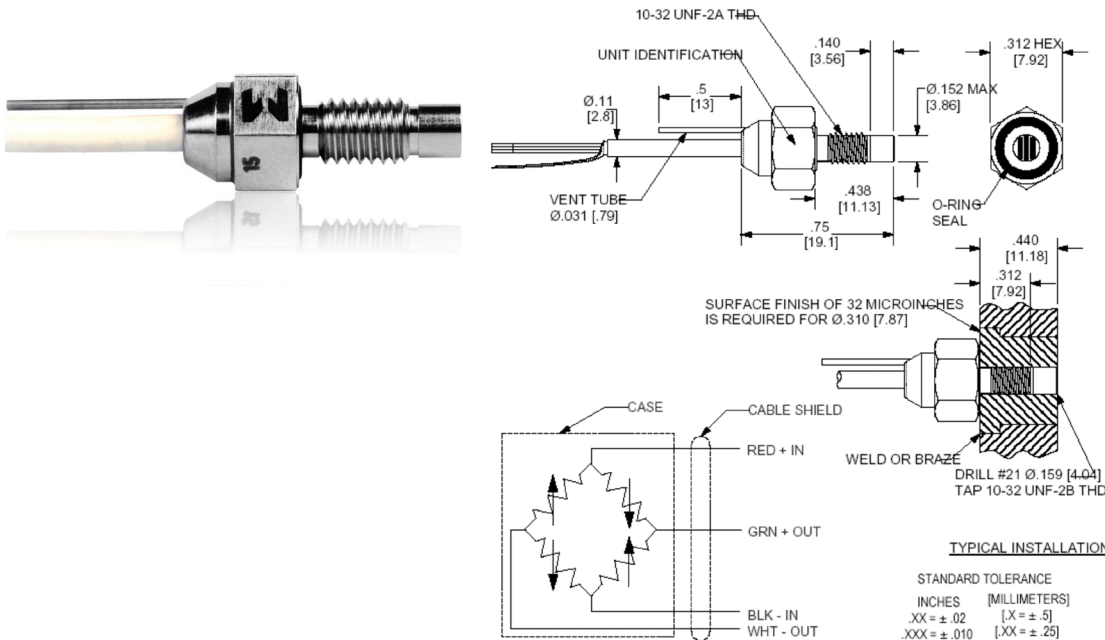


Piezoresistive pressure transducer

Model 8510B -1, -2, -5



Key features

- 1, 2 and 5 psig ranges
- 300mV full scale output
- Rugged, miniature
- Gage

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. Low pressure ranges are shown on this sheet. 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.

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.

8510B is available with metric M5 x 0.8 mounting thread as 8510B-XM5 on special order.

Recommended electronics for signal conditioning and power supply are models 126 and 136 general purpose three channel conditioners, ultra low noise 4430A conditioner, or the 436 (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	-1	-2	-5
Range [1]	psig	0-1	0-2	0-5
Positive sensitivity [2]	mV/psi	200 ±50	100 +55/-25	60 ±20
Combined: non-linearity, non-repeatability, pressure hysteresis [3]	% FSO RSS max	1.50	1.50	0.75
Non-linearity, independent	% FSO typ	1.0	1.0	0.5
Non-repeatability	% FSO typ	0.2	0.2	0.1
Pressure hysteresis	% FSO typ	0.2	0.2	0.1
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	55 000	70 000	85 000
Non-linearity at 3X range	% 3X FSO	2.5	2.5	2.0
Thermal transient response per	psi/°F	0.003	0.003	0.003
ISA-S37.10, para. 6.7, procedure I	psi/°C	0.005	0.005	0.005
Photoflash response [5]	Equiv. psi	0.2	0.3	0.7
Warm-up time [6]	ms	1	1	1
Acceleration sensitivity	Equiv. psi/g	0.0002	0.0002	0.0002
Burst pressure (diaphragm/reference side) [7]	psi min	25/25	40/40	100/100

Electrical

Full scale output	300 ±100 mV at 10.0 Vdc; 200 ±50 mV at 10.0 Vdc for 8510B-1
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	1500 ±600 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]	
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

Calibration data supplied

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

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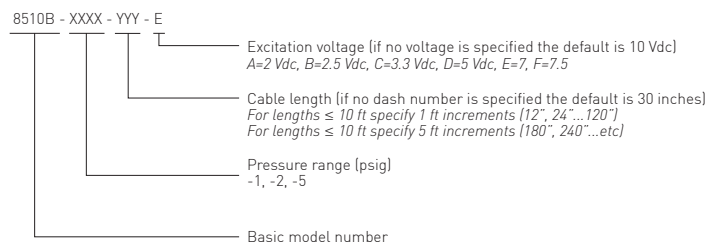
Accessories

EHR93	O-ring, Viton	Included
EHR96	O-ring, fluorosilicone	Optional
24328-3	4 conductor shielded cable, white	Optional

Notes

- 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.
- 1 psi = 6.895 kPa = 0.069 bar.
- FSO (Full Scale Output) is defined as transducer output from 0 to full scale pressure, which is nominally 300 mV.
- Zero Measurand Output (ZMO) is the transducer output with 0 psig applied.
- 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 Warm-up time is defined as elapsed time from excitation voltage "turn on" until the transducer output is within $\pm 1\%$ of reading accuracy.
- Reference side pressure may be 300 psi on all ranges if differential limits (psid) are not exceeded.
- Please specify the excitation voltage you will use and we will calibrate at that voltage for highest accuracy. See model definition.
- Internal seals are epoxy and are compatible with clean dry gas media. Media in (+) measurand port is exposed to CRES, nickel-iron alloy, Parylene C, epoxy, and the Viton® O-ring media in (-) measurand port is exposed to the above and RTV silicone coating. For use in water or corrosive media, contact the factory for modifications and installation precautions which may be taken to extend service life.
- 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
- 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



Other options

- M1 No vent tube
- M5 Metric thread
- M7 No screen
- M8 "A" screen, black grease - ITAR
- M11 "B" screen
- M37 Integral connector, no vent tube, hole on side
- M41 Gel
- M43 "B" screen, black grease - ITAR

Contact

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