3 Port Solenoid Valve

Reduced power consumption:

<table>
<thead>
<tr>
<th>Power Consumption</th>
<th>[With power saving circuit]</th>
<th>[Standard] (Conventional: 2.0 W)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.55 W</td>
<td></td>
<td>1.55 W</td>
</tr>
</tbody>
</table>

- **Built-in full-wave rectifier (AC)**
  - Noise reduction
    Noise is considerably reduced by changing it to DC mode with a full-wave rectifier.
  - Reduced apparent power
    Conventional: 5.6 VA → 1.55 VA

- **Longer life expectancy:**
  - 50 million cycles or more
  - (Conventional: 20 million cycles) *Based on SMC test conditions

- **Built-in strainer in the pilot valve**
  - Unexpected troubles due to foreign matter can be prevented.
  - Note) Be sure to mount an air filter on the inlet side.

- **Power consumption is reduced by power saving circuit.**
  - Power consumption is decreased by approx. 1/3 by reducing the wattage required to hold the valve in an energized state. (Effective energizing time is over 40 ms at 24 VDC.) Refer to electrical power waveform as shown below.

  ![Electrical power waveform of energy saving type](image)

  - **Applied voltage**
  - **24 V**
  - **0 V**
  - **1.55 W**
  - **Energy saving**
  - **0.55 W**
  - **With power saving circuit**
  - **40 ms**

- **Rubber material:** HNBR
  - Ozone-resistant specification
  - The pilot valve poppet is made of FKM.

- **Air Operated Valve**
  - Series VPA300/500/700

- **RoHS compliant**
  - SMC

CAT.ES11-97B
### Series VP300/500/700

#### Model Selection by Operating Conditions

**Solenoid Valve: Single Unit**

<table>
<thead>
<tr>
<th>Series</th>
<th>Sonic conductance C [dm³/(s·bar)]</th>
<th>Type of actuation</th>
<th>Port size</th>
<th>Voltage</th>
<th>Electrical entry</th>
<th>Light/surge voltage suppressor</th>
<th>Manual override</th>
</tr>
</thead>
<tbody>
<tr>
<td>VP300</td>
<td>4.2</td>
<td>Internal pilot N.C.</td>
<td>1/8</td>
<td>12 VDC</td>
<td>DIN terminal</td>
<td>DC With surge voltage suppressor</td>
<td>Non-locking push type</td>
</tr>
<tr>
<td></td>
<td></td>
<td>N.O.</td>
<td>1/4</td>
<td>24 VDC</td>
<td>M-type plug connector</td>
<td>DC With light/surge voltage suppressor</td>
<td>Push-turn locking slotted type</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>24 VAC</td>
<td></td>
<td>DC With surge voltage suppressor (Non-polar)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>100 VAC</td>
<td></td>
<td>AC With light/surge voltage suppressor</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>200 VAC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>110 VAC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VP500</td>
<td>8.9</td>
<td>External pilot N.C./N.O.</td>
<td>3/8</td>
<td>24 VAC</td>
<td>M-type plug connector</td>
<td>AC With light/surge voltage suppressor (Non-polar)</td>
<td>Push-turn locking lever type</td>
</tr>
<tr>
<td></td>
<td></td>
<td>N.O.</td>
<td>1/4</td>
<td>100 VAC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>220 VAC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>240 VAC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VP700</td>
<td>15.3</td>
<td>Internal pilot N.C.</td>
<td>1/4</td>
<td>24 VAC</td>
<td>M-type plug connector</td>
<td>AC With light/surge voltage suppressor (Non-polar)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>N.O.</td>
<td></td>
<td>100 VAC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>220 VAC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>240 VAC</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Features**

1. Series Sonic conductance C [dm³/(s·bar)]
2. Type of actuation
3. Port size
4. Voltage
5. Electrical entry
6. Light/surge voltage suppressor
7. Manual override

---

[Image of series VP300/500/700 models]

**Series VP300/500/700**

[Diagram of solenoid valve models]

---

[Diagram of solenoid valve features]
## Model Selection by Operating Conditions

### Solenoid Valve: Manifold

<table>
<thead>
<tr>
<th>Series</th>
<th>EXH port type</th>
<th>Manifold base model</th>
<th>Applicable stations Note)</th>
</tr>
</thead>
<tbody>
<tr>
<td>VP300</td>
<td>Common EXH</td>
<td>VV3P3-41</td>
<td>2 to 20 stations</td>
</tr>
<tr>
<td></td>
<td>Individual EXH</td>
<td>VV3P3-42</td>
<td></td>
</tr>
<tr>
<td>VP500</td>
<td>Common EXH</td>
<td>VV3P5-41</td>
<td>2 to 20 stations</td>
</tr>
<tr>
<td></td>
<td>Individual EXH</td>
<td>VV3P5-42</td>
<td></td>
</tr>
<tr>
<td>VP700</td>
<td>Common EXH</td>
<td>VV3P7-41</td>
<td>2 to 20 stations</td>
</tr>
<tr>
<td></td>
<td>Individual EXH</td>
<td>VV3P7-42</td>
<td></td>
</tr>
</tbody>
</table>

Note) Supply pressure to 1(P) ports and exhaust air from 3(R) ports on both sides for 10 stations or more.

Series VP300/500/700

Model Selection by Operating Conditions

---

**Features 2**
<table>
<thead>
<tr>
<th>Series</th>
<th>Sonic conductance C [dm³/(s·bar)]</th>
<th>Type of actuation</th>
<th>Port size</th>
<th>Voltage</th>
<th>Electrical entry</th>
<th>Light/surge voltage suppressor</th>
<th>Manual override</th>
</tr>
</thead>
<tbody>
<tr>
<td>VPA300</td>
<td>4.2</td>
<td>N.C.</td>
<td>1/8</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VPA500</td>
<td>8.9</td>
<td>N.O.</td>
<td>1/4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VPA700</td>
<td>15.3</td>
<td>N.O.</td>
<td>1/4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

For vacuum N.C./N.O.

<table>
<thead>
<tr>
<th>Series</th>
<th>Sonic conductance C [dm³/(s·bar)]</th>
<th>Type of actuation</th>
<th>Port size</th>
<th>Voltage</th>
<th>Electrical entry</th>
<th>Light/surge voltage suppressor</th>
<th>Manual override</th>
</tr>
</thead>
<tbody>
<tr>
<td>VPA300</td>
<td>3.8</td>
<td>N.C.</td>
<td>1/8</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VPA500</td>
<td>8.8</td>
<td>N.O.</td>
<td>1/4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VPA700</td>
<td>15.0</td>
<td>N.O.</td>
<td>3/8</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

For vacuum N.C.

Features 3
### Series VPA300/500/700

#### Model Selection by Operating Conditions

**Air Operated Valve: Manifold**

<table>
<thead>
<tr>
<th>Series</th>
<th>EXH port type</th>
<th>Manifold base model</th>
<th>Applicable stations (Note)</th>
</tr>
</thead>
<tbody>
<tr>
<td>VPA300</td>
<td>Common EXH</td>
<td>VV3PA3-41</td>
<td>2 to 20 stations</td>
</tr>
<tr>
<td></td>
<td>Individual EXH</td>
<td>VV3PA3-42</td>
<td></td>
</tr>
<tr>
<td>VPA500</td>
<td>Common EXH</td>
<td>VV3PA5-41</td>
<td>2 to 20 stations</td>
</tr>
<tr>
<td></td>
<td>Individual EXH</td>
<td>VV3PA5-42</td>
<td></td>
</tr>
<tr>
<td>VPA700</td>
<td>Common EXH</td>
<td>VV3PA7-41</td>
<td>2 to 20 stations</td>
</tr>
<tr>
<td></td>
<td>Individual EXH</td>
<td>VV3PA7-42</td>
<td></td>
</tr>
</tbody>
</table>

Note: Supply pressure to 1(P) ports and exhaust air from 3(R) ports on both sides for 10 stations or more.

---

Features 4
Rubber Seal
3 Port/Pilot Poppet Type
Body Ported/Single Unit

Series VP300/500/700

How to Order

Body ported

<table>
<thead>
<tr>
<th>Series</th>
<th>VP</th>
<th>3</th>
<th>4</th>
<th>2</th>
<th>-</th>
<th>5</th>
<th>G</th>
<th>1</th>
<th>01</th>
<th>A</th>
<th>-</th>
<th>-</th>
</tr>
</thead>
<tbody>
<tr>
<td>VP300</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VP500</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VP700</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Pilot type

- Nil
- Internal pilot
- External pilot

Pressure specification

- Nil
- Standard (0.7 MPa)
- High-pressure type (1.0 MPa)

Coil specification

- Nil
- With power saving circuit (DC only)

Rate voltage

<table>
<thead>
<tr>
<th>DC</th>
<th>5</th>
<th>24 VDC</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>12 VDC</td>
<td></td>
</tr>
</tbody>
</table>

AC (50/60 Hz)

<table>
<thead>
<tr>
<th>1</th>
<th>100 VAC</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>200 VAC</td>
</tr>
<tr>
<td>3</td>
<td>110 VAC (115 VAC)</td>
</tr>
<tr>
<td>4</td>
<td>220 VAC (230 VAC)</td>
</tr>
<tr>
<td>7</td>
<td>240 VAC</td>
</tr>
<tr>
<td>B</td>
<td>24 VAC</td>
</tr>
</tbody>
</table>

Rated voltage

<table>
<thead>
<tr>
<th>DC</th>
<th>1/8</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>110 VAC (115 VAC)</td>
</tr>
<tr>
<td>22</td>
<td>220 VAC (230 VAC)</td>
</tr>
<tr>
<td>24</td>
<td>24 VAC</td>
</tr>
</tbody>
</table>

Made to Order

<table>
<thead>
<tr>
<th>Grommet</th>
<th>L-type plug connector</th>
<th>M-type plug connector</th>
<th>DIN terminal (IP65 compatible)</th>
<th>DIN terminal (EN175301-803) terminal</th>
<th>Conduit terminal</th>
</tr>
</thead>
<tbody>
<tr>
<td>G</td>
<td>Lead wire length 300 mm</td>
<td>Lead wire length 300 mm</td>
<td>DIN terminal (IP65 compatible)</td>
<td>DIN terminal (EN175301-803) terminal</td>
<td>Conduit terminal</td>
</tr>
<tr>
<td>H</td>
<td>Lead wire length 600 mm</td>
<td>Lead wire length 600 mm</td>
<td>DIN terminal (IP65 compatible)</td>
<td>DIN terminal (EN175301-803) terminal</td>
<td>Conduit terminal</td>
</tr>
</tbody>
</table>

- LN and MN types are with 2 sockets.
- Refer to back page 2 when different length of lead wire for LM-type plug connector is required.
- Refer to back page 3 for details on the DIN (EN175301-803) terminal.

Interchangeable specification with the previous valve mounting hole pitch type (Refer to page 24).

X500

<table>
<thead>
<tr>
<th>Made to Order</th>
<th>LN</th>
<th>MN</th>
</tr>
</thead>
<tbody>
<tr>
<td>X505</td>
<td>Pilot exhaust port with piping thread (M3) specification (Refer to page 24).</td>
<td></td>
</tr>
</tbody>
</table>

 Electrical entry

- CE compliant
- NC
- CO
- DC
- AC

Ce

Caution

- LN and MN types are with 2 sockets.
- Refer to back page 2 when different length of lead wire for LM-type plug connector is required.
- Refer to back page 3 for details on the DIN (EN175301-803) terminal.

Note) With the same specifications as the DC type, all lead wire entries for the 24 VAC type are CE marking compliant.

Note) Only DIN and conduit terminal types are available for AC mode. Refer to the electrical entry for details.

Note) There is no S option for AC mode, since a rectifier prevents surge voltage generation. *

Note) LN and MN types are with 2 sockets.

Note) Only DIN and conduit terminal types are available for AC mode. Refer to the electrical entry for details.

Note) Only DIN and conduit terminal types are available for AC mode. Refer to the electrical entry for details.

Note) Only DIN and conduit terminal types are available for AC mode. Refer to the electrical entry for details.

Note) Only DIN and conduit terminal types are available for AC mode. Refer to the electrical entry for details.

Caution

When using the surge voltage suppressor type, residual voltage will remain. Refer to back page 5 for details.
Low power consumption 1.5 W (DC)
Possible to use as either a selector or divider valve
Possible to change from N.C. to N.O.
Possible to use in vacuum applications Up to –100 kPa

Use external pilot type in the following cases:
• For vacuum or for low pressure 0.2 MPa or less
• Please consult with SMC for use in a vacuum hold application.
• When having P port downsized in diameter
• When using A port as the atmospheric releasing port, e.g. air blower

Specifications

<table>
<thead>
<tr>
<th>Fluid</th>
<th>Air</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of actuation</td>
<td>N.C. or N.O. (Convertible)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Internal pilot</th>
<th>Standard</th>
<th>0.2 to 0.7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating pressure range (MPa)</td>
<td>High-pressure type</td>
<td>0.2 to 1.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>External pilot</th>
<th>Standard</th>
<th>–100 kPa to 0.7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating pressure range (MPa)</td>
<td>High-pressure type</td>
<td>0.2 to 1.0</td>
</tr>
<tr>
<td>Operating pressure range (MPa)</td>
<td>Same as operating pressure (Min. 0.2 MPa)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ambient and fluid temperature (°C)</th>
<th>–10 to 50 (No freezing)</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Max. operating frequency (Hz)</th>
<th>5</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Manual override</th>
<th>Non-locking push type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pilot exhaust type</td>
<td>Individual exhaust</td>
</tr>
<tr>
<td>Lubrication</td>
<td>Not required</td>
</tr>
<tr>
<td>Mounting orientation</td>
<td>Unrestricted</td>
</tr>
</tbody>
</table>

Impact/Vibration resistance (m/s²) Note)
300/50
Enclosure Dust-tight (IP65 for D, Y, T)

Note) Impact resistance: No malfunction occurred when it is tested 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 2000 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)

Solenoid Specifications

<table>
<thead>
<tr>
<th>Electrical entry</th>
<th>Grommet (G), (H) L-type plug connector (L) M-type plug connector (M) DIN terminal (D) DIN (EN175301-803) terminal (Y) Conduit terminal (T)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coil rated voltage (V)</td>
<td>DC (50/60 Hz) 24, 12 AC (50/60 Hz) 24, 100, 110, 200, 220, 240</td>
</tr>
<tr>
<td>Allowable voltage fluctuation</td>
<td>±10% of rated voltage</td>
</tr>
<tr>
<td>Power consumption (W)</td>
<td>DC 1.5 (With light: 1.55) (With light only) 0.75 (With light only)</td>
</tr>
<tr>
<td>Apparent power (VA) *</td>
<td>AC 1.5 (With light: 1.65) (With light only) 1.55 (With light: 1.7)</td>
</tr>
<tr>
<td>Surge voltage suppressor</td>
<td>Diode (Non-polar type: Varistor)</td>
</tr>
<tr>
<td>Indicator light</td>
<td>LED (Neon bulb is used for AC mode of D, Y, T.)</td>
</tr>
</tbody>
</table>

* It is in common between 110 VAC and 115 VAC, and between 220 VAC and 230 VAC.
* Allowable voltage fluctuation is –15% to +5% of the rated voltage for 115 VAC or 230 VAC.
* Since voltage drops due to the internal circuit in S, Z, T types (with power saving circuit), the allowable voltage fluctuation should be within the following range.
  24 VDC: –7% to +10%
  12 VDC: –4% to +10%

Response Time

<table>
<thead>
<tr>
<th>Model</th>
<th>Pressure specifications</th>
<th>Response time ms (at 0.5 MPa)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Without light/surge voltage suppressor</td>
<td>With light/surge voltage suppressor</td>
</tr>
<tr>
<td>---------</td>
<td>--------------------------------------</td>
<td>---------------------------------</td>
</tr>
<tr>
<td></td>
<td>S, Z type</td>
<td>R, U type</td>
</tr>
<tr>
<td>VP342</td>
<td>13 or less</td>
<td>16 or less</td>
</tr>
<tr>
<td>VP542</td>
<td>17 or less</td>
<td>20 or less</td>
</tr>
<tr>
<td>VP742</td>
<td>14 or less</td>
<td>17 or less</td>
</tr>
<tr>
<td></td>
<td>16 or less</td>
<td>21 or less</td>
</tr>
<tr>
<td></td>
<td>19 or less</td>
<td>44 or less</td>
</tr>
<tr>
<td></td>
<td>22 or less</td>
<td>25 or less</td>
</tr>
</tbody>
</table>

Note) Based on dynamic performance test, JIS B 8374-1981. (Coil temperature: 20°C, at rated voltage)
Series VP300/500/700

Flow Characteristics/Weight

<table>
<thead>
<tr>
<th>Model</th>
<th>Port size</th>
<th>1 ↔ 2 (P ↔ A)</th>
<th>2 ↔ 3 (A ↔ R)</th>
<th>Weight (g) Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>VP342</td>
<td>1/8</td>
<td>C [dm³/(s·bar)]</td>
<td>b</td>
<td>0.26</td>
</tr>
<tr>
<td>VP542</td>
<td>1/4</td>
<td>4.2</td>
<td>0.22</td>
<td>1.0</td>
</tr>
<tr>
<td>VP742</td>
<td>3/8</td>
<td>7.9</td>
<td>0.21</td>
<td>1.8</td>
</tr>
<tr>
<td>VP742</td>
<td>3/8</td>
<td>8.9</td>
<td>0.16</td>
<td>2.2</td>
</tr>
<tr>
<td>VP742</td>
<td>1/2</td>
<td>11.9</td>
<td>0.21</td>
<td>2.7</td>
</tr>
<tr>
<td>VP742</td>
<td>1/2</td>
<td>15.1</td>
<td>0.21</td>
<td>3.6</td>
</tr>
</tbody>
</table>

Note) Values without bracket

Application Example

(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 (Exhaust center)

Construction

Body ported

JIS symbol

<table>
<thead>
<tr>
<th>Pilot type</th>
<th>N.C.</th>
<th>N.O.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal pilot</td>
<td>(A)</td>
<td>(A)</td>
</tr>
<tr>
<td>(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 (Exhaust center)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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>White</td>
</tr>
<tr>
<td>2</td>
<td>Adapter plate</td>
<td>Resin</td>
<td>Gray</td>
</tr>
<tr>
<td>3</td>
<td>End plate</td>
<td>Resin</td>
<td>White</td>
</tr>
<tr>
<td>4</td>
<td>Piston</td>
<td>Resin</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Spool valve</td>
<td>Aluminum/HNBR</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Retainer</td>
<td>Resin</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Spring</td>
<td>Stainless steel</td>
<td></td>
</tr>
</tbody>
</table>

Bracket Assembly Part No.

<table>
<thead>
<tr>
<th>Description</th>
<th>Model</th>
<th>Part no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bracket (With 2 screws)</td>
<td>VP342</td>
<td>VP300-227-1A</td>
</tr>
<tr>
<td>VP542</td>
<td>VP500-227-1A</td>
<td></td>
</tr>
<tr>
<td>VP742</td>
<td>VP700-227-1A</td>
<td></td>
</tr>
</tbody>
</table>

Replacement Parts

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Part no.</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>Pilot valve assembly</td>
<td>Refer to &quot;How to Order Pilot Valve Assembly&quot; on page 4.</td>
<td>Built-in strainer</td>
</tr>
</tbody>
</table>

3
How to Order Pilot Valve Assembly

⚠️ Caution
When only the pilot valve assembly is replaced, it is not possible to change from V211 (Grommet or L/M-type) to V212 (DIN or Conduit type), or vice versa.

Valve model: **VP □ □ □ □ □ □ 5 G Z □ □ □ □ □**
* Select from the below in accordance with the valve used.

- **Grommet or L/M-type**
  - V211
  - Light/surge voltage suppressor
    - **Nil**: Without light/surge voltage suppressor
    - **S**: With surge voltage suppressor
    - **Z**: With light/surge voltage suppressor
    - **R**: With surge voltage suppressor (Non-polar)
    - **U**: With light/surge voltage suppressor (Non-polar)
  - Caution
    - For V212 (DIN or Conduit type), the coil specification and voltage (including light/surge voltage suppressor) cannot be changed by changing the pilot valve assembly.

- **DIN or Conduit type**
  - DIN connector
  - Light/surge voltage suppressor
    - **Nil**: Without light/surge voltage suppressor
    - **S**: With surge voltage suppressor
    - **Z**: With light/surge voltage suppressor
    - **R**: With surge voltage suppressor (Non-polar)
    - **U**: With light/surge voltage suppressor (Non-polar)
  - Caution
    - For V212 (DIN or Conduit type), the coil specification and voltage (including light/surge voltage suppressor) cannot be changed by changing the pilot valve assembly.

⚠️ Caution
Tightening torque of the pilot valve assembly mounting screw
M2.5: 0.32 N·m

---

Pressure specification
- **Nil**: Standard (0.7 MPa)
- **K**: High-pressure type (1.0 MPa)

Coil specification
- **T**: With power saving circuit (DC only)
  - T type is only available for DC mode.

Electrical entry
- **G**: Grommet (Lead wire length 300 mm)
- **H**: Grommet (Lead wire length 600 mm)
- **L**: L-type plug connector
  - With lead wire
  - Without lead wire
- **LN**: L-type plug connector
  - With lead wire
  - Without lead wire
- **LO**: L-type plug connector
  - With lead wire
  - Without lead wire
- **M**: M-type plug connector
  - With lead wire
  - Without lead wire
- **MN**: M-type plug connector
  - With lead wire
  - Without lead wire
- **MO**: M-type plug connector
  - With lead wire
  - Without lead wire

* LN and MN types are with 2 sockets.
  - Refer to back page 2 when different length of lead wire for L/M-type plug connector is required.

Rated voltage
- **DC**
  - **5**: 24 VDC
  - **6**: 12 VDC

- **AC (50/60 Hz)**
  - **1**: 100 VAC
  - **2**: 200 VAC
  - **3**: 110 VAC [115 VAC]
  - **4**: 220 VAC [230 VAC]
  - **7**: 240 VAC
  - **B**: 24 VAC

Note: There is no S option for AC mode, since a rectifier prevents surge voltage generation. When T is selected, only Z type of light/surge voltage suppressor is available.

Caution
When using the surge voltage suppressor type, residual voltage will remain. Refer to back page 5 for details.
Series VP300/500/700

Series VP300/Body Ported/Dimensions

Grommet (G)

Approx. 300
(Lead wire length)

1/8, 1/4
2(A) port

M5 x 0.8
External pilot port
(External pilot specification: R)

2 x ø3.2
(For mounting)

19.7
(Indicator light)

(Mounting groove
for M5 thread)

(17.5)

42.7

15

26.2

11

20.4

26.2

11

20.4

26.2

26.6

ø3.8

PE port

+ Refer to page 24 separately when piping to PE port is required.

L-type plug connector (L)

M-type plug connector (M)

DIN terminal (D, Y)

Conduit terminal (T)

Unless otherwise indicated, dimensions are the same as Grommet (G).
Series VP500/Body Ported/Dimensions

Grommet (G)

Approx. 300 (Lead wire length)

1/4, 3/8
2(A) port

2 x ø4.2
(For mounting)

1/8
External pilot port
(External pilot specification: R)

*(Refer to page 24 separately when piping to PE port is required.)*

L-type plug connector (L)

M-type plug connector (M)

DIN terminal (D, Y)

Conduit terminal (T)

Unless otherwise indicated, dimensions are the same as Grommet (G).
### Series VP300/500/700

#### Series VP700/Body Ported/Dimensions

**Grommet (G)**

![Diagram of Grommet (G)](image)

- Applicable cable O.D.: ø4.5 to ø7
- External pilot port (External pilot specification: R)
- Manual override
- External pilot port □
- DC without light/surge voltage suppressor

**L-type plug connector (L)**

- Applicable cable O.D.: ø4.5 to ø7

**M-type plug connector (M)**

- Applicable cable O.D.: ø4.5 to ø7

**DIN terminal (D, Y)**

- Applicable cable O.D.: ø4.5 to ø7

**Conduit terminal (T)**

- Applicable cable O.D.: ø4.5 to ø7

Unless otherwise indicated, dimensions are the same as Grommet (G).
Rubber Seal
3 Port/Pilot Poppet Type
Base Mounted/Single Unit

Series VP300/500/700

How to Order

Base mounted

Series VP 3 4 4 - 5 G - 1 - A -

Pilot type
Nil Internal pilot
R External pilot

Pressure specification
Nil Standard (0.7 MPa)
K High-pressure type (1.0 MPa)

Type of actuation
A N.C. (Normally closed)
B N.O. (Normally open)

Thread type
Nil Rc
F G
N NPT
T NPTF

Light/surge voltage suppressor
Nil DC AC
S Without light/surge voltage suppressor
Z With light/surge voltage suppressor
U With light/surge voltage suppressor (Non-polar)

Made to Order

Made to Order X500
Pilot exhaust port with piping thread (M3) specification (Refer to page 24).

Port size (Sub-plate)
Symbol Port size VP300 VP500 VP700
Nil Without sub-plate
01 1/8 — — —
02 1/4 — — —
03 3/8 — — —
04 1/2 — — —

Manual override
Nil: Non-locking push type
D: Push-turn locking slotted type
E: Push-turn locking lever type

Light/surge voltage suppressor
DC AC
Nil Without light/surge voltage suppressor
S With surge voltage suppressor
Z With surge voltage suppressor
U With surge voltage suppressor (Non-polar)

Caution
When using the surge voltage suppressor type, residual voltage will remain. Refer to back page 5 for details.

Note) Only DIN and conduit terminal types are available for AC mode. Refer to the electrical entry for details.

Coil specification
Nil With power saving circuit (DC only)

Rated voltage
DC
5 24 VDC
6 12 VDC
AC (50/60 Hz)
1 100 VAC
2 200 VAC
3 110 VAC (115 VAC)
4 220 VAC (230 VAC)
5 240 VAC

Electrical entry
Grommet
L-type plug connector
M-type plug connector
DIN terminal
DIN (EN175301-803) terminal
Conduit terminal

G: Lead wire length 300 mm
H: Lead wire length 600 mm
L: With lead wire (length 300 mm)
M: With lead wire (length 300 mm)
N: Without lead wire
O: Without connector

Electrical entry

Note) Be sure to select the power saving circuit type when it is continuously energized for a long time.
(T type is only available for DC mode. When T is selected, only Z type of lights/surge voltage suppressor is available.
(Note that when the electrical entry of DIN terminal type without connector is selected, only DOS and YOS are available.)

Note) Only DIN and conduit terminal types are available for AC mode. Refer to the electrical entry for details.

Note) When using the surge voltage suppressor type, residual voltage will remain. Refer to back page 5 for details.

* LN and MN types are with 2 sockets.
* Refer to back page 2 when different length of lead wire for LM-type plug connector is required.
* Refer to back page 3 for details on the DIN (EN175301-803) terminal.
* Note) With the same specifications as the DC type, all lead wire entries for the 24 VAC type are CE marking compliant.

* With a gasket and two mounting bolts.
Use external pilot type in the following cases:
• For vacuum or for low pressure 0.2 MPa or less
• Please consult with SMC for use in a vacuum hold application.
• When having P port downsized in diameter
• When using A port as the atmospheric releasing port, e.g. air blower
• If manifold, external pilot piping can be centralized in manifold base.

Note) Based on dynamic performance test, JIS B 8374-1981. (Coil temperature: 20°C, at rated voltage)

Fluid
Type of actuation | N.C. or N.O. (Convertible)
Internal pilot
Operating pressure range (MPa) | Standard
High-pressure type | 0.2 to 0.7
High-pressure type | 0.2 to 1.0
External pilot
Operating pressure range (MPa) | Standard
High-pressure type | –100 kPa to 0.7
High-pressure type | –100 kPa to 1.0
Pilot pressure range | Same as operating pressure (Min. 0.2 MPa)
Ambient and fluid temperature (°C) | –10 to 50 (No freezing)
Max. operating frequency (Hz) | 5
Manual override | Non-locking push type
Push-turn locking slotted type
Push-turn locking lever type
Pilot exhaust type | Individual exhaust
Lubrication | Not required
Mounting orientation | Unrestricted
Impact/Vibration resistance (m/s²) (Note) | 300/50
Enclosure | Dust-tight (IP65 for D, Y, T)

Note) Impact resistance: No malfunction occurred when it is tested 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 2000 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)

Electrical entry
Grommet (G), (H) L-type plug connector (L) M-type plug connector (M)
DIN terminal (D) DIN (EN175301-803) terminal (Y) Conduit terminal (T)

Coil rated voltage (V) DC (50/60 Hz) 24, 12
AC (50/60 Hz) 200, 220, 240
Allowable voltage fluctuation | ±10% of rated voltage

Power consumption (W) DC 1.5 (With light: 1.55) 1.5 (With light: 1.75)
100 V 0.55 (With light only) 0.75 (With light only)
24 V 1.5 (With light: 1.55) 1.5 (With light: 1.75)
110 V 1.55 (With light: 1.65) 1.55 (With light: 1.7)
200 V
220 V
240 V

Apparent power (VA)* AC

Surge voltage suppressor Diode (Non-polar type: Varistor)
LED (Neon bulb is used for AC mode of D, Y, T.)

Response time ms (at 0.5 MPa)

Model | Pressure specifications | Without light/surge voltage suppressor | With light/surge voltage suppressor | AC
--- | --- | --- | --- | ---
VP344 | Standard (0.2 to 0.7) | 13 or less | 38 or less | 38 or less
VP544 | High-pressure type (0.2 to 1.0) | 17 or less | 42 or less | 42 or less
VP744 | Standard (0.2 to 0.7) | 14 or less | 39 or less | 39 or less
VP744 | High-pressure type (0.2 to 1.0) | 18 or less | 43 or less | 43 or less
VP744 | High-pressure type (0.2 to 1.0) | 19 or less | 44 or less | 44 or less

Note) Based on dynamic performance test, JIS B 8374-1981. (Coil temperature: 20°C, at rated voltage)
Flow Characteristics/Weight

<table>
<thead>
<tr>
<th>Model</th>
<th>Port size</th>
<th>1 ↔ 2 (P ↔ A)</th>
<th>2 ↔ 3 (A ↔ R)</th>
<th>Weight (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>C [dm³/(s·bar)]</td>
<td>b</td>
<td>Cv</td>
</tr>
<tr>
<td>VP344</td>
<td>1/8</td>
<td>3.8</td>
<td>0.22</td>
<td>0.8</td>
</tr>
<tr>
<td></td>
<td>1/4</td>
<td>3.9</td>
<td>0.22</td>
<td>0.9</td>
</tr>
<tr>
<td>VP544</td>
<td>1/4</td>
<td>7.5</td>
<td>0.16</td>
<td>1.7</td>
</tr>
<tr>
<td>VP744</td>
<td>3/8</td>
<td>8.8</td>
<td>0.07</td>
<td>2.0</td>
</tr>
<tr>
<td></td>
<td>1/2</td>
<td>12.9</td>
<td>0.10</td>
<td>2.9</td>
</tr>
</tbody>
</table>

Note: ( ) : Values without sub-plate

Application Example

(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

(8) Double-acting cylinder drive (Exhaust center)

Construction

Base mounted

JIS symbol

Component Parts

Replacement Parts

How to Order Sub-plate

VP 3 00−202−1

Series

Thread type

Port size

Caution

Tightening Torque of Mounting Screw

M3: 0.8 N·m
M4: 1.4 N·m
M5: 2.9 N·m
How to Order Pilot Valve Assembly

**Caution**
When only the pilot valve assembly is replaced, it is not possible to change from V211 (Grommet or L/M-type) to V212 (DIN or Conduit type), or vice versa.

Valve model: **VP [ ] [ ] [ ] - 5GZ [ ] 1 [ ]**
*Select from the below in accordance with the valve used.

**Grommet or L-type**

V211
Pilot valve assembly

**DIN or Conduit type**

DIN or Conduit type

V212
Pilot valve assembly

**Pressure specification**

- **Nil** Standard \(0.7 \text{ MPa}\)
- **K** High-pressure type \(1.0 \text{ MPa}\)

**Coil specification**

- **Nil** Standard
- **T** With power saving circuit (DC only)

**Note**
- LN and MN types are with 2 sockets.
- Refer to back page 2 when different length of lead wire for L/M-type plug connector is required.

**Light/surge voltage suppressor**

<table>
<thead>
<tr>
<th>DC</th>
<th>AC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nil</td>
<td>Without light/surge voltage suppressor</td>
</tr>
<tr>
<td>S</td>
<td>With surge voltage suppressor</td>
</tr>
<tr>
<td>Z</td>
<td>With light/surge voltage suppressor (Non-polar)</td>
</tr>
<tr>
<td>R</td>
<td>With surge voltage suppressor (Non-polar)</td>
</tr>
<tr>
<td>U</td>
<td>With light/surge voltage suppressor (Non-polar)</td>
</tr>
</tbody>
</table>

**Caution**
When using the surge voltage suppressor type, residual voltage will remain. Refer to back page 5 for details.

**Electrical entry**

- **G** Grommet (Lead wire length 300 mm)
- **H** Grommet (Lead wire length 600 mm)
- **L** L-type plug connector With lead wire
- **LN** L-type plug connector Without lead wire
- **LO** L-type plug connector Without connector
- **M** M-type plug connector With lead wire
- **MN** M-type plug connector Without lead wire
- **MO** M-type plug connector Without connector

**Rated voltage**

**DC**

| 1 | 100 VAC |
| 2 | 200 VAC |
| 3 | 220 VAC [230 VAC] |
| 4 | 240 VAC |
| 5 | 24 VDC |
| 6 | 12 VDC |

**AC (50/60 Hz)**

| 1 | 110 VAC [115 VAC] |
| 2 | 220 VAC |
| 3 | 240 VAC |
| 4 | 24 VAC |

**Caution**
For V212 (DIN or Conduit type), the coil specification and voltage (including light/surge voltage suppressor) cannot be changed by changing the pilot valve assembly.

**Caution**
Tightening torque of the pilot valve assembly mounting screw
M2.5: 0.32 N·m
Series VP300/500/700

Pilot Poppet Type
Base Mounted/Single Unit

Series VP300/Base Mounted/Dimensions

Grommet (G)

Unless otherwise indicated, dimensions are the same as Grommet (G).
Series VP500/700

Series VP500/Base Mounted/Dimensions

Grommet (G)

Unless otherwise indicated, dimensions are the same as Grommet (G).
Series VP700/Base Mounted/Dimensions

Grommet (G)

L-type plug connector (L)
M-type plug connector (M)
DIN terminal (D, Y)
Conduit terminal (T)

Unless otherwise indicated, dimensions are the same as Grommet (G).
How to Order Manifold

**Type 41/Common exhaust**

**Series**
- 3: VP300
- 5: VP500
- 7: VP700

**Pilot type**
- Nil: Internal pilot
- R: External pilot

**Thread type**
- Nil: Rc
- F: G
- N: NPT
- T: NPTF

**Port size**
- Symbol: Port size: Applicable series
- 02: 1/4: VP300
- 03: 3/8: VP500
- 04: 1/2: VP700

**Stations**
- 02: 2 stations
- 20: 20 stations

**Type 42/Individual exhaust**

**Series**
- 3: VP300
- 5: VP500
- 7: VP700

**Pilot type**
- Nil: Internal pilot
- R: External pilot

**Thread type**
- Nil: Rc
- F: G
- N: NPT
- T: NPTF

**Port size**
- Symbol: Port size: Applicable series
- 02: 1/4: VP300
- 03: 3/8: VP500
- 04: 1/2: VP700

**Stations**
- 02: 2 stations
- 20: 20 stations

Note: When the external pilot type manifold is selected, external pilot type valves are mounted.
### How to Order Valve

(With a gasket and two mounting bolts)

**VP 3 4 4 □ 1 A □**

**Series**
- 3: VP300
- 5: VP500
- 7: VP700

**Pilot type**
- Nil: Internal pilot
- R: External pilot

**Pressure specification**
- Nil: Standard (0.7 MPa)
- K: High-pressure type (1.0 MPa)

**Type of actuation**
- A: N.C. (Normally closed)
- B: N.O. (Normally open)

**Manual override**
- Nil: Non-locking push type
- D: Push-turn locking slotted type
- E: Push-turn locking lever type

**Light/surge voltage suppressor**
- Nil: Without light/surge voltage suppressor
- S: With surge voltage suppressor
- Z: With light/surge voltage suppressor
- R: With surge voltage suppressor (Non-polar)
- U: With light/surge voltage suppressor (Non-polar)

**Coil specification**
- Nil: Without power saving circuit (DC only)
- T: With power saving circuit (DC only)

**Made to Order**
- Nil: Made to order
- X500: Pilot exhaust port with piping thread (M3) specification (Refer to page 24).

**Electrical entry**

<table>
<thead>
<tr>
<th>Grommet</th>
<th>L-type plug connector</th>
<th>M-type plug connector</th>
<th>DIN terminal</th>
<th>DIN (EN175301-803) terminal</th>
<th>Conduit terminal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q: Lead wire length 300 mm</td>
<td>L: With lead wire length 300 mm</td>
<td>M: With lead wire length 300 mm</td>
<td>[IP65 compatible]</td>
<td>[IP65 compatible]</td>
<td>[IP65 compatible]</td>
</tr>
<tr>
<td>H: Lead wire length 600 mm</td>
<td>DC</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Rated voltage**
- DC
  - 5: 24 VDC
  - 6: 12 VDC
- AC (50/60 Hz)
  - 1: 100 VAC
  - 2: 200 VAC
  - 3: 110 VAC (115 VAC)
  - 4: 220 VAC (230 VAC)
  - 7: 240 VAC
  - 8: 24 VAC

**Caution**

- LN and MN types are with 2 sockets.
- Refer to back page 2 when different length of lead wire for L/M-type plug connector is required.
- Refer to back page 3 for details on the DIN (EN175301-803) terminal.

**Note**
- Only DIN and conduit terminal types are available for AC mode. Refer to the electrical entry for details.
- There is no S option for AC mode, since a rectifier prevents surge voltage generation.
- LN and MN types are with 2 sockets.
- Refer to back page 2 when different length of lead wire for L/M-type plug connector is required.
- Refer to back page 3 for details on the DIN (EN175301-803) terminal.

*LN and MN types are with 2 sockets.
Refer to back page 2 when different length of lead wire for L/M-type plug connector is required.
Refer to back page 3 for details on the DIN (EN175301-803) terminal.
*With the same specifications as the DC type, all lead wire entries for the 24 VAC type are CE marking compliant.
Piping is concentrated on the base side.
All external pilots are gathered in the base. Common external pilot port allows one piping.

2 types of exhaust ports
Common or individual exhaust type are available. For individual exhaust type, exhaust can be restricted.

Easy to change between N.C. and N.O.
Type of actuation can be easily changed from normally closed to normally open by changing the direction of a valve and end-plate only 180°.

Refer to back page 6 for changing the type of actuation.

Manifold Specifications

<table>
<thead>
<tr>
<th>Series</th>
<th>Base model</th>
<th>Piping specifications</th>
<th>Port size</th>
<th>Applicable valve</th>
<th>Applicable stations (Note)</th>
<th>Manifold base Weight: W [g]</th>
<th>Stations: n</th>
</tr>
</thead>
<tbody>
<tr>
<td>VP300</td>
<td>VP3P3-41</td>
<td>Common (SUP) port type</td>
<td>1/4</td>
<td>VP344</td>
<td>2 to 20 stations</td>
<td>W = 110n + 90</td>
<td></td>
</tr>
<tr>
<td></td>
<td>VP3P3-42</td>
<td>Individual port type</td>
<td>1/4</td>
<td>VP344</td>
<td>2 to 20 stations</td>
<td>W = 190n + 150</td>
<td></td>
</tr>
<tr>
<td>VP500</td>
<td>VP5P5-41</td>
<td>Common (SUP) port type</td>
<td>3/8</td>
<td>VP544</td>
<td>2 to 20 stations</td>
<td>W = 410n + 380</td>
<td></td>
</tr>
<tr>
<td></td>
<td>VP5P5-42</td>
<td>Individual port type</td>
<td>1/2</td>
<td>VP744</td>
<td>2 to 20 stations</td>
<td>W = 110n + 90</td>
<td></td>
</tr>
</tbody>
</table>

Note) Supply pressure to 1(P) ports and exhaust pressure from 3(R) ports on both sides for 10 stations or more.

Manifold Option

<table>
<thead>
<tr>
<th>Description</th>
<th>Part no.</th>
<th>Applicable manifold base model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blanking plate assembly</td>
<td>VP300-25-1A</td>
<td>VP3P3</td>
</tr>
<tr>
<td>(With a gasket and two mounting bolts)</td>
<td>VP500-25-1A</td>
<td>VP3P5</td>
</tr>
<tr>
<td></td>
<td>VP700-25-1A</td>
<td>VP3P7</td>
</tr>
</tbody>
</table>

How to Order Manifold Assembly (Example)

Ordering example (VV3P3-41)

VP344-5GZ1-A
VP344-5GZ1-B
VP300-25-1A

• Indicate the valves to be attached below the manifold part number, in order starting from station 1 as shown in the drawing.

• Indicate the valves to be attached below the manifold part number, in order starting from station 1 as shown in the drawing.

• The asterisk denotes the symbol for assembly. Prefix it to the part nos. of the solenoid valve, etc.

• Refer to back page 6 for changing the type of actuation.
**Series VP300/Dimensions**

**Type 41/Common exhaust: VV3P3-41 [ ]-Stations 1-02**

Grommet (G)

1. **Common external pilot port** (External pilot specification: R)
2. **Manual override**
3. **PE port**

*Refer to page 24 separately when piping to PE port is required.*

---

### Grommet (G)

**DC without light/surge voltage suppressor**

---

### L-type plug connector (L)

### M-type plug connector (M)

### DIN terminal (D, Y)

### Conduit terminal (T)

---

Unless otherwise indicated, dimensions are the same as Grommet (G).
Series VP300/Dimensions

Type 42/Individual exhaust: VV3P3-42□- [Stations] 3-02

Grommet (G)

Approx. 300 (Lead wire length)

L1

L2

1/4 (Pitch) P = 27.5

3(R) port

2 x ø6.5
(For mounting)

M5 x 0.8
Common external pilot port
(External pilot specification: R)

N.O. N.C.

Manual override

PE port

Common external pilot port
(External pilot specification: R)

PE port

(Station n) (Station 1)

(Indicator light)

Station n

L1

L2

Grommet (G)

DC without light/surge voltage suppressor

L-type plug connector (L)

M-type plug connector (M)

DIN terminal (D, Y)

Conduit terminal (T)

Unless otherwise indicated, dimensions are the same as Grommet (G).
Series VP500/Dimensions

Type 41/Common exhaust: VV3P5-41 Station 1-03
Grommet (G)

| Station | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | Notes |
|---------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|
| L1      | 95| 128| 161| 194| 227| 260| 293| 326| 359| 392| 425| 458| 491| 524| 557| 590| 623| 656| 689|       |
| L2      | 80| 113| 146| 179| 212| 245| 278| 311| 344| 377| 410| 443| 476| 509| 542| 575| 608| 641| 674|       |

L-type plug connector (L)

M-type plug connector (M)

DIN terminal (D, Y)

Conduit terminal (T)

Grommet (G)
DC without light/surge voltage suppressor

Unless otherwise indicated, dimensions are the same as Grommet (G).
Series VP500/Dimensions

Type 42/Individual exhaust: VV3P5-42□-Station n3-03

Grommet (G)

DC without light/surge voltage suppressor

Unless otherwise indicated, dimensions are the same as Grommet (G).
Series VP700/Dimensions

Type 41/Common exhaust: VV3P7-41 — Stations 1-04
Grommet (G)

<table>
<thead>
<tr>
<th>Stations</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>
<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
<th>15</th>
<th>16</th>
<th>17</th>
<th>18</th>
<th>19</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1</td>
<td>115</td>
<td>156</td>
<td>197</td>
<td>238</td>
<td>279</td>
<td>320</td>
<td>361</td>
<td>402</td>
<td>443</td>
<td>484</td>
<td>525</td>
<td>566</td>
<td>607</td>
<td>648</td>
<td>689</td>
<td>730</td>
<td>771</td>
<td>812</td>
</tr>
<tr>
<td>L2</td>
<td>99</td>
<td>140</td>
<td>181</td>
<td>222</td>
<td>263</td>
<td>304</td>
<td>345</td>
<td>386</td>
<td>427</td>
<td>468</td>
<td>509</td>
<td>550</td>
<td>591</td>
<td>632</td>
<td>673</td>
<td>714</td>
<td>755</td>
<td>796</td>
</tr>
</tbody>
</table>

L-type plug connector (L)

M-type plug connector (M)

DIN terminal (D, Y)

Conduit terminal (T)

Unless otherwise indicated, dimensions are the same as Grommet (G).
Series VP300/500/700

Series VP700/Dimensions

Type 42/Individual exhaust: VV3P7-42□- [Stations] 3-04

Grommet (G)

L-type plug connector (L)

M-type plug connector (M)

DIN terminal (D, Y)

Conduit terminal (T)

Grommet (G)
DC without light/surge voltage suppressor

Unless otherwise indicated, dimensions are the same as Grommet (G).
Pilot Exhaust Port with Piping Thread (M3) Specification

In this specification, piping to the pilot exhaust port (PE port) is available when the valve is used in an environment where the exhaust from the pilot valve is not allowable, or intrusion of ambient dust should be prevented.

How to Order Valve

VP 3 4 2 7 4 1 X500

- Entry is the same as standard products.
  The specifications, performance and external dimensions are the same as those of standard models.

Body Ported Interchangeable Specification with the Previous Valve Mounting Hole Pitch Type

The mounting hole has been changed to the long type in order to provide interchangeability with the previous VP300/500 series.

How to Order Valve

VP 3 4 2 5 4 1 X505

- Entry is the same as standard products.
  The specifications, performance and external dimensions are the same as those of standard models.

Note) VP742 is not available because the mounting hole pitch is the same as the previous type.
How to Order

VPA 3 4 2 [Series] 1 0 1 [Valve option] A [Port size] [Thread type]

Series
3 VPA300
5 VPA500
7 VPA700

Valve option
Nil Standard
V For vacuum

Port size
Symbol | Port size | VPA300 | VPA500 | VPA700
----- | --------- | ------ | ------ | ------
01 | 1/8 | — | — | —
02 | 1/4 | — | — | —
03 | 3/8 | — | — | —
04 | 1/2 | — | — | —

Thread type
Nil Rc
F G
N NPT
T NPTF

Specifications

<table>
<thead>
<tr>
<th>Fluid</th>
<th>Type of actuation</th>
<th>Operating pressure range (MPa)</th>
<th>Pilot pressure (MPa)</th>
<th>Ambient and fluid temperature (°C)</th>
<th>Lubrication</th>
<th>Mounting orientation</th>
<th>Impact/Vibration resistance (m/s²) Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air</td>
<td>N.C. or N.O. (Convertible)</td>
<td>Standard</td>
<td>0.2 to 1.0</td>
<td>—100 kPa to 0.2</td>
<td>—10 to 50 (No freezing)</td>
<td>Not required</td>
<td>Unrestricted</td>
</tr>
</tbody>
</table>

Note) Impact resistance: No malfunction to axis and right angle directions of main valve, each one time when pilot signal ON and OFF. (Values at the initial period)
Vibration resistance: No malfunction from test with 45 to 2000 Hz one sweep, to axis and right angle direction of main valve, each one time when pilot signal ON and OFF. (Values at the initial period)

Flow Characteristics/Weight

<table>
<thead>
<tr>
<th>Model</th>
<th>Port size</th>
<th>1 ↔ 2 (P ↔ A)</th>
<th>2 ↔ 3 (A ↔ R)</th>
<th>Weight (g) Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>VPA342</td>
<td>1/8</td>
<td>3.5 0.26</td>
<td>0.8 3.6 0.26</td>
<td>118</td>
</tr>
<tr>
<td></td>
<td>1/4</td>
<td>4.2 0.22</td>
<td>1.0 4.2 0.23</td>
<td>114</td>
</tr>
<tr>
<td>VPA542</td>
<td>3/8</td>
<td>7.9 0.21</td>
<td>1.8 7.2 0.27</td>
<td>237</td>
</tr>
<tr>
<td>VPA742</td>
<td>1/2</td>
<td>11.9 0.21</td>
<td>2.7 11.8 0.20</td>
<td>501</td>
</tr>
</tbody>
</table>

Note) Values without brackets

Caution
Refer to back cover for Safety Instructions, “Handling Precautions for SMC Products” (M-E03-3) for Common Precautions.
Construction

Standard

JIS symbol

<table>
<thead>
<tr>
<th></th>
<th>N.C.</th>
<th>N.O.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard</td>
<td><img src="image" alt="Diagram" /></td>
<td><img src="image" alt="Diagram" /></td>
</tr>
<tr>
<td>For vacuum</td>
<td><img src="image" alt="Diagram" /></td>
<td><img src="image" alt="Diagram" /></td>
</tr>
</tbody>
</table>

For vacuum

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>White</td>
</tr>
<tr>
<td>2</td>
<td>Adapter plate</td>
<td>Aluminum die-casted</td>
<td>Gray</td>
</tr>
<tr>
<td>3</td>
<td>End plate</td>
<td>Resin</td>
<td>White</td>
</tr>
<tr>
<td>4</td>
<td>Piston</td>
<td>Resin</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Spool valve</td>
<td>Aluminum/HNBR</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Retainer</td>
<td>Resin</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Spring</td>
<td>Stainless steel</td>
<td></td>
</tr>
</tbody>
</table>

Bracket Assembly Part No.

<table>
<thead>
<tr>
<th>Description (With 2 screws)</th>
<th>Model</th>
<th>Part no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>VPA342</td>
<td>VP300-227-1A</td>
<td></td>
</tr>
<tr>
<td>VPA542</td>
<td>VP500-227-1A</td>
<td></td>
</tr>
<tr>
<td>VPA742</td>
<td>VP700-227-1A</td>
<td></td>
</tr>
</tbody>
</table>
Series VPA300/500/700

Series VPA300/Body Ported/Dimensions

Standard/VPA342-1-  

1/8, 1/4  
2(A) port  

1/8  
12 (PA) port  

2 x ø3.2  
(For mounting)  

1/8, 1/4  
1(P), 3(R) port

(Mounting groove for M5 thread)

1/8  
12(PA) port

1/8, 1/4  
2(A) port

2 x ø3.2  
(For mounting)

1/8, 1/4  
1(P), 3(R) port

(Mounting groove for M5 thread)

For vacuum/VPA342V-1-  

1/8, 1/4  
2(A) port

2 x ø3.2  
(For mounting)

1/8, 1/4  
1(P), 3(R) port

(Mounting groove for M5 thread)
Series VPA500/Body Ported/Dimensions

Standard/VPA542-1-02A03B (-F)

For vacuum/VPA542V-1-02A03B (-F)
Series VPA300/500/700

Series VPA700/Body Ported/Dimensions

Standard/VPA742-1-\( \frac{105}{2} \)A\( \frac{24}{3} \)B (-F)

(Mounting groove for M6 thread)

For vacuum/VPA742V-1-\( \frac{105}{2} \)A\( \frac{24}{3} \)B (-F)

(Mounting groove for M6 thread)
Series VPA300/500/700

3 Port/Air Operated Valve
Base Mounted/Single Unit

How to Order

VPA 3 4 4 □ - 1 - 01 □

Series
3 VPA300
5 VPA500
7 VPA700

Type of actuation
A N.C. (Normally closed)
B N.O. (Normally open)

Body option
Nil Standard
V For vacuum

Thread type
Nil Rc
F G
N NPT
T NPTF

Port size (Sub-plate)
Symbol Port size VPA300 VPA500 VPA700
Nil Without sub-plate*
01 1/8 ○ — —
02 1/4 ○ ○ —
03 3/8 — ○ ○
04 1/2 — — —

* With a gasket and two mounting bolts

Specifications

<table>
<thead>
<tr>
<th>Fluid</th>
<th>Type of actuation</th>
<th>Operating pressure range (MPa)</th>
<th>Pilot pressure (MPa)</th>
<th>Ambient and fluid temperature (°C)</th>
<th>Lubrication</th>
<th>Mounting orientation</th>
<th>Impact/Vibration resistance (m/s²)</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N.C. or N.O. (Convertible)</td>
<td>Standard 0.2 to 1.0</td>
<td>-100 kPa to 0.2</td>
<td>-10 to 50 (No freezing)</td>
<td>Not required</td>
<td>Un restricted</td>
<td>300/50</td>
<td></td>
</tr>
</tbody>
</table>

Flow Characteristics/Weight

<table>
<thead>
<tr>
<th>Model</th>
<th>Port size</th>
<th>1 ↔ 2 (P ↔ A)</th>
<th>2 ↔ 3 (A ↔ R)</th>
<th>Weight (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>C (dm³/(s·bar))</td>
<td>b</td>
<td>Cv</td>
</tr>
<tr>
<td>VPA344</td>
<td>1/8</td>
<td>3.6</td>
<td>0.22</td>
<td>0.8</td>
</tr>
<tr>
<td>VPA544</td>
<td>1/4</td>
<td>3.9</td>
<td>0.22</td>
<td>0.9</td>
</tr>
<tr>
<td>VPA744</td>
<td>3/8</td>
<td>8.8</td>
<td>0.07</td>
<td>2.0</td>
</tr>
<tr>
<td></td>
<td>1/2</td>
<td>14.7</td>
<td>0.05</td>
<td>3.3</td>
</tr>
</tbody>
</table>

Note) ( ): Values without sub-plate

Caution

Refer to back cover for Safety Instructions, “Handling Precautions for SMC Products” (M-E03-3) for Common Precautions.
**Construction**

### JIS symbol

<table>
<thead>
<tr>
<th></th>
<th>N.C.</th>
<th>N.O.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard</td>
<td><img src="image1" alt="Standard symbol" /></td>
<td><img src="image2" alt="Standard symbol" /></td>
</tr>
<tr>
<td>For vacuum</td>
<td><img src="image3" alt="For vacuum symbol" /></td>
<td><img src="image4" alt="For vacuum symbol" /></td>
</tr>
</tbody>
</table>

### 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>White</td>
</tr>
<tr>
<td>2</td>
<td>Adapter plate</td>
<td>Aluminum die-casted</td>
<td>Gray</td>
</tr>
<tr>
<td>3</td>
<td>End plate</td>
<td>Resin</td>
<td>White</td>
</tr>
<tr>
<td>4</td>
<td>Piston</td>
<td>Resin</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Spool valve</td>
<td>Aluminum/HNBR</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Retainer</td>
<td>Resin</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Spring</td>
<td>Stainless steel</td>
<td></td>
</tr>
</tbody>
</table>

### Replacement Parts

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Part no.</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>Gasket</td>
<td>VP300-217-1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>VP500-217-1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>VP700-217-1</td>
<td>HNBR</td>
</tr>
<tr>
<td>9</td>
<td>Sub-plate</td>
<td>VP300-202-□</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hexagon socket head bolt (1 pc.)</td>
<td>VP300-224-1 (M3 x 36)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>VP500-224-1 (M4 x 46)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>VP700-224-1 (M5 x 66)</td>
<td></td>
</tr>
</tbody>
</table>

**Caution**

**Tightening Torque of Mounting Screw**

- M3: 0.8 N·m
- M4: 1.4 N·m
- M5: 2.9 N·m

**Standard**

| ![Standard assembly](image5) |

**For vacuum**

| ![For vacuum assembly](image6) |

**How to Order Sub-plate**

**Series**

- 3 VP344
- 5 VP544
- 7 VP744

**Thread type**

- Nil
- Rc
- F
- G
- N
- NPT
- T
- NPT

**Port size**

<table>
<thead>
<tr>
<th>Symbol</th>
<th>VP344</th>
<th>VP544</th>
<th>VP744</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1/8</td>
<td>1/4</td>
<td>3/8</td>
</tr>
<tr>
<td>2</td>
<td>1/4</td>
<td>3/8</td>
<td>1/2</td>
</tr>
</tbody>
</table>
Air Operated Valve
Base Mounted/Single Unit

Series VPA300/500/700

Series VPA300/Base Mounted/Dimensions

Standard/VPA344-1

For vacuum/VPA344V-1
Series VPA300/500/700

Series VPA500/Base Mounted/Dimensions

Standard/VPA544-1

For vacuum/VPA544V-1
3 Port/Air Operated Valve Manifold
Common Exhaust Type 41 / Individual Exhaust Type 42
Series VPA300/500/700

How to Order Manifold

**Type 41/Common exhaust**

**VV3PA 3-41-04 1-02**

- **Series**
  - 3: VPA300
  - 5: VPA500
  - 7: VPA700

- **Stations**
  - 02: 2 stations
  - 20: 20 stations

- **Thread type**
  - Nil
  - F
  - G
  - N: NPT
  - T: NPTF

- **Port size**
  - Symbol | Port size | Applicable series
  - 02 | 1/4 | VPA300
  - 03 | 3/8 | VPA500
  - 04 | 1/2 | VPA700

**Type 42/Individual exhaust**

**VV3PA 3-42-04 3-02**

- **Series**
  - 3: VPA300
  - 5: VPA500
  - 7: VPA700

- **Stations**
  - 02: 2 stations
  - 20: 20 stations

- **Thread type**
  - Nil
  - F
  - G
  - N: NPT
  - T: NPTF

- **Port size**
  - Symbol | Port size | Applicable series
  - 02 | 1/4 | VPA300
  - 03 | 3/8 | VPA500
  - 04 | 1/2 | VPA700

**Manifold Option**

<table>
<thead>
<tr>
<th>Description</th>
<th>Part no.</th>
<th>Applicable manifold base model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blanking plate assembly (With a gasket and two mounting bolts)</td>
<td>VP300-25-1A</td>
<td>VV3PA3</td>
</tr>
<tr>
<td></td>
<td>VP500-25-1A</td>
<td>VV3PA5</td>
</tr>
<tr>
<td></td>
<td>VP700-25-1A</td>
<td>VV3PA7</td>
</tr>
</tbody>
</table>
How to Order Valve (With a gasket and two mounting bolts)

**VPA 3 4 4 □ 1 □ A**

- **Series**
  - VPA300
  - VPA500
  - VPA700

- **Type of actuation**
  - A: N.C. (Normally closed)
  - B: N.O. (Normally open)

- **Thread type**
  - Nil
  - F
  - G
  - N
  - T
  - RC
  - NPT
  - NPTF

- **Body option**
  - Nil
  - Standard
  - V: For vacuum

---

**Manifold Specifications**

<table>
<thead>
<tr>
<th>Series</th>
<th>Base model</th>
<th>Piping specifications</th>
<th>Applicable valve</th>
<th>Applicable stations</th>
<th>Manifold base</th>
<th>Weight: W [g]</th>
</tr>
</thead>
<tbody>
<tr>
<td>VPA300</td>
<td>VV3PA3-41</td>
<td>1P (SUP) port type</td>
<td>VPA344</td>
<td>2 to 20 stations</td>
<td></td>
<td>W = 110n + 90</td>
</tr>
<tr>
<td></td>
<td>VV3PA3-42</td>
<td>3R (EXH) port type</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VPA500</td>
<td>VV3PA5-41</td>
<td>Common</td>
<td>VPA544</td>
<td>2 to 20 stations</td>
<td></td>
<td>W = 190n + 150</td>
</tr>
<tr>
<td></td>
<td>VV3PA5-42</td>
<td>Individual</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VPA700</td>
<td>VV3PA7-41</td>
<td>Common</td>
<td>VPA744</td>
<td>2 to 20 stations</td>
<td></td>
<td>W = 410n + 380</td>
</tr>
<tr>
<td></td>
<td>VV3PA7-42</td>
<td>Individual</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note:** Supply pressure to 1(P) ports and exhaust air from 3(R) ports on both sides for 10 stations or more.

**Refer to back page 6 for changing the type of actuation.**

---

**How to Order Manifold Assembly (Example)**

**Ordering example (VV3PA3-41)**

- VV3PA3-41-051-02: 1 set (Type 41, 5-station manifold base part no.)
- VP300-25-1A: 1 set (Blanking plate assembly part no.)
- VPA344-1-A: 2 sets (N.C. type part no.)
- VPA344-1-B: 2 sets (N.O. type part no.)

The asterisk denotes the symbol for assembly. Prefix it to the part nos. of the valve, etc.

*Indicate the valves to be attached below the manifold part number, in order starting from station 1 as shown in the drawing.*
## Series VPA300/Dimensions

### Type 41/Common exhaust: VV3PA3-41-

<table>
<thead>
<tr>
<th>Stations 1-02</th>
<th>Station n</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/8</td>
<td>1/8</td>
</tr>
<tr>
<td>12(PA) port</td>
<td>12(PA) port</td>
</tr>
<tr>
<td>N.O. N.C.</td>
<td>N.O. N.C.</td>
</tr>
</tbody>
</table>

**Dimensions**

- **L1**: 288.5 mm
- **L2**: 316 mm

### Type 42/Individual exhaust: VV3PA3-42-

<table>
<thead>
<tr>
<th>Stations 3-02</th>
<th>Station n</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/4</td>
<td>1/4</td>
</tr>
<tr>
<td>3(R) port</td>
<td>3(R) port</td>
</tr>
<tr>
<td>N.O. N.C.</td>
<td>N.O. N.C.</td>
</tr>
</tbody>
</table>

**Dimensions**

- **L1**: 316 mm
- **L2**: 343.5 mm

---

### Table 1

<table>
<thead>
<tr>
<th>Stations</th>
<th>L1</th>
<th>L2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>83.5</td>
<td>68.5</td>
</tr>
<tr>
<td>2</td>
<td>111</td>
<td>96</td>
</tr>
<tr>
<td>3</td>
<td>138.5</td>
<td>123.5</td>
</tr>
<tr>
<td>4</td>
<td>151</td>
<td>151</td>
</tr>
<tr>
<td>5</td>
<td>178.5</td>
<td>178.5</td>
</tr>
<tr>
<td>6</td>
<td>206</td>
<td>206</td>
</tr>
<tr>
<td>7</td>
<td>233.5</td>
<td>233.5</td>
</tr>
<tr>
<td>8</td>
<td>261</td>
<td>261</td>
</tr>
<tr>
<td>9</td>
<td>288.5</td>
<td>288.5</td>
</tr>
<tr>
<td>10</td>
<td>316</td>
<td>316</td>
</tr>
<tr>
<td>11</td>
<td>343.5</td>
<td>343.5</td>
</tr>
<tr>
<td>12</td>
<td>371</td>
<td>371</td>
</tr>
<tr>
<td>13</td>
<td>398.5</td>
<td>398.5</td>
</tr>
<tr>
<td>14</td>
<td>426</td>
<td>426</td>
</tr>
<tr>
<td>15</td>
<td>463.5</td>
<td>463.5</td>
</tr>
<tr>
<td>16</td>
<td>481</td>
<td>481</td>
</tr>
<tr>
<td>17</td>
<td>508.5</td>
<td>508.5</td>
</tr>
<tr>
<td>18</td>
<td>536</td>
<td>536</td>
</tr>
<tr>
<td>19</td>
<td>563.5</td>
<td>563.5</td>
</tr>
<tr>
<td>20</td>
<td>591</td>
<td>591</td>
</tr>
</tbody>
</table>
Series VPA500/Dimensions

Type 41/Common exhaust: VV3PA5-41-[Stations 1-03]

Type 42/Individual exhaust: VV3PA5-42-[Stations 3-03]
### Series VPA700/Dimensions

#### Type 41/Common exhaust: VV3PA7-41-1-04

<table>
<thead>
<tr>
<th>Station n</th>
<th>2 stations</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>
<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
<th>15</th>
<th>16</th>
<th>17</th>
<th>18</th>
<th>19</th>
<th>20 stations</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1</td>
<td>115</td>
<td>156</td>
<td>197</td>
<td>238</td>
<td>279</td>
<td>320</td>
<td>361</td>
<td>402</td>
<td>443</td>
<td>484</td>
<td>525</td>
<td>566</td>
<td>607</td>
<td>648</td>
<td>689</td>
<td>730</td>
<td>771</td>
<td>812</td>
<td>853</td>
</tr>
<tr>
<td>L2</td>
<td>99</td>
<td>140</td>
<td>181</td>
<td>222</td>
<td>263</td>
<td>304</td>
<td>345</td>
<td>386</td>
<td>427</td>
<td>468</td>
<td>509</td>
<td>550</td>
<td>591</td>
<td>632</td>
<td>673</td>
<td>714</td>
<td>755</td>
<td>796</td>
<td>837</td>
</tr>
</tbody>
</table>

#### Type 42/Individual exhaust: VV3PA7-42-3-04

<table>
<thead>
<tr>
<th>Station n</th>
<th>2 stations</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>
<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
<th>15</th>
<th>16</th>
<th>17</th>
<th>18</th>
<th>19</th>
<th>20 stations</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1</td>
<td>115</td>
<td>156</td>
<td>197</td>
<td>238</td>
<td>279</td>
<td>320</td>
<td>361</td>
<td>402</td>
<td>443</td>
<td>484</td>
<td>525</td>
<td>566</td>
<td>607</td>
<td>648</td>
<td>689</td>
<td>730</td>
<td>771</td>
<td>812</td>
<td>853</td>
</tr>
<tr>
<td>L2</td>
<td>99</td>
<td>140</td>
<td>181</td>
<td>222</td>
<td>263</td>
<td>304</td>
<td>345</td>
<td>386</td>
<td>427</td>
<td>468</td>
<td>509</td>
<td>550</td>
<td>591</td>
<td>632</td>
<td>673</td>
<td>714</td>
<td>755</td>
<td>796</td>
<td>837</td>
</tr>
</tbody>
</table>

---

**Series VPA300/500/700**
Body Ported Interchangeable Specification with the Previous Valve Mounting Hole Pitch Type

The mounting hole has been changed to the long type in order to provide interchangeability with the previous VPA300/500 series.

How to Order Valve

VPA342 -1- □□□-X505

Entry is the same as standard products. The specifications, performance and external dimensions are the same as those of standard models.

Note) VPA742 is not available because the mounting hole pitch is the same as the previous type.

VPA342

VPA542
**Warning**

Without an electric signal for the solenoid valve the manual override is used for switching the main valve. Connected actuator is started by manual operation. Use the manual override after confirming that there is no danger.

- **Non-locking push type**
  - Push down on the manual override button with a small screwdriver until it stops. Release the screwdriver and the manual override will return.

- **Push-turn locking slotted type**
  - Push the manual override button with a small flat head screwdriver until it stops. Turn it in the clockwise direction at 90° to lock the manual. Turn it counterclockwise to release it.

- **Push-turn locking lever type**
  - After pushing down, turn in the direction of the arrow. If it is not turned, it can be operated the same way as the non-locking type.

**Caution**

When locking the manual override with the push-turn locking type (D or E type), be sure to push it down before turning. Turning without first pushing it down can cause damage to the manual override and other trouble such as air leakage, etc. Do not apply excessive torque when turning the locking type manual override. (0.1 N·m)

---

**Manual Override**

---

**How to Use L/M-Type Plug Connector**

**Caution**

1. **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.

2. **Crimping lead wires and sockets**
   - Not necessary if ordering the lead wire pre-connected model. Strip 3.2 to 3.7 mm at the end of the lead wires, insert the ends of the core wires evenly into the sockets, and then crimp with a crimping tool. When this is done, take care that the coverings of the lead wires do not enter the core wire crimping area. (Please contact SMC for details on the crimping tool.)

3. **Attaching and detaching sockets with lead wire**
   - **Attaching**
     - Insert the sockets into the square holes of the connector (Groove indication), and continue to push the sockets all the way in until they lock by hooking into the seats in the connector. (When they are pushed in, their hooks open and they are locked automatically.) Then, 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. 1 mm). If the socket will be used again, first spread the hook outward.
Caution
Plug connector lead wires have a standard length of 300 mm, however, the following lengths are also available.

<table>
<thead>
<tr>
<th>Lead wire length</th>
<th>0</th>
<th>6</th>
<th>10</th>
<th>15</th>
<th>20</th>
<th>25</th>
<th>30</th>
<th>50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nil</td>
<td>300 mm</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>600 mm</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>1000 mm</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>1500 mm</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>2000 mm</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>2500 mm</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>3000 mm</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>50</td>
<td>5000 mm</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

How to Order Connector Assembly

DC : V200-30-4A
100 VAC : V200-30-1A
200 VAC : V200-30-2A
AC other voltages: V200-30-3A
Without lead wire : V200-30-A
(With connector and 2 pcs. of socket)

How to Order

Include the connector assembly part number together with the part number for the plug connector’s solenoid valve without connector.

(Example) 2000 mm lead wire length

DC

AC

VP342-5LO1-01A
V200-30-4A-20

VP342-1LO1-01A
V200-30-1A-20

Set screw

Tightening torque

0.4 to 0.5 N·m

Terminal screw

Tightening torque

0.4 to 0.5 N·m

Ground nut

Tightening torque

2.5 to 3.75 N·m

Set screw

Tightening torque

0.4 to 0.5 N·m

Terminal block

3 locations

Polarity indication

(Location for light mounting)

(Voltage symbol)

How to Use DIN Terminal

The DIN terminal type with an IP65 enclosure is protected against dust and water, however, it must not be used in water.

Caution

Connection

1) Loosen the set screw and pull the connector out of the solenoid valve terminal block.
2) After removing the set screw, insert a flat head screwdriver, etc. into the notch on the bottom of the terminal block and pry it open, separating the terminal block and the housing.
3) Loosen the terminal screws on the terminal block, insert the core of the lead wire into the terminal, and attach securely with the terminal screws. In addition, when using the DC mode type with a surge voltage suppressor (polar: S and Z types), connect wires corresponding to the polarity (+ or −) that is printed on the terminal block.
4) Tighten the ground nut to secure the wire. In the case of connecting wires, select cabtire cords carefully because if those out of the specified range (ø4.5 to ø7) are used, it will not be able to satisfy IP65 (enclosure). Tighten the ground nut and set screw within the specified range of torque.

Changing the entry direction

After separating terminal block and housing, the cord entry direction can be changed by attaching the housing in the opposite direction.

Precautions

Plug in and pull out the connector vertically without tilting to one side.

Applicable cable

Cable O.D.: ø4.5 to ø7
(Reference) 0.5 mm² to 1.5 mm², 2-core or 3-core, equivalent to JIS C 3306

Applicable crimped terminal

O terminal: R1.25-4M that is specified in JIS C 2805
Y terminal: 1.25-3L, which is released by JST Mfg. Co., Ltd.
Stick terminal: Size 1.5 or shorter

Caution

Plug in and pull out the connector vertically without tilting to one side.

How to Order Connector Assembly

DC : V200-30-4A
100 VAC : V200-30-1A
200 VAC : V200-30-2A
AC other voltages: V200-30-3A
Without lead wire : V200-30-A
(With connector and 2 pcs. of socket)

How to Order

Include the connector assembly part number together with the part number for the plug connector’s solenoid valve without connector.

(Example) 2000 mm lead wire length

DC

AC

VP342-5LO1-01A
V200-30-4A-20

VP342-1LO1-01A
V200-30-1A-20

Series VP
Specific Product Precautions 2
Be sure to read before handling.
Refer to back cover for Safety Instructions, “Handling Precautions for SMC Products” (M-E03-3) for 3/4/5 Port Solenoid Valves Precautions.
### DIN (EN175301-803) Terminal

Y type DIN terminal corresponds to the DIN connector with terminal pitch 10 mm, which complies with EN175301-803B. Since the terminal pitch is different from the D type DIN connector, these two types are not interchangeable.

#### How to Use Conduit Terminal

**Caution**

1. **Connection**
   - Loosen the set screw and remove the terminal block cover from the terminal block.
   - Loosen the terminal screws on the terminal block, insert the core of the lead wire or crimped terminal into the terminal, and attach securely with the terminal screws. In addition, when using the DC mode type with a surge voltage suppressor (polar: S and Z types), connect wires to terminal 1 and 2 corresponding to the polarity (+ or −) as shown on the right figure.
   - Secure the cord by fastening the ground nut.

   In the case of connecting wires, select cabtire cords carefully because if those out of the specified range (ø4.5 to ø7) are used, it will not be able to satisfy IP65 (enclosure). Tighten the ground nut and set screw within the specified range of torque.

2. **Applicable cable**
   - Cable O.D.: ø4.5 to ø7
   - Connector specification: Equivalent to R1.25-3 that is specified in JIS C 2805

3. **Applicable crimped terminal**
   - O terminal: Equivalent to 1.25-3, which is released by JST Mfg. Co., Ltd.
   - Use O terminal when a ground terminal is used.

### How to Order DIN Connector

**Caution**

- Without indicator light
  - DC, AC, Other voltages: V200- -1
- With indicator light
  - DC
    - Polar type (□Z): V200- -3-
    - Non-polar type (□U): V200- -5-
  - AC (□Z): V200- -7-

#### Circuit with indicator light (Built-in connector)

- LED: Light emitting diode
- R: Resistor
- NL: Neon bulb
- D: Protective diode

**Note** The 24 VAC specifications are the same as those in the DC (□U) circuit diagram.
**Series VP**

**Specific Product Precautions 4**

Be sure to read before handling.
Refer to back cover for Safety Instructions, “Handling Precautions for SMC Products” (M-E03-3) for 3/4/5 Port Solenoid Valves Precautions.

---

**Leakage Voltage**

⚠️ **Caution**

Especially when a resistor and a switching element are used in parallel or C-R device (surge voltage suppressor) is used for the protection of the switching device, note that leakage voltage will be increased by passing leakage voltage through the resistor and C-R device. Therefore, suppressor residual leakage voltage should be as follows.

- **DC coil**: 3% or less of the rated voltage
- **AC coil**: 8% or less of the rated voltage

---

**Continuous Duty**

⚠️ **Caution**

- If a valve is energized continuously for long periods of time, the rise in temperature due to heat-up of the coil assembly may cause a decline in solenoid valve performance, reduce service life, or have adverse effects on peripheral equipment. If the valve is energized continuously for a long time, or the total energizing time per day becomes longer than the non-energizing time, use a valve with power saving circuit. Also, it is possible to reduce the energizing time by using a N.O. (normally open) valve.
- When the valve is mounted onto a control panel, take measures against radiation in order to keep the valve temperature within the specified range.

---

**Light/Surge Voltage Suppressor**

⚠️ **Caution**

- **<DC>**
  - **Polar type**
    - With surge voltage suppressor (□S)
      - Polarity protection diode
      - Red (+)  
      - Black (–)
    - For DIN type, installed □ in the connector
  - Grommet or L/M-type plug connector
    - With light/surge voltage suppressor (□Z)
      - Polarity protection diode
      - Red (+)  
      - Black (–)

- **Non-polar type**
  - With surge voltage suppressor (□R)
    - (-) (+)  
    - Varistor
  - Grommet or L/M-type plug connector
    - With light/surge voltage suppressor (□U)
      - (-) (+)  
      - Varistor

- DIN or Conduit terminal
  - With light/surge voltage suppressor (□U)
    - (-) (+)  
    - Varistor

- Please connect correctly the lead wires to + (positive) and – (negative) indications on the connector. (For non-polar type, the lead wires can be connected to either one.)
- When the valve with mis-wiring protection diode is used, the voltage will drop by approx. 1 V. Therefore, pay attention to the allowable voltage fluctuation (For details, refer to the solenoid specification of each type of valve).
- Solenoids, whose lead wires have been pre-wired: + (positive) side red and – (negative) side black.

---

Back page 4
### Light/Surge Voltage Suppressor

**With power saving circuit**

Power consumption is decreased by approx. 1/3 by reducing the wattage required to hold the valve in an energized state. (Effective energizing time is over 40 ms at 24 VDC.)

Refer to the electrical power waveform as shown below.

#### Electrical power waveform of energy saving type

<table>
<thead>
<tr>
<th>Applied voltage</th>
<th>24 V</th>
<th>0 V</th>
<th>Standard</th>
<th>With power saving circuit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.55 W</td>
<td>24 V</td>
<td>0 V</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.55 W</td>
<td>24 V</td>
<td>0 V</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 W</td>
<td>24 V</td>
<td>0 V</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Since the voltage will drop by approx. 0.5 V due to the transistor, pay attention to the allowable voltage fluctuation. (For details, refer to the solenoid specifications of each type of valve.)

- **Polarity protection diode**
  - Red (+) - LED
  - Black (-) - PWM circuit

- **Diode**

#### Caution

**Residual voltage of the surge voltage suppressor**

Note) If a varistor or diode surge voltage suppressor is used, there is some residual voltage to the protection element and rated voltage. Therefore, refer to the table below and pay attention to the surge voltage protection on the controller side. Also, since the response time does change, refer to the specifications on page 2 and 9.

<table>
<thead>
<tr>
<th>Surge voltage suppressor</th>
<th>DC 24 V</th>
<th>AC 24 V</th>
</tr>
</thead>
<tbody>
<tr>
<td>S, Z</td>
<td>Approx. 1 V</td>
<td>Approx. 1 V</td>
</tr>
<tr>
<td>R, U</td>
<td>Approx. 47 V</td>
<td>Approx. 32 V</td>
</tr>
</tbody>
</table>

### Countermeasure for Surge Voltage Intrusion

**Caution**

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 the 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).

#### <AC>

There is no S option, since a rectifier prevents surge voltage generation.

- **Grommet or L/M-type plug connector**
  - With light/surge voltage suppressor (□Z)

- **DIN or Conduit terminal**
  - With light/surge voltage suppressor (□Z)

- **LED**

- **Varistor**

Note) LED for 24 VAC.
When changing the actuation or restarting the valve after the change, make sure that safety is fully assured and pay great attention.

Example: Changing from N.C. to N.O.

1) Base mounted

1. Remove the body from the sub-plate and reset the “▼” mark on the body corresponding to the “N.O.” mark on the sub-plate as shown in the figure above.
2. Remove the end plate from the body and rotate the end plate by 180° so that the “N.O.” mark on the end plate is at the top of the valve.

* It is not necessary to change the piping when this is done.

2) Body ported

* Remove the end plate from the body and rotate the end plate by 180° to correspond the “N.O.” mark on the end plate to the top of the valve.

Piping should be arranged as follows.

<table>
<thead>
<tr>
<th>Type of actuation</th>
<th>Port</th>
<th>1P</th>
<th>2A</th>
<th>3R</th>
</tr>
</thead>
<tbody>
<tr>
<td>N.C.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N.O.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Applicable Fittings: Series KQ2H, KQ2S

<table>
<thead>
<tr>
<th>Series</th>
<th>Piping port</th>
<th>Port size</th>
<th>Applicable tubing O.D.</th>
</tr>
</thead>
<tbody>
<tr>
<td>VP(A)300</td>
<td>1P, 2A, 3R</td>
<td>1/8, 1/4</td>
<td>ø3, ø4, ø6, ø8, ø10, ø12, ø16</td>
</tr>
<tr>
<td></td>
<td>X</td>
<td>M5</td>
<td></td>
</tr>
<tr>
<td>VP(A)500</td>
<td>1P, 2A, 3R</td>
<td>1/4, 3/8</td>
<td></td>
</tr>
<tr>
<td></td>
<td>X</td>
<td>1/8</td>
<td></td>
</tr>
<tr>
<td>VP(A)700</td>
<td>1P, 2A, 3R</td>
<td>3/8, 1/2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>X</td>
<td>1/8</td>
<td></td>
</tr>
<tr>
<td>VV3P(A)3</td>
<td>1P, 2A, 3R</td>
<td>1/4</td>
<td></td>
</tr>
<tr>
<td>Manifold base</td>
<td>X</td>
<td>M5</td>
<td></td>
</tr>
<tr>
<td>VV3P(A)5</td>
<td>1P, 2A, 3R</td>
<td>3/8</td>
<td></td>
</tr>
<tr>
<td>Manifold base</td>
<td>X</td>
<td>M5</td>
<td></td>
</tr>
<tr>
<td>VV3P(A)7</td>
<td>1P, 2A, 3R</td>
<td>1/2</td>
<td></td>
</tr>
<tr>
<td>Manifold base</td>
<td>X</td>
<td>1/8</td>
<td></td>
</tr>
</tbody>
</table>

When changing the actuation or restarting the valve after the change, make sure that safety is fully assured and pay great attention.
### 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.

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

### Safety Instructions

#### 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 recent 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, 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 transportation, 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.

#### 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. 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.

#### 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 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.

### Revision History

<table>
<thead>
<tr>
<th>Edition</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>E1</td>
<td>Addition of 24 VAC to Rated voltage for Series VP300/500/700.</td>
</tr>
<tr>
<td></td>
<td>Addition of -X505 to Made to Order for Series VP300/500.</td>
</tr>
<tr>
<td></td>
<td>Addition of -X505 to Made to Order for Series VP300/500. OZ</td>
</tr>
</tbody>
</table>

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**SMC Corporation**

Akihabara UDX 15F, 4-14-1, Sotokanda, Chiyoda-ku, Tokyo 101-0021, JAPAN

Phone: 03-5207-8249 Fax: 03-5298-5362

URL http://www.smcworld.com

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Specifications are subject to change without prior notice and any obligation on the part of the manufacturer.
Large Size 3 Port Solenoid Valve  
Series VP3145/3165/3185  
Rubber Seal

Large flow capacity, small exhaust resistance  
(Refer to “Flow Characteristic” table.)

Easy conversion to N.C. or N.O.  
Function plate makes it possible to use as a N.C. or N.O. valve with the port unchanged.

Possible to use in vacuum or under low pressures  
Vacuum: Up to 101.2 kPa  
Low pressure: 0 to 0.2 MPa

Free mounting orientation

How to Order

How to Order Pilot Valve Assembly

Note) N.O. valve operates properly only when appropriate pressure is applied to the pilot.

Made to Order  
(Refer to pages 1501 to 1503 for details.)
Series VP3145/3165/3185

External Pilot

Use external pilot model in the following cases.
- Vacuum or low pressure (0.2 MPa or less):
  Vacuum/Low pressure type
- Using the valve with supply port external throttle:
  General type
- Air pressure of supply port is slow:
  General type
- Resistance in outlet side is small in case of air blowing or filling an air tank:
  General type

Note 1) Keep external pilot pressure within the pressure range below.
Note 2) Conversion of internal pilot and external pilot cannot be done.

Specifications

<table>
<thead>
<tr>
<th>Fluid</th>
<th>Air</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Type of actuation</th>
<th>N.C. or N.O. (Convertible)</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Pilot type</th>
<th>Internal pilot</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>External pilot</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Operating pressure range (MPa)</th>
<th>Main pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N.C. or N.O. (Convertible)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pilot pressure</th>
<th>0.2 to 0.8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Response time (ms)</td>
<td>Refer to the graph left.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fluid</th>
<th>Air</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Ambient and fluid temperature (°C)</th>
<th>0 (No freezing) to 60</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Shock/Vibration resistance (m/s²)</th>
<th>150/50</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Lubrication</th>
<th>N.C. or N.O. (Convertible)</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Manual override</th>
<th>Yes (Non-locking)</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Mounting orientation</th>
<th>Unrestricted</th>
</tr>
</thead>
</table>

| Note 1) Based on dynamic performance test, JIS B 8374-1981. (Coil temperature: 20°C, at rated voltage, without surge voltage suppressor) |
| Note 2) This solenoid valve requires lubrication. Use turbine oil Class 1 (ISO VG32). |
| Note 3) 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)

flow Characteristics/Mass

<table>
<thead>
<tr>
<th>Valve model</th>
<th>Port size</th>
<th>Effective area (mm²)</th>
<th>Mass (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>VP3145</td>
<td>3/8</td>
<td>20</td>
<td>1.5</td>
</tr>
<tr>
<td>VP3185</td>
<td>1/4</td>
<td>570</td>
<td>2.8</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Valve model</th>
<th>Port size</th>
<th>Effective area (mm²)</th>
<th>Mass (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>VP3165</td>
<td>3/4</td>
<td>230</td>
<td>2.0</td>
</tr>
<tr>
<td>VP3185</td>
<td>1 1/4</td>
<td>570</td>
<td>2.8</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Valve model</th>
<th>Port size</th>
<th>Effective area (mm²)</th>
<th>Mass (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>VP3165</td>
<td>3/4</td>
<td>230</td>
<td>2.0</td>
</tr>
<tr>
<td>VP3185</td>
<td>1 1/4</td>
<td>570</td>
<td>2.8</td>
</tr>
</tbody>
</table>

Note) At rated voltage

* For grommet
Conduit terminal - +0.2 kg
Construction/Internal Pilot

As in the figure below, this pilot-operated solenoid valve consists of a compact 3 port solenoid valve as the pilot valve and a large 3 port valve as the main valve. The pilot valve controls opening and closing the main valve. N.C. or N.O. function conversion can be done by switching the pilot passage.

Piping (Vacuum Use)

1. Piping in general:
   - EXH port = Vacuum pump/Blower (Suction side)
   - OUT port = Tank/Vacuum pad Plug (2 port valve) (Load side)
   - IN port = Air releasing Air pressure-in

2. Following the above piping, vacuum passage is switched between OUT and EXH, therefore, N.C./N.O. indication on the function plate and switching of the vacuum passage are reversed; N.C. (Normally closed) in vacuum passage are reversed.
   
   "N.C." indicated on the plate
   → N.O. in vacuum passage (Normally open)
   "N.O." indicated on the plate
   → N.C. in vacuum passage (Normally closed)

N.C./N.O. Conversion

To convert valve operation from N.C. to N.O. or N.O. to N.C., remove the pilot valve, move the function plate along the gasket, both top and bottom until the mark meets N.C. (N.O.)

Please note however, that the N.O. valve functions properly only when the appropriate pressure is applied to the valve.

Note: Pilot valve and body are shown in a different direction from the actual product in order to show the construction and air passage.
Series **VP3145**

**Dimensions: VP3145**

**Grommet: VP3145□-□□G6□**

**Conduit terminal: VP3145□-□□T6□**

**DIN terminal: VP3145□-□□D6□**

- Manual override
- External pilot port
- Lead wire length 200 mm
- Mounting hole
- Conduit terminal with indicator light (TL)
- DIN terminal

---

*Note: External pilot port Rc 1/4 is processed for threads in external pilot model only.*

---

[With indicator light (TL)]
Large Size 3 Port Solenoid Valve Series VP3165

Dimensions: VP3165

Grommet: VP3165□-□□G₆□

Note) External pilot port Rc 1/4 is processed for threads in external pilot model only.

Conduit terminal: VP3165□-□□T₅□

DIN terminal: VP3165□-□□D₅□

Conduit terminal with indicator light (TL)

DIN terminal: VP3165□-□□D₅□

Solenoid with indicator light (TL)

Applicable cable ø6 to ø12

Max. 11

Light position

2.5 mm

Light position

3.5

Max. 11

Applicable cable ø6 to ø12

[]: With indicator light (TL)
Series VP3185

Dimensions: VP3185

Grommet: VP3185□□□G\(\frac{1}{2}\)□

Conduit terminal: VP3185□□□T\(\frac{1}{2}\)□

DIN terminal: VP3185□□□D\(\frac{1}{2}\)□

Note: External pilot port Rc \(\frac{1}{4}\) is processed for threads in external pilot model only.

[ ]: With indicator light (TL)
Made to Order:
Series VP3145/3165/3185
Main Valve Double Acting Type: -X80/X81

How to Order

**VP31 4 5- 06 1 D Z A 1- N- X 81-**

<table>
<thead>
<tr>
<th>Body size</th>
<th>4 1/2</th>
<th>6 1</th>
<th>8 1 1/2</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Port size (IN, OUT port)</th>
<th>Symbol</th>
<th>Port size</th>
<th>VP3145</th>
<th>VP3165</th>
<th>VP3185</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>03</td>
<td>3/4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>04</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>06</td>
<td>3/4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>1 1/4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>14</td>
<td>1 1/2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>20</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Coil rated voltage | 1       | 100 VAC, 50/60 Hz |
|                    | 2       | 200 VAC, 50/60 Hz |
|                    | 3*      | 110 to 120 VAC, 50/60 Hz |
|                    | 4*      | 220 VAC, 50/60 Hz |
|                    | 5       | 24 VDC |
|                    | 6*      | 12 VDC |
|                    | 7*      | 240 VAC, 50/60 Hz |
|                    | 9*      | Other |

<table>
<thead>
<tr>
<th>Electrical entry</th>
<th>G</th>
<th>H</th>
<th>T</th>
<th>D</th>
<th>L</th>
<th>N</th>
<th>M</th>
<th>MO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grommet (Lead wire: 300 mm)</td>
<td>Grommet terminal</td>
<td>DIN terminal</td>
<td>Without connector</td>
<td>With connector</td>
<td>L plug connector</td>
<td>M plug connector</td>
<td>MO</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Electrical entry</th>
<th>G</th>
<th>H</th>
<th>T</th>
<th>D</th>
<th>L</th>
<th>N</th>
<th>M</th>
<th>MO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grommet (Lead wire: 600 mm)</td>
<td>Grommet terminal</td>
<td>DIN terminal</td>
<td>Without connector</td>
<td>With connector</td>
<td>L plug connector</td>
<td>M plug connector</td>
<td>MO</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Type of actuation</th>
<th>1</th>
<th>Single solenoid</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2</td>
<td>Double solenoid</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Type of actuation</th>
<th>1</th>
<th>Single solenoid</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2</td>
<td>Double solenoid</td>
</tr>
</tbody>
</table>

| Coil rated voltage | 1       | 100 VAC, 50/60 Hz |
|                    | 2       | 200 VAC, 50/60 Hz |
|                    | 3*      | 110 to 120 VAC, 50/60 Hz |
|                    | 4*      | 220 VAC, 50/60 Hz |
|                    | 5       | 24 VDC |
|                    | 6*      | 12 VDC |
|                    | 7*      | 240 VAC, 50/60 Hz |
|                    | 9*      | Other |

<table>
<thead>
<tr>
<th>Light/Surge voltage suppressor</th>
<th>Nil</th>
<th>Z</th>
<th>S</th>
</tr>
</thead>
<tbody>
<tr>
<td>With light/surge voltage suppressor</td>
<td>With surge voltage suppressor</td>
<td>With surge voltage suppressor</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Electrical entry</th>
<th>G</th>
<th>H</th>
<th>T</th>
<th>D</th>
<th>L</th>
<th>N</th>
<th>M</th>
<th>MO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grommet (Lead wire: 300 mm)</td>
<td>Grommet (Lead wire: 600 mm)</td>
<td>DIN terminal</td>
<td>Without controller</td>
<td>With controller</td>
<td>L plug connector</td>
<td>M plug connector</td>
<td>MO</td>
<td></td>
</tr>
</tbody>
</table>

How to Order Pilot Valve Assembly

**VF3 40-**

<table>
<thead>
<tr>
<th>Type of actuation</th>
<th>1</th>
<th>Single solenoid</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2</td>
<td>Double solenoid</td>
</tr>
</tbody>
</table>

| Coil rated voltage | 1       | 100 VAC, 50/60 Hz |
|                    | 2       | 200 VAC, 50/60 Hz |
|                    | 3*      | 110 to 120 VAC, 50/60 Hz |
|                    | 4*      | 220 VAC, 50/60 Hz |
|                    | 5       | 24 VDC |
|                    | 6*      | 12 VDC |
|                    | 7*      | 240 VAC, 50/60 Hz |
|                    | 9*      | Other |

<table>
<thead>
<tr>
<th>Electrical entry</th>
<th>G</th>
<th>H</th>
<th>T</th>
<th>D</th>
<th>L</th>
<th>N</th>
<th>M</th>
<th>MO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grommet (Lead wire: 300 mm)</td>
<td>Grommet (Lead wire: 600 mm)</td>
<td>DIN terminal</td>
<td>Without controller</td>
<td>With controller</td>
<td>L plug connector</td>
<td>M plug connector</td>
<td>MO</td>
<td></td>
</tr>
</tbody>
</table>
Series VP3145/3165/3185

Specifications

Type of actuation
External pilot 3 port solenoid valve

Fluid
Air

Operating pressure range
–101.2 kPa to 0.8 MPa

Pilot pressure
85 to 115% of main pressure, Min. 0.2 MPa

Ambient and fluid temperature
0 to 50 °C (No freezing)

Lubrication
Required (Equivalent to turbine oil Class 1 ISO VG32)

Mounting orientation
Unrestricted

Impact/Vibration resistance
150/50 m/s²

Solenoid Specifications

Electrical entry
Grommet, Grommet terminal, Conduit terminal
DIN terminal, L plug connector, M plug connector

Coil rated voltage (V)
AC (50/60 Hz) 100, 200, 110°, 220°, 240°

Allowable voltage fluctuation
–15 to 10%

Apparent power (AC) (Note)
Inrush 5.6 VA/50 Hz, 5.0 VA/60 Hz
Holding 3.4 VA/50 Hz, 2.3 VA/60 Hz

Power consumption (DC) (Note)
W/o indicator light 1.8W
W/ indicator light 2W

Caution

Piping and other usage are the same as standard products.

Dimensions

VP3145-DZA1-X81

JIS Symbol

-X80

-X81

Note 1) This solenoid valve requires lubrication. Use turbine oil Class 1 (ISO VG32).

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)

- When B spec. of -X81 (N.O. spec.), VF3140 solenoid has to be positioned at left, when looking at the EXH port in the front face.
- In the case of -X80, VF3240-DZA1-X81 (Pilot valve) will be mounted.

Series VP3145/3165/3185

Specifications

Type of actuation
External pilot 3 port solenoid valve

Fluid
Air

Operating pressure range
–101.2 kPa to 0.8 MPa

Pilot pressure
85 to 115% of main pressure, Min. 0.2 MPa

Ambient and fluid temperature
0 to 50 °C (No freezing)

Lubrication
Required (Equivalent to turbine oil Class 1 ISO VG32)

Mounting orientation
Unrestricted

Impact/Vibration resistance
150/50 m/s²

Solenoid Specifications

Electrical entry
Grommet, Grommet terminal, Conduit terminal
DIN terminal, L plug connector, M plug connector

Coil rated voltage (V)
AC (50/60 Hz) 100, 200, 110°, 220°, 240°

Allowable voltage fluctuation
–15 to 10%

Apparent power (AC) (Note)
Inrush 5.6 VA/50 Hz, 5.0 VA/60 Hz
Holding 3.4 VA/50 Hz, 2.3 VA/60 Hz

Power consumption (DC) (Note)
W/o indicator light 1.8W
W/ indicator light 2W

Caution

Piping and other usage are the same as standard products.

Dimensions

VP3145-DZA1-X81

JIS Symbol

-X80

-X81

Note 1) This solenoid valve requires lubrication. Use turbine oil Class 1 (ISO VG32).

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)

- When B spec. of -X81 (N.O. spec.), VF3140 solenoid has to be positioned at left, when looking at the EXH port in the front face.
- In the case of -X80, VF3240-DZA1-X81 (Pilot valve) will be mounted.
Large Size 3 Port Solenoid Valve  

**Series VP3145/3165/3185**

### Dimensions

**VP3165-DZA1-X81**

- When B spec. of -X81 (N.O. spec.), VF3140 solenoid has to be positioned at left, when looking at the EXH port in the front face.
- In the case of -X80, VF3240-P (Pilot valve) will be mounted.

**VP3185-DZA1-X81**

- When B spec. of -X81 (N.O. spec.), VF3140 solenoid has to be positioned at left, when looking at the EXH port in the front face.
- In the case of -X80, VF3240-P (Pilot valve) will be mounted.
**Caution**

**Piping**
If supply port air pressure drops to less than 0.2 MPa, the valve may malfunction. In such a case, use external pilot type. (When throttling IN port, or operating with OUT port open to the atmosphere or in a similar operation.)

**Pressure balance among each port**
This solenoid valve is pressure-unbalanced type. Operate it within this pressure range: \(\text{IN} \geq \text{OUT} \geq \text{EXH}\). If not operated in the range, the valve will malfunction.

**Use as 2 port valve**
1. Plug EXH port in case of pressure-in and plug IN port in case of vacuum use.
2. This valve has slight air leakage and cannot be used for such purposes as holding air pressure (including vacuum) in the pressure container.

**Supply air**
Install an air filter and a lubricator on the upstream side.

**Lubrication**
This solenoid valve requires lubrication. Use turbine oil Class 1 (ISO VG32). Besides that, for brands of each manufacturer, refer to page 6.

**Environment**
If using the valve in a dusty environment, install a silencer at EXH port and PE port to prevent dust from entering.

**N.C./N.O. conversion**
When changing the direction of a switching plate to convert from N.C. to N.O. and vice versa, note that the equipment to be connected will act reversely.

**How to Calculate the Flow Rate**
For obtaining the flow rate, refer to front matters 44 to 47.

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**Light/Surge Voltage Suppressor**

<table>
<thead>
<tr>
<th>Grommet (G)</th>
<th>Conduit terminal (T)</th>
<th>DIN terminal (D)</th>
</tr>
</thead>
<tbody>
<tr>
<td>With indicator light (L)</td>
<td>None</td>
<td>Neon bulb</td>
</tr>
<tr>
<td>Surge voltage suppressor (S)</td>
<td>Varistor</td>
<td>48 VDC or less</td>
</tr>
<tr>
<td>With light/surge voltage suppressor (Z)</td>
<td>None</td>
<td>100 VAC or more</td>
</tr>
</tbody>
</table>

*Items that are marked "With indicator light," "With surge voltage suppressors," and "With light/surge voltage suppressor" are all non-polar types.*

**How to Use DIN Terminal**

1. **Disassembly**
   1. After loosening the screw (1), then if the housing (4) is pulled in the direction of the screw, the connector will be removed from the body of equipment (solenoid, etc.).
   2. Pull out the screw (1), then remove the gasket (2a) or (2b).
   3. On the bottom part of the terminal block (3), there's a cut-off part (indication of an arrow) (3a). If a small flat head screwdriver is inserted between the opening in the bottom, terminal block (3) will be removed from the cover (4). (Refer to the figure below.)
   4. Remove the cable gland (5) and plain washer (6) and rubber seal (7).

2. **Wiring**
   1. Pass them through the cable (8) in the order of cable ground (5), washer (6), rubber seal (7), and then insert into the housing (4).
   2. Dimensions of the cable (8) are the figure as below. Skin the cable and crimp the cramped terminal (9) to the edges.
   3. Remove the screw with washer (3e) from the bracket (3e). (Loosen in the case of Y-shape type terminal.) As shown in the below figure, mount a crimped terminal (9), and then again tighten the screw (3e). Note) Tighten within the tightening torque of 0.5 N-m ±15%.

   **Note**
   a) It is possible to wire even in the state of bare wire. In that case, loosen the screw with washer (3e) and place a lead wire (3d) into the bracket, and then tighten it once again.
   b) Maximum size of cramped terminal (9) is up to 1.25 mm² —3.5 when O terminal. For Y terminal, it is up to 1.25 mm² —4.
   c) Cable (8) external: 6 to 12 mm ø

   **Note** For the one with the external dimension ranged between 9 to 12 mm ø, remove the inside parts of the rubber seal (7) before using.

3. **Assembly**
   1. Terminal block (3) connected with housing (4) should be reinstated. (Push it down until you hear the click sound.)
   2. Putting rubber seal (7), plain washer (6), in this order into the cable introducing slit on the housing (4), then further tighten the cable gland (5) securely.
   3. By inserting gasket (2a) or (2b) between the bottom part of the terminal block (3) and a plug on an equipment, screw in (1) on top of the housing (4) and tighten it.

   **Note** Tighten within the tightening torque of 0.5 N-m ±20%.

   **Note** The orientation of a connector can be changed arbitrarily, depending on the combination of a housing (4) and a terminal block (3).