PS-2301 Series

Liquid Differential Pressure Sensors with Valve Manifold

Overview

The PS-2301 Series liquid differential pressure sensors with valve manifold is a high accuracy solution for monitoring differential pressure in wet-to-wet applications. Its single diaphragm design enables a true wet-to-wet differential pressure measurement with superior ±0.25% FS accuracy compared to competitive units which calculate differential pressure using two single point pressure sensors. The stainless steel capacitive sensor provides a highly accurate, linear analog output proportional to the pressure over a wide temperature range. The PS-2301 Series is offered with an optional 3 or 5 valve machined brass manifold for ease of installation and maintenance.

Applications

- Energy Management Systems
- Process Control Systems
- Flow Measurement of Various Gases or Liquids
- Liquid Level Measurement or Pressurized Vessels
- Pressure Drop Across Filters

Features & Benefits

- ±0.25% FS Accuracy
- No Liquid Fill Diaphragm
- NEMA 4 Rated Housing
- Low Line Pressure Effect
- Fast Response Time
- Gas & Liquid Compatible
- Meets CE Conformance Standards

Model Selection

		PS-2301	001PD	3V	11	B
Pressure Range	001PD = 0 to 1 psid 002PD = 0 to 2 psid 005PD = 0 to 5 psid 010PD = 0 to 10 psid 025PD = 0 to 25 psid 030PD = 0 to 30 psid 050PD = 0 to 50 psid 0R5PB = ±0.5 psid 001PB = ±1 psid 2R5PB = ±2.5 psid 005PB = ±5 psid 010PB = ±10 psid 025PB = ±25 psid 050PB = ±50 psid					
Pressure Fitting	3V = 3-valve manifold 5V = 5-valve manifold					
Output	11 = 4-20mA					
Bleed Screw Seals	B = Viton					

Proof Pressure

Unidirectional		
Pressure Range PSID	Proof Pressure High Side PSI	Proof Pressure Low Side PSI
0 to 1.0	50	2.5
0 to 2.0	50	5
0 to 5.0	100	12.5
0 to 10.0	100	25
0 to 25.0	350	62.5
0 to 30.0	350	75
0 to 50.0	350	125
0 to 100.0	350	250

Bidirectional		
Pressure Range PSID	Proof Pressure High Side PSI	Proof Pressure Low Side PSI
0 to ±0.5	50	1.25
0 to ±1.0	50	2.5
0 to ±2.5	100	6.35
0 to ±5.0	100	12.5
0 to ±10.0	200	25
0 to ±25.0	350	62.5
0 to ±50.0	350	125

Product Specifications

Performance Data

Accuracy RSS1 (at constant temp)	±0.25% FS
Non-Linearity, BFSL	±0.20% FS
Hysteresis	0.10% FS
Non-Repeatability	0.05% FS

Thermal Effects[2]

Compensated Range °F(°C)	+30 to +150 (-1 to +65)
Zero Shift %FS/100°F(%FS/50°C)	2.0 (1.8)
Span Shift %FS/100°F(%FS/50°C)	2.0 (1.8)
Line Pressure Effect	Zero shift ±0.004% FS/PSIG line pressure
Resolution	Infinite, limited only by output noise level (0.02%FS)
Static Acceleration Effect	2%FS/g (most sensitive axis)
Natural Frequency	500 Hz (gaseous media)
Warm-up Shift	±0.1% FS total
Response Time	30 to 50 milliseconds
Long Term Stability	0.5%FS/1 YR
Maximum Line Pressure	350 PSIG

Environmental Data

Operating[3] Temperature °F (°C)	0 to +175 (-18 to +80)
Storage Temperature °F (°C)	-65 to +250 (-54 to +121)
Vibration	5 g from 5 Hz to 500 Hz
Acceleration	10g
Shock	50g

Physical Description

Case	Stainless Steel/Aluminum
Electrical Connection	Barrier strip terminal block with conduit enclosure & 0.875 DIA conduit opening.
Pressure Fittings	1/4”-18 NPT internal
Weight (approx.)	14.4 oz
Sensor Cavity Volume	0.27 in^3 Positive Port, 0.08 in^3 Negative Port

(With 1/4”NPT external fittings installed-does not include cavity volume of 1/4”NPT external fittings.)

Physical Description (3-Valve Manifold Assembly)[4]

Manifold Block	Brass
Valves (3)[5]	V1 for Connection to + port
	V2 for Connection to - port V3 for Equalizing Pressure
Valve Type	90° On/Off
Process Connections	1/4”-18 NPT Internal Thread
Dimensions	7.05”W x 6.25”H x 2.16’’D
Weight	<2.5 lbs.

Product Specifications (cont'd)

Physical Description (5-Valve Manifold Assembly)[6]

Manifold Block	Brass
Valve (5)[5]	V1 for Connection to ± Port
	V2 for Connection to – Port V3 for Equalizing Pressure
	V4 & V5 for Connection to External
	Gauge or Alternate Plumbing Configuration
Process Connection	1/4"-18 NPT Internal Thread
Dimensions	7.05"W x 6.25"H x 2.16''D
Weight	<3.8 lbs.

Electrical Data (Voltage)

Circuit	3-Wire (Exc, Out, Com)
Excitation	9 to 30 VDC for 0-5 VDC Output, 13 to 30 VDC for 0-10 VDC Output
Output[7]	0 to 5 VDC[8], 0 to 10 VDC[8]
Output Impedance	100 ohms

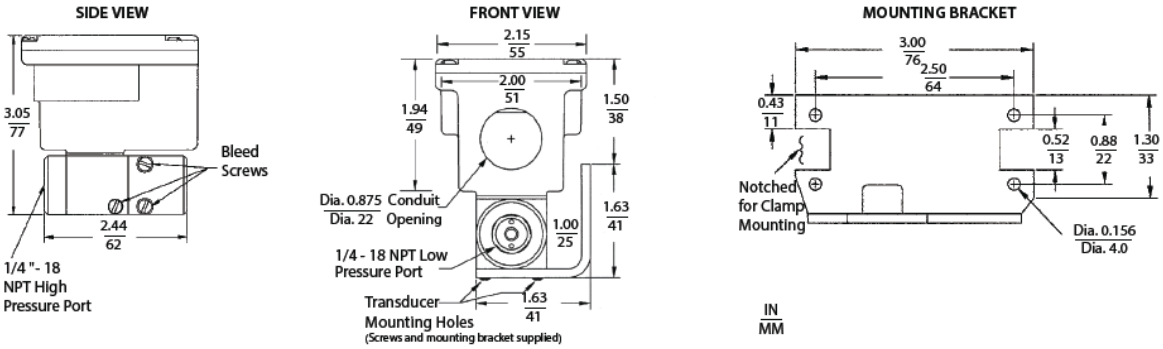
Electrical Data (Current)

Circuit	2-Wire
Output[9]	4 to 20mA[10]
External Load	0 to 1000 ohms
Minimum supply voltage (VDC)	9+ 0.02 x (Resistance of receiver plus line)
Maximum supply voltage (VDC)	30+ 0.004 x (Resistance of receiver plus line)

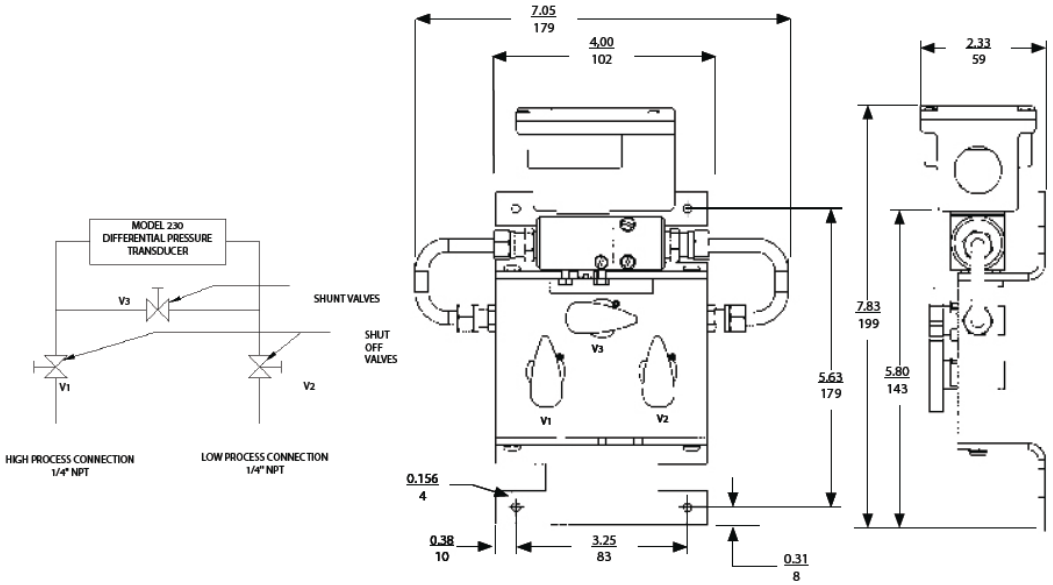
Notes:

1. RSS of Non-Linearity, Hysteresis, and Non-Repeatability.
2. Units calibrated at nominal 70˚F. Maximum thermal error computed from this datum
3. Operating temperature limits of the electronics only. Pressure media temperatures may be considerably higher.
4. Order assembled with the PS-2301 Series (Code 3V) or separately as Option 891.
5. Refer to dimensional drawings
6. Order assembled with the PS-2301 Series (Code 5V)
7. Calibrated into a 50K ohm load, operable into a 5000 ohm load or greater.
8. Zero output factory set to within ±25mV (for 5 VDC output) or ±50mV (for 10 VDC output). Span (Full Scale) output factory set to ±25 mV (for 5 VDC output) or ± 50 mV (for 10 VDC output
9. Calibrated at factory with a 24 VDC loop supply voltage and a 250 ohm load.
10. Zero output factory set to within ±0.16mA. Span factory set to within ±0.16 mA

Dimensions (PS-2301 Series)

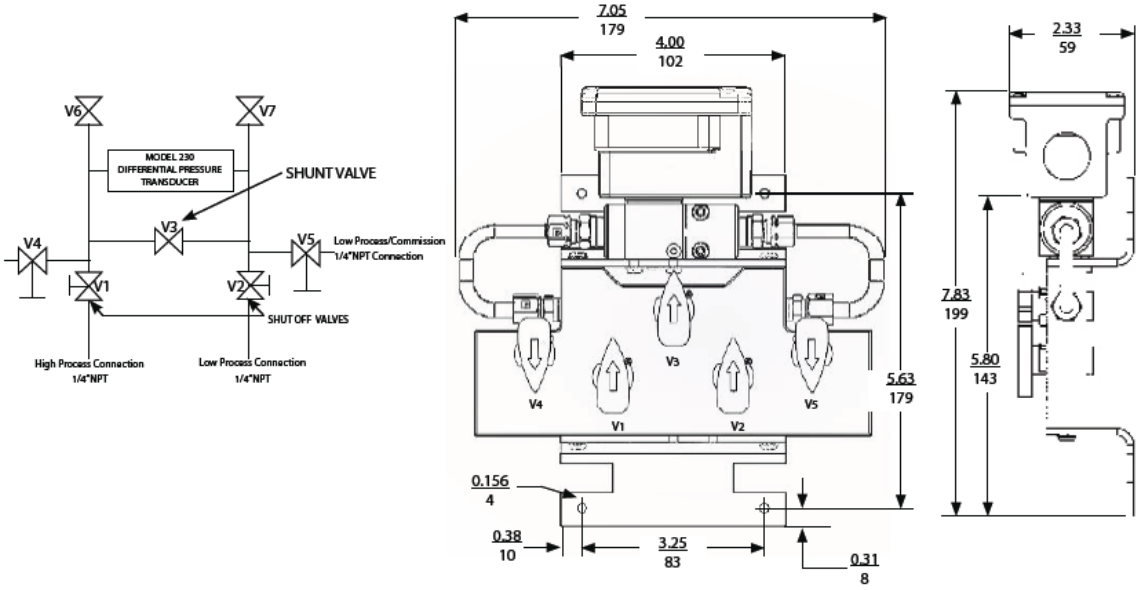


Dimensions (w/ 3-Valve Manifold Assembly)



For differential pressure measurements at high line pressure (350 PSIG max), it is recommended that the pressure sensor be installed with a valve in each line, plus a shunt valve across the high and low (reference) pressure ports as shown.

Dimensions (w/ 5-Valve Manifold Assembly)



For differential pressure measurements at high line pressure (350 PSIG max), it is recommended that the pressure sensor be installed with a valve in each line, plus a shunt valve across the high and low (reference) pressure ports as shown.
Note: V6 and V7 bleed valves are not required when used with a Setra Model 230. Use the bleed screws on Model 230 to bleed the lines of air.