Compact Direct Operated 2/3 Port Solenoid Valve for Water and Air

**Series VDW**

**VDW10/20/30:** 2 Port, **VDW200/300:** 3 Port

**Molded coil specifications have been added!**

<table>
<thead>
<tr>
<th>IP65</th>
<th>Compact / Lightweight (as compared to the VX series)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grommet/Molded</td>
<td>100 g: Reduced approx. by –50% (for orifice diameter equivalent to ø2)</td>
</tr>
</tbody>
</table>

Note) Faston™ is a trademark of Tyco Electronics Corp.
For Water and Air Compact Direct Operated 2/3 Port Solenoid Valve

**Series VDW**

- **Compact** (as compared to the VX series)
  - Single valve volume: **Reduced by –75%** (VDW20)
  - Manifold length: **Reduced by –18%** (VDW30, 7 stations)

- **Lightweight** (as compared to the VX series)
  - 100 g: **Reduced approx. by –50%**
    (for orifice diameter equivalent to ø2)

**Improved durability (Nearly twice the life of the previous series)**

- High flow rate: Cv factor 0.04 to 0.46 (2 port)
- Universal porting VDW200/300 (3 port)
- Improved environment resistance
  - Environment resistance is improved by using a molded coil. (Enclosure IP65 or equivalent, grommet mold)

**Lineup by Compact Design**

<table>
<thead>
<tr>
<th>2 Port</th>
<th>3 Port</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ø17</td>
<td>Ø28</td>
</tr>
<tr>
<td>VDW10</td>
<td>VDW20</td>
</tr>
<tr>
<td>Ø28</td>
<td>Ø20.5</td>
</tr>
<tr>
<td>VDW20</td>
<td>VDW30</td>
</tr>
<tr>
<td>Ø20.5</td>
<td>Ø28</td>
</tr>
<tr>
<td>VDW200</td>
<td>VDW300</td>
</tr>
</tbody>
</table>
Compact Direct Operated  
2 Port Solenoid Valve for Water and Air  
Series VDW10/20/30

How to Order Valves (Single Unit)

For Water, Air, Vacuum

VD W 2 1 - 1 G - 2 - 01 - - - -

Series
1 10
2 20
3 30

Valve type

N.C.

OUT (2)

IN (1)

Voltage

Symbol | Voltage | Grommet / Tape winding (G) | Faston terminal / Molded (F) | Grommet / Molded (W)
--- | --- | --- | --- | ---
1 | 100 VAC (50/60 Hz) | ● | — | ●
2 | 200 VAC (50/60 Hz) | ● | — | ●
3 | 110 VAC (50/60 Hz) | ● | — | ●
4 | 220 VAC (50/60 Hz) | ● | — | ●
5 | 24 VDC | ● | ● | ●
6 | 12 VDC | ● | ● | ●
V | 6 VDC | ● | ● | ●
S | 5 VDC | ● | ● | ●
R | 3 VDC | ● | ● | ●

* Please consult with SMC regarding other voltages.

Coil type

G – Grommet / Tape winding  
W – Grommet / Molded

Magnet wire protection: Tape winding  
Magnet wire protection: Resin Molded

F – Faston terminal / Molded

Magnet wire protection: Resin Molded

Material and insulation type

Symbol | Body material | Seal material | Coil insulation
--- | --- | --- | ---
Nill | Brass (C37) | NBR | Class B
A | FKM | | |
B | EPDM | | |
G | Stainless steel | FKM | |
H | EPDM | | |
J | FKM | | |
L (Note) | Nil | | |

Note) The armature assembly is a corrosion resistant construction.

Thread type

Nil | Rc
F | G
N | NPT

Port size

Symbol | Port size | Series
--- | --- | ---
M5 | M5 | 10 20 30
01 | 1/8 (6A) | — — —
02 | 1/4 (8A) | — — —

Orifice diameter

Symbol | Orifice diameter (mm ø) | Series
--- | --- | ---
1 | 1 | 10
2 | 1.6 | 20
1 | 1.6 | 20
2 | 2.3 | 20
3 | 3.2 | 20
2 | 2 | 30
3 | 3 | 30
4 | 4 | 30

Made to Order (Refer to page 244.)

Option

Nil | None
F | Foot bracket

Note) The foot bracket is packed with a valve.

Series and Coil Type Combinations

| Series | Grommet / Tape winding | Faston terminal / Molded | Grommet / Molded |
--- | --- | --- | ---
10 | ● | — | ●
20 | ● | ● | ●
30 | ● | ● | ●

Note) The foot bracket is packed with a valve.
Standard Specifications

Valve specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valve construction</td>
<td>Direct operated poppet</td>
</tr>
<tr>
<td>Fluid</td>
<td>Water (except waste water or agricultural water), Air, Low vacuum</td>
</tr>
<tr>
<td>Withstand pressure (MPa)</td>
<td>2.0</td>
</tr>
<tr>
<td>Ambient temperature (°C)</td>
<td>−10 to 50</td>
</tr>
<tr>
<td>Fluid temperature (°C)</td>
<td>1 to 50 (No freezing)</td>
</tr>
<tr>
<td>Environment</td>
<td>Location without corrosive or explosive gases</td>
</tr>
<tr>
<td>Valve leakage (cm³/min)</td>
<td>0 (with water pressure) 1 or less (Air)</td>
</tr>
<tr>
<td>Mounting orientation</td>
<td>Unrestricted</td>
</tr>
<tr>
<td>Vibration/Impact (m/s²)</td>
<td>30/150</td>
</tr>
<tr>
<td>Rated voltage</td>
<td>24 VDC, 12 VDC, 6 VDC, 5 VDC, 3 VDC, 100 VAC, 110 VAC, 200 VAC, 220 VAC (50/60 Hz)</td>
</tr>
<tr>
<td>Allowable voltage fluctuation (%)</td>
<td>±10% of rated voltage</td>
</tr>
<tr>
<td>Coil insulation type</td>
<td>Class B</td>
</tr>
<tr>
<td>Enclosure</td>
<td>Dust-proof (equivalent to IP40)</td>
</tr>
<tr>
<td>Grommet / Tape winding</td>
<td>Dust-tight (equivalent to IP60)</td>
</tr>
<tr>
<td>Faston terminal / Molded</td>
<td>Dust-tight / Low jetproof (equivalent to IP65)</td>
</tr>
<tr>
<td>Power consumption (W)</td>
<td>2.5 (VDW10), 3 (VDW20/30)</td>
</tr>
</tbody>
</table>

Note 1) When used under conditions which may cause condensation on the exterior of the product, select Grommet / Molded.
Note 2) When used with deionized water, select “L” (Stainless steel, FKM) for the material type.
Note 3) Since the AC coil specification includes a rectifier element, there is no difference in power consumption between inrush and holding.
In the case of 110/220 VAC, the VDW10 is 3 W and the VDW20/30 is 3.5 W.
Note 4) Vibration resistance — No malfunction when tested with one sweep of 5 to 200 Hz in the axial direction and at a right angle to the armature, in both energized and deenergized states.
Impact resistance — No malfunction when tested with a drop tester in the axial direction and at a right angle to the armature, one time each in energized and deenergized states.
Note 5) Since electrical connections are exposed, there is no water resistance.

Characteristic Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>Port size</th>
<th>Orifice dia. (mm ø)</th>
<th>Max. operating pressure differential (MPa) Note 1)</th>
<th>Operating Pressure range (MPa) Note 2)</th>
<th>Mass (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>VDW10</td>
<td>M5</td>
<td>1</td>
<td>0.9 0.4</td>
<td>0 to 1.0</td>
<td>0.08</td>
</tr>
<tr>
<td>VDW20</td>
<td>M5 1/8 (6A)</td>
<td>1.6</td>
<td>0.6 0.2</td>
<td>0 to 1.0</td>
<td>0.1</td>
</tr>
<tr>
<td>VDW30</td>
<td>1/8 (6A) 1/4 (8A)</td>
<td>2</td>
<td>0.8 0.2</td>
<td>1/8: 0.23 1/4: 0.26</td>
<td></td>
</tr>
</tbody>
</table>

Note 1) The maximum operating pressure differential changes depending on the flow direction of the fluid. Refer to page 264 for details.
Note 2) For low vacuum specifications, the operating pressure range is 1 Torr (1.33 x 10⁻² Pa) to 1.0 MPa.
Please consult with SMC if using below 1 Torr (1.33 x 10⁻² Pa).

Flow Characteristics

<table>
<thead>
<tr>
<th>Model</th>
<th>Port size</th>
<th>Orifice dia. (mm ø)</th>
<th>Water 1→2 (IN→N.C.)</th>
<th>Air 1→2 (IN→N.C.)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Av x 10⁻⁶ m³/s</td>
<td>Cv converted C [dm³/(s·bar)]</td>
</tr>
<tr>
<td>VDW10</td>
<td>M5</td>
<td>1</td>
<td>0.96 0.04 0.14 0.40</td>
<td></td>
</tr>
<tr>
<td>VDW20</td>
<td>M5 1/8 (6A)</td>
<td>1.6</td>
<td>0.17 0.07 0.30 0.25 0.07</td>
<td></td>
</tr>
<tr>
<td>VDW30</td>
<td>1/8 (6A) 1/4 (8A)</td>
<td>2</td>
<td>0.16 0.08 0.31 0.45 0.09</td>
<td></td>
</tr>
</tbody>
</table>

Made to Order
(For details, refer to page 259.)

Symbol | Specifications
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>X22</td>
<td>Non-leak (10⁻⁶ Pa·m³/sec) / Vacuum (0.1Pa-abs) specification</td>
</tr>
<tr>
<td>X23</td>
<td>Oil-free specification</td>
</tr>
<tr>
<td>X60</td>
<td>Lead wire length: 600 mm specification</td>
</tr>
<tr>
<td>X133</td>
<td>Seal material: Kairez® specification Note)</td>
</tr>
</tbody>
</table>

Note) Kairez® is a registered trademark of DuPont Dow Elastomers.

Series VDW10/20/30

244
Construction

VDW11

VDW21

VDW31

Component Parts

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Standard</th>
<th>Option</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Body</td>
<td>Brass (C37)</td>
<td>Stainless steel</td>
</tr>
<tr>
<td>2</td>
<td>Tube assembly</td>
<td>Stainless steel</td>
<td>—</td>
</tr>
<tr>
<td>3</td>
<td>Coil assembly</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>4</td>
<td>Armature assembly</td>
<td>Stainless steel, PPS, NBR</td>
<td>FKM, EPDM</td>
</tr>
<tr>
<td>5</td>
<td>O-ring (Body)</td>
<td>NBR</td>
<td>FKM, EPDM</td>
</tr>
<tr>
<td>6</td>
<td>Return spring</td>
<td>Stainless steel</td>
<td>—</td>
</tr>
<tr>
<td>7</td>
<td>Cover</td>
<td>SPCE</td>
<td>—</td>
</tr>
<tr>
<td>8</td>
<td>Clip</td>
<td>Stainless steel</td>
<td>—</td>
</tr>
</tbody>
</table>
**Series VDW10/20/30**

**Dimensions**

**VDW11-□\textsubscript{G} W**

- Lead wire \( \approx \) 300
- Rectifier element AC type

**VDW21-□\textsubscript{G} W**

- Lead wire \( \approx \) 300
- Rectifier element AC type

**VDW31-□\textsubscript{G} W**

- Lead wire \( \approx \) 300
- Rectifier element AC type

**Bracket assembly part no.**

- **Series 10, 20**
  - **VDW** 2 0 – 15A – 1
  - **Series**
    - 1 10
    - 2 20

- **Series 30**
  - **VCW20** 12 – 01A

Dimensions inside ( ) are for port size 1/8.
Dimensions

VDW21-□F  
VDW31-□F

Bracket assembly part no.
- Series 20  
  VDW20 — 15A — 1
- Series 30  
  VCW20 — 12 — 01A
How to Order Manifold

**VV2DW 2-05-01**

Enter the mounting valve and option part numbers under the manifold base part number.

* Ordering example *

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>VVDW23-5G-2</td>
<td>1 set Valve part no. (Stations 1 to 5)</td>
</tr>
<tr>
<td>VVDW2-0501</td>
<td>5 sets Manifold part no.</td>
</tr>
</tbody>
</table>

### Manifold Options

#### Blanking plate assembly

**VVDW 20-3A**

- **Series** 10, 20
- **Material**
  - G: Stainless steel
  - H: EPDM
  - J: FKM

* Plate material is stainless steel only.

#### Series 30

**VVCW20-3A**

- **Material**
  - G: Stainless steel
  - H: EPDM
  - J: FKM

* Please consult with SMC regarding other voltages.
Compact Direct Operated
2 Port Solenoid Valve for Water and Air Series VDW10/20/30

Dimensions

VV2DW1

<table>
<thead>
<tr>
<th>Dimension</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>
</tr>
</thead>
<tbody>
<tr>
<td>L1</td>
<td>35</td>
<td>52.5</td>
<td>70</td>
<td>87.5</td>
<td>105</td>
<td>122.5</td>
<td>140</td>
<td>157.5</td>
<td>175</td>
</tr>
<tr>
<td>L2</td>
<td>45</td>
<td>62.5</td>
<td>80</td>
<td>97.5</td>
<td>115</td>
<td>132.5</td>
<td>150</td>
<td>167.5</td>
<td>185</td>
</tr>
<tr>
<td>L3</td>
<td>52</td>
<td>69.5</td>
<td>87</td>
<td>104.5</td>
<td>122</td>
<td>139.5</td>
<td>157</td>
<td>174.5</td>
<td>192</td>
</tr>
<tr>
<td>Manifold composition</td>
<td>2 stns. x 1</td>
<td>3 stns. x 1</td>
<td>2 stns. x 2</td>
<td>2 stns. + 3 stns.</td>
<td>3 stns. x 2</td>
<td>2 stns. x 2 + 3 stns.</td>
<td>2 stns. + 3 stns. x 2</td>
<td>3 stns. x 3</td>
<td>2 stns. x 2 + 3 stns. x 2</td>
</tr>
</tbody>
</table>

Note: Manifold base is consisted of the junction of 2 and 3 station bases. Refer to page 252 and 253 regarding manifold additions.
**Series VDW10/20/30**

### Dimensions

**VV2DW2**

![Diagram of VDW2DW2 manifold](image)

<table>
<thead>
<tr>
<th>Dimension</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>
</tr>
</thead>
<tbody>
<tr>
<td>L1</td>
<td>44</td>
<td>66</td>
<td>88</td>
<td>110</td>
<td>132</td>
<td>154</td>
<td>176</td>
<td>198</td>
<td>220</td>
</tr>
<tr>
<td>L2</td>
<td>53</td>
<td>75</td>
<td>97</td>
<td>119</td>
<td>141</td>
<td>163</td>
<td>185</td>
<td>207</td>
<td>229</td>
</tr>
<tr>
<td>L3</td>
<td>62</td>
<td>84</td>
<td>106</td>
<td>128</td>
<td>150</td>
<td>172</td>
<td>194</td>
<td>216</td>
<td>238</td>
</tr>
</tbody>
</table>

**Manifold composition**

- 2 stns. x 1
- 3 stns. x 1
- 2 stns. x 2
- 2 stns. + 3 stns.
- 3 stns. x 2
- 2 stns. x 2 + 3 stns.
- 2 stns. + 3 stns. x 2
- 3 stns. x 3
- 2 stns. x 2 + 3 stns. x 2

**Note:** Manifold base is consisted of the junction of 2 and 3 station bases. Refer to page 252 and 253 regarding manifold additions.

**Diagram:**
- Dimensions: L1, L2, L3
- Out port: 4 x M4
- IN port: 2 x 1/4" (Thread type)
- IN port: (OUT port) n x M5 x 0.8
- When w/o bracket, M4 threads at both ends (4 locations) can be used for other purposes.

**Table:**
- L Dimension (mm)
- n (stations)
Compact Direct Operated
2 Port Solenoid Valve for Water and Air *Series VDW10/20/30*

**VV2DW3**

**Manifold composition**

- 2 stns. x 1
- 3 stns. x 1
- 2 stns. x 2
- 2 stns. + 3 stns.
- 3 stns. x 2
- 2 stns. x 2 + 3 stns.
- 2 stns. + 3 stns. x 2
- 3 stns. x 3
- 2 stns. x 2 + 3 stns. x 2

**Note**
Manifold base is consisted of the junction of 2 and 3 station bases.
Refer to page 252 and 253 regarding manifold additions.
**Manifold Exploded View**

<table>
<thead>
<tr>
<th>Bracket assembly</th>
<th>Manifold base for 2 stations</th>
<th>Passage pipe assembly</th>
<th>Manifold base for 3 stations</th>
<th>Bracket assembly</th>
</tr>
</thead>
</table>

> Figure shows VV2DW2.

**Manifold additions**

1. Install a passage pipe assembly in between the manifold bases to be added.
2. Connect the respective manifold bases with a connecting plate assembly. (Tightening torque: 0.9 ± 0.1 N·m)
3. Attach brackets to the manifold bases. (when equipped with brackets) (Tightening torque: 0.9 ± 0.1 N·m)

*Note: Manifold can be increased by every 2 or 3-station unit.*

Order one set each of manifold base, connection plate assembly and passage pipe assembly.

Order one set each of manifold base, connection plate assembly and passage pipe assembly.
Compact Direct Operated
2 Port Solenoid Valve for Water and Air  
**Series VDW10/20/30**

**<Manifold base>**
- **Series 10, 20**
  - **VDW 2 0 - 2 C - 1 01**
  - **Material**
    - C: Brass (C37)
    - S: Stainless steel
  - **Stations**
    - 1: For 2 stations
    - 2: For 3 stations
  - **Thread type**
    - Nil, Fc, N
  - **OUT port size**
    - Symbol: M5
    - Port size: 1/8 (6A)
  - Series 10 is available with M5 only.

**<Connecting plate assembly>**
- **Series 10, 20**
  - **VDW 2 0 - 4 A**
  - **Note** Two sets of connecting plate and mounting screws.

**<Passage pipe assembly>**
- **Series 10, 20**
  - **VDW 2 0 - 6 A -**
  - **Material**
    - Symbol
      - A: Brass (C37)
      - B: FKM
      - G: EPDM
      - H: Stainless steel
      - J: EPDM

**<Bracket assembly>**
- **Series 10, 20**
  - **VDW 2 0 - 5 A**
  - **Note** Consists of a set for D and U sides.

- **Series 30**
  - **VVCW20 - 5 A**

- **Series 30**
  - **VVCW20-4A**
  - **VVCW20-6A**
Compact Direct Operated
3 Port Solenoid Valve for Water and Air
Series VDW200/300

How to Order Valves (Single Unit)

VD W 2 50 - 1 G - 2 - 01

For Water, Air, Vacuum

Series

2 200
3 300

Valve type

Grommet / Tape winding (G)
Faston terminal, Molded (F)
Grommet / Molded (W)

Voltage

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Voltage</th>
<th>Grommet / Tape winding (G)</th>
<th>Faston terminal, Molded (F)</th>
<th>Grommet / Molded (W)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>100 VAC (50/60 Hz)</td>
<td>●</td>
<td>—</td>
<td>●</td>
</tr>
<tr>
<td>2</td>
<td>200 VAC (50/60 Hz)</td>
<td>●</td>
<td>—</td>
<td>●</td>
</tr>
<tr>
<td>3</td>
<td>110 VAC (50/60 Hz)</td>
<td>●</td>
<td>—</td>
<td>●</td>
</tr>
<tr>
<td>4</td>
<td>222 VAC (50/60 Hz)</td>
<td>●</td>
<td>—</td>
<td>●</td>
</tr>
<tr>
<td>5</td>
<td>24 VDC</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>6</td>
<td>12 VDC</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>V</td>
<td>6 VDC</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>S</td>
<td>5 VDC</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>R</td>
<td>3 VDC</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
</tbody>
</table>

Coil type

G – Grommet / Tape winding
W – Grommet / Molded

Magnet wire protection: Tape winding
Magnet wire protection: Resin Molded

F – Faston terminal / Molded

Magnet wire protection: Resin Molded

Option

Made to Order
(Refer to page 255.)

Material and insulation type

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Body material</th>
<th>Seal material</th>
<th>Coil insulation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nil</td>
<td>NBR</td>
<td>None</td>
<td>Class B</td>
</tr>
<tr>
<td>A</td>
<td>Brass (C37)</td>
<td>FKM</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>Stainless steel</td>
<td>EPDM</td>
<td></td>
</tr>
<tr>
<td>G</td>
<td>Stainless steel</td>
<td>NBR</td>
<td></td>
</tr>
<tr>
<td>H</td>
<td>Stainless steel</td>
<td>FKM</td>
<td></td>
</tr>
<tr>
<td>J</td>
<td>Stainless steel</td>
<td>EPDM</td>
<td></td>
</tr>
</tbody>
</table>

Note) The foot bracket is packed with a valve.

Thread type

Nil Rc
F G
N NPT

Port size

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Port size</th>
<th>Series</th>
</tr>
</thead>
<tbody>
<tr>
<td>M5</td>
<td>M5</td>
<td>200</td>
</tr>
<tr>
<td>01</td>
<td>1/8 (6A)</td>
<td>300</td>
</tr>
<tr>
<td>02</td>
<td>1/4 (8A)</td>
<td>—</td>
</tr>
</tbody>
</table>

Orifice diameter

<table>
<thead>
<tr>
<th>Symbol</th>
<th>N.C. Orifice diameter (mm ø)</th>
<th>N.O. Orifice diameter (mm ø)</th>
<th>Series</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>1</td>
<td>200</td>
</tr>
<tr>
<td>2</td>
<td>1.6</td>
<td>2</td>
<td>300</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>1.8</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Please consult with SMC regarding other voltages.

Note) Brass (C37) is a corrosion resistant construction.

Note) The armature assembly is a corrosion resistant construction.

200 300
Standard Specifications

Valve specifications

<table>
<thead>
<tr>
<th>Characteristic Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
</tr>
<tr>
<td>VDW200</td>
</tr>
<tr>
<td>VDW300</td>
</tr>
</tbody>
</table>

Note 1) Indicates the maximum operating pressure differential of pressure ports 2 and 3.
Note 2) The maximum operating pressure differential changes depending on the flow direction of the fluid. Refer to page 264 for details.
Note 3) For low vacuum specifications, the operating pressure range is 1 Torr (1.33 x 10² Pa) to 1.0 MPa.

Flow Characteristics

<table>
<thead>
<tr>
<th>Model</th>
<th>Port size</th>
<th>Orifice dia. (mm ø)</th>
<th>Water 1→2 (IN→N.C.)</th>
<th>Air 1→2 (IN→N.C.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>VDW200</td>
<td>M5 1/8 (6A)</td>
<td>1 0.72 0.03</td>
<td>0.96 0.04</td>
<td>0.12 0.35 0.03</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.6 1 0.9 0.08</td>
<td></td>
<td>0.31 0.45 0.09</td>
</tr>
<tr>
<td>VDW300</td>
<td>1/8 (6A) 1/4 (8A)</td>
<td>2 3.8 0.16</td>
<td>3.1 0.13</td>
<td>0.52 0.52 0.16</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3 6.7 0.28</td>
<td></td>
<td>1.0 0.52 0.30</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4 11 0.44</td>
<td></td>
<td>1.5 0.49 0.46</td>
</tr>
</tbody>
</table>

Note) Please consult with SMC when used under conditions which may cause condensation on the exterior of the product.
Note 2) When used with deionized water, select “L” (Stainless steel, FKM) for the material type.
Series VDW200/300

Construction

Component Parts

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Standard</td>
</tr>
<tr>
<td>1</td>
<td>Body</td>
<td>Brass (C37)</td>
</tr>
<tr>
<td>2</td>
<td>Tube assembly</td>
<td>Stainless steel</td>
</tr>
<tr>
<td>3</td>
<td>Coil assembly</td>
<td>—</td>
</tr>
<tr>
<td>4</td>
<td>Armature assembly</td>
<td>Stainless steel, PPS, NBR</td>
</tr>
<tr>
<td>5</td>
<td>O-ring (Body)</td>
<td>NBR</td>
</tr>
<tr>
<td>6</td>
<td>Return spring</td>
<td>Stainless steel</td>
</tr>
<tr>
<td>7</td>
<td>Cover</td>
<td>SPCE</td>
</tr>
<tr>
<td>8</td>
<td>Socket</td>
<td>C36</td>
</tr>
<tr>
<td>9</td>
<td>O-ring</td>
<td>NBR</td>
</tr>
<tr>
<td>10</td>
<td>Plate</td>
<td>SPCC</td>
</tr>
<tr>
<td>11</td>
<td>Wave washer</td>
<td>Stainless steel</td>
</tr>
</tbody>
</table>
Compact Direct Operated
3 Port Solenoid Valve for Water and Air  
**Series VDW200/300**

---

### Dimensions

**VDW250**

- Lead wire: Approx. 300
- M5, 1/8
- 3 (N.O.) port
- 2 x Ø3.5

**VDW350**

- Lead wire: Approx. 300
- Rectifier element
- AC type
- M5, 1/8
- 3 (N.O.) port
- 2 x M4 x 6
- Dimensions inside ( ) are for port size 1/8.

---

**Bracket assembly part no.**

- **Series 200**
  - VDW20 — 15A — 1
- **Series 300**
  - VCW20 — 12 — 01A
Series VDW200/300

Dimensions

VDW250-□F

VDW350-□F

Bracket assembly part no.
- Series 200
  VDW20—15A—1
- Series 300
  VCW20 — 12 — 01A
### Series VDW

**Made to Order Specifications:**
Please consult with SMC for detailed size, specifications and delivery.

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>X22</td>
<td>Non-leak (10^-6 Pa·m³/sec) / Vacuum (0.1 Pa-abs) Specification</td>
</tr>
<tr>
<td>X23</td>
<td>Oil-free Specification</td>
</tr>
<tr>
<td>X60</td>
<td>Lead Wire Length: 600 mm Specification</td>
</tr>
<tr>
<td>X133</td>
<td>Seal Material: Kalrez® Specification</td>
</tr>
</tbody>
</table>

**Symbol**

- **VDW** Standard model no.
- **X22**
- **X23**
- **X60**
- **X133**

**Specifications**

- **Lead Wire Length:** 600 mm
- **Seal Material:** Kalrez®
- **Made to Order**
**Series VDW**

**Specific Product Precautions 1**

Be sure to read this before handling.

Refer to front matters 42 and 43 for Safety Instructions, and pages 17 to 19 for 2 Port Solenoid Valves for Fluid Control Precautions.

---

**Design**

**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**
   Please consult with SMC when using with energization for long periods of time.

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

4. **This solenoid valve cannot be used for explosion proof applications.**

5. **Maintenance space**
   The installation should allow sufficient space for maintenance activities (removal of valve, etc.).

---

**Selection**

**Warning**

1. **Confirm the specifications.**
   Give careful consideration to the operating conditions such as the application, fluid and environment, and use within the operating ranges specified in this catalog.

2. **Fluid temperature**
   Please use within the operating fluid temperature range.

3. **Fluid quality**
   **In the case of water**
   The use of a fluid which contains foreign matter 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. In general, a mesh of about 80 to 100 is a guideline for the filter.

   **In the case of air**
   Please use ordinary compressed air where a filter of 40 µm or less is provided on the inlet side piping. (Except dry air)

**Caution**

1. **Leakage voltage**
   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.

   ![Leakage Voltage Diagram]

   **AC coil**
   10% or less of rated voltage

   **DC coil**
   2% or less of rated voltage

2. **Low temperature operation**
   1) The valves can be used up to an ambient temperature of −10°C, however take measures to prevent solidification of impurities or freezing etc.
   2) When using valves for water application in cold climates, first stop the water supply/discharge of the pump etc., and then take measures to prevent freezing such as draining water in pipe. When heating by steam, be careful not to expose the coil portion to steam. Also, please take measures to prevent freezing such as heating the body.
### Warning

1. **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.

2. **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.

3. **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.

4. **Secure with brackets, except in the case of steel piping and copper fittings.**

5. **Avoid sources of vibration, or adjust the arm from the body to the minimum length so that resonance will not occur.**

6. **Instruction manual**
   The product should be mounted and operated after the instruction manual is thoroughly read and its contents are understood. Keep the instruction manual where it can be referred to as needed.

7. **Painting and coating**
   Warnings or specifications printed or labeled on the product should not be erased, removed or covered up.

### 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.

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

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

4. **Always tighten threads with the proper tightening torque.**
   When attaching fittings to valves, tighten with the proper tightening torque shown below.

#### Tightening Torque for Piping

<table>
<thead>
<tr>
<th>Connection threads</th>
<th>Proper tightening torque N·m (kgf-cm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>M5</td>
<td>1.5 to 2 (15 to 20)</td>
</tr>
<tr>
<td>Rc 1/8</td>
<td>7 to 9 (70 to 90)</td>
</tr>
<tr>
<td>Rc 1/4</td>
<td>12 to 14 (120 to 140)</td>
</tr>
<tr>
<td>Rc 3/8</td>
<td>22 to 24 (220 to 240)</td>
</tr>
</tbody>
</table>

* Reference
  Tightening of M5 fitting threads
  After tightening by hand, tighten approximately 1/6 turn further with a tightening tool. However, when using miniature fittings, tighten an additional 1/4 turn after tightening by hand. (In cases where there are gaskets in two places, such as a universal elbow or universal tee, double the additional tightening to 1/2 turn.)

5. **Connection of piping to products**
   - When connecting piping to a product, refer to its instruction manual to avoid mistakes regarding the supply port, etc.
   - Do not apply external force to the coil when holding it to connect piping, as the tube may deform.
**Series VDW**

**Specific Product Precautions 3**

Be sure to read this before handling. Refer to front matters 42 and 43 for Safety Instructions, and pages 17 to 19 for 2 Port Solenoid Valves for Fluid Control Precautions.

---

### Wiring

**Caution**

1. As a rule, use electrical 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.
2. Use electrical circuits which do not generate chattering in their contacts.
3. 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.

---

### Operating Environment

**Warning**

1. Do not use the valves in an atmosphere having corrosive gases, chemicals, salt 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.

---

### Electrical Connections

**Caution**

Refer to front matters 42 and 43 for Safety Instructions, and pages 17 to 19 for 2 Port Solenoid Valves for Fluid Control Precautions.

---

### Electrical Circuit

**Caution**

1. Filters and strainers
   
   1) Be careful regarding clogging of filters and strainers.
   2) Replace filter elements after one year of use, or earlier if the pressure drop reaches 0.1 MPa.
   3) Clean strainers when the pressure drop reaches 0.1 MPa.
   4) Exhaust the drain from an air filter periodically.

2. Storage

   When not using for a long time (more than approx. one month) after use with water, thoroughly remove all moisture to prevent rust and deterioration of rubber materials, etc.

---

### Table: Lead wire color

<table>
<thead>
<tr>
<th>Rated voltage</th>
<th>Lead wire color 1</th>
<th>Lead wire color 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>DC</td>
<td>Black</td>
<td>Red</td>
</tr>
<tr>
<td>100 VAC</td>
<td>Blue</td>
<td>Blue</td>
</tr>
<tr>
<td>200 VAC</td>
<td>Red</td>
<td>Red</td>
</tr>
<tr>
<td>Other AC</td>
<td>Gray</td>
<td>Gray</td>
</tr>
</tbody>
</table>

* There is no polarity for DC.

* Lead wire: AWG20, outside diameter of insulator 1.79
Replacing the Solenoid Coils

**Caution**

**2 port valve**

Press the clip in direction ① with a flat head screwdriver, etc., and remove it from the tube assembly groove.

Remove the cover in direction ②, and replace the solenoid coil.

After replacing the coil, insert the clip into the tube assembly groove from direction ③. After inserting it into the groove, confirm the position and condition of the clip.

**3 port valve**

After removing the socket with a wrench, etc., lift off the plate, wave washer and cover, and replace the coil assembly. After replacing the coil, first tighten the socket by hand while holding down the plate and wave washer, and then tighten it further with a torque of 0.8 to 1 N·m.

- Precautions when attaching and removing the socket
  - Be careful that the O-ring installed on the bottom (plate side) of the socket does not fall out or become chewed up, etc.
  - Be sure to secure the body by wrench, etc., and tighten the socket within the tightening torque range given above. If the torque is applied excessively, there is a danger of damaging the threads.

Refer to front matters 42 and 43 for Safety Instructions, and pages 17 to 19 for 2 Port Solenoid Valves for Fluid Control Precautions.
Series VDW
Specific Product Precautions 5

Be sure to read this before handling.
Refer to front matters 42 and 43 for Safety Instructions, and pages 17 to 19 for 2 Port Solenoid Valves for Fluid Control Precautions.

Replacement Parts

● Solenoid coil part no.
VDW 2 0 – 1
Series
1 10
2 20, 200
3 30, 300

Coil type
C Grommet / Tape winding
F Faston terminal / Molded
W Grommet / Molded

Type
1 10, 20, 30
2 200, 300

● Lead wire length
Nil 300 mm
L1 300 mm

● Voltage
1 200 VAC
2 110 VAC
3 220 VAC
4 24 VDC
5 12 VDC
6 6 VDC
S 5 VDC
R 3 VDC

Caution
When piping to an N.O. port, be sure to perform piping work while securing the socket by using wrench or other tool. Refer to back page 261 for other precautions related to piping.

Fluid Flow Direction

Caution
The maximum operating pressure differential differs depending on the flow direction of the fluid. If the pressure differential at each port exceeds the values in the table below, valve leakage may occur.

2 Port Valve

<table>
<thead>
<tr>
<th>Model</th>
<th>Orifice diameter (mm)</th>
<th>Max. operating pressure differential (MPa)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Pressure port 1</td>
</tr>
<tr>
<td>VDW10</td>
<td>1</td>
<td>0.9</td>
</tr>
<tr>
<td></td>
<td>1.6</td>
<td>0.4</td>
</tr>
<tr>
<td>VDW20</td>
<td>1.6</td>
<td>0.7</td>
</tr>
<tr>
<td></td>
<td>2.3</td>
<td>0.4</td>
</tr>
<tr>
<td>VDW30</td>
<td>3.2</td>
<td>0.2</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>0.8</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>0.4</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>0.2</td>
</tr>
</tbody>
</table>

Note) When applying pressure from port 2, be careful to avoid vibration and impacts, etc.

3 Port Valve

<table>
<thead>
<tr>
<th>Model</th>
<th>Orifice diameter (mm)</th>
<th>Max. operating pressure differential (MPa)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Pressure port 1</td>
</tr>
<tr>
<td>VDW200</td>
<td>1</td>
<td>0.9</td>
</tr>
<tr>
<td></td>
<td>1.6</td>
<td>0.7</td>
</tr>
<tr>
<td>VDW300</td>
<td>2</td>
<td>0.8</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>0.4</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>0.2</td>
</tr>
</tbody>
</table>

Note 1) Indicates the maximum operating pressure differential of pressure ports 2 and 3.

Note 2) When the port 2 pressure is in the higher pressure side, be careful to avoid vibration and impacts, etc.

AZ-T-VDW Valve model no. on page 243, 248, 254

● Clip part no. (2 port)
VDW 2 0 – 10
Series
2 10, 20
3 30

● Socket assembly part no. (3 port)
VDW 2 0 – 12A
Series
2 200
3 300

Port size
Symbol: M5
<table>
<thead>
<tr>
<th>Port size</th>
<th>200</th>
<th>300</th>
</tr>
</thead>
<tbody>
<tr>
<td>M5</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>01</td>
<td>1/8 (6A)</td>
<td>○</td>
</tr>
<tr>
<td>02</td>
<td>1/4 (8A)</td>
<td>—</td>
</tr>
</tbody>
</table>

Material
Symbol: A
<table>
<thead>
<tr>
<th>Socket material</th>
<th>Seal material</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brass (C37)</td>
<td>NBR</td>
</tr>
<tr>
<td>Stainless steel</td>
<td>FKM</td>
</tr>
<tr>
<td>NBR</td>
<td>EPDM</td>
</tr>
<tr>
<td>FKM</td>
<td>FKM</td>
</tr>
</tbody>
</table>

Thread type
Nil Rc
F G
N NPT
<table>
<thead>
<tr>
<th>Glossary</th>
<th>Other</th>
</tr>
</thead>
</table>
| **Pressure** | 1. Material  
NBR: Nitrile rubber  
FKM: Fluoro rubber = FPM — Trade name: Viton®, DAI-EL™, etc.  
EPDM: Ethylene propylene rubber = EPR  
C37: Brass  
SUS: Stainless steel |
| 1. **Maximum operating pressure differential**  
This indicates the maximum pressure differential (inlet and outlet pressure differential) which can be allowed for operation with the valve closed or open. When the outlet pressure is 0 MPa, this becomes the maximum operating pressure.  
2. **Maximum operating pressure**  
This indicates the limit of pressure that can be applied inside the pipelines. (Line pressure)  
(The pressure differential of the solenoid valve unit must be no more than the maximum operating pressure differential.)  
3. **Withstand pressure**  
The pressure which must be withstood without a drop in performance after returning to the operating pressure range (The value under the prescribed conditions). | |
| **Electricity** | **Faston Terminal** |
| 1. **Surge voltage**  
A high voltage which is momentarily generated in the shut-off unit by shutting off the power. | 1. Faston™ is a trademark of Tyco Electronics Corp.  
2. For electrical connection of the Faston terminal and molded coil, please use Tyco’s “Amp/Faston connector/250 Series” or the equivalent.  
3. When providing a body ground, please use the frame ground (M3.5).  
(Recommended fastening bolt: M3.5, length 5 mm) |
Compact Direct Operated 2 Port Solenoid Valve

**Lightweight**

2.8 oz → 3.5 oz

- **New** Aluminum/Resin(PPS) body
- Conventional C37 body

**Compact**

- New: 42.5 mm
- Conventional model: 48 mm

(Compared with Size 1, C37/Stainless steel body)

**Environmental performance**

- IP65

**Power consumption**

- 2.5 W (Size 1)
- 3 W (Size 2)

**Series VDW**

Body material

Aluminum • Resin(PPS)

C37(Brass) • Stainless Steel

Air • Medium vacuum • Water

New RoHS

Conventional model

Aluminum body

Resin body

One-touch fitting ø3.2, ø4, ø6

CAT.NAS70-49A
Compact Direct Operated 2 Port Solenoid Valve

Series VDW

Enclosure
IP65

Flame resistance
UL94V-0 conformed

Improved armature durability

Low-noise construction
Metal noise reduced by the rubber damper

Piping variations
Screw piping, One-touch fitting

Power consumption
2.5 W (Size 1)
3 W (Size 2)

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

Body material
Air • Water
Aluminum, Resin (PPS)
Water • Medium vacuum
C37 (Brass), Stainless steel

Features

Body material
Fluid
Size
Orifice diameter
Port size
Other special options

Air
Medium vacuum
Water

Aluminum

(NBR)

Size 2
—

(M5) 1/8 ø3.2 ø4 ø6

Resin (PPS)

(NBR)

(NBR)

Size 1
—

Size 2
—

(C37/Stainless steel)

(FKM)

(NBR)

Size 1
—

Size 2
—

The materials in ( ) are the seal materials.

Note 1) As standard for medium vacuum type.
Note 2) Only for air.

- Special voltage
48 VAC
220 VAC
240 VAC
12 VDC

- G thread, NPT thread
- Oil-free [Note 1]
- Low concentration ozone resistant
(Seal material: FKM) [Note 2]

Direct Operated 2 Port Solenoid Valve

Series VX21/22/23

Applicable fluid: Air, Medium vacuum, Water, Oil
Body material: Aluminum, C37, Stainless steel, Resin

Valve type
Port size
Orifice diameter (mm)

N.C.
1/8 to 1/2
One-touch fitting: ø6 to ø12
2, 3, 4, 5, 7, 8, 10
Compact Direct Operated 2 Port Solenoid Valve

Series VDW

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>290 psi (2.0 MPa) (resin body type)</td>
</tr>
<tr>
<td>Max. system pressure</td>
<td>145 psi (1.0 MPa)</td>
</tr>
<tr>
<td>Body material</td>
<td>Aluminum, Resin, C37(Brass), Stainless steel</td>
</tr>
<tr>
<td>Seal material</td>
<td>NBR, FKM</td>
</tr>
<tr>
<td>Enclosure</td>
<td>Dusttight, Low jetproof (IP65)</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</td>
</tr>
<tr>
<td>DC</td>
<td>100 VAC, 200 VAC, 110 VAC, 230 VAC, (220 VAC, 240 VAC, 48 VAC) Note(0)</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)</td>
</tr>
<tr>
<td>DC</td>
<td>10% or less of rated voltage</td>
</tr>
<tr>
<td>Coil insulation type</td>
<td>Class B</td>
</tr>
</tbody>
</table>

Note) Voltage in ( ) indicates special voltage. (Refer to page 8.)

⚠️ 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 Note 2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size 1</td>
<td>2.5</td>
<td>140°F (60°C)</td>
</tr>
<tr>
<td>Size 2</td>
<td>3</td>
<td>140°F (60°C)</td>
</tr>
</tbody>
</table>

Note 1) Power consumption, Apparent power: The value at ambient temperature of 68°F (20°C) and when the rated voltage is applied. (Variation: ±10%)

Note 2) The value at ambient temperature of 68°F (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) 2)</th>
<th>Temperature rise Note 3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size 1</td>
<td>2.5</td>
<td>140°F (60°C)</td>
</tr>
<tr>
<td>Size 2</td>
<td>3</td>
<td>140°F (60°C)</td>
</tr>
</tbody>
</table>

Note 1) Power consumption, Apparent power: The value at ambient temperature of 68°F (20°C) and when the rated voltage is applied. (Variation: ±10%)

Note 2) The value at ambient temperature of 68°F (20°C) and when the rated voltage is applied. The value depends on the ambient environment. This is for reference.

Note 3) The value at ambient temperature of 68°F (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 2) Page 2 0
- Item: Water (Page 6) Page 6 2
- Item: Medium vacuum (Page 4) Page 4 4

```
VDW 1 0 A 0 A A
  1
```

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

```
VDW 1 0 A A
  2
```

Step 3

Select electric specifications.

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

```
VDW 1 0 A A
  3
```

For other special options, refer to page 8.
## Model/Valve Specifications

### N.C.

**Configuration symbol**

![Configuration symbol image]

Note: The configuration 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 (mm)</th>
<th>Model</th>
<th>Flow-rate characteristics</th>
<th>Maximum operating pressure differential psi (MPa)</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>M5, M1/2</td>
<td>1.6</td>
<td>VDW20</td>
<td>C_{10} = 0.30, b = 0.45, Cv = 0.07</td>
<td>102 (0.7)</td>
<td>2.8 oz (80g)</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 (mm)</th>
<th>Model</th>
<th>Flow-rate characteristics</th>
<th>Maximum operating pressure differential psi (MPa)</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>M5 ø3.2 One-touch fitting</td>
<td>1.0</td>
<td>VDW10</td>
<td>C_{10} = 0.14, b = 0.40, Cv = 0.04</td>
<td>131 (0.9)</td>
<td>1.6 oz (45g)</td>
</tr>
<tr>
<td>2</td>
<td>M5 ø4 One-touch fitting</td>
<td>1.6</td>
<td>VDW20</td>
<td>C_{10} = 0.30, b = 0.25, Cv = 0.07</td>
<td>58 (0.4)</td>
<td>2.8 oz (80g)</td>
</tr>
</tbody>
</table>

### Valve Leakage

#### Internal Leakage

<table>
<thead>
<tr>
<th>Seal material</th>
<th>Leakage rate (Air)</th>
</tr>
</thead>
<tbody>
<tr>
<td>NBR</td>
<td>1 cm³/min or less (Aluminum body type)</td>
</tr>
</tbody>
</table>

#### External Leakage

<table>
<thead>
<tr>
<th>Seal material</th>
<th>Leakage rate (Air)</th>
</tr>
</thead>
<tbody>
<tr>
<td>NBR</td>
<td>1 cm³/min or less (Aluminum body type)</td>
</tr>
</tbody>
</table>

Note: Leakage is the value at ambient temperature 68°F (20°C).

### Fluid and Ambient Temperature

<table>
<thead>
<tr>
<th>Fluid temperature °F (°C)</th>
<th>Ambient temperature °F (°C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>14 to 122 (−10 to 50)</td>
<td>14 to 122 (−10 to 50)</td>
</tr>
</tbody>
</table>

Note: Dew point temperature: 14°F (−10°C) or less
### How to Order (Single Unit)

**VDW**

1. **Fluid**
   - 0: For air

2. **Size/Valve type**
   - Symbol: A
   - Size: 1
   - Valve type: Single unit (N.C.)

3. **Body material/Port size/Orifice diameter**
   - **A**
     - Port size: M5
     - Orifice diameter: 1.0
   - **B**
     - Port size: ø3.2 One-touch fitting
     - Orifice diameter: 1.0
   - **C**
     - Port size: ø4 One-touch fitting
     - Orifice diameter: 1.0
   - **D**
     - Port size: ø6 One-touch fitting
     - Orifice diameter: 1.0

4. **Voltage/Electrical entry**
   - **Symbol**
     - **A**: 24 VDC
     - **B**: 100 VAC
     - **C**: 110 VAC
     - **D**: 200 VAC
     - **E**: 230 VAC
     - **Z**: Other voltages

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

6. **For other special options, refer to page 8.**
   - **Special voltage**
     - 48 VAC
     - 220 VAC
     - 240 VAC
     - 12 VDC
   - **Low concentration ozone resistant (Seal material: FKM)**
   - **Oil-free**
   - **G thread**
   - **NPT thread**

**Dimensions—Page 9 (Single unit)**
**Model/Valve Specifications**

**N.C.**

![Image of valve]

**Configuration symbol (Application example)**

- Used with vacuum
- Used with pressure

**Fluid and Ambient Temperature**

<table>
<thead>
<tr>
<th>Fluid temperature °F (°C)</th>
<th>Ambient temperature °F (°C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>33.8 to 122 (1 to 50)</td>
<td>14 to 122 (−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 $^{(a)}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>FKM</td>
<td>$10^{-6}$Pa·m$^3$/sec or less</td>
</tr>
</tbody>
</table>

**External Leakage**

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

**Note** Leakage ($10^{-6}$Pa·m$^3$/sec) is the value at differential pressure 14.5 psi (0.1 MPa) and ambient temperature 68°F (20°C).

**Configuration symbol (Application example)**

- The configuration 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.
### Specifications

#### Model VDW

**For Air**

- **Symbol:** G, H, J, K
- **Body material:** C37 Stainless steel
- **Port size:** M5
- **Orifice diameter:** 1.0, 1.6

**For Water**

- **Symbol:** G, H, J, K
- **Body material:** C37 Stainless steel
- **Port size:** M5
- **Orifice diameter:** 1.0, 1.6

**For Medium Vacuum**

- **Symbol:** G, H, J, K
- **Body material:** C37 Stainless steel
- **Port size:** M5
- **Orifice diameter:** 1.0, 1.6

#### How to Order (Single Unit)

**VDW 1 4 A A**

- **Fluid:** For medium vacuum

### Common Specifications

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

### 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></td>
</tr>
<tr>
<td>Z</td>
<td></td>
<td>Other voltages</td>
</tr>
</tbody>
</table>

**For other special options, refer to page 8.**

- **Special voltage:** 48 VAC, 220 VAC, 240 VAC, 12 VDC
- **G thread**
- **NPT thread**
- **Bracket interchangeable with old type**

### Dimensions

Dimensions→Page 9 (Single unit)
**Model/Valve Specifications**

**N.C.**

**Configuration symbol**

Note: The configuration 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 psi (MPa)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>AV (x10⁻⁶/m²)</td>
<td>Conversion Cv</td>
</tr>
<tr>
<td>1</td>
<td>M5</td>
<td>1.0</td>
<td>VDW12</td>
<td>0.96</td>
<td>0.04</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.6</td>
<td></td>
<td>1.70</td>
<td>0.07</td>
</tr>
<tr>
<td>2</td>
<td>M5, 1/8</td>
<td>1.6</td>
<td>VDW22</td>
<td>1.70</td>
<td>0.07</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.3</td>
<td></td>
<td>4.30</td>
<td>0.18</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.2</td>
<td></td>
<td>7.20</td>
<td>0.30</td>
</tr>
</tbody>
</table>

**Resin 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 psi (MPa)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>AV</td>
<td>Conversion Cv</td>
</tr>
<tr>
<td>1</td>
<td>M5</td>
<td>1.0</td>
<td>VDW12</td>
<td>0.96</td>
<td>0.04</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.6</td>
<td></td>
<td>1.70</td>
<td>0.07</td>
</tr>
<tr>
<td>2</td>
<td>M5</td>
<td>1.6</td>
<td>VDW22</td>
<td>1.70</td>
<td>0.07</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.3</td>
<td></td>
<td>4.30</td>
<td>0.18</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.2</td>
<td></td>
<td>7.20</td>
<td>0.30</td>
</tr>
</tbody>
</table>

Refer to “Glossary of Terms” on page 12 for details on the maximum operating pressure differential.

**Fluid and Ambient Temperature**

<table>
<thead>
<tr>
<th>Fluid temperature °F (°C)</th>
<th>Ambient temperature °F (°C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>33.8 to 122° (1 to 50)</td>
<td>14 122 (−10 to 50)</td>
</tr>
</tbody>
</table>

Note: With no freezing

**Valve Leakage**

**Internal Leakage**

Note 1) Internal leakage when pressure is supplied to Port 1 (IN).

<table>
<thead>
<tr>
<th>Seal material</th>
<th>Leakage rate (Water) Note 2</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) Note 2</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 68°F (20°C).
### How to Order (Single Unit)

**VDW 1 2 A A**

#### Fluid

- **For water**: 2

#### Size/Valve type

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Size</th>
<th>Valve type</th>
<th>Body material</th>
<th>Port size</th>
<th>Orifice diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1</td>
<td>Single unit N.C.</td>
<td>Resin (PPS)</td>
<td>M5</td>
<td>1.0</td>
</tr>
<tr>
<td>B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.6</td>
</tr>
<tr>
<td>C</td>
<td></td>
<td></td>
<td>Resin (PPS)</td>
<td>φ3.2 One-touch fitting</td>
<td>1.0</td>
</tr>
<tr>
<td>D</td>
<td></td>
<td></td>
<td></td>
<td>φ4 One-touch fitting</td>
<td>1.0</td>
</tr>
<tr>
<td>E</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.6</td>
</tr>
<tr>
<td>F</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.6</td>
</tr>
<tr>
<td>G</td>
<td></td>
<td>Stainless steel</td>
<td>C37</td>
<td>M5</td>
<td>1.0</td>
</tr>
<tr>
<td>H</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.6</td>
</tr>
<tr>
<td>J</td>
<td></td>
<td>Stainless steel</td>
<td>M5</td>
<td></td>
<td>1.0</td>
</tr>
<tr>
<td>K</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.6</td>
</tr>
</tbody>
</table>

#### Size/Valve type

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Size</th>
<th>Valve type</th>
<th>Body material</th>
<th>Port size</th>
<th>Orifice diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>2</td>
<td>Single unit N.C.</td>
<td>Resin (PPS)</td>
<td>M5</td>
<td>1.6</td>
</tr>
<tr>
<td>B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2.3</td>
</tr>
<tr>
<td>C</td>
<td></td>
<td></td>
<td>Resin (PPS)</td>
<td>φ4 One-touch fitting</td>
<td>2.3</td>
</tr>
<tr>
<td>D</td>
<td></td>
<td></td>
<td></td>
<td>φ6 One-touch fitting</td>
<td>2.3</td>
</tr>
<tr>
<td>E</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3.2</td>
</tr>
<tr>
<td>F</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3.2</td>
</tr>
<tr>
<td>G</td>
<td></td>
<td>Stainless steel</td>
<td>C37</td>
<td>M5</td>
<td>1.6</td>
</tr>
<tr>
<td>H</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2.3</td>
</tr>
<tr>
<td>J</td>
<td></td>
<td>Stainless steel</td>
<td>M5</td>
<td></td>
<td>3.2</td>
</tr>
<tr>
<td>K</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.6</td>
</tr>
<tr>
<td>L</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2.3</td>
</tr>
<tr>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td>1/8</td>
<td>2.3</td>
</tr>
<tr>
<td>N</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3.2</td>
</tr>
<tr>
<td>P</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.6</td>
</tr>
<tr>
<td>Q</td>
<td></td>
<td></td>
<td></td>
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<td>3.2</td>
</tr>
<tr>
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<td>1.6</td>
</tr>
<tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>2.3</td>
</tr>
<tr>
<td>T</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>U</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.6</td>
</tr>
<tr>
<td>V</td>
<td></td>
<td></td>
<td></td>
<td>1/8</td>
<td>2.3</td>
</tr>
<tr>
<td>W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3.2</td>
</tr>
</tbody>
</table>

#### Common Specifications

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

#### Body material/Port size/Orifice diameter

- **Fluid**

#### 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></td>
</tr>
<tr>
<td>Z</td>
<td></td>
<td>Other voltages</td>
</tr>
</tbody>
</table>

For other special options, refer to page 8.

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

- **Oil-free**
- **G thread**
- **NPT thread**
- **Bracket interchangeable with old type**

**Dimensions → Page 9 (Single unit)**
**Series VDW**

### Other Special Options

#### Electrical options (Special voltage)

VDW **10AZ1A**

- **Enter standard product number.**
- **Enter standard product number.**
- **Electrical option**
- **Electrical option**

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Voltage</th>
<th>Electrical entry</th>
</tr>
</thead>
<tbody>
<tr>
<td>1A</td>
<td>48 VAC</td>
<td>C</td>
</tr>
<tr>
<td>1B</td>
<td>220 VAC</td>
<td>G</td>
</tr>
<tr>
<td>1C</td>
<td>240 VAC</td>
<td>H</td>
</tr>
<tr>
<td>1D</td>
<td>12 VDC</td>
<td>N</td>
</tr>
</tbody>
</table>

**Material**

- **Cu + Fe + Resin**
- **Fe**
- **Stainless steel**
- **NBR, FKM**
- **Aluminum, PPS resin, C37, Stainless steel**

---

#### Other options (Low concentration ozone resistant, oil-free, special thread)

VDW **10AAZ**

- **Enter standard product number.**
- **Enter standard product number.**
- **Other option (Low concentration ozone resistant, oil-free, special thread)**

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Oil-free</th>
<th>Special thread</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td></td>
<td>G</td>
<td>Port size 1/8</td>
</tr>
<tr>
<td>B</td>
<td></td>
<td>NPT</td>
<td>Port size 5/8</td>
</tr>
<tr>
<td>C</td>
<td></td>
<td>M6</td>
<td>Port size 5/8</td>
</tr>
<tr>
<td>D</td>
<td></td>
<td>G</td>
<td>Port size 1/8</td>
</tr>
<tr>
<td>E</td>
<td></td>
<td>NPT</td>
<td>Port size 5/8</td>
</tr>
<tr>
<td>F</td>
<td></td>
<td>M6</td>
<td>Port size 5/8</td>
</tr>
<tr>
<td>G</td>
<td></td>
<td>Standard</td>
<td></td>
</tr>
<tr>
<td>H</td>
<td></td>
<td>G</td>
<td>Port size 1/8</td>
</tr>
<tr>
<td>J</td>
<td></td>
<td>NPT</td>
<td>Port size 5/8</td>
</tr>
<tr>
<td>K</td>
<td></td>
<td>M6</td>
<td>Port size 5/8</td>
</tr>
<tr>
<td>L</td>
<td></td>
<td>Standard</td>
<td></td>
</tr>
<tr>
<td>M</td>
<td></td>
<td>G</td>
<td>Port size 1/8</td>
</tr>
<tr>
<td>N</td>
<td></td>
<td>NPT</td>
<td>Port size 5/8</td>
</tr>
<tr>
<td>P</td>
<td></td>
<td>M6</td>
<td>Port size 5/8</td>
</tr>
<tr>
<td>Z</td>
<td></td>
<td>Standard</td>
<td></td>
</tr>
</tbody>
</table>

**Note:** Applicable to air

---

#### Bracket interchangeable with old type

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

- **Only for aluminum and stainless steel**
- **(Select stainless steel when interchangeable product is necessary for water.)**

VDW **XBX**

- **Enter standard product number.**
- **Bracket interchangeable with old type**

---

**Construction**

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

- **Body material:** Aluminum, PPS resin, C37, Stainless steel

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

---

**Component Parts**

**VDW**

<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, C37, Stainless steel</td>
</tr>
</tbody>
</table>

**Example:** VDW **20AZ1AZXB**

- **Electrical option**
- **Other option**
- **Bracket interchangeable with old type**

---

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

---

**Note:**

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

---

**Example:**

**VDW** **10AZ1A XB**

- **Electrical option**
- **Other option**
- **Bracket interchangeable with old type**

---

**Symbol**

- **Specifi-cal**
- **Special voltage**
- **Enter standard product number.**
- **Bracket interchangeable with old type**

---

**Series VDW**

**Other Special Options**

---

**VDW**

<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>PPS resin</td>
</tr>
<tr>
<td>8</td>
<td>Bracket</td>
<td>SPCC</td>
</tr>
</tbody>
</table>
Compact Direct Operated 2 Port Solenoid Valve Series VDW

Dimensions

**Body material** Aluminum

Grommet

![Diagram of valve dimensions]

- Full wave rectifier (AC type)
- 2 x J thread depth K
- Note: Bracket interchangeable with old type (VDW□□□□XB) only

<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 method</th>
<th>Electrical entry</th>
<th>Grommet</th>
</tr>
</thead>
<tbody>
<tr>
<td>VDW2</td>
<td>M5, 1/8</td>
<td>15</td>
<td>22</td>
<td>11</td>
<td>52</td>
<td>20</td>
<td>8</td>
<td>13.5</td>
<td>M3</td>
<td>5 15</td>
<td>17 36.5</td>
</tr>
</tbody>
</table>

Note: Dimensions are in millimeters (mm).
With one-touch fittings
Grommet

For information on handling one-touch fittings and appropriate tubing, refer to page 15 and KJ series one-touch fittings in Best Pneumatics No. 6. The KJ series information can be downloaded from the following SMC website, http://www.smcworld.com

Model | One-touch fitting | Mounting bracket dimensions | Electrical entry | Grommet
--- | --- | --- | --- | ---
VDW1 | ø3.2, ø4 | 28 14 11 34 17 17 15.5 30.5 |
VDW2 | ø4, ø6 | 33 16.5 14 39 19.5 20 17 35 |

Port size M5/M6
Grommet

<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>VDW1</td>
<td>M5(M6)</td>
<td>20 10 46 15 9.5 11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>VDW2</td>
<td>M5(M6)</td>
<td>22 11 51 20 9.5 13.5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Dimensions

### Body material: C37

**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>
<th>Mounting method</th>
<th>Electrical entry</th>
</tr>
</thead>
<tbody>
<tr>
<td>VDW1</td>
<td>M5</td>
<td>20</td>
<td>10</td>
<td>42.5</td>
<td>15</td>
<td>6</td>
<td>11</td>
<td>M2.5</td>
<td>4 11 15.5 30</td>
</tr>
<tr>
<td>VDW2</td>
<td>M5, 1/8</td>
<td>22</td>
<td>11</td>
<td>52</td>
<td>20</td>
<td>8</td>
<td>13.5</td>
<td>M3</td>
<td>5 15 17 36.5</td>
</tr>
</tbody>
</table>

### Body material: Stainless Steel

**Grommet**

<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 method</th>
<th>Electrical entry</th>
</tr>
</thead>
<tbody>
<tr>
<td>VDW1</td>
<td>M5</td>
<td>12</td>
<td>20</td>
<td>10</td>
<td>42.5</td>
<td>15</td>
<td>6</td>
<td>11</td>
<td>M2.5</td>
<td>4 11 15.5 30</td>
</tr>
<tr>
<td>VDW2</td>
<td>M5, 1/8</td>
<td>15</td>
<td>22</td>
<td>11</td>
<td>52</td>
<td>20</td>
<td>8</td>
<td>13.5</td>
<td>M3</td>
<td>5 15 17 36.5</td>
</tr>
</tbody>
</table>


**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. **Minimum operating pressure differential**
   The minimum pressure differential (the difference between the inlet pressure and outlet pressure) required to keep the main valve fully opened.

3. **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.]

4. **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 shutdown 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.

   **Example) IP —**
   ```
   IP — [Second characteristic numeral]
   First characteristic numeral
   ```

   **First Characteristics:**
   Degrees of protection against solid foreign objects
   
<table>
<thead>
<tr>
<th>First characteristic numeral</th>
<th>Degrees of protection against solid foreign objects</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>Second characteristic numeral</th>
<th>Degrees of protection against water</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 horizontally falling water drops</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.

---

**Others**

1. **Material**
   - NBR: Nitrile rubber
   - FKM: Fluoro rubber – Trade names: Viton®, Dai-el®, etc.

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

3. **Configuration symbol**
   In the JIS symbol (            ) 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.

**Product with flow direction 2 → 1 with pressure supplied to port 2**

When operating the product with pressure supplied to port 2 and pressure in the flow direction from port 2 to 1, the pressure difference between port 2 and port 1 should be according to the values shown in the table below.

<table>
<thead>
<tr>
<th>Size</th>
<th>Orifice diameter [mm]</th>
<th>Max. operating pressure differential Δps [MPa]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size 1</td>
<td>ø1.0</td>
<td>58 (0.4)</td>
</tr>
<tr>
<td></td>
<td>ø1.6</td>
<td>29 (0.2)</td>
</tr>
<tr>
<td>Size 2</td>
<td>ø1.6</td>
<td>29 (0.2)</td>
</tr>
<tr>
<td></td>
<td>ø2.3</td>
<td>15 (0.1)</td>
</tr>
<tr>
<td></td>
<td>ø3.2</td>
<td>7.3 (0.05)</td>
</tr>
</tbody>
</table>

**Caution**

When operating the product with flow direction 2 → 1 with pressure supplied to port 2 and pressure in the flow direction from port 2 to 1, 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).
### Design

**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.**

### Selection

**Warning**

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.**

2. **Fluid quality**

   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 80 to 100 mesh. When using tap water, since substances such as calcium and magnesium which generate hard scale and sludge are included and can cause the valve to malfunction, install water softening equipment and a filter (strainer) right before the valve to remove these substances.

3. **Air quality**

   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 an air filter close to the valve 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 a 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 a mist separator on 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.5 for further details on compressed air quality.

4. **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.

5. **Countermeasures against static electricity**

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

6. **Low temperature operation**

   1) **The valve can be used in an ambient temperature of between 14 to –4°F (–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.**
Warning

7. Fluid quality
   - 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 50 to 100 mesh. When using tap water, since substances such as calcium and magnesium which generate hard scale and sludge are included and can cause the valve to malfunction, install water softening equipment and a filter (strainer) right before the valve to remove these substances.
   - Air
     Use ordinary compressed air where a filter of 5 µm or less is provided on the inlet side piping. (Except dry air)

Caution

1. Leakage voltage
   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.

2. Selecting model
   Material depends on fluid. Select optimal models for the fluid.

Mounting

3. Mount a valve with its coil position upwards, not downwards.
   When 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.

4. 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.

5. Secure with brackets, except in the case of steel piping and copper fittings.

6. Avoid sources of vibration, or adjust the arm from the body to the minimum length so that resonance will not occur.

7. Painting and coating
   Warnings or specifications printed or labeled on the product should not be erased, removed or covered up.

Piping

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.

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 attaching fittings to valves, tighten with the proper tightening torque shown below.

<table>
<thead>
<tr>
<th>Connection thread</th>
<th>Proper tightening torque (lbf·ft (N·m))</th>
</tr>
</thead>
<tbody>
<tr>
<td>M5</td>
<td>0.7 to 1.1 (1 to 1.5)</td>
</tr>
<tr>
<td>M6</td>
<td>0.7 to 1.1 (1 to 1.5)</td>
</tr>
<tr>
<td>Rc1/8</td>
<td>5.2 to 6.6 (7 to 9)</td>
</tr>
</tbody>
</table>

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. 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.)

### Table: Recommended Piping Conditions

<table>
<thead>
<tr>
<th>Tube size</th>
<th>Nylon tube</th>
<th>Soft nylon tube</th>
<th>Polyurethane tube</th>
<th>Straight portion length</th>
</tr>
</thead>
<tbody>
<tr>
<td>ø3.2</td>
<td>44 or more</td>
<td>29 or more</td>
<td>25 or more</td>
<td>16 or more</td>
</tr>
<tr>
<td>ø4</td>
<td>56 or more</td>
<td>30 or more</td>
<td>26 or more</td>
<td>20 or more</td>
</tr>
<tr>
<td>ø6</td>
<td>84 or more</td>
<td>39 or more</td>
<td>39 or more</td>
<td>30 or more</td>
</tr>
</tbody>
</table>

![Fig. 1 Recommended piping configuration](image1)

![Fig. 2 Binding tubes with bands](image2)

**Wiring**

**Caution**

1. 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.
2. Use electric circuits which do not generate chattering in their contacts.
3. 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.
4. When a surge from the solenoid affects the electrical circuitry, install a surge voltage suppressor, etc., in parallel with the solenoid. Or, adopt an option that comes with the surge voltage protection circuit. (However, a surge voltage occurs even if the surge voltage protection circuit is used. For details, please consult with SMC.)

**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. Removing the product
   - The valve will reach a high temperature when used with high temperature fluids. Confirm that the valve temperature has dropped sufficiently before performing work. If touched inadvertently, there is a danger of being burned.
   1) Shut off the fluid supply and release the fluid pressure in the system.
   2) Shut off the power supply.
   3) Remove the product.

2. Low frequency operation
   - 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**

1. Filters and strainers
   1) Be careful regarding clogging of filters and strainers.
   2) Replace filter elements after one year of use, or earlier if the pressure drop reaches 14.5 psi (0.1 MPa).
   3) Clean strainers when the pressure drop reaches 14.5 psi (0.1 MPa).

2. Lubrication
   - When using after lubricating, never forget to lubricate continuously.

3. Storage
   - In case of long term storage after use with heated water, thoroughly remove all moisture to prevent rust and deterioration of rubber materials, etc.

4. Exhaust the drainage from an air filter periodically.

**Operating Precautions**

**Warning**

1. If there is a possibility of reverse pressure being applied to the valve, take countermeasures such as mounting a check valve on the downstream side of the valve.
2. When problems are caused by a water hammer, install water hammer relief equipment (accumulator, etc.), or use an SMC water hammer relief valve (Series VXR). For details, please consult with SMC.
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 (1)</th>
<th>Lead wire color (2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>DC</td>
<td>Black</td>
<td>Red</td>
</tr>
<tr>
<td>100 VAC</td>
<td>Blue</td>
<td>Blue</td>
</tr>
<tr>
<td>200 VAC</td>
<td>Red</td>
<td>Red</td>
</tr>
<tr>
<td>Other AC</td>
<td>Gray</td>
<td>Gray</td>
</tr>
</tbody>
</table>

* There is no polarity.

Electric Circuits

**Caution**

- **[DC circuit]**

  ![DC circuit diagram]

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

  ![AC circuit diagram]

One-touch Fitting

**Caution**

For information on handling one-touch fittings and appropriate tubing, refer to page 15 and the KJ series one-touch fittings in Best Pneumatics No. 6. The KJ series information can be downloaded from the following SMC website, http://www.smcworld.com
These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of “Caution,” “Warning” or “Danger.” They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC)*1, and other safety regulations.

**Caution:** Indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.

**Warning:** Indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.

**Danger:** Indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

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**Warning**

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

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

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

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

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**Caution**

1. The product is provided for use in manufacturing industries.
   The product herein described is basically provided for peaceful use in manufacturing industries. If considering using the product in other industries, consult SMC beforehand and exchange specifications or a contract if necessary.

If anything is unclear, contact your nearest sales branch.

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**Limited warranty and Disclaimer/Compliance Requirements**

The product used is subject to the following “Limited warranty and Disclaimer” and “Compliance Requirements”.

Read and accept them before using the product.

**Limited warranty and Disclaimer**

1. The warranty period of the product is 1 year in service or 1.5 years after the product is delivered.\(^2\)
   The product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.

2. For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided.
   This limited warranty applies only to our product independently, and not to any other damage incurred due to the failure of the product.

3. Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalog for the particular products.

   \(^2\) Vacuum pads are excluded from this 1 year warranty.
   A vacuum pad is a consumable part, so it is warranted for a year after it is delivered.
   Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty.

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**Compliance Requirements**

1. The use of SMC products with production equipment for the manufacture of weapons of mass destruction (WMD) or any other weapon is strictly prohibited.

2. The exports of SMC products or technology from one country to another are governed by the relevant security laws and regulations of the countries involved in the transaction. Prior to the shipment of a SMC product to another country, assure that all local rules governing that export are known and followed.