

Ball valve Type 21 / Type 21α

Electric actuated Type Z

15~50mm (1/2"-2")

User's Manual



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

ASAHI YUKIZAI CORPORATION

-To use the product properly -

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 signs>

 Warning	This remark expresses the user to take caution due to the potential for serious injury or death.
 Caution	This remark expresses the user to take caution due to the potential for damage to the valve if used in such a manner.

<Prohibited & Mandatory signs>

 Prohibition	Prohibited: When operating the valve, this symbol indicates an action that should not be taken.
 Forcing	Mandatory action: When operating the valve, this symbol indicates mandatory actions that must be adhered to.

Table of Contents

1. Our product warranty coverage.....	4
Applicable to	4
Warranty Period	4
Guaranteed range.....	4
Disclaimer	4
2. Safety Instructions.....	5
Unpacking, Transportation and Storage	5
Handling of products.....	6
3. Name of each part.....	8
4. Product specifications.....	11
Model number table	11
Valve	11
Relationship between maximum allowable pressure and temperature	12
Actuator.....	13
Wiring Diagram	14
About parallel wiring	15
Standard option.....	15
5. Piping method	16
Flanged end.....	16
Threaded end.....	20
Socket end (adhesive).....	22
Socket end (fusion), spigot end (fusion)	24
Product support.....	26
6. Electrical Wiring procedure	30
7. Commissioning method	34
Manual Operation procedure	35
Motor-Driven Operating procedure	36
Water flow test	36
8. Improvement of internal leakage (sheet leakage)	38
9. How to disassemble/assemble parts for replacement.....	40
10. How to adjust the limit switch.....	42
11. How to change LED open/close indication	43
12. How to remove/install the actuator.....	44
13. Inspection items.....	46
Daily inspection.....	47
Periodic inspection.....	48
14. Cause of malfunction and remedy.....	50
15. How to query for faults or replacements	54
16. Disposal method of residual materials and waste materials	55
Inquiries	56

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.
- Defect 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	<p>Serious injury can result.</p> <ul style="list-style-type: none"> <input type="checkbox"/> When hanging or slinging a valve, pay sufficient attention to safety, and do not enter under the load.
 Caution	
 Prohibition	<p>The valve can be damaged, or leak.</p> <ul style="list-style-type: none"> <input type="checkbox"/> Do not subject the product to impact by throwing, dropping or hitting. <input type="checkbox"/> Do not scratch or pierce the product with a sharp object such as a knife or hand hook. <input type="checkbox"/> Do not pile up cardboard boxes forcefully to prevent the load from collapsing. <input type="checkbox"/> Avoid contact with coal tar, creosote (a wood preservative), white pesticides, insecticides, paints, etc.
 Forcing	<p>The valve can be damaged, or leak.</p> <ul style="list-style-type: none"> <input type="checkbox"/> 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.) <input type="checkbox"/> After unpacking, make sure that the product is correct and that it meets the specifications. <input type="checkbox"/> "Desiccant (silica gel)" is enclosed for the purpose of adjusting humidity inside the actuator. Do not dispose of the silica gel, but use it with it enclosed. <input type="checkbox"/> If the indicator on the silica gel changes color from blue to pink, replace it with a new one. Contact your dealer or your nearest office.

Handling of products

 Warning	
 Prohibition	<p>Serious injury can result.</p> <ul style="list-style-type: none"> <input type="checkbox"/> Do not disassemble the actuator. <input type="checkbox"/> Do not touch moving parts during operation with hands, feet or tools.
 Forcing	<p>The valve can be damaged or seriously injured.</p> <ul style="list-style-type: none"> <input type="checkbox"/> 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. <input type="checkbox"/> This valve is structurally dead space. Vaporizing fluids such as hydrogen hydroxide (H₂O₂) and soda hypochlorite (NaClO) may vaporize in the dead space 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.) <input type="checkbox"/> 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. <p>Doing so may damage the actuator or cause serious injury.</p> <ul style="list-style-type: none"> <input type="checkbox"/> Before use, check the power supply and voltage on the nameplate.

 Caution	
 Prohibition	<p>The valve can be damaged, or leak.</p> <ul style="list-style-type: none"> <input type="checkbox"/> Do not step on the valve or place heavy objects on it. <input type="checkbox"/> Keep away from fire and hot objects. <input type="checkbox"/> Do not use the product in places where it may be submerged. <input type="checkbox"/> Do not subject the valve to large vibrations. <p>Doing so may damage the actuator.</p> <ul style="list-style-type: none"> <input type="checkbox"/> 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 55°C ambient temperature.

 **Caution**

 **Forcing**

There is a danger of injury.

- Use only the tools 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.

- 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 on a regular basis referring to "**13. Inspection items.**" Pay particular attention to temperature changes and aging during long-term storage or shutdown or use.
- 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, a mark of the ball opening may remain on the seat (PTFE) and the sealing performance may temporarily deteriorate when the valve is fully closed. Therefore, it is recommended to use the valve fully open or closed.

Doing so may damage the base plate.

- When removing the actuator from the valve body, be sure to use the base plate removal jig (optional item).

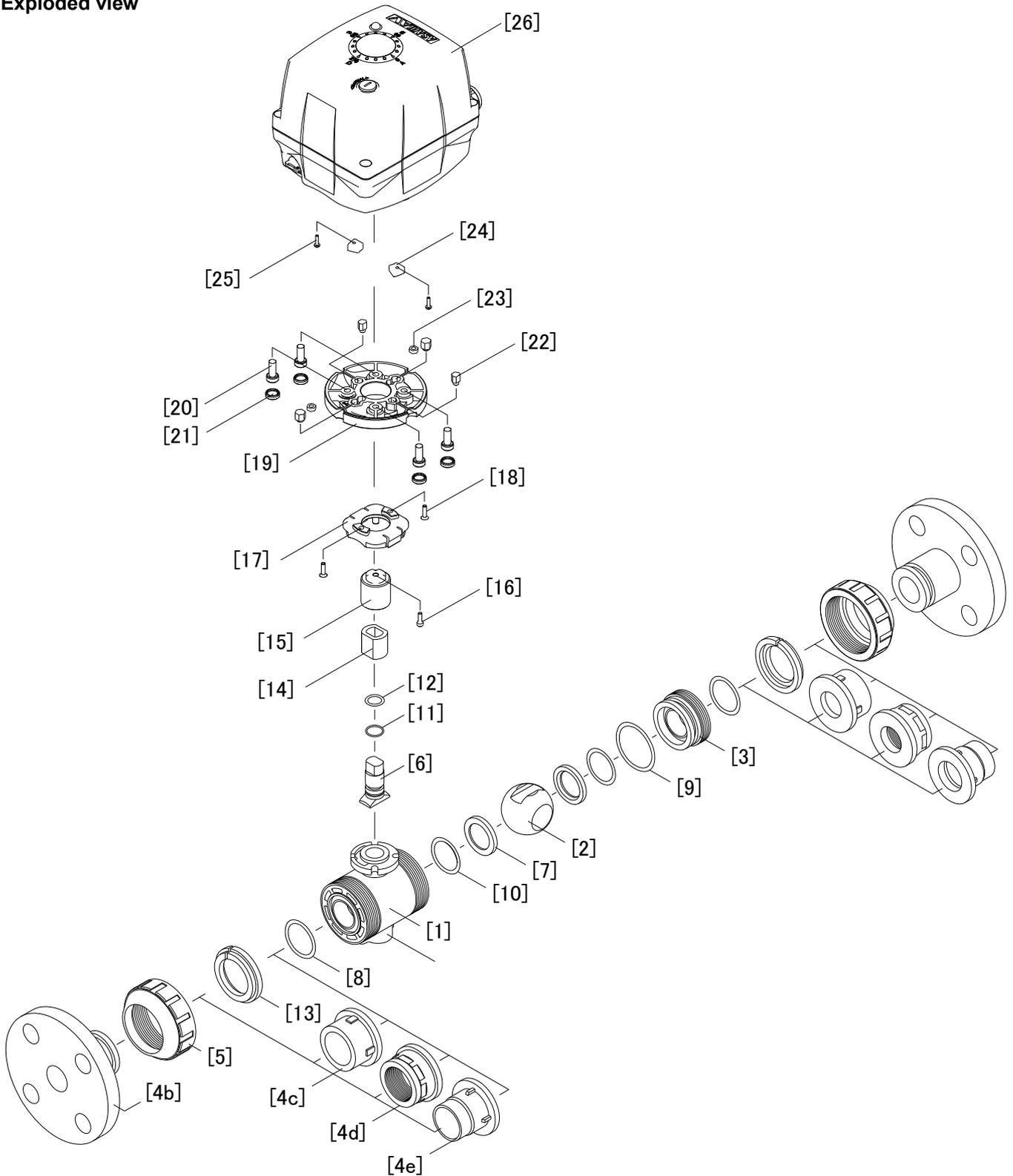
Doing so may damage the actuator.

- 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 55°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

Exploded view



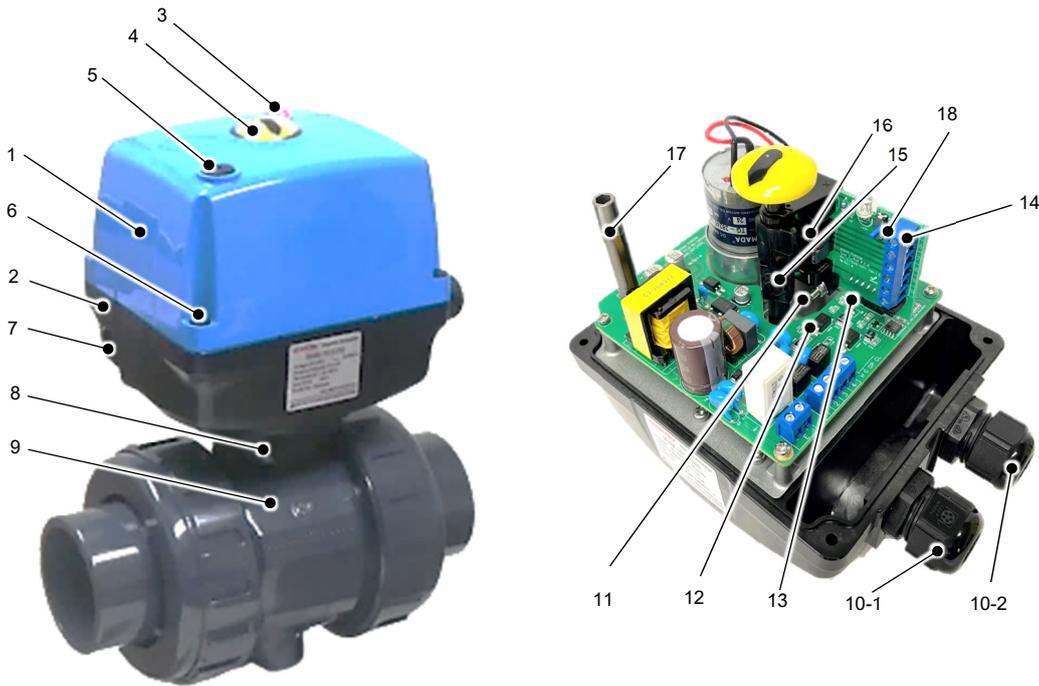
Valve parts list

No.	Name	No.	Name	No.	Name
[1]	Body *1)	[8]	O-ring (A)	[18]	Bolt
[2]	Ball *1)	[9]	O-ring (B) *2)	[19]	Connector plate
[3]	Carrier *1)	[10]	O-ring(C) *2)	[20]	Bolt
[4b]	End connector (Flanged end)	[11]	O-ring (D)	[21]	Rubber cap
[4c]	End connector (Socket end)	[12]	O-ring (E)	[22]	Rubber cap
[4d]	End connector (Threaded end)	[13]	Stop ring	[23]	Nut
[4e]	End connector (Spigot end)	[14]	Adapter	[24]	Stopper
[5]	Union nut	[15]	Bush	[25]	Tapping screw
[6]	Stem *1)	[16]	Bolt	[26]	Actuator
[7]	Seat *1)	[17]	Base plate		

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

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

Actuator structure



Actuator parts list

No.	Name
1	Cover
2	Body
3	LED light
4	Indicator
5	Bushing for manual operation
6	Bolt cap
7	Auto/Manual Selector
8	Base plate
9	Valve
10-1	Cable gland for power line input (sponge type dust seal included)
10-2	Cable gland for signal-line outputting (with NBR ceiling plug)
11	Space heater
12	Grounding terminal block
13	Terminal block for power input
14	Terminal block for signal output
15	Limit cam for left/right opening
16	Limit switch for limit/output
17	Shaft for manual operation (with hexagon socket)
18	Open/close indication LED color selector

4. Product specifications

Model number table

Actuation	Valve type	Actuator type	Voltage	Body material	Seal material	Connection	Standard	Size	High Purity Series
A	* *	Z	U	*	*	*	*	* * *	*
A Automatic	21 Type 21 2A Type 21α	Z Type Z	U 95~240VAC	U U-PVC C C-PVC P PP F PVDF	E EPDM V FKM	F Flanged S Socket N Threaded P Spigot	J JIS 1 JIS10K 5 JIS5K D DIN A ANSI	015 15mm (½") 020 20mm (¾") 025 25mm (1") 032 32mm (1¼") 040 40mm (1½") 050 50mm (2")	Non Standard 1 Lubricant Free

NOTE

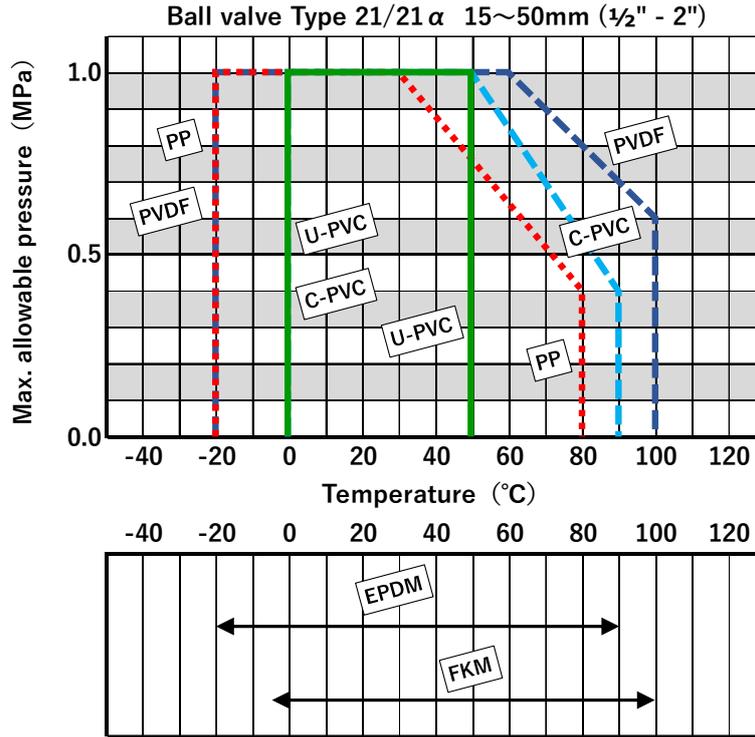
- JIS standard socket-type of the body material PVDF is not manufactured.
- JIS standard socket-type 32mm with PP body material is not manufactured.
- Connecting method Spigot type is only DIN standard and body material C-PVC is not manufactured.

Valve

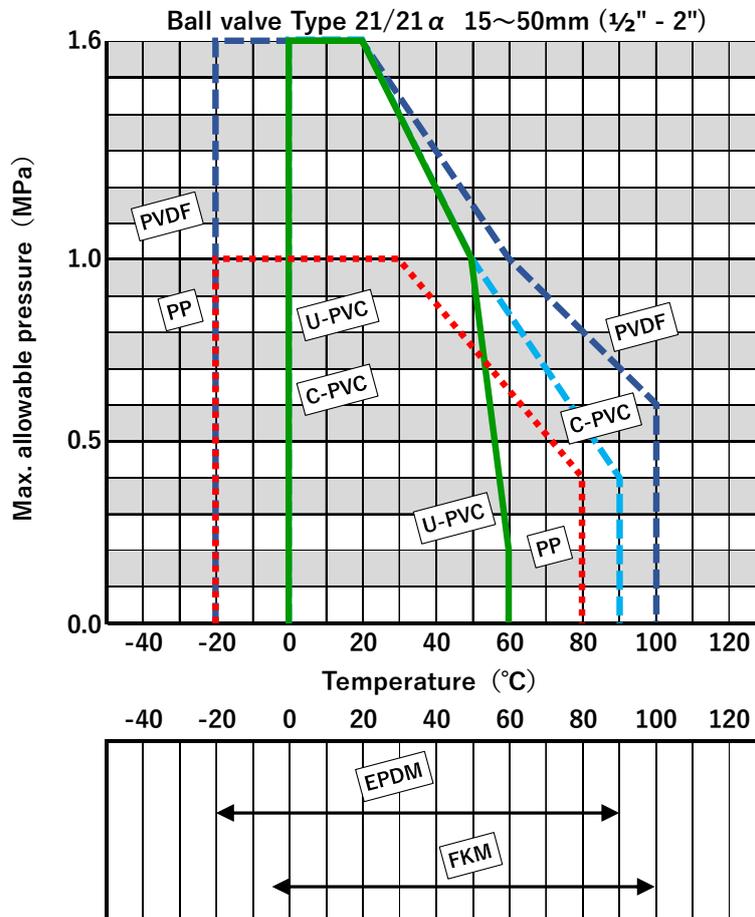
Body material \ Nominal diameter	U-PVC	C-PVC	PP	PVDF
	15-50mm (½"-2")	Type 21α		Type 21

Relationship between maximum allowable pressure and temperature

- Connecting standard is other than DIN/ANSI



- When the connecting standard is DIN/ANSI



Actuator

Applicable size		15~50mm (½" - 2")
Actuator type		AV-Z-025
Rated torque *1)		10 N-m
Maximum output torque		25 N-m
Rated voltage *2)		95~240VAC ± 10% 50/60Hz (universal power supply)
Power consumption		17VA
Motor protection *3)		Overcurrent protection device
Operating range (Min-Max)		0° to 90° (maximum operating angle 110°:-10° to 100°)
Opening and closing time		8 sec. / 90° (No load), 9 sec. / 90° (Loaded)
External dimensions		W175(145)×D120×H150mm [(145) excluding cable gland]
Weight		1.7kg
Operating environment	Installation Environment *4)	Indoor and outdoor (with restrictions and conditions)
	Protection class	IP67
	Pollution level	2
	Ambient temperature	Indoor and outdoor (with restrictions and conditions)
Duty cycle (Duty cycle) *1)		30%
Wiring port	Cable gland	For power input & signal output: 1 place each, CE / VDE standard
	Terminal block	Screw type, Applicable wire: Outer diameter φ7~13mm, Wire diameter 0.75~2.0mm ²
Housing material		Cover: Polycarbonate (blue) flame retardant UL94V-0 Body: Polycarbonate with glass (black) flame retardant UL94V-0
Function	Status output *5)	1 piece (no-voltage contact), contact capacitance Max.250VAC-1A for full open/close
	Status display *6)	Indicator/LED lamp (Green: Open , Red: Close)
	Manual Operation	With Auto/Manual selector. 9 rotations /90° with an Allen wrench
	Space heater	Rated power 5W (function only when energized)
Insulation resistance		500VDC, 10MΩ or more
Withstand voltage		1500VAC, 1 minute

*1) Loads and Duty cycle are as per S4 (IEC60034-1 equivalent to bulb loads).

*2) The length of the power line cable should be within 100 meters as a guideline.

*3) In case of an overload, the thermistor functions and the power to the motor is cut off. (Self-restoration occurs when the power supply is cut off.)

*4) This actuator can be used in IP67 environments. However, when opening the housing for maintenance/adjustment, etc., it should be done in a pollution degree 2 environment (e.g. indoors, etc., in an environment free from dust and moisture).

*5) Keep the devices connected to the limit switch (non-voltage contact) for open/close signals within the contact capacitance "1A". (Risk of damage)

*6) LED (Green: Open, Red: Close) is factory-set. The color can be changed with the selector switch in the actuator.

Wiring Diagram

Caution



Prohibition

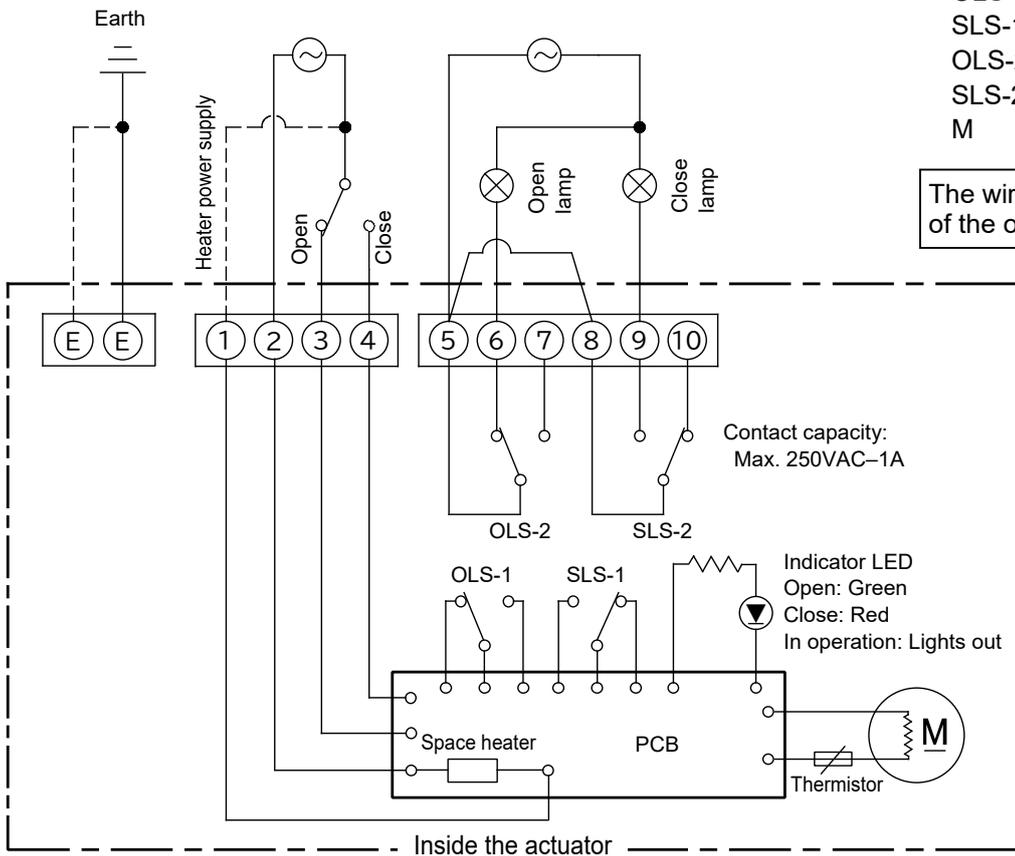
Failure to do so may cause seat leakage.

▶ Do not stop the power supply by the operation of the contact switch.

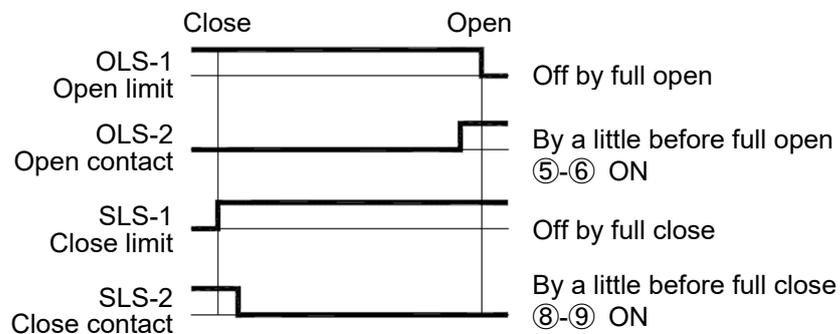
• Reference Wiring Example

OLS-1 : Open limit switch
 SLS-1 : Close limit switch
 OLS-2 : Open contact switch
 SLS-2 : Close contact switch
 M : Motor

The wiring diagram shows the end of the open operation



Switching chart

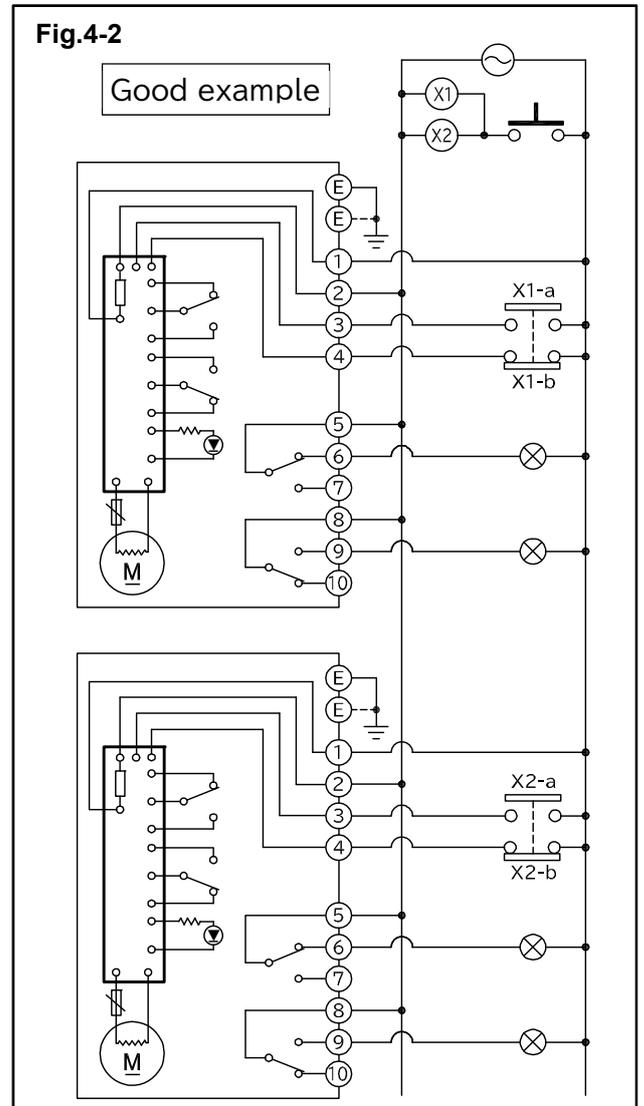
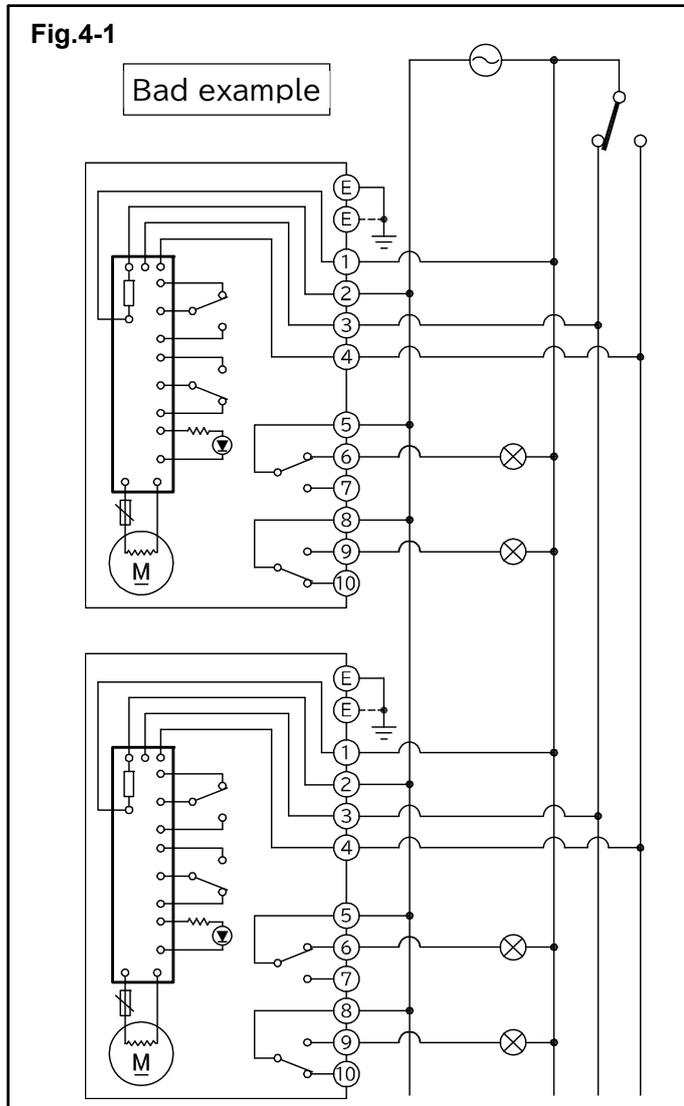


- The full-open/fully-closed non-voltage limit switch becomes ON approx. 8° before the limit switch.
- The valve continues operation even after the no-voltage limit switch is turned ON, after which the limit switch is turned OFF, and the power to the motor is automatically shut off.

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. 4-1.)

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



Standard option

Option name	Objectives and specifications	Applicable nominal diameter
Micro-load specification No-voltage limit switch	<ul style="list-style-type: none"> • Input to PLC, etc. • 1mA~100mA, 5VDC~30VDC 	15~50mm

Contact us for other special options, etc.

5. Piping method

Flanged end

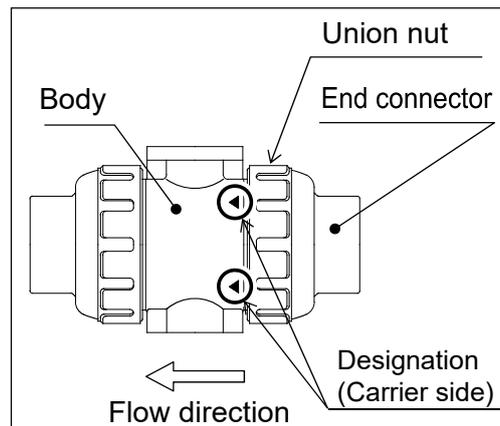
 Warning	
 Prohibition	<p>Serious injury can result.</p> <ul style="list-style-type: none"> <input type="checkbox"/> When hanging or slinging a valve, pay sufficient attention to safety, and do not enter under the load.
 Forcing	<p>There is a risk of electric shock or injury.</p> <ul style="list-style-type: none"> <input type="checkbox"/> Be sure to perform safety inspections of the machine tool and power tool beforehand. <input type="checkbox"/> Wear appropriate protective equipment according to the type of work being performed.

 Caution	
 Prohibition	<p>The valve can be damaged, or leak.</p> <ul style="list-style-type: none"> <input type="checkbox"/> Do not overtighten the union nut. <input type="checkbox"/> Do not use a pipe wrench to tighten the union nut. <input type="checkbox"/> Do not tighten the bolts and nuts for piping to the specified torque values in Table 5-2.
 Forcing	<p>The valve can be damaged, or leak.</p> <ul style="list-style-type: none"> <input type="checkbox"/> Install the product so that excessive stress such as tension, compression, bending or impact is not applied to the piping or valve. <input type="checkbox"/> Fix the end connector during piping work or disassembly and reassembly. <input type="checkbox"/> 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). <input type="checkbox"/> When connecting to metal piping, do not apply piping stress to the valve. <input type="checkbox"/> Use a connection flange with a full-face seat. <input type="checkbox"/> Check that there is no difference in mutual flange standards. <input type="checkbox"/> 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.) <input type="checkbox"/> Keep the axis misalignment and parallelism of the flange surface below the values shown in Table 5-1 "Axis misalignment and parallelism." <input type="checkbox"/> Tighten the bolts and nuts for piping diagonally with the specified torque values in Table 5-2.

⚠ Caution

Safe use.

- When installing the valve 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.)



Necessary items	▶ Torque wrench	▶ Spanner or an eyeglass wrench	▶ Belt Wrench
	▶ Bolts, nuts and washers for piping	▶ AV packing	▶ Waste cloth

[Procedure]

- 1) Clean mutual flange surfaces with a waste cloth.
- 2) Set AV gasket 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) Screw in the union nut by 1/4 to 1/2 turn with a belt wrench to prevent damage to the union nut.

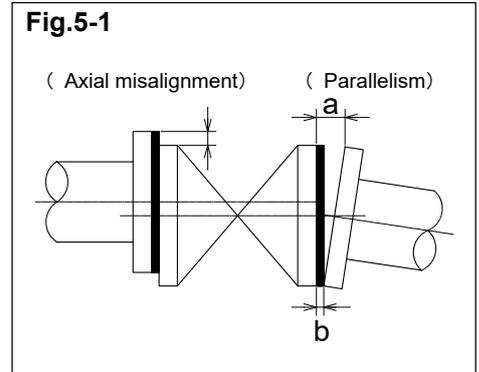


Table 5-1
Axial misalignment and parallelism

Nominal diameter	Axial misalignment	Parallelism (a-b)
15mm	1.0 mm	0.5 mm
20mm		
25mm		
32mm		
40mm	1.0 mm	0.8 mm
50mm		

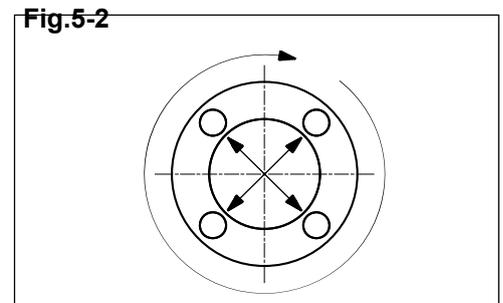
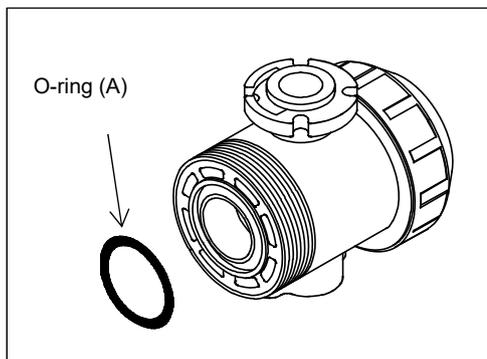


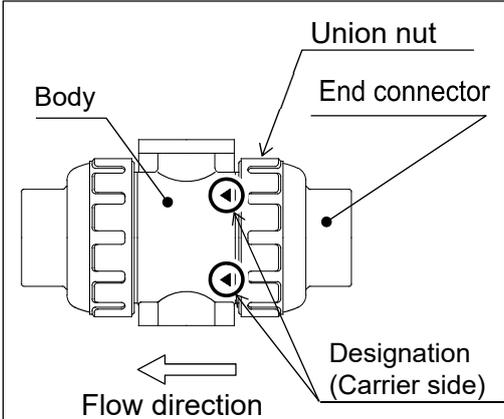
Table 5-2 Flange tightening torque

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



Threaded end

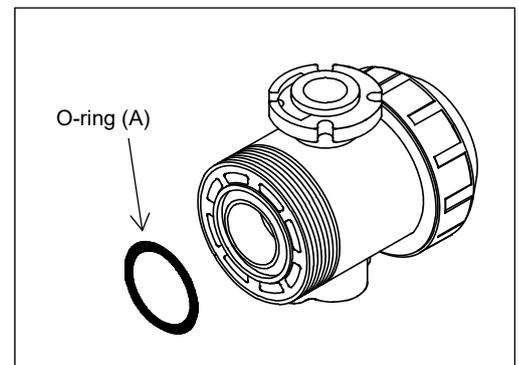
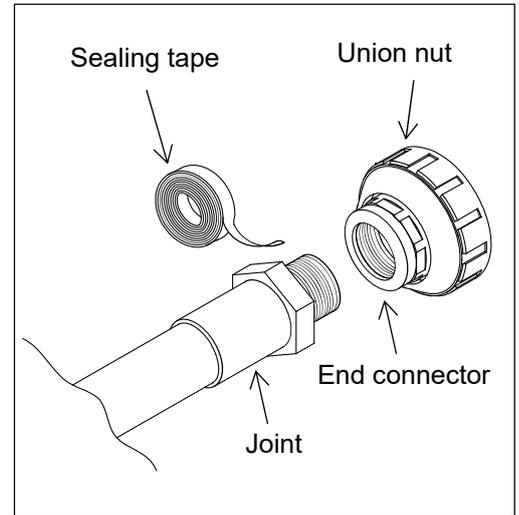
 Warning	
 Prohibition	<p>Serious injury can result.</p> <ul style="list-style-type: none"> <input type="checkbox"/> When hanging or slinging a valve, pay sufficient attention to safety, and do not enter under the load.
 Forcing	<p>There is a risk of electric shock or injury.</p> <ul style="list-style-type: none"> <input type="checkbox"/> Be sure to perform safety inspections of the machine tool and power tool beforehand. <input type="checkbox"/> Wear appropriate protective equipment according to the type of work being performed.

 Caution	
 Prohibition	<p>The valve can be damaged, or leak.</p> <ul style="list-style-type: none"> <input type="checkbox"/> Do not overtighten the screws on the connections. <input type="checkbox"/> Do not overtighten the union nut. <input type="checkbox"/> Do not use a pipe wrench to tighten the union nut.
 Forcing	<p>The valve can be damaged, or leak.</p> <ul style="list-style-type: none"> <input type="checkbox"/> The union nut of this product is lightly tightened to make it easier to loosen. Be sure to remove the end connector before installation. <input type="checkbox"/> Install the product so that excessive stress such as tension, compression, bending or impact is not applied to the piping or valve. <input type="checkbox"/> Fix the end connector during piping work or disassembly and reassembly. <input type="checkbox"/> 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). <input type="checkbox"/> When connecting to metal piping, do not apply piping stress to the valve. <input type="checkbox"/> Make sure that the screws at the joints are made of resin. <input type="checkbox"/> 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.
-	<p>Safe use.</p> <ul style="list-style-type: none"> <input type="checkbox"/> When installing the valve 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.) <div style="text-align: right;">  </div>

Necessary items	▶ Sealing tape	▶ Belt Wrench	▶ Spanner wrench or Motor wrench
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[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) Screw in 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) 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)

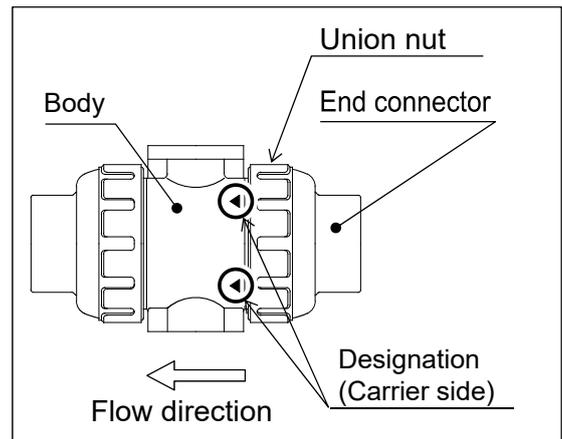
 Warning	
 Prohibition	<p>Serious injury can result.</p> <ul style="list-style-type: none"> <input type="checkbox"/> When hanging or slinging a valve, pay sufficient attention to safety, and do not enter under the load. <p>Fire or an explosion can result.</p> <ul style="list-style-type: none"> <input type="checkbox"/> Ensure adequate ventilation when using adhesives and do not use open flames around them.
 Forcing	<p>Electric shock or There is a danger of injury.</p> <ul style="list-style-type: none"> <input type="checkbox"/> Be sure to perform safety inspections of the machine tool and power tool beforehand. <input type="checkbox"/> Wear appropriate protective equipment according to the type of work being performed.

 Caution	
 Prohibition	<p>There is a danger of injury.</p> <ul style="list-style-type: none"> <input type="checkbox"/> The adhesive contains volatile solvents, so do not inhale odors directly. <p>The valve can be damaged, or leak.</p> <ul style="list-style-type: none"> <input type="checkbox"/> Do not apply too much adhesive. Excessive adhesive will flow into the valve. <input type="checkbox"/> Do not strike the pipe when inserting it into the end connector. <input type="checkbox"/> Do not overtighten the union nut. <input type="checkbox"/> Do not use a pipe wrench to tighten the union nut.
 Forcing	<p>There is a danger of injury.</p> <ul style="list-style-type: none"> <input type="checkbox"/> If the adhesive adheres to the skin, remove it immediately. <input type="checkbox"/> If you feel worse or feel unusual when using the adhesive, promptly seek a doctor's diagnosis and take appropriate action. <p>The valve can be damaged, or leak.</p> <ul style="list-style-type: none"> <input type="checkbox"/> The union nut of this product is lightly tightened to make it easier to loosen. Be sure to remove the end connector before installation. <input type="checkbox"/> Install the product so that excessive stress such as tension, compression, bending or impact is not applied to the piping or valve. <input type="checkbox"/> Fix the end connector during piping work or disassembly and reassembly. <input type="checkbox"/> 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). <input type="checkbox"/> Be careful when constructing under low temperature, as solvent vapor is less likely to evaporate and tends to remain. <input type="checkbox"/> After piping, open both ends of the pipe and use a blower (low-pressure type) to ventilate to remove the solvent vapor. <input type="checkbox"/> Use "ASAHI AV cement" depending on the material. <input type="checkbox"/> Perform the water flow test after 24 hours or more have elapsed after completion of bonding.

⚠ Caution

Safe use.

- ▶ When installing the valve 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.)



Necessary items

- ▶ 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) Screw in the union nut by 1/4 to 1/2 turn with a belt wrench to prevent damage to the nut.

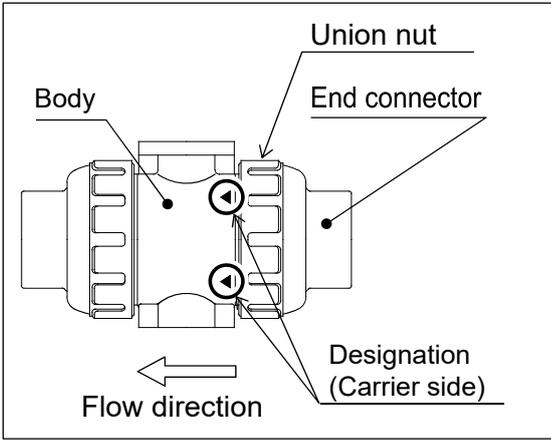


Table 5-3. Usage of adhesives (Reference)

Nominal size	Volume
15mm	1.0 g
20mm	1.3 g
25mm	2.0 g
32mm	2.4 g
40mm	3.5 g
50mm	4.8 g

Socket end (fusion), spigot end (fusion)

 Warning	
 Prohibition	<p>Serious injury can result.</p> <ul style="list-style-type: none"> <input type="checkbox"/> When hanging or slinging a valve, pay sufficient attention to safety, and do not enter under the load.
 Forcing	<p>Electric shock or there is a danger of injury.</p> <ul style="list-style-type: none"> <input type="checkbox"/> Be sure to perform safety inspections of the machine tool and power tool beforehand. <input type="checkbox"/> Wear appropriate protective equipment according to the type of work being performed.

 Caution	
 Prohibition	<p>The valve can be damaged, or leak.</p> <ul style="list-style-type: none"> <input type="checkbox"/> Do not overtighten the union nut. <input type="checkbox"/> Do not use a pipe wrench to tighten the union nut.
 Forcing	<p>The valve can be damaged, or leak.</p> <ul style="list-style-type: none"> <input type="checkbox"/> The union nut of this product is lightly tightened to make it easier to loosen. Be sure to remove the end connector before installation. <input type="checkbox"/> Install the product so that excessive stress such as tension, compression, bending or impact is not applied to the piping or valve. <input type="checkbox"/> Fix the end connector during piping work or disassembly and reassembly. <input type="checkbox"/> 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).
	<p>Safe use.</p> <ul style="list-style-type: none"> <input type="checkbox"/> When installing the valve at the end of the pipe, pay attention to the flow direction. (Check ◀ 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.) <div style="text-align: right;">  </div>

Necessary items	<input type="checkbox"/> Belt Wrench	<input type="checkbox"/> Fusing machine	<input type="checkbox"/> Instruction manual of the fusing machine
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[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) 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	<p>Electric shock or There is a danger of injury.</p> <ul style="list-style-type: none"> <input type="checkbox"/> Be sure to perform safety inspections of the machine tool and power tool beforehand. <input type="checkbox"/> Wear appropriate protective equipment according to the type of work being performed.
------------------	---

⚠ Caution

⊘ Prohibition	<p>The valve can be damaged, or leak.</p> <ul style="list-style-type: none"> <input type="checkbox"/> Do not over-tighten when supporting piping with a U-band, etc. <input type="checkbox"/> When installing a valve in the piping around the pump, do not cause large vibrations in the valve.
! Forcing	<p>The valve can be damaged, or leak.</p> <ul style="list-style-type: none"> <input type="checkbox"/> Do not over-tighten when supporting piping with a U-band, etc. <input type="checkbox"/> Install it vertically when screwing in the Ensats. ▶ For detailed handling of the special tool for installation of the Ensats, refer to the instruction manual of the Ensats manufacturer separately.

Necessary items	<input type="checkbox"/> Wrench	<input type="checkbox"/> Rubber sheet	<input type="checkbox"/> U-band (with bolt)
	▶ Bolts/nuts/washers	▶ Ensats	▶ Ensats mounting special tool

Attach the Ensats to the bottom stand.

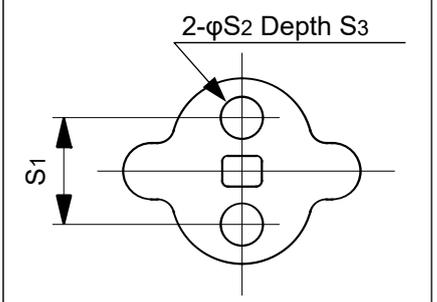
[Procedure]

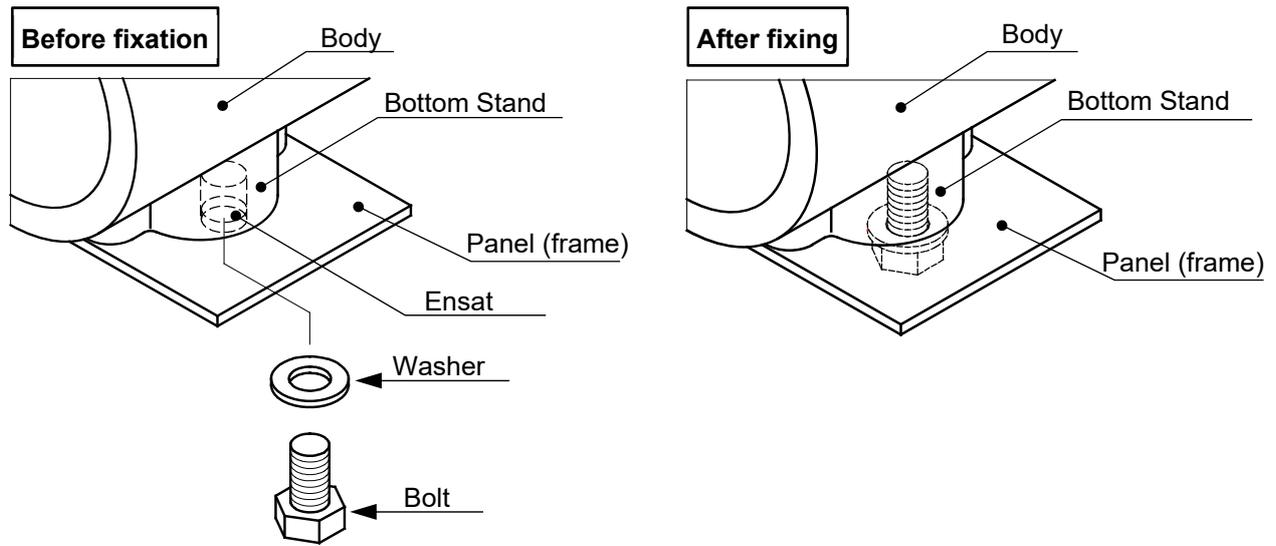
1) Refer to the Ensats instruction manual and screw the Ensats into the bottom stand.

Table 5-4 Bottom Stand and Ensats Dimensions

Size	Bottom Stand			Ensats		
	S1	S2	S3	Thread size	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	

Fig.5-3 Bottom Stand Shape

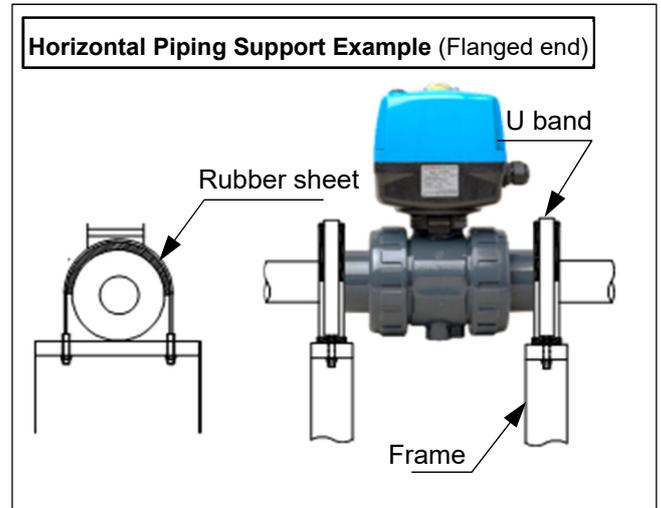


Product Support (continued)**Fig. 5-5 Bottom stand fixing example**

□ Support valve and piping (horizontal piping)

[Procedure]

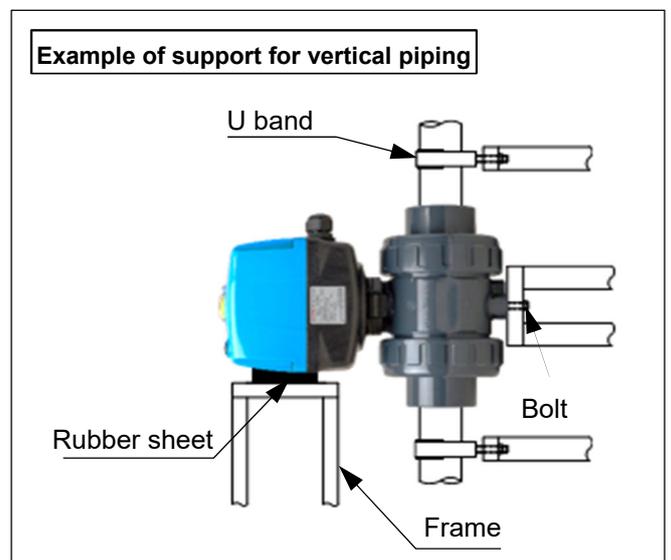
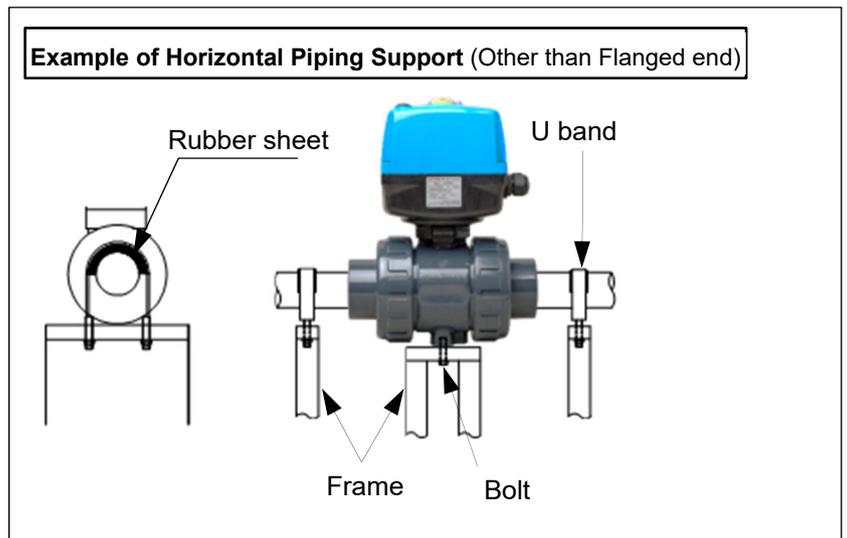
- 1) For flange type, lay the rubber sheet on the flange part of the valve. Lay a rubber sheet on top of the pipe section if it is not a flange type.
- 2) Put the U-band over the rubber sheet and secure it to the frame with the nut.



□ 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.





6. Electrical Wiring procedure

 Warning	
 Prohibition	<p>There is a risk of electric shock.</p> <ul style="list-style-type: none"> <input type="checkbox"/> Do not perform wiring while the power is on. <input type="checkbox"/> Do not touch any other parts on the board or the terminal block wiring part. <input type="checkbox"/> 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). <input type="checkbox"/> Do not perform wiring work with wet hands or tools.
 Forcing	<p>Electric shock or There is a danger of injury.</p> <ul style="list-style-type: none"> <input type="checkbox"/> Be sure to perform safety inspections of the machine tool and power tool beforehand. <input type="checkbox"/> Wear appropriate protective equipment according to the type of work being performed.

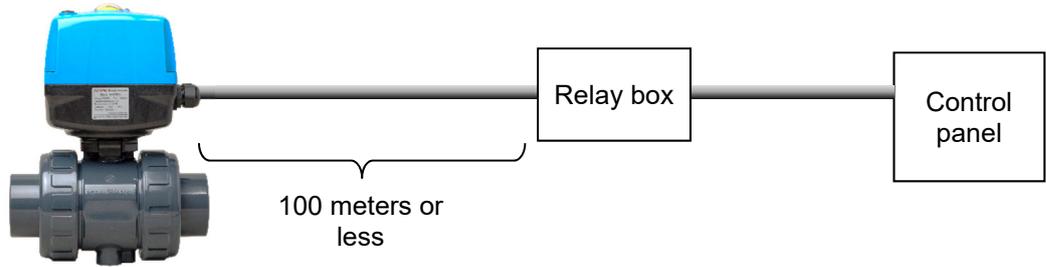
 Caution	
 Prohibition	<p>Doing so may cause the actuator to fail or malfunction.</p> <ul style="list-style-type: none"> <input type="checkbox"/> Do not apply a load to the non-voltage limit switch exceeding the contact capacity. <input type="checkbox"/> Do not connect multiple (two or more) motorized valves in parallel. <input type="checkbox"/> Do not use the product near high-voltage lines, inverters, or other objects that generate noise or magnetism. <input type="checkbox"/> Do not remove the sealing plug supplied with the cable gland if you are not wiring the signal wire.
 Forcing	<p>There is a risk of electric shock or injury.</p> <ul style="list-style-type: none"> <input type="checkbox"/> Keep hands free of moisture and oil during operation. <p>Doing so may cause the actuator to fail or malfunction.</p> <ul style="list-style-type: none"> <input type="checkbox"/> Provide an open/close switch (or relay contact) for each electric valve. <input type="checkbox"/> Be sure to connect the ground wire. <input type="checkbox"/> Connect the wires correctly according to the wiring diagram. <input type="checkbox"/> Perform the wiring work without insulation failure. <input type="checkbox"/> Tighten the terminal block with the recommended tightening torque (0.15~0.18 N-m) so that there is no looseness. <input type="checkbox"/> Connect the wires so that the conductors of the lead wires do not come into contact with each other. <input type="checkbox"/> Tighten the cable gland securely with the recommended tightening torque (3 N-m). <input type="checkbox"/> The cover of the actuator is sealed by an O-ring. When removing and reinstalling the cover for wiring work, etc., make sure that the O-ring is set in place. <input type="checkbox"/> Tighten the screws to attach the cover of the actuator with the recommended tightening torques (1N-m). <input type="checkbox"/> Securely tighten the cable gland when it is used outdoors or in a place where it will be exposed to rain water or water drops. <input type="checkbox"/> After wiring, make sure that the screws (crimp terminals, etc.) are not tightened or loosened. <input type="checkbox"/> This product supports universal power supply. Use the product within the specified power supply voltage.

⚠ Caution

! Forcing

Doing so may cause the actuator to fail or malfunction.

- ❑ The non-voltage limit switch does not support minute loads (for example, when connecting to a 1mA~100mA, 5V~30V, PLC) in the standard product. Select and use an optional product.
- ❑ 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 100 meters or less for connection as a guide.
- ❑ When the distance from the switchboard to the actuator exceeds 100 meters, connect between them through a relay (mechanical relay) to make the distance from the relay to the actuator 100 meters or less.



Necessary items	<input type="checkbox"/> Phillips screwdriver	<input type="checkbox"/> Flat-blade screwdriver (Precision)	<input type="checkbox"/> Electric knife
	<input type="checkbox"/> Wire stripper	<input type="checkbox"/> wrench	<input type="checkbox"/> crimp pliers
			<input type="checkbox"/> bar terminal

[Procedure]

- 1) Remove the four bolt caps on the cover. (See **Fig. 6-1**. Be careful not to lose the bolt cap.)
- 2) Loosen the four screws securing the cover with a Phillips screwdriver and remove the cover.
- 3) Remove the dust seal and sealing plug from the cable gland and thread the cable. (See **Fig. 6-2**.)
- 4) Strip the insulation of the cable sheath and the lead wire with an electric knife and wire stripper.
- 5) Attach the ferrule to the tip of the lead wire with a crimp pliers. When wiring without ferrules, twist the end of the lead wire so that no beard comes out.
- 6) Follow the wiring diagram and use a flathead screwdriver (precision) to connect the ferrule terminal (or the end of the lead wire) to the terminal block with the recommended tightening torque 0.15~0.18 N-m. (See **Fig. 6-3**. Either of the two ground terminals can be used.)
- 7) Secure the cable by tightening the cable gland with a wrench to the recommended tightening torques 3N-m. (See **Fig. 6-4**.)
- 8) Orient the removed cover according to the "Alignment of the shaft for manual operation" as a guide and install it.
- 9) Tighten the four screws securing the cover with a Phillips screwdriver diagonally with the recommended tightening torque 1N-m to attach the bolt cap.

Fig 6-1

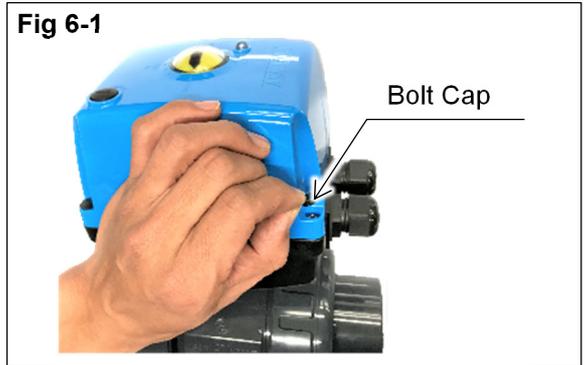


Fig 6-2

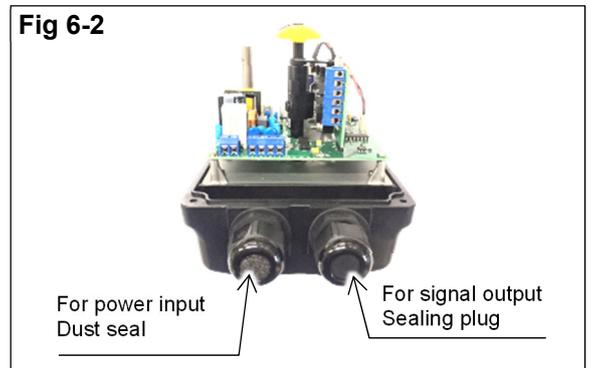


Fig.6-3

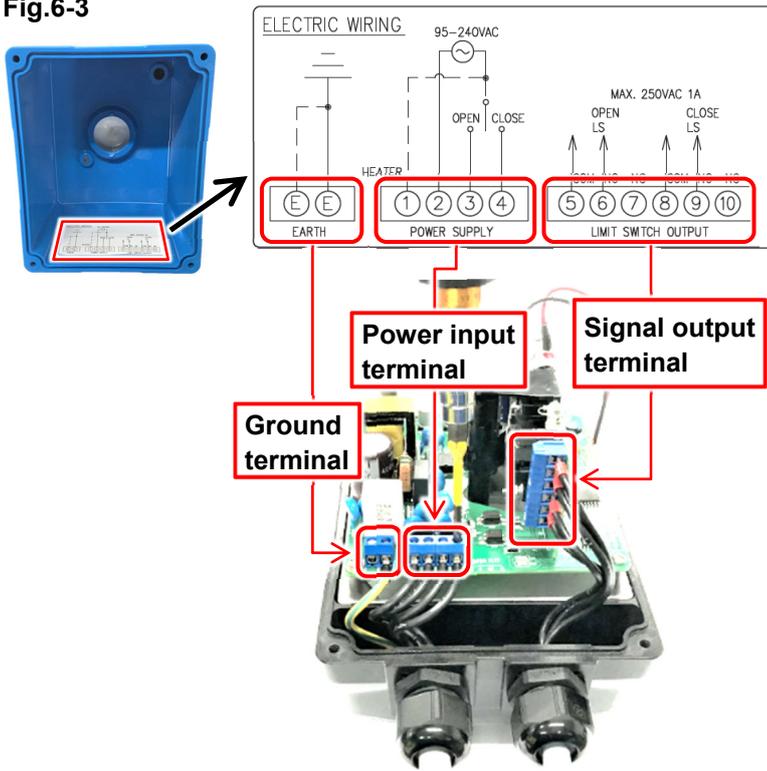


Fig.6-4



7. Commissioning method

 Warning	
 Prohibition	<p>Serious injury can result.</p> <ul style="list-style-type: none"> <input type="checkbox"/> Insulation-resistance DC500V, 10MΩ. Do not apply high voltage considering the actuator specifications below the withstanding voltage AC1500V, 1min. <input type="checkbox"/> Never touch any moving parts (valves and actuators) during operation.
 Forcing	<p>Electric shock or There is a danger of injury.</p> <ul style="list-style-type: none"> <input type="checkbox"/> Be sure to perform safety inspections of the machine tool and power tool beforehand. <input type="checkbox"/> Wear appropriate protective equipment according to the type of work being performed.

 Caution	
 Prohibition	<p>You may be electrocuted or injured.</p> <ul style="list-style-type: none"> <input type="checkbox"/> Do not perform electric operation with the actuator cover open. <input type="checkbox"/> Do not perform manual operation while the power is on. <input type="checkbox"/> Do not operate the motor with the hex key for manual operation attached to the shaft for manual operation. <p>Doing so may damage the actuator.</p> <ul style="list-style-type: none"> <input type="checkbox"/> Do not turn the manual override further than necessary from the fully open and fully closed positions.
 Forcing	<p>There is a risk of electric shock or injury.</p> <ul style="list-style-type: none"> <input type="checkbox"/> Keep hands free of moisture and oil during operation. <p>Doing so may cause the actuator to fail or malfunction.</p> <ul style="list-style-type: none"> <input type="checkbox"/> Confirm that Auto/Manual selector switch (A/M selector switch) is completely switched to the manual operation before operating the manual operation. <input type="checkbox"/> 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. <input type="checkbox"/> 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

Necessary items	▶ Hex key (Hex 5mm)	▶ Flat-blade screwdriver
-----------------	---------------------	--------------------------

[Point] : Function of Auto/Manual selector switch

- Switching to the manual (M) mode shuts off the power to the internal motor and stops the actuator operation. This allows the actuator to be stopped by manual operation or in an emergency without interrupting the power supply to the actuator.
- A/M selector switch is designed to switch by pushing it in and turning it 90° to prevent safety and malfunction.

[Procedure]

- 1) Hold A/M selector and push it in, and turn it clockwise to set the "△" marking from "AUTO (A)" to "MAN (M)." (See Fig. 7-1. When you release your finger, A/M selector is raised.)
- 2) Insert a flathead screwdriver into the manual operation bush on the top of the cover, and turn it counterclockwise to remove the manual operation bush. (See Fig. 7-2.)
- 3) Insert the hex wrench into the shaft for manual operation.

- ! The hexagonal wrench is "standard type" described in JIS B 4648:2008 (Long pattern: 85mm/ short pattern: 33mm) should be used.

- 4) Turn the hex wrench while observing the indicator. (See Fig. 7-3. Open/close rotation speed: 8 to 9 rotations/90°)
 - Clockwise : Valve closing direction
 - Counterclockwise: Valve opening direction

- ! A mechanical stopper is built into the open and closed sides, Use the following ranges as a guide. (BV21, 21α type:-10 to 100°)

- ⊘ In the unlikely event of contact with the mechanical stopper, Do not operate with excessive force.

- 5) When manual operation is complete, remove the hex key from the shaft for manual operation.
- 6) Insert a flathead screwdriver into the manual operation bush removed in **step 2)** and turn it clockwise to attach it to the top of the cover.
- 7) Hold A/M selector and push it in, and turn it counterclockwise to set the "△" mark from "Manual (M)" to "Auto (A)." (When you release the button, A/M selector will pop up.)

Fig.7-1

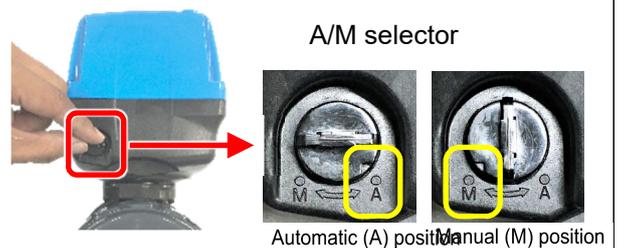


Fig.7-2

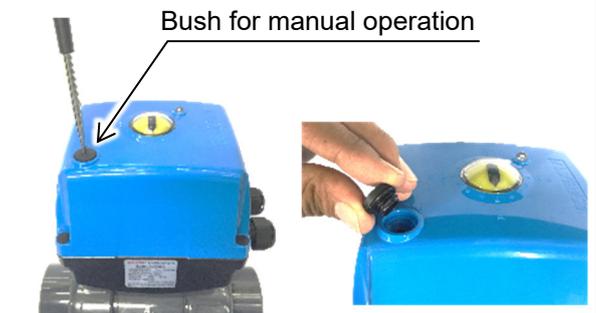
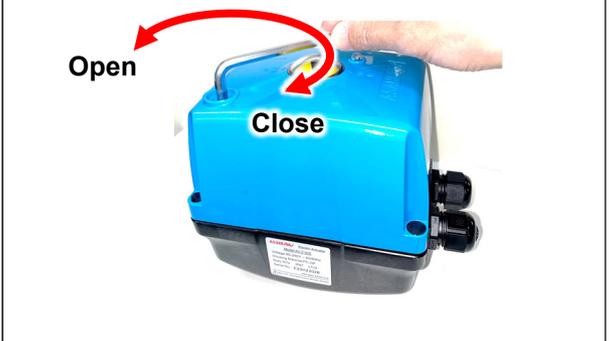


Fig. 7-3



Motor-Driven Operating procedure

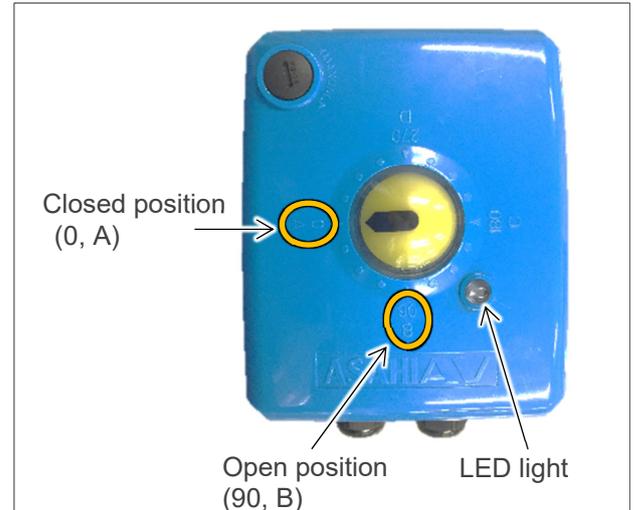
[Procedure]

- 1) Turn on the power.
- 2) Open or close the external selector switch to check that the displayed direction of the valve matches the operating direction.
- 3) Ensure that LED indicator on the top of the cover is lit green or red when the cover is fully open or closed. If you want to change the opening/closing display color, refer to "**11. How to switch the opening/closing display LED color**".
- 4) Shut off the power supply to finish the trial run work.

Water flow test

[Procedure]

- 1) Flow fluid into the piping.
- 2) Operate the valve by opening or closing the external selector switch on the operation panel.
- 3) Check that there is no internal (sheet leakage) or external leakage.
- 4) Fully open or closed to turn off the power.
- 5) If leakage occurs, refer to "**14. 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. Disassembly/Assembly Method for Replacement of Parts".

 **Warning**

 Forcing	<p>Serious injury can result.</p> <ul style="list-style-type: none"> <input type="checkbox"/> A little fluid remains in the valve. Wear protective gloves and eye protection.
--	---

 **Caution**

 Prohibition	<p>The valve can be damaged, damaged, or leak.</p> <ul style="list-style-type: none"> <input type="checkbox"/> Do not overtighten the carrier. <input type="checkbox"/> Do not overtighten the union nut. <input type="checkbox"/> Do not use a pipe wrench to tighten the union nut.
--	---

Necessary items	<input type="checkbox"/> Strap wrench	<input type="checkbox"/> Hand wheel for manual override (option)	<input type="checkbox"/> protective gloves	
	<input checked="" type="checkbox"/> Eye protector	<input checked="" type="checkbox"/> Baseplate removal tool (Option. see photo on right)		

[Procedure]

- 1) Zero the pressure in the piping to completely drain the fluid.
- 2) Follow steps 2) to 6) in <Removal> in "12. How to Remove/Install Actuator" to remove the actuator section.
- 3) For products with a shaft adapter on the stem of the valve, also remove the shaft adapter.
- 4) Loosen the right and left union nuts with a Strap wrench.
- 5) Remove the body from the piping.
- 6) After removing the fluid remaining in the valve by half-opening the valve with the handle for the manual valve, fully close the valve and remove the handle for the manual valve.
- 7) Remove the O-ring (A) attached to the carrier.
- 8) Mate the convex part of the upper part of the handle for manual valve with the concave part of the carrier.
- 9) Turn the hand wheel for the manual valve and adjust the surface pressure by turning the carrier with reference to **Fig. 8-1**.
- 10) Attach the handle for the manual valve to the stem, and check that manual operation can be performed smoothly.
- 11) After fully closing the valve with the manual valve handle, remove the manual valve handle.
- 12) Attach the O-ring (A) to the carrier.
- 13) Return the body part to the piping so that there is no misalignment.
- 14) Screw the right and left union nuts onto the body until they are hand tight.
- 15) Screw the union nut 1/4 to 1/2 turn to prevent it from being damaged by the belt wrench.
- 16) For products with a shaft adapter on the stem of the valve, attach the shaft adapter to the stem of the valve.
- 17) Attach the actuator part to the valve according to steps 1) to 3) in <Installation> in "12. How to Remove/Install Actuator".
- 18) Make sure that fluid flows into the piping, and that the valve operates smoothly by turning on the power and opening and closing several times with electric operation, and that there is no external leakage.
- 19) Fully close the valve by motorized operation and check that there is no seat leakage.

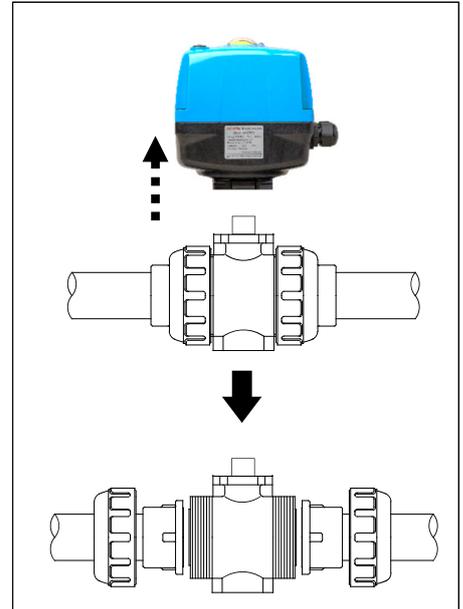
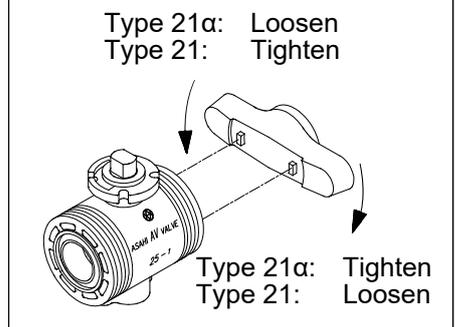


Fig.8-1



9. How to disassemble/assemble parts for 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

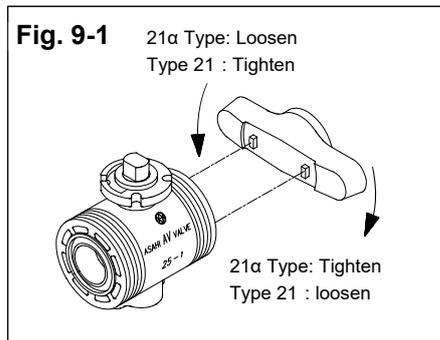
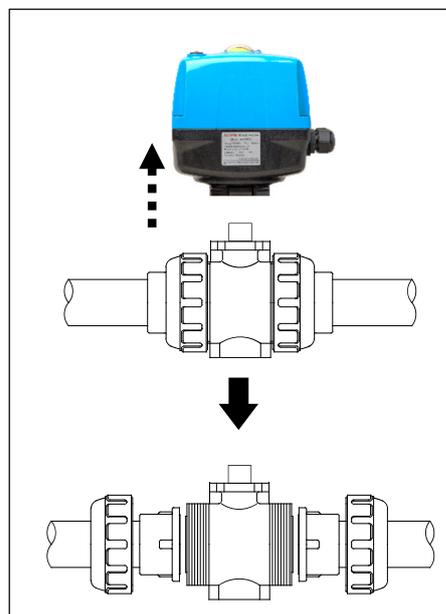
The valve can be damaged, or leak.

- Do not overtighten the carrier.
- Do not overtighten the union nut.
- ▶ Do not use a pipe wrench to tighten the union nut.

Necessary items	<input type="checkbox"/> Belt Wrench	<input type="checkbox"/> Handle for manual valve (sold separately)	
	<input type="checkbox"/> Protective gloves.	<input type="checkbox"/> Protective goggles	
	<input type="checkbox"/> Base plate removal jig (optional; see photo on the right)		

[Disassembly procedure]

- 1) Zero the pressure in the piping to completely drain the fluid.
- 2) Follow steps 2) to 6) in <Removal> in "12. How to Remove/Install Actuator" to remove the actuator section.
- 3) For products with a shaft adapter on the stem of the valve, also remove the shaft adapter.
- 4) Loosen the right and left union nuts with a belt wrench.
- 5) Remove the body from the piping.
- 6) Attach the handle for the manual valve to the stem. After removing the fluid remaining in the valve with the valve in the half-opened state, fully close the valve and remove the handle for the manual valve.
- 7) Remove the O-rings (A) attached to both ends of the body part.
- 8) Mate the convex part of the upper part of the handle for the manual valve with the concave part of the carrier.
- 9) Rotate the hand valve handle to remove the carrier. (See Fig. 9-1.)
- 10) Remove the seat, O-ring (B) and O-ring (C) attached to the carrier, taking care not to damage them.
- 11) Push out the ball by hand.
- 12) Push the stem from the top flange side to the body side.
- 13) Remove the seat and O-ring (C) from the body without damaging them.
- 14) Remove the O-ring (D) and O-ring (E) from the stem, taking care not to damage them.

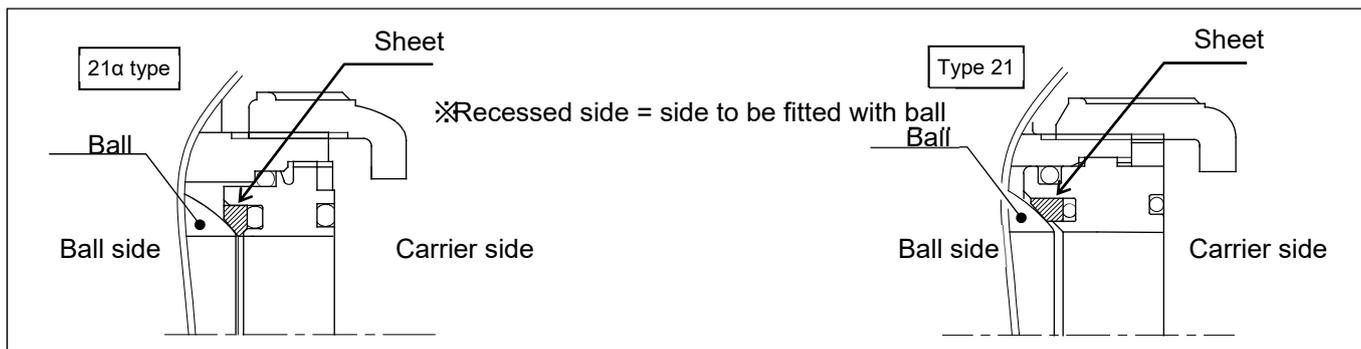


[Assembly Procedure]

- 1) Follow the procedure from step 14) to the reverse procedure in <Disassembly>.

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

When installing the actuator on the valve, make sure that the actuator opening display is aligned with the ④ stem orientation, and then install the actuator on the valve following the procedure described in <Installation> in "11. How to Remove/Install the Actuator".



10. How to adjust the limit switch

Caution



Forcing

There is a danger of injury.

- To prevent the actuator from moving unintentionally, make adjustments with the power supply turned off.

Necessary items □ Hex key (Hex width 5mm) □ wrench (Width 12mm) □ Phillips screwdriver

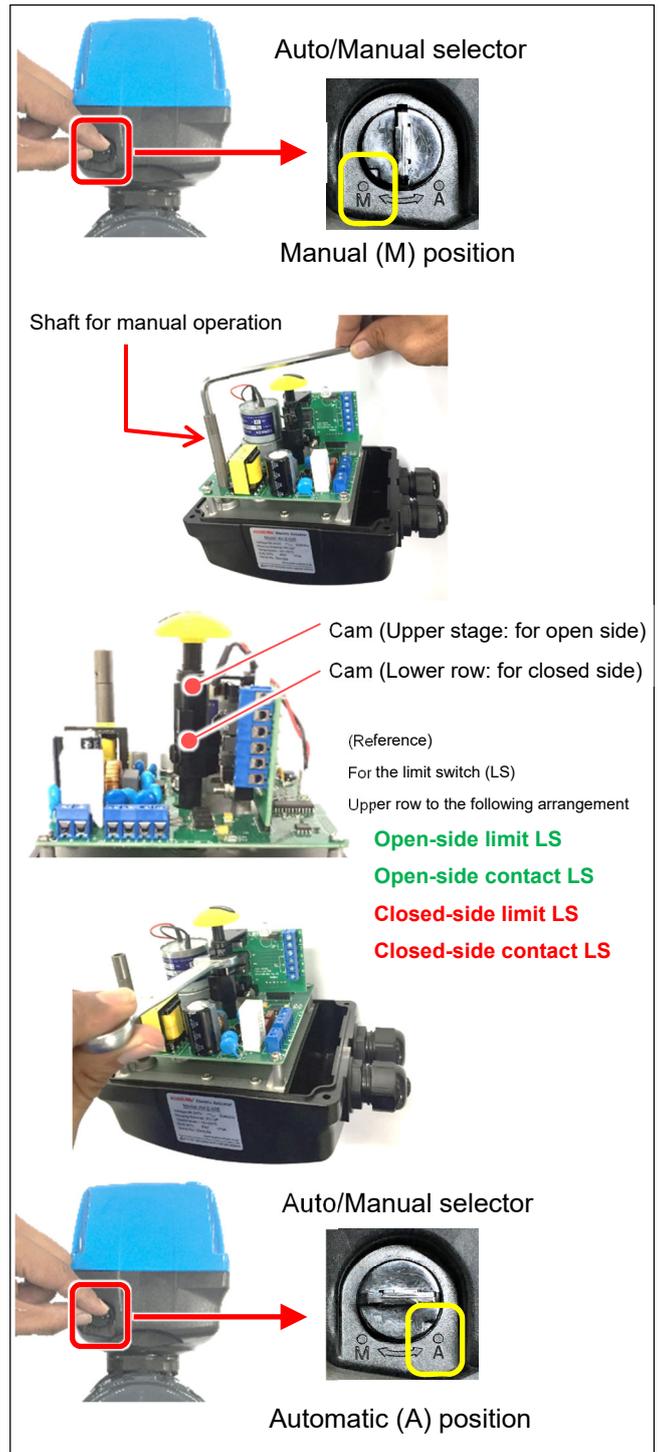
[Procedure]

- 1) Push in A/M selector and turn it clockwise to set the "△" marking from "AUTO (A)" to "MAN (M)." (A/M selector switch raised when you release your hand.)
- 2) Remove the four bolt caps on the cover.
- 3) Loosen the four screws securing the cover with a Phillips screwdriver and remove the cover.
- 4) Insert a hex wrench into the shaft for manual operation.
- 5) Turn the Allen key to set the valve opening to the position where you want to open or close the valve. (See "7. Commissioning Method".)
- 6) Insert the wrench into the two-sided part of the cam.
- 7) Rotate the cam and confirm that the limit switch "click, click" and two-step operation has been performed.
- 8) Turn the Allen key and check that the limit switch operates at the adjusted opening. If the adjustment is insufficient, repeat steps 4) to 7).



A mechanical stopper is built into the left open side and the right open side. Operate it using the following ranges as a guide. (BV21, 21α type:-10 to 100°)

- 9) Orient the removed cover according to the "Alignment of the shaft for manual operation" as a guide and install it.
- 10) Tighten the four screws that secure the cover with a Phillips screwdriver to attach the bolt cap.
- 11) Push in A/M selector and turn it counter clockwise to set the "△" stamp from "Manual (M)" to "Auto (A)." (A/M selector switch raised when you release your hand.)
- 12) Open and close by electric operation. Check that the pointer of the indicator is in the adjusted position on the open or closed side.



11. How to change LED open/close indication

For products with switchable open/close indication LED color, "*" is listed at the end of the serial number. (Refer to Fig. 11-1.) LED color can be selected by operating the switch on the board. (See Fig. 11-2.)



Fig.11-1: Actuator label

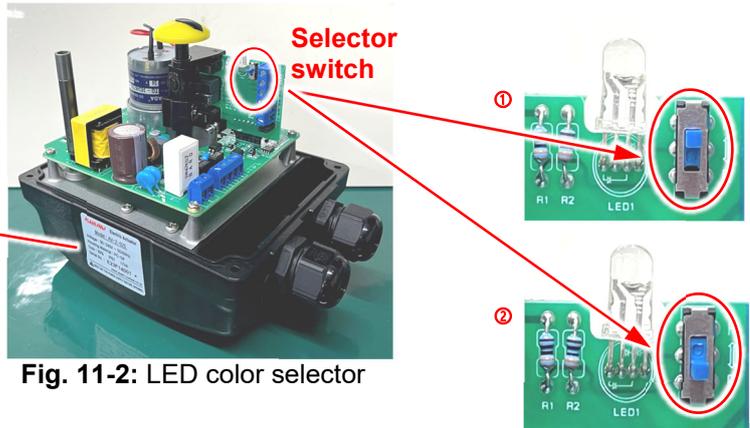


Fig. 11-2: LED color selector

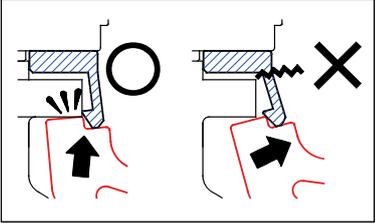
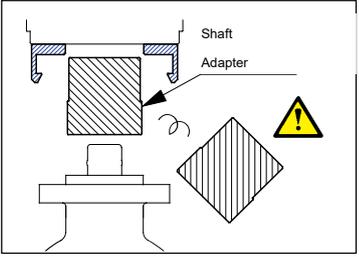
The switchover and LED light colors are shown below. (See Table 11.)

Table11: Open/close indication LED light color and switchover

Position of the selector switch	Open/close display	Remarks
		Selector switch This position when shipped

12. How to remove/install the actuator

⚠ Caution

<p>⊘ Prohibition</p>	<p>Doing so may damage the base plate.</p> <ul style="list-style-type: none"> ❑ When removing the base plate from the valve, do not apply excessive force to the base plate removal jig to forcibly spread the claw part. ❑ Do not replace or remove the base plate excessively. ❑ Do not apply excessive load to the piping or valves when installing or removing the baseplate. 	
<p>! Forcing</p>	<p>Doing so may damage the base plate.</p> <ul style="list-style-type: none"> ❑ Be sure to use the base plate removal jig when removing the actuator. <p>There is a danger of injury.</p> <ul style="list-style-type: none"> ❑ There is a metal fitting between the valve and the actuator. When removing the base plate from the valve, be careful not to pop out or drop the fitting. 	

Necessary items

▶ Base plate removal jig (option, see photo on the right)



<Removal>

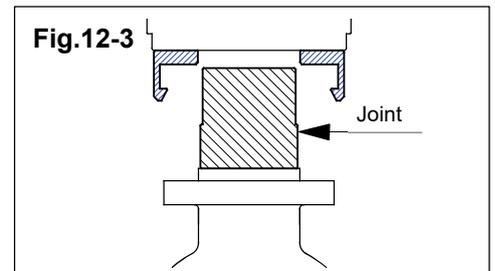
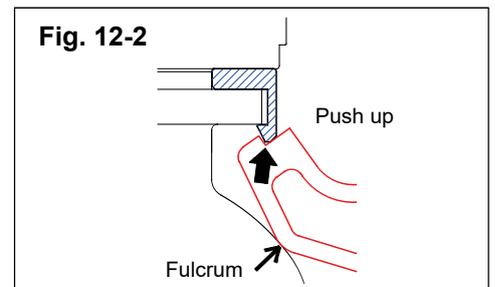
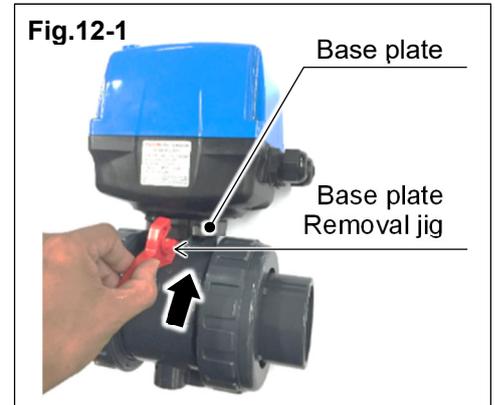
[Procedure]

- 1) Sets the pressure in the piping to zero.
- 2) Fully open or closed to turn off the power.
- 3) Align the end of the base plate removal jig with the center of one claw of the base plate. (See Fig. 12-1.)
- 4) With the side face of the valve as a fulcrum, move the removal jig so that the base plate claw portion is pushed up from below, and remove the hook from the valve body. (See Fig. 12-2.)
- 5) Follow Steps 3) to 4) on the other claw to remove the hook from the valve body.
- 6) When both claws are disengaged, lift the actuator vertically and disconnect it from the valve. (See Fig. 12-3.)

<Installation>

[Procedure]

- 1) Check that the actuator travel indication is aligned with the valve stem and fitting.
- 2) Check the mating position of the top flange and base plate of the valve.
- 3) Push in the base plate while checking visually until the claw part of the base plate is securely hooked on the top flange.



13. Inspection items

 **Caution**

<p> Forcing</p>	<p>Fluid may leak from the valve or the actuator may fail.</p> <ul style="list-style-type: none"> □ 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. <p>You may be electrocuted or injured.</p> <ul style="list-style-type: none"> □ 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 "14. Cause of trouble and remedy".
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Daily inspection

As inspection items Inspection method	Guideline of judgment	Check point	Treatment method
External leakage (visual inspection)	For leakage No	[Flanged end] Pipe flange connection	① Retighten the pipe bolts to the specified torque. ② Remove the valve from the pipe and retighten 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])
		Top flange of the valve	Remove the valve from the piping and replace the valve or defective part. (Ref: 9. How to disassemble/assemble parts for 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 parts for replacement)
Internal leakage (visual and measurement)	For leakage No	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 parts for 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 parts for replacement)
Operating position Displacement (visual inspection)	In a shift No	Actuator opening display	Remove the actuator cover and adjust the limit switch operating position. (Ref: 10. How to adjust limit switch)

Daily inspection (continued)

As inspection items Inspection method	Guideline of judgment	Check point	Treatment method
Abnormal noise (hearing)	Abnormal noise No	Valves and actuators	Remove the valve from the pipe and replace the valve or actuator. (Ref: 9. How to disassemble/assemble parts for replacement)
		Piping around the valve	Reconfirm the conditions of use (Ref: 2. Safety Instructions)
Odor *1) (sniffing)	With a strange smell No	Valves and actuators	Remove the valve from the pipe and replace the valve or actuator. (Ref: 9. How to disassemble/assemble parts for replacement)

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

Periodic inspection

●Guideline for the inspection cycle: 3 months

As inspection items Inspection method	Guideline of judgment	Check point	Remedy for malfunctions
Operating time (Measurement)	Error within ± 1 second	Actuator opening display	Confirm the power supply voltage (Ref: Actuator nameplate)
			Remove the valve from the pipe and replace the valve or actuator. (Ref: 9. How to disassemble/assemble parts for replacement)
Vibration (palpation)	To differences from other parts No	Valve and actuator	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 parts for 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

As inspection items Inspection method	Guideline of judgment	Check point	Remedy for malfunctions
On the manual handle Operability (touch)	Smoothly Turning	Manual operation unit	Remove the valve from the pipe and replace the valve or actuator. (Ref: 9. How to disassemble/assemble parts for replacement)
Of bolts Looseness (visual and palpation)	Loose No	For fixing the actuator cover	Retighten the screws with the following torque Nominal diameter 15~50mm:1 N-m
		Terminal block	Retighten the screws with the following torques Nominal diameter 15~50m :0.15~0.18 N-m
		[Flange type] For flange piping	Retighten the pipe bolts to the specified torque. (Ref: 5. Piping method [Flanged end])
Water intrusion *1) (visual inspection)	Of the intrusion No	Inside the actuator	Replace the actuator (Ref: 9. How to disassemble/assemble parts for replacement)
Intrusion of foreign matter *1) (visual inspection)	Of the intrusion No	Inside the actuator	Replace the actuator (Ref: 9. How to disassemble/assemble parts for replacement)
Insulation resistance test *1) (Measurement)	50 MΩ or more Having	Inside the actuator	Replace the actuator (Ref: 9. How to disassemble/assemble parts for replacement)
Corrosion or rust *1) (visual inspection)	Corrosion or Of rust No	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 parts for replacement)
Product damage	No scratches, cracks, or deformation	Appearance of the product	Remove the valve from the pipe and replace the valve or actuator. (Ref: 9. How to disassemble/assemble parts for replacement)

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

14. 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 Allen key does not turn (or cannot turn) 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 parts for 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 parts for 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)
	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 parts for 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.
	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 parts for 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 parts for replacement)
Fluid leaks even when fully closed (Internal leak)	High fluid pressure	Use below the maximum allowable pressure (Ref: 9. How to disassemble/assemble parts for 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 (Sheet 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 parts for replacement)
	Missing parts	Remove the valve from the piping and attach the relevant part or replace the valve. (Ref: 9. How to disassemble/assemble parts for replacement)
	Foreign matter caught in valve	Remove the valve from the piping, disassemble it, and remove foreign matter. (Ref: 9. How to disassemble/assemble parts for replacement)
	Piping stress is applied to the valve.	Remove the piping stress

Cause of malfunction and remedy (continued)

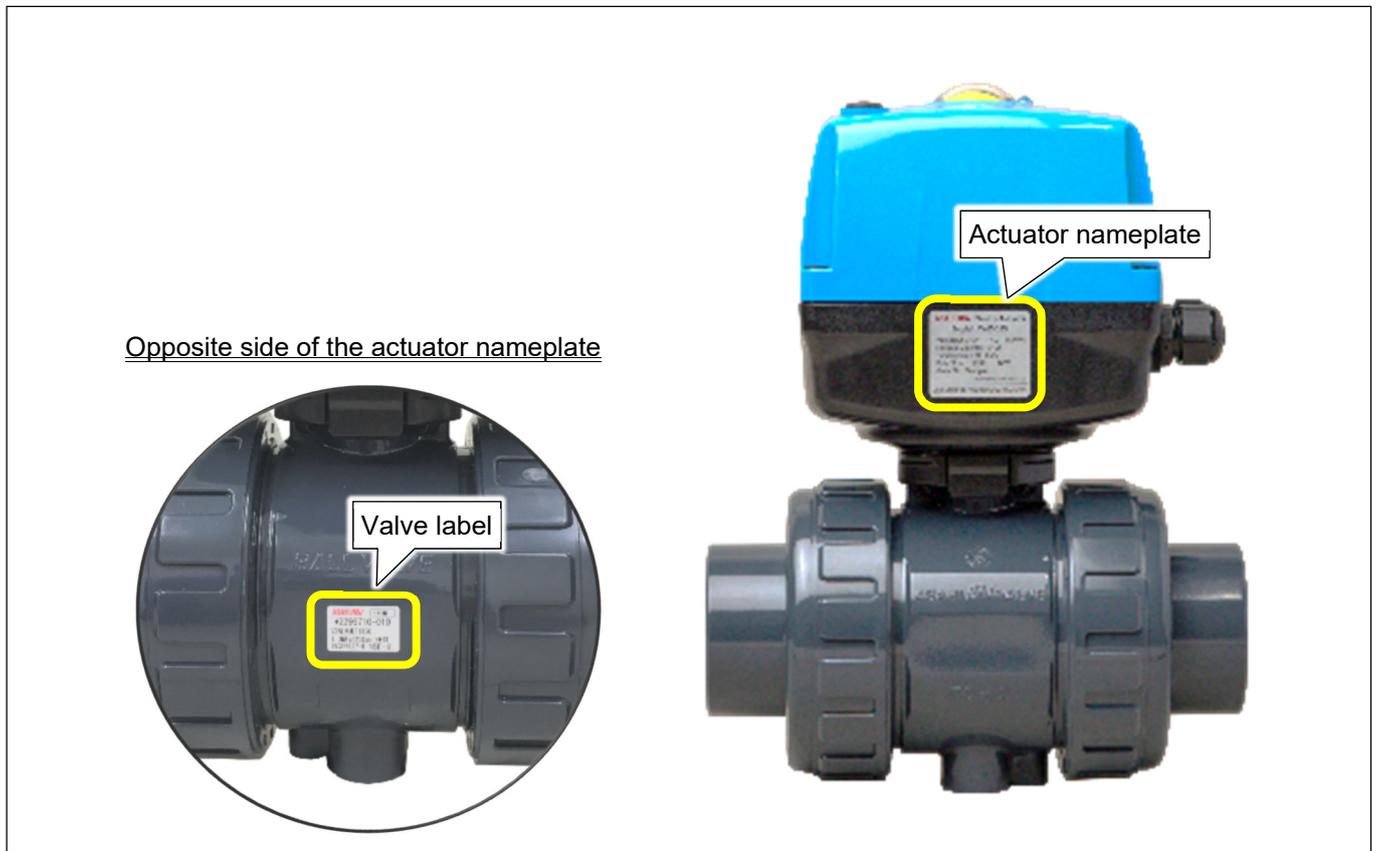
Failure phenomenon	Possible cause	Measures and measures
Fluid leaks from valve (external leak)	Union nut is loose	Retighten the union nut (Ref: 5. Piping method)
	O-ring is scratched, worn, deformed, melted, or altered	Stop using the product immediately, remove the valve from the piping, replace the relevant part, or replace the valve. (Ref: 9. How to disassemble/assemble parts for 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 parts for replacement)
	Valve is cracked or broken	Stop using the product immediately, remove the valve from the piping, and replace the valve. (Ref: 9. How to disassemble/assemble parts for replacement)
Actuator is operating but valve is not open or closed	Damaged stem or ball	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 parts for 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 parts for 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 parts for 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 parts for 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 parts for replacement)

Cause of malfunction and remedy (continued)

Failure phenomenon	Possible cause	Measures and measures
Actuator is corroded	The watch is exposed to chemical liquids.	Stop using the product immediately, remove the valve from the piping, and replace the actuator. (Ref: 9. How to disassemble/assemble parts for replacement)
Valve is corroded or deformed	The watch is exposed to chemical liquids.	Stop using the product immediately, remove the valve from the piping, and replace the valve. (Ref: 9. How to disassemble/assemble parts for replacement)

15. How to query for faults or replacements

If the problem is not improved or parts replacement is required after taking measures or corrective actions, check the nameplate on the side of the actuator and the label information attached to the side of the valve, and contact the nearest dealer or our sales office.



16. Disposal method of residual materials and waste materials

 Warning	
 Forcing	When burnt, toxic gas is generated. <input type="checkbox"/> 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 distributor, our sales office, or our web website for inquiries about this product.

[User's Manual]

Ball Valve Type 21, 21α Electric Type Z
15~50mm (1/2"-2")



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

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

January 2024