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

**Features**

- 200, 500 and 2000 psig ranges
- 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. High 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 M5 x 0.8 mounting thread as 8510B-XXM5 on special order.

Recommended electronics for signal conditioning and power supply are the Endevco model 126 and 136 general purpose three channel conditioners, ultra low noise 4430A conditioner, or the 4990A-X (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), 100 Hz and 10 Vdc unless otherwise noted. Calibration data, traceable to National Institute of Standards and Technology (NIST), is supplied.

<table>
<thead>
<tr>
<th>Dynamic characteristics</th>
<th>Units</th>
<th>-200</th>
<th>-500</th>
<th>-2000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range [1]</td>
<td>psig</td>
<td>0–200</td>
<td>0–500</td>
<td>0–2000</td>
</tr>
<tr>
<td>Positive sensitivity [2]</td>
<td>mV/psi</td>
<td>1.5 ±0.5</td>
<td>0.6 ±0.2</td>
<td>0.15 ±0.05</td>
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<tr>
<td>Combined: non-linearity, non-repeatability, pressure hysteresis [3]</td>
<td>% FSO RSS max</td>
<td>0.50</td>
<td>0.50</td>
<td>1.0</td>
</tr>
<tr>
<td>Non-linearity, independent</td>
<td>% FSO typ</td>
<td>0.25</td>
<td>0.25</td>
<td>0.25</td>
</tr>
<tr>
<td>Non-repeatability</td>
<td>% FSO typ</td>
<td>0.1</td>
<td>0.1</td>
<td>0.2</td>
</tr>
<tr>
<td>Pressure hysteresis</td>
<td>% FSO typ</td>
<td>0.1</td>
<td>0.1</td>
<td>0.2</td>
</tr>
<tr>
<td>Zero measurand output [4]</td>
<td>mV max</td>
<td>±10</td>
<td>±10</td>
<td>±10</td>
</tr>
<tr>
<td>Zero shift after 3X range</td>
<td>±% FSO max</td>
<td>0.2</td>
<td>0.2</td>
<td>0.2</td>
</tr>
<tr>
<td>Thermal zero shift</td>
<td>±% FSO max</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Thermal sensitivity shift</td>
<td>±% max</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Resonance frequency</td>
<td>Hz</td>
<td>320 000</td>
<td>500 000</td>
<td>900 000</td>
</tr>
<tr>
<td>Non-linearity at 3X range</td>
<td>% 3X FSO RSS max</td>
<td>0.1</td>
<td>0.1</td>
<td>0.16</td>
</tr>
<tr>
<td>ISA-S37.10, para. 6.7, procedure I</td>
<td>% FSO typ</td>
<td>0.02</td>
<td>0.02</td>
<td>0.30</td>
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<tr>
<td>Photoflash response [5]</td>
<td>Equiv. psi</td>
<td>28</td>
<td>70</td>
<td>1300</td>
</tr>
<tr>
<td>Warm-up time [6]</td>
<td>ms</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Acceleration sensitivity</td>
<td>Equiv. psi/g</td>
<td>0.0003</td>
<td>0.0004</td>
<td>0.00027</td>
</tr>
<tr>
<td>Burst pressure (diaphragm/reference side) [7]</td>
<td>psi</td>
<td>1000/300</td>
<td>2500/300</td>
<td>10 000/300</td>
</tr>
</tbody>
</table>

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 ±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)
  - 0.003 cubic inches (0.005 cc)
- Dead volume (+) port
  - 0.0003 cubic inch (0.05 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
- 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

Optional accessories
EHR96 O-ring, fluorosilicone
24328-3 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 ±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, 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.
11. 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.