

## For your safety, please read the following before using.

- ① Do not drop, hit or allow excessive shock. Even if switch body appears undamaged, internal components may be broken and can cause malfunction.
- ② Turn power off before connecting wiring. Wrong wiring or short circuit will damage and / or cause malfunction.
- ③ Do not use in environment containing steam or oil vapor.
- ④ This product is not explosion-proof rated. Do not use in atmosphere containing flammable or explosive gases.
- ⑤ Wiring for pressure controller should avoid power source line and high voltage line. If use in the same circuit, noise may cause malfunction.

A. SPECIFICATIONS		EP400													
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	
Setting 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	
Setting 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/cm <sup>2</sup>		0.001	0.001	-	-	0.001	0.01	0.01	0.1	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	0.1	1	1
	psi		0.01	0.01	-	-	0.01	0.1	0.1	1	1	1	1	1(*5)	1(*5)
	inHg		0.1	-	-	-	0.1	-	-	-	-	-	-	-	-
	mmHg		1	-	0.1	0.1	1	-	-	-	-	-	-	-	-
Power supply voltage		12 to 24V DC ±10%, Ripple (P-P) 10% or less													
Current consumption		≤ 40mA (With no load)													
Sensor input		1~5V or 4~20mA													
Switch output		NPN: open collector 2 outputs Max. load current: 125mA Max. supply voltage: 30V DC Residual voltage: ≤ 1.5V						PNP: open collector 2 outputs Max. load current: 125mA Max. supply voltage: 24V DC Residual voltage: ≤ 1.5V							
Repeatability (Switch output)		±0.1% F.S. ±1 digit													
Hysteresis	One point set mode	Adjustable (*2)													
	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													
7 segment LCD display		Two color(Red/Green) main & unit display, Orange sub-display (Sampling rate: 5 times/1sec.)													
Indicator accuracy		±1% F.S. ±1 digit (ambient temperature: 25 ±3°C)													
Switch ON Indicator		Orange (1 & 2 Indicator) OUT1 OUT2													
Analog output (Voltage Output) *3		Output Voltage: 1 to 5V ±2% F.S. (within rated pressure range) Linearity: ±1% F.S. Output impedance: about 1kΩ													
Analog output (Current Output) *4		Output Current: 4 to 20mA ±2% F.S.(within rated pressure range) Linearity: ±1% F.S. Max.Load Impedance: 300Ω at power supply of 12V 600Ω at power supply of 24V Min.Load impedance: 50Ω													
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	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 <sup>2</sup> (10G), 3 times each in direction of X, Y and Z													
Temperature characteristic		±0.5% F.S. of detected pressure (25°C) at temp. Range of 0~50°C													
Lead wire		Oil-resistance cable(0.15mm <sup>2</sup> )													
Weight		Approx. 67g (with 2 meter lead wire)													

\*1. S-0 : Set the sensor range ( 1999 ~ -1999 ) by self. The decimal place can be adjusted.

\*2. Hysteresis value is adjustable within 1 ~ 8 digits for one point set mode and window comparator mode.

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

\*4. If analog current output is selected, the analog voltage output cannot be selected at the same time.

\*5. If set pressure unit is psi, the value requires to ten multiply by display value.

## B. ORDERING INFORMATION

**EP4** 1 0 - 0 1 0

### Input Specifications

- 1 : Voltage input
- 2 : Current input

### Output Channel

0 : 1 Channel

### Standard Part

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

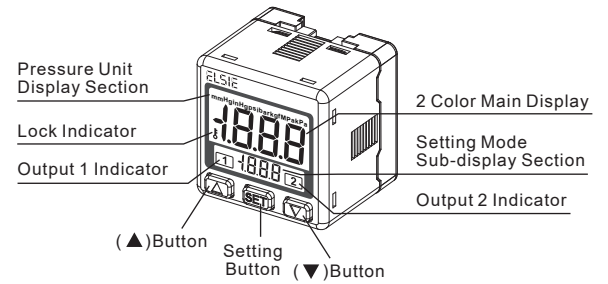
### Input/Output Specifications

- 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

### 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  $\varnothing 0.8 \sim \varnothing 1.0$  mm, 24~26AWG
- CN-0046B : Sensor connector  $\varnothing 1.0 \sim \varnothing 1.2$  mm, 24~26AWG
- CN-0046C : Sensor connector  $\varnothing 1.2 \sim \varnothing 1.6$  mm, 24~26AWG
- P10□-01 : Transducer

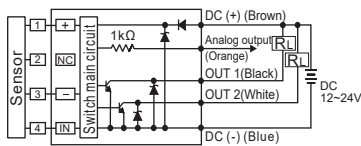
## C. PANEL DESCRIPTION



## D. OUTPUT CIRCUIT WIRING DIAGRAMS

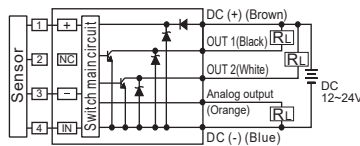
EP4□0-010

2NPN+Analog(Voltage) output



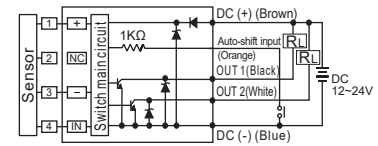
EP4□0-011

2NPN+Analog(Current) output



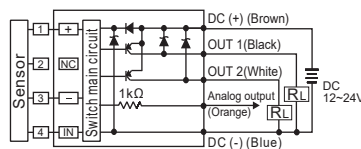
EP4□0-05

2NPN output + Auto-shift input



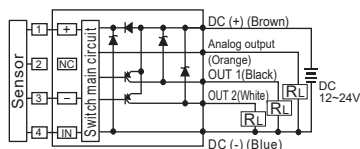
EP4□0-030

2PNP+Analog(Voltage) output



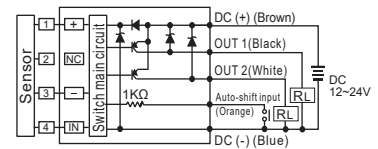
EP4□0-031

2PNP+Analog(Current) output



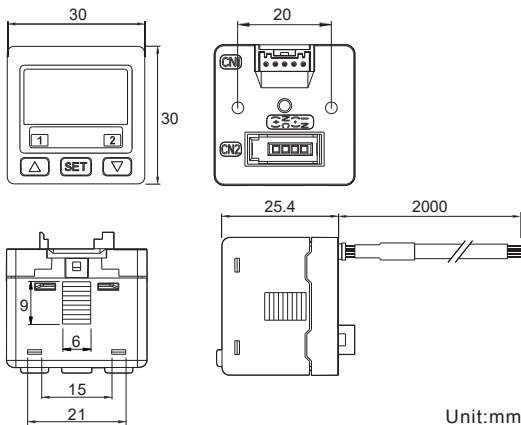
EP4□0-07

2PNP output + Auto-shift input



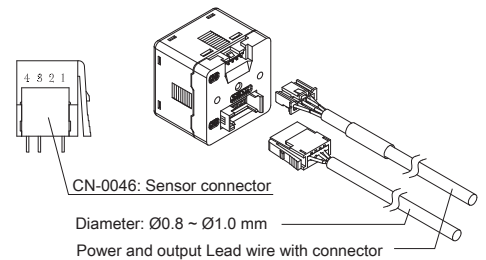
\*Two wire current input only can be used "+" & "OUT" type.

## E. DIMENSIONS

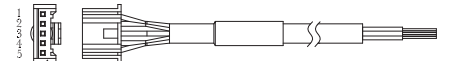


## F. CONNECTOR

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

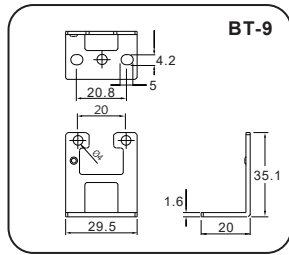
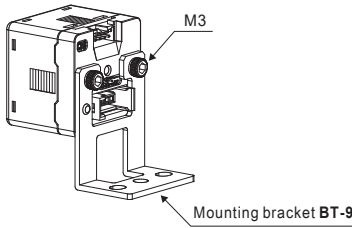
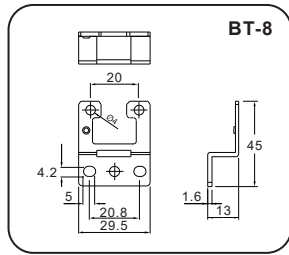
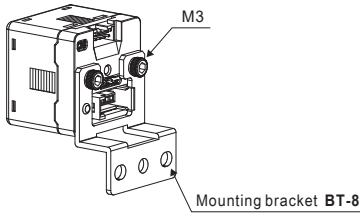


PIN No.	Wire Color
1	Brown (DC+)
2	Orange (Analog or Auto Shift)
3	White (OUT2)
4	Black (OUT1)
5	Blue (DC-)

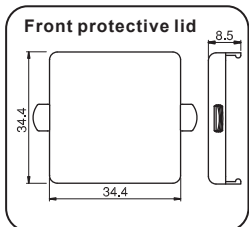
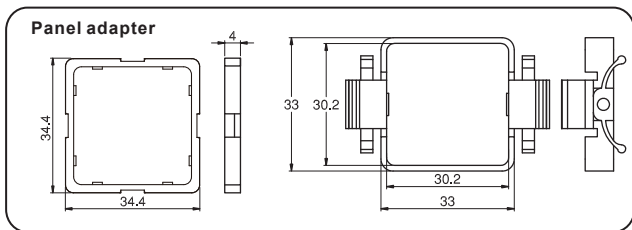
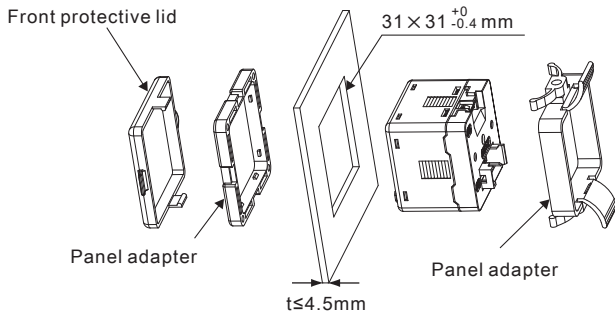


## G. OPTIONAL PARTS DIMENSIONS

### ① Mounting bracket

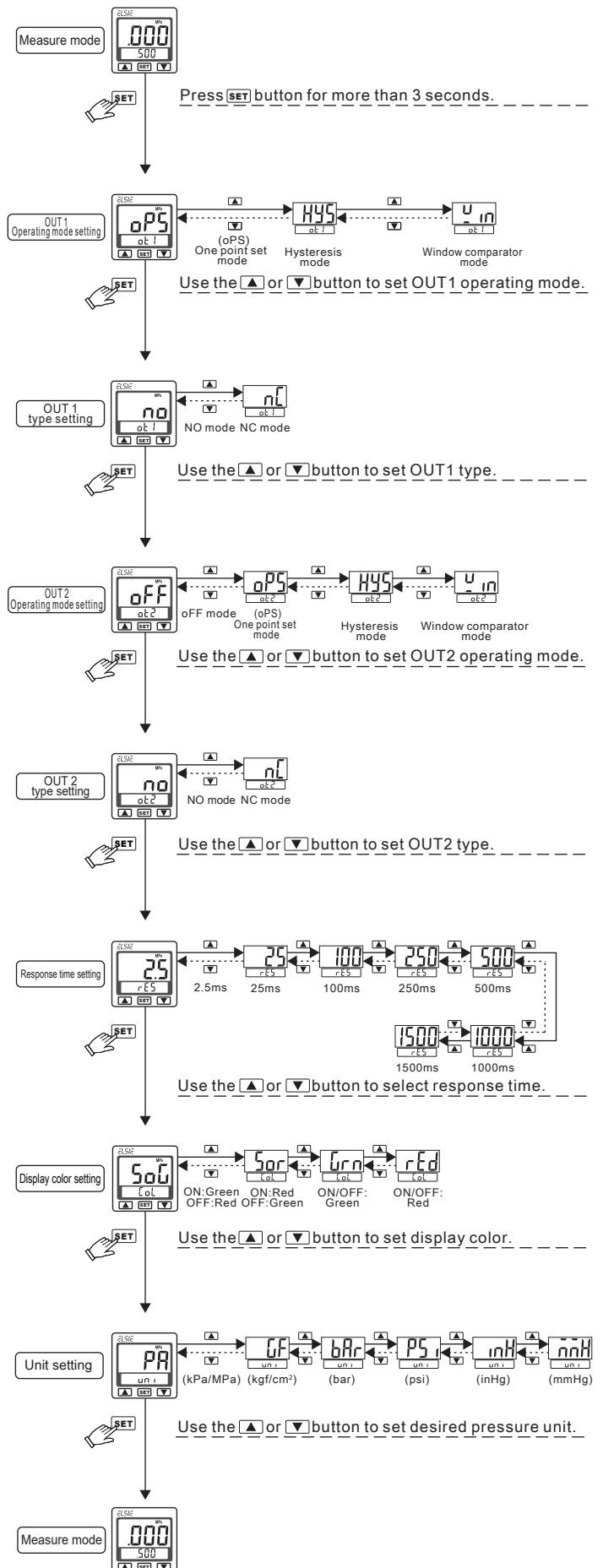


### ② Panel Mounting

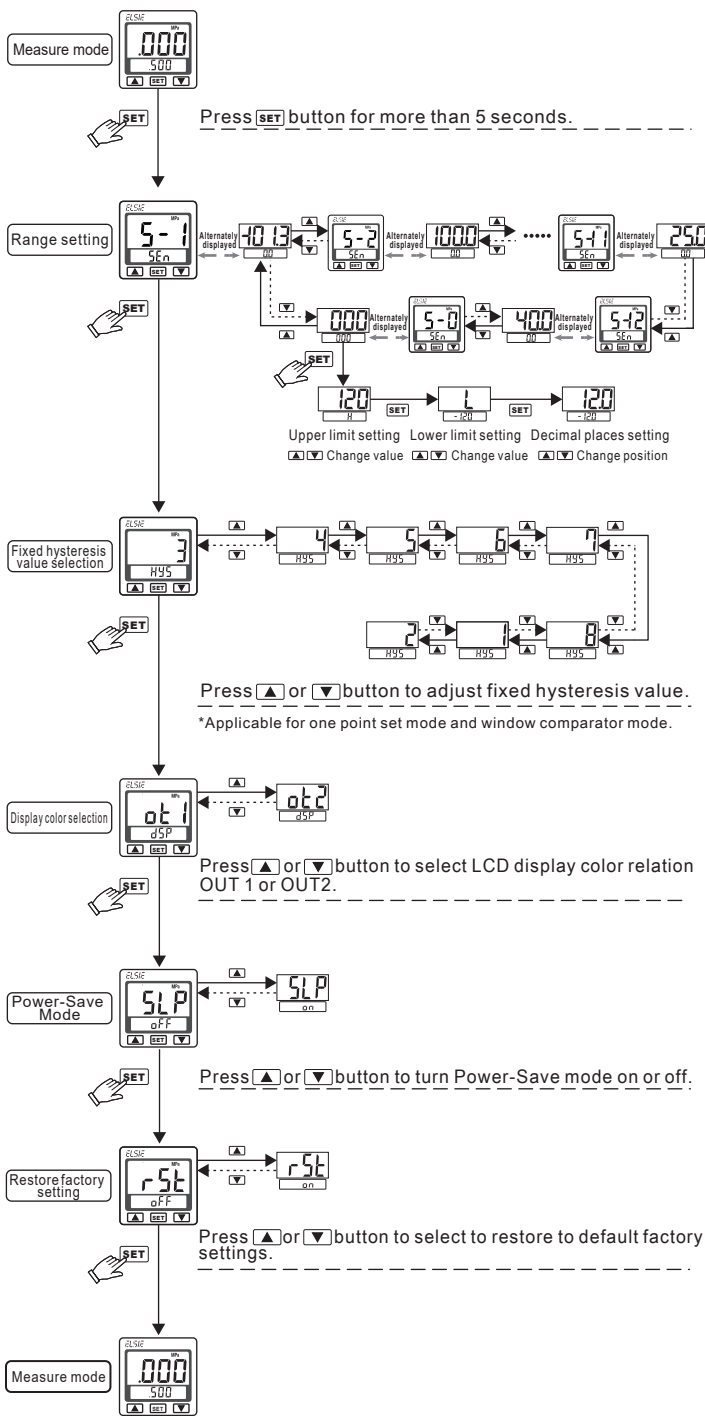


Unit:mm

## H. INITIAL SETTING MODE

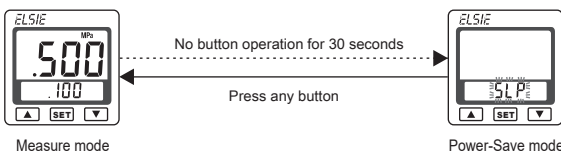


## I. ADVANCE SETTING MODE



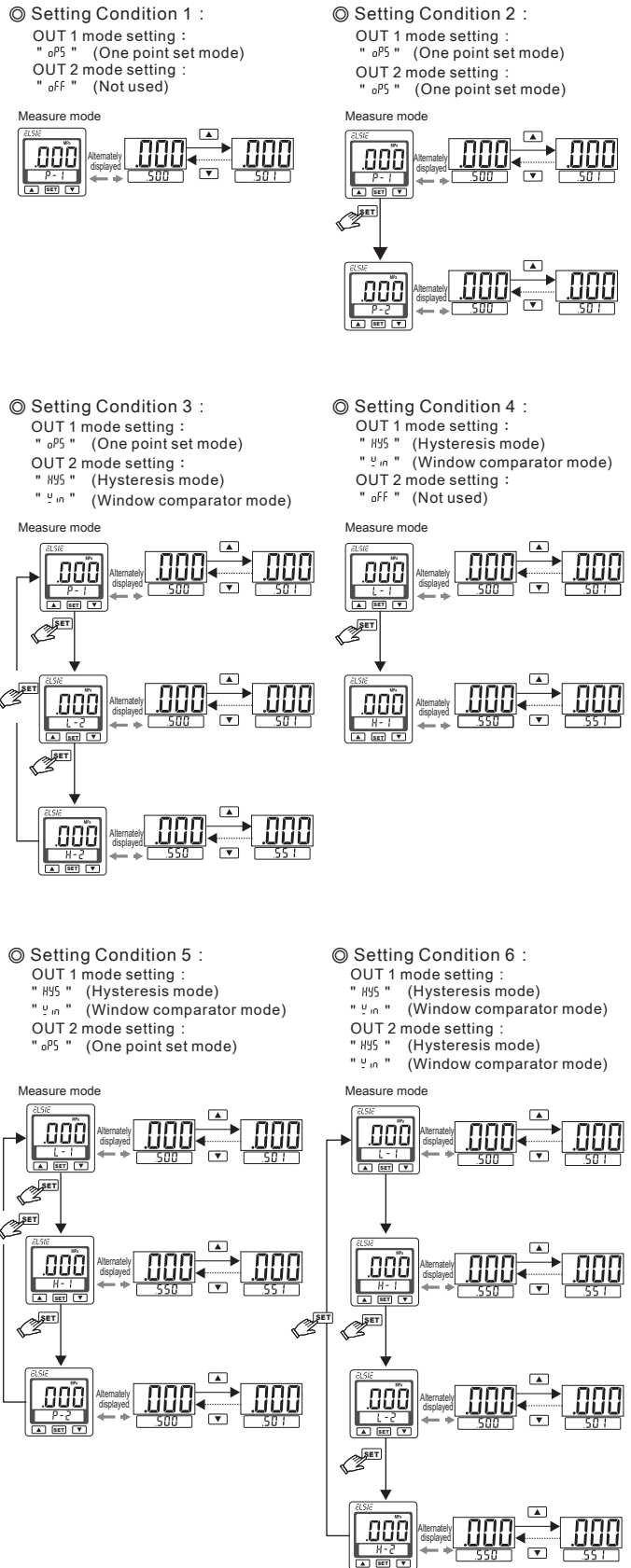
## J. POWER-SAVE MODE

- 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.



(Main display is off, sub-display will flash " 5LP ")

## K. PRESSURE SETTING MODE

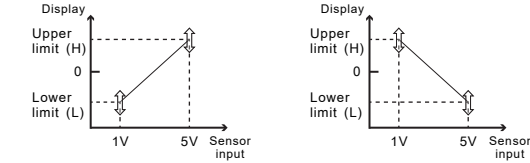


**[NOTE :]**  
 Do not disconnect power when the sub-display and setting value is flashing alternately; otherwise the system cannot store the values.

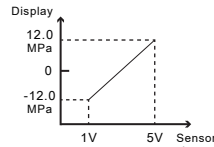
## L. S-0 PRESSURE SETTING MODE

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

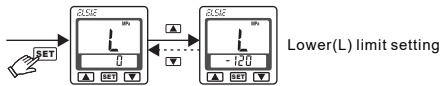
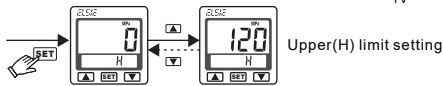
※NOTE : Upper limit (H) and lower limit (L) can't be set the same polarity.



Ex.)  $\pm 12.0$  MPa



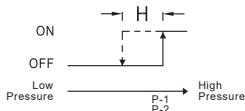
	S-0
Upper(H)	000
Lower(L)	000



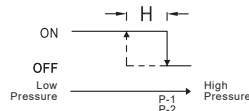
## M. OUTPUT TYPE

(1) One point set mode:

**Normal open mode**

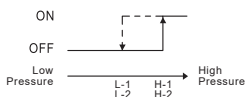


**Normal close mode**

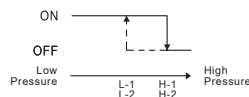


(2) Hysteresis mode:

**Normal open mode**

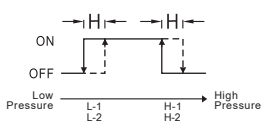


**Normal close mode**

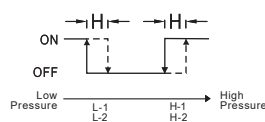


(3) Window comparator mode:

**Normal open mode**





**Normal close mode**

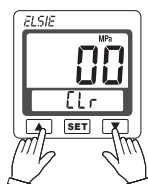


[NOTE :]

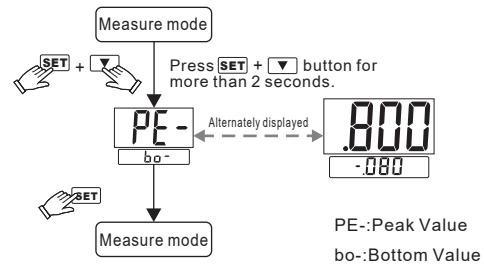
- In case hysteresis is set at less than or equal to 3 digits, switch output may chatter if input pressure fluctuates near the set point.
- When using window comparator mode, the difference between two set points must be greater than the fixed hysteresis, otherwise will cause the switch output to malfunction.

## N. ZERO POINT SETTING

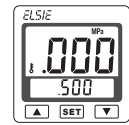
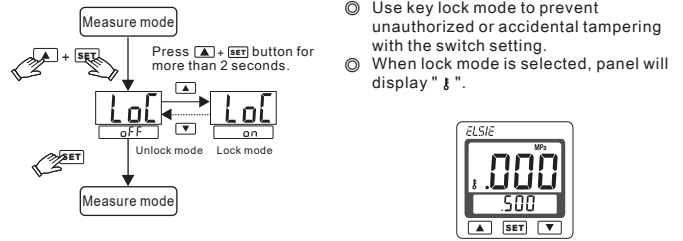
Press the  +  button at the same time until the "00" is shown. Release the button to end zero setting.



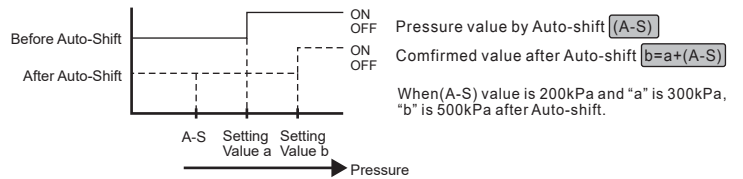
## O. PEAK/BOTTOM HOLD FUNCTION



## P. KEY LOCK/UNLOCK MODE



## Q. AUTO-SHIFT MODE



## R. APPENDED TABLE

AWG	Diameter (mm)	Color of cover	ELSIE Product No.	Sumitomo 3M Ltd. Product No.
24~26	$\varnothing 0.8 \sim \varnothing 1.0$ mm	Red	CN-0046A	37104-3101-000FL
	$\varnothing 1.0 \sim \varnothing 1.2$ mm	Yellow	CN-0046B	37104-3122-000FL
	$\varnothing 1.2 \sim \varnothing 1.6$ mm	Orange	CN-0046C	37104-3163-000FL

## S. ERROR CODE INSTRUCTION

Error Type	Error code	Error Condition	Troubleshooting
Excess load current error	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.
	Er2	Output 2 load current is more than 125 mA	
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	

## T. 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