5 Port Solenoid Valve

**VQZ1000/2000/3000**

Manifold 

**Connector Kit**

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### How to Order Manifold

**VQZ**

<table>
<thead>
<tr>
<th>Series</th>
<th>Body width</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>10mm</td>
</tr>
<tr>
<td>2</td>
<td>15mm</td>
</tr>
<tr>
<td>3</td>
<td>18mm</td>
</tr>
</tbody>
</table>

**Station**

- 2 stations
- 20 stations

**Connector Kit**

- C

**Body**

- Body ported

**Seal**

- Metal seal
- Rubber seal

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### How to Order Valve

**VQZ**

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</tbody>
</table>

**Configuration**

- 2 position single
- 2 position double
- 3 position closed center
- 3 position exhaust center
- 3 position pressure center
- 3 port for mixture mounting N.C.
- 3 port for mixture mounting N.O.

**Symbol**

- K
- Y
- R

**Function**

- High pressure (Metal seal)
- Low wattage
- External pilot

**Note**

- 1) Option
- 3) Refer to p.1.12-7 for power consumption for AC style.
- 4) When specifying more than one option, indicate them alphabetically.

**Port size (4(A), 2(B) port)**

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Port size</th>
</tr>
</thead>
<tbody>
<tr>
<td>C3</td>
<td>One-touch fitting for ø3.2</td>
</tr>
<tr>
<td>C4</td>
<td>One-touch fitting for ø4</td>
</tr>
<tr>
<td>C5</td>
<td>One-touch fitting for ø6</td>
</tr>
<tr>
<td>C6</td>
<td>One-touch fitting for ø8</td>
</tr>
<tr>
<td>C7</td>
<td>One-touch fitting for ø10</td>
</tr>
<tr>
<td>M5</td>
<td>MS Plead</td>
</tr>
</tbody>
</table>

**Manual override**

- Non-locking push style (Flush)
- Locking style (Slotted)

**Electrical entry**

- Grommet (DC specification)
- L plug terminal without connector
- M plug connector with lead wire
- M plug terminal without connector
- Y DIN connector
- Y DIN terminal without connector

**Coil voltage**

- 100V AC (50/60Hz)
- 200V AC (50/60Hz)
- 110V AC (50/60Hz)
- 220V AC (50/60Hz)
- 24V DC
- 36V DC
- Others

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1.12-18
## Manifold Specifications

<table>
<thead>
<tr>
<th>Series</th>
<th>Base model</th>
<th>Piping specification</th>
<th>Port size</th>
<th>Applicable valve</th>
<th>Applicable stations</th>
<th>Manifold base weight (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>VQZ1000</td>
<td>VV5QZ12-05C</td>
<td>Top</td>
<td>Rc(PT) 1/8</td>
<td>C3(p3.2) C4(p4) C6(p6) M5(M5 thread)</td>
<td>2 to 20 stations</td>
<td>VQZ120-21</td>
</tr>
<tr>
<td>VQZ2000</td>
<td>VV5QZ22-05C</td>
<td>Top</td>
<td>Rc(PT) 1/8</td>
<td>C4(p4) C6(p6) M5(M5 thread)</td>
<td>2 to 20 stations</td>
<td>VQZ220-21</td>
</tr>
<tr>
<td>VQZ3000</td>
<td>VV5QZ32-05C</td>
<td>Top</td>
<td>Rc(PT) 1/4</td>
<td>C6(p6) C8(p8) C10(p10) Rc(PT)1/4</td>
<td>2 to 20 stations</td>
<td>VQZ320-21</td>
</tr>
</tbody>
</table>

### How to Order Manifold Assembly (Example)

| VV5QZ22-05C | 1 set (C kit 5 stations manifold base) |
| VVQZ2000-10A-2 | 1 set (Blank plate assembly) |
| VQZ120-5M-C6 | 1 set (Valve P/N=single solenoid) |
| VQZ220-5M-C6 | 2 set (Valve P/N=double solenoid) |
| VQZ320-5M-C6 | 1 set (Valve P/N=3 position) |

Prefix "∗" mark to valves etc. to be assembled on the manifold.

Add valve suffix and option number to the manifold base number. When part numbers written collectively are complicated, specify by using a manifold specification form.

Write sequentially from the 1st station on the D side.
**VQZ1000/2000/3000** Body Ported

**Dimensions: VQZ1000**

**VV5QZ12—Station C**

Grommet (G)

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**L plug connector (L)**

- 4 ø4.5 Mounting holes
- DIN rail clamp screws
- Cover diameter ø1.5
- Cross section 0.23mm²

**M plug connector (M)**

- Cover diameter ø1.5
- Cross section 0.23mm²

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**Dimensions**

|   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  |
|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| L1 | 30.5 | 41  | 51.5| 62  | 72.5| 83  | 93.5| 104 | 114.5| 125 | 135.5| 146 | 156.5| 167 | 177.5| 188 | 198.5| 209 | 219.5|
| L2 | 38.5 | 49  | 59.5| 70  | 80.5| 91  | 101.5| 112.5| 122.5| 133 | 143.5| 154 | 164.5| 175 | 185.5| 196 | 206.5| 217 | 227.5|
| L3 | 62.5 | 75  | 87.5| 100 | 112.5| 125 | 137.5| 150 | 162.5| 175 | 187.5| 200 | 212.5| 225 | 237.5| 250 |
| L4 | 73  | 85.5| 98  | 110.5| 110.5| 123 | 135.5| 148 | 160.5| 173 | 185.5| 198 | 210.5| 223 | 235.5| 248 | 248 | 260.5|

**Equation**

- \[ L1 = 10.5n + 9.5 \]
- \[ L2 = 10.5n + 17.5 \]

**n:** Station (Max. 20 stations)

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1.12-20
Manifold Option

Blank plate assembly
VVQZ1000-10A-2
VVQZ2000-10A-2
VVQZ3000-10A-2

This is used when removing the valve for maintenance, or reserving a valve mounting space on the manifold for future use.

DIN rail
AXT100-DR

* Suffix number into □ from the dimension table below. Refer to each manifold dimensions for L dimension.

To order a manifold with DIN rail already attached, insert “D” at the end of the manifold part number.
The DIN rail is approximately 30mm longer than the length of manifold.

Fitting blank plug
KQP-23-X19
KQP-04-X19
KQP-06-X19
KQP-08-X19
KQP-10-X19

Color: White

EXH port silencer

Silencer is installed in the EXH port.

Port plug
VVQZ1000-CP(For VQZ1000/VQZ2000)
VVQZ2000-CP(For VQZ3000)

Used to block an unused cylinder port when using a 4 way valve as a 3 way valve.

Dimensions

<table>
<thead>
<tr>
<th>Model</th>
<th>Silencer P/N</th>
<th>AN110-01</th>
<th>AN200-02</th>
</tr>
</thead>
<tbody>
<tr>
<td>VQZ1000</td>
<td>AN110-01</td>
<td></td>
<td></td>
</tr>
<tr>
<td>VQZ2000</td>
<td>AN110-01</td>
<td></td>
<td></td>
</tr>
<tr>
<td>VQZ3000</td>
<td>AN200-02</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

L=12.5n+10.5
**VQZ1000/2000/3000**  
**Body Ported**

### Manifold Option

**Double check block (Externally placed downstream): For VQZ1000 only VQ1000-FPG—**

Using a 3 position exhaust center valve, this check block can stop and hold a cylinder in mid-stroke. The combination of a 2 position single or double solenoid with a double check will prevent the cylinder from "dropping" at stroke end when the residual supply pressure is released.

### Specifications

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. operating pressure</td>
<td>0.8MPa</td>
</tr>
<tr>
<td>Min. operating pressure</td>
<td>0.15MPa</td>
</tr>
<tr>
<td>Ambient and fluid temp.</td>
<td>-5 to 60°C</td>
</tr>
<tr>
<td>Effective area (Cv)</td>
<td>2.7mm² (0.15)</td>
</tr>
<tr>
<td>Max. operating frequency</td>
<td>180 c.p.m.</td>
</tr>
</tbody>
</table>

Note 1) As per JISB8375-1981 (Supply pressure: 0.5MPa)

### Dimensions

### How to Order

#### Double check block

**VQ1000-FPG—**

- **OUT side port side**:
  - C4: One-touch fitting for ø4
  - C6: One-touch fitting for ø6

- **IN side port side**:
  - C4: One-touch fitting for ø4
  - C6: One-touch fitting for ø6

**Manifold**

**VVQ1000-FPG—**

- Stations
  - 01: 1 station
  - 06: 6 stations

**<Examples>**

- VQ1000-FPG-C4/M5-D, 3 sets
- VQ1000-FPG-C6/M5-D, 3 sets

**Option**

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DIN rail mounting (for manifold)</td>
<td>D</td>
</tr>
<tr>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>With bracket</td>
<td>F</td>
</tr>
<tr>
<td>With name plate</td>
<td>N</td>
</tr>
</tbody>
</table>

### Cautions

- Since air leakage from the pipe between the valve and cylinder or the fittings will prevent the cylinder from stopping for a long time. Check for air leakage using neutral household detergent, such as dish washing soap. Also check the cylinder's tube gasket, piston seal and rod seal for leakage.
- Since sight air leakage from One-touch fittings is allowed, use of a piping screw (with M5 thread) is recommended when stopping the cylinder in the middle for a long time.
- Combining double check block with 3 position closed center or pressure center solenoid valve will not work.
- M5 fitting assembly is attached, without being incorporated in the perfect block. After screwing in the fittings, mount the ass'y on the double check block. Tightening torque: 0.8 to 1.2Nm.
- If exhaust side of double check block is narrowed down too much, this decreases the intermediate stop accuracy.
Manifold Option

Double check block (Externally placed downstream): For VQ2000 only

Using a 3 position exhaust center valve, this check block can stop and hold a cylinder in mid-stroke. The combination of 2 position single or double solenoid with a double check block will prevent the cylinder from “dropping” at stroke end when residual supply pressure is released.

Specifications

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<td>0.15MPa</td>
</tr>
<tr>
<td>Ambient and fluid temp.</td>
<td>–5 to 50°C</td>
</tr>
<tr>
<td>Effective area (Cd)</td>
<td>18mm² (1.0)</td>
</tr>
<tr>
<td>Max. operating frequency</td>
<td>180 c.p.m</td>
</tr>
</tbody>
</table>

Note 1) As per JISB8375-1981 (Supply pressure: 0.5MPa)

Dimensions

Valve

- IN side port size
  - R1: PT1/8
  - R2: PT1/4
- OUT side port size
  - O1: RpPT1/8
  - O2: RpPT1/4
- C6: One-touch fitting for ø8
- C8: One-touch fitting for ø6

Manifold

- IN side port size
  - R: RpPT1/8
- OUT side port size
  - O1: RpPT1/8
  - O2: RpPT1/4
  - C6: One-touch fitting for ø8
  - C8: One-touch fitting for ø6

Option

- None
- D: DIN rail mounted (for manifold)
- F: With bracket
- N: With name plate

<Examples>

- 2 position
- 3 position/exhaust center
- Drop prevention
- Stop in the middle

<Example>

- VVQ2000-FPG-06—6 stations of manifold
  - VVQ2000-FPG-C6C6-D, 3 sets
  - VVQ2000-FPG-C8C8-D, 3 sets

Caution

- Since air leakage from the pipe between the valve and cylinder or the fittings will prevent the cylinder from stopping for a long time. Check for air leakage using neutral household detergent, such as dish washing soap. Also check the cylinder’s tube gasket, piston seal and rod seal for leakage.
- If slight air leakage from One-touch fittings is allowed, use of a piping screw (with MS thread) is recommended when stopping the cylinder in the middle for a long time.
- Combining double check block with 3 position closed center or pressure center solenoid will not work.
- When screwing the fittings in the double check block, applied torque is as shown below:

<table>
<thead>
<tr>
<th>Thread</th>
<th>Torque Nm</th>
</tr>
</thead>
<tbody>
<tr>
<td>RpPT1/8</td>
<td>7 to 9</td>
</tr>
<tr>
<td>RpPT1/4</td>
<td>10 to 14</td>
</tr>
</tbody>
</table>

- Set the cylinder load so that the cylinder pressure will be within two times that of the supply pressure.
- If exhaust side of double check block is narrowed down too much, this decreases the intermediate stop accuracy.
One Side Solenoid (Latching Solenoid)

The standard 2 position double solenoid valve has two solenoids, one on each end of the valve body. The latching solenoid option (with self holding mechanism) functions in the same manner as a 2 position double solenoid but uses only one solenoid to do the job.

How to Order Latching Solenoid Valve

VQZ Series

| 1 | VQZ1000 |
| 2 | VQZ2000 |
| 3 | VQZ3000 |

Combination symbol

- L: Body
- M: Port size
- Function: (2)

Electrical entry (L, M)

Port size

Double solenoid

Cautions for Latching Use Manual Override

1. Use a circuit in which the ON and OFF signals are not simultaneously energized.
2. Minimum energization time for self holding is 20ms.
3. Avoid using the latching solenoid valves in environments where impact or collisions with the valve might occur. Also, do not use in places where a strong magnetic fields are present.
4. The armature in the solenoid is set in the B side ON position (Reset) at the factory. However shifting of the armature might occur during shipping so please confirm the position by energizing the solenoid.
5. Please consult SMC for extended energization applications.

Wiring

Lead wires are connected to the valve as shown below. Connect them with the power supply.

Positive COM specification

- Black: COM (-)
- White: B side solenoid (+)

Negative COM specification

- Red: A side solenoid (+)
- White: COM (-)
- Black: COM (+)

Electrical Circuit

Latching solenoid (DC)

- 24V DC
- Note 1: Set side in energized state: Lighting (Orange)
- Note 2: With miss wiring preventing function (Stop diode)
- Note 3: With surge absorption function (ZNR/Surge absorption diode)

Latching solenoid (AC)

- 100V, 110V AC
- 200V, 220V AC
- Note 1: Set side in energized state: Lighting (Green)
- Note 2: Flow direction: P–R (A set) side in energized state)
- Note 3: Negative COM specification available.

Lead wires

24V DC
- Black
- Red
- White

100V, 110V AC
- (Yellow)
- (Blue)
- (Gray)

200V, 220V AC
- [Yellow]
- [Red]
- [Gray]

Manual Override

The manual override is on the pilot valve for latching solenoid valves.

Blanking

- To lock in set position (Flow path: P→A): Turn the manual override clockwise by 180° to make A press down. Valve is now locked in the set condition. (Flow path: P→A)
- To reset (Flow path: P→B): Turn manual override counterclockwise to mark B and press down. Valve will then be in the reset condition. (Flow path: P→B)