



## Installation and Maintenance Manual Series 52-VQZ2000 Intrinsic Safety Solenoid Valve



II 2G Ex ia IIC T4...T6

### Marking description

II 2G Ex ia IIC T4...T6      Max. Ta +50°C (T4, T5)  
Max. Ta +45°C (T6)

Group II  
Category 2  
Suitable for Gas environment  
Type of Protection "intrinsic safety"  
KEMA 08ATEX0093 X

## 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.
- These 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 safety instructions in this manual and the product catalogue must be observed, along with other relevant safety practices.

<b>⚠ DANGER</b>	In extreme conditions, there is a possibility of
<b>⚠ WARNING</b>	If instructions are not followed there is a
<b>⚠ CAUTION</b>	If instructions are not followed there is a possibility of injury or equipment damage.

### ⚠ WARNING

- The compatibility of equipment is the responsibility of the person who designs the system or decides its specifications.**  
Since the products specified here can be used in various operating conditions, their compatibility with a specific system must be based on specifications, post analysis and/or tests to meet specific requirements. The expected performance and safety assurance will be the responsibility of the person who has determined the compatibility of the system. This person should continuously review the suitability of all items specified, referring to the latest catalogue information and taking into consideration the possibility of equipment failure when configuring a system. Be particularly careful in determining the compatibility with the fluid to be used.
- Only trained personnel should operate pneumatically operated machinery and equipment.**  
The fluid can be dangerous if handled incorrectly. Assembly, handling or maintenance of the system should be performed by trained and experienced personnel.
- Do not service machinery/equipment or attempt to remove components until safety is confirmed.**
  - Inspection and maintenance of machinery/equipment should only be performed once measures to prevent falling or runaway of driven component have been confirmed. Measures to prevent danger from the fluid should also be taken.
  - When equipment is to be removed, confirm the safety processes as mentioned above. Release the fluid pressure and be certain there is no danger from fluid leakage or fluid remaining in the system. Switch off electrical supplies.
  - Before machinery/equipment is re-started, ensure all safety measures are being implemented.

## 1 Safety Instructions (continued)

- Do not use this product outside of the specifications. Contact SMC if it is to be used in any of the following conditions:**
  - Conditions and environments beyond the given specifications, or if the product is to be used outdoors.
  - With fluids whose application causes concern due to the type of fluid or additives, etc.
  - Installations in conjunction with atomic energy, railway, air navigation, vehicles, medical equipment, food and beverage, recreation equipment, emergency stop circuits, press applications, or safety equipment.
  - An application which possibly having negative effects on people, property, or animals, requires special safety analysis.
- Not suitable for Zone 0 applications. Only suitable for Zone 1 and Zone 2.**

### ⚠ CAUTION

- Ensure that the air supply system is filtered to 5 microns.

## 2 Specifications

Model		52-VQZ2000
Valve construction		Compact body Base mounted Pilot operated spool valve
Number of ports		3 and 4
Fluid		Air and inert gas
Operating pressure range	3-port	0.15 to 0.7 MPa
	4-port single	0.15 to 0.7 MPa
Ambient and fluid temperature (No freezing)		-10 to 50°C (T4, T5) -10 to 45°C (T6)
Lubrication		Not required
Mounting position		Free
Impact/Vibration resistance <sup>(1)</sup>		150/30 m/s <sup>2</sup>
Enclosure	Plug connector (L)	IP30
	Plug connector (LL)	IP40
	Terminal (TT)	IP65
	Grommet (G)	IP65
Rated voltage		12 VDC
Allowable voltage fluctuation		±10% of rated voltage
Type of coil insulation		Class B
Power consumption		0.52 W
Ignition protection		Ex ia IIC T4... T6 Intrinsic safety
Equipment category		II 2G
Certificate of conformity		KEMA 08ATEX0093 X

Note 1)

- Impact resistance: There should be no malfunction of the valve after testing along the valve axis and at right angles to the valve and armature. Carry out each test with the valve energised and de-energised (value at initial stage).
- Vibration resistance: There should be no malfunction of the valve after testing using a 8.3 to 2000Hz sweep along the valve axis and at right angles to the valve and armature. Carry out each test with the valve energised and de-energised (value at initial stage).

## 3 Installation

### 3.1 Installation

#### ⚠ WARNING

- Do not install the product unless the safety instructions have been read and understood.
- Any mounting position is possible.
- Please use valve pitches equal or above 16mm when using multiple valves together.
- The explosive atmosphere should not be allowed to enter the pneumatic circuit, even in case of expected malfunction.
- After confirming the gasket is correctly placed under the valve, securely tighten the bolts with **0.25 to 0.35 Nm** torque.
- 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.

#### Mounting interface 3-port

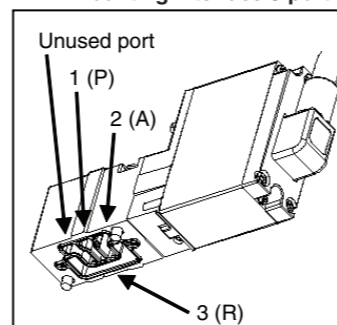


Fig. 1

#### Mounting interface 4-port

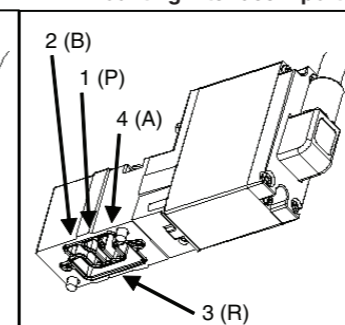


Fig. 2

### 3.2 Environment

#### ⚠ WARNING

- Do not use in an environment where the product is directly exposed to corrosive gases, chemicals, salt water, water or steam.
- Do not use in an explosive atmosphere, except Zones 1 and 2.
- The product should not be exposed to prolonged sunlight. Use a protective cover.
- Do not mount the product in a location where it is subject to excessive vibrations and/or impacts. Impact resistance of this solenoid valve is 150 m/s<sup>2</sup>. Vibration resistance of this solenoid valve is 30 m/s<sup>2</sup>
- Do not mount the product in a location exposed to radiant heat.

### 3.3 Piping

#### ⚠ CAUTION

- Before piping make sure to clean up chips, cutting oil, dust etc.
- When installing piping or fittings, ensure sealant material does not enter inside the port. When using seal tape, leave 1.5 to 2 threads exposed on the end of the pipe/fitting.

## 3 Installation (continued)

### 3.4 Electrical Connection

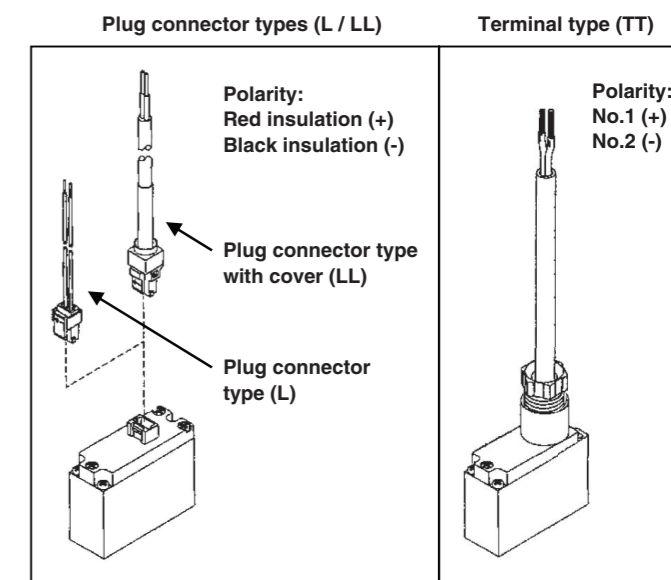


Fig. 3

Fig. 4

#### Grommet type (G)

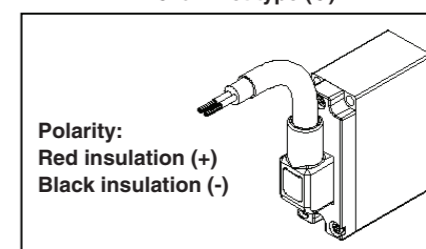


Fig. 5

#### ⚠ WARNING

- This product must be connected in accordance with the +/- polarity indication.
- This product must be connected to a certified intrinsically safe circuit (e.g. Zener barrier) for apparatus group IIC with the following maximum values:

$$\begin{aligned}
 U_i &= 28V \\
 I_i &= 225mA \text{ (resistively limited)} \\
 P_i &= 1W \\
 C_i &= 0nF \\
 L_i &= 0mH
 \end{aligned}$$

Confirm the solenoid input voltage at the lead wires is 12VDC +/-10%. The resistance of the solenoid valve is  $R_{20}=278\Omega$ .

- Do not bend or pull cables repeatedly.

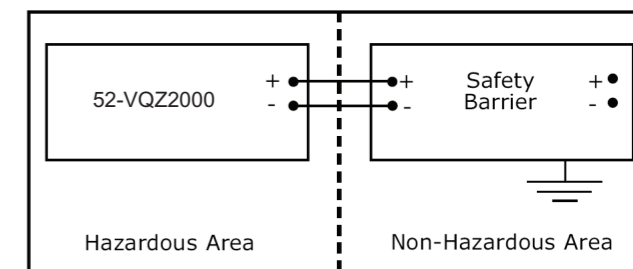


Fig. 6

### 3.5 Lubrication

#### ⚠ CAUTION

- SMC products have been lubricated for life at manufacture, and do not require lubrication in service.
- 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 Manual override

### ⚠ WARNING

Exercise extreme caution when operating the manual override as connected equipment will commence operation. Ensure all safety precautions are in place prior operation.

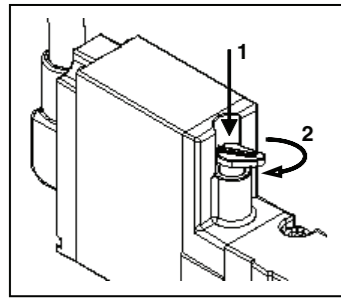


Fig. 7

- To operate the manual override press in direction of 1.
- To lock the manual override press in direction of 1 and turn in direction of 2.

## 5 Circuit Symbols

3-port

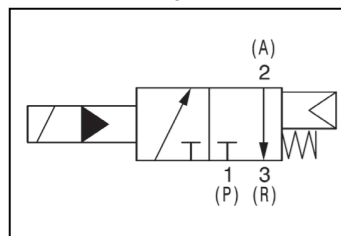


Fig. 8

4-port

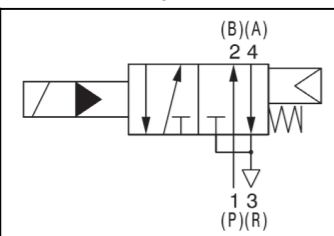


Fig. 9

## 6 Maintenance

### 6.1 General Maintenance

#### ⚠ WARNING

- Not following proper maintenance procedures could cause the product to malfunction and lead to equipment damage.
- If handled improperly, compressed air can be dangerous. Maintenance of pneumatic systems should be performed by qualified personnel only.
- Drain: remove condensate from the filter bowl on regular basis.
- Before performing maintenance ensure the supply pressure is shut off and all residual air pressure is released from the system.
- After maintenance apply operating pressure and power to the equipment and check for proper operation and possible air leaks. If operation is abnormal, verify product set-up parameters.
- Do not make any modification to the product.
- Do not disassemble the product, unless required by installation or maintenance instructions.

### 6.2 Valve Removal

#### ⚠ WARNING

- Shut off the air supply and release the air pressure in the system.
- Shut off the power supply.
- Remove the valve, ensuring the gasket is retained.

## 7 Limitations of Use

### ⚠ WARNING

- Do not exceed any of the specifications in section 2 of this document or the specific product catalogue.

### 7.1 Confirm the specifications

- Give careful consideration to the operating conditions such as the application and environment and use within the operating ranges specified in the catalogue.

## 7 Limitations of Use (continued)

### 7.2 Maintenance space

- The installation should allow sufficient space for maintenance activities.

### 7.3 Extended periods of continuous energization

- When a solenoid valve is continuously energized for long periods of time, temperature increase from coil heat radiated can result in deteriorating performance and shortened service life of the solenoid valve, as well as adverse effects on peripheral equipment in the vicinity.
- Be especially careful when using three or more adjacent valves with manifolds and keeping them continuously energized for extended periods, as this may result in dramatic increases in temperature.

## 8 Contact

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BELGIUM	(32) 3 355 1464	NORWAY	(47) 67 12 90 20
CZECH REP.	(420) 541 424 611	POLAND	(48) 22 211 9600
DENMARK	(45) 7025 2900	PORTUGAL	(351) 21 471 1880
FINLAND	(358) 207 513513	SLOVAKIA	(421) 2 444 56725
FRANCE	(33) 1 6476 1000	SLOVENIA	(386) 73 885 412
GERMANY	(49) 6103 4020	SPAIN	(34) 945 184 100
GREECE	(30) 210 271 7265	SWEDEN	(46) 8 603 1200
HUNGARY	(36) 23 511 390	SWITZERLAND	(41) 52 396 3131
IRELAND	(353) 1 403 9000	UNITED KINGDOM	(44) 1908 563888
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