



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

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CALIBRATION

Valid To: April 30, 2026

Certificate Number: 7440.01

In recognition of the successful completion of the A2LA evaluation process (including an assessment of the organization's compliance with R205 – A2LA's Calibration Program Requirements), accreditation is granted to this laboratory to perform the following calibrations^{1, 7}:

I. Dimensional

Parameter/Equipment	Range	CMC ² (±)	Comments
Micrometers ³	Up to 1 in (1 to 6) in (6 to 12) in	52 µin 89 µin 160 µin	Starrett – Weber B89 Grade 0 gage blocks, long block set
Depth Micrometers ³	Up to 12 in	160 µin	Starrett – Weber B89 Grade 0 gage blocks, long block set
Calipers ³	Up to 6 in (6 to 12) in (12 to 24) in	70 µin 710 µin 750 µin	Starrett – Weber B89 Grade 0 gage blocks, long block set
Test Indicators ³	Up to 0.1 in	120 µin	Starrett – Weber B89 Grade 0 gage blocks
Dial Indicators ³	Up to 2 in	80 µin	Starrett – Weber B89 Grade 0 gage blocks

Parameter/Equipment	Range	CMC ^{2, 4} (\pm)	Comments
Height Gages ³	Up to 24 in	720 μ m	Starrett – Weber B89 Grade 0 gage blocks, long block set, surface plate
Ring Gages ³	(0.25 to 12) in	(13 + 5L) μ m	Labmaster TM , master rings

II. Electrical – DC/Low Frequency

Parameter/Equipment	Range	CMC ^{2, 5} (\pm)	Comments
DC Voltage – Generate ³	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	6.8 μ V/V + 0.4 μ V 3.8 μ V/V + 0.7 μ V 2.8 μ V/V + 2.5 μ V 2.9 μ V/V + 4 μ V 3.8 μ V/V + 40 μ V 4.8 μ V/V + 0.4 mV	Fluke 5730A multiproduct calibrator
	10 V	14 μ V	Fluke 732A
DC Voltage – Measure ³	Up to 200 mV 200 mV to 2 V (2 to 20) V (20 to 200) V (200 to 1050) V	9.1 μ V/V + 0.2 μ V 3.1 μ V/V + 0.3 μ V 3.0 μ V/V + 0.5 μ V 4.7 μ V/V + 30 μ V 4.8 μ V/V + 0.5 mV	Fluke 8588A reference multimeter
	(1 to 10) kV	0.37 mV/V + 30 mV	Vitrek 4700
	(10 to 120) kV	1.1 mV/V + 0.6 V	Ross VD120- 6.2Y-A voltage divider, HP 34401A 6.5- digit multimeter

Parameter/Equipment	Range	CMC ^{2, 5} (\pm)	Comments
DC Current – Generate ³	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	36 μ A/A + 6 nA 31 μ A/A + 7 nA 34 μ A/A + 40 nA 46 μ A/A + 0.7 μ A 64 μ A/A + 12 μ A 0.35 mA/ A + 0.48 mA 0.79 mA/A + 0.59 mA	Fluke 5730A multiproduct calibrator Fluke 5725A amplifier Fluke 5522A calibrator
DC Current Clamps – Generate ³	(20 to 150) A (150 to 1025) A	4.2 mA/A + 0.11 A 4.2 mA/A + 0.39 A	Fluke 5522A, Fluke 5500A/COIL
DC Current – Measure ³	Up to 20 μ A (20 to 200) μ A 200 μ A to 2 mA (2 to 20) mA (20 to 200) mA 200 mA to 2 A (2 to 20) A (20 to 30) A	35 μ A/A + 0.4 nA 12 μ A/A + 0.4 nA 11 μ A/A + 4 nA 15 μ A/A + 40 nA 59 μ A/A + 1 μ A 0.14 mA/A + 0.1 mA 0.24 mA/A + 0.4 mA 0.57 mA/A + 4.4 mA	Fluke 8588A reference multimeter
Resistance – Generate ³ , Fixed Points	0 Ω 1 Ω 1.9 Ω 10 Ω 19 Ω 100 Ω 190 Ω 1 k Ω 1.9 k Ω 10 k Ω 19 k Ω 100 k Ω 190 k Ω 1 M Ω 1.9 M Ω 10 M Ω 19 M Ω 100 M Ω	41 $\mu\Omega$ 81 $\mu\Omega$ 0.16 m Ω 0.29 m Ω 0.44 m Ω 1.1 m Ω 2.2 m Ω 7.9 m Ω 15 m Ω 68 m Ω 0.15 Ω 1.1 Ω 1.8 Ω 15 Ω 32 Ω 0.42 k Ω 0.95 k Ω 12 k Ω	Fluke 5730A multiproduct calibrator

Parameter/Equipment	Range	CMC ^{2, 5} (\pm)	Comments
Resistance – Generate ³ , Fixed Points (cont)	1 Ω 10 k Ω	8.6 $\mu\Omega$ 42 m Ω	IET SRL resistors
Resistance – Generate ³ , (Simulated)	Up to 11 Ω (11 to 33) Ω (33 to 110) Ω (110 to 330) Ω 330 Ω to 1.1 k Ω (1.1 to 3.3) k Ω (3.3 to 11) k Ω (11 to 33) k Ω (33 to 110) k Ω (110 to 330) k Ω 330 k Ω to 1.1 M Ω (1.1 to 3.3) M Ω (3.3 to 11) M Ω (11 to 33) M Ω (33 to 110) M Ω (110 to 330) M Ω 330 M Ω to 1.1 G Ω	32 $\mu\Omega/\Omega$ + 0.78 m Ω 26 $\mu\Omega/\Omega$ + 1.2 m Ω 24 $\mu\Omega/\Omega$ + 1.1 m Ω 23 $\mu\Omega/\Omega$ + 1.6 m Ω 23 $\mu\Omega/\Omega$ + 1.6 m Ω 23 $\mu\Omega/\Omega$ + 16 m Ω 23 $\mu\Omega/\Omega$ + 16 m Ω 23 $\mu\Omega/\Omega$ + 0.16 Ω 23 $\mu\Omega/\Omega$ + 0.16 Ω 28 $\mu\Omega/\Omega$ + 1.6 Ω 28 $\mu\Omega/\Omega$ + 1.6 Ω 74 $\mu\Omega/\Omega$ + 24 Ω 0.11 m Ω/Ω + 39 Ω 0.40 m Ω/Ω + 2 k Ω 0.55 m Ω/Ω + 2.4 k Ω 4.0 m Ω/Ω + 78 k Ω 14 m Ω/Ω + 0.39 M Ω	Fluke 5522A multiproduct calibrator
Resistance – Measure ³	Up 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 200 M Ω to 2 G Ω (2 to 20) G Ω	19 $\mu\Omega/\Omega$ + 4 $\mu\Omega$ 12 $\mu\Omega/\Omega$ + 14 $\mu\Omega$ 9.6 $\mu\Omega/\Omega$ + 50 $\mu\Omega$ 9.3 $\mu\Omega/\Omega$ + 0.5 m Ω 9.6 $\mu\Omega/\Omega$ + 5 m Ω 10 $\mu\Omega/\Omega$ + 50 m Ω 15 $\mu\Omega/\Omega$ + 1 Ω 20 $\mu\Omega/\Omega$ + 10 Ω 88 $\mu\Omega/\Omega$ + 1 k Ω 0.26 m Ω/Ω + 0.1 M Ω 1.4 m Ω/Ω + 10 M Ω	Fluke 8588A reference multimeter

Parameter/Range	Frequency	CMC ^{2, 5} (\pm)	Comments
AC Voltage – Generate ³			
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	0.40 mV/V + 4 μ V 0.26 mV/V + 4 μ V 0.25 mV/V + 4 μ V 0.52 mV/V + 4 μ V 0.86 mV/V + 5 μ V 1.6 mV/V + 10 μ V 2.6 mV/V + 20 μ V 3.1 mV/V + 20 μ V	Fluke 5730A multiproduct calibrator
(2.2 to 22) m 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 1MHz	0.27 mV/V + 4 μ V 0.13 mV/V + 4 μ V 93 μ V/V + 4 μ V 0.21 mV/V + 4 μ V 0.49 mV/V + 5 μ V 0.93 mV/V + 10 μ V 1.4 mV/V + 20 μ V 3.2 mV/V + 20 μ V	
(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 1MHz	0.24 mV/V + 12 μ V 96 μ V/V + 7 μ V 62 μ V/V + 7 μ V 0.12 mV/V + 7 μ V 0.32 mV/V + 17 μ V 0.61 mV/V + 20 μ V 1.3 mV/V + 25 μ V 2.8 mV/V + 45 μ V	
220 mV 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 1MHz	0.24 mV/V + 40 μ V 89 μ V/V + 15 μ V 47 μ V/V + 8 μ V 68 μ V/V + 10 μ V 97 μ V/V + 30 μ V 0.33 mV/V + 80 μ V 0.92 mV/V + 0.2 mV 1.9 mV/V + 0.3 mV	
(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 1MHz	0.24 mV/V + 0.4 mV 92 μ V/V + 0.15 mV 48 μ V/V + 50 μ V 70 μ V/V + 0.1 mV 0.11 mV/V + 0.2 mV 0.31 mV/V + 0.6 mV 0.99 mV/V + 2 mV 1.9 mV/V + 3.2 mV	

Parameter/Range	Frequency	CMC ^{2, 5} (±)	Comments
AC Voltage – Generate ³ (cont)			
(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	0.24 mV/V + 4 mV 93 μV/V + 1.5 mV 56 μV/V + 0.6 mV 86 μV/V + 1 mV 0.16 mV/V + 2.5 mV 0.82 mV/V + 16 mV 4.3 mV/V + 40 mV 7.2 mV/V + 80 mV	Fluke 5730A multiproduct calibrator
(220 to 1100) V	(15 to 50) Hz 50 Hz to 1 kHz	0.27 mV/V + 16 mV 70 μV/V + 2.5 mV	
(220 to 1100) V	(1 to 20) kHz (20 to 30) kHz	0.13 mV/V + 6 mV 0.38 mV/V + 11 mV	Fluke 5725A amplifier
(220 to 750) V	(30 to 50) kHz (50 to 100) kHz	0.38 mV/V + 11 mV 1.4 mV/V + 45 mV	
AC Voltage – Measure ³			
(1 to 12) mV	1 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	0.35 mV/V + 1.1 μV 0.42 mV/V + 1.1 μV 0.43 mV/V + 1.1 μV 3.1 mV/V + 1.1 μV 11 mV/V + 4 μV 21 mV/V + 4 μV	Fluke 8588A reference multimeter
(12 to 120) mV	1 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 (1 to 2) MHz (2 to 4) MHz (4 to 8) MHz (8 to 10) MHz	95 μV/V + 0.5 μV 0.14 mV/V + 0.5 μV 0.24 mV/V + 1 μV 0.54 mV/V + 5 μV 2.2 mV/V + 30 μV 12 mV/V + 0.1 mV 15 mV/V + 0.5 mV 42 mV/V + 1 mV 85 mV/V + 1 mV 0.17 V/V + 1 mV	

Parameter/Range	Frequency	CMC ^{2, 5} (±)	Comments
AC Voltage – Measure ³ (cont)			
120 mV to 1.2 V	1 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 (1 to 2) MHz (2 to 4) MHz (4 to 8) MHz (8 to 10) MHz	78 μV/V + 5 μV 0.13 mV/V + 5 μV 0.23 mV/V + 10 μV 0.54 mV/V + 50 μV 2.2 mV/V + 0.3 mV 11 mV/V + 1 mV 16 mV/V + 5 mV 41 mV/V + 10 mV 83 mV/V + 10 mV 0.16 V/V + 10 mV	Fluke 8588A reference multimeter
(1.2 to 12) V	1 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 (1 to 2) MHz (2 to 4) MHz (4 to 8) MHz (8 to 10) MHz	78 μV/V + 50 μV 0.13 mV/V + 50 μV 0.23 mV/V + 0.1 mV 0.54 mV/V + 0.5 mV 2.2 mV/V + 3 mV 11 mV/V + 10 mV 15 mV/V + 50 mV 41 mV/V + 0.1 V 83 mV/V + 0.1 V 0.16 V/V + 0.1 V	
(12 to 120) V	1 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	93 μV/V + 0.5 mV 0.12 mV/V + 0.5 mV 0.25 mV/V + 1 mV 0.62 mV/V + 5 mV 3.9 mV/V + 50 mV 13 mV/V + 0.5 V	
(120 to 1050) V	1 Hz to 2 kHz (2 to 10) kHz (10 to 30) kHz (30 to 100) kHz	0.12 mV/V + 25 mV 0.12 mV/V + 25 mV 0.24 mV/V + 25 mV 0.64 mV/V + 0.1 V	
(1 to 10) kV	(30 to 200) Hz	1.5 mV/V + 0.1 V	Vitrek 4700
(10 to 84) kV	(45 to 65) Hz	5.5 mV/V + 30 V	Ross VD120-6.2Y-A voltage divider, HP 34401A 6.5-digit multimeter

Parameter/Range	Frequency	CMC ^{2, 5} (\pm)	Comments
AC Current – Generate ³			
(9 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	0.29 mA/A + 16 nA 0.17 mA/A + 10 nA 0.11 mA/A + 8 nA 0.26 mA/A + 12 nA 0.91 mA/A + 65 nA	Fluke 5730A multiproduct calibrator
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	0.31 mA/A + 40 nA 0.18 mA/A + 35 nA 0.12 mA/A + 35 nA 0.19 mA/A + 0.11 μ A 0.91 mA/A + 0.65 μ A	
(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	0.30 mA/A + 0.4 μ A 0.18 mA/A + 0.35 μ A 0.11 mA/A + 0.35 μ A 0.19 mA/A + 0.55 μ A 0.91 mA/A + 5 μ A	
(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	0.31 mA/A + 4 μ A 0.17 mA/A + 3.5 μ A 0.11 mA/A + 2.5 μ A 0.20 mA/A + 3.5 μ A 0.91 mA/A + 10 μ A	
220 mA to 2.2 A	20 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz	0.23 mA/A + 35 μ A 0.40 mA/A + 80 μ A 6.0 mA/A + 0.16 mA	
(2.2 to 11) A	40 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz	0.41 mA/A + 0.17 mA 0.86 mA/A + 0.38 mA 3.4 mA/A + 0.75 mA	Fluke 5725A amplifier
(11 to 20.5) A	(45 to 100) Hz 100 Hz to 1 kHz (1 to 5) kHz	0.95 mA/A + 3.9 mA 1.2 mA/A + 3.9 mA 24 mA/A + 3.9 mA	Fluke 5522A multiproduct calibrator

Parameter/Range	Frequency	CMC ^{2, 5} (\pm)	Comments
AC Current Clamps– Generate ³			
(20 to 150) A	(45 to 65) Hz (65 to 440) Hz	4.6 mA/A + 0.2 A 8.2 mA/A + 0.2 A	Fluke 5522A, 5500A/COIL
(150 to 1000) A	(45 to 65) Hz (65 to 440) Hz	4.7 mA/A + 0.7 A 11 mA/A + 0.73 A	
AC Current – Measure ³			
(1 to 20) μ A	1 Hz to 2 kHz (2 to 10) kHz (10 to 30) kHz	2.2 mA/A + 2.5 nA 2.2 mA/A + 2.5 nA 2.3 mA/A + 2.5 nA	Fluke 8588A reference multimeter
(20 to 200) μ A	1 Hz to 2 kHz (2 to 10) kHz (10 to 30) kHz (30 to 100) kHz	0.31 mA/A + 5 nA 0.55 mA/A + 5 nA 0.84 mA/A + 5 nA 4.2 mA/A + 10 nA	
200 μ A to 2 mA	1 Hz to 2 kHz (2 to 10) kHz (10 to 30) kHz (30 to 100) kHz	0.29 mA/A + 50 nA 0.54 mA/A + 50 nA 0.82 mA/A + 50 nA 4.1 mA/A + 0.1 μ A	
(2 to 20) mA	1 Hz to 2 kHz (2 to 10) kHz (10 to 30) kHz (30 to 100) kHz	0.29 mA/A + 0.5 μ A 0.54 mA/A + 0.5 μ A 0.83 mA/A + 0.5 μ A 4.1 mA/A + 1 μ A	
(20 to 200) mA	1 Hz to 2 kHz (2 to 10) kHz (10 to 30) kHz	0.29 mA/A + 5 μ A 0.53 mA/A + 5 μ A 0.83 mA/A + 5 μ A	
200 mA to 2 A	1 Hz to 2 kHz (2 to 10) kHz (10 to 30) kHz	0.31 mA/A + 0.1 mA 0.56 mA/A + 0.1 mA 0.83 mA/A + 0.1 mA	
(2 to 20) A	10 Hz to 2 kHz (2 to 10) kHz	0.85 mA/A + 0.5 mA 0.85 mA/A + 0.5 mA	
(20 to 30) A	10 Hz to 2 kHz (2 to 10) kHz	0.87 mA/A + 12 mA 1.6 mA/A + 12 mA	

Parameter/Equipment	Range	CMC ² (±)	Comments
Electrical Simulation of Thermocouple Indicating Devices – Generate/Measure ³ –			
Type B	(600 to 800) °C (800 to 1000) °C (1000 to 1550) °C (1550 to 1820) °C	0.35 °C 0.28 °C 0.24 °C 0.27 °C	Fluke 5522A multiproduct calibrator
Type C	(0 to 150) °C (150 to 650) °C (650 to 1000) °C (1000 to 1800) °C (1800 to 2316) °C	0.24 °C 0.21 °C 0.25 °C 0.4 °C 0.66 °C	
Type E	(-250 to -100) °C (-100 to -25) °C (-25 to 350) °C (350 to 650) °C (650 to 1000) °C	0.41 °C 0.14 °C 0.13 °C 0.14 °C 0.18 °C	
Type J	(-210 to -100) °C (-100 to -30) °C (-30 to 150) °C (150 to 760) °C (760 to 1200) °C	0.28 °C 0.16 °C 0.14 °C 0.16 °C 0.2 °C	
Type K	(-200 to -100) °C (-100 to -25) °C (-25 to 120) °C (120 to 1000) °C (1000 to 1372) °C	0.28 °C 0.16 °C 0.15 °C 0.22 °C 0.33 °C	

Parameter/Equipment	Range	CMC ² (±)	Comments
Electrical Simulation of Thermocouple Indicating Devices – Generate/Measure ³ – (cont)			
Type L	(-200 to -100) °C (-100 to 800) °C (800 to 900) °C	0.31 °C 0.22 °C 0.16 °C	Fluke 5522A multiproduct calibrator
Type N	(-200 to -100) °C (-100 to -25) °C (-25 to 120) °C (120 to 410) °C (410 to 1300) °C	0.33 °C 0.19 °C 0.17 °C 0.16 °C 0.22 °C	
Type R	(0 to 250) °C (250 to 400) °C (400 to 1000) °C (1000 to 1767) °C	0.46 °C 0.29 °C 0.27 °C 0.32 °C	
Type S	(0 to 250) °C (250 to 1000) °C (1000 to 1400) °C (1400 to 1767) °C	0.38 °C 0.29 °C 0.3 °C 0.37 °C	
Type T	(-250 to -150) °C (-150 to 0) °C (0 to 120) °C (120 to 400) °C	0.54 °C 0.24 °C 0.17 °C 0.14 °C	
Type U	(-200 to 0) °C (0 to 600) °C	0.44 °C 0.22 °C	
Electrical Simulation of RTD Indicating Devices 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	0.097 °C 0.11 °C 0.12 °C 0.13 °C 0.14 °C 0.16 °C 0.22 °C	Fluke 5522A multiproduct calibrator

Parameter/Equipment	Range	CMC ^{2, 5, 6} (±)	Comments
Electrical Simulation of RTD Indicating Devices ³ – (cont)			
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	0.097 °C 0.1 °C 0.11 °C 0.12 °C 0.14 °C 0.15 °C	Fluke 5522A multiproduct calibrator
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	0.21 °C 0.092 °C 0.096 °C 0.11 °C 0.11 °C 0.12 °C 0.12 °C 0.14 °C 0.21 °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	0.054 °C 0.057 °C 0.056 °C 0.064 °C 0.11 °C 0.12 °C 0.13 °C 0.14 °C	
Pt 385, 500 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	0.037 °C 0.044 °C 0.044 °C 0.051 °C 0.066 °C 0.067 °C 0.074 °C 0.089 °C	

Parameter/Equipment	Range	CMC ^{2, 5} (±)	Comments
Electrical Simulation of RTD Indicating Devices ³ – (cont)			
Pt 385, 1000 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	0.025 °C 0.025 °C 0.033 °C 0.041 °C 0.048 °C 0.056 °C 0.056 °C 0.18 °C	Fluke 5522A multiproduct calibrator
PtNi 385, 120 Ω (Ni 120)	(-80 to 0) °C (0 to 100) °C (100 to 260) °C	0.088 °C 0.078 °C 0.12 °C	
Cu 427, 10 Ω	(-100 to 260) °C	0.94 °C	
Oscilloscopes ³ –			
AC Voltage 50 Ω Load 1 MΩ Load	1 mVp-p to 6.6 Vp-p 1 mVp-p to 130 Vp-p	2.4 mV/V + 32 μV 0.78 mV/V + 32 μV	Fluke 5522A/11 multiproduct calibrator with 1.1 GHz scope option
DC Voltage 50 Ω Load 1 MΩ Load	(-6.6 to 6.6) V (-130 to .130) V	2.5 mV/V + 32 μV 0.39 mV/V + 32 μV	
Leveled Sine Wave 50 Ω Load	5 m Vp-p to 2.5 Vp-p 50 kHz 50 kHz to 100 MHz (100 to 300) MHz (300 to 600) MHz 5 mVp-p to 3.5 Vp-p 600 MHz to 1.1 GHz	17 mV/V + 0.24 mV 14 mV/V + 78 μV 19 mV/V + 78 μV 33 mV/V + 78 μV 41 mV/V + 78 μV	
Time Markers Sinewave Sine/Square-wave Spike/Square-wave Spike, Square-wave, Pulse Spike, Square-wave	(2 to 5) ns 10 ns (20 to 50) ns 100 ns to 20 ms 50 ms to 5 s	2.0 μs/s 2.0 μs/s 2.0 μs/s 2.0 μs/s (25 + 1000T) μs/s	<i>T</i> is time in seconds

Parameter/Range	Frequency	CMC ^{2, 5} (±)	Comments
Capacitance – Generate ³ (Simulated)			
(220 to 400) pF	10 Hz to 10 kHz	5.4 mF/F + 7.8 pF	Fluke 5522A multiproduct calibrator
400 pF to 1.1 μF	10 Hz to 10 kHz	4.2 mF/F + 7.8 pF	
(1.1 to 3.3) nF	10 Hz to 3 kHz	4.4 mF/F + 7.8 pF	
(3.3 to 11) nF	10 Hz to 1 kHz	2.7 mF/F + 7.8 pF	
(11 to 33) nF	10 Hz to 1 kHz	2.4 mF/F + 78 pF	
(33 to 110) nF	10 Hz to 1 kHz	2.7 mF/F + 78 pF	
(110 to 330) nF	10 Hz to 1 kHz	2.6 mF/F + 0.24 nF	
330 nF to 1.1 μF	(10 to 600) Hz	2.7 mF/F + 0.78 nF	
(1.1 to 3.3) μF	(10 to 300) Hz	2.6 mF/F + 2.4 nF	
(3.3 to 11) μF	(10 to 150) Hz	2.7 mF/F + 7.8 nF	
(11 to 33) μF	(10 to 120) Hz	3.6 mF/F + 24 nF	
(33 to 110) μF	(10 to 80) Hz	4.0 mF/F + 78 nF	
(110 to 330) μF	(0 to 50) Hz	3.5 mF/F + 0.24 μF	
330 μF to 1.1 mF	(0 to 20) Hz	3.5 mF/F + 0.78 μF	
(1.1 to 3.3) mF	(0 to 6) Hz	3.5 mF/F + 2.4 μF	
(3.3 to 11) mF	(0 to 2) Hz	3.5 mF/F + 7.8 μF	
(11 to 33) mF	(0 to 0.6) Hz	5.8 mF/F + 24 μF	
(33 to 110) mF	(0 to 0.2) Hz	8.6 mF/F + 78 μF	

III. Mechanical

Parameter/Equipment	Range	CMC ^{2, 6} (±)	Comments
Torque Indicating Devices ³	(4 to 40) ozf-in (2 to 20) lbf-in (20 to 200) lbf-in (10 to 100) lbf-ft (100 to 1000) lbf-ft	2.2 % of reading + 0.005 ozf-in 0.19 % of reading + 0.002 lbf-in 0.19 % of reading + 0.02 lbf-in 0.29 % of reading + 0.01 lbf-ft 1.3 % of reading + 0.1 lbf-ft	AKO TSD 6500 torque calibrator
Vacuum – Measuring Equipment ³	(-14 to 0) psi	0.0042 psi	Additel 912A pump, Additel 681 gauge

Parameter/Equipment	Range	CMC ^{2, 6} (±)	Comments	
Pressure – Measuring Equipment ³	Pneumatic	(0 to 30) psig (30 to 100) psig (100 to 300) psig (300 to 1000) psig	0.0036 psi 0.018 % of reading 0.057 psi 0.018 % of reading	Fluke PPC4 pressure calibrator
	Hydraulic	(1000 to 15 000) psig	0.041 % of reading	Ametek TQ-150 deadweight tester

IV. Thermodynamics

Parameter/Equipment	Range	CMC ^{2, 6} (±)	Comments
Temperature – Measure/ Measuring Equipment ³	(-25 to 0) °C (0 to 50) °C (50 to 150) °C	0.064 °C 0.065 °C 0.067 °C	Fluke 5615-9-A PRT, Fluke 9142-P field metrology well
	(150 to 200) °C (200 to 350) °C (350 to 420) °C (420 to 660) °C	0.23 °C 0.37 °C 0.43 °C 0.63 °C	Fluke 5609-12-A PRT, Fluke 9144-P field metrology well

V. Time & Frequency

Parameter/Equipment	Range	CMC ^{2, 6} (±)	Comments
Frequency – Measuring Equipment ³	1 µHz to 80 MHz	38 pHz/Hz	SRS FS740 GPS: Agilent 33250A function/arbitrary waveform generator
	80 MHz to 3.0 GHz	30 pHz/Hz	Agilent N931 0A Signal Generator

Parameter/Equipment	Range	CMC ^{2, 6} (\pm)	Comments
Frequency – Measure ³	100 mHz to 225 MHz 225 MHz to 3.0 GHz	50 pHz/Hz 30 pHz/Hz	SRS FS740 GPS, HP 53131A universal counter
Stopwatches, Timers ³	Up to 20 s/d	65 ms/d	Helmut Klein 4500 Timometer

¹ This laboratory offers commercial calibration 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 In the statement of CMC, L is the nominal numerical value of the length of the unit under test in inches.

⁵ 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. CMC's are expressed as either a specific value that covers the full range or as a percent or fraction of the reading plus a fixed floor specification

⁶ 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.

⁷ This scope meets A2LA's *P112 Flexible Scope Policy*.



Accredited Laboratory

A2LA has accredited

CAL-TEK COMPANY, LLC

N. Billerica, MA

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/NC SL 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 10th day of October 2024.

A blue ink signature of Mr. Trace McInturff, written in a cursive style.

Mr. Trace McInturff, Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 7440.01
Valid to April 30, 2026
Revised January 30, 2026

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