SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

WESCAN CALIBRATION
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CALIBRATION

Valid To: January 31, 2027 Certificate Number: 1500.03

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 to perform the following calibrations[1, 8]:

I. Dimensional

Parameter/Equipment	Range	CMC[2, 4] (±)	Comments
Length Standards	(1 to 40) in	(13 + 4.0*L*) µin	Gauge blocks, gauging head & amplifier
Crimp Tools	> 0.011 in	0.000 23 in	Pin gauges, precision micrometer, digital caliper
Diameter – External	Up to 1 in	30 µin	Digital micrometer
Height Gauges[3, 5]	Up to 24 in (24 to 40) in	(1.0 + 3.7*L*) µin (13 + 3.5*L*) µin	Gauge blocks
Calipers[3, 5]	Up to 40 in	(5.6 + 4.1*L*) µin	Gauge blocks

Parameter/Equipment	Range	CMC[2, 4] (±)	Comments
Micrometers[3, 5] – OD ID Depth	 Up to 60 in Up to 24 in Up to 12 in	 (8.2 + 3.8*L*) µin (5.5 + 4.0*L*) µin (2.9 + 3.4*L*) µin	 Gauge blocks
Indicators[3, 5]	Up to 3 in	(7.0 + 2.8*L*) µin	Gauge blocks
Indicator Calibrators[5]	Up to 2 in	12 µin	Gauge blocks
Gauge Head/Amplifier (MU Checker)	(0.0001 to 0.2) in	5.4 µin	Gauge blocks
Step Gauges	Up to 6 in	(7.7 + 0.90*L*) µin	Gauge blocks
ID Instruments[3, 5]	Up to 24 in	(5.5 + 4.0*L*) µin	Gauge blocks, gauging head/amplifier
Thickness Gauges[3, 5]	(0.001 to 0.6) in (> 0.6 to 1) in	4.7 µin 11 µin	Shims & gauge blocks
Precision Levels[5]	Up to 12 in	27 µin/in	Sine bar, gauge blocks, surface plate
Rules/Tapes[5]	Up to 30 in increments	0.0018 in	Gauge blocks
Protractors[5]	At 0° & 90° (> 0° to < 90)°	0.0015° 0.0028°	Sine plate, gauge blocks, square

II. Electrical – DC/Low Frequency

Parameter/Equipment	Range	CMC[2, 10] (±)	Comments
DC Voltage[3] – Generate	(0 to 329.9999) mV (0.33 to 3.299 999) V (3.3 to 32.999 99) V (33 to 329.9999) V (330 to 1000.000) V	16 µV/V + 0.78 µV 8.6 µV/V + 1.6 µV 9.4 µV/V + 16 µV 14 µV/V + 120 µV 14 µV/V + 1200 µV	552X series calibrator
DC Voltage – Measure – Generate (Monitor)	(0 to 100) mV 100 mV to 1 V (1 to 10) V (10 to 100) V (100 to 1000) V (1 to 10) kV (1 to 35) kV	5.7 µV/V + 0.34 µV 4.5 µV/V + 0.35 µV 4.5 µV/V + 0.57 µV 6.8 µV/V + 0.035 mV $(20 + (12 \cdot V / 1000)^2)$ µV/V + 0.19 mV 0.035 % + 0.15 V 0.030 % + 0.14 V	HP 3458A opt 002 V is the voltage in V Vitrek 4700 Vitrek 4700 & HVL-35
DC Current[3] – Measure – Generate (Monitor)	(0 to 120) nA 100 nA to 1.2 µA (1 to 12) µA (10 to 120) µA 100 µA to 1.2 mA (1 to 12) mA (10 to 120) mA 100 mA to 1.05 A (1 to 3) A (3 to 10) A (10 to 20) A	34 µA/A + 45 pA 23 µA/A + 45 pA 23 µA/A + 0.11 nA 23 µA/A + 0.91 nA 23 µA/A + 5.7 pA 23 µA/A + 57 pA 40 µA/A + 0.57 µA 120 µA/A + 11 µA 0.016 % + 48 µA 0.017 % + 18 µA 0.022 % - 10 µA	HP 3458A opt 002 Fluke Y5020 & HP 3458A opt 002

Parameter/Equipment	Range	CMC[2, 7, 10] (±)	Comments
DC Current[3] – Generate	(0 to 329.999) µA (0.330 to 3.299 99) mA (3.3 to 32.9999) mA (33 to 329.999) mA (0.33 to 1.099 99) A (1.1 to 2.999 99) A (3 to 10.9999) A (11 to 20.5) A	0.012 % + 0.016 µA 78 µA/A + 0.039 µA 78 µA/A + 0.20 µA 78 µA/A + 2.0 µA 0.016 % + 32 µA 0.03 % + 32 µA 0.039 % + 390 µA 0.078 % + 580 µA	552X series calibrator
Clamp-on Meters	(20 to 149.999) A (150 to 549.999) A (550 to 1025) A	0.58 % + 0.17 A 0.58 % + 0.58 A 0.59 % + 0.58 A	552X series w/ 5500A/coil
Resistance[3] – Measure – Generate (Monitor)	(1 to 11) mΩ	0.052 %	Leeds & Northrup 4300 w/HP 3458A opt 002
	11 mΩ 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 GΩ	18 µΩ/Ω + 58 µΩ 15 µΩ/Ω + 0.58 mΩ 13 µΩ/Ω + 0.57 mΩ 13 µΩ/Ω + 5.7 mΩ 13 µΩ/Ω + 56 mΩ 18 µΩ/Ω + 2.3 Ω 58 µΩ/Ω + 120 Ω 0.058 % + 1200 Ω 0.58 % + 12 kΩ	HP 3458A opt 002
Resistance[3] – Generate	(0 to 10.9999) Ω (11 to 32.9999) Ω (33 to 109.9999) Ω (110 to 329.9999) Ω (330 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 330 kΩ 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	32 µΩ/Ω + 0.78 mΩ 24 µΩ/Ω + 1.2 mΩ 22 µΩ/Ω + 1.1 mΩ 22 µΩ/Ω + 1.6 mΩ 22 µΩ/Ω + 1.6 mΩ 22 µΩ/Ω + 16 mΩ 22 µΩ/Ω + 16 mΩ 22 µΩ/Ω + 0.16 Ω 22 µΩ/Ω + 0.16 Ω 25 µΩ/Ω + 1.6 Ω 25 µΩ/Ω + 1.6 Ω 47 µΩ/Ω + 24 Ω 0.011 % + 36 Ω 0.02 % + 2.0 kΩ 0.039 % + 2.4 kΩ 0.24 % + 78 kΩ 1.2 % + 390 kΩ	552X series calibrator

Parameter/Range	Frequency	CMC[2, 10] (±)	Comments
Capacitance – Generate[3]			
(0.19 to 0.4) nF	10 Hz to 10 kHz	0.39 % + 0.0078 nF	552X series calibrator
(0.4 to 1.1) nF	10 Hz to 10 kHz	0.39 % + 0.0078 nF	
(1.1 to 3.3) nF	10 Hz to 3 kHz	0.39 % + 0.0078 nF	
(3.3 to 11) nF	10 Hz to 1 kHz	0.20 % + 0.0078 nF	
(11 to 33) nF	10 Hz to 1 kHz	0.20 % + 0.078 nF	
(33 to 110) nF	10 Hz to 1 kHz	0.20 % + 0.078 nF	
(110 to 330) nF	10 Hz to 1 kHz	0.20 % + 0.24 nF	
330 nF to 1.1 µF	(10 to 300) Hz	0.20 % + 0.78 nF	
(1.1 to 3.3) µF	(10 to 300) Hz	0.20 % + 2.4 nF	
(3.3 to 11) µF	(10 to 150) Hz	0.20 % + 7.8 nF	
(11 to 33) µF	(10 to 120) Hz	0.32 % + 24 nF	
(33 to 110) µF	(10 to 80) Hz	0.35 % + 78 nF	
(110 to 330) µF	(0 to 50) Hz	0.35 % + 240 nF	
330 µF to 1.1 mF	(0 to 20) Hz	0.35 % + 0.78 µF	
(1.1 to 3.3) mF	(0 to 6) Hz	0.35 % + 2.4 µF	
(3.3 to 11) mF	(0 to 2) Hz	0.35 % + 7.8 µF	
(11 to 33) mF	(0 to 0.6) Hz	0.59 % + 24 µF	
(33 to 110) mF	(0 to 0.2) Hz	0.86 % + 78 µ	

Parameter/Equipment	Range	CMC[2, 10] (±)	Comments
DC Power[3] – Generate			
33 mV to 1020 V (@)			
(0.33 to 330) mA	(0.000 011 to 336.6) W	0.022 % + 48 µW	Fluke 552X series calibrator
(0.33 to 3) A	(0.011 to 3060) W	0.020 % + 0.18 mW	
(3 to 20.5) A	(0.99 to 20 910) W	0.063 % - 0.24 mW	

Parameter/Range	Frequency	CMC[2, 10] (±)	Comments
AC Power[3] – Generate			
(33 to 330) mV @			
(3.3 to 9) mA	(45 to 65) Hz	0.27 % - 0.024 µW	Fluke 552X series calibrator
(9 to 33) mA	(45 to 65) Hz	0.11 % + 0.18 µW	
(33 to 90) mA	(45 to 65) Hz	0.13 % + 0.028 W	
(90 to 330) mA	(45 to 65) Hz	0.091 % + 0.032 µW	
(330 to 900) mA	(45 to 65) Hz	0.12 % - 0.42 µW	
(0.9 to 2.2) A	(45 to 65) Hz	0.10 % + 2.3 µW	
(2.2 to 4.5) A	(45 to 65) Hz	0.12 % - 1.2 µW	
(4.5 to 20.5) A	(45 to 65) Hz	0.10 % + 7.0 µW	

Parameter/Range	Frequency	CMC[2, 10] (±)	Comments
AC Power[3] – Generate (cont)			
330 mV to 1020 V @			
(3.3 to 9) mA	(45 to 65) Hz	0.11 % + 0.29 µW	Fluke 552X series calibrator
(9 to 33) mA	(45 to 65) Hz	0.10 % - 0.27 mW	
(33 to 90) mA	(45 to 65) Hz	0.11 % - 0.035 µW	
(90 to 330) mA	(45 to 65) Hz	0.073 % - 0.65 mW	
(330 to 900) mA	(45 to 65) Hz	0.11 % - 0.59 mW	
(0.9 to 2.2) A	(45 to 65) Hz	0.084 % - 0.18 mW	
(2.2 to 4.5) A	(45 to 65) Hz	0.11 % + 21 mW	
(4.5 to 20.5) A	(45 to 65) Hz	0.091 % + 1.1 mW	

Parameter/Equipment	Range	CMC[2] (±)	Comments
Electrical Simulation of RTD Indicators & Indicating Systems[3] –			
Pt 385, 100 Ω	(-200 to -80) °C	0.039 °C	552X series calibrator
	(-80 to 0) °C	0.039 °C	
	(0 to 100) °C	0.055 °C	
	(100 to 300) °C	0.07 °C	
	(300 to 400) °C	0.078 °C	
	(400 to 630) °C	0.094 °C	
	(630 to 800) °C	0.18 °C	
Electrical Calibration of Thermocouple Indicators & Indicating Systems[3] –			
Type B	(600 to 800) °C	0.35 °C	552X series calibrator
	(800 to 1000) °C	0.27 °C	
	(1000 to 1550) °C	0.24 °C	
	(1550 to 1820) °C	0.26 °C	
Type E	(-250 to -100) C	0.39 C	
	(-100 to -25) C	0.13 C	
	(-25 to 350) C	0.11 C	
	(350 to 650) C	0.13 C	
	(650 to 1000) C	0.17 C	

Parameter/Equipment	Range	CMC[2] (±)	Comments
Electrical Calibration of Thermocouple Indicators & Indicating Systems[3] – (cont)			
Type J	(-210 to -100) °C (-100 to -30) °C (-30 to 150) °C (150 to 760) °C (760 to 1200) °C	0.21 °C 0.13 °C 0.11 °C 0.14 °C 0.18 °C	552X series calibrator
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 0.21 °C 0.32 °C	
Type N	(-200 to -100) °C (-100 to -25) °C (-25 to 120) °C (120 to 410) °C (410 to 1300) °C	0.32 °C 0.18 °C 0.15 °C 0.14 °C 0.21 °C	
Type R	(0 to 250) °C (250 to 1000) °C (1000 to 1400) °C (140 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 (140 to 1767) °C	0.37 °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	0.49 °C 0.19 °C 0.13 °C 0.11 °C	
Thermistors	(-80 to -40) °C (-40 to 100) °C (100 to 150) °C	0.084 °C 0.0063 °C 0.0095 °C	Decade resistance boxes w/HP 3458A opt 002

Parameter/Range	Frequency	CMC[2, 10] (±)	Comments
AC Voltage – Generate[3]			
(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 % + 4.7 µV 0.012 % + 4.7 µV 0.016 % + 4.7 µV 0.078 % + 4.7 µV 0.28 % + 9.4 µV 0.63 % + 39 µV	552X series calibrator
(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	0.024 % + 6.3 µV 0.012 % + 6.3 µV 0.013 % + 6.3 µV 0.028 % + 6.3 µV 0.063 % + 25 µV 0.16 % + 55 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	0.024 % + 39 µV 0.012 % + 47 µV 0.015 % + 47 µV 0.024 % + 39 µV 0.055 % + 97 µV 0.19 % + 470 µV	
(3.3 to 32.9999) V	(10 to 45) Hz 45 Hz to 10 kHz (10 to 20) kHz (20 to 50) kHz (50 to 100) kHz	0.024 % + 510 µV 0.012 % + 470 µV 0.019 % + 470 µV 0.028 % + 470 µV 0.07 % + 1300 µV	
(33 to 329.999) V	45 Hz to 1 kHz (1 to 10) kHz (10 to 20) kHz (20 to 50) kHz (50 to 100) kHz	0.015 % + 1600 µV 0.016 % + 4700 µV 0.02 % + 4700 µV 0.024 % + 4700 µV 0.16 % + 39 000 µV	
(330 to 1020) V	45 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz	0.024 % + 7800 µV 0.02 % + 7800 µV 0.024 % + 7800 µV	

Parameter/Range	Frequency	CMC[2, 10] (±)	Comments
AC Voltage – Measure[3]			
Up 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	0.035 % + 3.5 µV 0.024 % + 1.3 µV 0.035 % + 1.3 µV 0.12 % + 1.3 µV 0.58 % + 1.3 µV 4.7 % + 2.4 µV	HP 3458A opt 002
(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 300 kHz to 1 MHz (1 to 2) MHz	0.0081 % + 4.7 µV 0.0081 % + 2.4 µV 0.017 % + 2.4 µV 0.035 % + 2.4 µV 0.093 % + 2.4 µV 0.35 % + 12 µV 1.2 % + 12 µV 1.8 % + 12 µV	
100 mV 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 300 kHz to 1 MHz (1 to 2) MHz	0.0081 % + 47 µV 0.0081 % + 24 µV 0.017 % + 24 µV 0.035 % + 24 µV 0.093 % + 24 µV 0.35 % + 120 µV 1.2 % + 120 µV 1.8 % + 120 µV	
(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 300 kHz to 1 MHz (1 to 2) MHz	0.0081 % + 0.47 mV 0.0081 % + 0.24 mV 0.017 % + 0.24 mV 0.035 % + 0.24 mV 0.093 % + 0.24 mV 0.35 % + 1.2 mV 1.2 % + 1.2 mV 1.8 % + 1.2 mV	
(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 (100 to 300) kHz 300 kHz to 1 MHz	0.024 % + 4.7 mV 0.024 % + 2.4 mV 0.024 % + 2.4 mV 0.041 % + 2.4 mV 0.14 % + 2.4 mV 0.47 % + 12 mV 1.8 % + 12 mV	

Parameter/Range	Frequency	CMC[2, 10] (±)	Comments
AC Voltage – Measure[3] (cont)			
(100 to 750) V	(1 to 40) Hz 40 Hz to 1 kHz (1 to 20) kHz (20 to 50) kHz (50 to 100) kHz	0.047 % + 47 mV 0.047 % + 24 mV 0.07 % + 24 mV 0.14 % + 24 mV 0.35 % + 24 mV	HP 3458A opt 002
(1 to 10) kV	(30 to 200) Hz (200 to 450) Hz (450 to 600) Hz	0.14 % + 0.14 V 0.46 % + 0.16 V 0.87 % - 0.47 V	Vitrek 4700
(1 to 35) kV	(30 to 200) Hz (200 to 450) Hz (450 to 600) Hz	0.064 % + 0.24 V 0.69 % + 0.28 V 1.5 % - 7.4 V	Vitrek 4700 & HVL-35
AC Current[3] – Generate			
(29 to 329.99) µA	(10 to 20) Hz (20 to 45) Hz 45 to 1 kHz (1 to 5) kHz (5 to 10) kHz (10 to 30) kHz	0.16 % + 0.078 µA 0.12 % + 0.078 µA 0.097 % + 0.078 µA 0.24 % + 0.12 µA 0.63 % + 0.16 µA 1.3 % + 0.32 µA	552X series calibrator
(0.33 to 3.2999) mA	10 to 20) Hz (20 to 45) Hz 45 to 1 kHz (1 to 5) kHz (5 to 10) kHz (10 to 30) kHz	0.16 % + 0.12 µA 0.097 % + 0.12 µA 0.078 % + 0.12 µA 0.16 % + 0.16 µA 0.39 % + 0.24 µA 0.78 % + 0.47 µA	
(3.3 to 32.999) mA	(10 to 20) Hz (20 to 45) Hz 45 to 1 kHz (1 to 5) kHz (5 to 10) kHz (10 to 30) kHz	0.14 % + 1.6 µA 0.07 % + 1.6 µA 0.032 % + 1.6 µA 0.063 % + 1.6 µA 0.16 % + 2.4 µA 0.32 % + 3.2 µA	

Parameter/Range	Frequency	CMC[2, 10] (±)	Comments
AC Current[3] – Generate (cont)			
(33 to 329.99) mA	(10 to 20) Hz (20 to 45) Hz 45 to 1 kHz (0 to 5) kHz (5 to 10) kHz (10 to 30) kHz	0.14 % + 16 µA 0.070 % + 16 µA 0.032 % + 16 µA 0.078 % + 39 µA 0.16 % + 78 µA 0.32 % + 160 µA	552X series calibrator
(0.33 to 1.099 99) A	(10 to 45) Hz 45 to 1 kHz (0 to 5) kHz (5 to 10) kHz	0.14 % + 78 µA 0.039 % + 78 µA 0.47 % + 780 µA 2.0 % + 3900 µA	
(1.1 to 2.999 99) A	(10 to 45) Hz 45 to 1 kHz (0 to 5) kHz (5 to 10) kHz	0.14 % + 78 µA 0.047 % + 78 µA 0.47 % + 780 µA 2.0 % + 3900 µA	
(0 to 10.9999) A	(45 to 100) Hz (100 to 1 kHz (0 to 5) kHz	0.047 % + 1600 µA 0.078 % + 1600 µA 2.4 % + 1600 µA	
(11 to 20) A	(45 to 100) Hz (100 to 1000) Hz (1 to 5) kHz	0.11 % + 4.4 mA 0.14 % + 4.4 mA 2.7 % + 4.5 mA	
Clamp-On Meters:			
Toroidal Type:			
(20 to 54.999) A (55 to 149.999) A (150 to 1025) A	45 to 65) Hz	0.31 % + 0.054 A 0.34 % + 0.042 A 0.34 % + 0.13 A	552X series w/ 5500A/coil
(20 to 54.999) A (55 to 149.999) A (150 to 400) A	(65 to 440) Hz	0.93 % + 0.054 A 0.94 % + 0.046 A 1.2 % + 0.22 A	
Non-Toroidal Type:			
(20 to 149.999) A (150 to 549.999) A (550 to 1025) A	(45 to 65) Hz	0.65 % + 0.30 A 0.66 % + 1.1 A 0.65 % + 1.1 A	
(20 to 149.999) A (150 to 400) A	(65 to 440) Hz	1.2 % + 0.30 A 1.4 % + 1.1 A	

Parameter/Range	Frequency	CMC[2, 10] (±)	Comments
AC Current[3] – Measure – Generate (Monitor)			
(0 to 100) µA	(10 to 20) Hz (20 to 45) Hz (45 to 100) Hz 100 Hz to 5 kHz	0.46 % + 23 nA 0.17 % + 23 nA 0.070 % + 23 nA 0.070 % + 23 nA	HP 3458A opt 002
100 µA to 1 mA	(10 to 20) Hz (20 to 45) Hz (45 to 100) Hz 100 Hz to 5 kHz (5 to 20) kHz (20 to 50) kHz	0.17 % + 23 µA 0.17 % + 0.23 µA 0.070 % + 0.23 µA 0.035 % + 0.23 µA 0.068 % + 0.25 µA 0.46 % + 0.46 µA	
(1 to 10) mA	(10 to 20) Hz (20 to 45) Hz (45 to 100) Hz 100 Hz to 5 kHz (5 to 20) kHz (20 to 50) kHz	0.46 % + 2.3 µA 0.17 % + 2.3 µA 0.070 % + 2.3 µA 0.035 % + 2.3 µA 0.070 % + 2.3 µA 0.46 % + 4.6 µA	
(10 to 100) mA	(10 to 20) Hz (20 to 45) Hz (45 to 100) Hz 100 Hz to 5 kHz (5 to 20) kHz (20 to 50) kHz	0.46 % + 23 µA 0.17 % + 23 µA 0.070 % + 23 µA 0.035 % + 23 µA 0.070 % + 23 µA 0.46 % + 46 µA	
100 mA to 1 A	(10 to 20) Hz (20 to 45) Hz (45 to 100) Hz 100 Hz to 5 kHz (5 to 20) kHz	0.46 % + 0.23 mA 0.46 % + 0.23 mA 0.093 % + 0.23 mA 0.12 % + 0.23 mA 0.35 % + 0.23 mA	
(1 to 20) A	45 Hz to 1 kHz (1 to 5) kHz	0.031 % + 65 µA 0.046 % + 0.21 mA	HP 3458A opt 002 w/ Fluke Y5020 shunt
Distortion (THD)	20 Hz to 20 kHz (20 to 100) kHz	14 % of Indicated THD 30 % of Indicated THD	HP 8903A

Parameter/Equipment	Range	CMC[2, 7, 10] (±)	Comments
Oscilloscopes[3] –			
Amplitude – DC Signal: 50 Ω Load 1 MΩ Load	 1 mV to 6.6 V 1 mV to 130 V	 0.20 % + 32 µV 0.039 % + 32 µV	552X/SC1100
Amplitude – Square Wave: 50 Ω Load	 1 mV to 6.6 Vp-p 10 Hz to 100 kHz	 0.20 % + 32 µV	
1 MΩ Load	1 mV to 130 Vp-p 10 Hz to 100 kHz	0.078 % + 32 µV	
Bandwidth Flatness	50 kHz to 100 MHz (100 to 300) MHz (300 to 600) MHz (600 to 1100) MHz	1.2 % + 78 µV 1.6 % + 78 µV 3.2 % + 78 µV 3.9 % + 78 µV	
Time Marker	50 ms to 5 s 2 ns to 20 ms	(20 + (t1000)) µs/s 1.9 µs/s	t = time in seconds
Resistance – Measure	(40 to 60) Ω (0.5 to 1.5) MΩ	0.079 % 0.078 %	

III. Mechanical

Parameter/Equipment	Range	CMC[2, 7, 9] (±)	Comments
Force – Measure & Measuring Equipment[3, 5]	Up to 450 lbf	0.026 %	Dead weight
Load Cells / Force Gauges			
Compression	Up to 5000 lbf Up to 25 000 lbf Up to 60 000 lbf	0.12 % + 0.28 lbf 0.1 % + 0.4 lbf 0.069 % + 3 lbf	Load cells with digital display
Tension	Up to 5000 lbf Up to 25 000 lbf Up to 60 000 lbf	0.07 % + 0.03 lbf 0.23 % + 0.07 lbf 0.18 % - 0.7 lbf	Load cells with digital display

Parameter/Equipment	Range	CMC[2, 7, 9] (±)	Comments
Scales & Balances[3, 5]	1 mg to 1 g (0 to 10) g 10 g to 11 kg (11 to 500) kg	0.0050 mg (0.000 48 – 0.000 038*X*) % 0.000 060 % 0.012 %	Troemner weights *X* in g Class F weights
Volume[3] – Measure & Measuring Equipment	(0.5 to 2) µL (2 to 20) µL (20 to 200) µL (200 to 1000) µL (1000 to 25 000) µL	0.040 µL 0.052 µL (0.037 + 0.0033·*V*) µL (0.26 + 0.0020·*V*) µL (2.1 + 0.0011·*V*) µL	Balances *V* is the volume in µL
Torque – Measure[3]	(0.33 to 600) lb·ft	0.30 %	CDI torque system
Torque – Measuring Equipment[3]	(1 to 2000) lb·ft	0.060 %	Weights & arms
Pressure/Vacuum–– Measure & Measuring Equipment[3, 5]	Down to -14.2 psi (0 to 10) psi (> 10 to 15 000) psi	0.44 % 0.027 psi 0.12 %	Digital pressure gauges

IV. Thermodynamics

Parameter/Equipment	Range	CMC[2, 9] (±)	Comments
Temperature – Measure[3]	(-196 to -30) °C	0.033 °C	Fluke 5609, Fluke 1529
Temperature – Measure & Measuring Equipment[3]	-78 °C (-30 to 125) °C (125 to 425) °C (425 to 650) °C	0.033 °C 0.039 °C 0.053 °C 0.15 °C	Fluke 5609, Fluke 1529 with solid CO_2 & isopropyl alcohol w/ Fluke 7103 w/ Fluke 9172 w/ Omega CL700A

Parameter/Equipment	Range	CMC[2, 10] (±)	Comments
Temperature – Measure & Measuring Equipment[3]	Ice Point (Generate Only)	0.0027 °C	ASTM E563 ice point
Thermocouples	(-78 to 650) °C	0.059 °C	HP3458A, ice bath, Fluke 5609 /1529
Infrared Temperature – Measure & Measuring Equipment[3]	(35 to 500) °C	(0.30 + 0.0040 rdg) °C	Fluke 4181 Emissivity = 0.95 where wavelength = (8 to 14) µm
Relative Humidity – Measure & Measuring Equipment[3, 5]	(10 to 90) % RH (90 to 95) % RH	1.3 % RH 2.1 % RH	Vaisala M170/HMP77B

V. Time & Frequency

Parameter/Equipment	Frequency	CMC[2, 6, 9] (±)	Comments
Frequency – Measure[3, 5]	1 mHz to 18 GHz	3.5 parts in 10^{12} + 0.6*Rs* Hz	HP Z3801A GPS locked w/ frequency counter
Frequency – Measuring Equipment[5]	10 MHz Reference 1 mHz to 18 GHz	3.5 parts in 10^{12} Hz 3.5 parts in 10^{12} + 0.6*Rs* Hz	HP Z3801A GPS HP Z3801A GPS locked w/ signal generator
Frequency – Measure – Measuring Equipment[3, 5]	10 MHz Reference 1 mHz to 18 GHz	1 part in 10^{7} Hz 1 part in 10^{7} + 0.6*Rs* Hz	HP 5334B oscillator HP 5334B oscillator locked w/ signal generator

[1] This laboratory offers commercial calibration service and field calibration service, where noted.

[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 of the device measured in inches; *D* is the numerical value of the nominal diameter of the device measured in inches. *R* is the resolution of the unit under test.

[5] The contributions from the "best existing device" are not included in the CMC claim.

[6] *Rs* is the resolution of the signal generator or counter.

[7] Unless otherwise indicated, all % means % of reading.

[8] This scope meets A2LA's *P112 Flexible Scope Policy*.

[9] 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.

[10] 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.

Accredited Laboratory

A2LA has accredited

WESCAN CALIBRATION

Calgary, AB, CANADA

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 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 17th day of February 2025.

Mr. Trace McInturff, Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 1500.03
Valid to January 31, 2027

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