



ORIGINAL INSTRUCTIONS



Refer to Declaration of Conformity for relevant Directives

## Instruction Manual

### Normally Open Pressure Switch

### IS10 Series



The intended use of the Pressure Switch is to detect pressure above or below a set value. The user is able to set the value in the specified range.

#### 1 Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of "Caution," "Warning" or "Danger." They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC)<sup>(1)</sup>, and other safety regulations.

<sup>(1)</sup> ISO 4414: Pneumatic fluid power - General rules relating to systems.  
ISO 4413: Hydraulic fluid power - General rules relating to systems.  
IEC 60204-1: Safety of machinery - Electrical equipment of machines. (Part 1: General requirements)  
ISO 10218-1: Manipulating industrial robots - Safety. etc.

- Refer to product catalogue, Operation Manual and Handling Precautions for SMC Products for additional information.
- Keep this manual in a safe place for future reference.

<b>Caution</b>	Caution indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.
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<b>Warning</b>	Warning indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.
<b>Danger</b>	Danger indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

#### Warning

- Always ensure compliance with relevant safety laws and standards.
- All work must be carried out in a safe manner by a qualified person in compliance with applicable national regulations
- System reaction time is to be determined by the machine builder

#### 2 Specifications

MODEL	IS10-01 IS10(E,M)-※	IS10-01-6 IS10(E,M)-※-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	
Error of scale	±0.05 MPa or less	
Repeatability	±0.05 MPa or less	
Hysteresis	Fixed 0.08 MPa or less	
Electrical entry	Grommet	
Enclosure	IP40	
Air quality	5 μm	
Port size (IS10-01)	1/8	
Weight (IS10-01)	62 g	
Impact resistance <sup>NOTE 1</sup>	1000 m/s <sup>2</sup>	
Vibration resistance <sup>NOTE 2</sup>	50 m/s <sup>2</sup> (0.35mm)	

NOTE 1) three axes and two directions were tested 3 times and no malfunction of the valve occurred (pulse shape: sine wave). Pulse time 11 ms.

#### 2 Specifications - continued

NOTE 2) No malfunction occurred in a sweep cycle test between 10 to 150 Hz at vibration sweep 0.35mm. The test was performed in the three axes and two directions, 7 min per cycle (20 cycles). For further test details contact SMC.

##### Switch Characteristics

Max. contact capacity	AC 2 VA, DC2 W		
	24 VAC/DC or less	48 VAC/DC	100 VAC/DC
Max. operating current	50 mA	40 mA	24 mA

#### 3 Installation

##### 3.1 Installation

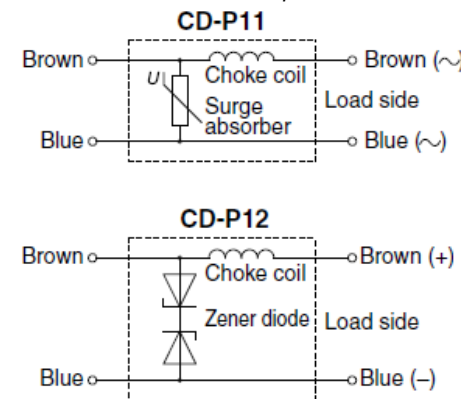
#### Warning

- Do not install the product unless the safety instructions have been read and understood.
- When handling the product, hold the body and do not apply tensile stress to the power supply cable. Otherwise, damage may occur to the product.
- Avoid repeatedly bending or stretching the lead wire.** Wiring which applies repeated bending and tensile stress to the lead wire can break the circuit. If the lead wire is damaged, causing operation failure, replace the product with a new one.
- Do not drop or subject the product to impacts when handling.
- Connect load before connecting with power source. The switch is instantaneously damaged when the load is not connected.
- Make the wiring length as short as possible. When the load which is operated by the pressure switch is an inductive load, or the lead wire is 5 m or longer, use the contact protection box<sup>NOTE1</sup> shown in the table below. Otherwise, damage to the switch can result.

Part no.	Voltage	Lead wire length
CD-P11	100 VAC	Switch side: 0.5 m
CD-P12	24 VDC	Load side: 0.5 m

NOTE 1: In case of use in safety related application do not use the contact protection box CD-P11 or CD-P12

##### Internal circuit of contact protection box



##### How to connect contact protection box

Connect the lead wires from the body and the contact protective box side indicated "SWITCH." Make the lead wire as short as possible, within 1 m.

- 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.

- Dimensions of lead wire  
Enclosure:  $\phi$  3.4  
Insulator:  $\phi$  1.1  
Conductor:  $\phi$  0.64

##### 3.2 Environment

#### Warning

- Do not use in an environment where corrosive gases, chemicals, salt water or steam are present.
- Do not use in an explosive atmosphere.
- Do not expose to direct sunlight. Use a suitable protective cover.

#### 3 Installation - continued

- Do not install in a location subject to vibration or impact in excess of the specification. Excessive vibration may cause malfunction or may incorrect setting.
- Do not mount in a location exposed to radiant heat.
- Do not apply vacuum. If this occurs this may result in breakage.
- Applicable fluid is limited to air and inert gas. Other fluids are not acceptable. Especially, never use flammable fluid and gas, which may result in explosion since the product is not designed to be explosion-proof.
- Avoid using the switch in a magnetic environment. It may cause a malfunction.
- Do not use in such an environment, where water or oil is splashed. Since it is the open type construction, if water or oil enters into the internal parts, the electric circuit will be corroded and may result in a malfunction or damage.
- Supply the pressure for the product continuously to operate a switch. If the increasing or decreasing pressure is slow, there will be "stick-slip".

##### 3.3 Piping

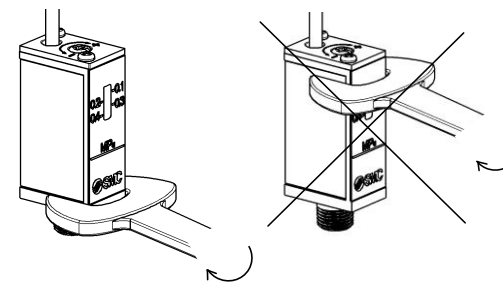
#### Caution

- 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 thread exposed on the end of the pipe/fitting.
- Tighten fittings to the specified tightening torque.

Recommended tightening torque:

Thread	Tightening Torque (N-m)
NPT, R 1/8	7 to 9

- Apply a wrench to the bottom of the product when screwing. Turning it by applying a wrench on the top of the main body may cause damage to the product. Recommended tightening torque: 7 to 9 N-m



- 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.
- Mounting direction is available in either horizontal or perpendicular.
- This product (IS10 series) uses a reed switch. If the chattering of the output signal is a problem, choose a solid state type pressure switch or adjust by PLC.

##### 3.4 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, refer to catalogue for details.

#### 4 Settings

- Please set the product 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 outside of the range of the display pressure and setting pressure.
- Turn the adjusting screw and place the red line of adjustment screw in line with the marking on the scale plate. Turn clockwise to adjust for high pressure.
- Use a screwdriver of a size suitable for the head of adjustment screw.
- The scale displays the value for the off pressure.
- When detecting the 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

- Please refer to the catalogue.

#### 6 Outline Dimensions (mm)

- Please refer to the catalogue.

#### 7 Maintenance

##### 7.1 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. Maintenance of pneumatic systems should be performed only by qualified personnel.
- 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.

- If any electrical connections are disturbed during maintenance, ensure they are reconnected correctly and safety checks are carried out as required to ensure continued compliance with applicable national regulations.
- Do not make any modification to the product.
- Do not disassemble the product, unless required by installation or maintenance instructions.
- 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.
- Wear safety glasses when conducting periodic inspections.
- Take precautions when using a switch for an interlock circuit. 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.
- Ensure there is enough space around the product to carry out maintenance.

#### 8 Limitations of Use

##### 8.1 Limited warranty and Disclaimer/Compliance Requirements

Refer to Handling Precautions for SMC Products.

#### 9 Contacts

Refer to Declaration of Conformity and [www.smcworld.com](http://www.smcworld.com) for contacts.

## SMC Corporation

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 Specifications are subject to change without prior notice from the manufacturer.  
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