



Laboratory
Accreditation
Bureau

Certificate of Accreditation

ISO/IEC 17025:2005

Certificate Number L2216

Cal Lab Company, Inc.
17035 Westview Avenue
South Holland, IL 60473

has met the requirements set forth in L-A-B's policies and procedures, and all requirements of ANSI Z540-1, ANSI/NCSL Z540.3 and ISO/IEC 17025:2005 "General Requirements for the competence of Testing and Calibration Laboratories." 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 January 2009).

Accreditation valid through September 29, 2013

**R. Douglas Leonard, Jr., Managing Director
Laboratory Accreditation Bureau
Presented the 23rd of December 2010**

*Laboratory Accreditation Bureau is found to be in compliance with ISO/IEC 17011:2004 and recognized by ILAC (International Laboratory Accreditation Cooperation) and NACLA (National Cooperation for Laboratory Accreditation).

Scope of Accreditation For Cal Lab Company, Inc.

17035 Westview Avenue
South Holland, IL 60473
J. Brent Snoddy
708-596-5800

In recognition of a successful assessment to ISO/IEC 17025:2005, ANSI Z540-1 and ANSI/NCSL Z540.3, accreditation is granted to **Cal Lab Company, Inc.** to perform the following **Calibrations / Dimensional Inspections**:

Accreditation granted through: **September 29, 2013**

Calibration

Length– Hand Tools and Precision Gages 1D

Calibration Parameter/Equipment	Range	Calibration and Measurement Capability (+/-) ²	Remarks
Bench Micrometers	(0 to 2) in	12 μin	Gauge Blocks
Bore Gauges (2 point)	(0 to 8 x 0.0001) in	(91 + 4L) μin	Labmaster Universal Ring Gauges
	(0 to 8 x 0.001) in	(580 + 1.5L) μin	
Calipers ID & OD ^{1,4}	(0 to 20) in	(280 + 10L) μin	Gauge Blocks and Accessories
	(21 to 40) in	(380 + 7L) μin	
	(41 to 60) in	(960 + 3L) μin	
Dial/Digital Thickness Gauges	(0 to 0.5) in	60 μin	Gauge Blocks
Gauging Amplifiers & LVDT Heads	(0 to 0.001) in	5.1 μin	P&W Labmaster Universal
Height Gauges ¹	(0 to 24) in	(290 + 2L) μin	Gauge Blocks
	(24 to 40) in	(250 + 4L) μin	
Height Masters	(0 to 24) in	(24 + 6L) μin	Gauge Blocks & Gauging Amplifier
Indicators ⁸	(0 to 0.001) in	6.9 μin	P&W Labmaster Universal

Calibration Parameter/Equipment	Range	Calibration and Measurement Capability (+/-) ²	Remarks
	(0 to 0.01) in	43 μin	
	(0.01 to 8) in ¹	(56 + 66L) μin	Gauge Blocks ¹
Micrometer Heads Length	(0 to 1) in	33 μin	P&W Labmaster Universal
Micrometer Heads Anvil Flatness	n/a	7.6 μin	Optical Flat
Micrometers, Depth – Length	(0 to 12) in	(45 + 5L) μin	Gauge Blocks
Micrometers, Depth – Base Flatness	(0 to 3) in	7.6 μin	Optical Flat
Micrometers ID ¹	(0 to 4) in	(32 + 8L) μin	Gauge Blocks & End Caps
	(5 to 20) in	(46 + 7L) μin	
	(21 to 40) in	(350 + 3L) μin	
	(41 to 60) in	(580 + 4L) μin	
Micrometers OD ¹	(0 to 4) in	(32 + 8L) μin	Gauge Blocks
	(5 to 20) in	(46 + 7L) μin	
	(21 to 40) in	(350 + 3L) μin	
	(41 to 60) in	(580 + 4L) μin	
Micrometer Anvil Flatness ¹	3 in Diameter	9.4 μin	Optical Flat
Micrometers Screw Thread ^{3,1}	(0 to 1) in	(160 + 10L) μin	Thread Setting Plugs
Micrometers, V-Anvil ¹	(0.0625 to 2) in	(53 + 7L) μin	Gauge Balls

Length – Hand Tools and Precision Gages 2D

Calibration Parameter/Equipment	Range	Calibration and Measurement Capability (+/-) ²	Remarks
Optical Comparators ¹	Magnification 10X, 20X, 31.25X, 50X and 62.5X	0.0012 in	Magnification Checker, Glass Scale & Angle Block Set
	Linear 0 to 6 in	113 μin	

Calibration Parameter/Equipment	Range	Calibration and Measurement Capability (+/-) ²	Remarks
	Angle 0° to 90°	0.021°	
Bevel Protractors & Inclinometers	(0 to 90)°	2.88 min	Gauge Blocks, Cylindrical Square & Sine Plate

Length - Artifacts and Standards 1D

Calibration Parameter/Equipment	Range	Calibration and Measurement Capability (+/-) ²	Remarks
Caliper Masters	(0.5 to 12) in	(16 + 9L) μin	P&W Labmaster Universal
	(13 to 60) in	(200 + 0.4L) μin	Comparator and Gauge Blocks
Cylindrical Plug Gages	(0 to 12) in	(2 + 4L) μin	P&W Labmaster Universal
Cylindrical Ring Gauges	(0.02 to 1) in	15 μin	P&W Labmaster Universal
	(1 to 13) in	(15 + 1L) μin	
Depth Micrometer Master	(0.5 to 11.5) in	(28 + 1L) μin	Comparator and Gauge Blocks
End Measuring Rods	(0.5 to 12) in	(16 + 9L) μin	P&W Labmaster Universal
	(13 to 60) in	(200 + 0.4L) μin	Comparator and Gauge Blocks
Feeler Gauges (Leaf-Style) ¹	(0 to 0.25) in	76 μin	Bench Micrometer
Gauge Balls (size only)	(0.0625 to 2) in	(10 + 4L) μin	P&W Labmaster Universal
Gauge Blocks ⁷	(0 to 1) in	4.4 μin	P&W Labmaster Universal and Gauge Blocks
	(2 to 12) in	(1.4 + 2L) μin	
Micrometer Masters	(0 to 12) in	(2 + 4L) μin	P&W Labmaster Universal
Optical Flats & Parallels	Flatness to 4 in diameter	7.6 μin	Optical Flat
	Parallelism	4.5 μin	P&W Labmaster Universal
Pin Gauges – Class ZZ ¹	(0.011 to 1) in	(88+ 0.4L) μin	Bench Micrometer
Riser Blocks	(6 to 24) in	(19 + 7L) μin	Comparator and Gauge Blocks

Calibration Parameter/Equipment	Range	Calibration and Measurement Capability (+/-) ²	Remarks
Snap Gauges	(0.02 to 13) in	(15 + 1L) μin	Labmaster Universal
Tapered Plugs	(0 to 2) in	(13 + 12L) μin	Labmaster Universal, Gauge Blocks & Plug Gauges
Tapered Rings	(0 to 2) in	(15 + 5.3L) μin	Labmaster Universal, Gauge Blocks
Thread Measuring Wires	(4 to 80) TPI	4.4 μin	P&W Labmaster Universal
Thread Micrometer Standards	(1 to 2) in	(170 + 1L) μin	Optical Comparator

Length - Artifacts and Standards 2D

Calibration Parameter/Equipment	Range	Calibration and Measurement Capability (+/-) ²	Remarks
Angle Blocks	(1 to 60)°	0.0022°	Master Angle Blocks, Sine Plate & Gauging Amplifier
Angle Gauges (Leaf Style)	(0 to 90)°	3.7 min	Optical Comparator
Electronic Differential Levels	1000 arc s	1.4 arc s	Angle Generator
Functional Gauges & Fixtures	Linear 0 to 12 in	190 μin	Optical Comparator
	Angle 0° to 90°	0.065°	
Radius Gauges (Leaf Style)	Up to 1 in	210 μin	Optical Comparator
Sine Bars & Plates	(1 to 60)° Angle	6.1 arc s	Gauge Blocks, Angle Blocks & Gauging Amp
Thread Pitch Gauges (Leaf Style) ⁶	(4 to 84) TPI	160 μin	Optical Comparator

Length - Other

Calibration Parameter/Equipment	Range	Calibration and Measurement Capability (+/-) ²	Remarks
Pipe Thread Plugs	(4 to 80 TPI) Pitch Diameter	(100 + 3L) μin	Labmaster Universal and Sine Plug
	Up to 1 in	(3.1 + 20L) μin	Comparator and Gauge Blocks
Thread Plugs - Setting	(4 to 80 TPI) Pitch Diameter	(84 + 4L) μin	Labmaster Universal & Thread Measuring Wires
	(0.06 to 4) in Major Diameter	(16 + 8.6L) μin	Labmaster Universal

Calibration Parameter/Equipment	Range	Calibration and Measurement Capability (+/-) ²	Remarks
	Root Radius & Minor Diameter	210 μin	Optical Comparator
Thread Plugs - Working	(4 to 80 TPI) Pitch Diameter	(160 + 2L) μin	Labmaster Universal & Thread Measuring Wires
	(0.060 to 4) in Major Diameter	(26 + 5L) μin	Labmaster Universal
	Root Radius & Minor Diameter	210 μin	Optical Comparator

Length – Laser Frequency – Dimensional Equipment

Calibration Parameter/Equipment	Range	Calibration and Measurement Capability (+/-) ²	Remarks
Laser Micrometers	(0 to 2) in	(21 + 9.7L) μin	Master Setting Discs

Mass – Force

Calibration Parameter/Equipment	Range	Calibration and Measurement Capability (+/-) ²	Remarks
Force	(0 to 5) lbf	0.0001 lbf + 0.002 lbf/lbf	Deadweight
	(5 to 50) lbf	0.009 lbf + 0.0001 lbf/lbf	
	(50 to 600) lbf	0.06 lbf + 0.0001 lbf/lbf	

Mass – Hardness

Calibration Parameter/Equipment	Range	Calibration and Measurement Capability (+/-) ²	Remarks
Durometer Indenter	Angle	0.065°	Optical Comparator
	Diameter	220 μin	
	Radius	250 μin	
Durometer Force	Type A, B, O	0.05 N	Durometer Calibrator and/or Balance
	Type C, D, & DO	0.1 N	

Mass – Pressure

Calibration Parameter/Equipment	Range	Calibration and Measurement Capability (+/-) ²	Remarks
Absolute – Measure & Generate	(-14.7 to 1 015) psia	2.3 x 10 ⁻⁵ psia	Deadweight Tester
Hydraulic – Measure & Generate	(20 to 6 000) psig	9.1 x 10 ⁻⁵ psig	Deadweight Tester

Calibration Parameter/Equipment	Range	Calibration and Measurement Capability (+/-) ²	Remarks
Low Pressure – Measure & Generate	(0 to 2) inH ₂ O	0.0008 inH ₂ O	Manometer
	(-10 to +10) inH ₂ O	0.0036 inH ₂ O	Micromanometer
Pneumatic – Measure & Generate	(0.2 to 1000) psi	2.3 x 10 ⁻⁵ psig	Deadweight Tester
Pressure – Measure & Generate ¹	(0 to 15) psi	0.01 psig	Pressure Transducers
	(-15 to 30) psi	0.026 psig	
	(0 to 100) psi	0.06 psig	
	(0 to 500) psi	0.3 psig	
	(0 to 1 000) psi	0.66 psig	
	(0 to 10 000) psi	10 psig	

Mass – Scale and Balances

Calibration Parameter/Equipment	Range	Calibration and Measurement Capability (+/-) ²	Remarks
Scales & Balances	(0 to 610) g	0.9 mg + 0.02 mg/mg	ASTM Class 1 Weights
	610 g to 35 kg	0.056 g + 0.002 g/kg	
	(0.5 to 600) lb	0.082 lb + 0.00005 lb/lb	NIST 105-1 Class F Weights

Mass – Torque

Calibration Parameter/Equipment	Range	Calibration and Measurement Capability (+/-) ²	Remarks
Torque - Measure	(20 to 200) ozf·in	0.08 ozf·in + 0.003 ozf·in / ozf·in	Torque Tester
	(4 to 50) lbf·in	0.009 lbf·in + 0.003 lbf·in / lbf·in	
	(30 to 400) lbf·in	0.05 lbf·in + 0.003 lbf·in / lbf·in	
	(80 to 1 000) lbf·in	0.95 lbf·in + 0.002 lbf·in / lbf·in	
	(20 to 250) lbf·ft	0.07 lbf·ft + 0.003 lbf·ft / lbf·ft	
	(100 to 1 000) lbf·ft	0.01 lbf·ft + 0.006 lbf·ft / lbf·ft	

Calibration Parameter/Equipment	Range	Calibration and Measurement Capability (+/-) ²	Remarks
Torque - Source	(20 to 200) ozf·in	0.04 ozf·in + 0.00004 ozf·in / ozf·in	Weights, Torque Arms & Wheels
	(4 to 50) lbf·in	0.11 lbf·in + 0.000005 lbf·in / lbf·in	
	(30 to 400) lbf·in	0.03 lbf·in + 0.00001 lbf·in / lbf·in	
	(80 to 1 000) lbf·in	0.2 lbf·in + 0.000001 lbf·in / lbf·in	
	(20 to 250) lbf·ft	0.06 lbf·ft + 0.00003 lbf·ft / lbf·ft	
	(250 to 1000) lbf·ft	0.2 lbf·ft + 0.00006 lbf·ft / lbf·ft	

Mass – Vacuum

Calibration Parameter/Equipment	Range	Calibration and Measurement Capability (+/-) ²	Remarks
Vacuum Measure & Generate	(0 to -14.7) psig	2.3 x 10 ⁻⁵ psia	Deadweight Tester
Vacuum – Measure & Generate ¹	(0 to -14) psi	0.013 psig	Pressure Transducer

Amount of Substance –Conductivity and pH

Calibration Parameter/Equipment	Range	Calibration and Measurement Capability (+/-) ²	Remarks
pH Meters	4, 7 & 10 pH	0.045 pH	Buffer Solutions and RTD Probe

Electrical - Voltage

Calibration Parameter/Equipment	Range	Calibration and Measurement Capability (+/-) ²	Remarks
DC Voltage – Source	(0 to 220) mV	8 nV/mV + 0.61 μV	Fluke 5700A
	(0.22 to 2.2) V	7 μV/V + 1 μV	
	(2.2 to 11) V	7 μV/V + 4 μV	
	(11 to 22) V	7 μV/V + 6.6 μV	
	(22 to 220) V	8 μV/V + 81 μV	
	(220 to 1000) V	9 μV/V + 0.5 mV	
DC Voltage - Source ¹	(0 to 330) mV	0.018 μV/mV + 2.1 V	Fluke 5520A/SC1100
	(0.3 to 3.3) V	10.6 μV/V + 3.8 μV	

Calibration Parameter/Equipment	Range	Calibration and Measurement Capability (+/-) ²	Remarks
	(3.3 to 33) V	12 μ V/V + 35 μ V	
	(33 to 330) V	18 μ V/V + 260 μ V	
	(330 to 1 000) V	18 mV/V + 1.5 mV	
DC Voltage - Source	(1 to 15) kV	1 mV / V + 85 mV	Hipotronics Source, Ross Divider & Keithley 2000
DC Voltage - Source ¹	(10 to 100) kV	5 V / kV + 2 V	Hipotronics Source & KVM 100
AC Voltage - Source (0.22 to 2.2) mV	(10 to 20) Hz	0.5 μ V/mV + 4.5 μ V	Fluke 5700A
	(20 to 40) Hz	0.2 μ V/mV + 4.5 μ V	
	40 Hz to 20 kHz	0.11 μ V/mV + 4.5 μ V	
	(20 to 50) kHz	0.37 μ V/mV + 4.5 μ V	
	(50 to 100) kHz	0.85 μ V/mV + 7 μ V	
	(100 to 300) kHz	1.1 μ V/mV + 13 μ V	
	(300 to 500) kHz	2.7 μ V/mV + 23 μ V	
	500 kHz to 1 MHz	3.4 μ V/mV + 25 μ V	
AC Voltage - Source (2.2 to 22) mV	(10 to 20) Hz	0.5 μ V/mV + 5 μ V	Fluke 5700A
	(20 to 40) Hz	0.2 μ V/mV + 5 μ V	
	40 Hz to 20 kHz	0.1 μ V/mV + 5 μ V	
	(20 to 50) kHz	0.4 μ V/mV + 5 μ V	
	(50 to 100) kHz	0.8 μ V/mV + 7 μ V	
	(100 to 300) kHz	1 μ V/mV + 12 μ V	
	(300 to 500) kHz	2 μ V/mV + 25 μ V	
	500 kHz to 1 MHz	3 μ V/mV + 25 μ V	

Calibration Parameter/Equipment	Range	Calibration and Measurement Capability (+/-) ²	Remarks
AC Voltage - Source (22 to 220) mV	(10 to 20) Hz	0.5 μ V/mV + 13 μ V	Fluke 5700A
	(20 to 40) Hz	0.2 μ V/mV + 12 μ V	
	40 Hz to 20 kHz	0.1 μ V/mV + 8 μ V	
	(20 to 50) kHz	0.3 μ V/mV + 8 μ V	
	(50 to 100) kHz	0.8 μ V/mV + 25 μ V	
	(100 to 300) kHz	1 μ V/mV + 25 μ V	
	(300 to 500) kHz	2 μ V/mV + 35 μ V	
	500 kHz to 1 MHz	3 μ V/mV + 80 μ V	
AC Voltage - Source (0.22 to 2.2) V	(10 to 20) Hz	0.5 mV/V + 80 μ V	Fluke 5700A
	(20 to 40) Hz	0.2 mV/V + 0.25 mV	
	40 Hz to 20 kHz	70 μ V/V + 6.5 μ V	
	(20 to 50) kHz	0.1 mV/V + 16 μ V	
	(50 to 100) kHz	0.2 mV/V + 70 μ V	
	(100 to 300) kHz	0.4 mV/V + 0.13 mV	
	(300 to 500) kHz	1 mV/V + 0.35 mV	
	500 kHz to 1 MHz	2 mV/V + 0.85 mV	
AC Voltage - Source (2.2 to 22) V	(10 to 20) Hz	0.5 mV/V + 0.80 mV	Fluke 5700A
	(20 to 40) Hz	0.2 mV/V + 0.25 mV	
	40 Hz to 20 kHz	70 μ V/V + 62 μ V	
	(20 to 50) kHz	0.1 mV/V + 0.16 mV	
	(50 to 100) kHz	0.2 mV/V + 0.35 mV	
	(100 to 300) kHz	0.5 mV/V + 1.5 mV	

Calibration Parameter/Equipment	Range	Calibration and Measurement Capability (+/-) ²	Remarks
	(300 to 500) kHz	1 mV/V + 4.3 mV	
	500 kHz to 1 MHz	3 mV/V + 8.5 mV	
AC Voltage - Source (22 to 220) V	(10 to 20) Hz	0.5 mV/V + 8 mV	Fluke 5700A
	(20 to 40) Hz	0.2 mV/V + 2.5 mV	
	40 Hz to 20 kHz	80 μ V/V + 0.83 mV	
	(20 to 50) kHz	0.2 mV/V + 3.5 mV	
	(50 to 100) kHz	0.5 mV/V + 8 mV	
	(100 to 300) kHz	1 mV/V + 90 mV	
	(300 to 500) kHz	5 mV/V + 90 mV	
	500 kHz to 1 MHz	10 mV/V + 190 mV	
AC Voltage - Source (220 to 1100) V	(15 to 50) Hz	80 μ V/V + 1.8 mV	Fluke 5700A
	50 Hz to 1 kHz	0.4 mV/V + 16 mV	
AC Voltage - Source ¹ (1 to 33) mV	(10 to 45) Hz	0.8 μ V/mV + 6 μ V	Fluke 5520A/SC1100
	45 Hz to 10 kHz	0.15 μ V/mV + 6.3 μ V	
	(10 to 20) kHz	0.2 μ V/mV + 6.3 μ V	
	(20 to 50) kHz	1 μ V/mV + 6.2 μ V	
	(50 to 100) kHz	3.5 μ V/mV + 12 μ V	
	(100 to 500) kHz	8 μ V/mV + 50 μ V	
AC Volts, Source ¹ (33 to 330) mV	(10 to 45) Hz	0.3 μ V/mV + 8.1 μ V	Fluke 5520A/SC1100
	45 Hz to 10 kHz	0.15 μ V/mV + 8.1 μ V	
	(10 to 20) kHz	0.16 μ V/mV + 8.1 μ V	
	(20 to 50) kHz	0.35 μ V/mV + 8.1 μ V	

Calibration Parameter/Equipment	Range	Calibration and Measurement Capability (+/-) ²	Remarks
	(50 to 100) kHz	0.8 μ V/mV + 32 μ V	
	(100 to 500) kHz	2 μ V/mV + 70 μ V	
AC Voltage - Source ¹ (0.33 to 3.3) V	(10 to 45) Hz	300 μ V/V + 50 μ V	Fluke 5520A/SC1100
	45 Hz to 10 kHz	150 μ V/V + 60 μ V	
	(10 to 20) kHz	190 μ V/V + 60 μ V	
	(20 to 50) kHz	300 μ V/V + 50 μ V	
	(50 to 100) kHz	700 μ V/V + 130 μ V	
	(100 to 500) kHz	2.4 mV/V + 0.6 mV	
AC Voltage - Source ¹ (3.3 to 33) V	(10 to 45) Hz	0.3 mV/V + 0.65 mV	Fluke 5520A/SC1100
	45 Hz to 10 kHz	0.3 mV/V + 0.65 mV	
	(10 to 20) kHz	0.24 mV/V + 0.6 mV	
	(20 to 50) kHz	0.35 mV/V + 0.6 mV	
	(50 to 100) kHz	0.9 mV/V + 1.6 mV	
AC Voltage - Source ¹ (33 to 330) V	45 Hz to 1 kHz	0.19 mV/V + 2 mV	Fluke 5520A/SC1100
	(1 to 10) kHz	0.2 mV/V + 6 mV	
	(10 to 20) kHz	0.25 mV/V + 6 mV	
	(20 to 50) kHz	0.3 mV/V + 6 mV	
	(50 to 100) kHz	2 mV/V + 50 mV	
AC Voltage - Source ¹ (330 to 1 000) V	45 Hz to 1 kHz	0.3 mV/V + 10 mV	Fluke 5520A/SC1100
	(1 to 5) kHz	0.25 mV/V + 10 mV	
	(5 to 10) kHz	0.3 mV/V + 10 mV	
DC Voltage – Measure	(0 to 200) mV	4 μ V / V + 0.11 μ V	Fluke 8508A

Calibration Parameter/Equipment	Range	Calibration and Measurement Capability (+/-) ²	Remarks
	(0.2 to 2) V	4 μV + 3 μV / V	
	(2 to 20) V	4 μV + 3 μV / V	
	(20 to 200) V	0.04 mV + 4.5 μV / V	
	(200 to 1000) V	0.53 mV + 4.5 μV / V	
	(1 to 15) kV	1 mV / V + 85 mV	
DC Voltage – Measure ¹	(1 to 100) kV	5 V / kV + 2 V	KVM 100
	(20 to 200) kV	5 V / kV + 20 V	KVM 200
pH Calibrators	± 120 mV	0.027 mV	Fluke 8508
AC Voltage – Measure Up to 200 mV	(1 to 10) Hz	14 μV + 160 μV / V	Fluke 8508A
	(10 to 40) Hz	4 μV + 0.13 mV / V	
	(40 to 100) Hz	4 μV + 0.11 mV / V	
	100 Hz to 2 kHz	2 μV + 0.1 mV / V	
	(2 to 10) kHz	4 μV + 0.1 mV / V	
	(10 to 30) kHz	8 μV + 0.3 mV / V	
	(30 to 100) kHz	20 μV + 0.7 mV / V	
(0.2 to 2) V	(1 to 10) Hz	120 μV + 0.140 mV / V	Fluke 8508A
	(10 to 40) Hz	20 μV + 0.1 mV / V	
	(40 to 100) Hz	20 μV + 85 μV / V	
	100 Hz to 2 kHz	20 μV + 65 μV / V	
	(2 to 10) kHz	20 μV + 85 μV / V	
	(10 to 30) kHz	40 μV + 0.20 mV / V	
	(30 to 100) kHz	0.2 mV + 0.5 mV / V	

Calibration Parameter/Equipment	Range	Calibration and Measurement Capability (+/-) ²	Remarks
	(100 to 300) kHz	2 mV + 3 mV / V	
	300 kHz to 1 MHz	20 mV + 10 mV / V	
(2 to 20) V	(1 to 10) Hz	1.2 mV + 0.14 mV / V	Fluke 8508A
	(10 to 40) Hz	0.2 mV + 0.11 mV / V	
	(40 to 100) Hz	0.19 mV + 0.09 mV / V	
	100 Hz to 2 kHz	0.19 mV + 0.07 mV / V	
	(2 to 10) kHz	0.19 mV + 0.09 mV / V	
	(10 to 30) kHz	0.38 mV + 0.22 mV / V	
	(30 to 100) kHz	1.9 mV + 0.53 mV / V	
	(100 to 300) kHz	20 mV + 3.2 mV / V	
	300 kHz to 1 MHz	0.2 V + 11 mV / V	
(20 to 200) V	(10 to 40) Hz	12 mV + 0.15 mV / V	Fluke 8508A
	(10 to 40) Hz	2 mV + 0.11 mV / V	
	(40 to 100) Hz	2 mV + 90 μV / V	
	100 Hz to 2 kHz	2 mV + 16 μV / V	
	(2 to 10) kHz	2 mV + 89 μV / V	
	(10 to 30) kHz	4 mV + 0.22 mV / V	
	(30 to 100) kHz	20 mV + 0.53 mV / V	
	(100 to 300) kHz	0.2 V + 3.2 mV / V	
	300 kHz to 1 MHz	2 V + 11 mV / V	
(200 to 1000) V	(1 to 10) Hz	0.38 mV / V + 21 mV	Fluke 8508A 300 V, add 0.00004 (reading - 300) ² μV/V
	(10 to 40) Hz	0.12 mV / V + 20 mV	

Calibration Parameter/Equipment	Range	Calibration and Measurement Capability (+/-) ²	Remarks
	40 Hz to 10 kHz	0.3 mV / V + 10 mV	
	(10 to 30) kHz	0.2 mV / V + 40 mV	
	(30 to 100) kHz	0.0005 mV / V + 0.21 mV	
AC Voltage – Measure	(1 to 10) kV @ 60Hz	10 mV / V + 17 mV	Ross Divider & Keithley 2000
AC Voltage – Measure ¹	(1 to 100) kV	5 V / kV + 2 V	KVM 100
	(20 to 200) kV	5 V / kV + 20 V	KVM 200
Electrical Simulation of RTD Indicating Devices ¹ Pt 385, 100 Ω	(-200 to -80) °C	0.052 °C	Fluke 5520A/SC1100
	(-80 to 0) °C	0.052 °C	
	(0 to 100) °C	0.07 °C	
	(100 to 300) °C	0.091 °C	
	(300 to 400) °C	0.1 °C	
	(400 to 630) °C	0.12 °C	
	(630 to 800) °C	0.23 °C	
Pt 385, 200 Ω	(-200 to -80) °C	0.043 °C	Fluke 5520A/SC1100
	(-80 to 0) °C	0.043 °C	
	(0 to 100) °C	0.043 °C	
	(100 to 260) °C	0.052 °C	
	(260 to 300) °C	0.12 °C	
	(300 to 400) °C	0.13 °C	
	(400 to 600) °C	0.14 °C	
	(600 to 630) °C	0.16 °C	
Pt 385, 500 Ω	(-200 to -80) °C	0.043 °C	Fluke 5520A/SC1100

Calibration Parameter/Equipment	Range	Calibration and Measurement Capability (+/-) ²	Remarks
	(-80 to 0) °C	0.052 °C	
	(0 to 100) °C	0.052 °C	
	(100 to 260) °C	0.062 °C	
	(260 to 300) °C	0.081 °C	
	(300 to 400) °C	0.081 °C	
	(400 to 600) °C	0.091 °C	
	(600 to 630) °C	0.11 °C	
Pt 385, 1000 Ω	(-200 to -80) °C	0.034 °C	Fluke 5520A/SC1100
	(-80 to 0) °C	0.034 °C	
	(0 to 100) °C	0.043 °C	
	(100 to 260) °C	0.052 °C	
	(260 to 300) °C	0.062 °C	
	(300 to 400) °C	0.072 °C	
	(400 to 600) °C	0.072 °C	
	(600 to 630) °C	0.23 °C	
Pt 3916, 100 Ω	(-200 to -190) °C	0.25 °C	Fluke 5520A/SC1100
	(-190 to -80) °C	0.043 °C	
	(-80 to 0) °C	0.053 °C	
	(0 to 100) °C	0.062 °C	
	(100 to 260) °C	0.072 °C	
	(260 to 300) °C	0.082 °C	
	(300 to 400) °C	0.092 °C	

Calibration Parameter/Equipment	Range	Calibration and Measurement Capability (+/-) ²	Remarks
	(400 to 600) °C	0.1 °C	
	(600 to 630) °C	0.23 °C	
Pt 3926, 100 Ω	(-200 to -80) °C	0.053 °C	Fluke 5520A/SC1100
	(-80 to 0) °C	0.053 °C	
	(0 to 100) °C	0.072 °C	
	(100 to 300) °C	0.092 °C	
	(300 to 400) °C	0.1 °C	
	(400 to 630) °C	0.12 °C	
PtNi 385, 120 Ω	(-80 to 0) °C	0.083 °C	Fluke 5520A/SC1100
	(0 to 100) °C	0.083 °C	
	(100 to 260) °C	0.14 °C	
Cu 427, 10 Ω	(-100 to 260) °C	0.3 °C	Fluke 5520A/SC1100
Electrical Simulation of Thermocouple Indicating Devices ¹ Type B	(600 to 800) °C	0.44 °C	Fluke 5520A/SC1100
	(800 to 1000) °C	0.34 °C	
	(1000 to 1550) °C	0.3 °C	
	(1550 to 1820) °C	0.33 °C	
Type C	(0 to 150) °C	0.3 °C	Fluke 5520A/SC1100
	(150 to 650) °C	0.26 °C	
	(650 to 1000) °C	0.31 °C	
	(1000 to 1800) °C	0.5 °C	
	(1800 to 2316) °C	0.84 °C	
Type E	(-250 to -100) °C	0.5 °C	Fluke 5520A/SC1100

Calibration Parameter/Equipment	Range	Calibration and Measurement Capability (+/-) ²	Remarks
	(-100 to -25) °C	0.16 °C	
	(-25 to 350) °C	0.14 °C	
	(350 to 650) °C	0.16 °C	
	(650 to 1000) °C	0.21 °C	
Type J	(-210 to -100) °C	0.27 °C	Fluke 5520A/SC1100
	(-100 to -30) °C	0.16 °C	
	(-30 to 150) °C	0.14 °C	
	(150 to 760) °C	0.17 °C	
	(760 to 1200) °C	0.23 °C	
Type K	(-200 to -100) °C	0.33 °C	Fluke 5520A/SC1100
	(-100 to -25) °C	0.18 °C	
	(-25 to 120) °C	0.16 °C	
	(120 to 1000) °C	0.26 °C	
	(1000 to 1372) °C	0.4 °C	
Type N	(-200 to -100) °C	0.4 °C	Fluke 5520A/SC1100
	(-100 to -25) °C	0.22 °C	
	(-25 to 120) °C	0.19 °C	
	(120 to 410) °C	0.18 °C	
	(410 to 1300) °C	0.27 °C	
Type R	(0 to 250) °C	0.57 °C	Fluke 5520A/SC1100
	(250 to 400) °C	0.57 °C	
	(400 to 1000) °C	0.33 °C	

Calibration Parameter/Equipment	Range	Calibration and Measurement Capability (+/-) ²	Remarks
	(1000 to 1767) °C	0.4 °C	
Type S	(0 to 250) °C	0.47 °C	Fluke 5520A/SC1100
	(250 to 1000) °C	0.36 °C	
	(1000 to 1400) °C	0.37 °C	
	(1400 to 1767) °C	0.46 °C	
Type T	(-250 to -150) °C	0.63 °C	Fluke 5520A/SC1100
	(-150 to 0) °C	0.24 °C	
	(0 to 120) °C	0.16 °C	
	(120 to 400) °C	0.14 °C	

Electrical - Resistance

Calibration Parameter/Equipment	Range	Calibration and Measurement Capability (+/-) ²	Remarks
Resistance – Source Fixed Points	0 Ω	50 μΩ	Fluke 5700A
	1 Ω	95 μΩ	
	1.9 Ω	0.18 mΩ	
	10 Ω	0.28 mΩ	
	19 Ω	0.51 mΩ	
	100 Ω	1.7 mΩ	
	190 Ω	2.5 mΩ	
	1 kΩ	13 mΩ	
	1.9 kΩ	25 mΩ	
	10 kΩ	120 mΩ	
	19 kΩ	230 mΩ	

Calibration Parameter/Equipment	Range	Calibration and Measurement Capability (+/-) ²	Remarks
	100 kΩ	1.4 Ω	
	190 kΩ	2.7 Ω	
	1 MΩ	21 Ω	
	1.9 MΩ	40 Ω	
	10 MΩ	400 Ω	
	19 MΩ	890 Ω	
	100 MΩ	11 kΩ	
	(0.1 to 2) Ω	10 μΩ / Ω + 4 μΩ	
Resistance – Measure	(2 to 20) Ω	9 μΩ / Ω + 14 μΩ	Fluke 8508A
	(20 to 200) Ω	7.5 μΩ / Ω + 50 μΩ	
	200 Ω to 2 kΩ	7.5 μΩ / Ω + 0.5 mΩ	
	(2 to 20) kΩ	8 μΩ / Ω + 5 mΩ	
	(20 to 200) kΩ	7.5 μΩ / Ω + 50 mΩ	
	200 kΩ to 2 MΩ	8.9 μΩ / Ω + 0.9 Ω	
	(2 to 20) MΩ	15 Ω / MΩ + 110 Ω	
	(20 to 200) MΩ	10 kΩ + 65 Ω / MΩ	Fluke 8508A HV mode
	200 MΩ to 2 GΩ	1 MΩ + 0.51 MΩ / Ω	
	(2 to 20) GΩ	10 MΩ + 0.53 MΩ / Ω	
Resistance – Source ¹	(0 to 11) Ω	40 μΩ / Ω + 1 mΩ	Fluke 5520A/SC1100
	(11 to 33) Ω	30 μΩ / Ω + 1.5 mΩ	
	(33 to 110) Ω	28 μΩ / Ω + 1.4 mΩ	
	(110 to 330) Ω	28 μΩ / Ω + 2.1 mΩ	

Calibration Parameter/Equipment	Range	Calibration and Measurement Capability (+/-) ²	Remarks
	(330 to 1 100) Ω	28 μΩ / Ω + 2 mΩ	
	(1.1 to 3.3) kΩ	28 μΩ / Ω + 200 mΩ	
	(3.3 to 11) kΩ	30 μΩ / Ω + 200 mΩ	
	(11 to 33) kΩ	30 μΩ / Ω + 210 mΩ	
	(33 to 110) kΩ	28 μΩ / Ω + 240 mΩ	
	(110 to 330) kΩ	32 μΩ / Ω + 2 Ω	
	(0.33 to 1.1) MΩ	32 μΩ / Ω + 2 Ω	
	(1.1 to 3.3) MΩ	69 μΩ / Ω + 21 Ω	
	(3.3 to 11) MΩ	130 μΩ / Ω + 50 Ω	
	(11 to 33) MΩ	250 μΩ / Ω + 2.5 kΩ	
	(33 to 110) MΩ	0.5 mΩ / Ω + 3 kΩ	
	(110 to 330) MΩ	3 mΩ / Ω + 100 kΩ	
	(330 to 1 100) MΩ	15 mΩ / Ω + 0.5 MΩ	

Electrical - Current

Calibration Parameter/Equipment	Range	Calibration and Measurement Capability (+/-) ²	Remarks
AC Current - Source (22 to 220) uA	(10 to 20) Hz	0.7 nA/A + 25 nA	Fluke 5700A
	(20 to 40) Hz	0.36 nA/A + 20 nA	
	40 Hz to 1 kHz	0.14 nA/A + 16 nA	
	(1 to 5) kHz	0.6 nA/A + 40 nA	
	(5 to 10) kHz	1.6 nA/A + 80 nA	
AC Current - Source (0.22 to 2.2) mA	(10 to 20) Hz	0.7 nA/μA + 41 nA	Fluke 5700A
	(20 to 40) Hz	0.35 nA/μA + 37 nA	

Calibration Parameter/Equipment	Range	Calibration and Measurement Capability (+/-) ²	Remarks
	40 Hz to 1 kHz	0.14 nA/μA + 39 nA	
	(1 to 5) kHz	0.6 nA/μA + 40 nA	
	(5 to 10) kHz	1.6 nA/μA + 80 nA	
AC Current - Source (2.2 to 22) mA	(10 to 20) Hz	0.7 nA/μA + 0.4 μA	Fluke 5700A
	(20 to 40) Hz	0.35 nA/μA + 0.35 μA	
	40 Hz to 1 kHz	0.17 nA/μA + 0.3 μA	
	(1 to 5) kHz	0.6 nA/μA + 4 μA	
	(5 to 10) kHz	1.6 nA/μA + 8 μA	
AC Current - Source (22 to 220) mA	(10 to 20) Hz	0.7 nA/μA + 4.1 μA	Fluke 5700A
	(20 to 40) Hz	0.38 nA/μA + 2.8 μA	
	40 Hz to 1 kHz	0.14 nA/μA + 3.8 μA	
	(1 to 5) kHz	0.6 nA/μA + 40 μA	
	(5 to 10) kHz	1.6 nA/μA + 80 μA	
AC Current - Source (0.22 to 2.2) A	20 Hz to 1 kHz	0.35 nA/μA + 36 μA	Fluke 5700A
	(1 to 5) kHz	0.75 nA/μA + 81 μA	
	(5 to 10) kHz	8.5 nA/μA + 160 μA	
DC Current - Source	(0 to 220) μA	50 μA/A + 8.7 nA	Fluke 5700A
	(0.22 to 2.2) mA	50 μA/A + 8.3 nA	
	(2.2 to 22) mA	50 μA/A + 80 nA	
	(22 to 220) mA	69 μA/A + 0.6 μA	
	(0.22 to 2.2) A	0.12 mA/A + 0.24 mA	
DC Current – Source ¹	0 μA to 330 μA	0.14 nA/μA + 27 nA	Fluke 5520A/SC1100

Calibration Parameter/Equipment	Range	Calibration and Measurement Capability (+/-) ²	Remarks
	0.3 mA to 3.3 mA	0.1 μ A/ μ A + 52 nA	
	3.3 mA to 33 mA	0.1 μ A/ μ A + 0.28 μ A	
	33 mA to 330 mA	0.1 μ A/ μ A + 2.5 μ A	
	0.33 A to 1.1 A	0.2 mA/A + 40 μ A	
	1.1 A to 3 A	0.38 mA/A + 40 μ A	
	3.0 A to 11 A	0.5 mA/A + 0.5 mA	
	11 A to 20 A	1 mA/A + 0.75 mA	
	(20 to 100) A	0.4 mA / A + 22 mA	
DC Source – Current Clamps ¹	(10 to 150) A	3.6 mA / A + 1.5 mA	Fluke 5520A/SC1100 with Fluke 50-turn coil
	(150 to 1025) A	3.4 mA / A + 0.11 A	
AC Current – Source ¹ (30 to 330) μ A	(10 to 20) Hz	2 nA/ μ A + 0.1 μ A	Fluke 5520A/SC1100
	(20 to 45) Hz	1.5 nA/ μ A + 0.1 μ A	
	45 Hz to 1 kHz	1.2 nA/ μ A + 0.1 μ A	
	(1 to 5) kHz	3 nA/ μ A + 0.15 μ A	
	(5 to 10) kHz	8 nA/ μ A + 0.2 μ A	
	(10 to 30) kHz	16 nA/ μ A + 0.4 μ A	
(0.33 to 3.3) mA	(10 to 20) Hz	2 μ A/mA + 0.15 μ A	Fluke 5520A/SC1100
	(20 to 45) Hz	1.2 μ A/mA + 0.15 μ A	
	45 Hz to 1 kHz	1 μ A/mA + 0.15 μ A	
	(1 to 5) kHz	2 μ A/mA + 0.2 μ A	
	(5 to 10) kHz	5 μ A/mA + 0.3 μ A	

Calibration Parameter/Equipment	Range	Calibration and Measurement Capability (+/-) ²	Remarks
	(10 to 30) kHz	10 μ A/mA + 0.6 μ A	
(3.3 to 33) mA	(10 to 20) Hz	1.8 μ A/mA + 2 μ A	Fluke 5520A/SC1100
	(20 to 45) Hz	0.9 μ A/mA + 2 μ A	
	45 Hz to 1 kHz	0.4 μ A/mA + 2 μ A	
	(1 to 5) kHz	0.8 μ A/mA + 2 μ A	
	(5 to 10) kHz	2 μ A/mA + 3 μ A	
	(10 to 30) kHz	4 μ A/mA + 4 μ A	
(33 to 330) mA	(10 to 20) Hz	1.8 μ A/mA + 20 μ A	Fluke 5520A/SC1100
	(20 to 45) Hz	0.9 μ A/mA + 20 μ A	
	45 Hz to 1 kHz	0.4 μ A/mA + 20 μ A	
	(1 to 5) kHz	1 μ A/mA + 50 μ A	
	(5 to 10) kHz	2 μ A/mA + 0.1 mA	
	10 kHz to 30 kHz	4 μ A/mA + 0.2 mA	
(0.33 to 1.1) A	(10 to 45) Hz	1.6 μ A/mA + 0.18 mA	Fluke 5520A/SC1100
	45 Hz to 1 kHz	0.44 μ A/mA + 0.12 mA	
	(1 to 5) kHz	5.2 μ A/mA + 1.3 mA	
	(5 to 10) kHz	2.2 μ A/mA + 0.61 mA	
(1.1 to 3) A	(10 to 45) Hz	1.8 mA/A + 0.1 mA	Fluke 5520A/SC1100
	45 Hz to 1 kHz	0.6 mA/A + 0.1 mA	
	(1 to 5) kHz	6 mA/A + 1 mA	
	(5 to 10) kHz	25 mA/A + 5 mA	
(3 to 11) A	(45 to 100) Hz	0.6 mA/A + 2 mA	Fluke 5520A/SC1100

Calibration Parameter/Equipment	Range	Calibration and Measurement Capability (+/-) ²	Remarks
	100 Hz to 1 kHz	1 mA/A + 2 mA	
	(1 to 5) kHz	30 mA/A + 2 mA	
(11 to 20) A	(45 to 100) Hz	1.2 mA/A + 5 mA	Fluke 5520A/SC1100
	100 Hz to 1 kHz	1.5 mA/A + 5 mA	
	(1 to 5) kHz	30 mA/A + 5 mA	
(20 to 100) A	45 Hz to 1 kHz	1.8 mA / A + 0.12 A	Ballantine 1620 Transconductance Amplifier
AC Current Source – Current Clamps ¹ (45 to 65) Hz	(10 to 16.5) A	0.2 mA / A + 0.3 A	Fluke 5520A/SC1100 with Fluke 50-turn coil
	(16.5 to 150) A	2.7 mA / A + 0.25 A	
	(150 to 1025) A	3.8 mA / A + 0.15 A	
(65 to 440) Hz	(10 to 16.5) A	0.27 mA / A + 0.28 A	Fluke 5520A/SC1100 with Fluke 50-turn coil
	(16.5 to 150) A	8.7 mA / A + 0.18 A	
	(150 to 1025) A	9.5 mA / A + 0.14 A	
DC Current – Measure	(0 to 200) μ A	40 nA / μ A + 17 nA	Fluke 8508A
	200 μ A to 2 mA	10 nA / μ A + 6 nA	
	(2 to 20) mA	0.01 μ A / mA + 6 nA	
	(20 to 200) mA	0.03 μ A / mA + 0.9 μ A	
	200 mA to 2 A	200 μ A / A + 17 μ A	
	(2 to 20) A	0.4 mA / A + 0.41 mA	
AC Current – Measure (20 to 200) μ A	10 Hz to 10 kHz	0.3 nA / μ A + 0.025 μ A	Fluke 8508A
	(10 to 30) kHz	0.6 nA / μ A + 0.024 μ A	
	(30 to 100) kHz	4 nA / μ A + 0.021 μ A	

Calibration Parameter/Equipment	Range	Calibration and Measurement Capability (+/-) ²	Remarks
(0.2 to 2) mA	10 Hz to 10 kHz	0.28 μ A / mA + 0.2 μ A	
	(10 to 30) kHz	0.65 μ A / mA + 0.2 μ A	
	(30 to 100) kHz	4 μ A / mA + 0.2 μ A	
(2 to 20) mA	10 Hz to 10 kHz	0.28 μ A / mA + 2 μ A	
	(10 to 30) kHz	0.65 μ A / mA + 2 μ A	
	(30 to 100) kHz	4 μ A / mA + 2 μ A	
(20 to 200) mA	10 Hz to 10 kHz	0.25 μ A / mA + 20 μ A	
	(10 to 30) kHz	0.6 μ A / mA + 20 μ A	
200 mA to 2 A	10 Hz to 2 kHz	0.6 mA / A + 0.2 mA	
	(2 to 10) kHz	0.7 mA / A + 0.2 mA	
	(10 to 30) kHz	3 mA / A + 0.2 mA	
(2 to 20) A	10 Hz to 2 kHz	0.8 mA / A + 2 mA	
	(2 to 10) kHz	2.5 mA / A + 2 mA	

Electrical - Inductance

Calibration Parameter/Equipment	Range	Calibration and Measurement Capability (+/-) ²	Remarks
Inductance – Measure and Generate ¹ 1 kHz	(10 to 100) μ H	2 nH / μ H + 8 nH	Stanford Research SR720
	(0.1 to 1) mH	0.8 μ H / mH + 0.2 μ H	
	(1 to 10) mH	0.5 μ H / mH + 0.5 μ H	
	(10 to 100) mH	0.5 μ H / mH + 3 mH	
	(0.1 to 1) H	0.3 mH / H + 0.3 mH	
	1 H to 10 kH	0.5 mH / H + 0.3 mH	

Electrical - Capacitance

Calibration Parameter/Equipment	Range	Calibration and Measurement Capability (+/-) ²	Remarks
Capacitance – Source	(0.19 to 0.4) nF	0.005 nF / nF + 0.01 nF	Fluke 5520A/SC1100
	(0.4 to 1.1) nF	0.005 nF / nF + 0.01 nF	
	(1.1 to 3.3) nF	0.005 nF / nF + 0.01 nF	
	(3.3 to 11) nF	0.002 nF / nF + 0.1 nF	
	(11 to 33) nF	0.002 nF / nF + 0.1 nF	
	(33 to 110) nF	0.003 nF / nF + 0.088 nF	
	(110 to 330) nF	0.002 nF / nF + 0.3 nF	
	(0.33 to 1.1) μF	0.003 μF / μF + 0.98 nF	
	(1.1 to 3.3) μF	0.003 μF / μF + 3 nF	
Capacitance – Source	(3.3 to 11) μF	0.003 μF / μF + 10 nF	Fluke 5520A/SC1100
	(11 to 33) μF	0.004 μF / μF + 30 nF	
	(33 to 110) μF	0.005 μF / μF + 0.1 μF	
	(110 to 330) μF	0.005 μF / μF + 0.3 μF	
	(0.33 to 1.1) mF	0.005 μF / μF + 1 μF	
	(1.1 mF to 3.3) mF	0.9 mF / mF + 57 μF	
	(3.3 to 1)1 mF	3 μF / mF + 55 μF	
	(11 to 33) mF	7 μF / mF + 48 μF	
(33 to 110) mF	10 μF / mF + 0.1 mF		

Electrical - Oscilloscopes

Calibration Parameter/Equipment	Range	Calibration and Measurement Capability (+/-) ²	Remarks
Amplitude – Square Wave (peak to peak) ¹ 50 Ω	1 mV to 6.6 V	2.5 μV / V + 0.04 μV	Fluke 5520A/SC1100
1 MΩ (1 mV to 130 Vpp)	(0.01 to 1) kHz	1 μV / V + 0.04 μV	

Calibration Parameter/Equipment	Range	Calibration and Measurement Capability (+/-) ²	Remarks
	(1 to 10) kHz	2.5 $\mu\text{V} / \text{V} + 0.04 \mu\text{V}$	
Leveled Sine Wave Amplitude ¹ (@ 50 kHz ref.)	50 kHz to 100 MHz	20 $\mu\text{V} / \text{V} + 0.33 \mu\text{V}$	Fluke 5520A/SC1100
	(100 to 300) MHz	40 $\mu\text{V} / \text{V} + 0.31 \mu\text{V}$	
	(300 to 600) MHz	60 $\mu\text{V} / \text{V} + 0.31 \mu\text{V}$	
	(600 to 1100) MHz	70 $\mu\text{V} / \text{V} + 0.3 \mu\text{V}$	
Flatness ¹ (@ 50 kHz ref.)	50 kHz to 100 MHz	15 $\mu\text{V} / \text{V} + 0.1 \mu\text{V}$	Fluke 5520A/SC1100
	(100 to 300) MHz	20 $\mu\text{V} / \text{V} + 0.1 \mu\text{V}$	
	(300 to 600) MHz	40 $\mu\text{V} / \text{V} + 0.1 \mu\text{V}$	
	(600 to 1050) MHz	50 $\mu\text{V} / \text{V} + 0.1 \mu\text{V}$	
Time Marker ¹	1 ns to 20 ms	5 ps / μs	Fluke 5520A/SC1100
	50 ms	75 μs	
	0.1 s	0.13 μs	
	0.2 s	0.23 ms	
	0.5 s	0.53 ms	
	1 s	1 ms	
	2 s	2 ms	
	5 s	5 ms	
Rise Time – Voltage ¹	5 mV to 2.5 V	321 ps	Fluke 5520A/SC1100

Electrical – Other

Calibration Parameter/Equipment	Range	Calibration and Measurement Capability (+/-) ²	Remarks
DC Power ¹	(0 to 336) W	0.04% of output	Fluke 5520A/SC1100

Calibration Parameter/Equipment	Range	Calibration and Measurement Capability (+/-) ²	Remarks
	(336 to 3060) W	0.054% of output	
	(3060 to 20 910) W	0.13% of output	
AC Power (45 to 65) Hz ¹	(0.11 to 3) mW	0.14% of output	Fluke 5520A/SC1100
	(3 to 11) mW	0.1% of output	
	(11 to 30) mW	0.16% of output	
	(30 to 110) mW	0.12% of output	
	(110 to 300) mW	0.15% of output	
	(300 to 730) mW	0.13% of output	
	(0.73 to 1.5) W	0.15% of output	
AC Power (45 to 65) Hz ¹	(1.5 to 6.8) W	0.14% of output	Fluke 5520A/SC1100
	(6.8 to 9.2) W	0.14% of output	
	(9.2 to 34) W	0.1% of output	
	(34 to 92) W	0.14% of output	
	(92 to 337) W	0.1% of output	
	(337 to 918) W	0.13% of output	
	(918 to 2 244) W	0.11% of output	
	(2 244 to 4 590) W	0.14% of output	
	(4 590 to 11 220) W	0.12% of output	

Time and Frequency – Frequency / Period

Calibration Parameter/Equipment	Range	Calibration and Measurement Capability (+/-) ²	Remarks
Frequency – Measure	Up to 1.3 GHz	6.9 parts in 10 ¹¹	Counter & Rubidium Oscillator
Frequency Measuring Equipment	10 MHz	5 parts in 10 ¹²	WWV Receiver

Calibration Parameter/Equipment	Range	Calibration and Measurement Capability (+/-) ²	Remarks
	10 MHz	2.3 parts in 10 ¹¹	Rubidium Oscillator
Tachometers ¹ (Contact Type)	(1 to 4 000) rpm	0.88 rpm	Tachometer Calibrator
Tachometers ¹ (Non-Contact Type)	(25 to 90 000) rpm	0.29 rpm + 3 μrpm / rpm	Frequency Counter

Time and Frequency – Time Dissemination

Calibration Parameter/Equipment	Range	Calibration and Measurement Capability (+/-) ²	Remarks
Stopwatches & Timers	Up to 24 hr	0.42 s + 6 μs / s	Universal Counter

Thermodynamic – IR Temperature

Calibration Parameter/Equipment	Range	Calibration and Measurement Capability (+/-) ²	Remarks
IR Thermometers ¹	(50 to 500) °C	0.49 °C + 0.001 °C / °C	Blackbody (ε = 0.95) and RTD

Thermodynamic – Thermodynamic Sources

Calibration Parameter/Equipment	Range	Calibration and Measurement Capability (+/-) ²	Remarks
Temperature Generate ^{1,9}	Ice Point	0.073 °C	Ice Point Well & RTD
	(-20° to 200) °C	0.056 °C	Temperature Bath & RTD
	(33° to 300) °C	0.35°C + 0.003 °C / °C	Dry-well & RTD
Temperature Generate	(-10° to 70) °C	0.14 °C	Thunder Scientific 2500ST
Temperature Measure ¹	(-196 to 420) °C	0.037 °C	RTD

Thermodynamic – Humidity

Calibration Parameter/Equipment	Range	Calibration and Measurement Capability (+/-) ²	Remarks
Humidity – Measure ¹	(10 to 80) %	1.4% RH	Thermo-hygrometer
Humidity – Generate	(10 to 95) %	0.57 %RH + 0.24 % of reading	Thunder Scientific 2500ST

Dimensional Inspection

Length - Dimensional Inspection – Dimensional Measurement 1D

Calibration Parameter/Equipment	Range	Calibration and Measurement Capability (+/-) ²	Remarks
Length Measures – External	(0 to 12) in	(4 + 10L) μin	Labmaster Universal
Length Measures – Internal	(0.02 to 13) in	(15 + 1L) μin	
Length Measures – Hand Tools	(0 to 2) in	(92 + 6L) μin	Digital Micrometers
	(0 to 8) in	(1400 + 5L) μin	Digital Caliper

Length - Dimensional Inspection – Dimensional Measurement 2D

Calibration Parameter/Equipment	Range	Calibration and Measurement Capability (+/-) ²	Remarks
Optical Comparator Measurements	Angle 0° to 90°	0.065°	Optical Comparator
	Linear 0 to 8 in	190 μin	
Angle/Sine Measurements	(0 to 90)°	6.5 arc sec	Gauge Blocks & Sine Plate

Notes:

- 1) Laboratory offers calibration services at the laboratory's own facilities and at the client or other agreed upon facilities.
- 2) Calibration and Measurement Capabilities represent expanded uncertainties at approximately a 95% confidence level using a coverage factor of k=2.
- 3) L = length in inches, m = length in meters, R = Resolution of the unit under test, M = represents the source mismatch uncertainty.
- 4) Measurements include the following measurement functions: ID, OD, Step and Depth Extension Rods.
- 5) Inch thread setting plugs only with 60° Included Angle.
- 6) Includes 60° Metric, Unified and 55° Whitworth pitch gauges.
- 7) Uncertainty is for Steel Blocks. Carbide and Ceramic blocks may have a different uncertainty due to deformation coefficients and different coefficients of thermal expansion.
- 8) Includes dial, digital and test indicators.
- 9) Includes Liquid-in-Glass Thermometers, RTDs, Thermocouples, Bi-metallic Thermometers, etc.