Small size, High accuracy pressure control digital pressure sensor

**Features**
- High accuracy digital pressure sensor
- High brightness red LED (LED height: 9.5 mm)
- High resolution: 1/1000
- Convertible pressure unit
  - Negative pressure, Compound pressure: kPa, kgf/cm², bar, psi, mmHg, mmH₂O, inHg
  - Standard pressure: kPa, kgf/cm², bar, psi
- Various output modes: Hysteresis mode, Automatic sensitivity setting mode, Independent 2 output mode, Window comparative output mode
- Chattering prevention for output (Selectable response time: 2.5, 5, 100, 500 ms)
- Analog output (1-5VDC) scale function
- Reverse power polarity and overcurrent protection circuit
- Zero-point adjustment function
- Peak and Bottom hold display

**Ordering information**

<table>
<thead>
<tr>
<th>Item</th>
<th>Appearance</th>
<th>Pressure type</th>
<th>Output type</th>
<th>Pressure port</th>
<th>R1/8</th>
<th>No mark</th>
<th>C</th>
<th>No mark</th>
</tr>
</thead>
<tbody>
<tr>
<td>PS A-V</td>
<td>Regular square (30mm×30mm)</td>
<td>PS Pressure Sensor</td>
<td>Cable</td>
<td>NPT1/8</td>
<td>Standard (PSA Series)</td>
<td>NPN open collector output</td>
<td>Positive (Cable integrated type)</td>
<td></td>
</tr>
<tr>
<td>C P</td>
<td>Rectangular (10.2mm×54mm)</td>
<td>PSB Series</td>
<td>Connector type</td>
<td>M5</td>
<td>Standard (PSB Series)</td>
<td>PNP open collector output</td>
<td></td>
<td></td>
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<tr>
<td>Rc1/8</td>
<td>Rectangular (10.2mm×54mm)</td>
<td>PSB Series</td>
<td>Connector type</td>
<td>01</td>
<td>0100kPa</td>
<td>- 1000kPa</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>1000kPa</td>
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</table>

**Pressure and Max. pressure display range**

<table>
<thead>
<tr>
<th>Type</th>
<th>Negative pressure</th>
<th>Standard pressure</th>
<th>Compound pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>kPa</td>
<td>0.0 to -101.3</td>
<td>0.0 to 100.0</td>
<td>-100.0 to 100.0</td>
</tr>
<tr>
<td>kgf/cm²</td>
<td>5.0 to -101.3</td>
<td>0.0 to 100.0</td>
<td>(-101.2 to 110.0)</td>
</tr>
<tr>
<td>bar</td>
<td>0.000 to -1.034</td>
<td>0.000 to 1.000</td>
<td>0.000 to 1.000</td>
</tr>
<tr>
<td>psi</td>
<td>0.006750</td>
<td>0.010197</td>
<td>0.0735578</td>
</tr>
<tr>
<td>mmHg</td>
<td>7500616</td>
<td>101971.553</td>
<td>101971.553</td>
</tr>
<tr>
<td>mmH₂O</td>
<td>101971.553</td>
<td>145.038243</td>
<td>145.038243</td>
</tr>
<tr>
<td>psi</td>
<td>142233.4</td>
<td>142233.4</td>
<td>142233.4</td>
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<tr>
<td>mmHg</td>
<td>142233.4</td>
<td>223438.64</td>
<td>223438.64</td>
</tr>
<tr>
<td>mmH₂O</td>
<td>223438.64</td>
<td>295.299875</td>
<td>295.299875</td>
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</tbody>
</table>

**Pressure conversion chart**

<table>
<thead>
<tr>
<th>from</th>
<th>to</th>
<th>Pa</th>
<th>kPa</th>
<th>MPa</th>
<th>kgf/cm²</th>
<th>mmHg</th>
<th>mmH₂O</th>
<th>psi</th>
<th>bar</th>
<th>inHg</th>
</tr>
</thead>
<tbody>
<tr>
<td>1Pa</td>
<td>1</td>
<td>1</td>
<td>0.001</td>
<td>0.000001000</td>
<td>0.000010197</td>
<td>0.0007501</td>
<td>0.0101972</td>
<td>0.000145038</td>
<td>0.000010000</td>
<td>0.000029534</td>
</tr>
<tr>
<td>1kPa</td>
<td>1000.000</td>
<td>1</td>
<td>0.010000</td>
<td>0.010197</td>
<td>7.500616</td>
<td>101971.553</td>
<td>145.038243</td>
<td>10</td>
<td>295.299875</td>
<td></td>
</tr>
<tr>
<td>1MPa</td>
<td>1000000</td>
<td>1000</td>
<td>1</td>
<td>10.197162</td>
<td>7500616</td>
<td>101971.553</td>
<td>145.038243</td>
<td>10</td>
<td>295.299875</td>
<td></td>
</tr>
<tr>
<td>1kgf/cm²</td>
<td>98066.54</td>
<td>98.066543</td>
<td>0.09806</td>
<td>0.009806</td>
<td>735.5595</td>
<td>10000.20</td>
<td>142233.4</td>
<td>0.980665</td>
<td>28.95878</td>
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</tr>
<tr>
<td>1mmHg</td>
<td>133.322368</td>
<td>0.133322</td>
<td>0.000133</td>
<td>0.001359</td>
<td>1</td>
<td>13.5954</td>
<td>0.019336</td>
<td>0.001333</td>
<td>0.039370</td>
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<tr>
<td>1mmH₂O</td>
<td>9.80665</td>
<td>9.80665</td>
<td>0.00980</td>
<td>0.00980</td>
<td>1</td>
<td>13.5954</td>
<td>0.019336</td>
<td>0.001333</td>
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<tr>
<td>1psi</td>
<td>6894.757</td>
<td>6.894757</td>
<td>0.68975</td>
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<td>51.71630</td>
<td>703.07</td>
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<td>0.068947</td>
<td>2.036003</td>
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<tr>
<td>1bar</td>
<td>100000.0</td>
<td>100.0000</td>
<td>1</td>
<td>10196.69</td>
<td>145.0339</td>
<td>1</td>
<td>29.52998</td>
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<td></td>
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</tr>
<tr>
<td>1inHg</td>
<td>3386.417</td>
<td>3.388418</td>
<td>0.03386</td>
<td>0.034532</td>
<td>25.40022</td>
<td>345.31849</td>
<td>0.491158</td>
<td>0.033863</td>
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</tbody>
</table>

Ex) For calculating 760mmHg as kPa: According to above chart, 1mmHg is 0.133322kPa, therefore 760mmHg will be 760×0.133322kPa=101.32472kPa.
PSA / PSB Series

Specifications

<table>
<thead>
<tr>
<th>Pressure type</th>
<th>Gauge pressure</th>
<th>Negative pressure</th>
<th>Standard pressure</th>
<th>Compound pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model NPN open collector output</td>
<td>PSA-V01-</td>
<td>PSA-01-</td>
<td>PSA-1-</td>
<td>PSA-C01-</td>
</tr>
<tr>
<td></td>
<td>PSB-V01-</td>
<td>PSB-01-</td>
<td>PSB-1-</td>
<td>PSB-C01-</td>
</tr>
<tr>
<td></td>
<td>PSA-V01C-</td>
<td>PSA-01C-</td>
<td>PSA-1C-</td>
<td>PSA-C01C-</td>
</tr>
<tr>
<td></td>
<td>PSB-V01C-</td>
<td>PSB-01C-</td>
<td>PSB-1C-</td>
<td>PSB-C01C-</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pressure type</th>
<th>Output voltage (V)</th>
<th>Pressure (kPa)</th>
<th>±2% F.S.</th>
<th>Full scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model NPN open collector output</td>
<td>PSA-01-</td>
<td>PSA-1-</td>
<td>PSA-C01-</td>
<td>PSA-01P-</td>
</tr>
<tr>
<td></td>
<td>PSA-01P-</td>
<td>PSA-1P-</td>
<td>PSA-C01P-</td>
<td>PSA-01C-</td>
</tr>
<tr>
<td></td>
<td>PSA-01CP-</td>
<td>PSA-1CP-</td>
<td>PSA-C01CP-</td>
<td>PSA-01CP-</td>
</tr>
</tbody>
</table>

| Display and set pressure range | 0.0 to -101.3kPa | 0.0 to 100.0kPa | 0.0 to 1,000kPa | -100.0 to 100.0kPa |
| Applied fluid | Air, Non-corrosive gas |
| Power supply | 12-24VDC ±10%(Ripple P-P : Max. 10%) |
| Current consumption | Max. 50mA |
| Control output | NPN or PNP open collector output |
| Hysteresis | 1digit fixed(2digits for psi unit) |
| Repeat error | ±0.2% F.S. ±1digit |
| Response time | Selectable 2.5ms, 5ms, 100ms, 500ms |
| Short circuit protection | Built-in |
| Analog output | • Output voltage: 1-5VDC ±2% F.S. • Zero-point: Within 1VDC ±2% F.S. • Span: Within 4VDC ±2% F.S. • Linear: Within ±2% F.S. • Resolution: Approx. 1/200 • Output impedance: 1kΩ |
| Display digit | 3½digit |
| Display method | 7Segment LED |
| Min. display interval | 1digit/psi unit: 2 digits are fixed |
| Pressure unit | kPa, kgf/cm², bar, psi, mmHg, mmH2O, inHg |
| Display accuracy | 0℃ to 50℃: Max. ±1% F.S., -10 to 0℃: Max. ±2% F.S. |
| Ambient temperature | -10 to 50℃, storage: -20 to 60℃ |
| Ambient humidity | 35 to 95%RH, storage: 35 to 95%RH |
| Vibration | 1.5mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hours |
| Material | • PSA: Front case: PC, Rear case: PC(Insert glass), Pressure port: die-cast(Zn) • PSB: Case, Pressure port: PA • PSB-C: Case, Pressure port, Cover: IIEF |
| Protection | IP40(IEC standard) |
| Cable integrated type | ø4, 5-wire, Length : 2m (AWG24, Core diameter: 0.08mm, Number of cores: 40, Insulation out diameter: ø1mm) |
| Connector type | 5-wire, Length : 3m(AWG24, Insulation out diameter : ø1mm) |
| Approval | CE |
| Unit weight | • PSA: Approx. 120g • PSB: Approx. 70g • PSB-C: Approx. 80g |

PSA-01

- Analog output voltage-Pressure characteristic
- Analog output voltage-Linear characteristic

Notes:
1. °F.S.: Rated pressure.
2. In hysteresis output mode, detection difference is variable.
3. There may be ±1digit error in hysteresis by pressure unit calculation error.
4. The specification of pressure port is marked on the upper part of the case.
5. Pressure ports are distinguished by the colors, silver [Rc(PT)1/8] or black [NPT1/8].
6. Environment resistance is rated at no freezing or condensation.
## Dimensions

**PSA Series**

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
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</thead>
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<tr>
<td>30</td>
<td>30</td>
<td>38.5</td>
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<tr>
<td>23</td>
<td>20</td>
<td>15.5</td>
</tr>
<tr>
<td>13</td>
<td>20</td>
<td>35.5</td>
</tr>
<tr>
<td>30</td>
<td>20</td>
<td>6</td>
</tr>
</tbody>
</table>

- Atmospheric pressure inflow hole
- Cable: ø4, 2m
- Pressure port
  - Standard (Silver): Rc(PT)1/8"
  - Option (Black): NPT1/8"

**PSB Series**

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>20</td>
<td>10.3</td>
</tr>
<tr>
<td>19</td>
<td>4</td>
<td>47.2</td>
</tr>
<tr>
<td>7</td>
<td>3</td>
<td>54.2</td>
</tr>
</tbody>
</table>

- Pressure port (M5 depth 5mm)
- 2-M2 wrench bolt
- 2-Ø3.4 Mounting hole (M3 Bolt)

**Fixing bracket A for mounting (PSA Series)**

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>6</td>
<td>30</td>
</tr>
<tr>
<td>30</td>
<td>25</td>
<td>39.4</td>
</tr>
<tr>
<td>15</td>
<td>41</td>
<td>2-M4 Bolt</td>
</tr>
</tbody>
</table>

**Fixing bracket B for mounting (PSA Series)**

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>28</td>
<td>35</td>
<td>50</td>
</tr>
<tr>
<td>43.4</td>
<td>28</td>
<td>1.6</td>
</tr>
<tr>
<td>54.2</td>
<td>47.2</td>
<td>44</td>
</tr>
</tbody>
</table>

**Panel mounting bracket (PSA Series)**

- When front cover is mounted

**Bracket A**

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>6</td>
<td>30</td>
</tr>
<tr>
<td>3-Ø3.2</td>
<td>2-M4 Bolt</td>
<td></td>
</tr>
</tbody>
</table>

**Bracket B**

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>6</td>
<td>30</td>
</tr>
<tr>
<td>3-Ø3.2</td>
<td>2-M4 Bolt</td>
<td></td>
</tr>
</tbody>
</table>

**Panel cut-out**

- (Panel thickness: 0.8mm to 3.5mm)

**Accessory (sold separately)**

- Panel mounting bracket (PSO-01)
- Front protection cover (PSO-02)
There is no short-circuit protection in analog voltage output. Do not connect this output to power supply or capacitive load directly. Please observe input impedance of connected equipment when using analog voltage output. And be sure to check voltage drop caused by resistance of extended wire.

### Front panel identification

1. 3½digit LED display (red)  
   - Display sensing pressure, every setting value and display error.
2. 1 output indicator (red)  
   - Output 1 is ON, LED will be ON.
3. 2 output indicator (PSA: red, PSB: green)  
   - Output 2 is ON, LED will be ON.

### Setting (PSA/PSB)

- **RUN mode**
  - Press **M** key over 3 sec.
  - Press **A** key over 3 sec.
  - Press **▼** key over 1 sec.

- **M** Parameter setting  
  - Display unit setting  
  - Output operation mode setting  
  - Response time setting  
  - Analog output scale setting (1VDC)  
  - Analog output scale setting (5VDC)  
  - Key lock setting

- **A** Preset value setting
  - Sensing level 1 setting
  - Sensing level 2 setting

- **▼** Peak hold
  - Peak hold
  - Bottom hold

- **M** Zero-point adjustment
  - Zero-point adjustment

### Zero point adjustment (PSA/PSB)

1. In state of atmospheric pressure during RUN mode, press **▼** key and **A** key at the same time for over 1 sec.
2. When the zero point adjustment is completed, it will display **Er 1** and return to RUN mode automatically.

※If executing zero point adjustment when external pressure has been applied, **Er 1** will be flashing. Please execute zero point again in state of atmospheric pressure.

※Please execute zero point adjustment regularly.
Pressure Sensor

![Parameter setting(PSA/PSB)]

**RUN mode**

Press M Key over 3sec.

- **Display unit setting**
  - Press M key momentarily, the unit will be saved, then move to the next mode.
  - Previously set unit will flash in turn every 0.5 sec.
  - Press or A key to select the unit.

- **Negative pressure, compound pressure:**
  - For using mmH₂O unit, multiply display value by 100.

- **Standard pressure:**
  - Acceptable setting range: Min. value of rated pressure ≤ A-1 ≤ 90% of rated pressure
  - (Press M key momentarily, the selected pressure is set as 1VDC scales, then move to the next mode.)

- **Output operation mode setting**
  - Previous output operation mode will flash by turning on.(0.5sec.)
  - Select the output operation mode with M, A Key.
  - Press M key momentarily, the response time will be saved, then move to the next mode.

- **Response time setting**
  - SPD and the previous response time will flash by turning on.(0.5sec.)
  - Select the output operation mode with M, A Key.
  - Press M key momentarily, the response time will be saved, then move to the next mode.

- **Analog output scale setting (1VDC)**
  - R-1 and the previous pressure will flash by turning on.(0.5sec.)
  - Set the pressure which will output 1VDC with M, A Key.
  - Allowable setting range: Min. value of rated pressure ≤ [R-1] ≤ 90% of rated pressure
  - (Press M key momentarily, the selected pressure is set as 1VDC scales, then move to the next mode.)

- **Analog output scale setting (5VDC)**
  - R-5 and the previous pressure will flash by turning on.(0.5sec.)
  - Set the pressure which will output 5VDC by M, A Key.
  - Allowable setting range: [R-5] +10% of rated pressure ≤ [R-5] < Max. value of rated pressure
  - (Press M key momentarily, the selected pressure is set as 5VDC scales, then move to the next mode.)

- **Key Lock**
  - Key and the previous key lock will flash by turning on.(0.5sec.)
  - Select key lock with M, A Key.
  - Press M key momentarily, key lock is set, then move to the display unit setting mode.

- **Key lock functions**
  - LOC : Disable to change preset value and parameter value
    (Enable to change Key mode only)
  - PRL : Enable to change preset value, disable to change parameter value
  - UnL : Enable to change preset value and parameter value (Lock off)

※When advance to parameter setting mode and preset setting mode, it displays "Setting item" and "Previous setting value" by 0.5 sec. turn. This display will stop by pressing or A key (Display setting value), if any key is untouched for over 1 sec., it will display old value by 0.5sec. turn again.

※When M key is pressed for 3sec. during setting, it will return to RUN mode with memorizing on EEPROM. However, when there is any key is untouched for 60sec., it turns to RUN mode with keeping the previous setting value not current setting value.

※There is memory protection by EEPROM, but life cycle of EEPROM is 100,000 times.
Preset value setting(PSA/PSB)

© Hysteresis mode[F - 1] and independent 2 output mode[F - 3, F - 4, F - 5]

- After applying ST1 into Pressure port, then press Key.
- After applying ST2 into Pressure port, then press Key.

※ ST1 setting range : Min. display pressure < ST1 ≤ Max. display pressure
※ ST2 setting range : - Hysteresis mode: Min. display pressure ≤ ST2 < ST1
- 2 independent output mode: Min. display pressure < ST2 ≤ Max. display pressure

© Automatic sensitivity setting mode[F - 2]

- After applying ST1 into Pressure port, then press Key.
- After applying ST2 into Pressure port, then press Key.

※ ST1 setting range : Min. display pressure < ST1 ≤ Max. display pressure
※ ST2 setting range : - Hysteresis mode: Min. display pressure ≤ ST2 < ST1
- 2 independent output mode: Min. display pressure < ST2 ≤ Max. display pressure
Adjustable range of set value: Between ST1 and ST2.

© Window comparison output mode[F - 6]

- Low value setting range : Min. display pressure < LO ≤ Max. display pressure
- High value setting range : LO < HI ≤ Max. display pressure
- If no key is touched for 60sec., it will return to RUN mode. [Automatic sensitivity setting mode[F - 2] is exception]
- When changing the display unit, preset value will be calculated according to the display unit.
- Whenever key touched one time, it is increased(decreased) as 1 digit(2 digits for psi unit and compound pressure) but it will be continuously increasing(decreasing) by pressing Key constantly.

Peak hold and bottom hold check

1. Press key for over 3sec. in RUN mode.
2. PEH and memorized max. pressure(Negative pressure type is for max. negative pressure) will flash by turning on (0.5sec.) then display peak hold value.
3. LOH and memorized min. pressure(Negative pressure type is for min. negative pressure) will flash by turning on (0.5sec.) then display bottom hold value.
4. If pressing key one time shortly, memorized peak hold and bottom hold value will be removed then return to RUN mode.
※ When the peak hold and bottom hold value is over the max. display pressure value, it displays HHH. On the opposite, it displays LLL. Please remove peak hold and bottom hold value by using key.
1. Hysteresis mode [F-1]
※ It can be set for pressure sensing level [ST1] and sensing difference [ST2].
※ ST1 setting range:
  - Min. display pressure ≤ ST1 ≤ Max. display pressure
  - ST2 setting range:
  - Min. display pressure ≤ ST2 ≤ ST1
  - OUT 1: When applying pressure is larger than ST1, it will be ON.
  - OUT 2: When applying pressure is lower than ST2, it will be ON.

2. Automatic sensitivity setting mode [F-2]
※ This function is to set pressure sensing level to the proper position automatically, it is set by received pressure from two positions [ST1, ST2].
※ The sensing hysteresis fixed to 1 digit (2 digits for psi unit and compound type).
※ The pressure sensing level [ST1, ST2] is shown in the following calculation.

\[ \text{ST1} = \frac{\text{ST1} + 
\text{ST2}}{2} \]

※ OUT 1: When applying pressure is larger than ST1 value, it will be ON.
※ OUT 2: When applying pressure is between ST1 and ST2, it will be ON.

Note1) If it is not enough for difference of sensing level between ST1 and ST2, ST1 & ST2 will be displayed.
Please set again after applying enough pressure.

Note2) ST1 setting range: Min. display pressure ≤ ST1 ≤ Max. display pressure -1% of rated pressure
ST2 setting range: ST1 +1% of rated pressure ≤ ST2 ≤ Max. display pressure

Note3) If fine adjustment for sensing level is required, adjust sensing level by \[ \text{SET} \], \[ \text{OR} \] key.
(Adjustment range: Between ST1 and ST2)

3. Independent 2 output mode [F-3, F-4, F-5]
※ ST1 and ST2 can be set independently within display pressure range. One is for control, the other is for alarm or optional control.
※ The sensing hysteresis fixed to 1 digit (2 digits for psi unit and compound type).
※ ST1 setting range:
  - Min. display pressure ≤ ST1 ≤ Max. display pressure
  - ST2 setting range:
  - Min. display pressure ≤ ST2 ≤ Max. display pressure
※ Independent 2 output mode [F-3]
  - OUT 1: It will be ON, when it is over ST1.
  - OUT 2: It will be ON, when it is over ST2.
※ Independent 2 opposite mode [F-4]
  - OUT 1: It will be OFF, when it is over ST1.
  - OUT 2: It will be OFF, when it is over ST2.
※ Independent 2 cross mode [F-5]
  - OUT 1: It will be OFF, when it is under ST1.
  - OUT 2: It will be ON, when it is under ST2.

4. Window comparison output mode [F-6]
※ It is able to set High limit value [HI], Low limit value [LO] of pressure sensing level in this mode.
※ The sensing hysteresis fixed to 1 digit (psi unit and compound type 2 digits).
※ LO setting range:
  - Min. display pressure ≤ LO ≤ Max. display pressure
  - HI setting range: LO < HI ≤ Max. display pressure
  - OUT 1: It will be ON between high limit value [HI] and low limit value [LO]
  - OUT 2: It will be ON when it is over high limit value [HI] and low limit value [LO].
Functions(PSA/PSB)

Pressure unit change
PSA-V01(C)(P)/PSB-C01(C)(P) has 7 kinds of pressure unit and PSA-01(C)(P)/PSB-1(C)(P) has 4 kinds of pressure unit.
Please select the proper unit for application.
• PSA-V01(C)(P), PSA-C01(C)(P) : kPa, kgf/cm², bar, psi, mmHg, inHg, mmH₂O
• PSA-01(C)(P), PSA-1(C)(P) : kPa, kgf/cm², bar, psi
※When using mmH₂O multiply the display value by 100.

Output mode change
There are 6 kinds of control output modes in order to provide the various detection. Select a mode for your proper application.
• Hysteresis mode [F-1]
When variable hysteresis is required for pressure detection.
• Automatic sensitivity setting mode [F-2]
When it is required to set detecting sensitivity automatically at proper position.
• Independent 2 output mode [F-3, F-4, F-5]
When it is required to detect pressure from two position with one product.
• Window comparison output mode [F-6]
When it is required to detect pressure in a certain range.

Response time change (chattering prevention)
It can prevent chattering of control output by changing response time. It is able to set 4 kinds of response time(2.5, 5, 100, 500ms) and if the response is getting longer, the sensing will be more stable by increasing the number of digital filter.

Analog output scale setting
It is not fixed the analog output(1-5VDC) scale as the rated pressure range but this is a function to change properly for user's application. When the position[1-5] for 1VDC output and the position[1-5] for 5VDC output are set, the pressure range of 1-5 to 5-1 is to 1-5VDC analog output.

Key lock
This unit has 2 kinds of key lock function in order to prevent wrong operation.
• LOC : All keys are locked, it is impossible to change any parameter setting/preset, zero point adjustment, peak hold and bottom hold. (Enable to change EY mode only).
• PRL : This is partial locked status, it is impossible to change parameter setting. (Enable to change EY mode only).
• UNL : All keys are unlocked.

Zero-point adjustment
This function is to set the display value of pressure at zero when port is opened to atmospheric pressure.

Peak hold and bottom hold
This function is diagnosis malfunction of the system caused by parasitic pressure or to check through memorizing the max./min. pressure that occurred in the system.

Error display

<table>
<thead>
<tr>
<th>Error display</th>
<th>Description</th>
<th>Troubleshooting</th>
</tr>
</thead>
<tbody>
<tr>
<td>ER1</td>
<td>When external pressure is input while adjusting zero point</td>
<td>Try again after removing external pressure</td>
</tr>
<tr>
<td>ER2</td>
<td>When overload is applied on control output</td>
<td>Remove overload</td>
</tr>
<tr>
<td>ER3</td>
<td>When the setting value is not matched with setting condition</td>
<td>Check setting conditions and set proper setting values</td>
</tr>
<tr>
<td>HHH</td>
<td>When applied pressure exceeds High-limit of display pressure range</td>
<td>Apply pressure within display pressure range</td>
</tr>
<tr>
<td>LLL</td>
<td>When applied pressure exceeds Low-limit of display pressure range</td>
<td></td>
</tr>
</tbody>
</table>

Installation (PSA Series)

1. When installing pressure port, it is able to bring pressure from 3 directions by changing the mounting direction of the pressure port.
2. Basic spec of pressure port is Rc(PT) 1/8"(color: Silver). [option:NPT 1/8(color: black)] It is able to use general one touch fitting.
3. Please use seal tape at port plug in order to prevent pressure leak.
4. Please block another two pressure ports not used with port plug.
5. Please connect it by using spanner(13mm) at the metal part in order not to overload on the body when connecting one touch fitting.

Caution
The tightening torque of one touch fitting should be max.100kgf.cm. If not, it may cause mechanical problem.
6. PSA Series has 2 kinds of brackets so it is able to install it in two different ways.
7. At first, please unscrew hexagon wrench bolt and assemble the bracket on this unit by fixing the hexagon wrench bolt.

⚠️ **Caution**

In this case, tightening torque of hexagon wrench should be max. 30kgf-cm. If not, it may cause mechanical problem.

8. Bracket(PSO-01) and front protection cover(PSO-02) are sold separately. Please see the pictures for installation.

### Installation(PSB Series)

1. Pressure port is M5. Use general one touch fitting.

![Diagram of PSA/PSB Series](image)

- **Body**
- **Pressure port**
- **O-Ring**
- **Hexagon wrench bolt (M2×10)**
- **One touch fitting**

2. It is able to use it without the pressure port according to environment. In this case O-Ring between pressure port and its body should not be taken out in order to prevent pressure leak.

3. Please connect it by using spanner(10mm) at pressure port in order not to overload on the body when connecting one touch fitting.

![Diagram of PSA/PSB Series](image)

- **10mm Spanner**

⚠️ **Caution**

The tightening torque of one touch fitting and hexagon wrench should be Max. 50kgf-cm and 20kgf-cm. It may cause mechanical trouble. Please do not use spanner to install as it may cause mechanical trouble.

### Proper usage

#### Caution

PSA, PSB Series is for sensing of non corrosive gas. Do not use this product at corrosive gas or flammable gas, etc.

- Please use this unit within the range of specification, if applying pressure is larger than specification, it may not be working properly due to damage.
- After supplying power, it takes 3 sec. to work.
- When using switching mode power supply, frame ground (F.G.) terminal of power supply should be grounded.

- It may cause malfunction by noise, when wiring with power line or high voltage line.
- Do not insert any sharp or pointed object into pressure port. It may cause mechanical problem due to sensor damage.
- Do not use this unit with flammable gas, because this is not an explosion proof structure.
- Be sure that this unit should not be contacted directly with water, oil, thinner, etc.

#### Accessory

- **PSA/PSB**
  - Pressure unit label

<table>
<thead>
<tr>
<th>±100kPa</th>
<th>±101.3kPa</th>
<th>100kPa</th>
<th>1MPa</th>
</tr>
</thead>
<tbody>
<tr>
<td>±10kgf</td>
<td>±101.3kgs</td>
<td>±10kgf</td>
<td>±101.3kgs</td>
</tr>
<tr>
<td>±1kbar</td>
<td>±101.3kgs</td>
<td>±1kbar</td>
<td>±101.3kgs</td>
</tr>
<tr>
<td>0.1bar</td>
<td>0.1013bar</td>
<td>0.01kbar</td>
<td>101.3kgs</td>
</tr>
<tr>
<td>0.1kPa</td>
<td>±101.3kgs</td>
<td>10kPa</td>
<td>±101.3kgs</td>
</tr>
<tr>
<td>±150mmH2O</td>
<td>±101.3kgs</td>
<td>150mmH2O</td>
<td>±101.3kgs</td>
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<tr>
<td>±152.4inHg</td>
<td>±101.3kgs</td>
<td>±152.4inHg</td>
<td>±101.3kgs</td>
</tr>
<tr>
<td>±102.0kPa</td>
<td>±101.3kgs</td>
<td>±102.0kPa</td>
<td>±101.3kgs</td>
</tr>
</tbody>
</table>

#### Only for PSA Series

- Port plug
- Bracket A
- Bracket B