

# Autonics

## DIGITAL PRESSURE SENSOR PSA/PSB SERIES



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

### Caution for your safety

- Please keep these instructions and review them before using this unit.
- Please observe the cautions that follow:
  - Warning** Serious injury may result if instructions are not followed.
  - Caution** Product may be damaged, or injury may result if instructions are not followed.
- The following is an explanation of the symbols used in the operation manual.
  - caution: Injury or danger may occur under special conditions.

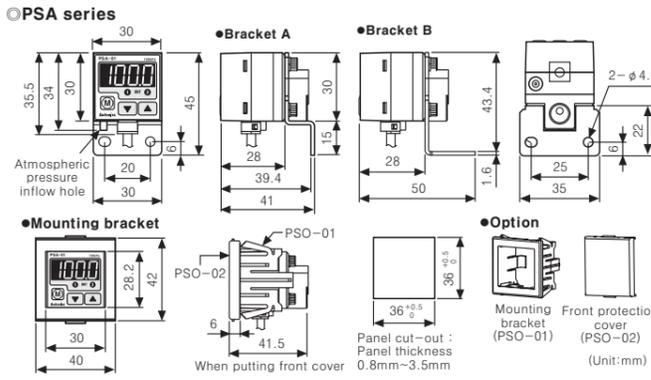
### Warning

- 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.

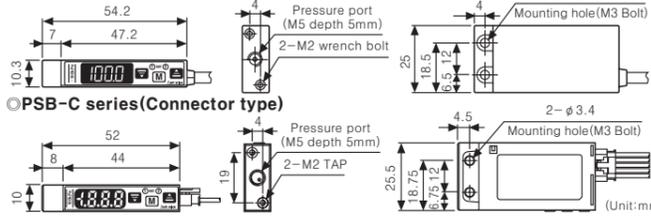
### Caution

- 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.

### Dimensions



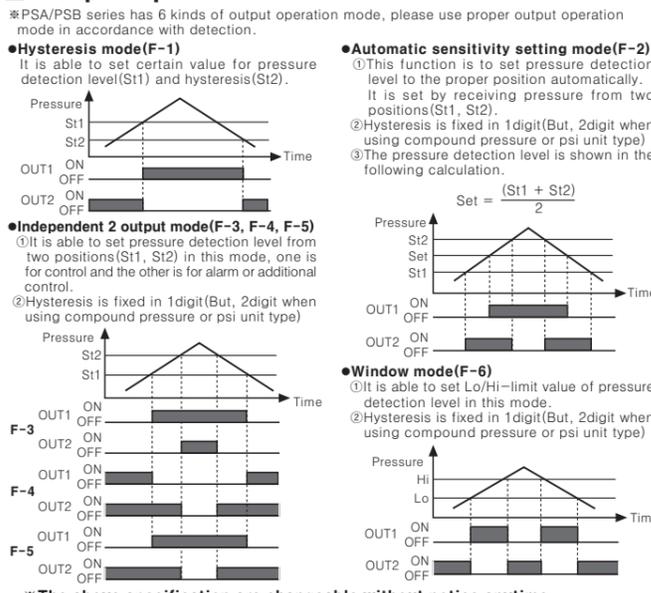
### PSB series (Wiring-integrated type)



### Functions

- Change of display unit**  
PS□-V01(C) (P) and PS□-C01(C) (P) has 7 kinds of pressure unit, PS□-01(C) (P) and PS□-1(C) (P) has 4 kinds of pressure unit. Please select the proper unit for application.
  - PS□-V01(C) (P), PS□-C01(C) (P) : kPa, kgf/cm<sup>2</sup>, bar, psi, mmHg, inHg, mmH<sub>2</sub>O
  - PS□-01(C) (P), PS□-1(C) (P) : kPa, kgf/cm<sup>2</sup>, bar, psi
 \*When using mmH<sub>2</sub>O 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)
  - PA.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.

### Output operation mode

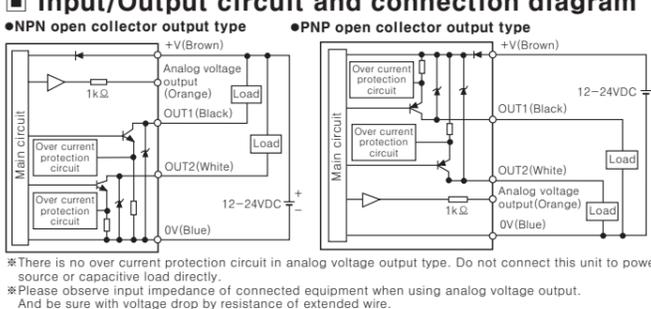


\*The above specification are changeable without notice anytime.

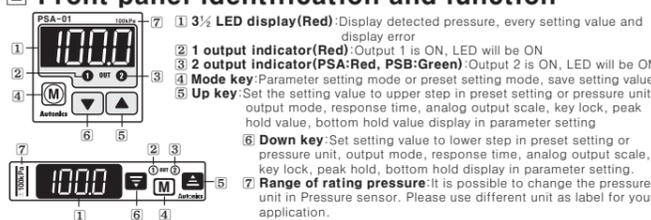
### Specifications

Pressure type	Gauge pressure		
	Negative pressure type	Standard pressure type	Compound pressure type
Model	PSA-V01 PSB-V01 PSB-V01C	PSA-01 PSB-01 PSB-01C	PSA-1 PSB-1 PSB-1C
Rated pressure range	0.0 to -101.3kPa	0.0 to 100.0kPa	0 to 1,000kPa
Display pressure range	5.0 to -101.3kPa	-5.0 to 110.0kPa	-50 to 1,100kPa
Max. pressure range	2 times of rating pressure		1.5 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"> <li>NPN open collector output ≒ Max. sink current: Max. 100mA, Applied voltage: Max. 30VDC, Residual voltage: Max. 1V</li> <li>PNP open collector output ≒ Max. source current: Max. 100mA, Residual voltage: Max. 2V</li> </ul>		
Hysteresis(+1)	1digit fixed(But psi unit: 2digit fixed)		2digit fixed
Repeat error	±0.2% F.S. ±1digit		±0.2% F.S. ±2digit
Response time	Selectable 2.5ms, 5ms, 100ms, 500ms		
Short circuit protection	Built-in		
Analog output	<ul style="list-style-type: none"> <li>Output voltage: 1V~5VDC ±2% F.S.</li> <li>Zero point: Within 1VDC ±2% F.S.</li> <li>Resolution: Approx. 1/200</li> </ul>		<ul style="list-style-type: none"> <li>Linear: Within ±2% F.S.</li> <li>Span: Within 4VDC ±2% F.S.</li> <li>Output impedance: 1kΩ</li> </ul>
Display method	3 1/2 digit LED 7segment		
Min. display interval	1digit(2digits/psi unit : 2digit fixed)		2digits
Pressure unit	kPa, kgf/cm <sup>2</sup> , bar, psi, mmHg, mmH <sub>2</sub> O, inHg		kPa, kgf/cm <sup>2</sup> , bar, psi, mmHg, mmH <sub>2</sub> O, inHg
Characteristic of control output and display temp.	Max. ±1% F.S. of display pressure at 25°C within 0°C to 50°C		
Analog output temp. characteristic	Max. ±2% F.S. of display pressure at 25°C within 0°C to 50°C		
Environment	<ul style="list-style-type: none"> <li>Ambient temperature: -10°C to +50°C (at non-dew status)</li> <li>Storage temperature: -20°C to +60°C (at non-freezing status)</li> <li>Ambient humidity: 35 to 85%RH</li> <li>Storage humidity: 35 to 85%RH</li> <li>Vibration: 1.5mm amplitude at frequency of 10 to 55Hz in each of X, Y, Z directions for 2 hours</li> </ul>		
Material	<ul style="list-style-type: none"> <li>PSA ≒ Front case: PC, Rear case: PC(Insert glass), Pressure port: die-cast(Zn)</li> <li>PSB ≒ Case, Pressure port: PA, PSB-C ≒ Case, Pressure port, Cover(LEXF)</li> </ul>		
Protection	IP40(IEC specification)		
Wire	φ4, 5P, Length ≒ 2m(0.2mm <sup>2</sup> ), Connector type: 3m		
Weight	PSA : Approx. 120g, PSB : Approx. 70g, PSB-C : Approx. 80g		

### Input/Output circuit and connection diagram

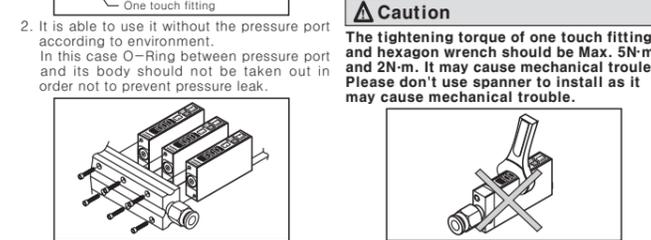


### Front panel identification and function



### Installation

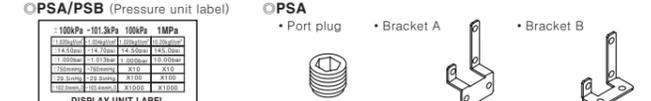
- When installing pressure port it is able to bring pressure from 3 directions by changing the mounting direction of the pressure port.
- Pressure port has two types, PT1/8 and NPT1/8, therefore be sure to use proper port when using one touch fitting.
- Please use seal tape at port plug in order to prevent 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.
- Pressure port is M5. It is able to use general one touch fitting.
- Please connect it by using spanner(10mm) at pressure port in order not to overload on the body when connecting one touch fitting.



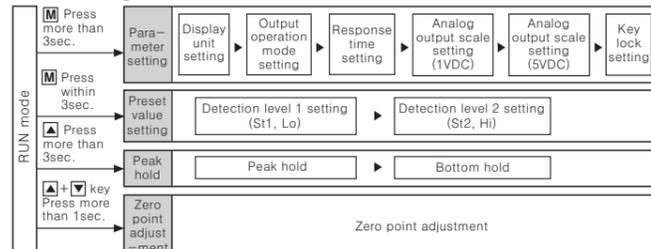
### Error

Error display	Problem	Remedy
Er1	If external pressure applied, when adjusting Zero point	Please try again after external pressure removing
Er2	When overloaded on control output	Remove overload
Er3	When the setting value is not matched with setting condition	Set proper setting value after checking setting condition
HHH	When the applied pressure exceeds the upper display pressure range up	Apply pressure within display pressure range
LLL	When the applied pressure exceeds the lower display pressure range down	Apply pressure within display pressure range

### Accessory



### Setting



### Zero point adjustment

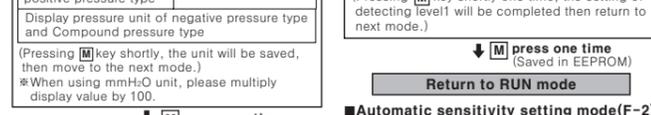
- Please press [▲] and [▼] key for over 1sec. at the same time putting an applied pressure in state of the atmospheric pressure.
- When the zero point adjustment is completed, it will display [0.0] and return to RUN mode automatically.

### Preset value setting

- Set the pressure detection level
- Please set preset value after unlocking key lock when key lock function is set. (Please see key lock setting)
- Be sure that the setting method is different by each output operation modes.

### 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)



### Output operation mode setting

- [▲][▼] and previous set output mode will flicker in 0.5sec. by turns.
- Select the output operation mode by [▲][▼] key.
- [F-1] [F-2] [F-3] [F-4] [F-5] [F-6] (Pressing [M] key shortly, the output operation mode will be saved, then move to the next mode.)

### Response time setting

- [5P] and previous set response time will flicker in 0.5sec. by turns.
- Select the response time by [▲][▼] key.
- [2.5] [50] [100] [500] (Pressing [M] key shortly, the response time will be saved, then move to the next mode.)

### Analog output scale setting(1VDC)

- [A-1] and previous set pressure will flicker in 0.5sec. by turns.
- Set the pressure value which 1VDC will be outputted by [▲][▼] key.
- Available setting range : Min. value of rating pressure ≤ [A-1] ≤ 90% of rating pressure (Pressing [M] key shortly one time, the selected pressure will be set as 1VDC scales then move to the next mode.)

### Analog output scale setting(5VDC)

- [A-5] and previous set pressure will flicker in 0.5sec. by turns.
- Set the pressure value which 5VDC will be outputted by [▲][▼] key.
- Available setting range : [A-1]+10% of rating pressure ≤ [A-5] ≤ Max. value of rating pressure (Pressing [M] key shortly one time, the selected pressure will be set as 5VDC scales then move to the next mode.)

### Key lock setting

- [PEY] and previous set key lock will flicker by turns.
- Select key lock by [▲][▼] key.
- [Loc] [PA.L] [UnL] (Pressing [M] key shortly one time, key lock will be set then move to the setting display unit.)

### Return to RUN mode

- When pressing [M] key for over 3sec. for setting it will return to RUN mode memorizing set value so far at EEPROM. Also, if no key touched for 60sec. it will display previous setting value with ignoring current setting.
- Setting data will be kept by EEPROM even though the power off. But, note that the life cycle of EEPROM is 100,000 times.

### Peak hold and Bottom hold

- Press [▲] for more than 3sec. in RUN mode. [PEH] and memorized max. pressure(Negative type is for max. vacuum pressure) will flicker in 0.5sec. by turns, then display Peak hold value.
- [bH] and memorized min. pressure(Negative type is for max. vacuum pressure) will flicker in 0.5sec. by turns, then display Bottom hold value.
- If pressing [▲] key one time shortly, memorized Peak hold and Bottom hold value will be removed then return to RUN mode.

### Return to RUN mode

- When the Peak hold and Bottom hold value are over than display pressure range, it displays [HHH] On the opposite, it displays [LLL].
- Please check the preset value again when output operation mode is changed.
- When the display unit is changed, preset value will be calculated according to the display unit.
- If no key touched for 60sec., it will return to RUN mode [Except for automatic sensitivity setting mode(F-2)]
- Whenever [▲][▼] key touched one time, 1digit (2digits when using psi unit of compound type) are increased(decreased) but it will be continuously increased (decreased) by pressing key constantly.

### 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 mmH<sub>2</sub>O unit, please multiply display value by 100.

### Main products

- CONTROLLER
- 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(CO<sub>2</sub>, Nd:YAG)

**Autonics Corporation**  
http://www.autonics.com

**Satisfiable Partner For Factory Automation**

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