Model 230

Wet/Wet Differential Pressure Transducer

(Available with 3-Valve Manifold Assembly)

Ranges: 0 - ±0.5 psid to 0 - 100 psid Liquids or Gases Both Sides

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. All parts exposed to the pressure media are stainless steel and elastomer seals. The 230 has a NEMA 4/IP65 rated package to withstand environmental effects. 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.

New! 3-VALVE MANIFOLD

The Model 230 can be supplied with an optionl 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 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.)

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 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

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
- Low Cost
- 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.

ISO 9001 Certified

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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
Thermal Effects**	
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 nomial 70°F. Maximum thermal error computed from this datum.

Specifications subject to change without notice.

Environmental Data

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

*Operating temperature limits of the electronics only. Pressure media temperatures may be considerably higher or lower.

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.)	14.4oz
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.)

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

Electrical Data (Voltage) Cont'd.

Output*	0-5 VDC** or 0-10 VDC**
Output Impedance	100 ohms

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

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

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

Electrical Data (Current)

Circuit	2-Wire
Output*	4 to 20mA**
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

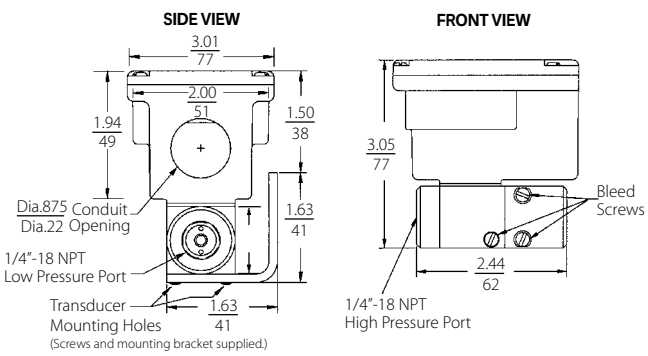
Model 230: Gases or liquids compatible with 17-4 PH Stainless Steel, 300 Series Stainless Steel, Viton and Silicone O-Rings.

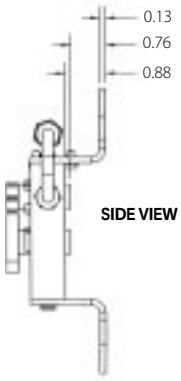
3-Valve Manifold: Gases or liquids compatible with 360 brass, Copper 122, Acetal plug valves and Nitrile O-rings.

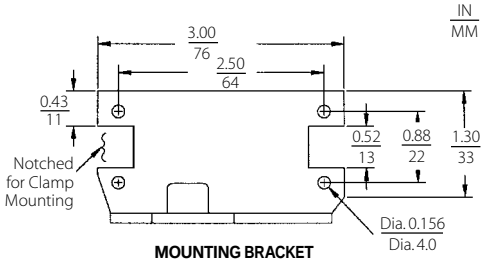
Note: Hydrogen not recommended for use with 17-4 PH stainless steel.

Outline Drawings

Model 230

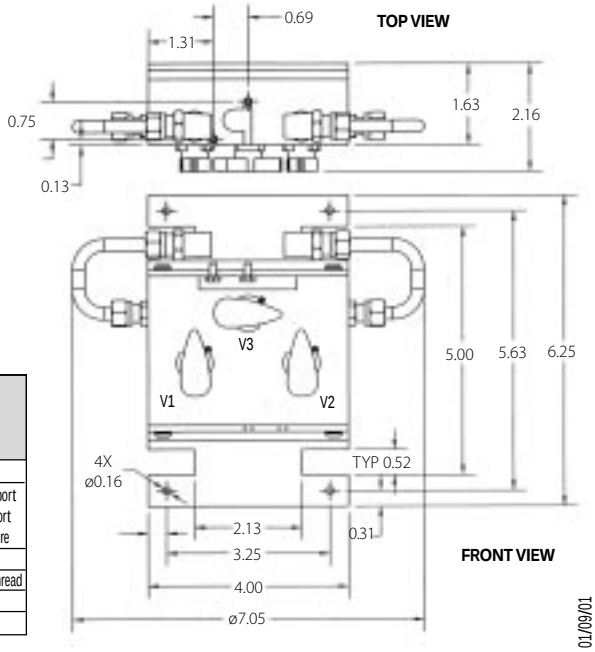






3-Valve Manifold Physical Description (Order as Pressure Fitting Code 3V)	
Manifold Block	Brass
Valves (3)	V1 for connection to +port V2 for connection to -port V3 for equalizing pressure
Valve type	90 Degree On/Off
Process Connections	1/4" -18 NPT Internal Thread
Dimensions	7"W x 6"H x 2"D
Weight	<2.5 lbs.

3-Valve Manifold



SSP230 Rev.D 01/09/01

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.

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Model

2301 = 230

Ranges

Unidirectional	Bidirectional
001PD = 0-1.0 PSID	**0R5PB =** ±0.5 PSID
002PD = 0-2.0 PSID	**001PB =** ±1.0 PSID
005PD = 0-5.0 PSID	**2R5PB =** ±2.5 PSID
010PD = 0-10.0 PSID	**005PB =** ±5.0 PSID
025PD = 0-25.0 PSID	**010PB =** ±10.0 PSID
050PD = 0-50.0 PSID	**025PB =** ±25.0 PSID
100PD = 0-100.0 PSID	**050PB =** ±50.0 PSID

Pressure Fitting

2F = 1/4" NPT (F)
3V = 3-Valve Manifold Assembly

Output

11 = 4 to 20mA
2D = 0 to 5 VDC
2E = 0 to 10 VDC

Bleed Screw Seals

Standard
B = Viton/Silicone
Optional
A = Buna-N

Optional

C = Calibration Certificate

If 3-Valve Manifold Assembly is ordered separately without 230 transducer, order as Option 891. Please contact factory for versions not shown.

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