PSE20-0 M — —

Input/Output specifications
- 0: NPN 5 outputs + Auto shift input
- 1: PNP 5 outputs + Auto shift input

Unit specifications
- Nil: With unit display switching function
- M: Fixed SI unit

Note) Fixed unit
- For vacuum low pressure & compound pressure: kPa
- For high pressure: MPa

Accessory: Power supply/Output connection cable (2 m)
Included with the controller.

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Option 1
- Without panel mount/protective cover
- Panel mount
- Front protective cover + Panel mount

Option 2
- Without connector
- Sensor connector (4 pcs.)

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Option
When only optional parts are required, order with the part numbers listed below.

<table>
<thead>
<tr>
<th>Description</th>
<th>Part no.</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Panel mount adapter</td>
<td>ZS-26-B</td>
<td>Waterproof seal, screws included</td>
</tr>
<tr>
<td>Front protective cover</td>
<td>ZS-26-01</td>
<td></td>
</tr>
<tr>
<td>Front protective cover + Panel mount adapter</td>
<td>ZS-26-C</td>
<td>Waterproof seal, screws included</td>
</tr>
<tr>
<td>□48 conversion adapter</td>
<td>ZS-26-D</td>
<td>□48 conversion adapter</td>
</tr>
<tr>
<td>Connector</td>
<td>ZS-26-E</td>
<td>ZS-26-E (4 pcs. per set)</td>
</tr>
</tbody>
</table>

Order panel mount adapter separately.

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Note) Fixed unit
For vacuum low pressure & compound pressure: kPa
For high pressure: MPa

This adapter is used to mount Series PSE200 on the panel fitting of Series PS100.
## Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>PSE200</th>
<th>PSE201</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output specification</td>
<td>NPN open collector</td>
<td>PNP open collector</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>Power supply voltage — 1.5 V</td>
</tr>
<tr>
<td>Current consumption</td>
<td>55 mA or less (Current consumption for sensor is not included.)</td>
<td>Power supply current for sensor Note 1) 40 mA maximum (100 mA maximum for the total power supply current when 4 sensors are input.)</td>
</tr>
<tr>
<td>No. of inputs</td>
<td>1 to 5 VDC (Input impedance: Approx. 800 kΩ)</td>
<td>4 inputs</td>
</tr>
<tr>
<td>Hysteresis</td>
<td>Variable</td>
<td>Variable</td>
</tr>
<tr>
<td>Switch output</td>
<td>5 outputs (CH1: 2 outputs, CH2 to 4: 1 output)</td>
<td>3-digit fixed</td>
</tr>
<tr>
<td>Maximum load current</td>
<td>80 mA</td>
<td>80 mA</td>
</tr>
<tr>
<td>Maximum load voltage</td>
<td>30 VDC (With NPN)</td>
<td>30 VDC (With NPN)</td>
</tr>
<tr>
<td>Residual voltage</td>
<td>1 V or less (With load current of 80 mA)</td>
<td>1 V or less (With load current of 80 mA)</td>
</tr>
<tr>
<td>Output protection</td>
<td>With short circuit protection</td>
<td>With short circuit protection</td>
</tr>
<tr>
<td>Response time</td>
<td>5 ms or less</td>
<td>5 ms or less</td>
</tr>
<tr>
<td>Repeatability</td>
<td>±0.1% F.S. or less</td>
<td>±0.1% F.S. or less</td>
</tr>
<tr>
<td>Setting/Display accuracy</td>
<td>±0.5% F.S., ±1 digit or less (at ambient temperature of 25° ±3°C)</td>
<td>±0.5% F.S., ±1 digit or less (at ambient temperature of 25° ±3°C)</td>
</tr>
<tr>
<td>Display</td>
<td>For measured value display: 4-digit, 7-segment indicator, Display color: Yellow</td>
<td>For channel display: 1-digit, 7-segment indicator, Display color: Red</td>
</tr>
<tr>
<td>Indication light</td>
<td>Red (Lights up when output is ON.)</td>
<td>Red (Lights up when output is ON.)</td>
</tr>
<tr>
<td>Auto shift input</td>
<td>Non-voltage input (Reed or Solid state), Input 10 ms or more, Independently controllable auto shift function ON/OFF</td>
<td>With auto identification function</td>
</tr>
<tr>
<td>Auto identification function Note 2)</td>
<td>With auto identification function</td>
<td>With auto identification function</td>
</tr>
<tr>
<td>Resistance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enclosure</td>
<td>Front face: IP65, Other: IP40</td>
<td>Front face: IP65, Other: IP40</td>
</tr>
<tr>
<td>Ambient temperature range</td>
<td>Operating: 0° to 50°C, Stored: −10° to 60°C (No freezing or condensation)</td>
<td>Operating: 0° to 50°C, Stored: −10° to 60°C (No freezing or condensation)</td>
</tr>
<tr>
<td>Ambient humidity range</td>
<td>Operating/Stored: 35 to 85% RH (No condensation)</td>
<td>Operating/Stored: 35 to 85% RH (No condensation)</td>
</tr>
<tr>
<td>Vibration resistance</td>
<td>10 to 500 Hz at whichever is smaller of 1.5 mm amplitude or 98 m/s² acceleration, in X, Y, Z directions for 2 hrs. each (De-energized)</td>
<td>10 to 500 Hz at whichever is smaller of 1.5 mm amplitude or 98 m/s² acceleration, in X, Y, Z directions for 2 hrs. each (De-energized)</td>
</tr>
<tr>
<td>Impact resistance</td>
<td>980 m/s² in X, Y, Z directions, 3 times each (De-energized)</td>
<td>980 m/s² in X, Y, Z directions, 3 times each (De-energized)</td>
</tr>
<tr>
<td>Temperature characteristics</td>
<td>±0.5% F.S. or less based on 25°C</td>
<td>±0.5% F.S. or less based on 25°C</td>
</tr>
<tr>
<td>Material</td>
<td>Enclosure: PBT; Display: Transparent nylon; Back rubber cover: CR</td>
<td>Enclosure: PBT; Display: Transparent nylon; Back rubber cover: CR</td>
</tr>
<tr>
<td>Weight</td>
<td>Approx. 60 g (Power supply/output connecting cable not included)</td>
<td>Approx. 60 g (Power supply/output connecting cable not included)</td>
</tr>
<tr>
<td>Applicable pressure sensor</td>
<td>PSE530 (For high pressure)</td>
<td>PSE531 (For vacuum)</td>
</tr>
<tr>
<td>Regulating pressure range</td>
<td>–0.1 to 1 MPa</td>
<td>10 to –101 kPa</td>
</tr>
<tr>
<td>Set pressure resolution</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Note 3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>kPa</td>
<td>—</td>
<td>0.1</td>
</tr>
<tr>
<td>MPa</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>kgf/cm²</td>
<td>0.001</td>
<td>0.001</td>
</tr>
<tr>
<td>bar</td>
<td>0.001</td>
<td>0.001</td>
</tr>
<tr>
<td>psi</td>
<td>0.1</td>
<td>0.01</td>
</tr>
<tr>
<td>mmHg</td>
<td>—</td>
<td>1</td>
</tr>
<tr>
<td>InHg</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

Note 1) If the Vcc and 0 V side of the sensor input connector are short circuited, the inside of the controller will be damaged.

Note 2) Auto identification function comes with “Series PSE53□□” pressure sensor only. Other SMC series (PSE510 and PSE520) are not equipped with this function.

Note 3) For controllers with unit display switching function. (Either of SI units, [kPa] or [MPa], will be the set unit for those controllers without unit switching function.)
**Series PSE200**

### Dimensions

**PSE200 & PSE201**

![Diagram of PSE200 & PSE201 dimensions]

**Power supply/Output connector (8P)**

<table>
<thead>
<tr>
<th>PIN no.</th>
<th>Terminal</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>DC (+)</td>
</tr>
<tr>
<td>2</td>
<td>DC (–)</td>
</tr>
<tr>
<td>3</td>
<td>CH1_OUT1</td>
</tr>
<tr>
<td>4</td>
<td>CH1_OUT2</td>
</tr>
<tr>
<td>5</td>
<td>CH2_OUT1</td>
</tr>
<tr>
<td>6</td>
<td>CH3_OUT1</td>
</tr>
<tr>
<td>7</td>
<td>CH4_OUT1</td>
</tr>
<tr>
<td>8</td>
<td>Auto shift input</td>
</tr>
</tbody>
</table>

**Power supply/Output connection cable (Included)**

<table>
<thead>
<tr>
<th>Pin no.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Brown</td>
<td>DC (+)</td>
</tr>
<tr>
<td>2 Blue</td>
<td>DC (–)</td>
</tr>
<tr>
<td>3 Black</td>
<td>CH1_OUT1</td>
</tr>
<tr>
<td>4 White</td>
<td>CH1_OUT2</td>
</tr>
<tr>
<td>5 Gray</td>
<td>CH2_OUT1</td>
</tr>
<tr>
<td>6 Red</td>
<td>CH3_OUT1</td>
</tr>
<tr>
<td>7 Green</td>
<td>CH4_OUT1</td>
</tr>
<tr>
<td>8 Yellow</td>
<td>Auto shift input</td>
</tr>
</tbody>
</table>

**Sensor connector (4P x 4)**

<table>
<thead>
<tr>
<th>PIN no.</th>
<th>Terminal</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>DC (+)</td>
</tr>
<tr>
<td>2</td>
<td>IN (1 to 5 V)</td>
</tr>
<tr>
<td>3</td>
<td>DC (–)</td>
</tr>
<tr>
<td>4</td>
<td>N.C.</td>
</tr>
</tbody>
</table>

**Connector (Option)**

![Diagram of sensor connector and power supply/output connector]
Dimensions

Front protective cover + Panel mount

53
47
42.4

48 conversion adapter + Panel mount

55 or more
37.5 ±0.1

Panel fitting dimension
Applicable panel thickness: 0.5 to 8 mm
Series PSE530/200

Descriptions

4-digit display
Displays the measured pressure value, content for each setting, and error code.

Switch output display
Displays the output status of OUT1 (CH1 to CH4), OUT2 (CH1 only).
Lights up when it is ON.

UP button
Use this button to change the mode or set value.

SET button
Use this button to set the mode or set value.

DOWN button
Use this button to change the mode or set value.

Unit display
The selected unit lights up. Use unit labels for units other than MPa and kPa.

Channel display
Displays the selected channel.

Error Code & Solution

<table>
<thead>
<tr>
<th>LED display</th>
<th>Contents</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>E</strong> 1</td>
<td>Excess current is flowing into the switch output of OUT1.</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><strong>E</strong> 2</td>
<td>Excess current is flowing into the switch output of OUT2.</td>
<td></td>
</tr>
<tr>
<td><strong>E</strong> 3</td>
<td>Pressure is applied to a pressure sensor during the reset operation (a zero point adjustment) as follows: When compound pressure is used: ±2.5% F.S. or more. When pressure other than compound pressure is used: ±5% F.S. or more. After displaying for 2 seconds, it will return to the measuring mode.</td>
<td>Bring the pressure back to atmospheric pressure and use the reset function (zero point adjustment) again.</td>
</tr>
<tr>
<td><strong>E</strong> 5</td>
<td>Supply pressure exceeds the maximum regulating pressure.</td>
<td>Reduce/increase supply pressure to within the regulating pressure range.</td>
</tr>
<tr>
<td><strong>E</strong> 6</td>
<td>Supply pressure is below the minimum regulating pressure.</td>
<td></td>
</tr>
<tr>
<td><strong>E</strong> 7</td>
<td>Internal data error.</td>
<td>Please contact SMC.</td>
</tr>
<tr>
<td><strong>E</strong> 8</td>
<td>Internal data error.</td>
<td>Please contact SMC if it does not recover.</td>
</tr>
</tbody>
</table>

Internal Circuit and Connection

PSE200-(M)□
• NPN open collector 5 outputs + Auto shift 1 input specification

PSE201-(M)□
• PNP open collector 5 outputs + Auto shift 1 input specification
Operation 1: Initial Setting

1 Channel selection

Press the SET button and hold for 2 seconds or longer.

2 Range setting

If the controller is equipped with a unit switching function, unit setting can be changed. (Refer to page 16-3-17 for details.)

3 Output mode setting

OUT1 setting

OUT2 setting (CH1 only)

Note: Sensor range varies depending on the type of pressure sensor.
**Operation 1: Initial Setting**

### 4 Response time setting

Press **SET** button.

**Anti-chattering function**

Devices such as large bore cylinders and high-flow vacuum ejectors consume a large volume of air when they operate, and this may cause a momentary drop in the supply pressure. This function prevents such momentary drops from being detected as abnormal pressures by changing the response time setting.

**<Principle>**

The pressure values measured within the response time that is selected by the user are averaged. By comparing this average pressure value with the set pressure value, switch output (ON/OFF) is determined.

### 5 Manual setting/Auto preset

Press **SET** button.

**CH1 setting** is completed when the channel display changes from blinking to lights on. Repeat the same setting steps for CH2 to CH4.
Operation 2: Pressure Setting

Manual setting

Channel selection

OUT1 setting (1)
For normally open
Displays alternately
Increases the set value
Decreases the set value
For normally closed

OUT1 setting (2)
For normally open
Displays alternately
Increases the set value
Decreases the set value
For normally closed

OUT2 setting (1)/CH1 only
For normally open
Displays alternately
Increases the set value
Decreases the set value
For normally closed

OUT2 setting (2)/CH1 only
For normally open
Displays alternately
Increases the set value
Decreases the set value
For normally closed

Output mode

Hysteresis mode: Hysteresis of the switch output can be set arbitrarily.

<Normally open>

Switch output 1 & 2

ON

OFF

High pressure: Compound pressure type
Positive pressure type
High vacuum: Vacuum type

<Normally closed>

Switch output 1 & 2

ON

OFF

High pressure: Compound pressure type
Positive pressure type
High vacuum: Vacuum type

Note) If the hysteresis is set for less than 2 digits, the switch output may possibly chatter when the input pressure changes around the set value.

Window comparator mode: Allows the switch output to be turned ON or OFF within any set pressure range.

<Normally open>

Switch output 1 & 2

ON

OFF

High pressure: Compound pressure type
Positive pressure type
High vacuum: Vacuum type

<Normally closed>

Switch output 1 & 2

ON

OFF

High pressure: Compound pressure type
Positive pressure type
High vacuum: Vacuum type

Note) The hysteresis is set to 3 digits. When setting the pressure, allow 7 digits or more.

Regulating pressure range | Main application | Display | Hysteresis mode | Window comparator mode
---|---|---|---|---
-101.0 to 101.0 kPa | Adsorption and vacuum release verification | n0 | P2(n2) ≤ P1(n1) | P2(n2) > P1(n1)
P2(n2) > P1(n1) | P2(n2) > P1(n1)
P2(n2) ≤ P1(n1) | P2(n2) ≤ P1(n1) | P2(n2) > P1(n1)
P2(n2) > P1(n1) | P2(n2) > P1(n1)

10.0 to -101.0 kPa | Adsorption verification | n1 | P2(n2) > P1(n1) | P2(n2) < P1(n2)
-10.0 to 10.0 kPa | Supply pressure verification | n2 | P2(n2) > P1(n1) | P2(n2) < P1(n2)
-0.1 to 1000.0 MPa | Leak test | n3 | P2(n2) ≤ P1(n1) | P2(n2) ≤ P1(n2)

Note 1) If the hysteresis is set too small, the switch output may possibly chatter when the input pressure changes around the set value.

Note 2) The hysteresis is set to 3 digits. When setting the pressure, allow 7 digits or more. If the allowance is less than 7 digits, the controller will not operate.
Operation 2: Pressure Setting

Auto preset

**Channel selection**

- **OUT1 auto preset preparation**
  Prepare the equipment to be set in this mode.

- **OUT1 auto preset**
  For adsorption verification:
  In this mode, repeat the adsorption and release of the workpiece for a few times.
  The optimum values will be set automatically.

- **OUT2 auto preset preparation** (CH1 only)
  For adsorption verification:
  Change the conditions of the workpiece such as the (suction) nozzle with vacuum pad attachment and supply vacuum pressure.

- **OUT2 auto preset** (CH1 only)
  For adsorption verification:
  In this mode, repeat the adsorption and release of the workpiece for a few times.
  The optimum values will be set automatically.

Adsortion Verification

Max. A: Maximum pressure value when workpiece is adsorbed.
Min. B: Minimum pressure value when workpiece is not adsorbed.
Operation 3: Special Setting

1 Precision indicator setting  Refer to A Display calibration function on page 16-3-17 for details.

After setting all 4 channels, press button. Proceed to the copy mode.

Channel selection

Setting is complete (CH1). Return to calibration mode. Repeat the setting procedure for CH2 to CH4.

Displays alternately

Displays the adjusted amount of pressure since the time of shipment (±5% R.D. or less).

Refer to B Copy setting function on page 16-3-17 for details.

After setting for copy mode, press button. Proceed to the auto shift mode.

Setting is complete. Return to the copy mode.

Operation 3: Special Setting

3 Auto shift
Refer to Auto shift function on page 16-3-17 for details.

Auto shift mode

<table>
<thead>
<tr>
<th>CH1</th>
<th>Displays alternately</th>
</tr>
</thead>
<tbody>
<tr>
<td>On</td>
<td>Off</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CH2</th>
<th>Displays alternately</th>
</tr>
</thead>
<tbody>
<tr>
<td>On</td>
<td>Off</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CH3</th>
<th>Displays alternately</th>
</tr>
</thead>
<tbody>
<tr>
<td>On</td>
<td>Off</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CH4</th>
<th>Displays alternately</th>
</tr>
</thead>
<tbody>
<tr>
<td>On</td>
<td>Off</td>
</tr>
</tbody>
</table>

Setting is complete.
Proceed to the auto identification mode.

4 Auto identification
Refer to Auto identification function on page 16-3-17 for details.

Auto identification mode

<table>
<thead>
<tr>
<th>CH1</th>
<th>Auto identification mode ON.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>CH2</th>
<th>Displays alternately</th>
</tr>
</thead>
<tbody>
<tr>
<td>On</td>
<td>Off</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CH3</th>
<th>Displays alternately</th>
</tr>
</thead>
<tbody>
<tr>
<td>On</td>
<td>Off</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CH4</th>
<th>Displays alternately</th>
</tr>
</thead>
<tbody>
<tr>
<td>On</td>
<td>Off</td>
</tr>
</tbody>
</table>

Setting is complete.

To measuring mode
Multi-channel Controller/Pressure Sensor  Series PSE530/200

Function Details

A Display calibration function
This function eliminates slight differences in the output values of all 4 channels and allows uniformity in the numbers displayed. Displayed values of the pressure sensors can be adjusted to within ±5%.

![Graph showing the relationship between applied pressure and displayed pressure value](image)

- Displayed value at the time of shipment
- Adjustable range of display calibration function

Note) When the display calibration function is used, the regulating pressure value may change ±1 digit.

B Copy function
Information that can be copied includes the following:  ① Pressure set values, ② Range settings, ③ Display Units, ④ Output modes, ⑤ Response times.

- When CH1 is copied to CH2, CH3, and CH4, information of OUT1 in CH1 will be copied.
- When CH2, CH3, or CH4 is copied to CH1, information of OUT1 in CH2, CH3, or CH4 will be copied only to OUT1 in CH1.

Note) When the copy function is used, the regulating pressure value of the copied channel may change ±1 digit.

C Auto shift function
If there is a fluctuation in the supply pressure, erroneous operation may occur (e.g., in the case of adsorption verification, the switch does not turn ON even though the workpiece is being adsorbed, or does not turn OFF even though the workpiece is no longer being adsorbed.) The auto shift function rectifies pressure changes to ensure proper ON/OFF switch response during such fluctuations.

<Principle>
At the point when the supply pressure fluctuates, the set pressure value is rectified by setting the auto shift input (external input) to Lo (no-voltage input), using the pressure measured at that point as a standard.

- This function is good only for those channels whose function selection is turned on during the auto shift mode setting.
- Maintain the constant pressure for 10 ms or more after a drop in the auto shift input.
- When the auto shift is input, “ooo” will be displayed for approximately 1 second, and the pressure value at that point will be saved as a rectified value “C_5” for CH1 or “C_3” for CH2 and CH3. Based on the saved rectified values, the set value “P_1” to “P_4” or “n_1” to “n_4” will likewise be rectified.
- The time from the moment the auto shift is input, to the moment the switch output actually operates is 15 ms or less.
- If the set value rectified by the auto shift input exceeds the regulating pressure range, it will be rectified once more to within the values of the regulating pressure range.
- When the auto shift function is turned off, the shift value will be zero.
- When all of the auto shift functions are turned off, “ooo” will not be displayed even if the auto shift input is set to Lo (no-voltage input).
- Values “C_5” and “C_3”, rectified after the auto shift is input, will be lost once the power is turned off.
- Values “C_5” and “C_3”, rectified after the auto shift function is used, will be reset to zero (initial value) when the power is turned back on again.

Note) Rectified values are not saved in EEPROM.

D Auto identification function
This function automatically identifies the pressure range of the pressure sensor that is connected to the multi-channel pressure sensor controller, thus eliminating the need of having to reset the range again after replacing the sensor. This function will be activated either when “Aon” is set in the auto identification mode or when the power is turned back on in that condition. However, this function only works in conjunction with specific pressure sensors (SMC Series PSE53E3). When other pressure sensors are used, this function will not work. When using other types of pressure sensors, first set the auto identification mode to “AOff”, and then proceed to setting the range. Turning the power back on while in the “Aon” setting can cause a malfunction.

When auto shift is NOT used:
When the supply pressure fluctuates, a correct sensing is no longer possible.
- Supply pressure normal
- Supply pressure drop
- Supply pressure increase

When auto shift is used:
- Set value rectification
- Set value rectification

E Unit display switching function
Display units can be switched with this function. Units that can be displayed vary depending on the range of the pressure sensors connected to the controller.
Display units can be selected using either [ ] or [ ].

Unit Display and Resolution

<table>
<thead>
<tr>
<th>Applicable pressure sensor</th>
<th>PSE530</th>
<th>PSE531</th>
<th>PSE532</th>
<th>PSE533</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regulating pressure range</td>
<td>–0.1 to 1 MPa</td>
<td>0 to –101 kPa</td>
<td>–101 to 101 kPa</td>
<td>10 to –101 kPa</td>
</tr>
<tr>
<td>PR</td>
<td>kPa</td>
<td>MPa</td>
<td>kgf/cm²</td>
<td>bar</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>0.1</td>
<td>0.1</td>
<td>0.001</td>
<td>0.01</td>
<td>0.01</td>
</tr>
<tr>
<td>0.1</td>
<td>0.1</td>
<td>0.001</td>
<td>0.01</td>
<td>0.01</td>
</tr>
<tr>
<td>0.1</td>
<td>0.001</td>
<td>0.001</td>
<td>0.001</td>
<td>0.001</td>
</tr>
<tr>
<td>0.1</td>
<td>0.001</td>
<td>0.001</td>
<td>0.001</td>
<td>0.001</td>
</tr>
<tr>
<td>mmHg</td>
<td>inHg</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Operation 4: Other Functions

**Reset**

Press and hold for 1 second or longer.

**Key lock**

Press and hold for 4 seconds or longer. Note: Channel selection and channel scan operation will not be locked even if the key lock function is on.

**Peak/Bottom display**

Press and hold for 2 seconds or longer. Peak/Bottom mode OFF. Peak/Bottom mode will be deactivated if any buttons other than above are pressed during the peak/bottom mode.

**Channel scan**

Press and hold for 2 seconds or longer. Channel scan function deactivated. Return to the measuring mode.

Note: Pressure value for each channel are displayed at 2 second intervals.
**Series PSE**

**Specific Product Precautions 1**

Be sure to read before handling.

### Pressure Sensor

**Warning**

1. Do not drop, bump, or apply excessive impacts (980 m/s²) while handling. Although the body of the sensor may not be damaged, the inside of the sensor could be damaged and lead to a malfunction.

2. The tensile strength of the cord is 23 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 3.5 N⋅m when installing piping. Exceeding this value may cause malfunctioning of the sensor.

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

5. Connecting the sensor cable (Option)
   - Hold the female connector of the sensor cable with your fingers and carefully insert it into the connector.

![Connector Diagram]

A connector cover is provided as part of the cable assembly (see the figure below). It is designed to keep the female connector from slipping out of the sensor. To lock the connector cover in place, first make sure it is facing in the right direction as you slip it over the female connector, then lock it to the sensor body by turning it clockwise. To remove the cover, first unlock it by turning it counterclockwise, then pull back on it. To remove the female connector, grab it with your fingers and pull back on it. Do not pull on the cable.

### Controller

**Warning**

1. Do not drop, bump, or apply excessive impacts (1000 m/s²) while handling. Although the body of the controller case may not be damaged, the inside of the controller could be damaged and cause a malfunction.

2. The tensile strength of the power supply/output connection cable is 50 N; that of the pressure sensor lead wire with connector is 25 N. Applying a greater pulling force than the applicable specified tensile strength to either of these components can lead to a malfunction. When handling, hold the body of the controller—do not dangle it from the cord.

### 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. Switch output may malfunction.

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.

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

### Operating Environment

**Warning**

1. Our multi-channel pressure sensor controllers 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. Our multi-channel pressure sensor controllers do not have an explosion proof rating. Never use pressure sensors in the presence of inflammable or explosive gases.

3. Enclosure “IP65” applies only to the front face of the panel when mounting. Do not use in an environment where oil splashing or spraying are anticipated.
**Mounting**

**Caution**

The front face of the panel mount conforms to IP65 (IP40 when using the 48 conversion adapter); however, there is a possibility of liquid filtration if the panel mount adapter is not installed securely and properly. Securely fix the adaptor with screws as shown below.

**Standard**

![Diagram of Front protective cover (ZS-26-01) and Panel mount (ZS-26-B)](image)

Tighten screws 1/4 to 1/2 turn after the heads are flush with the panel.

**When using 48 conversion adapter**

![Diagram of 48 conversion adapter (ZS-26-D)](image)

**Wiring**

**Caution**

1. **Connecting sensor cable and connector (ZS-26-E)**
   - Cut the sensor cable as shown below.
   - Insert each lead wire into the corresponding connector number by following the chart provided below.

<table>
<thead>
<tr>
<th>Connector no.</th>
<th>Core wire color of sensor cable</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Brown (DC+)</td>
</tr>
<tr>
<td>2</td>
<td>Black (Analog output)</td>
</tr>
<tr>
<td>3</td>
<td>Blue (DC−)</td>
</tr>
<tr>
<td>4</td>
<td>N.C.</td>
</tr>
</tbody>
</table>

- Make sure that the number of connector and the core wire color match. After verifying that the wires are inserted all the way, temporarily hold the connector down manually.
- Using pliers, snap A into B as shown below so that there is no gap between A and B, and secure the connector.
- The A and B portion of the sensor connector are already tacked down temporarily at the time of shipment. Do not snap the A portion in place before inserting the cable. Note that the connector cannot be taken apart to be reused once it is crimped. Use a new sensor connector in case wiring or the snapping of A into B are done incorrectly.

2. **Connecting power supply/output connection cable**
   - To connect the connector to the multi-channel pressure sensor, push the connector with its A portion facing toward you into the socket until it clicks as shown below.
   - To remove the connector, pull it straight out while applying pressure to the fingers on both sides.
Wiring

Caution

3. Connecting to other series
- Any pressure sensor (SW) can be connected as long as it generates analog output (1 to 5 V) signal. However, the pressure range must match.
- SMC pressure sensors, Series PSE510 & PSE520, are also connectable.
- When connecting to pressure sensors other than the Series PSE530, connector types will vary depending on the wire core size of the cable and the outside diameter of the insulation cover. Refer to the table provided below.

<table>
<thead>
<tr>
<th>Connector part no.</th>
<th>Wire core size</th>
<th>Insulation cover O.D.</th>
<th>Sensor part no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZS-26-E</td>
<td>AWG24-26 (0.14 to 0.2 mm²)</td>
<td>ø1.0 to 1.4</td>
<td>PSE510, PSE530</td>
</tr>
<tr>
<td>ZS-26-E-1</td>
<td>AWG24-26 (0.14 to 0.2 mm²)</td>
<td>ø1.4 to 2.0</td>
<td>PSE521</td>
</tr>
<tr>
<td>ZS-26-E-2</td>
<td>AWG20-22 (0.3 to 0.5 mm²)</td>
<td>ø1.0 to 1.4</td>
<td>PSE520</td>
</tr>
<tr>
<td>ZS-26-E-3</td>
<td>AWG20-22 (0.3 to 0.5 mm²)</td>
<td>ø1.4 to 2.0</td>
<td></td>
</tr>
</tbody>
</table>

- Refer to the following diagram for connecting Series PSE520 to the connector.

Regulating Pressure Range & Rated Pressure Range

Caution

1. Regulating pressure range: Refers to allowable pressure range in a pressure setting mode.
   - Setting range is between \( P_{1(n_1)} \) to \( P_{4(n_4)} \).
   - For Series PSE200, the regulating pressure range and the setting pressure range that can be displayed are the same.
2. Rated pressure range: Refers to the pressure range that satisfies the product specifications.
   - Pressure range that satisfies the product specifications (accuracy and linearity) for PSE530.
Safety Instructions

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

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

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

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

Note 1) ISO 4414: Pneumatic fluid power--General rules relating to systems.
Note 2) JIS B 8370: General Rules for Pneumatic Equipment

⚠️ Warning

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

2. Only trained personnel should operate pneumatically operated machinery and equipment.
   Compressed air can be dangerous if an operator is unfamiliar with it. Assembly, handling or repair of pneumatic systems should be performed by trained and experienced operators.

3. Do not service machinery/equipment or attempt to remove components until safety is confirmed.
   1. Inspection and maintenance of machinery/equipment should only be performed once measures to prevent falling or runaway of the driver objects have been confirmed.
   2. When equipment is to be removed, confirm the safety process as mentioned above. Cut the supply pressure for this equipment and exhaust all residual compressed air in the system.
   3. Before machinery/equipment is restarted, take measures to prevent shooting-out of cylinder piston rod, etc.

4. Contact SMC if the product is to be used in any of the following conditions:
   1. Conditions and environments beyond the given specifications, or if product is used outdoors.
   2. Installation on equipment in conjunction with atomic energy, railway, air navigation, vehicles, medical equipment, food and beverages, recreation equipment, emergency stop circuits, clutch and brake circuits in press applications, or safety equipment.
   3. An application which has the possibility of having negative effects on people, property, or animals, requiring special safety analysis.
Common Precautions

Be sure to read before handling.
For detailed precautions on every series, refer to main text.

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**Selection**

⚠️ **Warning**

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

---

**Mounting**

⚠️ **Warning**

1. Instruction manual
   Install the products and operate them only after reading the instruction manual carefully and understanding its contents.
   Also keep the manual where it can be referred to as necessary.

2. Securing the space for maintenance
   When installing the products, please allow access for maintenance.

3. Tightening torque
   When installing the products, please follow the listed torque specifications.

---

**Piping**

⚠️ **Caution**

1. Before piping
   Make sure that all debris, cutting oil, dust, etc, are removed from the piping.

2. Wrapping of pipe tape
   When screwing piping or fittings into ports, ensure that chips from the pipe threads or sealing material do not get inside the piping. Also, when the pipe tape is used, leave 1.5 to 2 thread ridges exposed at the end of the threads.

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**Air Supply**

⚠️ **Warning**

1. Operating fluid
   Please consult with SMC when using the product in applications other than compressed air (including vacuum).
   Regarding products for general fluid, please ask SMC about applicable fluids.

2. Install an air dryer, aftercooler, etc.
   Excessive condensate in a compressed air system may cause valves and other pneumatic equipment to malfunction.
   Installation of an air dryer, after cooler etc. is recommended.

3. Drain flushing
   If condensate in the drain bowl is not emptied on a regular basis, the bowl will over flow and allow the condensate to enter the compressed air lines.
   If the drain bowl is difficult to check and remove, it is recommended that a drain bowl with the auto-drain option be installed.
   For compressed air quality, refer to “Air Preparation Equipment” catalog.

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

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**Operating Environment**

⚠️ **Warning**

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

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**Maintenance**

⚠️ **Warning**

1. Maintenance procedures are outlined in the operation manual.
   Not following proper procedures could cause the product to malfunction and could lead to damage to the equipment or machine.

2. Maintenance work
   If handled improperly, compressed air can be dangerous. Assembly, handling and repair of pneumatic systems should be performed by qualified personnel only.

3. Drain flushing
   Remove drainage from air filters regularly. (Refer to the specifications.)

4. Shut-down before maintenance
   Before attempting any kind of maintenance make sure the supply pressure is shut of and all residual air pressure is released from the system to be worked on.

5. Start-up after maintenance and inspection
   Apply operating pressure and power to the equipment and check for proper operation and possible air leaks. If operation is abnormal, please verify product set-up parameters.

6. Do not make any modifications to be product.
   Do not take the product apart.
Quality Assurance Information (ISO 9001, ISO 14001)

Reliable quality of products in the global market

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

Quality management system
ISO 9001

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

Environmental management system
ISO 14001

This is an international standard related to environmental management systems and environmental inspections. While promoting environmentally friendly automation technology, SMC is also making diligent efforts to preserve the environment.
SMC Product Conforming to Inter

SMC products complying with EN/ISO, CSA/UL standards are supporting

The CE mark indicates that machines and components meet essential requirements of all the EC Directives applied. It has been obligatory to apply CE marks indicating conformity with EC Directives when machines and components are exported to the member Nations of the EU. Once “A manufacturer himself” declares a product to be safe by means of CE marking (declaration of conformity by manufacturer), free distribution inside the member Nations of the EU is permissible.

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

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

**EC Directives and Pneumatic Components**

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

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

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

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

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

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

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**Products conforming to CE Standard**

With CE symbol for simple visual recognition

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

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