NN60354400
Doc. no. DOC1035351

Operation Manual

PRODUCT NAME

Direct Operated 2-Port Solenoid Valve

MODEL / Series / Product Number

JSX *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 industries.
Use in non-manufacturing industries 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.

1. Precautions for Design

⚠Warning

1. Confirm the specifications.

Give careful consideration to the operating conditions, such as the application, fluid, and environment, and use within the specified operating ranges. If the product is used beyond the specification range, this may cause the product to break or 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 shutoff valve, etc.

This product is not designed for use as an emergency shutoff valve. If the valve is used in this type of system, other safety measures should be implemented.

3. Cannot be used for pressure holding (including vacuum)

Since the valve is subject to air leakage, they cannot be used to hold the pressure (including vacuum) inside of a pressure vessel because valve air leakage is unavoidable.

4. Closed liquid circuit

In a closed circuit, when liquid is static, the pressure could rise due to temperature fluctuations. This pressure rise could cause either a malfunction or damage to components such as valves. To prevent this, install a relief valve in the system.

5. Actuator driving

When an actuator, such as a cylinder, is to be driven using a valve, take appropriate measures to prevent potential danger caused by actuator operation.

6. Extended periods of continuous energization

The solenoid coil generates heat when continuously energized. Avoid using in sealed containers. Install the valve in a well-ventilated area. Furthermore, do not touch the coil during or after energization.

7. Water hammer

When an impact, such as water hammer, etc., caused by rapid pressure fluctuation is applied, the valve may be damaged. Install water hammer relief equipment (an accumulator, etc.) or use an SMC water hammer relief valve (VXR series). Please contact SMC for details.

8. Back pressure

If there is a possibility that back pressure will be applied, take countermeasures by installing a check valve, etc., on the downstream side.

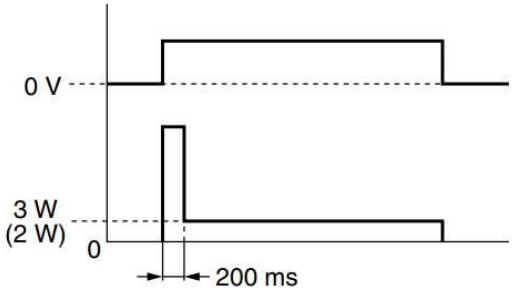
9. Prohibition of disassembly and modification

Do not disassemble or modify the product or replacement parts, including additional machining. This may cause human injury and/or an accident.

10. High flow/ Power saving type

Power consumption is reduced compared with the standard model by reducing the wattage required to hold the valve in an energized state. Effective after being energized for more than 200 ms when the voltage is applied.

The OFF time should be at least 2 s.
If the OFF time is less than 2 s, the coil may generate an abnormal amount of heat, resulting in damage, depending on the length of ON time.
Do not use in an environment subject to constant vibration and/or impact.
The valve may close when held in an energized state.



* The value in ( ) is for the JSX10U.

⚠Caution

1. Power saving circuit

The power saving circuit (PWM control) built into the product reduces power consumption via high-speed switching operation with the PWM control circuit after the rated voltage has been applied for approx. 200 ms when energized. Please note that the effect of this PWM control can cause the following problems depending on the type of switch and drive circuit used.

1. When a mechanical relay, etc., is used in the drive circuit, the product may not turn ON normally if chattering occurs within approx. 200 ms of the start of energization.
2. When a filter or another device is installed between the power supply and the product to achieve noise reduction, the current may be reduced due to filtering, which may prevent the product from turning ON normally.
3. When an SSR (solid state relay) with a built-in photo coupler is used in the drive circuit, the photo coupler may not turn OFF, preventing the product from switching OFF (it will remain ON).

2. Operating Environment

⚠Warning

Do not use the product in locations such as those described below.

1. Locations with atmospheres in which water vapor is present or locations in which corrosive fluids (chemicals), sea water, or water may come into contact with the product

Implement appropriate protective measures if water will be applied to the product for long periods of time, even for products which have IP65 or IP67 enclosures. Such water may enter through microscopic gaps in the product's external surfaces, resulting in fire damage or short-circuiting of the solenoid valve coils. If installing the product in close proximity to equipment such as machine tools, processing machines, etc., which use large amounts of liquids or oils, be sure to confirm that liquid dispersal or spatter from the peripheral equipment does not come into contact with the product.

2. Locations with explosive atmospheres

3. Locations subject to vibration or impact

4. Locations where radiated heat will be received from nearby heat sources

5. Locations where freezing may occur within piping lines

[When the fluid is liquid]

If the product is to be used in cold regions or during winter, be sure to implement measures to prevent the freezing of fluids. If the fluid is likely to freeze, implement measures such as draining the water in the piping when the equipment is OFF or installing a heater or insulation in the piping. If warming the solenoid valve, be sure to avoid the coil portion as warming it will result in poor heat dissipation.

[When the fluid is air]

With high flow rates, drain may be generated due to adiabatic expansion, resulting in freezing. Be sure to periodically drain the product or conduct drain removal using an air dryer.

⚠Caution

1. Locations that are outdoors

This product is not guaranteed for outdoor use. (Including improved weather resistance product)
However, when outdoor use is unavoidable, please take the following protective measures and use it within the products specifications.

1) Install a protective cover, etc., to protect the product from direct sunlight.
2) Encase the product in an enclosure to protect it from rain and wind.

* If only a roof-type cover is provided for the product, it will not be sufficiently protected from side winds or rain splashing up from the ground, which will result in water adhering to and entering the product. In addition, when the product is encased in an enclosure, be sure to implement proper ventilation measures to prevent overheating due to long-term energizing of the product.

3) Be sure to confirm that the location is not one in which condensation is easily generated.
* If the product is used in an environment with large temperature fluctuations, etc., condensation may be generated, and water may adhere to the external surface of the product. Be sure to implement protective measures against condensation, such as ambient temperature control, in such locations where condensation is easily generated.

4) Take measures to protect the lead wires using conduits, etc.

3. Precautions for Fluid

⚠Warning

1. Fluid selection

1) Compatibility between the components and fluids should be checked in the application before use.
2) Since the compatibility of the fluid used may vary depending on its type, additives, concentration, temperature, etc., give sufficient consideration when selecting the material.
3) Use a fluid with a kinematic viscosity of 50 mm2/s or less.

2. Do not use the product with the fluids shown below.

1) Fluids that are harmful to humans
2) Combustion-supporting or flammable fluids
3) Corrosive gas
4) Sea water, Saline solution

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

4. Fluid temperature

Operate within the specified operating fluid temperature range.

5. Install a filter (strainer) to ensure clean fluids.

1) The use of a fluid that contains foreign matter can cause problems, such as malfunction and seal failure by promoting the wear of the valve seat and armature, by sticking to the sliding parts of the armature, etc. Install a filter (strainer) on the upstream side of the valve to remove foreign matter.
Air: 5 μm or less Water: 100 mesh or more
2) Replace or clean the filter (strainer) when the pressure drop reaches 0.1 MPa to prevent them from getting clogged

6. Use an oil-free specification when oil particles are not allowed to enter the passage.

4. Fluid Quality

⚠Warning

1. Air

1) Do not use compressed air that contains chemicals, synthetic oils that include organic solvents, salt, corrosive gases, etc., as it can cause malfunction or damage.
2) Compressed air that contains excessive drainage may cause the malfunction of valves and other pneumatic equipment. Install an aftercooler or an air dryer on the inlet side of the valve as a countermeasure against drainage.
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 to remove any carbon powder.
4) For compressed air quality, refer to the Web Catalog.
5) When operating fluid air with a dew point of −70°C or lower, the inside of the valve may wear and the product life will be shortened.

2. Water

1) Be aware that rust stains, chloride separation, etc., from the piping may cause malfunction, leakage, or, in worse case scenarios, damage due to corrosion. Also, such damage may result in the spraying of fluids or scattering of parts. Please be sure to have protective measures in place in case such incidents should occur.

2) In the case that water contains substances such as calcium and magnesium, which generate hard scale and sludge, install water softening equipment and a filter (strainer) directly upstream from the valve to remove these substances, as this scale and sludge can cause the valve to malfunction.

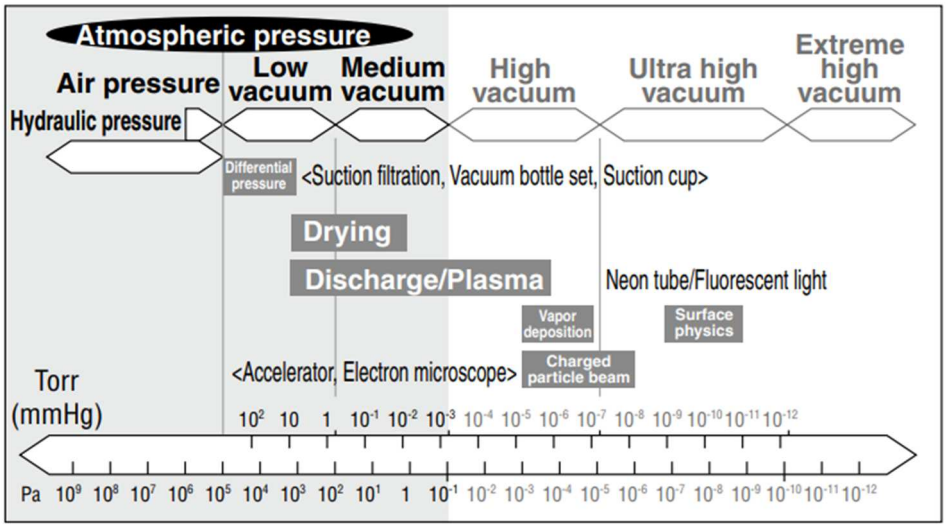
3) The water pressure of tap water is usually 0.4 MPa or less, but the pressure can sometimes increase to 1.0 MPa in tall buildings. Therefore, pay attention to the max. operating pressure differential.

3. Oil

Generally, FKM is used as seal material, as it is resistant to oil. The resistance of the seal material may deteriorate depending on the type of oil, manufacturer, or additives. Check the resistance before use. The kinematic viscosity must not exceed 50 mm2/s.

4. Vacuum

Please be aware that there is a range of pressure that can be used.



Vacuum piping direction: if the system uses a vacuum pump, we ask that you install the vacuum pump on the secondary side. Also, install a filter on the primary side, and be careful that no foreign object is picked up. Please replace the valve after operating the device approximately 300,000 times.

5. Steam

The use of a steam that contains foreign matter can cause problems, such as malfunction and seal failure, by promoting the wear of the valve seat and armature, and by sticking to the sliding parts of the armature, etc. Install a suitable filter (strainer) immediately upstream from the valve. As per standard, the mesh count for the strainer should be 100 mesh. However, the size and shape of the foreign matter that occur depends on the operating environment. Check the fluid status and choose an appropriate mesh count. The supply water to a boiler includes materials that create a hard sediment or sludge, such as calcium and magnesium. Sediment and sludge from steam can cause the valve to not operate properly. Install a water softening device which removes these materials. Do not use operation steam which contains chemicals, synthetic oils that contain organic solvents, salts, corrosive gases, etc., as these can cause damage or deterioration. The seal material (special FKM) used for wetted parts of the product can withstand steam in standard conditions. However, the resistance of the sealing material can deteriorate depending on the types of additives such as boiler compounds and water conditioners within the boiler steam. Please only utilize the product after determining the sealing material resistance within the actual usage conditions.

5. Mounting

⚠Warning

1. Ensure sufficient space for maintenance and inspection.

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

3. Do not install the product near a heat source and install it in locations where the product is not affected by radiant heat.

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

When the product is installed, apply a wrench to the outside of the piping connection while paying attention that it will not come into contact with the coil.

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

When insulation is used as a countermeasure against freezing, the insulation should be limited to the piping and body only. Do not insulate the coil. This can cause the coil to burn out.

6. If air leakage increases or equipment does not operate properly, stop operation.

After installation or during maintenance, check that the product is correctly mounted with appropriate functional and leakage inspections by supplying compressed air and power supplies. Do not use the product when the equipment does not operate correctly.

7. Do not touch the valve while it is being energized or right after it has been energized.

Valves will reach high temperatures after operation. Use caution, as there is a danger of being burnt if a valve is touched directly.

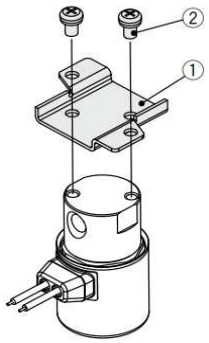
⚠Caution

1. Painting and coating

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

6. How to Assemble Brackets

⚠Caution



1. Body material: Stainless steel (N.C. specification, Port size: 1/8, N.O. specification, Port size:1/8～3/8), Brass, Aluminum

How to assemble

1) Mount the bracket ① to the bottom of the valve using the mounting screws ②.

Tightening torque

JSX10: 0.6 N·m ±5%, JSX20/30: 1.5 N·m ±5%

Bracket Assembly Part Nos. (With mounting screws)

Size	Body material	Port size	Thread type	Bracket assembly part no.	Weight (g)	Bracket material
10	Brass, Stainless steel	1/8	Rc NPT G	JSX021-12A-3	10	Stainless steel
20	Stainless steel			JSX022-12A-3	30	
20	Brass, Stainless steel*1	1/8, 1/4, 3/8		JSX20-12A-4	40	
30		1/8, 1/4, 3/8				
20	Aluminum	1/8, 1/4, 3/8		VX021N-12A	20	
30		1/4, 3/8		VX022N-12A	30	

*1 Only N.O. specification is available.

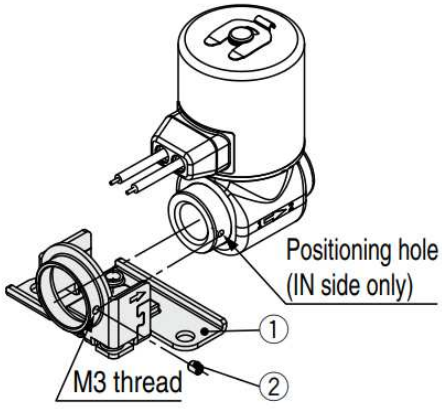
2. Body material: Stainless steel (N.C. specification, Port size: 1/4, 3/8)

How to assemble

1) Insert the bracket ① into the IN port side of the valve.

2) Secure it with the hexagon socket head set screw ②.

Tightening torque: 0.4 N·m ±5%



Caution regarding assembly

1) Pay attention to the bracket insertion direction. There is only a positioning hole on the IN port side. Therefore, the bracket cannot be mounted to the OUT port side.

2) The bracket should be mounted after connecting the fitting. (Refer to the “Piping” section)

* The bracket is shipped together with the product.

Bracket Assembly Part Nos. (With set screw)

Size	Port size	Thread type	Bracket assembly part no. (With set screw)	Weight (g)	Bracket Material
20,30	1/4	Rc,NPT,G	JSX022-12A-2-1	40	Stainless steel
	3/8	Rc,NPT			
		G	JSX022-12A-2-2	40	

7. Piping

⚠ Warning

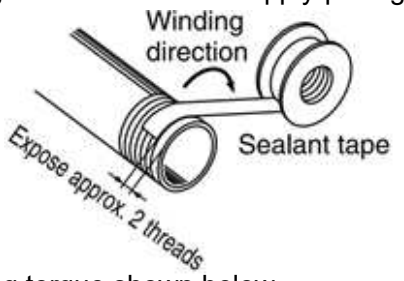
1. **There may be cases in which the tubing detaches from the fitting and thrashes around uncontrollably due to tubing degradation or fitting breakage. To prevent this, fit the tubing with a protective cover or secure it in place.**
2. **If using tube piping, secure the product to a permanent fixture. Do not suspend it from the tubing.**

⚠ Caution

1. **For handling One-touch fittings, refer to the "Fittings and Tubing Precautions" in the "Handling Precautions for SMC Products."**
2. **Preparation before piping**

   Before piping is connected, it should be thoroughly blown out with air (flushing) or washed to remove chips, cutting oil, and other debris from inside the pipe. Install piping so that it does not apply pulling, pressing, bending, or other forces on the valve body.
3. **Winding of sealant tape**

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



4. **Screw tightening torque for piping**

   When connecting piping to the valve, tighten with the proper tightening torque shown below.

   Tightening Torque for Piping

Connection thread	Proper tightening torque [N·m]
1/8	7～9
1/4	12～14
3/8	22～24

⚠ If the tightening torque is applied to the fitting while the valve is secured to the bracket, the bracket might break.

5. **When using a fitting other than an SMC fitting**

   Follow the instructions given by the fitting manufacturer.
6. **Avoid connecting ground lines to piping, as this may cause the electric corrosion of the system.**
7. **When connecting piping to a product, avoid mistakes regarding the supply port, etc**
8. **Recommended piping conditions**

   When connecting piping to the One-touch fitting, use a pipe length with sufficient margin, in accordance with the piping conditions shown in Fig. 1. Also, when using a tying band, etc., to bind the piping together, make sure that external force does not come to bear on the fitting. (See Fig. 2.)

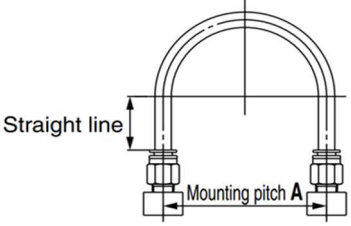


Fig. 1 Recommended piping

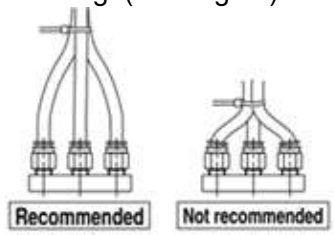
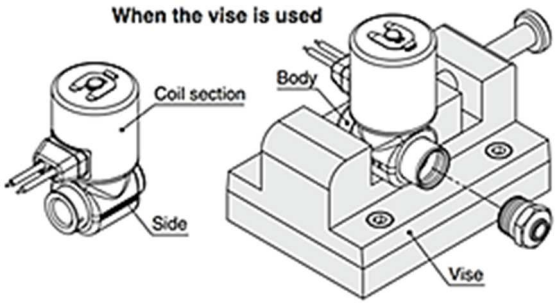


Fig. 2 When using a tying band to bind the piping together

Unit: mm

Tubing size	Mounting pitch A			Straight line length
	Nylon tubing	Soft nylon tubing	Polyurethane tubing	
φ1/8"	44 or more	29 or more	25 or more	16 or more
φ6	84 or more	39 or more	39 or more	30 or more
φ1/4"	89 or more	56 or more	57 or more	32 or more
φ8	112 or more	58 or more	52 or more	40 or more
φ10	140 or more	70 or more	69 or more	50 or more
φ12	168 or more	82 or more	88 or more	60 or more

9. **When connecting a fitting to the valve, clamp the side of the body with a vise.**



⚠ If the tightening torque is applied to the fitting while the valve is secured to the bracket, the bracket might break.

10. **When using a stainless steel bracket (N.C. specification, Port size: 1/4, 3/8), connect the fitting in accordance with the following procedure.**
    Step 1) Connect the fittings to both the IN and OUT sides of the valve.
    Step 2) Insert the IN side port of the valve into the bracket hole.
    Step 3) Secure the valve to the bracket with the hexagon socket set screw.

8. Wiring

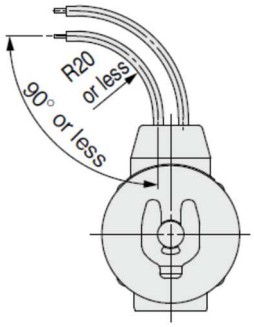
⚠ Warning

The solenoid valve is an electrical product. For safety, install an appropriate fuse and circuit breaker before use.

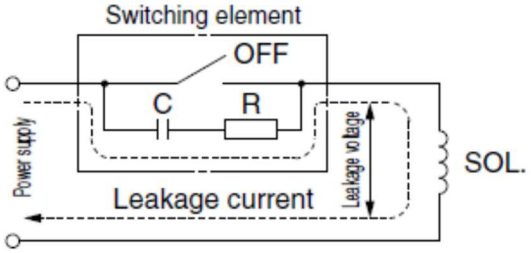
When using multiple solenoid valves, it is not sufficient to merely install one fuse. For protecting the equipment more safely, select an appropriate fuse to each circuit of the solenoid valve.

⚠ Caution

1. **As a rule, use electrical wire with a cross sectional area of 0.5 to 1.25 mm2 for wiring.**
2. **External force applied to the lead wire**
   If an excessive force is applied to the lead wire, this may cause faulty wiring. Take appropriate measures so that a force of 10 N or more is not applied to the lead wire. Do not bend the lead wires beyond 90° with a radius of less than 20 mm or damage may occur.



3. **Use electrical circuits which do not generate chattering in their contacts.**
4. **Use voltage which is within ±10% of the rated voltage. In cases with a DC power supply where importance is placed on responsiveness, stay within ±5% of the rated value. The voltage drop is the value in the lead wire section connecting the coil.**
5. **When a surge from the solenoid affects the electrical circuitry, install a surge voltage suppressor, etc., in parallel with the solenoid. Or, use the product with a surge voltage suppressor.**
   Residual voltage of the surge voltage suppressor
   DC specification: Approx. 60 V
   AC specification: Approx. 1 V
   High flow/ Power saving type: Approx. 1 V
6. **Leakage voltage**
   When the solenoid valve is operated using the controller, etc., the leakage voltage should be the product allowable leakage voltage or less. Particularly when using a resistor in parallel with a switching element and using a C-R element to protect the switching element, take note that leakage current will flow through the resistor, C-R element, etc., creating a possible danger that the valve may not turn off.



AC coil: 5% or less of the rated voltage
DC coil: 2% or less of the rated voltage

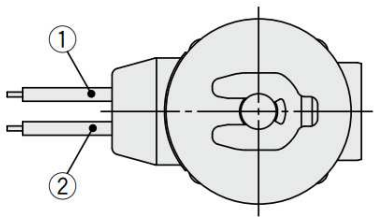
9. Electrical Connections

⚠ Caution

1. Grommet

Lead wire: AWG20 Insulator O.D.: 2.6 mm

Rated voltage	Lead wire color	
	①	②
DC	Black	Red
DC(High flow/ power saving type)	Black(-)	Red(+)
100VAC	Blue	Blue
200VAC	Red	Red
Other AC	Gray	Gray

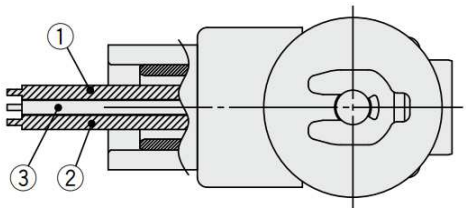


* Only the high flow/ power saving type has polarity

2. Conduit

Lead wire: AWG18 Insulator O.D.: 2.8 mm

Rated voltage	Lead wire color		
	①	②	③
DC	Black	Red	Green/Yellow
DC(High flow/ power saving type)	Black(-)	Red(+)	Green/Yellow
100VAC	Blue	Blue	Green/Yellow
200VAC	Red	Red	Green/Yellow
Other AC	Gray	Gray	Green/Yellow



* Only the high flow/ power saving type has polarity
* ③: Ground wire

3. DIN terminal

Disassembly

1. After loosening the binding head screw with flange, then if the housing is pulled in the direction of the arrow, the connector will be removed from the solenoid valve.
2. Pull out the binding head screw with flange from the housing.
3. There is a cutout on the bottom of the terminal block. Insert a small flat head screwdriver, etc., into this cutout, and remove the terminal block from the housing. (Refer to the figure to the right.)
4. Remove the gland nut, and pull out the washer and the rubber seal.

Wiring

1. Pass the cable through the gland nut, washer, and rubber seal in this order, and insert these parts into the housing.
2. Loosen the binding head screw of the terminal block, then insert the core wire or the crimped terminal of the lead wire into the terminal, and securely fix it with the binding head screw.
   The binding head screw of the terminal block is M3.

   *1 Tighten the screw to a torque of between 0.5 and 0.6 N・m.

   *2 Cable O.D.: ø 6 to ø 12 mm

   *3 For an outside cable diameter of ø 9 to ø 12 mm, remove the internal parts of the rubber seal before use.

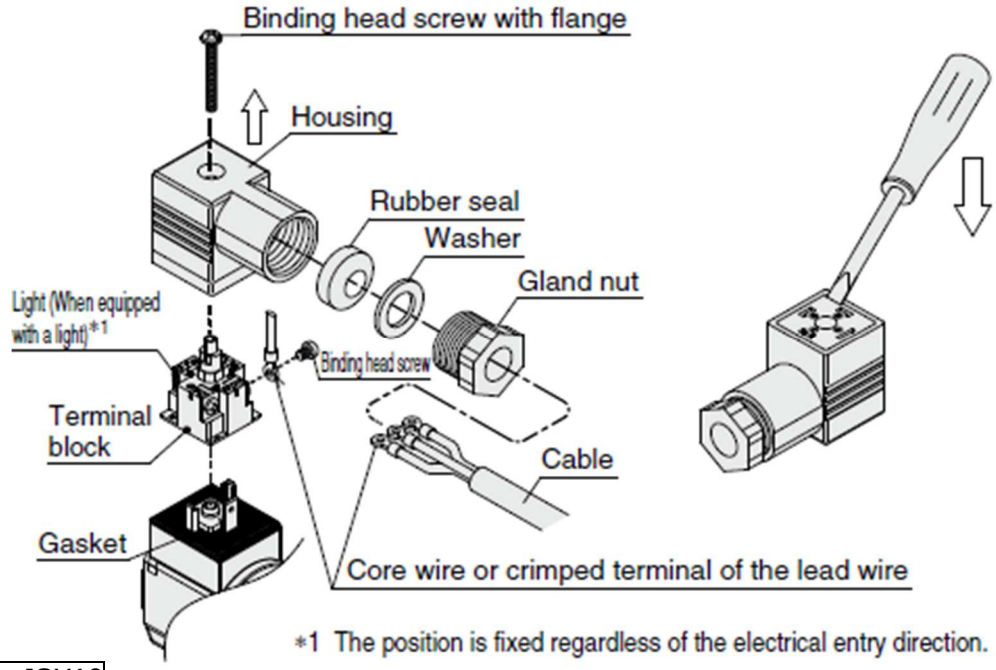
Assembly

1. Pass the cable through the gland nut, washer, rubber seal, and the housing in this order, and connect to the terminal block. Then, set the terminal block inside the housing. (Push in the terminal block until it snaps into position.)
2. Insert the rubber seal and the washer in this order into the cable entry of the housing, and then tighten the gland nut securely.

3. Insert the gasket between the bottom part of the terminal block and the plug attached to the equipment, and then insert the binding head screw with flange from the top of the housing, and tighten it.

*1 Tighten the screw to a torque of 0.5 N・m.

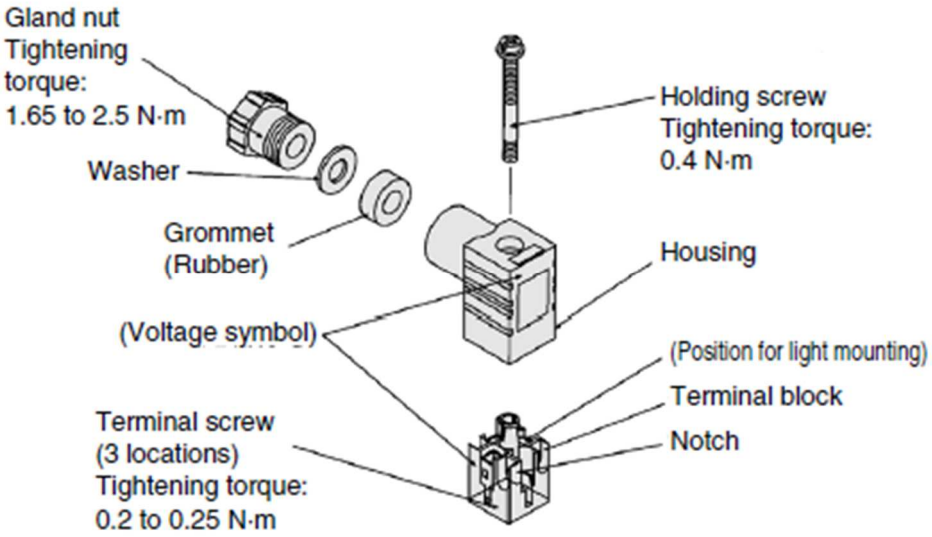
*2 The orientation of the connector can be changed in steps of 90° by changing the method of assembling the housing and the terminal block.



For the JSX10

Compatible cable

Cord O.D.: ø 3.5 to ø 7　(Reference) 0.5 mm2, 2-core or 3-core, equivalent to JIS C 3306



⚠ Caution

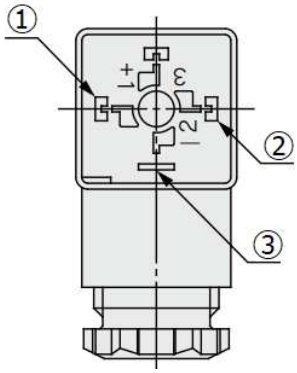
Internal connections are as shown below. Make connections to the power supply accordingly.

Terminal no.	②	②
DIN terminal *1	-(+)	+(-)
DIN Terminal *2 (high flow/ power saving type)	-	+

*1 There is no polarity.

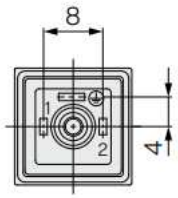
*2 The high flow/ power saving type has polarity.

*3 ③:Ground wire



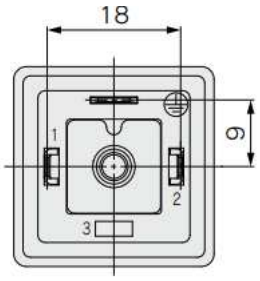
DIN (EN 175301-803) Terminal

This DIN terminal corresponds to the Form C DIN connector with an 8 mm terminal pitch.



Size: 10
Applicable cable O.D.: ø3.5 to ø7

This DIN terminal corresponds to the Form A DIN connector with an 18 mm terminal pitch.



Size: 20, 30
Applicable cable O.D.: ø6 to ø12

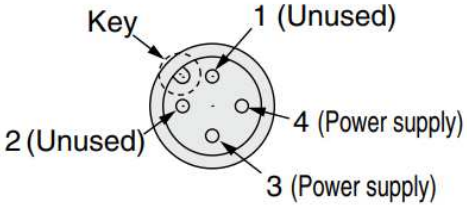
4. M12 connector

1. The IP67 (enclosure) rating of the valve can be obtained by using a cable with a female connector of IP67 specification. Please note that this product cannot be used in water.
2. Do not use a tool to mount the connector as this may cause damage. Only tighten it by hand. (0.39 to 0.49 N·m)
3. Avoid repeatedly bending or stretching the cable and applying heavy objects or force to it.
4. Do not pull the connector or cable unnecessarily.
5. Do not bend the cable at the root of the connector when installed.

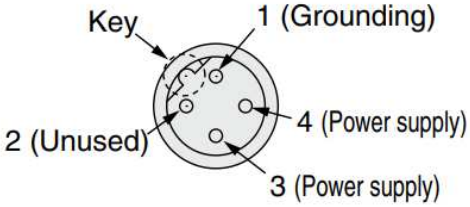
■ **Coding and pin arrangement of the M12 connector on the valve side**

The shape (coding) and pin arrangement of the M12 connector are as follows.

DC specification: A-coded, 4-pin



AC specification: B-coded, 4-pin



Terminal no.	3	4
PIN terminal	+(-)	-(+)
PIN Terminal(high flow/ power saving type)	+	-

* There is no polarity.
* Only the high flow/ power saving type has polarity

When using the cable with a female connector, make sure that the coding is correct. When installing the cable, be sure to align the key on the cable side connector (female side) with the key on the valve side connector (male side). Be careful not to squeeze it in the wrong direction as pin damage, etc.,

10. Electrical Circuits

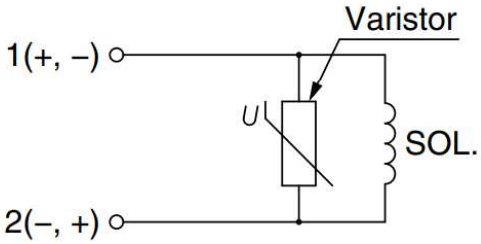
⚠ Caution

1. DC circuit

● Grommet

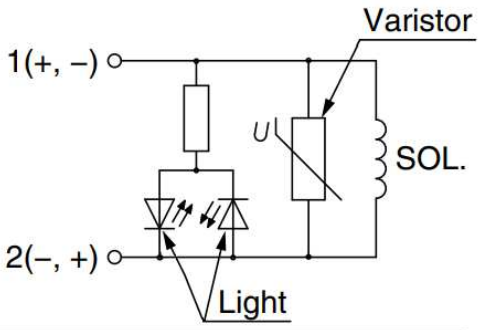
Without electrical option

● Grommet, Conduit, DIN terminal



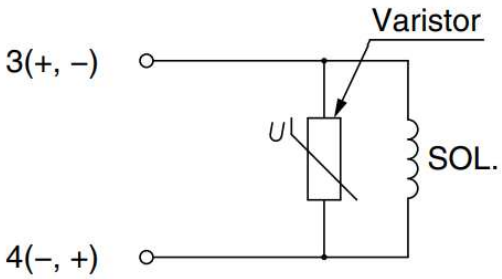
With surge voltage suppressor

● DIN terminal



With light/surge voltage suppressor

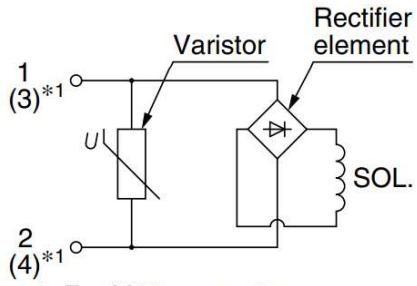
● M12 connector



With surge voltage suppressor

2. AC circuit The standard product is equipped with a surge voltage suppressor.

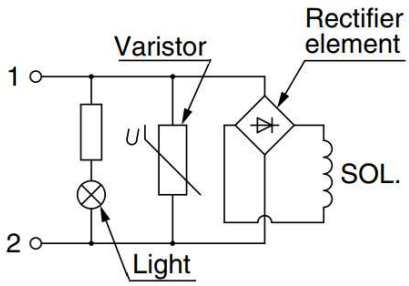
● Grommet Conduit,
DIN terminal, M12 connector



*1 For M12 connector

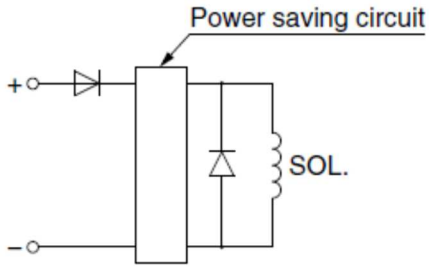
Without electrical option

● DIN terminal



With light

3. High flow/ Power saving type



Polarity	+	-
Grommet	2 (Red)	1 (Black)
Conduit	2 (Red)	1 (Black)
DIN terminal	2	1
M12 connector	4	3

* Be sure to confirm the polarity when connecting.

11. Maintenance

⚠ Warning

1. Removal of 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 filters (strainers) periodically.

1) Replace filters after one 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. Exhaust the drainage from air filters periodically.

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

4. Low frequency operation

Switch valves at least once every 30 days to prevent malfunction.
Also, in order to use them under the optimum state, conduct a regular inspection biannually.

5. Storage

In the 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.

6. Perform a maintenance and inspection periodically.

Confirm that the product is mounted correctly by conducting suitable function and leakage tests periodically. If air leakage increases or equipment does not operate properly, stop operation.

12. Return of Product

⚠ Warning

If the product to be returned is contaminated or is possibly contaminated with substances that are harmful to humans, for safety reasons, please contact SMC beforehand and then employ a specialist cleaning company to decontaminate the product. After the decontamination prescribed above has been carried out, submit a Product Return Request Sheet or the Detoxification /Decontamination Certificate to SMC and await SMC's approval and further instructions before attempting to return the item.

Please refer to the International Chemical Safety Cards (ICSC) for a list of harmful substances.

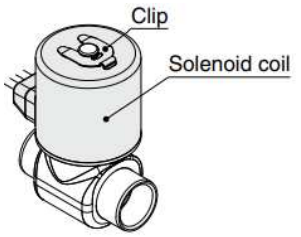
If you have any further questions, please don't hesitate to contact your SMC sales representative.

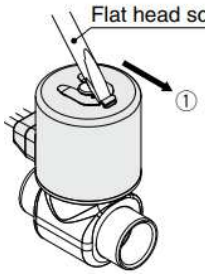
13. Replacing the Solenoid Coils

⚠ Warning

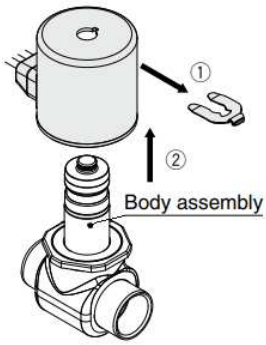
1. When replacing the solenoid coil, turn off the power supply.
2. Be careful for possible high-temperature of the solenoid coil due to the fluid temperature and operating conditions.

⚠ Caution



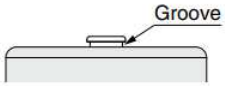


Insert a flat head screwdriver, etc., into the groove in the clip and slide it in the direction of ① to remove it.

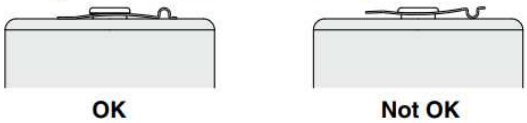


Once the clip has been removed, the coil can be removed from above (in the direction of ②).

Insert the replacement coil into the body assembly, and then insert the clip by aligning it with the groove in the top of the body assembly.



Be sure to confirm the clip direction (back and front) as well as the insertion state.



Clip direction

Inserted condition

* When inserting the coil, be sure to push it in until the groove in the body assembly is visible.

14. Models (Normally Closed type Stainless steel /Brass)

How To Order

JSX 2 1 – S N 302 R – 5 G – D – B

❶ ❷ ❸ ❹ ❺ ❻ ❼ ❽ ❾ ❿

❶ Size

Symbol	Size
1	10
2	20
3	30

❷ Valve type

Symbol	Valve type
1	N.C. 2(OUT) 1(IN)

❸ Body material

Symbol	Body material
S	Stainless steel
C	Brass

❹ Seal material

Symbol	Seal material
N	NBR
F	FKM
E	EPDM

❺ Orifice diameter and port size

Symbol	Orifice diameter [mmø]	Port size	Size 10	Size 20	Size 30
101	1.6	1/8	●	—	—
201	2.4	1/8	●	—	—
301	3.2	1/8	—	●	—
302		1/4	—	●	—
303		3/8	—	●	—
402	4.0	1/4	—	●	●
403		3/8	—	●	●
502	5.6	1/4	—	●	●
503		3/8	—	●	●
702	7.1	1/4	—	●	●
703		3/8	—	●	●

❻ Thread type

Symbol	Thread type
R	Rc
N	NPT
F	G

❼ Rated voltage

AC

Symbol	Rated voltage	Symbol	Rated voltage
1	100 VAC	7	240 VAC
2	200 VAC	8	48 VAC
3	120 (110) VAC	B	24 VAC
4	220 VAC	J	230 VAC

DC

Symbol	Rated voltage
5	24 VDC
6	12 VDC

❾ Oil-free option

Symbol	Option
Nil	None
D	Oil-free

❿ Option

Symbol	Option
Nil	None
B	With bracket (Stainless steel)

❽ Electrical entry

Symbol	Electrical entry		Size 10	Size 20	Size 30
G	Grommet*1		●	●	●
GS	Grommet with PCB (With surge voltage suppressor)		●	●	●
CS	Conduit (With surge voltage suppressor)		—	●	●
DS	DIN terminal (With surge voltage suppressor)		●	●	●
DZ	DIN terminal with light (With surge voltage suppressor)		●	●	●
DN	DIN terminal without connector (With surge voltage suppressor)		●	●	●
WN	M12 connector/Without connector cable (With surge voltage suppressor)*2		●	●	●

*1 DC voltage only
*2 A cable for the M12 connector is not included with the product.

Flow Rate Characteristics

Size	Port size	Orifice diameter [mmø]	Flow rate characteristics*1 Air C [dm³/(s·bar)]	b	Cv	Water, Oil Kv	Conversion Cv	Max. operating pressure differential [MPa]	Model	Weight*2 [g] Stainless steel body*3	Brass body
10	1/8	1.6	0.36	0.58	0.08	0.07	0.08	0.9	JSX11-S/C□101	160	160
		2.4	0.62	0.45	0.15	0.13	0.15	0.4	JSX11-S/C□201	160	160
20	1/8	3.2	1.35	0.48	0.35	0.30	0.35	0.7	JSX21-S/C□301	320	330
	1/4	3.2	1.35	0.48	0.35	0.30	0.35	0.7	JSX21-S/C□302	320	330
		4.0	2.02	0.48	0.52	0.45	0.52	0.3	JSX21-S/C□402	320	330
		5.6	2.62	0.43	0.73	0.63	0.73	0.2	JSX21-S/C□502	320	330
		7.1	3.15	0.44	0.88	0.76	0.88	0.1	JSX21-S/C□702	320	330
	3/8	3.2	1.35	0.48	0.35	0.30	0.35	0.7	JSX21-S/C□303	320	360
		4.0	2.02	0.48	0.52	0.45	0.52	0.3	JSX21-S/C□403	320	360
		5.6	2.62	0.43	0.73	0.63	0.73	0.2	JSX21-S/C□503	320	360
		7.1	3.15	0.44	0.88	0.76	0.88	0.1	JSX21-S/C□703	320	360
30	1/4	4.0	2.02	0.48	0.52	0.45	0.52	1.0	JSX31-S/C□402	450	490
		5.6	2.62	0.43	0.73	0.63	0.73	0.5	JSX31-S/C□502	450	490
		7.1	3.15	0.44	0.88	0.76	0.88	0.2	JSX31-S/C□702	450	490
	3/8	4.0	2.02	0.48	0.52	0.45	0.52	1.0	JSX31-S/C□403	450	520
		5.6	2.62	0.43	0.73	0.63	0.73	0.5	JSX31-S/C□503	450	520
		7.1	3.15	0.44	0.88	0.76	0.88	0.2	JSX31-S/C□703	450	520

*1 The flow rate characteristics of this product vary.
*2 The values were calculated based on the combination of an Rc or NPT thread and a grommet. Add 20 g for the grommet type with PCB, 70 g for the conduit type, 50 g for the DIN terminal type, and 15 g for the M12 connector type.
*3 Add 30 g for the G thread (port size 3/8) type.

Applicable Fluid Checklist

Applicable fluid	Seal material NBR	FKM	EPDM
Air	●	●	●
Water	●	●	●
Oil	—	●	—

* The list shows the compatibility between general fluids and the seal materials. Consider the operating environment and application sufficiently before selecting the seal material. Fluid and component compatibility should be checked before use.

15. Common Specifications (Normally Closed type Stainless steel / Brass)

Size			10	20	30
Valve specifications	Valve construction		Direct operated poppet		
	Valve type		Normally closed (N.C.)		
	Fluid and fluid temperature		Air: −10 to 60°C (Dew point temperature: −10°C or less) Water: 1 to 60°C (No freezing) Oil: −5 to 60°C (Kinematic viscosity: 50 mm²/s or less)		
	Withstand pressure		2.0 MPa		
	Max. system pressure		1.0 MPa		
	Ambient temperature		−20 to 60°C		
	Valve leakage*1/ External leakage*1	Air	1 cm³/min (ANR) or less		
		Water, Oil	0.1 cm³/min or less		
	Mounting orientation		Unrestricted		
	Enclosure*2		IP67 (IP65 for the DIN terminal)		
	Standards*3		CE/UKCA, UL Recognized, UL Listed		
	Operating environment		Location without the presence of corrosive gases, explosive gases, or constant water adhesion		
	Body material		Stainless steel, Brass		
	Seal material		NBR, FKM, EPDM		
Coil specifications	Rated voltage	AC	24 V, 48 V, 100 V, 110 V, 120 V, 200 V, 220 V, 230 V, 240 V		
		DC	12 V, 24 V		
	Allowable voltage fluctuation		±10% of the rated voltage		
	Allowable leakage voltage	AC	5% or less of the rated voltage		
		DC	2% or less of the rated voltage		
	Apparent power*4, *5	AC	4.5 VA	8 VA	9.5 VA
	Power consumption*4	DC	4 W	6 W	8 W
	Temperature rise*6	AC/DC	70/65°C		

*1 Leakage: The value at a differential pressure of 0.01 MPa or higher and an ambient temperature of 20°C

*2 This product has an IP65,67 enclosure, but if water enters the product, it may result in malfunction or breakage. Therefore, take appropriate measures to prevent water from entering the product when using in an environment where it is constantly exposed to water.

*3 Standards compliance varies depending on the model. For details, see item 38,39

*4 Power consumption/Apparent power: The value at an ambient temperature of 20°C and when the rated voltage is applied (Variation: ±10%)

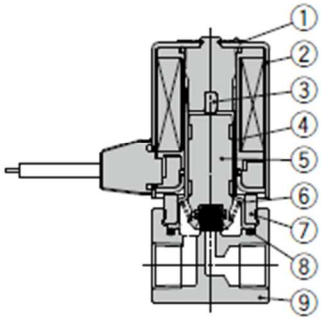
*5 There is no difference in the frequency and the inrush and energized apparent power, since a rectifying circuit is used in the AC.

*6 Temperature rise: The value at an ambient temperature of 20°C and when the rated voltage is applied. Use this value as a reference as the actual value varies depending on the ambient environment.

Be sure to read the "Specific Product Precautions" before handling the product.

16. Construction (Normally Closed type Stainless steel / Brass)

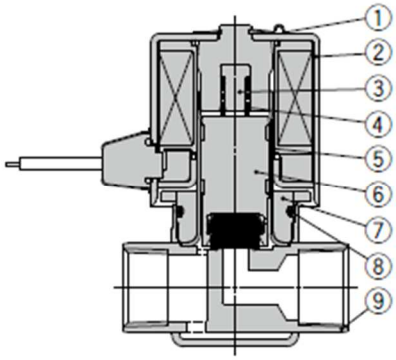
JSX10
Body material: Stainless steel, Brass



Component Parts

No.	Description	Material	
1	Clip	Stainless steel	
2	Solenoid coil	Stainless steel, Cu, Resin	
3	Stopper	PPS	
4	Tube assembly	Stainless steel	
5	Armature assembly	Stainless steel, PPS, NBR (FKM, EPDM)	
6	Spring	Stainless steel	
7	Set nut	Stainless steel	
8	Gasket	NBR, (FKM, EPDM)	
9	Body	Stainless steel	Brass

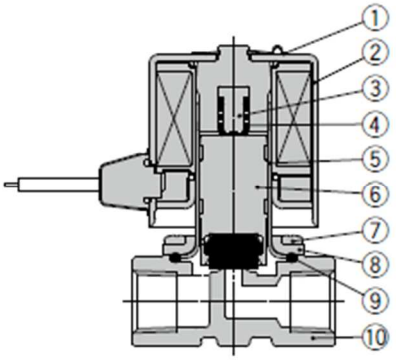
JSX20, 30
Body material: Stainless steel



Component Parts

No.	Description	Material
1	Clip	Stainless steel
2	Solenoid coil	Stainless steel, Cu, Resin
3	Stopper	PPS
4	Spring	Stainless steel
5	Tube assembly	Stainless steel
6	Armature assembly	Stainless steel, PPS, NBR (FKM, EPDM)
7	Nut	Stainless steel
8	Gasket	NBR (FKM, EPDM)
9	Body	Stainless steel

Body material: Brass



Component Parts

No.	Description	Material
1	Clip	Stainless steel
2	Solenoid coil	Stainless steel, Cu, Resin
3	Stopper	PPS
4	Spring	Stainless steel
5	Tube assembly	Stainless steel
6	Armature assembly	Stainless steel, PPS, NBR (FKM, EPDM)
7	Mounting screw	Stainless steel
8	Bonnet	Stainless steel
9	Gasket	NBR (FKM, EPDM)
10	Body	Brass

17. Models (Normally Closed type Aluminum)

How to order

JSX 2 1 – A N 302 R – 5 G – D – B

❶ ❷ ❸ ❹ ❺ ❻ ❼ ❽ ❾ ❿

❶ Size

Symbol	Size
2	20
3	30

❷ Valve type

Symbol	Valve type
1	N.C. 2(OUT) 1(IN)

❸ Body material

Symbol	Body material
A	Aluminum

❹ Seal material

Symbol	Seal material
N	NBR
F	FKM

❺ Orifice diameter and port size

Symbol	Orifice diameter [mmø]	Port size	Size 20 (Aluminum body)	Size 30 (Aluminum body)
301	3	1/8	●	—
302		1/4	●	—
402	4	1/4	—	●
403		3/8	—	●
501	5	1/8	●	—
502		1/4	●	—
702	7	1/4	—	●
703		3/8	—	●

❻ Thread type

Symbol	Thread type
R	Rc
N	NPT
F	G

❼ Rated voltage

AC

Symbol	Rated voltage	Symbol	Rated voltage
1	100 VAC	7	240 VAC
2	200 VAC	8	48 VAC
3	120 (110) VAC	B	24 VAC
4	220 VAC	J	230 VAC

DC

Symbol	Rated voltage
5	24 VDC
6	12 VDC

❽ Electrical entry

Symbol	Electrical entry		Size 20	Size 30
G	Grommet*1		●	●
GS	Grommet with PCB (With surge voltage suppressor)		●	●
CS	Conduit (With surge voltage suppressor)		●	●
DS	DIN terminal (With surge voltage suppressor)		●	●
DZ	DIN terminal with light (With surge voltage suppressor)		●	●
DN	DIN terminal without connector (With surge voltage suppressor)		●	●
WN	M12 connector/Without connector cable (With surge voltage suppressor)*2		●	●

*1 DC voltage only
*2 A cable for the M12 connector is not included with the product.

❾ Oil-free option

Symbol	Option
Nil	None
D	Oil-free

❿ Option

Symbol	Option
Nil	None
B	With bracket

Flow Rate Characteristics

Size	Port size	Orifice diameter [mmø]	Flow rate characteristics*1 C [dm³/(s·bar)]	b	Cv	Max. operating pressure differential [MPa]	Model	Weight*2 [g]
20	1/8, 1/4	3	1.41	0.54	0.35	0.7	JSX21-A□30□	240
		5	1.66	0.54	0.52	0.2	JSX21-A□50□	240
30	1/4, 3/8	4	1.57	0.59	0.52	1.0	JSX31-A□40□	400
		7	3.02	0.53	0.88	0.2	JSX31-A□70□	400

*1 The flow rate characteristics of this product vary.
*2 Indicates case of grommet type
Add 20 g for the grommet type with PCB, 70 g for the conduit type, 50 g for the DIN terminal type, and 15 g for the M12 connector type.

18. Common Specifications (Normally Closed type Aluminum)

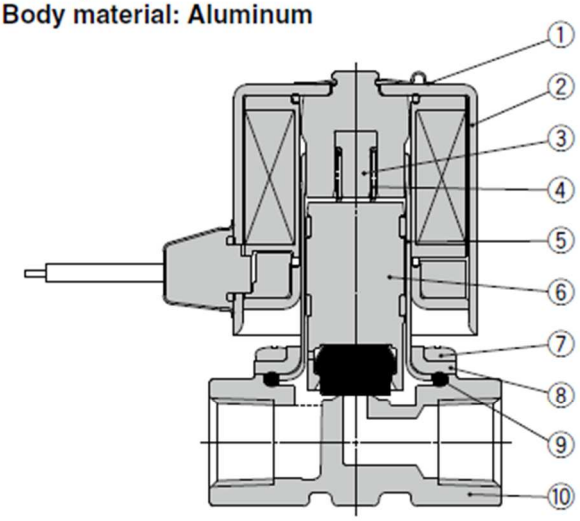
Size			20	30
Valve specifications	Valve construction		Direct operated poppet	
	Valve type		Normally closed (N.C.)	
	Fluid and fluid temperature		Air: −10 to 60°C (Dew point temperature: −10°C or less)	
	Withstand pressure		2.0 MPa	
	Max. system pressure		1.0 MPa	
	Ambient temperature		−20 to 60°C	
	Valve leakage*1/External leakage*1	Air	1 cm³/min (ANR) or less	
	Mounting orientation		Unrestricted	
	Enclosure*2		IP67 (IP65 for the DIN terminal)	
	Standards*3		CE/UKCA	
	Operating environment		Location without the presence of corrosive gases, explosive gases, or constant water adhesion	
	Body material		Aluminum	
	Seal material		NBR, FKM	
Coil specifications	Rated voltage	AC	24 V, 48 V, 100 V, 110 V, 120 V, 200 V, 220 V, 230 V, 240 V	
		DC	12 V, 24 V	
	Allowable voltage fluctuation		±10% of the rated voltage	
	Allowable leakage voltage	AC	5% or less of the rated voltage	
		DC	2% or less of the rated voltage	
	Apparent power*4, *5	AC	8 VA	9.5 VA
	Power consumption*4	DC	6 W	8 W
	Temperature rise*6	AC/DC	70/65°C	

*1 Leakage: The value at a differential pressure of 0.01 MPa or higher and an ambient temperature of 20°C
*2 This product has an IP65,67 enclosure, but if water enters the product, it may result in malfunction or breakage. Therefore, take appropriate measures to prevent water from entering the product when using in an environment where it is constantly exposed to water.
*3 Standards compliance varies depending on the model. For details, see item 38,39
*4 Power consumption/Apparent power: The value at an ambient temperature of 20°C and when the rated voltage is applied (Variation: ±10%)
*5 There is no difference in the frequency and the inrush and energized apparent power, since a rectifying circuit is used in the AC.
*6 Temperature rise: The value at an ambient temperature of 20°C and when the rated voltage is applied. Use this value as a reference as the actual value varies depending on the ambient environment.

Be sure to read the "Specific Product Precautions" before handling the product.

19. Construction (Normally Closed type Aluminum)

JSX20, 30
Body material: Aluminum



Component Parts

No.	Description	Material
1	Clip	Stainless steel
2	Solenoid coil	Stainless steel, Cu, Resin
3	Stopper	PPS
4	Spring	Stainless steel
5	Tube assembly	Stainless steel
6	Armature assembly	Stainless steel, PPS, NBR, (FKM)
7	Mounting screw	Stainless steel
8	Bonnet	Stainless steel
9	Gasket	NBR, (FKM)
10	Body	Aluminum

20. Models (Normally Open type)

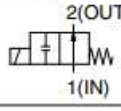
How to order

JSX ❶2 ❷2 – ❸S ❹N ❺302 ❻R – ❼5 ❽G – ❾D – ❿B

❶ Size

Symbol	Size
2	20
3	30

❷ Valve type

Symbol	Valve type
2	N.O. 

❸ Body material

Symbol	Body material
S	Stainless Steel
C	Brass

❹ Seal material

Symbol	Seal material
N	NBR
F	FKM
E	EPDM

❺ Orifice diameter and port size

Symbol	Orifice diameter [mmø]	Port size	Size 20	Size 30
301	3.2	1/8	●	●
302		1/4	●	●
303		3/8	●	●
402	4	1/4	●	●
403		3/8	●	●
502	5.6	1/4	●	●
503		3/8	●	●
702	7.1	1/4	●	●
703		3/8	●	●

❻ Thread type

Symbol	Thread type
R	Rc
N	NPT
F	G

❼ Rated voltage

AC

Symbol	Rated voltage	Symbol	Rated voltage
1	100 VAC	7	240 VAC
2	200 VAC	8	48 VAC
3	120 (110) VAC	B	24 VAC
4	220 VAC	J	230 VAC

DC

Symbol	Rated voltage
5	24 VDC
6	12 VDC

❾ Oil-free option

Symbol	Option
Nil	None
D	Oil-free

❿ Option

Symbol	Option
Nil	None
B	With bracket (Stainless steel)

❽ Electrical entry

Symbol	Electrical entry		Size 20	Size 30
G	Grommet*1		●	●
GS	Grommet with PCB (With surge voltage suppressor)		●	●
CS	Conduit (With surge voltage suppressor)		●	●
DS	DIN terminal (With surge voltage suppressor)		●	●
DZ	DIN terminal with light (With surge voltage suppressor)		●	●
DN	Without DIN connector (With surge voltage suppressor)		●	●
WN	M12 connector/Without connector cable (With surge voltage suppressor)*2		●	●

*1 DC voltage only
*2 A cable for the M12 connector is not included with the product.

Flow Rate Characteristics

Size	Port size	Orifice diameter [mmø]	Flow rate characteristics*1 Air C [dm³/(s·bar)]	Air b	Air Cv	Water, Oil Kv	Water, Oil Cv	Max. operating pressure differential [MPa]	Model	Weight*2 [g] Stainless steel body	Weight*2 [g] Brass body
20	1/8	3.2	1.31	0.52	0.39	0.33	0.38	0.7	JSX22-S/C□301	400	410
	1/4	3.2	1.31	0.52	0.39	0.33	0.38	0.7	JSX22-S/C□302	410	420
		4.0	2.05	0.51	0.59	0.50	0.58	0.4	JSX22-S/C□402	410	420
		5.6	3.30	0.47	0.91	0.79	0.91	0.1	JSX22-S/C□502	410	420
		7.1	3.68	0.43	1.06	0.91	1.05	0.05	JSX22-S/C□702	410	420
	3/8	3.2	1.31	0.52	0.39	0.33	0.38	0.7	JSX22-S/C□303	430	440
		4.0	2.05	0.51	0.59	0.50	0.58	0.4	JSX22-S/C□403	430	440
		5.6	3.30	0.47	0.91	0.79	0.91	0.1	JSX22-S/C□503	430	440
		7.1	3.68	0.43	1.06	0.91	1.05	0.05	JSX22-S/C□703	430	440
30	1/8	3.2	1.31	0.52	0.39	0.33	0.38	0.9	JSX32-S/C□301	580	590
	1/4	3.2	1.31	0.52	0.39	0.33	0.38	0.9	JSX32-S/C□302	590	600
		4.0	2.02	0.51	0.59	0.50	0.58	0.6	JSX32-S/C□402	590	600
		5.6	2.62	0.47	0.91	0.79	0.91	0.2	JSX32-S/C□502	590	600
		7.1	3.15	0.43	1.06	0.91	1.05	0.1	JSX32-S/C□702	590	600
	3/8	3.2	1.31	0.52	0.39	0.33	0.38	0.9	JSX32-S/C□302	610	620
		4.0	2.02	0.51	0.59	0.50	0.58	0.6	JSX32-S/C□403	610	620
		5.6	2.62	0.47	0.91	0.79	0.91	0.2	JSX32-S/C□503	610	620
		7.1	3.15	0.43	1.06	0.91	1.05	0.1	JSX32-S/C□703	610	620

Applicable Fluid Checklist

Applicable fluid	Seal material NBR	Seal material FKM	Seal material EPDM
Air	●	●	●
Water	●	●	●
Oil	—	●	—

* The list shows the compatibility between general fluids and the seal materials. Consider the operating environment and application sufficiently before selecting the seal material. Fluid and component compatibility should be checked before use.

*1 The flow rate characteristics of this product vary.
*2 The values were calculated based on the combination of an Rc or NPT thread and a grommet. Add 20 g for the grommet type with PCB, 70 g for the conduit type, 50 g for the DIN terminal type, and 15 g for the M12 connector type.

21. Common Specifications (Normally Open type)

Size			20	30
Valve specifications	Valve construction		Direct operated poppet	
	Valve type		Normally closed (N.C.)	
	Fluid and fluid temperature		Air: −10 to 60°C (Dew point temperature: −10°C or less) Water: 1 to 60°C (No freezing) Oil: −5 to 60°C (Kinematic viscosity: 50 mm^2/s or less)	
	Withstand pressure		2.0 MPa	
	Max. system pressure		1.0 MPa	
	Ambient temperature		−20 to 60°C	
	Valve leakage*1/External leakage*1	Air	1 cm^3/min (ANR) or less	
		Water, Oil	0.1 cm^3/min or less	
	Mounting orientation		Unrestricted	
	Enclosure*2		IP67 (IP65 for the DIN terminal)	
	Standards*3		CE/UKCA	
	Operating environment		Location without the presence of corrosive gases, explosive gases, or constant water adhesion	
	Body material		Stainless steel, Brass	
	Seal material		NBR, FKM, EPDM	
Coil specifications	Rated voltage	AC	24 V, 48 V, 100 V, 110 V, 120 V, 200 V, 220 V, 230 V, 240 V	
		DC	12 V, 24 V	
	Allowable voltage fluctuation		±10% of the rated voltage	
	Allowable leakage voltage	AC	5% or less of the rated voltage	
		DC	2% or less of the rated voltage	
	Apparent power*4, *5	AC	8 VA	9.5 VA
	Power consumption*4	DC	6 W	8 W
	Temperature rise*6	AC/DC	70/65°C	

*1 Leakage: The value at a differential pressure of 0.01 MPa or higher and an ambient temperature of 20°C

*2 This product has an IP65,67 enclosure, but if water enters the product, it may result in malfunction or breakage. Therefore, take appropriate measures to prevent water from entering the product when using outdoors or in an environment where it is constantly exposed to water.

*3 Standards compliance varies depending on the model. For details, refer to page 38.

*4 Power consumption/Apparent power: The value at an ambient temperature of 20°C and when the rated voltage is applied (Variation: ±10%)

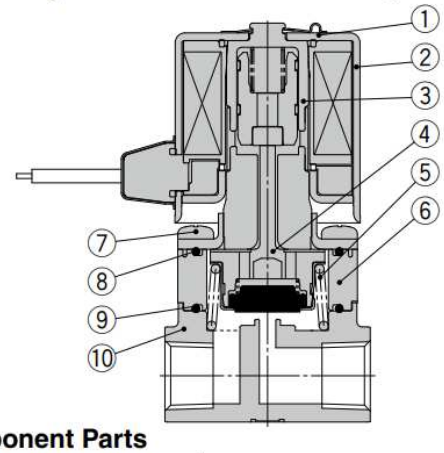
*5 There is no difference in the frequency and the inrush and energized apparent power, since a rectifying circuit is used in the AC.

*6 Temperature rise: The value at an ambient temperature of 20°C and when the rated voltage is applied. Use this value as a reference as the actual value varies depending on the ambient environment.

Be sure to read the "Specific Product Precautions" before handling the product.

22. Construction (Normally Open type)

JSX20, 30 series Normally open (N.O.)
Body material: Stainless steel, Brass



Component Parts

No.	Description	Material
1	**Clip**	Stainless steel
2	**Solenoid coil**	Stainless steel, Cu, Resin
3	**Sleeve assembly**	Stainless steel, PPS
4	**Push rod assembly**	Stainless steel, PPS, NBR (FKM, EPDM)
5	**Spring**	Stainless steel
6	**Adapter**	PPS
7	**Mounting screw**	Stainless steel
8	**O-ring**	NBR (FKM, EPDM)
9	**O-ring**	NBR (FKM, EPDM)
10	**Body**	Stainless steel, Brass

23. Models (High Flow/ Power Saving Type Stainless Steel/Brass)

How to order

JSX 2 1 U – S N 403 R – 5 GS – D – B

❶ ❷ ❸ ❹ ❺ ❻ ❼ ❽ ❾ ❿

Symbol	
U	High flow type

❶ Size

Symbol	Size
1	10
2	20
3	30

❷ Valve type

Symbol	Valve type
1	N.C. 2(OUT) 1(IN)

❸ Body material

Symbol	Body material
S	Stainless steel
C	Brass

❹ Seal material

Symbol	Seal material
N	NBR
F	FKM
E	EPDM

❺ Orifice diameter and port size

Symbol	Orifice diameter [mmø]	Port size	Size 10	20	30
201	2.4	1/8	●	—	—
402	4.0	1/4	—	●	—
403		3/8	—	●	—
702	7.1	1/4	—	●	●
703		3/8	—	●	●

❻ Thread type

Symbol	Thread type
R	Rc
N	NPT
F	G

❼ Rated voltage

Symbol	Rated voltage
5	24 VDC
6	12 VDC

❾ Oil-free option

Symbol	Option
Nil	None
D	Oil-free

❿ Option

Symbol	Option
Nil	None
B	With bracket (Stainless steel)

❽ Electrical entry

Symbol	Electrical entry		Size 10	20	30
GS	Grommet with PCB (With surge voltage suppressor)		●	●	●
CS	Conduit (With surge voltage suppressor)		—	●	●
DS	DIN terminal (With surge voltage suppressor)		●	●	●
DZ	DIN terminal with light (With surge voltage suppressor)		●	●	●
DN	DIN terminal without connector (With surge voltage suppressor)		●	●	●
WN	M12 connector/Without connector cable*1 (With surge voltage suppressor)		●	●	●

*1 A cable for the M12 connector is not included with the product.

* A grommet type is not available.
* Not in compliance with UL standards

Flow rate characteristics

Size	Port size	Orifice diameter [mmø]	Flow rate characteristics*1 Air C	b	Cv	Water, Oil Kv	Conversion Cv	Max. operating pressure differential [MPa]	Model	Weight*2 [g] Stainless steel body*3	Brass body
10	1/8	2.4	0.62	0.45	0.15	0.13	0.15	0.9	JSX11U-S,N,C,F,E□201	180	180
20	1/4	4.0	2.02	0.48	0.52	0.45	0.52	1.0	JSX21U-S,N,C,F,E□402	340	350
		7.1	3.15	0.44	0.88	0.76	0.88	0.4	JSX21U-S,N,C,F,E□702	340	350
	3/8	4.0	2.02	0.48	0.52	0.45	0.52	1.0	JSX21U-S,N,C,F,E□403	340	380
		7.1	3.15	0.44	0.88	0.76	0.88	0.4	JSX21U-S,N,C,F,E□703	340	380
30	1/4	7.1	3.15	0.44	0.88	0.76	0.88	0.8	JSX31U-S,N,C,F,E□702	470	510
	3/8	7.1	3.15	0.44	0.88	0.76	0.88	0.8	JSX31U-S,N,C,F,E□703	470	540

*1 The flow rate characteristics of this product vary.
*2 The values were calculated based on the combination of an Rc or NPT thread and a grommet with PCB. Add 50 g for the conduit type, 30 g for the DIN terminal type, and –5 g for the M12 connector type.
*3 Add 30 g for the G thread (port size 3/8) type.

Applicable Fluid Checklist

Applicable fluid	Seal material NBR	FKM	EPDM
Air	●	●	●
Water	●	●	●
Oil	—	●	—

* The list shows the compatibility between general fluids and the seal materials. Consider the operating environment and application sufficiently before selecting the seal material. Fluid and component compatibility should be checked before use.

24. Common Specifications (High Flow/Power Saving Type Stainless Steel/Brass)

Size			10	20	30
Valve specifications	Valve construction		Direct operated poppet		
	Valve type		Normally closed (N.C.)		
	Fluid and fluid temperature		Air: –10 to 60°C (Dew point temperature: –10°C or less) Water: 1 to 60°C (No freezing) Oil: –5 to 60°C (Kinematic viscosity: 50 mm²/s or less)		
	Withstand pressure		2.0 MPa		
	Max. system pressure		1.0 MPa		
	Ambient temperature		–20 to 60°C		
	Valve leakage/ External leakage*1	Air	1 cm³/min (ANR) or less		
		Water, Oil	0.1 cm³/min or less		
	Mounting orientation		Unrestricted		
	Enclosure*2		IP67 (IP65 for the DIN terminal)		
	Standards*3		CE/UKCA		
	Operating environment		Location without the presence of corrosive gases, explosive gases, or constant water adhesion		
	Body material		Stainless steel, Brass		
	Seal material		NBR, FKM, EPDM		
	Vibration/Impact resistance*6		30/100 m/s²		
Coil specifications	Rated voltage	DC	12 V, 24 V		
	Allowable voltage fluctuation		±10% of the rated voltage		
	Allowable leakage voltage		2% or less of the rated voltage		
	Power consumption (Holding)*4		2 W	3 W	3 W
	Inrush current	12 VDC	1.25 A	2 A	2 A
		24 VDC	0.63 A	1 A	1 A
	Temperature rise*5		25°C	25°C	25°C

∗1 Leakage: The value at a differential pressure of 0.01 MPa or higher and an ambient temperature of 20°C

∗2 This product has an IP65,67 enclosure, but if water enters the product, it may result in malfunction or breakage. Therefore, take appropriate measures to prevent water from entering the product when using outdoors or in an environment where it is constantly exposed to water.

*3 The high flow type is not in compliance with UL standards. For CE/UKCA compliance, see item 38.

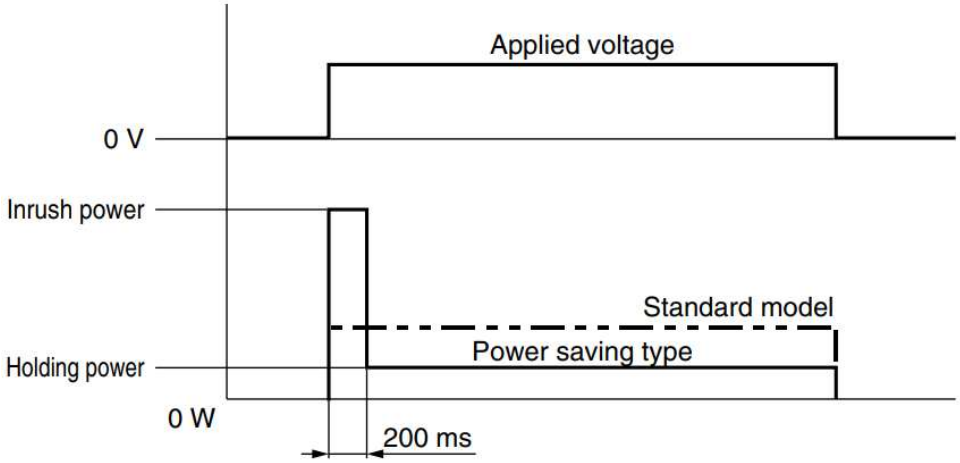
∗4 Power consumption: The value at an ambient temperature of 20°C and when the rated voltage is applied (Variation: ±10%)

∗5 Temperature rise: The value at an ambient temperature of 20°C and when the rated voltage is applied. Use this value as a reference as the actual value varies depending on the ambient environment.

∗6 Vibration resistance: No malfunction occurred in a one-sweep test between 45 and 2000 Hz. The test was performed in both an energized and de-energized state in the axial direction and at a right angle to the armature. Impact resistance: No malfunction occurred when tested with a drop tester in the axial direction and at a right angle to the armature in both an energized and de-energized state, once in each condition. (Value in the initial state) Do not use in an environment subject to constant vibration and/or impact.

Be sure to read the "Specific Product Precautions" before handling the product.

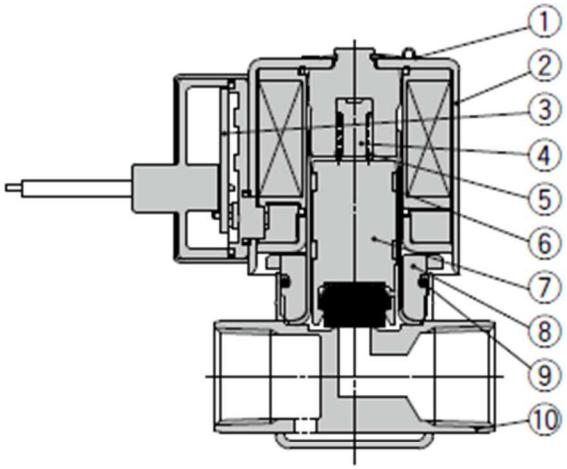
Power Saving Specification



Power is saved by reducing the wattage required to hold the valve. Effective after being energized for more than 200 ms

∗ The valve has polarity. Refer to the "Electrical Circuits" on item 10 and be careful not to reverse the polarity.

25. Construction
(High Flow/Power Saving Type Stainless Steel/Brass)



Component Parts

No.	Description	Material
1	**Clip**	Stainless steel
2	**Solenoid coil**	Stainless steel, Cu, Resin
3	**Board assembly**	—
4	**Stopper**	PPS
5	**Spring**	Stainless steel
6	**Tube assembly**	Stainless steel
7	**Armature assembly**	Stainless steel, PPS, NBR (FKM, EPDM)
8	**Nut**	Stainless steel
9	**Gasket**	NBR (FKM, EPDM)
10	**Body**	Stainless steel

26. Models (High Flow/ Power Saving Type Aluminum)

How to order

JSX ❷ ❶ U – ❸ ❹ ❺ ❻ – ❼ ❽ – ❾ – ❿

Symbol	High flow type
U	

❶ Size

Symbol	Size
2	20
3	30

❷ Valve type

Symbol	Valve type
1	N.C. 2(OUT) 1(IN)

❸ Body material

Symbol	Body material
A	Aluminum

❹ Seal material

Symbol	Seal material
N	NBR
F	FKM

❺ Orifice diameter and port size

Symbol	Orifice diameter [mmø]	Port size	Size 20 (Aluminum body)	Size 30 (Aluminum body)
501	5	1/8	●	—
502		1/4	●	—
702	7	1/4	—	●
703		3/8	—	●

❻ Thread type

Symbol	Thread type
R	Rc
N	NPT
F	G

❼ Rated voltage

DC

Symbol	Rated voltage
5	24 VDC
6	12 VDC

❽ Electrical entry

Symbol	Electrical entry		Size 20	Size 30
GS	Grommet with PCB (With surge voltage suppressor)		●	●
CS	Conduit (With surge voltage suppressor)		●	●
DS	DIN terminal (With surge voltage suppressor)		●	●
DZ	DIN terminal with light (With surge voltage suppressor)		●	●
DN	DIN terminal without connector (With surge voltage suppressor)		●	●
WN	M12 connector/Without connector cable (With surge voltage suppressor)*1		●	●

*1 A cable for the M12 connector is not included with the product.

❾ Oil-free option

Symbol	Option
Nil	None
D	Oil-free

❿ Option

Symbol	Option
Nil	None
B	With bracket (Stainless steel)

Flow Rate Characteristics

Size	Port size	Orifice diameter [mmø]	Flow rate characteristics*1 Air C	Air b	Air Cv	Max. operating pressure differential [MPa]	Model	Weight*2 [g]
20	1/8	5.0	1.66	0.54	0.52	0.9	JSX21U-A□501	260
	1/4	5.0	1.66	0.54	0.52	0.9	JSX21U-A□502	260
30	1/4	7.0	3.02	0.53	0.88	0.8	JSX31U-A□702	420
	3/8	7.0	3.02	0.53	0.88	0.8	JSX31U-A□703	420

*1 The flow rate characteristics of this product vary.
*2 Add 50 g for the conduit type, 30 g for the DIN terminal type, and −5 g for the M12 connector type.

27. Specifications (High Flow/ Power Saving Type Aluminum)

Size			20	30
Valve specifications	Valve construction		Direct operated poppet	
	Valve type		Normally closed (N.C.)	
	Fluid and fluid temperature		Air: −10 to 60°C (Dew point temperature: −10°C or less)	
	Withstand pressure		2.0 MPa	
	Max. system pressure		1.0 MPa	
	Ambient temperature		−20 to 60°C	
	Valve leakage/External leakage*1		1 cm^3/min (ANR) or less	
	Mounting orientation		Unrestricted	
	Enclosure*2		IP67 (IP65 for the DIN terminal)	
	Standards*3		CE/UKCA	
	Operating environment		Location without the presence of corrosive gases, explosive gases, or constant water adhesion	
	Body material		Aluminum	
	Seal material		NBR, FKM, EPDM	
	Vibration/Impact resistance*6		30/100 m/s^2	
Coil specifications	Rated voltage	DC	12 V, 24 V	
	Allowable voltage fluctuation		±10% of the rated voltage	
	Allowable leakage voltage		2% or less of the rated voltage	
	Power consumption (Holding)*4		3 W	3 W
	Inrush current	12 VDC	2 A	2 A
		24 VDC	1 A	1 A
	Temperature rise*5		25°C	25°C

∗1 Leakage: The value at a differential pressure of 0.01 MPa or higher and an ambient temperature of 20°C

∗2 This product has an IP65,67 enclosure, but if water enters the product, it may result in malfunction or breakage. Therefore, take appropriate measures to prevent water from entering the product when using outdoors or in an environment where it is constantly exposed to water.

∗3 The high flow type is not in compliance with UL standards.
For CE/UKCA compliance, see item 38.

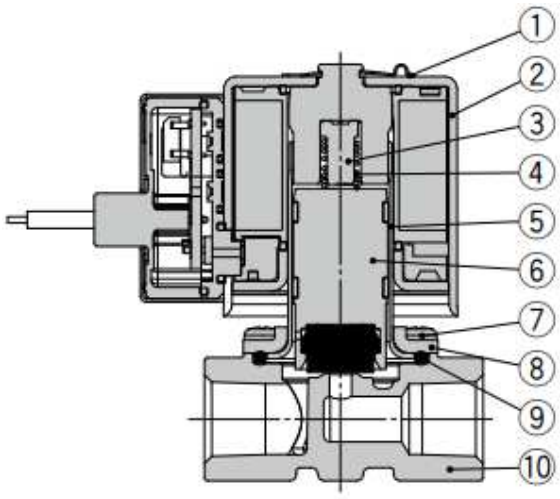
∗4 Power consumption: The value at an ambient temperature of 20°C and when the rated voltage is applied (Variation: ±10%)

∗5 Temperature rise: The value at an ambient temperature of 20°C and when the rated voltage is applied. Use this value as a reference as the actual value varies depending on the ambient environment.

∗6 Vibration resistance: No malfunction occurred in a one-sweep test between 8.3 and 2000 Hz. The test was performed in both an energized and deenergized state in the axial direction and at a right angle to the armature. Impact resistance: No malfunction occurred when tested with a drop tester in the axial direction and at a right angle to the armature in both an energized and de-energized state, once in each condition. (Value in the initial state)
Do not use in an environment subject to constant vibration and/or impact.

Be sure to read the "Specific Product Precautions" before handling the product.

28. Construction (High Flow/ Power Saving Type Aluminum)



Component Parts

No.	Description	Material
1	Clip	Stainless steel
2	Solenoid coil	Stainless steel, Cu, Resin
3	Stopper	PPS
4	Spring	Stainless steel
5	Tube assembly	Stainless steel
6	Armature assembly	Stainless steel, PPS, NBR (FKM, EPDM)
7	Mounting screw	Fe
8	Bonnet	Stainless steel
9	Gasket	NBR (FKM, EPDM)
10	Body	Aluminum

29. Models (Vacuum Type)

How to order

JSX 2 1 V – S F 302 R – 5 GS – D – B

❶ ❷ ❸ ❹ ❺ ❻ ❼ ❽ ❾ ❿

V	Vacuum type

❶ Size

Symbol	Size
1	10
2	20
3	30

❷ Valve type

Symbol	Valve type
1	N.C. 2(OUT) 1(IN)

❸ Body material

Symbol	Body material
S	Stainless steel
C	Brass

❹ Seal material

Symbol	Seal material
F	FKM

❺ Orifice diameter and port size

Symbol	Orifice diameter [mmø]	Port size	Size 10	20	30
101	1.6	1/8	●	—	—
201	2.4	1/8	●	—	—
301	3.2	1/8	—	●	—
302		1/4	—	●	—
303		3/8	—	●	—
402	4.0	1/4	—	●	●
403		3/8	—	●	●
502	5.6	1/4	—	●	●
503		3/8	—	●	●
702	7.1	1/4	—	●	●
703		3/8	—	●	●

❻ Thread type

Symbol	Thread type
R	Rc
N	NPT
F	G

∗ Only thread type "F" (G thread) can be selected for the JSX10.

❼ Rated voltage

AC

Symbol	Rated voltage
1	100 VAC
2	200 VAC
3	120 (110) VAC
4	220 VAC
7	240 VAC
8	48 VAC
B	24 VAC
J	230 VAC

DC

Symbol	Rated voltage
5	24 VDC
6	12 VDC

❽ Electrical entry

Symbol	Electrical entry		Size 10	20	30
G	Grommet∗1		●	●	●
GS	Grommet with PCB (With surge voltage suppressor)		●	●	●
CS	Conduit (With surge voltage suppressor)		—	●	●
DS	DIN terminal (With surge voltage suppressor)		●	●	●
DZ	DIN terminal with light (With surge voltage suppressor)		●	●	●
DN	DIN terminal without connector (With surge voltage suppressor)		●	●	●
WN	M12 connector/Without connector cable (With surge voltage suppressor)∗2		●	●	●

∗1 DC voltage only

∗2 A cable for the M12 connector is not included with the product.

❾ Oil-free option

Symbol	Option
Nil	None
D	Oil-free

❿ Option

Symbol	Option
Nil	None
B	With bracket (Stainless steel)

Flow Rate Characteristics

Size	Port size	Orifice diameter [mmø]	Flow rate characteristics∗1 Air C	b	Cv	Operating pressure range [Pa-abs]	Model	Weight∗2 [g] Stainless steel body∗3	Brass body
10	1/8	1.6	0.36	0.58	0.08	0.1 to atmospheric pressure	JSX11V-□F101	160	160
		2.4	0.62	0.45	0.15		JSX11V-□F201	160	160
20	1/8	3.2	1.35	0.48	0.35		JSX21V-□□301	320	330
	1/4	3.2	1.35	0.48	0.35		JSX21V-□□302	320	330
		4.0	2.02	0.48	0.52		JSX21V-□□402	320	330
		5.6	2.62	0.43	0.73		JSX21V-□□502	320	330
		7.1	3.15	0.44	0.88		JSX21V-□□702	320	330
	3/8	3.2	1.35	0.48	0.35		JSX21V-□□303	320	360
		4.0	2.02	0.48	0.52		JSX21V-□□403	320	360
		5.6	2.62	0.43	0.73		JSX21V-□□503	320	360
		7.1	3.15	0.44	0.88		JSX21V-□□703	320	360
30	1/4	4.0	2.02	0.48	0.52		JSX31V-□□402	450	490
		5.6	2.62	0.43	0.73		JSX31V-□□502	450	490
		7.1	3.15	0.44	0.88		JSX31V-□□702	450	490
	3/8	4.0	2.02	0.48	0.52		JSX31V-□□403	450	520
		5.6	2.62	0.43	0.73		JSX31V-□□503	450	520
		7.1	3.15	0.44	0.88		JSX31V-□□703	450	520

∗1 The flow rate characteristics of this product vary.

∗2 Add 50 g for the conduit type, 30 g for the DIN terminal type, and –5 g for the M12 connector type.

∗3 The values were calculated based on the combination of an Rc or NPT thread and a grommet with PCB. Add 30 g for the G thread (port size 3/8) type.

30. Specifications (Vacuum Type)

Size			10	20	30
Valve specifications	Valve construction		Direct operated poppet		
	Valve type		Normally closed (N.C.)		
	Fluid and fluid temperature		Vacuum: –10 to 60°C (Dew point temperature: –10°C or less)		
	Withstand pressure		2.0 MPa		
	Max. system pressure		1.0 MPa		
	Ambient temperature		–20 to 60°C		
	Valve leakage/External leakage*1	Vacuum	10^{-6} Pa·m³/s or less		
	Mounting orientation		Unrestricted		
	Enclosure*2		IP67 (IP65 for the DIN terminal)		
	Standards*3		CE/UKCA		
	Operating environment		Location without the presence of corrosive gases, explosive gases, or constant water adhesion		
	Body material		Stainless steel, Brass		
	Seal material		FKM		
Coil specifications	Rated voltage	AC	24 V, 48 V, 100 V, 110 V, 120 V, 200 V, 220 V, 230 V, 240 V		
		DC	12 V, 24 V		
	Allowable voltage fluctuation		±10% of the rated voltage		
	Allowable leakage voltage	AC	5% or less of the rated voltage		
		DC	2% or less of the rated voltage		
	Apparent power (Holding)*4, *5	AC	4.5 VA	8 VA	9.5 VA
	Power consumption (Holding)*4	DC	4 W	6 W	8 W
	Temperature rise*6	AC/DC	70/65°C		

*1 Leakage (10^{-6} Pa·m³/s): The value at 0.1 Pa·abs and an ambient temperature of 20°C

*2 This product has an IP65,67 enclosure, but if water enters the product, it may result in malfunction or breakage. Therefore, take appropriate measures to prevent water from entering the product when using outdoors or in an environment where it is constantly exposed to water.

*3 Standards compliance varies depending on the model. For details, refer to page 38,39.

*4 Power consumption: The value at an ambient temperature of 20°C and when the rated voltage is applied (Variation: ±10%)

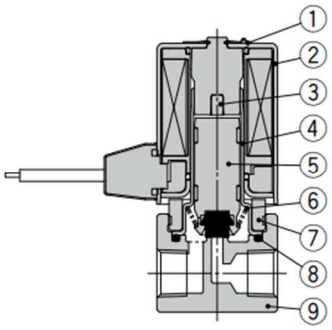
*5 There is no difference in the frequency and the inrush and energized apparent power, since a rectifying circuit is used in the AC.

*6 Temperature rise: The value at an ambient temperature of 20°C and when the rated voltage is applied. Use this value as a reference as the actual value varies depending on the ambient environment.

Be sure to read the "Specific Product Precautions" before handling the product.

31. Construction (Vacuum Type)

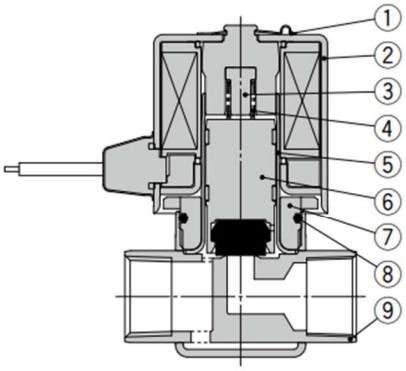
Body material: Stainless steel, Brass



Component Parts

No.	Description	Material
1	Clip	Stainless steel
2	Solenoid coil	Stainless steel, Cu, Resin
3	Stopper	PPS
4	Tube assembly	Stainless steel
5	Armature assembly	Stainless steel, PPS (FKM)
6	Spring	Stainless steel
7	Set nut	Stainless steel
8	Gasket	FKM
9	Body	Stainless steel / Brass

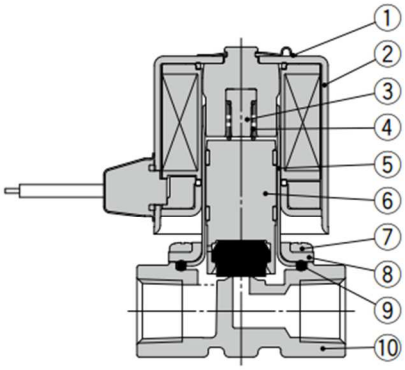
Body material: Stainless steel



Component Parts

No.	Description	Material
1	Clip	Stainless steel
2	Solenoid coil	Stainless steel, Cu, Resin
3	Stopper	PPS
4	Spring	Stainless steel
5	Tube assembly	Stainless steel
6	Armature assembly	Stainless steel, PPS (FKM)
7	Nut	Stainless steel
8	Gasket	FKM
9	Body	Stainless steel

Body material: Brass



Component Parts

No.	Description	Material
1	Clip	Stainless steel
2	Solenoid coil	Stainless steel, Cu, Resin
3	Stopper	PPS
4	Spring	Stainless steel
5	Tube assembly	Stainless steel
6	Armature assembly	Stainless steel, PPS (FKM)
7	Mounting screw	Fe
8	Bonnet	Stainless steel
9	Gasket	FKM
10	Body	Brass

32. Models (High Pressure Type)

How to order

JSX 3 1 H – S N 302 R – 5 G – D – B

❶ ❷ ❸ ❹ ❺ ❻ ❼ ❽ ❾ ❿

Symbol	
H	High pressure type

❶ Size

Symbol	Size
3	30

❷ Valve type

Symbol	Valve type
1	N.C. 2 (OUT) 1 (IN)

❸ Body material

Symbol	Body material
S	Stainless Steel
C	Brass

❹ Seal material

Symbol	Seal material
N	NBR
F	FKM
E	EPDM

❺ Orifice diameter and port size

Symbol	Orifice diameter [mmø]	Port size	Size 30
302	3.2	1/4	●
303		3/8	●

❻ Thread type

Symbol	Thread type
R	Rc
N	NPT
F	G

❼ Rated voltage

AC

Symbol	Rated voltage	Symbol	Rated voltage
1	100 VAC	7	240 VAC
2	200 VAC	8	48 VAC
3	120 (110) VAC	B	24 VAC
4	220 VAC	J	230 VAC

DC

Symbol	Rated voltage
5	24 VDC
6	12 VDC

❽ Electrical entry

Symbol	Electrical entry		Size 30
G	Grommet*1		●
GS	Grommet with PCB (With surge voltage suppressor)		●
CS	Conduit (With surge voltage suppressor)		●
DS	DIN terminal (With surge voltage suppressor)		●
DZ	DIN terminal with light (With surge voltage suppressor)		●
DN	DIN terminal without connector (With surge voltage suppressor)		●
WN	M12 connector/Without connector cable (With surge voltage suppressor)*2		●

*1 DC voltage only
*2 A cable for the M12 connector is not included with the product.

❾ Oil-free option

Symbol	Option
Nil	None
D	Oil-free

❿ Option

Symbol	Option
Nil	None
B	With bracket (Stainless steel)

Flow Rate Characteristics

Size	Port size	Orifice diameter [mmø]	Flow rate characteristics*1 Air C	b	Cv	Max. operating pressure differential [MPa]	Model	Weight*2 [g] Stainless steel body*3	Brass body
30	1/4	3.2	1.2	0.43	0.33	3.0	JSX31H-□□502	450	490
	3/8	3.2	1.2	0.43	0.33	3.0	JSX31H-□□503	450	520

•1 The flow rate characteristics of this product vary.
•2 Add 50 g for the conduit type, 30 g for the DIN terminal type, and −5 g for the M12 connector type.
•3 The values were calculated based on the combination of an Rc or NPT thread and a grommet with PCB. Add 30 g for the G thread (port size 3/8) type.

33. Specifications (High Pressure Type)

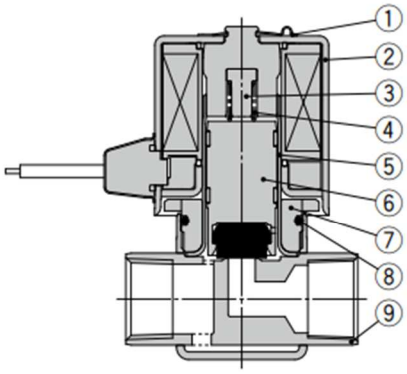
Size			30
Valve specifications	Valve construction		Direct operated poppet
	Valve type		Normally closed (N.C.)
	Fluid and fluid temperature		Air: −10 to 60°C (Dew point temperature: −10°C or less)
	Withstand pressure		4.5 MPa
	Max. system pressure		3.0 MPa
	Ambient temperature		−20 to 60°C
	Valve leakage/External leakage*1	Air	1 cm³/min (ANR) or less
	Mounting orientation		Unrestricted
	Enclosure*2		IP67 (IP65 for the DIN terminal)
	Standards*3		CE/UKCA
	Operating environment		Location without the presence of corrosive gases, explosive gases, or constant water adhesion
	Body material		Stainless steel, Brass
	Seal material		NBR, FKM, EPDM
Coil specifications	Rated voltage	AC	24 V, 48 V, 100 V, 110 V, 120 V, 200 V, 220 V, 230 V, 240 V
		DC	12 V, 24 V
	Allowable voltage fluctuation		±10% of the rated voltage
	Allowable leakage voltage	AC	5% or less of the rated voltage
		DC	2% or less of the rated voltage
	Apparent power (Holding)*4, *5	AC	16 VA
	Power consumption (Holding)*4	DC	13 W
	Temperature rise*6	AC/DC	70/65°C

*1 Leakage: The value at a differential pressure of 0.01 MPa or higher and an ambient temperature of 20°C
*2 This product has an IP65,67 enclosure, but if water enters the product, it may result in malfunction or breakage. Therefore, take appropriate measures to prevent water from entering the product When using outdoors or in an environment where it is constantly exposed to water.
*3 Standards compliance varies depending on the model. For details, refer to page 38,39.
*4 Power consumption: The value at an ambient temperature of 20°C and when the rated voltage is applied (Variation: ±10%)
*5 There is no difference in the frequency and the inrush and energized apparent power, since a rectifying circuit is used in the AC.
*6 Temperature rise: The value at an ambient temperature of 20°C and when the rated voltage is applied. Use this value as a reference as the actual value varies depending on the ambient environment.

Be sure to read the "Specific Product Precautions" before handling the product.

34. Construction (High Pressure Type)

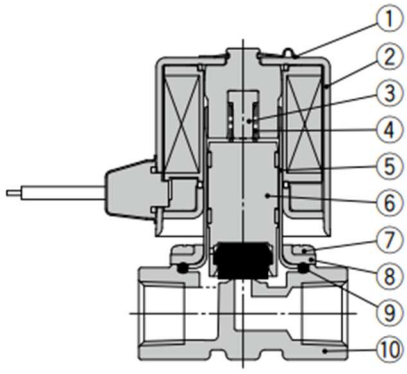
Body material: Stainless steel



Component Parts

No.	Description	Material
1	Clip	Stainless steel
2	Solenoid coil	Stainless steel, Cu, Resin
3	Stopper	PPS
4	Spring	Stainless steel
5	Tube assembly	Stainless steel
6	Armature assembly	Stainless steel, PPS, NBR (FKM, EPDM)
7	Nut	Stainless steel
8	Gasket	NBR (FKM, EPDM)
9	Body	Stainless steel

Body material: Brass



Component Parts

No.	Description	Material
1	Clip	Stainless steel
2	Solenoid coil	Stainless steel, Cu, Resin
3	Stopper	PPS
4	Spring	Stainless steel
5	Tube assembly	Stainless steel
6	Armature assembly	Stainless steel, PPS, NBR (FKM, EPDM)
7	Mounting screw	Fe
8	Bonnet	Stainless steel
9	Gasket	NBR (FKM, EPDM)
10	Body	Brass

35. Models (Steam Type)

How to order

JSX 3 1 S – S F 502 R – 5 CS – D – B

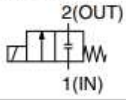
❶ ❷ ❸ ❹ ❺ ❻ ❼ ❽ ❾ ❿

S	Steam type

❶ Size

Symbol	Size
3	30

❷ Valve type

Symbol	Valve type
1	N.C.  2(OUT) 1(IN)

❸ Body material

Symbol	Body material
S	Stainless steel
C	Brass

❹ Seal material

Symbol	Seal material
F	FKM

❺ Orifice diameter and port size

Symbol	Orifice diameter [mmø]	Port size	Size 30
502	5.6	1/4	●
503		3/8	●
702	7.1	1/4	●
703		3/8	●

❻ Thread type

Symbol	Thread type
R	Rc
N	NPT
F	G

❼ Rated voltage

AC

Symbol	Rated voltage	Symbol	Rated voltage
1	100 VAC	7	240 VAC
2	200 VAC	8	48 VAC
3	120 (110) VAC	B	24 VAC
4	220 VAC	J	230 VAC

DC

Symbol	Rated voltage
5	24 VDC
6	12 VDC

❽ Electrical entry

Symbol	Electrical entry		Size 30
CS	Conduit (With surge voltage suppressor)		●

❾ Oil-free option

Symbol	Option
Nil	None
D	Oil-free

❿ Option

Symbol	Option
Nil	None
B	With bracket (Stainless steel)

Flow Rate Characteristics

Size	Port size	Orifice diameter [mmø]	Flow rate characteristics*1 Heated Water, Steam Kv	Conversion Cv	Max. operating pressure differential [MPa]	Model	Weight [g] Stainless steel body*2	Brass body
30	1/4	5.6	0.63	0.73	1.0	JSX31S-□502	500	540
		7.1	0.76	0.88	0.5	JSX31S-□702	500	540
	3/8	5.6	0.63	0.73	1.0	JSX31S-□503	500	570
		7.1	0.76	0.88	0.5	JSX31S-□703	500	570

*1 The flow rate characteristics of this product vary.
*2 The values were calculated based on the combination of an Rc or NPT thread and a Conduit. Add 30 g for the G thread (port size 3/8) type.

36. Specifications (Steam Type)

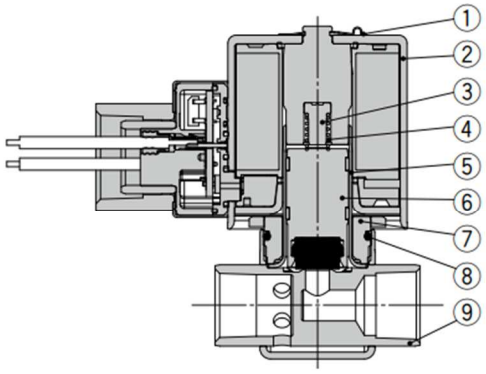
Size			30
Valve specifications	Valve construction		Direct operated poppet
	Valve type		Normally closed (N.C.)
	Fluid and fluid temperature		Steam: 183°C or less
			Heated water: 99°C or less
	Withstand pressure		2.0 MPa
	Max. system pressure		1.0 MPa
	Ambient temperature		−20 to 60°C
	Valve leakage/ External leakage*1	Steam	1.0 cm^3/min or less
		Heated water	0.1 cm^3/min or less
	Mounting orientation		Unrestricted
	Enclosure*2		IP67
	Standards*3		CE/UKCA
	Operating environment		Location without the presence of corrosive gases, explosive gases, or constant water adhesion
	Body material		Stainless steel, Brass
	Seal material		FKM
Coil specifications	Rated voltage	AC	24 V, 48 V, 100 V, 110 V, 120 V, 200 V, 220 V, 230 V, 240 V
		DC	12 V, 24 V
	Allowable voltage fluctuation		±10% of the rated voltage
	Allowable leakage voltage	AC	5% or less of the rated voltage
		DC	2% or less of the rated voltage
	Apparent power (Holding)*4, *5	AC	16 VA
	Power consumption (Holding)*4	DC	13 W
	Temperature rise*6	AC/DC	100°C

*1 Leakage: The value at a differential pressure of 0.01 MPa or higher and an ambient temperature of 20°C
*2 This product has an IP65,67 enclosure, but if water enters the product, it may result in malfunction or breakage. Therefore, take appropriate measures to prevent water from entering the product when using outdoors or in an environment where it is constantly exposed to water.
*3 Standards compliance varies depending on the model. For details, refer to page 38,39.
*4 Power consumption: The value at an ambient temperature of 20°C and when the rated voltage is applied (Variation: ±10%)
*5 There is no difference in the frequency and the inrush and energized apparent power, since a rectifying circuit is used in the AC.
*6 Temperature rise: The value at an ambient temperature of 20°C and when the rated voltage is applied. Use this value as a reference as the actual value varies depending on the ambient environment.

Be sure to read the "Specific Product Precautions" before handling the product.

37. Construction (Steam Type)

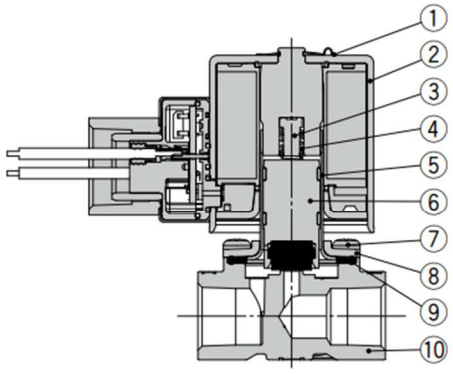
Body material: Stainless steel



Component Parts

No.	Description	Material
1	Clip	Stainless steel
2	Solenoid coil	Stainless steel, Cu, Resin
3	Stopper	PPS
4	Spring	Stainless steel
5	Tube assembly	Stainless steel
6	Armature assembly	Stainless steel, PPS (FKM)
7	Nut	Stainless steel
8	Gasket	FKM
9	Body	Stainless steel

Body material: Brass



Component Parts

No.	Description	Material
1	Clip	Stainless steel
2	Solenoid coil	Stainless steel, Cu, Resin
3	Stopper	PPS
4	Spring	Stainless steel
5	Tube assembly	Stainless steel
6	Armature assembly	Stainless steel, PPS (FKM)
7	Mounting screw	Fe
8	Bonnet	Stainless steel
9	Gasket	FKM
10	Body	Brass

38. CE/UKCA-compliant Products

Table of CE/UKCA-compliant Products

* Refer to the table below for CE/UKCA -compliant products.

○ : Support、× : Unsupported (Product number setting available)、- : No product number setting

Electrical entry	Rated voltage									
	AC								DC	
	1	2	3	4	7	8	B	J	5	6
	100VAC	200VAC	120VAC (110VAC)	220VAC	240VAC	48VAC	24VAC	230VAC	24VDC	12VDC
G Grommet	–	–	–	–	–	–	–	–	○	○
GS Grommet with PCB (With surge voltage suppressor)	○	×	×	×	×	○	○	×	○	○
CS Conduit (With surge voltage suppressor)	○	○	○	○	○	○	○	○	○	○
DS DIN terminal (With surge voltage suppressor)	○	○	○	○	○	○	○	○	○	○
DZ DIN terminal with light (With surge voltage suppressor)	○	○	○	○	○	○	○	○	○	○
DN DIN terminal without connector (With surge voltage suppressor)	○	○	○	○	○	○	○	○	○	○
WN M12 connector/Without connector cable (With surge voltage suppressor)	○	○	○	○	○	○	○	○	○	○

39. UL-compliant Products

JSX10, 20, 30 Series

Table of UL-compliant Products

• Refer to the table below for UL-compliant products.

c UL us Recognized

G Grommet 

GS Grommet with PCB 

DN DIN terminal without connector 

WN M12 connector/ Without connector cable 

JSX11

Series/Valve type	Body material	Seal material	Orifice diameter/Port size	Thread type	Rated voltage	Electrical entry	Option
JSX11	S	N	101	R	1	G*1	*
		F	201	N	2	GS	
		E		F	3	DN	
					4	WN	
					5		
					6		
					7		
					8		
					B		
					J		

JSX21

Series/Valve type	Body material	Seal material	Orifice diameter/Port size	Thread type	Rated voltage	Electrical entry	Option
JSX21	S	N	301	R	1	G*1	*
		F	302	N	2	GS	
		E	303	F	3	DN	
			402		4	WN	
			403		5		
			502		6		
			503		7		
			702		8		
			703		B		
					J		

JSX31

Series/Valve type	Body material	Seal material	Orifice diameter/Port size	Thread type	Rated voltage	Electrical entry	Option
JSX31	S	N	402	R	1	G*1	*
		F	403	N	2	GS	
		E	502	F	3	DN	
			503		4	WN	
			702		5		
			703		6		
					7		
					8		
					B		
					J		

*1 Only applicable to rated voltage symbols "5" and "6"

c UL us LISTED Listed

CS Conduit 

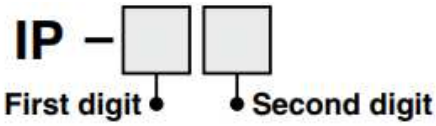
JSX21

Series/Valve type	Body material	Seal material	Orifice diameter/Port size	Thread type	Rated voltage	Electrical entry	Option
JSX21	S	N	301	R	1	CS	*
		F	302	N	2		
		E	303	F	3		
			402		4		
			403		5		
			502		6		
			503		7		
			702		8		
			703		B		
					J		

JSX31

Series/Valve type	Body material	Seal material	Orifice diameter/Port size	Thread type	Rated voltage	Electrical entry	Option
JSX31	S	N	402	R	1	CS	*
		F	403	N	2		
		E	502	F	3		
			503		4		
			702		5		
			703		6		
					7		
					8		
					B		
					J		

40. Definition and Terminology

<table>
<tr><td rowspan="3">Pressure Terminology</td><td>Max.operating pressure differential</td><td>The max. pressure differential (the difference between the inlet and outlet pressure) which is allowed for operation. When the outlet pressure is 0 MPa, this becomes the max. operating pressure.</td></tr>
<tr><td>Max. system pressure</td><td>The max. pressure that can be applied inside the pipelines (line pressure).
[The pressure differential of the solenoid valve portion must not exceed the max. operating pressure differential.]</td></tr>
<tr><td>Withstand pressure</td><td>The pressure in which the valve must be withstood without a drop in performance after holding for one minute under prescribed pressure and returning to the operating pressure range. (value under the prescribed conditions</td></tr>
<tr><td rowspan="3">Electrical Terminology</td><td>Apparent power (VA)</td><td>Volt-ampere is the product of voltage (V) and current (A).
Power consumption (W): For AC, W = V·A·cos θ.
For DC, W = V·A.
* cos θ shows power factor. cos θ ≈ 0.9</td></tr>
<tr><td>Surge voltage</td><td>A high-voltage which is momentarily generated by shutting off the power in the shut-off area.</td></tr>
<tr><td>Degrees of protection</td><td>degree defined in the “JIS C 0920: Waterproof test of electric machinery/appliance and the degree of protection against the intrusion of solid foreign objects.”
 

●First Digit:
Degree of protection against solid foreign objects
<table><tr><td>0</td><td>Not protected</td></tr><tr><td>1</td><td>Protected against solid foreign objects of 50 mmø and larger</td></tr><tr><td>2</td><td>Protected against solid foreign objects of 12 mmø and larger</td></tr><tr><td>3</td><td>Protected against solid foreign objects of 2.5 mmø and larger</td></tr><tr><td>4</td><td>Protected against solid foreign objects of 1.0 mmø and larger</td></tr><tr><td>5</td><td>Dust protected</td></tr><tr><td>6</td><td>Dust-tight</td></tr></table>
●Second Digit:
Degree of protection against water
<table><tr><td>0</td><td>Not protected</td><td>—</td></tr><tr><td>1</td><td>Protected against vertically falling water droplets</td><td>Dripproof type 1</td></tr><tr><td>2</td><td>Protected against vertically falling water droplets when enclosure is tilted up to 15°</td><td>Dripproof type 2</td></tr><tr><td>3</td><td>Protected against rainfall when enclosure is tilted up to 60°</td><td>Rainproof type</td></tr><tr><td>4</td><td>Protected against splashing water</td><td>Splashproof type</td></tr><tr><td>5</td><td>Protected against water jets</td><td>Water-jet-proof type</td></tr><tr><td>6</td><td>Protected against powerful water jets</td><td>Powerful water-jet-proof type</td></tr><tr><td>7</td><td>Protected against the effects of temporary immersion in water</td><td>Immersible type</td></tr><tr><td>8</td><td>Protected against the effects of continuous immersion in water</td><td>Submersible type</td></tr></table></td></tr>
<tr><td rowspan="3">Others</td><td>Material</td><td>NBR: Nitrile rubber
FKM: Fluorine rubber
EPDM: Ethylene propylene rubber</td></tr>
<tr><td>Oil free</td><td>It means degreasing cleaning of fluid contact parts</td></tr>
<tr><td>Symbol</td><td>When the valve is closed, flow is blocked from port 1 to port 2. However, if the pressure in port 2 is higher than port 1, the valve will not be able to block the fluid and it will flow from port 2 to port 1.</td></tr>
</table>

41. Replacement Parts

Solenoid Coil Assembly

When ordering, be sure to add the "-KT1" suffix to the end of the part number of the valve currently in use.

JSX 2 1 – S N 101 R – 5 G – B – KT1

● **Enter the standard product number.**

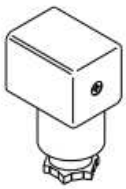
The solenoid coil assembly is shipped with a name plate with the valve part number printed on it. In addition, the name plate has the marks of all applicable standards printed on it.

For the solenoid coil assembly, eligibility for CE/UKCA marking and UL/CSA standard certification varies depending on the electrical entry type and the rated voltage.

When ordering a solenoid coil assembly with different specifications than the valve currently in use, refer to the "(Models) How to Order" to confirm the status of standard compliance.

For solenoid coil replacement instructions, refer to the "13 Replacing the Solenoid Coils"

DIN Connector Part No.



<For JSX20/30>

Electrical option	Rated voltage	Connector part no.
None	24 VDC	3G-GDM2A
	12 VDC	
	100 VAC	
	120 (110) VAC	
	200 VAC	
	220 VAC	
	230 VAC	
	240 VAC	
	24 VAC	
	48 VAC	
With light	24 VDC	GDM2A-L5
	12 VDC	GDM2A-L6
	100 VAC	GDM2A-L1
	120 (110) VAC	GDM2A-L1
	200 VAC	GDM2A-L2
	220 VAC	GDM2A-L2
	230 VAC	GDM2A-L2
	240 VAC	GDM2A-L2
	24 VAC	GDM2A-L5
	48 VAC	GDM2A-L15

<For JSX10>

Electrical option	Rated voltage	Connector part no.
None	24 VDC	JSX021-1-18
	12 VDC	
	100 VAC	
	120 (110) VAC	
	200 VAC	
	220 VAC	
	230 VAC	
	240 VAC	
	24 VAC	
	48 VAC	
With light	24 VDC	SY100-82-3-05
	12 VDC	SY100-82-3-06
	100 VAC	SY100-82-2-01
	120 (110) VAC	SY100-82-2-03
	200 VAC	SY100-82-2-02
	220 VAC	SY100-82-2-04
	230 VAC	SY100-82-2-04
	240 VAC	SY100-82-2-04

* Contact SMC for details on the 24 and 48 VAC types with a light for the JSX10.

Gasket Part No. for DIN Connector

VCW20-1-29-1 (For JSX20/30)

* Contact SMC for details on the type for the JSX10.

Clip

For JSX10 VDW20-10

For JSX20/30 VX021N-10S

42. Troubleshooting

If any failure is found during operation, please check using the trouble check sheet and provide countermeasures.

43. Trouble Check Sheet（Target series ：JSX）

Operating conditions

Deliver date	MM/DD, YYYY
Operating period	months
Accumulated operating cycles	Approx. cycles

Warranty period: Within 1.5 years after the product is delivered or 1 year in service.
Refer to and use this trouble check sheet as a cause diagnosis check sheet when a trouble has occurred to solve it early.

Phenomenon		Possible cause	Condition check	Countermeasures
The product does not operate.	☐ ON Does not turn ON.	The power supply voltage is not applied.	☐ Is there any abnormality, such as failure, with the power supply or control circuit? Is there any abnormality, such as broken wire or mis wiring, in the wiring system? →	There is a possibility of an abnormality with the power supply, control circuit, or wiring system. (1) Replace or repair the power supply, control circuit, or wiring system.
		Abnormal supply pressure	☐ Is the operating pressure beyond the operating pressure differential range? →	The operating pressure may be beyond the operating pressure differential range. (1) Use the product within the operating pressure differential range. (2) Select an appropriate model.
		Drop of solenoid coil attraction force	☐ Are you using the product with an applied voltage below the allowable voltage range lower limit? * Allowable voltage range lower limit value: 90% of the rated voltage →	There is a possibility that because the applied voltage was below the allowable voltage range lower limit, the attraction force of the solenoid coil dropped and the armature did not operate. (1) Use the product within the range of ±10% of the rated voltage.
			☐ Is the fluid or ambient temperature above the upper limit of the operating temperature range? →	The attraction force of the solenoid coil may have been reduced due to high temperature. (1) Use the product within its operating temperature range. (2) Select a solenoid valve with high temperature specifications.
		Broken or blown solenoid coil	☐ Is water or other liquid splashed to the coil? →	If the product was used in an environment where water, steam, or condensation may attach to the product for a long period of time, water or other liquid may have entered the solenoid coil and broken the wire. (1) Take a waterproof countermeasure such as installation of a cover on the solenoid coil unit.
			☐ Is the product subject to surge voltage? →	The solenoid coil may have been burned or disconnected due to an excessive surge voltage. (1) Take measures for reducing surge voltage. (2) Replace the solenoid coil with a solenoid coil with surge voltage suppressor.
			☐ Is the applied voltage above the upper limit of the allowable voltage range? * Allowable voltage range upper limit value: 110% of the rated voltage →	The applied voltage may be above the upper limit of the allowable voltage range. (1) Use the product within the voltage range of rated voltage ±10% V.
		Armature operation failure	☐ Has any foreign matter mixed in the fluid? Has any foreign matter entered the solenoid valve? →	As foreign matter was caught in the sliding part of the armature, this may have caused ~~the~~ sticking or attraction failure of the armature~~.~~. (1) On the upstream side of the valve, install an appropriate filter or strainer. * In general, the gas filtration rating of filter element is 5 μm or below. The liquid filtration rating is 100 mesh or above as a guide. (2) After conducting piping, blow air to the piping including solenoid valves.
			☐ Is the product subject to vibration and/or impact? →	A malfunction of the armature or breakage of parts may have occurred due to vibration or impact. (1) Use the product in a location free from vibration or impact.
			☐ Is the kinematic viscosity of the fluid above the allowable value? * Allowable value: 50 mm^2/s →	The armature may have malfunctioned due to the increase of the sliding resistance. (1) Use the product within its allowable kinematic viscosity. (2) When you use the product with high-viscosity fluid, select an air operated valve. (VXA series: allowable value: 500 mm^2/s or less.)
		Deterioration and breakage of rubber seal part	☐ Is the solenoid valve part material compatible with the fluid? →	The rubber seal part may have shrunk, deteriorated and broken, or swollen due to the nature of the fluid, which possibly led to the operation failure. (1) Check the compatibility between the product components and the fluid. * The compatibility of the fluid may differ depending on conditions such as type, additives, concentration, and temperature. Therefore, pay due attention when selecting the material.

Phenomenon		Possible cause	Condition check	Countermeasures
The product does not operate.	☐ OFF Does not turn OFF.	Leakage voltage	☐ Is the voltage exceeding the products allowable leakage voltage specification applied when the power supply is turned off? →	There is a possibility that the power supply, control circuit, or wiring system is abnormal. (1) Check if the control system is working correctly. (2) Keep the leakage voltage from the control system at the allowable value or below. AC coil: 5% or less of the rated voltage DC coil: 2% or less of the rated voltage
		Reverse pressure circuit	☐ Is the piping connection direction such that a reverse pressure is applied to the circuit in a reverse system manner? →	The sealing may have failed because a reverse pressure was applied in the circuit. (1) Check the connecting direction of piping. In particular, when the circuit is used for drawing a vacuum, conduct piping so that the upstream side of the solenoid valve is on the atmosphere side and the downstream side on the vacuum pump side. (2) If a reverse pressure is applied in the piping circuit, install a check valve.
		Armature operation failure	☐ Has any foreign matter mixed in the fluid? Has any foreign matter entered the solenoid valve? →	As foreign matter was caught in the sliding part of the armature, this may have caused sticking or attraction failure of the armature. (1) On the upstream side of the valve, install an appropriate filter or strainer. * In general, the gas filtration rating of filter element is 5 μm or below. The liquid filtration rating is 100 mesh or above as a guide. (2) After conducting piping, blow air to the piping including solenoid valves.
			☐ Is the product subject to vibration and/or impact? →	A malfunction of the armature or breakage of parts may have occurred due to vibration or impact. (1) Use the product in a location free from vibration or impact.
		Deterioration and breakage of rubber seal part	☐ Is the solenoid valve part material compatible with the fluid? →	The rubber seal part may have shrunk, deteriorated and broken, or swollen due to the nature of the fluid, which possibly led to the operation failure or reduction in the sealing. (1) Check the compatibility between the product components and the fluid. * The compatibility of the fluid may differ depending on conditions such as type, additives, concentration, and temperature. Therefore, pay due attention when selecting the material.
			☐ Is the fluid or ambient temperature above the operating temperature range upper limit? →	The rubber seal part may be deteriorated due to high temperature. (1) Use the product within the operating temperature range.
			☐ Is the fluid or ambient temperature below the operating temperature range lower limit? →	The rubber seal part may be hardened due to low temperature, or freezing of fluid may have broken a part. (1) Use the product within the operating temperature range. (2) Take anti-freezing measures such as installation of heaters on the piping.
Fluid leakage occurs.	☐ Leakage from valve (Internal leakage)	Leakage voltage	☐ Is the applied voltage exceeding the product specification when the product is turned off? →	There is a possibility that the power supply, control circuit, or wiring system is abnormal. (1) Check if the control system is working correctly. (2) Keep the leakage voltage from the control system at the allowable value or below. AC coil: 5% or less of the rated voltage DC coil: 2% or less of the rated voltage
		Reverse pressure circuit	☐ Is the piping connection direction such that a reverse pressure is applied to the circuit in a reverse system manner? →	The sealing may have failed because a reverse pressure was applied in the circuit. (1) Check the connecting direction of piping. In particular, when the circuit is used for drawing a vacuum, conduct piping so that the upstream side of the solenoid valve is on the atmosphere side and the downstream side on the vacuum pump side. (2) If a reverse pressure is applied in the piping circuit, install a check valve.
		Inconsistency between allowable leakage values	☐ Is the allowable leakage value of the solenoid valve (refer to the catalog) above the allowable leakage value of the system? →	To have better control of the leakage rate, check the allowable leakage value and then contact us.
		Armature operation failure	☐ Has any foreign matter mixed in the fluid? Has any foreign matter entered the solenoid valve? →	As foreign matter was caught in the sliding part of the armature, this may have caused sticking or attraction failure of the armature, or reduction in the valve sealing performance. (1) On the upstream side of the valve, install an appropriate filter or strainer. * In general, the gas filtration rating of filter element is 5 μm or below. The liquid filtration rating is 100 mesh or above as a guide. (2) After conducting piping, blow air to the piping including solenoid valves.
			☐ Is the product subject to vibration and/or impact? →	A malfunction of the armature or breakage of parts may have occurred due to vibration or impact. (1) Use the product in a location free from vibration or impact.

Phenomenon		Possible cause	Condition check	Countermeasures
Fluid leakage occurs.	☐ Leakage from valve (Internal leakage)	Deterioration and breakage of rubber seal part	☐ Is the solenoid valve part material compatible with the fluid? →	The rubber seal part may have shrunk, deteriorated and broken, or swollen due to the nature of the fluid, which possibly led to the reduction in the valve sealing. (1) Check the compatibility between the product components and the fluid. * The compatibility of the fluid may differ depending on conditions such as type, additives, concentration, and temperature. Therefore, pay due attention when selecting the material.
			☐ Is the fluid or ambient temperature above the operating temperature range upper limit? →	The rubber seal part may be deteriorated due to high temperature. (1) Use the product within the operating temperature range.
			☐ Is the fluid or ambient temperature below the operating temperature range lower limit? →	The rubber seal part may be hardened due to low temperature, or freezing of fluid may have broken a part. (1) Use the product within the operating temperature range. (2) Take anti-freezing measures such as installation of heaters on the piping.
	☐ Air tightness is insufficient. (External leakage)	Inconsistency between allowable leakage values	☐ Is the allowable leakage value of the solenoid valve (refer to the catalog) above the allowable leakage value of the system? →	To have better control of the leakage rate, check the allowable leakage value and then contact us.
		Damage to parts in contact with fluid, such as tube and body	☐ Is the product subject to vibration and/or impact? →	The parts may have been damaged due to vibration or impact. (1) Use the product in a location free from vibration or impact.
		Deterioration of rubber seal part	☐ Is the solenoid valve part material compatible with the fluid? →	The rubber seal part may have shrunk, deteriorated and broken, or swollen due to the nature of the fluid, which possibly led to the operation failure. (1) Check the compatibility between the product components and the fluid. * The compatibility of the fluid may differ depending on conditions such as type, additives, concentration, and temperature. Therefore, pay due attention when selecting the material.
			☐ Is the fluid or ambient temperature above the operating temperature range upper limit? →	The rubber seal part may be deteriorated due to high temperature. (1) Use the product within the operating temperature range.
			☐ Is the fluid or ambient temperature below the operating temperature range lower limit? →	The rubber seal part may be hardened due to low temperature, or freezing of fluid may have broken a part. (1) Use the product within the operating temperature range. (2) Take anti-freezing measures such as installation of heaters on the piping.
Small flow	-	Armature operation failure	☐ Has any foreign matter mixed in the fluid? Has any foreign matter mixed in the solenoid valve? →	As foreign matter was caught in the sliding part of the armature, this may have caused sticking, or attraction failure of the armature, or reduction in the valve sealing performance. (1) On the upstream side of the valve, install an appropriate filter or strainer. * In general, the gas filtration rating of filter element is 5 μm or below. The liquid filtration rating is 100 mesh or above as a guide. (2) After conducting piping, blow air to the piping including solenoid valves.
		Deterioration and breakage of rubber seal part	☐ Is the solenoid valve part material compatible with the fluid? →	The rubber seal part may have shrunk, deteriorated and broken, or swollen due to the nature of the fluid, which possibly led to the operation failure or reduction of valve position. (1) Check the compatibility between the product components and the fluid. * The compatibility of the fluid may differ depending on conditions such as type, additives, concentration, and temperature. Therefore, pay due attention when selecting the material.
There is noise.	-	Drop of solenoid coil attraction force	☐ Is the applied voltage below the lower limit of the allowable voltage fluctuation? * Lower limit of the allowable voltage range: 90% of the rated voltage →	As the applied voltage was below the lower limit of the allowable voltage range, it is assumed that the armature was not completely attracted, which caused the buzzing sound to be louder than usual. (1) Use the product within the range of ±10% of the rated voltage.
			☐ Is the fluid or ambient temperature above the operating temperature range upper limit? →	The rubber seal part may be deteriorated due to high temperature. (1) Use the product within the operating temperature range. (2) Select a solenoid valve for high temperature specifications.
		Armature operation failure	☐ Has any foreign matter mixed in the fluid? Has any foreign matter mixed in the solenoid valve? →	As foreign matter was caught in the sliding part of the armature, this may have caused the attraction failure of the armature. (1) On the upstream side of the valve, install an appropriate filter or strainer. * In general, the gas filtration rating of filter element is 5 μm or below. The liquid filtration rating is 100 mesh or above as a guide. (2) After conducting piping, blow air to the piping including solenoid valves.

Revision history

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