



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

CE



NEW SERIES 137B PENCIL PROBES WITH 10-32 OR BNC JACK CONNECTORS, WITH 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.

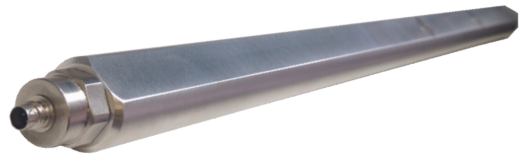


Series 137B quartz, free-field, ICP® blast pressure probes have a unique pencil shape that allows the shock wave to progress smoothly across the sensor, providing distortion free measurements. Applications include measuring blast pressure to obtain peak pressure, total impulse, shock wave and time-of-arrival 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.

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.

“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.





Model 137B2XB (BNC Connector)



Model 137B2XA (10-32 Connector with Protective Cover)



Model 137B25 (4-pin Connector with 2-Channel Output)

| FREE-FIELD ICP® BLAST PRESSURE PROBE | | | | |
|---|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|
| Model Number | 137B21B | 137B22B | 137B23B | 137B24B |
| Measurement Range | 1 kpsi [3] 6895 kPa [3] | 500 psi 3447 kPa | 50 psi 345 kPa | 250 psi 1724 kPa |
| Useful Overrange | — | 1 kpsi [1] 6895 kPa [1] | 100 psi [1] 690 kPa [1] | 500 psi [1] 3447 kPa [1] |
| Sensitivity | 1 mV/psi 0.145 mV/kPa | 10 mV/psi 1.45 mV/kPa | 100 mV/psi 14.5 mV/kPa | 20 mV/psi 2.9 mV/kPa |
| Maximum Pressure | 5 kpsi 34,475 kPa | 5 kpsi 34,474 kPa | 1 kpsi 6895 kPa | 5 kpsi 34,474 kPa |
| Resolution | 8.5 mpsi 0.059 kPa | 1 mpsi 0.007 kPa | 10 mpsi 0.069 kPa | 0.7 mpsi 0.005 kPa |
| Resonant Frequency | > 400 kHz | > 400 kHz | > 400 kHz | > 400 kHz |
| Rise Time (Incident) | < 4 µsec | < 4 µsec | < 4 µsec | < 4 µsec |
| Non-linearity | < 1 % [2] | < 1 % [2] | < 1 % [2] | < 1 % [2] |
| Temperature Range | -100 to +275 °F -73 to +135 °C | -100 to +275 °F -73 to +135 °C | -100 to +275 °F -73 to +135 °C | -100 to +275 °F -73 to +135 °C |
| Discharge Time Constant(at room temp) | > 0.2 sec | > 0.2 sec | > 0.2 sec | > 0.2 sec |
| Electrical Connector | BNC Coaxial Jack | BNC Coaxial Jack | BNC Coaxial Jack | BNC Coaxial Jack |
| Housing Material | Aluminum | Aluminum | Aluminum | Aluminum |
| Diaphragm Material | Invar | Invar | Invar | Invar |
| Sealing | Epoxy | Epoxy | Epoxy | Epoxy |
| Additional Accessories | | | | |
| Mating Cable Connectors | — | — | AC | — |
| Recommended Stock Cables (29 pF/ft, 95 pF/m) | — | — | 002 Multi-strand for Blast | — |
| Dual Output Cable | 010AYXXXQM | — | — | 010AYXXXQM |
| Additional Versions | | | | |
| 10-32 Coaxial Jack Connector with Protective Cover | 137B21A | 137B22A | 137B23A | 137B24A |
| Placebo, BNC Jack Only | 137BPBO | 137BPBO | 137BPBO | 137BPBO |
| Two-Sensor Pencil Probe | 137B28 | 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. [2] Zero-based, least-squares, straight line method. [3] For +/- 1V output. | | | | |

RECOMMENDED SIGNAL CONDITIONERS

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.

CE



TEDS
CIRCUITRY
COMPATIBLE

SERIES 483C05

- AC-powered
- 8-channel
- 1M Hz response

CE



MODEL 482A21

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

CE



TEDS
CIRCUITRY
COMPATIBLE

MODELS 482C05

- AC-powered
- 4-channel version
- 1M Hz response

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