2-Colour Display High Precision Digital Pressure Switch

New
M8 connector type

Applicable fluid
Air, Non-corrosive gas, Non-flammable gas

Can copy to up to 10 switches simultaneously.
The settings of the master pressure switch (source of copy) can be copied to the slave pressure switches.
- Reduction in setting work
- Prevention of mistakes in setting

Easy handling!
Raised rubber switch buttons for easy and comfortable operation

3-step setting
Adjust to the set-value by the or button.

2-colour display
See abnormal values at a glance.

Series ZSE40A(F)/ISE40A

RoHS IP65

CAT.EUS100-79Aa-UK
Piping Variations

- R1/8, NPT1/8
- Rc1/8, G1/8
- ø4, ø6 one-touch fitting
- M5 x 0.8

Mounting Variations

- Bracket A
- Bracket B
- Bracket D
- Direct mounting (Wall mounting)
- Panel mounting

Interchangeable with the ZSE40/ISE40 series for mounting

Series

- ZSE40A (vacuum pressure)
- ZSE40AF (compound pressure)
- ISE40A (positive pressure)

Secret code setting function
A function to prevent operation by anyone other than the designated operator while the keys are locked.

- An optional 3-digit value is entered.

Power-saving function
The display can be turned off to save the power consumption. (Power consumption reduced by max. 20%)

Resolution conversion function
The flickering on the display can be eliminated.

MPa/kPa switching function
The indication unit for vacuum, compound pressure and positive pressure can be integrated into either MPa or kPa.

Features 1
# 2-Colour Display High Precision Digital Pressure Switch

**Series ZSE40A(F)/ISE40A**

## How to Order

### For vacuum/compound pressure

**ZSE40A**

- **01**
- **X**
- **M**

### For positive pressure

**ISE40A**

- **01**
- **X**
- **M**

## Rated pressure range

- **ISE40A**
  - –0.1 to 1.000 MPa

- **ZSE40A**
  - 0.0 to –101.3 kPa
  - –100.0 to 100 kPa

## Piping specifications

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
<th>Symbol</th>
<th>Part no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Bracket A</td>
<td>A</td>
<td>ZS-24-A</td>
</tr>
<tr>
<td>B</td>
<td>Bracket B</td>
<td>B</td>
<td>ZS-24-B</td>
</tr>
<tr>
<td>D</td>
<td>Bracket D</td>
<td>D</td>
<td>ZS-35-D</td>
</tr>
<tr>
<td>E</td>
<td>Panel mount adapter</td>
<td>E</td>
<td>ZS-35-C</td>
</tr>
<tr>
<td>F</td>
<td>Panel mount adapter + Front protective cover</td>
<td>F</td>
<td>ZS-35-F</td>
</tr>
</tbody>
</table>

## Rated pressure range

| **ISE40A** | 0.0 to –101.3 kPa |
| **ZSE40A** | –100.0 to 100 kPa |

## Output specifications

- **R**: NPN open collector 2 outputs + Analogue voltage/Auto-shift switching
- **T**: PNP open collector 2 outputs + Analogue voltage/Auto-shift switching
- **S**: NPN open collector 2 outputs + Analogue current/Auto-shift switching
- **V**: PNP open collector 2 outputs + Analogue current/Auto-shift switching
- **X**: NPN open collector 2 outputs + Copy function
- **Y**: PNP open collector 2 outputs + Copy function

## Options/Part No.

<table>
<thead>
<tr>
<th>Part no.</th>
<th>Option</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZS-24-A</td>
<td>Bracket A, With 2 mounting screws each M3 x 5L and M4 x 5L</td>
</tr>
<tr>
<td>ZS-24-B</td>
<td>Bracket B, With 2 mounting screws M4 x 5L</td>
</tr>
<tr>
<td>ZS-24-D</td>
<td>Bracket D, With 2 mounting screws each of M3 x 5L and M4 x 5L</td>
</tr>
<tr>
<td>ZS-35-C</td>
<td>Panel mount adapter (Piping: For 01/N01)</td>
</tr>
<tr>
<td>ZS-35-D</td>
<td>Panel mount adapter (Piping: For W1/WF1/M5/C4/C6)</td>
</tr>
<tr>
<td>ZS-35-F</td>
<td>Panel mount adapter + Front protective cover (Piping: For 01/N01)</td>
</tr>
<tr>
<td>ZS-35-G</td>
<td>Panel mount adapter + Front protective cover (Piping: For W1/WF1/M5/C4/C6)</td>
</tr>
</tbody>
</table>

## Options

- **With unit switching function**
  - **M**: Fixed SI unit
  - **P**: With unit switching function (Initial value psi)

## Note

- Some options are unavailable depending on the piping specifications. Refer to “Combination of piping specifications with option 1 and part numbers of options”.

---

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

<table>
<thead>
<tr>
<th>Part no.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZS-24-A</td>
<td>Panel mount adapter (Piping: For 01/N01)</td>
</tr>
<tr>
<td>ZS-35-D</td>
<td>Panel mount adapter (Piping: For W1/WF1/M5/C4/C6)</td>
</tr>
<tr>
<td>ZS-35-F</td>
<td>Panel mount adapter + Front protective cover (Piping: For 01/N01)</td>
</tr>
<tr>
<td>ZS-35-G</td>
<td>Panel mount adapter + Front protective cover (Piping: For W1/WF1/M5/C4/C6)</td>
</tr>
</tbody>
</table>

---

**Note:** The W1 and WF1 include 1 hexagon socket head plug.
How to Order [For M8 (3 pins) connector]

**For positive pressure**

**ISE40A**

**Rated pressure range**

ISE40A  
−0.1 to 1.000 MPa

**For vacuum**

**ZSE40A**

**Rated pressure range**

ZSE40A  
0.0 to −101.3 kPa

**Piping specifications**

- 01  
  R1/8 (M5 female threaded)
- N01  
  NPT1/8 (M5 female threaded)

**Output specifications**

- N  
  NPN open collector 1 output
- P  
  PNP open collector 1 output

**Unit specifications**

- —  
  With unit display switching function
- M  
  Fixed SI unit Note 1)
- P  
  With unit switching function (Initial value psi)

**Options 1/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>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZS-24-A</td>
<td>Bracket A</td>
<td>Mounting screw M3 x 5L, M4 x 5L (2 pcs. for each)</td>
</tr>
<tr>
<td>ZS-24-D</td>
<td>Bracket D</td>
<td>Mounting screw M3 x 5L, M4 x 5L (2 pcs. for each)</td>
</tr>
</tbody>
</table>

**Note 1)** Unit kPa, MPa

**Option 2**

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Operation manual</th>
<th>Calibration certificate</th>
</tr>
</thead>
<tbody>
<tr>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Y</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>K</td>
<td>—</td>
<td>●</td>
</tr>
<tr>
<td>T</td>
<td>—</td>
<td>●</td>
</tr>
</tbody>
</table>

**Option 1**

<table>
<thead>
<tr>
<th>—</th>
<th>None</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Bracket A</td>
</tr>
<tr>
<td>D</td>
<td>Bracket D</td>
</tr>
</tbody>
</table>

**M8 connector type**

* No lead wires are connected.
## Specifications

### Piping Specifications

<table>
<thead>
<tr>
<th>Part no.</th>
<th>01</th>
<th>N01</th>
<th>W1</th>
<th>WF1</th>
<th>M5</th>
<th>C4</th>
<th>C6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Port size</td>
<td>R1/8 (With M5 female thread)</td>
<td>NPT1/8 (With M5 female thread)</td>
<td>Rc1/8</td>
<td>G1/8 (Note 5)</td>
<td>M5 x 0.8 female thread</td>
<td>ø4 One-touch fitting</td>
<td>ø6 One-touch fitting</td>
</tr>
<tr>
<td>Material of parts in contact with fluid</td>
<td>Sensor pressure receiving area</td>
<td>Silicon</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Piping port</td>
<td>C3602 (Electroless nickel plating) O-ring: HNBR</td>
<td>ZDC2 O-ring: HNBR</td>
<td>ZDC2, POM, Stainless steel 304, C3604 (Electroless nickel plating) O-ring: HNBR, NBR</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>78 g</td>
<td>79 g</td>
<td>97 g</td>
<td>104 g</td>
<td>101 g</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M8 connector</td>
<td>46 g</td>
<td>46 g</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Analogue Output

Voltage output

Current 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 –101.3 kPa</td>
<td>10.1 kPa</td>
<td>0</td>
<td>–101.3 kPa</td>
</tr>
<tr>
<td>For compound pressure</td>
<td>–100.0 to 100.0 kPa</td>
<td>—</td>
<td>–100.0 kPa</td>
<td>100.0 kPa</td>
</tr>
<tr>
<td>For positive pressure</td>
<td>–0.100 to 1.000 MPa</td>
<td>–0.100 MPa</td>
<td>0</td>
<td>1.000 MPa</td>
</tr>
</tbody>
</table>

Descriptions

**Output (OUT1) display (Orange)**
Lights up when OUT1 is turned ON.

**Output (OUT2) display (Orange)**
Lights up when OUT2 is turned ON.

**△ 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.

**LCD**
Displays the current pressure, set mode, selected display unit, 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.

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

**▼ button**
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.
Internal Circuits and Wiring Examples

- X
NPN (2 outputs) + Copy function

- Y
PNP (2 outputs) + Copy function

- R/S
- R: NPN (2 outputs) + Analog voltage output
- S: NPN (2 outputs) + Analog current output

- T/V
- T: PNP (2 outputs) + Analog voltage output
- V: PNP (2 outputs) + Analog current output

For M8 connector, 3 pins

- N
NPN (1 output)

- P
PNP (1 output)
Series ZSE40A(F)/ISE40A

Dimensions

ZSE40A(F)/ISE40A-01
-N01

ZSE40A(F)/ISE40A-W1
-WF1
2-Colour Display High Precision Digital Pressure Switch **Series ZSE40A(F)/ISE40A**

### Dimensions/For M8 (3-pin) connector

**ZSE40A/ISE40A-01-□-□L**

- **N01-□-□L**

#### M8 (3-pin) cable with connector

**V100-49-1-□**

<table>
<thead>
<tr>
<th>Cable length (L)</th>
<th>Part no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>300 mm</td>
<td>V100-49-1-1</td>
</tr>
<tr>
<td>500 mm</td>
<td>V100-49-1-2</td>
</tr>
<tr>
<td>1000 mm</td>
<td>V100-49-1-3</td>
</tr>
<tr>
<td>2000 mm</td>
<td>V100-49-1-4</td>
</tr>
<tr>
<td>5000 mm</td>
<td>V100-49-1-7</td>
</tr>
</tbody>
</table>

#### PCA-1557772
Series ZSE40A(F)/ISE40A

Dimensions

ZSE40A(F)/ISE40A-C4

-C6

-One-touch fitting ø4, ø6

-ZSE40A(F)/ISE40A-C4

8 x 4.5
depth, depth of
counter bore 4

M5 x 0.8 thread depth 5
Dimensions

ZSE40A(F)/ISE40A-01-□-□A□
-ZSE40A(F)/ISE40A-N01-□-□A□

With bracket A

For M8 (3-pin) connector

ZSE40A/ISE40A-01-□-□LA
-ZSE40A/ISE40A-N01-□-□LA

With bracket A
Series ZSE40A(F)/ISE40A

Dimensions

ZSE40A(F)/ISE40A-01-□-□D□
-N01-□-□D□
With bracket D

For M8 (3-pin) connector
ZSE40A/ISE40A-01-□-□LD
-N01-□-□LD
With bracket D
Dimensions

ZSE40A(F)/ISE40A-W1-□-□A□
-WF1-□-□A□
With bracket A

ZSE40A(F)/ISE40A-W1-□-□B□
-WF1-□-□B□
With bracket B
Series ZSE40A(F)/ISE40A

Dimensions

ZSE40A(F)/ISE40A-W1-□-□D□
-WF1-□-□D□

With bracket D
Dimensions

ZSE40A(F)/ISE40A-01-□□□□E□□
-N01-□□□□□□
Panel mounting

Panel thickness 1 to 5

ZSE40A(F)/ISE40A-01-□□□□F□□
-N01-□□□□□□
Panel mounting + Front protective cover

Panel thickness 1 to 5
## Dimensions

### ZSE40A(F)/ISE40A-W1-□-□E□

Panel mounting

### ZSE40A(F)/ISE40A-W1-□-□E□

Panel mounting + Front protective cover

**Panel thickness 1 to 5**

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Dimensions</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZSE40A(F)/ISE40A-W1-□-□E□</td>
<td>41.2 x 40 x 38.6 mm</td>
<td>Panel mounting</td>
</tr>
<tr>
<td>ZSE40A(F)/ISE40A-W1-□-□E□</td>
<td>41.2 x 40 x 38.6 mm</td>
<td>Panel mounting + Front protective cover</td>
</tr>
</tbody>
</table>

**ZSE40A(F)/ISE40A**
Dimensions

ZSE40A(F)/ISE40A-C4\(\square\)E\(\square\)
-C6\(\square\)E\(\square\)
Panel mounting

ZSE40A(F)/ISE40A-C4\(\square\)F\(\square\)
-C6\(\square\)F\(\square\)
Panel mounting + Front protective cover
Panel thickness 1 to 5 mm

Note) This is the minimum value for the piping method 01 or N01.
Take the piping material and tubing into account for design. When the corner is to have radius, it must be R3 or less.
Function Details

A Copy function (F97)
The settings of the master pressure switch can be copied to several slave pressure switches. This can reduce the labour for setting and prevent the entry of incorrect set-values.

The set-value can be copied to up to 10 switches simultaneously.
(Maximum communication distance 4 m)

1) Wire as shown in the left figure.
2) Select the slave switch which is to be the master, and change it into a master using the buttons. (In the default setting, all switches are set as slaves.)
3) Press the \( \text{button of the master switch to start copying.} \)

B Auto-preset function (F 4)
Auto-preset function, when selected in the initial 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 work piece several times.

Suction Verification

C Display calibration function (F 6)
Fine adjustment of the indicated value of the pressure sensor can be made within the range of \( \pm 5\% \) of the read value. (The scattering of the indicated value can be eliminated.)

Formula for Obtaining the Set-Value

\[
\begin{align*}
P_1 & = A - \frac{A-B}{4} \\
n_1 & = B + \frac{A-B}{4} \\
H_1 & = \frac{A-B}{2}
\end{align*}
\]

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 \( \text{ buttons are simultaneously pressed for 1 second or longer, while "holding", the hold value will be reset.} \)

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

F Zero-clear 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. The indicated value can be adjusted within \( \pm 7\% \) F.S. of the pressure when ex-factory. (ZSE40AF (for compound pressure) \( \pm 3.5\% \) F.S.)

Note) When the display calibration function is used, the set pressure value may change \( \pm 1\) digit.
G Error indication function

<table>
<thead>
<tr>
<th>Error name</th>
<th>Error code</th>
<th>Description</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overcurrent error</td>
<td>Er1</td>
<td>Load current of switch output (OUT1) exceeds 80 mA.</td>
<td>Turn the power off and remove the output factor for the overcurrent. Then, turn the power on.</td>
</tr>
<tr>
<td></td>
<td>Er2</td>
<td>Load current of switch output (OUT2) exceeds 80 mA.</td>
<td></td>
</tr>
<tr>
<td>Residual pressure error</td>
<td>Er3</td>
<td>During zero-clear operation, pressure over ±7% F.S. is applied. (ZSE40AF (compound) ±3.5% F.S.) After 1 second, the mode will reset to measurement mode. ±1% F.S. of the zero-clear range varies between individual products.</td>
<td>Perform zero-clear operation again after restoring the applied pressure to an atmospheric pressure condition.</td>
</tr>
<tr>
<td>Applied pressure error</td>
<td>ErH</td>
<td>Supply pressure exceeds the maximum set pressure.</td>
<td>Reset applied pressure to a level within the set pressure range.</td>
</tr>
<tr>
<td></td>
<td>ErL</td>
<td>Supply pressure is below the minimum set pressure.</td>
<td></td>
</tr>
<tr>
<td>Auto-shift error</td>
<td>Er0</td>
<td>The value measured at the time of auto-shift input is outside the set pressure range. * After displaying the error code for about 1 second, the switch returns to the measuring mode.</td>
<td>The controller does not respond to the auto-shift signal. Check the equipment and machinery for this point.</td>
</tr>
<tr>
<td>System error</td>
<td>Er4</td>
<td>Internal data error</td>
<td>Turn the power off and turn it on again. If the failure cannot be solved, ask SMC for repair.</td>
</tr>
<tr>
<td></td>
<td>Er6</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Er7</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Er8</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Er9</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

If the above remedy cannot recover the operation, ask SMC for repair.

H Anti-chattering function (F 3)

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 above remedy cannot recover the operation, ask SMC for repair.

I Display unit switching function (F 0)

Display units can be switched with this function.

<table>
<thead>
<tr>
<th>Minimum unit setting</th>
<th>Display unit</th>
<th>kPa</th>
<th>MPa (Note)</th>
<th>kgf/cm²</th>
<th>bar</th>
<th>psi</th>
<th>inHg</th>
<th>mmHg</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZSE40A (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>ZSE40AF (compound pressure)</td>
<td>0.1</td>
<td>0.001</td>
<td>0.001</td>
<td>0.001</td>
<td>0.02</td>
<td>0.1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>ISE40A (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>

Note) The ZSE40A (vacuum pressure) and ZSE40AF (compound pressure) will have different setting and display resolution when the unit is set to MPa.
**Function Details**

**J  Power-saving mode (F80)**
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 (F81)**
It can be set whether secret code input is required or not when key is locked. It is set to input no secret code when ex-factory.

**L  Auto-shift function (F 5)**
When there are large fluctuations in the supply pressure, the switch may fail to operate correctly. The auto-shift function compensates such supply pressure fluctuations. It measures the pressure at the time of auto-shift signal input and uses it as the reference pressure to correct the set-value on the switch.

**Set-value correction by auto-shift function**

<table>
<thead>
<tr>
<th>Pressure (Differential)</th>
<th>Supply pressure normal</th>
<th>Supply pressure drop</th>
<th>Supply pressure increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Switch output</td>
<td>ON</td>
<td>OFF</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hi</td>
<td>Lo</td>
<td></td>
</tr>
</tbody>
</table>

- Rectified value
  When the auto-shift is selected, “000” will be displayed for about 1 second, and the pressure value at that point will be saved as a rectified value “Rectified value”. Based on the saved rectified values, the set-value of "P_1", "P_2", "P_3", and "P_4" will likewise be rectified.

Note) When an output is reversed, "n_1", "n_2", "n_3", "n_4" will be rectified.

**Possible Set Range for Auto-Shift Input**

<table>
<thead>
<tr>
<th></th>
<th>Regulating pressure range</th>
<th>Possible set range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compound pressure</td>
<td>−105.0 to 105.0 kPa</td>
<td>−210 to 210 kPa</td>
</tr>
<tr>
<td>Vacuum pressure</td>
<td>10.0 to −105.0 kPa</td>
<td>115.0 to −115.0 kPa</td>
</tr>
<tr>
<td>Positive pressure</td>
<td>−0.105 to 1.050 MPa</td>
<td>−1.155 to 1.155 MPa</td>
</tr>
</tbody>
</table>

**Auto-shift zero**
The basic function of auto-shift zero is the same as the function for auto-shift. Also, it corrects values on the display, based on a pressure value of "0", when the auto-shift is selected.
Series ZSE40A(F)/ISE40A
Made to Order
Please contact SMC for detailed dimensions, specifications, and lead times.

1 Lead wire length 3 m

It has a lead wire extended to 3 meters.

How to Order

ZSE40A(F)/ISE40A – ■ – ■ – ■ – ■ – X501

Piping specifications
Output specifications
Option

2 M12 4-pin pre-wired connector (Lead wire length 100 mm)

How to Order

ZSE40A(F)/ISE40A – ■ – ■ – ■ – ■ – X531

Output specifications
X: NPN open collector 2 outputs
Y: PNP open collector 2 outputs

Unit specifications/option

Piping specifications

Pin arrangement
### Handling

<table>
<thead>
<tr>
<th>Caution</th>
</tr>
</thead>
<tbody>
<tr>
<td>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.</td>
</tr>
<tr>
<td>2. The tensile strength of the cord is 49 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.</td>
</tr>
<tr>
<td>3. Do not exceed the screw-in torque of 7 to 9 N·m when connecting the pipe to the switch. Exceeding this torque may cause the switch to malfunction.</td>
</tr>
<tr>
<td>4. Do not use pressure sensors with corrosive and/or flammable gases or liquids.</td>
</tr>
</tbody>
</table>

### Operating Environment

<table>
<thead>
<tr>
<th>Caution</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Do not use the product in a place where it could be splashed by oils or solvents.</td>
</tr>
<tr>
<td>2. When this pressure switch is used in a place where water and dust splash on, water and dust may enter inside the switch through the atmospheric vent port. Insert a ø4 tube (I.D. ø2.5) into the atmospheric vent port, and bring piping of the opposite side up to the safe position to keep it from water and dust. Do not bend the tube or close the hole of it. It causes malfunction with the measurement of positive pres-</td>
</tr>
</tbody>
</table>

### Connection

<table>
<thead>
<tr>
<th>Caution</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Incorrect wiring can damage the switch and cause a malfunction or erroneous switch output.</td>
</tr>
<tr>
<td>2. Connections should be done while the power is turned off.</td>
</tr>
<tr>
<td>3. 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.</td>
</tr>
<tr>
<td>4. If a commercial switching regulator is used, make</td>
</tr>
</tbody>
</table>

### Operating Environment

<table>
<thead>
<tr>
<th>Caution</th>
</tr>
</thead>
<tbody>
<tr>
<td>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.</td>
</tr>
<tr>
<td>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.</td>
</tr>
</tbody>
</table>

---

[Diagram showing atmospheric vent port and tube insertion.]

- Make sure that the tube is inserted to the end of the atmospheric vent port.
- Use SMC tubing, TU0425. (Material: Polyurethane, Tube O.D. ø4, I.D. ø2.5)

3. Take measures against static electricity with equipment when this switch is used in connection with resin piping. Also, the ground should be separate from that of the units that generate strong electromagnetic noise or high frequency, otherwise, the switch can be damaged by static electricity.
Mounting

**Caution**

1. Mounting with panel mount adapter

![Diagram of panel mount adapter installation](image)

2. Mounting with bracket

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

![Diagram of bracket installation](image)

**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 ZSE40A</td>
<td>–101.3 kPa</td>
</tr>
<tr>
<td>For vacuum pressure ZSE40AF</td>
<td>–100 kPa</td>
</tr>
<tr>
<td>For positive pressure ISE40A</td>
<td>–100 kPa</td>
</tr>
</tbody>
</table>

The tightening torque for bracket mounting screw should be 0.5 to 0.7 N·m for M3 and 1.4 to 1.6 N·m for M4.
Related Equipment

2-Colour Display High Precision Digital Pressure Switch  **ZSE/ISE30A**

<table>
<thead>
<tr>
<th>Series</th>
<th>Type</th>
<th>Rated pressure range</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZSE30AF</td>
<td>Compound pressure</td>
<td>–100.0 to 100.0 kPa</td>
</tr>
<tr>
<td>ZSE30A</td>
<td>Low pressure/vacuum</td>
<td>0.0 to –101.0 kPa</td>
</tr>
<tr>
<td>ISE30A</td>
<td>Positive pressure</td>
<td>0.100 to 1.000 MPa</td>
</tr>
</tbody>
</table>

**Features**
- With one-touch fitting (Straight, Elbow)
- Space-saving, capable of vertical and horizontal contact mounting
- With display calibration function
- Simultaneous copying is possible for maximum 10 units.
- IP40

2-Colour Display Digital Pressure Switch  **ZSE/ISE80**

<table>
<thead>
<tr>
<th>Series</th>
<th>Type</th>
<th>Rated pressure range</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZSE80F</td>
<td>Compound pressure</td>
<td>–100.0 to 100.0 kPa</td>
</tr>
<tr>
<td>ZSE80</td>
<td>Vacuum pressure</td>
<td>–101.0 to 0.0 kPa</td>
</tr>
<tr>
<td>ISE80</td>
<td>Positive pressure</td>
<td>–0.100 to 1.000 MPa</td>
</tr>
<tr>
<td>ISE80H</td>
<td>Positive pressure</td>
<td>–0.100 to 2.000 MPa</td>
</tr>
</tbody>
</table>

**Features**
- Suitable for a wide variety of fluids with stainless diaphragm
- IP65
- RoHS compliant
- Low leakage. VCR®, Swagelok® compatible fittings can be selected.
- With one-touch fittings (Straight, Elbow)
- Back piping, underside piping

Note) VCR® and Swagelok® are trademarks of Swagelok Company.
**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.

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**Safety Instructions**

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

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**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**

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 catalogue for the particular products.

**Compliance Requirements**

1. 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.