



# Operation Manual

PRODUCT NAME

Air catch sensor

MODEL / Series / Product Number

*ISA1#*

**SMC Corporation**

## 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) \*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 10218-1992: Manipulating industrial robots -Safety.
- etc.

 <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**

#### **1. 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.

#### **2. 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.

#### **3. 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.

#### **4. 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, combustion 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 specifications 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.

## **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.

## **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. \*2)  
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.

\*2) Vacuum pads are excluded from this 1 year warranty.

A vacuum pad is a consumable part, so it is warranted for a year after it is delivered.

Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty.

### **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 regulation 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.**

Products that SMC manufactures or sells are not measurement instruments that are qualified by pattern approval tests relating to the measurement laws of each country.  
Therefore, SMC products cannot be used for business or certification ordained by the measurement laws of each country.

# AIRCATCH SENSOR OPERATION MANUAL

Thank you very much for purchasing **SMC** aircatch sensor.  
Please read this operation manual carefully and operate the product correctly.

**SMC CORPORATION** P5025-11

<Precaution> Please be sure to follow cautions for operation since important factors for safety are described in them.

## ⚠ Warnings, Notes, Cautions for Operation

### Operation

- Do not give excessive shock (1000m/s<sup>2</sup>) such as dropping and hitting during operation. Even if switch case is not damaged, the inside may be broken and malfunction may occur.
- Tensile strength of cord is 49N(5kgf). Tensile strength more than that will cause failure. Hold the body for handling.
- Foreign matter should not be allowed to enter the air catch sensor, as it utilizes small-bored orifices. Apply only dried air which has been filtered with 5 μm filter. Periodically drain the filter. Extra attention must be paid in particular to those air catch sensors operated at low temperatures—the drain or other moisture may solidify from freezing.
- Please keep operating pressure at 0.2MPa or less as air catch sensor uses semiconductor pressure sensor.
- Don't use equipments and fitting causing as leakage and resistance between the switch body and detecting nozzle of piping. Piping need to be fully flushed before piping.
- Rapid ON/OFF of supply pressure might turn on output for approximately 0.5sec.

### Operating Environment

- If the air catch sensor is to be operated inside a sealed enclosure, the interior must be at atmospheric pressure.
- This Pressure switch does not have explosion-proof structure. Do not use in the atmosphere of explosive gas because it may bring about explosion accidents.
- Air catch sensor is for IP66. On the occasion when moist and oil might enter the case from exhaust port, please locate the port from away moist and oil by connecting M5 fitting. If the sensor is equipped with a gauge in this case, please remove the gauge and plug it. Otherwise, moist and oil enter to the gauge and might cause malfunction.

When the gauge is mounted outside, please keep the piping as short as possible so as not to slow the response time.

### Wiring

- Connect wire confirming wiring colors and terminal No. with operation manual since wrong wiring causes damage to switch, malfunction and wrong operation.
- If bending stress and tensile stress are applied to lead wire repeatedly, wiring will be disconnected.
- For wiring, insulation failure (using the same wires as other circuit, ground fault, insulation failure between terminals) should be avoided. Too much current is flowed into switch and damage may occur.
- Wiring for switch should be separated from power line. Control circuit including switch may malfunction due to noise.
- Do not short-circuit load. If load has a short-circuit, switch will be broken immediately as excessive load is flowed into switch. Especially, take care for switching of power line (brown) and output line (black, white).

※Be careful that the colors of lead wires have been changed by revision of the IEC standards for wiring. The old wiring colors correspond to the new ones shown in the table below.

	Old colors	New colors
Power supply wire	Red	Brown
GND wire	Black	Blue
Wire for Output 1	White	Black

### Design/Selection

- Operate with proper power supply voltage. If voltage other than The specified one is used, it will cause fire and electric shock.
- Ensure load exceeding max is not to used. load capacity. Switch may be broken or life may end too early.
- Do not use load generating surge voltage. Although surge protection is provided for output of circuit, it may be broken if surge voltage is applied repeatedly. When load, which generates surge, such as relay and solenoid valve is operated directly, use the type built-in surge absorbing element.
- If there are devices which generate strong surge around pressure switch (electromagnetic type lifter, high frequency induction furnace, motor etc.), take measures for devices generating surge and avoid using the same line.
- Be sure to follow setting pressure range and max. operating pressure. Operation out of the pressure range causes failure. If switch is operated at exceeding max. operating pressure, it will be broken.
- Do not use with corrosive and inflammable gas or fluid.
- If the detecting nozzle is exposed to scattering water and machine oil, install the switch at the highest position from the detecting nozzle to prevent reverse flow.

### Maintenance/Check

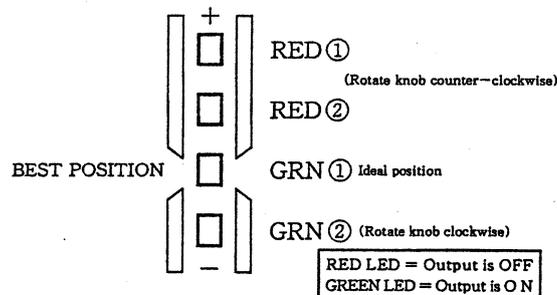
- Perform periodic check to confirm if it operates correctly since safety may not be guaranteed because of unexpected misoperation or mishandling.
- If it is used for interlock circuit, multiply interlock circuit preparing for failure, and perform periodic check to confirm if it operates normally.
- Wipe off dirt with soft cloth. For heavy dirt, wipe with cloth rinsed in neutral detergent diluted with water and squeezed, afterwards then finish with dry cloth.

## 1. Specifications

Fluid	Dried air (filtrated with the filter of 5 μ m)	
Operating press.	0.05MPa~0.2MPa	
Recommended distance range.	0.1MPa~0.2MPa	
Detection distance range.	0.01~0.3mm	
Repeatability incl. temp. characteristic	±0.01mm (0~60℃ when 25℃ is the standard. temp.)	
Hysteresis	0.01mm (Detection distance 0.01~0.15mm)	
Detection nozzle bore size	φ 1 standard	
Indication	Operation lamp; Green lamp at on state	
Power supply voltage	DC12~24V (Ripple ±10%) or less	
Current consumption	≤30mA	
Type of Output	I S A 1 1	NPN Open collector 30V ≤ 80mA
	I S A 1 5	PNP Open collector ≤80mA
Operating temp. range	0~60℃ (No dew formation)	
Vibration resistance	10G	
Proof pressure	0.5MPa	
Proof noise	Direct input 1000Vpp	
	Pulse duration 1 μ s pulse rise 1ns	
Weight	250g (incl. gauge and 5m lead wire)	
Port size	Rc1/8	
Air consumption	16 ℓ /min (@0.10MPa supply pressure)	
	21 ℓ /min (@0.15MPa supply pressure)	
	25 ℓ /min (@0.20MPa supply pressure)	

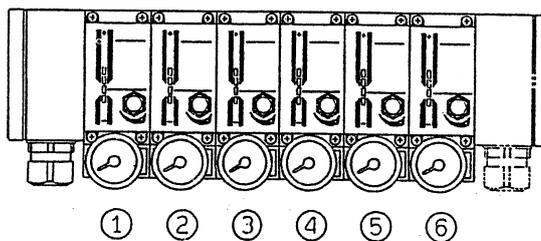
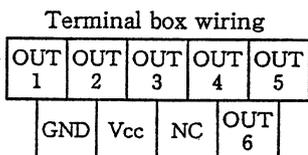
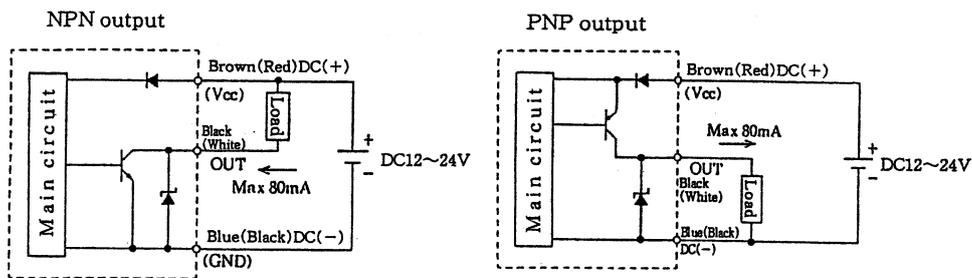
## 2. Setting

View the LED level meter while rotating the calibration knob to adjust the air catch sensor, as detailed below.

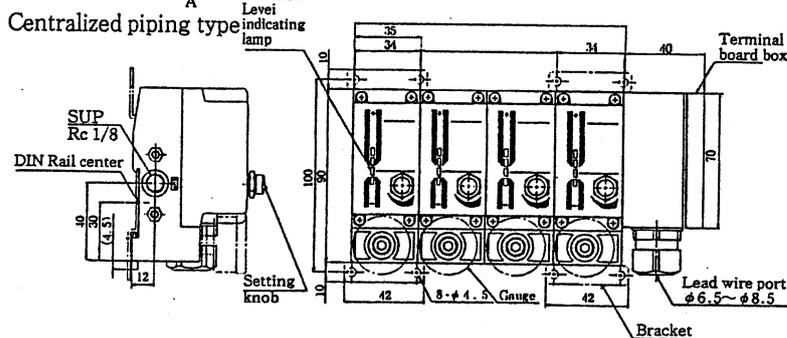
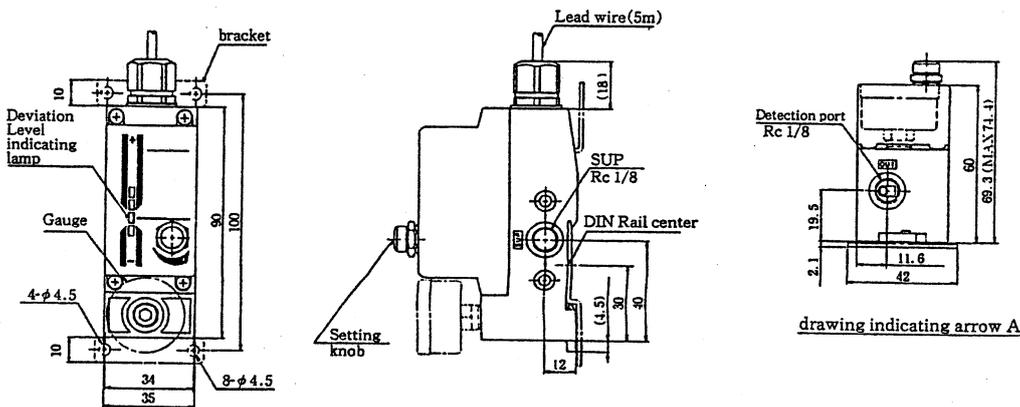


- 1 In order to ensure an accurate calibration, insert feeler gauges between the work and the detect nozzle to simulate the maximum allowable distance between the two.
- 2 Verify the unit is connected to a pneumatic pressure supply. If the calibration knob is fully closed, all LED lamps should be extinguished.
- 3 When turning the calibration knob towards the plus mark (counter-clockwise), the LED lamps will light in the following sequence:  
RED ① → RED ② → GRN ① → GRN ②
- 4 The output turns on when GRN ① illuminates; adjustment is complete once GRN ① has illuminates.
- 5 Place the feeler gauge over the detect nozzle again and verify the GRN ① LED illuminates.
- 6 Hold the calibration knob in the set position with one hand and tighten the locknut with a spanner wrench using the other. Tighten until the calibration knob no longer rotates.

### 3. Wiring

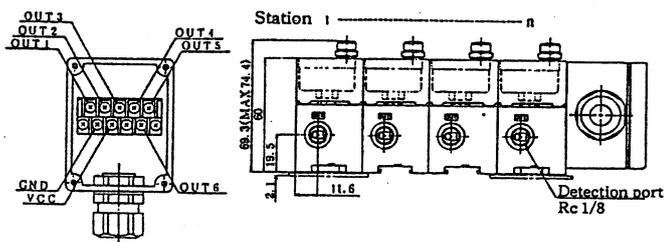


### 4. Outside dimensions Individual piping type



Dimensions

Stations	2	3	4	5	6
L <sub>1</sub>	70	105	140	175	210
L <sub>2</sub>	-	36	71	106	141



Terminal board box wiring diagram

#### Note

- Same dimension as shown here when the terminal box is mounted at the left side of switches.
- When 2-station type is used, the terminal box is mounted on the second switch if it is on the right side, and is mounted on the first switch if it is on the left side.