2-Colour 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. Push
End 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: –0.1 to 1.0 MPa

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

RoHS compliant
Series ZSE30A(F)/ISE30A
Features 1

Mounting
Bracket configuration allows mounting in four positions.

- Bracket A
- Bracket B

Panel mount
Mountable side by side without clearance

Replaceable one-touch fittings
The clip type allows easy removal of fittings. Fitting’s type and size can be changed.

- Clip
- One-touch fitting

Lead wire
Connector cover added.

4-digit display
4-digit display allows easy reading of displayed values. Example: 0.5 MPa

- Connector cover
- Lead wire with connector (2 m)

Possible to check set-value during key locking

Series

- Series ZSE30A (vacuum)
- Series ZSE30AF (compound)
- Series ISE30A (positive)

- 0.0 to –101.0 kPa
- –101.0 to 101.0 kPa
- 101.0 to –100.0 kPa

- 0.1 kPa
- 1.0 kPa
- 1 MPa

- 10.0 kPa
- 100.0 kPa
- 1000.0 kPa

- 1/1000
- 1/100

- Vacuum
- Compound
- Positive

Additional functions

- Secret code setting function
- Power-saving function
- Resolution-switch function
- MPa/kPa switch function

- NPN or PNP open collector 1 output
- NPN or PNP open collector 2 outputs
- NPN or PNP open collector 1 output + Analog output (voltage or current)

- R1/8, NPT1/8 (M5 female threaded)
- ø4, ø6, ø5/32, ø1/4 one-touch fittings

- Withstand pressure
- Minimum unit setting
- Rated pressure range
- Secret code setting function
- Key locking function keeps unauthorized users from tampering with buttons.
- Power-saving function
- Power consumption is reduced by turning off the monitor (power consumption reduced 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 both in MPa or kPa.
# 2-Colour Display High-Precision Digital Pressure Switch

## Series ZSE30A(F)/ISE30A

### How to Order

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Operating manual</th>
<th>Calibration certificate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>W</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>K</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>T</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>R</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

### Option 1

- **Display unit**
  - **M**: Fixed SI unit (Note 3)
  - **P**: With unit display (Note 2)
- **Without lead wire**
- **Lead wire with connector**
  - (lead wire length 2 m) (Note)
  - and with connector cover

### Option 2

- **Bracket A**
- **Bracket B**
- **Panel mount adapter**

### Option 3

- **Symbol**
  - ISE30A
  - ZSE30A
  - ZSE30AF

### Rated pressure range

- **ISE30A**: -0.1 to 1 MPa
- **ZSE30A**: 0 to –101 kPa
- **ZSE30AF**: –100 to 100 kPa

### Piping

- **Straight type**
- **Elbow type**

###Lead wire and connector

- **Note**
  - Made to Order
  - Under the New Measurement Law, sales of switches with the unit switching function have not been allowed for use in Japan.
  - Fixed unit: kPa, MPa

### Lead wire with connector

- **Note**
  - Made to Order
  - For output types N and P, the number of core of lead wires will be 3, and for other types, it will be 4.

---

*Note 1) Made to Order
Note 2) Under the New Measurement Law, sales of switches with the unit switching function have not been allowed for use in Japan.
Note 3) Fixed unit: kPa, MPa*
When optional parts are required separately, use the following part numbers to place an order.

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

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>−0.105 to 1.050 MPa</td>
</tr>
<tr>
<td>Regulating 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>Proof pressure</td>
<td>500 kPa</td>
<td>500 kPa</td>
<td>1.5 MPa</td>
</tr>
<tr>
<td>Setting/display resolution</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>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 (with 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>With short circuit protection</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>Hysteresis mode</td>
<td>Variable (0 or above) (Note 1)</td>
<td></td>
</tr>
<tr>
<td>Window comparator mode</td>
<td>Linear F.S. or less (with rated pressure range)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current output</td>
<td>1 to 5V ±2.5% F.S. or less (with rated pressure range)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Voltage 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>Output current</td>
<td>4 to 20 mA ±2.5% F.S. or less (with rated pressure range)</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>Load impedance</td>
<td>Maximum load impedance: 300 Ω with power supply voltage of 12 V; 600 Ω with power supply voltage of 24 V</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minimum load impedance: 50 Ω</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Display</td>
<td>4-digit, 7-segment, 2-colour LCD (Red and Green)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Display accuracy</td>
<td>±2% F.S. ±1 digit (ambient temperature of 25–35°C)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indicator light</td>
<td>Lights up when switch output is ON; OUT1: Green, OUT2: Red</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Environment resistance</td>
<td>Enclosure</td>
<td>IP40</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: 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 enclosure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Insulation resistance</td>
<td>50 MΩ or more between live parts and enclosure (all 500 VDC Mega)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vibration resistance</td>
<td>10 to 150 Hz, 1.5 mm amplitude (or 20 m/s² acceleration), in X, Y, Z directions, 3 times 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>

Piping Specifications

<table>
<thead>
<tr>
<th>Port size</th>
<th>Model</th>
<th>01 R1/8 MG x 0.8</th>
<th>N01 NPT1/8 MG x 0.8</th>
<th>C4H ø4 mm ø5/32 inch</th>
<th>C6H ø6 mm</th>
<th>N7H ø1/4 inch</th>
<th>C4L ø4 mm ø5/32 inch</th>
<th>C6L ø6 mm</th>
<th>N7L ø1/4 inch</th>
</tr>
</thead>
<tbody>
<tr>
<td>One-touch fitting, Straight type</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</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>
<td>—</td>
</tr>
</tbody>
</table>

Wetted parts material

<table>
<thead>
<tr>
<th>Weight</th>
<th>Including lead wire with connector (2 cores, 2 m)</th>
<th>80 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>Excluding lead wire with connector</td>
<td>43 g</td>
<td>32 g</td>
<td>33 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.

Part no. | Option | Note |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>ZS-38-A1</td>
<td>Bracket A</td>
<td>Mounting screw (with 2 pcs. of M3 x 6L)</td>
</tr>
<tr>
<td>ZS-38-A2</td>
<td>Bracket B</td>
<td>Mounting screw (with 2 pcs. of M3 x 6L)</td>
</tr>
<tr>
<td>ZS-38-C</td>
<td>Panel mount adapter</td>
<td>Mounting screw (with 2 pcs. of M3 x 6L)</td>
</tr>
<tr>
<td>ZS-38-D</td>
<td>Panel mount adapter + front protection cover</td>
<td>Mounting screw (with 2 pcs. of M3 x 6L)</td>
</tr>
<tr>
<td>ZS-38-01</td>
<td>Front protection cover</td>
<td>—</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>
<tr>
<td>ZS-38-4G</td>
<td>Lead wire with connector (with connector cover)</td>
<td>3 cores, for 2 outputs, 2 m</td>
</tr>
</tbody>
</table>

Part no. | Option | Note |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<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 unit with a connector for copying</td>
<td>Copy function up to 10 slaves</td>
</tr>
<tr>
<td>ZS-38-C4H</td>
<td>One-touch fittings ø4 mm straight</td>
<td>O-ring, one-touch clip included</td>
</tr>
<tr>
<td>ZS-38-C6H</td>
<td>One-touch fittings ø6 mm straight</td>
<td>O-ring, one-touch clip included</td>
</tr>
<tr>
<td>ZS-38-N7H</td>
<td>One-touch fittings ø1/4 inch straight</td>
<td>O-ring, one-touch clip included</td>
</tr>
<tr>
<td>ZS-38-C4L</td>
<td>One-touch fittings ø4 mm elbow</td>
<td>O-ring, one-touch clip included</td>
</tr>
<tr>
<td>ZS-38-C6L</td>
<td>One-touch fittings ø6 mm elbow</td>
<td>O-ring, one-touch clip included</td>
</tr>
<tr>
<td>ZS-38-N7L</td>
<td>One-touch fittings ø1/4 inch elbow</td>
<td>O-ring, one-touch clip included</td>
</tr>
<tr>
<td>ZS-38-H</td>
<td>Operating manual CD-ROM</td>
<td>—</td>
</tr>
</tbody>
</table>
**Analogue Output**

**Output voltage**

<table>
<thead>
<tr>
<th>Output voltage</th>
<th>Output current</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 V</td>
<td>20 mA</td>
</tr>
<tr>
<td>1 V</td>
<td>4 mA</td>
</tr>
<tr>
<td>0.6 V</td>
<td>2.4 mA</td>
</tr>
</tbody>
</table>

**Range**

<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 kPa</td>
<td>0</td>
<td>1 MPa</td>
</tr>
</tbody>
</table>

**Descriptions**

- **Unit display**: Displays the unit being used (only kPa and MPa).
- **OUT1 Output display (Green)**: Lights up when switch output (OUT1) is turned ON.
- **UP button**: 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 SET button**: Use this button to switch the mode and set the set value.
- **LCD display**: Displays the current pressure condition, setting mode, and error codes. A display colour type can be selected from either a single colour display with red or green, or a 2-colour display in which green and red are switched according to the output. Four different display settings are available.
- **OUT2 Output display (Red)**: Lights up when switch output (OUT2) is turned ON.
- **DOWN button**: Use this button to select the mode or decrease the ON/OFF set value. It is also used for switching to the bottom value 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 keyboard can be locked to prevent any incorrect function of the switch.</td>
</tr>
<tr>
<td>Zero-out function</td>
<td>The pressure display can be set to 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.</td>
</tr>
<tr>
<td>kPa=MPa switch function</td>
<td>Converts the unit between kPa and MPa.</td>
</tr>
</tbody>
</table>
Internal Circuits and Wiring Examples

Z/ISE30A(F) – N

NPN (1 output)

Max. 28 V, 80 mA
Residual voltage 1 V or less

N

P

PNP (1 output)

Max. 80 mA
Residual voltage 1 V or less

A

NPN (2 outputs)

Max. 28 V, 80 mA
Residual voltage 1 V or less

B

PNP (2 outputs)

Max. 80 mA
Residual voltage 1 V or less

Note) 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) + Analogue voltage output**

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

**D**

**NPN (1 output) + Analogue current output**

- Max. 28 V, 80 mA
- Residual voltage 1 V or less
- Analogue 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) + Analogue voltage output**

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

**F**

**PNP (1 output) + Analogue current output**

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

Note) 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

2 x M3 x 0.5 thread depth 4

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

Note) Bracket configuration allows mounting in four directions.

Note) Bracket configuration allows mounting in four directions.

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

Option 2

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

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

Note) Bracket configuration allows mounting in four directions.
Series ZSE30A(F)/ISE30A

Dimensions

Panel mount
Z/ISE30A(F) – [Diagram]

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

D
Panel mount adapter + Front protection cover
(Option unit part no.: ZS-27-D)
2-Colour Display
High-Precision Digital Pressure Switch Series ZSE30A(F)/ISE30A

Panel fitting dimensions

1 pc. mounting

Multiple (2 pcs. or more) horizontal mounting

Multiple (2 pcs. or more) vertical mounting

1 pc. mounting

Multiple (2 pcs. or more) horizontal mounting

Multiple (2 pcs. or more) vertical mounting

Panel mount

Panel thickness 0.5 to 6

Panel mount adapter
Option unit part no.: ZS-27-C

Panel mount adapter + Front protection cover
Option unit part no.: ZS-27-D

Panel fitting dimensions

4 x R2 or less

31 x n pcs. + 3.5 x (n pcs. – 1)

4 x R2 or less

31 x n pcs. + 3 x (n pcs. – 1)

4 x R2 or less

31 x n pcs. + 3.5 x (n pcs. – 1)
Function Details

A Copy function (F97)

The settings of the master sensor can be copied to several slave sensors, which reduces the time taken for setting and prevents the input of wrong values.

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

Steps to follow:
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) Force one sensor to be 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.

**Suction Verification**

<table>
<thead>
<tr>
<th>Pressure</th>
<th>Vacuum</th>
<th>Max. A</th>
<th>P₁₁</th>
<th>H₁₁</th>
<th>Min. B</th>
<th>H₂₂</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Formula for Obtaining the Set-Value**

<table>
<thead>
<tr>
<th>P₁₁ or P₂₂</th>
<th>H₁₁ or H₂₂</th>
</tr>
</thead>
<tbody>
<tr>
<td>P₁₁ = A – (A-B)/4</td>
<td>H₁₁ = (A-B)/2</td>
</tr>
<tr>
<td>n₁₁ = B + (A-B)/4</td>
<td></td>
</tr>
</tbody>
</table>

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 (V) 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 measured pressure. For the pressure switch with analogue output, the analogue 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).
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.

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

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

<table>
<thead>
<tr>
<th>Display unit</th>
<th>Min. unit setting</th>
<th>kPa</th>
<th>MPa (set)</th>
<th>kgf/cm²</th>
<th>bar</th>
<th>psi</th>
<th>inHg</th>
<th>mmHg</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZSE30A</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</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</td>
<td>1</td>
<td>0.001</td>
<td>0.01</td>
<td>0.1</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note) 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)
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.
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), Japan Industrial Standards (JIS) Note 1) and other safety regulations Note 2).

Note 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)
JIS B 8361: General rules for hydraulic equipment.
JIS B 8370: General rules for pneumatic equipment.
JIS B 9960-1: Safety of machinery – Electrical equipment of machines. (Part 1: General requirements)
etc.

Note 2) Labor Safety and Sanitation Law, etc.

⚠️ 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 possibility of serious injury or loss of life.

### 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 are used under various operating conditions, their compatibility with the specific equipment must be based on specifications based or after analysis and or 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 trained personnel 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 components and machinery/equipment until safety is confirmed.**

   1. Inspection and maintenance of machinery/equipment should only be performed after confirmation of safe locked-out control positions.
   2. When the product is to be removed, confirm that the safety process as mentioned above are implemented and the power from any appropriate source is cut, and read/understand the specific product precautions carefully.
   3. Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.

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

   1. Conditions and environments beyond of the given specifications, or if product is used outdoors.
   2. Installation on equipment in conjunction with atomic energy, railways, air navigation, space, shipping, vehicles, military, medical treatment, combustion and recreation, food and beverages, emergency stop circuits, 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 and therefore requires 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.
Safety Instructions

**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 it is delivered. **Note**
   The product may also have specified durability, running distance or replacement parts. Please consult your nearest sales point.
2. For any failure or damage reported within the warranty period which is clearly SMC’s responsibility, replacement product/parts will be provided.
   This limited warranty applies only to SMC’s product independently, and not to any other damage incurred due to the failure of it.
   **Note** 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 deliver.
   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**

When the product is exported, strictly follow the laws required by the Ministry of Economy, Trade and Industry (Foreign Exchange and Foreign Trade Control Law).
**Warning**

1. Do not drop, bump, or apply excessive impacts (100 m/s²) while handling. Although the body of the pressure switch may not be damaged, the internal parts of the pressure switch 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 installing piping. Exceeding these values may cause malfunctioning of the switch.

4. Do not use pressure switch 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 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 pressure switch may not be damaged, the internal parts of the pressure switch could be damaged and lead to a malfunction.

**Caution**

1. Mounting/removing with panel mount adapter
   - To release push the clips outward as shown on the picture, and pull back towards you.

2. Mounting with bracket.
   - 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.

**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 connector when the power is on. A switch output malfunction may occur.

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

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

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**Warning**

1. SMC pressure switches are CE marked; however, they are not equipped with surge protection against lightning. Lightning surge countermeasures should be applied directly to system components as necessary.

2. SMC pressure switches do 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 occurs.

**Operating Environment**

**Caution**

- 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.

**Warning**

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

**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.
Set Pressure Range and Rated Pressure Range

⚠️ Caution

Set the pressure within the rated pressure range.
The set pressure range is the range of pressure that is possible to be set.
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>
<th>–100 kPa</th>
<th>0</th>
<th>100 kPa</th>
<th>500 kPa</th>
<th>1 MPa</th>
</tr>
</thead>
<tbody>
<tr>
<td>For vacuum pressure ZSE30A</td>
<td>–101 kPa</td>
<td>–105 kPa</td>
<td>0</td>
<td>10 kPa</td>
<td></td>
<td></td>
</tr>
<tr>
<td>For compound pressure ZSE30AF</td>
<td>–100 kPa</td>
<td>–105 kPa</td>
<td>100 kPa</td>
<td>105 kPa</td>
<td></td>
<td></td>
</tr>
<tr>
<td>For positive pressure ISE30A</td>
<td>–100 kPa</td>
<td>–105 kPa</td>
<td>1 MPa</td>
<td></td>
<td></td>
<td>1.05 MPa</td>
</tr>
</tbody>
</table>

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