



# CERTIFICATE OF ACCREDITATION

## ANSI-ASQ National Accreditation Board

500 Montgomery Street, Suite 625, Alexandria, VA 22314, 877-344-3044

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 17025:2005

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 calibrations to which this accreditation applies.

AC-1986.01

Certificate Number

  
ANAB Approval

Certificate Valid: 07/06/2018-09/11/2019  
Version No. 005 Issued: 07/06/2018



This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005. 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 17025:2005  
AND ANSI/NCSL Z540-1-1994 (R2002)**

**Trident Calibration Labs**  
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**CALIBRATION**

Valid to: **September 11, 2019**

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
	(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



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



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	0.214 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		
(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		Fluke 5520A/SC600 Multiproduct Calibrator	
(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 μV/V + 40 μV	
	40 Hz to 1 kHz	81 μV/V + 20 μV	
	(1 to 20) kHz	0.16 μV/V + 20 μV	
	(20 to 50) kHz	0.35 mV/V + 20 μV	
	(50 to 100) kHz	0.92 mV/V + 20 μV	
	(100 to 300) kHz	3.47 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 μV/V + 40 μV	
	40 Hz to 1 kHz	81 μV/V + 20 μV	
	(1 to 20) kHz	0.17 μV/V + 20 μV	
	(20 to 50) kHz	0.36 mV/V + 20 μV	
	(50 to 100) kHz	0.93 mV/V + 20 μV	
	(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	1.44 mV/V + 0.2 mV		
(100 to 300) kHz	4.65 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		



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) $\mu$ A (10 to 20) Hz (20 to 40) Hz 40 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz 220 $\mu$ 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 $\mu$ A 1.2 mA/A + 0.65 $\mu$ 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 $\mu$ A 1.2 mA/A + 5 $\mu$ A 0.6 mA/A + 4 $\mu$ A 0.29 mA/A + 3.5 $\mu$ A 0.14 mA/A + 2.5 $\mu$ A 0.47 mA/A + 3.5 $\mu$ A 1.2 mA/A + 10 $\mu$ A 0.52 mA/A + 35 $\mu$ A 0.58 mA/A + 80 $\mu$ A 6.6 mA/A + 160 $\mu$ A	Fluke 5700A Multiproduct Calibrator

**Electrical – DC/Low Frequency**

<b>Parameter/Equipment</b>	<b>Range</b>	<b>Expanded Uncertainty of Measurement (+/-)</b>	<b>Reference Standard, Method, and/or Equipment</b>
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) $\mu$ 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 $\mu$ A 1.8 mA/A + 0.03 $\mu$ A 0.7 mA/A + 0.03 $\mu$ A 0.7 mA/A + 0.03 $\mu$ A	HP 3458A Multimeter
	100 $\mu$ A to 1 mA (10 to 20) Hz (20 to 45) Hz (45 to 100) Hz (0.1 to 5) kHz (5 to 20) kHz	4.6 mA/A + 0.2 $\mu$ A 1.8 mA/A + 0.2 $\mu$ A 0.7 mA/A + 0.2 $\mu$ A 0.4 mA/A + 0.2 $\mu$ A 0.7 mA/A + 0.2 $\mu$ A	
	(1 to 10) mA (10 to 20) Hz (20 to 45) Hz (45 to 100) Hz (0.1 to 5) kHz (5 to 20) kHz	4.6 mA/A + 2 $\mu$ A 1.8 mA/A + 2 $\mu$ A 0.7 mA/A + 2 $\mu$ A 0.4 mA/A + 2 $\mu$ A 0.7 mA/A + 2 $\mu$ A	
	(10 to 100) mA (10 to 20) Hz (20 to 45) Hz (45 to 100) Hz (0.1 to 5) kHz (5 to 20) kHz	4.6 mA/A + 20 $\mu$ A 1.8 mA/A + 20 $\mu$ A 0.7 mA/A + 20 $\mu$ A 0.4 mA/A + 20 $\mu$ A 0.7 mA/A + 20 $\mu$ A	
	100 mA to 1 A (10 to 20) Hz (20 to 45) Hz (45 to 100) Hz (0.1 to 5) kHz (5 to 20) kHz	4.6 mA/A + 0.2 mA 1.9 mA/A + 0.2 mA 1 mA/A + 0.2 mA 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) $\mu$ F (1.1 to 3.3) $\mu$ F (3.3 to 11) $\mu$ F (11 to 33) $\mu$ F (33 to 110) $\mu$ F (110 to 330) $\mu$ 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/ $\mu$ F + 0.78 nF 2.2 nF/ $\mu$ F + 2.3 nF 2.2 nF/ $\mu$ F + 7.8 nF 3.3 nF/ $\mu$ F + 23 nF 3.7 nF/ $\mu$ F + 78 nF 3.5 $\mu$ F/mF + 0.23 $\mu$ F 3.5 $\mu$ F/mF + 0.78 $\mu$ F 3.5 $\mu$ F/mF + 2.3 $\mu$ F 3.5 $\mu$ F/mF + 7.8 $\mu$ F 5.8 $\mu$ F/mF + 23 $\mu$ F 8.5 $\mu$ F/mF + 78 $\mu$ F	Fluke 5520A/SC600 Multiproduct Calibrator
Oscilloscopes Square Wave 50 $\Omega$ Load  1 M $\Omega$ Load  Leveled Sine Wave Relative to 50 kHz  Time Marker Into 50 $\Omega$ 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 $\mu$ V  1.3 mV/V + 32 $\mu$ V  14.6 mV/V + 78 $\mu$ V 18.3 mV/V + 78 $\mu$ V 34 mV/V + 78 $\mu$ V  2.3 $\mu$ s/s  41 $\mu$ s/s  42 $\mu$ s/s  5.8 ps	Fluke 5520A/SC600 Multiproduct Calibrator



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	
	Type U		
(-200 to 0) °C	0.6 °C		
(0 to 600) °C	0.31 °C		
Electrical Simulation of RTD Indicators	Pt 395 (100 Ω)		Fluke 5520A/SC600 Multiproduct Calibrator
	(-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	
	Pt 3926 (100 Ω)		
	(-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	0.10 °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		

**Electromagnetic – RF/Microwave**

<b>Parameter/Equipment</b>	<b>Range</b>	<b>Expanded Uncertainty of Measurement (+/-)</b>	<b>Reference Standard, Method, and/or Equipment</b>
RF Attenuation – Tuned RF Power Measure 100 kHz to 26.5 GHz	(0.0 to -10) dB (-10 to -20) dB (-20 to -30) dB (-30 to -40) dB (-40 to -50) dB (-50 to -60) dB (-60 to 70) dB (-70 to -80) dB (-80 to -90) dB (-90 to -100) dB (-100 to -110) dB (-110 to -120) 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	(+23.98 to -56.00) dBm (+13 to -110) dBm	0.69 dB 2.6 dB	HP 3325B, HP 83630B Signal Generators
RF Power – Measure	(+20 to -30) dBm DC to 26.5 GHz	3.5% of reading	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

**Electromagnetic – RF/Microwave**

<b>Parameter/Equipment</b>	<b>Range</b>	<b>Expanded Uncertainty of Measurement (+/-)</b>	<b>Reference Standard, Method, and/or Equipment</b>
Amplitude Modulation – Measure <sup>3, 8</sup>			
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 <sup>3, 8</sup>			
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	Up to 10 in	(3.9 + 1.1L) $\mu$ in	Grade B Gage Blocks
Calipers	Up to 10 in	(3.9 + 1.1L) $\mu$ in	
Height/Depth Gages	Up to 10 in	(3.9 + 1.1L) $\mu$ in	
Indicators	Up to 10 in	(3.9 + 1.1L) $\mu$ in	

**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 20 psia Up to 50 psia Up to 100 psia	0.035 psia 0.072 psia 0.14 psia	Condec UPC5000 Pressure Standard
	(0 to 10,000) psi	2.4 psi	Fluke 2700G Pressure Gage
Torque	Up to 20 lbf·in (20 to 100) lbf·in	1.2 % of reading 0.6 % of reading	Mountz EZTORQ II 100I Torque Analyzer
	(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 225 MHz to 26.5 GHz	58 mHz 0.59 Hz	HP 53132A Counter with DATUM GPS Receiver, 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