

Model 230

True Wet-to-Wet Differential Pressure Transducer

The Model 230 is Setra's highest 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 $\pm 0.25\%$ 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 230 is offered with an optional 3 or 5 valve machined brass manifold for ease of installation and maintenance.

Avoid Line Pressure w/ Single Diaphragm Sensor

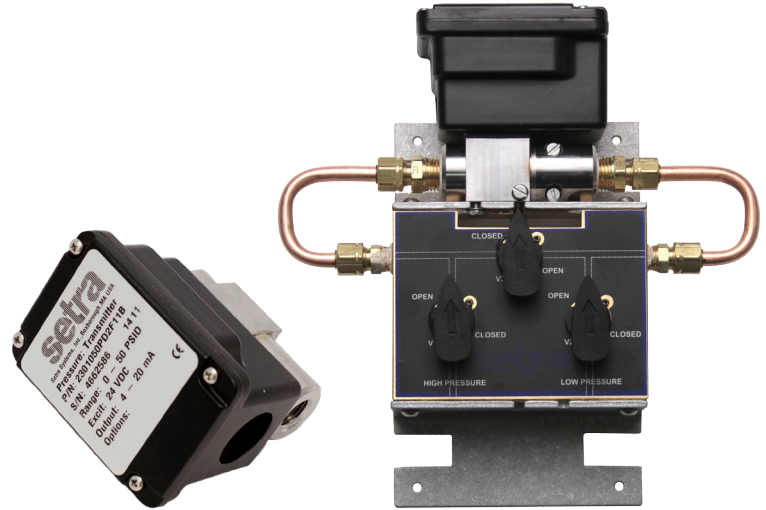
Unlike the competition, the 230 is a true wet-to-wet sensor with a single diaphragm construction. The differential pressure range of a single diaphragm is not impacted by line pressure whereas dual differential pressure sensors require the individual sensors to measure gauge pressure, comparing the outputs to determine the differential pressure.

Increase the Sensors Response Time

The 230 utilizes an all stainless steel capacitive sensor which responds 20x faster than oil filled sensors and provides conditioned electronic circuitry with a highly accurate, linear analog output proportional to the pressure over a wide temperature range.

Save Time on Money & Installation

When time and project costs are a priority, the 230 is offered with an optional 3 or 5 valve machined brass manifold for ease of installation and maintenance. The brass body has no internal process connections, therefore eliminating the risk of internal leaks.



- Single Diaphragm Design
- All Stainless Steel Capacitive Sensor
- 3 or 5 Valve Manifold Assembly Options

Model 230 Features:

- Only true wet-to-wet differential pressure transducer on the market
- $\pm 0.25\%$ FS Accuracy
- Available to 1 PSID with 350 PSI Line Pressure
- No Liquid Fill Diaphragm
- NEMA 4 Rated Housing
- Low Line Pressure Effect
- Fast Response Time
- Gas & Liquid Compatible
- CE & RoHS Compliant

Applications:

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

Model 230

True Wet-to-Wet Differential Pressure Transducer



PROOF PRESSURE

GENERAL SPECIFICATIONS

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

Performance Data		Physical Description (Model 230)	
Accuracy RSS ¹ (at constant temp)	±0.25% FS	Case	Stainless Steel/Aluminum
Non-Linearity, BFLS	±0.20% FS	Electrical Connection	Barrier strip terminal block with conduit enclosure & 0.875 DIA conduit opening.
Hysteresis	0.10% FS	Pressure Fittings	1/4"-18 NPT internal
Non-Repeatability	0.05% FS	Weight (approx.)	14.4 oz
Thermal Effects²		Sensor Cavity Volume	0.27 in ³ Positive Port, 0.08 in ³ Negative Port
Compensated Range °F(°C)	+30 to +150 (-1 to +65)	(With 1/4"NPT external fittings installed-does not include cavity volume of 1/4"NPT external fittings.)	
Zero Shift %FS/100°F(%FS/50°C)	2.0 (1.8)	Physical Description (3-Valve Manifold Assembly)⁴	
Span Shift %FS/100°F(%FS/50°C)	2.0 (1.8)	Manifold Block	Brass
Line Pressure Effect	Zero shift ±0.004% FS/PSIG line pressure	Valves (3) ⁵	V1 for Connection to + port V2 for Connection to - port V3 for Equalizing Pressure
Resolution	Infinite, limited only by output noise level (0.02%FS)	Valve Type	90° On/Off
Static Acceleration Effect	2%FS/g (most sensitive axis)	Process Connections	1/4"-18 NPT Internal Thread
Natural Frequency	500 Hz (gaseous media)	Dimensions	7.05"W x 6.25"H x 2.16"D
Warm-up Shift	±0.1% FS total	Weight	<2.5 lbs.
Response Time	30 to 50 milliseconds	Physical Description (5-Valve Manifold Assembly)⁶	
Long Term Stability	0.5%FS/1 YR	Manifold Block	Brass
Maximum Line Pressure	350 PSIG	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
Environmental Data		Process Connection	1/4"-18 NPT Internal Thread
Operating ³ Temperature °F (°C)	0 to +175 (-18 to +80)	Dimensions	7.05"W x 6.25"H x 2.16"D
Storage Temperature °F (°C)	-65 to +250 (-54 to +121)	Weight	<3.8 lbs.
Vibration	5 g from 5 Hz to 500 Hz	Electrical Data (Voltage)	
Acceleration	10g	Circuit	3-Wire (Exc, Out, Com)
Shock	50g	Excitation	9 to 30 VDC for 0-5 VDC Output, 13 to 30 VDC for 0-10 VDC Output
Pressure Media		Output ⁷	0 to 5 VDC ⁸ , 0 to 10 VDC ⁸
Model 230		Output Impedance	100 ohms
Gases or liquids compatible with 17-4 PH Stainless Steel, 300 Series Viton O-Rings. Note: Hydrogen not recommended for use with 17-4 PH stainless steel. Optional Buna-N O-rings are recommended for hydrocarbon applications.		Electrical Data (Current)	
3 & 5 Valve Manifold		Circuit	2-Wire
Gases or liquids compatible with 360 brass, Copper 122, Acetal plug valves and Nitrile O-rings.		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).

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 Model 230 (Code 3V) or separately as Option 891.

⁵ Refer to drawings

⁶ Order assembled with the Model 230 (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 24VDC 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

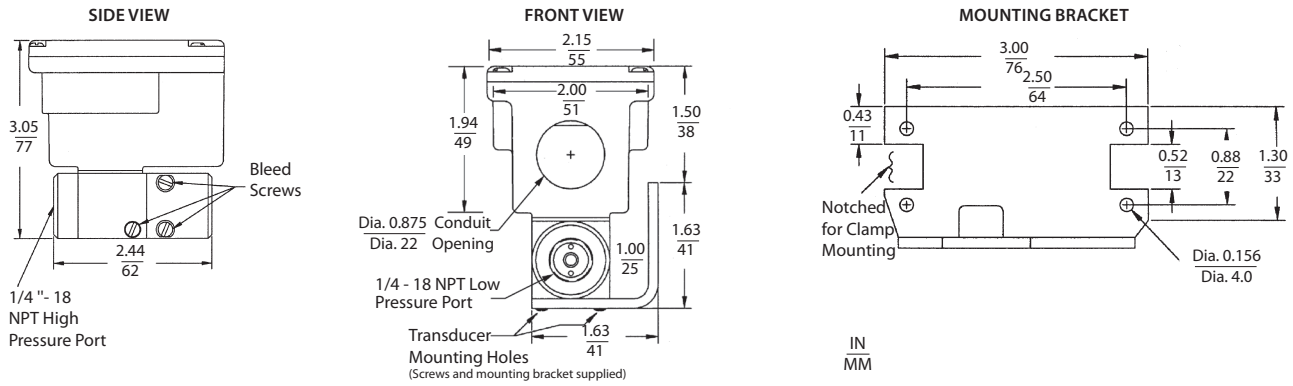
Specifications subject to change without notice.

Model 230

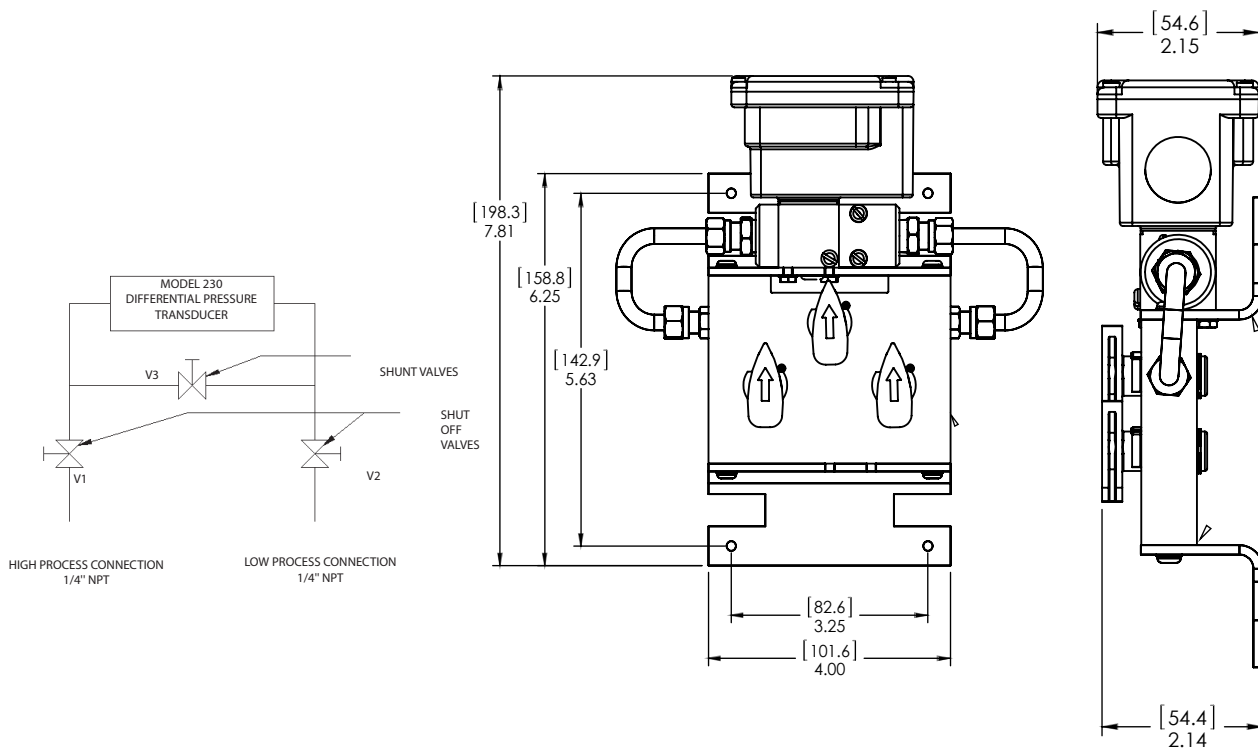
True Wet-to-Wet Differential Pressure Transducer



MODEL 230 DIMENSIONS



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.

Model 230

True Wet-to-Wet Differential Pressure Transducer



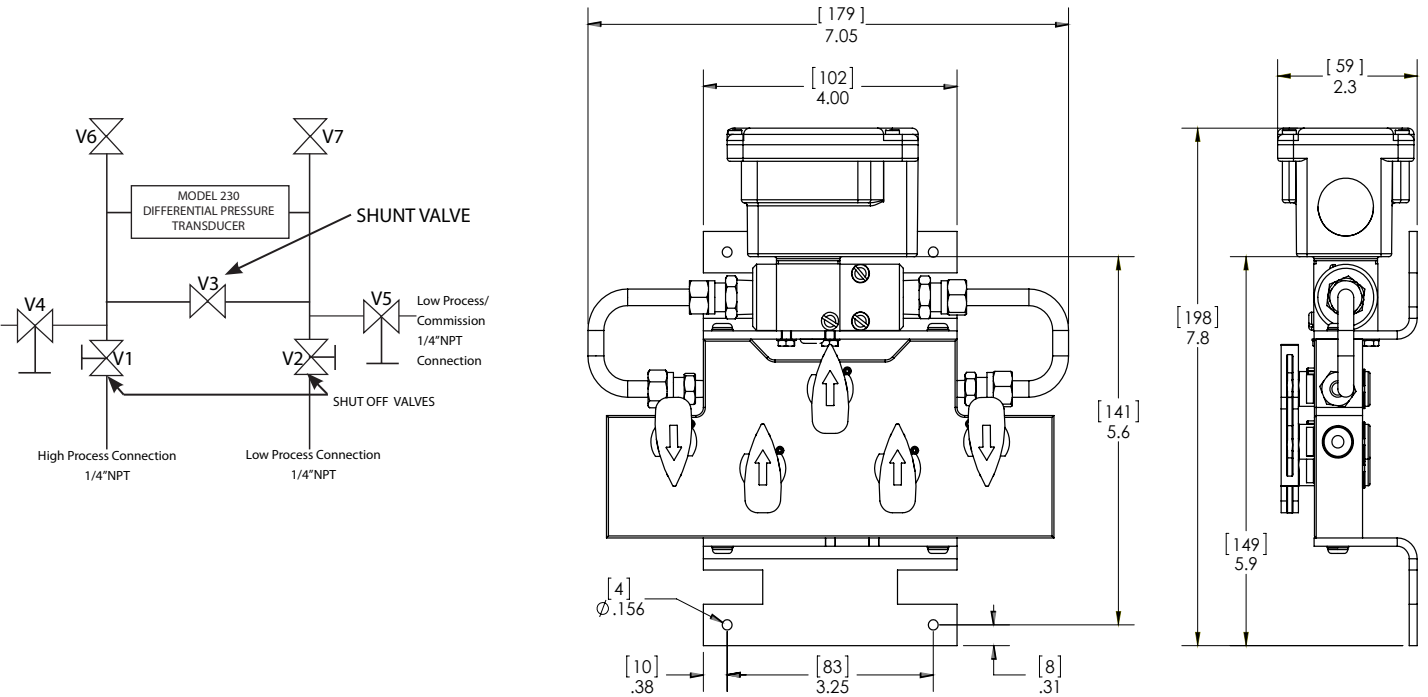
ORDERING INFORMATION

2	3	0	1	-					-			-			-		
Model	Range				Pressure Fitting		Output		Bleed Screw Seals			Optional					
2301 = 230	Unidirectional		Bidirectional		2F	1/4" NPT (F)	11	4-20 mA	Std.	B	Viton	C	Calibration Certificate				
001PD	0 to 1 PSID	0R5PB	±0.5 PSID	3V	3-Valve Manifold	2D	0.05-5.05 VDC	Opt.	A	Buna-N							
002PD	0 to 2 PSID	001PB	±1 PSID	5V	5-Valve Manifold	2E	0.05-10.05 VDC										
005PD	0 to 5 PSID	2R5PB	±2.5 PSID														
010PD	0 to 10 PSID	005PB	±5 PSID														
025PD	0 to 25 PSID	010PB	±10 PSID														
030PD	0 to 30 PSID	025PB	±25 PSID														
050PD	0 to 50 PSID	050PB	±50 PSID														
100PD	0 to 100 PSID																

Please contact factory for versions not shown.

Ordering Example: 2301005PD2F11B = Model 230 0 to 5 PSID unidirectional, 1/4-18 NPT Ext. fitting, 4 to 20 mA Output, and Viton/Silicone Seals.
 2301005PD3V11B = Model 230, 0 to 5 PSID unidirectional, 3-Valve Manifold, 4 to 20 mA, Output, and Viton/Silicone Seals (Assembled w/3- Valve Manifold).

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.