



## Model 223

### Ultra High Purity Flow-Through Pressure Transducers

#### 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
- CE and RoHS compliant

#### Applications

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

Setra's model 223 ultra-high purity pressure transducer is designed for the most damaging specialty gas monitoring and control applications, where construction integrity, purity and performance cannot be sacrificed.

The 223 has a small, streamlined sensor chamber for easy purgeability. The sensor 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.

#### Setra's variable capacitance

This superior mechanical and thermal stability is achieved through Setra's patented variable capacitance sensor. Its fundamentally simple design features a 316L VIM/VAR stainless steel sensor passivated to Ra (7 Ra max) finish, which eliminated surface irregularities and provides the proper surface chemistry for corrosion resistance, and an insulated electrode plate fastened to the center of the sensor diaphragm, forming a variable capacitor. As pressure increase 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 223 transducers are able to endure bake out to 185°F (85°C), without affecting calibration. Every sensor is mass spectrometer helium leak tested to  $1 \times 10^{-9}$  ATM.CC/sec.

This ultra-high purity series is based on Setra's proven capacitive sensing technology and the highly accurate and stable voltage or current output signals are virtually EMI/RFI immune.

After manufacture and assembly, Setra's ultra-high purity pressure transducers are flushed with deionized water, purged with high-purity heated nitrogen, baked, double bagged, backfilled with nitrogen and sealed, prior to shipping.



## Specifications

### Electrical data (voltage)

Circuit	3-Wire
Excitation	10 to 30 VDC for 5V FSO 13 to 30 VDC for 10 VFO
Output <sup>3</sup>	0-5 VDC or 0.2-5.2 VDC <sup>4</sup> 0-10 VDC or 0.2-10.2 VDC <sup>4</sup>
Current consumption	<8mA

### Electrical data (current)

Circuit	2-Wire
Output <sup>5</sup>	4-20 mA <sup>6</sup>
External load	0 to 800 ohms
Min. supply voltage (VDC)	10 + 0.02x (resistance of receiver plus line)
Max. supply voltage (VDC)	30 + 0.004x (resistance of receiver plus line)

### Approvals

Non-Incendive	Certified for use in potentially hazardous locations
North America	Optional 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.

<sup>1</sup>RSS of non-linearity, non-repeatability and hysteresis

<sup>2</sup>Operating temperature limits of the electronics only. Pressure media temperature may be considerably higher or lower.

<sup>3</sup>Calibrated into a 50K ohm load, operable into 5000 ohm load or greater

<sup>4</sup>zero output factory set to with ±25mV (for 5 VDC output) or ±50mV (for 10 VDC output).

Specifications subject to change without notice

## Pressure ranges

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

Note: Setra quality standards are based on ANSI-Z540-1. The calibration of the 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

### Environmental data

Operating temperature <sup>2</sup>	-40° to +185°F (-40° to +85°C)
Storage temperature	-40° to +185°F (-40° to +85°C)

### Current unit ordered w/option N1

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

### 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

### Physical description

Case	Stainless steel
Electrical connection	6ft. multi-conductor cable, bayonet, 9-pin or 15-pin D-sub connector
Pressure fittings	See ordering information
Zero/span adjustments	Side access
Weight (approx.)	5.6 ounces (160 grams)

### Performance data

Accuracy RSS <sup>1</sup> (at constant temp)	±0.25% FS or ±1.0% of reading
Non-linearity, (BFSL)	±0.15% FS
Hysteresis	0.20% FS
Non-repeatability	0.02% FS

<sup>4</sup>Span (full scale) output factory set within ±25mV (for 5VDC output) or ±50mV (for 10 VDC output)

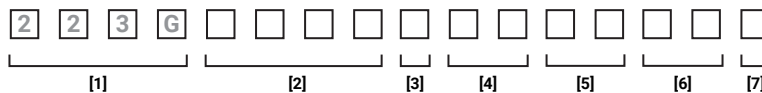
<sup>5</sup>Calibrated at the factory set to with a 24VDC loop supply voltage and a 250 ohm load.

<sup>6</sup>Zero output factory set to within ±0.08mA. Span (full scale) output factory set to within ±0.16mA.

## Ordering information

Example part number: 223G30CPGAA11B1J

Model 223 with a Pressure Range of 0 to 3000 PSI, #4 M/M Fixed Face Seals, 4 to 20 mA Output, 4 pin Bayonet Connector, and Accuracy ±1.0% of Reading with a Calibration Certificate



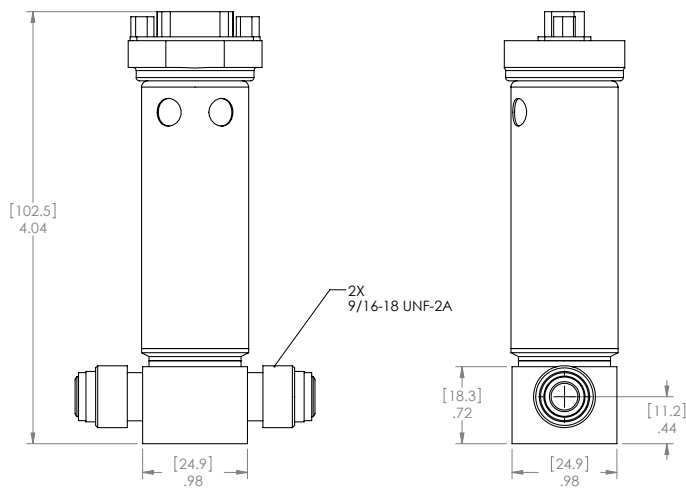
[1]	[2]	[3]	[4]	[5]	[6]	[7]
<b>Model</b>	<b>Pressure range</b>	<b>Pressure type</b>	<b>Fitting</b>	<b>Output</b>	<b>Elec. termination</b>	<b>Accuracy</b>
<b>223G</b> Model 223	<b>025P</b> 25 PSI <b>050P</b> 50 PSI <b>100P</b> 100 PSI <b>250P</b> 250 PSI <b>500P</b> 500 PSI <b>10CP</b> 1000 PSI <b>30CP</b> 3000 PSI <b>Z01P</b> -14.7 to 85.3 PSI <b>Z02P</b> -14.7 to 235.3 PSI <b>Z03P</b> -14.7 to 985.3 PSI <b>Z05P</b> -14.7 to 2985.3 PSI <b>1R7B</b> 1.7 BAR <b>3R4B</b> 3.4 BAR <b>007B</b> 7 BAR <b>017B</b> 17 BAR <b>035B</b> 35 BAR <b>070B</b> 70 BAR <b>200B</b> 200 BAR	<b>A</b> Absolute <b>C</b> Compound <b>G</b> Gauge	<b>AA</b> #4 M/M fixed face seals (2.24" end to end) <b>BB</b> #4 F/F swivel face seals (3.65" end to end) <b>BC</b> #4 M/F swivel face seals (4.25" end to end) <b>BA</b> #4 M/M swivel face seals (4.25" end to end) <b>2T</b> 1/4" tube stub (1.85" end to end) <b>3T</b> 3/8" tube stubs (2.25" end to end) <b>4T</b> 1/2" tube stubs (2.25" end to end)	<b>11</b> 4-20mA <b>2B</b> 0-5 VDC <b>2C</b> 0-10 VDC <b>33</b> 0.2-5.2 VDC <b>59</b> 0.2-10.2 VDC <b>N1</b> 4-20 mA <sup>1</sup>	<b>B1</b> 4 pin bayonet connector <b>06</b> 6 ft. multi-conductor cable <b>D1</b> 15-pin D-sub <b>D9</b> 9-pin D-sub	<b>F</b> ±0.25% FS w/cal. cert. <b>J</b> ±1.0% of reading w/ cal. cert

<sup>1</sup>ETL certified as conforming to UL 121201 for Class 1, groups A, B, C, D, Division 2  
 ATEX approved to EN60079-0 and EN60079-15 II 3 G  
 Ex nA IIC T4 Gc X -30°C <Ta<+80°C

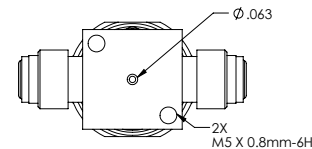
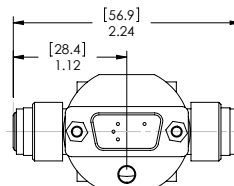
See Setra's model 224 with top access zero and span potentiometers, and additional electrical connectors

Please contact factory for configurations not shown.

## Dimensions



Fitting code	Pressure fitting	"L" in. (mm)
AA	#4 M/M-fixed face seals	2.24 (57.2)
BB	#4 F/F-swivel face seals	3.05 (77.5)
BC	#4 M/F-swivel face seals	3.65 (92.7)
BA	#4 M/M-swivel face seals	4.25 (108)
2T	1/4" O.D. tube stubs	1.85 (47)
3T	3/8" O.D. tube stubs	2.25 (57.2)
4T	1/2" O.D. tube stubs	2.25 (57.2)



Inches  
(mm)



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