

# Multi-Sense™ - Model 231

## Wet-to-Wet, Differential Pressure Transducer



Setra's Model 231 Multi-Sense™ Wet-to-Wet differential pressure transducer all-inclusive design provides users with field accessible ranging, choice of output and field zeroing.

Choose from three configurable Model 231 pressure transducers: 5 up to 50 psid, 10 up to 100 psid, or 25 up to 250 psid. Each Model 231 has 4 unidirectional and 4 bidirectional switch selectable pressure ranges and can be reconfigured in the field for 0-5 VDC, 1-5 VDC, 0-10 VDC, or 4 to 20 mA output. (The 4 to 20 mA output is operable as a true 2-wire device.) The Model 231 jumper selectable port swap feature eliminates costly replumbing if the pressure transducer is improperly installed or replaced. An optional LCD display is available for on-site indication of line and differential pressure.

The Model 231 is designed with Setra's own dual pressure sensors, which incorporate thin film sensing technology. This technology offers exceptional thermal accuracy and signal linearity. Utilizing this technology, the Model 231 is resistant to long-term drift caused by dopant migration and Fermi-level effects, intrinsic in piezoresistive and silicon based technologies, which are exaggerated at elevated temperatures and by extended pressure cycling.

### 3-VALVE MANIFOLD

The Model 231 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. If the Model 231 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.)



**"All-in-One"**  
**8 Selectable Ranges...One Transducer**

NOTE: Setra quality standards are based on ANSI-Z540-1.  
The calibration of this product is NIST traceable.

Patent Pending

### 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

- Field Selectable Output
- True 4 to 20 mA Output
- 0-5, 1-5, and 0-10 VDC Output
- Field Selectable Pressure Ranges
- Field Accessible Push-Button Zero and Remote Zero
- Dual Sensors
- Hinged Cover
- Field Selectable Port Swap
- Optional LCD Display
- All Cast Aluminum, NEMA 4 Rated Housing
- Meets CE Conformance Standards
- RoHS Compliant

### Benefits

- Hinged Cover for Easy Access to Switch Selectable Features
- Dual Pressure Sensors Provide Independent High and Lo Pressures
- LCD Display for In-Situ Viewing of Hi, Lo, and Differential Pressure
- Field Calibration Saves Time and Money
- Port Swap Feature Eliminates Replumbing Existing Installations
- Reduces Inventory
- Saves Installation Cost



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**800-257-3872**

# Model 231 Specifications

## Performance Data

Accuracy RSS\* (at constant temp.)

Pressure Ranges A,B,C	±1.0% FS
Pressure Range D	±2.0% FS

## Pressure Ranges

	A	B	C	D
MS1	50	25	10	5
MS2	100	50	20	10
MS3	250	125	50	25

## Thermal Effects\*\*

Compensated Range °F (°C)	+32 to +130 (0 to +54)
Zero Shift %FS/100°F (50°C)	2.0 (1.8)
Span Shift %FS/100°F (50°C)	2.0 (1.8)

Warm-up Shift	<0.12% FS
Response Time	1 to 5 sec. (selectable)
Maximum Working Pressure	Maximum Range of Pressure Ordered

Proof Pressure	2.2 x Full Scale
Burst Pressure	40 x Full Scale

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

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

## Pressure Media

Liquids or Gases Compatible with 17-4 PH Stainless Steel

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

## Environmental Data

Temperature	
Operating °F (°C)	-4 to +185 (-20 to +85)
Storage °F (°C)	-4 to +185 (-20 to +85)
Vibration	10g from 50 Hz to 2000 Hz
Shock	200g

\*Operating temperature limits of the electronics only.

Pressure media temperatures may be considerably higher or lower.

## Physical Description (Model 231)

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 51mm)
Weight	1.5 lb
Sensor Cavity Volume	0.2 cc

## Electrical Data (Voltage)

Circuit	3-Wire
Excitation	12 to 30 VDC/18 to 28 VAC (Reverse Excitation Protected)
Output*	0 to 5 VDC 0 to 10 VDC 1 to 5 VDC
Output Impedance	30 Ohms
Current Consumption	4 mA (typ.) at 5 VDC 5 mA (typ.) at 10 VDC 40 mA (typ.) at 18-28 VAC

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

## Electrical Data (Current)

Circuit	2-Wire (Reverse Excitation Protected)
Output*	4 to 20 mA, Clipped and Capped
External Load	0 to 1000 Ohms

Minimum supply voltage (VDC) = 12 + 0.02 x (Resistance of receiver plus line).

Maximum 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.

## 3-Valve Manifold Assembly\*

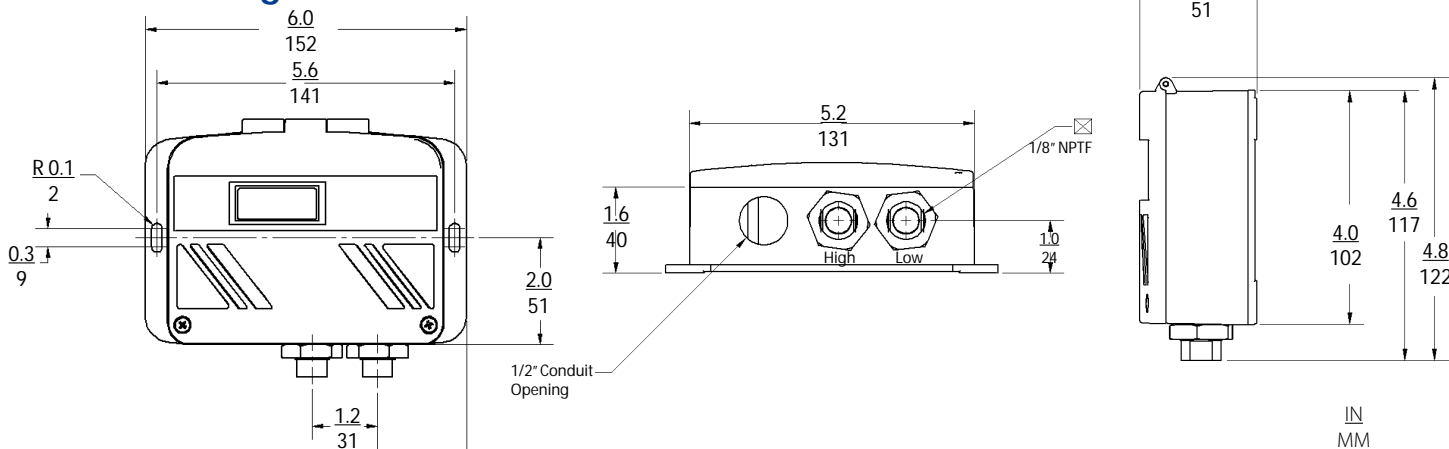
### Physical Description

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	6" x 11" (152mm x 279mm)
Weight	3 lbs.

\*Order assembled with the Model 231 (Code 3V) or order separately as Option 231900-01.

Specifications subject to change without notice.

## Outline Drawing



## ORDERING INFORMATION

Code all blocks in table.

Example: Part No. 231GMS12FD is a Model 231, 5 PSID up to 50 PSID, 1/8" NPT Female Fitting, and LCD Display

<table border="1"> <tr> <td>2</td> <td>3</td> <td>1</td> <td>G</td> </tr> </table> <p><b>Model</b> 231G = 231</p>	2	3	1	G	<table border="1"> <tr> <td> </td> <td> </td> <td> </td> </tr> </table> <p><b>Ranges</b> <b>Unidirectional &amp; Bidirectional</b> MS1 = 5, 10, 25 50 psid ±5, ±10, ±25, ±50 psid MS2 = 10, 20, 50, 100 psid ±10, ±20, ±50, ±100 psid MS3 = 25, 50, 125, 250 psid ±25, ±50, ±125, ±250 psid</p>				<table border="1"> <tr> <td> </td> <td> </td> </tr> </table> <p><b>Pressure Connection</b> 2F = 1/8-18 NPT Female (Standard) <b>Optional</b> 3V = 3-V Manifold assembled w/Model 231</p>			<table border="1"> <tr> <td> </td> </tr> </table> <p><b>Option</b> N = No Display D = LCD Display</p>	
2	3	1	G										

Please contact factory for versions not shown.

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

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