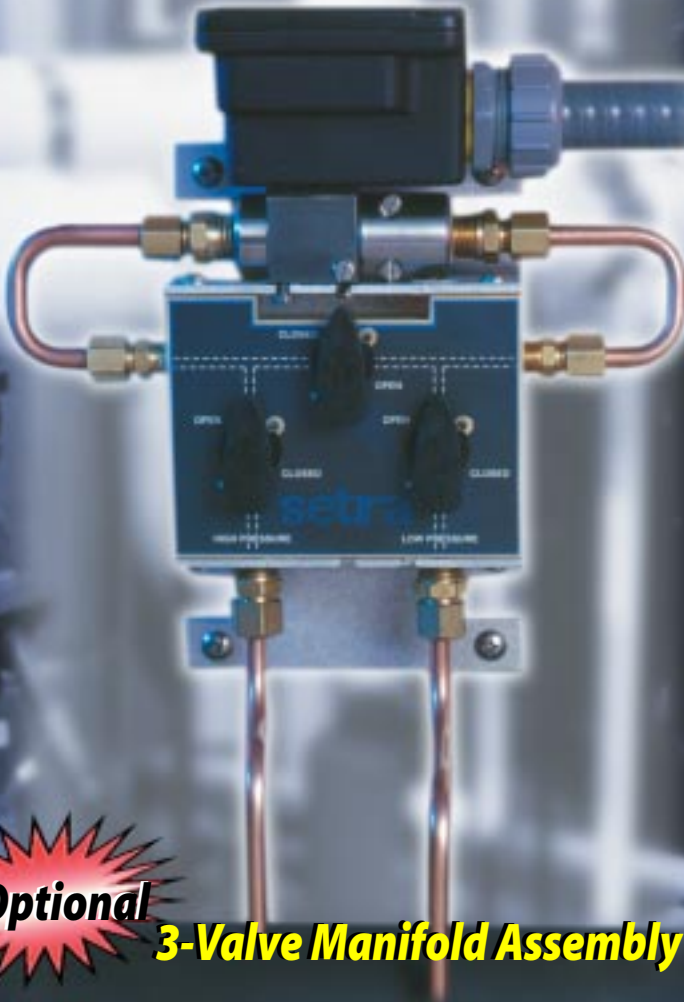


Model 230

Wet/Wet Pressure Transducer



Optional

3-Valve Manifold Assembly

TEESING

Setra Systems Model 230 is a high output, low differential pressure transducer designed for wet to wet differential pressure measurements of liquids or gases. A fast-response capacitance sensor and signal conditioned electronic circuitry provide a highly accurate, linear analog output proportional to pressure. Both unidirectional and bidirectional pressure ranges are available for applications with line pressure up to 250 psig.

A unique isolation system transmits the motion of the differential pressure sensing diaphragm from the high line pressure environment (e.g. corrosive liquids) to the dry (air) enclosure where it moves one of a pair of capacitance plates proportionally to the diaphragm movement. This system responds to pressure changes approximately 20 times faster than conventional fluid-filled transducers. The electronic circuit linearizes output vs. pressure and compensates for thermal effects of the sensor.

The 230 has a NEMA 4/IP65 rated package to withstand environmental effects.

3-VALVE MANIFOLD

The Model 230 can be supplied with an optional 3-Valve Manifold assembly for ease of installation and maintenance. The 3-Valve Manifold is a machined brass body requiring no internal pipe connections, thereby eliminating the risk of internal leaks. The manifold's rugged, yet compact, construction requires minimum space for installation and use. The 230 bleed ports allow for total elimination of air in the line and pressure cavities. If the Model 230 is ordered with the 3-Valve Manifold, the system is shipped completely assembled and ready for wall or pipe mounting. (Order as Pressure Fitting Code 3V.)



Model 230 Specifications

Performance Data

Accuracy RSS* (at constant temp)	±0.25% FS
Non-Linearity, BFSL	±0.20% FS
Hysteresis	0.10% FS
Non-Repeatability	0.05% FS
<u>Thermal Effects**</u>	
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 Working Pressure	250 psig

*RSS of Non-Linearity, Non-Repeatability and Hysteresis.

**Units calibrated at nominal 70°F. Maximum thermal error computed from this datum.

Environmental Data

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

*Operating temperature limits of the electronics only.

Pressure media temperatures may be considerably higher or lower.

Physical Description (Model 230)

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.)	

Specifications are subject to change without notice.

Physical Description

(3-Valve Manifold Assembly)*

Manifold Block	Brass
Valves (3)**	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.

*Order assembled with the Model 230 (Code 3V) or separately as Option 891. (Manifold can only be mated with Setra's Model 230.)

**Refer to drawing on back page.

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*	0 to 5 VDC** 0 to 10 VDC**
Output Impedance	100 ohms

*Calibrated into a 50K ohm load, operable into a 5000 ohm load or greater.

**Zero output factory set to within ±25mV (for 5 VDC output) or ±50mV (for 10 VDC output).

**Span (Full Scale) output factory set to within ±25mV (for 5 VDC output) or ±50mV (for 10 VDC output).

Electrical Data (Current)

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

*Calibrated at factory with a 24 VDC loop supply voltage and a 250 ohm load.

**Zero output factory set to within ±0.08mA.

**Span output factory set to within ±0.08mA.

Pressure Media

For the Model 230

Gases or liquids compatible with 17-4 PH Stainless Steel, 300 Series Stainless Steel, Viton and Silicone O-Rings.

Note: Hydrogen not recommended for use with 17-4 PH stainless steel. Optional Buna-N O-rings are recommended for hydrocarbon applications.

For the 3 Valve Manifold

Gases or liquids compatible with 360 brass, Copper 122, Acetal plug valves and Nitrile O-rings.

Applications

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

Features

- NEMA 4/IP65 Rating
- No Liquid Fill Diaphragm
- Available with 3-Valve Manifold Assembly Option
- Low Line Pressure Effect
- Fast Response
- Gas and Liquid Compatible
- Low Differential Ranges

When it comes to a product to rely on - choose the Model 230. When it comes to a company to trust - choose Setra.

Pressure Ranges

UNIDIRECTIONAL		
Pressure Range PSID	Proof Pressure High Side* PSI	Proof Pressure Low Side* PSI
0 to 1	20	2.5
0 to 2	40	5
0 to 5	100	12.5
0 to 10	100	25
0 to 25	250	62.5
0 to 30	250	75
0 to 50	250	125
0 to 100	250	250

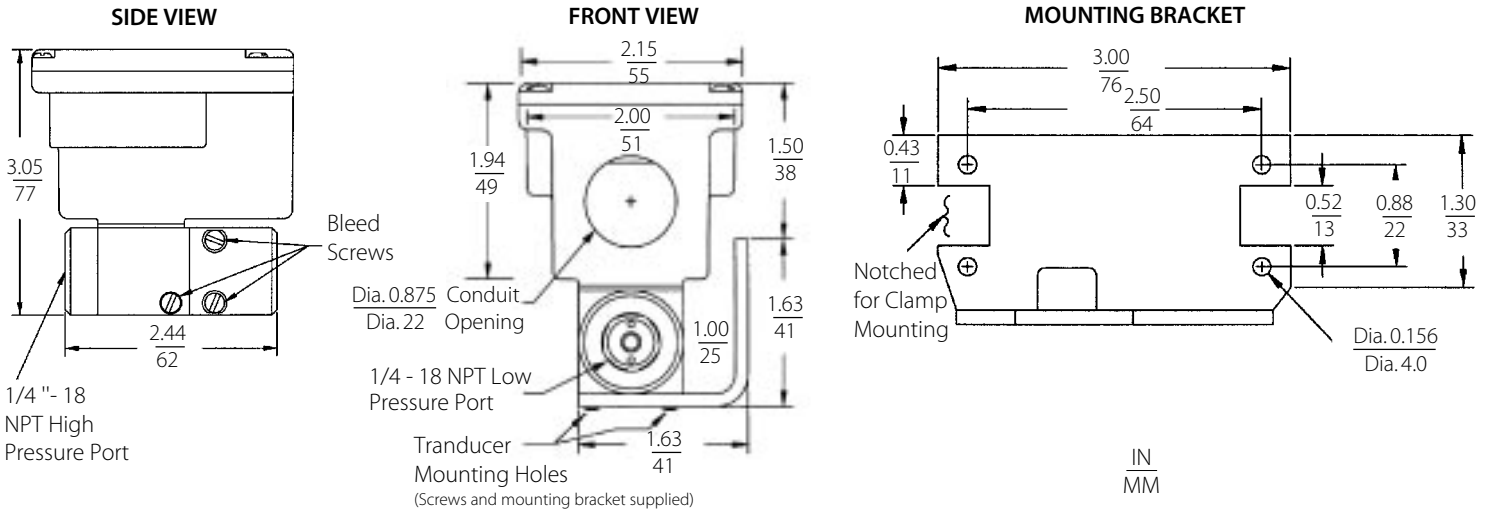
BIDIRECTIONAL		
Pressure Range PSID	Proof Pressure High Side* PSI	Proof Pressure Low Side* PSI
0 to ±0.5	20	1.25
0 to ±1	40	2.5
0 to ±2.5	100	6.25
0 to ±5	100	12.5
0 to ±10	200	25
0 to ±25	250	62.5
0 to ±50	250	125

*The zero will shift slightly when high differential overpressure is applied. The shift may be as much as ±10% FS with overpressure applied to the low pressure port. Other parameters (sensitivity, linearity, etc) will not shift. If the overpressure is normally only in one direction, the user may apply this overpressure to preset the sensor. Subsequent overload of less magnitude will not cause additional shift. The unit is pre-zeroed at the factory after application of maximum overload pressure to the high pressure port.

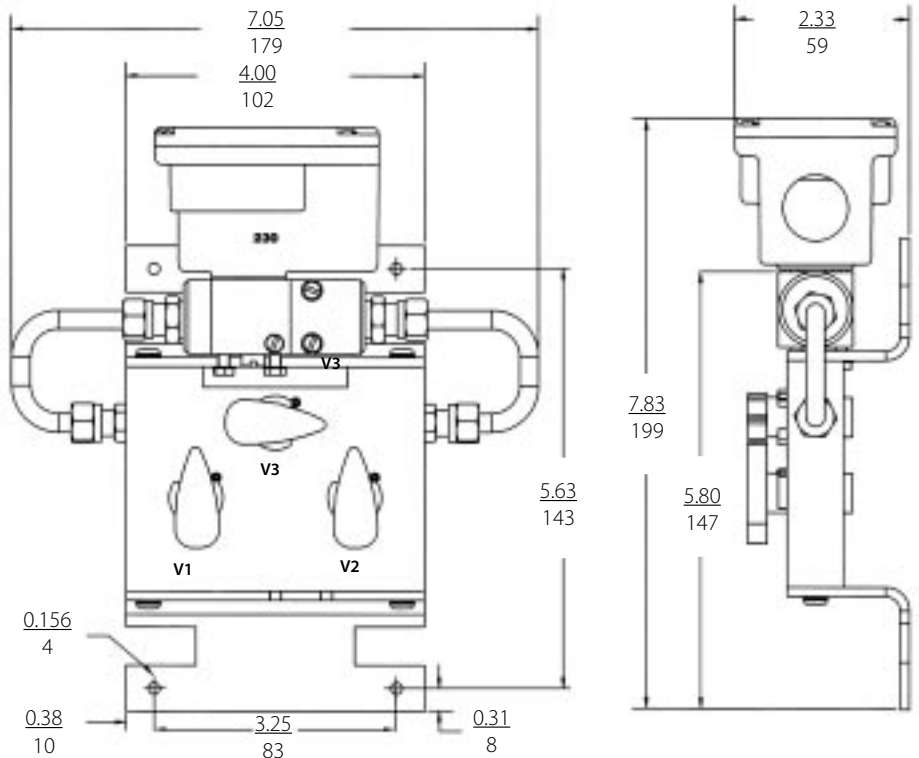
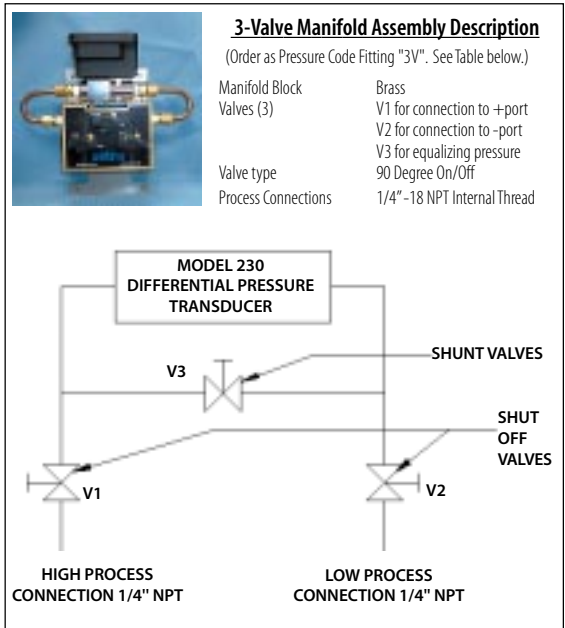
NOTE: Setra quality standards including ISO 9001 are based on ANSI-Z540-1. The calibration of this product is NIST traceable. U.S. Patent nos. 4054833



Outline Drawings – Model 230 Transducer



Outline Drawing – Model 230 Transducer with 3-Valve Manifold Assembly



TEESING

ORDERING INFORMATION

Code all blocks in table.

Examples: Part No. 2301005PD2F11B for a 230 Transducer, 0 to 5 PSID Unidirectional Range, 1/4" Female NPT Fitting, 4 to 20mA Output, and Viton/Silicone Seals.
 Part No. 2301005PD3V11B for a 230 Transducer, 0 to 5 PSID Unidirectional Range, 4 to 20mA Output, and Viton/Silicone Seals, Assembled with the 3-Valve Manifold.

2	3	0	1	—		—		—		—	
Model				Ranges				Pressure Fitting	Output	Bleed Screw Seals	Optional
2301 = 230				001PD = 0-1.0 PSID	0R5PB = ±0.5 PSID	2F = 1/4" NPT (F)	11 = 4 to 20mA	Standard	C = Calibration Certificate		
				002PD = 0-2.0 PSID	001PB = ±1.0 PSID	3V = 3-Valve	2D = 0 to 5 VDC	Viton/Silicone			
				005PD = 0-5.0 PSID	2R5PB = ±2.5 PSID	Manifold Assembly*	2E = 0 to 10 VDC	Optional			
				010PD = 0-10.0 PSID	005PB = ±5.0 PSID			Buna-N			
				025PD = 0-25.0 PSID	010PB = ±10.0 PSID						
				030PD = 0-30.0 PSID	025PB = ±25.0 PSID						
				050PD = 0-50.0 PSID	050PB = ±50.0 PSID						
				100PD = 0-100.0 PSID							

*Order assembled with the Model 230 (Code 3V) or separately as Option 891. (Manifold can only be mated with Setra's Model 230.)

Please contact factory for versions not shown.

While we provide application assistance on all Setra products, both personally and through our literature, it is up to the customer to determine the suitability of the product in the application.



SSP230Rev E 09/30/03