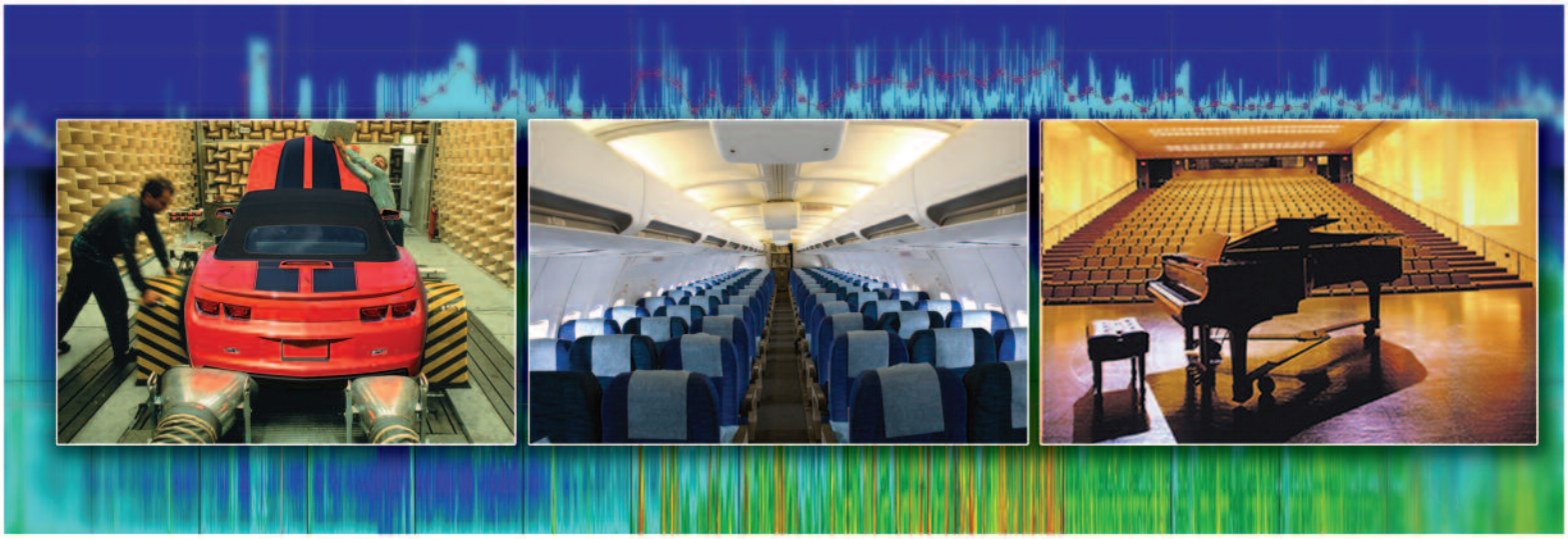
PCB PIEZOTRONICS INC.

Acoustic Measurement Sensors & Instrumentation

For Precise Sound Measurements



NVH TESTING
GUNSHOT ANALYSIS
CABIN NOISE TESTING
BUILDING ACOUSTICS
SOUND POWER
OCCUPATIONAL HEALTH
PASS-BY TESTING
HOLOGRAPHY
MACHINERY MONITORING
ENVIRONMENTAL NOISE
NOISE IDENTIFICATION
SOUND INTENSITY
WIND ENERGY
LOUDSPEAKER DESIGN

PCB Piezotronics ☎ Toll-Free in USA 800-828-8840 ☎ 716-684-0001 www.pcb.com www.pcb.com/shopsensors

PCB® – Trusted by Companies and Laboratories Worldwide

PCB Piezotronics, Inc. offers a variety of acoustic measurement products, including modern prepolarized and traditional externally polarized condenser, 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.

All PCB® acoustic products are made from the highest quality materials and are used by a variety of industries and customers including: automotive, aerospace & defense, OEM's, universities, consultants, white goods (appliance) manufacturing, and more.

Over 45 Years Experience:

As a global supplier, PCB® has dedicated itself to the development of sensor technology and today employs over 1000 people worldwide. A large engineering staff and skilled employees, including Ph.Ds in acoustics and related technologies, enable PCB® to offer a wide variety of product offerings ranging from our acoustic sensors to accelerometers, force, torque, pressure, load, MEMS sensors, dosimeters and sound level meters. We know the relationships between different test and measurement requirements, and the environmental effects to be concerned about, and can recommend the best solution for your application.

Manufacturing Sensors Since 1967!

Innovation:

PCB® is the founder of ICP® technology, which all the modern prepolarized acoustic designs are based upon. PCB® invests heavily in its employees and equipment making us a leader in technology. Whether it is being nominated for a top sensor design like the first to market high temperature HT378B02, or pioneering microelectronics, or enabling our business partners to measure the lowest noise level in the world with our 3 inch microphone, you can be assured that PCB® is on the leading edge of acoustic designs.

Model HT378B02

Performance You Demand at a Price You Can Afford

New Product Finder Shop Online Now!

- *Over 1500 Microphones In-Stock*
- *Shipped in 3 Days or Less*
- *Interchangeable with Other IEC Compliant Microphones*
- *A2LA, ILAC Accredited**
- *5 Year Warranty*

$860 USD

1/2 inch Free-field Prepolarized Microphone and Preamplifier

378B02

- Our most popular model. Ideal for testing in open areas and anechoic chambers
- 3.15 Hz -20 kHz (+/- 2dB)
- TEDS compliant

$630 USD

1/2 inch Free-field Prepolarized Microphone

377B02

- 50 mV/Pa
- 3.15 Hz -20 kHz (+/- 2dB)
- 15 dBA – 146 dB

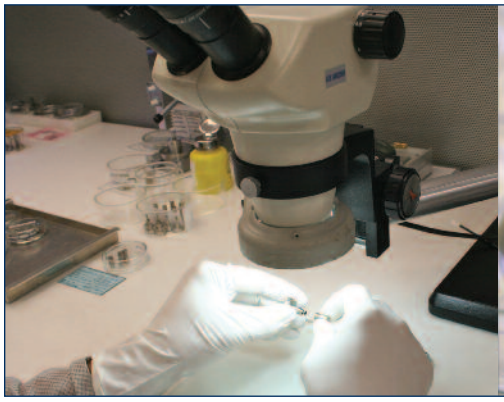
$295 USD

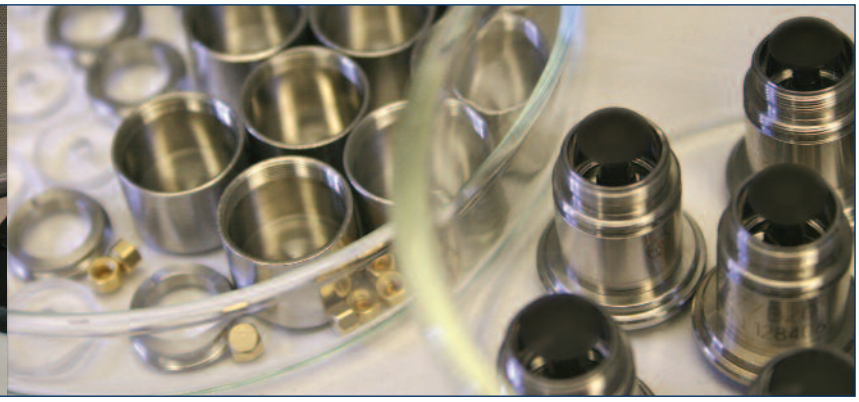
1/4 inch Array Style Prepolarized Microphones

130E20, 130E21 & 130E22

- Value oriented for multichannel audible range testing
- BNC connector, also available with a 10-32, or SMB connector
- TEDS compliant

* Applies to 377 and 378 Series



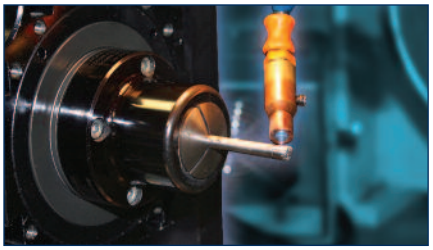


In-house Manufacturing

All PCB® acoustic products are made from the highest quality materials. PCB's in-house manufacturing capabilities allows us to control all the factors that affect quality and delivery. We know what it takes to manufacture the best products and do not out-source parts to machine shops that do not fully understand sensor manufacturing and the effects of contamination. This is why PCB® has made significant investments in our people and operations, including:

High Volume Robotic Machining Cells

PCB's self-sufficient facilities control factors that affect quality, quantity and delivery. This reduces dependency on outside sources, allows PCB® to meet urgent needs, keeps cost down and then pass along the savings to the customer.

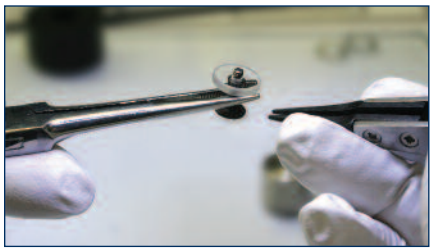


Laser Welding

Welded diaphragms are made in-house and in clean areas to provide sensitivity stability and added robustness.

Enhanced Control of Quality

Equipped with multiple clean rooms, PCB® manufactures and assembles its microelectronics by seasoned certified professionals.



Clean Rooms

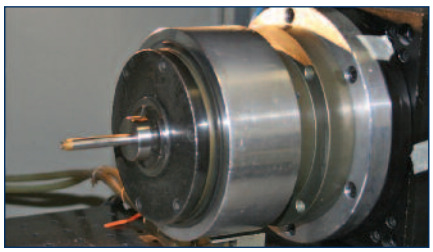
Parts are assembled in clean rooms ensuring consistency and compatibility to Type 1, Class 1 and working class IEC standards.

Environmental Chambers

Environmental stress relieving and testing ensures long term stability in the harshest environments.

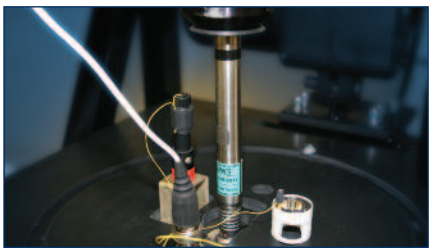
Nitrogen Storage Chambers

All critical components and assemblies are stored in nitrogen chambers to minimize contamination and maximize stability.



Laser Etching

Provides accessibility to part number and serial numbers. Disassembly is not required to easily read model and serial number designations.



Calibration

Every PCB® microphone and preamplifier is calibrated with traceable certifications. Some competitors only offer sensitivity readings or certifications of compliance.

Inspection

Every PCB® microphone and preamplifier is individually inspected to ensure a quality product gets shipped each and every time.

Selecting the Right Microphone

There are a number of models and choices when deciding to purchase a microphone and preamplifier system to measure sound or unwanted sound, called noise. In some cases, multiple microphone and preamplifier models could be used for the same application. For detailed information concerning microphone selection, maintenance, calibration and more , visit www.pcb.com/acoustics to download the PCB® Microphone Handbook.

Microphones Field Types

Free-field

A **free-field microphone** is designed for used in an environment without reflections. Anechoic rooms and outdoor spaces without structures are good examples of a free-field. The free-field response is the voltage response with respect to the pressure when exposed to a plane progressive sound wave. A free-field microphone has a flat frequency response to any source whose primary direction is collinear with the axis of the microphone.

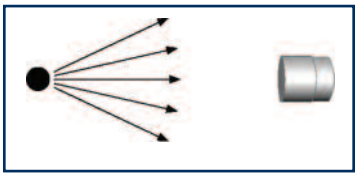


Fig 1. Free-field

Sound Source Location on White Goods for Noise Reduction

Pressure Field

A **pressure field microphone** is unique in that the microphone is not designed to be in the sound field. The strict definition of pressure sensitivity is the output voltage of the microphone when the diaphragm is exposed to a uniform sound pressure. As the name suggests, a pressure microphone should be flush mounted to a surface or structure, similar to a pressure transducer. Pressure microphones are not tuned to compensate for the microphone being part of the field.

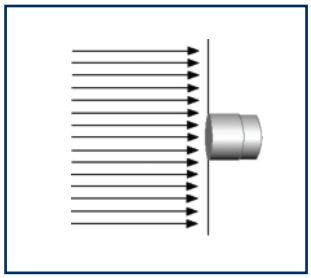


Fig 2. Pressure Field

Gun Shot and Blast Testing to Prevent Hearing Damage

Random Incidence

A **random incidence microphone** is designed for use in areas where the sound field could come from any direction, and have a very good directivity characteristic. The random incident response is the output voltage of the cartridge with respect to an input in a diffuse sound field. Random incident microphones are best used in reverberant rooms and manufacturing floors where many sound sources are present.

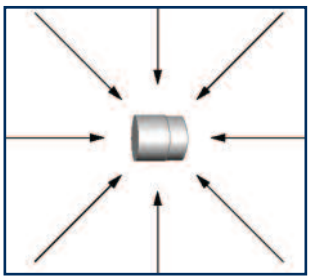
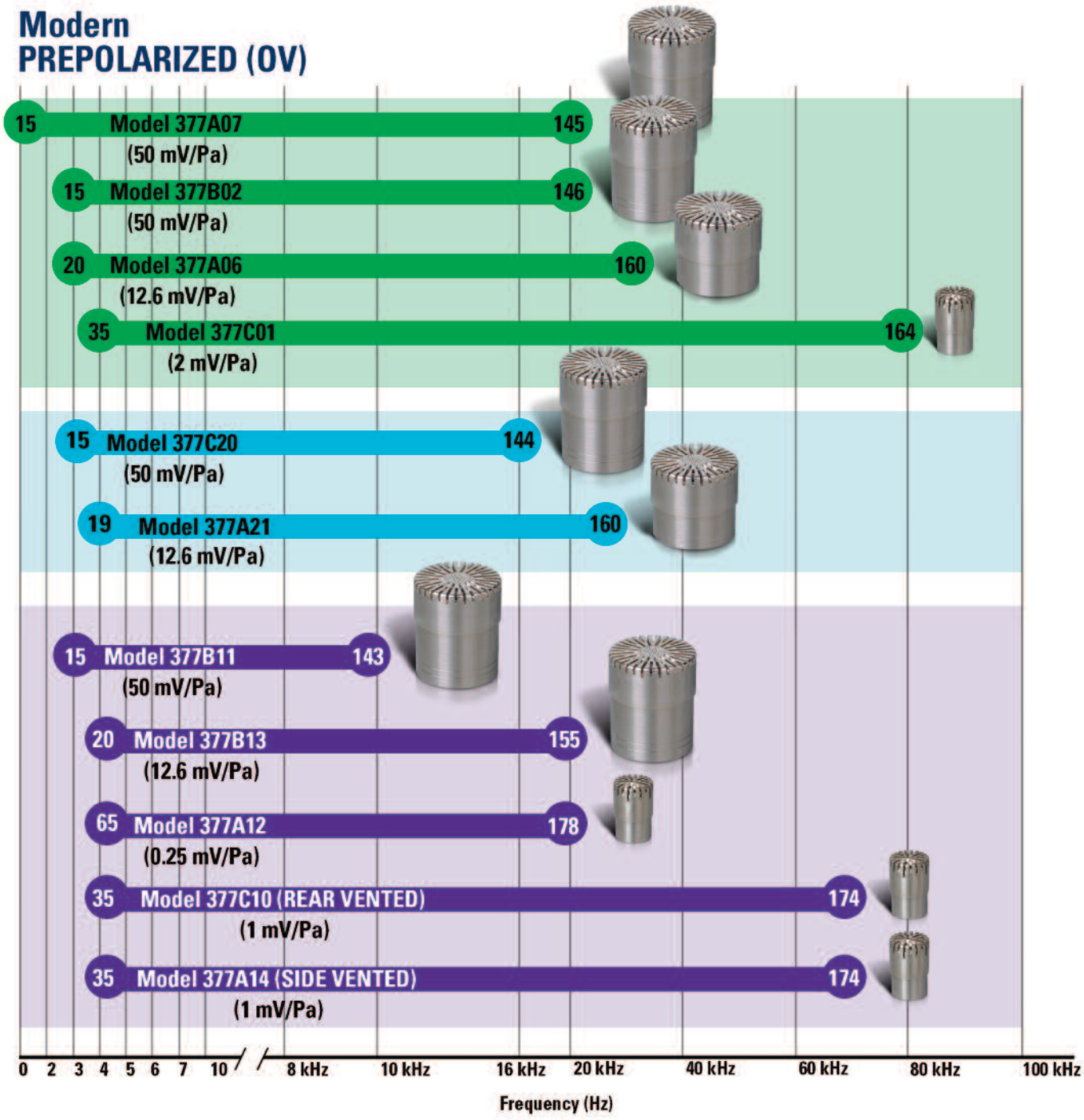
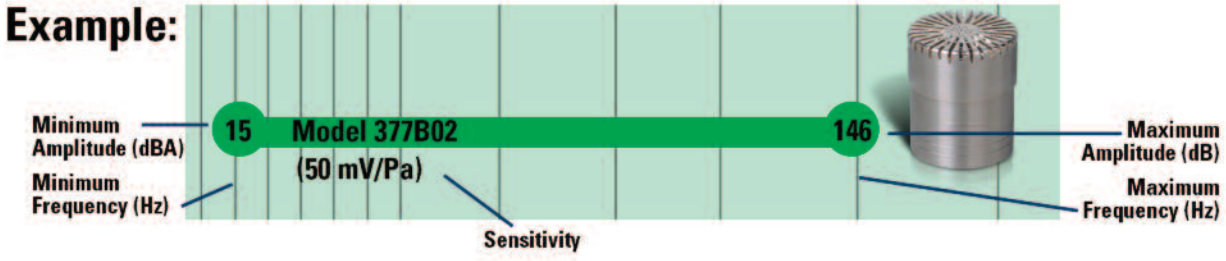


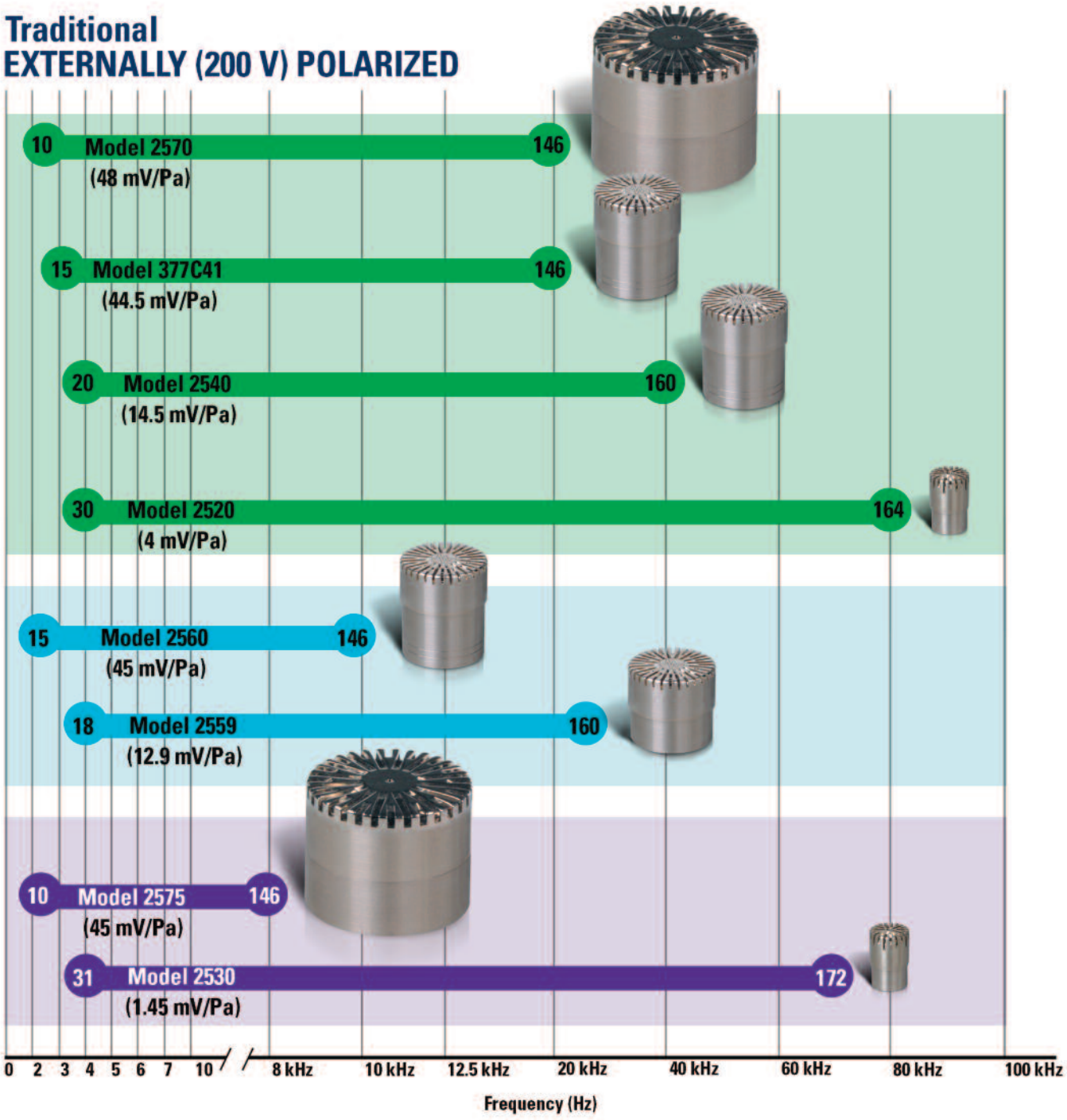
Fig 3. Random Incidence

Cabin Noise Measurement for Operator Comfort

Microphone Comparison







Response Type:

Free-field
Random Incidence
Pressure Field

Size:

Modern Prepolarized Precision Condenser Microphones and Preamplifiers

Prepolarized microphones were designed a few decades after their counterpart the traditional externally polarized microphones were developed. Prepolarized microphones have many advantages over the externally polarized models. This design utilizes power circuitry that PCB® invented for sensors, called ICP® power. By applying a polymer coating to the top of the backplane and embedding a charge on it, you can now eliminate costly 200V power supplies and use an 2-20 mA constant current supply or signal conditioner as a power source.

Prepolarized models are better suited for portable applications or ones that may see high humidity. An added benefit is their interchangeability with other test equipment, for example most accelerometers or piezoelectric pressure sensors. This allows the use of low cost coaxial cables with 10-32, SMB or BNC connectors. With a multiple channel power supply, you can perform your vibration and acoustic tests within the same set-up, saving both time and money.

Model 378A06 Random Incidence 1/2" Microphone & Preamplifier

TEDS Microphone & Preamplifier Systems, IEEE (P)1451.4 Compliant

	Free-field System				
TEDS Version 0.9	**378C01**	**378B02**	**HT378B02**	**378A06**	**378A07**
TEDS Version 1.0	**TLD378C01**	**TLD378B02**	**HTTLD378B02**	**TLD378A06**	**TLD378A07**
Mated Pair System Components	377C01 426B03	377B02 426E01	377B02 HT426E01	377A06 426E01	377A07 426E01
Diameter	1/4 in	1/2 in	1/2 in	1/2 in	1/2 in
Notes	High Amplitude, High Frequency Measurements	Audible Range, Low - Medium (dB) Amplitudes, Most Common	High Temperature Version of 378B02	Medium to high amplitude and frequency measurments	Extreme low frequency infrasound measurments
Application	Ultrasound, Blast, Gun Shot, Noise Identification	Pass-by, Noise Identification, Sound Power, Sound Intensity, Type 1 Sound Level Meters	Engine Analysis, Exhaust Testing, HVAC, Leak Detection	Railway and horn testing, alarm monitoring	Wind turbine testing, sonic boom detection

Transducer Electronic Data Sheets (TEDS) enhance the identification of each microphone. All PCB® Microphone & Preamplifier Systems come standard with TEDS functionality and are compliant with the IEEE (P)1451.4 standard. TEDS version is dependent upon your reader or data acquisition system.

	Pressure Field System					Random Incidence System		
TEDS Version 0.9	**378A12**	**378A14**	**378C10**	**378B11**	**378A13**	**HT378C20**	**378A21**	**378C20**
TEDS Version 1.0	**TLD378A12**	**TLD378A14**	**TLD378C10**	**TLD378B11**	**TLD378A13**	**HTTLD378C20**	**TLD378A021**	**TLD378C20**
Mated Pair System Components	377A12 426A03	377A14 426A05	377C10 426B03	377B11 426E01	377A13 426E01	377C20 HT426E01	377A21 426E01	377C20 426E01
Diameter	1/4 in	1/4 in	1/4 in	1/2 in	1/2 in	1/2 in	1/2 in	1/2 in
Notes	Extreme High Amplitude Measurements	High Frequency, High Amplitude Measurements Side Vented	High Frequency, High Amplitude Measurements Rear Vented	High Sensitivity, Low Frequency, Low Noise Measurements	Mid Range Frequency and Amplitude Measurements	High temperature version of 378C20	Medium to high amplitude and frequency measurements	Audible Range, High Sensitivity, Low - Medium (dB) Amplitudes
Application	Blast Detection, Cavity Analysis, Gunshot Noise Measurements	Ultrasound, Impedence Tubes, Cavity Analysis	Ultrasound, Impedence Tubes, Cavity Analysis	Infrasound, Impedence Tubes, Cavity Analysis, Panel Testing	Impedence Tubes, Cavity Analysis, Panel Testing	Environmental noise, HVAC testing	Cabin noise, consumer product testing	Cabin Testing, Environmental Noise, Room Acoustics, Type 1 Sound Level Meters

Engineered to Maximize System Performance

PCB® matches the microphone and preamplifier to complement each other to maximize performance. IEC 61094-4 compliant microphones are mechanical devices which require electronics in the form of a preamplifier. While most manufacturers devote their design efforts on the microphone, PCB® engineers concentrate their R&D on the complete system design. What good is having a microphone that can be used to 125° C, if your preamplifier is the limiting factor and rated for 60° C? PCB® preamplifiers have a very low noise floor, minimal attenuation effects, and maximum temperature range. The result is that your "System Performance" has enhanced dynamic range and can remain accurate in the widest temperature range for the toughest applications.

Analysis of Engine Noise

Models
377C01
377C10
377A12
377A14
1/4" Microphones

Models
377B02
377A06
377A07
377B11
377B13
377C20
377A21
1/2" Microphones

Model 426A11 1/2" ICP® Preamplifier

Models HT426E01, 426E01, 426A10 1/2" ICP® Preamplifier

Model 426B03, 426A05
1/4" ICP® Preamplifier

Model 426A07
1/4" ICP® Short Preamplifier

Model 426A13
1/2" ICP® Short Preamplifier

CE TEDS CIRCUITRY COMPATIBLE All our preamplifiers are CE marked and TEDS compliant.

Modern Prepolarized (0 V) Precision Condenser Microphones

	Free-field				Pressure Field					Random Incidence	
Model Number	**377C01**	**377B02**	**377A06**	**377A07**	**377A12**	**377A14**	**377C10**	**377B11**	**377B13**	**377C20**	**377A21**
Diameter	1/4 in	1/2 in	1/2 in	1/2 in	1/4 in	1/4 in	1/4 in	1/2 in	1/2 in	1/2 in	1/2 in
Open Circuit Sensitivity	2 mV/Pa	50 mV/Pa	12.6 mV/Pa	50 mV/Pa	0.25 mV/Pa	1 mV/Pa	1 mV/Pa	50 mV/Pa	12.6 mV/Pa	50 mV/Pa	12.6 mV/Pa
Frequency Range (± 2 dB)	5.4 Hz to 80 kHz	3.15 Hz to 20 kHz	3 Hz to 31.5 kHz	0.07 Hz to 20 kHz	4 Hz to 20 kHz	4 Hz to 70 kHz	4 Hz to 70 kHz	3.15 Hz to 10 kHz	4 Hz to 20 kHz	3.14 Hz to 16 kHz	4 Hz to 25 kHz
Dynamic Range - 3% Distortion Limit [1]	164 dB	146 dB	160 dB	145 dB	178 dB	174 dB	174 dB	143 dB	155 dB	144 dB	160 dB
Dynamic Range - Cartridge Thermal Noise [1]	35 dB (A)	15 dB (A)	20 dB (A)	15 dB (A)	65 dB (A)	35 dB (A)	35 dB (A)	15 dB (A)	20 dB (A)	15 dB (A)	19 dB (A)
Temperature Range	-40 to +248 °F -40 to +120 °C	-40 to +302 °F -40 to +150 °C	-40 to +248 °F -40 to 120 °C	-40 to +248 °F -40 to 120 °C	-40 to +248 °F -40 to +120 °C	-40 to +248 °F -40 to +120 °C	-40 to +248 °F -40 to +120 °C	-40 to +248 °F -40 to +120 °C	-40 to +248 °F -40 to +120 °C	-40 to +248 °F -40 to +120 °C	-40 to +248 °F -40 to 120°C

Notes
[1] re 20 µPa

These low-noise, general purpose, prepolarized microphone preamplifiers are powered by any constant current (2-20 mA) ICP® sensor power supply. All models are supplied with TEDS capability and are designed to be used with prepolarized microphones.

ICP® Preamplifiers for Prepolarized Microphones

Model Number	**426B03**	**426A05**	**426A07**	**426E01**	**HT426E01**	**426A10**	**426A11**	**426A13**
Diameter	1/4 in	1/4 in	1/4 in	1/2 in	1/2 in	1/2 in	1/2 in	1/2 in
Gain (Attenuation)	-0.08 dB [1]	-0.19 dB [1]	-0.19 dB [1]	-0.05 dB [1]	-0.06 dB [2]	-0.1 dB [1]	-0.16 dB [1]	-0.20 dB [1]
Frequency Response (± 0.1 dB)	5 Hz to 126 kHz	5 Hz to 126 kHz	2.5 Hz to 126 kHz	6.3 Hz to 125 kHz	6.3 Hz to 126 kHz	80 Hz to 125 kHz	5 Hz to 125 kHz	10 Hz to 126 kHz
Electrical Noise (A-weight)	≤ 3.2 µV [1]	≤ 3.2 µV [1]	≤ 2.5 µV [1]	≤ 2.8 µV [1]	≤ 4.9 µV [2]	≤ 3.6 µV [1]	≤ 7.5 µV [1]	≤ 3 µV [1]
Electrical Noise (Linear)	≤ 5.6 µV [1]	≤ 5.6 µV [1]	≤ 5.6 µV [1]	≤ 5 µV [1]	≤ 13.4 µV [2]	≤ 11.2 µV [1]	≤ 5.7 µV [1]	≤ 6 µV [1]
Output Voltage (Maximum)	± 8 V pk	± 8 V pk	± 8 V pk	± 7 V pk	± 7 V pk	± 7 V pk	± 5 V pk	± 8 V pk
Temperature Range	-40 to +158 °F -40 to +70 °C	-40 to +158 °F -40 to +70 °C	-40 to +158 °F -40 to +70 °C	-40 to +176 °F -40 to +80 °C	-40 to +257 °F -40 to +125 °C	-40 to +176 °F -40 to +80 °C	-4 to +158 °F -20 to +70 °C	-40 to +158 °F -40 to +70 °C
Output Connector	10-32 Coaxial Jack	10-32 Coaxial Jack	10-32 Coaxial Jack	BNC Jack	BNC Jack	BNC Jack	BNC Jack	BNC Jack
TEDS IEEE P1451.4	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Application	General Purpose	Used with Side Vented Microphones	Confined Areas	General Purpose	High Temperature	High Pass Filter	Gain, Filter	Confined Areas

Notes
[1] Measured with an 18 pF reference microphone [2] Measured with a 12 pF reference microphone

Prepolarized ICP® Array Microphones

Prepolarized ICP® Array microphones are a cost-effective alternative to the higher end, class one test and measurement microphones. They are suitable for sound measurements within the normal human hearing range. Multiple array microphones with their excellent phase characteristics can be combined with the appropriate software to effectively map acoustic energy flow. The number of microphones, spacing and predetermined patterns, which are typically dictated by the software and application, allow you to analyze spatial transformation of complex sound fields to understand hot spots. Noise source location can be pinpointed and the speed and direction of sound can be determined.

These value-priced array microphones are an excellent choice for large channel count applications such as noise identification, near field acoustic holography, sound pressure mapping, and beamforming.

All PCB® array microphones come standard with TEDS functionality and are compliant with the IEEE (P)1451.4 standard. Transducer Electronic Data Sheets (TEDS) enhance the identification of each microphone.

Highlights

- Low per channel cost
- Powered by ICP® sensor signal conditioners
- Integrated preamplifier
- Water & dust resistant model available

Applications

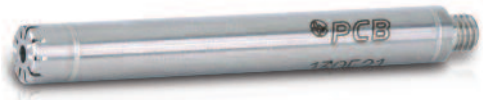
- Holography
- Sound Pressure Mapping
- Noise Source Identification
- Beamforming

Model 130A24
(BNC Connector)

Model 130A23
(SMB Connector)

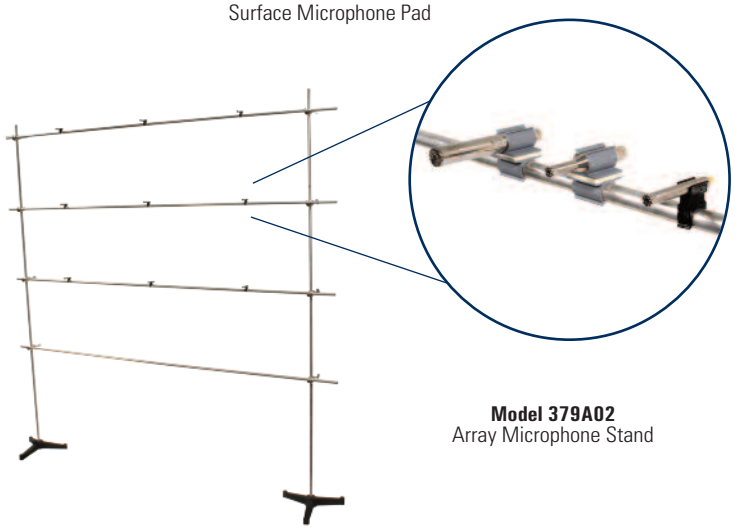
Model 130B40
Low Profile
Surface Microphone Pad

Model 130E20
(BNC Connector)



Model 130E21
(10-32 Connector)

Model 130E22
(SMB Connector)



Model 379A02
Array Microphone Stand

ICP® Array Microphones with Integral Preamplifier

Model Number	130A23	130A24	130E20	130E21	130E22	130B40
Microphone Diameter	1/4 in	1/2 in	1/4 in [4]	1/4 in	1/4 in	1/4 in
Response	Free-Field	Free-Field	Free-Field	Free-Field	Free-Field	Pressure
Sensitivity (± 3 dB at 250 Hz)	14 mV/Pa	14 mV/Pa	45 mV/Pa	45 mV/Pa	45 mV/Pa	8.5 mV/Pa
Frequency response (± 2 dB)	20 Hz to 20k Hz	20 Hz to 16k Hz [5]	20 Hz to 20k Hz [1]	20 Hz to 20k Hz [1]	20 Hzto 20k Hz [1]	20 Hz to 10k Hz [2]
Dynamic Range	30 dBA to 143 dB [3]	30 dBA to 143 dB [3]	30 dBA to 122 dB	30 dBA to 122 dB	30 dBA to 122 dB	32 dBA to 142 dB [3]
Polarized Voltage	0 V	0 V	0 V	0 V	0 V	0 V
Temperature Range	-14 to +122 °F	-14 to +122 °F	+14 to +122 °F	+14 to +122 °F	+14 to +122 °F	-40 to +176 °F
	-10 to +50 °C	-10 to +50 °C	-10 to +50 °C	-10 to +50 °C	-10 to +50 °C	-40 to +80 °C
Connector	SMB Socket	BNC Jack	BNC Jack	10-32 Jack	SMB Socket	10-32 Jack
Application	High frequency and high amplitudes	Rugged water and dust resistant	General purpose	General purpose	Quick release connectivity	Low Profile and surface mount for windy applications
Notes						
[1] ± 5 dB. [2] ± 3 dB, 20 to 20k Hz ± 6 dB. [3] 150 dB Max Without Clipping. [4] 1/2" Preamplier Dia. [5] ± 3 dB						

Traditional Externally Polarized Precision Condenser Microphones and Preamplifiers

Externally polarized microphones were the original standard for all test and measurement acoustic applications. This design utilizes a separate 200V power supply and special cables with 7 pin style connectors. Their ease of design enables a large product offering. Externally polarized microphones are typically used to replace microphones in existing older systems, or when a prepolarized alternative is not available.

Models
2520
2530
1/4" Microphones

Models
2540
2559
2560
377C41
1/2" Microphones

Models
2570
2575
1" Microphones

Building and Room Acoustic Analysis

Externally Polarized (200 V) Precision Condenser Microphone Cartridges

	Free-field				Pressure-field		Random Incidence	
Model Number	**2520**	**2540**	**377C41**	**2570**	**2530**	**2575**	**2559**	**2560**
Diameter	1/4 in	1/2 in	1/2 in	1 in	1/4 in	1 in	1/2 in	1/2 in
Open Circuit Sensitivity	4 mV/Pa	14.5 mV/Pa	44.5 mV/Pa	48 mV/Pa	1.4 mV/Pa	45 mV/Pa	12.9 mV/Pa	45.2 mV/Pa
Frequency Range (± 2 dB)	4 Hz to 80 kHz	4 Hz to 40 kHz	3.15 Hz to 20 kHz	2.6 Hz to 20 kHz	4 Hz to 70 kHz	2.6 Hz to 80 kHz	4 Hz to 25 kHz	2.6 Hz to 10 kHz
Dynamic Range - 3% Distortion Limit [1]	164 dB	160 dB	146 dB	146 dB	172 dB	146 dB	160 dB	146 dB
Dynamic Range - Cartridge Thermal Noise [1]	30 dB (A)	20 dB (A)	15 dB (A)	10 dB (A)	31 dB (A)	10 dB (A)	18 dB (A)	15 dB (A)
Temperature Range	-40 to +302 °F -40 to +150 °C	-40 to +302 °F -40 to +150 °C	-40 to +302 °F -40 to +150 °C	-40 to +302 °F -40 to +150 °C	-40 to +302 °F -40 to +150 °C	-40 to +302 °F -40 to +150 °C	-40 to +302 °F -40 to +150 °C	-40 to +302 °F -40 to +150 °C
Notes								
[1] re 20 µPa								

Preamplifiers for Externally Polarized Microphones

Model 426A30 is a rugged 1/2 inch diameter preamplifier optimized for use with externally polarized microphones. It is compatible with microphones as defined in the international standard IEC 61094, and connects to a 200V power supply requiring a 7-pin cable with connectors. Model 426A31 is a 1/4 inch diameter preamplifier with integral 10 ft. cable that terminates with a 7-pin connector.

Model 426A30 Preamplifier

Model 426B31 1/4" Preamplifier

Preamplifiers

Model Number	**426B31**	**426A30**
Diameter	1/4 in	1/2 in
Gain (Attenuation)	-0.14 dB [2]	-0.2 dB [1]
Frequency Response (± 0.5 dB)	3.98 Hz to 126 kHz	3.0 Hz to 126 kHz
Electrical Noise (A-weight)	≤ 4.8 µV [2]	≤ 2.8 µV [1]
Electrical Noise (Linear) [1]	≤ 12 µV [2]	≤ 5 µV [1]
Output Voltage (Maximum)	± 25 V pk	± 14 V pk
Temperature Range	-4 to +167 °F -20 to +75 °C	-40 to +185 °F -40 to +85 °C
Output Connector	Integral Cable with 7-Pin	7-Pin
TEDS IEEE (P)1451.4	Yes	No
Notes		
[1] Measured with an 18 pF reference microphone [2] Measured with a 6.8 pF reference microphone		

Microphone Power Supply

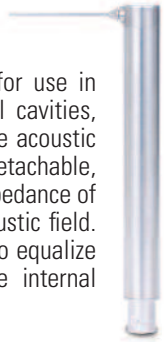
- 0 and 200 polarization voltage
- Extended battery life (40 hours)
- 0, 20, and 40 dB gain
- Selectable flat (Z), A, and C-weighting

Model 2221
Microphone Preamplifier Power Supply

Additional Acoustic Products and Accessories

High Temperature Probe Microphone

Model 377B26 Probe microphone is designed for use in difficult measurement situations, such as small cavities, harsh environments, and high temperatures. 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.



In-line "A-weighting" Filter

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

Adaptors

079A02 – 1/4 inch Microphone to 1/2 inch Preamplifier Adaptor

079B03 – 1/2 inch Microphone to 1/4 inch Preamplifier Adaptor

079B25 – 1 inch Microphone to 1/2 inch Preamplifier Adaptor

079A24 – Tripod Stand Adaptor to Convert 5/8 inch Stud to 1/4 inch For Microphone Holder

079A29 – Swivel Head, Stand to Holder Adaptor

079A41 – Right angle adapter for 1/4 inch Microphone

079A42 – Right angle adapter for 1/2 inch Microphone

Cables (Additional lengths available)

EXA010 – 10 Foot Cable with 7 Pin Connector

003C10 – 10 Foot Coaxial Cable with 10-32 Plug and BNC Plug

003D10 – 10 Foot Coaxial Cable with BNC Plugs

003U10 – 10 Foot Coaxial Cable with SMB Plugs

003V10 – 10 Foot Coaxial Cable with SMB Plug and BNC Plug

Calibration Equipment

CAL200 – 1 kHz, 94 and 114 dB, Calibrator

ADP024 – CAL200 to 1/4 inch Microphone Adaptor

CAL250 – 250 Hz, 114 dB Calibrator

ADP021 – CAL250 to 1/4 inch Microphone Adaptor

079A31 – 8-Channel Coupler for the CAL250 Calibrator

079A30 – Pistonphone to 1 inch Microphone Adaptor


079A07


079A06


EPS2116


079C20


079B21

Environmental Protection

079A06 – 3-1/2 inch Windscreen for 1/2 inch Microphone

079A07 – 3-1/2 inch Windscreen for 1/4 inch Microphone

079C20 – Nose Cone for 1/4 inch Microphone

079B21 – Nose Cone for 1/2 inch Microphone

EPS2116 – Outdoor Protection, 3/4 inch Mount & 1/4 inch Side Exit Mount


079B10


079A11


079C23


079B32

Holders

079B10 – Holder for 1/4 inch Microphone

079A11 – Holder for 1/2 inch Microphone

079C23 – Swivel Head with 1/4 inch and 1/2 inch Holders

079B32 – Clip Holder for 1/4 inch Microphone


079A15


079B16


079A17


079A18


379A02

Stands and Mounts

079A15 – Tripod Stand with Boom Arm

079B16 – Miniature Tripod Stand with Adjustable Legs

079A17 – Camera Tripod Stand

079A18 – Adjustable Clamp

379A02 – Array Microphone Stand

ICP® Signal Conditioners


Model 480C02
Battery Powered ICP® Sensor
Signal Conditioner


Model 485B36
USB Dual Channel ICP® Sensor
Signal Conditioner


480B21
3-Channel Battery Powered Sensor
Signal Conditioner


Series 481A
16-Channel Line-powered
Signal Conditioner


483C05
8-Channel Sensor
Signal Conditioner


482C05
4-Channel Sensor
Signal Conditioner

Additional Acoustic Products offered by the PCB Group

Sound Level Meters

Model 831:

The Model 831 is Larson Davis' most recent sound level meter platform. Advances in technology provide up to 2GB of internal memory, with superior performance and a reliable design. Various firmware modules expand the functionality of Model 831 for a variety of Environmental Noise and Architectural Acoustics measurements. The Model 831 also includes the easy-to-use personal health and safety measurement features of other advanced SLM products.

Soundtrack LxT®:

The SoundTrack LxT® sound level meter represents a significant advance in performance, reliability and ease-of-use. This ergonomically designed meter ensures that gathering, analyzing and presenting detailed workplace and environmental noise data is simple, fast, and accurate.

LARSON DAVIS
A PCB PIEZOTRONICS DIV.

Please visit **www.LasonDavis.com** for further details.

Environmental Protection Shrouds:

Environmental Shrouds are complete weather protection systems for ½ inch microphone systems. The environmental shrouds are the perfect choice for longer-term measurements in inclement weather. Their special acoustic windscreen material and configuration protect the microphones from rain, sleet, and snow. The shrouds seal the preamplifier in a desiccated chamber, thus preserving performance in high humidity environments. The desiccant volume is many times greater than that of inline desiccant cartridges, for lasting protection without interference between the microphone and preamplifier. The shroud is also equipped with bird-spikes to deter winged intruders.

Permanent Outdoor Microphone with Remote Humidity Sensing

The 426A12 outdoor microphone has been designed for permanent outdoor use in any weather condition. It is constructed of stainless steel to resist corrosion, and its profile minimizes both wind resistance and acoustic reflections. It includes a rain hat, wind screen, bird spikes and an electrostatic actuator which can be controlled remotely for on-site calibration checks. With the proper choice of microphone, it can provide frequency response characteristics consistent with precision sound level meter requirements for free-field or random incidence measurements. Equipped with A, C and Z-weighting filters and a 20 dB gain, the 426A12 is ideal for use with any electronic sound measurement system.

Acoustic Calibration Products

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. Calibrators are lightweight, portable, and battery operated.

Model CAL200
Acoustic Calibrator

Model CAL250
Acoustic Calibrator

Precision Calibrators		
Model Number	**CAL200**	**CAL250**
Microphone Sizes	1/4 in (6 mm)*, 1/2 in (12 mm)	1/8 in (3 mm)*,1/4 in (6 mm)*,1/2 in (12 mm),1 in (25 mm)
Frequency	1 kHz ± 1%	250 Hz ± 0.8%
Output Level (re 20 µPa)	94 dB,114 dB ± 0.2 dB	114 ± 0.1 dB
Barometric Pressure Compensation	Automatic	Automatic
ANSI S1.40	Yes	Yes
IEC 60942 Class 1	Yes	Yes
Notes:	* With optional adaptors	

Turnkey Acoustic Calibration Workstation, Model 9350C

The Precision Acoustic Calibration Workstation Model 9350C is an accurate, turnkey, automated, PC-based system. The 9350C offers efficient and cost-effective calibration of 1/4", 1/2" and 1" microphone cartridges (open-circuit sensitivity), microphone cartridges with preamplifiers (closed-circuit sensitivity) and microphone frequency response function. In addition, the system provides for conformance testing of microphone preamplifiers and acoustic calibrators.

The 9350C generates ISO 17025 compliant calibration certificates for:

- Microphone Cartridge Calibration
- Microphone and Preamplifier Calibration
- Preamplifier Conformance Test
- Source Calibration (example: pistonphone)

TMS THE MODAL SHOP
A PCB GROUP COMPANY

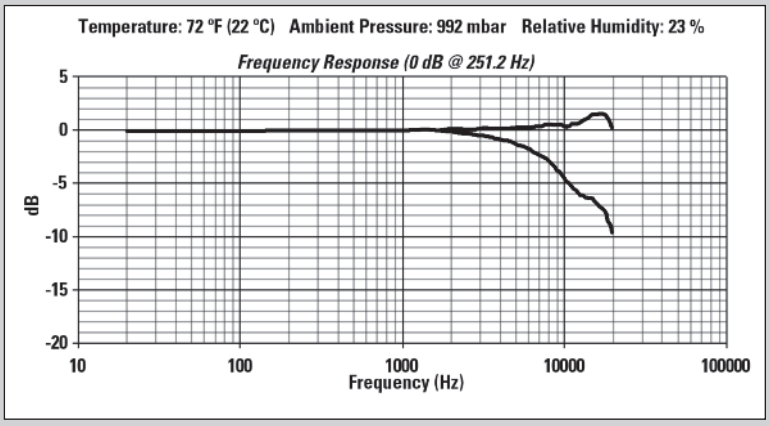
Precision Acoustic Calibration Workstation

The Modal Shop also provides extensive rental services through a vast inventory of microphones, preamplifiers and sound level meters. Please visit **www.modalshop.com** for further details.

Acoustic Calibration Services

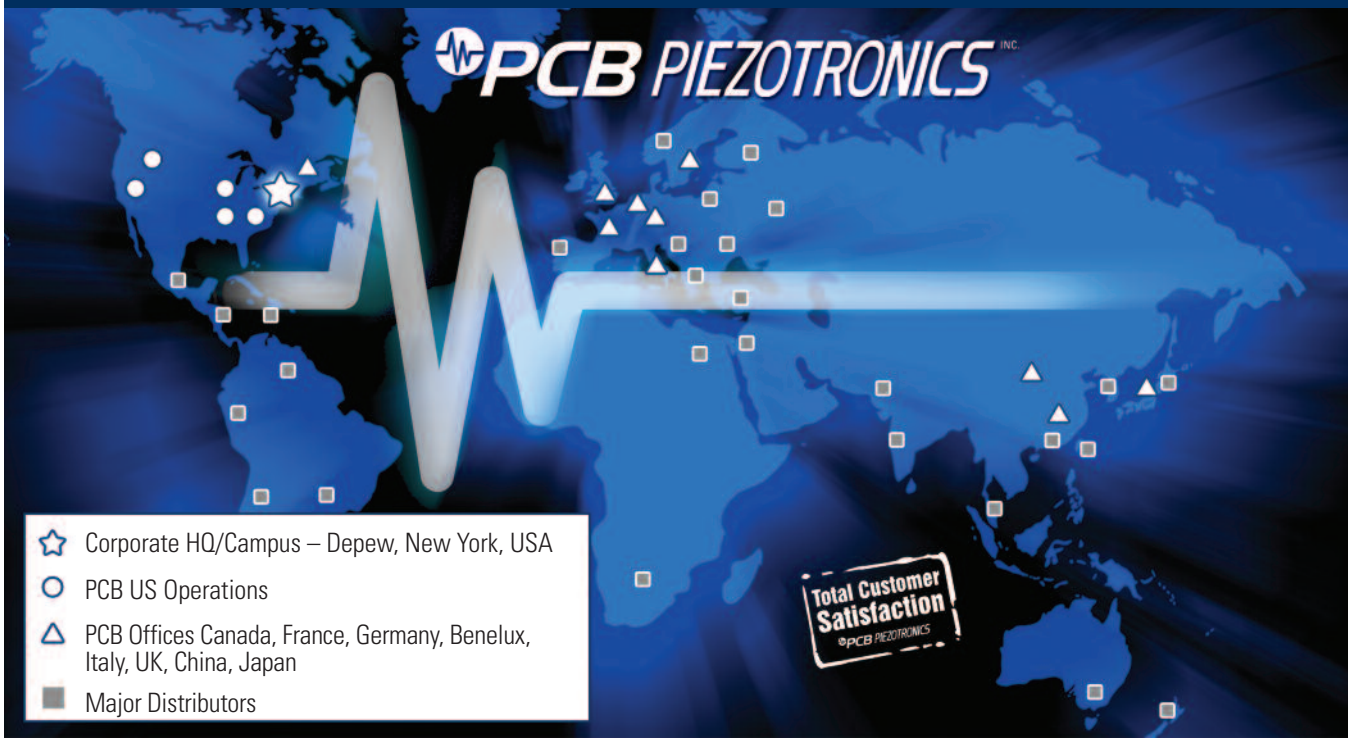
PCB® Has a "State-of-the-Art" Acoustic Calibration System

All acoustic microphone calibrations come complete with test documentation showing the actuator pressure response, corrected responses, the conditions under which the calibration was performed, and the equipment used. PCB® is 9001 certified and all calibrations are NIST traceable and compliant with ISO 10012-1, ANSI/NCSL Z540-1-1994 and ISO 17025. Reference microphones are traceable through PTB and the 377 series calibrations are A2LA compliant and uncertainty factors are provided. PCB® is equipped to calibrate most competitor's microphones and preamplifiers.



Freq (Hz)	Lower (dB)	Upper (dB)	Freq (Hz)	Lower (dB)	Upper (dB)	Freq (Hz)	Lower (dB)	Upper (dB)
20.0	-0.08	-0.08	1584.9	-0.14	0.07	6683.4	-2.14	0.38
25.1	-0.02	-0.02	1678.8	-0.16	0.07	7079.5	-2.35	0.43
31.6	0.00	0.00	1778.3	-0.17	0.08	7498.9	-2.61	0.46
39.8	0.01	0.01	1883.7	-0.19	0.09	7943.3	-2.94	0.45
50.1	0.01	0.01	1995.3	-0.22	0.09	8414.0	-3.24	0.49
63.1	0.02	0.02	2113.5	-0.24	0.10	8912.5	-3.58	0.53
79.4	0.02	0.02	2238.7	-0.26	0.11	9440.6	-3.98	0.54
100.0	0.02	0.02	2371.4	-0.30	0.11	10000.0	-4.54	0.41
125.9	0.01	0.01	2511.9	-0.33	0.13	10592.5	-4.98	0.42
158.5	0.01	0.01	2660.7	-0.37	0.14	11220.2	-5.32	0.54
199.5	0.01	0.01	2818.4	-0.41	0.15	11885.0	-5.77	0.55
251.2	0.00	0.00	2985.4	-0.46	0.16	12589.3	-6.06	0.71
316.2	0.00	0.01	3162.3	-0.51	0.17	13335.2	-6.16	1.03
398.1	-0.01	-0.01	3349.7	-0.57	0.17	14125.4	-6.41	1.18
501.2	-0.02	0.02	3548.1	-0.64	0.18	14962.4	-6.50	1.47
631.0	-0.03	0.01	3758.4	-0.72	0.18	15848.9	-6.83	1.52
794.3	-0.04	0.05	3981.1	-0.82	0.18	16788.0	-7.13	1.59
1000.0	-0.06	0.06	4217.0	-0.91	0.20	17782.8	-7.63	1.48
1059.3	-0.07	0.06	4466.8	-1.01	0.22	18836.5	-8.50	1.01
1122.0	-0.08	0.06	4731.5	-1.12	0.25	19952.6	-9.83	0.10
1188.5	-0.08	0.07	5011.9	-1.25	0.28	-	-	-
1258.9	-0.09	0.07	5308.8	-1.41	0.29	-	-	-
1333.5	-0.10	0.08	5623.4	-1.57	0.31	-	-	-
1412.5	-0.11	0.08	5956.6	-1.75	0.32	-	-	-
1496.2	-0.13	0.07	6309.6	-1.94	0.35	-	-	-

Upper curve: Free-field response of microphone at 0° sound incidence with grid cover
Lower curve: Pressure-field response as tested with electrostatic actuator



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