

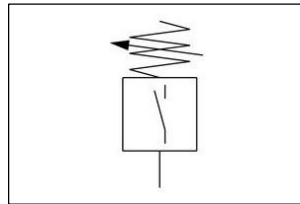


ORIGINAL INSTRUCTIONS



Refer to Declaration of Conformity for relevant Directives

Instruction Manual  
ISG  
Pressure Switch



The intended use of the ISG pressure switch is to check pneumatic, hydraulic, water and other liquid pressures.

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.
	<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.
- The compatibility of pneumatic equipment is the responsibility of the person who designs the pneumatic system or decides its specifications.

2 Specifications

2.1 Specification for each model

Example: ISG210-030-Q

Model (ISG-)		Pressure (MPa)	Hysteresis range (MPa)	Proof pressure (MPa)	Repeatability (MPa)	Wetted material	Hysteresis scale plate
Drip-proof	Open type						
210-030	110-030	0.02~0.3	0.015~0.2	1	±0.006	Brass	No
210-031	110-031						Yes
211-030	111-030						No
211-031	111-031						Yes
220-030	120-030	0.05~0.7	0.02~0.35	1.5	±0.014	Brass	No
220-031	120-031		0.02~0.45				Yes
221-030	121-030		0.02~0.35				No
221-031	121-031		0.02~0.45				Yes
230-030	130-030	0.1~1	0.03~0.4	1.5	±0.02	Brass	No
230-031	130-031		0.03~0.6				Yes
231-030	131-030		0.03~0.4				No
231-031	131-031		0.03~0.6				Yes
290-030	190-030	-10~100 kPa	7~53 kPa	0.5	±2 kPa	Brass	No
291-030	191-030						SUS316

2.2 General Specifications

Fluid	Not corrode wetted parts	
Ambient and fluid temperature	-5~80°C (No freezing)	
Contact composition	1a1b	
Wiring specifications	Terminal	
Electrical Entry	Open type	Grommet
	Water-tight	CAPCON Ø11~13
Enclosure	Open type	Equivalent to IP40
	Water-tight	Equivalent to IP44
Weight	Open type	1.2 kg
	Water-tight	1.3 kg

2.3 Fluid

Type of operating fluid is limited by the material of the wetted parts. Select the model taking into consideration the material suitable for the operating fluid.

Fluid	Body material in contact with fluid material	
	Bellows	Fluid entering part
Non-corrosive water/air/liquid/inert gas	Phosphor bronze	Brass
Fluids which do not corrode SUS316	Stainless steel 316	Stainless steel 316

3 Installation

3.1 Installation

**Warning**

- Do not install the product unless the safety instructions have been read and understood.

3 Installation - continued

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.
- Put a protective cover if the product is exposed to sunlight.
- Do not use in a place that is subjected to heavy vibrations and/or shocks.
- Never use in an environment where flammable fluids or gases are used. This product is not explosion proof and may trigger an explosive disaster.
- Do not use in an environment where water or oil is splashed. Because of the open type construction of the product, if water or oil were to enter, the electrical circuit would be corroded and result in malfunction or damage. Even the drip-proof type product may be penetrated by water and oil if exposed for too long during operation.
- Avoid using and storing the product with sulphide gas, ammonia, chlorine gas, silicone gas, and at high temperatures and humidity.
- Contact with these substances could corrode the product and cause failure.
- Do not mount the product in a location where it is exposed to radiant heat.

3.3 Piping

**Caution**

- Before connecting 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 1.5-2 threads exposed on the end of the pipe/fitting.
- Tighten fittings to the specified tightening torque:

Thread	Tightening torque (Nm)
R 3/8	15~20

- When changing the piping by hand, hold by the hexagonal nut. The wiring must not be subjected to excessive force as this may cause malfunction or damage to the product.

3.4 Mounting

**Warning**

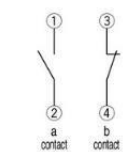
- Read the instruction manual carefully. The product should be mounted and operating with a good understanding of its contents. Keep the manual where it can be easily referred to at any time.
- Mounting is possible in either horizontal or vertical orientations.

3.5 Wiring

**Warning**

- Do not have the internal wiring attached to the connection lever for switch operation. It may malfunction
- Use the wiring applicable to the operating voltage and compliant to the IEC standard.
- Short the wiring as much as possible. If the length is too long, the in-rush current generated when the product is turned on will increase, which can shorten the product life.
- The grounding terminal is M4.
- Use the round bare type of crimping terminal compliant with the IEC standard to prevent it from coming off.
- Connect the wiring of snap switch in accordance with the symbols on the terminal. The 1, 2, 3 and 4 do not have polarity respectively.

1a1b Snap type (Standard)



When rising pressure

① - ② = ON  
③ - ④ = OFF

3 Installation - continued

**Caution**

- The grommet size of the open type switch is Ø17. It is possible to connection the electric piping  $\frac{1}{2B}$  without the grommet.
- Terminal thread type is M4.
- Wiring must not be subjected to excessive force. It may cause malfunction or damage.
- Do not apply repeated bending stress or tensile force on wiring. The wiring condition which applies repeated bending stress or tensile force on the wiring could damage the wires.
- If the wiring is damaged, it may lead to operating failure and the product should be replaced.
- Be careful to prevent interference between wiring and internal components as this could result in malfunction and electric shock.

3.6 Rated Voltage of Snap Switch

Rated voltage	Non-inductive		Inductive	
	Load	Light load	Inductive	Motor load
110VAC	12	2	12	3
220VAC	10	1	10	1.5
24VDC	3	2.5	3	2.5
48VDC	1.5	1.2	1.5	1.25
110VDC	0.5	0.25	0.5	0.2

Insulation resistance: 100 MΩ or more at 500 VDC by mega-meter.

Voltage resistance: 2000 VAC/1 min.

3.7 Pressure Source

**Warning**

- Do not use toxic, corrosive, or combustible gas since materials of wetted parts are brass, phosphor bronze, and SUS 316.
- Use only fluids which does not corrode the wetted parts made of brass, phosphor bronze and SUS 316. The fluid corrosive characteristics need to be confirmed with the fluid manufacturer.

4 Settings

4.1 Pressure Setting

**Caution**

- Set the pressure by adjusting the setting pressure adjusting bolt to the right to increase, and to the left to decrease
- Scale plate is used for reference only. Use a gauge to get the correct pressure value.
- Confirm that the product is within a range for pressure indication scale. The operation of this product will become unstable outside of the range.

4.2 Hysteresis Setting

**Caution**

How to set the hysteresis (difference from ON and OFF)

- Without hysteresis scale:** rotate a hysteresis adjusting bolt (width across flat: 10). The hysteresis will increase by a clockwise rotation and decrease by counter-clockwise rotation.
- Excessively tightening the bolt could cause the spring to come off.
- With a hysteresis scale:** Hysteresis adjusting bolt is covered with a screw cap and is adjusted by a flat driver (With across flat: 1,2 and length 10).

## 5 How to Order

Refer to the catalogue for 'How to Order'.

## 6 Outline Dimensions (mm)

Refer to the catalogue for outline dimensions.

## 7 Maintenance

### 7.1 General Maintenance

#### Warning

- Perform a periodical check to ensure the product operates normally. Unintended malfunction and mishandling may break the safety.
- Do not touch the internal wiring during energizing. This could result in an electric shock. Turn off the power supply before performing electric wiring to the product.

#### 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. Exhaust all residual compressed air in the system, and release all energy (liquid pressure, spring, condenser, gravity).
- 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.
- Ensure there is the necessary space for maintenance activities.

- Bellows assembly is available for maintenance. When replacing other parts, please contact SMC since they cannot be replaced by the user. See catalogue for maintenance part numbers for the bellows.
- Inspection and maintenance of the equipment should only be performed once measures to prevent falling or runaway of the driver objects have been confirmed.

## 8 Limitations of Use

### 8.1 Limited warranty and Disclaimer/Compliance Requirements

Refer to Handling Precautions for SMC Products.

#### Caution

**Contact SMC if the product will be used in any of the following conditions:**

- Conditions and environments beyond the given specifications, or if the product is used outdoors.
- Installation on equipment, food and beverages, recreation equipment, emergency stop circuits, clutch and brake circuits in press applications, or safety equipment.
- An application which has the possibility of having negative effects on people, property, or animals, requiring special safety analysis.
- If products are used in an interlock circuit, prepare a double interlock style circuit with mechanical protection function for the prevention of a breakdown. Examine the devices periodically to check if they function correctly.

### 8.2 Obligations to the end user

#### Caution

- Check the fluid used for the product. Unsuitable fluid could result in leakage and malfunction.

## 8 Limitations of Use- continued

Keep to specified voltage and current. Using outside of this range can result in damage of the product, electric shock and fire. If the product is used with large volume load such as a motor, a magnet switch or relay should be combined. Otherwise, the snap switch may malfunction.

- Ensure the product is used within the specifications outlined in section 2. Using outside of the pressure, hysteresis, and temperature ranges could result in damage.
- Do not drop or apply excessive force to the product.

## 9 Product disposal

This product should not be disposed of in the municipal waste system. Check your local regulations and guidelines to dispose this product correctly, to reduce the impact on human health and the environment.

## 10 Contacts

# SMC Corporation

URL : [http:// www.smcworld.com](http://www.smcworld.com) (Global) [http// www.smceu.com](http://www.smceu.com) (Europe)  
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 Specifications are subject to change without prior notice from the manufacturer.  
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