



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

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CALIBRATION

Valid To: April 30, 2024

Certificate Number: 4828.01

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following calibrations^{1, 7}:

I. Electrical – DC/Low Frequency

Parameter/Equipment	Range	CMC ^{2, 5} ($\pm$)	Comments
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	5.2 μ V/V + 100 nV 3.5 μ V/V + 400 nV 3.5 μ V/V + 4.0 μ V 5.5 μ V/V + 40 μ V 5.5 μ V/V + 500 μ V	Fluke 8508A
DC Voltage ³ – Generate	(0 to 330) mV 330 mV to 3.3 V (3.3 to 33) V (33 to 330) V (330 to 1000) V	16 μ V/V + 1.0 μ V 9.0 μ V/V + 2.0 μ V 9.0 μ V/V + 16 μ V 14 μ V/V + 120 μ V 14 μ V/V + 1.2 mV	Fluke 5520A
DC Current ³ – Measure	Up 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	12 μ A/A + 0.40 nA 12 μ A/A + 4.0 nA 14 μ A/A + 40 nA 48 μ A/A + 0.80 μ A 0.019 % + 16 μ A 0.043 % + 0.40 mA	Fluke 8508A

Parameter/Equipment	Range	CMC ^{2, 5} (±)	Comments
DC Current ³ – Generate	(0 to 330) μ A 330 μ A to 3.3 mA (3.3 to 33) mA (33 to 330) mA 330 mA to 1.1 A (1.1 to 3.0) A (3 to 11) A (11 to 20.5) A	0.012 % + 0.020 μ A 78 μ A/A + 0.040 μ A 78 μ A/A + 0.20 μ A 78 μ A/A + 1.9 μ A 0.016 % + 31 μ A 0.030 % + 31 μ A 0.039 % + 390 μ A 0.079 % + 580 μ A	Fluke 5520A
Clamp On Only	(20 to 50) A (>50 to 1025) A	0.58 % + 0.5 A 0.54 % + 0.5 A	Fluke 5500A coil & Fluke 5520A
DC Resistance ³ – Measure	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	28 $\mu\Omega/\Omega$ + 4.0 $\mu\Omega$ 24 $\mu\Omega/\Omega$ + 14 $\mu\Omega$ 8.0 $\mu\Omega/\Omega$ + 50 $\mu\Omega$ 8.0 $\mu\Omega/\Omega$ + 0.50 m Ω 11 $\mu\Omega/\Omega$ + 5.0 m Ω 12 $\mu\Omega/\Omega$ + 50 m Ω 9.0 $\mu\Omega/\Omega$ + 1.0 Ω 20 $\mu\Omega/\Omega$ + 100 Ω 0.029 % + 10 k Ω 0.15 % + 1.0 M Ω	Fluke 8508A
Electrical Simulation of RTDs ³ –			
Pt 385, 100 Ω	(-200 to 0) $^{\circ}$ C (0 to 100) $^{\circ}$ C (100 to 300) $^{\circ}$ C (300 to 400) $^{\circ}$ C (400 to 630) $^{\circ}$ C (630 to 800) $^{\circ}$ C	0.04 $^{\circ}$ C 0.05 $^{\circ}$ C 0.07 $^{\circ}$ C 0.08 $^{\circ}$ C 0.09 $^{\circ}$ C 0.18 $^{\circ}$ C	Fluke 5520A
Pt 3926, 100 Ω	(-200 to 0) $^{\circ}$ C (0 to 100) $^{\circ}$ C (100 to 300) $^{\circ}$ C (300 to 400) $^{\circ}$ C (400 to 630) $^{\circ}$ C	0.04 $^{\circ}$ C 0.05 $^{\circ}$ C 0.07 $^{\circ}$ C 0.08 $^{\circ}$ C 0.09 $^{\circ}$ C	
Pt 3916, 100 Ω	(-200 to -190) $^{\circ}$ C (-190 to -80) $^{\circ}$ C (-80 to 0) $^{\circ}$ C (0 to 100) $^{\circ}$ C (100 to 260) $^{\circ}$ C (260 to 300) $^{\circ}$ C (300 to 400) $^{\circ}$ C (400 to 600) $^{\circ}$ C (600 to 630) $^{\circ}$ C	0.19 $^{\circ}$ C 0.03 $^{\circ}$ C 0.04 $^{\circ}$ C 0.05 $^{\circ}$ C 0.05 $^{\circ}$ C 0.06 $^{\circ}$ C 0.07 $^{\circ}$ C 0.08 $^{\circ}$ C 0.18 $^{\circ}$ C	

Parameter/Equipment	Range	CMC ^{2, 5} (±)	Comments
DC Resistance ³ – Generate	(0 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 999.99) MΩ	35 μΩ/Ω + 0.0078 Ω 28 μΩ/Ω + 0.012 Ω 36 μΩ/Ω + 0.012 Ω 37 μΩ/Ω + 0.016 Ω 37 μΩ/Ω + 0.016 Ω 22 μΩ/Ω + 0.16 Ω 22 μΩ/Ω + 0.080 Ω 22 μΩ/Ω + 0.78 Ω 22 μΩ/Ω + 0.78 Ω 25 μΩ/Ω + 7.8 Ω 25 μΩ/Ω + 7.8 Ω 47 μΩ/Ω + 120 Ω 0.012 % + 190 Ω 0.020 % + 2.0 kΩ 0.039 % + 2.4 kΩ 0.23 % + 78 kΩ 1.2 % + 400 kΩ	Fluke 5520A
Electrical Simulation of Thermocouples ³ –			
Type E	(-250 to -100) °C (-100 to -25) °C (-25 to 350) °C (350 to 650) °C (650 to 1000) °C	0.45 °C 0.26 °C 0.26 °C 0.26 °C 0.28 °C	Fluke 5520A
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 0.26 °C 0.26 °C 0.27 °C 0.29 °C	
Type K	(-200 to -100) °C (-100 to -25) °C (-25 to 120) °C (120 to 1000) °C (1000 to 1372) °C	0.36 °C 0.27 °C 0.26 °C 0.31 °C 0.39 °C	
Type N	(-200 to -100) °C (-100 to -25) °C (-25 to 120) °C (120 to 140) °C (410 to 1300) °C	0.39 °C 0.29 °C 0.27 °C 0.27 °C 0.31 °C	
Type R	(0 to 250) °C (250 to 400) °C (400 to 1000) °C (1000 to 1767) °C	0.50 °C 0.36 °C 0.37 °C 0.39 °C	

Parameter/Equipment	Range	CMC ² (±)	Comments
Electrical Simulation of Thermocouples ³ – (cont)			
Type S	(0 to 250) °C (250 to 1000) °C (1000 to 1400) °C (1400 to 1767) °C	0.43 °C 0.36 °C 0.37 °C 0.43 °C	Fluke 5520A
Type T	(-250 to -150) °C (-150 to 0) °C (0 to 120) °C (120 to 400) °C	0.55 °C 0.30 °C 0.26 °C 0.26 °C	

Parameter/Range	Frequency	CMC ^{2, 5} (±)	Comments
AC Voltage ³ – Measure			
Up 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	0.031 % + 14 µV 0.030 % + 4.0 µV 0.012 % + 4.0 µV 0.011 % + 2.0 µV 0.014 % + 4.0 µV 0.034 % + 8.0 µV 0.077 % + 20 µV	Fluke 8508A
200 mV 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 (100 to 300) kHz 300 kHz to 1 MHz	0.015 % + 120 µV 0.012 % + 20 µV 90 µV/V + 20 µV 76 µV/V + 20 µV 0.011 % + 20 µV 0.022 % + 40 µV 0.057 % + 200 µV 0.30 % + 2.0 mV 1.0 % + 20 mV	
(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 (100 to 300) kHz 300 kHz to 1 MHz	0.015 % + 1.2 mV 0.012 % + 200 µV 90 µV/V + 200 µV 75 µV/V + 200 µV 0.011 % + 200 µV 0.022 % + 400 µV 0.057 % + 2.0 mV 0.30 % + 20 mV 1.0 % + 200 mV	

Parameter/Range	Frequency	CMC ^{2, 5} (±)	Comments
AC Voltage ³ – Measure (cont)			
(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 (100 to 300) kHz 300 kHz to 1 MHz	0.015 % + 12 mV 0.012 % + 2.0 mV 90 µV/V + 2.0 mV 75 µV/V + 2.0 mV 0.011 % + 2.0 mV 0.022 % + 4.0 mV 0.057 % + 20 mV 0.30 % + 200 mV 1.0 % + 2.0 V	Fluke 8508A
(200 to 1000) V	(1 to 10) Hz (10 to 40) Hz 40 Hz to 10 kHz (10 to 30) kHz (30 to 100) kHz	0.016 % + 70 mV 0.013 % + 20 mV 0.012 % + 20 mV 0.023 % + 40 mV 0.062 % + 200 mV	
AC Voltage ³ – Generate			
(1 to 33) mV	(10 to 45) Hz 45 Hz to 10 kHz (10 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 500) kHz	0.062 % + 5.0 µV 0.012 % + 5.0 µV 0.017 % + 5.0 µV 0.078 % + 5.0 µV 0.27 % + 9.0 µV 0.62 % + 39 µV	Fluke 5520A
(33 to 330) mV	(10 to 45) Hz 45 Hz to 10 kHz (10 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 500) kHz	0.023 % + 6.0 µV 0.013 % + 6.0 µV 0.012 % + 6.0 µV 0.027 % + 6.0 µV 0.062 % + 25 µV 0.16 % + 54 µV	
330 mV to 3.3 V	(10 to 45) Hz 45 Hz to 10 kHz (10 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 500) kHz	0.023 % + 39 µV 0.012 % + 47 µV 0.015 % + 47 µV 0.023 % + 39 µV 0.054 % + 97 µV 0.19 % + 470 µV	
(3.3 to 33) V	(10 to 45) Hz 45 Hz to 10 kHz (10 to 20) kHz (20 to 50) kHz (50 to 100) kHz	0.024 % + 500 µV 0.013 % + 470 µV 0.019 % + 470 µV 0.027 % + 470 µV 0.070 % + 1.2 mV	

Parameter/Range	Frequency	CMC ^{2, 5} (±)	Comments
AC Voltage ³ – Generate (cont)			
(33 to 330) V	45 Hz to 1 kHz (1 to 10) kHz (10 to 20) kHz (20 to 50) kHz (50 to 100) kHz	0.015 % + 1.6 mV 0.016 % + 4.7 mV 0.019 % + 4.7 mV 0.023 % + 4.7 mV 0.16 % + 39 mV	Fluke 5520A
(330 to 1020) V	45 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz	0.023 % + 7.8 mV 0.019 % + 7.8 mV 0.023 % + 7.8 mV	
AC Current ³ – Measure			
Up to 200 µA	(1 to 10) Hz 10 Hz to 10 kHz (10 to 30) kHz (30 to 100) kHz	0.050 % + 20 nA 0.050 % + 20 nA 0.071 % + 20 nA 0.40 % output + 20 nA	Fluke 8508A
200 µA to 2 mA	(1 to 10) Hz 10 Hz to 10 kHz (10 to 30) kHz (30 to 100) kHz	0.032 % + 200 nA 0.031 % + 200 nA 0.076 % + 200 nA 0.40 % output + 200 nA	
(2 to 20) mA	(1 to 10) Hz 10 Hz to 10 kHz (10 to 30) kHz (30 to 100) kHz	0.031 % + 2.0 µA 0.030 % + 2.0 µA 0.074 % + 2.0 µA 0.40 % output + 2.0 µA	
(20 to 200) mA	(1 to 10) Hz 10 Hz to 10 kHz (10 to 30) kHz	0.032 % + 20 µA 0.030 % + 20 µA 0.063 % + 20 µA	
200 mA to 2 A	10 Hz to 2 kHz (2 to 10) kHz (10 to 30) kHz	0.062 % + 200 µA 0.079 % + 200 µA 0.30 % output + 200 µA	
(2 to 20) A	10 Hz to 2 kHz (2 to 10) kHz	0.087 % + 2.0 mA 0.25 % output + 2.0 mA	

Parameter/Range	Frequency	CMC ^{2, 5} (±)	Comments
AC Current ³ – Generate			
(29 to 330) µA	(10 to 20) Hz (20 to 45) Hz 45 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz (10 to 30) kHz	0.23 % output + 0.08 µA 0.21 % output + 0.08 µA 0.20 % output + 0.08 µA 0.29 % output + 0.12 µA 0.64 % output + 0.20 µA 1.3 % output + 0.30 µA	Fluke 5520A
330 µA to 3.3 mA	(10 to 20) Hz (20 to 45) Hz 45 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz (10 to 30) kHz	0.16 % output + 0.12 µA 0.10 % output + 0.12 µA 0.08 % output + 0.12 µA 0.16 % output + 0.20 µA 0.39 % output + 0.20 µA 0.78 % output + 0.50 µA	
(3.3 to 33) mA	(10 to 20) Hz (20 to 45) Hz 45 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz (10 to 30) kHz	0.14 % output + 1.6 µA 0.080 % output + 1.6 µA 0.030 % output + 1.6 µA 0.060 % output + 1.6 µA 0.16 % output + 2.3 µA 0.31 % output + 3.1 µA	
(33 to 330) mA	(10 to 20) Hz (20 to 45) Hz 45 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz (10 to 30) kHz	0.14 % output + 16 µA 0.070 % output + 16 µA 0.030 % output + 16 µA 0.08 % output + 39 µA 0.16 % output + 78 µA 0.31 % output + 160 µA	
330 mA to 1.1 A	(10 to 45) Hz 45 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz	0.14 % output + 78 µA 0.040 % output + 78 µA 0.47 % output + 0.78 mA 1.9 % output + 4.0 mA	

Parameter/Range	Frequency	CMC ^{2, 5} (±)	Comments
AC Current ³ – Generate (cont)			
(1.1 to 3) A	(10 to 45) Hz 45 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz	0.14 % output + 78 µA 0.050 % output + 78 µA 0.47 % output + 0.78 mA 1.9 % output + 4.0 mA	Fluke 5520A
(3 to 11) A	(45 to 100) Hz 100 Hz to 1 kHz (1 to 5) kHz	0.050 % output + 1.6 mA 0.080 % output + 1.6 mA 2.3 % output + 1.6 mA	
(11 to 20.5) A	(45 to 100) Hz 100 Hz to 1 kHz (1 to 5) kHz	0.090 % output + 4.0 mA 0.12 % output + 4.0 mA 2.3 % output + 4.0 mA	
(20.5 to 150) A	(45 to 65) Hz (65 to 440) Hz	0.6 % output + 0.25 A 1.0 % output + 0.25 A	
(150 to 1025) A	(45 to 65) Hz (65 to 440) Hz	0.6 % output + 0.90 A 1.0 % output + 0.90 A	
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) µF (1.1 to 3.299 99) µF (3.3 to 10.9999) µF (11 to 32.9999) µF (33 to 109.999) µF (110 to 329.999) µF 0.33 µF 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	0.57 % + 0.008 nF 0.57 % + 0.008 nF 0.39 % + 0.008 nF 0.19 % + 0.008 nF 0.19 % + 0.008 nF 0.19 % + 0.008 nF 0.19 % + 0.23 nF 0.19 % + 0.8 nF 0.19 % + 2.3 nF 0.19 % + 7.8 nF 0.31 % + 23 nF 0.35 % + 78 nF 0.35 % + 230 nF 0.35 % + 0.8 µF 0.35 % + 2 µF 0.35 % + 8 µF 0.58 % + 23 µF 0.85 % + 78 µF	Fluke 5520A

II. Mechanical

Parameter/Equipment	Range	CMC ^{2, 4, 6} ($\pm$)	Comments
Pressure ³ – Measuring Equipment	(Up to 100) psia (>100 to 300) psia (>300 to 1000) psia	0.04 psia 0.14 psia 0.17 psia	Fluke PPC4 pressure module
Scales & Balances ³	>100 mg to 20 g (>20 to 250) g >250 g to 1 kg (>1 to 3) kg (>3 to 10) kg (>10 to 20) kg (>20 to 24) kg	0.03 mg + 0.6R 0.11 mg + 0.6R 0.70 mg + 0.6R 2.0 mg + 0.6R 4.4 mg + 0.6R 16 mg + 0.6R 26 mg + 0.6R	Class 1 weights

III. Thermodynamics

Parameter/Equipment	Range	CMC ^{2, 4, 6} ($\pm$)	Comments
Humidity ³ – Measuring Equipment	(10 to 20) % RH (>20 to 50) % RH (>50 to 95) % RH	0.13 % RH + 0.6R 0.36 % RH + 0.6R 0.76 % RH + 0.6R	Thunder Scientific 2500
Humidity ³ – Measure	(10 to 35) % RH (35 to 50) % RH (50 to 95) % RH	0.51 % RH 0.47 % RH 0.88 % RH	Rotronics HC2A-3
Temperature ³ – Measure	-197 °C (-38 to 0) °C (0 to 231) °C (231 to 420) °C	3 mK 2 mK 4.5 mK 6.4 mK	SPRT
Temperature – Measuring Equipment ³	(-90 to 140) °C	0.06 °C + 0.6R	SPRT, Fluke Superthermometer readout & dry block

IV. Time & Frequency

Parameter/Equipment	Range	CMC ^{2, 6} ($\pm$)	Comments
Frequency – Measure	(1 to 225) MHz	4.3 μ Hz/Hz	Frequency counter Agilent 53131A
Frequency – Measuring Equipment	0.01 Hz to 2 MHz	2 μ Hz/Hz + 3.9 μ Hz	Fluke 5520A

¹ This laboratory offers commercial and field calibration service.

² Calibration and Measurement Capability (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. Calibration and Measurement Capabilities 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 Calibration and Measurement Capability, R represents the numerical value of the resolution of the device. In the statement of CMC, percentages are to be read as percent of reading, unless otherwise noted. Percent "FS" represents percent of "Full Scale."

⁵ The stated measure values are determined using the indicated instruments (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

Evolution Scientific, Inc

Doylestown, PA

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 1st day of February 2022.

A blue ink signature of Trace MacInturff, Vice President of Accreditation Services, written over a horizontal line.

Mr. Trace MacInturff Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 4828.01
Valid to April 30, 2024
Revised March 20, 2024

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