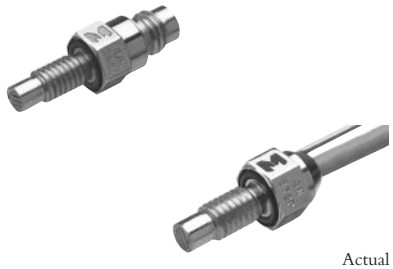
Piezoresistive Pressure Transducer

ENDEVCO MODEL 8510B-1 -2 -5

Model 8510B-1, -2 and -5

- **1 to 5 psi, 300 mV Full Scale**
- **Rugged, Miniature**



Actual size

DESCRIPTION

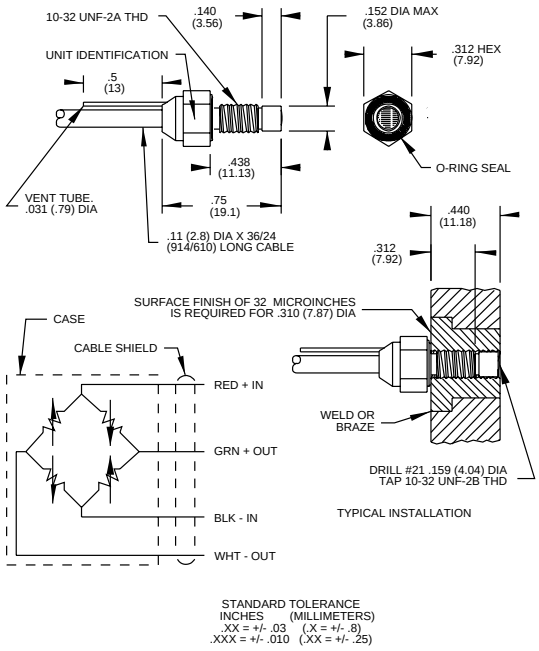
The ENDEVCO® Model 8510B is a rugged, miniature, high sensitivity piezoresistive pressure transducer. It has a 10-32 mounting thread, 0.15 inch (3.8 mm) face diameter and is available in ranges from 1 psi to 2000 psi. Low pressure ranges are shown on this sheet. Its high sensitivity combined with high 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.

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 4428A or 4430A Signal Conditioner, or OASIS 2000 Computer-Controlled System are recommended as signal conditioner and power supply.



*Option X: 40°F to 140°F (5°C to 60°C)

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-1	-2	-5
RANGE [1]	psig	0 - 1	0 - 2	0 - 5
POSITIVE SENSITIVITY [2]	mV/psi	200 ± 50	150 ± 50	60 ± 20
COMBINED: NON-LINEARITY, NON-REPEATABILITY, PRESSURE HYSTERESIS [3]	% FSO RSS Max	1.5	1.5	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
From 40°F to 140°F (5°C to 60°C)	±% FSO Max	3	3	3 X-Option
THERMAL SENSITIVITY SHIFT				
From 0°F to 200°F (-18°C to +93°C)	±% Max	4	4	4
From 40°F to 140°F (5°C to 60°C)	±% Max	4	4	4 X-Option

ENDEVCO MODEL 8510B-1 -2 -5

Piezoresistive Pressure Transducer

SPECIFICATIONS—continued

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

	Units	8510B-1	-2	-5
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	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-5 can be used to measure + or -5 psig. Sensitivity in the positive direction is typically within 1% of sensitivity in the negative direction. Sensitivity calibration provided with each unit is for positive direction.
2. 1 psi = 6.895 kPa = 0.069 bar.
3. FSO (Full Scale Output) is defined as transducer output change from 0 psig to + full scale pressure. Calibration provided is for positive pressure. Sensitivity to negative pressures is typically within 1% of positive pressure sensitivity.
4. Zero Measurand Output (ZMO) is the transducer output with 0 psig applied.
5. Per ISA-S37.10, Para. 6.7, Proc. I. 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 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.
10. O-Ring, Parker 5-125, compound V747-75 (VITON) is supplied unless otherwise specified on purchase order. Flourosilicone O-Ring for leak-tight operation below 0°F 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.
12. 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 turn-around 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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