3 Port Solenoid Valve

**Reduced power consumption:**

- **0.55 W** [With power saving circuit]
- **1.55 W** [Standard]

(Conventional: 2.0 W)  

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.

- 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)  

- **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.

- Rubber material: HNBR
  - Ozone-resistant specification

  ∗ The pilot valve poppet is made of FKM.

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

- **Series VP300/500/700**

RoHS compliant

CAT.ES11-97A
## 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</td>
<td>Non-locking push type</td>
</tr>
<tr>
<td>VP500</td>
<td>8.9</td>
<td>N.O.</td>
<td>1/4</td>
<td>24 VDC</td>
<td></td>
<td>With surge voltage suppressor</td>
<td></td>
</tr>
<tr>
<td>VP700</td>
<td>15.3</td>
<td>External pilot N.C./N.O.</td>
<td>3/8</td>
<td>100 VAC</td>
<td>DIN (EN1753 01-403) terminal</td>
<td>With light/surge voltage suppressor</td>
<td></td>
</tr>
<tr>
<td>VP300</td>
<td>3.8</td>
<td>Internal pilot N.C.</td>
<td>1/8</td>
<td>110 VAC</td>
<td></td>
<td>With surge voltage suppressor</td>
<td></td>
</tr>
<tr>
<td>VP500</td>
<td>8.8</td>
<td>N.O.</td>
<td>1/4</td>
<td>220 VAC</td>
<td></td>
<td>With light/surge voltage suppressor (Non-polar)</td>
<td></td>
</tr>
<tr>
<td>VP700</td>
<td>15.0</td>
<td>N.O.</td>
<td>3/8</td>
<td>240 VAC</td>
<td></td>
<td>With light/surge voltage suppressor</td>
<td></td>
</tr>
</tbody>
</table>

**Port size**
- 1/8
- 1/4
- 3/8
- 1/2

**Features**

1. VP-A.qxd 08.12.8 10:44 AM Page F1
## 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</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>

**Features 2**

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

---

**VP-A.qxd  08.12.8 10:45 AM  Page F2**
### Series VPA300/500/700

#### Model Selection by Operating Conditions

**Air Operated 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>VPA300</td>
<td>4.2</td>
<td>N.C.</td>
<td>1/8</td>
<td>1/4</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>3/8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VPA700</td>
<td>15.3</td>
<td>For vacuum N.C./N.O.</td>
<td>3/8</td>
<td>1/2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VPA300</td>
<td>3.8</td>
<td>N.C.</td>
<td>1/8</td>
<td>1/4</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>3/8</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>1/2</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**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</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>3(R) port 1/4</td>
<td>1(P) port 1/4</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2(A) port 1/4</td>
<td></td>
</tr>
<tr>
<td>VPA300</td>
<td>Individual EXH</td>
<td>VV3PA3-42</td>
<td>2 to 20 stations</td>
</tr>
<tr>
<td></td>
<td>3(R) port 1/4</td>
<td>1(P) port 1/4</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2(A) port 1/4</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>3(R) port 1/4</td>
<td>1(P) port 1/4</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2(A) port 1/4</td>
<td></td>
</tr>
<tr>
<td>VPA500</td>
<td>Individual EXH</td>
<td>VV3PA5-42</td>
<td>2 to 20 stations</td>
</tr>
<tr>
<td></td>
<td>3(R) port 1/4</td>
<td>1(P) port 1/4</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2(A) port 1/4</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>3(R) port 1/2</td>
<td>1(P) port 1/2</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2(A) port 1/2</td>
<td></td>
</tr>
<tr>
<td>VPA700</td>
<td>Individual EXH</td>
<td>VV3PA7-42</td>
<td>2 to 20 stations</td>
</tr>
<tr>
<td></td>
<td>3(R) port 1/2</td>
<td>1(P) port 1/2</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2(A) port 1/2</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**
### How to Order

**Series VP300/500/700**

**Rubber Seal**

3 Port/Pilot Poppet Type

Body Ported/Single Unit

#### Body ported

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

#### Pilot type

- **Internal pilot**
- **External pilot**

#### Pressure specification

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

#### Coil specification

<table>
<thead>
<tr>
<th>Nil</th>
<th>T</th>
<th>With power saving circuit (DC only)</th>
</tr>
</thead>
</table>

#### Rated voltage

- **DC**
  - 24 VDC
  - 12 VDC
- **AC (50/60 Hz)**
  - 100 VAC
  - 200 VAC
  - 110 VAC (115 VAC)
  - 220 VAC (230 VAC)
  - 240 VAC (280 VAC)

#### Electrical entry

- **Grommet**
  - **G**: Lead wire length 300 mm
  - **H**: Lead wire length 600 mm
- **L-type plug connector**
  - **L**: With lead wire length 300 mm
  - **M**: Without lead wire length 300 mm
- **M-type plug connector**
  - **M**: With lead wire length 300 mm
  - **N**: Without lead wire length 300 mm
- **IP55 compatible**
  - **D**: With connector
  - **T**: With connector
  - **Y**: Without connector

#### Made to Order

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

#### Manual override

- **D**: Push-turn locking slotted type
- **E**: Push-turn locking lever type

#### Light/surge voltage suppressor

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

**Note:**

- For AC mode, there is no S option available.
- In the DIN terminal type, a light is installed in the connector, DOZ, DOU, YOZ, YOU are not available.

#### Caution

When using the surge voltage suppressor type, residual voltage will remain. Refer to back page 7 for details.

---

**Approved**

**CE compliant**

**DC**

**AC**
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>
<tr>
<td>Internal pilot</td>
<td>Standard</td>
</tr>
<tr>
<td>Operating pressure range (MPa)</td>
<td>0.2 to 0.7</td>
</tr>
<tr>
<td>High-pressure type</td>
<td>0.2 to 1.0</td>
</tr>
<tr>
<td>External pilot</td>
<td>Standard</td>
</tr>
<tr>
<td>Operating pressure range (MPa)</td>
<td>–100 kPa to 0.7</td>
</tr>
<tr>
<td>High-pressure type</td>
<td>–100 kPa to 1.0</td>
</tr>
<tr>
<td>Pilot pressure range</td>
<td>Same as operating pressure (Min. 0.2 MPa)</td>
</tr>
<tr>
<td>Ambient and fluid temperature (°C)</td>
<td>–10 to 50 (No freezing)</td>
</tr>
<tr>
<td>Max. operating frequency (Hz)</td>
<td>5</td>
</tr>
</tbody>
</table>

Manual override
Non-locking push type
Push-turn locking slotted type
Push-turn locking lever type

Pilot exhaust type
Individual exhaust

Mounting orientation
Unrestricted

Impact/Vibration resistance (m/s²)(NpH)
300/50

Enclosure
Dual light (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 (24VDC) 24, 12 AC (50/60 Hz) 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 (Standard 1.5 (With light: 1.55), 1.5 (With light: 1.75) With surge voltage suppressor 0.55 (With light only), 0.75 (With light only))</td>
</tr>
<tr>
<td>Apparent power (VA)</td>
<td>AC (155 (With light: 1.65), 1.55 (With light: 1.7))</td>
</tr>
</tbody>
</table>

Surge voltage suppressor:
Diode (Non-polar type: Varistor)

Indicator light:
LED (Neon bulb is used for AC mode of D, Y, T)

- 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 0.3 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>S, Z type</td>
<td>R, U type</td>
</tr>
<tr>
<td>VP342</td>
<td>Standard (0.2 to 0.7) 13 or less</td>
<td>38 or less</td>
</tr>
<tr>
<td></td>
<td>High-pressure type (0.2 to 1.0) 17 or less</td>
<td>42 or less</td>
</tr>
<tr>
<td>VP542</td>
<td>Standard (0.2 to 0.7) 14 or less</td>
<td>39 or less</td>
</tr>
<tr>
<td></td>
<td>High-pressure type (0.2 to 1.0) 18 or less</td>
<td>43 or less</td>
</tr>
<tr>
<td>VP742</td>
<td>Standard (0.2 to 0.7) 19 or less</td>
<td>44 or less</td>
</tr>
<tr>
<td></td>
<td>High-pressure type (0.2 to 1.0) 22 or less</td>
<td>47 or less</td>
</tr>
</tbody>
</table>

Note) Based on dynamic performance test, JIS B 8375-1981. (Coil temperature: 20°C, at rated voltage)
Series VP300/500/700

Flow Characteristics/Mass

<table>
<thead>
<tr>
<th>Model</th>
<th>Port size</th>
<th>1 ↔ 2 (P ↔ A)</th>
<th>2 ↔ 3 (A ↔ R)</th>
<th>Mass (g) Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>VP342</td>
<td>1/8</td>
<td>3.5 0.26 0.8</td>
<td>3.6 0.26 0.9</td>
<td>149 185</td>
</tr>
<tr>
<td>VP542</td>
<td>1/4</td>
<td>4.2 0.22 1.0</td>
<td>4.2 0.23 1.0</td>
<td>146 181</td>
</tr>
<tr>
<td>VP742</td>
<td>3/8</td>
<td>8.9 0.16 2.2</td>
<td>8.9 0.20 2.1</td>
<td>241 277</td>
</tr>
<tr>
<td></td>
<td>1/2</td>
<td>11.9 0.21 2.7</td>
<td>11.8 0.20 2.7</td>
<td>484 520</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
(8) 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></td>
<td>1(P) 2(A) 3(R)</td>
</tr>
<tr>
<td>External pilot</td>
<td></td>
<td>1(P) 2(A) 3(R)</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>

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>

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></td>
<td>VP542</td>
<td>VP500-227-1A</td>
</tr>
<tr>
<td></td>
<td>VP742</td>
<td>VP700-227-1A</td>
</tr>
</tbody>
</table>
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□□□ 5G Z □□□
- Select from the below in accordance with the valve used.

Grommet or L/M-type

V 2 1 1 5G Z 1

DIN or Conduit type

V 2 1 2 5G Z

Light/surge voltage suppressor

<table>
<thead>
<tr>
<th>DC</th>
<th>AC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nil Without light/surge voltage suppressor</td>
<td>○</td>
</tr>
<tr>
<td>S  With surge voltage suppressor</td>
<td>○</td>
</tr>
<tr>
<td>Z  With light/surge voltage suppressor</td>
<td>○</td>
</tr>
<tr>
<td>U  With surge voltage suppressor</td>
<td>—</td>
</tr>
</tbody>
</table>

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 7 for details.

Electrical entry

<table>
<thead>
<tr>
<th>G</th>
<th>Grommet (Lead wire length 300 mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>L</td>
<td>Grommet (Lead wire length 600 mm)</td>
</tr>
<tr>
<td>L</td>
<td>With lead wire</td>
</tr>
<tr>
<td>LN</td>
<td>Without lead wire</td>
</tr>
<tr>
<td>LO</td>
<td>Without connector</td>
</tr>
<tr>
<td>M</td>
<td>M-type plug connector</td>
</tr>
<tr>
<td>MN</td>
<td>With lead wire</td>
</tr>
<tr>
<td>MO</td>
<td>Without lead wire</td>
</tr>
<tr>
<td>LN</td>
<td>Without connector</td>
</tr>
</tbody>
</table>

Note: LN and MN types are with 2 sockets.

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

Series VP300/Body Ported/Dimensions

Grommet (G)

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/Body Ported/Dimensions

Grommet (G)

Approx. 300 (Lead wire length)

Max. 10

Applicable cable O.D. ø4.5 to ø7

Grommet (G)
DC without light/surge voltage suppressor

External pilot port (External pilot specification: R)

Manual preset

2 x ø4.2 (For mounting)

2 x ø4.2 (For mounting)

Applicable cable O.D. ø4.5 to ø7

Grommet (G)

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

Grommet (G)

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/8, 1/2</td>
<td>External pilot port (External pilot specification: R)</td>
</tr>
<tr>
<td>2 x ø5.2</td>
<td>(For mounting)</td>
</tr>
<tr>
<td>ø4.5 to ø7</td>
<td>Applicable cable O.D.</td>
</tr>
<tr>
<td>2(A) port</td>
<td></td>
</tr>
<tr>
<td>107.5</td>
<td></td>
</tr>
<tr>
<td>3/8, 1/2</td>
<td>PE port</td>
</tr>
<tr>
<td>2 x ø5.2</td>
<td>(For mounting)</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).
# Rubber Seal

## 3 Port/Pilot Poppet Type

### Base Mounted/Single Unit

### Series VP300/500/700

### How to Order

<table>
<thead>
<tr>
<th>Base mounted</th>
<th>VP 3 4 4</th>
<th>Pilot type</th>
<th>5G</th>
<th>1 A</th>
</tr>
</thead>
</table>

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

#### Thread type
- **Nil**: F, G, NPT, NPTF
- **R**: Rc

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

<table>
<thead>
<tr>
<th>Electrical entry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grommet</td>
</tr>
<tr>
<td>G: Lead wire</td>
</tr>
<tr>
<td>H: Lead wire</td>
</tr>
<tr>
<td>L: With lead wire</td>
</tr>
<tr>
<td>M: Without leadwire</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Port size (Sub-plate)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Symbol</td>
</tr>
<tr>
<td>Port size</td>
</tr>
<tr>
<td>VP300</td>
</tr>
<tr>
<td>VP500</td>
</tr>
<tr>
<td>VP700</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pressure specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nil: Standard (0.7 MPa)</td>
</tr>
<tr>
<td>T: High pressure type (1.0 MPa)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Rated voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>DC</td>
</tr>
<tr>
<td>12 VDC</td>
</tr>
<tr>
<td>12 VDC</td>
</tr>
<tr>
<td>100 VAC</td>
</tr>
<tr>
<td>200 VAC</td>
</tr>
<tr>
<td>110 VAC (115 VAC)</td>
</tr>
<tr>
<td>220 VAC (230 VAC)</td>
</tr>
<tr>
<td>240 VAC</td>
</tr>
</tbody>
</table>

#### Coil specification
- **Nil**: With power saving circuit (DC only)
- **T**: Power saving circuit (AC only)

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

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

### Caution
- When using the surge voltage suppressor type, residual voltage will remain. Refer to back page 7 for details.

---

* Note) Only DIN and conduit terminal types are available for AC mode. Refer to the electrical entry for details.
Series VP300/500/700

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.
- Refer to back page 8 for changing the type of actuation.
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
• If manifold, external pilot piping can be centralized in manifold base.

Specifications

<table>
<thead>
<tr>
<th>Fluid</th>
<th>Type of actuation</th>
<th>Air</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Internal pilot</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Operating pressure range (MPa)</td>
<td>Standard - 0.2 to 0.7</td>
</tr>
<tr>
<td></td>
<td>High-pressure type</td>
<td>Standard - 0.2 to 1.0</td>
</tr>
<tr>
<td></td>
<td>External pilot</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Operating pressure range (MPa)</td>
<td>Standard -100 kPa to 0.7</td>
</tr>
<tr>
<td></td>
<td>High-pressure type</td>
<td>Same as operating pressure (Min. 0.2 MPa)</td>
</tr>
<tr>
<td></td>
<td>Pilot pressure range</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ambient and fluid temperature (°C)</td>
<td>–10 to 50 (No freezing)</td>
</tr>
<tr>
<td></td>
<td>Max. operating frequency (Hz)</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Manual override</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pilot exhaust type</td>
<td>Individual exhaust</td>
</tr>
<tr>
<td></td>
<td>Mounting orientation</td>
<td>Unrestricted</td>
</tr>
<tr>
<td></td>
<td>Impact/Vibration resistance (m/s²)</td>
<td>300/50</td>
</tr>
</tbody>
</table>

Solenoid Specifications

| Electrical entry | Grommet (G), (H) M-type plug connector (M) L type plug connector (L) |
|------------------|-----------------|-----------------|-----------------|
| Coll rated voltage (V) | DC | 24, 12 |
|                   | AC (50/60 Hz) | 100, 110, 200, 220, 240 |
| Allowable voltage fluctuation | ≤10% of rated voltage |
| Power consumption (W) | DC | 0.55 (With light only) 0.75 (With light only) |
|                     | AC | 1.55 (With light: 1.65) 1.55 (With light: 1.7) |

<table>
<thead>
<tr>
<th>Surge voltage suppressor</th>
<th>Diode (Non-polar type: Varistor)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indicator light</td>
<td>LED (Neon bulb is used for AC mode of D, Y, T.)</td>
</tr>
</tbody>
</table>

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>VP344</td>
<td>Standard (0.2 to 0.7)</td>
<td>With light/surge voltage suppressor 13 or less 39 or less 16 or less 38 or less</td>
</tr>
<tr>
<td></td>
<td>High-pressure type (0.2 to 1.0)</td>
<td>17 or less 42 or less 20 or less 42 or less</td>
</tr>
<tr>
<td>VP544</td>
<td>Standard (0.2 to 0.7)</td>
<td>With light/surge voltage suppressor 14 or less 39 or less 17 or less 39 or less</td>
</tr>
<tr>
<td></td>
<td>High-pressure type (0.2 to 1.0)</td>
<td>18 or less 43 or less 21 or less 43 or less</td>
</tr>
<tr>
<td>VP744</td>
<td>Standard (0.2 to 0.7)</td>
<td>Without light/surge voltage suppressor 19 or less 44 or less 22 or less 44 or less</td>
</tr>
<tr>
<td></td>
<td>High-pressure type (0.2 to 1.0)</td>
<td>22 or less 47 or less 25 or less 47 or less</td>
</tr>
</tbody>
</table>

Notes:
- Based on dynamic performance test, JIS B 8375-1981. (Coil temperature: 20°C, at rated voltage)
### Application Example

#### (1) Blow-off valve

X port

N.C.  

External pilot

![Diagram of blow-off valve](image1)

#### (2) Pressure release valve

X port

External pilot

![Diagram of pressure release valve](image2)

#### (3) Selector valve

X port

External pilot

![Diagram of selector valve](image3)

#### (4) Valve for vacuum

X port

Vacuum pump

Vacuum pad

![Diagram of valve for vacuum](image4)

#### (5) Divider valve

X port

External pilot

![Diagram of divider valve](image5)

#### (6) Single-acting cylinder drive

X port

N.O.

![Diagram of single-acting cylinder drive](image6)

#### (7) Double-acting cylinder drive (Exhaust center)

N.C.

N.O.

![Diagram of double-acting cylinder drive](image7)

### Construction

#### Base mounted

**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><img src="image8" alt="Diagram of JIS symbol" /></td>
<td><img src="image9" alt="Diagram of JIS symbol" /></td>
</tr>
<tr>
<td>External pilot</td>
<td><img src="image10" alt="Diagram of JIS symbol" /></td>
<td><img src="image11" alt="Diagram of JIS 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>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>

### 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 11</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Gasket</td>
<td>VP300-217-1, VP500-217-1, VP700-217-1</td>
<td>HNBR</td>
</tr>
<tr>
<td>10</td>
<td>Sub-plate</td>
<td>VP500-202-1, VP700-202-1</td>
<td>Aluminum die-casted</td>
</tr>
<tr>
<td>11</td>
<td>Hexagon socket head bolt (1 pc.)</td>
<td>VP300-224-1 (M3 x 36), VP500-224-1 (M4 x 46), VP700-224-1 (M5 x 66)</td>
<td>For valve mounting</td>
</tr>
</tbody>
</table>

### How to Order Sub-plate

**Series**

| 300-202-1 | VP344, VP544, VP744 |

**Thread type**

| 3 | VP344 |
| 5 | VP544 |
| 7 | VP744 |

**Port size**

<table>
<thead>
<tr>
<th>Series</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>VP344</td>
<td>1/8</td>
<td>1/4</td>
</tr>
<tr>
<td>VP544</td>
<td>1/4</td>
<td>3/8</td>
</tr>
<tr>
<td>VP744</td>
<td>3/8</td>
<td></td>
</tr>
</tbody>
</table>

**Tightening Torque of Mounting Screw**

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

**Caution**

<table>
<thead>
<tr>
<th><strong>Note</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>( ) Values without sub-plate</td>
</tr>
</tbody>
</table>

---

**Flow Characteristics/Mass**

<table>
<thead>
<tr>
<th>Model</th>
<th>Port size</th>
<th>1 x 2 (P x A)</th>
<th>2 x 3 (A x R)</th>
</tr>
</thead>
<tbody>
<tr>
<td>VP344</td>
<td>1/8</td>
<td>3.6 0.22 0.8 3.5 0.24 0.8</td>
<td>216 149 252 185</td>
</tr>
<tr>
<td>VP544</td>
<td>1/4</td>
<td>7.5 0.16 1.7 7.3 0.20 1.7</td>
<td>370 245 406 281</td>
</tr>
<tr>
<td>VP744</td>
<td>3/8</td>
<td>12.9 0.10 2.9 13.3 0.24 3.1</td>
<td>676 459 712 495</td>
</tr>
<tr>
<td>VP344</td>
<td>4/8</td>
<td>14.7 0.05 3.3 15.0 0.17 3.4</td>
<td>658 459 694 495</td>
</tr>
</tbody>
</table>

**Note**

- Values without sub-plate

---

**Series VP300/500/700**

**Pilot Poppet Type**

**Base Mounted/Single Unit**
### Series VP300/500/700

#### 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:**

- **Grommet or L/M-type**
  - V211
  - V212

**DIN or Conduit type**

- DIN connector
  - V211
  - V212

#### Pressure specification

- **Nil**
- **K**
  - High pressure type (0.7 MPa)

#### Coil specification

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

**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

#### Light/surge voltage suppressor

<table>
<thead>
<tr>
<th></th>
<th>DC</th>
<th>AC</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Nil</strong></td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td><strong>S</strong></td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td><strong>Z</strong></td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td><strong>U</strong></td>
<td>O</td>
<td>O</td>
</tr>
</tbody>
</table>

**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 7 for details.

#### Electrical entry

- **G**
  - Grommet (Lead wire length 300 mm)
- **H**
  - Grommet (Lead wire length 600 mm)
- **L**
  - L-type plug connector
- **LN**
  - L-type plug connector
- **LO**
  - L-type plug connector
- **M**
  - M-type plug connector
- **MN**
  - M-type plug connector
- **MO**
  - M-type plug connector

**Note:** LN and MN types are with 2 sockets.
*LN and MN types are with 2 sockets.
*Refer to back page 4 when different length of lead wire for L/M-type plug connector is required.

#### Rated voltage

**DC**
- 5 V DC
- 12 V DC

**AC (50/60 Hz)**
- 100 V AC
- 200 V AC
- 110 V AC (115 V AC)
- 220 V AC (230 V AC)
- 240 V AC

**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 7 for details.

**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
Pilot Poppet Type
Base Mounted/Single Unit  Series VP300/500/700

Series VP300/Base Mounted/Dimensions

Grommet (G)

L-type plug connector (L)

M-type plug connector (M)

DIN terminal (D, Y)

Conduit terminal (T)

Approved

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

Series VP500/Base Mounted/Dimensions

Grommet (G)

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 VP700/Base Mounted/Dimensions

Grommet (G)

Approx. 300 (Lead wire length)

DC without light/surge voltage suppressor

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

**Type 41/Common exhaust**

**VV3P**  
- Series: VP300/VP500/VP700  
- Pilot type: Internal pilot R, External pilot  
- Thread type: Nil, Rc, F, N, G, T, NPT, NPTF  
- Port size: 1/4, 3/8, 1/2  
- Stations: 02, 20  
- Symbol Port size Applicable series  
  - 1/4: VP300  
  - 3/8: VP500  
  - 1/2: VP700

**Note:** When the external pilot type manifold is selected, external pilot type valves are mounted.

**Type 42/Individual exhaust**

**VV3P**  
- Series: VP300/VP500/VP700  
- Pilot type: Internal pilot R, External pilot  
- Thread type: Nil, Rc, F, N, G, T, NPT, NPTF  
- Port size: 1/4, 3/8, 1/2  
- Stations: 02, 20  
- Symbol Port size Applicable series  
  - 1/4: VP300  
  - 3/8: VP500  
  - 1/2: VP700

**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 - 5 G 1 A

#### Series
- VP300
- VP500
- 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
- DC
- AC
- Nil: Without light/surge voltage suppressor
- S: With surge voltage suppressor
- Z: With light/surge voltage suppressor
- R: With light/surge voltage suppressor (Non-polar)
- U: With light/surge voltage suppressor (Non-polar)

#### Note)
- There is no S option for AC mode, since a rectifier prevents surge voltage generation.
- In the DIN terminal type, since a light is installed in the connector, DOZ, DOU, YOZ, YOU are not available.

### Caution

When using the surge voltage suppressor type, residual voltage will remain. Refer to back page 7 for details.

#### Made to Order

<table>
<thead>
<tr>
<th>Made to Order</th>
<th>Made to Order</th>
<th>Made to Order</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nil</td>
<td>X500</td>
<td>X500</td>
</tr>
</tbody>
</table>

#### Electrical entry

<table>
<thead>
<tr>
<th>Type</th>
<th>DC Specification</th>
<th>AC Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>L: Lead wire length 300 mm</td>
<td>Made to Order</td>
<td>Made to Order</td>
</tr>
<tr>
<td>L: Lead wire length 600 mm</td>
<td>Made to Order</td>
<td>Made to Order</td>
</tr>
<tr>
<td>M: Lead wire length 300 mm</td>
<td>Made to Order</td>
<td>Made to Order</td>
</tr>
<tr>
<td>M: Lead wire length 600 mm</td>
<td>Made to Order</td>
<td>Made to Order</td>
</tr>
<tr>
<td>M: With lead wire</td>
<td>Made to Order</td>
<td>Made to Order</td>
</tr>
<tr>
<td>M: Without lead wire</td>
<td>Made to Order</td>
<td>Made to Order</td>
</tr>
<tr>
<td>N: Without light/surge voltage suppressor</td>
<td>Made to Order</td>
<td>Made to Order</td>
</tr>
<tr>
<td>N: Without connector</td>
<td>Made to Order</td>
<td>Made to Order</td>
</tr>
<tr>
<td>N: Without connector</td>
<td>Made to Order</td>
<td>Made to Order</td>
</tr>
<tr>
<td>N: Without light/surge voltage suppressor</td>
<td>Made to Order</td>
<td>Made to Order</td>
</tr>
<tr>
<td>O: Lead wire length 300 mm</td>
<td>Made to Order</td>
<td>Made to Order</td>
</tr>
<tr>
<td>O: Lead wire length 600 mm</td>
<td>Made to Order</td>
<td>Made to Order</td>
</tr>
<tr>
<td>O: With connector</td>
<td>Made to Order</td>
<td>Made to Order</td>
</tr>
<tr>
<td>O: Without connector</td>
<td>Made to Order</td>
<td>Made to Order</td>
</tr>
<tr>
<td>O: Without connector</td>
<td>Made to Order</td>
<td>Made to Order</td>
</tr>
<tr>
<td>O: With light/surge voltage suppressor</td>
<td>Made to Order</td>
<td>Made to Order</td>
</tr>
<tr>
<td>P: With connector</td>
<td>Made to Order</td>
<td>Made to Order</td>
</tr>
<tr>
<td>P: Without connector</td>
<td>Made to Order</td>
<td>Made to Order</td>
</tr>
<tr>
<td>Q: With connector</td>
<td>Made to Order</td>
<td>Made to Order</td>
</tr>
<tr>
<td>Q: Without connector</td>
<td>Made to Order</td>
<td>Made to Order</td>
</tr>
<tr>
<td>Q: Without connector</td>
<td>Made to Order</td>
<td>Made to Order</td>
</tr>
<tr>
<td>Q: Without connector</td>
<td>Made to Order</td>
<td>Made to Order</td>
</tr>
</tbody>
</table>

#### Note)
- LN and MN types are with 2 sockets.
- In the DIN terminal type, since a light is installed in the connector, DOZ, DOU, YOZ, YOU are not available.

---

*CE compliant*
**Series VP300/500/700**

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 8 for changing the type of actuation.

**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 Mass: W [g]</th>
<th>Stations: n</th>
</tr>
</thead>
<tbody>
<tr>
<td>VP300</td>
<td>VV3P3-41</td>
<td>Common 1/4</td>
<td>VP344</td>
<td>2 to 20 stations</td>
<td>W = 110n + 90</td>
<td></td>
</tr>
<tr>
<td></td>
<td>VV3P3-42</td>
<td>Individual 3/8</td>
<td>VP544</td>
<td>2 to 20 stations</td>
<td>W = 190n + 150</td>
<td></td>
</tr>
<tr>
<td>VP500</td>
<td>VV3P5-41</td>
<td>Common 1/2</td>
<td>VP744</td>
<td>2 to 20 stations</td>
<td>W = 410n + 380</td>
<td></td>
</tr>
<tr>
<td></td>
<td>VV3P5-42</td>
<td>Individual 1/2</td>
<td>VP744</td>
<td>2 to 20 stations</td>
<td>W = 410n + 380</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 (With a gasket and two mounting bolts)</td>
<td>VP300-25-1A</td>
<td>VP3P3</td>
</tr>
<tr>
<td></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)

Ordering example (VV3P3-41)

---

The asterisk denotes the symbol for assembly.
Prefix it to the part nos. of the solenoid 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 VP300/Dimensions

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

Grommet (G)

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

PE port
∗(ø3.8)

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 VP300/Dimensions**

Type 42/Individual exhaust: VV3P3-42

Grommet (G)

- 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 VP500/Dimensions

Type 41/Common exhaust: VV3P5-41[Stations]1-03

Grommet (G)

- M5 x 0.8
- Common external pilot port
- (External pilot specification: R)
- PE port: ø3.8
- Refer to page 24 separately when piping to PE port is required.

**Grommet (G)**

DC without light/surge voltage suppressor

<table>
<thead>
<tr>
<th>Stations</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<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</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1</td>
<td>95</td>
<td>128</td>
<td>161</td>
<td>194</td>
<td>227</td>
<td>260</td>
<td>293</td>
<td>326</td>
<td>359</td>
<td>392</td>
<td>425</td>
<td>458</td>
<td>491</td>
<td>524</td>
<td>557</td>
<td>590</td>
<td>623</td>
<td>656</td>
<td>689</td>
<td></td>
</tr>
<tr>
<td>L2</td>
<td>82</td>
<td>115</td>
<td>146</td>
<td>178</td>
<td>212</td>
<td>248</td>
<td>284</td>
<td>320</td>
<td>356</td>
<td>392</td>
<td>428</td>
<td>465</td>
<td>503</td>
<td>541</td>
<td>579</td>
<td>614</td>
<td>650</td>
<td>686</td>
<td>724</td>
<td></td>
</tr>
</tbody>
</table>

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

Approx. 300 (Lead wire length)

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

Approx. 300

**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).
Series VP300/500/700

Series VP500/Dimensions

Type 42/Individual exhaust: VV3P5-42–Stations3-03

Grommet (G)

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

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

Grommet (G)
DC without light/surge voltage suppressor

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

Series VP700/Dimensions

Type 42/Individual exhaust: VV3P7-42

Grommet (G)

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

Grommet (G)
DC without light/surge voltage suppressor

Unless otherwise indicated, dimensions are the same as Grommet (G).
1 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\(_{3\frac{3}{4}}\) 4\(_{\frac{5}{4}}\) X500

Entry is the same as standard products.
The specifications, performance and external dimensions are the same as those of standard models.
3 Port/Air Operated Valve
Body Ported/Single Unit

Series VPA300/500/700

How to Order

VPA[3][4][2]–1[01][A]

Body option
- Nil
- V (Standard)
- For vacuum

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

Thread type
- R (Rc)
- N (NPT)
- F (NPTF)

Port size
- 01: 1/8
- 02: 1/4
- 03: 3/8
- 04: 1/2

Note: Values without brackets

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>
<tr>
<td>Operating pressure range (MPa)</td>
<td>Standard 0.2 to 1.0</td>
</tr>
<tr>
<td>For vacuum</td>
<td>−100 kPa to 0.2</td>
</tr>
<tr>
<td>Pilot pressure (MPa)</td>
<td>0.2 to 1.0 (Equivalent to the operating pressure or more)</td>
</tr>
<tr>
<td>Ambient and fluid temperature (°C)</td>
<td>−10 to 50 (No freezing)</td>
</tr>
<tr>
<td>Lubrication</td>
<td>Not required</td>
</tr>
<tr>
<td>Mounting orientation</td>
<td>Unrestricted</td>
</tr>
<tr>
<td>Impact/Vibration resistance (m/s²)</td>
<td>300/50</td>
</tr>
</tbody>
</table>

Flow Characteristics/Mass

<table>
<thead>
<tr>
<th>Model</th>
<th>Port size</th>
<th>1 ↔ 2 (P ↔ A) C [dm³/(s·bar)]</th>
<th>b</th>
<th>Cv</th>
<th>2 ↔ 3 (A ↔ R) C [dm³/(s·bar)]</th>
<th>b</th>
<th>Cv</th>
<th>Mass (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>VPA342</td>
<td>1/8</td>
<td>3.5 0.26 0.8</td>
<td></td>
<td>3.6 0.26 0.9</td>
<td></td>
<td>118</td>
<td></td>
<td></td>
</tr>
<tr>
<td>VPA542</td>
<td>1/4</td>
<td>4.2 0.22 1.0</td>
<td>1.8</td>
<td>4.2 0.23 1.0</td>
<td>1.8</td>
<td>114</td>
<td></td>
<td></td>
</tr>
<tr>
<td>VPA742</td>
<td>3/8</td>
<td>8.9 0.16 2.2</td>
<td>2.2</td>
<td>8.9 0.20 2.1</td>
<td>2.1</td>
<td>227</td>
<td></td>
<td></td>
</tr>
<tr>
<td>VPA742</td>
<td>1/2</td>
<td>11.9 0.21 2.7</td>
<td>2.7</td>
<td>11.8 0.20 2.7</td>
<td>2.7</td>
<td>501</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Values without brackets

Caution

Refer to back pages 1 and 2 for Safety Instructions, “Handling Precautions for SMC Products” (M-E03-3) for Common Precautions.

* Refer to back page 8 for changing the type of actuation.
Air Operated Valve
Body Ported/Single Unit

Series VPA300/500/700

Construction

Standard

JIS symbol

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

For vacuum

![Diagram](image3)

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>Bracket</td>
<td>VPA342</td>
<td>VP300-227-1A</td>
</tr>
<tr>
<td></td>
<td>VPA542</td>
<td>VP500-227-1A</td>
</tr>
<tr>
<td></td>
<td>VPA742</td>
<td>VP700-227-1A</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></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>
Series VPA300/Body Ported/Dimensions

Standard/VPA342-1 \( \frac{1}{8}, \frac{1}{4} \) (-F)

(Mounting groove for M5 thread)

For vacuum/VPA342V-1 \( \frac{1}{8}, \frac{1}{4} \) (-F)

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

Standard/VPA542-1 (-F)

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

Series VPA700/Body Ported/Dimensions

Standard/VPA742-1-03/04/06 (-F)

For vacuum/VPA742V-1-03/04/06 (-F)

(Mounting groove for M6 thread)
**3 Port/Air Operated Valve**
**Base Mounted/Single Unit**

**Series VPA300/500/700**

### How to Order

**VPA 344-1-01 A**

- **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
  - F
  - N
  - T
  - Rc
  - G
  - NPT
  - NPTF

- **Port size (Sub-plate)**
  - 01: 1/8
  - 02: 1/4
  - 03: 3/8
  - 04: 1/2

- **Port size**
  - Without sub-plate:
    - VPA300
    - VPA500
    - VPA700

- **With a gasket and two mounting bolts**

### Specifications

- **Fluid**: Air
- **Type of actuation**: N.C. or N.O. (Convertible)
- **Operating pressure range (MPa)**
  - Standard: 0.2 to 1.0
  - For vacuum: ~100 kPa to 0.2
- **Pilot pressure (MPa)**
  - 0.2 to 1.0 (Equivalent to the operating pressure or more)
- **Ambient and fluid temperature (°C)**
  - ~10 to 50 (No freezing)
- **Lubrication**: Not required
- **Mounting orientation**: Unrestricted
- **Impact/Vibration resistance (m/s²)**
  - 300/50

**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/Mass

<table>
<thead>
<tr>
<th>Model</th>
<th>Port size</th>
<th>1 ↔ 2 (P ↔ A)</th>
<th>2 ↔ 3 (A ↔ R)</th>
<th>Mass (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></td>
<td>1/4</td>
<td>3.9</td>
<td>0.22</td>
<td>0.9</td>
</tr>
<tr>
<td>VPA544</td>
<td>1/4</td>
<td>7.5</td>
<td>0.16</td>
<td>1.7</td>
</tr>
<tr>
<td></td>
<td>3/8</td>
<td>8.8</td>
<td>0.07</td>
<td>2.0</td>
</tr>
<tr>
<td>VPA744</td>
<td>3/8</td>
<td>12.9</td>
<td>0.10</td>
<td>2.9</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:** V: Values without sub-plate

---

**Caution**

Refer to back page 2 for Safety Instructions, “Handling Precautions for SMC Products” (M-E03-3) for Common Precautions.

*Refer to back page 8 for changing the type of actuation.*
Series VPA300/500/700

Construction

<table>
<thead>
<tr>
<th>JIS symbol</th>
<th>N.O.</th>
<th>N.O.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>For vacuum</td>
<td>12</td>
<td>12</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-cast</td>
<td>White</td>
</tr>
<tr>
<td>2</td>
<td>Adapter plate</td>
<td>Aluminum die-cast</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>VP344</td>
<td>HNBR</td>
</tr>
<tr>
<td>9</td>
<td>Sub-plate</td>
<td>VP500-202</td>
<td>Alum. die-cast</td>
</tr>
<tr>
<td></td>
<td>Hexagon socket</td>
<td>VP300-224-1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>head bolt (1 pc.)</td>
<td>(M3 x 36)</td>
<td></td>
</tr>
</tbody>
</table>

How to Order Sub-plate

<table>
<thead>
<tr>
<th>Series</th>
<th>Thread type</th>
<th>Port size</th>
</tr>
</thead>
<tbody>
<tr>
<td>VPA344</td>
<td>NPTF</td>
<td>1/8</td>
</tr>
<tr>
<td>VPA544</td>
<td>NPT</td>
<td>1/4</td>
</tr>
<tr>
<td>VPA744</td>
<td>NPT</td>
<td>3/8</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
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

Approved
Series VPA700/Base Mounted/Dimensions

Standard/VPA744-1

For vacuum/VPA744V-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**
  - NB
  - Rc
  - N
  - NPT
  - F
  - G
  - N
  - NPT
- **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**
  - NB
  - Rc
  - N
  - NPT
  - F
  - G
  - N
  - NPT
- **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</td>
<td>VP300-25-1A</td>
<td>VV3PA3</td>
</tr>
<tr>
<td>(With a gasket and two mounting bolts)</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 34 4 - 1 - A**

<table>
<thead>
<tr>
<th>Series</th>
<th>Type of actuation</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>VPA300</td>
</tr>
<tr>
<td>5</td>
<td>VPA500</td>
</tr>
<tr>
<td>7</td>
<td>VPA700</td>
</tr>
</tbody>
</table>

**Body option**

<table>
<thead>
<tr>
<th>Nil</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>V</td>
<td>For vacuum</td>
</tr>
</tbody>
</table>

**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 Mass: W [g] Stations: n</th>
</tr>
</thead>
<tbody>
<tr>
<td>VPA300</td>
<td>VV3PA3-41</td>
<td>Common 1/4</td>
<td>VPA344</td>
<td>2 to 20 stations</td>
<td>W = 110n + 90</td>
</tr>
<tr>
<td></td>
<td>VV3PA3-42</td>
<td>Individual</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VPA500</td>
<td>VV3PA5-41</td>
<td>Common 3/8</td>
<td>VPA544</td>
<td>2 to 20 stations</td>
<td>W = 190n + 150</td>
</tr>
<tr>
<td></td>
<td>VV3PA5-42</td>
<td>Individual</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VPA700</td>
<td>VV3PA7-41</td>
<td>Common 1/2</td>
<td>VPA744</td>
<td>2 to 20 stations</td>
<td>W = 410n + 380</td>
</tr>
<tr>
<td></td>
<td>VV3PA7-42</td>
<td>Individual</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 8 for changing the type of actuation.

How to Order Manifold Assembly (Example)

**Ordering example (VV3PA3-41)**

1. Indicate the valves to be attached below the manifold part number, in order starting from station 1 as shown in the drawing.
2. The asterisk denotes the symbol for assembly. Prefix it to the part nos. of the valve, etc.
3. Indicate the valves to be attached below the manifold part number, in order starting from station 1 as shown in the drawing.
Series VPA300/500/700

Series VPA300/Dimensions

Type 41/Common exhaust: VV3PA3-41-(Stations)1-02

Type 42/Individual exhaust: VV3PA3-42-(Stations)3-02
Series VPA500/Dimensions

Type 41/Common exhaust: VV3PA5-41- (Stations)1-03

Type 42/Individual exhaust: VV3PA5-42- (Stations)3-03
### Series VPA300/500/700

#### Series VPA700/Dimensions

**Type 41/Common exhaust:** VV3PA7-41-[Stations]-1-04

<table>
<thead>
<tr>
<th>Station</th>
<th>L1</th>
<th>L2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>115</td>
<td>99</td>
</tr>
<tr>
<td>2</td>
<td>156</td>
<td>140</td>
</tr>
<tr>
<td>3</td>
<td>197</td>
<td>181</td>
</tr>
<tr>
<td>4</td>
<td>238</td>
<td>222</td>
</tr>
<tr>
<td>5</td>
<td>289</td>
<td>263</td>
</tr>
<tr>
<td>6</td>
<td>340</td>
<td>304</td>
</tr>
<tr>
<td>7</td>
<td>391</td>
<td>345</td>
</tr>
<tr>
<td>8</td>
<td>443</td>
<td>427</td>
</tr>
<tr>
<td>9</td>
<td>495</td>
<td>468</td>
</tr>
<tr>
<td>10</td>
<td>547</td>
<td>511</td>
</tr>
<tr>
<td>11</td>
<td>600</td>
<td>564</td>
</tr>
<tr>
<td>12</td>
<td>652</td>
<td>616</td>
</tr>
<tr>
<td>13</td>
<td>704</td>
<td>668</td>
</tr>
<tr>
<td>14</td>
<td>757</td>
<td>721</td>
</tr>
<tr>
<td>15</td>
<td>809</td>
<td>773</td>
</tr>
<tr>
<td>16</td>
<td>862</td>
<td>826</td>
</tr>
<tr>
<td>17</td>
<td>915</td>
<td>879</td>
</tr>
<tr>
<td>18</td>
<td>968</td>
<td>932</td>
</tr>
<tr>
<td>19</td>
<td>1021</td>
<td>995</td>
</tr>
</tbody>
</table>

**Type 42/Individual exhaust:** VV3PA7-42-[Stations]-3-04

<table>
<thead>
<tr>
<th>Station</th>
<th>L1</th>
<th>L2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>115</td>
<td>99</td>
</tr>
<tr>
<td>2</td>
<td>156</td>
<td>140</td>
</tr>
<tr>
<td>3</td>
<td>197</td>
<td>181</td>
</tr>
<tr>
<td>4</td>
<td>238</td>
<td>222</td>
</tr>
<tr>
<td>5</td>
<td>289</td>
<td>263</td>
</tr>
<tr>
<td>6</td>
<td>340</td>
<td>304</td>
</tr>
<tr>
<td>7</td>
<td>391</td>
<td>345</td>
</tr>
<tr>
<td>8</td>
<td>443</td>
<td>427</td>
</tr>
<tr>
<td>9</td>
<td>495</td>
<td>468</td>
</tr>
<tr>
<td>10</td>
<td>547</td>
<td>511</td>
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<tr>
<td>11</td>
<td>600</td>
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<tr>
<td>12</td>
<td>652</td>
<td>616</td>
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<td>13</td>
<td>704</td>
<td>668</td>
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<tr>
<td>14</td>
<td>757</td>
<td>721</td>
</tr>
<tr>
<td>15</td>
<td>809</td>
<td>773</td>
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<tr>
<td>16</td>
<td>862</td>
<td>826</td>
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<tr>
<td>17</td>
<td>915</td>
<td>879</td>
</tr>
<tr>
<td>18</td>
<td>968</td>
<td>932</td>
</tr>
<tr>
<td>19</td>
<td>1021</td>
<td>995</td>
</tr>
</tbody>
</table>

**Dimensions:**

- **Type 41/Common exhaust:**
  - N.O.: 107.1 mm
  - N.C.: 51.5 mm
  - 1/2 2(A) port
  - 1/2 3(R) port
  - 2 x ø8.5 (For mounting)
  - N.C./N.O./P = 41

- **Type 42/Individual exhaust:**
  - N.O.: 107.1 mm
  - N.C.: 51.5 mm
  - 1/2 2(A) port
  - 2 x ø8.5 (For mounting)
  - N.C./N.O./P = 41

---

**Approved**
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), Japan Industrial Standards (JIS)*1 and other safety regulations*2.

* 1) ISO 4414: Pneumatic fluid power – General rules relating to systems.
   ISO 4413: Hydraulic fluid power – General rules relating to systems.
   IEC 60204-1: Safety of machinery – Electrical equipment of machines. (Part 1: General requirements)
   JIS B 8370: General rules for pneumatic equipment.
   JIS B 8361: General rules for hydraulic equipment.
   JIS B 9960-1: Safety of machinery – Electrical equipment of machines. (Part 1: General requirements)
   etc.

* 2) Labor Safety and Sanitation Law, etc.

---

**Caution:** Operator error could result in injury or equipment damage.

**Warning:** Operator error could result in serious injury or loss of life.

**Danger:** In extreme conditions, there is a possibility of serious injury or loss of life.

---

**Warning**

1. The compatibility of the product is the responsibility of the person who designs the equipment or decides its specifications.
   Since the product specified here is used under various operating conditions, its compatibility with specific equipment must be decided by the person who designs the equipment or decides its specifications based on necessary analysis and test results. The expected performance and safety assurance of the equipment will be the responsibility of the person who has determined its compatibility with the product. This person should also continuously review all specifications of the product referring to its latest catalog information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.

2. Only personnel with appropriate training should operate machinery and equipment.
   The product specified here may become unsafe if handled incorrectly. The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.

3. Do not service or attempt to remove product and machinery/equipment until safety is confirmed.
   1. The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.
   2. When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.
   3. Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.

4. Contact SMC beforehand and take special consideration of safety measures if the product is to be used in any of the following conditions.
   1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.
   2. Installation on equipment in conjunction with atomic energy, railways, air navigation, space, shipping, vehicles, military, medical treatment, combustion and recreation, or equipment in contact with food and beverages, emergency stop circuits, clutch and brake circuits in press applications, safety equipment or other applications unsuitable for the standard specifications described in the product catalog.
   3. An application which could have negative effects on people, property, or animals requiring special safety analysis.
   4. Use in an interlock circuit, which requires the provision of double interlock for possible failure by using a mechanical protective function, and periodical checks to confirm proper operation.
Safety Instructions

Caution

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. ③
   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.
   ③ Vacuum pads are excluded from this 1 year warranty.
   A vacuum pad is a consumable part, so it is warranted for a year after it is delivered.
   Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty.

Compliance Requirements

When the product is exported, strictly follow the laws required by the Ministry of Economy, Trade and Industry (Foreign Exchange and Foreign Trade Control Law).
How to Use L/M-Type Plug Connector

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 (DC polarity 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.

Approved
Series VP
Specific Product Precautions 2

Be sure to read before handling. Refer to back pages 1 and 2 for Safety Instructions, “Handling Precautions for SMC Products” (M-E03-3) for 3/4/5 Port Solenoid Valves Precautions.

Plug Connector Lead Wire Length

**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>300 mm</th>
<th>1000 mm</th>
<th>1500 mm</th>
<th>2000 mm</th>
<th>2500 mm</th>
<th>3000 mm</th>
<th>5000 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nil</td>
<td>6</td>
<td>10</td>
<td>15</td>
<td>20</td>
<td>25</td>
<td>30</td>
<td>50</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 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 cable sizes carefully because if those out of the specified range (ø4.5 to ø7) are used, it will not be able to satisfy IP65 (enclosure).

**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**

- Make sure not to damage elements, etc., with the lead wires of the cord.

**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.
- Slick terminal: Size 1.5 or shorter

Approved
Series VP
Specific Product Precautions 3

Be sure to read before handling.
Refer to back pages 1 and 2 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 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)
    - Connector specification:
      - D type
      - Y type
    - Rated voltage
      - 01: 100/110 VAC [115 VAC]
      - 02: 200/220 VAC [230 VAC]
      - 07: 240 VAC

Circuit with indicator light (Built-in connector)

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

DC (□□U) circuit

- LED: Light emitting diode
- D: Protective diode
- R: Resistor

DC (□□Z) circuit

How to Use Conduit Terminal

**Caution**

Connection

1) Loosen the set screw and remove the terminal block cover from the terminal block.
2) 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.
3) Secure the cord by fastening the ground nut.

In the case of connecting wires, select cable types 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.

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: Equivalent to R1.25-3 that is specified in JIS C 2805 Y terminal: Equivalent to 1.25-3, which is released by JST Mfg. Co., Ltd.
- Use O terminal when a ground terminal is used.

Back page 5
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.

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.

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

Light/Surge Voltage Suppressor

Caution

- DC:
  Polar type
  With surge voltage suppressor ([JS])
  Polarity protection diode

  Grommet or L/M-type plug connector
  With surge voltage suppressor ([JZ])
  Polarity protection diode

  DIN or Conduit terminal
  With surge voltage suppressor ([JR])
  Polarity protection diode

  Non-polar type
  With surge voltage suppressor ([JR])
  Polarity protection diode

- 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 6
**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.

*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.)*

---

**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.

**Residual Voltage**

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

**Countermeasure for Surge Voltage Intrusion**

With non-polar type solenoid valves, at times of sudden interruption of the loading power supply, such as emergency shutdown, surge voltage intrusion may be generated from loading equipment with a large capacity (power consumption), and 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).

---

**Figure 1. Surge intrusion circuit example (NPN outlet example) (24 VDC)**

**Figure 2. Surge intrusion circuit example (NPN outlet example) (24 VDC)**
### Series VP

**Specific Product Precautions 6**

Be sure to read before handling.
Refer to back pages 1 and 2 for Safety Instructions, “Handling Precautions for SMC Products” (M-E03-3) for 3/4/5 Port Solenoid Valves Precautions.

---

#### Type of Actuation Changing

**Warning**

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**

   ![Diagram of Base Mounted Actuation Changing]

   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**

   ![Diagram of Body Ported Actuation Changing]

   1. 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>Inlet side</td>
<td>Outlet side</td>
<td>Exhaust side</td>
<td></td>
</tr>
<tr>
<td>N.O.</td>
<td>Exhaust side</td>
<td>Outlet side</td>
<td>Inlet side</td>
<td></td>
</tr>
</tbody>
</table>

---

#### One-touch Fittings

**Caution**

When fittings are used, they may interfere with one another depending on their types and sizes. Therefore, the dimensions of the fittings to be used should first be confirmed in their respective catalogs.

Fittings whose compliance with the VP series is already confirmed are stated below. If the fitting within the applicable range is selected, there will not be any interference.

**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, 1/8</td>
<td>ø3.2, ø4, ø6, ø8, ø10, ø12, ø16</td>
</tr>
<tr>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>VP(A)500</td>
<td>1P, 2A, 3R</td>
<td>1/8, 3/8</td>
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<tr>
<td></td>
<td>X</td>
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<td></td>
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<tr>
<td>VP(A)700</td>
<td>1P, 2A, 3R</td>
<td>1/8</td>
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</tr>
<tr>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>VV3P(A)3</td>
<td>1P, 2A, 3R</td>
<td>1/8</td>
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<tr>
<td>Manifold base</td>
<td>X</td>
<td>M5</td>
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</tr>
<tr>
<td>VV3P(A)5</td>
<td>1P, 2A, 3R</td>
<td>1/8</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>1/8</td>
<td></td>
</tr>
<tr>
<td>Manifold base</td>
<td>X</td>
<td>M5</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.

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Be sure to read before handling.
Refer to back pages 1 and 2 for Safety Instructions, “Handling Precautions for SMC Products” (M-E03-3) for 3/4/5 Port Solenoid Valves Precautions.

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Back page 8
SMC’S GLOBAL MANUFACTURING, DISTRIBUTION AND SERVICE NETWORK

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SMC Pneumatics Finland Oy
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SMC Pneumatique SA
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GREECE
SMC Hellas E.P.E.
HUNGARY
SMC Hungary Ípári Automatizálási Kft.
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UAB “SMC Pneumatics”
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MALAYSIA
PHILIPPINES
Shoketsu SMC Corporation
SOUTH KOREA
SMC Pneumatics Korea Co., Ltd.
TAIWAN
SMC Pneumatics (Taiwan) Co., Ltd.
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SINGAPORE
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Safety Instructions
Be sure to read “Handling Precautions for SMC Products” (M-E03-3) before using.