Compact Direct Operated 2 Port Solenoid Valve

**VDW Series**

**Lightweight**

- **80g**
  - Aluminum/Resin (PPS) body (VDW2)
- **100g**
  - Current Brass body (VDW2)

**Compact**

- 15 mm
- Current model 17 mm
- 42.5 mm
- 48 mm

(Compared with VDW1, Brass/Stainless steel body)

**Environmental performance**

- **IP65**

**Power consumption**

- **2.5 W** (VDW1)
- **3 W** (VDW2)

**Body material**

- **Aluminum • Resin (PPS)**
- **Brass • Stainless Steel**

- **Only for air.**

- One-touch fitting ø3.2, ø4, ø6

- **RoHS**

*RoHS: Restriction of Hazardous Substances*
Compact Direct Operated 2 Port Solenoid Valve  

**Enclosure** IP65

**Flame resistance** UL94V-0 conformed

**Seal material**
- NBR (Air, Water)
- FKM (Medium vacuum)

**Improved armature durability**

**Low-noise construction**
Metal noise reduced by the rubber damper

**Piping variations**
Screw piping, One-touch fitting

**Body material**
- Aluminum
- Resin (PPS)
- Brass, Stainless steel

**Power consumption**
- 2.5 W (VDW1)
- 3 W (VDW2)

**Fluid**
- Air
- Medium vacuum
- Water

**Size**
- Size 1 (VDW1)
- Size 2 (VDW2)
- Size 1 (VDW1)
- Size 2 (VDW2)

**Orifice diameter**
- 1
- 1.6
- 2.3
- 3.2

**Port size**
- M5
- 1/8
- ø3,2
- ø4
- ø6

**Other special options**
- Special voltage
  - 48 VAC
  - 220 VAC
  - 240 VAC
  - 24 VAC
  - 12 VDC
- G thread, NPT thread
- Oil-free (Note 1)
- Low concentration ozone resistant, Deionized water
  - (Seal material: FKM) (Note 2)
- With bracket

**Notes**
- Note 1) As standard for medium vacuum type.
- Note 2) For air, water.

---

The materials in ( ) are the seal materials.
**Compact Direct Operated 2 Port Solenoid Valve**

**VDW Series**

For Air • Medium Vacuum • Water

### Standard Specifications

<table>
<thead>
<tr>
<th>Valve specifications</th>
<th>Direct operated poppet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Withstand pressure</td>
<td>2.0 (resin body type 1.5)</td>
</tr>
<tr>
<td>Max. system pressure (Note 3)</td>
<td>1.0</td>
</tr>
<tr>
<td>Body material</td>
<td>Aluminum, Resin, Brass, Stainless steel</td>
</tr>
<tr>
<td>Seal material</td>
<td>NBR, FKM</td>
</tr>
<tr>
<td>Enclosure</td>
<td>Dusttight, Low jetproof (IP65) (Note 2)</td>
</tr>
<tr>
<td>Environment</td>
<td>Location without corrosive or explosive gases</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Coil specifications</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated voltage</td>
<td>AC 100 VAC, 200 VAC, 110 VAC, 230 VAC, 220 VAC, 240 VAC, 48 VAC, 24 VAC (Note 1)</td>
</tr>
<tr>
<td>DC 24 VDC, (12 VDC) (Note 1)</td>
<td></td>
</tr>
<tr>
<td>Allowable voltage fluctuation</td>
<td>±10% of rated voltage</td>
</tr>
<tr>
<td>Allowable leakage voltage</td>
<td>AC (With a full wave rectifier) 5% or less of rated voltage</td>
</tr>
<tr>
<td>DC 2% or less of rated voltage</td>
<td></td>
</tr>
<tr>
<td>Coil insulation type</td>
<td>Class B</td>
</tr>
</tbody>
</table>

Be sure to read “Specific Product Precautions” before handling.

### Solenoid Coil Specifications

** Normally Closed (N.C.) **

** DC Specification **

<table>
<thead>
<tr>
<th>Size</th>
<th>Power consumption (W) (Note 1)</th>
<th>Temperature rise (°C) (Note 2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size 1</td>
<td>2.5</td>
<td>60</td>
</tr>
<tr>
<td>Size 2</td>
<td>3</td>
<td>60</td>
</tr>
</tbody>
</table>

Note 1) Power consumption, Apparent power: The value at ambient temperature of 20°C and when the rated voltage is applied. (Variation: ±10%)

Note 2) The value at ambient temperature of 20°C and when the rated voltage is applied. The value depends on the ambient environment. This is for reference.

** AC Specification (With a full wave rectifier) **

<table>
<thead>
<tr>
<th>Size</th>
<th>Apparent power (VA) (Note 1)</th>
<th>Temperature rise (°C) (Note 8)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size 1</td>
<td>2.5</td>
<td>60</td>
</tr>
<tr>
<td>Size 2</td>
<td>3</td>
<td>60</td>
</tr>
</tbody>
</table>

Note 1) Power consumption, Apparent power: The value at ambient temperature of 20°C and when the rated voltage is applied. (Variation: ±10%)

Note 2) There is no difference in the frequency and the inrush and energized apparent power, since a rectifying circuit is used in the AC (with a full wave rectifier).

Note 3) The value at ambient temperature of 20°C and when the rated voltage is applied. The value depends on the ambient environment. This is for reference.

### Selection Steps

** Step 1 ** Select the fluid.

- ** Item **
  - Air [Page 456]
  - Water [Page 460]
  - Medium vacuum [Page 458]

** Symbol **

VDW 1 2 0 A A

** Step 2 ** Select “Body material”, “Port size” and “Orifice diameter” from “Flow rate — Pressure” of each fluid.

- ** Item **
  - Select from “Flow rate — Pressure.”
  - Body material: Resin
  - Port size: M5
  - Orifice diameter: 1

** Symbol **

VDW 1 0 A A

** Step 3 ** Select electric specifications.

- ** Item **
  - Select electric specifications.
  - Voltage: 24 VDC
  - Electrical entry: Grommet

** Symbol **

VDW 1 0 A A

** Step 4 ** For other special options, refer to page 462.
Model/Valve Specifications

N.C.

Symbol

Note) The symbol shows ports 1 and 2 as blocked, but there is actually a limit to the blocking capability when the pressure of port 2 is greater than the pressure of port 1. Please contact SMC when low leakage performance is required.

Normally Closed (N.C.)

Aluminum Body Type

<table>
<thead>
<tr>
<th>Size</th>
<th>Port size</th>
<th>Orifice diameter (mmø)</th>
<th>Model</th>
<th>Flow rate characteristics (^\text{Note 1)})</th>
<th>Maximum operating pressure differential (MPa)</th>
<th>Weight (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>M5, 1/8</td>
<td>1.6</td>
<td>VDW20</td>
<td>C [dm(^3)/(s·bar)] b Cv Pressurized port 1</td>
<td>0.30 0.45 0.07 0.7</td>
<td>80</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.3</td>
<td></td>
<td></td>
<td>0.58 0.45 0.18 0.4</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.2</td>
<td></td>
<td></td>
<td>1.10 0.38 0.30 0.2</td>
<td></td>
</tr>
</tbody>
</table>

Resin Body Type (Built-in One-touch Fittings) \(^*\)

<table>
<thead>
<tr>
<th>Size</th>
<th>Port size</th>
<th>Orifice diameter (mmø)</th>
<th>Model</th>
<th>Flow rate characteristics (^\text{Note 1)})</th>
<th>Maximum operating pressure differential (MPa)</th>
<th>Weight (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>M5 ø3.2 One-touch fitting ø4 One-touch fitting</td>
<td>1.0</td>
<td>VDW10</td>
<td>C [dm(^3)/(s·bar)] b Cv Pressurized port 1</td>
<td>0.14 0.40 0.04 0.9</td>
<td>45</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.6</td>
<td></td>
<td></td>
<td>0.30 0.25 0.07 0.4</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>M5 ø4 One-touch fitting ø6 One-touch fitting</td>
<td>1.6</td>
<td>VDW20</td>
<td></td>
<td>0.30 0.45 0.07 0.7</td>
<td>80</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.3</td>
<td></td>
<td></td>
<td>0.42 0.45 0.12 0.4</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.2</td>
<td></td>
<td></td>
<td>0.56 0.40 0.16 0.2</td>
<td></td>
</tr>
</tbody>
</table>

Note 1\(^\text{)}\) The flow rate characteristics of this product have variations.

When the highly precise flow control is required according to the system to be used, select an orifice diameter 1.3 times larger than that shown above and install a restrictor on the downstream side of the solenoid valve to make the adjustment.

Note 2\(^\text{)}\) Refer to “Glossary of Terms” on page 466 for details on the maximum operating pressure differential.

Fluid and Ambient Temperature

<table>
<thead>
<tr>
<th>Fluid temperature (°C)</th>
<th>Ambient temperature (°C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>–10 (^\text{Note 1)}) to 50</td>
<td>–10 to 50</td>
</tr>
</tbody>
</table>

Note) Dew point temperature: –10°C or less

Valve Leakage

Internal Leakage

<table>
<thead>
<tr>
<th>Seal material</th>
<th>Leakage rate (Air) (^\text{Note 2)})</th>
</tr>
</thead>
<tbody>
<tr>
<td>NBR</td>
<td>1 cm(^3)/min or less (Aluminum body type)</td>
</tr>
<tr>
<td></td>
<td>15 cm(^3)/min or less (Resin body type)</td>
</tr>
</tbody>
</table>

External Leakage

<table>
<thead>
<tr>
<th>Seal material</th>
<th>Leakage rate (Air) (^\text{Note 2)})</th>
</tr>
</thead>
<tbody>
<tr>
<td>NBR</td>
<td>1 cm(^3)/min or less (Aluminum body type)</td>
</tr>
<tr>
<td></td>
<td>15 cm(^3)/min or less (Resin body type)</td>
</tr>
</tbody>
</table>

Note) Leakage is the value at ambient temperature 20°C.
**How to Order (Single Unit)**

**Size/Valve type**
- Symbol: A
- Size: 1
- Valve type: Single
- Body material: Resin (PPS)
- Port size: M5
- Orifice diameter: 1.0

**Body material/Port size/Orifice diameter**
- Symbol: A
- Body material: Resin (PPS)
- Port size: M5
- Orifice diameter: 1.0

**Voltage/Electrical entry**
- Symbol: A
- Voltage: 24 VDC
- Electrical entry: Grommet

**Common Specifications**
- Valve type: N.C.
- Seal material: NBR
- Coil insulation type: Class B
- Thread type: Rc*

* One-touch fittings are attached to the resin body type.

---

**For other special options, refer to page 462.**

- Special voltage:
  - 48 VAC
  - 220 VAC
  - 240 VAC
  - 24 VAC
  - 12 VDC

- Low concentration ozone resistant (Seal material: FKM)
- Oil-free
- G thread
- NPT thread
- With bracket (Aluminum body only)

---

**Dimensions—Page 463 (Single unit)**
**For Medium Vacuum Single Unit**

* This valve can also be used with air.
(Refer to the valve specifications on page 456 for air.)

### Model/Valve Specifications

**N.C.**

#### Fluid and Ambient Temperature

<table>
<thead>
<tr>
<th>Fluid temperature (°C)</th>
<th>Ambient temperature (°C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 to 50</td>
<td>-10 to 50</td>
</tr>
</tbody>
</table>

Note) With no freezing

#### Valve Leakage

**Internal Leakage**

<table>
<thead>
<tr>
<th>Seal material</th>
<th>Leakage rate $10^{−6}$ Pa·m$^3$/sec or less</th>
</tr>
</thead>
<tbody>
<tr>
<td>FKM</td>
<td></td>
</tr>
</tbody>
</table>

**External Leakage**

<table>
<thead>
<tr>
<th>Seal material</th>
<th>Leakage rate $10^{−6}$ Pa·m$^3$/sec or less</th>
</tr>
</thead>
<tbody>
<tr>
<td>FKM</td>
<td></td>
</tr>
</tbody>
</table>

Note) Leakage ($10^{−6}$ Pa·m$^3$/sec) is the value at 0.1 Pa·abs and ambient temperature 20°C.

---

**Normally Closed (N.C.)**

* Flow rate characteristics show those when the port size is M5 (size 1) or 1/8 (size 2).

<table>
<thead>
<tr>
<th>Size</th>
<th>Port size</th>
<th>Orifice diameter (mmø)</th>
<th>Model</th>
<th>Flow rate characteristics $^1$</th>
<th>Maximum operating pressure differential (MPa) $^2$</th>
<th>Weight (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>M5</td>
<td>1.0</td>
<td>VDW14</td>
<td>C [dm$^3$/s·bar]</td>
<td>0.14</td>
<td>0.40</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.6</td>
<td></td>
<td>b</td>
<td>0.30</td>
<td>0.25</td>
</tr>
<tr>
<td></td>
<td>M5, 1/8</td>
<td>1.6</td>
<td>VDW24</td>
<td>C [dm$^3$/s·bar]</td>
<td>0.30</td>
<td>0.45</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.3</td>
<td></td>
<td>b</td>
<td>0.58</td>
<td>0.45</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.2</td>
<td></td>
<td>C</td>
<td>1.10</td>
<td>0.38</td>
</tr>
</tbody>
</table>

Note 1) The flow rate characteristics of this product have variations.
When the highly precise flow control is required according to the system to be used, select an orifice diameter 1.3 times larger than that shown above and install a restrictor on the downstream side of the solenoid valve to make the adjustment.

Note 2) Refer to “Glossary of Terms” on page 466 for details on the maximum operating pressure differential.

---

**Symbol (Application example)**

Used with vacuum

Used with pressure

Note) The symbol shows ports 1 and 2 as blocked, but there is actually a limit to the blocking capability when the pressure of port 2 is greater than the pressure of port 1. Please contact SMC when low leakage performance is required.

---

**VDW Series**

* This valve can also be used with air.
(Refer to the valve specifications on page 456 for air.)

---

© 458
## Compact Direct Operated 2 Port Solenoid Valve  **VDW Series**

### For Medium Vacuum Single Unit

### How to Order (Single Unit)

#### VDW 1 4 A A

**Fluid**
- **4** For medium vacuum

**Common Specifications**
- **Valve type** N.C.
- **Seal material** FKM
- **Coil insulation type** Class B
- **Thread type** Rc
- **Oil-free**

### Size/Valve type

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Size/Valve type</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Size 1 (VDW1)</td>
</tr>
<tr>
<td>2</td>
<td>Size 2 (VDW2)</td>
</tr>
</tbody>
</table>

### Body material/Port size/Orifice diameter

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Body material</th>
<th>Port size</th>
<th>Orifice diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>G</td>
<td>Brass</td>
<td>M5</td>
<td>1.0</td>
</tr>
<tr>
<td>H</td>
<td>Brass</td>
<td></td>
<td>1.6</td>
</tr>
<tr>
<td>J</td>
<td>Stainless steel</td>
<td>M5</td>
<td>1.0</td>
</tr>
<tr>
<td>K</td>
<td>Stainless steel</td>
<td></td>
<td>1.6</td>
</tr>
</tbody>
</table>

### Voltage/Electrical entry

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Voltage</th>
<th>Electrical entry</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>24 VDC</td>
<td>Grommet</td>
</tr>
<tr>
<td>B</td>
<td>100 VAC</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>110 VAC</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>200 VAC</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>230 VAC</td>
<td>Other voltages</td>
</tr>
<tr>
<td>Z</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**For other special options, refer to page 462.**

- **Special voltage**
  - 48 VAC
  - 220 VAC
  - 240 VAC
  - 24 VAC
  - 12 VDC

- **Thread**
  - G thread
  - NPT thread
  - With bracket

**Dimensions**
- Page 463 (Single unit)

---

**Dimensions**
- Page 463 (Single unit)
**VDW Series**

For Water | Single Unit

* This valve can also be used with air. (Refer to the valve specifications on page 456 for air.)

---

**Model/Valve Specifications**

### N.C.

**Symbol**

![Symbol](image)

Note 1) The symbol shows ports 1 and 2 as blocked, but there is actually a limit to the blocking capability when the pressure of port 2 is greater than the pressure of port 1. Please contact SMC when low leakage performance is required.

** Normally Closed (N.C.)**

**C37, Stainless Steel Body Type**

<table>
<thead>
<tr>
<th>Size</th>
<th>Port size</th>
<th>Orifice diameter (mm)</th>
<th>Model</th>
<th>Flow rate characteristics</th>
<th>Maximum operating pressure differential (MPa)</th>
<th>Weight (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>M5</td>
<td>1.0</td>
<td>VDW12</td>
<td>0.034</td>
<td>0.9</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.6</td>
<td></td>
<td>0.06</td>
<td>0.4</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>M5, 1/8</td>
<td>2.3</td>
<td>VDW22</td>
<td>0.15</td>
<td>0.4</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.2</td>
<td></td>
<td>0.26</td>
<td>0.2</td>
<td></td>
</tr>
</tbody>
</table>

**Resin Body Type**

Flow rate characteristics show those when the One-touch fitting with a port size of ø4 (size 1 or 2) is used.

<table>
<thead>
<tr>
<th>Size</th>
<th>Port size</th>
<th>Orifice diameter (mm)</th>
<th>Model</th>
<th>Flow rate characteristics</th>
<th>Maximum operating pressure differential (MPa)</th>
<th>Weight (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>M5</td>
<td>1.0</td>
<td>VDW12</td>
<td>0.034</td>
<td>0.9</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.6</td>
<td></td>
<td>0.06</td>
<td>0.4</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>M5</td>
<td>2.3</td>
<td>VDW22</td>
<td>0.10</td>
<td>0.4</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.2</td>
<td></td>
<td>0.14</td>
<td>0.2</td>
<td></td>
</tr>
</tbody>
</table>

Note 1) The flow rate characteristics of this product have variations. When the highly precise flow control is required according to the system to be used, select an orifice diameter 1.3 times larger than that shown above and install a restrictor on the downstream side of the solenoid valve to make the adjustment.

Note 2) Refer to “Glossary of Terms” on page 466 for details on the maximum operating pressure differential.

**Fluid and Ambient Temperature**

<table>
<thead>
<tr>
<th>Fluid temperature (°C)</th>
<th>Ambient temperature (°C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 to 50</td>
<td>−10 to 50</td>
</tr>
</tbody>
</table>

Note 1) With no freezing

**Valve Leakage**

### Internal Leakage

<table>
<thead>
<tr>
<th>Seal material</th>
<th>Leakage rate (Water)</th>
</tr>
</thead>
<tbody>
<tr>
<td>NBR</td>
<td>0.1 cm³/min or less (C37, Stainless steel body type)</td>
</tr>
</tbody>
</table>

### External Leakage

<table>
<thead>
<tr>
<th>Seal material</th>
<th>Leakage rate (Water)</th>
</tr>
</thead>
<tbody>
<tr>
<td>NBR</td>
<td>0.1 cm³/min or less (C37, Stainless steel body type)</td>
</tr>
</tbody>
</table>

Note 2) Leakage is the value at ambient temperature 20°C.
How to Order (Single Unit)

VDW 1 2 A A

Fluid

Size / Valve type

Symbol | Size | Valve type | Body material / Port size / Orifice diameter | Symbol | Body material / Port size / Orifice diameter \\
|-------|------|------------|-----------------------------------------------|-------|-----------------------------------------------
| A     | Resin (PPS) (With bracket) | M5 | 1.0 |
| B     | Resin (PPS) (With bracket) | 0.3 | 2.3 |
| C     | Resin (PPS) (With bracket) | 0.4 | 3.2 |
| D     | Resin (PPS) (With bracket) | 1.0 | 1.6 |
| E     | Resin (PPS) (With bracket) | 0.4 | 2.3 |
| F     | Brass | M5 | 1.6 |
| G     | Stainless steel | M5 | 1.0 |
| H     | Stainless steel | M5 | 1.6 |

Body material / Port size / Orifice diameter

Symbol | Port size | Orifice diameter |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>M5</td>
<td>1.0</td>
</tr>
<tr>
<td>B</td>
<td>0.3</td>
<td>2.3</td>
</tr>
<tr>
<td>C</td>
<td>0.4</td>
<td>3.2</td>
</tr>
<tr>
<td>D</td>
<td>1.0</td>
<td>1.6</td>
</tr>
<tr>
<td>E</td>
<td>0.4</td>
<td>2.3</td>
</tr>
<tr>
<td>F</td>
<td>Brass</td>
<td>M5</td>
</tr>
<tr>
<td>G</td>
<td>Stainless steel</td>
<td>M5</td>
</tr>
<tr>
<td>H</td>
<td>Stainless steel</td>
<td>M5</td>
</tr>
</tbody>
</table>

Voltage / Electrical entry

Symbol | Voltage | Electrical entry |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>24 VDC</td>
<td>Grommet</td>
</tr>
<tr>
<td>B</td>
<td>100 VAC</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>110 VAC</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>200 VAC</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>230 VAC</td>
<td></td>
</tr>
<tr>
<td>Z</td>
<td>Other voltages</td>
<td></td>
</tr>
</tbody>
</table>

For other special options, refer to page 462.

Dimensions → Page 463 (Single unit)
VDW Series
Other Special Options

**Electrical options (Special voltage)**

<table>
<thead>
<tr>
<th>Voltage</th>
<th>Electrical entry</th>
</tr>
</thead>
<tbody>
<tr>
<td>48 VAC</td>
<td>—</td>
</tr>
<tr>
<td>220 VAC</td>
<td>—</td>
</tr>
<tr>
<td>240 VAC</td>
<td>—</td>
</tr>
<tr>
<td>24 VAC</td>
<td>—</td>
</tr>
<tr>
<td>12 VDC</td>
<td>—</td>
</tr>
</tbody>
</table>

**Other options (Low concentration ozone resistant, Deionized water, oil-free, special thread)**

<table>
<thead>
<tr>
<th>Material</th>
<th>Symbol</th>
<th>Special thread</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cu + Fe + Resin</td>
<td>N11</td>
<td>— (Standard)</td>
</tr>
<tr>
<td>Fe</td>
<td>A</td>
<td>G1/8</td>
</tr>
<tr>
<td>Stainless steel</td>
<td>B</td>
<td>NPT1/8</td>
</tr>
<tr>
<td>Stainless steel</td>
<td>C</td>
<td>M6</td>
</tr>
<tr>
<td>NBR, FKM</td>
<td>Z</td>
<td>G1/8</td>
</tr>
<tr>
<td>NBR, FKM</td>
<td>D</td>
<td>NPT1/8</td>
</tr>
<tr>
<td>Stainless steel</td>
<td>E</td>
<td>M6</td>
</tr>
<tr>
<td>NBR, FKM</td>
<td>F</td>
<td>G1/8</td>
</tr>
<tr>
<td>Stainless steel</td>
<td>G</td>
<td>NPT1/8</td>
</tr>
<tr>
<td>Stainless steel</td>
<td>H</td>
<td>M6</td>
</tr>
<tr>
<td>Stainless steel</td>
<td>J</td>
<td>G1/8</td>
</tr>
<tr>
<td>Stainless steel</td>
<td>K</td>
<td>NPT1/8</td>
</tr>
<tr>
<td>Stainless steel</td>
<td>L</td>
<td>M6</td>
</tr>
<tr>
<td>Stainless steel</td>
<td>M</td>
<td>G1/8</td>
</tr>
<tr>
<td>Stainless steel</td>
<td>N</td>
<td>NPT1/8</td>
</tr>
<tr>
<td>Stainless steel</td>
<td>P</td>
<td>M6</td>
</tr>
</tbody>
</table>

**Construction**

**Normally closed (N.C.)**

Body material: Aluminum, PPS resin, Brass, Stainless steel

**Body material: PPS resin (One-touch fitting type)**

Component Parts

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Solenoid coil</td>
<td>Cu + Fe + Resin</td>
</tr>
<tr>
<td>2</td>
<td>Fixed armature</td>
<td>Fe</td>
</tr>
<tr>
<td>3</td>
<td>Tube</td>
<td>Stainless steel</td>
</tr>
<tr>
<td>4</td>
<td>Return spring</td>
<td>Stainless steel</td>
</tr>
<tr>
<td>5</td>
<td>Armature assembly</td>
<td>NBR, FKM, Stainless steel, PPS resin</td>
</tr>
<tr>
<td>6</td>
<td>Seal</td>
<td>NBR, FKM</td>
</tr>
<tr>
<td>7</td>
<td>Body</td>
<td>Aluminum, PPS resin, Brass, Stainless steel</td>
</tr>
</tbody>
</table>

**Bracket interchangeable with old type**

The brackets are interchangeable with brackets of old VDW10/20 series.
For details of exterior dimensions, please contact SMC.

Example) VDW 20A A1A A2A XB

* Enter symbols in the order to the right when ordering a combination of electrical option, other options, and bracket interchangeable with old type.

*1 Applicable for air type (VDW 0) and water type (VDW 2).
*2 When G or NPT is selected, choose the 1/8 port size standard model.
*3 When M6 is selected, choose the M5 port size standard model.
*4 When using deionized water or any other fluid that may corrode C37 (brass), select a stainless steel body.

**Example| VDW 20A A1A A2A XB**
Compact Direct Operated 2 Port Solenoid Valve

**Dimensions/Single Unit**

**Body material** **Aluminum**

Grommet

![Diagram of a compact direct operated 2 port solenoid valve](image)

<table>
<thead>
<tr>
<th>Model</th>
<th>Port size</th>
<th>A</th>
<th>B</th>
<th>B1</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>Mounting bracket dimensions (XD)</th>
<th>Electrical entry</th>
</tr>
</thead>
<tbody>
<tr>
<td>VDW2</td>
<td>M5, 1/8</td>
<td>15</td>
<td>22</td>
<td>11</td>
<td>51.7</td>
<td>20</td>
<td>8</td>
<td>13.5</td>
<td>G 4 U 33 W X 14 Y 39</td>
<td>Q 20 R 17 36.2</td>
</tr>
</tbody>
</table>

**Made to Order**

*<Special lead wire length>*

Produced upon receipt of order. Please contact SMC for lead times.

**VDW**

- **Lead wire length**
  - XL1 600 mm
  - XL2 1000 mm
  - XL3 1500 mm
  - XL4 3000 mm
**VDW Series**

**Air, Medium Vacuum, Water**

### Dimensions/Single Unit

**Body material** Resin

With One-touch fittings

Grommet

For information on handling One-touch fittings and on appropriate tubing, refer to page 469 and the Fittings & Tubing section of the "Handling Precautions for SMC Products" on the SMC website.

**Port size M5/M6**

Grommet

<table>
<thead>
<tr>
<th>Model</th>
<th>One-touch fitting</th>
<th>B</th>
<th>B1</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>VDW1</td>
<td>ø3.2, ø4</td>
<td>31.7</td>
<td>17.1</td>
<td>46.1</td>
<td>15</td>
<td>9.5</td>
<td>11</td>
</tr>
<tr>
<td>VDW2</td>
<td>ø4, ø6</td>
<td>35.9</td>
<td>19.8</td>
<td>52.9</td>
<td>20</td>
<td>10.4</td>
<td>13.5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Model</th>
<th>One-touch fitting</th>
<th>Mounting bracket dimensions</th>
<th>Electrical entry</th>
<th>Grommet</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>U</td>
<td>W</td>
<td>X</td>
</tr>
<tr>
<td>VDW1</td>
<td>ø3.2, ø4</td>
<td>28</td>
<td>11</td>
<td>34</td>
</tr>
<tr>
<td>VDW2</td>
<td>ø4, ø6</td>
<td>33</td>
<td>14</td>
<td>39</td>
</tr>
</tbody>
</table>

Body material: Resin

2 x ø3.4 Mounting hole

Full wave rectifier (AC type)

2 x P Port size

With One-touch fittings

Grommet

<table>
<thead>
<tr>
<th>Model</th>
<th>Port size</th>
<th>B</th>
<th>B1</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>VDW1</td>
<td>M5(M6)</td>
<td>20</td>
<td>10</td>
<td>46.1</td>
<td>15</td>
<td>9.5</td>
<td>11</td>
</tr>
<tr>
<td>VDW2</td>
<td>M5(M6)</td>
<td>22</td>
<td>11</td>
<td>50.9</td>
<td>20</td>
<td>9.5</td>
<td>13.5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Model</th>
<th>Port size</th>
<th>Mounting bracket dimensions</th>
<th>Electrical entry</th>
<th>Grommet</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>U</td>
<td>W</td>
<td>X</td>
</tr>
<tr>
<td>VDW1</td>
<td>M5(M6)</td>
<td>28</td>
<td>11</td>
<td>34</td>
</tr>
<tr>
<td>VDW2</td>
<td>M5(M6)</td>
<td>33</td>
<td>14</td>
<td>39</td>
</tr>
</tbody>
</table>
Compact Direct Operated 2 Port Solenoid Valve  
**VDW Series**

**Dimensions/Single Unit**

**Body material** Brass

Grommet

![Diagram of Brass Body Material with dimensions and mounting information]

- 2 x ø3.4 Mounting hole
- Port size
- Full wave rectifier (AC type)
- 2 x J thread depth

<table>
<thead>
<tr>
<th>Model</th>
<th>Port size</th>
<th>B</th>
<th>B₁</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>J</th>
<th>K</th>
<th>M</th>
</tr>
</thead>
<tbody>
<tr>
<td>VDW1</td>
<td>M5</td>
<td>20</td>
<td>10</td>
<td>42.4</td>
<td>15</td>
<td>6</td>
<td>11</td>
<td>M2.5</td>
<td>4</td>
<td>11</td>
</tr>
<tr>
<td>VDW2</td>
<td>M5, 1/8</td>
<td>22</td>
<td>11</td>
<td>51.7</td>
<td>20</td>
<td>8</td>
<td>13.5</td>
<td>M3</td>
<td>5</td>
<td>15</td>
</tr>
</tbody>
</table>

**Body material** Stainless Steel

Grommet

![Diagram of Stainless Steel Body Material with dimensions and mounting information]

- 2 x ø3.4 Mounting hole
- Port size
- Full wave rectifier (AC type)
- 2 x J thread depth

<table>
<thead>
<tr>
<th>Model</th>
<th>Port size</th>
<th>A</th>
<th>B</th>
<th>B₁</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>J</th>
<th>K</th>
<th>M</th>
</tr>
</thead>
<tbody>
<tr>
<td>VDW1</td>
<td>M5</td>
<td>12</td>
<td>20</td>
<td>10</td>
<td>42.4</td>
<td>15</td>
<td>6</td>
<td>11</td>
<td>M2.5</td>
<td>4</td>
<td>11</td>
</tr>
<tr>
<td>VDW2</td>
<td>M5, 1/8</td>
<td>15</td>
<td>22</td>
<td>11</td>
<td>51.7</td>
<td>20</td>
<td>8</td>
<td>13.5</td>
<td>M3</td>
<td>5</td>
<td>15</td>
</tr>
</tbody>
</table>

**Model Port size**

- **P**
- **B**
- **B₁**
- **C**
- **D**
- **E**
- **F**
- **J**
- **K**
- **M**

**Mounting method**

- **J**
- **K**
- **M**

**Electrical entry**

- **G**
- **U**
- **W**
- **X**
- **Y**
- **Q**
- **R**

**Grommet**

<table>
<thead>
<tr>
<th>Model</th>
<th>Port size</th>
<th>P</th>
<th>G</th>
<th>U</th>
<th>W</th>
<th>X</th>
<th>Y</th>
<th>Q</th>
<th>R</th>
</tr>
</thead>
<tbody>
<tr>
<td>VDW1</td>
<td>M5</td>
<td>4</td>
<td>28</td>
<td>11</td>
<td>34</td>
<td>17</td>
<td>15.5</td>
<td>30.15</td>
<td></td>
</tr>
<tr>
<td>VDW2</td>
<td>M5, 1/8</td>
<td>4</td>
<td>33</td>
<td>14</td>
<td>39</td>
<td>20</td>
<td>17</td>
<td>36.2</td>
<td></td>
</tr>
</tbody>
</table>
1. Material
NBR: Nitrile rubber
FKM: Fluororubber

2. Oil-free treatment
The degreasing and washing of wetted parts

3. Symbol
Symbol (INOUT) IN and OUT are in a blocked condition ( ), but actually in the case of reverse pressure (OUT> IN), there is a limit to the blocking.
Product with flow direction 2 → 1 with pressure supplied to port 2 and universal specification product are available as specials.

Pressure Terminology

1. Maximum operating pressure differential
The maximum pressure differential (the difference between the inlet and outlet pressure) which is allowed for operation. When the outlet pressure is 0 MPa, this becomes the maximum operating pressure.

2. Maximum system pressure
The maximum pressure that can be applied inside the pipelines (line pressure).
[The pressure differential in the solenoid valve portion must be less than the maximum operating pressure differential.]

3. Withstand pressure
The pressure in which the valve must be withstood without a drop in performance after holding for one minute under prescribed (static) pressure and returning to the operating pressure range. [value under the prescribed conditions]

Electrical Terminology

1. Surge voltage
A high voltage which is momentarily generated by shutting off the power in the shut-off area.

2. Enclosure
A degree of protection defined in the "JIS C 0920: Waterproof test of electric machinery/appliance and the degree of protection against the intrusion of solid foreign objects". Verify the degree of protection for each product.

First Characteristics:
Degrees of protection against solid foreign objects

<table>
<thead>
<tr>
<th></th>
<th>First characteristic numeral</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Non-protected</td>
</tr>
<tr>
<td>1</td>
<td>Protected against solid foreign objects of ø50 mm and greater</td>
</tr>
<tr>
<td>2</td>
<td>Protected against solid foreign objects of ø12 mm and greater</td>
</tr>
<tr>
<td>3</td>
<td>Protected against solid foreign objects of ø2.5 mm and greater</td>
</tr>
<tr>
<td>4</td>
<td>Protected against solid foreign objects of ø1.0 mm and greater</td>
</tr>
<tr>
<td>5</td>
<td>Dust-protected</td>
</tr>
<tr>
<td>6</td>
<td>Dusttight</td>
</tr>
</tbody>
</table>

Second Characteristics:
Degrees of protection against water

<table>
<thead>
<tr>
<th></th>
<th>Second characteristic numeral</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Non-protected</td>
</tr>
<tr>
<td>1</td>
<td>Protected against vertically falling water drops</td>
</tr>
<tr>
<td>2</td>
<td>Protected against vertically falling water drops when enclosure tilted up to 15°</td>
</tr>
<tr>
<td>3</td>
<td>Protected against rainfall when enclosure tilted up to 60°</td>
</tr>
<tr>
<td>4</td>
<td>Protected against splashing water</td>
</tr>
<tr>
<td>5</td>
<td>Protected against water jets</td>
</tr>
<tr>
<td>6</td>
<td>Protected against powerful water jets</td>
</tr>
<tr>
<td>7</td>
<td>Protected against the effects of temporary immersion in water</td>
</tr>
<tr>
<td>8</td>
<td>Protected against the effects of continuous immersion in water</td>
</tr>
</tbody>
</table>

Example) IP65: Dusttight, Low jetproof type
“Low jetproof type” means that no water intrudes inside an equipment that could hinder from operating normally by means of applying water for 3 minutes in the prescribed manner. Take appropriate protection measures, since a device is not usable in an environment where a droplet of water is splashed constantly.
VDW Series
Specific Product Precautions 1

Be sure to read this before handling the products.
Refer to back page 50 for Safety Instructions and pages 17 to 19 for 2 Port Solenoid Valve for Fluid Control Precautions.

⚠️ Warning

1. Cannot be used as an emergency shutoff valve, etc.
The valves presented in this catalog are not designed for safety applications such as an emergency shutoff valve. If the valves are used in this type of system, other reliable safety assurance measures should also be adopted.

2. Extended periods of continuous energization
The solenoid coil will generate heat when continuously energized. Avoid using in a tightly shut container. Install it in a well-ventilated area. Furthermore, do not touch it while it is being energized or right after it is energized.

3. Liquid rings
In cases with a flowing liquid, provide a bypass valve in the system to prevent the liquid from entering the liquid seal circuit.

4. Actuator drive
When an actuator, such as a cylinder, is to be driven using a valve, take appropriate measures to prevent potential danger caused by actuator operation.

5. Pressure (including vacuum) holding
It is not usable for an application such as holding the pressure (including vacuum) inside of a pressure vessel because air leakage is entailed in a valve.

6. When an impact, such as water hammer, etc., caused by the rapid pressure fluctuation is applied, the solenoid valve may be damaged. Give an attention to it.

⚠️ Warning

2. Fluid quality

<Air>
1) Use clean air.
Do not use compressed air that contains chemicals, synthetic oils including organic solvents, salt or corrosive gases, etc., as it can cause damage or malfunction.

2) Install an air filter.
Install air filters close to the valves on the upstream side. A filtration degree of 5 µm or less should be selected.

3) Install an aftercooler or air dryer, etc.
Compressed air that contains excessive drainage may cause malfunction of valves and other pneumatic equipment. To prevent this, install an aftercooler or air dryer, etc.

4) If excessive carbon powder is generated, eliminate it by installing mist separators at the upstream side of valves.
If excessive carbon powder is generated by the compressor, it may adhere to the inside of the valves and cause a malfunction.
Refer to Best Pneumatics No.7 for further details on compressed air quality.

<Vacuum>
Please be aware that there is a range of pressure that can be used.

Vacuum piping direction: if the system uses a vacuum pump, we ask that you install the vacuum pump on the secondary side (Port 2).
Also, install a filter on the primary side (Port 1), and be careful that no foreign object is picked up.
Please replace the valve after operating the device approximately 300,000 times.

Selection

1. Fluid

1) Type of fluid
Before using a fluid, check whether it is compatible with the materials of each model by referring to the fluids listed in this catalog. Use a fluid with a kinematic viscosity of 50 mm²/s or less. If there is something you do not know, please contact SMC.

2) Flammable oil, Gas
Confirm the specification for leakage in the interior and/or exterior area.

3) Corrosive gas
Cannot be used since it will lead to cracks by stress corrosion or result in other incidents.

4) Depending on water quality, a brass body can cause corrosion and internal leakage may occur. If such abnormalities occur, exchange the product for a stainless steel body.

5) Use an oil-free specification when any oily particle must not enter the passage.

6) Applicable fluid on the list may not be used depending on the operating condition. Give adequate confirmation, and then determine a model, just because the compatibility list shows the general case.
## Warning

### Water

The use of a fluid that contains foreign objects can cause problems such as malfunction and seal failure by promoting wear of the valve seat and armature and by sticking to the sliding parts of the armature etc. Install a suitable filter (strainer) immediately upstream from the valve. As a general rule, use 100 mesh. The supply water includes materials that create a hard sediment or sludge such as calcium and magnesium. Since this scale and sludge can cause the valve to malfunction, install water softening equipment, and a filter (strainer) directly upstream from the valve to remove these substances.

### Tap water pressure:

The water pressure for tap water is normally 0.4 MPa or less. However, in places like a high-rise building, the pressure may be 1.0 MPa. When selecting tap water, be careful of the maximum operating pressure differential.

When using water or heated water, poor operation or leaks may be caused by dezincification, erosion, corrosion, etc. The brass (Brass) body of this product uses dezincification resistant material as a standard. We also offer a stainless steel body type with improved corrosion resistance. Please use the one that fits your needs.

### 3. Ambient environment

Use within the operable ambient temperature range. Check the compatibility between the product’s composition materials and the ambient atmosphere. Be certain that the fluid used does not touch the external surface of the product.

### 4. Countermeasures against static electricity

Take measures to prevent static electricity since some fluids can cause static electricity.

### 5. Low temperature operation

1) The valve can be used in an ambient temperature of between –10 to –20°C. However, take measures to prevent freezing or solidification of impurities, etc.

2) When using valves for water application in cold climates, take appropriate countermeasures to prevent the water from freezing in tubing after cutting the water supply from the pump, by draining the water etc. When warming by a heater etc., be careful not to expose the coil portion to a heater. Installation of a dryer, heat retaining of the body is recommended to prevent a freezing condition in which the dew point temperature is high and the ambient temperature is low, and the high flow runs.

## Caution

### 1. Leakage voltage

When the solenoid valve is operated using the controller, etc., the leakage voltage should be the product allowable leakage voltage or less. Particularly when using a resistor in parallel with a switching element and using a C-R element (surge voltage suppressor) to protect the switching element, take note that leakage current will flow through the resistor, C-R element, etc., creating a possible danger that the valve may not turn off.

1. **Selecting model**

   Material depends on fluid. Select optimal models for the fluid.

### Mounting

1. **Warning**

   - If air leakage increases or equipment does not operate properly, stop operation.
   - After mounting is completed, confirm that it has been done correctly by performing a suitable function test.
   - Do not apply external force to the coil section.
   - When tightening is performed, apply a wrench or other tool to the outside of the piping connection parts.
   - Mount a valve with its coil position upwards, not downwards.
   - Mounting a valve with its coil positioned downwards, foreign objects in the fluid will adhere to the iron core leading to a malfunction. Especially for strict leakage control, such as with vacuum applications and non-leak specifications, the coil must be positioned upwards.
   - Do not warm the coil assembly with a heat insulator, etc.
   - Use tape, heaters, etc., for freeze prevention on the piping and body only. They can cause the coil to burn out.
   - Secure with brackets, except in the case of steel piping and copper fittings.
   - Avoid sources of vibration, or adjust the arm from the body to the minimum length so that resonance will not occur.
   - Painting and coating

   Warnings or specifications printed or labeled on the product should not be erased, removed or covered up.
**Warning**

1. During use, deterioration of the tube or damage to the fittings could cause tubes to come loose from their fittings and thrash about.
To prevent uncontrolled tube movement, install protective covers or fasten tubes securely in place.

2. For piping the tube, fix the product securely using the mounting holes so that the product is not in the air.

**Caution**

1. **Preparation before piping**
   Before piping is connected, it should be thoroughly blown out with air (flushing) or washed to remove chips, cutting oil and other debris from inside the pipe.
   Install piping so that it does not apply pulling, pressing, bending or other forces on the valve body.

2. **Avoid connecting ground lines to piping**, as this may cause electric corrosion of the system.

3. **Tighten threads with the proper tightening torque.**
   When using steel piping, tighten with the proper tightening torque shown below.
   Lower tightening torque will lead into fluid leakage.

<table>
<thead>
<tr>
<th>Connection thread</th>
<th>Proper tightening torque (N·m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>M5</td>
<td>1 to 1.5</td>
</tr>
<tr>
<td>M6</td>
<td>1.5</td>
</tr>
<tr>
<td>Rc1/8</td>
<td>7 to 9</td>
</tr>
</tbody>
</table>

* For resin bodies, the proper tightening torque is 0.4 to 0.6 N·m (reference value). After tightening by hand, tighten by an additional 1/6th rotation with a tightening tool.

4. **Connection of piping to products**
   When connecting piping to a product, refer to its operation manual to avoid mistakes regarding the supply port, etc.

5. **Winding of sealant tape**
   When connecting pipes, fittings, etc., be sure that chips from the pipe threads and sealing material do not enter the valve. Furthermore, when sealant tape is used, leave 1.5 to 2 thread ridges exposed at the end of the threads.

6. In applications such as vacuum and non-leak specifications, use caution specifically against the contamination of foreign objects or airtightness of the fittings.

**Recommended Piping Conditions**

1. When connecting tubes using one-touch fittings, provide some spare tube length shown in Fig. 1, recommended piping configuration.
   Also, do not apply external force to the fittings when binding tubes with bands, etc. (see Fig. 2.)

2. **Wiring**
   - As a rule, use electric wire with a cross sectional area of 0.5 to 1.25 mm² for wiring.
   - Furthermore, do not allow excessive force to be applied to the lines.
   - Use electric circuits which do not generate chattering in their contacts.
   - Use voltage which is within ±10% of the rated voltage. In cases with a DC power supply where importance is placed on responsiveness, stay within ±5% of the rated value. The voltage drop is the value in the lead wire section connecting the coil.


**VDW Series**

**Specific Product Precautions 4**

Be sure to read this before handling the products.
Refer to back page 50 for Safety Instructions and pages 17 to 19 for 2 Port Solenoid Valve for Fluid Control Precautions.

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### Operating Environment

**Warning**

1. Do not use in an atmosphere having corrosive gases, chemicals, sea water, water, water steam, or where there is direct contact with any of these.
2. Do not use in explosive atmospheres.
3. Do not use in locations subject to vibration or impact.
4. Do not use in locations where radiated heat will be received from nearby heat sources.
5. Employ suitable protective measures in locations where there is contact with water droplets, oil or welding spatter, etc.

### Maintenance

**Warning**

1. Filters and strainers
   - Be careful regarding clogging of filters and strainers.
   - Replace filter elements after one year of use, or earlier if the pressure drop reaches 0.1 MPa.
   - Clean strainers when the pressure drop reaches 0.1 MPa.
2. Lubrication
   - Switch valves at least once every 30 days to prevent malfunction. Also, in order to use it under the optimum state, conduct a regular inspection once a half year.

**Caution**

When operating the product with flow direction 2 → 1 with pressure supplied to port 2, there is a risk of the valve opening momentarily and fluid leaking to the downstream side due to a rapid increase of the upstream pressure.

A special product will be available when holding pressure supplied from port 2 in the flow direction 2 → 1 with low leakage performance is required.

#### Universal specification

A special can be available for Universal Specification, where product operation can be both flow from port 1 to port 2 (1 → 2) and from port 2 to port 1 (2 → 1).

---

### Operating Precautions

**Warning**

1. Do not use in an atmosphere having corrosive gases, chemicals, sea water, water, water steam, or where there is direct contact with any of these.
2. Do not use in explosive atmospheres.
3. Do not use in locations subject to vibration or impact.
4. Do not use in locations where radiated heat will be received from nearby heat sources.
5. Employ suitable protective measures in locations where there is contact with water droplets, oil or welding spatter, etc.

### Electric Connections

**Caution**

- Grommet
  - Class B coil: AWG20
  - Outside insulator diameter of 1.8 mm

<table>
<thead>
<tr>
<th>Rated voltage</th>
<th>Lead wire color</th>
</tr>
</thead>
<tbody>
<tr>
<td>DC 100 VAC</td>
<td>Black, Red</td>
</tr>
<tr>
<td>100 VAC</td>
<td>Blue, Blue</td>
</tr>
<tr>
<td>200 VAC</td>
<td>Red, Red</td>
</tr>
<tr>
<td>Other AC</td>
<td>Gray, Gray</td>
</tr>
</tbody>
</table>

* There is no polarity.

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### Electric Circuits

#### [DC circuit]

- Grommet
  - 1 (+, −) → SOL
  - 2 (−, +) → SOL

#### [AC circuit]

- Grommet
  - 1 (+, −) → Varistor
  - Rectifier element
  - 2 (−, +) → SOL

* For AC (Class B), the standard product is equipped with surge voltage suppressor.

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### One-touch Fitting

**Caution**

For information on handling One-touch fittings and on appropriate tubing, refer to page 469 and the Fittings & Tubing section of the “Handling Precautions for SMC Products” on the SMC website.