Doc. No.VQC1000V-OMM0002-B

# Operation Manual

PRODUCT NAME

Solenoid Valve

MODEL/ Series

VQC1000/2000 Series
(*Pilot Valve V100*)

# 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)*1), and other safety regulations.

*1) ISO 4414: Pneumatic fluid power -- General rules relating to systems
ISO 4413: Hydraulic fluid power -- General rules relating to systems
IEC 60204-1: Safety of machinery -- Electrical equipment of machines (Part 1: General requirements)
ISO 10218-1: Manipulating industrial robots -- Safety

| | |
|---|---|
| **Caution** | **Caution** indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury. |
| **Warning** | **Warning** indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury. |
| **Danger** | **Danger** indicates a hazard with a high level of risk which, if not avoided, will result in death or serious 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. Contact SMC beforehand and take special consideration of safety measures if the product is to be used in any of the following conditions.**

1.Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.

2.Installation on equipment in conjunction with atomic energy, railways, air navigation, space, shipping, vehicles, military, medical treatment, combustion and recreation, or equipment in contact with food and beverages, emergency stop circuits, clutch and brake circuits in press applications, safety equipment or other applications unsuitable for the standard specifications described in the product catalog.

3.An application which could have negative effects on people, property, or animals requiring special safety analysis.

4.Use in an interlock circuit, which requires the provision of double interlock for possible failure by using a mechanical protective function, and periodical checks to confirm proper operation.

# Safety Instructions

**⚠ Caution**

**The product is provided for use in manufacturing industries.**
The product herein described is basically provided for peaceful use in manufacturing industries.
If considering using the product in other industries, consult SMC beforehand and exchange specifications or a contract if necessary.
If anything is unclear, contact your nearest sales branch.

## 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.*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 govemed by the relevant security laws and regulation of the countries involved in the transaction. Prior to the shipment of a SMC product to another country, assure that all local rules goveming that export are known and followed.**

**⚠ Caution**

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

*VQC1000/2000 Series*

# Precautions for 5 Port Solenoid Valve ①

**Be sure to read before handling.**

## 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 or temperatures, etc., beyond the range of specifications, as this can cause damage or malfunction.(Refer to the specifications.)

Please contact SMC when using a fluid other than compressed air (including vacuum).

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. Intermediate stops**

●Rubber seal: Use a closed center type valve.

● Metal seal: For the exhaust center type valve, use in combination with either a double check spacer or a double check block.

●For the 3-position closed center, it is difficult to make the 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.

However, as the metal seal closed center type valve leaks more air than the rubber seal, the intermediate stopping time will be shorter.

**4. Effect of back pressure when using a manifold.**

Use caution when valves are used on a manifold because actuators may malfunction due to back pressure.

Especially when using a 3-position exhaust center valve or a single acting cylinder, take appropriate measures to prevent malfunction by using it with an individual EXH spacer assembly, a back pressure check valve, or an individual exhaust manifold.

**5. Holding 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 instruction manual 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 and inspection purposes install a system for releasing residual pressure. Especially in the case of the 3-position closed center valve, 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 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.

**9. 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.

**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 operating 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.

・A 0.4 W or lower valve, such as the SY series, or a valve with a power-saving circuit

If conflicting instructions are given in the “Specific Product Precautions” or on the “How to Order Valves” page, give them priority.

**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

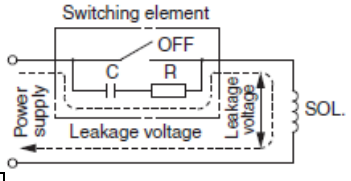
**1. Precautions for 2-position double solenoid valves**

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.

**2. 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

Should be 3% or less of the rated voltage.

# Precautions for 5 Port Solenoid Valve ②

**Be sure to read before handling.**

## 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 from7 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).

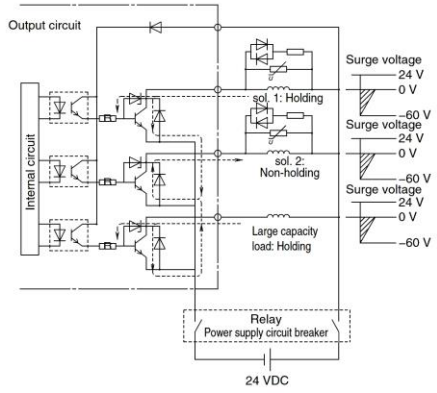



**Figure 1. Surge intrusion circuit example (NPN outlet example)**

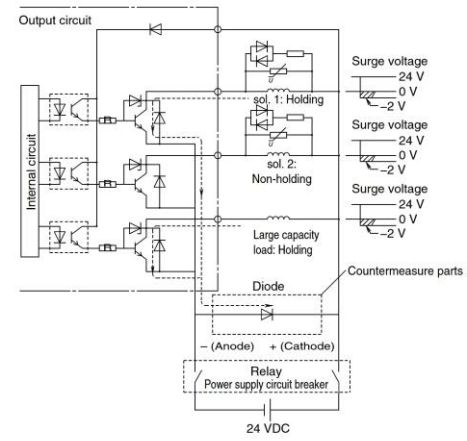



**Figure 2. Surge intrusion countermeasure example (NPN outlet example)**

**5. Operation in low temperature condition**

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

**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, and a double solenoid valve is used for air blowing, the solenoids should be energized when air is being blown.

**7. Mounting orientation**

Rubber seal : Mounting orientation is free.

Metal seal : Mounting orientation of a single solenoid is universal. No specific orientation is necessary. When installing a double solenoid or a 3-position configuration, mount the valve so that spool valve is horizontal.

**8. Initial lubrication of main valve**

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

- Rubber seal, spool valve: Grease
- Metal seal, spool valve: Turbine oil

Turbine oil is applied to the spool valve of the metal seal type. Therefore, turbine oil may seep out when a new product is delivered or while the valve is in storage.

**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.

## 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.

Please consult with SMC before applying paint to resinous parts, as this may have an adverse effect due to the solvent in the paint.

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## Piping

### ⚠ Caution

**1. Refer to the Fittings and Tubing Precautions (Best Pneumatics No.6) 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.

# Precautions for 5 Port Solenoid Valve ③

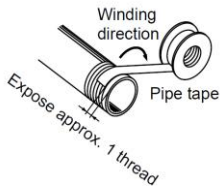
**Be sure to read before handling.**

## Piping

### ⚠Caution

**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. Closed center**

For the closed center, 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.

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

**Ⅰ 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.

**Ⅱ 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.

**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 |

**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 |

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 operation manual to avoid mistakes regarding the supply pert, 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 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.

When instructions are given in the Specific Product Precautions, follow these specifications.

## Lubrication

### ⚠Warning

**1. Lubrication**

**[Rubber seal]**

1) 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 turbine oil (no additives), ISO VG32. For details about lubricant manufacturers' brands, refer to the SMC website. Additionally, please contact SMC for details about class 2 turbine oil (with additives) ISO VG32.

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.

# Precautions for 5 Port Solenoid Valve ④

**Be sure to read before handling.**

**[Metal seal]**

1) These valves can be used without lubrication.
2) If a lubricant is used in the system, use class 1 turbine oil (no additives), ISO VG32. For details about lubricant manufacturers' brands, refer to the SMC website. Additionally, please contact SMC for details about class 2 turbine oil (with additives) ISO VG32.

### 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**

Please consult with SMC when using the product in applications other than compressed air.

**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 extremely dry 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. Please consult with SMC.**

**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.

## 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.
For the 3-position closed center, 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.

# Precautions for 5 Port Solenoid Valve ⑤

**Be sure to read before handling.**

### 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 the manual override is operated, connected equipment will be actuated.

Operate 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 turbine oil (with no additives), VG32. If other lubricant oil is used, it may cause a malfunction. Please contact SMC for information on the suggested class 2 turbine oil (with additives), VG32.

### 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.

# Specific Product Precautions 1

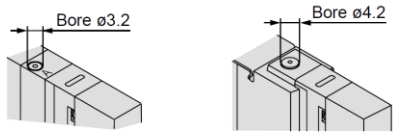
**Be sure to read this before handling**

## Manual Override

### ⚠Warning

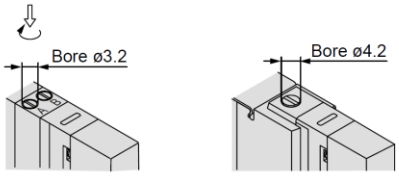
**Connected actuator is started by manual operation.**
**Use the manual override after confirming that there is no danger. Push type is standard. (Tool required)Locking type is semi-standard. (Tool required)**

**Non-locking push type (Tool required)**



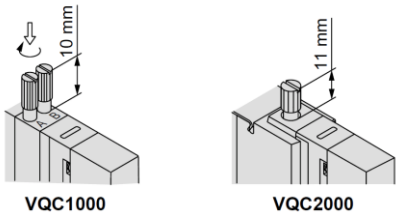

Push down on the manual override with a small screwdriver until it stops. Release the screwdriver and the manual override will return.

**Locking type (Tool required) <Semi-standard>**




Push down on the manual override with a small flat head crew driver until it stops. Turn it clockwise by 90° to lock it. Turn it counterclockwise to release it.

**Locking type (Manual) <Semi-standard>**



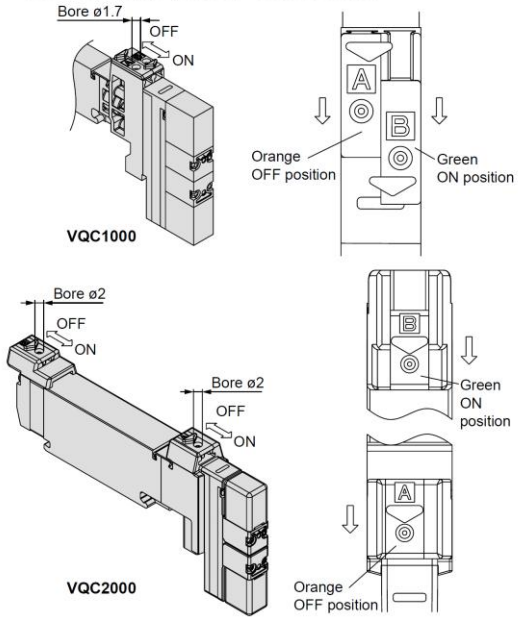

Push down on the manual override with a small screwdriver or with your fingers until it stops. Turn it clockwise by 90° to lock it. Turn it counterclockwise to release it.

### ⚠Caution

**Do not apply excessive torque when turning the locking type manual override. (0.1 N·m or less)**

### ⚠Warning

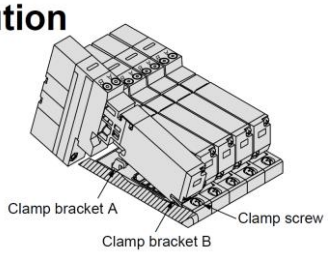
**Slide locking type (Manual) <Semi-standard>**




The manual override is locked by sliding it all the way to the pilot valve side (ON side) with a small flat head screwdriver or with your fingers. Slide it to the fitting side (OFF side) to release it. In addition, it can also be used as a push type by using a screwdriver, etc., of ø1.7 or less. (ø2 or less for VQC2000)

## How to Mount/Remove Solenoid Valves

### ⚠Caution




**Removing**

**1.** Loosen the clamp screw until it turns freely. (The screw is captive.)
**2.** Lift the coil side of the valve body while pressing down slightly on the screw head and remove it from the clamp bracket B. When the screw head cannot be pressed easily, gently press the area near the manual override of the valve.

**Mounting**

**1.** Press down on the clamp screw. Clamp bracket A opens. Diagonally insert the hook on the valve end plate side into clamp B.
**2.** Press the valve body downward. (When the screw is released, it will be locked by clamp bracket A.)
**3.** Tighten the clamp screw. (Proper tightening torque: VQC1000, 0.25 to 0.35 N·m; VQC2000, 0.5 to 0.7 N·m)

### ⚠Caution

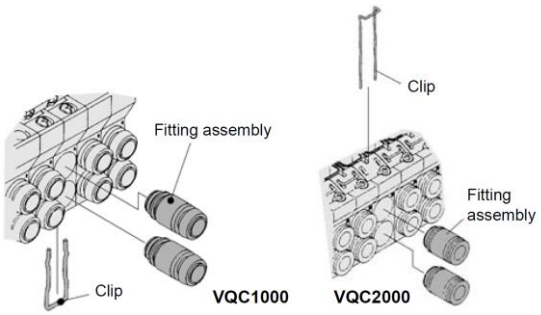
Dust on the sealing surface of the gasket or solenoid valve can cause air leakage.

# *VQC1000/2000 series*
# Specific Product Precautions 2
**Be sure to read this before handling**

## Cylinder Port Fittings Replacement

### ⚠Caution

**One-touch fittings on the cylinder port are a cassette for easy replacement. The fittings are blocked by a clip. After removing the corresponding valve and take out the clip with a flat head screwdriver, etc., then replace the fittings. For mounting, insert the fitting until it strikes against the inside wall and then insert the clip to the specified position.**




| Applicable tubing O.D. | Fitting assembly part no. | |
|---|---|---|
| | VQC1000 | VQC2000 |
| Applicable tubing ø3.2 | VVQ1000-50A-C3 | — |
| Applicable tubing ø4 | VVQ1000-50A-C4 | VVQ1000-51A-C4 |
| Applicable tubing ø6 | VVQ1000-50A-C6 | VVQ1000-51A-C6 |
| Applicable tubing ø8 | — | VVQ1000-51A-C8 |
| M5 | VVQ1000-50A-M5 | — |
| Applicable tubing ø1/8" | VVQ1000-50A-N1 | — |
| Applicable tubing ø5/32" | VVQ1000-50A-N3 | VVQ1000-51A-N3 |
| Applicable tubing ø1/4" | VVQ1000-50A-N7 | VVQ1000-51A-N7 |
| Applicable tubing ø5/16" | — | VVQ1000-51A-N9 |

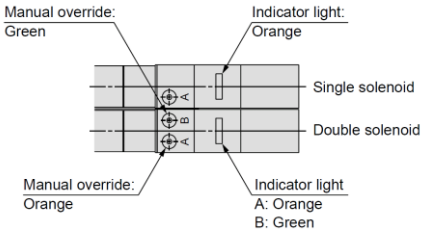
### ⚠Caution

1) Use caution that O-rings must be free from scratches and dust. Otherwise, air leakage may result.
2) After screwing in the fittings, mount the M5 fitting assembly on the manifold base. (Tightening torque: 0.8 to 1.2 N·m)
3) Purchasing order is available in units of 10 pieces.

## Light/Surge Voltage Suppressor

### ⚠Caution

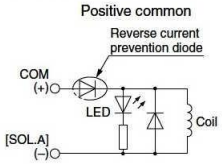
**The lighting positions are concentrated on one side for both single solenoid type and double solenoid type. In the double solenoid type, A side and B side energization are indicated by two colors which match the colors of the manual overrides.**



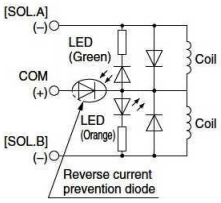

(Drawing shows a VQC1000 case.)

**DC circuit diagram**

**Single solenoid**




**Double solenoid**




Note) A-side energization:
A light (Orange) illuminates.
B-side energization:
B light (Green) illuminates.

With wrong wiring prevention (stop diode) mechanism

With a surge absorption (surge absorption diode) mechanism

# Specific Product Precautions 3

**Be sure to read this before handling**

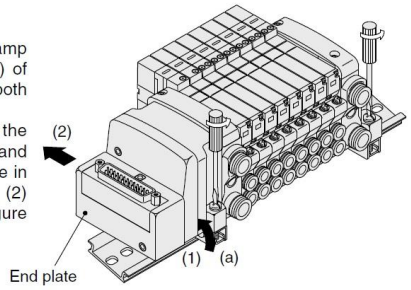
## How to Mount/Remove DIN Rail

### ⚠Caution

**Removing**

**1.** Loosen the clamp screw on side (a) of the end plate on both sides.

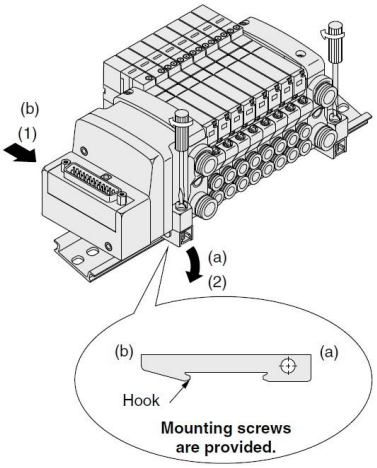
**2.** Lift side (a) of the manifold base and slide the end plate in the direction of (2) shown in the figure to remove.




**Mounting**

**1.** Hook side (b) of the manifold base on the DIN rail.

**2.** Press down side (a) and mount the end plate on the DIN rail. Tighten the clamp screw on side (a) of the end plate. (Proper tightening torque: VQC1000, 1.1 to 1.3 N·m; VQC2000, 1.4 to 1.6 N·m.)




## IP67 Enclosure

### ⚠Caution

Wiring connection for models conforming to IP67 should also have enclosures equivalent to or of stricter than IP67.

## Built-in Silencer Element

### ⚠Caution

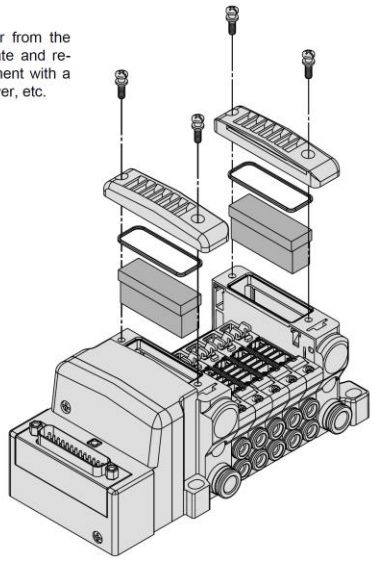
A filter element is incorporated in the end plate on both sides of the manifold base. A dirty and choked element may reduce cylinder speed or cause malfunction. Clean or replace the dirty element.

**Element Part No.**

| Type | Element part no. | |
|---|---|---|
| | **VQC1000** | **VQC2000** |
| Direct EXH outlet with built-in silencer | VVQ1000-82A-1 | VVQ2000-82A-1 (D-side end plate) VVQC2000-82A-1 (U-side end plate) |

The minimum order quantity is 10 pcs.

Remove the cover from the top of the end plate and remove the old element with a flat head screwdriver, etc.



## How to Calculate Flow Rate

$\frac{P_2 + 0.1}{P_1 + 0.1} \leq 0.5$, **choked flow**

$$Q = 120 \times S(P_1 + 0.1) \sqrt{\frac{293}{273 + t}}$$

$\frac{P_2 + 0.1}{P_1 + 0.1} > 0.5$, **subsonic flow**

$$Q = 240 \times S \sqrt{(P_2 + 0.1)(P_1 - P_2)} \sqrt{\frac{293}{273 + t}}$$

Conversion with sonic conductance C:
S=0.5XC

Q : Air flow rate [$dm^3$/min(ANR)]
S : Effective area [$mm^2$]
$P_1$ : Upstream pressure [MPa]
$P_2$ : Downstream pressure [MPa]
t : Temperature [℃]

# Specific Product Precautions 4

**Be sure to read this before handling**

## EX500/EX250/EX126 Precautions

### ⚠Warning

**1. These products are intended for use in general factory automation equipment.**
Avoid using these products in machinery/equipment which affects human safety, and in cases where malfunction or failure can result in extensive damage.

**2. Do not use in explosive environments, in the presence of inflammable gases, or in corrosive environments. This can cause injury or fire.**

**3. Work such as transporting, installing, piping, wiring, operation, control and maintenance should be performed by knowledgeable and qualified personnel only. As handling involves the risk of a danger of electrocution, injury or fire.**

**4. Install an external emergency stop circuit that can promptly stop operation and shut off the power supply.**

**5. Do not modify these products. Modifications done to these products carry the risk of injury and damage.**

### ⚠Caution

**1. Read the instruction manual carefully, strictly observe the precautions and operate within the range of the specifications.**

**2. Do not drop these products or submit them to strong impacts. This can cause damage, failure or malfunction.**

**3. In locations with poor electrical conditions, take steps to ensure a steady flow of the rated power supply. Use of a voltage outside of the specifications can cause malfunction, damage to the unit, electrocution or fire.**

**4. Do not touch connector terminals or internal circuit elements when current is being supplied. There is a danger of malfunction, damage to the unit or electrocution if connector terminals or internal circuit elements are touched when current is being supplied.**
Be sure that the power supply is OFF when adding or removing manifold valves or input blocks or when connecting or disconnecting connectors.

**5. Operate at an ambient temperature that is within the specifications. Even when the ambient temperature range is within the specifications, do not use in locations where there are rapid temperature changes.**

**6. Keep wire scraps and other extraneous materials from getting inside these products. This can cause fire, failure or malfunction.**

**7. Give consideration to the operating environment depending on the type of enclosure being used.**
To achieve IP65 and IP67 protection class, provide appropriate wiring between all units using electrical wiring cables, communication connectors and cables with M12 connectors. Also, provide waterproof caps when there are unused ports, and perform proper mounting of input units, input blocks, SI units and manifold valves. Provide a cover or other protection for applications in which there is constant exposure to water.

**8. Use the proper tightening torques.**
There is a possibility of damaging threads if tightening exceeds the tightening torque range.

**9. Provide adequate protection when operating in locations such as follows:**
- Where noise is generated by static electricity
- Where there is a strong electric field
- Where there is a danger of exposure to radiation
- When in close proximity to power supply lines

**10. When these products are installed in equipment, provide adequate protection against noise by using noise filters.**

**11. Since these products are components whose end usage is obtained after installation in other equipment, the customer should confirm conformity to EMC directives for the finished product.**

**12. Do not remove the name plate.**

**13. Perform periodic inspections and confirm normal operation, otherwise it may be impossible to guarantee safety due to unexpected malfunction or erroneous operation.**

**14. Do not use in places where there are cyclic temperature changes.**
In case that the cyclic temperature is beyond normal temperature changes, the inside product is likely to be adversely effected.

**15. Do not use in direct sunlight.**
Do not use in direct sunlight. It may cause malfunction or damage.

**16. Do not use in places where there is radiated heat around it.**
Such a place is likely to cause malfunction.

## Safety Instructions on Power Supply

### ⚠Caution

**1. Operation is possible with a single power supply or a separate power supply. However, be sure to provide two wiring systems (one for solenoid valves, and one for input and control units).**

**2. When it is UL compliant, use a class 2 power supply unit in accordance with UL1310 for a combined direct current power supply.**

## Safety Instructions on Cable

### ⚠Caution

**1. Avoid miswiring, as this can cause malfunction, damage and fire in the unit.**

**2. To prevent noise and surge in signal lines, keep all wiring separate from power lines and high-voltage lines. Otherwise, this can cause malfunction.**

**3. Check wiring insulation, as defective insulation can cause damage to the unit when excessive voltage or current is applied.**

**4. Do not bend or pull cables repeatedly, and do not place heavy objects on them or allow them to be pinched. This can cause broken lines.**

# Specific Product Precautions 5

**Be sure to read this before handling**

## EX600 Precautions

### Design/Selection

#### ⚠Warning

**1. Use this product within the specification range.**
Using beyond the specified specifications range can cause fire, malfunction, or damage to the system.
Confirm the specifications when operating.

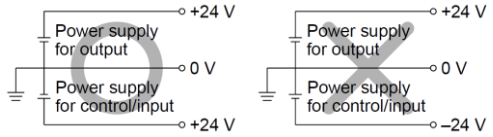
**2. When using for an interlock circuit:**
**・Provide a multiple interlock system which is operated by another system (such as mechanical protection function).**
**・Perform an inspection to check that it is working properly.**
This may cause possible injury due to malfunction.

#### ⚠Caution

**1. When it is UL compliant, use a class 2 power supply unit in accordance with UL1310 for a combined direct current power supply.**

**2. Use this product within the specified voltage range.**
Using beyond the specified voltage range is likely to cause the units and connecting devices to be damaged or to malfunction.

**3. The power supply for the unit should be 0 V as the standard for both power supply for output as well as power supply for control/input.**




**4. Do not install a unit in a place where it can be used as a foothold.**
Applying any excessive load such as stepping on the unit by mistake or placing a foot on it, will cause it to break.

**5. Keep the surrounding space free for maintenance.**
When designing a system, take into consideration the amount of free space needed for performing maintenance.

**6. Do not remove the name plate.**
Improper maintenance or incorrect use of instruction manual can cause failure and malfunction. Also, there is a risk of losing conformity with safety standards.

**7. Beware of inrush current when the power supply is turned on.**
Some connected loads can apply an initial charge current which will trigger the over current protection function, causing the unit to malfunction.

### Mounting

#### ⚠Caution

**1. When handling and assembling units:**
**• Do not touch the sharp metal parts of the connector or plug.**
**• Do not apply excessive force to the unit.**
The connecting portions of the unit are firmly joined with seals.
**• When joining units, take care not to get fingers caught between units.**
Injury can result.

**2. Do not drop, bump, or apply excessive impact.**
Otherwise, the unit can become damaged, malfunction, or fail to function.

**3. Observe the tightening torque range.**
Tightening outside of the allowable torque range will likely damage the product.
IP67 protection class cannot be guaranteed if the screws are not tightened to the specified torque.

**4. When lifting a large size manifold solenoid valve unit, take care to avoid causing stress to the valve connection joint.**
The connection parts of the unit may be damaged.
Because the unit may be heavy, carrying and installation should be performed by more than one operator to avoid strain or injury.

**5. When placing a manifold, mount it on a flat surface.**
Torsion in the whole manifold can lead to trouble such as air leakage or defective insulation.

### Wiring

#### ⚠Caution

**1. Confirm grounding to maintain the safety of the reduced wiring system and for anti-noise performance.**
Provide a specific grounding as close to the unit as possible to minimize the distance to grounding.

**2. Avoid repeatedly bending or stretching the cable and applying a heavy object or force to it.**
Wiring applying repeated bending and tensile stress to the cable can break the circuit.

**3. Avoid miswiring.**
If miswired, there is a danger of malfunction or damage to the reduced wiring system.

**4. Do not wire while energizing the product.**
There is a danger of malfunction or damage to the reduced wiring system or input/output equipment.

**5. Avoid wiring the power line and high-pressure line in parallel.**
Noise or surge produced by signal line resulting from the power line or high pressure line could cause malfunction.
Wiring of the reduced wiring system or input/output device and the power line or high-pressure line should be separated from each other.

**6. Confirm the wiring insulation.**
Defective insulation (contact with other circuits, improper insulation between terminals, etc.) may cause damage to the reduced wiring system or input/output device due to excessive voltage or current.

**7. When a reduced wiring system is installed in machinery/ equipment, provide adequate protection against noise by using noise filters, etc.**
Noise in signal lines may cause malfunction.

**8. When connecting wires of input/output device or handheld terminal, prevent water, solvent or oil from entering inside from the connecter section.**
This can cause damage, equipment failure, or malfunction.

**9. Avoid wiring patterns in which excessive stress is applied to the connector.**
This may cause malfunction or damage to the unit due to contact failure.

# Specific Product Precautions 6

**Be sure to read this before handling**

## EX600 Precautions

### Operating Environment

#### ⚠Warning

**1. Do not use in an atmosphere containing an inflammable gas or explosive gas.**
Use in such an atmosphere is likely to cause a fire or explosion. This system is not explosion-proof.

#### ⚠Caution

**1. Select the proper type of enclosure according to the environment of operation.**
IP65/67 protection class is achieved when the following conditions are met.
1) The units are connected properly with wiring cable for power supply, communication connector, and cable with M12 connector.
2) Suitable mounting of each unit and manifold valve.
3) Be sure to mount a seal cap on any unused connectors.
If using in an environment that is exposed to water splashes, please take measures such as using a cover.

When EX600-D・・E or EX600-D・・F are connected, the enclosure of the manifold should be IP40.
Also, the Handheld Terminal confirms to IP20, so prevent foreign matter from entering inside, and water, solvent or oil from coming in direct contact with it.

**2. Provide adequate protection when operating in locations such as the following.**
Failure to do so may cause damage or malfunction. The effect of countermeasures should be checked in individual equipment and machine.
1) Where noise is generated by static electricity, etc.
2) Where there is a strong electric field
3) Where there is a danger of exposure to radiation
4) When in close proximity to power supply lines

**3. Do not use in an environment where oil and chemicals are used.**
Operating in environments with coolants, cleaning solvents, various oils or chemicals may cause adverse effects (damage, malfunction) to the unit even in a short period of time.

**4. Do not use in an environment where the product could be exposed to corrosive gas or liquid.**
This may damage the unit and cause it to malfunction.

**5. Do not use in locations with sources of surge generation.**
Installation of the unit in an area around the equipment (electromagnetic lifters, high frequency induction furnaces, welding machine, motors etc.), which generates the large surge voltage could cause to deteriorate an internal circuitry element of the unit or result in damage. Implement countermeasures against the surge from the generating source, and avoid touching the lines with each other.

**6. Use the product type that has an integrated surge absorption element when directly driving a load which generates surge voltage by relay, solenoid valves or lamp.**
When a surge generating load is directly driven, the unit may be damaged.

**7. The product is CE marked, but not immune to lightning strikes. Take measures against lightning strikes in your system.**

**8. Keep dust, wire scraps and other extraneous material from getting inside the product.**
This may cause malfunction or damage.

**9. Mount the unit in such locations, where no vibration or shock is affected.**
This may cause malfunction or damage.

**10. Do not use in places where there are cyclic temperature changes.**
In case that the cyclic temperature is beyond normal temperature changes, the internal unit is likely to be adversely effected.

**11. Do not use in direct sunlight.**
Do not use in direct sunlight. It may cause malfunction or damage.

**12. Use this product within the specified ambient temperature range.**
This may cause malfunction.

**13. Do not use in places where there is radiated heat around it.**
Such a place is likely to cause malfunction.

### Adjustment/Operation

#### ⚠Warning

**1. Do not perform operation or setting with wet hands.**
There is a risk of electrical shock.

**<Handheld Terminal>**

**2. Do not apply pressure to the LCD display.**
There is a possibility of the crack of LCD display and injuring.

**3. The forced input/output function is used to change the signal status forcibly. When operating this function, be sure to check the safety of the surroundings and installation.**
Otherwise, injury or equipment damage could result.

**4. Incorrect setting of parameters can cause malfunction. Be sure to check the settings before use.**
This may cause injury or equipment damage.

#### ⚠Caution

**1. Use a watchmaker's screwdriver with thin blade for the setting of each switch of the SI unit.**
**When setting the switch, do not touch other unrelated parts.**
This may cause parts damage or malfunction due to a short circuit.

**2. Provide adequate setting for the operating conditions.**
Failure to do so could result in malfunction.
Refer to the instruction manual for setting of the switches.

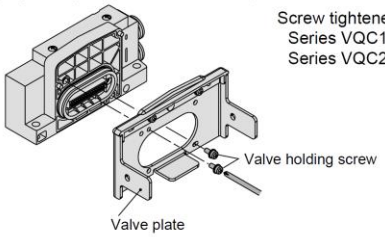
**3. For the details of programming and address setting, refer to the manual from the PLC manufacturer.**
The content of programming related to protocol is designed by the manufacturer of the PLC used.

**<Handheld Terminal>**

**4. Do not press the setting buttons with a sharp pointed object.**
This may cause damage or malfunction.

**5. Do not apply excessive load and impact to the setting buttons.**
This may cause damage, equipment failure or malfunction.

When the order does not include the SI unit, the valve plate to connect the manifold and SI unit is not mounted. Use attached valve fixing screws and mount the valve plate.
(Tightening torque: 0.6 to 0.7 N·m)




**Trademark**
DeviceNet™ is a trademark of ODVA.
Product names described in this catalog may be used as trademarks by each manufacturer.

# Specific Product Precautions 7

**Be sure to read this before handling**

## EX600 Precautions

### Maintenance

## ⚠Warning

**1. Do not disassemble, modify (including circuit board replacement) or repair this product.**
Such actions are likely to cause injuries or breakage.

**2. When an inspection is performed,**
- **Turn off the power supply.**
- **Stop the air supply, exhaust the residual pressure in piping and verify that the air is released before performing maintenance work.**

Unexpected malfunction of system components and injury can result.

## ⚠Caution

**1. When handling and replacing the unit:**
- **Do not touch the sharp metal parts of the connector or plug.**
- **Do not apply excessive force to the unit.**
  The connecting portions of the unit are firmly joined with seals.
- **When joining units, take care not to get fingers caught between units.**
  Injury can result.

**2. Perform periodic inspection.**
Unexpected malfunction in the system composition devices is likely to occur due to malfunction of machinery or equipment.

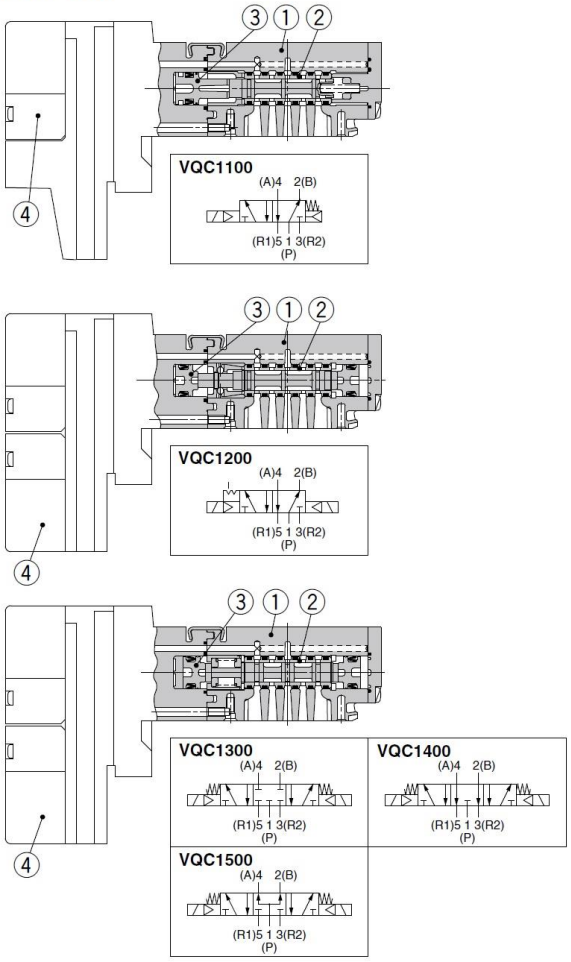
**3. After maintenance, make sure to perform an appropriate functionality inspection.**
In cases of abnormality such as faulty operation, stop operation. Unexpected malfunction in the system composition devices is likely to occur.

**4. Do not use benzene and thinner for cleaning units.**
Damage to the surface or erasure of the display can result. Wipe off any stains with a soft cloth.
If the stain is persistent, wipe off with a cloth soaked in a dilute solution of neutral detergent and wrung out tightly, and then finish with a dry cloth.

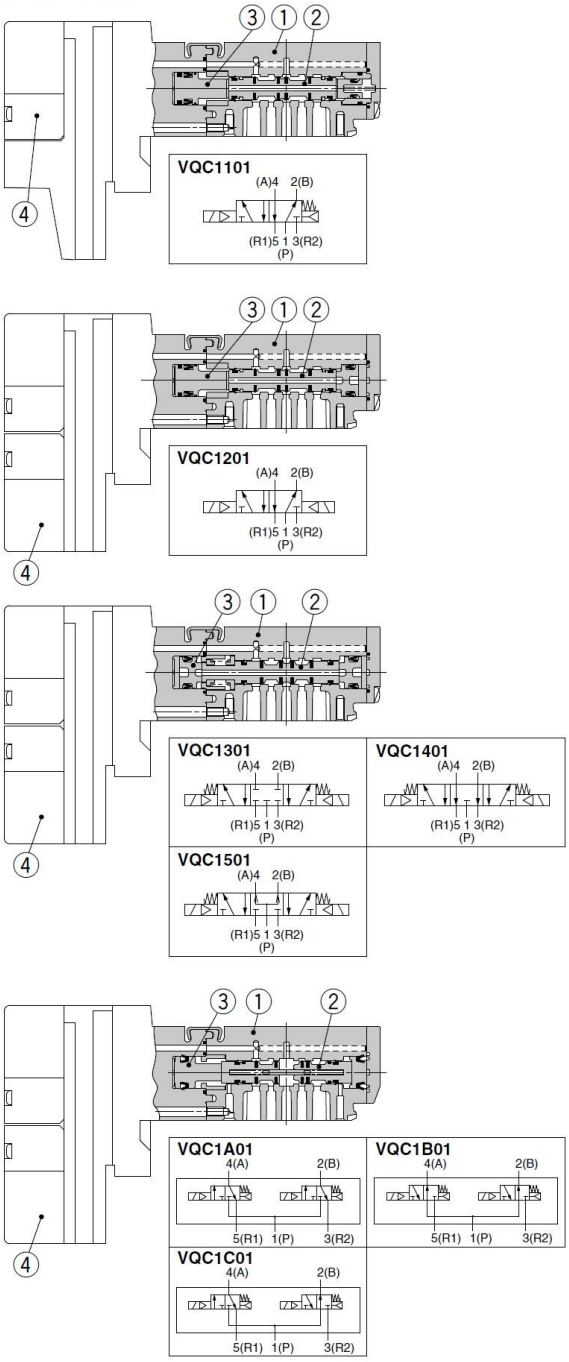
# *VQC1000/2000 Series*
# Construction

## VQC1000 Plug-in Unit: Main Parts/Replacement Parts

### Metal seal




### Rubber seal




### Component Parts

| No. | Description | Material | Note |
|---|---|---|---|
| 1 | **Body** | Zinc die-casted | |
| 2 | **Spool/Sleeve** | Stainless steel | |
| 3 | **Piston** | Resin | |
| 4 | **Pilot valve assembly** | — | |

Note) Refer to page 21 for "How to Order Pilot Valve Assembly."

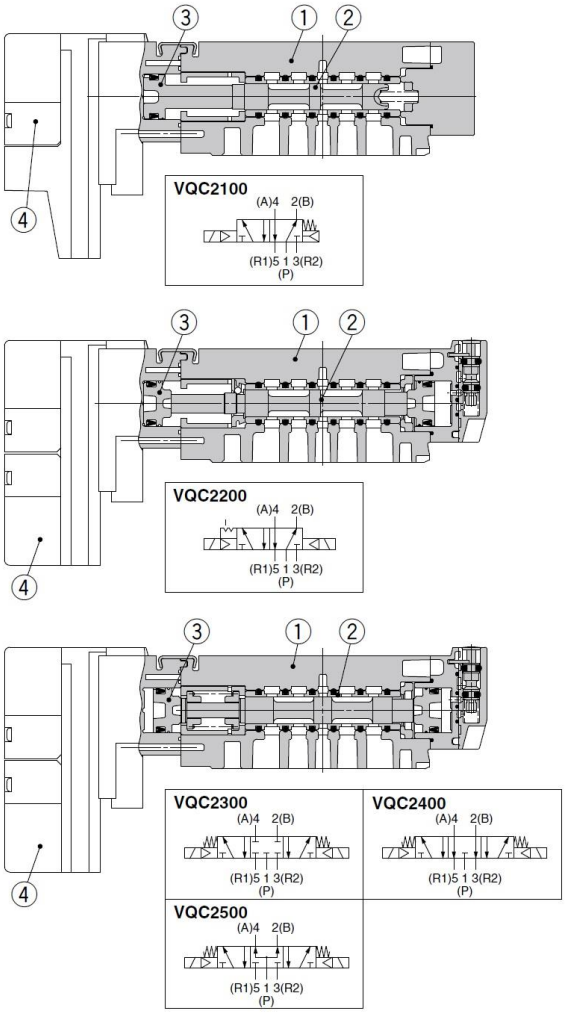
### Component Parts

| No. | Description | Material | Note |
|---|---|---|---|
| 1 | **Body** | Zinc die-casted | |
| 2 | **Spool valve** | Aluminum, HNBR | |
| 3 | **Piston** | Resin | |
| 4 | **Pilot valve assembly** | — | |

Note) Refer to page 21 for "How to Order Pilot Valve Assembly."

## VQC2000 Plug-in Unit: Main Parts/Replacement Parts

### Metal seal

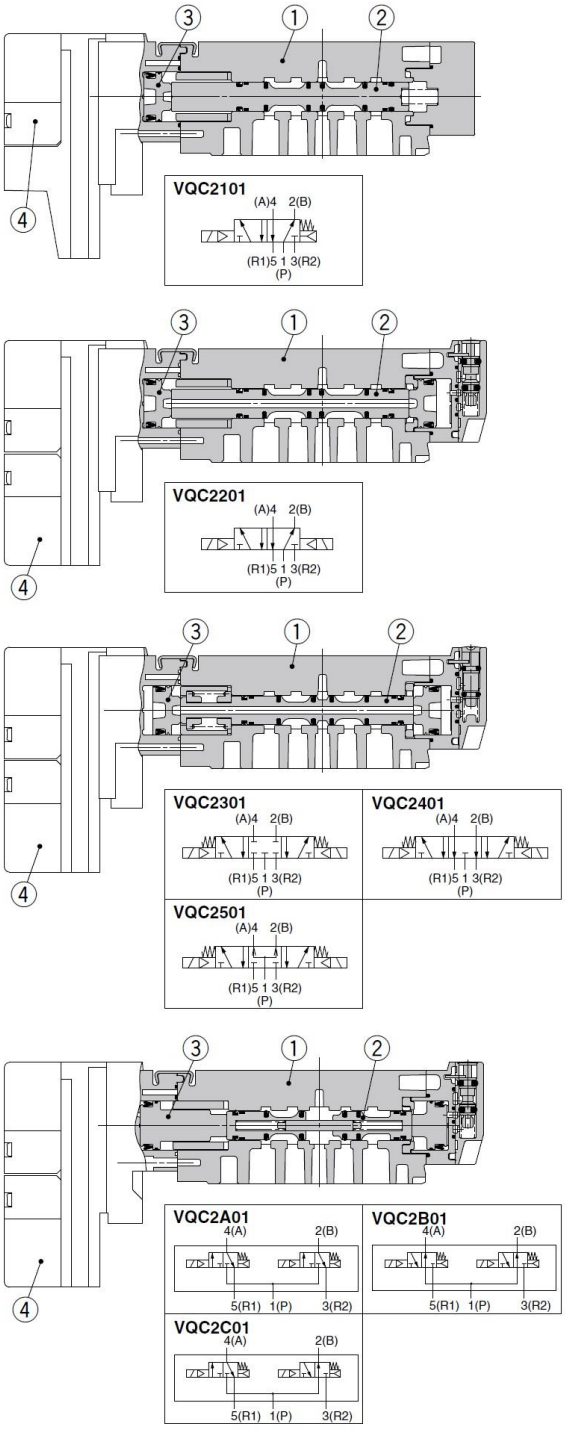



### Component Parts

| No. | Description | Material | Note |
|---|---|---|---|
| 1 | **Body** | Zinc die-casted | |
| 2 | **Spool/Sleeve** | Stainless steel | |
| 3 | **Piston** | Resin | |
| 4 | **Pilot valve assembly** | — | |

Note) Refer to page 21 for "How to Order Pilot Valve Assembly."

### Rubber seal

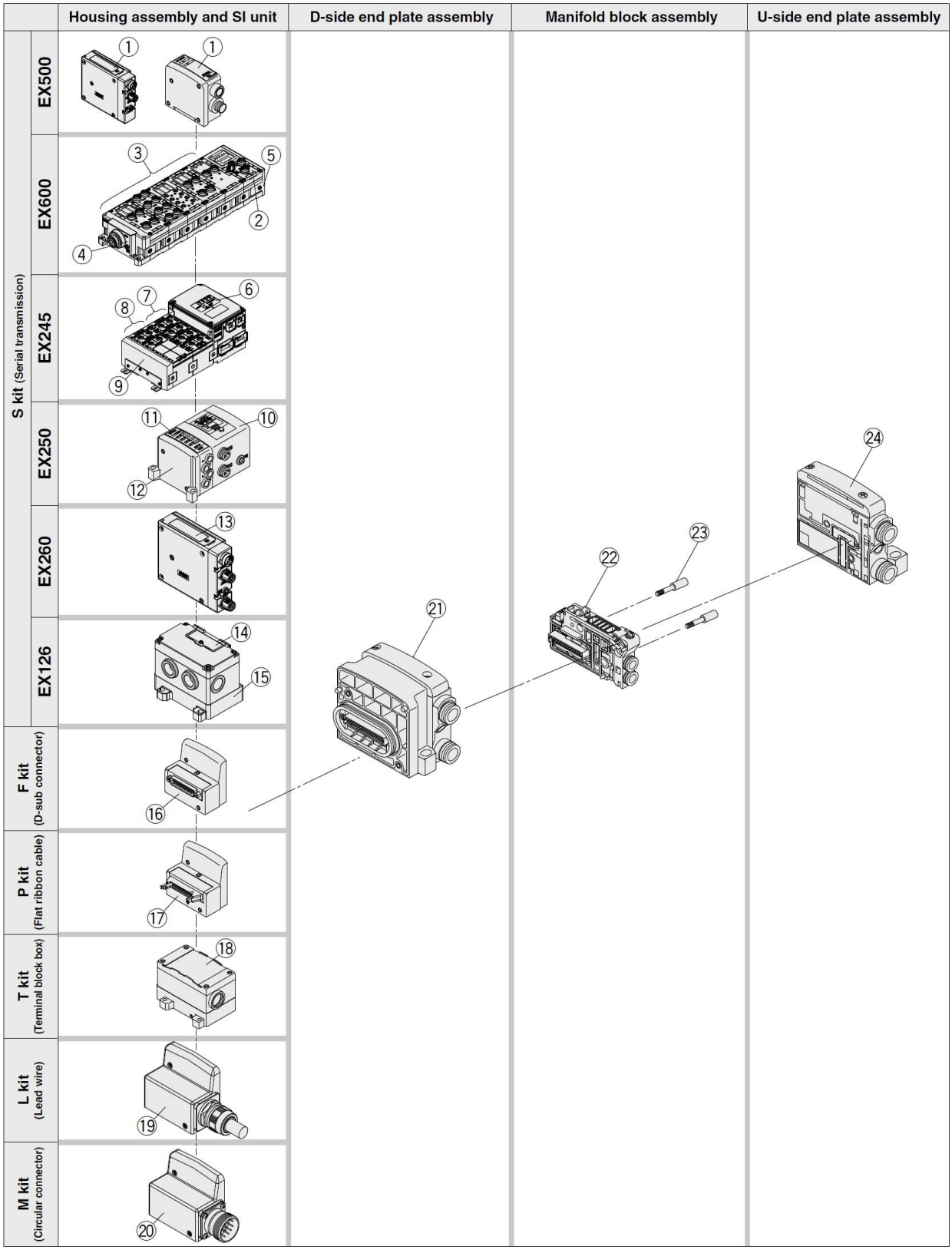



### Component Parts

| No. | Description | Material | Note |
|---|---|---|---|
| 1 | **Body** | Zinc die-casted | |
| 2 | **Spool valve** | Aluminum, HNBR | |
| 3 | **Piston** | Resin | |
| 4 | **Pilot valve assembly** | — | |

Note) Refer to page 21 for "How to Order Pilot Valve Assembly."

# *VQC1000/2000 Series*
# Exploded View of Manifold



## Manifold Assembly Part No.

### Housing Assembly and SI Unit/Input Block

| No. | Description | Part no. | Note |
|---|---|---|---|
| ① | **SI unit** | **EX500-S103** | EtherNet/IP™, PROFINET PNP (Negative common) |
| | | **EX500-Q001** | DeviceNet™, PROFIBUS DP, EtherNet/IP™ NPN (Positive common) |
| | | **EX500-Q101** | DeviceNet™, PROFIBUS DP, EtherNet/IP™ PNP (Negative common) |
| ② | **SI unit** | **EX600-SDN1A** | DeviceNet™ PNP (Negative common) |
| | | **EX600-SDN2A** | DeviceNet™ NPN (Positive common) |
| | | **EX600-SMJ1** | CC-Link PNP (Negative common) |
| | | **EX600-SMJ2** | CC-Link NPN (Positive common) |
| | | **EX600-SPR1A** | PROFIBUS DP PNP (Negative common) |
| | | **EX600-SPR2A** | PROFIBUS DP NPN (Positive common) |
| | | **EX600-SEN1** | EtherNet/IP™ (1 port) PNP (Negative common) |
| | | **EX600-SEN2** | EtherNet/IP™ (1 port) NPN (Positive common) |
| | | **EX600-SEN3** | EtherNet/IP™ (2 port) PNP (Negative common) |
| | | **EX600-SEN4** | EtherNet/IP™ (2 port) NPN (Positive common) |
| | | **EX600-SPN1** | PROFINET PNP (Negative common) |
| | | **EX600-SPN2** | PROFINET NPN (Positive common) |
| | | **EX600-SEC1** | EtherCAT PNP (Negative common) |
| | | **EX600-SEC2** | EtherCAT NPN (Positive common) |
| | | **EX600-WEN1** Note) | Wireless base module EtherNet/IP™ Negative common (PNP) |
| | | **EX600-WEN2** Note) | Wireless base module EtherNet/IP™ Positive common (NPN) |
| | | **EX600-WPN1** Note) | Wireless base module PROFINET Negative common (PNP) |
| | | **EX600-WPN2** Note) | Wireless base module PROFINET Positive common (NPN) |
| | | **EX600-WSV1** Note) | Wireless remote module Negative common (PNP) |
| | | **EX600-WSV2** Note) | Wireless remote module Positive common (NPN) |
| ③ | **Digital input unit** | **EX600-DXNB** | NPN input, M12 connector, 5 pins (4 pcs.), 8 inputs |
| | | **EX600-DXPB** | PNP input, M12 connector, 5 pins (4 pcs.), 8 inputs |
| | | **EX600-DXNC** | NPN input, M8 connector, 3 pins (8 pcs.), 8 inputs |
| | | **EX600-DXNC1** | NPN input, M8 connector, 3 pins (8 pcs.), 8 inputs, with open circuit detection |
| | | **EX600-DXPC** | PNP input, M8 connector, 3 pins (8 pcs.), 8 inputs |
| | | **EX600-DXPC1** | PNP input, M8 connector, 3 pins (8 pcs.), 8 inputs, with open circuit detection |
| | | **EX600-DXND** | NPN input, M12 connector, 5 pins (8 pcs.), 16 inputs |
| | | **EX600-DXPD** | PNP input, M12 connector, 5 pins (8 pcs.), 16 inputs |
| | | **EX600-DXNE** | NPN input, D-sub connector, 25 pins, 16 inputs |
| | | **EX600-DXPE** | PNP input, D-sub connector, 25 pins, 16 inputs |
| | | **EX600-DXNF** | NPN input, Spring type terminal box, 32 pins, 16 inputs |
| | | **EX600-DXPF** | PNP input, Spring type terminal box, 32 pins, 16 inputs |
| | **Digital output unit** | **EX600-DYNB** | NPN output, M12 connector, 5 pins (4 pcs.), 8 outputs |
| | | **EX600-DYPB** | PNP output, M12 connector, 5 pins (4 pcs.), 8 outputs |
| | | **EX600-DYNE** | NPN output, D-sub connector, 25 pins, 16 outputs |
| | | **EX600-DYPE** | PNP output, D-sub connector, 25 pins, 16 outputs |
| | | **EX600-DYNF** | NPN output, Spring type terminal box, 32 pins, 16 outputs |
| | | **EX600-DYPF** | NPN output, Spring type terminal box, 32 pins, 16 outputs |
| | **Digital input/output unit** | **EX600-DMNE** | NPN input/output, D-sub connector, 25 pins, 8 inputs/outputs |
| | | **EX600-DMPE** | PNP input/output, D-sub connector, 25 pins, 8 inputs/outputs |
| | | **EX600-DMNF** | NPN input/output, Spring type terminal box, 32 pins, 8 inputs/outputs |
| | | **EX600-DMPF** | PNP input/output, Spring type terminal box, 32 pins, 8 inputs/outputs |
| | **Analog input unit** | **EX600-AXA** | M12 connector, 5 pins (2 pcs.), 2-channel input |
| | **Analog output unit** | **EX600-AYA** | M12 connector, 5 pins (2 pcs.), 2-channel output |
| | **Analog input/output unit** | **EX600-AMB** | M12 connector, 5 pins (4 pcs.), 2-channel inputs/outputs |
| ④ | **End plate** | **EX600-ED2** | M12 power supply connector, B-coded |
| | | **EX600-ED2-2** | M12 power supply connector, B-coded, with DIN rail mounting bracket |
| | | **EX600-ED3** | 7/8 inch power supply connector |
| | | **EX600-ED3-2** | 7/8 inch power supply connector, with DIN rail mounting bracket |
| | | **EX600-ED4** | M12 power supply connector IN/OUT, A-coded, Pin arrangement 1 |
| | | **EX600-ED4-2** | M12 power supply connector IN/OUT, A-coded, Pin arrangement 1, with DIN rail mounting bracket |
| | | **EX600-ED5** | M12 power supply connector IN/OUT, A-coded, Pin arrangement 2 |
| | | **EX600-ED5-2** | M12 power supply connector IN/OUT, A-coded, Pin arrangement 2, with DIN rail mounting bracket |
| ⑤ | **Valve plate** | **EX600-ZMV1** | Enclosed parts: round head screws (M4 x 6) 2 pcs., round head screws (M3 x 8) 4 pcs. |

Note) The wireless system is suitable for use only in a country where it is in accordance with the Radio Act and regulations of that country.

## Manifold Assembly Part No.

### Housing Assembly and SI Unit/Input Block

| No. | Description | Part no. | Note |
|---|---|---|---|
| ⑥ | **SI unit** | **EX245-SPN1A** | Communication connector: Push Pull connector (SCRJ): 2 pcs./Power supply connector: Push Pull connector (24 V): 2 pcs. |
| | | **EX245-SPN2A** | Communication connector: Push Pull connector (RJ45): 2 pcs./Power supply connector: Push Pull connector (24 V): 2 pcs. |
| | | **EX245-SPN3A** | Communication connector: M12 connector (4-pin, Socket, D-coded): 2 pcs./Power supply connector: 7/8 inch connector (5-pin, Plug): 1 pc. 7/8 inch connector (5-pin, Socket): 1 pc. |
| ⑦ | **Digital input module** | **EX245-DX1** | Digital input (16 inputs) |
| ⑧ | **Digital output module** | **EX245-DY1** | Digital output (16 outputs) |
| ⑨ | **End plate** | **EX245-EA2-5** | |
| ⑩ | **SI unit** | **EX250-SPR1** | PROFIBUS DP PNP (Negative common) |
| | | **EX250-SAS3** | AS-Interface, 8 in/8 out, 31 slave modes, 2 power supply systems PNP (Negative common) |
| | | **EX250-SAS5** | AS-Interface, 4 in/4 out, 31 slave modes, 2 power supply systems PNP (Negative common) |
| | | **EX250-SAS7** | AS-Interface, 8 in/8 out, 31 slave modes, 1 power supply system PNP (Negative common) |
| | | **EX250-SAS9** | AS-Interface, 4 in/4 out, 31 slave modes, 1 power supply system PNP (Negative common) |
| | | **EX250-SCA1A** | CANopen PNP (Negative common) |
| | | **EX250-SDN1** | DeviceNet™ PNP (Negative common) |
| | | **EX250-SEN1** | EtherNet/IP™ PNP (Negative common) |
| ⑪ | **Input block** | **EX250-IE1** | M12, 2 inputs |
| | | **EX250-IE2** | M12, 4 inputs |
| | | **EX250-IE3** | M8, 4 inputs |
| ⑫ | **End plate assembly** | **EX250-EA1** | Standard |
| | | **EX250-EA2** | For DIN rail mounting |
| ⑬ | **SI unit** | **EX260-SDN1** | DeviceNet™, M12 connector, 32 outputs PNP (Negative common) |
| | | **EX260-SDN2** | DeviceNet™, M12 connector, 32 outputs NPN (Positive common) |
| | | **EX260-SDN3** | DeviceNet™, M12 connector, 16 outputs PNP (Negative common) |
| | | **EX260-SDN4** | DeviceNet™, M12 connector, 16 outputs NPN (Positive common) |
| | | **EX260-SPR1** | PROFIBUS DP, M12 connector, 32 outputs PNP (Negative common) |
| | | **EX260-SPR2** | PROFIBUS DP, M12 connector, 32 outputs NPN (Positive common) |
| | | **EX260-SPR3** | PROFIBUS DP, M12 connector, 16 outputs PNP (Negative common) |
| | | **EX260-SPR4** | PROFIBUS DP, M12 connector, 16 outputs NPN (Positive common) |
| | | **EX260-SPR5** | PROFIBUS DP, D-sub connector, 32 outputs PNP (Negative common) |
| | | **EX260-SPR6** | PROFIBUS DP, D-sub connector, 32 outputs NPN (Positive common) |
| | | **EX260-SPR7** | PROFIBUS DP, D-sub connector, 16 outputs PNP (Negative common) |
| | | **EX260-SPR8** | PROFIBUS DP, D-sub connector, 16 outputs NPN (Positive common) |
| | | **EX260-SMJ1** | CC-Link, M12 connector, 32 outputs PNP (Negative common) |
| | | **EX260-SMJ2** | CC-Link, M12 connector, 32 outputs NPN (Positive common) |
| | | **EX260-SMJ3** | CC-Link, M12 connector, 16 outputs PNP (Negative common) |
| | | **EX260-SMJ4** | CC-Link, M12 connector, 16 outputs NPN (Positive common) |
| | | **EX260-SEC1** | EtherCAT, M12 connector, 32 outputs PNP (Negative common) |
| | | **EX260-SEC2** | EtherCAT, M12 connector, 32 outputs NPN (Positive common) |
| | | **EX260-SEC3** | EtherCAT, M12 connector, 16 outputs PNP (Negative common) |
| | | **EX260-SEC4** | EtherCAT, M12 connector, 16 outputs NPN (Positive common) |
| | | **EX260-SPN1** | PROFINET, M12 connector, 32 outputs PNP (Negative common) |
| | | **EX260-SPN2** | PROFINET, M12 connector, 32 outputs NPN (Positive common) |
| | | **EX260-SPN3** | PROFINET, M12 connector, 16 outputs PNP (Negative common) |
| | | **EX260-SPN4** | PROFINET, M12 connector, 16 outputs NPN (Positive common) |
| | | **EX260-SEN1** | EtherNet/IP™, M12 connector, 32 outputs PNP (Negative common) |
| | | **EX260-SEN2** | EtherNet/IP™, M12 connector, 32 outputs NPN (Positive common) |
| | | **EX260-SEN3** | EtherNet/IP™, M12 connector, 16 outputs PNP (Negative common) |
| | | **EX260-SEN4** | EtherNet/IP™, M12 connector, 16 outputs NPN (Positive common) |
| | | **EX260-SPL1** | Ethernet POWERLINK, M12 connector, 32 outputs PNP (Negative common) |
| | | **EX260-SPL3** | Ethernet POWERLINK, M12 connector, 16 outputs PNP (Negative common) |
| | | **EX260-SIL1** | IO-Link M12 connector, 32 outputs PNP (Negative common) |
| ⑭ | **SI unit** | **EX126D-SMJ1** | CC-Link NPN (Positive common) |
| ⑮ | **Terminal block plate** | **VVQC1000-74A-2** | For EX126 SI unit mounting |
| ⑯ | **D-sub connector housing assembly** | **VVQC1000-F25-1** | F kit, 25 pins |
| ⑰ | **Flat ribbon cable housing assembly** | **VVQC1000-P26-1** | P kit, 26 pins |
| | | **VVQC1000-P20-1** | P kit, 20 pins |
| ⑱ | **Terminal block box housing assembly** | **VVQC1000-T0-1** | T kit |
| ⑲ | **Lead wire housing assembly** | **VVQC1000-L25-0-1** | L kit with 0.6 m lead wire |
| | | **VVQC1000-L25-1-1** | L kit with 1.5 m lead wire |
| | | **VVQC1000-L25-2-1** | L kit with 3.0 m lead wire |
| ⑳ | **Circular connector housing assembly** | **VVQC1000-M26-1** | M kit, 26 pins |

## Manifold Assembly Part No.

### <D-Side End Plate Assembly>

㉑ D-side end plate assembly part no.

VVQC 1 000-3A-1- □ - □

**Series**

| | |
|---|---|
| 1 | VQC1000 |
| 2 | VQC2000 |

**Port size**

| Symbol | VQC1000 | VQC2000 |
|---|---|---|
| C8 | ● | |
| C10 | | ● |
| N9 | ● | |
| N11 | | ● |

**Option**

| | |
|---|---|
| Nil | Common EXH |
| R | External pilot |
| S | Direct EXH outlet with built-in silencer |

### <U-Side End Plate Assembly>

㉔ U-side end plate assembly part no.

VVQC 1 000-2A- 1 - C8 - □

**Series**

| | |
|---|---|
| 1 | VQC1000 |
| 2 | VQC2000 |

**Supply/Exhaust port entry direction**

| | |
|---|---|
| 1 | Cylinder port side |
| 2 Note) | Branch type |

Note) VQC2000 only

**Port size**

| Symbol | VQC1000 | VQC2000 |
|---|---|---|
| C8 | ● | |
| C10 | | ● |
| C12 | | ● |
| N9 | ● | |
| N11 | | ● |
| N13 | | ● |

**Option**

| | |
|---|---|
| Nil | Common EXH |
| R | External pilot |
| S | Direct EXH outlet with built-in silencer |

### <Manifold Block Assembly>

㉒ Manifold block assembly part no.

VVQC 1 000-1A- D - C6 - □

**Series**

| | |
|---|---|
| 1 | VQC1000 |
| 2 | VQC2000 |

Note) Tie-rods (2 pcs.) for additional stations included.

**Wiring specifications**

| | |
|---|---|
| D | Double wiring |
| S | Single wiring |

**Port size**

| Symbol | Port size | VQC1000 | VQC2000 |
|---|---|---|---|
| C3 | For ø3.2 One-touch fitting | ● | |
| C4 | For ø4 One-touch fitting | ● | ● |
| C6 | For ø6 | ● | ● |
| C8 | For ø8 | | ● |
| N1 | For ø1/8" | ● | |
| N3 | For ø5/32" | ● | ● |
| N7 | For ø1/4" | ● | ● |
| N9 | For ø5/16" | | ● |
| M5 | For M5 thread | ● | |

**Option**

| | |
|---|---|
| Nil | None |
| B | With back pressure check valve |

### <Replacement Parts>

**Pilot valve assembly**

V112 □ - 5 A

**Coil voltage**

| | |
|---|---|
| 5 | 24 VDC |
| 6 | 12 VDC |

**Function**

| | |
|---|---|
| Nil | Standard (0.4 W) |
| B | High-speed response type (0.95 W) |
| K | High-pressure type (1.0 MPa, 0.95 W) |

Note 1) Common to single solenoid and double solenoid
Note 2) The voltage (including light/surge voltage suppressor), positive common and negative common cannot be changed by changing the pilot valve assembly.

㉓ Tie-rod assembly part no. (2 pcs.)

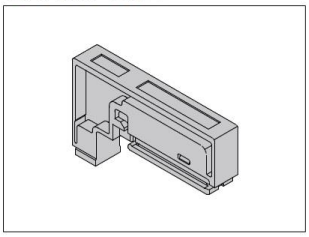
| | |
|---|---|
| VQC1000 | VVQC1000-TR-□ |
| VQC2000 | VVQC2000-TR-□ |

Note 1) Please order when reducing the number of manifold stations. When increasing the number of stations, additional orders are not required since they are included in the manifold block assembly.
Note 2) □: Stations 02 to 24

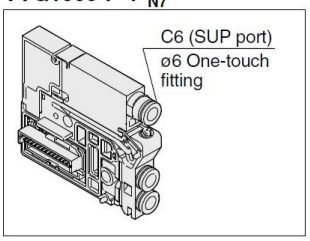
## Manifold Options

Refer to pages 24 through to 27 for details.

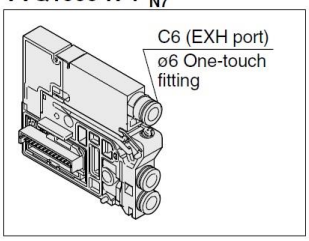
**Blanking plate assembly**
**VVQ1000-10A-1**



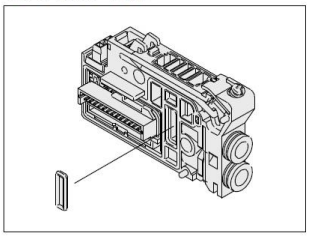
**Individual SUP spacer**
**VVQ1000-P-1-$^{C6}_{N7}$**



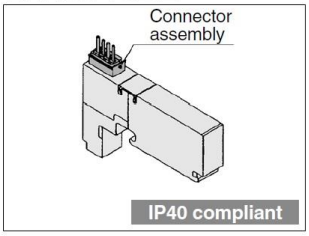

**Individual EXH spacer**
**VVQ1000-R-1-$^{C6}_{N7}$**



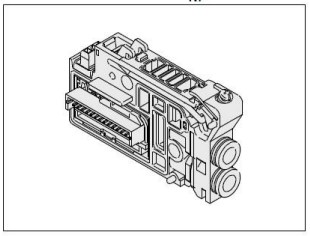

**SUP block plate**
**VVQ1000-16A**



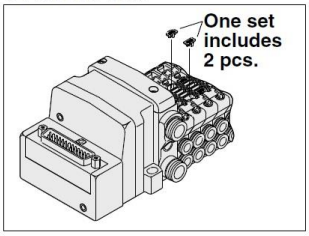
**Blanking plate with connector**
**VVQ1000-1C□-□**



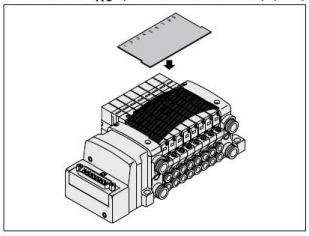

**EXH block plate assembly**
**VVQC1000-19A-$^{S}_{D}$-$^{C3,\ C4}_{C6,\ M5}$ $^{N1,\ N3}_{N7}$**



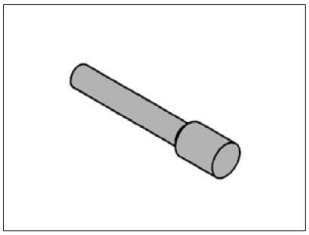
**Back pressure check valve assembly [-B]**
**VVQ1000-18A**



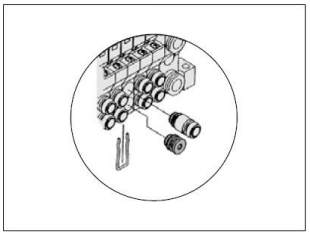

**Name plate [-N]**
**VVQ1000-$^{N}_{Nc}$-(1 to Max. stations) (-X4)**



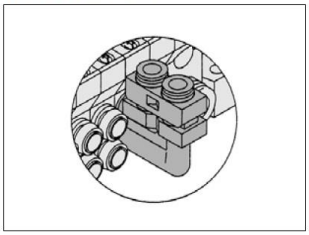
**Blanking plug**
**KQ2P-□**



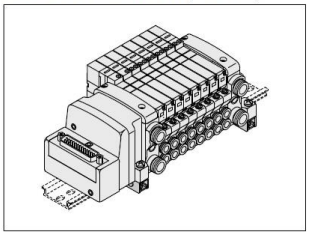
**Port plug**
**VVQ0000-58A**



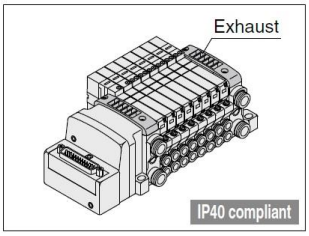
**Elbow fitting assembly**
**VVQ1000-F-L□**



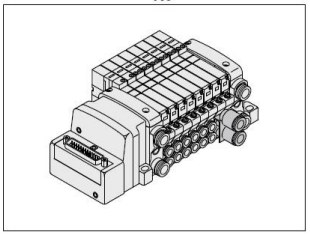
**DIN rail mounting bracket [-D]**
**VVQ1000-57A**
{For F/L/M/P/S (EX500) kit}
**VVQC1000-57A-S**
{For S (EX250) kit}
**VVQC1000-57A-T** (For T kit)



**Direct EXH outlet with built-in silencer [-S]**

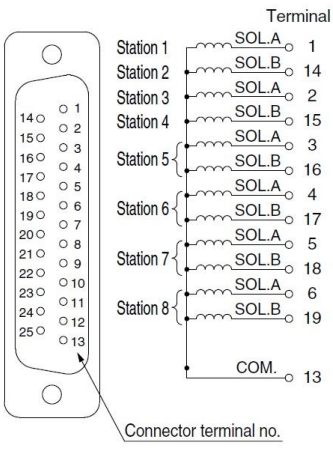



**Dual flow fitting assembly**
**VVQ1000-52A-$^{C8}_{N9}$**



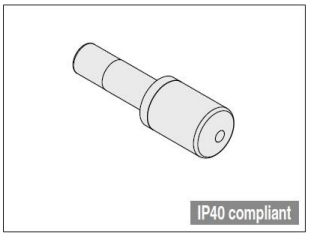
**Special electrical wiring specifications [-K]**

Wiring example)
D-sub connector

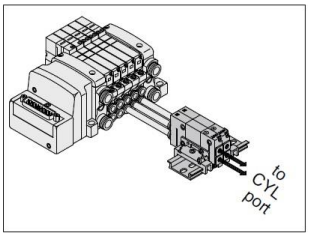



Standard manifolds are for double wiring, but mixed wiring (single and double wiring) can be specified as an option.

**Silencer (For EXH port)**
**AN15-C08**



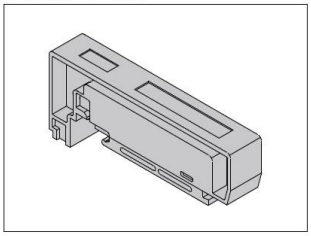

**Double check block**
**VVQ1000-FPG-□□-□**



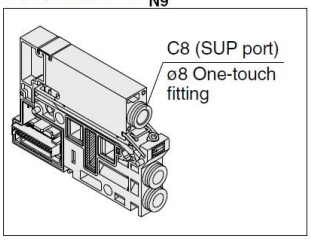
## Manifold Options

Refer to pages 28 through to 30 for details.

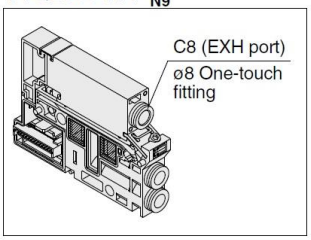
**Blanking plate assembly**
**VVQ2000-10A-1**



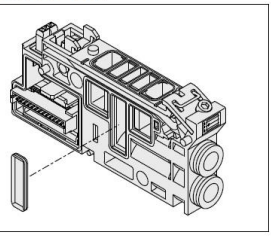
**Individual SUP spacer**
**VVQ2000-P-1-$^{C8}_{N9}$**



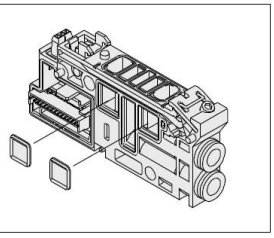

**Individual EXH spacer**
**VVQ2000-R-1-$^{C8}_{N9}$**



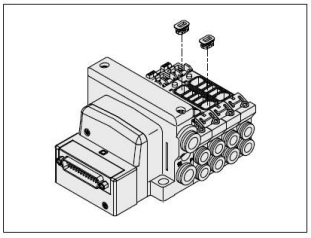

**SUP block plate**
**VVQ2000-16A**



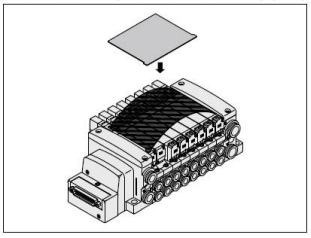
**EXH block plate**
**VVQ2000-19A**



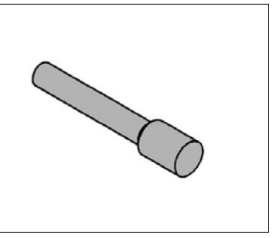
**Back pressure check valve assembly [-B]**
**VVQ2000-18A**



**Name plate [-N]**
**VVQ2000-N-(1 to Max. stations) (-X4)**

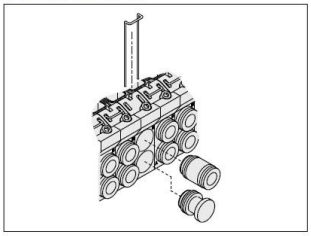


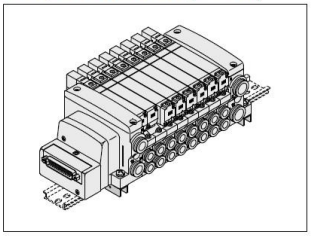
**Blanking plug**
**KQ2P-□**



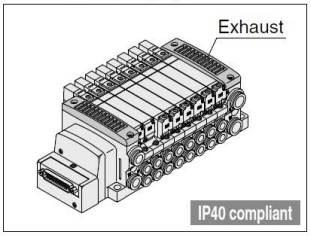
**DIN rail mounting bracket [-D]**
**VVQ2000-57A**
{For F/L/M/P/S (EX500) kit}
**VVQC2000-57A-S**
{For S (EX250) kit}
**VVQC2000-57A-T** (For T kit)

**Port plug**
**VVQ1000-58A**

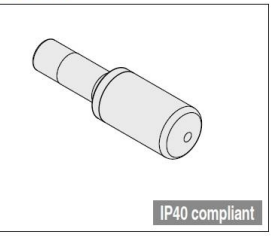




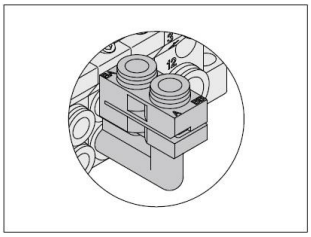
**Direct EXH outlet with built-in silencer [-S]**



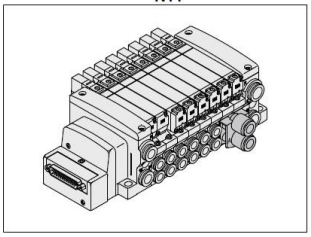

**Silencer (For EXH port)**
**AN20-C10**




**Elbow fitting assembly**
**VVQ2000-F-L□**

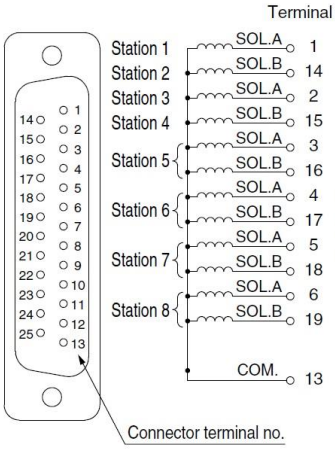


**Dual flow fitting assembly**
**VVQ2000-52A-$^{C10}_{N11}$**



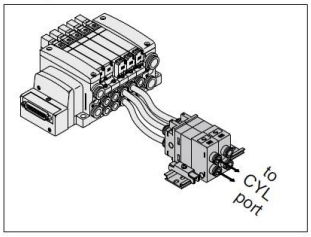
**Special electrical wiring specifications [-K]**

Wiring example)
D-sub connector




Standard manifolds are for double wiring, but mixed wiring (single and double wiring) can be specified as an option.

**Double check block**
**VVQ2000-FPG-□□-□**

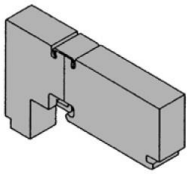


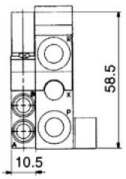
## VQC1000: Manifold Optional Parts

### Blanking plate assembly
**VVQ1000-10A-1**

Symbol

It is used by attaching on the manifold block for being prepared for removing a valve for maintenance reasons or planning to mount a spare valve, etc.

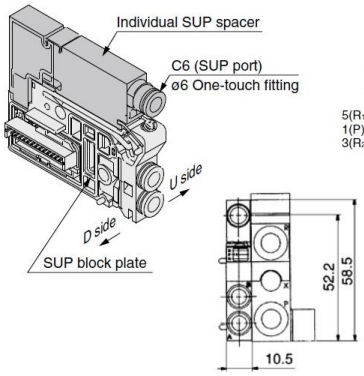


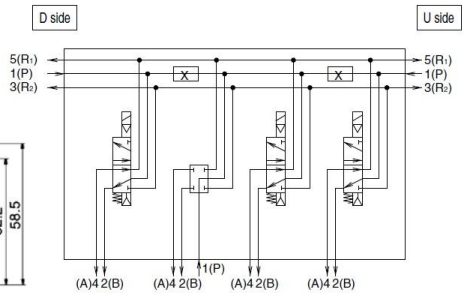



### Individual SUP spacer
**VVQ1000-P-1-$^{C6}_{N7}$**

When the same manifold is to be used for different pressures, individual SUP spacers are used as SUP ports for different pressures. (One station space is occupied.)
Block both sides of the station, for which the supply pressure from the individual SUP spacer is used, with SUP block plates. (Refer to the application example.)

* Specify the spacer mounting position and SUP block plate position by means of the manifold specification sheet. The block plate is used in one or two places for one set. (Two SUP block plates for blocking SUP passage are attached to the individual SUP spacer.)
* As a standard, electric wiring is connected to the position of the manifold station where the individual SUP spacer is mounted.
* If wiring is not required for stations equipped with spacers, enter "X" in the special wiring specifications column in the manifold specification sheet.

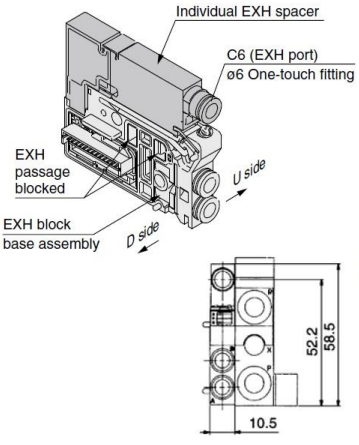


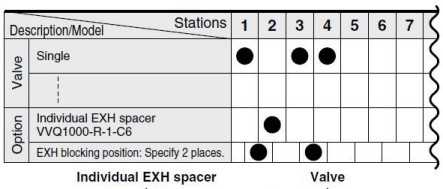



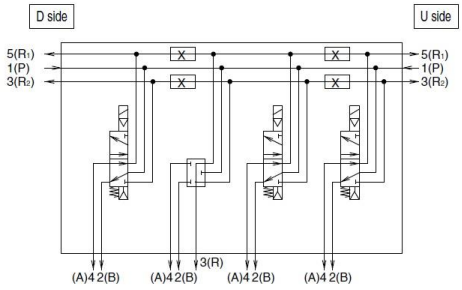

### Individual EXH spacer
**VVQ1000-R-1-$^{C6}_{N7}$**

When valve exhaust affects other stations due to the circuit configuration, this spacer is used for individual valve exhaust. (One station space is occupied.)
Block both sides of the individual valve EXH station. (Refer to the application example.)

* Specify the spacer mounting position, as well as the EXH passage blocking position by means of the manifold specification sheet. The block plate is used in one or two places for one set.
* An EXH block base assembly is used in the blocking position when ordering an EXH spacer incorporated with a manifold. However, do not order an EXH block base assembly because it is attached to the spacer.
  When separately ordering an individual EXH spacer, separately order an EXH block base assembly because it is not attached to the spacer.
* As a standard, electric wiring is connected to the position of the manifold station where the individual EXH spacer is mounted.
* If wiring is not required for stations equipped with spacers, enter "X" in the special wiring specifications column in the manifold specification sheet.
* Do not install any back pressure check valve on the manifold station, on which the spacer is to be mounted. When installing the back pressure check valve on other manifold station, be sure to specify the manifold station position on the manifold specification sheet instead of ordering by specifying the manifold option symbol "B".



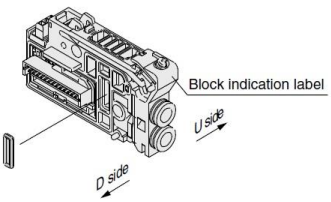

### SUP block plate
**VVQ1000-16A**

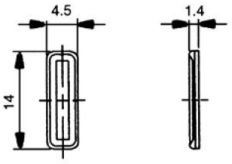
When different pressures are supplied to a manifold, a SUP block plate is used to block the stations under different pressures.

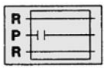
* Specify the mounting position by means of the manifold specification sheet.

**<Block indication label>**
Indication labels to confirm the blocking position are attached (Each for SUP passage and SUP/EXH passage blocking positions).

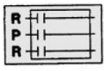
* When ordering a block plate incorporated with a manifold, a block indication label is attached to the manifold.




**SUP passage blocked**




**SUP/EXH passage blocked**

## Blanking plate with connector

**VVQ1000-1C□-□**

Symbol

**Connector**

| | |
|---|---|
| Nil | Without connector |
| 1 | With connector/2-wire |
| 2 | With connector/4-wire |

**Connector lead wire length (mm)**

| | | | |
|---|---|---|---|
| Nil | 300 | 20 | 2000 |
| 6 | 600 | 25 | 2500 |
| 10 | 1000 | 30 | 3000 |
| 15 | 1500 | | |

Blanking plate with a connector for individually outputting electricity to drive a single valve or equipment that are not on the manifold base.

* When "N" is suffixed to the end of the name plate, the plate will be different from a standard shape.

Note) Electric current should be 1A or less (including the mounted valves).



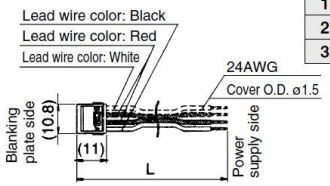

## Connector assembly part no.

**AXT661-43A-6**

**Lead wire length (mm)**

| | |
|---|---|
| 43 | 4-wire |
| 44 | 2-wire |

| | |
|---|---|
| Nil | 300 |
| 6 | 600 |
| 10 | 1000 |
| 20 | 2000 |
| 30 | 3000 |




## EXH block base assembly

**VVQC1000-19A-□-(C3/C4/C6/M5/N1/N3/N7)**

**Wiring specifications**

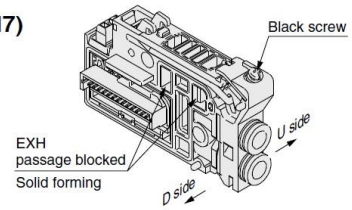
| | |
|---|---|
| S | Single wiring |
| D | Double wiring |

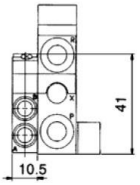
The manifold block assembly is used between stations for which exhaust is desired to be divided when valve exhaust affects other stations due to the circuit configuration. The EXH passage on the D-side is blocked in the EXH block base assembly. It is also used in combination with an individual EXH spacer for individual exhaust.

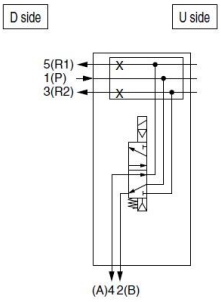
**<Block indication label>**

Indication labels to confirm the blocking position are attached (Each for EXH passage and SUP/EXH passage blocking positions).

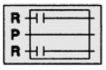
* When ordering this option incorporated with a manifold, a block indication label is attached to the manifold.



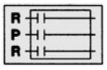




* Specify the mounting position by means of the manifold specification sheet.
* When ordering this option incorporated with a manifold, specify the EXH block base assembly part number with "*" in front of it beneath the manifold part number.




**EXH passage blocked**




**SUP/EXH passage blocked**

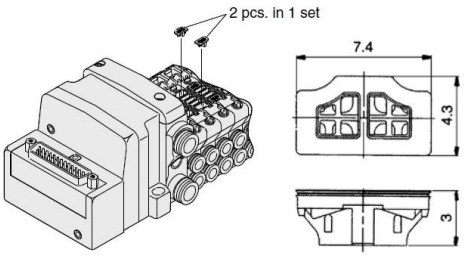
## Back pressure check valve assembly [-B]

**VVQ1000-18A**

It prevents cylinder from malfunctioning by other valve's exhaust entry. Insert it into R (EXH) port on the manifold side of a valve which is affected. It is effective when a single-acting cylinder is used or an exhaust center type solenoid valve is used.

* When ordering it being mounted on all manifold stations, suffix "-B" to the end of the manifold part number.

Note) When a back pressure check valve is desired, and is to be installed only in certain manifold stations, clearly indicate the part number and specify the mounting station by means of the manifold specification sheet.




(Precautions)

1. The manifold installed type back pressure check valve assembly is assembly parts with a check valve structure. However, since slight air leakage against the back pressure is allowed due to its structure, adverse effects of the back pressure due to increase in exhaust resistance cannot be prevented if the manifold exhaust port and other exhaust ports are put together for piping or if the piping diameter is narrowed. As a result, this may cause the actuator and air operated equipment to malfunction. So, be careful not to restrict the exhaust air.
2. When a back pressure check valve is mounted, the effective area of the valve will decrease by about 20%.

## Name plate [-N]

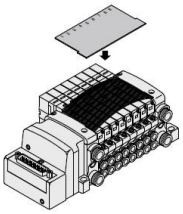
**VVQ1000-$\frac{N}{NC}$-Station (1 to Max. stations) (-X4)**

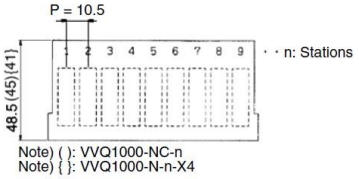
**N: Standard**
**NC: For mounting blanking plate with connector**

**-X4: For mounting slide locking type manual valve**

It is a transparent resin plate for placing a label that indicates solenoid valve function, etc. Insert it into the groove on the side of the end plate and bend it as shown in the figure.

* When the blanking plate with connector is mounted, it automatically will be "VVQ1000-NC-n"
* When the slide locking type manual valve is mounted, it automatically will be "VVQ1000-N-n-X4"
* When ordering this option incorporated with a manifold, suffix "-N" to the end of the manifold part number.

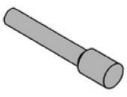


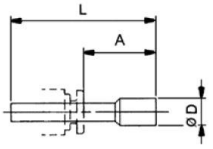



## Blanking plug (For One-touch fittings)

**KQ2P-□**

It is inserted into an unused cylinder port and SUP/EXH ports. Purchasing order is available in units of 10 pieces.






## Dimensions

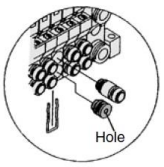
| Applicable fitting size ød | Model | A | L | D |
|---|---|---|---|---|
| 3.2 | KQ2P-23 | 16 | 31.5 | 5 |
| 4 | KQ2P-04 | 16 | 32 | 6 |
| 6 | KQ2P-06 | 18 | 35 | 8 |
| 8 | KQ2P-08 | 20.5 | 39 | 10 |

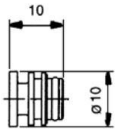
| Applicable fitting size ød | Model | A | L | D |
|---|---|---|---|---|
| 1/8" | KQ2P-01 | 16 | 31.5 | 5 |
| 5/32" | KQ2P-03 | 16 | 32 | 6 |
| 1/4" | KQ2P-07 | 18 | 35 | 8.5 |
| 5/16" | KQ2P-09 | 20.5 | 39 | 10 |

## VQC1000: Manifold Optional Parts

### Port plug
**VVQ0000-58A**

The plug is used to block the cylinder port.
* When ordering this option incorporated with a manifold, indicate "CM" for the port size of the manifold part number, as well as, the mounting position and number of stations and cylinder port mounting positions, 4(A) and 2(B) by means of the manifold specification sheet.
* Gently screw an M3 screw in the port plug hole and pull it for removal.

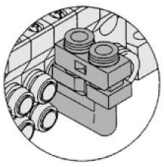


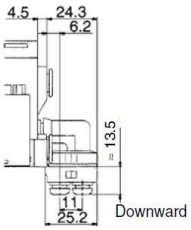



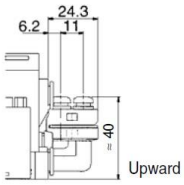

### Elbow fitting assembly
**VVQ1000-F-L(C3/C4/C6/M5/N1/N3/N7)**

It is used for piping that extends upward or downward from the manifold.
* When ordering this option incorporated with a manifold, indicate "L□" or "B□" for the manifold port size (when installed in all stations.)

When installing it in part of the manifold stations, specify the elbow fitting assembly part number and the mounting position and number of stations by means of the manifold specification sheet.
* When mounting elbow fitting assembly on the edge of manifold station and a silencer on EXH port, select a silencer, AN15-C08.
  A silencer (AN200-KM8) is interfered with fittings.



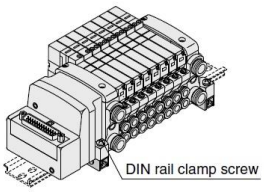


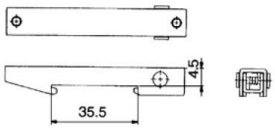




### DIN rail mounting bracket [-D]
**VVQ1000-57A**
**{For F/L/M/P/S (EX500) kit}**
**VVQC1000-57A-S**
**{For S (EX250) kit}**
**VVQC1000-57A-T (For T kit)**

It is used for mounting a manifold on a DIN rail.
* When ordering this option incorporated with a manifold, suffix "-D" to the end of the manifold part number.

1 set of DIN rail mounting bracket is used for 1 manifold (2 DIN rail mounting brackets).



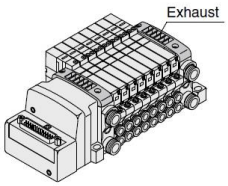



Mounting screws are attached.

### Direct EXH outlet with built-in silencer [-S]

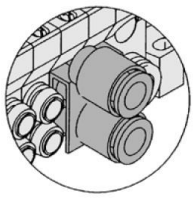
This is a type with an exhaust outlet atop the manifold end plate. The built-in silencer exhibits an excellent noise suppression effect. (Noise reduction: 30 dB)
* When ordering this option incorporated with a manifold, suffix "-S" to the end of the manifold part number.

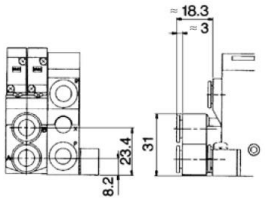
Note) A large quantity of drainage generated in the air source results in exhaust of air together with drainage.




### Dual flow fitting assembly
**VVQ1000-52A-$^{C8}_{N9}$**

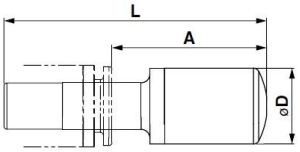
This is a fitting to multiply the flow rate by combining the outputs of 2-valve stations. It is used for driving a large bore cylinder. This is a One-touch fitting for a port size of ø8 or ø5/16".
* The port size of the manifold part number is "MM".
  Clearly indicate the dual flow fitting assembly part number and specify the mounting positions by means of the manifold specification sheet.
* In dual flow fitting assembly, a special clip which is combined in one-piece of 2 stations is attached as a holding clip.






### Silencer (For EXH port)

This silencer is to be inserted into the EXH port (One-touch fittings) of the common exhaust type.
* When mounting elbow fitting assembly (VVQ1000-F-L□) on the edge of manifold station, select a silencer, AN15-C08. A silencer (AN200-KM8) is interfered with fittings.




**Dimensions**

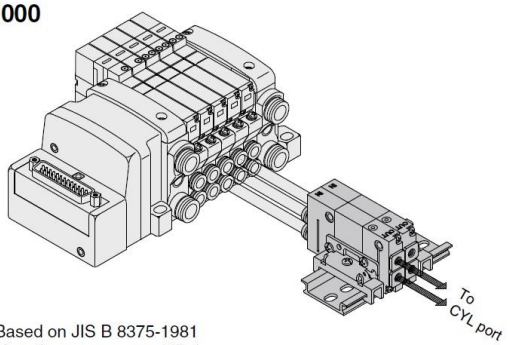
| Series | Applicable fitting size ød | Model | A | L | D | Effective area (mm²) | Noise reduction (dB) |
|---|---|---|---|---|---|---|---|
| **VQC1000** | 8 | AN15-C08 | 26.5 | 45 | 13 | 20 | 30 |

## Double check block (Separated) for VQC1000
## VQ1000-FPG-□□-□

It is used on the outlet side piping to keep the cylinder in the intermediate position for long periods of time. Combining the double check block with a built-in pilot type double check valve and a 3-position exhaust center solenoid valve will enable the cylinder to stop in the middle or maintain its position for a long time.
The combination with a 2-position single/double solenoid valve will permit this block to be used for preventing the dropping at the cylinder stroke end when the SUP residual pressure is released.

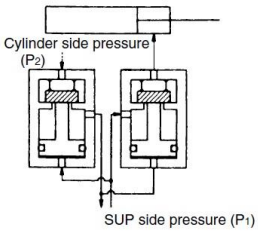
### Specifications

| | |
|---|---|
| **Max. operating pressure** | 0.8 MPa |
| **Min. operating pressure** | 0.15 MPa |
| **Ambient and fluid temp.** | –5 to 50°C |
| **Flow rate characteristics: C** | 0.60 dm³/(s·bar) |
| **Max. operating frequency** | 180 c.p.m |




Note) Based on JIS B 8375-1981
(Supply pressure: 0.5 MPa)

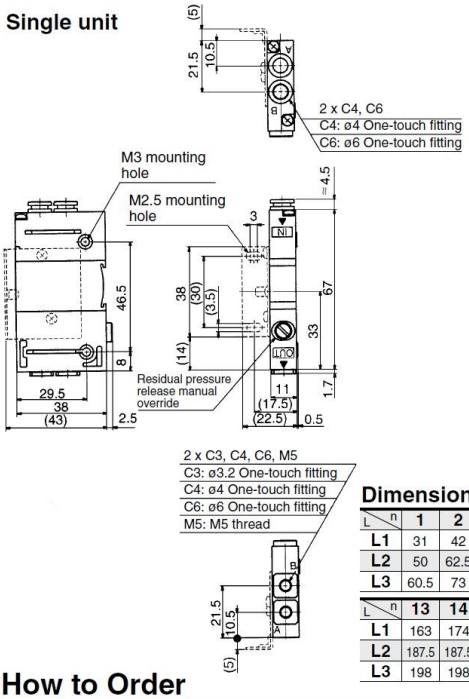
**<Circuit diagram>**



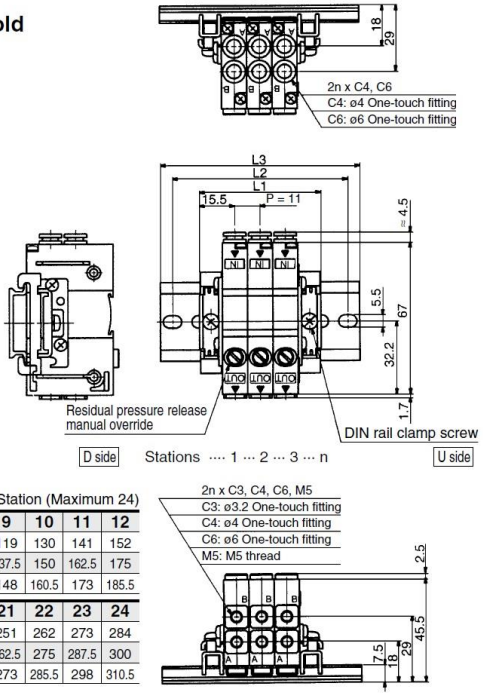

VVQ1000-FPG-02 1 set
* VQ1000-FPG-C6M5-D 2 pcs.

## Dimensions

### Single unit




### Manifold




### Dimensions

Formula L1 = 11n + 20 n: Station (Maximum 24)

| L \ n | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **L1** | 31 | 42 | 53 | 64 | 75 | 86 | 97 | 108 | 119 | 130 | 141 | 152 |
| **L2** | 50 | 62.5 | 75 | 87.5 | 100 | 112.5 | 125 | 125 | 137.5 | 150 | 162.5 | 175 |
| **L3** | 60.5 | 73 | 85.5 | 98 | 110.5 | 123 | 135.5 | 135.5 | 148 | 160.5 | 173 | 185.5 |

| L \ n | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **L1** | 163 | 174 | 185 | 196 | 207 | 218 | 229 | 240 | 251 | 262 | 273 | 284 |
| **L2** | 187.5 | 187.5 | 200 | 212.5 | 225 | 237.5 | 250 | 250 | 262.5 | 275 | 287.5 | 300 |
| **L3** | 198 | 198 | 210.5 | 223 | 235.5 | 248 | 260.5 | 260.5 | 273 | 285.5 | 298 | 310.5 |

## How to Order

### Double check block

**VQ1000-FPG- C4 M5 – F**

**IN side port size**

| | |
|---|---|
| **M5** | M5 thread |
| **C3** | ø3.2 One-touch fitting |
| **C4** | ø4 One-touch fitting |
| **C6** | ø6 One-touch fitting |
| **N3** | ø5/32" One-touch fitting |
| **N7** | ø1/4" One-touch fitting |

**OUT side port size**

| | |
|---|---|
| **M5** | M5 thread |
| **C3** | ø3.2 One-touch fitting |
| **C4** | ø4 One-touch fitting |
| **C6** | ø6 One-touch fitting |
| **N3** | ø5/32" One-touch fitting |
| **N7** | ø1/4" One-touch fitting |

**Option**

| | |
|---|---|
| **Nil** | None |
| **F** | With bracket |
| **D** | DIN rail mounting (For manifold) |
| **N** | Name plate |

Note) When two or more symbols are specified, indicate them alphabetically. Example) -DN

### Manifold (DIN rail mounting)

**VVQ1000-FPG- 06**

**Stations**

| | |
|---|---|
| **01** | 1 station |
| ⋮ | ⋮ |
| **16** | 16 stations |

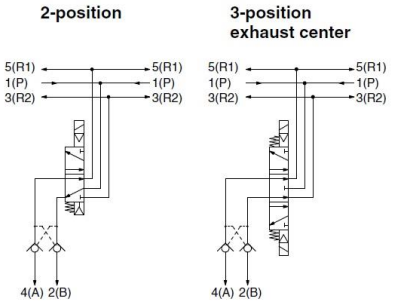
When ordering a double check block, order the DIN rail mounting [-D].

**<Ordering example>**
**VVQ1000-FPG-06···6-station manifold**
***VQ1000-FPG-C4M5-D, 3 sets**
***VQ1000-FPG-C6M5-D, 3 sets**
**Double check block**

### Bracket Assembly

| Part no. | Tightening torque |
|---|---|
| **VQ1000-FPG-FB** | 0.22 to 0.25 N·m |

**<Example>**




### ⚠ Caution

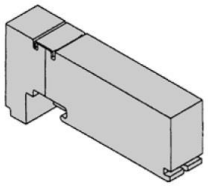
- Air leakage from the pipe between the valve and cylinder or from the fittings will prevent the cylinder from stopping for long periods of time. Check the leakage using neutral household detergent, such as dish washing soap. Also, check the cylinder's tube gasket, piston packing and rod packing for air leakage.
- Since One-touch fittings allow slight air leakage, screw piping (with M5 thread) is recommended when stopping the cylinder in the middle for long periods of time.
- Combining double check block with 3-position closed center or pressure center solenoid valve will not work.
- M5 fitting assembly is attached, not incorporated into the double check block. After screwing in the M5 fittings, mount the assembly on the double check block. {Tightening torque: 0.8 to 1.2 N·m}
- If the exhaust of the double check block is restricted too much, the cylinder may not operate properly and may not stop intermediately.
- Set the cylinder load so that the cylinder pressure will be within two times that of the supply pressure.

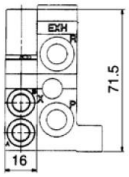
## VQC2000: Manifold Optional Parts

### Blanking plate assembly
**VVQ2000-10A-1**

Symbol

It is used by attaching on the manifold block for being prepared for removing a valve for maintenance reasons or planning to mount a spare valve, etc.

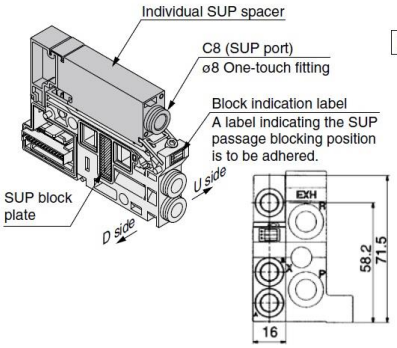


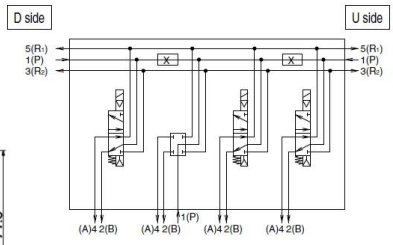



### Individual SUP spacer
**VVQ2000-P-1-$^{C8}_{N9}$**

When the same manifold is to be used for different pressures, individual SUP spacers are used as SUP ports for different pressures. (One station space is occupied.)
Block both sides of the station, for which the supply pressure from the individual SUP spacer is used, with SUP block plates. (Refer to the application example.)

* Specify the spacer mounting position and SUP passage blocking position by means of the manifold specification sheet. The block plate is used in one or two places for one set. (Two SUP block plates for blocking SUP passage are attached to the individual SUP spacer.)
* As a standard, electric wiring is connected to the position of the manifold station where the individual SUP spacer is mounted.
* If wiring is not required for stations equipped with spacers, enter "X" in the special wiring specifications column in the manifold specification sheet.

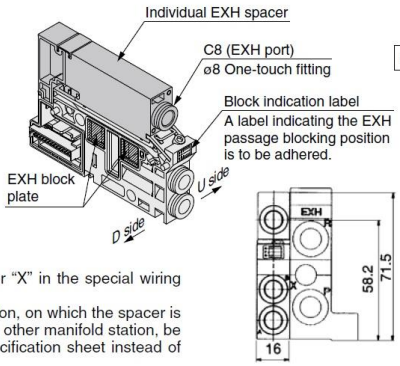


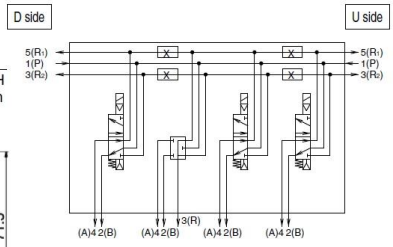




### Individual EXH spacer
**VVQ2000-R-1-$^{C8}_{N9}$**

When valve exhaust affects other stations due to the circuit configuration, this spacer is used for individual valve exhaust. (One station space is occupied.)
Block both sides of the individual valve EXH station. (Refer to the application example.)

* Specify the spacer mounting position, as well as the EXH passage blocking position by means of the manifold specification sheet. The block plate is used in one or two places for one set. (Four EXH block plates (2 sets) for blocking EXH passage are attached to the individual EXH spacer.)
* As a standard, electric wiring is connected to the position of the manifold station where the individual EXH spacer is mounted.
* If wiring is not required for stations equipped with spacers, enter "X" in the special wiring specifications column in the manifold specification sheet.
* Do not install any back pressure check valve on the manifold station, on which the spacer is to be mounted. When installing the back pressure check valve on other manifold station, be sure to specify the manifold station position on the manifold specification sheet instead of ordering by specifying the manifold option symbol "B".

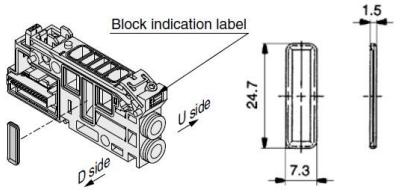


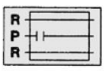

### SUP block plate
**VVQ2000-16A**

When different pressures are supplied to a manifold, a SUP block plate is used to block the stations under different pressures.

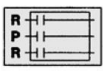
* Specify the mounting position by means of the manifold specification sheet.




**<Block indication label>**
Indication labels to confirm the blocking position are attached. (Each for SUP passage and SUP/EXH passage blocking positions)




**SUP passage blocked**



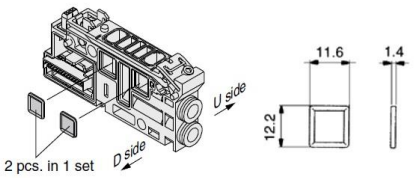

**SUP/EXH passage blocked**

* When ordering a block plate incorporated with a manifold, a block indication label is attached to the manifold.

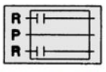
### EXH block plate
**VVQ2000-19A**

The EXH block plate is used between stations for which exhaust is desired to be divided when valve exhaust affects other stations configuration. It is also used in combination with an individual EXH spacer for individual exhaust.

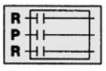
* Specify the mounting position by means of the manifold specification sheet.




**<Block indication label>**
Indication labels to confirm the blocking position are attached. (Each for EXH passage and SUP/EXH passage blocking positions)




**EXH passage blocked**




**SUP/EXH passage blocked**

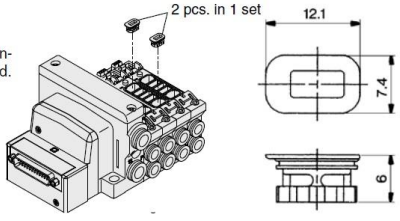
* When ordering a block plate incorporated with a manifold, a block indication label is attached to the manifold.

### Back pressure check valve assembly [-B]
**VVQ2000-18A**

It prevents cylinder malfunction caused by other valve exhaust entry. Insert it into R (EXH) port on the manifold side of a valve which is affected. It is effective when a single-acting cylinder is used or an exhaust center type solenoid valve is used.

* When ordering this option incorporated with a manifold, suffix "-B" to the end of the manifold part number.

Note) When a back pressure check valve is desired, and is to be installed only in certain manifold stations, clearly indicate the part number and specify the mounting position by means of the manifold specification sheet.




<Precautions>
1. The manifold installed type back pressure check valve assembly is assembly parts with a check valve structure. However, since slight air leakage against the back pressure is allowed due to its structure, adverse effects of the back pressure due to increase in exhaust resistance cannot be prevented if the manifold exhaust port and other exhaust ports are put together for piping or if the piping diameter is narrowed. As a result, this may cause the actuator and air operated equipment to malfunction. So, be careful not to restrict the exhaust air.
2. When a back pressure check valve is mounted, the effective area of the valve will decrease by about 20%.

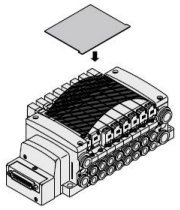
## Name plate [-N]

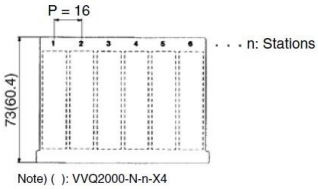
**VVQ2000-N-Station (1 to Max. stations) (-X4)**

**-X4: For mounting slide locking type manual valve**

It is a transparent resin plate for placing a label that indicates solenoid valve function, etc.
Insert it into the groove on the side of the end plate and bend it as shown in the figure.

* When the slide locking type manual valve is mounted, it automatically will be "VVQ2000-N-n-X4"
* When ordering this option incorporated with a manifold, suffix "-N" to the end of the manifold part number.

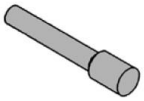


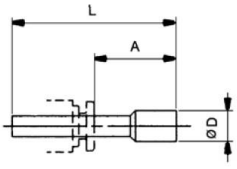



## Blanking plug (For One-touch fittings)

**KQ2P-□**

It is inserted into an unused cylinder port and SUP/EXH ports.
Purchasing order is available in units of 10 pieces.






### Dimensions

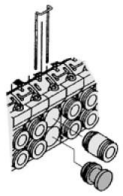
| Applicable fitting size ød | Model | A | L | D |
|---|---|---|---|---|
| 4 | **KQ2P-04** | 16 | 32 | 6 |
| 6 | **KQ2P-06** | 18 | 35 | 8 |
| 8 | **KQ2P-08** | 20.5 | 39 | 10 |
| 10 | **KQ2P-10** | 22 | 43 | 12 |
| 5/32" | **KQ2P-03** | 16 | 32 | 6 |
| 1/4" | **KQ2P-07** | 18 | 35 | 8.5 |
| 5/16" | **KQ2P-09** | 20.5 | 39 | 10 |
| 3/8" | **KQ2P-11** | 22 | 43 | 11.5 |

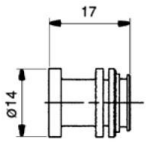
## Port plug

**VVQ1000-58A**

The plug is used to block the cylinder port.

* When ordering this option incorporated with a manifold, indicate "CM" for the port size of the manifold part number, as well as, the mounting station and cylinder port mounting positions, A and B, by means of the manifold specification sheet.





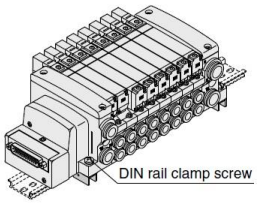

## DIN rail mounting bracket [-D]

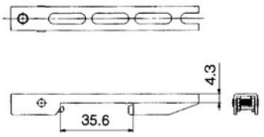
**VVQC2000-57A**
**{For F/L/M/P/S (EX500) kit}**
**VVQC2000-57A-S**
**{For S (EX250) kit}**
**VVQC2000-57A-T (For T kit)**

It is used for mounting a manifold on a DIN rail.

* When ordering this option incorporated with a manifold, suffix "-D" to the end of the manifold part number.

1 set of DIN rail mounting bracket is used for 1 manifold (2 DIN rail mounting brackets).



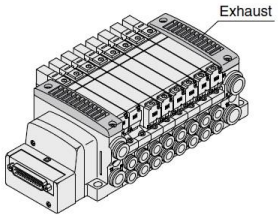




## Direct EXH outlet with built-in silencer [-S]

This is a type with an exhaust outlet atop the manifold end plate. The built-in silencer exhibits an excellent noise suppression effect. (Noise reduction: 30 dB)

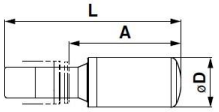
* When ordering this option incorporated with a manifold, suffix "-S" to the end of the manifold part number.

Note) A large quantity of drainage generated in the air source results in exhaust of air together with drainage.




## Silencer (For EXH port)

This silencer is to be inserted into the EXH port (One-touch fittings).



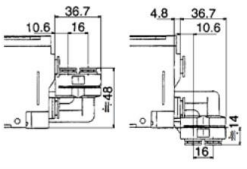

### Dimensions

| Series | Applicable fitting size ød | Model | A | L | D | Effective area ($mm^2$) (Cv factor) | Noise reduction (dB) |
|---|---|---|---|---|---|---|---|
| **VQC2000** | 10 | AN20-C10 | 36.5 | 57.5 | 16.5 | 30 | 30 |

## Elbow fitting assembly

**VVQ2000-F-L(C4/C6/C8/N3/N7/N9)**

It is used for piping that extends upward or downward from the manifold.
When installing it only in some manifold stations, specify the elbow fitting assembly part number and the mounting position by means of the manifold specification sheet.

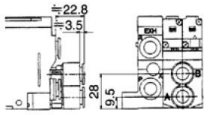



## Dual flow fitting assembly

**VVQ2000-52A-$^{C10}_{N11}$**

This is a fitting to multiply the flow rate by combining the outputs of 2-valve stations. It is used for driving a large bore cylinder. This is a One-touch fitting for a port size of ø10 or ø3/8".

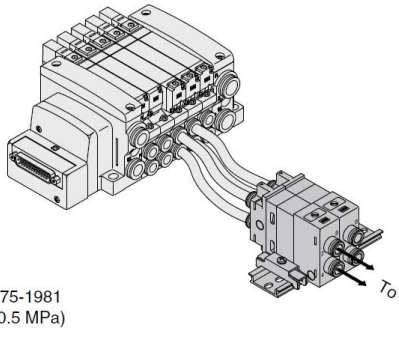
* The port size of the manifold part number is "MM".
Clearly indicate the dual flow fitting assembly part number and specify the mounting position by means of the manifold specifications.



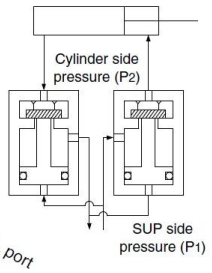
## VQC2000: Manifold Optional Parts

### Double check block (Separated) for VQC2000
### VQ2000-FPG-□□-□

It is mounted on the outlet side piping to keep the cylinder in the intermediate position for long periods of time. Combining with a 3-position exhaust center solenoid valve will enable the cylinder to stop in the middle or maintain its position for a long time. Combining with a 2-position single/double solenoid valve will prevent a cylinder from dropping at the stroke end when the residual pressure of SUP is released.




<Circuit diagram>



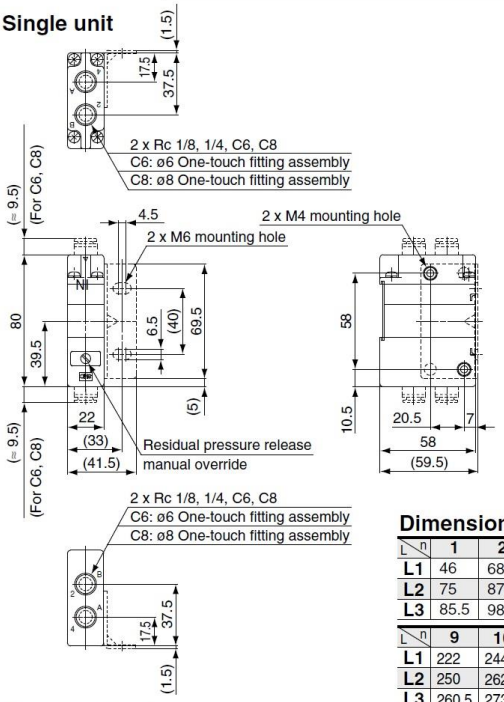

**Specifications**

| | |
|---|---|
| Max. operating pressure | 0.8 MPa |
| Min. operating pressure | 0.15 MPa |
| Ambient and fluid temp. | –5 to 50°C |
| Flow rate characteristics: C | 3.0 dm³/(s·bar) |
| Max. operating frequency | 180 c.p.m |

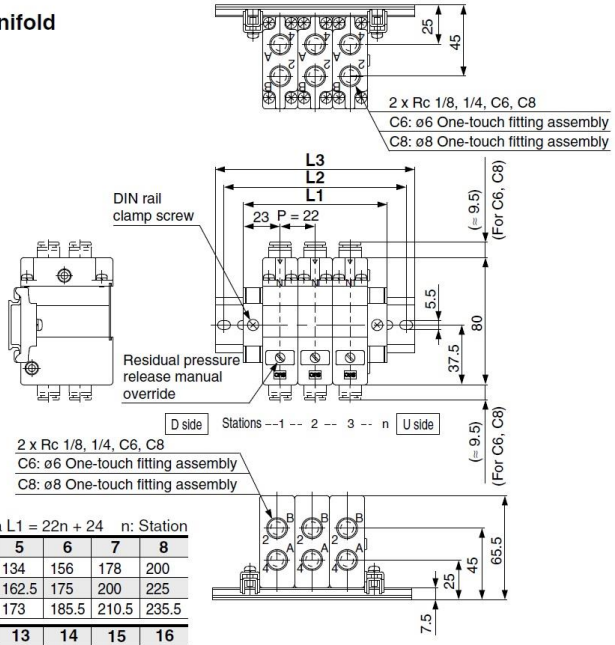
Note) Based on JIS B 8375-1981
(Supply pressure: 0.5 MPa)

## Dimensions

**Single unit**




**Manifold**




**Dimensions** Formula L1 = 22n + 24 n: Station

| L / n | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| L1 | 46 | 68 | 90 | 112 | 134 | 156 | 178 | 200 |
| L2 | 75 | 87.5 | 112.5 | 137.5 | 162.5 | 175 | 200 | 225 |
| L3 | 85.5 | 98 | 123 | 148 | 173 | 185.5 | 210.5 | 235.5 |

| L / n | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|
| L1 | 222 | 244 | 266 | 288 | 310 | 332 | 354 | 376 |
| L2 | 250 | 262.5 | 287.5 | 312.5 | 337.5 | 362.5 | 375 | 400 |
| L3 | 260.5 | 273 | 298 | 323 | 348 | 373 | 385.5 | 410.5 |

## How to Order

### Double check block

**VQ2000-FPG- 01 01 - F**

**IN side port size**

| | |
|---|---|
| 01 | Rc 1/8 |
| 02 | Rc 1/4 |
| C6 | ø6 One-touch fitting |
| C8 | ø8 One-touch fitting |
| N7 | ø1/4" One-touch fitting |
| N9 | ø5/16" One-touch fitting |

**OUT side port size**

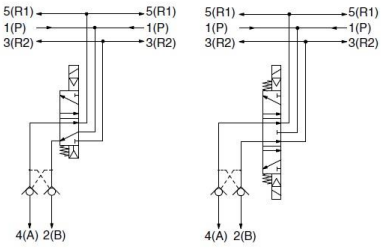
| | |
|---|---|
| 01 | Rc 1/8 |
| 02 | Rc 1/4 |
| C6 | ø6 One-touch fitting |
| C8 | ø8 One-touch fitting |
| N7 | ø1/4" One-touch fitting |
| N9 | ø5/16" One-touch fitting |

**Option**

| | |
|---|---|
| Nil | None |
| D | DIN rail mounting (For manifold) |
| F | With bracket |
| N | Name plate |

Note) When two or more symbols are specified, indicate them alphabetically.
Example) -DN

<Example>




### Manifold (DIN rail mounting)

**VVQ2000-FPG- 06**

**Stations**

| | |
|---|---|
| 01 | 1 station |
| ⋮ | ⋮ |
| 16 | 16 stations |

When ordering a double check block, order the DIN rail mounting [-D].

**<Ordering example>**
**VVQ2000-FPG-06···6-station manifold**

- ✻VQ2000-FPG-C6C6-D, 3set
- ✻VQ2000-FPG-C8C8-D, 3set

} Double check block

**Bracket Assembly**

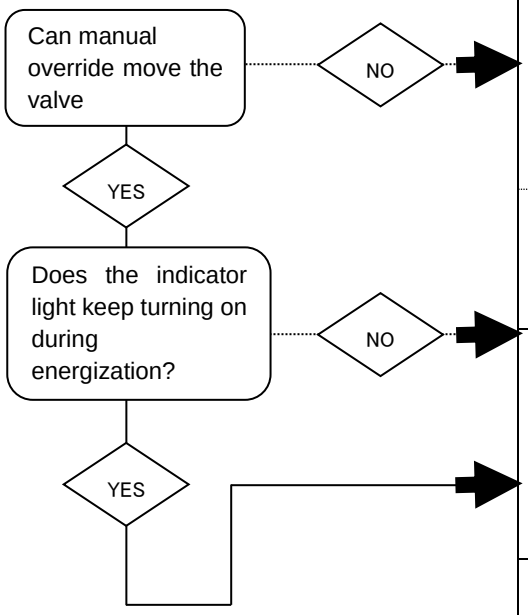
| Part no. | Tightening torque |
|---|---|
| VQ2000-FPG-FB | 0.8 to 1.0 N·m |

## ⚠ Caution

- Air leakage from the pipe between the valve and cylinder or from the fittings will prevent the cylinder from stopping for long periods of time. Check the leakage using neutral household detergent, such as dish washing soap. Also, check the cylinder's tube gasket, piston packing and rod packing for air leakage.
- Since One-touch fittings allow slight air leakage, screw piping is recommended when stopping the cylinder in the middle for long periods of time.
- Combining double check block with 3-position closed center or pressure center solenoid valve will not work.
- When fittings, etc. are being screwed to the double check block, tighten them with the torque below.

| Connection thread | Proper tightening torque (N·m) |
|---|---|
| Rc 1/8 | 7 to 9 |
| Rc 1/4 | 12 to 14 |

- If the exhaust of the double check block is restricted too much, the cylinder may not operate properly and may not stop intermediately.
- Set the cylinder load so that the cylinder pressure will be within two times that of the supply pressure.

| Trouble | When the valve is failing, use this flow chart to clarify the cause of the failure and take countermeasures appropriate for the cause. | Possible cause | Countermeasures |
|---|---|---|---|
| Operating failure<br>The air supply does not switch the valve. |  | 1) Sliding failure or stick of main valve.<br>A foreign material included in supplied air is caught by main valve and makes the main valve unable to slide smoothly or sticky. | • Replace with new valve.<br>• Clean the supplied air. |
| | | 2) Pressure drop.<br>The pressure of supplied air lowers the valve which can operate the valve (min. operating pressure). | Raise the pressure of supplied air up to operating pressure of the valve. |
| | | 1) Failure of electrical system<br>• Incorrect wiring<br>• Blow of fuse and breakage of lead wire.<br>• Poor contact at contactor wire or connection part<br>• Failure of sequencer<br>• Lack of supply voltage | Check these items and replace part and re-wire positively. |
| | | 1) Voltage drop<br>Even if the indicator light keeps turning on, the valve can't be operated due to the voltage drop. | • Check the voltage and if it is not enough to operate the valve, take appropriate measures. |
| | | 2) Leakage current<br>When the power turns off, the valve can't be switched due to residual voltage. | • Confirm the residual voltage is follows.<br>• DC is 3% or less of rated voltage. |
| | | 3) Failure of pilot valve<br>• Foreign matter caught in core of pilot valve.<br>• Disconnection coil wire of pilot valve<br>• Swelled out poppet of pilot valve | • Replace part or re-wire positively.<br>• Check voltage. Replace valve. (Pilot valve) |
| | | • Burnt coil of pilot valve (Higher voltage or wrong coil used, Coil splashed by water) | • Replace valve (pilot valve). Protect the valve so that water does not splash the coil. |
| Response failure<br>The operation of the valve is delay. | | 1) Current leakage<br>When the power turns off, the valve can be switched late due to residual voltage. | • Confirm the residual voltage is follows.<br>• DC is 3% or less of rated voltage. |
| | | 2) Clogging of filter element of manifold. | • Clean the element or replace with new element. |
| | | 3) Sliding failure or stick of main valve.<br>A foreign material included in supplied air is caught by main valve and makes the main valve unable to slide smoothly or sticky. | • Replace with new valve.<br>• Clean the supplied air. |
| Trouble | When the valve is failing, use this flow chart to | Possible cause | Countermeasures |

| | | | |
|---|---|---|---|
| | clarify the cause of the failure and take countermeasures appropriate for the cause. | | |
| Air leakage | Confirm there is air leakage.<br>1. Between valve and base | 1-1) Looseness of clamp screw or mounting bolt. | Give more torque to clamp screw.<br>・VQC1000 : 0.25～0.35N・m<br>・VQC2000 : 0.5～0.7N・m<br>If the damage is seen on the gasket, replace with new gasket. |
| | | 1-2) Caught gasket | Replace with new gasket. |
| | | 1-3) Intrusion of foreign matter | To remove foreign matter by air blow of piping and when a gasket damaged, replace with new gasket. |
| | 2. Air leaks through One-touch fitting | 2-1) Tube is not inserted enough deeply.<br>2-2) Tube has a flaw.<br>2-3) Tube is cut diagonally. | Check these items and replace part and re-wire positively. |
| | | 2-4) Packing of one touch fitting is damaged. | Replace with one-touch fitting. |
| | 3. Air leaks through exhaust port (R port)<br>Note) The valve with metal seal allows air leakage from main valve approx. 200Ncc for each port ( at 0.5MPa). The air leakage within the range should not be considered abnormal. | 3-1) Looseness of clamp screw or mounting bolt. | Give more torque to clamp screw.<br>Tightening torque<br>・VQC1000 : 0.25～0.35N・m<br>・VQC2000 : 0.5～0.7N・m<br>If the damage is seen on the gasket, replace with new gasket. |
| | | 3-2) A foreign material included into supplied air is caught by the main valve and increases internal air leakage. | • Replace with new valve.<br>• Clean the supplied air. |
| | 4. Air leaks through manifold. | Insufficient bolt tightening | After stopping air and re-tighten the bolts. |

| Revision history | |
|---|---|
| B Safety Instructions<br>Specific Product Precautions<br>Valve construction<br>Manifold Options | 2020.7 |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