The production of the VDW10/20/30 series was discontinued.
(Except for VDW10/20 manifold and 3 port type)
For details about new series: VDW10/20 → page 453
VDW30 → VX2 series

Molded coil specifications have been added!

Grommet/Molded
Flat terminal/Molded
The production of the VDW10/20/30 series was discontinued. (Except for VDW10/20 manifold and 3 port type) For details about new series: VDW10/20 → page 453 VDW30 → VX2 series

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

- The use of a unique magnetic material reduces the operating resistance of moving parts, while improving service life, wear and corrosion resistance.

**Improved corrosion resistance**
Special material introduced

**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)

**Clip type**
Ease of maintenance has been improved.
Changing of the coil is made easy by means of clip design. (2 port)

**Brass (C37)/Stainless steel manifolds added to series (2 port)**

**Threaded assembly**
Simplifies maintenance.

**Threaded for bottom mounting**
Special bracket can be mounted.

**Lineup by Compact Design**

<table>
<thead>
<tr>
<th>2 Port</th>
<th>P.473</th>
</tr>
</thead>
<tbody>
<tr>
<td>ø17</td>
<td>VDW10</td>
</tr>
<tr>
<td>ø20.5</td>
<td>VDW20</td>
</tr>
<tr>
<td>ø28</td>
<td>VDW30</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3 Port</th>
<th>P.484</th>
</tr>
</thead>
<tbody>
<tr>
<td>ø20.5</td>
<td>VDW200</td>
</tr>
<tr>
<td>ø28</td>
<td>VDW300</td>
</tr>
</tbody>
</table>
The production was discontinued.

Compact Direct Operated
2 Port Solenoid Valve for Water and Air

VDW10/20/30 Series

How to Order Valves (Single Unit)

For Water, Air, Vacuum

Series

1 10
2 20
3 30

Valve type

N.C.

Voltage

Symbol | Voltage | Grommet / Tape winding (G) | Flat 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 – Flat terminal / Molded

Series and Coil Type Combinations

<table>
<thead>
<tr>
<th>Series</th>
<th>Grommet / Tape winding</th>
<th>Flat terminal / Molded</th>
<th>Grommet / Molded</th>
</tr>
</thead>
</table>
| 10 | ● | ― | ●
| 20 | ● | ● | ●
| 30 | ● | ● | ●

Material and insulation type

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

Note) The armature assembly is a corrosion resistant construction.

Thread type

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

Port size

Orifice diameter

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

Valve specifications

<table>
<thead>
<tr>
<th>Fluid</th>
<th>Withstand pressure (MPa)</th>
<th>Ambient temperature (°C)</th>
<th>Fluid temperature (°C)</th>
<th>Environment</th>
<th>Valve leakage (cm³/min)</th>
<th>Mounting orientation</th>
<th>Vibration/Impact (m/s²)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2.0</td>
<td>−10 to 50</td>
<td>1 to 50 (No freezing)</td>
<td>Location without corrosive or explosive gases</td>
<td>0 (with water pressure) 1 or less (Air)</td>
<td>Unrestricted</td>
<td>30/150</td>
</tr>
</tbody>
</table>

Valve construction

- Direct operated poppet

Coil specifications

<table>
<thead>
<tr>
<th>Rated voltage</th>
<th>Allowable voltage fluctuation (%)</th>
<th>Coil insulation type</th>
<th>Enclosure</th>
<th>Power consumption (W)</th>
</tr>
</thead>
<tbody>
<tr>
<td>24 VDC, 12 VDC, 6 VDC, 5 VDC, 3 VDC, 100 VAC, 110 VAC, 200 VAC, 220 VAC (50/60 Hz)</td>
<td>±10% of rated voltage</td>
<td>Class B</td>
<td>Dust-proof (equivalent to IP40)</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>Weight (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Pressure port 1</td>
<td>0 to 1.0</td>
<td></td>
</tr>
<tr>
<td>VDW10</td>
<td>M5</td>
<td>1</td>
<td>0.9</td>
<td>0.1</td>
<td>0.08</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.6</td>
<td>0.7</td>
<td>1/8: 0.23</td>
<td>0.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.3</td>
<td>0.2</td>
<td>1/4: 0.26</td>
<td>0.2</td>
</tr>
<tr>
<td>VDW20</td>
<td>M5</td>
<td>1/8 (6A)</td>
<td>0.3</td>
<td>1/8: 0.23</td>
<td>0.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1/4 (8A)</td>
<td>0.2</td>
<td>1/4: 0.26</td>
<td>0.2</td>
</tr>
<tr>
<td>VDW30</td>
<td></td>
<td>1/8 (6A)</td>
<td>0.6</td>
<td>1/8: 0.23</td>
<td>0.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1/4 (8A)</td>
<td>0.4</td>
<td>1/4: 0.26</td>
<td>0.2</td>
</tr>
</tbody>
</table>

Note 1) The maximum operating pressure differential changes depending on the flow direction of the fluid. Refer to page 157 for details.
Note 2) For low vacuum specifications, the operating pressure range is 1 Torr (1.33 x 10² Pa) to 1.0 MPa.
Please consult with SMC if using below 1 Torr (1.33 x 10² Pa).

Flow Rate 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>N.C. Kr Cv converted</td>
<td>C[dm³/(s·bar)] b</td>
</tr>
<tr>
<td>VDW10</td>
<td>M5</td>
<td>1</td>
<td>0.03</td>
<td>0.04</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.6</td>
<td>0.06</td>
<td>0.07</td>
</tr>
<tr>
<td>VDW20</td>
<td>M5</td>
<td>1/8 (6A)</td>
<td>0.06</td>
<td>0.07</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.3</td>
<td>0.15</td>
<td>0.18</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.2</td>
<td>0.25</td>
<td>0.30</td>
</tr>
<tr>
<td>VDW30</td>
<td></td>
<td>1/8 (6A)</td>
<td>0.14</td>
<td>0.16</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1/4 (8A)</td>
<td>0.24</td>
<td>0.28</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4</td>
<td>0.39</td>
<td>0.44</td>
</tr>
</tbody>
</table>
Compact Direct Operated
2 Port Solenoid Valve for Water and Air VDW10/20/30 Series

The production of the VDW10/20/30 series was discontinued. (Except for VDW10/20 manifold and 3 port type)
For details about new series: VDW10/20 → page 453
VDW30 → VX2 series

Construction

VDW11

VDW21

VDW31

The production was discontinued.

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>
VDW10/20/30 Series

The production of the VDW10/20/30 series was discontinued. (Except for VDW10/20 manifold and 3 port type)
For details about new series: VDW10/20 → page 453
VDW30 → VX2 series

**Dimensions**

**VDW11-□G**
- Lead wire: L Approx. 300
- Lead wire: L Approx. 300

**VDW21-□G**
- Lead wire: L Approx. 300
- Lead wire: L Approx. 300

**VDW31-□G**
- Lead wire: L Approx. 300
- Lead wire: L Approx. 300

**Bracket assembly part no.**
- 10, 20 series
  - VDW 2 0 – 15A – 1
  - Series
    - 1
    - 10
    - 2
    - 20
- 30 series
  - VCW20 – 12 – 01A

Dimensions inside ( ) are for port size 1/8.
Compact Direct Operated
2 Port Solenoid Valve for Water and Air VDW10/20/30 Series

The production of the VDW10/20/30 series was discontinued. (Except for VDW10/20 manifold and 3 port type)
For details about new series: VDW10/20 → page 453
VDW30 → VX2 series

Bracket assembly part no.
- 20 series
  VDW20 — 15A — 1
- 30 series
  VCW20 — 12 — 01A

Dimensions

The production was discontinued.
# How to Order Manifold

## VV2DW 2 - 05 01 -

**Series**
- 1: 10
- 2: 20
- 3: 30

**Material**
- Symbol: Nil
- Manifold material: Brass (C37)
- Seal material: NBR
- A: FKM
- B: EPDM
- G: NBR
- H: FKM
- J: EPDM

**Stations**
- 02: 2 stations
- 10: 10 stations

**Out port size**
- Symbol: Port size
- Series: 10 20 30
- M5: M5
- 01: 1/8 (6A)
- 02: 1/4 (8A)

**Valve type**
- Nil
- F: With bracket
- G: NPT

**Thread type**
- Nil
- Rc
- F
- G
- N
- NPT

**Option**
- Nil
- CE-compliant
- Q

**CE-compliant**
- Nil
- CE-compliant

**Material and insulation type**
- Symbol: Body material
- Seal material: Coil insulation
- Nil
- A: Brass (C37)
- B: NBR
- G: FKM
- H: EPDM
- J: FKM

**Coil type**
- Symbol: Orifice diameter
- Orifice diameter (mm)
- Series
- G: Grommet / Tape winding
- F: Flat terminal / Molded
- W: Grommet / Molded

**Orifice diameter**
- Symbol: Orifice diameter (mm)
- Series: 10 20 30
- 1: 1
- 2: 1.6
- 3: 3.2
- 4: 2

**Series**
- Note: About series and coil type combinations, refer to page 473.

## How to Order Valves (For Manifold)

## VDW 2 3 - 5 G - 2 -

**Series**
- 1: 10
- 2: 20
- 3: 30

**Valve type**
- Nil
- F
- G
- N
- NPT

**Material and insulation type**
- Symbol: Body material
- Seal material: Coil insulation
- Nil
- A: Brass (C37)
- B: NBR
- G: FKM
- H: EPDM
- J: FKM

**Coil type**
- Symbol: Orifice diameter
- Orifice diameter (mm)
- Series
- G: Grommet / Tape winding
- F: Flat terminal / Molded
- W: Grommet / Molded

**Orifice diameter**
- Symbol: Orifice diameter (mm)
- Series: 10 20 30
- 1: 1
- 2: 1.6
- 3: 3.2
- 4: 2

## Manifold Options

**Blanking plate assembly**
- 10, 20 series

**VVDW 2 0 - 3A -**

**Symbol**
- G: Stainless steel
- H: EPDM

**Material**
- Plate material: NBR
- Seal material: FKM

**Series**
- 1: 10
- 2: 20

**30 series**

**VVCW20 - 3A -**

The production was discontinued.

**Symbol**
- G: Stainless steel
- H: EPDM

**Material**
- Plate material: NBR
- Seal material: FKM

[Diagram showing manifold assembly and connections]

- "Q" symbol for assembly
- Add "Q" in front of the part numbers to have solenoid valves, etc. mounted on manifold.
Compact Direct Operated
2 Port Solenoid Valve for Water and Air **VDW10/20/30 Series**

**Dimensions**

**VV2DW1**

- **Dimensions**
  - **L Dimension** (mm)
    - | Dimension | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
    - | L1 | 35 | 52.5 | 70 | 87.5 | 105 | 122.5 | 140 | 157.5 | 175 |
    - | L2 | 45 | 62.5 | 80 | 97.5 | 115 | 132.5 | 150 | 167.5 | 185 |
    - | L3 | 52 | 69.5 | 87 | 104.5 | 122 | 139.5 | 157 | 174.5 | 192 |
    - Manifold composition: 2 stns. x 1 3 stns. x 1 2 stns. x 2 2 stns. + 3 stns. 3 stns. x 2 2 stns. + 3 stns. x 2 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 pages 482 and 483 regarding manifold additions.
**Dimensions**

**VV2DW2**

**L Dimension**

<table>
<thead>
<tr>
<th>Dimension</th>
<th>n (stations)</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>44</td>
</tr>
<tr>
<td>L2</td>
<td>53</td>
</tr>
<tr>
<td>L3</td>
<td>62</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 2 + 3 stns. x 2

*Note:* Manifold base is consisted of the junction of 2 and 3 station bases. Refer to pages 482 and 483 regarding manifold additions.

*When w/o bracket, M4 threads at both ends (4 locations) can be used for other purposes.*
### Dimension

<table>
<thead>
<tr>
<th>Dimension</th>
<th>n (stations)</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1</td>
<td>70, 105, 140, 175, 210, 245, 280, 315, 350</td>
</tr>
<tr>
<td>L2</td>
<td>82, 117, 152, 187, 222, 257, 292, 327, 362</td>
</tr>
<tr>
<td>L3</td>
<td>94, 129, 164, 199, 234, 269, 304, 339, 374</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.
- 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 pages 482 and 483 regarding manifold additions.

---

**The production was discontinued.**
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.
**<Manifold base>**

- **Series**: 10, 20 series
- **Material**:
  - C: Brass (C37)
  - S: Stainless steel
- **Stations**: 1: For 2 stations, 2: For 3 stations
- **Thread type**:
  - N: Nil
  - R: Rc
  - N: G
- **OUT port size**:
  - Symbol: M5
  - Port size: 01: 1/8 (6A)

*Note: 10 series is available with M5 only.*

**<Connecting plate assembly>**

- **Series**: 10, 20 series
- **Material**:
  - A: Brass (C37)
  - B: Stainless steel
- **Stations**: 1: For 2 stations, 2: For 3 stations
- **Thread type**:
  - N: Nil
  - R: Rc
  - N: G
- **OUT port size**:
  - Symbol: M5
  - Port size: 01: 1/8 (6A)

*Note: Two sets of connecting plate and mounting screws.*

**<Passage pipe assembly>**

- **Series**: 10, 20 series
- **Material**:
  - A: Brass (C37)
  - B: Stainless steel
- **Stations**: 1: For 2 stations, 2: For 3 stations
- **Thread type**:
  - N: Nil
  - R: Rc
  - N: G
- **OUT port size**:
  - Symbol: M5
  - Port size: 01: 1/8 (6A)

**<Bracket assembly>**

- **Series**: 10, 20 series
- **Material**:
  - A: Brass (C37)
  - B: Stainless steel
- **Stations**: 1: For 2 stations, 2: For 3 stations
- **Thread type**:
  - N: Nil
  - R: Rc
  - N: G
- **OUT port size**:
  - Symbol: M5
  - Port size: 01: 1/8 (6A)

*Note: Consists of a set for D and U sides.*

The production was discontinued.
Compact Direct Operated 3 Port Solenoid Valve for Water and Air

VDW200/300 Series

How to Order Valves (Single Unit)

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Voltage</th>
<th>Grommet / Tape winding</th>
<th>Flat terminal, Molded</th>
<th>Valve type</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>100 VAC (50/60 Hz)</td>
<td>G</td>
<td>F</td>
<td>G - Grommet / Tape winding</td>
</tr>
<tr>
<td>2</td>
<td>200 VAC (50/60 Hz)</td>
<td>G</td>
<td>F</td>
<td>G - Grommet / Tape winding</td>
</tr>
<tr>
<td>3</td>
<td>110 VAC (50/60 Hz)</td>
<td>G</td>
<td>F</td>
<td>G - Grommet / Tape winding</td>
</tr>
<tr>
<td>4</td>
<td>220 VAC (50/60 Hz)</td>
<td>G</td>
<td>F</td>
<td>G - Grommet / Tape winding</td>
</tr>
<tr>
<td>5</td>
<td>24 VDC</td>
<td>G</td>
<td>F</td>
<td>G - Grommet / Tape winding</td>
</tr>
<tr>
<td>6</td>
<td>12 VDC</td>
<td>G</td>
<td>F</td>
<td>G - Grommet / Tape winding</td>
</tr>
<tr>
<td>V</td>
<td>6 VDC</td>
<td>G</td>
<td>F</td>
<td>G - Grommet / Tape winding</td>
</tr>
<tr>
<td>S</td>
<td>5 VDC</td>
<td>G</td>
<td>F</td>
<td>G - Grommet / Tape winding</td>
</tr>
<tr>
<td>R</td>
<td>3 VDC</td>
<td>G</td>
<td>F</td>
<td>G - Grommet / Tape winding</td>
</tr>
</tbody>
</table>

Note) The foot bracket is packed with a valve.

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>Brass (C37)</td>
<td>NBR</td>
<td>Class B</td>
</tr>
<tr>
<td>A</td>
<td>Stainless steel</td>
<td>FKM</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>NBR</td>
<td>EPDM</td>
<td></td>
</tr>
<tr>
<td>H</td>
<td>FKM</td>
<td>EPDM</td>
<td></td>
</tr>
<tr>
<td>J</td>
<td>FKM</td>
<td>FKM</td>
<td></td>
</tr>
<tr>
<td>L</td>
<td>Nil</td>
<td>Nil</td>
<td></td>
</tr>
</tbody>
</table>

Note) The armature assembly is a corrosion resistant construction.

Thread type

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Port size</th>
<th>Series</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nil</td>
<td>M5</td>
<td>200</td>
</tr>
<tr>
<td>F</td>
<td>01</td>
<td>01</td>
</tr>
<tr>
<td>G</td>
<td>02</td>
<td>02</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>300</td>
</tr>
<tr>
<td>4</td>
<td>4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Standard Specifications

### Valve construction
- Direct operated poppet

### Fluid
- Water (except waste water or agricultural water), Air, Low vacuum

### Withstand pressure
- 2.0 MPa

### Ambient temperature
- -10 to 50 °C

### Fluid temperature
- 1 to 50 (No freezing)

### Environment
- Location without corrosive or explosive gases

### Valve leakage
- 0 (with water pressure) 1 (Air)

### Mounting orientation
- Unrestricted

### Vibration/Impact
- 20/150 m/s²

### Rated voltage
- 24 VDC, 12 VDC, 100 VAC, 110 VAC, 200 VAC, 220 VAC (50/60 Hz)

### Allowable voltage fluctuation
- ±10% of rated voltage

### Coil insulation type
- Class B, Dust-proof (equivalent to IP40), Dust-tight (equivalent to IP60)

### Enclosure
- Dust-tight / Low jetproof (equivalent to IP65)

### Power consumption
- 3 W

### Designations
- VDW200/300 Series
- Compact Direct Operated
- 3 Port Solenoid Valve for Water and Air

---

### Made to Order
- Symbol Specifications
- X22 Non-leak (10⁻⁶ Pa·m³/sec) / Vacuum (0.1Pa-abs) specification
- X60 Oil-free specification
- X133 Lead wire length: 600 mm specification
- X133 Seal material: Perfluoroelastomer specification

---

### Characteristic Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>Port size</th>
<th>Orifice dia. (mm ø)</th>
<th>Max. operating pressure differential (MPa)</th>
<th>Operating pressure range (MPa)</th>
<th>Weight (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>VDW200</td>
<td>M5 1/8 (6A)</td>
<td>1</td>
<td>0.9</td>
<td>0 to 1.0</td>
<td>0.12</td>
</tr>
<tr>
<td></td>
<td>1.6</td>
<td>1.6</td>
<td>0.8</td>
<td>1/8: 0.27</td>
<td>1: 0.30</td>
</tr>
<tr>
<td>VDW300</td>
<td>1/8 (6A)</td>
<td>1</td>
<td>0.7</td>
<td>0.1</td>
<td>0.12</td>
</tr>
<tr>
<td></td>
<td>1/4 (8A)</td>
<td>0.4</td>
<td>0.2</td>
<td>0.05</td>
<td></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 494 for details.

Note 3) For low vacuum specifications, the operating pressure range is 1 Torr (1.33 x 10⁻⁵ Pa) to 1.0 MPa. Please consult with SMC if using below 1 Torr (1.33 x 10⁻⁵ Pa).

---

### Flow Rate Characteristics

<table>
<thead>
<tr>
<th>Model</th>
<th>Port size</th>
<th>Orifice dia. (mm ø)</th>
<th>Water</th>
<th>Air</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>N.C.</td>
<td>N.O.</td>
<td>1→2 (IN→N.C.)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Kv</td>
<td>Cv converted</td>
<td>Kv</td>
</tr>
<tr>
<td>VDW200</td>
<td>M5 1/8 (6A)</td>
<td>1</td>
<td>0.03</td>
<td>0.03</td>
</tr>
<tr>
<td></td>
<td>1.6</td>
<td>1.6</td>
<td>0.06</td>
<td>0.07</td>
</tr>
<tr>
<td>VDW300</td>
<td>1/8 (6A)</td>
<td>2</td>
<td>0.14</td>
<td>0.16</td>
</tr>
<tr>
<td></td>
<td>1/4 (8A)</td>
<td>3</td>
<td>0.24</td>
<td>0.28</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>4</td>
<td>0.39</td>
<td>0.44</td>
</tr>
</tbody>
</table>
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>Stainless steel, PPS, 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>SPCC</td>
<td>—</td>
</tr>
<tr>
<td>8</td>
<td>Socket</td>
<td>C36</td>
<td>Stainless steel</td>
</tr>
<tr>
<td>9</td>
<td>O-ring</td>
<td>NBR</td>
<td>FKM, EPDM</td>
</tr>
<tr>
<td>10</td>
<td>Plate</td>
<td>SPCC</td>
<td>—</td>
</tr>
<tr>
<td>11</td>
<td>Wave washer</td>
<td>Stainless steel</td>
<td>—</td>
</tr>
</tbody>
</table>
**Compact Direct Operated**

**3 Port Solenoid Valve for Water and Air**

**VDW200/300 Series**

---

**Dimensions**

**VDW250—□□**

- Lead wire L Approx. 300
- Rectifier element AC type
- Dimensions inside ( ) are for port size 1/8.

**VDW350—□□**

- Lead wire L Approx. 300
- Rectifier element AC type
- Dimensions inside ( ) are for port size 1/8.

---

**Bracket assembly part no.**

- 200 series
  
  **VDW20 — 15A — 1**

- 300 series
  
  **VCW20 — 12 — 01A**
VDW200/300 Series

Dimensions

### VDW250-□F

- M5, 1/8
- 3 (N.O.) port
- 2 x ø3.5 (Bracket mounting hole)

### VDW350-□F

- 1/8, 1/4
- 3 (N.O.) port
- 4 x ø5

Bracket assembly part no.

- 200 series
  - VDW20 — 15A — 1

- 300 series
  - VCW20 — 12 — 01A
### VDW Series

**Made to Order Specifications:**

Please consult with SMC for detailed size, specifications and delivery.

<table>
<thead>
<tr>
<th>#</th>
<th>Specification Type</th>
<th>Symbol</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Non-leak ((10^{-6} \text{ Pa}\cdot\text{m}^3/\text{sec}))/Vacuum ((0.1 \text{ Pa-abs})) Specification</td>
<td>X22</td>
</tr>
<tr>
<td>2</td>
<td>Oil-free Specification</td>
<td>X23</td>
</tr>
<tr>
<td>3</td>
<td>Lead Wire Length: 600 mm Specification</td>
<td>X60</td>
</tr>
<tr>
<td>4</td>
<td>Seal Material: Perfluoroelastomer Specification</td>
<td>X133</td>
</tr>
</tbody>
</table>

**Note:** Select from A, H, or L for the material and insulation type.

---

The production of the VDW10/20/30 series was discontinued. (Except for VDW10/20 manifold and 3 port type).

For details about new series:

VDW10/20 → page 453
VDW30 → VX2 series
Pressure Terminology

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).

Electrical Terminology

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

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

- 0 Non-protected
- 1 Protected against solid foreign objects of 50 mm ø and greater
- 2 Protected against solid foreign objects of 12 mm ø and greater
- 3 Protected against solid foreign objects of 2.5 mm ø and greater
- 4 Protected against solid foreign objects of 1.0 mm ø and greater
- 5 Dust-protected
- 6 Dusttight

Second Characteristics:
Degrees of protection against water

- 0 Non-protected
- 1 Protected against vertically falling water drops
- 2 Protected against vertically falling water drops when enclosure tilted up to 15°
- 3 Protected against rainfall when enclosure tilted up to 60°
- 4 Protected against splashing water
- 5 Protected against water jets
- 6 Protected against powerful water jets
- 7 Protected against the effects of temporary immersion in water
- 8 Protected against the effects of continuous immersion in water

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.

Other

1. Material
- NBR: Nitrile rubber
- FKM: Fluororubber
- EPDM: Ethylene propylene rubber
- C37: Brass
- SUS: Stainless steel

Flat Terminal

1. Flat terminal/Electrical connection size of molded coil

2. When providing a body ground, please use the frame ground (M3.5).
(Recommended fastening bolt: M3.5, length 5 mm)
**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.

---

**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**

⚠️ 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.

   ![Leakage Voltage Diagram]

   **AC coil**
   - Leakage voltage: 10% or less of rated voltage
   - Leakage current: 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.

---

**Mounting**

⚠️ 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. **Operation manual**

   The product should be mounted and operated after the Operation Manual is thoroughly read and its contents are understood. Keep the Operation 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.
**Warning**

**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. **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.

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 operation 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.

**Electrical Connections**

**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.

**Lead wire color**

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

*There is no polarity for DC.

*Lead wire: AWG20, outside diameter of insulator 1.79

**Electrical Circuit**

**Caution**

- DC circuit
- AC circuit

**Rectifier element**
### 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.

#### Maintenance

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.

### Replacing the Solenoid Coils

#### Caution

2 port valve

1. Press the clip in direction ① with a flat head screwdriver, etc., and remove it from the tube assembly groove.
2. Remove the cover in direction ②, and replace the solenoid coil.
3. 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.

### Important Notes

The production of the VDW10/20/30 series was discontinued. (Except for VDW10/20 manifold and 3 port type) For details about new series: VDW10/20 → page 453

VDW30 → VX2 series
Replacing the Solenoid Coils

**Caution**

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.

### Replacement Parts

- **Solenoid coil part no.**
  
  VDW | 2 | 0 | 1 | C | 1 | 1 |
  
  1 | 10
  2 | 20, 200
  3 | 30, 300

- **Coil type**
  
  C | Grommet / Tape winding
  F | Flat terminal / Molded
  W | Grommet / Molded

- **Lead wire length**
  
  Nill | 300 mm
  L1 | 600 mm
  
  (Note) Type L1 is optional.

- **Voltage**
  
  1 | 100 VAC
  2 | 200 VAC
  3 | 110 VAC
  4 | 220 VAC
  5 | 24 VDC
  6 | 12 VDC
  V | 6 VDC
  S | 5 VDC
  R | 3 VDC

**Coil Type and Voltage Combinations**

<table>
<thead>
<tr>
<th>Voltage</th>
<th>Grommet / Tape winding</th>
<th>Flat terminal / Molded</th>
<th>Grommet / Molded</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 VAC</td>
<td>■</td>
<td>■</td>
<td>■</td>
</tr>
<tr>
<td>200 VAC</td>
<td>■</td>
<td>■</td>
<td>■</td>
</tr>
<tr>
<td>110 VAC</td>
<td>■</td>
<td>■</td>
<td>■</td>
</tr>
<tr>
<td>220 VAC</td>
<td>■</td>
<td>■</td>
<td>■</td>
</tr>
<tr>
<td>24 VDC</td>
<td>■</td>
<td>■</td>
<td>■</td>
</tr>
<tr>
<td>12 VDC</td>
<td>■</td>
<td>■</td>
<td>■</td>
</tr>
<tr>
<td>6 VDC</td>
<td>■</td>
<td>■</td>
<td>■</td>
</tr>
<tr>
<td>5 VDC</td>
<td>■</td>
<td>■</td>
<td>■</td>
</tr>
<tr>
<td>3 VDC</td>
<td>■</td>
<td>■</td>
<td>■</td>
</tr>
</tbody>
</table>

(Note) To have a label on the cover, enter the part number below together with the coil part number.

**AZ-T-VDW**

Valve model no. on pages 473, 478, 484

- **Clip part no. (2 port)**
  
  VDW | 2 | 0 | 10
  
  2 | 10, 20

- **Socket assembly part no. (3 port)**
  
  VDW | 2 | 0 | 12A | 01 |
  
  2 | 200
  3 | 300

**Material**

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Port size</th>
<th>Material</th>
<th>Socket material</th>
<th>Seal material</th>
</tr>
</thead>
<tbody>
<tr>
<td>M5</td>
<td>M5</td>
<td>○</td>
<td>Brass (C37)</td>
<td>NBR</td>
</tr>
<tr>
<td>01</td>
<td>1/8 (6A)</td>
<td>○</td>
<td>Stainless steel</td>
<td>FKM</td>
</tr>
<tr>
<td>02</td>
<td>1/4 (8A)</td>
<td>—</td>
<td>Stainless steel</td>
<td>EPDM</td>
</tr>
</tbody>
</table>

- **Thread type**
  
  Nil  | Rc        
  F    | G         
  N    | NPT       

The production of the VDW10/20/30 series was discontinued. (Except for VDW10/20 manifold and 3 port type)

For details about new series: VDW10/20 → page 453
VDW30 → VX2 series
**VDW Series**

**Specific Product Precautions 5**

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.

---

**Piping to 3 Port Valve N.O. Port**

⚠️ **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 491 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.

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### 3 Port Valve

<table>
<thead>
<tr>
<th>Model</th>
<th>Orifice diameter (mm ø)</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.