Ball valve Type 21/21α
Electric actuated Type T
15～100mm

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.

Handling of products

⚠ Warning	
Prohibition	**Serious injury can result.** ▶ Do not disassemble the actuator. ▶ Do not touch moving parts during operation with hands, feet or tools.
Forcing	**There is a danger of injury.** ▶ 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. ▶ 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.

⚠ 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.

⚠Caution

Forcing

There is a danger of injury.
The valve can be damaged or leak.

▶ This valve is structurally dead space. Vaporizing fluids such as hydrogen hydroxide (H_2O_2) and soda hypochlorite (NaClO) may vaporize in the deadspace and cause an abnormal pressure rise inside the valve. Be very careful. (Gas with abnormal pressure increase due to vaporization is a compressible fluid. Therefore, if a valve should break, fragments will scatter explosively, which is very dangerous.)

There is a danger of injury.

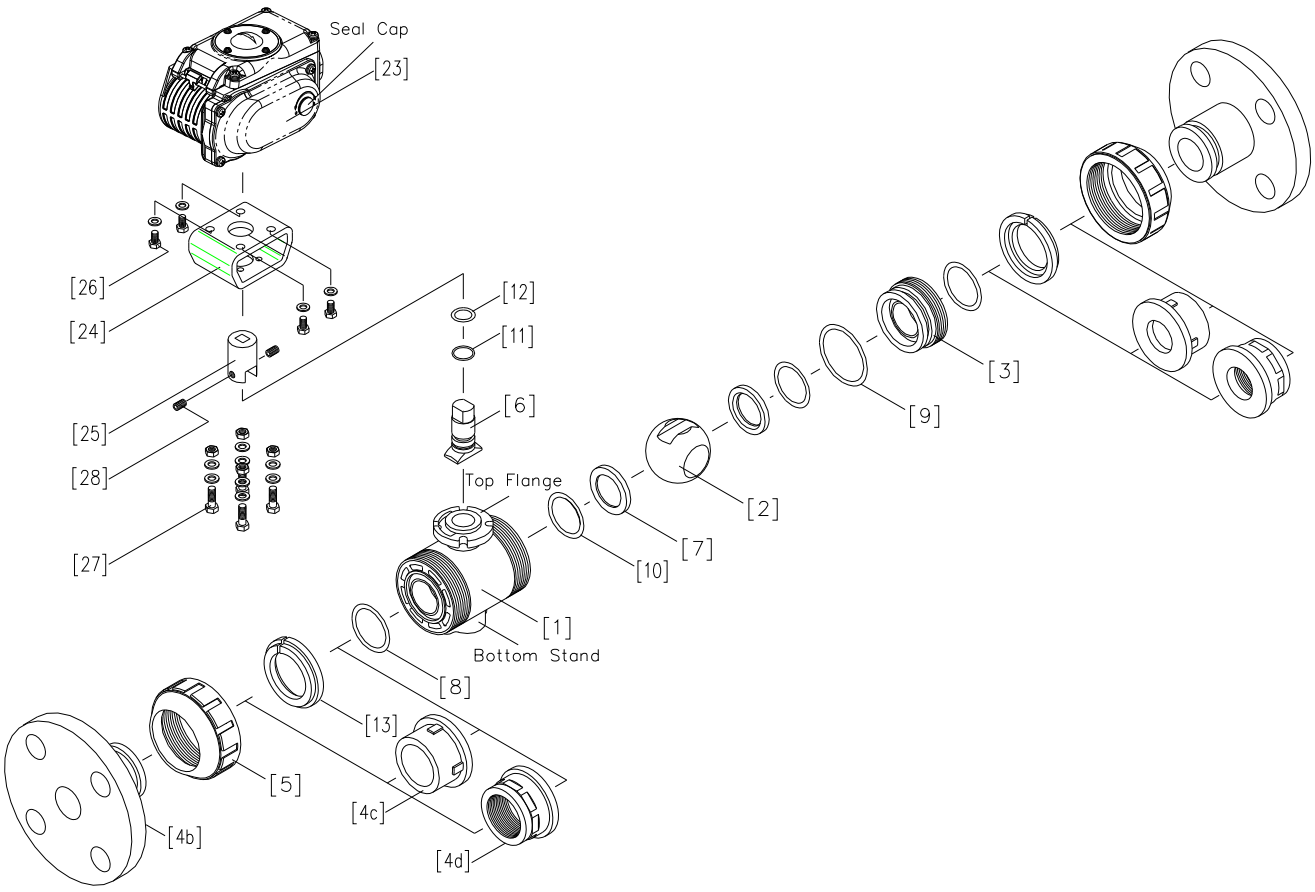
▶ Use the supplied handle or a tool specified by the manufacturer for manual operation.
▶ When performing manual operation, make sure that the actuator is not operated by the motor.
▶ Secure sufficient space for maintenance and inspection when piping.

The valve can be damaged or leak.

▶ Check the voltage on the power supply and nameplate before use.
▶ 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.
▶ During operation, the surface temperature of the actuator may rise due to heat generated by internal equipment. Pay attention to the opening/closing frequency so that the temperature does not exceed the allowable range.
▶ 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 "16. Inspection items". Pay particular attention to temperature changes and aging during long-term storage or shutdown or use.
▶ If internal leakage occurs when the valve is fully closed, adjust the stopper.
▶ 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.
▶ If the valve is used at an intermediate position, the mark of the ball opening will remain on the seat (PTFE), and sealing performance may temporarily deteriorate when the valve is fully closed. Therefore, it is recommended to use the valve fully open or closed.
▶ 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

Nominal size 15～50mm

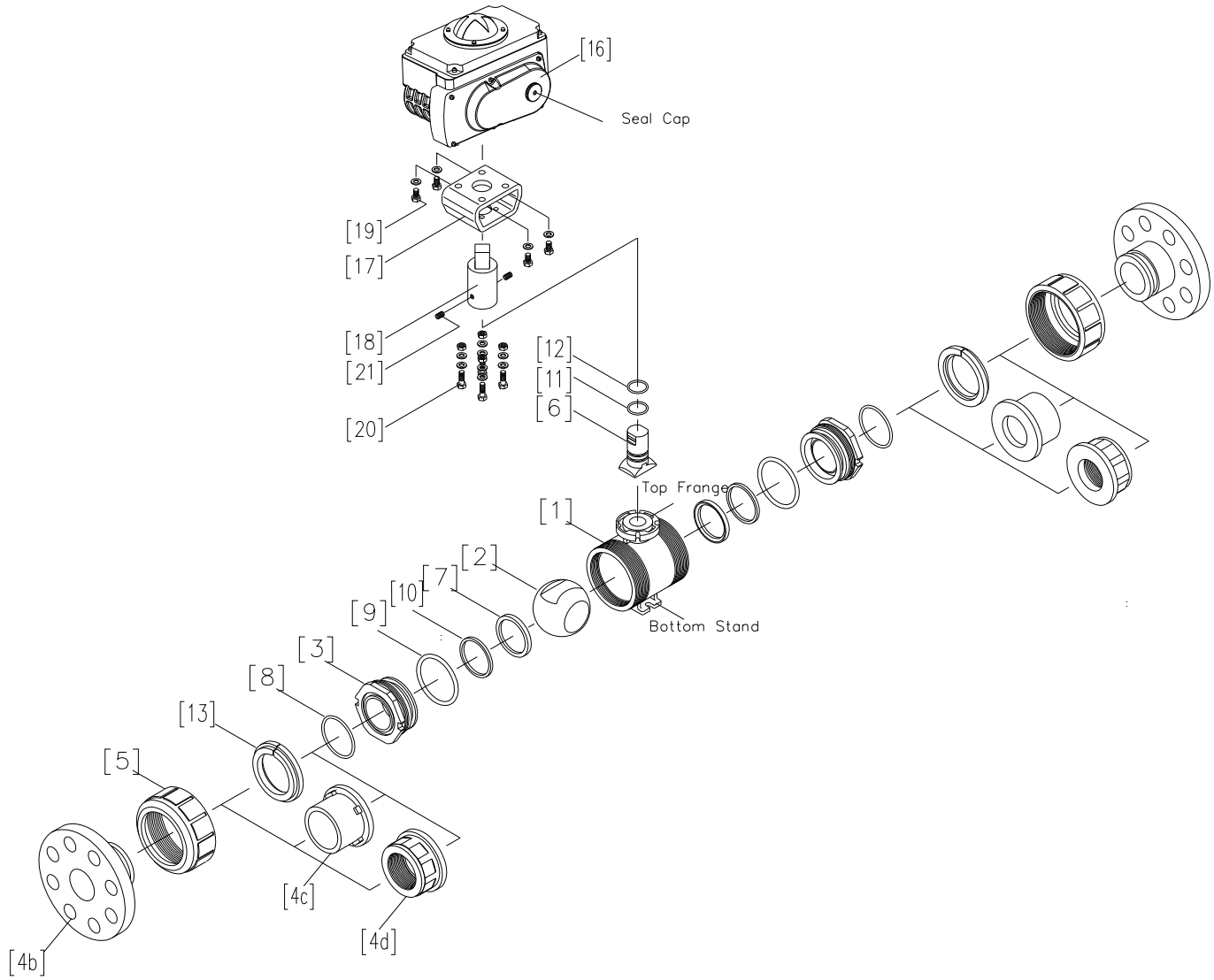


[1]	Body *1)	[6]	Stem *1)	[13]	Stop ring
[2]	Ball *1)	[7]	Seat *1)	[23]	Actuator
[3]	Carrier*1)	[8]	O-ring (A)	[24]	Mounting base
[4b]	End connector (Flange type)	[9]	O-ring(B) *2)	[25]	Fitting
[4c]	End connector (socket type)	[10]	O-ring(C) *2)	[26]	Bolt (A)
[4d]	End connector (threaded type)	[11]	O-ring (D)	[27]	Bolt/nut (B)
[5]	Union nut	[12]	O-ring (E)	[28]	Screw (B)

*1) The 21 and 21α types are not interchangeable.

*2) The 21 and 21α types are partially incompatible. Contact us for details.

Nominal size 65～100mm



[1]	Body	[6]	Stem	[13]	Stop ring
[2]	Ball	[7]	Seat	[16]	Actuator
[3]	Carrier	[8]	O-ring (A)	[17]	Mounting base
[4b]	End connector (Flange type)	[9]	O-ring (B)	[18]	Fitting
[4c]	End connector (socket type)	[10]	Cushion	[19]	Bolt
[4d]	End connector (threaded type)	[11]	O-ring (C)	[20]	Bolts and nuts
[5]	Union nut	[12]	O-ring (D)	[21]	Screw

4. Product Specifications

Model number table

ACTUATION	TYPE	ACTUATOR TYPE	POWER SOURCE	BODY MATERIAL	SEAL MATERIAL	CONNECTION	STANDARD	SIZE	HIGH PURITY SERIES /SPACE HEATER
A	* *	T	*	*	*	*	*	* * *	*
A AUTOMATIC VALVE	21 TYPE 21 2A TYPE 21a	T TYPE T	1 Single-Phase 100VAC 2 Single-Phase 200VAC	U PVC C C-PVC P PP F PVDF	E EPDM V FKM	S SOCKET N THREADED P SPIGOT F FLANGED	J JIS D DIN A ANSI 1 JIS 10K 5 JIS 5K	015 15mm 020 20mm 025 25mm 032 32mm 040 40mm 050 50mm 065 65mm 080 80mm 100 100mm	BLANK NO LUBRICANT NO SPACE HEATER 1 LUBRICANT FREE NO SPACE HEATER 0C NO LUBRICANT WITH SPACE HEATER 1C LUBRICANT FREE WITH SPACE HEATER

NOTE

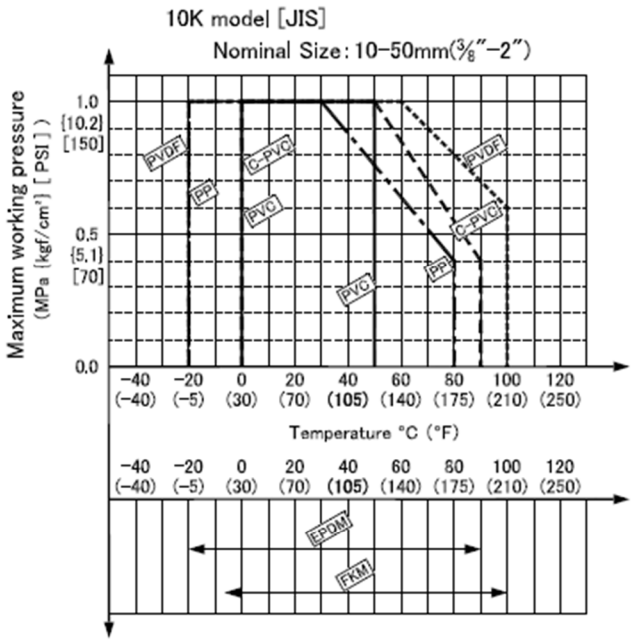
- JIS standard socket-type of the body material PVDF is not manufactured.
- JIS standard socket-type 32mm with PP body material is not manufactured.
- The Nominal size 65～100mm are equipped with space-heaters as standard.

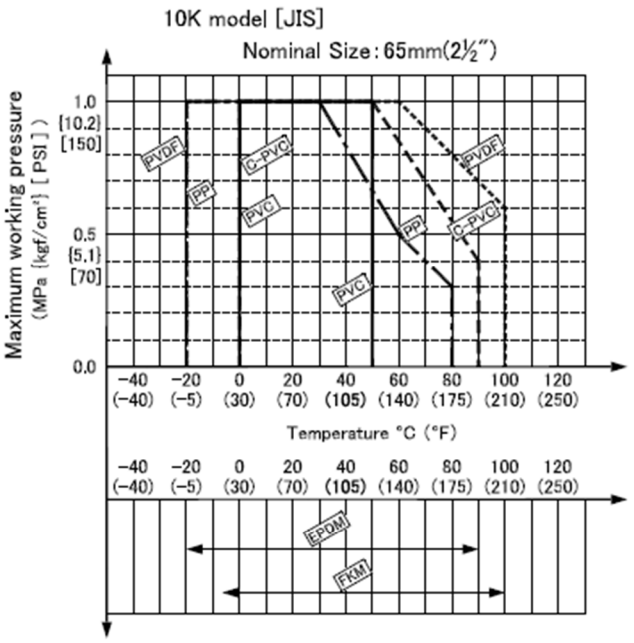
Valve

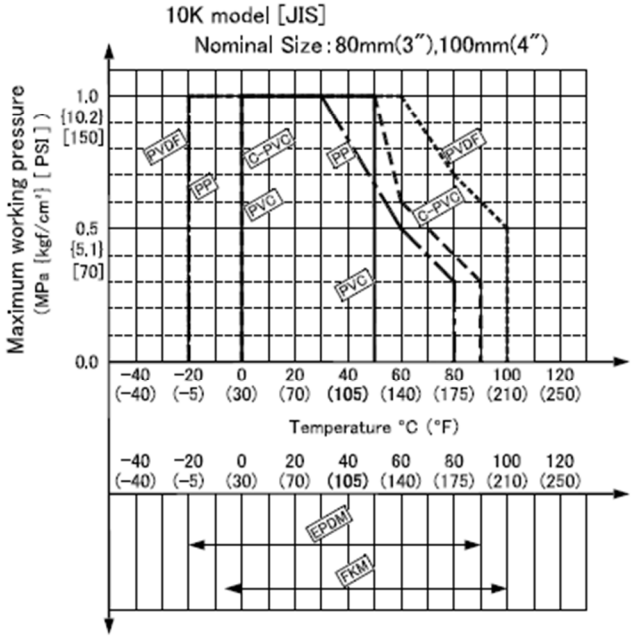
Body material / Nominal size	U-PVC	C-PVC	PP	PVDF
15～50mm	Type 21α		Type 21	
65～100mm	Type 21		Type 21	

Relationship between maximum allowable pressure and temperature

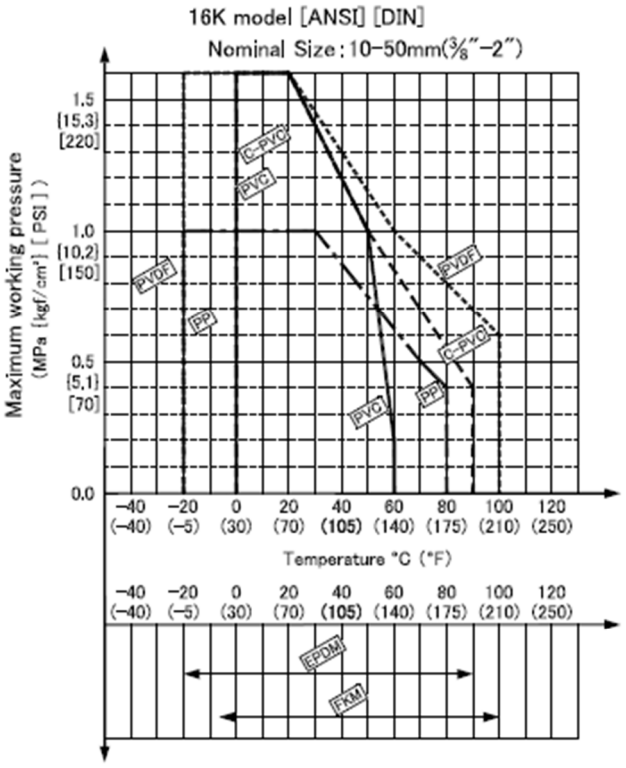
・Connecting standard is other than DIN/ANSI

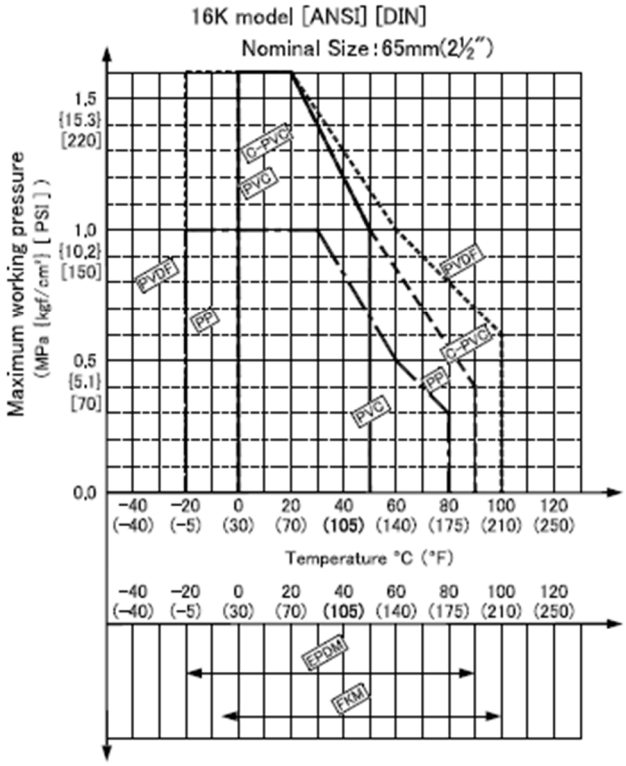


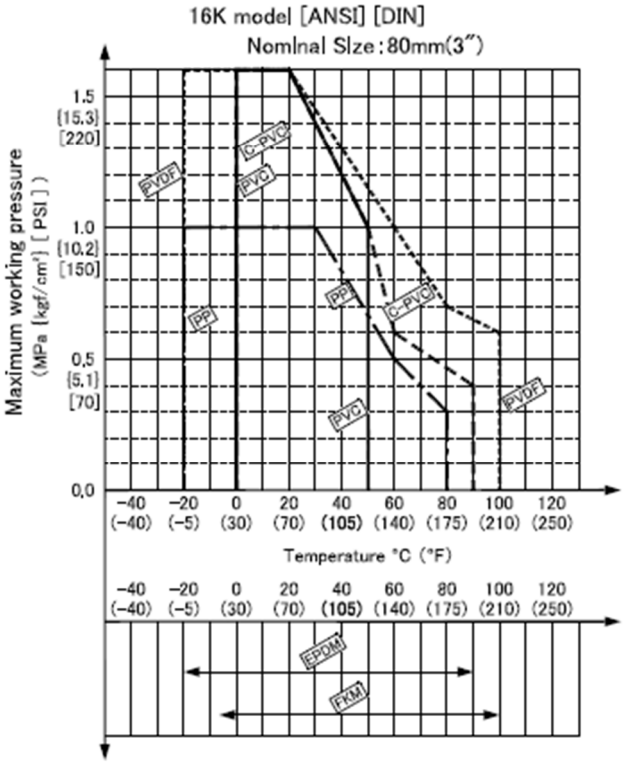


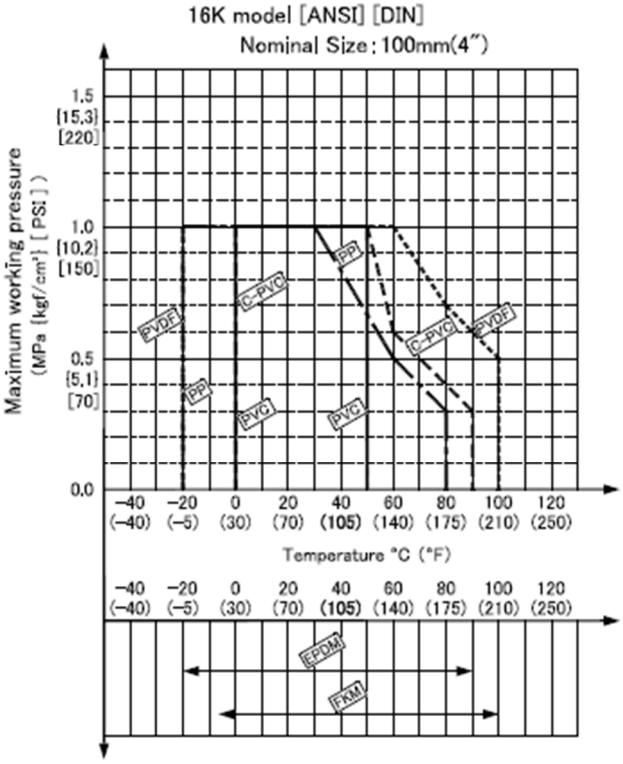


・When the connecting standard is DIN/ANSI









Actuator

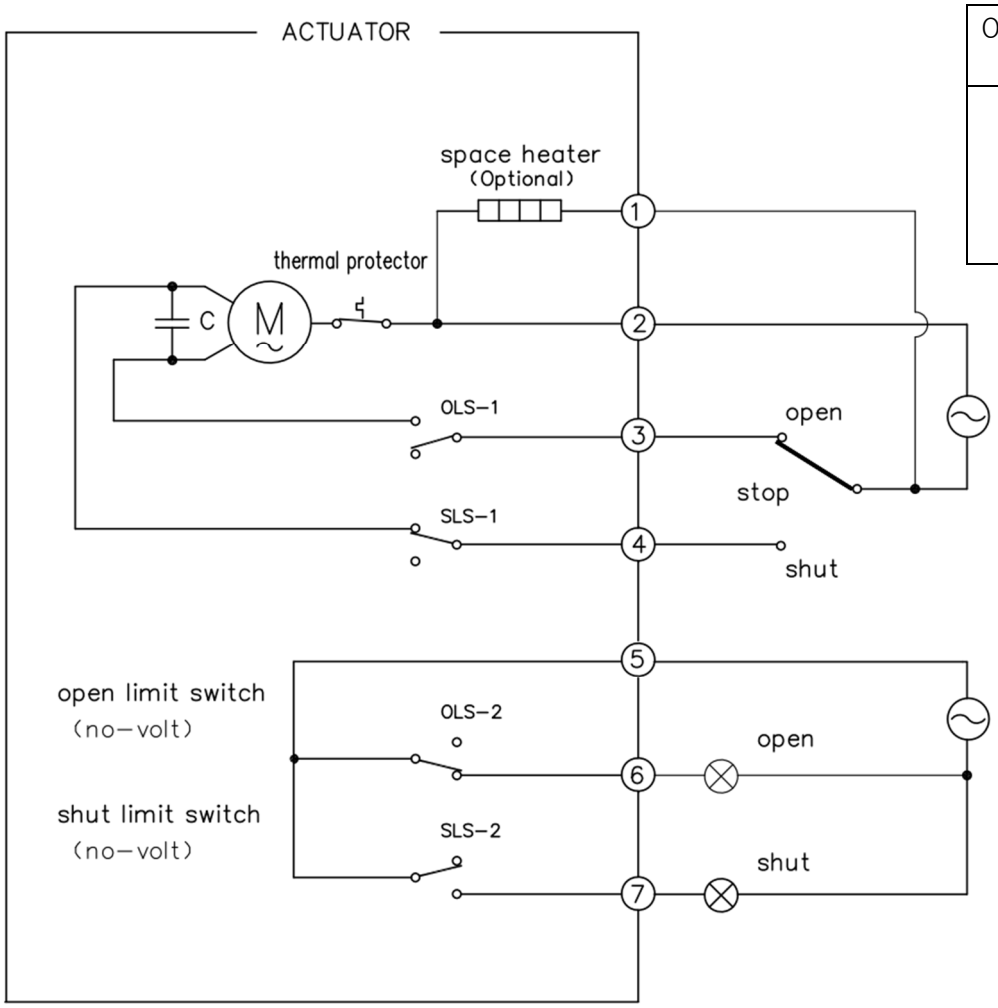
Applicable Nominal size (mm)		15～50	65～100
Actuator model		T-00	T-0
Open/close time (sec)	50Hz	10	25
	60Hz	8	20
Degree of protection		Protection class 5 jet-proof type (IP65 equivalent)	Protection class 5 jet-proof type (IP65 equivalent)
Motor start current (A) 50/60Hz	100VAC	0.80/0.80	1.20/1.20
	110VAC	1.00/1.00	1.40/1.40
	200VAC	0.50/0.50	0.50/0.50
	220VAC	0.70/0.70	0.70/0.70
Motor Rated Current (A) 50/60Hz	100VAC	0.40/0.40	0.50/0.50
	110VAC	0.50/0.50	0.60/0.60
	200VAC	0.25/0.25	0.25/0.25
	220VAC	0.30/0.30	0.30/0.30
Manual operation handle revolution		7.5	6.7
Power consumption (VA)	100VAC	40	50
	110VAC	44	55
	200VAC	50	60
	220VAC	55	66
Cable connector Nominal size		G1/2	G1/2
Motor rated output (W)		8	8
Number of motor poles (P)		4	4
Motor insulation type		Class E	Class E
Motor rated time (min)		30	30
Limit switch capacitance ※1)		250VAC 5A	250VAC 10A
Space heater rated power (W)		2 ※2)	8
Ambient temperature (℃)		-10°C～50 (60)※3)	-10°C～50 (60)※3)

※1) Contact us if the contact rating of the limit switch is less than or equal to (1mA～100mA, 5 to 30VDC).
※2) T-00 space heaters are optional.
※3) For the type with E-E Positioner and potentiometer (both are standard option products), it is "-10 to 50°C".

Wiring Diagram

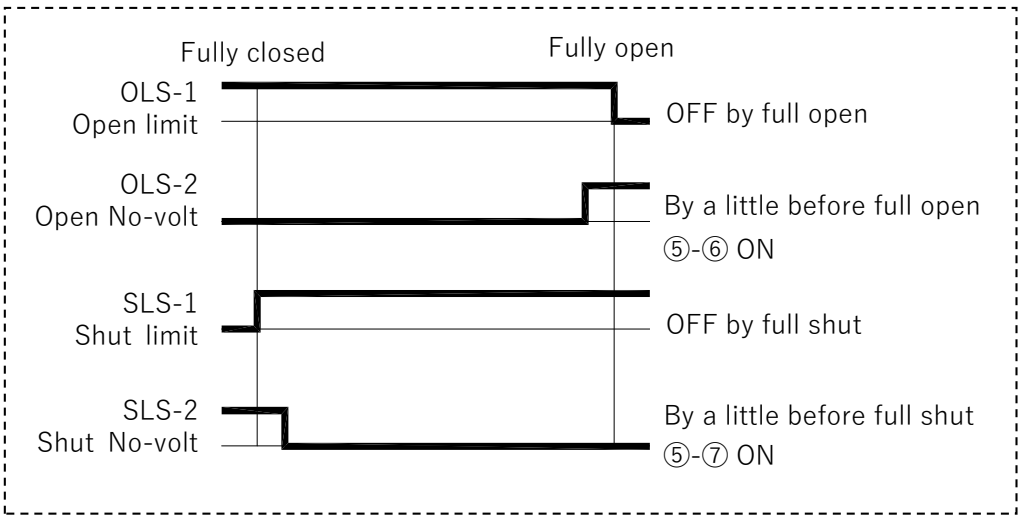
・Nominal size 15～50mm

Operating voltage (single phase)	Frequency
☐ 100VAC ☐ 110VAC ☐ 200VAC ☐ 220VAC	☐ 50Hz ☐ 60Hz

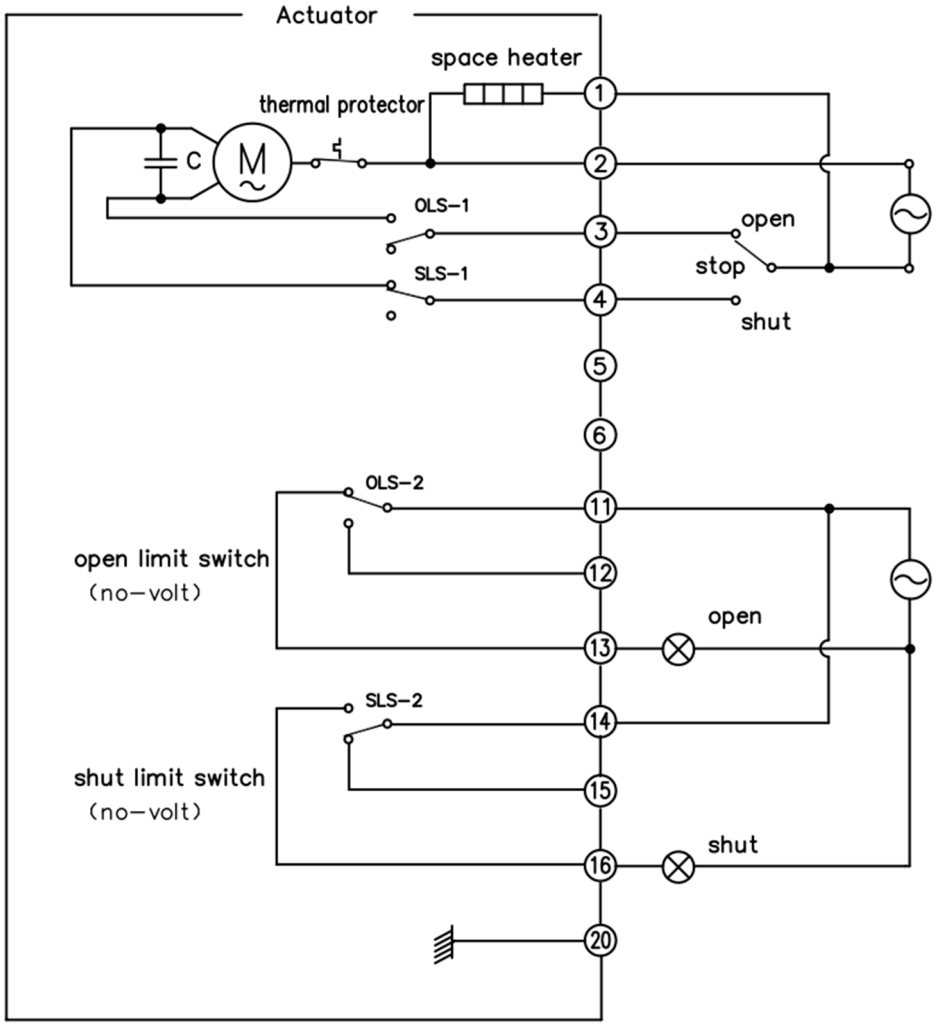


NOTE: The wiring diagram shows when the opening operation ends.

Switching chart



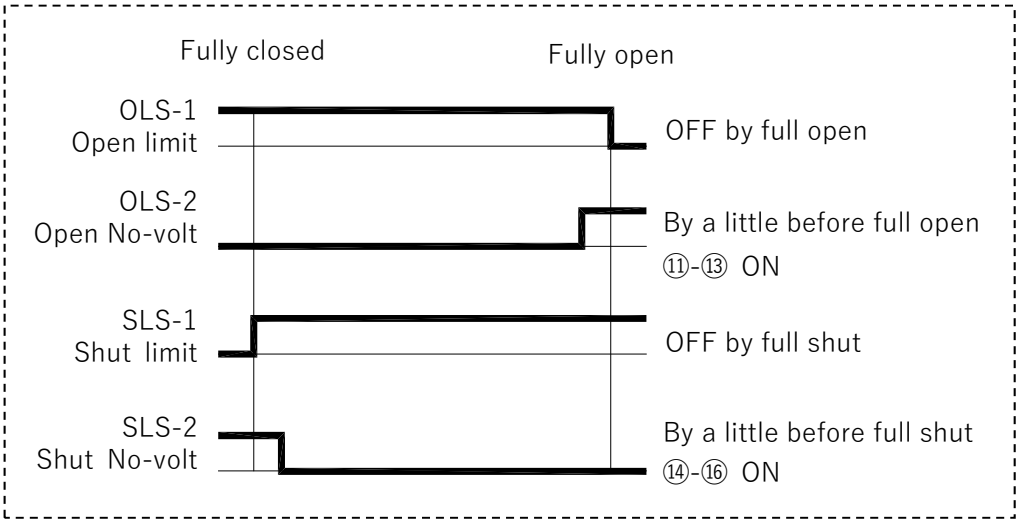
・Nominal size 65～100mm



Operating voltage (single phase)	Frequency
☐ 100VAC ☐ 110VAC ☐ 200VAC ☐ 220VAC	☐ 50Hz ☐ 60Hz

NOTE: The wiring diagram shows when the opening operation ends.

Switching chart



・About parallel wiring

If several (two or more) electrically operated valves are connected in parallel and operated simultaneously with a single open/close switch (or relay contact), current flows as shown by the dotted lines, causing malfunction. In this condition, the actuator may cause chattering and the actuator may fail. Avoid such wiring connections. (See Fig. 4-1.)

Provide an open/close switch (or relay contact) for each unit to ensure correct operation. (See Fig. 4-2.)

Fig. 4-1

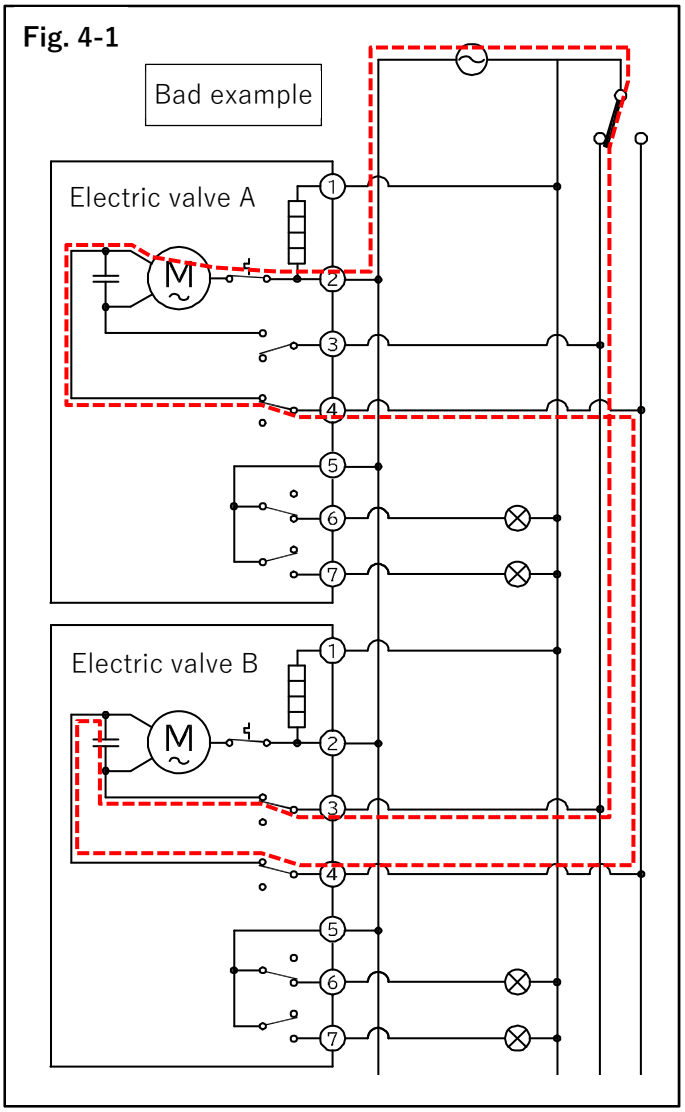
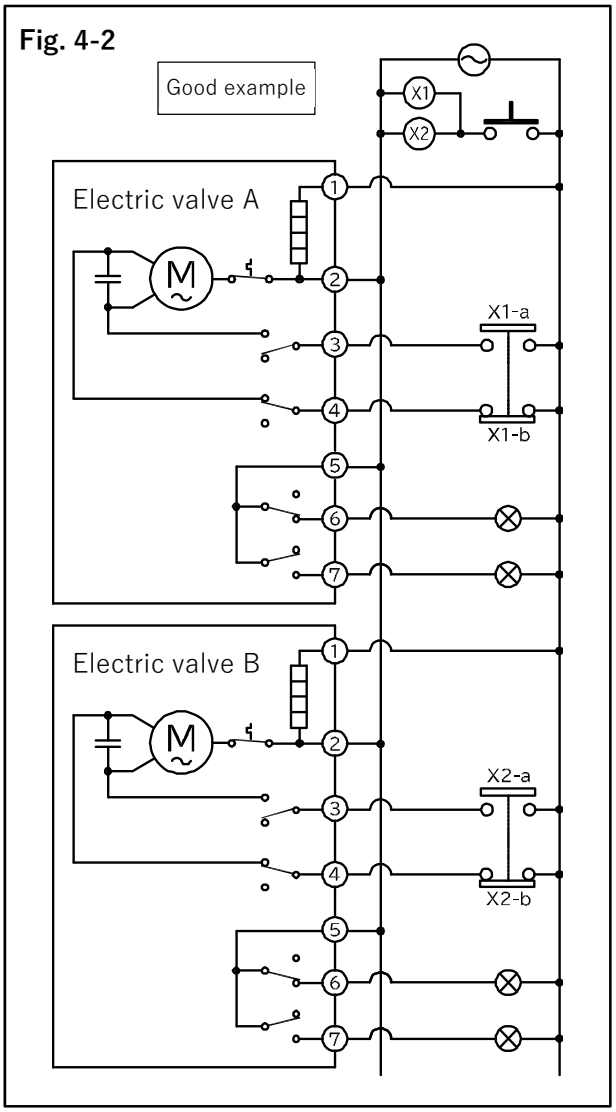


Fig. 4-2



Standard option

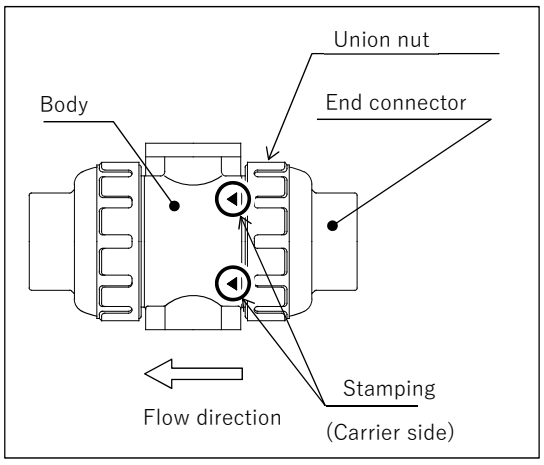
Option name	Objectives and specifications	Applicable Nominal size
Space heater	・Control of condensation inside the actuator ・Possible to retrofit	15～50mm (65～100mm is standard-equipped)
Potentiometer	・Outputs the opening of the valve as a resistance value ・Select from 135Ω or 500Ω	65～100mm (15～50mm can be used to rank up the actuator.)
Intermediate limit switch	・Detects the intermediate position (one for each opening/closing) ・Without switching voltage limit switch	65～100mm (15～50mm can be used to rank up the actuator.)
Servo unit (Power Positioner)	・Operates in proportion to 4～20mADC input signal	65～100mm (15～50mm can be used to rank up the actuator.)
Speed controller	・Delay of opening and closing time is possible	65～100mm (15～50mm can be used to rank up the actuator.)
Manual handle	・Valve can be opened and closed during power loss	15～50mm (65～100mm is standard-equipped)
Metal insert (for bottom stand)	・A metal internal thread for supporting a valve	15～50mm

Contact us for combinations of the above options and other special options.

5. Piping method

Flange type

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 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	**There is a danger of 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. **The valve can be damaged or leak.** ▶ 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. ▶ Use a connection flange with a full-face seat. ▶ Check that there is no difference in mutual flange standards. ▶ 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 in accordance with Table 5-2 "Specified Torque Values for Flange Tightening."
-	**Safe use.** ▶ When installing a valve with Nominal size 15～50mm at the end of the pipe, pay attention to the flow direction. (Check the ◀ mark on the body of the carrier side. The carrier part of the secondary side (downstream side) is integrated with the body, so if it is installed at the end of the pipe, it will be safer to use.) 

Preparations	▶ Torque Wrench ▶ Spanner or an eyeglass wrench ▶ Piping bolts, nuts, and washers ▶ AV packing ▶ Waste cloth

[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.)
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.)
7) When it is necessary to loosen or remove the union nut for construction reasons, follow the procedure below to tighten the union nut.

7-1) Make sure that the O-ring (A) is installed in the body correctly.
7-2) Bring the end connector and union nut into contact with the body side so that the O-ring (A) does not come off.
7-3) Tighten the union nut by hand until it is tight.
7-4) Threaded the union nut by 1/4 to 1/2 turn with a belt wrench to prevent damage to the union nut.

Fig. 5-1

(Axial misalignment) (Parallelism)

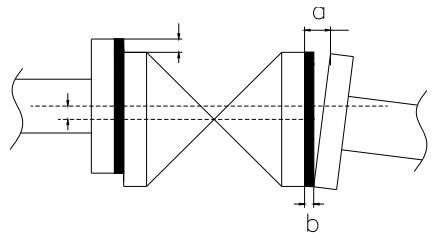


Table 5-1
Axis misalignment and parallelism

Nominal size	Shaft misalignment	Parallelism (a-b)
15mm	1.0 mm	0.5 mm
20mm		
25mm		
32mm		
40mm	1.0 mm	0.8 mm
50mm		
65mm		
80mm		
100mm		

Fig. 5-2

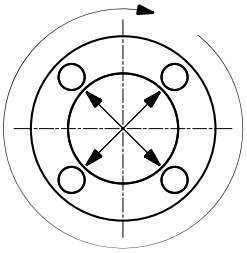
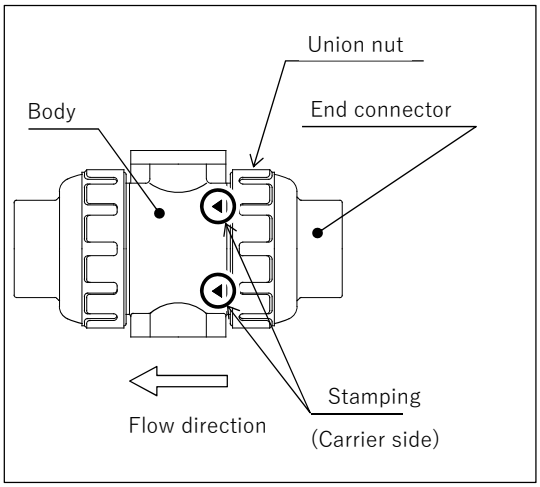


Table 5-2 Flange tightening torque

Nominal size	PTFE coating	PVDF coating	Rubber
15mm	17.5 N-m	17.5 N-m	8.0 N-m
20mm			
25mm	20.0 N-m	20.0 N-m	20.0 N-m
32mm			
40mm			
50mm	22.5 N-m	22.5 N-m	22.5 N-m
65mm			
80mm	30.0 N-m	30.0 N-m	30.0 N-m
100mm			

Threaded type

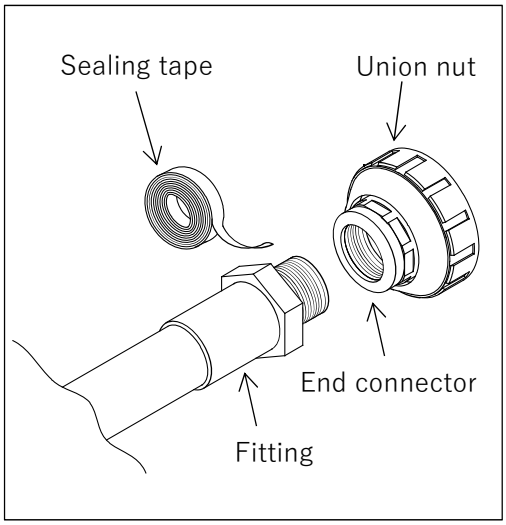
Warning	
Prohibition	**Serious injury can result.** ▶ When hanging or slinging a valve, pay sufficient attention to safety, and do not enter under the load.

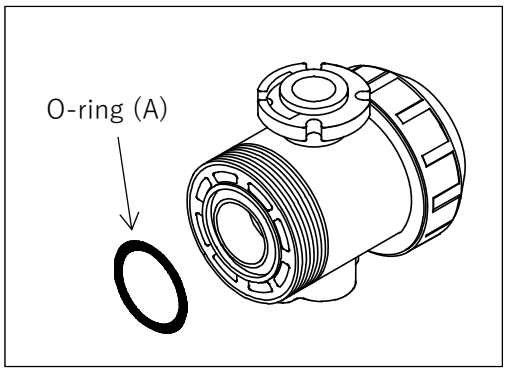
Caution	
Prohibition	**The valve can be damaged or leak.** ▶ Do not overtighten the screws at the joints. ▶ Do not overtighten the union nut. ▶ Do not use a pipe wrench to tighten the union nut.
Forcing	**There is a danger of injury.** ▶ Be sure to perform safety inspections of the machine tool and power tool beforehand. ▶ Wear appropriate protective equipment according to the type of work being performed. **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 threaded part. If liquid sealant or liquid gasket is used, stress cracking (environmental stress cracking) may occur.
-	**Safe use.** ▶ When installing a valve with Nominal size 15～50mm at the end of the pipe, pay attention to the flow direction. (Check the ◀ mark on the body of the carrier side. The carrier part of the secondary side (downstream side) is integrated with the body, so if it is installed at the end of the pipe, it will be safer to use.) 

Preparations ▶ Sealing tape ▶ Belt Wrench ▶ Spanner or an eyeglass wrench

[Procedure]

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





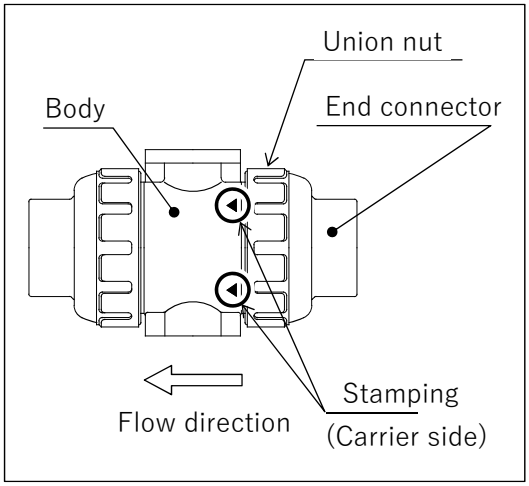
Socket type (adhesive)

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.

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.** ▶ 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. ▶ 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.

⚠Caution

-	**Safe use.** ▶ When installing a valve with Nominal size 15～50mm at the end of the pipe, pay attention to the flow direction. (Check the ◀ mark on the body of the carrier side. The carrier part of the secondary side (downstream side) is integrated with the body, so if it is installed at the end of the pipe, it will be safer to use.)



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 (A) is correctly installed in the body.
9) Bring the end connector into contact with the body so that the O-ring (A) does not come off.
10) Tighten the union nut by hand until it is tight.
11) Threaded the union nut by 1/4 to 1/2 turn with a belt wrench to prevent damage to the nut.

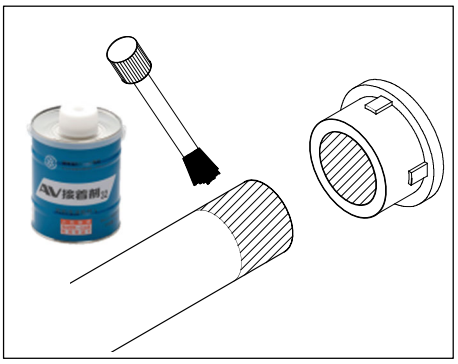
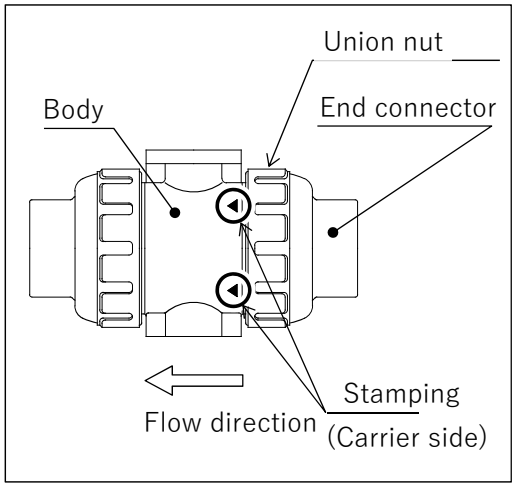


Table 5-3
Usage of adhesives (reference)

Nominal size	Volume used
15mm	1.0 g
20mm	1.3 g
25mm	2.0 g
32mm	2.4 g
40mm	3.5 g
50mm	4.8 g
65mm	6.9 g
80mm	9.0 g
100mm	13.0 g

Socket type (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.

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	**There is a danger of 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. **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).
-	**Safe use.** ▶ When installing a valve with Nominal size 15～50mm at the end of the pipe, pay attention to the flow direction. (Check the ◀ mark on the body of the carrier side. The carrier part of the secondary side (downstream side) is integrated with the body, so if it is installed at the end of the pipe, it will be safer to use.) 

Preparations ▶ Belt Wrench ▶ Fusing machine ▶ Instruction manual of the fusing machine

[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 (A) is correctly installed in the body.
6) Bring the end connector into contact with the body so that the O-ring (A) does not come off.
7) Tighten the union nut by hand until it is tight.
8) Threaded the union nut by 1/4 to 1/2 turn with a belt wrench to prevent damage to the nut.

Product support

⚠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	**There is a danger of 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. **The valve can be damaged or leak.** ▶ Do not over-tighten when supporting piping with a U-band, etc. ▶ Install it vertically when threaded in the Ensat. ▶ For detailed handling of the special tool for installation of the Ensat, refer to the instruction manual of the entertainment manufacturer separately.

Preparations	▶ Wrench ▶ Rubber sheet ▶ U-band (with bolt) ▶ Bolts/nuts/washers ▶ Ensat (for Nominal size 15～50mm) ▶ Exclusive tool for mounting on an Ensat (for Nominal size 15～50mm)

□ **Attaching the Ensat to the Bottom Stand** (Nominal size 15～50mm)

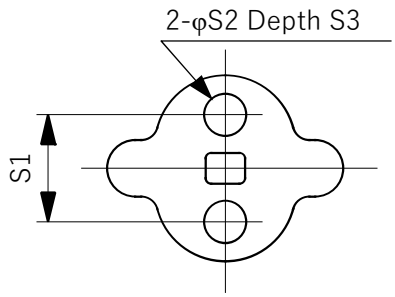
[Procedure]

1) Screw the Ensat into the bottom stand by referring to the Ensat's manual.

Table5-4 Bottom Stand and Ensat Dimensions

Nominal size	Bottom Stand			Ensat		
	S1	S2	S3	Nominal screw	Length	Material
15mm	19	7.3	11	M5	10	Stainless steel or Brass
20mm	19	7.3	11	M5	10	
25mm	19	7.3	11	M5	10	
32mm	30	9	15	M6	14	
40mm	30	9	15	M6	14	
50mm	30	9	15	M6	14	

Figure 5-3 Bottom Stand Shape



Product Support (continued)

▶ Fastening the Bottom Stand to the Frame

[Procedure]

1) Refer to Fig. 5-5 and Fig. 5-6 to fix the bottom stand and the frame.

Table5-5 Bottom Stand Dimensions

Nominal size	Bottom Stand		
	S1	S2	S3
65mm	48	9	6
80mm	55	11	7
100mm	65	11	8

Figure 5-4 Bottom Stand Shape

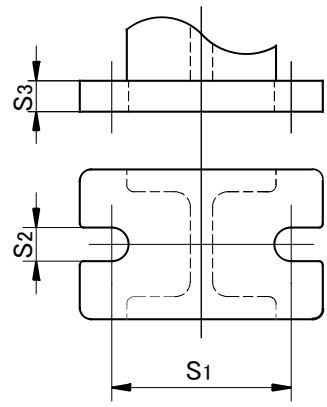


Fig. 5-5 Bottom stand fixing (Nominal size 15～50mm)

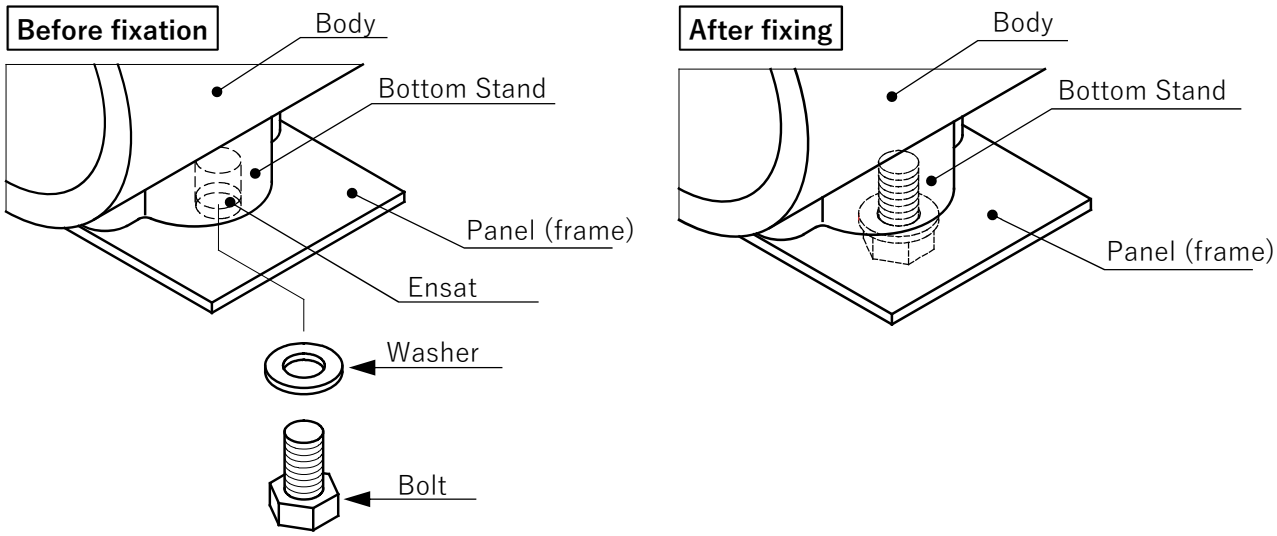
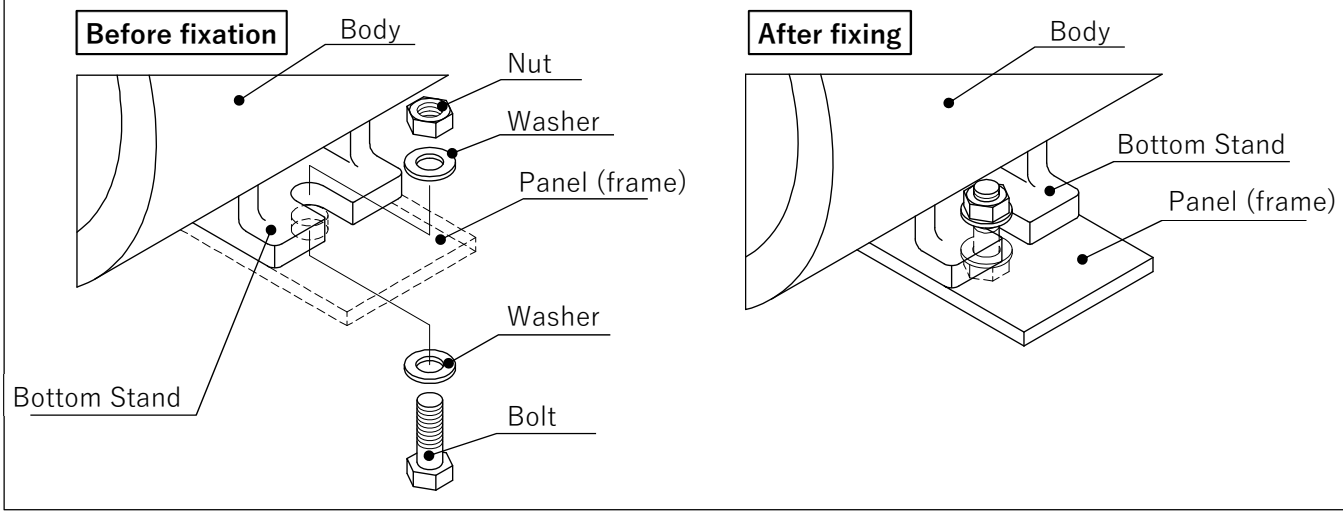


Fig. 5-6 Bottom stand fixing (Nominal size 65～100mm)

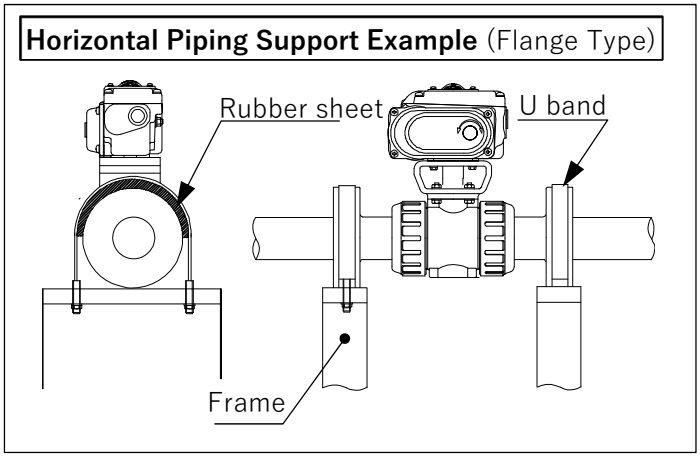


▶ **Support valve and piping** (horizontal piping)

[Procedure]

1) For flange type, lay the rubber sheet on the flange part of the valve. Lay a rubber sheet on top of the pipe section if it is not a flange type.
2) Put the U-band over the rubber sheet and secure it to the frame with the nut.

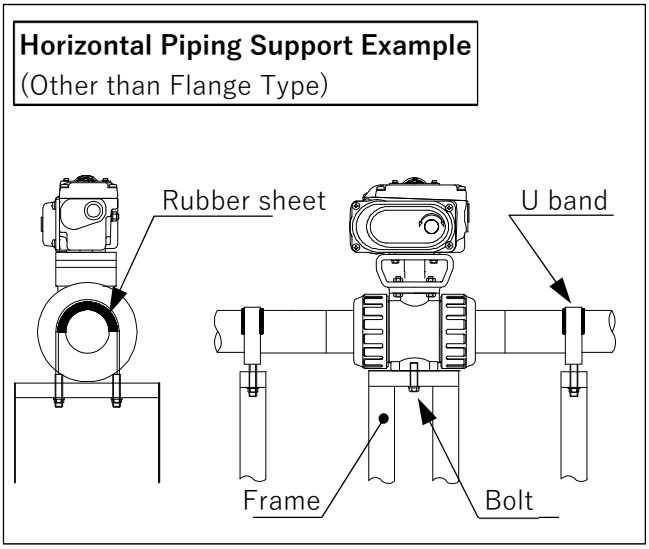
(Support installation example)

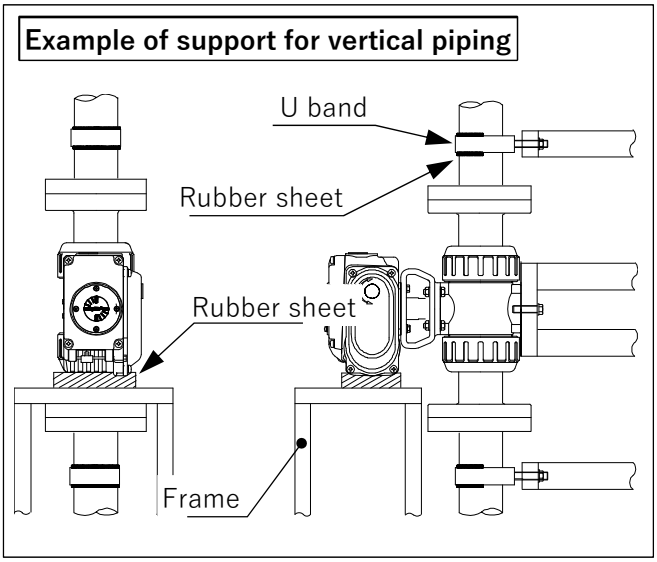


▶ Supporting the valve and piping (vertical piping)

[Procedure]

1) For flange type, lay the rubber sheet on the flange part of the valve. Lay a rubber sheet on top of the pipe section if it is not a flange type.
2) Put the U-band over the rubber sheet and secure it to the frame with the nut.
3) Place the rubber sheet between the actuator and the frame.



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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.

Caution	
Prohibition	**Doing so may cause the actuator to fail or malfunction.** ▶ Do not apply a load to the non-voltage limit switch exceeding the contact capacity. Contact your nearest sales office if the product is used under a small burden (1mA ～100mA, 5V～30VDC). ▶ Without wiring multiple (two or more units) in series, provide one open/close switch (or relay contact) at a time. ▶ Do not use the product near high-voltage lines, inverters, or other objects that generate noise or magnetism. ▶ If the actuator is installed outdoors or in a location where rainwater or moisture may enter the actuator, prevent rainwater or the like from entering the actuator through the wiring port of the actuator or the actuator cover.
Forcing	**There is a danger of 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. **Doing so may cause the actuator to fail or malfunction.** ▶ Check that the power supply voltage of the actuator matches the power supply voltage to be wired. ▶ Be sure to connect the ground wire. ▶ Perform wiring work when there is no insulation defect. ▶ Wire correctly according to the wiring diagram. ▶ After wiring, make sure that the screws (crimp terminals, etc.) are not tightened or loosened. ▶ Install the cable connector and actuator cover securely.

Preparations	▶ Phillips screwdriver ▶ Hex Wrench ▶ Cable connector ▶ Wrench ▶ Monkey wrench ▶ Electric knife ▶ Terminal crimping tool ▶ Wire stripper ▶ Crimp contact (screw designation: M3)

[Procedure]

1) Open the actuator cover. (The opening method varies depending on the actuator model.)

▶ **Model T-00** (for Nominal size 15～50mm)

(1) Loosen the four screws securing the actuator cover with a Phillips screwdriver. (The screws do not come off.)

(2) The actuator cover has a single open structure. Lift from the wiring port side to open.

(3) Slide the stopper for the actuator cover to secure the actuator cover in the open position. (See Fig. 6-1.)

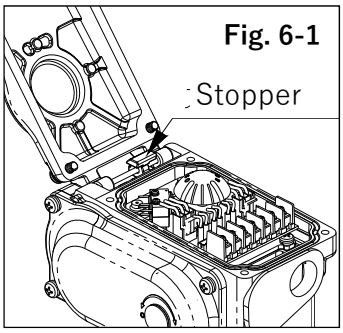


Fig. 6-1

▶ **Model T-0** (for Nominal size 65～100mm)

(1) Loosen the four screws securing the actuator cover with an Allen wrench and remove them.

(2) Lift the actuator cover vertically and remove it.

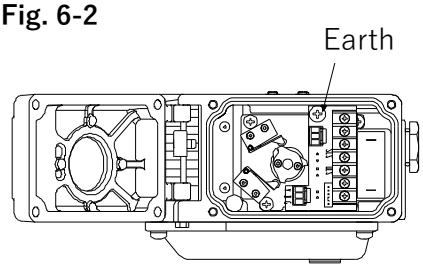


Fig. 6-2

2) Remove the protective screw from the electrical connection by loosening it with a monkey wrench.
3) Attach the cable connector to the electrical wiring port.
4) Route the cable through the cable connector.
5) Strip the insulation of the outer skin (sheath) and lead wire of the cable with an electric knife and wire stripper.
6) Attach the crimp terminal to the end of the lead wire with a terminal crimp tool.
7) Fix the crimp terminal to the terminal block with a Phillips screwdriver as shown in the wiring diagram.
8) Connect the ground to the screw shown in Fig. 6-2 for the model T-00 and to the terminal block for the model T-0.
9) Secure the cable by tightening the cable connector with a spanner or monkey wrench.
10) Close the actuator cover and install the four screws (or bolts) using a Phillips screwdriver (or hex wrench).

7. Commissioning method

Warning	
Prohibition	**Serious injury can result.** ▶ Never touch any moving parts (valves and actuators) during operation.

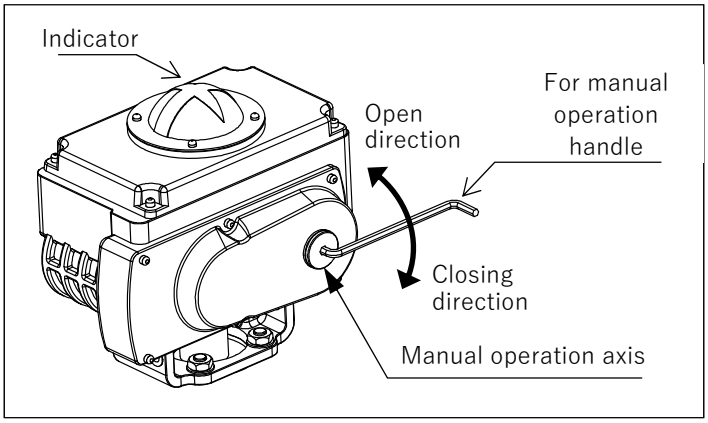
Caution	
Prohibition	**You may be electrocuted or injured.** ▶ Do not perform electric operation with the actuator cover open. ▶ Do not perform manual operation while the power is on. ▶ Do not perform electric operation with the manual operation handle attached to the manual operation shaft. **Doing so may damage the actuator.** ▶ Do not turn the manual override further than necessary from the fully open/closed positions.
Forcing	**Doing so may cause the actuator to fail or malfunction.** ▶ 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.

Manual operation

Preparations	▶ Handle for manual override (optional for Nominal size 15～50mm, standard-equipped for 65～100mm) *If the handle for manual override is not available, it can be substituted with a hex wrench (hex 5mm).

[Procedure]

1) Insert the handle for manual operation (or hex wrench) into the hex hole of the manual operation shaft of the actuator.
2) Turn the manual override handle while watching the valve travel meter to fully open and close the valve.
   ▶ Valve opening direction: Counterclockwise
   ▶ Valve closing direction: Clockwise
3) Fully open or fully closed to remove the manual operation handle (or hex wrench) from the manual operation shaft.
4) If the product does not operate normally, refer to "12. Cause of malfunction and remedy".



Electric operation

[Procedure]

1) Turn on the power.
2) Open or close the external selector switch on the operation panel to check that the valve display direction and operating direction match.
3) Fully open or closed to turn off the power.
4) If the product does not operate normally, refer to "12. Cause of malfunction and remedy".

Water flow test

[Procedure]

1) Flow fluid into the piping.
2) Open or close the external selector switch on the operation panel to activate the valve.
3) Check that there is no internal (sheet leakage) or external leakage.
4) Fully open or closed to turn off the power.
5) If a leak occurs, refer to "12. Cause of malfunction and remedy."

8. Improvement of internal leakage (seat leakage)

If internal leakage (seat leakage) occurs when the valve is fully closed, tightening the carrier may improve seat leakage.
If seat leakage does not improve even after retightening the carrier, replace the valve according to "9. How to disassemble/assemble for parts replacement".

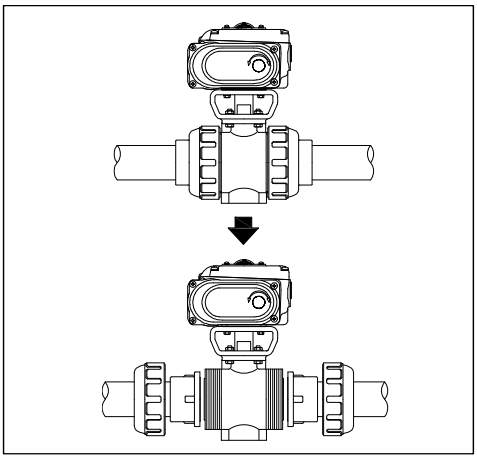
⚠Warning	
Forcing	**Serious injury can result.** ▶ A little fluid remains in the valve. Wear protective gloves and eye protection.

⚠Caution	
Prohibition	**The valve can be damaged, or leak.** ▶ Do not overtighten the carrier. ▶ Do not overtighten the union nut. ▶ Do not use a pipe wrench to tighten the union nut.

Preparations	▶ Belt Wrench ▶ Handle for manual valve (sold separately) ▶ Protective gloves ▶ Protective goggles ▶ Handle for manual override or hex wrench (hex 5mm)

[Procedure]

1) Zero the pressure in the piping to completely drain the fluid.
2) Fully close the valve by motor operation.
3) Turn off the power.
4) Loosen the right and left union nuts with a belt wrench.
5) Remove the body from the piping.
6) Remove the O-ring (A) attached to the carrier.
   ※For the Nominal size 15～50mm, remove the O-ring (A) from the carrier on the right-hand side towards the trademark (AV marking).
7) Mate the convex part on the top of the handle for manual valve (optional item) with the concave part of the carrier.
   ※The Nominal size 15～50mm is adjustable only for the carrier on the right-hand side towards the trademark (AV marking).
8) Turn the manual override and rotate the carrier with reference to Fig. 8-1 to adjust the surface pressure.
9) After the adjustment is completed, attach the O-ring (A) to the carrier.
10) Return the body part to the piping so that there is no misalignment.
11) Screw the right and left union nuts onto the body until they are hand tight.
12) Screw the union nut 1/4 to 1/2 turn to prevent it from being damaged by the belt wrench.
13) Turn on the power and let fluid flow into the piping. Open and close the valve several times by electric operation to check that it operates smoothly and that there is no external leakage.
14) Fully close the valve by motor operation and check that there is no seat leakage.



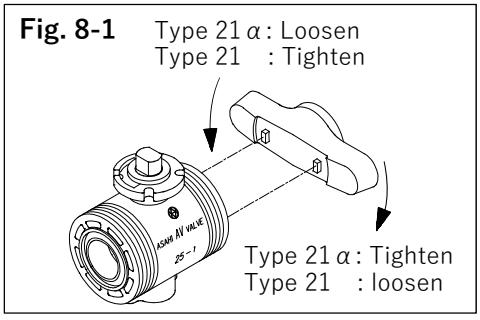


Fig. 8-1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9. How to disassemble/assemble for parts replacement

If internal leakage (seat leakage) or external leakage occurs when the valve is fully closed, the leakage may be improved by replacing the parts.
If the leak does not improve after replacing the parts, remove and replace the valve according to this item.

Warning	
Forcing	**Serious injury can result.** ▶ A little fluid remains in the valve. Wear protective gloves and eye protection.

Caution	
Prohibition	**The valve can be damaged or leak.** ▶ Do not overtighten the carrier. ▶ Do not overtighten the union nut. ▶ Do not use a pipe wrench to tighten the union nut.

Preparations	▶ Belt Wrench ▶ Handle for manual valve (sold separately) ▶ Protective gloves ▶ Protective goggles ▶ Handle for manual override or hex wrench (hex 5mm)

[Procedure]

<Disassembly>

1) Completely drain the fluid in the piping.
2) Fully close the valve by motor or manual operation.
3) Turn off the power.
4) Loosen the right and left union nuts with a belt wrench.
5) Remove the valve from the piping.
6) Loosen the bolt (A) between the actuator and the mounting base and remove the actuator.
7) Loosen the screws securing the stem and the joint with a hex wrench, and remove the joint.
8) Loosen the bolts and nuts (B) holding the top flange and the mounting base with a wrench, and remove the mounting base.
9) Mate the protrusion on the top of the manual override (optional accessory) with the recess in the carrier [3].
   ※The Nominal size 15～50mm is adjustable only for the carrier on the right-hand side towards the trademark (AV marking).
10) Referring to Fig. 9-1, remove the carrier by turning it clockwise or counterclockwise. (1 on one side for Nominal size 50mm or smaller, 2 on both sides for Nominal size 65mm or larger)
11) Remove the sheet by hand to prevent damage.
12) Push out the ball by hand.
13) Push the stem from the top flange side to the body side.

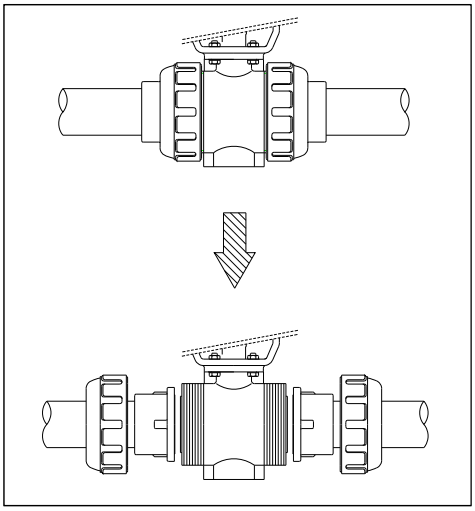
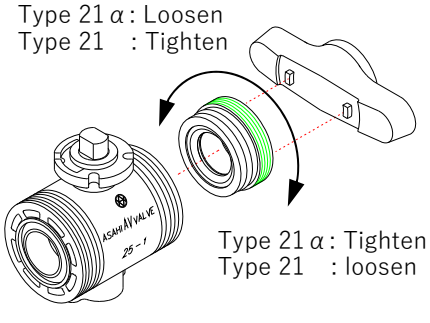


Fig. 9-1



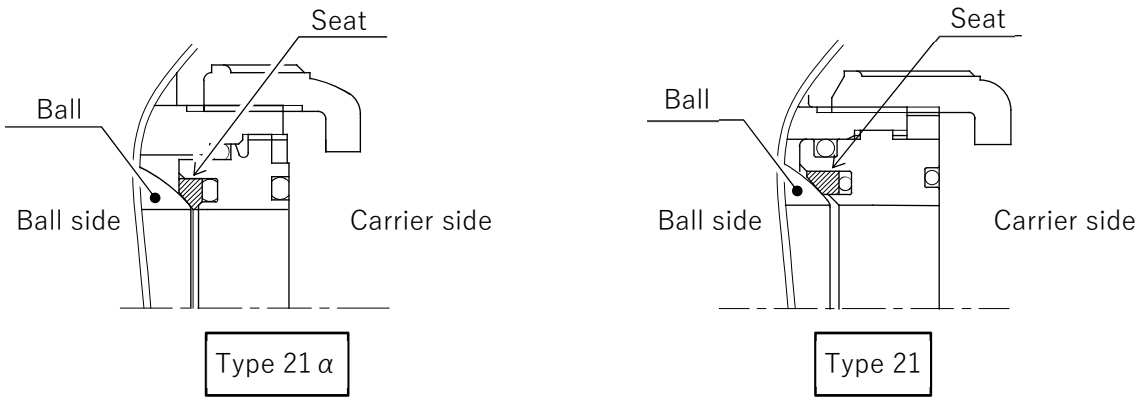
[**Procedure**]

<**Assembly**>

1) Follow the procedure from step 13) to the reverse procedure in <Disassembly>.

※The sheet has both sides. When installing, check the front and back sides.

※Recessed side = side to be fitted with ball



10. How to adjust the limit switch

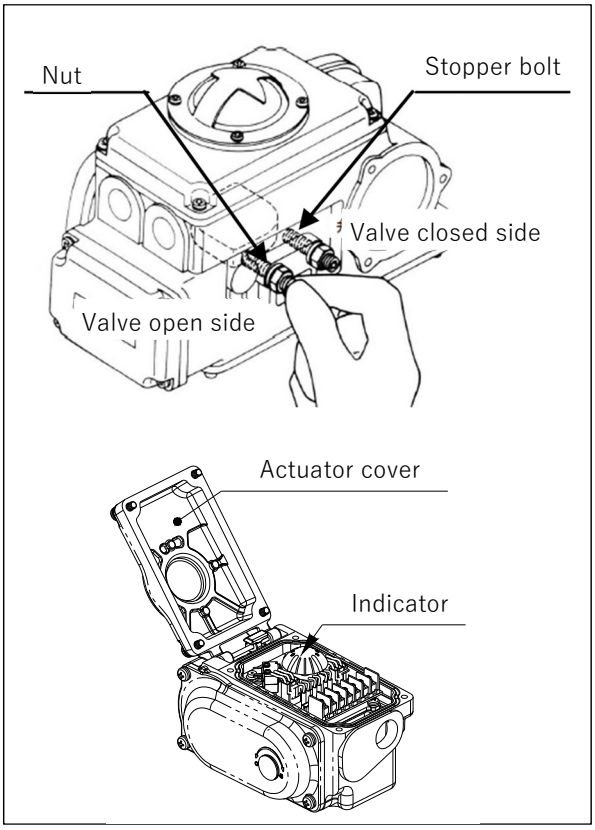
Nominal size 15～50mm

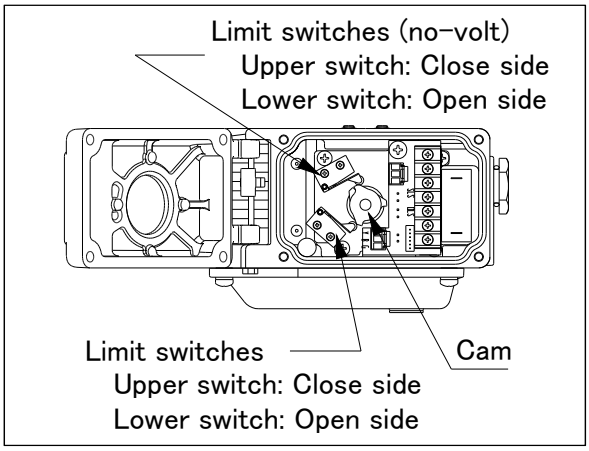
⚠Caution	
Forcing	**Doing so may damage the actuator.** ▶ Before adjusting the limit switch, be sure to loosen the stopper bolt fixing nut and loosen the stopper bolt 4 to 5 turns. (The limit switch and stopper bolt are already adjusted when shipped from the factory.)
-	**The intermediate position of the "T-00" actuator cannot be adjusted structurally.**

Preparations ▶ Phillips screwdriver ▶ Handle for manual override or hex wrench (hex 5mm)

[Procedure]

1) Turn off the power and set the pressure in the piping to zero.
2) Fully open the valve using the manual operation handle (option) or hex wrench. (Refer to "7. Commissioning method.)
3) Open the actuator cover by loosening it with a Phillips screwdriver, and remove it by pulling the opening indicator plate upward.
4) Loosen the two screws that secure the cam to the stem using a Phillips screwdriver.
5) Rotate the cam and confirm that the limit switch "clicks and clicks" in two-step operation. The cam is divided into two stages, with the upper stage for the closing side and the lower stage for the opening side.
6) Hold the cam lightly by hand and tighten the two screws with a Phillips screwdriver.
7) Open and close the valve with the manual operation handle (option) or hex wrench to check whether the fully closed and fully open positions are the degrees of opening that you want to adjust. If not, repeat steps 4), 5), and 6).
8) Remove the manual operation handle (option) or hex wrench from the manual operation shaft.
9) Attach the opening display plate, attach the actuator cover, and tighten with a Phillips screwdriver.
10) Turn on the power. Open and close the valve by electric operation. Confirm that the opening is "O" when fully opened and "S" when fully closed.





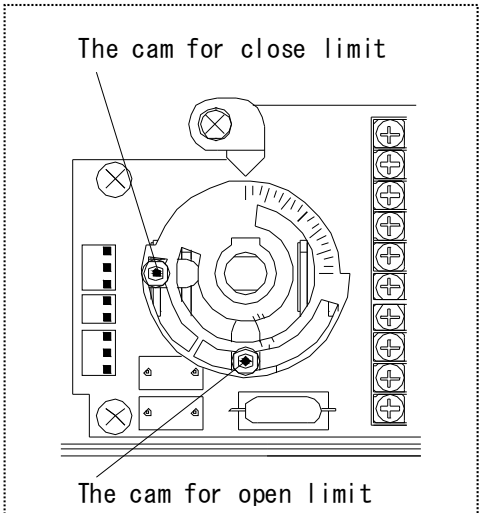
Nominal size 65～100mm

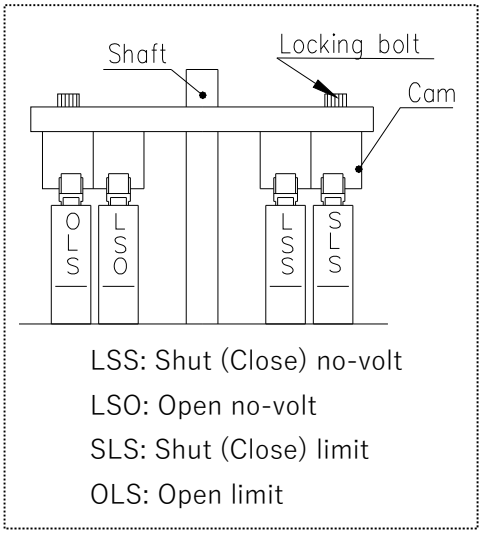
⚠Caution	
Forcing	**Doing so may damage the actuator.** ▶ Before adjusting the limit switch, be sure to loosen the stopper bolt fixing nut and loosen the stopper bolt 4 to 5 turns. (The limit switch and stopper bolt are already adjusted when shipped from the factory.)

Preparations ▶ Phillips screwdriver ▶ Hex wrench (Hex 3mm)

[Procedure]_

1) Turn off the power to the actuator and completely drain the fluid from the piping.
2) Loosen and remove the hexagon socket head cap screw on the actuator cover with a hexagon wrench, and then pull out the indicator upward.
3) Manual operation is performed to the opening (fully open or fully closed) to be adjusted by the manual handle.
4) Loosen the set screw of the cam for the limit switch you want to adjust with a hex wrench.
5) Move the cam by hand in the direction you want to adjust. Check that the limit switch has operated.
6) While lightly supporting the cam by hand, tighten the set screw with a hex wrench. The position where these limit switches are tapped is the stop position for fully open and fully closed, and the opening of 2% to 3% before is the respective signal output position.
7) After operating the cam for limit switch to the position for tapping the limit switch on the closed side by manual operation (refer to page 20), turn the stopper bolt in the closing direction by hand, and tighten the nut while 1/4 to 1/2 turn is loosened from the position where the rotation is no longer possible. In the same way, manually operate the cam for limit switch to the position where the limit switch is tapped, and then adjust the opening direction stopper bolt in the same way as in the closing direction.
8) Check that the opening is the one that you want to adjust manually. If the adjustment is insufficient, repeat steps 3) to 6).
9) Attach the actuator cover and tighten with a Phillips screwdriver.
10) Fully open and closed with electric operation. Confirm that the opening is pointing to fully open "O" or fully closed "S."





LSS: Shut (Close) no-volt
LSO: Open no-volt
SLS: Shut (Close) limit
OLS: Open limit

11. 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 "12. Cause of malfunction and remedy."

Daily inspection

Inspection items and methods	Guideline of judgment	Inspection point	Treatment method
External leakage (visual inspection)	No leakage	[Flange type] 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 [Flange type])
		[Socket type] Adhesive construction section	Remove the valve from the piping and retry the bonding process. (Ref: 5. Piping method [Socket type])
		[Threaded type] Threaded connection	Remove the valve from the piping and screw the valve in again. (Ref: 5. Piping method [Threaded type])
		Top flange of the valve	Remove the valve from the piping and replace the valve or defective part. (Ref: 9. 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)
		Surface of the entire valve	Remove the valve from the pipe and replace the valve. (Ref: 9. How to disassemble/assemble for parts replacement)
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: 9. 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: 9. How to disassemble/assemble for parts replacement)
Misalignment of operating position (visual inspection)	No deviation	Actuator opening display	Remove the actuator cover and adjust the limit switch operating position. (Ref: 10. How to adjust the limit switch)
Abnormal noise (hearing)	No abnormal noise	Valves and actuators	Remove the valve from the pipe and replace the valve or actuator. (Ref: 9. How to disassemble/assemble for parts replacement)
		Piping around the valve	Reconfirm the conditions of use (Ref: 2. Safety Instructions)
Odor ＊1) (sniffing)	No odor	Valves and actuators	Remove the valve from the pipe and replace the valve or actuator. (Ref: 9. 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	Inspection point	Remedy for malfunctions
Operating time (Measurement)	Error within ±1 second	Actuator opening display	Check the power supply voltage (±10%). (Ref: Actuator nameplate)
			Remove the valve from the pipe and replace the valve or actuator. (Ref: 9. How to disassemble/assemble for parts replacement)
Vibration (palpation)	No different from other parts	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: 9. 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	Inspection point	Remedy for malfunctions
Operability of manual handle (touch)	Rotates smoothly	Manual operation unit	Remove the valve from the pipe and replace the valve or actuator. (Ref: 9. How to disassemble/assemble for parts replacement)
Looseness of bolts (visual and palpation)	No Loose	For mounting base + valve	Retighten the mounting bolts with the following torque. Nominal size 15～32mm : 5 N-m 40, 50mm : 6 N-m 65, 80mm : 8 N-m 100mm : 10 N-m
		For mounting base + actuator	Retighten the mounting bolts with the following torque. Nominal size 15～100mm: 8 N-m
		For fixing the actuator cover	Retighten the screws with the following torque Nominal size 15～100mm: 5 N-m
		Terminal block	Retighten the screws with the following torques Nominal size 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])
Water-intrusion *1) (visual inspection)	No intrusion	Inside the actuator	Replace the actuator (Ref: 9. How to disassemble/assemble for parts replacement)
Intrusion of foreign matter *1) (visual inspection)	No intrusion	Inside the actuator	Replace the actuator (Ref: 9. How to disassemble/assemble for parts replacement)
Insulation resistance test *1) (Measurement)	Must be 50MΩ or more	Inside the actuator	Replace the actuator (Ref: 9. How to disassemble/assemble for parts replacement)
Corrosion Or rust *1) (visual inspection)	No corrosion or rust	Appearance of the product and in the actuator	Remove the valve from the pipe and replace the valve or actuator. (Ref: 9. How to disassemble/assemble for parts replacement)
Product damage	No scratches, cracks, or deformation	Appearance of the product	Remove the valve from the pipe and replace the valve or actuator. (Refer to P24_14. Disassembly method for replacing parts)

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

12. 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 be turned) during manual operation.	The valve is already fully open (or fully closed).	Rotate the hex wrench in the reverse direction (Ref. 7. Commissioning method)
	The power remains supplied in the opposite direction of the handle operation direction.	Turning the power off and then manually operating
	Foreign matter caught in valve	Remove the valve from the piping, disassemble it, and remove foreign matter. (Ref: 9. 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.
	Wiring to the terminal block is disconnected.	Stop operation immediately and recheck the connection status. (Ref: 4. Wiring diagram for product specifications)
	The cable or the connection inside the actuator is broken.	Replace the cable or the actuator. (Ref: 9. How to disassemble/assemble for parts replacement)
	Simultaneous switching energizing or incorrect wiring to the terminal block	Stop operation immediately and recheck the connection status. (Ref: 4. Wiring diagram for product specifications)
	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: 9. 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)
	The thermal protector is activated.	Stop using the product immediately, and lower the ambient temperature or the opening/closing frequency.
	The capacitor is burnt out (punctured).	Stop using the product immediately and replace the actuator. (Ref: 9. 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: 9. How to disassemble/assemble for parts replacement)
	The actuator does not move due to external corrosion of the actuator.	Stop using the product immediately and replace the actuator. (Ref: 9. How to disassemble/assemble for parts replacement)
	The insulation resistance of the actuator has dropped.	Stop operation immediately, check the insulation resistance, and replace the actuator. (Ref: 9. How to disassemble/assemble for parts replacement)
Fluid leaks even when fully closed (internal leak)	High fluid pressure	Use below the maximum allowable pressure (Ref: 9. How to disassemble/assemble for parts replacement)
	The carrier is loose.	Remove the valve from the pipe and tighten the carrier to adjust the surface pressure. (Ref: 8. Improvement of internal leakage (seat leakage))
	Sheet or ball is worn or scratched	Remove the valve from the piping, replace the relevant part, or replace the valve. (Ref: 9. 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: 9. 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: 9. 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)	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: 9. 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: 9. 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: 5. Piping method)
Actuator is operating but valve is not open or closed	Damaged stem, ball, or fitting	Stop using the product immediately, remove the valve from the piping, replace the relevant part, or replace the valve. (Ref: 9. 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: 9. 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: 9. 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: 9. 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: 9. 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: 9. 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: 9. How to disassemble/assemble for parts replacement)

13. 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]

Ball Valve 21/21α Electric Actuated Type T
15～100mm

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

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