THE AMERICAN ASSOCIATION FOR LABORATORY 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 18 June 2005*).

Presented this 24th day of March 2008.

President
For the Accreditation Council
Certificate Number 1862.01
Valid to February 28, 2010

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 28, 2010 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]:

I. Electrical – DC/Low Frequency

Parameter/Equipment	Range	Best Uncertainty[2, 3] (±)	Comments
DC Voltage – Measure	(0 to 20) mV (20 to 200) mV 200 mV to 2 V (2 to 25) V (25 to 250) V	0.020 % + 6.9 µV 0.020 % + 6.9 µV 0.020 % + 12 µV 0.028 % + 1.2 mV 0.028 % + 1.5 mV	NI4060 DAQ card
DC Current – Measure	(0 to 200) mA	0.048 % + 12 µA	NI4060 DAQ card
AC Voltage – Measure	(0 to 200) mV (200 to 500) mV 500 mV to 1 V (1 to 2) V (2 to 5) V (5 to 10) V (10 to 250) V	0.068 % + 0.040 mV 0.068 % + 0.068 mV 0.068 % + 0.11 mV 0.068 % + 0.21 mV 0.068 % + 0.51 mV 0.13 % + 1.1 mV 0.72 % + 79 mV	NI6111E DAQ card NI4060 DAQ card

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II. Mechanical

Parameter/Equipment	Range	Best Uncertainty[2] (±)	Comments
Acoustic Pressure	114.0 dB SPL @ 250 Hz	0.2 dB reading (rdg)	Microphone reference
Static Force	(10 to 500) lbf (100 to 10 000) lbf (10 000 to 100 000) lbf	0.04 % full scale (fs) 0.06 % fs 0.08 % fs	Dead weight Strain gauge, load cell reference
Dynamic Force	(0 to 100 000) lbf	1 % fs	Strain gauge, load cell reference
Impulse Force	(0 to 5000) lb (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 (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 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 124.0 dB 250 Hz	1 % fs 0.45 dB rdg	Digital Heise reference (pneumatic) Piston phone reference

Peter Unger

Parameter/Equipment	Range	Best Uncertainty[2] (±)	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 (10 to 99) Hz (100 to 1999) Hz (2000 to 10 000) Hz (11 000 to 15 000) Hz	2 % rdg 1.5 % rdg 1 % rdg 2.5 % rdg 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 (1 to 30) Hz (30.01 to 199) Hz (200 to 1000) Hz	1.8 % rdg 1 % rdg 1.5 % rdg 3 % rdg	PCB quartz acceleration reference, back to back comparison method
Primary Vibration – Mid to High Frequency Amplitude	5 Hz 5 Hz $< f <$ 100 Hz 100 Hz 159 Hz 159 Hz $< f \leq$ 1000 Hz 1000 Hz $< f \leq$ 5000 Hz 5000 Hz $< f \leq$ 15 kHz	1 % rdg 0.5 % rdg 0.2 % rdg 0.2 % rdg 0.5 % rdg 1 % rdg 1.5 % rdg	Laser interferometry
Primary Vibration –			Laser interferometry
Mid to High Frequency Phase	5 Hz $\leq f <$ 5000 Hz 5000 Hz $< f \leq$ 15 kHz	0.5° 1°	
Low Frequency Phase	0.5 Hz $\leq f <$ 10 Hz	0.5 °	And long stroke shaker
Primary Vibration –			Laser interferometry and long stroke shaker
Low Frequency Amplitude	0.5 Hz $\leq f <$ 10 Hz	0.3 % rdg	

Parameter/Equipment	Range	Best Uncertainty[2] (±)	Comments
Torque	(10 to 25 000) in·lb	0.04 % fs	Beam length and dead weight
	(25 000 to 100 000) in·lb	0.14 % fs	Back-to-back torque sensor reference
	(100 000 to 500 000) in·lb	0.09 % fs	Back-to-back torque using beam length and load cell reference

[1] This laboratory offers commercial calibration service.

[2] "Best Uncertainty" 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 of nearly ideal measuring equipment. Best uncertainties represent expanded uncertainties expressed at approximately the 95 % level of confidence, usually using a coverage factor of $k = 2$. The best uncertainty of a specific calibration performed by the laboratory may be greater than the best uncertainty due to the behavior of the customer's device and to influences from the circumstances of the specific calibration.

[3] Best measurement uncertainties are expressed as either a specific value that covers the full range or as a fraction of the reading plus a fixed floor specification.