

Installation and Maintenance Manual
Connector type manifold
Series VV100



1 Safety Instructions

- This manual contains essential information for the protection of users and others from possible injury and/or equipment damage.
- Read this manual before using the product, to ensure correct handling, and read the manuals of related apparatus before use.
- Keep this manual in a safe place for future reference.
- These instructions indicate the level of potential hazard by label of "DANGER", "WARNING" or "CAUTION", followed by important safety information which must be carefully followed.
- To ensure safety of personnel and equipment the safety instructions in this manual and the product catalogue must be observed, along with other relevant safety practices.

DANGER	In extreme conditions, there is a possibility of serious injury or loss of life.
WARNING	If instructions are not followed there is a possibility of serious injury or loss of life.
CAUTION	If instructions are not followed there is a possibility of injury or equipment damage.

1 Safety Instructions (continued)

Exemption from Liability.

- SMC, its officers and employees shall be exempt from liability for any loss or damage arising out of earthquake or fire, action by a third person, accidents, customer error with or without intention, product misuse and any other damages caused by abnormal operating conditions.
- SMC, its officers, and its employees shall be exempt from liability for any incidental damage that is caused by the use or the inability to use this product (loss of business interests, business interruptions, etc)
- SMC is exempt from liability for any damages caused by operations not contained in the catalogs and/or instruction manuals, and operations outside of the specification range.
- SMC is exempt from liability for any loss or damage whatsoever caused by malfunctions of its products when combined with other devices or software.

2 Specifications

2.1 Valve specifications

Fluid	Air	
Operating pressure range MPa	Positive pressure	0 ~ 0.7MPa
	Vacuum pressure	N.C. 1port :-100kPa~0.6 / 3port :100kPa~0 N.O. 1port :-100kPa~0 / 3port :100kPa~0.6
Ambient and fluid temperature °C	Max.50	
Maximum operating frequency Hz	20	
Lubrication	Non required	
Mounting position	Unrestricted	
Impact / Vibration resistance m/s ²	150/30 *Note	
Protection structure	IP40	

Note :

Impact resistance: No malfunction occurred when it was tested with a drop tester in the axial direction and at right angles to the main valve & armature; in both energized & de-energized states and for every time in each condition (Values at the initial period.)

Vibration resistance: No malfunction occurred in a one-sweep test between 45 and 2000 Hz. Tests ere performed at both energized and de-energized states in the axial direction and at right angles to the main valve & armature. (Valves at the initial period.)

2.2 Coil specifications

Rated voltage *Note	24,12VDC	
Allowable voltage fluctuation	±10% rated voltage	
Power Consumption W	Standard	0.4
	Power saving type (Extended periods continuously energized)	0.15
Surge voltage suppressor	Diode	
Indicator light	LED	

Note) Keep the following voltage range for Z type and T type (with power saving circuit) because it might have voltage drop due to internal circuit.

Z type	T type
24VDC : -7 ~ +10%	24VDC : -5 ~ +10%
12VDC : -6 ~ +10%	12VDC : -6 ~ +10%

2.3 Symbol

Type of actuation	Single	Double
N.C.		
N.O.		

3 Installation

3.1 Installation

WARNING

- Do not install the product unless the safety instructions have been read and understood.
- Interlock circuit**
If the products are used in an interlock circuit, prepare a double interlock style circuit with a mechanical protection function for the prevention of a breakdown. Examine these.

3.2 Environment

WARNING

- Do not use in an environment where the product is directly exposed to corrosive gases, chemicals, salt water, water or steam.
- Do not use in an explosive atmosphere.
- The product should not be exposed to prolonged sunlight. Use a protective cover.
- Do not mount the product in a location where it is subject to strong vibrations and/or shock. Check the product specifications.
- Do not mount the product in a location exposed to radiant heat. If using in an atmosphere where there is possible contact with water droplets, oil, weld spatter, etc., take suitable preventative measures.
- When the solenoid valve is mounted in a control panel or its energized for a long time, make sure that the ambient temperature is within the valve's specified range

3.3 Piping

CAUTION

- Before piping make sure to clean up chips, cutting oil, dust etc.
- When installing piping or fittings, ensure sealant material does not enter inside the port. When using seal tape, leave 1.5 to 2 threads exposed on the end of the pipe/fitting.
- Tighten fittings according to appropriate tightening torque.

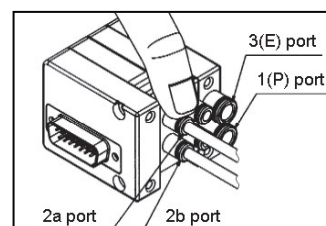
Thread	Appropriate tightening torque N•m
M5	1.5 to 2

3.4 One-touch fitting

CAUTION

Tube attachment

- Take a tube having no flaws on its periphery and cut it off at a right angle. When cutting the tube, use tube cutters TK-1, 2 or 3. Do not use pincers, nippers or scissors etc. If cutting is done with tools other than tube cutters, the tube may be cut diagonally or become flattened. This makes a secure installation impossible, and causes problems such as air leakage or the tube being pulled out after installation. Allow some extra length in the tube.



Hold down part of the release bush with your finger or a similar tool, as shown in the diagram, and pull out in the direction indicated by the arrow.

- Grasp the tube and push it in slowly, inserting it securely all the way into the fitting.
- After inserting the tube, pull on it lightly to confirm that it will not come out. Problems such as air leakage or the tube being pulled out can occur if the tube is not inserted securely all the way into the fittings.

Tube detachment

- Push in the release bushing and the collar at the same time.
- Pull out the tube while holding down the release bushing so that it does not come out. If the release bushing is not pressed down sufficiently there will be increased bite on the tube and it will become more difficult to pull out.
- When the removed tube is to be used again, cut off the portion which has been chewed before reusing it. If this is not done then the chewed portion of the tube can cause problems such as air leakage or difficulty in removing the tube from the fitting.

3 Installation (continued)

3.5 Precautions on other tube brands

CAUTION

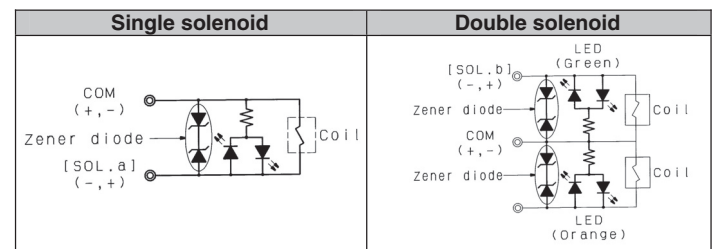
- When using non-SMC brand tubes, confirm that the following specifications are satisfied with respect to the outside diameter tolerance of the tube.

Nylon tube	±0.1mm
Soft nylon tube	±0.1mm
Polyurethane tube	+0.15mm -0.2mm
- Do not use tubes that do not meet these outside diameter tolerances. It may not be possible to connect them, or they may cause other problems, such as air leakage or the tube pulling out after connection.

3.6 Indicator Light/Surge Voltage Suppressor

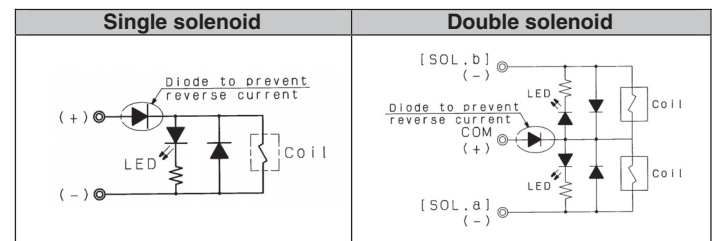
Non-polar type

When the solenoid valve has no polarity:

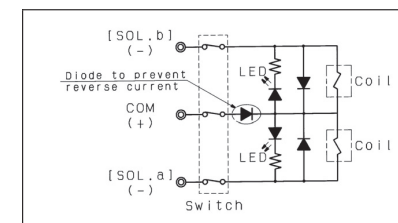


Polar type

When the solenoid valve has polarity:



With switch



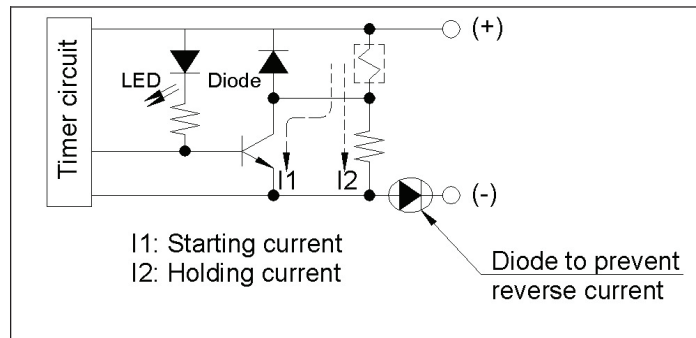
Extended periods of continuous energisation

- Continuous energisation of the valve for extended periods of time may have an adverse effect on the solenoid valve performance and the peripheral equipment. This is due to temperature rises caused by the heat generated by the coil. Consult with SMC if a valve will be continuously energised for extended periods of time or if the energized period per day will be longer than the de-energized period. It is also possible to shorten the energisation period by using valves of the N.O.(normally open) type.
- When solenoid valves are mounted in a control panel, employ measures to radiate away excess heat, so that temperatures remain within the valve specification range. Be particularly aware when three or more stations that are sequentially aligned on the manifold are continuously energised. This will cause a drastic temperature rise.

CAUTION

- Ensure that the air supply system is filtered to 5 microns.

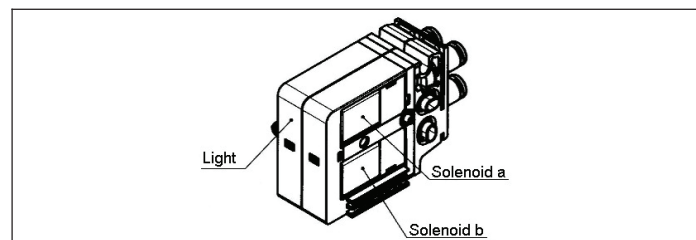
3 Installation (continued)



3.7 Light Indication

CAUTION

When equipped with indicator light and surge voltage suppressor, the light window turns orange when solenoid A is energized, and green when solenoid B is energized.



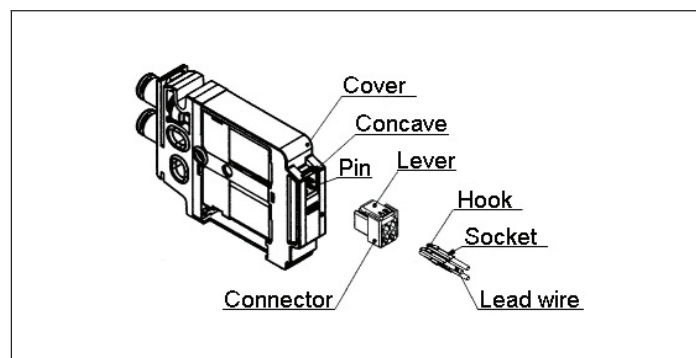
3.8 How to Use Plug Connector

CAUTION

When attaching and detaching a connector, first shut off the electric power and the air supply. Also, crimp the lead wires and sockets securely.

Attaching and detaching connectors

- To attach a connector, hold the lever and connector unit between your fingers and insert straight onto the pins of the solenoid valve so that the lever's pawl is pushed into the groove and locks.
- To detach a connector, remove the pawl from the groove by pushing the lever downward with your thumb, and pull the connector straight out.



4 Maintenance

4.1 General Maintenance

CAUTION

- Not following proper maintenance procedures could cause the product to malfunction and lead to equipment damage.
- If handled improperly, compressed air can be dangerous. Maintenance of pneumatic systems should be performed by qualified personnel only.
- Before performing maintenance ensure the supply pressure is shut off and all residual air pressure is released from the system.
- After maintenance apply operating pressure and power to the equipment and check for proper operation and possible air leaks. If operation is abnormal, verify product set-up parameters.
- Do not make any modification to the product.
- Do not disassemble the product, unless required by installation or maintenance instructions.

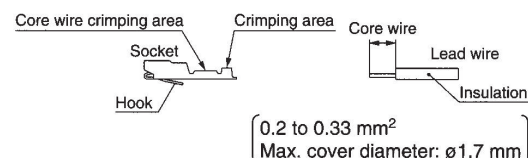
4.2 Fitting Assembly Replacement

CAUTION

By replacing a valve's fitting assembly, it is possible to change the port size of the 2a, 2b, 1(P), and 3(E) ports. When replacing it, pull out the fitting assembly after removing the clip with a flat head screwdriver, etc. To mount a new fitting assembly, insert it into place and then fully reinsert the clip.

Crimping or lead wires and sockets

Peel 3.2 to 3.7mm of the tip of lead wire, enter the core wires neatly into a socket and crimp it with a special crimp tool. Be careful so that the cover of lead wire does not enter into the crimping part. (Crimping tool: Model no. DXT170-75-1).



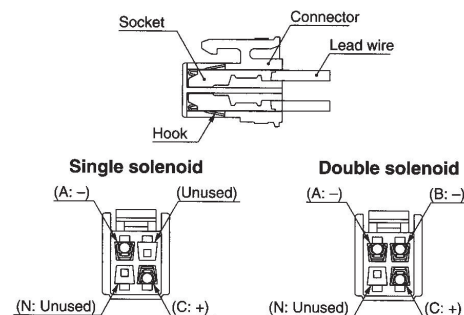
Attaching and detaching lead wires with sockets

Attaching

Insert the sockets into the square holes of the connector (with A,B,C and N indication), and continue to push the sockets all the way in until the lock by hooking into the seats in the connector. (When they are pushed in, their hooks open and they are locked automatically.) Next, confirm that they are locked by pulling lightly on the lead wires.

Detaching

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



5 Limitations of Use

CAUTION

- Leakage voltage**
The suppressor residual voltage should be 3 % or less of the rated voltage.
- Surge voltage suppressor**
If a surge protection circuit contains non-ordinary diodes such as zener diodes or varistor, a residual voltage will remain that is in proportion to the protective elements & the rated voltage. Therefore, give consideration to surge voltage protection of the controller. In the case of diodes, the residual voltage is approximately 1 V.
- Low temperature operation**
Unless otherwise indicated in the specifications for each valve, operation is possible to -10°C, but appropriate measures should be taken to avoid solidification or freezing of drainage and moisture, etc.
- Mounting orientation**
Mounting orientation is universal.
- Low frequency operation**
Valves should be operated at least once every 30 days to prevent malfunction. (Use caution regarding the air supply.)

5.1 Supply air

WARNING

- Use clean air**
If the compressed air supply includes chemicals, synthetic materials (including organic solvents), salinity, corrosive gas etc., it can lead to damage or malfunction.

CAUTION

- Install an air filter**
Install an air filter at the upper streamside of the valve. Filtration degree should be 5µm or less.

5.2 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

- The warranty period of the product is 1 year in service or 1.5 years after the product is delivered.^{*)} Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.
 - 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.
 - Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalog for the particular products.
- *3) 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.

5.3 Compliance Requirements

When the product is exported, strictly follow the laws required by the Ministry of Economy, Trade and Industry (Foreign Exchange and Foreign Trade Control Law).

6 Contacts

AUSTRIA	(43) 2262-62 280	NETHERLANDS	(31) 20-531 8888
BELGIUM	(32) 3-355 1464	NORWAY	(47) 67 12 90 20
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DENMARK	(45) 70 25 29 00	PORTUGAL	(351) 21 471 1880
FINLAND	(358) 207 513513	SLOVAKIA	(421) 2 444 56725
FRANCE	(33) 1-64 76 1000	SLOVENIA	(386) 73 885 412
GERMANY	(49) 6103 4020	SPAIN	(34) 945-18 4100
GREECE	(30) 210 271 7265	SWEDEN	(46) 8-603 0700
HUNGARY	(36) 1-371 1343	SWITZERLAND	(41) 52-396 3131
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