MODELS 137B2XB, 137B2XA, 137B25

QUARTZ, FREE-FIELD, ICP® BLAST PRESSURE PENCIL PROBE

One-piece design improves alignment
Micro-second rise time
400 kHz resonant frequency
Two pressure outputs in one probe

TYPICAL APPLICATIONS

Air Blast Measurement
Peak Pressure and Total Impulse
Explosive Research and Structural Loading
Shock Wave Velocity and/or Time-of-Arrival Determinations MTS

SERIES 137B PENCIL PROBES WITH 10-32 OR BNC JACK CONNECTORS, SINGLE AND DUAL OUTPUT AVAILABLE

The Pencil Probe is designed to measure shock waves caused from explosions in air. Such explosions are found in the industries of Defense and Mining, or wherever explosives research is conducted.

Series 137B pencil probes incorporate acceleration-compensated quartz sensing elements and integral ICP® microelectronics that assist driving the blast signal over long cables, with improved stability and durability.

Series 137B quartz, free-field, ICP® blast pressure pencil probes are offered with both 10-32 coaxial jack connector and BNC electrical connectors. New to the series are two-sensor probes that allow an easy way to capture shock speed close to the explosion. The pencil probes continue to feature an extremely fast micro-second response time, with resonant frequency above 400k Hz.
Series 137B quartz, free-field, ICP® blast pressure probes have an unique pencil shape that allows the shock wave to progress smoothly across the sensor, providing distortion free measurements. Applications include measuring blast pressure to obtain peak pressure, total impulse, shock wave and time-of-arrival measurements often used to study blast effects.

A blast wave, usually incident to the longitudinal axis of the pencil probe, will become distorted at its higher frequencies (shorter wavelengths) when encountering the probe tip. The unique shape of the probe allows the blast wave to reconstitute itself by the time it arrives at the sensing face, which is located transverse to the longitudinal axis of the probe. A machined “flat” along the side of the probe minimizes distortion of the blast wave that would otherwise occur due to the flat sensing face of the sensor protruding from a cylindrical probe body. When the probe is pointed at blast waves, the configuration permits accurate measurement of static overpressure.

“Placebo” transducers enable data validation to be accomplished. The placebo transducer should respond only to extraneous “environmental factors.” Ideally, its output would be zero. PCB® can assist by supplying “placebo” transducers to support this validation process, Model 137BPBO.

The sensors require ICP® (IEPE) constant current power supply. Signal conditioners with a minimum of 100 kHz are recommended, but 1 MHz is desired. A list of 1 MHz PCB® ICP® signal conditioners can be found on page 4.
<table>
<thead>
<tr>
<th>Free-Field ICP® Blast Pressure Probe</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Model Number</strong></td>
</tr>
<tr>
<td><strong>Sensitivity</strong></td>
</tr>
<tr>
<td><strong>Maximum Pressure</strong></td>
</tr>
<tr>
<td><strong>Resolution</strong></td>
</tr>
<tr>
<td><strong>Resonant Frequency</strong></td>
</tr>
<tr>
<td><strong>Rise Time (Incident)</strong></td>
</tr>
<tr>
<td><strong>Temperature Range</strong></td>
</tr>
<tr>
<td>**Discharge Time Constant(at room temp)</td>
</tr>
<tr>
<td><strong>Electrical Connector</strong></td>
</tr>
<tr>
<td><strong>Housing Material</strong></td>
</tr>
<tr>
<td><strong>Diaphragm Material</strong></td>
</tr>
<tr>
<td><strong>Sealing</strong></td>
</tr>
</tbody>
</table>

**Additional Accessories**

- **Mating Cable Connectors**: — — AC — AC
- **Recommended Stock Cables (29 pF/ft, 95 pF/m)**: 002ACXXXAC 002ACXXXAC 002ACXXXAC 002ACXXXAC 002ACXXXAC
- **Dual Output Cable**: 010AYXXXQM 010AYXXXQM 010AYXXXQM 010AYXXXQM 010AYXXXQM

**Additional Versions**

- **10-32 Coaxial Jack Connector with Protective Cover**: 137B21A 137B22A 137B23A 137B24A —
- **Placebo, BNC Jack Only**: 137BPBO 137BPBO 137BPBO 137BPBO 137BPBO
- **Two-Sensor Pencil Probe**: 137B26 137B27 137B25 137B26 —
- **Active Sensor in front, Placebo in rear**: — — — 137B32 —

**Notes**

[1] For +10 volt output, minimum 24 VDC supply voltage required. Negative 10 volt output may be limited by output bias.
Series 137B require standard ICP® power with the ability to adjust constant current. It is important to account for extra cable capacitance found in long cables used in blast test environments by increasing the constant current. The signal conditioner should also have at least 100 kHz bandwidth, preferably 1 MHz.

**RECOMMENDED SIGNAL CONDITIONERS**

**MODEL 482A21**
- Single & 4-channel versions
- Unity gain, low-noise, AC and DC powerable
- 1M Hz response

**MODELS 482C05**
- AC-powered
- 4-channel version
- 1M Hz response

**SERIES 483C05**
- AC-powered
- 8-channel
- 1M Hz response