



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

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CALIBRATION

Valid To: *SEE FOOTER 9*

Certificate Number: 3601.01

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. Dimensional

Parameter/Equipment	Range	CMC ² (±)	Comments	Location ⁹
Micrometers –	Up to 12 in	80 µin	Grade 0 gage blocks	HAR
	(12 to 40) in	590 µin		
Supermicrometer	Up to 1 in	13 µin	Grade 00 gage blocks	HAR
Calipers	Up to 40 in	300 µin	Grade 0 gage blocks	HAR
	(40 to 80) in	590 µin		
Length & Travel Indicators	Up to 1 in	26 µin	P&W Model C Supermic™	HAR
	Up to 6 in	480 µin	Grade 0 gage blocks & granite surface plate	
Height Gages	Up to 24 in	670 µin	Grade 0 gage blocks & Starrett granite surface plate	HAR

Parameter/Equipment	Range	CMC ² (±)	Comments	Location ⁹
Micrometer Standards	Up to 10 in (10 to 40) in	35 µin 82 µin	P&W Model C Supermic™ & grade 0 gage blocks	HAR
Parallels, Straight Edges, 1-2-3 Blocks – Parallel & Straight Length, Width, Height	Up to 40 in Up to 40 in	45 µin 45 µin	Amplifier, gage probe & surface plate P&W Model C Supermic™ & grade 0 gage blocks	HAR
Precision Levels – Bubble Levels Inclinometers, Digital Protractors	Up to 15 in Up to 180 °	100 µin 0.94 sec of arc	Precision height gage Sine plate & gage blocks	HAR HAR
Sine Plates & Sine Bars – Angle Parallelism	Up to 12 in Up to 12 in	40 µin 60 µin	Master gage blocks, master angle blocks, surface plate, amplifier with gage head	HAR
Angle Blocks	Up to 45 °	0.66 sec of arc	Sine plate, gage blocks & electronic indicator	HAR

Parameter/Equipment	Range	CMC ^{2,4} (±)	Comments	Location ⁹
Surface Plates ³ –				
Flatness	(12 to 102) in diagonal	$(10\sqrt{DL}) \mu\text{in}$	Electronic level system	HAR
Repeatability	(0.000 02 to 0.002) in	31 μin	Repeat-o-meter	HAR
Threaded Plug Gages –				
Major Diameter	Up to 12 in	60 μin	Universal length measuring machine	HAR
Simple Pitch Diameter	Up to 80 TPI	60 μin	ULM & 3-wire method	
Thread Wires –				
Working	(4 to 80) TPI	20 μin	Universal length measuring machine	HAR

II. Electrical DC/Low Frequency

Parameter/Equipment	Range	CMC ^{2,6} (±)	Comments	Location ⁹
DC Voltage – Generate ³	Up to 330 mV (0.33 to 3.3) V (3.3 to 33) V (33 to 330) V (330 to 1020) V	2.4 μV/V + 3 μV 2.1 μV/V + 5 μV 4.5 μV/V + 50 μV 5.5 μV/V + 500 μV 16 μV/V + 1500 μV	Fluke 5502A	HAR
DC Current – Generate ³	Up to 330 μA (0.33 to 33) mA (3.3 to 33) mA (33 to 330) mA (0.33 to 1.1) A (1.1 to 3) A (3 to 11) A (11 to 20.5) A (10 to 16.5) A (16.5 to 150) A (150 to 1025) A	0.017 % + 0.07 μA 0.002 % + 0.45 μA 0.016 % + 3.6 μA 0.022 % + 36 μA 0.002 % + 44 μA 0.11 % + 1.2 mA 0.08 % + 7.5 mA 2 % + 200 mA 0.25 % + 2 mA 0.26 % + 15 mA 0.28 % + 50 mA	Fluke 5502A Fluke 5502A, 50 turn coil	HAR HAR
DC Voltage – Measure ³	Up to 200 mV Up to 2 V Up to 20 V Up to 200 V Up to 1000 V (1 to 40) kV (5 to 100) kV	0.65 μV/V + 2.0 μV 3.5 μV/V + 0.3 μV 7.7 μV/V + 0.05 μV 27 μV/V + 5.0 μV 300 μV/V + 25 μV 0.034 kV 0.011 kV	Fluke 8588A HP 34401A w/80K-40 high voltage probe Haefely- Hipotronics KVM100-W	HAR HAR HAR
DC Current – Measure ³	Up to 10 μA Up to 100 μA Up to 2 mA Up to 20 mA Up to 200 mA Up to 2 A Up to 20 A	52 μA + 103 μA 0.012 % + 0.01 μA 48 μA/A + 0.04 μA 80 μA/A + 0.20 μA 120 μA/A + 1.8 μA 0.070 % + 51 μA 0.12 % + 370 μA	Fluke 8588A	HAR

Parameter/Range	Frequency	CMC ^{2,6} (±)	Comments	Location ⁹
AC Voltage – Generate ³				
Up 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	0.15 % + 20 µV 0.10 % + 20 µV 0.15 % + 20 µV 0.20 % + 20 µV 0.4 % + 33 µV 1.2 % + 60 µV	Fluke 5502A	HAR
(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	0.055 % + 20 µV 0.033 % + 20 µV 0.073 % + 20 µV 0.10 % + 40 µV 0.23 % + 170 µV 0.50 % + 330 µV		
(0.33 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	0.055 % + 60 µV 0.11 % + 60 µV 0.07 % + 60 µV 0.06 % + 60 µV 0.15 % + 0.2 mV 0.50 % + 0.9 mV		
(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	0.017 % + 0.8 mV 0.058 % + 0.6 mV 0.088 % + 0.6 mV 0.10 % + 0.6 mV 0.23 % + 0.2 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	0.052 % + 3 mV 0.091 % + 9 mV 0.10 % + 9 mV 0.12 % + 9 mV 0.24 % + 80 mV		
(330 to 1020) V	45 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz	0.051 % + 20 mV 0.08 % + 20 mV 0.09 % + 20 mV		

Parameter/Range	Frequency	CMC ^{2,6} (±)	Comments	Location ⁹
AC Current – Generate ³				
Up 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 % + 0.1 µA 0.25 % + 0.1 µA 0.24 % + 0.1 µA 0.36 % + 0.15 µA 0.85 % + 0.2 µA 1.6 % + 0.4 µA	Fluke 5502A with LCOMP off	HAR
(0.33 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	0.29 % + 0.15 µA 0.24 % + 0.15 µA 0.22 % + 0.15 µA 0.28 % + 0.2 µA 0.58 % + 0.3 µA 1.0 % + 0.6 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	0.18 % + 2 µA 0.09 % + 2 µA 0.05 % + 2 µA 0.08 % + 2 µA 0.20 % + 3 µA 0.42 % + 4 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	0.18 % + 20 µA 0.09 % + 20 µA 0.04 % + 20 µA 0.10 % + 50 µA 0.20 % + 0.1 mA 0.42 % + 0.2 mA		
(0.33 to 1.1) A	(10 to 45) Hz 45 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz	0.44 % + 0.1 mA 0.15 % + 0.1 mA 0.62 % + 1 mA 2.5 % + 5 mA		
(1.1 to 3) A	(10 to 45) Hz 45 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz	0.19 % + 0.1 mA 0.16 % + 0.1 mA 2.1 % + 1 mA 3.2 % + 5 mA		
(3 to 11) A	(45 to 100) Hz 100 Hz to 1 kHz (1 to 5) kHz	0.41 % + 0.1 mV 0.23 % + 0.1 mV 3.0 % + 1 mV		
(11 to 20.5) A	(45 to 100) Hz 100 Hz to 1 kHz (1 to 5) kHz	0.16 % + 0.1 mV 0.19 % + 0.1 mV 3.0 % + 1 mV		

Parameter/Range	Frequency	CMC ^{2,6} (±)	Comments	Location ⁹
AC Voltage –Measure				
(0 to 200) mV	(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	0.027 % + 7.3 μV 0.019 % + 7.2 μV 0.018 % + 6.0 μV 0.017 % + 7.0 μV 0.036 % + 6.4 μV 0.06 % + 30 μV	Fluke 8508A	HAR
(0 to 2) V	(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	0.029 % + 36 μV 0.029 % + 41 μV 0.006 % + 43 μV 0.031 % + 39 μV 0.031 % + 82 μV 0.030 % + 390 μV 0.043 % + 420 μV 0.13 % + 5.4 mV		
(0 to 20) V	(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	0.015 % + 460 μV 0.015 % + 400 μV 0.015 % + 420 μV 0.015 % + 380 μV 0.015 % + 970 μV 0.016 % + 6.2 mV		
(5 to 100) kV RMS (5 to 100) kV Peak/√2	(50 to 420) Hz (50 to 420) Hz	0.022 kV 0.11 kV	Haefely- Hipotronics KVM100-W	HAR
(0 to 200) V	(40 to 100) Hz 100 Hz to 2 kHz (2 to 10) kHz (10 to 30) kHz (30 to 100) kHz	0.015 % + 1.4 mV 0.015 % + 2.8 mV 0.015 % + 4.0 mV 0.015 % + 2.4 mV 0.016 % + 250 mV	Fluke 8508A	
(0 to 1000) V	40 Hz to 5 kHz	0.029 % + 250 mV		

Parameter/Range	Frequency	CMC ^{2, 5, 6} (±)	Comments	Location ⁹
AC Current – Measure				
(0 to 200) µA	10 Hz to 10 kHz (10 To 30) kHz	0.026 % 0.065 %	Fluke 8508A	HAR
(0 to 2) mA	10 Hz to 10 kHz (10 to 30) kHz	0.080 % 0.11 %		
(0 to 20) mA	10 Hz to 10 kHz (10 to 30) kHz	0.050 % 0.065 %		
(0 to 200) mA	10 Hz to 10 kHz (10 to 30) kHz	0.05 % 0.06 %		
(0 to 2) A	10 Hz to 2 kHz (2 to 10) kHz	0.07 % 0.09 %		
(0 to 20) A	10 Hz to 2 kHz (2 to 10) kHz	0.018 % 0.039 %		

Parameter/Equipment	Range	CMC ^{2, 6} (±)	Comments	Location ⁹
Capacitance – Generate ³	(220 to 400) pF (0.4 to 1.1) nF (1.1 to 3.3) nF (3.3 to 11) nF (11 to 33) nF (33 to 110) nF (110 to 330) nF (0.33 to 1.1) µF (1.1 to 3.3) µF (3.3 to 11) µF (11 to 33) µF (33 to 110) µF (110 to 330) µF (0.33 to 1.1) mF (1.1 to 3.3) mF (3.3 to 11) mF (11 to 33) mF (33 to 110) mF	0.43 % + 0.01 nF 0.61 % + 0.01 nF 0.73 % + 0.01 nF 0.56 % + 0.01 nF 0.58 % + 0.1 nF 0.56 % + 0.1 nF 0.58 % + 0.3 nF 0.58 % + 1 nF 0.58 % + 3 nF 0.62 % + 10 nF 0.58 % + 30 nF 0.57 % + 0.1 µF 0.70 % + 0.3 µF 0.71 % + 1 µF 0.48 % + 3 µF 0.46 % + 10 µF 0.91 % + 30 µF 1.3 % + 100 µF	Fluke 5502A	HAR

Parameter/Equipment	Range	CMC ^{2,6} (±)	Comments	Location ⁹
Resistance – Generate ³	Up to 11 Ω (11 to 33) Ω (33 to 110) Ω (110 to 330) Ω (0.33 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 (0.33 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 (0.33 to 1.1) GΩ	0.025 % + 0.001 Ω 0.014 % + 0.0015 Ω 0.01 % + 0.0014 Ω 0.01 % + 0.002 Ω 0.01 % + 0.002 Ω 0.01 % + 0.02 Ω 0.01 % + 0.02 Ω 0.01 % + 0.2 Ω 0.012 % + 0.2 Ω 0.012 % + 2 Ω 0.015 % + 2 Ω 0.015 % + 30 Ω 0.06 % + 50 Ω 0.10 % + 2.5 kΩ 0.55 % + 3 kΩ 0.52 % + 0.1 MΩ 1.3 % + 0.5 MΩ	Fluke 5502A	HAR
Resistance – Generate ³ (Fixed Values)	1 kΩ 10 kΩ 100 kΩ 1 MΩ 10 MΩ 100 MΩ 1 GΩ 10 GΩ 100 GΩ 1 TΩ 10 TΩ	0.015 kΩ 0.015 kΩ 0.083 kΩ 0.015 MΩ 0.083 MΩ 0.083 MΩ 0.016 GΩ 0.027 GΩ 0.36 GΩ 0.58 GΩ 0.60 GΩ	IET Labs VRS- 100-11-1K-BP	HAR
Resistance – Measure	Up to 2 Ω Up to 20 Ω Up to 200 Ω Up to 2 kΩ Up to 20 kΩ Up to 200 kΩ Up to 2 MΩ Up to 20 MΩ Up to 200 MΩ Up to 2 GΩ	41 μΩ /Ω + 7.6 mΩ 0.009 % + 6.4 mΩ 45 μΩ /Ω + 12 mΩ 0.012 % + 31 mΩ 30 μΩ /Ω + 150 mΩ 77 μΩ /Ω + 1.7 Ω 0.005 % + 43 Ω 0.03 % + 990 Ω 0.04 % + 15 kΩ 2.0 % + 450 kΩ	Fluke 8508A	HAR

Parameter/Equipment	Range	CMC ² (±)	Comments	Location ⁹
Electrical Calibration of Thermocouple Indicators ³ – Generate & Measure				
Type E	(-250 to -100) °C (-100 to -25) °C (-25 to 350) °C (350 to 650) °C (650 to 1000) °C	0.50 °C 0.16 °C 0.14 °C 0.16 °C 0.21 °C	Fluke 5502A	HAR
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 0.17 °C 0.15 °C 0.18 °C 0.24 °C		
Type K	(-200 to -100) °C (-100 to -25) °C (-25 to 120) °C (120 to 1000) °C (1000 to 1372) °C	0.33 °C 0.19 °C 0.17 °C 0.26 °C 0.40 °C		
Type T	(-250 to -150) °C (-150 to 0) °C (0 to 120) °C (120 to 400) °C	0.63 °C 0.24 °C 0.16 °C 0.14 °C		
Electrical Calibration of RTD Indicators ³ – Generate				
Pt 385, 100 Ω	(-200 to -80) °C (-80 to 0) °C Up to 100 °C (100 to 300) °C (300 to 400) °C (400 to 630) °C (630 to 800) °C	0.07 °C 0.07 °C 0.10 °C 0.13 °C 0.15 °C 0.17 °C 0.33 °C	Fluke 5502A	HAR

Parameter/Equipment	Range	CMC ² (±)	Comments	Location ⁹
Oscilloscope ³ –				
DC Volt Function Into 50 Ω	Up to 6.6 V	0.23 mV	Fluke 5502A/SC600	HAR
Into 1 MΩ	(1 to 2.5) mV (2.5 to 500) mV (1 to 2.2) V (2.3 to 11) V (12 to 130) V	0.014 mV 0.019 mV 0.082 mV 0.27 mV 1.1 mV		
Square Wave Signal 10 Hz to 10 kHz Into 50 Ω	1 mV to 6.6 V	0.43 mV		
Into 1 MΩ	(1 to 25) mV (26 to 110) mV (111 to 500) mV (1 to 2.2) V (2.3 to 11) V (11 to 130) V	0.045 mV 0.018 mV 0.061 mV 0.24 mV 0.35 mV 17 mV		
Level Sinewave Signal 5 mV to 5.5 V Into 50 Ω	50 kHz 51 kHz to 100 MHz (101 to 300) MHz (301 to 600) MHz	0.024 mV 0.093 mV 0.11 mV 0.87 mV		
Time Markers Into 50 Ω 1 V-pk	5 s to 2 ns	0.05 ns		

V. Mechanical

Parameter/Equipment	Range	CMC ² (±)	Comments	Location ⁹
Scales & Balances ³	100 g	30 µg	Class 0 weights	HAR, MOB
	50 g	15 µg		
	20 g	9 µg		
	10 g	6 µg		
	(1 to 5) g	4 µg		
	(1 to 500) mg	1.2 µg		
	22.7 kg (50 lb)	15 mg	Class 1 weights	HAR, MOB
	11.34 kg (25 lb)	4.8 mg		
	4.54 kg (10 lb)	1.3 mg		
	2.27 kg (5 lb)	0.66 mg		
	25 kg	8.4 mg		
	20 kg	9.1 mg		
	10 kg	1.5 mg	HAR, MOB	
	5 kg	0.85 mg		
	2 kg	0.46 mg		
	1 kg	0.13 mg		
	500 g	68 µg		
	200 g	40 µg		
	100 g	24 µg		
	50 g	9.6 µg		
	20 g	5.6 µg		
	10 g	5.0 µg		
	5 g	3.5 µg		
	3 g	2.9 µg		
	2 g	2.1 µg		
	1 g	1.8 µg		
	500 mg	1.3 µg		
	300 mg	1.0 µg		
	200 mg	1.0 µg		
	100 mg	1.0 µg		
	50 mg	1.0 µg		
	20 mg	0.66 µg		
	10 mg	0.76 µg		
5 mg	0.5 µg			
3 mg	0.41 µg			
2 mg	0.38 µg			
1 mg	0.43 µg			

Parameter/Equipment	Range	CMC ^{2,5} (±)	Comments	Location ⁹		
Scales & Balances ³ (cont)	(1 to 5) kg	0.11 mg	Class 2 weights	HAR, MOB		
	500 g	0.10 mg				
	(1 to 200) g	82 µg	Class 4 weights	HAR, MOB		
	100 mg	1.2 µg				
	1 kg	0.82 g				
	(1 to 500) g	0.82 mg				
	453.6 kg (1000 lb)	11 g			Class F weights (Class 5/6)	HAR, MOB
	226.8 kg (500 lb)	2.8 g				
	22.7 kg (50 lb)	580 mg				
	11.34 kg (25 lb)	210 mg				
4.54 kg (10 lb)	120 mg					
2.27 kg (5 lb)	27 mg					
0.91 kg (2 lb)	11 mg					
0.46 kg (1 lb)	8.5 mg					
0.23 kg (0.5 lb)	2.3 mg					
500 kg	7 g	Test cart	HAR, MOB			
200 kg	3 g					
25 kg	630 mg					
20 kg	280 mg					
10 kg	110 mg					
5 kg	0.78 mg					
2 kg	0.44 mg					
1 kg	0.12 mg					
500 g	0.069 mg					
2268 kg (5000 lb)	170 g			Class F test cart & weight blocks	HAR, MOB	
2721.5 kg (6000 lb)	230 g					
Truck & Rail Scales	(6000 to 200 000) lb	0.0012 %	Class F test cart & weight blocks	HAR, MOB		
Tank & Hopper Scales – Force Method	Up to 200 000 lb	0.008 %	Load cells	HAR, MOB		

Parameter/Equipment	Range	CMC ^{2,8} (±)	Comments	Location ⁹
Torque – Measuring Equipment	(5 to 50) lbf·in (50 to 500) lbf·in (25 to 250) lbf (250 to 2500) lbf	0.16 lbf·in 1.2 lbf·in 1.5 lbf 3.0 lbf	Norbar torque transducers	HAR
Force – Measuring Equipment				
Compression	Up to 2 ozf (2 to 8) ozf (8 to 16) ozf (16 to 24) ozf (24 to 32) ozf (32 to 40) ozf	0.82 ozf 1.1 ozf 2.0 ozf 2.9 ozf 3.8 ozf 4.7 ozf	Force transducers	HAR
Tension	Up to 20 000 lbf Up to 200 000 lbf Up to 500 000 lbf Up to 11 000 lbf Up to 20 000 lbf (11 000 to 55 000) lbf Up to 200 000 lbf	0.44 lbf 8.9 lbf 61 lbf 4.9 lbf 0.44 lbf 8.9 lbf 8.9 lbf	Force transducers Force transducers	 MOB HAR MOB HAR
Tensiometer/Force – Measuring Equipment	Up to 2400 lbf	0.85 lbf	King Nutronics 3615 with ASTM Class 6 weights	HAR

Parameter/Equipment	Range	CMC ^{2, 8} (±)	Comments	Location ⁹
Mass, Fixed Points (NIST Class F, ASTM Class 5 & 6)	22.7 kg (50 lb)	110mg	Class 1 weights comparison method	HAR
	11.34 kg (25 lb)	100 mg		
	9.07 kg (20 lb)	100mg		
	4.54 kg (10 lb)	100 mg		
	2.27 kg (5 lb)	29 mg		
	25 kg	59 mg	Class 0 weights comparison method	HAR
	20 kg	59 mg		
	10 kg	59 mg		
	5 kg	58 mg		
	1 kg	120 mg		
	500 g	0.6 mg		
	200 g	0.11 mg		
	100 g	72 µg		
	50 g	19 µg		
	20 g	18 µg		
10 g	24 µg			
5 g	11 µg			
2 g	9.6 µg			
1 g	12 µg			
	2 kg	82 mg	Class 2 weight comparison method	HAR
Pressure – Measuring Equipment	Up to 100 psia (-15 to 0) psig Up to 500 psig Up to 1000 psig Up to 5000 psig Up to 20 000 psig Up to 40 000 psig	0.06 psia 0.003 psig 0.045 psig 0.11 psig 0.65 psig 2.3 psig 7.6 psig	Pressure transducers	HAR, MOB

VI. Optical Quantities

Parameter/Equipment	Range	CMC ^{2, 8} (±)	Comments	Location ⁹
Fiber Optic Power – Measuring Instruments			Optical attenuator & stabilized light source	HAR
Attenuation	(1 to 50) dB	0.95 dB		

VII. Thermodynamics

Parameter/Equipment	Range	CMC ^{2, 8} (±)	Comments	Location ⁹
Temperature – Measure	(-197 to 0) °C Up to 157 °C (157 to 232) °C (232 to 420) °C (420 to 660) °C	0.027 °C 0.027 °C 0.027 °C 0.029 °C 0.053 °C	Fluke 9144 field metrology well with Fluke 5609 PRT	HAR
	(-197 to 0) °C Up to 157 °C (157 to 232) °C (232 to 420) °C	0.017 °C 0.017 °C 0.017 °C 0.026 °C	Fluke 1502A, 5616 PRT	
Temperature – Measuring Equipment	Up to 50 °C (50 to 200) °C (200 to 420) °C (420 to 550) °C (550 to 660) °C	0.08 °C 0.11 °C 0.14 °C 0.17 °C 0.2 °C	Fluke 9144 field metrology well	HAR
Infrared Temperature – Measuring Equipment ³	35 °C (35 to 100) °C (100 to 200) °C (200 to 350) °C (350 to 500) °C	0.45 °C 0.63 °C 0.90 °C 1.4 °C 2.1 °C	Fluke 4181 Blackbody - emissivity 0.95 wavelength 8 to 14 µm	HAR
Humidity – Measure	(11 to 49) % RH (50 to 79) % RH 80 % RH	0.61 % RH 0.68 % RH 0.74 % RH	Vaisala HM45/HMP113 temp/humidity meter w/probe	HAR
Humidity – Measuring Equipment	(5 to 95) % RH at (15 to 35) °C	0.5 % RH	Thunder Scientific 2500	HAR

VIII. Time & Frequency

Parameter/Equipment	Range	CMC ^{2, 6} (±)	Comments	Location ⁹
Frequency – Measuring Equipment ³	(0.01 to 119.99) Hz (120 to 1199.9) Hz (1.2 to 11.999) kHz (12 to 119.99) kHz	0.004 % + 4 mHz 0.003 % + 30 mHz 0.003 % + 300 mHz 0.0024 % + 3 Hz	Fluke 5502A	HAR

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 In the statement of CMC, L is the numerical value of the nominal length in inches and DL is the Diagonal length in inches.

⁵ In the statement of CMC, percent is to be read as percent of reading.

⁶ 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.

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

⁸ 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.

⁹ The locations of the laboratories that can perform the calibrations are given by a letter code with valid to dates given in the table below:

Location	Code	Valid to Dates
(Main Location) 130 Brookhollow Esplanade, Harahan, LA 70123	HAR	June 30, 2024
(Field Location) 7911 Morris Hill Road, Semmes, AL 36575	MOB	June 30, 2024



Accredited Laboratory

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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/NCCL 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 15th of July of 2022.

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

Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 3601.01
Valid to June 30, 2024.
Revised January 12, 2024

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