CERTIFICATE OF ACCREDITATION

The ANSI National Accreditation Board

Hereby attests that

Kistler Instrument Corporation
75 John Glenn Drive
Amherst, NY 14228
(with a satellite location as listed on the scope of accreditation)

Fulfills the requirements of

ISO/IEC 17025:2017

and national standard

ANSI/NCSL Z540-1-1994 (R2002)

In the field of

CALIBRATION

This certificate is valid only when accompanied by a current scope of accreditation document.
The current scope of accreditation can be verified at www.anab.org.

R. Douglas Leonard Jr., VP, PILR SBU

Expiry Date: 07 July 2022
Certificate Number: AC-1117

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017.
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).

SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017 AND ANSI/NCSL Z540-1-1994 (R2002)

Kistler Instrument Corporation

75 John Glenn Drive
Amherst, NY 14228
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Email: fred.bartz@kistler.com Website: www.kistler.com

CALIBRATION

Valid to: **July 7, 2022** Certificate Number: **AC-1117**

Acoustics and Vibration

Parameter / Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method and/or Equipment
Vibration Magnitude / Frequency Response (0.5 to 20) Hz	5 mV to 4 V / g_n	1.3 % of reading	MB Dynamics Win 475, Reference accelerometer
Vibration Magnitude & Charge / Frequency Response (10 to 2 000) Hz (>2 000 to 10 000) Hz (>10 000 to 15 000) Hz (>15 000 to 18 000) Hz (>18 000 to 20 000) Hz	5 mV to 4 V / g_n 0.1 pC to 100 pC / g_n	0.84 % of reading 0.93 % of reading 1.7 % of reading 2.2 % of reading 5% of reading	Kistler Vibration System, 8002K Accelerometer, 5020 Charge Amplifier
Vibration, Rotational (Magnitude)	12.5 Hz	1.1 % of reading	Kistler Vibration System 8002K/5020

Electrical – DC/Low Frequency

Parameter / Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method and/or Equipment
Charge (Automated)	(1.6 to 90 000) pC	0.34 % of reading	Kistler Charge Calibrator 5395, Function Generator, DMM
Charge (Manual)	(5 to 2 000 000) pC	0.1 % of reading	Kistler Charge Calibrator 5395, Function Generator,

Electrical – DC/Low Frequency

Parameter / Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method and/or Equipment
Gain Accuracy[2]	0.5 to 150	0.25 % of reading	National Instruments Data Acquisition Board PXI-4461
Gain Accuracy[2]	1x, 10x, 100x	0.7 % of reading	Digital Multimeter

Mass and Mass Related

Parameter / Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method and/or Equipment
Force, Dynamic (Voltage Sensitivity)	(0.04 to 5) lbf	1.3 % of reading	Class 4 & 6 Mass Pieces, Oscilloscope
Force, Impulse Hammer (Sensitivity at 100 Hz)	(100 to 5 000) lbf	1.3 % of reading	Agilent Signal Analyzer 3562A
Force, Static (Voltage, Charge Sensitivity)	(50 to 50 000) lbf	0.18 % of reading	Morehouse Ring Dynamometers
Pressure, Absolute	(-14.5 to <0) psi (>0 to 500) psi	0.28 % of reading	Mensor Digital Pressure Gage 11900-401
Pressure, Sinusoidal	(50 to 1 000) psi	1.3 % of reading	Pressure Sensor, Amplifier, Oscilloscope
Pressure, Static	(20 to 15 000) psi	0.56 % of reading	Mansfield and Green Deadweight Tester
Pressure, Static	(5 000 to 100 000) psi	0.56 % of reading	6213BU High Pressure Transducer
Pneumatic Pressure[2] Gage / Absolute (Current: 4 mA to 20 mA)	(-14.5 to <0) psi (>0 to 1 500) psi	0.25 % of reading	Mensor Digital Pressure Gages 600 & CPC6000
Pneumatic Pressure[3] Gage / Absolute (Voltage: Up to 10 V)	(-14.5 to <0) psi (>0 to 1 500) psi	0.2 % of reading	
Hydraulic Pressure[3], (Current: 4 mA to 20 mA)	(500 to 5 000) psig	0.25 % of reading	Pressurements Dead Weight Tester
Hydraulic Pressure[3], (Voltage: Up to 10 V)	(500 to 6 000) psig	0.2 % of reading	Pressurements Dead Weight Tester
Hydraulic Pressure[3], (Voltage: Up to 10 V)	(0 to 700) bar	0.2 % of reading	Ruska Hydraulic Pressure Controller

Services performed at satellite location

30280 Hudson Drive
Novi, MI 48377
Bruce Noland 248-668-6843

Acoustics and Vibration

Parameter / Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method and/or Equipment
Vibration (Magnitude / Frequency Response) (3 to 8) Hz (>8 to 16) Hz (>16 to 1 000) Hz (>1 000 to 5 000) Hz (>5 000 to 10 000) Hz	0.04 mV to 4 V/g_n at 100 Hz 0.1 pC to 100 pC / g_n	2 % of reading 1 % of reading 0.75 % of reading 1.5 % of reading 2.5 % of reading	Spektra Vibration System CS18

Electrical – DC/Low Frequency

Parameter / Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method and/or Equipment
DC Voltage - Source	(-10 to 10) V	0.1 V	Hewlett Packard Universal Source 3245A, Digistant 4462
DC Voltage - Measure	(0 to 20) V	0.001 1 V	Keithley Digital Multimeter 2000
Charge	(2 to 2 100 000) pC	0.18 % of reading	Kistler Charge Calibrator 5395
Current – Measure	(0 to 20) mA	0.003 1 mA	Keithley Digital Multimeter 2000

Mass and Mass Related

Parameter / Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method and/or Equipment
Force, Static	(100 to 500) N (>500 to 5 000) N (>5 000 to 50 000) N (2 500 to 500 000) N	0.38 % of reading 0.17 % of reading 0.16 % of reading 0.29 % of reading	Load Frame and Reference Load Cell
Pressure, Static	(1 to 4 350) psi	0.42 % of reading	Reference Pressure Sensor

Mass and Mass Related

Parameter / Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method and/or Equipment
Velocity	(1 to 330) kph	0.17 % of reading	Speed Measurement System
Force Moment	(0.5 to 25) kN (12.5 to 1 000) Nm	0.2 % of reading	Load Frame and Reference Load Cell
Torque Transducers[1]	(2 to 10) N·m (10 to 200) N·m (50 to 500) N·m 500 N·m to 2 kN·m (2 to 4) kN·m	0.11 % of reading 0.079 % of reading 0.065 % of reading 0.13 % of reading 0.13 % of reading	VDI/VDE 2646, reference transducer
Torque Wrenches[1]	(2 to 500) N·m	0.91 % of reading + *R*	ISO 6789, reference transducer

Time and Frequency

Parameter / Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method and/or Equipment
Frequency - Measure	(0 to 20 000) Hz	0.018 9 Hz	Agilent Universal Counter 53131A, Keysight 53220A
Time - Measure	(0 to 150) µs	0.93 µs	

Calibration and Measurement Capability (CMC) is expressed in terms of the measurement parameter, measurement range, expanded uncertainty of measurement and reference standard, method, and/or equipment. The expanded uncertainty of measurement is expressed as the standard uncertainty of the measurement multiplied by a coverage factor of 2 (k=2), corresponding to a confidence level of approximately 95%.

Notes:

1. On-site calibration service is available for this parameter, since on-site conditions are typically more variable than those in the laboratory, larger measurement uncertainties are expected on-site than what is reported on the accredited scope.
2. Gain Accuracy is expressed as a ratio of input voltage to output voltage therefore it has no units
3. Uncertainty is expressed as a percent of unit under test range.
4. *R* = resolution of the unit under test.
5. This scope is formatted as part of a single document including Certificate of Accreditation No. AC-1117.

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