



CERTIFICATE OF ACCREDITATION

The ANSI National Accreditation Board

Hereby attests that

Trident Calibration Labs
9005 Eton Avenue, Suite B
Canoga Park, CA 91304

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: 11 September 2023
Certificate Number: AC-1986.01



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)**

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CALIBRATION

Valid to: **September 11, 2023**

Certificate Number: **AC-1986.01**

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
DC Voltage - Source	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	7 nV/mV + 0.6 μ V 6.24 μ V/V + 1 μ V 6.3 μ V/V + 3.5 μ V 6.2 μ V/V + 6.5 μ V 7 μ V/V + 80 μ V 8.7 μ V/V + 0.5 mV	Fluke 5700A Multiproduct Calibrator
DC Voltage - Measure	Up to 100 mV 100 mV to 1 V (1 to 10) V (10 to 100) V 100 V to 1 kV	19 μ V/V + 0.3 μ V 14 μ V/V + 0.3 μ V 14 μ V/V + 0.5 μ V 16 μ V/V + 30 μ V 16 μ V/V + 0.1 mV	HP 3458A Multimeter
	(1 to 10) kV	0.04 % of reading	Vitretek 4700 High Voltage Meter
DC Current - Source	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	0.04 nA/ μ A + 5.43 nA 33 nA/mA + 6.2 nA 32 nA/mA + 39 nA 41 nA/mA + 0.62 nA 91 μ A/A + 12 μ A	Fluke 5700A Multiproduct Calibrator
DC Current - Source	(3 to 11) A (11 to 20.5) A	0.39 mA/A + 0.39 mA 0.78 mA/A + 0.58 mA	Fluke 5522A/SC1100 Multiproduct Calibrator
DC Current - Measure	(10 to 100) μ A 100 μ A to 1 mA (1 to 10) mA (10 to 100) mA 100 mA to 1 A	20 μ A/A + 8 nA 20 μ A/A + 5 nA 20 μ A/A + 5 nA 54 μ A + 5 nA 0.14 mA/A + 10 μ A	HP 3458A Multimeter



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Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
DC Resistance - Source	Up to 11 Ω (11 to 33) Ω (33 to 110) Ω (110 to 330) Ω 330 Ω to 1.1 kΩ (1.1 to 3.3) kΩ (3.3 to 11) kΩ (11 to 33) kΩ (33 to 110) kΩ (110 to 330) kΩ 330 kΩ to 1.1 MΩ (1.1 to 3.3) MΩ (3.3 to 11) MΩ (11 to 33) MΩ (33 to 110) MΩ (110 to 330) MΩ (330 to 1100) MΩ	38 μΩ/Ω + 0.78 mΩ 25 μΩ/Ω + 1.2 mΩ 23 μΩ/Ω + 1.1 mΩ 22 μΩ/Ω + 1.6 mΩ 22 mΩ/kΩ + 1.6 mΩ 22 mΩ/kΩ + 16 mΩ 22 mΩ/kΩ + 16 mΩ 22 mΩ/kΩ + 0.16 Ω 22 mΩ/kΩ + 0.16 Ω 25 mΩ/kΩ + 1.6 Ω 26 Ω/MΩ + 1.6 Ω 48 Ω/MΩ + 23 Ω 0.1 kΩ/MΩ + 39 Ω 0.22 kΩ/MΩ + 1.9 kΩ 0.45 kΩ/MΩ + 2.3 kΩ 2.3 kΩ/MΩ + 78 kΩ 12 kΩ/MΩ + 0.39 MΩ	Fluke 5522A/SC1100 Multiproduct Calibrator
DC Resistance Fixed Points	1 Ω 1.9 Ω 10 Ω 19 Ω 100 Ω 190 Ω 1 kΩ 1.9 kΩ 10 kΩ 19 kΩ 100 kΩ 190 kΩ 1 MΩ 1.9 MΩ 10 MΩ 19 MΩ 100 MΩ	97 μΩ/Ω 97 μΩ/Ω 30 μΩ/Ω 29 μΩ/Ω 19 μΩ/Ω 19 μΩ/Ω 16 μΩ/Ω 16 μΩ/Ω 9.8 μΩ/Ω 9.5 μΩ/Ω 9.7 μΩ/Ω 9 μΩ/Ω 11 μΩ/Ω 14 μΩ/Ω 27 μΩ/Ω 0.12 mΩ/Ω 1.3 mΩ/Ω	Fluke 5700A Multiproduct Calibrator



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Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Resistance – Measure (4 Wire Measurements)	(0 to 10) Ω (10 to 100) Ω 100 Ω to 1 kΩ (1 to 10) kΩ (10 to 100) kΩ 100 kΩ to 1 MΩ (1 to 10) MΩ (10 to 100) MΩ	29 μΩ/Ω + 5 μΩ 16 μΩ/Ω + 5 μΩ 14 uΩ/Ω + 0.5 mΩ 10 μΩ/Ω + 0.5 mΩ 15 μΩ/Ω + 0.5 mΩ 0.21 mΩ/Ω + 2 Ω 0.42 mΩ/Ω + 10 Ω 0.5 mΩ/Ω + 1 kΩ	HP 3458A Multimeter
AC Voltage – Source	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 (2.2 to 22) 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 (22 to 220) 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	1.6 μV/mV + 4.5 μV 0.72 μV/mV + 4.5 μV 0.71 μV/mV + 4.5 μV 1.2 μV/mV + 4.5 μV 1.8 μV/mV + 7 μV 3 μV/mV + 13 μV 4.5 μV/mV + 25 μV 5.7 μV/mV + 25 μV 0.49 μV/mV + 5 μV 0.24 μV/mV + 5 μV 0.14 μV/mV + 5 μV 0.35 μV/mV + 5 μV 0.72 μV/mV + 7 μV 1.1 μV/mV + 12 μV 1.6 μV/mV + 25 μV 3 μV/mV + 25 μV 0.54 μV/mV + 13 μV 0.18 μV/mV + 8 μV 0.088 μV/mV + 8 μV 0.26 μV/mV + 8 μV 0.67 μV/mV + 25 μV 0.87 μV/mV + 25 μV 1.4 μV/mV + 35 μV 2.7 μV/mV + 80 μV	Fluke 5700A Multiproduct Calibrator



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Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
AC Voltage – Source	220 mV to 2.2 V		Fluke 5700A Multiproduct Calibrator
	(10 to 20) Hz	0.61 mV/V + 80 μV	
	(20 to 40) Hz	0.13 mV/V + 25 μV	
	40 Hz to 20 kHz	0.061 mV/V + 6 μV	
	(20 to 50) kHz	0.098 mV/V + 16 μV	
	(50 to 100) kHz	0.21 mV/V + 70 μV	
	(100 to 300) kHz	0.36 mV/V + 0.13 mV	
	(300 to 500) kHz	0.84 mV/V + 0.35 mV	
	500 kHz to 1 MHz	1.8 mV/V + 0.85 mV	
	(2.2 to 22) V		
	(10 to 20) Hz	0.52 mV/V + 0.8 mV	
	(20 to 40) Hz	0.13 mV/V + 0.25 mV	
	40 Hz to 20 kHz	0.061 mV/V + 0.06 mV	
	(20 to 50) kHz	0.099 mV/V + 0.16 mV	
	(50 to 100) kHz	0.2 mV/V + 0.35 mV	
	(100 to 300) kHz	0.41 mV/V + 1.5 mV	
	(300 to 500) kHz	1 mV/V + 4.3 mV	
	500 kHz to 1 MHz	2.3 mV/V + 8.5 mV	
AC Voltage – Source	(22 to 220) V		Fluke 5522A/SC1100 Multiproduct Calibrator
	(10 to 20) Hz	0.56 mV/V + 8 mV	
	(20 to 40) Hz	0.13 mV/V + 2.5 mV	
	40 Hz to 20 kHz	0.066 mV/V + 0.8 mV	
	(20 to 50) kHz	0.18 mV/V + 3.5 mV	
	(50 to 100) kHz	0.39 mV/V + 8 mV	
	(100 to 300) kHz	1.2 mV/V + 90 mV	
	220 V to 1 kV		
	(15 to 50) Hz	0.31 mV/V + 16 mV	
	50 Hz to 1 kHz	0.067 mV/V + 3.5 mV	
AC Voltage – Source	330 V to 1 kV		Fluke 5522A/SC1100 Multiproduct Calibrator
	(1 to 5) kHz	40 μV/V + 10 mV	
	(5 to 10) kHz	9.6 μV/V + 10 mV	
AC Voltage – Measure	Up to 10 mV		HP 3458A Multimeter
	Up to 40 Hz	0.35 mV/V + 0.3 mV	
	40 Hz to 1 kHz	0.23 mV/V + 1.1 mV	
	(1 to 20) kHz	0.35 mV/V + 1.1 mV	
	(20 to 50) kHz	1.2 mV/V + 1.1 mV	
	(50 to 100) kHz	5.8 mV/V + 1.1 mV	
(100 to 300) kHz	46 mV/V + 0.2 mV		



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Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
AC Voltage – Measure	(10 to 100) mV		HP 3458A Multimeter HP 3458A Multimeter
	Up to 40 Hz	81 μ V/V + 40 μ V	
	40 Hz to 1 kHz	81 μ V/V + 20 μ V	
	(1 to 20) kHz	0.16 μ V/V + 20 μ V	
	(20 to 50) kHz	0.35 mV/V + 20 μ V	
	(50 to 100) kHz	0.92 mV/V + 20 μ V	
	(100 to 300) kHz	3.5 mV/V + 0.1 mV	
	(0.3 to 1.0) MHz	12 mV/V + 0.1 mV	
	(0.1 to 1) V		
	Up to 40 Hz	81 μ V/V + 40 μ V	
	40 Hz to 1 kHz	81 μ V/V + 20 μ V	
	(1 to 20) kHz	0.17 μ V/V + 20 μ V	
	(20 to 50) kHz	0.36 mV/V + 20 μ V	
	(50 to 100) kHz	0.93 mV/V + 20 μ V	
	(100 to 300) kHz	3.5 mV/V + 0.1 mV	
	(0.3 to 1.0) MHz	12 mV/V + 0.1 mV	
	(1 to 10) V		
	Up to 40 Hz	0.47 mV/V + 0.4 mV	
	40 Hz to 1 kHz	0.47 mV/V + 0.2 mV	
	(1 to 20) kHz	0.7 mV/V + 0.2 mV	
	(20 to 50) kHz	0.87 mV/V + 0.2 mV	
	(50 to 100) kHz	1.4 mV/V + 0.2 mV	
	(100 to 300) kHz	4.7 mV/V + 1 mV	
(0.3 to 1.0) MHz	16 mV/V + 1 mV		
(10 to 100) V			
Up to 40 Hz	5.6 mV/V + 4 mV		
40 Hz to 1 kHz	5.6 mV/V + 2 mV		
(1 to 20) kHz	5.6 mV/V + 2 mV		
(20 to 50) kHz	8.7 mV/V + 2 mV		
(50 to 100) kHz	16 mV/V + 2 mV		
(100 to 300) kHz	17 mV/V + 10 mV		
100 V to 1 kV			
Up to 40 Hz	49 mV/V + 40 mV		
40 Hz to 1 kHz	49 mV/V + 20 mV		
(1 to 20) kHz	49 mV/V + 20 mV		
(20 to 50) kHz	49 mV/V + 20 mV		
(50 to 100) kHz	49 mV/V + 20 mV		
AC Voltage – Measure	(1 to 10) kV (50, 60) Hz	0.16 % of reading	Vitrek 4700 High Voltage Meter

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
AC Current - Source	(0 to 220) μ A		Fluke 5700A Multiproduct Calibrator
	(10 to 20) Hz	0.66 mA/A + 16 nA	
	(20 to 40) Hz	0.29 mA/A + 10 nA	
	40 Hz to 1 kHz	0.14 mA/A + 8 nA	
	(1 to 5) kHz	0.47 mA/A + 12 nA	
	(5 to 10) kHz	1.2 mA/A + 65 nA	
	220 μ A to 2.2 mA		
	(10 to 20) Hz	0.64 mA/A + 40 nA	
	(20 to 40) Hz	0.3 mA/A + 35 nA	
	40 Hz to 1 kHz	0.17 mA/A + 35 nA	
	(1 to 5) kHz	0.48 mA/A + 0.11 μ A	
	(5 to 10) kHz	1.2 mA/A + 0.65 μ A	
	(2.2 to 22) mA		
	(10 to 20) Hz	0.6 mA/A + 0.4 nA	
	(20 to 40) Hz	0.29 mA/A + 0.35 nA	
	40 Hz to 1 kHz	0.14 mA/A + 0.35 nA	
	(1 to 5) kHz	0.47 mA/A + 0.6 μ A	
	(5 to 10) kHz	1.2 mA/A + 5 μ A	
(22 to 220) mA			
(10 to 20) Hz	0.6 mA/A + 4 μ A		
(20 to 40) Hz	0.29 mA/A + 3.5 μ A		
40 Hz to 1 kHz	0.14 mA/A + 2.5 μ A		
(1 to 5) kHz	0.47 mA/A + 3.5 μ A		
(5 to 10) kHz	1.2 mA/A + 10 μ A		
220 mA to 2.2 A			
20 Hz to 1 kHz	0.52 mA/A + 35 μ A		
(1 to 5) kHz	0.58 mA/A + 80 μ A		
(5 to 10) kHz	6.6 mA/A + 160 μ A		
AC Current - Source	(2.2 to 11) A		Fluke 5522A/SC1100 Multiproduct Calibrator
	(45 to 100) Hz	0.47 mA/A + 1.6 mA	
	100 Hz to 1 kHz	0.78 mA/A + 1.6 mA	
	(1 to 5) kHz	23 mA/A + 1.6 mA	
	(11 to 20.5) A		
	(45 to 100) Hz	0.96 mA/A + 3.9 mA	
	100 Hz to 1 kHz	1.2 mA/A + 3.9 mA	
	(1 to 5) kHz	23 mA/A + 3.9 mA	



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Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
AC Current – Measure	(0 to 100) μ A		HP 3458A Multimeter
	(10 to 20) Hz	4.6 mA/A + 0.03 μ A	
	(20 to 45) Hz	1.8 mA/A + 0.03 μ A	
	45 Hz to 1 kHz	0.7 mA/A + 0.03 μ A	
	100 Hz to 5 kHz	0.7 mA/A + 0.03 μ A	
	100 μ A to 1 mA		
	(10 to 20) Hz	4.6 mA/A + 0.2 μ A	
	(20 to 45) Hz	1.8 mA/A + 0.2 μ A	
	(45 to 100) Hz	0.7 mA/A + 0.2 μ A	
	(0.1 to 5) kHz	0.4 mA/A + 0.2 μ A	
	(5 to 20) kHz	0.7 mA/A + 0.2 μ A	
	(1 to 10) mA		
	(10 to 20) Hz	4.6 mA/A + 2 μ A	
	(20 to 45) Hz	1.8 mA/A + 2 μ A	
	(45 to 100) Hz	0.7 mA/A + 2 μ A	
	(0.1 to 5) kHz	0.4 mA/A + 2 μ A	
	(5 to 20) kHz	0.7 mA/A + 2 μ A	
	(10 to 100) mA		
	(10 to 20) Hz	4.6 mA/A + 20 μ A	
	(20 to 45) Hz	1.8 mA/A + 20 μ A	
(45 to 100) Hz	0.7 mA/A + 20 μ A		
(0.1 to 5) kHz	0.4 mA/A + 20 μ A		
(5 to 20) kHz	0.7 mA/A + 20 μ A		
100 mA to 1 A			
(10 to 20) Hz	4.6 mA/A + 0.2 mA		
(20 to 45) Hz	1.9 mA/A + 0.2 mA		
(45 to 100) Hz	1 mA/A + 0.2 mA		
(0.1 to 5) kHz	1.2 mA/A + 0.2 mA		
(5 to 20) kHz	3.5 mA/A + 0.2 mA		
Capacitance – Source			Fluke 5522A/SC1100 Multiproduct Calibrator
10 Hz to 10 kHz	(0.19 to 1.1) nF	5 pF/nF + 7.8 pF	
10 Hz to 3 kHz	(1.1 to 3.3) nF	4 pF/nF + 7.8 pF	
(0.01 to 1) kHz	(3.3 to 11) nF	2 pF/nF + 7.8 pF	
(0.01 to 1) kHz	(11 to 110) nF	7 pF/nF + 78 pF	
(0.01 to 1) kHz	(110 to 330) nF	2.1 pF/nF + 0.23 nF	
(10 to 600) Hz	(0.33 to 1.1) μ F	2.1 nF/ μ F + 0.78 nF	
(10 to 300) Hz	(1.1 to 3.3) μ F	2 nF/ μ F + 2.3 nF	
(10 to 150) Hz	(3.3 to 11) μ F	2.1 nF/ μ F + 7.8 nF	
(10 to 120) Hz	(11 to 33) μ F	3.2 nF/ μ F + 23 nF	
(10 to 80) Hz	(33 to 110) μ F	3.7 nF/ μ F + 78 nF	



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Electrical – DC/Low Frequency

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Capacitance – Source (10 to 50) Hz (10 to 20) Hz Up to 6 Hz Up to 2 Hz Up to 0.6 Hz Up to 0.2 Hz	(110 to 330) μ F (0.33 to 1.1) mF (1.1 to 3.3) mF (3.3 to 11) mF (11 to 33) mF (33 to 110) mF	3.7 μ F/mF + 0.23 μ F 3.7 μ F/mF + 0.78 μ F 3.7 μ F/mF + 2.3 μ F 3.5 μ F/mF + 7.8 μ F 5.9 μ F/mF + 23 μ F 8.5 μ F/mF + 78 μ F	Fluke 5522A/SC1100 Multiproduct Calibrator
Oscilloscopes Square Wave 50 Ω Load 1 M Ω Load Leveled Sine Wave Relative to 50 kHz Time Marker Into 50 Ω Load Rise Time	\pm 1 mV to \pm 6.6 V p-p 10 Hz to 10 kHz \pm 1 mV to \pm 130 V p-p 10 Hz to 10 kHz 5 mVpp to 5.5 Vpp 50 kHz to 100 MHz (100 to 300) MHz (300 to 600) MHz Cardinal Points 1 ns to 20 ms Non-Cardinal Points 1 ns to 20 ms Any value in range 50 ms to 5 s 300 ps	2.7 mV/V + 32 μ V 1.3 mV/V + 32 μ V 15 mV/V + 78 μ V 18 mV/V + 78 μ V 34 mV/V + 78 μ V 46 ns/s 0.81 μ s/s 0.21 ms/s 9.4 ps	Fluke 5522A/SC1100 Multiproduct Calibrator
Electrical Simulation of Thermocouple Indicators	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 2 316) $^{\circ}$ C	0.46 $^{\circ}$ C 0.39 $^{\circ}$ C 0.37 $^{\circ}$ C 0.38 $^{\circ}$ C 0.33 $^{\circ}$ C 0.32 $^{\circ}$ C 0.34 $^{\circ}$ C 0.54 $^{\circ}$ C 0.85 $^{\circ}$ C	Fluke 5522A/SC1100 Multiproduct Calibrator



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Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Electrical Simulation of Thermocouple Indicators	Type E		Fluke 5522A/SC1100 Multiproduct Calibrator
	(-250 to -100) °C	0.52 °C	
	(-100 to -25) °C	0.22 °C	
	(-25 to 350) °C	0.2 °C	
	(350 to 650) °C	0.25 °C	
	(650 to 1 000) °C	0.25 °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	0.27 °C	
	Type K		
	(-200 to -100) °C	0.36 °C	
	(-100 to -25) °C	0.23 °C	
	(-25 to 120) °C	0.22 °C	
	(120 to 1 000) °C	0.29 °C	
	(1 000 to 1 372) °C	0.44 °C	
	Type N		
	(-200 to -100) °C	0.43 °C	
	(-100 to -25) °C	0.29 °C	
	(-25 to 120) °C	0.23 °C	
	(120 to 410) °C	0.22 °C	
	(410 to 1 300) °C	0.3 °C	
	Type R		
	(0 to 250) °C	0.59 °C	
	(250 to 400) °C	0.38 °C	
	(400 to 1 000) °C	0.36 °C	
(1 000 to 1 767) °C	0.44 °C		
Type S			
(0 to 250) °C	0.49 °C		
(250 to 1 000) °C	0.39 °C		
(1 000 to 1 400) °C	0.39 °C		
(1 400 to 1 767) °C	0.5 °C		
Type T			
(-250 to -150) °C	0.65 °C		
(-150 to 0) °C	0.26 °C		
(0 to 120) °C	0.22 °C		
(120 to 400) °C	0.19 °C		

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Electrical Simulation of Thermocouple Indicators	Type U (-200 to 0) °C (0 to 600) °C	0.6 °C 0.31 °C	Fluke 5522A/SC1100 Multiproduct Calibrator
Electrical Simulation of RTD Indicators	Cu 427 (10 Ω) (-100 to 260) °C Pt 395 (100 Ω) (-200 to -80) °C (-80 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 -80) °C (-80 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 100) °C (100 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 -80) °C (-80 to 0) °C (0 to 100) °C (100 to 260) °C (260 to 300) °C (300 to 400) °C (400 to 600) °C (600 to 630) °C	0.31 °C 0.07 °C 0.07 °C 0.08 °C 0.11 °C 0.11 °C 0.13 °C 0.25 °C 0.1 °C 0.1 °C 0.11 °C 0.13 °C 0.16 °C 0.15 °C 0.28 °C 0.09 °C 0.11 °C 0.12 °C 0.1 °C 0.14 °C 0.15 °C 0.14 °C 0.26 °C 0.06 °C 0.11 °C 0.11 °C 0.12 °C 0.16 °C 0.15 °C 0.16 °C 0.17 °C	Fluke 5522A/SC1100 Multiproduct Calibrator

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Electrical Simulation of RTD Indicators	Pt 385 (500 Ω)		Fluke 5522A/SC1100 Multiproduct Calibrator
	(-200 to -80) °C	0.06 °C	
	(-80 to 0) °C	0.09 °C	
	(0 to 100) °C	0.1 °C	
	(100 to 260) °C	0.09 °C	
	(260 to 300) °C	0.12 °C	
	(300 to 400) °C	0.09 °C	
	(400 to 600) °C	0.1 °C	
	(600 to 630) °C	0.14 °C	
	Pt 385 (1 000 Ω)		
	(-200 to -80) °C	0.05 °C	
	(-80 to 0) °C	0.09 °C	
	(0 to 100) °C	0.06 °C	
	(100 to 260) °C	0.12 °C	
	(260 to 300) °C	0.07 °C	
	(300 to 400) °C	0.1 °C	
	(400 to 600) °C	0.11 °C	
	(600 to 630) °C	0.25 °C	
PtNi 385 (120 Ω)			
(-80 to 0) °C	0.13 °C		
(0 to 100) °C	0.1 °C		
(100 to 260) °C	0.17 °C		

Electrical – RF/Microwave

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
RF Attenuation – Tuned RF Power Measure 100 kHz to 26.5 GHz	(-10 to 0.0) dB	0.03 dB	HP 8902A Measuring Receiver with HP 11722A, HP 11792A, HP 11793A Power Sensors
	(-20 to -10) dB	0.06 dB	
	(-30 to -20) dB	0.08 dB	
	(-40 to -30) dB	0.11 dB	
	(-50 to -40) dB	0.14 dB	
	(-60 to -50) dB	0.16 dB	
	(-70 to -60) dB	0.2 dB	
	(-80 to -70) dB	0.23 dB	
	(-90 to -80) dB	0.25 dB	
	(-100 to -90) dB	0.27 dB	
	(-110 to -100) dB	0.35 dB	
	(-120 to -110) dB	0.43 dB	

Electrical – RF/Microwave

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
RF Power - Source DC to 20 MHz (0.1 to 26.5) GHz	(-56.00 to +23.98) dBm (-110 to +13) dBm	0.69 dB 2.6 dB	HP 3325B, HP 83630B Signal Generators
RF Power – Measure	(-30 to +20) dBm DC to 26.5 GHz	3.5% of reading + 0.004 dB	HP 8902A Measuring Receiver with HP 11722A, HP 11792A Power Sensors
Power Reference Out	1 mW, 50 MHz	1.8 % of reading	HP 432A Power Meter, HP 3458A Multimeter, with HP 8478A Power Sensor
Phase Modulation – Measure 150 kHz to 10 MHz 10 MHz to 26.5 GHz	200 Hz to 10 kHz 200 Hz to 20 kHz	4.8 % of reading + 1 Digit 3.7 % of reading + 1 Digit	HP 8902A Measuring Receiver with HP 11722A, HP 11792A, HP 11793A Power Sensors
Amplitude Modulation – Measure ^{3, 8} 150 kHz to 10 MHz 150 kHz to 10 MHz 10 MHz to 1.3 GHz 10 MHz to 1.3 GHz (1.3 to 26.5) GHz (1.3 to 26.5) GHz	Rate: 50 Hz to 10 kHz Depths: 5 % to 99 % Rate: 20 Hz to 10 kHz Depths: to 99 % Rate: 50 Hz to 50 kHz Depths: 5 % to 99 % Rate: 20 Hz to 100 kHz Depths: to 99 % Rate: 20 Hz to 100 kHz Depths: 5 % to 99 % Rate: 20 Hz to 100 kHz Depths: to 99 %	3.5 % of reading + 1 Digit 2.3 % of reading + 1 Digit 3.5 % of reading + 1 Digit 1.2 % of reading + 1 Digit 3.5 % of reading + 1 Digit 1.7 % of reading + 1 Digit	HP 8902A Measuring Receiver with HP 11722A, HP 11792A, HP 11793A Power Sensors
Frequency Modulation – Measure ^{3, 8} 250 kHz to 10 MHz 10 MHz to 1.3 GHz	Rate: 20 Hz to 10 kHz Dev.: ≤ 40 kHz peak Rate: 50 Hz to 100 kHz Dev.: ≤ 400 kHz peak	2.3 % of reading + 1 Digit 5.8 % of reading + 1 Digit	HP 8902A Measuring Receiver with HP 11722A, HP 11792A, HP 11793A Power Sensors

Electrical – RF/Microwave

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Frequency Modulation – Measure ^{3, 8} 10 MHz to 1.3 GHz	Rate: 20 Hz to 200 kHz Dev.: ≤ 400 kHz peak	1.2 % of reading + 1 Digit	HP 8902A Measuring Receiver with HP 11722A, HP 11792A, HP 11793A Power Sensors
(1.3 to 26.5) GHz	Rate: 50 Hz to 100 kHz Dev.: ≤ 400 kHz peak	5.8 % of reading + 1 Digit	
(1.3 to 26.5) GHz	Rate: 20 Hz to 200 kHz Dev.: ≤ 400 kHz peak	1.2 % of reading + 1 Digit	

Length – Dimensional Metrology

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Micrometers ²	Up to 10 in	(76 +1.2L) μin	Grade B Gage Blocks
Calipers ²	Up to 10 in	(159 +1.9L) μin	
Height/Depth Gages ²	Up to 10 in	(154 +1.7L) μin	
Indicators ²	Up to 4 in	(77 +0.5L) μin	

Mass and Mass Related

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Scales and Balances	Up to 50g (50 to 200) g (200 to 2000) g	0.16mg 0.15mg 1.7mg	NIST Handbook 105-1 Class F Mass
Pressure	Up to 200 psi Up to 500 psi Up to 1 000 psi	0.15 psi 0.47 psi 0.7 psi	Condec UPC5000 Pressure Standard
Pressure	(0 to 10 000) psi	2.4 psi	Fluke 2700G Pressure Gage
Torque Tools	(1 to 10) lbf·in	2.8 % of reading	Sturtevant Richmond Torq-Tronics 10i Torque Analyzer
	(10 to 100) lbf·in	0.6 % of reading	Mountz EZTORQ II 100I Torque Analyzer

Mass and Mass Related

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Torque Tools	(25 to 250) lbf·ft	0.97 % of reading	CDI 2503-F-ETT Torque Tester

Thermodynamics

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Relative Humidity Source	23 % RH 53 % RH 81 % RH	2.6 % RH	Vaisala HMP233 Humidity Indicator, Calibration Salts
Relative Humidity Measure	(10 to 80) % RH	2.5 % RH	Vaisala HMP233 Humidity Indicator

Time & Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Time Interval / Stopwatches	1 s to 24 hours	38 ms	HP 53132A Counter
Frequency – Source	10 MHz DC to 20 MHz 20 MHz to 26.5 GHz	7.4 mHz 58 mHz 0.58 Hz	DATUM 9390-6000 GPS Receiver, HP 3325B, HP 83630B Signal Generators
Frequency – Measure	DC to 225 MHz	58 mHz	HP 53132A Counter with DATUM GPS Receiver
Frequency – Measure	225 MHz to 26.5 GHz	0.59 Hz	HP 5343A Counter with DATUM GPS Receiver

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. This scope is formatted as part of a single document including Certificate of Accreditation No. AC-1986.01.



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