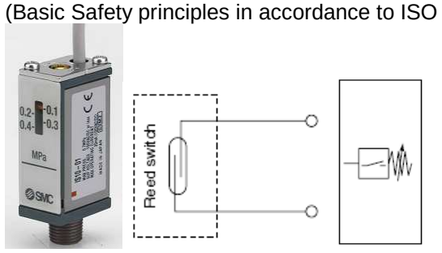
IS-TFP23

ORIGINAL INSTRUCTIONS

Installation and Maintenance Manual
Product Name Pressure Switch
IS10 Series

(Basic Safety principles in accordance to ISO 13849)



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.

This IMM is only applicable for validated products to ISO 13849. Refer to Doc. Nr. IS*-RRP0028.

1 Safety Instructions

⚠ Warning

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. Assembly, handling or repair of pneumatic systems should be performed by trained and experienced personnel.
- **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) Conditions and environments beyond the given specifications, or if the product is to be used outdoors.

1 Safety Instructions (Continued)

2) 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.
3) An application that has the possibility of having negative effects on people, property, or animals, requiring special safety analysis.

⚠ Caution

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

2 Specifications

Specifications

MODEL	IS10-01 IS10E-※ IS10M-※	IS10-01-6 IS10E-※-6 IS10M-※-6
Fluid	Air / Nitrogen 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℃(No freezing)	
Contact	1a	
Repeatability	±0.05 MPa or less	
Hysteresis	0.08 MPa or less	
Electrical entry	Grommet	
Enclosure	IP40	
Service life B10	Refer to IS*-RRP0028	

Switch Characteristics

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

3 Installation

3.1 Installation

⚠ Warning

- Do not install the product unless the safety instructions have been read and understood.
- Please use the main body when you handling the product. Do not handle using the power supply wiring. It may cause malfunction or damage.
- Do not frequently bend the lead wire, and do not add pull force. Repeated pulling or bending of the lead wire may cause of the wires to break. If the lead wire of a grommet style switch is damaged, the whole switch has to be replaced.
- Do not drop or subject the product to impacts when handling.

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 induction load or lead wire exceeding 5m long, the following contact protection box should be used. If not used it may lead to 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.

In case of use in ISO 13849 application do not use the contact protection box CD-P11 or CD-P12.

3.3 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.
- 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.

3 Installation (Continued)

- Applicable fluid is limited to air and nitrogen. 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”.

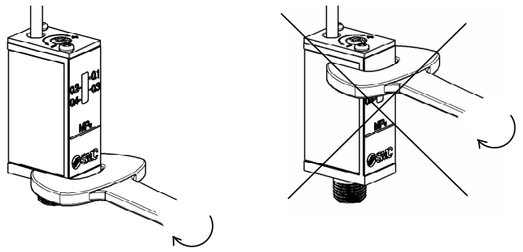
3.4 Piping

⚠ 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: 7 to 9 Nm.

Thread	Tightening Torque
NPT,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

- The spanner must be positioned on the bottom 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 to 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 a looseness and seal failure.
- 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.

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 blade driver suitable for the head of adjusting screw.
- Scale of switching set display is the set value at the pressure drop.
- 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

Pressure switch

IS10−❶ 01 ❷ −❸

Semi-standard: Select one option each in **a** through **c**. Place them in alphanumerical order.
Example) IS10-N01-6PZ

		Symbol	Description
❶	Thread type	Nil	Rc
		N	NPT
❷	Seal	Nil	None
		S	With seal
❸ Semi-standard	a Set pressure range	Nil	0.1 to 0.4 MPa
		6 Note1)	0.1 to 0.6 MPa
	b Lead wire length	Nil	0.5 m
		L	3 m
		Z	5 m
	c Scale plate pressure unit	Nil	MPa
		P Note2)	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.)

Pressure switch with spacer

IS10M−30−❶ ❷

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

		Symbol	Description	❶ Body size 20	30	40	50	60
❷ Semi-standard	a Set pressure range	Nil	0.1 to 0.4 MPa	●	●	●	●	●
		6 Note 1)	0.1 to 0.6 MPa	●	●	●	●	●
	b Lead wire length	Nil	0.5 m	●	●	●	●	●
		L	3 m	●	●	●	●	●
		Z	5 m	●	●	●	●	●
	c Scale plate pressure unit	Nil	MPa	●	●	●	●	●
		P Note 1)	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.)

Pressure switch with piping adaptor

IS10E−30❷03−❹

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

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

- Please refer to 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. 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 modifications to the product.
- Do not disassemble the product.
- Be absolutely sure to wear safety glasses 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 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

⚠ Danger

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

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).

9 Contacts

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