# Multi-Sense<sup>®</sup> - Model 231

## Wet-to-Wet, Differential, Multi-Configurable Pressure Transducer



Setra's Model 231 Multi-Sense® Wet-to-Wet differential pressure transducer allinclusive 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 and 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 (Conformance Standards \_\_\_\_\_
- RoHS Compliant

## **Benefits**

- Hinged Cover for Easy Access to Switch Selectable Features
- Dual Pressure Sensors Provide Independent High and Lo Pressures
- Optional 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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#### **Performance Data**

Accuracy RSS* (	(at constant temp.)	
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Pressure Ranges A, B, C	±1.0% FS
Pressure Range D	±2.0% FS

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	A	В	С	D	Max. Line Pressure
MS1	50	25	10	5	50
MS2	100	50	20	10	100
MS3	250	125	50	25	250

#### Thermal Effects

Compensated Range °F (°C) Zero Shift %FS/100°F (50°C) Span Shift %FS/100°F(50°C)	+32 to +130 (0 to +54) 2.0 (1.8) 2.0 (1.8)
Warm-up Shift	<0.12% FS
Response Time	1 to 5 sec. (selectable)
Maximum Line Pressure	
MS1	50 psid
MS2	100 psid
MS3	250 psid
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

# **Model 231 Specifications**

### **Environmental Data**

Temperature	
Operating <sup>*</sup> °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 electro	onics 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 сс

#### **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, one	rable into a 5000 obm 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)	$) = 30 + 0.004 \mathrm{x}$
(Resistance of receiver plus line)	).
*Calibrated at factory with a 24 VDC loc	op 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 2	231 (Code 3V) or order separately as
Accessory 231900-01.	

Specifications subject to change without notice.



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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