

# Panasonic INSTRUCTION MANUAL

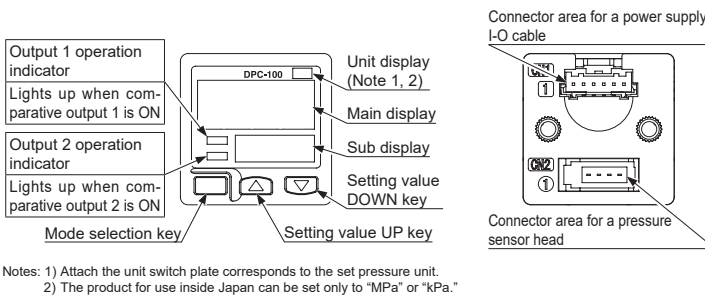
## Head Separated Digital Pressure Sensor Controller DPC-100 Series

Thank you very much for purchasing Panasonic products. 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.

### WARNING

- Never use this product in a situation for personnel protection.
- In case of using devices for personnel protection, use products which meet laws and standards, such as OSHA, ANSI or IEC etc., for personnel protection applicable in each region or country.
- A product intended for use in Japan conform to the Japanese Measurement Act. Do not use a product intended for use overseas in Japan.

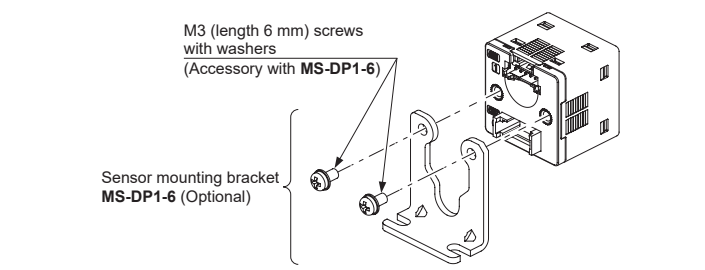
## 1 PART DESCRIPTION



- Attach the unit switch plate corresponds to the set pressure unit.
- The product to use inside Japan can be set only to "MPa" or "kPa".

## 2 MOUNTING

- The sensor mounting bracket **MS-DP1-6** 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.

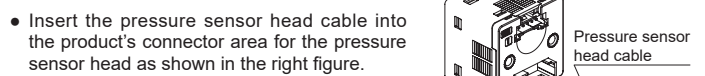


- The panel mounting bracket **MS-DP1-2** (optional), as well as the front cover **MS-DP1-3** (optional) are also available.
- For mounting of the panel mounting bracket, refer to the Instruction Manual enclosed with **MS-DP1-2**.

## 3 CONNECTION OF PRESSURE SENSOR HEAD

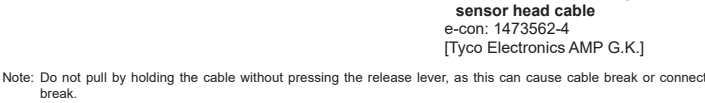
- This product can automatically recognize the connected pressure sensor head.
- When replacing the pressure sensor head, the threshold value may be changed. Therefore, confirm the threshold value.

### Connection method



### Disconnection method

- Pressing the release lever of the pressure sensor head cable, pull out the connector.



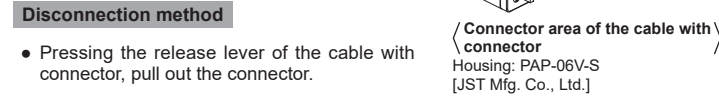
### <Connection connector pin arrangement>

Connector pin No.	Terminal name
1	Sensor head supply voltage
2	Analogue input
3	0 V
4	Model discrimination signal

## 4 WIRING

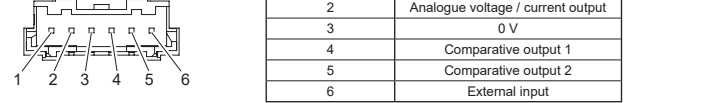
### Connection method

- Insert the cable with connector **CN-66A-C** into the product's connector area for a power supply / I/O cable as shown in the right figure.



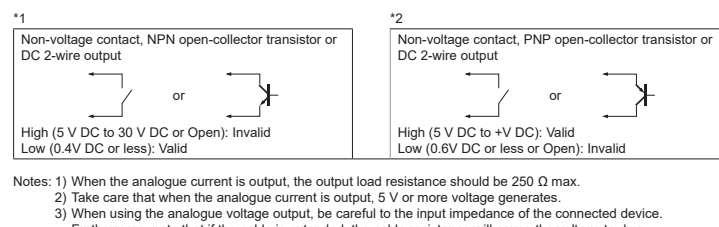
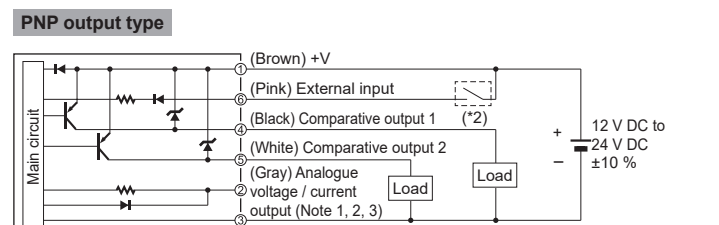
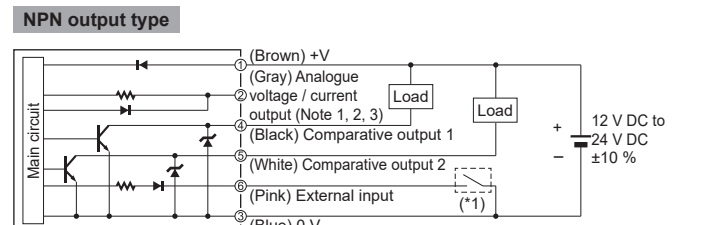
### Disconnection method

- Pressing the release lever of the cable with connector, pull out the connector.



## 5 I/O CIRCUIT DIAGRAMS

When using the analogue voltage output, take care to the input impedance of the connected device. Furthermore, note that if the cable is extended, the cable resistance will cause the voltage to drop.

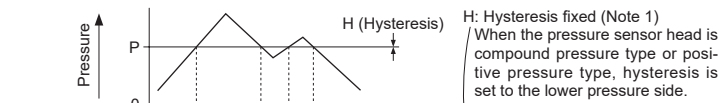


## 6 OUTPUT MODE AND OUTPUT OPERATION

- The EASY mode, hysteresis mode or window comparator mode can be selected as the output mode for comparative output 1 and comparative output 2. Refer to **<Comparative output 1 / 2 output mode setting>** in **3 MENU SETTING MODE** for details.

### EASY mode

- ON / OFF of the comparative output is controlled in this mode.

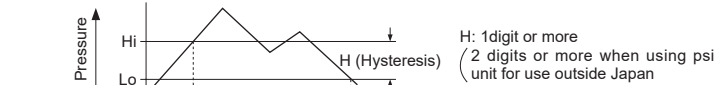


### <Connection connector pin arrangement>

Connector pin No.	Terminal name
1	Sensor head supply voltage
2	Analogue input
3	0 V
4	Model discrimination signal

## Hysteresis mode

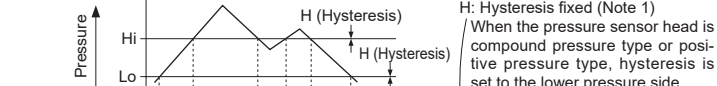
- The comparative output ON / OFF state can be controlled with randomly set hysteresis in this mode.



Notes: 1) "H<sub>1</sub>" or "L<sub>1</sub>" is displayed for comparative output 1 and "H<sub>2</sub>" or "L<sub>2</sub>" for comparative output 2 on the sub-display.  
2) When the pressure sensor head is compound pressure type or positive pressure type, high pressure indicates "H<sub>1</sub>" and low pressure indicates "L<sub>1</sub>" while in case of vacuum pressure type, high vacuum indicates "H<sub>1</sub>" and low vacuum indicates "L<sub>1</sub>".

### Window comparator mode

- In this mode, the ON or OFF state of the comparative output is controlled with a pressure in the set range.



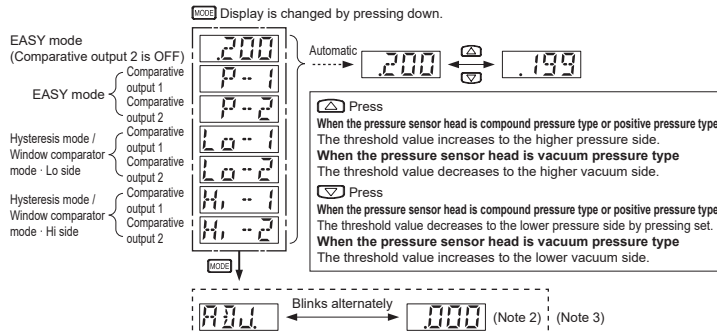
### <N.O. / N.C. selection>

- Hysteresis can be fixed in 8 steps. Refer to **<Hysteresis fixed value selection>** in **3 MENU SETTING MODE** for setting.
- "H<sub>1</sub>" or "L<sub>1</sub>" or "L<sub>1</sub>" is displayed for comparative output 1 and "H<sub>2</sub>" or "L<sub>2</sub>" or "L<sub>2</sub>" for comparative output 2 on the sub-display.
- When the pressure sensor head is compound pressure type or positive pressure type, high pressure indicates "H<sub>1</sub>" and low pressure indicates "L<sub>1</sub>" and low vacuum indicates "L<sub>1</sub>".
- Set the interval between the Lo side and Hi side to hysteresis fixed value or more.

## 7 RUN MODE

### Setting the threshold value

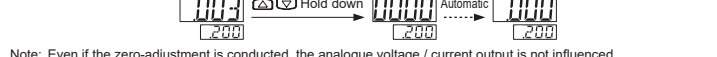
- Refer to **<Comparative output 1 / 2 output mode setting>** in **3 MENU SETTING MODE** for setting conditions.
- The Sub display conducts the threshold value. Main display does not change.



- If the set pressure range is exceeded, "UP" (exceeds the upper limit) or "DOWN" (exceeds the lower limit) will appear on the sub display. "0000" will also appear if the Hi side threshold value exceeds the Lo side threshold value when setting the "hysteresis mode / window comparator mode" threshold value.
- Auto-reference input and remote zero-adjustment value are displayed.
- In the dash line box is not displayed when not setting "9999" or "0000" in external input switch. For the setting method, refer to **<External input selection>** in **3 MENU SETTING MODE**.

### Zero-adjustment function

- The zero-adjustment function forcibly sets the pressure value to "zero" when the pressure port is opened.

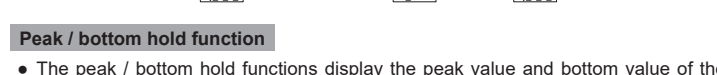


### Key lock function

- The key lock function prevents key operations so that the conditions set in each setting mode are not inadvertently changed.

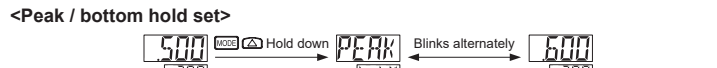


### <Key lock released>



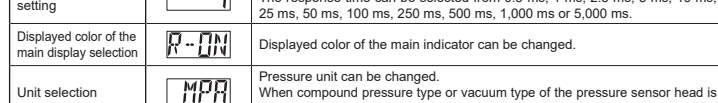
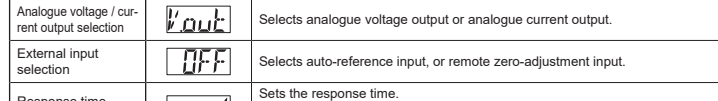
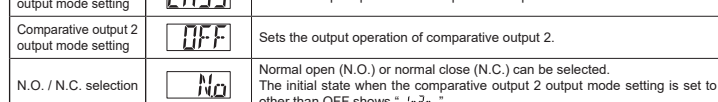
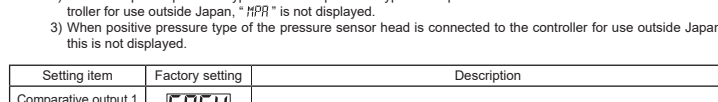
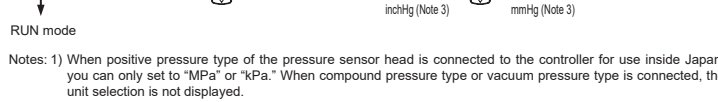
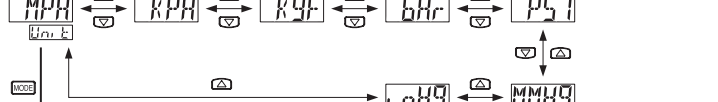
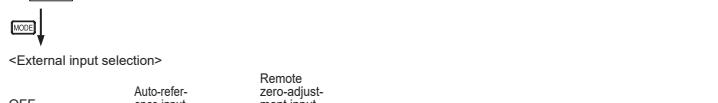
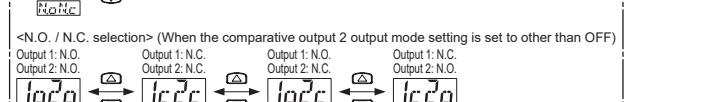
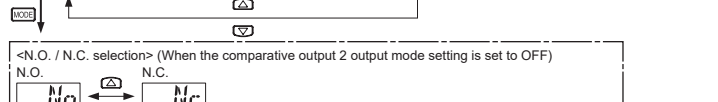
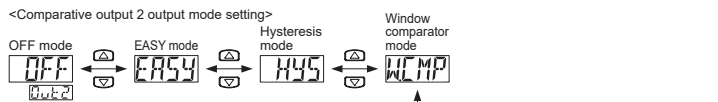
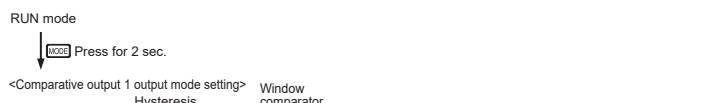
### Peak / bottom hold function

- 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.
- When the pressure sensor head is compound pressure type or positive pressure type, the higher pressure side indicates the peak value, while the lower pressure side indicates the bottom value. When the pressure sensor head is vacuum pressure type, the higher vacuum side indicates the peak value, while the lower vacuum side indicates the bottom value.



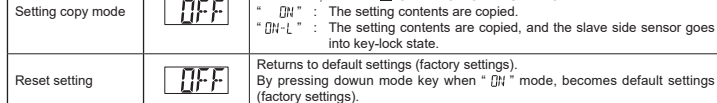
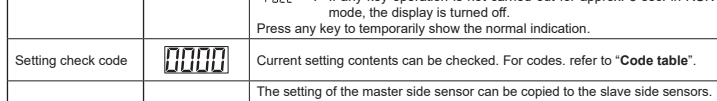
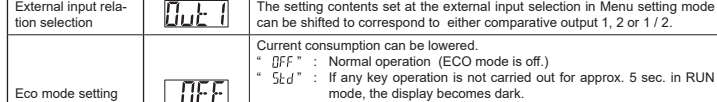
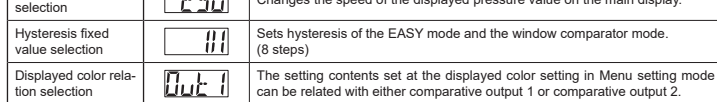
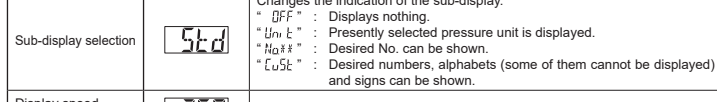
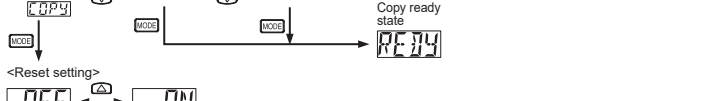
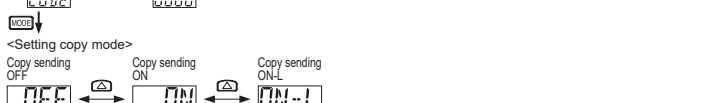
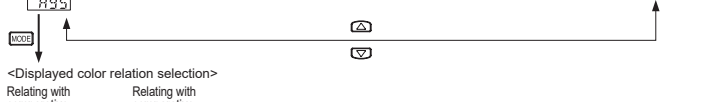
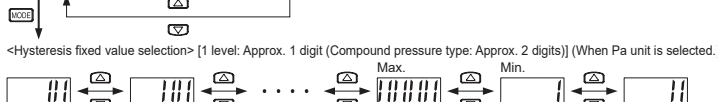
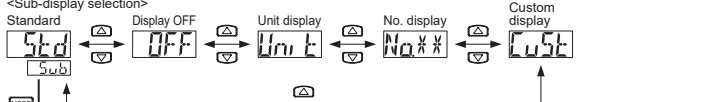
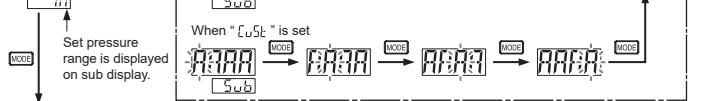
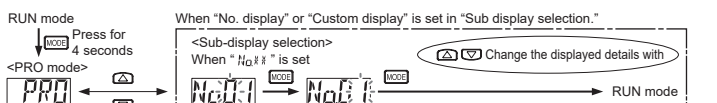
## 8 MENU SETTING MODE

- The mode will change to RUN mode when the mode selection key is held down during this setting process. In doing so, changed its ms before holding down the mode selection key have been set.



## 9 PRO MODE

- The mode will change to RUN mode when the mode selection key is held down during this setting process. However, changed its ms before holding down the mode selection key have been set.



## Code table

### • Main display (1st digit form left)

Code	1st digit	2nd digit	3rd digit	4th digit
0	Comparative output 1 output mode	N.O. / N.C. selection	Comparative output 2 output mode	N.O. / N.C. selection
1	EASY	N.C.	OFF	—
2	Hysteresis	N.C.	N.C.	—
3	Hysteresis	N.C.	N.C.	—
4	Window comparator	N.C.	N.C.	—
5	Window comparator	N.C.	N.C.	—
6	—	—	—	—
7	—	—	—	—

### • Sub-display (5th digit from left)

Code	5th digit	6th digit	7th digit	8th digit
0	Displayed color of the main display	Displayed color relation	Response time	Unit selection (Note)
1	Red when ON	Comparative output 1	0.5 ms	MPa
2	Green when ON	Comparative output 2	1 ms	kPa
3	Always red	Comparative output 1	2.5 ms	kgf/cm <sup>2</sup>
4	Always red	Comparative output 2	5 ms	bar
5	Always red	Comparative output 1	10 ms	psi
6	Always red	Comparative output 2	25 ms	mmHg
7	—	Comparative output 1	50 ms	inchHg
8	—	Comparative output 2	100 ms	—
9	—	—	250 ms	—
0	—	—	500 ms	—
1	—	—	1,000 ms	—
2	—	—	—	—
3	—	—	—	—
4	—	—	—	—
5	—	—	—	—
6	—	—	—	—
7	—	—	—	—
8	—	—	—	—
9	—	—	—	—

Note: When positive pressure type of the pressure sensor head is connected to the controller for use inside Japan, "0" (MPa) or "1" (kPa) is displayed. When compound pressure type or vacuum pressure type is connected, only "1" (kPa) is displayed.

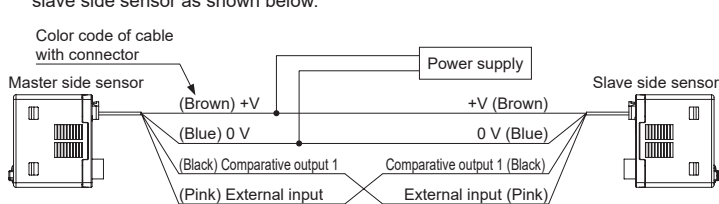
## 10 SETTING COPY FUNCTION

- This can copy the settings of the master side sensor to the slave side sensor.

- Be sure to use the setting copy function between the identical models. This function cannot be used between different models.
- Only one sensor can be connected on slave side with a master side sensor for the setting copy function.
- Do not use the setting copy function other than the following wiring, as pulsed output generates when turning the power ON after setting the master side sensor to the copy ready state.

### Setting procedure

- Set the setting copy function of the master side sensor to "Copy sending ON" or "Copy sending ON-L" with the pressure sensor head connected, and then press the mode selection key so that the sensor is in copy ready state. For details, refer to **<Setting copy mode>** in **3 MENU SETTING MODE**.
- Turn OFF the master side sensor.
- Remove the pressure sensor head and connect the master side sensor with the slave side sensor as shown below.



- Turn ON the master side sensor and the slave side sensor at the same time. (Note)
- Set contents (16-bit coded) are shown in orange on the main display of the master side sensor and the copying starts.
- The same code explained above is shown in green on the main display of the slave side sensor, and "OK" is shown on the sub-display (When copying is complete).
- Turn OFF the power of the master side sensor and the slave side sensor and disconnect the wire.

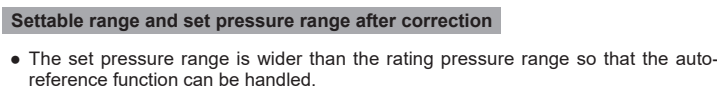
- If copying the setting to another sensor repeatedly, follow steps 3 to 7.

### To cancel the setting copy mode of master side sensor

- Whilst the slave side sensor is disconnected, turn on the power of the master side sensor.
- Press the mode selection key for approx. 2 seconds.

## 11 AUTO-REFERENCE FUNCTION

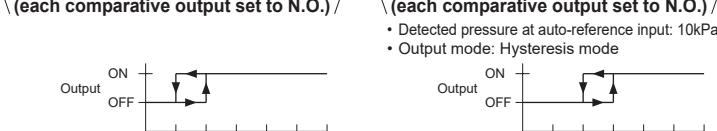
- The auto-reference function corrects the set value using the detected pressure value during auto-reference input as the reference pressure.
- Using the detected pressure value (P) as a reference, the set value f is automatically corrected to "set value f + P(a)".



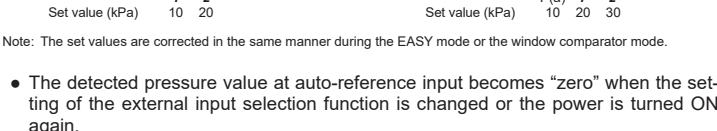
- The set pressure range is wider than the rating pressure range so that the auto-reference function can be handled.

### Operation chart

(During normal operation (each comparative output set to N.O.))



(During auto-reference input (each comparative output set to N.O.))



Note: The set values are corrected in the same manner during the EASY mode or the window comparator mode.

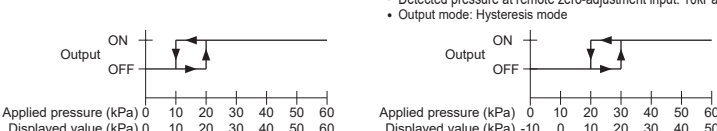
- The detected pressure value at auto-reference input becomes "zero" when the setting of the external input selection function is changed or the power is turned ON again.
- The auto-reference input value can be checked when setting the threshold value in RUN mode. Refer to the threshold value setting in **3 MENU SETTING MODE** for details.

## 12 REMOTE ZERO-ADJUSTMENT FUNCTION

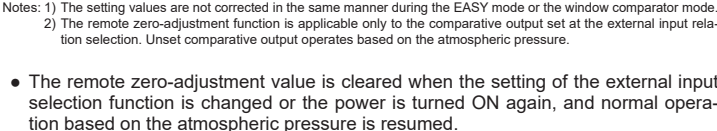
- The remote zero-adjustment function forcibly sets the pressure value to "zero" when the external signal is inputted.

### Operation chart

(During normal operation (each comparative output set to N.O.))



(During remote zero-adjustment input (each comparative output set to N.O.))



Note: 1) The setting values are not corrected in the same manner during the EASY mode or the window comparator mode.  
2) The remote zero-adjustment function is applicable only to the comparative output set at the external input relation selection. Unless comparative output operates based on the atmospheric pressure.

## 13 ERROR INDICATION

Error message	Cause	Corrective action
E-0	The controller and the pressure sensor head are not correctly connected. The pressure sensor head is damaged.	Connect the controller and the pressure sensor head correctly. Replace the pressure sensor head.
E-1	The load is short-circuited causing an overcurrent to flow.	Turn the power OFF and check the load.
E-2	When the zero-adjustment function is implemented, pressure is applied.	Reset the voltage applied to the pressure port to the atmospheric pressure and implement the zero-adjustment function again.
E-3	External input is carried out outside the rated pressure range.	Applied pressure range should be brought within the rated pressure range.
E-4	Communication error (Disconnection, faulty connection, etc.)	Check the wiring when using the copy function.
E-5	Communication error (Incorrect model.)	Make sure that the system is configured of the same models when using the copy function.
***	The applied pressure exceeds the upper limit of the display pressure range.	Applied pressure range should be brought within the rated pressure range.
---***	The applied pressure exceeds the lower limit (reverse pressure) of the display pressure range.	Applied pressure range should be brought within the rated pressure range.

When other error message is displayed, contact us.

## 14 SPECIFICATIONS

Type	NPN output type		PNP output type	
	For use inside Japan	For use outside Japan	For use inside Japan	For use outside Japan
Model No. (Note 1)	DPH-101Z	DPH-102Z	DPH-101P	DPH-101P
Supply voltage	12 V DC to 24 V DC ±10 %	12 V DC to 24 V DC ±10 %	Ripple P: 10 % or less	Ripple P: 10 % or less
Power consumption (Note 2)	Normal operation: 90 mW or less (current consumption 40 mA or less at 24 V supply voltage) ECO mode (STD): 720 mW or less (current consumption 30 mA or less at 24 V supply voltage) ECO mode (FULL): 600 mW or less (current consumption 2			