



Model 239

High Accuracy Low Differential Pressure Transducer

Features

- Industry standard for high accuracy
- Captures dynamic pressure changes
- Small footprint
- Optional high accuracy: 0.073% FS
- Fast response time: <10ms
- Fast warm-up: <0.1% over 5 min.
- Low thermal error
- CE & RoHS compliant

Applications

- Exhaust pressure
- Leak detection systems
- Filter pressure
- Medical instrumentation
- Part integrity testing
- Cleanrooms

Setra's Model 239 is the "standard" for measuring low differential pressure in the Test & Measurement industry. Decades worth of installations have helped the 239 build a reputation of reliability and remains the trusted choice for critical installations. The 239 delivers an optional high performance 0.073% FS accuracy over a wide temperature range which outperforms competitive transducers in the low pressure market. The 239 offers multiple options to meet both simple and demanding application requirements that are not provided on competitive transducers.

Long-term reliability

The Model 239 differential pressure transducer uses a simple and reliable variable capacitance sensor design. The 239 provides repeatable and dependable readings in rugged applications through its efficient sensor design.

Accuracy & performance for low pressure ranges

The Model 239 is a Test & Measurement grade transducer for extremely low pressure ranges. The 239 covers a large selection of pressure ranges with a $\pm 0.073\%$ FS accuracy option over a wide temperature range. The Model 239 provides the fastest response time compared to its competitors.

Customization is standard

Unlike many competitors, the 239 offers many mechanical and electrical options that can be integrated into existing system designs. These options reduce engineering design time, allowing for earlier project completion and quicker time to market.





Specifications

Performance data

Accuracy RSS ¹ (at constant temp)	±0.14% FS
Non-linearity (BFSL)	±0.10% FS
Hysteresis	0.10% FS
Non-repeatability	0.02% FS
Warm-up shift	<±0.1% FS residual shift after 5 minutes
Setting time	<100ms
Acceleration response	<0.0002 PSIG
Natural frequency	2000 Hz nominal
Operable line pressure	Vacuum to max 250 PSIG
Line pressure effect	2%/100 PSI

Thermal effects²

Compensated range °F(°C)	+30 to +150 (-1 to -65)
Zero/ span shift %FS/100°F (%FS/50°C)	<+1 (<±0.9)/<+1 (<±0.9)

Environmental data

Operating temperature ³ °F(°C)	0 to +175 (-18 to +80)
Storage temperature °F(°C)	-65 to +250 (-55 to +120)

Approvals

CE, RoHS

¹RSS of Non-Linearity, Hysteresis, and Non-Repeatability.

²Units calibrated at nominal 70°F. Max thermal error computer from this datum. x 2 for 0.5 and ±0.25 in W.C. changes.

³Calibrated at factory with a 24 VDC loop supply voltage and a 250 ohm load.

Physical description

Pressure fittings	1/8" -27NPT internal
Electrical connection	2' multiconductor cable
Weight (approx)	8 oz
Vibration	2g from 5 Hz to 500 Hz
Internal volumes	Positive port 0.03 in ³ negative port 0.1 in ³
Max volume change at FS	0.001 in ³
Acceleration	10g max
Shock	50g operating

Electrical data (voltage)

Circuit	4-wire (+Exc, -Exc, +Out, -Opt)
Excitation ⁴	22 to 30 VDC (reverse excitation protected)
Output impedance	<10 ohms
Output noise	<200 microvolts RMS (in band, 0Hz to 10kHz)
Output ⁵	See ordering information (for unidirectional ranges) ±2.5 VDC (for bidirectional ranges)

Pressure media

Positive pressure media: Gases compatible with stainless steel, hard anodized 6061 aluminum (Buna-N O-ring)

Reference pressure media: Clean dry air or other gases (non-corrosive, non-condensable)

⁴Internal regulation minimizes effect of excitation variation, with <±0.005% FS output change. Will operate on 28VDC aircraft power per MIL-STD-704A & not be damaged by emergency power conditions.

⁵Calibrated into 50K oh load. Operable into 5000 ohms or greater. Zero output factory set to within ±20mV. ±0.4%FS (±20mV on 5VDC span)

Proof pressure

Pressure range		Proof pressure	
Unidirectional	Bidirectional	Positive	Negative
0 to 0.5 in. W.C.	±0.25 in. W.C.	5 PSI	2.5 in. W.C.
0 to 1 in. W.C.	±0.5 in. W.C.	7 PSI	5 in. W.C.
0 to 2.5 in. W.C.	±1 in. W.C.	10 PSI	12.5 in. W.C.
0 to 5 in. W.C.	±2.5 in. W.C.	20 PSI	25 in. W.C.
0 to 15 in. W.C.	±5 in. W.C.	50 PSI	75 in. W.C.
0 to 30 in. W.C.	0 to ±15 in. W.C.	50 PSI	150 in. W.C.
0 to 5 PSID	0 to ±2.5 PSID	75 PSI	25 PSI
0 to 10 PSID	0 to ±5 PSID	100 PSI	50 PSI

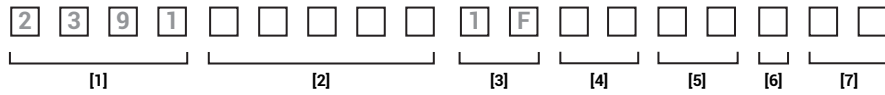
Pressure range		Proof pressure	
Unidirectional	Bidirectional	Positive	Negative
0 to 250 Pa	±125 Pa	0.5 BAR	1250 Pa
0 to 500 Pa	±250 Pa	0.7 BAR	3000 Pa
0 to 1000 Pa	±500 Pa	1.25 BAR	6250 Pa
0 to 2000 Pa	±1000 Pa	3.5 BAR	18500 Pa
0 to 5000 Pa	±2500 Pa	3.5 BAR	37000 Pa
0 to 15 kPa	±7500 Pa	3.5 BAR	37000 Pa
0 to 35 kPa		5 BAR	1.75 BAR
0 to 70 kPa	±35 kPa	7 BAR	3.5 BAR



Ordering information

Example part number: 2391005PB1F2S02WNN

Model 239, ±5 PSID pressure range, 1/8" NPT Int. fitting, ±2.5 VDC, 2' Cable Length, ±0.14% FS Accuracy, No Options.



[1]		[2]		[3]		[4]		[5]		[6]		[7]	
Model		Pressure range		Pressure fitting		Output		Termination		Accuracy		Options ⁴	
2391	Model 239	Unidirectional		1F 1/8" NPT Int.		2S ±2.5 VDC ¹		02 2' Cable 22 GA		W ±0.14% FS		N None	
		Bidirectional				2B 0 to 5 VDC ²		10 10' Cable 22 GA		9 ±0.073% FS		1 303SS housing positive port	
		0R5WD 0 to 0.5 in. W.C.	R2SWB ±0.25 in. W.C.			27 1 to 5 VDC		25 25' Cable 22 GA				3 Compensated temp. range (-65 to 250°F) ⁷	
		001WD 0 to 1 in. W.C.	0RSWB ±0.5 in. W.C.			28 1 to 6 VDC		Y1 2'30 GA 9-conductor ³				4 Viton O-ring	
		2R5WD 0 to 2.5 in. W.C.	001WB ±1 in. W.C.			2C 0 to 10 VDC		Y3 5'30 GA 9-conductor ³				D Mate with Datum	
		005WD 0 to 5 in. W.C.	2RSWB ±2.5 in. W.C.			2T 0 to 5 VDC ¹		Y4 10'30 GA 9-conductor ³				E Special excitation voltage ±24 VDC ⁷	
		015WD 0 to 15 in. W.C.	005WB ±5 in. W.C.					Y6 25'30 GA 9-conductor ³				G Special excitation voltage ±15VDC ⁷	
		030WD 0 to 30 in. W.C.	7RSWB ±7.5 in. W.C.									L Etched SS tags	
		005PD 0 to 5 PSID	015WB ±15 in. W.C.									M Remote full scale sensitivity ⁷	
		010PD 0 to 10 PSID	2RSPB ±2.5 PSID									R Remote calibration (adjustable) ⁷	
		250LD 0 to 250 Pa	005PB ±5 PSID									S Remote calibration adjustment (fixed) ⁷	
		500LD 0 to 500 Pa	125LB ±125 Pa									Y Clean for oxygen	
		10CLD 0 to 1000 Pa	250LB ±250 Pa										
		20CLD 0 to 2000 Pa	500LB ±500 Pa										
		50CLD 0 to 5000 Pa	10CLB ±1000 Pa										
		010KD 0 to 10 kPa	25CLB ±2500 Pa										
		015KD 0 to 15 kPa	50CLB ±5000 Pa										
		035KD 0 to 35 kPa	75CLB ±7500 Pa										
		070KD 0 to 60 kPa	035KB ±35 kPa										

¹ 2S and 2T are for bidirectional pressure ranges only

² 2B is for unidirectional pressure ranges only

³ Y1-Y6 = Red jacket cable

(Previously the standard for voltage outputs.)

⁴ Both boxes must be filled in alphanumeric order:

- If No options: N + N

- If 1 option: Option code + N

- If 2 options: Option code + Option code

⁵ Options M, R & S are for voltage units and Y1-Y6 termination codes

⁶ 2x Thermal effects specification

⁷ Option 3 can only be ordered with 22 GA wire and cannot be ordered with options E,G,M,R, and S.

Both boxes must be filled in alphanumeric order:

- If No options: N + N
- If 1 option: Option Code + N
- If 2 options: Option Code + Option Code

Specifications subject to change without notice.

Dimensions

