

# PXMS and PXDGS Series Installation Instructions

PXM-94091N  
Revised 01-01  
Section 05  
(00-02-0163)



Please read the following information before installing.

A visual inspection of this product for damage during shipping is recommended before mounting.

WARNING

This Murphy instrument is susceptible to damage when exposed to static electrical charges. To avoid damage, observe the following:

- ✓ Ground transmitter body before making electrical connections.
- ✓ When disconnecting, remove ground connection last.
- ✓ Disconnect all electrical power to the machine.
- ✓ Make sure the machine cannot operate during installation.
- ✓ Follow all safety warnings of the machine manufacturer.
- ✓ Read and follow all installation instructions.

## Description

The PXMS Series pressure transmitter and the PXDGS Series pressure transducer are state-of-the-art instruments providing 4 to 20 mA (PXMS) or 1-5 VDC (PXDGS) outputs. They feature a precision micro-machined silicon diaphragm with fully welded stainless steel pressure port for greater accuracy, stability and a wide range of compatibility. All wetted parts are 316L stainless steel.

## Specifications

**Accuracy (Full Scale, Best Straight Line):** ±0.25% including non-linearity, hysteresis and repeatability. Long term stability better than 0.25% FS over twelve (12) months.

**Overpressure/Proof Pressure:** 400% for up to 500 psi (3.45 MPa) [34 Bar]. 200% for higher ranges.

### Burst Pressure:

Ranges 0 to 600 psi (4.1 MPa) [40 Bar] = 600% of full scale  
 Ranges 1000 & 2000 psi (6.89 & 13.79 MPa) [68 & 137 Bar] = 4000 psi (27.5 MPa) [275 Bar].  
 Ranges 3000 to 10,000 psi (20 to 68.9 MPa) [200 to 689 Bar] = 20,000 psi (137.8 MPa) [1378 Bar].

**Response Time:** Frequency response better than 2 kHz.

### Temperature

Storage: -65 to 200°F (-54 to 93°C).  
 Operating: -40 to 180°F (-40 to 82°C).  
 Compensated: -20 to 160°F (-29 to 71°C).

### Total Thermal Effects Over Compensated Range:

±2% FS TEB except ±4% FS TEB for ±30 in. H<sub>2</sub>O range.

### Physical:

Enclosure: *Weather Resistant.*  
 Body: *316 stainless steel. Meets NACE MR01-75.*  
 Wetted Parts: *316L stainless steel.*  
 Process Connection: *1/4 NPT female.*  
 Electrical Cable: *Integral; 36 in. (914 mm); vented.*

### Environmental Effect:

Humidity: *No effect.*  
 Mounting: *Position/orientation has negligible effect.*  
 Shock/Vibration: *Negligible effect unless severe.*

**PXMS Power Requirements:** Typically 24 VDC is required, using the Loop Resistance Graph, 9-30 VDC.

**PXDGS Power Requirements:** 5-30 VDC, 2 mA typical.

**PXMS Series Transmitter Output:** 4-20 mA, 2-wire.

**PXDGS Series Transducer Output:** 1-5 VDC, 3-wire.

**Insulation:** Greater than 10 Mohms @ 500 VDC.

**RFI Protection:** Included.

**Voltage Surge/Spike:** Protected against a 600 V spike to IEC 60-2. Reverse polarity protected.

**Zero Offset and Span Setting:** ±0.5% FS. Field adjustable ±5.0% FS via potentiometer.

### Sealed or Vented:

Vented for ranges <= 1000 psi (6.89 MPa) [68 Bar].  
 Sealed (at one atmosphere at sea level) for ranges > 1000 psi (6.89 MPa) [68 Bar].

### Laboratory Approvals:

UL/CUL Class I, Div. 1, Groups A, B, C, D.  
 Class II, Division 1, Groups E, F, G; when installed with approved barrier per drawings 05-08-0006 for PXMS models or 05-08-0747 for PXDGS models (units through 6000 psi [34.48 MPa] [344 bar] only).

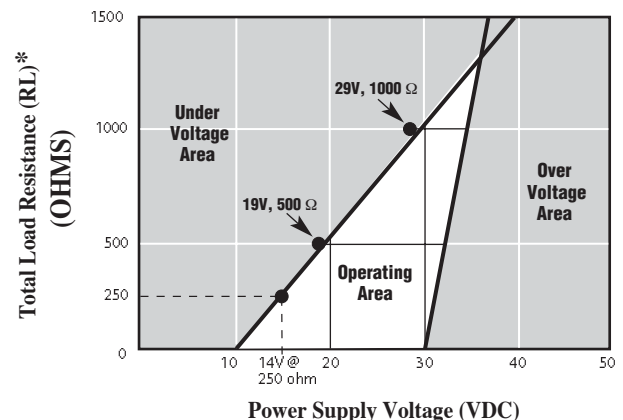
## Ranges Available<sup>†</sup>

-30" to +30" H <sub>2</sub> O (-76 to +76 cm H <sub>2</sub> O)	0-300 psi (2.07 MPa) [20.70 Bar]
-30" Hg to +30 psig (-76 cm Hg to 207 kPa) [2.07 Bar]	0-400 psi (2.75 MPa) [27.50 Bar]
-30" Hg to +100 psig (-76 cm Hg to 689 kPa) [6.89 Bar]	0-600 psi (4.14 MPa) [41 Bar]
0-5 psi (34 kPa) [0.34 Bar]	0-1,000 psi (6.89 MPa) [68 Bar]
0-15 psi (103 kPa) [1.03 Bar]	0-2,000 psi (13.79 MPa) [137 Bar]
0-30 psi (207 kPa) [2.07 Bar]	0-3,000 psi (20.69 MPa) [206 Bar]
0-60 psi (414 kPa) [4.14 Bar]	0-5,000 psi (34.48 MPa) [344 Bar]
0-100 psi (689 kPa) [6.89 Bar]	0-6,000 psi (41.37 MPa) [413 Bar]
0-200 psi (1.38 MPa) [13.80 Bar]	0-7,500 psi (51.71 MPa) [517 Bar]
	0-10,000 psi (68.95 MPa) [689 Bar]

<sup>†</sup>Conversions are approximate.

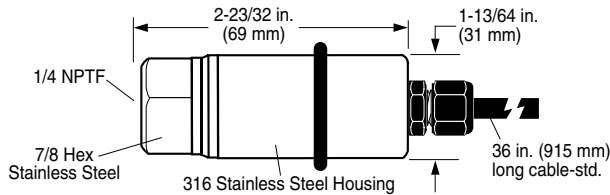
## Loop Resistance Graph

Supply voltage for the PXMS must be within range of 9-30 VDC. The Graph below shows the minimum supply voltage (VDC) required for a given load resistance (RL).

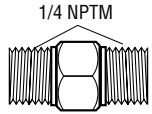


\*NOTE: Cable resistance effect included in RL.

## PXMS and PXDG Dimensions

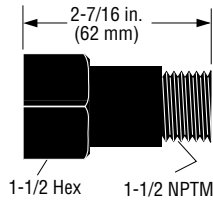


**SSA-XM Stainless Steel Pressure Adapter (86031205)**



**NOTE:** Maximum working pressure: 5,000 psi (34.48 MPa) [344 Bar].

**1/2 NPT Conduit Connector (05004538)**



## Electrical Connections



**CAUTION: HOOKUP CABLE IS NON-SERVICEABLE. DO NOT UNSCREW CAP NUT.**

### PXMS (standard model)

Red = + Power  
Blue = - Power  
Orange; Yellow; White; Shield = Not connected

### PXDG

Red = + Power  
Blue = - Power  
Yellow = Signal Output (1-5 VDC)  
Shield = Not connected

### PXMSA DIN connection

Pin 1 = + Power  
Pin 2 = - Power  
Pin 3 = Not connected  
Pin 4 = Ground

## Adjustment Potentiometers

Zero and Span adjustment is accomplished using the trim pots. Access the trim pots as follows:



**CAUTION: DO NOT ADJUST POTENTIOMETERS WITHOUT PROPER CALIBRATION EQUIPMENT. NEVER TURN THE POTENTIOMETERS MORE THAN 3/4 OF A TURN.**

1. Gently remove/roll the trimpot access O-ring out of the way. **DO NOT** use a screwdriver to remove the O-ring, this will damage its sealing capabilities.

2. Insert the trimpot tool in the trimpot holes (use only the tool supplied for adjustment).

**NOTE:** A thin layer of gel may cover the trim pots, but should not interfere with the adjustment. **DO NOT** remove the gel, the tool provided will penetrate it. Damaged trim pots will void the warranty.

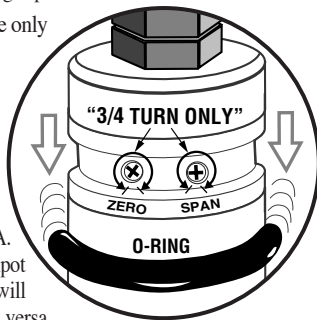
3. **Transmitter:** With zero pressure applied, adjust the Zero trimpot until output reads 4 mA.

4. Apply full range pressure, adjust the Span trimpot until output reads 20 mA. Adjusting the Span will cause the Zero output to shift slightly, and visa versa.

Therefore, adjusting Zero and Span trim pots repeatedly will assure the best accuracy.

5. **Transducer:** The 1 to 5 volt output is calibrated in the same manner as above, except 4 mA will be 1 volt, and 20 mA will be 5 volt.

6. Replace the access O-ring making sure it seals all around the housing.



## WARNING: READ BEFORE INSTALLATION

Fluid hammer and surges can destroy any pressure transmitter/transducer and must always be avoided. A pressure snubber should be installed to eliminate the damaging hammer effects.

Fluid hammer occurs when a liquid flow is suddenly stopped, as with quick closing solenoid valves. Surges occur when flow is suddenly begun, as when a pump is turned on at full power or a valve is quickly opened.

Liquid surges are particularly damaging to pressure transmitter/transducer if the pipe is originally empty. To avoid damaging surges, fluid line should remain full (if possible), pumps should be brought up to power slowly and valves operated slowly. To avoid damage from both fluid hammer and surges, a surge chamber should be installed, and a pressure snubber, such as Murphy PD-8100 Series (adjustable) or PM6203 Series (fixed) call Murphy for details, should be installed on every transmitter/transducer.

### Symptoms of fluid hammer and surges damaging effects:

- Pressure transmitter/transducer exhibits an output at zero pressure (large zero offset). If zero offset is less than 10% FS, user can usually re-zero transmitter, install proper snubber and continue monitoring pressures.
- Pressure transmitter/transducer output remains constant regardless of pressure.
- In severe cases, there will be no output.

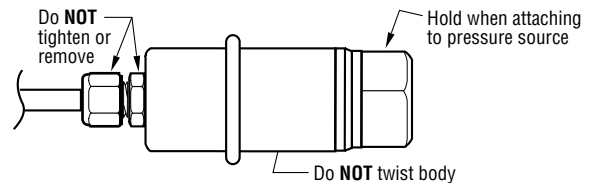
## Noise

For minimum noise susceptibility avoid running the transmitter's/transducer's cable in a conduit that contains high current AC power cables or ignition loom on engine. Where possible avoid running the cable near inductive equipment.

## Mounting



**CAUTION: THESE ARE DELICATE INSTRUMENTS. DO NOT INSTALL IN ANY MANNER THAT CAN CAUSE SIDE STRESS OR IS SUBJECT TO EXCESSIVE VIBRATION.**



The transmitter/transducer requires no special mounting hardware and can be mounted in any plane with negligible position error.

Although the unit can withstand substantial vibration without damage or significant output effects, it is always good practice to mount the transmitter/transducer where there is minimum vibration.

Apply Teflon tape/sealant to the pressure fittings threads before installing.

When tightening, apply a wrench to the hex wrench flats located just above the pressure fitting. **DO NOT** tighten by using a pipe wrench on the housing.

## Warranty

A limited warranty on materials and workmanship is given with this FW Murphy product. A copy of the warranty may be viewed or printed by going to [www.fwmurphy.com/support/warranty.htm](http://www.fwmurphy.com/support/warranty.htm)

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