Control Valves
Pneumatic Actuated Type AV
15～100mm

User's Manual

Thank you for choosing our product.
This User's 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 User's 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, User's 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 User's manual, etc. or the maintenance or replacement of consumable parts has been performed normally.
- ▶ The component is used for purposes other than the product's intended use.
- ▶ Failure or malfunction due to causes that could not be foreseen by our level of science and technology at the time of shipment.
- ▶ The fault is due to an external factor that is not our responsibility, such as natural disaster or disaster.

Disclaimer

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

2. Safety Instructions

Unpacking, Transportation and Storage

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

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

Product Handling

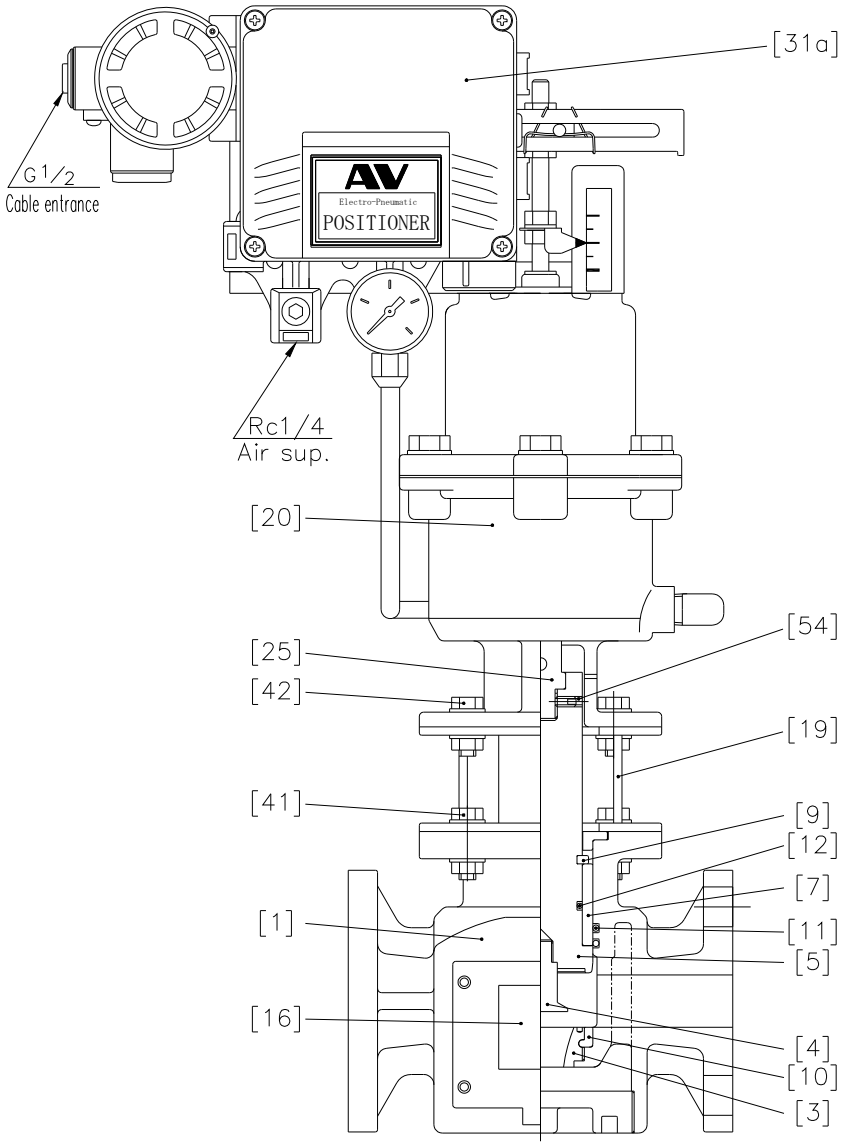
⚠Warning	
Prohibition	**Serious injury can result.** ▶ Do not disassemble the actuator.
Forcing	**The valve can be damaged or leak.** ▶ If positive pressure gas is used for our resin piping material, a dangerous condition may occur due to the repulsive force peculiar to compressible fluids even if the pressure is the same as the water pressure. Therefore, be sure to take safety measures for the surrounding area, such as covering the piping with protective materials. If you have any questions, please contact us separately. ▶ When conducting a pipe leak test after completion of piping construction, be sure to check with water pressure. Contact us in advance if you are unavoidable to test with a gas. ▶ When installing piping, gaskets are basically not required. However, when connecting to a resin flange that is prone to dents, scratches, or warping, use gaskets to ensure stable sealing performance.

⚠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. (There is a risk of deformation, damage or fire.)
Forcing	**The positioner may need to be readjusted.** ▶ The positioner is adjusted at the minimum operating pressure (0.4MPa) when shipped from the factory. Readjust the positioner when using it at anything other than the minimum operating pressure. **There is a danger of injury.** ▶ Secure sufficient space for maintenance and inspection when piping. **The valve can be damaged, or leak.** ▶ Keep body pressure and temperature 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. ▶ It is recommended to cover the entire valve with a protective plastic bag when it is used outdoors or in a badly atmospheric environment. (Rust may cause operation failure.) ▶ When using at an ambient temperature of 5°C or less, remove moisture from the operation air to prevent freezing. ▶ Use clean, dehumidified and dust-free air. However, consult with CKD when using high dry air with a dew point of-40°C or less. ▶ Do not disassemble the actuator.

3. Name of each part

15, 25mm (Body material: U-PVC)

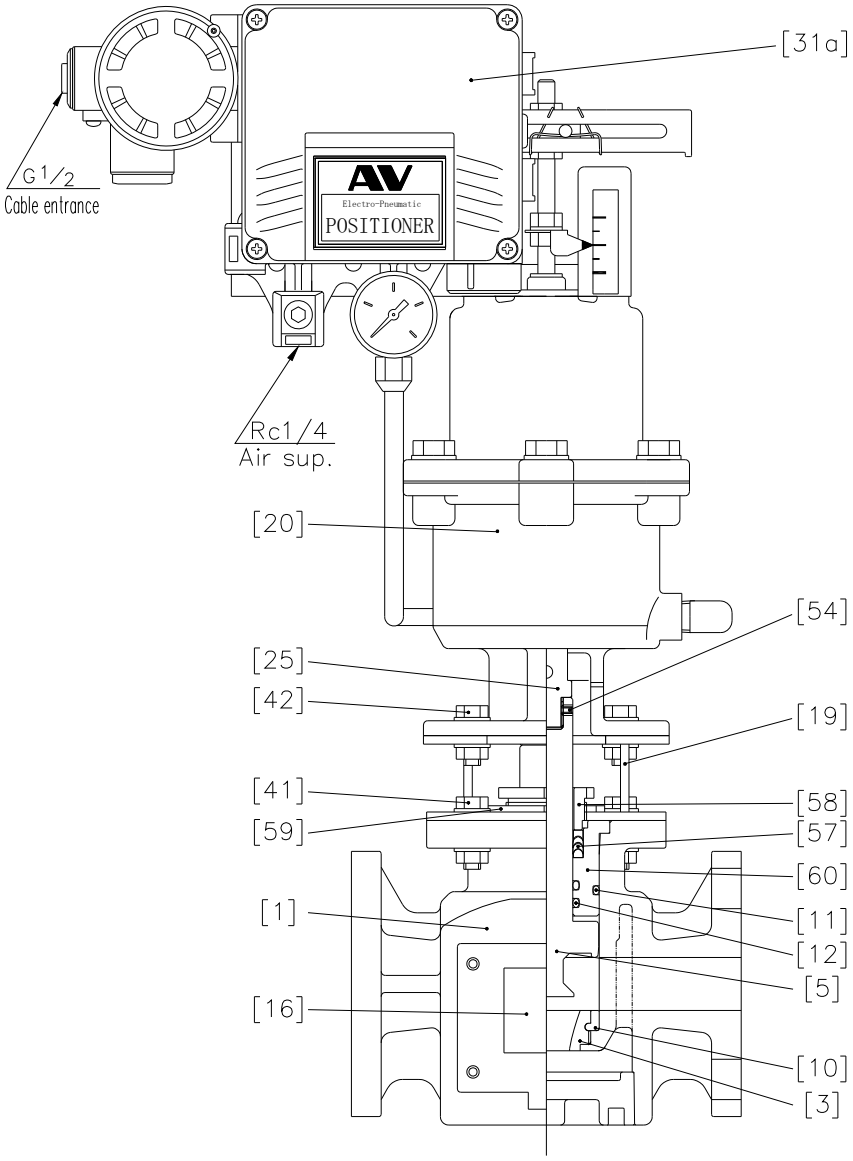
*Drawing shows E-P positioner of “Air to open” type.



[1]	Body	[10]	Seat	[25]	Stem
[3]	Orifice	[11]	O ring(A)	[31a]	Positioner
[4]	Plug	[12]	O ring(B)	[41]	Bolt･Nut (A)
[5]	Piston (A)	[16]	Name plate	[42]	Bolt･Nut (B)
[7]	Bush	[19]	Stand	[54]	Screw (B)
[9]	Stop ring	[20]	Actuator		

15, 25mmv(Body material: PVDF)

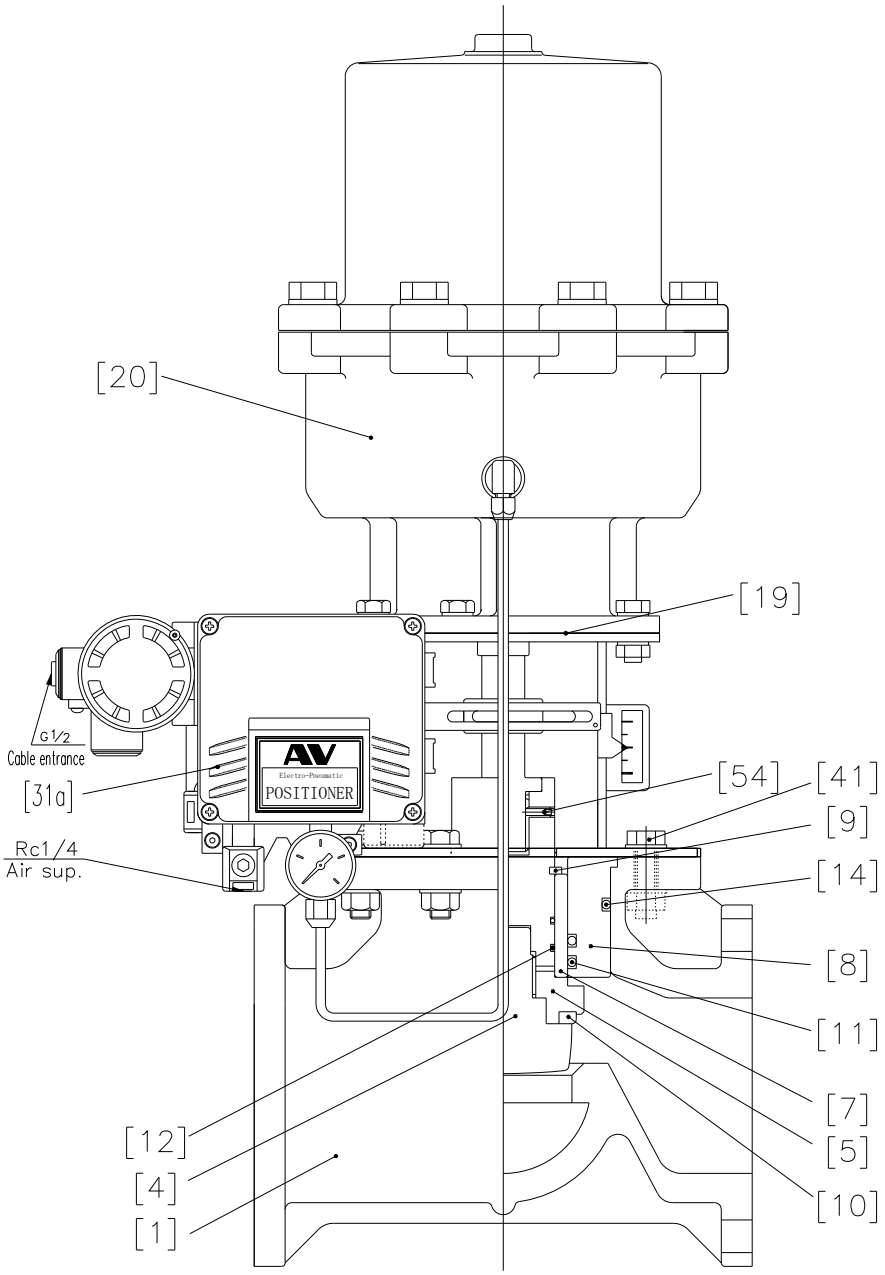
*Drawing shows E-P positioner of “Air to open” type



[1]	Body	[16]	Name plate	[42]	Bolt･Nut (B)
[3]	Orifice	[19]	Stand	[54]	Screw (B)
[5]	Piston (A)	[20]	Actuator	[57]	V-Packing
[10]	Seat	[25]	Stem	[58]	Packing holder
[11]	O ring(A)	[31a]	Positioner	[59]	Stopper
[12]	O ring(B)	[41]	Bolt･Nut (A)	[60]	Piston guide

50, 80, 100mm (Body material: U-PVC)

*Drawing shows E-P positioner of “Air to open” type.



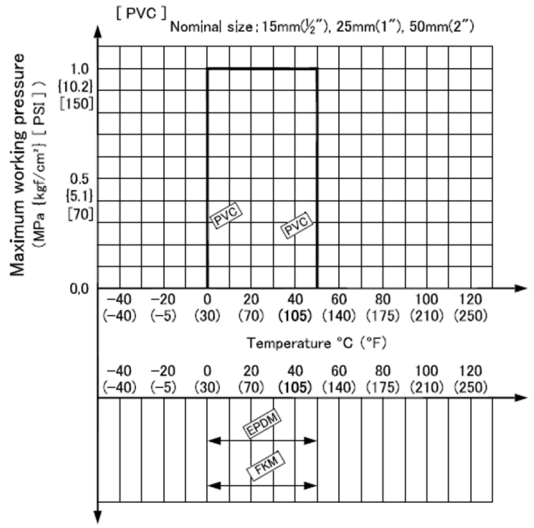
[1]	Body	[9]	Stop ring	[19]	Stand
[4]	Plug	[10]	Seat	[20]	Actuator
[5]	Piston (A)	[11]	O ring (A)	[31a]	Positioner
[7]	Bush	[12]	O ring (B)	[41]	Bolt･Nut (A)
[8]	Bush guide	[14]	O ring (D)	[54]	Screw (B)

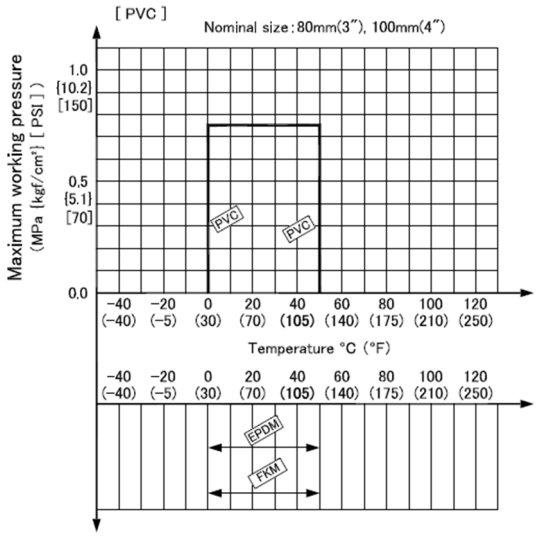
4. Product Specifications

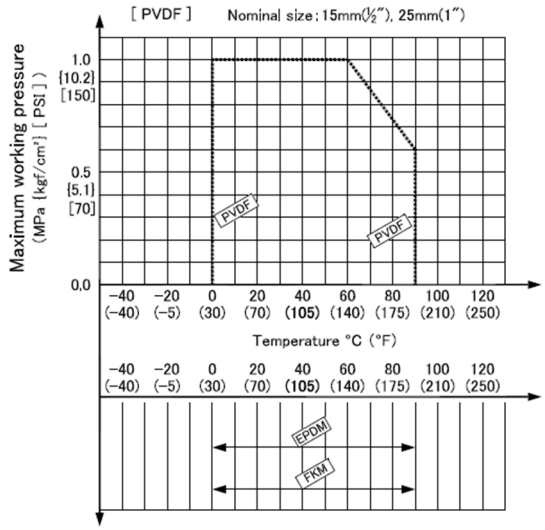
Model number table

ACTUATION	TYPE	ACTUATOR TYPE	ACTION	BODY MATERIAL	SEAL MATERIAL	CONNECTION	STANDARD	SIZE	POSITIONER
A	C V	V	*	*	*	F	*	* * *	* *
A AUTOMATIC VALVE	CV CONTROL VALVE	V TYPE AV	F DOUBLE ACTING G AIR TO OPEN	U PVC F PVDF	E EPDM V FKM	F FLANGED	1 JIS 10K D DIN A ANSI	015 15mm 025 25mm 050 50mm 080 80mm 100 100mm	01 E/P POSITIONER 02 P/P POSITIONER 03 E/P FR SET 04 P/P FR SET

Relationship between maximum allowable pressure and temperature







Valve

Size (mm)		15	25	50	80	100
Type	Double acting Air to open	Single seated control valve Air cylinder type				
Type of Nom. size	Double acting Air to open	-Standard control type -Minute control type	-Standard control type	- Large size control type		
Rated pressure (MPa)	Double acting Air to open	1.0	1.0	1.0	0.75	0.75
Shut off pressure (MPa)	Double acting	0.7	0.7	0.7	0.65	0.65
	Air to open	0.7	0.7	0.7	0.7	0.7
Flow characteristic	Double acting Air to open	Equal % or linear	Equal % or linear	Equal %	Equal %	Equal %
Inherent range ability	Double acting Air to open	-Standard 50:1 -Minute 20:1	50:1	50:1	50:1	50:1
Operating pressure (MPa)	Double acting Air to open	0.4-0.7	0.4-0.7	0.4-0.7	0.4-0.7	0.4-0.7
Air consumption NL per 1 open and close (at MPa)	Double acting	0.6	0.7	2.1	2.1	6.3
	Air to open	1.3	1.5	2.7	5.5	7.9
Air supply bore	Double acting Air to open	Rc 1/4				

Positioner

E-P positioner

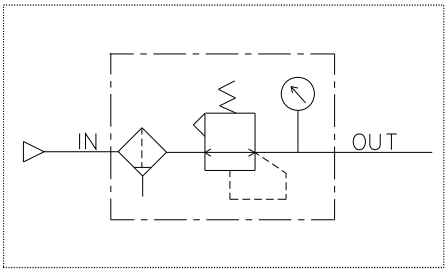
Actuation	Size	Type Sign	Input signal electric current /resistance	Air pipe bore	Electrical connection bore	Protection grade
Double acting Air to open	15mm 25mm	YT-1000L-SJ111S	4～20mADC /250Ω	Rc1/4	G1/2	E x d II BT5
	50mm 80mm 100mm	YT-1000L-SJ131S				

P-P positioner

Actuation	Size	Type Sign	Input signal air pressure (MPa)	Air pipe bore	Protection grade
Double acting Air to open	15mm 25mm	YT-1200L-S111S	0.02～0.10	Rc1/4	IP66
	50mm 80mm 100mm	YT-1200L-S131S			

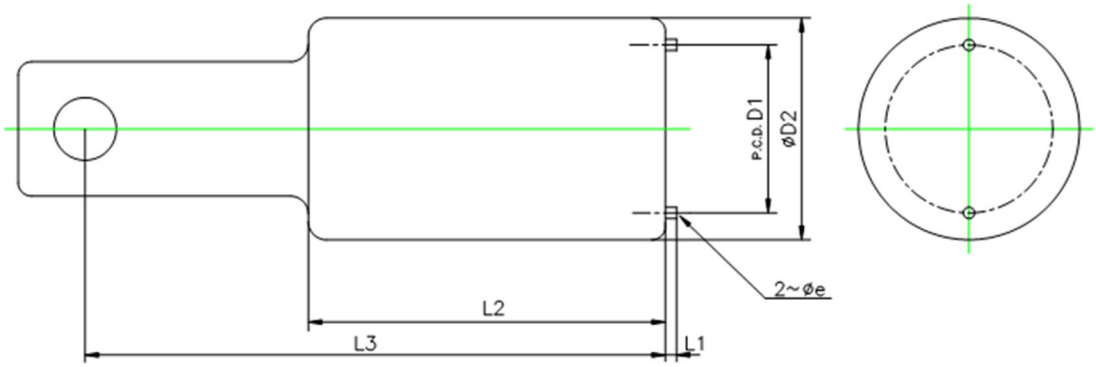
Filter-regulator (Option)

Action	Size	Type Sign	Pipe bore	Element degree of filtration
Double acting Air to open	15mm 25mm 50mm 80mm 100mm	ARU2-02-8A-G	Rc1/4	5μm



Specification of tools for disassembling and assembling valve

Orifice remover



Dimension table

Unit：mm

Size		D_1	D_2	L_1	L_2	L_3	e
15mm	1/2”	23.5	35.5	2.5	60	115	2.5
25mm	1”	37.5	49.5	2.5	80	125	2.5

5. Piping method

⚠Caution	
Forcing	**The positioner may need to be readjusted.** ▶ The positioner is adjusted at the minimum operating pressure (0.4MPa) when shipped from the factory. Readjust the positioner when using it at anything other than the minimum operating pressure. **The valve can be damaged, or leak.** ▶ Do not open or close the valve with dust or other foreign matter in the fluid. ▶ Since foreign matter such as sand may remain in the pipeline even after the valve is installed, open and close the valve after cleaning the inside of the pipe. ▶ If the stopper is loose, adjust the stopper. ▶ Use a connection flange with a full-face seat. ▶ Check that there is no difference in mutual flange standards. ▶ Be sure to use the sealing gaskets (AV gasket), bolts/nuts, and washers to tighten them to the specified tightening torque. (The tightening torque will change if the gasket is not an AV gasket.)

Preparations ▶ Torque wrench ▶ AV gasket

[Procedure]

1) Set the AV gasket between the flanges.
2) Insert washers and bolts from the pipe side, insert washers and nuts from the valve side, then temporarily tighten them by hand.

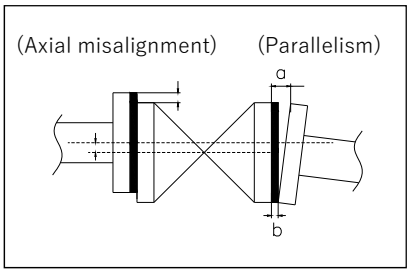
⚠Caution

Forcing

The valve can be damaged, or leak.

▶ Flange surface parallelism and shaft misalignment should be less than the values shown in the table below.

Size	Axial Misalignment	Parallelism (a-b)
15, 25mm	1.0mm	0.5mm
50, 80mm	1.0mm	0.8mm
100mm	1.0mm	1.0mm



3) Using a torque wrench, tighten the bolts and nuts gradually to the specified torque in a diagonal manner (Refer to fig.1.)

⚠Caution

Forcing

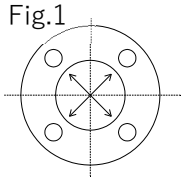
The valve can be damaged, or leak.

▶ Tighten the bolts and nuts of the connection flange diagonally to the specified torque.

Recommended torque value Unit：N･m {kgf・cm}

Size	15	25	50	80, 100
PTFE・PVDF Coated	17.5{179}	20.0{204}	22.5{250}	30.0{306}
Rubber	8.0{82}	20.0{204}	22.5{250}	30.0{306}

Fig.1



6. Support installation method

⚠Caution	
Prohibition	**The valve can fail, break, become damaged, or leak.** ▶ Do not cause large vibrations to the valve by the piping around the pump.
Forcing	**Otherwise, excessive force may be applied to the valve body and piping, thus leading to damage.** ▶ Install a valve support.

Preparations ▶ Spanner wrench ▶ U-type clamp (with bolt) ▶ Rubber sheet

Level installation

Set the stand under the valve.

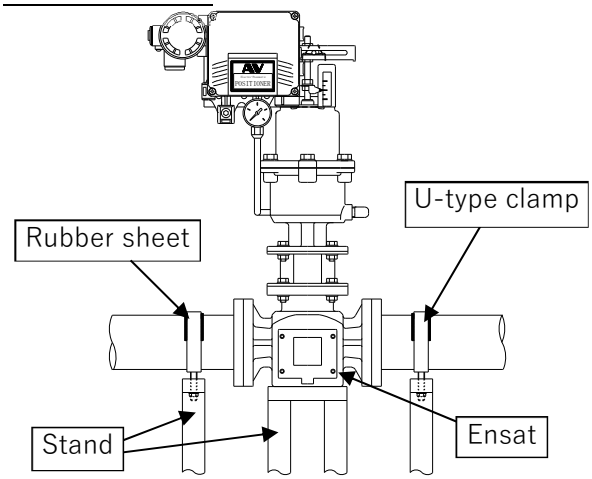
Only for Size 15, 25mm (1/2”, 1”), the Ensat which is equipped to the body enables the valve to fix to the stand. Refer to the chart below.

Dimension of Ensat

Size	15, 25mm
Ensat	M6

Spread the rubber sheet on the pipe and secure with U-type clamp.

Level installation



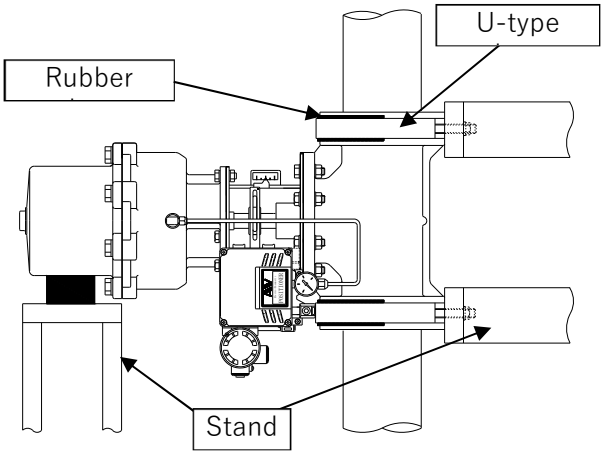
Perpendicular installation

Set the stand under the actuator and the actuator stand.

Only for Size 15, 25mm (1/2”, 1”), the Ensat which is equipped to the body enables the valve to fix to the stand. Refer to the chart above.

Spread the rubber sheet on the pipe and secure with U-type clamp.

Perpendicular installation



7. Air piping procedure

Caution	
Prohibition	**The valve can be damaged, or leak.** ▶ Do not remove the protective plug until just before connecting the air piping. ▶ Do not over-tighten the fitting for air piping.
Forcing	**The valve can be damaged, or leak.** ▶ Check the connection location, air piping size, and screw type from the approval drawing of the product, and then connect the air piping. ▶ Use clean, dehumidified and dust-free air. Consult with CKD when using high dry air with a dew point of-40°C or less. ▶ When using at an ambient temperature of 5°C or less, remove moisture from the operation air to prevent freezing. ▶ When using steel pipes for air piping, use the inner surface of the pipe treated with anti-rust treatment. ▶ Flush the inside of the air piping thoroughly before connecting the air piping. ▶ When connecting the air piping, be careful that foreign matter, such as sealant, does not enter the piping. ▶ Be sure to remove burrs on the threads of the pipe fittings. (This may cause galling or air leakage.)

Preparations		
	▶ Steel pipe or tube for piping	▶ Spanner wrench
	▶ Joint for steel pipe or tube	▶ Seal tape

[Procedure]

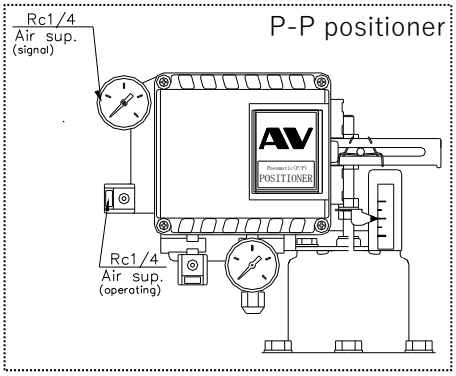
1) Wind a seal tape onto the male screw of the joint with a blank about 3mm (about 2 threads) left at the end.

2) Tighten the joint to the piping port of positioner or pressure reducing valve with filter by hand.

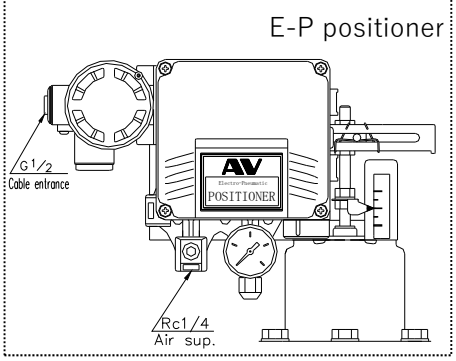
3) Screw the joint one turn with a spanner wrench.
   * Avoid excessive tightening.
   (The valve can be damaged.)

4) Mount a steel pipe or a tube.

P-P positioner



E-P positioner



8 Connection of E-P positioner procedure

Preparations	▶ Screwdriver (+)	▶ Connector (G1/2)	▶ Terminal crimping tool
	▶ Allen wrench	▶ Wire stripper	

[Procedure]

1) Loosen the terminal cover attaching a screwdriver (+) to the space of terminal board cover.
2) Pull the piping port protective cap off.
3) Draw the cable thorough the connector.
4) Strip the cable with a wire stripper.
5) Loosen screws of the crimp-style terminal, which is in the terminal board with a screwdriver (+) and remove it.
6) Install the crimp-style terminal on the lead wire with a terminal-crimping tool.
7) Connect to the terminal screws with a screwdriver in accordance with the indication of terminal board. (Refer to fig.1)
   ※Tighten the screws. (If not, electric leaks or shocks may occur.)
8) Tighten the connector to fix the cable.
9) Tighten the terminal board cover to the terminal board by hand.
10) Tighten the terminal board cover attaching the screwdriver (+) to the space of terminal board cover.
11) Tighten screws fixed the terminal board with a hexagon wrench.

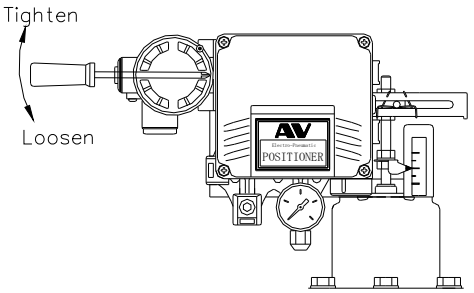
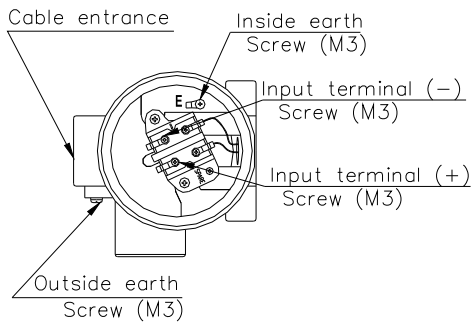


Fig.1



9. Operating procedure

⚠Caution	
Prohibition	**The valve can be damaged or leak.** ▶ For electro pneumatic positioner, do not leave the terminal box cover removed.
Forcing	**The valve can be damaged or leak.** ▶ When using a pressure reducing valve with a filter, ensure that the supply pressure is at least 0.4MPa.

[Procedure]

1) Supply air to the air supply opening.
2) Input the signal electric current, 4-20mADC for the E-P positioner and 0.02MPa [2.9psi] - 0.10MPa [14.5psi] for the P-P positioner.
3) Change the input signal and make sure that the travel indicator shows as below.

Input signal for E-P positioner (mA)	4	8	12	16	20
Input signal for P-P positioner (MPa {kgf/cm^2})	0.02 {0.2}	0.04 {0.4}	0.06 {0.6}	0.08 {0.8}	0.10 {1.0}
The valve travel indicator (%)	0	25	50	75	100

4) Turn off the input signal.
5) Stop supplying air.

10. Method of adjusting positioner

Preparations ▶ Screwdriver (+) ▶ Screwdriver (-)

[Procedure]

1) Loosen the screws fixed the positioner cover with a screwdriver (+) and remove the cover.

2) Supply air to the air supply bore.

3) Input the signal electric current, 4mADC for the E-P positioner. (Input the signal air, 0.02MPa{0.2kfg/cm^2} for the P-P positioner.)

4) Fully close the valve turning the zero point adjusting knob "+" and "-".

5) Input the signal electric current, DC20mA for the E-P positioner. (Input the signal air, 0.02MPa{0.2kfg/cm^2} for the P-P positioner.)

6) Loosen the lock screw fixed the range adjuster with a screwdriver (+).

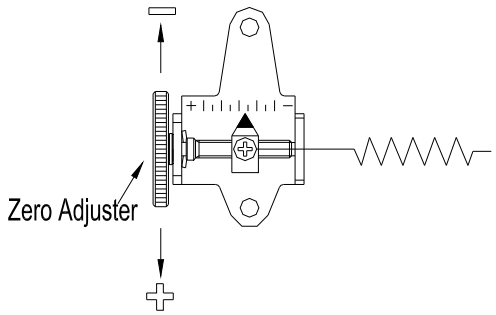
7) Fully open the valve turning the range adjuster.

8) Change the input signal and make sure that the signal and the travel indicator accord with each other. (Refer to page 13)

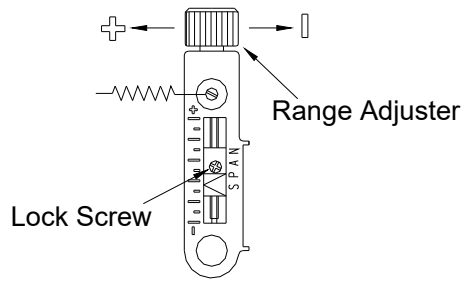
9) Tighten the lock screw fixed the range adjuster with a screwdriver (+).

10) Fix the positioner cover and tighten the screws with a screwdriver (+)

Zero Point adjusting Knob



Range adjusting Knob



11. How to disassemble/assemble for parts replacement

Warning	
Prohibition	**Serious injury can result.** ▶ Do not disassemble the actuator or positioner. ▶ When operating the actuator with air, never touch the drive section.

Caution	
Forcing	**Serious injury can result.** ▶ Be sure to perform safety inspections of the machine tool and power tool beforehand. ▶ When installing piping, be sure to wear the appropriate protective equipment according to the operation details. ▶ Completely drain the fluid in the piping when replacing the valve or replacing parts. If the fluid does not escape, reduce the fluid pressure to zero.

Size: 15, 25mm (1/2", 1") / Body material: U-PVC, PVDF / Air to open

Preparations	▶ Protective gloves ▶ Safety goggles ▶ Marker pen ▶ Spanner wrench ▶ Allen wrench ▶ Screwdriver (-) (Only required for PVDF made Products) ▶ Orifice remover

＜Disassembly＞

[Procedure]

1) Completely discharge fluid from pipes.
2) Close the main valve for air and discharge air from the actuator.
3) Remove the air piping from air supply bore of positioner.
4) As for the E-P positioner, turn off the electric input signal and remove the wiring.
   As for the P-P positioner, close the main valve for input signal air, and set the input signal pressure at zero then remove the input signal air pipe.
5) Loosen and remove the bolt-nut of coupled flange.
6) Remove the valve from the pipe.
7) Loosen the joint of air piping port on the actuator [20] side and remove it.
8) Supply the air, 0.4MPa [58 psi], to the air piping port of actuator [20] and open the valve fully.
9) Put a mark between the actuator [20] and body [1] with a marker pen.
10) Loosen the coupled bolt-nuts [41] of the body [1] and stand [19] and remove them.
11) Lift the actuator [20] with stand [19] up and remove it from the body.
    * Lift the actuator [20] up gently and perpendicularly. (Parts may be scratched.)
12) Stop supplying air to the actuator [20] and discharge it to close.
13) Loosen the screw (B) [54].
14) Turn the piston (A) [5] counterclockwise and remove it without damaging it.
15) Loosen the coupled bolt-nuts [42] of the actuator [20] and stand [19] and remove them.

Body material: U-PVC

16) Remove the stop ring [9] from the piston (A) [5].
17) Pull the bush [7] out of the piston (A) [5].
    * The plug [4] can not be removed because it is screwed in the piston (A) [5] after adhered.
    (If removed by force, the valve may be damaged.)
18) Loosen the orifice [3] with a tool for turning the orifice and remove it.

Body material: PVDF

16) Pull the piston guide [60] out of the piston (A) [5].
17) Loosen the stopper [59] and the packing holder [58] and remove them from the stand [19].
18) Loosen the orifice [3] with an orifice remover, turn the orifice and remove it.

＜Assembly＞

[Procedure]

1) Before starting assembly, silicone grease (fluorine grease is suitable for the chlorine fluid) should be spread on the sliding surfaces and sealing parts, for instance, body [1], piston (A) [5], bush [7] (body material: U-PVC), piston guide [60] (body material: PVDF) and each O-rings.

2) Carry out the assembly work in the reverse procedure from item 18).
*When tightening the bolt･nut [41], tighten them lightly, and open and close the valve a few times. Make sure that there isn't any problem, then tighten them up completely.

Size: 15, 25mm (1/2″, 1″) / Body material: U-PVC, PVDF / Double acting

Preparations	▶ Protective gloves ▶ Safety goggles ▶ Marker pen ▶ Spanner wrench ▶ Allen wrench ▶ Screwdriver (-) (Only required for PVDF made Products) ▶ Orifice remover

＜**Disassembly**＞

[Procedure]

1) Completely discharge fluid from pipes.
2) Close the main valve for air and discharge air from the actuator.
3) Remove the air piping.
4) As for the E-P positioner, turn off the electric input signal and remove the wiring.
As for the P-P positioner, close the main valve for input signal air, and set the input signal pressure at zero then remove the input signal air pipe.
5) Loosen and remove the bolt-nut of coupled flange.
6) Remove the valve from the pipe.
7) Loosen the joint of air piping port on the actuator [20] side and remove it.
8) Put a mark between the actuator [20] and body [1] with a marker pen.
9) Loosen the coupled bolt-nuts [41] of the body [1] and stand [19] and remove them.
10) Lift the actuator [20] with stand [19] up and remove it from the body [1].
* Lift the actuator [20] up gently and perpendicularly. (Parts may be scratched.)
11) Loosen the screw (B) [54].
12) Turn the piston (A) [5] counterclockwise and remove it without damaging it.
13) Loosen the coupled bolt-nuts [42] of the actuator [20] and stand [19] and remove them.

Body material: U-PVC

14) Remove the stop ring [9] from the piston (A) [5].
15) Pull the bush [7] out of the piston (A) [5].
* The plug [4] can not be removed because it is screwed in the piston (A) [5] after adhered (If removed by force, the valve may be damaged.)
16) Loosen the orifice [3] with a tool for turning the orifice and remove it.

Body material: PVDF

14) Pull the piston guide [60] out of the piston (A) [5].
15) Loosen the stopper [59] and the packing holder [58] and remove them from the stand [19].
16) Loosen the orifice [3] with an orifice remover, turn the orifice and remove it.

＜**Assembly**＞

[Procedure]

1) Before starting assembly, silicone grease (fluorine grease is suitable for the chlorine fluid) should be spread on the sliding surfaces and sealing parts, for instance, body [1], piston (A) [5], bush [7] (body material: U-PVC), piston guide [60] (body material: PVDF) and each O-rings.
2) Carry out the assembly work in the reverse procedure from item 16).
*When tightening the bolt･nut [41], tighten them lightly, and open and close the valve a few times. Make sure that there isn't any problem, then tighten them up completely.

Size: 50, 80, 100mm (2″, 3″, 4″) / Body material: U-PVC / Air to open

Preparations	▶ Protective gloves ▶ Safety goggles ▶ Marker pen ▶ Spanner wrench ▶ Allen wrench

＜**Disassembly**＞

[Procedure]

1) Completely discharge fluid from pipes.
2) Close the main valve for air and discharge air from the actuator.
3) Remove the air piping.
4) As for the E-P positioner, turn off the electric input signal and remove the wiring.
As for the P-P positioner, close the main valve for input signal air, and set the input signal pressure at zero then remove the input signal air pipe.
5) Loosen and remove the bolt-nut of coupled flange.
6) Remove the valve from the pipe.
7) Loosen the joint of air piping port on the actuator [20] side and remove it.
8) Supply the air, 0.4MPa {4.1kgf/cm^2} [58psi], to the air piping port of actuator [20] and open the valve fully.
9) Put a mark between the actuator [20] and body [1] with a marker pen.
10) Loosen the coupled bolt-nuts [41] of the body [1] and stand [19] and remove them.
11) Lift the actuator [20] with stand [19] up and remove it from the body [1].
* Lift the actuator [20] up gently and perpendicularly. (Parts may be scratched.)
12) Stop supplying air to the actuator [20] and discharge it to close.
13) Loosen the screw (B) [54].
14) Loosen the piston (A) [5] counterclockwise and remove it without damaging it.
15) Pull the bush guide [8] out of the bush [7].
16) Remove the stop ring [9] from the piston (A) [5].
17) Pull the bush [7] out of the piston (A) [5].
* The plug [4] can not be removed because it is screwed in the piston (A) [5] after adhered.

＜**Assembly**＞

[Procedure]

1) 1) Before starting assembly, silicone grease (fluorine grease is suitable for the chlorine fluid) should be spread on the sliding surface and sealing parts, for instance, body [1], piston (A) [5], bush [7], bush guide [8], each O-rings.
2) 2) Carry out the assembly work in the reverse procedure from item 17).
*When tightening the bolt･nut [41], tighten them lightly, and open and close the valve a few times. Make sure that there isn't any problem, then tighten them up completely.

Size: 50, 80, 100mm (2″, 3″, 4″) / Body material: U-PVC / Double acting

Preparations	▶ Protective gloves ▶ Safety goggles ▶ Marker pen ▶ Spanner wrench ▶ Allen wrench

＜**Disassembly**＞

[Procedure]

1) Completely discharge fluid from pipes.
2) Close the main valve for air and discharge air from the actuator.
3) Remove the air piping.
4) As for the E-P positioner, turn off the electric input signal and remove the wiring.
As for the P-P positioner, close the main valve for input signal air, and set the input signal pressure at zero then remove the input signal air pipe.
5) Loosen and remove the bolt-nut of coupled flange.
6) Remove the valve [1] from the pipe.
7) Loosen the joint of air piping port on the actuator [20] side and remove it.
8) Put a mark between the actuator [20] and body [1] with a marker pen.
9) Loosen the coupled bolt-nuts [41] of the body [1] and stand [19] and remove them.
10) Lift the actuator [20] with stand [19] up and remove it from the body [1].
* Lift the actuator [20] up gently and perpendicularly. (Parts may be scratched.)
11) Loosen the screw (B) [54].
12) Turn the piston (A) [5] counterclockwise and remove it without damaging it.
13) Pull the bush guide [8] out of the bush [7].
14) Remove the stop ring [9] from the piston (A) [5].
15) Pull the bush [7] out of the piston (A) [5].
* The plug [4] can not be removed because it is screwed in the piston (A) [5] after adhered

＜**Assembly**＞

[Procedure]

1) Before starting assembly, silicone grease (fluorine grease is suitable for the chlorine fluid) should be spread on the sliding surface and sealing parts, for instance, body [1], piston (A) [5], bush [7], bush guide [8], each O-rings.
2) Carry out the assembly work in the reverse procedure from item 15).
*When tightening the bolt･nut [41], tighten them lightly, and open and close the valve a few times. Make sure that there isn't any problem, then tighten them up completely.

12. Retightening of V packing (only for body material PVDF)

Warning	
Forcing	**The valve can be damaged or leak.。** ▶ Retightening of the V-packing may be an emergency measure against leakage from the piston sliding part. Inspect and replace consumable parts as a permanent measure.

Caution	
Prohibition	**The valve can be damaged or leak.。** ▶ The valve can be damaged, or leak.
Forcing	**The valve can be damaged, or leak.** ▶ Perform periodic maintenance. (Leakage may occur due to changes in temperature or aging during long-term storage, resting, or use.)

Preparations ▶ Protective gloves ▶ Safety goggles ▶ Screwdriver (-)

[Procedure]

1) Turn the stopper [59] counterclockwise by using a screwdriver.
2) Tighten the packing holder [58] clockwise by using a screwdriver properly.
3) Fix the packing holder [58] and tighten the stopper [59] clockwise.

13. Inspection item

⚠Caution	
Forcing	**The valve can be damaged, or leak.** ▶ 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. ▶ 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 malfunction and remedy".

Daily inspection

Inspection items and inspection methods	Guideline of judgment	Check point	Treatment method
External leakage (visual inspection)	No leakage	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)
		Top flange of the valve	Remove the valve from the piping and replace the valve or defective part. (Ref：11. How to disassemble/assemble for parts replacement)
		Surface of the entire valve	Remove the valve from the piping and replace the valve or defective part. (Ref：11. 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：11. 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：11. How to disassemble/assemble for parts replacement)
Abnormal noise (hearing)	No abnormal noise	Valves and actuators	Remove the valve from the piping and replace the valve or defective part. (Ref：11. How to disassemble/assemble for parts replacement)
		Piping around the valve	Reconfirm the conditions of use (Ref：2. Safety Instructions)
Unusual odor (sniffing)	No abnormal odor	Valves and actuators	Remove the valve from the piping and replace the valve or defective part. (Ref：11. How to disassemble/assemble for parts replacement)

Periodic inspection

▶Guideline for the inspection cycle: 3 months

Inspection items and inspection methods	Guideline of judgment	Check point	Treatment method
Vibration (palpation)	No difference 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 piping and replace the valve or defective part. (Ref：11. 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 for the inspection cycle: 6 months

Inspection items and inspection methods	Guideline of judgment	Check point	Treatment method
Looseness of bolts (visual and palpation)	No Loose	For mounting base + valve	Retighten the mounting bolts
		For mounting base + actuator	Retighten the mounting bolts
		For flange piping	Retighten the pipe bolts to the specified torque. (Ref：5. Piping method)
Water-intrusion (visual inspection)	No intrusion	Inside the actuator	Replace the actuator (Ref：11. How to disassemble/assemble for parts replacement)
Intrusion of foreign objects (visual inspection)	No intrusion	Inside the actuator	Replace the actuator (Ref：11. How to disassemble/assemble for parts replacement)
Corrosion Or rust (visual inspection)	No corrosion or rust	Appearance of the product and in the actuator	Remove the valve from the piping and replace the valve or defective part. (Ref：11. How to disassemble/assemble for parts replacement)
Product damage	No scratches, cracks, or deformation	Appearance of the product	Remove the valve from the piping and replace the valve or defective part. (Ref：11. How to disassemble/assemble for parts replacement)

14. Cause of malfunction and remedy

⚠Caution	
Forcing	**Electric shock or injury may occur.** ▶ If any malfunction is found, immediately stop using the product and take appropriate action. ▶ When replacing the valve or parts, remove the fluid in the piping completely before removing the valve from the piping. ▶ Turn off the power before removing the actuator cover.

Failure phenomenon	Possible cause	Measures and measures
Do not open or close by air operation.	Input signal is not input to the positioner	Insert the input signal.
	Input signal connection of the electro-pneumatic positioner is disconnected.	Check the connection condition again. (Ref：8 Connection of electric-pneumatic positioner procedure)
	Air is not supplied	Supply air.
	Low air pressure	Check the pressure and set the correct pressure.
	Foreign matter caught in valve	Disassemble to remove foreign matter (Ref：11. How to disassemble/assemble for parts replacement)
Fluid leaks even when fully closed (internal leak)	Sheet is worn	Replace seat (Ref：11. How to disassemble/assemble for parts replacement)
	Seat, piston and body are damaged	Replace applicable parts (Ref：11. How to disassemble/assemble for parts replacement)
	Foreign matter is caught.	Open and close several times to allow foreign matter to flow out
	The zero point of the positioner is misaligned.	Readjust the positioner (Ref：10. Method of adjusting positioner)
Fluid leaks from valve	O-ring is damaged or worn.	Replace the O-ring (Ref：11. How to disassemble/assemble for parts replacement)
	O-ring protrudes from the groove.	
	O-ring fold surface (or fixed surface) is damaged or worn.	Replace applicable parts (Ref：11. How to disassemble/assemble for parts replacement)

Cause of malfunction and remedy（continued）

Failure phenomenon	Possible cause	Measures and measures
Fluid leaks even when fully closed (internal leak)	High fluid pressure	Use below the maximum allowable pressure (Ref：11. How to disassemble/assemble for parts replacement)
	Seat or disc is worn or scratched	Remove the valve from the piping, replace the relevant part, or replace the valve. (Ref：11. How to disassemble/assemble for parts replacement)
	Missing parts	Remove the valve from the piping, replace the relevant part, or replace the valve. (Ref：11. 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：11. 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)	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：11. 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：11. 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：11. How to disassemble/assemble for parts replacement)
Actuator is operating but valve is not open or closed	The plug, piston or stem is damaged.	Stop using the product immediately, remove the valve from the piping, replace the relevant part, or replace the valve. (Ref：11. 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：11. 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 actuator. (Ref：11. How to disassemble/assemble for parts replacement)

15. 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]

Control Valves
Pneumatic Actuated
Type AV
15～100mm

ASAHI YUKIZAI

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

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