Thank you for purchasing products from Panasonic Electric Works SUNX Co., Ltd. Please read this Instruction Manual carefully and thoroughly for the correct and optimum use of this product. Kindly keep this manual in a convenient place for quick reference.

This product has been developed / produced for industrial use only.

- Use within the rated pressure range.
- Do not apply pressure exceeding the pressure resistance value. The diaphragm will be damaged resulting in faulty operation.
- Make sure that the power supply is off while wiring.
- Incorrect wiring will damage the sensor.
- Verify that the supply voltage including the ripple is within the rating.
- If power is supplied from a commercial switching regulator, ensure that the frame ground (F.G.) terminal of the power supply is connected to an actual ground.
- In case noise generating equipment (switching regulator, inverter motor, etc.) is used in the vicinity of this sensor, connect the frame ground (F.G.) terminal of the equipment to an actual ground.
- Do not use during the initial transient time (0.5s) after the power supply is switched on.
- Do not run the wires together with high-voltage lines or power lines or put them in the same raceway. This can cause malfunction due to induction.
- The specification may not be satisfied in a strong magnetic field.
- Avoid dust, dirt, and steam.
- Take care that the sensor does not come in direct contact with water, oil, grease, or organic solvents such as thinners, etc.
- Do not insert wires, etc., into the pressure port. The diaphragm will be damaged resulting in faulty operation.
- Do not operate the keys with pointed or sharp objects.
- Do not apply stress directly to the sensor cable joint by forcibly bending or pulling.

Use a 12mm end wrench (14mm for DP-100-E type) when tightening a commercial coupler to the pressure port. The tightening torque should be 9.8N·m or less (M5 female connector: 1N·m or less). The commercial coupler or pressure port section will be damaged if the tightening torque is excessive. Wrap sealing tape around the coupler when connecting to prevent leaks.
4 MOUNTING

- The sensor mounting bracket (MS-DP1-1) is available as an option. When mounting the sensor onto the sensor mounting bracket, etc., the tightening torque should be 0.5N·m or less.

- The panel mounting bracket MS-DP1-2 (optional) and MS-DP1-4 (optional), as well as the front cover MS-DP1-3 (optional) and DPX-04 (optional) are also available.

- The type of the front cover differs depending on the mounting bracket. Use MS-DP1-3 for MS-DP1-2, and DPX-04 for MS-DP1-4.

- To mount the panel mounting bracket, refer to the Instruction Manual enclosed with MS-DP1-2 or MS-DP1-4.

5 WIRING

Connection method
Attach the female connector of cable CN-14A-C to the 4-pin male connector.

Disconnection method
While pressing the release lever, pull out the connector.

Pin assignment, 4-pin male connector

<table>
<thead>
<tr>
<th>Pin no.</th>
<th>Terminal name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>+V</td>
</tr>
<tr>
<td>2</td>
<td>Comparative output 1</td>
</tr>
<tr>
<td>3</td>
<td>• Standard type: Comparative output 2</td>
</tr>
<tr>
<td></td>
<td>• Multifunction type: Analog voltage output or external input</td>
</tr>
<tr>
<td>4</td>
<td>0V</td>
</tr>
</tbody>
</table>

6 I/O CIRCUIT DIAGRAMS

Notes:
- When using the analog voltage output, pay careful attention to the connected device's input impedance.
- If the cable is extended, the cable resistance will cause the voltage to drop.

7 OUTPUT MODE AND OUTPUT OPERATION

The EASY mode, hysteresis mode or window comparator mode can be selected as the output mode for comparative output 1 and, for the standard type DP-100, comparative output 2.

For details, see page 5, section 10, MENU SETTING MODE.

Easy mode
The comparative output is turned ON or OFF (depending on the N.O./N.C. setting) when the threshold is reached. The tolerance of the threshold is specified by the hysteresis setting. For details, see page 6, section 11, PROC MODE.

Notes:
- Hysteresis can be fixed in 8 levels.
- P-1 is displayed for comparative output 1 and P-2 for comparative output 2 on the sub-display.
**Hysteresis mode**

The comparative output is turned ON or OFF (depending on the N.O./N.C. setting) when the upper or lower threshold is reached and remains ON or OFF until the other threshold is reached.

Notes:
- H (Hysteresis): 1 digit or more, 2 digits or more when psi is selected as the pressure unit.
- H-1 or Lo-1 is displayed for comparative output 1 and H-2 or Lo-2 for comparative output 2 on the sub-display.

**Window comparator mode**

The comparative output is turned ON or OFF (depending on the N.O./N.C. setting) when the pressure lies between the upper or lower threshold. The tolerance of the threshold is specified by the hysteresis setting. For details, see page 6, section 11, PRO MODE.

Notes:
- Hysteresis can be fixed in 8 levels.
- For details, see page 6, section 11, PRO MODE.
- H-1 or Lo-1 is displayed for comparative output 1 and H-2 or Lo-2 for comparative output 2 on the sub-display.

### 8 SELECTING MODES

DP-100 has 3 different modes:
- RUN mode. For details, see page 3, section 9, RUN MODE.
- Menu setting mode. For details, see page 5, section 10, MENU SETTING MODE.
- Pro mode. For details, see page 6, section 11, PRO MODE.

**Switching modes**

Press [MODE] to switch between modes.

From RUN mode, press [MODE] for 2s to select the menu setting mode.

From RUN mode, press [MODE] for 4s to select pro mode.

To return to RUN mode, press [MODE] for 2s.

### 9 RUN MODE

In RUN mode, you can lock the keys and adjust the threshold for the parameters set in menu setting mode while the sensor is operating. For details, see page 5, section 10, MENU SETTING MODE.

Threshold settings are displayed in the sub-display.

If you attempt to set threshold values that exceed the pressure range allowed, DP-100 will alert you. UP (exceeds the upper limit) or DOWN (exceeds the lower limit) will appear on the sub-display. DOWN will also appear if the H threshold value exceeds the Lo threshold value for the hysteresis mode or window comparator mode.

**Standard type**

### Setting condition 1

Comparative output 1 set to: **EASY (EASY mode)**

Comparative output 2 set to: **OFF (OFF)**

### Setting condition 2

Comparative output 1 set to: **EASY (EASY mode)**

Comparative output 2 set to: **EASY (EASY mode)**

### Setting condition 3

Comparative output 1 set to: **HYS (Hysteresis mode)**

Comparative output 2 set to: **WCMP (Window comparator mode)**

### Setting condition 4

Comparative output 1 set to: **HYS (Hysteresis mode)**

Comparative output 2 set to: **OFF (OFF)**

### Setting condition 5

Comparative output 1 set to: **HYS (Hysteresis mode)**

Comparative output 2 set to: **EASY (EASY mode)**

### Setting condition 6

Comparative output 1 set to: **HYS (Hysteresis mode)**

Comparative output 2 set to: **WCMP (Window comparator mode)**
Multifunction type

Setting condition 1

Comparative output 1 set to: **EASY** (EASY mode)
Analog voltage output / external input: \( V_{\text{out}} \) (Analog voltage output)

```
-200 \( \rightarrow \) -200 \( \rightarrow \) -199
```

Setting condition 2

Comparative output 1 set to: **EASY** (EASY mode)
Analog voltage output / external input: \( V_{\text{REF}} \) (Auto-reference input) \(^1\), or \( V_{\text{ZERO}} \) (Remote zero-adjustment input) \(^2\)

```
-200 \( \rightarrow \) -200 \( \rightarrow \) -199
```

\(^1\)For details, see page 7, section 13, AUTO-REFERENCE FUNCTION.
\(^2\)For details, see page 8, section 14, REMOTE ZERO-ADJUSTMENT FUNCTION, MULTIFUNCTION TYPE.

Setting condition 3

Comparative output 1 set to: **HYS** (Hysteresis mode), or **V CMP** (Window comparator mode)
Analog voltage output / external input: \( V_{\text{out}} \) (Analog voltage output)

```
-400 \( \rightarrow \) -599
```

Setting condition 4

Comparative output 1 set to: **HYS** (Hysteresis mode), or **V CMP** (Window comparator mode)
Analog voltage output / external input: \( V_{\text{REF}} \) (Auto-reference input) \(^1\), or \( V_{\text{ZERO}} \) (Remote zero-adjustment input) \(^2\)

```
-400 \( \rightarrow \) -399
```

\(^1\)For details, see page 7, section 13, AUTO-REFERENCE FUNCTION.
\(^2\)For details, see page 8, section 14, REMOTE ZERO-ADJUSTMENT FUNCTION, MULTIFUNCTION TYPE.

Common

Zero-adjustment function
The zero-adjustment function forcibly sets the pressure value to zero when the pressure port is opened.
To force the pressure value to zero, simultaneously press \( \text{MODE} + \text{MODE} \).

```
-58 \( \rightarrow \) MODE \( \rightarrow \) MODE
```

Key lock function
The key lock function protects settings from being changed inadvertently.
To lock, simultaneously press \( \text{MODE} + \text{MODE} \).

```
-58 \( \rightarrow \) MODE \( \rightarrow \) MODE
```

To unlock, simultaneously press \( \text{MODE} + \text{MODE} \).

```
-58 \( \rightarrow \) MODE \( \rightarrow \) MODE
```

Peak / bottom hold function
The peak / bottom hold functions display the peak value and bottom value of the fluctuating pressure. The peak value is displayed on the main display and the bottom value is displayed on the sub-display.
To set the peak / bottom hold function, simultaneously press \( \text{PEAK} + \text{PEAK} \).

```
-58 \( \rightarrow \) PEAK \( \rightarrow \) PEAK
```

To release the peak / bottom hold function, simultaneously press \( \text{PEAK} + \text{PEAK} \).

```
-58 \( \rightarrow \) PEAK \( \rightarrow \) PEAK
```
From RUN mode, press \[ \text{ } \] for 2s to select the menu setting mode. The examples below begin with the factory default settings.

**<RUN mode>**

1. **Press 2s.**
2. **<Mode setting for comparative output 1>**
   - **EASY mode**
   - **Hysteresis mode**
   - **Window comparator mode**
3. **<Mode setting for comparative output 2>**¹
   - **OFF mode**
   - **EASY mode**
   - **Hysteresis mode**
   - **Window comparator mode**
4. **<Analog voltage output / external input>**
   - **Analog voltage output**
   - **Auto-reference input**
   - **Remote zero-adjustment input**
5. **<N.O. / N.C. selection>**¹, ²
   - **Output 1: N.O.**
   - **Output 1: N.C.**
   - **Output 2: N.O.**
   - **Output 2: N.C.**
6. **<Pressure unit selection>**³, ⁴
   - **(MPa)**
   - **(kPa)**
   - **(bar)**
   - **(mmHg)**
   - **(inchHg)**
   - **(psi)**
   - **(kgf/cm²)**

**1 If for the standard type DP-100 comparative output 2 is set to "OFF", the N.O. / N.C. selection (normally open, normally closed selection) is the same as for the multifunction type, i.e. you will only set N.O. or N.C. for comparative output 1, not for both comparative outputs.**

**2 The default setting of the high pressure type is N.O. (normally open), and that of the low pressure type is N.C. (normally closed).**

**3 The default setting for the low pressure type is kPa. MPa is not available.**

**4 For the high pressure type, "inchHg" and "mmHg" are not available.**
## PRO MODE

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sub-display selection</td>
<td>Selects what is displayed in the sub-display.</td>
</tr>
<tr>
<td></td>
<td>• OFF: nothing.</td>
</tr>
<tr>
<td></td>
<td>• Unit: pressure unit selected.</td>
</tr>
<tr>
<td></td>
<td>• N**: desired number.</td>
</tr>
<tr>
<td></td>
<td>• G**: desired numbers, letters (as possible), signs.</td>
</tr>
<tr>
<td>Display speed selection</td>
<td>Sets the speed of how often the displayed pressure value on the main display is updated.</td>
</tr>
<tr>
<td>Hysteresis fixed value selection</td>
<td>Sets hysteresis for the EASY mode and window comparator mode (8 levels).</td>
</tr>
<tr>
<td>Color display scheme selection</td>
<td>Color for main display based on either comparative output 1 or comparative output 2. (Standard type only)</td>
</tr>
<tr>
<td></td>
<td>(Standard type only)</td>
</tr>
<tr>
<td></td>
<td>Color for main display based on either comparative output 1 or comparative output 2.</td>
</tr>
<tr>
<td></td>
<td>Color display scheme selection</td>
</tr>
<tr>
<td></td>
<td>(Standard type only)</td>
</tr>
<tr>
<td></td>
<td>Color for main display based on either comparative output 1 or comparative output 2.</td>
</tr>
<tr>
<td></td>
<td>ECO mode setting</td>
</tr>
<tr>
<td></td>
<td>Current consumption can be lowered.</td>
</tr>
<tr>
<td></td>
<td>• OFF: normal operation (ECO mode is off).</td>
</tr>
<tr>
<td></td>
<td>• Std: if no key operation is carried out for approx. 5s in RUN mode, the display becomes dark.</td>
</tr>
<tr>
<td></td>
<td>• FULL: if no key operation is carried out for approx. 5s in RUN mode, the display is turned off.</td>
</tr>
<tr>
<td></td>
<td>Press any key to temporarily show the normal display.</td>
</tr>
<tr>
<td>Setting check code</td>
<td>Current settings for DP-100 are stored in code, which you can display.</td>
</tr>
<tr>
<td>Setting copy mode</td>
<td>Settings can be copied from master sensors to slave sensors. For details, see page 7, section 12, SETTING COPY FUNCTION.</td>
</tr>
<tr>
<td></td>
<td>• OFF: settings are copied.</td>
</tr>
<tr>
<td></td>
<td>• ON-L: settings are copied; slave sensor is in key-lock state.</td>
</tr>
<tr>
<td>Reset setting</td>
<td>Returns to default (factory) settings.</td>
</tr>
</tbody>
</table>

From RUN mode, press for 4s to select pro mode.
The examples below begin with the factory default settings.

### <RUN mode>

1. **Press 4s.**

### <Pro mode>

1. **Setting: Setting: Setting: Setting:**

### <Sub-display selection>

- **Standard:**
- **Display OFF:**
- **Unit display:**
- **No. display:**
- **Custom display:**

### <Display speed selection>

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

### <Hysteresis fixed value selection>¹

### <Standard type only: Color display scheme>

- **Main display color will change based on comparative output 1**
- **Main display color will change based on comparative output 2**

### <ECO mode setting>

- **OFF**
- **Standard**
- **FULL**

### <Setting check code>²

### <Setting copy mode>

- **Copy sending OFF**
- **Copy sending ON**
- **Copy sending ON-L**

### <Reset setting>

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

---

¹1 level = approx. 1 digit, when Pa is selected as the pressure unit.
Turn off the power of the master side sensor and the slave side sensor.

Turn on the master sensor and the slave sensor at the same time.¹

Turn off the master sensor.

When the power is on, pulse output is output to comparative output 1.

If the power is not turned on at the same time, the setting contents may not be copied.¹

The master’s contents (16-bit coded) are shown in orange on its main display when copying is complete.

Connect the master and slave sensors as shown.

Use this function to copy the settings of a master sensor to a slave sensor.

Set the master sensor to ‘Copy ON’ or ‘Copy ON-L’. Press so that the sensor is in the copy ready state. For details, see page 6, section 11, PRO MODE.

Procedure, set copy function

1. While the slave sensor is disconnected, turn on the power of the master sensor.
2. Press for approx. 2s.

12 SETTING COPY FUNCTION

Use this function to copy the settings of a master sensor to a slave sensor.

Notes:
- The master and slave must be identical models.
- You can only copy settings to one slave at a time.

Procedure, cancel copy function

Press for approx. 2s.

13 AUTO-REFERENCE FUNCTION

The auto-reference function corrects the setting value using the detected pressure value during auto-reference input as the reference pressure.

Using the detected pressure value at auto-reference input P(a) as a reference, the set value 1’ is automatically corrected to “set value 1 + P(a)”.

Notes:
- The pressure range that can be set is wider than the rated pressure range so that the auto-reference function can be handled.
- If the corrected setting value exceeds the set pressure range when auto-reference input is carried out, the setting value will be automatically corrected to fall within the set pressure range. Thus, take care not to exceed the set pressure range.

Operation charts

During normal operation. (Each comparative output set to N.O.)
- Detected pressure at auto-reference input: 10kPa
- Output mode: Hysteresis mode

During remote zero-adjustment input. (Each comparative output set to N.O.)
- Detected pressure at auto-reference input: 10kPa
- Output mode: Hysteresis mode

Note: The setting values shift in the same manner during EASY mode or the window comparator mode.

- The detected pressure value at auto-reference input becomes “zero” when the setting of the analog voltage output / external input function is changed or the power is turned ON again.
- The auto-reference input value can be checked when setting the threshold value in RUN mode. For details, see page 3, section 9, RUN MODE.
The remote zero-adjustment function forcibly sets the pressure value to “zero” when the external signal is input. The setting value is not corrected when remote zero-adjustment is input. Make sure that the pressure and setting value during remote zero-adjustment do not exceed the pressure range that can be set.

**Operation charts**

- **During normal operation. (Each comparative output set to N.O.)**
  - Detected pressure at auto-reference input: 10kPa
  - Output mode: Hysteresis mode

- **During remote zero-adjustment input. (Each comparative output set to N.O.)**
  - Detected pressure at auto-reference input: 10kPa
  - Output mode: Hysteresis mode

**Note:** The setting values shift in the same manner during EASY mode or the window comparator mode.

- The remote zero-adjustment value is cleared when the setting of the analog voltage output/external input is changed or the power is turned ON again, and normal operation based on the atmospheric pressure is resumed.
- The remote zero-adjustment value can be confirmed when setting the threshold value in RUN mode. For details, see page 3, section 9, RUN MODE.

**15 ERROR INDICATION**

<table>
<thead>
<tr>
<th>Error</th>
<th>Cause</th>
<th>Corrective action</th>
</tr>
</thead>
<tbody>
<tr>
<td>E-1</td>
<td>The load is short circuited causing overcurrent.</td>
<td>Turn off the power and check the load.</td>
</tr>
<tr>
<td>E-2</td>
<td>Pressure is being applied during zero-adjustment.</td>
<td>Do not apply pressure applied at the pressure port; pressure should equal atmospheric pressure. Redo zero-adjustment.</td>
</tr>
<tr>
<td>E-4</td>
<td>External input is carried out outside the rated pressure range.</td>
<td>Applied pressure range should be adjusted to fall within rated pressure range.</td>
</tr>
<tr>
<td>E-5</td>
<td>Communication error, e.g. disconnection, faulty connection, etc.</td>
<td>Check the wiring when using the copy function.</td>
</tr>
<tr>
<td>E-6</td>
<td>Communication error, incorrect model.</td>
<td>Make sure the master and slave sensors are the same model when using the copy function.</td>
</tr>
<tr>
<td>1</td>
<td>The applied pressure exceeds the upper limit of the display pressure range.</td>
<td>Applied pressure range should be adjusted to fall within rated pressure range.</td>
</tr>
<tr>
<td>2</td>
<td>The applied pressure exceeds the lower limit (reverse pressure) of the display pressure range.</td>
<td>Applied pressure range should be adjusted to fall within rated pressure range.</td>
</tr>
</tbody>
</table>

**16 MODELS, ORDERING INFORMATION**

<table>
<thead>
<tr>
<th>DP10</th>
<th>1: low pressure type</th>
<th>2: high pressure type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nil: standard type</td>
<td>A: high function type</td>
<td></td>
</tr>
<tr>
<td>Nil: R18+M5 female screw</td>
<td>E: G18+M5 female screw</td>
<td></td>
</tr>
<tr>
<td>M: M5 female screw</td>
<td>N: NPT18+M5 female screw</td>
<td></td>
</tr>
<tr>
<td>Nil: NPN output type</td>
<td>P: PNP output type</td>
<td></td>
</tr>
<tr>
<td>Nil: cable with connector enclosed</td>
<td>J: no cable</td>
<td></td>
</tr>
</tbody>
</table>
## Specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>Standard type</th>
<th>Multifunction type</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low pressure type</td>
<td>High pressure type</td>
</tr>
<tr>
<td>Pressure type</td>
<td>Gauge pressure</td>
<td></td>
</tr>
<tr>
<td>Rated pressure range</td>
<td>-100 to + 100kPa</td>
<td>-0.1 to +1.0MPa</td>
</tr>
<tr>
<td>Set pressure range</td>
<td>-100 to + 100kPa</td>
<td>-0.1 to +1.0MPa</td>
</tr>
<tr>
<td>Pressure resistance</td>
<td>500kPa</td>
<td>1.5MPa</td>
</tr>
<tr>
<td>Applicable fluid</td>
<td>Non-corrosive gas</td>
<td></td>
</tr>
<tr>
<td>Supply voltage</td>
<td>12 to 24V DC ±10%, Ripple P-P 10% or less</td>
<td></td>
</tr>
<tr>
<td>Power consumption</td>
<td>Normal operation: 840mW or less (current consumption 35mA or less at 24V supply voltage)</td>
<td>ECO mode (STD): 600mW or less (current consumption 25mA or less at 24V supply voltage)</td>
</tr>
<tr>
<td>Comparative output</td>
<td>NPN output type</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• NPN open-collector transistor</td>
<td>• PNP open-collector transistor</td>
</tr>
<tr>
<td></td>
<td>• Maximum sink current: 100mA</td>
<td>• Maximum source current: 100mA</td>
</tr>
<tr>
<td></td>
<td>• Applied voltage: 30V DC or less (between comparative output and 0V)</td>
<td>• Applied voltage: 30V DC or less (between comparative output and +V)</td>
</tr>
<tr>
<td></td>
<td>• Residual voltage: 2V or less (at 100mA sink current)</td>
<td>• Residual voltage: 2V or less (at 100mA source current)</td>
</tr>
<tr>
<td>Output operation</td>
<td>Either N.O. or N.C., selectable</td>
<td></td>
</tr>
<tr>
<td>Hysteresis</td>
<td>±0.1% F.S. ± within 2 digits</td>
<td>±0.2% F.S. ± within 2 digits</td>
</tr>
<tr>
<td>Repeatability</td>
<td>±0.1% F.S. ± within 2 digits</td>
<td>±0.2% F.S. ± within 2 digits</td>
</tr>
<tr>
<td>Response time (ms)</td>
<td>2.5, 5, 10, 25, 50, 100, 250, 500, 1000, 5000ms, selectable</td>
<td></td>
</tr>
<tr>
<td>Analog voltage output</td>
<td></td>
<td></td>
</tr>
<tr>
<td>External input</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>-10 to +50°C (No dew condensation or ice formation allowed). Storage: -10 to +60°C.</td>
<td></td>
</tr>
<tr>
<td>Ambient humidity</td>
<td>35 to 85% RH. Storage: 35 to 85% RH.</td>
<td></td>
</tr>
<tr>
<td>Temperature characteristics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Material</td>
<td>Enclosure: PBT (with glass fiber); LCD display: acrylic; Pressure port: stainless steel (SUS 303); Mounting screws: brass (nickel-plated); O-ring: H-NBR; Switch: silicon rubber</td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>40g approx. (DP-100-E type: 45g approx., DP-100-M type: 30g approx.) (Main body only)</td>
<td></td>
</tr>
<tr>
<td>Accessories</td>
<td>CN-14A-C2 (Cable with a connector, 2m long; optional for J type). Unit switching label: 1 pc.</td>
<td></td>
</tr>
</tbody>
</table>