



Model 224

Ultra High Purity Flow-Through Pressure Transducer

Features

- Superior stability avoids downtime
- EMI/RFI immunity prevents false shutdown
- Sturdy design allows trouble-free installations
- Minimal torque effect
- High burst pressure ratings
- Easy purgeability
- Virtually insensitive to thermal transients in flow stream
- Optional ETL certified as conforming to UL 121201 and ATEX 2014/34/EU approval available for 4 to 20 mA output units
- CE and RoHS compliant

Applications

- High purity gas delivery
- Semiconductor process tools
- Pharmaceutical & biotech process
- Gas cabinets

Setra's Model 224 ultra-high purity pressure transducer is designed for the most demanding specialty gas monitoring and control applications, where construction integrity, purity and performance cannot be sacrificed.

The 224 has a small, streamlined sensor chamber for easy purgeability. The sensor is designed to provide superior mechanical and thermal stability, especially in transient temperature conditions resulting from flowing gases. Isolation of the sensing element from the pressure fitting virtually eliminates any torque effect.

Variable capacitance

This superior mechanical and thermal stability is achieved through Setra's patented variable capacitance sensor. Its fundamentally simple design features VAR 316L SS wetted parts, passivated to 5 Ra (7 Ra max) finish for system continuity, and an insulated electrode plate fastened to the center of the sensor diaphragm, which forms a variable capacitor. As pressure increases or decreases, the capacitance changes. This change in capacitance is detected and converted to a linear analog signal by Setra's unique electronic circuit.

Various tube diameters are available with optional face seal fittings. Sturdy construction allows for trouble-free instillation and high tolerance of system torsion and welding effects, providing confident installations. Model 224 transducers are able to endure bake out to 185°F (85°C), without affecting calibration. Every sensor is mass spectrometer helium leak tested to 1×10^{-9} ATM CC/sec. This ultra-high purity series is based on Setra's proven capacitive sensing technology and highly accurate and stable voltage or current output signals are virtually EMI/RFI immune.

Specifications

Performance data

Accuracy	±0.25% FS ±1.0% of reading
Non-linearity, (BFSL)	±0.15% FS
Hysteresis	±0.20% FS
Non-repeatability	±0.02% FS

Thermal effects

Compensated range	+15° to +150°F (-9° to +65°C)
Zero shift %FS/100°F(%FS/50°C)	2.0 (1.8)
Span shift %FS/100°F(%FS/50°C)	2.0 (1.8)
Warm-up shift	0.1% FS total

Electrical data (current)

Circuit	2-Wire
Output ⁵	^{6,7,4} -20 mA
External load	0-800 Ω
Minimum supply voltage	(VDC)=10+0.02x/(resistance of receiver plus line)
Maximum supply voltage	(VDC)=30+0.004x/(resistance of receiver plus line)

Electrical data (voltage)

Circuit	3-Wire
Excitation	10 to 30 VDC fo 5V FSO
Output ²	^{3,4} 0-5 VDC or 0.2-5.2 VDC ^{3,4} 0-10 VDC or 0.2-20.2 VDC
Current consumption	<8 mA

Physical description

Case	Stainless steel
Electrical connection	6ft. multiconductor cable, bayonet connector or D-sub connectors
Pressure fittings	See ordering information
Zero/Span adjustments	Top access
Weight	6 ounces (170 grams)

Environmental data

Operating temperature ¹	-40 to +185 (-40 to +85)
Storage temperature	-40 to +185 (-40 to +85)

Current unit ordered w/option N1

Operating °F (°C)	-22 to +176 (-30 to +80)
Storage °F (°C)	-22 to +176 (-30 to +80)

Approvals

Non-incendive	Certified for use in potentially hazardous locations
North America	ETL certified as conforming to UL 121201 available for units ordered with 4 to 20 mA current output (Select N1 option)
Europe	Optional ATEX 2014/34/EU approval available for units ordered with 4 to 20 mA current output (Select N1 option)

Pressure media

Gases or liquids compatible with 316L stainless steel.

¹Operating temperature limits of the electronics only. Pressure media temperatures may be considerably higher or lower.

²Calibrated into a 50K ohm load, operable into a 5000 ohm load or greater.

³Zero output factory set to within ±25mV (for 5 VDC output) or ±50mV (for 10 VDC output).

⁴Span (Full Scale) output factory set to within ±25mV (for 5 VDC output) or ±50mV (for 10 VDC output).

⁵Calibrated at factory with 24 VDC loop supply voltage and s 250 ohm load

⁶Zero output factory set to within ±.08mA

⁷Span (full scale) output factory set to within ±.08mA

Pressure ranges

0 psia or -14.7 psig to:	0 bar or -1 bar to:	Proof pressure (psig)	Burst pressure (psig)	Design Pressure (psig)
25	1.7	50	1500	180
50	3.4	75	3000	365
100	7.0	150	3000	365
250	17	350	5000	600
500	35	650	7500	900
1000	70	1250	7500	1500
3000	200	3500	10,000	3000
-14.7 to 85.3	---	150	3000	365
-14.7 to 235.3	---	350	5000	600
-14.7 to 985.3	---	1250	7500	1500
-14.7 to 2985.3	---	3500	10,000	3000

NOTE: setra quality standards are based on ansi-z540-. The calibration of this product is NIST traceable.

Proof Pressure: The maximum pressure that may be applied without changing performance beyond specifications (±1% FS zero shift).

Burst Pressure: The maximum pressure that may be applied to the positive pressure port without rupturing the sensing element.

Design Pressure calculated per ASME BPVC.IV-2015 HG-502.3

