

# Autonics

## DIGITAL PRESSURE SENSOR (Pneumatic type)

### PSQ SERIES

#### INSTRUCTION MANUAL



Thank you for choosing our Autonics product.  
Please read the following safety considerations before use.

#### Safety Considerations

- ※Please observe all safety considerations for safe and proper product operation to avoid hazards.
- ※Safety considerations are categorized as follows.
- Warning** Failure to follow these instructions may result in serious injury or death.
- Caution** Failure to follow these instructions may result in personal injury or product damage.
- ※The symbols used on the product and instruction manual represent the following.
- ⚠ symbol represents caution due to special circumstances in which hazards may occur.

#### Warning

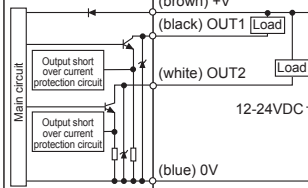
1. **Fail-safe device must be installed when using the unit with machinery that may cause serious injury or substantial economic loss.** (e.g. nuclear power control, medical equipment, ships, vehicles, railways, aircraft, combustion apparatus, safety equipment, crime/disaster prevention devices, etc.)
2. Failure to follow this instruction may result in fire, personal injury, or economic loss.
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#### Caution

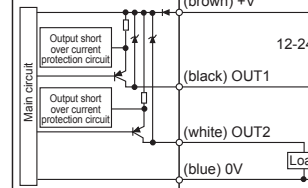
1. Use the unit within the rated specifications.
2. Failure to follow this instruction may result in fire or product damage.
3. Use dry cloth to clean the unit, and do not use water or organic solvent.
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#### Input/Output Circuit and Connections

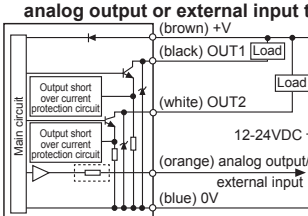
##### ○ NPN open collector output type



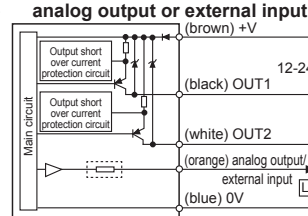
##### ○ PNP open collector output type



##### ○ NPN open collector output+ analog output or external input type



##### ○ PNP open collector output+ analog output or external input type

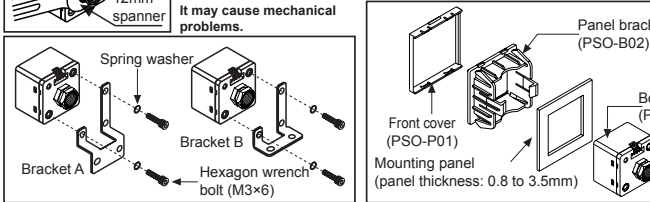


※ : output impedance  
※ If short-circuit the control output terminal or supply current over the rated specification, normal control signal is not output due to the output short over current protection circuit

#### Installation

1. Since pressure port is divided to standard and optional specification, be cautious when using commercial one touch fitting. (Standard: Rc1/8, Option: R1/8, NPT1/8)
2. Use a spanner (12mm) at the metal part of the unit in order not to overload on the body when connecting one touch fitting.
3. Two different fixing brackets are provided for PSQ Series. Select proper one according to your application environments.
4. At first, please unscrew hexagon wrench bolt and assemble the bracket on this unit by fixing hexagon the wrench bolt. In this case, tightening torque of hexagon wrench should be max. 3N·m. It may cause mechanical problems.

**Caution**  
The tightening torque of one touch fitting should be max. 10N·m. It may cause mechanical problems.



6. Do not pull the cable with a tensile strength of 30N or over.

#### Error and Troubleshooting

When occurring error, follow the below troubleshooting.

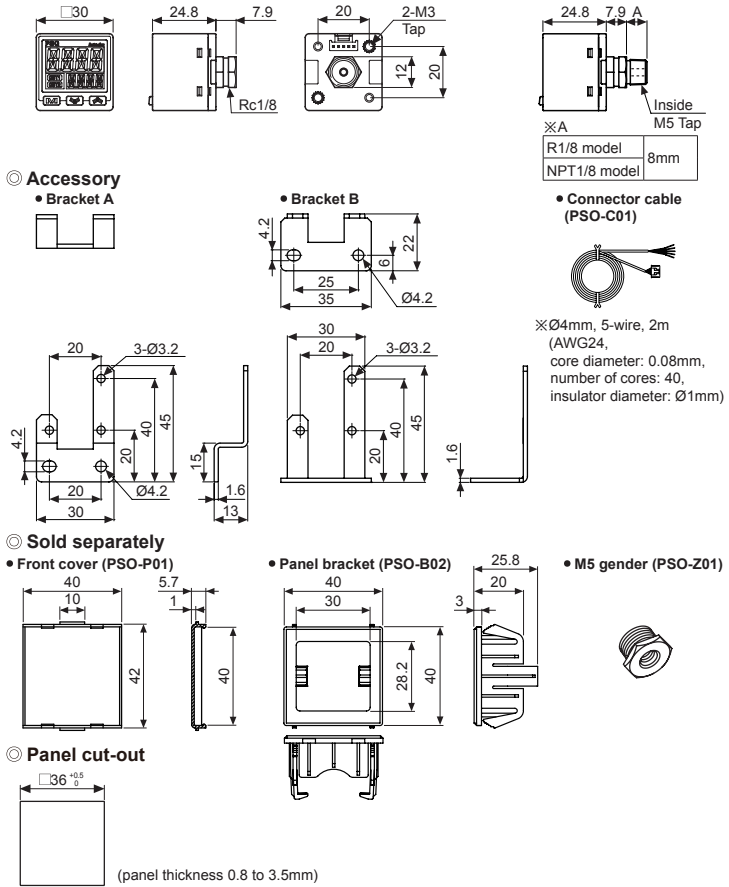
Display	Cause	Troubleshooting
ERR 1	When adjusting zero point while external pressure is input.	Try again after removing external pressure.
ERR 2	When over-current is applied on control output	Remove the over current conditions by adjusting load resistance.
ERR 3	When the range of Auto sensitivity setting mode $5\text{E}1$ , $5\text{E}2$ is set incorrectly.	Check the setting range and set $5\text{E}1$ , $5\text{E}2$ .
ERR 4	When connection between master and slave is wrong during copying parameters.	Check the cables between sensors and the connection of the same models.
ERR 5	When entering invalid password.	Enter valid password.
HHHH	When applied pressure exceeds the high-limit of display pressure range.	Apply pressure within the display pressure range.
LLLL	When the correction value of auto shift, remote zero exceeds the high-limit of the setting range.	Set the correction value of auto shift, remote zero within the setting range.
-HH-	When the correction value of auto shift, remote zero exceeds the low-limit of the setting range.	Set the correction value of auto shift, remote zero within the setting range.
-LL-	When the correction value of auto shift, remote zero exceeds the low-limit of the setting range.	Set the correction value of auto shift, remote zero within the setting range.
-HL-	When $5\text{H}1$ , $5\text{H}2$ occur both.	

※The above specifications are subject to change and some models may be discontinued without notice.  
※Be sure to follow cautions written in the instruction manual and the technical descriptions (catalog, homepage).

#### Unit Descriptions

1. Present value (PV) display part (green, red, orange by setting/status)
  2. Setting value (SV) display part (green)
  3. Output indicator (OUT1, OUT2) (orange)
  4. M key
  5. H key
- RUN mode: Press the M key for over 2 sec to enter parameter 1 group.  
Parameter setting mode: Press the M key to select the setting items.  
Press the H key for over 2 sec to return RUN mode.
- Preset value setting mode: Press the H key to increase/decrease setting value.  
Setting mode: Changes the parameter.

#### Dimensions



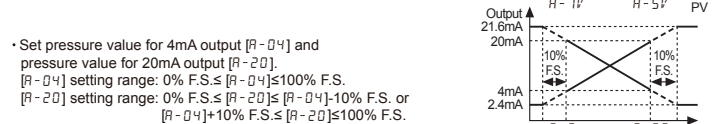
#### Specifications

Pressure type	Gauge pressure (compound pressure)				
Type	NPN or PNP open collector output type				
Model <sup>※1</sup>	PSQ-C01C-□	PSQ-C1C-□	PSQ-C01CU-□	PSQ-C1CU-□	
Rated pressure range	-100.0 to 100.0kPa	-100 to 1,000kPa	-100.0 to 100.0kPa	-100 to 1,000kPa	
Display & Setting pressure range	-101.3 to 110.0kPa	-101 to 1,100kPa	-101.3 to 110.0kPa	-101 to 1,100kPa	
Min. display unit	0.1kPa	1kPa	0.1kPa	1kPa	
Max. pressure range	2 times of rated pressure	1.5 times of rated pressure	2 times of rated pressure	1.5 times of rated pressure	
Applied fluid	Air, non-corrosive gas				
Power supply	12-24VDC≡ (ripple P-P: max. 10%)				
Allowable voltage range	90 to 110% of rated voltage				
Current consumption	Max. 50mA		Max. 50mA (current output: max. 70mA)		
Control output	NPN or PNP open collector output • Load voltage: max. 30VDC≡ • Load current: max. 100mA • Residual voltage: max. 2VDC≡				
	Hysteresis <sup>※2</sup> Min. display interval				
	Repeat error ±0.2% F.S. ± min. display interval				
	Response time Select one: 2.5ms, 5ms, 10ms, 25ms, 50ms, 100ms, 250ms, 500ms, 1,000ms, 5,000ms				
	Protection circuit Output short over current protection circuit				
Analog output <sup>※3</sup>	Voltage output	—			
	Current output	—			
External input <sup>※3</sup> (Auto shift/ Remote zero/ Hold)	—				
Display digits			Present value (PV) indicator, setting value (SV) indicator: 4-digit		
Display method			12 segment LCD method		
Min. display interval	MPa	0.001	0.001	0.001	0.001
	kPa	0.1	1	0.1	1
	kgf/cm <sup>2</sup>	0.001	0.01	0.001	0.01
	bar	0.001	0.01	0.001	0.01
	psi	0.02	0.2	0.02	0.2
	mmHg	1	—	1	—
	inHg	0.1	—	0.1	—
	mmH <sub>2</sub> O	0.1	—	0.1	—
	Display accuracy	0 to 50°C: max. ±0.5% F.S., -10 to 0°C: max. ±1% F.S.			
Insulation resistance		Over 50MΩ (at 500VDC megger)			
Dielectric strength		1,000VAC 50/60Hz for 1 min			
Vibration		1.5mm amplitude at frequency of 10 to 55Hz (for 1 min) in each of X, Y, Z direction for 2 hours			
Environment	-10 to 50°C, storage: -20 to 60°C				
Ambient temp. Ambient hum.	30 to 80%RH, storage: 30 to 80%RH				
Protection structure		IP40 (IEC standard)			
Material		Front case: polycarbonate, rear case: polycarbonate, pressure port: brass-nickel plated			
Approval		CE, RoHS			
Weight <sup>※4</sup>		Approx. 165g (approx. 80g)			

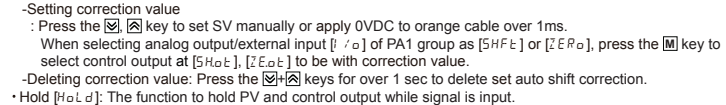
※1: □ in model represents the type of pressure port. Standard: Rc1/8, option: R1/8, NPT1/8.  
※2: In hysteresis output mode, it is variable.  
※3: Select one between analog output (voltage or current) and external input.  
※4: The weight includes packaging. The weight in parenthesis is for unit only.  
※For using mmH<sub>2</sub>O unit, multiply display value by 100.  
※Environment resistance is rated at no freezing or condensation.

#### Functions

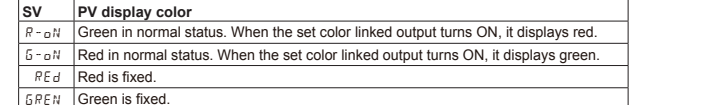
- **Parameter copy**  
This function is for copying parameter settings of Master to Slave 1:1. Master and Slave should be the same specification model.
- **At Master unit, SV display part:  $REdY$**   
Turn OFF the Master unit
- **Connect Master/Slave units**  
Turn ON the Master/Slave units with pressing the M key
- **Turn OFF the Master/Slave units and disconnect Master/Slave units**
- **Analog output scale adjustment**  
only for NPN or PNP open collector output+analog output or external input type model)  
Set output voltage, output current to the current display value at 1-5VDC voltage output [R-1], DC4-20mA [R-1] current output.  
Set pressure value for 1VDC output [R-1] and pressure value for 5VDC output [R-5].  
[R-1] setting range: 0% F.S. ≤ [R-1] ≤ 100% F.S.  
[R-5] setting range: 0% F.S. ≤ [R-5] ≤ [R-1]-10% F.S. or [R-1]+10% F.S. ≤ [R-5] ≤ 100% F.S.
- **Auto Shift/Remote Zero/Hold input**  
only for NPN or PNP open collector output+analog output or external input type)  
Auto Shift [5HF1], Remote Zero [5EP1]  
When reference pressure of the pressure sensor changes, apply auto shift or remote zero digital input. It corrects present pressure to reference pressure and by moving detection level as much as fluctuation level. In case of remote zero, it is the same function as auto shift but remote zero makes the measured pressure as 0 forcibly.  
When changing analog output and external input setting, auto shift correction value [5H1], remote zero correction value [5Z1] are also reset as 0.
- **Setting correction value**  
Press the H key to set SV manually or apply 0VDC to orange cable over 1ms.  
When selecting analog output/external input [I-1] of PA1 group as [5HF1] or [5EP1], press the M key to select control output at [5H01], [5Z01] to be with correction value.  
Deleting correction value: Press the H key for over 1 sec to delete set auto shift correction.  
Hold [H01]. The function to hold PV and control output while signal is input.
- **Response time (chattering prevention)**  
It can prevent control output from chattering by changing response time.  
There are 10 types of response time: 2.5ms, 5ms, 10ms, 25ms, 50ms, 100ms, 250ms, 500ms, 1000ms, 5000ms. If the response time is getting longer, the detection will be more stable by increasing the number of digital filter.
- **PV display color and color linked output**  
You can select PV display color to the linked output status.  
There are 4 types as below. Select color linked output among [5H1], [5H2], or [5H3].
- **SV**  
PV display color  
R-0H Green in normal status. When the set color linked output turns ON, it displays red.  
G-0H Red in normal status. When the set color linked output turns ON, it displays green.  
RED Red is fixed.  
GREEN Green is fixed.
- **SV display part**  
Select the display type at the SV display part in RUN mode.  
There are 3 types: displaying SV [5E1], displaying unit [5H1], none [5FF].
- **High/Low Peak Hold**  
This function is to diagnose malfunction of the system caused by parasitic pressure through memorizing input the max./min. pressure occurred from the system. Press the H key more than 1 sec in RUN mode and set the peak hold.



- **Auto Shift/Remote Zero/Hold input**  
only for NPN or PNP open collector output+analog output or external input type)  
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