

For your safety, please read the following before using.

- ① Do not use corrosive or flammable gas or liquid with this product.
- ② Please use within the rating pressure range. Do not apply pressure beyond recommended maximum withstand pressure, permanent damage to the pressure sensor may occur.
- ③ Do not drop, hit or allow excessive shock. Even if switch body appears undamaged, internal components may be broken and can cause malfunction.
- ④ Turn power off before connecting wiring. Wrong wiring or short circuit will damage and/or cause malfunction.
- ⑤ Do not use in environment containing steam or oil vapor.
- ⑥ This product is not explosion-proof rated. Do not use in atmosphere containing flammable or explosive gases.
- ⑦ Wiring for pressure sensor should avoid power source line and high voltage line. If use in the same circuit, noise may cause malfunction.
- ⑧ For Use on a Flat Surface of a Type 1 Enclosure.

A. SPECIFICATIONS		EP45P-□-□ (Positive)	EP45V-□-□ (Vacuum)	EP45C-□-□ (Compound)
Rated pressure range		0.000 ~ 1.000MPa	0.0 ~ -101.3kPa	-100.0 ~ 100.0kPa
Setting pressure range		-0.100 ~ 1.000MPa	10.0 ~ -101.3kPa	-101.0 ~ 101.0kPa
Withstand pressure		1.5MPa	300kPa	
Fluid		Filtered air, Non-corrosive / Non-flammable gas		
Set pressure resolution	kPa	—	0.1	
	MPa	0.001	—	
	kgf/cm ²	0.01	0.001	
	bar	0.01	0.001	
	psi	0.1	0.01	
	inHg	—	0.1	
	mmHg	—	1	
Power supply voltage		12 to 24V DC ±10%, Ripple (P-P) 10% or less		
Current consumption		≤ 40mA (With no load)		
Switch output	Output type	2 NPN or 2 PNP open collector		
	Max. load current	125 mA		
	Max. supply voltage	30V DC (at NPN output), 24V DC (at PNP output)		
	Residual voltage	≤ 1.5V		
	Response time	≤ 2.5ms (chattering-proof function: 25ms, 100ms, 250ms, 500ms, 1000ms and 1500ms selections)		
	Output short circuit protection	Yes		
Analog output	Voltage output	Voltage	1~5V (± 2.5%)	
		Impedance	About 1kΩ	
	Current output	Current	4~20mA (± 2.5%)	
		Impedance	Max.Load Impedance: 250Ω at power supply of 12V 600Ω at power supply of 24V Min.Load Impedance: 50Ω	
	Linearity	±1% F.S.		
Display	LCD display	3½ digit, 7segment (red/ green)		
	Switch ON Indicator	Orange (1 & 2 Indicator) OUT1 OUT2		
	Updates time	About 0.2s		
	Indicator accuracy	± 2% F.S. ± 1 digit (ambient temperature: 25 ± 3°C)		
Repeatability (Switch output)		±0.2% F.S. ±1 digit		
Environment	Enclosure	IP65		
	Operation ambient temp. range	0 ~ 50°C		
	Storage ambient temp. range	-10 ~ 60°C (No condensation or freezing)		
	Ambient humidity range	35 ~ 85% RH (No condensation)		
	Withstand voltage	1000V AC in 1-min (between case and lead wire)		
	Insulation resistance	50MΩ (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 ² (10G), 3 times each in direction of X, Y and Z		
Temperature characteristic		±2% F.S. of detected pressure (25°C) at temp. Range of 0~50°C		
Port size		F1:R1/8", M5; F2:NPT1/8", #10-32 UNF; F3: G1/8"(BSPP), M5 F1C:Rc1/8"; F2C:NPT1/8"; F3C:G1/8"(BSPP)		
Lead wire		Oil-resistance cable(0.15mm ²)		
Weight		Port F1~F3 approx. 86g; Port F1C~F3C approx. 114g (each including 2 meter lead wire)		

B. ORDERING INFORMATION

EP45C-010-F1

Pressure Range

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

Output Specifications

010 : 2 NPN + Analog (Voltage) output (1~5V)
011 : 2 NPN + Analog (Current) output (4~20mA)
02 : 2 NPN + Copy function
030 : 2 PNP + Analog (Voltage) output (1~5V)
031 : 2 PNP + Analog (Current) output (4~20mA)
04 : 2 PNP + Copy function

Pressure Port

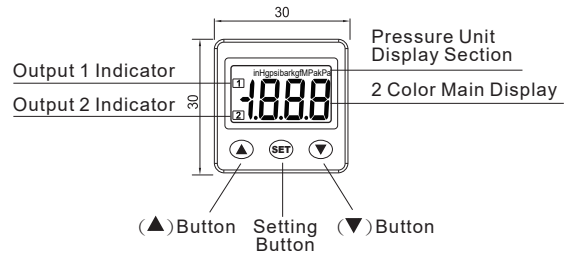
F1 : R1/8", M5, with external threads
F2 : NPT1/8", #10-32UNF, with external threads
F3 : G1/8"(BSPP), M5, with external threads

F1C : Rc1/8", with internal threads
F2C : NPT1/8", with internal threads
F3C : G1/8"(BSPP), with external threads

Optional Parts

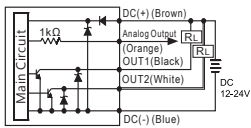
BT-10 : Mounting bracket (for Pressure Port F1~F3)
BT-11 : Mounting bracket (for Pressure Port F1~F3)
BT-1 : Mounting bracket (for Pressure Port F1C~F3C)
BT-17 : Mounting bracket (for Pressure Port F1C~F3C)
PA-E : Panel adapter
PA-F : Panel adapter + Front protective lid

C. PANEL DESCRIPTION

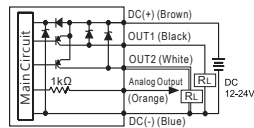


D. OUTPUT CIRCUIT WIRING DIAGRAMS

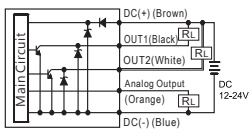
EP45□-010-□
2 NPN+Analog Output (1~5V)



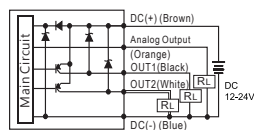
EP45□-030-□
2 PNP+Analog Output (1~5V)



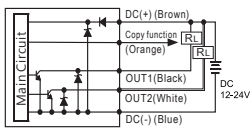
EP45□-011-□
2 NPN+Analog Output (4~20mA)



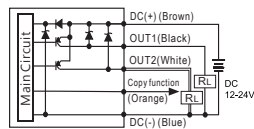
EP45□-031-□
2 PNP+Analog Output (4~20mA)



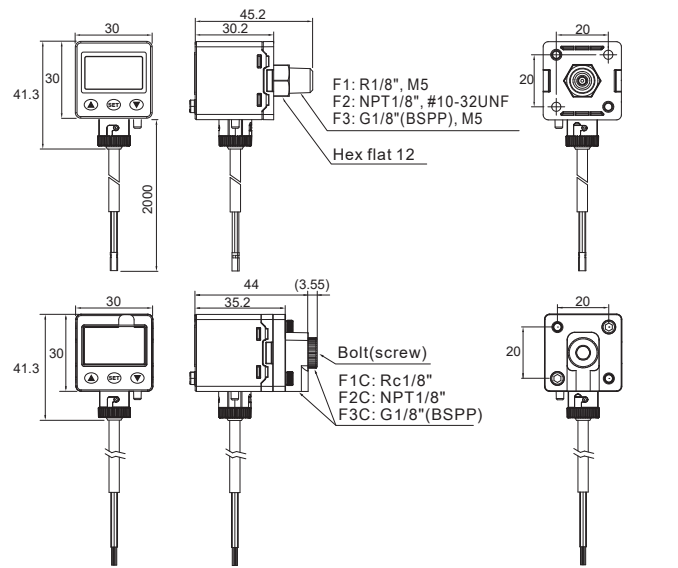
EP45□-02-□
2 NPN+Copy Function



EP45□-04-□
2 PNP+Copy Function



E. DIMENSIONS

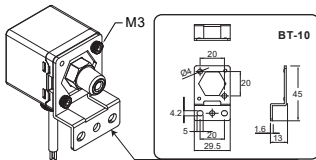


Unit:mm

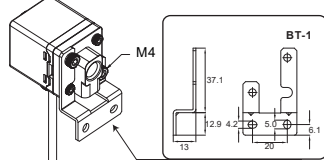
F. OPTIONAL PARTS DIMENSIONS

① Mounting bracket

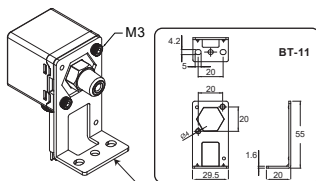
BT-10



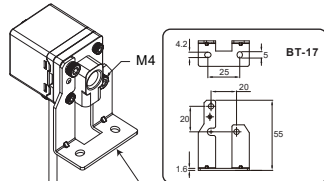
BT-1



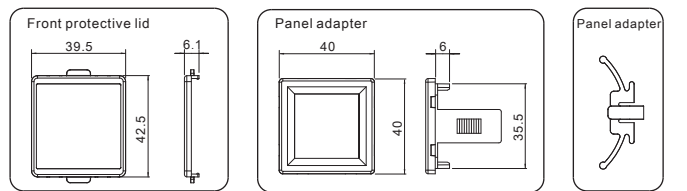
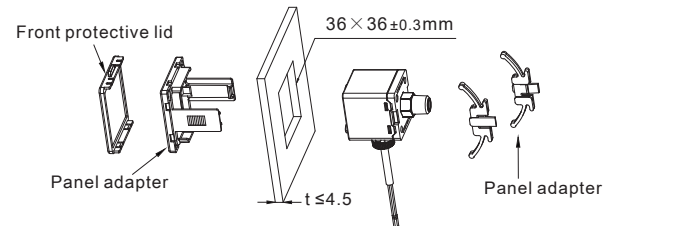
BT-11



BT-17

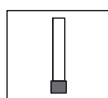
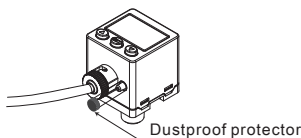


② Panel Mounting



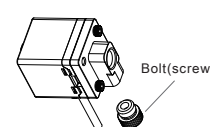
Unit:mm

③ Accessory



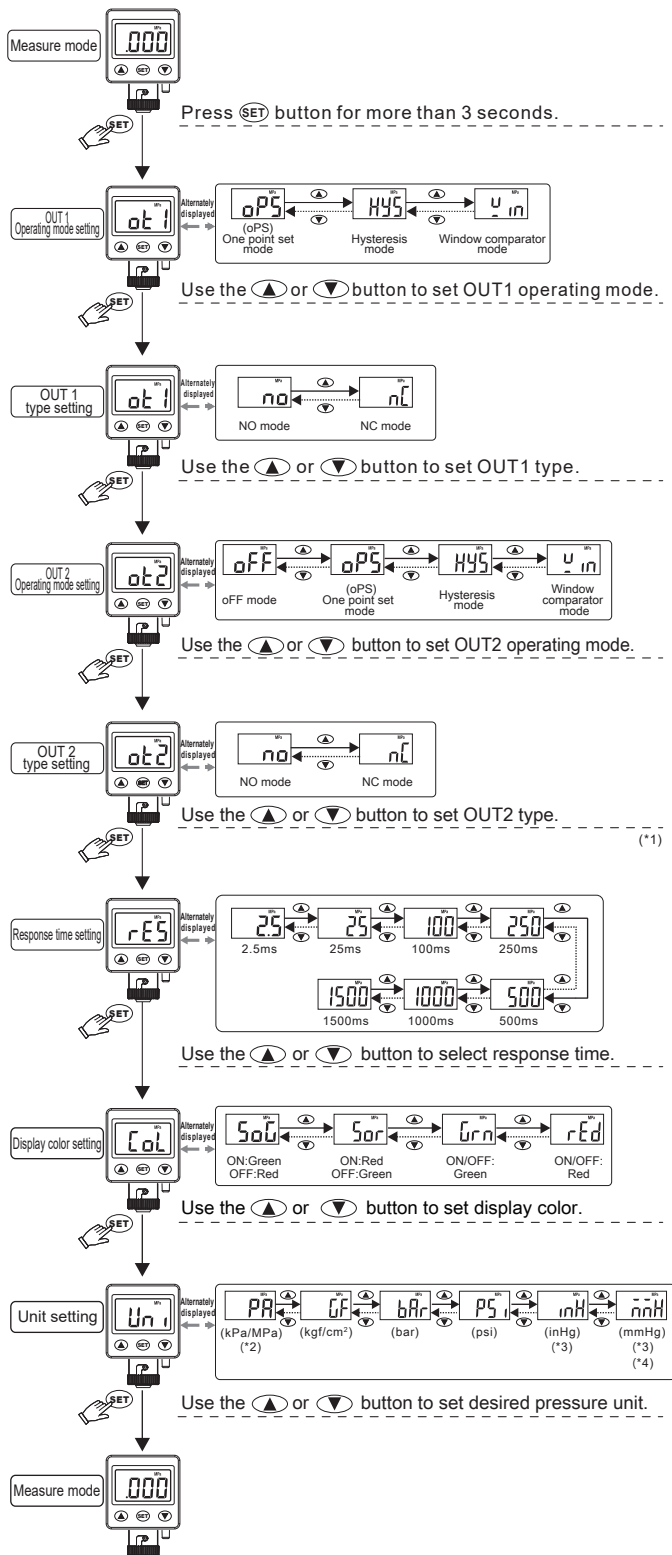
Caution :
This device must be installed to maintain IP 65 (Dust and splash proof) enclosure rating.

④ Accessory for pressure port F1C~F3C



1. This product has two inlet pressure ports, select the one most convenient for installation.
2. Please plug the unused inlet port with supplied port plug. Use seal tape to prevent pressure leak.

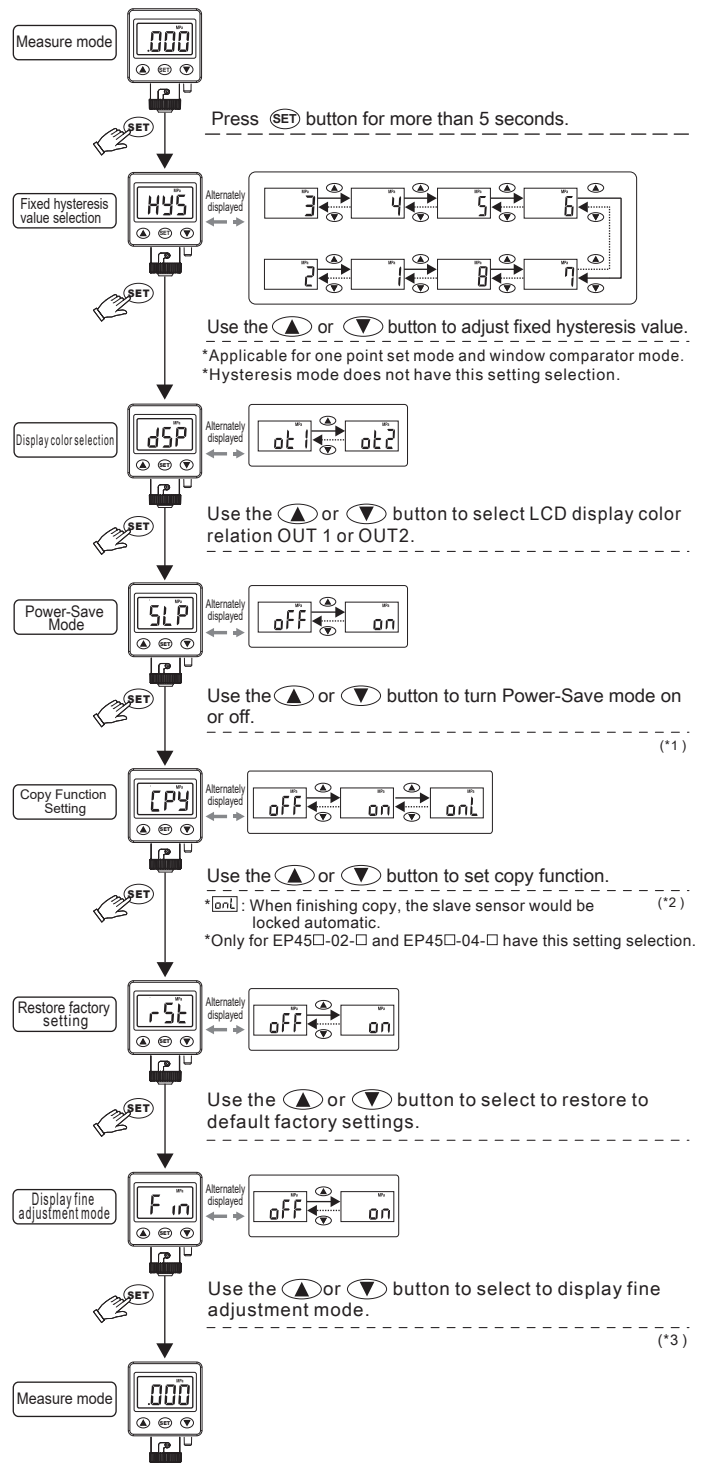
G. INITIAL SETTING MODE



[NOTE :]

- *1. This setting mode will not display when output 2 is set to oFF.
- *2. Pressure unit is MPa with positive pressure.
Pressure unit is kPa with vacuum and compound pressure.
- *3. Only applicable for Vacuum/Compound.
- *4. When selecting "mmHg", pressure unit is not displayed.

H. ADVANCE SETTING MODE

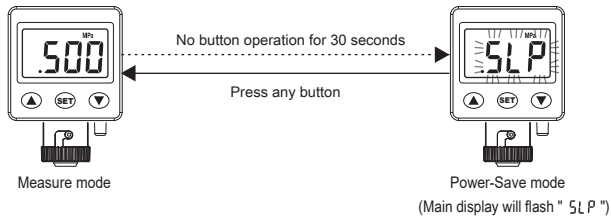


[NOTE :]

- *1. When setting is "on", the power-save mode is active.
Please refer to the item " " in detailed.
- *2. When setting is "on" or "onL", the display copy function mode is active.
Please refer to the item " " in detailed.
- *3. When setting is "on", the display fine adjustment mode is active.
Please refer to the item " " in detailed.

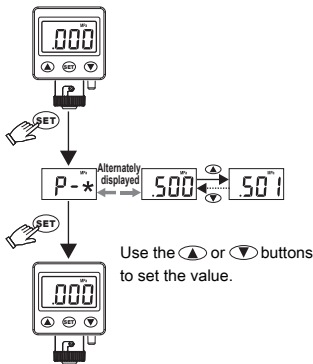
I. POWER-SAVE MODE

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

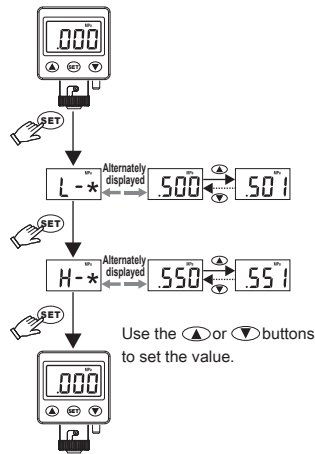


J. PRESSURE SETTING MODE

- One point set mode :
- Hysteresis mode / Window comparator mode :



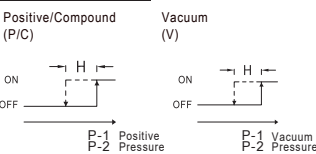
When out 1, "" displays 1
When out 2, "*" displays 2.



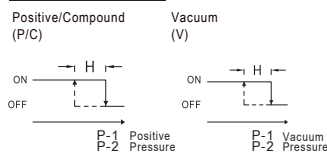
K. OUTPUT TYPE

- (1) One point set mode:

Normal open mode

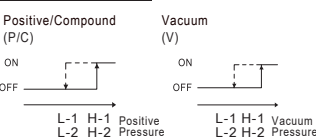


Normal close mode

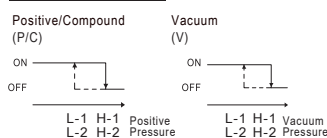


- (2) Hysteresis mode:

Normal open mode

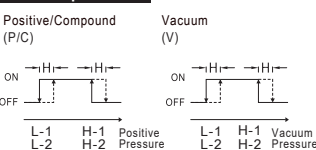


Normal close mode

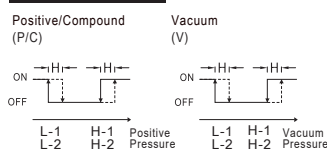


- (3) Window comparator mode:

Normal open mode



Normal close mode

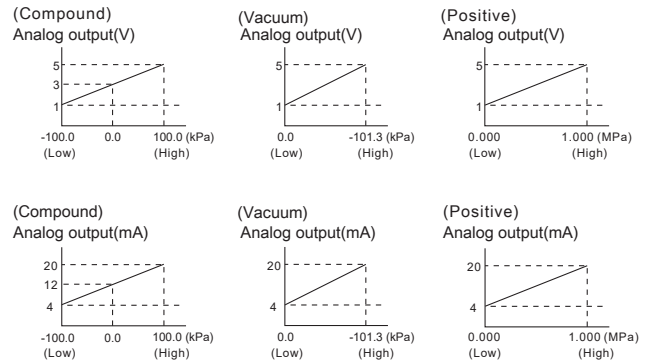


【 NOTE : 】

- *1. In case hysteresis is set as less than or equal to 2 digits, switch output may chatter if input pressure fluctuates near the set point.
- *2. When using window comparator mode, the difference between two set points must be greater than the fixed hysteresis, otherwise will cause the switch output to malfunction.

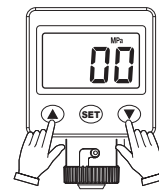
L. ANALOG OUTPUT DESCRIPTION

Analog output range 1-5V or 4-20mA, proportional to the pressure range.



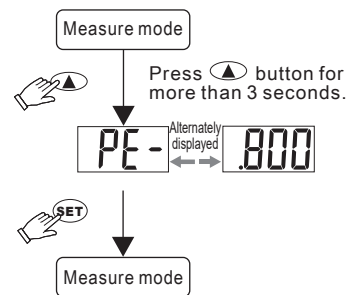
M. ZERO POINT SETTING

Press the ▲ + ▼ button at the same time until the "00" is shown. Release the button to end zero setting.

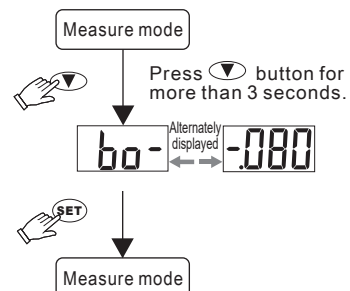


N. THE MAX. & MIN. DISPLAY MODE

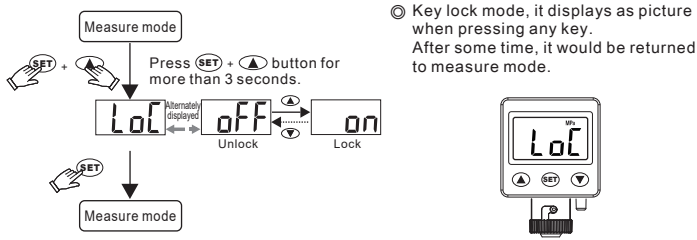
- The Max. value display mode :



- The Min. value display mode :



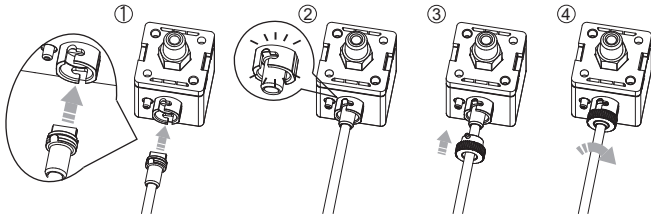
O. KEY LOCK/UNLOCK MODE



P. 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)



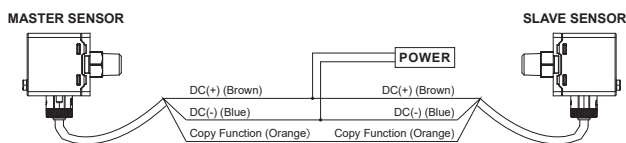
[NOTE:] Recommend not insert-extract over 20 times.

Q. COPY FUNCTION SETTING

- Copy function setting can use the master sensor to copy the pressure value to the slave sensors.
- Before copying, please confirm the model of pressure sensor. The function cannot use in difference mode.
- The copy function only can be one-to-one.

[SETTING STEP]

1. Please set the copy function to [on] or [on] to be on copy condition by master sensor. Please refer the copy setting of (H) advance setting mode.
2. Turn power off to both sensor.
3. Refer the connection way with the master and slave sensor as followings.



4. Turn on power at same time. (* 1)
5. Wait 5 sec., when finishing to convey the data, the master sensor display (alternately display) the slave sensor display (alternately display)
6. When convey the data failed, (Master) sensor displays [CPy] (Slave) sensor displays [Er8] (* 2)
7. Turn off power and remove the wire connection. If no remove the wire connection, the sensor would be broken.

- *1. If require to copy another slave sensor, please repeat the step ③ to ⑤.
- *2. Only for EP45□-02-□ and EP45□-04-□ have this setting selection.

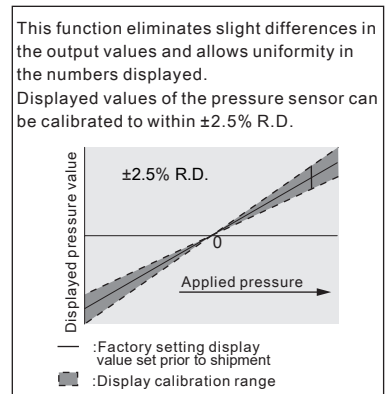
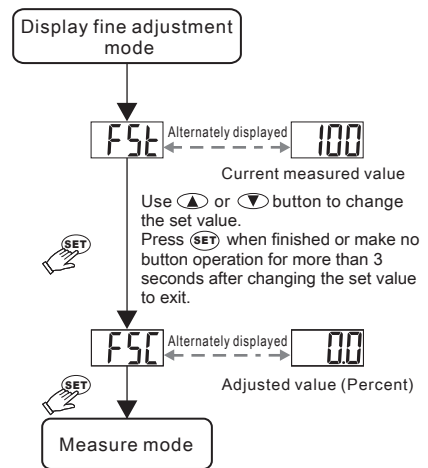
[NOTE]

- *1. If turn on power is not synchronization, the data cannot be copied.
- *2. When the data conveys failed, please check the wire connection. Then repeat the step ③ to ⑤.

• How to cancel the copy mode :

When the master sensor display [CPy] (display reciprocal), Please [▼] button to leave the copy mode.

R. FINE ADJUSTMENT MODE



R. D. (Real Detect)

- [NOTE :]
1. Setting resolution is ±0.1% R.D.
 2. The signal would be changed with analog output after adjusting.

S. ERROR CODE INSTRUCTION

Error Type	Error code	Error Condition	Troubleshooting
Excess load current error	out1 Er 1	Output 1 load current is more than 125 mA	Turn power off and check the cause of overload current or lower the current load under 125 mA, then restart.
	out2 Er 2	Output 2 load current is more than 125 mA	
Residual pressure error	Er 3	During zero reset, ambient pressure is over ±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	Er 4	Internal system error	Turn power off, and then restart. If error condition remains, please return to factory for inspection.
	Er 5	Internal system error	
	Er 6	Internal data error	
	Er 7	Internal data error	
Copy data error	Er 8	Please check the model no. and wire connection. Restart to turn on power if no return to normal condition, please return to factory for inspection.	

T. PRESSURE UNIT CONVERSION TABLE

From To	Pa	kPa	MPa	kgf/cm ²	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 ²	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