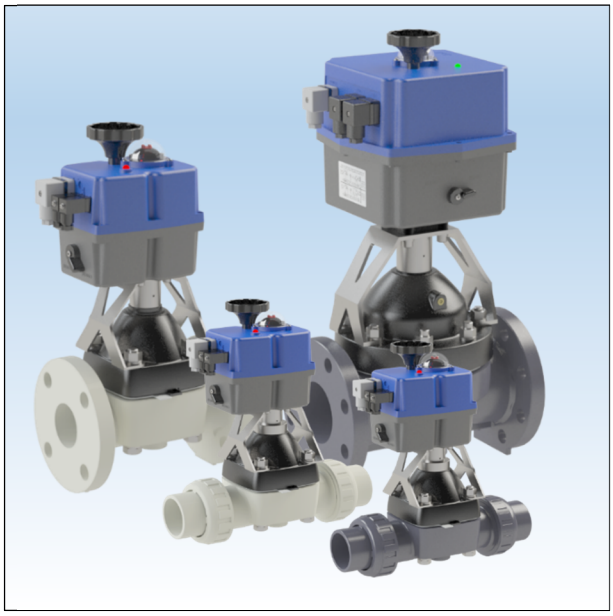
Diaphragm valve Type 14 (15-100mm)
True union diaphragm valve Type 14 (15-50mm)
Electric Type J

User's Manual



Thank you for choosing our product.
This instruction manual contains important information for safe use of our product, so please be sure to read it before handling the product.
After reading this manual, please be sure to keep it in a place where the user can see it at any time.

ASAHI YUKIZAI CORPORATION

-SAFETY PRECAUTIONS-

This instruction manual is written on the assumption that the person who handles our products has a basic knowledge of our products, electrical equipment, machinery, control, etc., and it contains technical terms depending on the handling contents.
Please read this manual carefully and fully understand the contents and observe the safety precautions for proper use.

In this manual, the warning, caution, prohibition, and enforcement are categorized together with the symbol to inform the situation and scale of human injury or property damage.
Failure to observe this precaution may result in unexpected failure or damage. Be sure to observe this precaution.

<WARNING/CAUTION indications>

WARNING	Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
CAUTION	Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury or property damage.

<Prohibited/Forced display>

Prohibition	In the handling of the product, it is prohibited to do it in "Do not do it".
Forcing	In the handling of the product, it is forced by "contents to be carried out without fail".

Table of Contents

1. Our product warranty coverage

Unless otherwise stated in the Contract or Specifications, etc., the warranty for the piping material products (hereinafter referred to as "applicable products") such as valves manufactured or sold by us is as follows.

Applicable to

This warranty applies only when the product is used in Japan. If you intend to use the product overseas, please contact us.

Warranty Period

The warranty period is one year after delivery.

Guaranteed range

In the event of failure or malfunction due to our responsibility during the above warranty period, we will replace or repair the product with a substitute free of charge.
Provided, however, that even within the warranty period, the warranty shall not apply to any of the following cases (charged service).

- ▶When the storage, operating conditions, precautions, etc. described in the specifications, instruction manual, etc. are not adhered to in the construction, installation, handling, maintenance, etc.
- ▶ Defects, such as the design of the customer's equipment or software, caused by other than the target product.
- ▶ The fault is due to modification or secondary processing of the product by something other than us.
- ▶ In the case of a failure which can be deemed to have been avoided if the periodic inspection described in the instruction manual, etc. or the maintenance or replacement of consumable parts has been performed normally.
- ▶ The component is used for purposes other than the product's intended use.
- ▶ Failure or malfunction due to causes that could not be foreseen by our level of science and technology at the time of shipment.
- ▶ The fault is due to an external factor that is not our responsibility, such as natural disaster or disaster.

Disclaimer

- ▶ The warranty will not cover secondary damage (damage to equipment, loss of opportunity, loss of profit, etc.) or any other damage caused by the failure of our product.
- ▶ Although we strive to improve the quality and reliability of our products, we do not guarantee their integrity. Especially when using this product for equipment that may infringe human life, body or property, take appropriate safety design measures, etc., with full consideration of problems that may normally occur. We assume no responsibility for such use if we have not obtained our consent in advance in writing of specifications, etc.
- ▶ Please observe the product specifications and precautions when using our products. We shall not assume any responsibility for any damage to the customer caused by the customer's negligence. However, this does not apply to damage caused by a defect in our product.

2. Safety Instructions

Unpacking, Transportation and Storage

WARNING	
Prohibition	**Serious injury can result.** ▶ When hanging or slinging a valve, pay sufficient attention to safety, and do not enter under the load.

CAUTION	
Prohibition	**The valve can be damaged or leak.** ▶ Do not subject the product to impact by throwing, dropping or hitting. ▶ Do not scratch or pierce the product with a sharp object such as a knife or hand hook. ▶ Do not pile up cardboard boxes forcefully to prevent the load from collapsing. ▶ Avoid contact with coal tar, creosote (a wood preservative), white pesticides, insecticides, paints, etc.
Forcing	**The valve can be damaged or leak.** ▶ Keep in cardboard until just before piping, and store indoors (at room temperature) away from direct sunlight. Also, avoid storing the product in places of high temperature. (The strength of cardboard packaging decreases when it gets wet. Be very careful when storing and handling it.) ▶ After unpacking, make sure that the product is correct and that it meets the specifications.

Product Handling

⚠ WARNING	
Prohibition	**Serious injury can result.** ▶ Do not disassemble the actuator. ▶ Do not touch moving parts during operation with hands, feet or tools.
Forcing	**Serious injury can result.** ▶ If positive pressure gas is used for our resin piping material, a dangerous condition may occur due to the repulsive force peculiar to compressible fluids even if the pressure is the same as the water pressure. Therefore, be sure to take safety measures for the surrounding area, such as covering the piping with protective materials. If you have any questions, please contact us separately. ▶ When conducting a pipe leak test after completion of piping construction, be sure to check with water pressure. Contact us in advance if you are unavoidable to test with a gas. **Doing so may damage the actuator or cause serious injury.** ▶ Before use, check the power supply and voltage on the nameplate. **The actuator may not operate or the answer signal may not be activated.** ▶ The inside of the actuator is constantly controlled by the temperature. After installation of the piping, turn on the power (fully open or closed). ▶ The open and closed contacts (relay contacts) are switched by relays inside the actuator. Supply electricity (AC24～240V) to the power supply when using the product.

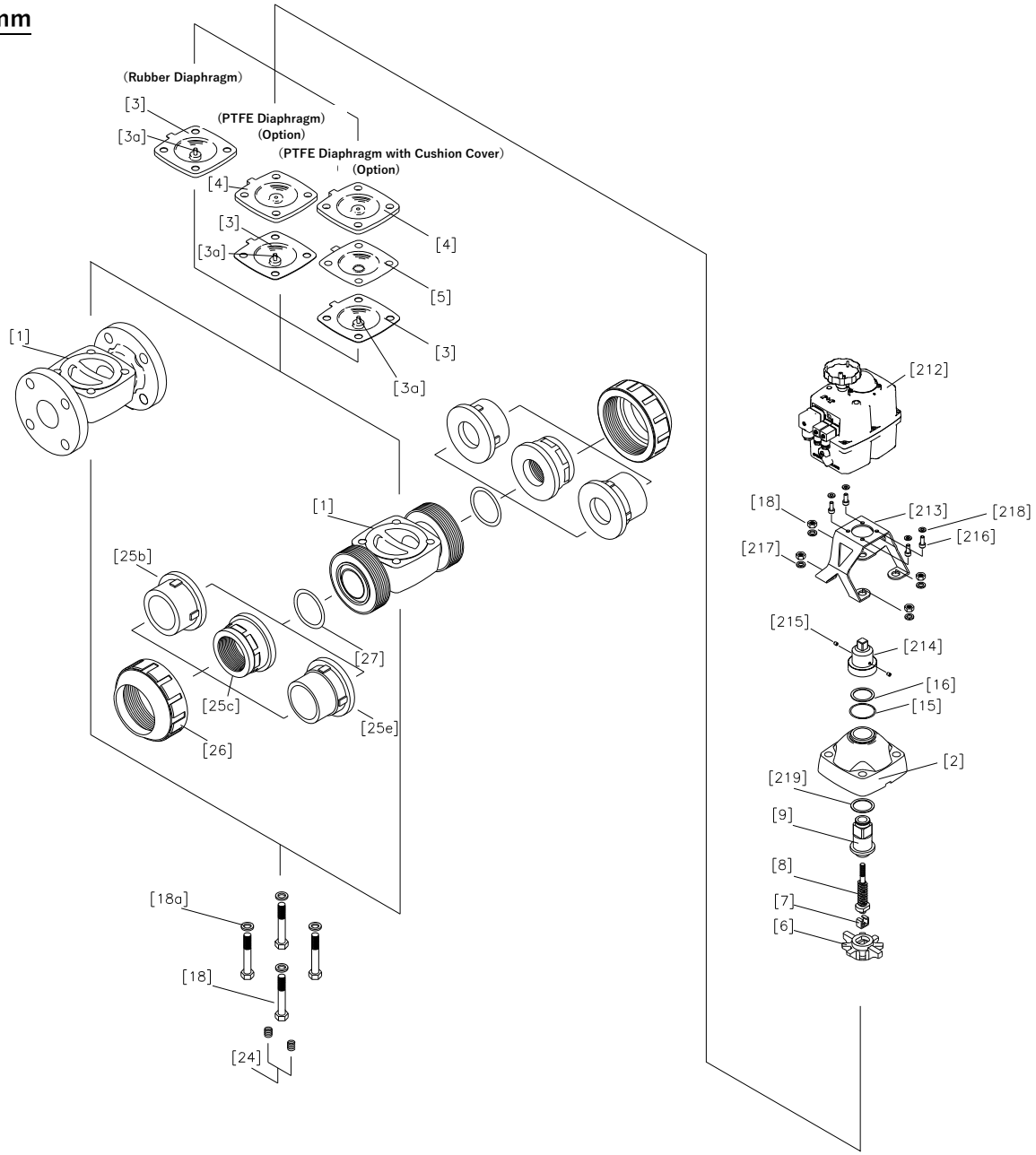
⚠ CAUTION	
Prohibition	**The valve can be damaged or leak.** ▶ Do not step on the valve or place heavy objects on it. ▶ Keep away from fire and hot objects. ▶ Do not use the product in places where it may be submerged. ▶ Do not subject the valve to large vibrations. **Doing so may damage the actuator.** ▶ The surface temperature of the actuator may rise during operation. This is due to the heat generated by the internal equipment and is not a malfunction, but do not use the product outside the allowable range of-10 to 50°C ambient temperature.

Handling of products (continued)

⚠ CAUTION	
Forcing	**There is a danger of injury.** ▶ When performing manual operation, make sure that the actuator is not operated by the motor. ▶ Secure sufficient space for maintenance and inspection when piping. **The valve can be damaged or leak.** ▶ Pay attention to the atmosphere where the valve is installed. Avoid locations where the product is exposed to sea breezes, corrosive gases, chemical liquids, sea water, steam, etc. ▶ Keep the pressure and temperature of the fluid within the allowable range. (The maximum allowable pressure includes water hammer pressure.) ▶ Use a valve of suitable material for the operating conditions. (Depending on the type of chemical liquid, the parts may be damaged. Contact us in advance for details.) ▶ Use fluids containing crystalline material under conditions that do not recrystallize. ▶ Avoid any place where the valve is constantly exposed to splashes of water and dust, or direct sunlight, or protect the valve with a cover or the like to cover the entire area. ▶ Perform maintenance periodically by referring to "**9. Inspection items**". Pay particular attention to temperature changes and aging during long-term storage or shutdown or use. ▶ The tightening bolts and nuts at the diaphragm (between the bonnet and body) may become loose due to changes in temperature during storage or use, and creep. After checking, retighten the bolts and nuts diagonally to the values shown in the bonnet tightening torque table (refer to **8. How to disassemble/assemble for parts replacement**). ▶ When installing a valve, provide an appropriate valve support so that excessive force is not applied to the valve and piping. ▶ Always use the product within the indicated product specifications. **Doing so may damage the actuator.** ▶ If you notice an unusual odor, heat, or smoke, immediately turn off the power supply. If any abnormality is found, be sure to consult your dealer or us for inspection. ▶ Keep the ambient temperature of the installation location within-10 to 50°C. ▶ Avoid locations with volatile gases or poor atmospheres. Provide a cover, etc., to cover the entire area.

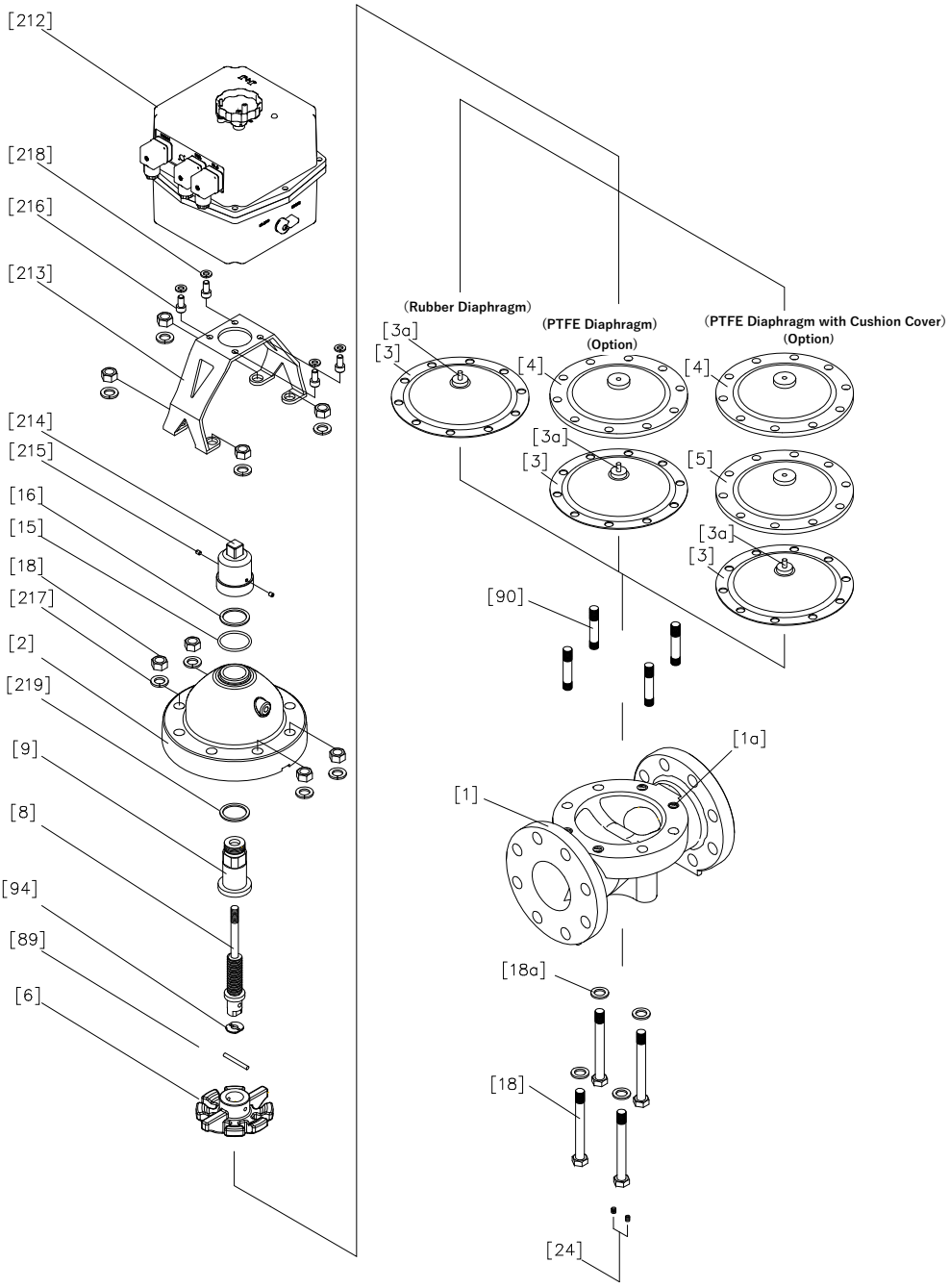
3. Name of each part

Size 15～50mm



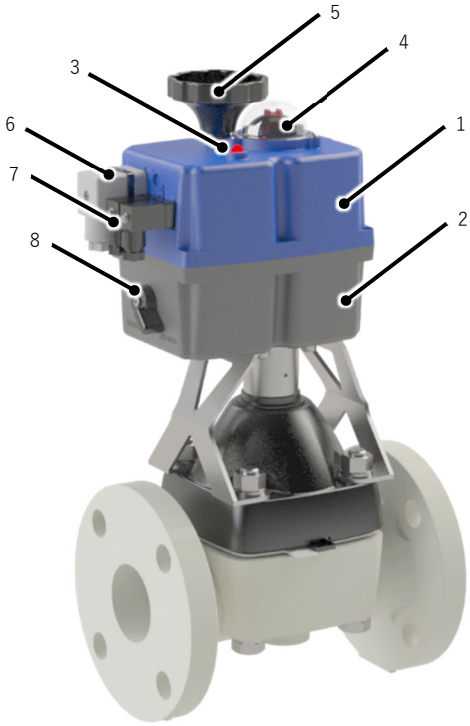
No.	Name	No.	Name	No.	Name
[1]	Body	[15]	O-ring	[212]	Actuator
[2]	Bonnet	[16]	Thrust ring	[213]	Stand
[3]	Diaphragm	[18]	Bolt/nut	[214]	Joint
[3a]	Inserted metal of diaphragm	[18a]	Washer	[215]	screw
[4]	Cushion	[24]	Ensat	[216]	Bolt
[5]	Cushion cover	[25b]	End connector (socket end)	[217]	Spring washer
[6]	Compressor	[25c]	End connector (Threaded end)	[218]	Spring washer
[7]	Joint	[25e]	End connector (spigot end)	[219]	Thrust ring
[8]	Stem	[26]	Union nut		
[9]	Sleeve	[27]	O-ring		

Size 65～100mm



No.	Name	No.	Name	No.	Name
[1]	Body	[9]	Sleeve	[212]	Actuator
[1a]	Inserted nut	[15]	O-ring	[213]	stand
[2]	Bonnet	[16]	Thrust ring	[214]	Joint
[3]	Diaphragm	[18]	Bolt/nut	[215]	screw
[3a]	Inserted metal of diaphragm	[18a]	Washer	[216]	Bolt
[4]	Cushion	[24]	Ensat	[217]	Spring washer
[5]	Cushion cover	[89]	Compressor pin	[218]	Spring washer
[6]	Compressor	[90]	Stud bolt and nut	[219]	Thrust ring
[8]	Stem	[94]	Metal of Compressor		

Actuator



Size 15~50mm

Size 65~100mm

DN (mm)	Actuator model
15～32	J4M-S6
40,50	J4M-S10
65～100	J4M-S40

Actuator Part Name

No.	Name
1	Cover
2	Body
3	LED light
4	Indicator
5	Handle for manual operation
6	DIN for power line entry
7	DIN connector for line out
8	Auto/Manual Selector (Auto/Manual)

4. Product Specifications

Model number table

Diaphragm valve Type 14 Electric type J

ACTUATION	TYPE	ACTUATOR TYPE / POWER	BODY MATERIAL	SEAL MATERIAL	CONNECTION	STANDARD	SIZE
A	14	JU	*	*	F	*	* * *
A Automatic Valve	14 Type 14	JU Type J Single Phase 24～240VAC	U U-PVC C C-PVC P PP F PVDF	E EPDM T PTFE V FKM F FKM-F C FKM-C	F Flanged end	1 JIS 10K D DIN PN10 A ANSI Grinnell standard J ANSI AV standard	015 15mm 020 20mm 025 25mm 032 32mm 040 40mm 050 50mm 065 65mm 080 80mm 100 100mm

True union Diaphragm valve Type 14 Electric type J

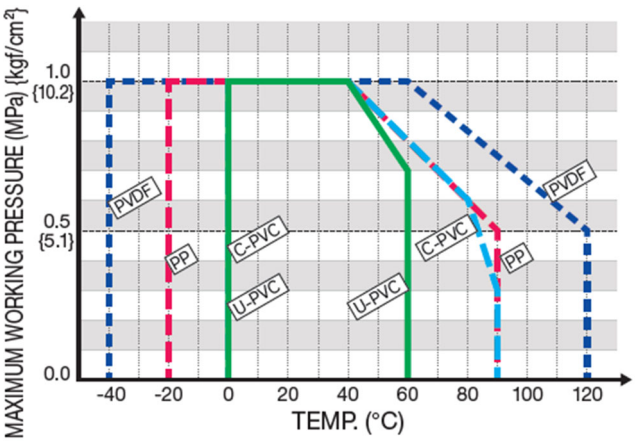
ACTUATION	TYPE	ACTUATOR TYPE / POWER	BODY MATERIAL	SEAL MATERIAL	CONNECTION	STANDARD	SIZE
A	T1	JU	*	*	*	*	* * *
A Automatic Valve	14 True union Type 14	JU Type J Single Phase 24～240VAC	U U-PVC C C-PVC P PP F PVDF	E EPDM V FKM 1 PTFE+EPDM 2 PTFE+FKM	S Socket end * N Threaded end P Spigot end	J JIS D DIN A ANSI	015 15mm 020 20mm 025 25mm 032 32mm 040 40mm 050 50mm

* PP and PVDF socket types are weld type.

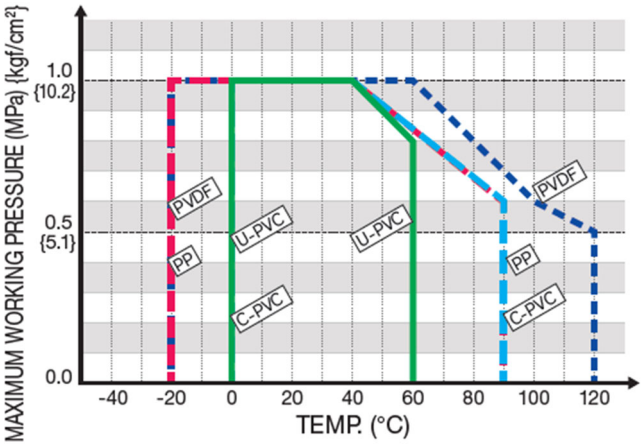
Relationship between maximum allowable pressure and temperature

Flanged end

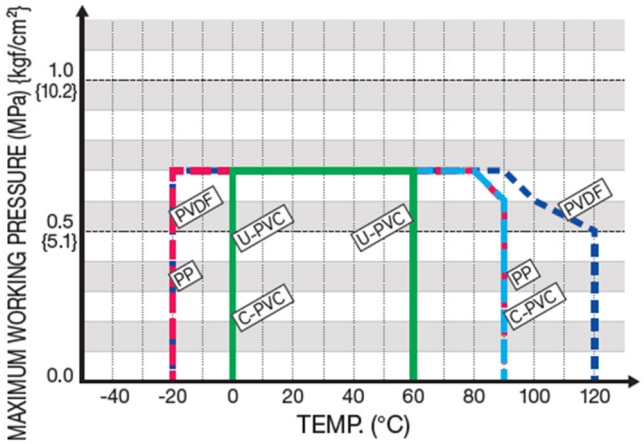
15-50mm



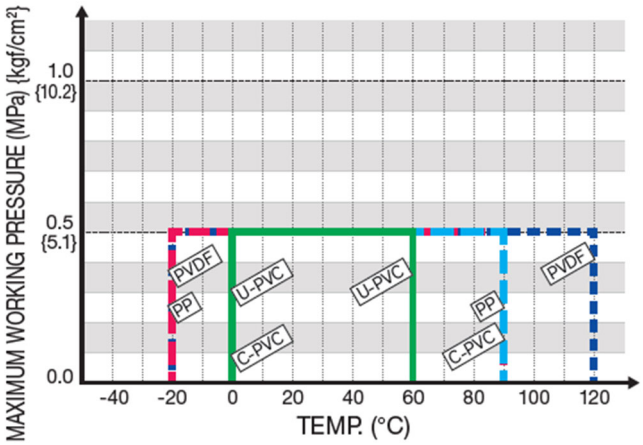
65mm



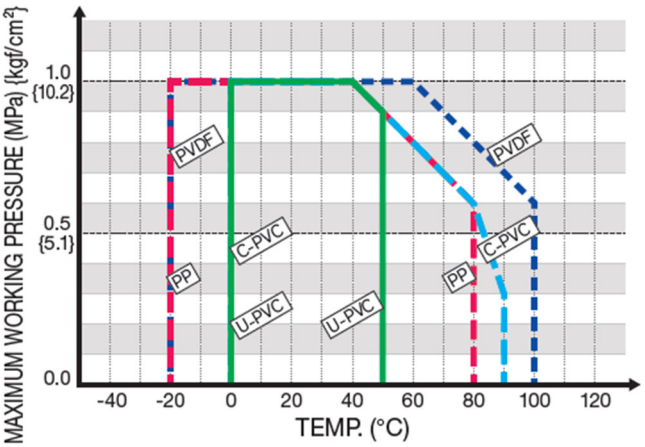
80mm



100mm



True union type (Socket, Threaded, Spigot)

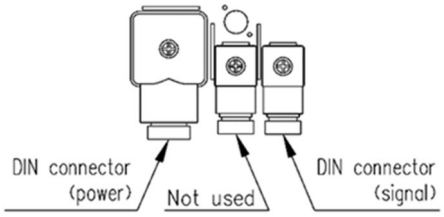


Actuator specifications

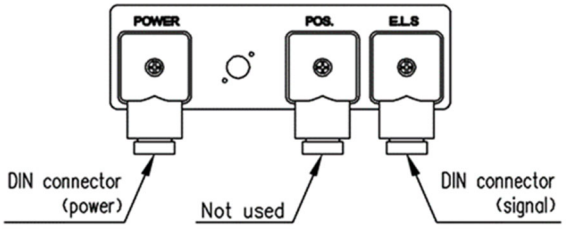
Actuator model *1			J4M-S6	J4M-S10	J4M-S40
Power supply *4			AC24-240V		
Open/close time/1 rotation (reference value)		Sec	6.5	12.8	12
Motor rated time		min			
Duty cycle			75%	75%	75%
Space Heater Space *3		W	3.5	3.5	3.5
Cable connector (DIN connector)	Applicable cable diameter for power plug		Φ8～10.5		
	Applicable cable diameter for signal plug		Φ5～6		Φ8～10.5
Protection grade			IP65		
Operating ambient temperature range		℃	-10～50		
Weight		kg	1.9	1.9	3.8
Rotate Manual *1			Clockwise: Closed, Counterclockwise: Open		
Power consumption	For supply-voltage 24VAC	W	54.1	57.9	130.4
	For supply-voltage 110VAC	W	49.6	47.9	130.9
	For supply-voltage 240VAC	W	68.1	68.1	202.8
Current consumption	For supply-voltage 24VAC	A	2.25	2.41	5.43
	For supply-voltage 110VAC	A	0.45	0.44	1.19
	For supply-voltage 240VAC	A	0.28	0.28	0.84
Housing material details			PA6		
Cover munsell value			RAL5017 blue		
Body muncell value			RAL7015 grey		
LED indicator			Fully open: green, fully closed: red		
Certified standard			CE		
Control method (open side)			Position detection		
Control method (Closed side)			Position detection		
Indicator (open side)			Short		
Indicator (Closed side)			Length		
Overload Protection*2			Stops when over negative (LED: flashes in red)		
Motor list	Motor type		24 VDC brushless motor		
Insulation type			Class B		
Detector*4	Detection details		Encoder		
	Detection operation		Encoder		
	Detection equipment		Encoder		
	Contact capacity		MAX.DC24V 1A		

※1 The handle also rotates in conjunction with the opening/closing operation. Be careful not to get caught.
※2 If an overload occurs due to foreign matter getting caught in the product, the torque limiter is activated and the product is repeatedly opened and closed up to three times (retry function). If the torque limiter is not reset after repeating three times, the actuator stops.
※3 The space heater is automatically controlled so that the inside of the actuator can reach the optimum temperature, so the power consumption fluctuates.
※4 The power supply for the actuator must be continuously energized (AV24～240V). If the power supply is interrupted, the signal from the detector is also interrupted.

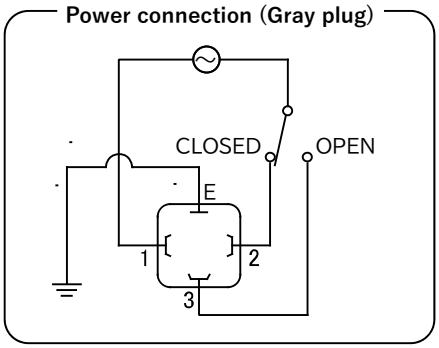
Wiring Diagram

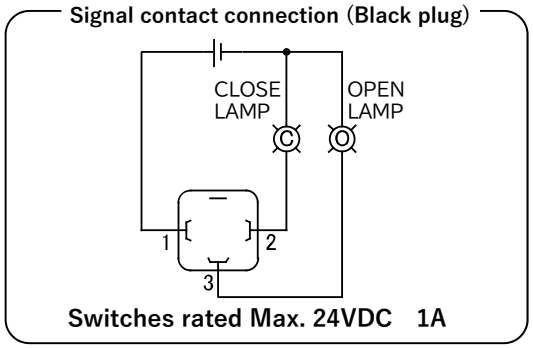


J4M-S6, S10 power line port



J4M-S40 power line port





※ The open and closed contacts (relay contacts) are switched by relays inside the actuator. Supply electricity (24～240VAC) to the power supply when using the product.

About parallel wiring

If several (two or more) motorized valves are connected in parallel and operated simultaneously with a single open/close switch (or relay contact), there is a possibility of malfunction. In this condition, the actuator may be damaged. Do not connect wires like this. (See **Fig. 4-2.**)

Provide an open/close switch (or relay contact) for each unit to ensure correct operation. (See **Fig. 4-1.**)

Fig. 4-1
Correct Example

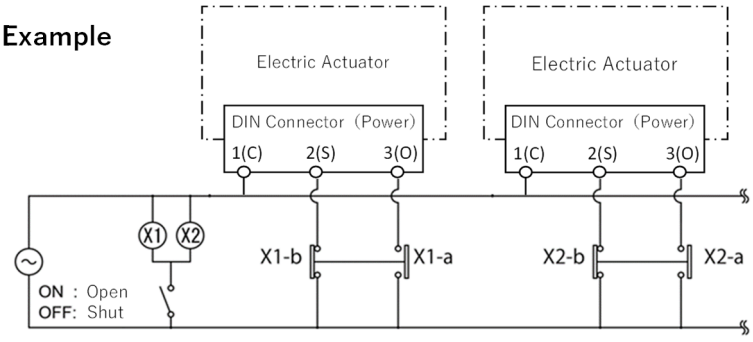
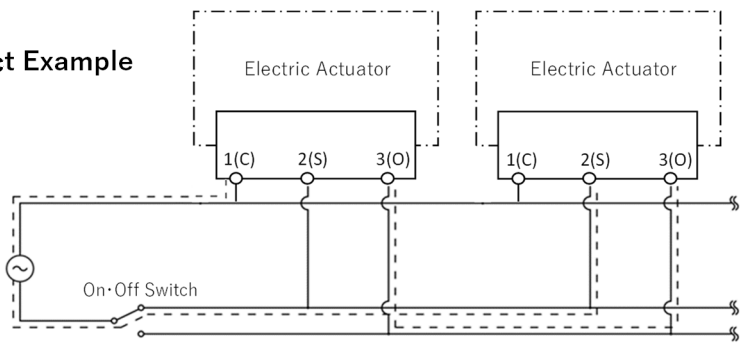


Fig. 4-2
Incorrect Example



5. Piping method

Flanged end

WARNING	
Prohibition	**Serious injury can result.** ▶ When hanging or slinging a valve, pay sufficient attention to safety, and do not enter under the load.
Forcing	**Serious injury can result.** ▶ Be sure to perform safety inspections of the machine tool and power tool beforehand. ▶ Wear appropriate protective equipment according to the type of work being performed.

CAUTION	
Prohibition	**The valve can be damaged or leak.** ▶ Do not over-tighten when piping support is removed with a U-band, etc. ▶ Do not overtighten the union nut. ▶ Do not use a pipe wrench to tighten the union nut. ▶ Do not tighten the bolts and nuts for piping to the specified torque values in Table 5-2.
Forcing	**The valve can be damaged or leak.** ▶ When installing the product, make sure that no excessive stress such as tension, compression, bending or impact is applied to the piping or valve. ▶ Fix the end connector during piping work or disassembly and reassembly. ▶ When attaching the valve to the end of the pipe, be sure to attach the union nut and end connector on the secondary side (downstream side). ▶ When connecting to metal piping, do not apply piping stress to the valve. ▶ Use a connection flange with a full-face seat. ▶ Be sure to use a sealing gasket (AV packing) between the flanges and tighten the pipe bolts/nuts to the specified torque values in Table 5-2 "Flange tightening torque." (When other than AV packing, the tightening torque value will change.) ▶ Keep the axis misalignment and parallelism of the flange surface below the values shown in Table 5-1 "Axis misalignment and parallelism." ▶ Tighten the bolts and nuts for piping diagonally with the specified torque values in Table 5-2.

Preparations	▶ Torque wrench ▶ wrench or ophthalmic wrench ▶ waste cloth ▶ Pipe head bolts/nuts, washers ▶ AV packing

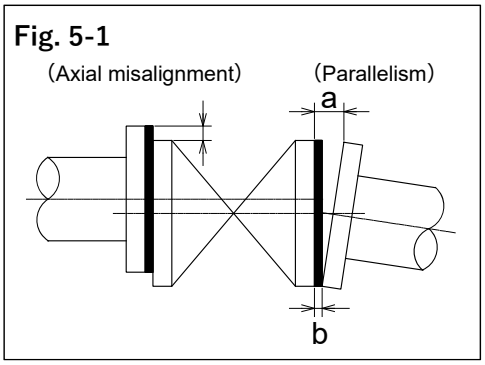
[Procedure]

1) Clean mutual flange surfaces with a waste cloth.
2) Set AV packing between the flanges.
3) Insert the washer and bolt from the connecting flange side. Insert the washer and nut from the valve side and tighten temporarily by hand.
4) Set the axis misalignment and parallelism of the flange surface below the values shown in Table 5-1, "Axis misalignment and parallelism." (See **Fig. 5-1**.)

Table 5-1 Axis misalignment and parallelism Unit: mm (inch)

Nom. Size	Axial Misalignment	Parallelism (a-b)
15-32mm (1/2”-1 1/4”)	1.0 (0.04”)	0.5 (0.02”)
40-80mm (1 1/2”-3”)	1.0 (0.04”)	0.8 (0.03”)
100mm (4”)	1.0 (0.04”)	1.0 (0.04”)

Fig. 5-1

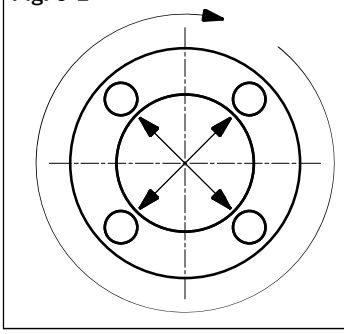


5) Using a torque wrench, gradually tighten the screws diagonally to "**Table 5-2 Flange tightening specified torque values**". (See **Fig. 5-2**.)
6) Tighten it more than two turns clockwise with "**Table 5-2 Flange Tightening Torque Specified Values**". (See **Fig. 5-2**.)

Table 5-2 Flange tightening specified torque values Unit: N-m

DN (mm)	15～20	25～40	50,65	80,100
PTFE coating PVDF coating	17.5	20.0	22.5	30.0
Rubber	8.0	20.0	22.5	30.0

Fig. 5-2



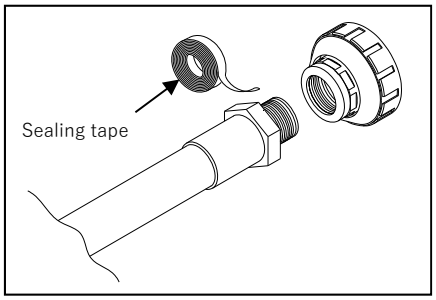
Threaded end

WARNING	
Prohibition	**Serious injury can result.** ▶ When hanging or slinging a valve, pay sufficient attention to safety, and do not enter under the load.
Forcing	**There is a risk of electric shock or injury.** ▶ Be sure to perform safety inspections of the machine tool and power tool beforehand. ▶ Wear appropriate protective equipment according to the type of work being performed.

CAUTION	
Prohibition	**The valve can be damaged or leak.** ▶ Do not overtighten the screws on the connections. ▶ Do not overtighten the union nut. ▶ Do not use a pipe wrench to tighten the union nut.
Forcing	**The valve can be damaged or leak.** ▶ The union nut of this product is lightly tightened to make it easier to loosen. Be sure to remove the end connector before installation. ▶ Install the product so that excessive stress such as tension, compression, bending or impact is not applied to the piping or valve. ▶ Fix the end connector during piping work or disassembly and reassembly. ▶ When attaching the valve to the end of the pipe, be sure to attach the union nut and end connector on the secondary side (downstream side). ▶ When connecting to metal piping, do not apply piping stress to the valve. ▶ Make sure that the screws at the joints are made of resin. ▶ Use sealing tape for the sealing material of the screw-in part. If liquid sealant or liquid gasket is used, stress cracking (environmental stress cracking) may occur.

Preparations □ Sealing tape □ Belt wrench □ wrench

[Procedure]



1) Wrap sealing tape around the male thread of the fitting, leaving approximately 3mm at the end.
2) Loosen the union nut with a belt wrench.
3) Remove the union nut and end connector.
4) Tighten the male thread of the fitting and the end connector until tight.
5) Screw the end connector with a wrench 1/2 to 1 turn to prevent scratching.
6) Check that the O-ring is attached to the body.
7) Bring the end connector and union nut into contact with the body so that the O-ring does not come off.
8) Tighten the union nut by hand until it is tight.
9) Screw in the union nut by 1/4 to 1/2 turn with a belt wrench to prevent damage to the nut.

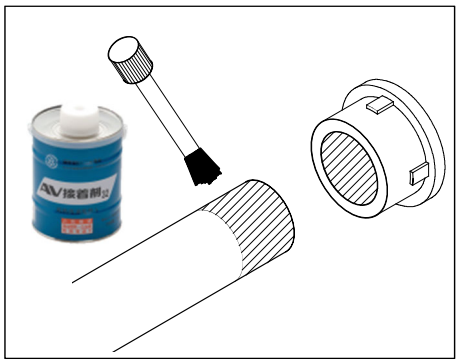
Socket end (adhesive)

WARNING	
Prohibition	**Serious injury can result.** ▶ When hanging or slinging a valve, pay sufficient attention to safety, and do not enter under the load. **Fire or an explosion can result.** ▶ Ensure adequate ventilation when using adhesives and do not use open flames around them.
Forcing	**There is a risk of electric shock or injury.** ▶ Be sure to perform safety inspections of the machine tool and power tool beforehand. ▶ Wear appropriate protective equipment according to the type of work being performed.

CAUTION	
Prohibition	**There is a danger of injury.** ▶ The adhesive contains volatile solvents, so do not inhale odors directly. **The valve can be damaged or leak.** ▶ Do not apply too much adhesive. Excessive adhesive will flow into the valve. ▶ Do not strike the pipe when inserting it into the end connector. ▶ Do not overtighten the union nut. ▶ Do not use a pipe wrench to tighten the union nut.
Forcing	**There is a danger of injury.** ▶ If the adhesive adheres to the skin, remove it immediately. ▶ If you feel worse or feel unusual when using the adhesive, promptly seek a doctor's diagnosis and take appropriate action. **The valve can be damaged or leak.** ▶ The union nut of this product is lightly tightened to make it easier to loosen. Be sure to remove the end connector before installation. ▶ Install the product so that excessive stress such as tension, compression, bending or impact is not applied to the piping or valve. ▶ Fix the end connector during piping work or disassembly and reassembly. ▶ When attaching the valve to the end of the pipe, be sure to attach the union nut and end connector on the secondary side (downstream side). ▶ Be careful when constructing under low temperature, as solvent vapor is less likely to evaporate and tends to remain. ▶ After piping, open both ends of the pipe and use a blower (low-pressure type) to ventilate to remove the solvent vapor. ▶ Use "ASAHI AV Cement" depending on the material. ▶ Perform the water flow test after 24 hours or more have elapsed after completion of bonding.

Preparations ▶ ASAHI AV Cement ▶ belt wrench ▶ waste cloth

[Procedure]



1) Loosen the union nut by hand.
2) Remove the union nut and end connector from the body.
3) Pass the union nut to the pipe side.
4) Wipe off the insertion part of the pipe and the socket part of the end connector with a waste cloth.
5) Refer to "**Table 5-3 Adhesive Consumption (Reference)**" and apply adhesive evenly in the order of the socket part of the end connector and the pipe insertion part.
6) After applying the adhesive, quickly insert the pipe into the end connector and hold it as is for at least 60 seconds.
7) Wipe off any excess adhesive with a waste cloth.
8) Check that the O-ring is correctly installed in the body.
9) Bring the end connector into contact with the body so that the O-ring does not come off.
10) Tighten the union nut by hand until it is tight.
11) Screw in the union nut by 1/4 to 1/2 turn with a belt wrench to prevent damage to the nut.

Table 5-3. Usage of adhesives (reference)

DN (mm)	15	20	25	32	40	50
Amount used (g)	1.0	1.3	2.0	2.4	3.5	4.8

Socket end, spigot end (fusing)

WARNING	
Prohibition	**Serious injury can result.** ▶ When hanging or slinging a valve, pay sufficient attention to safety, and do not enter under the load.
Forcing	**There is a risk of electric shock or injury.** ▶ Be sure to perform safety inspections of the machine tool and power tool beforehand. ▶ Wear appropriate protective equipment according to the type of work being performed.

CAUTION	
Prohibition	**The valve can be damaged or leak.** ▶ Do not overtighten the union nut. ▶ Do not use a pipe wrench to tighten the union nut.
Forcing	**The valve can be damaged or leak.** ▶ The union nut of this product is lightly tightened to make it easier to loosen. Be sure to remove the end connector before installation. ▶ Install the product so that excessive stress such as tension, compression, bending or impact is not applied to the piping or valve. ▶ Fix the end connector during piping work or disassembly and reassembly. ▶ When attaching the valve to the end of the pipe, be sure to attach the union nut and end connector on the secondary side (downstream side).

Preparations ▶ Belt wrench ▶ fusing machine ▶ fusing machine instruction manual

[Procedure]

1) Loosen the union nut by hand.
2) Remove the union nut and end connector from the body.
3) Pass the union nut to the pipe side.
4) From here, refer to the instruction manual of the fusing machine for fusing.
5) Check that the O-ring is correctly installed in the body.
6) Bring the end connector into contact with the body so that the O-ring does not come off.
7) Tighten the union nut by hand until it is tight.
8) Screw in the union nut by 1/4 to 1/2 turn with a belt wrench to prevent damage to the nut.

Product support

	⚠ WARNING
Forcing	**There is a risk of electric shock or injury.** ▶ Be sure to perform safety inspections of the machine tool and power tool beforehand. ▶ Wear appropriate protective equipment according to the type of work being performed.
	⚠ CAUTION

Prohibition	**The valve can be damaged or leak.** ▶ Do not over-tighten when supporting piping with a U-band, etc. ▶ When installing a valve in the piping around the pump, do not cause large vibrations in the valve.
Forcing	**The valve can be damaged or leak.** ▶ Do not over-tighten when supporting piping with a U-band, etc. ▶ Install it vertically when screwing in the Ensat. ▶ For detailed handling of the special tool for installation of the Ensat, refer to the instruction manual of the Ensat manufacturer separately.

Preparations ▶ Spanner ▶ U-band (with bolt) ▶ Rubber sheet

【Horizontal piping】

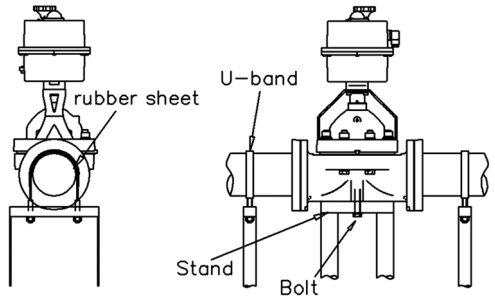
1. When using Ensat and installing supports.

[Procedure]

1) Bolt the Ensat section and the trestle at the bottom of the valve.
2) Place a rubber sheet on the top of the pipe section and secure it with a U-band.

Bolt size

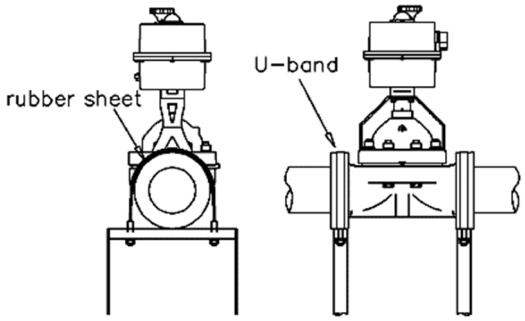
DN (mm)	15～32	40,50	65	80,100
Nominal	M5	M6	M8	M12



2. When installing supports without Ensat (with flanged end connectors).

[Procedure]

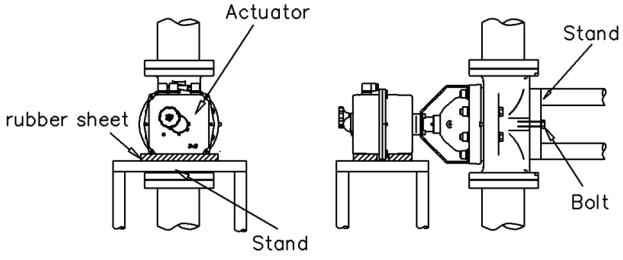
1) Place a rubber sheet on the flange of the valve and secure it with a U-band.



【Vertical piping】

[Procedure]

1) Bolt the Ensat section and the trestle at the bottom of the valve.
2) Lay a rubber sheet on the actuator part and support it with the frame.



6. Electrical Wiring

WARNING	
Prohibition	**There is a risk of electric shock.** ▶ Do not perform wiring while the power is on. ▶ Do not touch any other parts on the board or the terminal block wiring part. ▶ Do not perform wiring work in an environment where rain water or moisture may splash on the wiring work (e.g. Outdoor work in rainy weather). ▶ Do not perform wiring work with wet hands or tools.
Forcing	**There is a risk of electric shock or injury.** ▶ Be sure to perform safety inspections of the machine tool and power tool beforehand. ▶ Wear appropriate protective equipment according to the type of work being performed.

⚠ CAUTION

Prohibition

Doing so may cause the actuator to fail or malfunction.

- ▶ Do not connect multiple (two or more) motorized valves in parallel.
- ▶ Do not use the product near high-voltage lines, inverters, or other objects that generate noise or magnetism.
- ▶ Do not remove the sealing plug that comes with DIN connector. If you are not wiring the signal wire.
- ▶ Securely install DIN connector gasket.

Doing so may cause a short circuit, resulting in a fire.

- ▶ Do not allow the wires of the cable to come into contact with each other.

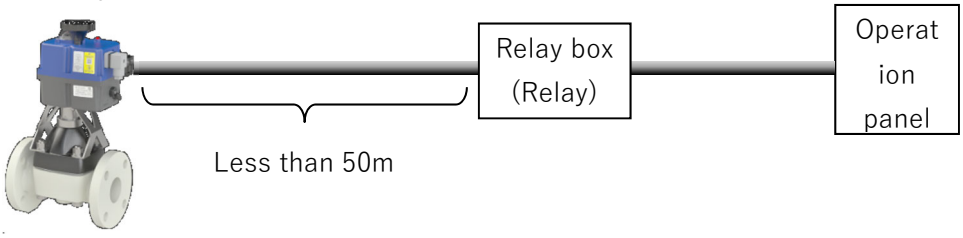
Forcing

There is a risk of electric shock or injury.

- ▶ Keep hands free of moisture and oil during operation.

Doing so may cause the actuator to fail or malfunction.

- ▶ Provide an open/close switch (or relay contact) for each electric valve.
- ▶ Be sure to connect the ground wire.
- ▶ Connect the wires correctly according to the wiring diagram.
- ▶ Perform the wiring work without insulation failure.
- ▶ Connect the wires so that the conductors of the lead wires do not come into contact with each other.
- ▶ Securely tighten DIN connector. For outdoor use, etc., where it will be exposed to rain water or water drops.
- ▶ After wiring, make sure that the screws (crimp terminals, etc.) are not tightened or loosened.
- ▶ This product supports universal power supply. Use the product within the specified power supply voltage.
- ▶ Keep the devices connected to the limit switch (non-voltage contact) for open/close signals within the contact capacitance (1A).
- ▶ Use a power line of 50 m or less as a guide for connecting.
- ▶ When the distance from the switchboard to the actuator exceeds 50 meters, connect between them through relays (mechanical relays) and limit the distance from the relay to the actuator to 50 meters or less.



Otherwise, the actuator may not operate or the open and closed contacts may not operate.

- ▶ The inside of the actuator is constantly controlled by the temperature. After installation of the piping, turn on the power (fully open or closed).
- ▶ The open and closed contacts (relay contacts) are switched by relays inside the actuator. Supply electricity (24～240VAC) to the power supply when using the product.

Preparations	▶ Precision Phillips screwdriver	▶ wire stripper	▶ water pump pliers
	▶ Crimp terminal	▶ Terminal crimping tool	▶ hex key
	▶ Electric knife		

[Procedure]

1) Remove the DIN connector screwed to the actuator using an Allen wrench. (Do not lose the gasket and the O-ring attached to the hex bolt.)

2) Disassemble the DIN connector. (The DIN connector cannot be disassembled without removing the hexagonal bolt.)
* Please remove the sealing plug.

3) Thread the end of the cable through the connector.

4) Using an electrician's knife and wire stripper, strip the outer skin off the end of the cable

5) Attach a stick terminal to the end of the cable using crimping pliers.
*We recommend using bar terminals, but if you wish to tie the cable without using bar terminals, twist the end of the cable so that the cable whiskers do not stick out.

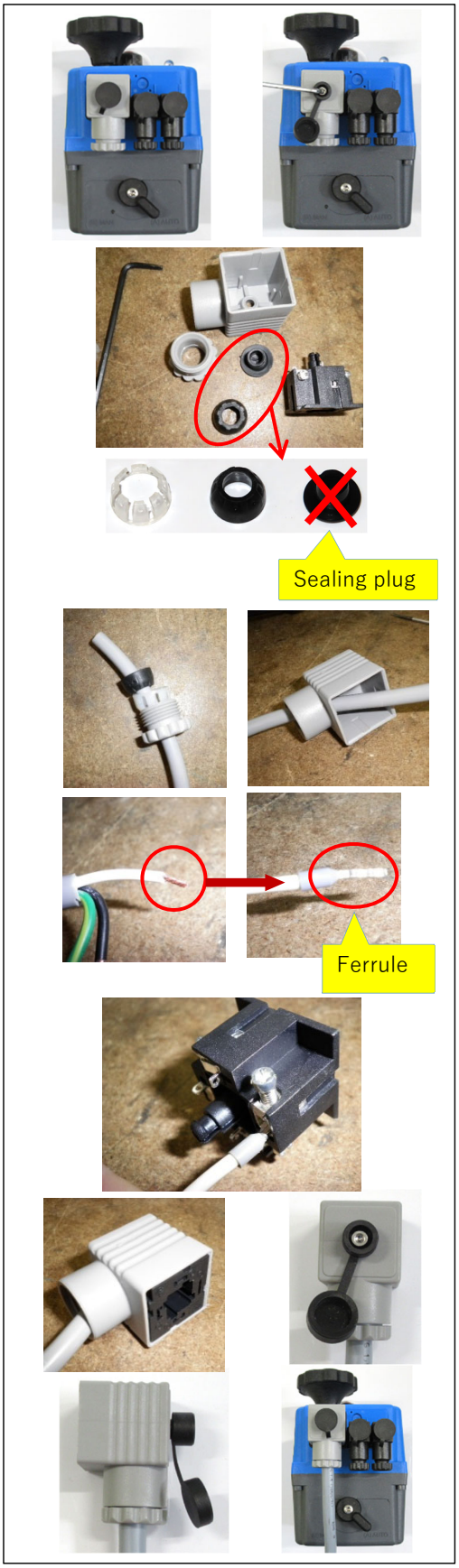
6) Using a Phillips or flathead screwdriver, connect the wires to the plug terminals according to the wiring diagram shown on Wiring Diagram.

7) Install the plug cover and thread the hexagonal bolt.

8) Tighten the plug connector using water pump pliers.

9) Attach a gasket to the DIN connector and connect it to the actuator.

10) Tighten the bolts using an Allen wrench.

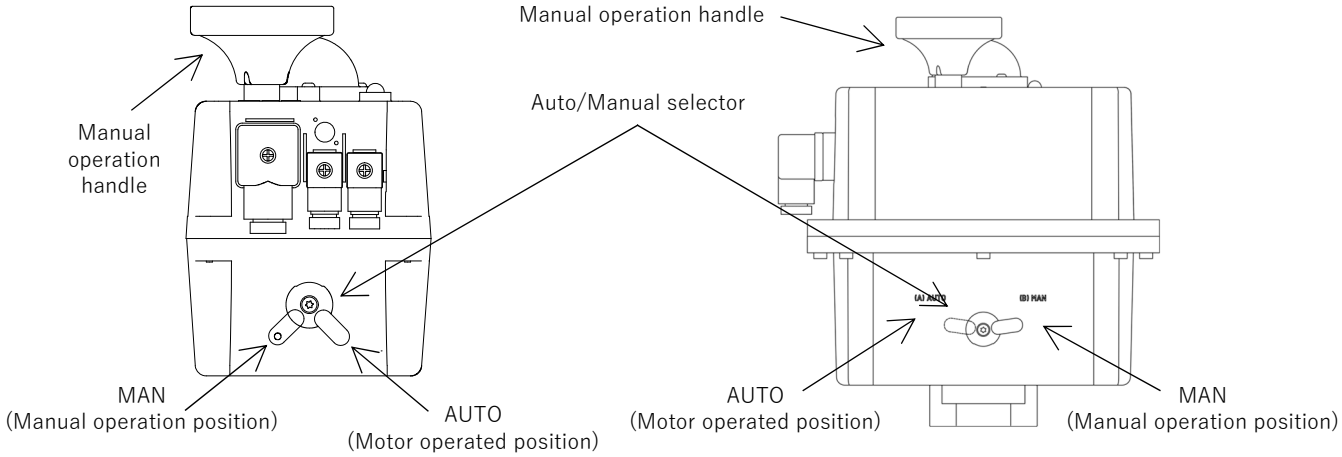


7. Commissioning method

WARNING	
Prohibition	**Serious injury can result.** ▶ Never touch any moving parts (valves and actuators) during operation.
Forcing	**There is a risk of electric shock or injury.** ▶ Be sure to perform safety inspections of the machine tool and power tool beforehand. ▶ Wear appropriate protective equipment according to the type of work being performed.

CAUTION	
Prohibition	**You may be electrocuted or injured.** ▶ Do not perform electric operation with the actuator cover open. ▶ Do not perform manual operation while the power is on. ▶ Perform manual operation after confirming that the actuator is not operated by the motor. **Doing so may damage the actuator and the bonnet.** ▶ Do not turn the manual override further than necessary from the fully open and fully closed positions.
Forcing	**There is a risk of electric shock or injury.** ▶ Keep hands free of moisture and oil during operation. **Doing so may cause the actuator to fail or malfunction.** ▶ Confirm that Auto/Manual selector switch (A/M selector switch) is completely switched to the manual operation before operating the manual operation. ▶ If you notice an unusual odor, heat, or smoke, immediately turn off the power supply. If any abnormality is found, be sure to consult your dealer or us for inspection. ▶ This product uses a switching power supply circuit. If there is a concern about the effects of noise, be sure to check the peripheral devices for malfunctions beforehand.

Manual operation



[Procedure]

1) Switch Auto/Manual selector to MAN (manual override position).
2) Turn the handle on the ceiling.
- ▶ Clockwise : Valve closing direction
- ▶ Counterclockwise: Valve opening direction

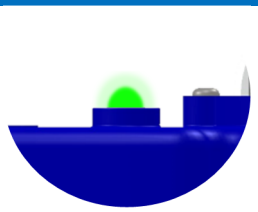
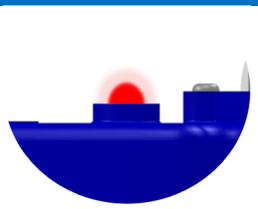
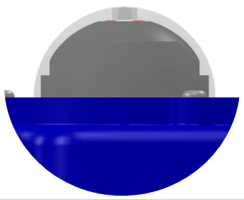
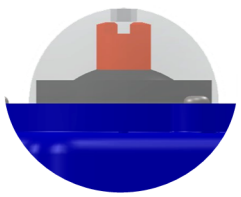
3) When manual operation is completed, switch Auto/Manual selector to AUTO (electric operation position).

Electric operation

[Procedure]

1) Make sure that Auto/Manual selector is in AUTO position.
2) Apply power to operate the valve fully open or fully closed.
3) Check that the operated orientation matches the color of LED light on the actuator.
4) Fully open or closed to turn off the power.

[Identifying LED lights and dome-shaped indicators]

aperture indication	OPEN	CLOSE
LED Lamp		
	Green light	Red light
Dome Shape Indicator		
	Black Indicator	red indicator

8. How to disassemble/assemble for parts replacement

WARNING	
Prohibition	**There is a risk of electric shock or injury.** ▶ Do not disassemble the actuator. ▶ Do not connect or separate lines when the power is on. Also, do not touch any other parts on the PCB or the terminal block wiring part. ▶ Never touch moving parts (valve and actuator) during operation. ▶ Do not disassemble or assemble the product while the power is on.
Forcing	**Serious injury can result.** ▶ If the work is to be performed with the piping in place, completely drain the fluid in the piping. If the fluid does not come out, set the fluid pressure to zero. ▶ A little fluid remains in the valve. Wear protective gloves and eye protection. ▶ Be sure to perform safety inspections of the machine tool and power tool before starting operation. ▶ Wear appropriate protective equipment for the work details when installing piping.

CAUTION	
Prohibition	**There is a danger of injury.** ▶ Do not perform manual operation with the power on. **Doing so may damage the actuator.** ▶ Do not turn the manual override further than necessary from the fully open and fully closed positions.
Forcing	**Doing so may cause the actuator to fail or malfunction.** ▶ Confirm that Auto/Manual selector switch (A/M selector switch) is completely switched to the manual operation before operating the manual operation. ▶ If you notice an unusual odor, heat, or smoke, immediately turn off the power supply. If any abnormality is found, be sure to consult your dealer or us for inspection. ▶ Tighten DIN connectors securely. ▶ Be sure to install DIN connector gasket.

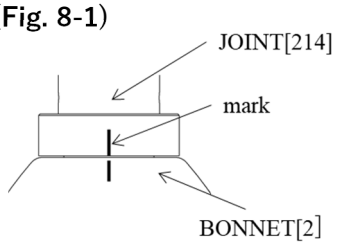
Preparations	▶ Protective gloves ▶ Protective goggles ▶ torque wrench ▶ glasses wrench (2 pcs) ▶ Spanner (15～50mm: 14 across flats, 65～100mm: 17 across flats)

Disassembly

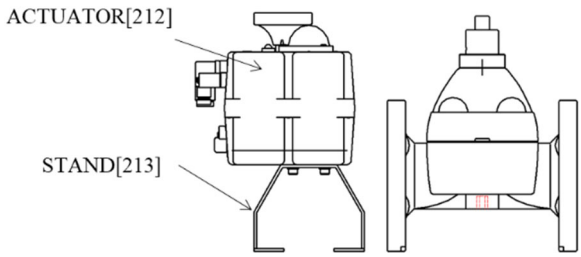
[Procedure]

1) Completely drain the fluid in the piping.
2) Move the valve to the fully open position by motor operation.
3) Mark joint [214] and bonnet [2] with an mark. (See **Fig.8-1**)
4) Turn off the power.
5) Completely loosen bolts and nuts [18] between body [1] and bonnet [2].
6) Remove actuator parts [212] and [213]. (**Fig.8-2**)
7) Use a wrench to turn Joint [214] clockwise with reference to the number of rotations in the table below.

(Fig. 8-1)



(Fig. 8-2)



Size (mm)	15,20	25,32	40,50	65	80,100
Rotational speed (reference)	3	4	5	9	10

8) Remove the diaphragm [3] by turning it 90°.

Assembly

[Procedure]

9) Make the diaphragm [3] the shape shown in **Fig. 8-3**.

10) Attach the diaphragm [3] by turning it 90°. Check that the pin of the Inserted metal of diaphragm is completely engaged with the joint.

11) Make the diaphragm [3] in the shape shown in **Fig. 8-4**.

12) Turn wrench counterclockwise until Joint [214] stops rotating.

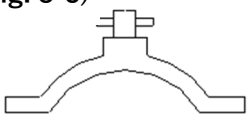
13) Turn the crown clockwise 1/2 turn back to align the marks.

14) Mount the actuator part [212] and [213] and bonnet part in the reverse order of 6) and 7).

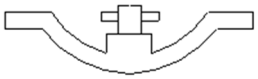
15) Tighten the bolts and nuts [18] and [90] between the body [1] and the bonnet [2] to the "bonnet tightening torque value" with a torque wrench in a diagonal line.

16) Tighten the bonnet in a clockwise direction with a tightening torque value of 2 turns or more.

(Fig. 8-3)



(Fig. 8-4)



Bonnet tightening torque value

Unit: N-m

Size / Diaphragm	15, 20mm	25, 32mm	40mm	50mm	65mm	80mm	100mm
Rubber	3	5	12	15	13	18	35
PTFE	5	8	15	20	15	20	40

9. Inspection item

CAUTION	
Forcing	**Fluid may leak from the valve or the actuator may fail.** ▶ Maintenance should be performed every 3 to 6 months as a guide in order to keep the watch in normal condition and use it for a long time. Pay particular attention to temperature changes and aging during long-term storage or shutdown or use. **You may be electrocuted or injured.** ▶ Turn off the power before removing the actuator cover. ▶ When removing the valve from the piping when replacing the valve or parts, completely remove the fluid from the piping before starting work. ▶ If any trouble is found, take the appropriate action referring to "**13. Cause of malfunction and remedy**".

Daily inspection

Inspection Items and Methods	Guideline of judgment	Check point	Treatment method
External leakage (visual inspection)	No leakage	[Flanged end] Pipe flange connection	1. Retighten the pipe bolts to the specified torque. 2. Remove the valve from the pipe and re-tighten the pipe bolts. (Ref: 5. Piping method [Flanged end])
		[Socket end] Adhesive construction section	Remove the valve from the piping and retry the bonding process. (Ref: 5. Piping method [Socket end])
		[Threaded end] Threaded connection	Remove the valve from the piping and screw the valve in again. (Ref: 5. Piping method [Threaded end])
		Valve body and bonnet connection	Retighten the bolts to the specified torque. (Ref: 8. How to disassemble/assemble for parts replacement)
		Union nut portion of the valve	1. Retighten the Union nut 2. Remove the valve from the piping, check the O-ring and sealing surface, and replace the defective part. (Ref: 5. Piping method)
Internal leakage (visual and measurement)	No leakage	Leakage to secondary side when valve is fully closed	Remove the valve from the piping and replace the valve or defective part. (Ref: 8. How to disassemble/assemble for parts replacement)
		Measured values of flowmeters, pressure gauges, etc.	Remove the valve from the piping and replace the valve or defective part. (Ref: 8. How to disassemble/assemble for parts replacement)
Abnormal noise (hearing)	No unusual noises	Valves and actuators	Remove the valve from the pipe and replace the valve or actuator. (Ref: 8. How to disassemble/assemble for parts replacement)
		Piping around the valve	Reconfirm the conditions of use (Ref: 2. Safety Instructions)
Odor ※1) (sniffing)	No unusual odors.	Valves and actuators	Remove the valve from the pipe and replace the valve or actuator. (Ref: 8. How to disassemble/assemble for parts replacement)
Switching action (visual inspection)	Open and close normally	Valves and actuators	Remove the valve from the pipe and replace the valve or actuator. (Ref: 8. How to disassemble/assemble for parts replacement)

※1) Failure to do so may result in burnout or fire.

Periodic inspection

• Guideline for the inspection cycle: 3 months

Inspection Items and Methods	Guideline of judgment	Check point	Remedy for malfunctions
Loose bolts (visual and palpation)	No looseness	For mounting base + valve	Retighten the mounting bolts with the following torque. (Ref: 8. How to disassemble/assemble for parts replacement)
Vibration (palpation)	No difference from other places.	Valves and actuators	Recheck the operating conditions and remove the source of vibration. (Ref: 2. Safety Instructions)
			Remove the valve from the pipe and replace the valve or actuator. (Ref: 8. How to disassemble/assemble for parts replacement)
		Piping around the valve	Recheck the operating conditions and remove the source of vibration. (Ref: 2. Safety Instructions)

•Guideline of the inspection cycle: 6 months

Inspection Items and Methods	Guideline of judgment	Check point	Remedy for malfunctions
Operability (feel) of manual handle	To turn smoothly	Manual operation unit	Remove the valve from the pipe and replace the valve or actuator. (Ref: 8. How to disassemble/assemble for parts replacement)
Loose bolts (visual and palpation)	No looseness	For mounting base + actuator	Retighten the mounting bolts with the following torque. Nominal diameter 15～50mm: 5.2N-m 65～100mm: 12.5N-m
		DIN Connecter	Retighten the screws with the following torques Nominal diameter 15～100mm:1 to 1.5 N-m
		[Flange type] For flange piping	Retighten the pipe bolts to the specified torque. (Ref: 5. Piping method [Flange type])
Product damage	No scratches, cracks, or deformation	Appearance of the product	Remove the valve from the pipe and replace the valve or actuator. (Ref: 8. How to disassemble/assemble for parts replacement)

10. Cause of malfunction and remedy

⚠ CAUTION	
Forcing	**You may be electrocuted or injured.** ▶ If any malfunction is found, immediately stop using the product and take appropriate action. ▶ When removing the valve from the piping when replacing the valve or parts, completely remove the fluid from the piping before starting work. ▶ Turn off the power before removing the actuator cover.

Failure phenomenon	Possible cause	Measures and measures
The handle does not turn (cannot turn) during manual operation.	The valve is already fully open (or fully closed).	Rotate the handle in the opposite direction (Ref: 7. Commissioning method)
	Foreign matter caught in valve	Remove the valve from the piping, disassemble it, and remove foreign matter. (Ref: 8. How to disassemble/assemble for parts replacement)
	Piping stress is applied to the valve.	Remove the piping stress
	The torque of the valve has increased due to the effects of the fluid (temperature, components, pressure, etc.)	Reconfirm the conditions of use (Ref: 2. Safety Instructions)
Do not open or close with electric operation	The power is off.	Check the voltage and turn on the power.
	The wiring to DIN connector is disconnected.	Stop operation immediately and recheck the connection status. (Ref: 6. Electrical wiring method)
	The cable connection is broken.	Replace the cable
	Simultaneous switching energizing or incorrect wiring to the terminal block	Stop operation immediately and recheck the connection status. (Ref: 4. Product specifications [Wiring diagram])
	The power supply voltage is different.	Check the voltage with a tester to obtain the correct voltage.
	Power supply voltage is low.	Check the voltage with a tester to obtain the correct voltage.
	Foreign matter caught in valve	Remove the valve from the piping, disassemble it, and remove foreign matter. (Ref: 8. How to disassemble/assemble for parts replacement)

Cause of malfunction and remedy (continued)

Failure phenomenon	Possible cause	Measures and measures
Do not open or close with electric operation	Piping stress is applied to the valve.	Remove the piping stress
	The torque of the valve has increased due to the effects of the fluid (temperature, components, pressure, etc.)	Reconfirm the conditions of use (Ref: 2. Safety Instructions)
	Components inside the actuator, such as motor, PCB and capacitor, are faulty.	Stop using the product immediately and replace the actuator. (Ref: 8. How to disassemble/assemble for parts replacement)
	Water or foreign matter has entered the actuator causing a short circuit.	Stop using the product immediately and replace the actuator. (Ref: 8. How to disassemble/assemble for parts replacement)
	The manual override is in the [MAN] position.	Switch the manual selector to the [AUTO] position. (Ref: 7. Commissioning method)
Fluid leaks even when fully closed (internal leak)	High fluid pressure	Use below the maximum allowable pressure (Ref: 8. How to disassemble/assemble for parts replacement)
	Scratches on diaphragm or body (damaged)	Remove the valve from the piping, replace the relevant part, or replace the valve. (Ref: 8. How to disassemble/assemble for parts replacement)
	The diaphragm is worn out.	Remove the valve from the piping, replace the relevant part, or replace the valve. (Ref: 8. How to disassemble/assemble for parts replacement)
	Missing parts	Remove the valve from the piping and attach the relevant part or replace the valve. (Ref: 8. How to disassemble/assemble for parts replacement)
	Foreign matter caught in valve	Remove the valve from the piping, disassemble it, and remove foreign matter. (Ref: 8. How to disassemble/assemble for parts replacement)
	Piping stress is applied to the valve.	Remove the piping stress

Cause of malfunction and remedy (continued)

Failure phenomenon	Possible cause	Measures and measures
Fluid leaks from valve (external leak)	Bolts and nuts between the body and bonnet are loose	Retighten to the specified torque (Ref: 8. How to disassemble/assemble for parts replacement)
	Scratches on diaphragm or body	Stop using the product immediately, remove the valve from the piping, replace the relevant part, or replace the valve. (Ref: 8. How to disassemble/assemble for parts replacement)
	Foreign matter caught between diaphragm and body	Stop using the product immediately, remove the valve from the piping, replace the relevant part, or replace the valve. (Ref: 8. How to disassemble/assemble for parts replacement)
	Have a diaphragm	Stop using the product immediately, remove the valve from the piping, replace the relevant part, or replace the valve. (Ref: 8. How to disassemble/assemble for parts replacement)
	Union nut is loose	Retighten the Union nut (Ref: 5. Piping method)
	O-ring is scratched, worn, melted, or altered	Stop using the product immediately, remove the valve from the piping, replace the relevant part, or replace the valve. (Ref: 8. How to disassemble/assemble for parts replacement)
	Scratches or wear are found on the sliding or fixing surfaces of the O-ring.	Stop using the product immediately, remove the valve from the piping, replace the relevant part, or replace the valve. (Ref: 8. How to disassemble/assemble for parts replacement)
	Valve is cracked or broken	Stop using the product immediately, remove the valve from the piping, and replace the valve. (Ref: 8. How to disassemble/assemble for parts replacement)

Cause of malfunction and remedy (continued)

Failure phenomenon	Possible cause	Measures and measures
Actuator is operating but valve is not open or closed	Damaged stem, sleeve or fitting	Stop using the product immediately, remove the valve from the piping, replace the relevant part, or replace the valve. (Ref: 8. How to disassemble/assemble for parts replacement)
The actuator emits a bad smell, heat, or smoke.	Actuator is defective	Stop using the product immediately, remove the valve from the piping, and replace the actuator. (Ref: 8. How to disassemble/assemble for parts replacement)
	Wrong connection to the terminal block	Stop using the product immediately, remove the valve from the piping, and replace the actuator. (Ref: 8. How to disassemble/assemble for parts replacement)
	An overcurrent is flowing to the actuator	Stop using the product immediately, remove the valve from the piping, and replace the actuator. (Ref: 8. How to disassemble/assemble for parts replacement)
	The actuator is affected by lightning.	Stop using the product immediately, remove the valve from the piping, and replace the actuator. (Ref: 8. How to disassemble/assemble for parts replacement)
Actuator is corroded	The watch is exposed to water, chemical liquids, or other liquids.	Stop using the product immediately, remove the valve from the piping, and replace the actuator. (Ref: 8. How to disassemble/assemble for parts replacement)
Valve is corroded or deformed	The watch is exposed to water, chemical liquids, or other liquids.	Stop using the product immediately, remove the valve from the piping, and replace the valve. (Ref: 8. How to disassemble/assemble for parts replacement)

11. Disposal method of residual materials and waste materials

WARNING	
Forcing	**When burnt, toxic gas is generated.** ▶ When disposing of the product or parts, please dispose of them according to the guidelines of each local authority by a professional disposal company.

Inquiries

Contact the nearest dealer, our sales office, or our web website for inquiries about this product.

[User's Manual]

Diaphragm valve Type 14
True union diaphragm valve Type 14
Electric actuated Type J

https://www.asahi-yukizai.co.jp/en

Please note that the content of this manual is subject to change without notice. **April 2024**