



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017
& ANSI/NCSL Z540-1-1994

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CALIBRATION

Valid To: July 31, 2025

Certificate Number: 3471.01

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following calibrations^{1, 6}:

I. Dimensional

Parameter/Equipment	Range	CMC ² (±)	Comments
Calipers ³	Up to 12 in	7.8 µin + 5.1 µin/in	Gage blocks grade 00
Dial Indicators ³	Up to 2 in	7.8 µin + 1.9 µin/in	Gage blocks grade 00
Micrometers ³	Up to 24 in	7.8 µin + 5.1 µin/in	Gage blocks grade 00
Gage Blocks	Up to 0.050 in (0.050 to 4.0) in	6.6 µin 6.6 µin + 2.3 µin/in	Gage block comparator w/ gage blocks grade 00

II. Electrical – DC/Low Frequency

Parameter/Equipment	Range	CMC ^{2, 4} (±)	Comments
DC Voltage ³ – Generate	Up to 220 mV 220 mV to 2.2 V (2.2 to 11) V (11 to 22) V (22 to 220) V (220 to 1000) V	0.49 µV + 5.7 nV/mV 0.8 µV + 3.5 µV/V 2.9 µV + 2.5 µV/V 4.3 µV + 2.5 µV/V 43 µV + 3.5 µV/V 0.42 mV + 4.5 µV/V	Fluke 5720A

Parameter/Equipment	Range	CMC ^{2, 4, 5} ($\pm$)	Comments
DC Voltage ³ – Generate, Fixed Points	1.018 V 10 V	2.6 μ V 23 μ V	Fluke 732B
DC Voltage ³ – Measure	Up to 200 mV 200 mV to 2 V (2 to 20) V (20 to 200) V (200 to 1000) V (1000 to 10 000) V	0.24 μ V + 5 nV/mV 1.1 μ V + 3.7 μ V/V 10 μ V + 3.5 μ V/V 0.88 mV + 3.2 μ V/V 1.4 mV + 5.2 μ V/V 0.018 %	Fluke 8508A w/ Fluke 80E-10
DC Current ³ – Generate	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 (2.2 to 11) A (11 to 20.5) A (2 to 20) A (20 to 100) A	6 nA + 35 pA/ μ A 7.1 nA + 30 nA/mA 41 nA + 30 nA/mA 0.73 μ A + 50 nA/mA 12 μ A + 0.11 mA/A 0.49 mA + 0.34 mA/A 9.4 mA + 0.8 mA/A 12 mA + 0.15 mA/A 28 mA + 0.26 mA/A	Fluke 5720A w/ Fluke 5725A Fluke 5520A w/ Ballantine 1620
DC Current ³ – Measure	Up to 220 μ A 200 μ A to 2 mA (2 to 20) mA (20 to 200) mA 200 mA to 2 A	2.4 nA + 7 pA/ μ A 7 nA + 11 nA/mA 53 nA + 14 nA/mA 1.5 nA + 47 nA/mA 26 μ A + 0.18 mA/A	Fluke 8508A

Parameter/Range	Frequency	CMC ^{2, 4, 5} ($\pm$)	Comments
DC Current ³ – Measure			
Up to 15 A	DC to 60 Hz	0.0034 %	Leeds & Northrup 4360
(15 to 100) A	DC to 60 Hz	0.0037 %	Leeds & Northrup 4361

Parameter/Range	Frequency	CMC ^{2, 4} (±)	Comments
Clamp Meters ³ , AC Current – Generate,			
Toroidal: (10 to 16.5) A (16.5 to 150) A (150 to 1025) A	(45 to 65) Hz	26 mA + 2.1 mA/A 50 mA + 1.9 mA/A 0.34 A + 1.9 mA/A	Fluke 5520A w/ coil
(10 to 16.5) A (16.5 to 150) A (150 to 1025) A	(65 to 440) Hz	60 mA + 6 mA/A 0.11 A + 5.3 mA/A 0.86 A + 5.3 mA/A	
Non-Toroidal: (10 to 16.5) A (16.5 to 150) A (150 to 1025) A	(45 to 65) Hz	60 mA/A + 3.8 mA/A 0.23 A + 3.7 mA/A 1.2 A + 3.7 mA/A	
(10 to 16.5) A (16.5 to 150) A (150 to 1025) A	(65 to 440) Hz	90 mA + 7.2 mA/A 0.28 A + 6.7 mA/A 1.6 A + 6.7 mA/A	

Parameter/Equipment	Range	CMC ^{2, 4} (±)	Comments
Clamp Meters, DC Current – Generate	(10 to 16.5) A (16.5 to 150) A (150 to 1025) A	50 mA + 6.5 mA/A 0.18 A + 3.4 mA/A 0.83 A + 3.3 mA/A	Fluke 5520A w/ coil
Resistance ³ – Generate Fixed Points	0 Ω 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	50 μΩ 95 μΩ 0.18 mΩ 0.26 mΩ 0.48 mΩ 1.1 mΩ 2.1 mΩ 9 mΩ 17 mΩ 90 mΩ 0.17 Ω 1.1 Ω 2.1 Ω 18 Ω 36 Ω 0.36 kΩ 0.89 kΩ 10 kΩ	Fluke 5720A

Parameter/Equipment	Range	CMC ^{2, 4} ($\pm$)	Comments
Resistance ³ – Generate Fixed Points (cont)	1 Ω 10 k Ω (0 to 10.9999) Ω (11 to 32.9999) Ω (33 to 109.9999) Ω (110 to 329.9999) Ω (0.33 to 1.099 999) k Ω (1.1 to 3.299 999) k Ω (3.3 to 10.999 99) k Ω (11 to 32.999 99) k Ω (33 to 109.9999) k Ω (110 to 329.9999) k Ω (0.33 to 1.099 999) M Ω (1.1 to 3.299 999) M Ω (3.3 to 10.999 99) M Ω (11 to 32.999 99) M Ω (33 to 109.9999) M Ω (110 to 329.9999) M Ω (330 to 1100) M Ω	12 $\mu\Omega$ 50 m Ω 1.2 m Ω + 24 $\mu\Omega/\Omega$ 1.5 m Ω + 24 $\mu\Omega/\Omega$ 1.9 m Ω + 22 $\mu\Omega/\Omega$ 4.1 m Ω + 22 $\mu\Omega/\Omega$ 9.1 m Ω + 22 $\mu\Omega/\Omega$ 41 m Ω + 22 $\mu\Omega/\Omega$ 92 m Ω + 22 $\mu\Omega/\Omega$ 0.41 Ω + 22 $\mu\Omega/\Omega$ 0.9 Ω + 22 $\mu\Omega/\Omega$ 8.4 Ω + 26 $\mu\Omega/\Omega$ 14 Ω + 26 $\mu\Omega/\Omega$ 93 Ω + 48 $\mu\Omega/\Omega$ 0.4 k Ω + 0.1 m Ω/Ω 4.4 k Ω + 0.2 m Ω/Ω 16 k Ω + 0.4 m Ω/Ω 0.35 M Ω + 2.4 m Ω/Ω 4.4 M Ω + 12 m Ω/Ω	Fluke 742A-1 Fluke 742A-10K Fluke 5520A
Resistance ³ – Measure	(0 to 2) Ω (2 to 20) Ω (20 to 200) Ω 200 Ω to 2 k Ω (2 to 20) k Ω (20 to 200) k Ω 200 k Ω to 2 M Ω (2 to 20) M Ω (20 to 200) M Ω	0.36 m Ω + 1.2 $\mu\Omega/\Omega$ 58 $\mu\Omega$ + 8.4 $\mu\Omega/\Omega$ 0.18 m Ω + 7.6 $\mu\Omega/\Omega$ 1.4 m Ω + 7.8 $\mu\Omega/\Omega$ 14 m Ω + 7.8 $\mu\Omega/\Omega$ 0.13 Ω + 8 $\mu\Omega/\Omega$ 1.9 Ω + 10 $\mu\Omega/\Omega$ 0.12 k Ω + 21 $\mu\Omega/\Omega$ 12 k Ω + 0.12 m Ω/Ω	Fluke 8508A

Parameter/Range	Frequency	CMC ^{2,4} (±)	Comments
Capacitance ³ – Generate, Fixed Points			
1 pF	1 kHz 1 MHz 2 MHz 3 MHz 4 MHz 5 MHz 10 MHz 13 MHz	0.35 fF 0.36 fF 0.42 fF 0.54 fF 0.72 fF 0.95 fF 2.5 fF 3.7 fF	Agilent 16380 series capacitors
10 pF	1 kHz to 5 MHz 10 MHz 13 MHz	3.5 fF 3.7 fF 3.8 fF	
100 pF	1 kHz to 5 MHz 10 MHz 13 MHz	35 fF 48 fF 60 fF	
1000 pF	1 kHz 1 MHz 2 MHz 3 MHz 4 MHz 5 MHz 10 MHz 13 MHz	0.35 pF 0.35 pF 0.38 pF 0.45 pF 0.56 pF 0.71 pF 1.9 pF 2.8 pF	
10 000 pF	120 Hz to 100 kHz	3.5 pF	
1 µF	120 Hz to 100 kHz	0.4 nF	

Parameter/Equipment	Range	CMC ^{2,4} (±)	Comments
Capacitance ³ – Measure @ 1 kHz	(1 to 10) pF (10 to 100) pF (100 to 1000) pF (1 to 10) nF (10 to 100) nF (100 to 1000) nF (1 to 10) µF (10 to 100) µF	0.048 pF 0.22 pF 1.1 pF 40 pF 0.11 nF 1 nF 9.2 nF 0.14 µF	GenRad 1689 M

Parameter/Equipment	Range	CMC ^{2, 4} ($\pm$)	Comments
Capacitance ³ – Generate	(0.19 to 0.3999) nF (0.4 to 1.0999) nF (1.1 to 3.2999) nF (3.3 to 10.9999) nF (11 to 32.9999) nF (33 to 109.999) nF (110 to 329.999) nF (0.33 to 1.099 99) μ F (1.1 to 3.2999) μ F (3.3 to 10.9999) μ F (11 to 32.9999) μ F (33 to 109.999) μ F (110 to 329.999) μ F (0.33 to 1.099 99) mF (1.1 to 3.2999) mF (3.3 to 10.9999) mF (11 to 32.9999) mF (33 to 110) mF	8.7 pF + 4 pF/nF 9.7 pF + 4 pF/nF 13 pF + 4 pF/nF 15 pF + 2 pF/nF 0.1 nF + 2 pF/nF 0.15 nF + 2 pF/nF 0.46 nF + 2 pF/nF 1.5 nF + 2 nF/ μ F 4.6 nF + 2 nF/ μ F 15 nF + 2 nF/ μ F 59 nF + 3.2 nF/ μ F 0.2 μ F + 3.6 nF/ μ F 0.64 μ F + 3.6 nF/ μ F 2 μ F + 3.6 μ F/mF 7 μ F + 3.5 μ F/mF 38 μ F + 2.5 μ F/mF 90 μ F + 6 μ F/mF 0.37 mF + 8.8 μ F/mF	Fluke 5522A
Inductance ³ – Measure, 12 Hz to 100 kHz	0.01 μ H to 1 mH (1 to 100) mH 100 mH to 1 H (1 to 10) H	1.4 μ H 0.1 mH 1.4 mH 11 mH	GenRad 1689 M
Inductance ³ – Generate, Fixed Points, 100 Hz to 1 kHz	100 μ H 1 mH 10 mH 100 mH 1 H	6.1 nH 1 μ H 9.8 μ H 54 μ H 0.57 mH	GenRad 1482 Series Inductors

Parameter/Range	Frequency	CMC ^{2,4} ($\pm$)	Comments
AC Voltage ³ – Generate			
220 μ V 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	4 μ V + 0.22 μ V/mV 4 μ V + 85 nV/mV 4 μ V + 75 nV/mV 4 μ V + 0.18 μ V/mV 5 μ V + 0.46 μ V/mV 10 μ V + 0.9 μ V/mV 20 μ V + 1.2 μ V/mV 20 μ V + 2.5 μ V/mV	Fluke 5720A
(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	4.5 μ V + 0.22 μ V/mV 4.2 μ V + 85 nV/mV 4.2 μ V + 75 nV/mV 4.4 μ V + 0.18 μ V/mV 6.1 μ V + 0.46 μ V/mV 12 μ V + 0.9 μ V/mV 23 μ V + 1.2 μ V/mV 26 μ V + 2.5 μ V/mV	
(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	17 μ V + 0.22 μ V/mV 9 μ V + 85 nV/mV 8.7 μ V + 75 nV/mV 11 μ V + 0.18 μ V/mV 16 μ V + 0.46 μ V/mV 31 μ V + 0.9 μ V/mV 48 μ V + 1.2 μ V/mV 78 μ V + 2.5 μ V/mV	
(0.22 to 2.2) 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	90 μ V + 0.22 mV/V 34 μ V + 79 μ V/V 18 μ V + 39 μ V/V 26 μ V + 70 μ V/V 54 μ V + 0.11 mV/V 0.16 mV + 0.34 mV/V 0.56 mV + 0.84 mV/V 0.64 mV + 1.5 mV/V	

Parameter/Range	Frequency	CMC ^{2,4} ($\pm$)	Comments
AC Voltage ³ – Generate (cont)			
(0.22 to 2.2) 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	90 μ V + 0.22 mV/V 34 μ V + 79 μ V/V 18 μ V + 39 μ V/V 26 μ V + 70 μ V/V 54 μ V + 0.11 mV/V 0.16 mV + 0.34 mV/V 0.56 mV + 0.84 mV/V 0.64 mV + 1.5 mV/V	Fluke 5720A
(2.2 to 22) 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	0.89 mV + 0.22 mV/V 0.33 mV + 80 μ V/V 0.15 mV + 40 μ V/V 0.26 mV + 70 μ V/V 0.41 mV + 95 μ V/V 1.2 mV + 0.26 mV/V 4 mV + 0.9 mV/V 6.1 mV + 1.3 mV/V	
(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	8.9 mV + 0.22 mV/V 3.4 mV + 80 μ V/V 1.7 mV + 47 μ V/V 3.5 mV + 72 μ V/V 5.9 mV + 0.13 mV/V 34 mV + 0.8 mV/V 0.13 V + 4.2 mV/V 0.24 V + 7 mV/V	* 220 V range subject to 2.2E7 V-Hz limitation
(220 to 1100) V	(15 to 50) Hz ** 50 Hz to 1 kHz	74 mV + 0.26 mV/V 17 mV + 60 μ V/V	** Max output 250 V from 15 Hz to 50 Hz
	40 Hz to 1 kHz (1 to 20) kHz (20 to 30) kHz	22 mV + 80 μ V/V 34 mV + 0.13 mV/V 93 mV + 0.36 mV/V	w/ 5725A
(220 to 750) V	(30 to 50) kHz (50 to 100) kHz	93 mV + 0.36 mV/V 0.34 V + 1.3 mV/V	

Parameter/Range	Frequency	CMC ^{2, 4} ($\pm$)	Comments
AC Voltage ³ – Measure			
(20 to 200) mV	(1 to 10) Hz (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	14 μ V + 0.16 μ V/mV 4.7 μ V + 0.12 μ V/mV 4.9 μ V + 0.1 μ V/mV 2.8 μ V + 0.1 μ V/mV 5.9 μ V + 0.13 μ V/mV 10 μ V + 0.31 μ V/mV 25 μ V + 0.66 μ V/mV	Fluke 8508A
(0.2 to 2) V	(1 to 10) Hz (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	0.15 mV + 0.15 mV/V 38 μ V + 0.11 mV/V 36 μ V + 88 μ V/V 34 μ V + 73 μ V/V 46 μ V + 0.11 mV/V 0.28 mV + 0.14 mV/V 0.3 mV + 0.51 mV/V	
(2 to 20) V	(1 to 10) Hz (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	0.29 mV + 0.16 mV/V 0.15 mV + 0.12 mV/V 0.31 mV + 80 μ V/V 0.11 mV + 74 μ V/V 0.2 mV + 0.11 mV/V 0.26 mV + 0.21 mV/V 0.86 mV + 0.51 mV/V	
(20 to 200) V	(1 to 10) Hz (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	12 mV + 0.16 mV/V 2.7 mV + 0.12 mV/V 2.7 mV + 90 μ V/V 2.7 mV + 75 μ V/V 3.5 mV + 0.11 mV/V 5.9 mV + 0.21 mV/V 25 mV + 0.51 mV/V	
(200 to 1000) V	(1 to 10) Hz (10 to 40) Hz 40 Hz to 1 kHz	72 mV + 0.15 mV/V 29 mV + 0.11 mV/V 33 mV + 0.11 mV/V	

Parameter/Range	Frequency	CMC ^{2, 4} ($\pm$)	Comments
AC Current ³ – Measure			
(20 to 200) μ A	(1 to 10) Hz 10 Hz to 10 kHz (10 to 30) kHz (30 to 100) kHz	0.23 μ A + 0.14 nA/ μ A 20 nA + 0.48 nA/ μ A 21 nA + 0.62 nA/ μ A 25 nA + 3.1 nA/ μ A	Fluke 8508A
(0.2 to 2) mA	(1 to 10) Hz 10 Hz to 10 kHz (10 to 30) kHz (30 to 100) kHz	0.42 μ A + 0.25 μ A/mA 0.57 μ A + 0.19 μ A/mA 0.27 μ A + 0.62 μ A/mA 0.56 μ A + 3.1 μ A/mA	
(2 to 20) mA	(1 to 10) Hz 10 Hz to 10 kHz (10 to 30) kHz (30 to 100) kHz	48 μ A + 33 nA/mA 2.1 μ A + 0.29 μ A/mA 2.1 μ A + 0.62 μ A/mA 2.8 μ A + 3.1 μ A/mA	
(20 to 200) mA	(1 to 10) Hz 10 Hz to 10 kHz (10 to 30) kHz	25 μ A + 0.29 μ A/mA 21 μ A + 0.28 μ A/mA 21 μ A + 0.58 μ A/mA	
(0.2 to 2) A	(1 to 2) Hz 2 Hz to 10 kHz (10 to 30) kHz	0.41 mA + 0.05 mA/A 0.28 mA + 0.67 mA/A 0.45 mA + 2.5 mA/A	
(2 to 20) A	10 Hz to 2 kHz (2 to 10) kHz	2.3 mA + 0.72 mA/A 2.5 mA + 1.9 mA/A	
AC Current ³ – Generate			
(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	63 nA + 0.13 nA/ μ A 12 nA + 0.14 nA/ μ A 9.2 nA + 0.11 nA/ μ A 15 nA + 0.25 nA/ μ A 75 nA + 0.9 nA/ μ A	Fluke 5720A
(29 to 329.99) μ A	(10 to 30) kHz	0.69 μ A + 13 nA/ μ A	5520A
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	93 nA + 0.23 μ A/mA 67 nA + 0.14 μ A/mA 60 nA + 0.11 μ A/mA 0.15 μ A + 0.18 μ A/mA 0.85 μ A + 0.9 μ A/mA	Fluke 5720A

Parameter/Range	Frequency	CMC ^{2,4} (±)	Comments
AC Current ³ – Generate (cont)			
(0.33 to 3.2999) mA	(10 to 30) kHz	3.3 µA + 8 µA/mA	5520A
(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	0.92 µA + 0.23 µA/mA 0.69 µA + 0.14 µA/mA 0.6 µA + 0.11 µA/mA 0.95 µA + 0.18 µA/mA 7 µA + 0.9 µA/mA	5720
(3.3 to 32.999) mA	(10 to 30) kHz	14 µA + 3.2 µA/mA	5520A
(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	9.3 µA + 0.23 µA/mA 6.8 µA + 0.14 µA/mA 5 µA + 0.11 µA/mA 7.5 µA + 0.18 µA/mA 30 µA + 0.9 µA/mA	5720A
(33 to 329.99) mA	(10 to 30) kHz	.27 mA + 3.2 µA/mA	5520A
220 mA to 2.2 A (2.2 to 11) A	20 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz	89 µA + 0.24 mA/A 0.17 mA + 0.39 mA/A 1.5 mA + 6 mA/A	Fluke 5720A
	40 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz	1.1 mA + 0.4 mA/A 2.3 mA + 0.85 mA/A 8.0 mA + 3.3 mA/A	w/5725A
(11 to 20.5) A	(45 to 100) Hz 100 Hz to 1 kHz (1 to 5) kHz	15 mA + 0.96 mA/A 17 mA + 1.2 mA/A 0.27 A + 24 mA/A	Fluke 5520A
(11 to 20) A (20 to 100) A	Up to 1 kHz	42 mA + 1.7 mA/A 0.15 A + 1.7 mA/A	Ballantine 1620A

Parameter/Range	Frequency	CMC ^{2, 4, 5} ($\pm$)	Comments
Oscilloscopes ³ –			
DC			
50 Ω	(0 to 6.6) V	0.84 mV + 2.4 mV/V	Fluke 5820A
1 M Ω	(0 to 6.6) V	0.95 mV + 0.25 mV/V	
Square			
50 Ω	1 mV to 6.6 Vp-p	0.72 mV + 2.4 mV/V	
1 M Ω	1 mV to 130 Vp-p	2.2 mV + 0.49 mV/V	
Fast Edge	≤ 150 ps	29 ps	
Leveled Sine Amplitude	50 kHz Reference 10 MHz Reference	1.8 mV + 20 mV/V 1.9 mV + 20 mV/V	
Leveled Sine Flatness Relative to 50 kHz	50 kHz to 100 MHz (100 to 300) MHz (300 to 500) MHz (500 to 600) MHz	1 mV + 38 mV/V 0.94 mV + 45 mV/V 0.92 mV + 65 mV/V 0.91 mV + 72 mV/V	
Relative to 10 MHz	600 MHz to 1.1 GHz (1.1 to 1.6) GHz (1.6 to 2.1) GHz	0.97 mV + 86 mV/V 1.2 mV + 86 mV/V 1 mV + 0.1 V/V	
Time Marker	5 s to 50 ms 20 ms to 500 ps	0.0012 % + 5 ns 0.0003 %	
Distortion ³ – Measure	20 Hz to 20 kHz (20 to 100) kHz	1.2 dB 2.3 dB	8903B
AC Power ^{3, 8} – Generate			
Up to 1020 V: Up to 33 W (33 to 330) W 330 W to 1.1 kW (1.1 to 3) kW (3 to 11) kW (11 to 20.9) kW	(45 to 65) Hz, PF=1	0.1 % 0.062 % 0.072 % 0.075 % 0.087 % 0.14 %	Fluke 5520A

Parameter/Equipment	Range	CMC ^{2, 4, 5} (±)	Comments
Duty Cycle ^{3, 8} – Generate	(1 to 9.99) % (10 to 49.99) % 50 % (50.01 to 90) % (90.01 to 99) %	0.33 % 0.02 % 0.013 % 0.02 % 0.32 %	Fluke 5520A
DC Power ^{3, 8} – Generate	Up to 1020 V: Up to 3 W (3 to 30) W (30 to 300) W 300 W to 3 kW (3 to 20.9) kW	0.017 % 0.014 % 0.014 % 0.033 % 0.085 %	Fluke 5520A
Electrical Calibration of Thermocouple Indicators & Indicating Systems ³ –			
Type E	(-250 to -100) °C (-100 to -25) °C (-25 to 350) °C (350 to 650) °C (650 to 1000) °C	0.59 °C 0.21 °C 0.17 °C 0.19 °C 0.29 °C	Martel 3001
Type J	(-210 to -100) °C (-100 to -30) °C (-30 to 150) °C (150 to 760) °C (760 to 1200) °C	0.33 °C 0.25 °C 0.19 °C 0.2 °C 0.28 °C	
Type K	(-200 to -100) °C (-100 to -25) °C (-25 to 120) °C (120 to 1000) °C (1000 to 1372) °C	0.39 °C 0.28 °C 0.19 °C 0.32 °C 0.5 °C	
Type R	(0 to 250) °C (250 to 400) °C (400 to 1000) °C (1000 to 1750) °C	0.67 °C 0.41 °C 0.39 °C 0.48 °C + 0.061 m°C/°C	

Parameter/Equipment	Range	CMC ² (±)	Comments
Electrical Calibration of Thermocouple Indicators & Indicating Systems ³ – (cont)			
Type S	(0 to 250) °C (250 to 1000) °C (1000 to 1400) °C (1400 to 1750) °C	0.65 °C 0.42 °C 0.43 °C 0.55 °C + 0.054 m°C/°C	Martel 3001
Type T	(-250 to -150) °C (-150 to 0) °C (0 to 120) °C (120 to 400) °C	0.74 °C 0.3 °C 0.21 °C 0.16 °C	
Electrical Calibration of RTD Indicators & Indicating Systems ³ –			
Pt 385, 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	0.047 °C 0.058 °C 0.058 °C 0.047 °C 0.048 °C 0.061 °C + 0.016 m°C/°C 0.064 °C + 0.021 m°C/°C	Martel 3001

III. Mechanical

Parameter/Equipment	Range	CMC ^{2, 5} (±)	Comments
Scales ³	Up to 200 lbs	0.82 x R	Class F weights

Parameter/Equipment	Range	CMC ^{2, 5, 7} ($\pm$)	Comments
Balances ³			
0.0001 g Resolution	(5 to 500) mg > 500 mg to 5 g > 5 g to 6 kg	0.82 x <i>R</i> 0.91 x <i>R</i> 1.0 x <i>R</i>	Class 1, 3 & 4 weights
0.001 g Resolution	5 mg to 10 g (> 10 to 50) g > 50 g to 6 kg	0.82 x <i>R</i> 0.91 x <i>R</i> 1.4 x <i>R</i>	
0.01 g Resolution	5 mg to 300 g > 300 g to 6 kg	0.82 x <i>R</i> 1.4 x <i>R</i>	
0.1 g Resolution	5 mg to 2 kg (2 to 6) kg	0.85 x <i>R</i> 1.0 x <i>R</i>	
1 g & 10 g Resolution	5 mg to 6 kg	0.82 x <i>R</i>	
Pressure – Measure & Measuring Equipment ³	(-1 to 0) psig (0 to 1) psig (0 to 15) psig (15 to 30) psig (30 to 500) psig (500 to 3000) psig (3000 to 5000) psig (0 to 1) inH ₂ O	0.013 psi 0.012 psi 0.052 psi 0.034 psi 0.44 psi 0.85 psi 3 psi 0.001 inH ₂ O	Pressure modules Druck DPI 610 pressure calibrator
Torque Tools – Wrenches, Gages & Drivers ³	(0.5 to 5) lbf·in (5 to 50) lbf·in (50 to 400) lbf·in (400 to 1000) lbf·in (83 to 600) lbf·ft	0.58 % 0.58 % 0.29 % 0.3 % 0.29 %	Torque testers
Torque – Measuring Equipment ³	5 ozf·in to 10 lbf·in (10 to 1000) lbf·in	0.05 % 0.036 %	Torque arms & Class 4 & Class F weights

IV. Thermodynamics

Parameter/Equipment	Range	CMC ^{2, 7} ($\pm$)	Comments
Relative Humidity – Measuring Equipment ³	11 %, 33 %, 75 %	1.3 % RH	Saturated salts/ Vaisala MI70 w/ HMP 77B
Relative Humidity – Measure ³	(20 to 90) % RH (90 to 95) % RH	1.3 % RH 2.1 % RH	Vaisala MI70 w/ HMP 77B
Temperature – Measuring Equipment	(-68 to -30) °C (-30 to < 0) °C 0 °C (> 0 to 120) °C (120 to 140) °C (140 to 180) °C	0.82 °C 0.039 °C 0.038 °C 0.014 °C 0.07 °C 0.82 °C	PRT/ w indicator
Temperature – Measure ³	(-200 to 400) °C	0.0042 °C + $\Delta T_{(\text{Change from } -420 \text{ °C})} \times 0.000\ 005\ 8$	PRT/ w indicator
Infrared Temperature – Measuring Equipment ³	(35 to 500) °C	0.82 °C	Blackbody

V. Time & Frequency

Parameter/Equipment	Range	CMC ^{2, 7} ($\pm$)	Comments
Frequency	10 MHz	50 μ Hz	58503A GPS Receiver
Frequency – Measuring Equipment ³	100 mHz to 20 MHz 20 MHz to 50 GHz	55 μ Hz + 27 pHz/Hz 0.58 mHz + 4.3 pHz/Hz	3325B function generator E8257D signal generator

Parameter/Equipment	Range	CMC ^{2, 7} ($\pm$)	Comments
Frequency – Measure ³	0.1 Hz to 3 GHz	5.8 μ Hz + 59 pHz/Hz	53131A frequency counter
	(3 to 50) GHz	0.11 Hz + 3 pHz/Hz	E8565EC spectrum analyzer
Stopwatches & Timers	$\pm$ (0 to 19.99) sec/day	0.037 sec/day	Vibrograph 4500 Timometer

¹ This laboratory offers commercial calibration service and field calibration service.

² Calibration and Measurement Capability Uncertainty (CMC) is the smallest uncertainty of measurement that a laboratory can achieve within its scope of accreditation when performing more or less routine calibrations of nearly ideal measurement standards or nearly ideal measuring equipment. CMCs represent expanded uncertainties expressed at approximately the 95 % level of confidence, usually using a coverage factor of $k = 2$. The actual measurement uncertainty of a specific calibration performed by the laboratory may be greater than the CMC due to the behavior of the customer's device and to influences from the circumstances of the specific calibration.

³ Field calibration service is available for this calibration. Please note the actual measurement uncertainties achievable on a customer's site can normally be expected to be larger than the CMC found on the A2LA Scope. Allowance must be made for aspects such as the environment at the place of calibration and for other possible adverse effects such as those caused by transportation of the calibration equipment. The usual allowance for the actual uncertainty introduced by the item being calibrated, (e.g., resolution) must also be considered and this, on its own, could result in the actual measurement uncertainty achievable on a customer's site being larger than the CMC.

⁴ The stated measured values are determined using the indicated instrument (see Comments). This capability is suitable for the calibration of the devices intended to measure or generate the measured value in the ranges indicated. CMCs are expressed as either a specific value that covers the full range or as a percentage or fraction of the reading plus a fixed floor specification.

⁵ In the statement of CMC, percentages are to be read as percent of reading unless otherwise noted. In the statement of CMC, R represents the resolution of the unit under test, L is the numerical value of the length of the device measured in inches.

⁶ This scope meets A2LA's *P112 Flexible Scope Policy*.

⁷ The type of instrument or material being calibrated is defined by the parameter. This indicates the laboratory is capable of calibrating instruments that measure or generate the values in the ranges indicated for the listed measurement parameter.



Accredited Laboratory

A2LA has accredited

TRESCAL, INC.

Bohemia, NY

for technical competence in the field of

Calibration

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 *General requirements for the competence of testing and calibration laboratories*. This laboratory also meets the requirements of ANSI/NCSL Z540-1-1994 and R205 – Specific Requirements: Calibration Laboratory Accreditation Program. 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).



Presented this 3rd day of July 2023.

A blue ink signature of Mr. Trace McInturff.

Mr. Trace McInturff, Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 3471.01
Valid to July 31, 2025

For the calibrations to which this accreditation applies, please refer to the laboratory's Calibration Scope of Accreditation.