

Piezoresistive Microphone

**ENDEVCO
MODEL
8510B-1
-2**

Model 8510B-1 and -2

- High Intensity
- Rugged, Miniature
- 300 mV Full Scale

DESCRIPTION

The ENDEVCO® Model 8510B is a miniature piezoresistive pressure transducer used for measuring high intensity sound. This transducer employs a four-active arm strain gage bridge diffused into a sculptured silicon diaphragm providing capability for measurement from static pressure throughout the normal audio range. The diaphragm's unique design offers a wide dynamic range and a wide frequency response.

Hybrid temperature compensation circuitry is contained within the transducer case, allowing sensitivity compensation over a range from 0°F to 200°F (-18°C to +93°C).* The Model 8510B has 10-32 mounting threads allowing for easy installation. This rugged ENDEVCO transducer offers high shock and vibration resistance.

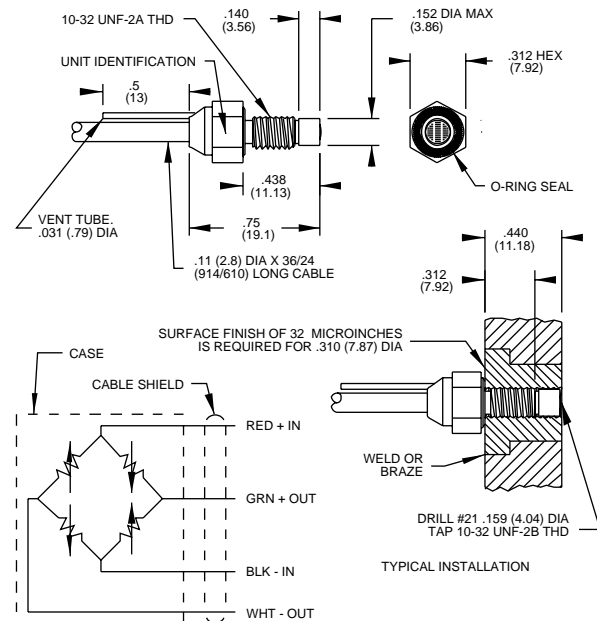
The miniature size of this transducer permits flush mounting on flat or contoured surfaces for boundary layer measurements in flight test or wind tunnels and on engine inlet acoustic studies.

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 OASIS 2000 Computer-Controlled System are recommended as signal conditioner and power supply.



Actual size



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

*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
RANGE [1]	dB SPL	At least 95 to 190	At least 100 to 190
SENSITIVITY	dB	-93, ref 1V per Pa minimum, (-91 ref 1V per Pa typical, equivalent to 200 mV/psi)	-97 ref 1V per Pa minimum, (-93 ref 1V per Pa typical, equivalent to 150 mV/psi)
AMPLITUDE LINEARITY	dB	± 0.5, 95 to 190 dB SPL	± 0.5, 100 to 190 dB SPL
ZERO MEASURAND OUTPUT	mV Max	± 10	± 10
SENSITIVITY CHANGE WITH TEMPERATURE			
From 0°F to 200°F (-18°C to +93°C)	dB	± 0.5	± 0.5
From 40°F to 140°F (5°C to 60°C)	dB	± 0.5	± 0.5

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SPECIFICATIONS—continued

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

	Units	8510B-1	-2
RESONANCE FREQUENCY	Hz	55 000	70 000
FREQUENCY RESPONSE	dB	±0.5 to 4000 Hz, ±5 to more than 16 000 Hz	±0.5 to 5000 Hz, ±5 to more than 20 000 Hz
DIRECTIVITY		Essentially omnidirectional within frequency range	
VIBRATION SENSITIVITY	dB SPL	97 at 1 g rms	97 at 1 g rms
WARM-UP TIME	ms	1	1
DIAPHRAGM BURST PRESSURE	dB SPL	> 195	> 197
SENSITIVITY CHANGE WITH PRESSURE		Not detectable beyond basic non-linearity error	

ELECTRICAL

SUPPLY VOLTAGE [2]	10 Vdc recommended, 18 Vdc maximum		
ELECTRICAL CONFIGURATION	Active four-arm piezoresistive bridge		
POLARITY	Positive output for increasing pressure into (+) port (end with screen on)		
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	< 78 dB SPL	< 80 dB SPL	

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	0.0003 cubic inches (0.005 cc)		
MOUNTING/TORQUE	10-32 UNF-2A threaded case 0.438 inch (11.12 mm) long/15 ±lbf-in (1.7 ±0.6 Nm)		
WEIGHT	2.3 grams (cable weighs 9 grams/meter)		

ENVIRONMENTAL

MEDIA [3]			
TEMPERATURE	-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. [4]

ACCESSORY

EHR93 O-RING, VITON

OPTIONAL ACCESSORIES

EHR96 O-RING, FLUOROSILICONE
 24328 4 CONDUCTOR SHIELDED CABLE

- Data supplied for all parameters in the Certified Performance section is reported in psi, % FSO and % reading.
- 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.

NOTES

- Reference 0 dB = .0002 rms μ bar (rms dynes/cm²) = 20 x 10⁻⁶ N/m² rms = 20 μ Pa rms.
- Operation of the transducer at voltages other than 10.0 Vdc requires that it be manufactured and calibrated at that voltage, since thermal errors increase with high excitation voltages.
- 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.

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.