



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017
& ANSI/NCSL Z540-1-1994 & ANSI/NCSL Z540.3-2006

PCB PIEZOTRONICS INC.
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CALIBRATION

Valid To: February 29, 2024

Certificate Number: 1862.01

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following calibrations^{1,6}:

I. Electrical – DC/Low Frequency

Parameter/Equipment	Range	CMC ^{2,3,5} (±)	Comments
DC Voltage – Measure	100 V 10 V 5 V 2 V 1 V 500 mV 200 mV 100 mV	0.082 % rdg 0.064 % rdg 0.066 % rdg 0.065 % rdg 0.067 % rdg 0.073 % rdg 0.081 % rdg 0.099 % rdg	Data acquisition card and voltage divider
DC Current – Measure	(0.5 to 100) mA	1.3 % rdg	Data acquisition card and standard resistor
AC Voltage – Measure	± 10 V ± 5 V ± 2 V ± 1 V ± 500 mV ± 200 mV ± 100 mV	0.064 % rdg 0.065 % rdg 0.065 % rdg 0.068 % rdg 0.071 % rdg 0.081 % rdg 0.087 % rdg	Data acquisition card
Capacitance – Measure, at 1kHz	10 pF to 10 μF (>10 to 30) μF	0.01 % rdg 0.02 % rdg	Substitution method, Agilent 3458A meter with transfer standard capacitor

II. Mechanical

Parameter/Equipment	Range	CMC ^{2,5} (±)	Comments
Acoustic Pressure – Measure	114.0 dB SPL @ 250 Hz	0.2 dB reading (rdg)	Acoustic calibrator and pre-amplifiers
Dynamic Force (Compression/Tension) – Measure	(0 to 100 000) lbf	1 % full scale (fs)	Reference load cell
Impulse Force – Sensitivity (Voltage/Force) Measure	(0 to 5000) lbf (0 to 1000) Hz	3.8 % rdg	Quartz reference accelerometer
Static Pressure – Measure	(0 to 30) psia (0 to 60) psia (0 to 15) psig (0 to 50) psig (0 to 100) psia or psig (0 to 300) psia or psig (0 to 600) psia or psig (0 to 1000) psia or psig (0 to 3000) psia or psig (0 to 6000) psia or psig (0 to 10 000) psia or psig	0.015 % fs 0.015 % fs 0.015 % fs 0.015 % fs 0.015 % fs 0.015 % fs 0.015 % fs 0.015 % fs 0.021 % fs 0.021 % fs 0.021 % fs	DHI pressure controller/calibrator
Static Medium Pressure – Measure	(0 to 15 000) psi	1 % fs	Dead weight reference (hydraulic)
Static High Pressure – Measure	(0 to 100 000) psi	1.7 % fs	Reference pressure transducer
Dynamic Low Pressure – Measure	(0 to 100) psi	1 % fs	Digital Heise reference pressure meter (pneumatic)
	124.0 dB @ 250 Hz	0.45 dB rdg	Piston phone reference

Parameter/Equipment	Range	CMC ^{2, 4, 5} (±)	Comments
Dynamic Medium Pressure – Measure	(0 to 1000) psi	1.3 % fs	Digital Heise reference pressure meter (pneumatic)
Dynamic High Pressure – Measure	(0 to 15 000) psi	3.0 % fs	Reference pressure sensor (hydraulic)
Vibration General Purpose – Sensitivity Magnitude			
Accelerometers	(5 to 9) Hz (10 to 99) Hz (100 to 1999) Hz (2000 to 10 000) Hz (10 001 to 15 000) Hz (15 001 to 20 000) Hz	2 % rdg 1.5 % rdg 1 % rdg 2.5 % rdg 5 % rdg 9 % rdg	Reference accelerometer, back to back comparison method
Low Frequency – Sensors	(0.5 to 0.99) Hz (1 to 30) Hz (30.01 to 199) Hz (200 to 1000) Hz	1.8 % rdg 1 % rdg 1.5 % rdg 3 % rdg	Reference accelerometer with long stroke shaker, back-to-back comparison method
Vibration General Purpose – Acceleration Level			
Portable Shakers	(79.6 to 159.2) Hz	1.5 % rdg	Accelerometer, back to back comparison method

Parameter/Equipment	Range ⁷	CMC ^{2,5} (±)	Comments
Vibration General Purpose – Sensitivity Phase			
Accelerometers	(≥5 to <10) Hz ≥10 Hz to <5 kHz (≥5 to <11) kHz (≥11 to <16) kHz (≥16 to ≤20) kHz	1° 0.75° 1.5° 2° 3°	Reference accelerometer, back to back comparison method
Low Frequency – Sensors	(≥0.5 to <10) Hz (≥10 to <200) Hz ≥200 Hz to ≤1 kHz	2.5° 0.75° 1.5°	Reference accelerometer with long stroke shaker, back to back comparison method
Primary Vibration – Sensitivity Magnitude – Measure			
Mid to High Frequency	5 Hz 5 Hz < f < 100 Hz 100 Hz < f ≤ 160 Hz 160 Hz < f ≤ 1000 Hz 1000 Hz < f ≤ 5000 Hz 5000 Hz < f ≤ 15 kHz 15 kHz < f ≤ 20 kHz	1 % rdg 0.5 % rdg 0.2 % rdg 0.5 % rdg 1 % rdg 1.5 % rdg 2.0 % rdg	Laser interferometry and shaker
Low Frequency	0.5 Hz ≤ f < 10 Hz	0.3 % rdg	Laser interferometry and long stroke shaker
Primary Vibration – Sensitivity Phase – Measure			
Mid to High Frequency	5 Hz ≤ f < 5000 Hz 5000 Hz < f ≤ 20 kHz	0.5° 1°	Laser interferometry and shaker
Low Frequency	0.5 Hz ≤ f < 10 Hz	0.5°	Laser interferometry and long stroke shaker
Acceleration Amplitude Linearity, Shock – Measure	(100 to 2000) g: (0.5 to 2) ms (>2000 to 10 000) g: (0.1 to 0.5) ms	1.9 % rdg 2.6 % rdg	Reference accelerometer with pneumatic shock tower, back-to-back comparison method

¹ This laboratory offers commercial calibration service.

² Calibration and Measurement Capability uncertainty (CMC) is the smallest uncertainty of measurement that a laboratory can achieve within its scope of accreditation when performing more or less routine calibrations of nearly ideal measurement standards or nearly ideal measuring equipment. CMCs represent expanded uncertainties expressed at approximately the 95 % level of confidence, usually using a coverage factor of $k = 2$. The actual measurement uncertainty of a specific calibration performed by the laboratory may be greater than the CMC due to the behavior of the customer's device and to influences from the circumstances of the specific calibration.

³ CMCs are expressed as either a specific value that covers the full range or as a fraction of the reading plus a fixed floor specification.

⁴ CMCs for Vibration parameters are for Sensitivity (accelerometers/sensors) or Acceleration level (shakers).

⁵ The type of instrument or material being calibrated is defined by the parameter. This indicates the laboratory is capable of calibrating instruments that measure or generate the values in the ranges indicated for the listed measurement parameter.

⁶ This scope meets A2LA's *P112 Flexible Scope Policy*.

⁷ In the statement of range, f is frequency.



Accredited Laboratory

A2LA has accredited

PCB PIEZOTRONICS INC.

Depew, NY

for technical competence in the field of

Calibration

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 *General requirements for the competence of testing and calibration laboratories*. This laboratory also meets the requirements of ANSI/NC SL Z540-1-1994 and the requirements of ANSI/NC SL Z540.3-2006 and R205 – Specific Requirements: Calibration Laboratory Accreditation Program. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (*refer to joint ISO-ILAC-IAF Communiqué dated April 2017*).



Presented this 17th day of February 2022.

A blue ink signature of the Vice President of Accreditation Services.

Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 1862.01
Valid to February 29, 2024

For the calibrations to which this accreditation applies, please refer to the laboratory's Calibration Scope of Accreditation.