



CERTIFICATE OF ACCREDITATION

ANSI-ASQ National Accreditation Board

500 Montgomery Street, Suite 625, Alexandria, VA 22314, 877-344-3044

This is to certify that

Technical Maintenance, Inc.

3060 Venture Lane

Melbourne, FL 32934

has been assessed by ANAB and meets the requirements of international standard

ISO/IEC 17025:2005

and national standards

ANSI/NCSL Z540-1-1994 (R2002) AND

ANSI/NCSL Z540.3-2006 (R2013)

while demonstrating technical competence in the field of

CALIBRATION

Refer to the accompanying Scope of Accreditation for information regarding the types of calibrations to which this accreditation applies.

AC-2080.08

Certificate Number

ANAB Approval

Certificate Valid: 11/10/2017-09/20/2019

Version No. 004 Issued: 11/10/2017



This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005. 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 17025:2005,
ANSI/NCSL Z540-1-1994 (R2002) AND ANSI/NCSL Z540.3-2006 (R2013)**

Technical Maintenance, Inc.
3060 Venture Lane
Melbourne, FL 32934
Scott Chamberlain 321-242-0890

CALIBRATION

Valid to: **September 20, 2019**

Certificate Number: **AC-2080.08**

Chemical Quantities

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
pH ¹	(4, 7, 10) pH	0.02 pH	pH buffer solutions
Conductivity, Liquid ¹	(2 to 10 000) μ S	1 % of reading	Conductivity solutions

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
DC Current – Generate ¹	Up to 220 μ A 220 μ A to 2.2 mA (2.2 to 22) mA (22 to 220) mA 220 mA to 2.2 A	40 μ A/A + 6 nA 35 μ A/A + 7 nA 36 μ A/A + 40 nA 48 μ A/A + 0.7 μ A 81 μ A/A + 12 μ A	Fluke 5730A/03 Multifunction Calibrator
	(2.2 to 11) A	0.36 mA/A + 0.48 mA	Fluke 5730A/03 Multifunction Calibrator 5725A Amplifier
	(11 to 20.5) A	0.76 mA/A + 0.75 mA	Fluke 5522A Multifunction Calibrator
DC Current – Generate ¹ Clamp Only	(20.5 to 1 000) A	0.9 % of reading	Coil/ Fluke 5522A Multifunction Calibrator



Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
DC Current – Measure ¹	Up to 220 μ A 220 μ A to 2.2 mA (2.2 to 22) mA (22 to 220) mA (0.22 to 1) A	6 μ A/A 5 μ A/A 6 μ A/A 10 μ A/A 37 μ A/A	Agilent 3458A/002 Precision Multimeter
DC Voltage ¹ – Generate	(0 to 220) mV 220 mV to 2.2 V (2.2 to 11) V (11 to 22) V (22 to 220) V (220 to 1 100) V	11 μ V/V + 0.4 μ V 5.2 μ V/V + 0.7 μ V 3.5 μ V/V + 2.5 μ V 3.5 μ V/V + 4 μ V 5 μ V/V + 40 μ V 6.5 μ V/V + 400 μ V	Fluke 5730A/03 Multifunction Calibrator
DC Voltage ¹ – Measure	Up to 100 mV (0.1 to 1) V (1 to 10) V (10 to 100) V (100 to 1 000) V	10 μ V/V + 0.3 μ V 9.0 μ V/V + 0.30 μ V 9.0 μ V/V + 50 μ V 11 μ V/V + 30 μ V 11 μ V/V + 0.1 mV	Agilent 3458A/002 Precision Multimeter
DC Voltage ¹ – Measure	(1 to 120) kV	0.23 % of reading	Ross VD120 High Voltage Divider HP 34401A Precision Multimeter
AC Voltage – Generate ¹	(0.22 to 2.2) mV (10 to 20) Hz (20 to 40) Hz 40 Hz to 20 kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz (300 to 500) kHz 500 kHz to 1 MHz (2.2 to 22) mV (10 to 20) Hz (20 to 40) Hz 40 Hz to 20 kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz (300 to 500) kHz 500 kHz to 1 MHz	0.27 mV/V + 4 μ V 0.14 mV/V + 4 μ V 0.13 mV/V + 4 μ V 0.22 mV/V + 4 μ V 0.52 mV/V + 5 μ V 1.1 mV/V + 10 μ V 1.4 mV/V + 20 μ V 2.7 mV/V + 20 μ V 0.24 mV/V + 4 μ V 91 μ V/V + 4 μ V 81 μ V/V + 4 μ V 0.2 mV/V + 4 μ V 0.5 mV/V + 5 μ V 1.1 mV/V + 10 μ V 1.4 mV/V + 20 μ V 2.7 mV/V + 20 μ V	Fluke 5730A/03 Multifunction Calibrator



Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
AC Voltage – Generate ¹	(22 to 220) mV		Fluke 5730A/03 Multifunction Calibrator
	(10 to 20) Hz	0.24 mV/V + 12 μV	
	(20 to 40) Hz	90 μV/V + 7 μV	
	40 Hz to 20 kHz	58 μV/V + 7 μV	
	(20 to 50) kHz	0.12 mV/V + 7 μV	
	(50 to 100) kHz	0.31 mV/V + 17 μV	
	(100 to 300) kHz	0.66 mV/V + 20 μV	
	(300 to 500) kHz	1.4 mV /V + 25 μV	
	500 kHz to 1 MHz	2.7 mV /V + 45 μV	
	220 mV to 2.2 V		
	(10 to 20) Hz	0.24 mV/V + 40 μV	
	(20 to 40) Hz	90 μV/V + 15 μV	
	40 Hz to 20 kHz	43 μV/V + 8 μV	
	(20 to 50) kHz	67 μV/V + 10 μV	
	(50 to 100) kHz	85 μV/V + 30 μV	
	(100 to 300) kHz	0.34 mV/V + 80 μV	
	(300 to 500) kHz	1 mV /V + 0.2 mV	
	500 kHz to 1 MHz	1.7 mV/V + 0.3 mV	
	(2.2 to 22) V		
	(10 to 20) Hz	0.24 mV/V + 0.4 mV	
	(20 to 40) Hz	91 μV/V + 0.15 mV	
	40 Hz to 20 kHz	43 μV/V + 50 μV	
	(20 to 50) kHz	67 μV/V + 0.1 mV	
	(50 to 100) kHz	83 μV/V + 0.2 mV	
	(100 to 300) kHz	0.25 mV/V + 0.6 mV	
	(300 to 500) kHz	1 mV/V + 2 mV	
	500 kHz to 1 MHz	1.5 mV/V + 3.2 mV	
	(22 to 220) V		
(10 to 20) Hz	0.24 mV /V + 4 mV		
(20 to 40) Hz	90 μV/V + 1.5 mV		
40 Hz to 20 kHz	52 μV/V + 0.6 mV		
(20 to 50) kHz	80 μV/V + 1 mV		
(50 to 100) kHz	0.15 mV /V + 2.5 mV		
(220 to 750) V			
40 Hz to 1 kHz	91 μV/V + 4 mV		
(1 to 20) kHz	0.17 mV /V + 6 mV		
(20 to 50) kHz	0.6 mV /V + 11 mV		
(50 to 100) kHz	2.3 mV /V + 45 mV		



Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
AC Voltage – Generate ¹	(750 to 1 000) V 40 Hz to 1 kHz (1 to 20) kHz (20 to 30) kHz	91 μ V/V + 4 mV 0.17 mV /V + 6 mV 0.6 mV /V + 11 mV	Fluke 5730A/03 Multifunction Calibrator 5725A Amplifier
AC Voltage – Measure ¹	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 10 mV 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 kHz to 1 MHz (1 to 2) MHz (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 (100 to 300) kHz 300 kHz to 1 MHz	0.03 % of reading + 0.03 % of range 0.02 % of reading + 0.011 % of range 0.03 % of reading + 0.011 % of range 0.1 % of reading + 0.011 % of range 0.5 % of reading + 0.011 % of range 4 % of reading + 0.02 % of range 0.007 % of reading + 0.004 % of range 0.007 % of reading + 0.002 % of range 0.014 % of reading + 0.002 % of range 0.03 % of reading + 0.002 % of range 0.8 % of reading + 0.002 % of range 0.3 % of reading + 0.01 % of range 1 % of reading + 0.01 % of range 1.5 % of reading + 0.01 % of range 0.02 % of reading + 0.004 % of range 0.02 % of reading + 0.002 % of range 0.02 % of reading + 0.002 % of range 0.04 % of reading + 0.002 % of range 0.12 % of reading + 0.002 % of range 0.4 % of reading + 0.002 % of range 1.5 % of reading + 0.01 % of range	Agilent 3458A/002 Precision Multimeter
AC Voltage – Measure ¹	(100 to 1 000) V (1 to 40) Hz 40 Hz to 1 kHz (1 to 20) kHz (20 to 50) kHz (50 to 100) kHz	0.05 % of reading + 0.004 % of range 0.04 % of reading + 0.002 % of range 0.06 % of reading + 0.002 % of range 0.12 % of reading + 0.002 % of range 0.3 % of reading + 0.002 % of range	Agilent 3458A/002 Precision Multimeter
AC Voltage – Measure ¹	(1 to 85) kV (50, 60) Hz	0.7 % of reading	Ross VD120 High Voltage Divider HP 34401A Precision Multimeter



Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
AC Current – Generate ¹	(9 to 220) μ A (10 to 20) Hz (20 to 40) Hz 40 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz	0.25 mA/A + 16 nA 0.16 mA /A + 10 nA 0.1 mA /A + 8 nA 0.28 mA /A + 12 nA 1.1 mA /A + 65 nA	Fluke 5730A/03 Multifunction Calibrator
AC Current – Generate ¹	(0.22 to 2.2) mA (10 to 20) Hz (20 to 40) Hz 40 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz (2.2 to 22) mA (10 to 20) Hz (20 to 40) Hz 40 Hz to 1 kHz 1 to 5 kHz (5 to 10) kHz (22 to 220) mA (10 to 20) Hz (20 to 40) Hz 40 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz	0.25 mA /A + 40 nA 0.16 mA /A + 35 nA 0.1 mA /A + 35 nA 0.2 mA /A + 0.110 μ A 1.1 mA /A + 0.650 μ A 0.25 mA /A + 0.4 μ A 0.16 mA /A + 0.35 μ A 0.1 mA /A + 0.35 μ A 0.2 mA /A + 0.55 μ A 1.1 mA /A + 5 μ A 0.25 mA /A + 4 μ A 0.16 mA /A + 3.5 μ A 0.1 mA /A + 2.5 μ A 0.2 mA /A + 3.5 μ A 1.1 mA /A + 10 μ A	Fluke 5730A/03 Multifunction Calibrator
AC Current – Generate ¹	(0.22 A to 2.2) A 20 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz	0.25 mA/A + 35 μ A 0.45 mA /A + 80 μ A 7 mA /A + 0.16 mA	Fluke 5730A/03 Multifunction Calibrator 5725A Amplifier
AC Current – Generate ¹	(2.2 to 11) A 40 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz (11 to 20.5) A (45 to 100) Hz 100 Hz to 1 kHz (1 to 5) kHz	0.46 mA /A + 0.17 mA 0.95 mA /A + 0.38 mA 3.6 mA /A + 0.75 mA 0.1 % of reading + 2 mA 0.12 % of reading + 5 mA 2.3 % of reading + 5 mA	Fluke 5522A Multifunction Calibrator
AC Current – Generate ¹ Clamp Only	(20.5 to 500) A (45 to 440) Hz	1.8 % of reading	Coil / Fluke 5522A Multifunction Calibrator



Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
AC Current – Measure ¹	Up to 100 μ A (10 to 20) Hz (20 to 45) Hz 45 Hz to 1 kHz	0.41 % of reading + 0.03 pA 0.16 % of reading + 0.03 pA 0.07 % of reading + 0.03 pA	Agilent 3458A/002 Precision Multimeter
AC Current – Measure ¹	(0.1 to 100) mA (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 (50 to 100) kHz (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	0.41 % of reading + 20 μ A 0.16 % of reading + 20 μ A 0.07 % of reading + 20 μ A 0.04 % of reading + 20 μ A 0.08 % of reading + 20 μ A 0.41 % of reading + 40 μ A 0.56 % of reading + 150 μ A 0.41 % of reading + 0.2 mA 0.17 % of reading + 0.2 mA 0.09 % of reading + 0.2 mA 0.11 % of reading + 0.2 mA 0.31 % of reading + 0.2 mA 1 % of reading + 0.4 mA	Agilent 3458A/002 Precision Multimeter
Resistance – Generate, Fixed Points ¹	1, 1.9 Ω 10, 19 Ω 100, 190 Ω 1, 1.9 k Ω 10, 19 k Ω 100, 190 k Ω 1 M Ω 1.9 M Ω 10 M Ω 19 M Ω 100 M Ω	98 $\mu\Omega/\Omega$ 23 $\mu\Omega/\Omega$ 10 $\mu\Omega/\Omega$ 6.5 $\mu\Omega/\Omega$ 6.5 $\mu\Omega/\Omega$ 8.5 $\mu\Omega/\Omega$ 13 $\mu\Omega/\Omega$ 18 $\mu\Omega/\Omega$ 40 $\mu\Omega/\Omega$ 48 $\mu\Omega/\Omega$ 0.1 m Ω/Ω	Fluke 5730A/03 Multifunction Calibrator



Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Resistance – Generate ¹	Up 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 (0.33 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 + 0.01 Ω 30 μΩ/Ω + 0.015 Ω 28 μΩ/Ω + 0.015 Ω 28 μΩ/Ω + 0.02 Ω 29 μΩ/Ω + 0.02 Ω 29 μΩ/Ω + 0.2 Ω 29 μΩ/Ω + 0.1 Ω 29 μΩ/Ω + 1 Ω 29 μΩ/Ω + 1 Ω 33 μΩ/Ω + 10 Ω 33 μΩ/Ω + 10 Ω 60 μΩ/Ω + 150 Ω 0.013 % of reading + 0.25 kΩ 0.025 % of reading + 2.5 kΩ 0.05 % of reading + 3.0 kΩ 0.3 % of reading + 100 kΩ 1.5 % of reading + 500 kΩ	Fluke 5522A Multifunction Calibrator
Resistance – Measure ¹ Fixed Points	Up to 10 Ω (10 to 100) Ω 100 Ω to 100 kΩ 100 kΩ to 1 MΩ (1 to 10) MΩ (10 to 100) MΩ 100 MΩ to 1 GΩ	16 μΩ/Ω + 50 μΩ 14 μΩ/Ω + 0.5 mΩ 12 μΩ/Ω + 5 mΩ 16 μΩ/Ω + 2 Ω 50 μΩ/Ω + 100 Ω 0.05% of reading + 1 kΩ 9.2 μΩ/Ω + 1 Ω	Agilent 3458A/002 Precision Multimeter
Capacitance – Generate ¹	(0.19 to 0.1099) nF (1.1 to 3.299) nF (3.3 to 329.999) nF (0.33 to 1.09999) μF (1.1 to 3.29999) μF (3.3 to 10.9999) μF (11 to 32.999) μF (33 to 109.999) μF (110 to 329.999) μF (0.33 to 1.09999) mF (1.1 to 3.2999) mF (3.3 to 10.9999) mF (11 to 32.9999) mF (33 to 110) mF	1.2 % of reading + 0.01 nF 1.2 % of reading + 0.01 nF 0.39 % of reading + 0.3 nF 0.38 % of reading + 3 nF 0.37 % of reading + 3 nF 0.38 % of reading + 10 nF 0.53 % of reading + 30 nF 0.58 % of reading + 0.1 μF 0.58 % of reading + 0.3 μF 0.57 % of reading + 1 μF 0.58 % of reading + 3 μF 0.59 % of reading + 10 μF 0.65 % of reading + 30 μF 1.3 % of reading + 0.1 mF	Fluke 5522A Multifunction Calibrator



Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Oscilloscope Calibration – Vertical Deflection ¹ 50 Ω, 1 kHz square wave	1 mV to 6.6 V	0.59 % of reading + 40 μV	Fluke 5522A/SC1100 Multifunction Calibrator
1 MΩ, 1 kHz square wave	1 mV to 130 V	0.44 % of reading + 40 μV	
Flatness – Leveled Sine Wave	5 mV to 5.5 V	2.5 % of reading + 0.1 mV	
	50 kHz to 100 MHz	2.2 % of reading + 0.1 mV	
	(100 to 300) MHz	4.6 % of reading + 0.1 mV	
	(300 to 600) MHz	6.4 % of reading + 0.1 mV	
	(600 to 1 100) MHz	6.4 % of reading + 0.1 mV	
Bandwidth	<300 ps	+ 13 ps / -110 ps	
Rise Time	1 ns to 20 ms	3 μs/s	
Time Interval ²	50 ms to 5 s	(26 + 1 000t) μs/s	
Power Meter Range Calibration ¹	3 μW to 100 mW	0.25 % of reading	HP 11683A Power Meter Calibrator
Electrical Calibration of Thermocouple Indicating Devices ¹ –	Type B (600 to 1 820) °C	0.41 °C	Fluke 7526A Process Calibrator
	Type C (0 to 2 316) °C	0.38 °C	
	Type E (-250 to 1 000) °C	0.29 °C	
	Type J (-210 to 1 200) °C	0.19 °C	
	Type K (-200 to 1 372) °C	0.21 °C	
	Type L (-200 to 900) °C	0.12 °C	
	Type N (-200 to 1 300) °C	0.26 °C	
	Type R (0 to 1 767) °C	0.45 °C	
	Type S (0 to 1 767) °C	0.44 °C	



Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Electrical Calibration of Thermocouple Indicating Devices ¹ –	Type T (-250 to 200) °C	0.41 °C	Fluke 7526A Process Calibrator
	(-200 to 400) °C	0.2 °C	
	Type U (-200 to 600) °C	0.19 °C	

Electrical – RF/Microwave

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Attenuation ¹ – Measure	10 MHz to 26.5 GHz (-10 to 0) dB	0.06 dB	Agilent N5531S Measuring Receiver
	(-20 to -11) dB	0.06 dB	
	(-30 to -21) dB	0.06 dB	
	(-40 to -31) dB	0.06 dB	
	(-50 to -41) dB	0.06 dB	
	(-60 to -51) dB	0.07 dB	
	(-70 to -61) dB	0.06 dB	
	(-80 to -71) dB	0.08 dB	
	(-90 to -81) dB	0.08 dB	
	(-100 to -91) dB	0.08 dB	
	(-110 to -101) dB	0.08 dB	
	10 MHz to 3.05 GHz (-120 to -111) dB	0.08 dB	
Amplitude Modulation ¹ – Measure	100 kHz to 10 MHz (5 to 99) % Depth	1 % of reading	Agilent N5531S Measuring Receiver
	10 MHz to 3 GHz (5 to 20) % Depth	2.9 % of reading	
	(20 to 99) % Depth	0.8 % of reading	
	(3 to 26.5) GHz (5 to 20) % Depth	5.2 % of reading	
(20 to 99) % Depth	1.8 % of reading		
Frequency Modulation ¹ – Measure	20 Hz to 10 kHz	3.1 % of reading	Agilent N5531S Measuring Receiver
	250 kHz to 10 MHz		
	(50 to 200) Hz	3.1 % of reading	
	10 MHz to 6.6 GHz	3.8 % of reading	
	(6.6 to 13.2) GHz	5 % of reading	
(13.2 to 26.5) GHz			



Electrical – RF/Microwave

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
RF Power – Generate	10 MHz to 40 GHz (-10 to 10) dBm (-60 to -10) dBm (-110 to -60) dBm	1.3 dBm 1.7 dBm 2.4 dBm	Keysight E8257D Signal Generator
RF Power ¹ – Measure	1 mW @ 50 MHz	0.003 2 mW	HP 478A Power Meter
	1 mW @ 50 MHz	0.003 2 mW	HP 8482A HP 8481A/E9300A Power Sensors
	(-30 to 20) dBm 100kHz to 4.2GHz 10MHz to 18GHz	0.068 dB 0.068 dB	Agilent N5531S Measuring Receiver
Phase Noise ¹ – SSB Measure	(-30 to 20) dBm 10MHz to 26.5GHz	0.11 dB	Agilent E4440A Spectrum Analyzer
AM/FM Distortion ¹	(-180 to 0) dB 1 MHz to 50 GHz	0.39 dB	HP 8903B Audio Analyzer
Harmonic Distortion	20 Hz to 20 kHz	1.2 dB	HP 8903B Audio Analyzer
	(-120 to 0) dB 20 Hz to 200 kHz	1.2 dB	Agilent E4448 Spectrum Analyzer

Length – Dimensional metrology

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Gage Blocks ²	Up to 13 in	(1.7+2.1L) μin	Master gage blocks, P&W universal measuring machine
Micrometers ^{1,2}	Up to 20 in	(32 + 4L) μin	Gage blocks (grade 2)
Calipers ^{1,2}	Up to 20 in	(48 + 7.2L) μin	
Dial Indicators ^{1,2}	Up to 10 in	(86 + 46L) μin	
Height Gages ^{1,2}	Up to 20 in	(194 + 3L) μin	Gage blocks (grade 2)
Rulers ¹	Up to 20 in	0.009 in	

Length – Dimensional metrology

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Feeler Gage ¹	Up to 1 in	74 μin	Pratt & Whitney Supermicrometer C
Cylindrical Gages ² – Plain Pins, Plugs	(0.04 to 14) in	(8 + 2D) μin	Master gage blocks, P&W universal measuring machine
Rings	(0 to 13) in	(2 + 3D) μin	
Thread Plugs ¹ – Major Diameter Pitch Diameter	Up to 12 in Up to 12 in	52 μin 110 μin	B & S 599-246-00, Van Keuren thread wire set, Gage blocks, P & W Model C
Thread Rings	Up to 12 in	57 μin	Thread setting plug gages
Surface Plates ¹ – Overall Flatness Only	Up to 6 ft × 6 ft	50 μin	Mahr Federal level system
Optical Comparators ¹ – Linearity	Up to 20 in (20 to 40) in	590 μin 790 μin	Gage blocks, SI Industries glass scales
Magnification	(10 to 100) X	590 μin	

Mass

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Scales & Balances ^{1,2}	(0.5 to 500) lb	0.013 % of reading + 0.6R	Class F Weights
Force – Tension and Compression ¹	(0.5 to 500) lbf	0.09 % of reading	Class F weights
Pressure ¹	(0 to 100) psi	0.028 psi	Additel ADT681-02-GP100 Digital Pressure Gage
	(100 to 1 000) psi	0.026 psi	Additel ADT681-02-GP1K Digital Pressure Gage
	(1 000 to 15 000) psi	3 psi	Additel ADT681-05-GP15K Digital Pressure Gage
Torque Tools ¹	4 lbf·in to 600 lbf·ft	0.32 % of reading	CDI 5000 ST torque tester



Thermodynamic

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Relative Humidity – Measure	(0 to 90) %RH	1.7 %RH	Vaisala MI70 / HMP75 Thermohygrometer
Temperature – Measuring Equipment ¹	(-25 to 350) °C	0.12 °C	Hart 1502A with 5616 PRT and dry block
Temperature – Measure ¹	(-25 to 600) °C	0.025 °C	Hart 1502A with 5616 PRT
IR Thermometry ¹	(20 to 100) °C	0.51 °C	Fluke 9132 Blackbody $\epsilon = 0.95, \lambda = (8 \text{ to } 14) \mu\text{m}$
	(100 to 300) °C	0.61 °C	
	(300 to 500) °C	0.8 °C	

Time and Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Frequency – Measure	10 MHz	1×10^{-11} Hz/Hz	HP 58503A/B GPS
Frequency – Measure ¹	10 Hz to 26.5 GHz	1×10^{-8} Hz/Hz	HP 53131A Counter, Agilent E4440A Spectrum Analyzer

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, t = time in seconds, D = diameter in inches, R = resolution of the device under test
3. This scope is formatted as part of a single document including Certificate of Accreditation No. AC-2080.08.


 Vice President

