NN61536601

Doc. No. DOC1042447

Operation Manual

PRODUCT NAME

Pulse Valve
SMARTVENT Type

MODEL / Series / Product Number

JSXF Series

SMC Corporation

Contents

Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of **"Caution," "Warning"** or **"Danger."** They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC)[*1)], and other safety regulations.

∗1) ISO 4414: Pneumatic fluid power - General rules and safety requirements for systems and their components
ISO 4413: Hydraulic fluid power - General rules and safety requirements for systems and their components
IEC 60204-1: Safety of machinery - Electrical equipment of machines - Part 1: General requirements
ISO 10218-1: Robots and robotic devices - Safety requirements for industrial robots - Part 1:Robots
etc.

Danger	**Danger** indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.
Warning	**Warning** indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.
Caution	**Caution** indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.

Warning

1. The compatibility of the product is the responsibility of the person who designs the equipment or decides its specifications.

Since the product specified here is used under various operating conditions, its compatibility with specific equipment must be decided by the person who designs the equipment or decides its specifications based on necessary analysis and test results. The expected performance and safety assurance of the equipment will be the responsibility of the person who has determined its compatibility with the product. This person should also continuously review all specifications of the product referring to its latest catalog information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.

2. Only personnel with appropriate training should operate machinery and equipment.

The product specified here may become unsafe if handled incorrectly. The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.

3. Do not service or attempt to remove product and machinery/equipment until safety is confirmed.

1. The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.
2. When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.
3. Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.

4. Our products cannot be used beyond their specifications. Our products are not developed, designed, and manufactured to be used under the following conditions or environments. Use under such conditions or environments is not covered.

1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.
2. Use for nuclear power, railways, aviation, space equipment, ships, vehicles, military application, equipment affecting human life, body, and property, fuel equipment, entertainment equipment, emergency shut-off circuits, press clutches, brake circuits, safety equipment, etc., and use for applications that do not conform to standard specifications such as catalogs and operation manuals.
3. Use for interlock circuits, except for use with double interlock such as installing a mechanical protection function in case of failure. Please periodically inspect the product to confirm that the product is operating properly.

Safety Instructions

⚠ Caution

We develop, design, and manufacture our products to be used for automatic control equipment, and provide them for peaceful use in manufacturing business.
Use in non-manufacturing business is not covered.
Products we manufacture and sell cannot be used for the purpose of transactions or certification specified in the Measurement Act.
The new Measurement Act prohibits use of any unit other than SI units in Japan.

Limited warranty and Disclaimer/Compliance Requirements

The product used is subject to the following “Limited warranty and Disclaimer” and “Compliance Requirements”.
Read and accept them before using the product.

Limited warranty and Disclaimer

1. The warranty period of the product is 1 year in service or 1.5 years after the product is delivered, whichever is first.*2)
   Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.
2. For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided.
   This limited warranty applies only to our product independently, and not to any other damage incurred due to the failure of the product.
3. Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalog for the particular products.

***2) Vacuum pads are excluded from this 1 year warranty.**
A vacuum pad is a consumable part, so it is warranted for a year after it is delivered.
Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty

Compliance Requirements

1. The use of SMC products with production equipment for the manufacture of weapons of mass destruction (WMD) or any other weapon is strictly prohibited.
2. The exports of SMC products or technology from one country to another are governed by the relevant security laws and regulations of the countries involved in the transaction. Prior to the shipment of a SMC product to another country, assure that all local rules governing that export are known and followed.

⚠ Caution

SMC products are not intended for use as instruments for legal metrology.
Measurement instruments that SMC manufactures or sells have not been qualified by type approval tests relevant to the metrology (measurement) laws of each country.
Therefore, SMC products cannot be used for business or certification ordained by the metrology (measurement) laws of each country.

1. Precautions for Design

⚠ Warning

1. Confirm the specifications.
Give careful consideration to the operating conditions such as the applications, fluids, voltage and environment, and use within the specified operating range.
If the product is used outside the specification range, it could lead to damage and malfunction.
SMC does not guarantee against any damage if the product is used outside of the specification range.

2. Cannot be used as an emergency shutdown valve, etc.
This product is not designed for safety applications such as an emergency shutdown valve.
If the valves are used in this type of system, other reliable safety assurance measures should also be adopted.

3. Cannot be used for holding pressure (including vacuum).
Since the valves are subject to air leakage, they cannot be used for applications such as holding pressure (including vacuum) in a pressure vessel.

4. Energizing valves continuously for an extended period of time
The solenoid coil generates heat if continuously energized. Do not use the product in sealed containers. Install the product in a ventilated location. Do not touch the valves with bare hand during or after energization.

5. Dual pressure
If there is a possibility that reverse pressure will be applied, take countermeasures such as mounting a check valve on the outlet side of the valve.

6. Disassembly and modification prohibited
Do not disassemble the product and replacement parts or make any modifications, including additional machining. It may cause human injury and/or an accident.

2. Precautions for Operating Environment

⚠ Warning

1. Do not use this product under any of the following conditions. It may lead to a malfunction or failure.
1) An environment containing corrosive gases, chemicals, sea water, water, steam, or locations where there is direct contact with any of these
2) Locations with explosive environment
3) Locations subject to direct sunlight
4) Locations subject to an excessive vibration or impact
5) Locations where radiant heat will be received from nearby heat sources

2. Take protective measures such as installing an enclosure (waterproof cover) in an environment where the product becomes wet with water.
The protection grade of this product is IP67 (IEC60529), but if water enters the product from a minute gap, it may lead to a malfunction or failure. Take protective measures when using the product in any of the following environments.
<Examples of environments where the product becomes wet with water>
1) Underwater
2) Locations where steam is generated
3) Locations where the product is exposed to water for a long time
4) Locations where water or oil splashes from the surrounding equipment
5) Locations where sea water is present

3. Use of the product outdoors

When using the product outdoors, take appropriate protective measures.

1) Provide a protective cover, etc. so that the product will not be exposed to direct sunlight.

2) Cover the product with an enclosure so that the product will not be exposed to rain or wind.

Even if you provide only a roof-type cover on top of the product, the product may become wet with water due to crosswind or rebounding of rain water from the ground. When covering the product with an enclosure, also take ventilation measures so that it will not be filled with heat due to long time energization.

4. Take measures against condensation when using the product in an environment it is exposed to condensation.

In a highly humid environment or another environment with significant changes in the temperature, condensation may occur.

If water enters the product, it may lead to a malfunction or failure. Be sure to take measures against condensation including room temperature control.

5. Take anti-freezing measures when using the product in any of the following low-temperature environments.

1) In cold regions or during winter

2) High dew‐point temperature and low ambient temperature

3) When flowing at a high flow rate

Examples of anti-freezing measures include draining inside the pipelines, drain removal by an air dryer, and warming with a heater. When taking warming measures, be sure to avoid the coil section because doing so will deteriorate heat radiation.

3. Precautions for Fluid

⚠Warning

1. Take measures to prevent static electricity since some fluids can cause static electricity.

2. Fluid temperature

Use the product within the specified fluid temperature range for the product.

3. Install a filter to use clean fluid.

1) The use of a fluid that contains foreign matter can cause problems such as malfunction and seal failure by wearing of the valve seat and armature, and by sticking to the sliding parts of the armature, etc. Install a filter of 5 μm or less on the valve's inlet side to remove foreign matter.

2) Filter will clog. Replace or clean the filter when the pressure drop reaches 0.1 MPa.

4. Material of Fluid

⚠Warning

1. Air

1) Do not use compressed air that contains chemicals, synthetic oils including organic solvents, salt or corrosive gases, etc., as it can cause malfunction or damage.

2) Compressed air that contains excessive drainage may cause malfunction of valves and other pneumatic equipment.
Install an aftercooler or an air dryer on the valve's inlet side as a drainage measure.

3) If excessive carbon powder is generated by the compressor, it may adhere to the inside of the valves and cause malfunction.
Install a mist separator on the inlet side of the valve as a countermeasure for removing the carbon powder.

4) For detailed information regarding the quality of the compressed air described above, refer to SMC's "Compressed Air Cleaning System."

5) When air with an ultra-low dew point of −70°C or lower, the inside of the valve may wear, reducing the product life.

5. Precautions for Mounting

⚠ Warning

1. When installing the product, secure enough space for maintenance and inspection.

When using a silencer, secure enough space for replacing the silencer.

2. When installing the product, avoid any sources of vibration, or adjust the arm from the body to the minimum length so that resonance will not occur.

3. Do not install the product near the heat source and install it where the product will not be affected by radiant heat.

4. Do not apply external force to the coil section.

When installing the product, apply the wrench or another tool to the outside of the piping connection so that it will not come into contact with the coil section.

5. Do not warm the coil section with a heat insulator, etc.

When warming the product as an anti-freezing measure, warm only the piping and body sections and do not warm the coil section.Heating the coil may burn it out.

6. If air leakage increases or the equipment does not operate properly, stop using it.

After installation and during maintenance, connect the compressed air and power and perform appropriate functional and leakage inspections to make sure that the equipment is installed properly. Do not use the equipment if it does not operate properly.

7. Do not touch valves with bare hands during or immediately after energization.

Valves will reach high temperatures after energization. Do not touch valves carelessly. You may get burned if you failed to do so.

⚠Caution

1. Installation of a regulator and restrictor

If a regulator or a restrictor is installed immediately before the valve inlet or immediately after the valve outlet, the valve may oscillate (chatter), causing a failure. Install it away from the valve or change the restriction.

2. Install a header tank with a sufficient capacity on the valve's inlet side.

Because this product is a high-flow valve, if the tank capacity is small, a valve open failure or valve oscillation (chattering) may occur due to a pressure drop or insufficient air supply, causing a failure.

3. Painting and coating

Warnings or specifications printed or labeled on the product should not be erased, removed or covered.

4. Apply the correct tightening torque.

Tightening at a torque exceeding the tightening torque range may damage the mounting screws, enclosure, and so on. Tightening at a torque less than the tightening torque range may cause a displacement of the mounting position or the loosening of the screw sections.

5. If a commercially available switching power supply is used, be sure to ground the frame ground (FG) terminal.

6. Precautions for Piping

⚠Warning

1. Tubes may become unfixed and break loose while the product is used due to deterioration of the tube or damage to the fitting.

To prevent the tube from breaking loose, install a protective cover or secure the tube.

⚠Caution

1. Refer to the Fittings and Tubing Precautions in the SMC catalog for tubes for which the handling one-touch fittings applies

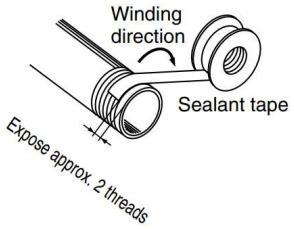
2. Preparation before piping

Before piping is connected, flush thoroughly with air or wash to remove chips, cutting oil and other debris from inside the pipe.

Connect piping in a way forces such as a tension, compression or bending will not be applied to the valve body.

3. Wrapping of sealant tapes

When connecting pipes, fittings, etc.,
be sure that chips from the pipe threads
and sealing material do not enter the valve.
Furthermore, when pipe tape is used,
leave 1.5 to 2 thread ridges exposed at the end of the threads.



4. When using a fitting other than an SMC fitting

Follow the instructions given by the manufacturer of the fitting used.

5. Be aware that connecting the ground wire to piping may cause corrosion of the system due to electrolytic corrosion.

6. When connecting piping to the product, pay attention not to make a mistake regarding the supply port, etc.

Notes for Piping: Direct Port Type

⚠Caution

1. Use a steel tube for the valve's inlet and outlet sides.

2. Screw tightening torque for piping

When attaching fittings to valves, tighten with the proper tightening torque shown on the right.

Tightening torque for piping

Thread	Proper tightening torque N·m
1/4	8 to 12
3/8	15 to 20
1/2	20 to 25
3/4	28 to 30
1	36 to 38
1･1/2	40 to 42

Notes for Piping: Compression Type

⚠ Warning

1. Do not use the compression fitting of the valve to support the valve piping.
The piping may be disconnected from the valve. Be sure to mount the valve to the fixed piping.
(The compression fitting does not have a function to secure and hold the valve.)

⚠Caution

1. Use a steel tube for the valve's inlet and outlet sides.

2. Tightening of the compression nut

Be sure to tighten the compressor nut sufficiently and make sure that there is no leakage, loosening, or rattling.

Note 1) Mount the valve to the fixed piping.

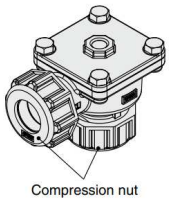
Note 2) Insert the piping through to the end to prevent the piping from being slanted to the valve.

Note 3) Do not expose the piping to oil or moisture. Otherwise, the valve comes off easily.

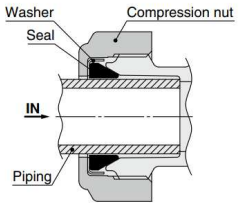
Note 4) Sealing performance may decrease due to the deterioration of seals and other reasons. Additionally tighten the compression nut regularly.

Additional tightening angle after hand-tightening (guide for nut tightening)

Size	Additional tightening angle
3/4(20A)	90° to 270°
1(25A)	135° to 315°
1･1/2(40A)	150° to 330°



Cross section of the nut



Notes for Piping: Immersion Type

⚠ Caution

Mounting the immersion type

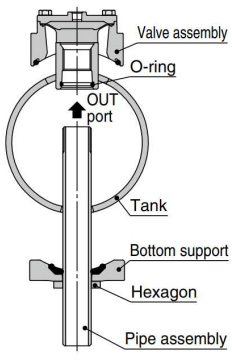
Please see the figure below when installing the valve to the tank you have prepared.
Be sure to tighten the pipe assembly sufficiently and make sure that there is no leakage, loosening, or rattling.

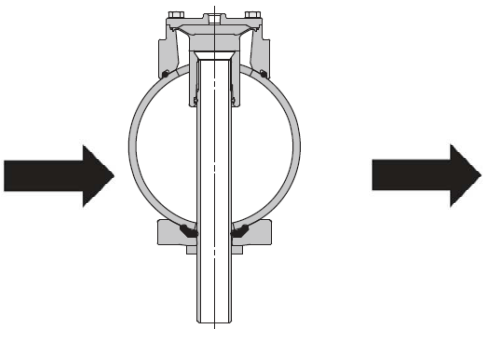
Step 1) Insert the pipe assembly vertically into the OUT port of the valve assembly.
(If the assembly is tilted when inserting, the O-ring inside the valve may be damaged.)

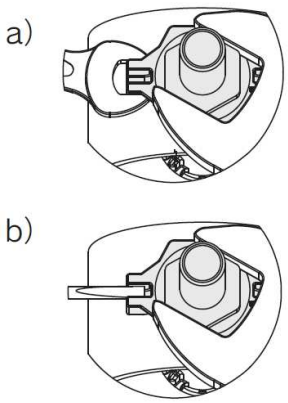
Step 2) Additionally tighten to fix the pipe assembly until the body and the bottom support contact the tank.

① Fix the bottom support using a wrench, etc. so that it will not rotate. See figure a).(You can also do the same by fixing as shown in figure b).) When fixing the bottom support, align the curved surfaces of the tank and the bottom support.

②Additionally tighten the hexagon portion of the pipe assembly.







Guide for tightening the pipe assembly (tightening torque)

Size	Tightening torque N·m
3/4(20A)	30
1(25A)	50
1･1/2(40A)	50
2(50A)	120

Note 1) Excessive tightening may damage the valve or deform or damage the tank.
Note 2) The vibration during air discharge may cause loosening of the pipe assembly. Additionally tighten the pipe assembly regularly.
Note 3) We recommend ANSI Sch40 for the tank. However, when creating the tank on your own, pay attention to the tank strength so that it will not deform when tightening the valve.

7. Precautions for Wiring

⚠Warning

1. Check the terminal when wiring.
Incorrect wiring may lead to the breakage, failure or malfunction of the valve. Be sure to check the terminal before wiring.

2. Make sure that no excessive force is applied to the lead wires.
Broken lead wires will result if bending stresses or tensile forces are applied to the lead wires.

3. Check the insulation of the wiring.
Poor insulation (interference with other circuits, poor insulation between terminals, etc.) may apply excessive voltage or current to the product causing damage.

4. Do not pull the lead wire forcefully, or lift the product by the lead wire.
Hold the product itself when handling. Otherwise, the lead wire may be damaged, leading to the failure or malfunction of the product. In addition, the product may be damaged or the connectors may drop.

5. Do not perform wiring while the power is on.
Otherwise, the product may be damaged or malfunction.

6. Do not route wires and cables together with power or high voltage cables.
Route the wires separately from the power or high voltage cables to prevent a signal line noise or surge from them from entering.

7. Use grommets and code grips.
When passing the lead wires through the entry ports, use grommets, code grip parts, etc. to secure the lead wires.
Choose a grommet and so on according to the IP performance and lead wire specification.

8. Install a fuse or circuit breaker.

8. Notes on Appearance

⚠Caution

1. A surface treatment is applied to the product to improve corrosion resistance. There may be a spot pattern on the surface depending on the treatment condition, but there is no problem in use.

9. Maintenance and Inspection

⚠ Warning

1. Removal of the product

1) Shut off the fluid supply and release the fluid pressure in the system.
2) Shut off the power supply.
3) Confirm that the valve temperature has dropped sufficiently before removing the product.

2. Replace or clean the filter regularly.

1) Replace filter after a year of use, or earlier if the pressure drop reaches 0.1 MPa.
2) Clean strainers when the pressure drop reaches 0.1 MPa.

3. Remove drainage from air filters regularly.

If condensate in the drain bowl is not emptied on a regular basis, the condensate will overflow and allow it to enter the compressed air lines. This will cause a malfunction of pneumatic equipment. If the drain bowl is difficult to check and remove, installation of a drain bowl with an auto drain option is recommended.

4. Silencer

When used for long hours, a silencer may clog and the response characteristic may change. Replace it after using it for 500,000 times as a guide though the timing of replacement depends on the quality of fluid and energized time.

5. Disassembly

Do not disassemble components other than the main valve and sub-valve.
Otherwise, a failure may be caused.
Refer to the Disassembly/Assembly Procedure on page 24 for the replacement of components.

6. When using at a low frequency

Switch valves at least once every 30 days to prevent malfunction. Also perform a periodic inspection once every 6 months to use the product in the optimum conditions.

7. Storage

In case of long term storage after use, thoroughly remove all moisture and store it in a location where the product is not exposed to sunlight and higher humidity to prevent rust and deterioration of rubber materials, etc.

8. Perform regular maintenance and inspections.

Regularly perform appropriate functional and leakage inspections to check if the product is mounted properly. If air leakage increases or the equipment does not operate properly, stop using it.

10. Return of Our Products

⚠ Warning

Before returning our product that is contaminated or possibly contaminated with a substance, fluid, or its residue that are considered harmful to humans, contact SMC for safety reasons. Appropriately clean (neutralize) the product, submit a Product Return Request Sheet or a Detoxification/Decontamination certificate to SMC, and then return the product to us after receiving an approval for return of the product from us.
With regard to harmful substances, check the International Chemical Safety Cards (ICSC) and the like.
Contact your nearest SMC Sales representative should you have any questions or inquiries.

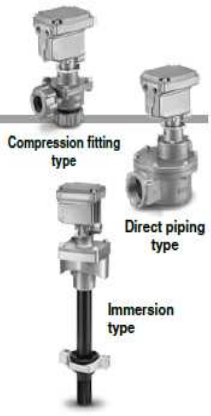
11. Model Indication and How to Order

Pulse Valve

SMARTVENT Type

JSXF-P□ Series

CE UK CA RoHS



How to Order

		❶	❷	❸	❹	❺	❻	❼	❽	❾	❿	⓫
Compression	JSXF	□	E		-06	R		-5	PR	B	-S	2
Direct Piping	JSXF	□	F		-06	R		-5	PR	B	-S	2
Immersion	JSXF	□	H	4	-06	R	1	-5	PR	B	-S	2

❶ Valve type

Nil	Solenoid valve

❷ Piping

E	Compression fitting type*1	
F	Direct piping type	
H	Immersion type*2	

*1 Seals and washers are included.
*2 The valve and pipe are not assembled in the package.

❸ Tank size (JSXFH only)

4	4 inch
5	5 inch
6	6 inch
8	8 inch
10	10 inch

❹ Port size*1

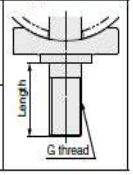
06	3/4 (20A)
10	1 (25A)
14	1 1/2 (40A)
20*2	2 (50A)

*1 For port size selection, refer to the "Variations for port size and option" table below.
*2 Port size 20 is only available for the JSXFH.

❺ Thread type

R	Rc
N	NPT
F	G

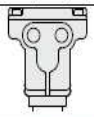
❻ OUT port piping configuration (JSXFH only)

Symbol	Length	G thread	Appearance
1	Short	None	
2	Long		
3	Short	Yes	
4	Long		

❼ Rated voltage

Symbol	Rated voltage
5	24 VDC

❽ Electric control

Symbol	Board type	External input (Differential pressure sensor)	
PP*1	Base	With (3 holes)	
PB		Without (2 holes)	
PR	Remote		

*1 When using a differential pressure sensor, select PP for the base valve. Use the differential pressure sensor of 2-wire (type) and 4 to 20 mA specification.

❾ Fluid and ambient temperatures

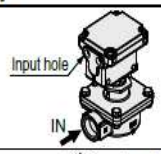
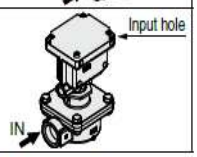
B	–40 to 60 °C

❿ Silencer

Nil	Without
S	With

· Shipped together with the product
· 2 pcs. for 40A and 50A

⓫ Electrical entry

Nil	IN side	
2	180° Inverted	

· It can be changed by the customer. Please contact us for details.

Variations for Port Size and Option

Model	Tank size	Port size			
		06	10	14	20
JSXFE	—	●	●	●	—
JSXFF	—	●	●	●	—
JSXFH	4 inch	●	—	—	—
	5 inch	●	●	—	—
	6 inch	—	●	●	—
	8 inch	—	—	●	●
	10 inch	—	—	—	●
Silencer		●	●	●	●

12. Specifications

Common specifications

Product number		JSXF□□-□□□-5(PP/PB)B-□□	JSXF□□-□□□-5PRB-□□
Valve		Base valve	Remote valve
Valve construction		Pilot diaphragm	
Valve type		Valve open when energized (Normally Closed)	
Fluid		Air	
Withstand pressure		1.5 MPa	
Minimum operating pressure		0.1 MPa	
Maximum operating pressure		0.9 MPa	
Maximum system pressure		0.9 MPa	
Fluid temperature		−40 to 60°C (No condensation or freezing)	
Ambient temperature		−40 to 60°C (No condensation or freezing)	
Enclosure		IP67[Note 1)] NEMA4	
Rated voltage		24 VDC	
Allowable voltage fluctuation		±10% of the rated voltage	
Valve power consumption[Note 2)]		18 W	
Board power consumption		25 mA	15 mA[Note 3]
ON setting	Setting range	100 to 234 msec	-
	Minimum unit	Approx. 14 to 15 msec	-
	Setting method	Rotary switches	-
OFF setting	Setting range	4 to 29 sec	-
	Minimum unit	Approx. 1 sec	-
	Setting method	Rotary switches	-
Valve connection[Note 4]		1 unit	Up to 31 units Simultaneously ON: Up to 2 units
Differential pressure sensor input[Note 5]	Applicable sensor	2-wire type 4 to 20 mA	-
	Threshold setting method	Rotary switches	-
Standards		CE/UKCA	

Note 1) For the enclosure, wiring components are mounted or plugged into the entry ports.

Note 2) Power consumption is the value at an ambient temperature of 20°C and when the coil to which the rated voltage is applied is ON (Variation range: ±10%).

Note 3) Current consumption per remote valve. It is added according to the number of valve units.

Note 4) Up to 2 remote valve units can be set to the same address. Be aware that if more units are set to the same address, they may not operate normally.
The base valve and the remote valve cannot be turned ON at the same time.
Base valves cannot be connected with each other.

Note 5) The differential pressure sensor is optional. For a base valve, select JSXF□□-□□□-5PPB-□□.

Individual specifications: Compression fitting/Direct port type

Series		JSXFE/F		
		06	**10**	**14**
Orifice diameter (mm)		Ø 32	Ø 40	Ø 50
Port size		3/4	1	1･1/2
Weight (g)	**Compression**	1,240	1,680	2,620
	Direct port	1,060	1,250	2,000

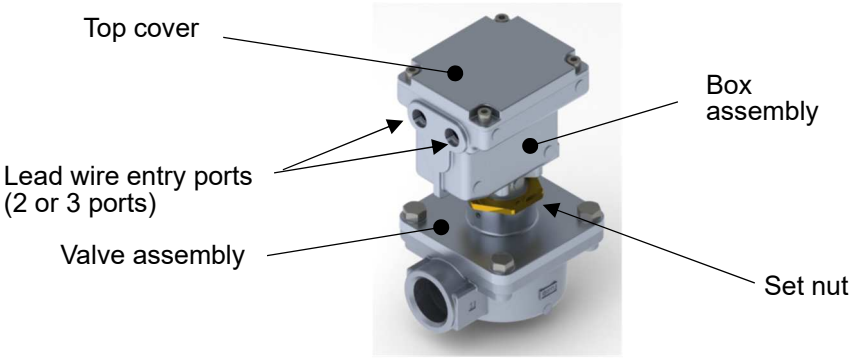
Individual specifications: Tank mount type (immersion type)

Series			JSXFH							
			06		**10**		**14**		**20**	
Orifice diameter (mm)			Ø 32		Ø 40		Ø 45		Ø 55	
Port size			3/4		1		1･1/2		2	
Tank size	**ANSI**		4	5	5	6	6	8	8	10
Weight (g)[Note 1)]	**Piping configuration**	**1**	1,880	1,890	2,500	2,560	3,480	3,600	5,190	5,360
		2	1,910	1,930	2,550	2,660	3,640	3,830	5,510	5,670
		3	1,880	1,890	2,500	2,560	3,480	3,600	5,190	5,360
		4	1,910	1,930	2,550	2,660	3,640	3,830	5,510	5,670

Note 1) The tank is not included in the weight.

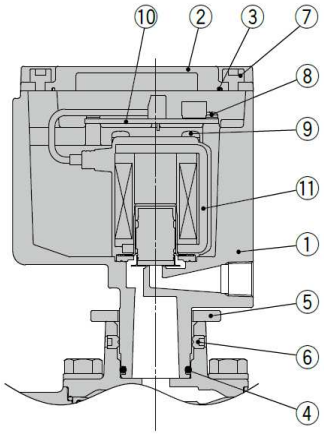
13. Component Drawing

Names of parts (Direct port type: 25A; Electrical entry direction: IN side)



Component drawing

The same as the air operated type except the following components:

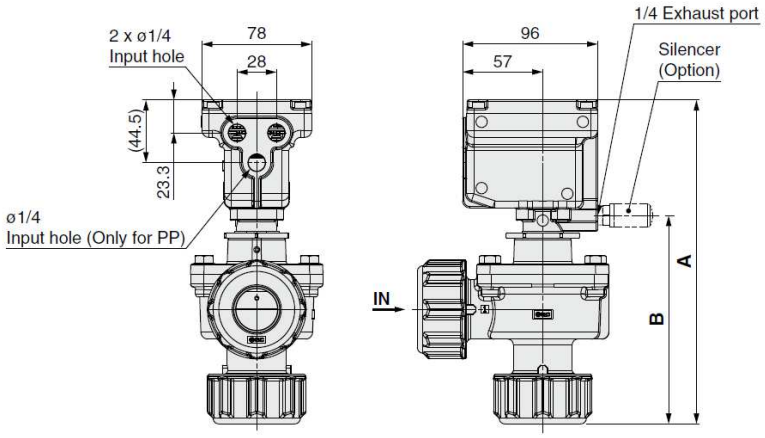


Component material

No.	Description	Material
1	Box	ADC
2	Top cover	ADC
3	Gasket	NBR
4	O-ring	NBR
5	Set nut	SUS
6	Hexagon socket head set screw	SUS
7	Hexagon socket head cap screw	SUS
8	Cross recessed round head screw	SUS
9	Cross recessed round head screw	Fe
10	Board assembly	-
11	Pilot valve	-

14. Dimensions

JSXFE/Compression fitting type

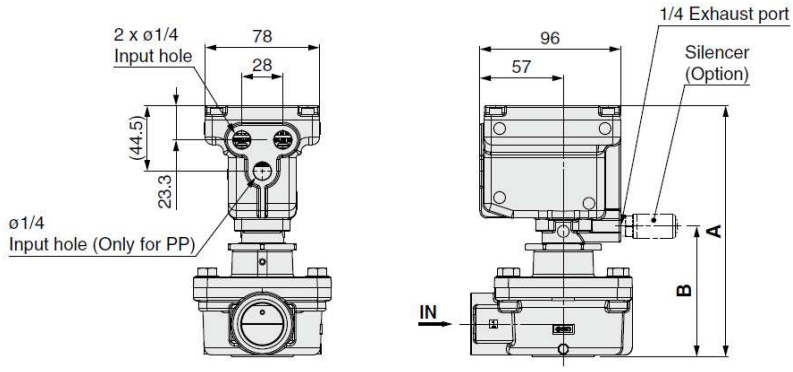


Dimensions [mm]

Model	Port size	A	B
JSXFE-06	3/4	196	114
JSXFE-10	1	230	148
JSXFE-14	1 1/2	280	198

Dimension indicates the value after screw tightening.

JSXFF/Direct piping type

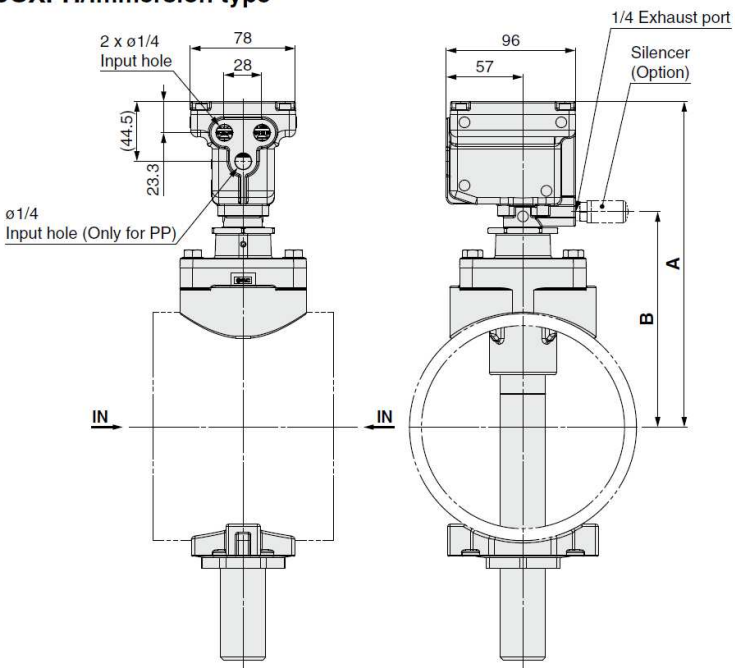


Dimensions [mm]

Model	Port size	A	B
JSXFF-06	3/4	162	80
JSXFF-10	1	171	89
JSXFF-14	1 1/2	221	139

Dimension indicates the value after screw tightening.

JSXFH/Immersion type



Dimensions [mm]

Model	Port size	A	B
JSXFH4-06	3/4	213	131
JSXFH5-06		227	145
JSXFH5-10	1	229	147
JSXFH6-10		242	160
JSXFH6-14	1 1/2	266	184
JSXFH8-24		291	209
JSXFH8-20	2	306	224
JSXFH10-20		333	251

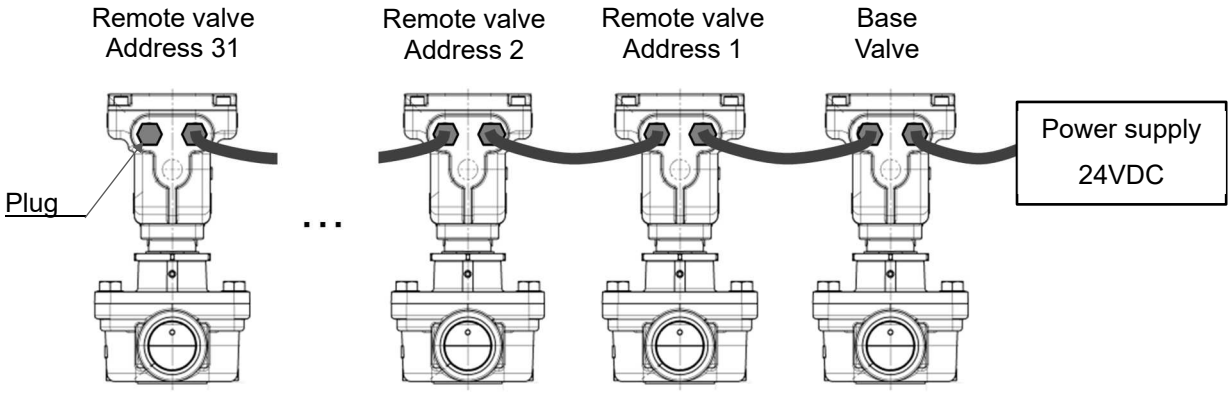
Dimension indicates the value after screw tightening.

15. Wiring

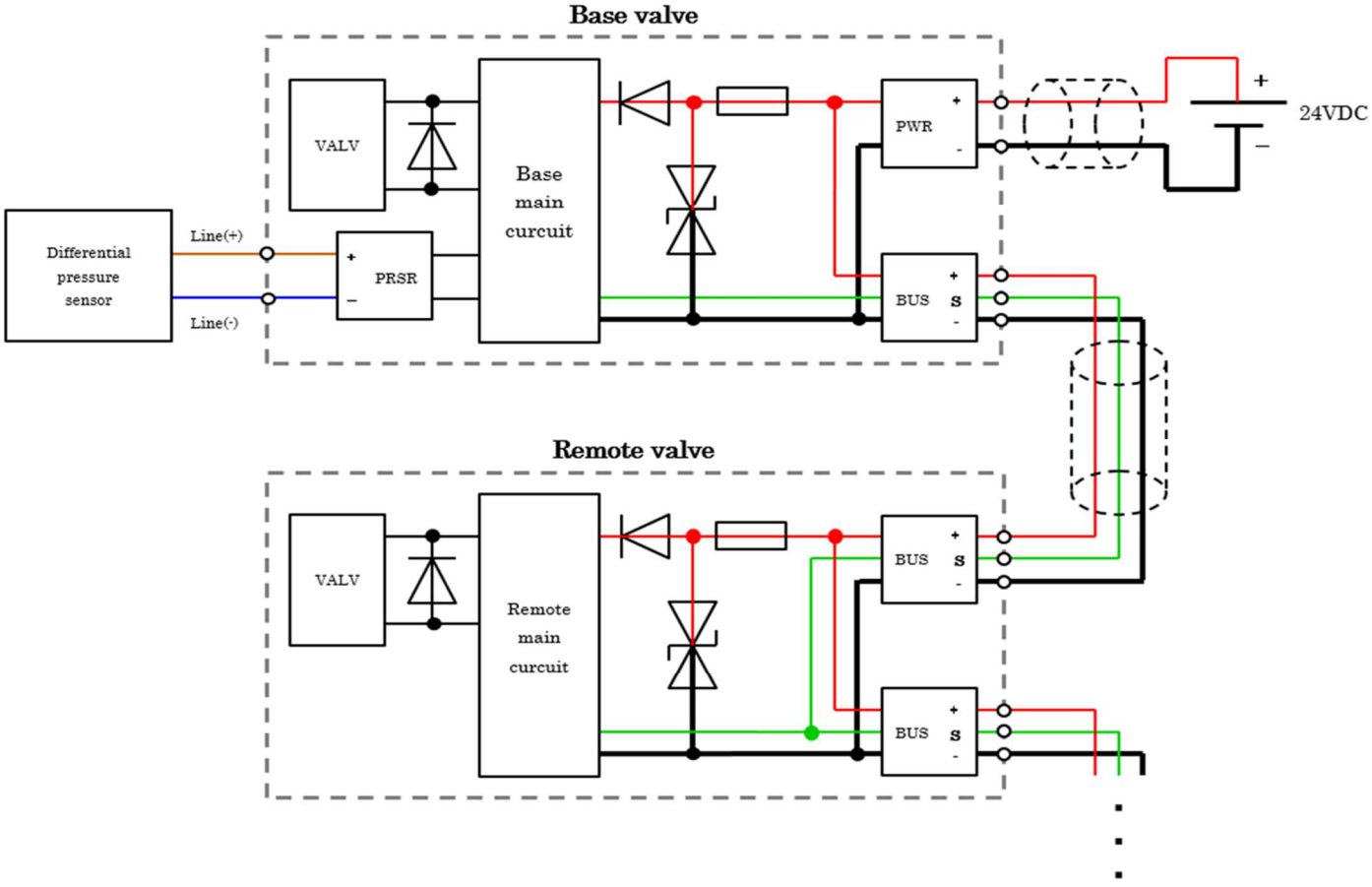
15.1. Wiring example and internal circuit

With the smart vent system, by supplying power to one unit of base valve, up to 31 units of remote valves can be controlled. The customer should prepare wiring components (lead wires, grommets, cord grips, etc.) according to the environment used.

Note) Remote valves turn ON in the order of set addresses instead of the order of their installation.



Connecting the BUS terminals with each other supplies voltage from the base valve to a remote valve. Thereafter, connecting the BUS terminal supplies voltage from the remote valve to another remote valve.



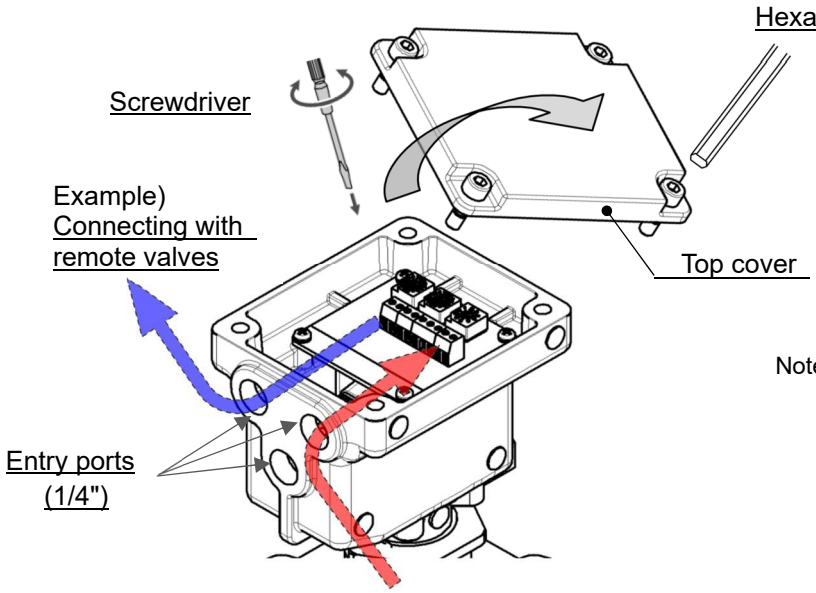
Note) Be sure to install a fuse or circuit breaker as necessary to protect the power supply.

15.2. Wiring work

Note) Be sure to perform wiring work after shutting off the power supply to the valves.

1. Use a hexagon wrench (#4) to loosen the bolts and remove them together with the top cover.
   Fall prevention is provided to the bolts.
2. Pass the lead wires through the entry ports and connect them to the respective terminal blocks using a screw driver. (Refer to Section 16.3. and 16.4.)
3. When passing the lead wires through the entry ports, be sure to use wiring parts (grommets, code grip parts, etc.) to secure the lead wires.
   The entry port size is the Rc, NPT, or G type 1/4 inch according to the model indication.

Note) Provide a plug to the entry port of the terminal remote valve.



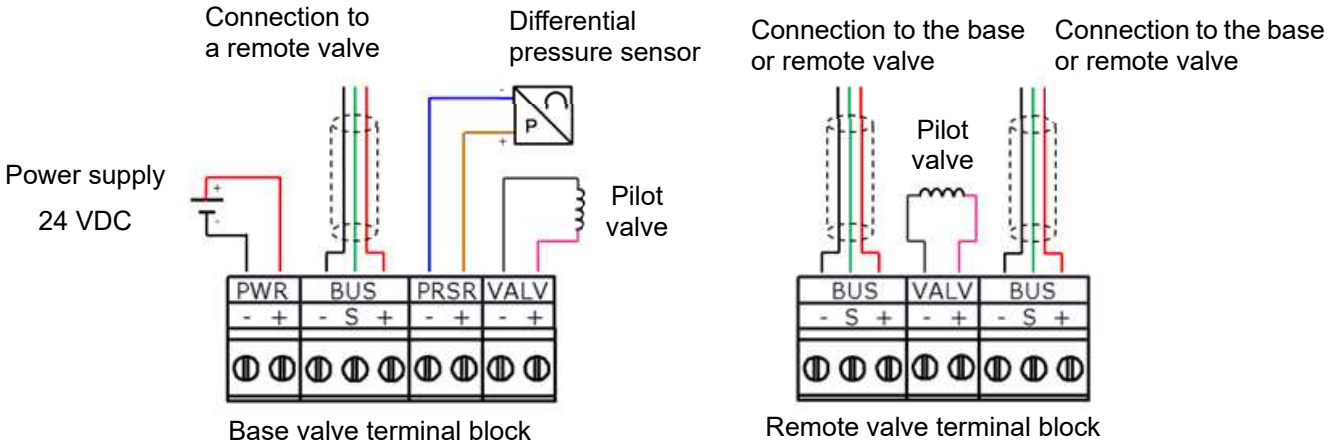
Example) Power supply voltage

Bolt tightening torque when the cover is mounted

Hexagon socket	Tightening torque
#4	0.4 N·m±10%

Note) Base valve: There are three entry ports only for the external entry (PP) type for the wiring of a differential pressure.

15.3. Wiring diagram



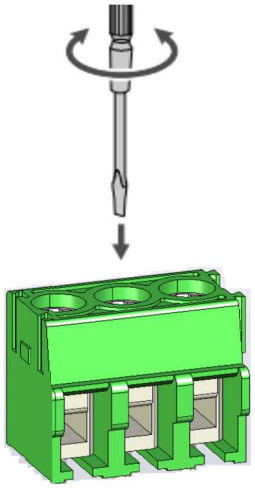
Base valve terminal block

Remote valve terminal block

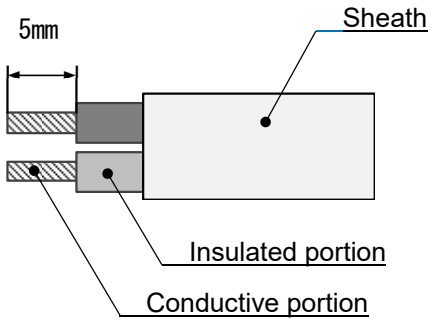
Note) The pilot valve has been wired for both the base and remote valves at a time of shipment.

Note) No load needs to mounted for the connection of a differential pressure.
When not using a differential pressure, use the product without connecting a differential pressure.

15.4. Wiring to terminal blocks



Terminal block



Lead wire specifications

Supported lead wire	AWG 26 to 16
Recommended strip length	5 mm
Tightening torque for the terminal block	0.22 N·m to 0.25 N·m

Note) Connect all the stranded wires at the conductive portion to the terminal block so that they will not become apart. If stranded wires that have become apart come in contact with other items, it may cause a failure or malfunction.

Note) Choose as thick lead wires for the power supply and BUS as possible to reduce voltage drop or power loss.
AWG20 or more and 508 mm (20 in.) or less are recommended. Before using a 508 mm or longer lead wire, check it with the actual device.

Note) Be careful not to allow foreign matter to enter the engaging part.
Contamination with foreign matter may cause a contact failure or generate heat.

Note) When plugging or unplugging a lead wire, do so horizontally or vertically.
If an excessive stress is applied when plugging or unplugging the lead wires, it may cause a damage or contact failure.
Also consider fixing the lead wires so that a tension will not be applied to the connected lead wires.

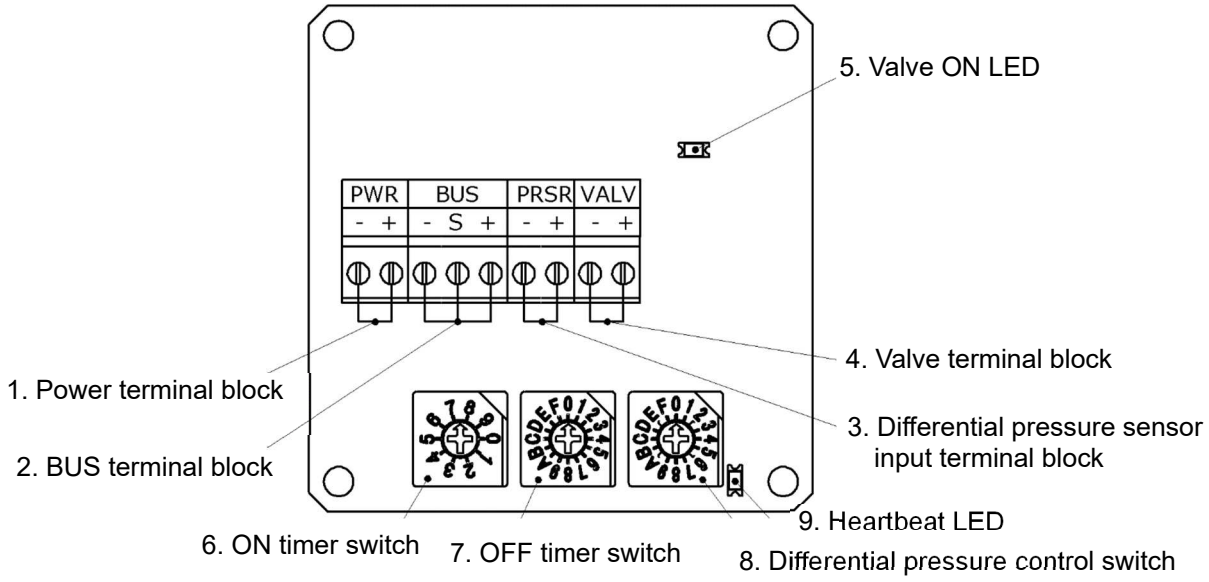
Note) There may be excess or deficiency in the conductive portion depending on the lead wire type even if you peel it at the recommended strip length.
If this is the case, adjust the strip length to ensure that the wire is conductive.

Note) When connecting the lead wire, hold the terminal block by hand so that an excess stress will not be applied to the solder pins.

Note) Be careful not to wet the board by working with wet hands or due to water entering the board, etc.

16. Names and Functions of Board Components

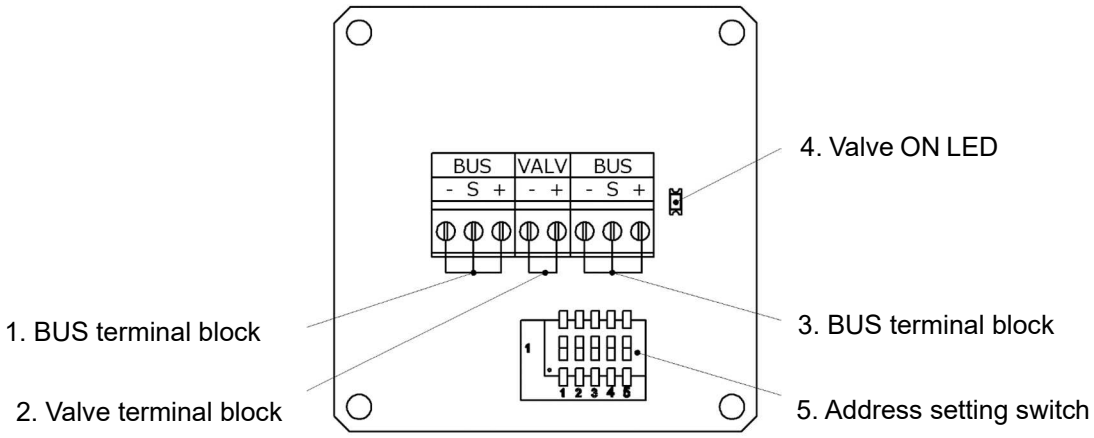
16.1. Board for the base valve



No.	Name	Mark	Description
1	Power terminal block	PWR	Connect 24 VDC. The connected voltage is supplied to the base and remote valves. When connecting, pay attention to the polarity (+, −).
2	BUS terminal block	BUS	A terminal block to connect with a remote valve. Connect to the BUS connection terminal block of the remote valve. When connecting,, pay attention to the polarity (+, S, −). "+" and "−" are used to supply power to the remote valve, and "S" is used for a communication signal.
3	Differential pressure sensor input terminal block	PRSR	An input terminal for a differential pressure (two-wire system, analog output: 4 to 20 mA). When connecting, pay attention to the polarity (+, −).
4	Valve terminal block	VALV	A voltage output terminal to output to a valve. It is wired at a time of shipment.
5	Valve ON LED	DS1	It turns ON when the valve is in operation.
6	ON timer switch	ON	A switch for setting the valve ON time. It is set to "0: 100 ms" at a time of shipment from the factory. Refer to page 21 for details.
7	OFF timer switch	OFF	A switch for setting the valve OFF time. It is set to "0: 4 sec" at a time of shipment from the factory. Refer to page 21 for details.
8	Differential pressure control switch[Note1)]	PRSR	When a differential pressure sensor is connected, set the differential pressure threshold at which the valve starts operating. It is set to "0: OFF" at a time of shipment from the factory. Refer to page 22 for details.
9	Heartbeat LED	DS2	It flashes in green once every second when the circuit is normally operating.

Note 1) When using a differential pressure sensor, choose JSXF□-□-5PPB-□□ for the base valve.

16.2. Board for remote valves



No.	Name	Mark	Description
1	BUS terminal block	BUS	A connection terminal for the base valve or a remote valve. When connecting,, pay attention to the polarity (+, S, −). "+" and "−" are used to supply power to the remote valve, and "S" is used for a communication signal.
2	Valve terminal block	VALV	A voltage output terminal to output to a valve. It is wired at a time of shipment.
3	BUS terminal block	BUS	A connection terminal for the base valve or a remote valve. When connecting,, pay attention to the polarity (+, S, −). "+" and "−" used to supply power to the remote valve, and "S" is used for a communication signal.
4	Valve ON LED	DS1	It turns ON when the valve is in operation.
5	Address setting switch	SW1	A switch for setting a remote valve address. It is set to "Address: **None**" at a time of shipment from the factory. Refer to page 23 for details.

Note) Remote valves turn ON in the order of set addresses instead of the order of their installation.

Note) Remote valves turn ON in the order of set addresses instead of the order of their installation.
Valves can be operated in various combinations by the address setting.

17. Operation Modes and How to Set a Mode

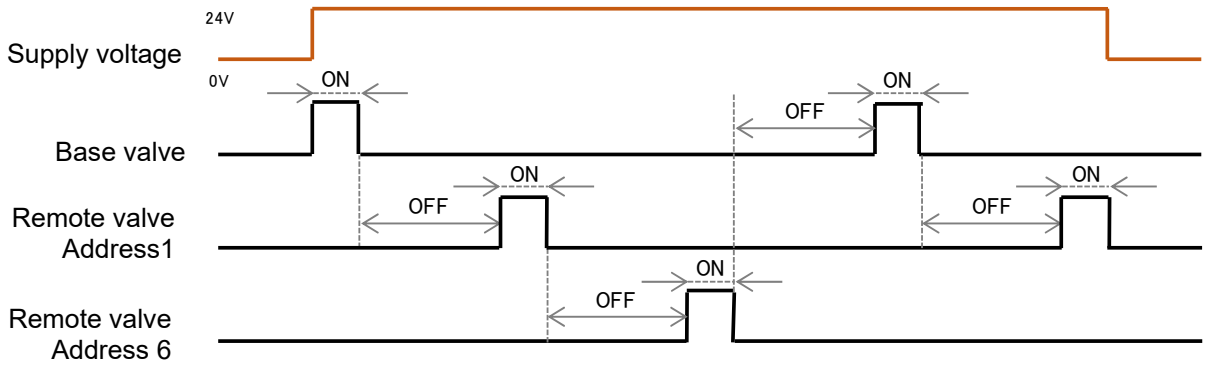
17.1. Continuous operation mode

In this mode, the base valve and remote valves will continue operating as long as the power supply voltage is applied.

The cycle operation, in which address 1 → address 31 are turned ON in order starting with the base valve as one cycle, continues while the power supply voltage is being applied.

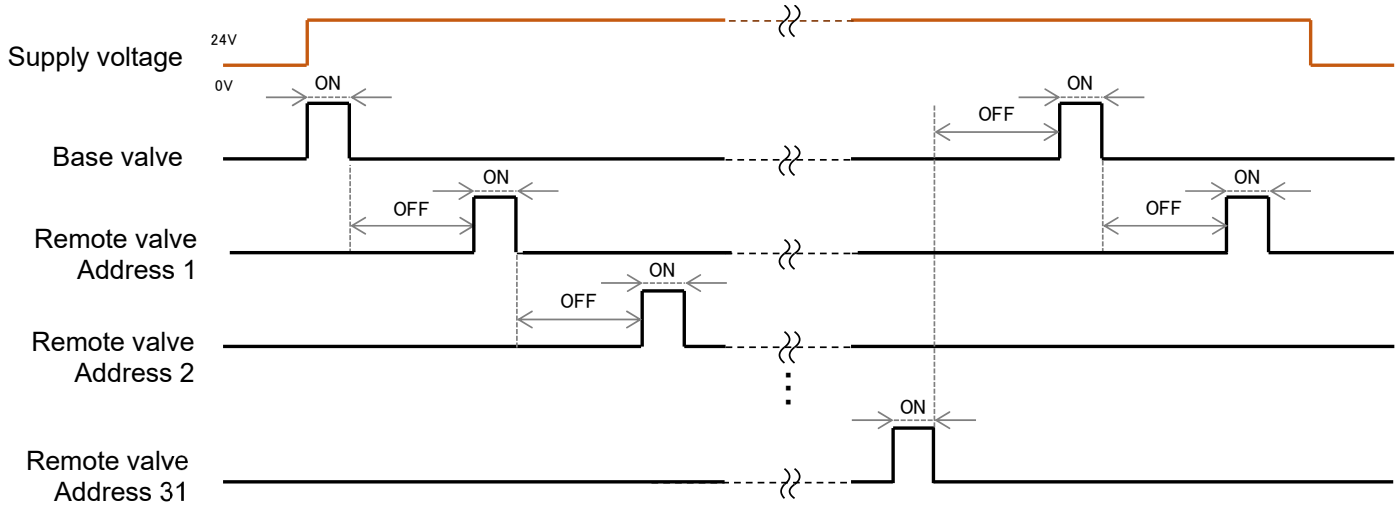
The ON time and OFF time (ON interval of each valve) are set for the base valve to control all valves.

・When using the base valve and 2 remote valves:
Base: ON → Address 1: ON → Address 6: ON → Base: ON → Address 1: ON →...



*As shown in the figure above, if an address is empty, the remote valve set in the next address automatically turns ON.

・When using the base valve and 31 remote valves:
Base: ON → Address 1: ON → Address 2: ON...→ Address 31: ON → Base: ON →...



17.2. Differential pressure detection mode

In this mode, a differential pressure is detected by connecting a differential pressure sensor to the base valve and setting a threshold using a differential pressure setting switch.

If the output from the differential pressure exceeds the threshold, a continuous operation for one cycle starts.

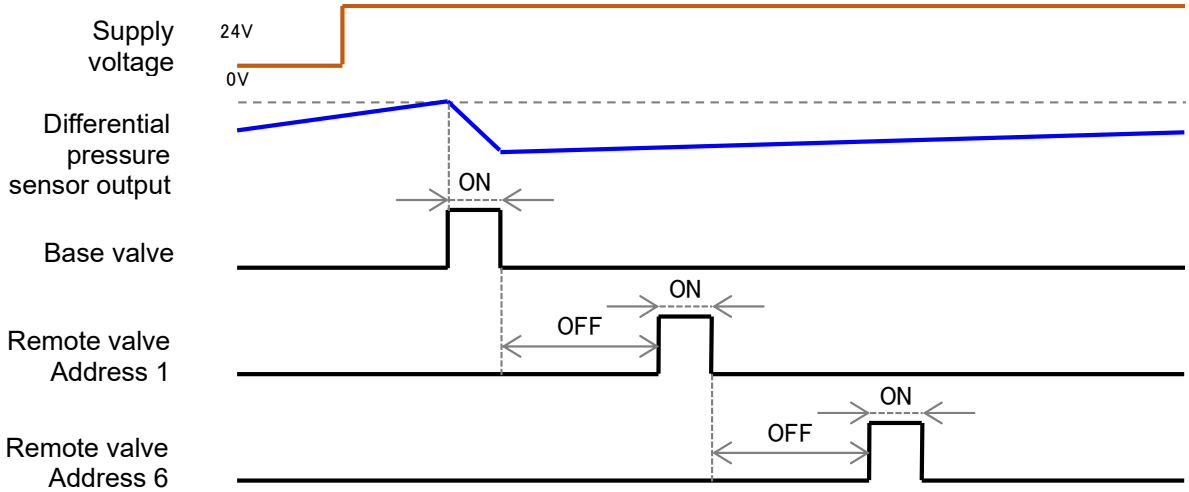
When the output falls below the threshold, the one-cycle ON operation automatically stops after the cycle is complete.

The threshold for the differential pressure sensor is set on the base valve.

The settings of the ON/OFF time, etc. are the same as continuous operation mode.

・When using the base valve and 2 remote valves:

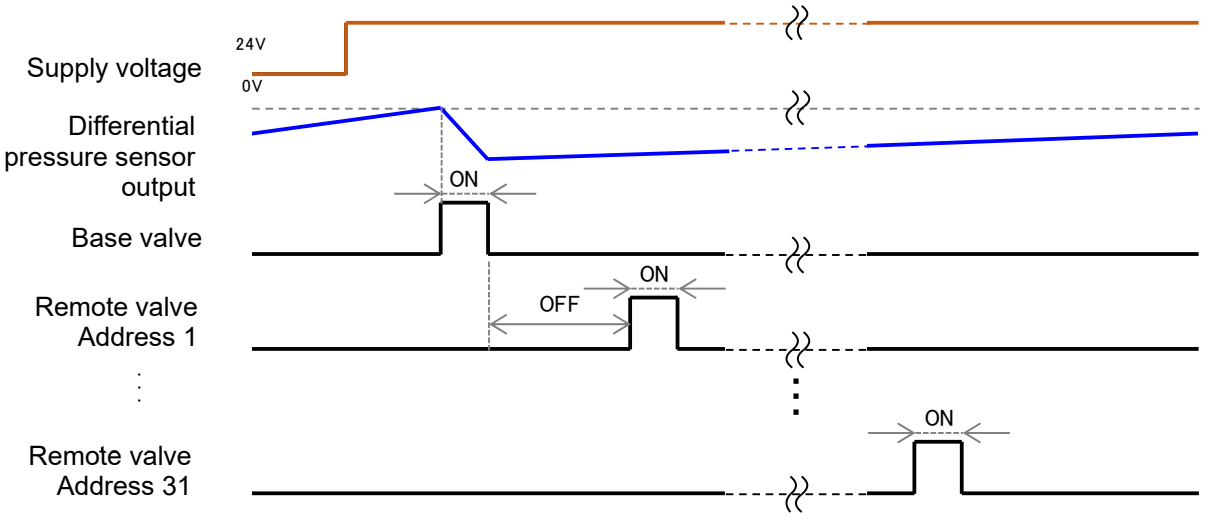
Base: ON → Address 1: ON → Address 6: ON



*As shown in the figure above, if an address is empty, the remote valve set in the next address automatically turns ON.

・When using the base valve and 31 remote valves:

Base: ON → Address 1: ON → Address 2: ON...→ Address 31: ON → Base: ON →..



17.3. How to set a mode

Note) Before setting a mode, be sure to shutting off the power supply to valves.

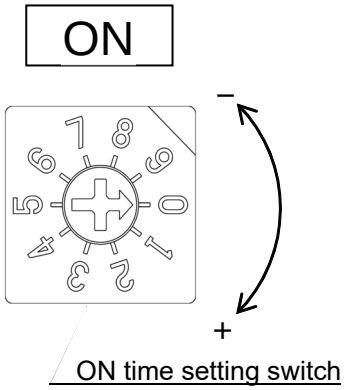
Note) Use an appropriate screwdriver for the groove and do not apply an excessive stress.

17.3.1. ON setting switch (Base valve)

Use the ON setting switch to set the valve ON time. You can set the time between 100 ms and 234 ms according to the switch setting. For the relationship between the switch setting and the ON time, refer to the table below.

It is set to "0: 100 msec" at a time of shipment from the factory.

Setting	ON time[msec]
0	100
1	114
2	130
3	144
4	160
5	174
6	190
7	204
8	220
9	234

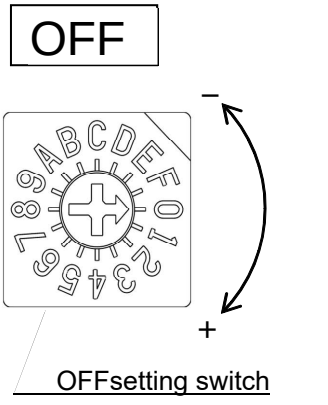


17.3.2. OFF setting switch (Base valve)

Use the OFF time setting switch to set the interval (OFF time) until each valve turns ON. You can set the time between 4s and 29s according to the switch setting. For the relationship between the switch setting and the OFF time, refer to the table below.

It is set to "0: 4 sec" at a time of shipment from the factory.

Setting	OFF time [sec]
0	4
1	5
2	6
3	7
4	8
5	9
6	10
7	11
8	12
9	14
A	16
B	18
C	20
D	23
E	26
F	29



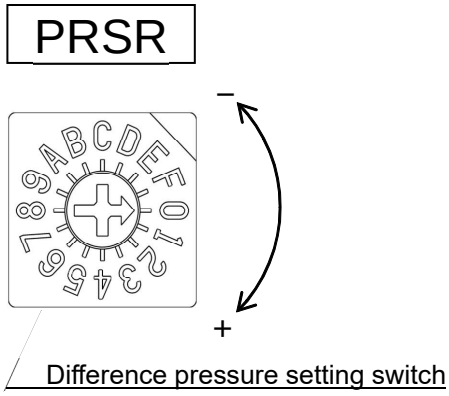
17.3.3. Differential pressure setting switch (Base valve)

Use the differential pressure switch to switch from continuous operation mode to differential pressure detection mode. Set the differential pressure threshold at which to start operation by setting 1 to F in differential pressure detection mode. If the output from the connected differential pressure sensor (two-wire system, 4 to 20 mA output) is above the threshold, the continuous operation mode starts. When it is below the threshold, the operation stops after completing one cycle.

If the setting is "0" or the sensor is not connected, the product operates in continuous operation mode. It is set to "0: OFF" at a time of shipment from the factory.

The table below shows example thresholds in the differential pressure sensor (PSE550-28-X505: 5 kPa type).

Setting	Mode	mA	kPa	PSI
0	Continuous	OFF	OFF	OFF
1	Differential pressure detection	5	0.31	0.05
2		6	0.63	0.09
3		7	0.94	0.14
4		8	1.25	0.18
5		9	1.56	0.23
6		10	1.88	0.27
7		11	2.19	0.32
8		12	2.50	0.36
9		13	2.81	0.41
A		14	3.13	0.45
B		15	3.44	0.50
C		16	3.75	0.54
D		17	4.06	0.59
E		18	4.38	0.63
F		19	4.69	0.68



Note) The ON, OFF, and differential pressure setting values in the table above are for reference only and not guaranteed values.Adjust the settings according to your equipment environment.

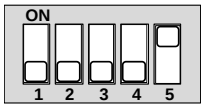
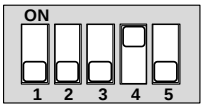
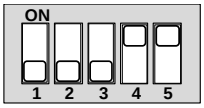
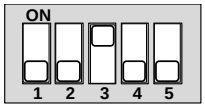
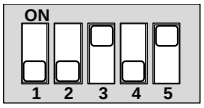
Note) You will feel a notch when you operate the rotary switch, and thanks to this structure the switch will not stop in the midway.
Be sure to avoid using the switch by stopping the rotation in the middle before you feel a notch. Otherwise, a malfunction may be caused.

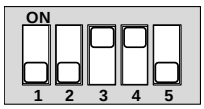
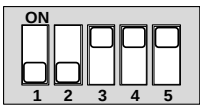
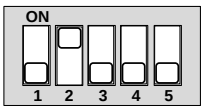
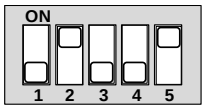
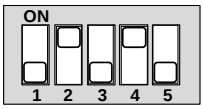
17.3.4. Address setting switch (Remote valves)

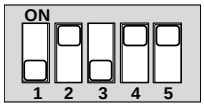
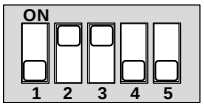
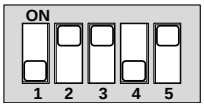
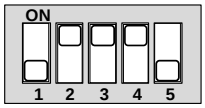
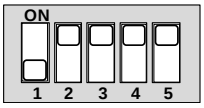
Check the table below to set the addresses for remote valves.

It is set to "Address: **None**" at a time of shipment from the factory.

Note) Be aware that a remote valve which is set to "Address: None" will not operate and will be skipped even when it is connected.

Address 1	Address 2	Address 3	Address 4	Address 5
				
O O O O I	O O O I O	O O O I I	O O I O O	O O I O I

Address 6	Address 7	Address 8	Address 9	Address 10
				
O O I I O	O O I I I	O I O O O	O I O O I	O I O I O

Address 11	Address 12	Address 13	Address 14	Address 15
				
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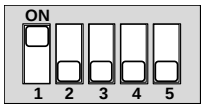	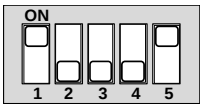	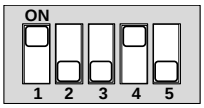	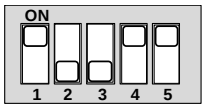	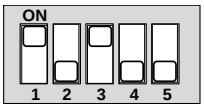
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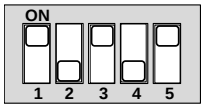
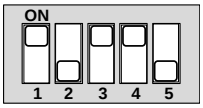
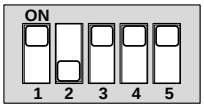
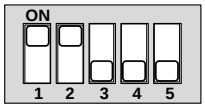
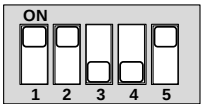
Address 21	Address 22	Address 23	Address 24	Address 25
				
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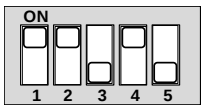
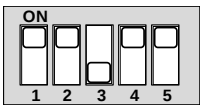
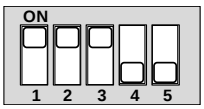
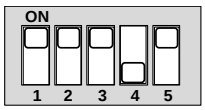
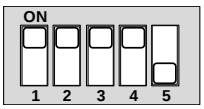
Address 26	Address 27	Address 28	Address 29	Address 30
				
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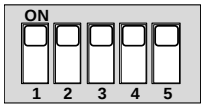
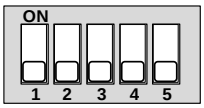
Address 31	No Address
	
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Note) Up to 2 remote valve units can be set to the same address. Be aware that if more units are set to the same address, they may not operate normally.

18. Replacement Parts

18.1. Replacement parts

Size	Product No.	Replacement parts product No.			
		Main valve assembly (Main valve + O-ring)	Sub-valve assembly (Sub-valve + O-ring)	Silencer-1	Silencer-2
Port size: 06	JSXF(E,F,H)*-06*-5P*B-(S)*	JSXF-06B-KT	—	Rc/G thread: AN20-02 NPT thread: AN20-N02	—
Port size: 10	JSXF(E,F,H)*-10*-5P*B-(S)*	JSXF-10B-KT	—		
Port size: 14	JSXF(E,F)*-14*-5P*B-(S)*	JSXF-14B-KT	JSXF-14B-KT2		Rc/G thread: AN30-03 NPT thread: AN30-N03
	JSXFH*-14*-5P*B-(S)*	JSXF-14B-1-KT			
Port size: 20	JSXFH*-20*-5P*B-(S)*	JSXF-20B-KT	JSXF-14B-KT2		

Caution

1) Before disassembling the product, be sure to cut off the power supply and pressure source and release the residual pressure.

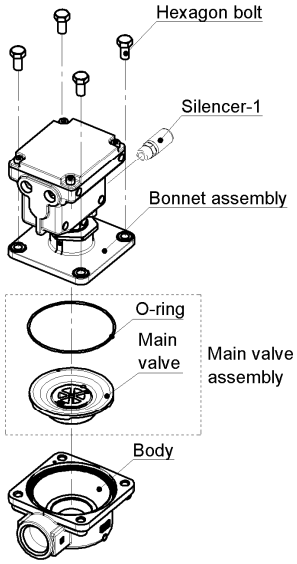
Disassembly procedure

1) Loosen the hexagon head bolts (cross recessed round head screws) and remove the bonnet assembly (bonnet), O-ring, and main valve (sub-valve).

Assembly procedure

1) Assemble the main valve (sub-valve) to the body.
   The main valve (sub-valve) has a required mounting orientation. Assemble as shown in Fig. 1 by paying attention to the arrangement. If the valve is assembled in incorrect direction, it can cause a malfunction.
2) Mount the O-ring to the body groove. (See Fig. 2)
   After mounting the O-ring, confirm that the entire circumference of the O-ring is fitted properly in the groove (for example, it should not be placed on or inserted under the main valve). If it is out of the groove, external leakage and/or operation failure may occur.
3) Mount the bonnet assembly (bonnet) to the body.
4) Tighten the hexagon head bolts (cross recessed round head screws) diagonally.
   (Refer to Table 1 below for the tightening torque.)

Port size: 06, 10



Port size: 14, 20

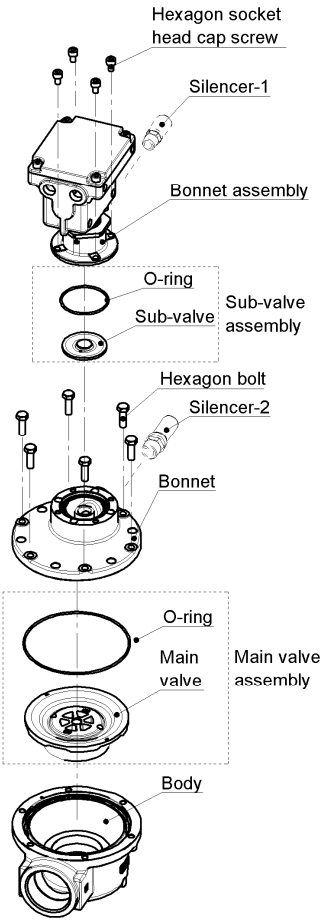
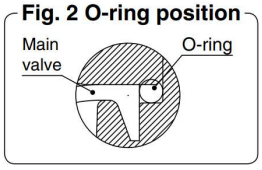


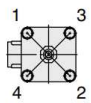
Table 1 Proper Tightening Torque [N·m]

JSXF□-06□		M8	12.5 to 13.8
JSXF□-10□		M8	12.5 to 13.8
JSXF□-14□	Main valve	M6	5.2 to 5.7
	Sub-valve	M4	1.5 to 1.7
JSXF□-20□	Main valve	M8	12.5 to 13.8
	Sub-valve	M4	1.5 to 1.7

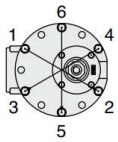
Fig. 2 O-ring position



Port sizes 06, 10 — Main valve

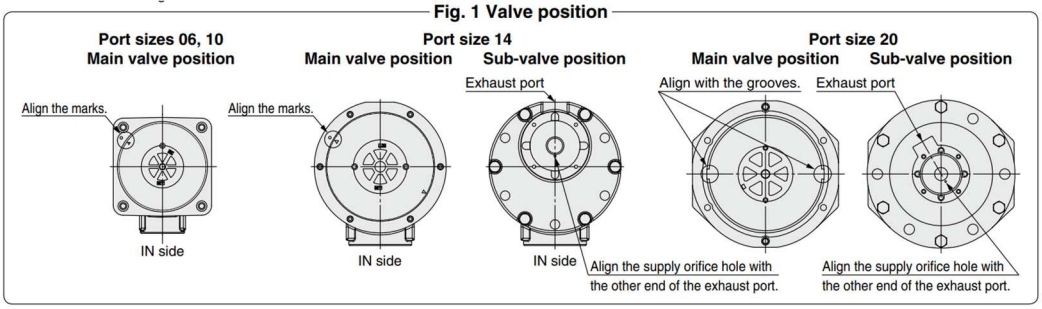


Port sizes 14, 20 — Main valve



Port sizes 14, 20 — Sub-valve

Fig. 1 Valve position



19. Changing the Electrical Entry Direction

19.1. How to change the electrical entry direction

If you want to change the direction of the electrical entry during piping, see the figure below.

Caution

Before disassembling the product, be sure to cut off the power supply and pressure source and release the residual pressure.

Procedure

1) Loosen the nuts and remove the two hexagon socket head set screws so that the box assembly can be rotated.

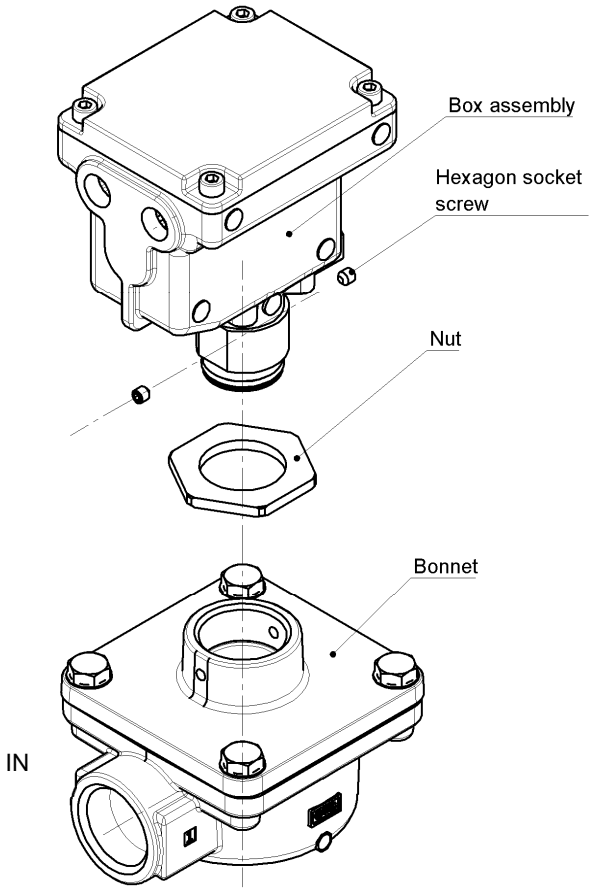
2) Rotate the box assembly clockwise and screw it in to the end.

3) Rotate the box assembly counterclockwise to adjust it to the desired position.

Note: Adjust in less than one counterclockwise rotation after rotating in the clockwise direction to the end.

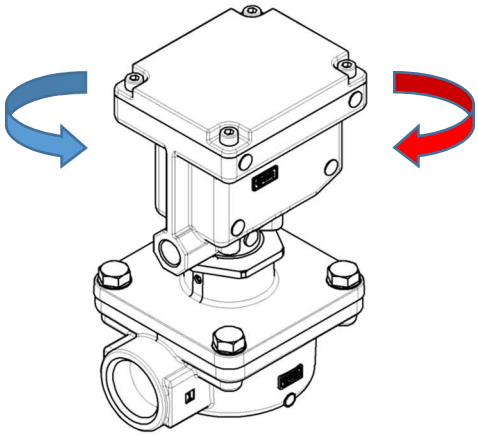
4) Tighten the nuts and hexagon socket head set screws in the order. Refer to the table below for the tightening torque.

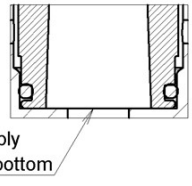
Parts name	Size	Proper tightening torque
Nut	Width across flats: 46 mm	50 N·m
Hexagon socket head set screw	M5	1.35 to 1.65 N·m



2)Counterclockwise: Less than one rotation

1)Clockwise: To the end.





Revision history
1: Nut tightening angle correction

SMC Corporation

4-14-1, Sotokanda, Chiyoda-ku, Tokyo 101-0021 JAPAN
Tel: + 81 3 5207 8249 Fax: +81 3 5298 5362
URL https://www.smcworld.com