



ORIGINAL INSTRUCTIONS

## Instruction Manual

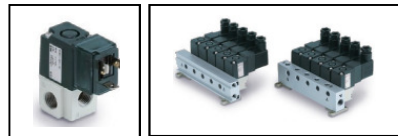
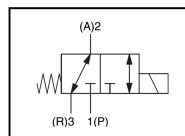


Refer to Declaration of Conformity for relevant Directives

## 3 Port Solenoid Valve

## Direct Operated Poppet Type

## Series VT307/VO307



The intended use of this product is the control of compressed air or vacuum in pneumatic industrial automation systems.

This product is validated according to ISO 13849 (See section 5.2 for validated components).

## 1 Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of "Caution," "Warning" or "Danger."

They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC)<sup>1)</sup>, and other safety regulations.

<sup>1)</sup> 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, etc.

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.

- 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.

	<b>Caution</b>	Caution indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.
	<b>Warning</b>	Warning indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.
	<b>Danger</b>	Danger indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

## Warning

- **The compatibility of pneumatic equipment is the responsibility of the person who designs the pneumatic system or decides its specifications.**

- Since the products specified here can be used in various operating conditions, their compatibility with the specific pneumatic system 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 catalogue information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.

- **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.

## 1 Safety Instructions (Continued)

The product is to be installed in restricted and maintenance areas where the likelihood of accidental access is limited and intentional access to the connector (by professionals) is infrequent.

- **Do not service machinery/equipment 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 equipment is to be removed, confirm 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 re-started, take measures to prevent unexpected operation and malfunction.

- **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 beyond the given specifications, or use outdoors or in a place exposed to direct sunlight.

2) Installations on equipment in conjunction with atomic energy, railways, air navigation, space, shipping, vehicles, military, medical treatment, combustions 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 specification described in the product catalogue.

3) An application which could have negative effects on people, property, or animals requiring special safety analysis outside the scope of ISO 13849 described in this document.

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.

- **Always ensure compliance with relevant safety laws and standards.**

All electrical work must be carried out in a safe manner by a qualified person in compliance with applicable national regulations.

## 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.

## 2 Specifications

## 2.1 Specifications

## 2.1.1 VT307/VO307 valve specifications

Type of actuation	Direct operated type 2 position single solenoid
Fluid	Air
Filtration	5 μm
Operating pressure range	0 to 1MPa (High-pressure type), 0 to 0.7MPa (Standard type)
Ambient and fluid temperature/°C	-10 to 50 (No freezing)
Response time <sup>Note 1)</sup>	20 ms or less (at 0.5MPa)
Max. operating frequency	10Hz
Min. operating frequency	See Section 2.1.31.3, 3.12 and 7.1
Lubrication	Not required (Use turbine oil Class 1 ISO VG32, if lubricated)
Manual override	Non-locking push type
Mounting orientation	Unrestricted
Impact / Vibration resistance <sup>Note 2)</sup>	150 / 50 m/s <sup>2</sup>
Enclosure	IP50 equivalent (for DIN terminal)
Duty cycle	See Section 2.1.3 and 3.12
B <sub>10</sub>	18 million cycles <sup>Note 3)4)</sup>
B <sub>10D</sub>	36 million cycles <sup>Note 3)4)</sup>
Standard <sup>Note 5)</sup>	Complies with the basic and well-tried safety principles of EN ISO 13849-2:2012

Table 1

Note 1) Based on dynamic performance test, JIS B 8374-1981. (Coil temperature: 20°C, at rated voltage, without surge voltage suppressor).

## 2 Specifications (Continued)

Note 2) **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 1000 Hz. Tests was 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).

Note 3) Under SMC test conditions. The B<sub>10</sub> figure is estimated from SMC life tests. The B<sub>10D</sub> figure is derived from B<sub>10</sub> using the assumption in EN ISO 13849-1:2015 Annex C. Contact SMC for details.

Note 4) B<sub>10</sub> for VT307E is 40,000 cycles for AC and 500,000 cycles for DC.

Note 5) Compliance only applies to the products listed in section 5 "How to order" Validated products.

## 2.1.2 Solenoid specifications

Electrical entry	DIN terminal		
Coil rated voltage (V)	AC (50/60 Hz)	100,200,110,220,240	
	DC	24,12	
Allowable voltage fluctuation	-15 to 10% of rated voltage		
Apparent power <sup>Note 1, Note 2)</sup>	AC	Inrush	12.7VA(50Hz), 10.7VA(60Hz)
		Holding	7.6VA(50Hz), 5.4VA(60Hz)
Power consumption <sup>Note 1), Note 2)</sup>	DC	Without indicator light : 4W, With indicator light : 4.2W	
	DC	Varistor, LED	
Light/Surge voltage suppressor	AC	Varistor, LED	
	DC	Diode, LED	

Table 2

Note 1) At rated voltage.

Note 2) The value is different for continuous duty type (VT307E) and energy-saving type (VT307Y/W). See below for details.

## 2.1.3 Continuous duty type: VT/VO307E

VT307E is recommended for continuous duty with long ON time.

## Caution

1) This model is for continuous duty, not for high cycle rates. But even for low cycle rates, if energizing the valve more than once a day, please consult with SMC.

2) Energize solenoid at least once in 30 days.

## Specifications different from standard are as follows:

Apparent power / AC	Inrush	7.9VA (50Hz), 6.2VA (60Hz)
	Holding	5.8VA (50Hz), 3.5VA (60Hz)
Power consumption DC	1.8W, With indicator light : 2W	
Response time <sup>Note)</sup>	30ms or less (at 0.5MPa)	

Table 3

Note) Based on dynamic performance test, JIS B 8374-1981. (Coil temperature: 20°C, at rated voltage, without surge voltage suppressor).

## 2.1.4 Energy-saving type: VT/VO307Y (VT/VO307W)

If low power consumption is required for electronic control, VT307Y(W) (1.8 W) is recommended.

## Specifications different from standard are as follows:

Power consumption DC	1.8W, With indicator light : 2W
Response time <sup>Note)</sup>	25ms or less (at 0.5MPa)

Table 4

Note) Based on dynamic performance test, JIS B 8374-1981. (Coil temperature: 20°C, at rated voltage, without surge voltage suppressor).

## 2.1.5 Vacuum spec. type: VT/VO307V (VT/VO307W)

The vacuum model has less air leakage than the standard model under low pressure. It is recommended for vacuum application.

## Caution

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

Operating pressure range	-101.2kPa to 0.1MPa
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Table 5

## 2 Specifications (Continued)

## 2.2 Flow rate characteristics

## 2.2.1 Valve

Model	Port size	Flow rate characteristics					
		1→2 (P→A)			2→3 (A→R)		
		C	b	Cv	C	b	Cv
VT307	1/8	0.71	0.35	0.18	0.68	0.27	0.17
VT307V (Vacuum spec. type)		0.41	0.26	0.10	0.44	0.35	0.11
VT307E (Continuous duty type)		0.71	0.31	0.19	0.71	0.25	0.17
VT307Y (Energy-saving type)		0.49	0.20	0.12	0.44	0.34	0.11
VT307W (Energy-saving, Vacuum spec. type)	1/4	0.49	0.20	0.12	0.44	0.34	0.11

Table 6

Model	Port size	Flow rate characteristics					
		3→2 (R→A)			2→1 (A→P)		
		C	b	Cv	C	b	Cv
VT307	1/8	0.65	0.36	0.17	0.63	0.35	0.17
VT307V (Vacuum spec. type)		0.48	0.27	0.12	0.35	0.33	0.10
VT307E (Continuous duty type)		0.68	0.33	0.17	0.71	0.26	0.18
VT307Y (Energy-saving type)		0.48	0.17	0.12	0.46	0.28	0.11
VT307W (Energy-saving, Vacuum spec. type)	1/4	0.48	0.17	0.12	0.46	0.28	0.11

Table 7

## 2.2.2 Manifold

Model	Flow rate characteristics					
	1→2 (P→A)			2→3 (A→R)		
	C	b	Cv	C	b	Cv
VT307	0.34	0.28	0.089	0.34	0.22	0.082
VT307V (Vacuum spec. type)	0.30	0.18	0.070	0.30	0.15	0.072
VT307E (Continuous duty type)	0.34	0.28	0.089	0.34	0.22	0.082
VT307Y (Energy-saving type)	0.30	0.18	0.070	0.30	0.15	0.072
VT307W (Energy-saving, Vacuum spec. type)	0.30	0.18	0.070	0.30	0.15	0.072

Table 8

Model	Flow rate characteristics					
	3→2 (R→A)			2→1 (A→P)		
	C	b	Cv	C	b	Cv
VT307	0.36	0.28	0.091	0.34	0.18	0.080
VT307V (Vacuum spec. type)	0.32	0.20	0.075	0.30	0.15	0.069
VT307E (Continuous duty type)	0.36	0.28	0.091	0.34	0.18	0.080
VT307Y (Energy-saving type)	0.32	0.20	0.075	0.30	0.15	0.069
VT307W (Energy-saving, Vacuum spec. type)	0.32	0.20	0.075	0.30	0.15	0.069

Table 9

## Caution

Special products might have specifications different from those shown in this section. Contact SMC for specific drawings. These drawings will give the appropriate specification details and compliance with the safety principles of ISO 13849, if applicable.

### 3 Installation

#### 3.1 Installation

##### Warning

- Do not install the product unless the safety instructions have been read and understood.

#### 3.2 Environment

##### Warning

- Do not use in an environment where corrosive gases, chemicals, salt water or steam are present.
- Do not use in an explosive atmosphere.
- Do not expose to direct sunlight. Use a suitable protective cover.
- Do not install in a location subject to vibration or impact. Check the product specifications.
- Do not mount in a location exposed to radiant heat.

#### 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 to the specified tightening torque.

Thread	Tightening Torque
Rc 1/8	7 to 9 Nm
Rc 1/4	12 to 14 Nm

Table 10

#### 3.4 Precautions on Design

##### Caution

- Actuator drive.**  
When an actuator, such as a cylinder, is to be driven using a valve, take appropriate measures (install a cover or barrier) to prevent potential danger caused by actuator operation.

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

Use caution when the valve is used on a manifold, because an actuator may malfunction due to back-pressure. Especially, when a single acting cylinder is operated, caution is necessary.

When there is a danger of such malfunction, take countermeasures such as using an individual EXH manifold.

- Holding of pressure (including vacuum)**

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

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

These valves 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.

- Release of residual pressure**

For maintenance purposes install a system for releasing residual pressure.

- Operation in a vacuum condition**

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

In addition, at the time of vacuum adsorption, be sure to vacuum at all times. Failure to do so may result in foreign matter sticking to the adsorption pad, or air leakage causing the work piece to drop.

- Vacuum switching valves and vacuum release valves.**

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

Use a valve designed for use under vacuum conditions.

- 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.

### 3 Installation (continued)

#### • Energizing for extended periods of time

##### Caution hot surface

\* Be aware that the valve surface may get hot.

If a valve is continuously energized for an extended period of time, the temperature of the valve will increase due to the heat generated by the coil. This will likely adversely affect the performance of the solenoid 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 low-wattage type or 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.

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

#### • Disassembly and modification prohibited

Do not disassemble the product or make any modifications, including additional machining. It may cause human injury and/or an accident and will void the warranty

#### 3.5 Selection

##### Caution

#### • Confirm the specifications.

Do not operate at pressures or temperatures, etc. beyond the range of specifications, as this can cause damage or malfunction. (Refer to specifications in catalogue).

#### 3.6 Lubrication

##### Caution

- SMC products have been lubricated for life at manufacture, and do not require lubrication in service.

- If a lubricant is used in the system, use turbine oil Class 1 (no additive), ISO VG32. Once lubricant is used in the system, lubrication must be continued because the original lubricant applied during manufacturing will be washed away.

#### 3.7 Indicator Light/Surge Voltage Suppressor

Surge suppression should be specified by using the appropriate part number. In ISO 13849 validated systems, if a valve type without suppression is used, suppression must be provided by the host controller.

##### Caution

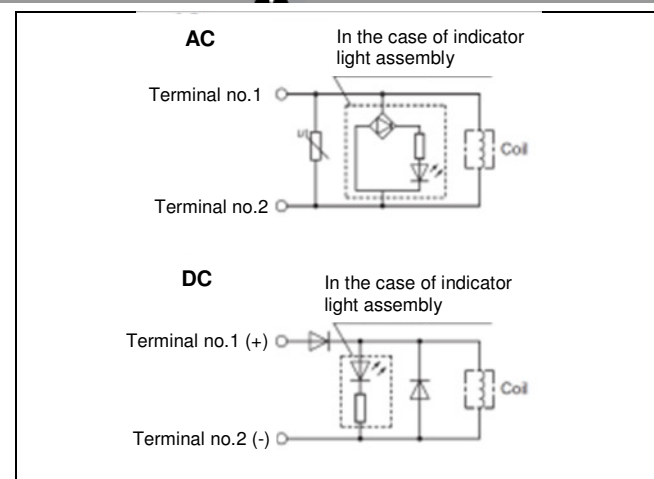


Figure 1

### 3 Installation (continued)

#### 3.8 Transient voltage of the Surge Voltage Suppressor

Even with surge suppressed valves, some transient voltage will be experienced by the host controller. The table below gives the voltage transient. Ensure the transient voltage is within the specification of the host controller.

#### • Residual Voltage

Surge voltage suppressor	Voltage	Surge
Z	24 V DC	Approx. -1 V
Z	12 V DC	Approx. -1 V
Z	100 V AC	Approx. 200 V
Z	200 V AC	Approx. 360 V
Z	110 V AC	Approx. 200 V
Z	220 V AC	Approx. 360 V
Z	240 V AC	Approx. 390 V

Table 11

#### 3.9 Electrical Connection

##### Caution

DIN terminal is connected as shown in Figure 2. Connect to the corresponding power supply.

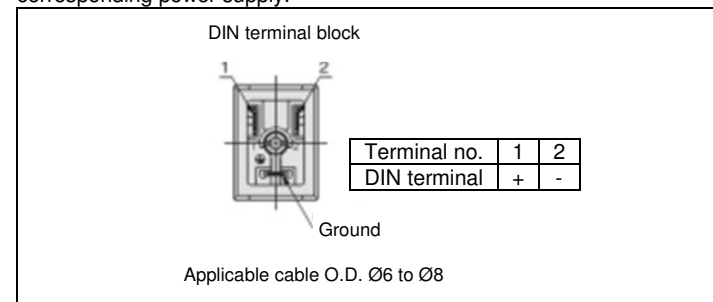


Figure 2

#### 3.10 Indicator light

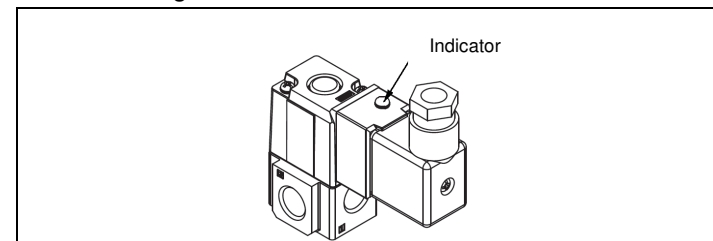


Figure 3

#### 3.11 Lead wire colour

Voltage	Color
100VAC	Blue
200VAC	Red
DC	Red(+), Black(-)
Others	Grey

Table 12

#### 3.12 Continuous energizing time

##### Caution

If the standard and low-power consumption types are energized continuously for a long time, switch the valve at least once every 30 days and the operating time should not exceed 1400 hours (equivalent to 2 months) per year.

Cannot be used as an emergency shutoff valve. If the operating time exceeds 1400 hours, use a continuous duty type valve (VT307E).

Note that the valve should be switched at least once every 30 days in this case.

If the valve is used for special applications (e.g. emergency shutdown valve), please contact your SMC sales representative.

### 3 Installation (continued)

#### 3.13 Operation in a vacuum condition

##### Caution

For operation in a vacuum condition, use VT/VO307V. Note that if the valve is used in an environment where the product is exposed to a large amount of dust, install a filter to the R port. If a suction pad is used, install a filter between the suction pad and valve. These valves are not intended as vacuum retaining valves.

#### 3.14 Bracket mounting:

##### VT307

Description	Part no.
Bracket	DXT152-25-1A (with screws)

Table 13

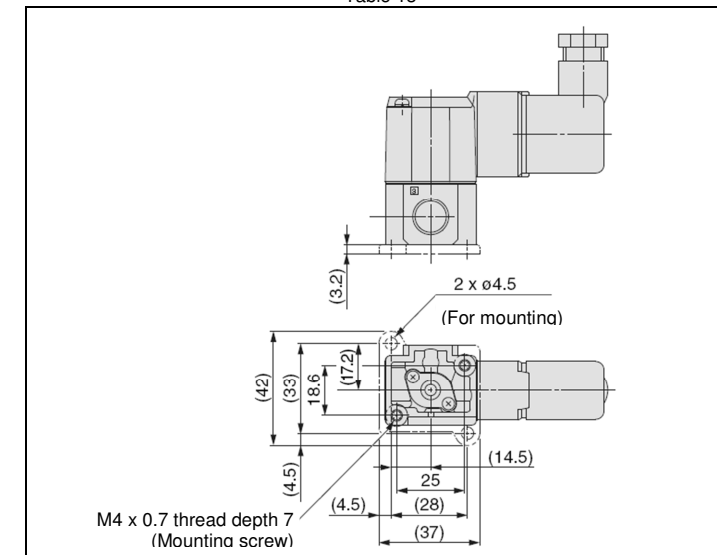


Figure 4

#### 3.15 Manifold

##### Warning

When mounting a valve on the manifold base, N.C. and N.O. can be selected by the function plate orientation. Also, since the cylinder operates in reverse, confirm that the function plate is correctly mounted.

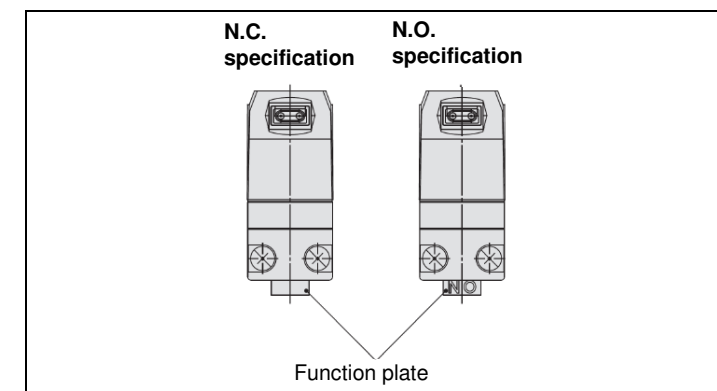


Figure 5

##### Caution

1. Each valve is fixed to the manifold base with two M4 mounting screws. Tighten the screws firmly when re-mounting.

2. For mounting, tighten M4, or equivalent screws, evenly to the manifold base.

Tightening torque of the mounting screw (M4): 1.4 N·m

### 3 Installation (continued)

#### 3.16 Changing from N.C. to N.O. (Manifold)

##### Caution

This product is delivered as N.C. valve. If N.O. valve is required, remove mounting screws of the required valve and turn over the function plate. (Ensure that there are gaskets on both sides of the plate.) Then, tighten the mounting screws to fix the valve to the manifold base.

Description	Part no.
Function Plate (with gasket)	DXT152-14-1A
	DXT152-14-1B (for 'E' option)

Table 14

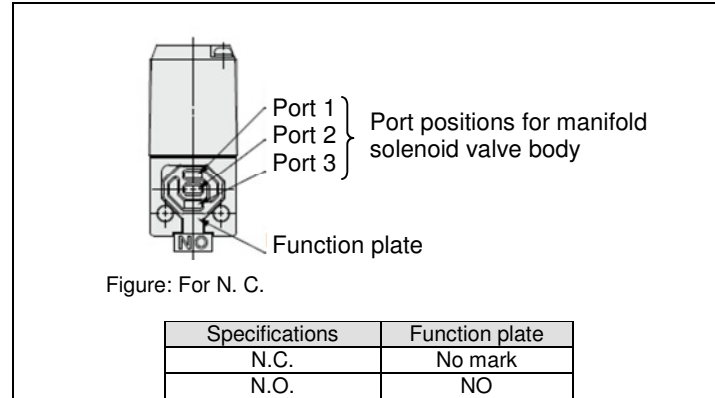


Figure 6

Specifications	Function plate
N.C.	No mark
N.O.	NO

#### 3.17 Piping

##### Caution

For the common exhaust type, pressurization or evacuation of the 3(R) port can cause a malfunction.

#### 3.18 How to Install DIN Terminal – see Figure 7

##### 1. Disassembly

- Undo the screw (1), then pull the housing (2) in the direction of the screw (1) to remove the connector from the equipment (solenoid, etc.)
- Pull the screw (1) out of the housing (2).
- On the bottom part of the terminal block (3), there is a recess (9). Insert a small flat head screwdriver into the recess and lever the terminal block (3) from the housing (2).
- Remove the cable gland (4) plain washer (5) and rubber seal (6).

##### 2. Wiring

- Pass the cable (7) through the cable gland (4) plain washer (5) and rubber seal (6) in this order, and then insert the cable into the housing (2).
- Loosen the screw (11) attached to the terminal block (3). Then pass the lead wire (10) through the terminal on the terminal block (3) and re-tighten the screw (11).

Note 1) Tighten using a torque of 0.5 N·m ±15%.

Note 2) Cable (7) outside diameter: ø6 to ø8 mm

Note 3) Crimped terminals like the round-shape or Y-shape cannot be used.

##### 3. Assembly

- After wiring the terminal block (3), mount the terminal block (3) into the housing (2). (Push it down until you hear a click sound).
- Put the rubber seal (6) and plain washer (5), in this order, into the cable entry of the housing (2), and then tighten the cable gland (4) securely.
- Insert the gasket (8) between the bottom part of terminal block (3) and the plug attached to the equipment and assemble the connector. Then, tighten screw (1) from the top of the housing (2) to secure it.

Note 1) Tighten using a torque of 0.5 N·m ±20%.

Note 2) Connector orientation can be changed 180° depending on how the housing (2) and the terminal block (3) are assembled.

### 3 Installation (continued)

#### DIN Connector

Description	Part no.
DIN connector	GM209NJ-B17 (CE-compliant)

Table 15

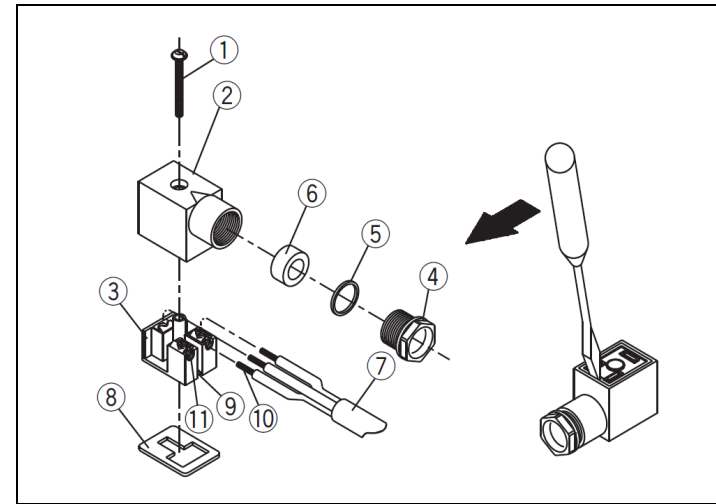


Figure 7

##### Warning

The ground terminal is connected to the coil assembly only and does not provide a protective earth for the body of the valve.

### 4 Settings

#### 4.1 Manual Override

##### Caution

Since connected equipment will operate when the manual override is activated, confirm that conditions are safe prior to activation.

##### Non-locking push type

- Push down the manual override button until it stops ON.
- Hold this position for the duration of the check (ON position).
- The manual override will return when released to the OFF position.

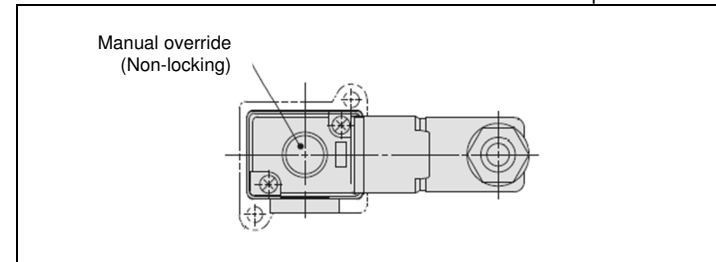


Figure 8

### 5 How to Order

**V T 307** **- 5 D** **1 - 01** **- F - Q**

Body type	Validated
T Body ported	●
O For manifold	●

Valve option	Validated
Nil Standard type	●
E* Continuous duty type	●
Y* Energy-saving type	●
V* Vacuum specification type	-
W* Energy-saving type, Vacuum specification type	-

\* Semi-standard

Pressure specifications	Validated
Nil Standard type (0.7 MPa)	●
K* High-pressure type (1 MPa)	●

\* Semi-standard

Rated voltage	Validated
1 100 VAC, 50/60 Hz	-
2 200 VAC, 50/60 Hz	-
3* 110 VAC, 50/60 Hz	-
4* 220 VAC, 50/60 Hz	-
5 24 VDC	●
6* 12 VDC	●
7* 240 VAC, 50/60 Hz	-

\* Semi-standard

◇: Validated according ISO13849

CE-compliant	Validated
Nil None	●
Q CE-compliant*	●

\* Electrical entry and light/surge voltage suppressor: D/DO/DZ/DOZ only

Bracket	Validated
Nil None	●
F With bracket	●

Thread type	Validated
Nil Rc	●
F G	●
N NPT	●
T NPTF	●

Port size	Validated
Nil Without port (for manifold)	●
01 1/8 (6A)	●
02 1/4 (8A)	●

Light/Surge voltage suppressor	Validated
Nil None	●
S With surge voltage suppressor (Grommet type only)	-
Z With light/surge voltage suppressor (DIN terminal only)	●

Electrical entry	Validated
Din terminal D Din terminal	●
DO Without connector	●
Grommet G 300 mm lead wire	-
H 600 mm lead wire	-

### 6 Outline Dimensions (mm)

See below and refer to the catalogue for this product.

#### 6.1 VT307 Body ported

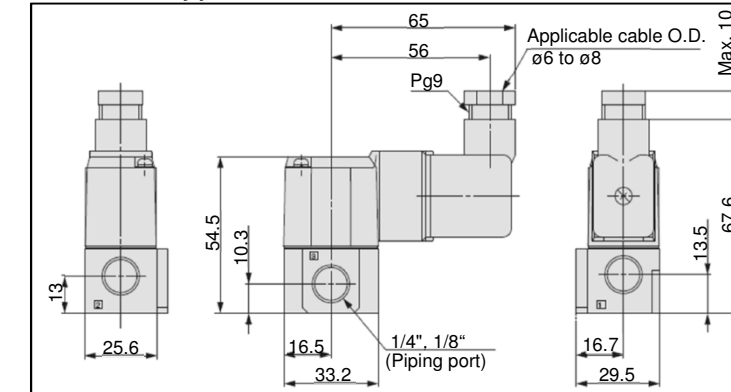


Figure 9

#### 6.2 VO307 Manifold Common Exhaust

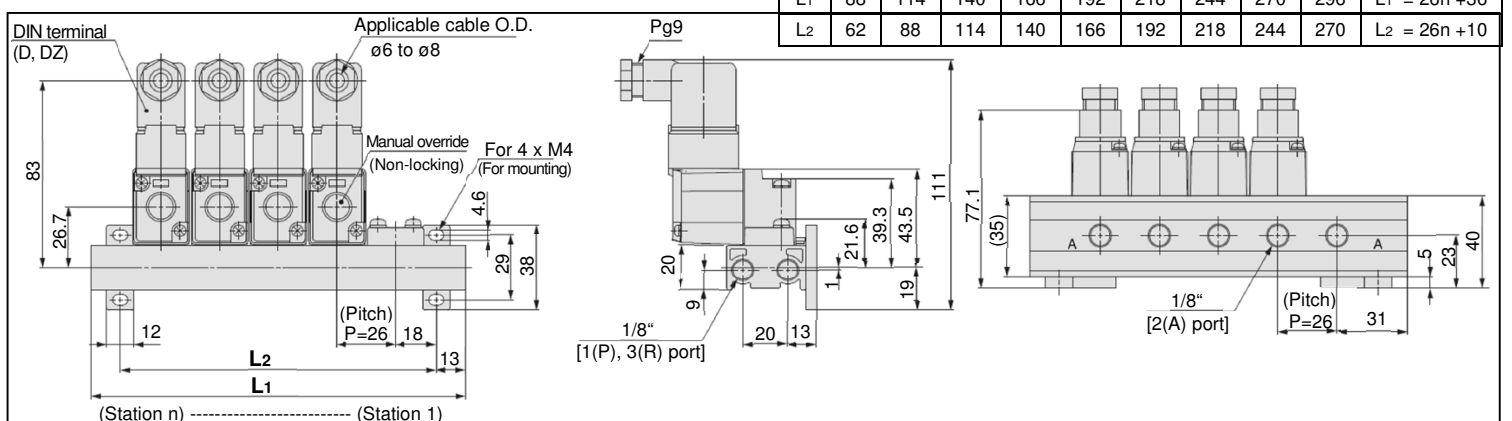


Figure 10

## 6 Outline dimensions (mm) (Continued)

### 6.3 VO307 Manifold Individual Exhaust

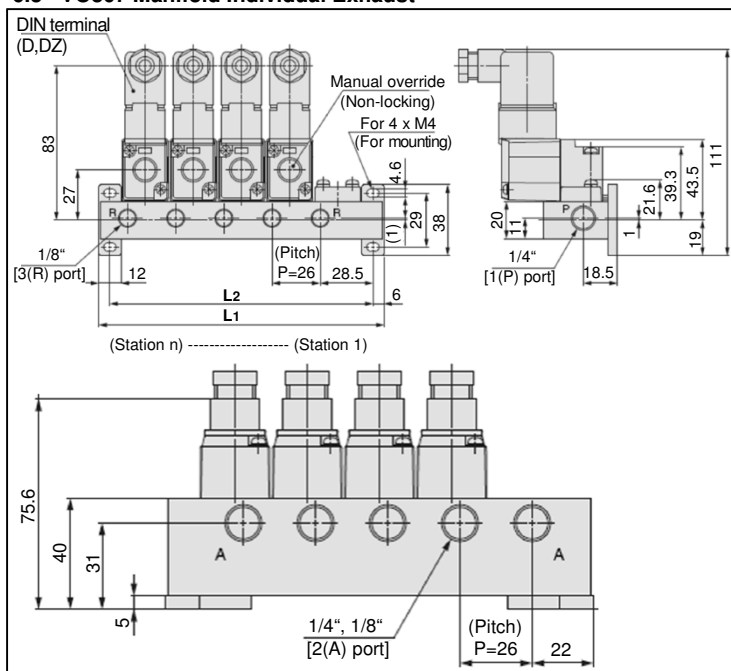


Figure 11

n	2	3	4	5	6	7	8	9	10	Formula
L <sub>1</sub>	76	102	128	154	180	206	232	258	284	L <sub>1</sub> = 26n + 24
L <sub>2</sub>	64	90	116	142	168	194	220	246	272	L <sub>2</sub> = 26n + 12

## 7 Maintenance

### 7.1 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 only by qualified personnel.
- Before performing maintenance, turn off the power supply and be sure to cut off the supply pressure. Confirm that the air is released to atmosphere.
- After installation and maintenance, apply operating pressure and power to the equipment and perform appropriate functional and leakage tests to make sure the equipment is installed correctly.
- If any electrical connections are disturbed during maintenance, ensure they are reconnected correctly and safety checks are carried out as required to ensure continued compliance with applicable national regulations.
- Do not make any modification to the product.
- Do not disassemble the product, unless required by installation or maintenance instructions.
- Low frequency operation**  
Valves should be operated at least once every 30 days to prevent malfunction. (Use caution regarding the air supply).

### 7.2 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.
- Install an air filter**  
Install an air filter at the upper streamside of the valve. Filtration degree should be 5 μm or less.

## 7 Maintenance (continued)

### 7.3 Blanking plate assembly

Description	Part no.
Blanking Plate (with gasket and screws)	DXT060-51-13A
	DXT060-51-13B (for 'E' option)

Table 16

- For blanking off any spare stations on the manifold assembly.
- Assemble blanking plate to manifold block ensuring gasket is present.
- Torque tighten mounting screws to a torque of 1.4 N·m.

#### Caution

- Before disassembly, be sure to turn off electric power and air supplies.
- Confirm that the air has been completely exhausted before performing any work.
- Take care not to get scratches or dirt etc. on the seals, as this can cause leakage.

## 8 Limitations of Use

### 8.1 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, whichever is first<sup>(1)</sup>. 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 catalogue for the particular products.

<sup>(1)</sup> 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

- The use of SMC products with production equipment for the manufacture of weapons of mass destruction (WMD) or any other weapon is strictly prohibited.
- The exports of SMC products or technology from one country to another are governed by the relevant security laws and regulations of the countries involved in the transaction. Prior to the shipment of a SMC product to another country, assure that all local rules governing that export are known and followed.

#### 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.

#### Warning

Do not exceed any of the specifications laid out in section 2 of this document or the specific product catalogue.

#### Caution

#### Leakage voltage

Ensure that any leakage current, when the switching element is OFF, meets the following limits:

- DC coil: 3% or less of rated voltage
- AC coil: 15% or less of rated voltage

## 8 Limitations of use (continued)

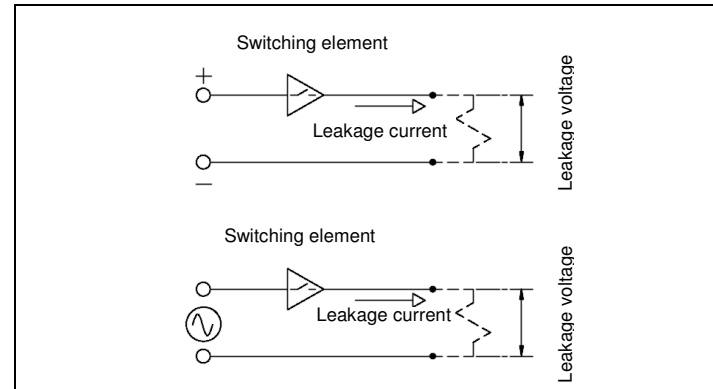


Figure 12

### 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.

#### 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.

#### Danger

Any use in an EN ISO 13849 system must be within the specified limits and application conditions. The user is responsible for the specification, design, implementation, validation and maintenance of the safety system (SRP/CS).

This product has variants which can be configured Normally Open (N.O.) or Normally Closed (N.C.). The user is responsible for ensuring that all necessary measures are taken to prevent foreseeable misuse.

#### Warning

If a safe output from a safety relay or PLC is used to operate this valve, ensure that any output test pulse duration is shorter than 1 ms to avoid the valve solenoid responding.

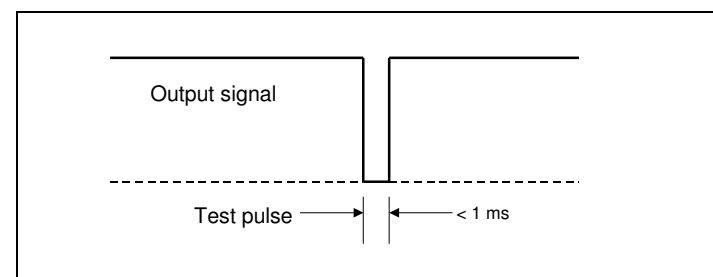


Figure 13

## 9 Contacts

AUSTRIA	SMC Pneumatik GmbH, Girakstrasse 8, AT-2100 Korneuburg, Austria
BELGIUM	SMC Pneumatics N.V./S.A. Nijverheidsstraat 20, B-2160 Wommelgem, Belgium
BULGARIA	SMC Industrial Automation Bulgaria EOOD, Business Park Sofia, Building 8-6th floor, BG-1715 Sofia, Bulgaria
CROATIA	SMC IndustrijskaAutomatikad.o.o. ZagrebačkaAvenija 104,10 000 Zagreb
CZECH REP.	SMC Industrial Automation CZ s.r.o. Hudcova 78a, CZ-61200 Brno, Czech Republic
DENMARK	SMC Pneumatik A/S,Egeskovvej 1, DK-8700 Horsens, Denmark
ESTONIA	SMC Pneumatics Estonia Oü,Laki 12, EE-10621 Tallinn, Estonia
FINLAND	SMC Pneumatics Finland Oy, PL72, Tiistinniintie 4, SF-02031 Espoo, Finland
FRANCE	SMC Pneumatique SA.1, Boulevard de Strasbourg, Parc Gustave Eiffel, Bussy Saint Georges, F-77607 Marne La ValléeCedex 3, France
GERMANY	SMC Pneumatik GmbH, Boschring 13-15, 63329 Egelsbach, Germany
GREECE	SMC Italia Hellas Branch, Anageniseos 7-9.P.C. 14342 N.Philadelphia, Athens, Greece
HUNGARY	SMC Hungary IpariAutomatizálásiKft.Torbágy u. 19, HU-2045 Törökbálint, Hungary
IRELAND	SMC Pneumatics (Ireland) Ltd.2002 Citywest Business Campus, Naas Road, Saggart, Co. Dublin, Ireland

ITALY	SMC Italia S.p.A.Via Garibaldi 62, I-20061Carugate, (Milano), Italy
LATVIA	SMC Pneumatics Latvia SIA, Dzelzavas str. 120g, Riga, LV-1021, Latvia
LITHUANIA	UAB "SMC Pneumatics", Oslo g. 1, LT-04123 Vilnius, Lithuania
NETHERLANDS	SMC Pneumatics B.V.De Ruyterkade 120, NL-1011 AB Amsterdam, the Netherlands
NORWAY	SMC Pneumatics Norway AS, Vollsveien 13 C, GranfosNæringspark, N-1366 Lysaker, Norway
POLAND	SMC Industrial Automation, Polska Sp z o.o. 02-826 Warszawa, ul. Poloneza 89, Poland
PORTUGAL	SMC España S.A. Zuazobidea 14, 01015 Vitoria, Spain
ROMANIA	SMC Romania S.r.l. Str.Frunzei 29, Sector 2, Bucharest, Romania
RUSSIA	SMC Pneumatik LLC. Business centre, building 3, 15 Kondratjevskij prospect, St.Petersburg, Russia, 195197
SLOVAKIA	SMC PriemyselnaAutomatizáciaSpols.r.o. Fantranská 1223, Teplickanadvahom, 01301, Slovakia
SLOVENIA	SMC IndustrijskaAvtomatikad.o.o. Mirnskacesta 7, SLO-8210 Trebnje, Slovenia
SPAIN	SMC España S.A. Zuazobidea 14, 01015 Vitoria, Spain
SWEDEN	SMC Pneumatics Sweden AB,Ekhagsvägen 29-31, SE-141 71 Segeltorp, Sweden
SWITZERLAND	SMC Pneumatik AG,Dorfstrasse 7, Postfach, 8484 Weisslingen, Switzerland
TURKEY	SMC PnömatikSanayiTicaretveServis A.Ş. GülbaharCaddesi, Aydin Plaza, No: 9/4 Güneşli – 34212, Istanbul
UK	SMC Pneumatics (U.K.) Ltd. Vincent Avenue, Crownhill, Milton Keynes, Buckinghamshire MK8 0AN, United Kingdom

## SMC Corporation

URL : <http://www.smcworld.com> (Global) <http://www.smceu.com> (Europe)  
 \*SMC Corporation, Akihabara UDX15F, 4-14-1, Sotokanda, Chiyoda-ku, Tokyo 100 0021  
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