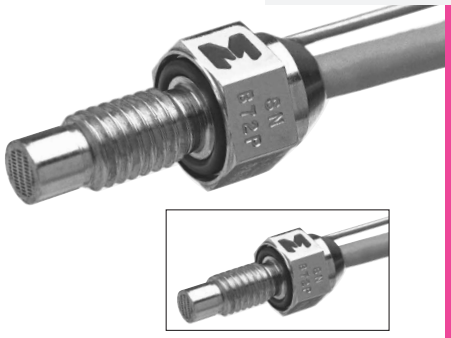
Piezoresistive Pressure Transducer

ENDEVCO MODEL 8510B

Model 8510B-200, -500 and -2000

- **200 to 2000 psi, 300 mV Full Scale**
- **Rugged, Miniature**



Actual size

DESCRIPTION

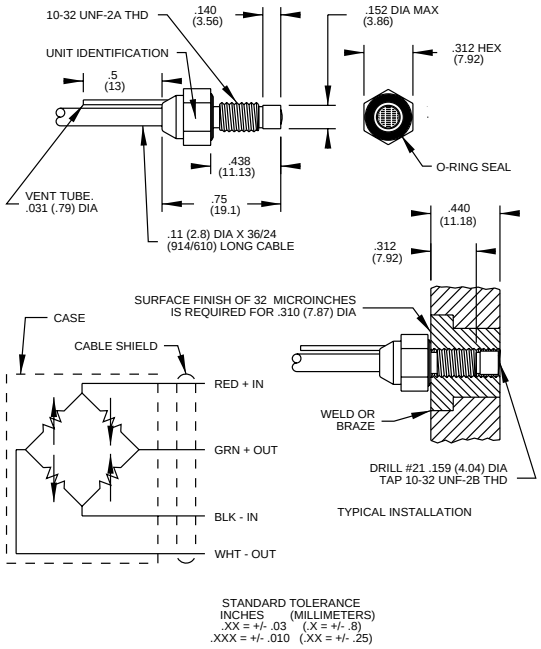
The ENDEVCO® Model 8510B is a rugged, miniature, high sensitivity piezoresistive pressure transducer. It has a 10-32 mounting thread, 0.15 inch (3.8 mm) face diameter and is available in ranges from 1 psi to 2000 psi. Its high sensitinity combined with high resonance makes it ideal for measuring dynamic 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 M5X0.8 mounting thread as 8510B-XXM5 on special order.

ENDEVCO Model 136 Three-Channel System, Model 4430A Signal Conditioner, or Model 68207 BCAS™ Computer Controlled System are recommended as signal conditioner and power supply.



SPECIFICATIONS

CERTIFIED PERFORMANCE: All specifications assume +75°F (+24°C) and 10 Vdc excitation unless otherwise stated. The following parameters are 100% tested. Calibration data, traceable to the National Institute of Standards and Technology (NIST), is supplied.

	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 to 200°F (-18°C to +93°C)	±% Max	4	4	4

ENDEVCO MODEL 8510B

Piezoresistive Pressure Transducer

SPECIFICATIONS—continued

TYPICAL PERFORMANCE CHARACTERISTICS: The following parameters are established from testing of sample units.

	Units	8510C -200	-500	-2000
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	Four 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

MEDIA [9] [10]	
TEMPERATURE [10] [11]	-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

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

ACCESSORY

EHR93	O-RING, VITON

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 negitive 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 300mV.
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 ±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. Internal seals are epoxy compatible with clean dry gas media. Media in (+) measurand port is exposed to CRES, nickle-iron alloy, Parylene C, epoxy, and the VITON O-Ring. Media in (-) measurand port is exposed to the above and RTV silicon coating. For use in water or corrosive media, contact the factory for modifications and installation precautions which may be taken to extend service life.
10. O-Ring, Parker 5-125, compound V747-75 (VITON) is supplied unless otherwise specified on purchase order. Fluorosilicone O-ring for leak-tight operation below 0°F is available on special order.
11. Units can be compensated over any 200°F (93°C) span from -65°F to +250°F (-54°C to +121°C) on special order.

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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