



New Products

New product

Weir-type diaphragm valve SWD and MWD Series



WEIR-TYPE DIAPHRAGM VALVE

Weir-type diaphragm valve – fruit of CKD technologies put together



Lineup of manual type
MWD Series!



New

CKD Corporation

CC-1096A **3**

Ultimate cleanness pursued. And ease of use.

New lineup of manual type MWD Series.

Wider selection of the piping port sizes for use of various equipment.



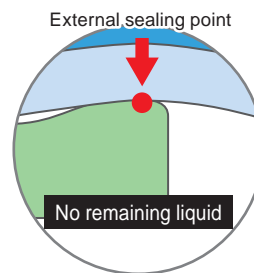
Manual type **MWD Series**

3 points for cleanness and usability

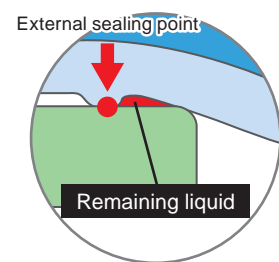
1 Clean

High asepsis

The flat structure of the diaphragm external seal has eliminated the pockets between the diaphragm and the body. The absence of the remained liquid in pockets keeps the valve clean.



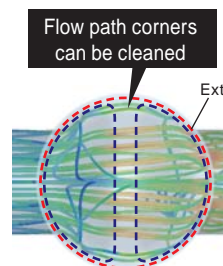
SWD/MWD Series



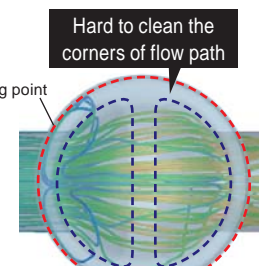
External sealing by a diaphragm bump

Easiness of replacement shortens the cleaning time

The fluid-catching dead space is small, so you can clean every corner of the flow path. Ease of liquid replacement shortens the time for cleaning.



SWD/MWD Series



External sealing by a diaphragm bump

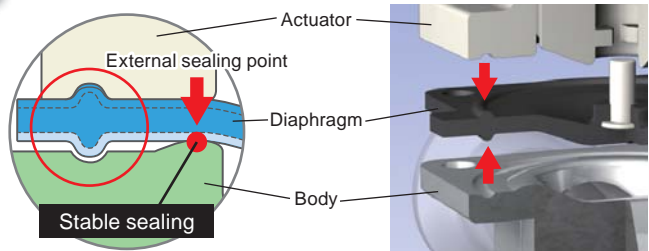


Air operated type **SWD Series**

2 Maintainability

Reduction of maintenance time

The improved diaphragm eases the replacement of diaphragms. A unique mechanism provides stable positioning. Easy assembling and secure sealing make maintenance times short.



Stable sealing through groove-fitting positioning

3 Compact

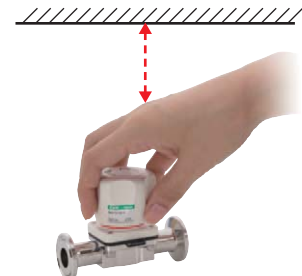
More flexibility in equipment design and development (air operated type)

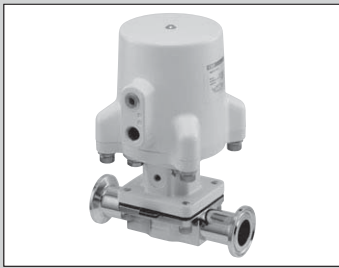
The actuator is compact compared to the valve port size, which is made possible by the unique technologies gained through the long-standing experience in the production of air pressure cylinders. The product helps the space saving of the equipment and facilities.



Providing enough maintenance space (manual type)

Use of the compact manual handle saves the space within the equipment, making the valve operation easy.





Weir-type diaphragm valve – air operated type

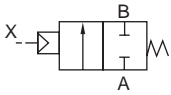
SWD Series

● Connection: ISO ferrule

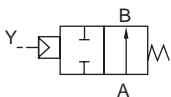


JIS symbol

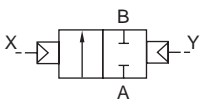
● NC (Normally closed)



● NO (Normally open)



● Double acting



Specifications

Item	SWD*1	SWD*2	SWD*3		
Actuation	NC	NO	Double acting		
Working fluid	Water, pure water, chemical liquid (fluids not corroding the contacting material)				
Fluid temperature	5 to 90 (130 for steam sterilization)				
Proof pressure	MPa	2.0			
Working pressure	MPa	0 to 0.6			
Valve seat leakage	cm ³ /min	0 (water pressure)			
Ambient temperature	°C	0 to 60			
Frequency	times/min	20			
Operating port	Rc1/8				
Operating pressure	SWD1*-8	MPa	0.35 to 0.7	0.25 to 0.35	0.2 to 0.3
	SWD1*-10				
	SWD2*-15		0.4 to 0.7	0.3 to 0.35	0.25 to 0.3
	SWD3*-25				
	SWD4*-40				
SWD1*-8	2.3				
Cv	SWD1*-10	2.6			
	SWD2*-15	4.5			
	SWD3*-25	13			
	SWD4*-40	27			
	Material	Diaphragm	PTFE/EPDM		
	Body	SUS316L (comparable to buffing #400, electrolytic grinding)			
	Actuator	ADC12			

* Refer to page 7 for repair parts.

How to order

SWD 1 1 - 8 - F

● A Model no. ● B Series

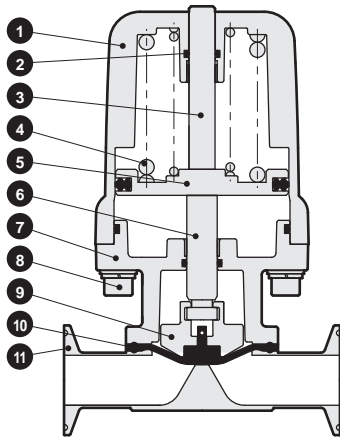
● C Actuation

● D Port size

● E Combination of materials of actuator, diaphragm, and body

		A Model No.			
		SWD1	SWD2	SWD3	SWD4
Symbol	Descriptions				
B Series					
1	Size 1	●			
2	Size 2		●		
3	Size 3			●	
4	Size 4				●
C Actuation					
1	NC (Normally closed)	●	●	●	●
2	NO (Normally open)	●	●	●	●
3	Double acting	●	●	●	●
D Port size					
8	Clamp joint 8A	●			
10	Clamp joint 10A	●			
15	Clamp joint 15A		●		
25	Clamp joint 25A (1S)			●	
40	Clamp joint 40A (1.5S)				●
E Combination of materials of actuator, diaphragm, and body					
	Actuator	Diaphragm	Body		
F	ADC12	PTFE/EPDM	SUS316L	●	●

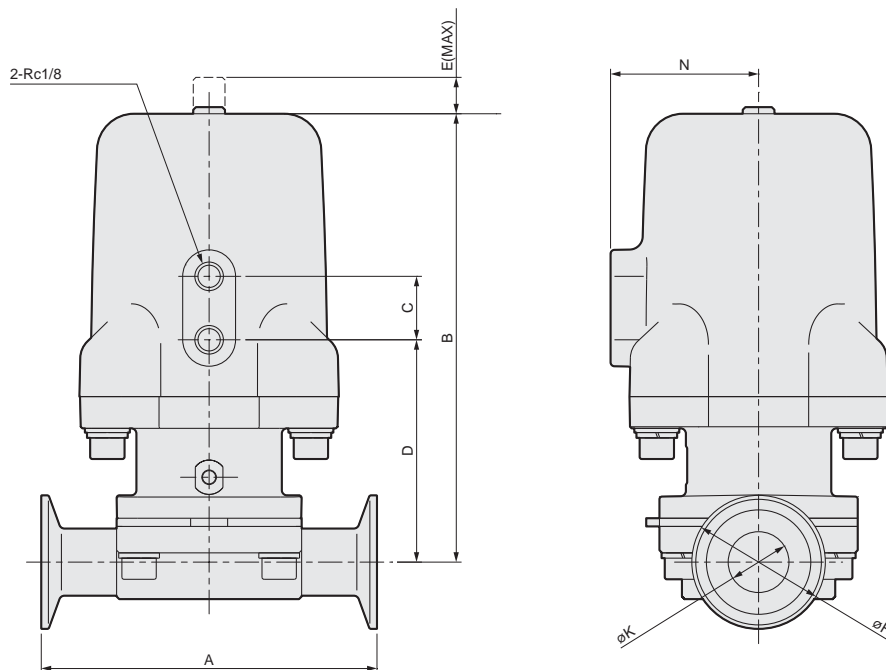
Internal structure and parts list



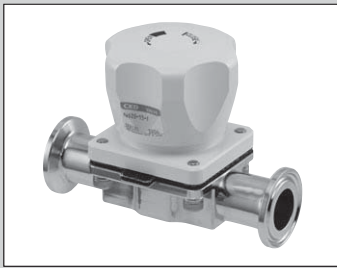
No.	Part name		Material
1	Cylinder cover	ADC12	Aluminum alloy die-casting
2	O-ring	FKM	Fluoro rubber
3	Indicator	SUS304	Stainless steel
4	Spring	SUS304 (or SWP)	Stainless steel
5	Piston	A2017	Aluminum
6	Piston rod	SUS304	Stainless steel
7	Rod cover, yoke	ADC12	Aluminum alloy die-casting
8	Hexagon socket head cap bolt	SUS304, SUSXM7	Stainless steel
9	Compressor	SCS13	Stainless steel
10	Diaphragm	PTFE, EPDM, SUS303, SUS304	Fluorine resin, ethylene propylene rubber, stainless steel
11	Body	SUS316L	Stainless steel

Dimensions

●SWD



Model no.	A	B	C	D	E	H	K	N
SWD1*-8-F	90	99.5	22	60	7	34	10.5	40
SWD1*-10-F	90	99.5	22	61.5	8.5	34	14	40
SWD2*-15-F	108	130	22	73	8.5	34	17.5	46.5
SWD3*-25-F	127	170	24	84	12.5	50.5	23	56
SWD4*-40-F	159	212	28	97	16.5	50.5	35.7	66



Weir-type diaphragm valve, manual type

MWD Series

● Connection: ISO ferrule



Specifications

Item		MWD10-8	MWD10-10	MWD20-15	MWD30-25	MWD40-40	
Working fluid		Water, pure water, chemical liquid (fluids not corroding the contacting material)					
Fluid temperature	°C	5 to 90 (130 for steam sterilization)					
Proof pressure	MPa	2.0					
Working pressure	MPa	0 to 0.6					
Valve seat leakage	cm ³ /min	0 (water pressure)					
Ambient temperature	°C	0 to 60					
Cv		2.3	2.6	4.5	13	27	
Operation section	Operating torque	N·m	0.7 to 1.1	0.7 to 1.1	1.0 to 1.5	1.7 to 3.0	3.0 to 4.0
Material	Diaphragm	PTFE/EPDM					
	Body	SUS316L (comparable to buffing #400, electrolytic grinding)					
	Actuator	A5056					

How to order

MWD **1** 0- **8** - **F**

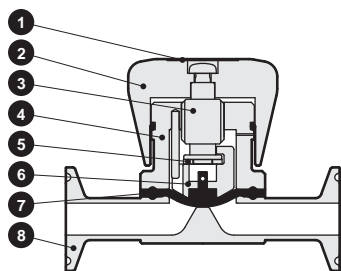
A Model no. **B** Series

C Port size

D Combination of materials of actuator, diaphragm, and body

		A Model No.			
		MWD1	MWD2	MWD3	MWD4
Symbol	Descriptions				
B Series					
1	Size 1	●			
2	Size 2		●		
3	Size 3			●	
4	Size 4				●
C Port size					
8	Clamp joint 8A	●			
10	Clamp joint 10A	●			
15	Clamp joint 15A		●		
25	Clamp joint 25A (1S)			●	
40	Clamp joint 40A (1.5S)				●
D Combination of materials of actuator, diaphragm, and body					
	Actuator	Diaphragm	Body		
F	A5056	PTFE/EPDM	SUS316L		● ● ● ●

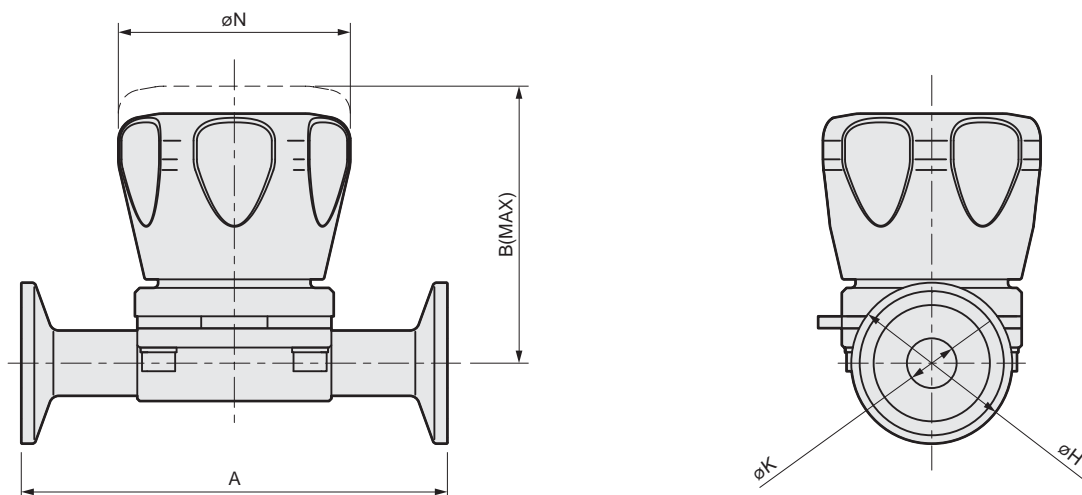
Internal structure and parts list



No.	Part name	Material	
1	Indicator	PET	Polyethylene terephthalate
2	Handle	A5056	Aluminum
3	Rod	SUS304	Stainless steel
4	Bonnet	A5056	Aluminum
5	Bearing	-	-
6	Compressor	SCS13	Stainless steel
7	Diaphragm	PTFE, EPDM, SUS303, SUS304	Fluorine resin, ethylene propylene rubber, stainless steel
8	Body	SUS316L	Stainless steel

Dimensions

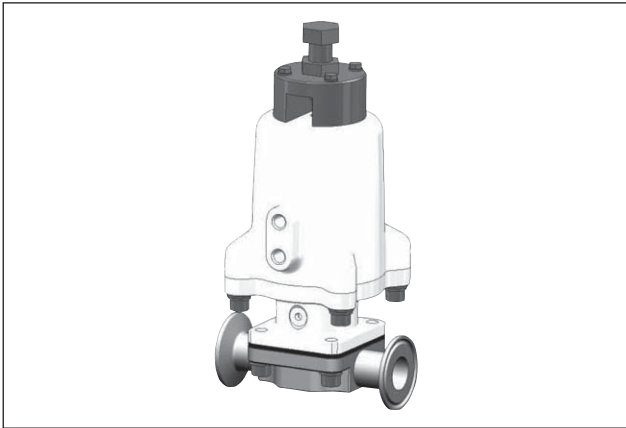
●MWD



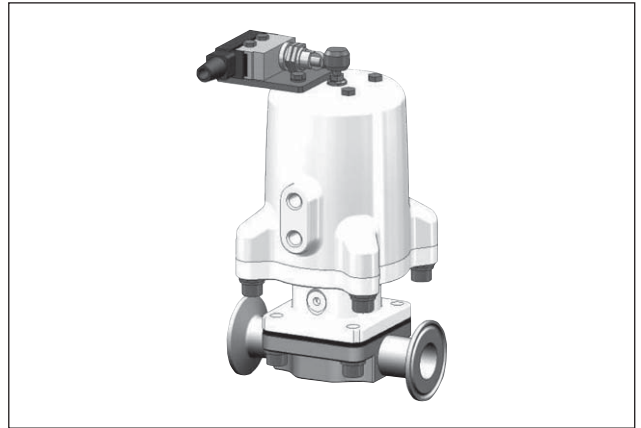
Model no.	A	B	H	K	N
MWD10-8-F	90	58.5	34	10.5	49
MWD10-10-F	90	60.7	34	14	49
MWD20-15-F	108	71.5	34	17.5	59
MWD30-25-F	127	88.7	50.5	23	69
MWD40-40-F	159	107.6	50.5	35.7	89

Custom order (1S, 1.5S)

With opening adjustment mechanism



With open/close switch



How to order repair parts

SWD - 1 PE

Model no.

A Series

Symbol	Descriptions
A Series	
1	Size 1
2	Size 2
3	Size 3
4	Size 4

* Model numbers apply to SWD and MWD both.





Safety Precautions

Always read before use

When designing and manufacturing equipment that employs CKD products, you are responsible for checking that the equipment's mechanism, pneumatic control circuit, hydraulic control circuit, and the electrical controls that control these parts can ensure safety. You are also responsible for manufacturing safe equipment. 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 or additionally machine the product. This product's applied scope is for use as equipment and parts for general industrial machinery. Therefore, outdoor use as well as the following conditions and environments shall be considered outside of the applied scope (except for products of outdoor specifications). (If you consult CKD upon adoption and consent to CKD product specification, it will be applicable; however, safeguards should be adopted that will circumvent dangers in the event of failure.)

 - 1** Usage with or within components or applications that come into direct contact with nuclear energy, railroad, aviation, ships, vehicles, medical devices, beverage, and food. Usage in applications where safety is required such as amusement equipment, emergency shutoff circuit, press machine, brake circuit, and safeguards.
 - 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.

Items listed under “caution” can also possibly lead to serious results depending on the situation. Important details are listed for each; please make sure to follow them.

Precautions when ordering

- 1** Warranty period
“Warranty Period” is one (1) year 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, according to its own judgement.
Note that the following faults are excluded from the warranty term:
 - (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 reason that is unforeseeable with technology put into practical use at the time of delivery
 - (6) Failure attributable to force majeureIn 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.



Safety precautions

Fluid control components: Warnings, cautions

Always read before use

Specific precautions: Weir-type diaphragm valve SWD/MWD Series

Design & Selection

Warning

- This product cannot be used as an emergency shutoff valve.
 - This product is not designed as a safety valve such as an emergency shutoff valve. When using in such a system, provide other measures to ensure safety.
- Incorrect selection and handling of devices could result in product problems and user system problems. The user is responsible for confirming the compatibility of the product specification and their system before selecting and handling the product.
- Take measures to protect personnel and equipment against injury or damage if this product fails.
- Liquid ring
 - Opening and closing movement of the valve makes the diaphragm go up and down, changing the inner volume of the valve. Therefore, when the fluid is incompressible (liquid), operation with the fluid sealed within the valve (liquid ring) places an abnormal pressure on the valve. In such cases, install a relief valve on the primary or secondary side of the valve to avoid a liquid ring circuit.
- Working fluid
 - Check the compatibility between the material of the product components and the working fluids.
- Temperature of fluid
 - Use the product within the specified fluid temperature range.
- Fluid pressure range
 - Use the product within the specified working pressure range.
- Iron rust and dirt, etc., in fluid can cause operation faults or leaks, and lower product performance. Eliminate such substances.

- Use of the product in high temperature or for steam
 - High-temperature fluid running through the pipe for steam sterilization or other purposes causes the valve body temperature to be high. Do not touch or contact the valve in such cases. Directly touching these sections could cause burns.

Caution

- Be noted that sudden changes of fluid temperature may cause internal leak.
- The upper side (actuator side) of the diaphragm does not contact the fluid, but it may have a fluid atmosphere due to penetration caused by the type of the fluid or the change of the fluid temperature.
- For compressed air for actuator control, use air or inert gas that has gone through a filter with filtration rating of 5 μm or over.
- If the product has not been used for a month or longer, carry out trial operation before starting real operation.
- When not using the product for a month or longer, remove any water left in the product. Water residue will cause rusting and may lead to operation faults or leaks.
If residual water cannot be removed, operate the valve several times a day to keep the best condition.
- The valve operation may not catch up with the provision or evacuation of the control air when these operations are made in a short time.
- Make sure that fluids do not adhere to the product body.
- Water-hammer or vibration may happen depending on the fluid pressure condition and the piping condition. Most cases will be improved by adjusting the open/close speed by the flow control valve. If the condition still does not improve, check the fluid pressure and piping conditions.
- When using the product with low frequency, consult with CKD.
- The indicator value rises when the valve opens. The indicator has grease coating. Be careful of adhesion.
- Do not step the valve, nor put the heavy things on it.
- Use the product within the specified pressure range of the control air.
- Observe the specified operation frequency. The specified operation frequency is 20 times/min or less.

Installation and adjustment

Warning

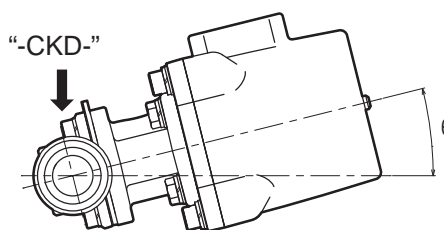
- Before piping, be sure to flush the inside of the pipe, and remove foreign matter such as dirt, metal chips, rust, and sealing tape. Dirt or foreign matter in fluid may prevent the valve from functioning correctly. If dirt or foreign matter may come inside, install a filter on the primary side of the valve in a way suiting the circuit used.
- Protect the valve from dust coming inside. If there are high levels of dust in the area, provide protection by installing a silencer or an elbow connector facing downward onto the exhaust port of the valve operation part so that dust does not enter.
- Check that stress, such as bending, tension, or compression, is not applied to the valve when connecting main pipes. Fix and support the pipe so that the weight and vibration of the pipe do not directly impact the valve.
- Tighten the piping with the torques listed in the table below.

Port size of operation port	Recommended piping torque
Rc1/8	3 to 5 N·m

- Although the pipes can be installed in any attitude, piping with the valve in inclination angles listed in Table 1 minimizes the amount of the liquid staying inside the valve (See Figure 1). Make the “-CKD-” mark, printed on the piping part of the body, vertical to the ground surface.

Table 1. Port size and valve inclination angles

Model no.	Port size	Valve inclination (θ°)
SWD1*-8, MWD10-8	8A	23
SWD1*-10, MWD10-10	10A	11
SWD2*-15, MWD20-15	15A	14
SWD3*-25, MWD30-25	25A (1S)	34
SWD4*-40, MWD40-40	40A (1.5S)	32



(Figure 1) Valve inclination

- Piping of body
 - Ferrule dimensions conform to ISO. Assemble them with gaskets and clamps of appropriate sizes.

During use and maintenance

Caution

- When replacing a valve, thoroughly replace the fluid with pure water and purge the pipe with dry air or inert gas so that the remaining fluid will not affect devices and people around. Read the product safety data sheet (MSDS) of the fluid used when you touch the valve, and wear necessary protection gears.
- If the product has not been used for more than a month, carry out trial operation before real operation.
- The warranty does not cover problems arising in products and parts that have been disassembled or substituted.

Warning

- Handling of the actuator
 - Actuators must not be disassembled by the user. It is dangerous because they have high load springs. Contact a CKD dealer or distributor when disassembling is required.
- Be sure to remove the pressure of the control air and the fluid, and confirm that there is no pressure inside the valve before you disassemble it.
- When replacing a diaphragm, thoroughly replace the fluid with pure water and purge the pipe with dry air or inert gas so that the remaining fluid will not affect devices and people around. Read the product safety data sheet (MSDS) of the fluid used when you touch the fluid path of valve, and wear necessary protection gears.
- Be sure to use the specified diaphragm for replacement.



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