Pressure Sensors

Section C

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⚠ Cautions

Pressure sensors are designed to monitor pressure and are not a safety measure to prevent accidents.

The compatibility of the sensor is the responsibility of the designer of the system and specifications.

Operating environment

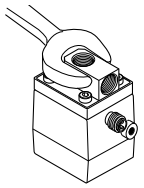
- Parker sensors have not been investigated for explosion-proof construction in hazardous environments.
- Do not use with flammable gases, liquids, or in hazardous environments.
- Avoid installing the sensor in locations where excessive voltage surges could damage or affect the performance of the sensor.

Operations

- Dedicate a power supply of 10.8 to 26.4VDC to the sensor and set the ripple to Vp-p10% or less. Avoid excessive voltage. Avoid voltage surges.
- A small amount of internal voltage drop is possible. Ensure the power supply minus any internal voltage drop exceeds the operating load.
- Verify the operating media is compatible with the specified sensor. Check the chemical make-up, operating temperatures, and maximum pressure ranges of the system before installing.
- Installation of air dryer system is recommended to remove moisture.

Installation

- Never insert an object into the pressure port other than an appropriate fluid connector.
- Avoid short-circuiting the sensor. Connect the brown lead to V+ and blue lead to 0V.
- Do not connect the output lead wires (black / white) to the power supply.
- Outputs not being used should be trimmed and insulated.
- Install as shown using the metal mounting bracket.



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Programming options

Options	MPS 37	MPS 34	SPC01	SCPSD
Outputs change N.O. / N.C.	✔	✔	—	✔
Units of measure change	✔	✔	—	✔
Hysteresis mode	✔	✔	—	✔
Window comparator mode	✔	✔	—	✔
Auto teach mode	✔	✔	—	—
Output response time	✔	✔	—	✔
Lockout option	✔	✔	—	—
Password lockout	—	—	—	✔
Max. value display	✔	✔	—	—
Min. value display	✔	✔	—	—
Zero reset	✔	✔	—	✔
Red / Green LED display options	✔	✔	—	—
Error output mode	✔	✔	—	✔
Setting of decimal point	—	—	—	✔

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Selecting the proper pressure sensor

Selecting a Parker Pressure Sensor for an application is more than just selecting the correct operating range of the sensor. Electromechanical pressure sensors convert the applied pressure to an electrical signal. When pressure is applied, the diaphragm is deflected causing the diffused resistors to change resistance (piezoelectric effect), which yields an electrical signal proportional to the pressure change. Applications for pressure switches are numerous and important in today's high-tech manufacturing environment. Parker Pressure Sensors are solid state sensors and not mechanical switches. The outputs are either analog (1 –5vc, 4-20ma or 0-20ma) or PNP/NPN Open Collector Transistor Type Outputs. The application will determine if the Open Collector Output is used in a Hysteresis or Window Comparator Function. The output mode of the sensor, as well as whether the sensor is normally open (non-passing) or normally closed (passing), can be programmed by you to fit your application. In addition to electrical outputs, most of these sensors have additional programming options that can be integrated into the system logic for additional benefits. These programming options are listed at the bottom of the page and are detailed on the next pages. Choose the best Pressure Sensor for the application based on Pressure Range, Output Type and additional programming options.

Programming options:

Outputs change N.O. / N.C.
The status of the Output at 0 PSIG is either Normally Open (Non-Passing) or Normally Closed (Passing) and can be set through programming.

Units of measure
The units of measure on the display can be changed to suit the application. Some choices are PSI, inHg, Bar, Kpa, Mpa or mmHg and are dependent on the pressure range of the sensor.

Hysteresis mode
This output mode provides one switch point and a reversing point When the switch point pressure is achieved, the output (NPN / PNP) changes state and will not change back until the reversing point pressure is achieved.

Window comparator mode
This output mode provides two switch points These two points create a window that the sensor output holds it state (NO or NC). This mode is also referred to as High/Low Setting. Anytime the pressure is higher or lower than the "window" the output changes state.

Auto setting mode
Programming feature that automatically sets switch point and reversing points for the outputs of the sensor based upon the minimum and maximum pressure readings of the sensor over time.

Output response time
Output response time is the time it takes for the output signal to change state after the pressure switch point is achieved. Sensor response time is typically less than 2.0 milliseconds and can be made slower by programming the response time in multiples of the standard sensor response time.

Lockout option
All sensor programming is locked out. Programming or LED Display cannot be changed when the sensor is locked out.

Password lockout
Lockouts the sensor from any programming changes. To unlock the sensor a user programmed 4 digit code must be entered into the sensor.

Max. valve display
Sensor will only display the maximum applied pressure reading until reset to measuring mode. A helpful tool in system set up.

Min valve display
Sensor will only display the minimum applied pressure reading until reset to measuring mode. A helpful tool in system set up.

Zero reset
Just like a pressure gauge, a pressure sensor measures the system pressure in relation to the atmospheric pressure. Pressure Sensors can be calibrated to the current atmospheric pressure by using the Zero Reset Function.

Red / Green LED display options
Display LED's change from Red to Green, or Green to Red when the output changes state. This can be a great visual indicator on a plant floor.

Error output
Error Message is displayed if the pressures, inputs, or outputs exceed the parameters of the sensor

Setting of decimal point
Depending on the units of measure, the decimal point can be adjusted up to three decimal points. (SCPSD only

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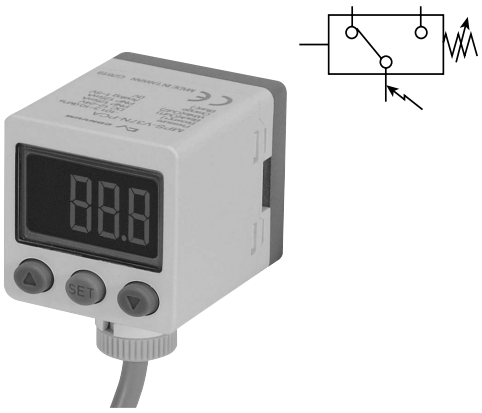
Features

- Sensor output:
  2 NPN or PNP open collector
  Transistor output, 12-24 VAC, with
  Analog output, 1 to 5 VDC
- Output response time less than 2.0 milliseconds
- RoHS
- Air and non-corrosive gase



Programming options

Outputs change N.O. / N.C.	✔
Units of measure change	✔
Hysteresis mode	✔
Window comparator mode	✔
Auto teach mode	✔
Output response time	✔
Lockout option	✔
Password lockout	—
Max. value display	✔
Min. value display	✔
Zero reset	✔
Red / Green LED display options	✔
Error output mode	✔

MPS-37 Sensor only ordering numbers

Pressure range	Electrical output	Electrical connection	Part number 1/8 NPSF Female	Part number 1/8 BSPP Female
0-30 inHg	(2) PNP with (1) 1-5VDC	2M 5 Wire Lead Wire	**MPS-V37N-PCA**	MPS-V37G-PCA
0-30 inHg	(2) NPN with (1) 1-5VDC	2M 5 Wire Lead Wire	**MPS-V37N-NCA**	MPS-V37G-NCA
-14.5 to 72 PSI	(2) PNP with (1) 1-5VDC	2M 5 Wire Lead Wire	**MPS-C37N-PCA**	MPS-C37G-PCA
-14.5 to 72 PSI	(2) NPN with (1) 1-5VDC	2M 5 Wire Lead Wire	**MPS-C37N-NCA**	MPS-C37G-NCA
0-145 PSI	(2) PNP with (1) 1-5VDC	2M 5 Wire Lead Wire	**MPS-P37N-PCA**	MPS-P37G-PCA
0-145 PSI	(2) NPN with (1) 1-5VDC	2M 5 Wire Lead Wire	**MPS-P37N-NCA**	MPS-P37G-NCA

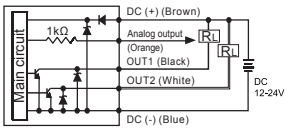
MPS-37 Accessories

Description	Part Number
Panel mounting bracket Note: Add "H" in suffex of Sensor Only Part Number to include with sensor	**MPS-ACCH10**
Surface mounting bracket Note: Add "K" in suffex of Sensor Only Part Number to include with sensor	**MPS-ACCK14**

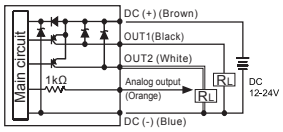
Example: MPS-P37N-PGA**K**, *includes sensor MPS-P37N-PGA with bracket MPS-ACCK14*

Internal circuit for open collector and analog output wiring

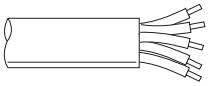
MPS-■37■-NCA
2 NPN+Analog (Voltage) output (1-5V)



MPS-■37■-PCA
2 PNP+Analog (Voltage) output (1-5V)



Lead Wiring



Brown	24VDC
White	NPN / PNP Open Collector Output 2
Blue	0VDC
Black	NPN / PNP Open Collector Output 1
Orange	Analog (1-5V)

Most popular.

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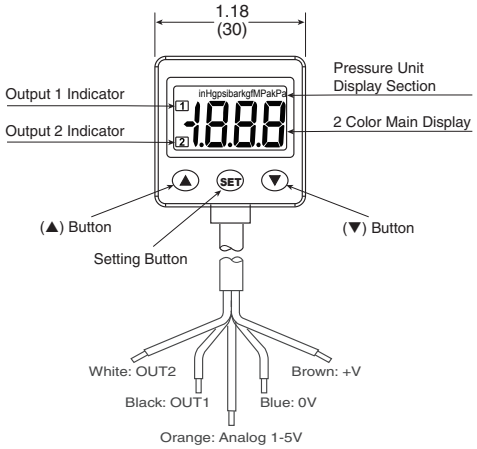
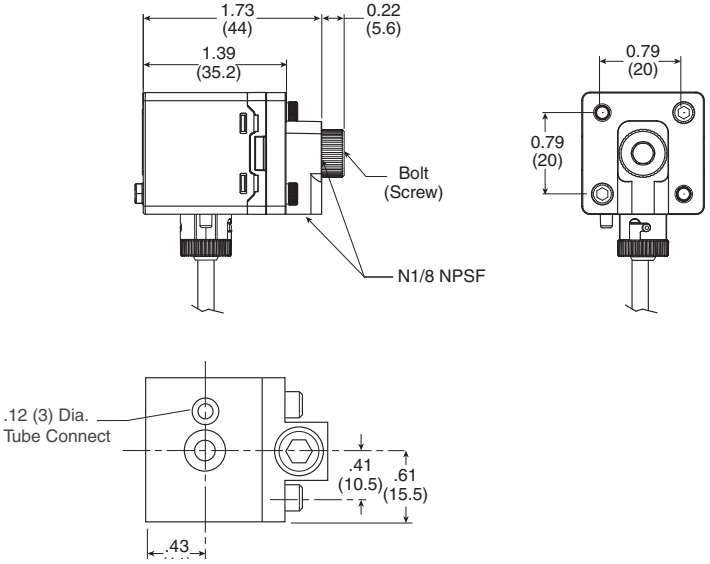
Specifications

	Vacuum (V)	Compound (R)	Positive (P)
Pressure range	-101.3 - 0 kPa (-14.5 to 0 PSI)	0 - 500 kPa (0 to 72 PSI)	-0.1 - 1 Mpa (0 to 145 PSI)
Proof pressure	0.3 Mpa (44 PSI)	0.8 Mpa (116 PSI)	1.5 Mpa (218 PSI)
Display resolution, Units of measure	0.1, kPa 0.001, kgf/cm^2 0.001, bar 0.01, PSI 0.1, inHg 1, mmHg 0.1, mmH_2O	1, kPa 0.01, kgf/cm^2 0.01, bar 0.1, PSI — — —	0.001, Mpa 0.01, kgf/cm^2 0.01, bar 0.1, PSI — — —
Media	Air & non-corrosive gases, incombustible gases		
Pressure port	**(N)** 1/8" NPSF, **(G)** 1/8" BSPP female		
Operating temperature	32 to 122°F (0 to 50°C)		
Storage temperature	-10 ~ 60°C (No condensation or freezing)		
Humidity	35 ~ 85% RH (No condensation)		
Electrical connection	Grommet open lead, 5 wire (0.15mm^2)		
Power supply	12 to 24VDC ±10% or less, Ripple (Vp-p) 10% or less		
Display	3½ digit, 7segment (red/ green)		
Display refresh	about .2 Seconds		
Control output	NPN or PNP open collector, 125 mA, 2 output		
Analog output	1 to 5VDC ≤ ±2.5% F.S. Linearity ≤1% of F.S.;		
Switch output	Output signal, NPN or PNP, Normally open or closed, LED indicator		
Output indicator	Orange (1 & 2 Indicator) OUT1 OUT2		
Output modes	Hysteresis or Window Comparator		
Response time	≤ 2.5 ms (chattering-proof function: 25ms, 100ms, 250ms, 500ms, 1000ms and 1500ms selections)		
Repeatability	± 0.2% of F.S. ± 1 digit or less		
Thermal error	≤ ± 2% of F.S. or less at range of 32 to 122°F (0 to 50°C)		
General protection	IP65, CE marked, EMC-EN61000-6-2: 2001, with dust tube connection		
Current consumption	≤ 40mA (with no load)		
Vibration resistance	10 to 150Hz, Double amplitude 1.5mm, XYZ, 2 hrs.		
Shock resistance	980 m/s^2 (about 10G), 3 times/each directions X, Y, Z		
Noise resistance	Vp-p400V, 10 ms, 0.5µs noise simulator		
Material	Housing: ABS (white), Pressure port: Zinc die-cast, Diaphragm: Silicone		
Mass	4.4 oz. (125g) (including cable)		

Dimensions

1/8" Female





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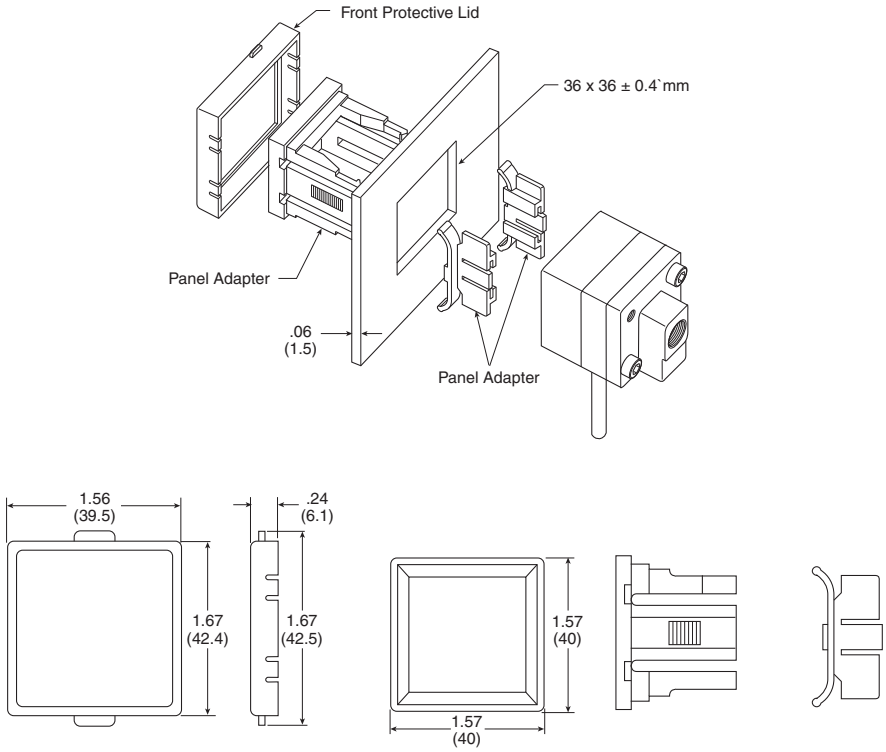
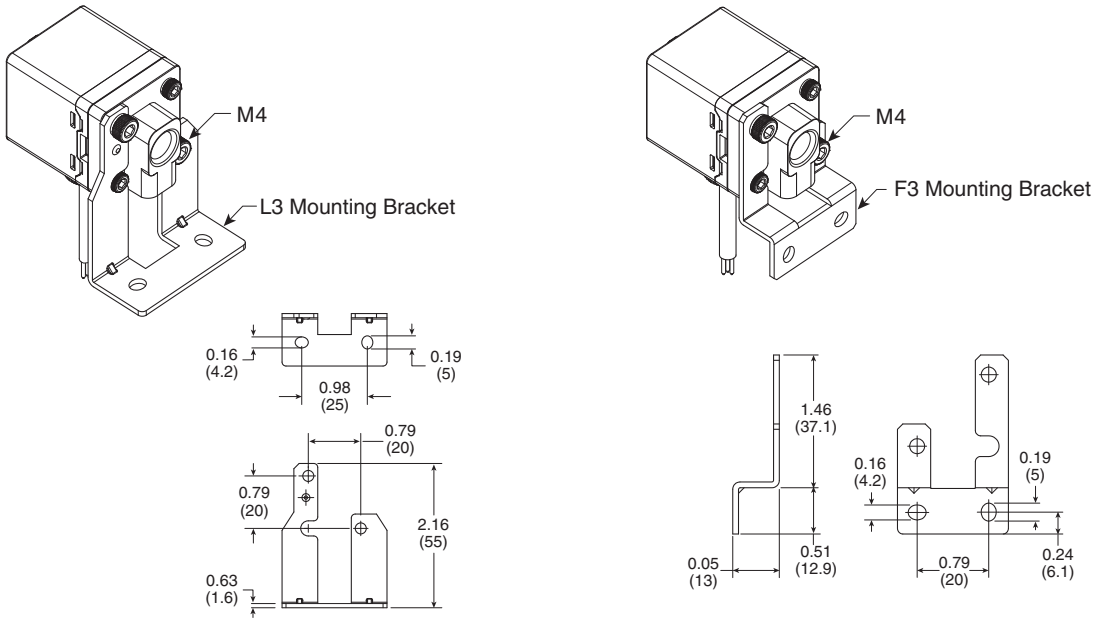
MPS-ACCH10
Panel mounting bracket



MPS-ACCK14
L3 & F3 mounting brackets and screws included



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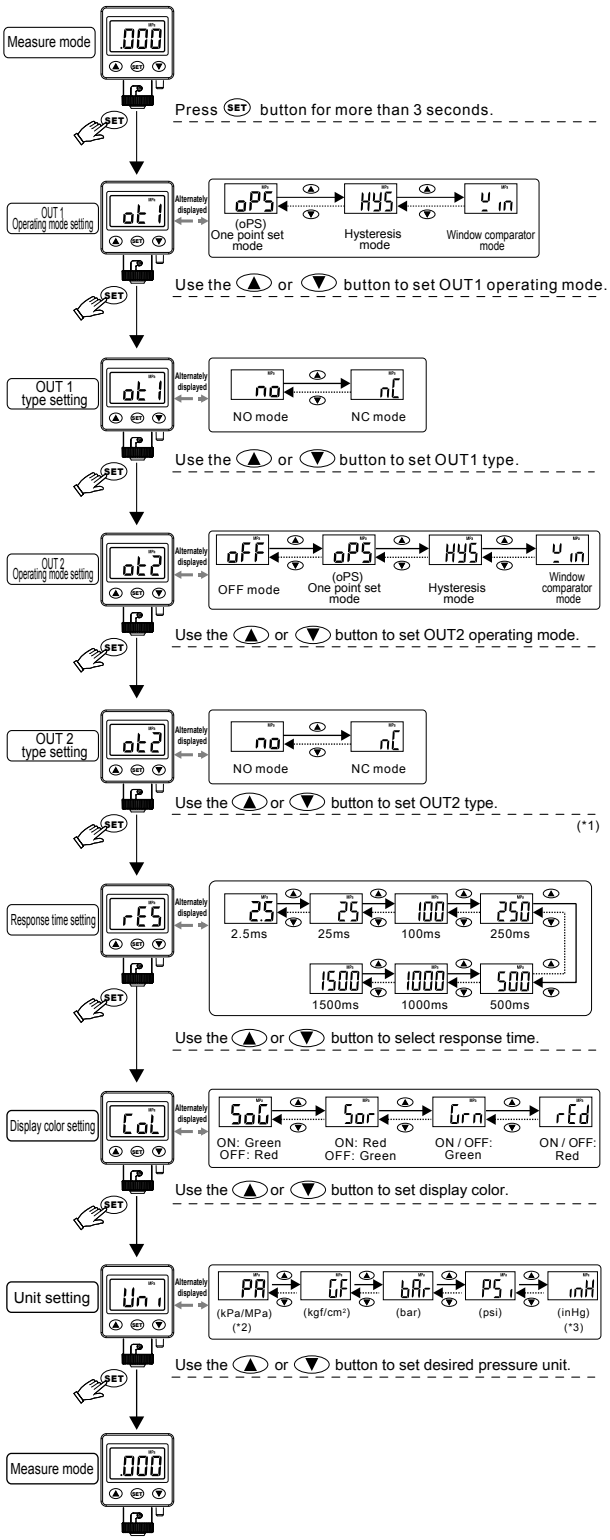
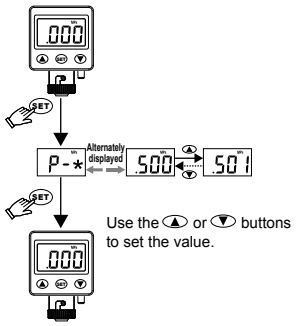
Initial Setting Mode



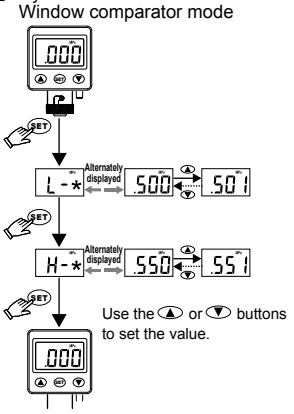
Note:
*1. This setting mode will not display when output 2 is set to oFF.
*2. Pressure unit is MPa with positive pressure.
Pressure unit is kPa with vacuum and compound pressure.
*3. Ony applicable for vacuum/compound.

Pressure Setting Mode

◎ One point set mode



◎ Hysteresis mode / Window comparator mode



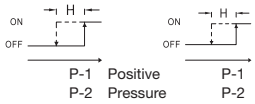
When out 1, "" displays 1
When out 2, "*" displays 2

Output type

One point set mode

Normal open mode

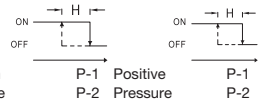
Positive/Compound (P/C)



Vacuum (V)

Normal close mode

Positive/Compound (P/C)

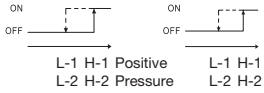


Vacuum (V)

Hysteresis mode:

Normal open mode

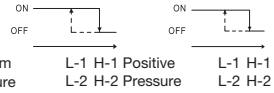
Positive/Compound (P/C)



Vacuum (V)

Normal close mode

Positive/Compound (P/C)

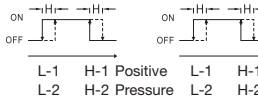


Vacuum (V)

Window comparator mode:

Normal open mode

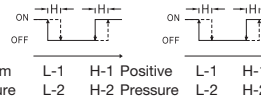
Positive/Compound (P/C)



Vacuum (V)

Normal close mode

Positive/Compound (P/C)



Vacuum (V)

Note:
*1. In case hysteresis is set at less than or equal to 2 digits, switch output may chatter if input pressure fluctuates near the set point.
*2. When using window comparator mode, the difference between two set points must be greater than the fixed hysteresis, otherwise will cause the switch output to malfunction.

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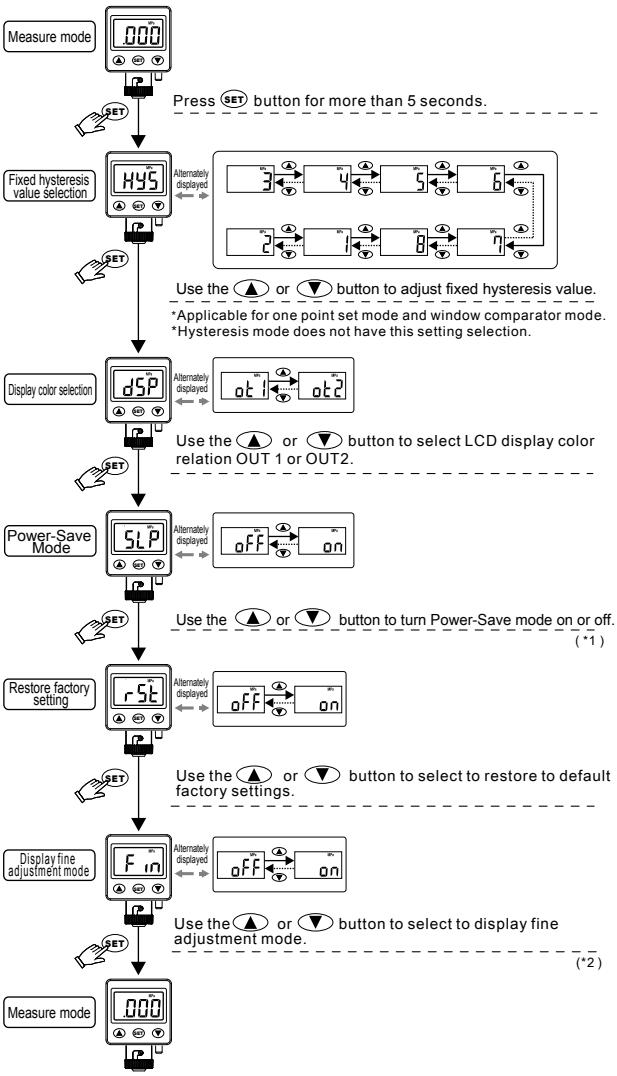
Advance Setting Mode



Note:

*1. When setting is "on", the power-save mode is active. Please refer to Power-Saver Mode details.

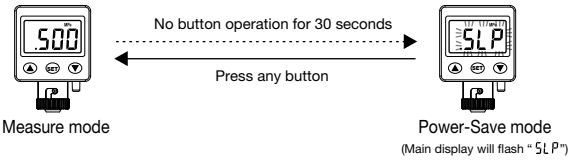
*2. When setting is "on", the display fine adjustment mode is active. Please refer to Fine Adjustment Mode details.

Power-Save Mode

◎ During Power-Save mode, the main display will turned off if no buttons is pressed after 30 seconds.

◎ During Power-Save mode, the output LCD may not be synchronize with the output. It is normal and will not affect output operation.

◎ Press any button to turn-on main display temporarily.

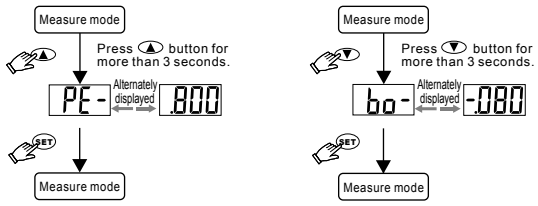


Zero Point Setting

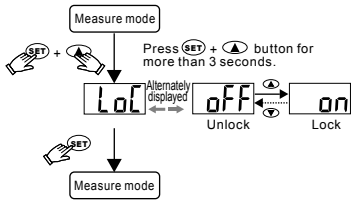
Use the ▲ + ▼ button at the same time until the "00" is shown, Release the button to end zero setting.

Maximum and Minimum Display Mode

◎ Maximum value display mode: ◎ Minimum value display mode:



Key Lock/Unlock Mode

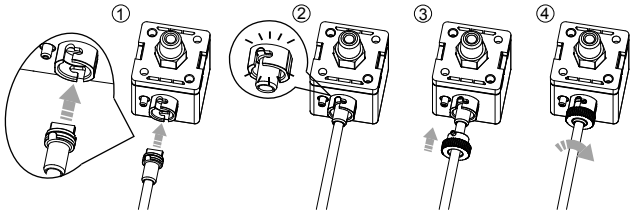


◎ Key lock mode, it displays as picture when pressing any key. After some time, it would be returned to measure mode.

Wire Installation Instruction

Please install the wire as the following step.

- Turn upward the salient point by terminal.(See figure ①)
- Install to the terminal to the groove by pressure sensor.(See figure ②)
- Terminal cover install to the products.(See figure ③)
- Turn the terminal cover to lock.(See figure ④)



NOTE: Recommend not insert-extract over 20 times.

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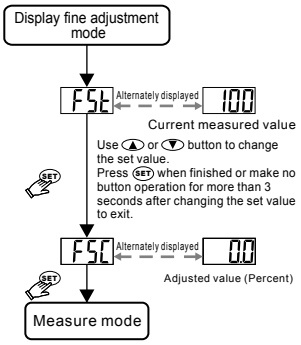
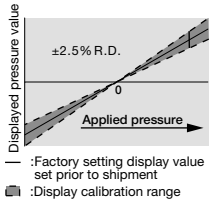
Fine Adjustment Mode



This function eliminates slight differences in the output values and allows uniformity in the numbers displayed.

Displayed values of the pressure sensor can be calibrated to within ± 2.5 % R.D.



:Factory setting display value set prior to shipment

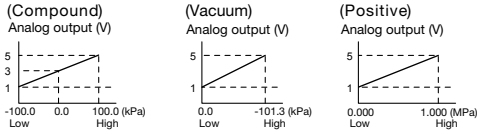
:Display calibration range

R.D. (Real Detect)

NOTE: 1. Setting resolution is ± 0.1% R.D.
2. The signal would be changed with analog output after adjusting

Analog Output Description

Analog output range 1 to 5V proportional to the pressure range.



Error messages

Error name		Display	Description	Solutions
Excess load current error	OUT1	*Er1*	Excess load current of 125 mA	Turn off power and check the cause of overload current or lower the current load under 80 mA, then restart
	OUT2	*Er2*		
Residual pressure error		*Er3*	During zero reset, ambient pressure is over ±3% F.S.	Change input pressure to ambient pressure and perform zero reset again
Applied pressure error		HHH	The applied pressure is excess the upper limit of pressure setting	Adjust the pressure within applied pressure range
		LLL	The applied pressure is excess the lower limit of pressure setting	
System error		*Er4*	Internal data error	Turn power off and then restart. If error condition remains, please return to factory for inspection
		Er6	Internal system error	
		Er7	Internal data error	
Copy data error		*Er8*	Copy data error	Please check the model no. and wire connection. Retart to turn on power if no return to normal condition, please return to factory for inspection.

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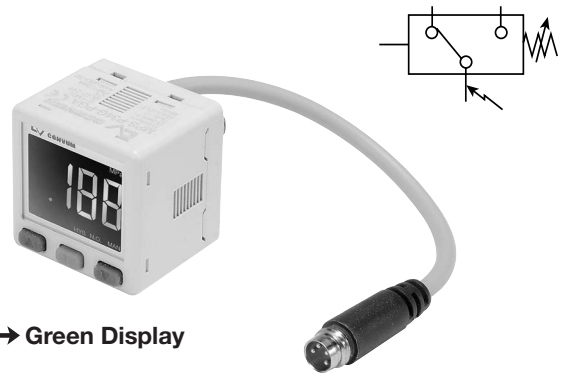
Features

- Sensor output:
  1 NPN or PNP Open collector
  Transistor output, 30VDC, 125mA with
  Analog output, 4 to 20mA
- Output response time less than 2.0 milliseconds
- RoHS
- Air and non-corrosive gases
- Sensor face includes icons to show sensor programming status



Red ⟷ Green Display

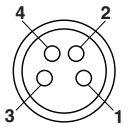
Programming options

Outputs change N.O. / N.C.	✔
Units of measure change	✔
Hysteresis mode	✔
Window comparator mode	✔
Auto teach mode	✔
Output response time	✔
Lockout option	✔
Password lockout	—
Max. value display	✔
Min. value display	✔
Zero reset	✔
Red / Green LED display options	✔
Error output mode	✔

Sensor pin out with analog output

Pin #

1 Brown: 24VDC
2 White: 4 to 20mA
3 Blue: 0VDC
4 Black: PNP Open Collector Output 1



MPS-34 Sensor only ordering numbers

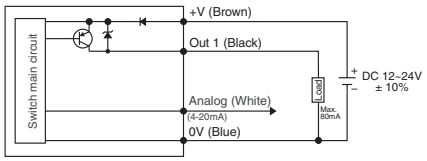
Pressure range	Electrical output	Electrical connection	Part number 1/8 NPSF male	Part number 1/8 BSPP male
0-30 inHg	(1) PNP with (1) 4-20ma	M8, 4 Pin	**MPS-V34N-PCI**	MPS-V34G-PCI
0-145 PSI	(1) PNP with (1) 4-20ma	M8, 4 Pin	**MPS-P34N-PCI**	MPS-P34G-PCI

MPS-34 Accessories

Description	Part number
Panel mounting bracket Note : Add "H" in suffex of Sensor Only Part Number to include with sensor	**MPS-ACCH9**
Surface mounting bracket Note : Add "K" in suffex of Sensor Only Part Number to include with sensor	**MPS-ACCK10**
Example: MPS-P34N-PCI**K**, *includes sensor MPS-P34N-PCI with bracket MPS-ACCK10*	
M8, 4-Pin, 2 meter cable	**CB-M8-4P-2M-PUR**
M8, 4-Pin, 5 meter cable	**CB-M8-4P-5M-PUR**

Internal circuit for open collector and analog output wiring

PNP Output (Analog (4-20mA)



Most popular.

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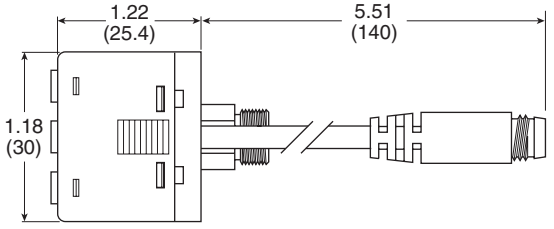
Specifications

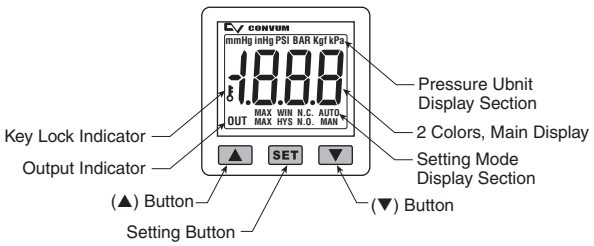
	Vacuum (V)	Positive (P)
Pressure range	-101.3 to 0 kPa (-14.5 to 0 PSI)	-0.1 to 1 Mpa (0 to 145 PSI)
Proof pressure	0.3 Mpa (44PSI)	1.5 Mpa (218 PSI)
Display resolution , Units of measure	0.1, kPa 0.001, kgf/cm² 0.001, bar 0.01, PSI 0.01, inHg 1, mmHg	1, kPa 0.01, kgf/cm² 0.01, bar 0.1, PSI - -
Media	Air & non-corrosive gases	
Pressure port	**(N)** 1/8" NPT male, **(G)** 1/8 BSPP male both with M5 female port	
Operating temperature	32 to 122°F (0 to 50°C)	
Storage temperature	-4 to 140°F (-20 to 60°C)	
Humidity	35 to 85% RH (no condensation)	
Electrical connection	**(C)** 4-pin, M8 connector on 150mm lead wire	
Power supply	12 to 24VDC ±10%, Ripple (P-P) 10% or less	
Display	3 + 1/2 digit, 2 color, 7-segment RED / GREEN LED	
Display refresh	Timing update : 0.1 ~ 3 sec. (Factory Set Unit: 0.1 sec.)	

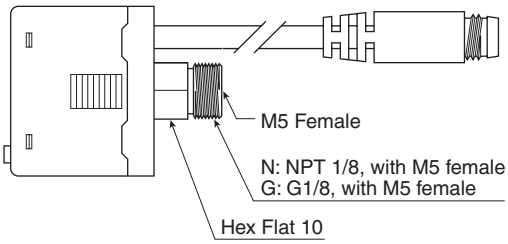
Switch output	Output signal, PNP, Normally open or closed, LED indicator, 125 mA max. output load
Output modes	Hysteresis or Window Comparator
Response time	≤ 2.5ms (chattering-proof function: 24ms, 250ms, 500ms, 1000ms and 1500ms selections)
Repeatability	± 0.2% of F.S. ± 1 digit
Output current	Output current 4 to 20mA; Linearity ±1.0% of F.S.; Maximum load impedance 300Ω at power supply of 12V; 600Ω at power supply of 12V; Minimum load impedance 50Ω
Thermal error	32 to 122°F (0 to 50°C) 25°C (77°C) + 2% of F.S. or less at range of 32 to 122°F (0 to 50°C)
General protection	IP40, CE marked, EMC-EN61000-6-2: 2001
Current consumption	45mA (with no load)
Vibration resistance	10 to 150Hz, Double amplitude 1.5mm, XYZ, 2 hrs.
Shock resistance	980 m/s² (about 10G), 3 times/each directions X, Y, Z
Noise Resistance	Vp-p400V, 10 ms, 0.5μs noise simulator
Material	Housing: ABS (gray) , Pressure port: Zinc die-cast, Diaphragm: Silicone
Mass	1.45 oz. (45g) with M8 connector

Dimensions

1/8" Male







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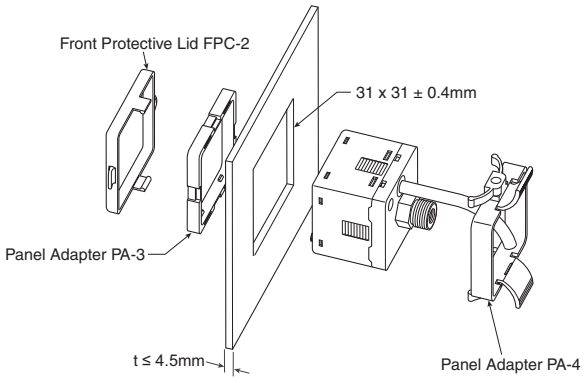
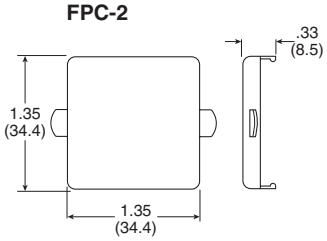
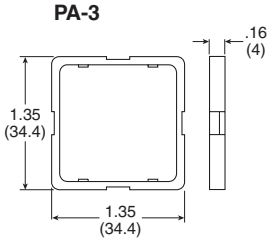
MPS-ACCH9
Panel mounting bracket



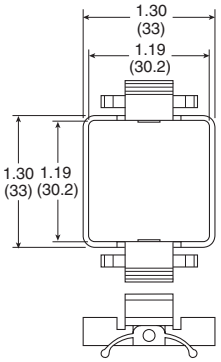
FPC-2



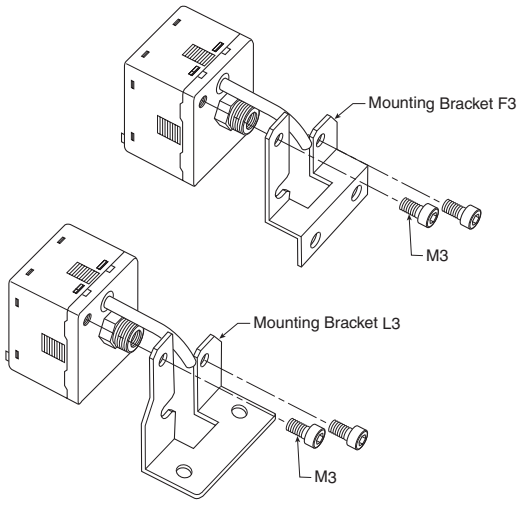
PA-3



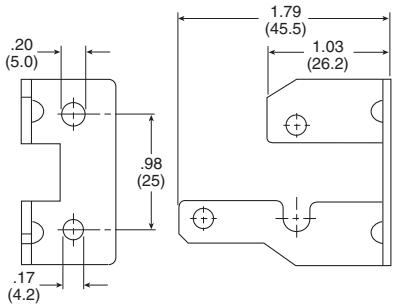
PA-4



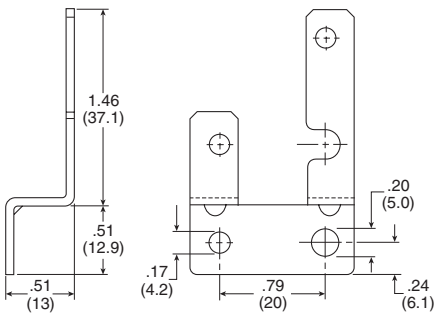
MPS-ACCK10
L3 & F3 mounting brackets and screws included



L3



F3



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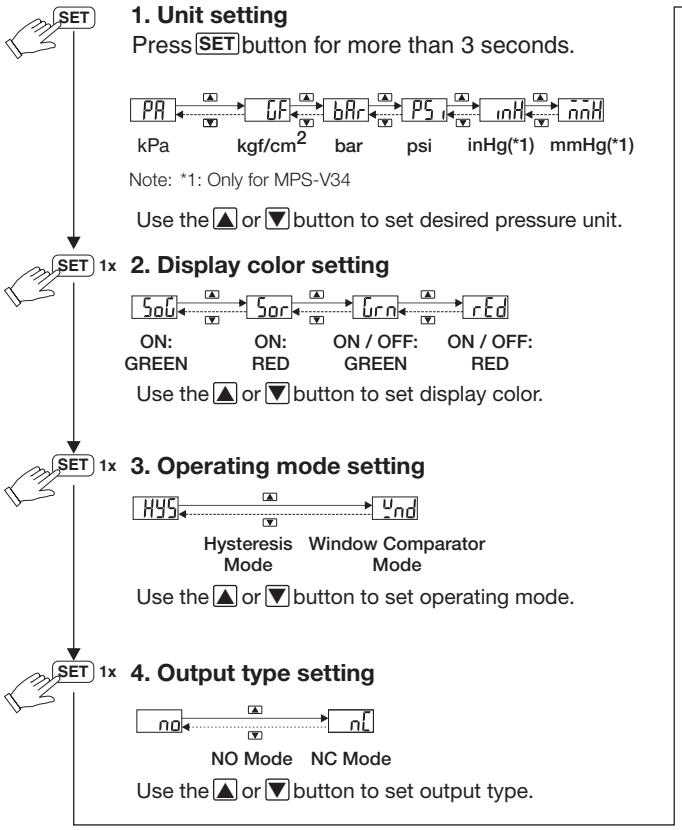
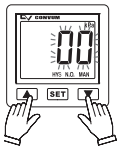
Initial setting mode



Zero point setting / the max. & min. display mode

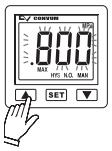
Zero setting:

- press the▼▲ button at the same time until the "00" is shown. Release the button to end zero setting.



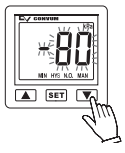
The max. value display mode:

- Press ▲ button 2 seconds to enter the max. value mode, pressure sensor will detect the max. value and keep max. value displayed.
- Press ▲ button 2 seconds to return to measure mode display.

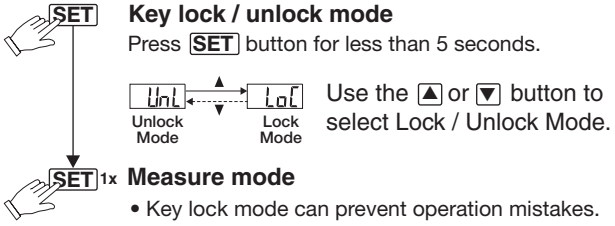


The min. value display mode:

- Press ▼ button 2 seconds to enter the min. value mode, pressure sensor will detect the min. value and keep min. value displayed.
- Press ▼ button 2 seconds to return to measure mode display.



Key lock / unlock mode



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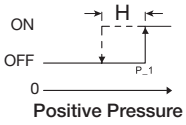
Pressure setting mode

Hysteresis Mode

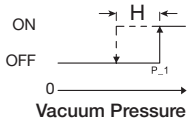
Output Hysteresis value can be preset.

Normal open mode

Positive (MPS-P34)

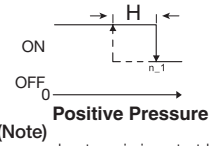


Vacuum (MPS-V34)

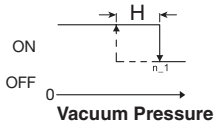


Normal close mode

Positive (MPS-P34)



Vacuum (MPS-V34)



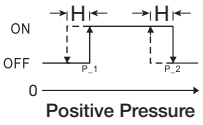
(Note)
In case hysteresis is set at less than or equal to 2 digits, switch output may chatter if input pressure fluctuates near the set point.

Window comparator Mode

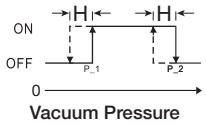
Within pressure setting range, pressure sensor output can be ON or OFF.

Normal open mode

Positive (MPS-P34)

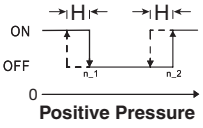


Vacuum (MPS-V34)

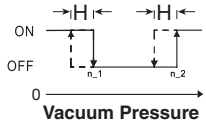


Normal close mode

Positive (MPS-P34)

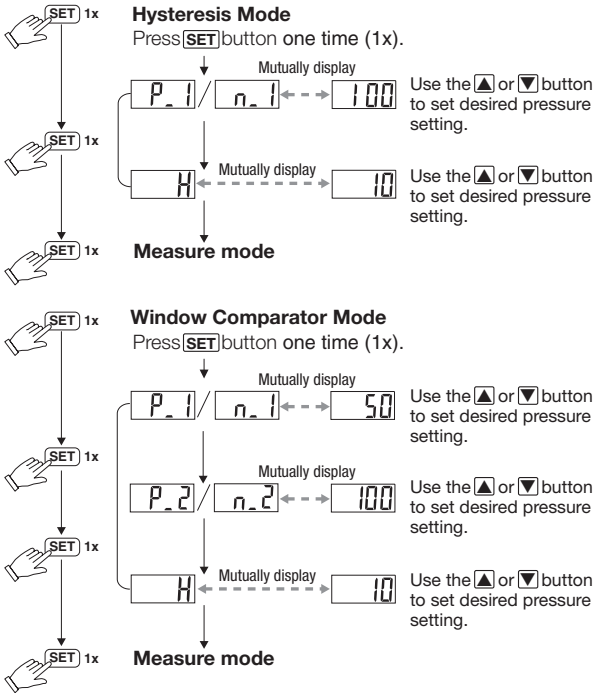


Vacuum (MPS-V34)



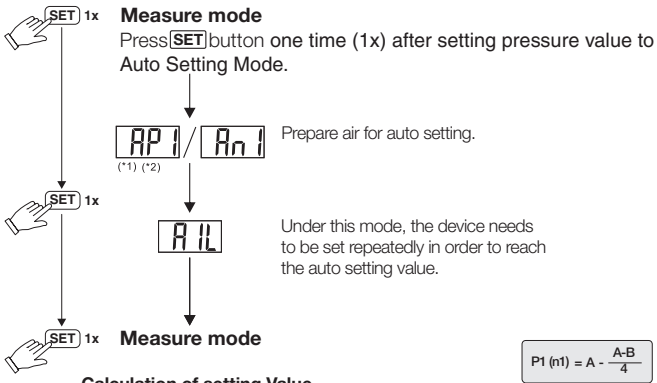
Manual setting mode

The LED shows: (P_* at normal open mode and (n_*) at normal close mode. Pressure setting value is shown normally and will not lead to pressure sensor pause or stop working.



Auto setting mode

1. The LED shows:
   (AP1) at normal open mode and (An1) at normal close mode.
2. In case of without need of auto pressure value setting, press ▼+▲ at the same time to enter measure mode.



Calculation of setting Value
A = The max. pressure value under auto setting mode.
B = The min. pressure value under auto setting mode.

$$P1\ (n1) = A - \frac{A-B}{4}$$

$$H = B\ \frac{A-B}{4}$$

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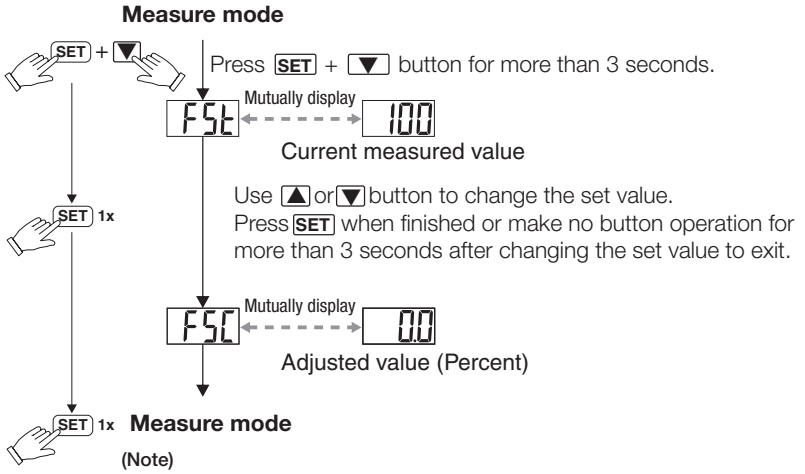
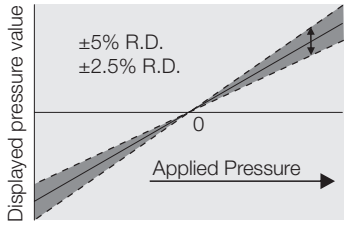
Fine adjustment mode



(Note)
MPS-34 : When display unit is in "MPa", setting resolution is 0.001 MPa.
MPS-34 : When display unit is in "kPa", setting resolution is 0.1 kPa.

This function eliminates slight differences in the output values and allows uniformity in the numbers displayed. Displayed values of the pressure sensor can be calibrated to within ±5% for MPS-P34 and ±2.5% for series MPS-V34.



—:Factory setting display value set prior to shipment
▩:Display calibration range

Error messages

Error name	Display	Description	Solutions
Excess load current error	*oCP*	Output load current of 125 mA	Turn off power and check the cause of overload current or lower the current load under 125 mA, then restart
Residual pressure error	*oUr*	During zero reset, ambient pressure is over ±3% F.S.	Change input pressure to ambient pressure and perform zero reset again
Applied pressure error	*HHH*	The applied pressure is excess the upper limit of pressure setting	Adjust the pressure within applied pressure range
	LLL	The applied pressure is excess the lower limit of pressure setting	
System Error	*Er4*	Internal data error	Turn power off and then restart. If error condition remains, please return to factory for inspection
	Er6	Internal system error	
	Er7	Internal data error	
	Er8	Internal system error	

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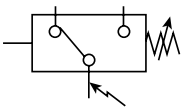
Features



- Stainless steel or ceramic diaphragms
- UL listed and CE marked
- Sensor outputs
  2 PNP Open collector transistor
  Output, 30 VDC, 100mA
- Optional additional current, 4 to 20mA
- Output response time less than 5.0ms
- Polarity protected
- Short circuit protected
- 4 digit LED
- Display head swivels 290°

Programming options

Outputs change N.O. / N.C.	✔
Units of measure change	✔
Hysteresis mode	✔
Window comparator mode	✔
Auto teach mode	—
Output response time	✔
Lockout option	—
Password lockout	✔
Max. value display	—
Min. value display	—
Zero reset	✔
Red / Green LED display options	—
Error output mode	✔
Setting of decimal point	✔

SCPSD-600-14-15

SCPSD Ordering numbers

Pressure range	Port size	Electrical output	Electrical connection	Part number
-1 to 16 Bar	1/4 BSPP Male	(2) PNP	M12, 4 Pin	SCPSD-016-04-17
-1 to 16 Bar	1/4 BSPP Male	(2) PNP with 4-20ma	M12, 5 Pin	SCPSD-016-14-15
0 to 250 Bar	1/4 BSPP Male	(2) PNP	M12, 4 Pin	SCPSD-250-04-17
0 to 250 Bar	1/4 BSPP Male	(2) PNP with 4-20ma	M12, 5 Pin	SCPSD-250-14-15
0 to 600 Bar	1/4 BSPP Male	(2) PNP	M12, 4 Pin	SCPSD-600-04-17
0 to 600 Bar	1/4 BSPP Male	(2) PNP with 4-20ma	M12, 5 Pin	SCPSD-600-14-15

☐ Most popular.

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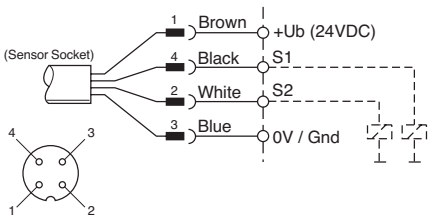
Specifications

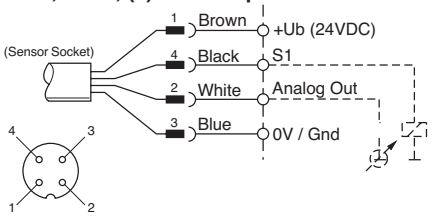
Pressure code	0250	016	250	600
Measure range PSI, (bar)	-14.7 to 250	(-1 to 16)	(0 to 250)	(0 to 600)
Overload pressure PSI, (bar)	725	(40)	(500)	(1200)
Burst pressure PSI, (bar)	725	(50)	(1200)	(2200)
Sensing element	Ceramic		Stainless Steel	
Parts in contact with media	Stainless steel 1.4404 Ceramic AL203, NBR* *FPDM		Stainless steel 1.4404, 1.4542, NBR*	
Units of measure	PSI, bar, MPA			
Switch cycles	>100 million			
Output response time	< 10ms			
Power supply	15 to 30VDC, Class 2 power supply			
Short circuit protection	Yes, 2.4 amp / open collector output			
Reverse polarity protection	Yes			
Overload protection	Yes			
Current consumption	< 100mA			
Output circuit	2 PNP (Sourcing) open collector transistor			
Analog output	0/4…20mA, Programmable, freely scaleable			
Output functions	Hysteresis, Window comparator			
Switching voltage	-1.5VDC			
Maximum current output	1A with 2 open collector outputs, .5A per output			
Accuracy	± 0.5% F.S. Typ., ± 1% Max.			
Repeatability	± 0.25% F.S.			
Display accuracy	± 0.5% F.S. Typ., ± 1 Digit			
Thermal error max.	±0.03% F.S. at -4 to 185°F (-20 to 85°C)			
Material	Pressure Die-cast zinc Z 410: Surface-finishing			
Display material	Polyester			
General protection	IP 67, EN60529, UL, CE Marked, EMC-EN50082-2 Class B, EN 50081-2			
Temperature range of media	-4 to 185°F (-20 to 85°C)			
Ambiant temperature range	-4 to 185°F (-20 to 85°C)			
Storage temperature	-40 to 212°F (-40 to 100°C)			
Display	4-Digit, 7-Segment LED, Red, 9mm height			
Tightening torque	35Nm			
Vibration resistance	20G, 10 to 500Hz, IEC60068-2-6			
Shock resistance	50 G, XYZ, 11ms, IEC60068-2-29			
Mass	10.6 oz. (300g)			

Internal circuit

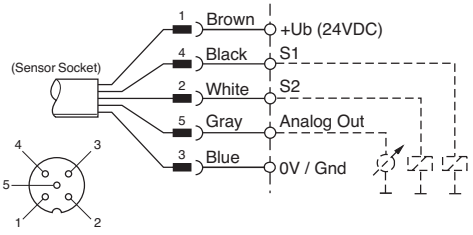
M12, 4-Pin, (2) PNP Outputs



M12, 4-Pin, (1) PNP Output with 4 to 20mA Analog



M12, 5-Pin, (2) PNP Outputs with 4 to 20mA Analog



Note: M12, 5-Pin Female Cable Connector will fit on both M12, 4-Pin and 5-Pin Male Sensor Connector.

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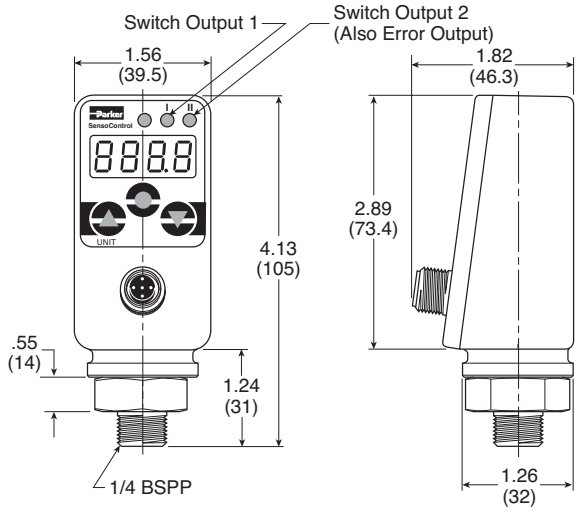
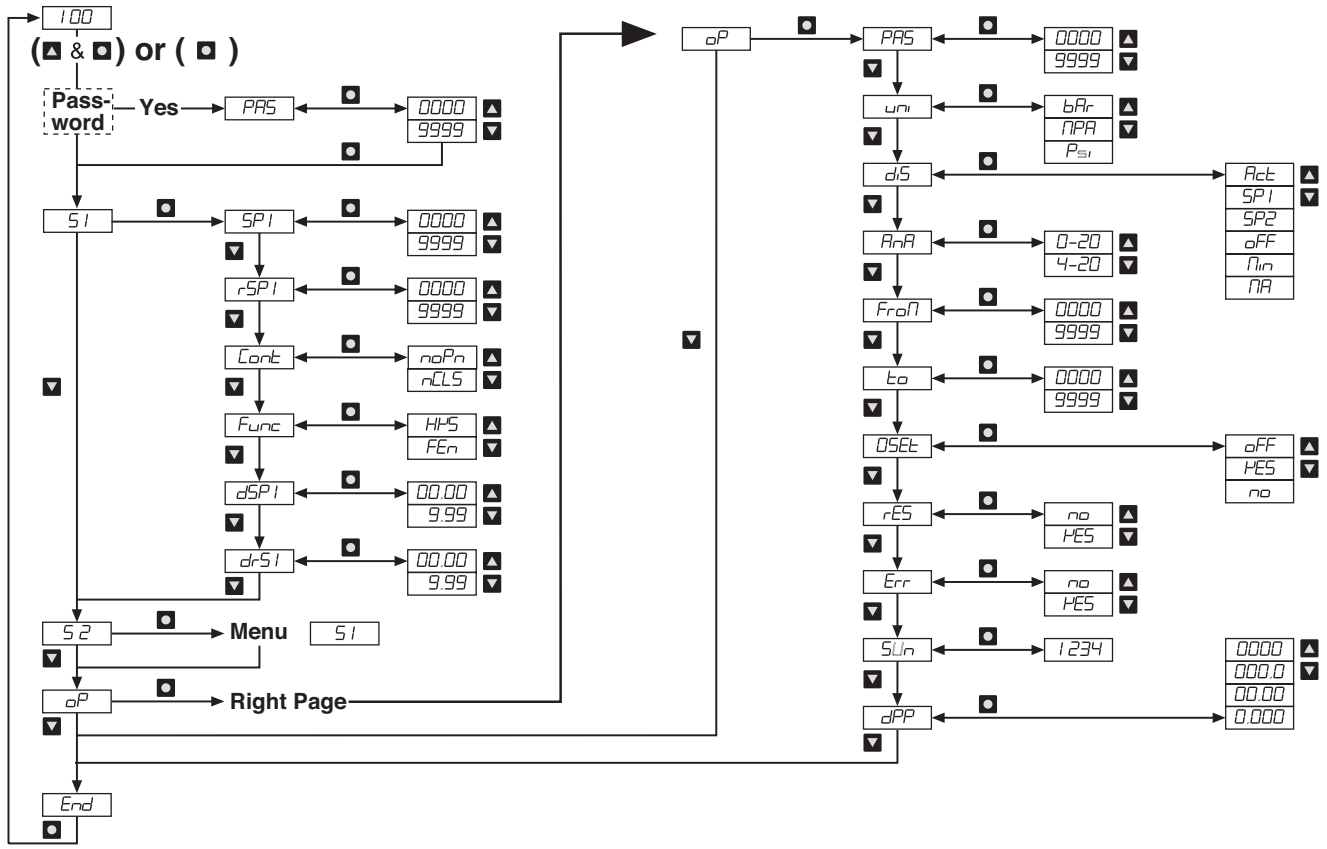
Dimensions



To program outputs and options of SCPSD, press and hold the ▲ (Up Arrow Icon) then press the ◘ (Circle Icon) until Pro6 is displayed. Release all buttons and follow menu to program outputs and options.

To review programed outputs and options of SCPSD, press and hold the ◘ (Circle Icon) until Pro6 is displayed. Release the ◘ (Circle Icon) and follow menu to program option and status.



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Parameters shown in digital display

To program switch outputs in menu S1 (S1 = output 1) or S2 (S2 = output 2), press ▲ and hold, then press ● . Pro6 will be displayed for 2 seconds.

PRS	This is dedicated to a password. Entry into the programming mode can be secured only when the correct figures have been entered
	Menu for programming the switch outputs:
S1	***S1*** = Switch output 1
S2	***S2*** = Switch output 2 (Menu is not active if S2 is being used as an error output)
	Switching point (SP): upper limiting value / pressure, at which the switch output changes its status.
SP1	***SP1*** = Switch output 1; input as pressure value (e.g. 400 bar)
SP2	***SP2*** = Switch output 2; input as pressure value (e.g. 430 bar)
	Reverse switching point (rSP): lower limiting value/ pressure at which switch output changes its status.
rSP1	***rSP1*** = Reverse switching point (rSP1) of switch output 1; input as pressure value (e.g. 390 bar)
rSP2	***rSP2*** = Reverse switching point (rSP2) of switch output 2; input as pressure value (e.g. 420 bar) The reverse switching point is always smaller than its respective switching point. If the reverse switching point is set higher than the switching point, the reverse switching point will be set automatically 0.5% of the instrument nominal pressure below the switching point. The warning sign Att (attention) will appear, which can be cleared with Enter.●
cont	Switch output as noPn = closer nCLS = opener
Func	Selection of switching functions: ***HySt*** = Hysteresis function ***FEn*** = Window fu nction
	Delay times; input from 0 to 9.99 s.
dSPI	***dSPI*** = delay time switching point output 1
drSL	***drSI*** = delay time reverse switching point output 1
dSP2	***dSP2*** = delay time switching point output 2
drS2	***drS2*** =delay time reverse switching point output 2

●

Settings for options program

oP	Options program
PA5	Password input 0000 = no password Example password 1234 = 1234
uni	Setting of units: ***bAr*** = bar ***NPA***= MPa ***PSi***= PSI
diS	Display: Value which will be shown on the digital display in run mode. ***Act*** = Actual system pressure ***Nin*** = Minimum system pressure; (pressure troughs) ***NA*** = Maximum system pressure; (pressure peaks) ***SPI*** = Switch point 1 ***SP2*** = Switch point 2 ***OFF*** = off indication
AnA	Setting of analog output (see point 4) ***0-20*** = 0-20 mA ***4-20*** = 4-20 mA
FroN	Calibration of starting value (0 or 4 mA) for the analog output. Settable from 0 to nominal instrument pressure. Example for ***AnA*** = 4-20: ***0000*** = at 0 bar the analog output yields 4mA. The starting value is always smaller than the end value. If the starting value is set greater than the end value, then the starting value will be automatically set 5% of the nominal instrument pressure below that of the end value. The warning sign ***Att 1*** will appear, which can be cleared with the Enter sign. ●
to	Calibration of end value (20mA) for the analog output. Settable from 0 up to nominal instrument pressure. ***0010*** = at 10 bar the analogue output yields 20 mA.
0Set	Zero adjustment: The actual pressure will be stored as a new zero point. For safety reasons this is limited to the range ± 5% of the nominal instrument pressure. Application example: a system with a continuous residual pressure, but which should be displayed as 0 bar. ***OFF*** = factory calibration ***yES*** = undertake zeroing adjustment now ***no*** = go back to the menu and do not make any new zeroing adjustments. After a zeroing adjustment, a pressure of up to 20 bar can be displayed as 0 on a 400 bar SCPSD. Before working on a system, it must be ensured that there is no pressure in it.
rES	Clearing the minimum and maximum value memory ***yES*** = yes, clear memory now ***no*** = no, do not clear memory
Err	Programming switch output 2 as an error output ***yES*** = yes ***no*** = no Switch Output 2 can be used optionally as an error output to display pressure switch function errors. As an error output it is normally closed, and in case of errors (***Err 1, Err 2, Err 3***) it is open. At the same time LED II lights up. The display and the output remain active until the error is cleared.
SUn	Indication of Software Version
dPP	Setting of the decimal point. (The maximum number of decimal points depends on the nominal pressure of the SCPSD instrument) ***0000*** = no decimal point ***000.0*** = 1 decimal point ***00.00*** = 2 decimal points ***0.000*** = 3 decimal points
End	End of programming mode

●

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Installation

Mechanical:

CAUTION: Install and de-install the SCPSD only when there is no pressure present.

Attach the SCPSD to the appropriate process connection. Installation should be undertaken only with a 22mm, across flats spanner. Ensure that the digital display is placed in the best viewing position by using the rotational housing adjustment. Turn the SCPSD manually to the required position. Maximum 290°.

Excessive turning beyond the easily detectable end stop will lead to damage.

- The housing can be attached:
- with self-tapping screws into two blind holes at the back of the housing
- with the mounting plate provided
- with cable ties

Electrical:

CAUTION: The SCPSD may be installed only by a qualified electrician in accordance with the respective national and international regulations.

Protect the SCPSD from electromagnetic influences and over-voltages.

Optional installation tips which are shown by experience to reduce the influence of interference:

- Use shorter cables
- Avoid short distances between connecting leads and power consuming devices and interference generating electrical and electronic equipment
- Use free running diodes

Avoid static and dynamic over-pressures which exceed the specified overload pressure. Even when the overload pressure is exceeded only for a short time the SCPSD may be damaged. Parker SensoControl diagnostic systems are recommended for measuring pressure peaks exactly.

If there is a danger of excessively high pressure peaks, it is recommended to:

- use an SCPSD with a higher nominal instrument pressure (analog output can then be correspondingly matched)
- install a standard throttling device upstream from the SCPSD

Error messages

Display	Description
Att	The set value is lower than the other respective parameters. When Enter is activated, the smaller value is matched up.
Err1	System Error (Internal)
Err2	Nominal instrument pressure range was exceeded by 10%. Please check system pressure.
Err3	Nominal instrument pressure range has been exceeded Error in analog electronics. Please check system pressure.

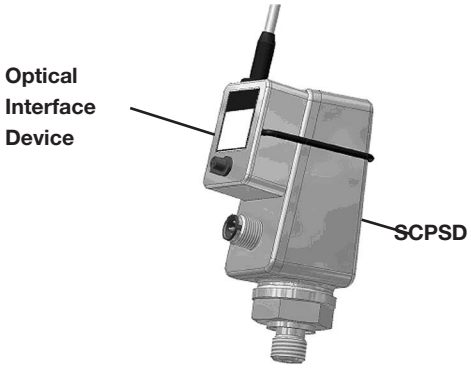
Electrical test unit (M12, 5-Pin)

SCSN-450-PSD

SCPSD programming kit

SCSD-PRG-KIT

Optical Interface Device that allows read / write and storing of SCPSD configuration data. Kit includes optical interface device, electrical test unit with PC cable (RS232 connector) and software.



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Features

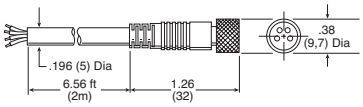
- M8, M12 female connector
- Length: 2m or 5m
- Cover: PVC or PUR
- Connection type: Swivel straight or angled
- IP67 swivel connector

Common Part Numbers

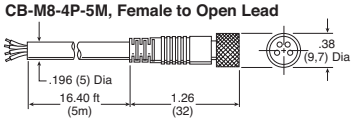
Connector	Contacts	Length	Cover	Part number
M8 female	4	2m	PUR	**CB-M8-4P-2M**
M8 female	4	5m	PUR	**CB-M8-4P-5M**
M8 angled female	4	5m	PUR	**CB-M8-4P-5M-90**
M12 female	4	2m	PVC	**CB-M12-4P-2M**
M12 female	5	2m	PVC	**CB-M12-5P-2M**

Dimensions

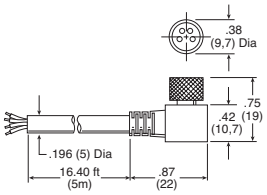
CB-M8-4P-2M, Female to Open Lead



CB-M8-4P-5M, Female to Open Lead



CB-M8-4P-5M-90, Female to Open Lead

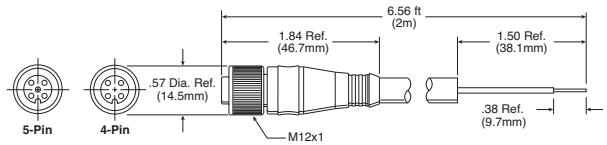


Female Interface
4-Pin, M8

Cable Pin	Color
1	Brown
2	White
3	Blue
4	Black

Male Interface
4-Pin, M8

CB-M12-4P-2M, Female to Open Lead
CB-M12-5P-2M, Female to Open Lead



Female Interface
5-Pin, M12

Cable Pin	Color
1	Brown
2	White
3	Blue
4	Black
5	Gray

Female Interface
4-Pin, M12

Cable Pin	Color
1	Brown
2	White
3	Blue
4	Black

☐ Most popular.

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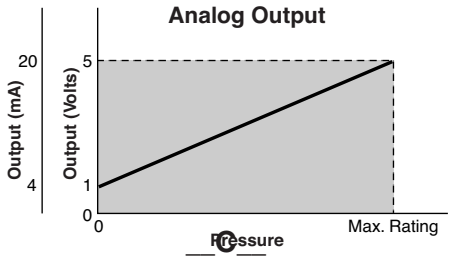
Glossary

__A__

Accuracy
The PERCENTAGE difference between the true value and that indicated by an instrument is the measure of the instrument's accuracy. It is expressed as a percentage of the full-scale value of the reading according to the type of instrument.

Analog output
An analog output provides an output voltage that is proportional and linear to the pressure measured by the sensor. This output signal provides continuous feedback to the analog card of the PLC.



Cable connector type
4-Pin, M8 cable connector referred to as PICO or Micro connector. 4-Pin, 5-Pin, M12 cable connector referred to as Mini connector.

Class 2 power supply
Power source not exceeding 30VDC and 8 amps.

Connection port size
Pressure port connections on the back or bottom of the sensor.

Current consumption
Maximum current consumed during operation. Does not include the load current.

__D__

Display resolution
Resolution is 1/1024. The least possible measurable unit to display on the display. This will vary with the units of measure and is adjustable on some sensors.
Shown below are the different unit increments displayed for different pressures.

Compound	Low pressure	Vacuum	Pressure
bar: 0.01	bar: 0.001	bar: 0.001	bar: 0.01
kPa: 1	kPa: 0.1	kPa: 0.1	mPa: 0.001
kgf/cm^2: 0.01	kgf/cm^2: 0.001	mmHg: 1	kgf/cm^2: 0.01
PSI: 0.1	PSI: 0.1	inHg: 0.1	PSI: 1

Dielectric strength
Sensors ability to withstand excess voltages.

Digital display unit
Minimum unit displayed on the sensor.

__E__

Error message
Error message is displayed if the pressures, inputs, or outputs exceed the parameters of the sensor.

__F__

Full scale
Abbreviated as F.S. this is the operating pressure scale of the sensor.

__G__

Grommet type
Electrical lead from the sensor.

__H__

Hysteresis
The difference in pressure below the switch point pressure which controls the ON-OFF status of the output signal. (See Output modes)

__I__

Input impedance
The source of the electrical response of the sensing element expressed in ohms.

IP ratings
IP40 - Protected against solid foreign objects of 0.04" (1mm) and greater.
Non-protected against the penetration of liquids.
IP65 - Dust tight.
Protected against water jets.
IP67 - Dust tight.
Protected against the effects of temporary immersion water.

Insulation resistance
Resistance between electrical circuit and the body, expressed in ohms at a voltage rating.

Internal voltage drop
Caused by the resistance of an electrical part in an electronic circuit. Example is a 2-wire pneumatic pressure switch.

__L__

LED
Electronic Display Technology

Load current
Amount of current flowing through the sensor once the output is activated.

Lock-out mode
Prevents accidental changes to the sensor settings.

__M__

Maximum operating pressure
Maximum operating pressure the sensor is rated for. Exceeding this pressure could damage the unit and will display FFF.

__N__

Noise resistance
Amount of electrical noise in the surrounding environment that could affect the sensor performance.

NPN pressure sensor output
NPN type open collector transistor outputs are solid state circuits that provide sinking output capabilities. When the transistor is on, the current for the load flows into the transistor. This output "sinks" toward 0VDC, 0mA.

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__O__

ON / OFF output
The electrical state of the output signal.

Open collector transistor
Output circuit that sinks (NPN) or sources (PNP) at the pressure switch-point setting.

Operating humidity range
Humidity range for proper operation of equipment.

Operating indicator light
LED indicator is on when ON-OFF output is ON.

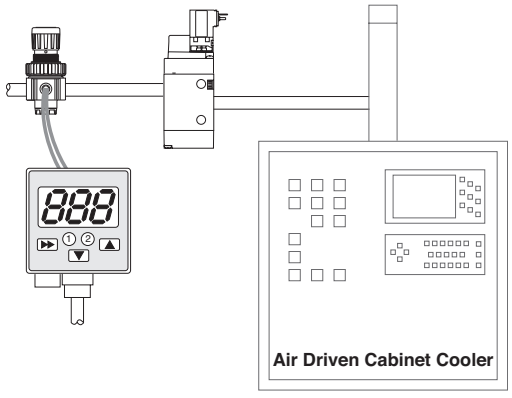
Operating pressure range
The pressure range the unit was designed to operate in.

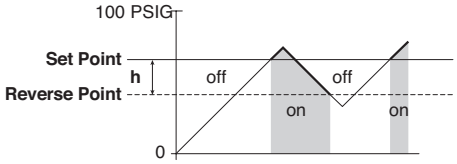
Operating temperature range
Acceptable temperature range for the specifications listed in the catalog.

Operating voltage
Voltage range for normal operation.

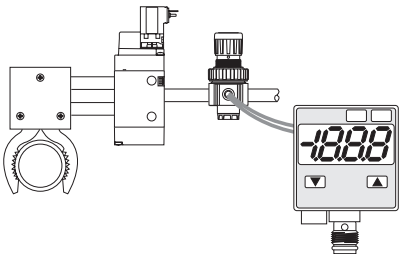
Output modes

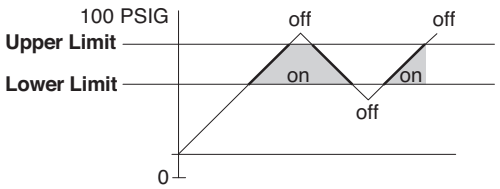
Switch point with hysteresis settings
This output mode provides one switch set point and a reversing point. The difference of these points is the hysteresis range **(h)**. When the switch point pressure is achieved, the output (NPN / PNP) is activated if normally open or deactivated if normally closed. Typically, this mode is used for pressure confirmation. For positive pressure applications, this operating mode does not provide any output or alarms beyond the switch point in the case of excessive pressures.
In the Air Driven Cabinet Cooler application below, H=10 PSIG, h=2 PSIG The unit will function properly above 10 PSIG and given some pressure variations, the sensor output will remain "on" until 8 PSIG. Below 8 PSIG the output will change to "off", which will be an indication that the cabinet is not being cooled efficiently or not at all.





Window comparator setting
This output mode provides two switch points (A) and (b) that control the output signals (NPN / PNP) between the two pressures. This creates a "window" of operation and is sometimes referred to as "high / low" setting. The Window Comparator Mode provides an output or alarm when pressures exceed the upper or lower limit.
The sensor in the below application monitors the pressure to the valve controlling a pneumatic gripper. If the pressure is below (A), the gripper may not have enough holding capacity for the application and the part could drop. If the pressure is above b, the gripper may excerpt too much force on the part and damage the part. If the pressure is in the window of operation, in-between (A) and (b), the application is within design specification.





Output response time
Response time of the output signal after the pressure switch point is achieved. Measured in milliseconds.

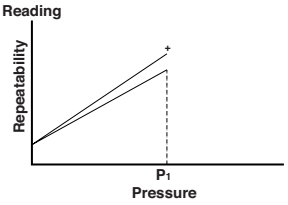
__P__

Panel mounting brackets
Brackets used to panel mount the sensor.

PNP pressure sensor output
PNP type open collector transistor outputs are solid state circuits that provide sourcing output capabilities. When the transistor is on, the current for the load flows out of the transistor. This output "sources" toward 24VDC, 125mA.

__R__

Repeatability
The repeatability refers to the sensor's ability to provide the same output with consecutive applications of the same pressure input.



Repeatability is represented as a percentage of the full scale value of the sensor. All Parker sensors are rated ± 0.2% F.S. P1 would be represented as 145 PSI x 0.002 = ±0.29 PSI.

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Glossary

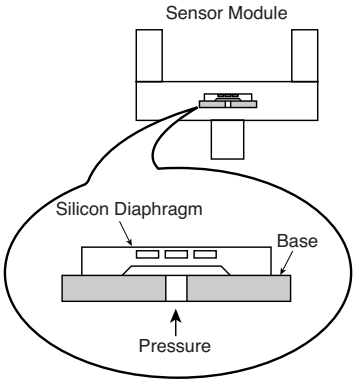
Reverse voltage protection
Diode circuitry to prevent "cross-wire" damage during installation of the sensor.

__S__

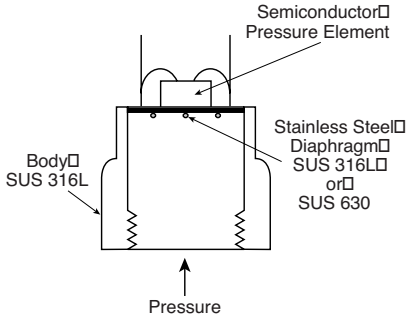
Setpoints
The number of the ON-OFF output signals in one product. Product with 2 setting points means 2 output type.

Shock resistance
The amount of vibration the sensor can withstand without affecting performance.

Silicon diaphragm
This type of sensor is used for air and non-corrosive gas applications.



Stainless steel diaphragm
This type of sensor is used for liquids, non-corrosive to 316L or 630 stainless steel.



Switch output
This is a reference to a digital or NPN / PNP open collector transistor output from the sensor. The technology is binary logic.

__T__

Thermal error
Temperature characteristics vary with applications. The performance of the sensor can be affected by changes in ambient temperatures. The sensor rating is represented by a percentage of the F.S.

__W__

Wetted parts
Sensor body parts that are in contact with process-type fluids are refered to as wetted parts.

__Z__

Zero reset
The sensor technology is PSIA. Periodically, the sensor's atmospheric reference may need to be adjusted manually or automatically as a result of small changes in the atmospheric reference point.

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