



CERTIFICATE OF ACCREDITATION

The ANSI National Accreditation Board

Hereby attests that

TesCom
3317 El Salido Parkway
Cedar Park, TX 78613
(and satellite location listed on the scope)

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.

A handwritten signature in black ink, appearing to read 'R. Douglas Leonard Jr.', is written over a horizontal line.

R. Douglas Leonard Jr., VP, PILR SBU

Expiry Date: 20 November 2023
Certificate Number: AC-1417



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)

TesCom

3317 El Salido Parkway
Cedar Park, TX 78613
Susan West 512-244-6689
susanw@tescomusa.com

CALIBRATION

Valid to: **November 20, 2023**

Certificate Number: **AC-1417**

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
DC Voltage – Source	Up to 220 mV (0.22 to 2.2) V (2.2 to 11) V (11 to 22) V (22 to 220) V (220 to 1 100) V	7.9 μ V/V + 0.4 μ V 5.2 μ V/V + 0.7 μ V 3.6 μ V/V + 2.5 μ V 3.6 μ V/V + 4 μ V 5.1 μ V/V + 40 μ V 6.7 μ V/V + 0.4 mV	Fluke 5720A Multiproduct Calibrator, Fluke 5725A Amplifier
DC Voltage – Measure	Up to 200 mV 200 mV to 2 V (2 to 20) V (20 to 200) V (200 to 1 000) V	3.1 μ V/V + 0.1 μ V 2.8 μ V/V + 0.4 μ V 2.5 μ V/V + 4 μ V 3.9 μ V/V + 40 μ V 3.9 μ V/V + 1 mV	Fluke 8508A Opt 01 8.5 Digit Multimeter
DC High Voltage – Measure ³	(1 to 60) kV	1 mV/V	Ross Engineering VD 60 High Voltage Divider, Fluke 8508A Opt 01 8.5 Digit Multimeter
DC Current – Source	Up to 220 μ A (0.22 to 2.2) mA (2.2 to 22) mA (22 to 100) mA (100 to 220) mA (0.22 to 1) A (1 to 2.2) A	42 μ A/A + 6 nA 36 μ A/A + 7 nA 36 μ A/A + 40 nA 46 μ A/A + 0.7 μ A 56 μ A/A + 0.7 μ A 82 μ A/A + 12 μ A 0.13 mA/A + 12 μ A	Fluke 5720A Multiproduct Calibrator



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Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
	(2.2 to 2.999 99) A	0.29 mA/A + 40 uA	Fluke 5520A/SC1100 Multiproduct Calibrator
DC Current – Source	(3 to 20) A (20 to 100) A	80 µA/A + 0.8 mA 82 µA/A + 4 mA	Fluke 5720A Multiproduct Calibrator, Fluke 52120A Amplifier
DC Current – Measure	(0 to 200) µA (0.2 to 2) mA (2 to 20) mA (20 to 200) mA (0.2 to 2) A (2 to 20) A	8 µA/A + 0.4 nA 7.3 µA/A + 4 nA 9.2 µA/A + 40 nA 35 µA/A + 0.8 µA 0.15 mA/A + 16 µA 0.32 mA/A + 0.4 mA	Fluke 8508A Opt 01 8.5 Digit Multimeter
Capacitance – Source ³ 10 Hz to 10 kHz 10 Hz to 3 kHz 10 Hz to 1 kHz 10 Hz to 1 kHz 10 Hz to 1 kHz (10 to 600) Hz (10 to 300) Hz (10 to 150) Hz (10 to 120) Hz (10 to 80) Hz (0 to 50) Hz (0 to 20) Hz (0 to 6) Hz (0 to 2) Hz (0 to 0.6) Hz (0 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) µF (1.1 to 3.3) µF (3.3 to 11) µF (11 to 33) µF (33 to 110) µF (110 to 330) µF (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	1.6 mF/F + 10 pF 3.2 mF/F + 10 pF 1.7 mF/F + 10 pF 1.9 mF/F + 10 pF 1.9 mF/F + 30 pF 1.7 mF/F + 1 nF 1.7 mF/F + 3 nF 1.7 mF/F + 10 nF 2.9 mF/F + 30 nF 3.3 mF/F + 0.1 µF 3.3 mF/F + 0.3 µF 3.3 mF/F + 1 µF 3.3 mF/F + 3 µF 3.3 mF/F + 10 µF 5.6 mF/F + 30 µF 8.3 mF/F + 0.1 mF	Fluke 5520A/SC1100 Multiproduct Calibrator



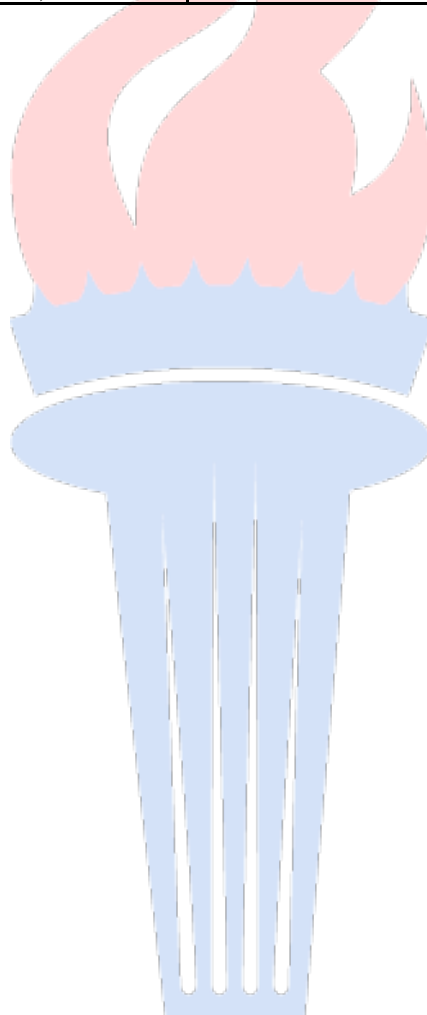
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Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Resistance – Source (Fixed Artifacts)	1 Ω	97 μΩ/Ω	Fluke 5720A Multiproduct Calibrator
	1.9 Ω	97 μΩ/Ω	
	10 Ω	23 μΩ/Ω	
	19 Ω	23 μΩ/Ω	
	100 Ω	10 μΩ/Ω	
	190 Ω	10 μΩ/Ω	
	1 kΩ	8.8 μΩ/Ω	
	1.9 kΩ	8.8 μΩ/Ω	
	10 kΩ	8.8 μΩ/Ω	
	19 kΩ	8.8 μΩ/Ω	
	100 kΩ	11 μΩ/Ω	
	190 kΩ	11 μΩ/Ω	
	1 MΩ	21 μΩ/Ω	
	1.9 MΩ	21 μΩ/Ω	
10 MΩ	41 μΩ/Ω		
Resistance – Source (Fixed Simulation)	19 MΩ 100 MΩ	50 μΩ/Ω 0.1 mΩ/Ω	Fluke 5720A Multiproduct Calibrator
Resistance – Source (Simulation)	Up to 11 Ω	11 μΩ/Ω + 1 mΩ	Fluke 5520A Multiproduct Calibrator
	(11 to 33) Ω	17 μΩ/Ω + 1.5 mΩ	
	(33 to 110) Ω	21 μΩ/Ω + 1.4 mΩ	
	(0.11 to 1.1) kΩ	21 μΩ/Ω + 2 mΩ	
	(1.1 to 11) kΩ	21 μΩ/Ω + 20 mΩ	
	(11 to 110) kΩ	21 μΩ/Ω + 0.2 Ω	
	(0.11 to 1.1) MΩ	25 μΩ/Ω + 2 Ω	
	(1.1 to 3.3) MΩ	45 μΩ/Ω + 30 Ω	
	(3.3 to 11) MΩ	0.1 mΩ/Ω + 50 Ω	
	(11 to 33) MΩ	0.18 mΩ/Ω + 2.5 kΩ	
	(33 to 110) MΩ	0.38 mΩ/Ω + 3 kΩ	
(110 to 330) MΩ	2.3 mΩ/Ω + 0.1 MΩ		
(0.33 to 1.1) GΩ	12 mΩ/Ω + 0.5 MΩ		
Resistance – Measure	Up to 2 Ω	9.4 μΩ/Ω + 4 μΩ	Fluke 8508A Opt 01 8.5 Digit Multimeter
	(2 to 20) Ω	6.2 μΩ/Ω + 14 μΩ	
	(20 to 200) Ω	6.3 μΩ/Ω + 50 μΩ	
	(0.2 to 2) kΩ	6.2 μΩ/Ω + 0.5 mΩ	
	(2 to 20) kΩ	6.1 μΩ/Ω + 5 mΩ	
	(20 to 200) kΩ	6.4 μΩ/Ω + 50 mΩ	
	(0.2 to 2) MΩ	7.1 μΩ/Ω + 1 Ω	
	(2 to 20) MΩ	9.8 μΩ/Ω + 0.1 kΩ	
	(20 to 200) MΩ	38 μΩ/Ω + 10 kΩ	
	(0.2 to 2) GΩ	1 mΩ/Ω + 1 MΩ	

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
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 (0.5 to 1) MHz	0.3 mV/V + 4 μ V 0.15 mV/V + 4 μ V 0.14 mV/V + 4 μ V 0.27 mV/V + 4 μ V 0.6 mV/V + 5 μ V 1.2 mV/V + 10 μ V 1.6 mV/V + 20 μ V 3.2 mV/V + 20 μ V	Fluke 5720A 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	(2.2 to 22) mV		Fluke 5720A Multiproduct Calibrator
	(10 to 20) Hz	0.25 mV/V + 4 μ V	
	(20 to 40) Hz	0.1 mV/V + 4 μ V	
	40 Hz to 20 kHz	93 μ V/V + 4 μ V	
	(20 to 50) kHz	0.21 mV/V + 4 μ V	
	(50 to 100) kHz	0.53 mV/V + 5 μ V	
	(100 to 300) kHz	1.1 mV/V + 10 μ V	
	(300 to 500) kHz	1.5 mV/V + 20 μ V	
	(0.5 to 1) MHz	2.8 mV/V + 20 μ V	
	(22 to 220) mV		
	(10 to 20) Hz	0.25 mV/V + 12 μ V	
	(20 to 40) Hz	94 μ V/V + 7 μ V	
	40 Hz to 20 kHz	84 μ V/V + 7 μ V	
	(20 to 50) kHz	0.2 mV/V + 7 μ V	
	(50 to 100) kHz	0.47 mV/V + 17 μ V	
	(100 to 300) kHz	92 μ V/V + 20 μ V	
	(300 to 500) kHz	1.4 mV/V + 25 μ V	
	(0.5 to 1) MHz	2.8 mV/V + 45 μ V	
	(0.22 to 2.2) V		
	(10 to 20) Hz	0.25 mV/V + 40 μ V	
	(20 to 40) Hz	94 μ V/V + 15 μ V	
	40 Hz to 20 kHz	47 μ V/V + 8 μ V	
	(20 to 50) kHz	77 μ V/V + 10 μ V	
	(50 to 100) kHz	0.11 mV/V + 30 μ V	
	(100 to 300) kHz	0.43 mV/V + 80 μ V	
	(300 to 500) kHz	1 mV/V + 0.2 mV	
	(0.5 to 1) MHz	1.7 mV/V + 0.3 V	
	(2.2 to 22) V		
(10 to 20) Hz	0.25 mV/V + 0.4 mV		
(20 to 40) Hz	93 μ V/V + 0.15 mV		
40 Hz to 20 kHz	47 μ V/V + 50 μ V		
(20 to 50) kHz	79 μ V/V + 0.1 mV		
(50 to 100) kHz	0.1 mV/V + 0.2 mV		
(100 to 300) kHz	0.29 mV/V + 0.6 mV		
(300 to 500) kHz	1.1 mV/V + 2 mV		
(0.5 to 1) MHz	1.6 mV/V + 3.2 mV		



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Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
AC Voltage – Source	(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 (0.5 to 1) MHz	0.25 mV/V + 4 mV 94 μ V/V + 1.5 mV 54 μ V/V + 0.6 mV 87 μ V/V + 1 mV 0.16 mV/V + 2.5 mV 0.92 mV/V + 16 mV 4.5 mV/V + 40 mV 8.2 mV/V + 80 mV	Fluke 5720A Multiproduct Calibrator
	(220 to 750) V (30 to 50) kHz (50 to 100) kHz (220 to 1 100) V (15 to 50) Hz 50 Hz to 1 kHz 40 Hz to 1 kHz (1 to 20) kHz (20 to 30) kHz	0.6 mV/V + 11 mV 2.4 mV/V + 45 mV 0.31 mV/V + 16 mV 74 μ V/V + 3.5 mV 94 μ V/V + 4 mV 0.17 mV/V + 6 mV 0.6 mV/V + 11 mV	Fluke 5720A Multiproduct Calibrator, Fluke 5725A Amplifier
AC Voltage – Measure	(20 to 200) mV (10 to 40) Hz (40 to 100) Hz 100 Hz to 2 kHz (2 to 10) kHz (10 to 30) kHz (30 to 100) kHz 200 mV to 2 V (10 to 40) Hz (40 to 100) Hz 100 Hz to 2 kHz (2 to 10) kHz (10 to 30) kHz (30 to 100) kHz (100 to 300) kHz 300 kHz to 1 MHz (2 to 20) V (10 to 40) Hz (40 to 100) Hz 100 Hz to 2 kHz (2 to 10) kHz (10 to 30) kHz (30 to 100) kHz	98 μ V/V + 4 μ V 78 μ V/V + 4 μ V 83 μ V/V + 2 μ V 96 μ V/V + 4 μ V 0.24 mV/V + 8 μ V 0.55 mV/V + 20 μ V 87 μ V/V + 20 μ V 64 μ V/V + 20 μ V 50 μ V/V + 20 μ V 77 μ V/V + 20 μ V 0.16 mV/V + 40 μ V 0.4 mV/V + 0.2 mV 1.9 mV/V + 2 mV 3.3 mV/V + 20 mV 87 μ V/V + 0.2 mV 65 μ V/V + 0.2 mV 51 μ V/V + 0.2 mV 77 μ V/V + 0.2 mV 0.16 mV/V + 0.4 mV 0.39 mV/V + 2 mV	Fluke 8508A Opt 01 8.5 Digit Multimeter



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Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
AC Voltage – Measure	(2 to 20) V (100 to 300) kHz (0.3 to 1) MHz	1.9 mV/V + 20 mV 3.3 mV/V + 0.2 V	Fluke 8508A Opt 01 8.5 Digit Multimeter
	(20 to 200) V (10 to 40) Hz (40 to 100) Hz 100 Hz to 2 kHz (2 to 10) kHz (10 to 30) kHz (30 to 100) kHz (100 to 300) kHz	88 μV/V + 2 mV 65 μV/V + 2 mV 52 μV/V + 2 mV 78 μV/V + 2 mV 0.16 mV/V + 4 mV 0.39 mV/V + 20 mV 1.9 mV/V + 0.2 V	
AC Voltage – Measure ³	(1 to 60) kV 60 Hz	5 mV/V	Ross Engineering VD 60 High Voltage Divider, Fluke 8508A Opt 01 8.5 Digit Multimeter
AC Current – Source	Up to 220 μA (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 0.17 mA/A + 10 nA 0.13 mA/A + 8 nA 0.3 mA/A + 12 nA 1.1 mA/A + 65 nA	Fluke 5720A Multiproduct Calibrator
	220 μA 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	0.26 mA/A + 40 nA 0.17 mA/A + 35 nA 0.13 mA/A + 35 nA 0.21 mA/A + 0.11 μA 1.1 mA/A + 0.65 μA 0.26 mA/A + 0.4 μA 0.17 mA/A + 0.35 μA 0.13 mA/A + 0.35 μA 0.22 mA/A + 0.55 μA 1.2 mA/A + 5 μA	

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
AC Current – Source	(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 10 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz	0.26 mA/A + 4 μA 0.17 mA/A + 3.5 μA 0.13 mA/A + 2.5 μA 0.22 mA/A + 3.5 μA 1.2 mA/A + 10 μA 0.27 mA/A + 35 μA 0.46 mA/A + 80 μA 7.2 mA/A + 0.16 mA	Fluke 5720A Multiproduct Calibrator
	(2.2 to 11) A 40 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz	0.48 mA/A + 0.17 μA 97 μA/A + 0.38 μA 3.7 mA/A + 0.75 μA	Fluke 5720A Multiproduct Calibrator, Fluke 5725A Amplifier
	(11 to 20) 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 (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	0.13 mA/A + 9.4 mA 0.24 mA/A + 9.4 mA 0.8 mA/A + 9.4 mA 2.4 mA/A + 31 mA 7.9 mA/A + 62 mA 24 mA/A + 94 mA 0.14 mA/A + 19 mA 0.24 mA/A + 28 mA 0.8 mA/A + 94 mA 2.4 mA/A + 0.23 A 7.9 mA/A + 0.42 A 32 mA/A + 0.7 A	Fluke 5720A Multiproduct Calibrator, Fluke 52120A Amplifier
AC Current – Measure	Up to 200 μA 10 Hz to 10 kHz (0.2 to 2) mA 10 Hz to 10 kHz (2 to 20) mA 10 Hz to 10 kHz (20 to 200) mA 10 Hz to 10 kHz (0.2 to 2) A 10 Hz to 2 kHz (2 to 10) kHz (2 to 20) A 10 Hz to 2 kHz (2 to 10) kHz	0.2 mA/A + 20 nA 0.18 mA/A + 0.2 μA 0.19 mA/A + 2 μA 0.21 mA/A + 20 μA 0.47 mA/A + 0.2 mA 0.56 mA/A + 0.2 mA 0.62 mA/A + 2 mA 2 mA/A + 2 mA	Fluke 8508A Opt 01 8.5 Digit Multimeter

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
AC Current Clamp-on Meters	(1.65 to 16.5) A (45 to 65) Hz (65 to 440) Hz	40 mA 90 mA	Fluke 5520A/SC 1100 Multiproduct Calibrator, Fluke 5500A/COIL 50-turn Coil
	(16.5 to 20) A (45 to 65) Hz (65 to 440) Hz	80 mA 0.17 A	
AC Current Clamp-on Meters	(20 to 100) A (50 to 65) Hz (65 to 400) Hz	90 mA 90 mA	Fluke 5720A Multiproduct Calibrator, Fluke 52120A Amplifier, 6 kA Coil, or Fluke 5520A Multiproduct Calibrator, Fluke 5500A/COIL 50-turn Coil
	(100 to 1 000) A (50 to 65) Hz (65 to 400) Hz	0.29 A 0.29 A	
AC Current Clamp-on Meters	(1 000 to 6 000) A (50 to 65) Hz (65 to 400) Hz	3.4 A 3.5 A	Fluke 5720A Multiproduct Calibrator, Fluke 52120A Amplifier, 6 kA Coil, or Fluke 5520A Multiproduct Calibrator, Fluke 5500A/COIL 50-turn Coil
	(1 000 to 6 000) A (50 to 65) Hz (65 to 400) Hz	3.4 A 3.5 A	
Oscilloscopes ² Amplitude – DC into 50 Ω Load into 1 MΩ Load	Up to ± 6.6 V Up to ± 130 V	1.9 mV/V + 40 μV 0.39 mV/V + 40 μV	Fluke 5520A/SC1100 Multiproduct Calibrator
Amplitude – Square Wave 10 Hz to 10 kHz into 50 Ω Load into 1 MΩ Load	1 mVp-p to 6.6 Vp-p 1 mVp-p to 130 Vp-p	1.9 mV/V + 40 μV 0.9 mV/V + 40 μV	
Amplitude – Leveled Sine Wave Flatness (Relative to 50 kHz)	5 mV to 5.5 V 50 kHz to 100 MHz (100 to 300) MHz (300 to 600) MHz	16 mV/V + 0.1 mV 19 mV/V + 0.1 mV 33 mV/V + 0.1 mV	
Amplitude – Leveled Sine (Absolute Amplitude)	4 mV to 3.5 V 600 MHz to 1.1 GHz	41 mV/V + 0.1 mV	
Time Marker into 50 Ω Load	5 mV to 5.5 V 50 kHz Reference	15 mV/V + 0.3 mV (20 + 1 000t) μs/s	
(Spike, Square Wave Spike, Square, 20 % Pulse Spike or Square Wave Square or Sine Wave	50 ms to 5 s 100 ns to 20 ms (20 to 50) ns 10 ns (1 to 5) ns	2 μs/s 2 μs/s 2 μs/s 2 μs/s	



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Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Oscilloscopes ² Edge Specs into 50 Ω Load Rise Time	< 300 ps	7.5 ps	Fluke 5520A/SC1100 Multiproduct Calibrator
Electrical Simulation of Thermocouple Indicating Devices – Source/Measure	Type B (600 to 800) °C	0.35 °C	Fluke 5520A/SC1100 Multiproduct Calibrator
	(800 to 1 000) °C	0.27 °C	
	(1 000 to 1 550) °C	0.24 °C	
	(1 550 to 1 820) °C	0.26 °C	
	Type C (0 to 150) °C	0.24 °C	
	(150 to 650) °C	0.21 °C	
	(650 to 1 000) °C	0.24 °C	
	(1 000 to 1 800) °C	0.39 °C	
	(1 800 to 2 316) °C	0.65 °C	
	Type E (-250 to -100) °C	0.39 °C	
	(-100 to -25) °C	0.12 °C	
	(-25 to 350) °C	0.11 °C	
	(350 to 650) °C	0.12 °C	
	(650 to 1 000) °C	0.16 °C	
	Type J (-210 to -100) °C	0.21 °C	
	(-100 to -30) °C	0.12 °C	
	(-30 to 150) °C	0.11 °C	
	(150 to 760) °C	0.13 °C	
	(760 to 1 200) °C	0.18 °C	
	Type K (-200 to -100) °C	0.26 °C	
(-100 to -25) °C	0.14 °C		
(-25 to 120) °C	0.14 °C		
(120 to 1 000) °C	0.2 °C		
(1 000 to 1 372) °C	0.31 °C		
Type L (-200 to -100) °C	0.29 °C		
(-100 to 800) °C	0.21 °C		
(800 to 900) °C	0.13 °C		



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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 Indicating Devices – Source/Measure	Type N		Fluke 5520A/SC1100 Multiproduct Calibrator
	(-200 to -100) °C	0.31 °C	
	(-100 to -25) °C	0.17 °C	
	(-25 to 120) °C	0.15 °C	
	(120 to 410) °C	0.14 °C	
	(410 to 1 300) °C	0.22 °C	
	Type R		
	(0 to 250) °C	0.44 °C	
	(250 to 400) °C	0.28 °C	
	(400 to 1 000) °C	0.27 °C	
	(1 000 to 1 767) °C	0.32 °C	
	Type S		
	(0 to 250) °C	0.37 °C	
	(250 to 1 000) °C	0.31 °C	
	(1 000 to 1 400) °C	0.29 °C	
	(1 400 to 1 767) °C	0.36 °C	
Type T			
(-250 to -150) °C	0.49 °C		
(-150 to 0) °C	0.19 °C		
(0 to 120) °C	0.12 °C		
(120 to 400) °C	0.11 °C		
Type U			
(-200 to 0) °C	0.43 °C		
(0 to 600) °C	0.21 °C		

Length – Dimensional Metrology

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Outside Micrometers ²	Up to 12 in	$(57 + 9L) \mu\text{in}$	Gage Blocks
Calipers ²	Up to 40 in	$(520 + 6.9L) \mu\text{in}$	Gage Blocks

Mass and Mass Related

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Balances and Scales ⁴ (0.1 mg resolution)	Up to 120 g	0.33 mg	ASTM E617 Class 1 Weights and internal calibration procedure utilized for the calibration of the weighing system.
(0.1 mg resolution)	(120 to 200) g	0.41 mg	
(1 mg resolution)	Up to 300 g	2.1 mg	
Torque Tools	(30 to 45) ozf·in (12.5 to 50) lbf·in (80 to 400) lbf·in (200 to 1 000) lbf·in (60 to 250) lbf·ft	1.8 % of reading 2 % of reading 1.6 % of reading 1.1 % of reading 1.3 % of reading	CDI 2000-610-02 Torque Calibration System

Thermodynamic

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Temperature – Source	(-95 to -5) °C (-5 to 110) °C (110 to 140) °C (140 to 400) °C	0.007 °C 0.004 °C 0.006 °C 0.005 °C	Liquid Bath, Drywells, Rosemount 162N100A Platinum Resistance Thermometer, Fluke 8508A Opt 01 8.5 Digit Multimeter
Temperature – Measure	(-196 to 400) °C	0.004 °C	Rosemount 162N100A Platinum Resistance Thermometer, Fluke 8508A Opt 01 8.5 Digit Multimeter

Services Performed at Satellite Location

903 East Nakoma, Suite 105
San Antonio, Texas 78216

Length – Dimensional Metrology

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Micrometers ²	Up to 1 in	(70 + 1.8L) μin	Gage Blocks
Calipers ²	Up to 6 in	(638 + 15L) μin	

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. L = length in inches, t = time in seconds.
3. Uncertainties do not include possible contributions from a “best available” unit under test, and/or contributions due to repeatability. In these cases, these contributors will be included in reported expanded uncertainties at time of calibration.
4. This scope is formatted as part of a single document including Certificate of Accreditation No. AC-1417.



R. Douglas Leonard Jr., VP, PILR SBU

