

8510B -200,-500,-2000 Piezoresistive pressure transducer

Features

- 200 to 2000 psi, 300 mV full scale
- Rugged, miniature



Description

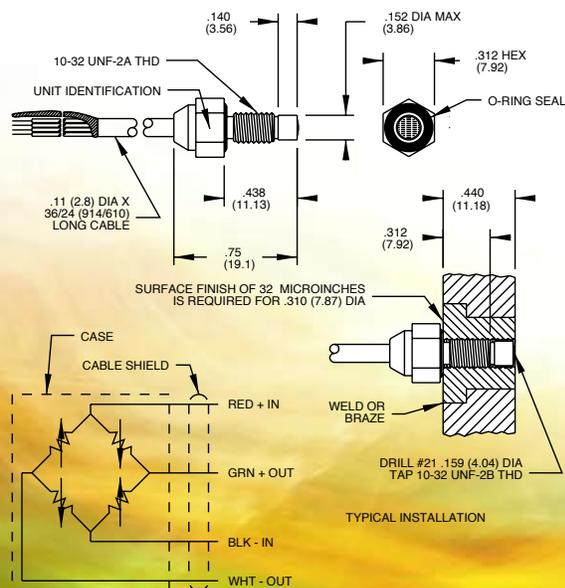
The Endevco® model 8510B is a rugged, miniature, high sensitivity piezoresistive pressure transducer. It has a 10-32 mounting thread, 0.15 inch (3.8 mm) face diameter and is available in ranges from 1 psi to 2000 psi. Its high sensitivity combined with high resonance makes it ideal for measuring dynamic pressure.

Endevco pressure transducers feature a four-active arm strain gage bridge diffused into a unique sculptured silicon diaphragm for maximum sensitivity and wideband frequency response. Self-contained hybrid temperature compensation provides stable performance over the temperature range of 0°F to 200°F (-18°C to +93°C). Endevco transducers also feature excellent linearity (even to 3X range), high shock resistance, and negligible sensitivity to temperature transients.

The model 8510B is designed for a wide variety of aerospace, automotive and industrial measurements which require a combination of small size, high sensitivity, and wideband frequency response. Its vent tube may be connected to a standard reference manifold or used for differential pressure measurements.

The model 8510B is available with metric M5 x 0.8 mounting thread as 8510B-XXM5 on special order.

Endevco model 136 Three-Channel System, model 4428A or 4430A signal conditioner, or OASIS 2000 computer-controlled system are recommended as signal conditioner and power supply.



STANDARD TOLERANCE
INCHES (MILLIMETERS)
.XX = +/- .03 (X = +/- .8)
.XXX = +/- .010 (XX = +/- .25)

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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), 100 Hz and 10 Vdc unless otherwise noted. Calibration data, traceable to National Institute of Standards and Technology (NIST), is supplied.

Dynamic characteristics	Units	8510B-200	-500	-2000
Range [1]	psig	0-200	0-500	0-2000
Positive sensitivity [2]	mV/psi	1.5 ±0.5	0.6 ±0.2	0.15 ±0.05
Combined: non-linearity, non-repeatability, pressure hysteresis [3]	% FSO RSS max	0.50	0.50	1.0
Non-linearity, independent	% FSO typ	0.25	0.25	0.25
Non-repeatability	% FSO typ	0.1	0.1	0.2
Pressure hysteresis	% FSO typ	0.1	0.1	0.2
Zero measurand output [4]	mV max	±10	±10	±10
Zero shift after 3X range	±% 3X FSO max	0.2	0.2	0.2
Thermal zero shift				
from 0°F to +200°F (-18°C to +93°C)	±% FSO max	3	3	3
Thermal sensitivity shift				
from 0°F and +200°F (-18°C to +93°C)	±% max	4	4	4
Resonance frequency	Hz	320 000	500 000	900 000
Non-linearity at 3X range	% 3X FSO	1	1	1
Thermal transient response per	psi/°F	0.01	0.01	0.16
ISA-S37.10, para. 6.7, procedure I	psi/°C	0.02	0.02	0.30
Photoflash response [5]	Equiv. psi	28	70	1300
Warm-up time [6]	ms	1	1	1
Acceleration sensitivity	Equiv. psi/g	0.0003	0.0004	0.00027
Burst pressure (diaphragm/reference side) [7]	psi min	1000/300	2500/300	10 000/300
Electrical				
Full scale output		300 ±100 mV at 10.0 Vdc		
Supply voltage [8]		10.0 Vdc recommended, 18.0 Vdc maximum		
Electrical configuration		Active four-arm piezoresistive bridge		
Polarity		Positive output for increasing pressure into (+) port (end with screen on it)		
Resistance				
Input		2000 ±800 ohms		
Output		1600 ±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		4 conductor No. 32 AWG Teflon® insulated leads, braided shield, silicone jacket, 30 ±3 in (760 ±76 mm)		
Dead volume (+) port		0.0003 cubic inches (0.005 cc)		
Mounting torque		10-32 UNF-2A threaded case 0.438 inch (11.12 mm) long/15 ±5 lbf-in (1.7 ±0.6 Nm)		
Weight		2.3 grams (cable weighs 9 grams/meter)		
Environmental characteristics				
Media [9] [10]		Internal seals are epoxy compatible with clean dry gas media. Media is exposed to CRES, ceramic, silicon, Parylene C, clean, dry air or other non-conductive gases, epoxy, silicone rubber, and the O-ring		
Temperature [9] [10]		-65°F to +250°F (-54°C to +121°C)		
Vibration		1000 g pk		
Acceleration		1000 g		
Shock		20 000 g, 100 microsecond haversine pulse		
Humidity		Isolation resistance greater than 100 megohms at 50 volts when tested per MIL-STD-202E, method 103B, test condition B		

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Calibration data supplied

Data supplied for all parameters in Certified Performance section. Optional calibrations available for all parameters in Typical Performance section.

Included accessories

EHR93	O-ring, Viton
3027A-120	Cable assembly

Optional accessories

EHR96	O-ring, fluorosilicone
24328	4 conductor shielded cable

Notes:

1. Pressure ranges can be considered bidirectional, e.g., an 8510B-200 can be used to measure + or -200 psig. Sensitivity in the positive direction is typically within 1% of sensitivity in the negative direction. Sensitivity calibration provided with each unit is for the positive direction.
2. 1 psi = 6.895 kPa = 0.069 bar.
3. FSO (Full Scale Output) is defined as transducer output from 0 to full scale pressure, which is nominally 300 mV.
4. Zero Measurand Output (ZMO) is the transducer output with 0 psig applied.
5. Per ISA-S37.10, Para. 6.7, Proc. II. 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 $\pm 1\%$ of reading accuracy.
7. Reference side pressure may be 300 psi on all ranges if differential limits (psid) are not exceeded.
8. Use of excitation voltages other than 10.0 Vdc requires manufacture and calibration at that voltage since thermal errors increase with high excitation voltages.
9. O-Ring, Endevco part number EHR93 Viton® is supplied unless otherwise specified on Purchase Order. Part number EHR96 Parker material L677-70 for leak tight operation below 0°F (-18°C) is available on special order.
10. Maintain high levels of precision and accuracy using Endevco's factory calibration services. Call Endevco's inside sales force at 800-982-6732 for recommended intervals, pricing and turnaround time for these services as well as for quotations on our standard products.

NOTE: Tighter specifications are available on special order.



Continued product improvement necessitates that Endevco reserve the right to modify these specifications without notice. Endevco maintains a program of constant surveillance over all products to ensure a high level of reliability. This program includes attention to reliability factors during product design, the support of stringent Quality Control requirements, and compulsory corrective action procedures. These measures, together with conservative specifications have made the name Endevco synonymous with reliability.

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