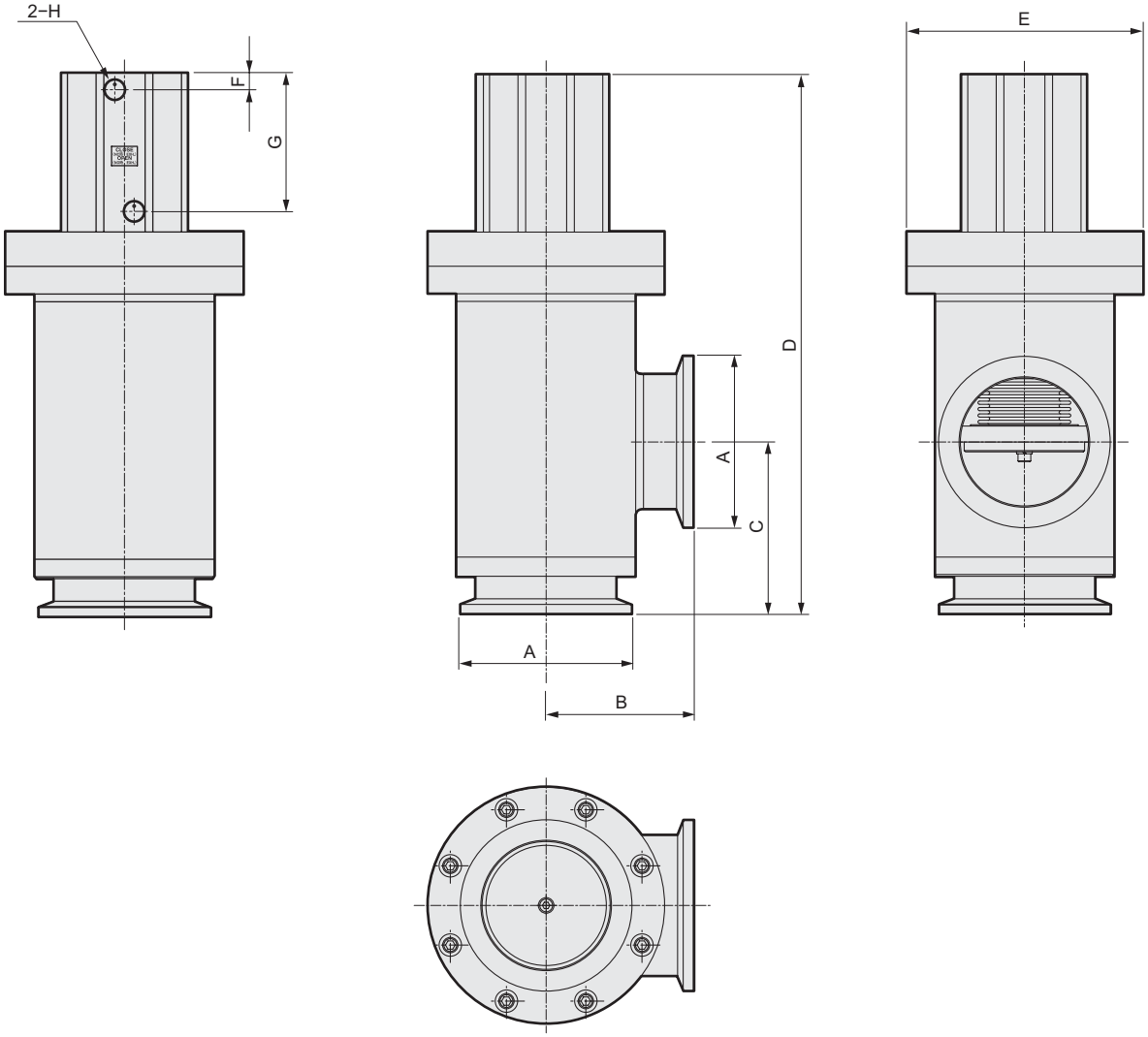
Safety precautions

Always read page 9 in the introduction and the precautions on page 102 to 109 to ensure correct and safe use of this product.

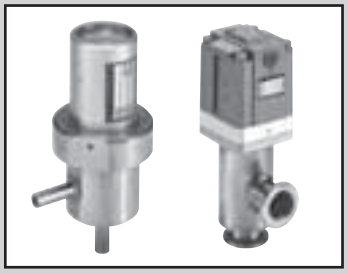
- Working media
- Installation
- Direction when connecting piping

Dimensions

AVB932-X0070



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



Air operated valve for high vacuum

AVP 5 6 7 8 *2 Series

● Double O-ring shaft seal

Model no.	Actuation	Orifice
AVP512	NC	ø24
AVP612	NC	ø40
AVP712	NC	ø50
AVP812	NC	ø80
AVP21	NC	ø 5

Model no.	Actuation	Orifice
AVP522	NO	ø24
AVP622	NO	ø40
AVP722	NO	ø50
AVP822	NO	ø80

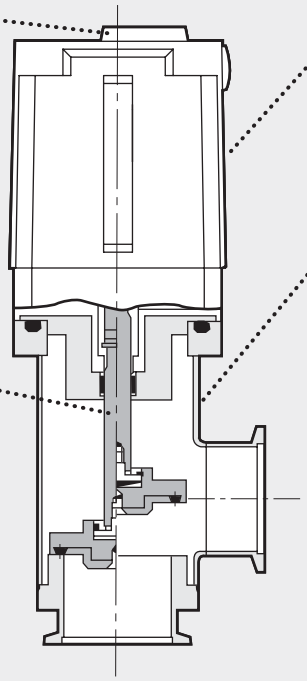
Model no.	Actuation	Orifice
AVP532	Double acting	ø24
AVP632	Double acting	ø40
AVP732	Double acting	ø50
AVP832	Double acting	ø80
(Custom order)		

Double O-ring shaft seal with outstanding reliability and maintenance

●Pilot-operated solenoid valve installable

●Long-life, high sealing
Outstanding lifespan and external sealing are attained due to double O-ring seal and grease container.
Durability: Half a million cycles (*1)

*1 Life when working media is inert gas within specified range, which does not contain solids such as reaction products.



●Miniature switch mountable
A reed switch (proximity) can be connected to confirm the operation.

●Usable with back pressure (choose any exhaust direction)
The vacuum pump can be connected to either port. (Excluding AVP712/812)

AVP21 only
●Ideal for leak valves
●Ultra-compact with 5 mm orifice

Safety precautions

Always read page 9 in the introduction and the precautions on page 102 to 109 to ensure correct and safe use of this product.

- Working media
- Installation
- Direction when connecting piping
- Proximity switch, reed switch

AVP21-8T

AVP**2-*K

Specifications

Descriptions		AVP21-8T	AVP5 1 2 3 2	AVP6 1 2 3 2	AVP7 1 2 3 2	AVP8 1 2 3 2 (Custom order)
Working fluid		Vacuum and inert gas				
Working pressure range Note 1 Pa (abs)	NC	1.3×10^{-6} to 2.5×10^{5}	1.3×10^{-6} to 1.5×10^{5}	1.3×10^{-6} to 1.0×10^{5}	1.3×10^{-6} to 1.0×10^{5}	1.3×10^{-6} to 1.0×10^{5}
	NO	–				Barotropic: 1.3×10^{-6} to 1.0×10^{5}
	Double acting	–	1.3×10^{-6} to 2.0×10^{5}			Back pressure: 1.3×10^{5} to 1.5×10^{5}
Maximum working differential pressure Note 2 MPa		0.25	NC: 0.15 NO: 0.15 Double acting: 0.2	NC: 0.1 NO: 0.1 Double acting: 0.2	NC: 0.1 (Back pressure not available) NO: 0.1 Double acting: 0.2	NC: 0.1 (Back pressure not available) NO: 0.15 Double acting: 0.2
Valve seat leakage Pa·m³/s (He)		1.3×10^{-9} or less				
External leakage Pa·m³/s (He)		1.3×10^{-8} or less				
Withstanding pressure MPa		0.3				
Fluid temperature ℃		5 to 60				
Ambient temperature ℃		0 to 60 (no freezing)				
Orifice mm		5	24	40	50	80
Stroke length mm		3	15	20	22	32
Conductance Note 3 ℓ/s		–	13	52	80	242
Connection		1/4" tube	NW25	NW40	NW50	NW80
Operating pressure MPa		0.3 to 0.5				
Weight kg		0.25	1.6	2.6	3.8	10.4
JIS symbol		●NC (excluding AVP712, AVP812) X; (AVP712, AVP812) Bottom port, X, Side port		●NO Y; Side port, Bottom port		●Double acting X Y

Note 1: For AVP822: 1.3×10^{-6} Pa to 1.5×10^{5} Pa,
For AVP822: 1.3×10^{-6} Pa to 2×10^{5} Pa.
Note that when using the AVP822 with a barotropic setting, the range is 1.3×10^{-6} Pa to 1.0×10^{5} Pa.
Note 2: The back pressure type is not used for AVP712 and AVP812.
Note 3: The conductance is the theoretical calculation value at the molecular flow range, and is not the actual measurement value.

Electric specifications		
Rated voltage		100VAC (50/60 Hz), 110VAC (60 Hz), 200VAC (50/60 Hz), 220VAC (60 Hz), 24VDC
Apparent power	Holding	3.9VA (50 Hz), 3.1VA (60 Hz)
	Starting	9.2VA (50 Hz), 7.9VA (60 Hz)
Power consumption	AC	2.0 W (50 Hz), 1.7W (60 Hz)
	DC	4.0 W
Heat proof class		B

Switch specifications

Descriptions	Proximity switch	
	T2H	T3H
Applications	Programmable controller	Programmable controller, relay, IC circuit, small solenoid valve
Power voltage	–	10 to 28VDC
Load voltage/current	10 to 30VDC, 5 to 20 mA Note5	30VDC, 150 mA or less
Power consumption	–	15 mA or less at 24VDC (when ON)
Internal voltage drop	4 V or less	0.5 V or less
Light	LED (ON lighting)	
Leakage current	1 mA or less	10 μA or less
Lead wire length Note 4	1 m (oil resistant vinyl round code 2-conductor 0.2 mm²)	1 m (oil resistant vinyl round code 3-conductor 0.2 mm²)
Maximum impact	294 m/s²	
Insulation resistance	20 M Ω and over when measured with a 500VDC megger	
Withstand voltage	There shall be no failure when 1000VAC is applied for 1 minute	
Ambient temperature range	-10 to +60℃	
Protective structure	IEC Standard IP67, JIS CO920 (water-tight type), oil-resistant	

Note 4: 3 m and 5 m lead wire lengths are available.
Note 5: Above-mentioned load currents maximum value 20 mA is for 25℃. The current will be lower than 20 mA if ambient temperature around the switch is higher than 25℃. (5-10 mA at 60℃)
Note 6: For other safety precautions regarding switch usage, refer to pages 105 to 109.

How to order

AVP 6 1 2 - 40K - ( ) - T2H 3 H - ( )

- Model no.
- Method for AVP21 omitted
- Ⓐ Series Note 1 Note 2
- Ⓑ Actuation Note 3
- Ⓒ Connection
- Ⓓ Coil Note 4
- Ⓔ Switch model no.
- Ⓕ Switch lead wire length
- Ⓖ Switch quantity (detecting position)
- Ⓗ Solenoid valve voltage

Symbol	Descriptions		
Ⓐ Series			
2	1/4"		
5	25A		
6	40A		
7	50A		
8	80A (Custom order)		
Ⓑ Actuation			
1	NC (normally closed)		
2	NO (normally open)		
3	Double acting		
Ⓒ Connection			
8T	1/4"tube	Only AVP21 is available	
25K	NW25	Only AVP5*2 is available	
40K	NW40	Only AVP6*2 is available	
50K	NW50	Only AVP7*2 is available	
80K	NW80	Only AVP8*2 is available	
Ⓓ Coil			
Blank	Without solenoid valve		
2C	Grommet coil		
2G	DIN terminal box		
Ⓔ Switch model no.			
Blank	Without switch		
T2H	Axial lead wire	Proximity	2 wire
T3H	Axial lead wire	Proximity	3 wire
Ⓕ Switch lead wire length			
Blank	1 m (standard)		
3	3 m		
5	5 m		
Ⓖ Switch quantity (detecting position)			
H	Detect when valve is open		
R	Detect when valve is closed		
D	Detect when valve is open/closed		
Ⓗ Solenoid valve voltage			
AC100V	100VAC (50/60 Hz), 110VAC (60 Hz)		
AC200V	200VAC (50/60 Hz), 220VAC (60 Hz)		
DC24V	24VDC		

Note on model no. selection

Note 1: AVP2 is available only for the AVP21-8T.
(There is no option setting.)

Note 2: The cylinder switch and solenoid valve are not used for the AVP21 type. Only NC is used for activation.

Note 3: If 2 (NO) is selected for Ⓑ Actuation, it is basically not possible to retrofit the solenoid valve. Designate the solenoid valve at purchase.

Note 4: The Ⓓ Coil setting is used only when 1 (NC) or 2 (NO) is selected for Ⓑ Actuation.
(The solenoid valve option is not used for the double-acting valve.)

<Example of model number>

AVP612-40K-T2H3H

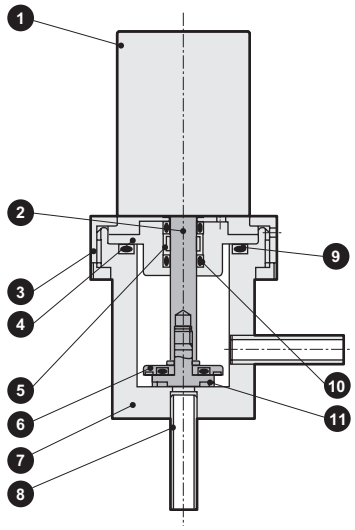
Model: AVP612 Air operated valve for high vacuum

Ⓐ Series	: 40 A
Ⓑ Actuation	: NC (normally closed)
Ⓒ Connection	: NW40
Ⓓ Coil	: Without solenoid valve
Ⓔ Switch type	: T2H (axial lead wire)
Ⓕ Lead wire length	: 3 m
Ⓖ Switch quantity	: Detect when valve is open

Internal structure and parts list

AVP21-8T

●NC



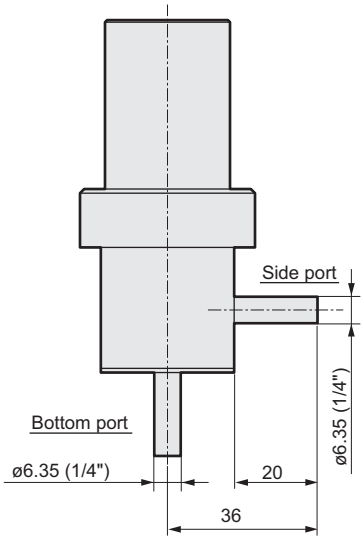
* The cylinder switch and solenoid valve are not available for the AVP21 type.
Only NC is available for actuation.

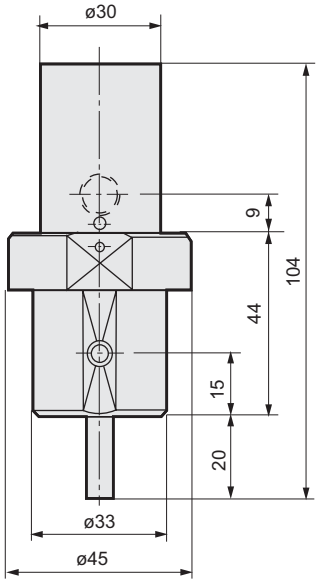
No.	Part name	Material
❶	Cylinder	
❷	Rod	SUS304
❸	Ring	C3604
❹	O ring holder	SUS304
❺	Grease shield	SUS304
❻	Valve disk B	SUS304
❼	Body	SUS304
❽	Pipe	SUS304
❾	O ring	FKM
❿	O ring	FKM
⓫	Valve disk A	FKM/SUS304

Dimensions

AVP21-8T

●NC

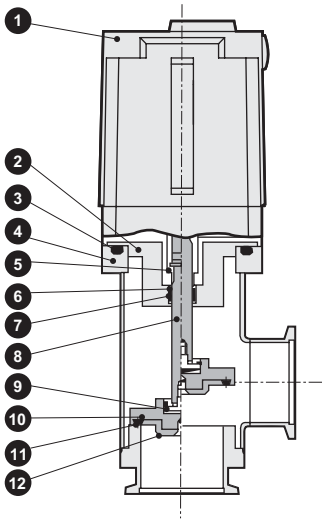




Internal structure and parts list

AVP∗∗2-∗K

●NC/NO/Double acting



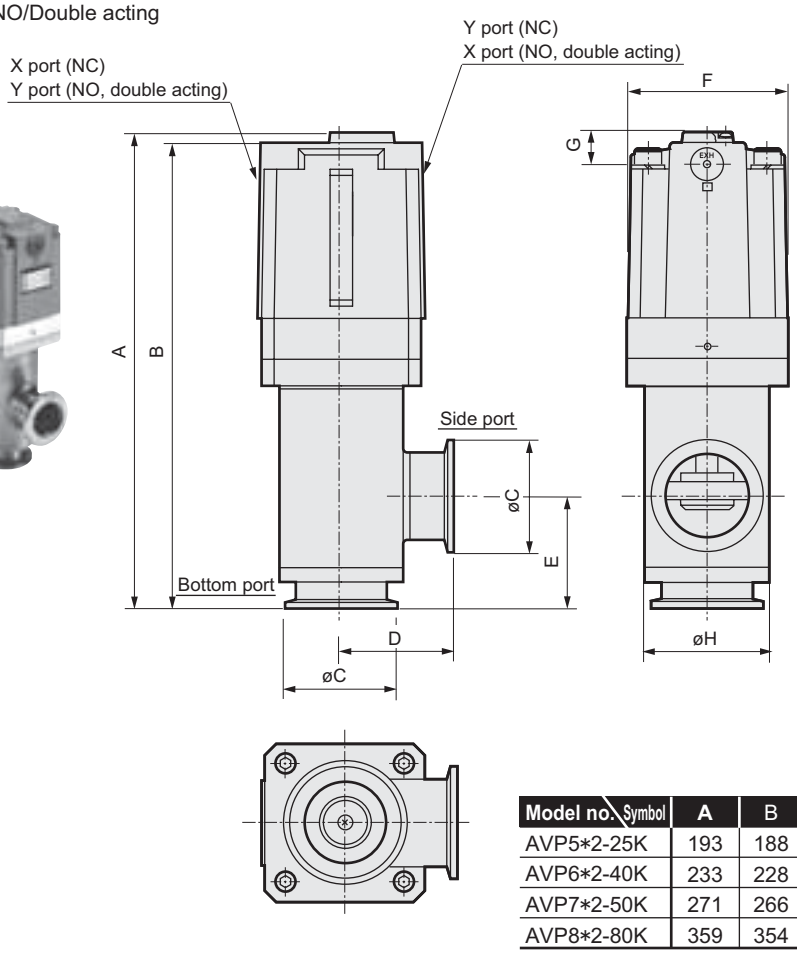
No.	Part name	Material
❶	Cylinder (magnet integrated)	
❷	O ring holder	SUS316
❸	O ring (∗1)	FKM
❹	Body	SUS316
❺	O ring holder	A5056
❻	O ring	FKM
❼	Grease shield	SUS304
❽	Valve rod	SUS316
❾	Rod piece	SUS304
❿	Valve disk A	SUS316
⓫	O ring	FKM
⓬	Valve disk B	SUS316

∗1 The external seal differs slightly for AVP7 and AVP8. (The ❸ O-ring seal is shown at left.)

Dimensions

AVP∗∗2-∗K

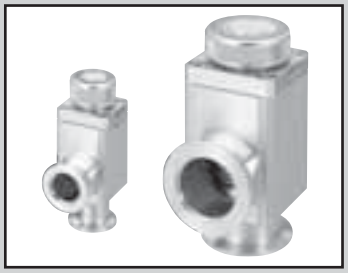
●NC/NO/Double acting



●The options (pilot-operated solenoid valve, cylinder switch) and dimensions are available upon request.
The solenoid valve option is not used for a double-acting valve.

Model no. \ Symbol	A	B	øC	D	E	F	G	øH
AVP5∗2-25K	193	188	40 (NW25)	50	50	63	15	48.6
AVP6∗2-40K	233	228	55 (NW40)	55	55	78	15.5	60.5
AVP7∗2-50K	271	266	75 (NW50)	70	70	78	15.5	76.3
AVP8∗2-80K	359	354	114 (NW80)	95	98	115	15.5	118

MEMO

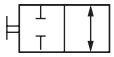


Manual valve for high vacuum

MVB*17 Series

● Formed bellows aluminum body type

Specifications

Descriptions	MVB217	MVB317	MVB417	MVB517
Working fluid	Vacuum and inert gas			
Working pressure range Pa (abs)	1.3×10^{-6} to 1×10^{5}			
Maximum working differential pressure MPa	0.1			
Valve seat leakage Pa·m³/s (He)	1.3×10^{-10} or less			
External leakage Pa·m³/s (He)	1.3×10^{-10} or less			
Withstanding pressure MPa	0.3			
Fluid temperature ℃	5 to 60			
Ambient temperature ℃	0 to 60 (no freezing)			
Orifice mm	ø17	ø24	ø39	ø48
Conductance Note1 ℓ/s	5	13	43	74
Connection	NW16	NW25	NW40	NW50
Operating torque Note 3 N·m	0.15 and over	0.25 and over	0.8 and over	1.5 and over
Handle rotations	5	7.5	12	15
Weight kg	0.4	0.6	1.4	2.3
JIS symbol				

Note 1: The conductance is the theoretical calculation value at the molecular flow range, and is not the actual measurement value.
Note 2: External O-ring uses grease for high vacuum.
Note 3: When turning the handle, the handle's torque will suddenly become light as it reaches full closure.
However, internal sealing is conducted by an internal spring. There is no problem with close-stop capability.

How to order

MVB **4** **17-** **40K**

Model no. Ⓐ Series Ⓑ Connection

Symbol	Descriptions
Ⓐ Series	
2	Orifice ø17
3	Orifice ø24
4	Orifice ø39
5	Orifice ø48

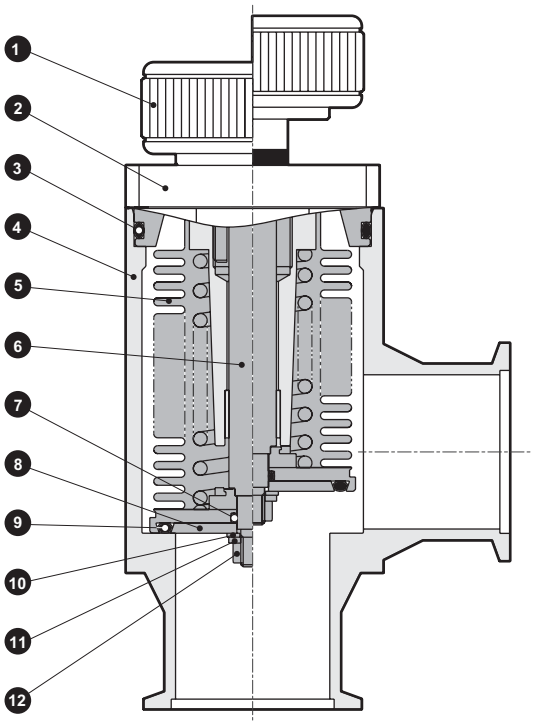
Ⓑ Connection		
16K	NW16	Available for MVB217 only
25K	NW25	Available for MVB317 only
40K	NW40	Available for MVB417 only
50K	NW50	Available for MVB517 only

<Example of model number>

MVB417-40K

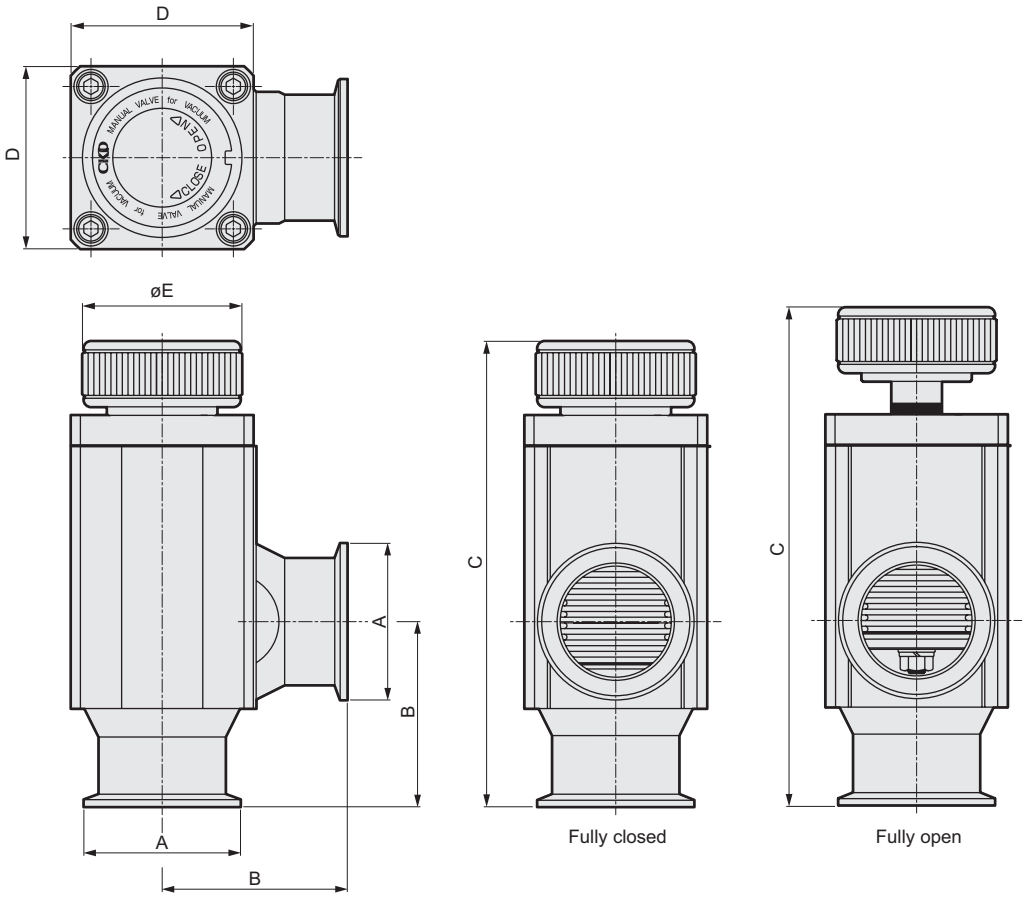
Model: MVB417 Manual valve for high vacuum
Ⓐ Series : Orifice ø39
Ⓑ Connection : NW40

Internal structure and parts list



No.	Part name	Material
1	Handle	SUS303 (16K/25K) A5056 (40K/50K)
2	Adaptor	A5056
3	O ring	FKM
4	Body	A6063
5	Bellows assembly	SUS316L
6	Rod	SUS316L
7	O ring	FKM
8	Valve disk B	SUS316L
9	O ring	FKM
10	Plain washer	SUS304
11	Spring washer	SUS304
12	Hexagon nut	SUS304

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

Manual valve for high vacuum

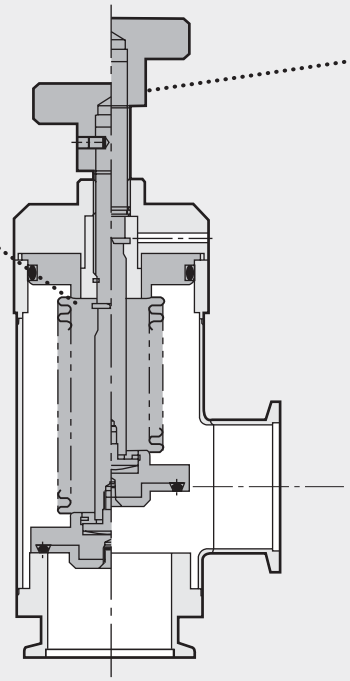
MVB$^{5}_{6}_{7}$0 Series

● Formed bellows ● Handle type

RoHS **Custom order**

Model no.	Actuation	Orifice	Model no.	Actuation	Orifice
MVB50	Manual	ø24	MVB70	Manual	ø50
MVB60	Manual	ø40			

Air-operated valve (AVB**2) performance is incorporated in the manual valve.



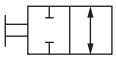
●Handle

●Long-life formed bellows
Special stainless steel material (ASL-350) provided. Outstanding corrosion resistance.

●Usable with back pressure (choose any exhaust direction)
The vacuum pump can be connected to either port.

●Low dust generation
Wetted areas (flow path) have no sliding parts that may generate particles.

Specifications

Descriptions	MVB50	MVB60	MVB70
Working fluid	Vacuum and inert gas		
Working pressure range Pa (abs)	1.3×10^{-6} to 1×10^{5}		
Maximum 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		
Withstanding pressure MPa	0.3		
Fluid temperature ℃	5 to 60		
Ambient temperature ℃	0 to 60 (no freezing)		
Orifice mm	ø24	ø40	ø50
Stroke length mm	15	20	22
Valve structure	Formed bellows		
Connection	NW25	NW40	NW50
Weight kg	1.4	2.4	3.2
JIS symbol			

Safety precautions

Read page 9 in the introduction and the precautions on page 102 to 109 to ensure correct and safe use of this product.

- Working media
- Installation
- Direction when connecting piping

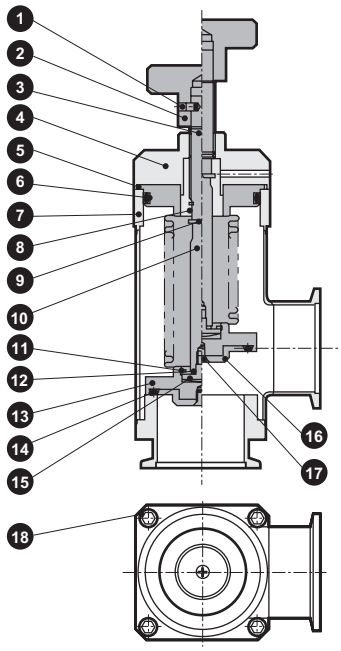
How to order

MVB 5 0 - 25K

- 0: Manual
- A Series
- B Connection

Symbol	Descriptions
A Series	
5	Orifice ø24
6	Orifice ø40
7	Orifice ø50
B Connection	
25K	25A (Only MVB50 is available)
40K	40A (Only MVB60 is available)
50K	50A (Only MVB70 is available)

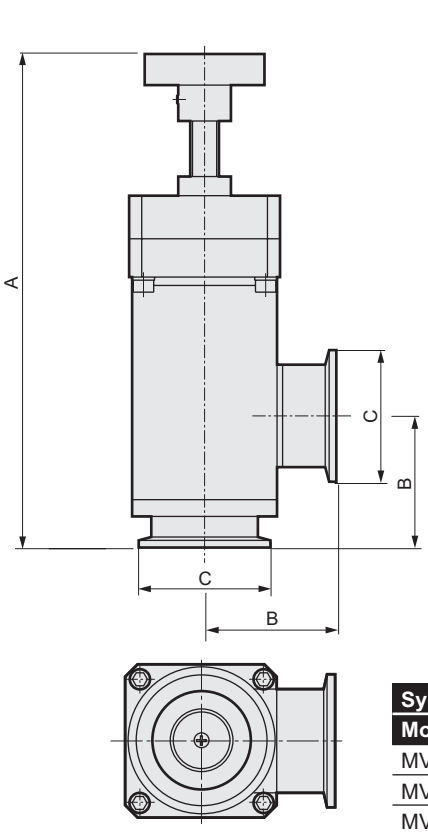
Internal structure and parts list

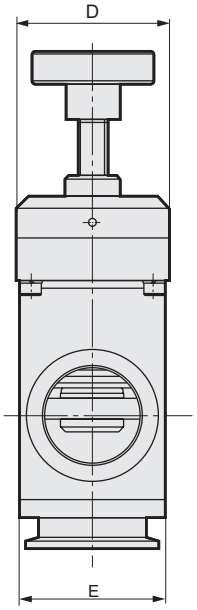


No.	Part name	Material	No.	Part name	Material
1	Hexagon socket set screw	SUS304	10	Rod	SUS316
2	Handle		11	Spring washer	SUS304
3	Manual rod	SUS303	12	C type snap ring	SUS304
4	Adaptor	A2017	13	Valve disk A	SUS316
5	Bellows assembly	ASL350, SUS316	14	O ring	FKM
6	O ring	FKM	15	Rod piece	SUS304
7	Body assembly	SUS304	16	Valve disk B	SUS316
8	E snap ring	SUS304	17	Flat headed cross cut screw	SUS304
9	Spring washer	SUS304	18	Cross headed bolt	SUS304

Dimensions

MVB∗0





Symbol / Model no.	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

Manual valve for high vacuum

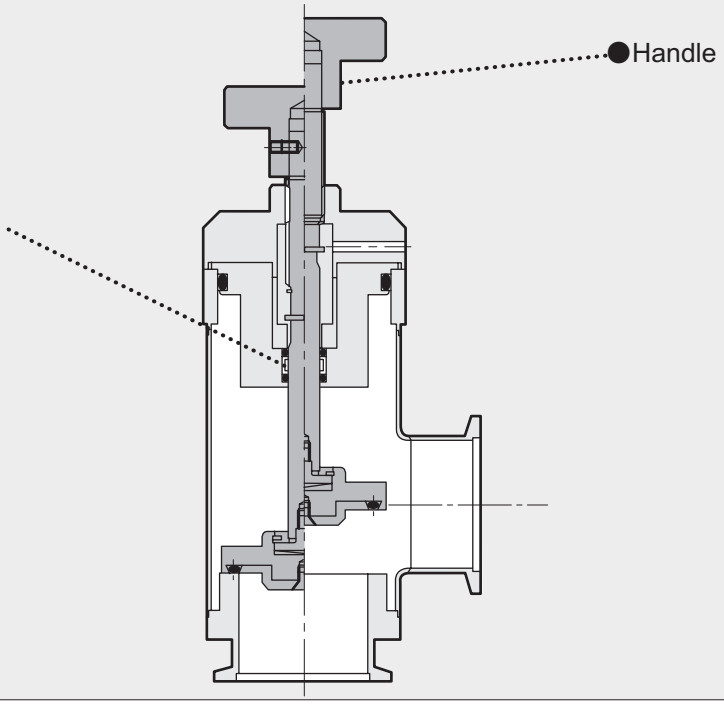
MVP$^{5}_{6}_{7}$0 Series

● Double O-ring seal type ● Handle type

RoHS **Custom order**

Model no.	Actuation	Orifice	Model no.	Actuation	Orifice
MVP50	Manual	ø24	MVP70	Manual	ø50
MVP60	Manual	ø40			

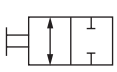
Air-operated valve (AVB**2) performance is incorporated in the manual valve.



●Long-life, high sealing
Outstanding lifespan and external sealing are attained due to double O-ring seal and grease container.

●Usable with back pressure (choose any exhaust direction)
The vacuum pump can be connected to either port.

Specifications

Descriptions	MVP50	MVP60	MVP70
Working fluid	Vacuum and inert gas		
Working pressure range Pa (abs)	1.3×10^{-6} to 2×10^{5}		
Maximum working differential pressure MPa	0.2		
Valve seat leakage Pa·m^3/s (He)	1.3×10^{-9} or less		
External leakage Pa·m^3/s (He)	1.3×10^{-8} or less		
Withstanding pressure MPa	0.3		
Fluid temperature ℃	5 to 60		
Ambient temperature ℃	0 to 60 (no freezing)		
Orifice mm	ø24	ø40	ø50
Stroke length mm	15	20	22
Valve structure	O-ring shaft seal		
Connection	NW25	NW40	NW50
Overall height inside parentheses ( )'s for when the valve is open mm	160 (175)	185 (205)	230 (252)
Distance between surfaces mm	50	55	70
Weight kg	1.4	2.5	3.7
JIS symbol			

Safety precautions

Read page 9 in the introduction and the precautions on page 102 to 109 to ensure correct and safe use of this product.

- Working media
- Installation
- Direction when connecting piping

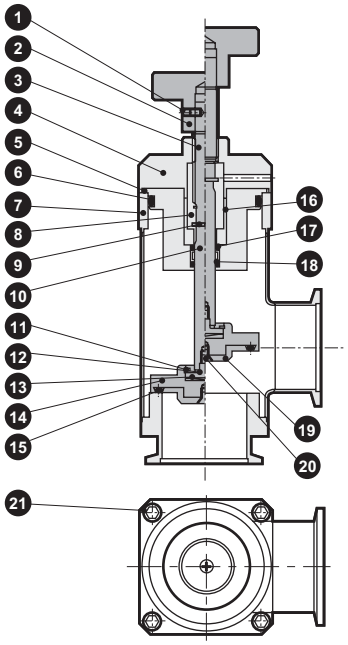
How to order

MVP **6** **0** - **40K**

- 0: Manual
- 6: Ⓐ Performance class
- 40K: Ⓑ Connection

Symbol	Descriptions
Ⓐ Performance class	
5	Orifice ø24
6	Orifice ø40
7	Orifice ø50
Ⓑ Connection	
25K	25A Available for MVP50 only
40K	40A Available for MVP60 only
50K	50A Available for MVP70 only

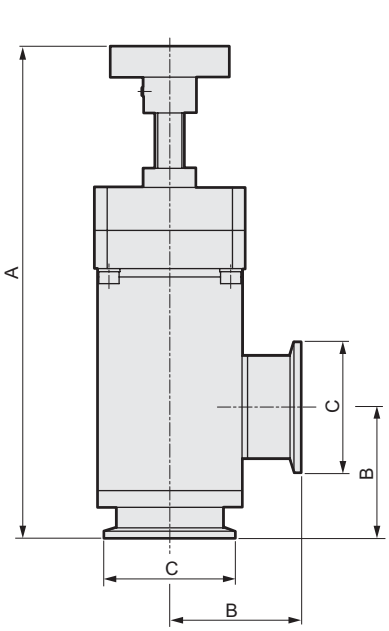
Internal structure and parts list

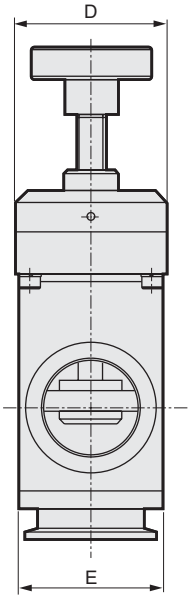


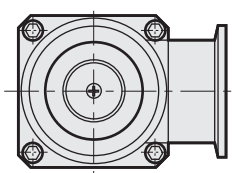
No.	Part name	Material	No.	Part name	Material
❶	Hexagon socket set screw	SUS304	⓬	C type snap ring	SUS304
❷	Handle		⓭	Rod piece	SUS304
❸	Manual rod	SUS303	⓮	Valve disk A	SUS316
❹	Adaptor	A2017	⓯	O ring	FKM
❺	O ring holder	SUS316	⓰	O ring holder	A5056
❻	O ring	FKM	⓱	O ring	FKM
❼	Body assembly		⓲	Grease shield	SUS304
❽	E snap ring	SUS304	⓳	Valve disk B	SUS316
❾	Spring washer	SUS304	⓴	Flat headed cross cut screw	SUS304
❿	Valve rod	SUS316	㉑	Cross headed bolt	SUS304
⓫	Spring washer	SUS304			

Dimensions

MVP∗0



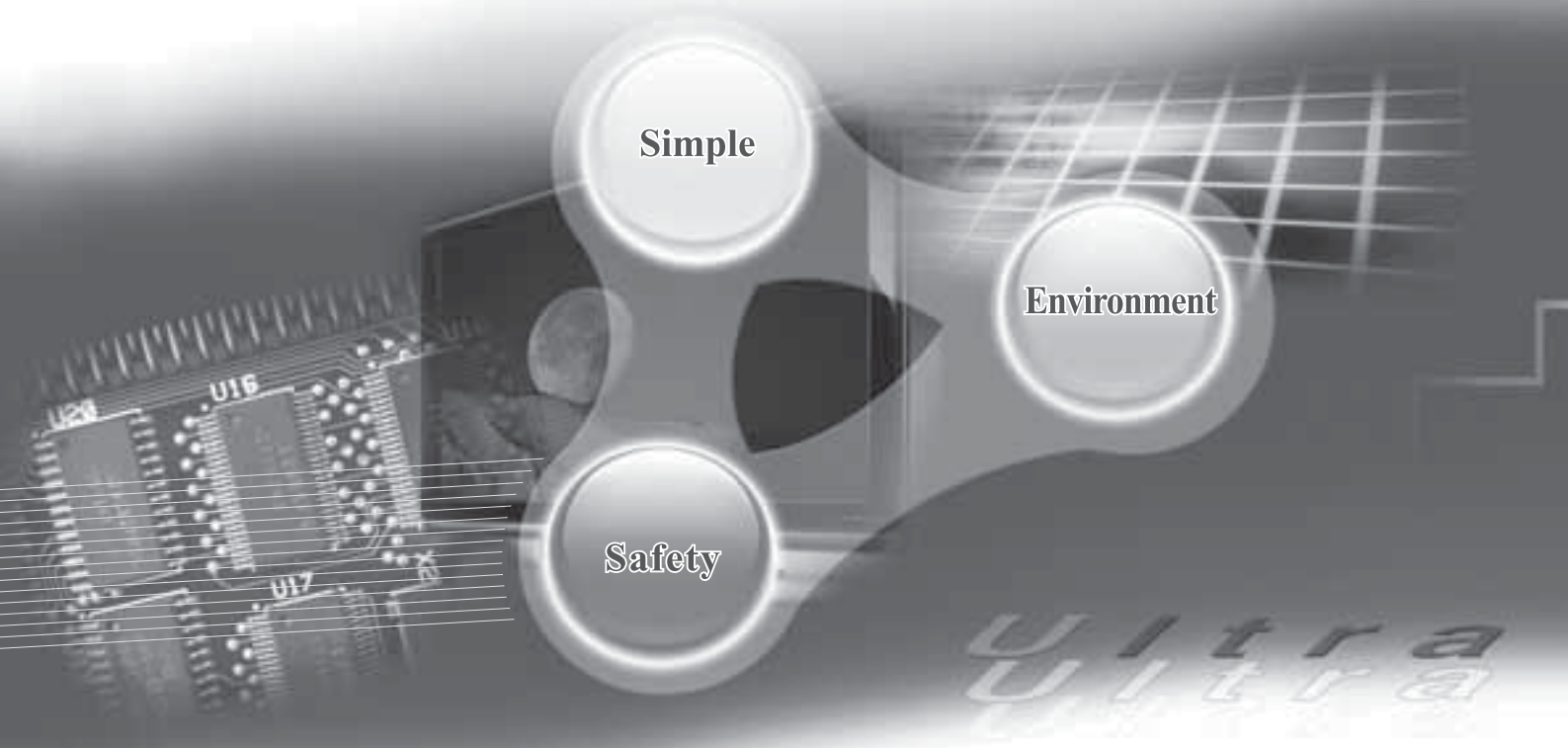




Symbol / Model no.	A Fully open	A Fully closed	B	C	D	E
MVP50	175	160	50	ø40 (NW25)	63	ø48.6
MVP60	205	185	55	ø55 (NW40)	63	ø60.5
MVP70	252	230	70	ø75 (NW50)	78	ø79

Now even more advanced. Vacuum valve with multistage openness degree.

Electric vacuum valve EVB series achieves a vast array of conductance through motorized adjustment of the valve's degree of opening.



■ **Ultra-fine concept**

CKD's unique UF concept implements complete cleanness in all critical areas for product development from design, evaluation, manufacturing methods, to manufacturing for total cleanness control of products.

Motor driven with 30 openness degree settings

Simple

Motor driven openness adjustment using external signal.
Min. pitch 0.15 mm (for NW25).
Optimal for simple conductance adjustment systems and automation of vacuum control.

Valve closures with proven spring seals

Safety

Air operated valve for high vacuum AVB**7 series employs proven ring seal method
Safety spring that forcibly closes the valve even when the power is cutoff such as power outages.

Openness degree monitoring function, variety of signal outputs

Safety

Monitor current degree of openness with integrated encoder.
Valve open/closed status action completion signal, alarm output function.

Long service life and excellent sealing performance

Environment

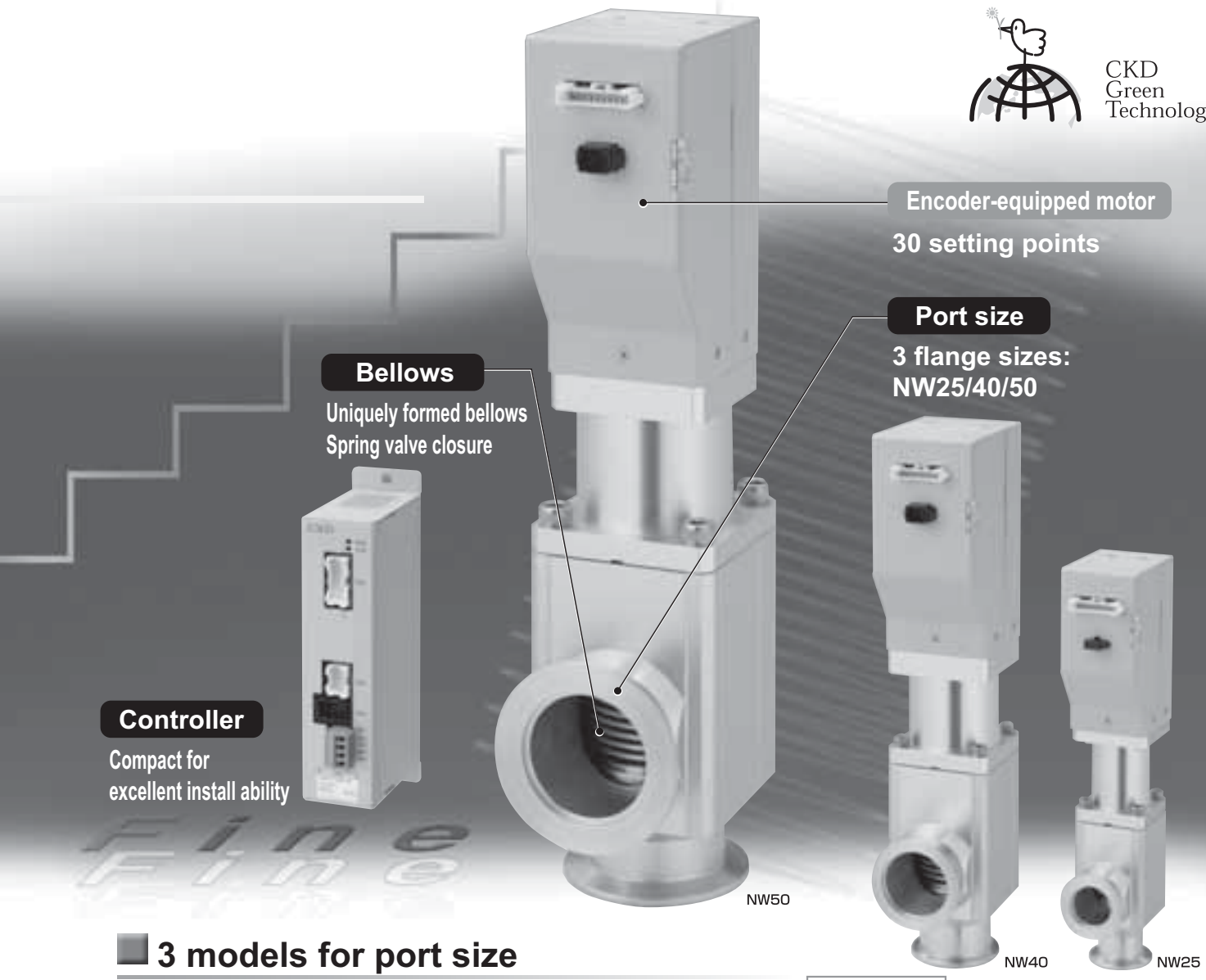
Air operated valve for high vacuum AVB**7 series utilizes proven bellows.
Highly reliable poppet method with long service life and sealing performance compared to typical butterfly valves.

- Nominal service life of 1 million cycles (CKD testing)
- Sealing performance equivalent to the previous AVB series.

Electric vacuum valve

EVB Series

CKD Green Technology



3 models for port size

Lineup of 3 port size models:
NW25/NW40/NW50.

Installation compatibility

Installation method is ISO21358 compliant.
Installation dimensions compatible
with AVB**7 series.

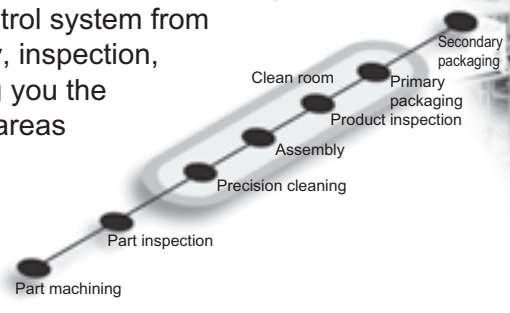
RoHS compliant

Environment RoHS

Substances harmful to the environment,
including lead and hexavalent chrome,
have been eliminated.

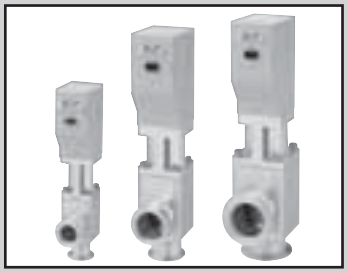
Total cleanness control system

This product has been manufactured using a seamless quality control system from machining, assembly, inspection, to packaging. Giving you the highest quality in all areas including cleanness.



Applications

- Now replacing the AVB*47 series two stage air operated valve for slow exhaust with applications for 3 stages or more.
- When openness degree monitoring (signal output) not possible with two-stage air operated valves is needed.
- When controlling exhaust via remote control.
- For adjusting exhaust conductance and stabilizing the inside of the chamber.



Electric vacuum valve

EVB*17 Series

● Formed bellows aluminum body type

RoHS

Specifications

Descriptions		EVB317	EVB417	EVB517
Working fluid		Vacuum and inert gas		
Working pressure range	Pa (abs)	1.3×10^{-6} to 1×10^{5}		
Setting points		30 points (segmented strokes)		
Resolution	mm	0.15	0.30	0.40
Repeatability	mm	0.10	0.15	0.20
Maximum working differential pressure	MPa	0.1		
Valve seat leakage	Pa·m³/s (He)	1.3×10^{-10} or less		
External leakage Note 1	Pa·m³/s (He)	1.3×10^{-11} or less		
Withstanding pressure	MPa	0.3		
Working fluid temperature range	℃	5 to 60		
Ambient temperature range	℃	5 to 50 (no dew condensation or freezing)		
Working humidity range	%	35 to 85 (no dew condensation or freezing)		
Storage humidity range	%	35 to 85 (no dew condensation or freezing)		
Working environment		No corrosive gases		
Orifice	mm	ø24	ø39	ø48
Conductance Note2	ℓ/s	13	43	74
Connection		NW25	NW40	NW50
Weight	kg	1.1	2.6	3.3

Note 1: External O-ring uses grease for high vacuum.
Note 2: The conductance is the theoretical calculation value at the molecular flow range, and is not the actual measurement value.

How to order

EVB 4 17 - 40K - 4D - S - 05 - 2

Model no.

Ⓐ Series

Actuation NC

Ⓑ Connection

Ⓒ Controller

Ⓓ Actuator cable dedicated to port size

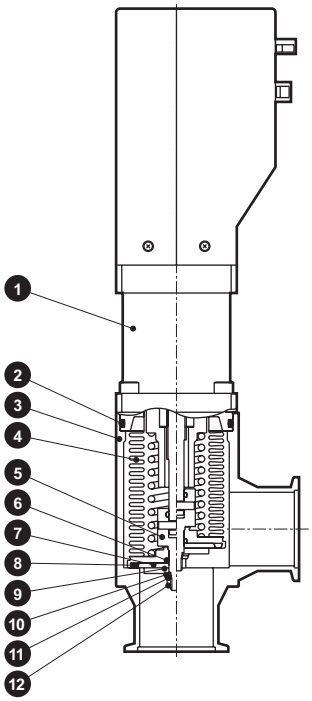
Ⓔ I/O cable

<Example of model number>
EVB417-40K-4D-S-05-2
Model: EVB417 Electric vacuum valve

Ⓐ Series	: Orifice ø39
Ⓑ Connection	: NW40
Ⓒ Controller	: EVB417
Ⓓ Actuator cable dedicated to port size	: 5 m
Ⓔ I/O cable	: 2 m

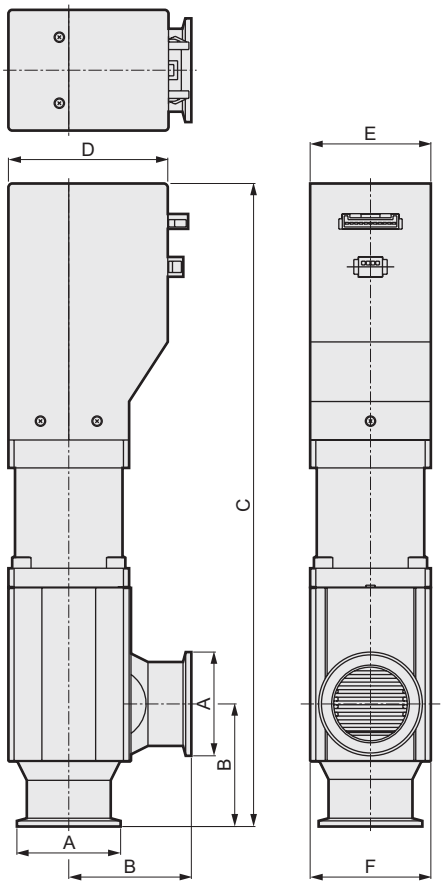
Symbol	Descriptions	
Ⓐ Series		
3	Orifice ø24	
4	Orifice ø39	
5	Orifice ø48	
Ⓑ Connection		
25K	NW25	Available for EVB317 only
40K	NW40	Available for EVB417 only
50K	NW50	Available for EVB517 only
Ⓒ Controller		
3D	EVB317 controller	
4D	EVB417 controller	
5D	EVB517 controller	
Ⓓ Actuator cable dedicated to port size		
03	3 m	
05	5 m	
10	10 m	
Ⓔ I/O cable		
2	2 m	

Internal structure and parts list



No.	Part name	Material
1	Actuator	
2	O ring	FKM
3	Body	A6063
4	Bellows	SUS316L
5	Rod cap	SUS304
6	O ring	FKM
7	Valve disk B	SUS316L
8	O ring	FKM
9	Skirt	SUS304
10	Plain washer	SUS304
11	Spring washer	SUS304
12	Hexagon nut	SUS304

Dimensions



Model no.	A	B	C	D	E	F
EVB317	ø40 (NW25)	50	259	66	49	45
EVB417	ø55 (NW40)	65	341	85	64	64
EVB517	ø75 (NW50)	70	352	85	64	77

Controller for EVB

RoHS

Common specifications

Descriptions		Specifications
Power supply	Power voltage	24VDC±10%
	Maximum instantaneous current	4 A
	Average current	1.2 A
Control power supply	Power voltage	24VDC±10%
	Power consumption	0.3 A
Display		LED (grn/red 1pc each)
Insulation resistance		50 M Ω (500VDC) or more
Withstand voltage		No abnormal condition when 1000VAC applied for 1 min
Working temperature range		0 to 50℃ (no dew condensation or freezing)
Working humidity range		35 to 85% (no dew condensation or freezing)
Storage temperature range		-20 to 60℃(no dew condensation or freezing)
Storage humidity range		35 to 85% (no dew condensation or freezing)
Working environment		No corrosive gases or powder dust
Weight		190 g

Use enough power to handle maximum instantaneous current.

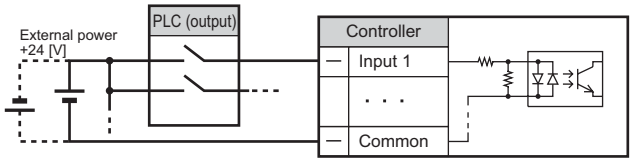
Input/output I/F specification

Descriptions		Specifications
Input	Point	7 points (photo coupler insulation)
	Input voltage	24VDC±10%
	Input current	3 mA/1 point
	Min. input current while ON	2 mA
	Max. input current while OFF	0.5 mA
Output	Point	6 points (photo coupler insulation)
	Output voltage	24VDC±10%
	Maximum load current	10 mA/1 point
	Max. internal voltage drop	6 V or less (at 25℃ or less) ∗
	Maximum current leakage	10 μA

∗ At 40℃, it is 6V or less with 9mA load current.

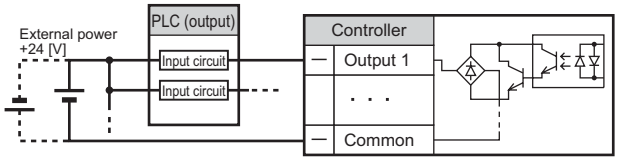
Input circuit

Circuit structure based on connection to PLC. Requires external power.
For "common", use as a common terminal and connect external power supply of +24 V or 0 V.
Use external output circuits (such as PLC) as relay contacts or transistor outputs.



Output circuit

Circuit structure based on connection to PLC. Requires external power.
For "common", use as a common terminal and connect external power supply of +24 V or 0 V.
Use input circuit that allows a max. load current of 10mA per one output circuit.



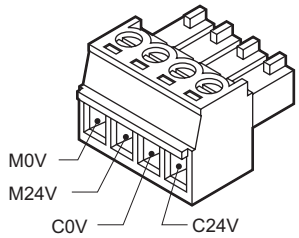
Controller connector layout

CN1 (electric supply)

Pin no.	Name
C24V	Control power (+)
C0V	Operating power (-)
M24V	Operating power (+)
M0V	Operating power (-)

For CN1 (power supply), a Phoenix Contact MINI-COMBICON plug MC1.5/4-ST-3.81 is attached.

- For CN2 (motor driven), connect the dedicated harness cable that comes with the product.
- Harness cable for CN2 (motor driven), varies for each port size.
- For CN3 (rotating sensor communication), connect the dedicated harness cable that comes with the product.



CN1 plug

CN5 (Input/output I/F)

Input/ output	Pin no.	Dedicated harness lead wire color	Name	Function
Input	1	Orange_black 1	SET1	Setting bit 0
	3	Gray_black 1	SET2	Setting bit 1
	5	White_black 1	SET3	Setting bit 2
	7	Yellow_black 1	SET4	Setting bit 3
	9	Pink_black 1	SET5	Setting bit 4
	11	Orange_black 2	ENT	Determination
	13	Gray_black 2	MODE	Special mode changeover
	15	White_black 2	COMI	Input signal common terminal
Output	2	Orange_red 1	ALARM1	Alarm 1
	4	Gray_red 1	ALARM2	Alarm 2
	6	White_red 1	BUSY	Not accepted (determining operation/stop)
	8	Yellow_red 1	CLOSE	Valve closed
	10	Pink_red 1	KEEP	Valve open/on-hold
	12	Orange_red 2	MODE	Special mode
	16	White_red 2	COMO	Output signal common terminal
	14	—	N.C.	
	17	—	N.C.	
	18	—	N.C.	
	19	—	N.C.	
	20	—	N.C.	

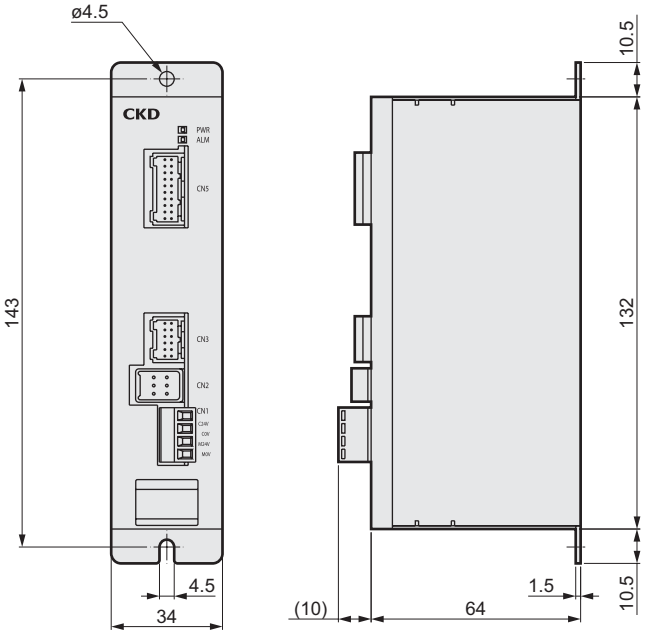
Do not connect anything to NC.

Special mode

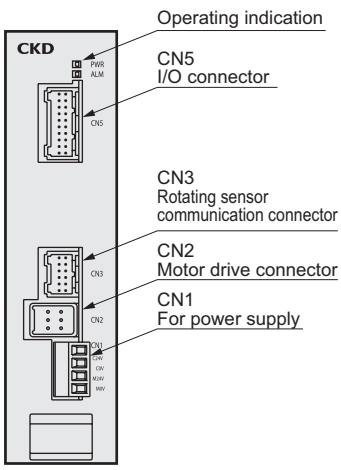
Code	SET5	SET4	SET3	SET2	SET1	Function summary
0	Low	Low	Low	Low	Low	Alarm 2 cancel /reset
1	Low	Low	Low	Low	High	Memory update of home position when valve is closed
2	Low	Low	Low	High	Low	Opening operation of fixed valve
3	Low	Low	Low	High	High	Opening operation of fixed valve

Set “MODE” input to high level, and code “SET5” to “SET1”of special mode to input status. Then special mode operation is available by setting High edge of “ENT” input from low.

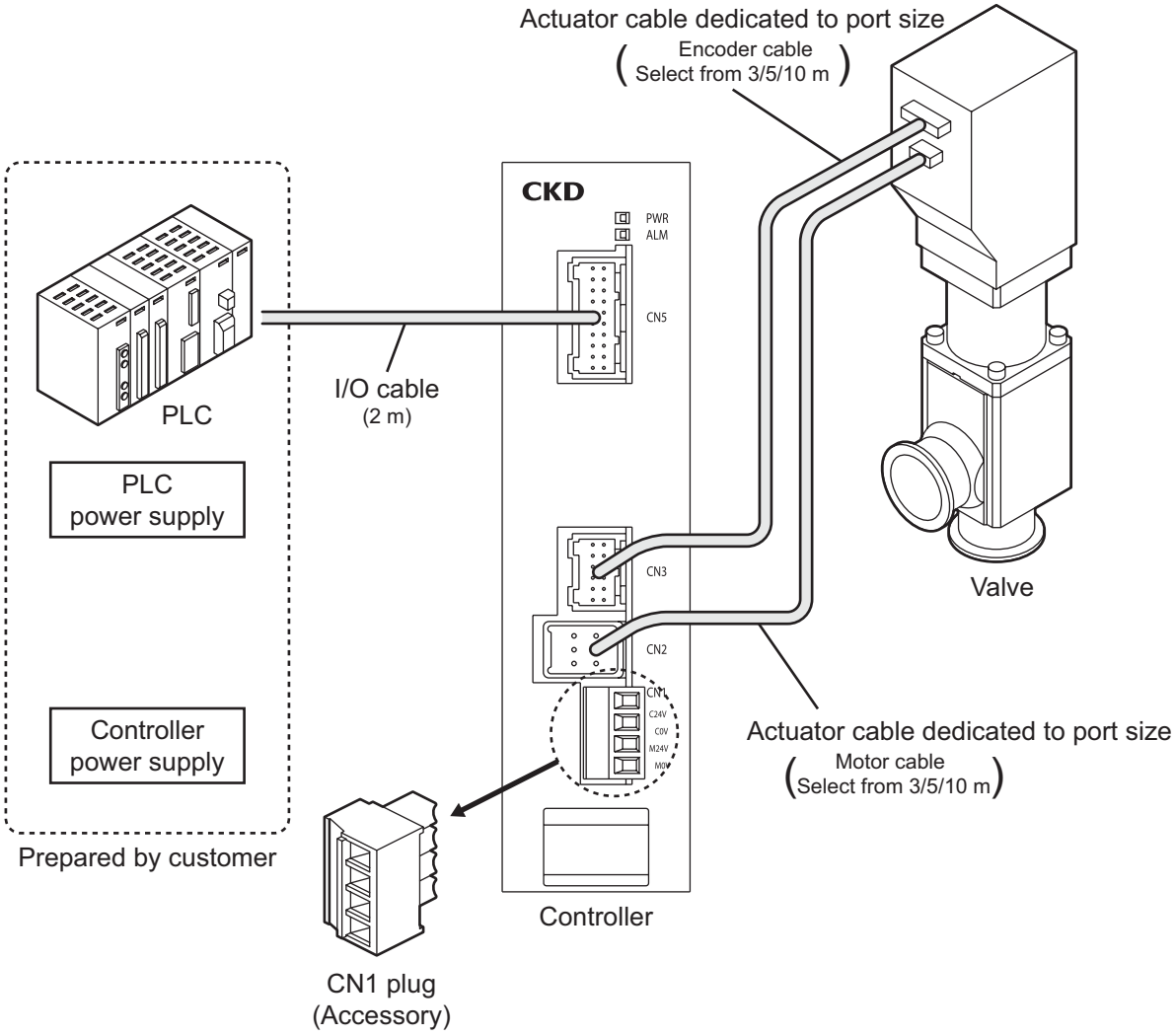
Dimensions



Panel description



System configuration chart

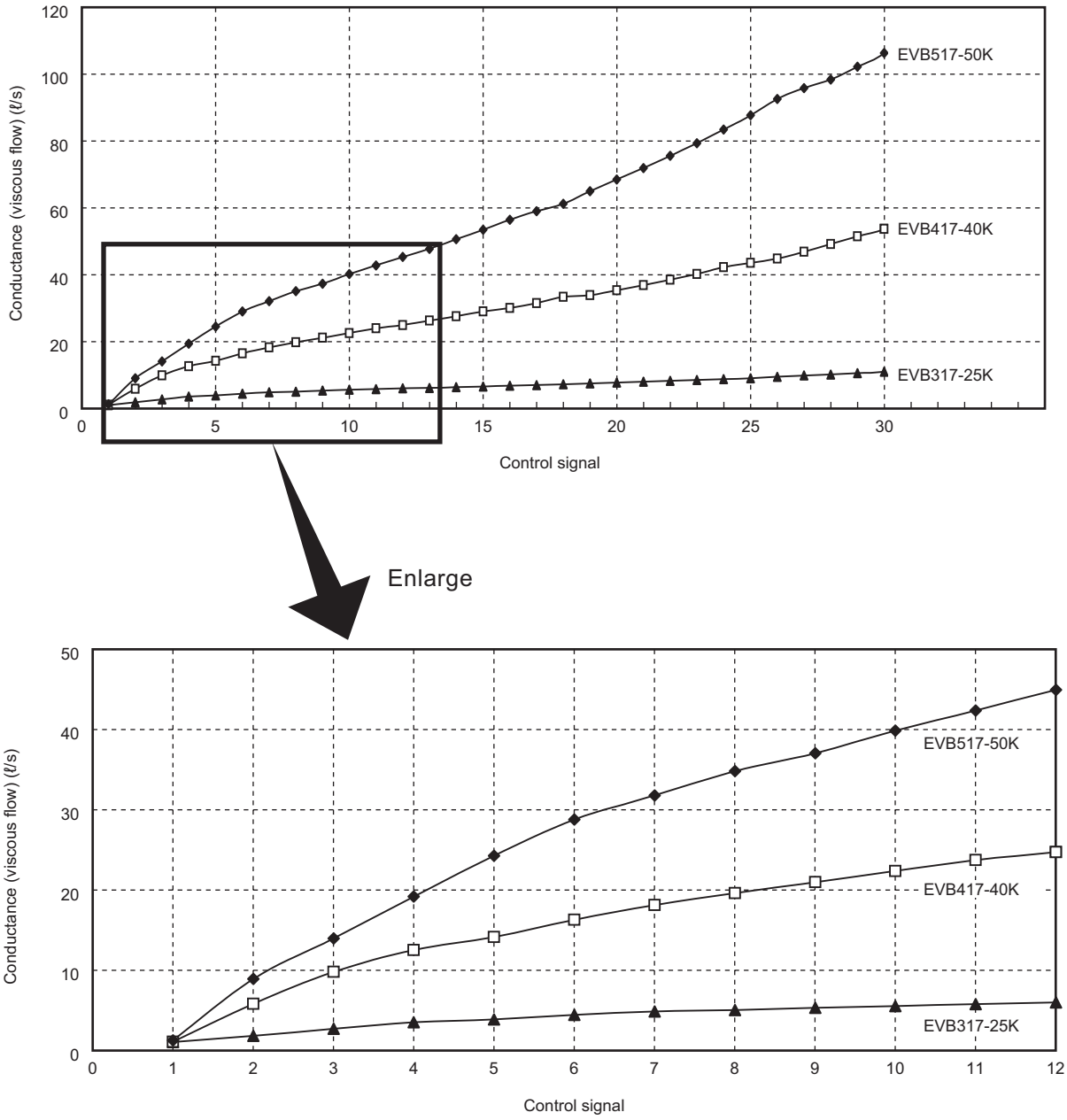


Product configuration

Name	Quantity
Valve	1
Controller (CN1 plug included)	1
Actuator cable dedicated to port size	1
I/O cable	1

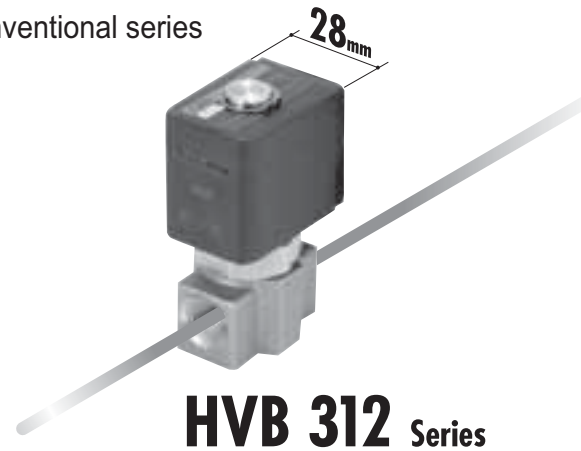
Customers shall be responsible for confirming our product's compatibility with the customer's own system, machine, and equipment. If using multiple power supply, use 0 V as the common power supply.
Control of power supply requires 300 mA current per each product unit. Motor drive power supply requires max. 4 A current per each product unit.
Use enough DC safety power supply to safely handle the necessary capacity.
Valves and controllers are adjusted as they are paired or grouped for shipping. Always use valves and controllers with the same name plate display details as a set.

Control signal x conductance

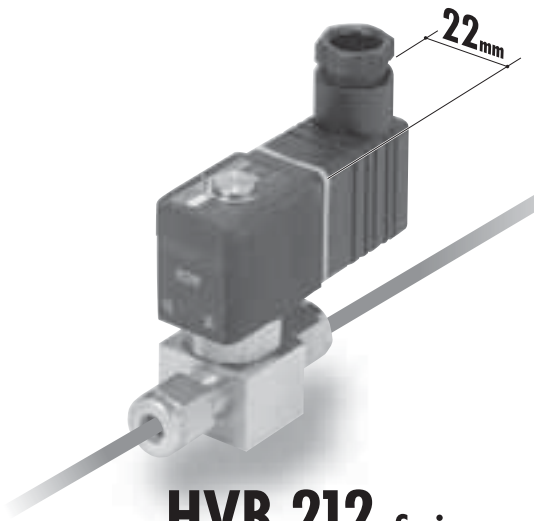


New HVB Series high-vacuum solenoid valve maintaining

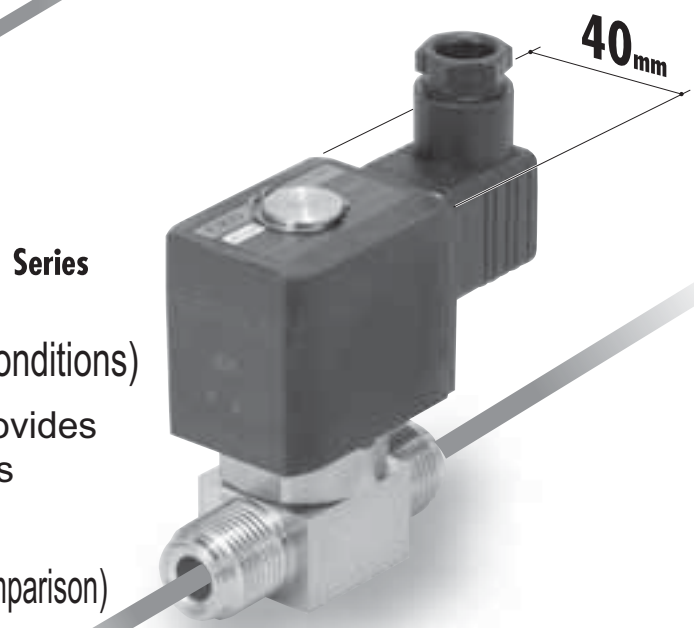
A new easier-to-use series has been added to the reliable, proven conventional series



HVB 312 Series



HVB 212 Series



HVB 512 Series

Durability 2,000,000 times (*CKD conditions)

This highly reliable high-quality valve provides superior performance even in continuous long-term use.

Power consumption reduced by 40% (CKD comparison)

Power consumption is greatly reduced.
This valve saves power even in long-term use with power on continuously.

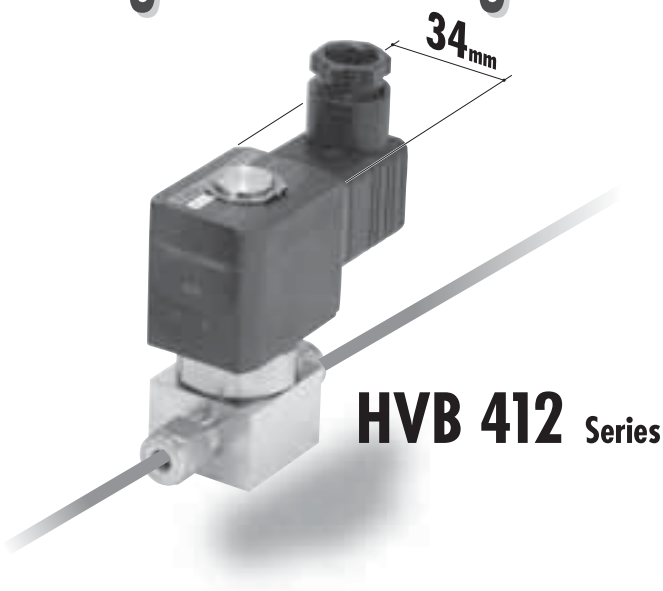
Vacuum leakage: 1×10^{-9} Pa·m^3/s or less

The high vacuum has a stable leakage range both inside and outside.

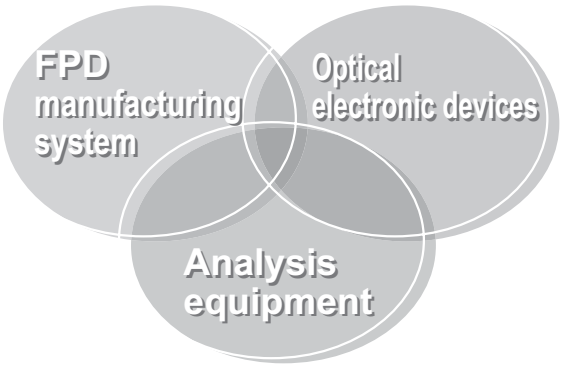
High vacuum solenoid valve

High Vacuum HVB Series

high vacuum degree and providing outstanding durability



HVB 412 Series



Lightweight and compact

This valve is lighter and smaller than the conventional type.

Coil width: 25% smaller

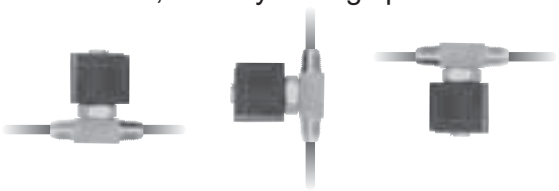
Weight : 23% lighter

Wide variations

Orifices are available in diameters of 1, 2, 3, 4.5, and 6. Coil widths are available at 22, 28, 34, and 40 mm.

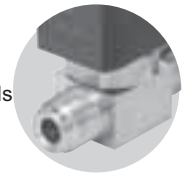
Unlimited installation

This valve can be installed to match the installation site, thereby saving space.



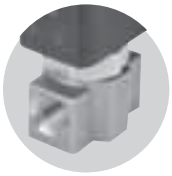
Three connection types

- JXR male threads
  Connectable to
  VCR female threads

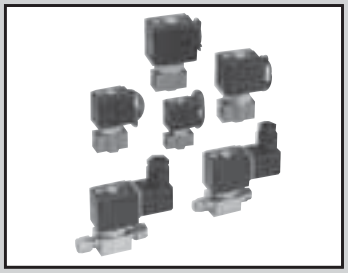


- Double barbed joint
  Connectable to
  a swage joint

- NPT



Series variation	Coil width (mm)				Orifice (mm)					Connection		
	22	28	34	40	ø1	ø2	ø3	ø4.5	ø6	JXR	Double barbed joint	NPT
HVB 212 Series	●				●	●				1/4"	1/4"	1/8"
HVB 312 Series		●				●	●			1/4"	1/4"	1/8"·1/4"
HVB 412 Series			●				●	●	●	1/4"·3/8"	1/4"·3/8"	1/4"·3/8"
HVB 512 Series				●				●	●	1/4"·3/8"	1/4"·3/8"	1/4"·3/8"

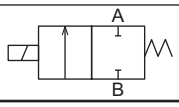


Solenoid valve for high vacuum

HVB 2 3 4 5 12 Series

Model no.	Actuation	Orifice	Model no.	Actuation	Orifice
HVB212	NC	ø1, ø2	HVB412	NC	ø3, ø4.5, ø6
HVB312	NC	ø2, ø3	HVB512	NC	ø4.5, ø6

Common specifications

Descriptions	HVB∗12
Working fluid	Air/vacuum/inert gas (∗1)
Withstanding pressure MPa	5.0
Fluid temperature ℃	5 to 55
Ambient temperature ℃	0 to 55 (no freezing)
Heat proof class	B
Allowable voltage fluctuation	Rated voltage 10%
Atmosphere	Not in explosive or corrosive environment
Valve structure	Directacting poppet structure
Valve seat leakage Pa·m³/sHe	1.0×10^{-9} or less (∗2)
External leakage Pa·m³/sHe	1.0×10^{-9} or less
Mounting attitude	Unrestricted
Number of endurance times	2 million times
JIS symbol	

Individual specifications

Descriptions / Model no.	Port size (∗3)	Orifice (mm)	Cv value (∗5)	Working pressure range Pa (abs) (∗10)	Max. working pressure (∗6) (MPa)	Back pressure (∗7) (MPa)	Rated voltage	Power consumption (W) AC	Power consumption (W) DC	Weight (∗9) (kg)
NC (normally closed) type										
HVB212	1/4"JXR male fitting 1/4"double barbed fitting NPT 1/8, Rc1/8	1	0.04	1.0×10^{-6} to 1.0×10^{6}	1.0	0.6	100VAC 50/60 Hz 200VAC 50/60 Hz 24VDC 12VDC	4.3	4	0.16
		2	0.17	1.0×10^{-6} to 0.3×10^{6}	0.3	0.15				
HVB312	1/4"JXR male fitting 1/4"double barbed fitting NPT 1/8, 1/4, Rc1/8, 1/4	2	0.17	1.0×10^{-6} to 0.8×10^{6}	0.8	0.5		6.5	6	0.29
		3	0.33	1.0×10^{-6} to 0.3×10^{6}	0.3	0.25				
HVB412	1/4"JXR male fitting 1/4"double barbed fitting NPT 1/4, Rc1/4	3	0.33	1.0×10^{-6} to 1.0×10^{6}	1.0	0.4		8.3	8 (∗8)	0.50
		4.5	0.6	1.0×10^{-6} to 0.3×10^{6}	0.3	0.2				
	3/8"JXR male fitting 3/8"double barbed fitting NPT 3/8, Rc3/8	6	1.05	1.0×10^{-6} to 0.2×10^{6}	0.1	0.05				
HVB512	1/4"JXR male fitting 1/4"double barbed fitting NPT 1/4, Rc1/4	4.5	0.6	1.0×10^{-6} to 0.8×10^{6}	0.8	0.2		11.8	11.5	0.69
	3/8"JXR male fitting 3/8"double barbed fitting NPT 3/8, Rc3/8	6	1.05	1.0×10^{-6} to 0.3×10^{6}	0.3	0.15				

∗1: The durability may drop remarkably depending on the degree of dryness.
∗2: Value when A port is the vacuum side.
∗3: The JXR fitting can be connected with the VCR fitting.
∗4: Keep the leakage current at value below or less.
∗5: The listed Cv values are for the NPT connection.
∗6: The maximum working pressure difference indicates the difference of the port B (high pressure side) and port A (low pressure side).
∗7: Pressurizing from the A port with the B port released to atmosphere is possible.
∗8: 12VDC is 8.6(W).
∗9: The listed weights are for the grommet lead wire and NPT connection.
∗10: Degree of vacuum of the working pressure range does not guarantee that there will be no ultimate vacuum time or change in degree of vacuum.
∗11: FKM is used for sealant material. Therefore, take into consideration discharge gas when using.

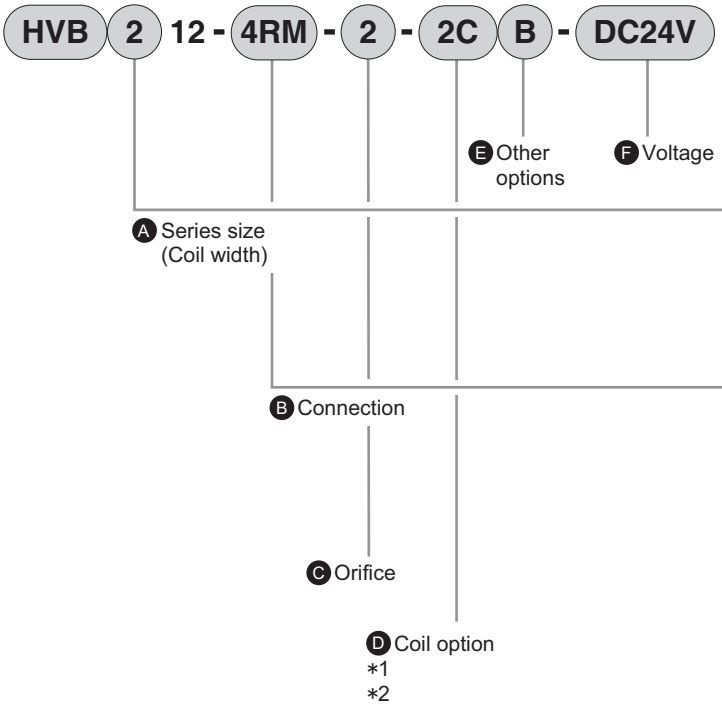
Leakage current	Voltage / Model no.	100VAC	200VAC	24VDC	12VDC
	HVB∗12	2 mA or less	1 mA or less	1 mA or less	2 mA or less

Safety precautions

Always read page 9 in the introduction and the precautions on page 102-104, and page 109 to ensure correct, safe use of this product.

- Working media
- Installation
- Direction when connecting piping
- Solenoid valve
- How to wire the terminal box

How to order



Symbol	Descriptions	Model no. HVB212	HVB312	HVB412	HVB512
A Series size					
2	22 mm	●			
3	28 mm		●		
4	34 mm			●	
5	40 mm				●
B Connection (refer to table1)					
4RM	1/4"JXR male fitting	●	●	●	●
6RM	3/8"JXR male fitting			●	●
4S	1/4"double barbed fitting	●	●	●	●
6S	3/8"double barbed fitting			●	●
6N	NPT 1/8	●	●		
8N	NPT 1/4		●	●	●
10N	NPT 3/8			●	●
6	Rc 1/8	●	●		
8	Rc 1/4		●	●	●
10	Rc 3/8			●	●
C Orifice (refero table1)					
Z	ø1	●			
2	ø2	●	●		
3	ø3		●	●	
5	ø4.5			●	●
6	ø6			●	●
D Coil option					
AC					
2CR	Standard: With grommet lead wire and all wave rectifier	●	●	●	●
DC					
2C	Standard: Grommet lead wire	●	●	●	●
2CS	Option: Grommet lead wire Surge suppressor	●	●	●	●
2G	Option: DIN terminal box (Pg11)	●	●	●	●
2HS	Option: DIN terminal box + light Surge suppressor (Pg11)	●	●	●	●
E Other options					
Blank	Standard: None	●	●	●	●
B	Option: Mounting plate	●	●	●	●
F Voltage					
AC100V	100VAC 50/60 Hz	●	●	●	●
AC200V	200VAC 50/60 Hz	●	●	●	●
DC24V	24VDC	●	●	●	●
DC12V	12VDC	●	●	●	●

Select from the combinations marked with a ● above.

Table 1: Fittng type and orifice combinations

	Connection			C Orifice				
	B	Fitting type	Size	Z ø1	2 ø2	3 ø3	5 ø4.5	6 ø6
HVB212	4RM	JXR male	1/4"	●	●			
	4S	Double barbed	1/4"	●	●			
	6N	NPT	1/8"	●	●			
	6	Rc	1/8"	●	●			
HVB312	4RM	JXR male	1/4"		●	●		
	4S	Double barbed	1/4"		●	●		
	6N	NPT	1/8"		●	●		
	8N	NPT	1/4"		●	●		
	6	Rc	1/8"		●	●		
	8	Rc	1/4"		●	●		
HVB412	4RM	JXR male	1/4"			●	●	
	6RM	JXR male	3/8"					●
	4S	Double barbed	1/4"			●	●	
	6S	Double barbed	3/8"					●
	8N	NPT	1/4"			●	●	
	10N	NPT	3/8"					●
	8	Rc	1/4"			●	●	
	10	Rc	3/8"					●
HVB512	4RM	JXR male	1/4"				●	
	6RM	JXR male	3/8"					●
	4S	Double barbed	1/4"				●	
	6S	Double barbed	3/8"					●
	8N	NPT	1/4"				●	
	10N	NPT	3/8"					●
	8	Rc	1/4"				●	
	10	Rc	3/8"					●

<Example of model number>

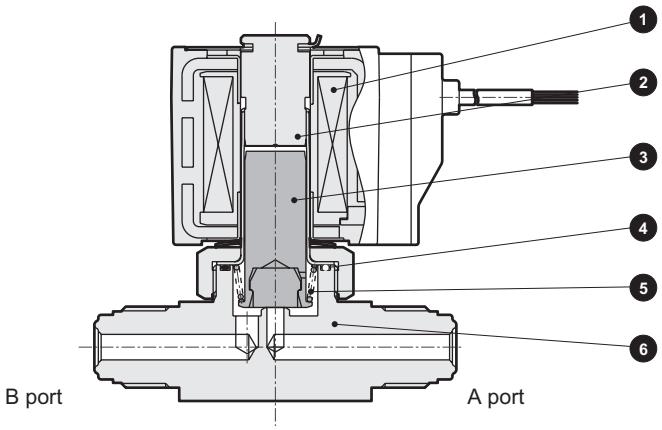
HVB212-4RM-2-2CB-DC24V

Model: HVB212

- A Series size : 22 mm
- B Connection : 1/4"JXR male fitting
- C Orifice : ø2
- D Coil option : Gommet lead wire
- E Other options : Mounting plate
- F Voltage : 24VDC

*1: The surge suppressor is incorporated as a standard with the full wave rectifier type.
*2: The compact terminal box (Pg9) is used when HVB212 D 2G/2HS is selected.

Internal structure and parts list

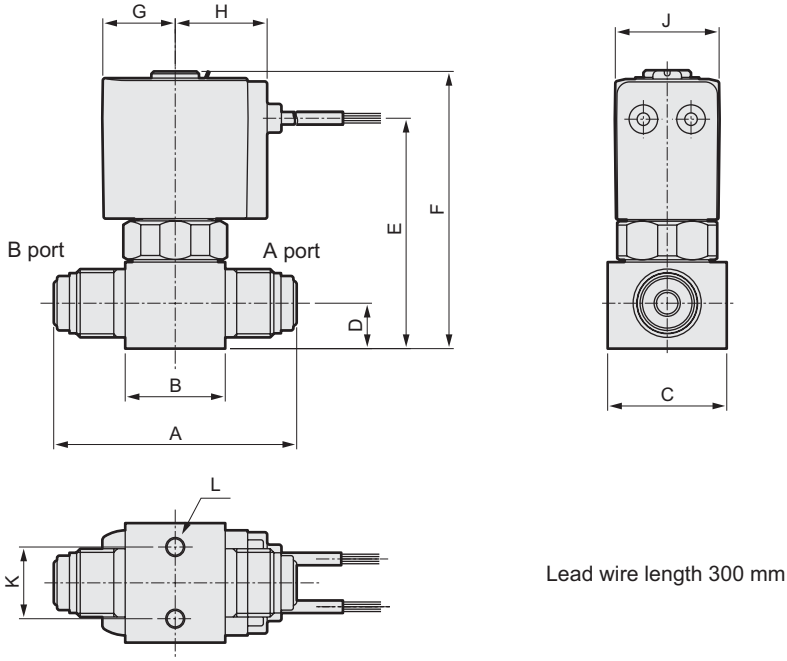


No.	Part name	Material		No.	Part name	Material	
1	Coil assembly	(molded coil)		4	O-ring	FKM	Fluorine rubber
2	Core assembly	SUS405, SUS316L	Stainless steel	5	Spring	SUS304	Stainless steel
3	Plunger assembly	SUS405, FKM	Stainless steel, fluoro rubber	6	Body	SUS304 or SCS13	Stainless steel

Dimensions

●Grommet lead wire (Voltage: DC type)/JXR male fitting type

HVB∗12-[4RM / 6RM]-∗-[2C]



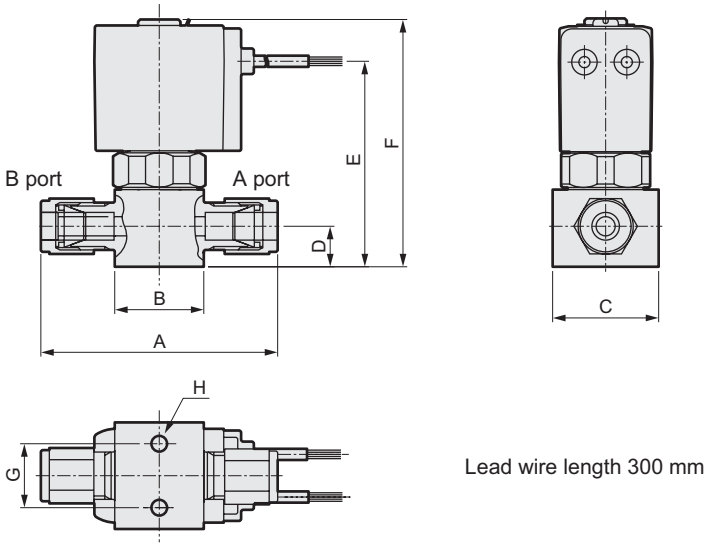
Lead wire length 300 mm

Model no.	A	B	C	D	E	F	G	H	J	K	L
HVB212-4RM	51	21	25	9.5	48	58	15.5	19.5	22	15	M4 × 0.7 depth 6
HVB312-4RM	64	30	25	9.5	53.5	64.5	18.5	22.5	28	18	M5 × 0.8 depth 8
HVB412-4RM	64	34	32	11.6	66	79.5	22.5	26	34	18	M5 × 0.8 depth 8
HVB412-6RM	75	34	32	11.6	66	79.5	22.5	26	34	18	M5 × 0.8 depth 8
HVB512-4RM	64	34	32	11.6	71.5	86.5	26	29.5	40	18	M5 × 0.8 depth 8
HVB512-6RM	75	34	32	11.6	71.5	86.5	26	29.5	40	18	M5 × 0.8 depth 8

Dimensions

●Grommet lead wire (Voltage: DC type)/double barbed fitting type

HVB∗12-[4S / 6S]-∗-[2C]

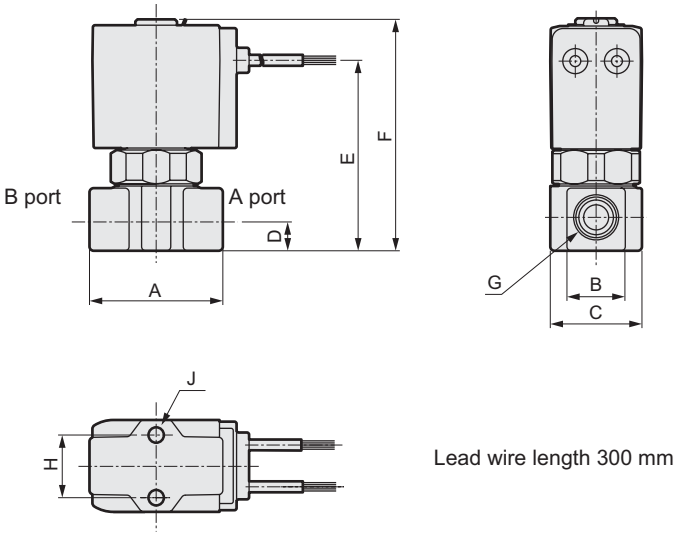


Lead wire length 300 mm

Model no.	A	B	C	D	E	F	G	H
HVB212-4S	56	21	25	9.5	48	58	15	M4 × 0.7 depth 6
HVB312-4S	69	30	25	9.5	53.5	64.5	18	M5 × 0.8 depth 8
HVB412-4S	69	34	32	11.6	66	79.5	18	M5 × 0.8 depth 8
HVB412-6S	80	34	32	11.6	66	79.5	18	M5 × 0.8 depth 8
HVB512-4S	69	34	32	11.6	71.5	86.5	18	M5 × 0.8 depth 8
HVB512-6S	80	34	32	11.6	71.5	86.5	18	M5 × 0.8 depth 8

●Grommet lead wire (Voltage: DC type)/NPT type

HVB∗12-[6N / 8N / 10N / 6 / 8 / 10]-∗-[2C]



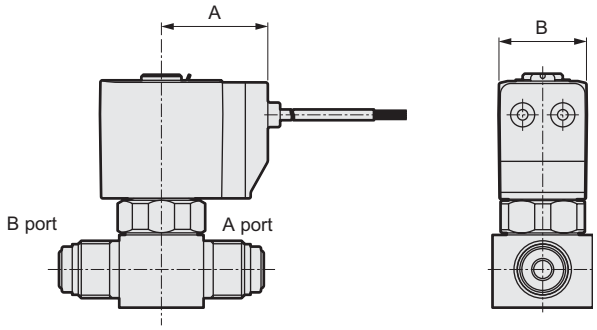
Lead wire length 300 mm

Model no.	A	B	C	D	E	F	G	H	J
HVB212-6N	32	14	22	8	45.5	56	NPT1/8	15	M4 × 0.7 depth 6
HVB312-$^{6}_{8}$N/$^{6}_{8}$	36	18	28	11	57.5	68.5	NPT1/8, NPT1/4	18	M5 × 0.8 depth 6
HVB412-$^{8}_{10}$N/$^{8}_{10}$	40	21	34	12	67	81	NPT1/4, NPT3/8	18	M5 × 0.8 depth 8
HVB512-$^{8}_{10}$N/$^{8}_{10}$	40	21	34	12	73.5	89	NPT1/4, NPT3/8	18	M5 × 0.8 depth 8

Optional dimensions

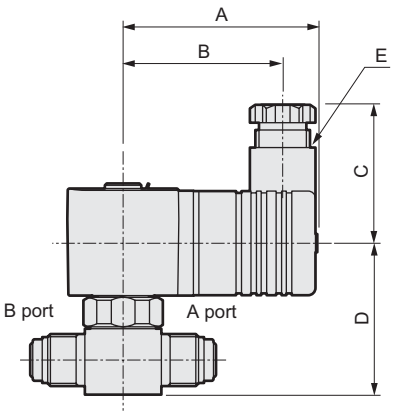
●Grommet lead wire (Voltage: AC type)/with full wave rectifier
HVB∗12-∗-∗-2CR

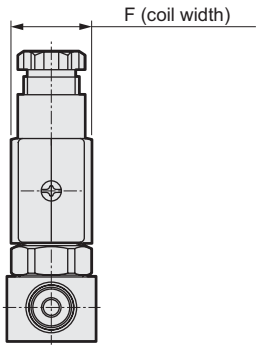
For common dimensions, refer to the grommet lead wire (DC type) dimensions on the previous page.



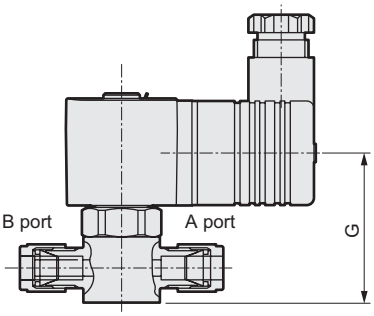
Model no.	A	B
HVB212	26.5	22
HVB312	29.5	28
HVB412	34	34
HVB512	37.5	40

●With DIN terminal box (with light/surge killer)
HVB∗12-∗-∗- 2G / 2HS

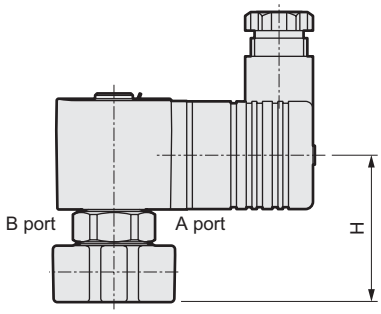




JXR male fitting: 4RM, 6RM



Double barbed fitting: 4S, 6S

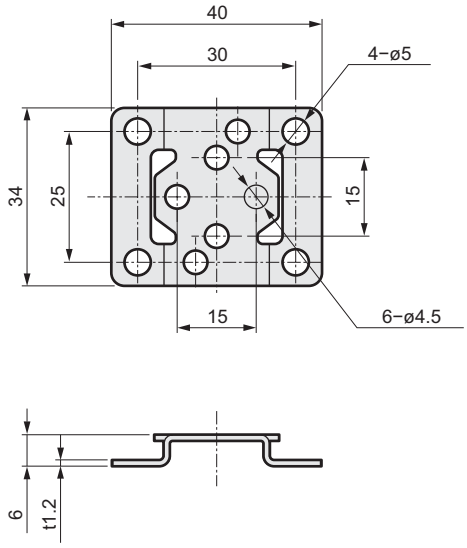


NPT fitting: 6N, 8N, 10N

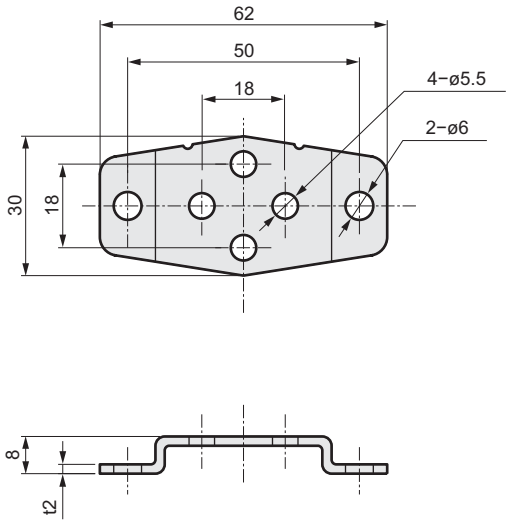
Model no.	A	B	C	D	E	F	G	H
HVB212	53	44	38	41.5	Pg9	22	41.5	39
HVB312	58.5	47	42	47.5	Pg11	28	47.5	51
HVB412	62	50.5	42	59.5	Pg11	34	59.5	61
HVB512	65.5	54	42	67	Pg11	40	67	69.5

Optional dimensions

●Installation plate
HVB212-*-*-*B



●Installation plate
HVB$^{3}_{5}$12-*-*-*B



Solenoid valve for high vacuum

HVB112 Series

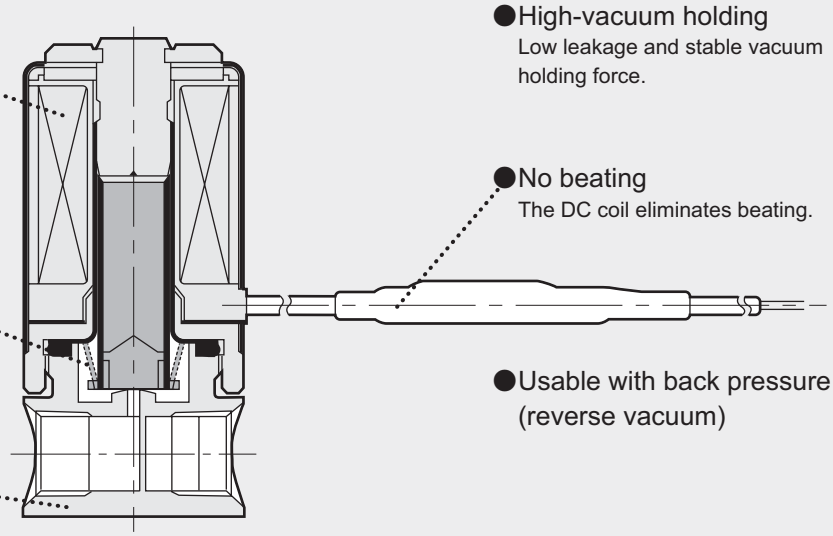
Model no.	Actuation	Orifice
HVB112	NC	ø1.6

Space-saving miniature solenoid valve

●Easy maintenance
This simple structure has few component parts.

●Special packing incorporated
FKM packing has outstanding seal life.

●Highly corrosion resistant
Stainless steel (SUS303) is used for the body. (The VCR fitting is SUS316.)

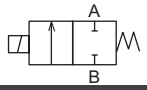


●High-vacuum holding
Low leakage and stable vacuum holding force.

●No beating
The DC coil eliminates beating.

●Usable with back pressure (reverse vacuum)

Specifications

Descriptions	HVB112-6N-∗	HVB112-8R-∗ (Custom order)
Working fluid	Vacuum/inert gas (Note 1)	
Working pressure range Pa (abs)	1.3×10^{-6} to 3×10^{5} (Note3)	
Maximum working differential pressure MPa	0.3	
Valve seat leakage Pa·m³/s (He)	1.0×10^{-9} or less	
External leakage Pa·m³/s (He)	1.0×10^{-9} or less	
Withstanding pressure MPa	0.5	
Back pressure (Note 2) MPa	0.2	
Fluid temperature ℃	5 to 55	
Ambient temperature ℃	0 to 55	
Orifice mm	1.6	
Cv value	0.09	
Frequency times/min or less	60	
Port size	NPT1/8	1/4 inch VCR female
Mounting attitude	Vertical installation with coil facing upward	
Weight kg	0.15	0.24
JIS symbol		
Electric specifications		
Rated voltage	100/200VAC (50/60 Hz), 24VDC	
Allowable voltage fluctuation	Rated voltage 10%	
Power consumption W	4.0	
Heat proof class	B	
Temperature rise K	70	

Note1: The durability may drop remarkably depending on the degree of dryness.
Note2: Pressurizing from the A port with the B port released to atmosphere is possible.
Note3: Degree of vacuum of the working pressure range does not guarantee that there will be no ultimate vacuum time or change in degree of vacuum.
Note4: FKM is used for sealant material. Therefore, take into consideration discharge gas when using.

Safety precautions

Read page 9 in the introduction and the precautions on page 102 to 109 to ensure correct and safe use of this product.

- Working media
- Installation
- Direction when connecting piping
- Solenoid valve

How to order

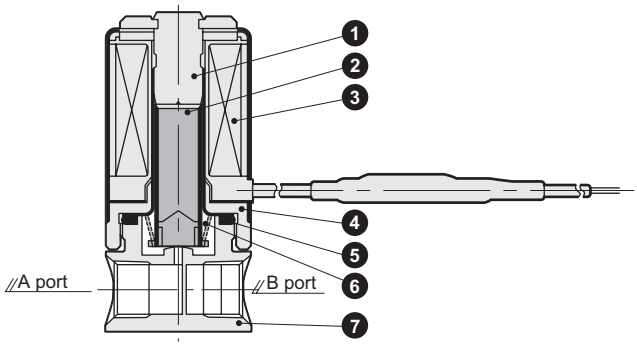
HVB 112 - 6N - 5 - AC100V

- HVB 112: Model no.
- 6N: Ⓐ Port size
- 5: Orifice ø1.6
- AC100V: Ⓑ Voltage

Symbol	Symbol
Ⓐ Port size	
6N	NPT1/8
8R	1/4"VCR female fitting (custom order)
Ⓑ Voltage	
AC100V	100VAC (50/60 Hz)
AC200V	200VAC (50/60 Hz)
DC24V	24VDC

Note: The old HVB11-6N-5 is equivalent to HVB112-6N-5.

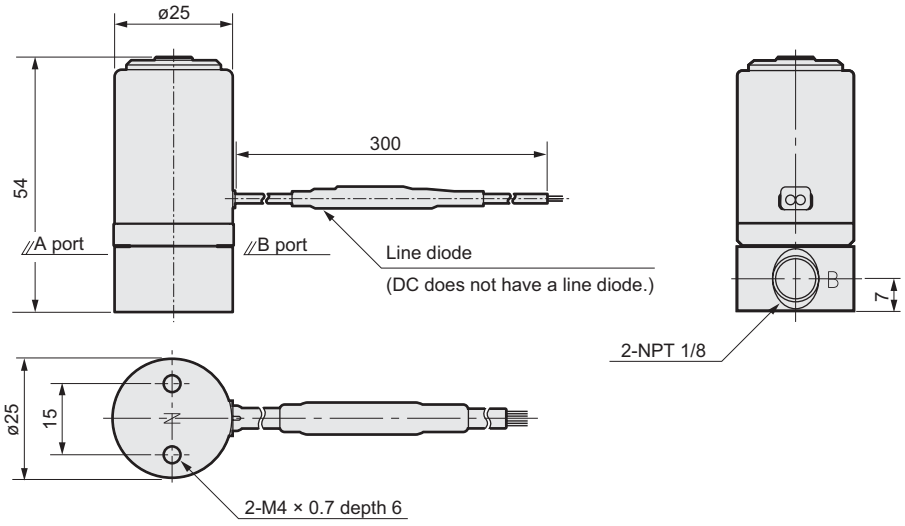
Internal structure and parts list



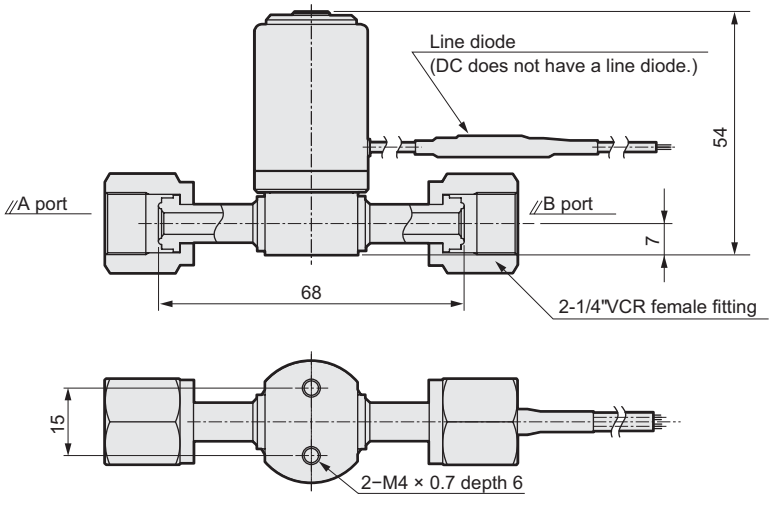
No.	Part name	Material
1	Core assembly	SUS316 SUS405
2	Plunger assembly	SUS405 FKM
3	Coil assembly	
4	Core B	SUM22
5	O ring	FKM
6	Spring	SUS304
7	Body	SUS303

Dimensions

HVB112



●With VCR fitting (custom order)



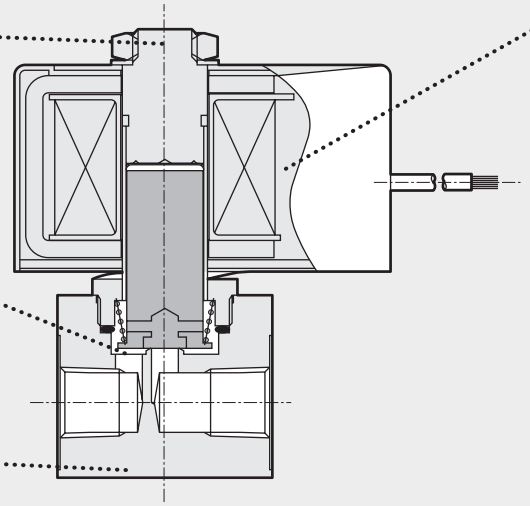
Note: The line diode is not included with the DC specifications.

Solenoid valve for high vacuum

HVB41 Series

Model no.	Actuation	Orifice
HVB41	NC	ø5

High-function solenoid valve based on comprehensive results and experience



●Easy maintenance
This simple structure has few component parts.

●Special packing incorporated
FKM packing has outstanding seal life.

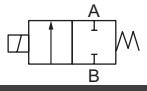
●Highly corrosion resistant
Stainless steel (SUS303) is used for the body.
(The VCR fitting is SUS316.)

●No beating
The DC coil eliminates beating.

●High-vacuum holding
Low leakage and stable vacuum holding force.

●Usable with back pressure (reverse vacuum)

Specifications

Descriptions	HVB41-8N-*	HVB41-8R-* (Custom order)
Working fluid	Vacuum/inert gas (Note 1)	
Working pressure range Pa (abs)	1.3×10^{-6} to 3×10^{5} (Note 3)	
Maximum working differential pressure MPa	0.3	
Valve seat leakage Pa·m³/s (He)	1.0×10^{-9} or less	
External leakage Pa·m³/s (He)	1.0×10^{-9} or less	
Withstanding pressure MPa	0.5	
Back pressure (Note 2) MPa	0.2	
Fluid temperature ℃	5 to 55	
Ambient temperature ℃	0 to 55	
Orifice mm	5	
Cv value	0.67	0.47
Frequency times/min or less	30	
Port size	NPT1/4 (with O-ring seat)	1/4inch VCR female
Mounting attitude	Vertical installation with coil facing upward	
Weight kg	0.79	0.86
JIS symbol		
Electric specifications		
Rated voltage	100/200VAC (50/60 Hz), 24VDC	
Allowable voltage fluctuation	Rated voltage 10%	
Power consumption W	14	
Heat proof class	B	
Temperature rise K	80	

Note1: The durability may drop remarkably depending on the degree of dryness.
Note2: Pressurizing from the A port with the B port released to atmosphere is possible.
Note3: Degree of vacuum of the working pressure range does not guarantee that there will be no ultimate vacuum time or change in degree of vacuum.
Note4: FKM is used for sealant material. Therefore, take into consideration discharge gas when using.

Safety precautions

Always read page 9 in the introduction and the precautions on page 102 to 109 to ensure correct and safe use of this product.

- Working media
- Installation
- Direction when connecting piping
- Solenoid valve

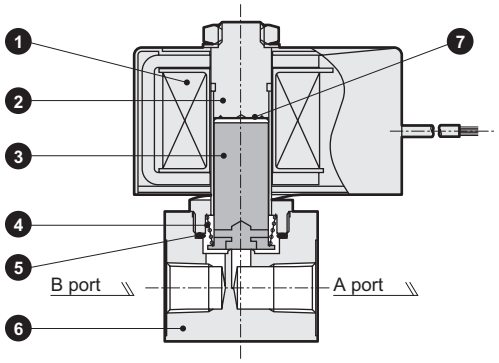
How to order

HVB 41 - 8N - 5 - 3M - AC100V

- HVB 41: Model no.
- 8N: Ⓐ Connection
- 5: Orifice ø5
- 3M: Ⓑ Option
- AC100V: Ⓥ Voltage

Symbol	Descriptions
Ⓐ Connection	
8N	NPT1/4 (with O-ring seat)
8R	1/4"VCR female fitting (custom order)
Ⓑ Option	
Blank	None
3M	HP terminal box G1/2
3N	HP terminal box with light G1/2
B	Installation plate
Ⓒ Voltage	
AC100V	100VAC (50/60 Hz)
AC200V	200VAC (50/60 Hz)
DC24V	24VDC

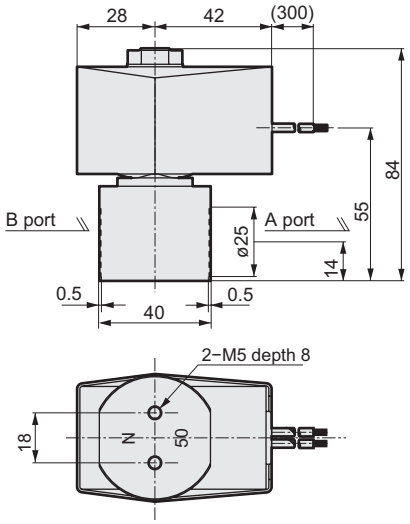
Internal structure and parts list

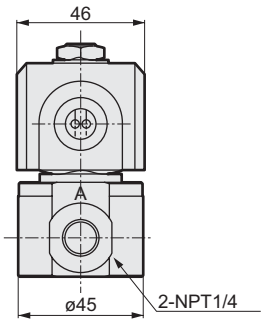


No.	Part name	Material
1	Coil assembly	
2	Core assembly	SUS405 SUS403 SUS316L
3	Plunger assembly	SUS405 FKM PET
4	Spring	SUS304
5	O ring	FKM
6	Body	SUS303
7	Cushion plate	PET

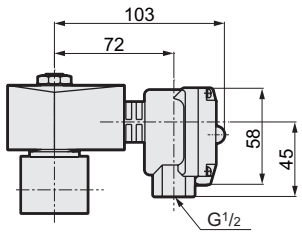
Dimensions

HVB41

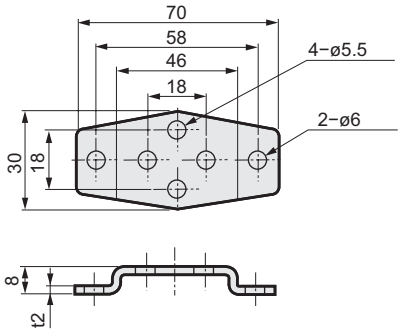




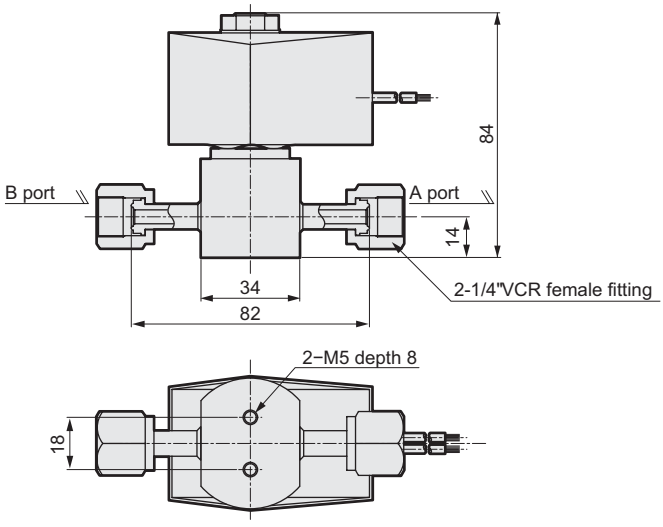
●HP terminal box



●Installation plate



●With VCR fitting (custom order)



Solenoid valve for high vacuum

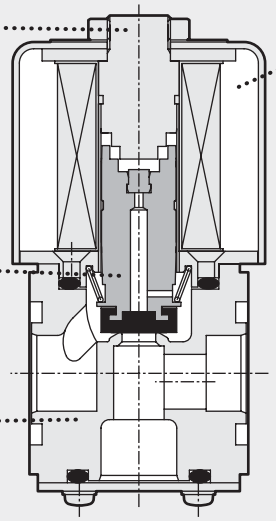
HVB$^{6}_{7}$12 Series

RoHS

Model no.	Actuation	Orifice
HVB612	NC	ø8, ø12

Model no.	Actuation	Orifice
HVB712	NC	ø12, ø15

Large flow rate solenoid valve with a wide variety of options.



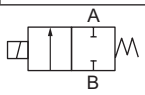
- **Easy maintenance**
  This simple structure has few component parts.
- **Unrestricted installation posture**
- **Special packing incorporated**
  FKM packing has outstanding seal life.
- **Highly corrosion resistant**
  Stainless steel (SCS13) is used for the body.
- **No beating**
  The DC coil eliminates beating.
- **High-vacuum holding**
  Low leakage and stable vacuum holding force.
- **Usable with back pressure (reverse vacuum)**
  (Note that reverse vacuum is not used with HVB51-12F-5 or HVB71-15F-5.)

Safety precautions

Always read page 9 in the introduction and the precautions on page 102 to ensure correct and safe use of this product.

- Working media
- Installation
- Direction when connecting piping
- Solenoid valve

Specifications

Model no.		HVB612-12F			HVB712-15F			
Descriptions		**-8B**	**-8H**	**-12B**	**-12B**	**-12H**	**-15B**	**-15H**
Working fluid		Vacuum and inert gas (Note 1)						
Working pressure range	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}
Maximum working differential pressure	MPa	0.2	0.3	0.1	0.15	0.3	0.1	0.1
Orifice	mm	8		12	12		15	
Cv value	Straight	1.8		2.7	3.2		4.3	
	L direction	2.1		3.2	3.6		4.7	
Back pressure (Note 2)	MPa	0.1		0.02	0.1		0.02	0.1
Valve seat leakage	$Pa \cdot m^3/s$ (He)	1.0×10^{-9} or less						
External leakage	$Pa \cdot m^3/s$ (He)	1.0×10^{-9} or less						
Withstanding pressure	MPa	0.5						
Fluid temperature	℃	5 to 55						
Ambient temperature	℃	0 to 55						
Frequency	times/min or less	10						
Mounting attitude		Free						
Port size		ø48 flange			ø52 flange			
Weight	kg	1.15			2.0			
JIS symbol								
Electric specifications								
Rated voltage		100VAC/200VAC (50/60 Hz), 24VDC						
Allowable voltage fluctuation		Rated voltage ±10%						
Power consumption	W	14.3	28	14.3	19	AC: 32.5 DC: 40	19	AC: 32.5 DC: 40
Heat proof class		B	H	B	B	H	B	H
Temperature rise	K	75	125	75	75	125	75	125

Note 1: The durability may drop remarkably depending on the degree of dryness.
Note 2: Pressurizing from the A port with the B port released to atmosphere is possible. (Note that reverse vacuum is not used with HVB612-12F-12B or HVB712-15F-15B.)
Note 3: Wet area O-ring uses grease for high vacuum.

How to order

HVB 6 12 - 12F - 8 B - 3N - AC100V

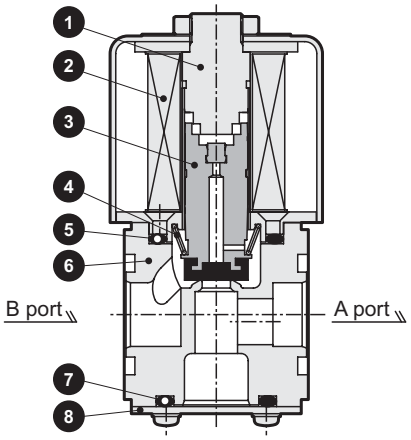
- HVB: Model no.
- 6: Ⓐ Series
- 12F: Ⓑ Connection
- 8: Ⓒ Orifice
- B: Ⓓ Heat proof class *1
- 3N: Ⓔ Option *2
- AC100V: Ⓕ Voltage

Symbol	Descriptions	Model no. HVB612	Model no. HVB712
Ⓐ Series size			
6	60 mm	●	
7	70 mm		●
Ⓑ Connection			
12F	ø48 flange	●	
15F	ø52 flange		●
Ⓒ Orifice			
8	ø8	●	
12	ø12	●	●
15	ø15		●
Ⓓ Heat proof class			
B	B class	●	●
H	H class	●	●
Ⓔ Option			
Blank	None	●	●
3M	HP terminal box G1/2	●	●
3N	HP terminal box with light G1/2	●	●
F	With companion flange	●	●
3MF	With HP terminal box G1/2+companion flange	●	●
3NF	HP terminal box with light G1/2 +companion flange	●	●
Ⓕ Voltage			
AC100V	100VAC (50/60 Hz)	●	●
AC200V	200VAC (50/60 Hz)	●	●
DC24V	24VDC	●	●

⚠ Note on model no. selection

*1: For "H" under section Ⓓ, HVB612 with ø12 is not available.
*2: Section Ⓔ for 3M, 3N, 3MF, 3NF, AC voltage is not available when section Ⓓ is "H".
*3: Contact CKD regarding fittings not listed above such as double barbed, JXR.

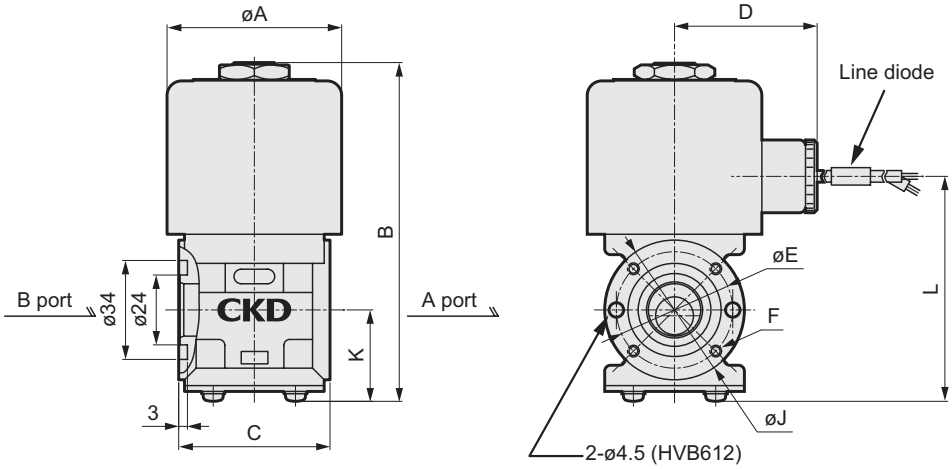
Internal structure and parts list



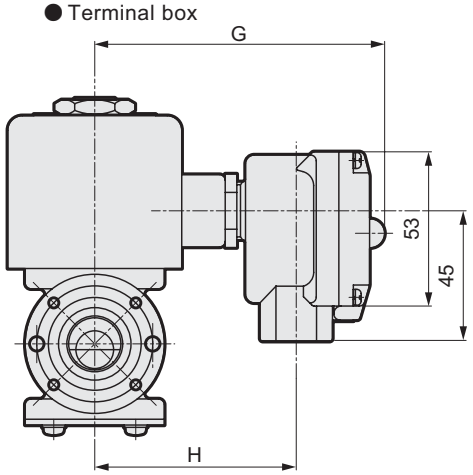
No.	Part name	Material
1	Core assembly	SUS405, SUS316, SUS403
2	Coil assembly	
3	Plunger assembly	SUS405, FKM, PFA, PET
4	Spring	SUS304
5	O ring	FKM
6	Body	SCS13
7	O ring	FKM
8	Bottom lid	SUS304

Dimensions and optional dimensions

● HVB$^{6}_{7}$12



● Terminal box

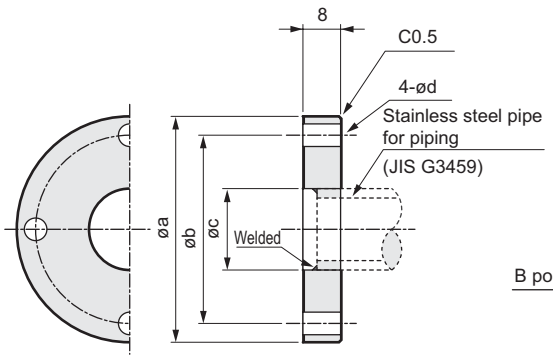


Model no.	Dimensions										
	A	B	C	D	E	F	G	H	J	K	L
HVB612	60	117	52	49	40	4-M4	101	70	48	32	77
HVB712	70	145	55	54	42.4	4-M5	106	75	52	33	107

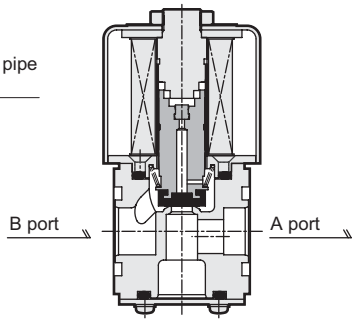
Note: Line diode is only in heat proof class H's AC specifications. Therefore, terminal box only for this series cannot be assembled.
Note: Mounting bolt and O-ring will be attached when ordering the companion flange.

Dimensions

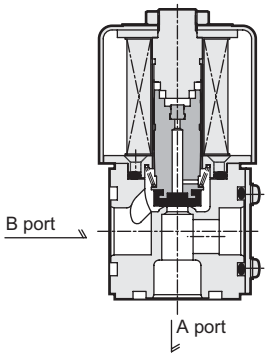
● Companion flange dimensions



● Straight piping



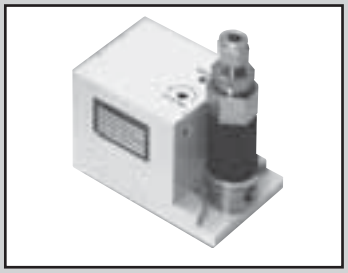
● L-type piping



Companion flange dimensions

Model no.	Companion flange dimensions					Mounting bolt	O ring
	a	b	c		d		
HVB612	48	40±0.2	17.3	$^{+0.5}_{0}$	4.8	M4-14	JIS B2401 V-24
HVB712	52	42.4±0.2	21.7	$^{+0.5}_{0}$	5.8	M5-14	

∗Mounting bolt and O-ring will be attached when ordering the companion flange.



Delay solenoid valve for vacuum

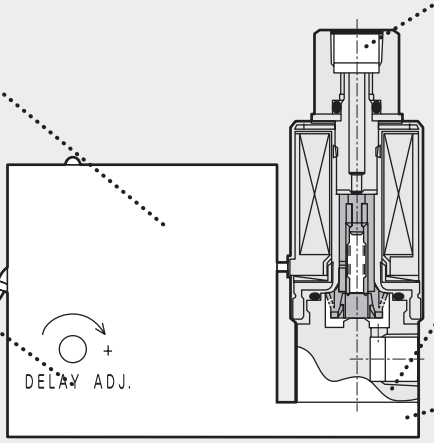
HVL$^{1}_{4}$2 Series

● OFF delay function solenoid valve

RoHS (HVL12 only)

Model no.	Connection size	Orifice	Voltage
HVL12	Rc1/8/1/4"double barbed fitting/NW10/NW16	ø1.2	24VDC, 100VAC, 200VAC
HVL42	Rc1/8/1/4"double barbed fitting/NW10/NW16	ø3.0	24VDC, 100/200VAC

Prevents oil from rising when service is momentarily interrupted.



●Delay leak function
Using the CR circuit, the vacuum is broken in a several second (0 to 10 seconds) interval when power stops.
(0 to 8 seconds only for HVL 12 AC)

●Easy time setting
Time is easily set with a screwdriver.

●Separable
The circuit and valve can be separated and installed.

●High vacuum holding
This valve has high-vacuum holding, with a valve seat and external leakage of 1.3×10^{-9} Pa·m^3/s (He) or less.

●Free pressure direction
Connection to the vacuum is made from either port.

●Highly corrosion resistant
SUS303 is used for body and FKM for valve seat.

●Selectable connection method
The Rc1/8 or 1/4-inch double barbed fitting and NW10.16 vacuum clamp fitting are used.

Main applications

Delay solenoid valve for vacuum (HVL series) intended use

Prevents oil from rising during momentary service interruptions

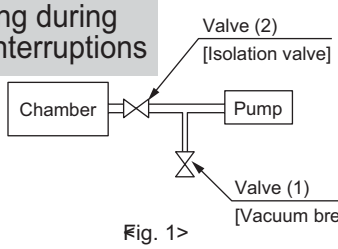
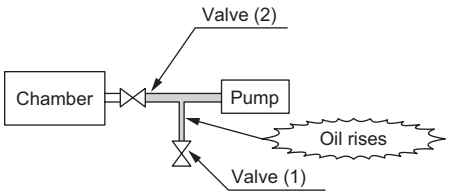


Fig. 1>



If the pipe is not released into the atmosphere when the pump stops...

Fig. 2>

Usually, after the machine stops, pipe between the chamber and pump is released into the atmosphere at valve (1) to prevent oil from entering pipes. To protect the chamber (maintain vacuum, prevent contamination), substance inside the piping must be released into the atmosphere after valve (2) is completely closed.

If the valve (1) is opened before valve (2) completely closes...

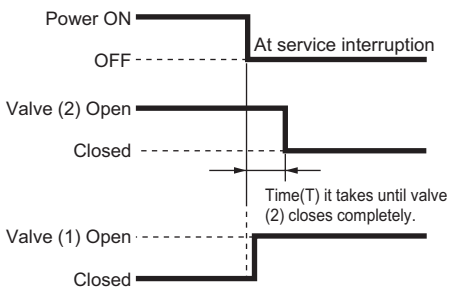


Fig. 3>

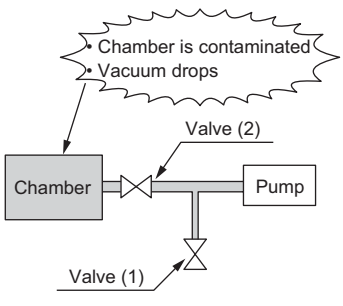


Fig. 4>

Rising of oil prevented and the chamber protected by using the HVL Series!

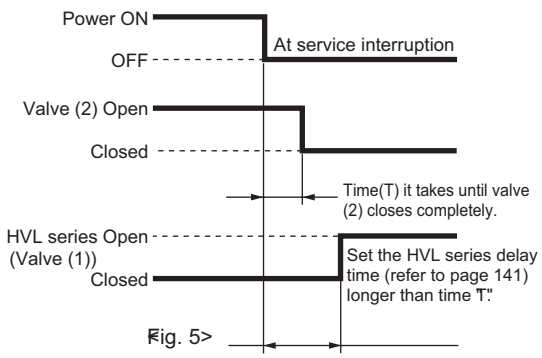
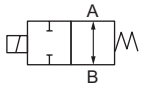


Fig. 5>

Specifications

Descriptions		HVL12	HVL42
Working fluid		Air, nitrogen (Note 1)	
Working pressure range Pa (abs)		1.3×10^{-6} to 2.0×10^{5}	
Maximum working differential pressure MPa		0.2	
Valve seat leakage Pa·m³/s (He)		1.3×10^{-9} or less	
External leakage Pa·m³/s (He)		1.3×10^{-9} or less	
Withstanding pressure MPa		0.5	
Fluid temperature ℃		5 to 50	
Ambient temperature ℃		0 to 50	
Orifice mm		1.2	3.0
Mounting attitude		Free	
Weight kg	AC	0.5	1.5
(Note 2)	DC	0.2	0.9
Frequency		0.5 times/min or less	
Port size		Rc1/8, 1/4"double barbed fitting, NW10.16 clamp fitting for vacuum	
Cv value		0.05	0.3
Delay time		AC: 0 to 8sec, DC: 0 to 10sec	AC/DC: 0 to 10 sec
Rated voltage		24VDC, 100VAC, AC200V 24VDC, (HVL42: 100VAC/200VAC depending on power supply and wiring)	
Allowable voltage fluctuation		Rated voltage 10%	
Power consumption W		4	11
JIS symbol			

Note 1: The durability may drop remarkably depending on the degree of dryness.
Note 2: Listed weight value is for when port connection is Rc1/8.

Safety precautions

Always read page 9 in the introduction and the precautions on page 102 to 109 to ensure correct and safe use of this product.

- Working media
- Installation
- Direction when connecting piping
- Solenoid valve

How to order

HVL 1 2 - 4S 6 - 5 - AC100V

- HVL: Model no.
- 1: Ⓐ Series
- 4S: Ⓑ A port connection method Note 1
- 6: Ⓒ B port connection method Note 1
- 5: Ⓓ Voltage
- AC100V

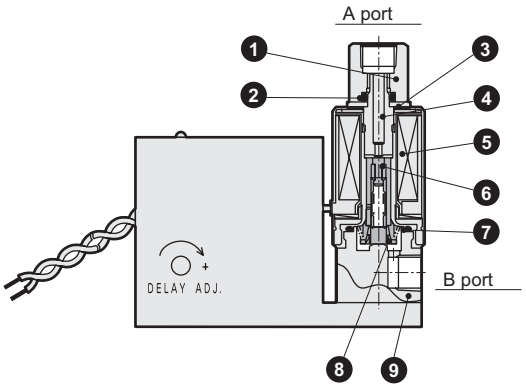
Symbol	Descriptions	Model no. HVL12	Model no. HVL42
Ⓐ Series			
1	Orifice 1.2	●	
4	Orifice 3.0		●
Ⓑ A port connection method Note 1			
6	Rc1/8	●	●
4S	1/4"double barbed fitting	●	●
10K	NW10 clamp flange for vacuum	●	●
16K	NW16 clamp flange for vacuum	●	●
Ⓒ B port connection method Note 1			
6	Rc1/8	●	●
4S	1/4"double barbed fitting		●
10K	NW10 clamp flange for vacuum		●
16K	NW16 clamp flange for vacuum		●
Ⓓ Voltage			
DC24V	24VDC	●	●
AC100V	100VAC	●	
AC200V	200VAC	●	
AC100V /AC200V	100VAC/200VAC Dual power supply Note 2		●

Note on model no. selection

Note 1: If A port and B port model no. are the same, select only one.
Example if both A port and B ports is Rc1/8
HVL1 2-6-5 voltage (correct)
HVL12-66-5 voltage (incorrect)
Note 2: They can both be used.

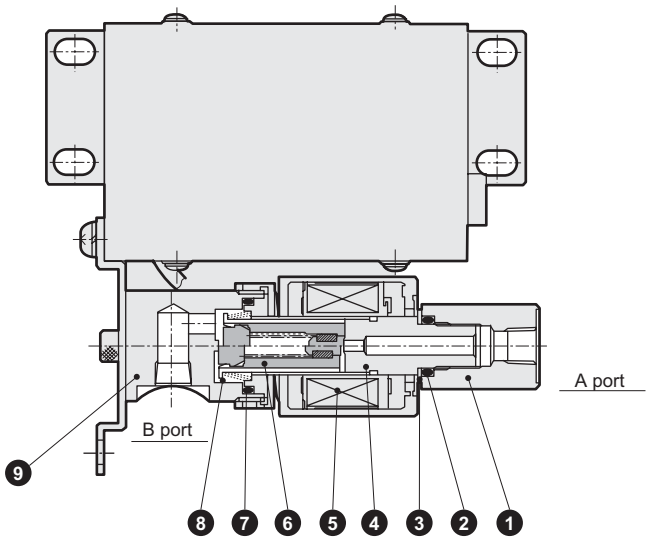
Internal structure and parts list

HVL12-6-5



No.	Part name	Material
1	Socket	SUS303
2	O ring	FKM
3	Washer	SUS304
4	Core assembly	SUS316L, SUS405
5	Coil assembly	PBT
6	Plunger assembly	SUS405, FKM, PTFE
7	O ring	FKM
8	Spring	SUS304
9	Body	SUS303

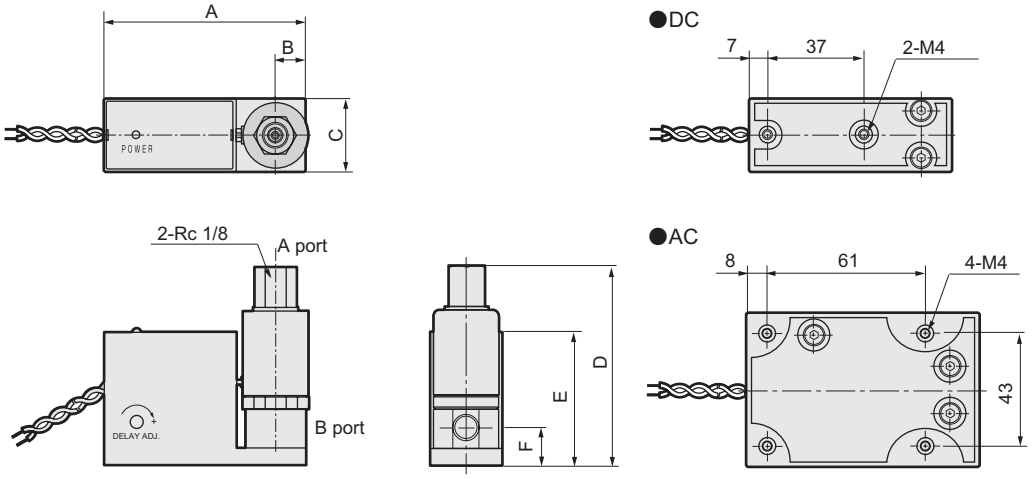
HVL42-6-5



No.	Part name	Material
1	Socket	SUS303
2	O ring	FKM
3	Washer	SUS301-CSP
4	Core assembly	SUS403, SUS316L, SUS405
5	Coil assembly	B class nylon mold
6	Plunger assembly	SUS405, FKM, PTFE
7	O ring	FKM
8	Spring	SUS304
9	Body	SUS303

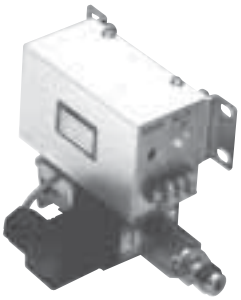
Dimensions

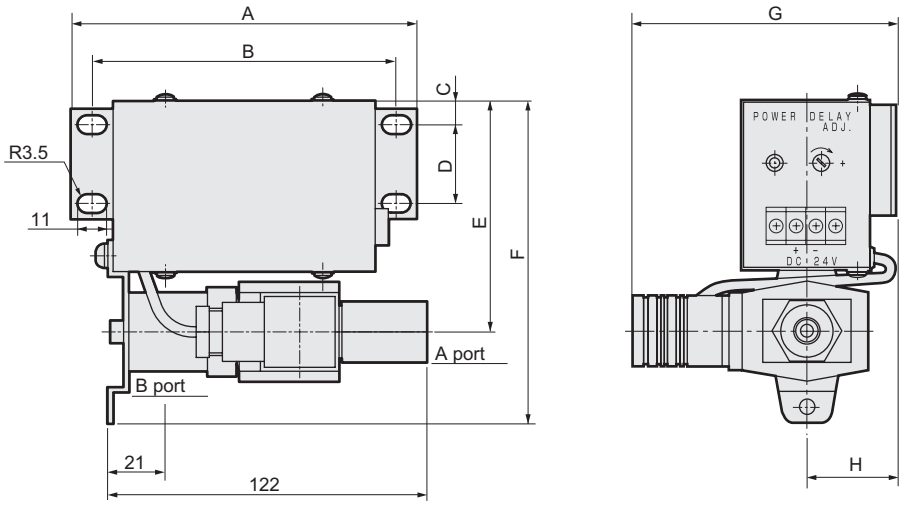
●HVL12-6-5



Model no. \ Symbol	A	B	C	D	E	F
HVL12-DC24V	78	11.5	28	76	51	14.5
HVL12-AC100V,200V	90	11.5	59	76	62	14.5

●HVL42-6-5





Model no. \ Symbol	A	B	C	D	E	F	G	H
HVL42-DC24V	132	116	9	30	88	123	102	35
HVL42-AC100V, 200V	152	136	20	30	103	138	105	37

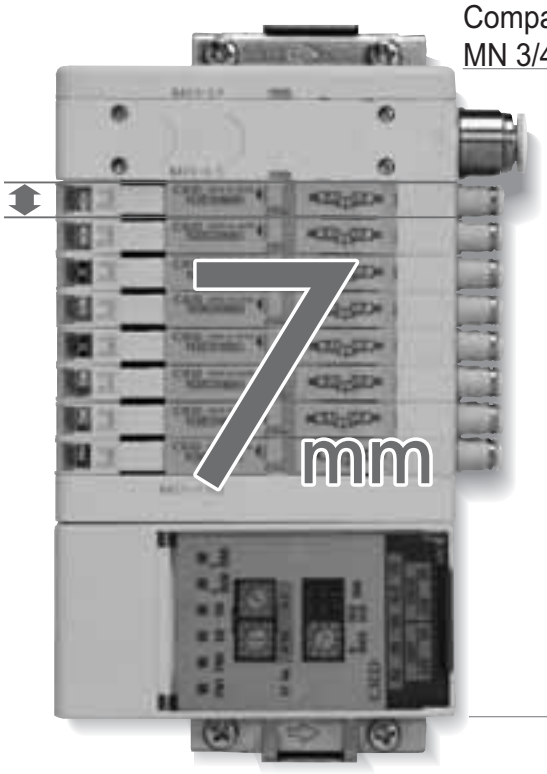
MEMO

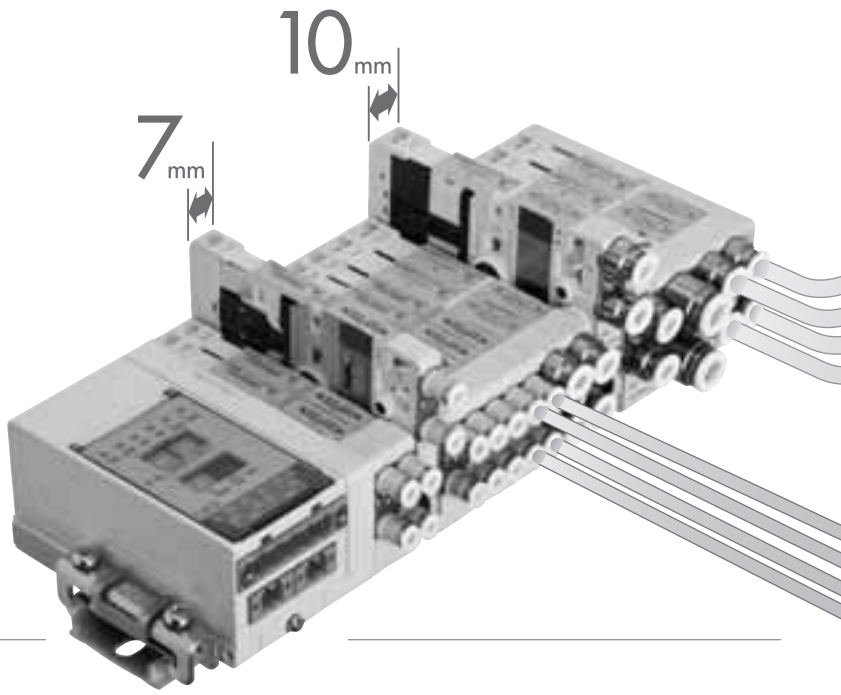
Related products

CONTENTS

7 mm pitch pilot style solenoid valve manifold

Compact and reduced-wiring 3/4 port valve block manifold
MN 3/4 E series





NEW **MN3 / 4E00** series

ECO ϕ3 HIGH SPEC SAFETY

Compact, space saving, and low power consumption

Environment preservation

RoHS

Achieved light weight, a reduction of material use, and energy saving with small size and power saving.
Quickly addressed environmental impact reduction of chemicals and use materials that comply with JIG-101A, Level A including lead-free soldering.

Compact and space saving

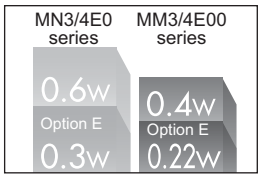
NEW

In addition to MN3/4E0 series of 10 mm width valve block type, MN3/4 E00 of 7 mm width valve block type and 7 mm manifold pitch is now available.
The 7 mm pitch and the more compact manifold contributes toward the downsizing and high integration achievement of the device.

Power saving

NEW

MN3/4E0 series: 0.6 W
MN3/4E00 series: 0.4 W
Further reduction of power consumption with power saving type (Option E)



* Value with lamp indicator

ϕ3 ø3 push-in fitting lineup

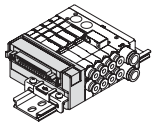
NEW

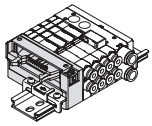
The ø3 tube, which achieves both reduction of piping volume and securing of flow rate, contributes to space saving of the tube piping, along with the ø1.8 tube.

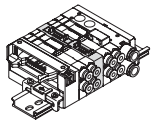
Variety

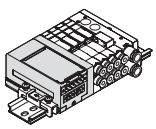
■ Various electric connections and options

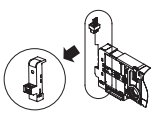
A variety of electric connections are available for all types of connectors and serial transmissions compatible with various networks. Easy plug-in enabled regulator block is also available.

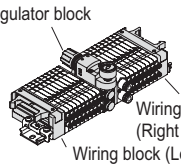

D-sub connector


Flat cable connector


Intermediate wiring block


Serial transmission

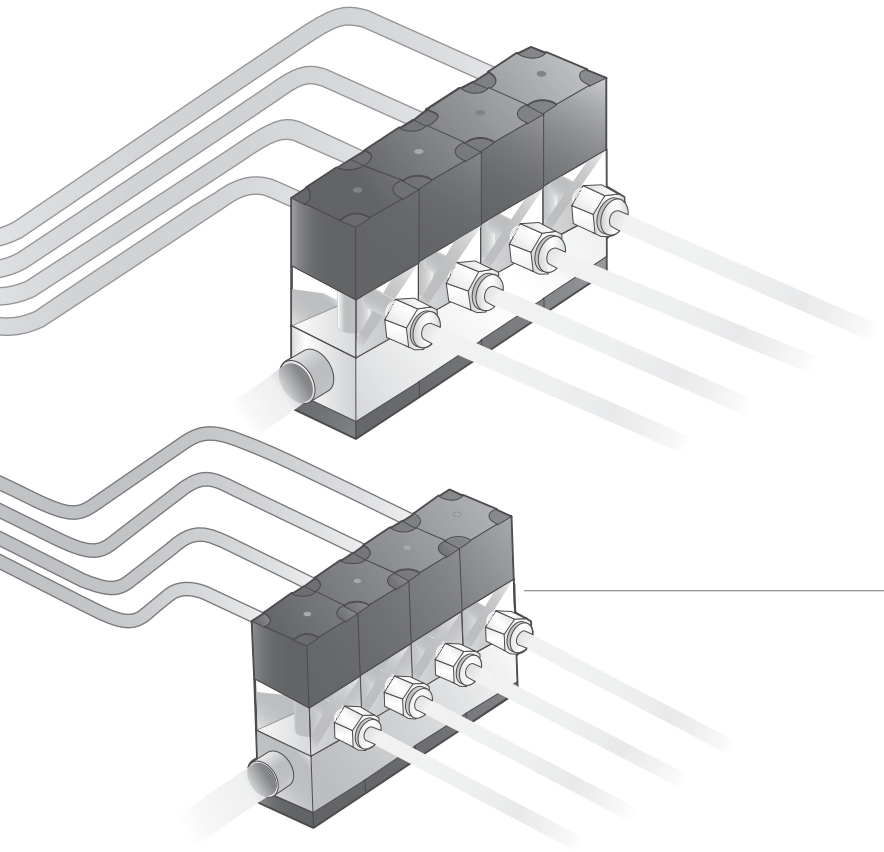

Individual wiring type

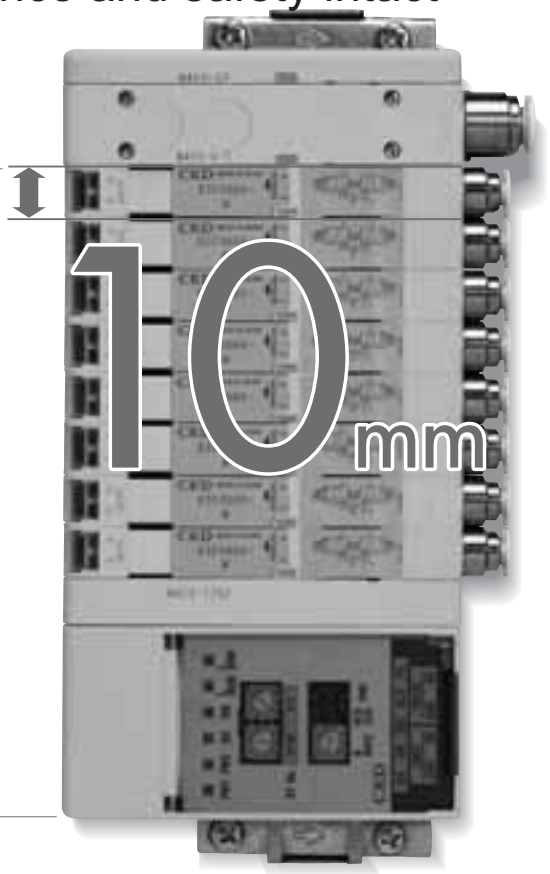


* Left and right mixed wiring is possible.

is now available with high performance and safety intact

with high integration, space saving, and high performance





MN3/4E0 series

ECO HIGH SPEC SAFETY

High performance block manifold with excellent responsiveness. Approximately 50% of space saving compared to existing models.

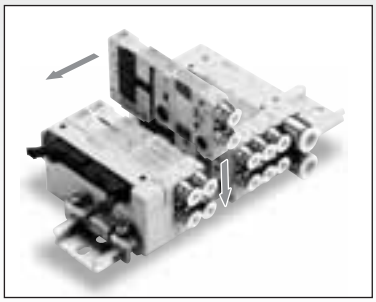
HIGH SPEC High performance

■12 ms balanced responsiveness between ports A and B.

(In-house data value of two N3E0 3 port valves integrated type)

■ No more bothersome connection work

Adoption of connectors allows wiring work to be completed during assembly. Regularity of connector pin array is not lost by electric connection from either left or right wiring block, even if the manifold of the valve is expanded or reduced.

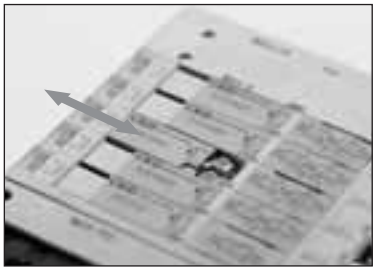


Assembly structure

SAFETY Safety

■ Prevent malfunctions

A check valve, manual override cover for preventing incorrect operations, and supply filter for preventing the entry of foreign matter are provided as standard.
An ultimate pursuit of safety prevents valve mulfunctions.



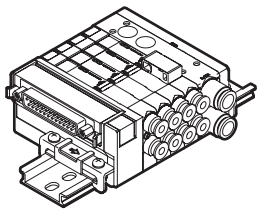
Manual override cover

A great variety of wiring variations

Wiring is reduced while pursuing ease-of-use.

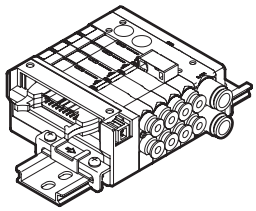
MN4E0
4E00

●D-sub connector (N4E0-T30)



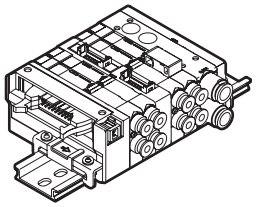
The connector used for T30 wiring, called a D sub-connector, is used widely for FA and OA devices. The 25P type is the connector designated in RS232C Standards that apply to personal computer communication functions.

●Flat cable connector (N4E0-T5*)



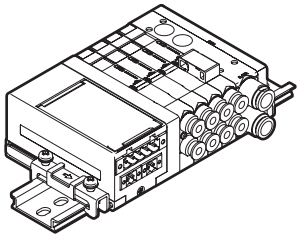
The connector used for T5* wiring complies with MIL Standards (MIL-C-83503). Wiring work is simplified with the pressure welded flat cable. Pin numbers are assigned differently based on the PLC maker, but the function assignment is the same.

●Intermediate wiring block (N4E0-TM*)



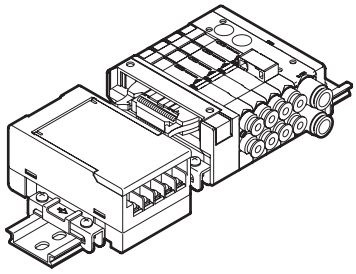
A reduced wiring connection can be made to the center of the manifold. Flat cable connector 10P and RITS connector 6P are available.

●Serial transmission (close contact type) (N4E0-T7*)



T7D1 T7D2	DeviceNet (16 points, 32 points)
T7G1 T7G2	CC-Link (16 points, 32 points)
T7N1 T7N2	SUNX S-LINK V (16 points, 32 points)

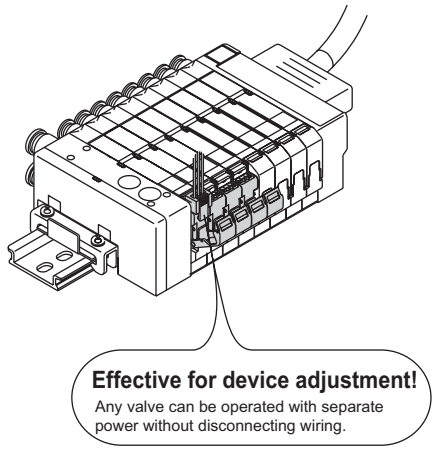
●Serial transmission (N4E0-T6*)



Compatible with each network. (Refer to the following table)

T6A0 T6A1	Uniwire System (8 points, 16 points)
T6C0 T6C1	OMRON CompoBus/S (8 points, 16 points)
T6E0 T6E1	SUNX S-LINK (8 points, 16 points)
T6G1	CC-Link (8 points)
T6J0 T6J1	Uni Wire H System (8 points, 16 points)

●Built-in individual power supply function (AUX) type (MN3E0 and MN4E0 series only)



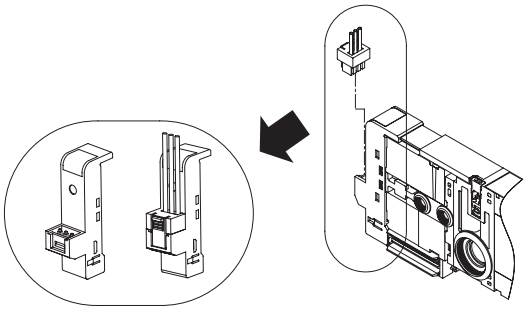
Individual external input is possible with reduced wiring manifold. This lets individual valves be operated without stopping the system.
Any valve can be operated with an external power supply while common wiring is connected.
The height does not differ with this compact design.

● Applications example

Exercise effectiveness at adjustment and maintenance for start-up of a device
When trying to operate any valve electrically without removing the existing wiring.
When trying to shut off any valve electrically without removing the exicting wiring.

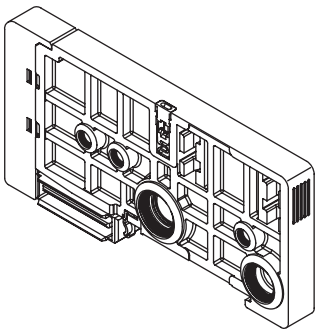
* The valve is cut off from wiring in the manifold when the external input socket is inserted, so this can be used as a temporary individual shut-off switch.

●Individual wiring system (Only for MN3E0 MN4E0 Series)

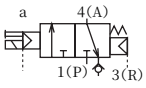
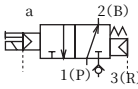
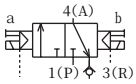
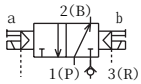
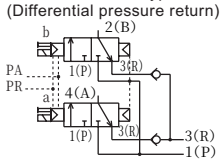
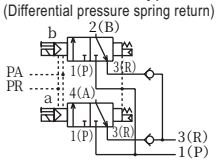
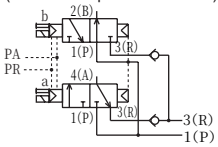
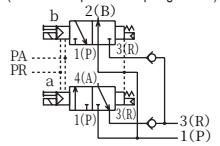
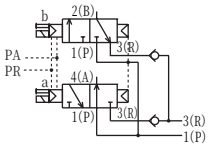
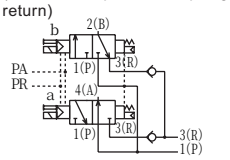
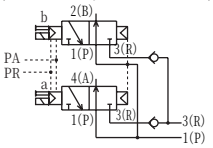
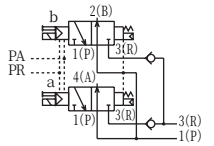
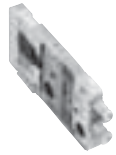
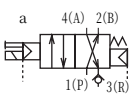
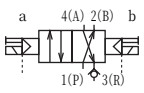
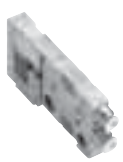
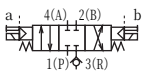
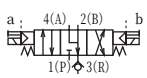
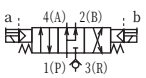


Inputs can be made individually from another system, independent from the common wiring for reduced wiring.

●Dummy block

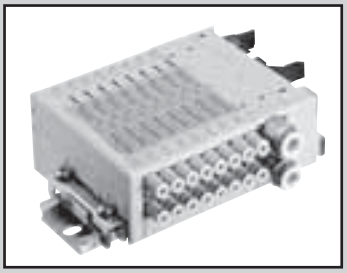


When the expanding manifold of the valve block is expected, it is possible to expand the manifold of the valve block (replacement) without changing the signal assignment of the reduced wiring by adjusting the wiring specifications in advance and using it.

Series appearance	No. of solenoid position JIS symbol The JIS symbols for the actual part may differ from these drawings due to the relation of the space and port position.
3 port valve **MN3E00** 3 port valve  (Valve pitch 7.0 mm)	3 port valve ●2-position NC self reset type (Differential pressure spring return)  **N3E0010/N3E010** ●2-position NO self reset type (Differential pressure spring return)  **N3E00110/N3E0110** ●2-position NC self hold type  **N3E0020/N3E020** ●2-position NO self hold type  **N3E00210/N3E0210**
MN3E0 3 port valve  (Valve pitch 10.0 mm)	
Dual 3 port valves integrated type **MN3E00** Dual 3 port valves integrated type  (Valve pitch 7.0 mm)	Dual 3 port valves integrated type ●NC/NC self reset type (Differential pressure return)  **N3E00660/N3E0660** ●NC/NC self reset type (Differential pressure spring return)  **N3E0066S0/N3E066S0** ●NC/NO self reset type (Differential pressure return)  **N3E00670/N3E0670** ●NC/NO self reset type (Differential pressure spring return)  **N3E0067S0/N3E067S0**
MN3E0 Dual 3 port valves integrated type  (Valve pitch 10.0 mm)	●NO/NC self reset type (Differential pressure return)  **N3E00760/N3E0760** ●NO/NC self reset type (Differential pressure spring return)  **N3E0076S0/N3E076S0** ●NO/NO self reset type (Differential pressure return)  **N3E00770/N3E0770** ●NO/NO self reset type (Differential pressure spring return)  **N3E0077S0/N3E077S0**
4 port valve **MN4E00** 4 port valve  (Valve pitch 7.0 mm)	4 port valve ●2-position single self reset type (Differential pressure spring return)  **N4E0010/N4E010** ●2-position double self hold type  **N4E0020/N4E020**
MN4E0 4 port valve  (Valve pitch 10.0 mm)	●3-position all ports closed  **N4E030** ●3-position ABR connection  **N4E040** ●3-position PAB connection  **N4E050**

Note 1 : Effective sectional area S and sonic conductance C are converted as S ≈ 5.0 x C.

	Flow characteristics C [dm³/(sbar)] Note 1	Voltage	Solenoid position													A/B port size							Electric connection						Page
			3 port valve				Dual 3 port valves integrated type				4 port valve							Push-in fitting				Female thread								
			Single NC type	Single NO type	Double NC type	Double NO type	A side NC, B side NC	A side NC, B side NO	A side NO, B side NC	A side NO, B side NO	2-position single	2-position double	3-position all ports closed	3-position A/B/R connection	3-position P/A/B connection	Mix	ø1.8 C18	ø3 C3	ø4 C4	ø6 C6	M3	M5	Fiber tube fitting CF	Individual wiring	D-sub connector T30□	Flat cable T5□	Intermediate wiring block TM□	Wiring block mix TX	Serial transmission T6□ T7□	
	0.3	Note 2 24 DC 12 DC Note 2 Serial transmission is 24 VDC only	●	●	●	●										●	●	●	●		●				●	●	●	●	●	192
	0.54		●	●	●	●										●	●		●	●		●	●	●	●	●	●	●	●	206
	0.3						●	●	●	●						●	●	●	●		●				●	●	●	●	●	192
	0.50						●	●	●	●						●	●		●	●		●	●	●	●	●	●	●	●	206
	0.3										●	●				●	●	●	●		●				●	●	●	●	●	192
	0.54 0.50 (N4E030 N4E050)										●	●	●	●	●	●	●		●	●		●	●	●	●	●	●	●	●	206



Reduced wiring block manifold 3,4 port pilot-operated value.

MN3E00/ MN4E00 Series

Common specifications

Descriptions		
Manifold method		Block manifold
Manifold type		Common supply/common exhaust, check valve integrated Note 1
Working fluid		Compressed air
Type of valve / operation method		Pilot-operated soft spool valve
Max. working pressure	MPa	0.7
Min. working pressure	MPa	0.2
Withstanding pressure	MPa	1.05
Ambient temperature	°C	5 to 55
Fluid temperature	°C	5 to 55
Lubrication		Not required Note 2
Protective structure		Dust proof
Vibration / impact	m/s^2	50 or less / 300 or less
Working environment		Not permissible to use in environment containing corrosive gas.
Manual override		Non-locking/locking common type/Non-locking only

Note 1: The check valve blocks the back pressure from adjacent air devices, etc. However, the structure does not allow the pressure seal to be held continuously, so do not use for other than the back pressure block.

Electrical specifications

Descriptions		
Rated voltage	V	12, 24 DC
Rated voltage fluctuation range		±10% (+10%, -5% when using for serial transmission)
Rated current A	24 VDC	0.017 (0.009) Note 3
	12 VDC	0.033 (0.018) Note 3
Power consumption W	24 VDC	0.4 (0.22) Note 3
	12 VDC	
Heat resistance class		B
Surge protective circuit		Surge suppressor attached
Indicator		LED

Note 2: This product has an oil-free specification. If lubricated, the original grease will spill out and the performance will drop.
Note 3: Values in parentheses are for low exoergic and energy saving circuit type.
When using the valve block low exoergic and energy-saving circuit type, energizing is limited to the plus common.

Individual specifications

Descriptions \ Port		3 port valve	4 port valve	Dual 3 port valves integrated type Note 2
Port size	A/B port	ø1.8, ø3, ø4 push-in fitting, M3		
	P/R port	ø6, ø8 push-in fitting		
	External pilot port	ø6 push-in fitting		-
Response time Note 1 ms	2-position Single	20 or less	20 or less	20 or less
	Double	20 or less	20 or less	-

Note 1: Response time is the value at supply pressure of 0.5 MPa and oil-free.
Note 2: With dual 3 port valves integrated type, the main pressure is used to operate the valving element, and cannot be used with the external pilot.
Check that the supply air flow is sufficient so that the supply pressure does not drop below the minimum working pressure due to the operation of the connecting load (air operated valve), etc.

Flow characteristics

		P→A/B		A/B→R	
		C [dm^3/(s • bar)]	b	C [dm^3/(s • bar)]	b
3 port valve	2-position	0.30	0.20	0.32	0.24
4 port valve	2-position	0.30	0.20	0.32	0.24
Dual 3 port valves integrated type	2-position	0.30	0.20	0.32	0.24

Note 1 : Effective sectional area S and sonic conductance C are converted as S ≈ 5.0 x C.
Note 2 : Value of ø4 push-in fitting

Weight

Wiring block (g)		D-sub connector type T30	Flat cable connector type T5*	Intermediate wiring block			Serial transmission	
				TM1A	TM1C	TM52	T6*	T7*
		67	59	32	32	34	205	128
Supply and exhaust block (g)		Q/QZ	QK	QKZ		QX		QKX
	Fitting Lateral	64	69	79		56		61
	Fitting Upward	90	94	98		62		66
Valve block (g)		2-position single	2-position double	Dual 3 port valves integrated type				
	Fitting Lateral	31.5	35.0	35.0				
	Fitting Upward	37.5	41.0	41.0				
Dummy block (g)		MPS/MPD						
		20						
Regulator block (g) Note 1		-						
		124						
End block (g)		ER/EL						
		40						
DIN rail (g)		-						
		0.19 g/mm						

Note 1: Value differs depending on specification of regulator block.

Maximum station no. energized by manifold

Descriptions			Double solenoid (double wiring)	Single solenoid	Mix manifold (solenoid number)
D-sub connector type (25 pin)	T30	D-sub connector type Left	12 stations	24 stations	24 points
	T30R	D-sub connector type Right	12 stations	24 stations	24 points
Flat cable connector type	T50	20 pin flat cable connector Left (with power supply terminal)	8 stations	16 stations	16 points
	T50R	20 pin flat cable connector Right (with power supply terminal)	8 stations	16 stations	16 points
	T51	20 pin flat cable connector Left (without power supply terminal)	9 stations	18 stations	18 points
	T51R	20 pin flat cable connector Right (without power supply terminal)	9 stations	18 stations	18 points
	T52	10 pin flat cable connector Left (without power supply terminal)	4 stations	8 stations	8 points
	T52R	10 pin flat cable connector Right (without power supply terminal)	4 stations	8 stations	8 points
	T53	26 pin flat cable connector Left (without power supply terminal)	12 stations	24 stations	24 points
	T53R	26 pin flat cable connector Right (without power supply terminal)	12 stations	24 stations	24 points
Intermediate wiring block type	TM1A	RITS connector 6P X 2 pcs. Note 1	5 stations	10 stations	10 points
	TM1C	RITS connector 6P Note 1	2 stations	5 stations	5 points
	TM52	10 pin flat cable connector	4 stations	8 stations	8 points
Serial transmission type (with unit)	T6A0	UNIWIRE SYSTEM 8 points	4 stations	8 stations	8 points
	T6A1	UNIWIRE SYSTEM 16 points	8 stations	16 stations	16 points
	T6C0	OMRON CompoBus/S 8 points	4 stations	8 stations	8 points
	T6C1	OMRON CompoBus/S 16 points	8 stations	16 stations	16 points
	T6E0	SUNX S-LINK 8 points	4 stations	8 stations	8 points
	T6E1	SUNX S-LINK 16 points	8 stations	16 stations	16 points
	T6J0	UNIWIRE H SYSTEM 8 points	4 stations	8 stations	8 points
	T6J1	UNIWIRE H SYSTEM 16 points	8 stations	16 stations	16 points
	T6G1	CC-Link 16 points	8 stations	16 stations	16 points
Serial transmission type (close contact type)	T7D1	DeviceNet 16 points	8 stations	16 stations	16 points
	T7D2	DeviceNet 32 points	16 stations	32 stations	32 points
	T7G1	CC-Link 16 points	8 stations	16 stations	16 points
	T7G2	CC-Link 32 points	16 stations	32 stations	32 points
	T7N1	SUNX S-LINK V 16 points	8 stations	16 stations	16 points
	T7N2	SUNX S-LINK V 32 points	16 stations	32 stations	32 points

Note 1: RITS connector 6P (1473562-6) Tyco Electronics Japan G.K.

Slave specifications

Descriptions		T6C1 T6C0	T6G1 Note 1	T6A1 T6A0	T6J1 T6J0	T6E1 T6E0	T7D1 Note 2 T7D2	T7G1 Note 1 T7G2	T7N1 T7N2
Power voltage	Unit side	24 VDC±10%		24 VDC			24 VDC±10%		
	Valve side	24 VDC+10%, -5%		+10% -5%			24 VDC+10%, -5%		
	Communication side	-		-			11 to 25VDC	-	
Current consumption	Unit side	T6C1: 60 mA or less T6C0: 40 mA or less (When all points output is ON)	100 mA or less (When all points output is ON)	100 mA or less (When all points output is ON) However, current consumption of valve is not included.		60 mA or less (When all points output is ON) However, current consumption of valve is not included.	T7D1: 60 mA or less T7D2: 85 mA or less (When all points output is ON)	T7G1: 65 mA or less T7G2: 90 mA or less (When all points output is ON)	T7N1: 40 mA or less T7N2: 50 mA or less (When all points output is ON)
	Valve side	15 mA or less (when all points are OFF)					15 mA or less (when all points are turned off)		
	Communication side	-		-			50 mA or less	-	
Output points		T6C1: 16 points T6C0: 8 points	16 points	T6A1: 16 points T6A0: 8 points	T6J1: 16 points T6J0: 8 points	T6E1: 16 points T6E0: 8 points	T7D1: 16 points T7D2: 32 points	T7G1: 16 points T7G2: 32 points	T7N1: 16 points T7N2: 32 points
Occupation number		T6C1:2 node address (8-point mode) T6C0:1 node address (8-point mode)	1 station	T6A1: Output 16 points T6A0: Output 8 points	T6J1: Output 16 points T6J0: Output 8 points	T6E1: FAN-in: 3 T6E0: FAN-in: 3 Note 3	T7D1: 2 byte T7D2: 4 byte	T7G1: 1 station T7G2: 1 station	T7N1: Output 16 points T7N2: Output 32 points

Note 1 : Version of CC-Link is 1.10.
Note 2 : Contact CKD for EDS file. (EDS file: Text file of parameters for communicating with each brand masters.)
Note 3 : FAN-in stands for input capacity from D-G line. (It is necessary to calculate the number of connection.)

Ozone proof

Ozone proof is supported as standard.

Clean room specifications

(Catalog No. CB-033S A)

- Dust generation preventing structure for use in cleanrooms

** -Voltage- P70

How to order manifold D-sub/flat cable connector

* Refer to page 192 for serial transmission type.

● Discrete valve block

N 3 E00 1 0 - C3 —— M W EF —— 3

● Block manifold

MN 4 E00 1 0 - C3 - R - M T53 E - 5 - 3

DIN rail mount method

Ⓐ Valve type

Ⓑ Solenoid position

Ⓒ Port size

Ⓓ Pressure adjustment function

Ⓔ Manual override

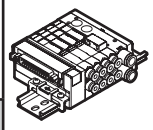
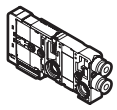
Ⓕ Wiring method

Ⓖ Terminal and connector pin array

Ⓗ Option

Ⓘ Station no.

Ⓙ Voltage

Type	
Block manifold	Discrete valve block
	

* Complete "manifold specification sheet" (page 211).

Symbol	Descriptions			
Ⓐ Valve type				
3	3 port valve, dual 3 port valve integrated type		●	●
4	4 port valve, 3/4 port valve mix		●	●
Ⓑ Solenoid position (Note 8)				
1	3 port valve	Single NC self reset type	(Differential pressure spring return)	●	●
11		Single NO self reset type		●	●
2		Double NC self hold type		●	●
21		Double NO self hold type		●	●
66	Dual 3 port valves integrated type (Note 1)	A side valve: NC self reset type	(Differential pressure return)	●	●
66S		B side valve: NC self reset type	(Differential pressure spring return)	●	●
67		A side valve: NC self reset type	(Differential pressure return)	●	●
67S		B side valve: NO self reset type	(Differential pressure spring return)	●	●
76		A side valve: NO self reset type	(Differential pressure return)	●	●
76S		B side valve: NC self reset type	(Differential pressure spring return)	●	●
77		A side valve: NO self reset type	(Differential pressure return)	●	●
77S		B side valve: NO self reset type	(Differential pressure spring return)	●	●
1	4 port valve	2-position single solenoid self reset type	(Differential pressure spring return)	●	●
2		2-position double solenoid self hold type		●	●
8	Mix manifold			●	
Ⓒ Port size					
C18	ø1.8 push-in fitting Lateral (supported tube UP-9402-**)			●	●
CL18	ø1.8 push-in fitting Upward (supported tube UP-9402-**)			●	●
C3	ø3 push-in fitting Lateral			●	●
CL3	ø3 push-in fitting Upward			●	●
C4	ø4 push-in fitting Lateral			●	●
CL4	ø4 push-in fitting Upward			●	●
M3	M3 female thread (with non-rotating)			●	●
CX	Mix push-in fitting			●	
Ⓓ Pressure adjustment function					
Blank	Without regulator block mounting manifold			●	
R	Regulator block mounting manifold (Note 2, 3)			●	
Ⓔ Manual override					
Blank	Locking/non-locking common type (with manual override cover)			●	●
M	Non-locking dedicated type (with manual override cover)			●	●
Ⓕ Wiring method					
Refer to the next page for wiring method.				●	
Ⓖ Terminal and connector pin array					
Blank	Standard wiring			●	●
W	Double wiring (Note 4)			●	●
Ⓗ Option					
Blank	None			●	●
E	Low exoergic, energy saving circuit integrated type (Note 5)			●	●
F	A/B port filter integrated (Note 6)			●	●
Ⓘ Station no.					(Note 9)
1	1 station			●	
to	to				
24	24 stations (Note 7)				
Ⓙ Voltage					
3	24 VDC			●	●
4	12 VDC			●	●

• Refer to Catalog No. CB-023S-7 for cable model no. with D-sub connector.

Note on model no. selection

Note 1: Dual 3 port valves integrated type cannot be used for external pilot type. Contact CKD for other working conditions.

Note 2: The type with dual 3 port valves integrated type resets the main valve with the main pressure, so if there is a difference between the pilot pressure and main pressure, the response time may be delayed.

Note 3: Check that the main pressure supplied to the valve block with dual 3 port valves integrated type is not higher than the pilot pressure, and that the main pressure does not drop below 0.2 MPa.

Note 4: Check the connector pin layout (example) given in catalog No. CC-945A for the double wiring specifications. When ordering a discrete valve block, the double wiring designation is limited to the 2 position single solenoid for the 4 port valve, and the 3 port valve.

Note 5: Energizing is limited to the plus common.

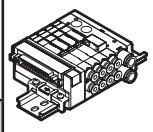
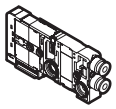
Note 6: A filter (for preventing entry of foreign matter) is incorporated in P port of the supply and exhaust block.

Note 7: It differs depending on specifications. Check that on page 179.

Note 8: Read cautions in the catalog No. CC-945A to find the details of specifications on self reset type. In addition, when mixing dummy block,select mix manifold.

Note 9: Dummy block is also included in the station no.

[Wiring method list]

Symbol	Descriptions	Type: Block manifold	Type: Discrete valve block
			
Ⓕ Wiring method			
T30	25 pin D sub-connector Left	●	
T30R	25 pin D sub-connector Right	●	
T50	20 pin flat cable connector Left (with power supply terminal) Note 11	●	
T50R	20 pin flat cable connector Right (with power supply terminal) Note 11	●	
T51	20 pin flat cable connector Left	●	
T51R	20 pin flat cable connector Right	●	
T52	10 pin flat cable connector Left	●	
T52R	10 pin flat cable connector Right	●	
T53	26 pin flat cable connector Left	●	
T53R	26 pin flat cable connector Right	●	
TM1A	Intermediate wiring block RITS connector 6P × 2 pieces Note 12	●	
TM1C	Intermediate wiring block RITS connector 6P Note 12	●	
TM52	Intermediate wiring block 10 pin flat cable connector	●	
TX	Wiring block Mix Note 13, 14	●	
Blank	Valve block for reduced wiring		●

Note 11: When mixing the connectors with the T50 or T50R type with power supply terminal, only T50R can be combined with T50, and T50 with T50R.
Note 12: RITS connector 6P (1473562-6) Tyco Electronics Japan G.K.
Note 13: Two pieces are designated in manifold specifications. Contact CKD for 3 pieces or more.
Note 14: If TX is selected for the wiring method, individual wiring cannot be selected.

How to order manifold Serial transmission

* Refer to page 194 for cable connector type for D-sub connector/flat cable connector.

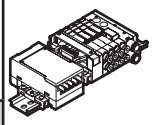
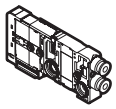
● Discrete valve block

N 3 E00 1 0- C3 —— M W EF —— 3

● Block manifold

MN 4 E00 1 0- C3 - R - M T6G1 E - 5 - 3

- DIN rail mount method
- A Valve type
- B Solenoid position
- C Port size
- D Pressure adjustment function
- E Manual override
- F Wiring method (serial transmission)
- G Terminal and connector pin array
- H Option
- I Station no.
- J Voltage

Type	
Block manifold	Discrete valve block
	

* Complete “manifold specification sheet” (page 225).

Symbol		Descriptions		Block manifold	Discrete valve block
A Valve type					
3		3 port valve, dual 3 port valve integrated type		●	●
4		4 port valve, 3/4 port valve mix		●	●
B Solenoid position (Note 8)					
1	3 port valve	Single NC self reset type	(Differential pressure spring return)	●	●
11	3 port valve	Single NO self reset type	(Differential pressure spring return)	●	●
2	3 port valve	Double NC self hold type		●	●
21	3 port valve	Double NO self hold type		●	●
66	Dual 3port valves integrated type (Note 1)	A side valve: NC self reset type	(Differential pressure return)	●	●
66S	Dual 3port valves integrated type (Note 1)	B side valve: NC self reset type	(Differential pressure spring return)	●	●
67	Dual 3port valves integrated type (Note 1)	A side valve: NC self reset type	(Differential pressure return)	●	●
67S	Dual 3port valves integrated type (Note 1)	B side valve: NO self reset type	(Differential pressure spring return)	●	●
76	Dual 3port valves integrated type (Note 1)	A side valve: NO self reset type	(Differential pressure return)	●	●
76S	Dual 3port valves integrated type (Note 1)	B side valve: NC self reset type	(Differential pressure spring return)	●	●
77	Dual 3port valves integrated type (Note 1)	A side valve: NO self reset type	(Differential pressure return)	●	●
77S	Dual 3port valves integrated type (Note 1)	B side valve: NO self reset type	(Differential pressure spring return)	●	●
1	4 port valve	2-position single solenoid self reset type	(Differential pressure spring return)	●	●
2	4 port valve	2-position double solenoid self hold type		●	●
8		Mix manifold		●	
C Port size					
C18		ø1.8 push-in fitting Lateral (supported tube UP-9402-**)		●	●
CL18		ø1.8 push-in fitting Upward (supported tube UP-9402-**)		●	●
C3		ø3 push-in fitting Lateral		●	●
CL3		ø3 push-in fitting Upward		●	●
C4		ø4 push-in fitting Lateral		●	●
CL4		ø4 push-in fitting Upward		●	●
M3		M3 female thread (with non-rotating)		●	●
CX		Mix push-in fitting		●	
D Pressure adjustment function					
Blank		Without regulator block mounting manifold		●	
R		Regulator block mounting manifold (Note 2, 3)		●	
E Manual override					
Blank		Locking/non-locking common type (with manual override cover)		●	●
M		Non-locking dedicated type (with manual override cover)		●	●
F Wiring method					
Refer to the next page for wiring method.				●	
G Terminal and connector pin array					
Blank		Standard wiring		●	●
W		Double wiring (Note 4)		●	●
H Option					
Blank		None		●	●
E		Low exoergic, energy saving circuit integrated type (Note 5)		●	●
F		A/B port filter integrated (Note 6)		●	●
I Station no.					(Note 10)
1		1 station		●	
to		to			
32		32 stations (Note 7)			
J Voltage					
3		24 VDC		●	●

Note on model No. selection

Note 1: Dual 3 port valves integrated type cannot be used for external pilot type. Contact CKD for other working conditions.

Note 2: The type with dual 3 port valves integrated type resets the main valve with the main pressure, so if there is a difference between the pilot pressure and main pressure, the response time may be delayed.

Note 3: Check that the main pressure supplied to the valve block with dual 3 port valves integrated type is not higher than the pilot pressure, and that the main pressure does not drop below 0.2 MPa.

Note 4: Check the connector pin layout (example) given in catalog No. CC-945A for the double wiring specifications.
When ordering a discrete valve block, the double wiring designation is limited to the 2 position single solenoid for the 4 port valve, and the 3 port valve.

Note 5: Energizing is limited to the plus common.

Note 6: A filter (for preventing entry of foreign matter) is incorporated in P port of the supply and exhaust block.

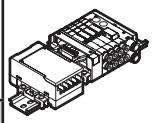
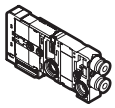
Note 7: It differs depending on specifications. Check that on page 193.

Note 8: Read cautions in the catalog No. CC-945A to find the details of specifications on self reset type.
In addition, when mixing dummy block,select mix manifold.

Note 9: Confirm the due date for T7N2 (S-LINK V 32 points output) in each case.

Note 10: Dummy block is also included in the station no.

[Wiring method list]

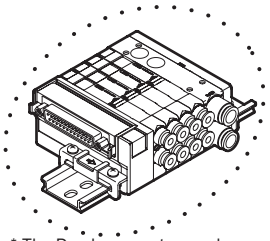
Symbol	Descriptions	Type: Block manifold	Type: Discrete valve block
			
Ⓕ Wiring method			
T6A0	UNIWIRE SYSTEM 8 points	●	
T6A1	UNIWIRE SYSTEM 16 points	●	
T6C0	OMRON CompoBus/S 8 points	●	
T6C1	OMRON CompoBus/S 16 points	●	
T6E0	SUNX S-LINK 8 points	●	
T6E1	SUNX S-LINK 16 points	●	
T6J0	UNIWIRE H SYSTEM 8 points	●	
T6J1	UNIWIRE H SYSTEM 16 points	●	
T6G1	CC-Link 16 points	●	
T7D1	Close contact type DeviceNet 16 points	●	
T7D2	Close contact type DeviceNet 32 points	●	
T7G1	Close contact type CC-Link 16 points	●	
T7G2	Close contact type CC-Link 32 points	●	
T7N1	Close contact type SUNX S-LINK V 16 points	●	
T7N2	Close contact type SUNX S-LINK V 32 points (Note 9)	●	
Blank	Valve block for reduced wiring		●

MEMO

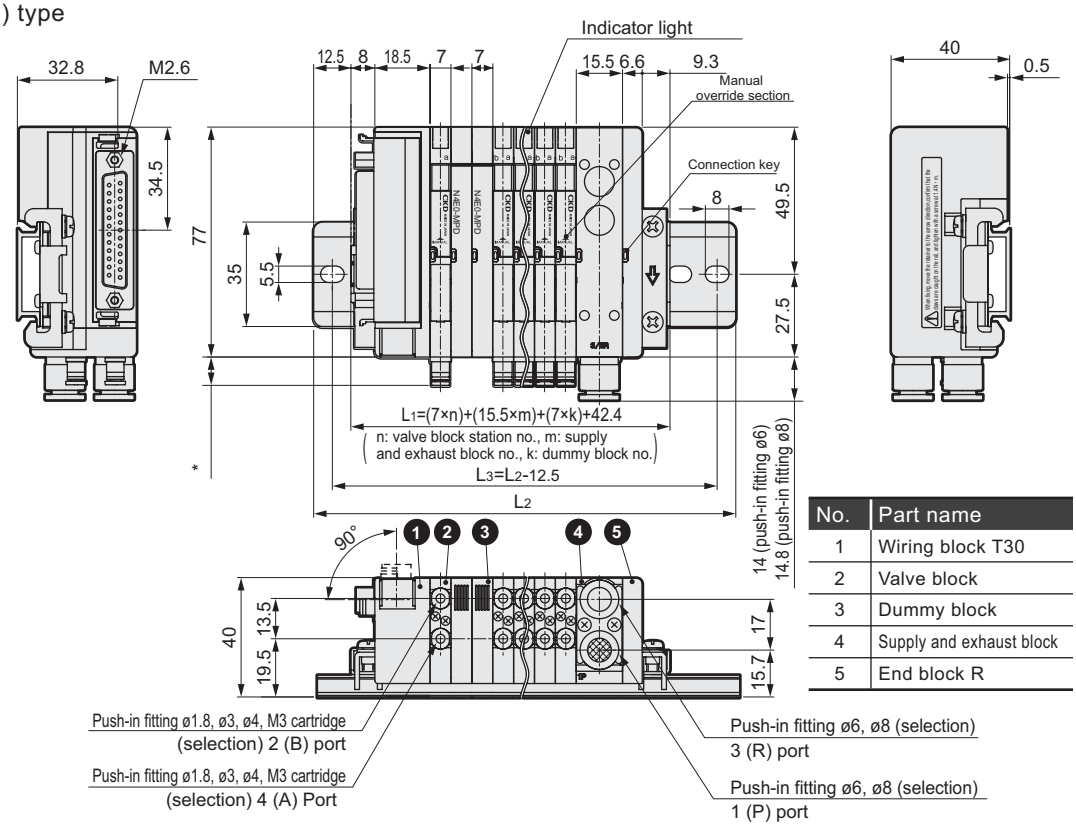
Dimensions

MN$^{3}_{4}$E00*-*-T30*-*-*

●D-sub connector (T30) type



* The D-sub connector can be faced to the top or bottom.
* Refer to page 205 to find direction switchover method for connection section.



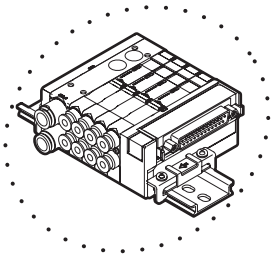
* Fitting size		
Push-in fitting	ø1.8	6.8
	ø3	9.5
	ø4	11.8
M3 female thread		6.1

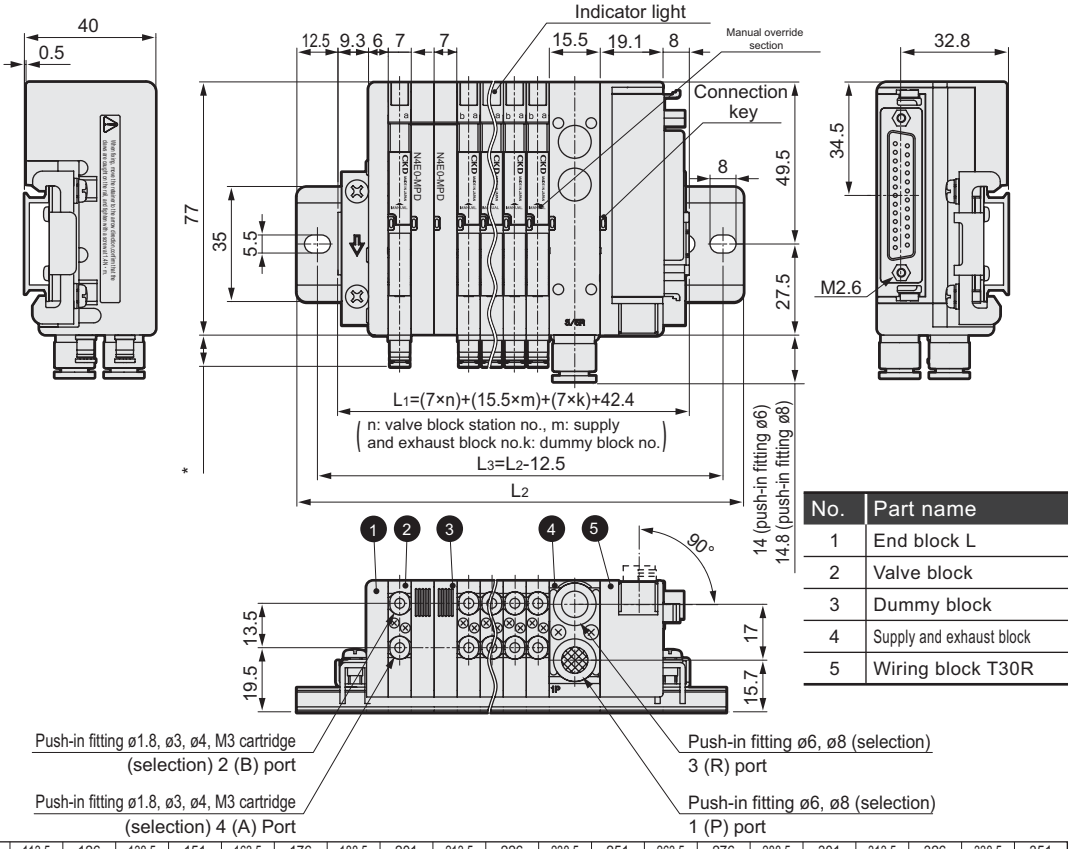
No.	Part name
1	Wiring block T30
2	Valve block
3	Dummy block
4	Supply and exhaust block
5	End block R

* Refer to page 204 for the dimension drawings of the L type push-in fitting for valve block (upward) and L type push-in fitting for supply and exhaust block (upward).

MN$^{3}_{4}$E00*-*-T30R*-*-*

●D-sub connector right type (T30R)





* Fitting size		
Push-in fitting	ø1.8	6.8
	ø3	9.5
	ø4	11.8
M3 female thread		6.1

No.	Part name
1	End block L
2	Valve block
3	Dummy block
4	Supply and exhaust block
5	Wiring block T30R

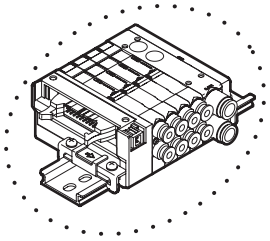
Manifold length L1 mm	76 or less	88.5 or less	101 or less	113.5 or less	126 or less	138.5 or less	151 or less	163.5 or less	176 or less	188.5 or less	201 or less	213.5 or less	226 or less	238.5 or less	251 or less	263.5 or less	276 or less	288.5 or less	301 or less	313.5 or less	326 or less	338.5 or less	351 or less
Installation rail length L2 mm	100	112.5	125	137.5	150	162.5	175	187.5	200	212.5	225	237.5	250	262.5	275	287.5	300	312.5	325	337.5	350	362.5	375
Installation rail pitch L3 mm	87.5	100	112.5	125	137.5	150	162.5	175	187.5	200	212.5	225	237.5	250	262.5	275	287.5	300	312.5	325	337.5	350	362.5

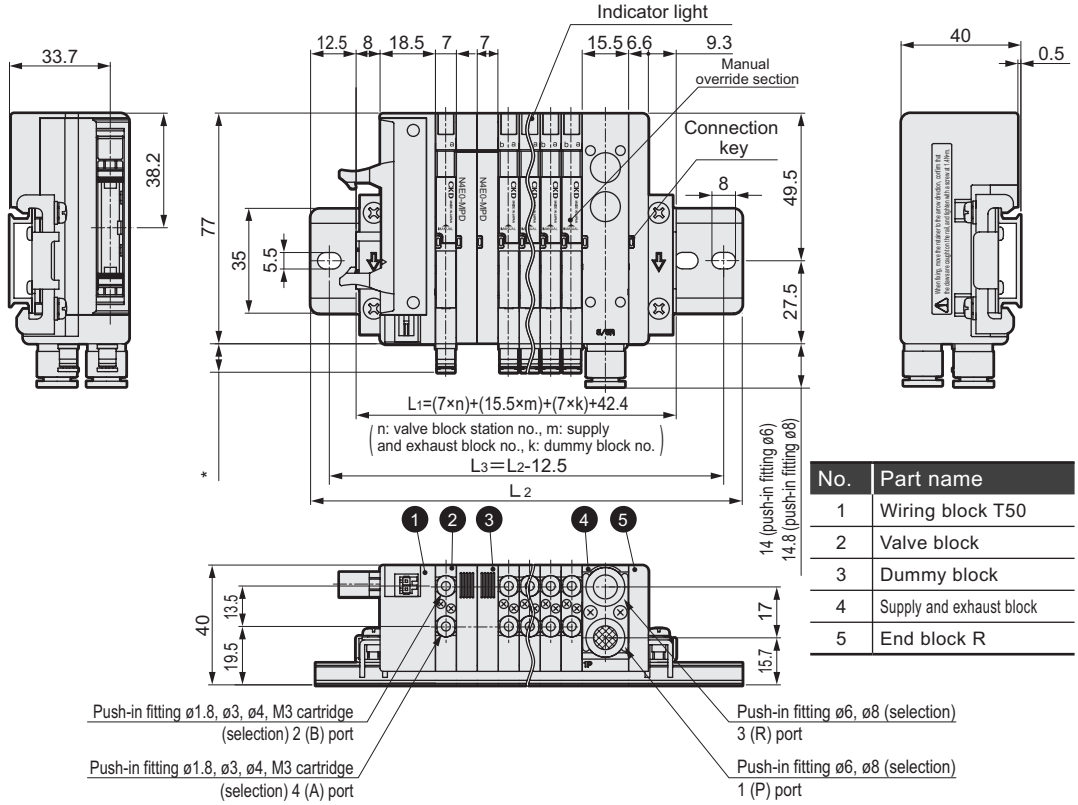
Dimensions

MN$^{3}_{4}$E00*-*-T50*-*-*

● Flat cable connector left type (T50)

* There are T51, and T53. The dimensions are the same as T50. Refer to page 201 for the dimensions of connector section.





No.	Part name
1	Wiring block T50
2	Valve block
3	Dummy block
4	Supply and exhaust block
5	End block R

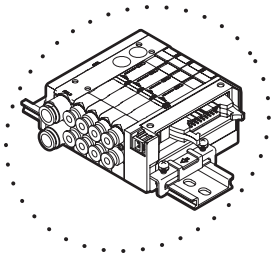
* Fitting size		
Push-in fitting	ø1.8	6.8
	ø3	9.5
	ø4	11.8
M3 female thread		6.1

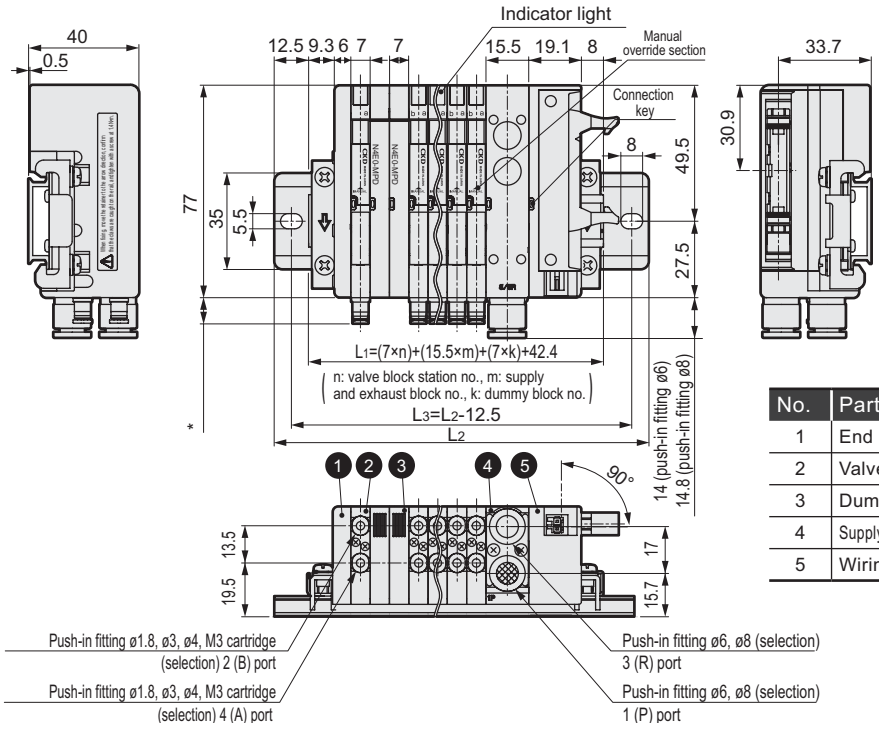
* Refer to page 204 for the dimension drawings of the L type push-in fitting for valve block (upward) and L type push-in fitting for supply and exhaust block (upward).

* The power supply connector can be used with T50 to supply power to the PLC output unit. Refer to page 205 for dimensions when the connector is connected, and to page 75 of precautions on wiring for electrical connection.

MN$^{3}_{4}$E00*-*-T50R*-*-*

● Flat cable connector right type (T50R)





No.	Part name
1	End block L
2	Valve block
3	Dummy block
4	Supply and exhaust block
5	Wiring block T50R

* Fitting size		
Push-in fitting	ø1.8	6.8
	ø3	9.5
	ø4	11.8
M3 female thread		6.1

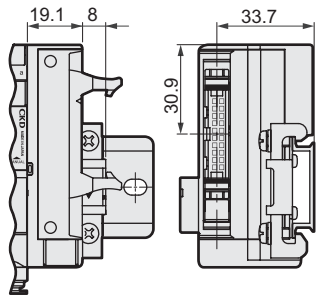
Manifold length L1 mm	76 or less	88.5 or less	101 or less	113.5 or less	126 or less	138.5 or less	151 or less	163.5 or less	176 or less	188.5 or less	201 or less	213.5 or less	226 or less	238.5 or less	251 or less	263.5 or less	276 or less	288.5 or less	301 or less	313.5 or less	326 or less	338.5 or less	351 or less
Installation rail length L2 mm	100	112.5	125	137.5	150	162.5	175	187.5	200	212.5	225	237.5	250	262.5	275	287.5	300	312.5	325	337.5	350	362.5	375
Installation rail pitch L3 mm	87.5	100	112.5	125	137.5	150	162.5	175	187.5	200	212.5	225	237.5	250	262.5	275	287.5	300	312.5	325	337.5	350	362.5

Dimensions

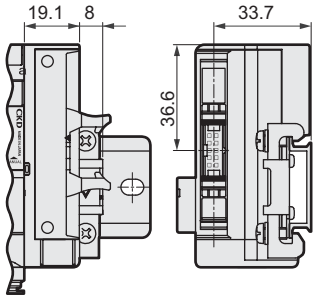
Flat cable connector (T51R/T52R/T53R): Dimensions of connector section

* This drawing indicates connector type on the right.
Connector type dimension on the left is also the same.

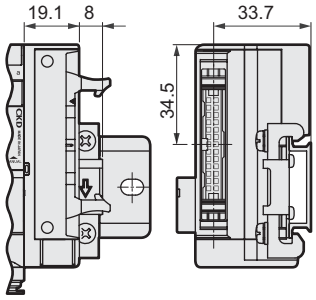
●T51R



●T52R



●T53R

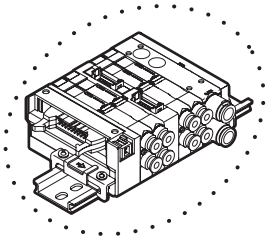


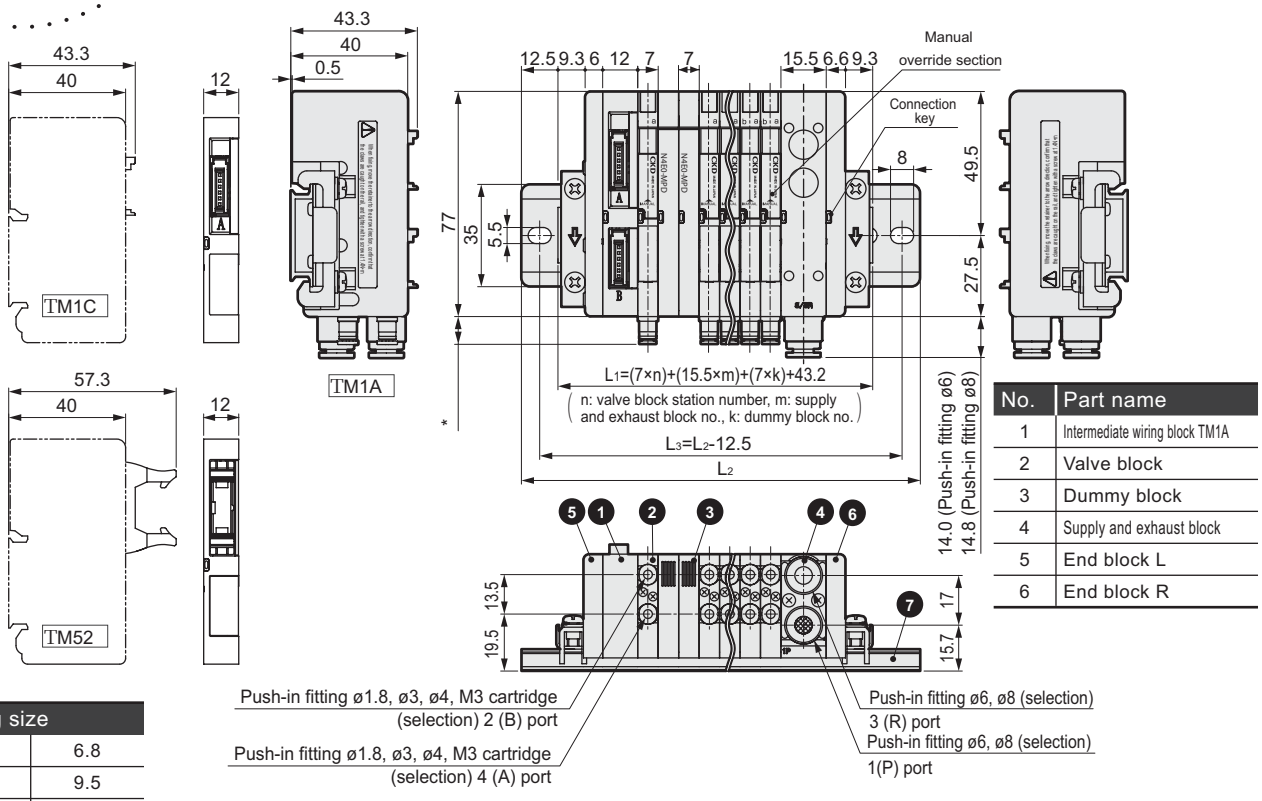
MN$^{3}_{4}$E00*-*-TM1$^{A}_{C}$*-*-*

●RITS connector intermediate wiring specification (TM1$^{A}_{C}$)

MN$^{3}_{4}$E00*-*-TM52*-*-*

●10 pin flat cable connector intermediate wiring specification (TM52)





No.	Part name
1	Intermediate wiring block TM1A
2	Valve block
3	Dummy block
4	Supply and exhaust block
5	End block L
6	End block R

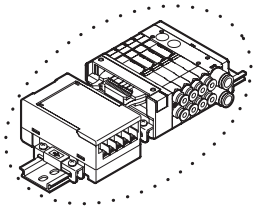
* Fitting size		
Push-in fitting	ø1.8	6.8
	ø3	9.5
	ø4	11.8
M3 female thread		6.1

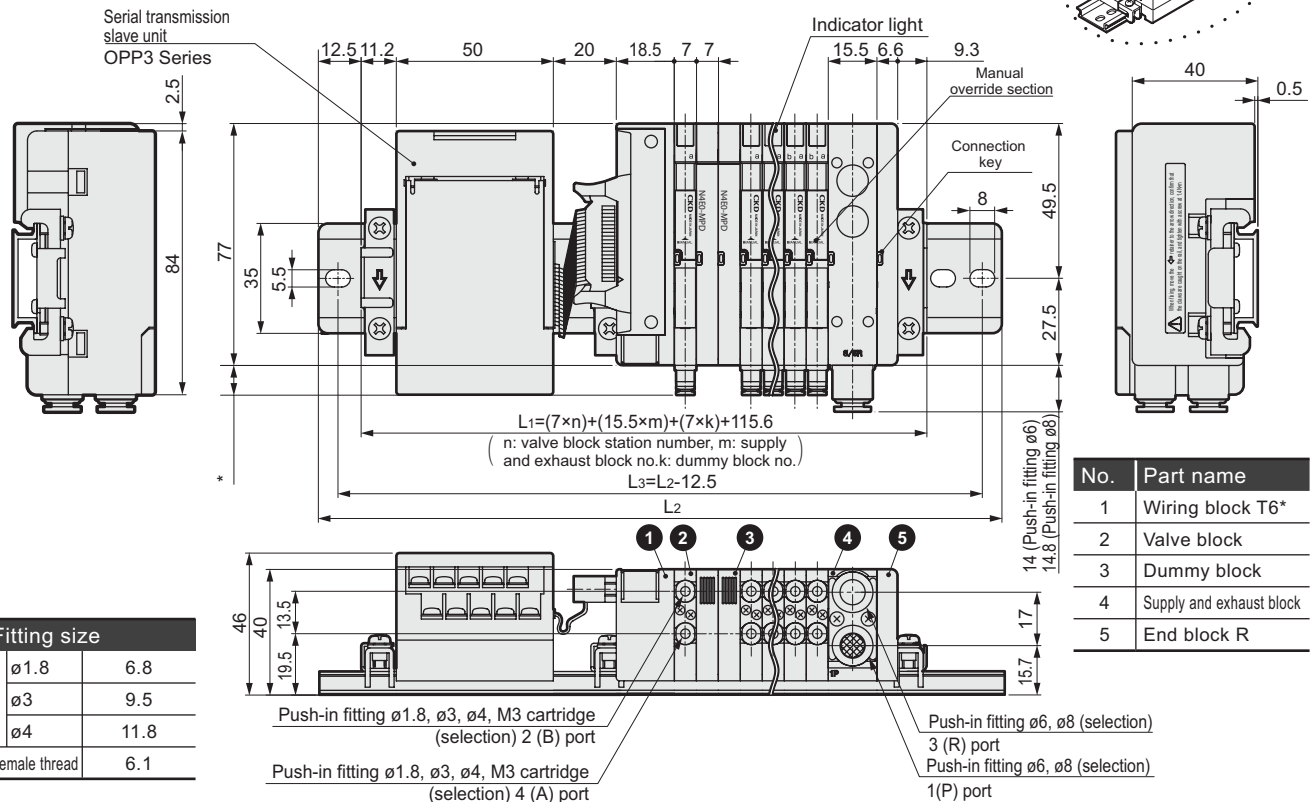
Manifold length L1 mm	76 or less	88.5 or less	101 or less	113.5 or less	126 or less	138.5 or less	151 or less	163.5 or less	176 or less	188.5 or less	201 or less	213.5 or less	226 or less	238.5 or less	251 or less	263.5 or less	276 or less	288.5 or less	301 or less	313.5 or less	326 or less	338.5 or less	351 or less
Installation rail length L2 mm	100	112.5	125	137.5	150	162.5	175	187.5	200	212.5	225	237.5	250	262.5	275	287.5	300	312.5	325	337.5	350	362.5	375
Installation rail pitch L3 mm	87.5	100	112.5	125	137.5	150	162.5	175	187.5	200	212.5	225	237.5	250	262.5	275	287.5	300	312.5	325	337.5	350	362.5

Dimensions

MN$^{3}_{4}$E00*-*-T6**-*-*

● Serial transmission type (T6A0/1,T6C0/1,T6E0/1,T6J0/1,T6G1)



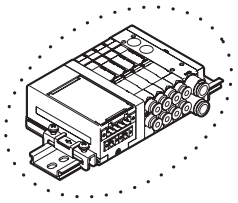


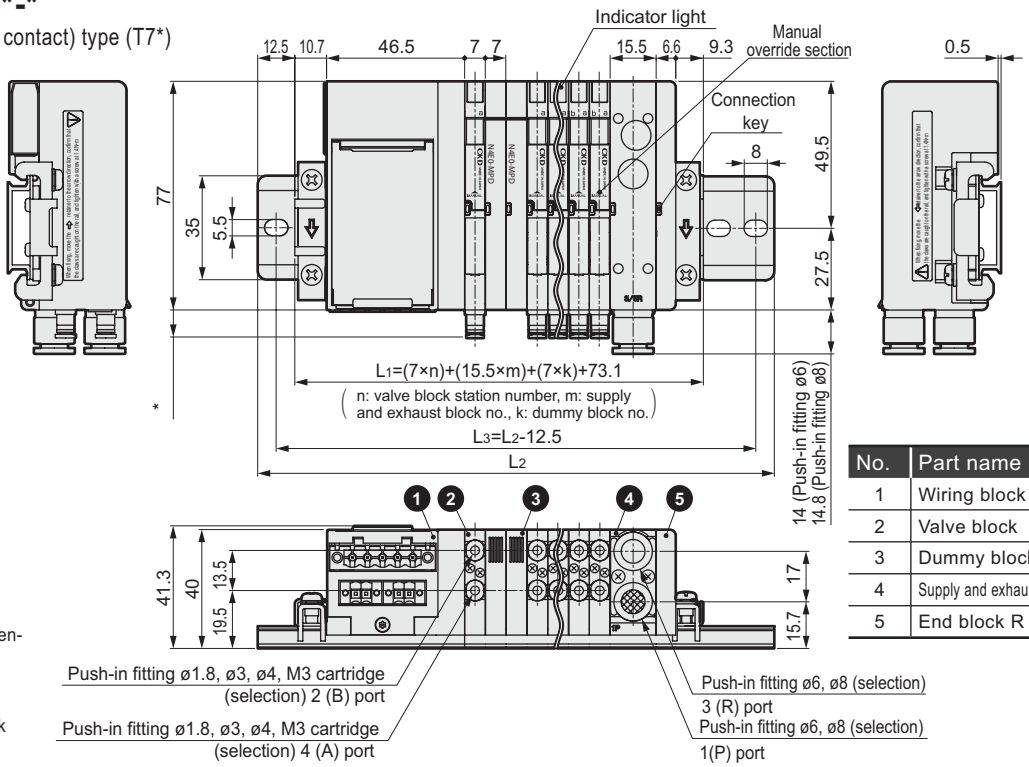
No.	Part name
1	Wiring block T6*
2	Valve block
3	Dummy block
4	Supply and exhaust block
5	End block R

* Fitting size		
Push-in fitting	ø1.8	6.8
	ø3	9.5
	ø4	11.8
M3 female thread		6.1

MN$^{3}_{4}$E00*-*-T7**-*-*

● Serial transmission (close contact) type (T7*)





No.	Part name
1	Wiring block T7*
2	Valve block
3	Dummy block
4	Supply and exhaust block
5	End block R

* Fitting size		
Push-in fitting	ø1.8	6.8
	ø3	9.5
	ø4	11.8
M3 female thread		6.1

* Refer to page 190 for the dimension drawings of the L type push-in fitting for valve block (upward) and L type push-in fitting for supply/exhaust block (upward).

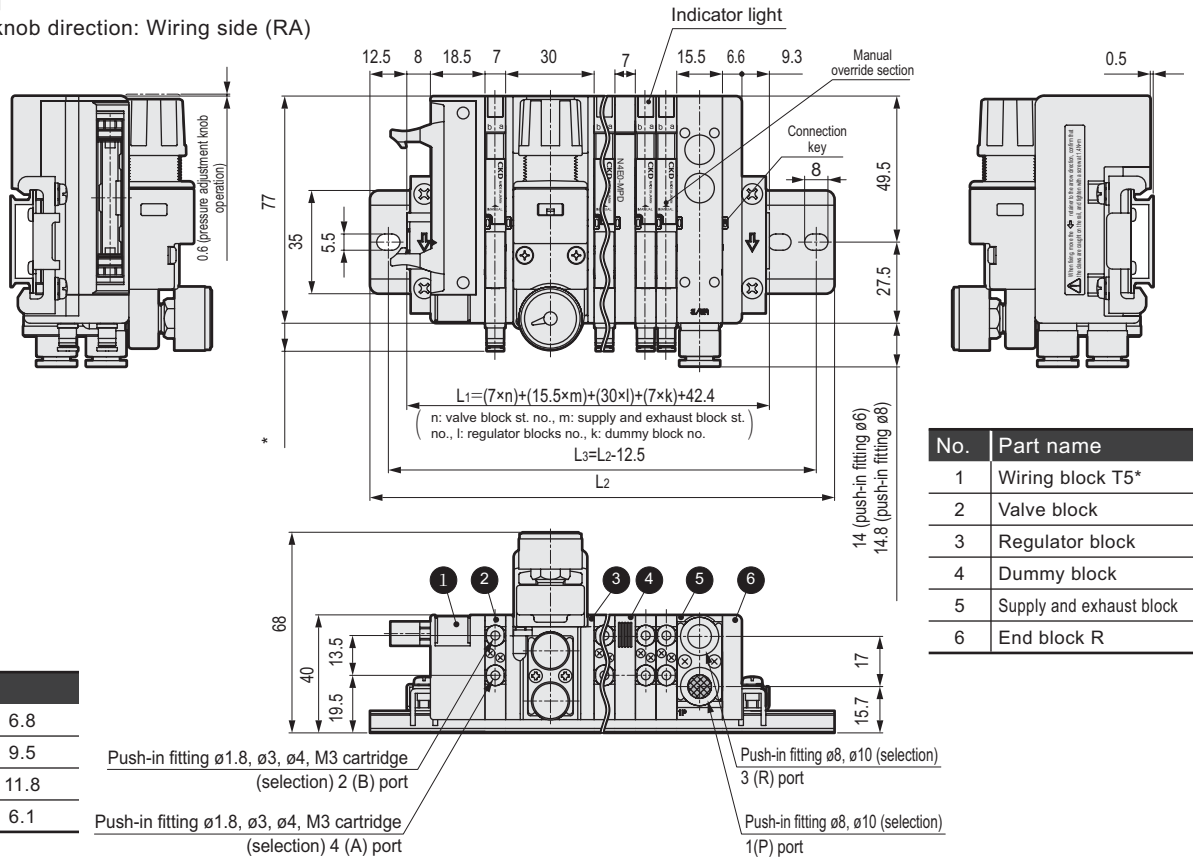
Manifold length L1 mm	76 or less	88.5 or less	101 or less	113.5 or less	126 or less	138.5 or less	151 or less	163.5 or less	176 or less	188.5 or less	201 or less	213.5 or less	226 or less	238.5 or less	251 or less	263.5 or less	276 or less	288.5 or less	301 or less	313.5 or less	326 or less	338.5 or less	351 or less
Installation rail length L2 mm	100	112.5	125	137.5	150	162.5	175	187.5	200	212.5	225	237.5	250	262.5	275	287.5	300	312.5	325	337.5	350	362.5	375
Installation rail pitch L3 mm	87.5	100	112.5	125	137.5	150	162.5	175	187.5	200	212.5	225	237.5	250	262.5	275	287.5	300	312.5	325	337.5	350	362.5

Dimensions

● Each piping block section (common for all types)

Regulator block
$MN^{3}_{4}E0*0-*-\boxed{R}-*$

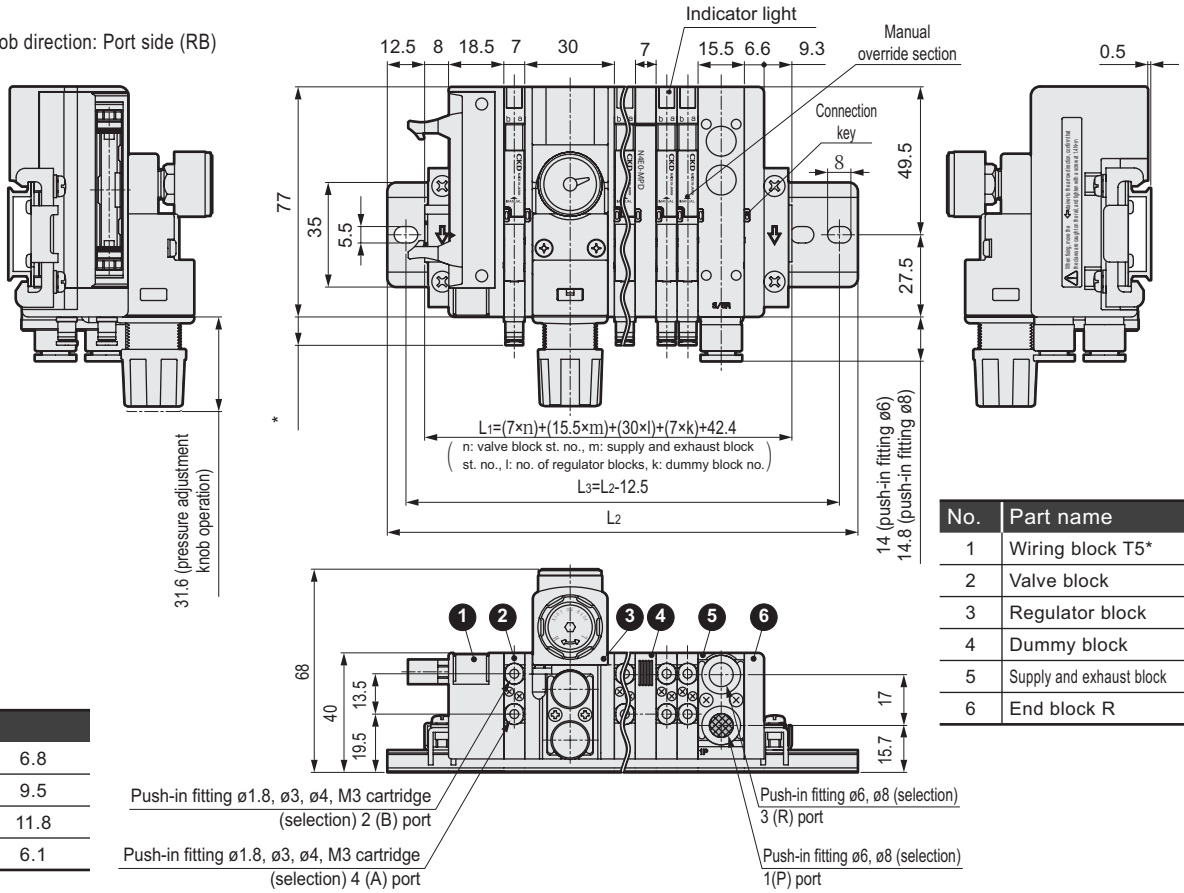
● Adjustment knob direction: Wiring side (RA)



No.	Part name
1	Wiring block T5*
2	Valve block
3	Regulator block
4	Dummy block
5	Supply and exhaust block
6	End block R

* Fitting size		
Push-in fitting	ø1.8	6.8
	ø3	9.5
	ø4	11.8
M3 female thread		6.1

● Adjustment knob direction: Port side (RB)



No.	Part name
1	Wiring block T5*
2	Valve block
3	Regulator block
4	Dummy block
5	Supply and exhaust block
6	End block R

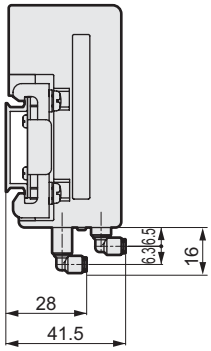
* Fitting size		
Push-in fitting	ø1.8	6.8
	ø3	9.5
	ø4	11.8
M3 female thread		6.1

Dimensions

●Piping blocks section (common for all types)

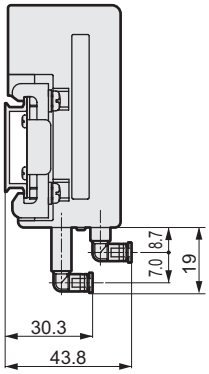
Push-in fittings for fiber tube (upward)

●ø1.8 (CL18)



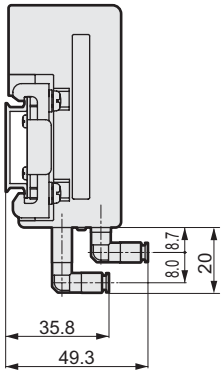
Push-in fitting (upward)

●ø3 (CL3)



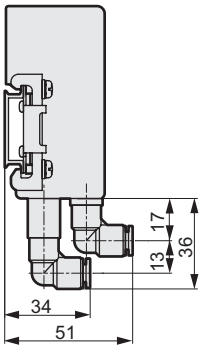
Push-in fitting (upward)

●ø4 (CL4)

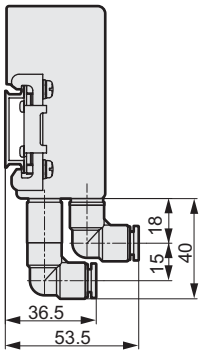


Supply and exhaust block push-in fitting L type (upward)

●ø6(CL6)

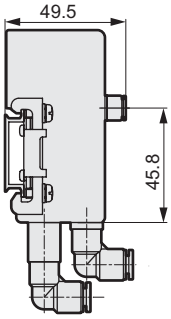


●ø8(CL8)

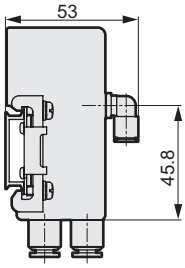


Supply and external block for external pilot

●Upward piping

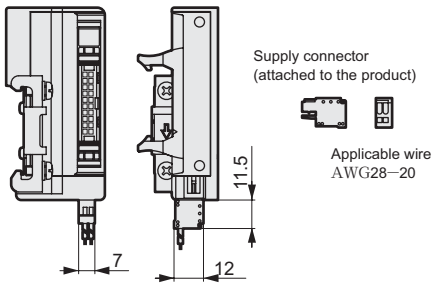


●Lateral piping



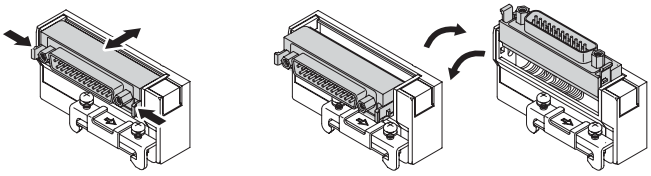
Dimensions

● Dimension of T50 power supply connector connection



● D-sub connector (T30/T30R): Direction switchover method for connector section

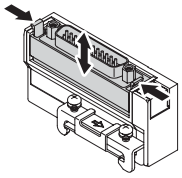
Using in a horizontal state



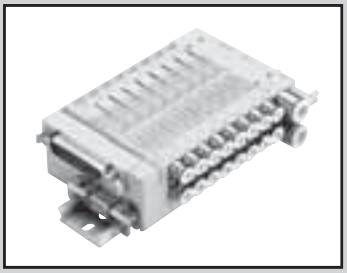
Hold the lever and pull the connector out horizontally.
Push the connector in horizontally when storing it.
(Fix the connector.)

Turn the connector.
Always fix the connector horizontally or vertically when using.

Using in a vertical state



Hold the lever and pull the connector out vertically.
Push the connector in horizontally when storing it.
(Fix the connector.)



Reduced wiring block manifold
pilot-operated 3/4 port valve

MN3E0/MN4E0 Series

Common specifications

Descriptions		
Manifold method		Block manifold
Manifold type		Common supply/common exhaust, check valve integrated Note 1
Working fluid		Compressed air
Type of valve and operation method		Pilot-operated soft spool valve
Max. working pressure	MPa	0.7
Min. working pressure	MPa	0.2
Withstanding pressure	MPa	1.05
Ambient temperature	°C	5 to 55
Fluid temperature	°C	5 to 55
Lubrication		Not required
Protective structure		Dust proof
Vibration/impact	m/s^2	50 or less/300 or less
Working environment		Not permissible to use in environment containing corrosive gas.
Manual override		Locking/non-locking common type

Note 1: The check valve blocks the back pressure from adjacent air devices, etc. However, the structure does not allow the pressure seal to be held continuously, so do not use for other than the back pressure block.

Electrical specifications

Descriptions		
Rated voltage V		12, 24 DC
Rated voltage fluctuation range		±10% (+10%, -5% when using for serial transmission)
Rated current A	24 VDC	0.025 (0.013) Note 2
	12 VDC	0.05 (0.025) Note 2
Power consumption W	24 VDC	0.6 (0.3) Note 2
	12 VDC	
Heat resistance class		B
Surge protection circuit		Surge suppressor attached
Indicator		LED

Note 2: Values in parentheses are for low exoergic, energy saving circuit type. When using the valve block with individual power supply function (AUX) or type with low exoergic, energy-saving circuit, energizing is limited to the plus common.

Individual specifications

Descriptions \ Port		3 port valve	4 port valve	Dual 3 port valves integrated type Note 2
Port size	A/B port	ø1.8, ø4, ø6 push-in fitting, M5, fiber tube		
	P/R port	ø6, ø8 push-in fitting		
	External pilot port	ø6 push-in fitting		-
Response time Note 1 ms	2-position Single	20 or less	20 or less	12 or less
	Double	12 or less	12 or less	-
	3-position	-	20 or less	-

Note 1: Response time is the value at supply pressure of 0.5 MPa and oil-free.
Note 2: With dual 3 port valves integrated type, the main pressure is used to operate the valving element, and cannot be used with the external pilot. Check that the supply air flow is sufficient so that the supply pressure does not drop below the minimum working pressure due to the operation of the connecting load (air operated valve), etc.

Flow characteristics

			C [dm^3/(s•bar)]	b
3 port valve	2-position		0.54	0.12
4 port valve	2-position		0.54	0.12
	3-position	All ports closed	0.50	0.08
		A/B/R connection	0.54	0.12
		P/A/B connection	0.50	0.11
Dual 3 port valves integrated type	2-position		0.50	0.16

Note 1 : Effective sectional area S and sonic conductance C are converted as S ≈ 5.0 x C.

Weight

Wiring block (g)		D-sub connector type T30	Flat cable connector type T5*	Intermediate wiring block TM1A	Intermediate wiring block TM1C	Intermediate wiring block TM52	Serial transmission T6*	Serial transmission T7*
		67	59	32	32	34	205	128
Supply and exhaust block (g)		Q/QZ	QK	QKZ		QX		QKX
	Fitting Lateral	64	69	79		56		61
	Fitting Upward	90	94	98		62		66
Valve block (g)		2-position single solenoid	2-position double solenoid	3-position		Dual 3 port valves integrated type		
	Fitting Lateral	47.5	52	53.5		52		
	Fitting Upward	54.5	59	60.5		59		
Dummy block (g)		MPS/MPD						
		20						
Regulator block (g) Note 1		-						
		124						
End block (g)		ER/EL						
		40						
DIN rail (g)		-						
		0.19g/mm						

Note 1: Value differs depending on specification of regulator block.

Maximum station no. energized by manifold

Type			Double solenoid (double wiring)	Single solenoid	Mix manifold (Solenoid number)
D-sub connector type (25 pins)	T30	D-sub connector type Left	12 stations	24 stations	24 points
	T30R	D-sub connector type Right	12 stations	24 stations	24 points
Flat cable connector type	T50	20 pin flat cable connector Left (with power supply terminal)	8 stations	16 stations	16 points
	T50R	20 pin flat cable connector Right (with power supply terminal)	8 stations	16 stations	16 points
	T51	20 pin flat cable connector Left (without power supply terminal)	9 stations	18 stations	18 points
	T51R	20 pin flat cable connector Right (without power supply terminal)	9 stations	18 stations	18 points
	T52	10 pin flat cable connector Left (without power supply terminal)	4 stations	8 stations	8 points
	T52R	10 pin flat cable connector Right (without power supply terminal)	4 stations	8 stations	8 points
	T53	26 pin flat cable connector Left (without power supply terminal)	12 stations	24 stations	24 points
	T53R	26 pin flat cable connector Right (without power supply terminal)	12 stations	24 stations	24 points
Intermediate wiring block type	TM1A	RITS connector 6PX2 pcs. Note 1	5 stations	10 stations	10 points
	TM1C	RITS connector 6P Note 1	2 stations	5 stations	5 points
	TM52	10 pin flat cable connector	4 stations	8 stations	8 points
Serial transmission type (with unit)	T6A0	UNIWIRE SYSTEM 8 points	4 stations	8 stations	8 points
	T6A1	UNIWIRE SYSTEM 16 points	8 stations	16 stations	16 points
	T6C0	OMRON CompoBus/S 8 points	4 stations	8 stations	8 points
	T6C1	OMRON CompoBus/S 16 points	8 stations	16 stations	16 points
	T6E0	SUNX S-LINK 8 points	4 stations	8 stations	8 points
	T6E1	SUNX S-LINK 16 points	8 stations	16 stations	16 points
	T6J0	UNIWIRE H SYSTEM 8 points	4 stations	8 stations	8 points
	T6J1	UNIWIRE H SYSTEM 16 points	8 stations	16 stations	16 points
	T6G1	CC-Link 16 points	8 stations	16 stations	16 points
Serial transmission type (close contact type)	T7D1	DeviceNet 16 points	8 stations	16 stations	16 points
	T7D2	DeviceNet 32 points	16 stations	32 stations	32 points
	T7G1	CC-Link 16 points	8 stations	16 stations	16 points
	T7G2	CC-Link 32 points	16 stations	32 stations	32 points
	T7N1	SUNX S-LINK V 16 points	8 stations	16 stations	16 points
	T7N2	SUNX S-LINK V 32 points	16 stations	32 stations	32 points

Note 1: RITS connector 6P (1473562-6) Tyco Electronics Japan G.K.

Slave station specifications

Descriptions		T6C1 T6C0	T6G1 Note 1	T6A1 T6A0	T6J1 T6J0	T6E1 T6E0	T7D1 Note 2 T7D2	T7G1 Note 1 T7G2	T7N1 T7N2
Power voltage	Unit side	24 VDC ± 10%		24 VDC			24 VDC ± 10%		
	Valve side	24 VDC + 10%, -5%		+10% -5%			24 VDC + 10%, -5%		
	Communication side	-		-			11 to 25VDC	-	
Current consumption	Unit side	T6C1: 60 mA or less T6C0: 40 mA or less (When all points output is ON)	100 mA or less (When all points output is ON)	100 mA or less (When all points output is ON) However, current consumption of valve is not included.		60 mA or less (When all points output is ON) However, current consumption of valve is not included.	T7D1: 60 mA or less T7D2: 85 mA or less (When all points output is ON)	T7G1: 65 mA or less T7G2: 90 mA or less (When all points output is ON)	T7N1: 40 mA or less T7N2: 50 mA or less (When all points output is ON)
	Valve side	15 mA or less (when all points are turned OFF)					15 mA or less (when all points are turned OFF)		
	Communication side	-		-			50 mA or less	-	
Output no.		T6C1: 16 points T6C0: 8 points	16 points	T6A1: 16 points T6A0: 8 points	T6J1: 16 points T6J0: 8 points	T6E1: 16 points T6E0: 8 points	T7D1: 16 points T7D2: 32 points	T7G1: 16 points T7G2: 32 points	T7N1: 16 points T7N2: 32 points
Occupation number		T6C1: 2 node address (8-point mode) T6C0: 1 node address (8-point mode)	1 station	T6A1: Output 16 points T6A0: Output 8 points	T6J1: Output 16 points T6J0: Output 8 points	T6E1: FAN-in: 3 T6E0: FAN-in: 3 Note 3	T7D1:2 byte T7D2:4 byte	T7G1: 1 station T7G2: 1 station	T7N1: Output 16 points T7N2: Output 32 points

Note 1: Version of CC-Link is 1.10.
Note 2: Contact CKD for EDS file. (EDS file: Text file of parameters for communicating with each brand masters.)
Note 3: FAN-in stands for input capacity from D-G line. (It is necessary to calculate the number of connection.)

Ozone specifications

Ozone specifications can be selected with option "A" in No. "H" for How to Order on pages 208 and 209.

Clean room specifications

(Catalog No. CB-033SA)

● Particle generation preventing structure for use in clean rooms

** - Voltage - P70

How to order manifold D-sub/flat cable connector

* Refer to page 210 for serial transmission type.

● Discrete valve block

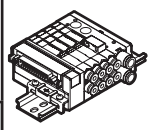
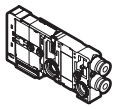
N 3 E0 66 0 - C4 —— M D2 ( ) F —— 3

● Block manifold

M N 4 E0 1 0 - C4 - R - M T53 D2 W F - 5 - 3

DIN rail mount method — Ⓐ Valve type — Ⓑ Solenoid position — Ⓒ Port size — Ⓓ Pressure adjustment function — Ⓔ Manual override — Ⓕ Wiring method — Individual wiring type — Ⓖ Terminal and connector pin array — Ⓗ Option — Ⓘ Station no. — Ⓙ Voltage

*Complete "manifold specification sheet" (page 225).

Symbol	Descriptions		Type: Block manifold	Type: Discrete valve block
				
Ⓐ Valve type				
3	3 port valve, dual 3 port valve integrated type		●	●
4	4 port valve, 3/4 port valve mix		●	●
Ⓑ Solenoid position (Note 10)				
1	3 port valve: Single NC self reset type	(Differential pressure spring return)	●	●
11	3 port valve: Single NO self reset type	(Differential pressure spring return)	●	●
2	3 port valve: Double NC self hold type		●	●
21	3 port valve: Double NO self hold type		●	●
66	Dual 3 port valves integrated type (Note 1): A side valve: NC self reset type	(Differential pressure return)	●	●
66S	Dual 3 port valves integrated type (Note 1): B side valve: NC self reset type	(Differential pressure spring return)	●	●
67	Dual 3 port valves integrated type (Note 1): A side valve: NC self reset type	(Differential pressure return)	●	●
67S	Dual 3 port valves integrated type (Note 1): B side valve: NO self reset type	(Differential pressure spring return)	●	●
76	Dual 3 port valves integrated type (Note 1): A side valve: NO self reset type	(Differential pressure return)	●	●
76S	Dual 3 port valves integrated type (Note 1): B side valve: NC self reset type	(Differential pressure spring return)	●	●
77	Dual 3 port valves integrated type (Note 1): A side valve: NO self reset type	(Differential pressure return)	●	●
77S	Dual 3 port valves integrated type (Note 1): B side valve: NO self reset type	(Differential pressure spring return)	●	●
1	4 port valve: 2-position single solenoid self reset type	(Differential pressure spring return)	●	●
2	4 port valve: 2-position double solenoid self hold type		●	●
3	4 port valve: 3-position all ports closed		●	●
4	4 port valve: 3-position A/B/R connection		●	●
5	4 port valve: 3-position P/A/B connection		●	●
8	Mix manifold		●	
Ⓒ Port size				
CF	ø1.8 barbed fitting (supported tube UP-9102-**)		●	●
C18	ø1.8 push-in fitting Lateral (supported tube UP-9402-**)		●	●
CL18	ø1.8 push-in fitting Upward (supported tube UP-9402-**)		●	●
C4	ø4 push-in fitting Lateral		●	●
CL4	ø4 push-in fitting Upward		●	●
C6	ø6 push-in fitting Lateral		●	●
CL6	ø6 push-in fitting Upward		●	●
M5	M5 female thread (with non-rotating)		●	●
CX	Mix push-in fitting		●	●
Ⓓ Pressure adjustment function				
Blank	Without regulator block mounting manifold		●	
R	Regulator block mounting manifold (Note 2, 3)		●	
Ⓔ Manual override				
Blank	Locking/non-locking common type (with manual cover)		●	●
M	Non-locking dedicated type (with manual cover)		●	●
Ⓕ Wiring method				
Refer to the next page for wiring method.			●	
Ⓖ Terminal and connector pin array				
Blank	Standard wiring		●	●
W	Double wiring (Note 4,5)		●	●
Ⓗ Option				
Blank	None		●	●
E	Low exoergic, energy saving circuit integrated type (Note 6)		●	●
U	Built-in individual power supply function (AUX) type (Note 6, 7)		●	●
A	Ozone proof		●	●
F	A/B port filter integrated (Note 8)		●	●
Ⓘ Station no.				(Note 11)
1	1 station		●	
to	to			
24	24 stations (Note 9)			
Ⓙ Voltage				
3	24 VDC		●	●
4	12 VDC		●	●

• Refer to Catalog No.CB-023A-7 for cable model no. with D-sub connector.

Note on model no. selection

Note 1: Dual 3 port valves integrated type cannot be used for external pilot type. Contact CKD for other working conditions.

Note 2: The type with dual 3 port valves integrated type resets the main valve with the main pressure, so if there is a difference between the pilot pressure and main pressure, the response time may be delayed.

Note 3: Check that the main pressure supplied to the valve block with dual 3 port valves integrated type is not higher than the pilot pressure, and that the main pressure does not drop below 0.2 MPa.

Note 4: Check the connector pin layout (example) given in Catalog No. CC-945A for the double wiring specifications.
When ordering a discrete valve block, the double wiring designation is limited to the 2 position single solenoid for the 4 port valve, and the 3 port valve.

Note 5: Double wiring cannot be selected for discrete individual wiring valve block

Note 6: Energizing is limited to the plus common.
In addition "E" and "U" cannot be selected simultaneously.

Note 7: For individual wiring, "U" cannot be selected simultaneously.

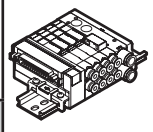
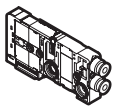
Note 8: A filter (for preventing entry of foreign matter) is incorporated in P port of the supply/exhaust block

Note 9: It differs depending on specifications. Check that on page 207.

Note 10: Read cautions in the catalog No. CC-945A to find the details of specifications on self reset type.
In addition, when mixing dummy block,select mix manifold.

Note 11: Dummy block is also included in the station no.

[Wiring method list]

Symbol	Descriptions		Type: Block manifold	Type: Discrete valve block
				
Ⓕ Wiring method				
T30	25 pin D sub-connector Left		●	
T30R	25 pin D sub-connector Right		●	
T50	20 pin flat cable connector Left (with power supply terminal) Note 11		●	
T50R	20 pin flat cable connector Right (with power supply terminal) Note 11		●	
T51	20 pin flat cable connector Left		●	
T51R	20 pin flat cable connector Right		●	
T52	10 pin flat cable connector Left		●	
T52R	10 pin flat cable connector Right		●	
T53	26 pin flat cable connector Left		●	
T53R	26 pin flat cable connector Right		●	
TM1A	Intermediate wiring block RITS connector 6P × 2 pcs. Note 12		●	
TM1C	Intermediate wiring block RITS connector 6P Note 12		●	
TM52	Intermediate wiring block 10 pin flat cable connector		●	
TX	Wiring block Mix Note 13, 14		●	
Blank	Valve block for reduced wiring			●
D2	Individual wiring type	D-connector 300 mm	●	●
D20		D-connector 500 mm	●	●
D21		D-connector 1000 mm	●	●
D22		D-connector 2000 mm	●	●
D23		D-connector 3000 mm	●	●
D2N		D-connector without socket	●	●
D3		D-connector with socket and terminal	●	●

Note 11: When mixing the connectors with the T50 or T50R type with power terminal, only T50R can be combined with T50, and T50 with T50R.
Note 12: RITS connector 6P (1473562-6) Tyco Electronics Japan G.K.
Note 13: Two pieces are designated in manifold specifications. Contact CKD for 3 pcs. or more.
Note 14: If TX is selected for the wiring method, individual wiring cannot be selected.

How to order manifold

Serial transmission

*Refer to page 208 for D-sub connector/flat cable connector type.

● Discrete valve block

N 3 E0 66 0- C4 —— M D2 F —— 3

● Block manifold

M N 4 E0 1 0- C4 - R - M T6G1 D2 W F - 5 - 3

DIN rail mount

Ⓐ Valve type

Ⓑ Solenoid position

Ⓒ Port size

Ⓓ Pressure adjustment function

Ⓔ Manual override

Ⓕ Wiring method (Serial transmission)

Ⓖ Terminal and connector pin array

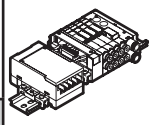
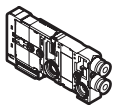
Individual wiring type

Ⓗ Option

Ⓘ Station no.

Ⓙ Voltage

*Complete manifold specification sheet (page 225).

Symbol	Descriptions			Type: Block manifold	Type: Discrete valve block
					
Ⓐ Valve type					
3	3 port valve, dual 3 port valve integrated type			●	●
4	4 port valve, 3/4 port valve mix			●	●
Ⓑ Solenoid position (Note 10)					
1	3 port valve	Single NC self reset type	(Differential pressure spring return)	●	●
11	3 port valve	Single NO self reset type	(Differential pressure spring return)	●	●
2	3 port valve	Double NC self hold type		●	●
21	3 port valve	Double NO self hold type		●	●
66	Dual 3 port valves integrated type (Note 1)	A side valve: NC self reset type	(Differential pressure return)	●	●
66S	Dual 3 port valves integrated type (Note 1)	B side valve: NC self reset type	(Differential pressure spring return)	●	●
67	Dual 3 port valves integrated type (Note 1)	A side valve: NC self reset type	(Differential pressure return)	●	●
67S	Dual 3 port valves integrated type (Note 1)	B side valve: NO self reset type	(Differential pressure spring return)	●	●
76	Dual 3 port valves integrated type (Note 1)	A side valve: NO self reset type	(Differential pressure return)	●	●
76S	Dual 3 port valves integrated type (Note 1)	B side valve: NC self reset type	(Differential pressure spring return)	●	●
77	Dual 3 port valves integrated type (Note 1)	A side valve: NO self reset type	(Differential pressure return)	●	●
77S	Dual 3 port valves integrated type (Note 1)	B side valve: NO self reset type	(Differential pressure spring return)	●	●
1	4 port valve	2-position single solenoid self reset type	(Differential pressure spring return)	●	●
2	4 port valve	2-position double solenoid self hold type		●	●
3	4 port valve	3-position all ports closed		●	●
4	4 port valve	3-position A/B/R connection		●	●
5	4 port valve	3-position P/A/B connection		●	●
8	Mix manifold			●	
Ⓒ Port size					
CF	ø1.8 barbed fitting (supported tube UP-9102-**)			●	●
C18	ø1.8 push-in fitting Lateral (supported tube UP-9402-**)			●	●
CL18	ø1.8 push-in fitting Upward (supported tube UP-9402-**)			●	●
C4	ø4 push-in fitting Lateral			●	●
CL4	ø4 push-in fitting Upward			●	●
C6	ø6 push-in fitting Lateral			●	●
CL6	ø6 push-in fitting Upward			●	●
M5	M5 female thread (with non-rotating)			●	●
CX	Mix push-in fitting			●	●
Ⓓ Pressure adjustment function					
Blank	Without regulator block mounting manifold			●	
R	Regulator block mounting manifold (Note 2, 3)			●	
Ⓔ Manual override					
Blank	Locking/non-locking common type (with manual override cover)			●	●
M	Non-locking dedicated type (with manual override cover)			●	●
Ⓕ Wiring method					
Refer to the next page for wiring method.				●	
Ⓖ Terminal and connector pin array					
Blank	Standard wiring			●	●
W	Double wiring (Note 4, 5)			●	●
Ⓗ Option					
Blank	None			●	●
E	Low exoergic, energy saving circuit integrated type (Note 6)			●	●
U	Built-in individual power supply function (AUX) type (Note 6, 7)			●	●
A	Ozone proof			●	●
F	A/B port filter integrated (Note 8)			●	●
Ⓘ Station no.					(Note 12)
1	1 station			●	
to	to				
32	32 stations (Note 9)				
Ⓙ Voltage					
3	24 VDC			●	●

Note on model No. selection

Note 1: Dual 3 port valves integrated type cannot be used for external pilot type. Contact CKD for other working conditions.

Note 2: The type with dual 3 port valves integrated type resets the main valve with the main pressure, so if there is a difference between the pilot pressure and main pressure, the response time may be delayed.

Note 3: Check that the main pressure supplied to the valve block with dual 3 port valves integrated type is not higher than the pilot pressure, and that the main pressure does not drop below 0.2 MPa.

Note 4: Check the connector pin layout (example) given in catalog No. CC-945A for the double wiring specifications.
When ordering a discrete valve block, the double wiring designation is limited to the 2 position single solenoid for the 4 port valve, and the 3 port valve.

Note 5: Double wiring cannot be selected for discrete individual wiring valve block.

Note 6: Energizing is limited to the plus common.
In addition "E" and "U" cannot be selected simultaneously.

Note 7: For individual wiring, "U" cannot be selected simultaneously.

Note 8: A filter (for preventing entry of foreign matter) is incorporated in P port of the supply/exhaust block

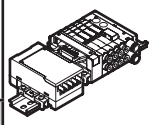
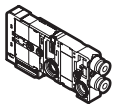
Note 9: It differs depending on specifications. Check that on page 207.

Note 10: Read cautions in the catalog No. CC-945A to find the details of specifications on self reset type.
In addition, when mixing dummy block,select mix manifold.

Note 11: Confirm the due date for T7N2 (S-LINK V 32 points output) in each case.

Note 12: Dummy block is also included in the station no.

[Wiring method list]

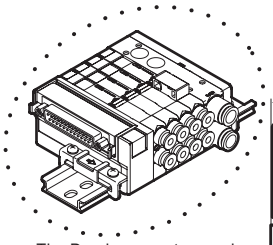
Symbol	Descriptions		Type: Block manifold	Type: Discrete valve block
				
Ⓕ Wiring method				
T6A0	UNIWIRE SYSTEM 8 points		●	
T6A1	UNIWIRE SYSTEM 16 points		●	
T6C0	OMRON CompoBus/S 8 points		●	
T6C1	OMRON CompoBus/S 16 points		●	
T6E0	SUNX S-LINK 8 points		●	
T6E1	SUNX S-LINK 16 points		●	
T6J0	UNIWIRE H SYSTEM 8 points		●	
T6J1	UNIWIRE H SYSTEM 16 points		●	
T6G1	CC-Link 16 points		●	
T7D1	Close contact type DeviceNet 16 points		●	
T7D2	Close contact type DeviceNet 32 points		●	
T7G1	Close contact type CC-LINK 16 points		●	
T7G2	Close contact type CC-LINK 32 points		●	
T7N1	Close contact type SUNX S-Link V 16 points		●	
T7N2	Close contact type SUNX S-Link V 32 points (Note 11)		●	
Blank	Valve block for reduced wiring			●
D2	Individual wiring type	D-connector 300 mm	●	●
D20		D-connector 500 mm	●	●
D21		D-connector 1000 mm	●	●
D22		D-connector 2000 mm	●	●
D23		D-connector 3000 mm	●	●
D2N		D-connector without socket	●	●
D3		D-connector with socket and terminal	●	●

MEMO

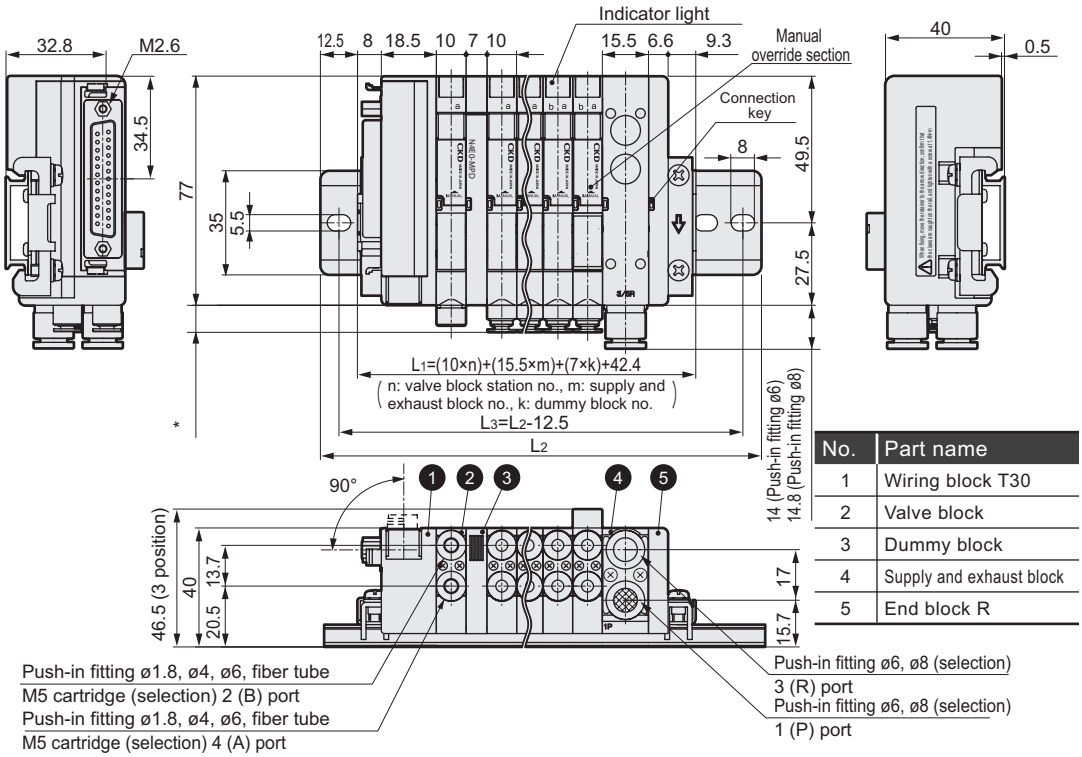
Dimensions

MN$^{3}_{4}$E0*-*-T30*-*-*

●D-sub connector (T30) type



- The D-sub connector can be faced to the top or bottom.
- Refer to page 205 for direction switchover method of connector section.



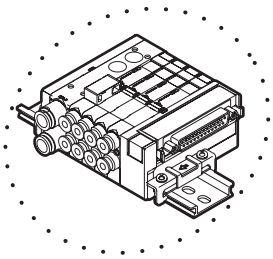
No.	Part name
1	Wiring block T30
2	Valve block
3	Dummy block
4	Supply and exhaust block
5	End block R

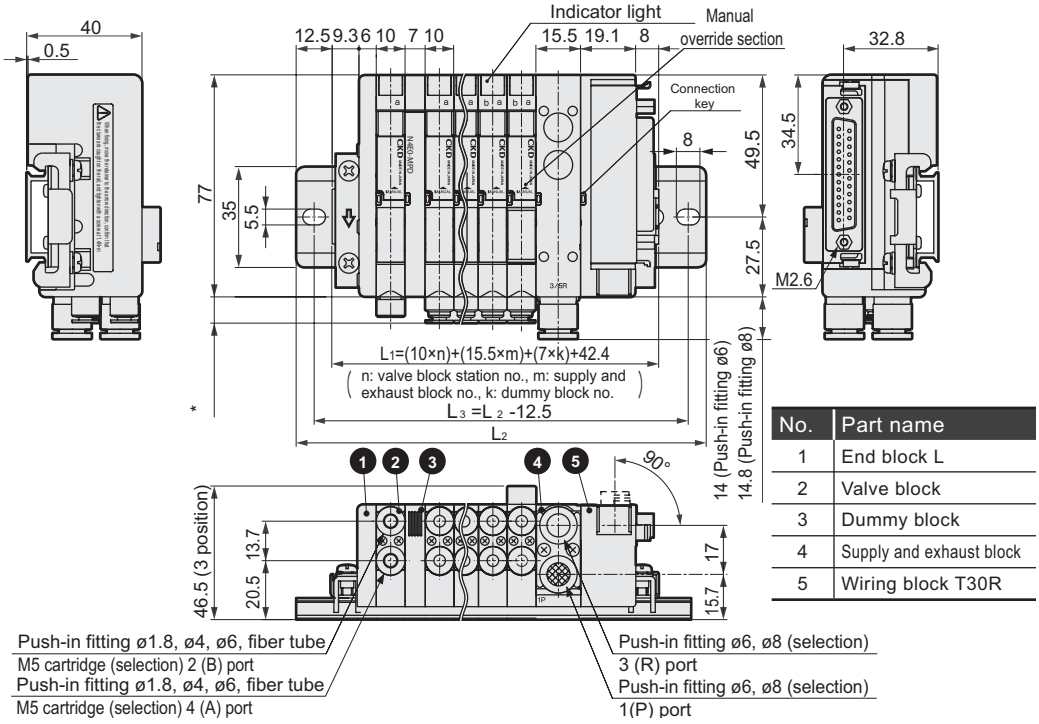
* Fitting size		
Push-in fitting	ø1.8	5.5
	ø4	9.1
	ø6	10.7
Fiber tube		8.5
M5 female thread		6.9

* Refer to page 219 for the dimension drawings of the L type push-in fitting for valve block (upward), L type push-in fitting for air supply and exhaust block (upward), and built-in individual power supply function (AUX) type.

MN$^{3}_{4}$E0*-*-T30R*-*-*

●D-sub connector right type (T30R)





No.	Part name
1	End block L
2	Valve block
3	Dummy block
4	Supply and exhaust block
5	Wiring block T30R

* Fitting size		
Push-in fitting	ø1.8	5.5
	ø4	9.1
	ø6	10.7
Fiber tube		8.5
M5 female thread		6.9

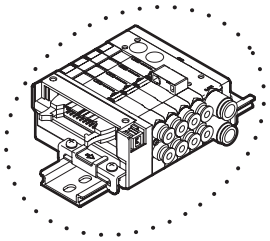
Manifold length L 1 mm	76 or less	88.5 or less	101 or less	113.5 or less	126 or less	138.5 or less	151 or less	163.5 or less	176 or less	188.5 or less	201 or less	213.5 or less	226 or less	238.5 or less	251 or less	263.5 or less	276 or less	288.5 or less	301 or less	313.5 or less	326 or less	338.5 or less	351 or less
Installation rail length L2 mm	100	112.5	125	137.5	150	162.5	175	187.5	200	212.5	225	237.5	250	262.5	275	287.5	300	312.5	325	337.5	350	362.5	375
Installation rail pitch L3 mm	87.5	100	112.5	125	137.5	150	162.5	175	187.5	200	212.5	225	237.5	250	262.5	275	287.5	300	312.5	325	337.5	350	362.5

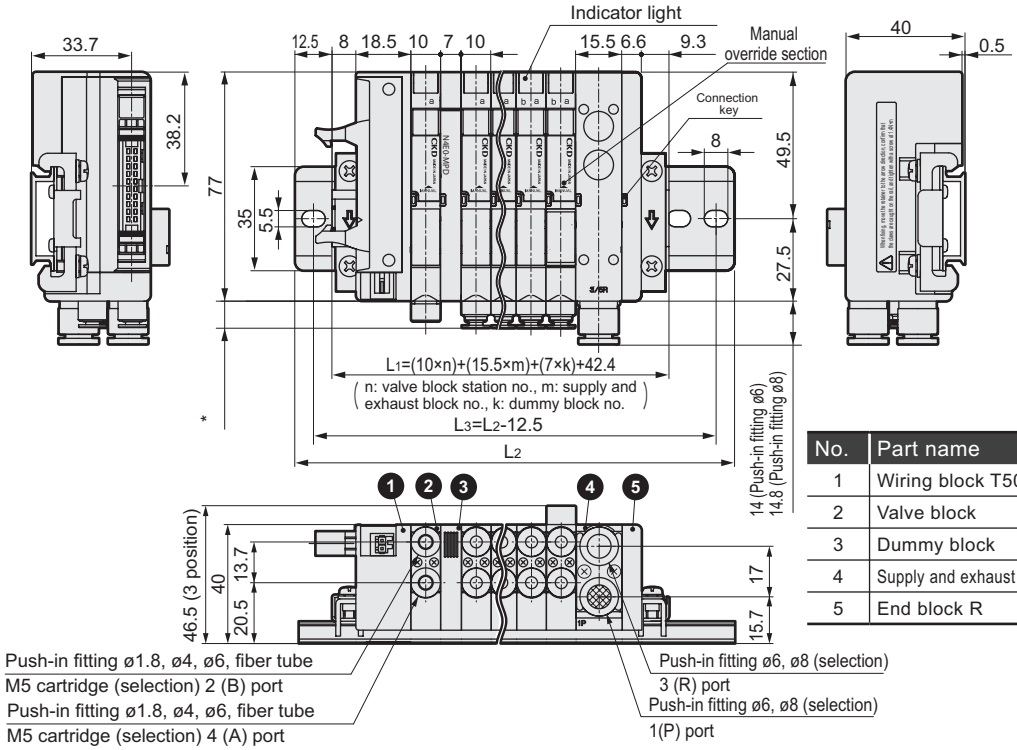
Dimensions

MN$^{3}_{4}$E0*-*-T50*-*-*

● Flat cable connector left type (T50)

* There are T51, T52, and T53. The dimensions are the same as T50. Refer to page 201 for the dimension of connector section.





No.	Part name
1	Wiring block T50
2	Valve block
3	Dummy block
4	Supply and exhaust block
5	End block R

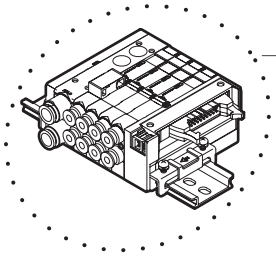
* Fitting size		
Push-in fitting	ø1.8	5.5
	ø4	9.1
	ø6	10.7
Fiber tube		8.5
M5 female thread		6.9

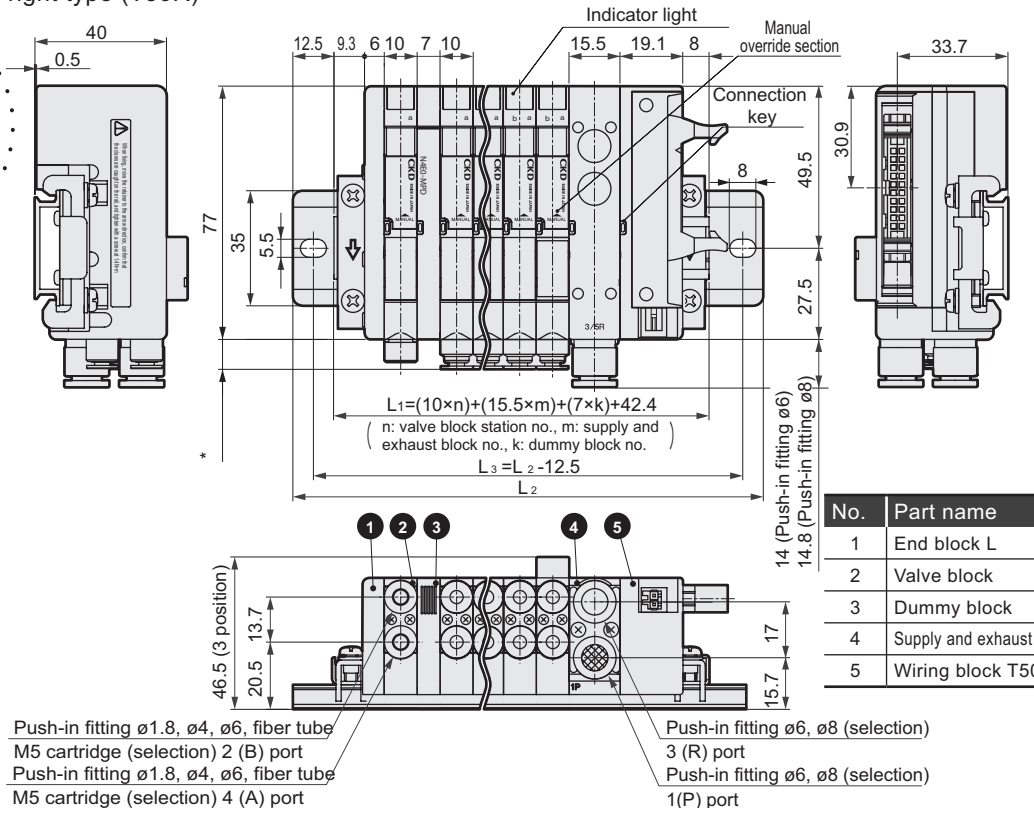
* Refer to page 219 for the dimension drawings of the L type push-in fitting for valve block (upward), fitting for fiber tube, and L type push-in fitting for air supply and exhaust block (upward).

* The power supply connector can be used with T50 to supply power to the PLC output unit. Refer to page 219 for dimensions when the connector is connected, and to Catalog No. CC-945A of precautions on wiring for electrical connection.

MN$^{3}_{4}$E0*-*-T50R*-*-*

● Flat cable connector right type (T50R)





No.	Part name
1	End block L
2	Valve block
3	Dummy block
4	Supply and exhaust block
5	Wiring block T50R

* Fitting size		
Push-in fitting	ø1.8	5.5
	ø4	9.1
	ø6	10.7
Fiber tube		8.5
M5 female thread		6.9

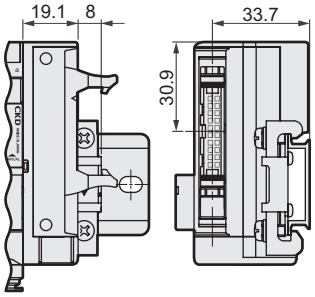
Manifold length L1 mm	76 or less	88.5 or less	101 or less	113.5 or less	126 or less	138.5 or less	151 or less	163.5 or less	176 or less	188.5 or less	201 or less	213.5 or less	226 or less	238.5 or less	251 or less	263.5 or less	276 or less	288.5 or less	301 or less	313.5 or less	326 or less	338.5 or less	351 or less
Installation rail length L2 mm	100	112.5	125	137.5	150	162.5	175	187.5	200	212.5	225	237.5	250	262.5	275	287.5	300	312.5	325	337.5	350	362.5	375
Installation rail pitch L3 mm	87.5	100	112.5	125	137.5	150	162.5	175	187.5	200	212.5	225	237.5	250	262.5	275	287.5	300	312.5	325	337.5	350	362.5

Dimensions

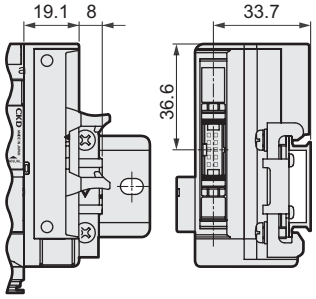
Flat cable connector (T51R/T52R/T53R): Dimensions of connector section

* This drawing indicates connector type on the right. Connector type dimension on the left is also the same.

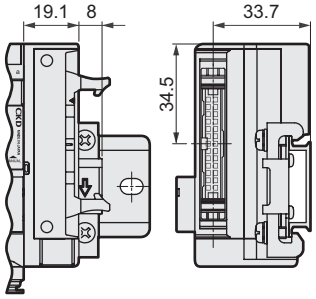
●T51R



●T52R



●T53R

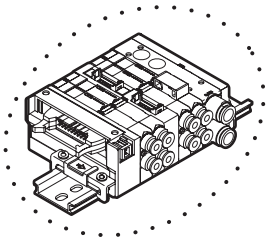


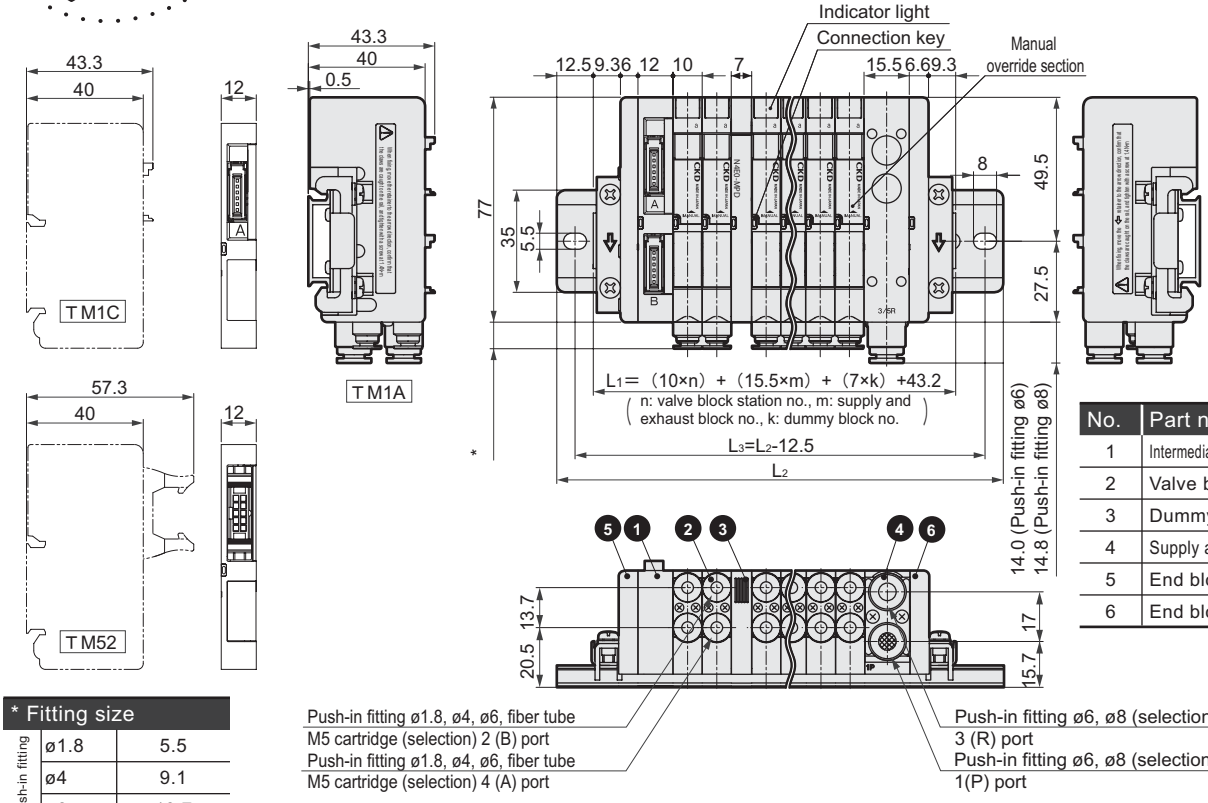
MN$^{3}_{4}$E0*-*-TM1$^{A}_{C}$*-*-*

●RITS connector intermediate wiring specification (TM1$^{A}_{C}$)

MN$^{3}_{4}$E0*-*-TM52*-*-*

●10 pin flat cable connector intermediate wiring specification (TM52)





No.	Part name
1	Intermediate wiring block TM1A
2	Valve block
3	Dummy block
4	Supply and exhaust block
5	End block L
6	End block R

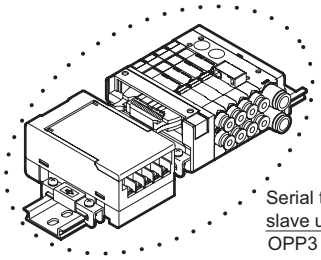
* Fitting size		
Push-in fitting	ø1.8	5.5
	ø4	9.1
	ø6	10.7
Fiber tube		8.5
M5 female thread		6.9

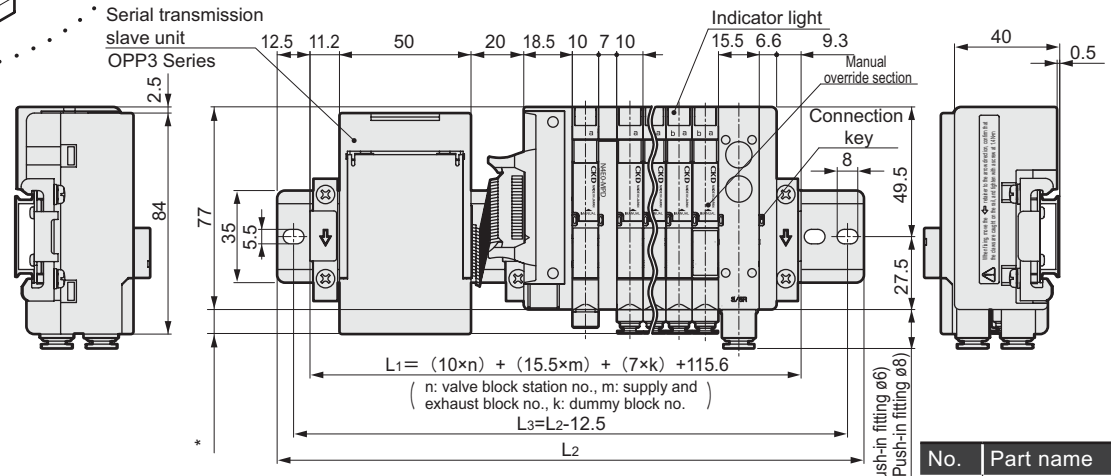
Manifold length L1 mm	76 or less	88.5 or less	101 or less	113.5 or less	126 or less	138.5 or less	151 or less	163.5 or less	176 or less	188.5 or less	201 or less	213.5 or less	226 or less	238.5 or less	251 or less	263.5 or less	276 or less	288.5 or less	301 or less	313.5 or less	326 or less	338.5 or less	351 or less
Installation rail length L2 mm	100	112.5	125	137.5	150	162.5	175	187.5	200	212.5	225	237.5	250	262.5	275	287.5	300	312.5	325	337.5	350	362.5	375
Installation rail pitch L3 mm	87.5	100	112.5	125	137.5	150	162.5	175	187.5	200	212.5	225	237.5	250	262.5	275	287.5	300	312.5	325	337.5	350	362.5

Dimensions

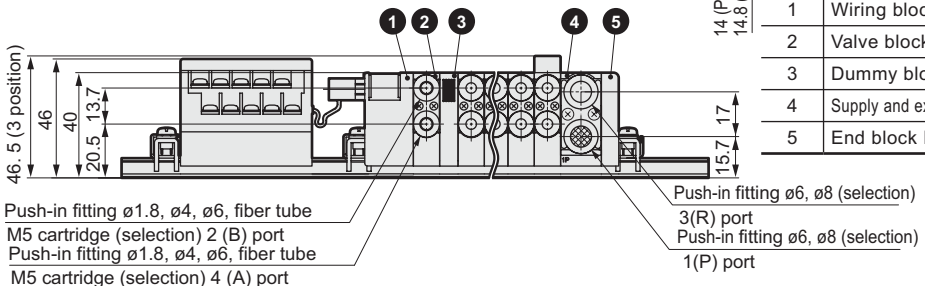
MN$^{3}_{4}$E0*-*-T6**-*-*

● Serial transmission type (T6A0/1,T6C0/1,T6E0/1,T6J0/1,T6G1)





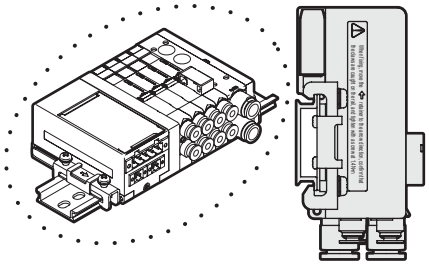
* Fitting size		
Push-in fitting	ø1.8	5.5
	ø4	9.1
	ø6	10.7
Fiber tube		8.5
M5 female thread		6.9

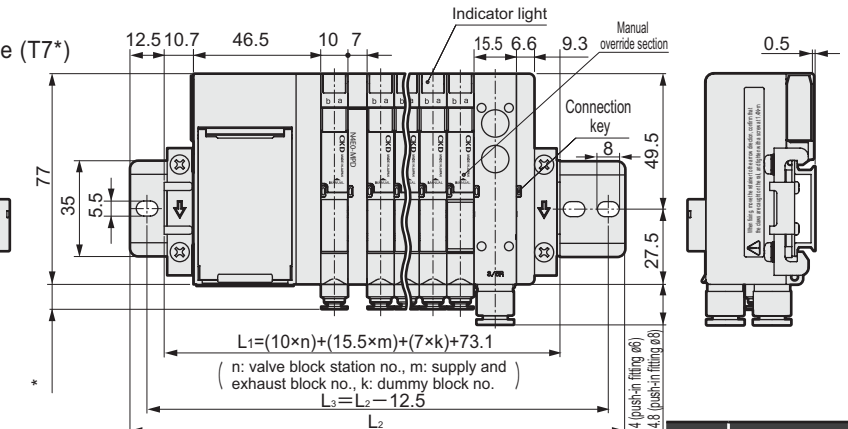


No.	Part name
1	Wiring block T6*
2	Valve block
3	Dummy block
4	Supply and exhaust block
5	End block R

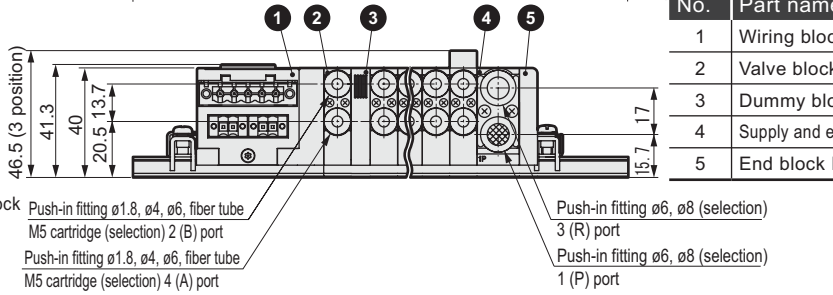
MN$^{3}_{4}$E0*-*-T7**-*-*

● Serial transmission (close contact) type (T7*)





* Fitting size		
Push-in fitting	ø1.8	5.5
	ø4	9.1
	ø6	10.7
Fiber tube		8.5
M5 female thread		6.9



No.	Part name
1	Wiring block T7*
2	Valve block
3	Dummy block
4	Supply and exhaust block
5	End block R

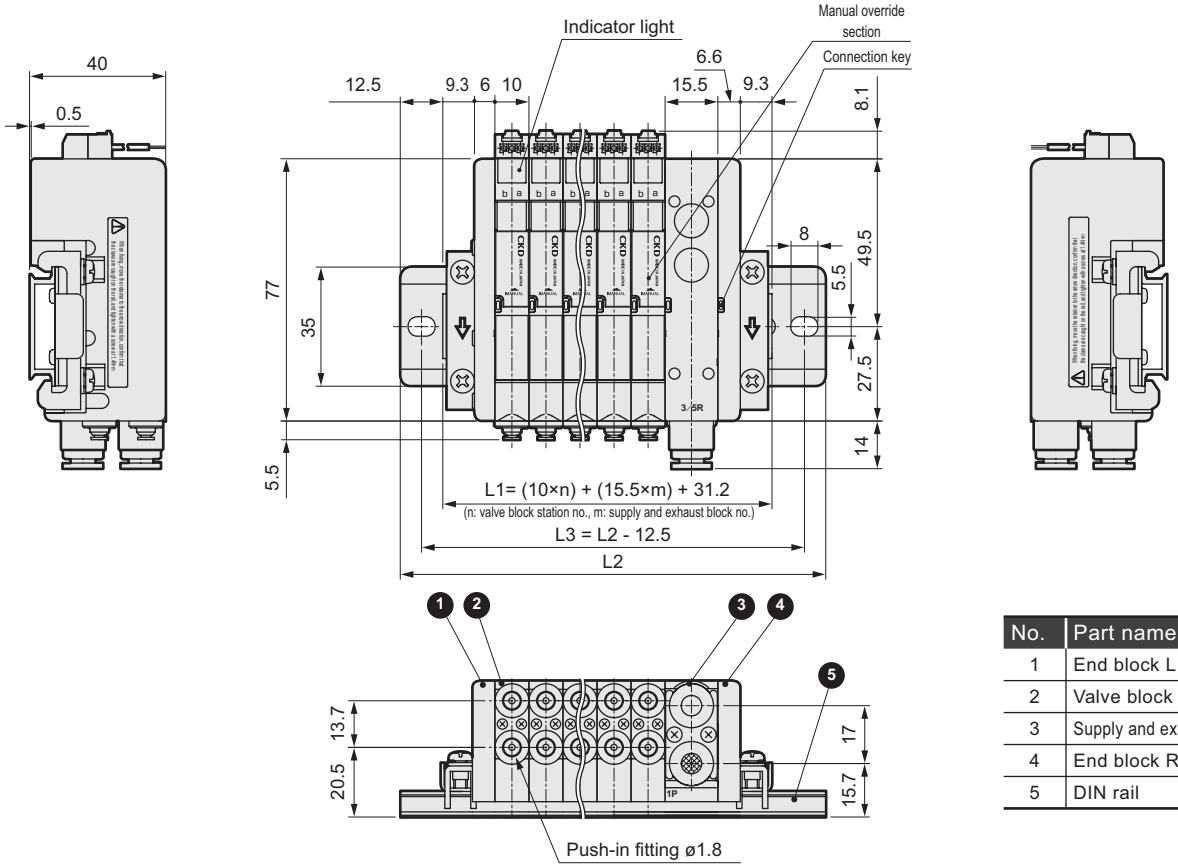
* Refer to page 205 for the dimension drawings of the L type push-in fitting for valve block (upward), fitting for fiber tube, and L type push-in fitting for air supply and exhaust block (upward).

Manifold length L1 mm	76 or less	88.5 or less	101 or less	113.5 or less	126 or less	138.5 or less	151 or less	163.5 or less	176 or less	188.5 or less	201 or less	213.5 or less	226 or less	238.5 or less	251 or less	263.5 or less	276 or less	288.5 or less	301 or less	313.5 or less	326 or less	338.5 or less	351 or less
Installation rail length L2 mm	100	112.5	125	137.5	150	162.5	175	187.5	200	212.5	225	237.5	250	262.5	275	287.5	300	312.5	325	337.5	350	362.5	375
Installation rail pitch L3 mm	87.5	100	112.5	125	137.5	150	162.5	175	187.5	200	212.5	225	237.5	250	262.5	275	287.5	300	312.5	325	337.5	350	362.5

Dimensions

MN$^{3}_{4}$E0*-*- (D2 to D3)-*-*

● Individual wiring connector type (D2,D20,D21,D22,D23,D2N,D3)



No.	Part name
1	End block L
2	Valve block
3	Supply and exhaust block
4	End block R
5	DIN rail

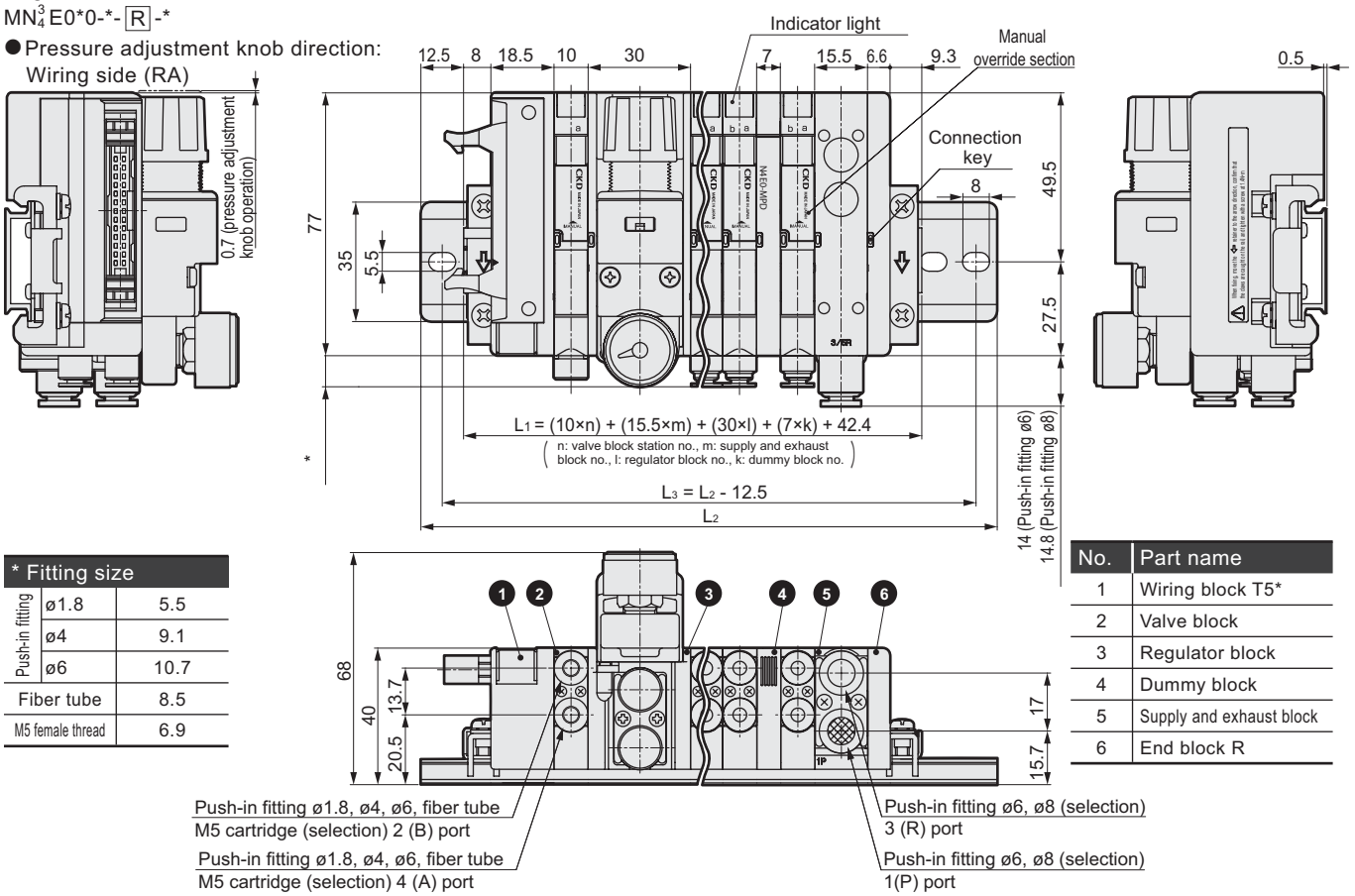
*This drawing shows the ø1.8 push-in fitting, lateral type (C18).

Dimensions

● Each piping block section (common for all types)

Regulator block
MN_4^3E0*0-*-R-*

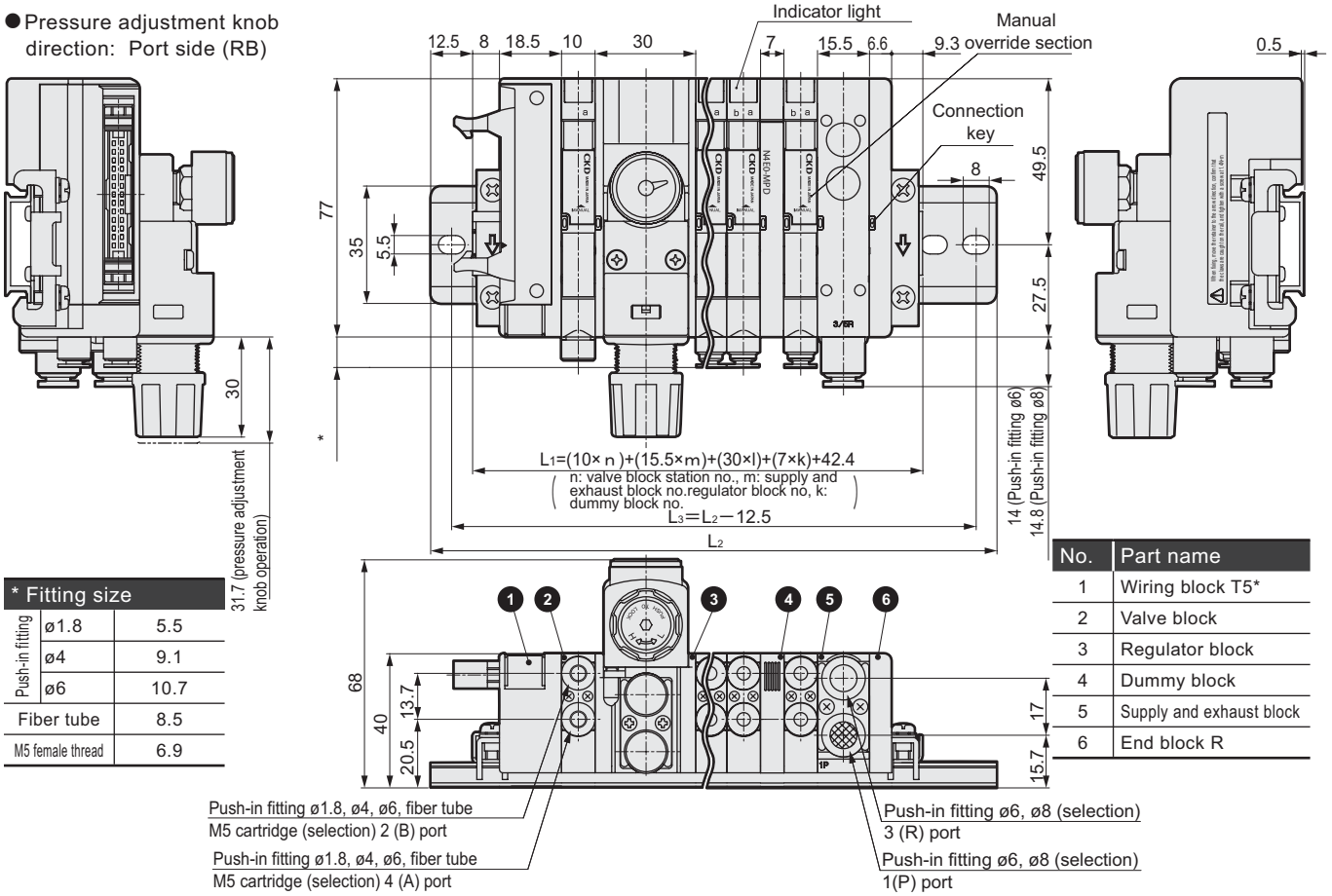
● Pressure adjustment knob direction: Wiring side (RA)



* Fitting size		
Push-in fitting	ø1.8	5.5
	ø4	9.1
	ø6	10.7
Fiber tube		8.5
M5 female thread		6.9

No.	Part name
1	Wiring block T5*
2	Valve block
3	Regulator block
4	Dummy block
5	Supply and exhaust block
6	End block R

● Pressure adjustment knob direction: Port side (RB)



* Fitting size		
Push-in fitting	ø1.8	5.5
	ø4	9.1
	ø6	10.7
Fiber tube		8.5
M5 female thread		6.9

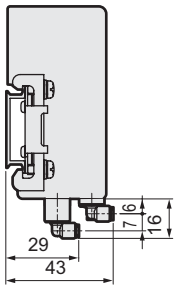
No.	Part name
1	Wiring block T5*
2	Valve block
3	Regulator block
4	Dummy block
5	Supply and exhaust block
6	End block R

Dimensions

● Piping blocks section (common for all types)

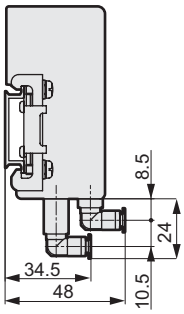
Push-in fittings for fiber tube (upward)

● ø1.8 (CL18)

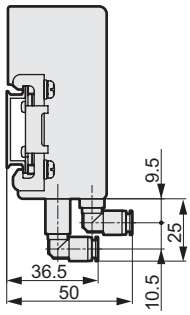


L type push-in fittings for valve block (upward)

● ø4 (CL4)

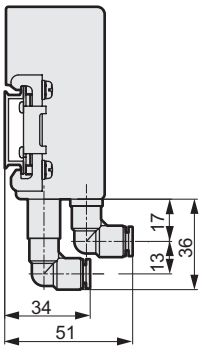


● ø6 (CL6)

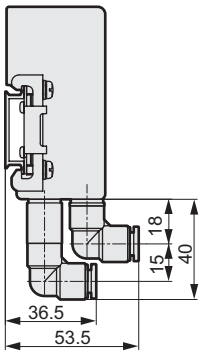


L type push-in fitting for supply and exhaust block (upward)

● ø6 (CL6)

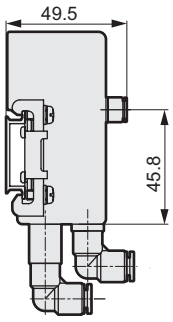


● ø8 (CL8)

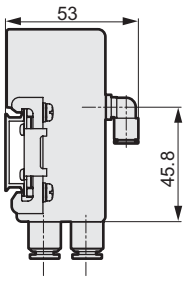


Supply and exhaust block for external pilot

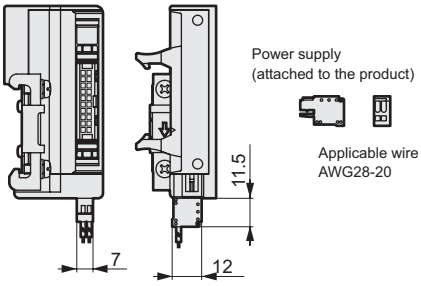
● Upward piping



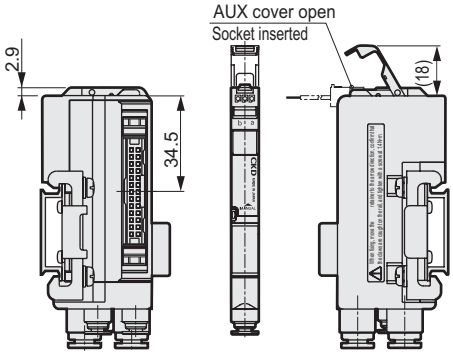
● Lateral piping



● Dimension of T50 power supply connector connection

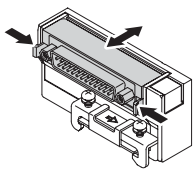


● Built-in individual power supply function (AUX) type

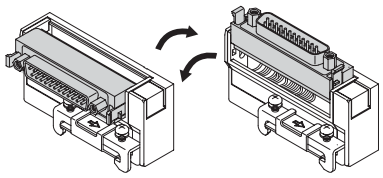


● D-sub connector (T30/T30R): Direction switchover method for connector section

Using in a horizontal state

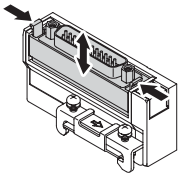


Hold the lever and pull the connector out horizontally.
Push the connector in horizontally when storing it.
(Fix the connector.)

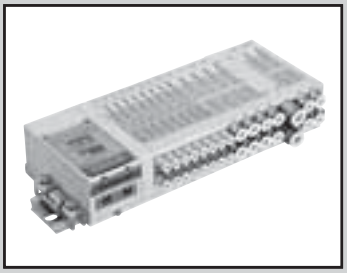


Turn the connector.
Always fix the connector horizontally or vertically when using.

Using in a vertical state



Hold the lever and pull the connector vertically.
Push the connector in horizontally when storing it.
(Fix the connector.)



MN4E0/MN4E00 Mix manifold

MN3EX0/MN4EX0 Series

● Applicable cylinder bore size: ø4 to ø32

RoHS

Specifications

Common to each series. Refer to pages 192 and 206.

How to order

Block manifold

MN (4) EX0 - (C4) - (R) - (M) (T53) ( ) (E) - (5) - (3)

- DIN rail mount method
- (A) Valve type
- (B) Port size
- (C) Pressure adjustment function
- (D) Manual override
- (E) Wiring method
- (F) Terminal and connector pin array
- (G) Option
- (H) Station no.
- (I) Voltage

Symbol	Descriptions
(A) Valve type	
3	3 port valve, dual 3 port valve integrated type
4	4 port valve, 3/4 port valve mix
(B) Port size	
C18	ø1.8 push-in fitting Lateral (supported tube UP-9402)
CL18	ø1.8 push-in fitting Upward (supported tube UP-9402)
C4	ø4 push-in fitting Lateral
CL4	ø4 push-in fitting Upward
CX	Mix push-in fitting
(C) Pressure adjustment function	
Blank	Without regulator block mounting manifold
R	Regulator block mounting manifold (Note 1, 2)
(D) Manual override	
Blank	Manual override with manual cover (locking/non-locking common type)
M	Manual override with manual cover (non-locking dedicated type)
(E) Wiring method	
Refer to the next page for wiring method.	
(F) Terminal and connector pin array	
Blank	Standard wiring
W	Double wiring (Note 3)
(G) Option	
Blank	None
E	Low exoergic, energy saving circuit type (Note 4)
A	Ozone proof
F	A/B port filter integrated (Note 5)
(H) Station number (Note 8)	
1	1 station
to	to
32	32 stations (Note 6)
(I) Voltage	
3	24 VDC
4	12 VDC

Note on model no. selection

Note 1: The type with dual 3 port valves integrated type resets the main valve with the main pressure, so if there is a difference between the pilot pressure and main pressure, the response time may be delayed.

Note 2: Check that the main pressure supplied to the valve block with dual 3 port valves integrated type is not higher than the pilot pressure, and that the main pressure does not drop below 0.2 MPa.

Note 3: Check the connector pin layout (example) given in catalog No. CC-945A for the double wiring specifications.
When ordering a discrete valve block, the double wiring designation is limited to the 2 position single solenoid for the 4 port valve, and the 3 port valve.

Note 4: Energizing is limited to the plus common.

Note 5: A filter (for preventing entry of foreign matter) is incorporated in P port of the supply and exhaust block.

Note 6: It differs depending on specifications. Check that on pages 193 and 207.

Note 7: Confirm the due date for T7N2 (S-LINK V 32 points output) in each case.

Note 8: Dummy block is also included in the station no.

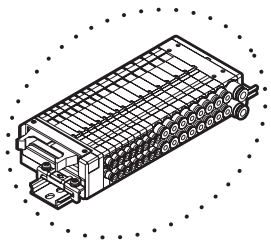
[Wiring method list]

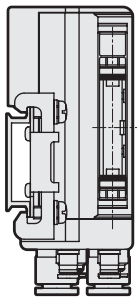
Symbol	Descriptions	
Ⓔ Wiring method		
TM1A	Intermediate wiring block RITS connector 6P × 2 pcs.	
TM1C	Intermediate wiring block RITS connector 6P	
TM52	Intermediate wiring block 10 pins flat cable connector 8 points supported	
T30	25 pin D sub-connector Left	
T30R	25 pin D sub-connector Right	
T50	20 pin flat cable connector Left (with power supply terminal)	
T50R	20 pin flat cable connector Right (with power supply terminal)	
T51	20 pin flat cable connector Left	
T51R	20 pin flat cable connector Right	
T52	10 pin flat cable connector Left	
T52R	10 pin flat cable connector Right	
T53	26 pin flat cable connector Left	
T53R	26 pin flat cable connector Right	
TX	Wiring block mix	
T6A0	UNIWIRE SYSTEM 8 points	
T6A1	UNIWIRE SYSTEM 16 points	
T6C0	OMRON CompoBus/S 8 points	
T6C1	OMRON CompoBus/S 16 points	
T6E0	SUNX S-LINK 8 points	
T6E1	SUNX S-LINK 16 points	
T6J0	UNIWIRE H SYSTEM 8 points	
T6J1	UNIWIRE H SYSTEM 16 points	
T6G1	CC-Link 16 points	
T7D1	Close contact type DeviceNet 16 points	
T7D2	Close contact type DeviceNet 32 points	
T7G1	Close contact type CC-Link 16 points	
T7G2	Close contact type CC-Link 32 points	
T7N1	Close contact type SUNX S-LINK V 16 points	
T7N2	Close contact type SUNX S-LINK V 32 points (Note 7)	
D2	Individual wiring type*	D-connector 300 mm
D20		D-connector 500 mm
D21		D-connector 1000 mm
D22		D-connector 2000 mm
D23		D-connector 3000 mm
D2N		D-connector without socket
D3		D-connector with socket and terminal

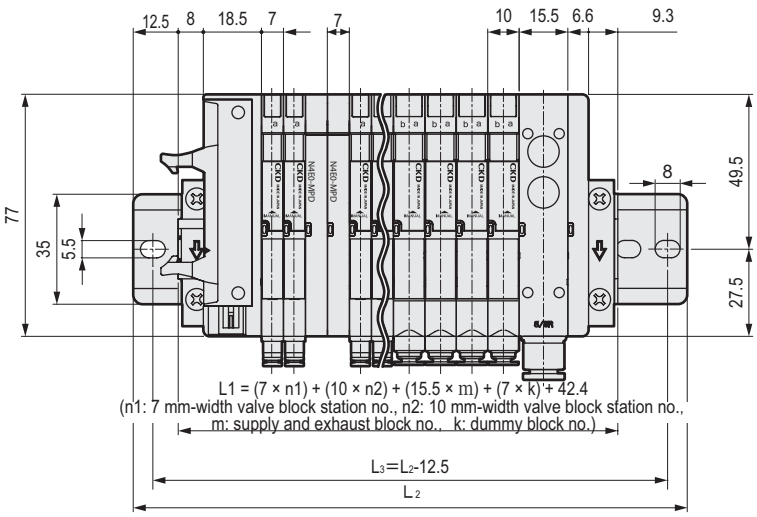
* Individual wiring: Individual wiring specification can be designated at any valve block (N3E0 and N4E0 only).

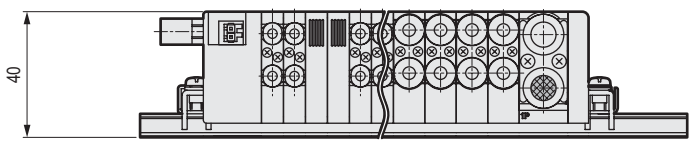
Mix block dimensions

MN$^{3}_{4}$EX0



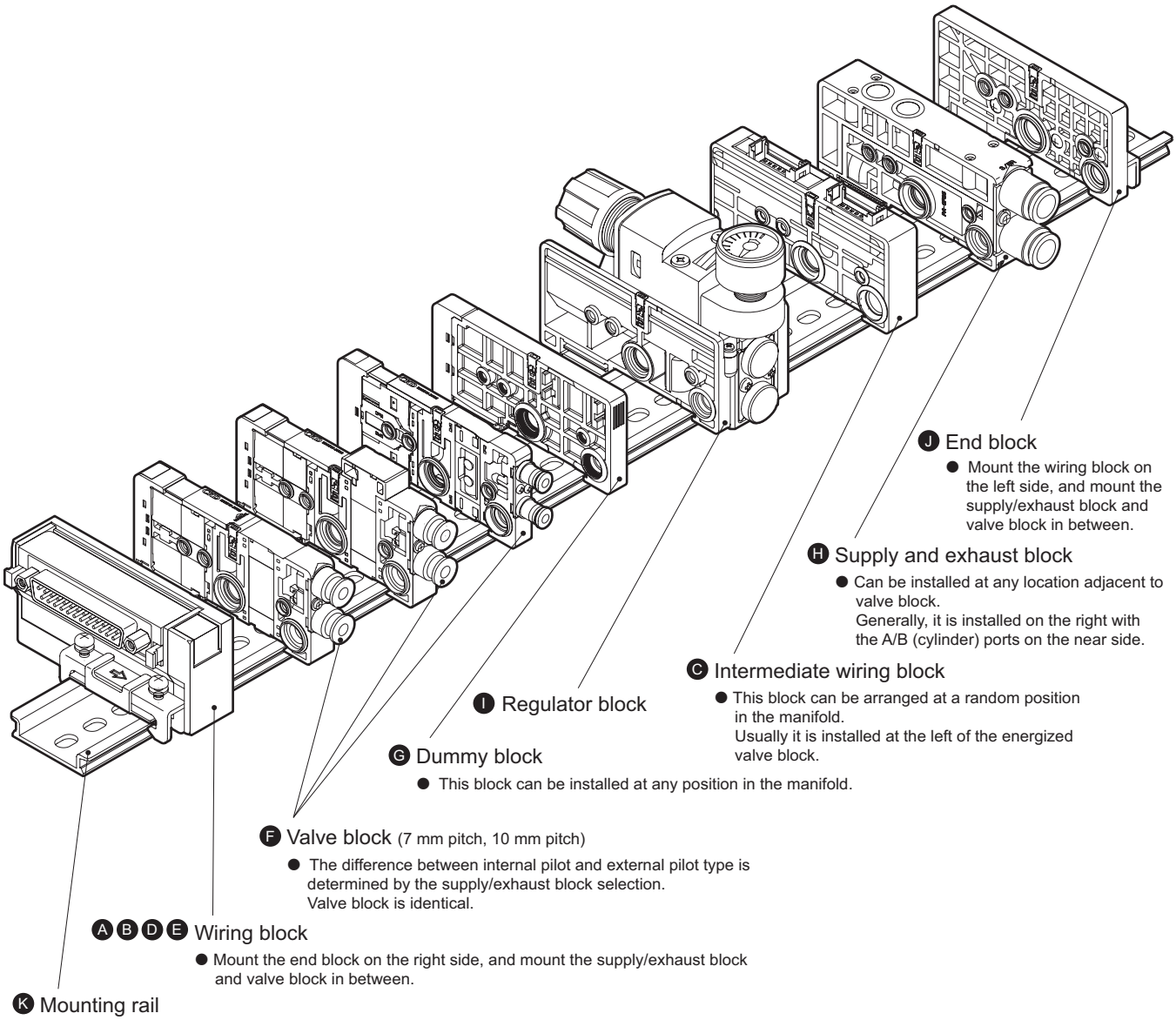






Block manifold: Block configurations

Free assembly lets multiple stations be expanded and serviced.



J End block
- Mount the wiring block on the left side, and mount the supply/exhaust block and valve block in between.

H Supply and exhaust block
- Can be installed at any location adjacent to valve block.
  Generally, it is installed on the right with the A/B (cylinder) ports on the near side.

C Intermediate wiring block
- This block can be arranged at a random position in the manifold.
  Usually it is installed at the left of the energized valve block.

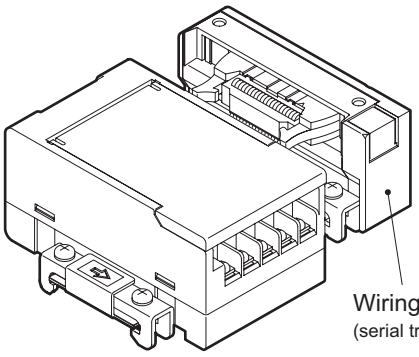
I Regulator block

G Dummy block
- This block can be installed at any position in the manifold.

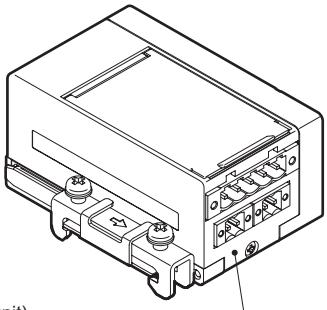
F Valve block (7 mm pitch, 10 mm pitch)
- The difference between internal pilot and external pilot type is determined by the supply/exhaust block selection.
  Valve block is identical.

A **B** **D** **E** Wiring block
- Mount the end block on the right side, and mount the supply/exhaust block and valve block in between.

K Mounting rail



Wiring block
(serial transmission slave unit)



Wiring block
(serial transmission slave unit
(close contact type))

MEMO

How to fill MN3E/MN4E series manifold specification sheet

●Manifold model no. (example) (When mixing the dummy block, select mix manifold and fill in the station no. including dummy block)

MN 4 E0 8 0 – CX – R – M – T50RD2 W F – 10 – 3

Ⓐ Model no. Ⓑ Solenoid position Ⓒ Port size Ⓓ Pressure adjustment function Ⓔ Manual override Ⓕ Wiring method Ⓖ Terminal and connector pin array Ⓗ Option Ⓘ Station no. Ⓙ Voltage

(Refer to pages 194, 196, 208, and 210 for manifold model no.)

•When completing this form, select the type from the "Block configurations" (Page 222).
•Complete from the left end, with the piping port on the near side, regardless of the wiring block method.

Part name	Model no.	Layout (1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36)	Quantity
Wiring block	N4E0-T 50R	○ at 15	1
	N4E0-T		
Arrangement assigned when individual wiring mixed(can be assigned only 10 mm)*		○ ○ at 2 3	2
Valve block 7 mm pitch	N E00 0-	Designate individual wiring	
	N E00 0-		
	N E00 0-	Station no. : 10th station	
	N E00 0-		
Valve block 10 mm pitch	N 3 E0 1 0- C6	○ ○ at 2 3	2
	N 4 E0 1 0- C4	○ at 5	1
	N 4 E0 2 0- C4	○ at 7 10	2
	N 4 E0 3 0- C4	○ ○ ○ at 11 12 13 Station no. : 1st station	3
Dummy block	N4E0-MPS		
	N4E0-MPD	○ ○ at 8 9	2
Supply and exhaust block	N4E0-Q Z - 8 - S	○ at 14	1
	N4E0-Q-8	○ at 16	1
	N4E0-Q - - - -		
Regulator block	N4E0-R A - FL - C8	○ at 4	1
	N4E0-R - - -		
	N4E0-R - - -		
End block	N4E0-E L	○ at 1	1
	N4E0-E		
Mounting rail	L2=		

Accessories

Blanking plug (push-in fitting)												Silencer				Push-in fitting tube remover
ø1.8		ø3		ø4		ø6		ø8		ø6		ø8		□ not required (check)		

Barbed thread fitting for ø1.8 tube (10 pcs./1 set)						Cable with D-sub connector
N4E0-JOINT-PTN2-M3		N4E0-JOINT-PTN2-M5		N4E0-JOINT-PTN2-6		N4T-CABLE-D0 -

Socket assembly for electric supply (for individual wiring and AUX)				Connector for wiring block TM1	
N4E0-SOCKET- -		3M0-SOCKET-SET		N4E0-TM-CONNECTOR	

(Fill in the integral multiple of 12.5.)

Preparing the manifold specifications

●Complete from the left with the piping port on the near side, regardless of wiring block.
●Indicate the total number of blocks designated in the required quantity at the right end of the table.
●Indicate the quantity for the required accessories.
●Indicate the mounting rail length. (Indicate only when a length other than the standard length is required. Indicate the integral multiple of 12.5)

Obtaining the DIN rail length

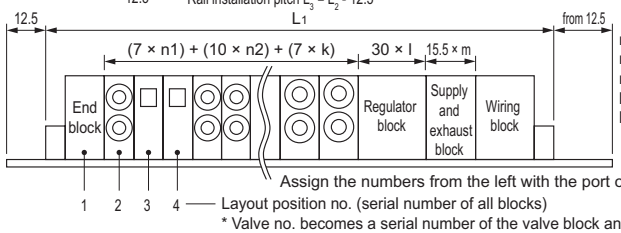
Obtain the mounting rail length and pitch based on the manifold length (L_1) with the following calculation formula.
The obtained rail length is the standard length and there is no need to indicate it in the specifications. Indicate the length in the specifications only when different from the standard length.

Manifold length L_1 = (7 × Valve block) + (10 × Valve block) + (7 × Dummy block) + (15.5 × Supply and exhaust block) + (30 × Regulator block) + Wiring block (including end block) ..... Select from the right table.

Installation rail length $L_2 = L_2' \times 12.5$

$L_2' = \frac{L_1 + 25}{12.5}$ →Round up decimal point and use integer number.

Rail installation pitch $L_3 = L_2 - 12.5$



n1: 7 mm width valve block no.
n2: 10 mm width valve block no.
m: supply and exhaust block no.
l: regulator block no.
k: dummy block no.

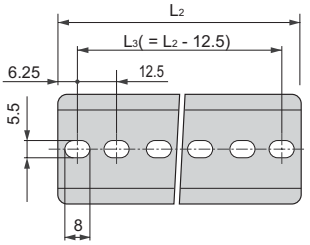
Assign the numbers from the left with the port on the near side.

1 2 3 4 —— Layout position no. (serial number of all blocks)

* Valve no. becomes a serial number of the valve block and the dummy block, which is different from the layout position no.

Wiring block width Dimensions

Wiring block		Dimensions (mm)
T30/T30R	Left or right wiring block	42.4
T5*/T5*R	Left or right wiring block	42.4
TM*	Intermediate wiring block	43.2
TM*×2	Intermediate wiring block x 2	55.2
TM*+T3*/T5*	Intermediate wiring block+Left or right wiring block	54.4
T30/T5*+T30R/T5*R	Left wiring block+ Right wiring block	53.6
T6*	Serial transmission slave unit	115.6
T7*	Serial transmission slave unit (close contact type)	73.1



MN3E/MN4E series manifold specifications

●Contact ● Quantity Set ● Request date: / /

Slip No. | Order No.

Issue / /

Your company name

Contact

Order no.

●Manifold model no. (When mixing the dummy block, select mix manifold and fill in the station no. including dummy block.)

7/10 mm-pitch Mix manifold

MN □ EX0 – □ – □ ··· □ □ □ □ – □ – □ (Refer to page 220 for manifold model no.)

7 mm-pitch Manifold

MN □ E00 □ 0 – □ ··· □ ··· □ □ □ □ ··· □ ··· □ (Refer to pages 194 and 196 for manifold model no.)

10 mm-pitch Manifold

MN □ E0 □ 0 – □ ··· □ ··· □ □ □ □ ··· □ ··· □ (Refer to pages 208 and 210 for manifold model no.)

Ⓐ Model no. Ⓑ Solenoid position classification Ⓒ Port size Ⓓ Pressure adjustment function Ⓔ Manual override Ⓕ Wiring method Ⓖ Terminal and connector pin array Ⓗ Option Ⓘ Station no. Ⓙ Voltage

•When completing this form, select the type from the "Block configurations" (page 222).
•Complete from the left end, with the piping port on the near side, regardless of the wiring block method.

Part name	Model no.	Layout 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	Quantity
Wiring block	N4E0-T □																																					
	N4E0-T □																																					
Arrangement assigned when individual wiring mixed(can be assigned only 10 mm)*																																						
Valve block 7 mm pitch	N □ E00 □ 0- □																																					
	N □ E00 □ 0- □																																					
	N □ E00 □ 0- □																																					
	N □ E00 □ 0- □																																					
Valve block 10 mm pitch	N □ E0 □ 0- □																																					
	N □ E0 □ 0- □																																					
	N □ E0 □ 0- □																																					
	N □ E0 □ 0- □																																					
Dummy block	N4E0-MPS																																					
	N4E0-MPD																																					
Supply and exhaust block	N4E0-Q □ - □ - □ - □																																					
	N4E0-Q □ - □ - □ - □																																					
	N4E0-Q □ - □ - □ - □																																					
Regulator block	N4E0-R □ - □ - □																																					
	N4E0-R □ - □ - □																																					
	N4E0-R □ - □ - □																																					
End block	N4E0-E □																																					
	N4E0-E □																																					

Mounting rail: L2 = □ (Fill in the integral multiple of 12.5.)

Accessories

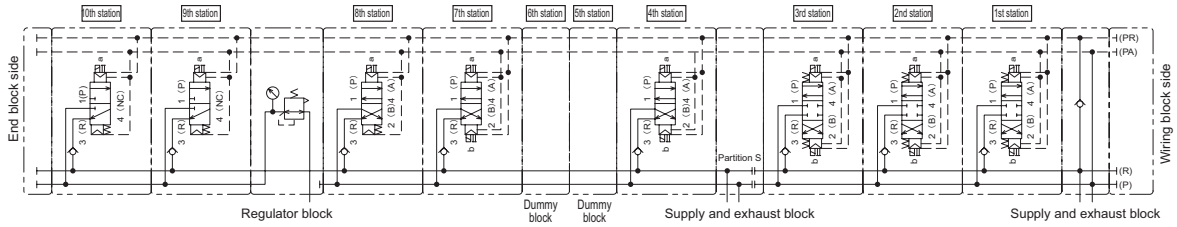
Blanking plug (push-in fitting)												Silencer				Push-in fitting tube remover □ not required (check)
ø1.8		ø3		ø4		ø6		ø8				ø6		ø8		

Barbed thread fitting for ø1.8 tube (10 pcs./1 set)								Cable with D-sub connector
N4E0-JOINT-PTN2-M3		N4E0-JOINT-PTN2-M5		N4E0-JOINT-PTN2-6				N4T-CABLE-D0 □ - □

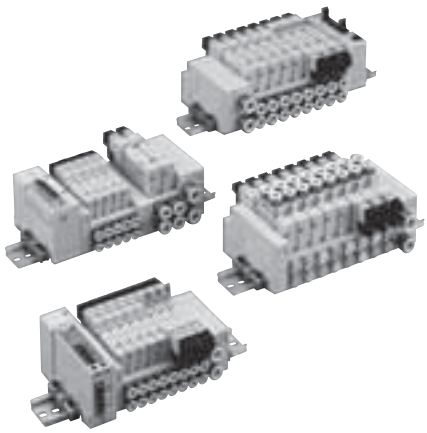
Socket assembly for electric supply (for individual wiring and AUX)						Connector for wiring block TM1	
N4E0-SOCKET- □ - □			3M0-SOCKET-SET			N4E0-TM-CONNECTOR	

*** The total number of individual wiring point is 16 points for the wiring method T** and individual wiring mixed method.**
If TX is selected for the wiring connection method, individual wiring cannot be selected.

Reference circuit diagram
This is the circuit diagram from the manifold (example) on the previous page. Use this for reference.



Solenoid valve for operation



(Catalog No. CB-23SA)

MN4GA/MN4GB Series

(3, 5 port valve block manifold)

User and eco-friendly next-generation block manifold

- Environment conditions
  Paint-less: There will be no particle occurrence of paint peel
  Indication of material names: Material names are stamped on key components to facilitate recycling, etc.
- Safety
  Misoperation prevention incorporated in connection key
- Ease-of-use
  Reduced wiring compliance: Serial (compact slave station OPP4)
  Connection port: Body porting/Sub-base porting
  TAG mounting name plate installation available
- Flexibility
  Mixed blocks compatible with MN4G1 and 2 mounting
- Reliability
  Response time 12ms ± 2ms (CKD data values with 4G1 series)
  Life 60,000,000 times and over (with clean air at 0.5 MPa pressure)

RoHS

Specifications

Descriptions			MN3G	MN4G
Working fluid			Compressed air	
Actuation			Pilot operated	
Valve structure			Soft spool	
Working pressure MPa			0.2 to 0.7	
Flow characteristics	C [dm^3/(s•bar)]		0.66 to 2.3	
	b		0.10 to 0.30	
Electric specifications				
Rated voltage V		DC	12, 24	
		AC	100	
Power consumption W	12, 24DC		0.55 (0.6)	
Apparent power VA	100VAC		1.0 (1.2)	

Note 1: Conversion for effective sectional area S and acoustic velocity conductance C is S ≈ 5.0 × C.
Note 2: Values in parentheses apply when a light is installed.

Clean exhaust filter

FAC Series

(Catalog No. CB-024SA)

Revolutionary exhaust for clean rooms.

- ●High accuracy filtration
  Filtration rating 0.01m, removal ratio 99.99% or more
- ●High secondary cleanness
  100% elimination of particles larger than 0.1μm
  ∗Flow rate conditions at 28.3/min (ANR) during the measurements
- ●Cost reducing and space saving
  Extra effort, costs, space issues with conventional external exhaust piping have been eliminated.
- ●Simplified piping
  All external exhaust piping are eliminated by installing the plug on the cylinder and the silencer on the switching valve, the piping will be simplified .
- ●Silencer
  Exhaust noise is suppressed to 60 dB (A) or less.
- ●Ample variations
  Three types: plug, silencer, and modular. Four flow rate series: 10, 100, 200, and 600ℓ/min (ANR) are available.

RoHS

Specifications (FAC10/FAC100/FAC200)

Model no.	FAC10					FAC100	FAC200
Working fluid	Compressed air						
Max. working pressure MPa	0.1						
Min. working pressure MPa	0						
Withstanding pressure MPa	0.3						
Working temperature range ℃	5 to 45					5 to 40	
Port size	ø4	ø6	ø8	ø10	ø12	R1/8, R1/4	R3/8, R1/2
Product weight g	2					65	85
Filtration rating μm	0.01 (Removal ratio 99.99% or more)						
Secondary cleanness	100% elimination of particles larger than 0.1μm Note 1						
Maximum flow rate ℓ/min(ANR)	4	10	20	35	50	100	200

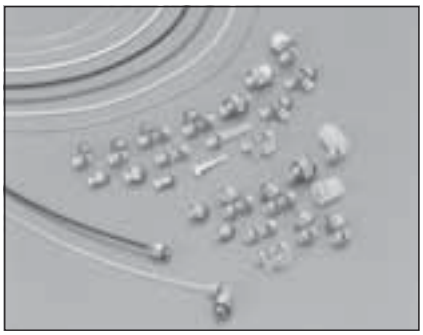
Note 1: Flow rate conditions at 28.3 ℓ/min (ANR) during the measurement.
For FAC10, 10 ℓ/min (ANR) applies.

Specifications (FAC300)

Model no.	FAC3000
Working fluid	Compressed air
Max. working pressure MPa	0.1
Min. working pressure MPa	0
Withstanding pressure MPa	0.3
Working temperature range ℃	5 to 45
Port size	Rc3/8, Rc1/2
Product weight g	290
Filtration rating μm	0.01 (Removal ratio 99.99% or more)
Secondary cleanness	100% elimination of particles larger than 0.1μm Note 1
Maximum flow rate ℓ/min(ANR)	600

Note 1: Flow rate conditions at 28.3 ℓ/min (ANR) during measurement.

Fitting/Tube



(Catalog No. CB-024SA)

For fiber tube ®push-in fitting

This new ultra-thin tube greatly improves usability with enlarged bore size and push-in fitting.

- ●New outer grasping diameter incorporated
- ●Tube bore size increased from ø1.0 to ø1.2, increasing flow by 3 times
- ●Small tube volume saving energy and space
- ●Series for clean models uses highly corrosion-resistant material
- ●Push-in fitting, standard PG series, and clean CG series available

RoHS

Specifications

●Fiber tube

Model no.	Antistatic type UP-9402-F1	Clean type EH-5802
Working fluid	Compressed air (Note1)	
Working pressure range (20℃) (Note 2)	-100kPa to 0.8MPa	-100kPa to 1.0MPa
Working temperature range ℃	-10 to 60 (no freezing)	
Outer diameter * inner diameter mm	ø1.8 × ø1.2	
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. installation radius mm	4	7
Burst pressure (20 ℃) MPa	2.5	3.8
Volume resistivity Ω•cm	10^{10} to 10^{12}	–
Material	Antistatic urethane	Special polyolefin
Color	Black/white/transparent/transparent blue/ transparent green/yellow (Note 3)/red (Note 3)	Black/Transparent

Note 1: Contact CKD for other working fluids.
Note 2: Refer to "Relation of usable temperature and pressure (normal breaking)" for the usable pressure range.
Note 3: Yellow and red are customer ordered.

●Push-in fiiting (standard)

Model no.	PG series
Working fluid	Compressed air (Note1)
Working pressure range	-100kPa to 1.0MPa
Working temperature range ℃	-10 to 60 (no freezing)
Applicable tube	Fiber tube (UP-9402-F1, EH-5802) Note 2

Note 1: Contact CKD for other working fluids.
Note 2: Barbed fitting for fiber tube (UP-9102-F1) cannot be used.
Note 3: This fitting is sold in sets of 10.

●Push-in fitting (clean type)

Model no.	CG Series
Working fluid	Clean air (Note1)
Working pressure range	-100kPa to 1.0MPa
Working temperature range ℃	-10 to 60 (no freezing)
Lubricant	Oil-prohibition
Applicable tube	Fiber tube (UP-9402-F1, EH-5802) Note 2

Note 1: Made with EPDM rubber material. Not suitable for fluids that include mineral oils. Contact CKD for other working fluids.
Note 2: Barbed fitting for fiber tube (UP-9102-F1) cannot be used.
Note 3: This fitting is sold in single sets.

Fitting/Tube

Fiber tube®

(Catalog No. CB-024S)

Ultra-thin tube for free piping

- This ultra-thin tube is as thin and flexible as leads
- Outer dimension ø1.8, min. bending radius 4mm
- Electrical resistance is approximately $1\times17^{7}\Omega\cdot$cm (antistatic)
- Ideal for fine-speed cylinder piping
- Wide variety of tube colors and fittings

RoHS

Specifications

●Tube

Descriptions	UP-9102-20-∗-F1
Working fluid	Compressed air
Working pressure range (20℃) (Note 1)	-100kPa to 0.7MPa
Working temperature range ℃	-10 to 60 (no freezing)
Outer diameter ∗ inner diameter mm	1.8 × 1.0
Inner diameter accuracy	±0.1
Outer diameter accuracy	±0.1
Min. bending radius (JIS B 8381) mm	2
Min. mounting radius mm	4
Burst pressure (20 ℃) MPa	2.1 (reference value)
Volume resistivity Ω/cm	1×10^{8} or less (black) 1×10^{12} or less (color other than black)
Material	Conductive urethane
Color	Black, white, transparent, transparent blue, transparent green, yellow (Note 2), red (Note 2)

●Dedicated fitting

Descriptions	PTN∗
Port size	M3, M5, R1/8, ø3.2 (Note4), ø4 (Note4), ø6 (Note4)
Working fluid	Compressed air
Working pressure range	-100kPa to 0.7MPa
Working temperature range ℃	-10 to 60 (no freezing)
Applicable tube	Tube UP-9102-20-∗-F1
Effective sectional area mm^2	Straight, barbed nipple: 0.3 Elbow: 0.2
Flow (Note3) ℓ/min (ANR)	Straight, barbed nipple: 20 Elbow: 13

Note 1: Refer to "Relation of usable temperature and pressure (normal breaking)" for the usable pressure range.
Note 2: Custom order.
Note 3: Flow rate is the atmospheric pressure conversion at 0.5 MPa.
Note 4: Applicable tube: Soft nylon tube (model no. FH-3224, F-1504, F-1506)
Urethane tube (U-9504, U-9506)

MEMO

System lineup

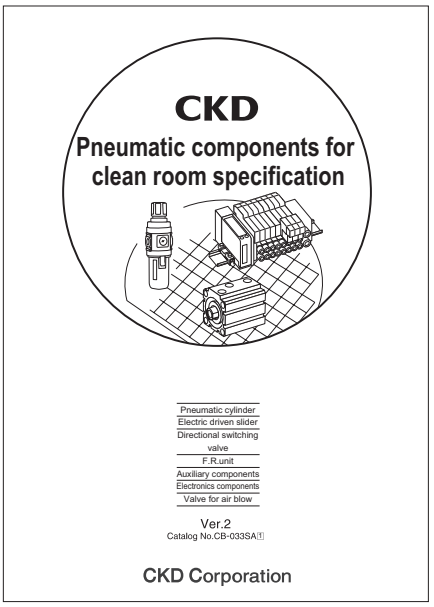
CONTENTS

Suitable for the most demanding semiconductor manufacturing process control

High Purity Chemical Liquid System Component General Catalog

Catalog No.CB-031A

- Industry leading results and reliability
- High specification cleanroom. From design to assembly and packing, high quality achieved with a seamless production system
- Wide array of fitting variations



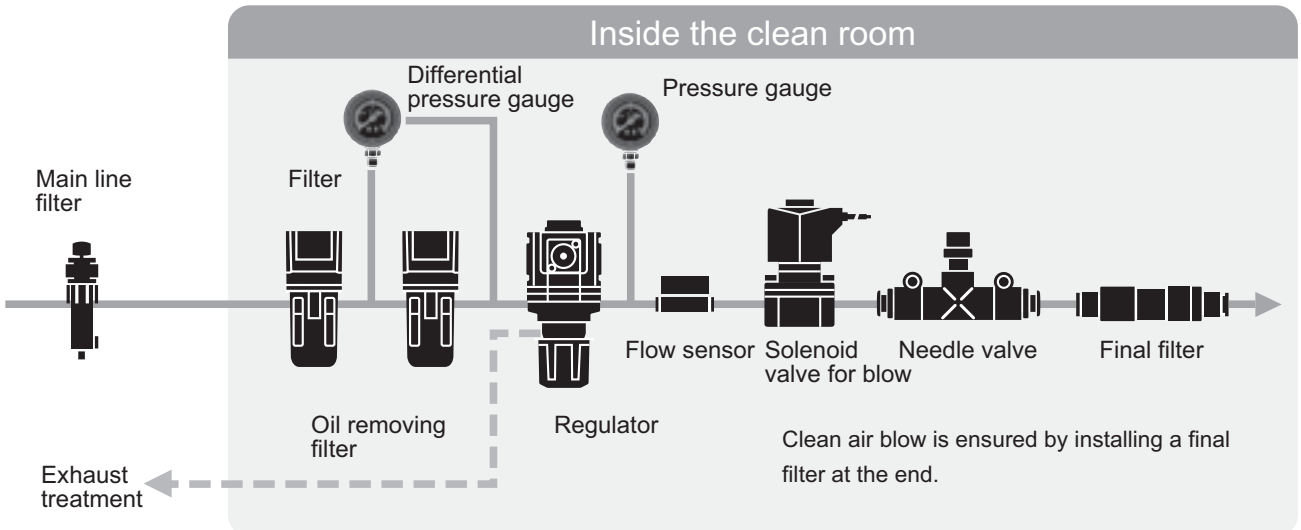
Pneumatic components for clean room specification

Catalog No. CB-33A

Compatible for various fields, and levels of clean room

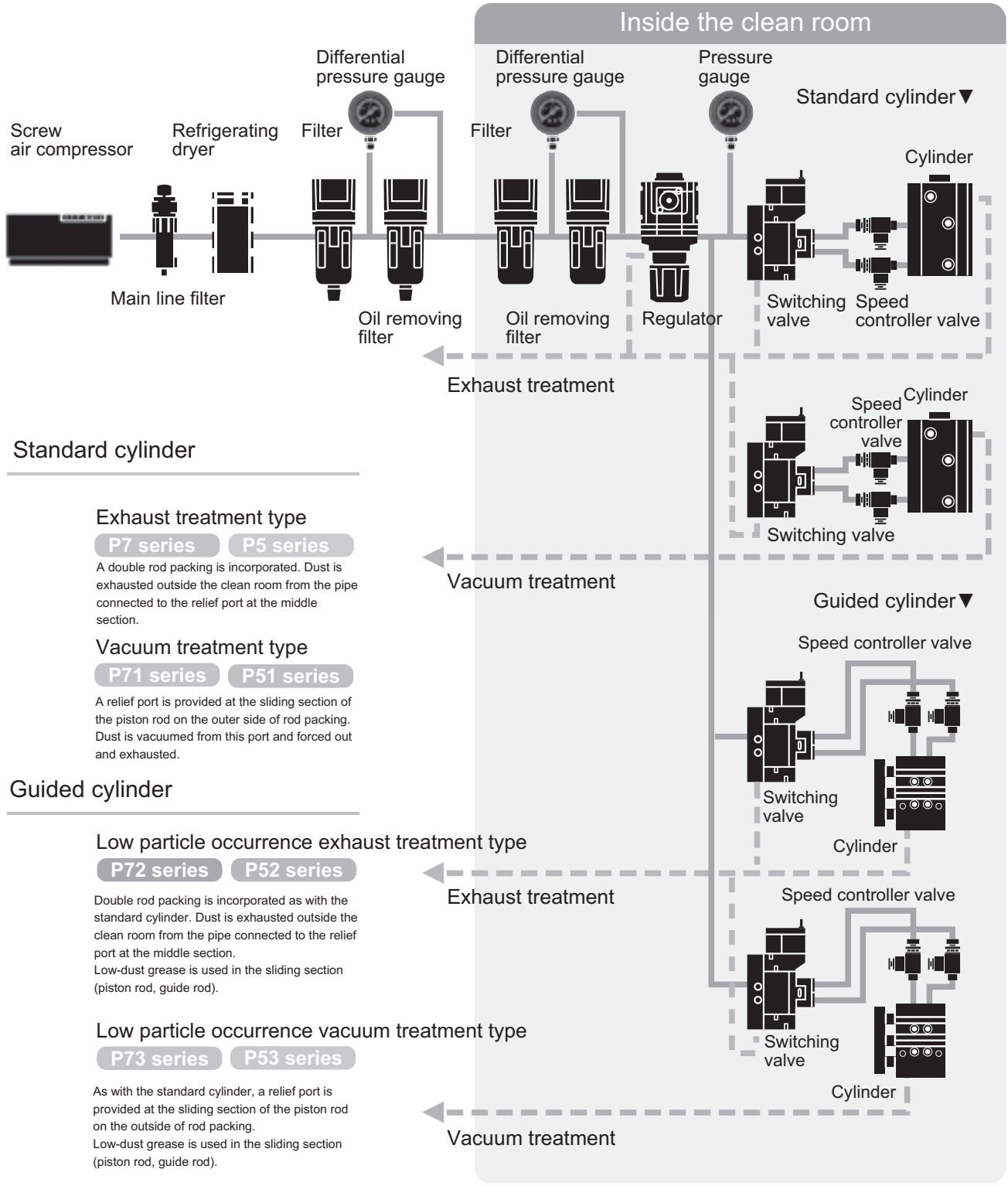
●Accurately producing ultra clean air

Clean blow system model circuit



●Zero particle generation with vacuum and exhaust treatment

Air-operated actuator system circuit structure



Standard cylinder

Exhaust treatment type

P7 series P5 series

A double rod packing is incorporated. Dust is exhausted outside the clean room from the pipe connected to the relief port at the middle section.

Vacuum treatment type

P71 series P51 series

A relief port is provided at the sliding section of the piston rod on the outer side of rod packing. Dust is vacuumed from this port and forced out and exhausted.

Guided cylinder

Low particle occurrence exhaust treatment type

P72 series P52 series

Double rod packing is incorporated as with the standard cylinder. Dust is exhausted outside the clean room from the pipe connected to the relief port at the middle section.
Low-dust grease is used in the sliding section (piston rod, guide rod).

Low particle occurrence vacuum treatment type

P73 series P53 series

As with the standard cylinder, a relief port is provided at the sliding section of the piston rod on the outside of rod packing.
Low-dust grease is used in the sliding section (piston rod, guide rod).

CKD Electric Catalog Guide (CAD DATA)

Using and ordering the electronic catalog

The CKD Electronic Catalog is acollection of CAD drawing including dimensions (CAD data) related to pneumatic components and control components.This data is provided on CD-ROM to aid in CAD design.
Please contact your CKD sales person or your nearest sales office for details of this CD.

■Indicate the following when placing your order:

❶CAD software name and version ❷OS name

There are CD-ROMs according to the CAD software to contain and OS type. Be sure to indicate the name of the CAD software and the OS that you are using.

■Compatible CAD type

❶DXF

Downloading from the internet Web site:

http://www.ckd.co.jp/english/

DXF data can be downloaded from the

CKD website Component Products > Product guide general catalog

CKD Electronic Catalog contents (CKD DATA)

CKD DATA are contained in CD ROM "CKD Digital Catalog ver.5"

How to use Electronic Catalog

■ Operating the CAD

Contact each CAD maker for details on operaling CAD

- How to open file
- How to create drawing
- Usable data format

■ Confirmation before use

Confirm "README.txt" stored in CD-ROM CKD electronic catalog for

- How to use
- Precautions
- Version information

■ Electronic catalog file list

Refer to

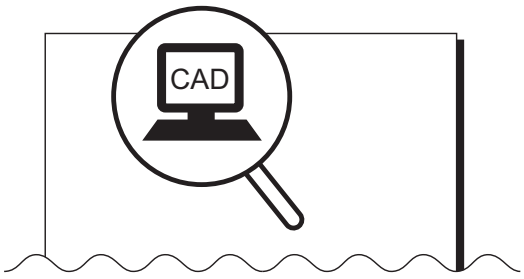
- List.xls

for the latest file list of the electronic catalog file list. Contained in CD-ROM.

Searching Electronic Catalog file name

1 Searching from this catalog

CAD data is available for items with a CAD mark.

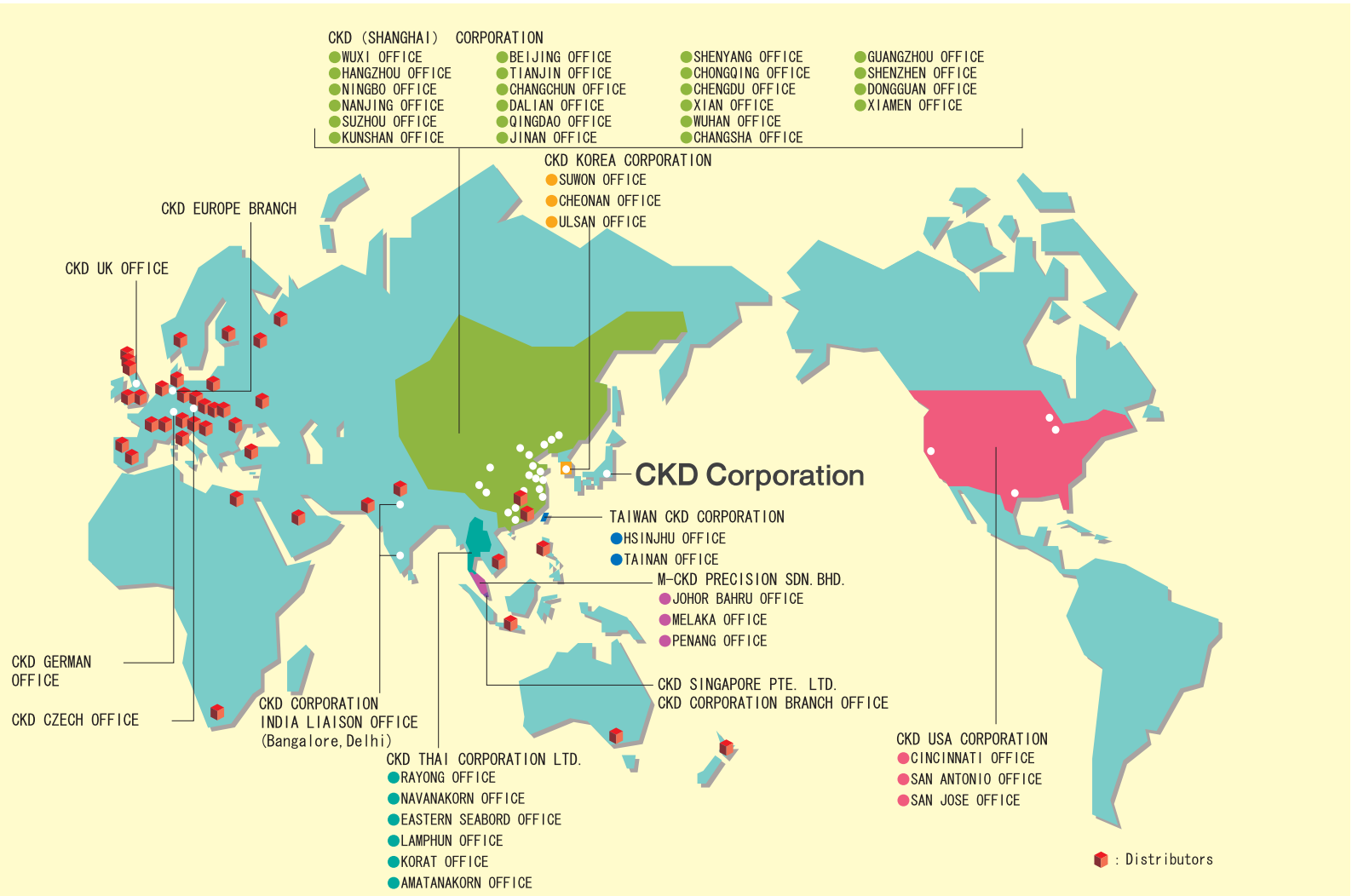


2 Searching from CD-ROM

When the CD-ROM is inserted in the drive, "CAD Data Search Software" starts and the search screen on the left opens. (*1) Required CAD data is searched for and saved in the hard disk.

*1: If the automatic start function is not set, start up "Kensaku.exe" in the CD-ROM. This search software need not be installed.

WORLD-NETWORK



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