

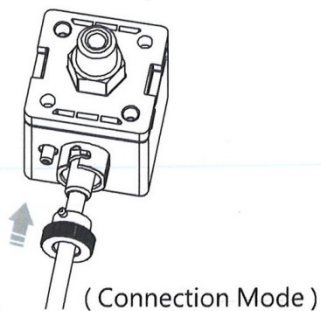


- IP65
- Copy setting.
- 2 NPN / PNP open collector + analog output (1~5V or 4~20mA).
- 2-color digital LCD display.
- Repeatability  $\pm 0.2\%$  F.S.  $\pm 1$  digit.

## 1 Quick Installation

- Save Installation Time
- Easy Removal

Data cable can be conveniently installed after the unit is attached to the equipment, increase installation speed!



( Connection Terminals )



( Finished Connection )



**2 Copy Setting**



- Reduce setting errors
- Reduce setting time

Can copy the setting value from master to slave sensor.

**3 Unit Easy Indication**

- Conversion unit is on display and easy to read.

inHg | psi | bar | kgf / cm<sup>2</sup> | MPa | kPa



**4 2 Color Main Display**

- Display different setting conditions. Can change the setting value and color mode.



|     |       |       |       |      |
|-----|-------|-------|-------|------|
|     | 50.0  | 50.0  | 50.0  | 50.0 |
| ON  | Green | Red   | Green | Red  |
| OFF | Red   | Green | Green | Red  |

**5 IP65**

- Can withstand low pressure water spout from all directions, and prevent product from damaging.



**6 Environmental Protection Design**

- RoHS Compliance / Without Harmful Substance



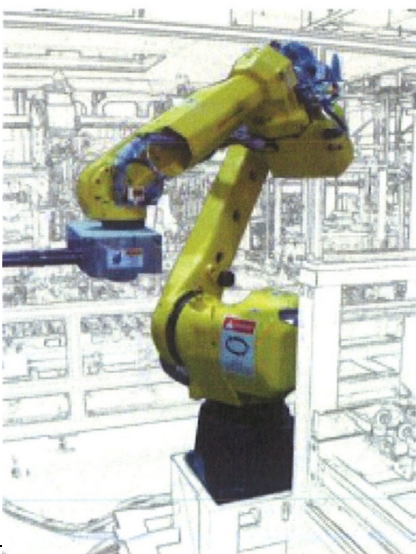
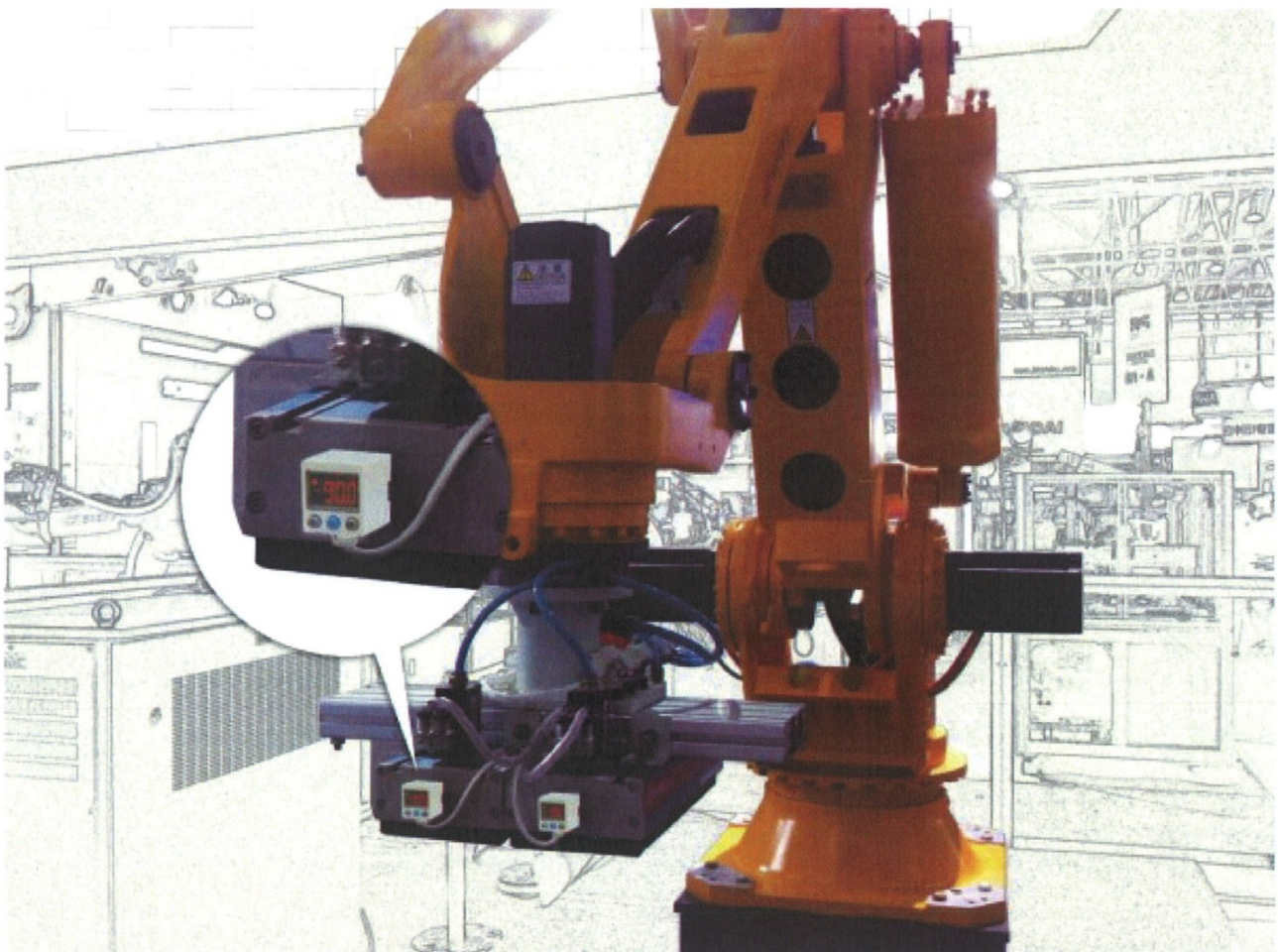
At "Restriction of the use of Hazardous Substance Directive" request, when processing the products, cannot use the exempted substance :  
Lead(Pb) / Mercury (Hg) / Cadmium (Cd) / Hexavalent Chromium (Cr<sup>IV</sup>) / Polybrominated Biphenyls (PBB) / Polybrominated Diphenyl Ethers (PBDE):



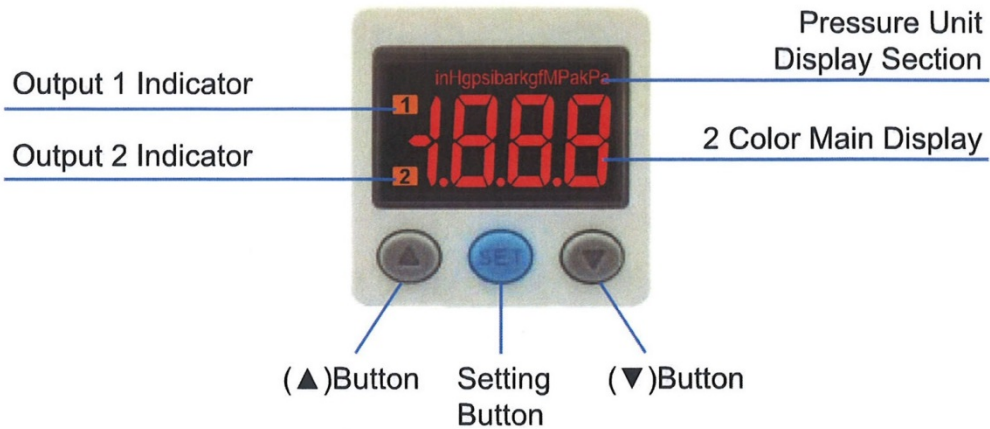


**PRODUCT APPLICATION**

Vacuum pressure detection on the robotic arm



## PANEL DESCRIPTION



## SPECIFICATIONS

| Type                    | MP45P<br>(Positive)  | MP45V<br>(Vacuum)         | MP45C<br>(Compound)        |
|-------------------------|--|---------------------------|----------------------------|
| Rated pressure range    | 0.0~1.000MPa   | -101.3~0.0kPa             | -100.0~100.0kPa            |
| Set pressure resolution | 1.000MPa<br>0<br>-0.100MPa   | 10.0kPa<br>0<br>-101.3kPa | 101.0kPa<br>0<br>-101.0kPa |
| Withstand pressure      | 1.5MPa   | 300kPa                    | 300kPa                     |
| Set pressure resolution | 0.001MPa   | 0.1kPa                    | 0.1kPa                     |
| Switch output           | NPN: open collector 2 outputs<br>Max. load current: 125mA<br>Max. supply voltage: 30V DC<br>Residual voltage: ≤ 1.5V |                           |                            |
| Port size               | PNP: open collector 2 outputs<br>Max. load current: 125mA<br>Max. supply voltage: 24V DC<br>Residual voltage: ≤ 1.5V |                           |                            |
|                         | F1 : R1/8", M5 ; F2 : NPT1/8", #10-32UNF ; F3 : G1/8", M5  |                           |                            |



## FUNCTION SETTING

### ■ COPY FUNCTION SETTING

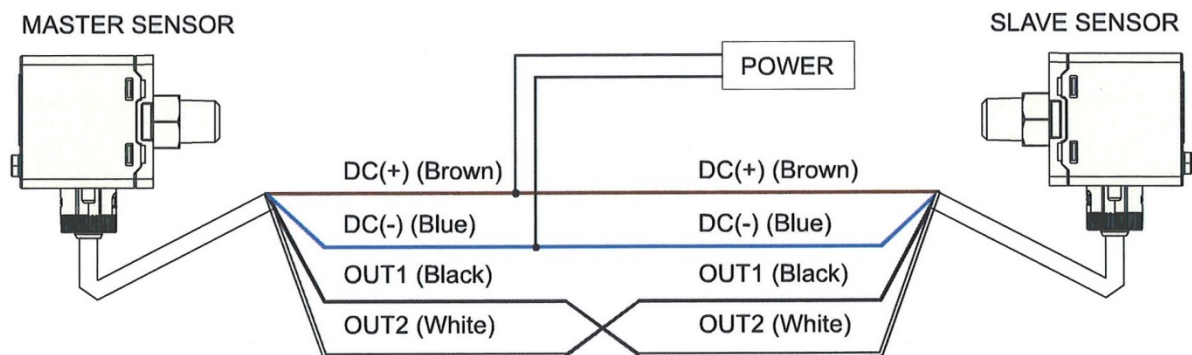
- Copy function setting can use the master sensor to copy the parameter to the slave sensors.
- Before copying, please confirm the model of pressure sensor. This function cannot be used with different model.
- The copy function only can be one-to-one.
- SETTING STEP:

① Please set the copy function to **on** or **onL** on the master sensor.

Slave sensor set to **SLU**.

② Turn off power to both master and slave sensor.

③ Refer to connection diagram below with the master and slave sensor :



④ Turn on power at the same time to the master and slave sensor. (\* 1)

⑤ Wait 5 sec., when finishing to convey the data,

the master sensor displays (alternating display) **CPY** ↔ **God**.

the slave sensor displays (alternating display) **SLU** ↔ **God**.

⑥ When data convey is failed,

(Master) sensor displays **CPY** ↔ **God**. (Slave) sensor displays **ErB** (\* 2)

⑦ Turn off power and remove the wire connection. Remove wire connection while power is still on may cause permanent damage to the sensor.

⑧ If another copy is required, set the slave sensor to **SLU**, then repeat step ③ to ⑤.

⑨ How to cancel the copy mode by master sensor :

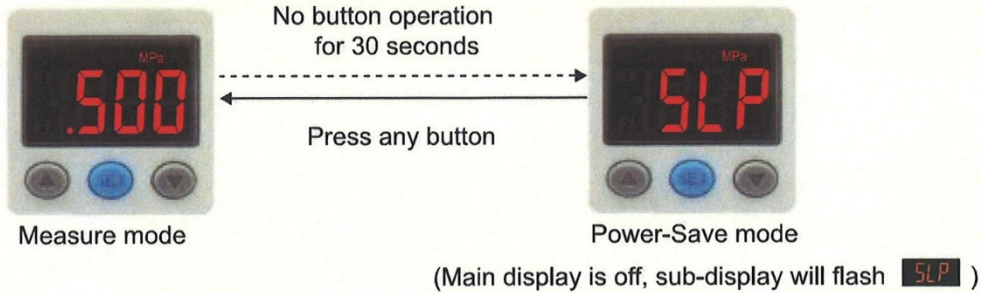
When the master sensor displays **CPY** ↔ **God**, press **▼** button to leave the copy mode.

【NOTE】 \* 1.If power on process is not synchronized, the data cannot be copied.

\* 2.When data convey is failed, please reset (slave) sensor to **SLU** and recheck wire connection, then repeat step ③ to ⑤.

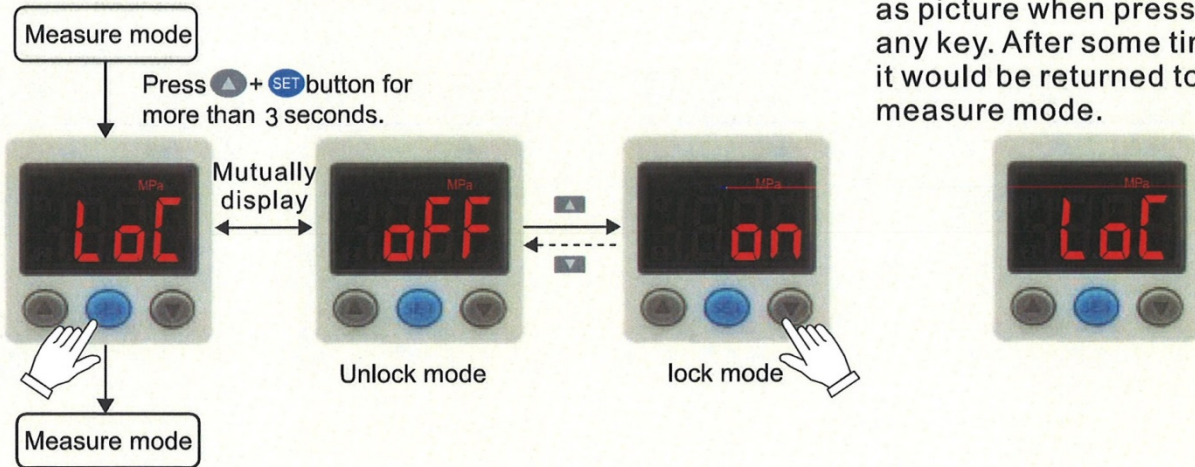
## POWER-SAVE MODE

- Under Power-Save mode, the main display will turn off if no buttons is pressed after 30 seconds.
- Under Power-Save mode, the output indicator may not synchronize with the output.  
It is normal and will not affect output operation.
- Press any button to turn-on main display temporarily.



## KEY LOCK / UNLOCK MODE

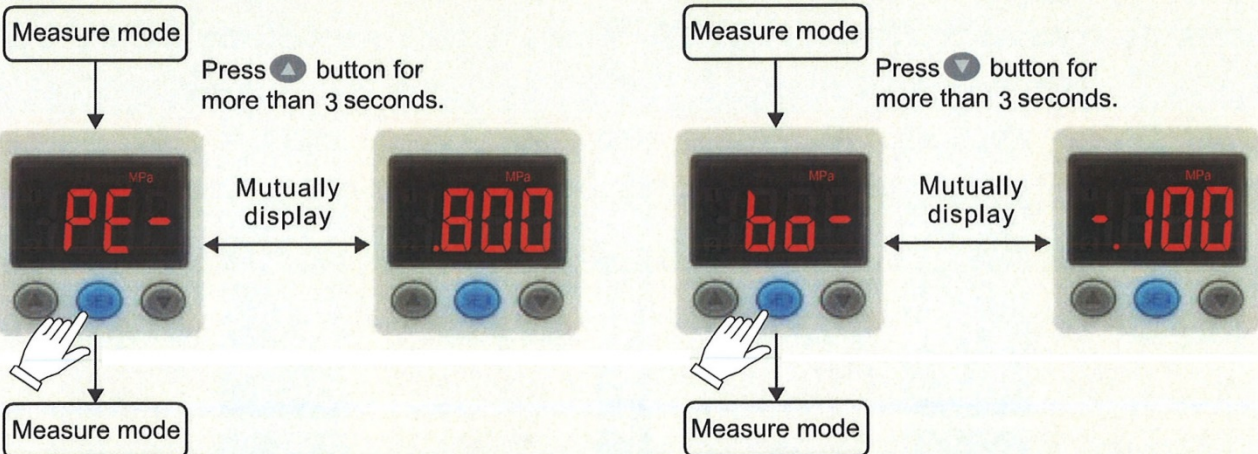
- Key lock mode, it displays as picture when pressing any key. After some time, it would be returned to measure mode.



## THE MAX. & MIN DISPLAY MODE



**PE-** : Peak value

**bo-** : Bottom value





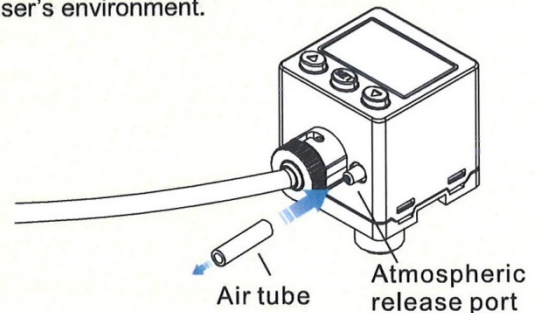
## ■ ZERO POINT SETTING

- Press the   button at the same time until the "00" is shown.  
Release the button to exit.



## ■ DUST AND SPLASH ENVIRONMENT

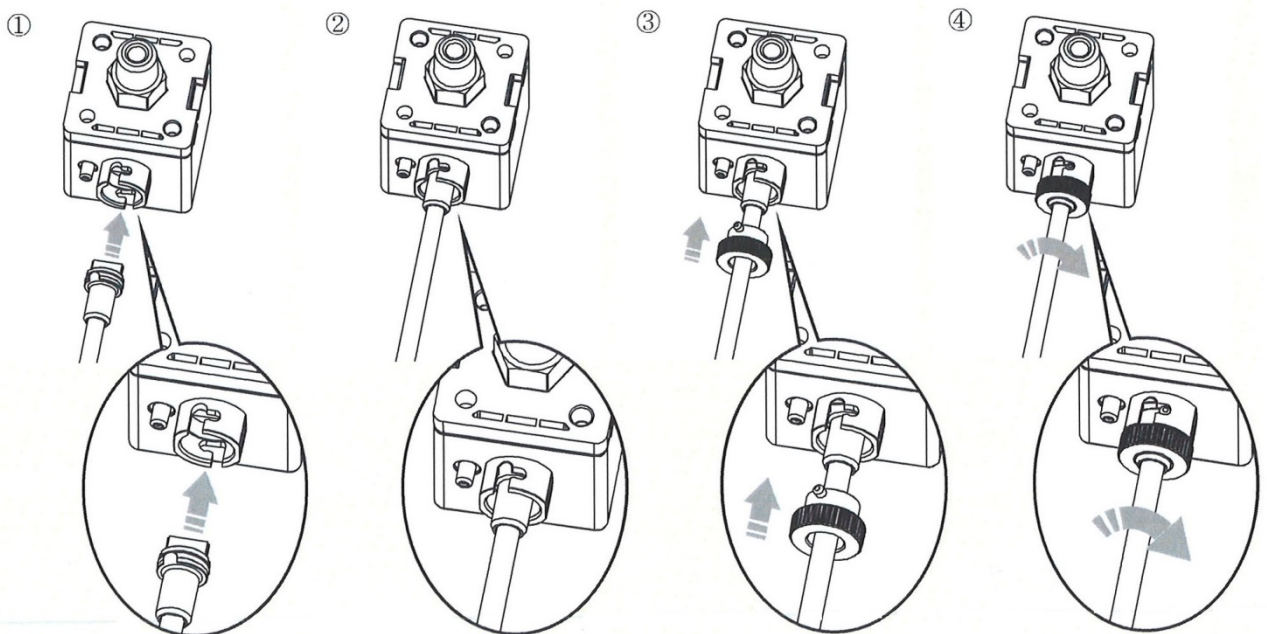
- To maintain IP65, please insert an air tube (O.D.: 4mm) into atmospheric release port and pipe the other end away from dust / spattering liquid environment.
- Use proper air tube dimension of O.D.: 4mm, I.D.:2.5mm, and the length is depending on the user's environment.



## ■ WIRE INSTALLATION INSTRUCTION

Please install the wire as the following step.

- Turn upward the salient point by terminal. (See figure ①)
- Install to the terminal to the groove by pressure sensor. (See figure ②)
- Terminal cover install to the products. (See figure ③)
- Turn the terminal cover to lock. (See figure ④)



## SPECIFICATIONS

| TYPE                                   |                        | MP45P<br>(Positive)   | MP45V<br>(Vacuum)  | MP45C<br>(Compound) |
|--|------------------------|---|--|---------------------|
| Rated pressure range                   |                        | 0.0~1.000MPa  | -101.3~0.0kPa  | -100.0~100.0kPa     |
| Set pressure range                     |                        | -0.100~1.000MPa   | -101.3~10.0kPa   | -101.0~101.0kPa     |
| Withstand pressure                     |                        | 1.5MPa  | 300kPa   |                     |
| Fluid                                  |                        | Air, Non-corrosive / Non-flammable gas  |  |                     |
| Set pressure resolution                | kPa                    | -   | 0.1  |                     |
|  | MPa                    | 0.001   | -  |                     |
|  | kgf/cm <sup>2</sup>    | 0.01  | 0.001  |                     |
|  | bar                    | 0.01  | 0.001  |                     |
|  | psi                    | 0.1   | 0.01   |                     |
|  | inHg                   | -   | 0.1  |                     |
| Power supply voltage                   |                        | 12 to 24V DC $\pm 10\%$ , Ripple (P-P) 10% or less  |  |                     |
| Current consumption                    |                        | $\leq 40\text{mA}$ (With no load)   |  |                     |
| Switch output                          |                        | NPN: open collector 2 outputs<br>Max. load current: 125mA<br>Max. supply voltage: 30V DC<br>Residual voltage: $\leq 1.5\text{V}$  | PNP: open collector 2 outputs<br>Max. load current: 125mA<br>Max. supply voltage: 24V DC<br>Residual voltage: $\leq 1.5\text{V}$ |                     |
| Repeatability(Switch output)           |                        | $\pm 0.2\%$ F.S. $\pm 1$ digit  |  |                     |
| Hysteresis                             | One point set mode     | Adjustable( *1)   |  |                     |
|  | Hysteresis mode        |   |  |                     |
|  | Window comparator mode |   |  |                     |
| Response time                          |                        | $\leq 2.5\text{ms}$<br>(chattering-proof function: 25ms, 100ms, 250ms, 500ms, 1000ms and 1500ms selections)   |  |                     |
| Output short circuit protection        |                        | Yes   |  |                     |
| LCD display                            |                        | 3 1/2 digit, 7 segment (red/green)  |  |                     |
| Indicator accuracy                     |                        | $\pm 2\%$ F.S. $\pm 1$ digit (ambient temperature: 25 $\pm 3^\circ\text{C}$ )   |  |                     |
| Switch ON Indicator                    |                        | Orange (1&2 Indicator) OUT1 OUT2  |  |                     |
| Analog output<br>(Voltage Output) (*2) |                        | Output Voltage: 1 to 5V $\pm 2.5\%$ F.S.<br>Linearity: $\pm 1\%$ F.S. Output impedance: about 1k $\Omega$   |  |                     |
| Analog output<br>(Current Output) (*3) |                        | Output Current: 4 to 20mA $\pm 2.5\%$ F.S.<br>Linearity: $\pm 1\%$ F.S.<br>Max.Load Impedance: 250 $\Omega$ at power supply of 12V,<br>600 $\Omega$ at power supply of 24V<br>Min.Load impedance: 50 $\Omega$ |  |                     |
| Environment                            | Environment            | IP65  |  |                     |
|  | Ambient temp. range    | Operation: 0 ~ 50 $^\circ\text{C}$ , Storage:-10 ~ 60 $^\circ\text{C}$ ( No condensation or freezing)   |  |                     |
|  | Ambient humidity range | Operation/Storage: 35 ~ 85% RH ( No condensation)   |  |                     |
|  | Withstand voltage      | 1000V AC in 1-min (between case and lead wire)  |  |                     |
|  | Insulation resistance  | 50M $\Omega$ min. (at 500V DC, between case and lead wire)  |  |                     |
|  | Vibration              | Total amplitude 1.5mm or 10G,10Hz-55Hz-10Hz scan for 1 minute, two hours each direction of X, Y and Z   |  |                     |
|  | Shock                  | 100m/s <sup>2</sup> (10G), 3 times each in direction of X, Y and Z  |  |                     |
| Temperature characteristic             |                        | $\pm 2.5\%$ F.S. of detected pressure (25 $^\circ\text{C}$ ) at temp. Range of 0~50 $^\circ\text{C}$  |  |                     |
| Port size                              |                        | F1 : R1/8", M5 ; F2 :NPT1/8", #10-32UNF ; F3 : G1/8", M5  |  |                     |
| Lead wire                              |                        | Oil-resistance cable(0.15mm <sup>2</sup> )  |  |                     |
| Weight                                 |                        | Approx. 86g (with 2 meter lead wire)  |  |                     |

[ NOTE ] \*1 : Hysteresis value is adjustable within 1 ~ 8 digits for one point set mode and window comparator mode.

\*2 : If analog voltage output is selected, the analog current output cannot be selected at the same time.

\*3 : If analog current output is selected, the analog voltage output cannot be selected at the same time.



## ORDERING INFORMATION

M P 4 5 C - 010 - F 1

### Pressure Range

C : Compound (-101.0 ~ 101.0 kPa)  
V : Vacuum (10.0 ~ -101.3 kPa)  
P : Positive (-0.100 ~ 1.000 MPa)

### Pressure Port

F1 : R1/8", M5  
F2 : NPT1/8", #10-32UNF  
F3 : G1/8", M5

### Output Specifications

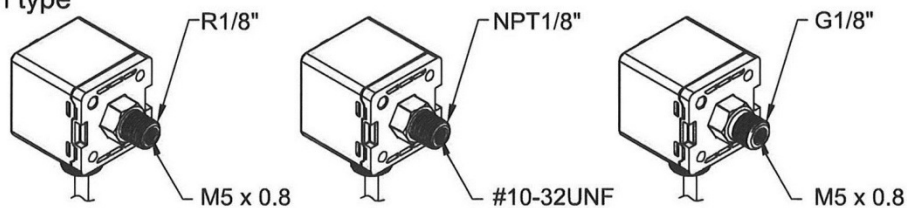
010 : 2 NPN+Analog (Voltage) output (1 ~ 5V)  
011 : 2 NPN+Analog (Current) output (4 ~ 20mA)  
030 : 2 PNP+Analog (Voltage) output (1 ~ 5V)  
031 : 2 PNP+Analog (Current) output (4 ~ 20mA)

### Optional Parts

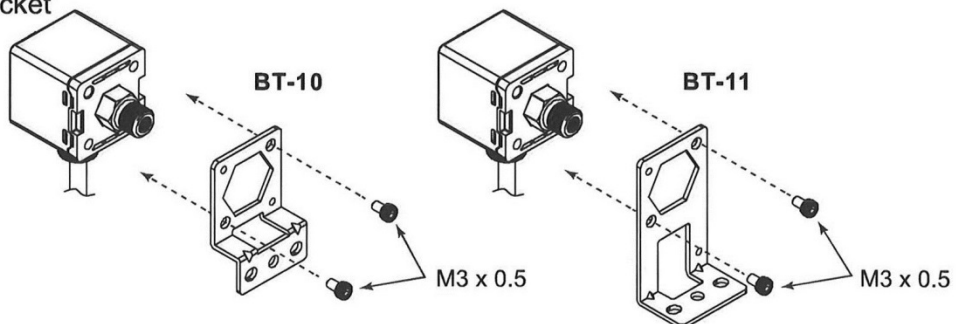
MP-A10: Mounting bracket (BT-10)  
MP-A11: Mounting bracket (BT-11)  
MP-B3: Panel adapter (PA-E)  
MP-C3: Panel adapter+Front protective lid (PA-F)

## INSTALLATION

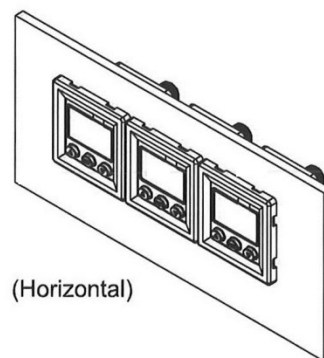
### ■ Connection type



### ■ Mounting bracket



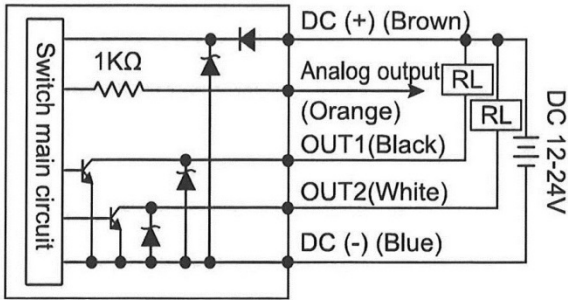
### ■ Panel Mounting



## OUTPUT CIRCUIT WIRING DIAGRAMS

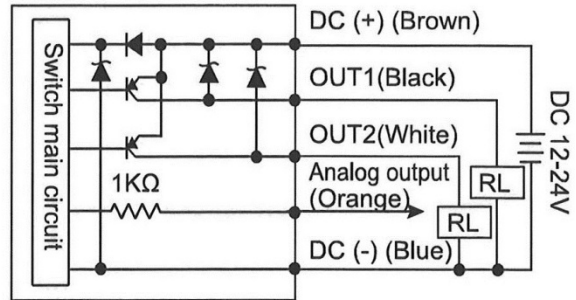
### ■ MP45□-010-□

2 NPN+Analog Voltage output(1 ~ 5V)



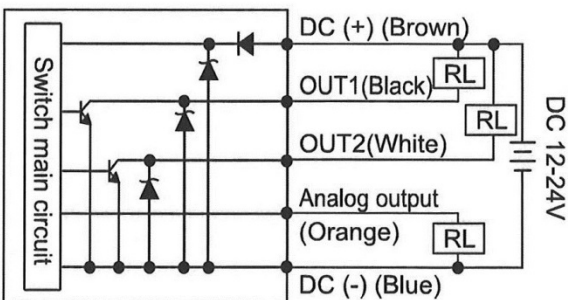
### ■ MP45□-030-□

2 PNP+Analog Voltage output(1 ~ 5V)



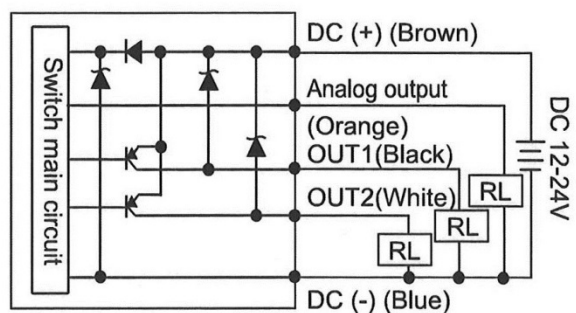
### ■ MP45□-011-□

2 NPN+Analog Current output(4 ~ 20mA)

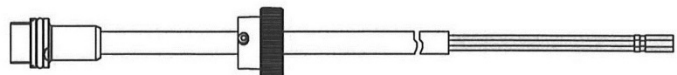
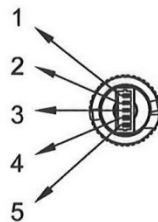


### ■ MP45□-031-□

2 PNP+Analog Current output(4 ~ 20mA)



| PIN No. | Wire Color            |
|---------|-----------------------|
| 1       | DC (-) (Blue)         |
| 2       | OUT1(Black)           |
| 3       | OUT2(White)           |
| 4       | Analog output(Orange) |
| 5       | DC (+) (Brown)        |

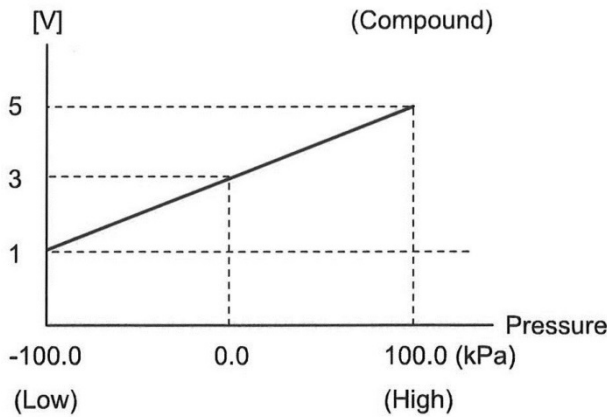




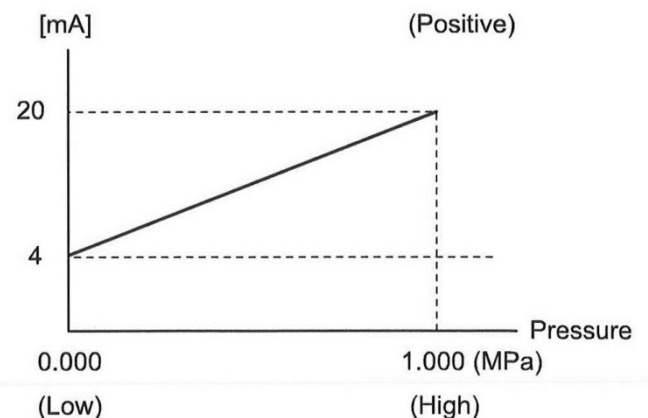
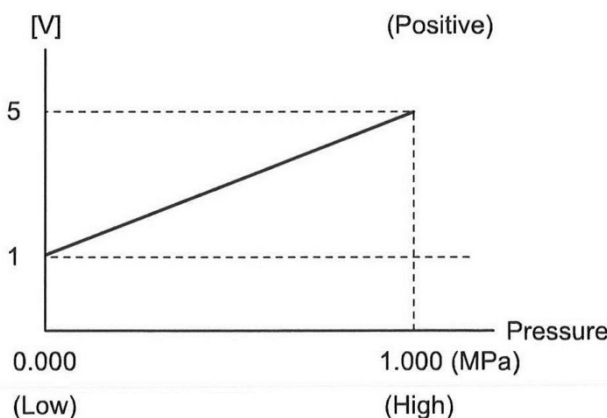
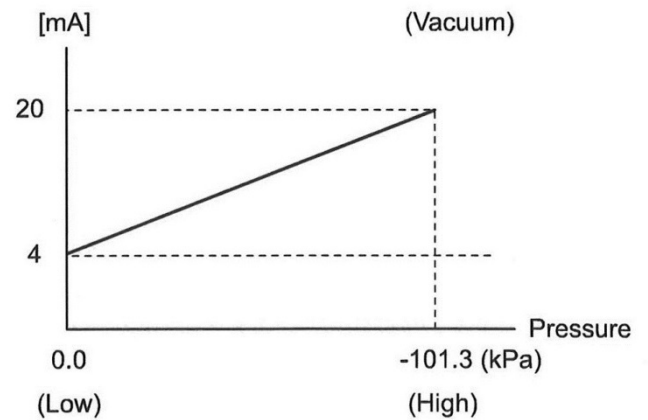
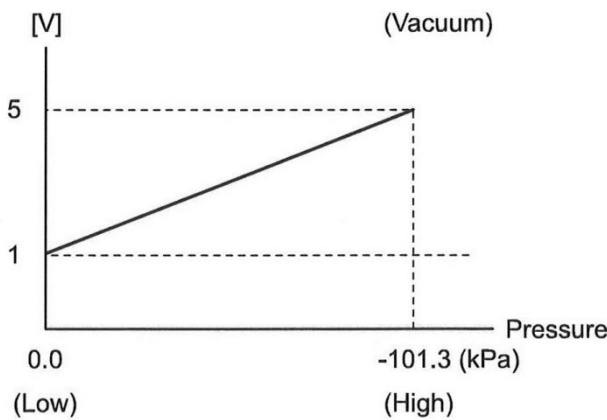
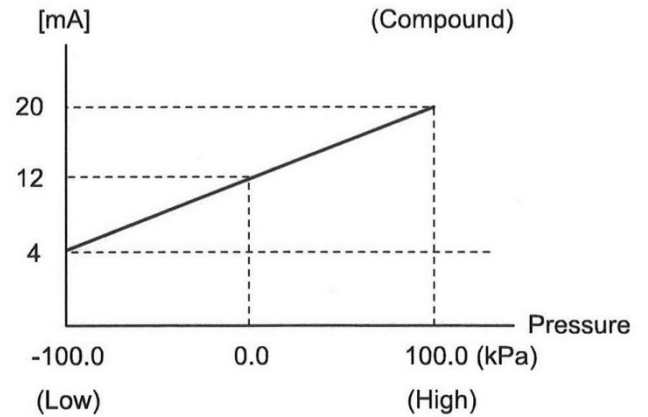
## ANALOG OUTPUT DESCRIPTION

■ Analog output is proportional to the rated pressure range.

● Voltage type

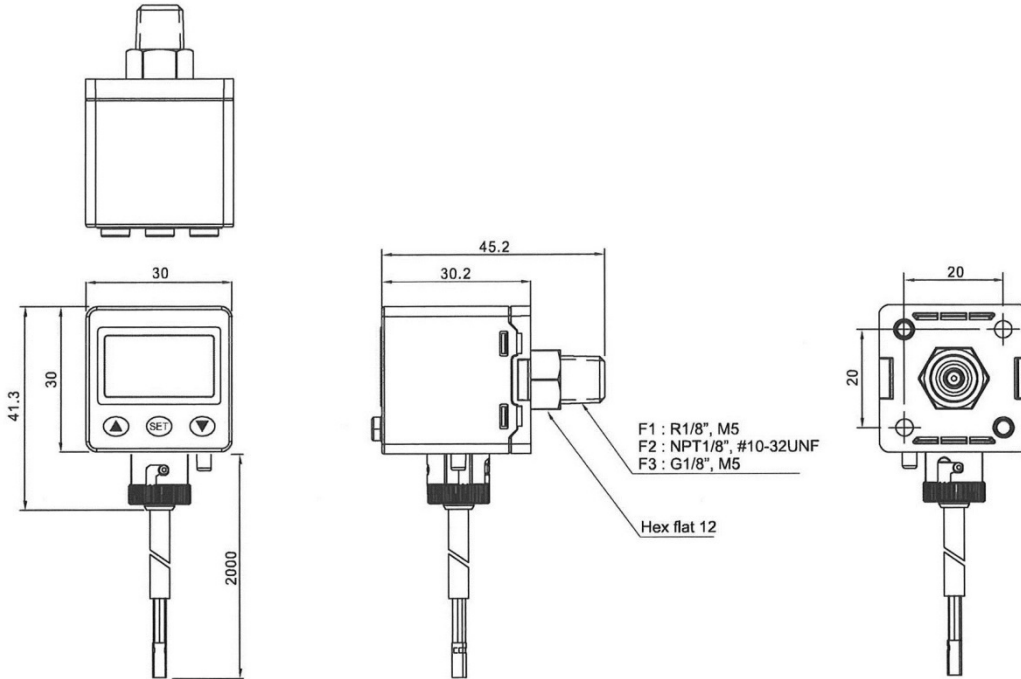


● Current type

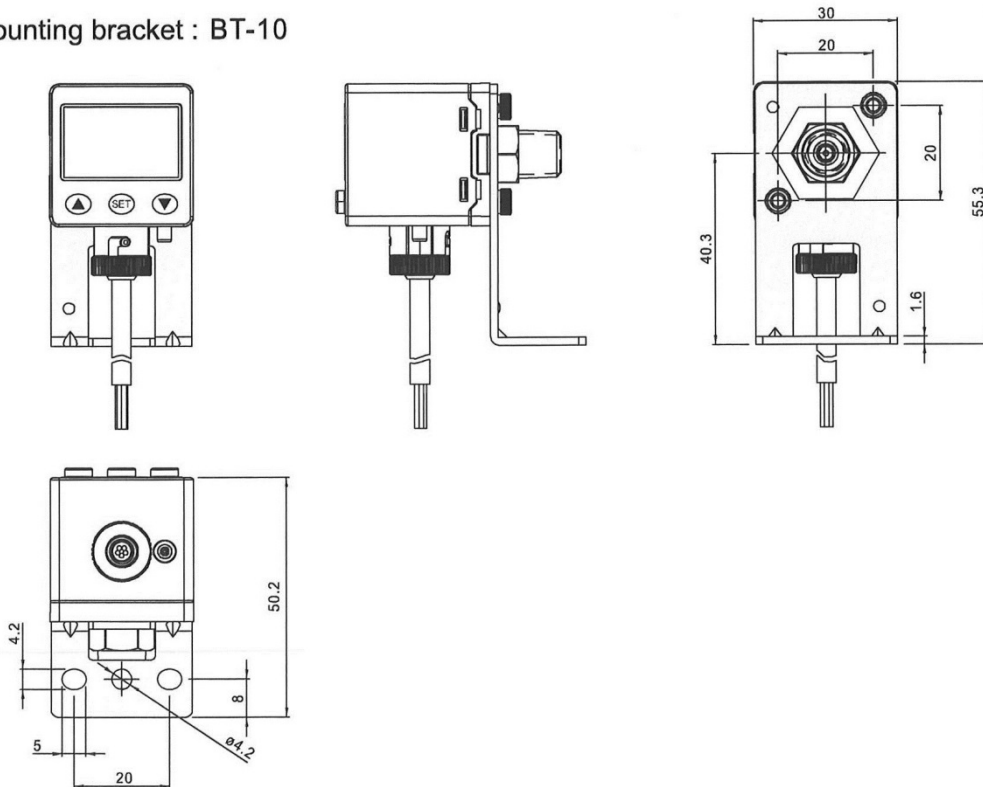


OPTIONAL PARTS DIMENSIONS

■ Dimensions

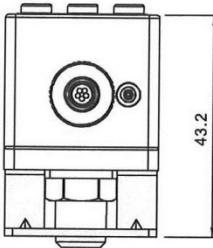
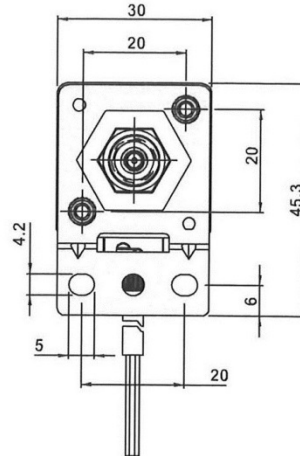
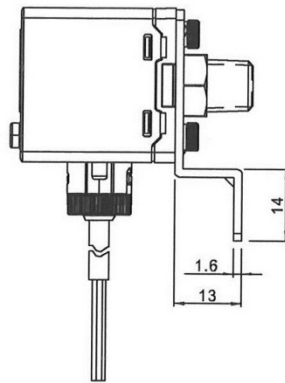
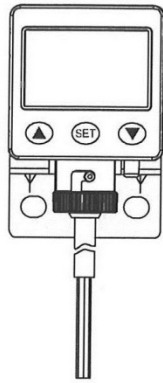


■ Mounting bracket : BT-10

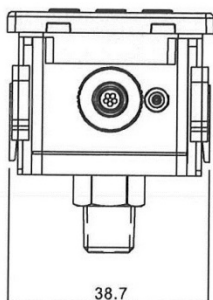
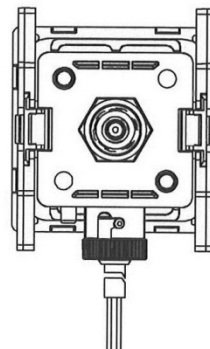
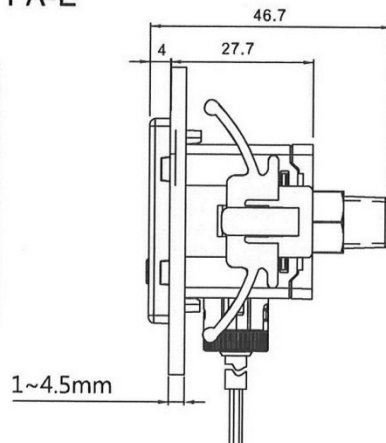
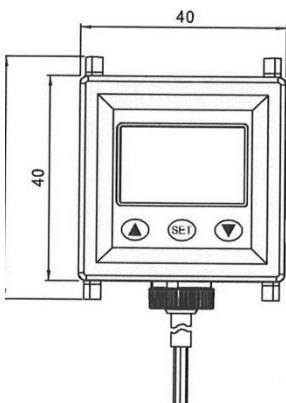




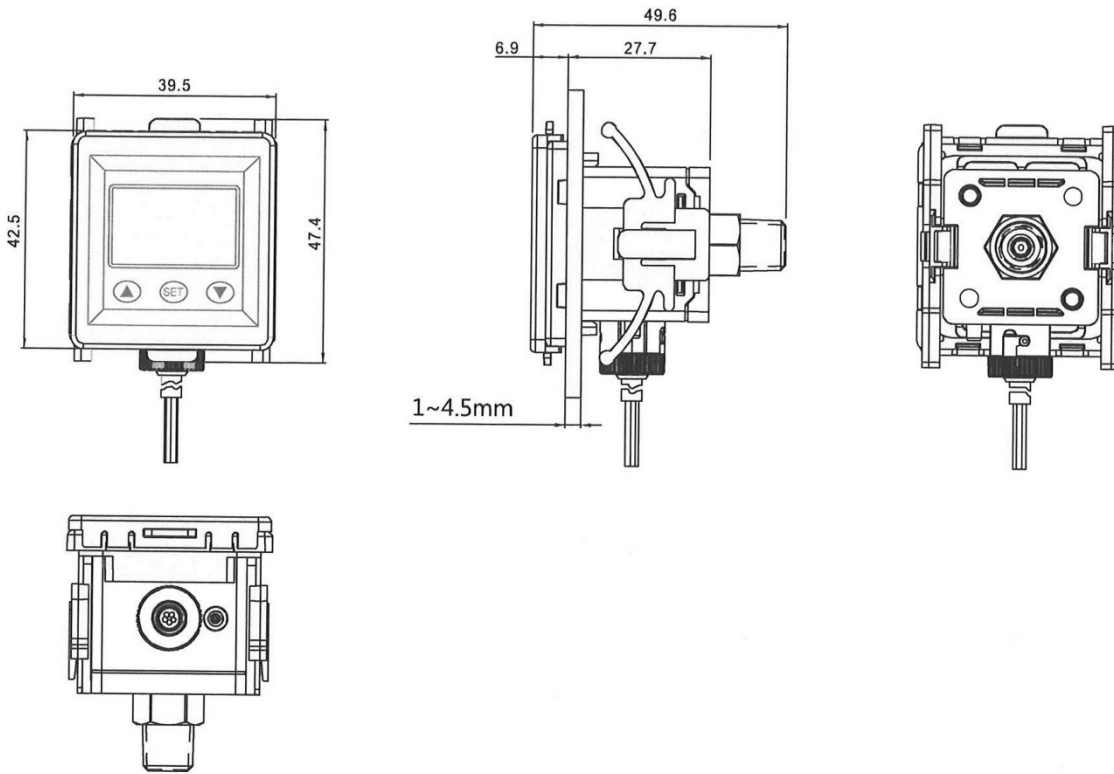
■ Mounting bracket : BT-11



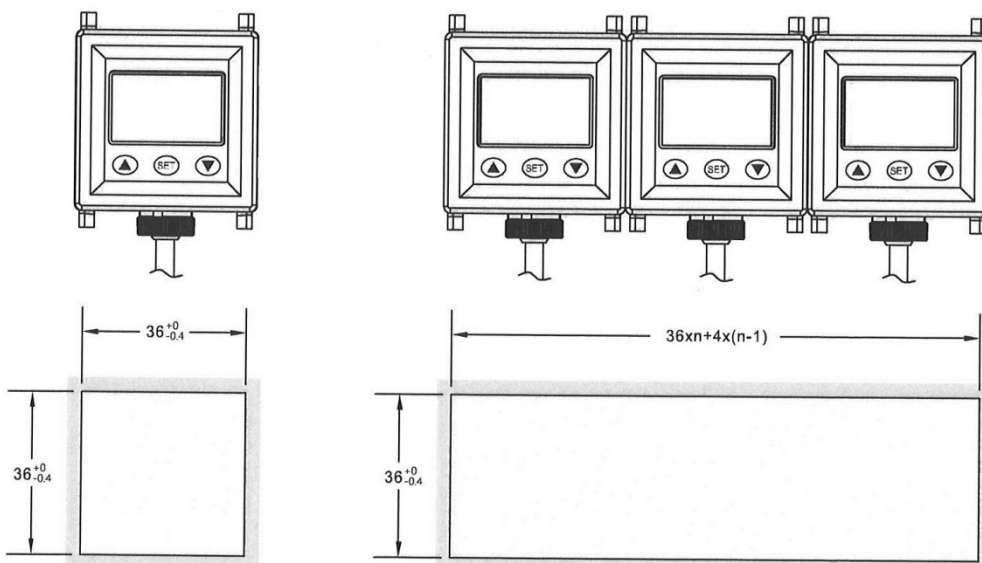
■ Panel adapter : PA-E



■ Panel adapter + Front protective lid : PA-F



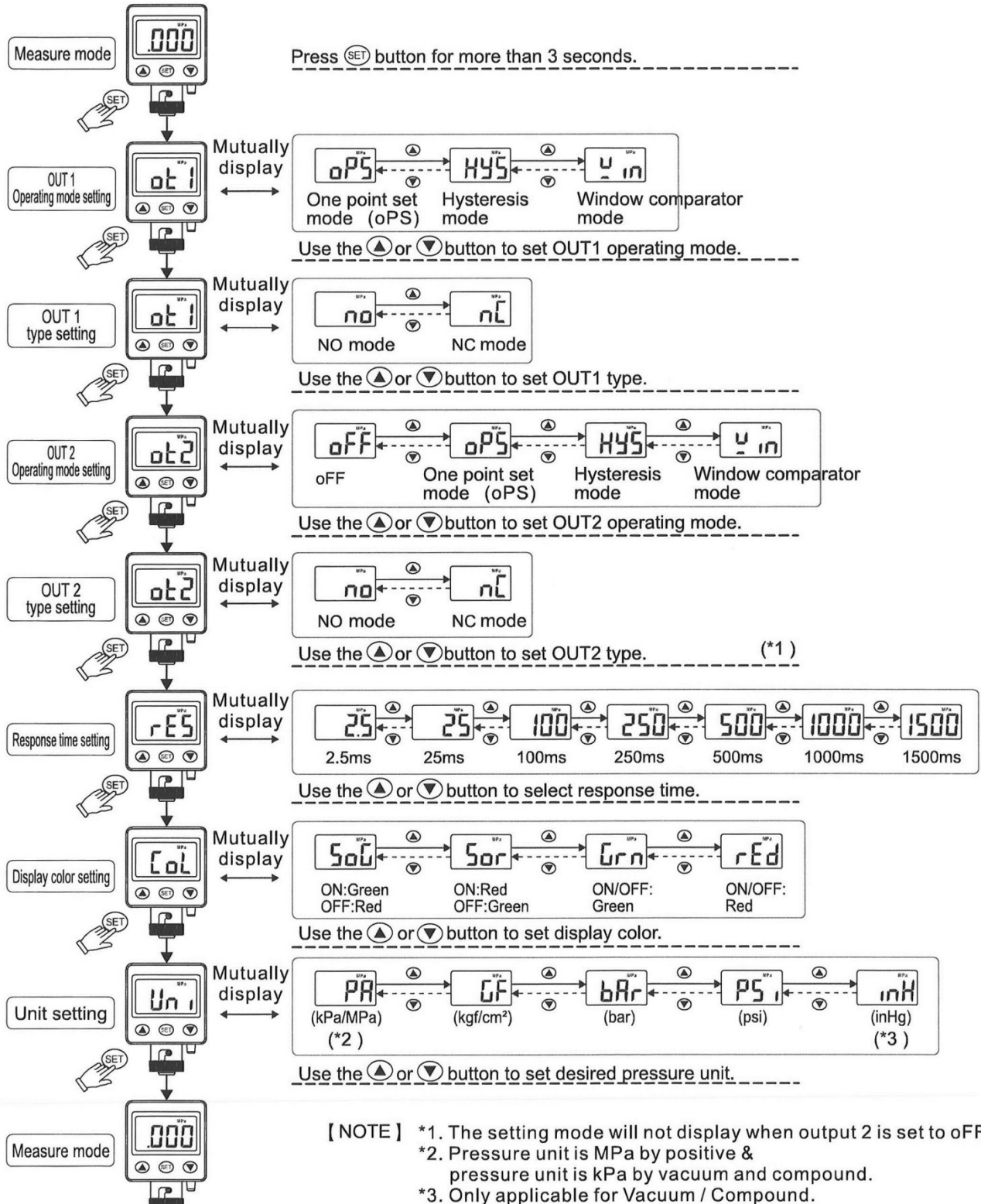
■ Panel cutout dimensions



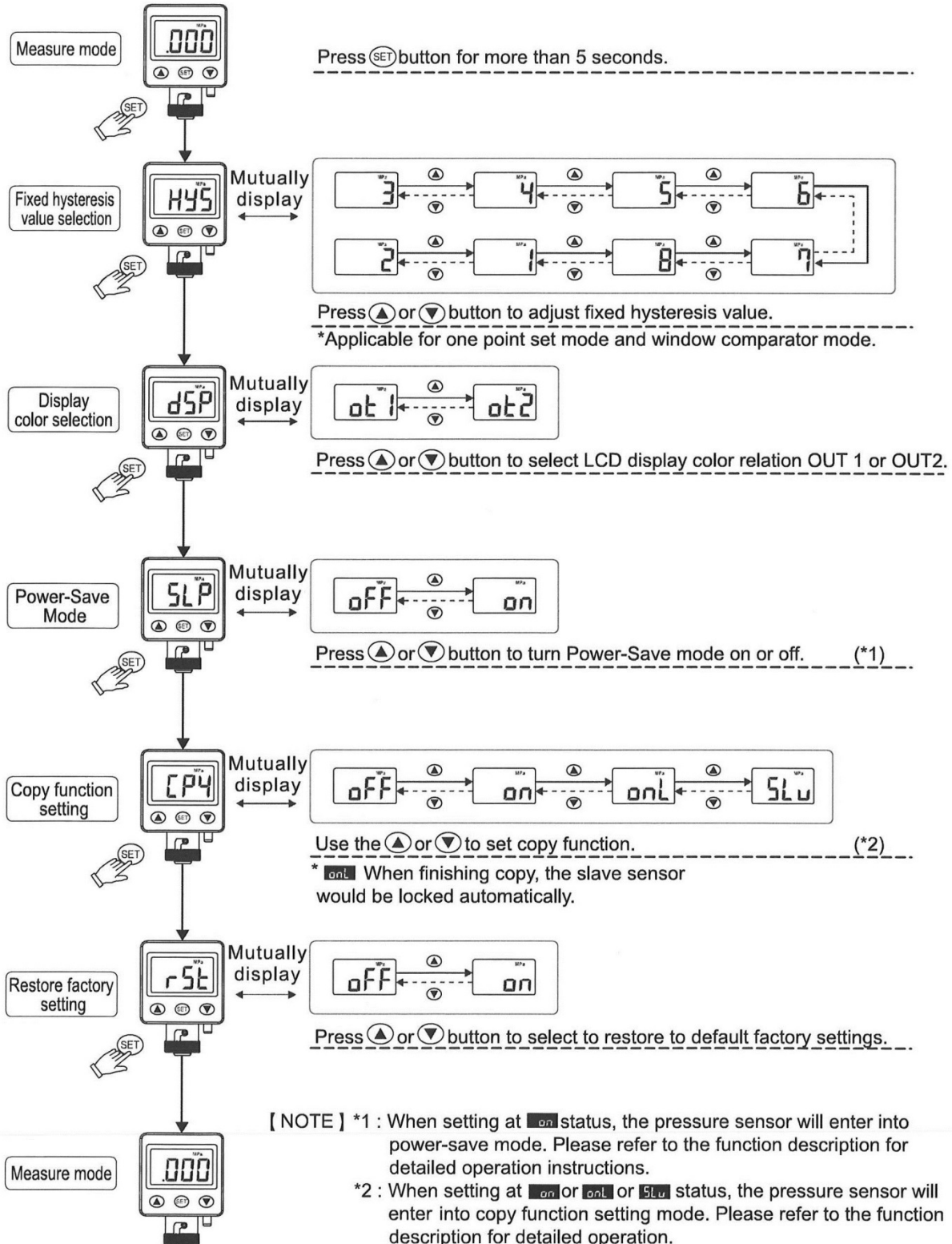


## OPERATION STEPS

### Initial setting mode



## ■ Advance setting mode





## ERROR CODE INSTRUCTION / PRESSURE UNIT CONVERSION TABLE

### ERROR CODE INSTRUCTION

| Error Type                | Error code | Error Condition  | Troubleshooting   |
|---------------------------|------------|--|---|
| Excess load current error | OUT1       | Er1  | Turn power off and check the cause of overload current or lower the load current under 125 mA, then restart.  |
|                           | OUT2       | Er2  |   |
| Residual pressure error   | Er3        | During zero reset, ambient pressure is over $\pm 3\%$ F.S.   | Change input pressure to ambient pressure and perform zero reset again.   |
| Applied pressure error    | HHH        | Supply pressure exceeds the upper limit of pressure setting. | Adjust the pressure within operating pressure range.  |
|                           | LLL        | Supply pressure exceeds the lower limit of pressure setting. |   |
| System error              | Er4        | Internal system error  | Turn power off and then restart. If error condition remains, please return to factory for inspection.   |
|                           | Er5        | Internal system error  |   |
|                           | Er6        | Internal data error  |   |
|                           | Er7        | Internal data error  |   |
| Data copy error           | Er8        | Data copy error  | Please recheck the model no. and wire connection, then set the salve sensor to "SLV". Turn the power on again, if error condition remains, please return to factory for inspection. |

### PRESSURE UNIT CONVERSION TABLE

| From \ To             | Pa       | kPa      | MPa       | kgf/cm <sup>2</sup> | mmHg       | psi         | bar       | inHg      |
|-----------------------|----------|----------|-----------|---------------------|------------|-------------|-----------|-----------|
| 1 Pa                  | 1        | 0.001    | 0.000001  | 0.000010197         | 0.00750062 | 0.000145038 | 0.00001   | 0.0002953 |
| 1 kPa                 | 1000.000 | 1        | 0.001000  | 0.010197            | 7.500616   | 0.145038    | 0.010000  | 0.2953    |
| 1 MPa                 | 1000000  | 1000     | 1         | 10.197              | 7500.616   | 145.038     | 10        | 295.2998  |
| 1 kgf/cm <sup>2</sup> | 98066.5  | 98.0665  | 0.0980665 | 1                   | 735.559    | 14.2233     | 0.980665  | 28.95979  |
| 1 mmHg                | 133.32   | 0.13332  | 0.000133  | 0.0013595           | 1          | 0.019336    | 0.0013332 | 0.039370  |
| 1 psi                 | 6895     | 6.895    | 0.006895  | 0.07031             | 51.7157    | 1           | 0.06895   | 2.036074  |
| 1 bar                 | 100000.0 | 100.0000 | 0.100000  | 1.01972             | 750.062    | 14.5038     | 1         | 29.52998  |
| 1 inHg                | 3386.388 | 3.386388 | 0.003386  | 0.034530            | 25.40000   | 0.491141    | 0.033863  | 1         |

**Gilt für folgende Artikel:**

**Elektronischer Druckschalter mit Digitalanzeige**

Artikel Nr.

Typen Nr.

133157 bis 133160

EDS010NPN15G bis EDS010PNP420G