



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017,
ANSI/NCSL Z540-1-1994 & ANSI/NCSL Z540.3-2006

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CALIBRATION

Valid To: February 28, 2022

Certificate Number: 2662.01

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, 5, 6} (±)	Comments
Diameter, External – Cylindrical Gauging, Pin and Plug Gages	Up to 1 in	28 µin	Laser micrometer
	Up to 4 in	15 µin	THV w/ gage blocks
Diameter, Internal – Plain Ring Gages	(0.4 to 3) in	6.3 µin/in + 19 µin	THV w/ master rings
Flatness – Measure ³	1.5 in	3.5 µin	Optical flat
Hand Tools ³ –			
Indicators	Up to 1 in	2.9 µin/in + 5.8 µin + 0.6R	Gage blocks
Micrometers	Up to 48 in		
Depth Gages	Up to 12 in		
Height Gages	Up to 48 in		
Calipers	Up to 48 in		
Indicators	Up to 1 in	2.3 µin/in + 50 µin	Micrometer Starrett 716

Parameter/Equipment	Range	CMC ² (±)	Comments
Length Standard	Up to 4 in (4 to 24) in	15 µin 3.7 µin/in + 25 µin	THV w/ gage blocks and height comparator
Rulers ³	Up to 48 in	1200 µin	Micro-rule

II. Electrical – DC/Low Frequency

Parameter/Equipment	Range	CMC ^{2,4} (±)	Comments
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	7.1 µV/V + 0.40 µV 3.7 µV/V + 0.80 µV 4.9 µV/V + 3.0 µV 4.9 µV/V + 4.3 µV 3.7 µV/V + 48 µV 4.7 µV/V + 0.48 mV	Fluke 5720A
DC High Voltage – Generate ³	(1 to 15) kV	0.0025 VDC + 1.2 VDC/KVDC	Peschel P20Y-D w/ Ross VD15-50Y-A- LB-AL, Agilent 34401A
DC Voltage – Measure ³	(0.01 to 1) mV (1 to 10) mV Up to 100 mV (0.1 to 1) V (1 to 10) V (10 to 100) V (100 to 1000) V	52 µV/V + 10 nV 41 µV/V + 4.8 nV 9.5 µV/V + 0.37 µV 6.1 µV/V + 0.37 µV 5.8 µV/V + 0.60 µV 8.7 µV/V + 37 µV 8.7 µV/V + 0.12 mV	Agilent 34420A Agilent 3458A
DC High Voltage – Measure ³	(1 to 15) kV (15 to 60) kV	0.0025 V + 1.2 V/kV 0.0064 V + 1.2 V/kV	Ross VD15-50Y-A- LB-AL w/ Agilent 34401A Ross VD60-6.2Y-A- LB-ACD

Parameter/Equipment	Range	CMC ^{2, 4} (±)	Comments
DC Current –Generate ³	Up to 220 µA (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	35 µA/A + 6.0 nA 31 µA/A + 7.0 nA 30 µA/A + 41 nA 41 µA/A + 0.71 µA 77 µA/A + 12 µA 0.034 % + 0.48 mA	Fluke 5720A w/ 5725A
	(11 to 20.5) A	0.10 % + 0.91 A	Fluke 5520A
	(20 to 120) A	0.23 µA/A + 2.1 mA	Agilent 3458A w/ 6031A, 9711A
	Clamp-On Only ³	(20.5 to 1000) A	0.34 % + 0.05 A
DC Current – Measure ³	100 nA to 10 µA (10 to 100) µA 100 µA to 10 mA (10 to 100) mA 100 mA to 1 A	17 µA/A + 0.80 nA 17 µA/A + 5.0 nA 17 µA/A + 50 nA 31 µA/A + 0.50 µA 0.010 % + 10 µA	Agilent 3458A
	(1 to 10) A (10 to 100) A (1 to 300) A	0.012 % + 10 µA 0.058 % + 18 µA 0.12 % + 16 µA	Guildline 9711A w/ Agilent 3458A
DC Resistance – Generate ³	Up to 10.9999 Ω (11 to 32.9999) Ω (33 to 109.9999) Ω (110 to 329.9999) Ω (0.33 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 109.999) kΩ (110 to 329.999) kΩ	40 µΩ/Ω + 1.0 mΩ 30 µΩ/Ω + 2.0 mΩ 28 µΩ/Ω + 2.0 mΩ 28 µΩ/Ω + 4.0 mΩ 28 µΩ/Ω + 13 mΩ 28 µΩ/Ω + 13 mΩ 28 µΩ/Ω + 30 mΩ 28 µΩ/Ω + 0.30 Ω 28 µΩ/Ω + 0.30 Ω 32 µΩ/Ω + 2.0 Ω	Fluke 5520A, 4-wire

Parameter/Equipment	Range	CMC ^{2, 4, 5} (±)	Comments	
DC Resistance – Generate ³ (cont)	(0.33 to 1.099 99) MΩ (1.1 to 3.299 00) MΩ (3.3 to 10.9999) MΩ (11 to 32.9999) MΩ (33 to 109.9999) MΩ (110 to 329.9999) MΩ (330 to 1100) MΩ	32 μΩ/Ω + 2.2 Ω 60 μΩ/Ω + 39 Ω 0.013 % + 63 Ω 0.025 % + 2.5 kΩ 0.050 % + 3.0 kΩ 0.30 % + 0.10 MΩ 1.5 % + 0.50 MΩ	Fluke 5520A, 2-wire	
	(1 to 100) MΩ	0.11 % + 1.3 kΩ	Biddle 72-6346-1	
DC Resistance – Generate, Fixed Points ³	0 Ω	41 μΩ	Fluke 5700A	
	1 Ω	81 μΩ/Ω		
	1.9 Ω	82 μΩ/Ω		
	10, 19 Ω	23 μΩ/Ω		
	100, 190 Ω	9.5 μΩ/Ω		
	1, 1.9 kΩ	8.5 μΩ/Ω		
	10, 19 kΩ	8.5 μΩ/Ω		
	100, 190 kΩ	11 μΩ/Ω		
	1 MΩ	20 μΩ/Ω		
	1.9 MΩ	30 μΩ/Ω		
	10 MΩ	35 μΩ/Ω		
	19 MΩ	45 μΩ/Ω		
	100 MΩ	0.010 %		
	1 Ω	0.3 μΩ/Ω		Ohm-Labs SmartResistor
	10 Ω	0.4 μΩ/Ω		
	100 Ω	0.5 μΩ/Ω		
	1 kΩ	0.5 μΩ/Ω		
10 kΩ	0.4 μΩ/Ω			
100 kΩ	0.6 μΩ/Ω			
1 MΩ	1.6 μΩ/Ω			
10 MΩ	4.2 μΩ/Ω			
1 GΩ	0.20 %	Keithley 5155-9		
10 GΩ	0.20 %	Keithley 5155-10		
100 GΩ	0.21 %	Keithley 5155-11		
1 TΩ	0.31 %	Keithley 5155-11		

Parameter/Equipment	Range	CMC ^{2, 4, 5} (±)	Comments
DC Resistance – Measure ³	(0.01 to 1) Ω (1 to 10) Ω	81 μΩ/Ω + 2.7 μΩ 77 μΩ/Ω + 36 μΩ	Agilent 34420A
	Up to 10 Ω (10 to 100) Ω (100 to 1000) Ω (1 to 10) kΩ (10 to 100) kΩ (100 to 1000) kΩ (1 to 10) MΩ (10 to 100) MΩ (0.1 to 1) GΩ	18 μΩ/Ω + 58 μΩ 12 μΩ/Ω + 0.58 mΩ 9.5 μΩ/Ω + 5.8 mΩ 9.5 μΩ/Ω + 58 mΩ 9.7 μΩ/Ω + 0.58 Ω 15 μΩ/Ω + 2.3 Ω 58 μΩ/Ω + 0.12 kΩ 0.058 % + 1.2 kΩ 0.59 % + 12 kΩ	Agilent 3458A
Thermocouple – Measure ³			
Type J	(-210 to -100) °C (-100 to 800) °C (800 to 1200) °C	0.14 °C 0.09 °C 0.1 °C	Fluke 5520A
Type K	(-250 to -200) °C (-200 to -100) °C (-100 to 500) °C (500 to 800) °C (800 to 1372) °C	0.46 °C 0.16 °C 0.1 °C 0.1 °C 0.13 °C	
Type T	(-250 to -200) °C (-200 to -100) °C (-100 to 0) °C (0 to 200) °C (200 to 400) °C	0.35 °C 0.16 °C 0.11 °C 0.09 °C 0.09 °C	

Parameter/Equipment	Range	CMC ^{2, 4, 5} (±)	Comments
Electrical Calibration of Thermocouple Indicators ³ –			
Type B	(600 to 800) °C (800 to 1550) °C (1550 to 1820) °C	0.35 °C 0.28 °C 0.22 °C	Fluke 5520A
Type C	(0 to 1000) °C (1000 to 1800) °C (1800 to 2000) °C (2000 to 2316) °C	0.16 °C 0.23 °C 0.26 °C 0.35 °C	
Type E	(-250 to -200) °C (-200 to -100) °C (-100 to 0) °C (0 to 600) °C (600 to 1000) °C	0.25 °C 0.12 °C 0.09 °C 0.08 °C 0.1 °C	
Type J	(-210 to -100) °C (-100 to 800) °C (800 to 1200) °C	0.14 °C 0.09 °C 0.1 °C	
Type K	(-250 to -200) °C (-200 to -100) °C (-100 to 500) °C (500 to 800) °C (800 to 1372) °C	0.46 °C 0.16 °C 0.1 °C 0.1 °C 0.13 °C	

Parameter/Equipment	Range	CMC ^{2,4} (±)	Comments
Electrical Calibration of Thermocouple Indicators ³ – (cont)			
Type L	(-200 to -100) °C (-100 to 900) °C	0.1 °C 0.09 °C	Fluke 5520A
Type N	(-250 to -200) °C (-200 to -100) °C (-100 to 0) °C (0 to 100) °C (100 to 800) °C (800 to 1300) °C	0.73 °C 0.23 °C 0.12 °C 0.11 °C 0.1 °C 0.12 °C	
Type R	(-50 to -25) °C (-25 to 0) °C (0 to 100) °C (100 to 400) °C (400 to 600) °C (600 to 1000) °C (1000 to 1600) °C (1600 to 1767) °C	0.55 °C 0.45 °C 0.39 °C 0.28 °C 0.22 °C 0.21 °C 0.19 °C 0.23 °C	
Type S	(-50 to -25) °C (-25 to 0) °C (0 to 100) °C (100 to 400) °C (400 to 600) °C (600 to 1000) °C (1000 to 1600) °C (1600 to 1767) °C	0.51 °C 0.43 °C 0.38 °C 0.29 °C 0.23 °C 0.22 °C 0.22 °C 0.26 °C	
Type T	(-250 to -200) °C (-200 to -100) °C (-100 to 0) °C (0 to 200) °C (200 to 400) °C	0.35 °C 0.16 °C 0.11 °C 0.09 °C 0.09 °C	
Type U	(-200 to 0) °C (0 to 200) °C (200 to 600) °C	0.16 °C 0.1 °C 0.1 °C	

Parameter/Equipment	Range	CMC ^{2,4} (±)	Comments
Electrical Calibration of RTDs – Generate ³			
Pt 385, 100 Ω	(-200 to -80) °C (-80 to 100) °C (100 to 300) °C (300 to 400) °C (400 to 600) °C (600 to 800) °C	0.013 °C 0.02 °C 0.024 °C 0.026 °C 0.033 °C 0.038 °C	Fluke 5520A
Pt 3926, 100 Ω	(-200 to -80) °C (-80 to 0) °C (0 to 100) °C (100 to 300) °C (300 to 400) °C (400 to 630) °C	0.013 °C 0.015 °C 0.017 °C 0.022 °C 0.026 °C 0.032 °C	
Pt 3916, 100 Ω	(-200 to -190) °C (-190 to -80) °C (-80 to 0) °C (0 to 100) °C (100 to 300) °C (300 to 400) °C (400 to 600) °C (600 to 630) °C	0.01 °C 0.013 °C 0.015 °C 0.017 °C 0.022 °C 0.026 °C 0.031 °C 0.033 °C	
Pt 385, 200 Ω	(-200 to -80) °C (-80 to 0) °C (0 to 100) °C (100 to 260) °C (260 to 300) °C (300 to 400) °C (400 to 630) °C	0.053 °C 0.056 °C 0.06 °C 0.06 °C 0.069 °C 0.071 °C 0.088 °C	
Pt 385, 500 Ω	(-200 to 0) °C (0 to 100) °C (100 to 300) °C (300 to 400) °C (400 to 630) °C	0.026 °C 0.028 °C 0.034 °C 0.038 °C 0.045 °C	
Pt 385, 1000 Ω	(-200 to 0) °C (0 to 100) °C (100 to 300) °C (300 to 400) °C (400 to 630) °C	0.015 °C 0.018 °C 0.024 °C 0.026 °C 0.033 °C	

Parameter/Range	Frequency	CMC ^{2,4} (±)	Comments
AC Voltage – Generate ³			
Up to 2.2 mV	(10 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 500 kHz to 1 MHz	0.022 % + 4.0 μV 85 μV/V + 4.0 μV 75 μV/V + 4.0 μV 0.018 % + 4.0 μV 0.046 % + 5.0 μV 0.090 % + 10 μV 0.12 % + 20 μV 0.25 % + 20 μV	Fluke 5720A
(2.2 to 22) mV	(10 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 500 kHz to 1 MHz	0.022 % + 4.0 μV 85 μV/V + 4.0 μV 75 μV/V + 4.0 μV 0.018 % + 4.0 μV 0.046 % + 5.0 μV 0.090 % + 10 μV 0.12 % + 20 μV 0.25 % + 20 μV	
(22 to 220) mV	(10 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 500 kHz to 1 MHz	0.022 % + 12 μV 85 μV/V + 7.0 μV 75 μV/V + 7.0 μV 0.018 % + 7.0 μV 0.042 % + 17 μV 0.075 % + 20 μV 0.12 % + 25 μV 0.25 % + 45 μV	
220 mV to 2.2 V	(10 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 500 kHz to 1 MHz	0.022 % + 82 μV 85 μV/V + 82 μV 40 μV/V + 82 μV 70 μV/V + 82 μV 0.011 % + 82 μV 0.034 % + 82 μV 0.090 % + 0.20 mV 0.15 % + 0.32 mV	

Parameter/Range	Frequency	CMC ^{2,4} (±)	Comments
AC Voltage – Generate ³ (cont)			
(2.2 to 22) V	(10 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 500 kHz to 1 MHz	0.022 % + 0.40 mV 80 μV/V + 0.15 mV 40 μV/V + 50 μV 70 μV/V + 0.10 mV 95 μV/V + 0.20 mV 0.026 % + 0.60 mV 0.090 % + 2.0 mV 0.13 % + 3.2 mV	Fluke 5720A
(22 to 220) V*	(10 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 500 kHz to 1 MHz	0.022 % + 4.0 mV 80 μV/V + 1.5 mV 47 μV/V + 0.61 mV 75 μV/V + 1.0 mV 0.013 % + 2.5 mV 0.080 % + 16 mV 0.42 % + 40 mV 0.70 % + 80 mV	* 220 V range subject to 2.2E7 V-Hz limitation
(220 to 1100) V	40 Hz to 1 kHz (1 to 20) kHz (20 to 30) kHz	80 μV/V + 4.1 mV 0.013 % + 6.1 mV 0.036 % + 11 mV	
(220 to 750) V	(30 to 50) kHz (50 to 100) kHz (100 to 300) kHz (300 to 500) kHz (500 to 1000) kHz	0.036 % + 11 mV 0.080 % + 45 mV 0.13 % + 83 mV 0.42 % + 91 mV 0.70 % + 1.1 V	
AC High Voltage – Generate ³			
(1 to 10) kV	50/60 Hz	2.3 V + 2.5 V/kV	Ross VD15-50Y-A-LB- AL w/ Agilent 34401A, Peschel P20Y-D
AC High Voltage – Measure ³			
(1 to 60) kV	50/60 Hz	2.3 V + 2.5 V/kV	Ross VD15-50Y-A-LB- AL w/ Agilent 34401A

Parameter/Range	Frequency	CMC ^{2,4} (±)	Comments
AC Voltage – Measure ³			
(0 to 2.2) mV	(10 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	0.17 % + 1.3 μV 0.074 % + 1.3 μV 0.042 % + 1.3 μV 0.081 % + 2.0 μV 0.12 % + 2.5 μV 0.23 % + 4.0 μV 0.24 % + 8.0 μV 0.35 % + 8.0 μV	Fluke 5790A
(2.2 to 7) mV	(10 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	0.085 % + 1.3 μV 0.037 % + 1.3 μV 0.021 % + 1.3 μV 0.040 % + 2.0 μV 0.060 % + 2.5 μV 0.12 % + 4.0 μV 0.13 % + 8.0 μV 0.23 % + 8.0 μV	
(7 to 22) mV	(10 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	0.029 % + 1.3 μV 0.019 % + 1.3 μV 0.011 % + 1.3 μV 0.021 % + 2.0 μV 0.031 % + 2.5 μV 0.081 % + 4.0 μV 0.089 % + 8.0 μV 0.17 % + 8.0 μV	
(22 to 70) mV	(10 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 % + 1.5 μV 0.012 % + 1.5 μV 65 μV/V + 1.5 μV 0.013 % + 2.0 μV 0.026 % + 2.5 μV 0.051 % + 4.0 μV 0.067 % + 8.0 μV 0.11 % + 8.0 μV	
(70 to 220) mV	(10 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	0.021 % + 1.5 μV 85 μV/V + 1.5 μV 38 μV/V + 1.5 μV 69 μV/V + 2.0 μV 0.016 % + 2.5 μV 0.025 % + 4.0 μV 0.038 % + 8.0 μV 0.10 % + 8.0 μV	

Parameter/Range	Frequency	CMC ^{2, 4, 5} (±)	Comments
AC Voltage – Measure ³ (cont)			
(220 to 700) mV	(10 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	0.021 % + 1.5 μV 76 μV/V + 1.5 μV 33 μV/V + 1.5 μV 51 μV/V + 2.0 μV 79 μV/V + 2.5 μV 0.018 % + 4.0 μV 0.030 % + 8.0 μV 0.096 % + 8.0 μV	Fluke 5790A
700 mV to 2.2 V	(10 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	0.020 % 66 μV/V 24 μV/V 46 μV/V 71 μV/V 0.016 % 0.026 % 0.090 %	
(2.2 to 7) V	(10 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	0.020 % 67 μV/V 24 μV/V 48 μV/V 81 μV/V 0.019 % 0.040 % 0.12 %	
(7 to 22) V	(10 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	0.020 % 67 μV/V 27 μV/V 48 μV/V 81 μV/V 0.019 % 0.040 % 0.12 %	
(22 to 70) V	(10 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	0.020 % 68 μV/V 32 μV/V 57 μV/V 94 μV/V 0.020 % 0.041 % 0.12 %	

Parameter/Range	Frequency	CMC ^{2, 4, 5} (±)	Comments
AC Voltage – Measure ³ (cont)			
(70 to 220) V	(10 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	0.020 % 68 µV/V 31 µV/V 69 µV/V 98 µV/V 0.021 % 0.050 %	Fluke 5790A
(220 to 700) V	(10 to 20) Hz (20 to 40) Hz 40 Hz to 20 kHz (20 to 50) kHz (50 to 100) kHz	0.020 % 99 µV/V 41 µV/V 0.013 % 0.050 %	
(700 to 1000) V	(10 to 20) Hz (20 to 40) Hz 40 Hz to 20 kHz (20 to 50) kHz (50 to 100) kHz	0.020 % 99 µV/V 38 µV/V 0.013 % 0.050 %	
AC Voltage – Wide Band Input ³			
(0 to 2.2) mV	(1 to 2) MHz (2 to 10) MHz (10 to 20) MHz (20 to 30) MHz	0.070 % + 1.0 µV 0.17 % + 1.0 µV 0.30 % + 1.0 µV 0.70 % + 2.0 µV	Fluke 5790A
(2.2 to 7) mV	(1 to 2) MHz (2 to 10) MHz (10 to 20) MHz (20 to 30) MHz	0.070 % + 1.0 µV 0.10 % + 1.0 µV 0.17 % + 1.0 µV 0.37 % + 1.0 µV	
(7 to 22) mV	(1 to 2) MHz (2 to 10) MHz (10 to 20) MHz (20 to 30) MHz	0.070 % + 0.17 µV 0.10 % + 0.17 µV 0.17 % + 0.17 µV 0.37 % + 0.17 µV	
22 mV to 7 V	(1 to 2) MHz (2 to 10) MHz (10 to 20) MHz (20 to 30) MHz	0.05 % + 1.4 µV 0.10 % + 1.4 µV 0.15 % + 1.4 µV 0.35 % + 1.4 µV	

Parameter/Range	Frequency	CMC ^{2, 4, 5} (\pm)	Comments
AC Current – Generate ³			
Up to 220 μ A	(10 to 20) Hz (20 to 40) Hz 40 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz	0.023 % + 16 nA 0.014 % + 10 nA 0.011 % + 8.0 nA 0.025 % + 12 nA 0.090 % + 65 nA	Fluke 5720A w/ 5725A
220 μ A to 2.2 mA	(10 to 20) Hz (20 to 40) Hz 40 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz	0.023 % + 40 nA 0.014 % + 36 nA 0.011 % + 36 nA 0.025 % + 0.11 μ A 0.090 % + 0.65 μ A	
(2.2 to 22) mA	(10 to 20) Hz (20 to 40) Hz 40 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz	0.023 % + 0.41 μ A 0.014 % + 0.36 μ A 0.011 % + 0.36 μ A 0.025 % + 0.56 μ A 0.090 % + 5.0 μ A	
(22 to 220) mA	(10 to 20) Hz (20 to 40) Hz 40 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz	0.023 % + 4.0 μ A 0.014 % + 4.0 μ A 0.011 % + 3.0 μ A 0.018 % + 4.0 μ A 0.090 % + 10 μ A	
220 mA to 2.2 A	20 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz	0.024 % + 35 μ A 0.039 % + 80 μ A 0.60 % + 0.16 mA	
(2.2 to 11) A	40 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz	0.040 % + 0.19 mA 0.085 % + 0.39 mA 0.33 % + 0.75 mA	
(11 to 20.5) A	(45 to 100) Hz 100 Hz to 1 kHz (1 to 5) kHz	0.12 % + 5.1 mA 0.15 % + 5.1 mA 3.0 % + 5.1 mA	
(20.5 to 1000) A	(45 to 65) Hz (65 to 440) Hz	0.39 % 0.94 %	Fluke 5520A w/ coil

Parameter/Range	Frequency	CMC ^{2, 4, 5} (±)	Comments
AC Current – Measure ³			
200 µA to 2 mA	(10 to 20) Hz 20 Hz to 1 kHz (1 to 10) kHz	0.021 % 0.010 % 54 µA/A	Fluke A40B, Fluke 5790A
(2 to 20) mA	(10 to 20) Hz (20 to 40) Hz 40 Hz to 10 kHz	0.021 % 93 µA/A 54 µA/A	
(20 to 200) mA	(10 to 20) Hz (20 to 40) Hz 40 Hz to 10 kHz	0.020 % 74 µA/A 39 µA/A	
200 mA to 2.2 A	40 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz	41 µA/A 74 µA/A 0.018 %	
(2.2 to 20) A	(45 to 100) Hz 100 Hz to 1 kHz (1 to 5) kHz	62 µA/A 68 µA/A 0.018 %	
(10 to 120) A	(50 to 400) Hz	0.15 %	L&N shunt, Fluke 5790A
(1 to 2) A (1 to 2) A (2 to 20) A (2 to 20) A (20 to 100) A	Up to 1 kHz (1 to 10) kHz Up to 1 kHz (1 to 10) kHz Up to 1 kHz	1.2 mA/A + 5.6 µA 1.2 mA/A + 16 µA 1.2 mA/A + 210 µA 5.8 mA/A + 210 µA 1.2 mA/A + 5.7 mA	Agilent 3458A w/ Valhalla 2575A
DC Power – Generate ³	(0.34 to 337) W 337 W to 3 kW (3 to 20) kW	0.023 % 0.022 % 0.07 %	Fluke 5520A
AC Power – Generate ³			
(45 to 65) Hz PF = 1	109 uW to 21 kW	0.11 %	Fluke 5520A
AC Ratio, Fixed Points	400 Hz 1 kHz	0.000 12 % 0.000 15 %	DT72A

Parameter/Range	Frequency	CMC ^{2, 4, 5} (±)	Comments
Synchro/Resolver ³ – Indicators (0 to 360) ^o Simulators (0 to 360) ^o	400 Hz 400 Hz	0.000 063 ^o 0.000 083 ^o	DSRS-5DR DCRB-5C-4R
Capacitance – Generate ³ (0.10 to 3.299) nF (0.33 to 10.999) nF (11 to 109.999) nF (110 to 329.99) nF (0.33 to 1.0999) μF (1.1 to 3.2999) μF (3.3 to 10.999) μF (11 to 32.999) μF (33 to 109.99) μF (110 to 329.99) μF (0.33 to 1.0999) mF (1.1 to 3.2999) mF (3.3 to 10.999) mF (11 to 32.999) mF (33 to 110) mF	10 Hz to 10 kHz (10 to 1000) Hz (10 to 1000) Hz (10 to 1000) Hz (10 to 600) Hz (10 to 300) Hz (10 to 150) Hz (10 to 120) Hz (10 to 80) Hz Up to 50 Hz Up to 20 Hz Up to 6 Hz Up to 2 Hz Up to 0.6 Hz Up to 0.2 Hz	0.51 % + 12 pF 0.26 % + 12 pF 0.26 % + 0.12 nF 0.26 % + 0.31 nF 0.26 % + 1.2 nF 0.26 % + 3.1 nF 0.26 % + 12 nF 0.42 % + 31 nF 0.46 % + 0.12 μF 0.46 % + 0.31 μF 0.46 % + 1.2 μF 0.46 % + 3.1 μF 0.46 % + 12 μF 0.78 % + 31 μF 1.2 % + 0.12 mF	Fluke 5520A
Capacitance – Generate, Fixed Points ³ 1 pF 10 pF 100 pF 1000 pF	1 kHz to 13 MHz	0.37 % 0.040 % 0.067 % 0.33 %	Agilent 16380A set (4 terminal)
Capacitance – Measure ³ (0 to 1100) μF	(0.1, 0.12, 1 and 10) kHz	0.023 %	GenRad 1689

Parameter/Range	Frequency	CMC ^{2, 4, 5} (\pm)	Comments
Inductance – Generate, Fixed Points 100 mH 0.1 mH 1 mH	(0.1, 1) kHz (0.1, 1, 10) kHz (0.1, 1, 10) kHz	0.11 mH 0.000 55 mH 0.0013 mH	GenRad 106K GenRad 106L GenRad 106G
Inductance – Measure ³ 1 μ H to 10 H	1 kHz	0.023 %	GenRad 1689
Oscilloscope ³ – 50 Ω Load 1 M Ω Load Squarewave Signal – 50 Ω @ 1 kHz 1 M Ω 10 Hz to 1 kHz (1 to 10) kHz Level Sine Wave – Amplitude (50 kHz Reference) Flatness (50 kHz Reference)	DC DC 1.0 mV to 6.6 V _{p-p} 1.0 mV to 130 V _{p-p} 1.0 mV to 130 V _{p-p} 50 kHz 50 kHz to 100 MHz (100 to 300) MHz (300 to 600) MHz (600 to 1100) MHz 50 kHz to 100 MHz (100 to 300) MHz (300 to 600) MHz (600 to 1100) MHz	0.25 % of output + 40 μ V 0.050 % of output + 40 μ V 0.25 % of output + 40 μ V 0.10 % of output + 40 μ V 0.25 % of output + 40 μ V 2.0 % + 300 μ V 3.5 % + 300 μ V 4.0 % + 300 μ V 6.0 % + 300 mV 7.0 % + 300 mV 1.5 % + 100 μ V 2.0 % + 100 μ V 4.0 % + 100 μ V 5.0 % + 100 μ V	Fluke 5520A/SC1100

Parameter/Range	Frequency	CMC ^{2,4} (±)	Comments
Oscilloscope ³ – (cont)			
Time Markers – Source and Period Into a 50 Ω Load	5 s to 50 ms 20 ms to 2 ns	(25 + 1000t) μs/s 2.5 μs/s	Fluke 5520A/SC1100 t = time in seconds
Rise Time – ≤ 2 MHz > 2 MHz	≤ 300 ps ≤ 350 ps	+ 0 ps / -100 ps + 0 ps / -100 ps	
Wave Generator – Amplitude – 1 MΩ 50 Ω	1.8 mV to 55 V _{pk-pk} 1.8 mV to 2.5 V _{pk-pk}	3.0 % of output + 100 μV 3.0 % of output + 100 μV	
Phase – Measure, Fixed Points ³	101 Hz 1 kHz 101 kHz 1 MHz 13 MHz	0.010° 0.0061° 0.068° 0.67° 8.4°	Agilent 53131A
(0 to 360)° 50 mV to 120 V	20 Hz to 10 kHz (10 to 40) kHz (40 to 100) kHz	0.081° 0.29° 0.98°	Krohn-Hite 6500

Parameter/Equipment	Frequency	CMC ^{2,4} (±)	Comments
AC Flatness – Measure, Fixed Points ³	100/200 Hz	0.0044 V	Precision measurements EL 1200 (75 Ω)
	10 kHz	0.0041 V	
	30 kHz	0.0042 V	
	100 kHz	0.0042 V	
	300 kHz	0.0041 V	
	1 MHz	0.0041 V	
	3 MHz	0.0042 V	
	8 MHz	0.0042 V	
	10 MHz	0.0042 V	
	20 MHz	0.0045 V	
	30 MHz	0.0048 V	
	50 MHz	0.0067 V	
	70 MHz	0.0098 V	
	80 MHz	0.012 V	
	10 Hz	0.0035 V	Ballantine 1395A-3 (50 Ω)
	100 Hz	0.0036 V	
	10 kHz	0.0036 V	
	30 kHz	0.0036 V	
	100 kHz	0.0038 V	
	300 kHz	0.0037 V	
	1 MHz	0.0036 V	
	3 MHz	0.0037 V	
	8 MHz	0.0039 V	
	10 MHz	0.0039 V	
	20 MHz	0.0062 V	
	30 MHz	0.0061 V	
	50 MHz	0.0094 V	
	70 MHz	0.015 V	
	80 MHz	0.018 V	
	10 Hz	0.021 V	
	100 Hz	0.021 V	
	10 kHz	0.021 V	
	30 kHz	0.021 V	
	100 kHz	0.021 V	
	300 kHz	0.021 V	
	1 MHz	0.10 V	
	3 MHz	0.021 V	
	8 MHz	0.022 V	
	10 MHz	0.022 V	
	20 MHz	0.12 V	

III. Electrical – RF/Microwave

Parameter/Range	Frequency	CMC ^{2, 4, 5} (±)	Comments
Power Meter – Power Reference, @ 1 mW ³	50 MHz	1.9 %	Agilent 432A w/ 478A
Absolute Power – Measure ³			Power meter w/:
(-70 to -30) dBm	10 MHz to 18 GHz	2.7 %	8484A, N-type
(-30 to +10) dBm	100 kHz to 4.2 GHz (4.2 to 18) GHz (18 to 26.5) GHz (26.5 to 50) GHz	1.4 % 1.9 % 2.4 % 0.087 dBm	8482A H85, N-type 8481A H85, N-type 8485A H85, 3.5 mm 8487A
(+10 to +20) dBm	100 kHz to 4.2 GHz (4.2 to 18) GHz (18 to 26.5) GHz (26.5 to 50) GHz	3.3 % 3.5 % 3.8 % 0.087 dBm	8482A H85, N-type 8481A H85, N-type 8485A H85, 3.5 mm 8487A
Relative Power – Measure ³			Agilent 8902A
(0 to -10) dB	10 MHz to 26.5 GHz	0.046 dB	
(-10 to -20) dB	10 MHz to 26.5 GHz	0.053 dB	
(-20 to -30) dB	10 MHz to 26.5 GHz	0.080 dB	
(-30 to -40) dB	10 MHz to 26.5 GHz	0.098 dB	
(-40 to -50) dB	10 MHz to 26.5 GHz	0.11 dB	
(-50 to -60) dB	10 MHz to 26.5 GHz	0.12 dB	
(-60 to -70) dB	10 MHz to 26.5 GHz	0.13 dB	
(-70 to -80) dB	10 MHz to 26.5 GHz	0.17 dB	
(-80 to -90) dB	10 MHz to 26.5 GHz	0.18 dB	
(-90 to -100) dB	10 MHz to 26.5 GHz	0.19 dB	
(-100 to -110) dB	10 MHz to 26.5 GHz	0.19 dB	
(-110 to -120) dB	10 MHz to 26.5 GHz	0.21 dB	

Parameter/Range	Frequency	CMC ^{2,4} (±)	Comments
Attenuation – Measure ³			
(0 to -10) dB	10 MHz to 26.5 GHz	0.024 dB	HP 8902A w/ 11722A, 11792A
(-10 to -20) dB	10 MHz to 26.5 GHz	0.029 dB	
(-20 to -30) dB	10 MHz to 26.5 GHz	0.035 dB	
(-30 to -40) dB	10 MHz to 26.5 GHz	0.041 dB	
(-40 to -50) dB	10 MHz to 26.5 GHz	0.047 dB	
(-50 to -60) dB	10 MHz to 26.5 GHz	0.053 dB	
(-60 to -70) dB	10 MHz to 26.5 GHz	0.058 dB	
(-70 to -80) dB	10 MHz to 26.5 GHz	0.064 dB	HP 8902A w/ 11722A
(-80 to -90) dB	10 MHz to 26.5 GHz	0.070 dB	
(-90 to -100) dB	10 MHz to 26.5 GHz	0.075 dB	
(-100 to -110) dB	10 MHz to 1.3 GHz	0.12 dB	
(-110 to -120) dB	10 MHz to 1.3 GHz	0.17 dB	
Attenuation – Generate ³			
10 dB	30 MHz	0.010 dB	Weinschel PA-2
20 dB	30 MHz	0.016 dB	
30 dB	30 MHz	0.022 dB	
40 dB	30 MHz	0.021 dB	
50 dB	30 MHz	0.028 dB	
60 dB	30 MHz	0.031 dB	
70 dB	30 MHz	0.033 dB	
80 dB	30 MHz	0.042 dB	
90 dB	30 MHz	0.045 dB	
100 dB	30 MHz	0.051 dB	
10 dBm	10 MHz to 12.4 GHz (12.4 to 18) GHz	0.58 dBm 0.69 dBm	HP 8496B
20 dBm	10 MHz to 12.4 GHz (12.4 to 18) GHz	0.81 dBm 0.92 dBm	
30 dBm	10 MHz to 12.4 GHz (12.4 to 18) GHz	1.0 dBm 1.4 dBm	

Parameter/Range	Frequency	CMC ^{2, 4, 5} (\pm)	Comments
Attenuation – Generate ³ (cont)			
40 dBm	10 MHz to 12.4 GHz (12.4 to 18) GHz	1.4 dBm 1.8 dBm	HP 8496B
50 dBm	10 MHz to 12.4 GHz (12.4 to 18) GHz	1.7 dBm 2.8 dBm	
60 dBm	10 MHz to 12.4 GHz (12.4 to 18) GHz	2.3 dBm 3.0 dBm	
70 dBm	10 MHz to 12.4 GHz (12.4 to 18) GHz	2.4 dBm 3.2 dBm	
80 dBm	10 MHz to 12.4 GHz (12.4 to 18) GHz	2.8 dBm 3.7 dBm	
90 dBm	10 MHz to 12.4 GHz (12.4 to 18) GHz	3.1 dBm 4.2 dBm	
100 dBm	10 MHz to 12.4 GHz (12.4 to 18) GHz	3.5 dBm 4.6 dBm	
110 dBm	10 MHz to 12.4 GHz (12.4 to 18) GHz	3.5 dBm 5.1 dBm	
Amplitude Modulation – Measure			
Rate: 50 Hz to 10 kHz Depths: 5 % to 99 %	150 kHz to 10 MHz	2.4 % + 1.0 digit	HP 8902A w/ 11793A
Rate: 20 Hz to 10 kHz Depths: Up to 99 %	150 kHz to 10 MHz	3.5 % + 1.0 digit	
Rate: 50 Hz to 50 kHz Depths: 5 % to 99 %	10 MHz to 1.3 GHz	1.2 % + 1.0 digit	
Rate: 20 Hz to 100 kHz Depths: Up to 99 %	10 MHz to 1.3 GHz	3.5 % + 1.0 digit	
Rate: 50 Hz to 50 kHz Depths: 5 % to 99 %	(1.3 to 26.5) GHz	1.8 % + 1.0 digit	
Rate: 20 Hz to 100 kHz Depths: Up to 99 %	(1.3 to 26.5) GHz	3.6 % + 1.0 digit	

Parameter/Range	Frequency	CMC ^{2, 4, 5} (±)	Comments
Frequency Modulation – Measure Rate: 20 Hz to 10 kHz Dev.: ≤ 40 kHz Peak Rate: 50 Hz to 100 kHz Dev.: ≤ 400 kHz Peak Rate: 20 Hz to 200 kHz Dev.: ≤ 400 kHz Peak Rate: 50 Hz to 100 kHz Dev.: ≤ 400 kHz Peak Rate: 20 Hz to 200 kHz Dev.: ≤ 400 kHz Peak	250 kHz to 10 MHz 10 MHz to 1.3 GHz 10 MHz to 1.3 GHz (1.3 to 26.5) GHz (1.3 to 26.5) GHz	2.3 % + 1.0 digit 1.2 % + 1.0 digit 5.8 % + 1.0 digit 1.2 % + 1.0 digit 5.8 % + 1.0 digit	HP 8902A w/ 11793A
Phase Modulation – Measure Rate: 200 Hz to 10 kHz (0 to 100) rad Rate: 200 Hz to 20 kHz (0 to 100) rad Rate: 200 Hz to 20 kHz (0 to 100) rad	Carrier: 150 kHz ≤ f_c < 10 MHz 10 MHz ≤ f_c < 1.3 GHz 10 MHz ≤ f_c < 26.5 GHz	4.7 % + 1.0 digit 3.6 % + 1.0 digit 3.5 % + 1.0 digit	HP 8902A w/ 11793A
Reflection S ₁₁ /S ₂₂ – Measure VSWR	45 MHz 45 MHz to 2 GHz (2 to 8) GHz (8 to 20) GHz (20 to 26.5) GHz	0.0076 lin 0.0070 lin 0.013 lin 0.013 lin 0.014 lin	8510C, 85053B, 85131D, 85052B

Parameter/Range	Frequency	CMC ^{2, 4} (±)	Comments
Transmission S ₁₂ /S ₂₁ – Measure			
(0 to 20) dB (20 to 40) dB (40 to 60) dB	45 MHz	(0.025 to 0.038) dB 0.16 dB (0.095 to 0.11) dB	8510C, 85053B, 85131D, 85052B
(0 to 20) dB (20 to 40) dB (40 to 60) dB	45 MHz to 2 GHz	(0.032 to 0.043) dB (0.15 to 0.16) dB 0.23 dB	
(0 to 20) dB (20 to 40) dB (40 to 60) dB	(2 to 8) GHz	(0.043 to 0.051) dB 0.19 dB (0.11 to 0.12) dB	
(0 to 20) dB (20 to 40) dB (40 to 60) dB	(8 to 20) GHz	(0.068 to 0.074) dB (0.21 to 0.22) dB 0.34 dB	
(0 to 20) dB (20 to 40) dB (40 to 60) dB	(20 to 26.5) GHz	(0.086 to 0.091) dB (0.25 to 0.26) dB 0.72 dB	
Distortion – Measure ³	20 Hz to 20 kHz (20 to 100) kHz	1.2 dB 2.3 dB	HP 8903B
	100 kHz to 2.5 GHz (2.5 to 26.5) GHz	1.8 dBm 2.6 dBm	HP 8566A HP 8563E

IV. Mechanical

Parameter/Equipment	Range	CMC ² (±)	Comments
Balances and Scales ³	(1 to 200) g 200 g to 1 kg (1 to 5) kg	0.031 mg + 3.0 µg/g 0.41 mg + 4.0 µg/g 0.61 mg + 3.0 µg/g	Class 1 weights
	(1 to 100) lb (100 to 500) lb (500 to 1200) lb	0.0057 lb 0.053 lb 0.57 lb	Class F weights

Parameter/Equipment	Range	CMC ^{2, 5, 6} (±)	Comments	
Pressure – Measure and Measuring Equipment ³	Pneumatic	(0.1 to 1.0) psig (1 to 100) psig	Fluke 700P22	
		(0 to 1000) psig	Additel ADT 681-RD-GP	
	Hydraulic	(100 to 1000) psig (1000 to 10 000) psig	0.029 % 0.032 %	Ametek T-100-1/C
		(0 to 10 000) psig	3.6 psi + 0.12 %	Additel ADT 681-RD-GP
Torque – Measure ³	(4 to 50) lbf·in (50 to 400) lbf·in (400 to 1000) lbf·in (83 to 250) lbf·ft	0.57 % 0.34 % 0.38 % 0.38 %	CDI Suretest and 4 in 1 transducer	
Force – Measuring Equipment, Compression and Tension ³	Up to 250 lbf	0.080 % + 0.6R	Class F weights and hangers	
Tachometers ³	(1 to 1000) rpm (1000 to 99 999) rpm	0.059 rpm 0.58 rpm	HP 3325B + LED	
Air Velocity – Measuring Equipment, Anemometers	(0.5 to 35) m/s	0.9 % + 0.021 m/s	Direct comparison w/ furnace controls micromanometer, TSI airflow pitot static tube	

V. Thermodynamics

Parameter/Equipment	Range	CMC ^{2, 5, 6} (\pm)	Comments
Temperature – Measuring Equipment	-78 °C	0.0036 % + 0.071 °C	Hart 1502A, 5628, isopropanol/dry ice slurry
	(-5 to 580) °C	0.0037 % + 0.044 °C	Hart 1502A, 5628, temperature baths/blocks
Infrared Thermometers ³	(35 to 500) °C	0.35 % + 0.5 °C	Hart 4181 black body $\epsilon = 0.9$ to 1.0 $\lambda = (8$ to $14)$ μm
Temperature – Measure, RTD, Thermocouples and Thermometers ³	(-200 to 660) °C	0.0024 % + 0.027 °C	Hart 1502A, 5628
Relative Humidity – Measuring Equipment ³	(10 to 90) % RH (10 to 55) °C	1.4 % RH	Geo Instruments 2000SP
Relative Humidity – Measure ³	(10 to 90) % RH	1.2 % RH	Vaisala MI70, HMP77

VI. Time & Frequency

Parameter/Equipment	Frequency	CMC ^{2, 6} (\pm)	Comments
Frequency – Measuring Equipment ³	10 MHz	0.010 nHz/Hz	GPS 58503A
	0.01 Hz to 26.5 GHz	0.010 nHz/Hz + 5 μHz	GPS receiver w/ generator
Frequency – Measure	0.01 Hz to 3.0 GHz	0.058 mHz	58503A, 53132A-003
	(3.0 to 26.5) GHz	0.58 Hz	58503A, EIP 28B

¹ This laboratory offers commercial calibration service 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 and this laboratory meets A2LA R104 – *General Requirements: Accreditation of Field Testing and Field Calibration Laboratories* for these calibrations. 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 measurands stated are generated using the indicated instrument (see Comments). This capability is suitable for the calibration of the devices intended to measure the measurand in the ranges indicated. CMC's are expressed as either a specific value that covers the full range or as a fraction or percent/fraction of the reading plus a fixed floor specification.
- ⁵ In the statement of CMC, R is the resolution of the unit under test; percentages are to be read as percent of reading, unless noted otherwise.
- 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*.



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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/NCSLI Z540-1-1994 and the requirements of ANSI/NCSLI Z540.3-2006 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 12th day of February 2020.

A blue ink signature of a person, likely the Vice President of Accreditation Services, written over a horizontal line.

Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 2662.01
Valid to February 28, 2022

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