Multi-Sense®
Model 231
Multi-Configurable, Wet-to-Wet Differential Pressure Transducer

Setra's 231 is a multi-configurable, wet-to-wet differential pressure transducer offering the user an all-in-one device with field selectable pressure ranges and analog outputs. The device is offered with an optional 3 or 5 valve machined brass manifold for ease of installation and maintenance. The 231 has a robust, NEMA 4 enclosure with an LCD display and a hinged, captive cover allowing for easy access to switches for adjusting the range and output.

Field Selectable Pressure Ranges

The 231 offers 8 field selectable pressure ranges which can be changed using a slide switch, eliminating the risk of ordering the wrong range or improperly installing the unit. The multi-range functionality allows the user to hold less inventory and add additional flexibility in the field.

Quick & Simple Installation

The 231 provides the user with an optional 3 or 5 valve machined brass manifold which can save money on installation and maintenance. The single piece construction of the brass body has no internal process connections, eliminating the risk of internal leaks.

Robust Enclosure for Difficult Applications

The 231 NEMA 4 housing offers an optional LCD display for instant indication of the high, low and differential pressure readings. A hinged enclosure makes it suitable for harsh environments and saves the hassle of misplacing it when completing a difficult installation.

- **Dual Sensors**
- **Suitable for Harsh Environments**
- **3 & 5 Valve Manifold Assembly Options**

Model 231 Features:

- 4 Field Selectable Outputs
- 8 Field Selectable Pressure Ranges
- Field Accessible Push-Button Zero & Remote Zero
- Hinged Cover
- Optional LCD Display
- All Cast Aluminum, NEMA 4 Rated Housing
- CE & RoHS Compliant

Applications:

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

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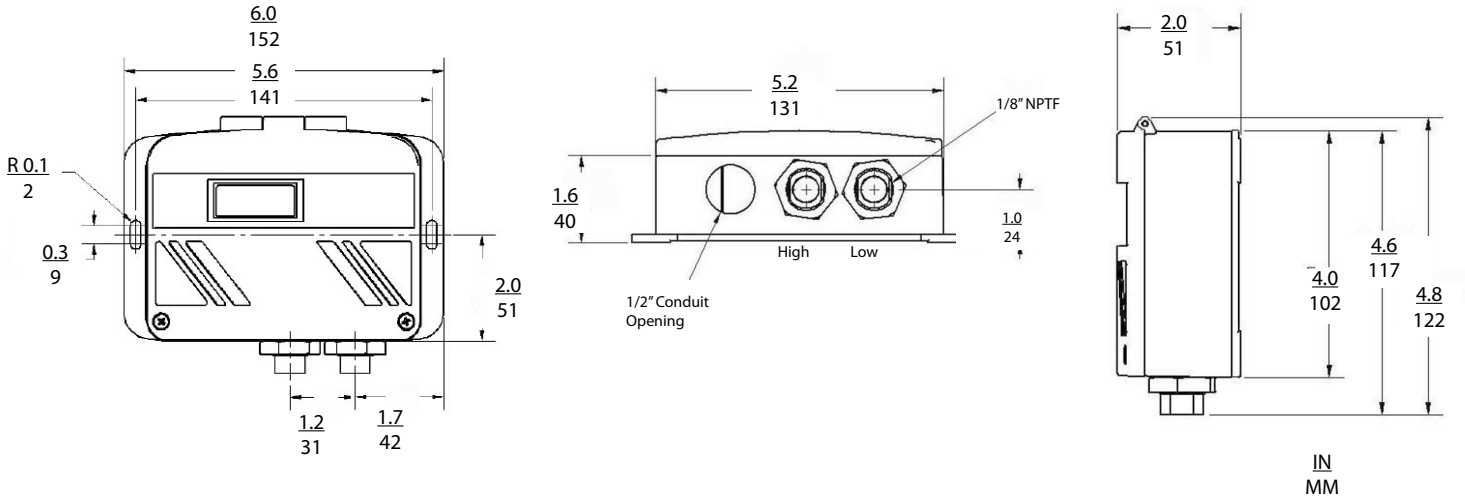
GENERAL SPECIFICATIONS

Electrical Data (Voltage)	
Circuit	3-Wire
Excitation	15 to 30 VDC/18 to 30 VAC (Reverse Excitation Protected)
Output[1]	0 to 5 VDC, 0 to 10 VDC, 1 to 5 VDC
Output Impedance	30 Ohms
Circuit Consumption	8 mA (typ.) at 5 VDC, 8 mA (typ) at 10 VDC, 40 mA (typ.) at 18-30 VAC
Electrical Data (Current)	
Curcuit	2-wire (Reverse Excitation Protected)
Output[2]	4 to 20 mA
External Load	0 to 250 Ohms
Min. Supply Voltage (VDC)	15 + 0.02 x (Resistance of receiver plus line)
Max. Supply Voltage (VDC)	30 + 0.004 x (Resistance of receiver plus line)
Physical Description	
Case	Die Cast Aluminum, Powder Coated
Pressure Fittings	1/8-18 NPT Internal
Electrical Connection	1/2 in. Conduit
Size	4.0 x 6 x 2 in. (102 x 152 x 51 mm)
Weight	1.5 lb
Sensor Vacity Volume	0.2 cc
Environmental Data	
Operating[3] Temperature °F (°C)	-4 to +185 (-20 to -85)
Storage Temperature °F (°C)	-4 to +185 (-20 to +85)
Vibration	10g from 50Hz to 2000 Hz
Shock	200g

Performance Data						
Accuracy RSS[4] (at constant temp.)						
Pressure Ranges A, B, C	±1.0% FS					
Pressure Ranges D	±2.0% FS					
Pressure Ranges						
Range Code	A	B	C	D	Max. Line Pressure	
MS1	50	25	10	5	50	
MS2	100	50	20	10	100	
MS3	250	125	50	25	250	
Pressure Media						
Liquids or Gases Compatible with 17-4 PH Stainless Steel Note: Hydrogen not recommended for use with 17-4 PH stainless steel						
Thermal Effects[5]						
Compensated Range °F (°C)	+32 to +130 (0 to +54)					
Zero/Span Shift %FS/100°F (50°C)	2.0 (1.8)					
Warm-up Shift	<0.12% FS					
Response Time	1 to 5 sec. (selectable)					
Proof Pressure	2 x Full Scale					
Burst Pressure	15 x Full Scale (50 PSI), 10 x Full Scale (75 x 150 PSI), 8 x Full Scale (250 PSI)					

[1] Calibrated into a 50K ohm load, operable into a 5000 ohm load or greater.
[2] Calibrated at factory with a 24 VDC loop supply voltage and a 250 ohm load.
[3] Operating temperature limits of the electronics only. Pressure media temperatures may be considerably higher or lower.
[4] RSS of Non-Linearity, Hysteresis, and Non-Repeatability.
[5] Units calibrated at nominal 70°F. Maximum thermal error computed from this datum.
Specifications subject to change without notice.

MODEL 231 DIMENSIONS



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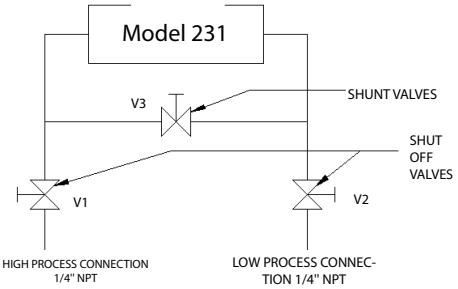
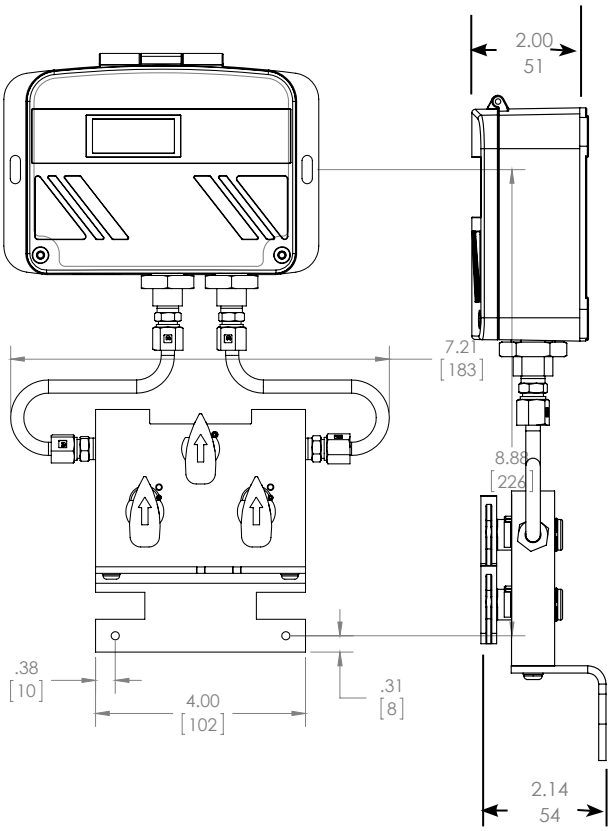
3-VALVE MANIFOLD ASSEMBLY DIMENSIONS

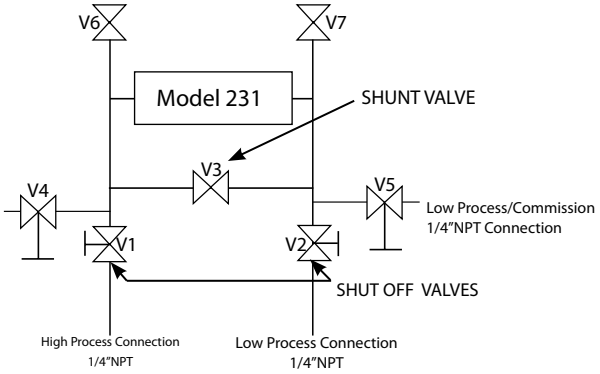
Manifold Block	Brass
Valves (3)	V1 for connection to +port V2 for connection to -port V3 for equalizing pressure
Valve type	90 Degree On/Off
Process Connections	1/4" -18 NPT Internal Thread

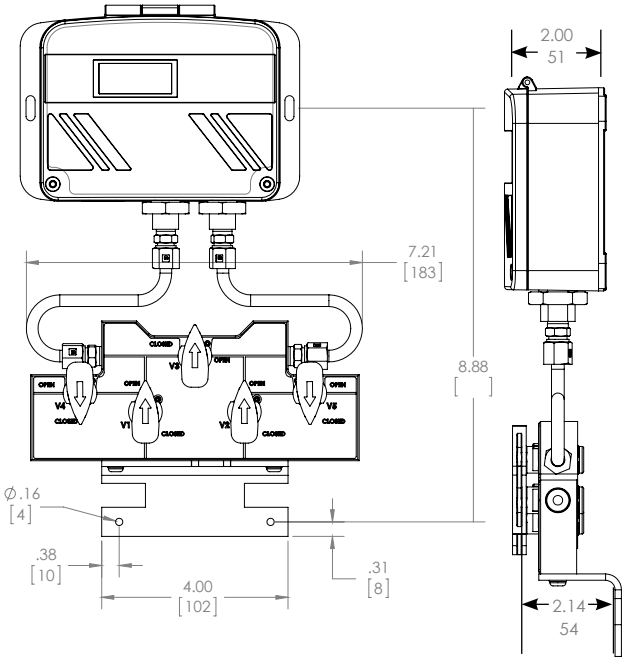




5-VALVE MANIFOLD ASSEMBLY DIMENSIONS

Manifold Block	Brass
Valves (5)	V1 for connection to ±port V2 for connection to -port V3 for equalizing pressure V4 for connection to external gauge or alternate plumbing configuration V5 for connection to external gauge or alternate plumbing configuration
Valve Type	90 Degree On/Off
Process Connection	1/4 "-18 NPT Internal Thread





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ORDERING INFORMATION

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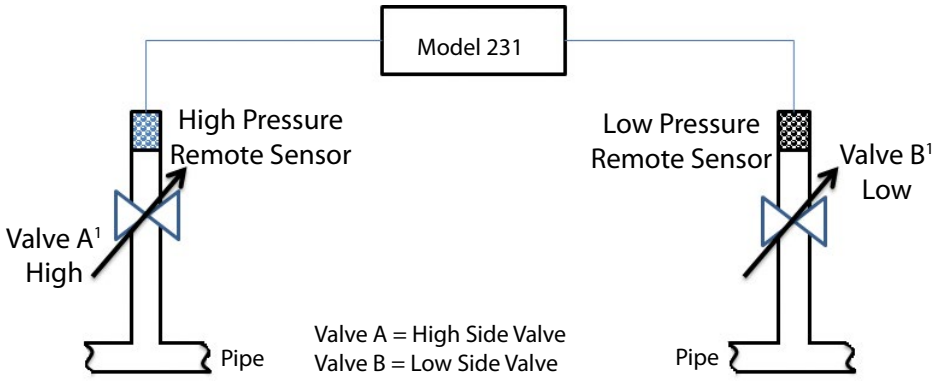
Model	Range Specifications[1]			Pressure Connection		Display	
231G = 231		Unidirectional	Bidirectional	2F	1/8-18 NPT female (Standard) Sensor (Conduit Version)	N	No Display
	MS1	5, 10, 25, 50 PSID	±5, ±10, ±25, ±50 PSID	3V	3-V Manifold assembled w/ Model 231	D	LCD Display
	MS2	10, 20, 50, 100 PSID	±10, ±20, ±50, ±100 PSID	5V	5-V Manifold assembled w/ Model 231		
	MS3	25, 50, 125, 250 PSID	±25, ±50, ±125, ±250 PSID				

[1] Maximum line pressure is maximum range of pressure ordered.

Ordering Example: 231GMS12FD = Model 231, 5 PSID up to 50 PSID, 1/8" NPT Female Fitting, and LCD Display 31GMS13VN= Model 231, 0 to 5 PSID up to 50 PSI, 3-Valve Manifold, and No LCD Display

INSTALLATION



PRESSURE RANGE CODE SELECTOR (IMPORTANT: READ BEFORE ORDERING)

Examine the pressure application and determine what is the Highest System Line Pressure.
Determine what is the Differential Pressure being measured.
Find the MAX. Line Pressure in the table on the right that is ≥ to your Highest System Line Pressure.
Verify that your DP falls within the selectable ranges in that row.
Follow that row to the left and select that range code.

Range Code	A	B	C	D	Max. Line Pressure
MS1	50	25	10	5	50
MS2	100	50	20	10	100
MS3	250	125	50	25	250

Example:

Highest System Line Pressure:	125 PSIG
Differential Pressure Measured:	50 PSID
"Max Line Pressure" ≥ to System Line Pressure:	250 PSID (50 PSID DP falls within ranges in this row)
Select Range Code:	MS3

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