METAL WORK PNEUMATIC

For your safety, please read the following before using.
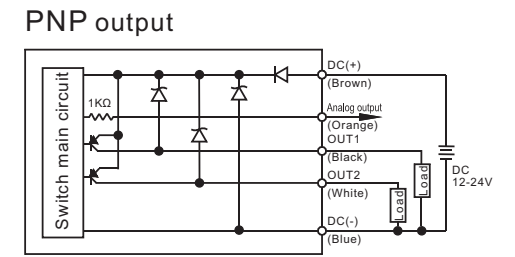
① Do not use corrosive or flammable gas or liquid with this product.

② Please use within the operating pressure range. Do not apply pressure beyond recommended maximum pressure, permanent damage to the pressure sensor may occur.

③ Do not drop, hit or allow excessive shock ($1000m/s^2$ or 100G). 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 switch should avoid power source line and high voltage line. If use in the same circuit, noise may cause malfunction.

SPECIFICATIONS

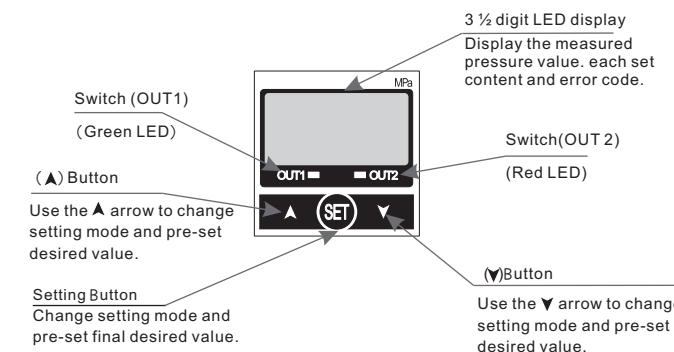| SPECIFICATIONS		CODE 9000600
Rated pressure range		0.000 ~ 1.000MPa/0.00 ~ 10.00 bar
Operating /Setting pressure range		-0.100 ~ 1.000MPa / -1.00 ~ 10.00 bar
Withstand pressure		1.5MPa/15 bar
Fluid		Air, Non-corrosive gases ,incombustible gases
Set pressure resolution	MPa	0.001
	kgf/cm^2	0.01
	bar	0.01
	psi	0.1
Power supply voltage		12 to 24VDC ±10%, Ripple (P-P) 10% or less
Current consumption		≦55mA
Switch output		PNP open collector 2 outputs Max. load current : 80mA Max. supply voltage: 24VDC Residual voltage :≦1V (load current 80mA)
Repeatability(Switch output)		≦±0.2% F.S. ±1digit
Hysteresis	Hysteresis mode	Adjustable
	Window comparator mode	Fixed(3 digits)
Response time		≦2.5ms (chattering-proof function: 24ms, 192ms and 768ms selections)
Output short circuit protection		Yes
7 segment LED display		3 1/2 digit LED display (Sampling rate: 5 times/1sec.)
Indicator accuracy		≦±2% F.S. ±1 digit (ambient temperature: 25 ±3°C)
Indicator		Green LED (OUT1) Red LED (OUT2)
Analog output		Output voltage: 1 to 5V ≦±2.5%F.S. (within rated pressure range) Linearity: ≦±1% F.S.
Environment	Enclosure	IP40
	Ambient temp. range	Operation: 0 ~ 50°C,Storage:-20 ~ 60°C (No condensation or freezing)
	Ambient humidity range	Operation/Storage: 35 ~ 85% RH (No condensation)
	Withstand voltage	1000VAC in 1-min (between case and lead wire)
	Insulation resistance	50Mohm min. (at 500VDC M, between case and lead wire)
	Vibration	Total amplitude 1.5mm,10Hz-55Hz-10Hz scan for 1 minute, two hours each direction of X,Y and Z
	Shock	980m/s^2(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		G 1/8
Lead wire		5-conductor oil-resistance cable(0.15mm^2)
Weight		105g(with 2-meter lead wire)

ORDERING INFORMATION

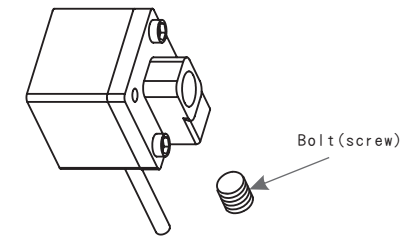|	
Positive pressure switch	Code 9000600
Mounting bracket BT-1+BT-2	Code 9000601
Panel adapter PA-1+PA-2	Code 9000602
Panel adapter+front protection lid PA-1+PA-2+FPC-1	Code 9000603

UNIT DIMENSION / PANEL INSTRUCTIONS

3 ½ digit LED display
Display the measured pressure value. each set content and error code.

Switch (OUT1) (Green LED)

Switch(OUT 2) (Red LED)

(▲) Button
Use the ▲ arrow to change setting mode and pre-set desired value.

(▼) Button
Use the ▼ arrow to change setting mode and pre-set desired value.

Setting Button
Change setting mode and pre-set final desired value.

TYPE OF SPARE PARTS / DIMENSION GRAPH

① **Mounting bracket**

Mounting bracket **BT-1**

Mounting bracket **BT-2**

BT-1 / BT-2

② **Panel type**

Front protective lid **FPC-1**

36×36 ± 0.3mm

Panel adapter **PA-1**

Panel adapter **PA-2**

t≦4.5mm

PA-1 / FPC-1 / PA-2

OUTPUT CIRCUIT WIRING GRAPH

PNP output

DC(+) (Brown)
Analog output (Orange)
OUT1 (Black)
OUT2 (White)
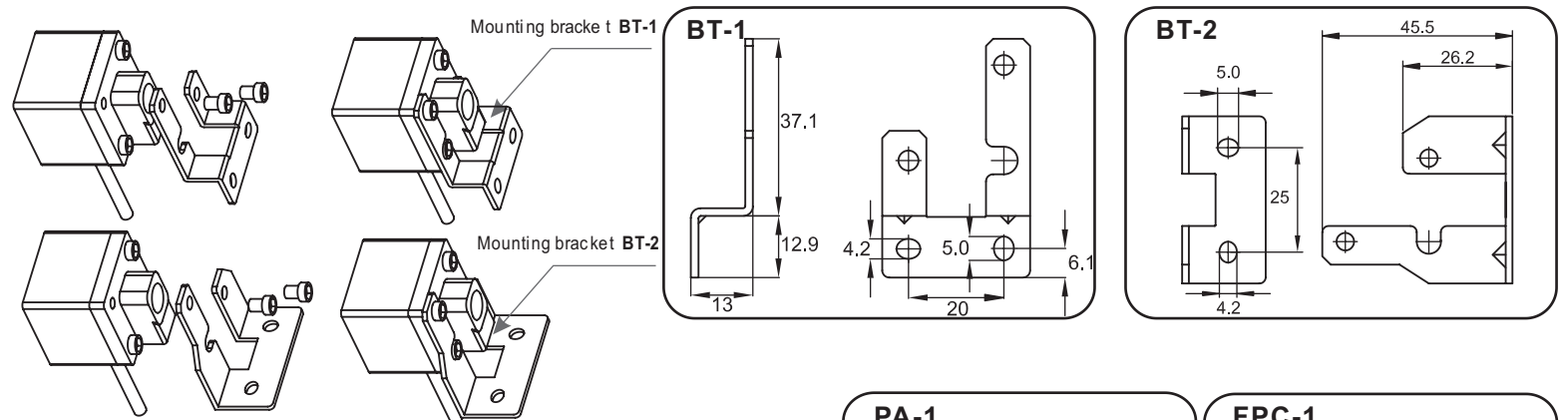DC(-) (Blue)
DC 12-24V

INSTALLATION

1. This product has two inlet pressure ports, select the one most convenient for installation.

2. Please plug the unused inlet port with supplied port plug. Use seal tape to prevent pressure leak.
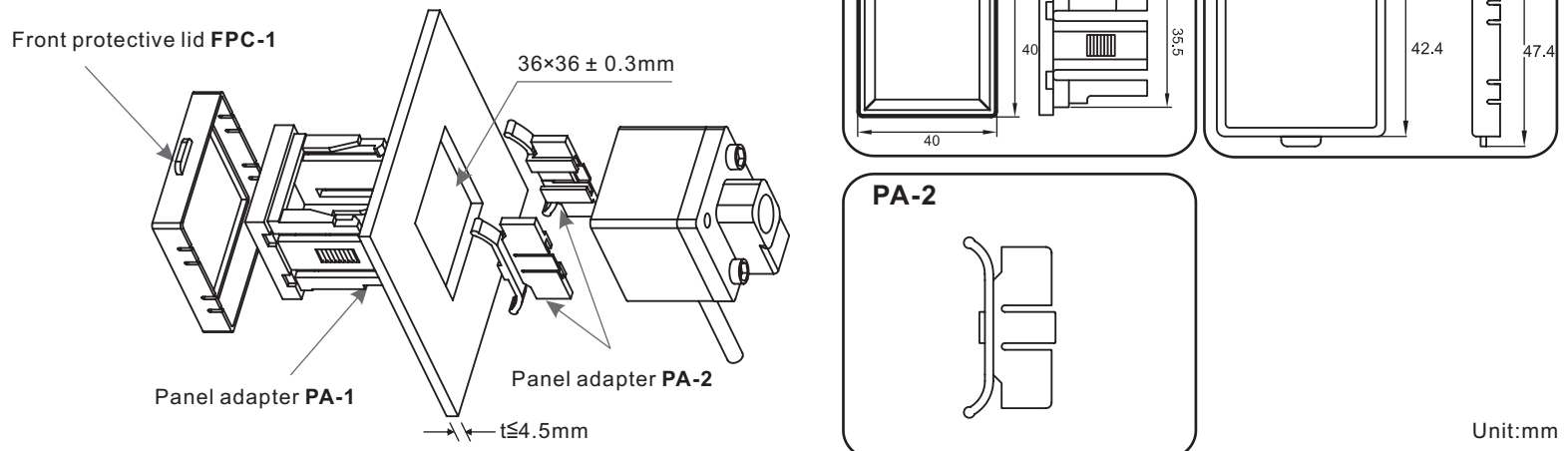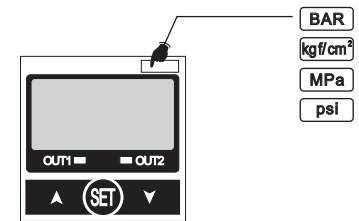

Bolt(screw)
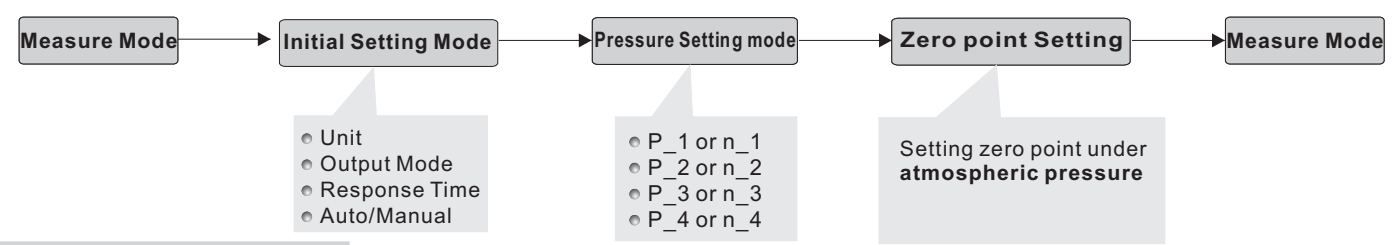
Unit:mm

Rev.1.0

![METAL WORK PNEUMATIC logo]

CHANGE PRESSURE UNIT TAG

When the pressure setting is not <u>MPa</u>, please remove the pressure unit tag and place the selected tag on the indicated area of the faceplate to assure the pressure unit is not misemployed and that setting error does not occur.
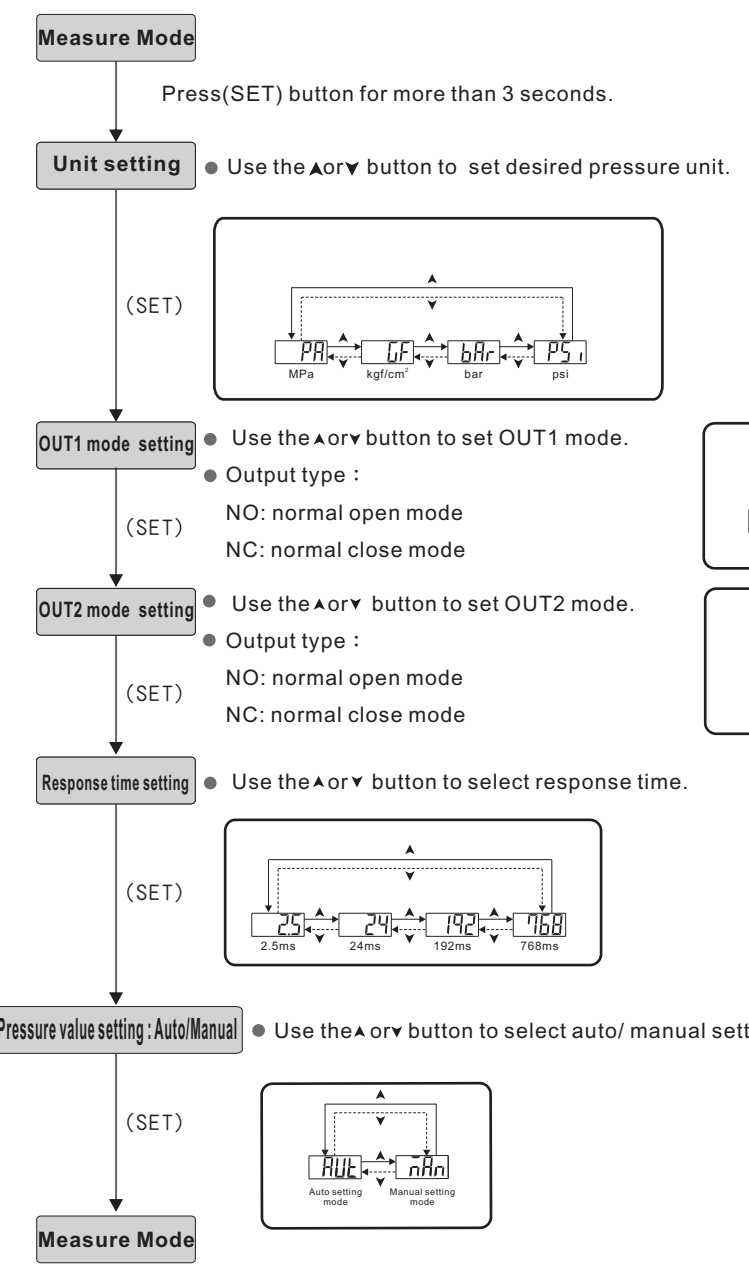
To From	Pa	MPa	kgf/cm^2	psi	bar
1 Pa	1	0.000001	0.000010197	0.000145038	0.00001
1 MPa	1000000	1	10.197	145.038	10
1 kgf/cm^2	98066.5	0.0980665	1	14.2233	0.980665
1 psi	6895	0.006895	0.07031	1	0.06895
1 bar	100000.0	0.100000	1.01972	14.5038	1

SETTING STEPS

Measure Mode → Initial Setting Mode → Pressure Setting mode → Zero point Setting → Measure Mode

- Unit
- Output Mode
- Response Time
- Auto/Manual

- P_1 or n_1
- P_2 or n_2
- P_3 or n_3
- P_4 or n_4

Setting zero point under **atmospheric pressure**

INITIAL SETTING MODE

Measure Mode

Press(SET) button for more than 3 seconds.

Unit setting ● Use the ▲or▼ button to set desired pressure unit.

(SET)

PA — GF — bAr — PSi
MPa kgf/cm^2 bar psi

OUT1 mode setting ● Use the ▲or▼ button to set OUT1 mode.
● Output type :
NO: normal open mode
NC: normal close mode

(SET)

1no — 1nc
no Mode nc Mode

OUT2 mode setting ● Use the ▲or▼ button to set OUT2 mode.
● Output type :
NO: normal open mode
NC: normal close mode

(SET)

2no — 2nc
no Mode nc Mode

Response time setting ● Use the ▲or▼ button to select response time.

(SET)

25 — 24 — 192 — 768
2.5ms 24ms 192ms 768ms

Pressure value setting : Auto/Manual ● Use the ▲or▼ button to select auto/ manual setting.
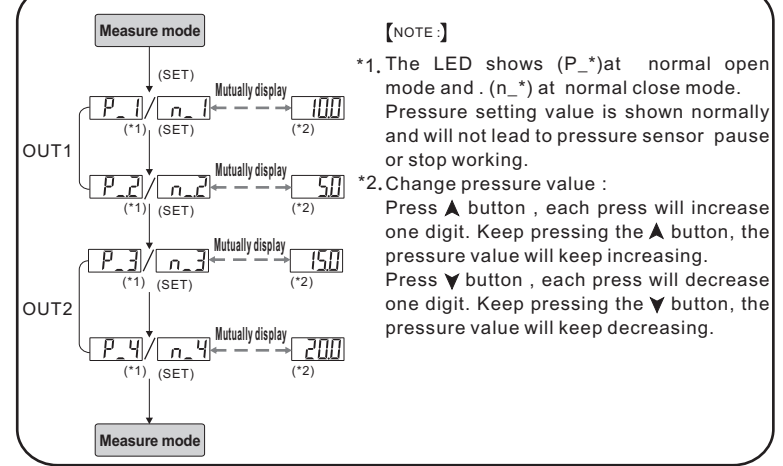
(SET)

AUt — nAn
Auto setting Manual setting
mode mode

Measure Mode

PRESSURE SETTING MODE

Select auto/manual setting mode during initial set-up

Manual setting mode

Measure mode
(SET)

OUT1
P_1 / n_1 Mutually display 100
(*1) (SET) (*2)

P_2 / n_2 Mutually display 50
(*1) (SET) (*2)

OUT2
P_3 / n_3 Mutually display 150
(*1) (SET) (*2)

P_4 / n_4 Mutually display 200
(*1) (SET) (*2)

Measure mode

【NOTE :】
*1. The LED shows (P_*)at normal open mode and . (n_*) at normal close mode. Pressure setting value is shown normally and will not lead to pressure sensor pause or stop working.
*2. Change pressure value :
Press ▲ button , each press will increase one digit. Keep pressing the ▲ button, the pressure value will keep increasing.
Press ▼ button , each press will decrease one digit. Keep pressing the ▼ button, the pressure value will keep decreasing.

Auto setting mode

Measure mode
(SET)

OUT1
AP1 / An1
(*1) (SET)

AiL
(*3) (SET)

OUT2
AP2 / An2
(*2) (SET)

A2L
(SET)

Measure mode

[Prepare auto setting mode at OUT1 switch.]
Under this mode, the device needs to be set repeatedly in order to reach the auto setting value.
[Prepare auto setting mode at OUT2 switch.]
Under this mode, the device needs to be set repeatedly in order to reach the auto setting value.

【NOTE :】
*1. In case of without need of OUT1 pressure value setting, press ▼+▲ at the same time to enter (AP2)/(An2).
*2. In case of without need of OUT2 pressure value setting,press ▼+▲ at the same time to enter measure mode.
3. The LED show 「AP」 at normal open mode and 「An*」 at normal close mode.

【 Calculation of Setting value 】

A=The max. pressure value under auto setting mode.
B=The min. pressure value under auto setting mode.

$$\frac{P1(n1)}{P3(n3)} = A - \frac{A-B}{4}$$

$$\frac{P2(n2)}{P4(n4)} = B + \frac{A-B}{4}$$

OUTPUT TYPE

Hysteresis Mode : P1(n1)>P2(n2) P3(n3)>P4(n4)
Output hysteresis value can be pre-set.

Normal open mode
ON
OFF
P_2 P_1
P_4 P_3
Positive Pressure

Normal close mode
ON
OFF
n_1 n_1
n_4 n_3
Positive Pressure

【Note :】 When hysteresis mode setting is within 2 digits, if the input and pre-set pressure is quite near, pressure sensor output might cause chattering.

Window comparator mode : P1(n1)<P2(n2) P3(n3)<P4(n4)
Within pressure setting range, pressure sensor output can be ON or OFF.

Normal open mode
H=3digits
ON
OFF
P_3 P_4
Positive Pressure

Normal close mode
H H
ON
OFF
n_3 n_2
n_4
Positive Pressure
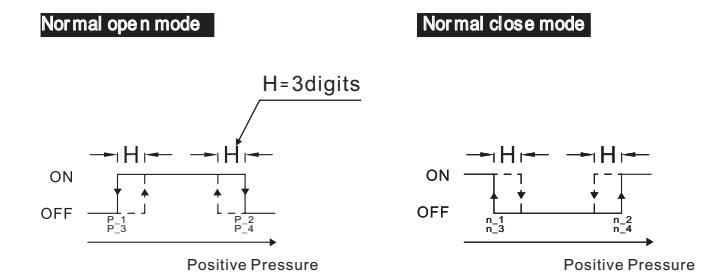
Note : Hysteresis is fixed in 3 digits.
Pressure value level setting : At least 6 digits.

ZERO POINT SETTING / THE MAX. & MIN. DISPLAY MODE

Zero setting :
● Press the ▼+▲ button at the same time until the "00" is shown. Release the button to end zero setting.
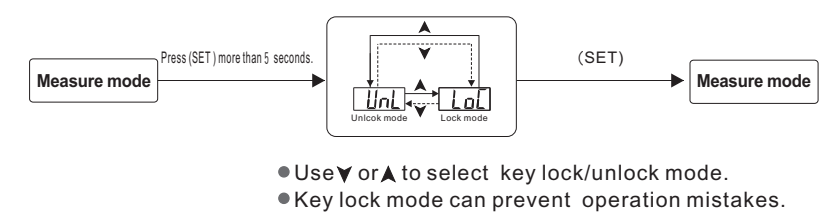
The Max. value display mode :
● Press ▲ button 2 seconds to enter the max. value mode, pressure sensor will detect the max. value and keep display.
● Press ▲ button 2 seconds to return to measure mode.

The Min. value display mode :
● Press ▼ button 2 seconds to enter the min. value mode, pressure sensor will detect the min.. value and keep display.
● Press ▼ button 2 seconds to return to measure mode.

KEY LOCK/UNLOCK MODE

Measure mode — Press (SET) more than 5 seconds. — UnL — LoL — (SET) — Measure mode
Unlock mode Lock mode

● Use ▼ or ▲ to select key lock/unlock mode.
● Key lock mode can prevent operation mistakes.

ERROR CODE INSTRUCTION

Error Name		Error code	Error instruction	Troubleshooting
Excess load current error	OUT1	Er1	Excess load current of 80 mA	Turn power off and check the cause of overload current or lower the current load under 80 mA, then restart.
	OUT2	Er2		
Residual pressure error		Er3	During zero reset, ambient pressure is over ±3 %F.S.	Change input pressure to ambient pressure and perform zero reset again.
Applied pressure error		- - -	The applied pressure is excess the upper limit of pressure setting.	Adjust the pressure within applied pressure range.
		_ _ _	The applied pressure is excess the lower limit of pressure setting.	
System error		Er4	Internal data error	Turn power off, and then restart. If error condition remains, please return to factory for inspection.
		Er6	Internal system error	
		Er7	Internal data error	
		Er8	Internal system error	