

For your safety, please read the following before using.

- ① Do not use corrosive fluid SUS316L, please confirm the specification in detailed.
- 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 This product is not explosion-proof rated. Do not use in atmosphere containing flammable or explosive gases.
- ⑥ Wiring for pressure sensor should avoid power source line and high voltage line. If use in the same circuit, noise may cause malfunction.
- ⑦ The product is complied CE certificate, but no surge absorber. If required, please find other way to solve.
- ⑧ Do not exceed the screw-in torque of 13.6 N.m when installing piping. Exceeding this value may cause malfunction.
- ⑨ Sensors at end-of-life must be disposed of in accordance with E-Waste regulations of the country/region, NOT disposed of with regular garbage.

A SPECIFICATIONS

MODEL		KP50EC (Compound Pressure)	KP50EV (Vacuum Pressure)	KP50EP (Positive Pressure)	KP50EH (High Pressure)
Rated pressure range		-100.0 ~ 100.0 kPa	0.0 ~ -101.3 kPa	0.000 ~ 1.000 MPa	0.000 ~ 2.00 MPa
Setting pressure range		-101.0 ~ 101.0 kPa	10.0 ~ -101.3 kPa	-0.100 ~ 1.000 MPa	-0.100 ~ 2.00 MPa
Withstand pressure		300 kPa		3 MPa	
Fluid		Fluid or air that will not corrode SUS 316L			
Sealed Liquid		Silicon oil			
Set pressure resolution	kPa	0.1		—	—
	MPa	—		0.001	0.001 (~1.999) 0.01 (2.00~)
	kgf/cm ²	0.001		0.01	0.01 (~19.99) 0.1 (20.0~)
	bar	0.001		0.01	0.01 (~19.99) 0.1 (20.0~)
	psi	0.01		0.1	0.1 (~199.9) 1 (200~)
	inHg	0.1		—	—
Power supply voltage		12 ~ 24V DC ±10%, Ripple (P-P) ≤10%			
Current consumption		≤ 40mA (With no load)			
Switch output		2 NPN : open collector 2 outputs Max. Load Current : 125 mA Max. Supply Voltage : 30V DC Residual Voltage : ≤ 1.5 V		2 PNP : open collector 2 outputs Max. Load Current : 125 mA Max. Supply Voltage : 24V DC Residual Voltage : ≤ 1.5 V	
Repeatability		± 0.3 % F.S. ± 1 digit			
Hysteresis	One point set mode	Adjustable (*1)			
	Hysteresis mode				
	Window comparator mode				
Response time		≤ 2.5 ms (Chattering-proof function : 25 ms, 100 ms, 250 ms, 500 ms, 1000 ms and 1500 ms selectable)			
Output short circuit protection		Yes			
Display		3 ½ digital, 7 segment LCD display (Red / Green / Orange) (Sampling rate : 5 times / sec.)			
Indicator accuracy		± 2 % F.S. ± 1 digit (Ambient temperature : 25 ± 3 °C)			
Switch on indicator		Orange Indicator 1 : OUT1 & Orange Indicator 2 : OUT2			
Analog output (Voltage output)		Output Voltage : 1 ~ 5 V ± 2.5 % F.S. (within rated pressure range) Linearity : ± 1 % F.S. Output Impedance : about 1 kΩ			
Analog output (Current output)		Output Current : 4 ~ 20 mA ± 2.5 % F.S. (within rated pressure range) Linearity : ± 1 % F.S. Max. Load Impedance : 250 Ω at power supply of 12 V , 600 Ω at power supply of 24 V Min. Load Impedance : 50 Ω			
Environment	Enclosure	IP65 (*2)			
	Ambient temp. range	Operation : 0 ~ 50 °C, Storage : -10 ~ 60 °C (No condensation or freezing)			
	Ambient humidity range	Operation / Storage : 35 ~ 85 % RH (No condensation)			
	Withstand voltage	250V AC in 1-min (between case and lead wire)			
	Insulation resistance	≥ 50 MΩ (at 500 V DC, between case and lead wire)			
	Vibration	Total amplitude 1.5 mm or 10 G, 10 Hz ~ 55 Hz ~ 10 Hz scan for 1 minute, 2 hours each direction of X, Y and Z			
	Shock	100 m/s ² (10 G), 3 times each in direction of X, Y and Z			
Temperature characteristic		± 3 % F.S. of detected pressure (25 °C) at temp. (Range of 0 ~ 50 °C)			
Port size (*3)		F1 : R1/4", M5; F2 : NPT1/4", #10-32 UNF; F3 : G1/4" (BSPP), M5; F1C : Rc1/8"			
Lead wire		Ø4 Oil-resistance cable (PVC) - 26 AWG (0.15 mm ²) - 5 cores			
Weight (with 2 meter lead wire)		Approx. 110 g (Rear ported) ; Approx. 150 g (Bottom ported)			

*1. Hysteresis value is adjustable within 1 ~ 8 digits for one point set mode and window comparator mode.

*2. Dustproof protector must be installed to maintain IP65.

*3. G port O-Ring material is NBR. If any special request, please contact KITA.

B ORDERING INFORMATION

K P 5 0 E H - 0 1 0 - F 1

Pressure Range

P : Positive (-0.100 ~ 1.000 MPa)
H : High (-0.100 ~ 2.00 MPa)
V : Vacuum (10.0 ~ -101.3 kPa)
C : Compound (-101.0 ~ 101.0 kPa)

Output Specifications

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

Pressure Port

F1 : R1/4", M5
F2 : NPT1/4", #10-32UNF
F3 : G1/4"(BSPP), M5
F1C : Rc1/8"
(only with rear ported)

Piping Direction

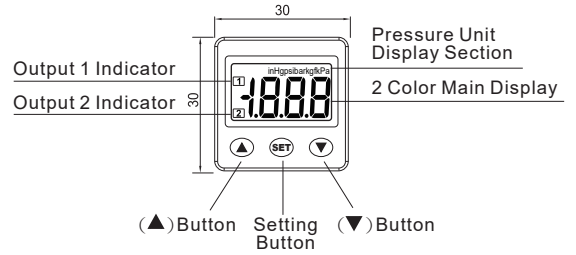
Blank : Rear ported
L : Bottom ported

Optional Parts

BT-10 : Mounting bracket
BT-11 : Mounting bracket
PA-E : Panel adapter
PA-F : Panel adapter + Front protective lid
I-0360 : Snubber (for Pressure Port F1&F3)
I-0379 : Snubber (for Pressure Port F2)

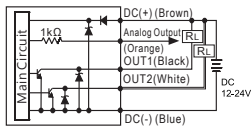
*KP50EP & KP50EH suggest to select a snubber.

C PANEL DESCRIPTION

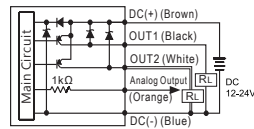


D OUTPUT CIRCUIT WIRING DIAGRAMS

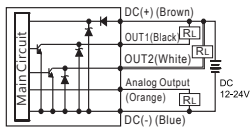
KP50E□-010-□
2 NPN+Analog Output (1~5V)



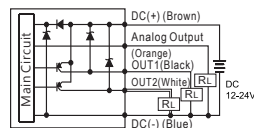
KP50E□-030-□
2 PNP+Analog Output (1~5V)



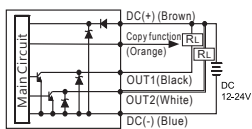
KP50E□-011-□
2 NPN+Analog Output (4~20mA)



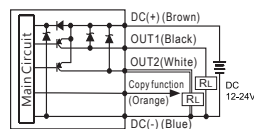
KP50E□-031-□
2 PNP+Analog Output (4~20mA)



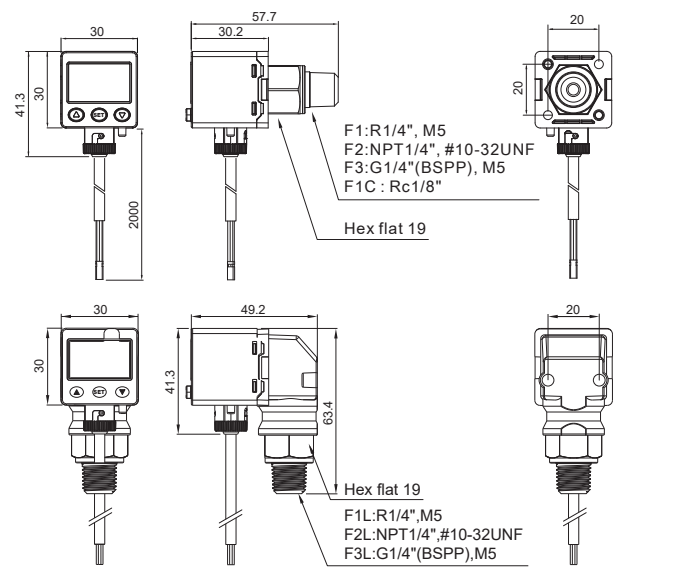
KP50E□-02-□
2 NPN+Copy Function



KP50E□-04-□
2 PNP+Copy Function



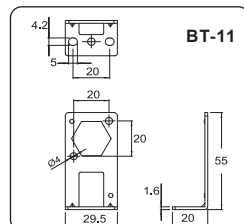
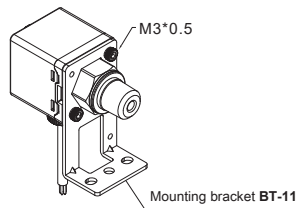
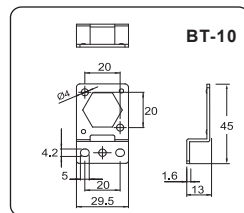
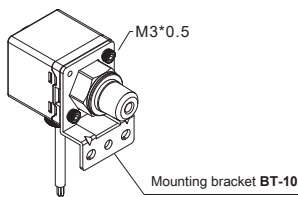
E DIMENSIONS



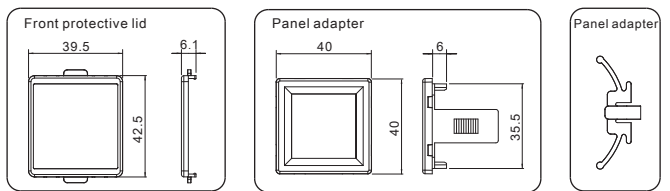
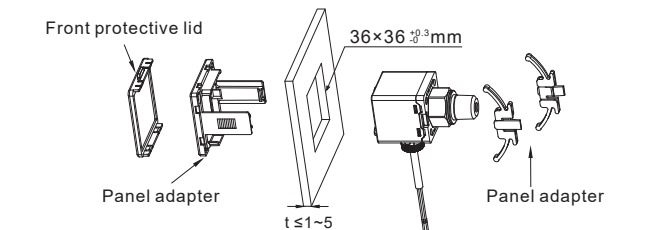
Unit:mm

F OPTIONAL PARTS DIMENSIONS

① Mounting bracket

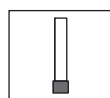
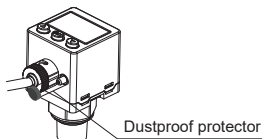


② Panel Mounting



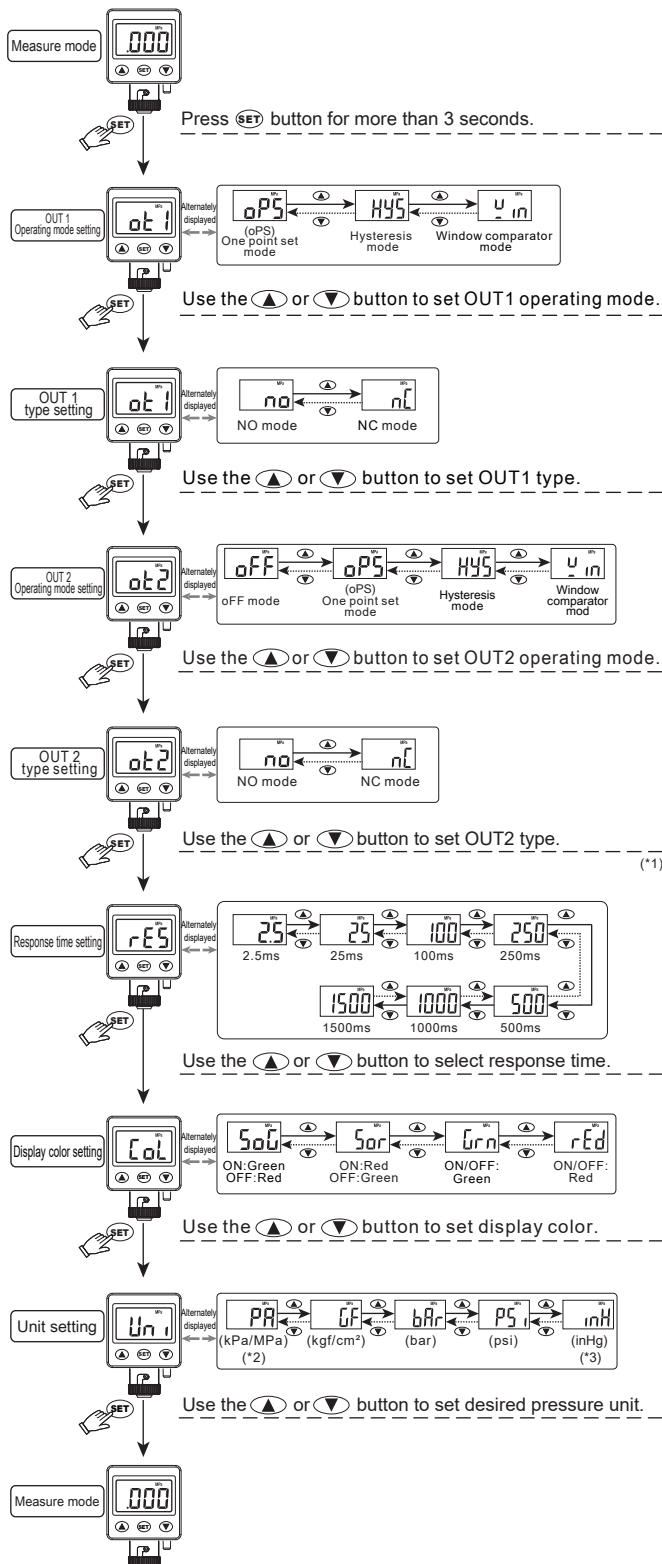
Unit:mm

③ Accessory

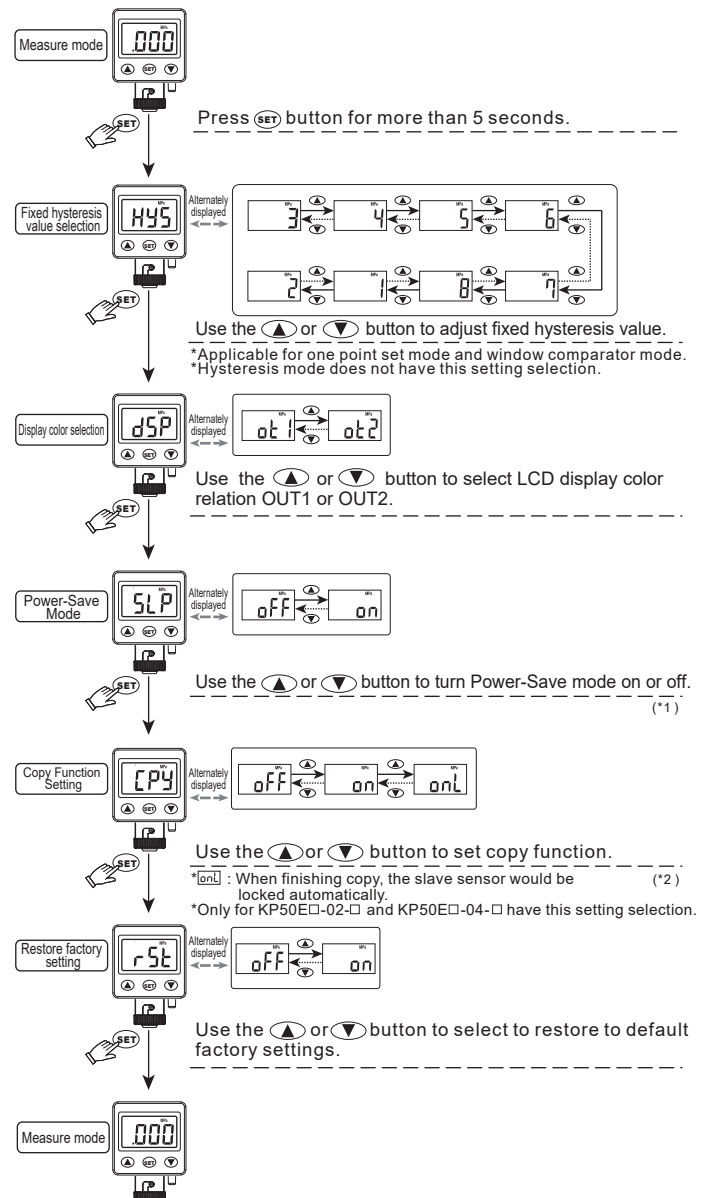


Caution :
This device must be installed to maintain IP 65 (Dust and splash proof) enclosure rating.

G INITIAL SETTING MODE

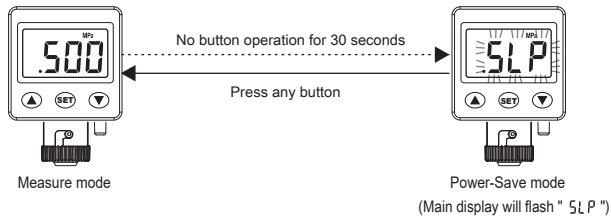


H ADVANCE SETTING MODE



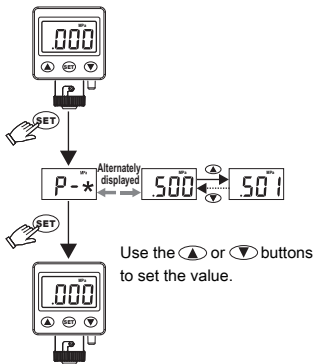
I POWER-SAVE MODE

- 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.



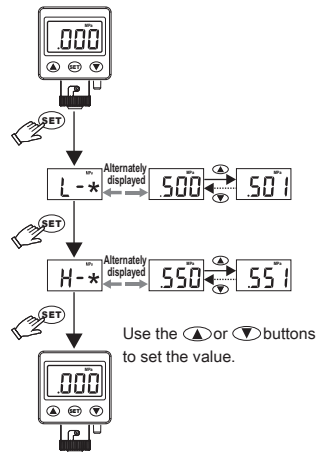
J PRESSURE SETTING MODE

- One point set mode :



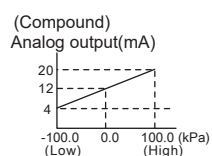
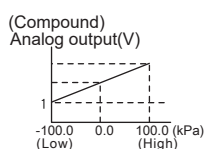
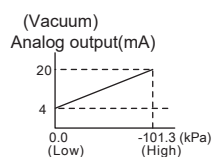
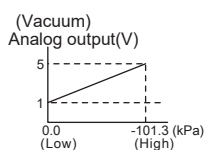
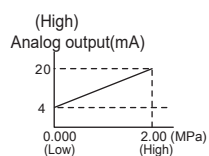
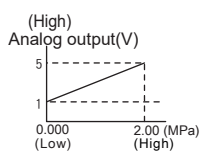
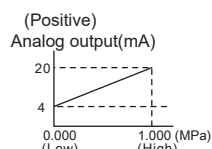
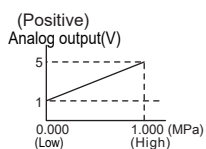
*When out 1, " *" displays 1
When out 2, " *" displays 2.

- Hysteresis mode / Window comparator mode :



K ANALOG OUTPUT DESCRIPTION

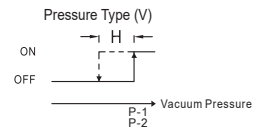
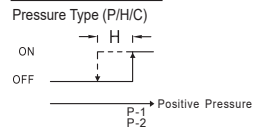
Analog output range 1~5V or 4~20mA, proportional to the pressure range.



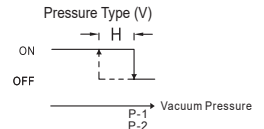
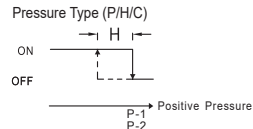
L OUTPUT TYPE

- One point set mode:

Normal open mode

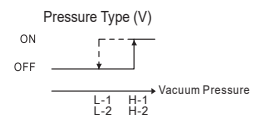
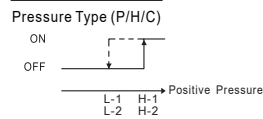


Normal close mode

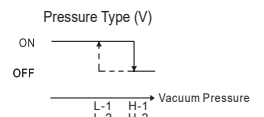
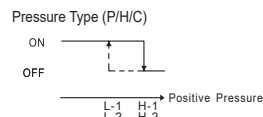


- Hysteresis mode:

Normal open mode

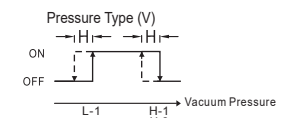
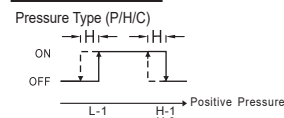


Normal close mode

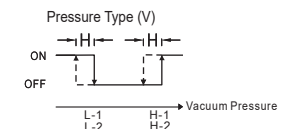
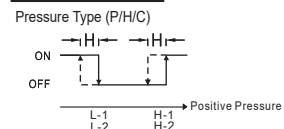


- Window comparator mode:

Normal open mode



Normal close mode

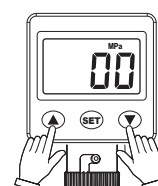


【NOTE :】

- *1. In case hysteresis is set at 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.

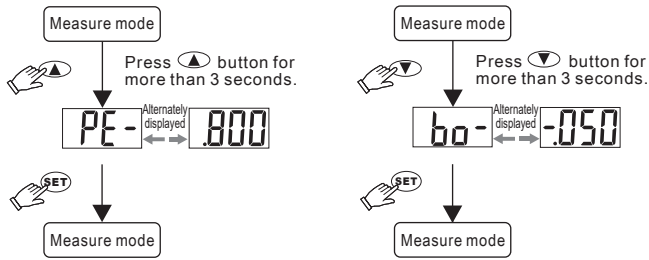
M ZERO POINT SETTING

Use the Δ + ∇ button at the same time until the "00" is shown.
Release the button to end zero setting.

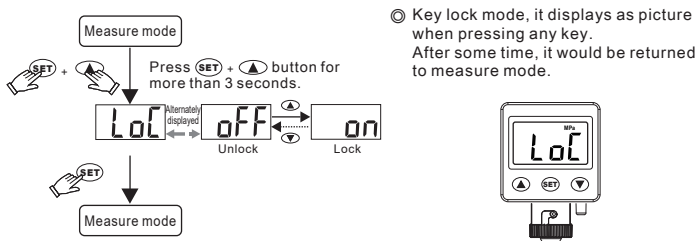


N THE MAX. & MIN. DISPLAY MODE

- ◎ The Max. value display mode : ◎ The Min. value display mode :



O KEY LOCK/UNLOCK MODE



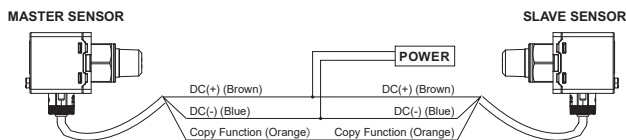
- ◎ Key lock mode, it displays as picture when pressing any key. After some time, it would be returned to measure mode.

P 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 be used in different model.
- ◎ The copy function only can be one-to-one.

[SETTING STEP]

- 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.
- Turn power off to both sensor.
- Refer the connection way with the master and slave sensor as follows.



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

- ★ If require to copy another slave sensor, please repeat the step ③ to ⑤ .
- ★ Only for KP50E□-02-□ and KP50E□-04-□ have this setting selection.

[NOTE]

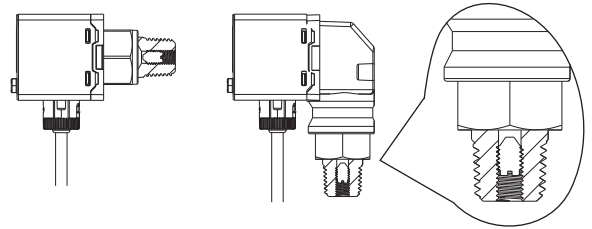
- *1. If turn on power is not synchronization, the data cannot be copied.
- *2. When the data conveys fail, please check the wire connection. Then repeat the step ③ to ⑤ .

◎ How to cancel the copy mode :

When the master sensor display **[CPY]** ↔ **[Lrd]** (display reciprocal), Please **[V]** button to leave the copy mode.

Q REMOVABLE SNUBBER INSTALLED

Pressure port equipped with snubber can avoid damage caused by sudden pressure surge of water or oil, improve product durability.

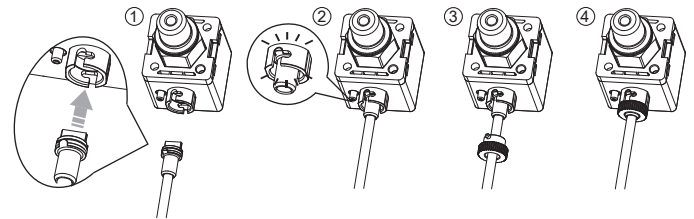


- *When snubber is clogged with contaminants, please use a flat head screwdriver to remove the snubber, clean and reinstall.
- *Snubber is not applied to F1C port.

R 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.

S ERROR CODE INSTRUCTION

Error Type	Error code	Error Condition	Troubleshooting
Excess load current error	out1 Er1	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 Er2	Output 2 load current is more than 125 mA	
Residual pressure error	Er3	During zero reset, ambient pressure is over ±3% F.S. (KP50EH series is ±1.5% 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	
Copy data error	Er8	Copy data error	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	psi	bar	inHg
1 Pa	1	0.001	0.000001	0.000010197	0.000145038	0.00001	0.0002953
1 kPa	1000.000	1	0.001000	0.010197	0.145038	0.010000	0.2953
1 MPa	1000000	1000	1	10.197	145.038	10	295.2998
1 kgf/cm ²	98066.5	98.0665	0.0980665	1	14.2233	0.980665	28.95979
1 psi	6895	6.895	0.006895	0.07031	1	0.06895	2.036074
1 bar	100000.0	100.0000	0.100000	1.01972	14.5038	1	29.52998
1 inHg	3386.388	3.386388	0.003386	0.034530	0.491141	0.033863	1