

Compact, Digital Display Pressure Sensors

■ Features

- High brightness red LED (LED height : 9.5mm)
- Min. display interval-Negative pressure: 0.1kPa
-Standard pressure: 0.1kPa, 1kPa
-Compound pressure: 0.2kPa
- Convertible pressure unit
- Negative, Compound pressure : kPa, kgf/cm², bar, psi, mmHg, mmH₂O, inHg
- Standard pressure : kPa, kgf/cm², bar, psi
- Various output modes : Hysteresis mode, Automatic sensitivity setting mode, Independent 2 output mode, Window comparative output mode
- Chattering prevention for output
(selectable response time : 2.5ms, 5ms, 100ms, 500ms)
- One-touch connector type for easy wiring and maintenance
- Analog output: voltage (1-5VDC)
- Reverse power polarity and overcurrent protection circuit
- Zero-point adjustment function, peak value monitoring function, bottom hold display

⚠ Please read "Safety Considerations" in the instruction manual before using.



PSA Series

PSB Series

PSB Series Connector type

■ Ordering Information

PS	A	V	01	C	P	Rc1/8	Pressure port	Rc1/8	Standard (PSA Series)
							Output type	NPT1/8	Option (PSA Series)
							Cable*1	M5	Standard (PSB Series)
							Pressure range	No mark	NPN open collector output
							Pressure type	P	PNP open collector output
							Appearance	No mark	Cable type
							Item	C	Connector type
								01	100kPa
								1	1,000kPa
								No mark	Standard pressure
								V	Negative pressure
								C	Compound pressure
								A	Regular square (30×30mm)
								B	Rectangular (cable type: 10.4×54.2mm connector type: 10×52mm)
								PS	Pressure Sensor

*1: It is only applied to PSB Series.

■ Pressure and Max. Pressure Display Range

Type	kPa	kgf/cm ²	bar	psi	mmHg	inHg	mmH ₂ O
Negative pressure	0.0 to -101.3 (5.0 to -101.3)	0.000 to -1.033 (0.051 to -1.033)	0.000 to -1.013 (0.05 to -1.013)	0.00 to -14.70 (0.74 to -14.70)	0 to -760 (38 to -760)	0.0 to -29.9 (1.5 to -29.9)	0.0 to -103.3 (5.2 to -103.3)
Standard pressure	0.0 to 100.0 (-5.0 to 110.0)	0.000 to 1.020 (-0.051 to 1.122)	0.000 to 1.000 (-0.050 to 1.100)	0.00 to 14.50 (-0.72 to 15.96)	—	—	—
	0 to 1000 (-50 to 1100)	0.00 to 10.20 (-0.51 to 11.22)	0.00 to 10.00 (-0.50 to 11.00)	0.0 to 145.0 (-7.2 to 159.6)	—	—	—
Compound pressure	-100.0 to 100.0 (-101.2 to 110.0)	-1.020 to 1.020 (-1.034 to 1.122)	-1.000 to 1.000 (-1.012 to 1.100)	-14.50 to 14.50 (-14.70 to 15.96)	-750 to 750 (-760 to 824)	-29.5 to 29.5 (-29.8 to 32.6)	-102.0 to 102.0 (-103.4 to 112.2)

※() is Max. pressure display range.

※For using a unit mmH₂O, multiply display value by 100.

■ Pressure Conversion Chart

from \ to	Pa	kPa	MPa	kgf/cm ²	mmHg	mmH ₂ O	psi	bar	inHg
1Pa	1	0.001	0.000001	0.000010197	0.007501	0.101972	0.000145038	0.00001	0.0002953
1kPa	1000	1	0.001	0.010197	7.500617	101.971626	0.145038	0.01	0.2953
1MPa	1000000	1000	1	10.197162	7500.61683	101971.626	145.038243	10	295.299875
1kgf/cm ²	98066.5	98.0665	0.098067	1	735.55924	10000.0005	14.223393	0.980665	28.959025
1mmHg	133.322368	0.133322	0.000133	0.001359	1	13.595099	0.019337	0.001333	0.039370
1mmH ₂ O	9.80665	0.009807	—	0.000099	0.073556	1	0.00142	0.000098	0.002896
1psi	6894.733	6.89473	0.006895	0.070307	51.714752	703.016716	1	0.068947	2.036014
1bar	100000	100	0.100000	1.019716	750.062	10197.1626	14.503824	1	29.529988
1inHg	3386.388	3.386388	0.003386	0.034532	25.40022	345.315507	0.491156	0.033864	1

E.g.) For calculating 760mmHg as kPa : According to above chart, 1mmHg is 0.133322kPa, therefore 760mmHg will be 760×0.133322kPa=101.32472kPa.

SENSORS
CONTROLLERS
MOTION DEVICES
SOFTWARE
(A) Photoelectric Sensors
(B) Fiber Optic Sensors
(C) LiDAR
(D) Door/Area Sensors
(E) Vision Sensors
(F) Proximity Sensors
(G) Pressure Sensors
(H) Rotary Encoders
(I) Connectors/ Connector Cables/ Sensor Distribution Boxes/ Sockets

PSA / PSB Series

Specifications

Pressure type		Gauge pressure			
		Negative pressure	Standard pressure	Compound pressure	
Model ^{※1}	NPN open collector output	PSA-V01-□ PSB-V01-□ PSB-V01C-□	PSA-01-□ PSB-01-□ PSB-01C-□	PSA-1-□ PSB-1-□ PSB-1C-□	PSA-C01-□ PSB-C01-□ PSB-C01C-□
	PNP open collector output	PSA-V01P-□ PSB-V01P-□ PSB-V01CP-□	PSA-01P-□ PSB-01P-□ PSB-01CP-□	PSA-1P-□ PSB-1P-□ PSB-1CP-□	PSA-C01P-□ PSB-C01P-□ PSB-C01CP-□
Rated pressure range		0.0 to -101.3kPa	0.0 to 100.0kPa	0.0 to 1,000kPa	-100.0 to 100.0kPa
Display and set pressure range		5.0 to -101.3kPa	-5.0 to 110.0kPa	-50 to 1,100kPa	-101.2 to 110.0kPa
Max. pressure range		2 times of rated pressure		1.5 times of rated pressure	2 times of rated pressure
Applied fluid		Air, Non-corrosive gas			
Power supply		12-24VDC \pm 10% (ripple P-P : Max. 10%)			
Current consumption		Max. 50mA			
Control output		NPN or PNP open collector output • Load voltage: Max. 30VDC \pm • Load current: Max. 100mA • Residual voltage - NPN: Max. 1VDC \pm , PNP: Max. 2VDC			
Hysteresis ^{※2}		1-digit fixed (2-digit for psi unit)			2-digit fixed
Repeat error		\pm 0.2% F.S. \pm 1-digit			\pm 0.2% F.S. \pm 2-digit
Response time		Selectable 2.5ms, 5ms, 100ms, 500ms			
Protection circuit		Output short over current protection circuit			
Analog output		• Output voltage: 1-5VDC \pm 2% F.S. • Zero-point: Within 1VDC \pm 2% F.S. • Span: Within 4VDC \pm 2% F.S. • Linear: Within \pm 2% F.S. • Resolution: Approx. 1/200 • Output impedance: 1k Ω			
Display digit		3½ -digit			
Display method		7-segment LED			
Min. display interval		1-digit (psi unit: 2-digit are fixed)			2-digit
Pressure unit		kPa, kgf/cm ² , bar, psi, mmHg, mmH ₂ O, inHg	kPa, kgf/cm ² , bar, psi		kPa, kgf/cm ² , bar, psi, mmHg, mmH ₂ O, inHg
Display accuracy		0 to 50°C: Max. \pm 1% F.S., -10 to 0°C : Max. \pm 2% F.S.			
Environment	Ambient temp.	-10 to 50°C, storage: -20 to 60°C			
	Ambient humi.	35 to 85%RH, storage: 35 to 85%RH			
Vibration		1.5mm amplitude at frequency of 10 to 55Hz (for 1 min) in each X, Y, Z direction for 2 hours			
Material		• PSA - Front, Rear case: Polycarbonate (insert glass), Pressure port: die-cast (Zn) • PSB - Case, Pressure port, Cover: IX EF • PSB-C - Case, Pressure port, Cover: IXEF			
Protection structure		IP40 (IEC standard)			
Cable	Cable type	\varnothing 4mm, 5-wire, 2m (AWG24, Core diameter: 0.08mm, Number of cores: 40, Insulation out diameter: \varnothing 1mm)			
	Connector type	5-wire, 3m (AWG24, Insulation out diameter: \varnothing 1mm)			
Approval		CE			
Weight ^{※3}		• PSA: Approx. 200g (approx. 120g) • PSB: Approx. 160g (approx. 70g) • PSB-C: Approx. 160g (approx. 70g)			

※1: '□' is pressure port type. Please refer to the 'Ordering Information'.

※2: In hysteresis output mode, detection difference is variable.

※3: The weight includes packaging. The weight in parenthesis in for unit only.

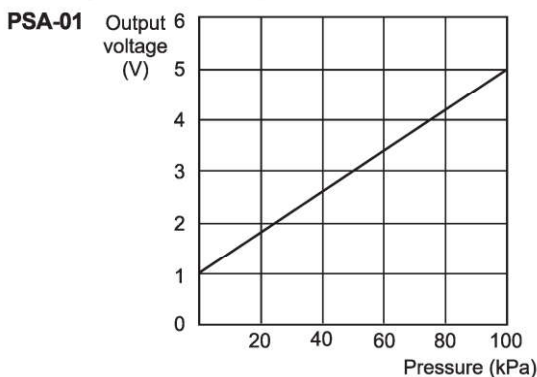
※F.S.: Rated pressure.

※There may be \pm 1-digit error in hysteresis by pressure unit calculation error.

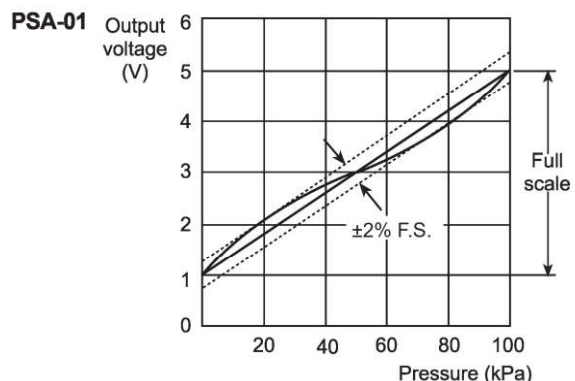
※The specification of pressure port is marked on the upper part of the case.

※Environment resistance is rated at no freezing or condensation.

• Analog output voltage-Pressure characteristic



• Analog output voltage-Linear characteristic

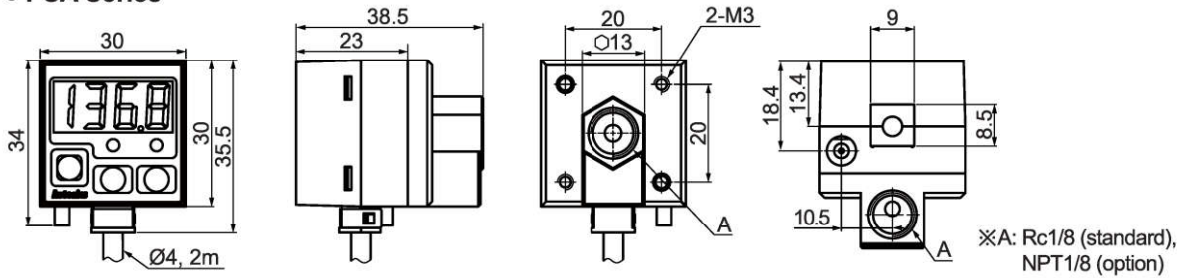


Compact, Digital Display Pressure Sensor

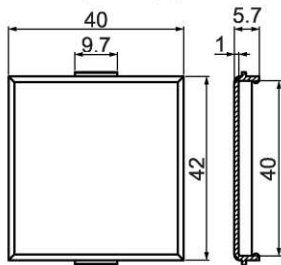
■ Dimensions

(unit: mm)

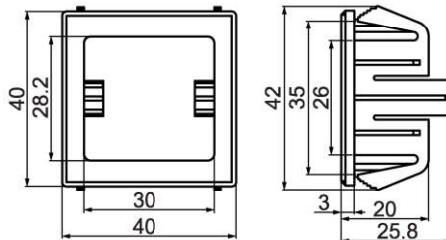
● PSA Series



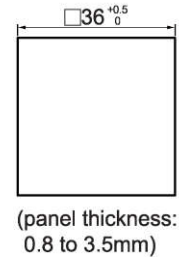
● Sold separately (front cover (PSO-P01))



● Sold separately (panel bracket (PSO-01))



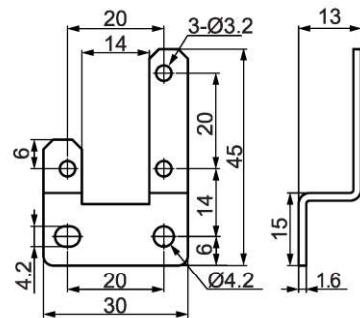
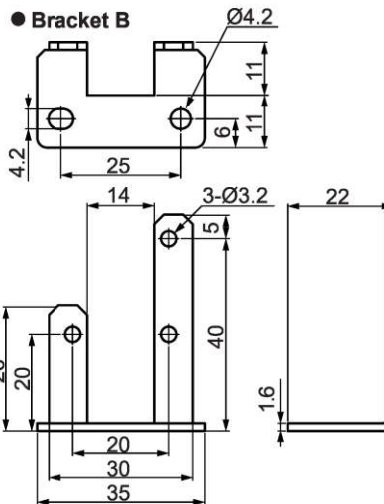
● Panel cut-out



● Bracket A

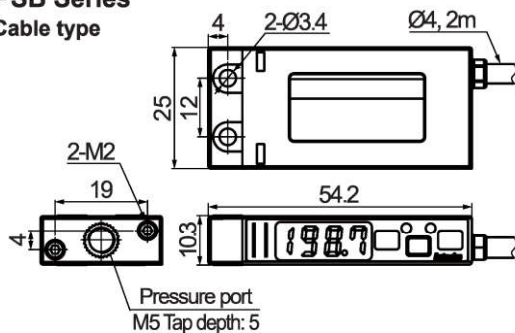


● Bracket B

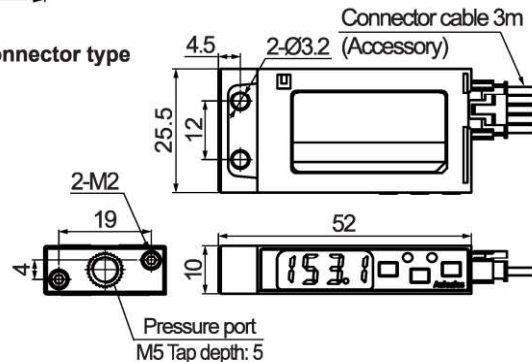


● PSB Series

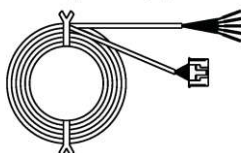
● Cable type



● Connector type



● Sold separately (connector cable (PSO-C01))



※ $\varnothing 4$ mm, 5-wire, 2m
(AWG24, core diameter: 0.08mm,
number of cores: 40, insulator
diameter: $\varnothing 1$ mm)

SENSORS

CONTROLLERS

MOTION DEVICES

SOFTWARE

(A) Photoelectric Sensors

(B) Fiber Optic Sensors

(C) LiDAR

(D) Door/Area Sensors

(E) Vision Sensors

(F) Proximity Sensors

(G) Pressure Sensors

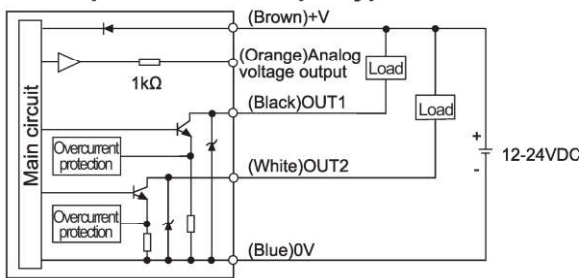
(H) Rotary Encoders

(I) Connectors/
Connector Cables/
Sensor Distribution
Boxes/ Sockets

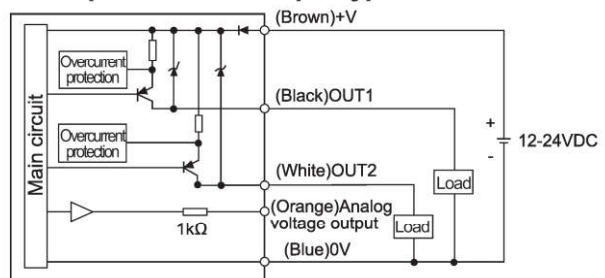
PSA / PSB Series

Control Output Diagram (PSA/PSB)

NPN open collector output type

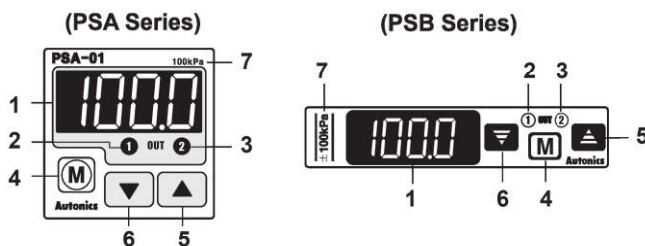


PNP open collector output type



- ※ There is no short-circuit protection in analog voltage output. Do not connect this output to power supply or capacitive load directly.
- ※ Please observe input impedance of connected equipment when use analog voltage output.
And be sure to check voltage drop caused by resistance of extended wire.
- ※ If short-circuit the control output terminal or supply current over the rated specification, control signal is abnormal due to the current protection circuit.

Unit Description



1. 3 1/2 digit LED display (red)

: Display sensing pressure, every setting value and display error.

2. 1 output indicator (red) : Output 1 is ON, LED will be ON.

3. 2 output indicator (PSA: red, PSB: green)

: Output 2 is ON, LED will be ON.

4. Mode key

: Parameter setting mode or preset setting mode, save setting value.

5. Up key

: Set the setting value to lower step in preset setting or pressure unit, output mode, response time, analog output scale, key lock, peak hold value, bottom hold value display in parameter setting.

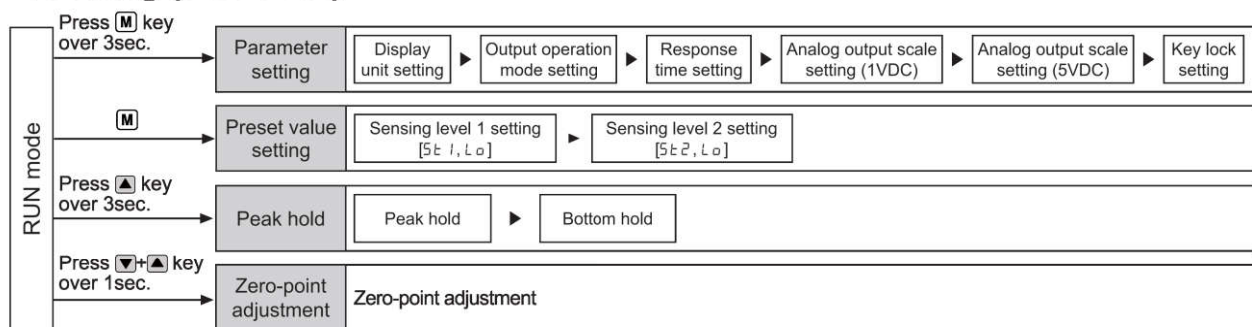
6. Down key

: Set setting value to upper step in preset setting or pressure unit, output mode, response time, analog output scale, key lock, peak hold, bottom hold display in parameter setting.

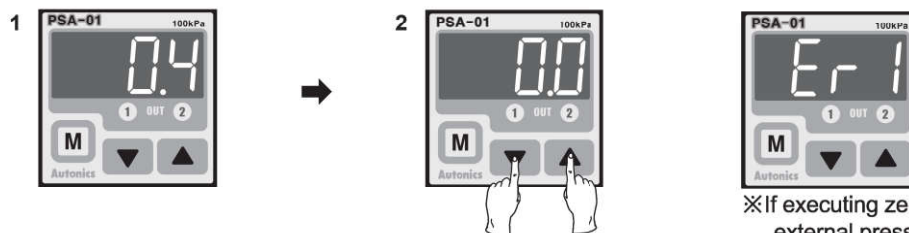
7. Range of rated pressure

: It is possible to change the pressure unit in PSA Series. Please use different unit as label for your application.

Setting (PSA/PSB)



Zero Point Adjustment (PSA/PSB)



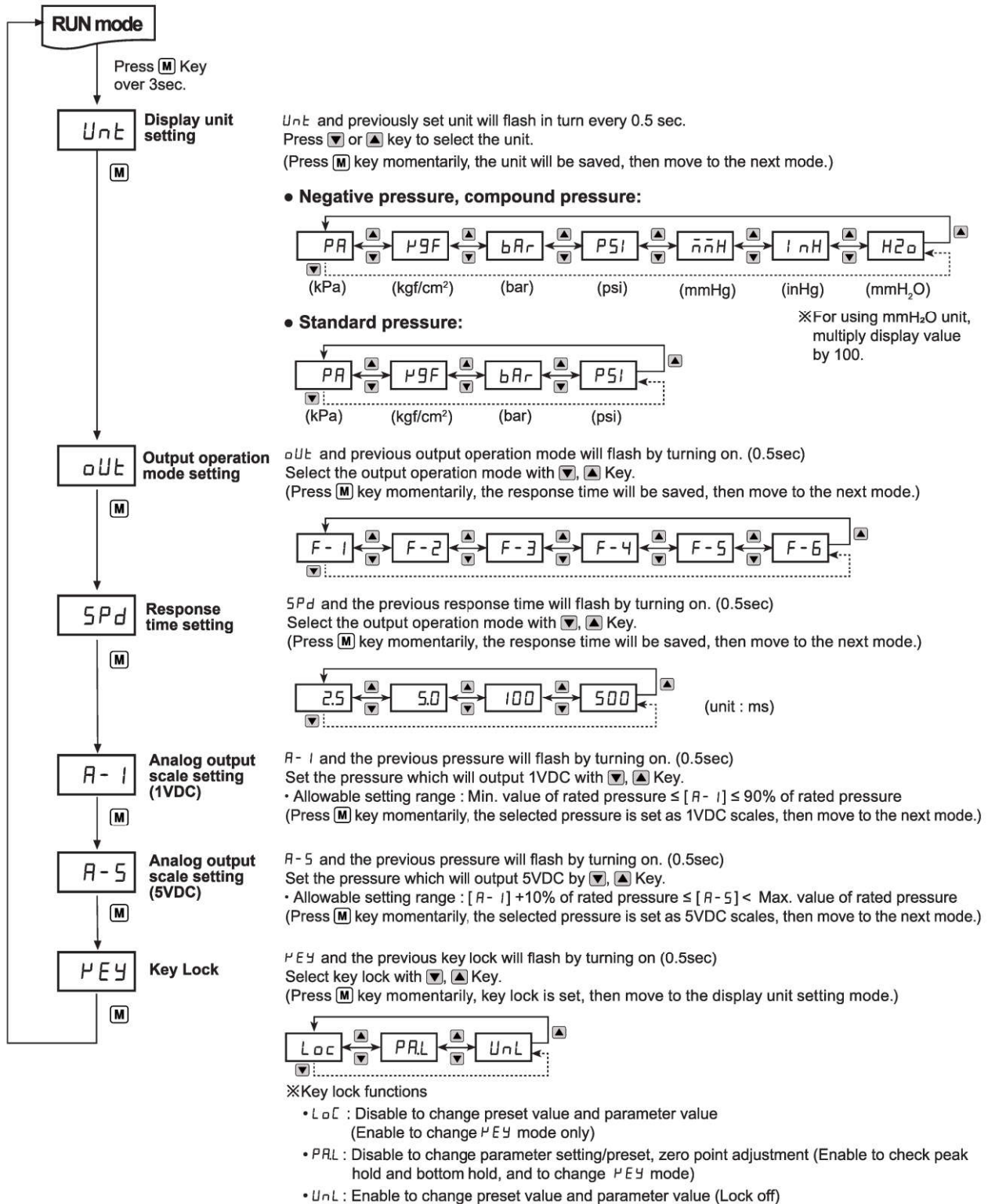
1. In state of atmospheric pressure during RUN mode, press **▼** key and **▲** key at the same time for over 1sec.
2. When the zero point adjustment is completed, it will display 0.0 and return to RUN mode automatically.

※ Please execute zero point adjustment regularly.

※ If executing zero point adjustment when external pressure has been applied, Er 1 will be flashing. Please execute zero point again in state of atmospheric pressure.

Compact, Digital Display Pressure Sensor

Parameter Setting (PSA/PSB)



SENSORS
CONTROLLERS
MOTION DEVICES
SOFTWARE
(A) Photoelectric Sensors
(B) Fiber Optic Sensors
(C) LiDAR
(D) Door/Area Sensors
(E) Vision Sensors
(F) Proximity Sensors
(G) Pressure Sensors
(H) Rotary Encoders
(I) Connectors/ Connector Cables/ Sensor Distribution Boxes/ Sockets

※When advance to parameter setting mode and preset setting mode, it displays "Setting item" and "Previous setting value" by 0.5 sec. turn. This display will stop by pressing \downarrow or \uparrow key (Display setting value), if any key is untouched for over 1 sec., it will display old value by 0.5sec. turn again.

※When M key is pressed for 3sec. during setting, it will return to RUN mode with memorizing on EEPROM. However, when there is any key is untouched for 60sec., it turns to RUN mode with keeping the previous setting value not current setting value.

※There is memory protection by EEPROM, but life cycle of EEPROM is 100,000 times.