



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

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CALIBRATION

Valid To: April 30, 2023

Certificate Number: 2551.01

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. Chemical

Parameter/Equipment	Range	CMC ² (±)	Comments
pH – Fixed Points ³	4.000 pH 7.000 pH 10.000 pH	0.01 pH 0.02 pH 0.04 pH	pH buffer standards
Conductivity ³	10 µS 100 µS 1000 µS 1413 µS 10 000 µS	0.65 µS 2.2 µS 23 µS 32 µS 230 µS	Conductivity standards

II. Dimensional

Parameter/Equipment	Range	CMC ² (±)	Comments
Micrometers ³	Up to 4 in (4 to 24) in	7 µin + 11 µin/in 48 µin + 12 µin/in	Gage blocks

Parameter/Equipment	Range	CMC ^{2,4} (±)	Comments
Calipers ³	Up to 4 in (4 to 24) in	420 μin + 1 μin/in 320 μin + 6 μin/in	Gage blocks
Gage Blocks	Up to 0.05 in (0.05 to 0.10) in (0.10 to 0.20) in (0.20 to 0.50) in (0.5 to 1.00) in (1.00 to 2.00) in (2.00 to 4.00) in	11 μin 11 μin 11 μin + 2 μin/in 11 μin + 7 μin/in 13 μin + 6 μin/in 16 μin + 6 μin/in 22 μin + 11 μin/in	Pratt & Whitney Labmaster™
Rulers	Up to 12 in	530 μin	Glass scale
Dial Indicators	Up to 1 in	(31 + 9L) μin	Gage blocks

III. Electrical – DC/Low Frequency

Parameter/Equipment	Range	CMC ^{2, 4, 6} (±)	Comments
DC Voltage – Generate	(0 to 330) mV (0 to 3.3) V (0 to 33) V (0 to 330) V (100 to 1000) V	18 μV/V + 1 μV 14 μV/V + 2.0 μV 15 μV/V + 20 μV 21 μV/V + 150 μV 15 μV/V + 1.5 mV	Fluke 5520A
DC Voltage – Measure	(0 to 200) mV (0.2 to 2) V (2 to 20) V (20 to 200) V (200 to 1000) V	4.4 μV/V + 1 μV 4.1 μV/V + 0.4 μV 5.0 μV/V + 4 μV 6.4 μV/V + 40 μV 4.6 μV/V + 500 μV	Fluke 8508A
DC High Voltage – Measure	(1 to 20) kV (20 to 25) kV	2.3 % 1.2 %	Fluke 80K-40 with Fluke 8508A
DC Clamp-On – Generate	(20 to 150) A (150 to 100) A	0.66 % + 0.14 A 0.43 % + 0.5 A	Fluke 5520A/Fluke 50A coil

Parameter/Equipment	Range	CMC ^{2,6} (±)	Comments
DC Current – Generate	(0 to 330) μ A (0.33 to 3.3) mA (3.3 to 33) mA (33 to 330) mA (0.33 to 3) A (3 to 11) A (11 to 20.5) A	0.012 % + 0.02 μ A 0.35 % + 0.05 μ A 0.35 % + 0.25 μ A 0.35 % + 2.5 μ A 0.39 % + 40 μ A 1.1 % + 500 μ A 0.30 % + 750 μ A	Fluke 5520A
DC Current – Measure	(0 to 200) μ A (0.2 to 2) mA (2 to 20) mA (20 to 200) mA (0.2 to 2) A (2 to 20) A	570 pA + 20 pA/ μ A 5 nA + 17 nA/mA 71 nA + 20 nA/mA 2.1 μ A + 69 nA/mA 37 μ A + 230 μ A/A 820 μ A + 500 μ A/A	Fluke 8508A
Resistance – Generate	(0 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 to 1100) M Ω	34 $\mu\Omega/\Omega$ + 0.01 Ω 24 $\mu\Omega/\Omega$ + 0.015 Ω 23 $\mu\Omega/\Omega$ + 0.015 Ω 23 $\mu\Omega/\Omega$ + 0.02 Ω 21 $\mu\Omega/\Omega$ + 0.02 Ω 22 $\mu\Omega/\Omega$ + 0.2 Ω 23 $\mu\Omega/\Omega$ + 0.1 Ω 24 $\mu\Omega/\Omega$ + 1 Ω 24 $\mu\Omega/\Omega$ + 1 Ω 46 $\mu\Omega/\Omega$ + 10 Ω 24 $\mu\Omega/\Omega$ + 10 Ω 44 $\mu\Omega/\Omega$ + 150 Ω 0.011 % + 250 Ω 0.021 % + 2.5 k Ω 0.048 % + 3 k Ω 0.24 % + 100 k Ω 1.2 % + 500 k Ω	Fluke 5520A
Resistance – Generate, Fixed Points	25 Ω 75 Ω 100 Ω 200 Ω 400 Ω	0.000 18 Ω 0.0014 Ω 0.000 71 Ω 0.0014 Ω 0.0028 Ω	M.I. 5420-25 IET SRX-75 M.I. 5420-100 M.I. 5420-200 M.I. 5420-400
Resistance – Measure	(0 to 2) Ω (2 to 20) Ω (20 to 200) Ω (0.2 to 2) k Ω (2 to 20) k Ω (20 to 200) k Ω (0.2 to 2) M Ω (2 to 20) M Ω (20 to 200) M Ω (0.2 to 2) G Ω	8 $\mu\Omega$ + 17 $\mu\Omega/\Omega$ 58 $\mu\Omega$ + 8 $\mu\Omega/\Omega$ 190 $\mu\Omega$ + 8 $\mu\Omega/\Omega$ 1.4 m Ω + 8 $\mu\Omega/\Omega$ 14 m Ω + 8 $\mu\Omega/\Omega$ 0.13 Ω + 8 $\mu\Omega/\Omega$ 1.9 Ω + 10 $\mu\Omega/\Omega$ 130 Ω + 21 $\mu\Omega/\Omega$ 12 k Ω + 120 $\mu\Omega/\Omega$ 1.2 M Ω + 1.4 m Ω/Ω	Fluke 8508A

Parameter/Equipment	Range	CMC ² (±)	Comments
Electrical Simulation of Thermocouple Indicators & Indicating Systems –			
Type E	(-250 to -100) °C (-100 to -25) °C (-25 to 350) °C (350 to 650) °C (650 to 1000) °C	0.40 °C 0.19 °C 0.17 °C 0.20 °C 0.54 °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	0.24 °C 0.18 °C 0.17 °C 0.18 °C 0.58 °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 0.21 °C 0.18 °C 0.23 °C 0.57 °C	
Type T	(-250 to -150) °C (-150 to 0) °C (0 to 120) °C (120 to 400) °C	0.51 °C 0.23 °C 0.19 °C 0.18 °C	

Parameter/Range	Frequency	CMC ^{2,6} (±)	Comments
AC Voltage – 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	0.063 % + 6 μV 0.016 % + 6 μV 0.019 % + 6 μV 0.08 % + 6 μV 0.28 % + 12 μV 0.63 % + 50 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	0.037 % + 8 μV 0.012 % + 8 μV 0.013 % + 8 μV 0.028 % + 8 μV 0.063 % + 32 μV 0.16 % + 70 μV	

Parameter/Range	Frequency	CMC ^{2,6} (±)	Comments
AC Voltage – Generate (cont)			
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	0.024 % + 50 µV 0.012 % + 60 µV 0.015 % + 60 µV 0.024 % + 50 µV 0.055 % + 130 µV 0.19 % + 600 µV	Fluke 5520A
(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 % + 650 µV 0.012 % + 600 µV 0.019 % + 600 µV 0.028 % + 600 µV 0.07 % + 1.6 mV	
(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	0.016 % + 2 mV 0.016 % + 6 mV 0.02 % + 6 mV 0.025 % + 6 mV 0.16 % + 50 mV	
(330 to 1020) V	45 Hz to 1 kHz (1 to 5) kHz	0.024 % + 0.13 mV 0.02 % + 10 mV	
AC Voltage – Measure			
(0 to 200) mV	(1 to 10) Hz (10 to 40) Hz (40 to 100) Hz (0.1 to 2) kHz (2 to 10) kHz (10 to 30) kHz	160 nV/mV + 14 µV 0.014 % + 4 µV 93 µV/V + 4 µV 0.011 % + 2 µV 0.012 % + 4 µV 0.028 % + 8 µV	Fluke 8508A
(0.2 to 2) V	(1 to 10) Hz (10 to 40) Hz (40 to 100) Hz (0.1 to 2) kHz (2 to 10) kHz (10 to 30) kHz (30 to 100) kHz	150 µV/V + 150 µV 0.01 % + 20 µV 83 µV/V + 20 µV 63 µV/V + 20 µV 90 µV/V + 20 µV 0.019 % + 40 µV 0.047 % + 200 µV	

Parameter/Range	Frequency	CMC ^{2,4,6} (±)	Comments
AC Voltage – Measure (cont)			
(2 to 20) V	(1 to 10) Hz (10 to 40) Hz (40 to 100) Hz (0.1 to 2) kHz (2 to 10) kHz (10 to 30) kHz (30 to 100) kHz (100 to 300) kHz	160 μV/V + 290 μV 95 μV/V + 200 μV 74 μV/V + 200 μV 64 μV/V + 200 μV 89 μV/V + 200 μV 0.018 % + 400 μV 0.045 % + 2 mV 0.24 % + 20 mV	Fluke 8508A
(20 to 200) V	(1 to 10) Hz (10 to 40) Hz (40 to 100) Hz (0.1 to 2) kHz (2 to 10) kHz (10 to 30) kHz (30 to 100) kHz	160 μV/V + 12 mV 95 μV/V + 2 mV 73 μV/V + 2 mV 62 μV/V + 2 mV 88 μV/V + 2 mV 0.018 % + 4 mV 0.046 % + 20 mV	
(200 to 1000) V	(10 to 40) Hz 40 Hz to 10 kHz	0.01 % + 20 mV 93 μV/V + 20 mV	
AC High Voltage – Measure			
(1 to 5) kV	60 Hz	5.8 %	Fluke 80K-40 with Fluke 8508A
AC Current – Generate			
(30 to 330) μA	(10 to 45) Hz 45 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz (10 to 30) kHz	0.12 % + 0.1 μA 0.10 % + 0.1 μA 0.23 % + 0.15 μA 0.62 % + 0.2 μA 1.3 % + 0.4 μA	Fluke 5520A
(0.33 to 3.3) mA	(10 to 45) Hz 45 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz (10 to 30) kHz	0.12 % + 0.4 μA 0.08 % + 0.15 μA 0.16 % + 0.2 μA 0.39 % + 0.3 μA 0.78 % + 0.6 μA	
(3.3 to 33) mA	(10 to 45) Hz 45 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz (10 to 30) kHz	0.07 % + 2 μA 0.03 % + 2 μA 0.06 % + 2 μA 0.16 % + 3 μA 0.32 % + 4 μA	

Parameter/Range	Frequency	CMC ^{2, 6} (±)	Comments
AC Current – Generate (cont)			
(33 to 330) mA	(10 to 45) Hz 45 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz	0.07 % + 20 µA 0.03 % + 20 µA 0.08 % + 50 µA 0.2 % + 100 µA	Fluke 5520A
(0.33 to 1.1) A	(10 to 45) Hz 45 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz	0.13 % + 100 µA 0.04 % + 100 µA 0.42 % + 1 mA 1.8 % + 5 mA	
(1.1 to 3) A	(10 to 45) Hz 45 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz	0.14 % + 10 mA 0.05 % + 10 mA 0.47 % + 1 mA 2 % + 5 mA	
(3 to 11) A	(45 to 100) Hz 100 Hz to 1 kHz (1 to 5) kHz	0.05 % + 2 mA 0.08 % + 2 mA 2.4 % + 2 mA	
(11 to 20.5) A	(45 to 100) Hz (0.1 to 1) kHz (1 to 5) kHz	0.1 % + 5 mA 0.12 % + 5 mA 2.4 % + 5 mA	
Clamp-On Meters – Generate			
Toroidal			
(20 to 150) A	(45 to 65) Hz (65 to 440) Hz	0.48 % + 0.025 A 0.76 % + 0.027 A	Fluke 5520A & Fluke 50 turn coil
(150 to 1000) A	(45 to 65) Hz (65 to 440) Hz	0.24 % + 0.09 A 0.98 % + 0.1 A	
Non-Toroidal			
(20 to 150) A	(45 to 65) Hz (65 to 440) Hz	0.61 % + 0.25 A 0.89 % + 0.25 A	
(150 to 1000) A	(45 to 65) Hz (65 to 440) Hz	0.45 % + 0.9 A 1.1 % + 0.9 A	

Parameter/Range	Frequency	CMC ^{2,6} (±)	Comments
AC Current – Measure			
(0 to 200) μA	(1 to 10) Hz (0.010 to 10) kHz (10 to 30) kHz (30 to 100) kHz	0.02 % + 0.02 μA 0.03 % + 0.02 μA 0.06 % + 0.02 μA 0.31 % + 0.02 μA	Fluke 8508A
(0.2 to 2) mA	(1 to 10) Hz (0.010 to 10) kHz (10 to 30) kHz (30 to 100) kHz	0.02 % + 0.2 μA 0.02 % + 0.2 μA 0.06 % + 0.2 μA 0.31 % + 0.2 μA	
(2 to 20) mA	(1 to 10) Hz (0.010 to 10) kHz (10 to 30) kHz (30 to 100) kHz	0.03 % + 2 μA 0.03 % + 2 μA 0.06 % + 2 μA 0.31 % + 2 μA	
(20 to 200) mA	(1 to 10) Hz (0.010 to 10) kHz (10 to 30) kHz	0.02 % + 20 μA 0.02 % + 20 μA 0.05 % + 20 μA	
(0.2 to 2) A	10 Hz to 2 kHz (2 to 10) kHz (10 to 30) kHz	0.05 % + 200 μA 0.06 % + 200 μA 0.23 % + 200 μA	
(2 to 20) A	10 Hz to 2 kHz (2 to 10) kHz	0.06 % + 2 mA 0.19 % + 2 mA	
Oscilloscope –			
Amplitude – DC Signal			Fluke 5522A/ SC1100
50 Ω Load	(0 to 6.6) V	33 μV + 2 mV/V	
1 MΩ Load	(0 to 130) V	33 μV + 390 μV/V	
Amplitude – Square Wave			
50 Ω Load	1 mV to 6.6 Vp-p 10 Hz to 10 kHz	40 μV + 2 mV/V	
1 MΩ Load	1 mV to 130 Vp-p 10 Hz to 1 kHz	190 μV + 780 μV/V	
	1 mV to 130 Vp-p (1 to 10) kHz	230 μV + 1.9 mV/V	

Parameter/Range	Frequency	CMC ^{2,6} (±)	Comments
Oscilloscope – (cont)			
Edge into 50 Ω	(200 to 300) ps 1 kHz to 2 MHz	82 ps	Fluke 5522A/ SC1100
	(200 to 350) ps (2 to 10) MHz	82 ps	
Bandwidth into 50 Ω 5 mV to 5.5 V	50 kHz (Reference)	330 μV + 17 mV/V	
	50 kHz to 100 MHz	400 μV + 31 mV/V	
	(100 to 300) MHz	420 μV + 36 mV/V	
	(300 to 600) MHz	520 μV + 57 mV/V	
4 mV to 3.5 V	(600 to 1100) MHz	580 μV + 67 mV/V	
Time Marker into 50 Ω	2 ns to 20 ms 50 ms to 5 s	0.000 52 % 0.000 63 % x T x 0.1 %	T = time in seconds

IV. Fluid Quantities

Parameter/Equipment	Range	CMC ^{2,4,5} (±)	Comments
Gas Flow – Measuring Equipment	10 sccm to 200 SLPM	0.25 %	Molbox™1+ /Molbloc™-L
	(200 to 2000) SLPM	0.25 %	Molbox™1+ /Molbloc™-S
Volume – Calibration of Pipettes, Fixed Points ³	0.1 μL 0.5 μL 1 μL 2 μL 5 μL 10 μL 20 μL 50 μL 100 μL 200 μL 500 μL 1000 μL 2000 μL 5000 μL 10 000 μL	0.03 μL 0.03 μL 0.03 μL 0.03 μL 0.04 μL 0.04 μL 0.05 μL 0.11 μL 0.2 μL 0.4 μL 1 μL 2 μL 4 μL 10 μL 20 μL	Gravimetric method

Parameter/Equipment	Range	CMC ^{2,4,5} (±)	Comments
Gas Concentration ³ –			
O ₂	(0 to 20) % O ₂	0.82 % + 0.01 % / %	Extech SDL 150 oxygen meter
CO ₂	(0 to 20) % CO ₂	0.37 % + 0.03 % / % CO ₂	Vaisala MI70 w/GMP70
Gas Detection Equipment –			
O ₂	(0 to 20) % O ₂	2.3 %	Certified gas
CO ₂	(0 to 20) % CO ₂	2.3 %	

V. Mechanical

Parameter/Equipment	Range	CMC ² (±)	Comments
Calibration of Mass Standards – Fixed points	0.001 g 0.002 g 0.003 g 0.005 g 0.010 g 0.020 g 0.030 g 0.050 g 0.10 g 0.20 g 0.30 g 0.50 g 1.0 g 2.0 g 5.0 g 10 g 20 g 30 g	3.8 µg 3.8 µg 5.5 µg 3.8 µg 3.8 µg 3.8 µg 5.5 µg 3.8 µg 3.8 µg 5.5 µg 3.8 µg 1.2 µg 13 µg 14 µg 14 µg 23 µg 31 µg 34 µg	Mass measurement by appropriate mass comparator method (ABBA Sw, ABA, modified ABA, etc.)

Parameter/Equipment	Range	CMC ² (±)	Comments
Calibration of Mass Standard – Fixed points (cont)	50 g 100 g 200 g 300 g 500 g 1000 g 2000 g 3000 g 5000 g 10 kg 20 kg 25 kg 30 kg	46 µg 95 µg 0.19 mg 0.30 mg 0.45 mg 0.92 mg 1.9 mg 11 mg 11 mg 14 mg 27 mg 31 mg 35 mg	Mass measurement by appropriate mass comparator method (ABBA Sw, ABA, modified ABA, etc.)
Calibration of Weighing Standards ³ – Fixed Points	0.001 g 0.002 g 0.005 g 0.010 g 0.020 g 0.050 g 0.10 g 0.20 g 0.50 g 1.0 g 2.0 g 5.0 g 10 g 20 g 50 g 100 g 200 g 500 g 1000 g 2000 g 5000 g 10 000 g 20 000 g	6.4 µg 7.7 µg 8.8 µg 7.6 µg 6.7 µg 7.9 µg 8.8 µg 6.9 µg 5.8 µg 24 µg 23 µg 33 µg 31 µg 36 µg 63 µg 0.18 mg 0.26 mg 0.64 mg 1.6 mg 12 mg 14 mg 31 mg 39 mg	Balance & scale field calibration using Class 1 & Class 3 weights

Parameter/Equipment	Range	CMC ^{2,4,6} (±)	Comments
Pneumatic Pressure – Measuring Equipment	(0 to 1) inH ₂ O	0.0003 inH ₂ O	Fluke 7250LP Mensor CPC6000
	(0 to 3) inH ₂ O	0.0004 inH ₂ O	
	(0 to 10) inH ₂ O	0.0005 inH ₂ O	
	(0 to 30) inH ₂ O	0.0015 inH ₂ O	
	(-15 to 65) psig (65 to 145) psig	0.004 psi 0.038 %	
Hydraulic Gage Pressure – Measuring Equipment	(-15 to 242) psig (242 to 500) psig	0.015 psi 0.012 %	580DX dead weight tester
	(0 to 8.75) psia (8.75 to 17.5) psia	0.0006 psia 0.016 %	
	(0 to 17.5) psia (17.5 to 35) psia	0.0017 psia 0.036 %	
	(8.75 to 17.5) psia	0.013 %	
Pressure – Measuring Equipment	(50 to 10 000) psig	0.02 %	Fluke 700P00 Fluke 700P01 Fluke 700P04 Fluke 700PD7 Fluke 700P31
	(0 to 1) inH ₂ O	0.35 %	
	(0 to 10) inH ₂ O	0.35 %	
	(0 to 15) psi	0.08 %	
	(-15 to 200) psi (50 to 10 000) psi	0.10 % 0.09 %	
Vacuum – Measuring Equipment	(0 to 1000) mTorr	9 %	MKS PVS6
	(1 to 1000) Torr	7 %	
Torque Wrenches	(5 to 50) ozf·in	0.63 %	CDI torque calibration system
	(15 to 200) ozf·in	0.53 %	
	(4 to 50) lbf·in	0.3 %	
	(30 to 400) lbf·in	0.3 %	
	(80 to 1000) lbf·in	0.33 %	
	(20 to 250) lbf·ft	0.3 %	
	(0.3 to 44) lbf·in	0.33 lbf·in	
	(2 to 440) lbf·in	2.9 lbf·in	
	(3 to 362) lbf·ft	2.4 lbf·ft	
	(60 to 600) lbf·ft	0.31 %	
Torque Transducers	(0.026 to 250) lbf·ft	0.12 %	Torque arms, wheels, & standard weights

VI. Thermodynamics

Parameter/Equipment	Range	CMC ^{2,6} (±)	Comments
Relative Humidity – Measuring Equipment (0 to 70) °C	(10 to 90) % RH	1 % RH	Thunder Scientific 2500ST-LT
Relative Humidity – Measure ³	(10 to 90) % RH	1.7 % RH	Vaisala MI70 & HMP77
Temperature – Measure ³	(-196 to 660) °C (660 to 1200) °C	0.0025 °C + 0.000 021 °C/°C 1.1 °C + 0.004 °C/°C	Fluke 5699 SPRT Type “S” thermocouple
Temperature – Measuring Equipment, Fixed Points Liquid Nitrogen Mercury Triple Point Water Indium Tin Zinc Aluminum	-195.8 °C -38.8344 °C 0.010 °C 156.5985 °C 231.928 °C 419.527 °C 660.323 °C	3.4 mK 2.6 mK 2.3 mK 3 mK 3.2 mK 3.5 mK 5.3 mK	Fluke miniature fixed reference point cells, SPRT
Temperature – Measuring Equipment	(-90 to -80) °C (-80 to -5) °C (-5 to 110) °C (110 to 180) °C (180 to 550) °C (550 to 660) °C (660 to 1200) °C	0.038 °C 0.015 °C 0.011 °C 0.017 °C + 0.000 059 °C/°C 0.016 °C + 0.000 055 °C/°C 0.12 °C 1.2 °C + 0.0039 °C/°C	Fluke 5628 PRT, calibration baths & furnaces Type “S” thermocouple, calibration furnace
Dew Point – Measuring Equipment	(-95 to -90) °C (-90 to -80) °C (-80 to -70) °C (-70 to 10) °C (10 to 60) °C	0.93 °C 0.56 °C 0.54 °C 0.94 °C 0.44 °C	Thunder Scientific 3900 humidity generator Thunder Scientific 2500ST-LT

VII. Time & Frequency

Parameter/Equipment	Range	CMC ^{2, 4, 6} (\pm)	Comments
Frequency – Measure	0.1 Hz to 10 MHz	10 parts in 10^9 Hz	Fluke 910 w/ frequency counter
Frequency – Measuring Equipment	(0.01 to 225) MHz	10 parts in 10^9 Hz	Fluke 910 w/ function generator
Rotational Speed – Optical ³ – Measuring Equipment	(2.5 to 100 000) RPM	0.0003 RPM + 0.000 038 RPM/RPM	Fluke 5522A
RPM – Measure ³	(2.5 to 100 000) RPM	1.1 RPM + 0.0058 RPM/RPM	Tachometer
Stopwatches & Timer ³	Up to 86 400 s	0.0012 %	Frequency counter, Fluke 910R

¹ This laboratory offers commercial 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 measured displacement in inches; a percent refers to percent of reading unless otherwise noted.

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. CMCs 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

TRESCAL, INC.

Lansdale, 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 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 28th day of September 2021.

A blue ink signature of the Vice President of Accreditation Services.

Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 2551.01
Valid to April 30, 2023
Revised January 3, 2022

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