



Installation and Maintenance Manual

Product Name **Pressure Switch**

56-IS10 Series



II 3G Ex nA II T5 -5°C ≤ Ta ≤ +60°C
II 3D Ex tD A22 IP67/IP40 T90°C

Read this manual before using this product

- The information within this document is to be used by pneumatically trained personnel only.
- For future reference, please keep manual in a safe place.
- This manual should be read in conjunction with the current catalogue.

ATEX marking description

II 3G Ex nA II T5 -5°C ≤ Ta ≤ +60°C
II 3D Ex tD A22 IP67/IP40 T90°C

| | | |
|---------------------------------|---------|--------------------------------|
| Equipment Group II | tD - | protected by enclosure |
| Category 3 | A22 - | for Zone 22 |
| G - Gas environment | IP67 - | Electrical component IP rating |
| D - Dust environment | | |
| Ex - European standards apply | IP40 - | Enclosure component IP rating |
| nA - Non-sparking apparatus | | |
| II - for all types of gas | Ta - | Ambient temperature |
| T5 - temperature classification | T90°C - | max. surface temperature |

1 Safety Instructions

1.1 General recommendation

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 "Caution", "Warning" or "Danger", 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.

| | |
|----------------|--|
| Caution | Indicates a hazard with a low level of risk, which if not avoided, could result in minor or moderate injury. |
| Warning | Indicates a hazard with a medium level of risk, which if not avoided, could result in death or serious injury. |
| Danger | Indicates a hazard with a high level of risk, which if not avoided, will result in death or serious injury. |

Warning

- The compatibility of pneumatic equipment is the responsibility of the person who designs the pneumatic system or decides its specifications.**
Since the products specified here can be used in various operating conditions, their compatibility with the specific pneumatic system must be based on specifications or after analysis and/or tests to meet specific requirements.
- Only trained personnel should operate pneumatically operated machinery and equipment.**
Compressed air can be dangerous if an operator is unfamiliar with it. Trained and experienced personnel should perform assembly, handling or repair of pneumatic systems.
- Do not service machinery/equipment or attempt to remove components until safety is confirmed.**
1) Inspection and maintenance of machinery/equipment should only be performed after confirmation of safe locked-out control positions.
2) When equipment is to be removed, confirm the safety process as mentioned above. Switch off air and electrical supplies and exhaust all residual compressed air in the system.
3) Before machinery/equipment is re-started, ensure all safety measures are taken to prevent sudden movement of cylinders etc. (Supply air into the system gradually to create back pressure, i.e. incorporate a soft-start valve).
- Do not use this product outside of the specifications. Contact SMC if it is to be used in any of the following conditions:**

1 Safety Instructions (Continued)

- Conditions and environments beyond the given specifications, or if the product is to be used outdoors.
- 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 that has the possibility of having negative effects on people, property, or animals, requiring special safety analysis.

Warning

- Not suitable for Zones 0/20 and 1/21. Only suitable for Zones 2/22.

Caution

- When mounting this product, it must be installed such that, even in the event of rare incidents, ignition sources due to impact and friction sparks are excluded.
- Ensure that the air supply system is filtered to 5 µm.

1.2 Conformity to standard

This product is certified to and complies with the following standards:

ATEX Directive 94/9/EC

- EN 60079-0:2006 Electrical apparatus for explosive gas – General requirements
- EN 60079-15:2005 Electrical apparatus for explosive gas – Construction. Test and marking of type of protection "n" electrical apparatus
- EN 61241-0:2006 Electrical apparatus for use in the presence of combustible dust. General requirements
- EN 61241-1:2004 Electrical apparatus for use in the presence of combustible dust. Protection by enclosures "tD"
- EN 13463-1:2009 Non-electrical equipment for potentially explosive atmospheres – basic methods and requirements

EMC Directive 2004/108/EC

- EN 60947-5-2:2007 Specification for low-voltage switchgear and controlgear. Control circuit devices and switching elements.
- EN 55011:2007+A2:2007 Industrial, scientific and medical (ISM) radio-frequency equipment - Electromagnetic disturbance characteristics - Limits and methods of measurement

2 Specifications

Specifications

| | | |
|-------------------------------|--|--|
| MODEL | 56-IS10-01 56-IS10E-※ 56-IS10M-※ 56-IS10-00 | 56-IS10-01-6 56-IS10E-※-6 56-IS10M-※-6 56-IS10-00-6 |
| Fluid | Air/Inert gas | |
| Proof pressure | 1.0 MPa | |
| Max. pressure | 0.7 MPa | |
| Operating pressure range | 0.1 to 0.4 MPa | 0.1 to 0.6 MPa |
| Ambient and fluid temperature | -5 to 60°C (No freezing) | |
| Contact | 1a | |
| Repeatability | ±0.05 MPa or less | |
| Hysteresis | 0.08 MPa or less | |
| Electrical entry | Grommet | |
| Max. Operating frequency | 0.5Hz | |

Proximity Switch Characteristics

| | | |
|------------------------|-------------------|-----------|
| Proximity Switch type | Reed Switch | |
| Wiring Style | 2 wire | |
| Max. contact capacity | AC 2 VA, DC2 W | |
| Voltage | 24 VAC/DC or less | 48 VAC/DC |
| Max. operating current | 50 mA | 40 mA |

2 Specifications (Continued)

2.1 Production Batch Code

The production batch code printed on the label indicates the month and year of production as per the following table.

| Year | 2010 | 2011 | 2012 | ... | 2021 | 2022 | 2023 | ... |
|-------|------|------|------|-----|------|------|------|-----|
| Month | O | P | Q | ... | Z | A | B | ... |
| Jan | o | Oo | Po | Qo | ... | Zo | Ao | Bo |
| Feb | P | OP | PP | QP | ... | ZP | AP | BP |
| Mar | Q | OQ | PQ | QQ | ... | ZQ | AQ | BQ |
| Apr | R | OR | PR | QR | ... | ZR | AR | BR |
| May | S | OS | PS | QS | ... | ZS | AS | BS |
| Jun | T | OT | PT | QT | ... | ZT | AT | BT |
| Jul | U | OU | PU | QU | ... | ZU | AU | BU |
| Aug | V | OV | PV | QV | ... | ZV | AV | BV |
| Sep | W | OW | PW | QW | ... | ZW | AW | BW |
| Oct | X | OX | PX | QX | ... | ZX | AX | BX |
| Nov | y | Oy | Py | Qy | ... | Zy | Ay | By |
| Dec | Z | OZ | PZ | QZ | ... | ZZ | AZ | BZ |

3 Installation

3.1 General recommendation

Warning

- Do not install the product unless the safety instructions have been read and understood.
- Please use the main body when handling the product. Do not handle using the power supply wiring. It may cause malfunction or damage.
- Do not bend or strain the lead wire.
- The wire should not be pulled. Repeated strain on the wire by pulling or bending of the lead wire may cause the wires to break. If the lead wire of the grommet style switch is damaged, the whole switch has to be replaced.
- Do not drop or subject the product to impacts when handling or after installation

3.2 Wiring

Warning

- Connect load before connecting with power source. The switch is instantaneously damaged when the load is not connected.
- In the case of inductive load or lead wire exceeding 5m long, take measures to avoid damage to the switch.
- Check the wiring for possible short circuits. If some of the wires are short circuited, the switch may be damaged due to excessive current flow.

3.3 Environment

Warning

- Do not use in an environment where corrosive gases, chemicals, salt water or steam are present.
- Do not expose to direct sunlight. Use a suitable protective cover.
- Do not install in a location subject to vibration or impact. Check the product specifications.
- Do not mount in a location exposed to radiant heat.
- Do not apply vacuum. If this occurs this may result in breakage.
- Avoid using the switch in a magnetic environment. It may cause a malfunction.
- Do not use in such an environment, where product could come into contact with water or oil.
- Supply the pressure for the product continuously to operate a switch. If the increasing or decreasing pressure is slow, there will be "stick-slip".

3.4 Piping

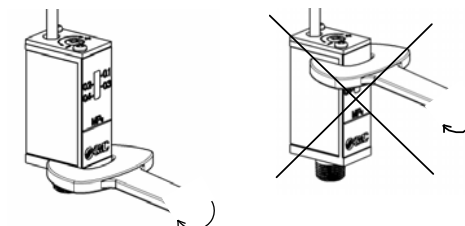
Caution

- 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.

Recommended tightening torque:

| Thread | Tightening Torque (N•m) |
|----------------|-------------------------|
| NPT, R, Rc 1/8 | 7 to 9 |
| NPT, Rc ¼ | 12 to 14 |
| NPT, Rc 3/8 | 22 to 24 |
| NPT, Rc 1/2 | 28 to 30 |
| NPT, Rc 3/4 | 28 to 30 |
| NPT, Rc 1 | 36 to 38 |

3 Installation (Continued)



The spanner must be positioned only on the base of the product as shown and another spanner on the piping adaptor or the spacer where IS10 screws in. If the spanner is placed and turned on the main body, this will lead to malfunction.

- To screw piping materials into components, tighten with a recommended tightening torque while holding the female thread side. If the minimum tightening torque is not observed, this can cause clearance in the connection between male and female fittings leading to seal leakage.
- Excess tightening torque can cause damage to the threads. Furthermore, tightening without holding the female thread side can cause damage due to the excess force that is applied directly to the bracket.

3.5 Lubrication

Caution

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

4 Settings

- Please set within the range of the display pressure in the scale plate. There is a possibility that defective operation and a set gap are generated when coming off from the range of the display pressure and setting it.
- Turn the adjusting screw and place the red line of moving screw in line with the scale of the scale board. Turn clockwise to adjust for high pressure.
- Use blade driver suitable for the head of adjusting screw. Scale of switching set display is the set value at the pressure drop.
- When detecting ON-pressure signal, note that set pressure on scale plate plus ON-OFF differential (Hysteresis) will be ON-pressure signal.
- Pressure display on the scale plate is just as a reference guide. For an accurate setting, measure it by pressure gauge.

5 How to Order

5.1 Pressure switch

56- IS10- 01 -

| Symbol | Description |
|--------|--|
| 1 | Thread type Nil N Rc NPT |
| 2 | Seal Nil N None S With seal |
| 3 | Set pressure range a Nil 0.1 to 0.4 MPa 6 Note 1) 0.1 to 0.6 MPa |
| 4 | Lead wire length b Nil 0.5 m L 3 m Z 5 m |
| 5 | Scale plate pressure unit c Nil MPa P Note 2) Both MPa and psi |

5.2 Pressure switch with spacer

56- IS10M- 30 -

| Symbol | Description |
|--------|-----------------------------|
| 1 | Body size 20 30 40 50 60 |

Semi-standard: Select one option each in a through c. Place them in alphanumeric order.
Example) IS10M-6LP

| Symbol | Description |
|--------|--|
| 1 | Body size 20 30 40 50 60 |
| 2 | Set pressure range a Nil 0.1 to 0.4 MPa 6 Note 1) 0.1 to 0.6 MPa |
| 3 | Lead wire length b Nil 0.5 m L 3 m Z 5 m |
| 4 | Scale plate pressure unit c Nil MPa P Note 2) Both MPa and psi |

Note 1) Set pressure range of 6P(L, Z) is 0.2 to 0.6 MPa (30 to 90 psi).
Note 2) This product is for overseas use only according to the new Measurement Law. (The SI unit type is provided for use in Japan.)

5.3 Pressure switch with piping adaptor

56- IS10E-**30**-**03**-

Semi-standard: Select one option each in a through d.
Place them in alphabetical order.
Example) IS10E-30N03-6PBZ

| | Symbol | Description | ① Body size | | | |
|-----------------|-----------------------------|-------------|------------------|----|----|---|
| | | | 20 | 30 | 40 | |
| ② Thread type | NII | Rc | ● | ● | ● | |
| | N | NPT | ● | ● | ● | |
| | F | G | ● | ● | ● | |
| ③ Port size | 01 | 1/8 | ● | — | — | |
| | 02 | 1/4 | ● | ● | — | |
| | 03 | 3/8 | ● | ● | ● | |
| | 04 | 1/2 | — | ● | ● | |
| | 06 | 3/4 | — | — | ● | |
| ④ Semi-standard | a Set pressure range | NII | 0.1 to 0.4 MPa | ● | ● | ● |
| | | 6 (Note 2) | 0.1 to 0.6 MPa | ● | ● | ● |
| | b Lead wire length | NII | 0.5 m | ● | ● | ● |
| | | L | 3 m | ● | ● | ● |
| | | Z | 5 m | ● | ● | ● |
| | c Scale plate pressure unit | NII | MPa | ● | ● | ● |
| | | P (Note 1) | Both MPa and psi | ● | ● | ● |
| | d Mounting position | NII | Right | ● | ● | ● |
| R | | Left | ● | ● | ● | |

Note 1) For thread type: NPT only.

This product is for overseas use only according to the new Measurement Law. (The SI unit type is provided for use in Japan.)

Note 2) Set pressure range of 6P(L, Z) is 0.2 to 0.6 MPa (30 to 90 psi).

6 Maintenance

6.1 General Maintenance

⚠ Caution

- Not following proper maintenance procedures could cause the product to malfunction and lead to equipment damage.
- If handled improperly, compressed air can be dangerous. Only qualified personnel should perform maintenance of pneumatic systems.
- Before performing maintenance, turn off the power supply and be sure to cut off the supply pressure. Confirm that the air is released to atmosphere.
- After installation and maintenance, apply operating pressure and power to the equipment and perform appropriate functional and leakage tests to make sure the equipment is installed correctly.
- Do not make any modification to the product.
- Do not disassemble the product.

- Be absolutely sure to wear safety glasses without when conducting periodic inspections.
- Perform periodic inspections to ensure proper operation of the switch. Verifying the operation of the switch on a regular basis can minimize unexpected problems with a machine or equipment.
- Take precautions when using a switch for an interlock circuitry. When a pressure switch is used for an interlock circuit, devise a multiple interlock system to prevent trouble or malfunction. Verify the operation of the switch and interlock function on a regular basis.
- Secure the space enough for maintenance. The maintenance cannot be done when there is no space.

7 Limitations of Use

⚠ Danger

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

8 Contacts

| | | | |
|------------|-------------------|----------------|-------------------|
| AUSTRIA | (43) 2262 62280-0 | LATVIA | (371) 781 77 00 |
| BELGIUM | (32) 3 355 1464 | LITHUANIA | (370) 5 264 8126 |
| BULGARIA | (359) 2 974 4492 | NETHERLANDS | (31) 20 531 8888 |
| CZECH REP. | (420) 541 424 611 | NORWAY | (47) 67 12 90 20 |
| DENMARK | (45) 7025 2900 | POLAND | (48) 22 211 9600 |
| ESTONIA | (372) 651 0370 | PORTUGAL | (351) 21 471 1880 |
| FINLAND | (358) 207 513513 | ROMANIA | (40) 21 320 5111 |
| FRANCE | (33) 1 6476 1000 | SLOVAKIA | (421) 2 444 56725 |
| GERMANY | (49) 6103 4020 | SLOVENIA | (386) 73 885 412 |
| GREECE | (30) 210 271 7265 | SPAIN | (34) 945 184 100 |
| HUNGARY | (36) 23 511 390 | SWEDEN | (46) 8 603 1200 |
| IRELAND | (353) 1 403 9000 | SWITZERLAND | (41) 52 396 3131 |
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Specifications are subject to change without prior notice from the manufacturer.

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