



CERTIFICATE OF ACCREDITATION

The ANSI National Accreditation Board

Hereby attests that

**Accredited Labs
dba**

**Cal Tec Process Management
1400 Grange Hall Road, Suite 500
Beavercreek, OH 45430**

Fulfills the requirements of

ISO/IEC 17025:2017

In the fields of

CALIBRATION AND DIMENSIONAL MEASUREMENT

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: 10 April 2028

Certificate Number: AC-1320



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

Accredited Labs dba Cal Tec Process Management

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CALIBRATION AND DIMENSIONAL MEASUREMENT

ISO/IEC 17025 Accreditation Granted: **10 April 2026**

Certificate Number: **AC-1320** Certificate Expiry Date: **10 April 2028**

CALIBRATION

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Capacitance – Source ¹	(0.2 to 1.2) nF 100 Hz to 10 kHz	0.09 % of reading + 2 pF	Comparison to Multifunction Calibrator
	(1.2 to 12) nF 150 Hz to 5 kHz	0.09 % of reading + 5 pF	
	(12 to 120) nF 200 Hz to 1.3 kHz	0.1 % of reading + 30 pF	
	(0.12 to 1.2) μF (2 to 310) Hz	0.1 % of reading + 0.3 nF	
	(1.2 to 12) μF (0.5 to 110) Hz	0.1 % of reading + 3 nF	
	(12 to 120) μF (0.5 to 40) Hz	0.12 % of reading + 25 nF	
	(0.12 to 1.2) mF (0.1 to 11) Hz	0.19 % of reading + 0.25 μF	
	(1.2 to 12) mF (0.03 to 4) Hz	0.19 % of reading + 3 μF	
	(12 to 120) mF (0.01 to 1.3) Hz	0.39 % of reading + 30 μF	
DC Voltage – Source ¹	(0 to 120) mV	9.3 μV/V + 0.8 μV	Comparison to Multifunction Calibrator
	(0.12 to 1.2) V	6.4 μV/V + 1 μV	
	(1.2 to 12) V	6.2 μV/V + 10 μV	
	(12 to 120) V	8.5 μV/V + 100 μV	
	(120 to 1 020) V	8.5 μV/V + 1 mV	

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
DC Voltage – Measure ¹	Up to 100 mV 100 mV to 1 V (1 to 10) V (10 to 100) V 100 V to 1 kV	7.7 μ V/V + 0.1 μ V 3 μ V/V + 0.4 μ V 3 μ V/V + 4 μ V 4.4 μ V/V + 40 μ V 4.5 μ V/V + 0.5 mV	Comparison to Precision DMM
AC Voltage – Source ¹	(1 to 12) mV (3 to 5) Hz (5 to 10) Hz 10 Hz to 20 kHz (20 to 50) kHz (50 to 100) kHz (100 to 500) kHz (12 to 120) mV (3 to 5) Hz (5 to 10) Hz 10 Hz to 20 kHz (20 to 50) kHz (50 to 100) kHz (100 to 500) kHz (0.12 to 1.2) V (3 to 5) Hz (5 to 10) Hz 10 Hz to 20 kHz (20 to 50) kHz (50 to 100) kHz (100 to 500) kHz (1.2 to 12) V (3 to 5) Hz (5 to 10) Hz (10 to 40) Hz 40 Hz to 20 kHz (20 to 50) kHz (50 to 100) kHz (100 to 500) kHz	1.9 mV/V + 7 μ V 0.68 mV/V + 7 μ V 0.12 mV/V + 6 μ V 0.29 mV/V + 6 μ V 1.2 mV/V + 15 μ V 6.2 mV/V + 30 μ V 1.9 mV/V + 7 μ V 0.68 mV/V + 7 μ V 0.11 mV/V + 6 μ V 0.27 mV/V + 8 μ V 0.62 mV/V + 20 μ V 1.6 mV/V + 30 μ V 1.9 mV/V + 0.75 mV 0.68 mV/V + 70 μ V 0.11 mV/V + 60 μ V 0.23 mV/V + 14 μ V 0.54 mV/V + 40 μ V 1.5 mV/V + 80 μ V 1.9 mV/V + 0.75 mV 0.68 mV/V + 0.75 mV 0.11 mV/V + 0.35 mV 0.11 mV/V + 50 μ V 0.23 mV/V + 50 μ V 0.54 mV/V + 125 μ V 1.6 mV/V + 0.6 mV	Comparison to Multifunction Calibrator

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
AC Voltage – Source ¹	(12 to 120) V		Comparison to Multifunction Calibrator
	(3 to 5) Hz	1.9 mV/V + 7.5 mV	
	(5 to 10) Hz	0.68 mV/V + 7.5 mV	
	(10 to 40) Hz	0.11 mV/V + 3.5 mV	
	40 Hz to 20 kHz	0.11 mV/V + 0.5 mV	
	(20 to 50) kHz	0.23 mV/V + 0.5 mV	
	(50 to 100) kHz	0.54 mV/V + 1.25 mV	
	(100 to 500) kHz	1.6 mV/V + 20 mV	
	(120 to 330) V		
	(3 to 5) Hz	1.9 mV/V + 75 mV	
	(5 to 10) Hz	0.68 mV/V + 75 mV	
	10 Hz to 20 kHz	0.11 mV/V + 8 mV	
	(20 to 50) kHz	0.23 mV/V + 8 mV	
	(50 to 100) kHz	1.2 mV/V + 12.5 mV	
AC Voltage – Measure ¹	(330 to 1 020) V		Comparison to Precision DMM
	(3 to 5) Hz	1.9 mV/V + 75 mV	
	(5 to 10) Hz	0.68 mV/V + 75 mV	
	10 Hz to 10 kHz	0.11 mV/V + 80 mV	
	(1 to 12) mV		
	1 Hz to 2 kHz	0.3 mV/V + 1 μ V	
	(2 to 10) kHz	0.38 mV/V + 1 μ V	
	(10 to 30) kHz	0.39 mV/V + 1 μ V	
	(30 to 100) kHz	3.1 mV/V + 1 μ V	
	(100 to 300) kHz	10 mV/V + 4 μ V	
	300 kHz to 1 MHz	20 mV/V + 4 μ V	
	(12 to 120) mV		
	1 Hz to 2 kHz	90 μ V/V + 1 μ V	
	(2 to 10) kHz	0.13 mV/V + 1 μ V	
	(10 to 30) kHz	0.23 mV/V + 1 μ V	
	(30 to 100) kHz	0.54 mV/V + 5 μ V	
	(100 to 300) kHz	2.1 mV/V + 30 μ V	
	300 kHz to 1 MHz	11 mV/V + 100 μ V	
	(1 to 2) MHz	16 mV/V + 500 μ V	
	(2 to 4) MHz	42 mV/V + 1 mV	
	(4 to 8) MHz	86 mV/V + 1 mV	
	(8 to 10) MHz	163 mV/V + 1 mV	

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
AC Voltage – Measure ¹	(0.12 to 1.2) V		Comparison to Precision DMM
	1 Hz to 2 kHz	78 $\mu\text{V/V} + 5 \mu\text{V}$	
	(2 to 10) kHz	125 $\mu\text{V/V} + 5 \mu\text{V}$	
	(10 to 30) kHz	0.23 mV/V + 10 μV	
	(30 to 100) kHz	0.54 mV/V + 50 μV	
	(100 to 300) kHz	2.1 mV/V + 300 μV	
	300 kHz to 1 MHz	10 mV/V + 1 mV	
	(1 to 2) MHz	15 mV/V + 5 mV	
	(2 to 4) MHz	41 mV/V + 10 mV	
	(4 to 8) MHz	84 mV/V + 10 mV	
	(8 to 10) MHz	157 mV/V + 10 mV	
	(1.2 to 12) V		
	1 Hz to 2 kHz	78 $\mu\text{V/V} + 50 \mu\text{V}$	
	(2 to 10) kHz	125 $\mu\text{V/V} + 50 \mu\text{V}$	
	(10 to 30) kHz	0.23 mV/V + 100 μV	
	(30 to 100) kHz	0.54 mV/V + 500 μV	
	(100 to 300) kHz	2.14 mV/V + 3 mV	
	300 kHz to 1 MHz	10 mV/V + 10 mV	
	(1 to 2) MHz	15 mV/V + 50 mV	
	(2 to 4) MHz	41 mV/V + 0.1 V	
	(4 to 8) MHz	84 mV/V + 0.1 V	
	(8 to 10) MHz	157 mV/V + 0.1 V	
	(12 to 120) V		
	1 Hz to 2 kHz	92 $\mu\text{V/V} + 0.5 \text{ mV}$	
	(2 to 10) kHz	0.11 mV/V + 0.5 mV	
	(10 to 30) kHz	0.23 mV/V + 1 mV	
	(30 to 100) kHz	0.6 mV/V + 5 mV	
	(100 to 300) kHz	3.8 mV/V + 50 mV	
	300 kHz to 1 MHz	11.2 mV/V + 0.5 V	
	(120 to 1 050) V		
	1 Hz to 10 kHz	0.11 mV/V + 0.25 mV	
	(10 to 30) kHz	0.23 mV/V + 0.25 mV	
	(30 to 100) kHz	0.6 mV/V + 0.1 V	

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Resistance – Source ¹	(0 to 12) Ω (12 to 120) Ω (0.12 to 1.2) k Ω (1.2 to 12) k Ω (12 to 120) k Ω (0.12 to 1.2) M Ω (1.2 to 12) M Ω (12 to 120) M Ω (120 to 1 200) M Ω	19 $\mu\Omega/\Omega$ + 10 m Ω 19 $\mu\Omega/\Omega$ + 15 m Ω 19 $\mu\Omega/\Omega$ + 20 m Ω 19 $\mu\Omega/\Omega$ + 200 m Ω 19 $\mu\Omega/\Omega$ + 1 Ω 19 $\mu\Omega/\Omega$ + 10 Ω 27 $\mu\Omega/\Omega$ + 150 Ω 330 $\mu\Omega/\Omega$ + 2.5 k Ω 3.1 m Ω/Ω + 0.1 M Ω	Comparison to Multifunction Calibrator
Resistance – Measure ¹	Up to 2 Ω (2 to 20) Ω (20 to 200) Ω 200 Ω to 2 k Ω (2 to 20) k Ω (20 to 200) k Ω 200 k Ω to 2 M Ω (2 to 20) M Ω (20 to 200) M Ω 200 M Ω to 2 G Ω	17 $\mu\Omega/\Omega$ + 4 $\mu\Omega$ 10 $\mu\Omega/\Omega$ + 14 $\mu\Omega$ 9.4 $\mu\Omega/\Omega$ + 50 $\mu\Omega$ 9.3 $\mu\Omega/\Omega$ + 0.5 m Ω 9.4 $\mu\Omega/\Omega$ + 5 m Ω 9.5 $\mu\Omega/\Omega$ + 50 m Ω 11 $\mu\Omega/\Omega$ + 1 Ω 19 $\mu\Omega/\Omega$ + 0.1 k Ω 0.12 m Ω/Ω + 10 k Ω 1.3 m Ω/Ω + 1 M Ω	Comparison to Precision DMM
DC Current – Source ¹	(0 to 120) μ A (0 to 1.2) mA (0 to 12) mA (12 to 120) mA (0.12 to 1.2) A (1.2 to 3.1) A (3.1 to 12) A (12 to 30.2) A	97 μ A/A + 6 nA 78 μ A/A + 15 nA 78 μ A/A + 80 nA 78 μ A/A + 0.8 μ A 120 μ A/A + 10 μ A 230 μ A/A + 150 μ A 230 μ A/A + 250 μ A 780 μ A/A + 500 μ A	Comparison to Multifunction Calibrator
DC Current – Source ¹	(20 to 100) A	82 μ A/A + 4 mA	Comparison to Multifunction Calibrator, Current Amplifier
DC Current Clamp-on Meters ¹	(6 to 60) A (60 to 155) A (155 to 600) A (600 to 1 020) A (1 000 to 5 000) A	5.6 mA/A + 0.15 A 5.6 mA/A + 0.15 A 6.7 mA/A + 0.35 A 7.1 mA/A + 1.5 A 7.1 mA/A + 0.35 A	Comparison to Multifunction Calibrator, 50 Turn Coil

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
DC Current – Measure ¹	(0 to 20) μ A (20 to 200) μ A (0.2 to 2) mA (2 to 20) mA (20 to 200) mA (0.2 to 2) A (2 to 20) A (20 to 30) A	28 μ A/A + 0.4 nA 10 μ A/A + 0.4 nA 9.8 μ A/A + 4 nA 14.6 μ A/A + 40 nA 60 μ A/A + 1 μ A 0.13 mA/A + 0.1 mA 0.24 mA/A + 0.4 mA 0.56 mA/A + 4.4 mA	Comparison to Precision DMM
AC Current – Source ¹	(10 to 120) μ A 3 Hz to 5 kHz (5 to 10) kHz (10 to 30) kHz (0.12 to 1.2) mA 3 Hz to 5 kHz (5 to 10) kHz (10 to 30) kHz (1.2 to 12) mA 3 Hz to 5 kHz (5 to 10) kHz (10 to 30) kHz (12 to 120) mA (3 to 45) Hz 45 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz (10 to 30) kHz (0.12 to 1.2) A (3 to 45) Hz 45 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz (10 to 30) kHz (1.2 to 3.1) A (3 to 45) Hz 45 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz	190 μ A/A + 10 nA 1.2 mA/A + 40 nA 3.9 mA/A + 1 μ A 190 μ A/A + 0.1 μ A 1.2 mA/A + 0.1 μ A 3.9 mA/A + 5 μ A 190 μ A/A + 1 μ A 1.2 mA/A + 1 μ A 3.9 mA/A + 10 μ A 190 μ A/A + 10 μ A 120 μ A/A + 5 μ A 190 μ A/A + 8 μ A 1.2 mA/A + 10 μ A 3.9 mA/A + 0.1 mA 190 μ A/A + 0.1 mA 190 μ A/A + 50 μ A 190 μ A/A + 80 μ A 1.9 mA/A + 0.3 mA 3.9 mA/A + 0.3 mA 290 μ A/A + 0.5 mA 230 μ A/A + 0.3 mA 290 μ A/A + 0.3 mA 1.9 mA/A + 0.5 mA	Comparison to Multifunction Calibrator

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
AC Current – Source ¹	(3.1 to 12) A (3 to 45) Hz 45 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz (12 to 30.2) A (3 to 45) Hz 45 Hz 1 kHz (1 to 5) kHz	290 μ A/A + 0.5 mA 230 μ A/A + 0.3 mA 290 μ A/A + 0.3 mA 1.9 mA/A + 1 mA 0.78 mA/A + 10 mA 0.54 mA/A + 8 mA 3.9 mA/A + 8 mA	Comparison to Multifunction Calibrator
AC Current – Source ¹	(20 to 120) A (10 to 65) Hz (65 to 300) Hz 300 Hz to 1 kHz (1 to 3) kHz (3 to 6) kHz (6 to 10) kHz	0.21 mA/A + 19 mA 0.29 mA/A + 28 mA 0.81 mA/A + 94 mA 2.4 mA/A + 0.23 A 7.9 mA/A + 0.42 A 0.32 mA/A + 0.7 A	Comparison to Multifunction Calibrator, Current Amplifier
AC Current ¹ Clamp-on Meters	(6 to 60) A (45 to 65) Hz (65 to 440) Hz (60 to 155) A (45 to 65) Hz (65 to 440) Hz (155 to 600) A (45 to 65) Hz (65 to 440) Hz (600 to 1 020) A (45 to 65) Hz (65 to 440) Hz (1 000 to 6 000) A (50 to 65) Hz (65 to 400) Hz	0.37 % of reading 0.85 % of reading 3.6 mA/A + 0.03 A 8.4 mA/A + 0.03 A 3.6 mA/A + 0.09 A 8.5 mA/A + 0.11 A 3.5 mA/A + 0.21 A 8.4 mA/A + 0.17 A 2.9 mA/A + 0.56 A 2 mA/A + 7.9 A	Comparison to Multifunction Calibrator, Wavetek 50-Turn Coil
AC Current – Measure ¹	Up to 20 μ A 1 Hz to 30 kHz (20 to 200) μ A 1 Hz to 2 kHz (2 to 10) kHz (10 to 30) kHz (30 to 100) kHz	2.1 mA/A + 2.5 nA 0.29 mA/A + 5 nA 0.54 mA/A + 5 nA 0.76 mA/A + 5 nA 4.1 mA/A + 10 nA	Comparison to Precision DMM

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
AC Current – Measure ¹	(0.2 to 2) mA 1 Hz to 2 kHz	0.29 mA/A + 50 nA	Comparison to Precision DMM
	(2 to 10) kHz	0.54 mA/A + 50 nA	
	(10 to 30) kHz	0.76 mA/A + 50 nA	
	(30 to 100) kHz	4.1 mA/A + 100 nA	
	(2 to 20) mA 1 Hz to 2 kHz	0.29 mA/A + 0.5 μ A	
	(2 to 10) kHz	0.54 mA/A + 0.5 μ A	
	(10 to 30) kHz	0.76 mA/A + 0.5 μ A	
	(30 to 100) kHz	4.1 mA/A + 1 μ A	
	(20 to 200) mA 1 Hz to 2 kHz	0.29 mA/A + 5 μ A	
	(2 to 10) kHz	0.53 mA/A + 5 μ A	
	(10 to 30) kHz	0.76 mA/A + 5 μ A	
	(0.2 to 2) A 1 Hz to 2 kHz	0.31 mA/A + 0.1 mA	
Oscilloscopes ¹ Amplitude – DC into 50 Ω Load into 1 M Ω Load Amplitude – Square Wave 10 Hz to kHz into 50 Ω Load into 1 M Ω Load Amplitude – Leveled Sine Wave Flatness (Relative to 50 kHz)	(2 to 10) kHz	0.56 mA/A + 0.1 mA	Comparison to Multifunction Calibrator w/Oscilloscope Option
	(10 to 30) kHz	0.81 mA/A + 0.1 mA	
	(2 to 20) A 1 Hz to 10 kHz	0.86 mA/A + 0.5 mA	
	(20 to 30) A 1 Hz to 2 kHz	0.86 mA/A + 12 mA	
	(2 to 10) kHz	1.3 mA/A + 12 mA	
	1 mV to 6.6 V	1.9 mV/V + 40 μ V	
	1 mV to 130 V	0.4 mV/V + 40 μ V	
	1 mV p-p to 6.6 V p-p	1.9 mV/V + 40 μ V	
	1 mV p-p to 130 V p-p	0.8 mV/V + 40 μ V	
	5 mV to 5.5 V	16 mV/V + 0.1 mV	
	50 kHz to 100 MHz	19 mV/V + 0.1 mV	
	(100 to 300) MHz	33 mV/V + 0.1 mV	
	(300 to 600) MHz	33 mV/V + 0.1 mV	

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Oscilloscopes ^{1,2} Amplitude – Leveled Sine (Absolute Amplitude) Time Marker into 50 Ω Load (Spike, Square Wave) Spike, Square, 20 % Pulse Spike or Square Wave Square or Sine Wave Edge Characteristics: (into 50 Ω) Rise Time	4 mV to 3.5 V 600 MHz to 1.1 GHz 5 mV to 5.5 V 50 kHz Reference 50 ms to 5 s 100 ns to 20 ms (20 to 50) ns 10 ns (1 to 5) ns <300 ps	41 mV/V + 0.1 mV 15 mV/V + 0.3 mV (20 + 1 000t) μ s/s 2 μ s/s 2 μ s/s 2 μ s/s 2 μ s/s 7.5 ps	Comparison to Multifunction Calibrator w/Oscilloscope Option
Electrical Calibration of Thermocouples – Generate & 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 Type C (0 to 150) $^{\circ}$ C (150 to 650) $^{\circ}$ C (650 to 1 000) $^{\circ}$ C (1 000 to 1 800) $^{\circ}$ C (1 800 to 2 315) $^{\circ}$ C Type D (0 to 150) $^{\circ}$ C (150 to 650) $^{\circ}$ C (650 to 1 000) $^{\circ}$ C (1 000 to 1 800) $^{\circ}$ C (1 800 to 2 315) $^{\circ}$ C Type E (-250 to -100) $^{\circ}$ C (-100 to -25) $^{\circ}$ C (-25 to 350) $^{\circ}$ C (350 to 650) $^{\circ}$ C (650 to 1 000) $^{\circ}$ C	0.35 $^{\circ}$ C 0.27 $^{\circ}$ C 0.24 $^{\circ}$ C 0.26 $^{\circ}$ C 0.19 $^{\circ}$ C 0.16 $^{\circ}$ C 0.2 $^{\circ}$ C 0.35 $^{\circ}$ C 0.62 $^{\circ}$ C 0.19 $^{\circ}$ C 0.16 $^{\circ}$ C 0.2 $^{\circ}$ C 0.35 $^{\circ}$ C 0.62 $^{\circ}$ C 0.32 $^{\circ}$ C 0.11 $^{\circ}$ C 0.09 $^{\circ}$ C 0.12 $^{\circ}$ C 0.16 $^{\circ}$ C	Comparison to Multifunction Calibrator w/Oscilloscope Option

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Electrical Calibration of Thermocouples – Generate & Measure ¹	Type G		Comparison to Multifunction Calibrator w/Oscilloscope Option
	(0 to 150) °C	0.4 °C	
	(150 to 650) °C	0.27 °C	
	(650 to 1 000) °C	0.2 °C	
	(1 000 to 1 800) °C	0.34 °C	
	(1 800 to 2 315) °C	0.61 °C	
	Type J		
	(-210 to -100) °C	0.19 °C	
	(-100 to -30) °C	0.1 °C	
	(-30 to 150) °C	0.09 °C	
	(150 to 760) °C	0.11 °C	
	(760 to 1 200) °C	0.16 °C	
	Type K		
	(-200 to -100) °C	0.23 °C	
	(-100 to -25) °C	0.1 °C	
	(-25 to 120) °C	0.11 °C	
	(120 to 1 000) °C	0.16 °C	
	(1 000 to 1 372) °C	0.28 °C	
	Type L		
	(-200 to -100) °C	0.25 °C	
	(-100 to 800) °C	0.16 °C	
	(800 to 900) °C	0.09 °C	
	Type N		
	(-200 to -100) °C	0.27 °C	
	(-100 to -25) °C	0.12 °C	
	(-25 to 120) °C	0.09 °C	
	(120 to 410) °C	0.09 °C	
	(410 to 1 300) °C	0.16 °C	
	Type R		
	(0 to 250) °C	0.41 °C	
	(250 to 400) °C	0.24 °C	
	(400 to 1 000) °C	0.21 °C	
	(1 000 to 1 767) °C	0.27 °C	
	Type S		
	(0 to 250) °C	0.34 °C	
	(250 to 1 000) °C	0.25 °C	
	(1 000 to 1 400) °C	0.26 °C	
	(1 400 to 1 767) °C	0.33 °C	

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Electrical Calibration of Thermocouples – Generate & Measure ¹	Type T (-250 to -150) °C (-150 to 0) °C (0 to 120) °C (120 to 400) °C Type U (-200 to 0) °C (0 to 600) °C	0.48 °C 0.16 °C 0.1 °C 0.09 °C 0.32 °C 0.09 °C	Comparison to Multifunction Calibrator w/Oscilloscope Option
RTD Resistance Simulation ¹	Pt 385, 100 Ω (-200 to 0) °C (0 to 100) °C (100 to 300) °C (300 to 400) °C (400 to 630) °C (630 to 800) °C Pt 3926, 100 Ω (-200 to 0) °C (0 to 100) °C (100 to 300) °C (300 to 400) °C (400 to 630) °C Pt 3916, 100 Ω (-200 to -190) °C (-190 to -80) °C (-80 to 0) °C (0 to 260) °C (260 to 300) °C (300 to 400) °C (400 to 600) °C (600 to 630) °C Pt 385, 200 Ω (-200 to 100) °C (100 to 260) °C (260 to 300) °C (300 to 400) °C (400 to 600) °C (600 to 630) °C	0.04 °C 0.05 °C 0.07 °C 0.08 °C 0.09 °C 0.18 °C 0.04 °C 0.04 °C 0.07 °C 0.08 °C 0.09 °C 0.19 °C 0.03 °C 0.04 °C 0.05 °C 0.06 °C 0.07 °C 0.08 °C 0.18 °C 0.03 °C 0.04 °C 0.09 °C 0.1 °C 0.11 °C 0.12 °C	Comparisons performed with Multifunction Calibrator and Electronic Indicator

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
RTD Resistance Simulation ¹	Pt 385, 500 Ω		Comparisons performed with Multifunction Calibrator and Electronic Indicator
	(-200 to -80) °C	0.03 °C	
	(-80 to 100) °C	0.04 °C	
	(100 to 260) °C	0.05 °C	
	(260 to 400) °C	0.06 °C	
	(400 to 600) °C	0.07 °C	
	(600 to 630) °C	0.09 °C	
	PtNi 385, 120 Ω (Ni 120)		
	(-80 to 100) °C	0.06 °C	
	(100 to 260) °C	0.11 °C	

Length – Dimensional Metrology

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
GPS Receivers (Survey Grade)	Global Positioning	HD 0.012 ft VD 0.02 ft	Comparison to Certified Length Master
Total Station Theodolite ²			Comparisons to CTPM Linear Master, CTPM Optical Range
Horizontal Distance (Angle)	Up to 360°	2.9"	
Vertical Distance (Angle)	(-10 to 10)°	3"	
Base Line Distance	Up to 30 m	0.73 mm	
Auto/Builders Level, Rotating Laser	Level Accuracy	0.004 6 in	Comparison to CTPM Linear Master
Height Gages ^{1,2}	Up to 24 in	(85 + 12L) μ in	Comparison to Length Standard, Gage Blocks
Outside Micrometers ^{1,2}	Up to 48 in	(19 + 15L) μ in	Comparison to Gage Blocks, Length Standards
Inside Micrometers ^{1,2}	(0.5 to 40) in	(48 + 13L) μ in	Comparison to Length Machine, Length Standard
Depth Micrometers ^{1,2}	Up to 12 in	(95 + 9L) μ in	Comparison to Depth Master, Gage Blocks

Length – Dimensional Metrology

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Dial Indicators ¹	Up to 2 in	67 µin	Comparison to Indicator Calibrator, Gage Blocks
Calipers ^{1,2}	Up to 24 in	$(580 + 21.7L) \mu\text{in}$	Comparison to Cal Master, Gage Blocks, Length Standards
Thread Plugs ²			
Major Diameter	(0.012 to 8) in	$(15 + 9.6L) \mu\text{in}$	3-Wire method using ULM, Thread Wires
Pitch Diameter	(0.012 to 8) in	$(33 + 7.9L) \mu\text{in}$	
Pin Gages ²	(0.012 to 2) in	$(15 + 14L) \mu\text{in}$	Comparison to Laser Micrometer
Plain Plug Gages ²	(0.012 to 8) in	$(5.4 + 11L) \mu\text{in}$	Comparison to ULM
Gage Blocks ²	(0.05 to 1) in 2 in 3 in 4 in	$(3.8 + 10L) \mu\text{in}$ 25 µin 37 µin 48 µin	Comparison to DMS 680, Master Gage Blocks
Laser Micrometers ^{1,2}	(0.005 to 12) in	$(15 + 10L) \mu\text{in}$	Comparison to Master Gage Pins
Surface Plates ^{1,2}			
Overall Flatness	(1 to 32) ft ²	$0.73'' * \sqrt{D}$ or $(\sqrt{D} * 18) \mu\text{in}$	In accordance with ASME B89.3.7 using Mahr Federal Level System
Local Area Flatness	Up to 0.001 in	80 µin	Repeat-o-Meter

Mass and Mass Related

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Pressure Gauges ¹	(-15 to 300) psi (0 to 3 000) psi (0 to 10 000) psi	0.24 psi 1.1 psi 3.2 psi	Comparison to Additel Pressure Gages

Mass and Mass Related

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Torque Tools ¹	(5 to 50) lbf·in (40 to 400) lbf·in (100 to 1 000) lbf·in (25 to 250) lbf·ft (60 to 600) lbf·ft	0.6 % of reading + 0.001 lbf·in 0.6 % of reading – 0.01 lbf·in 1 % of reading + 0.057 lbf·in 0.6 % of reading – 0.003 lbf·ft 0.6 % of reading – 0.02 lbf·ft	Comparison to Torque Calibrator

Thermodynamic

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Temperature – Measure ¹	(0 to 60) °C	0.18 °C	Comparison to Fluke 1620A w/ probe
Temperature – Measure/Source ¹ (Thermohygrometers)	(0 to 60) °C	0.18 °C	Comparison to Fluke 1620A w/ Probe
Humidity – Measure/Source ¹ (Thermohygrometers)	(20 to 70) %RH	1.6 %RH	Comparison to Master Thermohygrometer, Humidity Source, Fluke 1620A w/ probe
Temperature – Source ¹ (Thermometers Thermocouples)	(-25 to 350) °C	0.8 °C	Comparison to Fluke 9142 Field Metrology Well, Platinum Thermometer
Temperature Uniformity Surveys (TUS) ¹ (Ovens/Furnaces)	(0 to 850) °C	1.2 °C	Data Acquisition, Thermocouple Wire per AMS 2750 (G), CQI 9
System Accuracy Tests ¹ (SAT) (Temperature Controllers, Temperature Recorders)	(0 to 850) °C	1.2 °C	Temperature Calibrator, Thermocouple Wire per AMS 2750 (G), CQI 9

Time and Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Frequency – Source ¹ (Sinewave)	0.01 Hz to 2.000 MHz	1.9 mHz/Hz	Comparison to Multiproduct Calibrator (Main Output)

Time and Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Frequency – Source ¹ (Sinewave)	(2 to 1 100) MHz	1.9 mHz/Hz	Comparison to Multiproduct Calibrator (Scope Output)
Frequency – Source ¹ (Sinewave)	100 MHz to 6 GHz	6.1 μ Hz/Hz	Comparison to Frequency Generator
Frequency – Measure ¹	10 Hz to 8 GHz	0.63 μ Hz/Hz	Comparison to Frequency Counter

DIMENSIONAL MEASUREMENT

1 Dimensional

Parameter	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method and/or Equipment
Length Measurements – 1D ²	Up to 40 in	$(130 + 5.5L) \mu\text{in}$	Linear Height Gauge utilized as the Reference Standard.
Length Measurements – 1D	X axis: Up to 18 in Y axis: Up to 20 in Z axis: Up to 16 in	340 μin 340 μin 340 μin	Coordinate Measuring Machine utilized as the Reference Standard.

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 scope of accreditation.
2. L = length in inches; " = arc-second, t = time in seconds.
3. Unless otherwise specified in the far-right column, the calibration procedure/method was written internally.



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