

Autonics

DIGITAL PRESSURE SENSOR PSA/PSB SERIES

M A N U A L



Thank you very much for selecting Autonics products.
For your safety, please read the following before using.

Caution for your safety

- Please keep "Caution for your safety" to avoid accidents or damages as using it correctly.
- The meaning of 'Warning' and 'Caution' is as follows:
 - Warning** In case a serious injury or dead may be occurred.
 - Caution** In case a little injury or damage of this unit may be occurred.
- The meaning of the mark on the product and manual is as follows:
 - ▲ is a caution mark for danger in special condition.

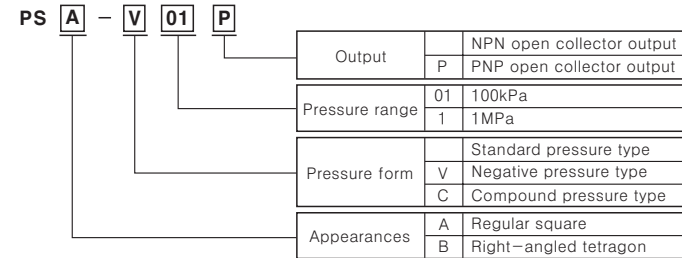
Warning

- Please use it with double safety devices when it is used at the equipments which may cause damages to human life or assets. (Ex:Nuclear power, Medical equipment, Vehicle, Train, Air plane, Combustion apparatus, Entertainment or Safety device etc.) It may cause a fire, human life or assets.
- Do not use it in flammable gas because it does not have an explosion proof construction. It may cause explosion.

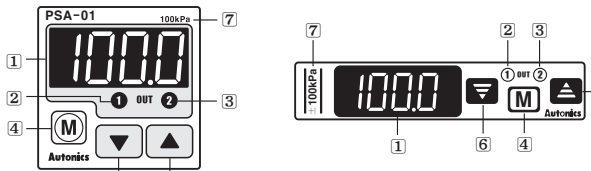
Caution

- Do not apply the pressure beyond rated pressure. It may cause damage to this unit.
- Do not use it beyond power supply. It may cause damage to this unit.
- Do not make a short circuit for the load. It may cause damage to this unit.
- Do not wire incorrectly in power polarity etc. It may cause damage to this unit.
- Do not use corrosive gas or liquid as it is only for non-corrosive gas. It may cause damage to this unit.
- Do not give power to its case or twist its case strongly. It may cause damage to this unit.

Ordering information



Front panel identification and function



- 3 1/2 LED display (Red) : Display detected pressure, every setting value and display error
- 1/2 output indicator (Red) : Output 1 is ON, LED will be ON
- 2 output indicator (PSA : Red, PSB : Green) : Output 2 is ON, LED will be ON
- Mode key : Parameter setting mode or preset setting mode, save setting value
- Up key : Set the setting value to upper 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
- Down key : Set setting value to lower step in preset setting or pressure unit, output mode, response time, analog output scale, key lock, peak hold, bottom hold display in parameter setting.
- Range of rating pressure : It is possible to change the pressure unit in Pressure sensor. Please use different unit as label for your application.

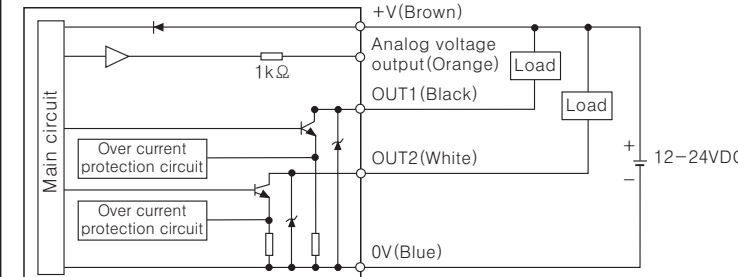
*The above specification are changeable without notice anytime.

Specifications

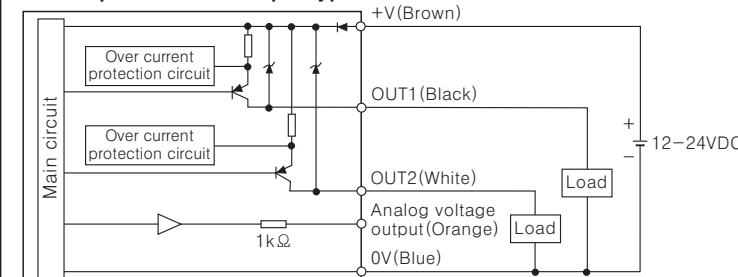
Pressure type	Gauge pressure			
	Negative pressure type	Standard pressure type		Compound pressure type
Model	NPN output PSA-V01 PSB-V01	PSA-01 PSB-01	PSA-1 PSB-1	PSA-C01 PSB-C01
	PNP output PSA-V01P PSB-V01P	PSA-01P PSB-01P	PSA-1P PSB-1P	PSA-C01P PSB-C01P
Rated pressure range	0.0 to -101.3kPa	0 to 100.0kPa	0 to 1,000kPa	-100.0 to 100kPa
Display pressure range	5.0 to -101.3kPa	-5.0 to 110.0kPa	-50 to 1,100kPa	-101.2 to 110kPa
Max. pressure range	2 times of rating pressure		1.5 times of rating pressure	2 times of rating pressure
Applicable fluid	Air, Non-corrosive gas			
Power supply	12V-24VDC ±10% (Ripple P-P:Max. 10%)			
Current consumption	Max. 50mA			
Control output	<ul style="list-style-type: none"> NPN open collector output ≡ Max. Sink current:Max. 100mA, Applied voltage:Max. 30VDC, Residual voltage:Max. 1V PNP open collector output ≡ Max. Source current:Max. 100mA, Residual voltage:Max. 2V 			
Hysteresis(*1)	1digit fixed(But psi unit:2digit fixed)		2digit fixed	
Repeat error	±0.2% F.S. ±1digit		F.S. ±2digit	
Response time	Selectable 2.5ms, 5ms, 100ms, 500ms			
Short circuit protection	Built-in			
Analog output	<ul style="list-style-type: none"> Output voltage:1V-5VDC ±2% F.S. • Linear:Within ±2% F.S. Zero point:Within 1VDC ±2% F.S. • Span:Within 4VDC ±2% F.S. Resolution:Approx. 1/200 • Output impedance:1kΩ 			
Display method	3 1/2 digit LED 7segment			
Min. display interval	1digit(2digits/psi unit : 2digit fixed)		2digits	
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	
Characteristic of control output and display temperature	Max. ±1% F.S.		Max. ±2% F.S.	
Analog output temperature characteristic	Max. ±2% F.S. of display pressure at 25°C within 0°C to 50°C			
Environment	Ambient temperature	-10°C to +50°C (at non-dew status)		
	Storage temperature	-20°C to +60°C (at non-freezing status)		
	Ambient humidity	35 to 85%RH		
	Storage humidity	35 to 85%RH		
	Vibration	1.5mm amplitude at frequency of 10 to 55Hz in each of X, Y, Z directions for 2 hours		
Material	PSA ≡ Front case:PC, Rear case:PC(Insert glass), Pressure port:die-cast(Zn) PSB ≡ Case, Pressure port:PA			
Protection	IP40(IEC specification)			
Wire	φ4, 5P, Length:2m(0.2mm ²)			
Weight	PSA : Approx. 120g, PSB : Approx. 70g			

Input/Output circuit and connection diagram

1. NPN open collector output type



2. PNP open collector output type



*There is no over current protection circuit in analog voltage output type. Do not connect this unit to power source or capacitive load directly.
*Please observe input impedance of connected equipment when using analog voltage output. And be sure with voltage drop by resistance of extended wire.

Accessory

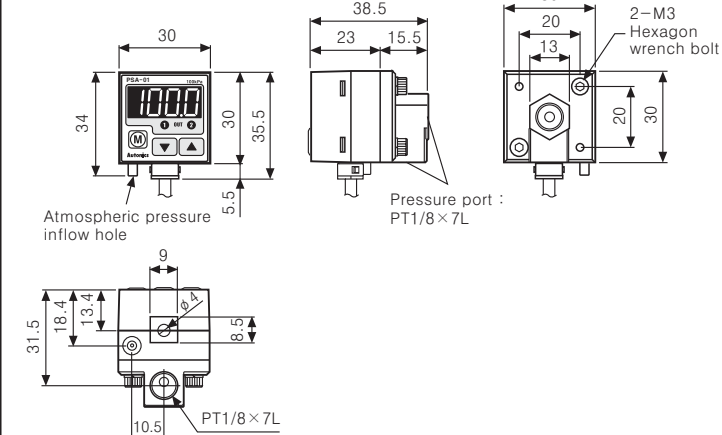
- PSA/PSB
 - Pressure unit label
- PSA
 - Port plug
- Bracket A
- Bracket B

±100kPa	-101.3kPa	100kPa	1MPa
1.00kPa	1.00kPa	1.00kPa	10.00kPa
10.00kPa	10.00kPa	10.00kPa	100.00kPa
100.00kPa	100.00kPa	100.00kPa	1000.00kPa
1.00MPa	1.00MPa	1.00MPa	10.00MPa
10.00MPa	10.00MPa	10.00MPa	100.00MPa
100.00MPa	100.00MPa	100.00MPa	1000.00MPa

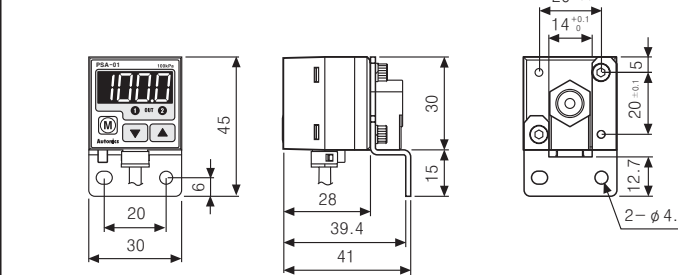
Dimensions

PSA series

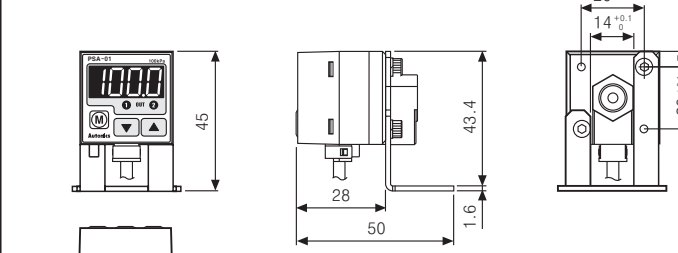
Product



Bracket A

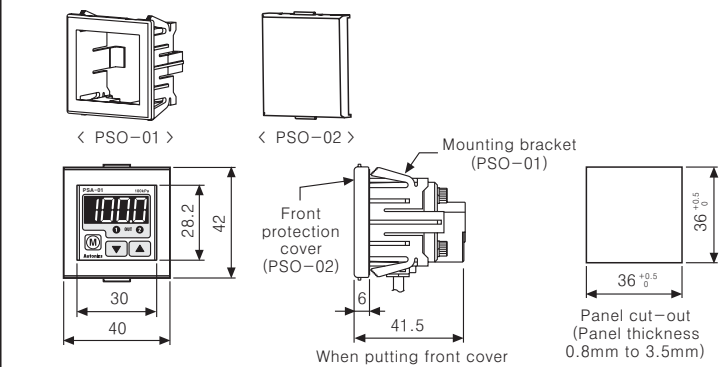


Bracket B

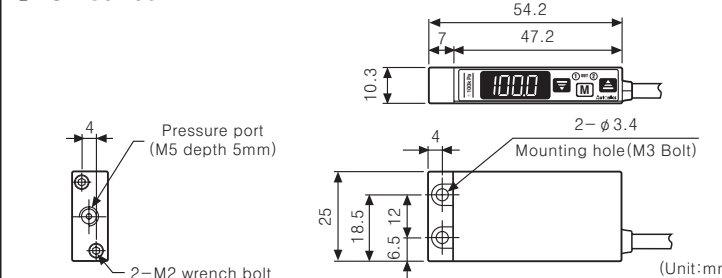


Bracket

Accessory



PSB series



Installation

PSA series

- When installing pressure port it is able to bring pressure from 3 directions by changing the mounting direction of the pressure port.
- Pressure port is PT1/8. It is able to use general one touch fitting.
- Please use seal tape at port plug in order to prevent pressure leak.
- Please block another two pressure ports not used with port plug.
- Please connect it by using spanner (13mm) at the metal part in order not to overload on the body when connecting one touch fitting.

Caution

The tightening torque of one touch fitting should be Max 10N · m. It may cause mechanical trouble.

- PSA series has 2kinds of brackets so it is able to install it in two different ways.
- At first, please unscrew hexagon wrench bolt and assemble the bracket on this unit by fixing the hexagon wrench bolt. In this case, tightening torque of hexagon wrench should be max. 3N · m. It may cause mechanical trouble.

- Bracket(PSO-01) and front protection cover(PSO-02) are optional to sell. Please see the pictures for installation.

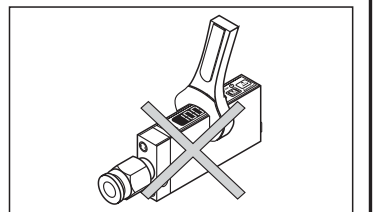
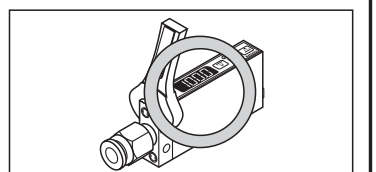
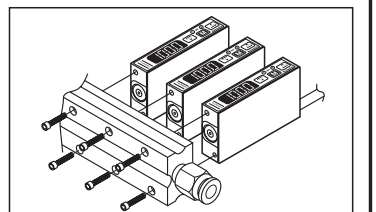
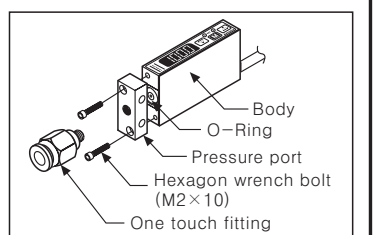
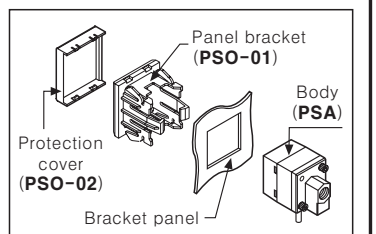
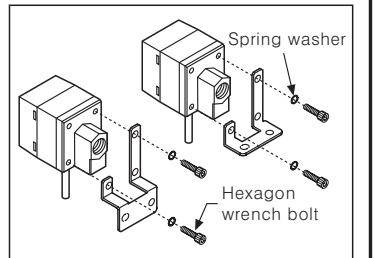
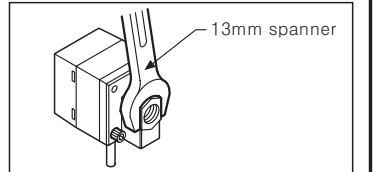
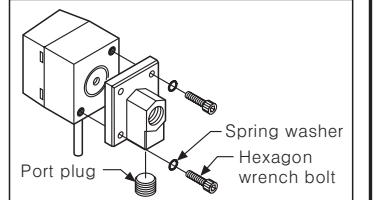
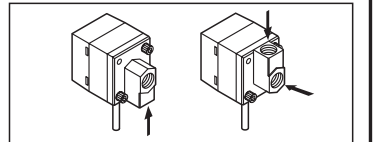
PSB series

- Pressure port is M5. It is able to use general one touch fitting.
- It is able to use it without the pressure port according to environment. In this case O-Ring between pressure port and its body should not be taken out in order not to prevent pressure leak.
- Please connect it by using spanner (10mm) at pressure port in order not to overload on the body when connecting one touch fitting.

Caution

The tightening torque of one touch fitting and hexagon wrench should be Max 10N · m and 2N · m. It may cause mechanical trouble.

Please don't use spanner to install as it may cause mechanical trouble.

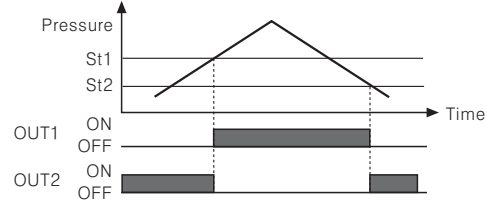


Output operation mode

※PSA(B) series has 6 kinds of output operation mode, please use proper output operation mode in accordance with detection.

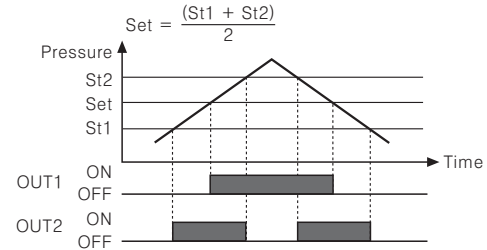
Hysteresis mode(F-1)

It is able to set certain value for pressure detection level(St1) and hysteresis(St2).



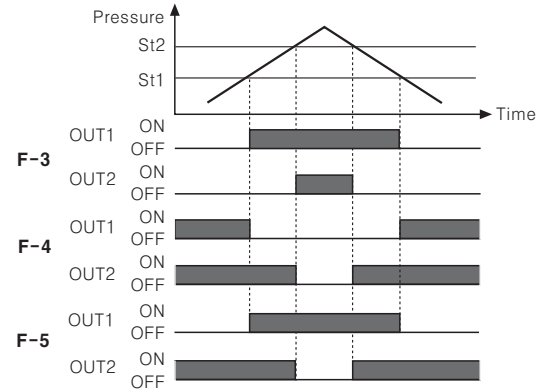
Automatic sensitivity setting mode(F-2)

- This function is to set pressure detection level to the proper position automatically. It is set by receiving pressure from two positions(St1, St2).
- Hysteresis is fixed in 1digit(But, 2digit when using compound pressure or psi unit type)
- The pressure detection level is shown in the following calculation.



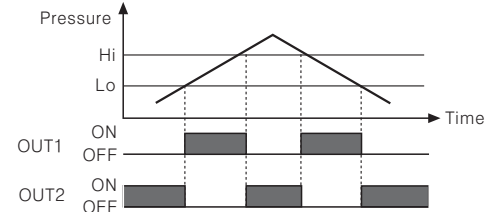
Independent 2 output mode(F-3, F-4, F-5)

- It is able to set pressure detection level from two positions(St1, St2) in this mode, one is for control and the other is for alarm or additional control.
- Hysteresis is fixed in 1digit(But, 2digit when using compound pressure or psi unit type)

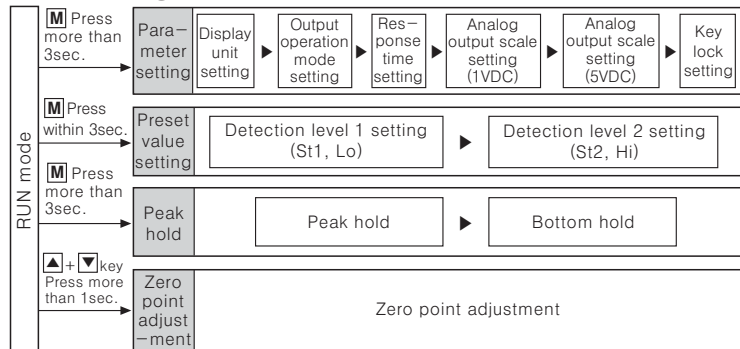


Window mode(F-6)

- It is able to set Lo/Hi-limit value of pressure detection level in this mode.
- Hysteresis is fixed in 1digit(But, 2digit when using compound pressure or psi unit type)



Setting

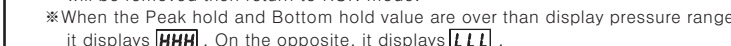
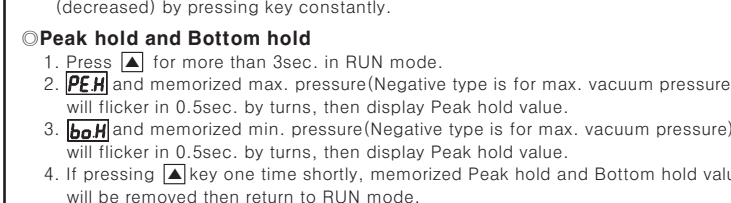
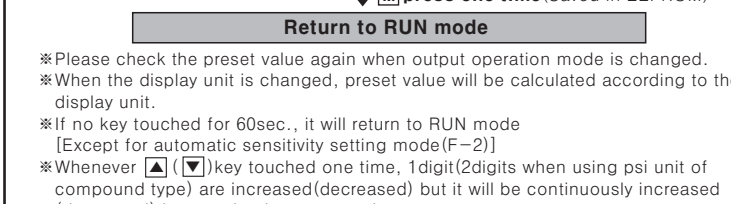
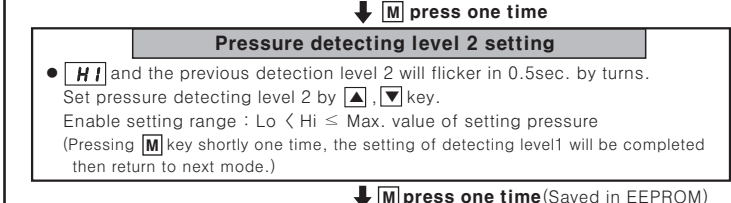
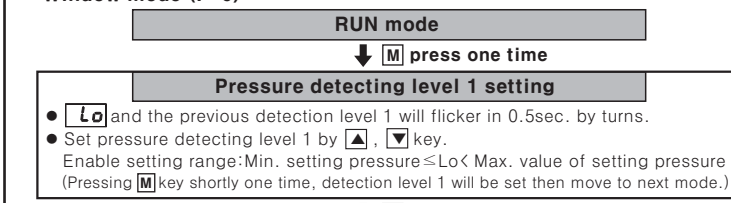
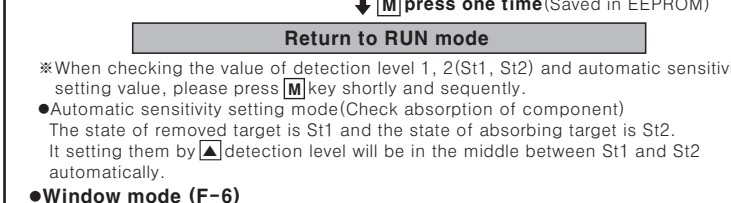
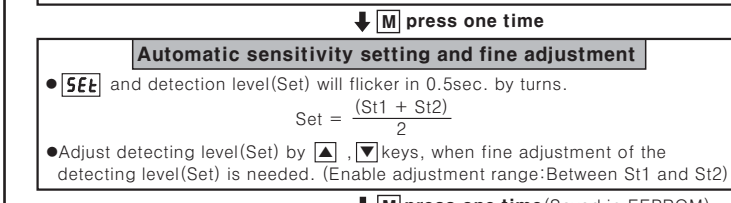
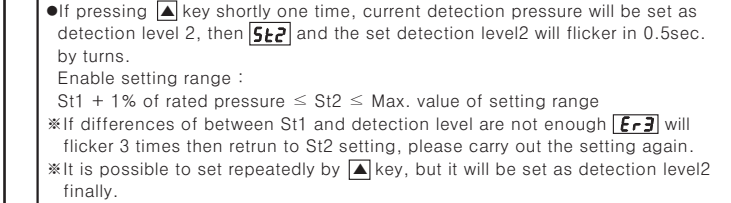
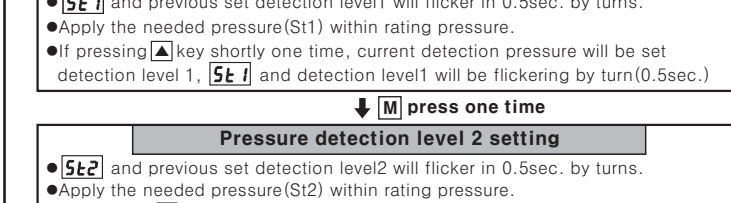
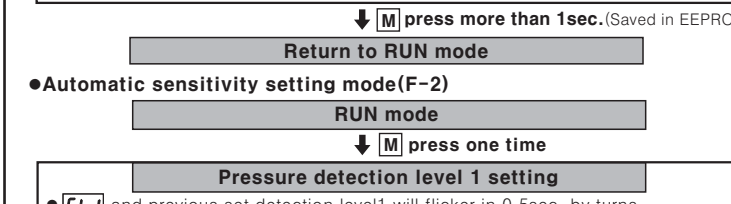
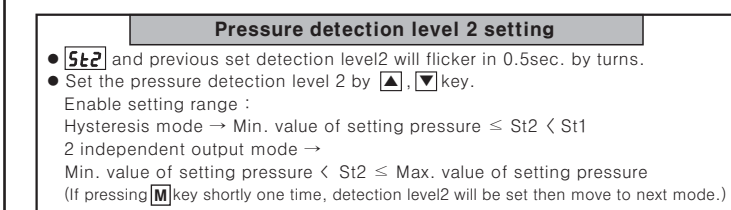
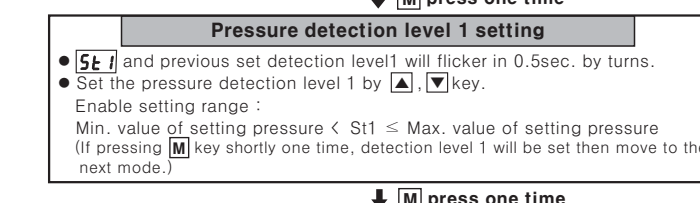
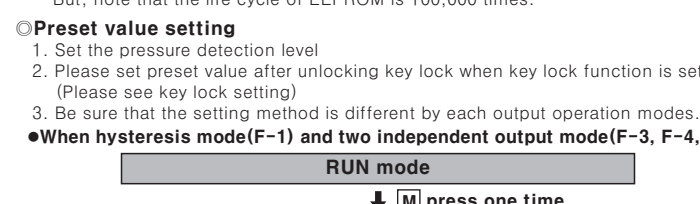
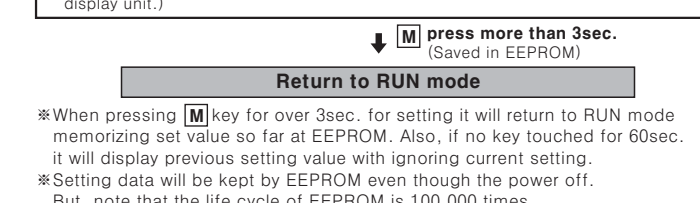
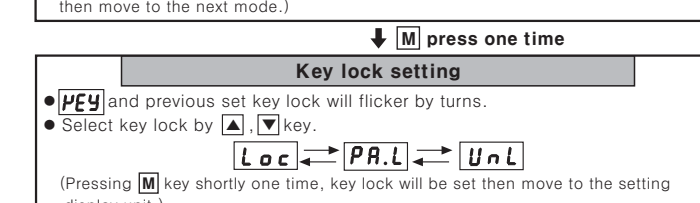
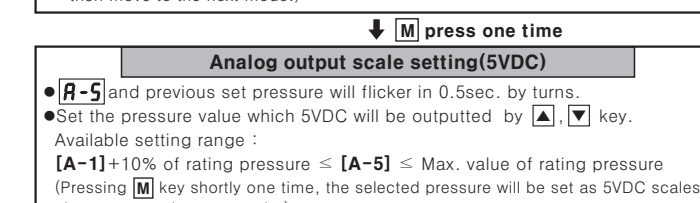
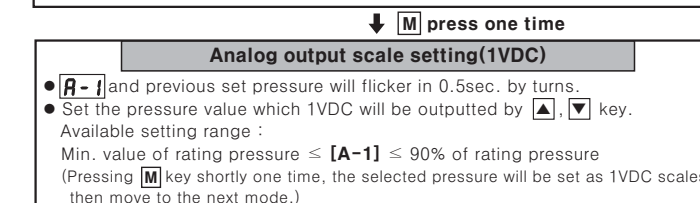
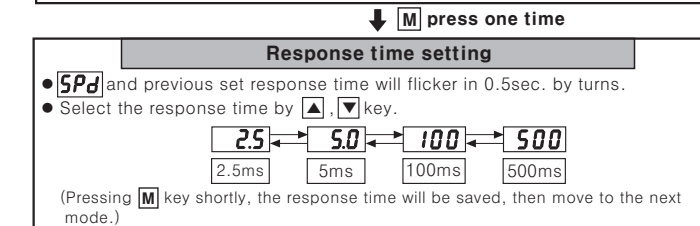
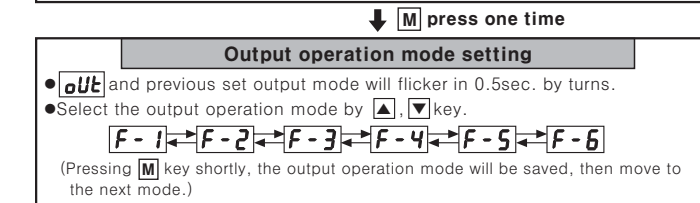
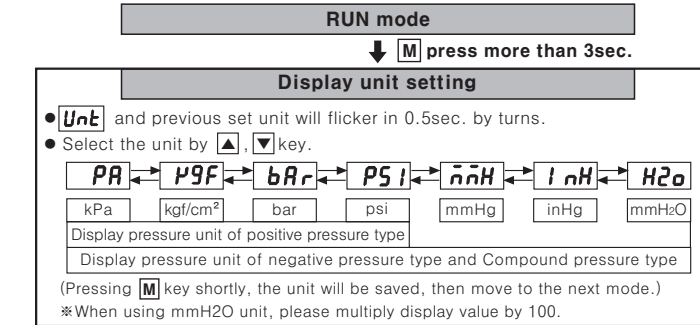


Zero point adjustment

- Please press Δ and ∇ key for over 1sec. at the same time putting an applied pressure in state of the atmospheric pressure.
 - When the zero point adjustment is completed, it will display $\square 0.0$ and return to RUN mode automatically.
- ※If executing Zero point adjustment on external pressure being at pressure port $\square Er 1$ will be flickered 3times. Please execute it in the atmospheric pressure after removing external pressure.
- ※Please execute Zero point adjustment regularly.

Parameter setting

- Pressure display unit, output operation mode, response time(Chattering prevention), Analog output scales, key lock.
- Please set parameter after unlocking lock function when lock function is set. (Please see below key lock setting)



Function

Change of display unit

- PS□-V01(P) and PS□-C01(P) has 7 kinds of pressure unit, PS□-01(P) and PS□-1(P) has 4 kinds of pressure unit. Please select the proper unit for application.
- PS□-V01(P), PS□-C01(P) : kPa, kgf/cm², bar, psi, mmHg, inHg, mmH₂O
- PS□-01(P), PS□-1(P) : kPa, kgf/cm², bar, psi
- ※When using mmH₂O unit, please multiply display value by 100.

Change of output mode

- There are 6 kinds of control output mode in order to realize the various pressure detection. Select a mode for your proper application.
- Hysteresis mode(F-1) : When needed to change hysteresis for detecting pressure.
- Automatic sensitivity setting mode(F-2) : When needed to set detection sensitivity automatically at proper position.
- Independent 2 output mode(F-3, F-4, F-5) : When needed to detect pressure from two position with one product.
- Window comparative output mode(F-6) : When needed to detect pressure in certain area.

Change of response time(Chattering prevention)

- It can prevent chattering of control output by changing response time. It is able to set 4kinds of response time(2.5ms, 5ms, 100ms, 500ms) and if the response time is getting longer, the detection will be more stable by increasing the number of digital filter.

Change of Analog output scale

- It is not set the analog output(1-5VDC) scale as a rated pressure range but also this is a function to change properly for user's application. If setting A1 position for 1VDC output and A5 position for 5VDC output, the pressure range of A1 to A5 is to 5VDC analog output. Therefore analog output will be 1-5VDC between A1 and A5.

Key lock function

- This unit has 2 kinds of key lock function in order to prevent wrong operation.
- Loc : All keys are locked therefore it is impossible to change any parameter setting/preset, Zero point adjustment, Peak hold and Bottom hold. (Able to change the status of lock)
- P.A.L : This is partial locked status, therefore it is impossible to change parameter setting(Able to change the status of lock) only, the rest functions can be changed.
- UnL : All of the setting is available, all keys are unlocked.

Zero point adjustment function

- This function is to set the display value of pressure as Zero point forcibly in case that of port is opened to atmospheric pressure.

Peak hold and Bottom hold function

- This function is to diagnosis malfunction of the system caused by parasitic pressure or to check through memorizing the max./min. pressure occurred from the system.

Error

Error display	Problem	Remedy
$\square Er 1$	If external pressure applied, when adjusting Zero point	Please try again after external pressure removing
$\square Er 2$	When overloaded on control output	Remove overload
$\square Er 3$	When the setting value is not matched with setting condition	Set proper setting value after checking setting condition
$\square HHH$	When the applied pressure exceeds the upper display pressure range up	Apply pressure within display pressure range
$\square LLL$	When the applied pressure exceeds the lower display pressure range down	

Caution for using

- Do not insert any sharp or pointed object into pressure port. It may cause mechanical trouble due to sensor damage.
- Be sure that this unit must avoid direct touch with water, oil, thinner etc.
- Be sure to avoid transient time(within 3sec.) after initial power on.
- When a switching moving regulator is used for power supply, Frame ground(F.G) terminal of its power supply part must be grounded.
- It may cause malfunction by noise, if wiring with power line or high voltage line.
- When moving this unit from warm place to cold place, please remove the humidity on the cover then use it.
- Do not press the setting button with sharp or pointed object.
- Do not put over 30N tensile strength on connection part or load.
- When using mmH₂O unit, please multiply display value by 100.

※It may cause malfunction if above instructions are not followed.

Main products

- COUNTER
- TIMER
- TEMPERATURE CONTROLLER
- PANEL METER
- TACHO/LINE SPEED/PULSE METER
- DISPLAY UNIT
- PROXIMITY SENSOR
- PHOTOELECTRIC SENSOR
- FIBER OPTIC SENSOR
- PRESSURE SENSOR
- ROTARY ENCODER
- SENSOR CONTROLLER
- POWER CONTROLLER
- STEPPING MOTOR & DRIVER & CONTROLLER
- LASER MARKING SYSTEM

Autonics Corporation
http://www.autonics.net

- HEAD QUARTER : 41-5, Yongdang-ri, Uingsang-eup, Yangsan-si, Gyeongsang, Korea 626-847
- INTERNATIONAL SALES : 512 Ansung B/D, 410-13, Shindorim-dong, Guro-gu, Seoul, Korea 152-070
TEL:82-2-2679-6585 / FAX:82-2-2679-6556
E-mail : sales@autonics.net

EP-E-77-0001E