2-Color Display
High-Precision Digital Pressure Switch

Settings can be copied to up to 10 slave sensors at once.
The settings of the master sensor can be copied to the slave sensors.
- Reduced setting efforts
- Reduced chance of set-value input error

3-step setting
1. Push
2. Adjust to set-value with buttons
3. Finish setting

Added vacuum range.
- Rated pressure range: 0.0 to –101.0 kPa

Expanded pressure range for positive-pressure type to the vacuum range.
- Rated pressure range: –0.100 to 1.000 MPa

2 added outputs
- NPN or PNP open collector 2 outputs
- NPN or PNP open collector 1 output + Analog output (1 to 5 V or 4 to 20 mA)

Series ZSE30A(F)/ISE30A

RoHS compliant

CAT.ES100-70B
**Mounting**
Bracket configuration allows mounting in four orientations.

- Bracket A
- Bracket B
- Bracket C

**Lead wire**
Added the connector cover.

**Series**

<table>
<thead>
<tr>
<th>Series</th>
<th>ZSE30A (vacuum)</th>
<th>ZSE30AF (compound)</th>
<th>ISE30A (positive)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated pressure range</td>
<td>0.0 to –101.0 kPa</td>
<td>–100.0 to 100.0 kPa</td>
<td>1.0 MPa</td>
</tr>
<tr>
<td>Set pressure range</td>
<td>10.0 to –105.0 kPa</td>
<td>–105.0 to 105.0 kPa</td>
<td>–0.105 to 1.050 MPa</td>
</tr>
<tr>
<td>Withstand pressure</td>
<td>500 kPa</td>
<td>500 kPa</td>
<td>1.5 MPa</td>
</tr>
<tr>
<td>Minimum unit setting</td>
<td>0.1 kPa</td>
<td>0.1 kPa</td>
<td>0.001 MPa</td>
</tr>
</tbody>
</table>

**Features 1**
- One-touch fitting
- Bracket configuration allows mounting in four orientations.
- Panel mount: Mountable side by side without clearance.
- Additional functions:
  - Secret code setting function: The key locking function keeps unauthorized persons from tampering with buttons.
  - Power-saving function: Power consumption is reduced by turning off the monitor. (Reduce power consumption by up to 20%.)
  - Resolution-switch function: It reduces the monitor to flicker.
  - MPa/kPa switch function: Vacuum, compound and/or positive pressure can be displayed in MPa or kPa.
2-Color Display High-Precision Digital Pressure Switch

Series ZSE30A(F)/ISE30A

How to Order

Output
- N: NPN open collector 1 output
- P: PNP open collector 1 output
- A: NPN open collector 2 outputs
- B: PNP open collector 2 outputs
- C+: NPN open collector 1 output + Analog voltage output
- D+: NPN open collector 1 output + Analog current output
- E+: PNP open collector 1 output + Analog voltage output
- F+: PNP open collector 1 output + Analog current output

Rated pressure range
- ISE30A: -0.1 to 1 MPa
- ZSE30A: 0 to –101 kPa
- ZSE30AF: -100 to 100 kPa

Option 1
- Display unit
  - Nil: Without unit display
  - M: Fixed SI unit
  - P: With unit display (Initial value psi)

Option 2
- Bracket
  - A1
  - A2
  - A3

Option 3
- Symbol
- Operating manual
- Calibration certificate

Piping
- Straight type
- Elbow type

Display unit
- Nil: Without lead wire
- L: Lead wire with connector (Lead wire length 2 m)
- G: Lead wire with connector (Lead wire length 2 m) + Connector cover

Option 3
- Symbol
- Operating manual
- Calibration certificate

Note 1) Under the New Measurement Law, sales of switches with the unit switching function have not been allowed for use in Japan.

Note 2) Fixed unit kPa, MPa

Note) For output types N and P, the number of core of lead wires will be 3, and for other types, it will be 4.

Option 3
- X510: For M12 4-pin pre-wired connector

Note) Available only for output “A” or “B”.

* Made to Order

For positive pressure

For vacuum/compound pressure

Rated pressure range
- ISE30A: -0.1 to 1 MPa
- ZSE30A: 0 to –101 kPa
- ZSE30AF: -100 to 100 kPa

Piping
- R1/8 (M5 female threaded)
- NPT1/8 (M5 female threaded)
- One-touch fitting ø4 mm, ø5/32 inch
- One-touch fitting ø6 mm
- One-touch fitting ø1/4 inch
- One-touch fitting ø4 mm, ø5/32 inch
- One-touch fitting ø6 mm
- One-touch fitting ø1/4 inch

Display unit
- Nil: Without unit display
- M: Fixed SI unit
- P: With unit display (Initial value psi)

Option 1
- Display unit
- Nil: Without unit display
- M: Fixed SI unit
- P: With unit display (Initial value psi)

Option 2
- Bracket
- A1
- A2
- A3

Option 3
- Symbol
- Operating manual
- Calibration certificate

Piping
- Straight type
- Elbow type

Display unit
- Nil: Without lead wire
- L: Lead wire with connector (Lead wire length 2 m)
- G: Lead wire with connector (Lead wire length 2 m) + Connector cover

Option 3
- Symbol
- Operating manual
- Calibration certificate

Note 1) Under the New Measurement Law, sales of switches with the unit switching function have not been allowed for use in Japan.

Note 2) Fixed unit kPa, MPa

Note) For output types N and P, the number of core of lead wires will be 3, and for other types, it will be 4.

* Made to Order
## Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>ZSE30A (Vacuum pressure)</th>
<th>ZSE30AF (Compound pressure)</th>
<th>ISE30A (Positive pressure)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated pressure range</td>
<td>0.0 to –101.0 kPa</td>
<td>–100.0 to 100.0 kPa</td>
<td>–0.100 to 1.000 MPa</td>
</tr>
<tr>
<td>Set pressure range</td>
<td>10.0 to –105.0 kPa</td>
<td>–105.0 to 105.0 kPa</td>
<td>–0.105 to 1.050 MPa</td>
</tr>
<tr>
<td>Withstand pressure</td>
<td>500 kPa</td>
<td>500 kPa</td>
<td>1.5 MPa</td>
</tr>
<tr>
<td>Minimum unit setting</td>
<td>0.1 kPa</td>
<td>0.1 kPa</td>
<td>0.001 MPa</td>
</tr>
<tr>
<td>Applicable fluid</td>
<td>Air, Non-corrosive gas, Non-flammable gas</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power supply voltage</td>
<td>12 to 24 VDC ±10%, Ripple (p-p) 10% or less (with power supply polarity protection)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current consumption</td>
<td>40 mA or less</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Switch output</td>
<td>NPN or PNP open collector 1 output, NPN or PNP open collector 2 outputs (selectable)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum load current</td>
<td>80 mA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum applied voltage</td>
<td>28 V (at NPN output)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Residual voltage</td>
<td>1 V or less (with load current of 80 mA)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Response time</td>
<td>2.5 ms or less (with anti-chattering function: 20, 100, 500, 1000, 2000 ms)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Short circuit protection</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Repeatability</td>
<td>±0.2% F.S. ±1 digit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hysteresis</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Voltage output</td>
<td>1 to 5V ±2.5% F.S.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current output</td>
<td>±1% F.S. or less</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Output impedance</td>
<td>Approx. 1 kΩ</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current output (Rated pressure range)</td>
<td>4 to 20 mA ±2.5% F.S.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Load impedance</td>
<td>±1% F.S. or less</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum load impedance: Power supply voltage 12 V: 300 Ω, Power supply voltage 24 V: 600 Ω</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Display</td>
<td>4-digit, 7-segment, 2-color LCD (Red/Green)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Display accuracy</td>
<td>±2% F.S. ±1 digit (Ambient temperature of 25 °C)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indicator light</td>
<td>Lights up when switch output is turned ON. OUT1: Green, OUT2: Red</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enclosure</td>
<td>IP40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating temperature range</td>
<td>Operating: 0 to 50 °C, Stored: –10 to 60 °C (No freezing or condensation)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating humidity range</td>
<td>Operating/Store: 35 to 85% RH (No condensation)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Withstand voltage</td>
<td>1000 VAC for 1 minute between live parts and case</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Insulation resistance</td>
<td>50 MΩ or more between live parts and case (at 500 VDC Mega)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vibration resistance</td>
<td>10 to 150 Hz at whichever is smaller of 1.5 mm amplitude or 20 m/s² acceleration, in X, Y, Z directions, for 2 hours each (Non-energized)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Impact resistance</td>
<td>100 m/s² in X, Y, Z directions, 3 times each (Non-energized)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Temperature characteristics</td>
<td>±2% F.S. (Based on 25°C)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lead wire</td>
<td>Oilproof heavy-duty vinyl cable, 3 cores ø3.5, 2 m</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Standards</td>
<td>CE Marking, UL/CSA, RoHS compliance</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note 1) If applied pressure fluctuates near the set value, set the hysteresis above the fluctuation range to prevent chattering.

Note 2) When analog voltage output is selected, analog current output cannot be used together.

Note 3) When analog current output is selected, analog voltage output cannot be used together.

### Piping Specifications

<table>
<thead>
<tr>
<th>Port size</th>
<th>01</th>
<th>N01</th>
<th>C4H</th>
<th>C6H</th>
<th>N7H</th>
<th>C4L</th>
<th>C6L</th>
<th>N7L</th>
</tr>
</thead>
<tbody>
<tr>
<td>One-touch fitting, Straight type</td>
<td>—</td>
<td>—</td>
<td>ø4 mm</td>
<td>ø6 mm</td>
<td>ø1/4 inch</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>One-touch fitting, Elbow type</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Wetted parts material</td>
<td>Sensor pressure receiving area: Silicon</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Weight</th>
<th>Including lead wire with connector (3 cores, 2 m)</th>
<th>81 g</th>
<th>70 g</th>
<th>71 g</th>
<th>73 g</th>
<th>75 g</th>
<th>73 g</th>
<th>75 g</th>
</tr>
</thead>
<tbody>
<tr>
<td>Including lead wire with connector (4 cores, 2 m)</td>
<td>85 g</td>
<td>74 g</td>
<td>75 g</td>
<td>77 g</td>
<td>79 g</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Excluding lead wire with connector</td>
<td>43 g</td>
<td>43 g</td>
<td>35 g</td>
<td>35 g</td>
<td>37 g</td>
<td>35 g</td>
<td>37 g</td>
<td></td>
</tr>
</tbody>
</table>

### Optional Part No.

When optional parts are required separately, use the following part numbers to place an order.

<table>
<thead>
<tr>
<th>Part no.</th>
<th>Option</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZS-38-A1</td>
<td>Bracket A</td>
<td>Mounting screw (with 2 pcs. of M4 x 3L)</td>
</tr>
<tr>
<td>ZS-38-A2</td>
<td>Bracket B</td>
<td>Mounting screw (with 2 pcs. of M4 x 3L)</td>
</tr>
<tr>
<td>ZS-38-A3</td>
<td>Bracket C</td>
<td>Mounting screw (with 2 pcs. of M4 x 3L)</td>
</tr>
<tr>
<td>ZS-38-C8</td>
<td>Panel mount adapter</td>
<td>Mounting screw (with 2 pcs. of M4 x 3L)</td>
</tr>
<tr>
<td>ZS-38-C7</td>
<td>Panel mount adapter + Front protection cover</td>
<td>Mounting screw (with 2 pcs. of M4 x 3L)</td>
</tr>
<tr>
<td>ZS-37-01</td>
<td>Front protection cover</td>
<td>Mounting screw (with 2 pcs. of M4 x 3L)</td>
</tr>
<tr>
<td>ZS-38-3L</td>
<td>Lead wire with connector</td>
<td>3 cores, for 1 output, 2 m</td>
</tr>
<tr>
<td>ZS-38-4L</td>
<td>Lead wire with connector</td>
<td>4 cores, for 2 outputs, 2 m</td>
</tr>
<tr>
<td>ZS-38-3G</td>
<td>Lead wire with connector (with connector cover)</td>
<td>3 cores, for 1 output, 2 m</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Part no.</th>
<th>Option</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZS-38-4G</td>
<td>Lead wire with connector (with connector cover)</td>
<td>4 cores, for 2 outputs, 2 m</td>
</tr>
<tr>
<td>ZS-38-5L</td>
<td>Lead wire with a connector for copying</td>
<td>3 cores, copy function 1 m</td>
</tr>
<tr>
<td>ZS-38-U</td>
<td>Lead wire with a connector for copying</td>
<td>3 cores, copy function (up to 10 slaves)</td>
</tr>
<tr>
<td>ZS-38-C4H</td>
<td>One-touch fittings ø4 mm straight</td>
<td>0-ring, one-touch clip included</td>
</tr>
<tr>
<td>ZS-38-C6H</td>
<td>One-touch fittings ø6 mm straight</td>
<td>0-ring, one-touch clip included</td>
</tr>
<tr>
<td>ZS-38-C6L</td>
<td>One-touch fittings ø6 mm elbow</td>
<td>0-ring, one-touch clip included</td>
</tr>
<tr>
<td>ZS-38-N7L</td>
<td>One-touch fittings ø1/4 inch elbow</td>
<td>0-ring, one-touch clip included</td>
</tr>
</tbody>
</table>
**Analog Output**

<table>
<thead>
<tr>
<th>Voltage output</th>
<th>Current output</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analog output [V]</td>
<td>Analog output [mA]</td>
</tr>
<tr>
<td>AB</td>
<td>C</td>
</tr>
<tr>
<td>0.6</td>
<td>5</td>
</tr>
</tbody>
</table>

### Descriptions

**Unit display**
Displays present unit (only for units of kPa and MPa).

**Output (OUT1) display (Green)**
Lights up when switch output (OUT1) is turned ON.

**△ button (UP)**
Use this button to select the mode or increase the ON/OFF set-value.
It is also used for switching to the peak display mode.

**S button (SET)**
Use this button to change the mode or confirm the set-value.

**LCD**
Displays the current pressure, set mode, and error code. Always use red or green display; or switch between green and red according to the output. Four different display settings are available.

**Output (OUT2) display (Red)**
Lights up when switch output (OUT2) is turned ON.

**▽ button (DOWN)**
Use this button to select the mode or decrease the ON/OFF set-value.
It is also used for switching to the bottom display mode.

### Functions (Refer to pages 10 and 11 for details.)

<table>
<thead>
<tr>
<th>Function</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Copy function</td>
<td>Copies the settings of the master sensor to the slave sensors.</td>
</tr>
<tr>
<td>Auto-preset function</td>
<td>Calculates and enters rough set values automatically from the actual operating conditions.</td>
</tr>
<tr>
<td>Precision indicator setting function</td>
<td>Evens out deviations in the displayed value.</td>
</tr>
<tr>
<td>Peak display function</td>
<td>Can retain the maximum pressure value displayed during measurement.</td>
</tr>
<tr>
<td>Bottom display function</td>
<td>Can retain the minimum pressure value displayed during measurement.</td>
</tr>
<tr>
<td>Key lock function (Security code input can be selected.)</td>
<td>The key board can be locked to prevent any incorrect function of the operation switch.</td>
</tr>
<tr>
<td>Zero-out function</td>
<td>The pressure display can be set at zero when the pressure is open to the atmosphere.</td>
</tr>
<tr>
<td>Anti-chattering function</td>
<td>Prevents possible malfunction due to sudden fluctuations in the primary pressure by adjusting the response time.</td>
</tr>
<tr>
<td>Unit display switching function</td>
<td>Can convert the display value.</td>
</tr>
<tr>
<td>Power-saving mode</td>
<td>Reduces power consumption.</td>
</tr>
<tr>
<td>Display resolution-switch function</td>
<td>Converts display resolution from the normal value of 1/1000 to 1/100. It reduces the monitor to flicker.</td>
</tr>
<tr>
<td>kPa⇔MPa switch function</td>
<td>Converts the unit between kPa and MPa.</td>
</tr>
</tbody>
</table>

### Analog Output

<table>
<thead>
<tr>
<th>Range</th>
<th>Rated pressure range</th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>For vacuum pressure</td>
<td>0.0 to –101.0 kPa</td>
<td>—</td>
<td>0</td>
<td>–101 kPa</td>
</tr>
<tr>
<td>For compound pressure</td>
<td>–100.0 to 100.0 kPa</td>
<td>—</td>
<td>–100 kPa</td>
<td>100 kPa</td>
</tr>
<tr>
<td>For positive pressure</td>
<td>–0.100 to 1.000 MPa</td>
<td>–0.1 MPa</td>
<td>0</td>
<td>1 MPa</td>
</tr>
</tbody>
</table>

---

**2-Color Display**

**High-Precision Digital Pressure Switch**

**Series ZSE30A(F)/ISE30A**
Internal Circuits and Wiring Examples

**Z/ISE30A(F)**

- **N**
  - NPN (1 output)
  - Diagram showing connection with 12 to 24 VDC, Max. 28 V, 80 mA, Residual voltage 1 V or less

- **P**
  - PNP (1 output)
  - Diagram showing connection with 12 to 24 VDC, Max. 80 mA, Residual voltage 1 V or less

- **A**
  - NPN (2 outputs)
  - Diagram showing connection with 12 to 24 VDC, Max. 28 V, 80 mA, Residual voltage 1 V or less

- **B**
  - PNP (2 outputs)
  - Diagram showing connection with 12 to 24 VDC, Max. 80 mA, Residual voltage 1 V or less

* The FUNC terminal is connected using a dedicated lead wire (ZS-38-5L or ZS-38-U) when the copy function is used. (Refer to “Copy function” on page 10.)
C  NPN (1 output) + Analog voltage output

Max. 28 V, 80 mA
Residual voltage 1 V or less
Analog voltage output
Output impedance: Approx. 1 kΩ

D  NPN (1 output) + Analog current output

Max. 28 V, 80 mA
Residual voltage 1 V or less
Analog current output
Max. load impedance:
Power supply voltage 12 V: 300 Ω
Power supply voltage 24 V: 600 Ω
Min. load impedance: 50 Ω

E  PNP (1 output) + Analog voltage output

Max. 80 mA
Residual voltage 1 V or less
Analog voltage output
Output impedance: Approx. 1 kΩ

F  PNP (1 output) + Analog current output

Max. 80 mA
Residual voltage 1 V or less
Analog current output
Max. load impedance:
Power supply voltage 12 V: 300 Ω
Power supply voltage 24 V: 600 Ω
Min. load impedance: 50 Ω

* The FUNC terminal is connected using a dedicated lead wire (ZS-38-5L or ZS-38-U) when the copy function is used. (Refer to “Copy function” on page 10.)
Series ZSE30A(F)/ISE30A

Dimensions

Z/ISE30A(F) – □ – □

Piping

01 / N01

C4H
One-touch fitting ø4 mm
Ø5/32 inch straight

C6H
One-touch fitting ø6 mm
Straight

N7H
One-touch fitting ø1/4 inch
Straight

C4L
One-touch fitting ø4 mm
Ø5/32 inch elbow

C6L
One-touch fitting ø6 mm
Elbow

N7L
One-touch fitting ø1/4 inch
Elbow

---

01: R1/8
N01: NPT1/8
2-Color Display
High-Precision Digital Pressure Switch Series ZSE30A(F)/ISE30A

With bracket
Z/ISE30A(F) – □ – □ – □ – □ – □

Option 2

A1
Bracket A
(Option unit part no.: ZS-38-A1)

A2
Bracket B
(Option unit part no.: ZS-38-A2)

A3
Bracket C
(Option unit part no.: ZS-38-A3)

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>41.4</td>
<td>16.4</td>
</tr>
<tr>
<td>C</td>
<td>53</td>
<td>28</td>
</tr>
</tbody>
</table>

* Bracket configuration allows mounting in four orientations.
Series ZSE30A(F)/ISE30A

Dimensions

Panel mount
Z/ISE30A(F) – □□□□□□□

Option 2

Panel mount adapter
(Optional unit part no.: ZS-27-C)

Panel mount adapter + Front protection cover
(Optional unit part no.: ZS-27-D)
Panel-cut dimensions

1 pc. mounting

Multiple (2 pcs. or more) horizontal mounting

Multiple (2 pcs. or more) vertical mounting

2-Color Display

High-Precision Digital Pressure Switch

Series ZSE30A(F)/ISE30A
**A Copy function (F97)**

The settings of the master sensor can be copied to the slave sensors. It is to reduce the time taken for setting and prevent the input of wrong values.

**Settings can be copied to up to 10 slave sensors at once.**
(Max. transmission distance: 4 m)

1) The sensors are connected by a dedicated lead wire (ZS-38-5L for master and one slave) or ZS-38-U (for master and up to 10 slaves). Copying is performed through a dedicated communication line.
2) Make the slave sensor which needs to be the master into the master by button operation. (Initially all sensors are set as slaves.)
3) Press the button on the master sensor to start copying.

**B Auto-preset function (F5)**

Auto-preset function, when selected in the setting, calculates and stores the set-value from the measured pressure. The optimum set-value is determined automatically by repeating vacuum and break with the target workpiece several times.

**C Precision indicator setting function (F6)**

Fine adjustment of the indicated value of the pressure sensor can be made within the range of ±5% of the read value. The scattering of the indicated value can be eliminated.

**D Peak and bottom display function**

This function constantly detects and updates the maximum (minimum) value and allows to hold the maximum (minimum) pressure value. When the buttons are simultaneously pressed for 1 second or longer, while “holding”, the held value will be reset.

**E Key lock function**

This function prevents incorrect operations such as accidentally changing the set-value.

**F Zero-out function**

This function clears and resets the zero value on the display of the measured pressure. For the pressure switch with analog output, the analog output shifts according to the indication. A displayed value can be adjusted within ±7% F.S. of the pressure when ex-factory. (±3.5% F.S. for ZSE30AF (compound pressure))
G Error indication function

<table>
<thead>
<tr>
<th>Error name</th>
<th>Error code</th>
<th>Description</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overcurrent error</td>
<td>Er 1</td>
<td>Load current of switch output (OUT1) exceeds 80 mA.</td>
<td>Shut off the power supply. After eliminating the output factor that caused the excess current, turn the power supply back on.</td>
</tr>
<tr>
<td></td>
<td>Er 2</td>
<td>Load current of switch output (OUT2) exceeds 80 mA.</td>
<td></td>
</tr>
<tr>
<td>Residual pressure error</td>
<td>Er 3</td>
<td>A pressure of ±7% F.S. of atmospheric pressure is applied in the zero-out function. (±3.5% F.S. or more for ZSE30AF (compound pressure)). The switch will automatically return to measuring mode in 1 second, however. Due to individual product differences, the setting range of the zero-out function varies within ±1% F.S.</td>
<td>Bring the pressure back to atmospheric pressure and try using the zero-out function.</td>
</tr>
<tr>
<td>Applied pressure error</td>
<td>Er 0</td>
<td>Supply pressure exceeds the maximum set pressure.</td>
<td>Bring the pressure back to within the set pressure range.</td>
</tr>
<tr>
<td></td>
<td>Er 1</td>
<td>Supply pressure is below the minimum set pressure.</td>
<td></td>
</tr>
<tr>
<td>System error</td>
<td>Er 4</td>
<td>Internal data error</td>
<td>Shut off the power supply. Turn the power supply back on. If the switch will not recover to normal, consult SMC for investigation.</td>
</tr>
<tr>
<td></td>
<td>Er 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Er 6</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Er 7</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Er 8</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Er 9</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

If the switch will not recover to normal even after all of the above-mentioned solutions have been applied, consult SMC for investigation.

H Anti-chattering function (F3)

A large bore cylinder or ejector consumes a large volume of air in operation and may experience a temporary drop in the supply pressure. This function prevents detection of such temporary drops in the supply pressure as an error.

Principle
This function averages pressure values measured during the response time set by the user and then compares the average pressure value with the pressure set point value to output the result on the switch.

![Diagram of anti-chattering function](image)

Available response time settings
- 20 ms, 100 ms, 500 ms, 1000 ms, 2000 ms

I Unit display switching function (F0)
Display units can be switched with this function.

<table>
<thead>
<tr>
<th>Display unit</th>
<th>Unit setting</th>
<th>kPa</th>
<th>MPa±</th>
<th>kg/cm²</th>
<th>bar</th>
<th>psi</th>
<th>inHg</th>
<th>mmHg</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZSE30A (Vacuum pressure)</td>
<td>0.1</td>
<td>0.001</td>
<td>0.001</td>
<td>0.001</td>
<td>0.01</td>
<td>0.1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>ZSE30AF (Compound pressure)</td>
<td>0.1</td>
<td>0.001</td>
<td>0.001</td>
<td>0.001</td>
<td>0.01</td>
<td>0.1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>ISE30A (Positive pressure)</td>
<td>1</td>
<td>0.001</td>
<td>0.01</td>
<td>0.01</td>
<td>0.1</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

For the ZSE30A (vacuum pressure) and ZSE30AF (compound pressure), when the display unit is MPa, setting and display resolutions are changed.

J Power-saving mode (F7)
Power-saving mode can be selected.
It shifts to the power-saving mode without button operation for 30 seconds. It is set to the normal mode (Power-saving mode is OFF.) when ex-factory. (Decimal points and operation indicator light (only when the switch output is turned ON.) blink in the power-saving mode.)

K Secret code setting (F8)
It can be set whether code number input is required or not when key is locked. It is set to input no code number when ex-factory.
**Series ZSE30A(F)/ISE30A**

**Made to Order**

Please contact SMC for detailed dimensions, specifications, and lead times.

1 M12 4-pin pre-wired connector (Lead wire length 100 mm) **X510**

**How to Order**

ZSE30A(F) / ISE30A [ ] [ ] [ ] - X510

- **Output specifications**
  - A: NPN open collector 2 outputs
  - B: PNP open collector 2 outputs

**Option cable**

ZS-38-4GM12

<table>
<thead>
<tr>
<th>Pin no.</th>
<th>Pin description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>DC (+)</td>
</tr>
<tr>
<td>2</td>
<td>OUT (2)</td>
</tr>
<tr>
<td>3</td>
<td>DC (-)</td>
</tr>
<tr>
<td>4</td>
<td>OUT (1)</td>
</tr>
</tbody>
</table>

**Connector pin numbers**

1 Brown

2 White

3 Blue

4 Black
**Series ZSE30A(F)/ISE30A**  
**Specific Product Precautions 1**

Be sure to read this before handling.  
Refer to back cover for Safety Instructions, “Handling Precautions for SMC Products” (M-E03-3) for Pressure Switches Precautions.

---

### Warning

1. Do not drop, bump, or apply excessive impacts (100 m/s²) while handling. Although the body of the sensor may not be damaged, the internal parts of the sensor could be damaged and lead to a malfunction.

2. The tensile strength of the cord is 35 N. Applying a greater pulling force on it can cause a malfunction. When handling, hold the body of the sensor—do not dangle it from the cord.

3. Do not exceed the screw-in torque of 7 to 9 N·m when connecting the pipe to the switch. Exceeding these values may cause the switch to malfunction.

4. Do not use pressure sensors with corrosive and/or flammable gases or liquids.

5. Allow a sufficient margin of tube length in piping in order to prevent application of torsional, tensile or moment load to the tubes and fittings.

6. When a brand of tubing other than SMC is used, make sure that the tolerance of the tube’s O.D. satisfies the following specifications.
   1) Nylon tubing: ±0.1 mm or less
   2) Soft nylon tubing: ±0.1 mm or less
   3) Polyurethane tubing: +0.15 mm or less, –0.2 mm or less

7. The applicable fluid is air. Consult SMC if the switch is to be used with other types of fluids.

---

### Caution

1. Mounting and removing with panel mount adapter

   - To release push the claws outward as shown on the picture, and pull back towards

2. Mounting with brackets

   - Mount a bracket to the using two M3 x 5L mounting screws and install on piping. The switch can be installed horizontally depending on the installation location.

   - When using bracket B, take piping dimensions into consideration for installation.

---

### Connection

**Warning**

1. Incorrect wiring can damage the switch and cause a malfunction or erroneous switch output. Connections should be done while the power is turned off.

2. Do not attempt to insert or pull the pressure sensor or its connector when the power is on. A switch output malfunction may occur.

**Caution**

1. Wire separately from power lines and high voltage lines, avoiding wiring in the same conduit with these lines. Malfunctions may occur due to noise from these other lines.

2. If a commercial switching regulator is used, make sure that the F.G. terminal is grounded.

---

### Mounting

**Caution**

**Connection/Removal of Connector**

- To connect the connector, insert it straight while pinching the lever, and then push the lever into the jack of the housing and lock it.

- To remove the connector, pull it straight out while applying pressure with your thumb to the lever and unhooking it from the jack.

- Do not attempt to insert or pull the pressure sensor or its connector when the power is on. A switch output malfunction may occur.

---

### Operating Environment

**Warning**

1. This pressure switch is CE marked; however, it is not equipped with surge protection against lightning. Lightning surge countermeasures should be applied directly to system components as necessary.

2. This pressure switch does not have an explosion proof rating. Never use in the presence of an explosive gas as this may cause a serious explosion.

3. Do not use in an environment where static electricity can cause problems, otherwise system failure or malfunction may result.

---

**Caution**

**Piping**

- Cut the tube perpendicularly.

- Hold the tube and insert it into the One-touch fitting carefully and securely all the way to the bottom.
Caution

Set the pressure within the rated pressure range.
The set pressure range is the range of pressure that is possible in setting.
The rated pressure range is the range of pressure that satisfies the specifications (accuracy, linearity, etc.) on the switch.
Although it is possible to set a value outside the rated pressure range, the specifications will not be guaranteed even if the value stays within the set pressure range.

<table>
<thead>
<tr>
<th>Switch</th>
<th>Pressure range</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>–100 kPa</td>
</tr>
<tr>
<td>For vacuum pressure</td>
<td>ZSE30A</td>
</tr>
<tr>
<td>For compound pressure</td>
<td>ZSE30AF</td>
</tr>
<tr>
<td>For positive pressure</td>
<td>ISE30A</td>
</tr>
</tbody>
</table>

- Rated pressure range of switch
- Set pressure range of switch
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.

Caution: Indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.

Warning: Indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.

Danger: Indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

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 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 catalog 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, 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 down 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 have been confirmed.
   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 equipment.
   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.

Limited warranty and Disclaimer/ Compliance Requirements

The product used is subject to the following “Limited warranty and Disclaimer” and “Compliance Requirements”.

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.\(^2\)
   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.

3. Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalog 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.

Safety Instructions

Be sure to read “Handling Precautions for SMC Products” (M-E03-3) before using.

SMC Corporation

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URL http://www.smcwotd.com
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Specifications are subject to change without prior notice and any obligation on the part of the manufacturer.

Edition B + Addition of Bracket C to options.
+ Addition of Made to Order (M12 4-pin pre-wired connector (X510)).

Revision history

Edition B

\(^1\) 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.

\(^2\) 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.

D-DN 1st printing LY printing OZ 7150SZ Printed in Japan.