



CERTIFICATE OF ACCREDITATION

The ANSI National Accreditation Board

Hereby attests that

V.J. Technologies, Inc., dba Standards and Calibrations
1223 Rand Road
Des Plaines, IL 60016

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.

Jason Stine, Vice President

Expiry Date: 30 November 2025
Certificate Number: AC-2524



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)

V.J. Technologies, Inc., dba Standards and Calibrations

1223 Rand Road
Des Plaines, IL 60016
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CALIBRATION

Valid to: **November 30, 2025**

Certificate Number: **AC-2524**

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
DC Voltage – Measure ¹	Up to 1 V (1 to 10) V (10 to 100) V (100 to 1 000) V	5.9 $\mu\text{V/V} + 0.4 \mu\text{V}$ 3.7 $\mu\text{V/V} + 0.5 \mu\text{V}$ 7.2 $\mu\text{V/V} + 50 \mu\text{V}$ 7.3 $\mu\text{V/V} + 0.5 \text{ mV}$	Agilent 3458A 8.5 Digit Multimeter
DC Voltage – Generate ¹	Up to 330 μV 330 μV to 3.3V (3.3 to 33) V (33 to 330) V (330 to 1 000) V	10 $\mu\text{V/V} + 1 \mu\text{V}$ 15 $\mu\text{V/V} + 2 \mu\text{V}$ 15 $\mu\text{V/V} + 20 \mu\text{V}$ 15 $\mu\text{V/V} + 0.15 \text{ mV}$ 15 $\mu\text{V/V} + 1.5 \text{ mV}$	Fluke 5520A-SC600 Multiproduct Calibrator
DC Current – Generate ¹ (Locked Ranges)	(0 to 330) μA (0 to 3.3) mA (0 to 33) mA (0 to 330) mA (0 to 1.1) A (1.1 to 3) A (0 to 11) A (11 to 20.5) A	0.18 mA 0.12 mA 0.12 mA 0.12 mA 0.28 mA 0.53 mA 1.4 mA 3 mA	Fluke 5520A-SC600 Multiproduct Calibrator
DC Current – Measure ¹	Up to 100 μA 100 μA to 1 mA (1 to 10) mA (10 to 100) mA 100 mA to 1A	42 $\mu\text{A/A} + 4 \text{ nA}$ 34 $\mu\text{A/A} + 4 \text{ nA}$ 31 $\mu\text{A/A} + 7 \text{ nA}$ 47 $\mu\text{A/A} + 70 \text{ nA}$ 0.015 % of reading + 0.7 μA	Agilent 3458A 8.5 Digit Multimeter

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Resistance – Generate ¹ (Artifacts)	(1 to 10) Ω (10 to 100) Ω 100 Ω to 1 k Ω (1 to 10) k Ω (10 to 100) k Ω 100 k Ω to 1 M Ω (1 to 10) M Ω (10 to 100) M Ω	0.014 % of reading 0.003 % of reading 0.003 % of reading 0.004 % of reading 0.004 % of reading 0.005 % of reading 0.005 % of reading 0.005 % of reading	IET SR 104 Resistance Standard, IET 242-D Resistance Measuring System with Transfer Standard using Resistance Transfer Method.
Resistance – Measure ¹ (Fixed Resistance Points)	(10, 100) Ω (1, 10, 100) k Ω 1 M Ω	0.004 % of reading + 5 m Ω 0.002 % of reading + 0.5 Ω 0.004 % of reading + 3 Ω	Agilent 3458A 8.5 Digit Multimeter
Resistance – Measure ¹	100 m Ω to 1 Ω 100 Ω to 10 M Ω (10 to 100) M Ω	0.014 % of reading 0.004 % of reading 0.004 % of reading	IET 242-D Resistance Measuring System
Inductance – Generate ¹ (Artifacts)	(1, 10, 100) mH (1, 5) H	0.12 % of reading 0.26 % of reading	GenRad 1482 Series Standard Inductors
Inductance – Measure ¹ 1 kHz	100 mH to 10 H	0.06 % of reading	Quadtech 1689M RLC Bridge
Capacitance – Generate ¹ (Artifacts)	100 pF to 1.1 μ F	0.15 % of reading	GenRad 1423A Decade Capacitor, GenRad 1403G Capacitor
Capacitance – Generate ¹ (Artifacts)	(1, 10) pF	0.2 % of reading	HP 16380A Capacitor Set
Capacitance – Generate ¹ (Simulation)	(1.1 to 3.3) μ F (3.3 to 11) μ F (11 to 33) μ F (33 to 110) μ F (110 to 330) μ F 330 μ F to 1.1 mF	0.29 % of reading + 3 nF 0.29 % of reading + 10 nF 0.29 % of reading + 30 nF 0.57 % of reading + 0.1 μ F 0.58 % of reading + 0.3 μ F 0.86 % of reading + 1 μ F	Fluke 5520A-SC600 Multiproduct Calibrator
Capacitance – Measure ¹	1 kHz 10 aF to 1.11 11 μ F (1.1 to 11) μ F	0.013 % of reading + 30 aF 0.066 % of reading	Quadtech 1620-AP Capacitance Bridge
Electrical Simulation of Thermocouple Indicating Devices – Source/Measure ¹	Type B (600 to 800) $^{\circ}$ C (800 to 1 000) $^{\circ}$ C (1 000 to 1 550) $^{\circ}$ C (1 550 to 1 820) $^{\circ}$ C	0.52 $^{\circ}$ C 0.41 $^{\circ}$ C 0.41 $^{\circ}$ C 0.37 $^{\circ}$ C	Fluke 5520A-SC600 Multiproduct Calibrator

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Electrical Simulation of Thermocouple Indicating Devices – Source/Measure ¹	Type C		Fluke 5520A-SC600 Multiproduct Calibrator
	(0 to 150) °C	0.37 °C	
	(150 to 650) °C	0.33 °C	
	(350 to 1 000) °C	0.38 °C	
	(1 000 to 1 800) °C	0.58 °C	
	(1 800 to 2 316) °C	0.98 °C	
	Type E		
	(-250 to -100) °C	0.59 °C	
	(-100 to -25) °C	0.22 °C	
	(-25 to 350) °C	0.2 °C	
	(350 to 650) °C	0.22 °C	
	(650 to 1 000) °C	0.27 °C	
	Type J		
	(-210 to -100) °C	0.33 °C	
	(-100 to -30) °C	0.22 °C	
	(-30 to 150) °C	0.2 °C	
	(150 to 760) °C	0.23 °C	
	(760 to 1 200) °C	0.29 °C	
	Type K		
	(-200 to -100) °C	0.33 °C	
	(-100 to -25) °C	0.22 °C	
	(-25 to 120) °C	0.2 °C	
	(120 to 1 000) °C	0.23 °C	
	(1 000 to 1 372) °C	0.29 °C	
	Type L		
	(-200 to -100) °C	0.44 °C	
	(-100 to 800) °C	0.33 °C	
	(800 to 900) °C	0.24 °C	
	Type N		
	(-200 to -100) °C	0.37 °C	
	(-100 to -25) °C	0.23 °C	
	(-25 to 120) °C	0.22 °C	
	(120 to 410) °C	0.21 °C	
	(410 to 1 300) °C	0.27 °C	
	Type R		
	(0 to 250) °C	0.57 °C	
	(250 to 400) °C	0.35 °C	
	(400 to 1 000) °C	0.34 °C	
	(1 000 to 1 767) °C	0.39 °C	

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Electrical Simulation of Thermocouple Indicating Devices – Source/Measure ¹	Type S (0 to 250) °C	0.58 °C	Fluke 5520A-SC600 Multiproduct Calibrator
	(250 to 1 000) °C	0.37 °C	
	(1 000 to 1 400) °C	0.37 °C	
	(1 400 to 1 767) °C	0.43 °C	
	Type T (-250 to -150) °C	0.57 °C	
	(-150 to 0) °C	0.25 °C	
	(0 to 120) °C	0.19 °C	
	Type U (-200 to 0) °C	0.66 °C	
	(0 to 600) °C	0.34 °C	
AC Voltage – Generate ¹	(1 to 33) mV (10 to 45) Hz	0.24 % of reading + 6 µV	Fluke 5520A-SC600 Multiproduct Calibrator
	45 Hz to 10 kHz	0.16 % of reading + 6 µV	
	(10 to 20) kHz	0.05 % of reading + 6 µV	
	(20 to 50) kHz	0.13 % of reading + 6 µV	
	(50 to 100) kHz	0.4 % of reading + 12 µV	
	(100 to 500) kHz	0.92 % of reading + 50 µV	
	(33 to 330) mV (10 to 45) Hz	0.053 % of reading + 8 µV	
	45 Hz to 10 kHz	0.041 % of reading + 8 µV	
	(10 to 20) kHz	0.021 % of reading + 8 µV	
	(20 to 50) kHz	0.044 % of reading + 8 µV	
	(50 to 100) kHz	0.093 % of reading + 32 µV	
	(100 to 500) kHz	0.26 % of reading + 70 µV	
	330 mV to 3.3 V (10 to 45) Hz	0.061 % of reading + 50 µV	
	45 Hz to 10 kHz	0.046 % of reading + 60 µV	
	(10 to 20) kHz	0.022 % of reading + 60 µV	
	(20 to 50) kHz	0.035 % of reading + 50 µV	
	(50 to 100) kHz	0.081 % of reading + 0.13 mV	
	(100 to 500) kHz	0.28 % of reading + 0.6 mV	
	(3.3 to 33) V (10 to 45) Hz	0.055 % of reading + 0.65 mV	
	45 Hz to 10 kHz	0.041 % of reading + 0.6 mV	
	(10 to 20) kHz	0.028 % of reading + 0.6 mV	
	(20 to 50) kHz	0.41 % of reading + 0.6 mV	
	(50 to 100) kHz	0.1 % of reading + 1.6 mV	

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
AC Voltage – Generate ¹	(33 to 330) V 45 Hz to 1 kHz (1 to 10) kHz (10 to 20) kHz (20 to 50) kHz (50 to 100) kHz (330 to 1 020) V 45 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz	0.041 % of reading + 2 mV 0.042 % of reading + 6 mV 0.028 % of reading + 6 mV 0.036 % of reading + 6 mV 0.23 % of reading + 50 mV 0.055 % of reading + 10 mV 0.031 % of reading + 10 mV 0.037 % of reading + 10 mV	Fluke 5520A-SC600 Multiproduct Calibrator
AC Voltage – Measure ¹ (Fixed Voltage Points)	10 mV (1 to 40) Hz 40 Hz to 1 kHz (1 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz 100 mV (1 to 40) Hz 40 Hz to 1 kHz (1 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz 1 V (1 to 40) Hz 40 Hz to 1 kHz (1 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz 10 V (1 to 40) Hz 40 Hz to 1 kHz (1 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz	0.14 % of reading + 3 μ V 0.14 % of reading + 1.1 μ V 0.15 % of reading + 1.1 μ V 0.16 % of reading + 1.1 μ V 0.62 % of reading + 1.1 μ V 1.1 % of reading + 2 μ V 0.03 % of reading + 4 μ V 0.03 % of reading + 2 μ V 0.025 % of reading + 2 μ V 0.036 % of reading + 2 μ V 0.095 % of reading + 2 μ V 0.35 % of reading + 10 μ V 0.016 % of reading + 20 μ V 0.013 % of reading + 40 μ V 0.017 % of reading + 20 μ V 0.036 % of reading + 20 μ V 0.09 % of reading + 20 μ V 0.35 % of reading + 20 μ V 0.017 % of reading + 0.4 mV 0.017 % of reading + 0.2 mV 0.019 % of reading + 0.2 mV 0.036 % of reading + 0.2 mV 0.11 % of reading + 0.2 mV 0.37 % of reading + 1 mV	Agilent 3458A 8.5 Digit Multimeter

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
AC Voltage – Measure ¹ (Fixed Voltage Points)	100 V (1 to 40) Hz 40 Hz to 1 kHz (1 to 20) kHz (20 to 50) kHz (50 to 100) kHz	0.03 % of reading + 4 mV 0.03 % of reading + 2 mV 0.032 % of reading + 2 mV 0.042 % of reading + 2 mV 0.16 % of reading + 2 mV	Agilent 3458A 8.5 Digit Multimeter
	1 000 V 1 Hz to 20 kHz	0.12 % of reading + 20 mV	
AC Current – Generate ¹	(29 to 329.99) μ A (10 to 20) Hz (20 to 45) Hz 45 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz (10 to 30) kHz	0.88 μ A 0.7 μ A 0.6 μ A 1.4 μ A 3.3 μ A 6.6 μ A	Fluke 5520A-SC600 Multiproduct Calibrator
	330 μ A to 3.299 9) mA (10 to 20) Hz (20 to 45) Hz 45 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz (10 to 30) kHz (3.3 to 32.999) mA (10 to 20) Hz (20 to 45) Hz 45 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz (10 to 30) kHz (33 to 329.99) mA (10 to 20) Hz (20 to 45) Hz 45 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz (10 to 30) kHz (330 mA to 1.099 99) A (10 to 45) Hz 45 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz	7.8 μ A 5 μ A 4 μ A 7.8 μ A 20 μ A 39 μ A 72 μ A 37 μ A 18 μ A 33 μ A 80 μ A 0.16 mA 1.7 mA 1.9 mA 1.5 mA 1.3 mA 1.7 mA 2.6 mA 2.4 mA 0.76 mA 8.8 mA 33 mA	

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
AC Current – Generate ¹	(1.1 to 2.999 99) A (10 to 45) Hz 45 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz (3 to 10.99 99) A (45 to 100) Hz 100 Hz to 1 kHz (1 to 5) kHz (11 to 20.5) A (45 to 100) Hz 100 Hz to 1 kHz (1 to 5) kHz	6.4 mA 2.2 mA 22 mA 92 mA 11 mA 16 mA 0.39 A 35 mA 41 mA 0.7 A	Fluke 5520A-SC600 Multiproduct Calibrator
AC Current – Measure ¹ (Fixed Current Points)	100 μ A 10 Hz to 1 kHz (1 to 5) kHz 1 mA 10 Hz to 1 kHz (1 to 5) kHz 10 mA 10 Hz to 1 kHz (1 to 5) kHz 100 mA 10 Hz to 1 kHz (1 to 5) kHz 1 A 10 Hz to 1 kHz (1 to 5) kHz	0.47 % of reading + 30 nA 0.14 % of reading + 30 nA 0.50 % of reading + 20 nA 0.09 % of reading + 20 nA 0.55 % of reading + 2 μ A 0.06 % of reading + 2 μ A 0.53 % of reading + 20 μ A 0.07 % of reading + 20 μ A 0.47 % of reading + 0.2 mA 0.12 % of reading + 0.2 mA	Agilent 3458A 8.5 Digit Multimeter
Oscilloscopes ¹ Amplitude	DC and Square Wave 10 Hz to 10 kHz	0.25 % of output + 0.1 mV	Fluke 5520A-SC600 Multiproduct Calibrator
Leveled Sine Wave Flatness, Relative to 50 kHz	50 kHz to 100 MHz (100 to 300) MHz	2.3 % of reading + 0.1 mV 3 % of reading + 0.1 mV	
Time Marker	100 μ s to 5 s (2 to 50) μ s 20 ns to 1 μ s (2 to 10) ns	30 μ Hz/Hz + 1 mHz 50 μ Hz/Hz + 15 mHz 0.005 % of reading 0.005 % of reading	
Rise Time	≤ 1 ns	0.005 % of reading	

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Oscilloscope ¹ Time Marker into 50 Ω load	300 MHz to 1 GHz	6.5 % of reading	Tektronix SG 504 Leveled Sine Wave Generator
Phase Angle – Generate ¹	1 Hz to 6.25 kHz (6.25 to 100) kHz	0.02 ° 0.1 °	Clark Hess 5000 Phase Standard
Phase Angle – Measure ¹	(0 to 90) ° 10 Hz to 10 kHz 10 kHz to 50 kHz 50 kHz to 100 kHz	0.04 ° 0.7 ° 1.2 °	Krohn Hite 6620 Phase Meter

Electrical – RF/Microwave

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Attenuation – Measure ¹	Up to 26.5 GHz (-10 to 0) dB (-20 to -10) dB (-30 to -20) dB (-40 to -30) dB (-50 to -40) dB (-60 to -50) dB (-70 to -60) dB (-80 to -70) dB (-90 to -80) dB (-100 to -90) dB	0.12 dB 0.1 dB 0.13 dB 0.17 dB 0.15 dB 0.17 dB 0.22 dB 0.24 dB 0.25 dB 0.32 dB	HP 8902MS Measuring Receiver
Amplitude Modulation ¹ Carrier Frequency: 150 kHz to 26.5 GHz Rate: 50 Hz to 50 kHz Rate: 20 Hz to 100 kHz	Depths: (10 to 99) % Depths: (5 to 99) %	1 % Depth 3 % Depth	HP 8902MS Measuring Receiver
Phase Modulation ¹ 150 kHz to 26.5 GHz Rate: 20 Hz to 20 kHz	Up to 400 rad	4.8 % Deviation	HP 8902MS Measuring Receiver
Frequency Modulation ¹ Carrier Frequency: 150 kHz to 26.5 GHz Rate: 20 Hz to 200 kHz Rate: 50 Hz to 100 kHz	Deviation up to 400 kHz Deviation up to 400 kHz	5 % Deviation 1 % Deviation	HP 8902MS Measuring Receiver
Power Meter Power Reference ³	1 mW 50 MHz	0.44 % of reading	HP 478A Power Meter

Electrical – RF/Microwave

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
RF Power – Measure ^{1,2}	10 MHz to 18 GHz (-50 to -20) dBm (-60 to -50) dBm	1.8 % of reading + <i>M</i> 3.2 % of reading + <i>M</i>	HP 8481D Power Sensor
	100 kHz to 4.2 GHz (-30 to +9.99) dBm (+10 to +20) dBm	1.6 % of reading + <i>M</i> 3.6 % of reading + <i>M</i>	HP 8482A Power Sensor
	10 MHz to 18 GHz (-30 to +9.99) dBm (+10 to +20) dBm	1.8 % of reading + <i>M</i> 3.5 % of reading + <i>M</i>	HP 8481A Power Sensor
	(18 to 26.5) GHz (-20 to +9.99) dBm (+10 to +20) dBm	2.8 % of reading + <i>M</i> 4.2 % of reading + <i>M</i>	HP 8485A Power Sensor
	(26.5 to 50) GHz (-20 to +9.99) dBm (+10 to +20) dBm	3.9 % of reading + <i>M</i> 4.9 % of reading + <i>M</i>	HP 8487A Power Sensor

Length – Dimensional Metrology

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Calipers ^{1,2}	(6 to 40) in	(0.5 <i>R</i> + 90 <i>L</i>) μin	Gage Blocks
Micrometers ^{1,2}	Up to 40 in	(0.5 <i>R</i> + 60 <i>L</i>) μin	Gage Blocks, ASME B89.1.13
Dial Indicators ^{1,2}	Up to 4 in	(300 + 0.5 <i>R</i>) μin	Indicator Checker, ASME B89.1.10M
Height Gages ^{1,2}	(6 to 40) in	(0.6 <i>R</i> + 70 <i>L</i>) μin	Gage Blocks
Pin Gages ²	(0.01 to 1.18) in	(73 + 2 <i>D</i>) μin	Mitutoyo LSM-3100 Laser Micrometer
Inside Micrometer ^{1,2}	(1 to 40) in	(0.5 + 18 <i>L</i>) μin	Gage Blocks, ASME B89.1.13
Gage Blocks ²	(0.05 to 4) in	(4 + 12 <i>L</i>) μin	Master Gage Blocks, Gage Block Comparator, ASME B89.1.9
Coating Thickness Gages ¹	(0.02 to 1 500) mm	1.4 μm	Master Thickness Gages
Inspection Gages ² Radius Gage Angle Gage Thread Pitch Gage	Up to 1 in Up to 90 ° (4 to 84) TPI	600 μin 3' 600 μin	Optical Comparator

Length – Dimensional Metrology

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Tape Measures	Up to 25 ft	0.016 in	Tape Measuring Machine
Rulers, Scales ²	Up to 40 in	$(800 + 60L) \mu\text{in}$	Tape Measuring Machine
Optical Flats and Parallels ² Flatness: Up to 2inD	Up to 96 μin	2.5 μin	Optical Flat
Optical Flats, Optical Parallels (Thickness)	Up to 1 in	10 μin	Master Gage Blocks, Comparator
Optical Parallel ² Parallelism: Up to 2inD	Up to 20 μin	5 μin	Master Gage Blocks, Comparator
Surface Finish Measuring Instruments	Up to 125 μin (Ra)	2.8 μin	Master Surface Finish Specimen
Surface Finish Specimen ¹	(1 to 40) μin (Ra) (40 to 125) μin (Ra) (125 to 250) μin (Ra) (250 to 500) μin (Ra)	2.4 μin 3.1 μin 7.8 μin 13 μin	Master Surface Finish Tester
Optical Comparator ^{1,2} Squareness Linear Scales Magnification	Up to 200 mm Up to 300 mm (5 to 50) X	$(1.6 + 7.5X) \mu\text{m}$ $(2.7 + 10X) \mu\text{m}$ 0.02 % of reading	Steel Square Glass Scale Glass Scale

Mass and Mass Related

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Scales and Balances ^{1,3} (SI)	1 mg to 100 g	2.1 mg	ASTM E617 Class 2 Weights and internal calibration procedure utilized in the calibration of the weighing system.
Scales and Balances ^{1,3} (Avoirdupois)	100 g to 2 kg	0.23 g	NIST Class F Weights and internal calibration procedure utilized in the calibration of the weighing system.
	1 oz to 50 lb	0.11 lb	
Pressure Gages	(600 to 10 000) psig	0.15 % of reading	Deadweight Tester
Torque Devices	(1 to 600) lbf·ft	1 % of reading	Torque Tester

Thermodynamic

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Temperature – Measure	(-20 to 400) °C	0.028 °C	Comparison to Rosemount 162CE SPRT
Temperature – Measuring Equipment ¹	(-20 to 400) °C	0.6 % of reading	Comparison to Rosemount 162CE SPRT
Relative Humidity	(11, 33, 75) %RH	3.8 %RH	Accredited Saturated Salt Solutions

Time and Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Frequency – Source	10 MHz Reference	2 nHz/Hz	Fluke 910R GPS Frequency Standard
Frequency – Source ¹	10 MHz Reference	2 nHz/Hz	Rubidium Frequency Standard
Frequency – Measure ¹	10 mHz to 40 GHz	2 nHz/Hz	Fluke 910R GPS Frequency Standard
Timers, Stopwatches	10 s to 24 hr	0.11 ms	Comparison to Quartz Timer

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. M = Source Mismatch Uncertainty at the time of calibration; R = resolution of unit under test (UUT); L = length in inches; D = diameter in inches; X = length in millimeters.
3. The CMC for scales and balances is highly dependent upon the resolution of the unit under test. The CMC presented here does not include the resolution of the unit under test. The resolution will be included in the reported measurement uncertainty at the time of calibration.
4. This scope is formatted as part of a single document including Certificate of Accreditation No. AC-2524.



Jason Stine, Vice President