

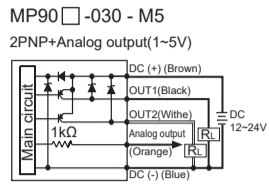
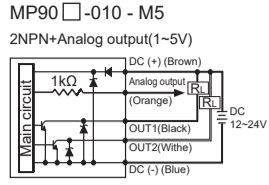
**For your safety, please read the following before using.**

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

**A. SPECIFICATIONS**

TYPE	MP90P-□-M5 (Positive)	MP90V-□-M5 (Vacuum)	MP90C-□-M5 (Compound)
Rated pressure range	0.000~1.000MPa	0.0~101.3kPa	-100.0~100.0kPa
Set pressure range	-0.100~1.000MPa	10.0~101.3kPa	-101.0~101.0kPa
Withstand pressure	1.5MPa	500kPa	
Fluid	Filtered Air, Non-corros / 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
	mmHg	—	0.1
Power supply voltage	12 to 24V DC ±10%, Ripple (P-P) 10% or less		
Current consumption	≤ 40 mA (with no load)		
Output type	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)	
Switch output	Residual voltage	≤ 1.5V	
	Response time	≤ 2.5ms (chattering-proof function: 25ms, 100ms, 250ms, 500ms, 1000ms and 1500ms selections)	
Analog output	Output short circuit protection	Yes	
	Voltage output Impedance	1~5V ±2.5% F.S. About 1kΩ	
Display	LED display	4 digit, 7 segment LED display (Red) (Sampling rate: 5 times / sec.)	
	Switch on indicator	Indicator Red: OUT1 & Indicator Green: OUT2	
Environment	Updates time	About 0.2s	
	Indicator accuracy	±2% F.S. ±1 digit (ambient temperature: 25 ±3°C)	
Enclosure	Repeatability (Switch output)	±0.2% F.S. ±1 digit	
	Enclosure	IP40	
Temperature characteristic	Operation ambient temp. range	0 ~ 50°C	
	Storage ambient temp. range	-10 ~ 60°C (No condensation or freezing)	
Insulation resistance	Ambient humidity range	35 ~ 85% RH (No condensation)	
	Withstand voltage	1000V AC in 1-min (between case and lead wire)	
Vibration	Insulation resistance	50MΩ (at 500V DC, between case and lead wire)	
	Vibration	Total amplitude 1.5mm or 10G, 10Hz-150Hz scan for 1 minute, two hours each direction of X, Y and Z	
Shock	Shock	980m/s <sup>2</sup> (100G), 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	M5		
Lead wire	Ø3.8 Oil-resistance cable (PVC) - 26 AWG (0.15 mm <sup>2</sup> ) - 5 cores		
Weight	Approx. 53g (with 2 meter lead wire)		

**B. OUTPUT CIRCUIT WIRING DIAGRAMS**



**C. ORDERING INFORMATION**

**MP90C-010-M5**

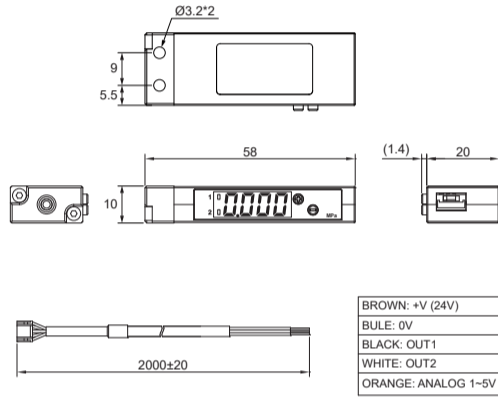
**Pressure Range**

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

**Output Specifications**

010 : 2 NPN + Analog output (1~5V)  
030 : 2 PNP + Analog output (1~5V)

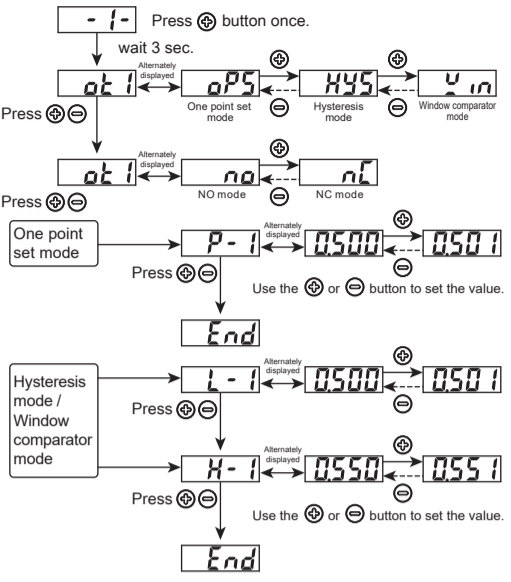
**D. DIMENSIONS**



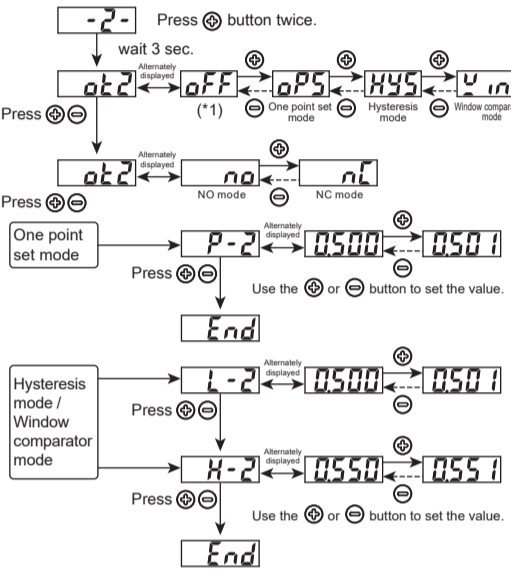
Unit:mm

**E. INITIAL SETTING MODE**

**1 OUT1 type setting**

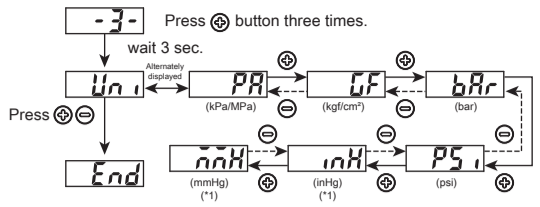


**2 OUT2 type setting**

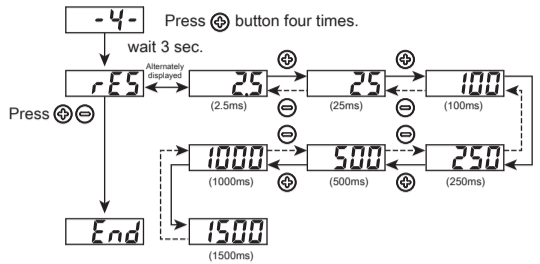


[NOTE :]  
\*1 When OUT2 Setting "oFF" directed end.

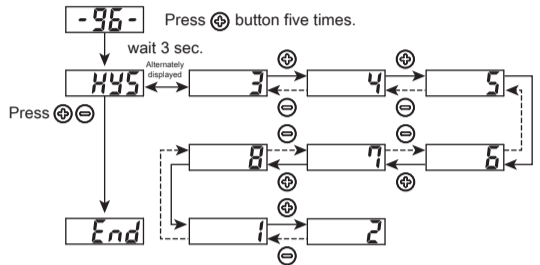
**3 Unit setting**



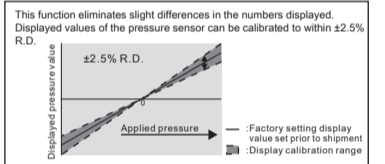
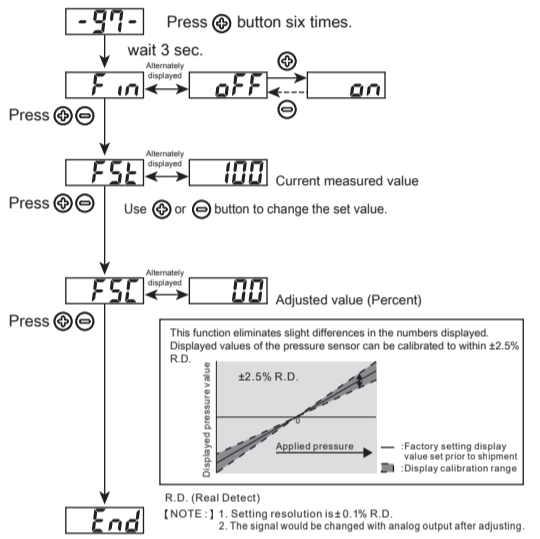
**4 Response time setting**



**5 Fixed hysteresis value selection**



**6 Display fine adjustment mode**

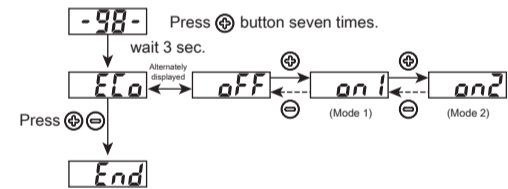


R.D. (Real Detect)  
[NOTE :] 1. Setting resolution is ±0.1% R.D.  
2. The signal would be changed with analog output after adjusting.

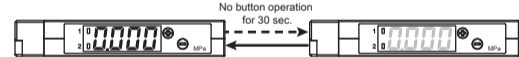
**E. INITIAL SETTING MODE**

**7 Power-Save mode**

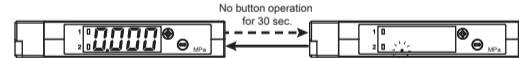
- During Power-Save mode, the main display will turned off if no buttons is pressed after 30 seconds.
- During Power-Save mode, the output LCD may not be synchronz with the output. It is normal and will not affect output operation.
- Press any button to turn-on main display temporarily.



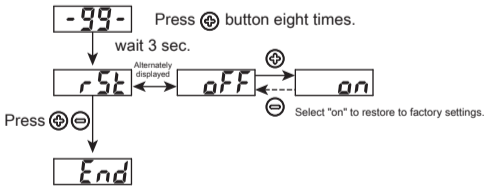
Mode 1  
The brightness of the display is reduced.



Mode 2  
Only the decimal point flashes.

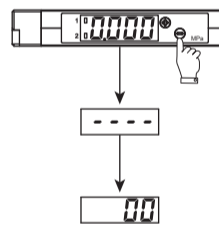


**8 Restore factory setting**



**F. ZERO POINT SETTING**

Press button for more than 3 sec. until "00" is shown.

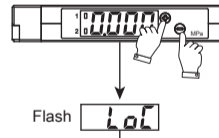


\*Zero resetting is possible only with an atmospheric pressure equivalent to 3% or less of F.S.

**G. KEY LOCK MODE**

Key lock mode can prevent operation mistakes.

Press button and button at the same time for 3 sec.

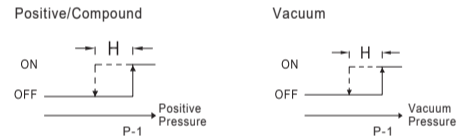


\*Unlock setting : Press button and button at the same time until the 'UnL' is displayed.

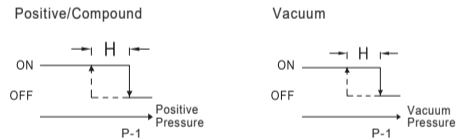
**H. OUTPUT TYPE**

(1) One point set mode:

**Normal open mode**

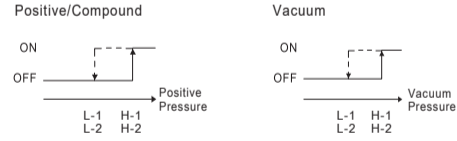


**Normal close mode**

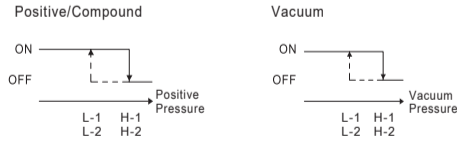


(2) Hysteresis mode:

**Normal open mode**

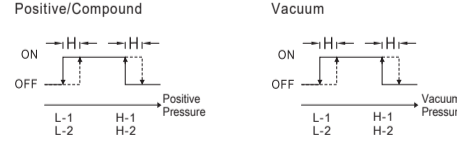


**Normal close mode**

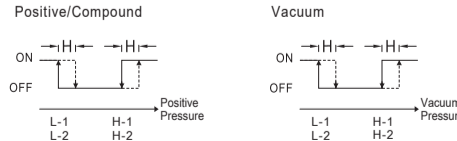


(3) Window comparator mode:

**Normal open mode**



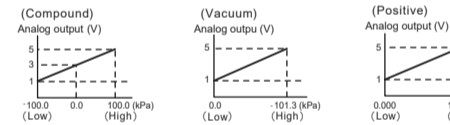
**Normal close mode**



[NOTE :]  
\*1. In case hysteresis is set at less than or equal to 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.

**I. ANALOG OUTPUT DESCRIPTION**

Analog output range 1 to 5V , proportional to the pressure range.



**J. PRESSURE UNIT CONVERSION TABLE**

From	To	Pa	kPa	MPa	kgf/cm <sup>2</sup>	psi	bar	mmHg
1 Pa	1	0.001	0.000001	0.000010197	0.000145038	0.0001	0.0002953	0.000750061
1 kPa	1000.000	1	0.001000	0.010197	0.145038	0.010000	0.2953	0.750061
1 MPa	1000000	1000	1	10.197	145.038	10	295.2998	750.061
1 kgf/cm <sup>2</sup>	98066.5	98.0665	0.0980665	1	14.2233	0.980665	28.95979	73.5559
1 psi	6895	6.895	0.006895	0.07031	1	0.06895	2.036074	51.7149
1 bar	100000.0	100.0000	0.100000	1.01972	14.5038	1	29.52998	750.061
1 mmHg	3386.388	3.386388	0.003386	0.034530	0.491141	0.033863	1	1.333224

**K. ERROR CODE INSTRUCTION**

Error Type	Error Code	Error Condition	Troubleshooting
Excessload 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.
Residual pressure error	Err2	Output 2 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.
Applied pressure error	Err	During zero reset, ambient pressure is over 53% F.S.	Change input pressure to ambient pressure and perform zero reset again.
Applied pressure error	FFF	Supply pressure exceeds the upper limit of pressure setting.	Adjust the pressure within operating pressure range.
Applied pressure error	-ff	Supply pressure exceeds the lower limit of pressure setting.	Adjust the pressure within operating pressure range.
System error	Er4	Internal system error Internal data error	Turn power off, and then restart. If error condition remains, please return to factory for inspection.

