

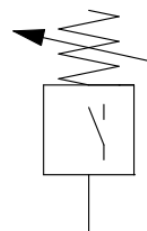


ORIGINAL INSTRUCTIONS



Refer to Declaration of Conformity for relevant Directives

Instruction Manual
Pressure Switch / Micro Switch
Type IS3000



The intended use of this pneumatic pressure switch is to measure, monitor and display the pressure reading for standard and micro loads. It can output a signal when the desired set pressure rise or fall is met.

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/IEC¹⁾, 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.

- 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.

	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.

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

2.1 Specifications

Model	IS3000-02	IS3100	IS3010-02	IS3110
Piping method	Rc1/4 thread	Gasket piping	Rc1/4 thread	Gasket piping
Micro switch type	Standard		Micro load	
Min. applicable load	5 VDC 160 mA		5 VDC 1 mA	
Fluid	Air / Inert gas			
Proof pressure	1.0M Pa			
Max. operating pressure	0.8M Pa			
Max frequency	1 cycle / sec			
Min frequency	1 cycle every 3 days			
Pressure adjustment	0.1 to 0.7 MPa			
Ambient and fluid temp.	-5 to 60 °C			
Contacts	1ab			
Error of scale	±0.1 MPa			
Hysteresis	0.05 MPa or less			
Repeatability	±0.05 MPa			
Enclosure	Equivalent to IP40 (Based on IEC60529)			

2 Specifications - continued

Weight	0.15 kg
Filtration	5 µm
Impact resistance ^{NOTE 1}	1000 m/s ²
Vibration resistance ^{NOTE2}	50 m/s ² (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. Contact SMC for further test details.

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). Contact SMC for further test details.

2.2 Micro Switch Ratings

Model	IS3000 / IS3100								IS3010 / IS3110	
	Non inductive (A)				Inductive load (A)				Non inductive(A)	
Load	Load resistance		Light load		Inductive load		Motor load		Load resistance	
	N.C	N.O	N.C	N.O	N.C	N.O	N.C	N.O	N.C	N.O
Circuit / Rated voltage (V)										
125 AC	5		1.5	0.7	3		2.5	1.3	0.1	
250 AC	3		1	0.5	2		1.5	0.8	-	
30 DC	4		2		3		3		0.1	
125 DC	0.4		0.05		0.4		0.05		-	

- Insulation resistance: 100MQ or more at 500 VDC by megameter
- Voltage resistance: 1500 VAC, Hz for min (when using switch with neon light 1000 VAC for 1 min)

3 Installation

3.1 Installation

Warning

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

Check the product specifications before use.

If the product is used outside of the specifications, it may cause malfunction, failure or damage to the product, leading to an electric shock, explosion or fire.

Use product within operating temperature, humidity and fluid temperature.

Even if within specifications, do not use in location where rapid temperature changes occur or in a location where there is heating/cooling cycles or where there is freezing or condensation. If the product is to be used in low temperature, protection against freezing is necessary.

Use the product within the specified operating pressure range.

Do not apply pressure which exceeds the proof pressure.

Ensure product is used within the power supply specifications.

If the product is used outside of the specifications, malfunction or failure may occur, leading to an electric shock or fire.

Do not use a load exceeding the maximum load voltage or current

3.1.1 Wiring

Warning

- Do not conduct wiring whilst power is ON. It may result in malfunction or failure. Touching the terminal or connector may cause an electric shock.
- Conduct wiring of the microswitch according to the symbols of the terminal. Ensure to remove lock nut. Cover fixing screw and cover before wiring.
- Ensure that internal wiring has no contact with lever and other driving parts. Failing to do so may result in malfunction.
- Since the light emitting diode (LED) is used for the light assembly for 24 VDC, there are 2 terminals and polarity. One is for "+" for red load wire and the other is "-" for black load wire. Light will not light up if wired incorrectly.

3 Installation - continued

- Light assembly for 24 VDC has 3mA of current leakage. Be aware that PLC may operate due to this current leakage. TO avoid this from occurring, connect the LED directly to a 24V power supply as shown in wiring diagram 'Figure 3'.
- Ex. 1) When using contact "a" only or "a&b" contacts

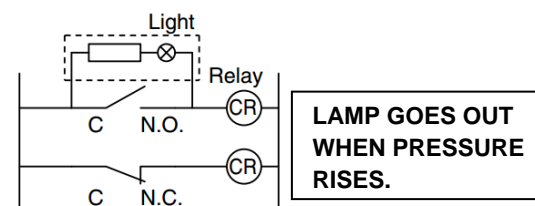


Figure 1

- Ex. 2) When using contact "b" only

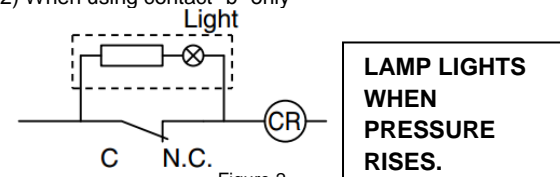


Figure 2

- Ex. 3)

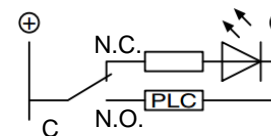


Figure 3

Caution

- In the case of using a switch with indicator light, wire the indicator light as shown.
- Please put the enclosed label of "LAMP LIGHTS WHEN PRESSURE

RISES" or "LAMP GOES OUT WHEN THE PRESSURE RISES" on the equipment where it is easy to see.

- Threads used for terminal is M3.

Warning

Ensure FG terminal is connected to ground when using a commercially available switch-mode power supply.

When a switch-mode power supply is connected to the product, switching noise will be superimposed and the product specification can no longer be met. This can be prevented by inserting a noise filter, such as a line noise filter and ferrite core, between the switch-mode power supply and the product, or by using a series power supply instead of a switch-mode power supply.

Use appropriate countermeasures against surge when using a load which generates a surge voltage. If surge voltages are repeatedly applied it may cause malfunction or failure.

Do not use in an area where surges are generated.

If the product is used in an environment where surges are generated malfunction or failure may occur. Take appropriate measures before using the product.

Avoid repeatedly bending, stretching or applying load to the cable.

Applying repeated bending, tensile stress or load to the cable can damage the wire. Recommended bend radius of the cable is 6 times the outside diameter of the sheath, or 33 times the outside diameter of the insulation material, whichever is larger.

Use appropriate countermeasures against surge when using a load which generates a surge voltage.

Do not use in an area where surges are generated.

If product is used in environment where surges are generated (solenoid lifter, high frequency induction furnace, motor, etc.), malfunction or failure may occur. Take appropriate measures before using the product.

Route wires of product separately from power or high voltage cables.

3 Installation - continued

If wires of product are routed with power or high voltage cables, malfunction or failure may occur due to noise.

Confirm proper insulation of wiring

If there is an insulation failure (short circuits, faulty ground connection, improper insulation between terminals, etc.) malfunction or failure may occur.

Do not use the product in a place where static electricity is a problem.

It may result in system failure or malfunction.

Install the product whilst taking into consideration the internal voltage drop (electrical type only).

Verify the following equation is satisfied after checking the operating voltage of the load: Power supply voltage – Product internal drop voltage > Minimum operating voltage. Even though the product operates normally, if the operating voltage is not satisfied, the load may not operate.

Caution

3.1.2 Mounting:

- Allow space required for maintenance. Otherwise, maintenance or pressure adjustment cannot be made, since adjusting screw is on top of the body.
- Mounting is possible in either horizontal or vertical orientations. If product is not mounted correctly, malfunction, failure or damage may occur.

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. This product is not explosion-proof.
- Do not expose to direct sunlight. Use a suitable protective cover.
- Do not install in a location subject to vibration or impact in excess of the product's specifications. In particular never mount a product in a location used as a foothold.

Do not mount in a location exposed to radiant heat that would result in temperatures in excess of the product's specifications

Applicable fluid is limited to air and inert gas. Other fluids or gases, especially flammable which may lead to an explosion should not be used 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 mount in a location exposed to radiant heat.

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 pressure for the product continuously to operate a switch. If the increasing or decreasing pressure is slow, there will be "stick-slip".

Ensure no foreign matter or condensate get inside the piping of product.

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

Thread	1/8	1/4	3/8	1/2	3/4	1
Tightening Torque [N·m]	7 to 9	12 to 14	22 to 24	28 to 30	28 to 30	36 to 38

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

4.1 Pressure Setting

Caution

- Turn the adjusting screw on the cover to set the pressure with a flat head screwdriver. Fix the screw with a locking nut after adjusting. Hysteresis is a fixed value. Increase the setting value by turning to “+” (H) side. Decrease the setting value by turning to the “-” (L) side.
- Use a flat head screwdriver to set the pressure. Then lock it in place with the lock nut. Otherwise the set pressure will change.
- The hysteresis (the ON-OFF range) is fixed.
- Set pressure scale is the value when pressure increases.

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

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 regular maintenance and confirm normal operation. Ensure to turn off power supply and stop fluid supply before performing.
- Slight scratches or dirt on the display or product body will not cause a problem. Please continue to use the product.
- Maintenance of the IS3000 should be easy if proper mounting installation as advised in section 3.1 is followed. There should be ample space around the terminals to change the wiring if needed.
- Do not use solvents such as benzene, thinner etc. to clean product. They could damage the surface of the body and erase markings on body. Use a soft cloth to remove stains.

Caution

- **Spare part is LIGHT ASSEMBLY only. If it is necessary to repair please contact SMC.**

Light Assembly

For : 110 VAC: 1530118-1 200 VAC: 1530118-2

24 VDC: 1530118-5

Able to convert into L1, L2, L5 by changing each light assembly.

8 Limitations of Use

8.1 Limited warranty and Disclaimer/Compliance Requirements

Refer to Handling Precautions for SMC Products.

Caution

- **Pay attention to the write limit of the input data.**

The input data (the set value, etc.) is written into memory, so if the power supply is cut, the data will not be lost. However there is a limit to the number of write operations.

- **IS3000 is not designed for use in vacuum.**

Do not use under vacuum pressure as the switch may implode.

- **Do not use fluids other than applicable fluids (air or inert gas).**

Never use liquids. Furthermore, do not use flammable or poisonous fluids as an explosion or fire may occur.

9 Contacts

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