CERTIFICATE OF ACCREDITATION

The ANSI National Accreditation Board

Hereby attests that

McCune's Instruments, Inc.
108 North Lee Street
Spokane, WA 99202

Fulfills the requirements of

ISO/IEC 17025:2017

and national standard

ANSI/NCSL Z540-1-1994 (R2002)

In the field of

CALIBRATION

This certificate is valid only when accompanied by a current scope of accreditation document.
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Jason Stine, Vice President

Expiry Date: 12 May 2027
Certificate Number: AC-2048

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017.
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).

SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

AND

ANSI/NCSL Z540-1-1994 (R2002)

McCune's Instruments, Inc.

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Spokane, WA 99202

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CALIBRATION

ISO/IEC 17025 Accreditation Granted: **12 May 2025**

Certificate Number: **AC-2048** Certificate Expiry Date: **12 May 2027**

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Thermocouple mV Simulation, Generate [1,3]	Type B (600 to 800) °C (800 to 1 000) °C (1 000 to 1 550) °C (1 550 to 1 820) °C Type C (0 to 150) °C (150 to 650) °C (650 to 1 000) °C (1 000 to 1 800) °C (1 800 to 2 316) °C Type E (-250 to -100) °C (-100 to -25) °C (-25 to 350) °C (350 to 650) °C (650 to 1 000) °C	 0.44 °C 0.34 °C 0.3 °C 0.33 °C 0.3 °C 0.26 °C 0.31 °C 0.5 °C 0.84 °C 0.5 °C 0.16 °C 0.14 °C 0.16 °C 0.21 °C	Comparison to Fluke 5520A Multiproduct Calibrator

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Thermocouple mV Simulation, Generate [1,3]	Type J		Comparison to Fluke 5520A Multiproduct Calibrator
	(-210 to -100) °C	0.27 °C	
	(-100 to -30) °C	0.16 °C	
	(-30 to 150) °C	0.14 °C	
	(150 to 760) °C	0.17 °C	
	(760 to 1 200) °C	0.23 °C	
	Type K		
	(-200 to -100) °C	0.33 °C	
	(-100 to -25) °C	0.18 °C	
	(-25 to 120) °C	0.16 °C	
	(120 to 1 000) °C	0.26 °C	
	(1 000 to 1 372) °C	0.4 °C	
	Type L		
	(-200 to -100) °C	0.37 °C	
	(-100 to 800) °C	0.26 °C	
	(800 to 900) °C	0.17 °C	
	Type N		
	(-200 to -100) °C	0.4 °C	
	(-100 to -25) °C	0.22 °C	
	(-25 to 120) °C	0.19 °C	
	(120 to 410) °C	0.18 °C	
	(410 to 1 300) °C	0.27 °C	
	Type R		
	(0 to 250) °C	0.57 °C	
	(250 to 400) °C	0.35 °C	
	(400 to 1 000) °C	0.33 °C	
	(1 000 to 1 760) °C	0.4 °C	
	Type S		
	(0 to 250) °C	0.47 °C	
	(250 to 1 000) °C	0.36 °C	
	(1 000 to 1 400) °C	0.37 °C	
	(1 400 to 1 767) °C	0.46 °C	
	Type T		
	(-250 to -150) °C	0.63 °C	
	(-150 to 0) °C	0.24 °C	
	(0 to 120) °C	0.16 °C	
	(120 to 400) °C	0.14 °C	

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Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Thermocouple mV Simulation, Measure [1,3]	Type B		Comparison to Fluke 5560A Multiproduct Calibrator
	(600 to 800) °C	0.34 °C	
	(800 to 1 000) °C	0.27 °C	
	(1 000 to 1 550) °C	0.23 °C	
	(1 550 to 1 820) °C	0.26 °C	
	Type C		
	(0 to 150) °C	0.2 °C	
	(150 to 650) °C	0.16 °C	
	(650 to 1 000) °C	0.2 °C	
	(1 000 to 1 800) °C	0.35 °C	
	(1 800 to 2 316) °C	0.62 °C	
	Type E		
	(-250 to -100) °C	0.31 °C	
	(-100 to -25) °C	0.11 °C	
	(-25 to 350) °C	0.086 °C	
	(350 to 650) °C	0.13 °C	
	(650 to 1 000) °C	0.16 °C	
	Type J		
	(-210 to -100) °C	0.19 °C	
	(-100 to -30) °C	0.1 °C	
	(-30 to 150) °C	0.086 °C	
	(150 to 760) °C	0.11 °C	
	(760 to 1 200) °C	0.16 °C	
	Type K		
	(-200 to -100) °C	0.22 °C	
	(-100 to -25) °C	0.1 °C	
	(-25 to 120) °C	0.086 °C	
	(120 to 1 000) °C	0.16 °C	
	(1 000 to 1 372) °C	0.27 °C	
	Type N		
	(-200 to -100) °C	0.26 °C	
	(-100 to -25) °C	0.12 °C	
	(-25 to 120) °C	0.094 °C	
	(120 to 410) °C	0.086 °C	
	(410 to 1 300) °C	0.16 °C	

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Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Thermocouple mV Simulation, Measure [1,3]	Type R (0 to 250) °C (250 to 400) °C (400 to 1 000) °C (1 000 to 1 767) °C Type S (0 to 250) °C (250 to 1 000) °C (1 000 to 1 400) °C (1 400 to 1 767) °C Type T (-250 to -150) °C (-150 to 0) °C (0 to 120) °C (120 to 400) °C	 0.4 °C 0.23 °C 0.21 °C 0.27 °C 0.33 °C 0.24 °C 0.25 °C 0.32 °C 0.47 °C 0.16 °C 0.1 °C 0.086 °C	Comparison to Fluke 5560A Multiproduct Calibrator
DC Voltage – Generate [1,3]	0 to 120 mV 0.12 to 1.2 V 1.2 to 12 V 12 to 120 V 120 to 1 020 V	0.000 94 % of reading + 0.62 µV 0.000 65 % of reading + 0.78 µV 0.000 62 % of reading + 7.8 µV 0.000 86 % of reading + 780 µV 0.000 86 % of reading + 0.79 mV	Comparison to Fluke 5560A Multiproduct Calibrator
DC Voltage – Measure [1,3]	Up to 202 mV 200 mV to 2.02 V (2 to 20.2) V (20 to 202) V (200 to 1 050) V	7.5 µV/V + 0.4 µV 4 µV/V + 0.6 µV 4 µV/V + 1 µV 6.5 µV/V + 61 µV 6.7 µV/V + 0.53 mV	Comparison to Digital Multimeter
DC High Voltage – Measure [1,3]	Up to 10 kV (10 to 90) kV	0.26 % of reading + 2 V 0.55 % of reading	Comparison to High Voltage Meter
AC Voltage – Generate [1,3]	(1 to 32.999) mV (10 to 45) Hz 45 Hz to 10 kHz (10 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 500) kHz	 0.8 mV/V + 6 µV 0.14 mV/V + 6 µV 0.2 mV/V + 6 µV 0.1 % of reading + 6 µV 0.35 % of reading + 12 µV 0.8 % of reading + 50 µV	Comparison to Fluke 5520A Multiproduct Calibrator

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AC Voltage – Generate [1,3]	(33 to 329.999) mV		Comparison to Fluke 5520A Multiproduct Calibrator
	(10 to 45) Hz	0.3 mV/V + 8 µV	
	45 Hz to 10 kHz	0.14 mV/V + 8 µV	
	(10 to 20) kHz	0.16 mV/V + 8 µV	
	(20 to 50) kHz	0.35 mV/V + 8 µV	
	(50 to 100) kHz	0.8 mV/V + 32 µV	
	(100 to 500) kHz	0.2 % of reading + 70 µV	
	0.33 to 3.299 V		
	(10 to 45) Hz	0.3 mV/V + 50 µV	
	45 Hz to 10 kHz	0.15 mV/V + 60 µV	
	(10 to 20) kHz	0.19 mV/V + 60 µV	
	(20 to 50) kHz	0.3 mV/V + 50 µV	
	(50 to 100) kHz	0.7 mV/V + 0.13 mV	
	(100 to 500) kHz	0.24 % of reading + 0.6 mV	
	(3.3 to 32.999) V		
	(10 to 45) Hz	0.3 mV/V + 0.65 mV	
	45 Hz to 10 kHz	0.15 mV/V + 0.6 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	
	(33 to 329.999) V		
	45 Hz to 1 kHz	0.19 mV/V + 2 mV	
	(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	0.2 % of reading + 50 mV	
	(330 to 1 020) V		
	45 Hz to 1 kHz	0.3 mV/V + 10 mV	
	(1 to 5) kHz	0.25 mV/V + 10 mV	
	(5 to 10) kHz	0.3 mV/V + 10 mV	

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AC Voltage – Generate [1,3]	Up to 12 mV		Comparison to Fluke 5560A Multiproduct Calibrator
	3 to 5 Hz	0.07 % of reading + 44 µV	
	5 to 10 Hz	0.029 % of reading + 21 µV	
	10 Hz to 20 kHz	0.012 % of reading + 4.7 µV	
	20 to 50 kHz	0.0068 % of reading + 27 µV	
	50 to 100 kHz	0.11 % of reading + 14 µV	
	100 to 300 kHz	0.58 % of reading + 30 µV	
	300 to 500 kHz	0.61 % of reading + 25 µV	
	(12 to 120) mV		
	3 to 5 Hz	0.18 % of reading + 31 µV	
	5 to 10 Hz	0.068 % of reading + 5.5 µV	
	10 Hz to 20 kHz	0.011 % of reading + 4.7 µV	
	20 to 50 kHz	0.018 % of reading + 2.6 µV	
	50 to 100 kHz	0.061 % of reading + 17 µV	
	100 to 300 kHz	0.15 % of reading + 28 µV	
	300 to 500 kHz	0.16 % of reading + 24 µV	
	(0.12 to 1.2) V		
	3 to 5 Hz	0.19 % of reading + 0.2 mV	
	5 to 10 Hz	0.068 % of reading + 56 µV	
	10 to 40 Hz	0.011 % of reading + 47 µV	
	40 Hz to 20 kHz	0.011 % of reading + 6.4 µV	
	20 to 50 kHz	0.023 % of reading + 11 µV	
	50 to 100 kHz	0.055 % of reading + 31 µV	
	100 to 300 kHz	0.15 % of reading + 63 µV	
	300 to 500 kHz	0.15 % of reading + 63 µV	
	(1.2 to 12) V		
	3 to 5 Hz	0.2 % of reading + 0.6 mV	
	5 to 10 Hz	0.068 % of reading + 0.59 mV	
	10 to 40 Hz	0.011 % of reading + 0.27 mV	
	40 Hz to 20 kHz	0.011 % of reading + 39 µV	
	20 to 50 kHz	0.023 % of reading + 39 µV	
	50 to 100 kHz	0.055 % of reading + 98 µV	
	100 to 300 kHz	0.16 % of reading + 0.47 mV	
	300 to 500 kHz	0.16 % of reading + 0.47 mV	

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AC Voltage – Generate [1,3]	(12 to 120) V		Comparison to Fluke 5560A Multiproduct Calibrator
	3 to 5 Hz	0.2 % of reading + 0.59 mV	
	5 to 10 Hz	0.068 % of reading + 590 µV	
	10 to 40 Hz	0.011 % of reading + 270 µV	
	40 Hz to 20 kHz	0.011 % of reading + 390 µV	
	20 to 50 kHz	0.023 % of reading + 390 µV	
	50 to 100 kHz	0.055 % of reading + 980 µV	
	100 to 300 kHz	0.13 % of reading + 16 mV	
	(120 to 330) V		
	3 to 5 Hz	0.2 % of reading + 59 mV	
	5 to 10 Hz	0.068 % of reading + 59 mV	
	10 Hz to 20 kHz	0.011 % of reading + 6.3 mV	
	20 to 50 kHz	0.023 % of reading + 6.3 mV	
	50 to 100 kHz	0.12 % of reading + 9.8 mV	
	(330 to 1020) V		
	3 to 5 Hz	0.2 % of reading + 59 mV	
	5 to 10 Hz	0.068 % of reading + 59 mV	
	10 Hz to 10 kHz	0.011 % of reading + 63 mV	
AC Voltage – Measure [1,3]	Up to 12 mV		Comparison to Digital Multimeter
	1 Hz to 2 kHz	0.29 mV/V + 1.3 µV	
	(2 to 10) kHz	0.37 mV/V + 1.3 µV	
	(10 to 30) kHz	0.38 mV/V + 1.3 µV	
	(30 to 100) kHz	0.3 % of reading + 1.3 µV	
	(100 to 300) kHz	1 % of reading + 4.8 mV	
	300 kHz to 1 MHz	2 % of reading + 4.8 mV	
	(12 to 121) mV		
	1 Hz to 2 kHz	88 µV/V + 0.61 µV	
	(2 to 10) kHz	0.13 mV/V + 0.61 µV	
	(10 to 30) kHz	0.23 mV/V + 1.2 µV	
	(30 to 100) kHz	0.53 mV/V + 6 µV	
	(100 to 300) kHz	0.21 % of reading + 36 µV	
	300 kHz to 1 MHz	1.1 % of reading + 0.12 mV	
	(1 to 2) MHz	1.5 % of reading + 0.6 mV	
	(2 to 4) MHz	4.1 % of reading + 1.2 mV	
	(4 to 8) MHz	8.4 % of reading + 1.2 mV	
	(8 to 10) MHz	16 % of reading + 1.2 mV	

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AC Voltage – Measure [1,3]	120 mV to 1.212 V		Comparison to Digital Multimeter
	1 Hz to 2 kHz	76 µV/V + 6 µV	
	(2 to 10) kHz	0.12 mV/V + 6 µV	
	(10 to 30) kHz	0.23 mV/V + 12 µV	
	(30 to 100) kHz	0.53 mV/V + 61 µV	
	(100 to 300) kHz	0.21 % of reading + 0.36 mV	
	300 kHz to 1 MHz	1 % of reading + 1.2 mV	
	(1 to 2) MHz	1.5 % of reading + 6.1 mV	
	(2 to 4) MHz	4 % of reading + 1.2 mV	
	(4 to 8) MHz	8.2 % of reading + 1.2 mV	
	(8 to 10) MHz	15 % of reading + 1.2 mV	
	(1.2 to 12.12) V		
	1 Hz to 2 kHz	76 µV/V + 61 µV	
	(2 to 10) kHz	0.12 mV/V + 61 µV	
	(10 to 30) kHz	0.23 mV/V + 0.12 mV	
	(30 to 100) kHz	0.53 mV/V + 0.61 mV	
	(100 to 300) kHz	0.21 % of reading + 3.6 mV	
	300 kHz to 1 MHz	1 % of reading + 12 mV	
	(1 to 2) MHz	1.5 % of reading + 61 mV	
	(2 to 4) MHz	4 % of reading + 0.12 V	
	(4 to 8) MHz	8.2 % of reading + 0 .12 V	
	(8 to 10) MHz	15 % of reading + 0.12 V	
	(12 to 121.2) V		
	1 Hz to 2 kHz	90 µV/V + 0.6 mV	
	(2 to 10) kHz	0.11 mV/V + 0.6 mV	
	(10 to 30) kHz	0.23 mV/V + 1.2 mV	
	(30 to 100) kHz	0.51 mV/V + 6 mV	
	(100 to 300) kHz	0.37 % of reading + 60 mV	
	300 kHz to 1 MHz	1.1 % of reading + 0.6 V	
	(120 to 1 050) V		
	1 Hz to 2 kHz	0.11 mV/V + 26 mV	
	(2 to 10) kHz	0.11 mV/V + 26 mV	
	(10 to 30) kHz	0.23 mV/V + 26 mV	
	(30 to 100) kHz	0.59 mV/V + 0.1 V	
AC Voltage – Measure [1,3]	(50 to 60) Hz		Comparison to High Voltage Meter
	Up to 10 kV	0.7 % of reading + 16 V	
	(10 to 70) kV	1.4 % of reading	

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Electrical – DC/Low Frequency

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DC Current – Generate [1,3]	(0 to 329.999) µA (0 to 3.299) mA (0 to 32.999) mA (0 to 329.999) mA (0 to 1.099) A (1.1 to 2.999 99) A	0.15 mA/A + 20 nA 0.1 mA/A + 50 nA 0.1 mA/A + 0.25 µA 0.1 mA/A + 2.5 µA 0.2 mA/A + 40 µA 0.38 mA/A + 40 µA	Comparison to Fluke 5520A Multiproduct Calibrator
DC Current – Generate [1,3]	Up to 120 µA (0.12 to 1.2) mA (1.2 to 12) mA (12 to 120) mA (0.12 to 1.2) A (1.2 to 3.1) A (3.1 to 12) A (12 to 30.2) A	0.0098 % of reading + 4.7 nA 0.0078 % of reading + 12 nA 0.0078 % of reading + 63 nA 0.0078 % of reading + 630 nA 0.012 % of reading + 7.8 µA 0.023 % of reading + 120 µA 0.023 % of reading + 0.2 mA 0.078 % of reading + 0.39 mA	Comparison to Fluke 5560A Multiproduct Calibrator
DC Current – Generate [1,3] 20A Range	(0 to 10.999) A (11 to 20.5) A	0.5 mA/A + 0.5 mA 0.1 % of reading + 0.75 mA	Comparison to Fluke 5520A Multiproduct Calibrator
DC Current – Generate [1,3]	(20 to 150) A (150 to 550) A (550 to 1 000) A	0.26 % of reading + 16 mA 0.26 % of reading + 56 mA 0.27 % of reading + 63 mA	Comparison to Fluke 5520A Multiproduct Calibrator, Current Coil
DC Current – Measure [1,3]	Up to 20.2 µA (20 to 202) µA 200 µA to 2.02 mA (2 to 20.2) mA (20 to 202) mA 200 mA to 2.02 A (2 to 20.2) A (20 to 30.2) A	27 µA/A + 0.81 nA 9.8 µ/A/A + 0.8 nA 9.2 µA/A + 8.1 nA 14 µA/A + 80 nA 57 µA/A + 2 µA 0.13 mA/A + 0.2 mA 0.23 mA/A + 0.8 mA 0.55 mA/A + 4.4 mA	Comparison to Digital Multimeter
DC Current – Measure [1,3]	(2 to 20) A	0.11 mA/A + 40 µA	Comparison to Current Shunt, Digital Multimeter

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AC Current – Generate [1,3]	(29 to 329.99) µA		Comparison to Multiproduct Calibrator
	(10 to 20) Hz	0.2 % of reading + 0.1 µA	
	(20 to 45) Hz	0.15 % of reading + 0.1 µA	
	45 Hz to 1 kHz	0.13 % of reading + 0.1 µA	
	(1 to 5) kHz	0.3 % of reading + 0.15 µA	
	(5 to 10) kHz	0.8 % of reading + 0.2 µA	
	(10 to 30) kHz	1.6 % of reading + 0.4 µA	
	(0.33 to 3.299) mA		
	(10 to 20) Hz	0.2 % of reading + 0.15 µA	
	(20 to 45) Hz	0.13 % of reading + 0.15 µA	
	45 Hz to 1 kHz	0.1 % of reading + 0.15 µA	
	(1 to 5) kHz	0.2 % of reading + 0.2 µA	
	(5 to 10) kHz	0.5 % of reading + 0.3 µA	
	(10 to 30) kHz	1 % of reading + 0.6 µA	
	(3.3 to 32.999) mA		
	(10 to 20) Hz	0.18 % of reading + 2 µA	
	(20 to 45) Hz	0.09 % of reading + 2 µA	
	45 Hz to 1 kHz	0.04 % of reading + 2 µA	
	(1 to 5) kHz	0.08 % of reading + 2 µA	
	(5 to 10) kHz	0.2 % of reading + 3 µA	
	(10 to 30) kHz	0.4 % of reading + 4 µA	
	(33 to 329.99) mA		
	(10 to 20) Hz	0.18 % of reading + 20 µA	
	(20 to 45) Hz	0.09 % of reading + 20 µA	
	45 Hz to 1 kHz	0.04 % of reading + 20 µA	
	(1 to 5) kHz	0.1 % of reading + 50 µA	
	(5 to 10) kHz	0.2 % of reading + 0.1 mA	
	(10 to 30) kHz	0.4 % of reading + 0.2 mA	
	(0.3 to 1.099 9) A		
	(10 to 45) Hz	0.18 % of reading + 0.1 mA	
	45 Hz to 1 kHz	0.05 % of reading + 0.1 mA	
	(1 to 5) kHz	0.6 % of reading + 1 mA	
	(5 to 10) kHz	2.5 % of reading + 5 mA	
	(1.1 to 2.999) A		
	(10 to 45) Hz	0.18 % of reading + 0.1 mA	
	45 Hz to 1 kHz	0.06 % of reading + 0.1 mA	
	(1 to 5) kHz	0.6 % of reading + 1 mA	
	(5 to 10) kHz	2.5 % of reading + 5 mA	

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AC Current – Generate [1,3]	(3 to 10.999) A (45 to 100) Hz (0.1 to 1) kHz (1 to 5) kHz (11 to 20.5) A (45 to 100) Hz 100 Hz to 1 kHz (1 to 5) kHz	 0.06 % of reading + 2 mA 0.1 % of reading + 2 mA 3 % of reading + 2 mA 0.12 % of reading + 5 mA 0.15 % of reading + 5 mA 3 % of reading + 5 mA	Comparison to Fluke 5520A Multiproduct Calibrator
AC Current – Generate [1,3]	Up to 120 µA 5 to 45 Hz 45 to 1 kHz 1 to 5 kHz 5 to 10 kHz 10 to 30 kHz (0.12 to 1.2) mA 3 to 45 Hz 45 to 1 kHz 1 to 5 kHz 5 to 10 kHz 10 to 30 kHz (1.2 to 12) mA 3 to 45 Hz 45 to 1 kHz 1 to 5 kHz 5 to 10 kHz 10 to 30 kHz (12 to 120) mA 3 to 45 Hz 45 to 1 kHz 1 to 5 kHz 5 to 10 kHz 10 to 30 kHz (0.12 to 1.2) A 3 to 45 Hz 45 to 1 kHz 1 to 5 kHz 5 to 10 kHz 10 to 30 kHz	 0.019 % of reading + 8 nA 0.02 % of reading + 7.9 nA 0.02 % of reading + 7.9 nA 0.12 % of reading + 31 nA 0.39 % of reading + 780 nA 0.0025 % of reading + 1.6 µA 0.0068 % of reading + 0.55 µA 0.0068 % of reading + 0.55 µA 0.049 % of reading + 1.7 µA 0.38 % of reading + 4.3 µA 0.019 % of reading + 0.79 µA 0.019 % of reading + 0.79 µA 0.019 % of reading + 0.79 µA 0.12 % of reading + 0.78 µA 0.39 % of reading + 7.8 µA 0.02 % of reading + 7.8 µA 0.012 % of reading + 3.9 µA 0.02 % of reading + 6.3 µA 0.12 % of reading + 7.8 µA 0.39 % of reading + 78 µA 0.02 % of reading + 78 µA 0.02 % of reading + 39 µA 0.02 % of reading + 63 µA 0.2 % of reading + 230 µA 0.39 % of reading + 0.23 mA	Comparison to Fluke 5560A Multiproduct Calibrator

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AC Current – Generate [1,3]	(1.2 to 3.1) A		Comparison to Fluke 5560A Multiproduct Calibrator
	3 to 45 Hz	0.029 % of reading + 0.39 mA	
	45 to 1 kHz	0.023 % of reading + 0.23 mA	
	1 to 5 kHz	0.029 % of reading + 0.23 mA	
	5 to 10 kHz	0.2 % of reading + 0.39 mA	
	(3.1 to 12) A		
	3 to 45 Hz	0.029 % of reading + 0.78 mA	
	45 to 1 kHz	0.023 % of reading + 0.39 mA	
	1 to 5 kHz	0.027 % of reading + 1.1 mA	
	5 to 10 kHz	0.2 % of reading + 0.78 mA	
	(12 to 30.2) A		
	3 to 45 Hz	0.078 % of reading + 7.8 mA	
	45 to 1 kHz	0.055 % of reading + 6.3 mA	
	1 to 5 kHz	0.39 % of reading + 6.3 mA	
AC Current – Generate [1,3] Clamp Meters	(20 to 150) A		Comparison to Fluke 5520A Multiproduct Calibrator, Current Coil
	(45 to 65) Hz	0.31 % of reading + 10 mA	
	(65 to 440) Hz	0.85 % of reading + 57 mA	
	(150 to 1 000) A		
	(45 to 65) Hz	0.3 % of reading + 0.14 A	
	(65 to 440) H	1.3 % of reading + 0.11 A	
AC Current – Measure [1,3]	Up to 20.2 µA		Comparison to Digital Multimeter
	1 Hz to 2 kHz	2 mA/A + 5 nA	
	(2 to 10) kHz	2 m/A/A + 5 nA	
	(10 to 30) kHz	2 mA/A + 5 nA	
	(20 to 202) µA		
	1 Hz to 2 kHz	0.28 mA/A + 10 nA	
	(2 to 10) kHz	0.53 mA/A + 10 nA	
	(10 to 30) kHz	0.74 mA/A + 10 nA	
	(30 to 100) kHz	4 mA/A + 20 nA	
	200 µA to 2.02 mA		
	1 Hz to 2 kHz	0.28 mA/A + 0.1 µA	
	(2 to 10) kHz	0.53 mA/A + 0.1 µA	
	(10 to 30) kHz	0.74 mA/A + 0.1 µA	
	(30 to 100) kHz	4 mA/A + 0.2 µA	
	(2 to 20.2) mA		
	1 Hz to 2 kHz	0.28 mA/A + 1 µA	
	(2 to 10) kHz	0.53 mA/A + 1 µA	
	(10 to 30) kHz	0.74 mA/A + 1 µA	
	(30 to 100) kHz	4.1 mA/A + 2 µA	

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Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
AC Current – Measure [1,3]	(20 to 202) mA 1 Hz to 2 kHz (2 to 10) kHz (10 to 30) kHz 200 mA to 2.02 A 1 Hz to 2 kHz (2 to 10) kHz (10 to 30) kHz	 0.28 mA/A + 10 µA 0.52 mA/A + 10 µA 0.74 mA/A + 10 µA 0.3 mA/A + 0.2 mA 0.55 mA/A + 0.2 mA 0.79 mA/A + 0.2 mA	Comparison to Digital Multimeter
AC Current – Measure [1,3]	(2 to 20.2) A 10 Hz to 2 kHz (2 to 10) kHz (20 to 30.2) A 1 Hz to 2 kHz (2 to 10) kHz	 0.84 mA/A + 1 mA 0.84 mA/A + 1 mA 0.84 mA/A + 12 mA 1.2 mA/A + 12 mA	Comparison to Digital Multimeter
AC Current – Measure [1,3]	(2 to 20) A 10 Hz to 2 kHz	 0.04 % of reading + 0.6 mA	Comparison to Current Shunt, Digital Multimeter
Resistance – Generate [1,3]	(0 to 11) Ω (11 to 33) Ω (33 to 110) Ω (110 to 330) Ω 330 Ω to 1.1 kΩ (1.1 to 3.3) kΩ (3.3 to 11) kΩ (11 to 33) kΩ (33 to 110) kΩ (110 to 330) kΩ 330 kΩ 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 330 MΩ to 1.1 GΩ	40 µΩ/Ω + 1 mΩ 30 µΩ/Ω + 1.5 mΩ 28 µΩ/Ω + 1.4 mΩ 28 µΩ/Ω + 2 mΩ 28 µΩ/Ω + 2 mΩ 28 µΩ/Ω + 20 mΩ 28 µΩ/Ω + 20 mΩ 28 µΩ/Ω + 0.2 Ω 28 µΩ/Ω + 0.2 Ω 32 µΩ/Ω + 2 Ω 32 µΩ/Ω + 2 Ω 60 µΩ/Ω + 30 Ω 0.13 mΩ/Ω + 50 Ω 0.25 mΩ/Ω + 2.5 kΩ 0.5 mΩ/Ω + 3 kΩ 3 mΩ/Ω + 0.1 MΩ 15 mΩ/Ω + 0.5 MΩ	Comparison to Fluke 5520A Multiproduct Calibrator

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Resistance – Generate [1,3]	Up to 12 Ω 12 to 120 Ω 120 to 1200 Ω 1.2 to 12 kΩ 12 to 120 kΩ 120 to 1200 kΩ 1.2 to 12 MΩ 12 to 120 MΩ 120 to 1200 MΩ	0.0016 % of reading + 0.98 mΩ 0.002 % of reading + 0.78 mΩ 0.0019 % of reading + 1.6 mΩ 0.0019 % of reading + 16 mΩ 0.0019 % of reading + 0.16 Ω 0.0019 % of reading + 1.6 Ω 0.0027 % of reading + 24 Ω 0.034 % of reading + 2 kΩ 0.31 % of reading + 78 kΩ	Comparison to Fluke 5560A Multiproduct Calibrator
Resistance – Measure [1,3]	Up to 2.02 Ω (2 to 20.2) Ω (20 to 202) Ω 200 Ω to 2.02 kΩ (2 to 20.2) kΩ (20 to 202) kΩ 200 kΩ to 2.02 MΩ (2 to 20.2) MΩ (20 to 202) MΩ 200 MΩ to 2.02 GΩ (2 to 20.2) GΩ	17 µΩ/Ω + 8 µΩ 10 µΩ/Ω + 28 µΩ 9.2 µΩ/Ω + 0.1 mΩ 9.1 µΩ/Ω + 1 mΩ 9.2 µΩ/Ω + 10 mΩ 9.3 µΩ/Ω + 0.1 Ω 11 µΩ/Ω + 2 Ω 17 µΩ/Ω + 20 Ω 68 µΩ/Ω + 0.2 kΩ 0.23 mΩ/Ω + 2 kΩ 1.3 mΩ/Ω + 20 kΩ	Comparison to Digital Multimeter
RTD Resistance Simulation, Generate [1,3]	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 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 0.1 °C 0.12 °C 0.23 °C 0.05 °C 0.07 °C 0.09 °C 0.1 °C 0.12 °C	Comparison to Fluke 5520A Multiproduct Calibrator

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Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
RTD Resistance Simulation, Generate [1,3]	Pt 3916, 100 Ω		Comparison to Fluke 5520A Multiproduct Calibrator
	(-200 to -190) °C	0.25 °C	
	(-190 to -80) °C	0.04 °C	
	(-80 to 0) °C	0.05 °C	
	(0 to 100) °C	0.06 °C	
	(100 to 260) °C	0.07 °C	
	(260 to 300) °C	0.08 °C	
	(300 to 400) °C	0.09 °C	
	(400 to 600) °C	0.1 °C	
	(600 to 630) °C	0.23 °C	
	Pt 385, 200 Ω		
	(-200 to 100) °C	0.04 °C	
	(100 to 260) °C	0.05 °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	0.04 °C	
	(-80 to 100) °C	0.05 °C	
	(100 to 260) °C	0.06 °C	
	(260 to 400) °C	0.08 °C	
	(400 to 600) °C	0.09 °C	
	(600 to 630) °C	0.11 °C	
RTD Resistance Simulation, Generate [1,3]	CU, 10 Ω		Comparison to Fluke 5560A Multiproduct Calibrator
	-80 to 260 °C	0.3 °C	
	CU, 50 Ω		
	-180 to 200 °C	0.4 °C	
	CU, 100 Ω		
	-180 to 40 °C	0.4 °C	
	40 to 200 °C	0.65 °C	
	NI, 120 Ω		
	-80 to 0 °C	0.07 °C	
	0 to 100 °C	0.07 °C	
	100 to 260 °C	0.13 °C	

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RTD Resistance Simulation, Generate [1,3]	PT 385, 100 Ω		Comparison to Fluke 5560A Multiproduct Calibrator
	-200 to 80 °C	0.05 °C	
	80 to 0 °C	0.05 °C	
	0 to 100 °C	0.07 °C	
	100 to 300 °C	0.09 °C	
	300 to 400 °C	0.1 °C	
	400 to 630 °C	0.12 °C	
	630 to 800 °C	0.23 °C	
	PT 3916, 100 Ω		
	-200 to -190 °C	0.25 °C	
	-190 to -80 °C	0.04 °C	
	-80 to 0 °C	0.05 °C	
	0 to 100 °C	0.06 °C	
	100 to 260 °C	0.07 °C	
	260 to 300 °C	0.08 °C	
	300 to 400 °C	0.09 °C	
	400 to 600 °C	0.1 °C	
	600 to 630 °C	0.23 °C	
	PT 3926, 100 Ω		
	-200 to 80 °C	0.05 °C	
	80 to 0 °C	0.05 °C	
	0 to 100 °C	0.07 °C	
	100 to 300 °C	0.09 °C	
	300 to 400 °C	0.1 °C	
	400 to 630 °C	0.12 °C	
	PT 385, 200 Ω		
	-200 to -80 °C	0.04 °C	
	-80 to 0 °C	0.04 °C	
	0 to 100 °C	0.04 °C	
	100 to 260 °C	0.05 °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	

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RTD Resistance Simulation, Generate [1,3]	PT 385, 500 Ω		Comparison to Fluke 5560A Multiproduct Calibrator
	-200 to -80 °C	0.04 °C	
	-80 to 0 °C	0.05 °C	
	0 to 100 °C	0.05 °C	
	100 to 260 °C	0.06 °C	
	260 to 300 °C	0.08 °C	
	300 to 400 °C	0.08 °C	
	400 to 600 °C	0.09 °C	
	600 to 630 °C	0.11 °C	
	PT 385, 1000 Ω		
	-200 to -80 °C	0.031 °C	
	-80 to 0 °C	0.031 °C	
	0 to 100 °C	0.04 °C	
	100 to 260 °C	0.05 °C	
	260 to 300 °C	0.06 °C	
	300 to 400 °C	0.07 °C	
	400 to 600 °C	0.07 °C	
	600 to 630 °C	0.23 °C	
Capacitance Simulation [1,3]	(0.19 to 3.299) nF	0.5 % of reading + 10 pF	Comparison to Fluke 5520A Multiproduct Calibrator
	(3.3 to 10.999) nF	0.25 % of reading + 10 pF	
	(11 to 109.999) nF	0.25 % of reading + 0.1 nF	
	(110 to 329.999) nF	0.25 % of reading + 0.3 nF	
	330 nF to 1.099 µF	0.25 % of reading + 1 nF	
	(1.1 to 3.299) µF	0.25 % of reading + 3 nF	
	(3.3 to 10.999) µF	0.25 % of reading + 10 nF	
	(11 to 32.999) µF	0.4 % of reading + 30 nF	
	(33 to 109.999) µF	0.45 % of reading + 0.1 µF	
	(110 to 329.999) µF	0.45 % of reading + 0.3 µF	
	330 nF to 1.099 mF	0.45 % of reading + 1 µF	
	(1.1 to 3.299) mF	0.45 % of reading + 3 µF	
	(3.3 to 10.999) mF	0.45 % of reading + 10 µF	
	(11 to 32.999) mF	0.75 % of reading + 30 µF	
	(33 to 110) mF	1.1 % of reading + 0.1 mF	

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Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Capacitance Simulation [1,3]	0.2 to 1.2 nF @1 kHz 1.2 to 12 nF @1 kHz 12 to 120 nF @610 Hz 0.12 to 1.2 µF @100 Hz 1.2 to 12 µF @80 Hz 12 to 120 µF @20 Hz 0.12 to 1.2 mF @5 Hz 1.2 to 12 mF @2 Hz 12 to 120 mF @1 Hz	0.094 % of reading + 3.1 pF 0.094 % of reading + 3.9 pF 0.1 % of reading + 23 pF 0.01 % of reading + 0.23 nF 0.1 % of reading + 2.3 nF 0.12 % of reading + 20 nF 0.19 % of reading + 0.2 µF 0.2 % of reading + 2.3 µF 0.39 % of reading + 23 nF	Comparison to Fluke 5560A Multiproduct Calibrator
Capacitance – Measure [1]	Up to 2.02 nF (1.8 to 20.2) nF (18 to 202) nF (0.18 to 2.02) µF (1.8 to 20.2) µF (18 to 202) µF (0.18 to 2.02) mF (1.8 to 20.2) mF (18 to 202) mF	1.8 mF/F + 2 pF 0.81 mF/F + 4 pF 0.5 mF/F + 20 pF 0.41 mF/F + 0.2 nF 0.42 mF/F + 2 nF 0.61 mF/F + 20 nF 0.62 mF/F + 0.2 µF 0.71 mF/F + 2 µF 0.71 mF/F + 20 µF	Comparison to Digital Multimeter
Inductance - Source	13 to 120 µH @1 kHz 0.12 to 1.2 mH @1 kHz 1.2 to 12 mH @110 Hz 12 to 120 mH @100 Hz 0.12 to 1.2 H @10 Hz 1.2 to 12 H @3 Hz 12 to 120 H @2 Hz	0.16 % of reading + 0.16 µH 0.094 % of reading + 0.78 µH 0.094 % of reading + 7.8 µH 0.094 % of reading + 78 µH 0.12 % of reading + 0.78 mH 0.16 % of reading + 7.8 mH 0.2 % of reading + 78 mH	Comparison to Fluke 5560A Multiproduct Calibrator
Phase – Source	(-180 to 180)º > 120 mV, < 3.1 A 3 to 65 Hz 65 to 500 Hz 500 Hz to 1 kHz 1 to 5 kHz 5 to 10 kHz 10 to 30 kHz	 0.078º 0.2 º 0.39 º 2 º 3.9 º 7.8 º	Comparison to Fluke 5560A Multiproduct Calibrator
DC Power – Source	Up to 30804 W	0.000 019 % of reading + 5.8 mW	Comparison to Fluke 5560A Multiproduct Calibrator

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AC Power - Source	(45 to 65) Hz 0.04 mW to 20910 W 0.1 mW to 30804 W 65 Hz to 1 kHz 1.5 mW to 3162 W 15 mW to 30804 W (1 to 5) kHz 14 mW to 1550 W (5 to 10) kHz 14 mW to 300 W (10 to 30) kHz 14 mW to 300 W	0.00033 % of reading + 7.1 mW 0.00025 % of reading + 6.7 mW 0.002 % of reading + 5 mW 0.00025 % of reading + 6.7 mW 0.0026 % of reading + 5.8 mW 0.0029 % of reading + 5.7 mW 0.0029 % of reading + 5.8 mW	Comparison to Fluke 5560A Multiproduct Calibrator
Oscilloscopes [1,3] Vertical Gain 50 Ω Load 1 MΩ Load	 1 mV to 6.6 V 1 mV to 200 V	 0.25 % of reading + 40 µV 0.1 % of reading + 40 µV	Comparison to Fluke 5520A Multiproduct Calibrator
Oscilloscopes [1,3] Bandwidth	5 mV to 3.5 V 50 kHz Reference 50 kHz to 100 MHz (100 to 300) MHz (300 to 600) MHz	 2% of reading + 40 µV 3.5 % of reading + 0.3 mV 4 % of reading + 0.3 mV 6 % of reading + 0.3 mV	Comparison to Fluke 5520A Multiproduct Calibrator
Oscilloscopes [1,3] Bandwidth	5 mV to 3.5 V 600 MHz to 1.1 GHz	 7 % of reading + 0.3 V	Comparison to Fluke 5520A Multiproduct Calibrator
Oscilloscopes [1,3] Time Base	50 ms to 5 s 20 ms to 2 ns	(25 + 1 000*t*) ms/s 2.5 µs	Comparison to Fluke 5520A Multiproduct Calibrator
Oscilloscopes [1,3] Vertical Gain 50 Ω Load 1 MΩ Load	 (1 to 6 600) mV (1 to 120 000) mV	 2.3 % of reading + 78 µV 2.3 % of reading + 78 µV	Comparison to Fluke 5560A Multiproduct Calibrator
Oscilloscopes [1,3] Bandwidth	5 mV to 5.5V 50 k to 10 MHz (10 to 600) MHz	 1.2 % of reading + 90 µV 2.3 % of reading + 86 µV	Comparison to Fluke 5560A Multiproduct Calibrator

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Oscilloscopes [1,3] Time Base	(0.5 to 5) ns (5 to 10) ns (20 to 50) ns (0.1 to 400) µS (0.5 to 5) S	0.00000064 % of reading + 1.9 µs 0.0000024 % of reading + 2 ps 0.0000036 % of reading + 5.8 ps 0.0000013 % of reading + 58 nS 0.000021 % of reading + 58 µS	Comparison to Fluke 5560A Multiproduct Calibrator
Oscilloscopes [1,3] Input Resistance	40 to 60 Ω 0.5 to 1.35 MΩ	0.078 % of reading + 8.9 µΩ 0.059 % of reading + 4 kΩ	Comparison to Fluke 5560A Multiproduct Calibrator
Oscilloscopes [1,3] Input Capacitance	5 to 50 pF	3.9 % of reading + 0.39 pF	Comparison to Fluke 5560A Multiproduct Calibrator
Oscilloscopes [1,3] DCV into 1 MΩ	(0 to 50) mV (50 to 500) mV (0.5 to 6.6) V (6.6 to 15) ns (12 to 120) ns	0.039 % of reading + 31 µV 0.039 % of reading + 32 µV 0.039 % of reading + 39 µV 0.039 % of reading + 0.12 ps 0.037 % of reading + 3 ps	Comparison to Fluke 5560A Multiproduct Calibrator
Oscilloscopes [1,3] DCV into 50 Ω	(0 to 50) mV (50 to 500) mV (0.5 to 6.6) V	0.2 % of reading + 31 µV 0.2 % of reading + 31 µV 0.2 % of reading + 33 µV	Comparison to Fluke 5560A Multiproduct Calibrator
Oscilloscopes [1,3] ACV into 50 Ω	(0 to 50) mV (50 to 500) mV (0.5 to 6.6) V	0.2 % of reading + 31 µV 0.2 % of reading + 34 µV 0.2 % of reading + 85 µV	Comparison to Fluke 5560A Multiproduct Calibrator
Oscilloscopes [1,3] ACV into 1 MΩ	(0 to 50) mV (50 to 500) mV (0.5 to 6.6) V (6.6 to 15) V (12 to 120) V	0.078 % of reading + 31 µV 0.077 % of reading + 36 µV 0.077 % of reading + 150 µV 0.078 % of reading + 77 µV 0.077 % of reading + 1.8 mV	Comparison to Fluke 5560A Multiproduct Calibrator

Length – Dimensional Metrology

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Calipers [1,2]	Up to 24 in (24 to 80) in	(510 + 2.9*L*) µin (520 + 8.4*L*) µin	Comparison to Gage Blocks
Micrometers [1,2]	Up to 24 in	(37 + 8.8*L*) µin	Comparison to Gage Blocks
Plug Gages	(0 to 1) in	34 µin	Comparison to Laser Micrometer

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Length – Dimensional Metrology

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Length Measurements	Up to 40 in	(2.9 + 1.8*L*) µin	Comparison to Universal Length Machine, Gage Blocks
Thread Plugs [2] Major Diameter Pitch Diameter	 Up to 10 in Up to 10 in	 (81 + 0.36*D*) µin (83 + 0.35*D*) µin	Comparison to Universal Length Machine, Gage Blocks, Thread Wires
Ring Gages [2]	(0.04 to 3) in (3 to 10) in	(16 + 2.1*D*) µin (18 + 1.4*D*) µin	Comparison to Universal Length Machine, Master Rings
Height Gages [1,2]	Up to 24 in	(33 + 12*L*) µin	Comparison to Gage Blocks, Surface Plate
Squares, Knee Blocks [2]	Up to 18 in	(88 +1.8*L*) µin	Comparison to Square, Comparator
Indicators [1,5]	Up to 0.4 in	14 µin	Comparison to Indicator Calibrator
Indicators [1,2,5]	Up to 4 in	(27 + 10*L*) µin	Comparison to Gage Blocks
Surface Plates [1,2] Overall Flatness Local Area Flatness	 Up to 350 in*DL* (0 to 19 800) µin ± 1 000 µin	 0.31 µin/in + 17 µin 14 µin	In accordance with ASME B89.3.7 using Electronic Level System Repeat-O-Meter
Digital Detector Array	(0.011 to 0.5) in	20 µin	Customer procedure MP-7604 using Pin Gages measurements supervised by laboratory
Digital Microscopes	Up to 100 µm (100 to 10 000) µm	1.2 µm 3 µm	Customer procedure MP-7598 using a Glass Scale measurements supervised by laboratory
Imaging Dimension Measurement System – Outside Diameter	0.1 in	20 µin	Customer procedure MP-7599 using pin gage measurements supervised by laboratory

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Length – Dimensional Metrology

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Imaging Dimension Measurement System – Inside Diameter	0.8 in	19 µin	Customer procedure MP-7599 using ring gage measurements supervised by laboratory
Imaging Dimension Measurement System – Height	0.1 in 0.2 in	4.3 µin 4.3 µin	Customer procedure MP-7599 using gage blocks measurements supervised by laboratory
Scanning Electron Microscope	2 µm 50 µm 500 µm	0.047 µm 0.25 µm 0.26 µm	Customer procedure MP-7600 using a Magnification Reference Standard measurement supervised by laboratory

Mass and Mass Related

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Pressure Devices [5]	(5 to 400) inH_2O	0.009 % of reading	Comparison to Deadweight Tester
Pressure Devices [5]	Up to 200 psi	0.051 % of reading + 0.002 9 psi	Comparison to Pressure Controller/Calibrator
Pressure Devices [5]	(10 to 10 000) psi	0.01 % of reading	Comparison to Deadweight Tester
Vacuum Devices	(> 0 to 30) inHg	0.007 6 % of reading + 0.000 73 psi	Comparison to Pressure Controller/Calibrator
Torque Tools, Torque Wrenches	(4 to 50) lbf·in (30 to 400) lbf·in (80 to 1 000) lbf·in (20 to 250) lbf·ft (60 to 600) lbf·ft (200 to 2 000) lbf·ft	0.29 % of reading 0.29 % of reading 0.29 % of reading 0.29 % of reading 0.29 % of reading 0.29 % of reading	Comparison to Torque Calibrator, Torque Transducers
Torque Calibrators, Torque Transducers	(4 to 50) lbf·in (30 to 400) lbf·in (400 to 1 000) lbf·in (50 to 2 000) lbf·ft	0.05 % of reading 0.05 % of reading 0.05 % of reading 0.049 % of reading	Comparison to Torque Arm, Masses

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Mass and Mass Related

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Balances and Scales [1,4] (SI)	(> 0 to 10 000) g	0.000 33 % of reading + 54 µg	ASTM E617 Class 1 weights and internal calibration procedure utilized for the calibration of the weighing system.
Balances and Scales [1,4] (SI)	(> 0 to 10 000) g	0.012 % of reading + 13 mg	NIST Class F weights and internal calibration procedure utilized for the calibration of the weighing system.
Balances and Scales [1,4] (Avoirdupois)	(> 0 to 30) lb (50 to 1 250) lb	0.006 lb 0.012 % of reading	NIST Class F weights and internal calibration procedure utilized for the calibration of the weighing system.
Force Gages (Tension only)	Up to 1 250 lbf	0.013 % of reading + 0.000 21 lbf	Comparison to NIST Class F weights
Microhardness Testers	HK Low Mid High	 20 HK 58 HK 87 HK	MP-7601, Indirect verification per ASTM E92 using hardness test Blocks measurements supervised by laboratory
Rockwell Hardness Testers	HRA Low Mid High HRB Low Mid High HRC Low Mid High HR15TW Low Mid High	 1.2 HRA 1.2 HRA 1.2 HRA 3.1 HRB 3 HRB 1.3 HRB 1.2 HRC 1.2 HRC 1.2 HRC 1.8 HR15TW 1.2 HR15TW 1.2 HR15TW	MP-7601, Indirect verification per ASTM E18 using hardness test Blocks measurements supervised by laboratory

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Mass and Mass Related

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Rockwell Hardness Testers	HR30TW Low Mid High HR45TW Low Mid High HR15N Low Mid High HR30N Low Mid High HR45N Low Mid High	 1.9 1.2 1.2 1.2 1.2 1.2 1.2 1.2 0.95 1.2 1.2 0.86 1.2 1.2 0.86	MP-7601, Indirect verification per ASTM E18 using hardness test Blocks measurements supervised by laboratory

Thermodynamic

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Humidity – Measure [1]	(0 to 90) %RH (90 to 100) %RH	1.4 %RH 2.1 %RH	Comparison to Vaisala Humidity and Temperature Meter
Temperature – Measure [1]	(0 to 50) °C	0.33 °C	Comparison to Vaisala Humidity and Temperature Meter
Ovens, Temperature Chambers, Furnaces, Freezers, etc. [1]	(-200 to 0) °C (0 to 600) °C	0.029 °C 0.015 % of reading + 0.021 °C	Comparison to Temperature Indicator with PRT
Temperature Sensors; Systems that utilize Thermocouples, Thermistors, RTD's, Bimetallic, and Expanding Reservoir Type Probes [1]	(-30 to 125) °C	0.053 % of reading + 0.088 °C	Comparison to Micro-bath monitored with Temperature Indicator with PRT

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Thermodynamic

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Temperature Sensors; Systems that utilize Thermocouples, Thermistors, RTD's, Bimetallic, and Expanding Reservoir Type Probes [1]	(50 to 650) °C	0.084 % of reading + 0.034 °C	Comparison to Drywell monitored with Temperature Indicator with PRT
Thermocouples	(50 to 500) °C	0.036 % of reading + 0.78 °C	Comparison to Drywell monitored with Temperature Indicator with PRT, Fluke 754
Temperature System Accuracy Test [1]	Type J (0 to 450) °F Type N (0 to 1 200) °F (1 200 to 2 100) °F Type T (-40 to 220) °F	 3.1 °F 5.9 °F 5.7 °F 2.2 °F	In accordance with AMS 2750 and Boeing 5621M.
Temperature Uniformity Test [1]	Type J (0 to 450) °F Type N (0 to 1 200) °F (1 200 to 2 100) °F Type T (-40 to 220) °F	 3.1 °F 5.9 °F 5.7 °F 2.2 °F	In accordance with AMS 2750 and Boeing 5621M.

Time and Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Timers, Chart Recorders [1]	Up to 2 hr	0.12 s	Comparison to Stopwatch
Frequency - Source	(0.01 to 120) Hz (120 to 1 200) Hz (1.2 to 12) kHz (12 to 120) kHz (120 to 1 200) kHz (1.2 to 2) MHz	4 µHz/Hz + 5.8 mHz 4.4 µHz/Hz + 58 mHz 4.4 µHz/Hz + 0.58 Hz 4.4 µHz/Hz + 5.8 Hz 4.4 µHz/Hz + 58 Hz 1.1 µHz/Hz + 0.58 kHz	Comparison to Fluke 5560A Multiproduct Calibrator

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Calibration and Measurement Capability (CMC) is expressed in terms of the measurement parameter, measurement range, expanded uncertainty of measurement and reference standard, method, and/or equipment. The expanded uncertainty of measurement is expressed as the standard uncertainty of the measurement multiplied by a coverage factor of 2 (k=2), corresponding to a confidence level of approximately 95%.

Notes:

1. On-site calibration service is available for this parameter, since on-site conditions are typically more variable than those in the laboratory, larger measurement uncertainties are expected on-site than what is reported on the accredited scope.
2. L = length in inches; DL = diagonal length in inches; t = time in seconds; D = diameter in inches.
3. Uncertainties for Electromagnetic – DC/Low Frequency do not include contributions from a "best existing" unit under test and as such, reported uncertainties will always be larger than those expressed on the scope of accreditation.
4. The uncertainties for scales and balances are highly dependent upon the resolution of the unit under test. The uncertainties presented here do not include the resolution of a unit under test. The resolution will be included in the reported measurement uncertainty at the time of calibration.
5. Resolution will be added at the time of calibration using the following formula: $0.6R$, where R = resolution of the unit under test.
6. Unless otherwise specified in the far-right column, the calibration procedure or method was developed internally.

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