



# Operation Manual

PRODUCT NAME

3 Port Solenoid Valve

MODEL/ Series

SYJ300/500/700 Series

**SMC Corporation**

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# 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)\*<sup>1)</sup>, 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.



# 3-Port Solenoid Valves Precautions 1

Be sure to read this before handling products.

## Design/Selection

### Warning

#### 1. Confirm the specifications.

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 (such as the installation of a cover or the restricting of access to the product) to prevent potential danger caused by actuator operation.

#### 3. Effects of back pressure when using a manifold

Use caution when valves are used on a manifold because actuators may malfunction due to back pressure. Use caution when driving the single acting cylinder.

#### 4. Holding pressure (including vacuum)

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

#### 5. Not suitable for use as an emergency shutoff 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 in such applications, additional safety measures should be adopted.

#### 6. Release of residual pressure

For maintenance and inspection purposes install a system for releasing residual pressure.

#### 7. 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 supply a constant supply of vacuum. Failure to do so may result in foreign matter sticking to the adsorption pad or air leakage, causing the workpiece to drop.

#### 8. Regarding vacuum switch valves and vacuum release valves

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

#### 9. 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.

#### 10. 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 either DC specification, power-saving type. In addition, it is possible to shorten the energized time by making a valve with an N.O. (normally open) specification.

#### 11. Do not disassemble the product or make any modifications, including additional machining.

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

#### 12. Resumption after a long period of holding time

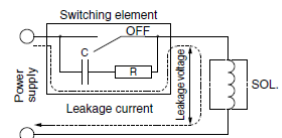
When resuming operation after a long period of holding time, there are cases in which, regardless of whether the product is in an ON or OFF state, there is a delay in the initial response time due to adhesion. Conducting several cycles of running-in operation will solve this problem. Please consider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

## Design/Selection

### Caution

#### 1. Leakage voltage

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



DC coil 3% or less of the rated voltage  
AC coil 8% or less of the rated voltage

#### 2. Solenoid valve drive for AC with a 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 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.

##### 3) Solenoid valve with full wave rectifier circuit

When the solenoid valve built-in full wave rectifier circuit with AC specifications is used, a return failure of the solenoid valve may occur depending on the kind of triac output circuit. Carefully check this point when selecting a SSR or sequencer.

For details, contact the SSR or sequencer manufacturer.



## SYJ Series

# 3-Port Solenoid Valves Precautions 2

Be sure to read this before handling products.

### Design/Selection

## ⚠ Caution

### 3. Surge voltage suppressor

- 1) The surge voltage suppressor built into the valve is intended to protect the output contacts so that the surge generated inside valve does not adversely affect the output contacts. Therefore, if an overvoltage or overcurrent is received from an external peripheral device, the surge voltage protection element inside the valve is overloaded, causing the element to break. In the worst case, the breakage causes the electric circuit to enter short-circuit status. If energizing continues while in this state, a large current flows. This may cause secondary damage to the output circuit, external peripheral device, or valve, and may also cause a fire. So, take appropriate protective measures, such as the installation of an overcurrent protection circuit in the power supply or a drive circuit to maintain a sufficient level of safety.
- 2) 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.

### 4. 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 a 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 (with polarity protection diode), or install a surge absorption diode between the loading equipment COM line and the output equipment COM line (see Figure 2).

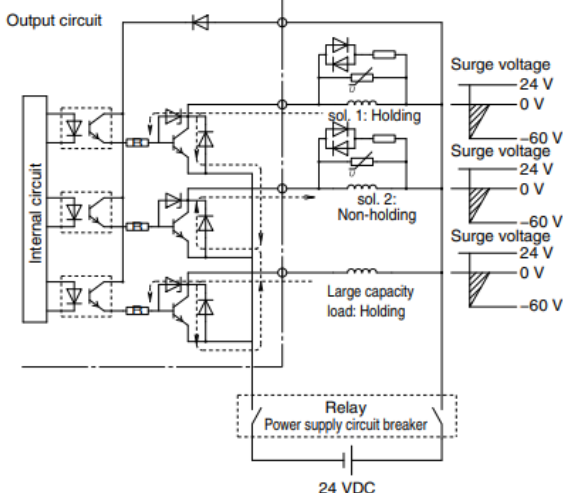


Figure 1. Surge intrusion circuit example (NPN outlet example)

## ⚠ Caution

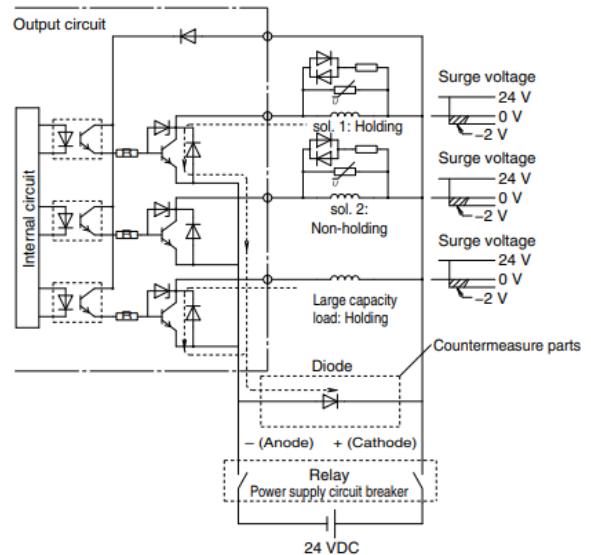


Figure 2. Surge intrusion countermeasure example (NPN outlet example)

### 5. Operation in low temperature conditions

It is possible to operate a valve in extreme temperatures, as low as  $-10^{\circ}\text{C}$ . Take appropriate measures to avoid the freezing of drainage, moisture, etc., in low temperatures.

### 6. 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 effect on the internal pilot type valve when internal pilot type valves 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.

### 7. Mounting orientation

The mounting orientation is universal.

### 8. Initial lubrication of main valve

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

- Rubber seal, spool valve: Grease

### 9. 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.



## SYJ Series

# 3-Port Solenoid Valves Precautions 3

Be sure to read this before handling products.

### 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 and inspection.

##### 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 operate 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 on 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

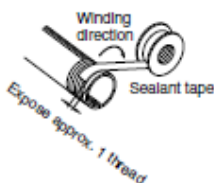
##### 1. Refer to the Fittings and Tubing Precautions for handling One-touch fittings.

##### 2. Preparation before piping

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

##### 3. Winding of sealant 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 sealant tape is used, leave 1 thread ridge exposed at the end of the threads.



##### 4. Connection of piping and fittings

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

- 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.

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

#### Caution

- 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

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

- Insufficient tightening may cause seal failure or loosen the threads.

- For reuse

- Normally, fittings with a sealant can be reused up to 2 to 3 times.
- To prevent air leakage through the sealant, remove any loose sealant stuck to the fitting by blowing air over the threaded portion.
- 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.
- Once the fitting has been tightened, backing it out to its original position often causes the sealant to become defective. Air leakage will occur.

##### 5. Uni thread fittings

- 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

- 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.

##### 6. Piping to products

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





## SYJ Series

# 3-Port Solenoid Valves Precautions 4

Be sure to read this before handling products.

### 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 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, be careful to apply the proper voltage. Improper voltage may cause malfunction or coil damage.

##### 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.

### Lubrication

#### Warning

##### 1. Lubrication

- 1) All valves except those listed below have been lubricated for life by the manufacturer and therefore do not require lubrication while in service.
- 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 lubricant is utilized within the system, since the original lubricant applied within the product during manufacturing will be washed away, please continue to supply lubrication to the system. Without continued lubrication, malfunctions could occur. If turbine oil is used, refer to the Safety Data Sheet (SDS) of the oil.

##### 2. Lubrication amount

If the lubrication amount is excessive, the oil may accumulate inside the pilot valve, causing malfunction or response delay.

So, do not apply a large amount of oil. When a large amount of oil needs to be applied, use an external pilot type to put the supply air on the pilot valve side in the non-lube state.

This prevents the accumulation of oil inside the pilot valve.

### 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 the 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. This may cause 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.

For compressed air quality, refer to the SMC Best Pneumatics No. 6 catalog.

##### 4. Use clean air.

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

#### 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 the 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 an excessive amount of carbon powder is present, 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 the SMC Best Pneumatics No. 6 catalog.





**SYJ Series**

## 3-Port Solenoid Valves Precautions 5

Be sure to read this before handling products.

### Operating Environment

#### **Warning**

1. Do not use in an atmosphere containing corrosive gases, chemicals, sea water, water, water steam, or where there is direct contact with any of these.
2. Products with IP65 and IP67 enclosures (based on IEC60529) are protected against dust and water. However, these products cannot be used in water.
3. Products compliant with IP65 and IP67 satisfy the product specifications when mounted properly. 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. Note that the valve is not for outdoor use.
7. Remove any sources of excessive heat.
8. If it is 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 or it's energized for a long period of time, make sure the ambient temperature is within the specifications of the valve.

#### **Caution**

1. **Temperature of ambient environment**  
Use the valve within the range of the ambient temperature specification of each valve. In addition, pay attention when using the valve in environments where the temperature changes drastically.
2. **Humidity of ambient environment**
  - When using the valve in environments with low humidity, take measures to prevent static.
  - If the humidity rises, take measures to prevent the adhesion of water droplets on the valve.

### Maintenance

#### **Warning**

1. **Perform maintenance and inspection according to the procedures indicated in the operation manual.**  
If handled improperly, human injury and/or malfunction or damage of machinery and 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.  
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.
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**  
When a manual override is operated, connected equipment will be actuated.  
Operate only after safety is confirmed.
5. **If the volume of air leakage increases or the valve does not operate normally, do not use the valve. Perform periodic maintenance on the valve to confirm the operating condition and check for any air leakage.**

#### **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.



## SYJ Series

# Specific Product Precautions 1

Be sure to read this before handling the products.

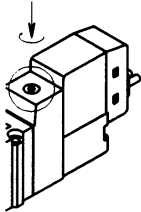
### Manual Override Operation

#### ⚠ Warning

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

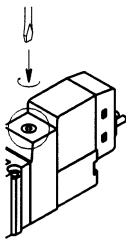
#### ■Non-locking push type [Standard]

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



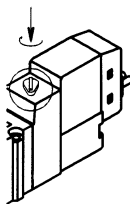
#### ⚠ Caution

When operating the locking type D with a screw driver, turn it gently using a watchmakers screw driver.

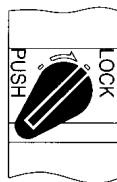
[Torque: Less than 0.1 N.m]

#### ■Push-turn locking lever 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.



Locked 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 200, 220 VAC Specifications

#### ⚠ Warning

Solenoid valves with grommet and L/M type plug connector AC specifications have a built-in rectifier circuit in the pilot section to operate the DC coil.

With 200, 220 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.

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

#### ⚠ Caution

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

SYJ300.....	P.17
SYJ500.....	P.19
SYJ700.....	P.21



## SYJ Series

# Specific Product Precautions 2

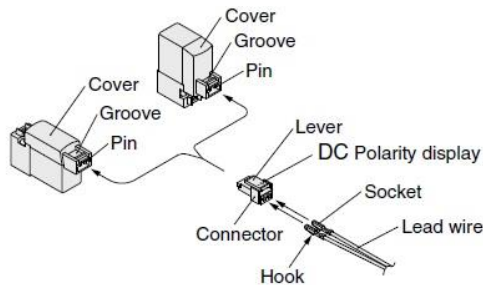
Be sure to read this before handling the products.

### 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.

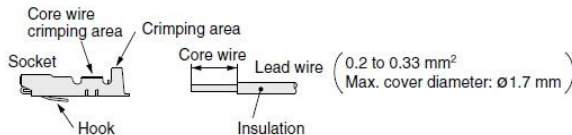


##### 2. Crimping of lead wires and sockets

Strip 3.2 to 3.7 mm 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.

Use an exclusive crimping tool for crimping.

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



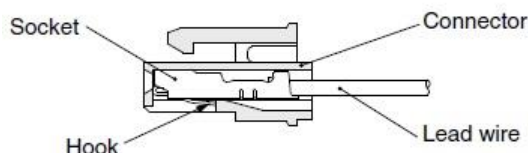
##### 3. Attaching and detaching sockets with lead wires

###### • Attaching

Insert the sockets into the square holes of the connector (+, - indication), and continue to push 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. 1 mm). If the socket will be used again, first spread the hook outward.



### Plug Connector Lead Wire Length

#### ⚠ Caution

Standard length is 300 mm, but the following lengths are also available.

### How to Order Connector Assembly

For DC: **SY100-30-4A**

For 100 VAC: **SY100-30-1A**

For 200 VAC: **SY100-30-2A**

For other voltages of AC: **SY100-30-3A**

Without lead wire: **SY100-30-A**  
(with connector and 2 of sockets only)

#### How to Order

Include the connector assembly part number together with the part number for the plug connector's solenoid valve without connector.

EX.) In case of 2000 mm of lead wire

<b>For DC</b>	<b>For AC</b>
SYJ312-5LO-M3	SYJ312-1LO-M3
SY100-30-4A-20	SY100-30-1A-20

#### • Lead wire length

	Lead wire length
Nil	300 mm
6	600 mm
10	1000 mm
15	1500 mm
20	2000 mm
25	2500 mm
30	3000 mm
50	5000 mm



## SYJ Series

# Specific Product Precautions 3

Be sure to read this before handling the products.

### Surge Voltage Suppressor

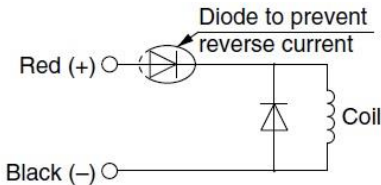
## Caution

<For DC>

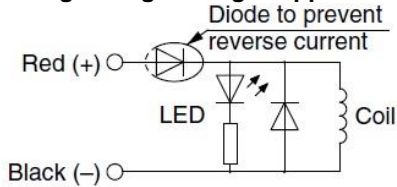
**Grommet, L/M Plug Connector**

### Standard type (with polarity)

Surge voltage suppressor (□S)

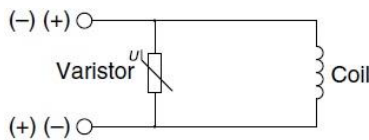


With light/surge voltage suppressor (□Z)

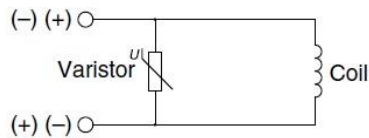


### Non-polar type

With surge voltage suppressor (□R)



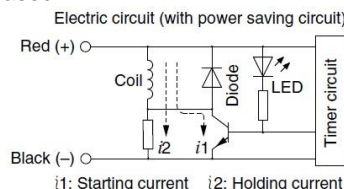
With light/surge voltage suppressor (□U)



- 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 24 and 12 VDC 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.)

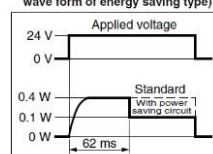


### Operating Principle

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

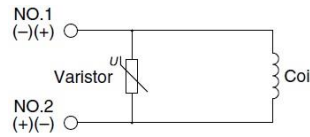
- Please be careful not to reverse the polarity, since a diode to prevent the reversed current is not provided for the power saving circuit.

(In the case of SYJ<sup>3</sup>□□T, the electric wave form of energy saving type)

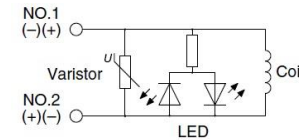


### DIN Terminal

With surge voltage suppressor (DS)



With light/surge voltage suppressor (DZ)

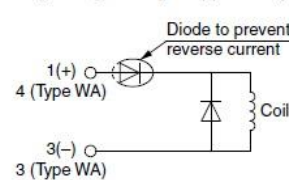


DIN terminal has no polarity.

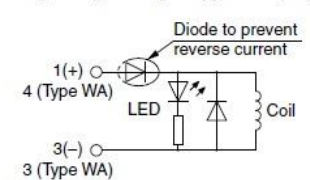
### M8 Connector

Standard type (with polarity)

With light/surge voltage suppressor (□S)

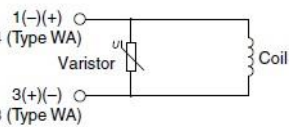


With light/surge voltage suppressor (□Z)

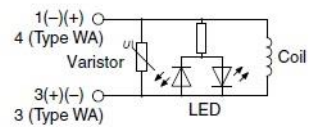


### Non-polar type

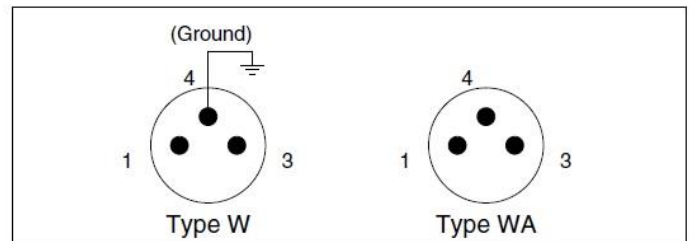
With surge voltage suppressor (□R)



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.



## SYJ Series

# Specific Product Precautions 4

Be sure to read this before handling the products.

### Surge Voltage Suppressor

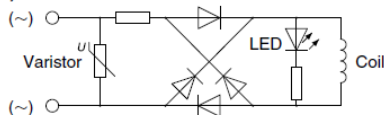
## Caution

<For AC>

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

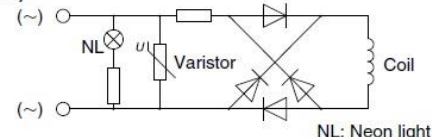
### Grommet, L/M Plug Connector

With light (□Z)



### DIN Terminal

With light (DZ)



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. The residual voltage of the diode is approximately 1 V.

### DIN Terminal Type Y

A type Y DIN connector is a DIN connector conforming to the 8-mm standard pitch between DIN terminals.

## Caution

- Since a type D DIN connector has a 9.4-mm pitch between DIN terminals, it is not interchangeable.
- Type D DIN connectors have the "N" indication at the end of rated voltage symbol. (For DIN connectors without lights, "N" is not indicated. Please refer to the name plate to distinguish.)
- Dimensions are the same as type D DIN connector.
- When replacing only the pilot valve assembly, V115-□D is interchangeable with V115-□Y. Do not replace V111 (G, H, L, M, W) to V115-□Y (DIN terminal), or 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 terminal 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

### 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.

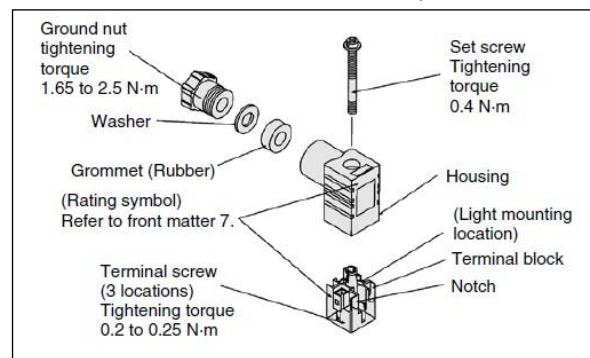
### Precautions

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

### Compatible cable

Cord O.D.:  $\phi 3.5$  to  $\phi 7$

(Reference) 0.5 mm<sup>2</sup>, 2-core or 3-core, equivalent to JIS C 3306



### DIN Connector Part No.

#### <Type D>

Without light	SY100-61-1
---------------	------------

#### With light

Rated voltage	Voltage symbol	Part no.
DC24V	24V	SY100-61-3-05
DC12V	12V	SY100-61-3-06
AC100V	100V	SY100-61-2-01
AC200V	200V	SY100-61-2-02
AC110V	110V	SY100-61-2-03
AC220V	220V	SY100-61-2-04

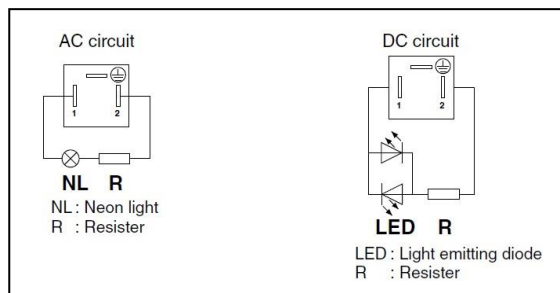
#### <Type Y>

Without light	SY100-82-1
---------------	------------

#### With light

Rated voltage	Voltage symbol	Part no.
DC24V	24VN	SY100-82-3-05
DC12V	12VN	SY100-82-3-06
AC100V	100VN	SY100-82-2-01
AC200V	200VN	SY100-82-2-02
AC110V(AC115V)	110VN	SY100-82-2-03
AC220V(AC230V)	220VN	SY100-82-2-04

### Circuit Diagram with Light







## SYJ Series Specific Product Precautions 5

Be sure to read this before handling the products.

### 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.

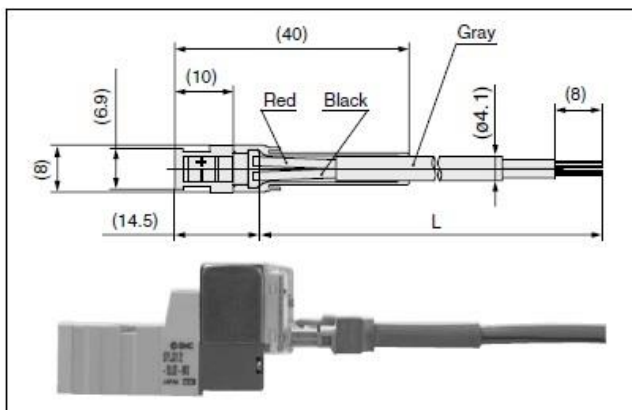
#### How to Order

SY100-68-A-□

● Lead wire length

Nil	300mm
6	600mm
10	1000mm
15	1500mm
20	2000mm
25	2500mm
30	3000mm
50	5000mm

#### Connector Assembly with Cover : Dimensions



#### How to Order

Enter the part number for a plug connector solenoid valve without connector together with the part number for a connector assembly with cover.

〈Ex1〉 Lead wire length of 2000mm

SYJ312-5LOZ-M3

SY100-68-A-20

〈Ex2〉 Lead wire length of 300mm (standard)

SYJ312-5LPZ-M3

Symbol for connector assembly with cover

※In this case, the part number for the connector assembly with cover is not required.

### 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 (V100-49-1-□) 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 10.5 mm or less when used with the SYJ300 series manifold. If more than 10.5 mm, 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)
3. The excessive stress on the cable connector will not be able to satisfy the IP65 rating. Please use caution and do not apply a stress of 30 N or greater.

#### ⚠ Caution

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

##### • Connector cable mounting



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 (V100-49-1-□). Be careful not to squeeze it in the wrong direction, as problems such as pin damage may occur.

##### ■ Connector cable

- 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<sup>3</sup><sub>5</sub><sup>7</sup>□□□-□□□□-□□

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

SYJ312-5W1ZE-M3

Symbol for electrical entry

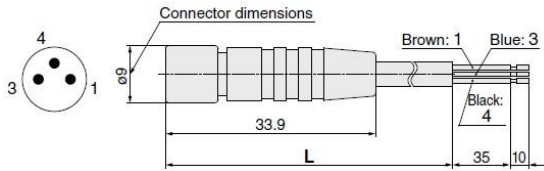


## SYJ Series Specific Product Precautions 6

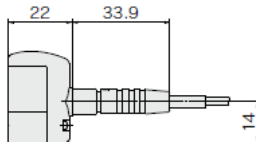
Be sure to read this before handling the products.

### M8 Connector

#### 1. To order connector cable only



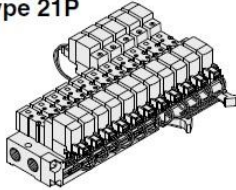
Cable length(L)	Part no.
300mm	V100-49-1-1
500mm	V100-49-1-2
1000mm	V100-49-1-3
2000mm	V100-49-1-4
5000mm	V100-49-1-7



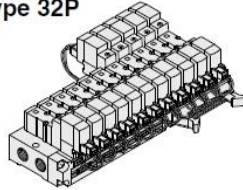
### Flat Ribbon Cable Manifold

#### ⚠ Caution

Type 21P



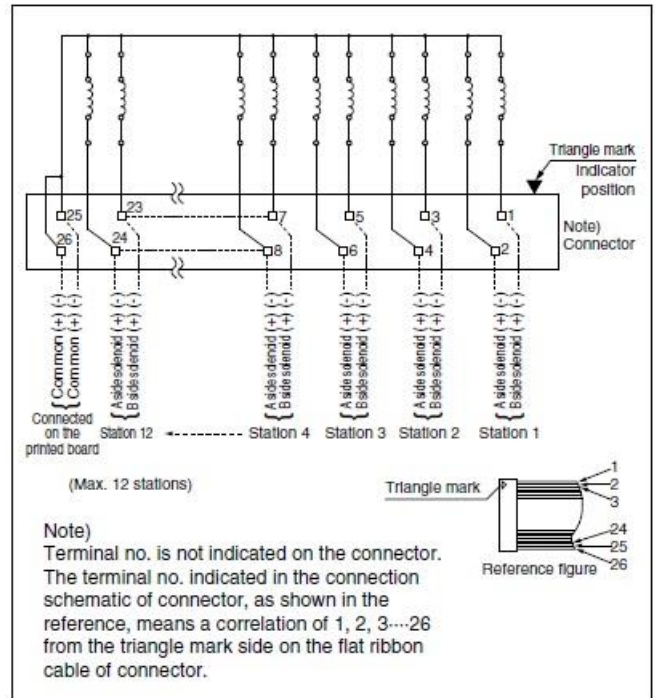
Type 32P



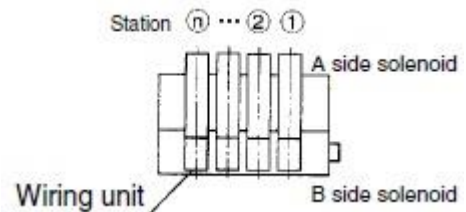
- In the manifold valves, the wiring to the individual valves is provided on a printed circuit board, and the connection to the external wires is consolidated through the use of a flat ribbon cable.
- A single MIL flat ribbon cable connects the entire manifold to your power source. This greatly reduces installation time.

### Flat Ribbon Cable Manifold

#### 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. For more stations, contact SMC.
- 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.







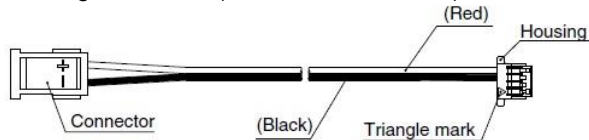
## SYJ Series Specific Product Precautions 7

Be sure to read this before handling the products.

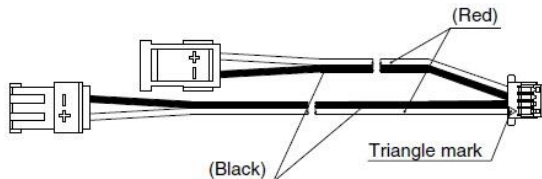
### EX510 Gateway-type Serial Transmission System

#### When ordering the connector assembly only

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



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



#### Connector Assembly Order No.

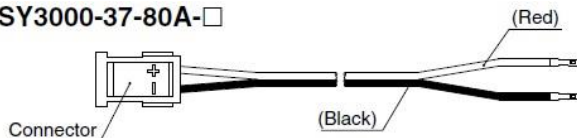
(Can be used for the manifold without a specified layout (8 stations or less))

Model	Part no.	Connector mounting position
SS5YJ3- <sup>21</sup> <sub>,32</sub> SA	SY3000-37-81A-2-N	Single : 1 to 4stations
	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- <sup>20</sup> <sub>,40</sub> , <sup>42</sup> <sub>,43</sub> SA	SY3000-37-81A-2-N	Single : 1 to 8stations
	SY3000-37-81A-2-5	Double/3 position : 1 to 8 stations
SS5YJ7- <sup>21</sup> <sub>,41</sub> SA	SY3000-37-81A-3-N	Single : 1 to 8stations
	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- <sup>21</sup> <sub>,32</sub> SA	SY3000-37-80A-5	On A side	1 to 8stations
	SY3000-37-80A-2	On B side	
	SY3000-37-80A-7	On A side	9 to 16stations
	SY3000-37-80A-4	On B side	
SS5YJ5- <sup>20</sup> <sub>,40</sub> , <sup>42</sup> <sub>,43</sub> SA	SY3000-37-80A-5	On A side	1 to 8stations
	SY3000-37-80A-2	On B side	
	SY3000-37-80A-7	On A side	9 to 12stations
	SY3000-37-80A-4	On B side	
	SY3000-37-80A-9	On A side	13 to 16stations
	SY3000-37-80A-7	On B side	
SS5YJ7- <sup>21</sup> <sub>,41</sub> SA	SY3000-37-80A-7	On A side	1 to 8stations
	SY3000-37-80A-3	On B side	
	SY3000-37-80A-10	On A side	9 to 12stations
	SY3000-37-80A-6	On B side	
	SY3000-37-80A-12	On A side	13 to 16stations
	SY3000-37-80A-9	On B side	

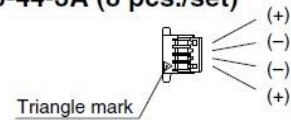
Note 1) The above is for station addition or maintenance. When ordering a connector assembly separately, a number will not be printed on the connector.

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 types of SYJ300 , do not use it without bracket.

### Replacement of Pilot Valve

#### Caution

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

Series	Thread size	Tightening torque
SYJ300	M1.7	0.12N.m
SYJ500	M2.5	0.45N.m
SYJ700	M3	0.8N.m



## SYJ Series Specific Product Precautions 8

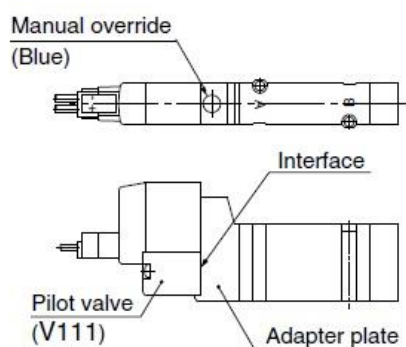
Be sure to read this before handling the products.

### Replacement of Pilot Valve

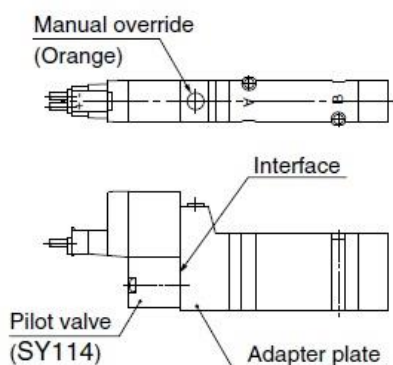
#### Caution

Pilot valves in this series are improved to provide excellent energy saving results. However following this improvement, these new valves are no longer compatible with the current pilot valve used at the interface. Consult with SMC when you need to exchange these pilot valves, in the case of manual override (marked in orange) of the adapter plate.

#### New type

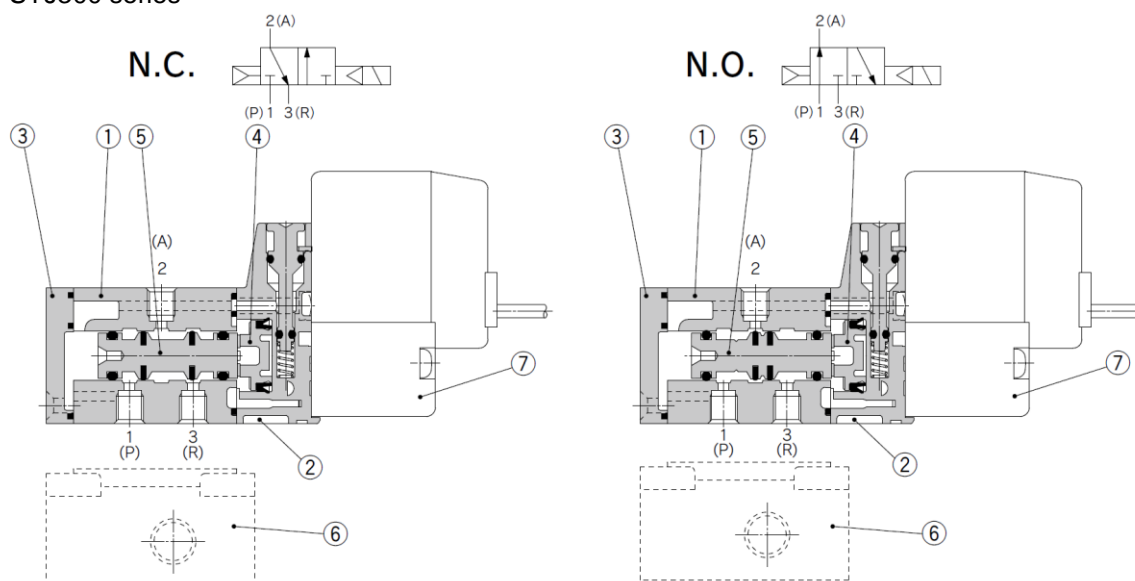


#### Current type



## Construction

### SYJ300 series



### 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	Aluminum+HNBR	-

### Replacement Parts

No.	Description	Part no.	Material
6	Sub-plate <sup>Note1)</sup>	SYJ300-9-1(-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.

### ①SS5YJ3-20,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

### ②SS5YJ3-31,-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:

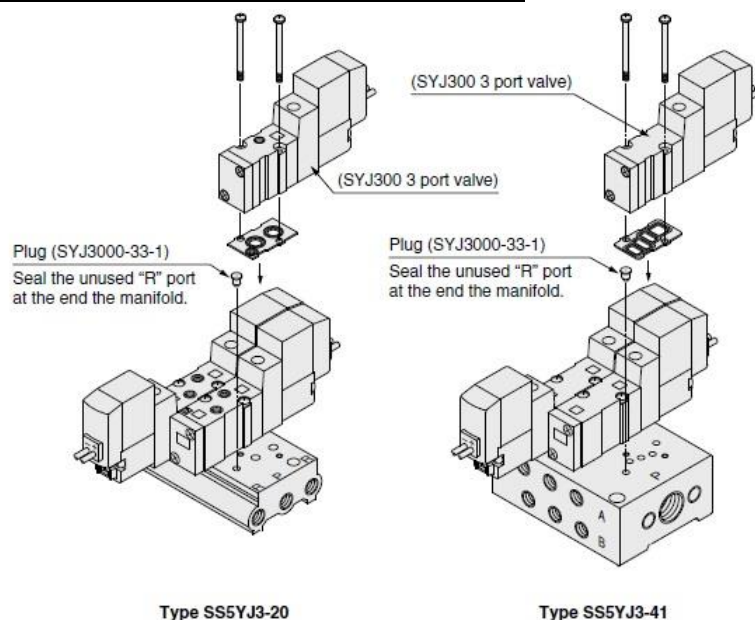
SYJ314,SYJ314M,SYJ324,SYJ324M

### ③SS5YJ3-41,-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



### Mounting screw tightening torques

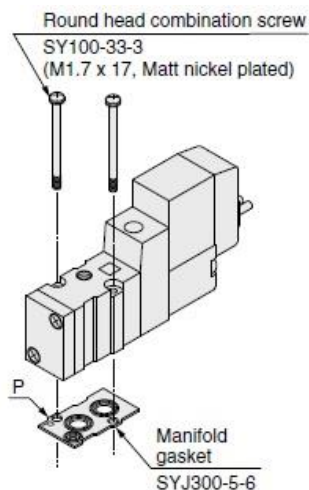
M1.7 : 0.12N·m

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

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

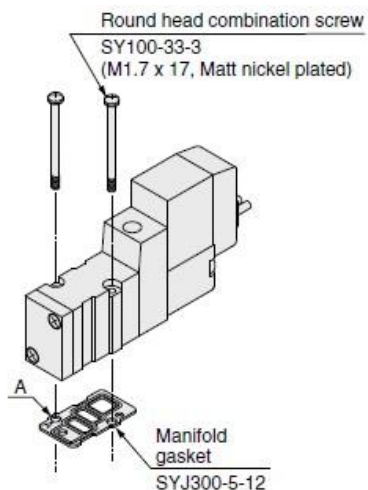
### Combinations of Solenoid Valve, Manifold, Gasket and Manifold Base

Body ported(Type SYJ3□2(R)(-Q))



**Applicable base**  
SS3YJ3-20(-Q) | Manifold  
SS3YJ3-20R(-Q) | base

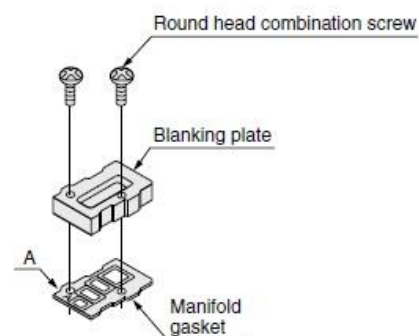
Base mounted(Type SYJ3□4(R)(-Q))



**Applicable base**  
**Sub-plate**  
SS3YJ3-41(-Q)  
SS3YJ3-S41(-Q)  
SS3YJ3-42(-Q)  
SS3YJ3-S42(-Q)  
SS3YJ3-42R(-Q)  
SS3YJ3-S42R(-Q) } Manifold  
base

### Blanking Plate Assembly

Part no. : SYJ300-10-7A(-Q)



**Applicable base**  
**Sub-plate**  
SS3YJ3-20(-Q)  
SS3YJ3-20R(-Q)  
SS3YJ3-41(-Q)  
SS3YJ3-S41(-Q)  
SS3YJ3-42(-Q)  
SS3YJ3-S42(-Q)  
SS3YJ3-42R(-Q)  
SS3YJ3-S42R(-Q) } Manifold  
base

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

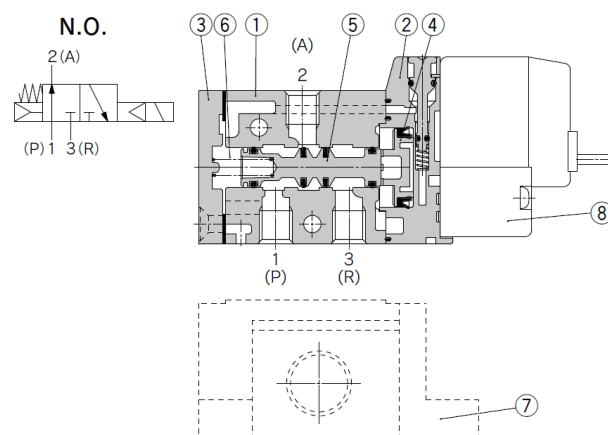
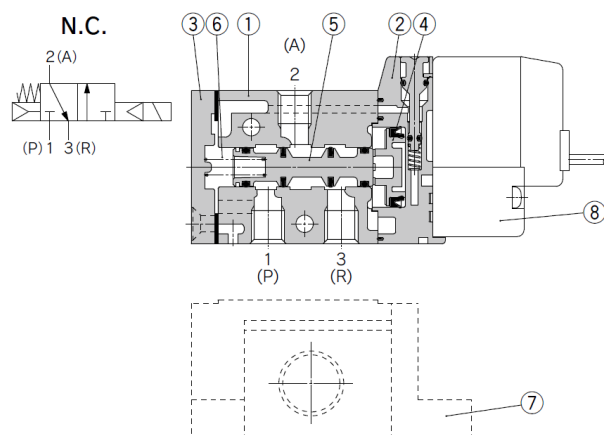
### Mounting screw tightening torques

M1.7 : 0.12N•m

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

## Construction

### SYJ500 Series



### Component Parts

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

### Replacement Parts

No.	Description	Part no.	Material
7	Sub-plate <sup>Note)</sup>	SYJ500-9-1(-Q)	Aluminum die-cast
8	Pilot valve	V111(T)-□□□	
—	Bracket assembly	SYJ5000-13-3A	

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

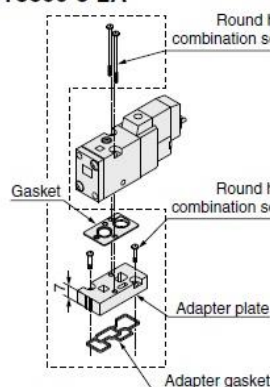
### Mix Installation of the SYJ500 and the SYJ5000 Valves on the Same Manifold

- Use of an adapter plate makes it possible to mount 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>

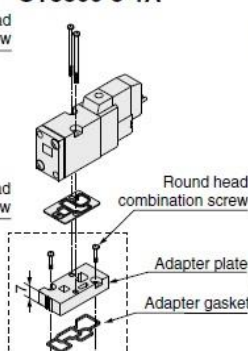
##### SYJ500-3-2A



#### Applicable manifold base

- Type SS5YJ5-20
- Type SS5YJ5-20P

##### SYJ500-3-1A

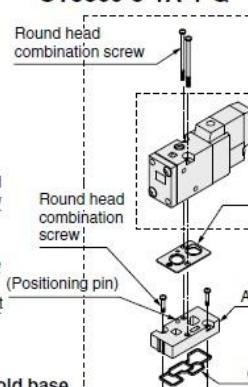


#### Applicable manifold base

- Type SS5YJ5-40
- Type SS5YJ5-41
- Type SS5YJ5-42
- Type SS5YJ5-43
- Type SS5YJ5-41P
- Type SS5YJ5-42P
- Type SS5YJ5-43P

#### <CE/UKCA-compliant>

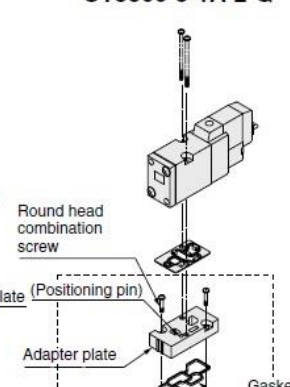
##### SYJ500-3-1A-1-Q



#### Applicable manifold base

- Type SS5YJ5-20-Q
- Type SS5YJ5-20P-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

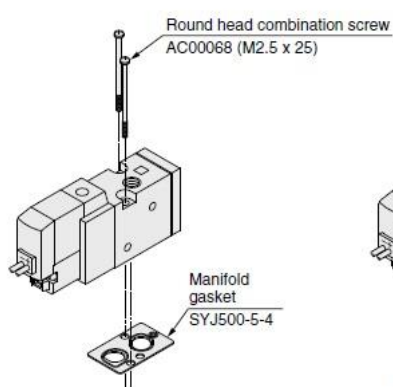
### Mounting screw tightening torques

M2.5 : 0.45N·m

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

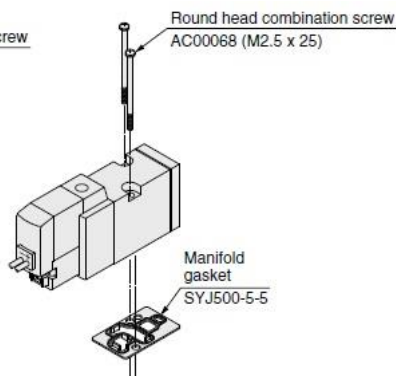
### Combinations of Solenoid Valve, Manifold Gasket and Manifold Base

Body ported(Type SYJ5□2(R)(-Q))



**Applicable base**  
Type SS3YJ5-21R(-Q)  
Type SS3YJ5-20(-Q)  
Manifold base

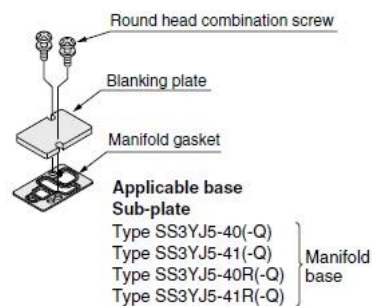
Base mounted(Type SYJ5□4(R)(-Q))



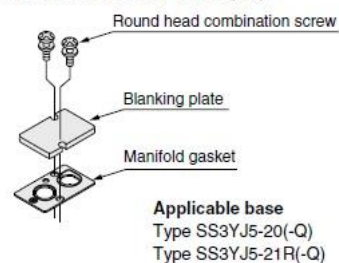
**Applicable base**  
Sub-plate  
Type SS3YJ5-40(-Q)  
Type SS3YJ5-41(-Q)  
Type SS3YJ5-40R(-Q)  
Type SS3YJ5-41R(-Q) } **Manifold base**

### Blanking Plate Assembly

Part no. : SYJ500-10-3A(-Q)



Part no.: SYJ500-10-1A(-Q)



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

### Mounting screw tightening torques

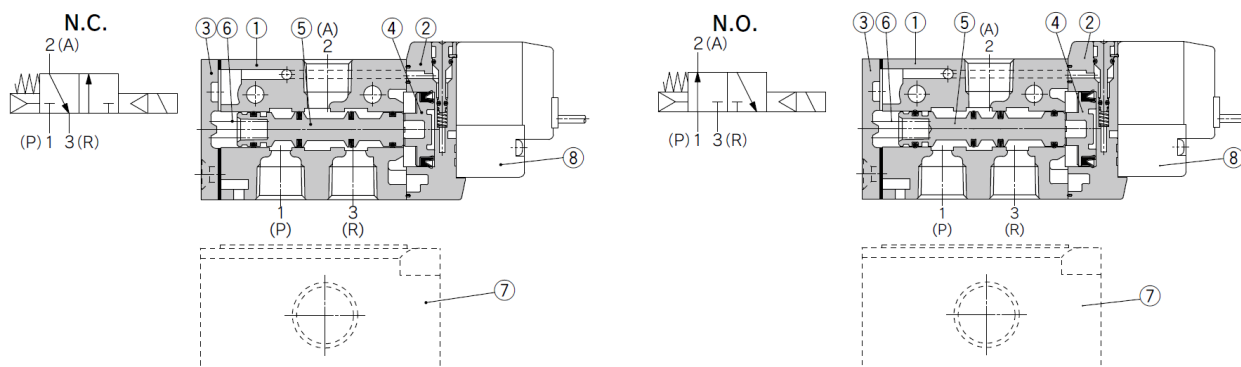
M2.5 : 0.45N・m

Use caution to the assembly orientation for solenoid valves(blanking plate) and manifold gasket.



## Construction

### SYJ700 Series



### 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	—	—
6	Spool spring	Stainless steel	—

### Replacement Parts

No.	Description	Part no.	Material	Note
7	Sub-plate <sup>note)</sup>	SYJ700-9-1(-Q)	Aluminum die-casted	1/8
		SYJ700-9-2(-Q)		1/4
8	Pilot valve	V111(T)-□□□		
—	Bracket Ass'y	SYJ700-19-1A		

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

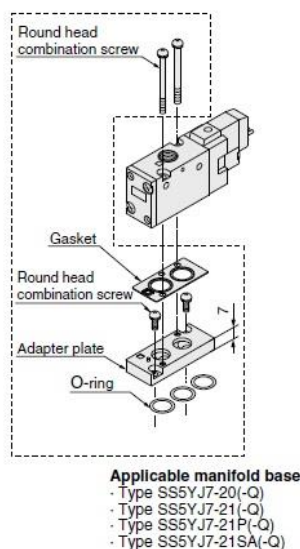
### Mix Installation of the SYJ700 and the SYJ7000 Valves on the Same Manifold

- 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

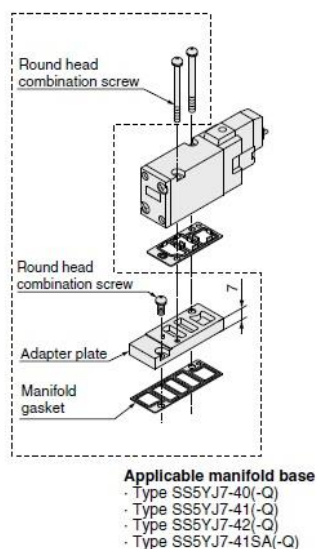
#### SYJ700-3-1A(-Q)

SYJ700 Series Body ported



#### SYJ700-3-2A(-Q)

SYJ700 Series Base mounted



### Mounting screw tightening torques

M3 : 0.8N·m

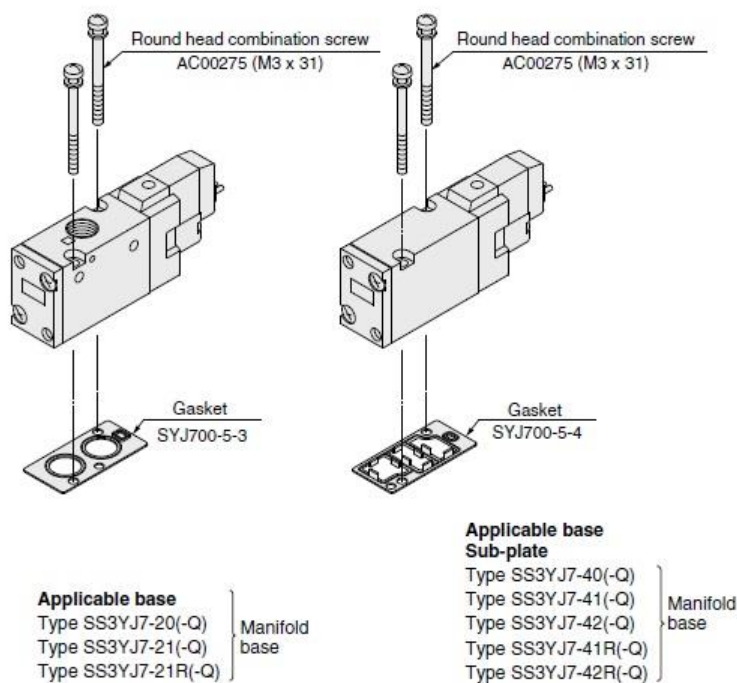
Use caution to the assembly orientation for solenoid valves, gasket, and optional parts.



## Combinations of Solenoid Valve, Manifold Gasket and Manifold Base

Body ported (Type SYJ7□2(-Q))

Base mounted (SYJ7□4(-Q)形)



## Mounting screw tightening torques

M3 : 0.8N・m

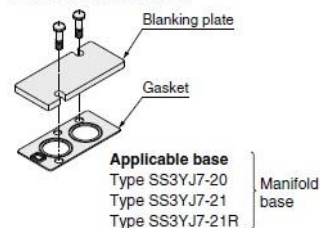
Use caution to the assembly orientation for solenoid valves, gasket ,and optional parts.

## Blanking Plate Assembly

<Standard>

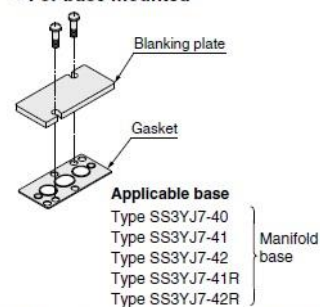
Part no.:SYJ700-10-1A

- For body ported
- For base mounted



Part no.: SYJ700-10-2A

- For base mounted

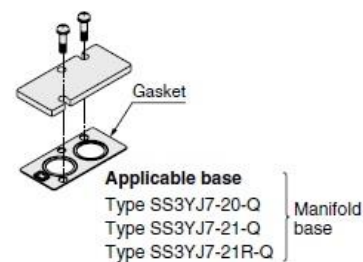


Note) It can be mounted on a body ported manifold base. However, when mounting a blanking part to a valve, place an order for a separate gasket (SYJ700-5-3) when placing an order for the valve.

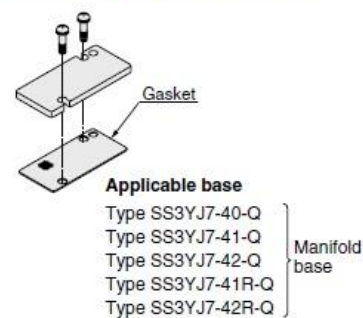
When using the SYJ700-10-1A, a gasket for this blanking plate assembly can be used as a gasket for the valve as well.

<CE/UKCA-compliant>

Part no.:SYJ700-10-2A-1-Q



Part no.: SYJ700-10-2A-2-Q



## 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 suppressor
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
LN	connector
LO	Without lead wire
M	M plug
MN	connector
MO	Without lead wire
WO	M8
W□	connector

\* 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

### • 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	With connector
DO	(Type D)	Without connector
Y	DIN terminal	With connector
YO	(Type Y)	Without connector

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

### • 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.



## Caution

### Mounting screw tightening torques

V111: 0.12N·m

V115: 0.16N·m

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

# 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? <div>             No →           </div>	<b>1) Operation failure or sticking of the main valve.</b> <ul style="list-style-type: none"> <li>● Foreign matter from the piping and air source got caught in the main valve, causing a malfunction.</li> <li>● Malfunction occurred due to sticking such as swelling of the rubber part of the main valve.</li> </ul>	<ul style="list-style-type: none"> <li>- Replace the valve.</li> <li>- Clean the air supply.</li> <li>- If incorrect oil has been used for lubrication, remove the oil by air blow.</li> <li>- 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.</li> </ul>
	Yes	<b>2) Pressure drop</b> Air source pressure is reduced and minimum operating pressure of the valve was not reached, causing an operation failure.	<ul style="list-style-type: none"> <li>- Adjust the pressure within the specification range for the valve.</li> </ul>
		<b>3) Excessive oil supply</b> Due to excessive lubrication, oil accumulated inside the valve, causing malfunction.	<ul style="list-style-type: none"> <li>- Reduce the amount of lubrication to the amount at which the oil does not splash from the exhaust port [3 (R)].</li> </ul>
	Energized? Is valve switched? <div>             No →           </div>	<b>1) Non-conformance of electric system</b> <ul style="list-style-type: none"> <li>- Incorrect wiring</li> <li>- Fuse blown out, lead wire broken</li> <li>- Incorrect contact at the contact and connection</li> <li>- Sequencer non-conformance</li> <li>- Supply voltage insufficient</li> </ul>	<ul style="list-style-type: none"> <li>- Check all parts and replace the part, if necessary.</li> <li>- Check the supply voltage.</li> </ul>
	Yes	<b>2) Drop of supply voltage</b> Operation failure of the valve due to voltage drop.	<ul style="list-style-type: none"> <li>- Check the supply voltage. Take corrective action if voltage drop is confirmed.</li> </ul>
		<b>3) Non-conformance of the installed pilot valve</b> <ul style="list-style-type: none"> <li>- Broken wire in the coil or burnout (High supply voltage, incorrect coil specification, entry of water)</li> </ul>	<ul style="list-style-type: none"> <li>- Replace the valve.</li> <li>- Protect the valve especially the coil to prevent being exposed to water.</li> </ul>
		<b>1) Leakage current</b> Operation failure of the valve occurred due to residual voltage. (Valve is not turned OFF)	<ul style="list-style-type: none"> <li>- Check the residual voltage.</li> <li>- Keep the residual voltage at 3% of the rated voltage or less.</li> </ul>
		<b>2) Non-conformance of the installed pilot valve</b> <ul style="list-style-type: none"> <li>- Foreign matter is caught in the moving part of the valve (or pilot valve).</li> <li>- Swelling of rubber parts inside the valve (or pilot valve)</li> </ul>	<ul style="list-style-type: none"> <li>- Clean the air supply.</li> <li>- Eliminate foreign matter with air blow.</li> <li>- Replace the valve when actions above do not improve the condition.</li> </ul>

Trouble	For valve non-conformance, take following countermeasures referring to trouble.	Possible causes	Countermeasures
Air leakage	Find and check the air leakage point.	<b>1) Valve mounting screw is loose</b>	- Tighten the mounting screw. <b>Proper tightening torque</b> -SYJ300 M1.7: 0.12N · m -SYJ500 M2.5: 0.45N · m -SYJ700 M3: 0.8N · m
	1. Leakage between valve and base. (Base mounted type)	<b>2) Damage or displacement of the gasket</b>	- If gasket is scratched, replace the gasket.
		<b>3) Foreign matter caught in the gasket seat</b>	- Eliminate foreign matter with air blow. - If gasket is scratched, replace the gasket.
	2. Air leakage from output [2(A)] port and exhaust [3(R)] port.	<b>1) Valve mounting screw is loose</b>	- Tighten the mounting screw. <b>Proper tightening torque</b> -SYJ300 M1.7: 0.12N · m -SYJ500 M2.5: 0.45N · m -SYJ700 M3: 0.8N · m - If gasket is scratched, replace the gasket.
		<b>2) Internal air leakage increased because foreign matter get caught in the main valve.</b>	- Replace the valve. - Clean the air supply.
	3. Air leakage from the pilot valve air exhaust port (PE port). (External pilot type)	<b>3) Sealing failure of the actuator (cylinder)</b>	- Refer to the operation manual of the actuator for details.
		<b>1) Foreign matter is caught in the pilot valve armature.</b>	- 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	Precautions for Solenoid Valve	2025.3

1st Printing :Wo

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Note: Specifications are subject to change without prior notice and any obligation on the part of the manufacturer.  
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