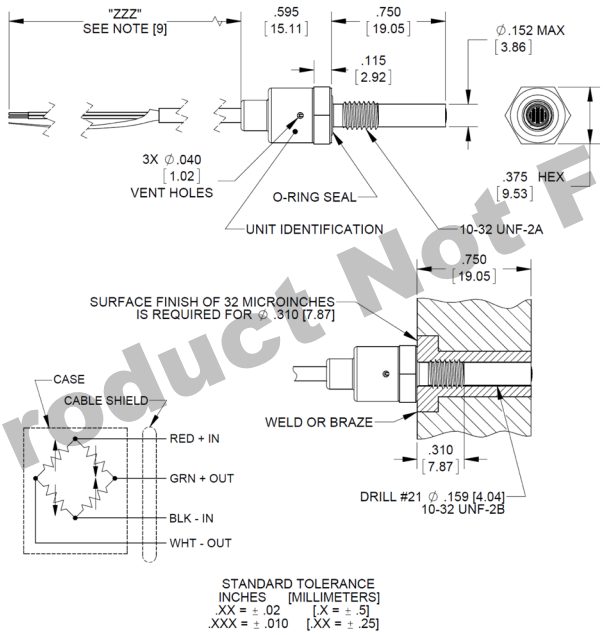
ENDEVCO
AN AMPHENOL COMPANY

Piezoresistive pressure transducer

Model 8523



Key features

- 15, 50, 100, 200 and 500 psig ranges
- 300 mV full scale
- High temperature, +500ºF (+260ºC)

Model 8523 is a rugged, miniature, high sensitivity piezoresistive pressure transducer. It has a 0.152 inch (3.86 mm) face diameter and is available in ranges from 15 to 500 psig. Model 8523 features high temperature performance to +500°F (+260°C) and can operate with diminished lifetime to +600°F (+316°C). Its excellent linearity combined with very high resonance makes it ideal for measuring dynamic pressure.

The transducer employs silicon strain gages bonded to a micro-machined silicon diaphragm for maximum sensitivity and wide frequency response. Internal sensitivity compensation and zero trim provides accuracy to +500°F (+260°C). This transducer exhibits low photo-flash sensitivity and high stability during temperature transients.

Model 8523 is designed to measure static or dynamic pressures. Its small diameter suits it to flush mounting for measuring skin pressures on aircraft, inlet distortion pressures in turbine engines or transmission pressures in automobiles. The transducer's high frequency response permits use on small scale models in wind tunnels. Three holes in the back of the unit vent to atmospheric pressure.

Recommended electronics for signal conditioning and power supply are model 126 and 136 general purpose three channel conditioners, or the 4990A-X (Oasis) multi-channel rack mount system.

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Specifications

The following performance specifications conform to ISA-RP-37.2 (1964) and are typical values, referenced at +75°F (+24°C) and 100 Hz, unless otherwise noted. Calibration data, traceable to National Institute of Standards and Technology (NIST), is supplied.

Dynamic characteristics	Units	-15	-50	-100	-200	-500
Range [1]	psig	0–15	0–50	0–100	0–200	0–500
Sensitivity [1]	mV/psi	20 +10/-6.7	6 +3/-2	3 +1.5/-1.0	1.5 +0.75/-0.5	0.6 +0.3/-0.2
Combined: non-linearity, non repeatability, pressure hysteresis [2]	% FSO RSS max	0.50	0.50	0.50	0.75	0.75
Non-linearity, independent	% FSO typ	0.25	0.25	0.25	0.4	0.4
Non-repeatability	% FSO typ	0.1	0.1	0.1	0.1	0.1
Pressure hysteresis	% FSO typ	0.1	0.1	0.1	0.1	0.1
Zero measurand output [3]	mV max	±10	±10	±10	±10	±10
Zero shift after 2X range	% 2X FSO max (typ)	0.2 (0.1)	0.2 (0.1)	0.2 (0.1)	0.2 (0.1)	0.2 (0.1)
Thermal zero shift						
From -30°F to 500°F (-34°C to +260°C) ref. to 75°F (24°C)	% FSO max	3.0	3.0	3.0	3.0	3.0
Thermal sensitivity shift						
From -30°F to 500°F (-34°C to +260°C) ref. to 75°F (24°C)	% max	4.0	4.0	4.0	4.0	4.0
Diaphragm resonance frequency	Hz (typ)	140 000	240 000	350 000	450 000	900 000
Non-linearity at 2X range	% 2X FSO (typ)	0.5	1.0	1.0	1.0	1.0
Zero shift with mounting torque						
15 lbf-in.	% FSO (typ)	0.25	0.25	0.25	0.25	0.25
Thermal transient response per ISA-S37.10, PARA. 6.7, procedure I [4]	psi / °F (typ)	0.002	0.004	0.005	0.006	0.006
Photoflash response [5]	equiv psi	0.1	0.2	0.3	0.5	1.0
Warm-up time [6]	ms	1	1	1	1	1
Acceleration sensitivity	equiv. psi/g	0.0004	0.0003	0.0003	0.0007	0.0010
Burst pressure (diaphragm)	psig min	44.7	114.7	214.7	414.7	1014.7

Electrical	
Full scale output	300 +150/-100 mV at 10.0 Vdc
Supply voltage [7]	10.0 Vdc recommended, 18 Vdc maximum
Electrical configuration	Active four-arm piezoresistive bridge
Polarity	Positive output for increasing pressure into (+) port
Resistance	
Input	1600 ±900 ohms
Output	800 ±500 ohms
Isolation	100 megohms minimum at 50 Volts, leads to case, leads to shield, shield to case
Noise	5 microvolts rms typical, DC to 50 000 Hz; 50 microvolts rms maximum, DC to 50 000 Hz

Mechanical	
Case, material	Stainless steel (17-4 PH CRES)
Cable, integral	Four conductor No. 30 AWG Teflon insulated conductors, braided shield, Teflon jacket
Dead volume, measurand (+) port	0.0003 cubic inches (0.005 cc)
Mounting/torque	10-32 UNF-2A threaded case 0.75 inch (19.05 mm) long / 15 ±5 lbf-in (1.7 ±0.6 Nm)
Weight	8.5 grams (cable weighs 14 grams/meter)

Environmental	
Media	Media in (+) port is exposed to stainless steel case, silicon diaphragm, ceramic, epoxy, RTV and fluorosilicone O-ring.
Temperature [8]	-65°F to +500°F (-54°C to +260°C)
Vibration / acceleration	300 g
Shock	10 000 g, 100 microsecond half-sine

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Accessories

Product	Description	8530B
EHR97	O-ring, fluorosilicone	Included
25045	Cable, 4 conductor	Optional

Notes

1. 1 psi = 6.895 kPa = 0.069 bar.
2. FSO (Full Scale Output) is defined as transducer output change from 0 psia to + full scale pressure.
3. Zero Measurand Output (ZMO) is the transducer output with 0 psia applied.
4. Significantly higher thermal transient errors occur if the excitation voltage exceeds 10 Vdc. For sensitive phase change studies, many users reduce the excitation to 5 Vdc or even 1 Vdc.
5. The metal screen partially shields the silicon diaphragm from incident radiation. Accordingly, light incident at acute angles to the screen generally increases the error by a factor of 2 or 3.
6. Warm-up time is defined as elapsed time from excitation voltage "turn on" until the transducer output is within ±1% of reading accuracy.
7. Use of excitation voltages other than 10.0 Vdc requires manufacture and calibration at that voltage since thermal errors increase with high excitation voltages.
8. 8523 can be operated at 500°F (260°C) continuously, at 550°F (288°C) for up to 24 hours and at 600°F (316°C) for up to 4 hours.
9. Maintain high levels of precision and accuracy using Endevco's factory calibration services. Call Endevco's inside sales force at 866-ENDEVCO for recommended intervals, pricing and turn-around time for these services as well as for quotations on our standard products.

Model definition

8523 - XXX - Y - ZZZ

- ZZZ: Cable length in inches (ie 8523-XXX-120 has a length of 120 inches) If no dash number is specified the default is 30 inches.
- Y: Excitation voltage (If no voltage is specified the default is 10 Vdc) A=2 Vdc, B=2.5 Vdc, C=3.3 Vdc, D=5 Vdc, E=7, F=7.5
- XXX: Pressure range (psig) -15, -50, -100, -200, -500
- 8523: Basic model number

Contact

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