

Model DPT 230

Wet/Wet Differential Pressure Transducer

(Available with 3-Valve Manifold Assembly)

Ranges: 0 to ± 0.5 psid up to 0 to 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.

The Model 230 can be supplied with a 3-valve manifold assembly (ordered as Pressure Fitting Code V) to protect against excessive differential overpressure, which may occur during installation, start-up or shut-down. The 230 bleed ports allow for total elimination of air in the line and pressure cavities. The manifold's rugged, yet compact, construction requires minimum space for installation. If the Model 230 is ordered with the 3-valve manifold, the system is shipped completely assembled and ready for wall or pipe mounting. If 3-Valve Manifold Assembly is ordered separately without 230 transducer, order as DPT 3-VALVE.



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

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

*The zero will shift slightly when high differential overpressure is applied. The shift may be as much as $\pm 10\%$ 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.

Applications

- Process Control
- Energy Management Systems
- Flow measurement of various gases or liquids
- Liquid level measurement of pressurized vessels
- Pressure Drop Across Filters

Features

- NEMA 4/IP65 rating
- 3-Valve Manifold Assembly
- High Accuracy
- Low Cost
- Fast Response
- Gas and Liquid Compatible
- Low Differential Ranges
- Low Line Pressure Effect
- No Liquid Fill Diaphragms



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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/°F(%FS/°C)	2.0 (1.8)
Span Shift %FS/°F(%FS/°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%/1 YR
Maximum Working Pressure	250 psig

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

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** 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 at 50mV (±25mV) for 0-5 VDC and 50mV (±50mV) for 0-10 VDC. **Span output factory set at 5 VDC (±25mV) or 10 VDC (±50mV).	

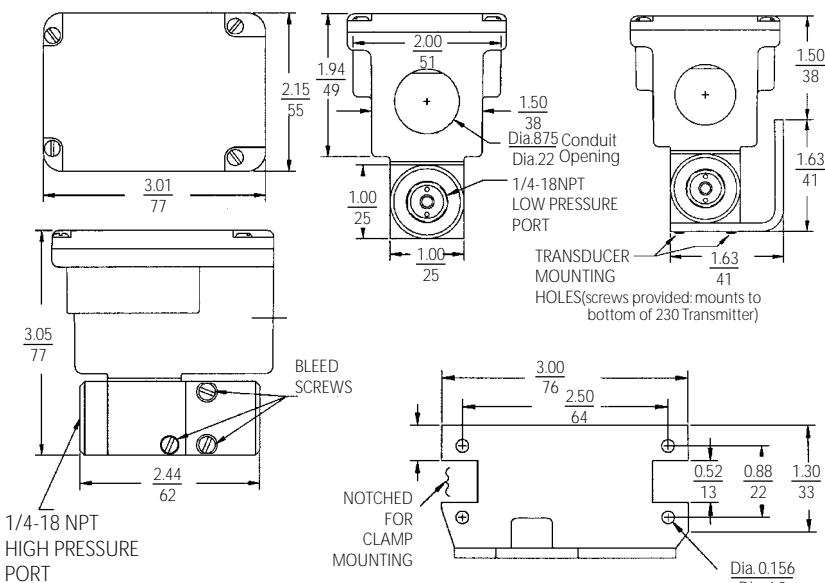
Electrical Data (Current)

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 at 4mA (±0.08mA) **Span output factory set at 20mA (±0.08mA)	

Pressure Media

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.

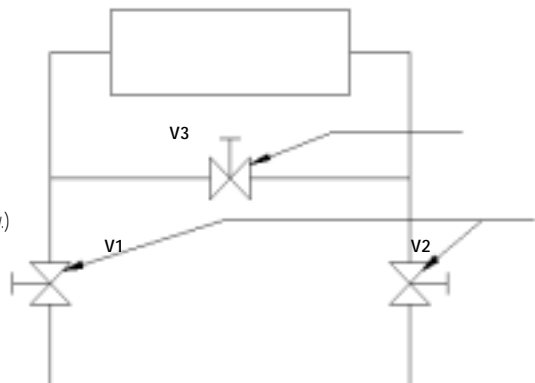
Outline Drawings



3-Valve Manifold Assembly Description

(Order by adding "-V" to standard part number. See example below.)

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



Ordering Information

Input Range PSID	Product Codes		
	0 to 5 VDC Output	0 to 10 VDC Output	4 to 20 mA Output
0 to 1	DPT2300-001D	DPT2302-001D	DPT2301-001D
0 to 2	DPT2300-002D	DPT2302-002D	DPT2301-002D
0 to 5	DPT2300-005D	DPT2302-005D	DPT2301-005D
0 to 10	DPT2300-010D	DPT2302-010D	DPT2301-010D
0 to 25	DPT2300-025D	DPT2302-025D	DPT2301-025D
0 to 50	DPT2300-050D	DPT2302-050D	DPT2301-050D
0 to 100	DPT2300-100D	DPT2302-100D	DPT2301-100D
-0.5 to 0.5	DPT2300-0R5B	DPT2302-0R5B	DPT2301-0R5B
-1 to 1	DPT2300-001B	DPT2302-001B	DPT2301-001B
-2.5 to 2.5	DPT2300-2R5B	DPT2302-2R5B	DPT2301-2R5B
-5 to 5	DPT2300-005B	DPT2302-005B	DPT2301-005B
-10 to 10	DPT2300-010B	DPT2302-010B	DPT2301-010B
-25 to 25	DPT2300-025B	DPT2302-025B	DPT2301-025B
-50 to 50	DPT2300-050B	DPT2302-050B	DPT2301-050B
Input Range PSID	Product Codes with 3-Valve Manifold Option		
	0 to 5 VDC Output	0 to 10 VDC Output	4 to 20 mA Output
0 to 1	DPT2300-001D-V	DPT2302-001D-V	DPT2301-001D-V
0 to 2	DPT2300-002D-V	DPT2302-002D-V	DPT2301-002D-V
0 to 5	DPT2300-005D-V	DPT2302-005D-V	DPT2301-005D-V
0 to 10	DPT2300-010D-V	DPT2302-010D-V	DPT2301-010D-V
0 to 25	DPT2300-025D-V	DPT2302-025D-V	DPT2301-025D-V
0 to 50	DPT2300-050D-V	DPT2302-050D-V	DPT2301-050D-V
0 to 100	DPT2300-100D-V	DPT2302-100D-V	DPT2301-100D-V
-0.5 to 0.5	DPT2300-0R5B-V	DPT2302-0R5B-V	DPT2301-0R5B-V
-1 to 1	DPT2300-001B-V	DPT2302-001B-V	DPT2301-001B-V
-2.5 to 2.5	DPT2300-2R5B-V	DPT2302-2R5B-V	DPT2301-2R5B-V
-5 to 5	DPT2300-005B-V	DPT2302-005B-V	DPT2301-005B-V
-10 to 10	DPT2300-010B-V	DPT2302-010B-V	DPT2301-010B-V
-25 to 25	DPT2300-025B-V	DPT2302-025B-V	DPT2301-025B-V
-50 to 50	DPT2300-050B-V	DPT2302-050B-V	DPT2301-050B-V

For calibration certificate, add DPT-CAL-REPORT after part number.

For separate 3-Valve Manifold order as DPT 3-VALVE

Example: Part No. 2300-005D-V for a 230 Transducer, 0 to 5 PSID. Unidirectional Range, 0 to 5 VDC Output. Assembled with the 3-Valve Manifold.

