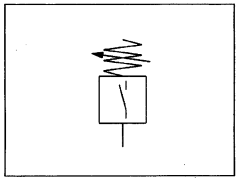
ORIGINAL INSTRUCTIONS

SMC

CE Refer to Declaration of Conformity for

Instruction Manual
Pressure Switch
56-IS10 Series



ATEX Classification		
II 3 G Ex h nA IIB T5 Gc		-5°C ≤ Ta ≤ +60°C
II 3 D Ex h tc IIIB T90°C Dc		

Certificate reference: SMC 19.0016 X
For special conditions of use see section 1.2

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

1 Safety Instructions

1.1 General Safety Instruction

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) *1), and other safety regulations.

*1) 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.

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.
- To ensure safety of personnel and equipment the safety instructions in this manual must be observed, along with other relevant safety practices.

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

1 Safety Instructions (Continued)

⚠ Warning

- **The compatibility of the product is the responsibility of the person who designs the equipment or decides its specifications.**
  Since the product specified here is used under various operating conditions, its compatibility with specific equipment must be decided by the person who designs the equipment or decides its specifications based on necessary analysis and test results. The expected performance and safety assurance of the equipment will be the responsibility of the person who has determined its compatibility with the product. This person should also continuously review all specifications of the product referring to its latest catalogue information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.
- **Only personnel with appropriate training should operate machinery and equipment.**
  The product specified here may become unsafe if handled incorrectly.
  The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.
- **Do not service or attempt to remove product and machinery/equipment until safety is confirmed.**
  1) The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.
  2) When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.
  3) Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.
- **Contact SMC beforehand and take special consideration of safety measures if the product is to be used in any of the following conditions.**
  1) Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.
  2) Installation on equipment in conjunction with atomic energy, railways, air navigation, space, shipping, vehicles, military, medical treatment, combustions and recreation, or equipment in contact with food and beverages, emergency stop circuits, clutch and brake circuits in press applications, safety equipment or other applications unsuitable for the standard specification described in the product catalogue.
  3) An application which could have negative effects on people, property, or animals requiring special safety analysis.
  4) Use in an interlock circuit, which requires the provision of double interlock for possible failure by using a mechanical protective function, and periodical checks to confirm proper operation.
- **Always ensure compliance with relevant safety laws and standards.**
  All electrical work must be carried out in a safe manner by a qualified person in compliance with applicable national regulations

⚠ Caution

- **The product is provided for use in manufacturing industries.**
  The product herein described is basically provided for peaceful use in manufacturing industries.
  If considering using the product in other industries, consult SMC beforehand and exchange specifications or a contract if necessary.
  If anything is unclear, contact your nearest sales branch.

Specific recommendations:

⚠ Warning

- Product must be protected against impact according to ATEX guidelines.
- Do not pull or strain the lead wire.
- To avoid build-up of dust regular cleaning of product is required with a damp cloth.
- Not suitable for Zones 0/20 and 1/21. Only suitable for Zones 2/22.

1 Safety Instructions (Continued)

⚠ 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.
- Conformity to standards:

This product conforms to the following ATEX standards:

Electrical Apparatus for Explosive Gas Atmospheres	EN IEC 60079-0:2018 EN IEC 60079-15:2010 EN 60079-31:2014
Non-Electrical Apparatus for Explosive Gas Atmospheres	EN 80079-36:2016

1.2 Special Conditions of Use

- Protect the product from sources of heat which can generate surface temperatures greater than the temperature classification.
- Protect the product and cable against all impact or mechanical damage.
- Protect the product from direct sunlight or UV light using a suitable protective cover.
- Use only a damp cloth to clean the product to avoid an electrostatic charge.

2 Specifications

2.1 Specifications

MODEL	56-IS10-01 56-IS10E-※ 56-IS10M-※	56-IS10-01-6 56-IS10E-※-6 56-IS10M-※-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	0.5 Hz	

2.2 Production Batch Code

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

Year / Month		2012	2013	2014	....	2021	2022	2023	....
		Q	R	S	....	Z	A	B	....
Jan	o	-	Ro	So	....	Zo	Ao	Bo	....
Feb	P	-	RP	SP	....	ZP	AP	BP	....
Mar	Q	-	RQ	SQ	....	ZQ	AQ	BQ	....
Apr	R	-	RR	SR	....	ZR	AR	BR	....
May	S	-	RS	SS	....	ZS	AS	BS	....
Jun	T	QT	RT	ST	....	ZT	AT	BT	....
Jul	U	QU	RU	SU	....	ZU	AU	BU	....
Aug	V	QV	RV	SV	....	ZV	AV	BV	....
Sep	W	QW	RW	SW	....	ZW	AW	BW	....
Oct	X	QX	RX	SX	....	ZX	AX	BX	....
Nov	y	Qy	Ry	Sy	....	Zy	Ay	By	....
Dec	Z	QZ	RZ	SZ	....	ZZ	AZ	BZ	....

2 Specifications (Continued)

2.3 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

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 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 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 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.
- For use in Zone 2/22 only.
- 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 water or oil is splashed.
- 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 thread exposed on the end of the pipe/fitting.
- Tighten fittings to the specified tightening torque.

Recommended tightening torque:

If a tool is used to retain the switch housing, then the tool should be placed over the metal part of the body (see fig.1).

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

3 Installation (Continued)

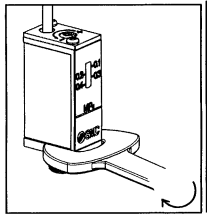


Fig. 1

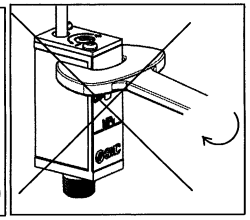


Fig. 2

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 Settings

- Set the pressure switch within pressure range displayed on the scale plate. Setting the pressure outside of the given range may result in operation defect.
- 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-I S 1 0 - □ 0 1 □ - □
① ② ③

		Symbol	Description
①	Thread type	Nil	R
		N	NPT
②	Sealant	Nil	Without sealant
		S	With sealant
③ Semi-standard	a Set pressure range	Nil	0.1 to 0.4MPa
		6 Note 1)	0.1 to 0.6MPa
	b Lead wire length	Nil	0.5m
		L	3m
		Z	5m
	c Pressure unit	Nil	MPa
		P Note 2)	Both MPa and psi

Note 1) Set pressure range of 6P(L, Z) is 0.2 to 0.6MPa (30 to 90psi).
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.)

5.2 Pressure switch with spacer

56-I S 1 0 M - 3 0 - □ -A
① ②

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

Note 1) Set pressure range of 6P(L, Z) is 0.2 to 0.6MPa (30 to 90psi).
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.)
*Prepare a spacer (Y series) separately for modular connection.

5 How to Order (Continued)

5.3 Pressure switch with piping adaptor

56-I S 1 0 E - 3 0 □ 0 3 - □ -A
① ② ③ ④

		Symbol	Description	Body size 20	30	40
①	Thread type	2	20	●	–	–
		3	30	–	●	–
		4	40	–	–	●
②	Thread type	Nil	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	Nil	0.1 to 0.4MPa	●	●	●
		6 Note 1)	0.1 to 0.6MPa	●	●	●
	b Lead wire length	Nil	0.5m	●	●	●
		L	3m	●	●	●
		Z	5m	●	●	●
	c Pressure unit	Nil	MPa	●	●	●
		P Note 2)	Both MPa and psi	●	●	●
	d Mounting position	Nil	Right	●	●	●
		R	Left	●	●	●

Note 1) Set pressure range of 6P(L, Z) is 0.2 to 0.6MPa (30 to 90psi).
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.)
*Prepare a spacer (Y series) separately for modular connection.
*A pressure switch can be mounted to AC40-06(-A) or larger by screwing IS10-01 into the piping adapter E500-"06-A-X501 or E600-"06 to 10-A-X501 (Rc1/8 thread on top surface) The assembled product is treated as a special product. This should be checked beforehand.

6 Outline Dimensions (mm)

Refer to the drawing for this product.

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.
- 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.

8 Limitations of Use

8.1 Limited warranty and Disclaimer/Compliance Requirements

- **The product used is subject to the following "Limited warranty and Disclaimer" and "Compliance Requirements". Read and accept them before using the product.**

- **Limited warranty and Disclaimer**

1) The warranty period of the product is 1 year in service or 1.5 years after the product is delivered, whichever is first [1]. Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.

2) For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided.
This limited warranty applies only to our product independently, and not to any other damage incurred due to the failure of the product.

3) Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalogue for the particular products.

- **Compliance Requirements**

1) The use of SMC products with production equipment for the manufacture of weapons of mass destruction (WMD) or any other weapon is strictly prohibited.

2) The exports of SMC products or technology from one country to another are governed by the relevant security laws and regulations of the countries involved in the transaction. Prior to the shipment of a SMC product to another country, assure that all local rules governing that export are known and followed.

Caution

- **SMC products are not intended for use as instruments for legal metrology.**
  Measurement instruments that SMC manufactures or sells have not been qualified by type approval tests relevant to the metrology (measurement) laws of each country.
  Therefore, SMC products cannot be used for business or certification ordained by the metrology (measurement) laws of each country.

Danger

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

9 Contacts

Refer to Declaration of Conformity and www.smcworld.com for contacts.

SMC Corporation

URL : http// www.smcworld.com (Global) http// www.smceu.com (Europe)
'SMC Corporation, Akihabara UDX15F, 4-14-1, Sotokanda, Chiyoda-ku, Tokyo 101 0021

Specifications are subject to change without prior notice from the manufacturer.
© 2019 SMC Corporation All Rights Reserved.

Template DKP50047-F-085E