



CERTIFICATE OF ACCREDITATION

ANSI National Accreditation Board
11617 Coldwater Road, Fort Wayne, IN 46845 USA

This is to certify that

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

has been assessed by ANAB and meets the requirements of international standard

ISO/IEC 17025:2017

and national standard

ANSI/NCSL Z540-1-1994 (R2002)

while demonstrating technical competence in the field of

CALIBRATION

Refer to the accompanying Scope of Accreditation for information regarding the types of activities to which this accreditation applies

AC-1986.01

Certificate Number


ANAB Approval

Certificate Valid Through: 09/11/2021
Version No. 006 Issued: 07/17/2019



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, 2021**

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 μV 6.24 μV/V + 1 μV 6.3 μV/V + 3.5 μV 6.2 μV/V + 6.5 μV 7 μV/V + 80 μV 8.7 μV/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 μV/V + 0.3 μV 14 μV/V + 0.3 μV 14 μV/V + 0.5 μV 16 μV/V + 30 μV 16 μV/V + 0.1 mV	HP 3458A Multimeter
DC Current - Source	Up to 220 μA 220 μA to 2.2 mA (2.2 to 22) mA (22 to 220) mA 220 mA to 2.2 A	0.04 nA/μA + 5.43 nA 33 nA/mA + 6.2 nA 32 nA/mA + 39 nA 41 nA/mA + 0.62 nA 91 μA/A + 12 μA	Fluke 5700A Multiproduct Calibrator
DC Current - Source	(3 to 11) A (11 to 20.5) A	0.42 mA/A + 0.39 mA 0.86 mA/A + 0.58 mA	Fluke 5520A/SC600 Multiproduct Calibrator
DC Current - Measure	(10 to 100) μA 100 μA to 1 mA (1 to 10) mA (10 to 100) mA 100 mA to 1 A	20 μA/A + 8 nA 20 μA/A + 5 nA 20 μA/A + 5 nA 54 μA + 5 nA 0.14 mA/A + 10 μA	HP 3458A Multimeter

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	34 μΩ/Ω + 0.78 mΩ 24 μΩ/Ω + 1.2 mΩ 25 μΩ/Ω + 1.1 mΩ 23 μΩ/Ω + 1.6 mΩ 23 mΩ/kΩ + 1.6 mΩ 23 mΩ/kΩ + 15.5 mΩ 23 mΩ/kΩ + 15.5 mΩ 23 mΩ/kΩ + 0.16 Ω 23 mΩ/kΩ + 0.16 Ω 34 mΩ/kΩ + 1.6 Ω 28 Ω/MΩ + 1.6 Ω 0.57 kΩ/MΩ + 23.3 Ω 0.15 kΩ/MΩ + 38.8 Ω 0.6 kΩ/MΩ + 1.9 kΩ 0.76 kΩ/MΩ + 2.3 kΩ 4 kΩ/MΩ + 78 kΩ 12 kΩ/MΩ + 0.39 MΩ	Fluke 5520A/SC600 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	29 $\mu\Omega/\Omega$ + 5 $\mu\Omega$	HP 3458A Multimeter
	(10 to 100) Ω	16 $\mu\Omega/\Omega$ + 5 $\mu\Omega$	
	100 Ω to 1 k Ω	14 $\mu\Omega/\Omega$ + 0.5 m Ω	
	(1 to 10) k Ω	10 $\mu\Omega/\Omega$ + 0.5 m Ω	
	(10 to 100) k Ω	15 $\mu\Omega/\Omega$ + 0.5 m Ω	
	100 k Ω to 1 M Ω	0.21 m Ω/Ω + 2 Ω	
	(1 to 10) M Ω	0.42 m Ω/Ω + 10 Ω	
	(10 to 100) M Ω	0.5 m Ω/Ω + 1 k Ω	
AC Voltage – Source	Up to 2.2 mV		Fluke 5700A Multiproduct Calibrator
	(10 to 20) Hz	1.6 $\mu\text{V}/\text{mV}$ + 4.5 μV	
	(20 to 40) Hz	0.72 $\mu\text{V}/\text{mV}$ + 4.5 μV	
	40 Hz to 20 kHz	0.71 $\mu\text{V}/\text{mV}$ + 4.5 μV	
	(20 to 50) kHz	1.2 $\mu\text{V}/\text{mV}$ + 4.5 μV	
	(50 to 100) kHz	1.8 $\mu\text{V}/\text{mV}$ + 7 μV	
	(100 to 300) kHz	3 $\mu\text{V}/\text{mV}$ + 13 μV	
	(300 to 500) kHz	4.5 $\mu\text{V}/\text{mV}$ + 25 μV	
	500 kHz to 1 MHz	5.7 $\mu\text{V}/\text{mV}$ + 25 μV	
	(2.2 to 22) mV		
	(10 to 20) Hz	0.49 $\mu\text{V}/\text{mV}$ + 5 μV	
	(20 to 40) Hz	0.24 $\mu\text{V}/\text{mV}$ + 5 μV	
	40 Hz to 20 kHz	0.14 $\mu\text{V}/\text{mV}$ + 5 μV	
	(20 to 50) kHz	0.35 $\mu\text{V}/\text{mV}$ + 5 μV	
	(50 to 100) kHz	0.72 $\mu\text{V}/\text{mV}$ + 7 μV	
	(100 to 300) kHz	1.1 $\mu\text{V}/\text{mV}$ + 12 μV	
	(300 to 500) kHz	1.6 $\mu\text{V}/\text{mV}$ + 25 μV	
	500 kHz to 1 MHz	3 $\mu\text{V}/\text{mV}$ + 25 μV	
	(22 to 220) mV		
	(10 to 20) Hz	0.54 $\mu\text{V}/\text{mV}$ + 13 μV	
	(20 to 40) Hz	0.18 $\mu\text{V}/\text{mV}$ + 8 μV	
	40 Hz to 20 kHz	0.088 $\mu\text{V}/\text{mV}$ + 8 μV	
	(20 to 50) kHz	0.26 $\mu\text{V}/\text{mV}$ + 8 μV	
	(50 to 100) kHz	0.67 $\mu\text{V}/\text{mV}$ + 25 μV	
(100 to 300) kHz	0.87 $\mu\text{V}/\text{mV}$ + 25 μV		
(300 to 500) kHz	1.4 $\mu\text{V}/\text{mV}$ + 35 μV		
500 kHz to 1 MHz	2.7 $\mu\text{V}/\text{mV}$ + 80 μV		



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 5520A/SC600 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		
	330 V to 1 kV			Fluke 5520A/SC600 Multiproduct Calibrator
	(1 to 5) kHz	40 μV/V + 10 mV		
(5 to 10) kHz	9.6 μV/V + 10 mV			

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
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	
	(10 to 100) mV		
	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		



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Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
AC Voltage – Measure	100 V to 1 kV Up to 40 Hz 40 Hz to 1 kHz (1 to 20) kHz (20 to 50) kHz (50 to 100) kHz	49 mV/V + 40 mV 49 mV/V + 20 mV 49 mV/V + 20 mV 49 mV/V + 20 mV 49 mV/V + 20 mV	HP 3458A Multimeter
AC Current - Source	(0 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 220 mA to 2.2 A 20 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz	0.66 mA/A + 16 nA 0.29 mA/A + 10 nA 0.14 mA/A + 8 nA 0.47 mA/A + 12 nA 1.2 mA/A + 65 nA 0.64 mA/A + 40 nA 0.3 mA/A + 35 nA 0.17 mA/A + 35 nA 0.48 mA/A + 0.11 μ A 1.2 mA/A + 0.65 μ A 0.6 mA/A + 0.4 nA 0.29 mA/A + 0.35 nA 0.14 mA/A + 0.35 nA 0.47 mA/A + 0.6 μ A 1.2 mA/A + 5 μ A 0.6 mA/A + 4 μ A 0.29 mA/A + 3.5 μ A 0.14 mA/A + 2.5 μ A 0.47 mA/A + 3.5 μ A 1.2 mA/A + 10 μ A 0.52 mA/A + 35 μ A 0.58 mA/A + 80 μ A 6.6 mA/A + 160 μ A	Fluke 5700A Multiproduct Calibrator



Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
AC Current - Source	(2.2 to 11) A (45 to 100) Hz 100 Hz to 1 kHz (1 to 5) kHz	1.3 mA/A + 1.6 mA 1.4 mA/A + 1.6 mA 24 mA/A + 1.6 mA	Fluke 5520A/SC600 Multiproduct Calibrator
	(11 to 20.5) A (45 to 100) Hz 100 Hz to 1 kHz (1 to 5) kHz	1.4 mA/A + 3.9 mA 5.1 mA/A + 3.9 mA 24 mA/A + 3.9 mA	
AC Current – Measure	(0 to 100) μ A (10 to 20) Hz (20 to 45) Hz 45 Hz to 1 kHz 100 Hz to 5 kHz	4.6 mA/A + 0.03 μ A 1.8 mA/A + 0.03 μ A 0.7 mA/A + 0.03 μ A 0.7 mA/A + 0.03 μ A	HP 3458A Multimeter
	100 μ A to 1 mA (10 to 20) Hz (20 to 45) Hz (45 to 100) Hz	4.6 mA/A + 0.2 μ A 1.8 mA/A + 0.2 μ A 0.7 mA/A + 0.2 μ A	
	(0.1 to 5) kHz (5 to 20) kHz	0.4 mA/A + 0.2 μ A 0.7 mA/A + 0.2 μ A	
	(1 to 10) mA (10 to 20) Hz (20 to 45) Hz (45 to 100) Hz	4.6 mA/A + 2 μ A 1.8 mA/A + 2 μ A 0.7 mA/A + 2 μ A	
	(0.1 to 5) kHz (5 to 20) kHz	0.4 mA/A + 2 μ A 0.7 mA/A + 2 μ A	
	(10 to 100) mA (10 to 20) Hz (20 to 45) Hz (45 to 100) Hz	4.6 mA/A + 20 μ A 1.8 mA/A + 20 μ A 0.7 mA/A + 20 μ A	
	(0.1 to 5) kHz (5 to 20) kHz	0.4 mA/A + 20 μ A 0.7 mA/A + 20 μ A	
	100 mA to 1 A (10 to 20) Hz (20 to 45) Hz (45 to 100) Hz	4.6 mA/A + 0.2 mA 1.9 mA/A + 0.2 mA 1 mA/A + 0.2 mA	
	(0.1 to 5) kHz (5 to 20) kHz	1.2 mA/A + 0.2 mA 3.5 mA/A + 0.2 mA	



Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Capacitance – Source 10 Hz to 10 kHz 10 Hz to 3 kHz (0.01 to 1) kHz (0.01 to 1) kHz (0.01 to 1) kHz (10 to 600) Hz (10 to 300) Hz (10 to 150) Hz (10 to 120) Hz (10 to 80) Hz (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	(0.19 to 1.1) nF (1.1 to 3.3) nF (3.3 to 11) nF (11 to 110) nF (110 to 330) nF (0.33 to 1.1) μ F (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 (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	8.3 pF/nF + 7.8 pF 4 pF/nF + 7.8 pF 2.4 pF/nF + 7.8 pF 2.4 pF/nF + 78 pF 2.3 pF/nF + 0.23 nF 1.9 nF/ μ F + 0.78 nF 2.2 nF/ μ F + 2.3 nF 2.2 nF/ μ F + 7.8 nF 3.3 nF/ μ F + 23 nF 3.7 nF/ μ F + 78 nF 3.5 μ F/mF + 0.23 μ F 3.5 μ F/mF + 0.78 μ F 3.5 μ F/mF + 2.3 μ F 3.5 μ F/mF + 7.8 μ F 5.8 μ F/mF + 23 μ F 8.5 μ F/mF + 78 μ F	Fluke 5520A/SC600 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	± 1 mV to ± 6.6 V p-p 10 Hz to 10 kHz ± 1 mV to ± 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 2.3 μ s/s 41 μ s/s 42 μ s/s 5.8 ps	Fluke 5520A/SC600 Multiproduct Calibrator



ANSI National Accreditation Board

Electrical Simulation of Thermocouple Indicators	Type B		
	(600 to 800) °C		0.46 °C
	(800 to 1 000) °C		0.39 °C
	(1 000 to 1 550) °C		0.37 °C
	(1 550 to 1 820) °C		0.38 °C
	Type C		
	(0 to 150) °C		0.33 °C
	(150 to 650) °C		0.32 °C
	(650 to 1 000) °C		0.34 °C
	(1 000 to 1 800) °C		0.54 °C
	(1 800 to 2 316) °C		0.85 °C
	Type E		
	(-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	
			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 Indicators	Type T		Fluke 5520A/SC600 Multiproduct Calibrator
	(-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 Simulation of RTD Indicators	Type U		Fluke 5520A/SC600 Multiproduct Calibrator
	(-200 to 0) °C	0.6 °C	
	(0 to 600) °C	0.31 °C	
	Pt 395 (100 Ω)		
	(-200 to -80) °C	0.07 °C	
(-80 to 0) °C	0.07 °C		
(0 to 100) °C	0.08 °C		
(100 to 300) °C	0.11 °C		
(300 to 400) °C	0.11 °C		
(400 to 630) °C	0.13 °C		
(630 to 800) °C	0.25 °C		
Electrical Simulation of RTD Indicators	Pt 3926 (100 Ω)		Fluke 5520A/SC600 Multiproduct Calibrator
	(-200 to -80) °C	0.1 °C	
	(-80 to 0) °C	0.1 °C	
	(0 to 100) °C	0.11 °C	
	(100 to 300) °C	0.13 °C	
	(300 to 400) °C	0.16 °C	
	(400 to 630) °C	0.15 °C	
	Pt 3916 (100 Ω)		
	(-200 to -190) °C	0.28 °C	
	(-190 to -80) °C	0.09 °C	
	(-80 to 0) °C	0.11 °C	
	(0 to 100) °C	0.12 °C	
	(100 to 260) °C	0.1 °C	
	(260 to 300) °C	0.14 °C	
	(300 to 400) °C	0.15 °C	
(400 to 600) °C	0.14 °C		
(600 to 630) °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 Indicators	Pt 385 (200 Ω)		Fluke 5520A/SC600 Multiproduct Calibrator
	(-200 to -80) °C	0.06 °C	
	(-80 to 0) °C	0.11 °C	
	(0 to 100) °C	0.11 °C	
	(100 to 260) °C	0.12 °C	
	(260 to 300) °C	0.16 °C	
	(300 to 400) °C	0.15 °C	
	(400 to 600) °C	0.16 °C	
	(600 to 630) °C	0.17 °C	
	Pt 385 (500 Ω)		
	(-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		
Cu 427 (10 Ω)			
(-100 to 260) °C	0.31 °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 (-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 (-110 to -100) dB (-120 to -110) dB	0.03 dB 0.06 dB 0.08 dB 0.11 dB 0.14 dB 0.16 dB 0.2 dB 0.23 dB 0.25 dB 0.27 dB 0.35 dB 0.43 dB	HP 8902A Measuring Receiver with HP 11722A, HP 11792A, HP 11793A Power Sensors
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

Electrical – RF/Microwave

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Amplitude Modulation – Measure ^{3, 8}			
150 kHz to 10 MHz	Rate: 50 Hz to 10 kHz Depths: 5 % to 99 %	3.5 % of reading + 1 Digit	HP 8902A Measuring Receiver with HP 11722A, HP 11792A, HP 11793A Power Sensors
150 kHz to 10 MHz	Rate: 20 Hz to 10 kHz Depths: to 99 %	2.3 % of reading + 1 Digit	
10 MHz to 1.3 GHz	Rate: 50 Hz to 50 kHz Depths: 5 % to 99 %	3.5 % of reading + 1 Digit	
10 MHz to 1.3 GHz	Rate: 20 Hz to 100 kHz Depths: to 99 %	1.2 % of reading + 1 Digit	
(1.3 to 26.5) GHz	Rate: 20 Hz to 100 kHz Depths: 5 % to 99 %	3.5 % of reading + 1 Digit	
(1.3 to 26.5) GHz	Rate: 20 Hz to 100 kHz Depths: to 99 %	1.7 % of reading + 1 Digit	
Frequency Modulation – Measure ^{3, 8}			
250 kHz to 10 MHz	Rate: 20 Hz to 10 kHz Dev.: ≤ 40 kHz peak	2.3 % of reading + 1 Digit	HP 8902A Measuring Receiver with HP 11722A, HP 11792A, HP 11793A Power Sensors
10 MHz to 1.3 GHz	Rate: 50 Hz to 100 kHz Dev.: ≤ 400 kHz peak	5.8 % of reading + 1 Digit	
10 MHz to 1.3 GHz	Rate: 20 Hz to 200 kHz Dev.: ≤ 400 kHz peak	1.2 % of reading + 1 Digit	
(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	(52 +2.2L) μ in	Grade B Gage Blocks
Calipers ²	Up to 10 in	(156 +1.8L) μ in	
Height/Depth Gages ²	Up to 10 in	(151 +1.1L) μ in	
Indicators ²	Up to 10 in	(51 +2.3L) μ in	

Mass and Mass Related

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Scales and Balances	Up to 50g	0.16mg	NIST Handbook 105-1 Class F Mass
	(50 to 200) g	0.15mg	
	(200 to 2000) g	1.7mg	
Pressure	Up to 20 psia	0.035 psi	Condec UPC5000 Pressure Standard
	Up to 50 psia	0.072 psi	
	Up to 100 psia	0.14 psi	
	(0 to 10 000) psi	2.4 psi	Fluke 2700G Pressure Gage
Torque Tools	(10 to 20) lbf·in (20 to 100) lbf·in	1.2 % of reading 0.6 % of reading	Mountz EZTORQ II 100I Torque Analyzer
Torque Tools	(50 to 250) lbf·ft	0.62 % of reading	CDI 2503-F-ETT Torque Tester

Thermodynamics

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Relative Humidity	10 %RH 50 %RH 80 %RH	2.4 %RH	Vaisala HMP233 Humidity Indicator, Calibration Salts

Time & Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Stopwatches	1 s to 3 hours	39 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.



Vice President

