



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

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CALIBRATION

Valid To: May 31, 2024

Certificate Number: 3708.01

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following calibrations^{1, 6}:

I. Dimensional

Parameter/Equipment	Range	CMC ^{2,4} (±)	Comments
Indicators	Up to 1 in	60 µin	Gage block
Calipers	Up to 16 in (> 16 to 40) in	430 µin (1.3L + 410) µin	Gage block
	Up to 500 mm (> 500 to 1000) mm	(0.0006L + 8.5) µm (0.0017L + 7.9) µm	
Micrometers	Outside	Up to 8 in (> 8 to 40) in	Gage block
		Up to 200 mm (> 200 to 1000) mm	
	Inside	Up to 8 in (> 8 to 40) in	
		Up to 200 mm (> 200 to 1000) mm	
Depth	Up to 12 in	120 µin	
	Up to 300 mm	1.7 µm	

Parameter/Equipment	Range	CMC ^{2,4} (±)	Comments
Height Gage	Up to 12 in (> 12 to 40) in	(1.8L + 62) μin (4.1L + 32) μin	Gage block
	Up to 300 mm (> 300 to 1000) mm	(0.0021L + 1.5) μm (0.0039L + 0.8) μm	
Gage Block	Up to 1 in (> 1 to 20) in	(2.5L + 8.2) μin (3.8L + 5) μin	Comparison with gage block grade 0
Plug Gage, Pin Gage	Up to 1 in (> 1 to 16) in	(1.8L + 8) μin (3.7L + 6) μin	Universal length machine
Plain Ring Gage	Up to 1 in (> 1 to 16) in	(1.8L + 8) μin (3.7L + 6) μin	Universal length machine
60° Thread Plug – Pitch Diameter Major Diameter	Up to 1 in (> 1 to 16) in	85 μin (2.0L + 77) μin	Universal length machine and thread measuring wire
	Up to 1 in (> 1 to 16) in	(1.8L + 8) μin (3.7L + 6) μin	
60° Adjustable Thread Ring Gage – Pitch Diameter Only	Up to 2 in	310 μin	Universal length machine, thread measuring wire and thread setting plug
Thread Wires	Up to 0.150 in	12 μin	Universal length machine
Length Standards Master Height Gage, Step Gage Ruler and Measuring Tape Setting Rods	Up to 12 in (> 12 to 24) in Up to 48 in	(2.3L + 20) μin (3.4L + 5) μin 0.0066 in	Gage block
	Up to 12 in (> 12 to 40) in	(3.2L + 22) μin (4.6L + 4.3) μin	Gage block

Parameter/Equipment	Range	CMC ^{2,4} (±)	Comments
Bore Gage	Up to 4 in	82 μin	Cylindrical ring gage
Square	Up to 18 in	(1.9L + 48) μin	Master angle plate, gage block
Level	Up to 12 in	150 μin	Gage block
Thickness Gage, Feeler Gage	Up to 1 in	51 μin	Universal length machine

II. Electrical – DC/Low Frequency

Parameter/Equipment	Range	CMC ^{2,5} (±)	Comments
DC Voltage – Generate ³	(> 0 to 330) mV (0.33 to 3.3) V (3.3 to 33) V (33 to 330) V (330 to 1000) V	0.0020 % + 1.0 μV 0.0011 % + 2.0 μV 0.0012 % + 20 μV 0.0018 % + 150 μV 0.0018 % + 1.5 mV	Multi-function calibrator
DC Voltage – Measure ³	(> 0 to 200) mV (0.2 to 2) V (2 to 20) V (20 to 200) V (200 to 1000) V	0.0006 % + 120 nV 0.0004 % + 500 nV 0.0004 % + 5 μV 0.0006 % + 50 μV 0.0006 % + 1.2 mV	Reference multimeter
DC High Voltage – Measure ³	(1 to 100) kV	0.06 % + 0.50 V	High accuracy voltage divider

Parameter/Equipment	Range	CMC ^{2,5} (±)	Comments
DC Current – Generate ³	(> 0 to 330) µA (0.3 to 3.3) 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) A	0.015 % + 20 nA 0.01 % + 50 nA 0.01 % + 250 nA 0.01 % + 2.5 µA 0.02 % + 40 µA 0.038 % + 40 µA 0.05 % + 500 µA 0.10 % + 750 µA	Multi-function calibrator
	(10 to 16.5) A (16.5 to 150) A (150 to 1025) A	0.50 % + 20 mA 0.50 % + 140 mA 0.50 % + 500 mA	Multi-function calibrator & 50 turn coil
DC Current – Measure ³	(> 0 to 200) µA (0.2 to 2) mA (2 to 20) mA (20 to 200) mA (0.2 to 2) A (2 to 20) A	0.0015 % + 0.40 nA 0.0015 % + 4.0 nA 0.0016 % + 40 nA 0.0045 % + 0.80 µA 0.021 % + 16 µA 0.046 % + 0.40 mA	Reference multimeter

Parameter/Range	Frequency	CMC ^{2,5} (±)	Comments
AC Voltage – Generate ³			
(1 to 33) mV	(10 to 45) Hz (0.045 to 10) kHz (10 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 500) kHz	0.080 % + 6 μV 0.015 % + 6 μV 0.020 % + 6 μV 0.10 % + 6 μV 0.35 % + 12 μV 0.80 % + 50 μV	Multi-function calibrator
(33 to 330) mV	(10 to 45) Hz (0.045 to 10) kHz (10 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 500) kHz	0.030 % + 8 μV 0.015 % + 8 μV 0.016 % + 8 μV 0.035 % + 8 μV 0.080 % + 32 μV 0.20 % + 70 μV	
(0.33 to 3.3) V	(10 to 45) Hz (0.045 to 10) kHz (10 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 500) kHz	0.030 % + 50 μV 0.015 % + 60 μV 0.019 % + 60 μV 0.030 % + 50 μV 0.070 % + 125 μV 0.24 % + 600 μV	
(3.3 to 33) V	(10 to 45) Hz (0.045 to 10) kHz (10 to 20) kHz (20 to 50) kHz (50 to 100) kHz	0.030 % + 650 μV 0.015 % + 600 μV 0.024 % + 600 μV 0.035 % + 600 μV 0.090 % + 1.6 mV	
(33 to 330) V	(0.045 to 1) kHz (1 to 10) kHz (10 to 20) kHz (20 to 50) kHz (50 to 100) kHz	0.019 % + 2 mV 0.020 % + 6 mV 0.025 % + 6 mV 0.030 % + 6 mV 0.20 % + 50 mV	
(330 to 1020) V	(0.045 to 1) kHz (1 to 5) kHz (5 to 10) kHz	0.030 % + 10 mV 0.025 % + 10 mV 0.030 % + 10 mV	

Parameter/Range	Frequency	CMC ^{2,5} (±)	Comments
AC Voltage – Measure ³			
(> 0 to 200) mV	(1 to 10) Hz (10 to 40) Hz (40 to 100) Hz (0.1 to 2) kHz (2 to 10) kHz (10 to 30) kHz (30 to 100) kHz	0.020 % + 16 µV 0.015 % + 5 µV 0.013 % + 5 µV 0.013 % + 2.4 µV 0.013 % + 5 µV 0.035 % + 10 µV 0.076 % + 24 µV	Reference multimeter
(0.2 to 2) V	(1 to 10) Hz (10 to 40) Hz (40 to 100) Hz (0.1 to 2) kHz (2 to 10) kHz (10 to 30) kHz (30 to 100) kHz (100 to 300) kHz (0.3 to 1) MHz	0.018 % + 140 µV 0.012 % + 24 µV 0.0095 % + 24 µV 0.0075 % + 24 µV 0.0095 % + 24 µV 0.025 % + 50 µV 0.056 % + 240 µV 0.30 % + 2.4 mV 1.0 % + 24 mV	
(2 to 20) V	(1 to 10) Hz (10 to 40) Hz (40 to 100) Hz (0.1 to 2) kHz (2 to 10) kHz (10 to 30) kHz (30 to 100) kHz (100 to 300) kHz (0.3 to 1) MHz	0.018 % + 1.4 mV 0.012 % + 240 µV 0.0095 % + 240 µV 0.0075 % + 240 µV 0.0095 % + 240 µV 0.025 % + 500 µV 0.056 % + 2.4 mV 0.30 % + 24 mV 1.0 % + 240 mV	
(20 to 200) V	(1 to 10) Hz (10 to 40) Hz (40 to 100) Hz (0.1 to 2) kHz (2 to 10) kHz (10 to 30) kHz (30 to 100) kHz (100 to 300) kHz (0.3 to 1) MHz	0.018 % + 14 mV 0.012 % + 2.4 mV 0.01 % + 2.4 mV 0.008 % + 2.4 mV 0.01 % + 2.4 mV 0.025 % + 5.0 mV 0.056 % + 24 mV 0.30 % + 240 mV 1.0 % + 2.4 V	
(200 to 1050) V	(1 to 10) Hz (10 to 40) Hz (0.040 to 10) kHz (10 to 30) kHz (30 to 100) kHz	0.018 % + 160 mV 0.014 % + 50 mV 0.011 % + 50 mV 0.025 % + 100 mV 0.062 % + 500 mV	

Parameter/Range	Frequency	CMC ^{2,5} (±)	Comments
AC High Voltage – Measure ³ (1 to 50) kV	60 Hz	0.60 % + 0.80 V	High accuracy voltage divider
AC Current – Generate ³ (29 to 330) µA	(10 to 20) Hz (20 to 45) Hz (0.045 to 1) kHz (1 to 5) kHz (5 to 10) kHz (10 to 30) kHz	0.20 % + 100 nA 0.15 % + 100 nA 0.13 % + 100 nA 0.30 % + 150 nA 0.80 % + 200 nA 1.6 % + 400 nA	Multi-function calibrator
(0.33 to 3.3) mA	(10 to 20) Hz (20 to 45) Hz (0.045 to 1) kHz (1 to 5) kHz (5 to 10) kHz (10 to 30) kHz	0.20 % + 150 nA 0.13 % + 150 nA 0.10 % + 150 nA 0.20 % + 200 nA 0.50 % + 300 nA 1.0 % + 600 nA	
(3.3 to 33) mA	(10 to 20) Hz (20 to 45) Hz (0.045 to 1) kHz (1 to 5) kHz (5 to 10) kHz (10 to 30) kHz	0.18 % + 2 µA 0.09 % + 2 µA 0.04 % + 2 µA 0.08 % + 2 µA 0.20 % + 3 µA 0.40 % + 4 µA	
(33 to 330) mA	(10 to 20) Hz (20 to 45) Hz (0.045 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 % + 100 µA 0.40 % + 200 µA	
(0.33 to 1.1) A	(10 to 45) Hz (0.045 to 1) kHz (1 to 5) kHz (5 to 10) kHz	0.18 % + 100 µA 0.05 % + 100 µA 0.60 % + 1 mA 2.5 % + 5 mA	
(1.1 to 3) A	(10 to 45) Hz (0.045 to 1) kHz (1 to 5) kHz (5 to 10) kHz	0.18 % + 100 µA 0.06 % + 100 µA 0.60 % + 1 mA 2.5 % + 5 mA	

Parameter/Range	Frequency	CMC ^{2,5} (±)	Comments
AC Current – Generate ³ (cont)			
(3 to 11) A	(45 to 100) Hz (0.1 to 1) kHz (1 to 5) kHz	0.06 % + 2 mA 0.10 % + 2 mA 3.0 % + 2 mA	Multi-function calibrator
(11 to 20) A	(45 to 100) Hz (0.1 to 1) kHz (1 to 5) kHz	0.12 % + 5 mA 0.15 % + 5 mA 3.0 % + 5 mA	
Toroidal Clamp			
(10 to 16.5) A	(45 to 65) Hz (65 to 440) Hz	0.28 % + 3.0 mA 0.79 % + 3.0 mA	Multi-function calibrator & 50 turn coil
(16.5 to 150) A	(45 to 65) Hz (65 to 440) Hz	0.28 % + 25 mA 0.79 % + 27 mA	
(150 to 1025) A	(45 to 65) Hz (65 to 440) Hz	0.28 % + 90 mA 0.79 % + 100 mA	
Non-Toroidal Clamp			
(10 to 16.5) A	(45 to 65) Hz (65 to 440) Hz	0.56 % + 30 mA 1.0 % + 30 mA	Multi-function calibrator & 50 turn coil
(16.5 to 150) A	(45 to 65) Hz (65 to 440) Hz	0.56 % + 250 mA 1.0 % + 250 mA	
(150 to 1025) A	(45 to 65) Hz (65 to 440) Hz	0.56 % + 900 mA 1.0 % + 900 mA	

Parameter/Range	Frequency	CMC ^{2,5} (±)	Comments
AC Current – Measure ³			
(> 0 to 200) µA	1 Hz to 10 kHz (10 to 30) kHz (30 to 100) kHz	0.059 % + 24 nA 0.078 % + 24 nA 0.40 % + 24 nA	Reference multimeter
(0.2 to 2) mA	(1 to 10) Hz (0.01 to 10) kHz (10 to 30) kHz (30 to 100) kHz	0.038 % + 0.24 µA 0.034 % + 0.24 µA 0.078 % + 0.24 µA 0.40 % + 0.24 µA	
(2 to 20) mA	(1 to 10) Hz (0.01 to 10) kHz (10 to 30) kHz (30 to 100) kHz	0.038 % + 2.4 µA 0.034 % + 2.4 µA 0.078 % + 2.4 µA 0.40 % + 2.4 µA	
(20 to 200) mA	(0.001 to 2) kHz (2 to 10) kHz (10 to 30) kHz	0.038 % + 24 µA 0.031 % + 24 µA 0.070 % + 24 µA	
(0.2 to 2) A	(0.01 to 2) kHz (2 to 10) kHz (10 to 30) kHz	0.071 % + 240 µA 0.082 % + 240 µA 0.30 % + 240 µA	
(2 to 20) A	(0.01 to 2) kHz (2 to 10) kHz	0.09 % + 2.4 mA 0.25 % + 2.4 mA	

Parameter/Equipment	Range	CMC ^{2,5} (±)	Comments
Resistance – Generate ³	(> 0 to 11) Ω (11 to 33) Ω (33 to 110) Ω (0.11 to 1.1) kΩ (1.1 to 11) kΩ (11 to 110) kΩ (0.11 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	0.004 % + 1 mΩ 0.003 % + 1.5 mΩ 0.0028 % + 1.4 mΩ 0.0028 % + 2 mΩ 0.0028 % + 20 mΩ 0.0028 % + 200 mΩ 0.0032 % + 2 Ω 0.006 % + 30 Ω 0.013 % + 50 Ω 0.025 % + 2.5 kΩ 0.05 % + 3 kΩ 0.30 % + 100 kΩ 1.5 % + 500 kΩ	Multi-function calibrator
Resistance – Measure ³	(> 0 to 2) Ω (2 to 20) Ω (20 to 200) Ω (0.2 to 2) kΩ (2 to 20) kΩ (20 to 200) kΩ (0.2 to 2) MΩ (2 to 20) MΩ (20 to 200) MΩ (0.2 to 2) GΩ (2 to 20) GΩ	0.0019 % + 5 μΩ 0.0012 % + 18 μΩ 0.001 % + 60 μΩ 0.001 % + 600 μΩ 0.001 % + 6 mΩ 0.001 % + 60 mΩ 0.0011 % + 1.2 Ω 0.002 % + 120 Ω 0.0075 % + 12 kΩ 0.068 % + 1.2 MΩ 0.068 % + 12 MΩ	Reference multimeter
Capacitance – Generate ³	(0.22 to 3.3) nF (3.3 to 11) nF (11 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	0.50 % + 10 pF 0.25 % + 10 pF 0.25 % + 0.1 nF 0.25 % + 0.3 nF 0.25 % + 1 nF 0.25 % + 3 nF 0.25 % + 10 nF 0.40 % + 30 nF 0.45 % + 100 nF 0.45 % + 300 nF 0.45 % + 1 μF 0.45 % + 3 μF 0.45 % + 10 μF 0.75 % + 30 μF 1.1 % + 100 μF	Multi-function calibrator

Parameter/Range	Frequency	CMC ^{2, 4, 5} (±)	Comments
Capacitance – Measure ³ (0.5 to 50) μF (0.005 to 10) μF (0.0025 to 2.5) μF (2.5 to 500) nF (0.25 to 75) nF	(20 to 100) Hz (0.1 to 1) kHz (1 to 10) kHz (10 to 100) kHz (0.1 to 1) MHz	0.13 % 0.08 % 0.08 % 0.08 % 0.08 %	Precision LCR meter
Inductance – Measure ³ (0.5 to 100) H (0.005 to 50) H (0.0005 to 5) H (0.0005 to 1) H (0.005 to 10) mH	(20 to 100) Hz (0.1 to 1) kHz (1 to 10) kHz (10 to 100) kHz (0.1 to 1) MHz	0.13 % 0.08 % 0.08 % 0.08 % 0.08 %	Precision LCR meter

Parameter/Equipment	Range	CMC ² (±)	Comments
Electrical Simulation of Thermocouple and Thermocouple Indicating Devices – Measure & Generate ³ –			
Type B	(600 to 800) °C (800 to 1000) °C (1000 to 1550) °C (1550 to 1820) °C	0.44 °C 0.34 °C 0.30 °C 0.33 °C	Multi-function calibrator
Type C	(> 0 to 150) °C (150 to 650) °C (650 to 1000) °C (1000 to 1800) °C (1800 to 2316) °C	0.30 °C 0.26 °C 0.31 °C 0.50 °C 0.84 °C	
Type E	(-250 to -100) °C (-100 to -25) °C (-25 to 350) °C (250 to 650) °C (650 to 1000) °C	0.50 °C 0.16 °C 0.14 °C 0.16 °C 0.21 °C	

Parameter/Equipment	Range	CMC ² (±)	Comments
Electrical Simulation of Thermocouple and Thermocouple Indicating Devices – Measure & Generate ³ (cont)			
Type J	(-210 to -100) °C (-100 to -30) °C (-30 to 150) °C (150 to 760) °C (760 to 1200) °C	0.27 °C 0.16 °C 0.14 °C 0.17 °C 0.23 °C	Multi-function calibrator
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 0.18 °C 0.16 °C 0.26 °C 0.40 °C	
Type N	(-200 to -100) °C (-100 to -25) °C (-25 to 120) °C (120 to 410) °C (410 to 1300) °C	0.40 °C 0.22 °C 0.19 °C 0.18 °C 0.27 °C	
Type R	(> 0 to 250) °C (250 to 400) °C (400 to 1000) °C (1000 to 1767) °C	0.57 °C 0.35 °C 0.33 °C 0.40 °C	
Type S	(> 0 to 250) °C (250 to 1000) °C (1000 to 1400) °C (1000 to 1767) °C	0.47 °C 0.36 °C 0.37 °C 0.46 °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	
Type U	(-200 to 0) °C (> 0 to 600) °C	0.56 °C 0.27 °C	

Parameter/Equipment	Range	CMC ² (±)	Comments
Electrical Simulation of RTD Indicating Devices – Generate ³			
Pt 385, 100 Ω	(-200 to 0) °C (> 0 to 100) °C (100 to 300) °C (300 to 400) °C (400 to 630) °C (630 to 800) °C	0.05 °C 0.07 °C 0.09 °C 0.10 °C 0.12 °C 0.23 °C	Multi-function calibrator
Pt 3926, 100 Ω	(-200 to 0) °C (> 0 to 100) °C (100 to 300) °C (300 to 400) °C (400 to 630) °C	0.05 °C 0.07 °C 0.09 °C 0.10 °C 0.12 °C	
Pt 3916, 100 Ω	(-200 to -190) °C (-190 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 600) °C (600 to 630) °C	0.25 °C 0.04 °C 0.05 °C 0.06 °C 0.07 °C 0.08 °C 0.09 °C 0.10 °C 0.23 °C	
Pt 385, 200 Ω	(-200 to 100) °C (100 to 260) °C (260 to 300) °C (300 to 400) °C (400 to 600) °C (600 to 630) °C	0.04 °C 0.05 °C 0.12 °C 0.13 °C 0.14 °C 0.16 °C	
Pt 385, 500 Ω	(-200 to -80) °C (-80 to 100) °C (100 to 260) °C (260 to 400) °C (400 to 600) °C (600 to 630) °C	0.04 °C 0.05 °C 0.06 °C 0.08 °C 0.09 °C 0.11 °C	
Pt 385, 1000 Ω	(-200 to 0) °C (> 0 to 100) °C (100 to 260) °C (260 to 300) °C (300 to 600) °C (600 to 630) °C	0.03 °C 0.04 °C 0.05 °C 0.06 °C 0.07 °C 0.23 °C	

Parameter/Equipment	Range	CMC ^{2,4} (±)	Comments
Electrical Simulation of RTD Indicating Devices – Generate ³ (cont)			
PtNi 385, 120 Ω	(-80 to 100) °C (100 to 260) °C	0.08 °C 0.14 °C	Multi-function calibrator
Cu 427, 10 Ω	(-100 to 260) °C	0.30 °C	
Oscilloscope ³ –			
Square Wave – Amplitude Voltage – Vpp (0.01 to 10) kHz Into 50 Ω Into 1 MΩ	Vpp: (0.001 to 6.6) V (0.001 to 130) V	0.25 % + 40 μV 0.10 % + 40 μV	Multi-function calibrator
Level Sine Wave – Vpp Amplitude Reference (0.05 to 10) MHz	Vpp: (0.005 to 5.5) V	2.0 % of Output + 300 μV	
Amplitude Flatness – Vpp Relative to 50 kHz (0.05 to 100) MHz	Vpp: (0.005 to 5.5) V	1.5 % of Output + 100 μV	
(100 to 300) MHz	(0.005 to 5.5) V	2.0 % of Output + 100 μV	
(300 to 600) MHz	(0.005 to 5.5) V	4.0 % of Output + 100 μV	
(600 to 1100) MHz	(0.005 to 5.5) V	5.0 % of Output + 100 μV	
Level Sine Wave Frequency	(0.05 to 1100) MHz	0.000 25 %	
Leading Edge Risetime	≤ 300 ps	+0 ps / -100 ps	
Time Markers	1 ns to 20 ms 50 ms 0.1 s 0.2 s 0.5 s 1 s 2 s 5 s	0.000 25 % 0.0075 % 0.013 % 0.023 % 0.053 % 0.10 % 0.20 % 0.50 %	

III. Fluid Quantities

Parameter/Equipment	Range	CMC ^{2,4} (±)	Comments
Mass Flow Meters ³ –	Up to 50 l/min (50 to 150) l/min (150 to 500) l/min	0.48 % + 0.14 l/min 0.44 % + 0.8 l/min 0.46 % + 1.5 l/min	Portable calibration flow meter

IV. Mechanical

Parameter/Equipment	Range	CMC ^{2,4} (±)	Comments
Pressure ³ – Pressure Gauge	(> 0 to 10) in H ₂ O (0.5 to < 8) psia (8 to 17) psia (> 17 to 30) psia (-1 to 5) psi (> 5 to 30) psi (> 30 to 100) psi (> 100 to 400) psi (> 400 to 1000) psi (> 1000 to 3000) psi (> 3000 to 6000) psi (> 0 to 3000) psi (> 3000 to 30 000) psi	0.0023 in H ₂ O 0.0036 psia (0.01 % + 0.000 08) psia 0.0036 psia 0.0007 psi 0.0036 psi 0.012 psi 0.059 psi (0.01 % + 0.014) psi (0.0008 % + 0.34) psi (0.01 % + 0.0033) psi (0.02 % + 0.0024) psi (0.02 % + 0.0009) psi	Pressure transducer Electronic deadweight tester
Torque Wrenches & Screwdrivers ³ – Clockwise and Counter-Clockwise	(Up to 10) lbf-in (> 10 to 100) lbf-in (> 8 to 100) lbf-ft (> 100 to 1000) lbf-ft	0.56 % + 0.01 lbf-in 0.54 % + 0.06 lbf-in 0.51 % + 0.09 lbf-ft 0.55 % + 0.39 lbf-ft	Electronic torque transducer and indicator

Parameter/Equipment	Range	CMC ^{2, 4, 7} (±)	Comments
Laboratory Scales & Balances ³	1 mg to 10 g (> 10 to 100) g > 100 g to 1 kg (> 1 to 5) kg (> 5 to 10) kg (> 10 to 20) kg (> 20 to 80) kg	0.03 mg 0.20 mg 1.9 mg 14 mg 33 mg 61 mg 130 mg	Using ASTM Class 1 & ASTM Class 0 weights
Force Measuring Devices ³ – Tension & Compression	(1 to 4) lbf (> 4 to 7) lbf (> 7 to 10) lbf (5 to 50) lbf (> 50 to 250) lbf (> 250 to 2000) lbf (> 2000 to 10 000) lbf	0.0011 lbf 0.0013 lbf 0.0014 lbf 0.018 lbf + 0.025 % of reading 0.05 % of reading 0.05 % of reading 0.06 % of reading	Using ASTM Class 6 weights Using load cell ASTM E74 load cell class A and indicator
Indirect Verification of Rockwell Hardness Testers	HRC Low Middle High HRBW Low Middle High	0.41 HRC 0.41 HRC 0.37 HRC 0.71 HRBW 0.72 HRBW 0.61 HRBW	Indirect verification according to ASTM E18 hardness standards

V. Thermodynamics

Parameter/Equipment	Range	CMC ^{2,7} (±)	Comments
Temperature – Measure & Measuring Equipment	(-80 to 150) °C	0.034 °C	ASTM E644 ASTM E220, ASTM E230 Temperature baths, dry well, calibration furnace, SPRT
	(150 to 250) °C	0.05 °C	
	(250 to 420) °C	0.28 °C	
	(421 to 600) °C	0.76 °C	
	(601 to 962) °C	1.4 °C	
	(963 to 1250) °C	2.3 °C	
Relative Humidity – Measuring Equipment	(10 to 98) % RH	0.52 % of reading	Automated “Two-Pressure” humidity generation system and PRT probe
Frost/Dew Point – Measuring Equipment	(-20 to 70) °C	0.063 °C	Automated “Two-Pressure” humidity generation system and PRT probe
Temperature -Measuring Equipment	(-10 to 72) °C	0.06 °C	Automated “Two-Pressure” humidity generation system and PRT probe
Infrared Thermometers ³	35 °C	0.46 °C	Precision infrared temperature calibrator $\epsilon = 0.95, \lambda = (8 \text{ to } 14) \mu\text{m}$
	(> 35 to 100) °C	0.70 °C	
	(> 100 to 250) °C	1.2 °C	
	(> 250 to 350) °C	1.8 °C	
	(> 350 to 500) °C	2.4 °C	

VI. Time & Frequency

Parameter/Equipment	Range	CMC ^{2, 7} (\pm)	Comments
Frequency – Measure ³	Up to 6 GHz	71 pHz/Hz	Frequency standard, counter
Frequency – Measuring Equipment ³	(1 to 10) Hz (10 to 100) Hz (100 to 1000) Hz 1 kHz to 100 MHz (100 to 1000) MHz (1 to 4) GHz	580 nHz/Hz 58 nHz/Hz 5.8 nHz/Hz 0.58 nHz/Hz 71 pHz/Hz 41 pHz/Hz	Frequency standard, signal generators
Timers and Stopwatches ³	≤ 24 h	38 ms	Universal frequency counter/timer, waveform generators
Tachometers ³ – Non-Contact	(0.6 to 100 000) rpm	0.000 25 % + 300 μ rpm	Multi-function calibrator

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 of the device measured in inches. In the statement of CMC, percent is defined as percent of reading unless otherwise noted. In the statement of CMC, x is defined as the torque or mass flow applied.

⁵ The stated measured values are determined using the indicated instrument (see Comments). This capability is suitable for the calibration of the devices intended to measure or generate the measured value in the ranges indicated. CMCs are expressed as either a specific value that covers the full range or as a percent or fraction of the reading plus a fixed floor specification.

⁶ This scope meets A2LA's *P112 Flexible Scope Policy*.

⁷ 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

INSTRUMENTATION DYNATHERM INC.

Saint-Laurent, QC, 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 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 June 2022.

A blue ink signature of a person, likely a representative of the accreditation body.

Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 3340.01
Valid to May 31, 2024

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