**General Purpose Pressure Switch**

**Series ISG**

ISG General Purpose Switch is widely used in machine tools, industrial machines, compressors, chemical plants, power plants, machineries for ships, and for automatic pressure control such as hydraulic, water, liquid and atmospheric pressure.

---

### Model/Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>Operating pressure range (MPa)</th>
<th>Hysteresis adjusting range (MPa)</th>
<th>Proof pressure (MPa)</th>
<th>Repeatability (MPa)</th>
<th>Body material in contact with fluid material</th>
<th>Hysteresis scale plate</th>
<th>Electrical entry</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISG110-030</td>
<td>ISG220-030</td>
<td>0.02 to 0.3</td>
<td>0.01 to 0.2</td>
<td>1.0</td>
<td>±0.006</td>
<td>Brass, Phosphor bronze</td>
<td>None</td>
</tr>
<tr>
<td>ISG110-031</td>
<td>ISG221-031</td>
<td>0.02 to 0.35</td>
<td>0.02 to 0.45</td>
<td>1.5</td>
<td>±0.014</td>
<td>Brass, Phosphor bronze</td>
<td>None</td>
</tr>
<tr>
<td>ISG111-030</td>
<td>ISG230-030</td>
<td>0.1 to 1.0</td>
<td>0.03 to 0.4</td>
<td>1.5</td>
<td>±0.02</td>
<td>Stainless steel 316</td>
<td>None</td>
</tr>
<tr>
<td>ISG111-031</td>
<td>ISG231-031</td>
<td>0.03 to 0.4</td>
<td>0.03 to 0.4</td>
<td>1.5</td>
<td>±0.02</td>
<td>Stainless steel 316</td>
<td>None</td>
</tr>
<tr>
<td>ISG120-030</td>
<td>ISG300-030</td>
<td>7 to 53 kPa</td>
<td>0.5</td>
<td>±2 kPa</td>
<td>Brass, Phosphor bronze</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>ISG121-030</td>
<td>ISG310-031</td>
<td>–10 to –100 kPa</td>
<td>0.1 to 1.0</td>
<td>±0.1</td>
<td>Stainless steel 316</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>ISG130-030</td>
<td>ISG320-030</td>
<td>7 to 53 kPa</td>
<td>0.5</td>
<td>±2 kPa</td>
<td>Stainless steel 316</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>ISG131-030</td>
<td>ISG330-031</td>
<td>7 to 53 kPa</td>
<td>0.5</td>
<td>±2 kPa</td>
<td>Stainless steel 316</td>
<td>None</td>
<td>None</td>
</tr>
</tbody>
</table>

 Ambient and fluid temp.: 5 to 80°C (No freezing), Contacts: 1a1b, 2ab (Made to Order), Port size: R 3/8, Weight: 1.3 kg (Open type), 1.5 kg (Dripproof)

* Option

---

### Fluid

Type of operating fluid is limited by the material of wetted parts.

<table>
<thead>
<tr>
<th>Fluid</th>
<th>Body material in contact with fluid material</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bellows</td>
<td>Fluid entering part</td>
</tr>
<tr>
<td>Phosphor bronze</td>
<td>Brass</td>
</tr>
<tr>
<td>Stainless steel 316</td>
<td>Stainless steel 316</td>
</tr>
</tbody>
</table>

Fluids which do not corrode stainless steel 316 e.g. steam (150°C or less) *

* Ambient temperature: 80°C or less.

---

### Contacts

1a1b Snap type (Standard)

<table>
<thead>
<tr>
<th>1a1b Contact</th>
<th>2a2b Contact</th>
<th>1a1b Contact</th>
<th>2a2b Contact</th>
</tr>
</thead>
<tbody>
<tr>
<td>a b</td>
<td>c d</td>
<td>e f</td>
<td>g h</td>
</tr>
</tbody>
</table>

When rising pressure: 1a1b = ON, 1b = OFF

2ab Snap type

<table>
<thead>
<tr>
<th>1ab Contact</th>
<th>2ab Contact</th>
<th>1ab Contact</th>
<th>2ab Contact</th>
</tr>
</thead>
<tbody>
<tr>
<td>1a1b Contact</td>
<td>2a2b Contact</td>
<td>1a1b Contact</td>
<td>2a2b Contact</td>
</tr>
</tbody>
</table>

When rising pressure: 1a1b = ON, 2a2b = ON

---

### Rated Voltage

<table>
<thead>
<tr>
<th>Rated voltage (V)</th>
<th>Non inductive (A)</th>
<th>Inductive load (A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC 110</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>220</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>440</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>550</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>DC 24</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>48</td>
<td>1.5</td>
<td>1.5</td>
</tr>
<tr>
<td>110</td>
<td>0.5</td>
<td>0.5</td>
</tr>
<tr>
<td>220</td>
<td>0.25</td>
<td>0.25</td>
</tr>
</tbody>
</table>

Induction resistance: 100 MΩ or more at 500 VDC by megameter

Voltage resistance: 2000 VAC/1 min.

---

![ISG190](image1.png) ![ISG130](image2.png)

**JIS Symbol**

---

ZSE | ZE3 | PS | ZE2 | ZSP | IS2 | ZSM | PF2 | IF | Data

---

16-9-5
## Construction

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>①</td>
<td>Setting pressure adjusting bolt</td>
</tr>
<tr>
<td>②</td>
<td>Scale plate</td>
</tr>
<tr>
<td>③</td>
<td>Pointer</td>
</tr>
<tr>
<td>④</td>
<td>Setting pressure adjusting spring</td>
</tr>
<tr>
<td>⑤</td>
<td>Main lever</td>
</tr>
<tr>
<td>⑥</td>
<td>Bellows assembly</td>
</tr>
<tr>
<td>⑦</td>
<td>Adjusting bolt</td>
</tr>
<tr>
<td>⑧</td>
<td>Snap switch (1a + 1b type)</td>
</tr>
</tbody>
</table>

## How to Order

![Image of Multi-purpose pressure switch](image-url)

**Enclosure**

- **Open type (Non-waterproof)**
- **Dripproof (Equivalent to IP44)**

**Operating pressure range**

1. 0.02 to 0.3 MPa
2. 0.05 to 0.7 MPa
3. 0.1 to 1.0 MPa
4. –10 to –100 kPa

**Material**

- Copper alloy
- Stainless steel 316

## Component Parts

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>①</td>
<td>Setting pressure adjusting bolt</td>
</tr>
<tr>
<td>②</td>
<td>Scale plate</td>
</tr>
<tr>
<td>③</td>
<td>Pointer</td>
</tr>
<tr>
<td>④</td>
<td>Setting pressure adjusting spring</td>
</tr>
<tr>
<td>⑤</td>
<td>Main lever</td>
</tr>
<tr>
<td>⑥</td>
<td>Bellows assembly</td>
</tr>
<tr>
<td>⑦</td>
<td>Adjusting bolt</td>
</tr>
<tr>
<td>⑧</td>
<td>Snap switch (1a + 1b type)</td>
</tr>
</tbody>
</table>

## Precautions

**Selection**

1. Select the model taking into consideration the material suitable for the operating fluid. Type of operating fluid is limited by the material of wetted parts. Please contact SMC for materials not specified.

**Warning**

1. Do not have the internal wiring attached to the connection lever for switch operation. It may malfunction.

**Caution**

1. The grommet size of open type switch is ø17. It is possible to connect the electric piping 1/2B without grommet.
2. Max. diameter of an electric cord usable for bulb gland is shown as below.

<table>
<thead>
<tr>
<th>Cable gland</th>
<th>Max. diameter of an electric cord</th>
</tr>
</thead>
<tbody>
<tr>
<td>20a</td>
<td>ø 12</td>
</tr>
<tr>
<td>20b</td>
<td>ø 13</td>
</tr>
<tr>
<td>20c</td>
<td>ø 15</td>
</tr>
</tbody>
</table>
3. Terminal thread type is M4.

**Mounting/Piping**

1. Mounting is possible in either horizontal or vertical orientations.

**Pressure Source**

**Warning**

1. In the case of using switch in any liquid, install a water hammer or surge reducer to prevent the damage to switch caused by surges or pulsation pressure.

**Pressure Setting**

1. Set the pressure by adjusting the setting pressure adjusting bolt to the right to increase and to the left to decrease.
2. Adjust the hysteresis with hysteresis adjusting bolt. In case of switch with scale plate, adjust the hysteresis with a flat head screwdriver tightening the adjusting bolt in the thread cap. Turn to the right to increase and to the left to decrease.
3. Hysteresis must be within the specified range in this catalog, operation may be unstable when activated out of the specified range.
4. Scale plate is only for reference. Use the gauge to get the correct pressure value.
5. Set pressure scale at the value of the pressure increase.

## Operating Environment

1. Never use in an environment, where flammable fluids or gases are used. Since this product is not explosion-proof and may trigger an explosive disaster.

## Operating Pressure Range

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>①</td>
<td>Setting pressure adjusting bolt</td>
</tr>
<tr>
<td>②</td>
<td>Scale plate</td>
</tr>
<tr>
<td>③</td>
<td>Pointer</td>
</tr>
<tr>
<td>④</td>
<td>Setting pressure adjusting spring</td>
</tr>
<tr>
<td>⑤</td>
<td>Main lever</td>
</tr>
<tr>
<td>⑥</td>
<td>Bellows assembly</td>
</tr>
<tr>
<td>⑦</td>
<td>Adjusting bolt</td>
</tr>
<tr>
<td>⑧</td>
<td>Snap switch (1a + 1b type)</td>
</tr>
</tbody>
</table>

## Notes

- Material: Copper alloy
- Stainless steel 316

## Other

1. Bellows assembly is available for maintenance. When replacing other parts, please contact SMC, since it cannot be repaired by user.

Order Bellows assembly with the part number as follows:

- Bellows assembly for ISG-□□□□
- (No other part numbers exist.)
- Ex.) Bellows assembly for ISG 110-030
General Purpose Pressure Switch  Series ISG

Dimensions

**Open type**
ISG110 to 191-030 (Without hysteresis scale plate)  ISG110 to 131-031 (With hysteresis scale plate)

**Driproof type**
ISG210 to 291-030 (Without hysteresis scale plate)  ISG210 to 231-031 (With hysteresis scale plate)
Safety Instructions

These safety instructions are intended to prevent a hazardous situation and/or equipment damage. These instructions indicate the level of potential hazard by labels of "Caution", "Warning" or "Danger". To ensure safety, be sure to observe ISO 4414 Note 1), JIS B 8370 Note 2) and other safety practices.

⚠️ Caution : Operator error could result in injury or equipment damage.

⚠️ Warning : Operator error could result in serious injury or loss of life.

⚠️ Danger : in extreme conditions, there is a possible result of serious injury or loss of life.

---

1. 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 are used in various operating conditions, their compatibility for the specific pneumatic system must be based on specifications or after analysis and/or tests to meet your specific requirements. The expected performance and safety assurance will be the responsibility of the person who has determined the compatibility of the system. This person should continuously review the suitability of all items specified, referring to the latest catalog information with a view to giving due consideration to any possibility of equipment failure when configuring a system.

2. 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 operators.

3. 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 once measures to prevent falling or runaway of the driver objects have been confirmed.
2. When equipment is to be removed, confirm the safety process as mentioned above. Cut the supply pressure for this equipment and exhaust all residual compressed air in the system.
3. Before machinery/equipment is restarted, take measures to prevent shooting-out of cylinder piston rod, etc.

4. Contact SMC if the product is to be used in any of the following conditions:

1. Conditions and environments beyond the given specifications, or if product is used outdoors.
2. Installation on equipment in conjunction with atomic energy, railway, air navigation, vehicles, medical equipment, food and beverages, recreation equipment, emergency stop circuits, clutch and brake circuits in press applications, or safety equipment.
3. An application which has the possibility of having negative effects on people, property, or animals, requiring special safety analysis.
Common Precautions
Be sure to read before handling.
For detailed precautions on every series, refer to main text.

Selection

⚠️ Warning
1. Confirm the specifications.
   Products represented in this catalog are designed for use in compressed air applications only (including vacuum), unless otherwise indicated.
   Do not use the product outside their design parameters.
   Please contact SMC when using the products in applications other than compressed air (including vacuum).

Mounting

⚠️ Warning
1. Instruction manual
   Install the products and operate them only after reading the instruction manual carefully and understanding its contents.
   Also keep the manual where it can be referred to as necessary.
2. Securing the space for maintenance
   When installing the products, please allow access for maintenance.
3. Tightening torque
   When installing the products, please follow the listed torque specifications.

Piping

⚠️ Caution
1. Before piping
   Make sure that all debris, cutting oil, dust, etc, are removed from the piping.
2. Wrapping of pipe tape
   When screwing piping or fittings into ports, ensure that chips from the pipe threads or sealing material do not get inside the piping. Also, when the pipe tape is used, leave 1.5 to 2 thread ridges exposed at the end of the threads.

Air Supply

⚠️ Warning
1. Operating fluid
   Please consult with SMC when using the product in applications other than compressed air (including vacuum).
   Regarding products for general fluid, please ask SMC about applicable fluids.
2. Install an air dryer, aftercooler, etc.
   Excessive condensate in a compressed air system may cause valves and other pneumatic equipment to malfunction.
   Installation of an air dryer, after cooler etc. is recommended.
3. Drain flushing
   If condensate in the drain bowl is not emptied on a regular basis, the bowl will over flow and allow the condensate to enter the compressed air lines.
   If the drain bowl is difficult to check and remove, it is recommended that a drain bowl with the auto-drain option be installed.
   For compressed air quality, refer to “Air Preparation Equipment” catalog.

4. Use clean air
   If the compressed air supply is contaminated with chemicals, synthetic materials, corrosive gas, etc., it may lead to break down or malfunction.

Operating Environment

⚠️ Warning
1. Do not use in environments where the product is directly exposed to corrosive gases, chemicals, salt water, water or steam.
2. Do not expose the product to direct sunlight for an extended period of time.
3. Do not use in a place subject to heavy vibrations and/or shocks.
4. Do not mount the product in locations where it is exposed to radiant heat.

Maintenance

⚠️ Warning
1. Maintenance procedures are outlined in the operation manual.
   Not following proper procedures could cause the product to malfunction and could lead to damage to the equipment or machine.
2. Maintenance work
   If handled improperly, compressed air can be dangerous.
   Assembly, handling and repair of pneumatic systems should be performed by qualified personnel only.
3. Drain flushing
   Remove drainage from air filters regularly. (Refer to the specifications.)
4. Shut-down before maintenance
   Before attempting any kind of maintenance make sure the supply pressure is shut of and all residual air pressure is released from the system to be worked on.
5. Start-up after maintenance and inspection
   Apply operating pressure and power to the equipment and check for proper operation and possible air leaks. If operation is abnormal, please verify product set-up parameters.
6. Do not make any modifications to be product.
   Do not take the product apart.
Quality Assurance Information (ISO 9001, ISO 14001)

Reliable quality of products in the global market

To enable our customers throughout the world to use our products with even greater confidence, SMC has obtained certification for international standards “ISO 9001” and “ISO 14001”, and created a complete structure for quality assurance and environmental controls. SMC products pursue to meet its customers’ expectations while also considering company’s contribution in society.

Quality management system
ISO 9001
This is an international standard for quality control and quality assurance. SMC has obtained a large number of certifications in Japan and overseas, providing assurance to our customers throughout the world.

Environmental management system
ISO 14001
This is an international standard related to environmental management systems and environmental inspections. While promoting environmentally friendly automation technology, SMC is also making diligent efforts to preserve the environment.
The CE mark indicates that machines and components meet essential requirements of all the EC Directives applied. It has been obligatory to apply CE marks indicating conformity with EC Directives when machines and components are exported to the member Nations of the EU. Once “A manufacturer himself” declares a product to be safe by means of CE marking (declaration of conformity by manufacturer), free distribution inside the member Nations of the EU is permissible.

- **CE Mark**
  SMC provides CE marking to products to which EMC and Low Voltage Directives have been applied, in accordance with CETOP (European hydraulics and pneumatics committee) guide lines.

- **As of February 1998, the following 18 countries will be obliged to conform to CE mark legislation**
  Iceland, Ireland, United Kingdom, Italy, Austria, Netherlands, Greece, Liechtenstein, Sweden, Spain, Denmark, Germany, Norway, Finland, France, Belgium, Portugal, Luxembourg

- **EC Directives and Pneumatic Components**
  - **Machinery Directive**
    The Machinery Directive contains essential health and safety requirements for machinery, as applied to industrial machines e.g. machine tools, injection molding machines and automatic machines. Pneumatic equipment is not specified in Machinery Directive. However, the use of SMC products that are certified as conforming to EN Standards, allows customers to simplify preparation work of the Technical Construction File required for a Declaration of Conformity.

  - **Electromagnetic Compatibility (EMC) Directive**
    The EMC Directive specifies electromagnetic compatibility. Equipment which may generate electromagnetic interference or whose function may be compromised by electromagnetic interference is required to be immune to electromagnetic affects (EMS/immunity) without emitting excessive electromagnetic affects (EMI/emission).

  - **Low Voltage Directive**
    This directive is applied to products, which operate above 50 VAC to 1000 VAC and 75 VDC to 1500 VDC operating voltage, and require electrical safety measures to be introduced.

  - **Simple Pressure Vessels Directive**
    This directive is applied to welded vessels whose maximum operating pressure (PS) and volume of vessel (V) exceed 50 bar/L. Such vessels require EC type examination and then CE marking.
national Standards

you to comply with EC directives and CSA/UL standards.

CSA Standards & UL Standards
UL and CSA standards have been applied in North America (U.S.A. and Canada) symbolizing safety of electric products, and are defined to mainly prevent danger from electric shock or fire, resulting from trouble with electric products. Both UL and CSA standards are acknowledged in North America as the first class certifying body. They have a long experience and ability for issuing product safety certificate. Products approved by CSA or UL standards are accepted in most states and governments beyond question. Since CSA is a test certifying body as the National Recognized Testing Laboratory (NRTL) within the jurisdiction of Occupational Safety and Health Administration (OSHA), SMC was tested for compliance with CSA Standards and UL Standards at the same time and was approved for compliance with the two Standards. The above CSA NRTL/C logo is described on a product label in order to indicate that the product is approved by CSA and UL Standards.

TSSA (MCCR) Registration Products
TSSA is the regulation in Ontario State, Canada. The products that the operating pressure is more than 5 psi (0.03 MPa) and the piping size is bigger than 1 inch. fall into the scope of TSSA regulation.

Products conforming to CE Standard
In this catalog each accredited product series is indicated with a CE mark symbol. However, in some cases, every available models may not meet CE compliance. Please visit our web site for the latest selection of available models with CE mark.

http://www.smcworld.com