Installation & Maintenance Manual

Solenoild valve for manifold pilot control: VQC4101-5-X10
(Basic and well-tried safety principles in accordance to ISO 13849)

The intended use of the valve is to control the external pilot air of other valves on the same valve manifold.

This product is validated according to ISO 13849 basic and well-tried safety principles. Refer to Doc. No. VQC4100-SWM0001.

1 Safety Instructions

This manual contains essential information for the protection of users and others from possible injury and/or equipment damage.

- Read this manual before using the product, to ensure correct handling, and read the manuals of related apparatus before use.
- Keep this manual in a safe place for future reference.
- Those instructions indicate the level of potential hazard by label of “DANGER”, “WARNING”, or “CAUTION”, followed by important safety information which must be carefully followed.
- To ensure safety of personnel and equipment the instructions in this manual and the product catalogue must be observed, along with the relevant safety practices.

Take care about the compliance with the relevant safety laws and standards.

1 Safety Instructions (continued)

1) Inspection and maintenance of machinery/equipment must be performed by trained and experienced personnel.

2) Installations in conformance to ISO 13849 (Basic and well-tried safety principles in accordance to ISO 13849)

3) Before machinery/equipment is re-energised, electrical supplies and exhaust all compressed air until safety is confirmed.

Do not service machinery/equipment or attempt to remove components until safety is confirmed.

2 Specifications

2.1 General specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
<th>Value</th>
<th>Value</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating pressure</td>
<td>0.05 to 0.7 MPa</td>
<td>0.7 to 6.0 MPa</td>
<td>5.0 to 18.0 MPa</td>
<td>6.0 to 25 MPa</td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>-20°C to +70°C</td>
<td>-20°C to +70°C</td>
<td>-20°C to +70°C</td>
<td>-20°C to +70°C</td>
</tr>
<tr>
<td>Rated current</td>
<td>0.4 A</td>
<td>0.8 A</td>
<td>2.0 A</td>
<td>3.2 A</td>
</tr>
<tr>
<td>Power consumption (DC)</td>
<td>1.0 W</td>
<td>2.0 W</td>
<td>4.0 W</td>
<td>6.0 W</td>
</tr>
<tr>
<td>Voltage suppressor</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 1

2.2 Flow-rate

<table>
<thead>
<tr>
<th>Model</th>
<th>Flow-rate Characteristics</th>
<th>Flow-rate Characteristics</th>
<th>Flow-rate Characteristics</th>
<th>Flow-rate Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0 kPa</td>
<td>0.4 l/min</td>
<td>0.8 l/min</td>
<td>1.2 l/min</td>
<td>1.6 l/min</td>
</tr>
<tr>
<td>2.0 kPa</td>
<td>0.8 l/min</td>
<td>1.6 l/min</td>
<td>2.4 l/min</td>
<td>3.2 l/min</td>
</tr>
<tr>
<td>3.0 kPa</td>
<td>1.2 l/min</td>
<td>2.4 l/min</td>
<td>3.6 l/min</td>
<td>4.8 l/min</td>
</tr>
<tr>
<td>4.0 kPa</td>
<td>1.6 l/min</td>
<td>3.2 l/min</td>
<td>4.8 l/min</td>
<td>6.4 l/min</td>
</tr>
<tr>
<td>5.0 kPa</td>
<td>2.0 l/min</td>
<td>4.0 l/min</td>
<td>6.0 l/min</td>
<td>8.0 l/min</td>
</tr>
</tbody>
</table>

Table 2

Note 1) When the Air Supply is cut (P = 0) the main valve returns to the original position.

Note 2) Values are calculated in accordance to ISO 8573-1:1981 operating with clean air and a supply pressure of 0.5 MPa equipped with light surge voltage suppressor. Values vary depending on the pressure as well as the air quality. Test the system at port size C8 and without back pressure check valves.

3 Installation

3.1 Environment

1) Do not use in an environment where the product is directly exposed to corrosive gases, chemicals, salt water, water or steam.
2) Products with IP67 enclosures (based on IEC60529) are protected against dust and water, however, these products cannot be used in water.
3) Incorrect mounting of the product violates the IP67 rating. Be sure to read the precautions of mounting for each product.
4) Do not use in an explosive atmosphere.
5) The product should not be exposed to prolonged sunlight. Use a protective cover.
6) Do not mount the product in a location where it is subject to strong vibrations and/or shock. The product specifications.

3.2 Piping

1) Preparation before piping

Before piping is connected, it should be thoroughly blown out with air (flushing). It is essential to remove chips, cutting and other debris from inside the pipe.

Install piping so that it does not apply pulling, pressuring, bending or other forces the valve body.

2) Holdng of pressure

Rubber sealed spool valves may have a slight leakage. This has to be taken into account for applications, in which the loss of pressure leads to a hazardous movement.

3) Maintenance space.

The installation should have sufficient space for maintenance and removal of valve, etc.

4) Release of residual pressure.

Provide a residual pressure release function for maintenance activities (removal of valve, etc.).

3.3 Lubrication

If a lubricant is used in the system, use turbine oil Class 1 (no additive), ISO VG32. Once lubricant is used in the system, lubrication must be continued because the original lubricant applied during manufacturing will be washed away.

4 Settings

4.1 Manual override

Since connected equipment will operate when the manual override is activated, confirm that conditions are safe prior to activation. The non-locking push type (tool required) is fitted.

Figure 5

The manual override will pressurize the pilot actuator and cause the main valve to change state.

4.2 Solenoild Valve Removal and Mounting

Figure 6

Mounting screw (M6)
4 Settings (continued)

4.1 Removal steps
1. Loosen the screws until they turn freely and remove the screws.
2. Remove the solenoid valve.

4.2 Mounting steps
1. Install the gasket and the valve on the base plate.
2. Confirm that the gasket is installed correctly.
3. Tighten the screws with a tightening torque of 0.8 to 1.2 N·m

Caution

Dust on the sealing surface of the gasket or solenoid valve can cause air leakage.
Take care that the pilot pressure is able to exhaust.

3. Tighten the screws with a tightening torque of 0.8 to 1.2 N·m

4.2.1 4 Settings

4.2.1 VQC4000

Order Number

Outline dimensions (mm)

Figure 7

Special pilot valve cover (Color: Red)

Take care that the pilot pressure is able to exhaust.

Dust on the sealing surface of the gasket or solenoid valve can cause air leakage.

7 Maintenance (continued)

5. Do not disassemble the product.

5.1 Replacing One-touch fittings

Cylinder port fittings are available with cassette type manifolds and are easily replaced. Fittings are secured with a retaining clip that is inserted vertically from either the top or bottom of the manifold. After removing the valve, remove the clip with a flat head screwdriver to replace the fittings. To mount a fitting, insert the fitting assembly until it stops and reinsert the retaining clip to its designated position.

8 Limitations of Use

This Special Valve is developed for use only on a Special Manifold block Assembly:

VVQC4000-1A-#-C0-X10

# = S – single wiring
# = D – double wiring

Use on other manifold block assemblies is not allowed. This can cause damage or malfunction.

Any use in an EN ISO 13849 system must be within the specified limits and application condition. The user is responsible for the specification, design, implementation, validation and maintenance of the safety system (SRP/CS).

6 Contacts

SMC Corporation

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