



# Operation Manual

PRODUCT NAME

3/5 Port Solenoid Valve

MODEL/ Series

VK300/3000 Series

**SMC Corporation**

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# Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of "Caution," "Warning" or "Danger." They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC)\*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: Manipulating industrial robots -Safety.

etc.



## 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

### **1. 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, whichever is first.\*2)**

**Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.**

**2. For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided.**

**This limited warranty applies only to our product independently, and not to any other damage incurred due to the failure of the product.**

**3. Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalog for the particular products.**

**\*2) Vacuum pads are excluded from this 1 year warranty.**

**A vacuum pad is a consumable part, so it is warranted for a year after it is delivered.**

**Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty.**

### **Compliance Requirements**

**1. The use of SMC products with production equipment for the manufacture of weapons of mass destruction(WMD) or any other weapon is strictly prohibited.**

**2. The exports of SMC products or technology from one country to another are governed by the relevant security laws and regulation of the countries involved in the transaction. Prior to the shipment of a SMC product to another country, assure that all local rules governing that export are known and followed.**

## Caution

**SMC products are not intended for use as instruments for legal metrology.**

Measurement instruments that SMC manufactures or sells have not been qualified by type approval tests relevant to the metrology (measurement) laws of each country.

Therefore, SMC products cannot be used for business or certification ordained by the metrology (measurement) laws of each country.



## VK300/3000 Series

# Precautions for 3/5 Port Solenoid Valve 1

Be sure to read before handling.

### Design / Selection

#### ⚠ Warning

##### 1. Confirm the specifications

This product is 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. 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.

Caution is necessary especially when a single acting cylinder is operated. When there is a danger of such a malfunction, take countermeasures such as using an individual EXH manifold.

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

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

##### 5. Not suitable for use as an emergency shutoff valve, etc.

VK series 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.

##### 6. Release of residual pressure

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

##### 7. Operation in a vacuum condition

When a valve is used for switching a vacuum, take measures to install a suction filter or similar to prevent external dust or other foreign matter from entering inside the valve.

In addition, at the time of vacuum adsorption, be sure to supply a constant supply of vacuum. Failure to do so may result in foreign matter sticking to the adsorption pad or air leakage, causing the workpiece to drop.

##### 8. Regarding a vacuum switch valve and a vacuum release valve

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

##### 9. Ventilation

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

##### 10. Extended periods of continuous energization

If a valve will be continuously energized for an extended period of time, the temperature of the valve will increase due to the heat generated by the coil assembly. This will likely adversely affect the performance of the valve and any nearby

peripheral equipment. Therefore, when the total energizing time per day is expected to be longer than the total de-energizing time per day, use a continuous duty type valve.

Depending on the operating conditions, it may be possible to use valves which are not mentioned above. Please contact SMC. In addition, it is possible to shorten the energizing time by using a N.O. (normal open) valve.

When the valve is mounted onto a control panel, incorporate measures to limit the heat radiation so that it is within the operating temperature range. Do not touch the valves by bare hand during or after energization.

For example, the temperature will be high when a 3 station manifold or larger is put next to other valves and continuously energised.

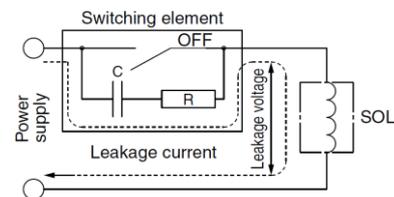
##### 11. Do not disassemble the product or make any modifications, including additional machining.

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

#### ⚠ Caution

##### 1. Leakage voltage

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



DC coil 2% or less of rated voltage

AC coil 20% or less of rated voltage

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

###### 1) Current leakage

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

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

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

##### 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.



## VK300/3000 Series

# Precautions for 3/5 Port Solenoid Valve 2

Be sure to read before handling.

### Design / Selection

#### ⚠ Caution

##### 3. Surge voltage suppressor

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

In the case of diodes, the residual voltage is approximately 1 V.

##### 4. Surge voltage intrusion

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

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

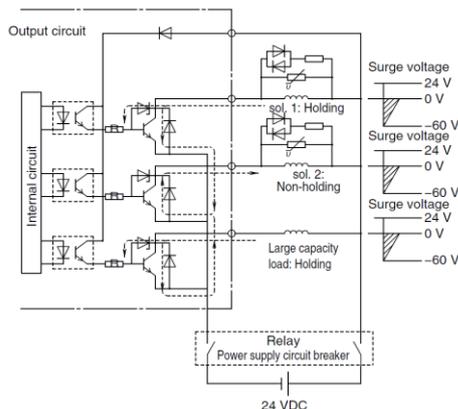


Figure 1. Surge intrusion circuit example (NPN outlet example)

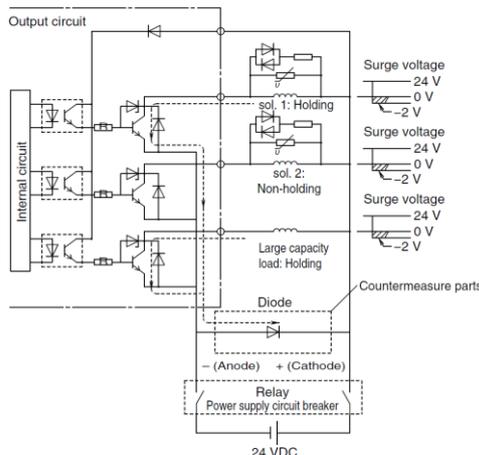


Figure 2. Surge intrusion countermeasure example (NPN outlet example)

##### 5. Operation in low temperature condition

Take appropriate measures to avoid the freezing of drainage, moisture, etc. in low temperatures.

- VK300 series can be used down to -5°C.
- VK3000 series can be used down to -10°C.

##### 6. Mounting orientation

Mounting orientation is unrestricted.

##### 7. Initial lubrication of main valve

Initial lubricant has already been applied to the main valve.

### Mounting

#### ⚠ Warning

##### 1. Operation Manual (this document)

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.

### Piping

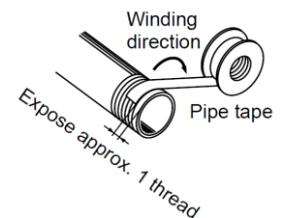
#### ⚠ Caution

##### 1. 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.

##### 2. 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.



##### 3. Connection of fittings

When screwing fittings into valves, tighten as follows.

(1) Follow the procedures below when installing an SMC fitting, etc.

###### • M5 types

After tightening the fitting by hand, use a wrench to tighten the fitting an additional approximately 1/6 to 1/4 turn. As a reference value, tightening torque is 1 to 1.5 N·m.

Note) If tightened excessively, the thread of the product may break or the gasket may deform. If tightened insufficiently, the thread of the product may become loose. In either case, air leakage can occur.

(2) Follow the procedure of the manufacturer when fittings other than SMC is used.

##### Tightening Torque for Piping

Connection thread	Proper tightening torque (N·m)
Rc1/8	3~ 5



## VK300/3000 Series

# Precautions for 3/5 Port Solenoid Valve 3

Be sure to read before handling.

### Piping

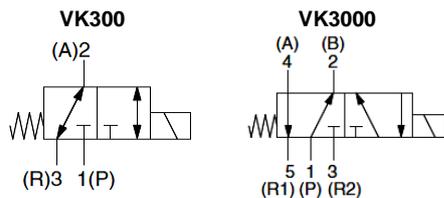
#### ⚠ Caution

##### 4. Piping to products

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

This product is universal porting type. N.C type, N.O. type, devider type and selector type can be used.

##### Symbol (Body ported)



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

##### 2. Applied voltage:

When electric power is connected to a solenoid valve, be careful to apply the proper voltage. Improper voltage may cause malfunction or coil damage.

##### 3. Check the connections.

Check if the connections are correct after completing all wiring.

##### 4. External force applied to the lead wire

If an excessive force is applied to the lead wire, this may cause faulty wiring. Take appropriate measures so that a force of 30 N or more is not applied to the lead wire.

### Lubrication

#### ⚠ Warning

##### Lubrication

- 1) The product has been lubricated for life by the manufacturer and therefore, does not require lubrication while in service.
- 2) If a lubricant is used in the system, use class 1 turbine oil (no additives), ISO VG32. Once a lubricant is used in the system, lubrication must be continued because the original lubricant applied during manufacture will be washed away. If turbine oil is used, refer to the Safety Data Sheet (SDS) of the oil.

##### 2. Lubrication amount

If too much oil is supplied, the oil will be accumulated in the product, causing malfunction or response delay.

### 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 detailed information regarding the quality of the compressed air described above, refer to SMC's Best Pneumatics 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  $\mu\text{m}$  or smaller.

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

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

##### 4. If 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 detailed information regarding the quality of the compressed air described above, refer to SMC's Best Pneumatics catalog.



## VK300/3000 Series

# Precautions for 3/5 Port Solenoid Valve 4

Be sure to read before handling.

### 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. 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.
3. Do not use in a place subject to heavy vibration and/or shock.
4. The valve should not be exposed to prolonged sunlight. Use a protective cover.  
Note that the valve is not for outdoor use.
5. Remove any sources of excessive heat.
6. If it is used in an environment where there is possible contact with oil, weld spatter, et., exercise preventive measures.
7. 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 inspection according to the procedures indicated in the operation manual (this document).

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

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

Before components are removed, first confirm that measures are in place to prevent workpieces from dropping, run-away equipment, etc. Then, cut off the supply air and electric power, and exhaust all air pressure from the system using the residual pressure release function.

When the equipment is operated after remounting or replacement, first confirm that measures are in place to prevent the lurching of actuators, etc. Then, confirm that the equipment is operating normally.

3. Low-frequency operation

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

#### 4. Manual override

When a manual override is operated, connected equipment will be actuated.

Operate only after safety is confirmed.

5. If the volume of air leakage increases or the valve does not operate normally, do not use the valve.

Perform periodic maintenance on the valve to confirm the operating condition and check for any air leakage.

#### Caution

1. Drain flushing

Remove drainage from the air filters regularly.

2. Lubrication

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.



# VK300/3000 Series

## Specific Product Precautions 1

Be sure to read this before handling the products.

### How to Wire DIN Terminal

#### ●Connection

1. Loosen the set screw and pull out the DIN connector from the terminal block of the solenoid.
2. Remove screw and insert screwdriver into the slit area near the bottom of terminal block to separate block and housing.
3. Loosen the terminal screws (slotted screws) on the terminal block, insert the core of the lead wire into the terminal, and attach securely with the terminal screws.
4. Tighten the ground nut to secure the cable.

#### ⚠Caution

Use caution in wiring because it will not meet the IP65 (enclosure) standard if you use the other cable than prescribed heavy-duty cable of size ( $\phi 3.5$  to  $\phi 7$ ).

Tighten the ground nut and set screw within the specified range of torque.

#### ●Change of electrical entry (Orientation)

After separating terminal block and housing, the cable entry direction can be changed by attaching the housing in the desired direction (4 directions in 90 increments).

\* In the case of w/ indicator light, avoid damaging the light with lead wire. ·

#### ●Precautions

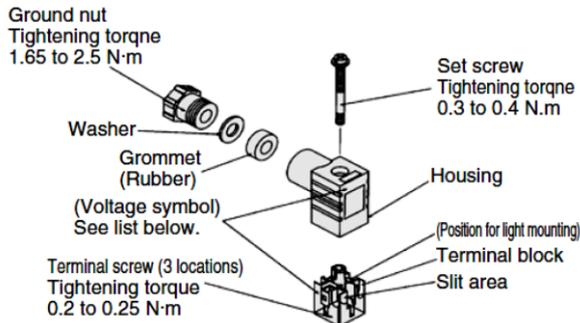
Plug a connector in or out vertically, never at an angle.

#### ●Applicable cable

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

(Reference)

0.5 mm<sup>2</sup> 2 core and 3 core wires equivalent to JIS C 3306

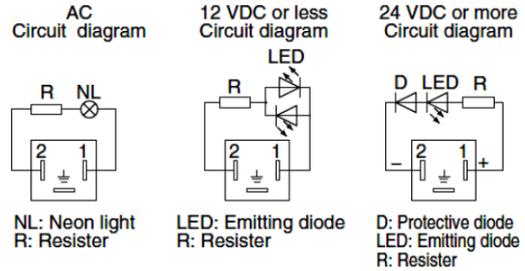


#### ●Connector part no.: VK300-82-1

#### ●Part no. of connector with indicator light

Rated voltage	Voltage symbol	Part no.
100 VAC	100V	VK300-82-2-01
110 VAC	110V	VK300-82-2-03
200 VAC	200V	VK300-82-2-02
220 VAC	220V	VK300-82-2-04
240 VAC	240V	VK300-82-2-07
6 VDC	6V	VK300-82-4-51
12 VDC	12V	VK300-82-4-06
24 VDC	24VD	VK300-82-3-05
48 VDC	48VD	VK300-82-3-53

#### ●Circuit with indicator light



### Light/Surge Voltage Suppressor

#### ⚠Caution

Rated voltage	Grommet (G)		DIN terminal (D)		Part no. symbol
	Standard: Y, V, W	Continuous duty type (E)	Standard: Y, V, W	Continuous duty type (E)	
AC	W/o indicator light	Diode, Coil	No.1, No.2, Diode, Coil (G, GS)	No.1, No.2, Diode, Coil (D, DS)	S
	With indicator light	None	No.1, No.2, Neon bulb, Varistor, Coil	No.1, No.2, Neon bulb, Diode, Coil	Z
DC 24V, 48V	W/o indicator light	Diode, Coil (Red (+), Black (-))	No.1(+), No.2(-), Diode, Coil	No.1(+), No.2(-), Diode, Coil	S
	With indicator light	None	No.1(+), No.2(-), LED, Diode, Coil	No.1(+), No.2(-), LED, Diode, Coil	Z
DC 6V, 12V	W/o indicator light	Varistor, Coil	No.1, No.2, Varistor, Coil	No.1, No.2, Varistor, Coil	S
	With indicator light	None	No.1, No.2, LED, Varistor, Coil	No.1, No.2, LED, Varistor, Coil	Z

\* The light comes with the DIN connector.

#### Precautions on connection of 24 V or more DC

Grommet type should be connected as following; Red lead wire for (+) side, Black lead wire for (-) side respectively.

With the DIN terminal, connect the positive (+) side to the connector's no. 1 terminal, and the negative (-) side to the no. 2 terminal. [Refer to the marks on the terminal board.]

\* For 12 VDC or below, there is no positive (+) or negative (-) directionality.



## VK300/3000 Series

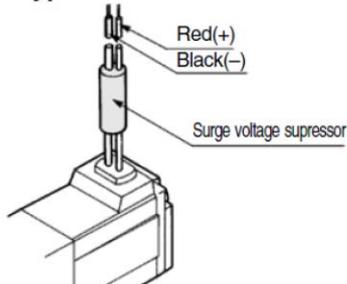
# Specific Product Precautions 2

Be sure to read this before handling the products.

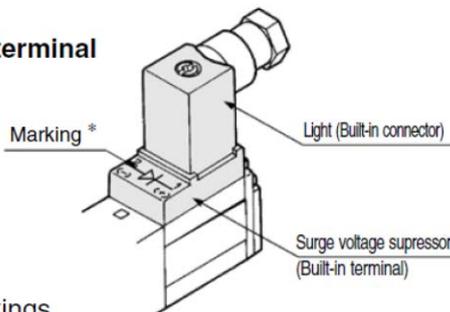
### Light/Surge Voltage Suppressor

#### ⚠ Caution

- Grommet type



- DIN terminal

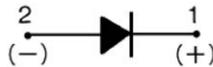


\* Markings

For AC, 12 VDC or less



For 24 VDC or more



### Valve Mounting Direction

#### ⚠ Warning

When mounting a valve on the manifold base or sub-plate, etc. the mounting orientation is already decided. If mounted in a wrong direction, the equipment to be connected may result in malfunction. Therefore check the mounting direction, and if it is correct, mount the valve.

### Vacuum Spec. Type: VK33□V(VK33□W)

In contrast to the standard product, this vacuum specification valve has less air leakage at low pressures, a feature that should be taken into consideration when using this valve for vacuum applications.

#### ⚠ Caution

Since this valve has slight air leakage, it can not be used for holding vacuum (including positive pressure holding) in the pressure container.

### Continuous Duty Type: VK33□E

Recommended for continuous duty with long time loading.

#### ⚠ Caution

1. This model is for continuous duty, not for high cycle rates. But even in low cycle rates, if energizing the valve more than once a day, please consult with SMC.
2. Energizing solenoid should be done at least once in 30 days.
3. As a rectifier is mounted to the product with continuous duty AC specification, diodes are included. (The specifications of G / GS and D / DS are the same.)



# VK300/3000 Series

## Specific Product Precautions 3

Be sure to read this before handling the products.

### Manifold Specifications VK300

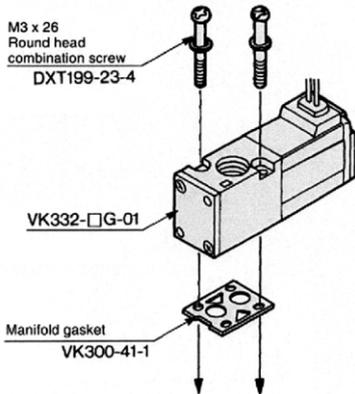
#### Caution

1. Mounting direction is fixed, do not mount on opposite side.
2. The VK300 series can be mounted on the manifold base VV5K3 of VK 3000 series. Refer to page 11 for details.

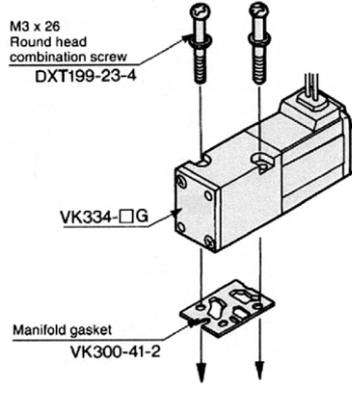
#### Combinations of Solenoid Valve, Manifold Gasket and Manifold Base

#### Combinations of Blanking Plate Assembly and Manifold Base

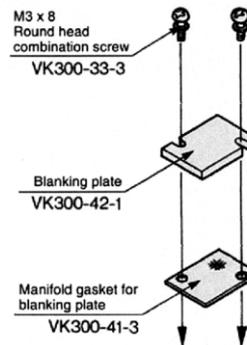
##### 3 port body ported: VK332



##### 3 port base mounted: VK334



##### Blanking plate assembly: VK300-42-1A



**Caution**  
Mounting Screw  
Tightening Torques  
M3: 0.6 N-m

**Applicable base**  
VV3K3-20 (-Q)  
21 (-Q)  
VV5K3-20 (-Q)  
21 (-Q) } Manifold base

**Applicable base**  
VK300-45-1 Sub-plate  
VV3K3-40 (-Q)  
(S) 42 (-Q)  
VV5K3-40 (-Q)  
(S) 41 (-Q)  
(S) 42 (-Q) } Manifold base

**Caution**  
Mounting Screw  
Tightening Torques  
M3: 0.6 N-m

	Body ported	Base mounted
Manifold gasket and screw assembly	VK300-41-1A	VK300-41-2A

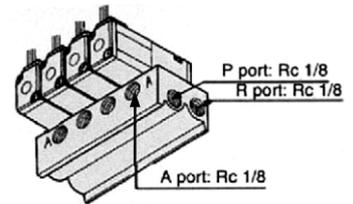
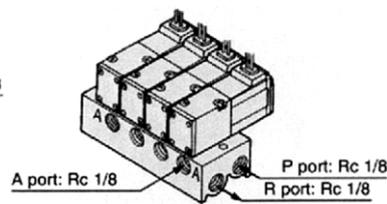
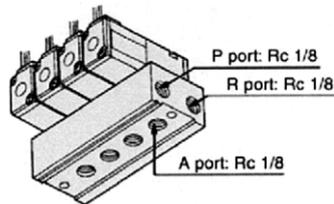
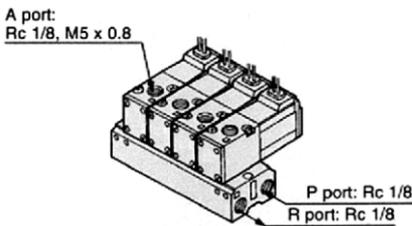
#### Common SUP/ Common EXH

Type 20(VV3K3-20): Body ported  
(A port top ported)

Type 40(VV3K3-40): Base mounted  
(A port bottom ported)

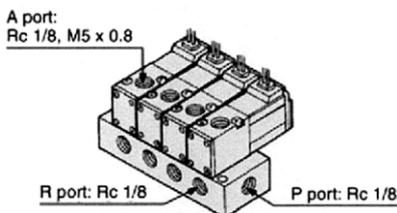
Type 42(VV3K3-42): Base mounted  
(A port side ported)

Type S42 (VV3K3-S42)  
(Solenoids on the same side of A port)



#### Common SUP/ Individual EXH

Type 21 (VV3K3-21): Body ported  
(A port top ported)





# VK300/3000 Series Specific Product Precautions 4

Be sure to read this before handling the products.

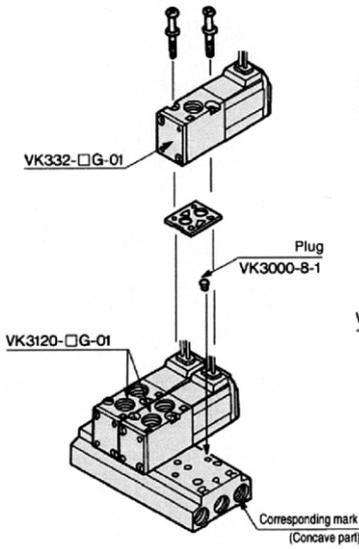
## VK3000

### Caution

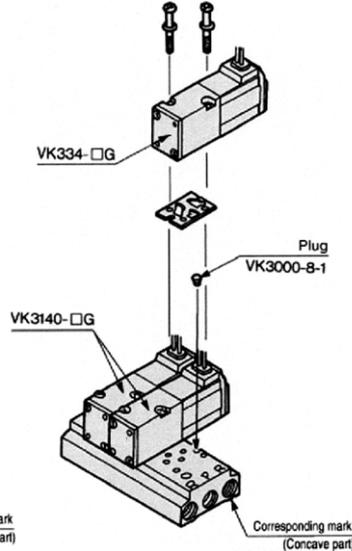
1. Mounting direction is fixed, do not mount on opposite side.

#### Mixed Mounting of VK300 and Manifold Base of VK3000 Series

##### Type VV5K3-20



##### Type VV5K3-40



#### 1. In the case of VV5K3-20/40

When installing the 3 port valve on the manifold base, plug the "R" port at the corresponding mark side with the rubber plug (VK3000-8-1) as shown in the figures on the right.

Note 1) Remove the plug if changing the 3 port valve to a 5 port valve.

Note 2) In case a 3 port valve VK300 is mounted on the manifold base for a 5 port valve VK3000, switching type is normally closed (N.C.). If requiring a normally open type (N.O.), plug the "A" port on the 5 port valve.

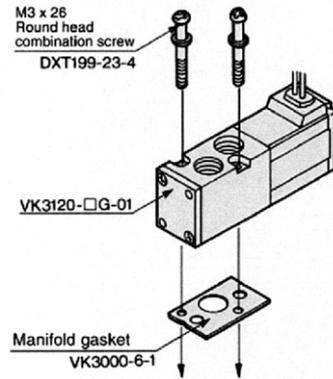
Note 3) "A" port of a 3 port valve for base mounted type becomes "A" port of a 5 port valve. Plug that "A" port to avoid mistaking "B" port for the "A" port.

#### 2. Other manifold

3 port valve can be mounted without any work.

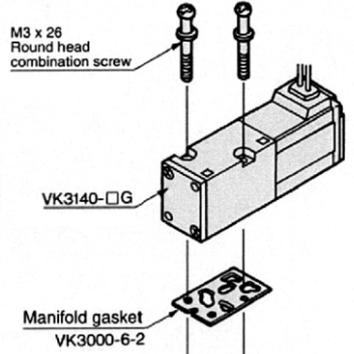
#### Combinations of Solenoid Valve, Manifold Gasket and Manifold Base

##### port body ported: VK3120



Applicable base  
VV5K3-20(-Q)  
VV5K3-21(-Q) } Manifold base

##### 5 port base mounted: VK3140



Applicable base  
VK3000-9-1 Sub-plate  
VV5K3-40(-Q)  
VV5K3-(S)41(-Q)  
VV5K3-(S)42(-Q) } Manifold base

**Caution**  
Mounting Screw  
Tightening Torques  
M3: 0.6 N-m

	Body ported	Base mounted
Manifold gasket Screw assembly	VK3000-6-1A	VK3000-6-2A

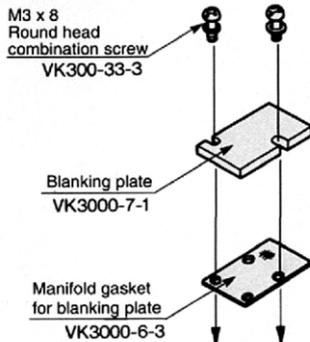
### Caution

Mounting Screw  
Tightening Torques

M3: 0.6 N-m

#### Combination of Blanking Plate Assembly and Manifold Base

##### Blanking plate assembly: VK3000-7-1A



Applicable base: In common for all types  
of VV5K3 (-Q) models

**Caution** Mounting Screw  
Tightening Torques  
M3: 0.6 N-m



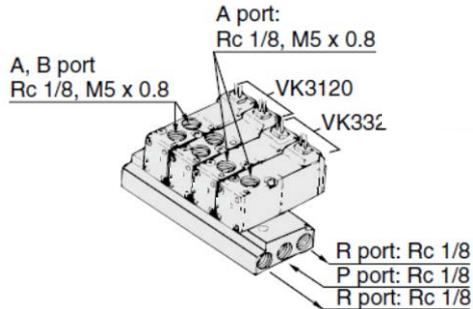
# VK300/3000 Series

## Specific Product Precautions 5

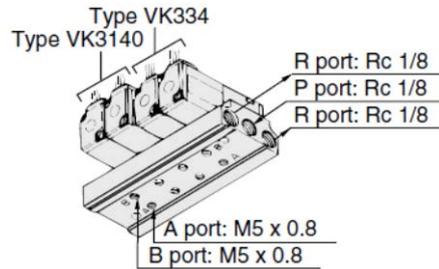
Be sure to read this before handling the products.

### Common SUP/Common EXH

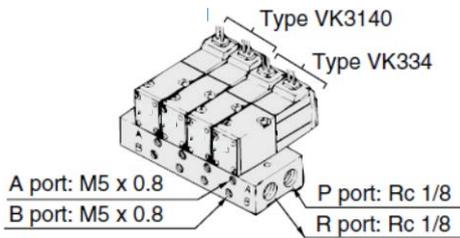
Type 20 (VV5K3-20): Body ported  
(A, B port top ported)



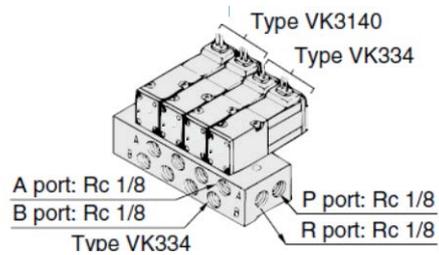
Type 40 (VV5K3-40): Base mounted  
(A, B port bottom ported)



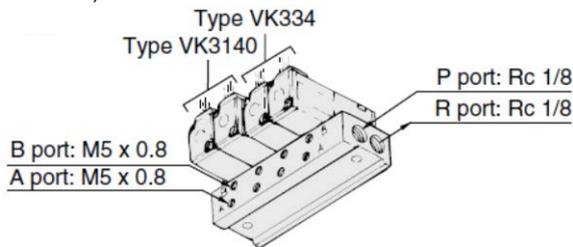
Type 41 (VV5K3-41): Base mounted  
(A, B port side ported)



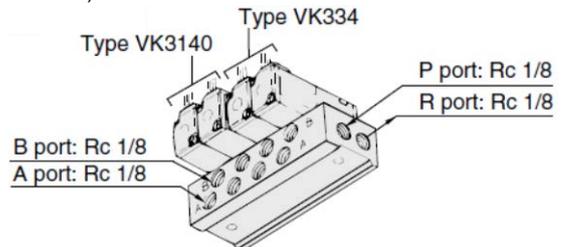
Type 42 (VV5K3-42): Base mounted  
(A, B port side ported)



Type S41  
(VV5K3-S41)

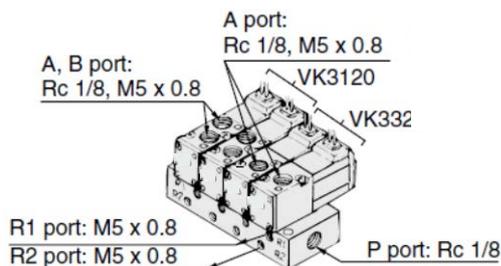


Type S42  
(VV5K3-S42)



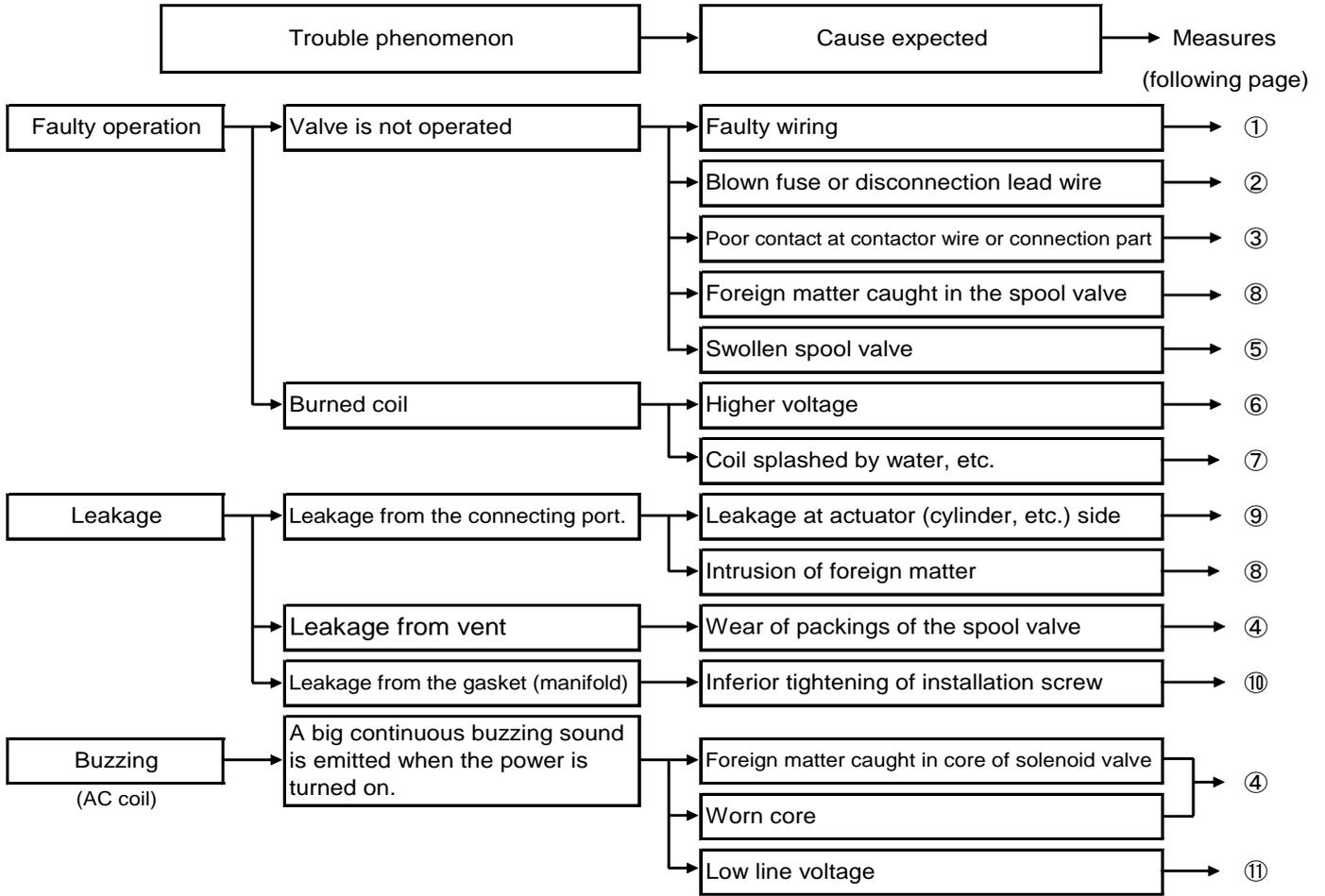
### Common SUP/ Individual EXH

Type 21 (VV5K3-21): Body ported  
(A, B port top ported)



# TROUBLESHOOTING

Should any trouble be found during operation, trace the source of the trouble in the following order and take corrective action.



## Remedy

No.	Remedy
①	Re-wire correctly.
②	Replace part.
③	Replace part or re-wire positively.
④	Replace valve.
⑤	· If wrong oil is used, completely air blow to remove oil, and replace valve. After valve is replaced, use turbine oil class 1 (ISO VG32). · When a large quantity of drain is given and cannot carry out drain omission surely, install either an auto-drain or a dryer. The valve should be replaced.
⑥	Check voltage. Replace valve.
⑦	Protect the valve so that water does not splash the coil. Replace valve.
⑧	In case of intrusion of foreign matter, to remove foreign matter by air blow of piping and then replace valve.
⑨	Repair or replace actuators.
⑩	After stopping air and re-tighten the bolts.
⑪	Regulate voltage so that the voltage at the time of the operation becomes specifications range.

If no improvement is achieved in spite of the above countermeasure, inside of the valve may have some abnormality. In this case, stop using the valve immediately.

If any of followings are carried out, inside of the valve may have some failure. In this case, stop using the valve immediately.

1. Voltage out of rated voltage has been used.
2. Oil other than the specified one has been lubricated.
3. Lubrication has been stopped intermediately, or lubrication was suspended temporary.
4. Water splashed directly.
5. Strong impact was given.
6. Alien substance such as drain and particle got into. Drain or garbage invaded a valve.
7. Prohibited way of using the valve which is written at "Precautions" section in this operation manual was carried out excluding above-mentioned.

In addition, in the case of trouble, please send it back to the supplier for repair or replacement.

#### Revision history

<b>A</b>	Renewal	MZ
<b>B</b>	Safety Instructions	Po
<b>C</b>	Safety Instructions	WR

1st printing : TZ

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

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VK300\*\*-OMH0002-C