

# proSense® Digital Pressure Switch / Transmitter

## Overview



- Precision digital pressure switch/transmitter with 2 meter cable
- Two digital outputs (NPN or PNP) which may be set individually and a 4-20 mA analog output
- Two vacuum to pressure ranges (-14.5 to 14.5 and -14.5 psig to 145 psig)
- Air, non-corrosive/non-flammable gases only
- Three operation modes: Easy, Window and Hysteresis
- 3-color digital LCD display
- 6 pressure unit conversions
- Lockable keypad
- Unit parameters are easily copied to other units
- Selectable response times to eliminate output chattering
- Fast zero reset
- Optional panel mount and bracket kits
- 2-year warranty

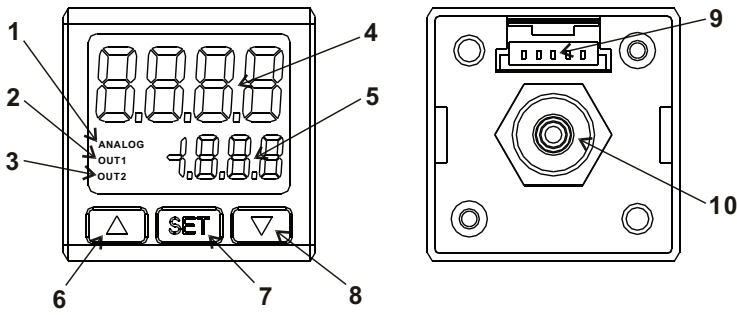


E157382

ProSense QPS Digital Pressure Switch / Transmitter				
Part Number	Description	Pcs/Pkg	Wt (lb)	Price
QPSL-AP-42	Digital pressure switch/transmitter -14.5 to 14.5 psig, 2 PNP out, 4-20 mA out, cable included	1	0.24	\$69.00
QPSL-AN-42	Digital pressure switch/transmitter -14.5 to 14.5 psig, 2 NPN out, 4-20 mA out, cable included	1	0.24	\$69.00
QPSH-AP-42	Digital pressure switch/transmitter -14.5 to 145 psig, 2 PNP out, 4-20 mA out, cable included	1	0.24	\$69.00
QPSH-AN-42	Digital pressure switch/transmitter -14.5 to 145 psig, 2 NPN out, 4-20 mA out, cable included	1	0.24	\$69.00

ProSense QPS Digital Pressure Switch / Transmitter Specifications				
Model	QPSL-AP-42	QPSL-AN-42	QPSH-AP-42	QPSH-AN-42
Pressure Range	-14.5 to +14.5 psig		-14.5 to +145 psig	
Maximum Pressure (Proof)	29 psig		217 psig	
Maximum Vacuum	-14.5 psig			
Pressure Accuracy	± 3% of full scale			
Temperature Influence @ 25°C	± 2% of full scale			
Fluid Measured	Air, Non-corrosive gas, Non-flammable gas			
Input Power	10.8 to 26.4 VDC			
Power Consumption	260mA maximum			
Digital Outputs	Output Type	2-PNP	2-NPN	2-PNP
	Maximum Current	100mA		
	Response Time	2ms, 4ms, 10ms, 30ms, 50ms, 100ms, 250ms, 500ms, 1,000ms, 5,000ms selectable		
	Residual Voltage	1.5 VDC		
Analog Outputs	Output Type	4-20 mA		
	Maximum Output Load Resistance	400Ω		
	Linear Accuracy	< ± 2% of full scale		
Process Connection	1/8" NPT outer / M5 inner bore (Nickel Plated Brass)			
Cable	Included with each unit, 2 meter (6.6 feet), 5 conductor, 26AWG, PVC jacket, and 50mm pigtail leads Replacement cable : QPS-CBL			
IP Rating	IP 40			
Case Materials	Case = ABS Plastic, Lens = Polycarbonate			
Shock Immunity	10 ~ 500 Hz, 10mm 3 axes for 2 hours			
Vibration Immunity	Max. 100m / s <sup>2</sup> 3 axes 6 directions, 3 times each			
Operating Temperature	0°C to +50°C (32°F to 122°F)			
Storage Temperature	-20°C to +65°C (-4°F to 149°F)			
Altitude	< 2,000m			
Ambient Humidity	35% to 80% (non-condensing)			
Approvals	cULus (E157382), CE, RoHS			

# proense® Digital Pressure Switch / Transmitter

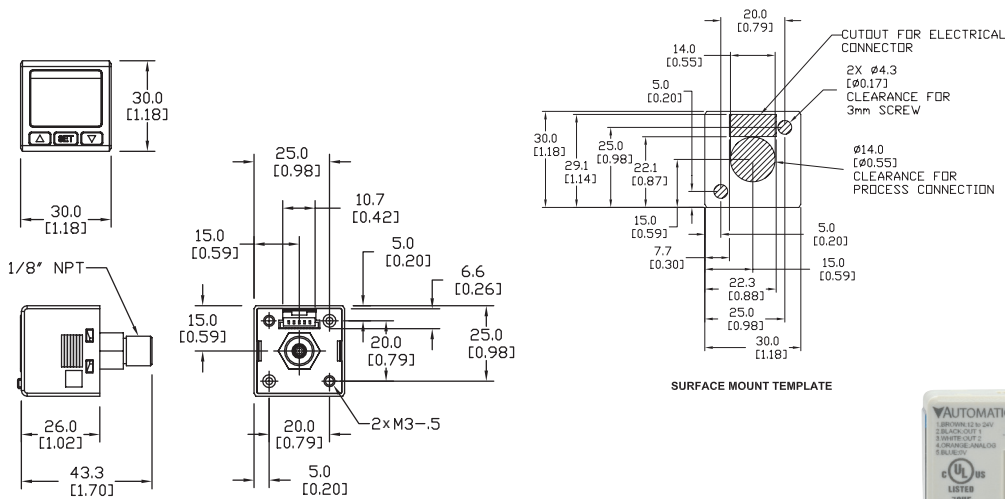


## Display, KeYPad, Connections

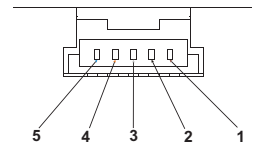
- 1 - Analog output indicator
- 2 - Digital output 1 indicator
- 3 - Digital output 2 indicator
- 4 - Pressure Value (PV)/parameter display (8 mm digits)
- 5 - Setpoint Value (SV)/setup item display (4 mm digits)
- 6 - Increment UP button
- 7 - SET or Enter button
- 8 - Decrement DOWN button
- 9 - Cable connection
- 10 - Pressure connection

## Dimensions

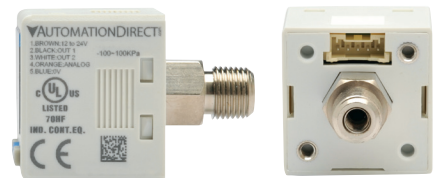
mm [inches]



## Cable Connection Terminals



- 1 - Positive power supply input (brown)
- 2 - Digital output 1 signal (black)
- 3 - Digital output 2 signal (white)
- 4 - Analog output signal (orange)
- 5 - Negative power supply input (blue)

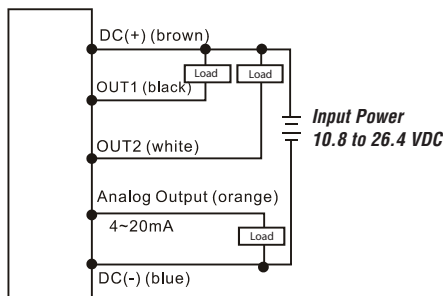


See our website [www.AutomationDirect.com](http://www.AutomationDirect.com) for complete Engineering drawings.

## Wiring

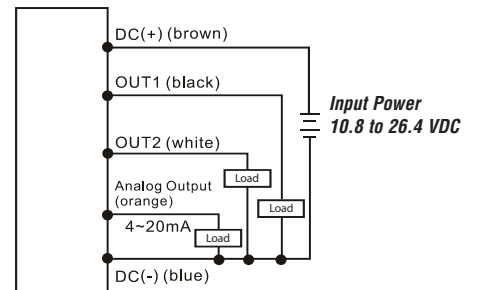
**QPSL-AN-42**  
**QPSH-AN-42**

Outputs:  
NPN discrete  
4-20mA analog



**QPSL-AP-42**  
**QPSH-AP-42**

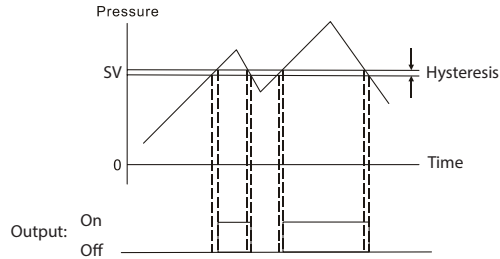
Outputs:  
PNP discrete  
4-20mA analog



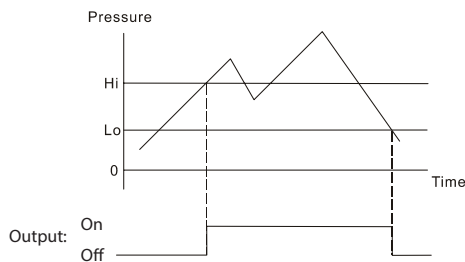
# pro<sup>ense</sup>® Digital Pressure Switch / Transmitter

## Operating Modes:

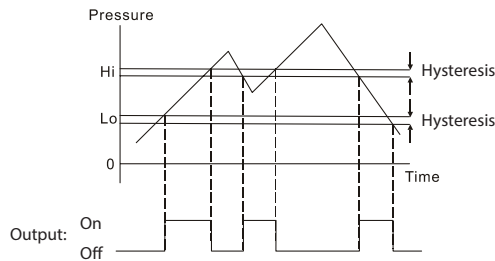
**Easy Mode:** When the measured pressure is greater than pressure setpoint plus the hysteresis setting ( $SV + \text{hysteresis}$ ), the output will change state. When the measured pressure is less than the pressure setpoint ( $<SV$ ), the output will change state. Each digital output can be individually set.



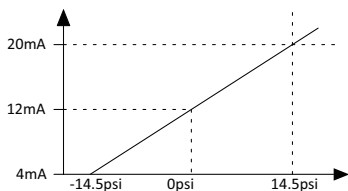
**Hysteresis Mode:** When the measured pressure is greater than the Hi setpoint, the output will change state. When the measured pressure is less than the Lo setpoint, the output will change state. Each digital output can be individually set.



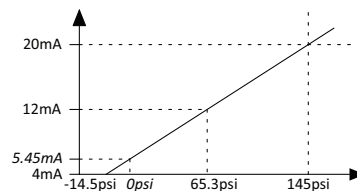
**Window Mode:** The output will change state when the measured pressure increases to the Lo setpoint plus the hysteresis setting ( $Lo + \text{hysteresis}$ ) and will change state again when the pressure increases to the Hi setpoint plus the hysteresis setting ( $Hi + \text{hysteresis}$ ). When the pressure decreases to the Hi setpoint the output will change state and will change state again when the pressure decreases to the Lo setpoint.



**Analog Output (4-20mA):** The analog output is directly proportional to the process pressure over the full range of the device. For example if the process pressure is 0 psig the 4-20 mA output of a QPSL will be approximately 12 mA or for the QPSH the pressure at 12 mA would be 65.3 psig and for 0 psig the output would be 5.45mA. The analog output is enabled as the factory default. It can be disabled with the "Analog Output Enable" parameter in Pro Setup Mode.



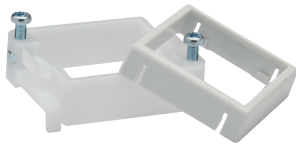
QPSL-xx-42



QPSH-xx-42

# pro<sup>ense</sup> Digital Pressure Switch / Transmitter Accessories

ProSense QPS Digital Pressure Switch / Transmitter Accessories				
Part Number	Description	Pcs/Pkg	Wt (lb)	Price
<b>QPS-PMK</b>	Panel mount kit for QPS series	1	0.1	\$1.50
<b>QPS-FMK</b>	Bracket mount kit for QPS series	1	0.1	\$1.00
<b>QPS-CBL</b>	Replacement cable for QPS series digital pressure switch and transmitter, 2 meters (6.6 feet)	1	0.1	\$20.00



QPS-PMK



QPS-FMK

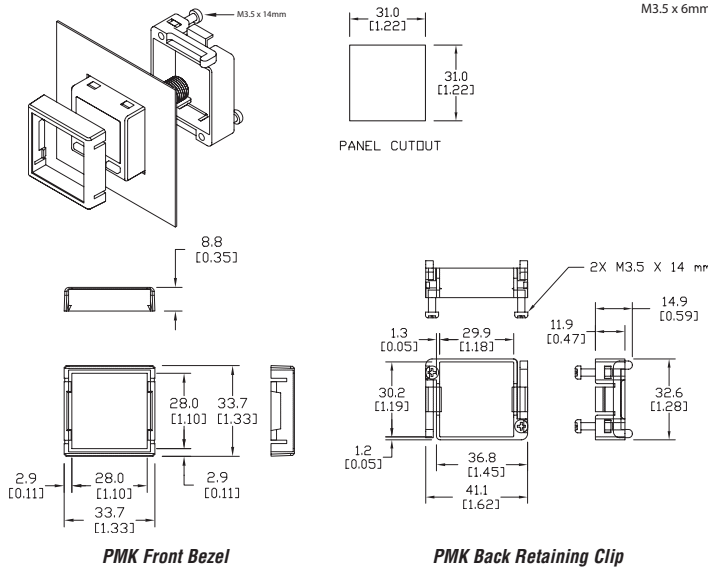


QPS-CBL

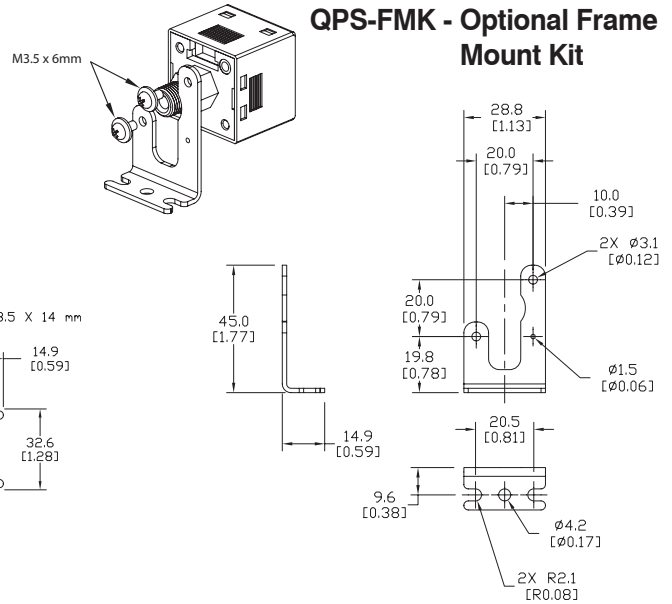
## Dimensions

mm [inches]

### QPS-PMK - Optional Panel Mount Kit

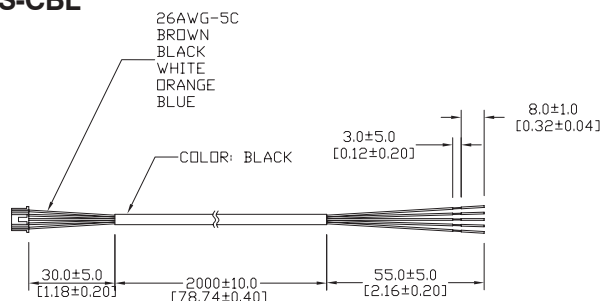


### QPS-FMK - Optional Frame Mount Kit



**Note: See the NITRA Pneumatics section for Push-to-Connect fittings and tubing**

### QPS-CBL



**Note: Cable included with each QPS series switch/transmitter**

# ProSense® Pressure Gauges



## Bourdon Tube Pressure Gauges

ProSense mechanical dial pressure gauges are available in a variety of configurations for use in most pneumatic, hydraulic, HVAC, plumbing, industrial and commercial applications. These high quality gauges use Bourdon tube sensing elements and do not require any external power sources to operate other than the media being sensed. Cases are available in durable steel or stainless steel and in either dry or liquid filled to dampen vibration and pulsations. Brass wetted parts are suitable for air, oil, or water applications while stainless steel wetted parts are available for corrosive applications. Dual marked dial faces (psig/kPa or inHg/kPa) are available in pressure ranges from vacuum up to 6000 psig.

The Bourdon tube pressure gauge applies the principle that a flattened tube will change to a more circular cross-section when pressurized. These tubes are then bent into a C-shape with one end crimped close and the other connected to the process. When the pressure inside the tube becomes greater than the ambient pressure the tube tries to straighten; this elongation is converted to a rotational motion with the use of a pinion gear attached to the pointer.



The bourdon tubes are calibrated at the factory for a specific range known as gauge pressure\*. This pressure is relative to ambient atmospheric pressure.

## Pressure Gauge Terms:

- **Atmospheric Pressure:** The weight of a column of air measuring one square inch from sea level to the top of the atmosphere. Sea level pressure = 29.92 inHg / 101.325 kPa / 14.696 psig / 1.0132 bar
- **Absolute Pressure:** Zero (0) in reference to a perfect vacuum  
“Absolute Pressure” = gauge pressure (+) atmospheric pressure.
- **\*Gauge Pressure:** Zero (0) in reference to “Atmospheric Pressure”.  
“Gauge Pressure” = absolute pressure (-) atmospheric pressure.
- **Differential Pressure:** Is the difference in pressure between two measuring points.

## Gauge Accuracy and Grade

Gauge accuracy and grade categorized by ASME (ANSI) Standard B40.1	
Gauge Accuracy	ANSI Grade
±5% Full Scale	D
±3% lower ¼ Scale; ±2% middle ½ scale; ±3% upper ¼ scale	B
±2% lower ¼ Scale; ±1% middle ½ scale; ±2% upper ¼ scale	A
±1% Full Scale	1A
±0.5% Full Scale	2A
±0.25% Full Scale	3A

## Gauge Selection Considerations

### Environment and Application

As the Bourdon tube is in direct contact with the medium being measured, the characteristics of the medium must be considered. If the medium is corrosive, stainless steel internals and casing should be chosen over brass. Brass is more suitable for general applications. The effects of moisture and weather conditions may also be harmful to the gauge and should be considered when selecting a gauge. Liquid filled gauges help prevent moisture build-up. Medium that will leave a deposit, clog or solidify in the Bourdon tube should be avoided.

For applications that produce harmful pulsation, vibration or pressure spikes, a liquid filled gauge will minimize the effects of vibration and provide a more accurate pressure reading.

### Gauge Size

ProSense gauges are available with dial sizes of 1.5, 2 or 2.5 inches.

### Connection

ProSense gauges offer lower and center back connections. The standard threads are 1/8" and 1/4" NPT.

### Accuracy

The degree of accuracy required should be determined to ensure that the proper gauge is used. ProSense gauges offer accuracies of +/- 1.5% or +/- 3-2-3% (ANSI/ASME Grade B). Generally, the more critical the application, the higher the accuracy required.

### Gauge Mounting

ProSense pressure gauges can be mounted in a variety of ways. For direct stem mount, we offer lower and center back connections. Bear in mind that if a piece of equipment produces heavy vibration making pressure reading difficult due to needle fluctuations, consider a liquid-filled gauge or remote mounting.

### Pressure Range

It is important to select a pressure range that is approximately twice the normal operating pressure of the media. The maximum operating pressure should not exceed 75% of the full scale range. If a gauge is not selected considering these criteria, it may result in fatigue of the Bourdon tube.

### Temperature Range

The normal temperature ranges for dry gauges are between -40°C to 65°C (-40°F to 150°F). The normal temperature ranges for glycerin-filled gauges are -20°C to 65°C (-4°F to 150°F). It is important to know the normal operating temperature of the environment for proper gauge use.