

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

Series VDW

- **Compact** (as compared to the VX series)

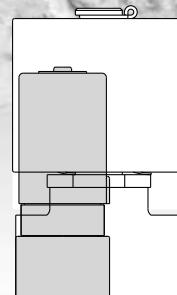
Single valve volume: **Reduced by -75%** (VDW20)

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 $\phi 2$)



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

Clip type

Ease of maintenance has been improved.

Changing of the coil is made easy by means of clip design. (2 port)

Threaded assembly

Simplifies maintenance.

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)

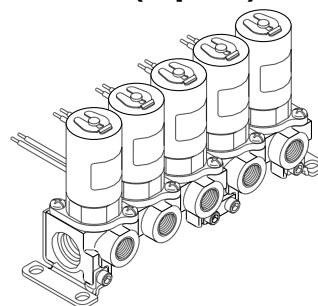
Threaded for bottom mounting

Special bracket can be mounted.

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



Grommet/Molded

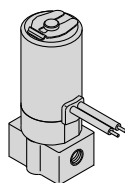


Lineup by Compact Design

2 Port

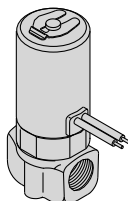
P.243

$\phi 17$



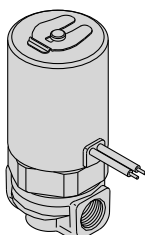
VDW10

$\phi 20.5$



VDW20

$\phi 28$



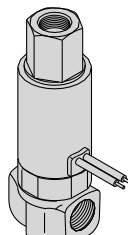
VDW30

3 Port

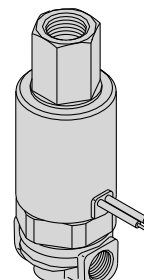
P.254

$\phi 28$

$\phi 20.5$



VDW200



VDW300

Compact Direct Operated 2 Port Solenoid Valve for Water and Air Series **VDW10/20/30**



How to Order Valves (Single Unit)

VDW **2** **1** - **1** **G** - **2** - **01** - - - -

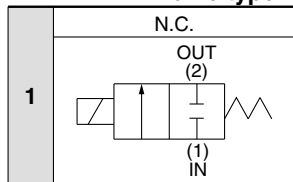
For Water, Air, Vacuum

Made to Order
(Refer to page 244.)

Series

| | |
|---|----|
| 1 | 10 |
| 2 | 20 |
| 3 | 30 |

Valve type



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 | |

Series and Coil Type Combinations

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

Option

| | |
|-----|--------------|
| Nil | None |
| F | Foot bracket |

Note) The foot bracket is packed with a valve.

Material and insulation type

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

Note) The armature assembly is a corrosion resistant construction.

Thread type

| | |
|-----|-----|
| Nil | Rc |
| F | G |
| N | NPT |

Port size

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

Orifice diameter

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

VX2

VXD

VXZ

VXE

VXP

VXR

VXH

VXF

VX3

VXA

VCH

VDW

VQ

LVM

VCA

VCB

VCL

VCS

VCW



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

| Symbol | Specifications |
|-------------|---|
| X22 | Non-leak (10^{-6} Pa·m ³ /sec) / Vacuum (0.1Pa-abs) specification |
| X23 | Oil-free specification |
| X60 | Lead wire length: 600 mm specification |
| X133 | Seal material: Kalrez® specification ^{Note)} |

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

Standard Specifications

| | | | |
|--|---|---------------------------|--|
| Valve specifications | Valve construction | | Direct operated poppet |
| | Fluid ^{Note 2)} | | Water (except waste water or agricultural water), Air, Low vacuum |
| | Withstand pressure (MPa) | | 2.0 |
| | Ambient temperature (°C) | | −10 to 50 |
| | Fluid temperature (°C) | | 1 to 50 (No freezing) |
| | Environment | | Location without corrosive or explosive gases |
| | Valve leakage (cm ³ /min) | | 0 (with water pressure) 1 or less (Air) |
| | Mounting orientation | | Unrestricted |
| | Vibration/Impact (m/s ²) ^{Note 4)} | | 30/150 |
| Coil specifications | Rated voltage | | 24 VDC, 12 VDC, 6 VDC, 5 VDC, 3 VDC, 100 VAC, 110 VAC, 200 VAC, 220 VAC (50/60 Hz) |
| | Allowable voltage fluctuation (%) | | ±10% of rated voltage |
| | Coil insulation type | | Class B |
| | Enclosure | Grommet / Tape winding | Dust-proof (equivalent to IP40) |
| | | Faston terminal / Molded | Dust-tight (equivalent to IP60) ^{Note 5)} |
| | | Grommet / Molded | Dust-tight / Low jetproof (equivalent to IP65) |
| Power consumption (W) ^{Note 3)} | | 2.5 (VDW10), 3 (VDW20/30) | |



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

| Model | Port size | Orifice dia. (mm ø) | Max. operating pressure differential (MPa) ^{Note 1)} | | Operating Pressure range (MPa) ^{Note 2)} | Mass (kg) |
|-------|----------------------|------------------------|---|-----------------|---|------------------------|
| | | | Pressure port 1 | Pressure port 2 | | |
| VDW10 | M5 | 1 | 0.9 | 0.4 | 0 to 1.0 | 0.08 |
| | | 1.6 | 0.4 | 0.2 | | |
| VDW20 | M5 1/8 (6A) | 1.6 | 0.7 | 0.2 | | 0.1 |
| | | 2.3 | 0.4 | 0.1 | | |
| | | 3.2 | 0.2 | 0.05 | | |
| VDW30 | 1/8 (6A) 1/4 (8A) | 2 | 0.8 | 0.2 | | 1/8: 0.23 1/4: 0.26 |
| | | 3 | 0.4 | 0.1 | | |
| | | 4 | 0.2 | 0.05 | | |



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 10² Pa) to 1.0 MPa.

Please consult with SMC if using below 1 Torr (1.33 x 10² Pa).

Flow Characteristics

| Model | Port size | Orifice dia. (mm ø) | Water | | Air | | |
|-------|----------------------|------------------------|---------------|--------------------------------------|---------------|-----------------|------|
| | | | 1→2 (IN→N.C.) | | 1→2 (IN→N.C.) | | |
| | | | N.C. | Av x 10 ⁻⁶ m ² | Cv converted | C [dm³/(s·bar)] | b |
| VDW10 | M5 | 1 | 0.96 | 0.04 | 0.14 | 0.40 | 0.04 |
| | | 1.6 | 1.7 | 0.07 | 0.30 | 0.25 | 0.07 |
| VDW20 | M5 1/8 (6A) | 1.6 | 1.9 | 0.08 | 0.31 | 0.45 | 0.09 |
| | | 2.3 | 4.3 | 0.18 | 0.58 | 0.45 | 0.18 |
| | | 3.2 | 7.2 | 0.30 | 1.2 | 0.38 | 0.33 |
| VDW30 | 1/8 (6A) 1/4 (8A) | 2 | 3.8 | 0.16 | 0.52 | 0.52 | 0.16 |
| | | 3 | 6.7 | 0.28 | 1.0 | 0.52 | 0.30 |
| | | 4 | 11 | 0.44 | 1.5 | 0.49 | 0.46 |