



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

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CALIBRATION

Valid To: August 31, 2024

Certificate Number: 1387.04

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

I. Dimensional

Parameter/Equipment	Range	CMC ^{2, 4} ($\pm$)	Comments
Bore Micrometers	Up to 12 in Up to 304.8 mm	(34 + 1.2D) μ in (0.86 + 0.0012D) μ m	Master rings
Dial Bore Gages (Bore Gage w/ Indicator)	Up to 4 in: 0.000 01 in 0.000 05 in 0.0001 in 0.0005 in 0.001 in 0.000 25 mm 0.001 mm 0.0025 mm 0.01 mm 0.025 mm	7.1 μ in 30 μ in 58 μ in 290 μ in 580 μ in 0.18 μ m 0.75 μ m 1.5 μ m 7.2 μ m 14 μ m	Gage blocks/indicator calibrator
Calipers ³	Up to 24 in (24 to 80) in Up to 610 mm (610 to 2032) mm	(7.1 + 7.6L) μ in (190 + 13L) μ in (0.19 + 0.2L) μ m (4.8 + 0.33L) μ m	Caliper checker, gage blocks

Parameter/Equipment	Range	CMC ^{2, 4} ($\pm$)	Comments
Caliper Checkers	Up to 12 in (25 to 305) mm	$(11 + 1.8L) \mu\text{in}$ $(0.28 + 0.0018L) \mu\text{m}$	Electronic indicator amplifier, gage blocks
Caliper Gage ³ – Internal, External	Up to 7.5 in Up to 190.5 mm	$(16 + 14D) \mu\text{in}$ $(0.41 + 0.36D) \mu\text{m}$	Gage blocks, ring gages
Depth Step Gages	(0.5 to 11.5) in (12.7 to 290) mm	$(12 + 3.0L) \mu\text{in}$ $(0.30 + 0.003L) \mu\text{m}$	Electronic indicator amplifier, gage blocks
Cylindrical Ring Gages ³	Up to 0.425 in (0.425 to 18) in Up to 10.80 mm (15.24 to 480) mm	$14 \mu\text{in}$ $(14 + 0.89D) \mu\text{in}$ $0.36 \mu\text{m}$ $(0.36 + 0.023D) \mu\text{m}$	Universal length machine, master rings, gage blocks
Disc, Plug & Pin Gages ³	Up to 20 in Up to 508 mm	$(12 + 1.0D) \mu\text{in}$ $(0.30 + 0.001D) \mu\text{m}$	Universal length machine
Electronic Indicator Amplifier ³	Up to 0.01 in Up to 0.254 mm	$9.3 \mu\text{in}$ $0.24 \mu\text{m}$	Gage blocks, optical flat
Go/No-go Gages ⁵	Up to 12 in Up to 304.8 mm Up to 27 in Ext. Measurement Up to 11.5 in Int. Measurement Up to 6 in	$(17 + 1.1L) \mu\text{in}$ $(0.44 + 0.0011L) \mu\text{m}$ $(12 + 1.0D) \mu\text{in}$ $(0.30 + 0.001D) \mu\text{m}$ $(12 + 3.0L) \mu\text{in}$ $(0.30 + 0.003L) \mu\text{m}$ 0.000 30 in	Vision system Universal length machine Electronic indicator amplifier, gage blocks Rings, plugs, hand tools
Optical Flats	Up to 2 in Up to 50.8 mm	$4.4 \mu\text{in}$ $0.12 \mu\text{m}$	Master optical flat

Parameter/Equipment	Range	CMC ^{2, 4} (±)	Comments
Sine Bars – Length Flatness Parallelism	Up to 12 in Up to 12 in Up to 508 mm Up to 12 in Up to 508 mm	(17 + 1.1L) µin 28 µin 0.71 µm 14 µin 0.36 µm	Vision system Electronic indicator amplifier
Glass Scales	Up to 12 in Up to 304.6 mm	(17 + 1.1L) µin (0.44 + 0.0011L) µm	Vision system
Gage Blocks – Length Only	Up to 1 in (1 to 4) in Up to 25.4 mm (25.4 to 101.6) mm	6.0 µin (6.0 + 0.72L) µin 0.15 µm (0.15 + 0.019L) µm	Master gage blocks (direct comparison)
Height Gages ³	Up to 40 in Up to 1016 mm	260 + 0.35 µin 6.6 + 0.009 µm	Gage blocks
Indicators/LVDTs ³	Up to 12 in: 0.000 01 in 0.000 05 in 0.0001 in 0.0005 in 0.001 in 0.000 25 mm 0.001 mm 0.0025 mm 0.01 mm 0.025 mm	7.1 µin 30 µin 58 µin 290 µin 580 µin 0.18 µm 0.75 µm 1.5 µm 7.2 µm 14 µm	Gage blocks/indicator calibrator
Length Standards ³	Up to 27 in Up to 680 mm Up to 40 in Up to 1016 mm	(12 + 1.0D) µin (0.30 + 0.001D) µm (16 + 0.89L) µin (0.41 + 0.000 89L) µm	Universal length machine Gage blocks, electronic indicator amplifier

Parameter/Equipment	Range	CMC ^{2, 4} ($\pm$)	Comments
Levels ³	Up to 12 in Up to 304.8 mm	140 μ in 3.5 μ m	Surface plate, sine bar, gage blocks
Micrometers ³ –	Up to 24 in Up to 609.6 mm	(0.83 + 16L) μ in (0.21 + 0.41L) μ m	Gage blocks
	(24 to 48) in Up to 1219.2 mm	(5.4 + 15L) μ in (0.14 + 0.39L) μ m	Gage blocks
Groove	Up to 4 in Up to 101.6 mm	(0.96 + 16L) μ in (0.25 + 0.39L) μ m	Gage blocks
Depth	Up to 16 in Up to 304.8 mm	(580 + 3.3L) μ in (0.015 + 0.09L) μ m	Gage blocks
Inside	Up to 20 in Up to 500 mm	(12 + 1.0D) μ in (0.30 + 0.001D) μ m	Universal length machine
Specialty Micrometers	Up to 4 in Up to 101.6 mm	(0.96 + 16L) μ in (0.25 + 0.39L) μ m	Gage blocks
Indicator Calibrators ³ (Mic Head Type)	Up to 1 in Up to 25.4 mm	(22 + 4.2L) μ in (1.1 + 0.0042L) μ m	LVDT's
Parallels	Up to 20 in Up to 508 mm	19 μ in 0.49 μ m	Electronic indicator amplifier
Plain Pins Class ZZ ³	Up to 2 in Up to 50.8 mm	24 μ in 0.61 μ m	Laser micrometer
Protractor –			
Bevel	Up to 180°	11 arcsec	Vision system
Digital ³	Up to 90°	27 arcsec	Sine plate, gage blocks

Parameter/Equipment	Range	CMC ^{2, 4} ($\pm$)	Comments
Snap Gage ³ – Flatness of Anvils Size	Up to 3 in Up to 76.2 mm Up to 1 in Up to 25.4 mm (1 to 20) in (25.4 to 508) mm	4.4 μ in 0.12 μ m 6.3 μ in 0.16 μ m (3.9 + 2.4L) μ in (0.10 + 0.0024L) μ m	Optical flat Gage blocks
Steel Rules ³	Up to 12 in Up to 304.8 mm (12 to 39) in (304.8 to 990.6) mm	(17 + 1.1L) μ in (0.44 + 0.0011L) μ m 150 μ in 3.7 μ m	Vision system Direct comparison
Steel Tapes ³	Up to 26 ft	0.04 in	Direct comparison
Thickness & Feeler Gage ³	Up to 2 in Up to 50.8 mm	(12 + 1.0D) μ in (0.30 + 0.001D) μ m	Universal length machine (ULM)
Thread Measuring Wires ³	(4 to 80) TPI (0.35 to 4.0) mm	8.1 μ in 0.21 μ m	Universal length machine, gage blocks, master pins
Angle Blocks	Up to 90°	11 arcsec	Vision system
Chamfer Check Gages	Set Ring Effective Diameter Gage Probe Angle	39 μ in 11 arcsec	Chamfer check master, set ring Vision system
Screw Thread Micrometer Standards	Up to 12 in Up to 304.8 μ m	(17 + 1.1L) μ in (0.44 + 0.0011L) μ m	Vision system

Parameter/Equipment	Range	CMC ^{2,4} ($\pm$)	Comments
Thread Plugs ³ –			
Major Diameter	Up to 8 in Up to 203.2 mm	$(7.6 + 1.3D) \mu\text{in}$ $(0.21 + 0.0013D) \mu\text{m}$	Universal length machine
Pitch Diameter	Up to 80 TPI Up to 4.0 mm pitch	$(68 + 1.2D) \mu\text{in}$ $(1.8 + 0.0012D) \mu\text{m}$	Universal length machine, thread measuring wires
Tapered Thread Plug Gage – Pitch Diameter	Up to 4 in Up to 101.6 mm	$(68 + 1.2D) \mu\text{in}$ $(1.8 + 0.0012D) \mu\text{m}$	Universal length machine, gage blocks
Step	Up to 1 in Up to 25.4 mm	15 μin 0.38 μm	Gage blocks
Universal Measuring Machines/Bench Micrometers ³	Up to 39 in Up to 1000 mm	$(7.6 + 1.0L) \mu\text{in}$ $(0.20 + 0.001L) \mu\text{m}$	Gage blocks
Laser Micrometers ³	Up to 2 in Up to 101.6 mm	$(23 + 2.4D) \mu\text{in}$ $(0.59 + 0.0024L) \mu\text{m}$	Class XXX master pins
Radius Gages	Up to 12 in Up to 304.8 mm	$(17 + 1.1L) \mu\text{in}$ $(0.44 + 0.0011L) \mu\text{m}$	Vision system
Surface Finish Testers ³ – Ra, Rz	(2 to 500) μin (0.05 to 12.5) μm	5.0 μin 0.13 μm	Master surface finish patch
Surface Finish Standards ³ – Ra, Rz	(2 to 500) μin (0.05 to 12.5) μm	5.2 μin 0.14 μm	Direct comparison to master surface patch
Bolt Protrusion Gauges	Up to 12 in Up to 304.8 mm	$(17 + 1.1L) \mu\text{in}$ $(0.44 + 0.0011L) \mu\text{m}$	Vision system

II. Dimensional Testing/Calibration⁵

Parameter/Equipment	Range	CMC ^{2, 4, 8} ($\pm$)	Comments
Surface Finish – Measure	(2 to 500) μin (0.05 to 12.5) μm	5.2 μin 0.14 μm	Master surface finish patch
Flatness – Measure	Up to 20 in Up to 508 mm	28 μin 0.71 μm	Electronic indicator
	Up to 2 in Up to 50.8 mm	4.4 μin 0.12 μm	Optical flat
Parallelism – Measure	Up to 20 in Up to 508 mm	14 μin 0.36 μm	Electronic indicator amplifier
Radius – Measure	Up to 12 in Up to 304.8 mm	(17 + 1.1L) μin (0.44 + 0.0011L) μm	Vision system
Straightness – Measure	Up to 12 in Up to 304.8 mm	22 μin 0.56 μm	Electronic indicator amplifier
Video Measurement ⁵ – X, Y Axis	Up to 12 in Up to 304.8 mm	(17 + 1.1L) μin (0.44 + 0.0011L) μm	Vision system
Angular Measurements ⁵	Up to 360°	11 arcsec	Vision system

III. Electrical – DC/Low Frequency

Parameter/Equipment	Range	CMC ^{2, 7} ($\pm$)	Comments
DC Voltage – Generate ³	(0 to 329.9999) mV (0 to 3.2999) V (0 to 32.9999) V (33 to 329.9999) V (100 to 1020) V	70 $\mu\text{V/V} + 4 \mu\text{V}$ 56 $\mu\text{V/V} + 12 \mu\text{V}$ 58 $\mu\text{V/V} + 110 \mu\text{V}$ 57 $\mu\text{V/V} + 1 \text{ mV}$ 65 $\mu\text{V/V} + 21 \text{ mV}$	Fluke 5500A

Parameter/Equipment	Range	CMC ^{2, 7} ($\pm$)	Comments
DC Voltage – Measure ³	(0 to 100) mV (0.1 to 1) V (1 to 10) V (10 to 100) V (100 to 1000) V	6.2 μ V/V + 0.30 μ V 3.2 μ V/V + 0.30 μ V 1.1 μ V/V + 0.50 μ V 3.4 μ V/V + 30 μ V 6.6 μ V/V + 0.10 mV	Agilent 3458A opt 002
DC Current – Generate ³	(0 to 3.299 99) mA (3.3 to 33) mA (33 to 330) mA 330 mA to 2.2 A (0 to 11) A	0.029 % + 0.079 μ A 0.029 % + 0.120 μ A 0.032 % + 3.1 μ A 0.056 % + 120 μ A 0.051 % + 330 μ A	Fluke 5500A
DC Current – Measure ³	(10 to 100) μ A 100 μ A to 1 mA (1 to 10) mA (10 to 100) mA (0.1 to 1) A	25 μ A/A + 0.8 nA 23 μ A/A + 5.0 nA 23 μ A/A + 50 nA 37 μ A/A + 0.50 μ A 0.013 % + 10 μ A	Agilent 3458A opt 002

Parameter/Range	Frequency	CMC ^{2, 7} (±)	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	0.028 % + 4.0 µV 0.011 % + 4.0 µV 91 µV/V + 4.0 µV 0.024 % + 4.0 µV 0.056 % + 5.0 µV 0.11 % + 10 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	0.025 % + 4.0 µV 91 µV/V + 4.0 µV 85 µV/V + 4.0 µV 0.021 % + 4.0 µV 0.051 % + 5.0 µV 0.11 % + 10 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	0.025 % + 12 µV 0.011 % + 7.0 µV 0.011 % + 7.0 µV 0.021 % + 7.0 µV 0.047 % + 17 µV 0.091 % + 20 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	0.025 % + 40 µV 91 µV/V + 15 µV 46 µV/V + 8.0 µV 76 µV/V + 10 µV 0.012 % + 30 µV 0.043 % + 80 µV	
(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	0.025 % + 400 µV 91 µV/V + 150 µV 46 µV/V + 50 µV 76 µV/V + 100 µV 0.011 % + 200 µV 0.028 % + 600 µV	
(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	0.024 % + 4.0 mV 91 µV/V + 1.5 mV 53 µV/V + 0.60 mV 81 µV/V + 1.0 mV 0.016 % + 2.5 mV 0.091 % + 16 mV	
(220 to 1100) V	40 Hz to 1 kHz (1 to 20) kHz	0.014 % + 4.0 mV 0.018 % + 6.0 mV	

Parameter/Range	Frequency	CMC ^{2, 7} (±)	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	0.030 % + 3.0 µV 0.020 % + 1.1 µV 0.040 % + 1.1 µV 0.11 % + 1.1 µV 0.51 % + 1.1 µV 4.1 % + 2.0 µV	Agilent 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 to 1) MHz (1 to 2) MHz	0.0080 % + 4.0 µV 0.0080 % + 2.0 µV 0.016 % + 2.0 µV 0.031 % + 2.0 µV 0.081 % + 2.0 µV 0.34 % + 10 µV 1.1 % + 10 µV 1.6 % + 10 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	0.0090 % + 40 µV 0.0070 % + 20 µV 0.017 % + 20 µV 0.036 % + 20 µV 0.82 % + 20 µV 0.31 % + 100 µV 1.1 % + 100 µV 1.6 % + 100 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 to 1 MHz	0.0080 % + 0.40 mV 0.0080 % + 0.20 mV 0.015 % + 0.20 mV 0.031 % + 0.20 mV 0.080 % + 0.20 mV 0.30 % + 1.0 mV 1.0 % + 1.0 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	0.030 % + 4.0 mV 0.030 % + 2.0 mV 0.030 % + 2.0 mV 0.040 % + 2.0 mV 0.13 % + 2.0 mV	
(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	0.040 % + 4.0 mV 0.040 % + 2.0 mV 0.060 % + 2.0 mV 0.14 % + 2.0 mV 0.40 % + 2.0 mV	

Parameter/Range	Frequency	CMC ^{2, 7} (±)	Comments
AC Current – Measure ³			
(5 to 100) µA	(10 to 20) Hz (20 to 45) Hz (45 to 100) Hz 100 Hz to 10 kHz	0.57 % rdg + 0.030 % rng 0.18 % rdg + 0.030 % rng 0.07 % rdg + 0.030 % rng 0.07 % rdg + 0.030 % rng	Agilent 3458A opt 002
(1 to 100) mA	(10 to 20) Hz (20 to 45) Hz (45 to 100) Hz 100 Hz to 1 kHz (5 to 20) kHz (20 to 50) kHz (50 to 100) kHz	0.55 % rdg + 0.020 % rng 0.18 % + 20 µA 0.080 % + 20 µA 0.043 % rdg + 0.02 % rng 0.090 % rdg + 0.02 % rng 0.50 % + 40 µA 0.70 % + 150 µA	
(0.1 to 1) A	(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	0.47 % rdg + 0.020 % rng 0.19 % + 200 µA 0.10 % + 200 µA 0.13 % rdg + 0.020 % rng 0.12 % rdg + 0.020 % rng 1.2 % + 40 µA	
AC Current – Generate ³			
(0.029 to 0.329 99) mA	(10 to 20) Hz (20 to 45) Hz 45 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz	0.29 % rdg + 0.17 µA 0.15 % rdg + 0.17 µA 0.15 % rdg + 0.29 µA 0.47 % rdg + 0.17 µA 0.29 % rdg + 0.17 µA	Fluke 5500A
(0.33 to 3.2999) mA	(10 to 20) Hz (20 to 45) Hz 45 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz	0.24 % rdg + 0.34 µA 0.12 % rdg + 0.35 µA 0.12 % rdg + 0.35 µA 0.24 % rdg + 0.35 µA 0.70 % rdg + 0.35 µA	
(3.3 to 32.999) mA	(10 to 20) Hz (20 to 45) Hz 45 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz	0.24 % rdg + 0.0035 mA 0.12 % rdg + 0.0035 mA 0.11 % rdg + 0.0035 mA 0.24 % rdg + 0.0035 mA 0.70 % rdg + 0.0035 mA	

Parameter/Range	Frequency	CMC ^{2, 7} (±)	Comments
AC Current – Generate ³ (cont)			
(33 to 329.99) mA	(10 to 20) Hz (20 to 45) Hz 45 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz	0.24 % rdg + 0.034 mA 0.12 % rdg + 0.034 mA 0.11 % rdg + 0.035 mA 0.24 % rdg + 0.035 mA 0.70 % rdg + 0.035 mA	Fluke 5500A
(0.33 to 2.19999) A	(10 to 45) Hz 45 Hz to 1 kHz (1 to 5) kHz	0.24 % rdg + 0.35 A 0.12 % rdg + 0.35 A 0.87 % rdg + 0.35 A	
(2.2 to 11) A	(45 to 65) Hz (65 to 500) Hz 500 Hz to 1 kHz	0.070 % rdg + 0.003 A 0.12 % rdg + 0.003 A 0.38 % rdg + 0.003 A	

Parameter/Equipment	Range	CMC ^{2, 7} (±)	Comments
Resistance – Generate ³	(0 to 10.999) Ω (11 to 32.999) Ω (33 to 109.999) Ω (110 to 329.999) Ω (0.330 to 1.099 99) kΩ (1.1 to 3.299 99) kΩ (3.3 to 10.9999) kΩ (11 to 32.9999) kΩ (33 to 109.999) kΩ (110 to 329.999) kΩ (0.33 to 1.099 99) MΩ (1.1 to 3.299 99) MΩ (3.3 to 10.9999) MΩ (11 to 32.9999) MΩ (33 to 109.999) MΩ	0.014 % + 93 mΩ 0.014 % + 17 mΩ 0.14 % + 17 mΩ 0.11 % + 17 mΩ 0.12 % + 66 mΩ 0.46 % + 55 mΩ 0.12 % + 660 mΩ 0.11 % + 690 mΩ 0.13 % + 6.9 Ω 0.15 % + 6.7 Ω 0.16 % + 87 Ω 0.20 % + 50 Ω 0.70 % + 650 Ω 1.4 % + 550 Ω 5.8 % + 6.5 kΩ	Fluke 5500A, 4-wire Fluke 5500A, 2-wire
Resistance – Measure ³	(0 to 10) Ω (10 to 100) Ω 100 Ω to 1 kΩ (1 to 100) kΩ 100 kΩ to 1 MΩ (1 to 10) MΩ (10 to 100) MΩ	15 μΩ/Ω + 5 μΩ 15 μΩ/Ω + 50 μΩ 19 μΩ/Ω + 50 μΩ 52 μΩ/Ω + 50 mΩ 50 μΩ/Ω + 60 μΩ 50 μΩ/Ω + 150 μΩ 0.070 % + 5.0 kΩ	Agilent 3458A opt 002

Parameter/Equipment	Range	CMC ^{2, 7} (±)	Comments
Capacitance – Generate ³	(0.33 to 0.499) nF (0.5 to 1.0999) nF (1.1 to 3.2999) nF (3.3 to 10.999) nF (11 to 32.999) nF (33 to 109.99) 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 330 µF to 1.1 mF	0.58 % + 0.012 nF 0.58 % + 0.012 nF 0.61 % + 0.011 nF 0.58 % + 0.012 nF 0.33 % + 0.11 nF 0.29 % + 0.13 nF 0.56 % + 1.2 nF 0.29 % + 1.2 nF 0.41 % + 3.5 nF 0.41 % + 12 nF 0.47 % + 35 nF 0.58 % + 120 nF 0.94 % + 350 nF 1.2 % + 350 nF	-Fluke 5500A
Electrical Calibration of Thermocouples and Thermocouple Indicating Systems ³ –			
Type B	(600 to 800) °C (800 to 1000) °C (1000 to 1550) °C (1550 to 1820) °C	0.59 °C 0.45 °C 0.39 °C 0.39 °C	Fluke 5500A
Type C	(0 to 150) °C (150 to 650) °C (650 to 1000) °C (1000 to 1800) °C (1800 to 2316) °C	0.37 °C 0.32 °C 0.38 °C 0.59 °C 0.97 °C	
Type E	(-250 to -100) °C (-100 to -25) °C (-25 to 350) °C (350 to 650) °C (650 to 1000) °C	0.57 °C 0.19 °C 0.16 °C 0.18 °C 0.24 °C	

Parameter/Equipment	Range	CMC ² (±)	Comments
Electrical Calibration of Thermocouples and Thermocouple 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	0.31 °C 0.19 °C 0.16 °C 0.20 °C 0.27 °C	Fluke 5500A
Type K	(-200 to -100) °C (-100 to -25) °C (-25 to 120) °C (120 to 1000) °C (1000 to 1372) °C	0.37 °C 0.21 °C 0.19 °C 0.30 °C 0.46 °C	
Type L	(-200 to -100) °C (-100 to 800) °C (800 to 900) °C	0.43 °C 0.30 °C 0.20 °C	
Type N	(-200 to -100) °C (-100 to -25) °C (-25 to 120) °C (120 to 410) °C (410 to 1300) °C	0.45 °C 0.27 °C 0.22 °C 0.21 °C 0.31 °C	
Type R	(0 to 250) °C (250 to 400) °C (400 to 1000) °C (1000 to 1767) °C	0.70 °C 0.43 °C 0.40 °C 0.43 °C	
Type S	(0 to 250) °C (250 to 1000) °C (1000 to 1400) °C (1400 to 1767) °C	0.58 °C 0.44 °C 0.44 °C 0.51 °C	
Type T	(-250 to -150) °C (-150 to 0) °C (0 to 120) °C (120 to 400) °C	0.70 °C 0.28 °C 0.19 °C 0.16 °C	
Type U	(-200 to 0) °C (0 to 600) °C	0.65 °C 0.31 °C	

Parameter/Equipment	Range	CMC ² (±)	Comments
Electrical Calibration of RTD Indicating Systems ³ –			
Pt 395, 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 (630 to 800) °C	0.060 °C 0.060 °C 0.090 °C 0.11 °C 0.12 °C 0.14 °C 0.26 °C	Fluke 5500A
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	0.060 °C 0.060 °C 0.090 °C 0.10 °C 0.12 °C 0.14 °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	0.29 °C 0.050 °C 0.060 °C 0.070 °C 0.090 °C 0.090 °C 0.10 °C 0.12 °C 0.26 °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 600) °C (600 to 630) °C	0.050 °C 0.050 °C 0.050 °C 0.060 °C 0.15 °C 0.17 °C 0.18 °C 0.19 °C	
Pt 385, 500 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 600) °C (600 to 630) °C	0.050 °C 0.070 °C 0.070 °C 0.080 °C 0.10 °C 0.10 °C 0.10 °C 0.12 °C	

Parameter/Equipment	Range	CMC ² (±)	Comments
Electrical Calibration of RTD Indicating Systems ³ – (cont)			
Pt 385, 1000 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 600) °C (600 to 630) °C	0.040 °C 0.040 °C 0.050 °C 0.070 °C 0.070 °C 0.090 °C 0.090 °C 0.27 °C	Fluke 5500A
PtNi 385, 120 Ω (Ni120)	(-80 to 0) °C (0 to 100) °C (100 to 260) °C	0.10 °C 0.10 °C 0.17 °C	
Cu 427, 10 Ω	(-100 to 260) °C	0.35 °C	

IV. Mechanical

Parameter/Equipment	Range	CMC ^{2, 6, 8} (±)	Comments
Torque Wrenches ³	(4 to 50) lbf·in (30 to 250) lbf·in (80 to 1000) lbf·in Up to 250 lbf·ft	1.1 % 1.3 % 0.51 % 0.77 %	Torque transducers

V. Time & Frequency

Parameter/Equipment	Range	CMC ^{2, 6, 8} (±)	Comments
Stop Watches/Time Measurement ³	Up to 24 hours	0.35 s	Comparison
Frequency – Measure	Up to 40 Hz 40 Hz to 10 MHz	0.43 % IV 0.18 % IV	3458A

¹ This laboratory offers commercial dimensional testing/calibration and on-site 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 Calibration and Measurement Capability Uncertainty (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 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 or millimeters. DL is the diagonal length in inches or millimeters. R is the resolution of the unit under test. D is the numerical value of the nominal diameter of the device measured in inches or millimeters. Pitch diameter is measured by the three-wire method. Major diameter is calibrated by direct measurement. In the statement of CMC, T indicates temperature in degrees Celsius. In the statement of CMC, H is the Humidity of the reading.

⁵ This laboratory meets R205 – *Specific Requirements: Calibration Laboratory Accreditation Program* for the types of dimensional tests listed above and is considered equivalent to that of a calibration.

⁶ In the statement of CMC, a percent refers to a percentage of reading unless otherwise noted and IV stands for indicated value.

⁷ 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.

⁸ The type of instrument or material being calibrated is defined by the parameter. This indicates the laboratory is capable of calibrating instruments that measure or generate the values in the ranges indicated for the listed measurement parameter.

⁹ This scope meets A2LA's *P112 Flexible Scope Policy*.



Accredited Laboratory

A2LA has accredited

MSI-VIKING GAGE, LLC.

Fairfield, OH

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 28th day of July 2022.

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 1387.04
Valid to August 31, 2024

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