Doc. No.SYJ3000-OMM0002-B

Operation Manual

PRODUCT NAME

5 Port Solenoid Valve

MODEL/ Series

SYJ3000/5000/7000 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. SMC products cannot be used beyond their specifications. They are not developed, designed, and manufactured to be used under the following conditions or environments. Use under such conditions or environments is not allowed.

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, combustion 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

SMC develops, designs, and manufactures products to be used for automatic control equipment, and provides them for peaceful use in manufacturing industries.
Use in non-manufacturing industries is not allowed.
Products SMC manufactures and sells cannot be used for the purpose of transactions or certification specified in the Measurement Act of each country.
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.

SYJ Series

Precautions for 5 Port Solenoid Valve ①

Be sure to read before handling. Refer to main text for detailed precautions on every series.

Design / Selection

⚠ Warning

1. Confirm the specification

Products represented in this catalog are designed only for use in compressed air systems (including vacuum). Do not operate at pressures, temperatures, etc., beyond the range of specifications, as this can cause damage or malfunction. (Refer to the specifications.) We do not guarantee against any damage if the product is used outside of the specification range.

2. Actuator drive

When an actuator, such as a cylinder, is to be driven using a valve, take appropriate measures (cover installation or approach prohibition) to prevent potential danger caused by actuator operation.

3. Intermediate stopping

For 3-position closed center type, it is difficult to make a piston stop at the required position accurately due to the compressibility of air. Furthermore, since valves and cylinders are not guaranteed for zero air leakage, it may not be possible to hold a stopped position for an extended period of time.

4. Effect of back pressure when using a manifold.

Use caution when valves are used on a manifold, because an actuator may malfunction due to back-pressure. For 3-position exhaust center valve or single acting cylinder, take appropriate measures to prevent the malfunction by using it with an individual EXH spacer assembly, a back pressure check valve or an individual exhaust manifold.

5. Holding of pressure (including vacuum).

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

6. Not suitable for use as an emergency shut-off valve, etc.

The valves listed in this catalog are not designed for safety applications such as an emergency shutoff valve. If the valves are used for the mentioned applications, additional safety measures should be adopted.

7. Release of residual pressure

For maintenance purposes install a system for releasing residual pressure. Especially in the case of 3-position closed center valve or double check valve type, ensure that the residual pressure between the valve and the cylinder is released.

8. Operation in a vacuum condition

When a valve is used for switching a vacuum, take measures to install a suction filter or similar to prevent external dust or other foreign matter from entering inside the valve. In addition, at the time of vacuum adsorption, be sure to vacuum at all times. Failure to do so may result in foreign matter sticking to the adsorption pad, or air leakage causing the workpiece to drop.

9. Regarding a vacuum switch valve and a vacuum release valve.

If a non-vacuum is installed in the middle of piping system having a vacuum, the vacuum condition will not be maintained. Use a valve designed for use under vacuum condition.

10. Double solenoid type

When using the double solenoid type for the first time, actuators may travel in an unexpected direction depending on the switching position of the valve. Implement measures to prevent any danger from occurring when operation the actuator.

11. Ventilation

Provide ventilation when using a valve in a confined area, such as in a closed control panel. For example, install a ventilation opening, etc. in order to prevent pressure from increasing inside of the confined area and to release the heat generated by the valve.

12.Extended periods of continuous energization

・If a valve will be continuously energized for an extended period of time, the temperature of the valve will increase due to the heat generated by the coil assembly. This will likely adversely affect the performance of the valve and any nearby peripheral equipment. Therefore, if the valve is to be energized for periods of longer than 30 minutes at a time or if during the hours of operation the energized period per day is longer than the de-energized period, we advise using a valve with specifications listed below

・For applications such as mounting a valve on a control panel, incorporate measure to limit the heat radiation so that the temperature will be high when a 3 station manifold.

13. Do not disassemble the product of make any modifications, including additional machining.

Doing so may cause human injury and/or an accident.

14.Resumption after a long period of holding time

When resuming operation after a long period of holding time, there are cases in which, regardless of whether the product is in an ON or OFF state, there is a delay in the initial response time due to adhesion. Conducting several cycles of running in operation will solve this problem. Please consider implementing this before resumption

⚠ Caution

1.Precautions for 2-position double solenoid valves

If a double solenoid valve is operated with momentary energization, it should be energized for at least 0.1 seconds. However, depending on the piping conditions, the cylinder may malfunction even when the double solenoid valve is energized for 0.1 seconds or longer. In this case, energize the double solenoid valve until the cylinder is exhausted completely.

SYJ Series

Precautions for 5 Port Solenoid Valve ②

Be sure to read before handling. Refer to main text for detailed precautions on every series.

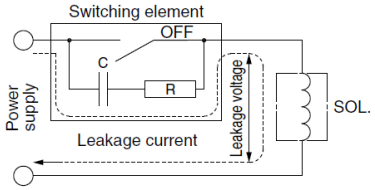
Design / Selection

⚠ Caution

2. Leakage voltage

Take note that the leakage voltage will increase when a resistor is used in parallel with switching element or a C-R circuit (surge voltage suppressor) is used for protecting a switching device because of the passing leakage voltage through the C-R circuit.

The suppressor residual leakage voltage should be as follows.



DC coil

Should be 3% or less of the rated voltage.

AC coil

Should be 8% or less of the rated voltage.

3. Solenoid valve drive for AC with solid state output (SSR, TRIAC output, etc.)

1) Current leakage

When using a snubber circuit (C-R element) for surge protection of the output, a very small amount of electrical current will continue to flow even during the OFF state. This results in the valve not returning. In the a situation where the tolerance is exceeded, as in the above case, take measures to install a bleeder resistor.

2) Minimum allowable load amount (Min. load current)

When the consumption current of a valve is less than the output's minimum allowable load volume or the margin is small, the output may not switch normally.

4. Surge voltage suppressor

If a surge protection circuit contains nonstandard diodes, such as Zener diodes or varistor, a residual voltage that is in proportion to the protective circuit and the rated voltage will remain. Therefore, take into consideration the surge voltage protection of the controller. In the case of diodes, the residual voltage is approximately 1 V.

5. Surge voltage intrusion

With non-polar type solenoid valves, at times of sudden interruption of the loading power supply, such as emergency shutdown, surge voltage intrusion may be generated from loading equipment with a large capacity (power consumption), and the solenoid valve in a de-energized state may switch over (see Figure 1).

When installing a breaker circuit for the loading power supply, consider using a solenoid valve with polarity protection diode), or install a surge absorption diode between the larding equipment COM line and the output equipment COM line (see Figure 2).

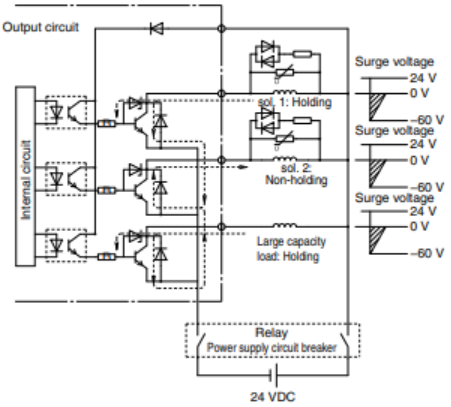


Figure 1. Surge intrusion circuit example (NPN outlet example)

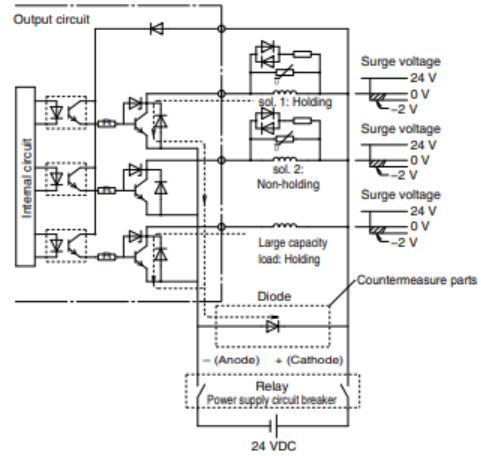


Figure 2. Surge intrusion countermeasure example (NPN outlet example)

6. Operation in a low temperature condition

It is possible to operated a valve in extreme temperature, as low as -10 ℃. Take appropriate measures to avoid freezing of drainage, moisture etc. in low temperature.

7. Operation for air blowing

When using a solenoid valve for air blowing, use an external pilot type. Use caution because the pressure drop caused by the air blowing can have an affect on the internal pilot type valve and external pilot type valves are used on the same manifold.

Additionally, when compressed air within the pressure range of the established specifications is supplied to the external pilot type valve's port, and a double solenoid valve is used for air blowing, the solenoids should normally be energized when air is being blown.

8. Mounting orientation

Refer to the specifications of each series.

9. Initial lubrication of main valve

The following initial lubricant has already been applied to the main valve.

- Rubber seal, spool valve: Grease

10. For the pilot EXH (PE) port

If the solenoid valve and the manifold's pilot EXH (PE) port is restricted extremely or blocked, abnormal operation of the solenoid valve may occur.

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SYJ Series

Precautions for 5 Port Solenoid Valve ③

Be sure to read before handling. Refer to main text for detailed precautions on every series.

Mounting

⚠ Warning

1. Operation manual

Install the products and operate them only after reading the operation manual carefully and understanding its contents. Also, keep the manual where it can be referred to as necessary.

2. Ensure sufficient space for maintenance activities.

When installing the products, allow access for maintenance.

3. Tighten threads with the proper tightening torque.

When installing the products, follow the listed torque specifications.

4. If air leakage increases or equipment does not operated properly, stop operation.

Check mounting conditions when air and power supplies are connected. Initial function and leakage tests should be performed after installation.

5. Painting and coating

Warnings or specifications printed or affixed to the product should not be erased, removed or covered up. Also, applying paint to resinous parts may have an adverse effect due to the solvent in the paint.

Piping

⚠ Caution

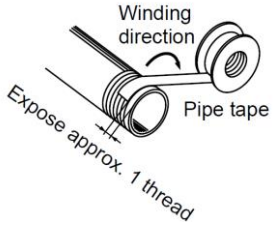
1. Refer to the Fittings and Tubing Precautions for handling one-touch fittings.

2. Preparation before piping

Before piping is connected, it should be thoroughly blow out with air (flushing) or washed to remove chips, cutting oil and other debris from inside the pipe.

3. Wrapping of pipe tape

When screwing piping or fittings into ports, ensure that chips from the pipe threads or sealing material do not enter the piping. Also, if pipe tape is used, leave 1 thread ridges exposed at the end of the threads.



4. Closed center and double check valve types

For closed center type, check the piping to prevent air leakage from the piping between the valve and the cylinder.

5. Connection of piping and fittings

When screwing piping or fittings into the valve, tighten them as follows.

⚠ Caution

(1) When using SMC's M3, M5 fittings, follow the procedures below to tighten them.

- **Connection thread: M3**

  First, tighten by hand, then use a suitable wrench to tighten the hexagonal portion of the body an additional 1/4 turn. The reference value for the tightening torque is 0.4 to 0.5 N·m.

- **Connection thread: M5**

  First, tighten by hand, then use a suitable wrench to tighten the hexagonal portion of the body an additional 1/6 to 1/4 turn. The reference value for the tightening torque is 1 to 1.5 N·m.

  ∗Excessive tightening may damage the thread portion or deform the gasket and cause air leakage. Insufficient tightening may loosen the threads or cause air leakage.

- **When using a fitting other than an SMC fitting, follow the instructions given by the fitting manufacturer.**

(2) For a fitting with sealant R or NPT, first, tighten it by hand, then use a suitable wrench to tighten the hexagonal portion of the body an additional two or three turns. For the tightening torque, refer to the table below.

Connection thread size (R, NPT)	Proper tightening torque (N·m)
1/8	3 to 5
1/4	8 to 12

(3) If the fitting is tightened with excessive torque, a large amount of sealant will seep out. Remove the excess sealant.

(4) Insufficient tightening may cause seal failure or loosen the threads.

(5) For reuse

1) Normally, fittings with a sealant can be reused up to 2 to 3 times.
2) To prevent air leakage through the sealant, remove any loose sealant stuck to the fitting by blowing air over the threaded portion.
3) If the sealant no longer provides effective sealing, wind sealing tape over the sealant before reusing. Do not use any form of sealant other than the tape type of sealant.
4) Once the fitting has been tightened, backing it out to its original position often causes the sealant to become defective. Air leakage will occur.

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SYJ Series

Precautions for 5 Port Solenoid Valve ④

Be sure to read before handling. Refer to main text for detailed precautions on every series.

Piping

⚠ Caution

6. Uni thread fittings

1) First, tighten the threaded portion by hand, then use a suitable wrench to tighten the hexagonal portion of the body further at wrench tightening angle shown below. For the reference value for the tightening torque, refer to the table below.

Connection Female Thread: Rc, NPT, NPTF

Uni thread size	Wrench tightening angle after tightened by hand (deg)	Tightening torque (N·m)
1/8	30 to 60	3 to 5
1/4	30 to 60	8 to 12
3/8	15 to 45	14 to 16

Connection Female Thread: G

Uni thread size	Wrench tightening angle after tightened by hand (deg)	Tightening torque (N·m)
1/8	30 to 45	3 to 4
1/4	15 to 30	4 to 5
3/8	15 to 30	8 to 9

2) The gasket can be reused up to 6 to 10 times. It can be replaced easily when it has sustained damage.

A broken gasket can be removed by holding it and then turning it in the same direction as loosening the thread. If the gasket is difficult to remove, cut it with nippers, etc. In such a case, use caution not to scratch the seat face because the seat face of the fitting's 45° gasket is the sealing face.

7. Piping to products

When piping to a product, refer to the instruction manual to avoid mistakes regarding the supply port, etc.

Wiring

⚠ Warning

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

⚠ Caution

1. Polarity

When connecting power to a solenoid valve with a DC specification and equipped with a light or surge voltage suppressor, check for polarity. If there is polarity, take note of the following.

Without diode to protect polarity:

If a mistake is made regarding the polarity, damage may occur to the diode in the valve, the switching element in the control device, power supply equipment, etc.

With diode to protect polarity:

If the polarity connection is wrong, the valve will not operate.

2. Applied voltage

When electric power is connected to a solenoid valve,

⚠ Caution

3. Check the connections.

Check if the connections are correct after completing all wiring.

4. 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 30 N or more is not applied to the lead wire. When instructions are given in the Specific Product Precautions, follow these specifications.

Lubrication

⚠ Warning

1. Lubrication

1) The valve has been lubricated for life by the factory and does not require any further.

2) If a lubricant is used in the system, use class 1 (no additives) and class 2 (with additives) ISO VG32 turbine oil.

For details about lubricant manufacturers' brands, refer to the SMC website.

Once a lubricant is used in the system, lubrication must be continued because the original lubricant applied during manufacturing will be washed away.

If turbine oil is used, refer to the Safety Data Sheet (SDS) of the oil.

Air Supply

⚠ Warning

1. Type of fluids

Be sure to use compressed air for the fluid.

2. When there is a large amount of drainage.

Compressed air containing a large amount of drainage can cause malfunction of pneumatic equipment. An air dryer or water separator should be installed upstream from filters.

3. Drain flushing

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. It causes malfunction of pneumatic equipment. If the drain bowl is difficult to check and remove, installation of a drain bowl with an auto drain option is recommended.

For compressed air quality, refer to SMC Best Pneumatics catalog.

4. Use clean air

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

SYJ Series

Precautions for 5 Port Solenoid Valve ⑤

Be sure to read before handling. Refer to main text for detailed precautions on every series.

Air Supply

⚠Caution

1. When low dew point air is used as the fluid, degradation of the lubrication properties inside the equipment may occur, resulting in reduced reliability (or reduced service life) of the equipment. Consider using products compatible with low dew points such as those from the 25A- series.

2. Install an air filter.

Install an air filter upstream near the valve. Select an air filter with a filtration size of 5 μm or smaller.

3. Take measures to ensure air quality, such as by installing an aftercooler, air dryer, or water separator.

Compressed air that contains a large amount of drainage can cause malfunction of pneumatic equipment such as valves. Therefore, take appropriate measures to ensure air quality, such as by providing an aftercooler, air dryer, or water separator.

4. If excessive carbon powder is seen, install a mist separator on the upstream side of the valve.

If excessive carbon dust is generated by the compressor, it may adhere to the inside of a valve and cause it to malfunction.

For compressed air quality, refer to SMC Best Pneumatics catalog.

Operating Environment

⚠Warning

1. Do not use in an atmosphere having corrosive gases, chemicals, sea water, water, water steam, or where there is direct contact with any of these .
2. Products with IP65 enclosures (based on IEC60529) are protected against dust and water, however, these products cannot be used in water.
3. Products compliant to IP65 satisfy the specifications through mounting. Be sure to read the Precautions for each product.
4. Do not use in an environment where flammable gas or explosive gas exists. Usage may cause a fire or explosion. The products do not have an explosion proof construction.
5. Do not use in a place subject to heavy vibration and/or shock.
6. The valve should not be exposed to prolonged sunlight. Use a protective cover.
7. Remove any sources of excessive heat.
8. If it used in an environment where there is possible contact with oil, weld spatter, etc., exercise preventive measures.
9. When the solenoid valve is mounted in a control panel

Maintenance

⚠Warning

1. Perform maintenance inspection according to the procedures indicated in the operation manual.

If handled improperly, malfunction and damage of machinery or equipment may occur.

2. Removal of equipment, and supply/exhaust of compressed air

Before components are removed, first confirm that measures are in place to prevent workpieces from dropping, run-away equipment, etc. Then, cut off the supply air and electric power, and exhaust all air pressure from the system using the residual pressure release function. For the 3-position closed center or double check valve types, exhaust the residual pressure between the valve and the cylinder. When the equipment is operated after remounting or replacement, first confirm that measures are in place to prevent the lurching of actuators, etc. Then, confirm that the equipment is operating normally. In particular, when a 2-position double solenoid valve is used, releasing residual pressure rapidly may cause the spool valve to malfunction, depending on the piping conditions, or the connected actuator to operate.

3. Low frequency operation

Valves should be operated at least once every 30 days to prevent malfunction. (Use caution regarding the air supply.)

4. Manual override operation

When the manual override is operated, connected equipment will be actuated.
Operate after safety is confirmed.

Maintenance

⚠Caution

1. Drain flushing

Remove drainage from the air filters regularly.

2. Lubrication

In the case of rubber seals, once lubrication has been started, it must be continued. Use class 1 (no additives) and class 2 (with additives) ISO VG32 turbine oil. For details about lubricant manufacturers' brands, refer to the SMC website. If other lubricant oil is used, it may cause a malfunction.

3. Manual override operation

When switching a double solenoid valve via the manual override operation, instantaneous operation may cause the malfunction of the cylinder. It is recommended that the manual override be held until the cylinder reaches the stroke end position.

SYJ Series/Specific Product Precautions 1

Be sure to read this before handling

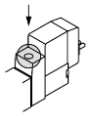
Manual Override Operation

Warning

When the manual override is operated, connected equipment will be actuated. Confirm safety before operating.

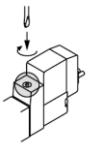
■Non-locking push type [Standard]

Press in the direction of the arrow.

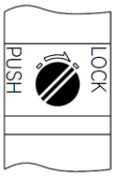


■Push-turn slotted locking type [Type D]

While pressing, turn in the direction of the arrow. If it is not turned, it can be operated the same way as the non-locking type.



Locked position

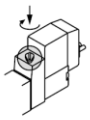


Caution

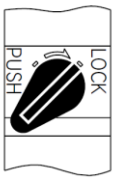
When operating the locking type D with a screw driver, turn it gently using a watchmakers' screwdriver.
[Torque: Less than 0.1N·m]

■Push-turn lever locking type [Type E]

While pressing, turn in the direction of the arrow. If it is not turned, it can be operated the same way as the non-locking type.



Locking position



Caution

When locking the manual override on the push-turn locking types (D,E), be sure to push it down before turning. Turning without first pushing it down can cause damage to the manual override and trouble such as air leakage, etc.

Solenoid valve for 200V,220V VAC specifications

Warning

Solenoid valves with grommet and L/M type plug connector AC specification have a built-in rectifier circuit in the pilot section to operate the DC coil.
With 200V, 220V VAC specification pilot valves, this built-in rectifier generates heat when energized. The surface may become hot depending on the energized condition; therefore, do not touch the solenoid valves.

Common Exhaust Type for Main and Pilot Valve

Caution

Pilot air is exhausted through the main valve body rather than directly to atmosphere.
・Suitable for applications where exhausting the pilot valve to atmosphere would be detrimental to the surrounding working environment.
・For use in extremely dirty environments where there is the possibility that dust could enter the pilot exhaust and damage the valve.
Ensure that the piping of exhaust air is not too restrictive.

Series SYJ3000/5000/7000 Mixed Installation of 3 Port and 5 Port Valves on Same Manifold.

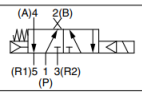
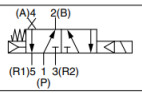
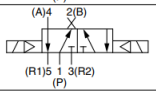
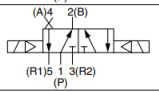
Caution

Series SYJ3000/5000/7000 and Series SYJ300/500/700 can be mounted on the same manifold. How to mount on the same manifold is shown on the following pages.

SYJ3000、SYJ300……P.166
SYJ5000、SYJ500……P.195
SYJ7000、SYJ700……P.227

If 4 or 5 port valve is used as a 3 port valve

Series SYJ3000,5000,7000 may be used as a N.C. or N.O. 3 port valve by plugging one of the A,B ports. Be sure not to plug the exhaust ports (R). Can be used when a double solenoid, 3 port valve is required.

Plug position		B port	A port
Type of actuation		N.C.	N.O.
Number of solenoids	Single		
	Double		

(JIS symbols above: SYJ5000 series)

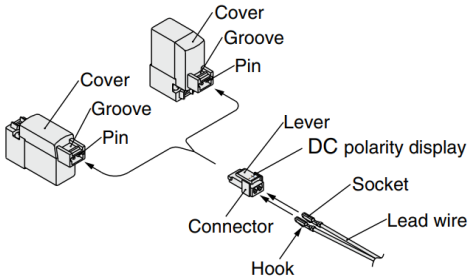
How to Use Plug Connector

Caution

1. Attaching and Detaching Connectors

・To attach a connector, hold the lever and connector unit between your fingers and insert straight onto the pins of the solenoid valve so that the lever's pawl is pushed into the groove and locks.

・To detach a connector, remove the pawl from the groove by pushing the lever downward with your thumb, and pull the connector straight out.



No.SYJ3000-OMM0002-B

SYJ Series/Specific Product Precautions 2

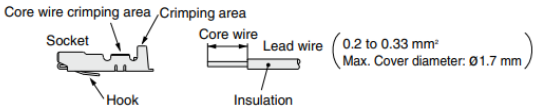
Be sure to read this before handling

⚠ Caution

2. Crimping of lead wires and sockets

Not necessary if ordering the lead wire pre-connected model. Strip 3.2 to 3.7mm at the end of the lead wires, insert the ends of the core wires evenly into the sockets, and then crimp with a crimping tool. When this is done, take care that the coverings of the lead wires do not enter the core wire crimping area.

(crimping tool : F1-706412 by Minebea Connect Inc.)



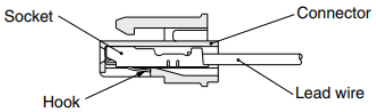
3. Attaching and detaching sockets with lead wires

·Attaching

Insert the sockets into the square holes of the connector (+,- indication), and continue to posh the sockets all the way in until they lock by hooking into the seats in the connector, (When they are pushed in, their hooks open and they are locked automatically.) Then confirm that they are locked by pulling lightly on the lead wires.

·Detaching

To detach a socket from a connector, pull out the lead wire while pressing the socket's hook with a stick having a thin tip (approx. 1mm). If the socket will be used again, first spread the hook outward.



Surge Voltage Suppressor

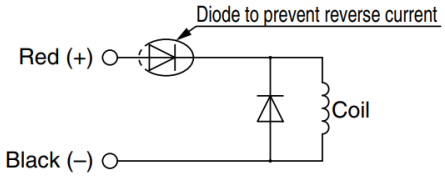
⚠ Caution

<For DC>

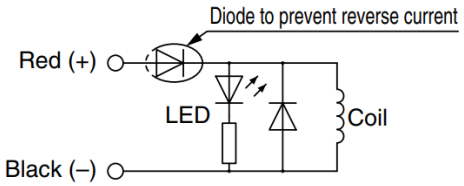
Grommet, L /M plug connector Type

■Standard type (with polarity)

Surge voltage suppressor (☐S)

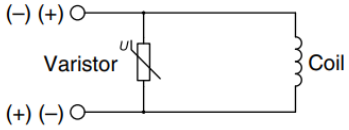


With light/surge voltage suppressor(☐Z)

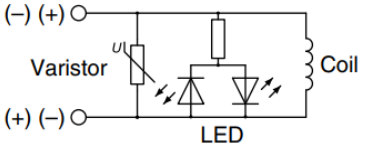


■Non-polar type

With surge voltage suppressor(☐R)



With light/surge voltage suppressor(☐U)



·Connect the standard type in accordance with the +,- polarity indication. (The non-polar type can be used with the connections made either way.)

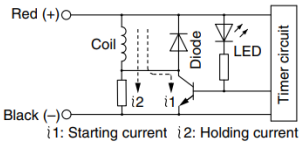
·Since voltage specifications other than standard 24V and 12VDC do not have diodes for polarity protection, be careful not to make errors in the polarity.

·When wiring is done at the factory, positive (+) is red and negative (-) is black.

■ With power saving circuit

Power consumption is decreased by 1/4 by reducing the wattage required to hold the valve in an energized state. (Effective energizing time is over 62 ms at 24 VDC.)

Electric circuit (with power saving circuit)

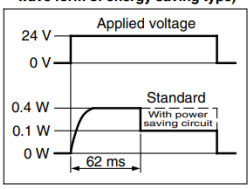


Operating Principle

With the above circuit, the current consumption when holding is reduced to save energy. Please refer to the electric wave data to the right.

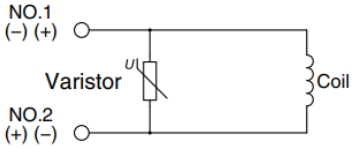
- Please be careful not to reverse the polarity, since a diode to prevent the reversed current is not provided for the power saving circuit.

(In the case of SYJ$\frac{3}{7}$□□0T, the electric wave form of energy saving type)

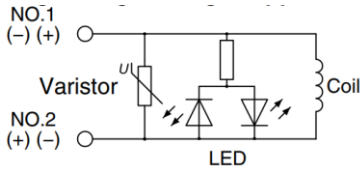


DIN terminal Type

With surge voltage suppressor (DS)



With light/surge voltage suppressor(☐Z)



DIN terminal has no polarity.

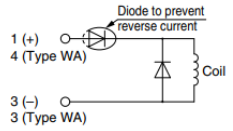
SYJ Series/Specific Product Precautions 3

Be sure to read this before handling

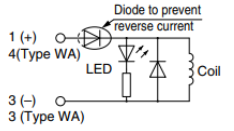
M8 connector Type

■Standard type (with polarity)

With light/surge voltage suppressor (□S)

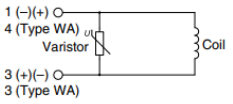


With light/surge voltage suppressor (□Z)

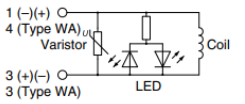


■Non- polar type

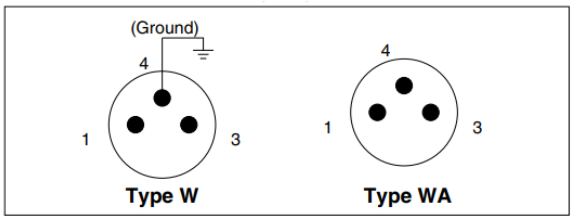
With surge voltage suppressor (□R)



With light/surge voltage suppressor (□U)



Solenoid valve side pin wiring diagram



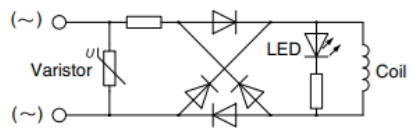
- For the standard type, connect + to 1 and – to 3 for Type W according to polarity, while + to 4 and – to 3 for Type WA. • Please be careful not to reverse the polarity, since a diode to prevent the reversed current is not provided for DC voltages other than 24 and 12 VDC.
- The WA-type valve cannot be grounded.

<For AC>

(There is no "S" type because the generation of surge voltage is prevented by a rectifier.)

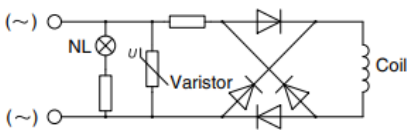
Grommet, L/M plug Connector Type

With light (□Z)



DIN Terminal Type

With light (DZ)



NL: Neon light

Note) Surge voltage suppressor of varistor has residual voltage corresponding to the protective element and rated voltage ; therefore, protect the controller side from the surge voltage. The residual voltage of the diode is approximately 1V.

Y type DIN terminal

- Y type DIN connector conforming to DIN pitch 8mm standard.
- D type DIN connector with 9.4mm pitch between terminals if not interchangeable.
- To distinguish from the D type DIN connector, "N" is listed at the end of voltage symbol. (For connector parts without lights, "N" is not indicated. Please refer to the name plate to distinguish.)
- Dimension are completely the same as D type DIN connector.
- When exchanging the pilot valve assembly only. "V115-□D" is interchangeable with "V115-□Y". Do not replace V114(G,H,L,M,W) to V115 (DIN terminal), and vice versa.

How to Use DIN Terminal

⚠ Caution

Connection

1. Loosen the holding screw and pull the connector out of the solenoid valve terminal block.
2. After removing the holding screw, insert a flat head screwdriver, etc. into the notch on the bottom of the terminal block and pry it open, separating the terminal block and the housing.
3. Loosen the terminal screws (slotted screws) on the terminals block, insert the cores of the lead wires into the terminals according to the connection method, and fasten them securely with the terminal screws.
4. Secure the cord by fastening the ground nut.

⚠ Caution

When making connections, take note that using other than the supported size (Ø3.5 to Ø7) heavy duty cord will not satisfy IP65 (enclosure) standards. Also, be sure to tighten the ground not and holding screw within their specified torque ranges.

⚠ Caution

Changing the entry direction

After separating the terminal block and housing, the cord entry can be changed by attaching the housing in the desired direction (4 directions at 90°intervals)

*When equipped with a light, be careful not to damage the light with the cord's lead wires.

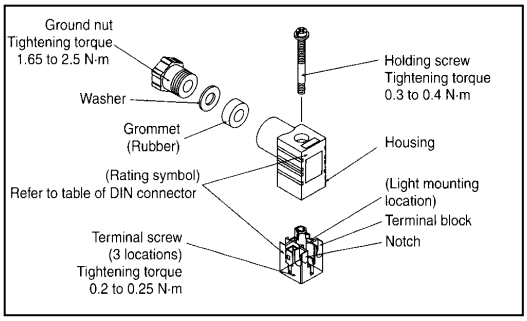
Precautions

Plug in and pull out the connector vertically without tilting to one side.

Compatible cable

Cord O.D.: ϕ3.5 to ϕ7

(Reference) 0.5mm^2, 2-core or 3-core, equivalent to JIS C 3306



SYJ Series/Specific Product Precautions 4

Be sure to read this before handling

Connector Assembly with Cover

Caution

Connector assembly with dust proof protective cover

- Effective to prevention of short circuit failure due to the entry of foreign matter into the connector.
- Chloroprene rubber for electrical use, which provides outstanding weather resistance and electrical insulation, is used for the cover material. However, do not allow contact with cutting oil, etc.
- Simple and unencumbered appearance by adopting round-shaped cord.

One-touch fittings

Caution

- Tubing attachment/detachment for One-touch fittings

1) Attaching of tubing

1. Take a tubing having no flaws on its periphery and cut it off at a right angle. When cutting the tubing, use tubing cutters TK-1,2 or 3. Do not use pinchers, nippers or scissors, etc. If cutting is done with tools other than tubing cutters, the tubing may be cut diagonally or become flattened, etc., making a secure installation impossible, and causing problems such as the tubing pulling out after installation or air leakage. Allow some extra length in the tubing.
2. Grasp the tubing and push it in slowly, inserting it securely all the way into the fitting.
3. After inserting the tubing, pull on it lightly to confirm that it will not come out. If it is not installed securely all the way into the fitting, this can cause problems such as air leakage or the tubing pulling out.

2) Detaching of tubing

1. Push in the release button sufficiently, pushing its collar equally around the circumference.
2. Pull out the tubing while holding down the release button so that it does not come out. If the release button is not pressed down sufficiently, there will be increased bite on the tubing and it will become more difficult to pull it out.
3. When the removed tubing is to be used again, cut off the portion which has been chewed before reusing it. If the chewed portion of the tubing is used as is, this can cause trouble such as air leakage or difficulty in removing the tubing.

Other Tubing Brands

Caution

1. When using other than SMC brand tubing, confirm that the following specifications are satisfied with respect to the outside diameter tolerance of the tubing.

1) Nylon tubing within±0.1mm
2) Soft nylon tubing within±0.1mm
3)Polyurethane tubing within±0.1mm
within±0.1mm

Do not use tubing which do not meet these outside diameter tolerances. It may not be possible to connect them, or they may cause other trouble, such as air leakage or the tubing pulling out after connection.

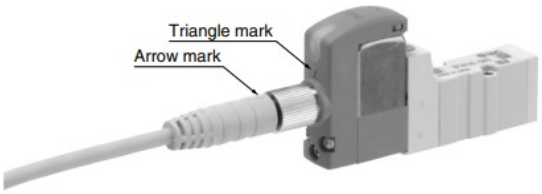
M8 connector

Caution

1. M8 connector types have an IP65 (enclosure) rating, offering protection from dust and water. However please note: these products are not intended for use in water.
   Select a SMC connector cable or a FA sensor type connector, with M8 threaded 3 pin specifications conforming to Nippon Electric Control Equipment Association Standard, NECA4202 (IEC60947-5-2). Make sure the connector O.D. is 10.5mm or less when used with the Series SYJ3000 manifold. If more than 10.5mm, it cannot be mounted due to the size.
2. Do not use a tool to mount the connector, as this may cause damage. Only tighten by hand. (0.4 to 0.6 N·m)

Caution

Failure to meet IP65 performance may result using alternative connectors than those shown above, or when insufficiently tightened.



Note) Connector cable should be mounted in the correct direction. Make sure that the arrow symbol on the connector is facing the triangle symbol on the valve when using SMC connector cable.
Be careful not to squeeze it in the wrong direction, as problems such as pin damage may occur.

SYJ Series/Specific Product Precautions 5

Be sure to read this before handling

M8 connector

■ **Connector cable**

• M8 connector cable for M8 can be ordered as follows:

How to Order

1. To order solenoid valve and connector cable at the same time

(Connector cable will be included in the shipment of the solenoid valve.)

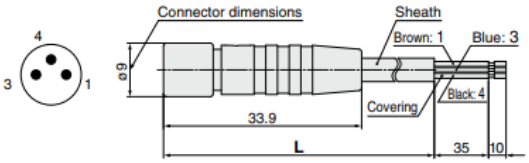
SYJ$\begin{matrix}3\\5\\7\end{matrix}$□□□−□□□□−□□

Electrical entry

W1,WA1: Cable length 300 mm
W2,WA2: Cable length 500 mm
W3,WA3: Cable length 1000 mm
W4,WA4: Cable length 2000 mm
W7,WA7: Cable length 5000 mm

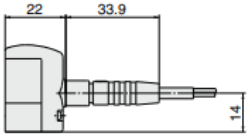
Ex. 1) Cable length: 300 mm
SYJ3120-5W1ZE-M3
Symbol for electrical entry

2. To order connector cable only



Cable length (L)	No.
300 mm	V100-49-1-1
500 mm	V100-49-1-2
1000 mm	V100-49-1-3
2000 mm	V100-49-1-4
5000 mm	V100-49-1-7

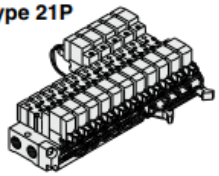
Sheath O.D.	ø3.4 mm
Cover diameter	ø1.16 mm
Conductor area	0.16 mm²



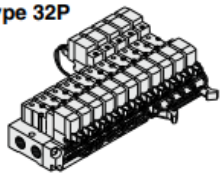
Flat Ribbon Cable Manifold

⚠Caution

Type 21P



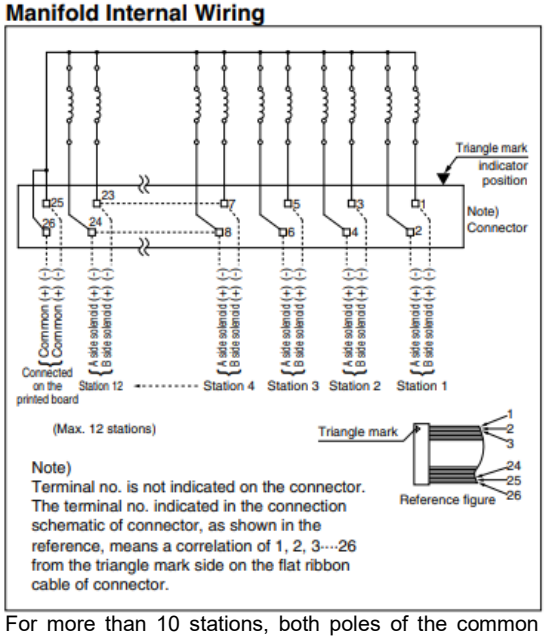
Type 32P



・In the manifold valves, the wiring to the individual valves is provided on a printed circuit board, and the connection to the external wires is consolidated through the use of a flat ribbon cable.

・A single MIL flat ribbon cable connects the entire manifold to your power source. This greatly reduces installation time.

Manifold Internal Wiring

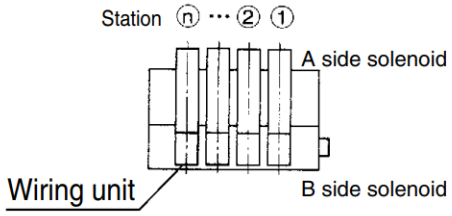


• For more than 10 stations, both poles of the common should be wired.

• For single solenoid, connect to the B side solenoid.

•The maximum number of stations that can be accommodated is 12.

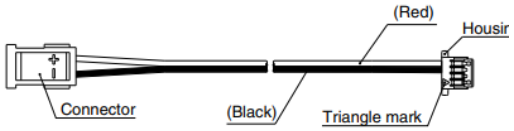
•Only non-polar valves are available for the DC flat cable manifold, therefore negative COM or positive COM wiring of the manifold is possible. The valve does not switch with negative COM if a Z type is used. Be sure to use a positive COM.



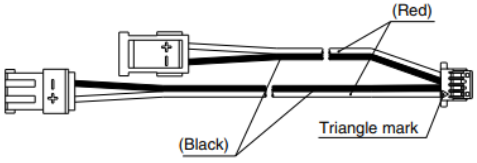
EX510 Gateway-type Serial Transmission System

When ordering the connector assembly only

For single solenoids (SY3000-37-81A-□-N)



For double solenoids (SY3000-37-81A-□-□)



SYJ Series/Specific Product Precautions 6

Be sure to read this before handling

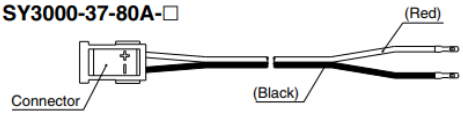
EX510 Gateway-type Serial Transmission System

Connector Assembly Order No.
(Can be used for the manifold without a specified layout (8 stations or less))

Model	Part no.	Connector mounting position
SS5YJ3- 21/32 SA	SY3000-37-81A-2-N	Single : 1 to 4 stations
	SY3000-37-81A-2-5	Double/3 position : 1 to 4 stations
	SY3000-37-81A-1-N	Single : 5 to 8 stations
	SY3000-37-81A-1-4	Double/3 position : 5 to 8 stations
SS5YJ5- 20/41/42/43 SA	SY3000-37-81A-2-N	Single : 1 to 8 stations
	SY3000-37-81A-2-5	Double/3 position : 1 to 8 stations
SS5YJ7- 21/41 SA	SY3000-37-81A-3-N	Single : 1 to 8 stations
	SY3000-37-81A-3-6	Double/3 position : 1 to 4 stations
	SY3000-37-81A-3-7	Double/3 position : 5 to 8 stations

Note) The above is for the station addition or maintenance. When ordering a connector assembly separately, a number would not be printed on the connector.

When ordering connector assembly (except housing)
SY3000-37-80A-□

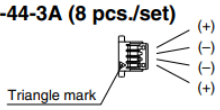


Connector Assembly Order No.
(Can be used for the manifold with a specified layout)

Model	Part no.	Connector mounting position	
SS5YJ3- 21/32 SA	SY3000-37-80A-5	On A side	1 to 8 stations
	SY3000-37-80A-2	On B side	
	SY3000-37-80A-7	On A side	9 to 16 stations
	SY3000-37-80A-4	On B side	
SS5YJ5- 20/41/42/43 SA	SY3000-37-80A-5	On A side	1 to 8 stations
	SY3000-37-80A-2	On B side	
	SY3000-37-80A-7	On A side	9 to 12 stations
	SY3000-37-80A-4	On B side	
	SY3000-37-80A-9	On A side	13 to 16 stations
	SY3000-37-80A-7	On B side	
SS5Y7- 21/41 SA	SY3000-37-80A-7	On A side	1 to 8 stations
	SY3000-37-80A-3	On B side	
	SY3000-37-80A-10	On A side	9 to 12 stations
	SY3000-37-80A-6	On B side	
	SY3000-37-80A-12	On A side	13 to 16 stations
	SY3000-37-80A-9	On B side	

Note 1) The above is for station addition or maintenance. When ordering a connector assembly separately, a number will not be printed on the connector.
Note 2) After inserting the connector assembly into the housing, be sure to confirm that the lead wire will not come off by lightly pulling the wire. Furthermore, do not reuse the lead wire after it has been inserted and removed.
Note 3) Wiring is set longer than the actual wiring distance.

When ordering the housing only
SY3000-44-3A (8 pcs./set)



Bracket

⚠ Caution

For bracket attached styles of SYJ3000 (Single) and SYJ7000, do not use it without bracket.

Solenoid maunting

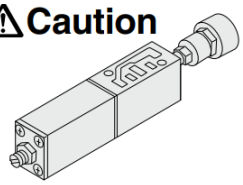
⚠ Caution

Mount it so that there is no slippage or deformation in gasket, and tighten with the tightening torque as shown below.

Model	Thread size	Tightening torque
SYJ3000	M1.7	0.12N·m
SYJ5000	M2.5	0.45N·m
SYJ7000	M3	0.8N·m

Interface Regulator

⚠ Caution



Spacer type regulating valve on manifold block can regulate the pressure to the valve individually.

Specifications

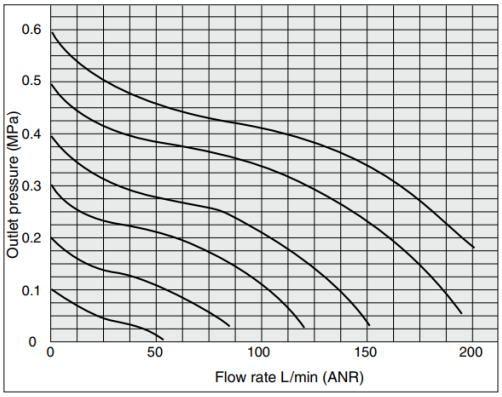
Interface regulator		ARBYJ5000	ARBYJ7000
Applicable solenoid valve model		SYJ5000	SYJ7000
Regulating port		P	P
Proof pressure		1.5 MPa	
Maximum operating pressure		1.0 MPa	
Set pressure range		0.05 to 0.7 MPa Note 1)	
Ambient and fluid temperature		-5 to 60°C (No freezing) Note 2)	
Thread size for connection of pressure gauge		M5 x 0.8	
Weight (kg)		0.06	0.09
Effective area at exhaust Note 3) side (mm²) S at P₁ = 0.7 MPa, P₂ = 0.5 MPa	P→A	1.9	5.1
	P→B	2.1	5.8
Effective area at supply Note 3) side (mm²) S at P₂ = 0.5 MPa	A→EA	4.5	12.6
	B→EB	4.5	12.6

Note 1) Set the pressure within the operating pressure range of the solenoid valve.
Note 2) The maximum operating temperature for the solenoid valve is 50°C.
Note 3) The effective area listed is for a single solenoid 2 position valve mounted on a sub-plate.
Note 4) Apply pressure from P port in the base for interface regulator.

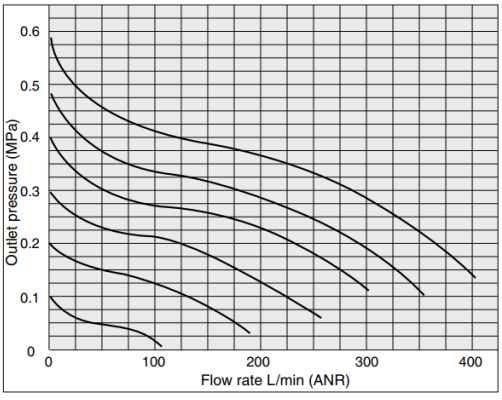
Flow Rate Characteristics

(P → A) Condition: Inlet pressure 0.7 MPa

● **ARBYJ5000-00-P**



● **ARBYJ7000-00-P**



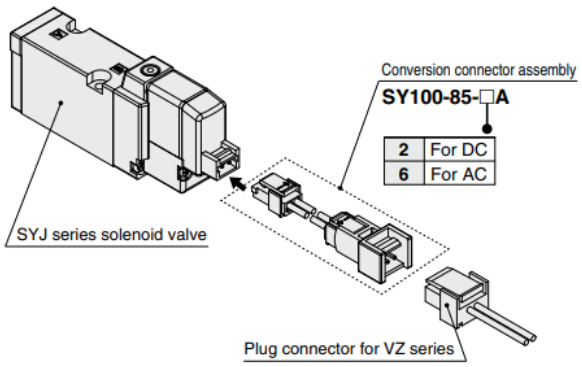
SYJ Series/Specific Product Precautions 7

Be sure to read this before handling

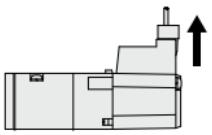
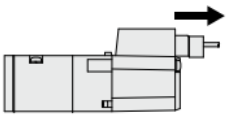
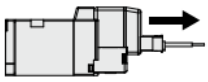
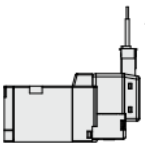
⚠Caution

1. The L and M plug connectors of the VZ series and SYJ series are not interchangeable.

When the VZ series wiring is to be used as is, order the required conversion connector assembly separately. (Refer to the part number below when ordering.)



2. The L and M plug connectors of the VZ series and SYJ series have different electrical entry directions.

	L plug connector	M plug connector
VZ series		
SYJ series		

3. The DIN connectors (D type) of the VZ series and SYJ series are interchangeable. Therefore, the DIN connector can continue to be used as is.

4. Mounting interchangeability is as shown below.

VZ series sub-plates and manifolds can continue to be used as is.

Valves for cylinders with a valve have the same mounting interchangeability.

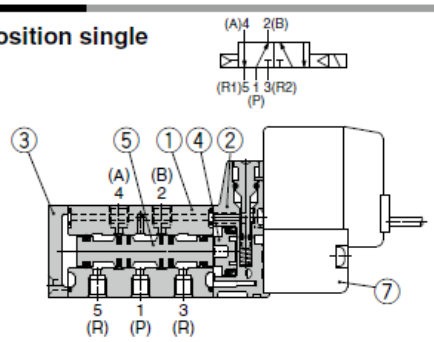
Note the rounding up of the series number.

VZ300 series ⇒ SYJ500 series
VZ500 series ⇒ SYJ700 series
VZ3000 series ⇒ SYJ5000 series
VZ5000 series ⇒ SYJ7000 series

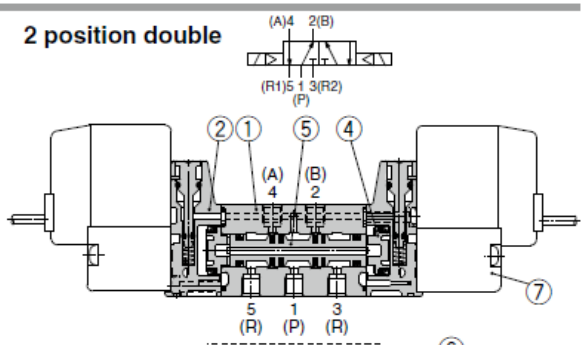
No.SYJ3000-OMM0002-B

Construction

2 position single

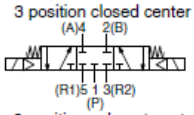


2 position double

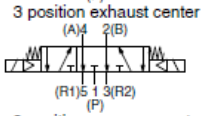


3 position closed center/Exhaust center/Pressure center

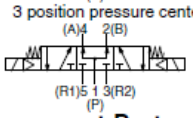
3 position closed center

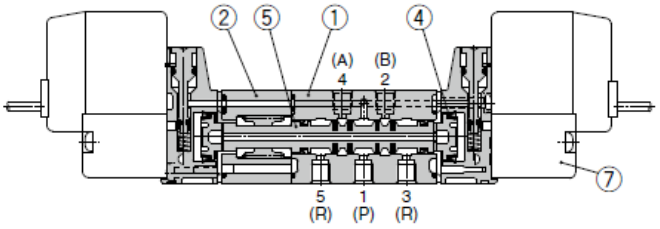


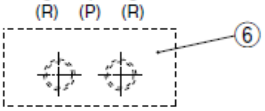
3 position exhaust center



3 position pressure center







(This figure shows a closed center type.)

Component Parts

No.	Description	Material	Note
1	**Body**	Zinc die-casted	White
2	**Piston plate**	Resin	White
3	**End cover**	Resin	White
4	**Piston**	Resin	
5	**Spool valve assembly**	Alminum, H-NBR	

Replacement Parts

No.	Description	Part no.	Note
6	**Sub-plate** Note)	SYJ3000-22-1 (-Q)	Zinc die-casted
7	**Pilot valve**	V111 (T) - □□□	

Note) Add suffix "-Q" for the CE/UKCA-compliant product.

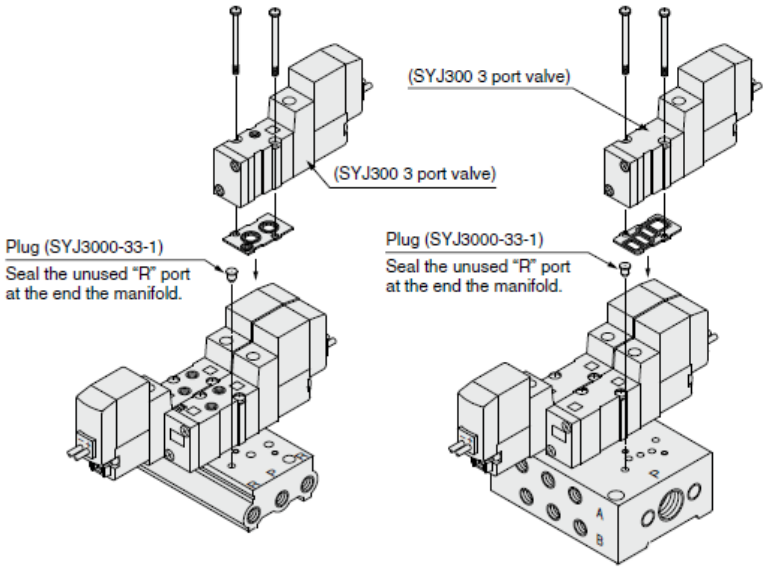
Mixed Installation of the SYJ300 and the SYJ3000 Valves on the Same Manifold

The SYJ300 series valves can be mounted on the manifolds for SYJ3000 series.

① **SS5YJ3-20, SS5YJ3-21P, SS5YJ3-21SA**
The 3 port valve can be used by simply sealing off the unused "R" port with rubber plug SYJ3000-33-1.
Applicable solenoid valves:
SYJ312, SYJ312M, SYJ322, SYJ322M series

② **SS5YJ3-31, -S31, SS5YJ3-32, -S32, SS5YJ3-32SA, SS5YJ3-46, -S46, SS5YJ3-32P**
The 3 port valve can be used without modification. The A port of the valve will flow out of the B port of the manifold.
Applicable solenoid valves:
SYJ314, SYJ314M, SYJ324, SYJ324M series

③ **SS5YJ3-41, -S41**
The 3 port valve can be used on the 4 port manifold by simply sealing off the unused "R" port with rubber plug SYJ3000-33-1. The A port of the valve will flow out of the B port of the manifold.
Applicable solenoid valves:
SYJ314, SYJ314M, SYJ324, SYJ324M series



Type SS5YJ3-20 **Type SS5YJ3-41**

A port of the 3 port valve flows out of the manifold B port.

⚠ Caution

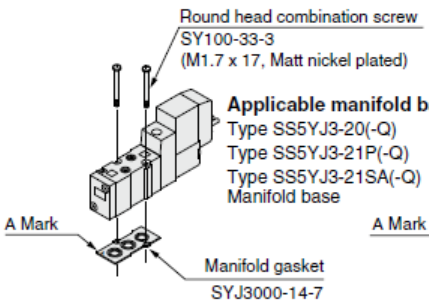
Mounting screw tightening torques

M1.7: 0.12 N·m

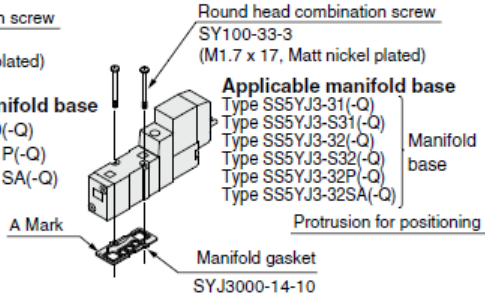
Use caution to the assembly orientation for solenoid valves, gasket, and optional parts.

Combinations of Solenoid Valve, Manifold Gasket and Manifold Base

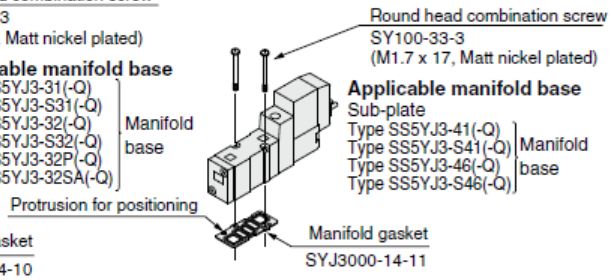
5 port body ported (Type SYJ3□2 ⁰³ (-Q))



4 port base mounted (Type SYJ3□3 ⁰³ (-Q))



5 port base mounted (Type SYJ3□4 ⁰³ (-Q))

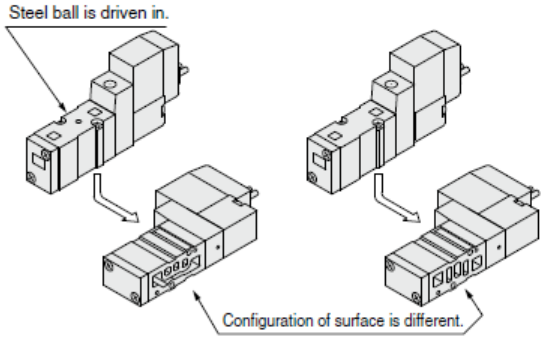


Note) Make sure to align the manifold gasket with the groove of the valve body.

Difference between SYJ3□3⁰₃ and SYJ3□4⁰₃

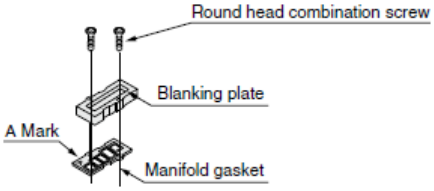
SYJ3□30, 3□33 (4 port)

SYJ3□40, 3□43 (5 port)



Combination of Blanking Plate Assembly and Manifold Base

Blanking plate assembly SYJ3000-21-12A(-Q)

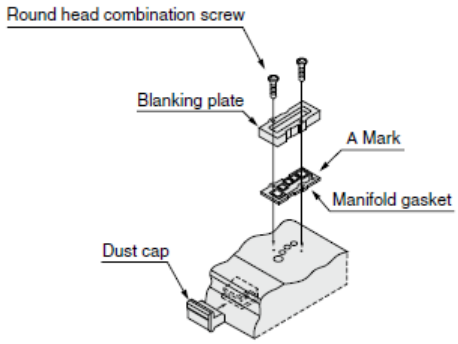


Applicable manifold base
Type SS5YJ3-20(-Q)
Type SS5YJ3-21SA(-Q)
Type SS5YJ3-41(-Q)
Type SS5YJ3-S41(-Q)
Type SS5YJ3-46(-Q)
Type SS5YJ3-S46(-Q)
Type SS5YJ3-31(-Q)
Type SS5YJ3-S31(-Q)
Type SS5YJ3-32(-Q)
Type SS5YJ3-S32(-Q)
Type SS5YJ3-32SA(-Q)
} Manifold base

Note) Manifold gasket "SYJ3000-14-2" can be used with the following manifold bases.

Manifold base of { Type SS5YJ3-31(-Q), -S31(-Q), -32(-Q), -S32(-Q), -32SA(-Q)

Blanking plate assembly SYJ3000-21-13A(-Q)



Applicable manifold base
SS5YJ3-21P(-Q)
SS5YJ3-32P(-Q)
} Manifold base

⚠ Caution

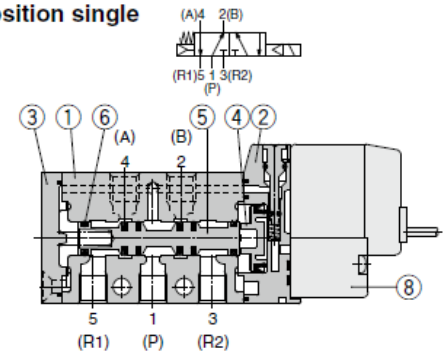
Mounting screw tightening torques

M1.7: 0.12 N·m

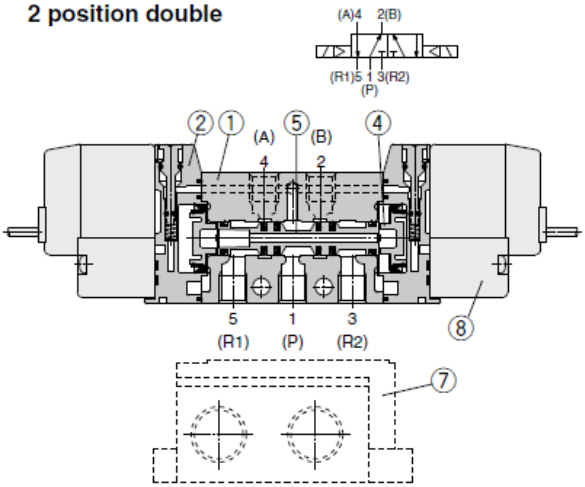
Use caution to the assembly orientation for solenoid valves, gasket, and optional parts.

Construction

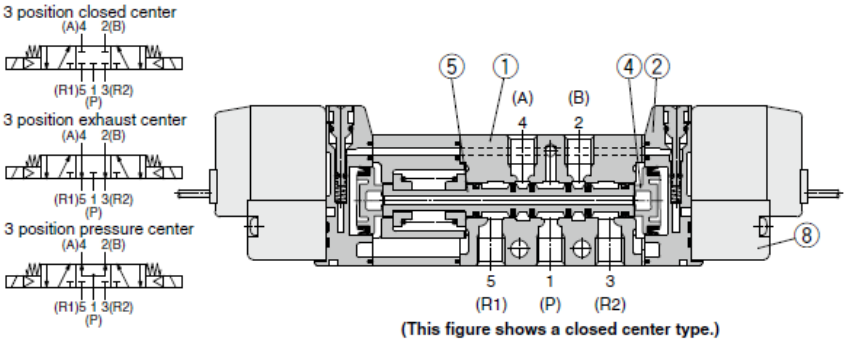
2 position single



2 position double



3 position closed center/exhaust center/pressure center



(This figure shows a closed center type.)

Component Parts

No.	Description	Material	Note
1	**Body**	Aluminum die-casted	White
2	**Piston plate**	Resin	White
3	**End cover**	Resin	White
4	**Piston**	Resin	—
5	**Spool valve assembly**	Aluminum, H-NBR	—
6	**Spool spring**	Stainless steel	—

Replacement Parts

No.	Description	Part no.	Note
7	**Sub-plate** Note)	SYJ5000-22-1 (-Q)	Aluminum die-casted
8	**Pilot valve**	V111(T)-□□□	
—	**Bracket assembly**	SYJ5000-13-3A	

∗ Add suffix "-Q" for the CE/UKCA-compliant product.

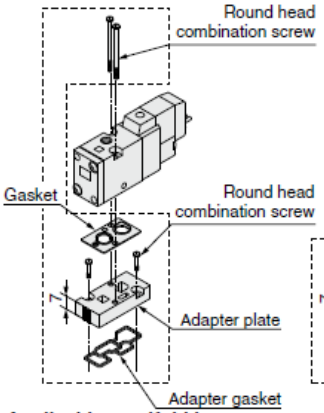
Mix Installation of the SYJ500 and the SYJ5000 Valves on the Same Manifold

- Use of an adapter plate makes it possible to mount the SYJ500 series on the manifold bases of the SYJ5000 series.
- When mounting the SYJ500 valve on the SYJ5000 manifold, the SYJ500 solenoid must be positioned on the same side of the manifold as a single solenoid SYJ500. (Refer to the figure below.)
- For base mounted type, the A port of the 3 port valve flows out the B port of manifold base.

Adapter Plate Assembly

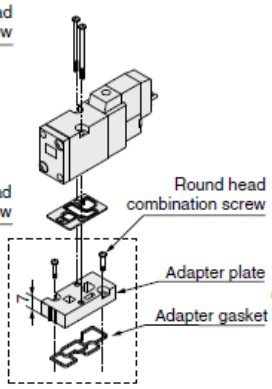
<Standard>

SYJ500-3-2A



Applicable manifold base
- Type SS5YJ5-20
- Type SS5YJ5-20P
- Type SS5YJ5-20SA

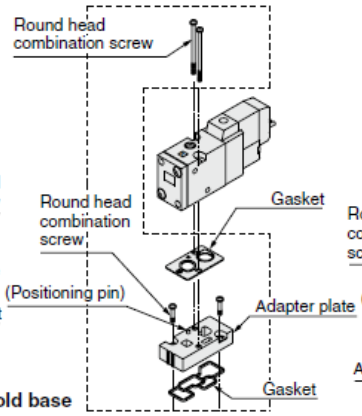
SYJ500-3-1A



Applicable manifold base
- Type SS5YJ5-40
- Type SS5YJ5-41
- Type SS5YJ5-42
- Type SS5YJ5-43
- Type SS5YJ5-41P
- Type SS5YJ5-42P
- Type SS5YJ5-43P
- Type SS5YJ5-41SA
- Type SS5YJ5-42SA
- Type SS5YJ5-43SA

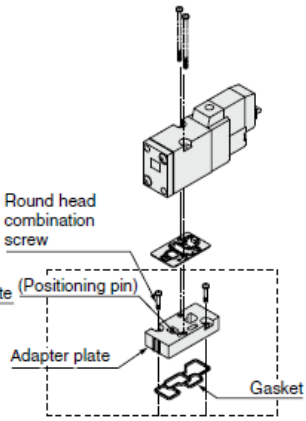
<CE/UKCA-compliant>

SYJ500-3-1A-1-Q



Applicable manifold base
- Type SS5YJ5-20-Q
- Type SS5YJ5-20P-Q
- Type SS5YJ5-20SA-Q

SYJ500-3-1A-2-Q



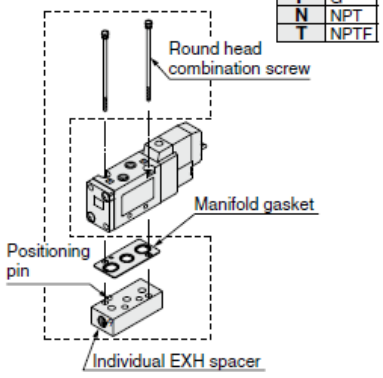
Applicable manifold base
- Type SS5YJ5-40-Q
- Type SS5YJ5-41-Q
- Type SS5YJ5-42-Q
- Type SS5YJ5-43-Q
- Type SS5YJ5-41P-Q
- Type SS5YJ5-43P-Q
- Type SS5YJ5-41SA-Q
- Type SS5YJ5-42SA-Q
- Type SS5YJ5-43SA-Q

Individual EXH Spacer Assembly

SYJ5000-17-3□A

Thread type

Nil	Rc
F	G
N	NPT
T	NPTF

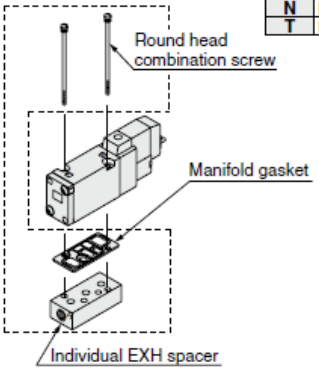


Applicable manifold base
- Type SS5YJ5-20(-Q)
- Type SS5YJ5-20P(-Q)
- Type SS5YJ5-20SA(-Q)

SYJ5000-17-4□A

Thread type

Nil	Rc
F	G
N	NPT
T	NPTF



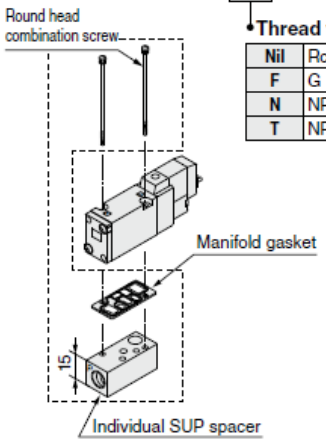
Applicable manifold base
- Type SS5YJ5-40(-Q)
- Type SS5YJ5-41(-Q)
- Type SS5YJ5-42(-Q)
- Type SS5YJ5-43(-Q)
- Type SS5YJ5-41P(-Q)
- Type SS5YJ5-43P(-Q)
- Type SS5YJ5-41SA(-Q)
- Type SS5YJ5-42SA(-Q)
- Type SS5YJ5-43SA(-Q)

Individual SUP Spacer Assembly

SYJ5000-16-2□A(-Q)

Thread type

Nil	Rc
F	G
N	NPT
T	NPTF



Applicable manifold base
- Type SS5YJ5-41(-Q)
- Type SS5YJ5-42(-Q)
- Type SS5YJ5-43(-Q)
- Type SS5YJ5-41P(-Q)
- Type SS5YJ5-43P(-Q)
- Type SS5YJ5-41SA(-Q)
- Type SS5YJ5-42SA(-Q)
- Type SS5YJ5-43SA(-Q)

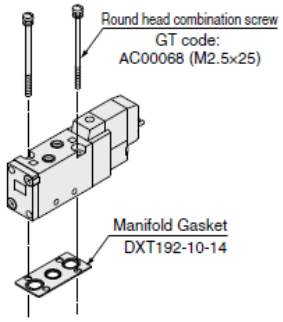
⚠ Caution

Mounting screw tightening torques	**M2.5: 0.45 N·m**

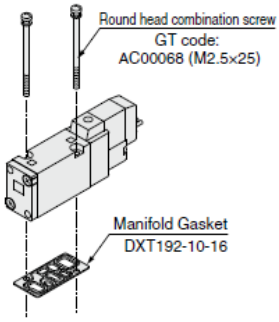
Use caution to the assembly orientation for solenoid valves, gasket, and optional parts.

Combinations of Solenoid Valve, Manifold Gasket and Manifold Base

<Standard>



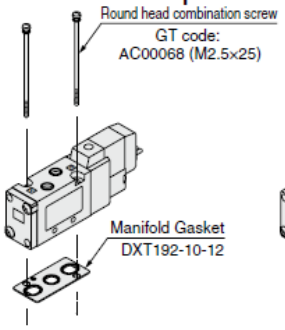
Applicable manifold base
- Type SS5YJ5-20
- Type SS5YJ5-20P
- Type SS5YJ5-20SA



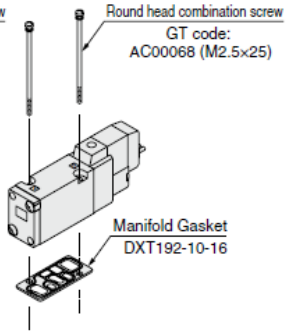
Applicable manifold base

Sub-plate
- Type SS5YJ5-40
- Type SS5YJ5-41
- Type SS5YJ5-42
- Type SS5YJ5-43
- Type SS5YJ5-41P
- Type SS5YJ5-43P
- Type SS5YJ5-41SA
- Type SS5YJ5-42SA
- Type SS5YJ5-43SA

<CE/UKCA-compliant>



Applicable manifold base
- Type SS5YJ5-20-Q
- Type SS5YJ5-20P-Q
- Type SS5YJ5-20SA-Q

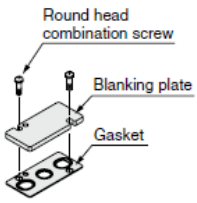


Applicable manifold base

Sub-plate
- Type SS5YJ5-40-Q
- Type SS5YJ5-41-Q
- Type SS5YJ5-42-Q
- Type SS5YJ5-43-Q
- Type SS5YJ5-41P-Q
- Type SS5YJ5-43P-Q
- Type SS5YJ5-41SA-Q
- Type SS5YJ5-42SA-Q
- Type SS5YJ5-43SA-Q

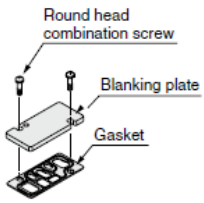
Blanking Plate Assembly

SYJ5000-21-5A



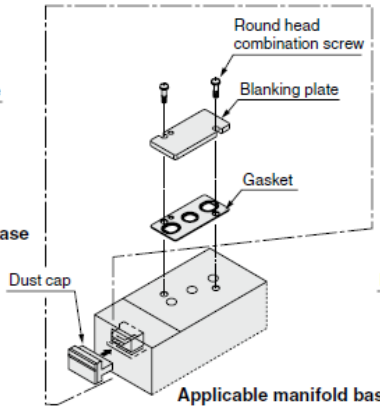
Applicable manifold base
- SS5YJ5-20(-Q)
- SS5YJ5-20SA(-Q)

SYJ5000-21-6A



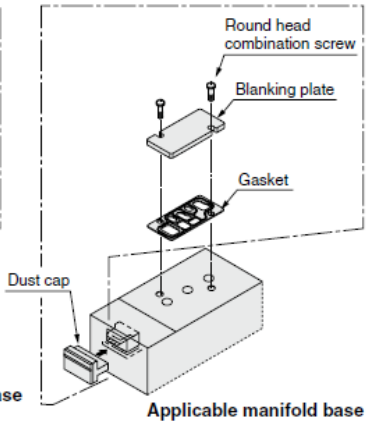
Applicable manifold base
- SS5YJ5-40(-Q)
- SS5YJ5-41(-Q)
- SS5YJ5-42(-Q)
- SS5YJ5-43(-Q)
- SS5YJ5-41SA(-Q)
- SS5YJ5-42SA(-Q)
- SS5YJ5-43SA(-Q)

SYJ5000-21-7A



Applicable manifold base
- SS5YJ5-20P(-Q)

SYJ5000-21-8A

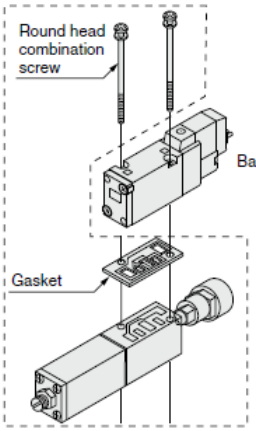


Applicable manifold base
- SS5YJ5-41P(-Q)
- SS5YJ5-43P(-Q)

Interface Regulator (P port regulation)

Spacer type regulating valve on manifold block can regulate the pressure to the valve individually.

ARBYJ5000-00-P(-Q)



Applicable manifold base
- Type SS5YJ5-40(-Q)
- Type SS5YJ5-41(-Q)
- Type SS5YJ5-42(-Q)
- Type SS5YJ5-43(-Q)

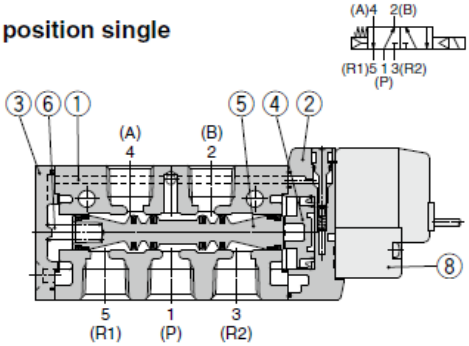
⚠ Caution

Mounting screw tightening torques	M2.5: 0.45 N·m

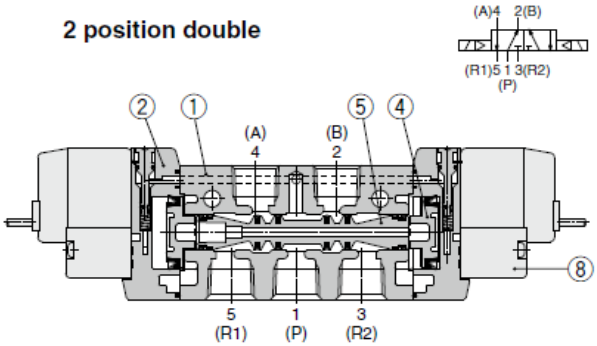
Use caution to the assembly orientation for solenoid valves, gasket, and optional parts.

Construction

2 position single

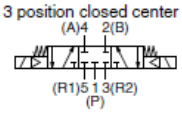


2 position double

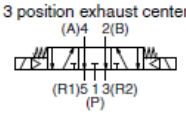


3 position closed center/exhaust center/pressure center

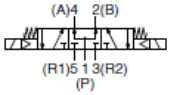
3 position closed center

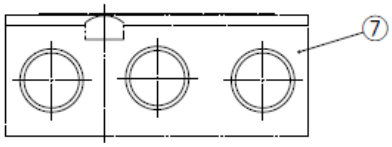


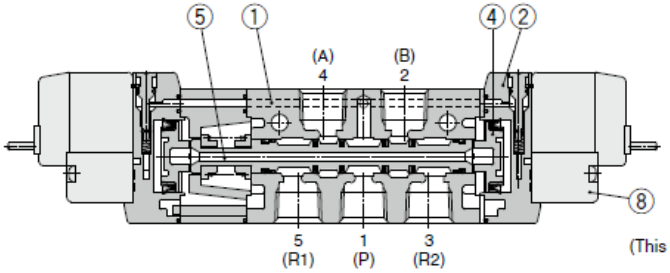
3 position exhaust center



3 position pressure center







(This figure shows a closed center type.)

Component Parts

No.	Description	Material	Note
1	**Body**	Aluminum die-casted	White
2	**Piston plate**	Resin	White
3	**End cover**	Aluminum die-casted	White
4	**Piston**	Resin	—
5	**Spool valve assembly**	Aluminum, H-NBR	—
6	**Spool spring**	Stainless steel	—

Replacement Parts

No.	Description	Part no.	Note	
7	**Sub-plate** Note)	SYJ7000-22-1(-Q)	1/8	Aluminum die-casted
		SYJ7000-22-2(-Q)	1/4	
8	**Pilot valve**	V111(T)-□□□	—	

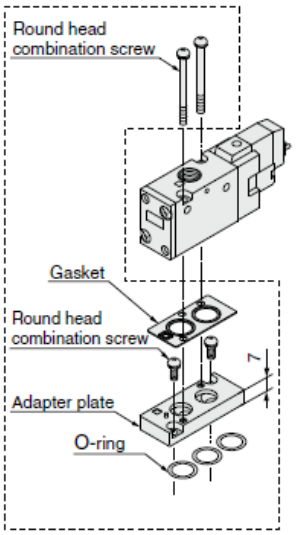
Note) Add suffix "-Q" for the CE/UKCA-compliant product.

Mix Installation of the SYJ700 and the SYJ7000 Valves on the Same Manifold

- Use of an adapter plate makes it possible to mount the SYJ700 series on the manifold bases of the SYJ7000 series.
- When mounting the SYJ700 valve on the SYJ7000 manifold, the SYJ700 solenoid must be positioned on the same side of the manifold as a single solenoid SYJ700. (Refer to the figure below.)
- For base mounted type, the A port of the 3 port valve flows out the B port of manifold base.

Adapter plate assembly SYJ700-3-1A(-Q)

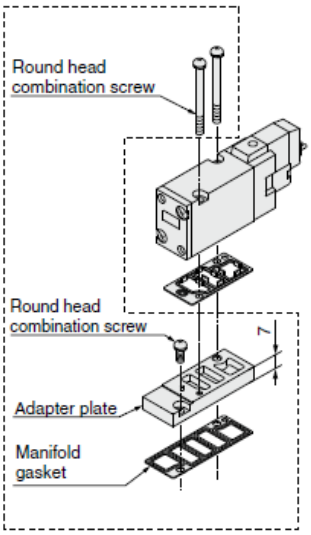
SYJ700 Series Body ported



Applicable manifold base
- Type SS5YJ7-20(-Q)
- Type SS5YJ7-21(-Q)
- Type SS5YJ7-21P(-Q)
- Type SS5YJ7-21SA(-Q)

Adapter plate assembly SYJ700-3-2A(-Q)

SYJ700 Series Base mounted

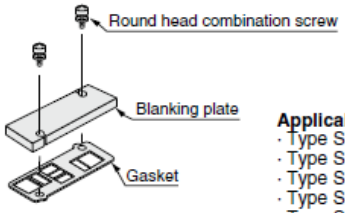


Applicable manifold base
- Type SS5YJ7-40(-Q)
- Type SS5YJ7-41(-Q)
- Type SS5YJ7-42(-Q)
- Type SS5YJ7-41SA(-Q)

Blanking Plate Assembly

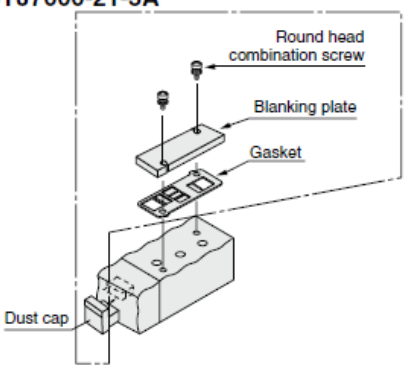
<Standard>

SYJ7000-21-1A



Applicable manifold base
- Type SS5YJ7-20
- Type SS5YJ7-21
- Type SS5YJ7-40
- Type SS5YJ7-41
- Type SS5YJ7-42
- Type SS5YJ7-41SA

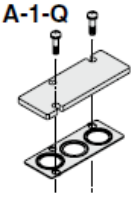
SYJ7000-21-3A



Applicable manifold base
- Type SS5YJ7-21P

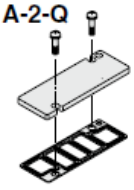
<CE/UKCA-compliant>

SYJ7000-21-1A-1-Q



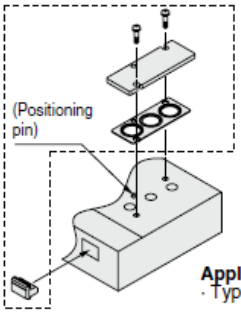
Applicable manifold base
- Type SS5YJ7-20-Q
- Type SS5YJ7-21-Q
- Type SS5YJ7-21SA-Q

SYJ7000-21-1A-2-Q



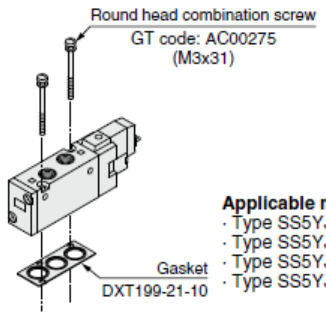
Applicable manifold base
- Type SS5YJ7-40-Q
- Type SS5YJ7-41-Q
- Type SS5YJ7-42-Q
- Type SS5YJ7-41SA-Q

SYJ7000-21-3A-Q

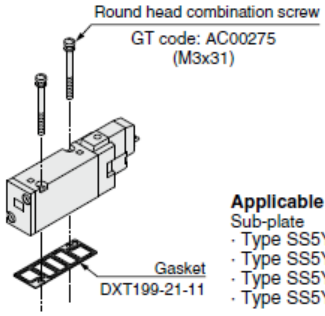


Applicable manifold base
- Type SS5YJ7-21P-Q

Combinations of Solenoid Valve, Manifold Gasket and Manifold Base



Applicable manifold base
- Type SS5YJ7-20(-Q)
- Type SS5YJ7-21(-Q)
- Type SS5YJ7-21P(-Q)
- Type SS5YJ7-21SA(-Q)



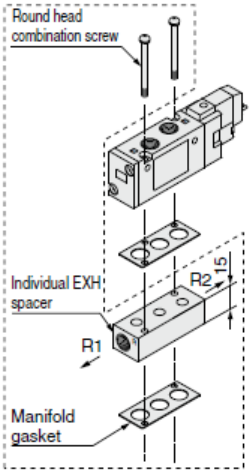
Applicable manifold base
Sub-plate
- Type SS5YJ7-40(-Q)
- Type SS5YJ7-41(-Q)
- Type SS5YJ7-42(-Q)
- Type SS5YJ7-41SA(-Q)

Individual EXH Spacer Assembly

SYJ7000-17-1□A(-Q)

Thread type

Nil	Rc
F	G
N	NPT
T	NPTF

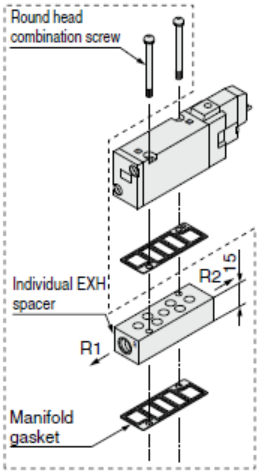


Applicable manifold base
- Type SS5YJ7-20(-Q)
- Type SS5YJ7-21(-Q)
- Type SS5YJ7-21P(-Q)
- Type SS5YJ7-21SA(-Q)

SYJ7000-17-2□A(-Q)

Thread type

Nil	Rc
F	G
N	NPT
T	NPTF



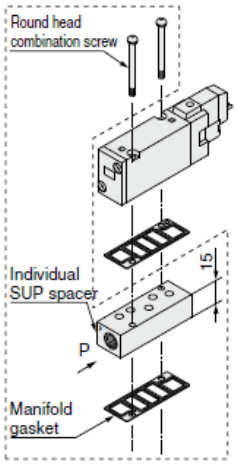
Applicable manifold base
- Type SS5YJ7-40(-Q)
- Type SS5YJ7-41(-Q)
- Type SS5YJ7-42(-Q)
- Type SS5YJ7-41SA(-Q)

Individual SUP Spacer Assembly

SYJ7000-16-2□A(-Q)

Thread type

Nil	Rc
F	G
N	NPT
T	NPTF

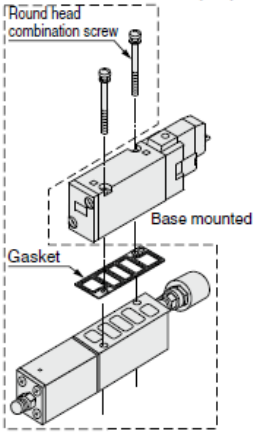


Applicable manifold base
- Type SS5YJ7-40(-Q)
- Type SS5YJ7-41(-Q)
- Type SS5YJ7-42(-Q)
- Type SS5YJ7-41SA(-Q)

Interface Regulator (P port regulation)

Spacer type regulating valve on manifold block can regulate the pressure to the valve individually.

ARBYJ7000-00-P(-Q)



Applicable manifold base
- Type SS5YJ7-40(-Q)
- Type SS5YJ7-41(-Q)
- Type SS5YJ7-42(-Q)

⚠ Caution

Mounting screw tightening torques

M3: 0.8 N·m

Use caution to the assembly orientation for solenoid valves, gasket, and optional parts.

How to Order Pilot Valve Assembly

V111 □ – 5 G □

Coil specifications

Nil	Standard
T	With power saving circuit (24, 12 VDC only)

* Power saving circuit is not available in the case of W□ type.

Rated voltage

5	24 VDC
6	12 VDC
V	6 VDC
S	5 VDC
R	3 VDC
1	100 VAC 50/60 Hz
2	200 VAC 50/60 Hz
3	110 VAC 50/60 Hz [115 VAC 50/60 Hz]
4	220 VAC 50/60 Hz [230 VAC 50/60 Hz]

* For type W□, DC voltage is only available.
* CE/UKCA-compliant: For DC only.

Light/Surge voltage suppressor

Nil	Without light/surge voltage suppressor
S	With surge voltage suppresor
Z	With light/surge voltage suppressor
R	With surge voltage suppressor (Non-polar type)
U	With light/surge voltage suppressor (Non-polar type)

* For AC voltage valves there is no "S" option. It is already built-in to the rectifier circuit.
* For type "R" and "U", DC voltage is only available.
* Power saving circuit is only available in the "Z" type.

Electrical entry

G	Grommet, 300 mm lead wire	
H	Grommet, 600 mm lead wire	
L	L plug connector	With lead wire
LN		Without lead wire
LO		Without connector
M	M plug connector	With lead wire
MN		Without lead wire
MO		Without connector
WO	M8 connector	Without connector cable
W□		With connector cable Note 1)

* For connector cable of M8 connector, refer to page 13 and 14.

Note 1) Enter the cable length symbols in □.Please be sure to fill in the blank referring to page 13 and 14.

V115 – 5 D □

Rated voltage

5	24 VDC
6	12 VDC
1	100 VAC 50/60 Hz
2	200 VAC 50/60 Hz
3	110 VAC 50/60 Hz [115 VAC 50/60 Hz]
4	220 VAC 50/60 Hz [230 VAC 50/60 Hz]

* DC specifications of type D and DO is only available with 12 and 24 VDC.
* Power saving circuit is not available in the case of D or DO type.

Light/Surge voltage suppressor

Nil	Without light/surge voltage suppressor
S	With surge voltage suppressor (Non-polar type)
Z	With light/surge voltage suppressor (Non-polar type)

* DOZ and YOZ are not available.
* For AC voltage valves there is no "S" option. It is already built-in to the rectifier circuit.

Electrical entry

D	DIN terminal (Type D)	With connector
DO		Without connector
Y	DIN terminal (Type Y)	With connector
DO		Without connector

Note) Do not replace V111 (G, H, L, M, W) to V115 (DIN terminal) and vice versa when replacing pilot valve assembly only.

Note) Since V111 and V115 are CE/UKCA-compliant as standard, the suffix "-Q" is not necessary.

⚠ Caution

Mounting screw tightening torques

V111 : 0.12N・m

V115 : 0.16N・m

TROUBLE SHOOTING

Trouble	For valve non-conformance, take following countermeasures referring to trouble.	Possible cause	Countermeasures
Malfunction No air changeover.	The valve operates when the manual override button is pushed? No →	**1) Operation failure or sticking of the main valve.** ●Foreign matter from the piping and air source got caught in the main valve, causing a malfunction. ●Malfunction occurred due to sticking such as swelling of the rubber part of the main valve.	- Replace the valve. - Clean the air supply. - If incorrect oil has been used for lubrication, remove the oil by air blow. - If there is a large amount of condensate or condensate cannot be removed completely, mount an auto drain or install a dryer and replace the valve.
	Yes	**2) Pressure drop** Air source pressure is reduced and minimum operating pressure of the valve was not reached, causing an operation failure.	- Adjust the pressure within the specification range for the valve.
		3) Excessive oil supply Due to excessive lubrication, oil accumulated inside the valve, causing malfunction.	- Reduce the amount of lubrication to the amount at which the oil does not splash from the exhaust port [5/3 (EA/EB)].
	Energized? Is valve switched? No →	**1) Non-conformance of electric system** - Incorrect wiring - Fuse blown out, lead wire broken - Incorrect contact at the contact and connection - Sequencer non-conformance	- Check all parts and replace the part, if necessary.
	Yes	- Supply voltage insufficient	- Check the supply voltage.
		2) Drop of supply voltage Operation failure of the valve due to voltage drop.	- Check the supply voltage. Take corrective action if voltage drop is confirmed.
		3) Non-conformance of the installed pilot valve - Broken wire in the coil or burnout (High supply voltage, incorrect coil specification, entry of water)	- Replace the valve. - Protect the valve especially the coil to prevent being exposed to water.
	→	**1) Leakage current** Operation failure of the valve occurred due to residual voltage. (Valve is not turned OFF)	- Check the residual voltage. - Keep the residual voltage at 3% of the rated voltage or less.
		2) Non-conformance of the installed pilot valve - Foreign matter is caught in the moving part of the valve (or pilot valve). - Swelling of rubber parts inside the valve (or pilot valve)	- Clean the air supply. - Eliminate foreign matter with air blow. - Replace the valve when actions above do not improve the condition.

Trouble	For valve non-conformance, take following countermeasures referring to trouble.	Possible causes	Countermeasures
Air leakage	Find and check the air leakage point. 1. Leakage between valve and base. (Base mounted type)	**1) Valve mounting screw is loose**	- Tighten the mounting screw. **Proper tightening torque** - M1.7: 0.12N・m - M2.5: 0.45N・m - M3: 0.8N・m
		2) Damage or displacement of the gasket	- If gasket is scratched, replace the gasket.
		3) Foreign matter caught in the gasket seat	- Eliminate foreign matter with air blow. - If gasket is scratched, replace the gasket.
	2. Air leakage from output [2(B),4(A)] port and exhaust [5 (EA),3(EB)] port.	**1) Valve mounting screw is loose**	- Tighten the mounting screw. **Proper tightening torque** - M1.7: 0.12N・m - M2.5: 0.45N・m - M3: 0.8N・m - If gasket is scratched, replace the gasket.
		2) Internal air leakage increased because foreign matter get caught in the main valve.	- Replace the valve. - Clean the air supply.
		3) Sealing failure of the actuator (cylinder)	- Refer to the operation manual of the actuator for details.
	3. Air leakage from the pilot valve air exhaust port (PE port). (External pilot type)	**1) Foreign matter is caught in the pilot valve armature.**	- Replace the valve. - Clean the air supply.

If the countermeasures above are not effective, there may be a trouble with the valve.
Stop using the valve immediately.

If any of the examples below are applicable, there may be an internal trouble with the valve.
Stop using the valve immediately.
① It was used with a voltage other than the rated voltage.
② The supplied oil was not the specified type.
③ Lubrication was stopped during operation. or lubrication was interrupted temporarily.
④ Severe impact was applied.
⑤ Foreign matter such as condensate or dust has entered into the product.
⑥ Other than the cases mentioned above, any usage which falls under the precautions in this operation manual.

※ If you request us to investigate, please send the valve back to us in its original condition without disassembling it.

Revision history		
A	Safety Instructions	oZ
B	Precautions for Solenoid Valve	2025.3

1st Printing :MX

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