



CERTIFICATE OF ACCREDITATION

The ANSI National Accreditation Board

Hereby attests that

Cal-Tek Company, LLC
20 Republic Road
N. Billerica, MA 01862

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: 22 May 2026
Certificate Number: AC-1328



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)

Cal-Tek Company, LLC

20 Republic Road

N. Billerica, MA 01862

Steven Donovan

800-447-4020

stevend@repaircalibration.net

CALIBRATION

Valid to: **May 22, 2026**

Certificate Number: **AC-1328**

Electrical – DC/Low Frequency

Parameter / Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method and/or Equipment
DC Voltage – Source ¹	Up to 220 mV 220 mV to 2.2 V (2.2 to 11) V (11 to 22) V (22 to 220) V 220 V to 1.1 kV	8.6 μ V/V + 0.4 μ V 3.9 μ V/V + 0.7 μ V 2.7 μ V/V + 2.5 μ V 2.9 μ V/V + 4 μ V 3.8 μ V/V + 40 μ V 4.8 μ V/V + 0.4 mV	Fluke 5730A Multiproduct Calibrator
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	15 μ V/V + 0.3 μ V 8.4 μ V/V + 0.3 μ V 4.2 μ V/V + 0.5 μ V 6.4 μ V/V + 30 μ V 20 μ V/V + 0.1 mV	HP 3458A 8.5 Digit Multimeter
DC Voltage – Measure ¹	(1.02 to 120) kV	1.1 mV/V	Ross VD120-6.2Y-A Voltage Divider, HP 34401A 6.5 Digit Multimeter
DC Current – Source ¹	Up to 220 μ A 220 μ A to 2.2 mA (2.2 to 22) mA (22 to 220) mA 220 mA to 2.2 A	38 μ A/A + 6 nA 35 μ A/A + 7 nA 32 μ A/A + 40 nA 41 μ A/A + 0.7 μ A 66 μ A/A + 12 μ A	Fluke 5730A Multiproduct Calibrator
DC Current – Source ¹	(2.2 to 11) A	0.35 mA/A + 0.48 mA	Fluke 5725A Amplifier, Multiproduct Calibrator
DC Current – Source ¹	(11 to 20.5) A	1.1 mA/A + 0.75 mA	Fluke 5522A Multiproduct Calibrator

Electrical – DC/Low Frequency

Parameter / Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method and/or Equipment
DC Current Clamps – Source ¹	(20 to 150) A (150 to 1 000) A	5.1 mA/A + 0.16 A 5.3 mA/A + 0.54A	Fluke 5522A Multiproduct Calibrator, Fluke 5500A/COIL
DC Current – Measure ¹	Up to 100 nA 100 nA to 1 μ A (1 to 10) μ A (10 to 100) μ A 100 μ A to 1 mA (1 to 10) mA (10 to 100) mA 100 mA to 1 A	0.11 mA/A + 40 pA 64 μ A/A + 40 pA 26 μ A/A + 0.1 nA 25 μ A/A + 0.8 nA 27 μ A/A + 5 nA 23 μ A/A + 50 nA 40 μ A/A + 0.5 μ A 0.13 mA/A + 10 μ A	HP 3458A 8.5 Digit Multimeter
DC Current – Measure ¹	(1 to 10) A (10 to 30) A	0.24 mA/A + 0.4 mA 0.57 mA/A + 4.4 mA	Fluke 8588A Reference Multimeter
Resistance – Source ¹ (Fixed Values)	1 Ω 1.9 Ω 10 Ω 19 Ω 100 Ω 190 Ω 1 k Ω 1.9 k Ω 10 k Ω 19 k Ω 100 k Ω 190 k Ω 1 M Ω 1.9 M Ω 10 M Ω 19 M Ω 100 M Ω	88 $\mu\Omega$ 0.16 m Ω 0.22 m Ω 0.41 m Ω 0.92 m Ω 1.9 m Ω 6 m Ω 12 m Ω 60 m Ω 0.11 Ω 0.79 Ω 1.6 Ω 13 Ω 29 Ω 0.32 k Ω 0.85 k Ω 11 k Ω	Fluke 5730A Multiproduct Calibrator

Electrical – DC/Low Frequency

Parameter / Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method and/or Equipment
Resistance – Source ¹ (Simulated)	(0 to 11) Ω (11 to 33) Ω (33 to 100) Ω (110 to 330) Ω (0.33 to 1.1) k Ω (1.1 to 3.3) k Ω (3.3 to 11) k Ω (11 to 33) k Ω (33 to 110) k Ω (110 to 330) k Ω (0.33 to 1.1) M Ω (1.1 to 3.3) M Ω (3.3 to 11) M Ω	49 $\mu\Omega/\Omega + 1$ m Ω 40 $\mu\Omega/\Omega + 1.5$ m Ω 31 $\mu\Omega/\Omega + 1.4$ m Ω 29 $\mu\Omega/\Omega + 2$ m Ω 33 $\mu\Omega/\Omega + 2$ m Ω 29 $\mu\Omega/\Omega + 20$ m Ω 29 $\mu\Omega/\Omega + 20$ m Ω 29 $\mu\Omega/\Omega + 0.2$ Ω 29 $\mu\Omega/\Omega + 0.2$ Ω 37 $\mu\Omega/\Omega + 2$ Ω 35 $\mu\Omega/\Omega + 2$ Ω 87 $\mu\Omega/\Omega + 30$ Ω 0.14 m $\Omega/\Omega + 50$ Ω	Fluke 5522A Multiproduct Calibrator
Resistance – Source ¹ (Simulated)	(11 to 33) M Ω (33 to 110) M Ω (110 to 330) M Ω (330 to 1 100) M Ω	0.47 m $\Omega/\Omega + 2.5$ k Ω 0.66 m $\Omega/\Omega + 3$ k Ω 4.7 m $\Omega/\Omega + 0.1$ M Ω 16 m $\Omega/\Omega + 0.5$ M Ω	Fluke 5522A Multiproduct Calibrator
Resistance – Measure ¹	Up 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 100 M Ω to 1 G Ω	20 $\mu\Omega/\Omega + 50$ $\mu\Omega$ 19 $\mu\Omega/\Omega + 0.5$ m Ω 11 $\mu\Omega/\Omega + 0.5$ m Ω 12 $\mu\Omega/\Omega + 5$ m Ω 11 $\mu\Omega/\Omega + 50$ m Ω 16 $\mu\Omega/\Omega + 2$ Ω 96 $\mu\Omega/\Omega + 0.1$ k Ω 0.5 m $\Omega/\Omega + 1$ k Ω 7 m $\Omega/\Omega + 10$ k Ω	HP 3458A 8.5 Digit Multimeter
AC Voltage – Source ¹	Up to 2.2 mV (10 to 20) Hz (20 to 40) Hz 40 Hz to 20 kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz (300 to 500) kHz 500 kHz to 1 MHz	0.42 mV/V + 4 μ V 0.34 mV/V + 4 μ V 0.35 mV/V + 4 μ V 0.47 mV/V + 4 μ V 0.76 mV/V + 5 μ V 1.5 mV/V + 10 μ V 1.9 mV/V + 20 μ V 4.5 mV/V + 20 μ V	Fluke 5730A Multiproduct Calibrator

Electrical – DC/Low Frequency

Parameter / Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method and/or Equipment
AC Voltage – Source ¹	(2.2 to 22) mV		Fluke 5730A Multiproduct Calibrator
	(10 to 20) Hz	0.25 mV/V + 4 μ V	
	(20 to 40) Hz	0.15 mV/V + 4 μ V	
	40 Hz to 20 kHz	0.13 mV/V + 4 μ V	
	(20 to 50) kHz	0.24 mV/V + 4 μ V	
	(50 to 100) kHz	0.58 mV/V + 5 μ V	
	(100 to 300) kHz	0.95 mV/V + 10 μ V	
	(300 to 500) kHz	1.3 mV/V + 20 μ V	
	500 kHz to 1MHz	2.6 mV/V + 20 μ V	
	(22 to 220) mV		
	(10 to 20) Hz	0.23 mV/V + 12 μ V	
	(20 to 40) Hz	92 μ V/V + 7 μ V	
	40 Hz to 20 kHz	61 μ V/V + 7 μ V	
	(20 to 50) kHz	0.12 mV/V + 7 μ V	
	(50 to 100) kHz	0.31 mV/V + 17 μ V	
	(100 to 300) kHz	0.6 mV/V + 20 μ V	
	(300 to 500) kHz	1.3 mV/V + 25 μ V	
	500 kHz to 1MHz	2.6 mV/V + 45 μ V	
	220 mV to 2.2 V		
	(10 to 20) Hz	0.23 mV/V + 40 μ V	
	(20 to 40) Hz	84 μ V/V + 15 μ V	
	40 Hz to 20 kHz	43 μ V/V + 8 μ V	
	(20 to 50) kHz	66 μ V/V + 10 μ V	
	(50 to 100) kHz	89 μ V/V + 30 μ V	
	(100 to 300) kHz	0.31 mV/V + 80 μ V	
	(300 to 500) kHz	0.92 mV/V + 0.2 mV	
	500 kHz to 1 MHz	1.6 mV/V + 0.3 mV	
	(2.2 to 22) V		
	(10 to 20) Hz	0.23 mV/V + 0.4 mV	
	(20 to 40) Hz	86 μ V/V + 0.15 mV	
	40 Hz to 20 kHz	49 μ V/V + 50 μ V	
	(20 to 50) kHz	87 μ V/V + 0.1 mV	
	(50 to 100) kHz	95 μ V/V + 0.2 mV	
	(100 to 300) kHz	0.27 mV/V + 0.6 mV	
	(300 to 500) kHz	0.92 mV/V + 2 mV	
	500 kHz to 1 MHz	1.5 mV/V + 3.2 mV	

Electrical – DC/Low Frequency

Parameter / Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method and/or Equipment
AC Voltage – Source ¹	(22 to 220) V (10 to 20) Hz (20 to 40) Hz 40 Hz to 20 kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz (300 to 500) kHz 500 kHz to 1 MHz 220 V to 1 kV (15 to 50) Hz 50 Hz to 1 kHz	0.23 mV/V + 4 mV 88 μ V/V + 1.5 mV 51 μ V/V + 0.6 mV 78 μ V/V + 1 mV 0.14 mV/V + 2.5 mV 0.82 mV/V + 16 mV 4.3 mV/V + 40 mV 9.3 mV/V + 80 mV 0.27 mV/V + 16 mV 66 μ V/V + 3.5 mV	Fluke 5730A Multiproduct Calibrator
AC Voltage – Source ¹	(220 to 1 100) V (1 to 20) kHz (20 to 30) kHz (220 to 750) V (30 to 50) kHz (50 to 100) kHz	0.13 mV/V + 6 mV 0.37 mV/V + 11 mV 0.37 mV/V + 11 mV 1.4 mV/V + 45 mV	Fluke 5725A Amplifier, Multiproduct Calibrator
AC Voltage – Measure ¹	Up to 10 mV (1 to 40) Hz 40 Hz to 1kHz (1 to 20) kHz (20 to 50) kHz (50 to 100) kHz 100 kHz to 1 MHz (1 to 4) MHz (4 to 8) MHz (10 to 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 300 kHz to 1 MHz (1 to 2) MHz (2 to 4) MHz (4 to 8) MHz (8 to 10) MHz	1.7 mV/V + 3 μ V 1.4 mV/V + 1.1 μ V 2.1 mV/V + 1.1 μ V 2.8 mV/V + 1.1 μ V 13 mV/V + 1.1 μ V 15 mV/V + 5 μ V 70 mV/V + 7 μ V 0.2 V/V + 8 μ V 0.32 mV/V + 4 μ V 0.26 mV/V + 2 μ V 0.29 mV/V + 2 μ V 0.65 mV/V + 2 μ V 1.1 mV/V + 2 μ V 3.3 mV/V + 10 μ V 11 mV/V + 10 μ V 16 mV/V + 10 μ V 40 mV/V + 70 μ V 40 mV/V + 80 μ V 0.15 V/V + 0.1 mV	HP 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	100 mV to 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 300 kHz to 1 MHz (1 to 2) MHz (2 to 4) MHz (4 to 8) MHz (8 to 10) MHz (1 to 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 300 kHz to 1 MHz (1 to 2) MHz (2 to 4) MHz (4 to 8) MHz (8 to 10) MHz (10 to 100) V (1 to 40) Hz 40 Hz to 20 kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz 300 kHz to 1 MHz 100 V to 1 kV (1 to 10) Hz (10 to 40) Hz 40 Hz to 10 kHz (10 to 30) kHz 30 to 100) kHz	0.16 mV/V + 40 μ V 0.13 mV/V + 20 μ V 0.19 mV/V + 20 μ V 0.37 mV/V + 20 μ V 0.85 mV/V + 20 μ V 3.1 mV/V + 0.1 mV 10 mV/V + 0.1 mV 17 mV/V + 0.1 mV 40 mV/V + 0.7 mV 41 mV/V + 0.8 mV 0.15 V/V + 1 mV 91 μ V/V + 0.4 mV 0.14 mV/V + 0.2 mV 0.28 mV/V + 0.2 mV 0.35 mV/V + 0.2 mV 1 mV/V + 0.2 mV 3.1 mV/V + 1 mV 10 mV/V + 1 mV 15 mV/V + 1 mV 40 mV/V + 7 mV 41 mV/V + 8 mV 0.15 V/V + 10 mV 0.29 mV/V + 4 mV 0.23 mV/V + 2 mV 0.39 mV/V + 2 mV 1.2 mV/V + 2 mV 4.1 mV/V + 10 mV 15 mV/V + 10 mV 0.4 mV/V + 40 mV 0.5 mV/V + 20 mV 1 mV/V + 20 mV 1.5 mV/V + 20 mV 3 mV/V + 20 mV	HP 3458A 8.5 Digit Multimeter
	(100 to 1 050) V 1 Hz to 2 kHz (2 to 10) kHz (10 to 30) kHz (30 to 100) kHz	0.12 mV/V + 25 mV 0.12 mV/V + 25 mV 0.25 mV/V + 25 mV 0.62 mV/V + 0.1 V	
AC Voltage – Measure ¹	(100 to 1 050) V 1 Hz to 2 kHz (2 to 10) kHz (10 to 30) kHz (30 to 100) kHz	0.12 mV/V + 25 mV 0.12 mV/V + 25 mV 0.25 mV/V + 25 mV 0.62 mV/V + 0.1 V	Fluke 8588A Reference Multimeter

Electrical – DC/Low Frequency

Parameter / Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method and/or Equipment
AC High Voltage – Measure	(1 to 84.84) kV 60 Hz	11 mV/V	Ross VD120-6.2Y-A Voltage Divider, HP 34401A 6.5 Digit Multimeter
AC Current – Source ¹	Up to 220 μ A (10 to 20) Hz (20 to 40) Hz 40 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz 220 μ A to 2.2 mA (10 to 20) Hz (20 to 40) Hz 40 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz (2.2 to 22) mA (10 to 20) Hz (20 to 40) Hz 40 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz (22 to 220) mA (10 to 20) Hz (20 to 40) Hz 40 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz	0.26 mA/A + 16 nA 0.18 mA/A + 10 nA 0.12 mA/A + 8 nA 0.3 mA/A + 12 nA 1.1 mA/A + 65 nA 0.27 mA/A + 40 nA 0.17 mA/A + 35 nA 0.13 mA/A + 35 nA 0.2 mA/A + 0.11 μ A 0.96 mA/A + 0.65 μ A 0.26 mA/A + 0.4 μ A 0.18 mA/A + 0.35 μ A 0.11 mA/A + 0.35 μ A 0.21 mA/A + 0.55 μ A 1.1 mA/A + 5 μ A 0.27 mA/A + 4 μ A 0.17 mA/A + 3.5 μ A 0.12 mA/A + 2.5 μ A 0.21 mA/A + 3.5 μ A 0.95 mA/A + 10 μ A	Fluke 5730A Multiproduct Calibrator
AC Current – Source ¹	220 mA to 2.2 A 20 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz	0.26 mA/A + 35 μ A 0.42 mA/A + 80 μ A 6.1 mA/A + 0.16 mA	Fluke 5730A Multiproduct Calibrator
AC Current – Source ¹	(2.2 to 11) A 40 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz	0.42 mA/A + 0.17 mA 0.86 mA/A + 0.38 mA 3.4 mA/A + 0.75 mA	Fluke 5725A Amplifier, Multiproduct Calibrator
AC Current – Source ¹	(11 to 20.5) A (45 to 100) Hz 100 Hz to 1 kHz (1 to 5) kHz	1.2 mA/A + 5 mA 1.5 mA/A + 5 mA 30 mA/A + 5 mA	Fluke 5522A Multiproduct Calibrator

Electrical – DC/Low Frequency

Parameter / Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method and/or Equipment
AC Current Clamps – Source ¹	(20 to 150) A (45 to 65) Hz (65 to 440) Hz (150 to 1 000) A (45 to 65) Hz (65 to 440) Hz	5.8 mA/A + 0.26 A 11 mA/A + 0.3 A 5.8 mA/A + 1 A 15 mA/A + 1.3 A	Fluke 5522A Multiproduct Calibrator, Fluke 5500A/COIL
AC Current – Measure	Up to 100 μ A (10 to 20) (20 to 45) Hz (45 to 100) Hz 100 Hz to 5 kHz 100 μ A to 1 mA (10 to 20) (20 to 45) Hz (45 to 100) Hz 100 Hz to 5 kHz (5 to 20) kHz (20 to 50) kHz (50 to 100) kHz (1 to 10) mA (10 to 20) (20 to 45) Hz (45 to 100) Hz 100 Hz to 5 kHz (5 to 20) kHz (20 to 50) kHz (50 to 100) kHz (10 to 100) mA (10 to 20) (20 to 45) Hz (45 to 100) Hz 100 Hz to 5 kHz (5 to 20) kHz (20 to 50) kHz (50 to 100) kHz 100 mA to 1 A (10 to 20) (20 to 45) Hz (45 to 100) Hz 100 Hz to 5 kHz (5 to 20) kHz (20 to 50) kHz	4 mA/A + 30 nA 1.6 mA/A + 30 nA 0.66 mA/A + 30 nA 0.7 mA/A + 30 nA 4.1 mA/A + 0.2 μ A 1.5 mA/A + 0.2 μ A 0.61 mA/A + 0.2 μ A 0.32 mA/A + 0.2 μ A 0.65 mA/A + 0.2 μ A 4 mA/A + 0.4 μ A 5.5 mA/A + 1.5 μ A 4 mA/A + 2 μ A 1.5 mA/A + 2 μ A 0.61 mA/A + 2 μ A 0.31 mA/A + 2 μ A 0.63 mA/A + 2 μ A 4 mA/A + 4 μ A 5.5 mA/A + 15 μ A 4 mA/A + 20 μ A 1.6 mA/A + 20 μ A 0.61 mA/A + 20 μ A 0.31 mA/A + 20 μ A 0.63 mA/A + 20 μ A 4 mA/A + 40 μ A 5.5 mA/A + 0.15 mA 4 mA/A + 0.2 mA 1.7 mA/A + 0.2 mA 0.81 mA/A + 0.2 mA 1.1 mA/A + 0.2 mA 3.2 mA/A + 0.2 mA 12 mA/A + 0.4 mA	HP 3458A 8.5 Digit Multimeter

Electrical – DC/Low Frequency

Parameter / Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method and/or Equipment
AC Current – Measure ¹	(1 to 10) A 10 Hz to 2 kHz (2 to 10) kHz (10 to 30) A 10 Hz to 2 kHz (2 to 10) kHz	0.85 mA/A + 0.5 mA 0.85 mA/A + 0.5 mA 0.88 mA/A + 12 mA 1.7 mA/A + 12 mA	Fluke 8588A Reference Multimeter
Electrical Simulation of Thermocouple Indicating Devices – Source/Measure ¹	Type B (600 to 800) °C (800 to 1 000) °C (1 000 to 1 550) °C (1 550 to 1 820) °C Type C (0 to 150) °C (150 to 650) °C (650 to 1 000) °C (1 000 to 1 800) °C (1 800 to 2 316) °C Type E (-250 to -100) °C (-100 to -25) °C (-25 to 350) °C (350 to 650) °C (650 to 1 000) °C Type J (-210 to -100) °C (-100 to -30) °C (-30 to 150) °C (150 to 760) °C (760 to 1 200) °C Type K (-200 to -100) °C (-100 to -25) °C (-25 to 120) °C (120 to 1 000) °C (1 000 to 1 372) °C	0.45 °C 0.35 °C 0.31 °C 0.34 °C 0.31 °C 0.27 °C 0.32 °C 0.51 °C 0.85 °C 0.52 °C 0.18 °C 0.16 °C 0.18 °C 0.22 °C 0.33 °C 0.19 °C 0.19 °C 0.20 °C 0.25 °C 0.35 °C 0.2 °C 0.18 °C 0.27 °C 0.41 °C	Fluke 5522A 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 L		Fluke 5522A Multiproduct Calibrator
	(-200 to -100) °C	0.39 °C	
	(-100 to 800) °C	0.28 °C	
	(800 to 900) °C	0.19 °C	
	Type N		
	(-200 to -100) °C	0.41 °C	
	(-100 to -25) °C	0.24 °C	
	(-25 to 120) °C	0.21 °C	
	(120 to 410) °C	0.2 °C	
	(410 to 1 300) °C	0.28 °C	
	Type R		
	(0 to 250) °C	0.48 °C	
	(250 to 400) °C	0.37 °C	
	(400 to 1 000) °C	0.38 °C	
	(1 000 to 1 767) °C	0.47 °C	
	Type S		
	(0 to 250) °C	0.48 °C	
	(250 to 1 000) °C	0.37 °C	
	(1 000 to 1 400) °C	0.38 °C	
	(1 400 to 1 767) °C	0.47 °C	
	Type T		
	(-250 to -150) °C	0.67 °C	
	(-150 to 0) °C	0.28 °C	
	(0 to 120) °C	0.2 °C	
	(120 to 400) °C	0.17 °C	
	Type U		
	(-200 to 0) °C	0.57 °C	
	(0 to 600) °C	0.28 °C	
Electrical Simulation of RTD Indicating Devices	Pt 385, 100 Ω		Fluke 5522A Multiproduct Calibrator
	(-200 to -80) °C	0.11 °C	
	(-80 to 0) °C	0.11 °C	
	(0 to 100) °C	0.12 °C	
	(100 to 300) °C	0.14 °C	
	(300 to 400) °C	0.15 °C	
	(400 to 630) °C	0.17 °C	
	(630 to 800) °C	0.26 °C	

Electrical – DC/Low Frequency

Parameter / Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method and/or Equipment
Electrical Simulation of RTD Indicating Devices ¹	Pt 3926, 100 Ω		Fluke 5522A Multiproduct Calibrator
	(-200 to -80) $^{\circ}\text{C}$	0.11 $^{\circ}\text{C}$	
	(-80 to 0) $^{\circ}\text{C}$	0.11 $^{\circ}\text{C}$	
	(0 to 100) $^{\circ}\text{C}$	0.12 $^{\circ}\text{C}$	
	(100 to 300) $^{\circ}\text{C}$	0.14 $^{\circ}\text{C}$	
	(300 to 400) $^{\circ}\text{C}$	0.15 $^{\circ}\text{C}$	
	(400 to 630) $^{\circ}\text{C}$	0.16 $^{\circ}\text{C}$	
	Pt 3916, 100 Ω		
	(-200 to -190) $^{\circ}\text{C}$	0.27 $^{\circ}\text{C}$	
	(-190 to -80) $^{\circ}\text{C}$	0.1 $^{\circ}\text{C}$	
	(-80 to 0) $^{\circ}\text{C}$	0.11 $^{\circ}\text{C}$	
	(0 to 100) $^{\circ}\text{C}$	0.12 $^{\circ}\text{C}$	
	(100 to 260) $^{\circ}\text{C}$	0.12 $^{\circ}\text{C}$	
	(260 to 300) $^{\circ}\text{C}$	0.13 $^{\circ}\text{C}$	
	(300 to 400) $^{\circ}\text{C}$	0.14 $^{\circ}\text{C}$	
	(400 to 600) $^{\circ}\text{C}$	0.15 $^{\circ}\text{C}$	
	(600 to 630) $^{\circ}\text{C}$	0.26 $^{\circ}\text{C}$	
	Pt 385, 200 Ω		
	(-200 to -80) $^{\circ}\text{C}$	0.06 $^{\circ}\text{C}$	
	(-80 to 0) $^{\circ}\text{C}$	0.07 $^{\circ}\text{C}$	
	(0 to 100) $^{\circ}\text{C}$	0.08 $^{\circ}\text{C}$	
	(100 to 260) $^{\circ}\text{C}$	0.09 $^{\circ}\text{C}$	
	(260 to 300) $^{\circ}\text{C}$	0.1 $^{\circ}\text{C}$	
	(300 to 400) $^{\circ}\text{C}$	0.11 $^{\circ}\text{C}$	
	(400 to 600) $^{\circ}\text{C}$	0.12 $^{\circ}\text{C}$	
	(600 to 630) $^{\circ}\text{C}$	0.24 $^{\circ}\text{C}$	
	Pt 385, 500 Ω		
	(-200 to -80) $^{\circ}\text{C}$	0.06 $^{\circ}\text{C}$	
	(-80 to 0) $^{\circ}\text{C}$	0.06 $^{\circ}\text{C}$	
	(0 to 100) $^{\circ}\text{C}$	0.06 $^{\circ}\text{C}$	
	(100 to 260) $^{\circ}\text{C}$	0.07 $^{\circ}\text{C}$	
	(260 to 300) $^{\circ}\text{C}$	0.14 $^{\circ}\text{C}$	
	(300 to 400) $^{\circ}\text{C}$	0.16 $^{\circ}\text{C}$	
	(400 to 600) $^{\circ}\text{C}$	0.17 $^{\circ}\text{C}$	
	(600 to 630) $^{\circ}\text{C}$	0.17 $^{\circ}\text{C}$	

Electrical – DC/Low Frequency

Parameter / Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method and/or Equipment
Electrical Simulation of RTD Indicating Devices ¹	Pt 385, 1 000 Ω (-200 to -80) $^{\circ}\text{C}$ (-80 to 0) $^{\circ}\text{C}$ (0 to 100) $^{\circ}\text{C}$ (100 to 260) $^{\circ}\text{C}$ (260 to 300) $^{\circ}\text{C}$ (300 to 400) $^{\circ}\text{C}$ (400 to 600) $^{\circ}\text{C}$ (600 to 630) $^{\circ}\text{C}$ PtNi 385, 120 Ω (Ni 120) (-80 to 0) $^{\circ}\text{C}$ (0 to 100) $^{\circ}\text{C}$ (100 to 260) $^{\circ}\text{C}$ Cu 427, 10 Ω (-100 to 260) $^{\circ}\text{C}$	0.03 $^{\circ}\text{C}$ 0.03 $^{\circ}\text{C}$ 0.04 $^{\circ}\text{C}$ 0.05 $^{\circ}\text{C}$ 0.06 $^{\circ}\text{C}$ 0.07 $^{\circ}\text{C}$ 0.07 $^{\circ}\text{C}$ 0.23 $^{\circ}\text{C}$ 0.11 $^{\circ}\text{C}$ 0.09 $^{\circ}\text{C}$ 0.15 $^{\circ}\text{C}$ 0.96 $^{\circ}\text{C}$	Fluke 5522A Multiproduct Calibrator
Oscilloscopes ¹ AC Voltage 50 Ω load 1 M Ω load DC Voltage 50 Ω load 1 M Ω load Leveled Sine Wave 50 Ω load	1 mVp-p to 6.6 Vp-p 1 mVp-p to 130 Vp-p (-6.6 to 6.6) V (-130 to 130) V 5 mVp-p to 2.5 Vp-p 50 kHz 50 kHz to 100 MHz (100 to 300) MHz (300 to 600) MHz 5 mVp-p to 3.5 Vp-p 600 MHz to 1.1 GHz	2.9 mV/V + 40 μV 1 mV/V + 40 μV 3 mV/V + 40 μV 0.5 mV/V + 40 μV 22 mV/V + 0.2 mV 18 mV/V + 0.1 mV 24 mV/V + 0.1 mV 42 mV/V + 0.1 mV 54 mV/V + 0.1 mV	Fluke 5522A/11 Multiproduct Calibrator with 1.1 GHz Scope Option
Oscilloscopes ^{1,2} Time Markers Sinewave Sine/Square-wave Spike/Square-wave Spike. Square-wave, Pulse Spike, Square-wave	(2 to 5) ns 10 ns (20 to 50) ns 100 ns to 20 ms 50 ms to 5 s	2.8 $\mu\text{s/s}$ 2.6 $\mu\text{s/s}$ 2.5 $\mu\text{s/s}$ 2.6 $\mu\text{s/s}$ (25 + 1 000T) $\mu\text{s/s}$	Fluke 5522A/11 Multiproduct Calibrator with 1.1 GHz Scope Option

Electrical – DC/Low Frequency

Parameter / Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method and/or Equipment
Capacitance – Source ¹ (Simulated)			
10 Hz to 10 kHz	(220 to 400) pF	6.7 mF/F + 10 pF	Fluke 5522A Multiproduct Calibrator
10 Hz to 10 kHz	400 pF to 1.1 μ F	5.7 mF/F + 10 pF	
10 Hz to 3 kHz	(1.1 to 3.3) nF	5.3 mF/F + 10 pF	
10 Hz to 1 kHz	(3.3 to 11) nF	3.4 mF/F + 10 pF	
10 Hz to 1 kHz	(11 to 33) nF	2.8 mF/F + 0.1 nF	
10 Hz to 1 kHz	(33 to 110) nF	3.4 mF/F + 0.1 nF	
10 Hz to 1 kHz	(110 to 330) nF	3.2 mF/F + 0.3 nF	
(10 to 600) Hz	330 nF to 1.1 μ F	3.4 mF/F + 1 nF	
(10 to 300) Hz	(1.1 to 3.3) μ F	3.2 mF/F + 3 nF	
(10 to 150) Hz	(3.3 to 11) μ F	3.4 mF/F + 10 nF	
(10 to 120) Hz	(11 to 33) μ F	4.7 mF/F + 30 nF	
(10 to 80) Hz	(33 to 110) μ F	5 mF/F + 0.1 μ F	
(0 to 50) Hz	(110 to 330) μ F	4.7 mF/F + 0.3 μ F	
(0 to 20) Hz	330 μ F to 1.1 mF	4.5 mF/F + 1 μ F	
(0 to 6) Hz	(1.1 to 3.3) mF	4.7 mF/F + 3 μ F	
(0 to 2) Hz	(3.3 to 11) mF	4.6 mF/F + 10 μ F	
(0 to 0.6) Hz	(11 to 33) mF	7.7 mF/F + 30 μ F	
(0 to 0.2) Hz	(33 to 110) mF	13 mF/F + 0.1 mF	

Length – Dimensional Metrology

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Micrometers ¹	Up to 1 in (1 to 6) in (6 to 12) in	52 μ in 89 μ in 160 μ in	Starrett - Weber B89 Grade 0 Gage Blocks, Long Block Set
Depth Micrometers ¹	Up to 12 in	160 μ in	Starrett - Weber B89 Grade 0 Gage Blocks, Long Block Set
Calipers ¹	Up to 6 in (6 to 12) in (12 to 24) in	70 μ in 710 μ in 750 μ in	Starrett - Weber B89 Grade 0 Gage Blocks, Long Block Set
Test Indicators ¹	Up to 0.1 in	120 μ in	Starrett - Weber B89 Grade 0 Gage Blocks
Dial Indicators ¹	Up to 2 in	80 μ in	Starrett - Weber B89 Grade 0 Gage Blocks

Length – Dimensional Metrology

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Height Gages ¹	Up to 24 in	720 μ in	Starrett Weber B89 Grade 0 Gage Blocks, Long Block Set Surface Plate
Ring Gages ^{2,3}	(0.25 to 1) in (1 to 12) in	(13 + 5L) μ in	Labmaster®, Master Rings

Mass and Mass Related

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Torque Indicating Devices ¹	(4 to 40) ozf·in (2 to 20) lbf·in (20 to 200) lbf·in (10 to 100) lbf·ft (100 to 1000) lbf·ft	2.2 % of reading + 0.005 ozf·in 0.19 % of reading + 0.002 lbf·in 0.19 % of reading + 0.02 lbf·in 0.29 % of reading + 0.01 lbf·ft 1.3 % of reading + 0.1 lbf·ft	AKO TSD 6500 Torque Calibrator
Vacuum – Source ¹ (Pneumatic)	(-14 to 0) psi	0.004 2 psi	Additel 912A Pump, Additel 681 Gauge
Pressure – Source ¹ (Pneumatic)	(0 to 30) psig (30 to 100) psig (100 to 300) psig (300 to 1 000) psig	0.003 6 psi 0.018 % of reading 0.057 psi 0.018 % of reading	Fluke PPC4 Pressure Calibrator
Pressure – Source ¹ (Hydraulic)	(1 000 to 15 000) psig	0.041 % of reading	Ametek TQ-150 Deadweight Tester

Thermodynamic

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Temperature – Source/Measure ¹	(-25 to 0) °C (0 to 50) °C (50 to 150) °C	0.064 °C 0.065 °C 0.067 °C	Fluke 5615-9-A PRT, Fluke 9142-P Field Metrology Well
Temperature – Source/Measure ¹	(150 to 200) °C (200 to 350) °C (350 to 420) °C (420 to 660) °C	0.23 °C 0.37 °C 0.43 °C 0.63 °C	Fluke 5609-12-A PRT, Fluke 9144-P Field Metrology Well

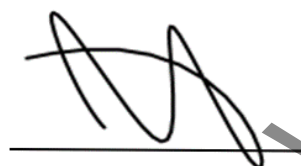
Time and Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Frequency – Source ¹	1 μ Hz to 80 MHz	38 pHz/Hz	SRS FS740 GPS, Agilent 33250A Function/Arbitrary Waveform Generator
Frequency – Source ¹	80 MHz to 3.0 GHz	30 pHz/Hz	SRS FS740 GPS, Agilent N9310A Signal Generator
Frequency – Measure ¹	100 mHz to 225 MHz 225 MHz to 3.0 GHz	50 pHz/Hz 30 pHz/Hz	SRS FS740 GPS, HP 53131A Universal Counter
Stopwatches, Timers ¹	Up to 20 s/d	65 ms/d	Helmut Klein 4500 Timometer

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 all parameters except as noted, 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. L = length in inches; T = time in seconds.
3. This measurement capability is available in the laboratory only.
4. The Legal Entity as defined by Applied Technical Services is CAL-TEK 2000, LLC.
5. This scope is formatted as part of a single document including Certificate of Accreditation No. AC-1328.



Jason Stine, Vice President