**3 Port Solenoid Valve**  
**VP300/500/700 Series**

Selectable power consumption!

- **0.4 w**
  - [Low wattage specification]

- **0.55 w**
  - [With power saving circuit]

- **1.55 w**
  - [Standard]

[Starting 1.55 W, Holding 0.55 W]  
*Current model: 2.0 W*  
*With DC light*

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.

<table>
<thead>
<tr>
<th>Applied voltage</th>
<th>Standard</th>
<th>Energy saving</th>
</tr>
</thead>
<tbody>
<tr>
<td>24 V</td>
<td>0 V</td>
<td>1.55 W</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.55 w</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0 W</td>
</tr>
</tbody>
</table>

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

- **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**
    - Current 5.6 VA → 1.55 VA [Standard]

- **Longer life expectancy: 50 million cycles or more**  
  - (Current: 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.

**Built-in strainer in the pilot valve**

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

**Smaller Footprint**

- **Air Operated Valve**  
  - **VPA300/500/700 Series**  
  - P.1555
### VP300/500/700 Series

#### 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><strong>VP300</strong></td>
<td>4.2</td>
<td>Internal pilot N.C.</td>
<td>1/8</td>
<td>12 VDC</td>
<td>Grommet</td>
<td>L-type plug connector</td>
<td>Non-locking push type</td>
</tr>
<tr>
<td><strong>VP500</strong></td>
<td>8.9</td>
<td>N.O.</td>
<td>1/4</td>
<td>24 VDC</td>
<td>L-type plug connector</td>
<td>M-type plug connector</td>
<td>Push-turn locking slotted type</td>
</tr>
<tr>
<td><strong>VP700</strong></td>
<td>15.3</td>
<td>External pilot N.C./N.O.</td>
<td>3/8</td>
<td>100 VAC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>VP300</strong></td>
<td>3.8</td>
<td>Internal pilot N.C.</td>
<td>1/8</td>
<td>200 VAC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>VP500</strong></td>
<td>8.8</td>
<td>External pilot N.C.</td>
<td>1/4</td>
<td>110 VAC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>VP700</strong></td>
<td>15.0</td>
<td>N.O.</td>
<td>3/8</td>
<td>220 VAC</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Low wattage specification

- From page 1278
- Power consumption: 0.35 W (Without light) 0.4 W (With light)
### Model Selection by Operating Conditions

#### VP300/500/700 Series

**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.

---

**VP300/500/700 Models**

- VP300 Series
  - VP300 Model
  - VP500 Model
  - VP700 Model

**Applicable stations Note)**

- VP300: 1-20 stations
- VP500: 1-20 stations
- VP700: 1-20 stations

**Operating Conditions**

- VP300/500/700 Series
  - Solenoid Valve: Manifold
  - VP300/500/700 Models
Rubber Seal
3 Port/Pilot Poppet Type
Body Ported/Single Unit

VP300/500/700 Series

How to Order

Body ported

Series

VP 3 4 2

- 5 G 1 - 01 A

Pilot type

NIL

INTERNAL PILOT

External Pilot

Pressure specification

NIL

Standard (0.7 MPa)

K

High-pressure type (1.0 MPa)

Thread type

NIL

Rc

F

With bracket

R

External PILOT

F

Without bracket

Coil specification

DC

AC (50/60 Hz) Note)

Rated voltage

DC

24 VDC

12 VDC

AC

100 VAC

200 VAC

110 VAC [115 VAC]

220 VAC [230 VAC]

240 VAC

24 VAC

Note) Be sure to select the power saving circuit (DC only).

Note) Be sure to select the power saving circuit type when it is continuously energized for a long time. (Refer to page 1296 for details.)

Type of actuation

A

N.C. (Normally closed)

B

N.O. (Normally open)

Port size

Symbol Port size VP300 VP500 VP700

01 1/8 — —

02 1/4 — —

03 3/8 — —

04 1/2 — —

Made to Order

X500

Pilot exhaust port with piping thread (M3) specification (Refer to page 1291).

X505

Interchangeable specification with the previous valve mounting hole pitch type (Refer to page 1291).

X600

Triac output specification (Refer to page 1291).

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 surge voltage suppressor (Non-polar)

R

With 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, YO are not available.

Note) For triac output, refer to the made-to-order specifications (X600).

Electrical entry

Grommet

L-type plug connector

M-type plug connector

DIN terminal

DIN (EN175301-803) terminal

Conduit terminal

X500

Pilot exhaust port with piping thread (M3) specification (Refer to page 1291).

X505

Interchangeable specification with the previous valve mounting hole pitch type (Refer to page 1291).

X600

Triac output specification (Refer to page 1291).

UL-compliant

1264

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

Note) Pressure specifications: 0.7 MPa, DC or 24 VAC only. Only applies to X500 and X505 for made-to-order specifications.

Note) Pressure specifications: 0.7 MPa, DC or 24 VAC only. Only applies to X500 and X505 for made-to-order specifications.

Note) Made-to-order specifications (X600).

uli

—

—

—

—

—

—

—

—

—

—

—

—

—

—

—

—

—

—

—

—

—

—

—

—

—

—

—

—

—

—

—

—

—

—

—

—

—

Caution

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

Note) For triac output, refer to the made-to-order specifications (X600).

Caution

When using the surge voltage suppressor type, residual voltage will remain. Refer to page 1300 for details.

+ LN and MN types are with 2 sockets.

+ Refer to page 1294 when different length of lead wire for L/M-type plug connector is required.

+ Refer to page 1295 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) Pressure specifications: 0.7 MPa, DC or 24 VAC only. Only applies to X500 and X505 for made-to-order specifications.
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 page 1300 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
• Since this valve has slight air leakage, it can not be used for holding vacuum (including positive pressure holding) in the pressure container.
• When having P port downsized in diameter
• When using A port as the atmospheric releasing port, e.g. air blower

### External Pilot

Use external pilot type in the following cases:
• For vacuum or for low pressure 0.2 MPa or less
• Since this valve has slight air leakage, it can not be used for holding vacuum (including positive pressure holding) in the pressure container.
• When having P port downsized in diameter
• When using A port as the atmospheric releasing port, e.g. air blower

### Made to Order

(Refer to page 1291 for details.)

- X500 Pilot exhaust port with piping thread (M3) specification
- X505 Interchangeable specification with the previous valve mounting hole pitch type
- X600 Triac output specification

### Specifications

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

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>Power consumption (W)</th>
<th>DC (With power saving circuit)</th>
<th>AC (Starting 1.55, Holding 0.55)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.55 Note)</td>
<td>Starting 1.55, Holding 0.55</td>
<td>0.75 Note)</td>
</tr>
<tr>
<td>0.75 Note)</td>
<td>Starting 1.75</td>
<td>1.0</td>
</tr>
</tbody>
</table>

Note) Based on dynamic performance test, JIS B 8419: 2010. (Coil temperature: 20°C, at rated voltage)

---

### 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>VP342</td>
<td>Standard (0.2 to 0.7)</td>
<td>Without light/surge voltage suppressor: 13 or less, with light/surge voltage suppressor: 16 or less</td>
</tr>
<tr>
<td></td>
<td>High-pressure type (0.2 to 1.0)</td>
<td>Without light/surge voltage suppressor: 17 or less, with light/surge voltage suppressor: 20 or less</td>
</tr>
<tr>
<td>VP542</td>
<td>Standard (0.2 to 0.7)</td>
<td>Without light/surge voltage suppressor: 14 or less, with light/surge voltage suppressor: 17 or less</td>
</tr>
<tr>
<td></td>
<td>High-pressure type (0.2 to 1.0)</td>
<td>Without light/surge voltage suppressor: 18 or less, with light/surge voltage suppressor: 21 or less</td>
</tr>
<tr>
<td>VP742</td>
<td>Standard (0.2 to 0.7)</td>
<td>Without light/surge voltage suppressor: 19 or less, with light/surge voltage suppressor: 22 or less</td>
</tr>
<tr>
<td></td>
<td>High-pressure type (0.2 to 1.0)</td>
<td>Without light/surge voltage suppressor: 22 or less, with light/surge voltage suppressor: 25 or less</td>
</tr>
</tbody>
</table>

Note) Based on dynamic performance test, JIS B 8419: 2010. (Coil temperature: 20°C, at rated voltage)
VP300/500/700 Series

Flow Rate Characteristics/Weight

<table>
<thead>
<tr>
<th>Model</th>
<th>Port size</th>
<th>Port size</th>
<th>Port size</th>
<th>Port size</th>
<th>Port size</th>
<th>Port size</th>
<th>Port size</th>
</tr>
</thead>
<tbody>
<tr>
<td>VP342</td>
<td>1/8</td>
<td>1/4</td>
<td>1/4</td>
<td>3/8</td>
<td>1/2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>VP542</td>
<td>1/4</td>
<td>7.9</td>
<td>8.9</td>
<td>11.9</td>
<td>15.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>VP742</td>
<td>3/8</td>
<td>1/4</td>
<td>3/8</td>
<td>1/2</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Vp342</th>
<th>Vp542</th>
<th>Vp742</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/8</td>
<td>1/4</td>
<td>3/8</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

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>2(A)</td>
<td>2(A)</td>
</tr>
<tr>
<td>(P1) 3(R)</td>
<td>(P1) 3(R)</td>
<td></td>
</tr>
<tr>
<td>External pilot</td>
<td>2(A)</td>
<td>2(A)</td>
</tr>
<tr>
<td>(P1) 3(R)</td>
<td>(P1) 3(R)</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>Poppet 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></td>
<td>VP542</td>
<td>VP500-227-1A</td>
</tr>
<tr>
<td></td>
<td>VP742</td>
<td>VP700-227-1A</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 “How to Order Pilot Valve Assembly” on page 1267.</td>
<td>Built-in strainer</td>
</tr>
</tbody>
</table>

1266
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/M-type
V 2 1 1 [ ]□□□□[5GZ]

=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)

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 page 1300 for details.

=DIN or Conduit type
V 2 1 2 [ ]□□□□[5]

=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.

⚠️ 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
VP300/500/700 Series

VP300 Series/Body Ported/Dimensions

Grommet (G)

Approx. 300 (Lead wire length)

Max. 10

82.7

73.7

102.9

Pg9

14

42.7

97.3

Approx. 300 (Lead wire length)

DC without light/surge voltage suppressor

Grommet (G)

(Mounting groove for M5 thread)

(Indicator light)

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

Grommet (G)

**VP300/500/700 Series**

**Grommet (G)**

DC without light/surge voltage suppressor

* Refer to page 1291 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).
**VP700 Series/Body Ported/Dimensions**

### Grommet (G)

**Approx. 300**

*Lead wire length*

### External pilot port

(External pilot specification: R)

### Applicable cable O.D.

ø4.5 to ø7

### Grommet (G)

DC without light/surge voltage suppressor

+ Refer to page 1291 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).
### How to Order

**Base mounted**

<table>
<thead>
<tr>
<th>Series</th>
<th>VP300</th>
<th>VP500</th>
<th>VP700</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pilot type</strong></td>
<td>Nil</td>
<td>Internal pilot</td>
<td>External pilot</td>
</tr>
<tr>
<td><strong>Pressure specification</strong></td>
<td>Nil</td>
<td>Standard (0.7 MPa)</td>
<td>High-pressure type (1.0 MPa)</td>
</tr>
<tr>
<td><strong>Coil specification</strong></td>
<td>Nil</td>
<td>T</td>
<td>T</td>
</tr>
<tr>
<td><strong>Rated voltage</strong></td>
<td>DC</td>
<td>24 VDC</td>
<td>12 VDC</td>
</tr>
</tbody>
</table>

**AC (50/60 Hz) Note**

<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>5</td>
<td>240 VAC</td>
</tr>
<tr>
<td>6</td>
<td>24 VAC</td>
</tr>
</tbody>
</table>

**Type of actuation**

<table>
<thead>
<tr>
<th>A</th>
<th>N.C. (Normally closed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>N.O. (Normally open)</td>
</tr>
</tbody>
</table>

**Thread type**

<table>
<thead>
<tr>
<th>F</th>
<th>Rc</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>NPT</td>
</tr>
<tr>
<td>T</td>
<td>NPTF</td>
</tr>
</tbody>
</table>

**Port size (Sub-plate)**

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Port size</th>
<th>VP300</th>
<th>VP500</th>
<th>VP700</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nil</td>
<td>Without sub-plate</td>
<td>X500</td>
<td></td>
<td></td>
</tr>
<tr>
<td>01</td>
<td>1/8</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>02</td>
<td>1/4</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>03</td>
<td>3/8</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>04</td>
<td>1/2</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

**Made to Order**

| X500 | Pilot exhaust port with piping thread (M3) specification (Refer to page 1291) |
| X600 | Triac output specification (Refer to page 1291) |

**DIN (EN175301-803) terminal**

**Manual override**

<table>
<thead>
<tr>
<th>Nil</th>
<th>Non-locking push type</th>
</tr>
</thead>
<tbody>
<tr>
<td>D</td>
<td>Push-turn locking slotted type</td>
</tr>
<tr>
<td>E</td>
<td>Push-turn locking lever type</td>
</tr>
</tbody>
</table>

**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</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 page 1300 for details.

---

**Note**

- Only DIN and conduit terminal types are available for AC mode. Refer to the electrical entry for details.
- Pressure specifications: 0.7 MPa, DC or 24 VAC only. Only applies to X500 and X505 for made-to-order specifications.
- Made to Order: X500, X600.
- Pressure specifications: 0.7 MPa, DC or 24 VAC only. Only applies to X500 and X505 for made-to-order specifications.
- Refer to page 1296 for details.
- Note) Be sure to select the power saving circuit type when it is continuously energized for a long time. (Refer to page 1296 for details.)
- T type is only available for DC mode. When T is selected, only Z type of light/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) 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.
- *LN and MN types are with 2 sockets.
- *Refer to page 1294 when different length of lead wire for L/M-type plug connector is required.
- *Refer to page 1295 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.
**Specifications**

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

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)</th>
<th>L-type plug connector (L)</th>
<th>M-type plug connector (M)</th>
<th>DIN terminal (D)</th>
<th>DIN (EN175301-803) terminal (Y)</th>
<th>Conduit terminal (T)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>G, H, L, M</td>
<td>D, Y, T</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coil rated voltage (V)</td>
<td>DC (50/60 Hz)</td>
<td>24, 12</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Allowable voltage fluctuation</td>
<td>±10% of rated voltage^{*}</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power consumption (W)</td>
<td>DC</td>
<td>Standard</td>
<td>With power saving circuit</td>
<td>1.5 (With light: 1.55)</td>
<td>1.5 (With light: 1.75)</td>
<td>0.55^{Note} (With light only)</td>
</tr>
<tr>
<td></td>
<td>AC 100 V</td>
<td>1.5 (With light: 1.55)</td>
<td>1.5 (With light: 1.75)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>110 V [115 V]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>200 V</td>
<td>1.55 (With light: 1.65)</td>
<td>1.55 (With light: 1.7)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>220 V</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>230 V</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>240 V</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Surge voltage suppressor</td>
<td>Diode (Non-polar type: Varistor)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indicator light</td>
<td>LED (Neon bulb is used for AC mode of D, Y, T.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

^{*} It is in common between 110 VAC and 115 VAC, and between 220 VAC and 230 VAC.

^{Note} Allowable voltage fluctuation is –15% to +5% of the rated voltage for 115 VAC or 230 VAC.

^{Note} 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%

Note) Refer to page 1296 for details.

**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>S, Z type</td>
<td>R, U type</td>
</tr>
<tr>
<td>VP344</td>
<td>Standard (0.2 to 0.7)</td>
<td>13 or less</td>
</tr>
<tr>
<td></td>
<td>High-pressure type (0.2 to 1.0)</td>
<td>17 or less</td>
</tr>
<tr>
<td>VP544</td>
<td>Standard (0.2 to 0.7)</td>
<td>14 or less</td>
</tr>
<tr>
<td></td>
<td>High-pressure type (0.2 to 1.0)</td>
<td>18 or less</td>
</tr>
<tr>
<td>VP744</td>
<td>Standard (0.2 to 0.7)</td>
<td>19 or less</td>
</tr>
<tr>
<td></td>
<td>High-pressure type (0.2 to 1.0)</td>
<td>22 or less</td>
</tr>
</tbody>
</table>

Note) Based on dynamic performance test, JIS B 8374-1981. ( Coil temperature: 20°C, at rated voltage)
Flow Rate 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>VP344</td>
<td>1/8</td>
<td>3.6 0.22 0.8</td>
<td>3.5 0.24 0.8</td>
<td>216 (149) 252 (185)</td>
</tr>
<tr>
<td>VP544</td>
<td>1/4</td>
<td>3.9 0.22 0.9</td>
<td>3.8 0.14 0.9</td>
<td>211 (149) 247 (185)</td>
</tr>
<tr>
<td>VP744</td>
<td>3/8</td>
<td>8.8 0.07 2.0</td>
<td>8.8 0.13 2.0</td>
<td>370 (245) 406 (281)</td>
</tr>
<tr>
<td>VP744</td>
<td>1/2</td>
<td>12.9 0.10 2.9</td>
<td>13.3 0.24 3.1</td>
<td>362 (245) 398 (281)</td>
</tr>
</tbody>
</table>

Application Example

(1) Blow-off valve  (2) Pressure release valve  (3) Selector valve  (4) Valve for vacuum

Construction

Base mounted

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>Poppet 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>VP344 VP544 VP744</td>
<td>Built-in strainer</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>VP300-202-1 VP500-202-1 VP700-202-1</td>
<td>Aluminum die-casted</td>
</tr>
<tr>
<td></td>
<td>Hexagon socket head bolt</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>

Note) ( ): Values without sub-plate

How to Order Sub-plate

VP 3 00 – 202 – 1

Caution

Tightening Torque of Mounting Screw

Table}

<table>
<thead>
<tr>
<th>Port size</th>
<th>M3</th>
<th>M4</th>
<th>M5</th>
</tr>
</thead>
<tbody>
<tr>
<td>VP344</td>
<td>1/8</td>
<td>1/4</td>
<td>3/8</td>
</tr>
<tr>
<td>VP544</td>
<td>1/8</td>
<td>1/4</td>
<td>3/8</td>
</tr>
<tr>
<td>VP744</td>
<td>1/8</td>
<td>1/4</td>
<td>3/8</td>
</tr>
</tbody>
</table>

Note) These specifications are common to the internal and external pilots.
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

V 2 1 1 □□□□□□□□ - 5GZ

DIN or Conduit type

V 2 1 2 □□□□□□□□ - 5

Light/surge voltage suppressor

<table>
<thead>
<tr>
<th></th>
<th>DC</th>
<th>AC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nil</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>S</td>
<td>○</td>
<td></td>
</tr>
<tr>
<td>Z</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>R</td>
<td>○</td>
<td></td>
</tr>
<tr>
<td>U</td>
<td>○</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 page 1300 for details.

Electrical entry

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

* LN and MN types are with 2 sockets.
* Refer to page 1294 when different length of lead wire for L/M-type plug connector is required.

Pressure specification

<table>
<thead>
<tr>
<th></th>
<th>Nil</th>
<th>K</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Standard (0.7 MPa)</td>
<td>High-pressure type (1.0 MPa)</td>
</tr>
</tbody>
</table>

Coil specification

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

Rated voltage

<table>
<thead>
<tr>
<th></th>
<th>DC</th>
<th>AC (50/60 Hz)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>100 VAC</td>
<td>100 VAC</td>
</tr>
<tr>
<td>2</td>
<td>200 VAC</td>
<td>200 VAC</td>
</tr>
<tr>
<td>3</td>
<td>110 VAC (115 VAC)</td>
<td>110 VAC (115 VAC)</td>
</tr>
<tr>
<td>4</td>
<td>220 VAC (230 VAC)</td>
<td>220 VAC (230 VAC)</td>
</tr>
<tr>
<td>5</td>
<td>24 VDC</td>
<td>24 VDC</td>
</tr>
<tr>
<td>6</td>
<td>12 VDC</td>
<td>12 VDC</td>
</tr>
</tbody>
</table>

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
VP300 Series/Base Mounted/Dimensions

Grommet (G)

Approx. 300 (Lead wire length)

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

2 x ø4.2
(For mounting)

Manual override

M5 x 0.8
External pilot port

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

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

Grommet (G)
DC without light/surge voltage suppressor

Margins (G)

Refer to page 1291 separately when piping to PE port is required.

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

**VP500 Series/Base Mounted/Dimensions**

**Grommet (G)**

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

Approx. 300 (Lead wire length)

**2 x ø5.2** (For mounting)

1/8 (External pilot port)

1/4, 3/8 (P) port

**PE port** (ø3.8)

- **Manual override**
- **NO 2A 1P NC NC 1.3**
- **122.3 28.5**
- **12.6 57**
- **83.8**

**DC without light/surge voltage suppressor**

- **Max. 101**
- **73.5 123.5**
- **44.6**

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

- **73.5**
- **50.8**
- **128.6**

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

- **84.5**
- **120.2**
- **115.1**

**DIN terminal (D, Y)**

- **Applicable cable O.D. ø4.5 to ø7**
- **104.5**
- **113.5**
- **Pg9**
- **107.7 [97.7]**

**Conduit terminal (T)**

- **Applicable cable O.D. ø4.5 to ø7**
- **117.7 [107.7]**
- **107.7 [97.7]**
- **Pg9**
- **131.5**

* Refer to page 1291 separately when piping to PE port is required.

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

Grommet (G)

Approx. 300 (Lead wire length)

Applicable cable O.D. ø4.5 to ø7

Manual override

PE port

∗ Refer to page 1291 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).
# Low Wattage Specification

## VP300/500 Series

### How to Order Valve

#### VP 3 4 2 R Y - 5 D Z E 1-02 T A - F

<table>
<thead>
<tr>
<th>Series</th>
<th>VP300</th>
<th>VP500</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Body type

- Body Ported
- Base Mounted

- Bracket
  - Nil: Without bracket
  - F: With bracket

- Type of actuation
  - A: N.O. (Normally Open)
  - B: N.C. (Normally Closed)

#### Pilot type

- Nil: Internal pilot
- R: External pilot

#### Low wattage type

- Rated voltage
  - 1: 100 VAC
  - 2: 200 VAC
  - 3: 110 VAC
  - 4: 220 VAC
  - 5: 24 VDC
  - 6: 12 VDC

#### Mountable manifold

- 41
- 42

#### Body Ported

- Electric entry

<table>
<thead>
<tr>
<th>Grommet</th>
<th>M-type plug connector</th>
<th>DIN terminal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q: Lead wire length 300 mm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>L: With lead wire (Length 300 mm)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M: With lead wire (Length 300 mm)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N: Without lead wire</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;IP65 compatible&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D: With connector</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Y: With connector</td>
<td></td>
<td></td>
</tr>
<tr>
<td>G: Lead wire length 600 mm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>L: Without lead wire</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M: Without lead wire</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N: Without connector</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D: Without connector</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Y: Without connector</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Base Mounted

- Electrical entry

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Port size</th>
<th>VP300</th>
<th>VP500</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>1/8</td>
<td>○</td>
<td>—</td>
</tr>
<tr>
<td>02</td>
<td>1/4</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>03</td>
<td>3/8</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

#### Port size

- Body Ported
  - Without sub-plate
- Base Mounted
  - Without sub-plate

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

### Light/Surge voltage suppressor and common specifications

<table>
<thead>
<tr>
<th>Nil</th>
<th>Without light/surge voltage suppressor</th>
</tr>
</thead>
<tbody>
<tr>
<td>R</td>
<td>With surge voltage suppressor (DC only, Non-polar) D and Y are not available</td>
</tr>
<tr>
<td>U</td>
<td>With light/surge voltage suppressor (DC only, Non-polar) D and Y are not available</td>
</tr>
<tr>
<td>S</td>
<td>With surge voltage suppressor (DC only)</td>
</tr>
<tr>
<td>Z</td>
<td>With light/surge voltage suppressor D0Z and Y0Z are not available</td>
</tr>
</tbody>
</table>
## 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 operating pressure range (MPa)</td>
<td>0.2 to 0.7</td>
</tr>
<tr>
<td>External pilot operating pressure range (MPa)</td>
<td>−100 KPa to 0.7</td>
</tr>
<tr>
<td>Pilot pressure range</td>
<td>Equivalent to operating pressure (Min. 0.2)</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>
<tr>
<td>Manual override</td>
<td>Non-locking push type</td>
</tr>
<tr>
<td></td>
<td>Push-turn locking slotted type</td>
</tr>
<tr>
<td></td>
<td>Push-turn locking lever type</td>
</tr>
<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>
<tr>
<td>Impact/Vibration resistance (m/s²) Note</td>
<td>DIN terminal (D)</td>
</tr>
<tr>
<td>Enclosure</td>
<td>Dustproof (IP65 for D and Y)</td>
</tr>
</tbody>
</table>

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

### Electrical entry

<table>
<thead>
<tr>
<th>Coil rated voltage (V)</th>
<th>DC 24, 12</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC (50/60 Hz)</td>
<td>100, 110, 200, 220</td>
</tr>
<tr>
<td>Allowable voltage fluctuation</td>
<td>±10% of rated voltage*</td>
</tr>
</tbody>
</table>

### Apparent power (VA)

<table>
<thead>
<tr>
<th>Type of voltage</th>
<th>DC</th>
<th>Standard 0.35 (With light: 0.4 (With light of DIN terminal: 0.45))</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 V</td>
<td>0.78 (With light: 0.81)</td>
<td>0.78 (With light: 0.87)</td>
</tr>
<tr>
<td>110 V</td>
<td>0.86 (With light: 0.89)</td>
<td>0.86 (With light: 0.97)</td>
</tr>
<tr>
<td>200 V</td>
<td>1.18 (With light: 1.22)</td>
<td>1.15 (With light: 1.30)</td>
</tr>
<tr>
<td>220 V [230 V]</td>
<td>1.30 (With light: 1.34)</td>
<td>1.27 (With light: 1.46)</td>
</tr>
<tr>
<td></td>
<td>[1.42 (With light: 1.46)]</td>
<td>[1.39 (With light: 1.60)]</td>
</tr>
</tbody>
</table>

### Surge voltage suppressor

<table>
<thead>
<tr>
<th>Type of actuation</th>
<th>Diode (DIN terminal, Non-polar type: Varistor)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indicator light</td>
<td>LED (Neon bulb is used for AC mode of D and Y.)</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 and Z types, 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>Series</th>
<th>Type of actuation</th>
<th>Response time ms (at 0.5 MPa)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Without light/surge voltage suppressor</td>
</tr>
<tr>
<td></td>
<td></td>
<td>S, Z type</td>
</tr>
<tr>
<td>VP300</td>
<td>VP342Y</td>
<td>16</td>
</tr>
<tr>
<td>VP300</td>
<td>VP344Y</td>
<td>16</td>
</tr>
<tr>
<td>VP500</td>
<td>VP542Y</td>
<td>31</td>
</tr>
<tr>
<td>VP500</td>
<td>VP544Y</td>
<td>31</td>
</tr>
</tbody>
</table>

Note) Based on dynamic performance test, JIS B 8375-1981. (Coil temperature: 20°C, at rated voltage)
DIN terminal (D,Y)
M-type plug connector (M)
L-type plug connector (L)

Dimensions

VP342Y

G: Approx. 300
H: Approx. 600
(Lead wire length)

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

1/8, 1/4
2/A port

2 x ø3.2
(For mounting)

Manual override

21.5
3.4
0.8

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

19.6
35

35
31
25

42
(AC)

46.5
19.6

46.1
36.7

53.1
(AC)

53.2

Max. 10

26.2
11

20.4
16

57.3

21

26.2

16

57.3
(1.6)

31.6
31.6

G: Approx. 300
H: Approx. 600

(Lead wire length)

(M5 mounting groove)

(Indicator light)

VP300/500 Series

1280

SMC
L-type plug connector (L)

M-type plug connector (M)

DIN terminal (D,Y)

1281
How to Order Manifold

**Type 41/Common exhaust**

<table>
<thead>
<tr>
<th>Series</th>
<th>VP300</th>
<th>VP500</th>
<th>VP700</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Pilot type**

- N: Internal pilot
- R: External pilot

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

**Thread type**

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

**Port size**

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Port size</th>
<th>Applicable series</th>
</tr>
</thead>
<tbody>
<tr>
<td>02</td>
<td>1/4</td>
<td>VP300</td>
</tr>
<tr>
<td>03</td>
<td>3/8</td>
<td>VP500</td>
</tr>
<tr>
<td>04</td>
<td>1/2</td>
<td>VP700</td>
</tr>
</tbody>
</table>

**Stations**

- 02: 2 stations
- 20: 20 stations

---

**Type 42/Individual exhaust**

<table>
<thead>
<tr>
<th>Series</th>
<th>VP300</th>
<th>VP500</th>
<th>VP700</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Pilot type**

- N: Internal pilot
- R: External pilot

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

**Thread type**

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

**Port size**

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Port size</th>
<th>Applicable series</th>
</tr>
</thead>
<tbody>
<tr>
<td>02</td>
<td>1/4</td>
<td>VP300</td>
</tr>
<tr>
<td>03</td>
<td>3/8</td>
<td>VP500</td>
</tr>
<tr>
<td>04</td>
<td>1/2</td>
<td>VP700</td>
</tr>
</tbody>
</table>

**Stations**

- 02: 2 stations
- 20: 20 stations
How to Order Valve (With a gasket and two mounting bolts)

VP 3 4 4 5 G 1 A

Series
3 VP300
5 VP500
7 VP700

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

Manual override
D Push-turn locking slotted type
E Push-turn locking lever type

Light/surge voltage suppressor
DC
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)

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

Pilot type
Nil Internal pilot
R External pilot

Coil specification
T With power saving circuit (DC only)

Rated voltage
DC 24 VDC
6 12 VDC

AC (50/60 Hz) 100 VAC
200 VAC
3 110 VAC [115 VAC]
4 220 VAC [230 VAC]
7 240 VAC

Electrical entry
G: Lead wire length 300 mm
H: Lead wire length 600 mm

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

Made to Order
X500 Pilot exhaust port with piping thread (M3)
X600 Triac output specification (Refer to page 1291)

Caution
When using the surge voltage suppressor type, residual voltage will remain. Refer to page 1300 for details.

Note)
- LN and MN types are with 2 sockets.
- Refer to page 1294 when different length of lead wire for L/M-type plug connector is required.
- Refer to page 1295 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 page 1300 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 weight: W [g]</th>
</tr>
</thead>
<tbody>
<tr>
<td>VP300</td>
<td>VP3P-41</td>
<td>Common</td>
<td>1/4</td>
<td>2 to 20 stations</td>
<td>W = 110n + 90</td>
</tr>
<tr>
<td>VP3P-42</td>
<td>Individual</td>
<td></td>
<td>VP344</td>
<td></td>
<td></td>
</tr>
<tr>
<td>VP500</td>
<td>VP5P-41</td>
<td>Common</td>
<td>3/8</td>
<td>2 to 20 stations</td>
<td>W = 190n + 150</td>
</tr>
<tr>
<td>VP5P-42</td>
<td>Individual</td>
<td></td>
<td>VP544</td>
<td></td>
<td></td>
</tr>
<tr>
<td>VP700</td>
<td>VP7P-41</td>
<td>Individual</td>
<td>1/2</td>
<td>2 to 20 stations</td>
<td>W = 410n + 380</td>
</tr>
<tr>
<td>VP7P-42</td>
<td>Individual</td>
<td></td>
<td>VP744</td>
<td></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</td>
<td></td>
<td></td>
</tr>
<tr>
<td>mounting bolts)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>VP3P-25-1A</td>
<td>VP3P3</td>
<td></td>
</tr>
<tr>
<td>VP5P-25-1A</td>
<td>VP3P5</td>
<td></td>
</tr>
<tr>
<td>VP7P-25-1A</td>
<td>VP3P7</td>
<td></td>
</tr>
</tbody>
</table>

### How to Order Manifold Assembly (Example)

**Ordering example (VV3P3-41)**

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

![Manifold Option](image)

**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.
- The asterisk denotes the symbol for assembly.
VP300 Series/Dimensions

Type 41/Common exhaust: VV3P3-41 Stations 1-02

Grommet (G)

Common external pilot port
(External pilot specification: R)

PE port*
(ø3.8)

* Refer to page 1291 separately when piping to PE port is required.

Grommet (G)
DC without light/surge voltage suppressor

M5 x 0.8

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).
VP300 Series/Dimensions

Type 42/Individual exhaust: VV3P3-42□-□Stations□□□-□2

Grommet (G)

- Refer to page 1291 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).
VP500 Series/Dimensions

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

[Diagram of VP500 Series/Dimensions]

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).

1287
VP300/500/700 Series

VP500 Series/Dimensions

Type 42/Individual exhaust: VV3P5-42□-□(Stations)□-□3-□□

Grommet (G)

[Diagram of Grommet (G)]

- Refer to page 1291 separately when piping to PE port is required.

<table>
<thead>
<tr>
<th>Station</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>80</td>
<td>113</td>
<td>146</td>
<td>179</td>
<td>212</td>
<td>245</td>
<td>278</td>
<td>311</td>
<td>344</td>
<td>377</td>
<td>410</td>
<td>443</td>
<td>476</td>
<td>509</td>
<td>542</td>
<td>575</td>
<td>608</td>
<td>641</td>
<td>674</td>
<td></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).
VP700 Series/Dimensions

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

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

Grommet (G)
DC without light/surge voltage suppressor

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

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

Grommet (G)

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$_3^3$$_4^4$ - $\Box$ - $\Box$ - 1 - $\Box$ - X500

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

2 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$_3^3$$_4^2$ - $\Box$ - $\Box$ - 1 - $\Box$ - 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.

3 TRIAC Output Specification

For AC type valve, use this specification when the pilot valve is not recovered even though valve power supply is turned OFF at the equipment using output unit with large leakage voltage over 8% of the rated voltage (TRIAC output such as PLC or SSR, etc.). Combination with low wattage specification is not possible.

How to Order Valve

VP$_3^3$$_7^4$ - $\Box$ - $\Box$ - 1 - $\Box$ - $\Box$ - X600

- Entry is the same as standard products. Note) Rated voltage: AC type only
Rubber Seal
3 Port/Pilot Poppet Type
VP300/500/700 Series

How to Order

30-VP344-1DB01AFQ

Conforming to
CSA standard

VP series
solenoid valve

Body size
1/4 standard
3/8 standard
1/2 standard

Type of actuation
In common between N.C. and N.O. (Pilot type)

Body type
Body ported
Base mounted

Valve option
Nil
Standard (Internal pilot)
R
External pilot

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

Electrical entry
D DIN terminal (With connector)
DO DIN terminal (Without connector)

CE-compliant
Nil
Q CE-compliant

Option
Nil
Without bracket
F With bracket
* 30-VP342, 542, and 742 only

Passage symbol
A Normally closed
B Normally open

Thread type
Nil Rc
F G
N NPT
T NPTF

Port size
Symbol Port size 30-VP342 30-VP544 30-VP742 30-VP344 30-VP544 30-VP744
Nil Without sub-plate ● ● ●
01 1/8 ● ● ●
02 1/4 ● ● ●
03 3/8 ● ● ●
04 1/2 ● ● ●
* 30-VP344, 544, and 744 only

Manual override
Nil
B Locking slotted type
C Locking lever type

* Semi-standard

Light/Surge voltage suppressor
Nil
Z With light/surge voltage suppressor

* Semi-standard

Caution
For safety instructions, specific product precautions, product specifications, dimensions, and model selection, refer to the individual product catalog (discontinued products). However, note that the DIN connector differs from the standard product.
VP Series
Specific Product Precautions 1

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)

How to Use L/M-Type Plug Connector

Warning
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 (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.
### VP Series

Specific Product Precautions 2

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

---

#### 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>Nil</th>
<th>300 mm</th>
<th>600 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>
</table>

#### How to Order Connector Assembly

<table>
<thead>
<tr>
<th>DC</th>
<th>V200-30-4A-</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 VAC</td>
<td>V200-30-1A-</td>
</tr>
<tr>
<td>200 VAC</td>
<td>V200-30-2A-</td>
</tr>
<tr>
<td>AC other voltages</td>
<td>V200-30-3A-</td>
</tr>
<tr>
<td>Without lead wire</td>
<td>V200-30-A (With connector and 2 pcs. of socket)</td>
</tr>
</tbody>
</table>

#### 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 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.

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.

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

**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

---

1294
**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.

### 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-

**Rated voltage**

- 05: 24 VDC
- 06: 12 VDC
- 07: 240 VAC

**AC (Z)**

- Connector specification
- D type 61
- Y type 63

Note) Order no. for 24 VAC specification is V200-65-5-B.

**How to Use Conduit Terminal**

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.

2. **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

3. **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.

**DIN (EN175301-803) Terminal**

**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-

**Rated voltage**

- 05: 24 VDC
- 06: 12 VDC
- 07: 240 VAC

**AC (Z)**

- Connector specification
- D type 61
- Y type 63

Note) Order no. for 24 VAC specification is V200-65-5-B.
VP Series
Specific Product Precautions 4

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

⚠️ Caution

<DC>

- **Polar type**
  - With surge voltage suppressor (□S)
  
  Red (+) —
  
  Black (−) —

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

  Red (+) —
  
  Black (−) —

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

  (+) —
  
  (−) —

  For DIN type, installed in the connector

- **Non-polar type**
  - With surge voltage suppressor (□R)

  (+, −) —
  
  (−, +) —

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

  (+, −) —
  
  (−, +) —

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

  (+, −) —
  
  (−, +) —

  For DIN type, installed in the connector

- 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>

![Electrical power waveform](image)

• 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.)

<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)

  (−) —
  
  (−) —

  Note) LED for 24 VAC.

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

  Note) ( ) : For DIN terminal (D,Y), Conduit terminal.

• 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 polarity 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.

Note: Neon bulb

NL: Neon bulb

Note) ( ) : For DIN terminal (D,Y), Conduit terminal.
Manual Override

**Warning**

1. Non-locking push type [Standard]
   Press in the direction of the arrow.

2. Push-turn locking slotted type [D 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 push type.

**Caution**

When operating the D type, use a watchmakers' screwdriver and turn lightly.
[Torque: Less than 0.1 N-m]

3. Push-turn locking lever type [E 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 push 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.

How to Use L/M-Type Plug Connector

**Caution**

1. Connector attachment/detachment
   - 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 wire and socket connection
   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 the dedicated crimping tools.)

3. Socket with lead wire attachment/detachment
   - **Attachment**
     Insert the sockets into the square holes of the connector (with 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.
   - **Detachment**
     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.

Solenoid Valve for 200/220 VAC Specification

**Warning**

AC specification solenoid valves with grommet or L/M-type plug connector have a built-in rectifier circuit in the pilot section to operate the DC coil. With 200/220 VAC specification pilot valves, this built-in rectifier generates heat when energized. The surface may become hot depending on the energized condition; therefore, do not touch the solenoid valves.
Low Wattage Specification (VP300/500)
Specific Product Precautions 6

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

<table>
<thead>
<tr>
<th>Plug Connector Lead Wire Length</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Caution</strong></td>
</tr>
</tbody>
</table>
Plug connector lead wires have a standard length of 300 mm, however, the following lengths are also available.

### How to Order Connector Assembly

<table>
<thead>
<tr>
<th>DC</th>
<th>100 VAC</th>
<th>Other AC voltages</th>
</tr>
</thead>
<tbody>
<tr>
<td>SY100–30–4A</td>
<td>SY100–30–1A</td>
<td>SY100–30–3A</td>
</tr>
<tr>
<td>SY100–30–2A</td>
<td>SY100–30–4A</td>
<td>SY100–30–1A–20</td>
</tr>
</tbody>
</table>

**How to Order**
Specify the connector assembly part number together with the part number for the plug connector type solenoid valve without connector.

(Example) Lead wire length: 2000 mm

### Lead wire length

<table>
<thead>
<tr>
<th>Lead wire length</th>
<th>DC 100 VAC 200 VAC Other AC voltages</th>
</tr>
</thead>
<tbody>
<tr>
<td>300 mm</td>
<td>600 mm</td>
</tr>
<tr>
<td>6</td>
<td>10</td>
</tr>
</tbody>
</table>

### Light/Surge Voltage Suppressor

| **Caution** |

### Grommet or L/M-type plug connector

**Polar type**
With surge voltage suppressor (S)

**Non-polar type**
With surge voltage suppressor (R)

**DIN terminal**
**Non-polar type**
With surge voltage suppressor (S)

With light/surge voltage suppressor (Z)

With light/surge voltage suppressor (U)
Light/Surge Voltage Suppressor

⚠️ Caution

<AC>
S type is not available, since a rectifier prevents surge voltage generation.

● Grommet or L/M-type plug connector

With light/surge voltage suppressor (Z)

![Diagram of Grommet or L/M-type plug connector]

● DIN terminal

With light/surge voltage suppressor (Z)

![Diagram of DIN terminal]

Note) LED for 24 VAC.

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 pages 1265 and 1272.

Residual Voltage

<table>
<thead>
<tr>
<th>Surge voltage suppressor</th>
<th>DC</th>
<th>AC</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>24</td>
<td>12</td>
</tr>
<tr>
<td>Diode</td>
<td>Approx. 1 V</td>
<td>Approx. 1 V</td>
</tr>
<tr>
<td>Varistor</td>
<td>Approx. 47 V</td>
<td>Approx. 32 V</td>
</tr>
</tbody>
</table>
How to Use DIN Connector

1. ISO#: Conforming to EN-175301-803C (former DIN 43650C) (Distance between pins: 8 mm)
   The DIN terminal type with an IP65 (enclosure) is protected against dust and water, however, it must not be used in water.

2. 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 (slotted head screw) on the terminal block, insert the core of the lead wire into the terminal according to wiring connection, and attach securely with the terminal screws.
   4) Tighten the ground nut to secure the wire.

3. Changing the entry direction
   After separating the terminal block and housing, the cord entry direction can be changed by attaching the housing in a different direction (four directions at 90° intervals).
   ∗ Make sure not to damage a light, etc., with the lead wires of the cord.

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

5. Applicable cable
   Cable O.D: Ø3.5 to Ø7
   (Reference) 0.5 mm², 2-core or 3-core, equivalent to JIS C 3306

DIN Connector Part No.

<table>
<thead>
<tr>
<th>DIN terminal (D)</th>
<th>With indicator light</th>
<th>Part no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated voltage</td>
<td>Voltage symbol</td>
<td>Part no.</td>
</tr>
<tr>
<td>24 VDC</td>
<td>24 V</td>
<td>SY100-61-3-05</td>
</tr>
<tr>
<td>12 VDC</td>
<td>12 V</td>
<td>SY100-61-3-06</td>
</tr>
<tr>
<td>100 VAC</td>
<td>100 V</td>
<td>SY100-61-2-01</td>
</tr>
<tr>
<td>200 VAC</td>
<td>200 V</td>
<td>SY100-61-2-02</td>
</tr>
<tr>
<td>110 VAC</td>
<td>110 V</td>
<td>SY100-61-2-03</td>
</tr>
<tr>
<td>220 VAC</td>
<td>220 V</td>
<td>SY100-61-2-04</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DIN terminal (Y)</th>
<th>Without indicator light</th>
<th>Part no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated voltage</td>
<td>Voltage symbol</td>
<td>Part no.</td>
</tr>
<tr>
<td>Common to all voltages</td>
<td>None</td>
<td>SY100-62-1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DIN terminal (Y)</th>
<th>With indicator light</th>
<th>Part no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated voltage</td>
<td>Voltage symbol</td>
<td>Part no.</td>
</tr>
<tr>
<td>24 VDC</td>
<td>24 V</td>
<td>SY100-62-3-05</td>
</tr>
<tr>
<td>12 VDC</td>
<td>12 V</td>
<td>SY100-62-3-06</td>
</tr>
<tr>
<td>100 VAC</td>
<td>100 V</td>
<td>SY100-62-2-01</td>
</tr>
<tr>
<td>200 VAC</td>
<td>200 V</td>
<td>SY100-62-2-02</td>
</tr>
<tr>
<td>110 VAC (115 VAC)</td>
<td>110 V</td>
<td>SY100-62-2-03</td>
</tr>
<tr>
<td>220 VAC (230 VAC)</td>
<td>220 V</td>
<td>SY100-62-2-04</td>
</tr>
</tbody>
</table>

Circuit diagram with light

AC circuit diagram

DC circuit diagram

Pilot Valve

The mounting of the low wattage type pilot valve is not interchangeable with that of the standard type. Additionally, be aware that the pilot valve cannot be replaced.
Body Ported/Base Mounted Specification
Specific Product Precautions

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

Light/Surge Voltage Suppressor

⚠️ 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 pages 1265 and 1272.

<table>
<thead>
<tr>
<th>Residual Voltage</th>
<th>Surge voltage suppressor</th>
<th>DC</th>
<th>AC</th>
</tr>
</thead>
<tbody>
<tr>
<td>S, Z</td>
<td>Approx. 24 V</td>
<td>24</td>
<td>12</td>
</tr>
<tr>
<td>R, U</td>
<td>Approx. 1 V</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

Precautions when replacing the old VP series with new VP series

⚠️ Caution
When replacing the built-in valve with the new VP series if the old VP series uses the external pilot manifold, be aware that the valve selection becomes different.

<table>
<thead>
<tr>
<th>Manifold model no.</th>
<th>Mounting valve</th>
</tr>
</thead>
<tbody>
<tr>
<td>VP(A)300</td>
<td>Internal pilot</td>
</tr>
<tr>
<td>VP(A)500</td>
<td>Internal pilot</td>
</tr>
<tr>
<td>VP(A)700</td>
<td>Internal pilot</td>
</tr>
<tr>
<td>VP3(A)3</td>
<td>Internal pilot</td>
</tr>
<tr>
<td>VP3(A)5</td>
<td>Internal pilot</td>
</tr>
<tr>
<td>VP3(A)7</td>
<td>Internal pilot</td>
</tr>
</tbody>
</table>

<How to distinguish the external pilot manifold>
When the piping is connected to the external pilot port, this manifold is the external pilot manifold.

⚠️ 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

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 of actuation</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>

⚠️ 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: KQ2H, KQ2S series

<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>X</td>
<td>1/8, 1/4</td>
<td>ø3.2 ø4 ø6 ø8 ø10 ø12 ø16</td>
</tr>
<tr>
<td>VP(A)500</td>
<td>X</td>
<td>1/8, 3/8</td>
<td>ø3.2 ø4 ø6 ø8 ø10 ø12 ø16</td>
</tr>
<tr>
<td>VP(A)700</td>
<td>X</td>
<td>1/8, 3/8, 1/2</td>
<td>ø3.2 ø4 ø6 ø8 ø10 ø12 ø16</td>
</tr>
<tr>
<td>VP3(A)3</td>
<td>X</td>
<td>1/4</td>
<td>ø3.2 ø4 ø6 ø8 ø10 ø12 ø16</td>
</tr>
<tr>
<td>VP3(A)5</td>
<td>X</td>
<td>M5</td>
<td>ø3.2 ø4 ø6 ø8 ø10 ø12 ø16</td>
</tr>
<tr>
<td>VP3(A)7</td>
<td>X</td>
<td>M5</td>
<td>ø3.2 ø4 ø6 ø8 ø10 ø12 ø16</td>
</tr>
</tbody>
</table>

One-touch Fittings

When the piping is connected to the external pilot port, this manifold is the external pilot manifold.

---

1300