



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017,
ANSI/NCSL Z540-1-1994 & ANSI/NCSL Z540.3-2006

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CALIBRATION

Valid To: March 31, 2027

Certificate Number: 2357.05

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 at the location listed above performing the following calibrations^{1,6}:

I. Electrical – DC/Low Frequency

Parameter/Equipment	Range	CMC ^{2,4} (±)	Comments
DC Voltage – Generate ³	0 V (0 to 220) mV (0.22 to 2.2) V (2.2 to 11) V (11 to 22) V (22 to 220) V (220 to 1100) V	67 nV 9.1 μV/V + 0.62 μV 6.3 μV/V + 0.93 μV 6.2 μV/V + 3.1 μV 6.3 μV/V + 6.2 μV 7.0 μV/V + 78 μV 8.6 μV/V + 0.47 mV	Copper short Fluke 5720A
DC Voltage – Measure ³	0 V Up to 100 mV (0.1 to 1.2) V (1.2 to 10) V (10 to 100) V (100 to 1000) V	67 nV 12 μV/V + 230 nV 7.3 μV/V + 0.23 μV 4.0 μV/V + 0.39 μV 6.4 μV/V + 23 μV 7.9 μV/V + 78 μV	Copper short HP 3458A, opt 002
DC Current – Generate ³	0 A Up to 220 μA 220 μA to 2.2 mA (2.2 to 22) mA (22 to 220) mA (0.22 to 2.2) A (2.2 to 11) A (1.1 to 2.999 99) A (0 to 10.9999) A (11 to 20.5) A	2.2 pA 41 μA/A + 5.4 nA 33 μA/A + 6.2 nA 33 μA/A + 39 nA 41 μA/A + 0.62 μA 71 μA/A + 12 μA 0.28 mA/A + 0.37 mA 0.30 mA/A + 31 μA 0.39 mA/A + 0.39 mA 0.78 mA/A + 0.58 mA	Open Fluke 5720A w/5725A Fluke 552XA w/ SC1100

Parameter/Equipment	Range	CMC ^{2,4} (±)	Comments
DC Current – Measure ³	0 A Up to 100 nA (0.1 to 1) μA (1 to 10) μA (10 to 100) μA (0.1 to 1) mA (1 to 10) mA (10 to 100) mA (0.1 to 1) A (> 1 to 20) A	2.2 pA 69 μA/A + 40 pA 36 μA/A + 40 pA 23 μA/A + 0.10 nA 25 μA/A + 0.80 nA 25 μA/A + 5.0 nA 25 μA/A + 50 nA 47 μA/A + 500 nA 0.013 % + 10 μA 38 μA/A	Open HP 3458A Fluke Y5020A w/ HP 3458A
DC Resistance – Generate ³	(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) kΩ (1.1 to 3.299 999) kΩ (3.3 to 10.999 99) kΩ (11 to 32.999 99) kΩ (33 to 109.9999) kΩ (110 to 329.9999) kΩ (0.33 to 1.099 999) MΩ (1.1 to 3.299 999) MΩ (3.3 to 10.999 99) MΩ (11 to 32.999 99) MΩ (33 to 109.9999) MΩ (110 to 329.9999) MΩ (330 to 1100) MΩ	46 μΩ/Ω + 0.78 mΩ 52 μΩ/Ω + 1.2 mΩ 34 μΩ/Ω + 1.1 mΩ 29 μΩ/Ω + 1.6 mΩ 27 μΩ/Ω + 1.6 mΩ 28 μΩ/Ω + 16 mΩ 27 μΩ/Ω + 16 mΩ 29 μΩ/Ω + 0.16 Ω 27 μΩ/Ω + 0.16 Ω 25 μΩ/Ω + 1.6 Ω 26 μΩ/Ω + 1.6 Ω 49 μΩ/Ω + 23 Ω 0.11 mΩ/Ω + 39 Ω 0.20 mΩ/Ω + 1.9 kΩ 0.40 mΩ/Ω + 2.3 kΩ 2.4 mΩ/Ω + 78 kΩ 12 mΩ/Ω + 390 kΩ	Fluke 552XA w/ SC1100
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	49 μΩ 0.13 mΩ 0.18 mΩ 0.23 mΩ 0.43 mΩ 1.1 mΩ 2.0 mΩ 8.2 mΩ 16 mΩ 85 mΩ 0.15 Ω 1.0 Ω 2.7 Ω 50 Ω 60 Ω 4.0 kΩ 8.5 kΩ 26 kΩ	Fluke 5720A

Parameter/Equipment	Range	CMC ^{2,4} (±)	Comments
DC Resistance – Measure ³	(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 100 MΩ to 1.2 GΩ	12 μΩ/Ω + 39 μΩ 9.5 μΩ/Ω + 0.39 mΩ 8.0 μΩ/Ω + 0.39 mΩ 7.8 μΩ/Ω + 3.9 mΩ 8.0 μΩ/Ω + 39 mΩ 12 μΩ/Ω + 1.6 Ω 39 μΩ/Ω + 78 Ω 0.40 mΩ/Ω + 0.78 kΩ 4.7 mΩ/Ω + 7.8 kΩ	HP 3458A, opt 002

Parameter/Range	Frequency	CMC ^{2,4} (±)	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 (0.5 to 1) MHz	0.55 mV/V + 3.9 μV 0.48 mV/V + 3.9 μV 0.51 mV/V + 3.9 μV 0.53 mV/V + 3.9 μV 0.85 mV/V + 4.7 μV 1.4 mV/V + 9.3 μV 2 mV/V + 19 μV 3.3 mV/V + 19 μV	Fluke 5720A w/ Fluke 5725A
(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 (0.5 to 1) MHz	0.25 mV/V + 3.9 μV 0.12 mV/V + 3.9 μV 0.12 mV/V + 3.9 μV 0.22 mV/V + 3.9 μV 0.49 mV/V + 4.7 μV 1 mV/V + 9.3 μV 1.4 mV/V + 19 μV 2.7 mV/V + 19 μV	
(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	0.37 mV/V + 12 μV 93 μV/V + 6.2 μV 83 μV/V + 6.2 μV 0.2 mV/V + 6.2 μV 0.47 mV/V + 16 μV 0.86 mV/V + 19 μV 1.3 mV/V + 23 μV 2.6 mV/V + 47 μV	

Parameter/Range	Frequency	CMC ^{2,4} (\pm)	Comments
AC Voltage – Generate ³ (cont)			
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 1 MHz	0.5 mV/V + 39 μ V 86 μ V/V + 16 μ V 42 μ V/V + 7.8 μ V 71 μ V/V + 9.3 μ V 0.13 mV/V + 31 μ V 0.39 mV/V + 78 μ V 0.93 mV/V + 0.19 mV 1.6 mV/V + 0.31 mV	Fluke 5720A w/ Fluke 5725A
(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	0.38 mV/V + 0.39 mV 91 μ V/V + 0.16 mV 42 μ V/V + 54 μ V 71 μ V/V + 93 μ V 94 μ V/V + 0.19 mV 0.25 mV/V + 0.62 mV 0.93 mV/V + 1.9 mV 1.4 mV/V + 3.1 mV	
(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	0.44 mV/V + 3.9 mV 87 μ V/V + 1.6 mV 52 μ V/V + 0.54 mV 79 μ V/V + 0.93 mV 0.14 mV/V + 2.3 mV 0.85 mV/V + 16 mV 4.2 mV/V + 39 mV 7.8 mV/V + 78 mV	Fluke 5720A w/ Fluke 5725A
(220 to 250) V	15 to 50 Hz 50 Hz to 1 kHz	0.28 mV/V + 16 mV 71 μ V/V + 3.1 mV	
(220 to 1100) V	40 Hz to 1 kHz (1 to 20) kHz (20 to 30) kHz	78 μ V/V + 3.1 mV 0.13 mV/V + 4.7 mV 0.47 mV/V + 8.5 mV	
(220 to 750) V	(30 to 50) kHz (50 to 100) kHz	0.47 mV/V + 8.5 mV 1.8 mV/V + 35 mV	

Parameter/Range	Frequency	CMC ^{2,4} (±)	Comments
AC Voltage – Generate ³ (cont)			
Wideband Output: Up to 1.1 mV	(10 to 30) Hz 30 Hz to 120 kHz (0.12 to 2) MHz (2 to 10) MHz (10 to 20) MHz (20 to 30) MHz	2.4 mV/V 0.98 mV/V 2.2 mV/V + 2.3 μV 3.7 mV/V + 2.3 μV 5.5 mV/V + 2.3 μV 13 mV/V + 12 μV	Fluke 5720A
(1.1 to 3) mV	(10 to 30) Hz 30 Hz to 120 kHz (0.12 to 2) MHz (2 to 10) MHz (10 to 20) MHz (20 to 30) MHz	2.4 mV/V 0.94 mV/V 1.3 mV/V + 2.3 μV 2.2 mV/V + 2.3 μV 4.9 mV/V + 2.3 μV 13 mV/V + 2.3 μV	
(3 to 11) mV	(10 to 30) Hz 30 Hz to 120 kHz (0.12 to 2) MHz (2 to 10) MHz (10 to 20) MHz (20 to 30) MHz	2.4 mV/V 0.94 mV/V 1.1 mV/V + 2.3 μV 2.0 mV/V + 2.3 μV 3.9 mV/V + 2.3 μV 8.6 mV/V + 2.3 μV	
(11 to 33) mV	(10 to 30) Hz 30 Hz to 120 kHz (0.12 to 2) MHz (2 to 10) MHz (10 to 20) MHz (20 to 30) MHz	2.4 mV/V 0.91 mV/V 1.0 mV/V + 2.3 μV 2.0 mV/V + 2.3 μV 3.8 mV/V + 2.3 μV 8.5 mV/V + 2.3 μV	
(33 to 110) mV	(10 to 30) Hz 30 Hz to 120 kHz (0.12 to 2) MHz (2 to 10) MHz (10 to 20) MHz (20 to 30) MHz	2.4 mV/V 0.87 mV/V 1.1 mV/V + 2.3 μV 2.0 mV/V + 2.3 μV 3.8 mV/V + 2.3 μV 8.1 mV/V + 2.3 μV	
(110 to 330) mV	(10 to 30) Hz 30 Hz to 120 kHz (0.12 to 2) MHz (2 to 10) MHz (10 to 20) MHz (20 to 30) MHz	2.3 mV/V 0.84 mV/V 1.1 mV/V + 2.3 μV 2.0 mV/V + 2.3 μV 3.8 mV/V + 2.3 μV 8.5 mV/V + 2.3 μV	
330 mV to 1.1 V	(10 to 30) Hz 30 Hz to 120 kHz (0.12 to 2) MHz (2 to 10) MHz (10 to 20) MHz (20 to 30) MHz	2.3 mV/V 0.84 mV/V 1.0 mV/V + 2.3 μV 2.0 mV/V + 2.3 μV 3.8 mV/V + 2.3 μV 8.5 mV/V + 2.3 μV	

Parameter/Range	Frequency	CMC ^{2,4} (±)	Comments
AC Voltage – Generate ³ (cont) Wideband Output: (1.1 to 3.5) V	(10 to 30) Hz 30 Hz to 120 kHz (0.12 to 2) MHz (2 to 10) MHz (10 to 20) MHz (20 to 30) MHz	2.3 mV/V 0.84 mV/V 1.0 mV/V + 2.3 μV 2.0 mV/V + 2.3 μV 3.8 mV/V + 2.3 μV 8.5 mV/V + 2.3 μV	Fluke 5720A
AC Voltage – Measure ³ (1 to 10) mV (10 to 100) mV (0.1 to 1) V (1 to 10) V (10 to 100) V	(1 to 40) Hz 40 Hz to 1 kHz (1 to 20) kHz (20 to 50) kHz (50 to 100) kHz (0.10 to 1) MHz (1 to 40) Hz 40 Hz to 1 kHz (1 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz (0.3 to 2) MHz (1 to 40) Hz 40 Hz to 1 kHz (1 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz (0.3 to 2) MHz (1 to 40) Hz 40 Hz to 1 kHz (1 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz (0.3 to 2) MHz (1 to 40) Hz 40 Hz to 1 kHz (1 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz (0.3 to 1) MHz	0.38 μV/mV + 2.3 μV 0.19 μV/mV + 0.85 μV 0.25 μV/mV + 0.85 μV 0.79 μV/mV + 0.85 μV 3.9 μV/mV + 0.85 μV 31 μV/mV + 3.9 μV 0.3 μV/mV + 3.1 μV 0.09 μV/mV + 1.6 μV 0.12 μV/mV + 1.6 μV 0.26 μV/mV + 1.6 μV 0.63 μV/mV + 1.6 μV 2.3 μV/mV + 7.8 μV 7.9 μV/mV + 7.8 μV 0.28 mV/V + 31 μV 0.07 mV/V + 16 μV 0.12 mV/V + 16 μV 0.26 mV/V + 16 μV 0.63 mV/V + 16 μV 2.3 mV/V + 78 μV 7.9 mV/V + 78 μV 0.28 mV/V + 0.31 mV 0.07 mV/V + 0.16 mV 0.12 mV/V + 0.16 mV 0.26 mV/V + 0.16 mV 0.63 mV/V + 0.16 mV 2.3 mV/V + 0.78 mV 7.9 mV/V + 0.78 mV 0.31 mV/V + 3.1 mV 0.16 mV/V + 1.6 mV 0.16 mV/V + 1.6 mV 0.3 mV/V + 1.6 mV 0.94 mV/V + 1.6 mV 3.1 mV/V + 7.8 mV 12 mV/V + 7.8 mV	HP 3458A

Parameter/Range	Frequency	CMC ^{2,4} (±)	Comments
AC Voltage – Measure ³ (cont) (100 to 700) V	(1 to 40) Hz 40 Hz to 1 kHz (1 to 20) kHz (20 to 50) kHz (50 to 100) kHz	0.42 mV/V + 31 mV 0.31 mV/V + 16 mV 0.47 mV/V + 16 mV 0.94 mV/V + 16 mV 2.3 mV/V + 16 mV	HP 3458A
AC Current – Generate ³ 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	0.4 mA/A + 16 nA 0.17 mA/A + 10 nA 0.12 mA/A + 8 nA 0.33 mA/A + 12 nA 1.0 mA/A + 65 nA	Fluke 5720A
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	0.36 mA/A + 40 nA 0.19 mA/A + 35 nA 0.15 mA/A + 35 nA 0.22 mA/A + 110 nA 1.0 mA/A + 650 nA	
(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	0.37 mA/A + 400 nA 0.17 mA/A + 350 nA 0.12 mA/A + 350 nA 0.20 mA/A + 550 nA 1.0 mA/A + 5.0 µA	
(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	0.38 mA/A + 4.0 µA 0.17 mA/A + 3.5 µA 0.13 mA/A + 2.5 µA 0.20 mA/A + 3.5 µA 1.0 mA/A + 10 µA	
220 mA to 2.2 A	20 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz	0.27 mA/A + 35 µA 0.41 mA/A + 80 µA 6.3 mA/A + 160 µA	Fluke 552XA w/ SC1100
(2.2 to 11) A	40 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz	0.4 mA/A + 170 µA 0.76 mA/A + 380 µA 2.9 mA/A + 750 µA	
(1.1 to 2.999 99) A	Up to 45 Hz 45 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz	1.4 mA/A + 78 µA 0.49 mA/A + 78 µA 4.7 mA/A + 0.78 mA 19 mA/A + 3.9 mA	

Parameter/Range	Frequency	CMC ^{2,4} (±)	Comments
AC Current – Generate ³ (cont)			
(3 to 10.9999) A	(45 to 100) Hz 100 Hz to 1 kHz (1 to 5) kHz	0.47 mA/A + 1.6 mA 0.78 mA/A + 1.6 mA 23 mA/A + 1.6 mA	Fluke 552XA w/ SC1100
(11 to 20.5) A	(45 to 100) Hz 100 Hz to 1 kHz (1 to 5) kHz	0.94 mA/A + 3.9 mA 1.2 mA/A + 3.9 mA 23 mA/A + 3.9 mA	
AC Current – Measure ³			
(0 to 100) µA	(10 to 20) Hz (20 to 45) Hz 45 Hz to 1 kHz 100 Hz to 5 kHz	0.47 % + 30 nA 0.18 % + 30 nA 0.071 % + 30 nA 0.07 % + 30 nA	HP 3458A
(0.1 to 1) mA	(10 to 20) Hz (20 to 45) Hz (45 to 100) Hz (0.1 to 5) kHz (5 to 20) kHz (20 to 50) kHz (50 to 100) kHz	0.47 % + 200 nA 0.18 % + 200 nA 0.071 % + 200 nA 0.036 % + 200 nA 0.071 % + 200 nA 0.47 % + 400 nA 0.65 % + 1.5 µA	
(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 (20 to 50) kHz (50 to 100) kHz	0.47 % + 2 µA 0.18 % + 2 µA 0.071 % + 2 µA 0.036 % + 2 µA 0.071 % + 2 µA 0.47 % + 4 µA 0.65 % + 15 µA	
(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 (20 to 50) kHz (50 to 100) kHz	0.47 % + 20 µA 0.18 % + 20 µA 0.071 % + 20 µA 0.036 % + 20 µA 0.071 % + 20 µA 0.47 % + 40 µA 0.65 % + 150 µA	
(0.1 to 1) A	(10 to 20) Hz (20 to 45) Hz (45 to 100) Hz (0.1 to 5) kHz (5 to 20) kHz (20 to 50) kHz	0.47 % + 200 µA 0.19 % + 200 µA 0.095 % + 200 µA 0.12 % + 200 µA 0.35 % + 200 µA 1.2 % + 400 µA	

Parameter/Equipment	Range	CMC ^{2, 4, 5} (\pm)	Comments
Power Supplies – Measure ³			
Ripple / Noise RMS - CV Ripple / Noise RMS - CC	Up to 1000 V Up to 50 A	59 μ V/V 59 μ A/A	Tektronix MDO3014 with load
Transient Response: Time Voltage	Up to 5 ms Up to 1 V	12 ms/s 8.3 mV/V	Tektronix MDO3014 with load
Oscilloscopes –			
Amplitude DC Signal: 50 Ω Load 1 M Ω Load	0 V to \pm 6.6 V 0 V to \pm 130 V	1.9 mV/V + 31 μ V 0.39 mV/V + 31 μ V	Fluke 552XA
Amplitude Square Wave 10 Hz to 10 kHz:			
50 Ω Load	1 mV to \pm 6.0 V _{p-p} 10 Hz to 10 kHz	2.1 mV/V + 31 μ V	
1 M Ω Load	1 mV to \pm 200 V _{p-p} 10 Hz to 10 kHz	0.78 mV/V + 31 μ V	
Bandwidth / Level Sine Flatness ³	50 kHz to 100 MHz (100 to 300) MHz (300 to 600) MHz (600 to 1100) MHz	2.9 % 3.1 % 4.1 % 4.7 %	
	(1.1 to 18) GHz (18 to 26.5) GHz	4.0 % 4.1 %	Power meter & sensor with signal generator
Time Marker	1 ns to 20 ms 50 ms to 5 s Non-Cardinal Point	2.5 μ s/s (19 + 38 <i>t</i>) μ s/s 39 μ s/s	Fluke 552XA <i>t</i> = time in seconds
Rise Time – Generate	1 kHz to 2 MHz, (200 to 300) ps	19 ps	
	(2 to 10) MHz, (200 to 350) ps	19 ps	
Resistance	(40 to 60) Ω (0.6 to 1.5) M Ω	0.79 m Ω / Ω 0.79 m Ω / Ω	

Parameter/Range	Frequency	CMC ^{2,4} (±)	Comments
Capacitance – Generate ³			
(0.19 to 1.1) nF	10 Hz to 10 kHz	4.1 pF/nF + 7.8 pF	Fluke 552XA w/ SC1100
(1.1 to 3.3) nF	10 Hz to 3 kHz	4.0 pF/nF + 7.8 pF	
(3.3 to 11) nF	(0.01 to 1) kHz	2.3 pF/nF + 7.8 pF	
(11 to 110) nF	(0.01 to 1) kHz	2.3 pF/nF + 78 pF	
(110 to 330) nF	(0.01 to 1) kHz	2.3 pF/nF + 0.23 nF	
(0.33 to 1.1) μF	(10 to 600) Hz	2.3 nF/μF + 0.78 nF	
(1.1 to 3.29) μF	(10 to 300) Hz	2.3 nF/μF + 2.3 nF	
(3.3 to 11) μF	(10 to 150) Hz	2.3 nF/μF + 7.8 nF	
(11 to 33) μF	(10 to 120) Hz	3.4 nF/μF + 23 nF	
(33 to 110) μF	(10 to 80) Hz	3.7 nF/μF + 78 nF	
(110 to 330) μF	(10 to 50) Hz	3.5 nF/μF + 0.23 μF	
(0.33 to 1.1) mF	(10 to 20) Hz	3.5 μF/mF + 0.78 μF	
(1.1 to 3.3) mF	(0 to 6) Hz	3.5 μF/mF + 2.3 μF	
(3.3 to 11) mF	(0 to 2) Hz	3.5 μF/mF + 7.8 μF	
(11 to 33) mF	(0 to 0.6) Hz	5.8 μF/mF + 23 μF	
(33 to 110) mF	(0 to 0.2) Hz	8.5 μF/mF + 78 μF	

Parameter/Equipment	Range	CMC ² (±)	Comments
Electrical Calibration of Thermocouple Indicators ³ –			
Type B	(600 to 800) °C (800 to 1000) °C (1000 to 1550) °C (1550 to 1820) °C	0.34 °C 0.27 °C 0.24 °C 0.26 °C	Fluke 552XA/SC1100
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 0.39 °C 0.65 °C	
Type E	(-250 to -100) °C (-100 to -25) °C (-25 to 350) °C (350 to 650) °C (650 to 1000) °C	0.39 °C 0.13 °C 0.11 °C 0.13 °C 0.17 °C	
Type J	(-210 to -100) °C (-100 to -30) °C (-30 to 150) °C (150 to 760) °C (760 to 1200) °C	0.25 °C 0.13 °C 0.12 °C 0.14 °C 0.18 °C	
Type K	(-200 to -100) °C (-100 to -25) °C (-25 to 120) °C (120 to 1000) °C (1000 to 1372) °C	0.26 °C 0.14 °C 0.13 °C 0.20 °C 0.31 °C	

Parameter/Equipment	Range	CMC ² (±)	Comments	
Electrical Calibration of Thermocouple Indicators ³ (cont) –				
Type N	(-200 to -100) °C (-100 to -25) °C (-25 to 120) °C (120 to 410) °C (410 to 1300) °C	0.31 °C 0.17 °C 0.15 °C 0.14 °C 0.21 °C	Fluke 552XA/SC1100	
Type R	(0 to 250) °C (250 to 400) °C (400 to 1000) °C (1000 to 1767) °C	0.45 °C 0.28 °C 0.26 °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 0.28 °C 0.29 °C 0.36 °C		
Type T	(-250 to -150) °C (-150 to 0) °C (0 to 120) °C (120 to 400) °C	0.50 °C 0.19 °C 0.13 °C 0.11 °C		
Type U	(-200 to 0) °C (0 to 600) °C	0.57 °C 0.29 °C		
Electrical Calibration of RTDs ³ –				
Pt 385 (100 Ω)	(-200 to -80) °C (-80 to 100) °C (100 to 300) °C (300 to 400) °C (400 to 630) °C (630 to 800) °C	0.085 °C 0.12 °C 0.11 °C 0.097 °C 0.11 °C 0.20 °C		Fluke 552XA/SC 1100
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	0.064 °C 0.076 °C 0.075 °C 0.089 °C 0.095 °C 0.17 °C		
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 0.060 °C 0.068 °C 0.070 °C 0.077 °C 0.084 °C 0.090 °C 0.13 °C 0.19 °C		

Parameter/Equipment	Range	CMC ² (±)	Comments
Electrical Calibration of RTDs ³ – (cont)			
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	0.041 °C 0.043 °C 0.044 °C 0.051 °C 0.098 °C 0.11 °C 0.11 °C 0.13 °C	Fluke 552XA/SC 1100
Pt 385 (500 Ω)	(-200 to -80) °C (-80 to 0) °C (0 to 100) °C (100 to 260) °C (260 to 400) °C (400 to 600) °C (600 to 630) °C	0.036 °C 0.043 °C 0.044 °C 0.051 °C 0.066 °C 0.073 °C 0.088 °C	
Pt 385 (1000 Ω)	(-200 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	0.029 °C 0.036 °C 0.042 °C 0.050 °C 0.18 °C 0.057 °C 0.18 °C	
PtNi 385 (120 Ω)	(-80 to 0) °C (0 to 260) °C	0.081 °C 0.11 °C	
Cu 427 (10 Ω)	(-100 to 260) °C	0.69 °C	

II. Electrical – RF / Microwave

Parameter/Range	Frequency	CMC ^{2, 5, 7} (±)	Comments
RF Power – Measure ³			
1 mW Power Meter Reference	50 MHz	0.26 %	HP 8478B-H84 w/ HP 432A & DMM
(-10 to +20) dBm (-20 to -10) dBm	100 kHz to 4.2 GHz	0.081 dB 0.080 dB	8482A
(-10 to +20) dBm (-20 to -10) dBm	(4.2 to 18) GHz	0.078 dB 0.083 dB	8481A
(-20 to +20) dBm	(18 to 26.5) GHz	0.080 dB	8485A

Parameter/Range	Frequency	CMC ^{2,7} (±)	Comments
RF Power – Generate ³			
(-56 to 27) dBm	DC to 5 MHz (> 5 to 20) MHz	0.19 dB 0.35 dB	Tektronix AFG2021
(16 to 24) dBm	(0.2 to 100) kHz (0.1 to 125) MHz	0.023 dB 0.049 dB	Fluke 96270A w/leveling head
(3 to 16) dBm	(0.2 to 100) kHz (0.1 to 150) MHz (0.25 to 1.4) GHz	0.023 dB 0.050 dB 0.20 dB	
(-7 to 3) dBm	(0.2 to 100) kHz (0.1 to 300) MHz (0.3 to 1.4) GHz (1.4 to 4.0) GHz	0.024 dB 0.052 dB 0.17 dB 0.26 dB	
(-47 to -17) dBm	(0.2 to 100) kHz (0.1 to 300) MHz (0.3 to 1.4) GHz (1.4 to 3.5) GHz (3.5 to 4.0) GHz	0.024 dB 0.052 dB 0.17 dB 0.26 dB 0.41 dB	
(-66 to -47) dBm	(0.1 to 10) MHz (10 to 300) MHz (0.3 to 1.4) GHz (1.4 to 4) GHz	0.16 dB 0.089 dB 0.33 dB 0.44 dB	
(-85 to -66) dBm	(0.1 to 10) MHz (10 to 150) MHz (0.15 to 1.5) GHz (1.5 to 4) GHz	0.40 dB 0.10 dB 0.42 dB 0.80 dB	
(-124 to -85) dBm	(10 to 100) MHz (0.1 to 1.4) GHz	0.62 dB 1.5 dB	

III. Mechanical

Parameter/Equipment	Range	CMC ^{2,5,7} (±)	Comments
Torque ³ – Measuring Equipment	(5 to 50) lbf·in (25 to 400) lbf·in (100 to 1000) lbf·in (20 to 250) lbf·ft	0.30 % 0.29 % 0.29 % 0.29 %	CDI 2000 4 to 1 transducer

IV. Time & Frequency

Parameter/Equipment	Range	CMC ^{2,7} (\pm)	Comments
Frequency ³ – Measuring Equipment	(0.001 to 1000) Hz 1000 Hz to 80 MHz	0.12 mHz/Hz 2.3 μ Hz/Hz	AFG2021 function generator
Frequency ³ – Measure	0.1 Hz to 80 MHz	0.11 μ Hz/Hz	Agilent 53132A counter
Rise/Fall Time – Measure	20 ps to 1 ns	21 ps	83485A (RT = 0.35/BW)
Time Interval – Measure	(25 to 50) ps (50 to 200) ps (75 to 125) ps (200 to 500) ps	10 ps 10 ps 10 ps 13 ps	Agilent 86100A w/83485A

¹ This accreditation covers 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. CMC are expressed as either a specific value that covers the full range or as a fraction/percent 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.

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

TEKTRONIX, INC.

Santa Clara, CA

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 the requirements of ANSI/NC SLI Z540.3-2006 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 27th day of December 2024.

A blue ink signature of Mr. Trace McInturff, written over a horizontal line.

Mr. Trace McInturff, Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 2357.05
Valid to March 31, 2027

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