

Model 204R

High Accuracy Pressure Transducers

for Corrosive Liquids or Gases
Gauge, Vacuum, Absolute and Differential Pressures

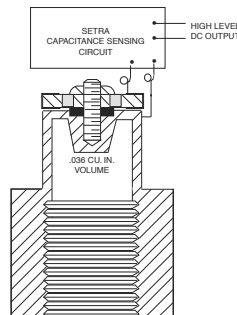


Setra's Model 204R pressure transducers are intended for accurate pressure measurements of gas or liquid media compatible with 17-4 PH stainless steel. The high level output signal and excellent stability, combined with fast dynamic response, make this unit ideal for industrial, laboratory and aerospace applications.

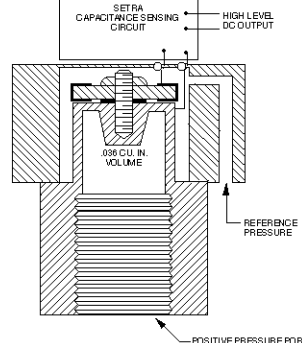
The exceptional accuracy is achieved by combining Setra's unique electronic circuitry with its patented variable capacitance sensor. This unit is compensated for both zero and sensitivity shifts due to environmental temperature variations. The Model 204R of-

fers high-level output (eg. 0-5 VDC or 4-20 mA), that requires no additional signal conditioning. The sensor features a one-piece 17-4 PH stainless steel pressure sensor and an insulated electrode, which form a variable capacitor. As the pressure increases, the capacitance decreases. This change in capacitance is detected and converted to a linear DC electric signal. On absolute pressure units, the reference side of the diaphragm is sealed under high vacuum.

Gauge Sensor



Differential Sensor



Extremely low hysteresis and very stable operation under extreme temperature conditions are inherent in this sensor design.
U.S. Patent nos. 3859575, 4093915

Pressure Ranges

Pressure Range PSID	Proof Pressure* PSID	Burst Pressure*	Approx. Natural Freq.: kHz	
0 to ±10 0 to 25	±50	±150 psid	2.0	
0 to ±25 0 to 50	±75	±200 psid	2.5	
0 to ±50 0 to 100	±150	±500 psid	3.5	
0 to ±100 0 to 250	±375	±1000 psid	5.0	
0 to ±250 0 to 500	±750	positive port: reference port:	+1500 psid 1000 psig	8.0
0 to ±500 0 to 1000	+1250 -1000	positive port: reference port:	+3000 psid 1000 psig	11.0
0 to 3000	+3750 -1000	positive port: reference port:	+4500 psid 1000 psig	15.0
0 to 5000	+6000 -1000	positive port: reference port:	+7500 psid 1000 psig	25.0
0 to 10000	+11000 -1000	positive port: reference port:	+12500 psid 1000 psig	30.0

*Reference port values apply to differential units only; where maximum pressure must not exceed 1000 psig.

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Applications

- High Accuracy General Purpose
- R&D Test and Measurement
- Vacuum Systems
- Dynamometers
- Engine Test Cells

Features

- Multiconductor 22AWG Cable for Easier Installation
- Etched Cover
- Fast Warm-Up
- 0-5 VDC or 4-20 mA Output
- 0.1% FS Accuracy
- Excellent Thermal Effects
- Low Output Noise
- Fast Response, Less than 1 Millisecond
- Solid One-Piece Stainless Steel Sensor
- RoHS Compliant
- Meets New CE Conformance Standards

When it comes to a product to rely on, choose the Model 204R. When it comes to a company to trust, choose Setra.

ISO
9001:
2008
Certified

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800-257-3872

Model 204R Specifications

Performance Data

	Unidirectional & Bidirectional Ranges ±10, ±25, ±50 PSID	Bidirectional Ranges ±100, ±250, ±500 PSID	10,000 PSID Range
Accuracy RSS* (at constant temp)	±0.11% FS	±0.22% FS	±0.14% FS
Non-Linearity, BFSL	±0.07% FS	±0.20% FS	±0.10% FS
Hysteresis	0.08% FS	0.08% FS	0.10% FS
Non-Repeatability	0.02% FS	0.02% FS	0.02% FS

Comp Range °F(°C)	+30 to +150 (-1 to +65)
Undirectional	
Zero Shift %FS/100°F(%FS/50°C)	<±0.4 (<±0.36)
Span Shift %FS/100°F(%FS/50°C)	<±0.3 (<±0.27)
Bidirectional	
Zero Shift %FS/100°F(%FS/50°C)	<1.0 (<0.09)
Span Shift %FS/100°F(%FS/50°C)	<1.0 (<0.09)

Acceleration Response	<0.05 PSI/G Pressure Port Axis Only
Volume Increase Due to FS Pressure Warm-up Shift	5 x 10 ⁻⁵ cu. in. ±0.5% Total (±0.1% residual shift after 5 Minutes at constant emperature)

Line Pressure Effect	Zero shift ±0.1% FS/100 psig of reference pressure
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*RSS of Non-Linearity, Hysteresis and Non-Repeatability.

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

Environmental Data

Temperature	
Operating °F (°C)	0 to +175 (-18 to +80)
Storage °F (°C)	-65 to +250 (-55 to +120)
Vibration	2g from 5 Hz to 500 Hz
Shock	50g
Acceleration	10g Maximum

Physical Description

Positive Pressure Fitting	1/4" - 18 NPT Internal
Reference Pressure Fitting	1/8" - 27 NPT Internal (on differential units)
Electrical Connection	Multiconductor 22AWG Cable
Weight	10 ounces

Electrical Data (Voltage Output)

Circuit	4-Wire (+Exc, -Exc, +Out, -Out)
Excitation*	22 to 30 VDC
	Reverse Excitation Protected
Output**	0 to 5 VDC*** (for unidirectional ranges) ±2.5 VDC*** (for bidirectional ranges)
Zero Adjustment	Accessible Inside of Case
Span Adjustment	Accessible Inside of Case
Output Impedance	<10 ohms
Output Noise	<100 microvolts RMS (0 to 10K Hz)
Current Consumption	<10 mA (0.25 Watts)

*Will operate on 28 VDC aircraft power per MIL-STD-704A and not be damaged by emergency power conditions. Nominal excitation is 24 VDC. Excitation variation effect is less than 0.2% FS output change.

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

***Zero output factory set to within ±10mV.

****Span (Full Scale) output factory set to within ±10mV.

Note: Both output leads are nominally 4.7 VDC above the negative excitation lead at zero pressure. Either negative excitation or negative output should be connected to case (ground). But both leads cannot be connected to case (ground). Unit is calibrated at the factory with the negative excitation connected to case (ground). Unit is calibrated at the factory with the negative excitation connected to case (ground).

Electrical Data (Current Output)

Circuit	2-Wire
Output*	4 to 20 mA**
External Load	0 to 1000 Ohms
Minimum supply voltage (VDC) = 17 + 0.02 x (Resistance of receiver plus line).	
Maximum supply voltage (VDC) = 42 + 0.004 x (Resistance of receiver plus line).	

Effect of Power Supply

Variations	<0.003mA/Volt
Output Noise	<10 Microamperes RMS (0 Hz to 10 KHz)

*Calibrated at factory with a 24 VDC loop supply voltage and a 250 ohm load.

**Zero output factory set to within ±0.03 mA. Span (Full Scale) output factory set to within ±0.03 mA.

Pressure Media

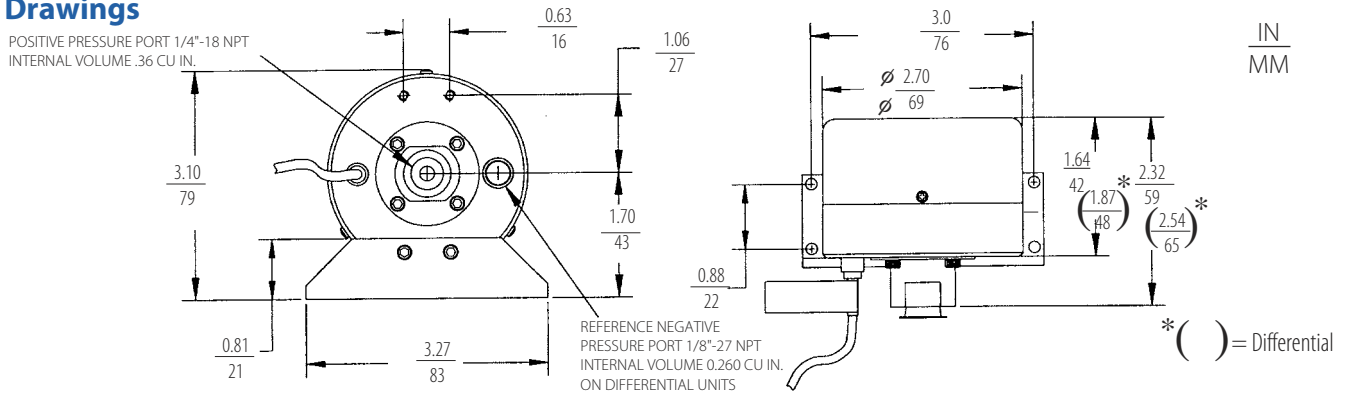
Positive Pressure Media	Gas or liquid compatible with 17-4 PH Stainless Steel.*
Reference Pressure Media	Clean dry air or non-corrosive gas (1000 psig maximum).

* Hydrogen not recommended for use with 17-4 PH Stainless Steel.

NOTE: Setra adheres to strict quality standards including ISO 9001 and ANSI-Z540-1. The calibration of this product is NIST traceable.

Specifications subject to change without notice.

Outline Drawings



Ordering Information: Code all blocks in table: Example Part

2	0	4	R							
Model	Pressure Ranges		Type	Pressure Fitting	Output	Electrical Termination	Options			
204R	PSI		G = Gauge A = Absolute D = Differential B = Bidirectional/Differential V = Vacuum (Z01 Range Code Only)	2F = 1/4" NPT Female (Process Port) 1/8" NPT Female (Ref. Port Differential Units)	11 = 4 to 20 mA 2B = 0 to 5 VDC 2C = 0 to 10 VDC	02 = 2 ft. Standard Cable XX = Custom Cable (ie., 10 ft. = 10) up to 25 ft.	A = Improved Accuracy: 0.073% FS (RSS) B = NEMA Weather Proof Enclosure Z = Combination of Options (Consult Factory)			
	Undirectional	Bidirectional								
	025P = 0 to 25 PSI	010P = 0 to ±10 PSI								
	050P = 0 to 50 PSI	025P = 0 to ±25 PSI								
	100P = 0 to 100 PSI	050P = 0 to ±50 PSI								
	250P = 0 to 250 PSI	100P = 0 to ±100 PSI								
	500P = 0 to 500 PSI	250P = 0 to ±250 PSI								
	10CP = 0 to 1000 PSI	500P = 0 to ±500 PSI								
	30CP = 0 to 3000 PSI									
	50CP = 0 to 5000 PSI									
	10KP = 0 to 10000 PSI									
	Z01P = 0 to -14.7 PSI									

NOTE: Standard configuration consists of: PSI Range, 1/4" NPT Fitting and 2 feet of cable.

Consult a Setra Applications Engineer for assistance on other configurations or units with multiple options.

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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