KP90 Series | Slim Pressure Sensor

KITA

PR-0412F 2024/02 Online Version

CE UKCA

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 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		KP90C (Compound Pressure)	KP90V (Vacuum Pressure)	KP90P (Positive Pressure)
Rated pressure range		-100.0 ~ 100.0 kPa	0.0 ~ -101.3 kPa	0.000 ~ 1.000 MPa
Set pressure range		-101.0 ~ 101.0 kPa	10.0 ~ -101.3 kPa	-0.100 ~ 1.000 MPa
Withstand pressure		500 kPa		1.5 MPa
Fluid		Filtered air, Non-corrosive / Non-flammable gas		
Set pressure resolution	kPa	0.1		—
	MPa	—		0.001
	kgf/cm^2	0.001		0.01
	bar	0.001		0.01
	psi	0.01		0.1
	inHg	0.1		—
	mmHg	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		± 0.2 % F.S. ± 1 digit		
Hysteresis	Hysteresis mode	Adjustable		
	Window comparator mode	Fixed (3 digits)		
Response time		≤ 2.5ms (chattering-proof function: 25ms, 100ms, 250ms, 500ms, 1000ms and 1500ms selectable)		
Output short circuit protection		Yes		
Display		4 digital, 7 segment LED display (Red) (Sampling rate : 5 times / sec.)		
Indicator accuracy		±2% F.S. ±1 digit (ambient temperature : 25±3℃)		
Switch on indicator		Red Indicator : OUT1 & Green Indicator : OUT2		
Analog output (Voltage output)		Output voltage : 1 ~ 5V ±2.5%F.S. (within rated pressure range) Linearity : ±1% F.S. Output impedance : 1 kΩ		
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 ~ 150 Hz ~ 10 Hz scan for 1 minute, 2 hours each direction of X, Y and Z		
	Shock	980 m/s^2 (100 G), 3 times each in direction of X, Y and Z		
Temperature characteristic		±2% F.S. of detected pressure (25℃) at temp. (Range of 0 ~ 50℃)		
Port size		M5 : M5 female thread		
Lead wire		Ø3.8 Oil-resistance cable (PVC) - 26 AWG (0.15 mm^2) - 5 cores		
Weight (with 2 meter lead wire)		Approx. 53g		

B ORDERING INFORMATION

K P 9 0 C - 0 1 0 - M 5

Pressure Range

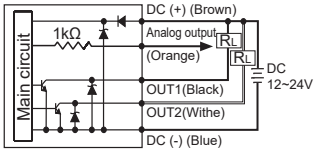
C : Compound (-101.0 ~ 101.0 kPa)
V : Vacuum (10.0 ~ -101.3 kPa)
P : Positive (-0.100~1.000 MPa)

Output Specifications

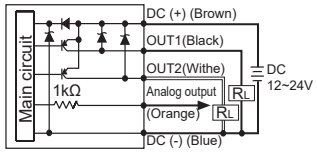
010 : 2 NPN output + Analog output (1~5V)
030 : 2 PNP output + Analog output (1~5V)

C OUTPUT CIRCUIT WIRING DIAGRAMS

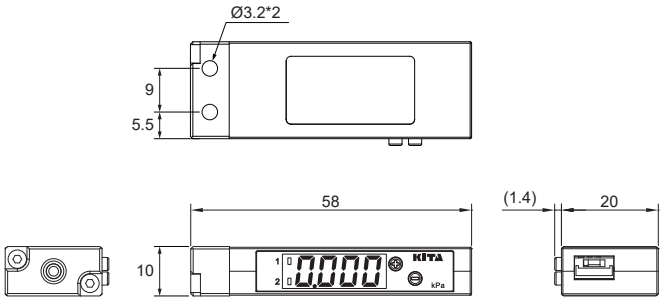
KP90 □-010 - M5
2NPN+Analog output (1~5V)

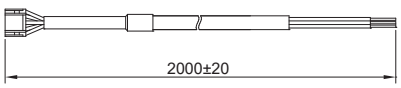


KP90 □-030 - M5
2PNP+Analog output (1~5V)



D DIMENSIONS



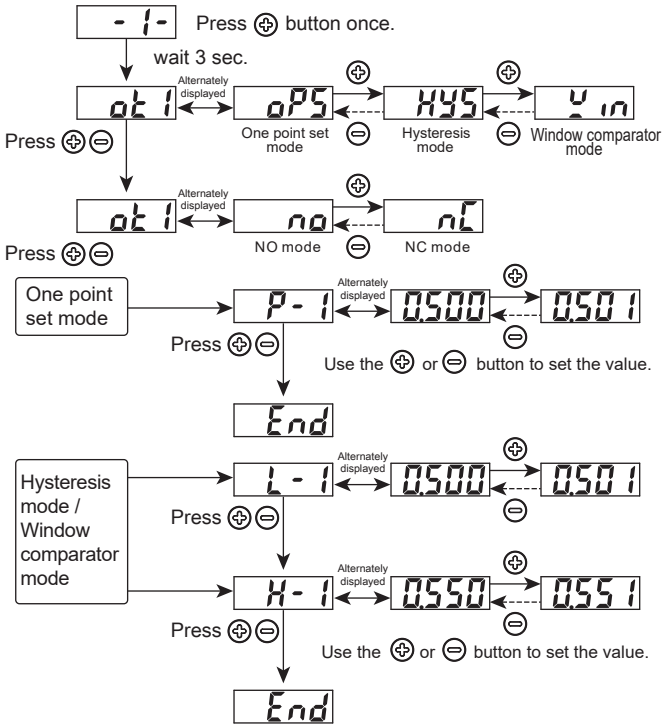


BROWN: +V (24V)
BULE: 0V
BLACK: OUT1
WHITE: OUT2
ORANGE: ANALOG 1~5V

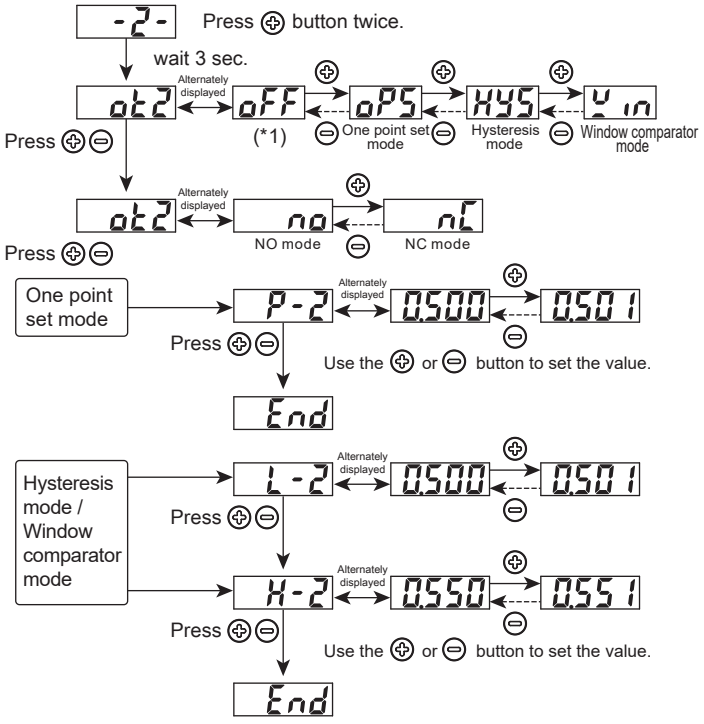
Unit:mm

E INITIAL SETTING MODE

1 OUT1 type setting



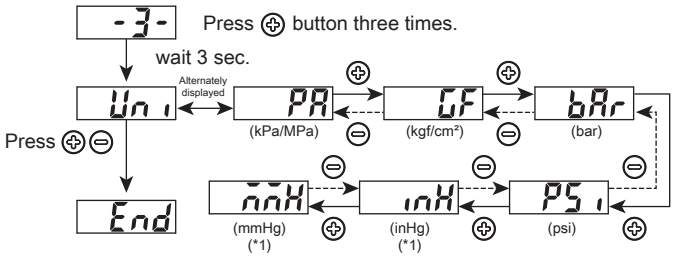
2 OUT2 type setting



【NOTE :】
*1 When OUT2 Setting “oFF” directed end.

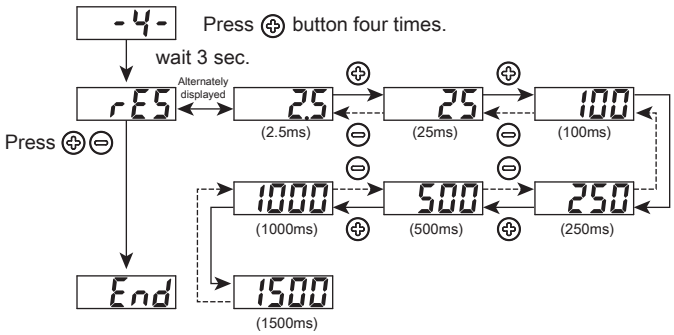
E INITIAL SETTING MODE

3 Unit setting

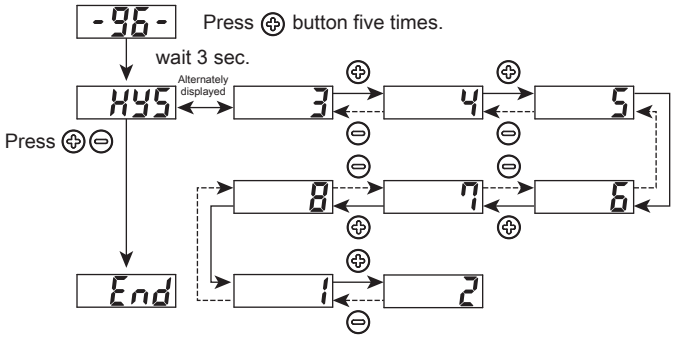


4 Response time setting

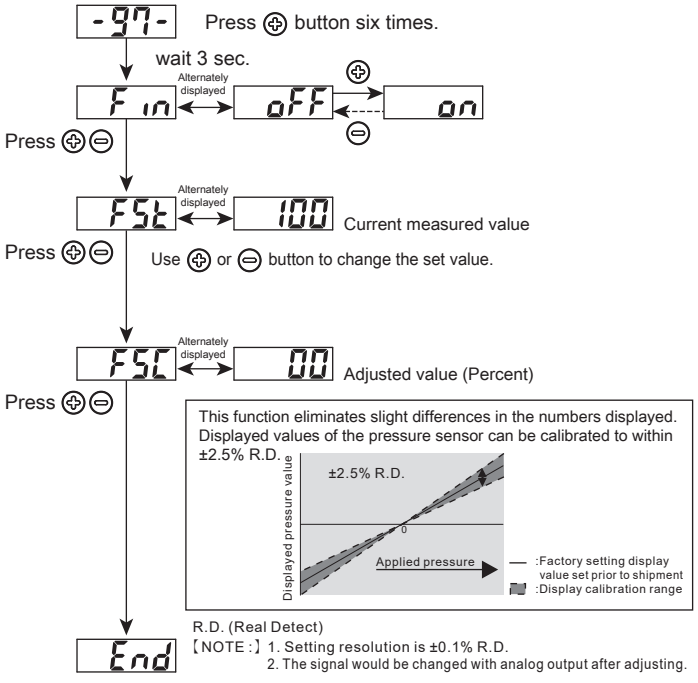
【NOTE :】
*1 Only applicable for Vacuum/Compound.



5 Fixed hysteresis value selection



6 Display fine adjustment mode

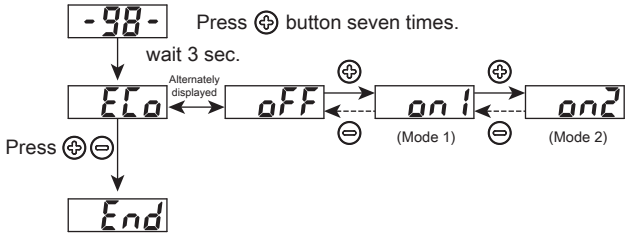


7 Power-Save mode

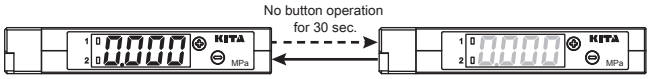
◎ During Power-Save mode, the main display will turned off if no buttons is pressed after 30 seconds.

◎ During Power-Save mode, the output LCD may not be synchronize with the output. It is normal and will not affect output operation.

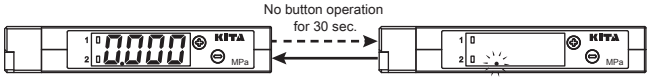
◎ Press any button to turn-on main display temporarily.



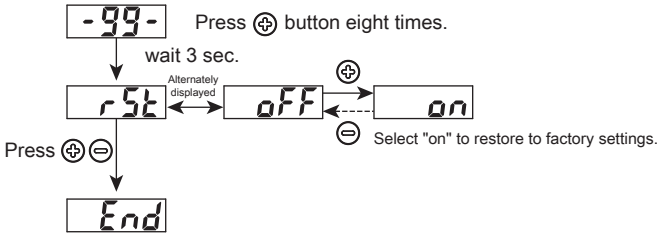
Mode 1
The brightness of the display is reduced.



Mode 2
Only the decimal point flashes.

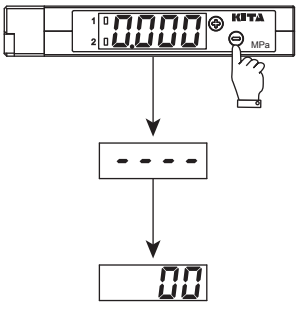


8 Restore factory setting



F ZERO POINT SETTING

Press ⊖ button for more than 3 sec. until “00” is shown.



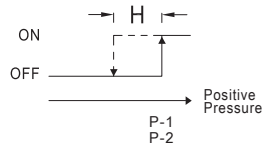
※Zero resetting is possible only with an atmospheric pressure equivalent to 3% or less of F.S.

G OUTPUT TYPE

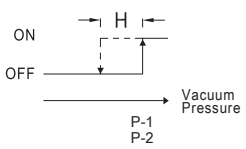
(1) One point set mode:

Normal open mode

Positive/Compound

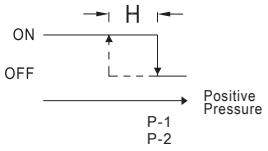


Vacuum

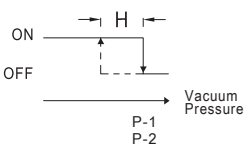


Normal close mode

Positive/Compound



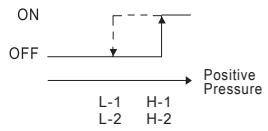
Vacuum



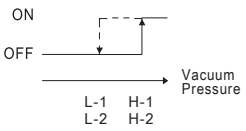
(2) Hysteresis mode:

Normal open mode

Positive/Compound

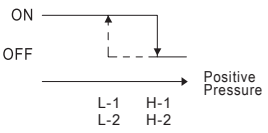


Vacuum

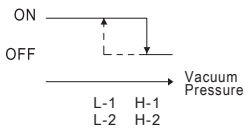


Normal close mode

Positive/Compound



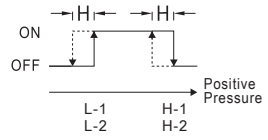
Vacuum



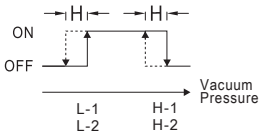
(3) Window comparator mode:

Normal open mode

Positive/Compound

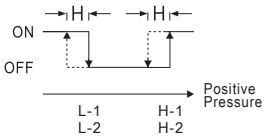


Vacuum

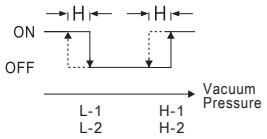


Normal close mode

Positive/Compound



Vacuum



【NOTE :】

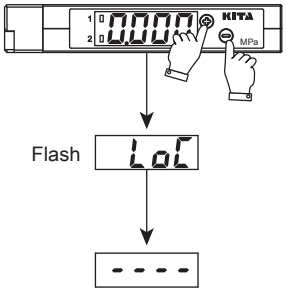
*1. In case hysteresis is set at less than or equal to 2 digits, switch output may chatter if input pressure fluctuates near the set point.

*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.

H KEY LOCK MODE

Key lock mode can prevent operation mistakes.

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

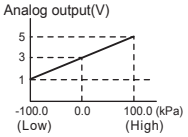


※Unlock setting : Press ⊕ button and ⊖ button at the same time until the UnC is displayed.

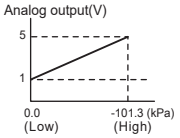
I ANALOG OUTPUT DESCRIPTION

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

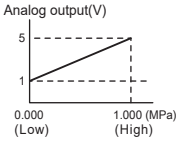
(Compound Pressure)
Analog output(V)



(Vacuum Pressure)
Analog output(V)



(Positive Pressure)
Analog output(V)



J 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

K ERROR CODE INSTRUCTION

Error Type		Error code	Error Condition	Troubleshooting
Excessload currenterror	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		Err	During zero reset, ambient pressure is over ±3% 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.
		-FF	Supply pressure exceeds the lower limit of pressure setting.	
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.