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.

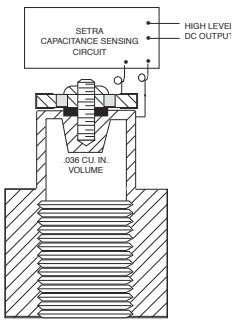
The exceptional accuracy is achieved by combining Setra's unique electronic circuitry with its patented variable capacitance sensor. This unit is compensated for both zero and sensitivity shifts due to environmental temperature variations. The Model 204R offers high-level output (eg. 0-5 VDC or 4-20 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.

Pressure Ranges

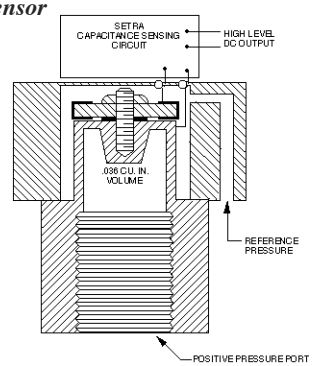
Pressure Range PSID	Proof Pressure* PSID	Burst Pressure*	Approx. Natural Freq.: kHz
0 to ±10 0 to 25	±50	±150 psid	2.0
0 to ±25 0 to 50	±75	±200 psid	2.5
0 to ±50 0 to 100	±150	±500 psid	3.5
0 to ±100 0 to 250	±375	±1000 psid	5.0
0 to ±250 0 to 500	±750 positive port: reference pot:	+1500 psid 1000 psig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

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

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

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
- 0.11% 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

Visit Setra Online: www.setra.com

setra

800-257-3872

159 Swanson Rd., Boxborough, MA/Telephone: 978-263-1400/Fax: 978-264-0292

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	5 x 10^{-5} cu. in.
Warm-up Shift	±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

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

**Units calibrated at nominal 70ºF . 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 variationeffect 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

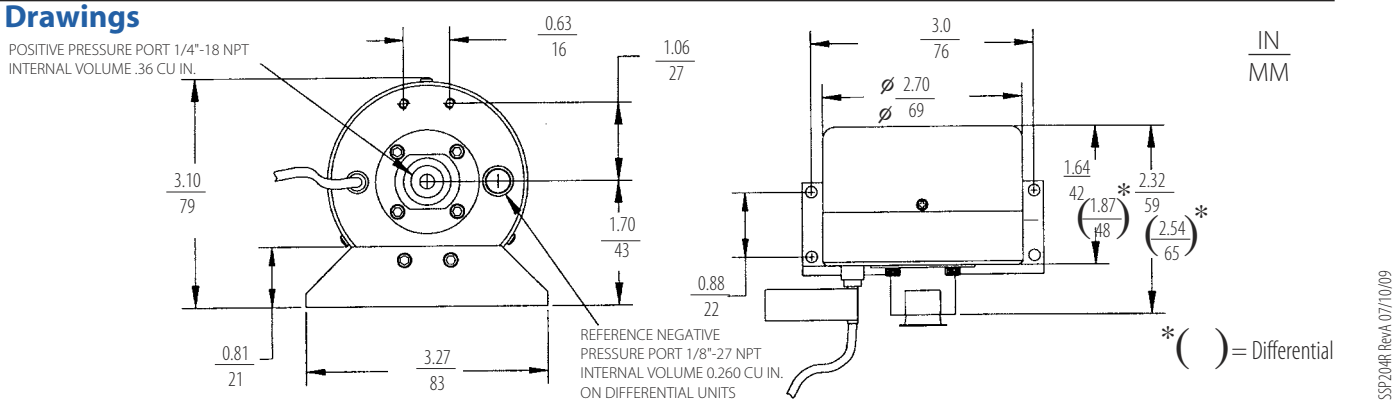
Positive Pressure Media	Gas or liquid compatible with 17-4 PH Stainless Steel.*
Reference Pressure Media	Clean dry air or non-corrosive gas (1000 psig maximum).

* 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



SSP 204R RevA 07/10/09

Ordering Information: Code all blocks in table: Example Part

2 0 4 R — ☐☐☐☐ — ☐ — ☐☐ — ☐☐ — ☐☐ — ☐

Model
204R

Pressure Ranges
PSI

Undidirectional	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	500 P =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	

Type
G = Gauge
A = Absolute
D = Differential
B = Bidirectional/Differential
V = Vacuum
(Z01 Range Code Only)

Pressure Fitting
2F = 1/4" NPT Female
(Process Port}
1/8" NPT Female
(Ref. Port Differential Units)

Output
11 = 4 to 20 mA
2B= 0 to 5 VDC
2C = 0 to 10 VDC

Electrical Termination
02 = 2 ft. Standard Cable
XX = Custom Cable
(ie., 10 ft. = 10) up to 25 ft.

Options
A = Improved Accuracy: 0.073% FS (RSS)
B = NEMA Weather Proof Enclosure
Z = Combination of Options
(Consult Factory)

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.

159 Swanson Road, Boxborough, MA 01719/Tel: 978-263-1400;
Toll Free: 800-257-3872; Fax: 978-264-0292; email: sales@setra.com