



The American Association for Laboratory Accreditation

World Class Accreditation

# 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 17025:2005 *General Requirements for the Competence of Testing and Calibration Laboratories*. This laboratory also meets the requirements of ANSI/NCSL Z540-1-1994 and any additional program requirements in the field of calibration. 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 8 January 2009).

Presented this 19<sup>th</sup> day of February 2010.



  
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President & CEO

For the Accreditation Council  
Certificate Number 1862.01  
Valid to February 28, 2012

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

SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005  
& ANSI/NCSL Z540-1-1994

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CALIBRATION

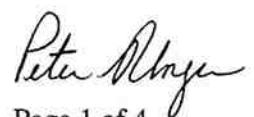
Valid To: February 29, 2012

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<sup>1</sup>:

I. Electrical – DC/Low Frequency

| Parameter/Equipment  | Range           | CMC <sup>2,3</sup> (±) | Comments         |
|----------------------|-----------------|------------------------|------------------|
| DC Voltage – Measure | (0 to 20) mV    | 0.020 % + 6.9 µV       | NI4060 DAQ card  |
|                      | (20 to 200) mV  | 0.020 % + 6.9 µV       |                  |
|                      | 200 mV to 2 V   | 0.020 % + 12 µV        |                  |
|                      | (2 to 25) V     | 0.028 % + 1.2 mV       |                  |
|                      | (25 to 250) V   | 0.028 % + 1.5 mV       |                  |
| DC Current – Measure | (0 to 200) mA   | 0.048 % + 12 µA        | NI4060 DAQ card  |
| AC Voltage – Measure | (0 to 200) mV   | 0.068 % + 0.040 mV     | NI6111E DAQ card |
|                      | (200 to 500) mV | 0.068 % + 0.068 mV     |                  |
|                      | 500 mV to 1 V   | 0.068 % + 0.11 mV      |                  |
|                      | (1 to 2) V      | 0.068 % + 0.21 mV      |                  |
|                      | (2 to 5) V      | 0.068 % + 0.51 mV      |                  |
|                      | (5 to 10) V     | 0.13 % + 1.1 mV        |                  |
| (10 to 250) V        | 0.72 % + 790 mV | NI4060 DAQ card        |                  |



II. Mechanical

| Parameter/Equipment    | Range   | CMC <sup>2</sup> (±)   | Comments  |
|------------------------|---|--|---|
| Acoustic Pressure      | 114.0 dB SPL<br>@ 250 Hz  | 0.2 dB reading (rdg)   | Microphone reference  |
| Dynamic Force          | (0 to 100 000) lbf  | 1 % fs   | Strain gauge, load cell reference                                 |
| Impulse Force          | (0 to 5000) lb<br>(0 to 1000) Hz  | 3.8 % rdg  | PCB quartz reference accelerometer                                |
| Static Medium Pressure | (0 to 15 000) psi   | 1 % fs   | Dead weight reference (hydraulic)                                 |
| Static Pressure        | (0 to 30) psia<br>(0 to 60) psia<br>(0 to 15) psig<br>(0 to 50) psig<br><br>(0 to 100) psia or psig<br>(0 to 300) psia or psig<br>(0 to 600) psia or psig<br>(0 to 1000) psia or psig<br>(0 to 3000) psia or psig<br>(0 to 6000) psia or psig<br>(0 to 10 000) psia or psig | 0.015 % fs<br>0.015 % fs<br>0.015 % fs<br>0.015 % fs<br><br>0.015 % fs<br>0.015 % fs<br>0.015 % fs<br>0.015 % fs<br>0.021 % fs<br>0.021 % fs<br>0.021 % fs | DHI PPC2+, DHI PPCK+ (vibrating quartz beam)                      |
| Static High Pressure   | (0 to 100 000) psi  | 1.7 % fs   | Strain gauge with digital reference                               |
| Dynamic Low Pressure   | (0 to 100) psi<br><br>124.0 dB<br>250 Hz  | 1 % fs<br><br>0.45 dB rdg  | Digital Heise reference (pneumatic)<br><br>Piston phone reference |

| Parameter/Equipment                                 | Range   | CMC <sup>2</sup> (±)   | Comments  |
|---|---|--|---|
| Dynamic Medium Pressure                             | (0 to 1000) psi   | 1.3 % fs   | Digital Heise reference (pneumatic)                               |
| Dynamic High Pressure                               | (0 to 25 000) psi   | 1.3 % fs   | PCB quartz pressure sensor reference (hydraulic)                  |
| Vibration General Purpose –                         | (5 to 9) Hz<br>(10 to 99) Hz<br>(100 to 1999) Hz<br>(2000 to 10 000) Hz<br>(11 000 to 15 000) Hz  | 2 % rdg<br>1.5 % rdg<br>1 % rdg<br>2.5 % rdg<br>7 % rdg  | PCB quartz acceleration reference, back to back comparison method |
| Portable Shaker Table                               | (79.6 to 159.2) Hz  | 1.4 % rdg  | Surface mounted quartz reference                                  |
| Low Frequency                                       | (0.5 to 99) Hz<br>(1 to 30) Hz<br>(30.01 to 199) Hz<br>(200 to 1000) Hz   | 1.8 % rdg<br>1 % rdg<br>1.5 % rdg<br>3 % rdg   | PCB quartz acceleration reference, back to back comparison method |
| Primary Vibration – Mid to High Frequency Amplitude | 5 Hz<br>5 Hz < $f$ < 100 Hz<br>100 Hz<br>159 Hz<br>159 Hz < $f$ ≤ 1000 Hz<br>1000 Hz < $f$ ≤ 5000 Hz<br>5000 Hz < $f$ ≤ 15 kHz<br>15 kHz < $f$ ≤ 20 kHz | 1 % rdg<br>0.5 % rdg<br>0.2 % rdg<br>0.2 % rdg<br>0.5 % rdg<br>1 % rdg<br>1.5 % rdg<br>2.0 % rdg | Laser interferometry  |
| Primary Vibration – Mid to High Frequency Phase     | 5 Hz ≤ $f$ < 5000 Hz<br>5000 Hz < $f$ ≤ 20 kHz  | 0.5°<br>1°   | Laser interferometry  |
| Low Frequency Phase                                 | 0.5 Hz ≤ $f$ < 10 Hz  | 0.5°   | And long stroke shaker  |
| Primary Vibration – Low Frequency Amplitude         | 0.5 Hz ≤ $f$ < 10 Hz  | 0.3 % rdg  | Laser interferometry and long stroke shaker                       |

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<sup>1</sup> This laboratory offers commercial calibration service.

<sup>2</sup> Calibration and Measurement Capability (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. Calibration and Measurement Capabilities 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.

<sup>3</sup> 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.