Compact, Dual LCD Display Digital Pressure Sensor

▣ Features

- Pressure measurement of any gas, liquid or oil [Fluid type]
  (※except substances which may corrode stainless steel 316L)
- Simultaneous display of present value (PV) and set value (SV)
  ※Selectable SV, pressure unit, or none display for SV display part
- Selectable NPN, PNP open collector output by parameter setting
- 3 colors for PV display part (run mode: red or green / setting mode: orange)
- 12-segment LCD display for easier value reading
- Measurement range: -100.0 to 100.0kPa, -100 to 1,000kPa
  (pneumatic type: compound pressure, fluid type: sealed gauge pressure)
- Analog output: voltage (1-5VDC), current (DC4-20mA)
- Parameter copy function
- Option input/output: auto shift, remote zero, hold (only for PSQ-☐C☐☐U-☐)
- Forced output control mode for device testing and maintenance
- Min. display unit: 0.1kPa, 1kPa (variable by model)
- One-touch connector type for easy wiring and maintenance
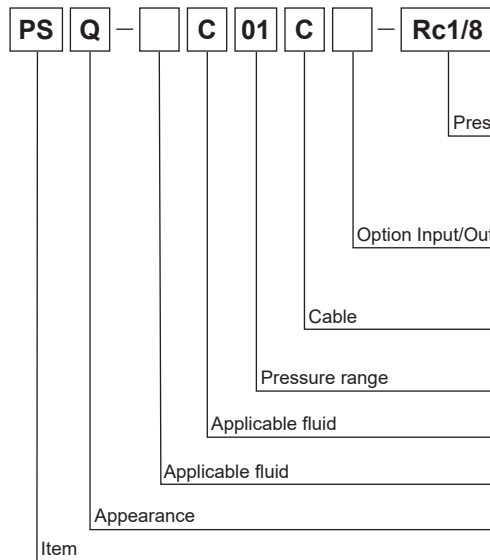- Password setting for SV

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

Pneumatic type

Fluid type

▣ Ordering Information

| PS | Q | — | | C | 01 | C | | — | Rc1/8 |

Pressure port \ Applied fluid	Pneumatic type	Fluid type
Rc1/8	●	●
R1/8	●	●
NPT1/8	●	—
R1/4	—	●
NPT1/4	—	●
9/16-18UNF	—	●

Pressure port

Option Input/Output	
No mark	NPN or PNP open collector output
U	NPN or PNP open collector output + analog output or external input type

Cable	
No mark	Cable type
C	Connector type

Pressure range	
01	100kPa
1	1,000kPa
C	Compound pressure

Applicable fluid	
No mark	Pneumatic type (air, non-corrosive gas)
B	Fluid type (gas, liquid, oil)

Applicable fluid

Appearance

Q	Regular square type (30×30mm), dual display

Item

PS	Pressure Sensor

▣ Pressure Conversion Chart

from \ to	Pa	kPa	MPa	kgf/cm²	mmHg	mmH₂O	psi	bar	inHg
1Pa	1	0.001	0.000001	0.000010197	0.007501	0.101972	0.000145038	0.00001	0.0002953
1kPa	1000.000	1	0.001	0.010197	7.500617	101.971626	0.145038	0.01	0.2953
1MPa	1000000	1000	1	10.197162	7500.61683	101971.626	145.038243	10	295.299875
1kgf/cm²	98066.5	98.0665	0.098067	1	735.55924	10000.0005	14.223393	0.980665	28.959025
1mmHg	133.322368	0.133322	0.000133	0.001359	1	13.595099	0.019337	0.001333	0.039370
1mmH₂O	9.80665	0.009807	—	0.000099	0.073556	1	0.00142	0.000098	0.002896
1psi	6894.733	6.89473	0.006895	0.070307	51.714752	703.016716	1	0.068947	2.036014
1bar	100000.0	100.0000	0.100000	1.019716	750.062	10197.1626	14.503824	1	29.529988
1inHg	3386.388	3.386388	0.003386	0.034532	25.40022	345.315507	0.491156	0.033864	1

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

PSQ Series

◼ Pressure and Max. Pressure Display Range

Type	MPa	kPa	kgf/cm²	bar	psi	mmHg	inHg	mmH$_2$O
Compound pressure	—	**-100.0 to 100.0** (-101.3 to 110.0)	**-1.020 to 1.020** (-1.033 to 1.122)	**-1.000 to 1.000** (-1.013 to 1.100)	**-14.50 to 14.50** (-14.70 to 15.95)	**-750 to 750** (-760.0 to 825.1)	**-29.5 to 29.5** (-29.91 to 32.48)	**-102.0 to 102.0** (-103.3 to112.2)
	—	**-100 to 1000** (-101 to 1100)	**-1.020 to 10.20** (-1.030 to 11.22)	**-1.000 to 10.00** (-1.01 to 11.00)	**-14.50 to 145.0** (-14.65 to 159.5)	**-750 to 7500** (-757.6 to 8251)	**-29.5 to 295** (-29.83 to 324.8)	**-102.0 to 1020** (-103.0 to 1122)

※( ) is Max. pressure display range.　　　　　　　　※For using mmH$_2$O unit, multiply display value by 100.

◼ Specifications

Pressure type		Gauge pressure (In case of fluid type, standard pressure are sealed gauge pressure[※1])			
Type		NPN or PNP open collector output type		NPN or PNP open collector output+ analog output or external input type	
Model		**PSQ-☐C01☐-☐**	**PSQ-☐C1☐-☐**	**PSQ-☐C01☐U-☐**	**PSQ-☐C1☐U-☐**
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	Pneumatic type	2 times of rated pressure	1.5 times of rated pressure	2 times of rated pressure	1.5 times of rated pressure
	Fluid type	3 times of rated pressure			
Applied fluid		**• Pneumatic type:** air, non-corrosive gas **• Fluid type:** air, non-corrosive gas and fluid that do not corrode stainless steel 316L			
Power supply		12-24VDC⎓ (ripple P-P: max. 10%)			
Allowable voltage range		90 to 110% of rated voltage			
Current consumption		Max. 50mA		Max. 50mA (analog output: max. 70mA)	
Control output		NPN or PNP open collector output · Load voltage: max. 30VDC⎓　　· Load current: max. 100mA　　· Residual voltage: max. 2VDC⎓			
	Hysteresis[※2]	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[※3]	Voltage output	—		· Output voltage: 1-5VDC⎓ ±2.5% F.S. · Linear: max. ±1% F.S. · Resolution: 1/2,000 · Output impedance: approx. 240Ω · Response time: 50ms	
	Current output	—		· Output current: DC4-20mA ±2.5% F.S. · Linear: max. ±1% F.S. · Resolution: 1/2,000 · Output impedance: approx. 100kΩ · Response time: 50ms	
External input[※3] (Auto shift/ Remote zero/Hold)		—		· ON voltage: max. 0.4VDC⎓ · OFF voltage: 5-Vin or open · Resolution: 1/2,000 · Output impedance: approx. 100kΩ	
Display digits		Present value (PV) display part, setting value (SV) display part: 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/cm²	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$_2$O	0.1	—	0.1	—
Display accuracy		0 to 50℃: max. ±0.5% F.S., -10 to 0℃: max. ±1% F.S.			
Insulation resistance		Over 50MΩ (at 500VDC megger)			
Dielectric strength		1,000VAC 50/60Hz for 1min			
Vibration		1.5mm amplitude at frequency of 10 to 55Hz (for 1min) in each X, Y, Z direction for 2 hours			
Environ-ment	Ambient temp.	-10 to 50℃, storage: -20 to 60℃			
	Ambient humi.	30 to 80%RH, storage: 30 to 80%RH			
Cable (fluid type)		Ø4mm, 5-wire, 3m (AWG24, core diameter: 0.08mm, number of cores: 40, insulator out diameter: Ø1mm)			
Protection structure		**• Pneumatic type:** IP40 (IEC standard)　　　　**• Fluid type:** IP65 (IEC standard)			
Material		**• Pneumatic type -** Front case: polycarbonate, rear case: polycarbonate, pressure port: brass-nickel plated **• Fluid type -** Front case: polycarbonate, rear case: polyamide 6, pressure port: stainless steel 316L			
Approval		C€ c🆄us			
Weight[※4]		**• Pneumatic type:** approx. 165g (approx. 80g)　　　**• Fluid type:** approx. 210g (approx. 125g)			

※1: The unit is sealed structure. It is based on atmospheric pressure 101.3kPa.
※2: In hysteresis output mode, it is variable.
※3: Select one between analog output (voltage or current) and external input.
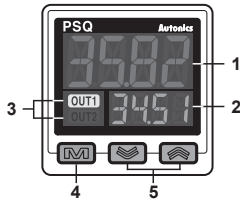※4: The weight includes packaging. The weight in parenthesis is for unit only.
※For using mmH$_2$O unit, multiply display value by 100.
※Environment resistance is rated at no freezing or condensation.

Compact, Dual LCD Display Digital Pressure Sensor
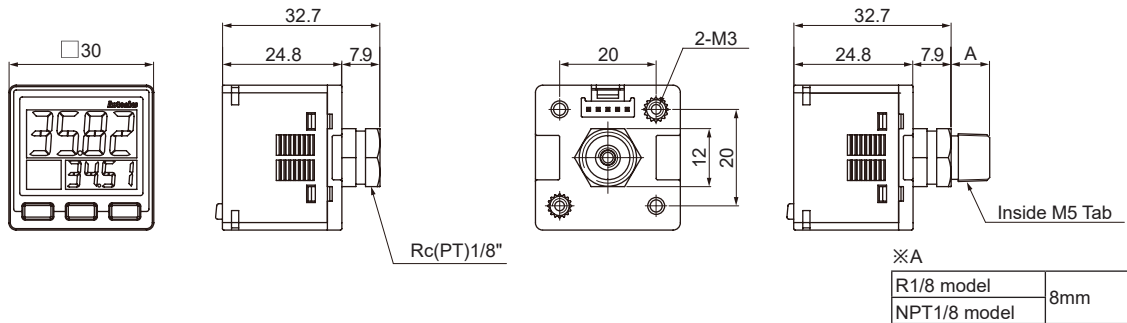
◼ Unit Description

1. Present value (PV) display part (green, red, orange by setting/status)
RUN mode: Displays PV.
Setting mode: Displays parameter.
2. Setting value (SV) display part (green)
RUN mode: Displays setting value, unit, etc.
Setting mode: Displays SV.
3. Output indicator (OUT1, OUT2) (orange): Turns ON while the control output turns ON.
4. M key
RUN mode: Press the M key for over 2 sec to enter parameter 1 group.
Press the M key for over 4 sec to enter parameter 2 group.
Setting mode: Press the M key to select the setting items.
Press the M key for over 2 sec to return RUN mode.
5. ⊻, ⊼ key
RUN mode: Press the ⊻, ⊼ key to set preset value of output operation mode.
Press the M+⊻ keys to set key lock/unlock.
Press the ⊻+⊼ keys to adjust zero point.
Press the M+⊼ keys to set peak hold.
Preset value setting mode: Press the ⊻, ⊼ key to increase/decrease setting value.
Setting mode: Changes the parameter.

◼ Dimensions
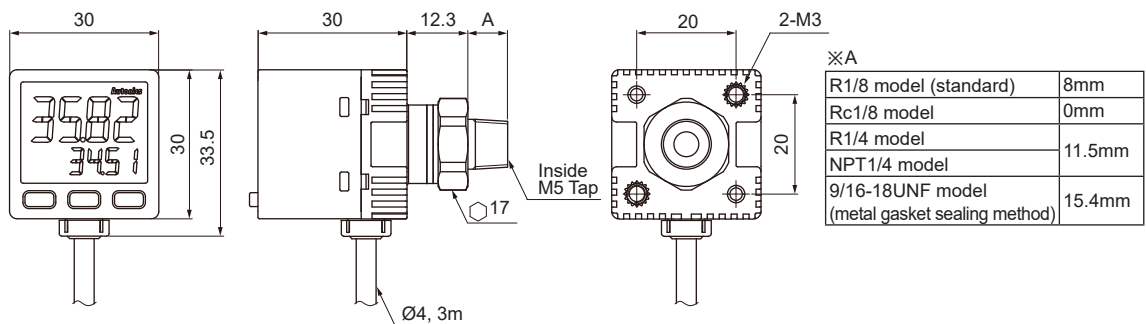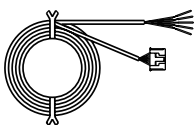
◎ Pneumatic type

(unit: mm)

※A	
R1/8 model	8mm
NPT1/8 model	

◎ Fluid type

※A	
R1/8 model (standard)	8mm
Rc1/8 model	0mm
R1/4 model	11.5mm
NPT1/4 model	
9/16-18UNF model (metal gasket sealing method)	15.4mm

◎ Accessory

● **Connector cable (PSO-C01, Pneumatic/Fluid type)**

※Ø4mm, 5-wire, 2m
(AWG24, core diameter: 0.08mm,
number of cores: 40,
insulator diameter: Ø1mm)

(A) Photoelectric Sensors

(B) Fiber Optic Sensors

(C) LiDAR

(D) Door/Area Sensors

(E) Vision Sensors

(F) Proximity Sensors

(G) Pressure Sensors

(H) Rotary Encoders

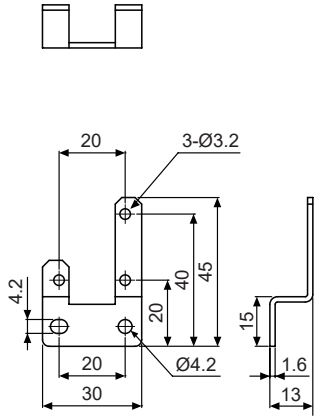(I) Connectors/ Connector Cables/ Sensor Distribution Boxes/ Sockets
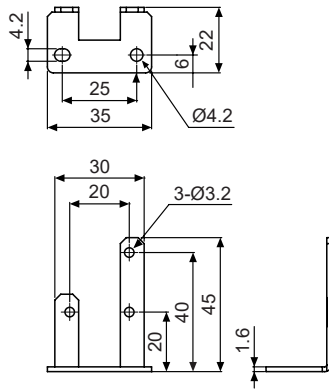
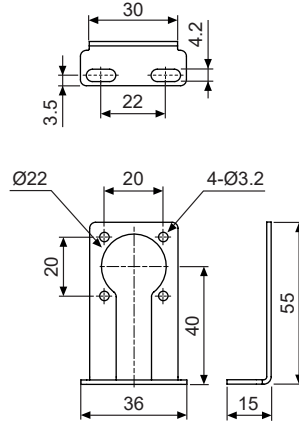# PSQ Series

▣ Dimensions

◎ Accessory

(unit: mm)
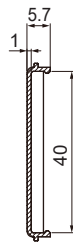
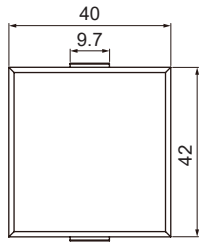● **Bracket A (Pneumatic type)**

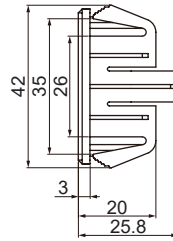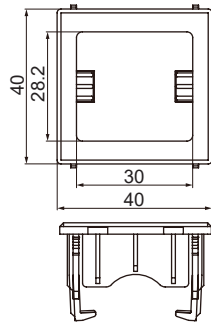● **Bracket B (Pneumatic type)**

● **Bracket C (Fluid type)**

◎ Sold separately

● **Integrated installation set (Pneumatic/Fluid type)**

· Front cover (PSO-P01)

· Panel bracket (PSO-B02)

· Panel cut-out

□36 $^{+0.5}_{0}$
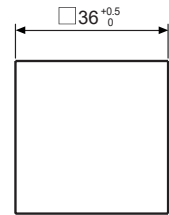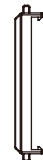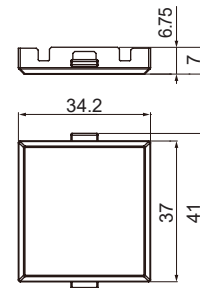
(panel thickness 0.8 to 3.5mm)
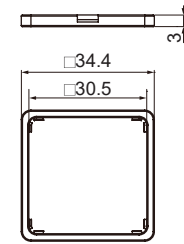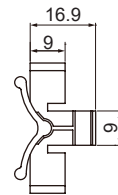
● **Separate installation set (Pneumatic type)**

· Front cover (PSO-P02)

· Front/Rear pael bracket set (PSO-B04)

<Front panel bracket>

<Rear panel bracket>

· Panel cut-out

□31 $^{0}_{-0.4}$

(panel thickness: 0.5 to 7mm)

<When 'N' units are installed in series>

31×N+3.5×(N-1)

31 $^{0}_{-0.4}$

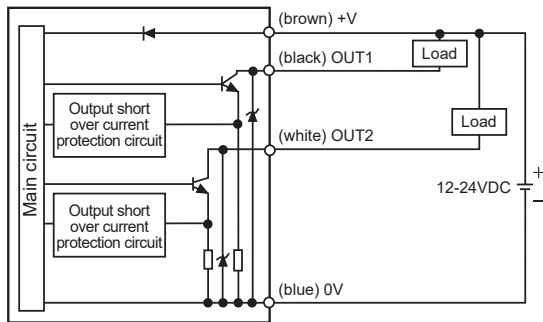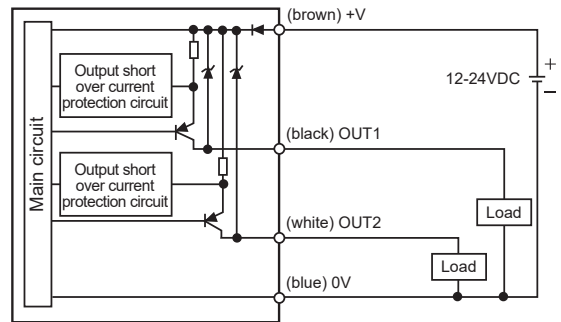Min. 55
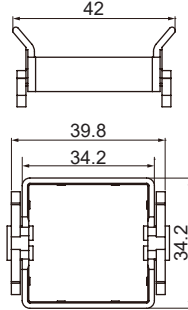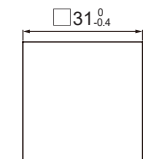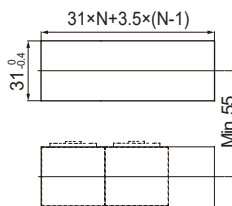
● **M5 gender (PSO-Z01, Pneumatic type)**

Compact, Dual LCD Display Digital Pressure Sensor

■ Input/Output Circuit and Connections

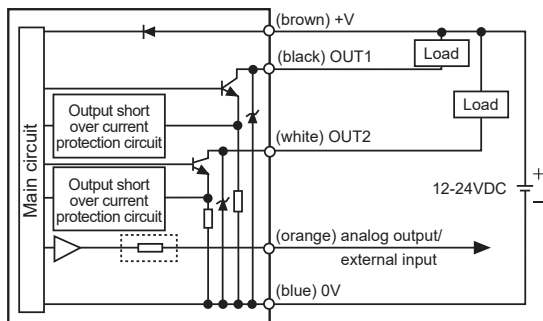### ◎ NPN open collector output type

(brown) +V
(black) OUT1
Load
(white) OUT2
Load
12-24VDC
(blue) 0V

Output short over current protection circuit

Output short over current protection circuit

Main circuit

◎ PNP open collector output type

(brown) +V
12-24VDC
(black) OUT1
(white) OUT2
Load
Load
(blue) 0V

Output short over current protection circuit

Output short over current protection circuit

Main circuit

◎ NPN open collector output+ analog output or external input type

(brown) +V
(black) OUT1
Load
(white) OUT2
Load
12-24VDC
(orange) analog output/ external input
(blue) 0V

Output short over current protection circuit

Output short over current protection circuit

Main circuit

※ ⌷⌷⌷ : output impedance

◎ PNP open collector output+ analog output or external input type

(brown) +V
12-24VDC
(black) OUT1
Load
(white) OUT2
(orange) analog output/ external input
Load
(blue) 0V

Output short over current protection circuit

Output short over current protection circuit

Main circuit
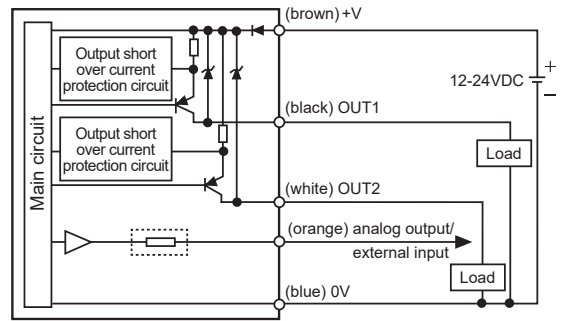
※ ⌷⌷⌷ : output impedance

■ Setting for Each Mode

Zero-point adjustment	☒+☒ for over 1 sec

※It sets reference pressure to the current atmospheric pressure as zero.

Preset value setting ← ☒, ☒ / M

High/Low peak hold ← M+☒ for over 1 sec / M

RUN mode

Parameter 1 group ← M for over 2 sec

Key lock ← M+☒ for over 1 sec

Parameter 2 group ← M for over 4 sec / M for over 2 sec

■ Zero-point Adjustment

1 PSQ Autonics

2 PSQ Autonics → PSQ Autonics

Press over 1 sec
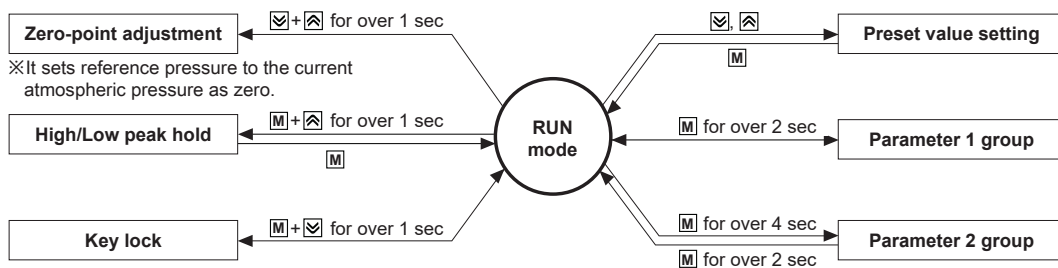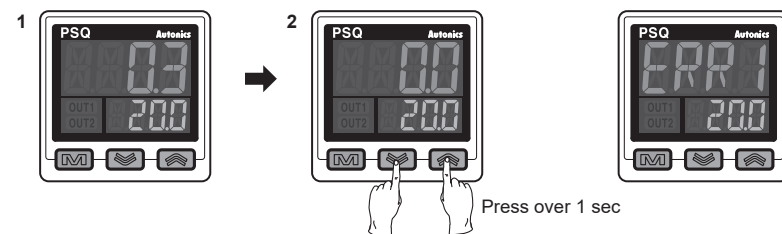
※If executing zero-point adjustment when external pressure over ±5% of rated pressure is applied, ERR1 flashes five times during pressing the keys. Remove external pressure and execute zero point again.

1. To set zero atmospheric pressure forcibly, press the ☒+☒ keys over 1 sec in RUN mode with the opened pressure port.
2. Zero point adjustment is completed, the PV display part displays 0.0 .
※Please execute zero-point adjustment regularly.

PSQ Series

▣ Parameter Setting

※After entering parameter 1/2 group, if there is no additional key input for 60 sec, it maintains previous setting value and it returns to RUN mode.
※Press the ⋁, ⋀ key to set the setting value.
※After entering parameter 1/2 group, press the Ⓜ key for over 2 sec to return to RUN mode.
※When pressing the Ⓜ key once returning RUN mode from parameter 1 group, 2 group within 2 sec, it enters the previous parameter group.
※Some parameters are activated/deactivated according to the setting of other parameters. Refer to the description of each parameter.

◎ Parameter Group

Parameter 1 group				
Parameter name		Setting range	Description	Factory default
oUt 1	OUT1 operation mode	EASY Easy HYS.M Hysteresis WIN Window comparison AUto Auto sensitivity setting F.oUt Forced output control	Select OUT1 operation mode. ※When setting OUT1 operation mode as auto sensitivity setting mode [AUto] or forced output control mode [F.oUt], OUT2 operation mode is set automatically same as the setting value of OUT1 operation mode.	EASY
oUt2	OUT2 operation mode	oFF OFF EASY Easy HYS.M Hysteresis WIN Window comparison	Select OUT2 operation mode.	oFF
I/o ※1	Analog output/ External input	A-V Analog voltage output A-C Analog current output SHFt Auto shift ZERo Remote zero HoLd Hold	Select analog output/external input operation mode. Auto shift: When reference pressure of the pressure sensor changes, It corrects present pressure to reference pressure and by moving detection level as much as fluctuation level. Remote zero: It is the same function as auto shift but remote zero makes the measured pressure as 0 forcibly. Hold: The function to hold present value (PV) and control output while signal is input. ※When OUT1 operation mode is set as [F.oUt] or applied pressure is higher/lower than the display pressure range, auto shift [SHFt], remote zero [ZERo] functions are not available.	A-V
SHot ※1	Auto shift applied terminal	oUt1 OUT1 oUt2 OUT2 ALL OUT1 & OUT2	Select auto shift applied terminal. ※Appears when Analog output/External input is [SHFt].	oUt1
ZEot ※1	Remote zero applied terminal	oUt1 OUT1 oUt2 OUT2 ALL OUT1 & OUT2	Select remote zero applied terminal. ※Appears when analog output/external input is [ZERo].	oUt1
No.NC	Output type	(see table below)		No
SPd	Response time	2.5, 5, 10, 25, 50, 100, 250, 500, 1000, 5000	It can prevent control output from chattering by changing response time. ※If the response time is getting longer, the detection will be more stable but present value (PV) might be different from the real pressure value.	2.5
CLoR	PV display color	R-oN Normal: Green / Output: Red G-oN Normal: Red / Output: Green REd Fixed red GREN Fixed green	Select the present value (PV) display and the color linked output.	R-oN
dISP	Color linked output	oUt1 OUT1 oUt2 OUT2 ALL OUT1 & OUT2	Select the color linked output. ※Appears when OUT2 operation mode is not [oFF] and PV display color is set as [R-oN] and [G-oN].	oUt1
UNIt	Display unit	KPA kPa MPA MPa KGF kgf/cm^2 bAR bar PSI psi MMHG mmHg INHG inHg H2o mmH$_2$O	Select the display unit. ※For using mmH$_2$O unit, multiply display value by 100.	KPA

Output type detail:

	OUT1	OUT2	
No	Normally Open	OFF	※Appears when OUT2 operation mode is [oFF].
NC	Normally Closed	OFF	
Io2o	Normally Open	Normally Open	※Appears when OUT1 operation mode is [AUto], or OUT2 operation mode is [HYS.M], [WIN].
Io2C	Normally Closed	Normally Open	
IC2o	Normally Closed	Normally Open	
IC2C	Normally Closed	Normally Closed	

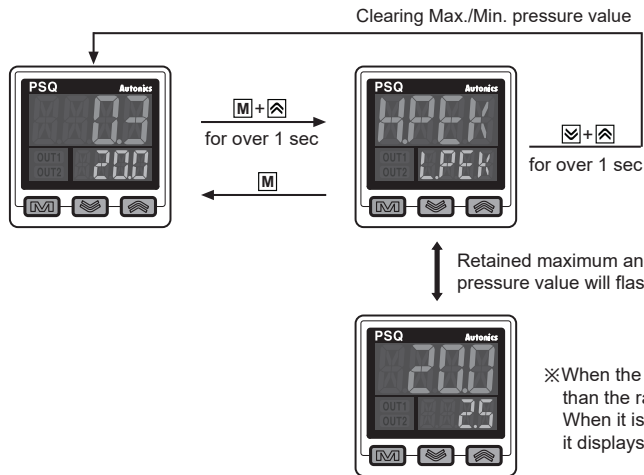※1: Appears only in NPN or PNP open collector output + analog output or external input model.

Compact, Dual LCD Display Digital Pressure Sensor

■ Parameter Setting

Parameter 2 group

Parameter name		Setting range		Description	Factory default
5Ub	SV display part	5Łd UNIŁ oFF	Standard Unit OFF	Select the display type at the SV display part in RUN mode. Standard [5Łd]: Display setting value (SV) always. Unit [UNIŁ]: Display pressure unit normally. When pressing ⊻, ⊼ key, display setting value (SV) for 5 sec. None [oFF]: It does not display any value normally. When pressing ⊻, ⊼ key, display setting value (SV) for 5 sec. ※If select unit [UNIŁ] or None [oFF], changing setting value (SV) is available when setting value is displayed.	5Łd
CoPY	Parameter copy	oFF oN oN-L	OFF ON ON with key lock	This function is for copying parameter settings of Master to Slave 1:1. ※For the details, refer to '■ Functions - ◎ Paprameter Copy'.	oFF
INIŁ	Parameter reset	oFF oN	OFF Reset parameter setting	Reset the parameter settings.	oFF
PWd	Password	0000 to 9999	——	Set the 4-digit password. [0000]: Disable password [000 1]: Only checking parameters	0000
5.oUŁ	Control output switching	NPN PNP	NPN PNP	Select type of control output.	NPN
HYS	Hysteresis for easy mode	I to IIIIIIII	Bar type (Min: 1ea , Max: 8ea)	Set the hysteresis for easy mode. | Rated pressure range	Hysteresis per 1 Bar
-100.0 to 100.0kPa	0.1kPa
-100.0 to 1,000kPa	1kPa	 ※Appears when OUT1 or OUT2 operation mode is easy mode. ※Although the display unit is changed, standard unit of hysteresis for easy mode is not changed.	III

■ 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.
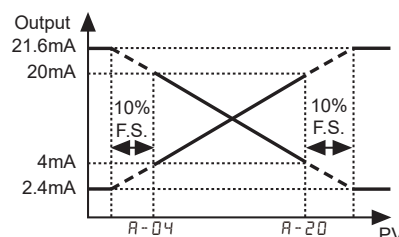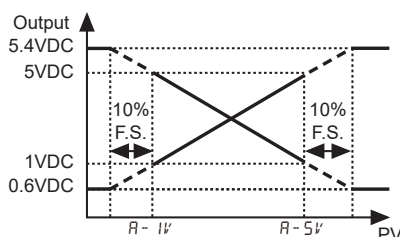
Clearing Max./Min. pressure value

M + ⊼ for over 1 sec

M

⊻ + ⊼ for over 1 sec

※Clearing Max./Min. pressure value.
1. Press the M + ⊼ key for over 1 sec in RUN mode and set the peak hold.
2. High peak is displayed on present value (PV) display, and low peak is displayed on setting value (SV) display.
3. Press the ⊻ + ⊼ key for over 1 sec, initialize high/ low peak value.

Retained maximum and minimum pressure value will flash every 0.5 sec

※When the memorized Max. pressure is higher than the rated pressure, it displays HHHH.
When it is lower than the rated pressure, it displays LLLL.

■ Analog Output Scale Adjustment

● only for NPN or PNP open collector output+analog output or external input type model

SENSORS

CONTROLLERS

MOTION DEVICES

SOFTWARE

(A) Photoelectric Sensors

(B) Fiber Optic Sensors

(C) LiDAR

(D) Door/Area Sensors

(E) Vision Sensors

(F) Proximity Sensors

(G) Pressure Sensors

(H) Rotary Encoders

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

PSQ Series

▣ Preset Setting

◎ Setting guide

· To enter the preset setting mode, press the ⊻, ⊼ key in RUN mode.
· Press the ⊻, ⊼ key to change preset value, the M key to move to the next mode.
· If there is no additional key or the M key input for over 2 sec during setting, the value is automatically set and it returns to RUN mode. (except forced output control mode)

●NPN or PNP open collector output(OUT1/2)

1. Select OUT1/2 operation mode [ouE 1/2] to use in parameter 1 group.
   (OUT1/2 operation mode: easy, hysteresis, window comparison, auto sensitivity setting, forced output control)
2. Enter the preset setting mode from RUN mode.
   (set items are displayed in the order of OUT1 - OUT2)
3. Set the value for each item.

· Setting example
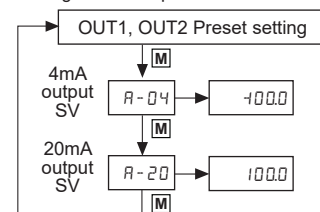 OUT1: Hysteresis mode
  OUT2: Window comparison mode
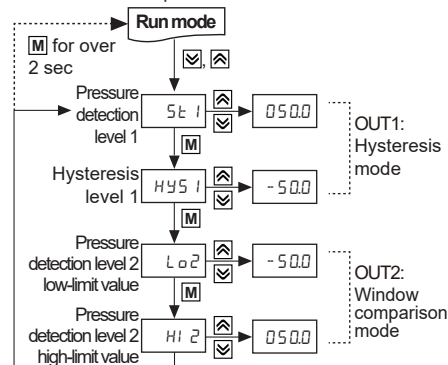
●Analog output/External input

1. Select analog output/extenal input mode [I/o] to use in parameter 1 group.
   (Analog output/extenal input: analog voltage output, analog current output, auto Shift, remote zero, hold)
2. Enter the preset setting mode from RUN mode.
   (analog output/external input items are displayed after OUT1 - OUT2)
3. Set the value for each item.

· Setting example
  Analog current output scale

●Note

· Setting items and setting value are displayed at the setting value (SV) display part alternatively.
· Operation mode (easy, hysteresis, window comparison, auto sensitivity setting) that can be set separately per each output (OUT1/OUT2) display parameter name with identification number.([5E]: [5E 1]/[5E2])
· When changing pressure unit or analog output/extenal input, the preset value is initialized corresponding to changed item.
· When changing operation mode, the preset value is reset for the changed mode.

●Preset setting by output operation mode

Output operation mode		Preset		Setting range	Factory default	
					-100.0 to 100.0kPa	-100 to 1,000kPa
EASY	Easy	P	Pressure detection level	Min. display pressure < [P] ≤ Max. display pressure	050.0	0500
HYS.M	Hysteresis	5E	Pressure detection level	Min. display pressure < [5E] ≤ Max. display pressure	050.0	0500
		HYS	Hysteresis level	Min. display pressure ≤ [HYS] < [5E]	-50.0	0000
WIN	Window comparison	Lo	Pressure detection level low-limit	Min. display pressure ≤ [Lo] ≤ Max. display pressure - (3 × min. display unit)	-50.0	0000
		HI	Pressure detection level high-limit	[Lo] + (3 × min. display unit) ≤ [HI] ≤ Max. display pressure	050.0	0500
AUEo	Auto sensitivity setting	5E 1	Pressure detection level 1	Min. display pressure ≤ [5E 1] ≤ Max. display pressure - 1% of rated pressure	-50.0	0000
		5E2	Pressure detection level 2	[5E 1] + 1% of rated pressure ≤ [5E2] ≤ Max. display pressure	050.0	0500
		5EE	Pressure detection level	$5EE = \frac{(5E 1 + 5E2)}{2}$, [5E 1] ≤ [5EE] ≤ [5E2] Pressure detection level [5EE] can be selectable by pressing the ⊻, ⊼ key.	000.0	0250
F.ouE	Forced output control	—	—	—	—	—
A-V	Analog voltage output	A-1V	1V output SV	0% F.S. ≤ [A-1V] ≤ 100% F.S.	-100.0	0000
		A-5V	5V output SV	[A-1V] + 10% F.S. ≤ [A-5V] ≤ 100% F.S. or 0% F.S. ≤ [A-5V] ≤ [A-1V] - 10% F.S.	100.0	1000
A-C	Analog current output	A-04	4mA output SV	0% F.S. ≤ [A-04] ≤ 100% F.S.	-100.0	0000
		A-20	20mA output SV	[A-04] + 10% F.S. ≤ [A-20] ≤ 100% F.S. or 0% F.S. ≤ [A-20] ≤ [A-04] - 10% F.S.	100.0	1000

Autonics

Compact, Dual LCD Display Digital Pressure Sensor

■ Preset Setting

●Preset setting by external input mode

External input mode		Preset		Setting range	Factory default
5HFt	Auto shift	5HJ N	Auto shift correction value※	Min. preset setting value < [5HJ N] < Max. preset setting value	000.0
ZERo	Remote zero	ZEJ N	Remote zero correction value※	Min. preset setting value < [ZEJ N] < Max. preset setting value	000.0
HoLd	Hold	—	—	—	—

※Apply 0VDC to orange cable over 1ms to operate auto shift or remote zero mode.
※Press the ☑+⌃ for over 1 sec to delete set auto shift correction.

◎ Supported operation mode list

NPN or PNP open collector output			
OUT1		**OUT2**	
EASY	Easy	oFF	OFF
		EASY	Easy
		HYS.M	Hysteresis
		WI N	Window comparison
HYS.M	Hysteresis	oFF	OFF
		EASY	Easy
		HYS.M	Hysteresis
		WI N	Window comparison
WI N	Window comparison	oFF	OFF
		EASY	Easy
		HYS.M	Hysteresis
		WI N	Window comparison
AUto	Auto sensitivity setting		
F.oUt	Forced output control		

Analog output※	
A-V	Analog voltage output
A-C	Analog current output

| External input※	
5HFt	Auto shift
ZERo	Remote zero
HoLd	Hold

※Analog output (voltage or current) and external input (auto shift/remote zero/hold) are not available at the same time.

■ Output Operation Mode

※**PSQ Series has 5 output operation mode. Use the proper operation mode in accordance with the desired application of detection.**
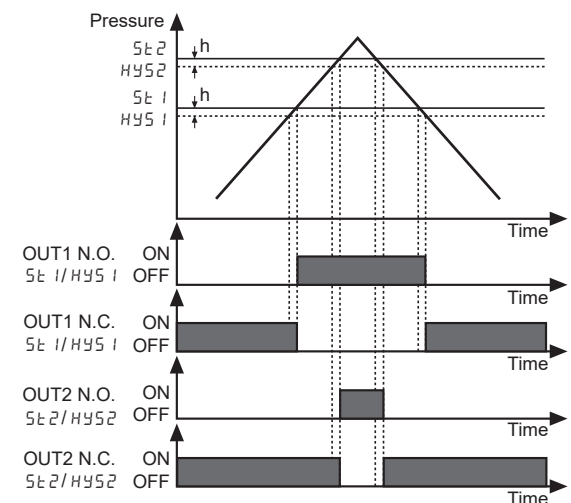
◎ Easy mode [EASY]

· Set the hysteresis of pressure detection automatically.
· Set the pressure detection level [P 1, P2].
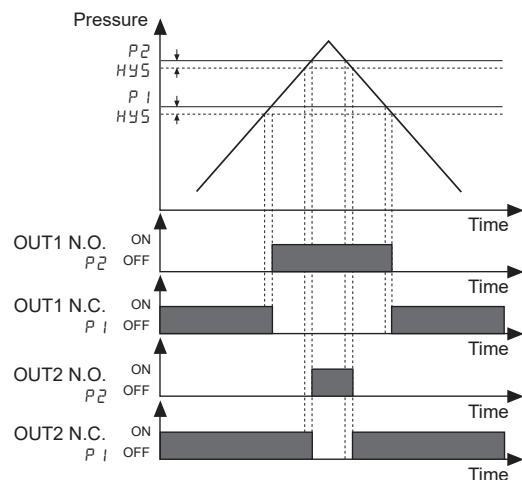
※It is possible to set the hysteresis value in hysteresis for easy mode of parameter 2 group.

◎ Hysteresis mode [HYS.M]

· Set the hysteresis of pressure detection.
· Set the pressure detection level [5t 1, 5t2] and hysteresis [HYS 1, HYS2].

SENSORS

CONTROLLERS

MOTION DEVICES

SOFTWARE

(A) Photoelectric Sensors

(B) Fiber Optic Sensors

(C) LiDAR

(D) Door/Area Sensors

(E) Vision Sensors

(F) Proximity Sensors

(G) Pressure Sensors

(H) Rotary Encoders

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

PSQ Series

■ Output Operation Mode

### ◎ Window comparison output mode [*WiN*]

· It detects pressure at the desired range.
· Set high-limit value of pressure detection level [*Hi 1, Hi 2*], and low-limit value of pressure detection level [*Lo 1, Lo2*].
· Hysteresis is fixed as Min. display interval.
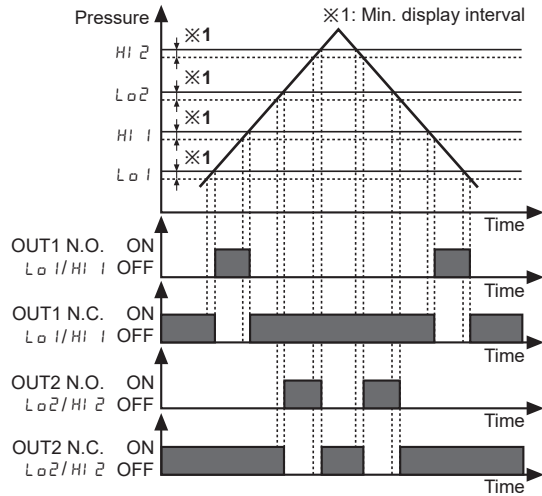
◎ Auto sensitivity setting mode [*Auto*]

· It sets the proper detection sensitivity automatically.
· It sets by the two pressure points [*St 1, St2*].
· Hysteresis is fixed as Min. display interval.
· The pressure detection level [*SEt*] is shown in the below formula.

$$SEt = \frac{(St 1 + St2)}{2}$$
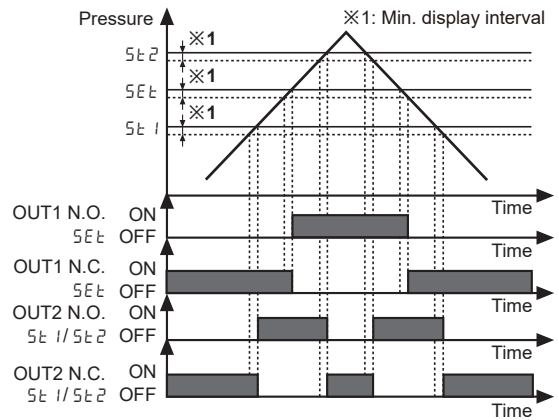
◎ Forced output control mode [*F.oUt*]

· Regardless of setting value, it maintains comparison output OFF and displays present pressure.
· Set OUT1 operation mode [*oUt 1*] of parameter 1 group as [*F.oUt*] and return to RUN mode. The PV display part displays the measured pressure and the SV display part displays [*F.oUt*].
· During forced output control mode, press the ⌄ or ⌃ key to turn ON/OFF OUT1, 2 manually.
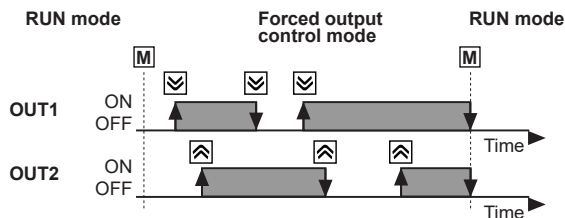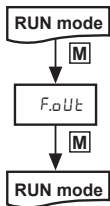
Compact, Dual LCD Display Digital Pressure Sensor

■ 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.

[Master]   (brown) +V   [Slave]
(blue) 0V
(black) OUT1   (black) OUT1
(white) OUT2 ✕ (white) OUT2
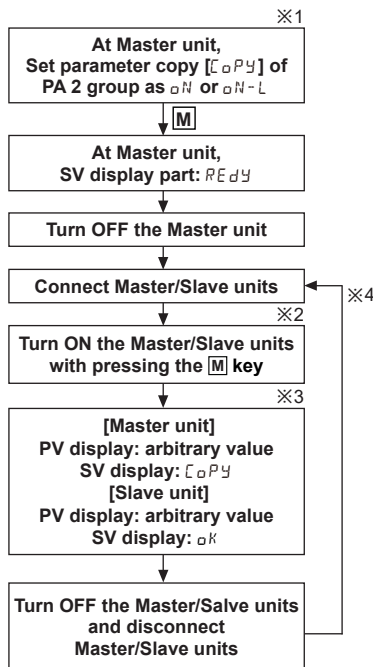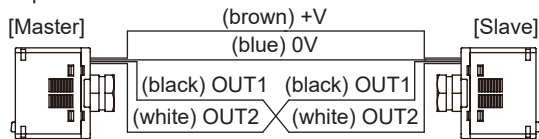
```
                                                    ※1
        At Master unit,
   Set parameter copy [CoPY] of
   PA 2 group as oN or oN-L
              ↓ M
        At Master unit,
   SV display part: REdY
              ↓
   Turn OFF the Master unit
              ↓
   Connect Master/Slave units  ←──────┐ ※4
              ↓                ※2       │
   Turn ON the Master/Slave units      │
   with pressing the M key             │
              ↓                ※3       │
   [Master unit]                       │
   PV display: arbitrary value         │
   SV display: CoPY                    │
   [Slave unit]                        │
   PV display: arbitrary value         │
   SV display: oK                      │
              ↓                        │
   Turn OFF the Master/Salve units  ───┘
   and disconnect
   Master/Slave units
```

※1: oN: Copies SVs.,
     oN-L : Copies SVs and locks front keys of Slave unit.
※2: When connecting Master unit and Slave unit incorrectly, the PV display of Master unit displays ERRY.
     Turn OFF the Master unit power and turn ON it.
     It displays REdY at SV display part.
※3: The PV display part of Master displays as orange color. The PV display part of Slave displays as green color. When completing copy, the PV display part of Master and Slave displays the same arbitrary value.
※4: Connect other Slave units to copy parameters.

◎ Analog output scale adjustment
※only for NPN or PNP open collector output+ analog output or external input type
Set output voltage, output current to the current display value at 1-5VDC voltage output [A-V], DC4-20mA [A-C] current output.
・Set pressure value for 1VDC output [A-1V] and pressure value for 5VDC output [A-5V].
   [A-1V] setting range: 0% F.S.≤ [A-1V]≤100% F.S.
   [A-5V] setting range: 0% F.S.≤ [A-5V]≤ [A-1V]-10% F.S. or
                  [A-1V]+10% F.S.≤ [A-5V]≤100% F.S.
・Set pressure value for 4mA output [A-04] and pressure value for 20mA output [A-20].
   [A-04] setting range: 0% F.S.≤ [A-04]≤100% F.S.
   [A-20] setting range: 0% F.S.≤ [A-20]≤ [A-04]-10% F.S. or
                  [A-04]+10% F.S.≤ [A-20]≤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 [**SHFt**], Remote Zero [**ZERo**]**
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 [SH.N], remote zero correction value [ZE.N] are also reset as 0.

・Setting correction value
: Press the ⊻, ⊼ key to set SV manually or apply 0VDC to orange cable over 1ms.
When selecting analog output/external input [I/o] of parameter 1 group as [SHFt] or [ZERo], press the M key to select control output at [SH.ot], [ZE.ot] to be with correction value.

・Deleting correction value
: Press the ⊻+⊼ keys for over 1 sec to delete set auto shift correction.

● **Hold [**HoLd**]**
The function to hold PV and control output while signal is input.

◎ Output mode change
● **OUT1 operation mode**
There are 4 kinds of control output mode in order to realize the various pressure detection.
• Hysteresis mode [HYS.M]
: When needed to change hysteresis for detecting pressure.
• Window comparison output mode [WI N]
: When needed to detect pressure in certain area.
• Automatic sensitivity setting mode [AUto]
: When needed to set detection sensitivity automatically at proper position.
• Forced output control mode [F.oUt]
: When needed to display pressure with remaining comparison output OFF regardless of setting value.

● **OUT2 operation mode**
Select control output mode between two types or oFF.
In case of OUT1 operation mode, select automatic sensitivity setting mode [AUto] or forced output control mode [F.oUt]. OUT2 operation mode setting is inactive.
• Hysteresis mode [HYS.M]
: When needed to change hysteresis for detecting pressure.
• Window comparison output mode [WI N]
: When needed to detect pressure in certain area.
• OFF [oFF]

SENSORS

CONTROLLERS

MOTION DEVICES

SOFTWARE

(A) Photoelectric Sensors

(B) Fiber Optic Sensors

(C) LiDAR

(D) Door/Area Sensors

(E) Vision Sensors

(F) Proximity Sensors

(G) Pressure Sensors

(H) Rotary Encoders

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

PSQ Series

◎ Output type change

Output type for OUT1 and OUT2 can be able to set Normally Open or Normally Closed.

※Note that Normally Open and Normally Closed provide opposite output.

SV	OUT1 output	OUT2 output
No	Normally Open	OFF
NC	Normally Closed	OFF
1o2o	Normally Open	Normally Open
1o2C	Normally Open	Normally Closed
1C2o	Normally Closed	Normally Open
1C2C	Normally Closed	Normally Closed

◎ 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, 1,000ms, 5,000ms. 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 [oUt 1], [oUt2], or [ALL].

SV	PV display color
R-oN	Green in normal status. When the set color linked output turns ON, it displays red.
G-oN	Red in normal status. When the set color linked output turns ON, it displays green.
REd	Red is fixed.
GREN	Green is fixed.

◎ Pressure unit change

PSQ series has 8 kinds of pressure unit.
Please select the proper unit for application.

• kPa, MPa, kgf/cm^2, bar, psi, mmHg, inHg, mmH$_2$O

※When using mmH$_2$O unit, multiply display value by 100.

◎ SV display part

Select the display type at the SV display part in RUN mode. There are 3 types; displaying SV [Std], displaying unit [UNIt], none [oFF]

◎ RESET

This function is to reset all parameters as factory default except control output SV to prevent wrong settings or difficult operation.

◎ Password

This function is to limit parameter settings, to check the parameter or to change the parameter settings only for entering the set password.

• 0000: Password function OFF
• 0001: Only checking parameters
• Setting range: 0002 to 9999

◎ Control output change

Select between NPN open collector output or PNP open collector output.

◎ Key lock

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

· Press the M+☑ key over 1 sec in RUN mode to lock keys. The PV display part displays [LoCK], and the SV display part displays [oN] for 1 sec and it returns in RUN mode.

· Press the M+☑ key over 1 sec in RUN mode to unlock keys. The PV display part displays [LoCK], and the SV display part displays [oFF] for 1 sec and it returns in RUN mode.

◎ Zero-point adjustment

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.

To set zero atmospheric pressure forcibly, press the ☑+⌂ keys over 1 sec in RUN mode with the opened pressure port.

◎ 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 M+⌂ key more than 1 sec in RUN mode and set the Peak Hold.

◎ Error and troubleshooting

Display	Cause	Troubleshooting
ERR1	When adjusting zero point while external pressure is input.	Try again after removing external pressure.
ERR2	When over current is applied on control output	Remove the over current conditions by adjusting load resistance.
ERR3	When the range of Auto sensitivity setting mode ST1, ST2 is set incorrectly.	Check the setting range and set St1, St2.
ERR4	When connection between master and slave is wrong during copying parameters.	Check the cables between sensors and the connection of the same models.
ERR5	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 applied pressure exceeds the low-limit of display pressure range.	
-HH-	When the correction value of auto shift, remote zero exceeds the high-limit of the setting range.	Set the correction value of auto shift, remove zero within the setting range.
-LL-	When the correction value of auto shift, remote zero exceeds the low-limit of the setting range.	
-HL-	When [HH], [LL] occur both.	

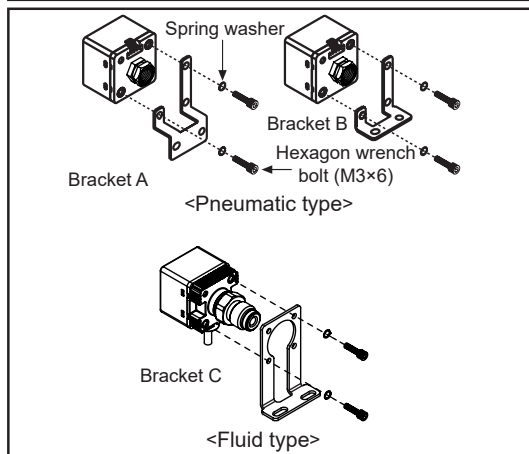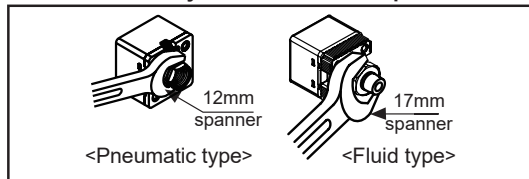# Compact, Dual LCD Display Digital Pressure Sensor

◼ Installation

1. Pressure port is divided as standard and option specification. Therefore, make sure use commercially available one touch fitting.
   - Pneumatic type: Rc1/8, R1/8, NPT1/8
   - Fluid type: Rc1/8, R1/8, R1/4, NPT1/4, 9/16-18UNF
2. Use a spanner (pneumatic type: 12mm, fluid type: 17mm) at the metal part of the unit in order not to overload on the body when connecting one touch fitting.
3. Two different brackets are provided for pneumatic type and one different brackets are provided for fluid type. 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 wrench bolt.
   In this case, tightening torque of hexagon wrench should be max. 3N·m. It may cause mechanical problems.
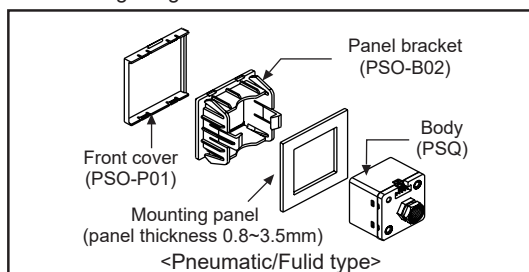
⚠ Caution

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

12mm spanner
<Pneumatic type>

17mm spanner
<Fluid type>

Spring washer

Bracket B

Bracket A

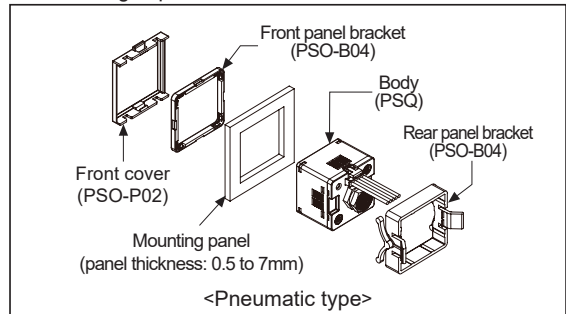Hexagon wrench bolt (M3×6)

<Pneumatic type>

Bracket C

<Fluid type>

5. PSQ Series has panel bracket (PSO-B02), front cover (PSO-P01) are sold separately. When mounting the unit on panel, please follow the below figure.

· When using integrated installation set

Panel bracket (PSO-B02)

Body (PSQ)

Front cover (PSO-P01)

Mounting panel (panel thickness 0.8~3.5mm)

<Pneumatic/Fulid type>

· When using separate installation set

Front panel bracket (PSO-B04)

Body (PSQ)

Rear panel bracket (PSO-B04)

Front cover (PSO-P02)

Mounting panel (panel thickness: 0.5 to 7mm)

<Pneumatic type>

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

◼ Proper Usage

⚠ Caution

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

· 12-24VDC model, power supply should be insulated and limited voltage/current or Class 2, SELV power supply device.
· Do not insert any sharp or pointed object into pressure port. Failure to follow these instructions may result in malfunction and damage to the sensor.
· Be sure that this unit must avoid direct touch with water, oil, thinner, etc.
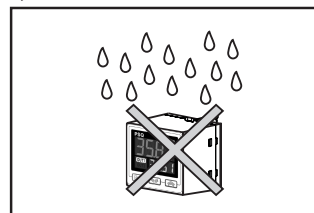
· Do not use the product in preparation time (within 3 sec). for operating after power-on.
· When using switching mode power supply, frame ground (F.G.) terminal of power supply should be grounded.

SMPS

F.G.
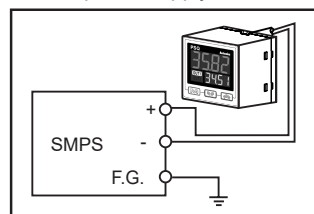
· Avoid wiring with power line or high voltage line. It may cause malfunction by noise.
· When moving this unit from cold place to warm place, please remove the humidity on the cover.
· Do not press the setting button with sharp or pointed object.
· Do not apply a tensile strength in excess of 30N to the cables or connector.
· This unit may be used in the following environment.
  ① Indoors
  ② Altitude max. 2,000m
  ③ Pollution degree 3
  ④ Installation category II

SENSORS

CONTROLLERS

MOTION DEVICES

SOFTWARE

(A) Photoelectric Sensors

(B) Fiber Optic Sensors

(C) LiDAR

(D) Door/Area Sensors

(E) Vision Sensors

(F) Proximity Sensors

(G) Pressure Sensors

(H) Rotary Encoders

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