KP400 Series | Multi - Controller

KITA

PR-0277G 2024/11 Online Version

CE UK CA

For your safety, please read the following before using.

① Suggest to connect, install, and set up by professional technicians.
② Do not drop, hit or allow excessive shock. Even if switch body appears undamaged, internal components may be broken and can cause malfunction.
③ Turn power off before connecting wiring. Wrong wiring or short circuit will damage and / or cause malfunction.
④ Do not use in environment containing steam or oil vapor.
⑤ This product is not explosion-proof rated. Do not use in atmosphere containing flammable or explosive gases.
⑥ Wiring for pressure controller should avoid power source line and high voltage line. If use in the same circuit, noise may cause malfunction.
⑦ 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		KP400											
Sensor Type		S-0	S-1	S-2	S-3	S-4	S-5	S-6	S-7	S-8	S-9	S-10	S-11	S-12
Rated pressure range		Self-Setting (※1)	0 ~ -101.3 kPa	0 ~ 100 kPa	0 ~ 2 kPa	0 ~ 5 kPa	-100 ~ 100 kPa	-101 ~ 500 kPa	0 ~ 1 MPa	0 ~ 2 MPa	0 ~ 2.5 MPa	0 ~ 10 MPa	0 ~ 25 MPa	0 ~ 40 MPa
Set pressure range			10 ~ -101.3 kPa	-10 ~ 100 kPa	-0.2 ~ 2 kPa	-0.5 ~ 5 kPa	-100 ~ 100 kPa	-101 ~ 500 kPa	-0.100 ~ 1 MPa	-0.100 ~ 2 MPa	-0.100 ~ 2.5 MPa	0 ~ 10 MPa	0 ~ 25 MPa	0 ~ 40 MPa
Set pressure range (Auto-shift input)		—	101.3 ~ -101.3 kPa	-100 ~ 100 kPa	-2 ~ 2 kPa	-5 ~ 5 kPa	-100 ~ 100 kPa	-500 ~ 500 kPa	-1 ~ 1 MPa	-2 ~ 2 MPa	-2.5 ~ 2.5 MPa	-10 ~ 10 MPa	-25 ~ 25 MPa	-40 ~ 40 MPa
Set pressure resolution	kPa	Self-Setting	0.1	0.1	0.01	0.01	0.1	1	—	—	—	—	—	—
	MPa		—	—	—	—	—	—	0.001	0.01	0.01	0.01	0.1	0.1
	kgf/cm²		0.001	0.001	—	—	0.001	0.01	0.01	0.1	0.1	0.1	1	1
	bar		0.001	0.001	—	—	0.001	0.01	0.01	0.1	0.1	0.1	1	1
	psi		0.01	0.01	—	—	0.01	0.1	0.1	1	1	1	1 (※2)	1 (※2)
	inHg		0.1	—	—	—	0.1	—	—	—	—	—	—	—
	mmHg		1	—	0.1	0.1	1	—	—	—	—	—	—	—
	– – –		—	—	—	—	—	—	—	—	—	—	—	—
Power supply voltage		12 ~ 24 V 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 : 30 V DC Residual Voltage : ≤ 1.5 V						2 PNP : open collector 2 outputs Max. Load Current : 125 mA Max. Supply Voltage : 24 V DC Residual Voltage : ≤ 1.5 V						
Repeatability		± 0.1 % F.S. ± 1 digit												
Hysteresis	One point set mode	Adjustable (※3)												
	Hysteresis mode													
	Window comparator mode													
Response time		≤ 2.5ms (chattering-proof function: 25ms, 100ms, 250ms, 500ms, 1000ms and 1500ms selectable)												
Output short circuit protection		Yes												
Display		3 ½ digital, 7 segment LCD display (Red/Green/Orange) (Sampling rate : 5 times / sec.)												
Indicator accuracy		±1% F.S. ±1 digit (ambient temperature : 25±3℃)												
Switch on indicator		Orange Indicator 1 : OUT1 & Orange Indicator 2 : OUT2												
Analog output (Voltage output)		Output voltage : 1 ~ 5V ±2% F.S. (within rated pressure range) Linearity : ±1% F.S. Output impedance : about 1 kΩ												
Analog output (Current output)		Output current : 4 ~ 20mA ±2% F.S. (within rated pressure range) Linearity : ±1% F.S. Max. load impedance : 300 Ω at power supply of 12V, 600 Ω at power supply of 24V Min. load impedance : 50 Ω												
Environment	Enclosure	IP40												
	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	1000V AC in 1-min (between case and lead wire)												
	Insulation resistance	≥ 50 MΩ (at 500V 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/s² (10 G), 3 times each in direction of X, Y and Z												
Temperature characteristic		±0.5% F.S. of detected pressure (25℃) at temp. (Range of 0 ~ 50℃)												
Lead wire		Ø4 PVC - 26 AWG (0.15 mm²) - 5 cores												
Weight (with 2 meter lead wire)		Approx. 67g												

※1. S-0 : Set the sensor range (1999 ~ -1999) by self. The decimal place can be adjusted.
※2. If set pressure unit is psi, the value requires to ten multiply by display value.
※3. Hysteresis value is adjustable within 1 ~ 8 digits for one point set mode and window comparator mode.

B ORDERING INFORMATION

K P 4 1 0 - 0 1 0

Input Specifications

1 : Voltage input
2 : Current input

Output Channel

0 : 1 Channel

Input/Output Specifications

010 : 2 NPN outputs & Analog output (1~5V)
011 : 2 NPN outputs & Analog output (4~20mA)
030 : 2 PNP outputs & Analog output (1~5V)
031 : 2 PNP outputs & Analog output (4~20mA)
05 : 2 NPN outputs & Auto-shift input
07 : 2 PNP outputs & Auto-shift input

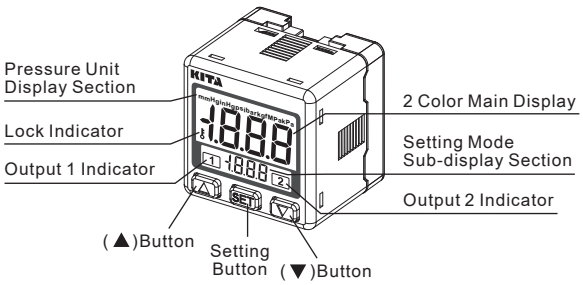
Standard Part

CN-0048-01 :
Power supply / Output connection cable

Optional Parts

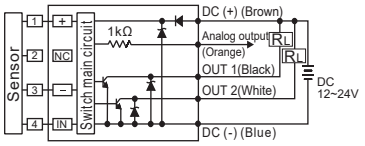
BT-8 : Mounting bracket
BT-9 : Mounting bracket
PA-C : Panel adapter
PA-D : Panel adapter + Front protective lid
CN-0046A : Sensor connector Ø0.8~Ø1.0 mm, 24~26AWG
CN-0046B : Sensor connector Ø1.0~Ø1.2 mm, 24~26AWG
CN-0046C : Sensor connector Ø1.2~Ø1.6 mm, 24~26AWG
KP10□-01 : Transducer

C PANEL DESCRIPTION

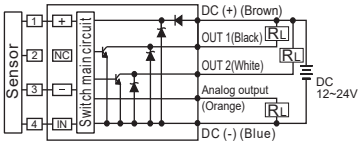


D OUTPUT CIRCUIT WIRING DIAGRAMS

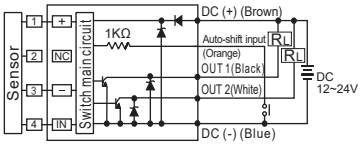
KP4□0-010
2NPN+Analog(Voltage) output



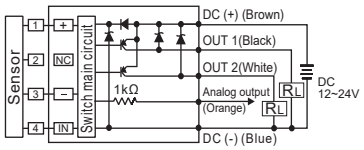
KP4□0-011
2NPN+Analog(Current) output



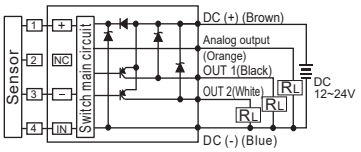
KP4□0-05
2NPN output + Auto-shift input



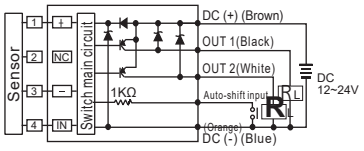
KP4□0-030
2PNP+Analog(Voltage) output



KP4□0-031
2PNP+Analog(Current) output

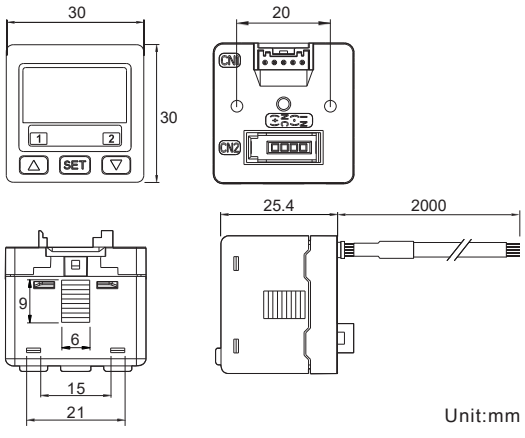


KP4□0-07
2PNP output + Auto-shift input



*Two wire current input only can be used "+" & "OUT" type.

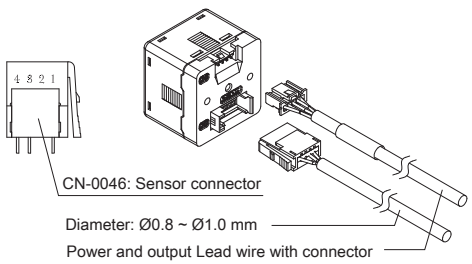
E DIMENSIONS



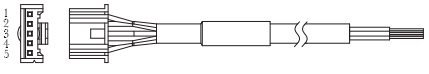
Unit:mm

F CONNECTOR

PIN No.	Wire Color
1	Brown (DC+)
2	NC
3	Blue (DC-)
4	Black (IN)

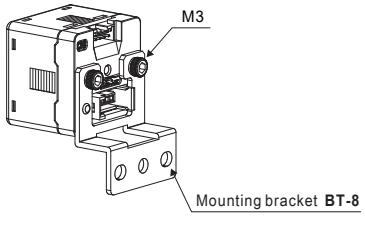


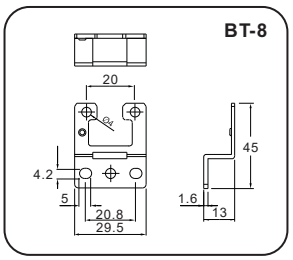
PIN No.	Wire Color
1	Brown (DC+)
2	Orange (Analog or Auto Shift)
3	White (OUT2)
4	Black (OUT1)
5	Blue (DC-)

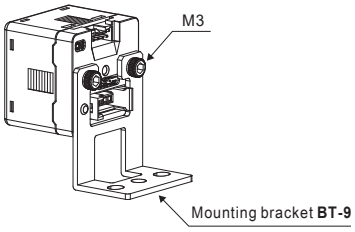


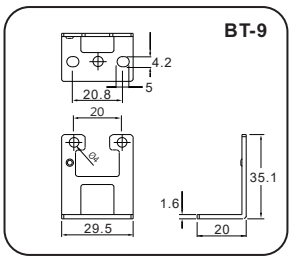
G OPTIONAL PARTS DIMENSIONS

① Mounting bracket

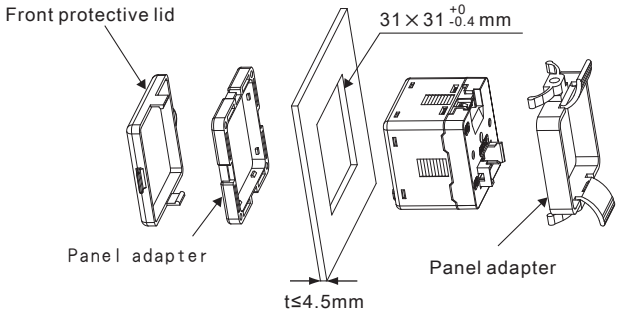


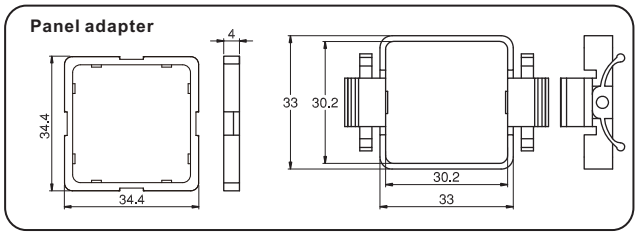


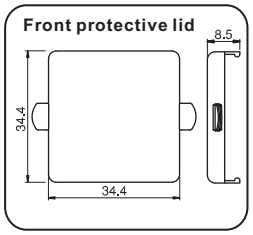




② Panel Mounting

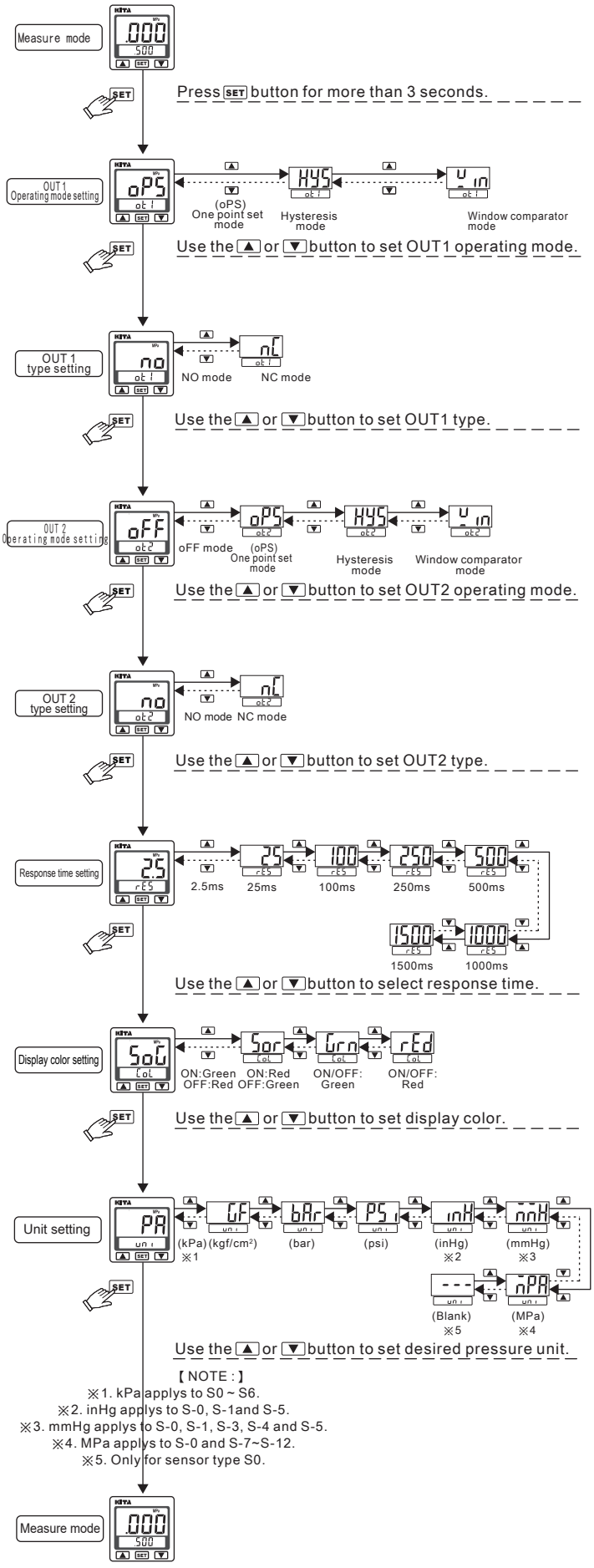




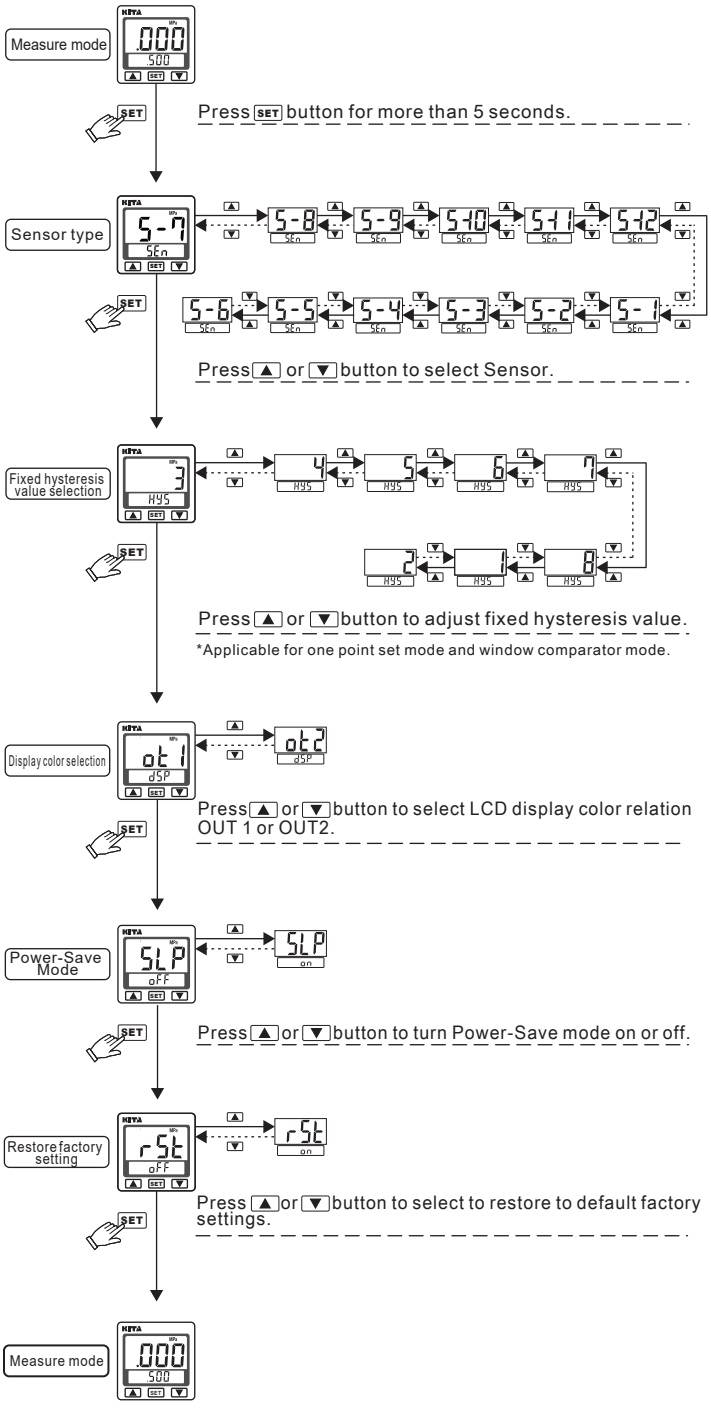


Unit:mm

H INITIAL SETTING MODE

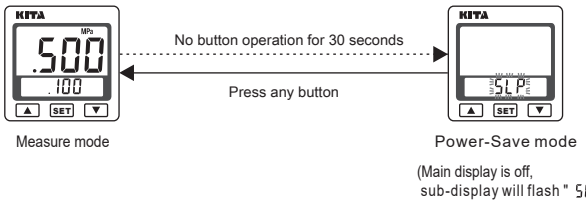


I ADVANCE SETTING MODE



J POWER-SAVE MODE

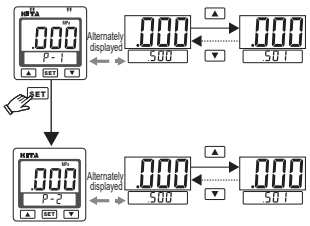
◎ During Power-Save mode, the main display will turned off if no buttons is pressed after 30 seconds.
◎ During Power-Save mode, the output LCD's may not be synchronize with the output. It is normal and will not affect output operation.
◎ Press any button to turn-on main display temporarily.



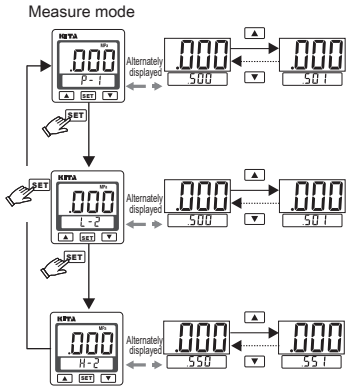
K PRESSURE SETTING MODE

◎ Setting Condition 1 :
OUT 1 mode setting :
" oPS " (One point set mode)
OUT 2 mode setting :
" oFF " (Not used)

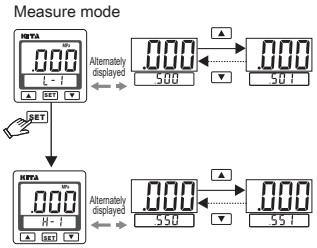
◎ Setting Condition 2 :
OUT 1 mode setting :
oPS (One point set mode)
" "
oPS (One point set mode)
OUT 2 mode setting :



◎ Setting Condition 3 :
OUT 1 mode setting :
" oPS " (One point set mode)
OUT 2 mode setting :
" HYS " (Hysteresis mode)
" Win " (Window comparator mode)



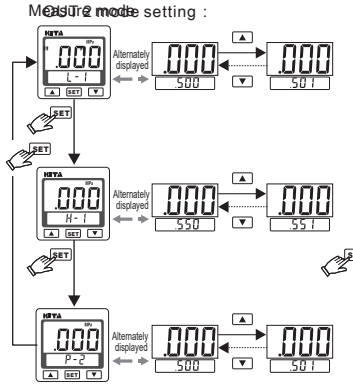
◎ Setting Condition 4 :
OUT 1 mode setting :
" HYS " (Hysteresis mode)
" Win " (Window comparator mode)
OUT 2 mode setting :
" oFF " (Not used)



◎ Setting Condition 5 :
OUT 1 mode setting :
HYS (Hysteresis mode)
" Win " (Window comparator mode)

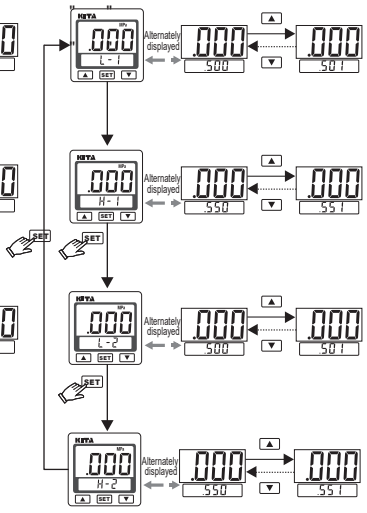
" oPS " (One point set mode)

Measure mode
OUT 2 mode setting :



◎ Setting Condition 6 :
OUT 1 mode setting :
HYS (Hysteresis mode)
" Win " (Window comparator mode)

" HYS " (Hysteresis mode)
Win (Window comparator mode)
OUT 2 mode setting :
Measure mode

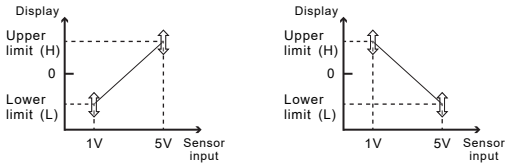


【NOTE :】
Do not disconnect power when the sub-display and setting value is flashing alternately; otherwise the system cannot store the values.

L S-0 PRESSURE SETTING MODE

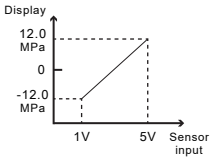
The pressure can be set to the value within the range of ±1999, and decimal place can be adjusted.

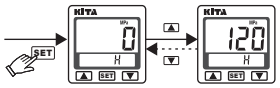
※NOTE : Upper limit (H) and lower limit (L) can't be set the same polarity.



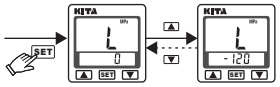
	S-0
Upper(H)	000
~	
Lower(L)	000

Ex.) ±12.0 MPa

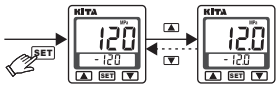




Upper(H) limit setting



Lower(L) limit setting

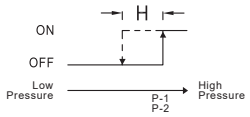


Decimal places setting

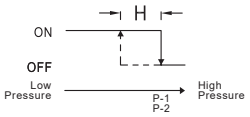
M OUTPUT TYPE

(1) One point set mode:

Normal open mode

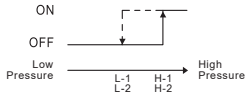


Normal close mode

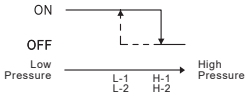


(2) Hysteresis mode:

Normal open mode

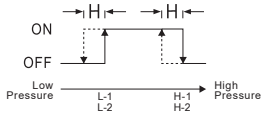


Normal close mode

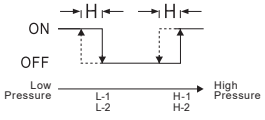


(3) Window comparator mode:

Normal open mode



Normal close mode



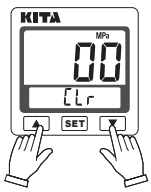
【NOTE :】

*1. In case hysteresis is set at less than or equal to 3 digits, switch output may chatter if input pressure fluctuates near the set point.

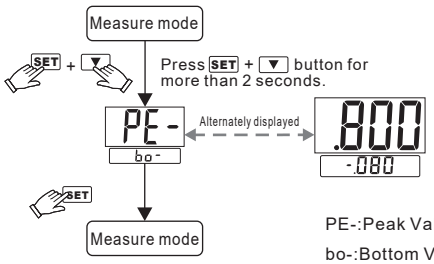
*2. When using window comparator mode, the difference between two set points must be greater than the fixed hysteresis, otherwise will cause the switch output to malfunction.

N ZERO POINT SETTING

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



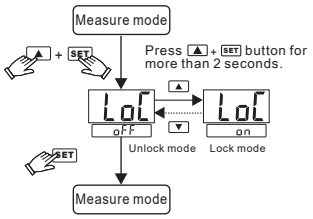
O PEAK/BOTTOM HOLD FUNCTION



PE-:Peak Value

bo-:Bottom Value

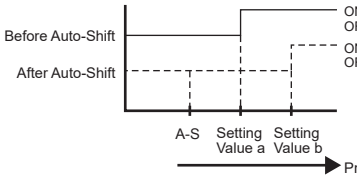
P KEY LOCK/UNLOCK MODE



◎ Use key lock mode to prevent unauthorized or accidental tampering with the switch setting.

◎ When lock mode is selected, panel will display " ⚷ ".

Q AUTO-SHIFT MODE



Pressure value by Auto-shift (A-S)

Comfirmed value after Auto-shift b=a+(A-S)

When(A-S) value is 200kPa and "a" is 300kPa, "b" is 500kPa after Auto-shift.

R APPENDED TABLE

AWG	Diameter (mm)	Color of cover	KITA Product No.	Sumitomo 3M Ltd. Product No.
24~26	Ø0.8 ~ Ø1.0 mm	Red	CN-0046A	37104-3101-000FL
	Ø1.0 ~ Ø1.2 mm	Yellow	CN-0046B	37104-3122-000FL
	Ø1.2 ~ Ø1.6 mm	Orange	CN-0046C	37104-3163-000FL

S ERROR CODE INSTRUCTION

Error Type	Error code	Error Condition	Troubleshooting
Excess load current error	out1	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	Output 2 load current is more than 125 mA	
Residual pressure error	Er3	During zero reset, ambient pressure is over ±3% F.S. for S1~S12 or ±2% of setting range for S0.	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	

T PRESSURE UNIT CONVERSION TABLE

From \ To	Pa	kPa	MPa	kgf/cm²	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/cm²	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