



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

SIMCO ELECTRONICS
3131 Jay Street
Santa Clara, CA 95054
Jim Morrissey Phone: 408 734 9750

CALIBRATION

Valid To: September 30, 2025

Certificate Number: 1395.17

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following calibrations^{1,9}:

I. Dimensional

Parameter/Equipment	Range	CMC ^{2,7} ($\pm$)	Comments
Micrometers ³ – OD, Depth	Up to 36 in	$(53 + 7.7L) \mu\text{in}$	Gage block set
Flatness	Up to 1 in	$6.4 \mu\text{in}$	Optical flats
Parallelism	0.0001 in	$14 \mu\text{in}$	
Height Gages ³	Up to 40 in	$(62 + 2.5L) \mu\text{in}$	Gage block set, surface plate
Calipers ³	Up to 72 in	$(330 + 7L) \mu\text{in}$	Gage blocks, ring gage
Linear Indicator – Digital & Analog	Up to 10 in: (50 μin resolution) (100 μin resolution) (0.001 in resolution)	$(20 + 5.3L) \mu\text{in}$ $(35 + 5.3L) \mu\text{in}$ $(130 + 5.3L) \mu\text{in}$	Gage blocks
Linear Length – Micrometer Standards, Attribute Length Standards	Up to 12 in	$(10 + 1.6L) \mu\text{in}$	Pratt & Whitney LabMaster™, gage block set

Parameter/Equipment	Range	CMC ^{2,7} ($\pm$)	Comments
Ring Gages	Up to 1 in (>1 to 4) in (>4 to 14) in	($5.4 + 0.78L$) μ in ($4.6 + 0.93L$) μ in ($8.1 + 0.93L$) μ in.	Pratt & Whitney LabMaster™, gage block set
Cylindrical Gages – Pins, Plugs, Discs	(0.01 to 12) in	($5.7 + 2.5L$) μ in	Pratt & Whitney LabMaster™, gage block set
Threaded Plug Gages – Pitch (60° Threads) Major Diameter	(5 to 80) TPI Up to 12 in	($67 + 4.2L$) μ in ($36 + 4.2L$) μ in	Gage blocks with thread wire & Pratt & Whitney LabMaster™
Adjustable Thread Ring Gages	Up to 5 in	Setting Plug Tolerance Grade W	Master setting plug
Bore Gages, Inside Micrometers, Intramikes ³	(0.081 to 6.0) in	($58 + 18L$) μ in	Gage blocks & ring gages
Linear Length – Non- Contact	Up to 12in >12 to 24in >24 to 40in	($0.0016 \text{ in} + 3.8L$) μ in ($0.0024 \text{ in} + 3.8L$) μ in ($0.0032 \text{ in} + 3.8L$) μ in	Denmark designs linear encoder

II. Electrical – DC/Low Frequency

Parameter/Range	Frequency	CMC ^{2, 4, 5, 7} ($\pm$)	Comments
AC Current – Clamp-on Meter ³			
Toroidal (20 to 150) A	(45 to 65) Hz (65 to 440) Hz	0.38 % + 0.029 A 0.93 % + 0.032 A	Fluke 5520A/SC600 Fluke 5500A/coil
(150 to 1000) A	(45 to 65) Hz (65 to 440) Hz	0.38 % + 0.1 A 0.93 % + 0.12 A	
Non-Toroidal (20 to 150) A	(45 to 65) Hz (65 to 440) Hz	0.68 % + 0.29 A 1.2 % + 0.29 A	
(150 to 1000) A	(45 to 65) Hz (65 to 440) Hz	0.67 % + 1 A 1.2 % + 1 A	
AC Current – Generate ³			
(0.2 to 2) mA	(10 to 20) Hz (20 to 40) Hz 40 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz	0.028 % + 0.6 μ A 0.016 % + 0.035 μ A 0.013 % + 0.035 μ A 0.021 % + 0.11 μ A 0.11 % + 0.65 μ A	Fluke 5720A
(2 to 20) mA	(10 to 20) Hz (20 to 40) Hz 40 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz	0.026 % + 0.4 μ A 0.017 % + 0.35 μ A 0.013 % + 0.35 μ A 0.021 % + 0.55 μ A 0.11 % + 5 μ A	
(20 to 200) mA	(10 to 20) Hz (20 to 40) Hz 40 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz	0.026 % + 4 μ A 0.017 % + 3.5 μ A 0.013 % + 2.6 μ A 0.022 % + 3.5 μ A 0.11 % + 10 μ A	
(0.2 to 2) A	20 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz	0.027 % + 0.035 mA 0.047 % + 0.08 mA 0.71 % + 0.16 mA	
(2 to 11) A	40 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz	0.047 % + 0.17 mA 0.096 % + 0.38 mA 0.36 % + 0.75 mA	Fluke 5725A
(11 to 20) A	(45 to 100) Hz 100 Hz to 1 kHz (1 to 5) kHz	0.12 % + 5 mA 0.15 % + 5 mA 3 % + 5 mA	Fluke 5520A

Parameter/Range	Frequency	CMC ^{2, 4, 5, 7} ($\pm$)	Comments
AC High Voltage – Measure ³	(1 to 70) kV	0.64 % + 0.6R	HP 34401A, Hallmark PVD100
AC Current – Measure ³			
(10 to 100) μ A	45 Hz to 1 kHz	0.072 % + 0.035 μ A	Agilent 3458A
(0.1 to 1) mA	(45 to 100) Hz 100 Hz to 5 kHz	0.070 % + 0.23 μ A 0.037 % + 0.23 μ A	
(1 to 10) mA	(45 to 100) Hz 100 Hz to 5 kHz	0.070 % + 2.3 μ A 0.037 % + 2.3 μ A	
(10 to 100) mA	(45 to 100) Hz 100 Hz to 5 kHz	0.070 % + 23 μ A 0.037 % + 23 μ A	
(0.1 to 1) A	(45 to 100) Hz 100 Hz to 5 kHz	0.093 % + 0.23 mA 0.12 % + 0.23 mA	
AC Voltage – Generate ³			
Up to 2.2 mV	Up 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	0.079 % + 4 μ V 0.076 % + 4 μ V 0.08 % + 4 μ V 0.13 % + 4 μ V 0.13 % + 5 μ V 0.21 % + 10 μ V 0.28 % + 20 μ V 0.5 % + 20 μ V	Fluke 5720A
(>2.2 to 22) mV	Up 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	0.025 % + 4 μ V 0.012 % + 4 μ V 0.013 % + 4 μ V 0.024 % + 4 μ V 0.054 % + 5 μ V 0.11 % + 10 μ V 0.15 % + 20 μ V 0.3 % + 20 μ V	
(>22 to 220) mV	Up 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	0.025 % + 12 μ V 0.0097 % + 7 μ V 0.0088 % + 7 μ V 0.021 % + 7 μ V 0.047 % + 17 μ V 0.091 % + 20 μ V 0.14 % + 25 μ V 0.28 % + 45 μ V	
(>0.22 to 2.2) V	Up 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	0.024 % + 40 μ V 0.0095 % + 15 μ V 0.0054 % + 8 μ V 0.0081 % + 10 μ V 0.0011 % + 30 μ V 0.043 % + 80 μ V 0.1 % + 0.2 mV 0.17 % + 0.3 mV	

Parameter/Range	Frequency	CMC ^{2, 4, 5, 7} (±)	Comments
AC Voltage – Generate ³ (cont)			
(>2.2 to 22) V	Up 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	0.024 % + 0.4 mV 0.0095 % + 0.4 mV 0.0054 % + 0.051 mV 0.0081 % + 0.1 mV 0.01 % + 0.2 mV 0.029 % + 0.6 mV 0.1 % + 2 mV 0.16 % + 3.2 mV	Fluke 5720A
(>22 to 220) V	Up 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	0.025 % + 4 mV 0.0094 % + 1.5 mV 0.0056 % + 0.061 mV 0.0089 % + 1 mV 0.016 % + 2.5 mV 0.09 % + 16 mV 0.44 % + 40 mV 0.8 % + 80 mV	
(>220 to 1100) V	Up to 50 Hz >50 Hz to 1 kHz	0.03 % + 16 mV 0.0074 % + 3.6 mV	
AC Voltage – Measure ³			
(1 to 10) mV	(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	0.039 % + 3.5 µV 0.029 % + 1.3 µV 0.039 % + 1.3 µV 0.012 % + 1.3 µV 0.6 % + 1.3 µV 4.6 % + 2.3 µV	Agilent 3458A
(10 to 100) mV	(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	91 µV/V + 4.6 µV 91 µV/V + 2.3 µV 0.017 % + 2.3 µV 0.037 % + 2.3 µV 0.093 % + 2.3 µV 0.35 % + 12 µV 1.2 % + 12 µV	
(0.1 to 1) V	(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 (0.1 to 1) MHz	83 µV/V + 46 µV 83 µV/V + 23 µV 0.016 % + 23 µV 0.035 % + 23 µV 0.092 % + 23 µV 0.35 % + 0.12 mV 1.2 % + 0.12 mV	

Parameter/Range	Frequency	CMC ^{2, 4, 5, 7} ($\pm$)	Comments
AC Voltage – Measure ³ (cont)			
(1 to 10) V	(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 (0.2 to 1) MHz	86 μ V/V + 0.47 mV 89 μ V/V + 0.23 mV 0.017 % + 0.23 mV 0.035 % + 0.23 mV 0.093 % + 0.23 mV 0.35 % + 1.2 mV 1.2 % + 1.2 mV	Agilent 3458A
(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	0.023 % + 4.6 mV 0.023 % + 2.3 mV 0.023 % + 2.3 mV 0.04 % + 2.3 mV 0.14 % + 2.3 mV	
(100 to 1000) V	(1 to 40) Hz 40 Hz to 1 kHz (1 to 20) kHz (20 to 50) kHz (50 to 100) kHz	0.046 % + 47 mV 0.046 % + 24 mV 0.069 % + 23 mV 0.14 % + 23 mV 0.35 % + 23 mV	
Capacitance – Generate ³	(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 109.9999) nF (110 to 329.999) nF (0.33 to 1.099 99) μ F (1.1 to 3.299 99) μ F (3.3 to 10.9999) μ F (11 to 32.9999) μ F (33 to 109.999) μ F (110 to 329.999) μ F (0.33 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	1.5 % + 0.01 nF 0.74 % + 0.01 nF 0.82 % + 0.01 nF 0.32 % + 0.01 nF 0.6 % + 0.1 nF 0.32 % + 0.1 nF 0.3 % + 0.1 nF 0.34 % + 1.0 nF 0.49 % + 3.0 nF 0.32 % + 3.0 nF 0.51 % + 10 nF 0.55 % + 100 nF 0.67 % + 300 nF 0.54 % + 1 μ F 0.56 % + 3 μ F 0.54 % + 10 μ F 0.9 % + 30 μ F 1.3 % + 100 μ F	Fluke 552XA

Parameter/Equipment	Range	CMC ^{2, 4, 5, 7} ($\pm$)	Comments
DC Current – Clamp on Meters ³	(20 to 150) A (150 to 1000) A	0.61 % + 0.16 A 0.61 % + 0.58 A	Fluke 5520A/SC600 Fluke 5500A/coil
DC Current – Generate ³	(Up to 220) μ A (0.22 to 2.2) mA (2.2 to 22) mA (22 to 220) mA (0.22 to 2.2) A (2.2 to 11) A (11 to 20) A (>20 to 100) A	40 μ A/A + 6 nA 42 μ A/A + 8.1 nA 42 μ A/A + 47 nA 53 μ A/A + 0.8 μ A 93 μ A/A + 14 μ A 0.036 % + 480 μ A 0.27 % + 1 mA 0.017 % + 1.1 mA	Fluke 5720A Fluke 5725A Fluke 5520A Keysight N8732A w/ shunt & meter
DC Current – Measure ³	Up to 1 nA (>1 to 10) nA (>10 to 100) nA (>0.1 to 1) μ A (>1 to 10) μ A (>10 to 100) μ A (>0.1 to 1) mA (>1 to 10) mA (>10 to 100) mA (>0.1 to 1) A (>1 to 10) A (>10 to 300) A	240 μ A/A + 0.036 pA 180 μ A/A + 0.036 pA 89 μ A/A + 0.047 pA 5.9 μ A/A + 0.3 pA 5.7 μ A/A + 0.3 pA 5.3 μ A/A + 30 pA 6.6 μ A/A + 0.3 nA 6.2 μ A/A + 30 nA 5.5 μ A/A + 0.3 μ A 6.4 μ A/A + 3 μ A 20 μ A/A + 30 μ A 46 μ A/A + 0.3 mA	Agilent 3458A Precision resistors
DC High Voltage – Measure ³	(1 to 100) kV	0.07 % + 0.6R	HP 34401A Hallmark PVD 100

Parameter/Equipment	Range	CMC ^{2, 4, 5, 7} ($\pm$)	Comments
DC Resistance – Generate ³	(0 to 11) Ω (11 to 33) Ω (33 to 110) Ω (110 to 330) Ω (0.33 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 (0.33 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 (0.11 to 1.1) G Ω	0.02 % + 10 m Ω 0.011 % + 15 m Ω 56 $\mu\Omega/\Omega$ + 15 m Ω 43 $\mu\Omega/\Omega$ + 20 m Ω 36 $\mu\Omega/\Omega$ + 20 m Ω 43 $\mu\Omega/\Omega$ + 200 m Ω 34 $\mu\Omega/\Omega$ + 100 m Ω 38 $\mu\Omega/\Omega$ + 1 Ω 35 $\mu\Omega/\Omega$ + 1 Ω 63 $\mu\Omega/\Omega$ + 10 Ω 29 $\mu\Omega/\Omega$ + 25 Ω 39 $\mu\Omega/\Omega$ + 320 Ω 0.013 % + 520 Ω 0.023 % + 5.2 k Ω 0.057 % + 6.2 k Ω 0.33 % + 200 k Ω 1.7 % + 1.0 M Ω	Fluke 5520A/SC600
DC Resistance – Measure ³	(0 to 10) Ω (10 to 100) Ω (0.1 to 1) k Ω (1 to 10) k Ω (10 to 100) k Ω (0.1 to 1) M Ω (1 to 10) M Ω (10 to 100) M Ω (0.1 to 1) G Ω	20 $\mu\Omega/\Omega$ + 50 $\mu\Omega$ 17 $\mu\Omega/\Omega$ + 0.5 m Ω 13 $\mu\Omega/\Omega$ + 0.5 m Ω 13 $\mu\Omega/\Omega$ + 5 m Ω 13 $\mu\Omega/\Omega$ + 50 m Ω 20 $\mu\Omega/\Omega$ + 2 Ω 68 $\mu\Omega/\Omega$ + 100 Ω 0.59 m Ω/Ω + 1 k Ω 5.9 m Ω/Ω + 10 k Ω	Agilent 3458A
DC Voltage – Generate ³	(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	9 $\mu\text{V}/\text{V}$ + 1.3 μV 5.2 $\mu\text{V}/\text{V}$ + 1.4 μV 3.7 $\mu\text{V}/\text{V}$ + 2.8 μV 3.7 $\mu\text{V}/\text{V}$ + 4.2 μV 5.2 $\mu\text{V}/\text{V}$ + 40 μV 6.7 $\mu\text{V}/\text{V}$ + 0.41 mV	Fluke 5720A
DC Voltage – Measure ³	(0 to 100) mV (0 to 1) V (1 to 10) V (10 to 100) V (100 to 1100) V	7.2 $\mu\text{V}/\text{V}$ + 0.45 μV 5.4 $\mu\text{V}/\text{V}$ + 0.46 μV 5.4 $\mu\text{V}/\text{V}$ + 0.94 μV 7.7 $\mu\text{V}/\text{V}$ + 45 μV 7.9 $\mu\text{V}/\text{V}$ + 0.23 μV	Agilent 3458A

Parameter/Equipment	Range	CMC ^{2, 4, 5} (±)	Comments
Electrical Simulation of Thermocouple Indicators & Indicating Systems ³ –			
Type E	(-270 to -200) °C (>-200 to 0) °C (>0 to 600) °C (>600 to 1000) °C	0.091 °C 0.05 °C 0.041 °C 0.045 °C	Fluke 5520A Vdc output mode w/ external thermocouple reference probe
Type J	(-210 to -100) °C (>-100 to 900) °C (>900 to 1200) °C	0.056 °C 0.049 °C 0.053 °C	
Type K	(-270 to -200) °C (>-200 to -100) °C (>-100 to 600) °C (>600 to 1000) °C (>1000 to 1372) °C	0.08 °C 0.052 °C 0.052 °C 0.057 °C 0.066 °C	
Type T	(-270 to -200) °C (>-200 to 0) °C (>0 to 400) °C	0.14 °C 0.069 °C 0.051 °C	

Parameter/Range	Frequency	CMC ^{2, 4, 5, 7} ($\pm$)	Comments
Oscilloscopes ³ –			
Level Sine Amp 50 kHz Ref.	5 mV to 5.0 V _(p-p)	3.4 % + 0.3 mV	Fluke 5520A/SC1100
Level Sine Flatness 5 mV to 5.5 V Relative to 50 kHz	50 kHz to 100 MHz (100 to 300) MHz (300 to 600) MHz (600 to 1100) MHz	3.2 % + 100 μ V 3.4 % + 100 μ V 4.3 % + 100 μ V 4.3 % + 100 μ V	
4 mV to 3.5 V			
DC Signal			
50 Ω	(0 to 6.6) V	0.20 % + 40 μ V	
1 M Ω	(0 to 130) V	0.27 % + 40 μ V	
Square Wave			
1 M Ω , 10 Hz to 10 kHz	1 mV to 130 V _(p-p)	0.21 % + 40 μ V	
50 Ω , 1 kHz to 10 kHz	1 mV to 6.6 V _(p-p)	0.35 % + 40 μ V	
Time Marker	1 ns to 20 ms	5 μ s/s	
Output Into 50 Ω	1 kHz to 2 MHz, (200 to 300) ps	40 ps	
Rise Time – Generate	(2 to 10) MHz, (200 to 350) ps	59 ps	

III. Electrical – RF/Microwave

Parameter/Range	Frequency	CMC ^{2,4} (±)	Comments
RF Power – Generate ³			
(7 to 0) dBm (<0 to -129) dBm	250 kHz to 2 GHz	0.7 dB 0.6 dB	Agilent/HP E4432B
(10 to 25) dBm (10 to -10) dBm (<-10 to -60) dBm (<-60 to -110) dBm	10 MHz to 2 GHz	1.4 dB 0.72 dB 1.1 dB 1.6 dB	Agilent/HP 83650B
(10 to 25) dBm (10 to -10) dBm (<-10 to -60) dBm (<-60 to -110) dBm	(2 to 20) GHz	1.5 dB 0.83 dB 1.2 dB 1.8 dB	
(10 to -10) dBm (<-10 to -60) dBm (<-60 to -110) dBm	(>20 to 40) GHz	1.1 dB 1.4 dB 2 dB	
(10 to -10) dBm (<-10 to -60) dBm (<-60 to -110) dBm	(>40 to 50) GHz	2 dB 2.3 dB 3 dB	
RF Power – Measure ³			
(-20 to +30) dBm (-20 to +30) dBm	10 MHz to 18 GHz (>18 to 26.5) GHz	0.63 dB 0.38 dB	Agilent N1914A/w Agilent E4412A Agilent E4413A
(-70 to 20) dBm	(>26.5 to 40) GHz (>40 to 50) GHz	0.38 dB 0.63 dB	Agilent 8487A/D
Distortion – Measure ³			
(-80 to 0) dB	20 Hz to 20 kHz	1.7 dB	HP 8903B
(-65 to 0) dB	(20 to 100) kHz	2.3 dB	

Parameter/Range	Frequency	CMC ^{2,4} (±)	Comments
RF Attenuation – Measure ³			
(0 to -10) dB (-10 to -20) dB (-20 to -30) dB (-30 to -40) dB (-40 to -50) dB (-50 to -60) dB (-60 to -70) dB (-70 to -80) dB (-80 to -90) dB (-90 to -100) dB (-100 to -110) dB	0.25 MHz to 1.3 GHz	0.17 dB 0.19 dB 0.21 dB 0.24 dB 0.26 dB 0.28 dB 0.31 dB 0.33 dB 0.35 dB 0.37 dB 0.40 dB	Agilent/HP 8902A measuring receiver
(0 to -10) dB (-10 to -20) dB (-20 to -30) dB (-30 to -40) dB (-40 to -50) dB (-50 to -60) dB (-60 to -70) dB (-70 to -80) dB (-80 to -90) dB (-90 to -100) dB (-100 to -110) dB	(>1.3 to 18) GHz	0.38 dB 0.38 dB 0.49 dB 0.49 dB 0.60 dB 0.50 dB 0.55 dB 0.59 dB 0.66 dB 0.65 dB 0.70 dB	
(0 to -10) dB (-10 to -20) dB (-20 to -30) dB (-30 to -40) dB (-40 to -50) dB (-50 to -60) dB (-60 to -70) dB (-70 to -80) dB (-80 to -90) dB (-90 to -100) dB (-100 to -110) dB	(>18 to 26.5) GHz	0.10 dB 0.10 dB 0.11 dB 0.12 dB 0.14 dB 0.16 dB 0.18 dB 0.21 dB 0.23 dB 0.32 dB 0.34 dB	HP 8902A measuring receiver w/11792A sensor & 11793A microwave converter
(0 to -30) dB (-30 to -70) dB	(>26.5 to 40) GHz	0.42 dB 0.72 dB	Agilent 8487A power sensor w/ N1914A
(0 to -30) dB (-30 to -70) dB	(>40 to 50) GHz	0.74 dB 1.1 dB	Agilent 8487D power sensor w/N1914A

IV. Mechanical

Parameter/Equipment	Range	CMC ^{2, 7, 10} ($\pm$)	Comments
Tensiometer/Force – Measuring Equipment ³	Up to 2000 lbf	0.021 % + 0.58R	Class F weights
Scales & Balances ^{3, 8}	(1 to 500) mg (>0.5 to 5) g (>5 to 20) g (>20 to 100) g (>100 to 1000) g (>1 to 30) kg (5 to 2000) lb	4.6 μ g + 0.6R 7 μ g + 0.6R 11 μ g + 0.6R 40 μ g + 0.6R 170 μ g + 0.6R 0.47 μ g/g + 0.6R 0.012 % + 0.6R	Class 1 weight sets Class F weight sets
Pressure, Absolute – Measuring Equipment ³	(0 to 8) kPa (>8 to 380) kPa (>380 to 1900) kPa (>1900 to 7600) kPa (>7600 to 69 000) kPa	0.0025 % + 0.056 Pa 0.0012 % + 1.6 Pa 0.0014 % + 6 Pa 0.002 % + 3.5 Pa 0.013 % + 7.1 kPa	DHI FPG8601 DHI PG7601 w/ DHI PC-7100/7600
Pressure, Differential – Measuring Equipment ³	(-60 to 60) in·H ₂ O	0.0038 % + 0.0013 in·H ₂ O	Fluke RPM4, BG15Kp, % is percent of span
POVA (Piston Operated Volumetric Apparatus) – Pipettes, Syringes, Burettes, Liquid Handlers, Dispensers	(1 to 10) μ L (10 to 100) μ L (100 to 1000) μ L (1000 to 5000) μ L (>5000 to 50 000) μ L	0.048 μ L/L + 0.064 μ L 0.28 μ L/L + 0.17 μ L 0.28 μ L/L + 2.0 μ L 0.28 μ L/L + 3.0 μ L 0.29 μ L/L + 4.9 μ L	Gravimetric calibration referenced to mass balances & ASTM Class 1 mass standards
Torque Wrenches – Measuring Equipment ³	(5 to 50) ozf·in (1 to 10) lbf·in (10 to 100) lbf·in (>100 to 1000) lbf·in (100 to 1000) lbf·ft	0.8 % + 0.58R 0.77 % + 0.58R 0.77 % + 0.58R 0.77 % + 0.58R 0.77 % + 0.58R	Hios HP-10 A.K.O. TSD 6000 w/ TSD-011 TSD-111 TSD-1011

Parameter/Equipment	Range	CMC ^{2, 7, 10} ($\pm$)	Comments
Torque Transducer – Measuring Equipment ³	(1 to 160) ozf·in (10 to 100) lbf·in (10 to 100) lbf·ft (100 to 1000) lbf·ft	0.027 % 0.023 % 0.023 % 0.023 %	Calibration arms & Class F weights
Mass – Measure Fixed	1 mg 2 mg 5 mg 10 mg 20 mg 50 mg 100 mg 200 mg 500 mg 1 g 2 g 5 g 10 g 20 g 50 g 100 g 200 g 500 g 1 kg 2 kg 5 kg 10 kg 20 kg 30 kg	9.3 μ g 9.4 μ g 9.6 μ g 5.2 μ g 5.4 μ g 5.7 μ g 6.0 μ g 6.0 μ g 8.9 μ g 9.5 μ g 18 μ g 18 μ g 43 μ g 56 μ g 88 μ g 140 μ g 0.32 mg 8.7 mg 11 mg 11 mg 22 mg 35 mg 54 mg 51 mg	Mettler-Toledo MX5 Sartorius ME- 215S Sartorius CC30001 Class 1 Mass Weight set using double substitution method
RPM – Measure ³	(0 to 50) rpm (>50 to 500) rpm (>500 to 5000) rpm (>5000 to 40 000) rpm	0.016 rpm + 0.58R 0.19 rpm + 0.58R 1.6 rpm + 0.58R 13 rpm + 0.58R	Ametek 1726 tachometer

V. Thermodynamics

Parameter/Equipment	Range	CMC ^{2, 10} ($\pm$)	Comments
Temperature – Measuring Equipment	(-40 to 140) °C	0.027 °C	Fluke 1551A, Isotech 798

Parameter/Equipment	Range	CMC ^{2, 10} ($\pm$)	Comments
Temperature – Measure	(-40 to 140) °C	0.028 °C	Fluke 1551A
Humidity – Measure ³	(11 to 90) % RH (>90 to 95) %RH	1.6 % RH 2.2 % RH	Vaisala M170/HMP76
Humidity – Measuring Equipment	(10 to 95) % RH	0.51 % RH	Thunder Scientific 2500

VI. Time & Frequency

Parameter/Equipment	Range ⁴	CMC ^{2, 7, 10} ($\pm$)	Comments
Frequency – Measuring Equipment	10 MHz	5 X 10 ⁻¹² Hz/Hz	Fluke 910 GPS controlled frequency standard
Frequency – Measure	DC to 225 MHz 225 MHz to 26.5 GHz (26.5 to 50) GHz	1.5 X 10 ⁻⁹ Hz/Hz + 0.58R 5 X 10 ⁻¹² Hz/Hz + 1.3 Hz 5 X 10 ⁻¹² Hz/Hz + 12 Hz	GPS Receiver w/: 53132A counter 5351B counter 8565E analyzer
Timers/Stopwatches ³	Up to 24 hr	56 ms	Fluke 910 GPS controlled rubidium frequency standard

VII. Chemical Quantities

Parameter/Equipment	Range ⁴	CMC ² ($\pm$)	Comments
pH Meters ³ – Three-Point Calibration	4.000 pH 7.000 pH 10.000 pH	0.012 pH 0.012 pH 0.012 pH	Standard solutions

¹ This laboratory offers commercial and field calibration services.

- 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'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.
- ⁵ Based on using the standard at the temperature the Fluke 5520A with SC600 was calibrated ($t_{cal} \pm 5^\circ\text{C}$) and assuming the instrument is zeroed at least every seven days or when the ambient temperature changes more than 5°C . For resistance, a zero calibration is performed at least every 12 hours within $\pm 1^\circ\text{C}$ of use.
- ⁶ Based on using the standard at the temperature the HP 3458A was calibrated ($t_{cal} \pm 5^\circ\text{C}$) and an auto-calibration (ACAL) was performed within the previous 24 hours ($\pm 1^\circ\text{C}$ of ambient temperature).
- ⁷ In the statement of CMC, L is the numerical value of the nominal length of the device measured in inches, R is the numerical value of the resolution of the device. In the statement of CMC, the value is defined as the percentage of reading.
- ⁸ In the statement of CMC, decade or cardinal values shown. Other values can be obtained using substitution method with uncertainty increased by a multiple for each substitution.
- ⁹ This scope meets A2LA's *P112 Flexible Scope Policy*.
- ¹⁰ 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

SIMCO ELECTRONICS

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/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 6th day of July 2023.

A blue ink signature of Mr. Trace McInturff.

Mr. Trace McInturff, Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 1395.17
Valid to September 30, 2025

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