

(E) Pressure Sensor

- PSAN Series(Pneumatic/Fluid, Square type) **Line-up** — E-1
- PSA Series(Pneumatic/Square type) — E-14
- PSB Series(Pneumatic/Slim type) — E-14

| | |
|-----|--|
| (A) | Photo electric sensor |
| (B) | Fiber optic sensor |
| (C) | Door/Area sensor |
| (D) | Proximity sensor |
| (E) | Pressure sensor |
| (F) | Rotary encoder |
| (G) | Connector/Socket |
| (H) | Temp. controller |
| (I) | SSR/Power controller |
| (J) | Counter |
| (K) | Timer |
| (L) | Panel meter |
| (M) | Tacho/Speed/Pulse meter |
| (N) | Display unit |
| (O) | Sensor controller |
| (P) | Switching power supply |
| (Q) | Stepping motor & Driver & Controller |
| (R) | Graphic/Logic panel |
| (S) | Field network device |
| (T) | Production stoppage models & replacement |

Line-up

PSAN Connector Type



PSAN Series

Small size, 1/2,000 resolution connector type digital pressure sensor

■ Features

- Ideal for a wide range of applications of gas, liquid, and oil.
(Inappropriate to corrosion environment for SUS316L)
- Enhanced environmental resistance with diaphragm
- 1/2,000 high resolution for indication
- Hold/Auto shift input function
(Only for models with Hold/Auto shift input type)
 - Hold : Holding instantaneous outputs and display value
 - Auto shift : Enable to output regardless of initial pressure change
- Hold function for instantaneous outputs and holding display value
- 2 independent outputs and NO/NC output selectable
- Forced-output mode embodied for easy operation test and monitoring
- One-touch connector type for easy maintenance
- Analog output (1/2,000 resolution, voltage : 1–5V, current : 4–20mA)
- Zero-point adjustment function, peak monitoring function, and chattering prevention function

⚠ Please read "Caution for your safety" in operation manual before using.



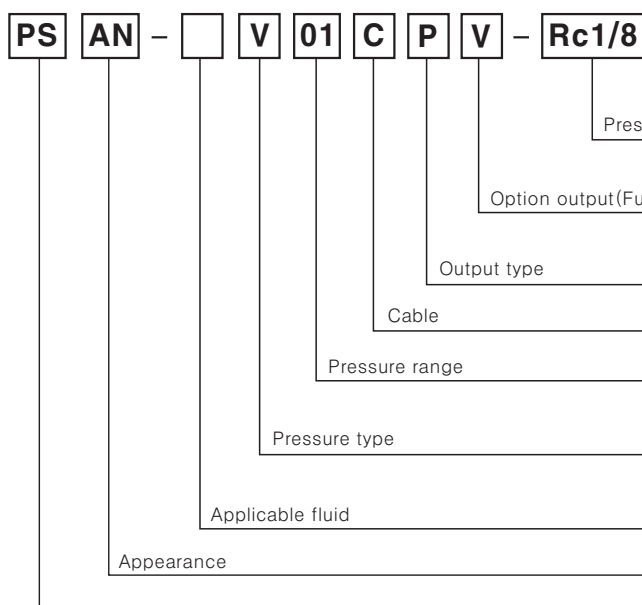
Pneumatic type



Fluid type

Line-up

■ Ordering information



| | |
|--------|------------------------------------|
| R1/8 | Standard(Fluid type) |
| Rc1/8 | Standard(Pneumatic type) |
| NPT1/8 | Option |
| V | Analog voltage(1–5V) output |
| A | Analog current(4–20mA) output |
| H | Hold/Auto shift input |
| Blank | NPN open collector output |
| P | PNP open collector output |
| C | Connector type |
| 01 | 100kPa |
| 1 | 1MPa |
| Blank | Positive pressure type |
| V | Vacuum pressure type |
| C | Compound pressure type |
| Blank | Pneumatic type(Gas) |
| L | Fluid type(Gas, Liquid, Oil) |
| AN | Regular square New type(30mm×30mm) |
| PS | Pressure Sensor |

※(★)In case of using M5 port, use PSO–Z01 (M5 Gender) together.

■ Pressure and Max. pressure display range

| Type | kPa | kgf/cm ² | bar | psi | mmHg | inHg | mmH ₂ O |
|-------------------|---|---|---|---|---|---|---|
| Vacuum pressure | 0.0 to -101.3 (5.0 to -101.3) | 0.000 to -1.034 (0.051 to -1.034) | 0.000 to -1.013 (0.050 to -1.013) | 0.00 to -14.70 (0.74 to -14.70) | 0 to -760 (38.0 to -760.0) | 0.0 to -29.9 (1.50 to -29.90) | 0.0 to -103.4 (5.1 to -103.4) |
| Positive 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 | -101.3 to 100.0 (-101.3 to 110.0) | -1.034 to 1.020 (-1.034 to 1.122) | -1.013 to 1.000 (-1.013 to 1.100) | -14.70 to 14.50 (-14.70 to 15.96) | -760 to 750 (-760.0 to 824.0) | -29.9 to 29.5 (-29.88 to 32.58) | -103.4 to 102.0 (-103.4 to 112.2) |

※() is Max. pressure display range.

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

Pressure Sensor

■ Pressure conversion chart

| from \ to | Pa | kPa | MPa | kgf/cm ² | mmHg | mmH ₂ O | psi | bar | inHg |
|----------------------|------------|-----------|----------|---------------------|-----------|--------------------|----------|----------|----------|
| 1kPa | 1000.000 | 1 | 0.001000 | 0.010197 | 7.500616 | 101.9689 | 0.145038 | 0.010000 | 0.2953 |
| 1kgf/cm ² | 98066.54 | 98.066543 | 0.09806 | 1 | 735.5595 | 10000.20 | 14.22334 | 0.980665 | 28.95878 |
| 1mmHg | 133.322368 | 0.133322 | 0.000133 | 0.001359 | 1 | 13.5954 | 0.019336 | 0.001333 | 0.039370 |
| 1mmH ₂ O | 9.80665 | 0.00980 | — | 0.000099 | 0.0735578 | 1 | 0.00142 | 0.000098 | 0.002895 |
| 1psi | 6894.757 | 6.89493 | 0.00689 | 0.070307 | 51.71630 | 703.07 | 1 | 0.068947 | 2.036074 |
| 1Pa | 100000.0 | 100.0000 | 0.100000 | 1.019689 | 750.062 | 10196.89 | 14.50339 | 1 | 29.52998 |
| 1inHg | 3386.417 | 3.386388 | 0.003386 | 0.034532 | 25.40022 | 345.31849 | 0.491158 | 0.033863 | 1 |

Ex) For calculating 760mmHg as kPa :

According to above chart, 1mmHg is 0.133322kPa, therefore 760mmHg will be 760×0.133322kPa=101.32472kPa.

■ Specifications

| Pressure type | | Gauge pressure | | | | | | | |
|--|--------------------------|---|------|------------------------|------|-----------------------------|------------------------|---------------------------|-------|
| | | Vacuum pressure type | | Positive pressure type | | | Compound pressure type | | |
| Model (★1) | Analog voltage output | PSAN-(L)V01C(P)V | | PSAN-(L)01C(P)V | | PSAN-(L)1C(P)V | | PSAN-(L)C01C(P)V | |
| | Analog current output | PSAN-(L)V01C(P)A | | PSAN-(L)01C(P)A | | PSAN-(L)1C(P)A | | PSAN-(L)C01C(P)A | |
| | Hold/Auto shift input | PSAN-(L)V01C(P)H | | PSAN-(L)01C(P)H | | PSAN-(L)1C(P)H | | PSAN-(L)C01C(P)H | |
| Rated pressure range | | 0.0 to −101.3kPa | | 0.0 to 100.0kPa | | 0 to 1,000kPa | | −101.3kPa to 100.0kPa | |
| Display pressure range | | 5.0 to −101.3kPa | | −5.0 to 110.0kPa | | −50 to 1,100kPa | | −101.3kPa to 110.0kPa | |
| Min.display unit(internal resolution) | | 0.1kPa (1/2,000) | | 0.1kPa (1/2,000) | | 1kPa (1/2,000) | | 0.1kPa (1/2,000) | |
| Max. pressure range | | 2 times of rated pressure | | | | 1.5 times of rated pressure | | 2 times of rated pressure | |
| Applicable fluid | | • Pneumatic type ☞ Air, Non-corrosive gas • Fluid type ☞ Air, Non-corrosive gas and fluid that will not corrode SUS316L | | | | | | | |
| Power supply | | 12V−24VDC ±10% (Ripple P−P:Max. 10%) | | | | | | | |
| Current consumption | | Max. 50mA(Analog Current Output type Max 75mA) | | | | | | | |
| Control output | | • 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(★2) | Min. display range | | | | | | | |
| | Repeat error | ±0.2%F.S ± Min. display range | | | | | | | |
| | Response time | Selectable 2.5ms, 5ms, 100ms, 500ms, 1000ms | | | | | | | |
| | Short circuit protection | Built-in | | | | | | | |
| Analog output (★3) | Voltage output | • Output voltage:1−5VDC ±2% F.S • Linear:Within ±1% F.S • Output impedance: 1kΩ • Zero point:Within 1VDC ±2% F.S • Span:Within4VDC ±2% F.S • Resolution:1/2,000(equal to display resolution) • Response Time:50ms | | | | | | | |
| | Current output | • Output current:4−20mA ±2% F.S • Linear:Within ±1% F.S • Zero-point:Within 4mA ±2% F.S • Span:Within16mA ±2% F.S • Resolution:1/2,000(equal to display resolution) • Response Time:70ms | | | | | | | |
| Display method | | 4 digit LED 7segment | | | | | | | |
| Min. Display interval(★4) | pressure unit resolution | 1000 | 2000 | 1000 | 2000 | 1000 | 2000 | 1000 | 2000 |
| | kPa | 0.1 | — | 0.1 | — | 1 | — | — | 0.1 |
| | kgf/cm ² | 0.001 | — | 0.001 | — | 0.01 | — | — | 0.001 |
| | bar | 0.001 | — | 0.001 | — | 0.01 | — | — | 0.001 |
| | psi | — | 0.01 | — | 0.01 | — | 0.1 | — | 0.02 |
| | mmHg | — | 0.4 | — | — | — | — | — | 0.8 |
| | inHg | — | 0.02 | — | — | — | — | — | 0.03 |
| | mmH ₂ O | 0.1 | — | — | — | — | — | — | 0.1 |
| Characteristic of control output and display temp. | | Max. ±0.5% F.S. of display pressure at 25℃ within 0℃ to 50℃ ※Max. ±1% F.S. of display pressure at 25℃ under −10℃ | | | | | | | |
| Analog output temp. characteristic | | Max. ±2% F.S. of display pressure at 25℃ within 0℃ to 50℃ | | | | | | | |
| Dielectric strength | | 1000VAC 50/60Hz for 1 minute | | | | | | | |
| Insulation resistance | | Min. 50MΩ (at 500VDC megger) | | | | | | | |
| Ambient temperature | | −10℃ to +50℃ (at non-dew status) | | | | | | | |
| Storage temperature | | −20℃ to +60℃ (at non-freezing status) | | | | | | | |
| Ambient humidity | | 30 to 80%RH | | | | | | | |
| Storage humidity | | 30 to 80%RH | | | | | | | |
| Vibration | | 1.5mm amplitude at frequency of 10 to 55Hz in each of X, Y, Z direction for 2 hours | | | | | | | |
| Protection | | IP40(IEC specification) | | | | | | | |
| Material | | • Pneumatic type ☞ Front case : PC, Rear case : PC, Pressure port : Nickel Plated Brass • Fluid type ☞ Front case : PC, Rear case : PA6, Pressure port : SUS316L | | | | | | | |
| Wire | | Connector cable (φ 4, 5P, Length: 2m, AWG 24, Insulator diameter: φ 1) | | | | | | | |
| Approval | | CE | | | | | | | |
| Unit weight | | • Pneumatic type ☞ Approx. 84g • Fluid type ☞ Approx. 57.5g | | | | | | | |

※F.S : Rated pressure.

※(★1) (P) represents PNP output type models.

※(★2) In hysteresis output mode, detection difference is variable. ※(★3) It is allowed to select one analog output type only.

※(★4) Resolution (1000/2000) of min. Display interval is automatically selected depend on pressure units.

(A) Photo electric sensor

(B) Fiber optic sensor

(C) Door/Area sensor

(D) Proximity sensor

(E) Pressure sensor

(F) Rotary encoder

(G) Connector/Socket

(H) Temp. controller

(I) SSR/Power controller

(J) Counter

(K) Timer

(L) Panel meter

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(P) Switching power supply

(Q) Stepping motor & Driver & Controller

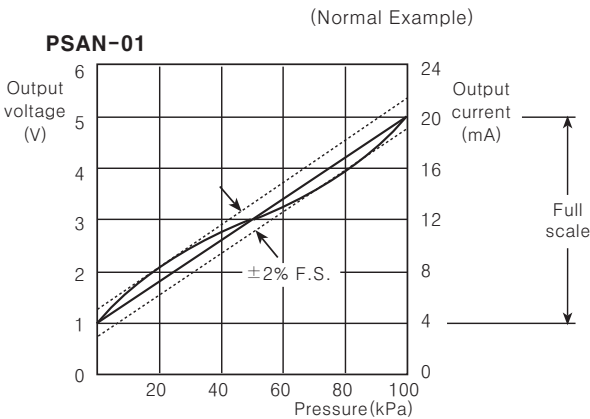
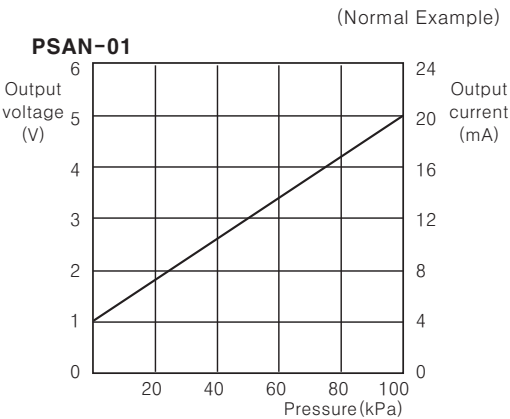
(R) Graphic/Logic panel

(S) Field network device

(T) Production stoppage models & replacement

PSAN Series

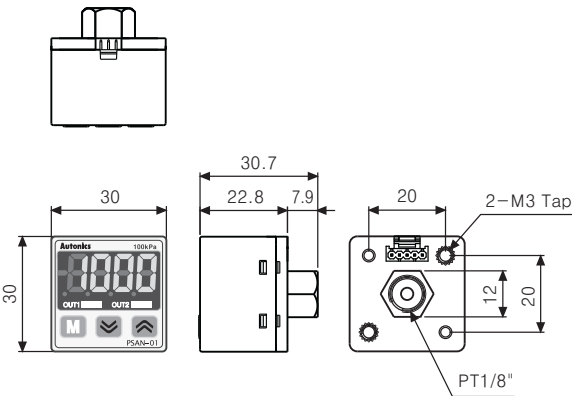
- Analog output voltage and current–Pressure characteristic
- Analog output voltage and current–Linear characteristic



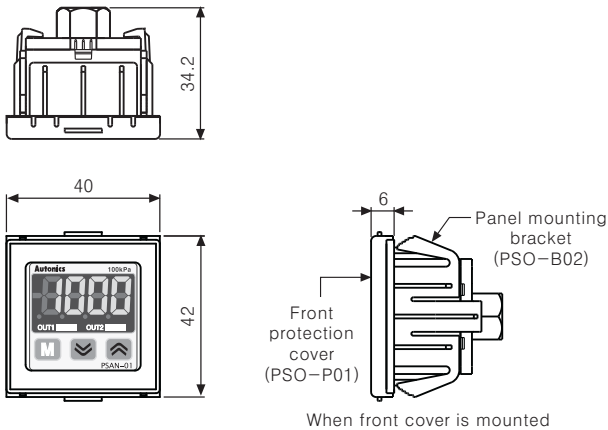
■Dimensions

- ◎Pneumatic type

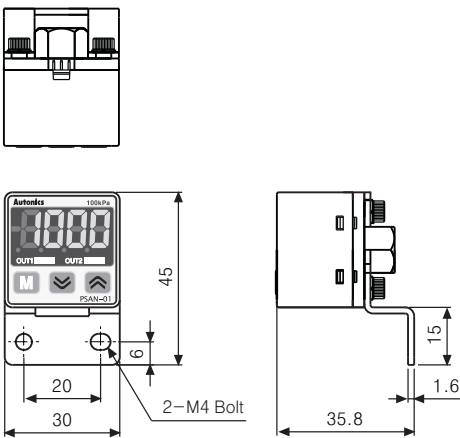
(Unit:mm)



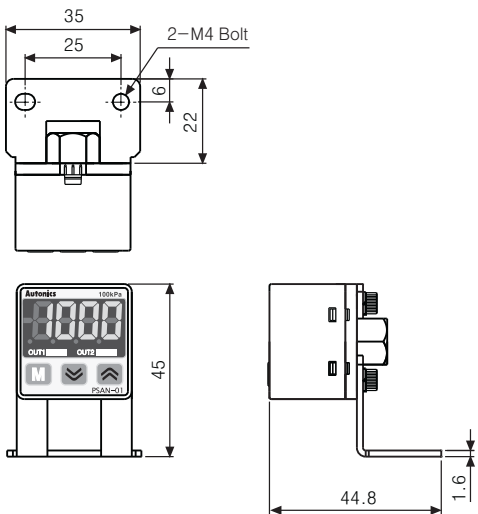
●Panel mounting bracket



●Fixing bracket A for mounting



●Fixing bracket B for mounting

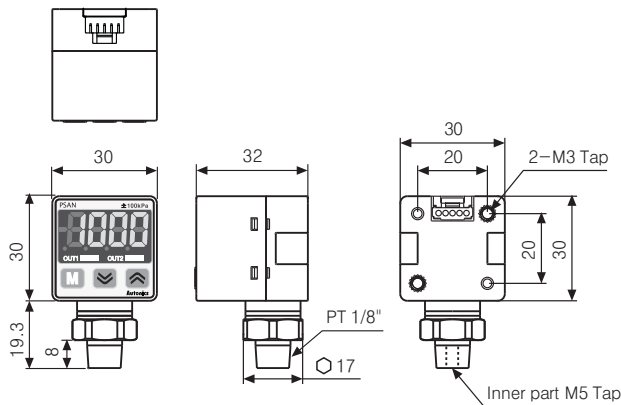


Pressure Sensor

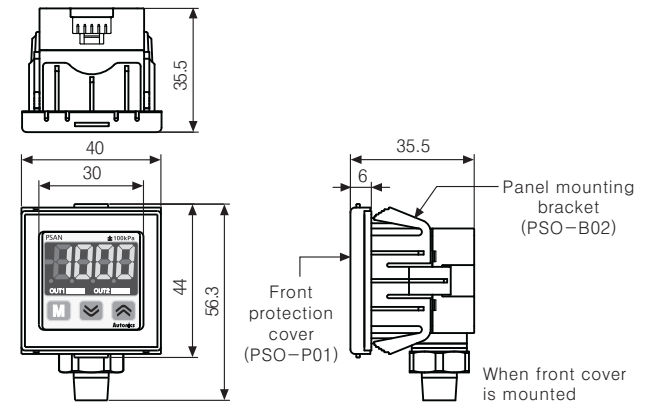
■ Dimensions

○ Fluid type

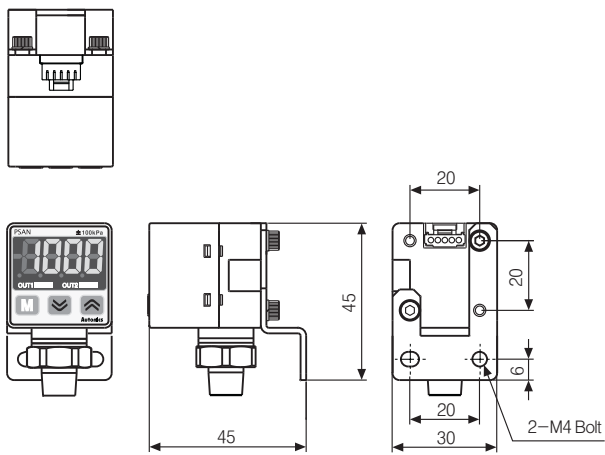
(Unit:mm)



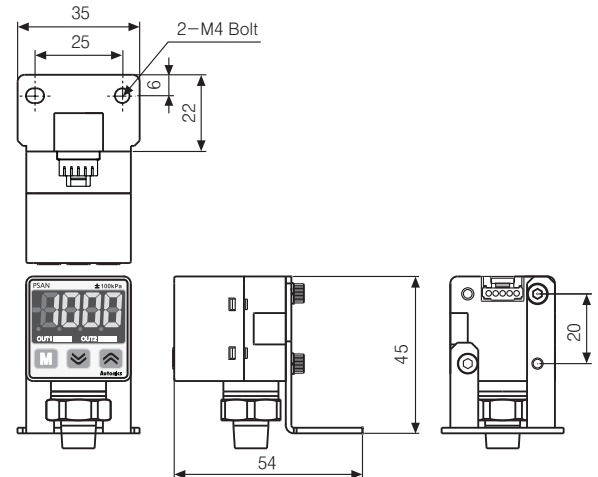
● Panel mounting bracket



● Fixing bracket A for mounting

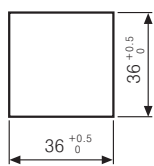


● Fixing bracket B for mounting



● Accessory (Sold separately)

● Panel cut-out



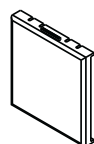
(Panel thickness : 0.8mm to 3.5mm)

● Panel mounting bracket



< PSO-B02 >

● Front protection cover



< PSO-P01 >

● M5 Gender



< PSO-Z01 >

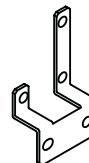
● Accessory

● Pressure unit label

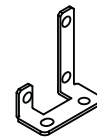
| ±100kPa | -101.3kPa | 2kPa | 10kPa | 100kPa | 1MPa |
|---------------------------|---------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| ±1.020kgf/cm ² | -1.034kgf/cm ² | 2.040kgf/cm ² | 10.20kgf/cm ² | 1.020kgf/cm ² | 10.20kgf/cm ² |
| ±14.50psi | -14.70psi | 29.00psi | 145.0psi | 14.50psi | 145.0psi |
| ±1.000bar | -1.013bar | 2.000bar | 10.00bar | 1.000bar | 10.00bar |
| ±750mmHg | -760mmHg | | | | |
| ±29.5inHg | -29.9inHg | | | /100 | /100 |
| ±102.0mmH ₂ O | -103.4mmH ₂ O | 2.040mmH ₂ O | 10.20mmH ₂ O | X100 | X100 |

DISPLAY UNIT LABEL

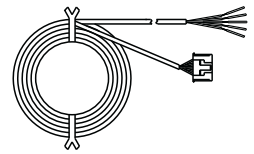
● Bracket A



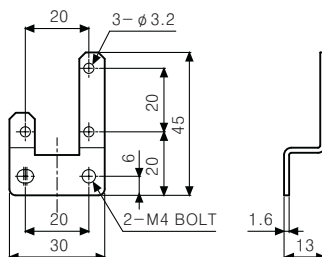
● Bracket B



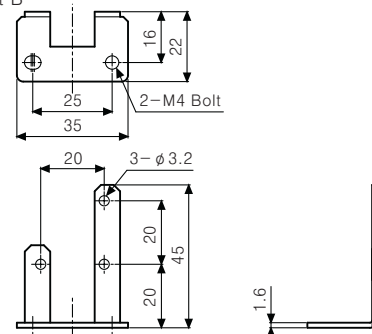
● Connector cable (PSO-C01)



● Bracket A



● Bracket B



(A) Photo electric sensor

(B) Fiber optic sensor

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(D) Proximity sensor

(E) Pressure sensor

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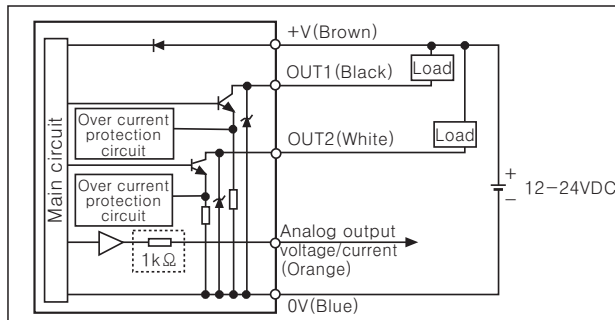
(T) Production stoppage models & replacement

PSAN Series

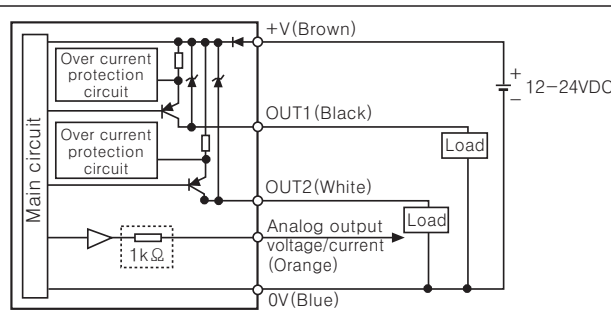
Control output diagram

○Analog output (Voltage output PSAN-□□□□V, Current output PSAN-□□□□A type)

●NPN open collector output type



●PNP open collector output type



※In case of analog voltage output type models short-circuit protection is not embodied. (: For voltage output type only.)

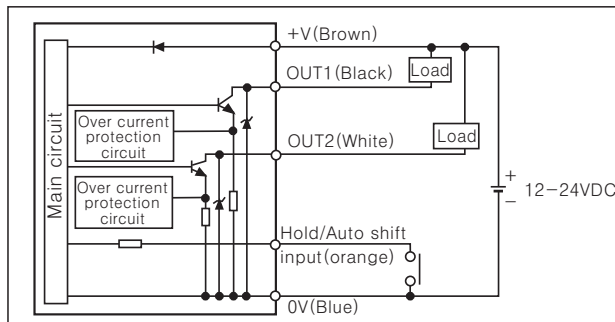
Do not connect with power source or load directly.

※Be careful with input impedance of connecting devices when using analog voltage output type models.

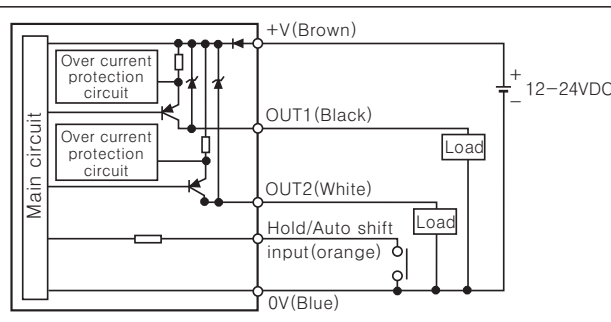
※Be careful with voltage drop due to cable resistance when extending sensor cable.

○Hold/Auto shift input (PSAN-□□□□H type)

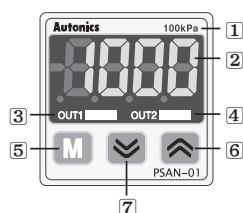
●NPN open collector output type



●PNP open collector output type



Front panel identification and function



① **Range of rated pressure** : The unit label is changeable.

Please use a desired measure unit label.

② **4 digit LED display(Red)** : Indicates measuring pressure value, setting value, and error message.

③ **Output1 indicator(Red)** : Output 1 is ON, LED will be ON.

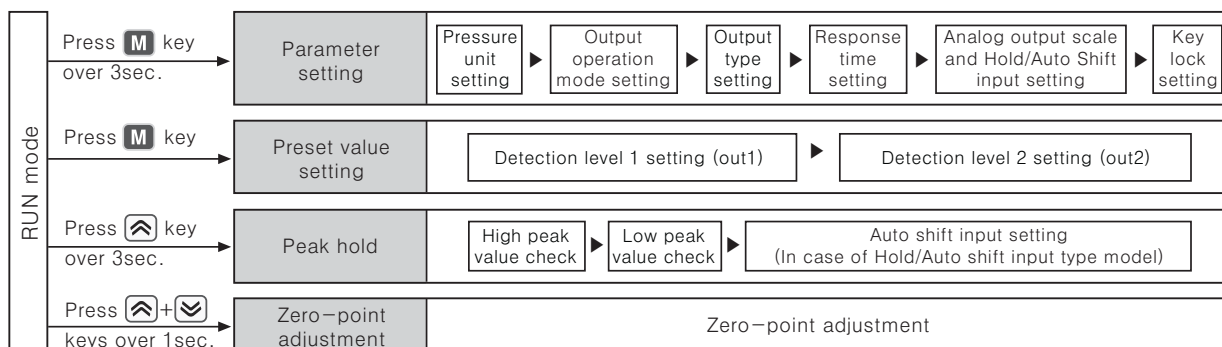
④ **Output2 indicator(Green)** : Output 2 is ON, LED will be ON.

⑤ **M key** : Used to enter into Preset/Parameter setting mode and to save Setting mode.

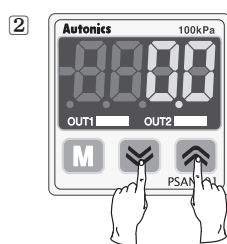
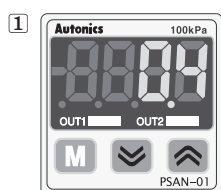
⑥ **key** : Used to set parameter and preset, peak value check mode, function setting or output operation mode.

⑦ **+key** : Used for zero-point adjustment function by pressing +key over 1 sec. simultaneously in RUN mode.

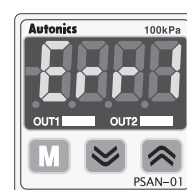
Setting



Zero-point adjustment



Press over 1sec.



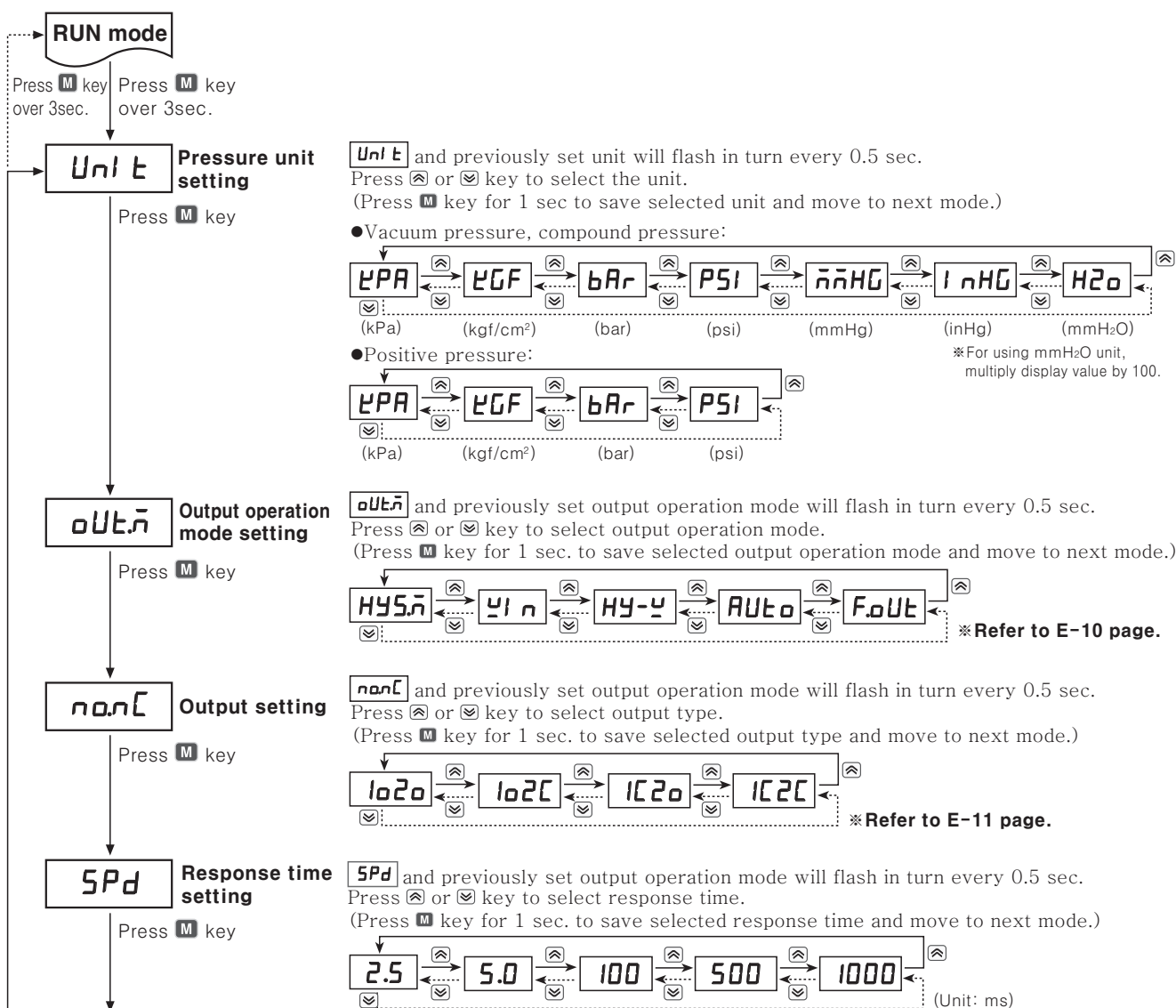
1. In state of atmospheric pressure during RUN mode, press key and key at the same time for over 1sec.
2. When the zero-point adjustment is completed, it will display and return to RUN mode automatically.

※Please execute zero-point adjustment regularly.

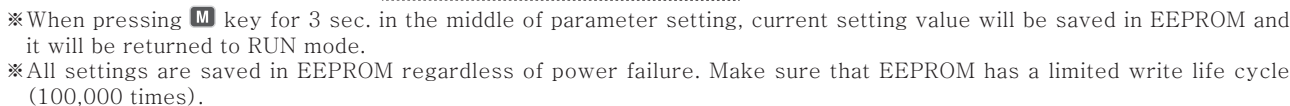
If executing zero-point adjustment when external pressure has been applied, **[Err1]** will flash. Please execute zero-point adjustment again in state of atmospheric pressure without external pressure.

Parameter setting

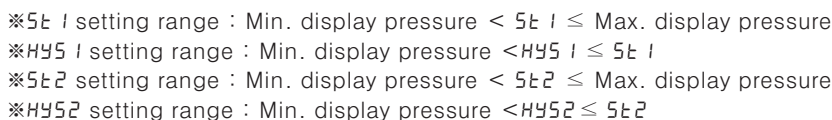
1. It is able to set pressure unit, display resolution, output operation mode, output type, response time, analog output scale, Hold/Auto shift and key lock setting in parameter setting mode.
2. If the key lock is set (lock1 or lock2), unlock the key lock before setting parameters.
(Refer to Key Lock setting below.)



| | |
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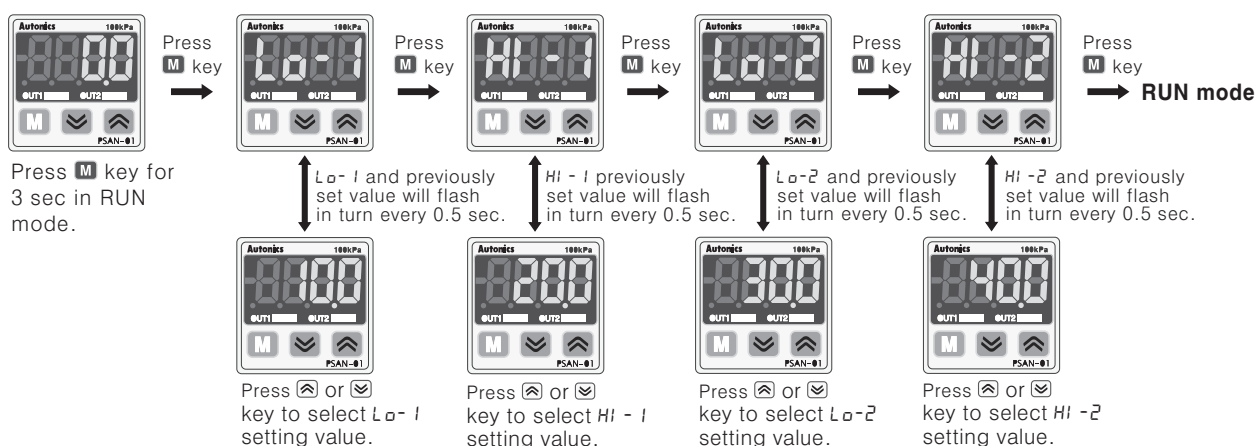


©Hysteresis mode(НУ5.п)



Pressure Sensor

○Window comparison output mode(ㄱ/ ㄴ)

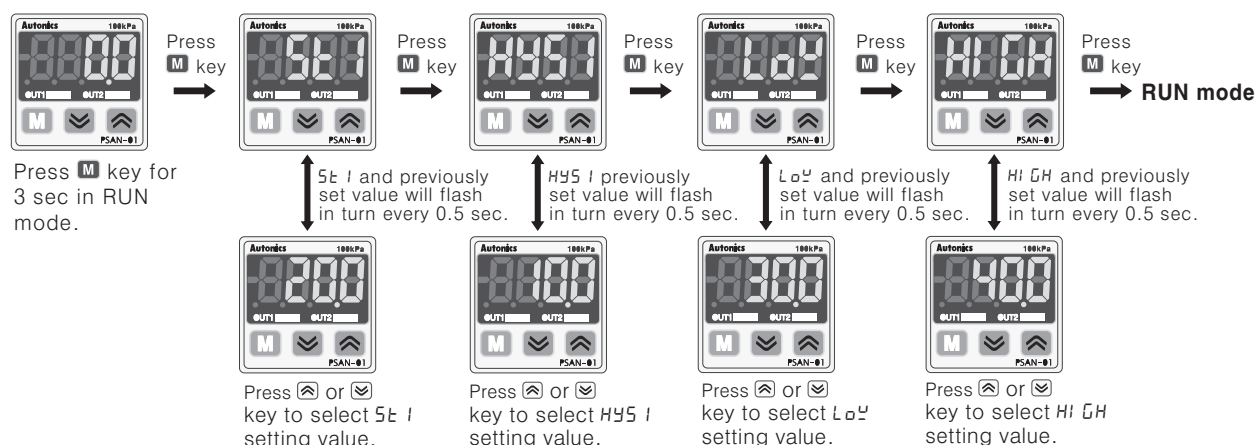


※Low value setting range : Min. display pressure < L_{0-1} , $L_{0-2} \leq$ Max. display pressure - (3 × Min. display range)

※High value setting range : $L0-1, L0-2 + (3 \times \text{Min. display range}) \leq H1-1, H1-2 \leq \text{Max. display pressure}$

※The minimum display unit for hysteresis is fixed to 1.

©Hysteresis-Window comparison output mode(HY-W)



※5t / setting range : Min. display pressure < 5t / ≤ Max. display pressure

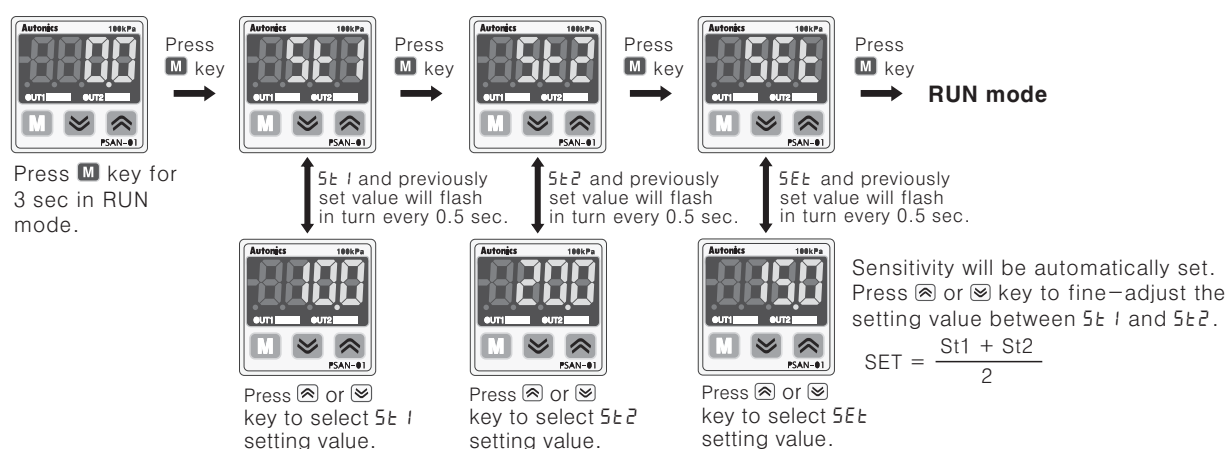
※H45 / setting range : Min. display pressure < H45 / ≤ 5t /

※Low value setting range : Min. display pressure < $L_{0.5}$ ≤ Max. display pressure - (3 × Min. display range)

※High value setting range : $\text{Low value} + (3 \times \text{Min. display range}) \leq HI \leq \text{Max. display pressure}$

※In case *HYS 1* and *5t 1* have the same setting values, it will have the minimum display unit as a hysteresis.

Ⓒ Automatic sensitivity setting mode (AUTO)



※5t / setting range : Min. display pressure ≤ 5t / ≤ Max. display pressure-1% of rated pressure

※5t2 setting range : $5t1 + 1\% \text{ of rated pressure} \leq 5t2 \leq \text{Max. display pressure}$

※ If certain detection level difference is not ensured, or setting conditions are not met, *Err3* message will flash three times and returned to *5t2* setting mode. Check all setting conditions and set proper setting values.

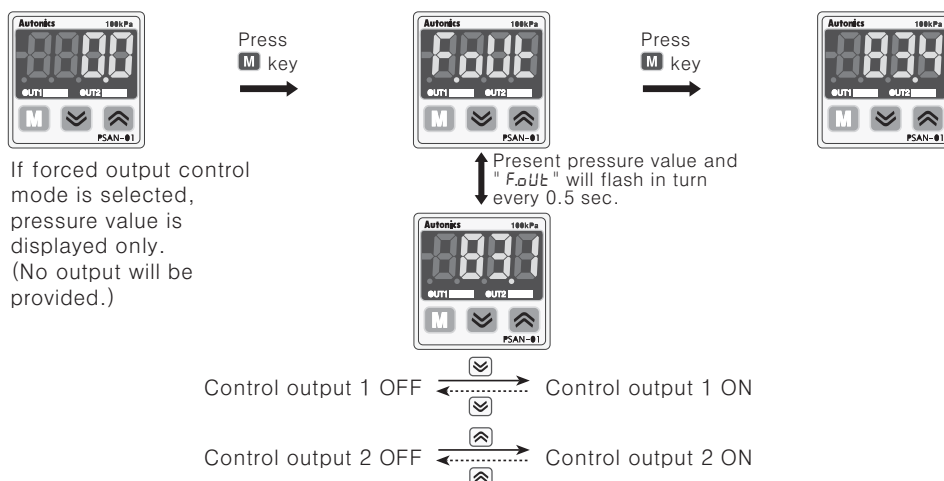
※ Press key to change set values and last set value will be saved for level 1 and level 2.

※In case of PSAN-□□□□H models, it is possible to set 5t1 and 5t2 using option input (yellow) after applying pressure on pressure port.

- | | |
|-----|--|
| (A) | Photo electric sensor |
| (B) | Fiber optic sensor |
| (C) | Door/Area sensor |
| (D) | Proximity sensor |
| (E) | Pressure sensor |
| (F) | Rotary encoder |
| (G) | Connector/Socket |
| (H) | Temp. controller |
| (I) | SSR/Power controller |
| (J) | Counter |
| (K) | Timer |
| (L) | Panel meter |
| (M) | Tacho/Speed/Pulse meter |
| (N) | Display unit |
| (O) | Sensor controller |
| (P) | Switching power supply |
| (Q) | Stepping motor & Driver & Controller |
| (R) | Graphic/Logic panel |
| (S) | Field network device |
| (T) | Production stoppage models & replacement |

PSAN Series

◎ **Forced output control mode(F.OUT)**



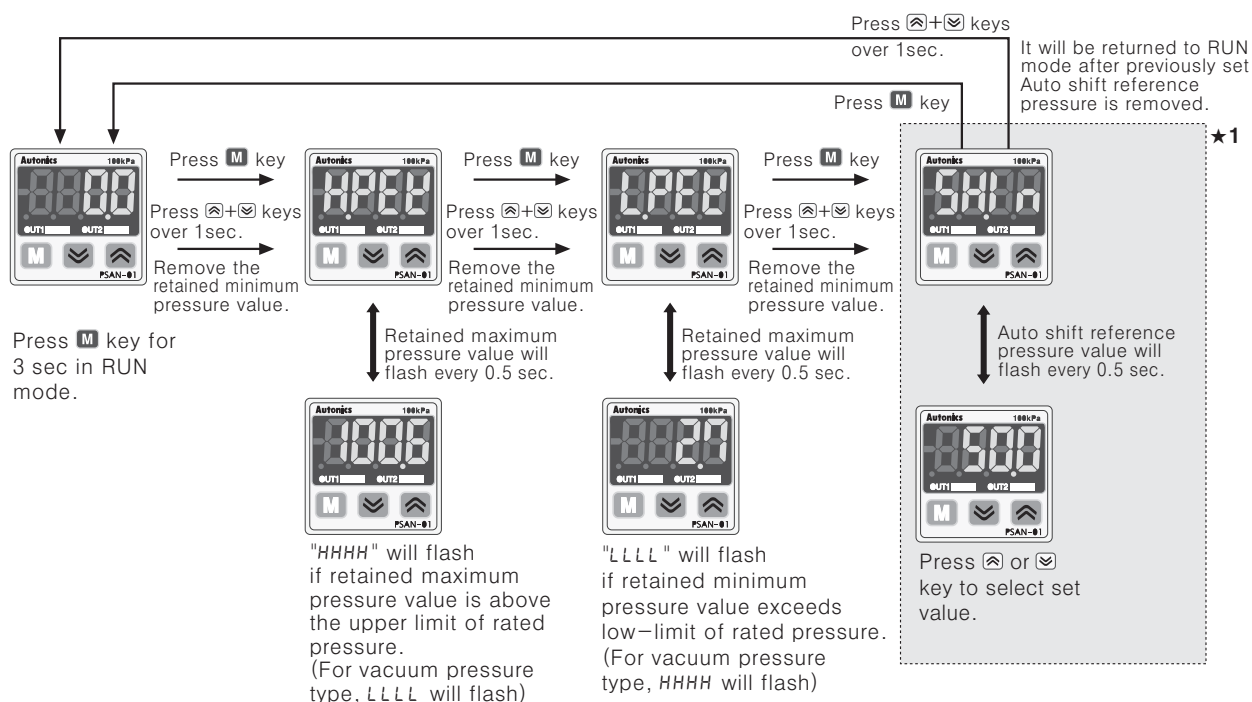
- **Factory default**

(Unit:kPa)

- ※ If there is no additional key operation within 60 sec while setting, it is returned to Run mode (Except for force output mode). Previously set values are remained.
- ※ In case of changing output operation mode, no preset values will be initialized. Instead, previous output operation settings will become the preset values.
- ※ When changing pressure display unit, resolution, and Hold/Auto shift input function, preset values will be initialized as shown the next table. (When changing pressure display unit, preset value will be automatically switched to changed pressure unit.)
- ※ When using the forced output function, Hold/Auto shift function is not available to use in Hold/Auto shift model.

| Output mode | Vacuum pressure -101.3 to 0 | Positive pressure 0 to 100.0 | Positive pressure 0 to 1,000 | Compound pressure -101.3 to 100.0 |
|-------------|--|--|--|--|
| НУ5.н | 5т 1:-50.0 НУ5 1:0 5т 2:-50.0 НУ5 2:0 | 5т 1:50.0 НУ5 1:0 5т 2:50.0 НУ5 2:0 | 5т 1:500 НУ5 1:0 5т 2:500 НУ5 2:0 | 5т 1:50.0 НУ5 1:-50.0 5т 2:50.0 НУ5 2:-50.0 |
| У1.п | Л0- 1:-50.0 Н1- 1:0 Л0- 2:-50.0 Н1- 2:0 | Л0- 1:0 Н1- 1:50.0 Л0- 2:0 Н1- 2:50.0 | Л0- 1:0 Н1- 1:500 Л0- 2:0 Н1- 2:500 | Л0- 1:-50.0 Н1- 1:50.0 Л0- 2:-50.0 Н1- 2:50.0 |
| НУ-У | 5т 1:-50.0 НУ5 1:0 Л0У:0 Н1 0Н:-50.0 | 5т 1:50.0 НУ5 1:0 Л0У:0 Н1 0Н:50.0 | 5т 1:500 НУ5 1:0 Л0У:0 Н1 0Н:500 | 5т 1:50.0 НУ5 1:-50.0 Л0У:-50.0 Н1 0Н:50.0 |
| АУ0.0 | 5т 1:0 5т 2:-50.0 5Ет:-25.0 | 5т 1:0 5т 2:50.0 5Ет:25.0 | 5т 1:0 5т 2:500 5Ет:250 | 5т 1:-50.0 5т 2:50.0 5Ет:0 |

■ **High peak/Low peak function and Auto shift reference pressure check/change**



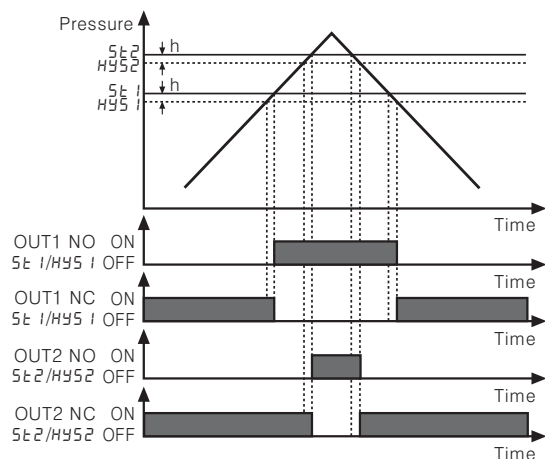
★1. ※Displayed only when "d-I n" is set to "5HFt". (PSAN-□□□□H models only)

※If there is no Auto shift input, "□" will be displayed. (Refer to E-11 page for more details.)

■ Output operation mode

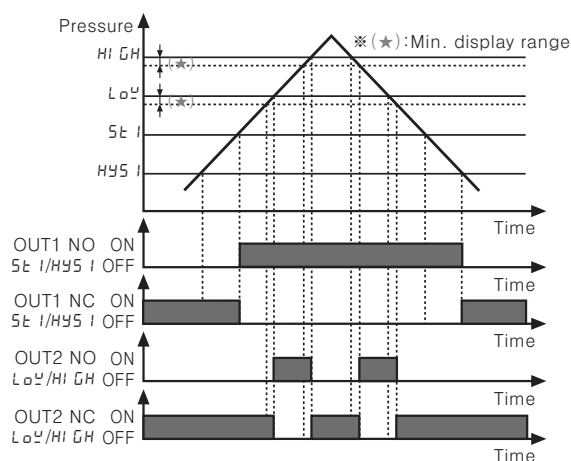
1. Hysteresis mode(HY5.ñ)

It is able to set certain value for pressure detection level(5t1, 5t2) and hysteresis(HY51, HY52).



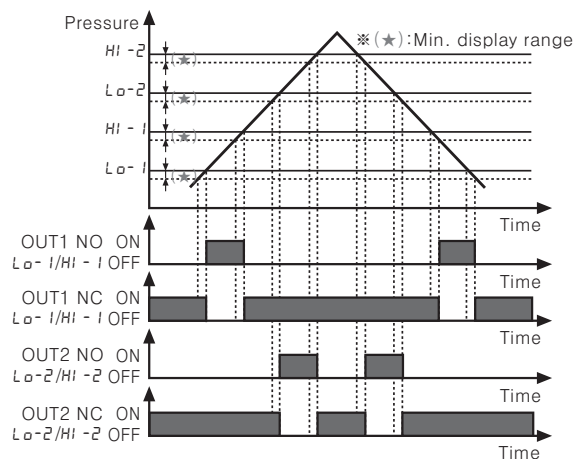
3. Hysteresis-window comparison output mode(HY-υ)

- ① It is available to set hysteresis mode and window comparison output mode when both hysteresis mode(5t1, HY51) and window comparison output mode(Loυ, HI GH) are necessary.
- ② Detection hysteresis is fixed to min. display range.



2. Window comparison output mode(υ1 η)

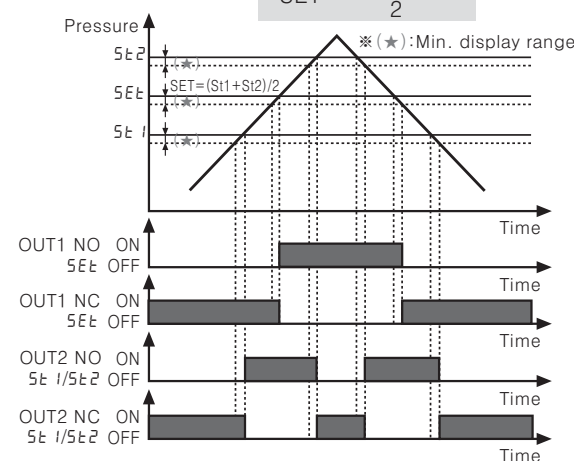
- ① It is able to set the range for high(HI-1, HI-2), low(Lo-1, Lo-2) limit of pressure detection level when it is required to detect pressure at a certain range.
- ② Detection hysteresis is fixed to min. display range.



4. Automatic sensitivity setting mode(AUto)

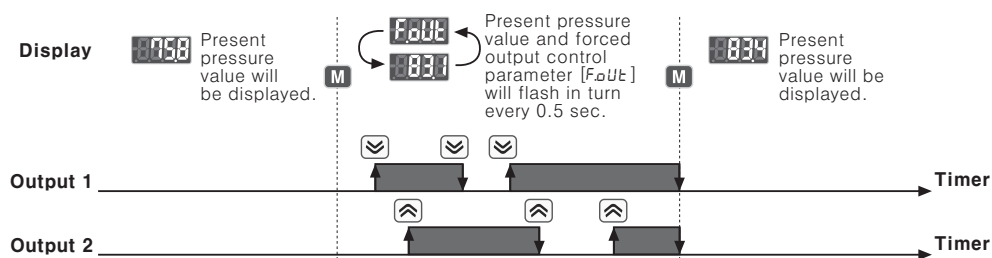
- ① This function is to set pressure detection level to the proper position automatically. It is set by applied pressure from two positions(5t1, 5t2).
- ② Detection hysteresis is fixed to min. display range.
- ③ The pressure detection level is shown in the following calculation.

$$SET = \frac{(St1 + St2)}{2}$$



5. Forced output control mode(FoULt)

- ① Used to display pressure with forcibly holding comparing output OFF regardless of setting value.
- ② Output 1, 2 can be ON/OFF manually by pressing key while the forced output control mode is applied.



| | |
|-----|--|
| (A) | Photo electric sensor |
| (B) | Fiber optic sensor |
| (C) | Door/Area sensor |
| (D) | Proximity sensor |
| (E) | Pressure sensor |
| (F) | Rotary encoder |
| (G) | Connector/Socket |
| (H) | Temp. controller |
| (I) | SSR/Power controller |
| (J) | Counter |
| (K) | Timer |
| (L) | Panel meter |
| (M) | Tacho/Speed/Pulse meter |
| (N) | Display unit |
| (O) | Sensor controller |
| (P) | Switching power supply |
| (Q) | Stepping motor & Driver & Controller |
| (R) | Graphic/Logic panel |
| (S) | Field network device |
| (T) | Production stoppage models & replacement |

■ Functions

◎ Pressure unit change function

PSAN-V01C(P) and PSAN-C01C(P) has 7 kinds of pressure unit, PSAN-01C(P) and PSAN-1C(P) has 4 kinds of pressure unit. Please select the proper unit for application.

- PSAN-V01C(P), PSAN-C01C(P) : kPa, kgf/cm², bar, psi, mmHg, inHg, mmH₂O
- PSAN-01C(P), PSAN-1C(P) : kPa, kgf/cm², bar, psi
- ※ When using mmH₂O unit, multiply display value by 100.

◎ Output mode change function

There are 5 kinds of control output mode in order to realize the various pressure detection.

- Hysteresis mode (**HYS**) : When needed to change hysteresis for detecting pressure.
- Window comparison output mode (**WIN**) : When needed to detect pressure in certain area.
- Hysteresis - Window comparison output mode (**HY-W**) : When both hysteresis mode and window comparison output mode are required.
- Automatic sensitivity setting mode (**AUTO**) : When needed to set detection sensitivity automatically at proper position.
- Forced output control mode (**FORCE**) : When needed to display pressure with remaining comparison output OFF regardless of setting value.

◎ Control output change function

Type of control output for Out1 and Out2 is able to set Normal Open or Normal Close.

※ Note that Normal Open and Normal Close provide opposite output.

| OUT1 output | OUT2 output | Parameter setting value |
|--------------|--------------|-------------------------|
| Normal Open | Normal Open | [1020] |
| Normal Open | Normal Close | [1021] |
| Normal Close | Normal Open | [1022] |
| Normal Close | Normal Close | [1023] |

◎ Response time change function (Chattering prevention)

It can prevent chattering of control output by changing response time. It is able to set 5 kinds of response time (2.5ms, 5ms, 100ms, 500ms, 1000ms) and if the response time is getting longer, the detection will be more stable by increasing the number.

◎ Analog output scale setting function

- Analog voltage output scale setting : The scale function for analog output voltage (1-5VDC) is not fixed to the rated pressure range. It can be changed for User's application. Analog output voltage range will be fixed to 1-5VDC within the pressure range from pressure point of 1VDC output (**R-10**) to pressure point of 5VDC output (**R-50**).
- Analog current output scale setting : The scale for analog output Current (4-20mA) is not fixed to the rated pressure range. It can be changed for User's application. Analog output voltage will be fixed to 4-20mA within the rated pressure range from pressure point of 4mA output (**R-04**) to pressure point of 20mA output (**R-20**).

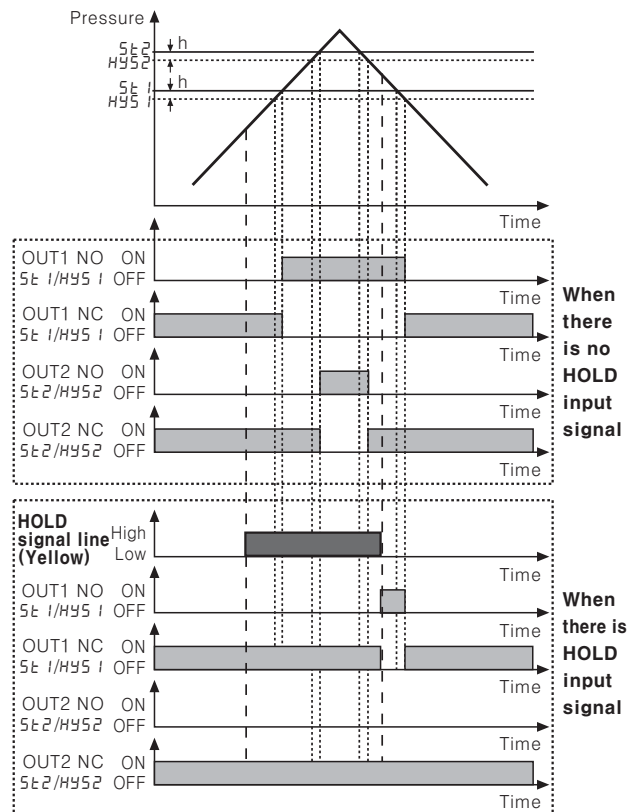
◎ Hold/Auto shift input setting function

- Hold function: A function to hold present pressure value and control output at the time of hold signal input.

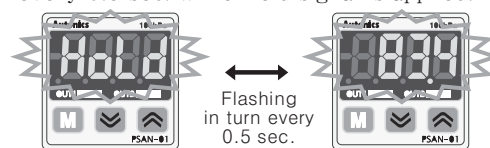
※ Present pressure value and Hold message will flash in turn every 0.5 sec. while Hold function is set. Make sure that Hold function is not able to execute while forced output mode is executed.

► Control output timing chart

EX) When Hold signal is applied in Hysteresis mode, refer to Control output diagram for hold signal input.



※ [Hold] and present pressure value will flash in turn every 0.5 sec. while Hold signal is applied.



- Auto shift function: A function to use the measured pressure at the moment of auto shift input as a reference pressure in order to correct the set point values of control output when initial pressure changes.

※ Reference pressure is fixed to atmospheric pressure (0.0kPa) when Auto shift function is not used.

※ **SHI** (Auto shift compensation value) will be reset to 0 when changing control output or preset values.

※ Auto shift function will not be executed if "HHHH" or "LLLL" error occurs or if forced output mode is set.

[**SHI**] : Reference pressure change through setting.

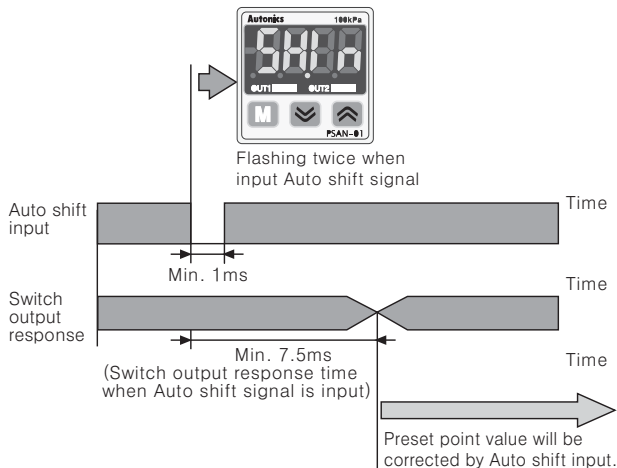
[**OUT1**] : Changed reference will be applied to control output 1 only.

[**OUT2**] : Changed reference will be applied to control output 2 only.

[**ALL**] : Changed reference will be applied to both control output 1 and control output 2.

► When Auto shift function is used

When Auto shift input signal remains at low level more than 1ms, the measured pressure at this point will be saved as a reference value to make correct judgment regardless of pressure changes. Corrected preset pressure value will be applied after 7.5ms. Measured reference pressure value will be saved in [5H:n].



※ When Auto shift function is used, the possible set pressure range will be wider than rated set pressure range.

※ The possible set pressure range for Auto shift type models.

| Pressure type | Set pressure range | Possible set pressure range for Auto shift type models |
|-------------------|-----------------------|--|
| Vacuum pressure | -101.3kPa to 5.0kPa | -101.3kPa to 101.3kPa |
| Standard pressure | -5.0kPa to 110.0kPa | -110.0kPa to 110.0kPa |
| | -50.0kPa to 1100kPa | -1100kPa to 1100kPa |
| Compound pressure | -101.3kPa to 110.0kPa | -101.3kPa to 110.0kPa |

※ If the set point value corrected by auto shift input exceeds set pressure range, an error message will flash three times and corrected value is not saved.

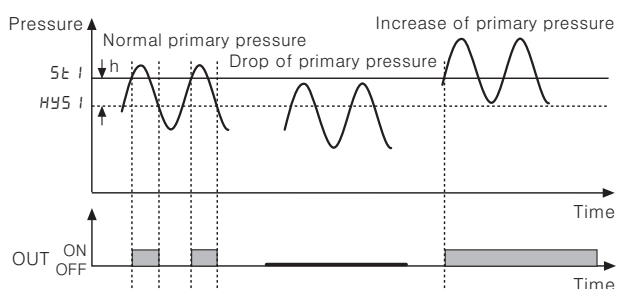
→ [-HH-] displayed when the set point value corrected by Auto shift input is above the upper limit of set pressure range.

→ [-LL-] displayed when the set point value corrected by Auto shift input is below the lower limit of set pressure range.

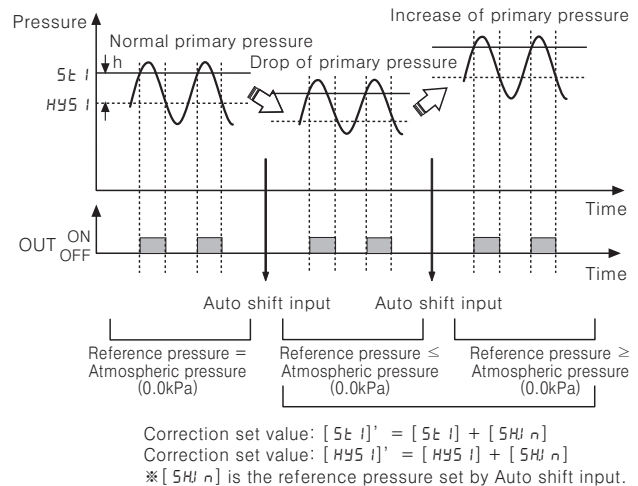
※ The correction value will be saved in EEPROM.

► Example of Auto shift function

< When Auto shift is not used >



< When Auto shift is used >



◎Key lock function

The key lock function prevents key operations so that conditions set in each mode.

- **LoL1** : All keys are locked; therefore it is not available to change parameter settings, preset value, zero adjustment, High/Low peak check, and 5H:n data initialization. (Lock setting change is available)
- **LoL2** : Partially locked status; therefore it is not available to change parameter settings only (Lock setting change is available). Other settings are still available.
- **oFF** : All of the setting is available, all keys are unlocked.

◎Zero-point adjustment function

The zero-point adjustment function forcibly sets the pressure value to "zero" when the pressure port is opened to atmospheric pressure. When the zero adjustment is applied, analog output [Voltage or Current] is changed by this function.

(Press + keys over 1 sec. in RUN mode.)

◎High Peak / Low Peak 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 display function

| Error display | Description | Troubleshooting |
|----------------------|--|--|
| Err1 | When external pressure is input while adjusting zero point | Try again after removing external pressure |
| Err2 | When overload is applied on control output | Remove overload |
| Err3 | When setting condition is not met in Auto sensitivity setting mode | Check setting conditions and set proper setting values |
| LLLL | When applied pressure exceeds Low-limit of display pressure range | Apply pressure within display pressure range |
| HHHH | When applied pressure exceeds High-limit of display pressure range | |
| -HH- -LL- -HL- | Auto shift correction error | Set the corrected setting value within setting pressure range. |

| | |
|-----|--|
| (A) | Photo electric sensor |
| (B) | Fiber optic sensor |
| (C) | Door/Area sensor |
| (D) | Proximity sensor |
| (E) | Pressure sensor |
| (F) | Rotary encoder |
| (G) | Connector/Socket |
| (H) | Temp. controller |
| (I) | SSR/Power controller |
| (J) | Counter |
| (K) | Timer |
| (L) | Panel meter |
| (M) | Tacho/Speed/Pulse meter |
| (N) | Display unit |
| (O) | Sensor controller |
| (P) | Switching power supply |
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| (R) | Graphic/Logic panel |
| (S) | Field network device |
| (T) | Production stoppage models & replacement |

PSAN Series

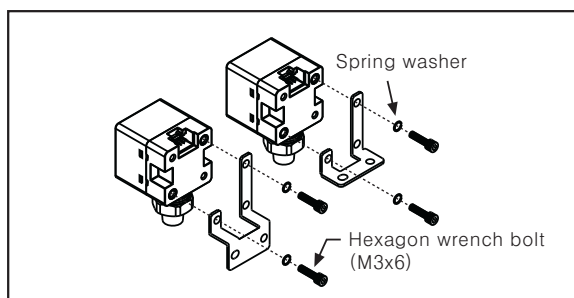
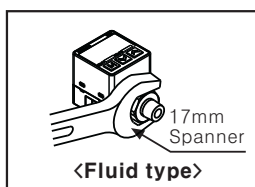
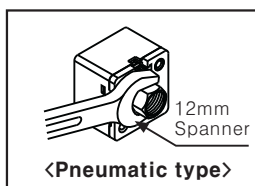
■ Installation

1. Pressure port has two types, PT1/8 and NPT1/8, therefore be sure to use proper port when using one touch fitting. (NPT 1/8 is option)
2. Please connect it by using spanner (12mm, 17mm) at the metal part in order not to overload on the body when connecting one touch fitting.
3. Two different fixing brackets are provided for PSAN model. Select proper one with considering your application environments.
4. At first, please unscrew hexagon wrench bolt and assemble the bracket on this unit by fixing hexagon the wrenchbolt.

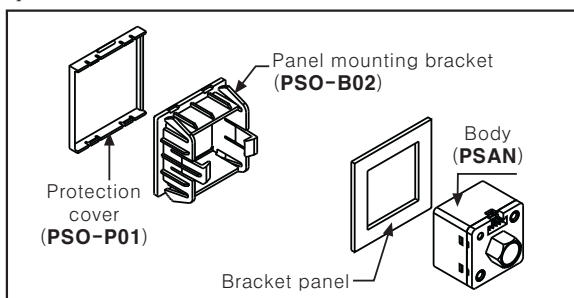
In this case, tightening torque of hexagon wrench should be max. 3kgf · cm. If not, it may cause mechanical problem.

⚠ Caution

The tightening torque of one touch fitting should be max. 100kgf · cm. If not, it may cause mechanical problem.



5. Bracket (PSO-B02) and front protection cover (PSO-P01) are sold separately. Please see the pictures for installation.

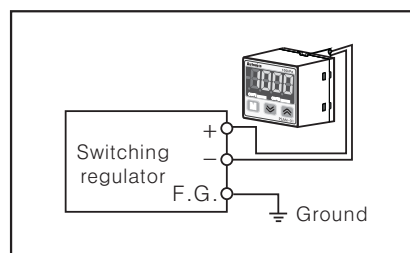


■ Proper usage

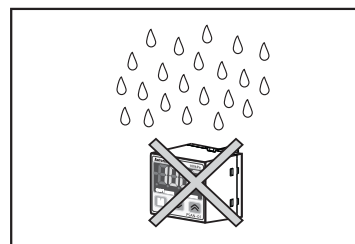
⚠ Caution

PSAN Series is for sensing of non corrosive gas. Do not use this product at corrosive gas or flammable gas, etc.

- Please using this unit within the range of specification, if applying pressure is larger than specification, it may not be working properly due to damage.
- After supplying power, it takes 3 sec. to work.
- When using switching regulator as power supply, it must be grounded (F.G.).



- It may cause malfunction by noise, when wiring with power line or high voltage line.
- Do not insert any sharp or pointed object into pressure port. It may cause mechanical problem due to sensor damage.
- Do not use this unit with flammable gas, because this is not an explosion proof structure.
- Be sure that this unit should not be contacted directly with water, oil, thinner, etc.



- Wiring must be done with power off.

Small size, High accuracy pressure control digital pressure sensor

■ Features

- High accuracy digital pressure sensor
- High brightness red LED(LED height : 9.5mm)
- High resolution : 1/1000
- Convertible pressure unit
Vacuum pressure, Compound pressure :
kPa, kgf/cm², bar, psi, mmHg, mmH₂O, inHg
Positive 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 : 2.5, 5, 100, 500ms)
- Analog output(1-5VDC)
- Reverse power polarity and overcurrent protection circuit
- Zero-point adjustment function
- Peak and Bottom hold display

⚠ Please read "Caution for your safety" in operation manual before using.



PSA Type



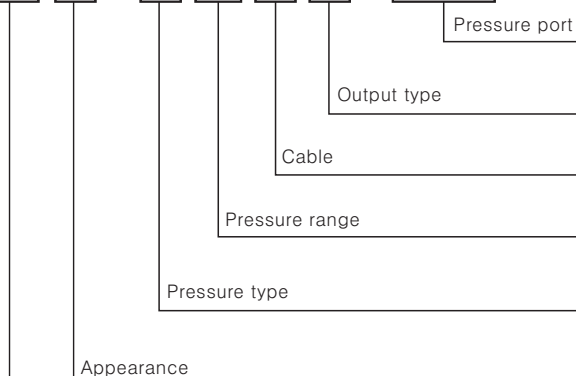
PSB Type



PSB Connector Type

■ Ordering information

PS A - V 01 C P - Rc1/8



| | |
|--------|---------------------------------|
| Rc1/8 | Standard(PSA Type) |
| NPT1/8 | Option(PSA Type) |
| M5 | Standard(PSB Type) |
| Blank | NPN open collector output |
| P | PNP open collector output |
| Blank | Positive(Cable integrated type) |
| C | Connector type |
| 01 | 100kPa |
| 1 | 1MPa |
| Blank | Positive pressure type |
| V | Vacuum pressure type |
| C | Compound pressure type |
| A | Regular square(30mm×30mm) |
| B | Rectangular(10.2mm×54mm) |
| PS | Pressure Sensor |

※ (★) is only applied to PSB Series.

■ Pressure and Max. pressure display range

| Type | kPa | kgf/cm ² | bar | psi | mmHg | inHg | mmH ₂ O |
|-------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|------------------------------|----------------------------------|--------------------------------------|
| Vacuum pressure | 0 to -101.3 (5.0 to -101.3) | 0 to -1.033 (0.051 to -1.034) | 0 to -1.013 (0.05 to -1.013) | 0 to -14.70 (0.74 to -14.70) | 0 to -760 (38 to -760) | 0 to -29.9 (1.5 to -29.9) | 0 to -103.4 (5.2 to -103.4) |
| Positive pressure | 0 to 100.0 (-5.0 to 110.0) | 0 to 1.020 (-0.051 to 1.122) | 0 to 1.020 (-0.050 to 1.100) | 0 to 14.50 (-0.726 to 15.96) | — | — | — |
| | 0 to 1000 (-50 to 1100) | 0 to 10.20 (-0.51 to 11.22) | 0 to 10.00 (-0.50 to 11.00) | 0 to 145.0 (-7.2 to 159.6) | — | — | — |
| Compound pressure | 100.0 to -100.0 (110.0 to -101.2) | 1.020 to -1.020 (1.122 to -1.034) | 1.020 to -1.020 (1.100 to -1.012) | 14.50 to -14.50 (15.96 to -14.70) | 750 to -750 (824 to -760) | 29.5 to -29.5 (32.6 to -29.9) | 102.1 to -103.4 (112.3 to -103.4) |

※ () is Max. pressure display range.

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

■ Pressure conversion chart

| from \ to | Pa | kPa | MPa | kgf/cm ² | mmHg | mmH ₂ O | psi | bar | inHg |
|----------------------|------------|-----------|----------|---------------------|-----------|--------------------|----------|----------|----------|
| 1kPa | 1000.000 | 1 | 0.001000 | 0.010197 | 7.500616 | 101.9689 | 0.145038 | 0.010000 | 0.2953 |
| 1kgf/cm ² | 98066.54 | 98.066543 | 0.09806 | 1 | 735.5595 | 10000.20 | 14.22334 | 0.980665 | 28.95878 |
| 1mmHg | 133.322368 | 0.133322 | 0.000133 | 0.001359 | 1 | 13.5954 | 0.019336 | 0.001333 | 0.039370 |
| 1mmH ₂ O | 9.80665 | 0.00980 | — | 0.000099 | 0.0735578 | 1 | 0.00142 | 0.000098 | 0.002895 |
| 1psi | 6894.757 | 6.89493 | 0.00689 | 0.070307 | 51.71630 | 703.07 | 1 | 0.068947 | 2.036074 |
| 1Pa | 100000.0 | 100.0000 | 0.100000 | 1.019689 | 750.062 | 10196.89 | 14.50339 | 1 | 29.52998 |
| 1inHg | 3386.417 | 3.386388 | 0.003386 | 0.034532 | 25.40022 | 345.31849 | 0.491158 | 0.033863 | 1 |

Ex) In case of calculating 760mmHg as kPa :

According to above chart, 1mmHg is 0.133322kPa, therefore 760mmHg will be 760×0.133322kPa=101.32472kPa.

(A) Photo electric sensor

(B) Fiber optic sensor

(C) Door/Area sensor

(D) Proximity sensor

(E) Pressure sensor

(F) Rotary encoder

(G) Connector/Socket

(H) Temp. controller

(I) SSR/Power controller

(J) Counter

(K) Timer

(L) Panel meter

(M) Tacho/Speed/Pulse meter

(N) Display unit

(O) Sensor controller

(P) Switching power supply

(Q) Stepping motor & Driver & Controller

(R) Graphic/Logic panel

(S) Field network device

(T) Production stoppage models & replacement

PSA / PSB Series

Specifications

| Pressure type | | Gauge pressure | | | |
|--|---------------------|--|--------------------------------|-----------------------------|---|
| | | Vacuum pressure type | Positive pressure type | | Compound pressure type |
| Model | NPN 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 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 to 100.0kPa | 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 |
| Applicable fluid | | Air, Non-corrosive gas | | | |
| Power supply | | 12-24VDC ±10% (Ripple P-P : Max. 10%) | | | |
| Current consumption | | Max. 50mA | | | |
| Control output | | • NPN open collector output ⚡ Sink current : Max. 100mA, Applied voltage : Max. 30VDC, Residual voltage : Max. 1V • PNP open collector output ⚡ Source current : Max. 100mA, Residual voltage : Max. 2V | | | |
| Hysteresis | | (*1) 1digit fixed (2digit/psi) | | | 2digits fixed |
| Repeat error | | ±0.2% F.S ±1digit | | | ±0.2% F.S ±2digits |
| Response time | | Selectable 2.5ms, 5ms, 100ms, 500ms | | | |
| Short circuit protection | | Built-in | | | |
| Analog output | | • Output voltage : 1-5VDC ±2% F.S • Zero-point: Within 1VDC ±2% F.S • Span: Within 4VDC ±2% F.S • Linear : Within ±2% F.S • Resolution : Approx. 1/200 • Output impedance : 1kΩ | | | |
| Display method | | 3½ digit LED 7Segment | | | |
| Min. display interval | | 1digit (2digit/psi) | | | 2digits |
| Pressure unit | | kPa, kgf/cm², bar, psi, mmHg, mmH2O, inHg | kPa, kgf/cm², bar, psi | | kPa, kgf/cm², bar, psi, mmHg, mmH2O, inHg |
| Characteristic of control output and displayed temp. | | (*2) Max. ±1% F.S | | | Max. ±2% F.S |
| Analog output temperature characteristic | | (*2) Max. ±2% F.S | | | |
| Environment | Ambient temperature | -10℃ to 50℃ (at non-freezing status) | | | |
| | Storage temperature | -20℃ to 60℃ (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, PSB-C ⚡ Case, Pressure port, Cover : IXEF | | | |
| Protection | | IP40 (IEC standard) | | | |
| Cable | | ø 4mm, 5P, Length : 2m (Connector type : 3m) | | | |
| Approval | | CE | | | |
| Unit weight | | PSA : Approx. 120g, PSB : Approx. 70g, PSB-C : Approx. 80g | | | |

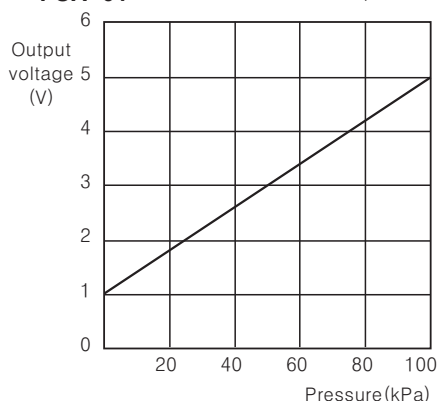
*F.S(Full Scale) : Specified pressure range.

*(*1) The Hysteresis is changeable in output operation of F-1 mode.

*(*2) It is based on the pressure of 25 $^{\circ}$ C within 0 to 50 $^{\circ}$ C.

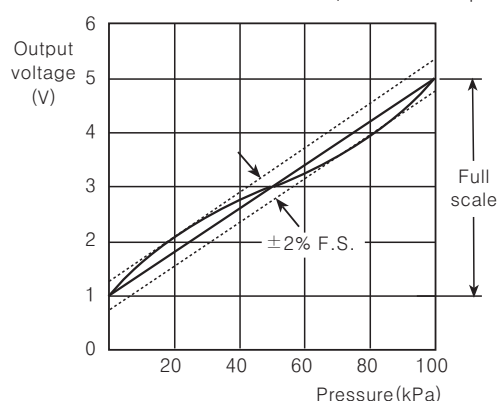
●Analog output voltage-Pressure characteristic

PSA-01 (Normal Example)



●Analog output voltage-Linear characteristic

PSA-01 (Normal Example)

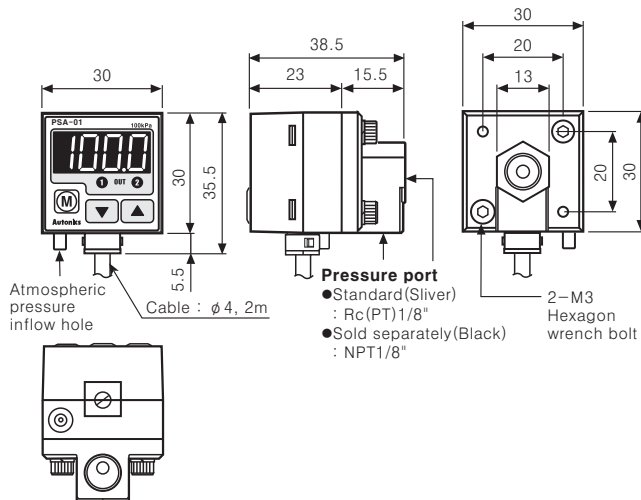


Pressure Sensor

■ Dimensions

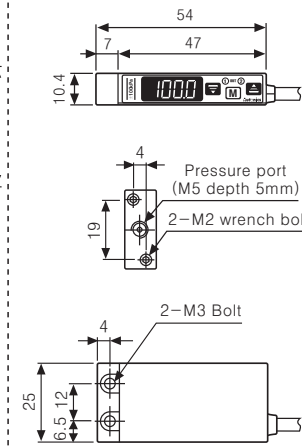
(Unit:mm)

●PSA

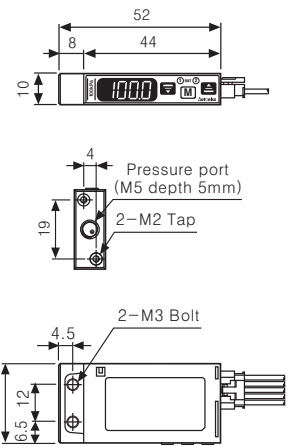


●PSB

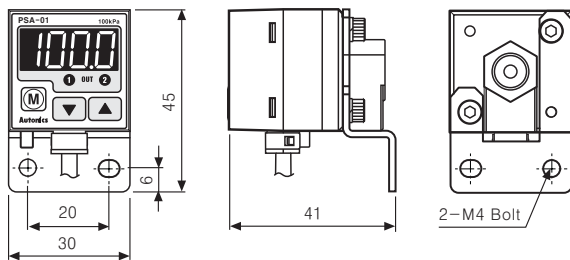
(Cable-integrated type)



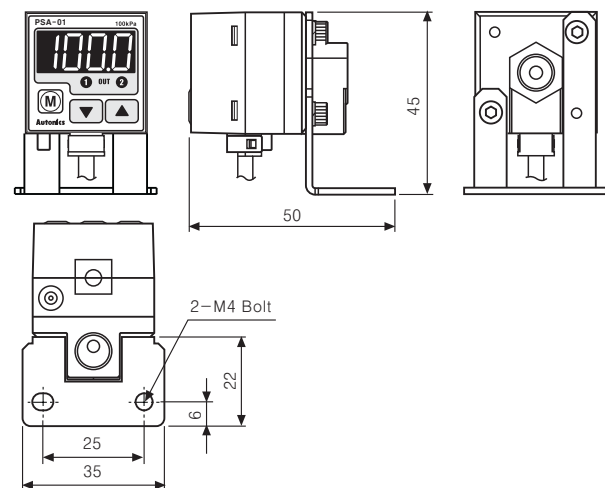
(Connector type)



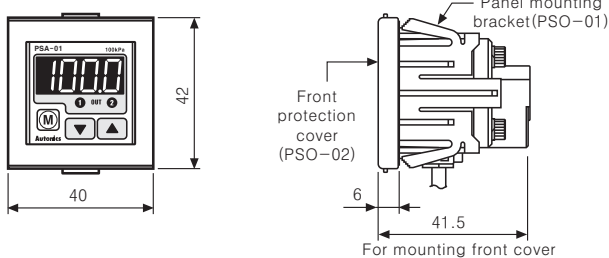
●Fixing bracket A for mounting(PSA type)



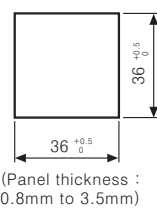
●Fixing bracket B for mounting(PSA type)



●Panel mounting bracke(PSA type)

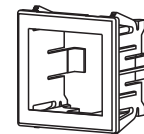


●Panel cut-out



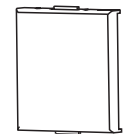
●Accessory(Sold separately)

• Panel mounting bracket



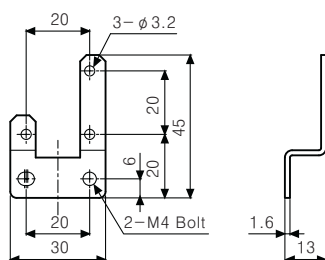
< PSO-01 >

• Front protection cover

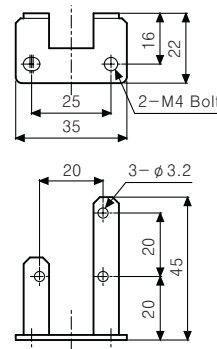


< PSO-02 >

●Bracket A



●Bracket B



(A) Photo electric sensor

(B) Fiber optic sensor

(C) Door/Area sensor

(D) Proximity sensor

(E) Pressure sensor

(F) Rotary encoder

(G) Connector/Socket

(H) Temp. controller

(I) SSR/Power controller

(J) Counter

(K) Timer

(L) Panel meter

(M) Tacho/Speed/Pulse meter

(N) Display unit

(O) Sensor controller

(P) Switching power supply

(Q) Stepping motor & Driver & Controller

(R) Graphic/Logic panel

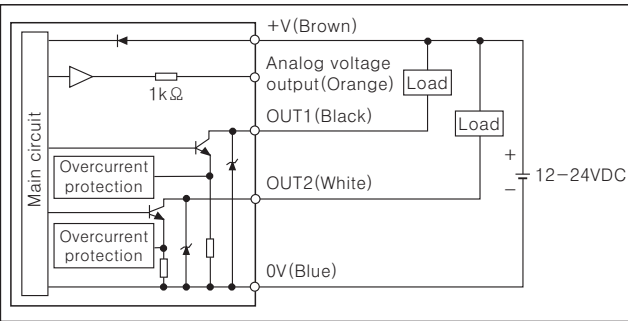
(S) Field network device

(T) Production stoppage models & replacement

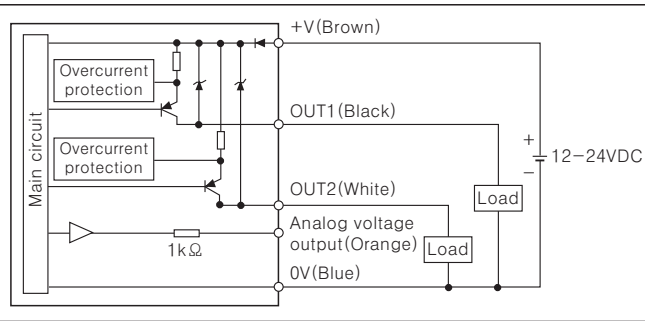
PSA / PSB Series

Control output diagram(PSA/PSB)

●NPN open collector output



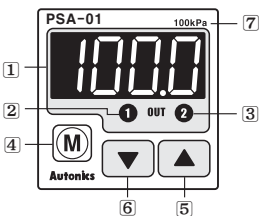
●PNP open collector output



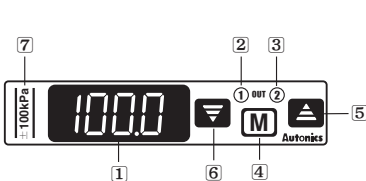
※There is no short-circuit protection in analog voltage output. Do not connect this output to power supply or capacitive load directly.
※Please observe input impedance of connected equipment when use analog voltage output.
And be sure to check voltage drop caused by resistance of extended wire.

Front panel identification

(PSA type)



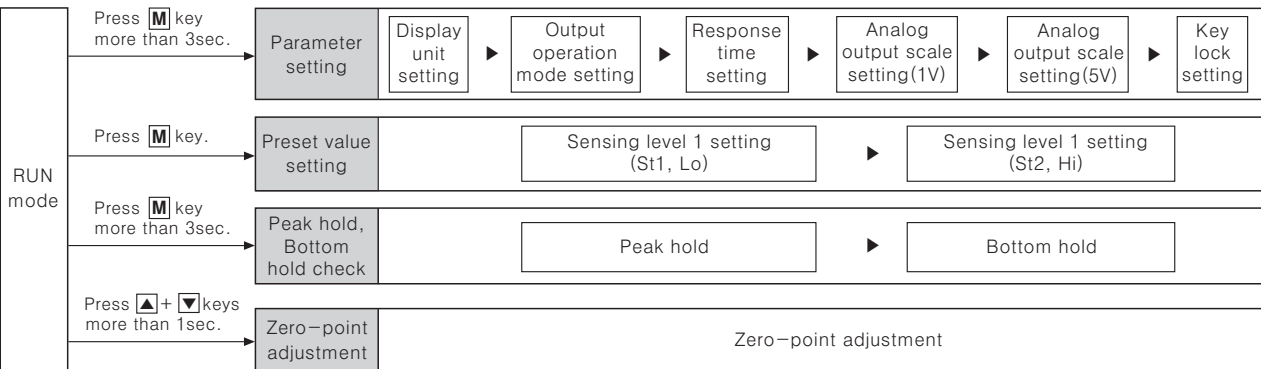
(PSB type)



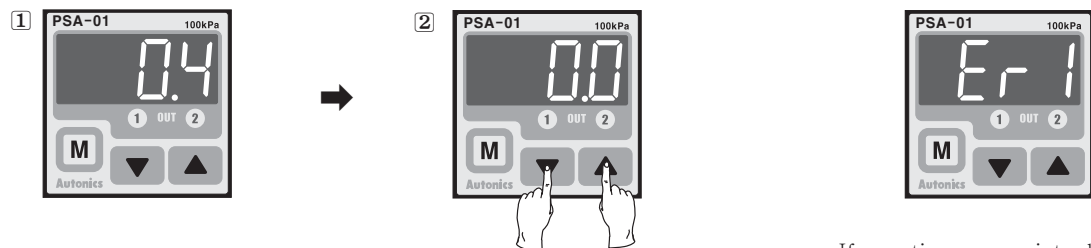
- ① **3 1/2 LED display(Red)** : Display sensing pressure, every setting value and display error.
② **1 output indicator(Red)** : Output 1 is ON, LED will be ON.
③ **2 output indicator(PSA:Red, PSB:Green)** : Output 2 is ON, LED will be ON.

- 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)



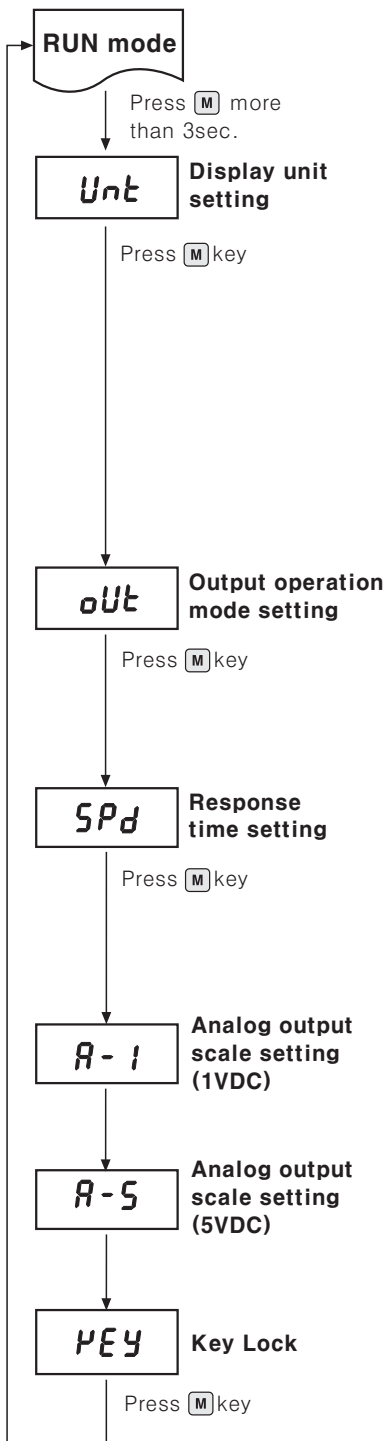
Zero point adjustment(PSA/PSB)



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 excuting zero point adjustment when external pressure has been applied, **Er1** will be flashing.
Please execute zero point again in state of atmospheric pressure.

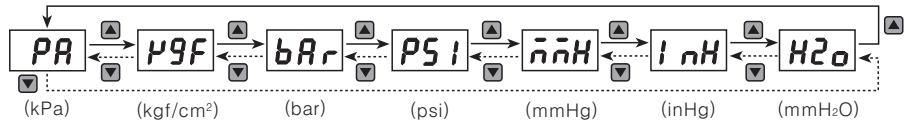
Parameter setting(PSA/PSB)



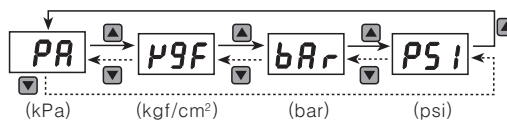
Unit and previous unit will flash by turning on.(0.5sec.)

Select the unit with Δ , ∇ key. (Press M key momentarily, the unit will be saved, then move to the next mode.)

●Vacuum and compound pressure type :



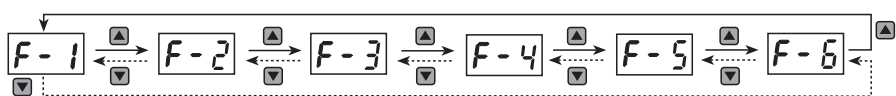
●Positive pressure type :



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

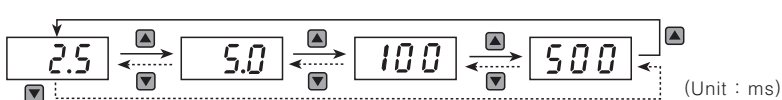
out and previous output operation mode will flash by turning on.(0.5sec.)

Select the output operation mode with Δ , ∇ key. (Press M key momentarily, the output operation mode will be saved, then move to the next mode.)



SPd and the previous response time will flash by turning on.(0.5sec.)

Select the output operation mode with Δ , ∇ key. (Press M key momentarily, the response time will be saved, then move to the next mode.)



A-1 and the previous pressure will flash by turning on.(0.5sec.)

Set the pressure which will output 1VDC with Δ , ∇ key.

Allowable setting range :

Min. value of rated pressure \leq **A-1** \leq 90% of rated pressure

A-5 and the previous pressure will flash by turning on.(0.5sec.)

Set the pressure which will output 5VDC by Δ , ∇ key.

Allowable setting range :

A-1 + 10% of rated pressure \leq **A-5** \leq Max. value of rated pressure

LoC and the previous key lock will flash by turning on(0.5sec.)

Select key lock with Δ , ∇ key.



※Key lock functions

LoC : Disable to change preset value and parameter value
(Enable to change **PEY** mode only)

PA.L : Enable to change preset value, disable to change parameter value

UnL : Enable to change preset value and parameter value (Lock off)

※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 ∇ or Δ 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.

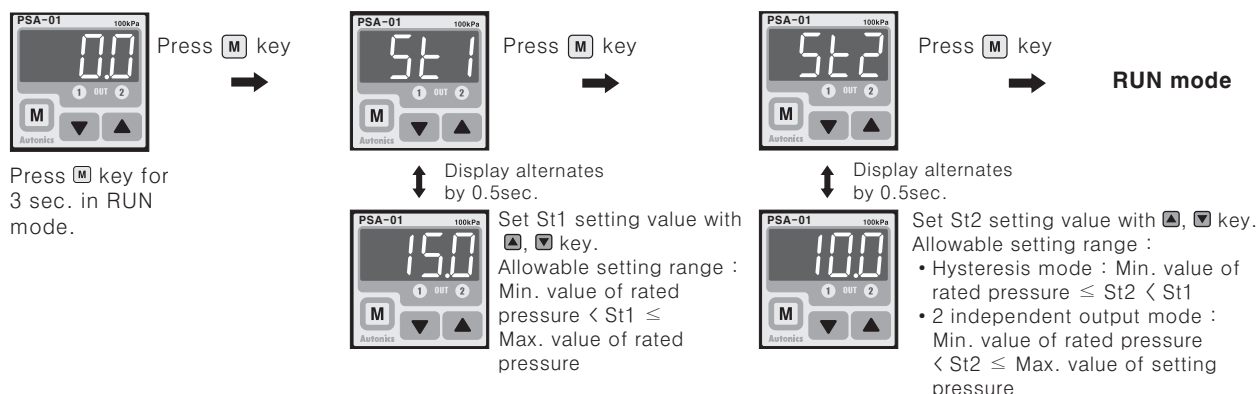
However, when there is any key is untouched for 60sec., it turns to RUN mode with keeping the previous setting value not current setting value.

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

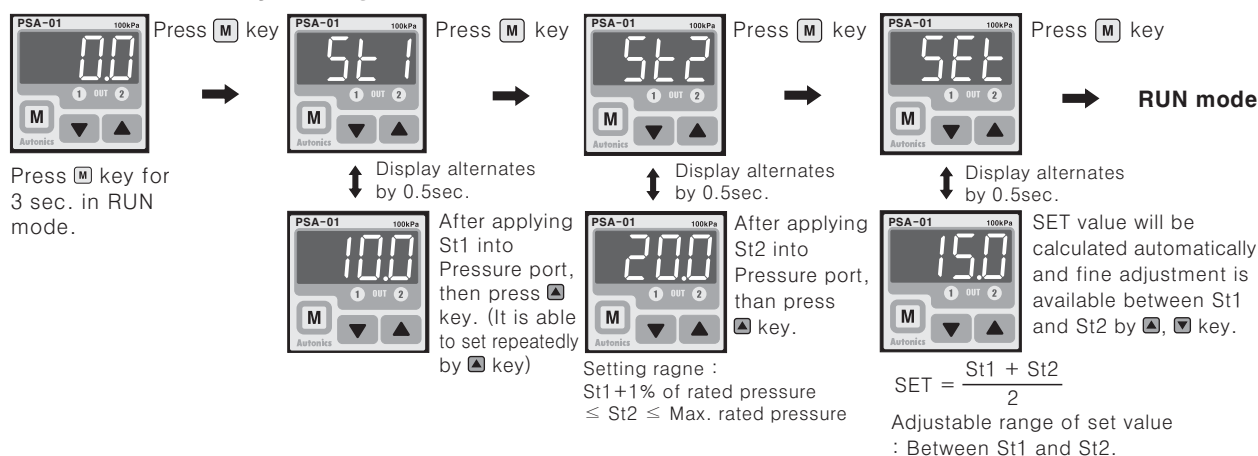
| | |
|-----|--|
| (A) | Photo electric sensor |
| (B) | Fiber optic sensor |
| (C) | Door/Area sensor |
| (D) | Proximity sensor |
| (E) | Pressure sensor |
| (F) | Rotary encoder |
| (G) | Connector/Socket |
| (H) | Temp. controller |
| (I) | SSR/Power controller |
| (J) | Counter |
| (K) | Timer |
| (L) | Panel meter |
| (M) | Tacho/Speed/Pulse meter |
| (N) | Display unit |
| (O) | Sensor controller |
| (P) | Switching power supply |
| (Q) | Stepping motor & Driver & Controller |
| (R) | Graphic/Logic panel |
| (S) | Field network device |
| (T) | Production stoppage models & replacement |

■ Preset value setting(PSA/PSB)

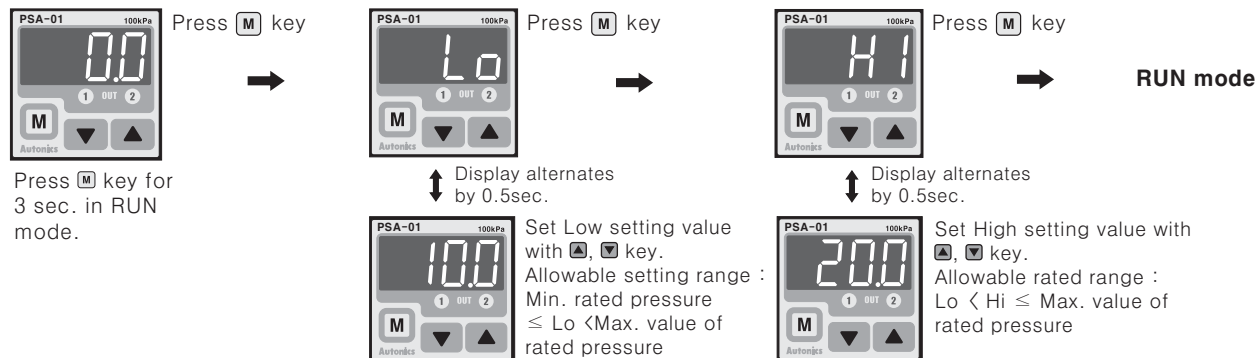
● Hysteresis mode(F-1) and independent(F-3, F-4, F-5) 2 output mode



● Automatic sensitivity setting mode(F-2)



● Window comparison output mode(F-6)



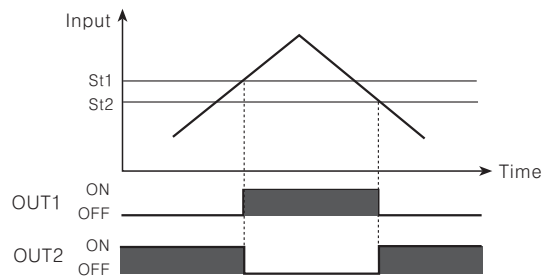
- If no key is touched for 60sec., it will return to RUN mode. [Automatic sensitivity setting mode(F-2) is exception]
- When changing the display unit, preset value will be calculated according to the display unit.
- Whenever key touched one time, it is increased(decreased) as 1 digit(2 digits for psi unit and compound pressure) but it will be continuously increasing(decreasing) by pressing [▲], [▼] key constantly.

■ Peak hold and bottom hold check

1. Press [▲] for more than 3sec. in RUN mode.
 2. **PE.H** and memorized max. pressure(Vacuum pressure type is for max. vacuum pressure) will flash by turning on (0.5sec.) then display peak hold value.
 3. **bo.H** and memorized min. pressure(Vacuum pressure type is for min. vacuum pressure) will flash by turning on (0.5sec.) then display bottom hold value.
 4. If pressing [▲] key one time shortly, memorized peak hold and bottom hold value will be removed then return to RUN mode.
- ※ When the peak hold and bottom hold value is over the max. display pressure value, it displays **HHH**.
On the opposite, it displays **LLL**. Please remove peak hold and bottom hold value by using [▲] key.

■ Output operation mode(PSA/PSB)

1. Hysteresis mode(F-1)



※It can be set for pressure sensing level(St1) and sensing difference(St2).

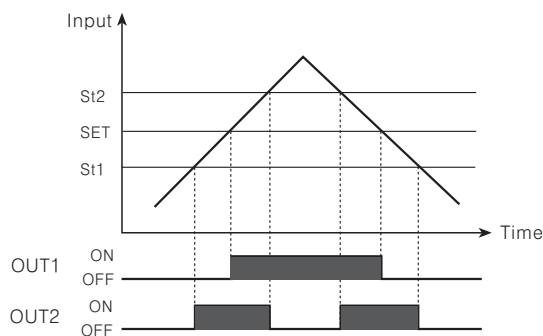
※St1 setting range : Min. display pressure ≤ St1 ≤ Max. display pressure

St2 setting range : Min. display pressure ≤ St2 ≤ St1

• OUT 1 : When applying pressure is larger than St1, it will be ON.

• OUT 2 : When applying pressure is lower than St2, it will be ON.

2. Automatic sensitivity setting mode(F-2)



※This function is to set pressure sensing level to the proper position automatically, it is set by received pressure from two position(St1, St2).

※The sensing hysteresis fixed to 1 digit(2 digits for psi unit and compound type)

※Sensing(SET) value will be calculated as below.

$$\text{SET setting value} = \frac{(\text{St1 setting value} + \text{St2 setting value})}{2}$$

• OUT 1 : When applying pressure is larger than SET value, it will be ON.

• OUT 2 : When applying pressure is between St1 and St2, it will be ON.

Note1) If it is not enough for difference of sensing level between St1 and St2, **[Er3]** will be displayed.

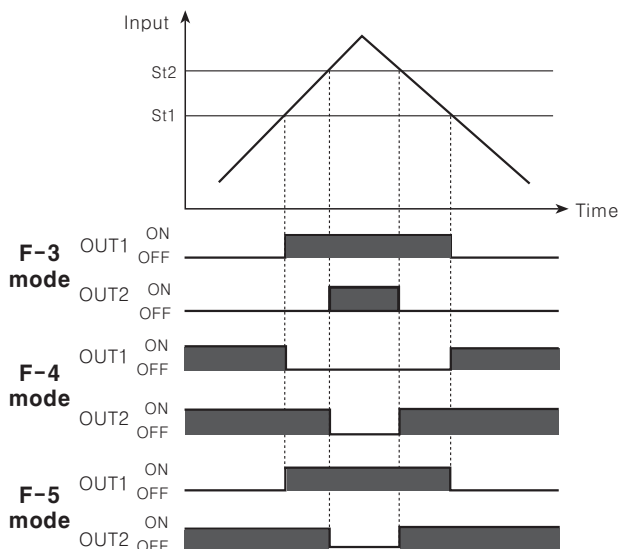
Please set again after applying enough pressure.

Note2) St2 setting range : St1 + 1% of rated pressure ≤ St2 ≤ Max. display pressure

Note3) If fine adjustment for sensing level is required, adjust sensing level by **[▲]**, **[▼]** key.

(Adjustment range : Between St1 and St2)

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



※St1 and St2 can be set independently within display pressure range. One is for control, the other is for alarm or optional control.

※The sensing hysteresis fixed to 1 digit(2 digits for psi unit and compound type)

※St1 setting range : Min. display pressure ≤ St1 ≤ Max. display pressure

St2 setting range : Min. display pressure ≤ St2 ≤ Max. display pressure

●Independent 2 output mode(F-3)

• OUT 1 : It will be ON, when it is over St1.

• OUT 2 : It will be ON, when it is over St2.

●Independent 2 opposite mode(F-4)

• OUT 1 : It will be OFF when it is over St1.

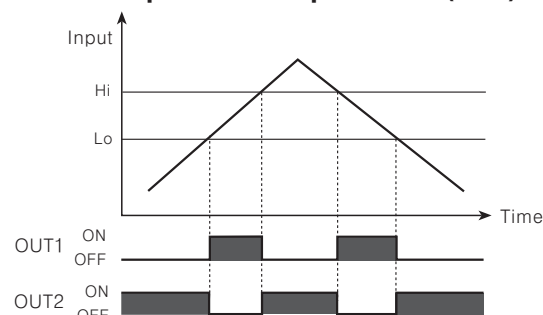
• OUT 2 : It will be OFF, when it is over St2.

●Independent 2 cross mode(F-5)

• OUT 1 : It will be OFF when it is under St1.

• OUT 2 : It will be ON, when it is under St2.

4. Window comparison output mode(F-6)



※It is able to set Lo/Hi-limit value of pressure sensing level in this mode.

※The sensing hysteresis fixed to 1 digit(psi unit and compound type 2 digits)

※Lo setting range : Min. display pressure ≤ Lo ≤ Max. display pressure

Hi setting range : Lo < Hi ≤ Max. display pressure

• OUT 1 : It will be ON between high limit value(Hi) and low limit value (Lo)

• OUT 2 : It will be ON when it is over high limit value(Hi) and low limit value (Lo).

| | |
|-----|--|
| (A) | Photo electric sensor |
| (B) | Fiber optic sensor |
| (C) | Door/Area sensor |
| (D) | Proximity sensor |
| (E) | Pressure sensor |
| (F) | Rotary encoder |
| (G) | Connector/Socket |
| (H) | Temp. controller |
| (I) | SSR/Power controller |
| (J) | Counter |
| (K) | Timer |
| (L) | Panel meter |
| (M) | Tacho/Speed/Pulse meter |
| (N) | Display unit |
| (O) | Sensor controller |
| (P) | Switching power supply |
| (Q) | Stepping motor & Driver & Controller |
| (R) | Graphic/Logic panel |
| (S) | Field network device |
| (T) | Production stoppage models & replacement |

■ Functions(PSA/PSB)

1. Pressure unit change function

PS□-V01(C)(P)/PS□-C01(C)(P) has 7 kinds of pressure unit and PS□-01(C)(P)/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/cm², bar, psi, mmHg, inHg, mmH₂O
- PS□-01(C)(P), PS□-1(C)(P) :
kPa, kgf/cm², bar, psi

※When using mmH₂O, multiply the display value by 100.

2. Output mode change function

There are 6 kinds of control output modes in order to provide the various detection.

Select a mode for your proper application.

- Hysteresis mode(F-1) :
When variable hysteresis is required for pressure detection.
- Automatic sensitivity setting mode(F-2) :
When it is required to set detecting sensitivity auto-matically at proper position.
- Independent 2 output mode(F-3, F-4, F-5) :
When it is required to detect pressure from two position with one product.
- Window comparison output mode(F-6) :
When is required to detect pressure in a certain range.

3. Response time change function(Chattering prevention)

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

4. Analog output scale setting function

It is not only used to set the analog output(1-5VDC) scale for a rated pressure range, but also can be used to change the range for proper user's application. Setting A1 position for 1VDC output and A2 position for 5VDC output. Therefore, analog output will be 1-5VDC between A1 and A2.

5. Key lock function

This unit has 2 kinds of key lock function in order to prevent wrong operation.

- $\text{L} \square \text{L}$: All keys are locked, it is impossible to change any parameter setting/preset, zero point adjustment, peak hold and bottom hold.
(Enable to change PEY mode only).
- PRL : This is partial locked status, it is impossible to change parameter setting(It is able to change the status of lock) only, the other functions can be changed.
- UnL : All keys are unlocked.

6. Zero-point adjustment function

This function is to set the display value of pressure at zero when port is opened to atmospheric pressure.

7. Peak hold and bottom hold function

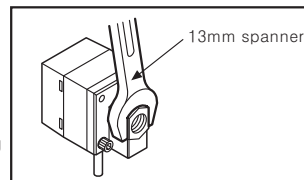
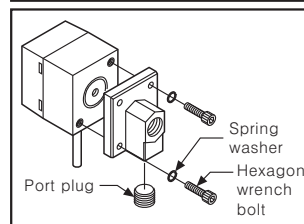
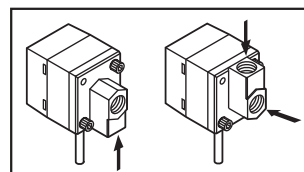
This function is diagnosis malfunction of the system caused by parasitic pressure or to check through memorizing the max./min. pressure that occurred in the system.

8. Error display function

| Error display | Description | Troubleshooting |
|---------------|---|---|
| Er1 | External pressure is applied, when adjusting Zero point | Please try again after external pressure removing |
| Er2 | When it is 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 | |

■ Installation(PSA)

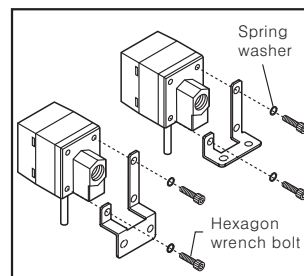
1. When installing pressure port, it is able to bring pressure from 3 directions by changing the mounting direction of the pressure port.
2. Basic spec of pressure port is Rc(PT) 1/8" (Color:Silver).
[Option:NPT 1/8" (Color:Black)]
It is able to use general one touch fitting.
3. Please use seal tape at port plug in order to prevent pressure leak.
4. Please block another two pressure ports not used with port plug.
5. 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

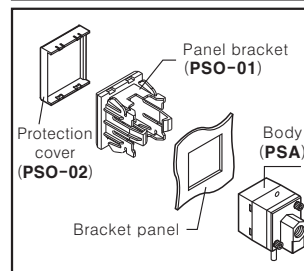
The tightening torque of one touch fitting should be max. 100kgf · cm. If not, it may cause mechanical problem.

6. PSA series has 2 kinds of brackets so it is able to install it in two different ways.
7. 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. 3kgf · cm. If not, it may cause mechanical problem.

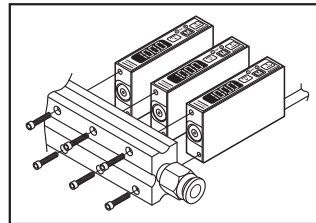
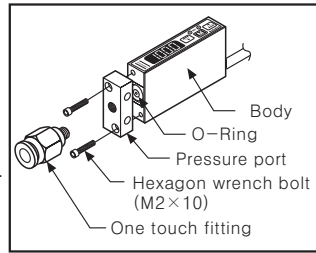
8. Bracket(PSO-01) and front protection cover(PSO-02) are sold separately.
Please see the pictures for installation.



Pressure Sensor

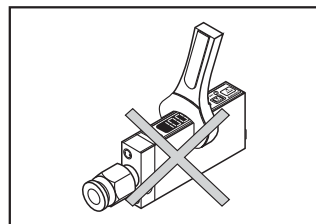
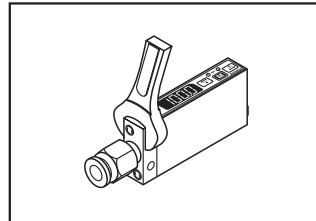
■ Installation(PSB)

1. Pressure port is M5.
It is able to use general one touch fitting.
2. 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.
3. 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. 50kgf · cm and 20kgf · cm. It may cause mechanical problem. Please do not use spanner to install as it may cause mechanical problem.



■ Accessory

●PSA/PSB

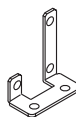
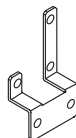
- Pressure unit label

| ±100kPa | ±101.3kPa | 100kPa | 1MPa |
|-------------------------|-------------------------|-------------------------|-------------------------|
| 1.05kgf/cm ² | 1.05kgf/cm ² | 1.05kgf/cm ² | 10.5kgf/cm ² |
| 14.50psi | 14.70psi | 14.50psi | 145.0psi |
| 1.00bar | 1.01bar | 1.00bar | 10.0bar |
| 750mmHg | 760mmHg | X10 | X10 |
| 29.5inHg | 29.9inHg | X100 | X100 |
| 1.02atm | 1.03atm | X1000 | X1000 |

DISPLAY UNIT LABEL

●PSA

- Port plug
- Bracket A
- Bracket B

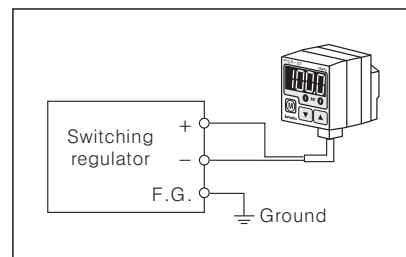


■ Proper usage

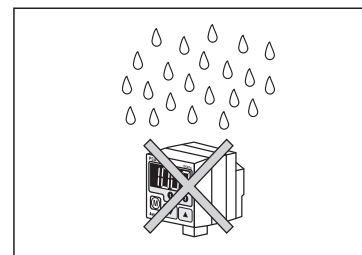
⚠ Caution

PSA, PSB Series is for sensing of non corrosive gas. Do not use this product at corrosive gas or flammable gas etc.

- Please using this unit within range of specification, if applying pressure is larger than specification, it may not be working properly due to damage.
- After supplying power, it takes 3 sec. to work.
- When using switching regulator as power supply, it must be grounded(F.G.).



- It may cause malfunction by noise, when wiring with power line or high voltage line.
- Do not insert any sharp or pointed object into pressure port.
It may cause mechanical problem due to sensor damage.
- Do not use this unit with flammable gas, this is not an explosion proof structure.
- Be sure that this unit should not be contacted directly with water, oil, thinner etc.



- Wiring must be done with power off.

| | |
|-----|--|
| (A) | Photo electric sensor |
| (B) | Fiber optic sensor |
| (C) | Door/Area sensor |
| (D) | Proximity sensor |
| (E) | Pressure sensor |
| (F) | Rotary encoder |
| (G) | Connector/Socket |
| (H) | Temp. controller |
| (I) | SSR/Power controller |
| (J) | Counter |
| (K) | Timer |
| (L) | Panel meter |
| (M) | Tacho/Speed/Pulse meter |
| (N) | Display unit |
| (O) | Sensor controller |
| (P) | Switching power supply |
| (Q) | Stepping motor & Driver & Controller |
| (R) | Graphic/Logic panel |
| (S) | Field network device |
| (T) | Production stoppage models & replacement |