3 Port Solenoid Valve

**VT307 Series**

Direct Operated Poppet Type

### Power consumption

- **Standard type**
  - 4 W
  - (Current product: 4.8 W)

- **Energy-saving type**
  - 1.8 W
  - (Current product: 2 W)

### Vacuum applications

- **-101.2 kPa**

### A single valve with various valve functions

(Universal porting type)

<table>
<thead>
<tr>
<th>N.C. valve</th>
<th>N.O. valve</th>
<th>Divider valve</th>
<th>Selector valve</th>
<th>etc.</th>
</tr>
</thead>
</table>

### Low concentration ozone resistant

Rubber seal material: HNBR for main valve

### Mounting dimensions are interchangeable with current product

- **Body ported type**
- **Manifold type**

---

**VT307 Series**

- VV061
- VV100
- V100
- S070
- VQD
- VQD-V
- VK
- VT
VT307 Series
3 Port Solenoid Valve  Direct Operated Poppet Type

A variety of valve options

Continuous duty type
Vacuum specification type
Energy-saving type + Vacuum specification type

Application examples

1. Blow-off valve
2. Pressure release valve
3. Selector valve
4. Valve for vacuum
5. Divider valve
6. Single-acting cylinder drive
7. Double-acting cylinder drive

3 Port Solenoid Valve, Universal Porting Type Variations

<table>
<thead>
<tr>
<th>Poppet type</th>
<th>Direct operated poppet type</th>
<th>Pilot poppet type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Series</td>
<td>VT307</td>
<td>VP300/500/700</td>
</tr>
<tr>
<td>VT317</td>
<td>0.62</td>
<td></td>
</tr>
<tr>
<td>VP325</td>
<td>1.4</td>
<td></td>
</tr>
<tr>
<td>VP300/500/700</td>
<td>0.8 to 3.6</td>
<td></td>
</tr>
<tr>
<td>Page</td>
<td>Page 1433</td>
<td>Page 1261</td>
</tr>
</tbody>
</table>
3 Port Solenoid Valve
Direct Operated Poppet Type
VT307 Series

Rubber Seal

How to Order

V T 307 - 5 G 1 - 01 - F -

Body type
T Body ported
O For manifold

Valve option
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
Nil Standard type (0.7 MPa)
K High-pressure type (1 MPa)
* Semi-standard

Rated voltage
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

Electrical entry
Grommet DIN terminal
G: 300 mm lead wire
H: 600 mm lead wire

D: With connector
DO: Without connector

CE-compliant
Nil None
Q CE-compliant
* Electrical entry and light/surge voltage suppressor: D/DO/DZ/DOZ only

Bracket
Nil None
F With bracket

Thread type
Nil Rc
F G
N NPT
T NPTF

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

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

Symbol

Manifold
Model Applicable manifold type Accessories
VO307(-Q) Common or individual exhaust
Function plate (DXT152-14-1A) Mounting screw (NXT013-3)

Note) It is not applicable to the continuous duty type. Refer to the accessories on page 1437.

Option
Description Part no.
Bracket DXT152-25-1A (With screw)
VT307 Series

Standard Specifications

<table>
<thead>
<tr>
<th>Type of actuation</th>
<th>Direct operated type 2 position single solenoid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluid</td>
<td>Air</td>
</tr>
<tr>
<td>Operating pressure range</td>
<td>0 to 1 MPa (High-pressure type), 0 to 0.7 MPa (Standard type)</td>
</tr>
<tr>
<td>Ambient and fluid temperature</td>
<td>−10 to 50°C (No freezing)</td>
</tr>
<tr>
<td>Response time</td>
<td>20 ms or less (at 0.5 MPa)</td>
</tr>
<tr>
<td>Max. operating frequency</td>
<td>10 Hz</td>
</tr>
<tr>
<td>Lubrication</td>
<td>Not required</td>
</tr>
<tr>
<td>Manual override</td>
<td>Non-locking push type</td>
</tr>
<tr>
<td>Mounting orientation</td>
<td>Unrestricted</td>
</tr>
<tr>
<td>Impact/Vibration resistance</td>
<td>150/50 m/s²</td>
</tr>
<tr>
<td>Enclosure</td>
<td>Dustproof</td>
</tr>
<tr>
<td>Electrical entry</td>
<td>Grommet, DIN terminal</td>
</tr>
<tr>
<td>Coil rated voltage (V)</td>
<td>AC (50/60 Hz), DC</td>
</tr>
<tr>
<td>Allowable voltage fluctuation</td>
<td>−15 to +10% of rated voltage</td>
</tr>
<tr>
<td>Apparent power</td>
<td>AC Inrush Holding</td>
</tr>
<tr>
<td>Power consumption</td>
<td>DC Without indicator light: 4 W, With indicator light: 4.2 W</td>
</tr>
<tr>
<td>Light/Surge voltage suppressor (DIN terminal type only)</td>
<td>AC Varistor, LED, DC Diode, LED</td>
</tr>
</tbody>
</table>

- Semi-standard
- Note 1) Based on dynamic performance test, JIS B 8419: 2010. (Coil temperature: 20°C, at rated voltage, without surge voltage suppressor)
- Note 2) Impact resistance: No malfunction occurred when it is tested with a drop tester in the axial direction and at the right angles to the main valve and armature in both energized and de-energized states every once for each condition. (Values at the initial period)
- Vibration resistance: No malfunction occurred in a one-sweep test between 45 and 1000 Hz. Test was performed at both energized and de-energized states in the axial direction and at the right angles to the main valve and armature. (Values at the initial period)
- Note 3) At rated voltage
- Note 4) The value is different for continuous duty type (VT307E), and energy-saving type (VT307Y/W).

Flow Rate Characteristics/Weight

<table>
<thead>
<tr>
<th>Valve model</th>
<th>Port size</th>
<th>Flow rate characteristics</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>VT307</td>
<td>1/8</td>
<td>0.71, 0.35, 0.18, 0.68, 0.27, 0.17, 0.65, 0.36, 0.17</td>
<td>0.15 kg</td>
</tr>
<tr>
<td>VT307V (Vacuum spec. type)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VT307T (Continuous duty type)</td>
<td>1/4</td>
<td>0.71, 0.31, 0.19, 0.71, 0.25, 0.17, 0.68, 0.33, 0.17</td>
<td></td>
</tr>
<tr>
<td>VT307Y (Energy-saving type)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VT307W (Energy-saving, Vacuum spec. type)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Valve Options |

**Continuous duty type: VT307E**

Exclusive use of VT307E is 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.

<table>
<thead>
<tr>
<th>Specifications different from standard are as follows.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apparent power AC</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Power consumption DC</td>
</tr>
<tr>
<td>Response time (sec)</td>
</tr>
</tbody>
</table>

Note) Refer to Note 1) of the standard specifications.

**Energy-saving type: VT307Y (VT307W)**

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: 1.8 W, With indicator light: 2 W
- Response time (sec): 25 ms or less (at 0.5 MPa)

Note) Refer to Note 1) of the standard specifications.

**Vacuum spec. type: VT307V (VT307W)**

This 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 the pressure container.

<table>
<thead>
<tr>
<th>Specifications different from standard are as follows.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating pressure range</td>
</tr>
</tbody>
</table>

1434
**Construction**

**De-energized**

- Manual override

**Energized**

- When energizing the molded coil, the armature is magnetically attracted to the core, and through the push rod, it pushes down the poppet valve. When energizing the molded coil, the armature is magnetically attracted to the core.

**Operation principle**

**<De-energized>**

Poppet valve 2 is pushed upward by the return spring 3, port 1 is closed. Then, port 2 and port 3 are connected.

Air flow direction:

Port 1 → Block, 2 → 3

**<Energized>**

When energizing the molded coil, the armature is magnetically attracted to the core, and through the push rod, it pushes down the poppet valve, port 2 is closed. Then, port 1 and port 3 are connected. At this time, there will be gaps between the armature and the core, but the armature will be magnetically firmly attracted to the core.

Air flow direction:

Port 1 ← Port 2, Port 3 ← Block

**Component Parts**

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Material</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Body</td>
<td>Aluminum die-casted</td>
<td>Color: White</td>
</tr>
<tr>
<td>2</td>
<td>Poppet valve</td>
<td>Aluminum, HNBR</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Return spring</td>
<td>Stainless steel</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Molded coil</td>
<td>Resin</td>
<td></td>
</tr>
</tbody>
</table>

**How to Use DIN Terminal**

1. **Disassembly**

   1) After loosening the screw, if the housing is pulled in the direction of the screw, the connector will be removed from the body of equipment (solenoid, etc.).

   2) Pull the screw out of the housing.

   3) On the bottom part of the terminal block, there’s a cut-off part. If a small flat head screwdriver is inserted between the opening in the bottom, terminal block will be removed from the housing.

   4) Remove the cable gland, plain washer and rubber seal.

2. **Wiring**

   1) Pass the cable through the cable gland, plain washer and rubber seal in this order, and then insert them into the housing.

   2) Loosen the screw attached to the terminal block. Then, pass the lead wire through the terminal block again and tighten the screw.

   Note 1: Tighten within the tightening torque of 0.5 N·m ±15%.

   Note 2: Cable outside diameter: ø6 to ø8 mm

   Note 3: Crimped terminal like round-shape or Y-shape cannot be used.

3. **Assembly**

   1) Pass the cable through the cable gland, plain washer and rubber seal in this order and connect to the terminal block. Then, mount the terminal block on the housing.

   (Press it down until you hear the click sound.)

   2) Put the rubber seal and plain washer in this order into the cable entry of the housing, and then tighten the gland securely.

   3) Insert the gasket between the bottom part of the terminal block and the plug attached to the equipment. Then, screw in from the top of the housing to tighten it.

   Note 1: Tighten within the tightening torque of 0.5 N·m ±20%.

**Changing the entry direction**

The orientation of a connector can be changed 180°, depending on the combination of a housing and terminal block.

**Electrical Connection**

**DIN terminal block**

Terminal no. 1 ← Block, Port 1 ← Port 2, Port 3 ← Block

- **Terminal no.**
  - 1
  - 2

- **DIN terminal**
  - +
  - −

- **Ground**

**Lead Wire Color**

<table>
<thead>
<tr>
<th>Voltage</th>
<th>Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>DC 100 VAC</td>
<td>Blue</td>
</tr>
<tr>
<td>DC 200 VAC</td>
<td>Red</td>
</tr>
<tr>
<td>DC Others</td>
<td>Red (+), Black (−)</td>
</tr>
</tbody>
</table>

- Applicable cable O.D. ø6 to ø8

**Connector for DIN Terminal**

<table>
<thead>
<tr>
<th>Description</th>
<th>Part no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>DIN connector</td>
<td>B1B09-2A (Standard)</td>
</tr>
<tr>
<td></td>
<td>GM209NJ-B17 (CE-compliant)</td>
</tr>
</tbody>
</table>
Note) There is also “VT307-□H1” (lead wire length: 600 mm).

DIN terminal: VT307-□D1

Applicable cable O.D. ø6 to ø8

M4 x 0.7 thread depth 7 (Mounting screw)
VT307 Series
Manifold Specifications

VT307 manifold is available both as a common exhaust and individual exhaust model.

Manifold valve can be easily converted from N.C. (Normally Closed) to N.O. (Normally Open) merely by turning over the function plate.

How to Order Manifold Base

VV307-01-05 2-01 -F

- Dummy symbol
- VT307 manifold
- Valve stations
  02 2 stations
  20 20 stations
  Max. 20 stations
- Specify model number of the manifold base, applicable valves and blanking plates when ordering.
  Refer to page 1433 for the model number of the valves.
  Ordering example: VV307-01-052-01-F—1 pc.
  (5 station manifolds base)
  VO307-1G1—4 pcs.
  DXT060-51-13A—1 pc.
  (Blanking plate)

- A port size (Base mounted)
  01 1/8 common exhaust/individual exhaust
  02 1/4 individual exhaust

- Exhaust port type
  2 Common exhaust
  3 Individual exhaust

Manifold Specifications

<table>
<thead>
<tr>
<th>Manifold type</th>
<th>B mount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. number of stations</td>
<td>20 stations (\textsuperscript{Note})</td>
</tr>
<tr>
<td>Applicable solenoid valve</td>
<td>VO307\textsuperscript{(-Q)}</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Exhaust port</th>
<th>Port location (Direction)/Port size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Symbol</td>
<td>Type</td>
</tr>
<tr>
<td>2</td>
<td>Common</td>
</tr>
<tr>
<td>3</td>
<td>Individual</td>
</tr>
</tbody>
</table>

Note: For 6 stations or more, supply air both sides of P port. The common exhaust type should exhaust from both of the R port.

Option

<table>
<thead>
<tr>
<th>Description</th>
<th>Part no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blanking plate (With gasket) \textsuperscript{Note}</td>
<td>DXT060-51-13A</td>
</tr>
</tbody>
</table>

Accessories for Applicable Solenoid Valve

<table>
<thead>
<tr>
<th>Description</th>
<th>Part no.</th>
<th>Qty.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Function plate (With gasket) \textsuperscript{Note}</td>
<td>DXT152-14-1 A</td>
<td>1 pc.</td>
</tr>
<tr>
<td>Mounting screws</td>
<td>NXT013-3</td>
<td>2 pcs.</td>
</tr>
</tbody>
</table>

Note: DXT060-51-13B, DXT152-14-1B are for the continuous duty type.

Flow Rate Characteristics/Weight

<table>
<thead>
<tr>
<th>Valve model</th>
<th>Flow rate characteristics</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valve model</td>
<td>1 \rightarrow 2 (P \rightarrow A)</td>
<td>2 \rightarrow 3 (A \rightarrow R)</td>
</tr>
<tr>
<td>VO307</td>
<td>0.34 0.28 0.089</td>
<td>0.34 0.22 0.082</td>
</tr>
<tr>
<td>VO307V (Vacuum spec. type)</td>
<td>0.34 0.28 0.089</td>
<td>0.34 0.22 0.082</td>
</tr>
<tr>
<td>VO307E (Continuous duty type)</td>
<td>0.30 0.18 0.070</td>
<td>0.30 0.15 0.072</td>
</tr>
<tr>
<td>VO307Y (Energy-saving type)</td>
<td>0.30 0.18 0.070</td>
<td>0.30 0.15 0.072</td>
</tr>
<tr>
<td>VO307W (Energy-saving, Vacuum spec. type)</td>
<td>0.30 0.18 0.070</td>
<td>0.30 0.15 0.072</td>
</tr>
</tbody>
</table>
**Dimensions: Common Exhaust**

VV307-01-□2-01-F

**L Dimension**

<table>
<thead>
<tr>
<th>n: Stations</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>L₁</td>
<td>88</td>
<td>114</td>
<td>140</td>
<td>166</td>
<td>192</td>
<td>218</td>
<td>244</td>
<td>270</td>
<td>296</td>
</tr>
<tr>
<td>L₂</td>
<td>62</td>
<td>88</td>
<td>114</td>
<td>140</td>
<td>166</td>
<td>192</td>
<td>218</td>
<td>244</td>
<td>270</td>
</tr>
</tbody>
</table>

Formula:

- \( L₁ = 26 \times n + 36 \)
- \( L₂ = 26 \times n + 10 \)
Dimensions: Individual Exhaust

**4V307-01-□-□-F**

<table>
<thead>
<tr>
<th>L Dimension</th>
<th>n: Stations</th>
<th>Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1</td>
<td>2</td>
<td>76</td>
</tr>
<tr>
<td>L2</td>
<td>64</td>
<td>90</td>
</tr>
</tbody>
</table>

**Formula**

- \( L_1 = 26 \times n + 24 \)
- \( L_2 = 26 \times n + 12 \)
VT307 Series
Specific Product Precautions

Be sure to read this before handling the products. Refer to back page 50 for Safety Instructions and pages 3 to 9 for 3/4/5 Port Solenoid Valve Precautions.

### Mounting

**⚠️ Warning**
When mounting a valve on the manifold base, N.C. and N.O. can be reversed by the function plate orientation. Also, since the cylinder operates in reverse, confirm if the function plate is correctly mounted or not.

<table>
<thead>
<tr>
<th>N.C. specification</th>
<th>N.O. specification</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Function plate" /></td>
<td><img src="image2" alt="Function plate" /></td>
</tr>
</tbody>
</table>

**⚠️ 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 into the mounting holes of the manifold base.
   Tightening torque of the mounting screw (M4): 1.4 N·m

### Changing from N.C. to N.O.

**⚠️ 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. (Make sure that there are gaskets on both sides of the plate.) Then, tighten the mounting screws to fix the valve to the manifold base.

<table>
<thead>
<tr>
<th>Specifications</th>
<th>Function plate</th>
</tr>
</thead>
<tbody>
<tr>
<td>N.C.</td>
<td>No mark</td>
</tr>
<tr>
<td>N.O.</td>
<td>NO</td>
</tr>
</tbody>
</table>

### Piping

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