Diaphragm valve Type 14
Pneumatic actuated Type AV
65～100mm

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".

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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.

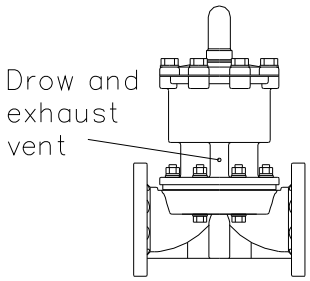
2. Safety Instructions

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.

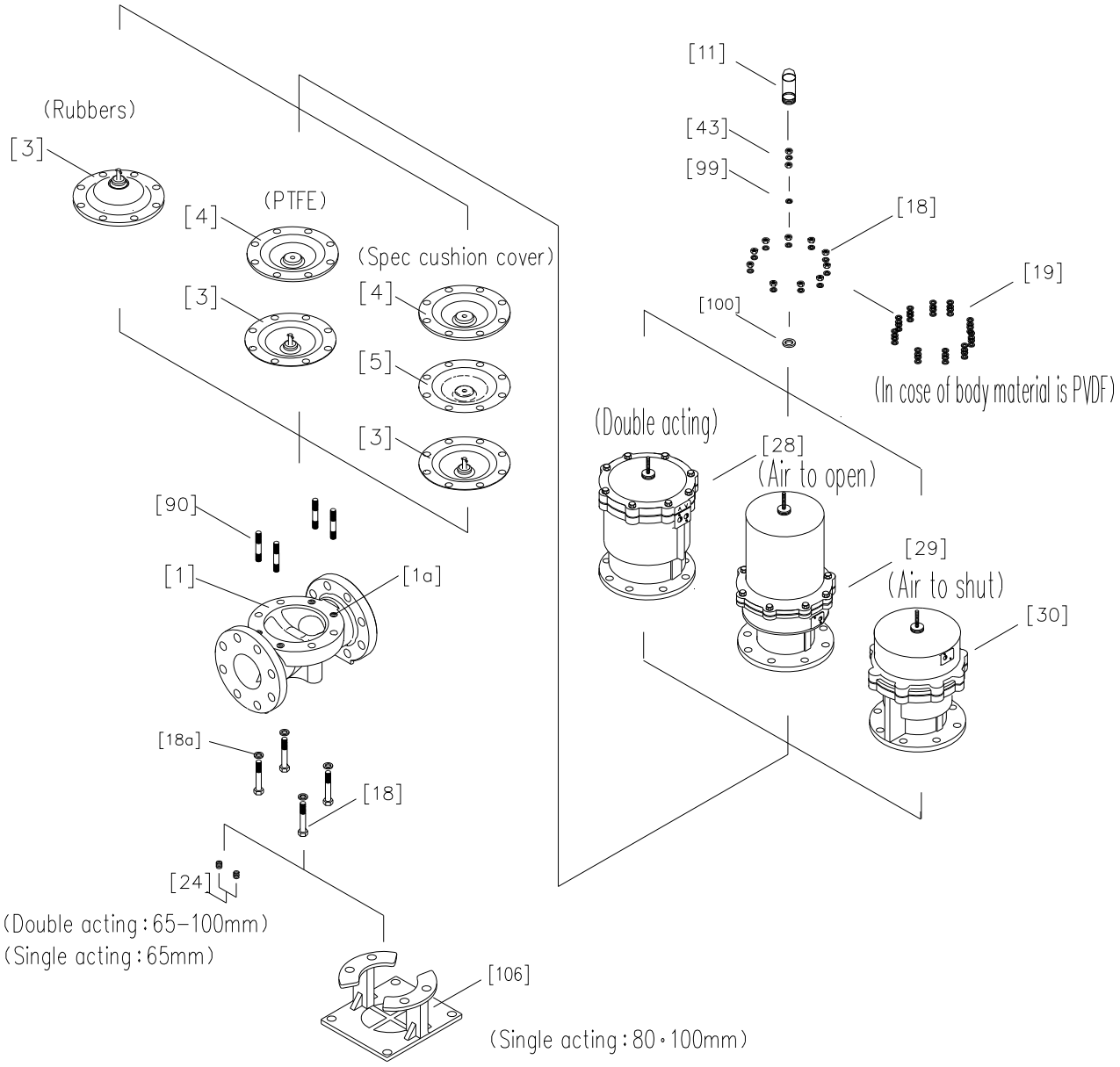
⚠ Caution	
Prohibition	**The valve can be damaged, or leak.** ▶ Do not subject the product to impact by throwing, dropping or hitting. ▶ Do not scratch or pierce the product with a sharp object such as a knife or hand hook. ▶ Do not pile up cardboard boxes forcefully to prevent the load from collapsing. ▶ 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	
Forcing	**The valve can be damaged or seriously injured.** ▶ 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. ▶ Actuators for diaphragm valves are provided with holes (intake and exhaust holes) through which excess air is sucked and exhausted in order to enable vertical operation of the diaphragm. (Rear part of the product) ▶ Note that if the diaphragm is damaged due to operating conditions, the working fluid may spout out of the suction and exhaust holes. 

⚠Caution	
Prohibition	**The valve can be damaged, or leak.** ▶ Do not step on the valve or place heavy objects on it. ▶ Keep away from fire and hot objects. ▶ Do not subject the valve to large vibrations. ▶ Do not use instruments or tools to assist manual operation.
Forcing	**There is a danger of injury.** ▶ 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 "**12. 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. ▶ Keep the ambient temperature of the installation location within-10 to 50°C. ▶ Avoid locations with volatile gases or poor atmospheres. Provide a cover, etc., to cover the entire area. ▶ Use clean, dehumidified and dedusted operating air. However, please consult with us in advance when using high dry air with a dew point of-40°C or less.

3. Name of each part



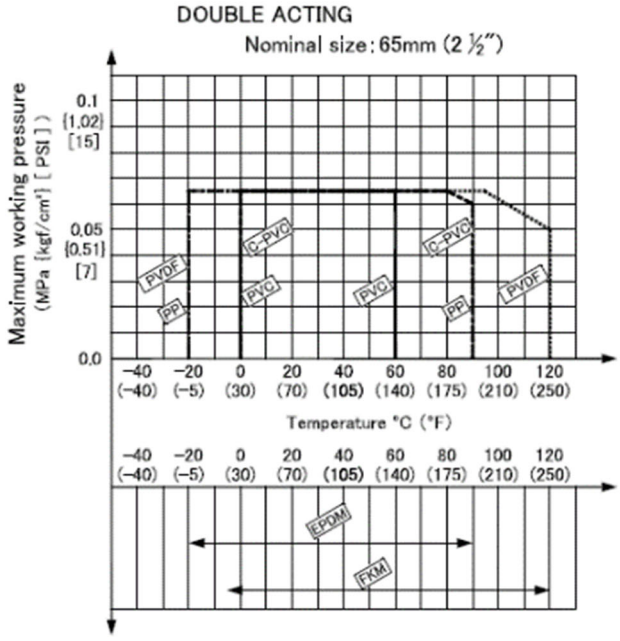
[1]	Body	[18]	Bolt/nut (A)	[30]	Actuator (Air to open)
[1a]	Nut	[18a]	Washer (A)	[43]	Stopper
[3]	Diaphragm	[19]	Spring-washer(A)	[90]	Stud bolt and nut
[4]	Cushion	[24]	Ensat (inset metal)	[99]	Valve seat
[5]	Cushion cover	[28]	Actuator (double acting)	[100]	Gasket (A)
[11]	Gauge cover	[29]	Actuator (Air to close)	[106]	Stand

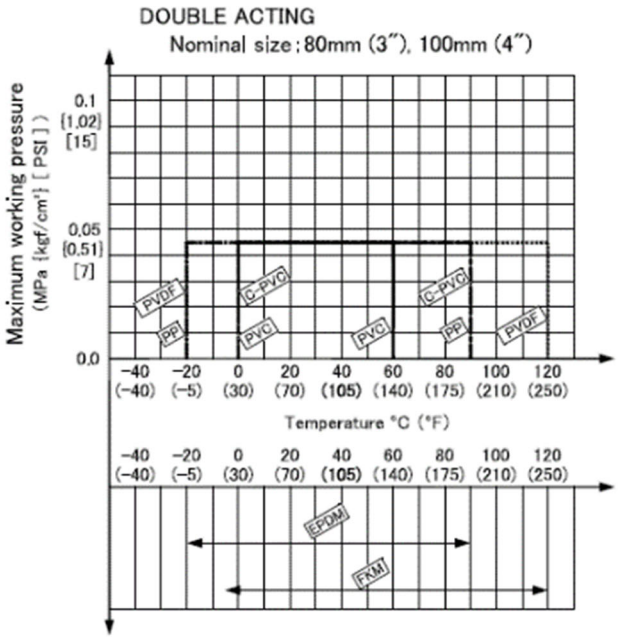
4. Product Specifications

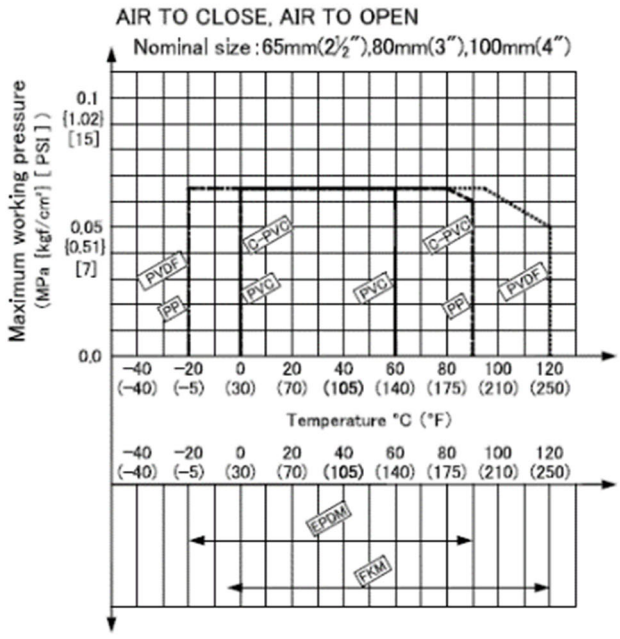
Model number table

ACTUATION	TYPE	ACTUATOR TYPE	ACTION	BODY MATERIAL	SEAL MATERIAL	CONNECTION	STANDARD	SIZE	HIGH PURITY SERIES
A	14	V	*	*	*	F	*	* * *	1
A AUTOMATIC VALVE	14 TYPE 14	V TYPE AV	F DOUBLE ACTING G AIR TO OPEN S AIR TO CLOSE	U PVC C C-PVC P PP F PVDF	E EPDM V FKM T PTFE	F FLANGED	1 JIS 10K D DIN A ANSI (GRINNEL STANDARD) J ANSI (AV STANDARD)	065 65mm 080 80mm 100 100mm	1 LIBRICANT FREE

Relationship between maximum allowable pressure and temperature







Actuator

Size (mm)		65	80	100
Operating pressure range MPa {kgf/cm^2}	Double acting, Air to open Air to close	0.4～0.6 {4.1～6.1}		
Air consumption NL/ open/close (at 0.4MPa)	Double acting	10.3	11.9	20.7
	Air to close	10.6	15.9	34.3
	Air to open	9.4	11.7	26.5
Air supply port size	Double acting, Air to open Air to close	Rc 1/4		

5. Optional specifications

Solenoid valve

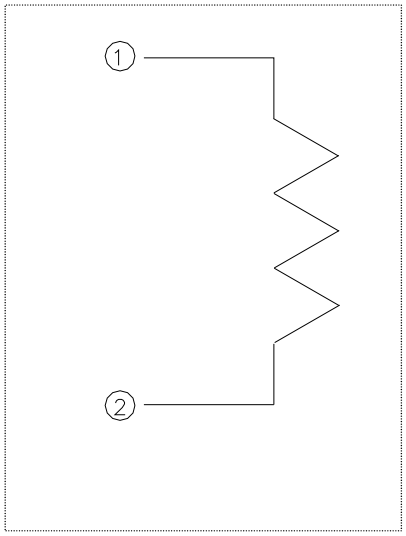
Operation	Size	Model code	Piping port size	Effective area	Power consumption	Additional functions
Double action Air to close Air to open	65～100mm	4N3S102K-W□-G31193	Rc 1/4	10mm^2 or higher	AC:6VA DC:5.5W	○Built-in bypass valve ○Installation of silencer with throttle valve (used as speed controller)

4N3S102K-W□-G31193

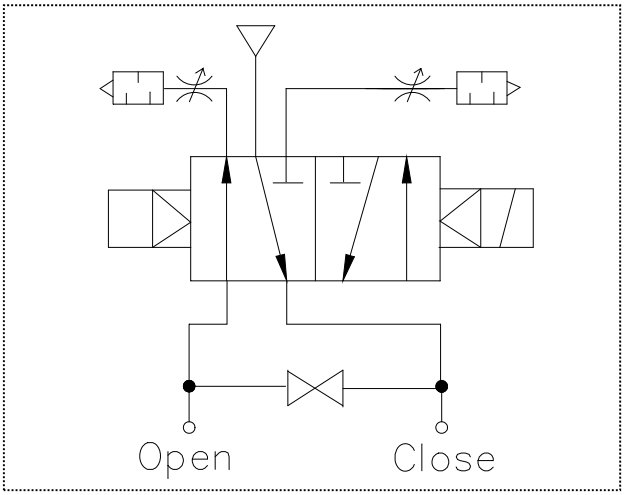
Rated voltage	Text entry
100VAC 50/60Hz	1
110VAC 50/60Hz	(2)
200VAC 50/60Hz	3
220VAC 50/60Hz	(4)
24VDC	5
48VDC	(6)
100VDC	(7)
125VDC	(8)

※ (　) Appended text is a special item.

Wiring diagram



JIS sign



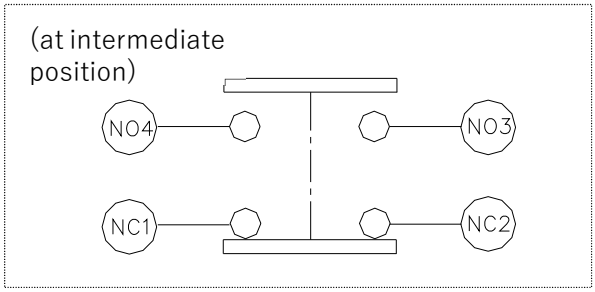
Limit switch

Operation	Size	Model code	Protection grade
Double acting Air to open Air to close	65～100mm	1LS1-J	IP67(IEC529)

Limit switch rating

Rated current (V)	Resistance load (A)	Induction load (A)
125VAC	10	6
250VAC	10	6
115VDC	0.8	0.2
230VDC	0.4	0.1

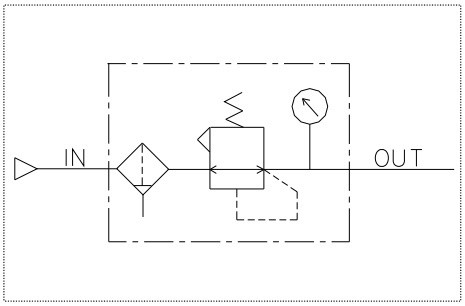
Internal circuit



Filter-regulator

Operation	Size	Model code	Piping port size	Element filtration rate
Double acting Air to close Air to open	65mm 80mm 100mm	ARU2-02-8A-G	Rc 1/4	5μm

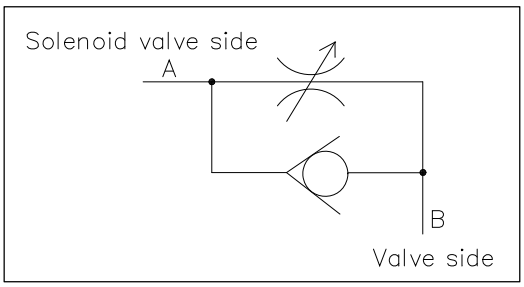
JIS symbol



Speed controller

Operation	Size	Model code	Piping port size
Double acting Air to close Air to open	65～100mm	SC7-08A	Rc 1/4

JIS symbol



Operation	Effective area(mm^2)		Needle Revolution speed
	Free flow	Control flow	
Double action Air to close Air to open	11.0	8.3	8 rotations

6. Piping method

Flange end

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

Caution	
Prohibition	**The valve can be damaged, or leak.** ▶ Do not overtighten the cap nut. ▶ Do not use a pipe wrench to tighten the cap nut. ▶ Do not tighten the bolts and nuts for piping to the specified torque values in Table 6-2.
Forcing	**There is a danger of injury.** ▶ Be sure to perform safety inspections of the machine tool and power tool beforehand. ▶ Wear appropriate protective equipment according to the type of work being performed. **The valve can be damaged, or leak.** ▶ Install the product so that excessive stress such as tension, compression, bending or impact is not applied to the piping or valve. ▶ Fix the body cap during piping work or disassembly and reassembly. ▶ When attaching the valve to the end of the pipe, be sure to attach the cap nut and body cap on the secondary side (downstream side). ▶ When connecting to metal piping, do not apply piping stress to the valve. ▶ Use a connection flange with a full-face seat. ▶ Check that there is no difference in mutual flange standards. ▶ Be sure to use sealing gaskets (AV packing) between the flanges, and tighten the pipe bolts/nuts to the specified torque values in Table 6-2 "Flange tightening torque values." (When other than AV packing, the tightening torque value will change.) ▶ The misalignment and parallelism of the flange surface should be less than the values given in "Table 6-1 Axis misalignment and parallelism". ▶ Tighten the bolts and nuts for piping diagonally to the specified torque values in Table 6-2.

Preparations ▶ Torque Wrench ▶ AV gasket

[Procedure]

1) Set AV gasket between the flanges.
2) Insert the washer and bolt from the connecting flange side, insert the washer and nut from the valve side, and tighten temporarily by hand.

⚠Caution

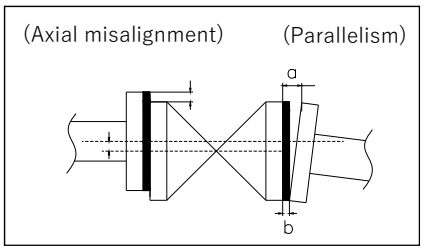
Forcing

The valve can be damaged, or leak.

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

Table 6-1 Axis misalignment and parallelism

Size (mm)	Shaft misalignment	Parallelism (a-b)
65,80	1.0mm	0.8mm
100	1.0mm	1.0mm



3) Gradually tighten to the specified torque value diagonally (see Fig. 1) with a torque wrench.

⚠Caution

Forcing

The valve can be damaged, or leak.

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

(Fig 1)

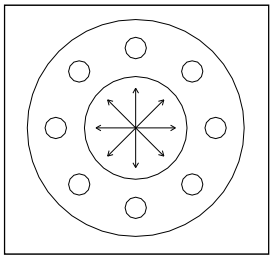


Table 6-2 Flange tightening torque

Units: N•m {kgf・cm}

Size	65mm	80,100mm
Torque value	22.5{230}	30.0{306}

Support of the product

The mounting (panel) and the piping method

⚠Caution	
Prohibition	**The valve can be damaged, or leak.** ▶ Do not over-tighten when supporting piping with a U-band, etc. ▶ When installing a valve in the piping around the pump, do not cause large vibrations in the valve.
Forcing	**There is a danger of injury.** ▶ Be sure to perform safety inspections of the machine tool and power tool beforehand. ▶ Wear appropriate protective equipment according to the type of work being performed. **The valve can be damaged, or leak.** ▶ Do not over-tighten when supporting piping with a U-band, etc. ▶ When installing the product, make sure that no excessive stress such as tension, compression, bending or impact is applied to the piping or valve. ▶ The cap nut of this product is lightly tightened to make it easier to loosen. Be sure to remove the body cap before installation. (There is a risk of external leakage.) ▶ Fix the body cap during piping installation or disassembly and reassembly. ▶ Be sure to attach the cap nut and body cap on the secondary side (downstream side) when attaching to the end of the piping line. ▶ When connecting a resin valve to metal piping, make sure that no piping stress is applied to the resin valve. ▶ Make sure that the screws at the joints are made of resin. ▶ Use sealing tape for the thread joints of our resin piping materials. ▶ When installing the valve at the end of the pipe, pay attention to the flow direction. (The union body is marked with ◂ and should be checked. The union section of the secondary side (downstream side) is integrated with the body, so when installed at the end of the pipe, it can be used more safely.) ▶ Install it vertically when screwing in the Ensat. ▶ For detailed handling of the special tool for installation of the entertainment, refer to the User's manual of the entertainment manufacturer separately.

Mounting method of the entertainment and the frame (panel)

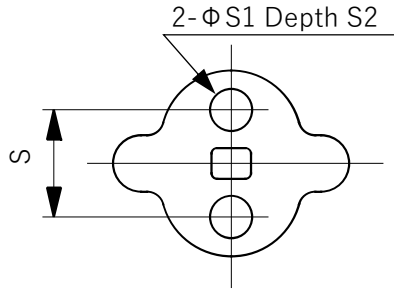
Procedure for attaching the Ensat (metal insert)

⚠Caution	
Forcing	▶ When screwing in the Ensat, mount them vertically. Refer to the Ensat Manufacturer's User's manual and H-V028 Diaphragm Valve/Universal Diaphragm 14 Type User's manual for more information on installation.

Preparations	▶ Special tool ▶ wrench (2 bolts/nuts) ▶ Bolts and nuts (without special tools)

Ensat mounting dimensions table Units; mm

Size	S	S1	S2
15～32	25	7	13
40、50	45	9	15
65	85	11	20
80	100	15	28
100	120	15	28



Proper Ensat (Reference)

Size (mm)	Nominal thread	Length (mm)	Material
15～32	M5	10	Brass (CuZn39Pb3)
40、50	M6	14	Brass (CuZn39Pb3)
65	M8	15	Brass (CuZn39Pb3)
80	M12	22	Brass (CuZn39Pb3)
100	M12	22	Brass (CuZn39Pb3)

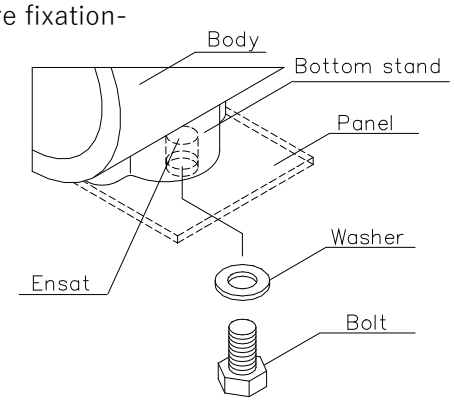
65mm only (without Stand) is provided as standard

Ensat manufacturer: K.K.V. Corporation

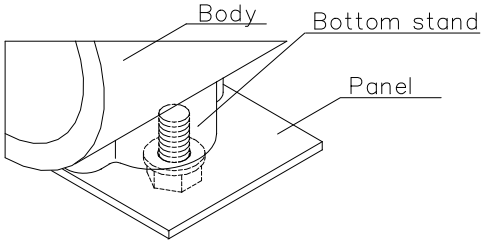
How to fix the bottom stand and frame (panel)

Mounting before and after mounting

-Before fixation-



-After fixing-



How to install support

⚠Caution	
Prohibition	**The valve can be damaged, or leak.** ▶ Do not over-tighten when supporting piping with a U-band, etc. ▶ When installing a valve in the piping around the pump, do not cause large vibrations in the valve.
Forcing	**There is a danger of injury.** ▶ Be sure to perform safety inspections of the machine tool and power tool beforehand. ▶ Wear appropriate protective equipment according to the type of work being performed. **The valve can be damaged, or leak.** ▶ Do not over-tighten when supporting piping with a U-band, etc. ▶ When installing the product, make sure that no excessive stress such as tension, compression, bending or impact is applied to the piping or valve. ▶ Be sure to attach the cap nut and body cap on the secondary side (downstream side) when attaching to the end of the piping line. ▶ When connecting a resin valve to metal piping, make sure that no piping stress is applied to the resin valve.

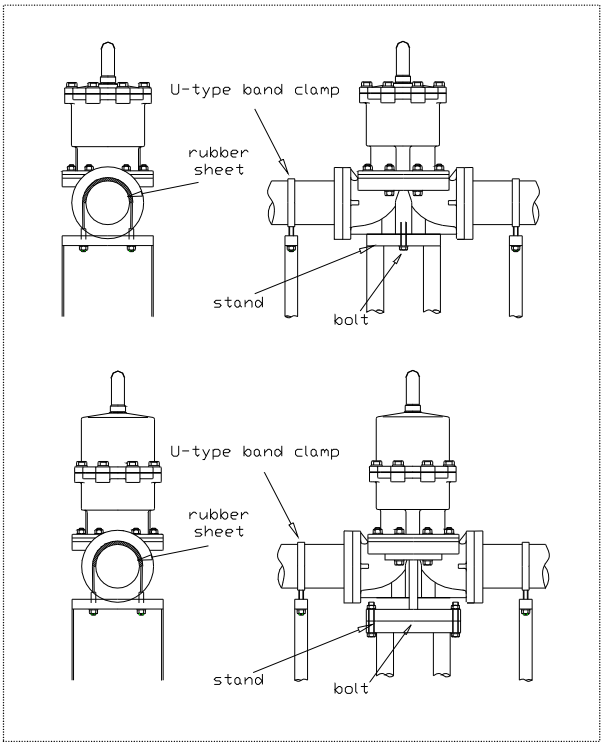
Preparations ▶ Spanner ▶ U-band (with bolt) ▶ Rubber seat

Horizontal piping

When using an entertainment (or Stand) and installing a support

▶ Secure the entertainment (or Stand) and the platform at the bottom of the valve with the bolts.

▶ Lay a rubber sheet on the top of the pipe section and secure it with the U-band.



Bolt Size (Ensat)

Size	65mm	80,100mm
Nominal	M8	M12

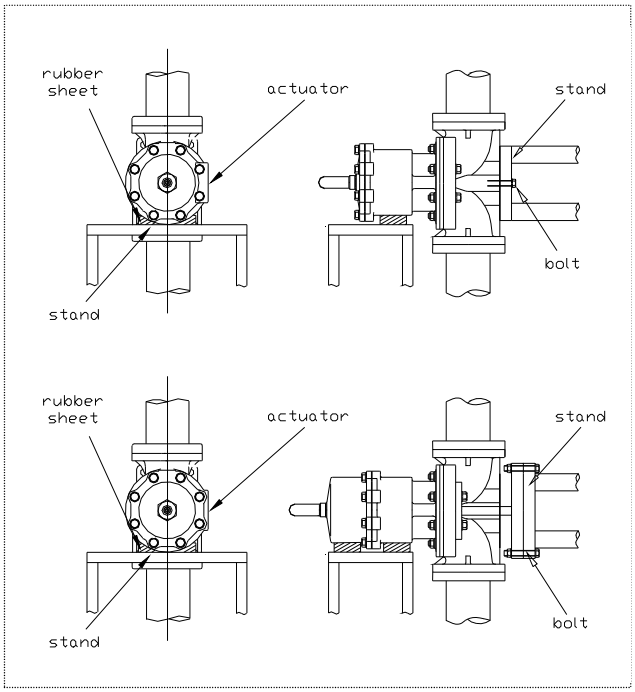
Bolt size (Stand)

Size	80 mm	100mm
Nominal	M16	M16

Vertical piping

▶ Secure the entertainment (or Stand) and the platform at the bottom of the valve with the bolts.

▶ Lay a rubber sheet on the actuator part and support it with the frame.



7. Air piping method

<1> Without option or with speed controller

Warning	
Prohibition	**You might be injured.** ▶ Do not remove the protective plug until just before connecting the air piping.

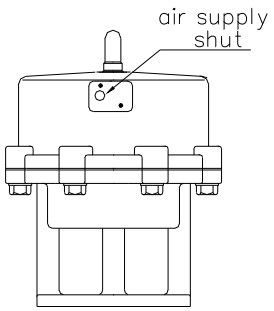
Caution	
Prohibition	**Damage may occur.** ▶ Do not over-tighten the fitting for air piping.
Forcing	**There is a danger of injury.** ▶ Wear appropriate protective equipment according to the type of work being performed. **Otherwise damage or malfunction can result.** ▶ Confirm the connection location, air piping size, and screw type from the approval delivery drawing etc. 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 copper piping for air piping, use one with rust-proof treatment on the inner surface of the pipe. ▶ 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 from the pipe fittings/threads. (This may cause gargle or air leakage.)

Preparations	▶ Copper or tube for air piping ▶ wrench ▶ Copper or tube fittings ▶ sealing tape

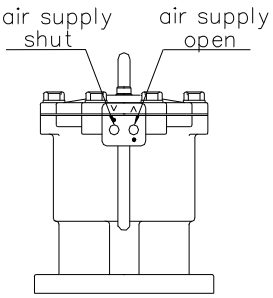
[Procedure]

1) Wrap sealing tape around the male thread of the fitting, leaving approximately 3mm at the end.
2) Tighten the fitting to the piping port of the actuator.
3) Screw the fitting in one turn with a wrench.
4) Install copper or tube for air piping.

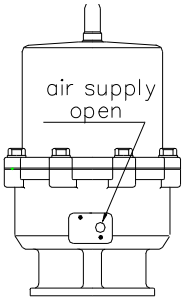
(Air to shut)



(Double acting)



(Air to open)



※Although the picture shows no speed controller, the piping procedure is the same.

<2> **With solenoid valve and filter regulator**

Warning	
Prohibition	**There is a danger of injury.** ▶ Do not remove the protective plug until just before connecting the air piping.

Caution	
Prohibition	**Doing so may cause damage.** ▶ Do not over-tighten the fitting for air piping.
Forcing	**There is a danger of injury.** ▶ Wear appropriate protective equipment according to the type of work being performed. **Otherwise damage or malfunction can result.** ▶ When using copper piping for air piping, use one with rust-proof treatment on the inner surface of the pipe. ▶ 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 from the pipe fittings/threads. (Scoring or air leakage occurs) ▶ Do not over-tighten the fitting for air piping. ▶ Be sure to lock the adjustment knob of the solenoid valve after adjustment. ▶ Regularly drain the drain from the pressure regulator with filter. ▶ Set the secondary pressure of the regulator with filter to a setting that meets the equipment specifications. (Otherwise, malfunction or failure may result.)

Preparations	▶ Copper or tube	▶ wrench
	▶ Copper or tube fittings	▶ Sealing tape

[Procedure]

1) Wrap sealing tape around the male thread of the fitting, leaving approximately 3mm at the end.

2) Tighten the fitting to the air piping port (see Fig. 1 and Fig. 2) with a fitting.

3) Screw the fitting in one turn with a wrench.

4) Install copper or tube tubes for air piping.

Fig 1

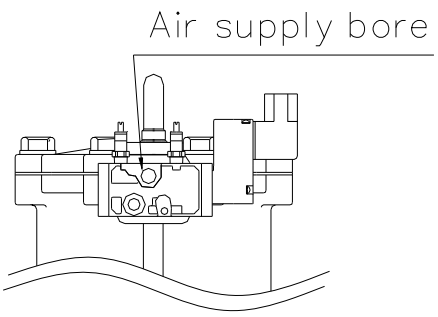
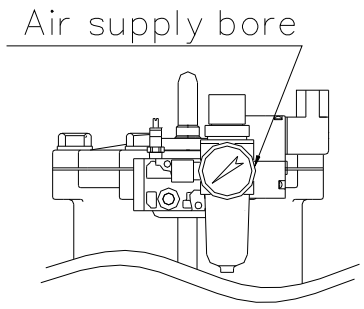


Fig 2



8. Wiring method

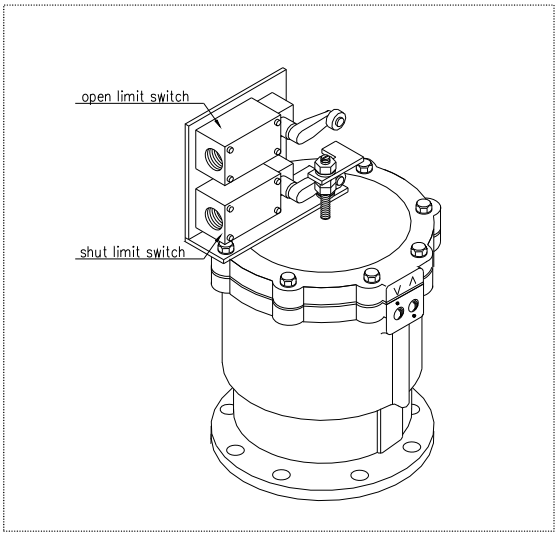
Limit switch

Warning	
Prohibition	**There is a risk of electric shock.** ▶ Do not perform wiring while the power is on.

Caution	
Prohibition	**Otherwise failure or malfunction of the machine can result.** ▶ If the product is installed outdoors or in a location where there is a possibility of rainwater or moisture intrusion, make sure that rainwater, etc. does not enter through the wiring port.
Forcing	**There is a danger of injury.** ▶ Be sure to perform safety inspections beforehand for the machine tools to be used. ▶ Wear appropriate protective equipment according to the type of work being performed. **Otherwise failure or malfunction of the machine can result.** ▶ Connect the wires using solderless terminals with insulation covering so that they do not come into contact with the cover or housing. (If the crimp terminal comes into contact with the cover, the cover may not close and may cause a ground fault.) ▶ Contact CKD when using a limit switch in a 1mA～100mA, 5V～30V.

Preparations	▶ Phillips screwdriver ▶ Connector (G1/2) ▶ Compression terminal ▶ Wire stripper ▶ Terminal crimping tool

[Procedure]



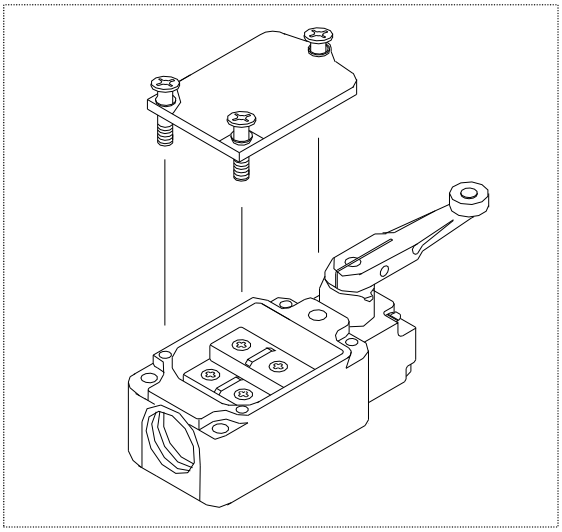
1) Loosen the three screws holding the limit switch cover with a Phillips screwdriver and remove the cover. (The screws are structured so that they do not come off the cover.)

2) Pull off the resin protective cap.

3) Pass the cable through the connector.

4) Peel off the outer skin of the cable with a wire stripper.

5) Use a terminal crimping tool to attach the crimping terminal to the lead wire.



6) Wire the terminal screws with a Phillips screwdriver according to the internal circuit diagram on page 14.
※Tighten the screws securely.

7) Tighten the three screws holding the limit switch cover with a Phillips screwdriver to attach the cover.

8) Tighten the cable with the connector.

Solenoid valve

⚠ Warning	
Prohibition	**There is a risk of electric shock.** ▶ Do not connect or separate lines to the solenoid valves while the power is on. ▶ Do not perform any work with wet hands or tools.

⚠ Caution	
Forcing	**There is a danger of injury.** ▶ Be sure to perform safety inspections beforehand for the machine tools to be used. ▶ Wear appropriate protective equipment according to the type of work being performed. **Otherwise, the machine may malfunction.** ▶ Be sure to lock the adjustment knob of the solenoid valve after adjustment.

Preparations	▶ Phillips screwdriver ▶ wire stripper ▶ Connector(G1/2) ▶ terminal crimping tool

[Procedure]

1) Loosen the cover setscrew with a Phillips screwdriver and remove the cover.
※Do not lose the O-ring.

2) Pull out the Faston terminal and insulation cover that are inserted to the coil side terminal.
※The grounding terminal is not provided with an insulating sleeve.

3) Pass the cables in the order of the connector and cover.

4) Peel off the outer skin of the cable with a wire stripper.

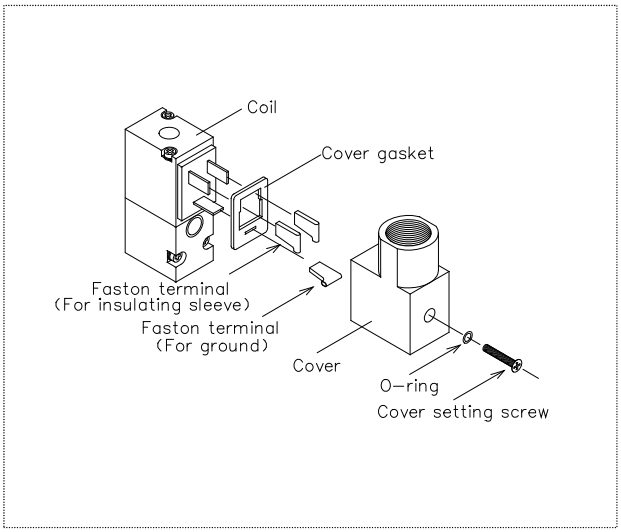
5) Pass the lead wire through the insulation cover.

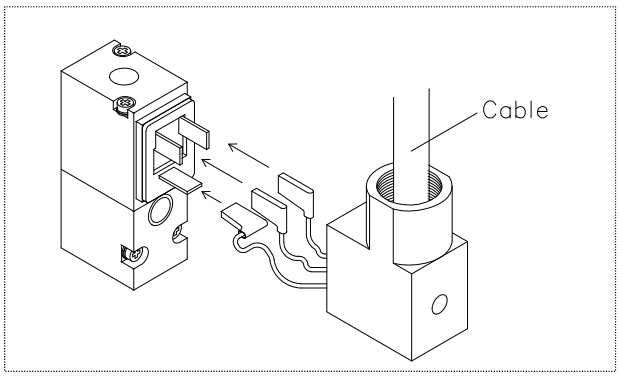
6) Use a terminal crimping tool to attach the Faston terminal to the lead wire.

7) Insert the Faston terminal into the coil side terminal and put the insulation cover on.

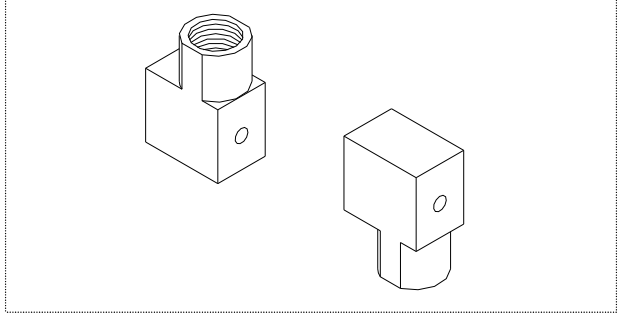
8) Attach the cover with the cover set screw.
[The cover can be mounted either with the wiring outlet at the top or bottom.(Fig. 1)]

9) Tighten the cable with the connector.





(Fig 1)



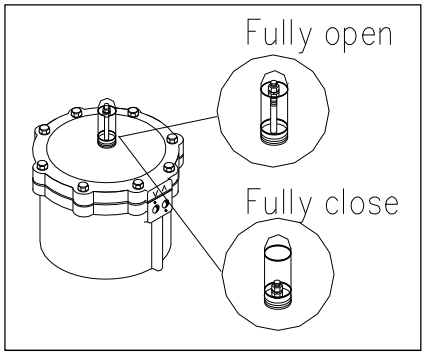
9. Commissioning method

Warning	
Prohibition	**Serious injury can result.** ▶ Do not supply air during manual operation.

Caution	
Prohibition	**You may be electrocuted or injured.** ▶ For models with solenoid valves, do not leave the solenoid valve terminal cover removed. ▶ Keep hands free of moisture and oil during operation.
Forcing	**Doing so may cause operation to fail.** ▶ Ensure that the supplied air pressure is at least 0.4MPa{4.1kgf/cm2.

[Procedure]

1) Supplies air to the air supply port.
2) Check that the air supply side is aligned with the stopper [20] position.
※With full opening adjustment mechanism (option), there is no stopper [20]. Check opening and closing with fluid flow.
3) Stop the air supply.

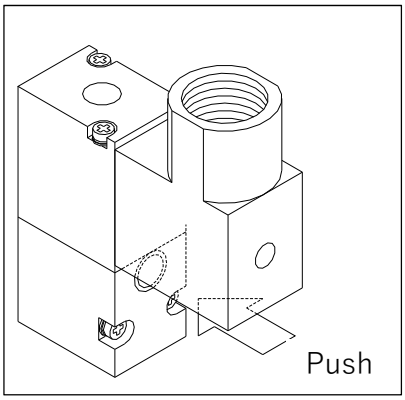


<For models with solenoid valve>

[Procedure]

1) Supplies air to the solenoid valve.
2) Check that the operation shown in the table below is achieved by pressing the push button (Fig. 1) next to the solenoid valve terminal cover with your finger.
3) Confirm that the solenoid valve is operated as shown in the table below by energizing or de-energizing.
4) Turn off the power to the solenoid valve.

(Fig 1)



Push button	Power supply	Double acting Air to open	Air to close
Press	Energizing	Valve fully open	Valve fully closed
Do not press	De-energizing	Valve fully closed	Valve fully open

Adjusting the Opening/Closing Speed <Double acting>

⚠Caution	
Prohibition	**Otherwise damage to the solenoid valve or malfunction can result.** ▶ Be sure to lock the adjustment knob of the solenoid valve after adjustment. (Do not tighten the lock nut with excessive force.)

Preparations ▶ Wrench

[Procedure]

1) Turn the adjustment knobs of both open and close speed controllers clockwise until they do not turn.
※Do not turn it too forcibly.
(risk of damage)

2) Supplies air to the solenoid valve.

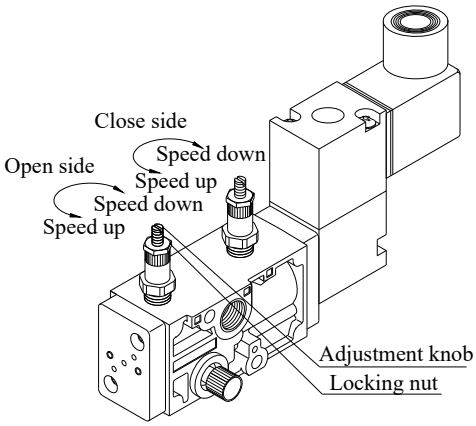
3) Energize the solenoid valve side and turn the adjusting knob of the open-side speed controller counterclockwise little by little.

4) Turn off the solenoid valve side and turn the adjusting knob of the closed side speed controller counterclockwise little by little.

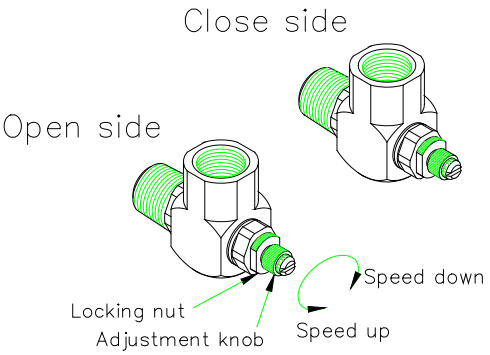
5) 3), Repeat 4) to set the desired opening/closing speed.

6) When the desired speed is achieved, hold the adjustment knob with your finger and rotate the lock nut clockwise with the spanner to secure the adjustment knob.
※Do not tighten the lock nut with excessive force.
(risk of damage)

With a solenoid valve



For models with speed controller



Opening/Closing Speed Adjustment Method <Single Action>

⚠ Caution	
Prohibition	**Otherwise damage to the solenoid valve or malfunction can result.** ▶ Be sure to lock the adjustment knob of the solenoid valve after adjustment. (Do not tighten the lock nut with excessive force.)

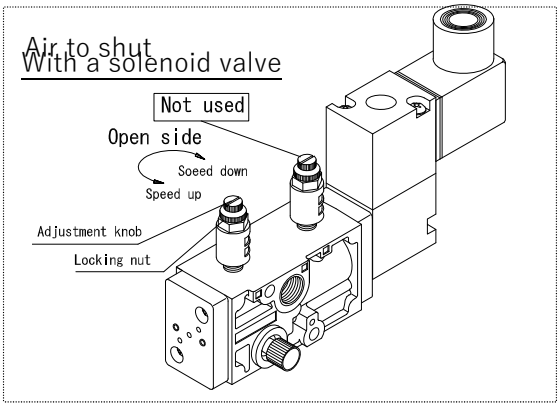
Preparations ▶ Wrench

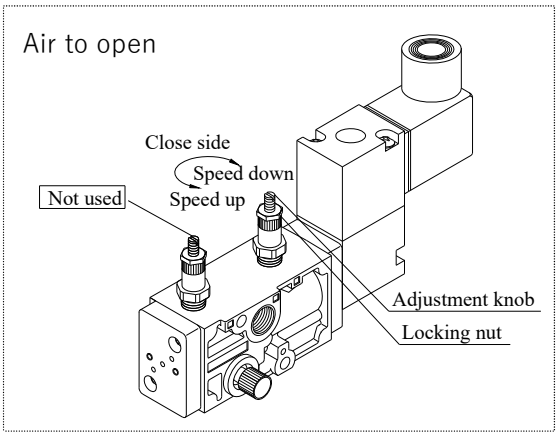
The direction in which the speed can be adjusted differs depending on the operating model.

Actuation type	Speed at which it opened	Speed at which it closes
Air to close	Cannot adjust	Can be adjusted
Air to open	Can be adjusted	Cannot adjust

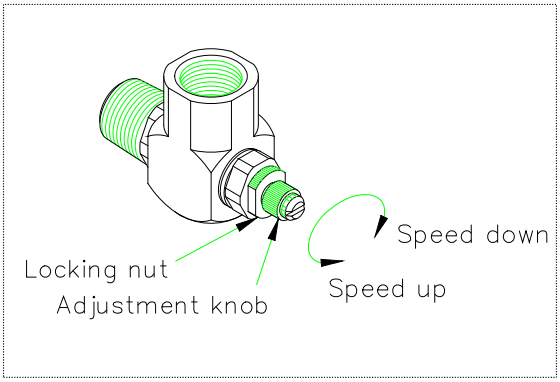
[Procedure]

1) Turn the speed controller adjustment knob clockwise until it does not turn.
   ※Do not turn it too forcibly.
   (risk of damage)
2) Supplies solenoid valve air.
3) After energizing the solenoid valve, turn off the power, and turn the speed controller adjustment knob counterclockwise little by little to set the desired opening/closing speed.
4) When the desired speed is achieved, hold the adjustment knob with your finger and rotate the lock nut clockwise with the spanner to secure the adjustment knob.
   ※Do not tighten the lock nut with excessive force.
   (risk of damage)





With speed controller



10. How to adjust and operate stoppers

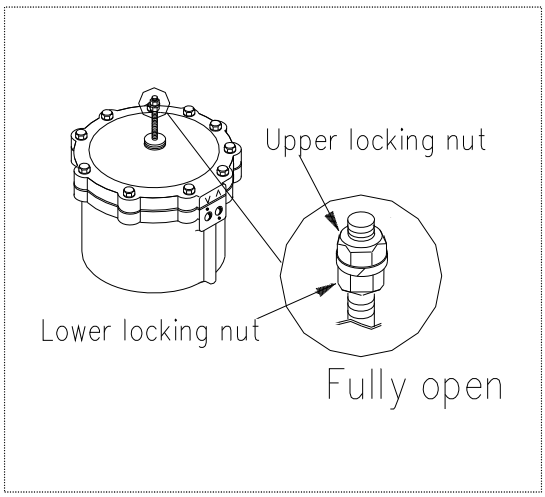
Warning	
Prohibition	**Serious injury can result.** ▶ When operating the actuator with air, never touch the drive section.

Caution	
Forcing	**The valve can be damaged, or leak.** ▶ If the stopper is loose or internal leakage occurs when the valve is fully closed, the stopper may not be functioning. Adjust the stopper. ▶ Tighten the stoppers securely. (If the tightening torque of the stoppers is insufficient, the stoppers may become loose.)

<How to adjust the stopper>

Preparations	▶ Wrench

[Procedure]



1) Remove gauge cover [11] by rotating it counterclockwise.
2) Fully open the valve by air operation.
3) Loosen the upper lock nut with a wrench while holding the lower lock nut of the stopper [43] with a wrench.
4) Remove stopper [43] from stem (A).
5) Fully close the valve with air.
6) Fit the lower locking nut of the stopper [43] onto the stem (A) and tighten until it cannot be turned by hand.
7) Rotate the lower locknut of the stopper [43] clockwise with a spanner until the fluid starts to leak slightly.
8) Turn the lower lock nut of the stopper [43] counterclockwise 1/4 to 1/2 turn from the position of step 7.
9) Fix the lower lock nut of the stopper [43] with a spanner and tighten the spring washer and the upper lock nut firmly with a mounting spanner.
10) Repeat fully opening ⇔ closing the valve by air operation to check for fluid leakage.
※If there is leakage of fluid, lock nut underneath stopper [43] counter-clockwise after steps 2 and 3 until no longer present
Turn 1/4 turn in the direction and return to step 9.
11) Mount the gauge cover [11] by rotating it clockwise.
※Use the same procedure to adjust the stopper when a limit switch, positioner, or other option is attached.
After adjusting the stopper, also adjust the option.
When the positioner is attached, make sure to turn OFF the auto control for safety.

11. How to disassemble/assemble for parts replacement

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

⚠ Warning	
Prohibition	**There is a danger of injury.** ▶ Do not disassemble the actuator. ▶ When operating the actuator with air, never touch the drive section.
Forcing	**There is a danger of injury.** ▶ 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.

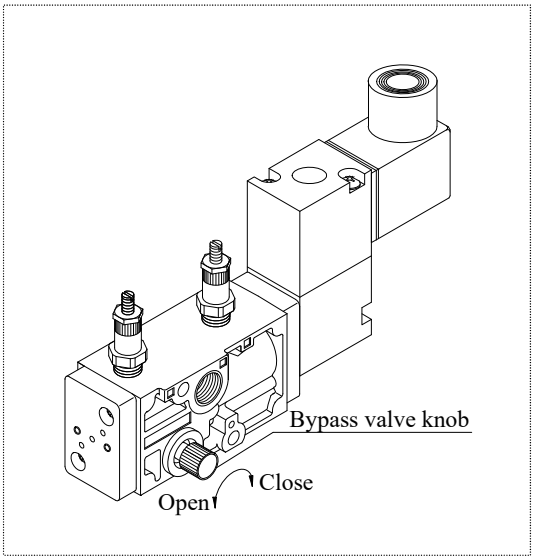
⚠ Caution	
Prohibition	**Damage may occur.** ▶ When replacing the valve or replacing parts, completely drain the fluid from the piping to reduce the fluid pressure to zero.
Forcing	**Damage may occur.** ▶ When connecting a resin valve to metal piping, be careful not to apply piping stress to the resin valve.

Preparations ▶ Spanner ▶ Protective gloves ▶ Protective glasses

<**Disassembly**>

[**Procedure**]

1) Completely drain the fluid in the piping.
2) Close the main valve of the air. If the valve is equipped with a solenoid valve, open the bypass valve to exhaust air from the actuator.
3) Disconnect air piping. (Do not remove the air piping for reverse operation)
4) Loosen the bolts and nuts (A) [18] and recessed bolts and nuts [90] between the body [1] and the actuators [28] and [29] completely with a wrench. (For reverse operation, if air is put in the actuator and disassembled, the operation can be smoothly performed.)
5) Remove the actuators [28] and [29] from the body.
6) Remove the diaphragm [3] by turning it 90° .
7) Disconnect air piping.



<**Assembly**>

[**Procedure**]

1) Follow the procedure from 7) in reverse. (Refer to Table 1 for the body tightening torque.)

(Table 1) Body tightening torque value Units: N•m {kgf・cm}

Size / Diaphragm	65mm	80mm	100mm
Rubber	13.0{133}	18.0 {184}	35.0 {357}
PTFE	15.0{153}	20.0 {204}	40.0 {408}

12. Inspection item

⚠Caution	
Forcing	**Fluid may leak from the valve or the actuator may fail.** ▶ Maintenance should be performed every 3 to 6 months as a guide in order to keep the watch in normal condition and use it for a long time. Pay particular attention to temperature changes and aging during long-term storage or shutdown or use. **You may be electrocuted or injured.** ▶ Turn off the power before removing the actuator cover. ▶ When removing the valve from the piping when replacing the valve or parts, completely remove the fluid from the piping before starting work. ▶ If any malfunction is found, take the appropriate action referring to "13.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: 6. Piping method)
		Surface of the entire valve	Remove the valve from the pipe and replace the valve. (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 pipe and replace the valve or actuator. (Ref: 11. How to disassemble/assemble for parts replacement)
		Piping around the valve	Reconfirm the conditions of use (Ref: 2. Safety Instructions)
Odor (sniffing)	No odor	Valves and actuators	Remove the valve from the pipe and replace the valve or actuator. (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	Remedy for malfunctions
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 pipe and replace the valve or actuator. (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 of the inspection cycle: 6 months

Inspection items and inspection methods	Guideline of judgment	Check point	Remedy for malfunctions
Looseness of bolts (visual and palpation)	No Loose	For Stand + valve	Retighten the mounting bolts
		For Stand + actuator	Retighten the mounting bolts
		For flange piping	Retighten the pipe bolts to the specified torque. (Ref: 6. 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 pipe and replace the valve or actuator. (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 pipe and replace the valve or actuator. (Ref: 11. How to disassemble/assemble for parts replacement)

13. 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
Do not turn the crown manually (not turn it).	The valve is already fully open (or fully closed).	Manually rotate in the opposite direction (Ref: 9. Commissioning method)
	Air is supplied to the actuator.	Close the air source valve and open the bypass valve.
	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
	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 by air operation.	Air is not supplied	Supply air.
	The solenoid valve voltage is different.	Check the voltage with a tester to obtain the correct voltage. (Ref: 4. Product Specifications)
	Solenoid valve voltage is low	Replace the cable or the actuator. (Ref: 11. How to disassemble/assemble for parts replacement)
	The bypass valve is open.	Close the bypass valve by turning the knob clockwise.
	The speed controller adjustment knob is turned all the way to the right.	Turn the knob to the left (Ref: 9. Commissioning method)
	Foreign matter caught in valve	Remove the valve from the piping, disassemble it, and remove any foreign matter. (Ref: 11. How to disassemble/assemble for parts replacement)
	Valve torque is increasing due to piping stress.	Remove the piping stress. (Ref: 4. Product Specifications)
	The torque of the valve increases due to the effect of the fluid (temperature, component, pressure).	Check the operating conditions again.

CAUSE OF FAILURE AND HOW TO REMEDY (continued)

Failure phenomenon	Possible cause	Measures and measures
Do not open/close with automatic 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)
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)
	The diaphragm or body 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 and attach 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 FAILURE AND HOW TO REMEDY (continued)

Failure phenomenon	Possible cause	Measures and measures
Fluid leaks from valve (external leak)	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 diaphragm 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 valve. (Ref: 11. How to disassemble/assemble for parts replacement)

14. Disposal method of residual materials and waste materials

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

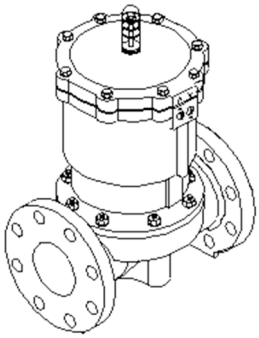
Inquiries

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

[User's manual]

Diaphragm valve Type 14 Pneumatic actuated Type AV
65～100mm

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**