Digital pressure sensor
PPX Series

Visibility is improved with digital twin display!

DIGITAL PRESSURE SENSOR PPX SERIES

Advanced pressure sensor!!
Operability is improved with dual display!

The product has been improved with 3 new functions.

**NEW 1** Visibility improved

Digital display is now wider and easy to see. Also, display pressure range and set pressure range are now wider too.

**NEW 2** Analog current output is added to high function type

High function type with which analog voltage output, analog current output, or external input can be selected instead of single comparison output. It can be adopted in multi-use.

**NEW 3** Further reduction of power consumption

- Reduce 14% in normal operation compared with conventional models
- Reduce 30% to 50% in ECO MODE

Digital pressure sensor

PPX Series
Direct setting with 2 screens

Current value [Main display]
3-color display (red, green, orange)
Color of main display part switches between
green and red corresponding to on or off of output.
It is orange during setting.

Set value [Sub display section]
Sub display part is customisable
Any alphanumerics other than set value can be displayed.

Copy function which helps to reduce man-hour and prevent mistakes

Setting copy

Equipped two independent outputs (standard type)

3 types of detection modes can be selected
- EASY MODE...controls comparison output on or off
- Hysteresis mode...controls comparison output on or off by setting hysteresis
- Window comparator...controls comparison output on or off with pressure in the setting range

Easy to operate

- Readable alphanumeric display

- Peak/bottom hold
  It displays the maximum value and minimum value of
  variable pressure in two displays.

- Response time can be adjusted in 10 stages (2.5ms to 5000ms)

- Setting details can be displayed in code number
# Digital pressure sensor applications

<table>
<thead>
<tr>
<th>Positive pressure and vacuum confirmation or interlock</th>
<th>High function type</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Positive pressure and vacuum confirmation" /></td>
<td><img src="image2.png" alt="High function type" /></td>
</tr>
<tr>
<td><strong>RP</strong></td>
<td>Easy settling with auto reference/remote zero adjusting</td>
</tr>
<tr>
<td><strong>VRA2000</strong></td>
<td>PPX</td>
</tr>
<tr>
<td><strong>PPX</strong></td>
<td>PPX</td>
</tr>
<tr>
<td><strong>PPX</strong></td>
<td>PPX</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Manifold</th>
<th>Both vacuum pressure and burst pressure can be controlled with a single unit.</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image3.png" alt="Manifold" /></td>
<td><img src="image4.png" alt="Both vacuum pressure and burst pressure can be controlled" /></td>
</tr>
<tr>
<td><strong>PPX</strong></td>
<td>PPX</td>
</tr>
<tr>
<td>Magnetic spring buffer FBU2</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Contact confirmation</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image5.png" alt="Contact confirmation" /></td>
</tr>
<tr>
<td><strong>PPX</strong></td>
</tr>
</tbody>
</table>
## Specifications

<table>
<thead>
<tr>
<th>Descriptions</th>
<th>Standard type</th>
<th>High function type</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Kind of pressure</strong></td>
<td><strong>Gauge pressure</strong></td>
<td><strong>Gauge pressure</strong></td>
</tr>
<tr>
<td><strong>Rated pressure</strong></td>
<td>PPX-R01*</td>
<td>For low pressure PPX-R01*H</td>
</tr>
<tr>
<td><strong>Set pressure</strong></td>
<td>-100.0 to +10.0kPa</td>
<td>-101.0 to +10.1kPa</td>
</tr>
<tr>
<td><strong>Proof pressure</strong></td>
<td>500kPa</td>
<td>500kPa</td>
</tr>
<tr>
<td><strong>Applicable fluid</strong></td>
<td>Air/non-corrosive gas</td>
<td>Air/non-corrosive gas</td>
</tr>
<tr>
<td><strong>Power supply voltage</strong></td>
<td>12 to 24VDC ±10% ripple P-P</td>
<td>24VDC ±10% ripple P-P</td>
</tr>
<tr>
<td><strong>Power consumption</strong></td>
<td>Normal: 720mW or less (power consumption 30mA or less at 24V power supply voltage)</td>
<td>Normal: 720mW or less (power consumption 30mA or less at 24V power supply voltage)</td>
</tr>
</tbody>
</table>

### Comparison output

<table>
<thead>
<tr>
<th>Comparison output</th>
<th>&lt;NPN output type&gt;</th>
<th>&lt;PNP output type&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>NPN transistor/open collector</td>
<td>Max. inrush current: 100mA</td>
<td>Max. outflow current: 100mA</td>
</tr>
<tr>
<td>Applied voltage: 30VDC or less</td>
<td>Residual voltage: 2V or less (at inrush current 100mA)</td>
<td>Residual voltage: 2V or less (at output current 100mA)</td>
</tr>
</tbody>
</table>

### Output operation

<table>
<thead>
<tr>
<th>Output operation</th>
<th>Select NO/NC with the key operation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Output mode</strong></td>
<td>EASY MODE/hysteresis mode/window comparator mode</td>
</tr>
<tr>
<td><strong>Hysteresis</strong></td>
<td>Min. 1 digit (variable)</td>
</tr>
<tr>
<td><strong>Repeatability</strong></td>
<td>±0.1% F.S. (Within ±2 digits)</td>
</tr>
<tr>
<td><strong>Response time</strong></td>
<td>2.5ms, 5ms, 10ms, 25ms, 50ms, 100ms, 250ms, 500ms, 1000ms, 5000ms select by the key operation</td>
</tr>
</tbody>
</table>

### External input

<table>
<thead>
<tr>
<th>External input</th>
<th>(auto reference/remote zero adjusting)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ON voltage</strong></td>
<td>0.4VDC or less</td>
</tr>
<tr>
<td><strong>OFF voltage</strong></td>
<td>5 to 30VDC or release</td>
</tr>
<tr>
<td><strong>Input impedance</strong></td>
<td>approx. 10kΩ</td>
</tr>
<tr>
<td><strong>Input time</strong></td>
<td>1ms and over</td>
</tr>
</tbody>
</table>

### Analog voltage output

<table>
<thead>
<tr>
<th>Analog voltage output</th>
<th>Output current: 4 to 20mA</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Zero point</strong></td>
<td>Within 12mA ±5% F.S.</td>
</tr>
<tr>
<td><strong>Linearity</strong></td>
<td>Within ±1% F.S.</td>
</tr>
<tr>
<td><strong>Output impedance</strong></td>
<td>approx. 1kΩ</td>
</tr>
</tbody>
</table>

### Analog current output

<table>
<thead>
<tr>
<th>Analog current output</th>
<th>Output current: 4 to 20mA</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Zero point</strong></td>
<td>Within 12mA ±5% F.S.</td>
</tr>
<tr>
<td><strong>Linearity</strong></td>
<td>Within ±1% F.S.</td>
</tr>
<tr>
<td><strong>Load resistance</strong></td>
<td>2502 (max.)</td>
</tr>
</tbody>
</table>

### Display

<table>
<thead>
<tr>
<th>Display</th>
<th>4-digit + 4-digit tri-color LCD display (display update cycle: 250ms, 500ms, 1000ms, select with key operations)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Display pressure range</strong></td>
<td>-101.0 to +101.0kPa</td>
</tr>
</tbody>
</table>

### Indicator light

<table>
<thead>
<tr>
<th>Indicator light</th>
<th>Orange LED</th>
<th>Orange LED</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Comparison output operational indicator light</strong></td>
<td>Comparison output 1 operational indicator light</td>
<td>Comparison output 2 operational indicator light</td>
</tr>
<tr>
<td><strong>Analog voltage output operational indicator light</strong></td>
<td>Lighting when setting</td>
<td></td>
</tr>
</tbody>
</table>

### Environmental resistance

<table>
<thead>
<tr>
<th>Environmental resistance</th>
<th>IP40 (IEC)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Degree of protection</strong></td>
<td><strong>Degree of protection</strong></td>
</tr>
<tr>
<td><strong>Ambient temperature</strong></td>
<td>-10 to +50°C, at store: -10 to +60°C</td>
</tr>
<tr>
<td><strong>Humidity</strong></td>
<td>35 to 85% RH (no dew condensation, freezing), store: 35 to 85% RH</td>
</tr>
<tr>
<td><strong>Withstand voltage</strong></td>
<td>1000VAC for one minute applied to all charged sections/between cases</td>
</tr>
<tr>
<td><strong>Insulation resistance</strong></td>
<td>50MO and over with 500VDC mega applied to all charged sections/between cases</td>
</tr>
<tr>
<td><strong>Vibration resistance</strong></td>
<td>Durability 1000m/s² (approx. 10 G) 3 times each in XYZ directions</td>
</tr>
<tr>
<td><strong>Shock resistance</strong></td>
<td>Durability 1000m/s² (approx. 10 G) 3 times each in XYZ directions</td>
</tr>
<tr>
<td><strong>Temperature characteristics (+20°C reference)</strong></td>
<td>Within ±0.5% F.S.</td>
</tr>
<tr>
<td><strong>Port size</strong></td>
<td>Note 1</td>
</tr>
<tr>
<td><strong>Material</strong></td>
<td>Case: PBT (with glass fiber), LCD display part: acrylic, pressure port: SUS303, mounting screw part: brass (nickel coat), switch part: silicon rubber</td>
</tr>
<tr>
<td><strong>Connection</strong></td>
<td>Connector</td>
</tr>
<tr>
<td><strong>Wiring length</strong></td>
<td>Up to 100m permissible with 0.3mm² or larger cable (less than 30m when CE Mark-compliant)</td>
</tr>
<tr>
<td><strong>Unit change</strong></td>
<td>Compatible only with export models (-KA) (MPa, kPa, kgf/cm², bar, psi, mmHg, inchHg)</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>Product weight: approx. 40g, weight including package: 130g</td>
</tr>
</tbody>
</table>

### Note

1. See Table 1 on the next page for export use.
2. For (- J), connector cable is not attached.
How to order

<How to order for domestic market>

PPX - R01 N - 6M -

- Pressure range
- Output type
- Piping shape
- Connector cable

<How to order for foreign markets>

PPX - R01 N - 6M - KA

- Pressure range
- Output type
- Piping shape
- Connector cable

Discrete option model no.

PPX - C1

- Unit change

Symbol | Descriptions
---|---
C1 | Cable with connector 1m
C2 | Cable with connector 2m
C3 | Cable with connector 3m
C5 | Cable with connector 5m
CN | Connector set (10 pcs. per set)
KL | Bracket (set screw attached)
KHS | Panel bracket
KCB | Front protective cover (when panel bracket used)

<table>
<thead>
<tr>
<th>Type</th>
<th>Model no.</th>
<th>Port size</th>
<th>Output type</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard type</td>
<td>PPX-R01N-6M-(J)-KA</td>
<td>M5 female thread +R (PT) 1/8 male thread</td>
<td>NPN transistor and open collector</td>
<td>For Asia</td>
</tr>
<tr>
<td>High function type</td>
<td>PPX-R01NH6M-KA</td>
<td>M5 female thread +G1/8 male thread</td>
<td>PNP transistor and open collector</td>
<td>For Europe</td>
</tr>
<tr>
<td>Standard type</td>
<td>PPX-R01B-6G-(J)-KA</td>
<td>M5 female thread +G1/8 male thread</td>
<td>NPN transistor and open collector</td>
<td>For Asia</td>
</tr>
<tr>
<td>High function type</td>
<td>PPX-R01PH6G-KA</td>
<td>M5 female thread +G1/8 male thread</td>
<td>PNP transistor and open collector</td>
<td>For Europe</td>
</tr>
<tr>
<td>Standard type</td>
<td>PPX-R01N-6N-(J)-KA</td>
<td>M5 female thread +NPT1/8 male thread</td>
<td>NPN transistor and open collector</td>
<td>For North America</td>
</tr>
<tr>
<td>High function type</td>
<td>PPX-R01NH6N-KA</td>
<td>M5 female thread +NPT1/8 male thread</td>
<td>PNP transistor and open collector</td>
<td>For North America</td>
</tr>
</tbody>
</table>

Note: It is available only if B output type "N" or "P" is selected.

With the new Measurement Law, the product with the unit change function for foreign markets cannot be used in Japan.

Symbol | Descriptions
---|---
A | Pressure range
| R01 | -100.0 to 100.0kPa
| R10 | -0.100 to 1.000MPa

B | Output type
| N | NPN transistor output 2 point (standard type)
| P | PNP transistor output 2 point (standard type)
| NH | NPN transistor output 1 point + analog voltage/current output or external input (high function type)
| PH | PNP transistor output 1 point + analog voltage/current output or external input (high function type)

C | Piping shape
| 6M Note 1 | R1/8, M5 female thread
| 6N Note 2 | NPT1/8, M5 female thread
| 6G Note 2 | G1/8, M5 female thread

D | Connector cable
| Blank | With 2m connector cable

Note 1: It is available only if B output type "N" or "P" is selected.

Note 2: It is available only if B output type "N" or "P" is selected.

Note 3: It is available only if B output type "N" or "P" is selected.

<Table 1>

<table>
<thead>
<tr>
<th>Destination</th>
<th>Switch output NPN</th>
<th>Unit</th>
<th>Unit change</th>
<th>Piping port</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domestic</td>
<td>○</td>
<td>○</td>
<td>kPa/MPa</td>
<td>○</td>
</tr>
<tr>
<td>Asia</td>
<td>○</td>
<td>○</td>
<td>kPa/MPa</td>
<td>○</td>
</tr>
<tr>
<td>Europe</td>
<td>○</td>
<td>○</td>
<td>kPa/MPa</td>
<td>○</td>
</tr>
<tr>
<td>North America</td>
<td>○</td>
<td>○</td>
<td>kPa/MPa</td>
<td>○</td>
</tr>
</tbody>
</table>

Note 1: Refer to page 24 for the unit seal label to be attached.
Analog output voltage - pressure characteristics

PPX-R01NH
R01PH

Pressure (kPa)

Voltage (V)

100.0
0
-100.0

PPX-R10NH
R10PH

Pressure (MPa)

Voltage (V)

1.000
0
-0.100

Analog output current - pressure characteristics

PPX-R01NH
R01PH

Pressure (kPa)

Current (mA)

20
12
4

PPX-R10NH
R10PH

Pressure (MPa)

Current (mA)

20
4.8
PPX Series Dimensions

- **PPX-R***-6M/6N (R/NPT thread)

- **PPX-R***-6G (G thread)
**PPX Series**

**Dimensions with options**

- **Bracket (PPX-KL)**

  ![Bracket (PPX-KL) Installation Drawing]

  - Weight: 15 g

- **Panel bracket (PPX-KHS) installation drawing**

  ![Panel Bracket (PPX-KHS) Installation Drawing]

  - Weight: 6 g

**Panel cut dimensions**

- **Installing 1 pc.**

  ![Panel cut dimensions for 1 pc.]

- **Installing consecutive n pcs. horizontally.**

  ![Panel cut dimensions for n pcs. horizontally.]

- **Installing consecutive n pcs. vertically.**

  ![Panel cut dimensions for n pcs. vertically.]

(Note 1): Panel thickness must be 0.5 to 6mm.
**Dimensions with options**

- Front protective cover (PPX-KCB) installation drawing

![Diagram of PPX Series](image)

- Cable with connector (PPX-C*)

![Diagram of Cable with Connector](image)

<table>
<thead>
<tr>
<th>Model no.</th>
<th>Cable length</th>
<th>Weight g</th>
</tr>
</thead>
<tbody>
<tr>
<td>PPX-C1</td>
<td>1m</td>
<td>Approx. 20g</td>
</tr>
<tr>
<td>PPX-C2</td>
<td>2m</td>
<td>Approx. 40g</td>
</tr>
<tr>
<td>PPX-C3</td>
<td>3m</td>
<td>Approx. 60g</td>
</tr>
<tr>
<td>PPX-C5</td>
<td>5m</td>
<td>Approx. 100g</td>
</tr>
</tbody>
</table>

- Connector set (PPX-CN)
  - Housing: JST MFG CO. LTD. PAP-04V-S
  - Contact: JST MFG CO. LTD. SPHD-001T-P0.5

![Diagram of Connector Set](image)
Circuit and connection

NPN output type

High function type

Standard type

PPX Series

<table>
<thead>
<tr>
<th>Load</th>
<th>Load</th>
<th>12 to 24 VDC ±10%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1kΩ</td>
<td>5V</td>
<td>(Brown) +V</td>
</tr>
<tr>
<td>(White) comparison output 1</td>
<td>(Black) comparison output 1</td>
<td>(Blue) 0V</td>
</tr>
<tr>
<td>100mA MAX.</td>
<td>100mA MAX.</td>
<td>12 to 24 VDC ±10%</td>
</tr>
<tr>
<td>12 to 24 VDC ±10%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Brown) +V</td>
<td>(Brown) +V</td>
<td>(Brown) +V</td>
</tr>
<tr>
<td>(White) analog voltage/current output or external input</td>
<td>(Black) comparison output 1</td>
<td>(Blue) 0V</td>
</tr>
<tr>
<td>(Note 1) (Note 2), (Note 3)</td>
<td>(Note 1) (Note 2), (Note 3)</td>
<td>(Note 1) (Note 2), (Note 3)</td>
</tr>
<tr>
<td>12 to 24 VDC ±10%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Brown) +V</td>
<td>(Brown) +V</td>
<td>(Brown) +V</td>
</tr>
<tr>
<td>1kΩ</td>
<td>5V</td>
<td>(Brown) +V</td>
</tr>
<tr>
<td>(White) comparison output 2</td>
<td>(Black) comparison output 1</td>
<td>(Blue) 0V</td>
</tr>
<tr>
<td>100mA MAX.</td>
<td>100mA MAX.</td>
<td>12 to 24 VDC ±10%</td>
</tr>
<tr>
<td>12 to 24 VDC ±10%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

PNP output type

High function type

Standard type

External input connection sample

(Note 1): Set output load resistor as 250Ω (MAX.), when analog current output.
(Note 2): Note that more than 5V voltage will be generated, when analog current output.
(Note 3): Be careful with input impedance of connecting device, when you use analog voltage output.

Also, note that voltage will be lower because of cable resistor, when cable is extended.
Overview

- Oil-prohibited treatment (degreasing) at gas contact areas (piping ports, etc.)
- Silicone grease-free at gas contact areas (no grease used at gas contact areas)

Features

- Ideal for applications with liquid crystal, semiconductor, food, medical, and electronic component etc., where grease must be avoided.
- Ideal for pressure detection on painting lines because no grease is used.

Specifications

Specifications are the same as standard type. Refer to page 1 for details.

How to order

PPX - [R01] N - 6M - P12

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Pressure range</th>
<th>Descriptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>R01</td>
<td>-100.0 to 100.0kPa</td>
</tr>
<tr>
<td></td>
<td>R10</td>
<td>-0.100 to 1.000MPa</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Output type</th>
<th>Descriptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>N</td>
<td>NPN transistor output 2 point</td>
</tr>
<tr>
<td></td>
<td>NH</td>
<td>NPN transistor output 1 point + analog voltage/current output or external input</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Piping shape</th>
<th>Descriptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>6M</td>
<td>R 1/8, M5 female thread</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Oil-prohibited specifications</th>
<th>Descriptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>D</td>
<td>P12</td>
<td>Oil-prohibition type</td>
</tr>
</tbody>
</table>

* 2 m connector cable attached.

Dimensions

Dimensions are the same as standard type. Refer to page 4 for details.
**PPX Series**

### Operation mode and output operation

<table>
<thead>
<tr>
<th>Output 1 operational indicator light</th>
<th>Output 2 operational/Analog voltage output indicator light</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comparison output 1 ON lighting</td>
<td>Standard type: Lighting when Comparison output 2 ON</td>
</tr>
<tr>
<td></td>
<td>High function type: Lighting when Analog voltage/current output is set</td>
</tr>
</tbody>
</table>

**EASY MODE**

This mode is used to turn comparison output on or off.

![EASY MODE Diagram]

**Hysteresis mode**

This mode randomly sets comparison output hysteresis and turns it on or off.

![Hysteresis mode Diagram]

**Window comparator mode**

This mode is used to turn comparison output on or off within the setting range.

![Window comparator mode Diagram]

---

**Note 1:** Hysteresis can be set to eight stages.

See "PRO mode" (page 13), Changing fixed hysteresis, for details on setting.

**Note 2:** “P”-“f” appears on the sub display for comparison output 1, and “P”-“zf” appears for comparison output 2.

---

**PPX Pressure port**

6M type: R1/8 + M5 female thread

6G type: G1/8 + M5 female thread

6N type: NPT1/8 + M5 female thread

---

**Pressure**

Comparison output OFF

Comparison output ON

**P**

H: fixed hysteresis value (Note 1)

**Lo**

**Hi**

H: 1 digit and over

(When unit is used: more than 2 digits)

**Setting UP key**

**Setting DOWN key**

---

(Note 1): Attach unit switching name plate (attached) which corresponds to the configured voltage unit for non-Japan use.

(Note 2): Only "MPa" and "kPa" are available to set for non-Japan use.

---

The output mode can be selected from EASY MODE, hysteresis mode, or window comparator mode for comparison output 1 and comparison output 2.

See "Menu setting mode" (page 11), Comparison output 1/2 output mode setting, for details.
**RUN MODE**

### Setting threshold
- See "Menu setting mode", Comparison output 1/2 output mode setting, and Analog voltage/current output/external input switching for details on setting.
- Threshold will be set on sub display part. Main display part will not be changed.

The display changes when the **MODE** key is pressed.

#### EASY MODE (when comparison output 2 is off)

![Easy Mode Diagram]

- **Comparison output 1**
- **Comparison output 2**

#### Hysteresis/window comparator mode Lo side
- **Comparison output 1**
- **Comparison output 2**

#### Hysteresis/window comparator mode Hi side
- **Comparison output 1**
- **Comparison output 2**

(Notes: "UP" (exceeding maximum) or "DOWN" (exceeding minimum) lights on the sub display when exceeding the set pressure range.
When the threshold is set for the hysteresis mode/window comparator mode, "DOWN" is displayed if the Hi side threshold is lower than the Lo side threshold.

(Notes 2): It displays auto reference value and remote zero adjusting value.
For more details, please refer to "Auto reference function" or "Remote zero adjusting function".
(Notes 3): Part in dash line will be displayed only when it is set either "ZEROf" or "ZREF".
Please refer to <Analog voltage/current output/external input switching> in "Menu setting mode" for how to set.

### Zero adjusting
- The zero adjusting function forcibly sets the pressure display to zero when the pressure port is released to atmospheric pressure.

![Zero Adjusting Diagram]

### Key lock
- The key lock function disables key operations so that conditions set for setting modes cannot be mistakenly changed.

(Setting key lock)

![Key Lock Setting Diagram]

(Releasing key lock)

![Key Lock Releasing Diagram]

### Peak/bottom hold
- The peak and bottom hold function displays peak and bottom varying pressure.
- The peak value is displayed on the main display, and the bottom value is displayed on the sub display.
- High pressure side is peak value, low pressure side is bottom value.

(Setting peak/bottom hold)

![Peak/Bottom Hold Setting Diagram]

(Releasing peak/bottom hold)

![Peak/Bottom Hold Releasing Diagram]
Menu setting mode

● If the mode switching key is held down long while a setting is made, the RUN mode opens and changed items are set.

RUN MODE
Hold down for 2 secs.

Setting comparison output 1 output mode

Setting comparison output 2 output mode (Note 1)

Switching N.O./N.C. (Note 1)

Setting response time

Switching main display section display color

Switching unit (note 2)

(Note 1): If the comparison output 2 output mode setting is set to "OFF", the display at N.O./N.C. changeover is the same as the high function type.

(Note 2): Only "MPa" or "kPa" is available to set for Japan use. Also, setting items for unit switching will not be displayed for low pressure types.

(Note 3): The high pressure type is not displayed.
<table>
<thead>
<tr>
<th>Setting descriptions</th>
<th>Initial status</th>
<th>Descriptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Setting comparison output 1 output mode</td>
<td>ON</td>
<td>Set comparison output 1 output mode.</td>
</tr>
<tr>
<td>Setting comparison output 2 output mode (Only standard type)</td>
<td>OFF</td>
<td>Set comparison output 2 output mode.</td>
</tr>
<tr>
<td>Analog voltage/current output/external input switching (Only high function type)</td>
<td>OUT</td>
<td>Analog voltage, current output, auto reference input, or remote zero adjusting input can be switched.</td>
</tr>
<tr>
<td>Switching N.O./N.C</td>
<td>N.O.</td>
<td>Set normal open (N.O.) or normal close (N.C.).</td>
</tr>
<tr>
<td>Setting response time</td>
<td>25</td>
<td>Set the response time. Response time can be selected from 2.5ms, 5ms, 10ms, 25ms, 50ms, 100ms, 250ms, 500ms, 1,000ms, or 5,000ms.</td>
</tr>
<tr>
<td>Switching main display section display color</td>
<td>R - UN</td>
<td>Display color of display part can be switched.</td>
</tr>
<tr>
<td>Switching unit</td>
<td>kPA</td>
<td>The pressure unit can be changed.</td>
</tr>
<tr>
<td></td>
<td>MPA</td>
<td></td>
</tr>
</tbody>
</table>
**PRO MODE**

- The mode will be switched to PRO MODE if the mode switchover key is held down for 4 seconds during RUN MODE.
- Hold down the mode switchover key for several seconds to switch to RUN MODE during the setting. In that case, the changed descriptions are set.
- The left end display section is in the initial state.

---

### RUN MODE

- Hold down for 4 s.

### To set No. display or custom display with sub-display section switching.

### Sub-display section switching

- **SUb**
  - **Off**
  - **Unit display**
  - **No. display**
  - **Custom display**

### Display speed switching

- **250** (250ms)
- **500** (500ms)
- **1000** (1000ms)

### Switching fixed hysteresis value

- (1 level: approx. 1 digit) (Pa unit)

### Interlock with display color switching

- **UO1**
  - **UO2**
  - **UO3**
  - **UO4**

### ECO MODE setting

- **OFF**
  - **STD**
  - **FULL**

### Setting confirmation code

- **OFF**

### Setting copy mode

- **OFF**
  - **ON**

### Reset setting

- **OFF**

---

**PPX Series**

13
### PPX Series

#### How to operate

<table>
<thead>
<tr>
<th>Setting descriptions</th>
<th>Initial status</th>
<th>Descriptions</th>
</tr>
</thead>
</table>
| Sub-display section switching | 5FD | Sub-display section display during RUN MODE can be switched.  
* "5FD": Nothing is displayed.  
* "000": The current pressure unit is displayed.  
* "001": Specified number is displayed.  
* "002": Specified number, character (some characters cannot be displayed) or symbol is displayed. |
| Display speed switching | 250 | Display speed of pressure displayed in the main display section can be switched. |
| Fixed hysteresis value switching | 111 | Hysteresis of EASY MODE and WINDOW COMPARATOR MODE can be set. (8 steps) |
| Switching display color (Only standard type) | 0FF | Comparison with the setting details with display colors switched at the main display part of menu setting mode. Interlock with either output 1 or comparison output 2 can be switched. |
| ECO MODE setting | OFF | Power consumption can be reduced.  
* "OFF": Normally (ECO MODE OFF)  
* "ON": Display section gets dark if the key operation is not done for 5 seconds in RUN MODE.  
* "L": Display section is turned OFF if the key operation is not done for 5 seconds in RUN MODE. Hold down any key to display normal state temporarily. |
| Setting confirmation code | UHUU | The current setting details can be checked. Refer to the code list for codes. |
| Setting copy mode | OFF | A copy of master side sensor setting details can be made to a slave side sensor. Refer to "Setting copy function" on page 15 for the details.  
* "OFF": A copy of setting details is sent.  
* "ON": A copy of setting details is sent, then key lock applies to the slave side sensor. |
| Reset setting | OFF | Reset to the initial state. If you press mode switchover key while "OFF", initial status (factory settings) will be retrieved. |

### Code list

<table>
<thead>
<tr>
<th>Code</th>
<th>1st digit</th>
<th>2nd digit</th>
<th>3rd digit</th>
<th>4th digit</th>
<th>Only standard type</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Standard type</td>
<td>High function type</td>
<td>Threshold value display</td>
<td>Display color of main display section</td>
<td>Display color of interlock</td>
</tr>
<tr>
<td></td>
<td>Comparison output 1/output mode</td>
<td>Comparison output 2/output mode</td>
<td>Comparison output 3/output mode</td>
<td>Comparison output 4/output mode</td>
<td>Comparison output 5/output mode</td>
</tr>
<tr>
<td></td>
<td>Comparison output 6/output mode</td>
<td>Comparison output 7/output mode</td>
<td>Comparison output 8/output mode</td>
<td>Comparison output 9/output mode</td>
<td>Comparison output 10/output mode</td>
</tr>
<tr>
<td>0</td>
<td>EASY</td>
<td>N.O.</td>
<td>OFF</td>
<td>OFF</td>
<td>Red when turned ON</td>
</tr>
<tr>
<td>1</td>
<td>Hysteresis</td>
<td>N.C.</td>
<td>EASY</td>
<td>N.O.</td>
<td>Auto reference</td>
</tr>
<tr>
<td>2</td>
<td>Window comparator</td>
<td>N.C.</td>
<td>Hysteresis</td>
<td>N.O.</td>
<td>Analog voltage output</td>
</tr>
<tr>
<td>3</td>
<td>N.O.</td>
<td>Window comparator</td>
<td>N.C.</td>
<td>P-1 Lo-1</td>
<td>P-2 Lo-2</td>
</tr>
<tr>
<td>4</td>
<td>N.C.</td>
<td>-</td>
<td>-</td>
<td>ADJ.</td>
<td>Normally</td>
</tr>
<tr>
<td>5</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>red</td>
</tr>
<tr>
<td>6</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Normally</td>
</tr>
<tr>
<td>7</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>green</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Code</th>
<th>5th digit</th>
<th>6th digit</th>
<th>7th digit</th>
<th>8th digit</th>
<th>Only standard type</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Response time</td>
<td>Unit switching</td>
<td>Display speed</td>
<td>ECO MODE</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>2.5ms</td>
<td>MPA</td>
<td>250ms</td>
<td>OFF</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>5ms</td>
<td>kPa</td>
<td>500ms</td>
<td>Std</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>10ms</td>
<td>kgf/cm²</td>
<td>1,000ms</td>
<td>Full</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>25ms</td>
<td>bar</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>50ms</td>
<td>psi</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>100ms</td>
<td>mmHg</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>250ms</td>
<td>inchHg</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>500ms</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>1,000ms</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>5,000ms</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

*Only for foreign markets (with unit change)*
Setting copy function

- This makes a copy of setting details to the slave side sensor from the master side sensor.
- A copy between different models cannot be made.
- The setting copy function applies to one slave side sensor per master side sensor.

<Installation procedure>
1. Set setting copy mode of the master sensor as "sending ON" or "ON-L", then press the mode switchover key to set ready state. Refer to "Setting copy mode" in the PRO MODE section on page 13 for details.
2. Turn off the power of master side sensor.
3. Wire between master and slave sides as the following diagram.
4. Turn the power of master and slave side sensors ON at the same time. (Note 2) (Note 3)
5. Setting details are 16-bit encoded, and displayed with orange in the main display section of the master side sensor, then a copy starts.
6. The same codes as the procedures are displayed with green in the main display section of the slave side sensor, and " " is displayed in the sub-display section. (A copy is completed).
7. Turn off the power of master and slave side sensors, then remove wiring.
   * If a copy of setting details is repeatedly made to another sensor, follow procedures to .
   * A copy of setting details could not be made if power is not turned on at the same time.
   * Pulse output is outputted from the comparison output 1 output, if power is turned on.

<To reset the master side sensor setting copy mode.>
1. Turn on power of a master side sensor (with wiring of slave side sensor removed).
2. Hold down the mode switchover key for 2 seconds.

Auto reference (only high function type)

- Auto reference is the function that corrects the setting of detection pressure as the reference pressure when auto reference input.
- Based on detection pressure P(a) when auto reference input, the setting (1)' is automatically corrected to "setting (1)+P(a)".

Setting available range and set pressure range after correcting
- The set pressure range is wider than the rated pressure range in accordance with auto reference.

If the corrected settings exceed set pressure range when auto reference input, the setting is automatically corrected to set pressure range. Do not exceed set pressure range.
**PPX Series**

**How to operate**

With EASY MODE and WINDOW COMPARATOR MODE, the setting is shifted in the same manner.

- Detection pressure is set to "zero", if the analog voltage output/external input switching setting is changed, or if power is turned ON again when auto reference input.
- The auto reference input can be checked when setting the threshold value in the RUN MODE.
Refer to the threshold value setting on Page 10; RUN MODE for the details.

**Remote zero adjusting (only high function type)**

Remote zero adjusting is the function that forcibly set the pressure at that time to "zero" with an external input signal.

The setting cannot be corrected when remote zero adjusting input. Do not exceed set pressure range for the pressure and the setting during remote zero adjusting.

**Operation chart**

<table>
<thead>
<tr>
<th>Output</th>
<th>OFF</th>
<th>ON</th>
</tr>
</thead>
</table>

- **Impressed pressure (kPa)**:
  - 0 10 20 30 40 50 60

- **Displayed value (kPa)**:
  - 0 10 20 30 40 50 60

- **Set value (kPa)**:
  - (1) (2) 10 20

(Note 1): With EASY MODE and WINDOW COMPARATOR MODE, the setting is shifted in the same manner.

If analog voltage output/external input setting is changed, or if the power is turned ON again, the remote zero adjusting value is cleared, and remote zero adjusting function goes back to the normal operation with atmospheric pressure standard. Remote zero adjusting value can be checked when setting the threshold value in RUN MODE.
Refer to the threshold value setting in "RUN MODE" section on Page 10 for the details.

**Error display**

<table>
<thead>
<tr>
<th>Error display</th>
<th>Descriptions</th>
<th>Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>[\text{E-1}]</td>
<td>The load is short-circuited, and overcurrent flows.</td>
<td>Check a load after the power turned OFF.</td>
</tr>
<tr>
<td>[\text{E-2}]</td>
<td>Pressure is applied during zero point adjustment.</td>
<td>Apply atmospheric pressure to the pressure port, then perform zero adjustment again.</td>
</tr>
<tr>
<td>[\text{E-4}]</td>
<td>External input overflows the rated pressure range.</td>
<td>Reset applied pressure to the rated pressure range.</td>
</tr>
<tr>
<td>[\text{E-5}]</td>
<td>Communication error (disconnection or incorrect connection, etc.)</td>
<td>Check wiring before using the copy function.</td>
</tr>
<tr>
<td>[\text{E-6}]</td>
<td>Communication error (A different model is used.)</td>
<td>Check the configuration used with same models before using the copy function.</td>
</tr>
<tr>
<td>[\text{10} \cdot 10]</td>
<td>Applied pressure reaches the upper limit of display pressure range.</td>
<td>Set applied pressure within rated pressure range.</td>
</tr>
<tr>
<td>[\text{10} \cdot 10]</td>
<td>Applied pressure reaches the lower limit (back pressure) of display pressure range.</td>
<td></td>
</tr>
</tbody>
</table>
Example of setting operation per application  

EASY MODE  

(Note 1): This is the example of setting from default setting (default).  
(Note 2): If the setting conditions are unknown, operate <reset setting> in PRO MODE, and reset to default before using.  

● Suction confirmation  

To EASY MODE  
R01 type (-100.0 to 100.0kPa)  
- Start from the mode when power turned ON (RUN MODE).  
- If RUN MODE is not selected, hold down the "MODE" key for several seconds to display the RUN MODE state.  

Comparison output 1  
EASY MODE  
ON OFF  

Comparison output 2  
EASY MODE  
OFF  

-100kPa [-70.0]  
0kPa  

● Suction + vacuum break confirmation  

Comparison output 1  
EASY MODE  
ON OFF  

Comparison output 2  
EASY MODE  
ON OFF  

-100kPa [-70.0]  
0kPa  

P-1 [-70.0]  
P-2 [80.0]  

Comparison output 1  
ON OFF  

Comparison output 2  
ON OFF  

P-1  
P-2  

ON OFF  

ON OFF  

ON OFF  

ON OFF  

Hold down for 2 s.  

Press to match the setting.  

Press to match the setting.  

Press once.  

Press twice.  

Press twice.  

Press once.  

Press once.  

Hold down for 2 s.  

Press once.  

Press once.  

Press once.  

Press once.  

Press once.  

Press once.  

Press once.  

Hold down for 2 s.  

Press once.  

Press once.  

Press once.  

Press once.  

Press once.  

Press once.  

Press once.  

Press once.  

Press once.  

Press once.  

Press once.  

Press once.  

Press once.  

Press once.  

Press once.  

Press once.  

Press once.  

Press once.  

Press once.  

Press once.  

Press once.
Example of setting operation per application

HYS MODE (hysteresis mode)

(Note 1): This is an example of setting from default setting.
(Note 2): If the setting conditions are unknown, operate <reset setting> in PRO MODE, and reset to default before using.

- **Suction confirmation**
  - To HYS MODE (hysteresis mode)
  - R01 type (-100.0 to 100.0kPa)
  - Start from the mode when power turned ON (RUN MODE).
  - If RUN MODE is not selected, hold down the "MODE" key for several seconds to display the RUN MODE state.

**RUN MODE screen**

**Menu setting mode screen**

**RUN MODE screen**

- **Suction + vacuum break confirmation**

**RUN MODE screen**

**Menu setting mode screen**
Example of setting operation per application

WCMP MODE (window comparator mode)

(Note 1): This is an example of setting from default setting.
(Note 2): If the setting conditions are unknown, operate <reset setting> in PRO MODE, and reset to default before using.

Source pressure confirmation

To WCMP MODE (window comparator mode)
R10 type (-0.100 to 1.000MPa)
- Start from the mode (RUN MODE) when power turned ON.
- If RUN MODE is not selected, hold down the "MODE" key for a while to enter RUN MODE.

Comparison output 1
WCMP MODE
Comparison output 2
EASY MODE

RUN MODE screen

Menu setting mode screen

Setting completion
When designing and manufacturing a device using CKD products, the manufacturer is obligated to check that device safety mechanical mechanism, pneumatic control circuit, or water control circuit and the system operated by electrical control that controls the devices is secured. It is important to select, use, handle, and maintain the product appropriately to ensure that the CKD product is used safely. Observe warnings and precautions to ensure device safety. Check that device safety is ensured, and manufacture a safe device.

**WARNING**

1. This product is designed and manufactured as a general industrial machine part. It must be handled by an operator having sufficient knowledge and experience in handling.

2. Use this product in accordance with specifications.
   - Contact CKD when using the product outside the unique specifications range, when using it outdoors, and when using it under the conditions and environment below. Do not attempt to modify or additionally machine the product.
   - Use for special applications requiring safety including nuclear energy, railroad, aviation, ship, vehicle, medical equipment, equipment, or applications coming into contact with beverage or food, amusement equipment, emergency shutoff circuits, press machine, brake circuits, or for safeguard.
   - Use for applications where life or assets could be adversely affected, and special safety measures are required.

3. Observe corporate standards and regulations, etc., related to the safety of device design and control, etc.
   - ISO4414, JIS B 8370 (pneumatic system rules)
   - JFPS2008 (principles for pneumatic cylinder use and selections)
   - Such as High Pressure Gas Maintenance Law and Occupational Safety and Sanitation Laws, other safety rule and corporate standards and regulations

4. Do not handle, pipe, or remove devices before confirming safety.
   - Inspect and service the machine and devices after confirming safety of the entire system related to this product.
   - Note that there may be hot or charged sections even after operation is stopped.
   - When inspecting or servicing the device, turn off the energy source (air supply or water supply), and turn off power to the facility. Discharge any compressed air from the system, and pay enough attention to possible water leakage and leakage of electricity.
   - When starting or restarting a machine or device that incorporates pneumatic components, make sure that the system safety, such as pop-out prevention measures, is secured.

5. Observe warnings and cautions on the pages below to prevent accidents.
   - The safety cautions are ranked as "DANGER", "WARNING" and "CAUTION" in this section.

**DANGER:** When a dangerous situation may occur if handling is mistaken leading to fatal or serious injuries, or when there is a high degree of emergency to a warning.

**WARNING:** When a dangerous situation may occur if handling is mistaken leading to fatal or serious injuries.

**CAUTION:** When a dangerous situation may occur if handling is mistaken leading to minor injuries or physical damage.

Note that some items described as "CAUTION" may lead to serious results depending on the situation. In any case, important information that must be observed is explained.

**Disclaimer**

1. Warranty period
   - "Warranty Period" is one (1) year from the first delivery to the customer.

2. Scope of warranty
   - In case any defect attributable to CKD is found during the term of warranty, CKD shall, at its own discretion repair the defect or replace the relevant product in whole or in part, according to its judgement.
   - Note that the following faults are excluded from the warranty term:
     1. Product abuse/misuse contrary to conditions/environment recommended in its catalogs/specifications
     2. Failure caused by other than the delivered product
     3. Use other than original design purposes
     4. Third-party repair/modification
     5. Faults caused by reason that is unforeseeable with technology put into practical use at the time of delivery
     6. Failure attributable to force majeure
   - The warranty mentioned here covers the discrete delivered product. Only the scope of warranty shall not cover losses induced by the failure of the delivered product.

3. Compatibility confirmation
   - In no event shall CKD be liable for merchantability or fitness for a particular purpose, notwithstanding any disclosure to CKD of the use to which the product is to be put.
Pneumatic components (electronic pressure switch and sensors)

Safety precautions
Always read this section before starting use.
Refer to "Pneumatic, vacuum and auxiliary components CB-024SA".

Design & Selection

⚠️ WARNING

- Use this product in accordance with specifications.
  - Applications, load current, voltage, temperature, shock and working environment, etc. exceeding the specifications range could lead to destruction and malfunction of peripheral equipment.
- Do not use oxygen, corrosive or combustible gas, or toxic fluid for this product.
- Do not use this product in flammable atmosphere
  - The pressure switch is not explosion proof. Do not use this product in flammable atmosphere, or explosions could occur.
- Do not install the product in completely sealed enclosure.
  - The internal pressure in the closed chamber could change if the fluid leaks in an accident. Use this product in the control box with safety device to control internal pressure, or indoors with no pressure differential from the outside.
- Power supply voltage
  Use the product within the specified power supply voltage range. If voltage exceeding specified range is applied, or current power (100 V AC) is applied, circuit damage could occur.
- Load short circuit
  Do not short-circuit the load, or circuit damage could occur.
- Incorrect wiring
  Avoid incorrect wiring such as connecting to the wrong electrode of the power source, etc., or the circuit damage could occur.

⚠️ CAUTION

- Applicable fluid
  When using applicable fluid other than air; nitrogen gas, etc., oxygen deficiency could be caused. Observe the following instructions.
  - Use this product in well ventilated location.
  - Ventilate the work area when nitrogen gas is being used.
  - Inspect piping regularly, so nitrogen gas does not leak.
  - Non-corrosive gas is materials in the air (nitrogen, carbon dioxide) and inactive gas (argon, neon).
  - To use for pressed air including water and oil, use PPD(3)-S type (stainless diaphragm sensor specifications), which has higher corrosion resistance.
- If this product is used for vacuum suction confirmation, care must be taken for following matters.
  - The pressure exceeding withstanding pressure in the specifications must not be applied to the product if positive pressure of vacuum break is applied.
- Working environment
  - Avoid use in the place that vibration or shock not less than 100m/s² is applied.
  - Care must be taken in not exceeding ambient temperature range including piping area.
  - Do not use the product in locations that water or oil may contact the products.

- Considering errors, etc. caused by precision/temperature characteristics, decide the setting.
- Care must be taken when this product is used in an interlock circuit.
  - When a pressure switch is used for interlock signals requiring high reliability, provide mechanical guards for a failure, or provide dual interlock as a switch (sensor) other than pressure switch. Conduct inspection regularly to check that the normal operation is done.
- Responsiveness is adversely affected depending on working pressure and capacity of loads. Install a regulator before the sensor if stable reproducibility is required.
- Use conditions to comply with CE marking
  - PPX Series is CE marked products complied with EMC directive. EN61000-6-2 regulation matched to immunity applies to this product. Conditions below are necessary to comply with these standards.
    - Conditions
      - Length of power line connected to the sensor must be less than 10m.
- Take the following countermeasures to prevent malfunction caused by noise.
  - Provide a line filter in AC power line.
  - Do not share power with an inverter or components causing motor noise, etc.
  - Remove noise from inductive load (such as solenoid valve and relay) with a surge suppressor such as CR or diode in the source side.
  - When using components (such as switching regulator and inverter motor) causing noise around the sensor installation section, ground a frame ground (F.G.) terminal of components.
  - Keep distance between a line connected to sensors and strong magnetic field.
  - Connect to sensors with shield wire.
  - Connect shield wire to the ground of power side.

- When the secondary side control pressure is released to atmosphere as air blow, pressure may fluctuate depending on piping and blow conditions. Execute a test under actual working conditions or contact to CKD.
- Select the product whose flow is not less than the total of that used for sensors when selecting a dryer, an air filter, an oil mist filter and a regulator.
**PPX Series**

**Precautions**

**WARNING**

- Avoid incorrect connection.
  - An incorrect connection may cause a fatal error not only to this product but also peripheral devices.
- DC power not insulated from AC primary side may damage the product and power, so an electric shock could occur.
  - Do not use the product in this case.
- If a commercially available switching regulator is used for power, ground a frame ground (F.G.) terminal of power.

**CAUTION**

- Do not use the product where the product is exposed to direct-sunlight, or may come in contact with water or oil.
- Avoid use in high steam and dirt environments.
- Care must be taken to avoid product contact with organic solvents such as thinner, water, oil and fat.
- Do not put wire, etc. into the pressure port, or diaphragm may be damaged preventing a normal operation.
- Performance could not be guaranteed in strong electromagnetic field.
- Flash air pipe connected to sensors before connecting. Prevent pipe from catching tips of sealing tape when piping.
- Apply adequate torque when connecting pipes.
  - To prevent air leakage and screw damage.
  - Tighten by hand at first, then use a tool to prevent screw thread damage.

<table>
<thead>
<tr>
<th>Set screw</th>
<th>Tightening torque N·m</th>
</tr>
</thead>
<tbody>
<tr>
<td>M3</td>
<td>0.3 to 0.6</td>
</tr>
<tr>
<td>M5</td>
<td>1 to 1.5</td>
</tr>
<tr>
<td>Rc1/8</td>
<td>3 to 5</td>
</tr>
</tbody>
</table>

**Piping**

- Apply a 12mm spanner (14mm for PPX-6G type) on the pressure port hexagon head section to fix, then apply tightening torque 9.8N·m or less if a commercially available joint is connected to the pressure port. A joint or the pressure port section could be broken if too much torque is applied.
  - Use seal tape to connect joints and prevent air leak.

- Please be careful when unpacking, as piping port is degreased and cleaned. (PPX-P12)

**Installation**

**WARNING**

- Sensor bracket PPX-KL is available.
  - If a sensor is installed with a bracket, etc., tightening torque must be 0.5N·m or less.

- Panel bracket PPX-KHS (optional) and front cover PPX-KCB (optional) are available.
CAUTION

- Care must be taken for protection of body and lead wire.
  - Do not apply stress to cable leading or connector section directly.
  - Do not dent or drop the body. Do not apply excessively repeated bending force and tension to lead wire, or could result in disconnection.
  - Connect an elastic material as a cable bearer to the movable part.

Connector wiring

- Insert cable with connector PPX-C* into the connector section of this product as right when connection.
- Pull out the connector while pressing the jaw of cable with connector when disconnecting.
- If the cable section is pulled out without pressing the jaw when disconnecting, the cable or connector could be broken.

<Connector pin layout drawing>

<table>
<thead>
<tr>
<th>Connector No.</th>
<th>Terminal name</th>
<th>Terminal name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>+V</td>
<td>Comparison output 1</td>
</tr>
<tr>
<td>2</td>
<td>Standard type: Comparison output 2</td>
<td>High function type: Analog voltage/current output or external input</td>
</tr>
<tr>
<td>3</td>
<td>0V</td>
<td></td>
</tr>
</tbody>
</table>

- Use an applicable cable and crimp tools for housing and contact if connected with the connector set (PPX-CN).

Applicable cable

- Use pipe 1m long, and do not apply tension and impact to the pipe. If longer pipe is used, tension not expected could be created by the pipe weight, vibration or impact. In this case, use an intermediate support to fix the pipe on the machine or equipment.
- Do not connect relays, switches or other devices to the output of this sensor in parallel at the PLC. Do not short-circuit the PLC input terminal connected to this sensor and (-) side of power to test input devices, neither, or the output circuit of this unit could be damaged.

Voltage must rise or fall quickly when power is turned ON or OFF. If the rated voltage is not reached, the sensor could malfunction. In some cases, the sensor could not recover after the rated voltage is reached. Reset the power in that case. Even if the voltage drops temporarily, shut down the power once, then turn ON the power again.

Avoid use during the transient state (0.5s) when power turned ON.

Install the product and wiring as far as possible from noise source such as a strong electric line, etc. Take other countermeasures for the surge from inductive loads on the power line.

Do not operate the control unit, machinery or equipment suddenly after wiring. Due to wrong setting, signals not expected could be output. First stop control unit, machinery and equipment, while energize these to test. Set the target setting after test.

Cable with 0.3mm² and over can be extended up to 100m. Note that the power line connected to this product must be less than 10m if used as a CE marked product.

Stop machinery and equipment, and check safety before setting switch output.

Operate the key with a fingertip. Knife, screwdriver and other hard or pointed objects may damage the plastic film over the control.

Do not turn off the power during or immediately after the key operation setting. It may prevent setting value from changing.

Piping

- Apply seal tape or sealant to screw-in joint, then screw the joint into the port to avoid excessive torque. Apply a spanner on the metal section to tighten.
- When winding seal tape, wind the tape leaving 2mm and over open from the thread top. If seal tape extrudes from the thread top, seal tape chips could be created when screwed in. These chips could enter into the circuit, and cause malfunction.

Use pipe 1m long, and do not apply tension and impact to the pipe. If longer pipe is used, tension not expected could be created by the pipe weight, vibration or impact. In this case, use an intermediate support to fix the pipe on the machine or equipment.

Wiring

- Connect cable with power turned OFF. Discharge static electricity charged in human body, tool or equipment before and during operation.
- Use stabilized power supply with ripple voltage 10% or less without noise.

Use pipe 1m long, and do not apply tension and impact to the pipe. If longer pipe is used, tension not expected could be created by the pipe weight, vibration or impact. In this case, use an intermediate support to fix the pipe on the machine or equipment.

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Precautions

During Use & Maintenance

**WARNING**

- Do not apply overcurrent.
  - Due to short-circuit of load, if overcurrent applies to the pressure switch, the switch could be damaged or ignite. Install a fuse on output or power line as a overcurrent protective circuit.

**CAUTION**

- Do not disassemble the product.
  - Disassembling the product could result in damage or deterioration of the product. CKD will not guarantee the performance after disassembling. When replacing or moving the product, remove the sensor without disassembling pressurized port.

- Stop machinery and equipment, then check the safety before operating the product.

- The case is made of resin. Do not use solvent, alcohol or any other cleaning agent, etc., to remove contamination, etc., or resin could be corroded or damaged. Wipe contaminations with a well wrung rag, etc., after soaked in weakened neutral detergent.

- Care must be taken for reverse current caused by disconnection or wiring resistance. When components including pressure switches are connected to the same power source of pressure switch, if (-) sides of output and power lines are short-circuited to check input devices of the control panel, or if (-) side of power line is disconnected, reverse current may apply to the output circuit of pressure switch, causing damages.

**Take countermeasures as followings to prevent damages caused by reverse current.**

1. Do not concentrate current to the power line, especially, (-) side power line, and use wire as thick as possible.
2. Limit numbers of components connected to the same power source of pressure switch.
3. Connect a diode in series to the pressure switch output line to prevent reverse current.
4. Connect a diode in series to power line (-) side of the pressure switch to prevent reverse current.

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**Take countermeasures as followings to prevent damage caused by surge current leading.**

1. Separate the power supply for outputs creating inductive load such as solenoid valve and relay, etc. and inputs such as pressure switch, etc.
2. If the power cannot be separated from the inductive load, install a surge absorbing element(s) per load. The surge absorbing element(s) connected to PLC, etc. merely protects the unit connected.
3. Connect surge absorbing element(s) to the points as following to reduce damages when lines are disconnected.

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When components are connected with connectors, if a connector is dislocated during energizing, the output circuit could be damaged because of the reason above. Turn off the power before dislocating a connector.
**Related products**

**Vacuum regulator  EVR Series**

- High precision pressure accuracy
  - Hysteresis: 0.3% F.S., linearity: ±0.5% F.S., resolution: 0.1% F.S., repeatability: 0.2% F.S.
- Improved temperature stability and durability
  - Zero point fluctuation: 0.06% F.S., span fluctuation: 0.06% F.S., durability: 3 times (compared with previous models)
- New functions are available
  - Zero residual pressure when input signal is 0% F.S. Select pressure control pattern.
- Easy operation
  - "Zero point adjustment", "span point adjustment", "pressure control pattern" can be operated with 2 buttons.
- Compatibility and installability
  - Installation compatibility with previous model (EV2500)
  - 2 types of connector are available. (straight type, L type, 1m and 3m for each type)

**Precision regulator air saving type RPE Series**

Environment conscious, new type precise regulator

- 70% less air consumption
- High precision pressure control
- Small size 42mm, light weight 250g
- Modular design
- Standard ozone-resistant materials for moving sections
- Non grease specification fluid passage

**Precision regulator  RP1000, RP2000 Series**

Suitable regulator for pressure control or balancer

- High precision pressure control
- Large pressure relief flow rate
- Micro pressure is configurable (RP1000)
- Small and compact
- Long service life (RP2000)
Related products

FRL Module type

Digital pressure sensor PPX is equipped as option for FRL modular type combination, filter regulator, and regulator.

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