

# Acoustic Measurement Products

For Precision Sound Level and Array Measurements

- Sound Power Testing
- Engine Noise Analysis
- Environmental Noise Analysis
- Near-field Acoustic Holography
- Building Noise Studies
- Acoustic Chamber Testing
- Sound Pressure Mapping



The Vibration Division of PCB® Piezotronics, Inc., offers a variety of acoustic measurement products, including condenser, modern prepolarized, traditional externally polarized, array, probe, low-profile surface, and special purpose microphones. Microphone products are complemented by an assortment of preamplifiers, signal conditioners, A-weighting filters, handheld calibrators, and accessories.

As with all PCB® instrumentation, this equipment is complemented with toll-free applications assistance, 24-hour customer service, and is backed by a no-risk policy that guarantees satisfaction or your money refunded.



**PCB** PIEZOTRONICS<sup>INC.</sup>  
VIBRATION DIVISION

*Total Customer Satisfaction Guaranteed*



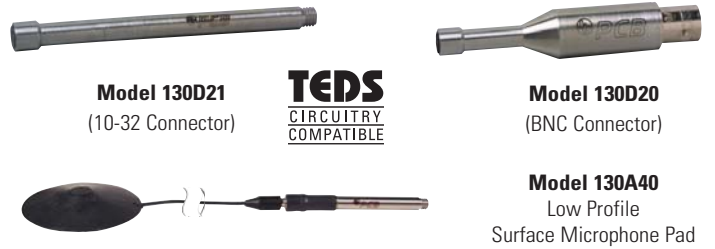
### ICP™ Array Microphones

- Low per-channel cost
- Powered from ICP® sensor signal conditioners

- Interchangeable with ICP® accelerometers

- Integrated preamplifier

Series 130 ICP™ Array Microphones provide a cost-effective method for large-channel count sound pressure measurements. They are powered by standard ICP® sensor signal conditioners. Typical applications include sound pressure mapping, acoustic mode analysis, near field acoustic holography, and vibro-acoustic testing.



Models 130D20 and 130D21 are available with Transducer Electronic Data Sheet (TEDS) option, compliant with IEEE 1451.4.

Array kits are also available, complete with patch panel, cables, and signal conditioners, for multi-channel applications. PCB® also offers versatile, precision-made array microphone test stands and flexible pattern arrays.

| ICP™ Array Microphones with Integral Preamplifier |                       |                 |                 |
|---|-----------------------|-----------------|-----------------|
| Model Number                                      | 130A40                | 130D20          | 130D21          |
| Microphone Diameter                               | 1/4"                  | 1/4"            | 1/4"            |
| Response  | Pressure              | Free-field      | Free-field      |
| Sensitivity (± 3 dB at 250 Hz)                    | 45 mV/Pa              | 45 mV/Pa        | 45 mV/Pa        |
| Frequency Response (± 1 dB)                       | 100 Hz to 4 kHz       | 100 Hz to 4 kHz | 100 Hz to 4 kHz |
| Frequency Response (-2, +5 dB)                    | 20 Hz to 10 kHz ± 2dB | 20 Hz to 15 kHz | 20 Hz to 15 kHz |
| Dynamic Range (10 Hz to 10 kHz, ref. 20 µPa)      | <30 to >122 dB        | <30 to >122 dB  | <30 to >122 dB  |
| Polarization Voltage                              | 0 V                   | 0 V             | 0 V             |
| Connector   | 10-32                 | BNC             | 10-32           |

### Modern Prepolarized and Traditional, Externally-Polarized Precision Condenser Microphones

- Proven ruggedized design
- Exceptional performance in high humidity

- Individually tested for performance
- Meet IEC and ANSI standards

- Can be utilized in Type 1 systems
- Operate from ICP® sensor power (prepolarized microphones)

A wide variety of traditional externally polarized and modern prepolarized free-field, pressure, and random incidence precision condenser microphones are available from PCB. Externally polarized models operate from a 200 V power source, while prepolarized models can operate from low-cost, constant current (2 to 20 mA) ICP® sensor signal conditioners and coaxial cables. Prepolarized microphones can also be interchanged with similar ICP® accelerometer set-ups.



The Series 377 incorporates microphones of the highest quality, accurate enough to be used for laboratory testing, and rugged enough for field use in Type 1 system measurements.

### Precision Condenser Microphone Cartridges

| Model Number                                | PREPOLARIZED                     |                                  |                                  |                                  |                                  |                                  |
|---|----------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|
|   | 377B01                           | 377B02                           | 377B10                           | 377B11                           | 377A12                           | 377B20                           |
| Diameter                                    | 1/4"                             | 1/2"                             | 1/4"                             | 1/2"                             | 1/4"                             | 1/2"                             |
| Response                                    | Free-field                       | Free-field                       | Pressure                         | Pressure                         | Pressure                         | Random Incidence                 |
| Open Circuit Sensitivity (at 250 Hz)        | 3.2 mV/Pa                        | 50 mV/Pa                         | 1 mV/Pa                          | 50 mV/Pa                         | 0.25 mV/Pa                       | 50 mV/Pa                         |
| Frequency Response (±2 dB)                  | 4 Hz to 80 kHz                   | 3.15 Hz to 20 kHz                | 4 Hz to 70 kHz                   | 3.15 Hz to 10 kHz                | 4 Hz to 20 kHz                   | 3.15 Hz to 12.5 kHz              |
| Polarization Voltage                        | 0 V                              | 0 V                              | 0 V                              | 0 V                              | 0 V                              | 0 V                              |
| Dynamic Range - 3% Distortion Limit [1]     | 165 dB                           | 146 dB                           | 170 dB                           | 146 dB                           | 187 dB [2]                       | 146 dB                           |
| Dynamic Range - Cartridge Thermal Noise [1] | 28 dB (A)                        | 15 dB (A)                        | 30 dB (A)                        | 15 dB (A)                        | 30 dB (A)                        | 15 dB (A)                        |
| Operating Temperature                       | -40 to 150 °C<br>(-40 to 302 °F) | -40 to 120 °C<br>(-40 to 248 °F) | -40 to 150 °C<br>(-40 to 302 °F) | -40 to 120 °C<br>(-40 to 248 °F) | -40 to 120 °C<br>(-40 to 248 °F) | -40 to 120 °C<br>(-40 to 248 °F) |

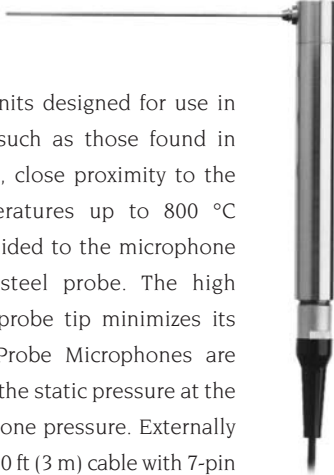
Notes: [1] re 20 µPa [2] with 426B03 preamplifier at 0.25 mV/Pa sensitivity.





### High Temperature Probe Microphones

Probe Microphones are compact units designed for use in difficult measurement situations, such as those found in small cavities, harsh environments, close proximity to the sound source, or in high temperatures up to 800 °C (1472 °F). The acoustic signal is guided to the microphone through a detachable, stainless-steel probe. The high acoustic input impedance of the probe tip minimizes its influence on the acoustic field. Probe Microphones are internally compensated to equalize the static pressure at the probe tip with the internal microphone pressure. Externally polarized Model 377A25 includes a 10 ft (3 m) cable with 7-pin LEMO connector termination, while Model 377A26 is a prepolarized version with BNC jack output connector.



### In-line “A-weighting” Filter

The Model 426B02 in-line A-weighting filter is powered by constant current excitation and is compatible with ICP™ microphone preamplifiers. When using this filter, however, a minimum of 4 mA excitation current is required of the ICP® sensor signal conditioner or readout device, which incorporates ICP® sensor power.

Model 426B02  
A-weighting Filter



### Accessories (please consult factory for full line)



### Precision Handheld Acoustic Calibrators

PCB® offers calibrators for microphones that meet IEC and ANSI standards. These units are easy to use and available with optional adaptors for use with a variety of microphone diameters. These units are lightweight, portable, and battery operated.

| Precision Calibrators            |                        |                      |                      |
|----------------------------------|------------------------|----------------------|----------------------|
| Model Number                     | CAL200                 | CAL250               | 394A40               |
| Microphone Sizes                 | 1/4", 1/2"             | 1/8", 1/4", 1/2", 1" | 1/8", 1/4", 1/2", 1" |
| Frequency                        | 1 kHz ± 1%             | 250 Hz ± 0.8%        | 250 Hz ± 0.5%        |
| Output Level (re 20 µPa)         | 94 dB, 114 dB ± 0.2 dB | 114 ± 0.1 dB         | 114 ± 0.08 dB        |
| Barometric Pressure Compensation | None                   | Automatic            | Manual               |
| ANSI S1.40-1984 Compliant        | Yes                    | Yes                  | N/A                  |
| IEC 60942 Class 1                | Yes                    | Yes                  | Yes                  |

\* With optional adaptors



Model CAL200  
Acoustic Calibrator



Model CAL250  
Acoustic Calibrator



Model 394A40  
Pistonphone Calibrator

### Total Customer Satisfaction:

- No minimum charges
- No restocking fees
- No expediting charges
- 24-hour SensorLine™ for technical assistance
- Satisfaction guaranteed or your money refunded
- A2LA Accredited Microphone Calibration Services



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Vibration Division toll free 888-684-0013  
24-hour SensorLine™ 716-684-0001  
Fax 716-685-3886 E-mail vibration@pcb.com  
Web site www.pcb.com

ISO 9001:2000 CERTIFIED AS9100:2004 CERTIFIED  
A2LA ACCREDITED to ISO 17025

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The Vibration Division of PCB® Piezotronics, Inc. specializes in the development, application, and support of shock and vibration sensors, microphones, impact hammers, piezoelectric actuators, and dynamic strain sensors for acceleration measurements, acoustic testing, and structural testing requirements. This product focus, coupled with the strengths and resources of PCB, permits the Vibration Division to offer exceptional customer service, 24-hour technical assistance, and a Total Customer Satisfaction guarantee.

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