

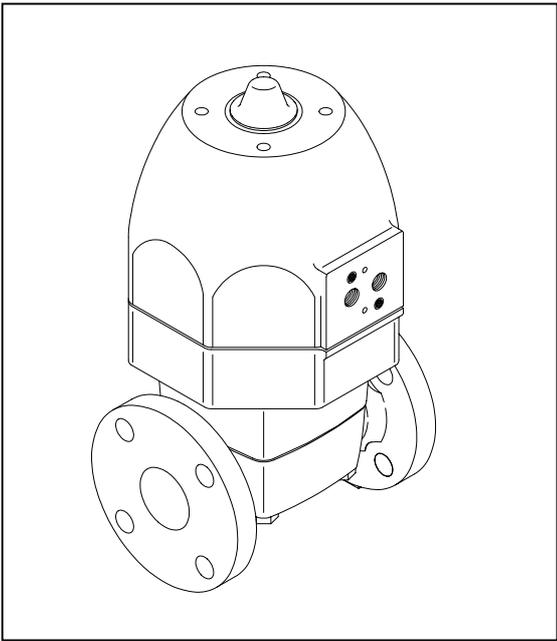
Serial No.	H – A007 E – 3
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Diaphragm Valve Type 14

Pneumatic Model Type AN

User's Manual



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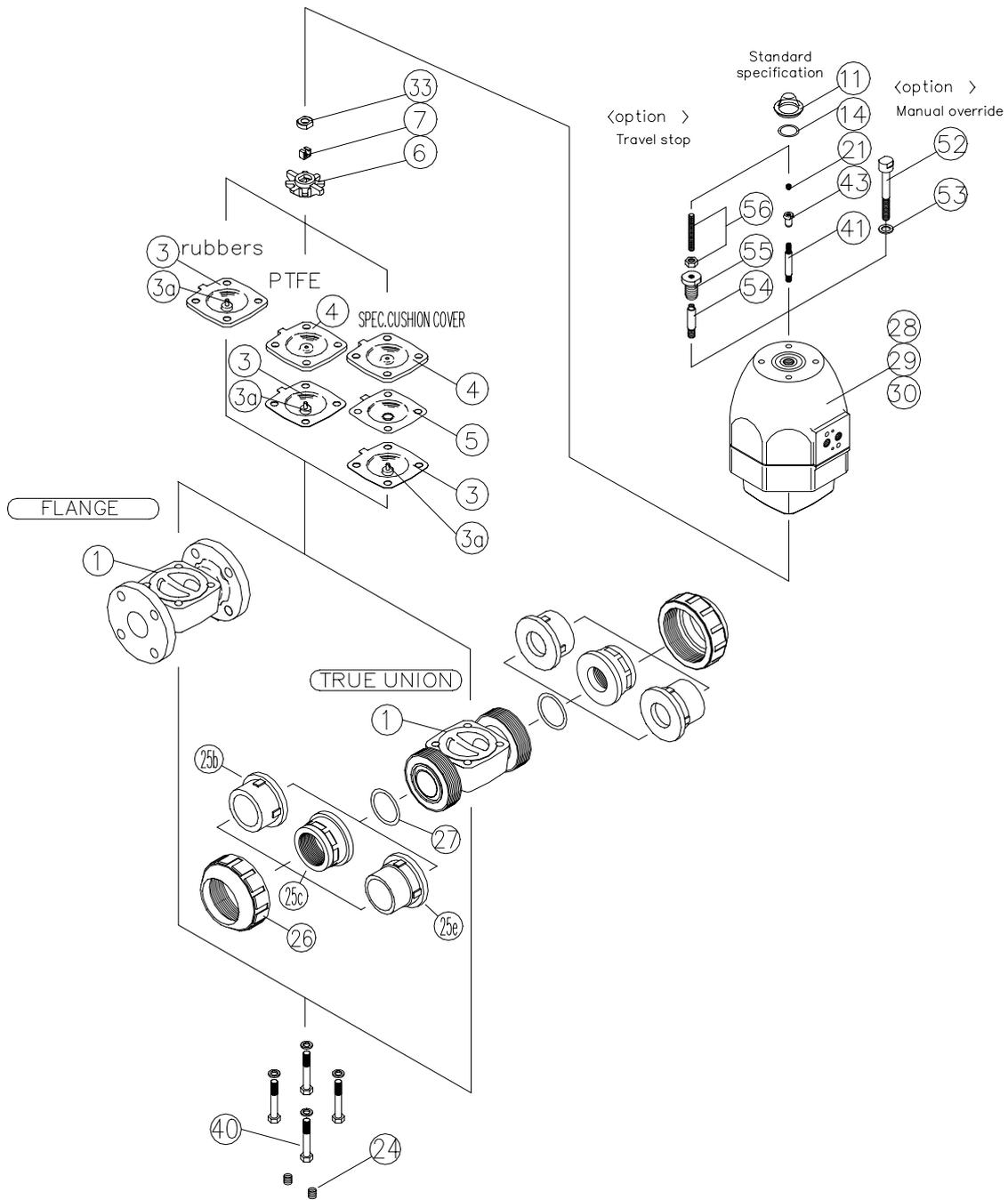
(1) General operating instructions

- Operate the valve within the pressure Vs temperature range.
(The valve can be damaged by operation beyond the allowable range.)
- Select a valve material that is compatible with the media, refer to “CHEMICAL RESISTANCE ON ASAHI AV VALVE”.
(Some chemicals may damage incompatible valve materials.)
- Bolt ④ torque should be checked before installation, as they may become loose after long-term storage. A periodic check of the valve condition as well as bonnet & flange bolt torque should be made part of preventative maintenance program properly re-tightening the bolts as necessary. It is especially important to re-tighten all bolts during the first shutdown, refer to installation on page 24.
- Do not disassemble the actuator. (Injury may occur.)
- Do not step on the valve or apply excessive weight on valve. (It can be damaged.)
- Make sure to consult a waste treatment dealer to dispose of the valves.
(Poisonous gas is generated when the valve is burned improperly.)
- Allow sufficient space for maintenance and inspection.
- Keep the valve away from excessive heat or fire. (It can be deformed or destroyed.)
- Set valve support on the valve. (Refer to page 13)
- Keep the valve away from places of direct sunlight, water and dust. Use cover to shield the valve.
(The valve will not operate properly.)
- Do not use AV valves in a place where they may become submerged in water.
(Submergence will make AV valve fail.)

(2) General instructions for transportation, unpacking and storage

- Keep the valve packed in the carton or box as delivered until installation.
- Keep the valve away from any coal tar, creosote (antiseptic for wood), termite insecticide, vermicides, and paint.
(This could cause swelling and damage the valve.)
- Do not impact or drop the valve. (It can be damaged.)
- Avoid scratching the valve with any sharp object

(3) Name of parts

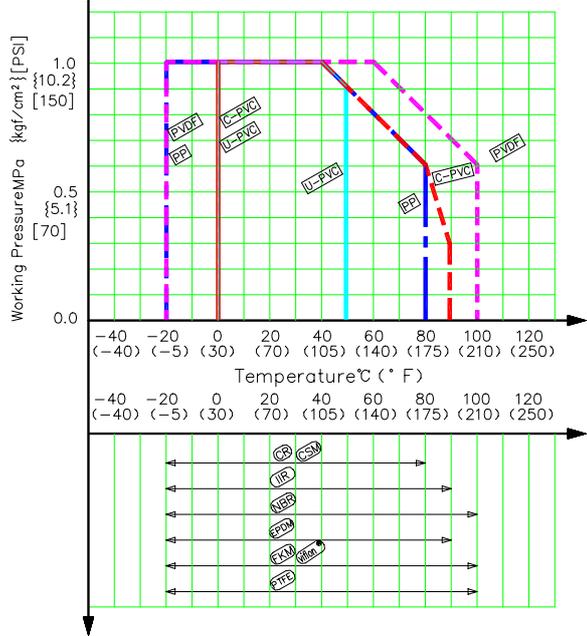
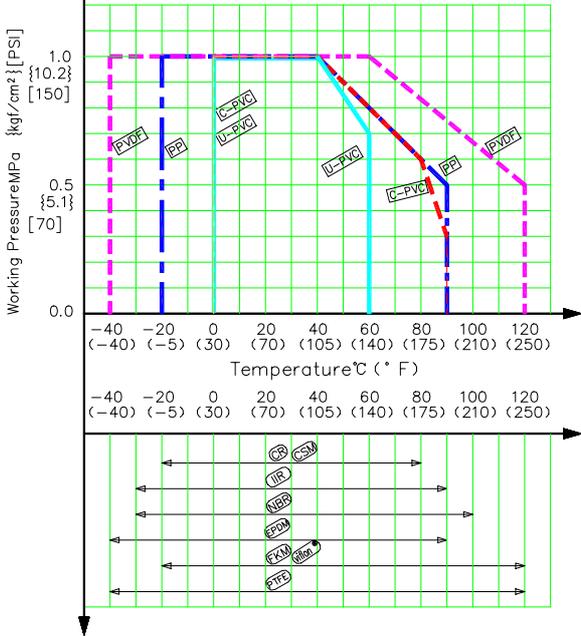


No.	DESCRIPTION	No.	DESCRIPTION	No.	DESCRIPTION
①	Body	②④	Ensat (insert metal)	④①	Bolt (B)
③	Diaphragm	②⑤b	End connector (Socket end type)	④③	Indicative rod
③a	Inserted metal of diaphragm	②⑤c	End connector (Threaded end type)	④⑤	Stopper
④	Cushion	②⑤e	End connector (Spigot end type)	⑤②	Manual shaft
⑤	Cushion cover	②⑥	Union nut	⑤③	Thrust ring
⑥	Compressor	②⑦	O-ring (C)	⑤④	Rod for travel stop
⑦	Joint	②⑧	Actuator (double acting)	⑤⑤	Fitting for travel stop
⑪	Gauge cover	③①	Actuator (air to shut)	⑤⑥	Bolt & nut
⑭	O-ring (A)	③③	Actuator (air to open)		
⑳	Screw		Compressor pushing plate		

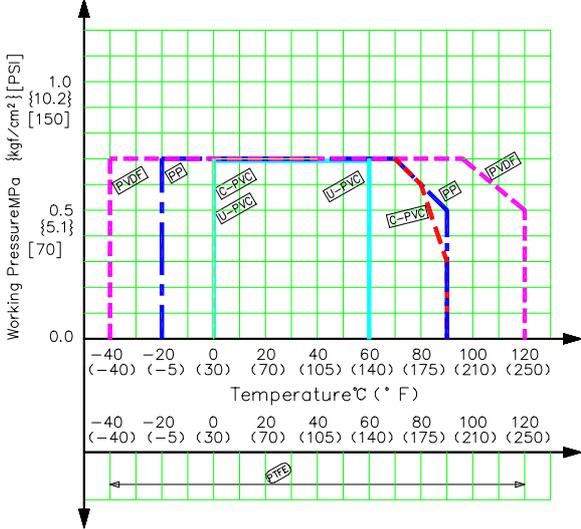
(4) Comparison between working temperature and pressure

FLANGE double action, air to shut 15~50mm
 FLANGE air to open 15~40mm
 FLANGE air to open 50mm(spec.maxmam working pressure 1.0MPa)

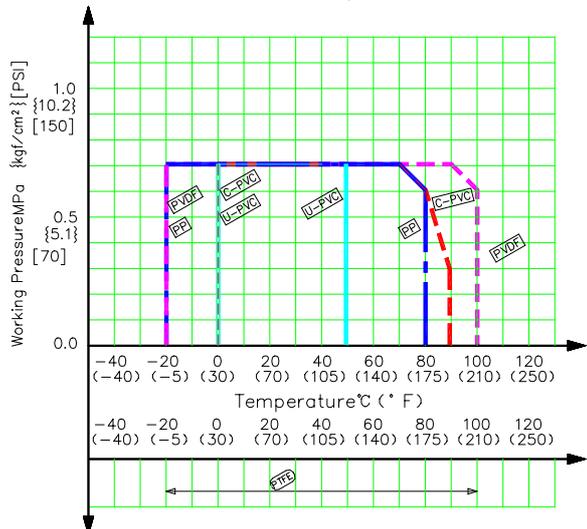
TRUE UNION double action, air to shut 15~50mm
 TRUE UNION air to open 15~40mm
 TRUE UNION air to open 50mm(spec.maximam working pressure 1.0MPa)

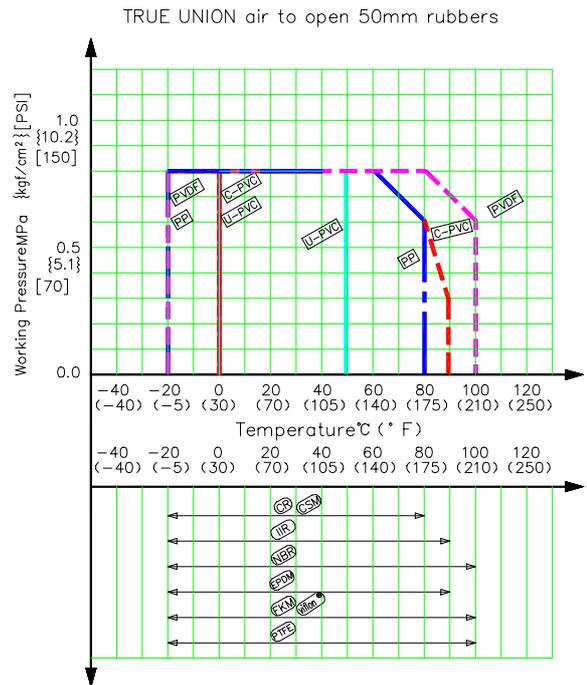
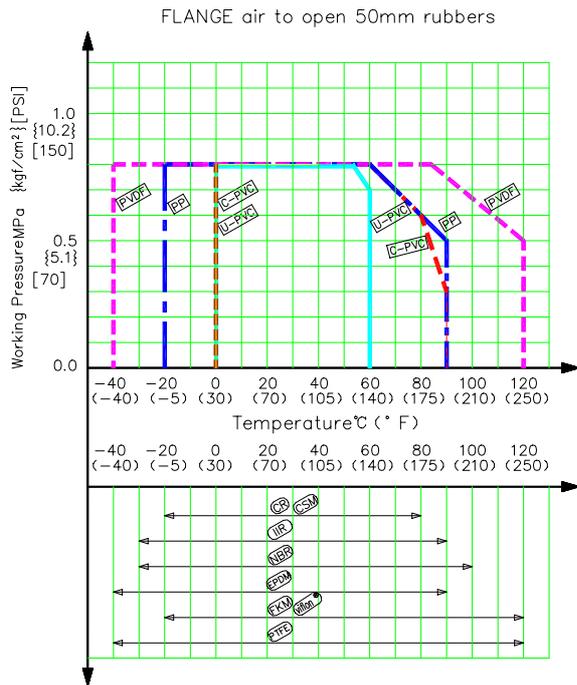


FLANGE air to open 50mm PTFE



TRUE UNION air to open 50mm PTFE



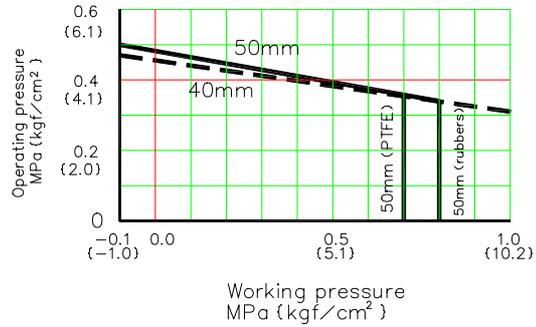
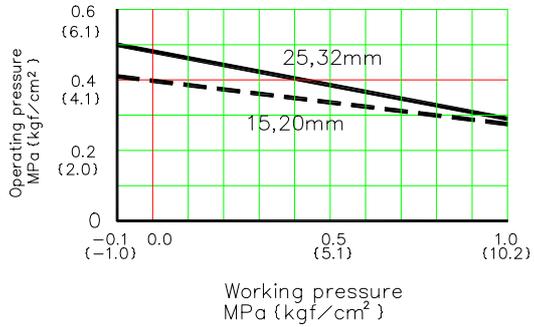


Caution

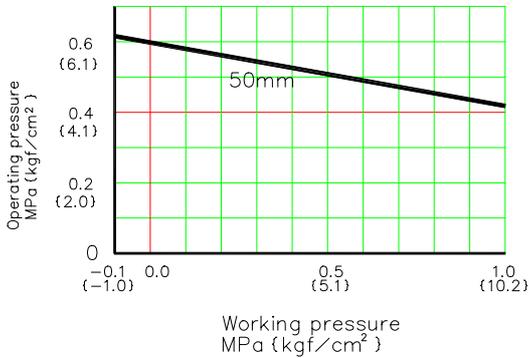
Do not operate the valve beyond the range of working temperature and pressure.
(The valve can be damaged.)

(5) Comparison between operating pressure and working pressure and opening

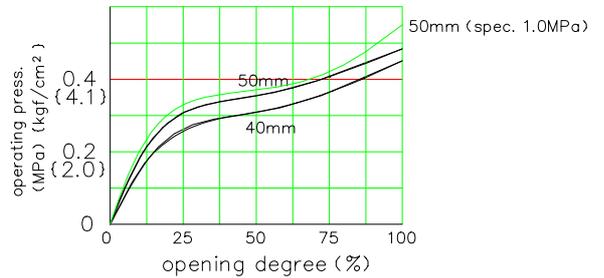
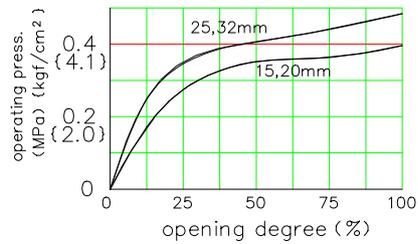
Working pressure—Operating pressure (air to open)



(spec.max.working pressure 1.0MPa)



opening degree—operating press. (working press. 0)



(6) Specifications of Actuator

Nominal size		15mm, 20mm (1/2", 3/4")	25mm, 32mm (1", 1 1/4")	40mm (1 1/2")	50mm (2")
Operating pressure MPa {kgf/cm ² } [PSI]	Double acting Air to open Air to shut	0.4-0.6 {4.1-6.1} [57-85]			
Air consumption, NI/per [inch ³] 1 opening of closing (0.4MPa)	Double acting	2.6 [160]	2.7 [170]	9.6 [590]	9.8 [600]
	Air to open	0.8 [49]	0.8 [49]	3.4 [210]	3.4 [210]
	Air to shut	1.8 [110]	1.9 [120]	6.1 [370]	6.3 [380]
Air supply orifice	Double acting Air to open Air to shut	Rc 1/4			

(7) Specifications of Options

(Specifications of Solenoid valve)

Actuation	Nom. Size	Model No.	Pipe bore	Effective cross section area mm ² (inch ²)	Power consumption	Additional function
All type	15mm (1/2")-50mm (2")	4N3S102K-W□-G31193	Rc 1/4	10(0.016) or more	AC ; 6VA DC ; 5.5W	<ul style="list-style-type: none"> ○ Bypass valve built-in ○ Silencer with needle Valve attached (to be used as speed controller)

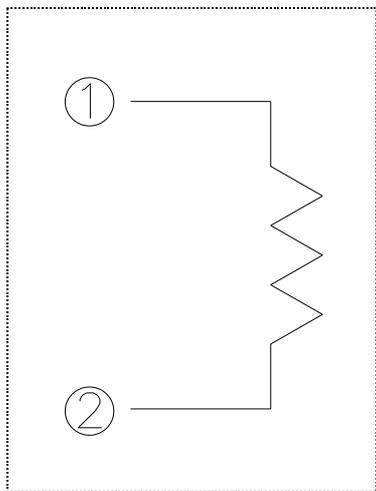
4N3S102K-W□-G31193



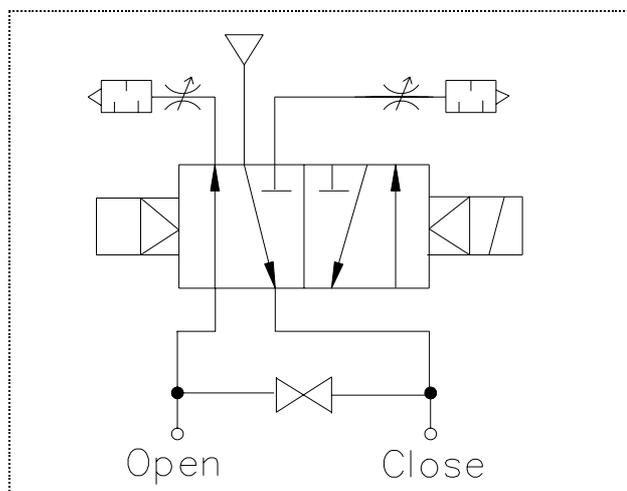
* () is special order.

Specification	sign
AC100V 50/60Hz	1
AC110V 50/60Hz	(2)
AC200V 50/60Hz	3
AC220V 50/60Hz	(4)
DC24V	5
DC48V	(6)
DC100V	(7)
DC125V	(9)

connection diagram



JIS sign



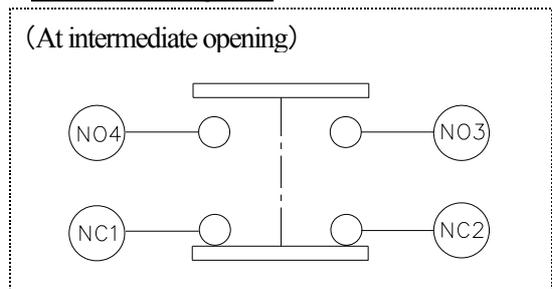
(Specifications of limit switch)

Actuation	Nominal size	Type sign	Protection grade
Double acting Air to open Air to shut	15mm-50mm (1/2" - 2")	1LS19-J	Equivalent to IP55

Limit switch rating

Rate voltage (V)	Resistive load (A)	Inductive load (A)
AC125	11	7
AC250	11	7
DC125	0.5	0.1
DC250	0.25	0.04

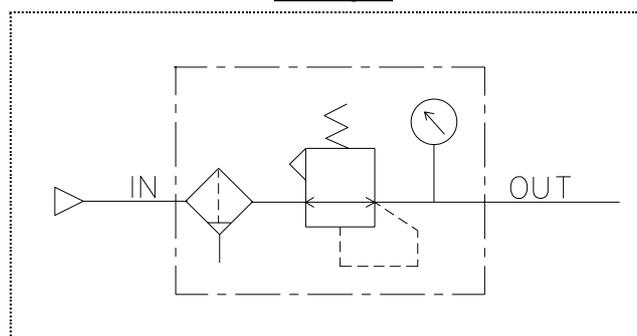
connection diagram



(Specification of pressure reducing valve with filter)

Actuation	Nom. Size	Type sign	Pipe bore	Element degree of filtration
All type	15mm-50mm (1/2" - 2")	ARU2-02-8A-B	Rc 1/4	5 μm

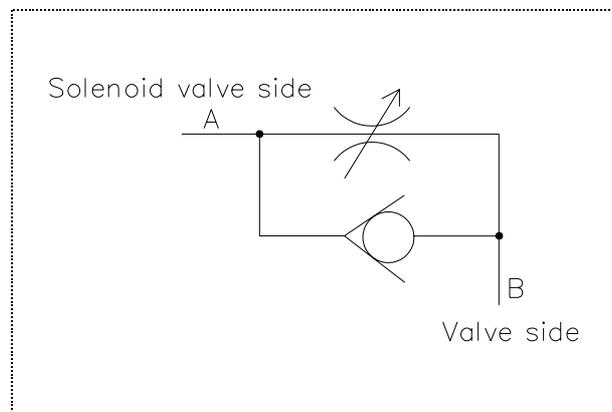
JIS sign



(Specification of speed controller)

Actuation	Nom. Size	Type sign	Pipe bore	Effective cross section area mm ² (inch ²)		Needle No. of revolution
				Free flow	Control flow	
All type	15mm-50mm (1/2" - 2")	SC7-08A	Rc 1/4	11(0.017)	8.3(0.013)	8 turns

JIS sign



(Specifications of fully open adjustment mechanism)

As to the block diagram and adjusting method, refer to pages 2 and 22, respectively.

(Specifications of manual operating mechanism (set only at air to open))

As to the block diagram and operating method, refer to pages 2 and 23, respectively.

(8) Installation procedure

Necessary items

- Torque wrench
- Spanner wrench
- Bolt, Nut, Washer (For many flanges specification)

- AV gasket

(When a non-AV gasket is used, a different tightening torque instruction should be followed.)

Procedure

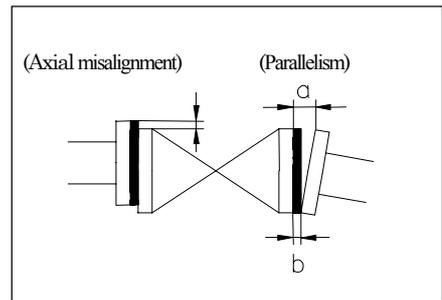
- 1) Set the AV gasket between the flanges.
- 2) Insert washers and bolts from the pipe side, insert washers and nuts from the valve side, then temporarily tighten by hand.



Caution

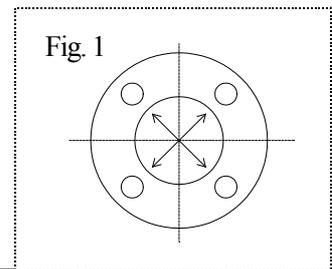
The parallelism and axial misalignment of the flange surface should be under the values shown in the following table to prevent damage the valve.
 (A failure to observe them can cause destruction due to stress application to the pipe.)

Nom. Size	Unit : mm (inch)	
	Axial Misalignment	Parallelism (a-b)
15mm-32mm (1/2" - 1 1/4")	1.0 (0.04)	0.5 (0.02)
40mm, 50mm (1 1/2" - 2")	1.0 (0.04)	0.8 (0.03)



- 3) Tighten the bolts and nuts gradually with a torque wrench to the specified torque level in a diagonal manner.
 (Refer to Fig.1.)

<u>Recommended torque value</u>		Unit : N-m {kgf-cm} [lb-inch]	
Nom. Size	15mm, 20mm (1/2", 3/4")	25mm - 40mm (1" - 1 1/2")	50 mm (2")
Torque value	17.5 {179}[155]	20.0 {204}[177]	22.5 {230}[200]



Caution

Avoid excessive tightening. (The valve can be damaged.)

Threaded type (Material : PVC, C-PVC, PP, PVDF)

Necessary items

- Sealing tape (A non-sealing tape can cause leakage.)
- Strap wrench (Do not use Pipe wrench.)
- Spanner wrench



Caution

Make sure that threaded connections are plastic x plastic.
(Metallic thread might damage the body cap)

Procedure

- 1) Wind a sealing tape around the external thread of joint, leaving the end (about 3mm) free.
- 2) Loosen the union nut (26) with a strap wrench.
- 3) Remove the union nut (26) and the end connector (25).
- 4) Lead the union nut (26) through the pipe.
- 5) Tighten the external thread of the joint and the end connector (25) hardly with hand.
- 6) Using a spanner wrench, screw in the end connector (25) by turning 180° -360° carefully without damaging it.



Caution

Avoid excessive tightening. (The valve can be damaged.)

- 7) Make sure that the O-ring (C) (27) is mounted.
- 8) Set the end connector (25) and union nut (26) directly on the body without allowing the O-ring (C) (27) to come off.
- 9) Tighten union nut (26) on each valve until hand tight.
- 10) Using a strap wrench tighten union nuts uniformly on each side approx. 90° - 180° turns, 1/4 to 1/2 turns.



Caution

Avoid excessive tightening. (The valve can be damaged)

Socket type (Material : PVC, C-PVC)

Necessary items

- PVC or C-PVC cement (Adhesive for vinyl chloride pipes)
- Strap wrench



Caution

Do not install a socket type valve where the atmospheric temperature is 5 °C (23 °F) or lower.
(The valve joint can fail.)

Procedure

- 1) Loosen the union nut (26) with a strap wrench.
- 2) Remove the union nut (26) and end connector (25).
- 3) Lead the union nut through the pipe.
- 4) Make sure the hub part of the end connector (25) is clean with waste cloth.
- 5) Apply adhesive evenly to the hub part of the end connector (25) and the pipe spigot.



Caution

Do not apply more adhesive than necessary.
(The valve can be damaged due to solvent cracking.)

Adhesive Quantity (guideline)

Nom. Size	15mm (1/2")	20mm (3/4")	25mm (1")	32mm (1 1/4")	40mm (1 1/2")	50mm (2")
Quantity(g)	1.0	1.3	2.0	2.4	3.5	4.8

- 6) After applying adhesive, insert the pipe quickly to the end connector (25) and leave it alone for at least 60 seconds.
- 7) Wipe away overflowing adhesive.
- 8) Make sure that O-ring(C) (27) is mounted
- 9) Set the end connector (25) and union nut (26) directly on the body without allowing the O-ring(C) (27) to come off.
- 10) Tighten union nut (26) on each valve until hand tight.
- 11) Using a strap wrench tighten union nuts uniformly on each side approx. 90° - 180° turns, 1/4 to 1/2 turns.



Caution

Avoid excessive tightening. (The valve can be damaged.)

Socket type (Material : PP, PVDF)

Spigot type (Material : PP, PVDF)

Necessary items

- Strap wrench (Do not use the pipe wrench.)
- Sleeve welder or automatic welding machine
- User's manual for sleeve welder or automatic welding machine

Procedure

- 1) Loosen the union nut with a strap wrench.
- 2) Remove the union nut (26) and the end connector.
- 3) Lead the union nut (26) through the pipe.
- 4) For the next step, refer to the user's manual for the sleeve welder or the automatic welding machine.
- 5) After welding, make sure that the O-ring (C) (27) is mounted.
- 6) Set the end connector (25), (25a) and the union nut (26) directly without allowing the O-ring (C) (27) to come off.
- 7) Tighten union nut (26) on each valve until hand tight.
- 8) Using a strap wrench, tighten the union nut an additional 90° - 180° carefully without damaging it



Caution

Avoid excessive tightening. (The valve can be damaged.)

(9) Support Setting Procedure

Necessary items

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



Caution

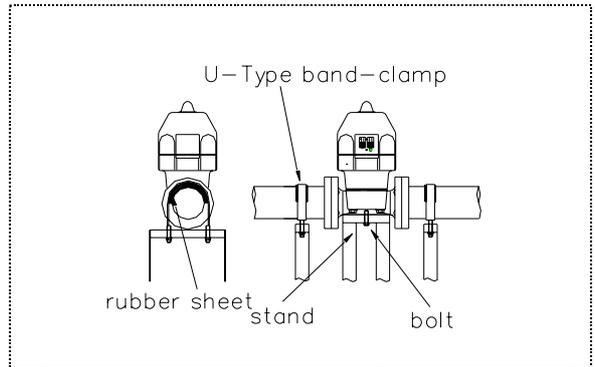
Set the valve support.
 (The valve may be damaged because the actuator is heavy.)
 Do not subject the valve pump vibrations.
 (The valve may be damaged.)

Level plumber

- Using metal insert(Ensert) & U-type clamp

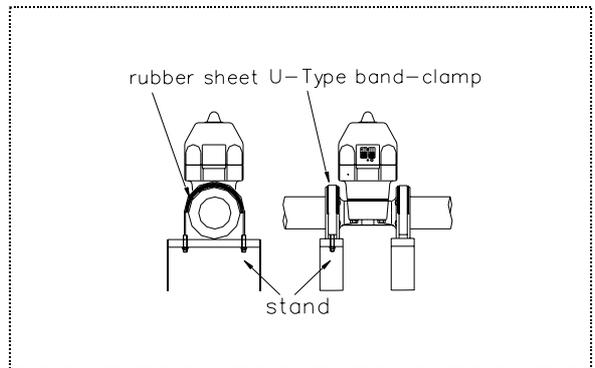
Fix the installation jig (under the valve) and stand with bolts (Refer to page 21)

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



- Using U-type clamp (Only Flanged type)

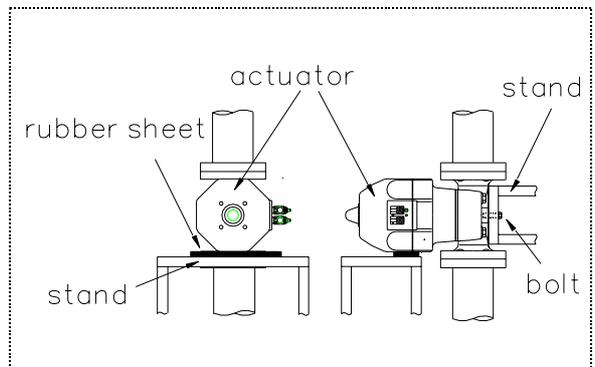
Spread the rubber sheet on the pipe and secure pipe with U-type clamp.



Perpendicular plumber

Fix the installation jig (under the valve) and stand with bolts (Refer to page 22)

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



(10) Air Piping procedure

<1> For a standard type and an attached speed controller type

- Necessary items
- Spanner wrench
 - Steel pipe or tube for piping
 - Sealing tape (If seal tape isn't used, leakage may be caused)
 - Joint for steel pipe or tube

 **Caution**

Use compressed air as operating fluid. Don't use oil pressure and water pressure.
(Actuator may be damaged.)

Use clean, filtered compressed air.
(Actuator may not work normally.)

When a steel pipe is used for piping, use the pipe the inside of which is treated to be rust preventive.
(The intrusion of rust into the actuator the electromagnetic valve may cause a malfunction.)

Don't forget to remove flash in the screw part of the joint.
(A crack and air leakage may be caused.)

Don't remove the protective plug up until piping.
(The intrusion of contaminants and water may cause the malfunction of the actuator.)

Clean the pipe by flashing before piping to prevent the malfunction of the actuator.

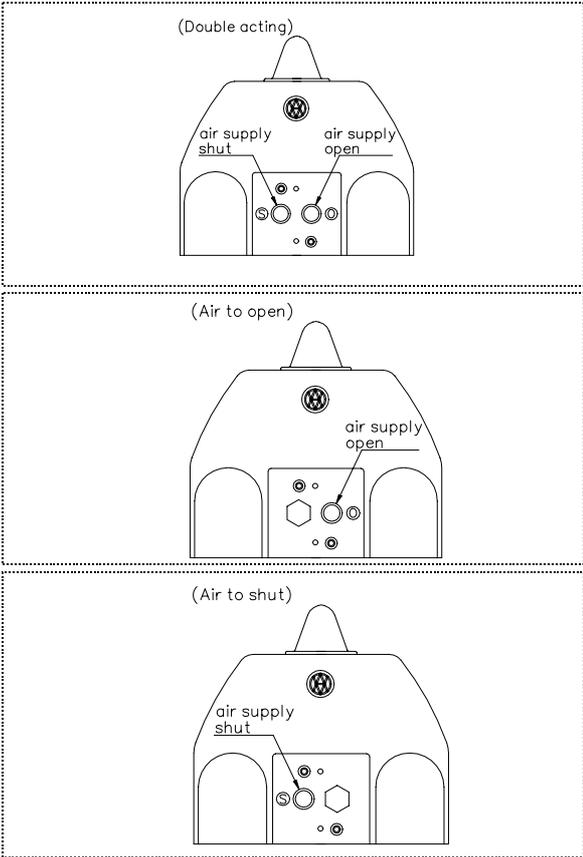
Procedure

- 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) Screw the joint in the piping female screw of the actuator by hand fully.
- 3) Screw the joint one turn with a spanner wrench.

 **Caution**

Avoid excessive tightening.
(The valve can be damaged.)

- 4) Mount a steel pipe or a tube.



◁▷ For a pressure reducing valve with a solenoid valve and a pressure reducing valve with a filter.

Necessary items

- Spanner wrench
- Steel pipe or tube for piping
- Sealing tape (If seal tape isn't used, leakage may be caused)
- Joint for steel pipe or tube



Caution

Use compressed air as operating fluid. Don't use oil pressure and water pressure.
(Actuator may be destroyed.)

Use clean, filtered compressed air.
(Actuator may not work normally.)

When a steel pipe is used for piping, use the pipe the inside of which is treated to be rust preventive.
(The intrusion of rust into the actuator the electromagnetic valve may cause a malfunction.)

Don't forget to flashing in the screw part of the joint.
(A crack and air leakage may be caused.)

Don't remove the protective plug up until piping.
(The intrusion of contaminants and water may cause the malfunction of the actuator.)

Clean the pipe by flashing before piping to prevent the malfunction of the actuator.

Procedure

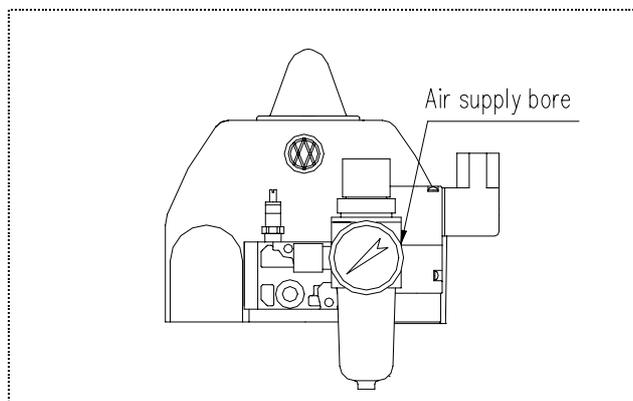
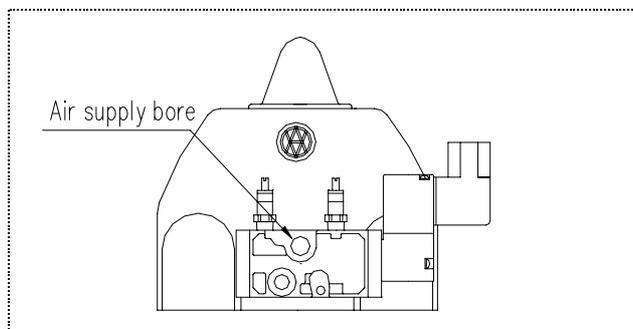
- 1) Wind a seal tape onto the male screw of the joint with a blank about 3mm (about 2 threads) left at the end.
- 2) Screw the joint in the piping female screw of the actuator by hand fully.
- 3) Screw the joint one turn with a spanner wrench.



Caution

Avoid excessive tightening.
(The valve can be damaged.)

- 4) Mount a steel pipe or a tube.

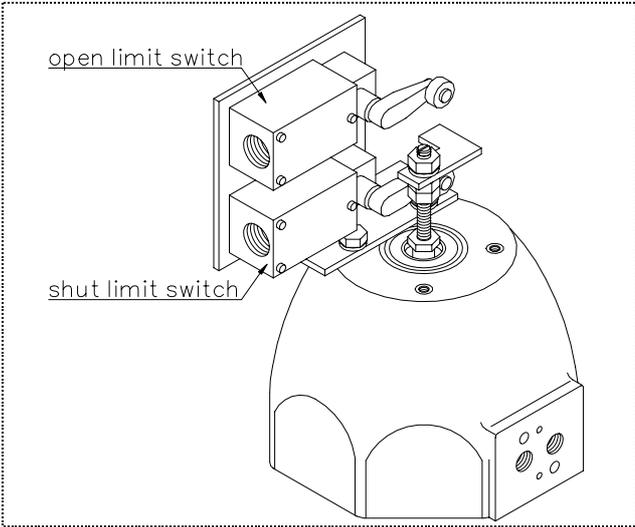


(11) Connection of limit switch procedure

- Necessary items
- Crimp-style terminal
 - Terminal crimping tool
 - Phillips head screw driver
 - Wire stripper
 - connector (G1/2)

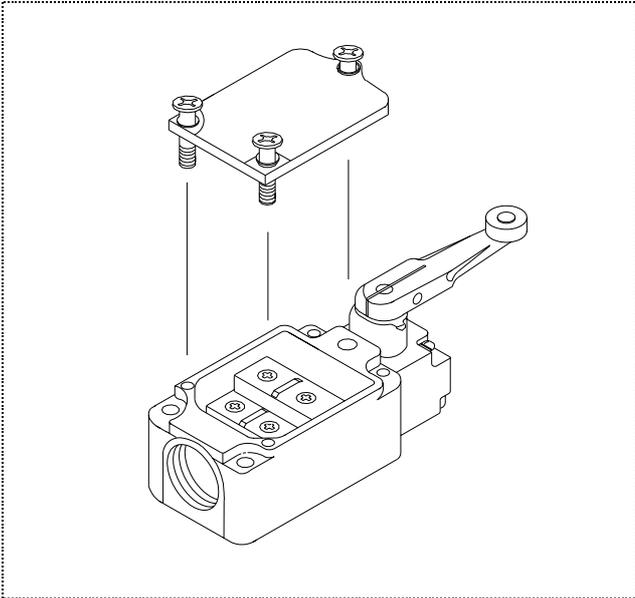
Procedure

- 1) Loosen the three screws used to attach the limit switch cover with a Phillips head screwdriver and remove cover from the limit switch.
(The screw is made so that it will not detach from the cover.)
- 2) Pull and remove protective cap, made of resin, from the cover.
- 3) Draw a cable through the connector.
- 4) Strip cable with a wire stripper.
- 5) Install a crimp-style terminal on the lead wire with a terminal crimping tool.
- 6) Connect terminal screw with a Phillips head screwdriver according to the internal circuit diagram shown in page 7.



! Caution
Tighten the screws.
(If not, electric leaks or shocks may occur.)

- 7) Tighten the above three screws with a Phillips head screwdriver to install cover on the limit switch.



(12) Connection of solenoid valve procedure

- Necessary items
- Terminal crimping tool
 - Connector (G1/2)
 - Screw driver (+)
 - Wire stripper

Caution
 Make sure of the agreement between the power voltage indicated on the solenoid valve and the voltage wiring to be done.
 (Wiring with wrong voltage may cause the failure in the solenoid unit.)

Procedure

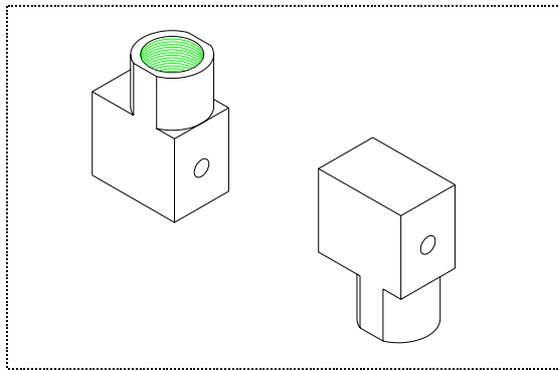
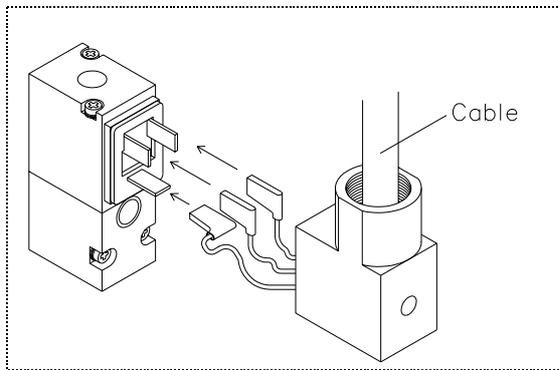
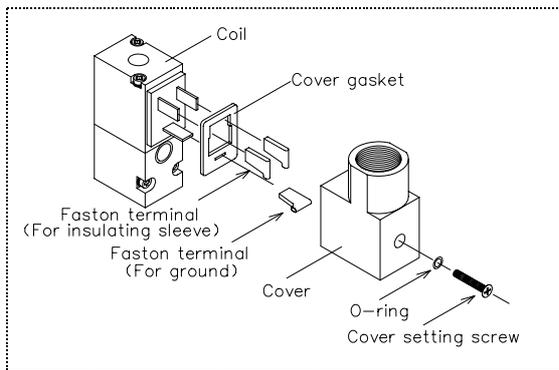
- 1) Loosen the hexagon socket head cap screws, and remove the cover.

Caution
 Don't loose O-ring.
 (Short circuit or shocks may occur.)

- 2) Remove the Fasten terminal inserted into coil side and the insulating sleeve.

Caution
 Insulating sleeve isn't attached in Fasten terminal.

- 3) Draw the cable through the connector to the cover.
- 4) Strip the cable with wire stripper.
- 5) Draw the lead wire through the cover.
- 6) Install the Fasten terminal on the lead wire with a terminal-crimping tool.
- 7) Insert the Fasten terminal into the coil side. And fit the cover.
- 8) Tighten the cover setting screws to fix it.
- 9) (The cover can be set with the wire extraction opening turned upward or downward.)
- 10) Tighten the cable by connector.



(13) Operating Procedure

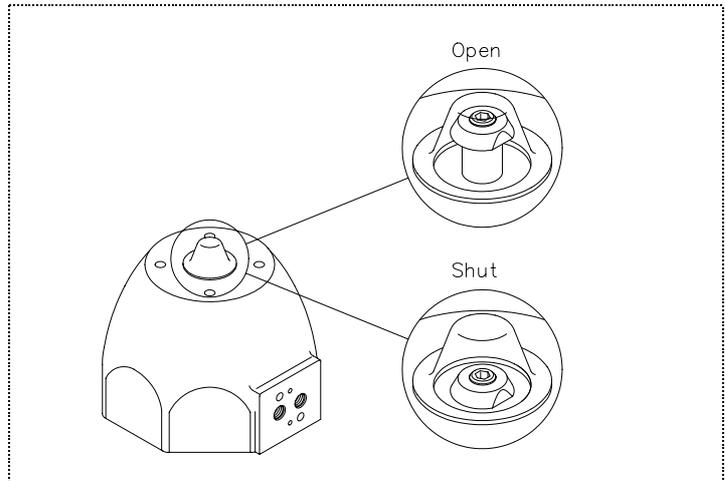
Automatic (Air) Operating Procedure

 Caution

When AV valve is equipped with a solenoid valve, do not leave solenoid valve terminal cover off.
 (Contact with the terminal will cause an electric shock.)
 Check that the supply pressure of the pressure reducing valve with a filter is 0.4MPa{4.1kgf/cm²} or more.
 (AV valve may not function.)
 Do not increase the set pressure of the pressure reducing valve with a filter is 0.6MPa{6.1kgf/cm²} or more.
 (AV valve may malfunction.)

Procedure

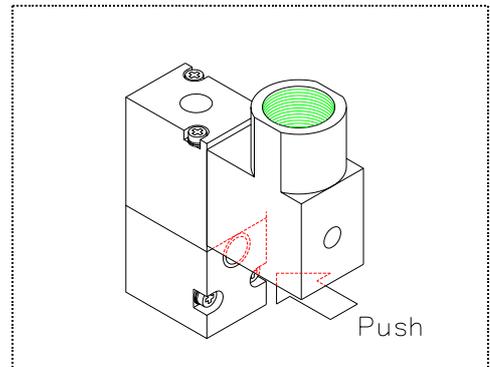
- 1) Supply air to the air supply opening.
- 2) Check that the air supplying side and
- 3) the stopper [43] position are matching.
- 4) Stop supplying air.



<For the solenoid valve >

Procedure

- 1) Supply the air to the solenoid valve.
- 2) Push the button with a finger, and confirm the action mode shown in the following table.
- 3) Apply regular rated voltage to the solenoid valve, and confirm the action mode shown in the following table.
- 4) Turn off the solenoid valve



Push button	Current	Double action	Single action	
			Air to open	Air to close
Pushed	On	Open		Shut
Not pushed	Off	Shut		Open

(14) Adjustment of opening / closing speed procedure

○ Double action type

Necessary items

- Spanner wrench

Procedure

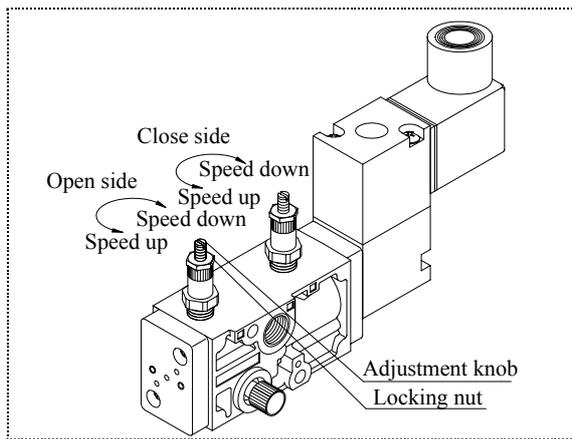
- 1) Turn right the adjustment knob of the solenoid valve fully.

Caution
 Avoid excessive tightening.
 (The speed controller can be damaged.)

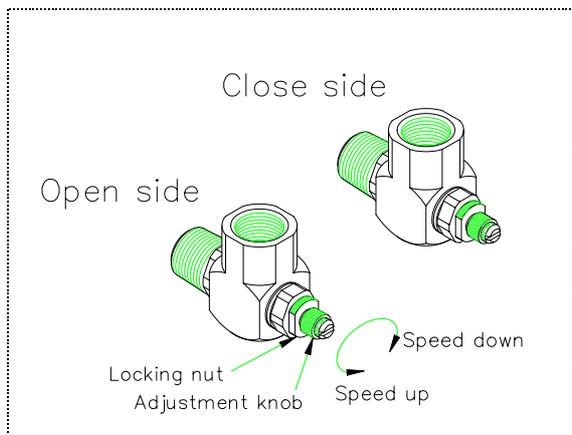
- 2) Supply the air to the solenoid valve.
- 3) Apply regular rated voltage to solenoid valve, and turn left the open side adjustment knob little by little.
- 4) Turn off the solenoid valve, and turn left the close side adjustment knob little by little.
- 5) Repeat item 3), 4) to adjust the opening / closing speed required.
- 6) When the adjustment is finished, fix the adjustment knob with locking nuts.

Caution
 Avoid excessive tightening.
 (The locking nut can be damaged.)

For Double action type with solenoid valve



For Double action type with speed controller



○ Single action type

Necessary items

● Spanner wrench

The actuation type changes the speed-adjustable direction.

Single action	Opening speed	Closing speed
Air to open type	Not adjustable	Adjustable
Air to close type	Adjustable	Not adjustable

Procedure

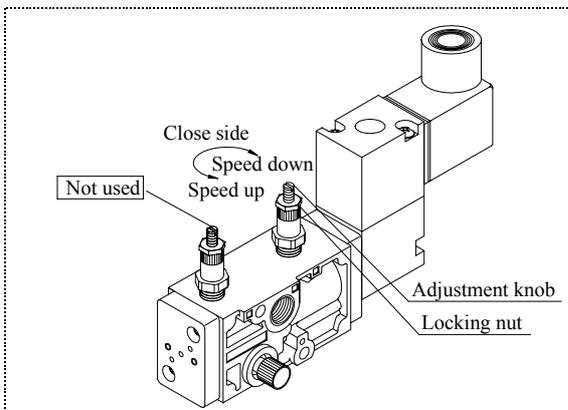
- 1) Turn right the adjustment knob of the solenoid valve fully.

 **Caution**
 Avoid excessive tightening.
 (The speed controller can be damaged.)

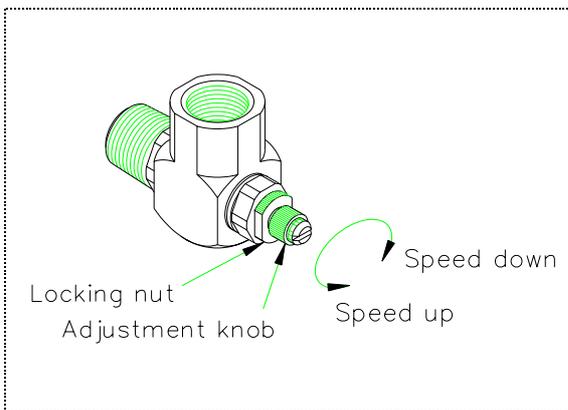
- 2) Supply the air to the solenoid valve.
- 3) Apply regular rated voltage to solenoid valve, and turn left the open side adjustment knob little by little.
- 4) Turn off the solenoid valve, and turn left the close side adjustment knob little by little.
- 5) Repeat item 3), 4) to adjust the opening / closing speed required.
- 6) When the adjustment is finished, fix the adjustment knob with locking nuts.

 **Caution**
 Avoid excessive tightening.
 (The locking nut can be damaged.)

For Single action type with solenoid valve



For Single action type with speed controller



(15) Mounting Insert-metal and base (panel)

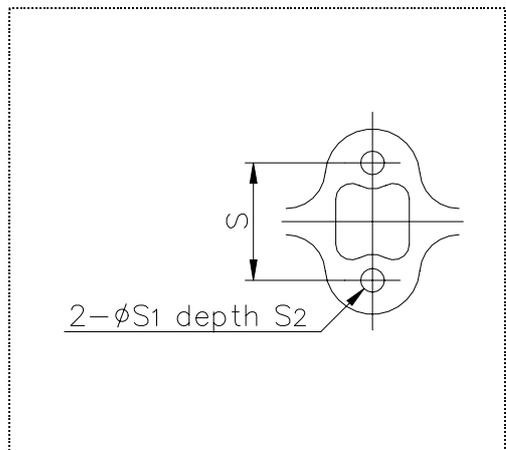
Procedure

Refer to the user's manual for the Ensats (Insert metal)
Commercially available.

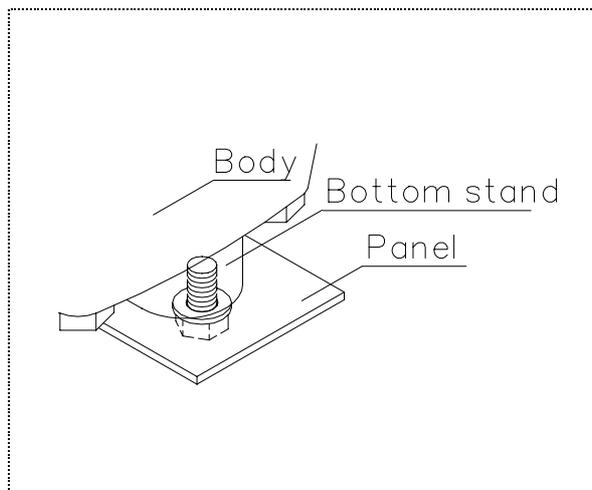
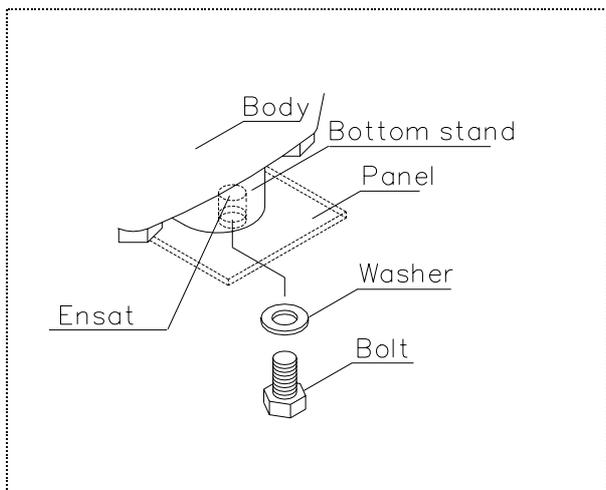
Bottom stand dimension

Unit ; mm (inch)

Nom. Size	S1	S2	S3
15mm-32mm (1/2", 1 1/4")	25 (0.98)	7 (0.28)	13 (0.51)
40mm, 50mm (1 1/2", 2")	45 (1.8)	9 (0.35)	15 (0.59)



Panel mount procedure



(16) Adjustment procedure for stopper

Necessary items

- Spanner wrench
- Allen wrench
- Driver(Flat head screw)
- Protective Gloves
- Goggles

Procedure

- 1) Loosen screw with a flat head screw to remove gauge cover ⑪.

 Caution
Do not damage O-ring (A) ⑭.

- 2) Fully open valve by controlling the volume of air.
- 3) Attach stopper ④③ with a wrench and use an allen wrench to loosen screw ⑳.
- 4) Turn stopper ④③ by a 1/4, counterclockwise.
- 5) Attach stopper ④③ with a wrench and use an allen wrench to tighten screw ⑳.

 Caution
Insufficient tightening may loosen the stopper.

- 6) Completely close valve by controlling the volume of air and check for leakage. If there is leakage, repeat steps 2) to 6) until leakage stops.
- 7) Install gauge cover ⑪.

(Fully open adjustment method (fully open adjustment mechanism is optional))

Necessary items

- Spanner wrench
- Allen wrench
- Driver(Flat head screw)
- Protective Gloves
- Goggles

Procedure

- 1) Loosen screw with a flat head screw to remove gauge cover ⑪.

 Caution
Do not damage O-ring (A) ⑲.

- 2) Completely close valve by controlling the volume of air.
- 3) Attach bolt and nut ⑤⑥ with an allen wrench, and use wrench to loosen the bolt and nut.
- 4) Screw bolt and nut ⑤⑥ into requires position.
- 5) Attach bolt and nut ⑤⑥ with an allen wrench, and use a wrench to tighten the bolt and nut.

 Caution
The bolt and nut may loosen if insufficiently tightened.

- 6) Open valve by controlling the volume of air and check valve for openness.

 Caution
If desired degree is not reached, repeat steps 2) to 6).

- 7) Install gauge cover ⑪.

(Manual operating method for (Manual operating mechanism is optional only for inverse operations.))

Necessary items

- Spanner wrench
- Allen wrench
- Driver(Flat head screw)

Procedure

- 1) Loosen screw with a flat head screw to remove gauge cover ⑪.

 Caution
Do not damage O-ring (A)⑭.

- 2) Fully open valve by controlling the volume of air.

 Caution
When it is impossible to control the volume of air due to power failure, omit step 2).

- 3) Attach stopper ④③ with a wrench, and use an allen wrench to loosen screw ②①
- 4) Remove stopper ④③ while turning counterclockwise.
- 5) Loosen screw completely with a flat head screw to remove indicative rod ④① from the upper portion of the actuator.
- 6) Shut valve completely by supplying air to it.

 Caution
When it is impossible to supply air to the valve due to power failure, omit step 6).

- 7) Install thrust ring ⑤③.
- 8) Install manual operating shaft at the same position as the indicative rod ④①.
- 9) When manual shaft ⑤② is turned with a wrench clockwise, the valve will open and counterclockwise, the valve will shut.
- 10) Replace manual shaft ⑤② and thrust ring ⑤③ with stopper ④③ screw ②① using the reverse procedure in steps 3) to 8).
- 11) Adjust stopper (refer to page 22).
- 12) Install gauge cover ⑪.

(17) Disassembling method for replacing parts

○ Double acting and air to open

Necessary items

- Spanner wrench
- Protective gloves
- Safety goggles



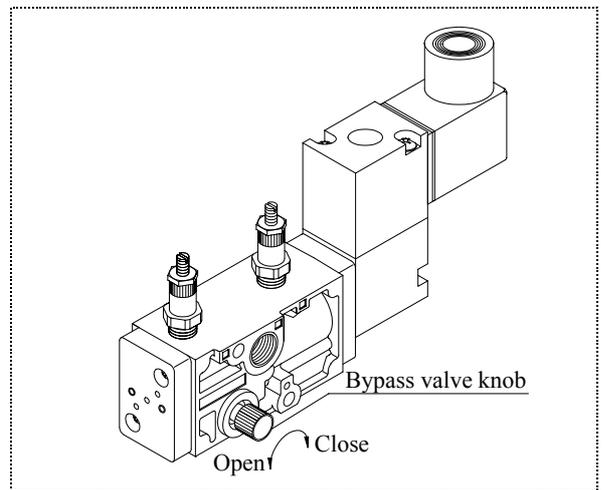
Caution

Wear protective gloves and safety goggles as some fluid remains in the valve.
(Injury may occur.)

(Disassemble)

Procedure

- 1) Completely discharge fluid from line.
- 2) Close main valve for air and open bypass valve to discharge air from the actuator.
- 3) Remove air line.
- 4) Loosen bolt (40) between the body and the actuator.
- 5) Remove actuator (28) or (29).
- 6) Remove diaphragm (3) by turning it 90 degrees.
- 7) Remove compressor (6).
- 8) Remove joint (7).



(Assembly)

Procedure

Assembly by using reverse procedures on steps 8) to 1).
(As to the body tightening torque, refer to Table 1.)

(Table 1) Body tightening torque value

Unit: N·m {kgf·cm} [lb·inch]

Diaphragm material \ Nominal size	15mm, 20mm (1/2", 3/4")	25mm, 32mm (1", 1 1/2")	40mm (1 1/2")	50mm (2")
	Rubber	3.0 {31} [27]	5.0 {51} [44]	12.0 {122} [106]
PTFE	5.0 {51} [44]	8.0 {82} [71]	15.0 {153} [133]	20.0 {204} [177]

○ Air to shut

Necessary items

- Spanner wrench
- Driver (flat head screw)
- Protective gloves
- Allen wrench
- Safety goggles



Caution

Wear protective gloves and safety goggles as some fluid remains in the valve.
(Injury may occur.)

(Disassemble)

Procedure

- 1) Discharge all fluid line.



Caution

Do not damage O-ring (A)¹⁹.

- 2) Loosen screws with flat head screw to remove gauge cover ¹¹.
- 3) Fully open valve by controlling the volume of air.
- 4) Attach stopper ⁴³ with a wrench, and use an allen wrench to loosen screw ²¹.
- 5) Remove stopper ⁴³ by turning counterclockwise.
- 6) Loosen screw completely, with flat head screw, to remove indicated rod ⁴¹ from the upper portion of the actuator.
- 7) Tighten screws with a flat head screw to install the rod ⁵⁴ to the same position as the indicated rod ⁴¹.



Caution

Rod for travel stop may loosen if insufficiently tightened ⁵⁴.

- 8) Install indicated table ⁵⁵ on the upper portion of actuator, and tightens by hand.
- 9) Put bolt and nut ⁵⁶ in the open adjustment table and screw in using five turns or so.
- 10) Attach bolt and nut ⁵⁶ with an allen wrench, and use a wrench to tighten up the nut ⁵⁶.
- 11) Release allen wrench from the bolt and nut ⁵⁶, and firmly install the fitting for travel stop ⁵⁵ on the upper portion of the actuator while using a wrench to turn the nut ⁵⁶.



Caution

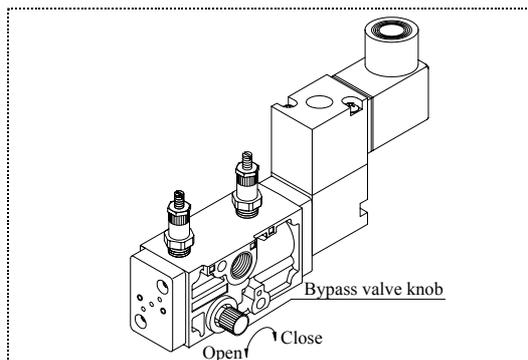
Fitting for travel stop ⁵⁵ may loosen if insufficiently installed.

- 12) Completely close valve by controlling the volume of air.
- 13) Adjust bolt and nut ⁵⁶ to a completely shut position. (refer to page 23.)
- 14) Close main air valve and open bypass valve to discharge air from the actuator.
- 15) Remove air line.
- 16) Loosen bolt ⁴⁰.
- 17) Remove actuator portion ³⁰.
- 18) Remove diaphragm ³ by turning it 90 degrees.
- 19) Remove compressor ⁶.
- 20) Remove joint ⁷.

(Assemble)

Procedure

Assemble by using reverse procedures from steps 21) to 1).
(As to the body tightening torque, refer to Table 1 shown on page 25.)



(18) Inspection items

○ Periodically inspect and maintain the AV valve in accordance with the plant schedule.

Portion to be inspected	Inspection item
Actuator	1) Existence of rust, peeling of paint, and dirt of inspection hole of valve travel indicator. 2) Tightening condition of respective threaded portions. (Loose or not) 3) Existence of rust and corrosion around the limit switch, and existence of internal disconnection. 4) Existence of abnormality in opening and closing operating sounds. 5) Smooth operation of manual handle. * It is unnecessary to supply oil to this actuator.
Valve	1) Existence of scratches, cracks, deformation, and discoloring. 2) Existence of leakage from the valve to the outside. 3) Existence of leakage when the valve is opened fully at right or left. 4) Tightening condition of bolt (B) (loose or not) .

(19) Troubleshooting

Problem	Cause	Treatment
The valve does not operate by air operations	The power source of the control panel is Turned off.	Turn on the power source.
	The solenoid valve is disconnected.	Check the connection again. (Refer to page 6)
	Air is not supplied to the solenoid valve.	Supply air to solenoid valve.
	The supply voltage to the solenoid valve is wrong.	Check voltage with a tester and set specified voltage.
	The voltage to the solenoid valve is low.	
	The bypass valve opens.	Close bypass valve by turning the bypass valve knob in a clockwise direction.
	The speed controller's knob is fully turned in a clockwise direction.	Turn speed controller's knob in a counterclockwise direction.(Refer to pages 19 and 20.)
The operation pressure is low.	Check the operating pressure.	

Problem	Cause	Treatment
Fluid leaks from the valve even when the valve is closed fully.	The diaphragm is worn.	Replace the diaphragm with a new one.(Refer to pages 24 and 25)
	The diaphragm or the body is scratched.	Replace scratched parts with new one.(Refer to pages 24 and 25)
	Foreign matter is in the valve.	Disassemble valve to remove foreign matter.(Refer to pages 24and 25.)
	The operating pressure is low.	Check the operating pressure.
Fluid leaks from the valve.	The bolt between the body and actuator is loose.	Tighten up the bolt to the specified torque.(Refer to page 24.)
	The diaphragm or the body is scratched.	Replace scratched parts with new one.(Refer to pages 24 and 25)
	There is foreign matter between the diaphragm and the body.	Disassemble valve to remove foreign matter.(Refer to pages 24and 25.)
	The union nut is loosened.	Tighten the union nut.
	The O-ring is scratched or worn.	Replace the O-ring with a new one.
The actuator operates, but the valve does not open or close.	The diaphragm or the joint metal fitting is broken.	Replace broken parts.(Refer to pages 24 and 25.)

(20) Handling of residual and waste materials



Caution

In discarding remaining or waste materials, be sure to ask waste service company.
(Poisonous gas is generated.)

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Distributor

Diaphragm Valve Type 14 Pneumatic Model Type AN

[Automatic Valve]

