3 Port Solenoid Valve

**VV100 Series**

Highly Integrated Unit Manifold

**2 direct-operated 3-port valves on 1 station**

Individually wired valve can be added.

**Connector**

(For plug-in connection)

**D-sub connector**

Number of connectors: 15 pins, 26 pins (for plug-in connection)

- **Connector entry direction**
  - Upward
  - Lateral
  - Side

**SUP/EXH block fittings**

- **Fitting entry direction**
  - Standard (Same direction as the cylinder ports)

**Plug-in Connector type manifold**

**Non Plug-in Individual wiring manifold**
Compact manifold with two 3-port valves on 1 station

Mounting

- Direct mounting
- Bracket mounting

Piping Variations

- Metric size: ø2, ø4 One-touch fitting
- Inch size: ø1/8", ø5/32" One-touch fitting

Applications

1. Operating a small bore size cylinder such as a pin cylinder
2. Air-operated valve for chemical valve

With Switch

- Possible to shut the signal of each valves individually.
- The valve coil is not energized even if an electric signal is fed by the manifold's connector.
- Effective use as a safety measure for maintenance.
Common Specifications ................................................................. P.1334
Construction .................................................................................. P.1335

**Plug-in** Connector Type Manifold

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- Manifold Electrical Wiring ........................................ P.1338
- Connector Wiring Diagram ........................................... P.1338
- Dimensions ................................................................. P.1339 to 1343

**Non Plug-in** Individual Wiring Manifold

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- Dimensions ................................................................. P.1346, 1347

Manifold Exploded View ............................................................... P.1348
Manifold Options ........................................................................ P.1349 to 1351
Specific Product Precautions ......................................................... P.1352 to 1356
Manifold Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>D-sub connector</th>
<th>Non plug-in</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type 10FA</td>
<td>Type 10FB</td>
<td>Type 10</td>
</tr>
<tr>
<td>Manifold type</td>
<td>Connector type</td>
<td>Individual wiring</td>
</tr>
<tr>
<td>1 (SUP), 3 (EXH)</td>
<td>Common SUP, EXH</td>
<td></td>
</tr>
</tbody>
</table>

Valve stations

<table>
<thead>
<tr>
<th>Port size</th>
<th>1 (SUP), 3 (EXH) port</th>
<th>C4, C6, N3, N7</th>
</tr>
</thead>
<tbody>
<tr>
<td>2a, 2b port</td>
<td>C2, C4, N1, N3</td>
<td></td>
</tr>
<tr>
<td>Weight W (g)</td>
<td>n: Valve stations</td>
<td>W = 56 + n</td>
</tr>
</tbody>
</table>

Note 1) Impact resistance: No malfunction occurred when it is tested with a drop tester in the axial direction and at the right angles to the main valve and armature in both energized and de-energized states every once for each condition. (Value in the initial state)

Vibration resistance: No malfunction occurred in one sweep test between 45 and 2000Hz. Test was performed in the axial direction and at the right angles to the main valve and armature in both energized and de-energized states for each condition. (Value in the initial state)

Note 2) For the allowable voltage fluctuation for Z and T types (with power saving circuit), observe the following range because there is voltage drop due to internal circuit.

Z type 24 VDC: ~7% to +10% 12 VDC: ~4% to +10%
T type 24 VDC: ~5% to +10% 12 VDC: ~6% to +10%

Note 3) Reference page 1353 for details.

Solenoid Valve Specifications

<table>
<thead>
<tr>
<th>Fluid</th>
<th>Operating pressure range (MPa)</th>
<th>Vacuum pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air</td>
<td>0 to 0.7</td>
<td>1 port: –100 kPa to 0.63 ports: –100 kPa to 0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>N.O. 1 port: –100 kPa to 0/3 ports: –100 kPa to 0.6</td>
</tr>
</tbody>
</table>

Maximum operating frequency (Hz)

<table>
<thead>
<tr>
<th>Maximum operating frequency (Hz)</th>
<th>Not required</th>
</tr>
</thead>
</table>

Lubrication

<table>
<thead>
<tr>
<th>Lubrication</th>
<th>Not required</th>
</tr>
</thead>
</table>

Mounting orientation

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

Impact/Vibration resistance (m/s²)

<table>
<thead>
<tr>
<th>Impact/Vibration resistance (m/s²)</th>
<th>150/30</th>
</tr>
</thead>
</table>

Enclosure

<table>
<thead>
<tr>
<th>Enclosure</th>
<th>Dustproof</th>
</tr>
</thead>
</table>

Coil rated voltage (DC)

<table>
<thead>
<tr>
<th>Coil rated voltage (DC)</th>
<th>24 V, 12 V</th>
</tr>
</thead>
</table>

Allowable voltage fluctuation (V)

<table>
<thead>
<tr>
<th>Allowable voltage fluctuation (V)</th>
<th>±10% of rated voltage</th>
</tr>
</thead>
</table>

Power consumption (W)

<table>
<thead>
<tr>
<th>Power consumption (W)</th>
<th>Standard 0.4</th>
</tr>
</thead>
<tbody>
<tr>
<td>With power saving circuit (Continuous duty type)</td>
<td>0.15 [Note 2]</td>
</tr>
</tbody>
</table>

Surge voltage suppressor

<table>
<thead>
<tr>
<th>Surge voltage suppressor</th>
<th>Diode</th>
</tr>
</thead>
</table>

Indicator light

<table>
<thead>
<tr>
<th>Indicator light</th>
<th>LED</th>
</tr>
</thead>
</table>

Response Time

<table>
<thead>
<tr>
<th>Response time ms (at 0.5 MPa)</th>
<th>7 or less</th>
</tr>
</thead>
</table>

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

Weight

<table>
<thead>
<tr>
<th>Valve model</th>
<th>Number of solenoids</th>
<th>Port size</th>
<th>Weight (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>V110□-C2/C4</td>
<td>1 pc. (Single)</td>
<td>C2, C4</td>
<td>31</td>
</tr>
<tr>
<td></td>
<td>2 pcs. (Double)</td>
<td>(a2, a4 One-touch fitting)</td>
<td>40</td>
</tr>
</tbody>
</table>

Flow Rate Characteristics

<table>
<thead>
<tr>
<th>Port size</th>
<th>Flow rate characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>1(P) 2a, 2b</td>
<td>1(P)→2a/2b</td>
</tr>
<tr>
<td>2a/2b→3(E)</td>
<td>C [dm³/(s·bar)] b</td>
</tr>
<tr>
<td>C6</td>
<td>C [dm³/(s·bar)] b</td>
</tr>
</tbody>
</table>

C2 0.03 0.22 0.05 0.31
C4 0.03 0.19 0.05 0.29

* The effective area S (mm²) is approximately 5 times as large as the sonic conductance (S = C x 5).
### Construction

#### Single

![Diagram of Single Construction]

#### Double

![Diagram of Double Construction]

### Component Parts

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Body</td>
<td>Resin</td>
</tr>
<tr>
<td>2</td>
<td>Cover</td>
<td>Stainless steel</td>
</tr>
<tr>
<td>3</td>
<td>Push rod</td>
<td>Resin</td>
</tr>
<tr>
<td>4</td>
<td>Armature assembly</td>
<td>Stainless steel/Resin</td>
</tr>
<tr>
<td>5</td>
<td>Core</td>
<td>Stainless steel</td>
</tr>
<tr>
<td>6</td>
<td>Poppet</td>
<td>FKM</td>
</tr>
<tr>
<td>7</td>
<td>Return spring</td>
<td>Stainless steel</td>
</tr>
<tr>
<td>8</td>
<td>Poppet spring</td>
<td>Stainless steel</td>
</tr>
<tr>
<td>9</td>
<td>Coil assembly</td>
<td>—</td>
</tr>
<tr>
<td>10</td>
<td>Pilot adapter</td>
<td>Resin</td>
</tr>
<tr>
<td>11</td>
<td>Port block</td>
<td>Resin</td>
</tr>
<tr>
<td>12</td>
<td>Clip</td>
<td>Stainless steel</td>
</tr>
</tbody>
</table>

### Replacement Parts

#### One-touch Fitting (Metric Size)

<table>
<thead>
<tr>
<th>No.</th>
<th>Port</th>
<th>Port size</th>
<th>Part no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2a</td>
<td>2b</td>
<td>ø2 One-touch fitting (Straight)</td>
<td>KJH02-C1</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>ø4 One-touch fitting (Straight)</td>
<td>KJH04-C1</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>ø6 One-touch fitting (Straight)</td>
<td>VVQ1000-50A-C4</td>
</tr>
<tr>
<td>13</td>
<td>1(P), 3(E)</td>
<td>ø4 One-touch fitting (Elbow)</td>
<td>KJL04-C1-N</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ø6 One-touch fitting (Elbow)</td>
<td>VVQ1000-50A-C6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ø4 One-touch fitting (Long elbow)</td>
<td>KJW02-C1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ø6 One-touch fitting (Long elbow)</td>
<td>KJW04-C1-N</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ø4 One-touch fitting (Long elbow)</td>
<td>VVQ1000-50A-N3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ø6 One-touch fitting (Long elbow)</td>
<td>VVQ1000-50A-N7</td>
</tr>
</tbody>
</table>

#### One-touch Fitting (Inch Size)

<table>
<thead>
<tr>
<th>No.</th>
<th>Port</th>
<th>Port size</th>
<th>Part no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2a</td>
<td>2b</td>
<td>ø1/8” One-touch fitting (Straight)</td>
<td>KJJH01-C1</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>ø5/32” One-touch fitting (Straight)</td>
<td>KJJH03-C1</td>
</tr>
<tr>
<td>13</td>
<td>1(P), 3(E)</td>
<td>ø5/32” One-touch fitting (Straight)</td>
<td>VVQ1000-50A-N3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ø1/4” One-touch fitting (Straight)</td>
<td>VVQ1000-50A-N7</td>
</tr>
</tbody>
</table>
The valve arrangement is numbered as the 1st station from D side.

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

The asterisk denotes the symbol for assembly. Prefix to the part no. of the solenoid valve, etc.

Prefix to the part no. of the solenoid valve, etc.

VV100 - 10F AD 2 - 05 U 1 - C6

Ordering example (VV100-10FA)

Double solenoid, individual wiring/lead wire length 300 mm (24 VDC)

V110-D5MZ-C4 (1 set) Double solenoid (24 VDC)
V110-D5CU-C4 (1 set) Double solenoid (24 VDC)
V110-D5MZ-C4 (3 sets)

V110-D5MZ-C4 (1 set) Double solenoid, individual wiring/lead wire length 300 mm part no.

V110-D5CU-C4 (3 sets)

The asterisk denotes the symbol for assembly. Prefix to the part no. of the solenoid valve, etc.

- The valve arrangement is numbered as the 1st station from D side.
- Indicate the valves to be attached below the manifold part number, in order starting from station 1 as shown in the drawing.

Mounting option

Symbol | Mounting
--- | ---
Nill | Manifold direct mounting type
Nil | With mounting nut M3 x 0.5
N | Manifold direct mounting type
N | With mounting nut No. 10-32 UNF (Inch size)
F1 | With bracket (Standard)
F2 | With bracket (Port downward)

SUP/EXH block port size

One-touch fitting (Metric size)

C4 | ø4 One-touch fitting (Straight)
C6 | ø6 One-touch fitting (Straight)
L4 | ø4 elbow fitting (Upward entry)
L6 | ø6 elbow fitting (Upward entry)
B4 | ø4 elbow fitting (Downward entry)
B6 | ø6 elbow fitting (Downward entry)

One-touch fitting (Inch size)

N3 | 5/32" One-touch fitting (Straight)
N7 | 1/4" One-touch fitting (Straight)

SUP/EXH block fitting entry direction

Standard

1 | Same direction as the cylinder ports
Side

2

* If the mounted valve is N.O., apply pressure to the 3(E) port and exhaust air from the 1(P) port.
How to Order Valve for Connector Type

**Standard**

```
V1 1 0 T - D 5 C U - C4 -
```

**With switch**

```
V1 1 0 - D 5 C Z J - C4 -
```

**Individual wiring**

[For plug-in mixed mounting]

```
V1 1 0 T - D 5 M Z - C4 -
```

---

**Type of actuation**

1. Normally closed (N.C.)
2. Normally open (N.O.)

* Normally closed and normally open type cannot be mounted on the same manifold. Refer to “Manifold Specifications” on page 1334 for the pressure port.

---

**Coil specification**

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nil</td>
<td>Standard</td>
</tr>
<tr>
<td>Y</td>
<td>With power saving circuit (Continuous duty type)</td>
</tr>
</tbody>
</table>

* Be certain to select “with power saving circuit” when the solenoid valve will be energized continuously for long periods of time.

---

**Number of solenoids**

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>S</td>
<td>1 pc. (Single solenoid)</td>
</tr>
<tr>
<td>D</td>
<td>2 pcs. (Double solenoid)</td>
</tr>
</tbody>
</table>

---

**Rated voltage**

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

---

**Common specification**

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>-COM.</td>
</tr>
<tr>
<td>T</td>
<td>+COM.</td>
</tr>
</tbody>
</table>

* For the non-polar type, there is no need to select a symbol.

---

**Connector entry**

- **C**: Dedicated for centralized wiring
- **M**: Individual wiring, With lead wire (Length 300 mm)
- **MN**: Individual wiring, Without lead wire (With connector, socket)
- **MO**: Individual wiring, Without connector

---

**Light/Surge voltage suppressor**

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>U</td>
<td>With light/surge voltage suppressor (Non-polar type)</td>
</tr>
<tr>
<td>Z</td>
<td>With light/surge voltage suppressor (Polar type)</td>
</tr>
</tbody>
</table>

* When the types with power saving circuit, with switches, and individual wiring are used, the non-polar type cannot be selected.

---

**Single solenoid wiring specification**

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nil</td>
<td>Single wiring</td>
</tr>
<tr>
<td>D</td>
<td>Double wiring</td>
</tr>
</tbody>
</table>

* Nil for the double solenoid. Select this when the unused numbers to wiring are set. See page 1338 for details.

---

**2a/2b fitting port size**

- **Straight fitting**
  - (Metric size) C2: ø2 One-touch fitting
  - (Inch size) C4: ø4 One-touch fitting
- **Elbow fitting (Upward entry)**
  - (Metric size) L2: ø2 One-touch fitting
  - (Inch size) LN2: ø1/8” One-touch fitting
- **Elbow fitting (Downward entry)**
  - (Metric size) B2: ø2 One-touch fitting
  - (Inch size) BN2: ø1/8” One-touch fitting

---

* Connector entries with the symbol “M” cannot use the switch signal from the D-sub connector on the manifold. For details, refer to Manifold Electrical Wiring on page 1338.

* When ordering a connector assembly separately, see pages 1355 and 1356.
Manifold Electrical Wiring (Image)

When a valve is added, the signals of the connector are assigned to the valve. This makes it completely unnecessary to disassemble the connector unit.

- The connector arrangement shown below differs from the actual arrangement. Refer to the Connector Wiring Diagram below.

Single Solenoid and Double Solenoid

Single Solenoid with Double Wiring Specification

Individually Wired Valve

Connector Wiring Diagram

Type FA: D-sub connector (15 pins)

Type FB: D-sub connector (26 pins)

Caution

When the non-polar U type valves are used, either +COM or –COM wiring of the manifold is possible. However when Z type valves are used, select the common specifications, +COM or –COM.
### Dimensions

**VV100-10F[D1- Stations]U-□□**

#### Table: L: Dimensions

<table>
<thead>
<tr>
<th>L</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>
</tr>
</thead>
<tbody>
<tr>
<td>L1</td>
<td>53.7</td>
<td>63.9</td>
<td>74.1</td>
<td>84.3</td>
<td>94.5</td>
<td>104.7</td>
<td>114.9</td>
<td>125.1</td>
<td>135.3</td>
<td>145.5</td>
<td>155.7</td>
<td>165.9</td>
</tr>
<tr>
<td>L2</td>
<td>20.4</td>
<td>30.6</td>
<td>40.8</td>
<td>51</td>
<td>61.2</td>
<td>71.4</td>
<td>81.6</td>
<td>91.8</td>
<td>102</td>
<td>112.2</td>
<td>122.4</td>
<td>132.6</td>
</tr>
</tbody>
</table>

#### Diagram:

- One-touch fitting
- Applicable tubing O.D: Ø4, Ø5/32, Ø1/4" (inch)
- Light/Surge voltage suppressor:
  - SOLa: Orange
  - SOLb: Green
- Switch

#### Notes:

1) 10FA and 10FB types have the same L1 and L2 dimensions, and the only difference is the number of poles of the connector. See page 1338 for the pin arrangement.

2) For manifold dimensions including elbow fitting, see page 1343.

3) As the distance between the block end to the thread is 2.5 mm, the screw depth should be 5 to 7 mm.
VV100 Series

Dimensions

VV100-10F
Bracket option: F1 (For side ported)
- Bracket for side ported
- One-touch fitting
- Applicable tubing O.D: Ø4 Ø6 Ø5/32" Ø1/4"
- If the fittings are mounted on side.

Bracket option: F2 (For bottom ported)
- 4 x M3 for mounting (Bracket)
- Bracket for bottom ported

Notes:
1) 10FA and 10FB types have the same L1 to L5 dimensions, and the only difference is the number of poles of the connector. See page 1338 for the pin arrangement.
2) For manifold dimensions including elbow fitting, see page 1343.

L: Dimensions

<table>
<thead>
<tr>
<th>L</th>
<th>0</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>
</tr>
</thead>
<tbody>
<tr>
<td>L1</td>
<td>53.7</td>
<td>63.9</td>
<td>74.1</td>
<td>84.3</td>
<td>94.5</td>
<td>104.7</td>
<td>114.9</td>
<td>125.1</td>
<td>135.3</td>
<td>145.5</td>
<td>155.7</td>
<td>165.9</td>
<td></td>
</tr>
<tr>
<td>L2</td>
<td>42.2</td>
<td>52.4</td>
<td>62.6</td>
<td>72.8</td>
<td>83</td>
<td>93.2</td>
<td>103.4</td>
<td>113.6</td>
<td>123.8</td>
<td>134</td>
<td>144.2</td>
<td>154.4</td>
<td></td>
</tr>
<tr>
<td>L3</td>
<td>50.2</td>
<td>60.4</td>
<td>70.6</td>
<td>80.8</td>
<td>91</td>
<td>101.2</td>
<td>111.4</td>
<td>121.6</td>
<td>131.8</td>
<td>142</td>
<td>152.2</td>
<td>162.4</td>
<td></td>
</tr>
<tr>
<td>L4</td>
<td>61.2</td>
<td>71.4</td>
<td>81.6</td>
<td>91.8</td>
<td>102</td>
<td>112.2</td>
<td>122.4</td>
<td>132.6</td>
<td>142.8</td>
<td>153</td>
<td>163.2</td>
<td>173.4</td>
<td></td>
</tr>
<tr>
<td>L5</td>
<td>68.6</td>
<td>78.8</td>
<td>89</td>
<td>99.2</td>
<td>109.4</td>
<td>119.6</td>
<td>129.8</td>
<td>140</td>
<td>150.2</td>
<td>160.4</td>
<td>170.6</td>
<td>180.8</td>
<td></td>
</tr>
</tbody>
</table>
### 3 Port Solenoid Valve/D-sub Connector

#### VV100 Series

**VV100-10F**: 3 Port Solenoid Valve/D-sub Connector

**Plug-in Connector Type Manifold**

---

**L1** and **L2** Dimensions

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
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<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1</td>
<td>34.2</td>
<td>44.4</td>
<td>54.6</td>
<td>64.8</td>
<td>75</td>
<td>85.2</td>
<td>95.4</td>
<td>105.6</td>
<td>115.8</td>
<td>126</td>
<td>136.2</td>
<td>146.4</td>
</tr>
<tr>
<td>L2</td>
<td>20.4</td>
<td>30.6</td>
<td>40.8</td>
<td>51</td>
<td>61.2</td>
<td>71.4</td>
<td>81.6</td>
<td>91.8</td>
<td>102</td>
<td>112.2</td>
<td>122.4</td>
<td>132.6</td>
</tr>
</tbody>
</table>

**Notes**:

1. 10FA and 10FB types have the same **L1** and **L2** dimensions, and the only difference is the number of poles of the connector. See page 1338 for the pin arrangement.
2. For manifold dimensions including elbow fitting, see page 1343.
3. As the distance between the block end to the thread is 2.5 mm, the screw depth should be 5 to 7 mm.
Dimensions

VV100-10F Series

Bracket option: F1 (For side ported)

Bracket option: F2 (For bottom ported)

If the fittings are mounted on side.

One-touch fitting [1(P), 3(E) port]
Applicable tubing O.D: ø4 ø6 ø5/32" ø1/4"

If the fittings are mounted on side.

One-touch fitting (2a, 2b port)
Applicable tubing O.D: ø2 ø4 ø1/8" ø5/32"

<table>
<thead>
<tr>
<th>L</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
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<th>10</th>
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</tr>
</thead>
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<tr>
<td>L1</td>
<td>34.2</td>
<td>44.4</td>
<td>54.6</td>
<td>64.8</td>
<td>75</td>
<td>85.2</td>
<td>95.4</td>
<td>105.6</td>
<td>115.8</td>
<td>126</td>
<td>136.2</td>
<td>146.4</td>
</tr>
<tr>
<td>L2</td>
<td>42.2</td>
<td>52.4</td>
<td>62.6</td>
<td>72.8</td>
<td>83</td>
<td>93.2</td>
<td>103.4</td>
<td>113.6</td>
<td>123.8</td>
<td>134</td>
<td>144.2</td>
<td>154.4</td>
</tr>
<tr>
<td>L3</td>
<td>50.2</td>
<td>60.4</td>
<td>70.6</td>
<td>80.8</td>
<td>91</td>
<td>101.2</td>
<td>111.4</td>
<td>121.6</td>
<td>131.8</td>
<td>142</td>
<td>152.2</td>
<td>162.4</td>
</tr>
</tbody>
</table>

Note 1) 10FA and 10FB types have the same L1 to L3 dimensions, and the only difference is the number of poles of the connector. See page 1338 for the pin arrangement.

Note 2) For manifold dimensions including elbow fitting, see page 1343.
One-touch fitting

[3(E) port]
Applicable tubing O.D: ø4 ø6
* Inch-size elbow fitting is not available.

[1(P) port]
Applicable tubing O.D: ø4 ø6
* Inch-size elbow fitting is not available.

One-touch fitting

[2a port]
Applicable tubing O.D: ø2 ø4 ø1/8" ø5/32"

Thread depth 4.8, hole depth 7 Note)
(For direct mounting)
4 x No. 10-32 UNF if the mounting option “N” is selected.

Note) As the distance between the block end to the thread is 2.5 mm, the screw depth should be 5 to 7 mm.

One-touch fitting

Light/Surge voltage suppressor
SOL.a: Orange
SOL.b: Green

Note) If the inch-size lock bracket screw (No. 4-40 UNC) is needed, the port size of air SUP/EXH block should also be inch size (straight only).

Solenoid No. - (Station 1)
Solenoid No. - (Station n)

(U side) - (D side)

If the fittings are mounted on side.
The valve arrangement is numbered as the 1st station from D side.

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

The asterisk denotes the symbol for assembly. Prefix to the part no. of the solenoid valve, etc.

How to Order Valve Manifold Assembly

Ordering example (VV100-10-□)

- Double solenoid (24 VDC)
- V110N-D5MZ-C4 (5 sets)

Note) If the mounted valve is N.O., apply pressure to the 3(E) port and exhaust air from the 1(P) port.

• SUP/EXH block port size
  1. One-touch fitting (Metric size)
     - C4 ø4 One-touch fitting (Straight)
     - C6 ø6 One-touch fitting (Straight)
     - L4 ø4 elbow fitting (Upward entry)
     - L6 ø6 elbow fitting (Upward entry)
     - B4 ø4 elbow fitting (Downward entry)
     - B6 ø6 elbow fitting (Downward entry)
  2. One-touch fitting (Inch size)
     - N3 ø5/32" One-touch fitting (Straight)
     - N7 ø1/4" One-touch fitting (Straight)

Note) If the mounting option "N" (Mounting nut: Inch size) is selected, the bracket cannot be mounted.

How to Order Manifold

VV100-□-□-□-□

SUP/EXH block
mounting position: U side

Valve stations

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Stations</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>1 station</td>
</tr>
<tr>
<td>12</td>
<td>12 stations</td>
</tr>
</tbody>
</table>

SUP/EXH block fitting entry direction

1. Standard (Same direction as the cylinder ports)
2. Side

Mounting option

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Mounting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nil</td>
<td>With mounting nut M3 x 0.5</td>
</tr>
<tr>
<td>N Note)</td>
<td>With mounting nut No. 10-32 UNF (Inch size)</td>
</tr>
<tr>
<td>F1</td>
<td>With bracket (Standard)</td>
</tr>
<tr>
<td>F2</td>
<td>With bracket (Port downward)</td>
</tr>
</tbody>
</table>

Note) If the mounted valve is N.O., apply pressure to the 3(E) port and exhaust air from the 1(P) port.

The asterisk denotes the symbol for assembly. Prefix to the part no. of the solenoid valve, etc.

The valve arrangement is numbered as the 1st station from D side.

Indicate the valves to be attached below the manifold part number, in order starting from station 1 as shown in the drawing.
How to Order Valve Dedicated for Non Plug-in Individual Wiring

V1 10 TN-D5 MZ-C4

Type of actuation
1 Normally closed (N.C.)
2 Normally open (N.O.)

* Normally closed and normally open type cannot be mounted on the same manifold.

Rated voltage
24 VDC
12 VDC

Coil specification
Nil Standard
T With power saving circuit (Continuous duty type)

* Be certain to select "with power saving circuit" when the solenoid valve will be energized continuously for long periods of time.

Non plug-in

Number of solenoids
Symbol Specifications
S 1 pc. (Single solenoid)
D 2 pcs. (Double solenoid)

2a/2b fitting port size

Straight fitting
(Metric size)
C2: ø2 One-touch fitting
C4: ø4 One-touch fitting

(Inch size)
N1: ø1/8" One-touch fitting
N3: ø5/32" One-touch fitting

Elbow fitting (Upward entry)
(Metric size)
L2: ø2 One-touch fitting
L4: ø4 One-touch fitting

(Inch size)
LN1: ø1/8" One-touch fitting
LN3: ø5/32" One-touch fitting

Elbow fitting (Downward entry)
(Metric size)
B2: ø2 One-touch fitting
B4: ø4 One-touch fitting

(Inch size)
BN1: ø1/8" One-touch fitting
BN3: ø5/32" One-touch fitting

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

Connector entry
M: Individual wiring, With lead wire
Length 300 mm

Without linkage printed circuit board

MN: Individual wiring, Without lead wire
(With connector, socket)

Without linkage printed circuit board

MO: Individual wiring, Without connector

Without linkage printed circuit board

Common specification
Nil +COM.
N −COM.

Number of solenoids
Symbol Specifications
S 1 pc. (Single solenoid)
D 2 pcs. (Double solenoid)

Specifications

Connection to manifold
VV061
VV100
V070
VQD
VQD-V
VK
VT

* When ordering a connector assembly separately, see pages 1355 and 1356.

VV100 Series
3 Port Solenoid Valve
Non Plug-in Individual Wiring Manifold

VV100 Series
3 Port Solenoid Valve
Non Plug-in Individual Wiring Manifold
### Dimensions

**VV100-10-** [Stations]**U1**-□□

#### VV100 Series

**Dimensions**

<table>
<thead>
<tr>
<th>L: Dimensions</th>
<th>n: Stations</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1</td>
<td>34.2</td>
</tr>
<tr>
<td>L2</td>
<td>20.4</td>
</tr>
</tbody>
</table>

Note 1) For manifold dimensions including elbow fitting, see page 1343.

Note 2) As the distance between the block end to the thread is 2.5 mm, the screw depth should be 5 to 7 mm.
VV100-10-[Stations] U1-□□□□□□□

Bracket option: F1 (For side ported)

Bracket for side ported

(Pitch)

if the fittings are mounted on side.

Applicable tubing O.D.:
- ø4
- ø5/32"
- ø1/4"

One-touch fitting

[1(P), 3(E) port]

11.4 (8.9)

L1

Bracket option: F2 (For bottom ported)

Bracket for bottom ported

4 x M3 for mounting (Bracket)

Approx. 300 (Lead wire length)

Solenoid No. -------- 1 1

Light/Surge voltage suppressor

SOL.a: Orange
SOL.b: Green

Solenoid No. -------- 1 2

Note) For manifold dimensions including elbow fitting, see page 1343.

<table>
<thead>
<tr>
<th>L1</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>
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</tr>
</thead>
<tbody>
<tr>
<td>L1</td>
<td>34.2</td>
<td>44.4</td>
<td>54.6</td>
<td>64.8</td>
<td>75</td>
<td>85.2</td>
<td>95.4</td>
<td>105.6</td>
<td>115.8</td>
<td>126</td>
<td>136.2</td>
<td>146.4</td>
</tr>
<tr>
<td>L2</td>
<td>42.2</td>
<td>52.4</td>
<td>62.6</td>
<td>72.8</td>
<td>83</td>
<td>93.2</td>
<td>103.4</td>
<td>113.6</td>
<td>123.8</td>
<td>134</td>
<td>144.2</td>
<td>154.4</td>
</tr>
<tr>
<td>L3</td>
<td>50.2</td>
<td>60.4</td>
<td>70.6</td>
<td>80.8</td>
<td>91</td>
<td>101.2</td>
<td>111.4</td>
<td>121.6</td>
<td>131.8</td>
<td>142</td>
<td>152.2</td>
<td>162.4</td>
</tr>
</tbody>
</table>
**VV100 Series**

**Manifold Exploded View**

**Connector Block Assembly Part No.**

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Part no.</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Connector block assembly [Note] (For plug-in)</td>
<td>V100-192-□A□-15</td>
<td>Refer to Connector Block Assembly Part No. table below.</td>
</tr>
<tr>
<td></td>
<td>SUP/EXH end block assembly [Note] (Common for plug-in and non plug-in types)</td>
<td>V100-193-1A-□</td>
<td>(Metric size)</td>
</tr>
<tr>
<td></td>
<td>&lt;Fitting entry direction: Standard&gt;</td>
<td>C4: ø4 One-touch fitting</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>C6: ø6 One-touch fitting</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>L4: ø4 elbow fitting (Upward entry)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>L6: ø6 elbow fitting (Upward entry)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>B4: ø4 elbow fitting (Downward entry)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>B6: ø6 elbow fitting (Downward entry)</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>SUP/EXH end block assembly [Note] (Common for plug-in and non plug-in types)</td>
<td>V100-193-2A-□</td>
<td>(Inch size)</td>
</tr>
<tr>
<td></td>
<td>&lt;Fitting entry direction: Side&gt;</td>
<td>N3: ø5/32&quot; One-touch fitting</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>N7: ø1/4&quot; One-touch fitting</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>&lt;Mounting nut part no. (4 pcs./set)&gt;</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Metric size (M3): V100-197-1A</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Inch size (No. 10-32 UNF): V100-197-2A</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>End block assembly [Note] (For non plug-in)</td>
<td>V100-199-1A</td>
<td>Metric size (M3): V100-197-1A</td>
</tr>
<tr>
<td></td>
<td>[Mounting nut (Metric size: M3)]</td>
<td>Inch size (No. 10-32 UNF): V100-197-2A</td>
<td></td>
</tr>
<tr>
<td></td>
<td>V100-199-2A</td>
<td>Metric size (M3): V100-197-1A</td>
<td></td>
</tr>
<tr>
<td></td>
<td>[Mounting nut (Inch size: No. 10-32 UNF)]</td>
<td>Inch size (No. 10-32 UNF): V100-197-2A</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Tension bolt (With hexagon nut)</td>
<td>V100-202-□A</td>
<td>Stations (1 to 12) 2 pcs./set</td>
</tr>
</tbody>
</table>

**Connector entry direction/Mounting nut thread type**

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Thread type</th>
<th>Connector entry direction</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Metric size (M3)</td>
<td>Lateral</td>
</tr>
<tr>
<td>2</td>
<td>Inch size (No. 10-32 UNF)</td>
<td>Upward</td>
</tr>
<tr>
<td>3</td>
<td>Metric size (M3)</td>
<td>Upward</td>
</tr>
<tr>
<td>4</td>
<td>Inch size (No. 10-32 UNF)</td>
<td>Upward</td>
</tr>
</tbody>
</table>

**Lock bracket thread type**

| Nil | Metric size (M2.6) |
| U   | Inch size (No. 4-40 UNC) |

---

**Note**

If a bracket is intended to be mounted, select ① Connector block assembly, ② SUP/EXH end block assembly 1A or 3A, and ③ End block assembly 1A with mounting nut (Metric size: M3).
Manifold Options

Bracket Assembly

V100-198-1A (For side ported) <Common for upward/lateral connectors>

V100-198-3A (For bottom ported) <For lateral connector>

V100-198-4A (For bottom ported) <For upward connector>

The screws (M3) with which the bracket is mounted on the manifold are included.

Bracket Mounting Procedure

<For side ported>

1. Fit the bracket to the groove at the connector block (end block).

2. Tighten the screws (Tightening torque M3: 0.6 N·m).

<For bottom ported>

Tighten the screws (Tightening torque M3: 0.6 N·m).

Note) The bracket can be mounted on the block with the mounting nut (Metric size: M3) only. It cannot be mounted on the block with inch-size mounting nut (No. 10-32 UNF).
### Manifold Options

#### Mounting Example

**Manifold direct mounting**
- **SUP/EXH block fitting entry direction:** Standard

![Mounting Example Diagram](image)

**SUP/EXH block fitting entry direction:** Side

![Mounting Example Diagram](image)

**Bracket mounting (For bottom ported)**
- **Upward connector**

![Mounting Example Diagram](image)

- **Lateral connector**

![Mounting Example Diagram](image)

---

### Panel fitting dimensions/Mounting hole dimensions

**M3 thread through hole (Metric size)**
- No.10-32UNF thread through hole (Inch size)

#### Panel fitting dimensions/Mounting hole dimensions

- **Station n:**
  - **L1:** 20.4, 30.6, 40.8, 51, 61.2, 71.4, 81.6, 91.8, 102, 112, 122, 133
  - **L2:** 22.4, 32.8, 43.2, 53.6, 64, 74.4, 84.8, 95.2, 106, 116, 126, 137
  - **L3:** 1.3, 2.5

**Panel fitting dimensions/Mounting hole dimensions**

- **Station n:**
  - **L1:** 61.2, 71.4, 81.6, 91.8, 102, 112, 122, 133
  - **L2:** 36.2, 46.6, 57, 67.4, 77.8, 88.2, 98.6, 109, 119, 130, 140, 151

**Panel fitting dimensions/Mounting hole dimensions**

- **Station n:**
  - **L1:** 52.4, 62.6, 72.8, 83, 93.2, 103, 114, 124, 134, 144, 154, 165
  - **L2:** 36.2, 46.6, 57, 67.4, 77.8, 88.2, 98.6, 109, 119, 130, 140, 151

---

**Reference dimension**

- **L1:**
  - **L2:**
  - **L3:**

---

**Reference dimension**

- **L1:**
  - **L2:**
  - **L3:**

---

**Reference dimension**

- **L1:**
  - **L2:**
  - **L3:**

---

**Reference dimension**

- **L1:**
  - **L2:**
  - **L3:**

---

**Reference dimension**

- **L1:**
  - **L2:**
  - **L3:**

---

**Reference dimension**

- **L1:**
  - **L2:**
  - **L3:**

---

**Reference dimension**

- **L1:**
  - **L2:**
  - **L3:**
Manifold Options

D-sub connector cable assembly

For 15 pins  V100-DS15-□□□ (N)

D-sub Connector Cable Assembly

<table>
<thead>
<tr>
<th>Cable length L</th>
<th>Assembly part no.</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.5 m</td>
<td>V100-DS15-015(N)</td>
<td></td>
</tr>
<tr>
<td>3 m</td>
<td>V100-DS15-030(N)</td>
<td></td>
</tr>
<tr>
<td>5 m</td>
<td>V100-DS15-050(N)</td>
<td>Cable 15 cores X23AWG</td>
</tr>
</tbody>
</table>

Note) For N, the unified thread is used.
For other commercial connectors, use a 15 pin type with female connector conforming to MIL-C24308.

D-sub Connector Cable Assembly

<table>
<thead>
<tr>
<th>Terminal no.</th>
<th>Lead wire color</th>
<th>Dot marking</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Black</td>
<td>None</td>
</tr>
<tr>
<td>2</td>
<td>Brown</td>
<td>None</td>
</tr>
<tr>
<td>3</td>
<td>Red</td>
<td>None</td>
</tr>
<tr>
<td>4</td>
<td>Orange</td>
<td>None</td>
</tr>
<tr>
<td>5</td>
<td>Yellow</td>
<td>None</td>
</tr>
<tr>
<td>6</td>
<td>Pink</td>
<td>None</td>
</tr>
<tr>
<td>7</td>
<td>Blue</td>
<td>None</td>
</tr>
<tr>
<td>8</td>
<td>Purple</td>
<td>White</td>
</tr>
<tr>
<td>9</td>
<td>Gray</td>
<td>Black</td>
</tr>
<tr>
<td>10</td>
<td>White</td>
<td>Black</td>
</tr>
<tr>
<td>11</td>
<td>White</td>
<td>Red</td>
</tr>
<tr>
<td>12</td>
<td>Yellow</td>
<td>Red</td>
</tr>
<tr>
<td>13</td>
<td>Orange</td>
<td>Red</td>
</tr>
<tr>
<td>14</td>
<td>Yellow</td>
<td>Black</td>
</tr>
<tr>
<td>15</td>
<td>Pink</td>
<td>Black</td>
</tr>
</tbody>
</table>

Electric Characteristics

<table>
<thead>
<tr>
<th>Item</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conductor resistance Ω/km, 20°C</td>
<td>65 or less</td>
</tr>
<tr>
<td>Withstand pressure V, 1 min, AC</td>
<td>1000</td>
</tr>
<tr>
<td>Insulation resistance MΩ/km, 20°C</td>
<td>5 or more</td>
</tr>
</tbody>
</table>

* The minimum bending radius for D-sub connector cables is 20 mm.

For 26 pins  V100-DS26-□□□ (N)

D-sub Connector Cable Assembly

<table>
<thead>
<tr>
<th>Cable length L</th>
<th>Assembly part no.</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.5 m</td>
<td>V100-DS26-015(N)</td>
<td></td>
</tr>
<tr>
<td>3 m</td>
<td>V100-DS26-030(N)</td>
<td></td>
</tr>
<tr>
<td>5 m</td>
<td>V100-DS26-050(N)</td>
<td>Cable 26 cores X23AWG</td>
</tr>
</tbody>
</table>

Note) For N, the unified thread is used.

D-sub Connector Cable Assembly

<table>
<thead>
<tr>
<th>Terminal no.</th>
<th>Lead wire color</th>
<th>Dot marking</th>
</tr>
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<tbody>
<tr>
<td>1</td>
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</tr>
<tr>
<td>2</td>
<td>Brown</td>
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</tr>
<tr>
<td>3</td>
<td>Red</td>
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</tr>
<tr>
<td>4</td>
<td>Orange</td>
<td>None</td>
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<tr>
<td>5</td>
<td>Yellow</td>
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</tr>
<tr>
<td>6</td>
<td>Pink</td>
<td>None</td>
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<tr>
<td>7</td>
<td>Blue</td>
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</tr>
<tr>
<td>8</td>
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<tr>
<td>9</td>
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<tr>
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<td>Black</td>
</tr>
<tr>
<td>16</td>
<td>Blue</td>
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</tr>
<tr>
<td>17</td>
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<tr>
<td>18</td>
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<td>None</td>
</tr>
<tr>
<td>26</td>
<td>Light blue</td>
<td>None</td>
</tr>
</tbody>
</table>
**VV100 Series**
Specific Product Precautions 1

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.

---

**Valve with Switch**

**Warning**

When turning off the valve using the switch, move it to the position where the valve is locked. If the switch is at an improper position and is energized, equipment connected to the valve could be actuated. Also, if the switch is turned OFF on the valve in the energized state, be careful because any actuators connected will actuate.

**Electric circuit diagram**

(with positive common and light/surge voltage suppressor)

- **[SOL.b]**
- **COM** (+)
- **Switch**
- **LED (Green)**
- **[SOL.a]** (-)
- **Polarity protection diode**

**ON position**

Normal operation: The valve is switched according to electric signals from the connector on the manifold side.

**OFF position**

The valve coil is kept in a deenergized state even when there is an electric signal from the connector on the manifold side.

**Light/Surge Voltage Suppressor**

**Caution**

- **Non-Polar Type**
  - Single solenoid
  - **COM** (+,-)  
  - **Varistor**
  - **SOL.a** (-)
  - **LED**

- **Positive Common**
  - Single solenoid
  - **COM** (+)
  - **[SOL.a]** (-)
  - **Polarity protection diode**

- **Negative Common**
  - Single solenoid
  - **COM** (-)
  - **[SOL.a]** (+)
  - **Polarity protection diode**

**Double solenoid**

- **SOL.b** (-,+)
- **COM** (+,-)
- **Varistor**
- **SOL.a** (-,+)
- **LED**
- **Polarity protection diode**

**Countermeasure for Surge Voltage Intrusion**

**Caution**

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

When turning off the valve using the switch, move it to the position where the valve is locked. If the switch is at an improper position and is energized, equipment connected to the valve could be actuated. Also, if the switch is turned OFF on the valve in the energized state, be careful because any actuators connected will actuate.

**Continuous Duty**

If a valve is energized continuously for long periods of time, the rise in temperature due to heat-up of the coil may cause a decline in solenoid valve performance, reduce service life, or have adverse effects on peripheral equipment. If a valve will be energized continuously, be sure to use the “Continuous duty type” with a power saving circuit. In particular, there will be a large increase in temperature if 3 or more neighboring stations are simultaneously energized continuously for long periods of time, or if the a and b sides are simultaneously energized continuously for long periods of time. Be very careful in such cases.
VV100 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.

Caution

Continuous Duty

With Power Saving Circuit

Compared to the standard products, power consumption is reduced down to approx. 1/3 (V10T) by cutting the unnecessary wattage required to hold the valve in an energized state. (Effective energizing time is over 67 ms at 24 VDC.)

Electric circuit diagram (with power saving circuit)

Positive common, single solenoid

Negative common, single solenoid

Working Principle

With the circuit above, the current consumption, when holding, is reduced to save energy. Refer to the electric wave data below.

Power waveform of power saving type (V10T)

- When a power saving circuit is installed, a diode to prevent reverse current is not available for 12 V DC specification. Therefore, use caution not to connect in reverse.
- Be careful about the allowable voltage fluctuation since a voltage drop of about 0.5 V occurs due to a transistor. (Refer to the solenoid specifications of each valve for details.)

Light Indication

When equipped with light/surge voltage suppressor, the light window turns orange when solenoid a is energized, and it turns green when solenoid b is energized.

Fitting Replacement

By replacing a valve’s fitting, it is possible to change the port size of the 2a, 2b, 1(P), and 3(E) ports. When replacing it, pull out the fitting after removing the clip or the plate with a flat head screwdriver, etc. To mount a new fitting, insert it into place and then fully reinsert the clip or the plate.

One-touch Fitting Part No.

Metric Size

<table>
<thead>
<tr>
<th>Port</th>
<th>Port size</th>
<th>Part no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2(a)</td>
<td>a2 One-touch fitting (Straight)</td>
<td>KJH02-C1</td>
</tr>
<tr>
<td>2(b)</td>
<td>a4 One-touch fitting (Straight)</td>
<td>KJH04-C1</td>
</tr>
<tr>
<td>2(b)</td>
<td>a2 One-touch fitting (Elbow)</td>
<td>KJL02-C1</td>
</tr>
<tr>
<td>2(b)</td>
<td>a4 One-touch fitting (Elbow)</td>
<td>KJL04-C1-N</td>
</tr>
<tr>
<td>3(E)</td>
<td>a2 One-touch fitting (Long elbow)</td>
<td>KJW02-C1</td>
</tr>
<tr>
<td>3(E)</td>
<td>a4 One-touch fitting (Long elbow)</td>
<td>KJW04-C1-N</td>
</tr>
<tr>
<td>1(P)</td>
<td>a4 One-touch fitting (Straight)</td>
<td>VVQ1000-50A-C4</td>
</tr>
<tr>
<td>3(E)</td>
<td>a6 One-touch fitting (Straight)</td>
<td>VVQ1000-50A-C6</td>
</tr>
<tr>
<td>3(E)</td>
<td>a4 One-touch fitting (Elbow)</td>
<td>SZ3000-73-1A-L4</td>
</tr>
<tr>
<td>3(E)</td>
<td>a6 One-touch fitting (Elbow)</td>
<td>SZ3000-73-1A-L6</td>
</tr>
<tr>
<td>3(E)</td>
<td>a4 One-touch fitting (Long elbow)</td>
<td>SZ3000-73-2A-L4</td>
</tr>
<tr>
<td>3(E)</td>
<td>a6 One-touch fitting (Long elbow)</td>
<td>SZ3000-73-2A-L6</td>
</tr>
</tbody>
</table>

Inch Size

<table>
<thead>
<tr>
<th>Port</th>
<th>Port size</th>
<th>Part no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2(a)</td>
<td>a1/8&quot; One-touch fitting (Straight)</td>
<td>KJH01-C1</td>
</tr>
<tr>
<td>2(b)</td>
<td>a5/32&quot; One-touch fitting (Straight)</td>
<td>KJH03-C1</td>
</tr>
<tr>
<td>1(P)</td>
<td>a5/32&quot; One-touch fitting (Straight)</td>
<td>VVQ1000-50A-N3</td>
</tr>
<tr>
<td>3(E)</td>
<td>a1/4&quot; One-touch fitting (Straight)</td>
<td>VVQ1000-50A-N7</td>
</tr>
</tbody>
</table>

Note 1) Be cautious to avoid damage or contamination to the O-rings, as this can cause air leakage.

Note 2) When removing a straight fitting from a valve, after removing the clip, attach tubing or a plug (KJP-02, KG2P-□□□) to the one-touch fitting, and pull it out while holding the tubing or plug. If it is pulled out while holding the release button of the fitting (resin part), the release button may be damaged.

Note 3) Be sure to turn off the power and stop the supply of air before disassembly. Furthermore, since air may remain inside the actuator, piping and manifold, confirm that the air is completely exhausted before starting any work.

Note 4) While inserting a tubing into an elbow fitting, hold the main body of the assembly by hand. Failure to do so will exert an undue force on the valve or the fitting, resulting in air leakage or damage.
![VV100 Series Specific Product Precautions 3](Image)

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.

### One-touch Fittings

**Caution**

1. Tube attachment/detachment for one-touch fittings
   1) Attaching of tubing
      1. Take a tube having no flaws on its periphery and cut it off at a right angle. When cutting the tube, use tube cutters TK-1, 2 or 3. Do not use pinchers, nippers or scissors, etc. If cutting is done with tools other than tube cutters, there is the danger that the tube may be cut diagonally or become flattened, etc., making a secure installation impossible, and causing problems such as the tube pulling out after installation or air leakage. Also allow some extra length in the tube.
      2. Grasp the tube and push it in slowly, inserting it securely all the way into the fitting.
      3. After inserting the tube, pull on it lightly to confirm that it will not come out. If it is not installed securely all the way into the fitting, this can cause problems such as air leakage or the tube pulling out.
   2) Detaching of tubing
      1. The 2a and 2b ports use the KJ series, so the tube can be removed by pressing on part of the release button. However, for the 1(P) and 3(E) ports, press the release button evenly as before.

Hold down part of the release button with your finger or a similar tool, as shown in the diagram, and pull out in the direction indicated by the arrow.

2) Pull out the tube while holding down the release button so that it does not come out. If the release button is not pressed down sufficiently, there will be increased bite on the tube and it will become more difficult to pull it out.

3) When the removed tube is to be used again, cut off the portion which has been chewed before reusing it. If the chewed portion of the tube is used as is, this can cause trouble such as air leakage or difficulty in removing the tube.

### Other Tubing Brands

**Caution**

1. When using tube other than SMC brand, confirm the following specifications are satisfied with respect to the outside diameter tolerance of the tube.
   1) Nylon tubing within ±0.1 mm
   2) Soft nylon tubing within ±0.1 mm
   3) Polyurethane tubing within +0.15 mm, within –0.2 mm

Do not use tubing which does not meet these outside diameter tolerances. It may not be possible to connect them, or they may cause other troubles, such as air leakage or the tube pulling out after connection.

### How to Use Plug Connector

**Caution**

When attaching and detaching a connector, first shut off the electric power and the air supply. Also, crimp the lead wires and sockets securely.

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 of lead wires and sockets
   Peel 3.2 to 3.7 mm of the tip of lead wire, enter the core wires neatly into a socket and crimp it with a special crimp tool. Be careful so that the cover of lead wire does not enter into the crimping part. (Crimping tool: Model no. DXT170-75-1)
How to Use Plug Connector

**Caution**

3. Attaching and detaching lead wires with sockets

- **Attaching**
  Insert the sockets into the square holes of the connector (with A, B, C, and N indication), and continue to push the sockets all the way in until the lock by hooking into the seats in the connector. (When they are pushed in, their hooks open and they are locked automatically.) Next, 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 is used again, spread the hook outward.

---

**Plug Connector Lead Wire Length**

**Caution**

Plug connector lead wires have a standard length of 300 mm, however, the following lengths are also available.

**Connector Assembly Part No.**

For single solenoid
- SJ3000-46-S-[ ] (for positive common)
- SJ3000-47-S-[ ] (for negative common)

For double solenoid
- SJ3000-46-D-[ ] (for positive common)
- SJ3000-47-D-[ ] (for negative common)

**Lead wire length**

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

For single solenoid: SJ3000-[46]-S-[ ]

For double solenoid: SJ3000-[46]-D-[ ]

**Common specifications**

<table>
<thead>
<tr>
<th>46</th>
<th>For positive common</th>
</tr>
</thead>
<tbody>
<tr>
<td>47</td>
<td>For negative common</td>
</tr>
</tbody>
</table>

For single solenoid:
- Without lead wire: SJ3000-46-S-N (positive/negative common)
  (Connector, Socket x 2 pcs. only)

For double solenoid:
- Without lead wire: SJ3000-46-D-N (positive/negative common)
  (Connector, Socket x 3 pcs. only)

**How to Order**

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

(Example) In case of lead wire length 2000 mm and positive common V110N-D5MOZ-C4
- SJ3000-46-D-20
**Connector Assembly for Manifolds (for Junction Common)**

**Caution**

Using the connector assembly (for junction common) for solenoid valves installed in the manifold reduces the labor involved in wiring work because common wiring for all solenoid valves is integrated into a single wire.

**Connector Assembly Part No. (for Junction Common)**

- **For single solenoid**
  - SJ3000-46-SC (for positive common)
  - SJ3000-47-SC (for negative common)

- **For double solenoid**
  - SJ3000-46-DC (for positive common)
  - SJ3000-47-DC (for negative common)

**Note**

In case of negative common, the lead wire changes from red to yellow.

**Wiring Procedure for Connector Assembly (for Junction Common)**

**Caution**

If only connector assembly (for junction common) is ordered, please wire according to the instructions in the diagram below. For details on socket mounting, refer to “How to Use Plug Connector” on the page 1355.

- **Socket**
  - Insert the socket into the connector of the neighboring solenoid valve.

**How to Order**

Indicate the part no. of the connector assembly for the manifold and solenoid valve.

If the arrangement is complicated, specify them by means of the manifold specification sheet.

- **Note 1**) Applications like connectors not wired to a valve is not possible.
- **Note 2**) For the solenoid valve, designate “Without connector (MOZ)” for the connector type.
- **Note 3**) Connector assembly with lead wire for place where the signals are transmitted to the common wiring. (Only the valves of first station and/or last station of manifold are compatible to connector with lead wire for common.)

**Double solenoid**

- SJ3000-46-DC (for positive common)
- SJ3000-47-DC (for negative common)

**Common specifications**

- **For positive common**
  - 46
- **For negative common**
  - 47

**Common wiring**

- SJ3000-46-S

**Connector Assembly Part No. (for Junction Common)**

- **(Example)**
  - VV100-10-04U1-C6 1 set
  - V110N-SSMOZ-C4 2 sets
  - V110N-D5MOZ-C4 2 sets
  - SJ3000-46-S 1 set (Connector assembly for single solenoid)
  - SJ3000-46-SC 1 set (Connector assembly for single solenoid)
    (for junction common)
  - SJ3000-46-DC 2 sets (Connector assembly for double solenoid)
    (for junction common)

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