



# CERTIFICATE OF ACCREDITATION

*This is to attest that*

## **STANDARD METER LABORATORY, INC.**

236 RICKENBACKER CIRCLE  
LIVERMORE, CALIFORNIA 94551, U.S.A.

### **Calibration Laboratory CL-146**

has met the requirements of AC204, *IAS Accreditation Criteria for Calibration Laboratories*, and has demonstrated compliance with ISO/IEC Standard 17025:2017, *General requirements for the competence of testing and calibration laboratories*. This organization is accredited to provide the services specified in the scope of accreditation.

Effective Date November 7, 2024

Expiration Date December 1, 2026



A handwritten signature in black ink, reading 'Raj Nathan'.

**President**

Visit [www.iasonline.org](http://www.iasonline.org) for current accreditation information.

# SCOPE OF ACCREDITATION

International Accreditation Service, Inc.

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## STANDARD METER LABORATORY, INC.

[www.sml-inc.com](http://www.sml-inc.com)

**Contact Name** Marcos Estrella

**Contact Phone** +1- 925-449-0220

*Accredited to ISO/IEC 17025:2017*

*Effective Date November 7, 2024*

### CALIBRATION AND MEASUREMENT CAPABILITY (CMC)\*

MEASURED QUANTITY or DEVICE TYPE CALIBRATED	RANGE	UNCERTAINTY <sup>1,2</sup> (±)	CALIBRATION METHOD OR PROCEDURE, STANDARD EQUIPMENT (OPTIONAL)
<b>Mechanical</b>			
Pressure Calibrators, Transmitters and Gauges	-1 inH <sub>2</sub> O to 1 inH <sub>2</sub> O	0.0002 inH <sub>2</sub> O	Direct measurement method using Fluke 7250 LP Pressure Calibrator
	-10 inH <sub>2</sub> O to 0 inH <sub>2</sub> O	0.0014 inH <sub>2</sub> O	
	0 inH <sub>2</sub> O to 10 inH <sub>2</sub> O	0.0013 inH <sub>2</sub> O	
	-30 inH <sub>2</sub> O to 0 inH <sub>2</sub> O	0.0066 inH <sub>2</sub> O	Direct measurement method using Fluke PM600-A350K Pressure Measurement Module
	0 inH <sub>2</sub> O to 30 inH <sub>2</sub> O	0.0066 inH <sub>2</sub> O	
	-14.5 psig to 0 psig	0.0013 psig	Direct measurement method using Fluke PM500-BG2M Pressure Measurement Module
	0.1 psig to 30 psig	0.0036 psig	
	0.1 psia to 0.2 psia	0.0016 psia	
	0.2 psia to 30 psia	0.0030 psia	
Torque Handtools – Mechanical (Torque wrenches, screwdrivers, etc.)	-14.5 psig to 0 psig	0.0062 psig	Direct measurement method using torque sensors: BMX-40z, BMX-25i, BMX-250i
	0.1 psig to 300 psig	0.033 psig	
	4 ozf-in to 250 lbf-in	0.31 %	
	10 lbf-ft to 1000 lbf-ft	0.5 %	Direct measurement method using torque sensors: LTT-100F, BMX-1000i
<b>Thermal</b>			

\* If information in this CMC is presented in non-SI units, the conversion factors stated in NIST Special Publication 811 "Guide for the Use of the International System of Units (SI)" apply.



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Temperature Simulation			Direct measurement method using Fluke 5522A multifunction calibrator
Thermocouple Type B	600 °C to 799.99 °C	0.44 °C	
	800 °C to 999.99 °C	0.34 °C	
	1000 °C to 1549.99 °C	0.30 °C	
	1550 °C to 1820 °C	0.33 °C	
Type C	0 °C to 149.99 °C	0.30 °C	
	150 °C to 649.99 °C	0.26 °C	
	650 °C to 999.99 °C	0.31 °C	
	1000 °C to 1799.99 °C	0.50 °C	
	1800 °C to 2316 °C	0.84 °C	
Type E	-250 °C to -100.01 °C	0.50 °C	
	-100 °C to -25.01 °C	0.016 °C	
	-25 °C to 349.99 °C	0.14 °C	
	350 °C to 649.99 °C	0.16 °C	
	650 °C to 1000 °C	0.21 °C	
Type J	-210 °C to -100.01 °C	0.27 °C	
	-100 °C to -30.01 °C	0.16 °C	
	-30 °C to 149.99 °C	0.14 °C	
	150 °C to 759.99 °C	0.17 °C	
	760 °C to 1200 °C	0.23 °C	
Type K	-200 °C to -100.01 °C	0.33 °C	
	-100 °C to -25.01 °C	0.18 °C	
	-25 °C to 119.99 °C	0.16 °C	
	120 °C to 999.99 °C	0.26 °C	
	1000 °C to 1372 °C	0.40 °C	
Type L	-200 °C to -100.01 °C	0.37 °C	
	-100 °C to 799.99 °C	0.26 °C	
	800 °C to 900 °C	0.17 °C	
Type N	-200 °C to -100.01 °C	0.40 °C	
	-100 °C to -25.01 °C	0.22 °C	
	-25 °C to 119.99 °C	0.19 °C	
	120 °C to 409.99 °C	0.18 °C	
	410 °C to 1300 °C	0.27 °C	
Type R	0 °C to 249.99 °C	0.57 °C	
	250 °C to 399.99 °C	0.35 °C	
	400 °C to 999.99 °C	0.33 °C	
	1000 °C to 1767 °C	0.40 °C	

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Temperature Simulation continued Thermocouple Type S	0 °C to 249.99 °C 250 °C to 999.99 °C 1000 °C to 1399.99 °C 1400 °C to 1767 °C	0.47 °C 0.36 °C 0.37 °C 0.46 °C	Direct measurement method using Fluke 5522A multifunction calibrator
Type T	-250 °C to -150.01 °C -150 °C to -0.01 °C 0 °C to 119.99 °C 120 °C to 400 °C	0.63 °C 0.24 °C 0.16 °C 0.14 °C	
Type U	-200 °C to -0.01 °C 0 °C to 600 °C	0.56 °C 0.27 °C	
RTD			
PT385, 100 Ω	-200 °C to 99.99 °C 100 °C to 629.99 °C 630 °C to 800 °C	0.07 °C 0.12 °C 0.23 °C	
PT3926, 100 Ω	-200 °C to -0.01 °C 0 °C to 399.99 °C 400 °C to 629.99 °C	0.05 °C 0.10 °C 0.12 °C	
PT3916, 100 Ω	-200 °C to -0.01 °C 0 °C to 599.99 °C 600 °C to 630 °C	0.05 °C 0.10 °C 0.23 °C	
PT385, 200 Ω	-200 °C to 259.99 °C 260 °C to 630 °C	0.05 °C 0.16 °C	
PT385, 500 Ω	-200 °C to 259.99 °C 260 °C to 630 °C	0.06 °C 0.11 °C	
PT385, 1000 Ω	-200 °C to 99.99 °C 100 °C to 599.99 °C 600 °C to 630 °C	0.04 °C 0.07 °C 0.23 °C	
PT385, 120 Ω	-80 °C to 99.99 °C 100 °C to 260 °C	0.08 °C 0.14 °C	
CU427, 10 Ω	-100 °C to 260 °C	0.3 °C	
Temperature Measuring Devices	-195.7 °C to 0 °C 0 °C to 100 °C 100 °C to 400 °C	0.004 °C 0.005 °C 0.007 °C	



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IR Thermometers	0 °C	0.10 °C	Direct measurement method using Ametek ATC-140A as a source
	35 °C	0.22 °C	Direct measurement method using Fluke 4181-156 calibrator as a source
	100 °C	0.24 °C	
	200 °C	0.33 °C	
	350 °C	0.53 °C	
500 °C	0.8 °C		
<b>Electrical – DC/LF</b>			
DC Voltage – Generate <sup>3</sup>	0 mV to 329.9999 mV 330 mV to 3.29999 V 3.3 V to 32.99999 V 33 V to 329.9999 V 100 V to 1020 V	21 µV/V + 1 µV 9.1 µV/V + 2 µV 9.4 µV/V + 20 µV 14 µV/V + 150 µV 14 µV/V + 1.5 mV	Direct measurement method using Fluke 5522A as a source
DC Voltage – Measure <sup>4</sup>	0 mV to 100 mV 100 mV to 1 V 1 V to 10 V 10 V to 100 V 100 V to 1000 V	30 µV/V + 0.3 µV 17 µV/V + 0.3 µV 9.3 µV/V + 0.5 µV 12 µV/V + 30 µV 13 µV/V + 100 µV	Direct measurement method with HP3458A multimeter
DC Current - Generate <sup>3</sup>	0 µA to 329.999 µA 330 µA to 3.29999 mA 3.3 mA to 32.9999 mA 33 mA to 329.999 mA 330 mA to 1.09999 A 1.1 A to 2.99999 A 3 A to 10.9999 A 11 A to 20.5 A	100 µA/A + 0.02 µA 76 µA/A + 0.05 µA 78 µA/A + 0.25 µA 78 µA/A + 2.5 µA 220 µA/A + 40 µA 320 µA/A + 40 µA 420 µA/A + 500 µA 810 µA/A + 750 µA	Direct measurement method using Fluke 5522A as a source
DC Current - Measure <sup>4</sup>	Up to 100 µA 100 µA to 1 mA 1 mA to 10 mA 10 mA to 100 mA 100 mA to 1 A	21 µA/A + 800 pA 140 µA/A + 5 nA 23 µA/A + 50 nA 43 µA/A + 500 nA 180 µA/A + 10 µA	Direct measurement method with HP3458A multimeter
DC Resistance – Generate <sup>3</sup>	0 Ω to 10.9999 Ω 11 Ω to 32.9999 Ω 33 Ω to 109.9999 Ω 110 Ω to 329.9999 Ω 330 Ω to 1.099999 kΩ 1.1 kΩ to 3.299999 kΩ 3.3 kΩ to 10.99999 kΩ 11 kΩ to 32.99999 kΩ 33 kΩ to 109.9999 kΩ 110 kΩ to 329.99999 kΩ 330 kΩ to 1.099999 MΩ 1.1 MΩ to 3.299999 MΩ 3.3 MΩ to 10.99999 MΩ	37 µΩ/Ω + 0.001 Ω 23 µΩ/Ω + 0.0015 Ω 20 µΩ/Ω + 0.0014 Ω 21 µΩ/Ω + 0.002 Ω 22 µΩ/Ω + 0.002 Ω 22 µΩ/Ω + 0.02 Ω 22 µΩ/Ω + 0.02 Ω 22 µΩ/Ω + 0.2 Ω 23 µΩ/Ω + 0.2 Ω 24 µΩ/Ω + 2 Ω 28 µΩ/Ω + 2 Ω 50 µΩ/Ω + 30 Ω 110 µΩ/Ω + 50 Ω	Direct measurement method using Fluke 5522A as a source

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DC Resistance – Generate <sup>3</sup> (cont'd.)	11 MΩ to 32.99999 MΩ 33 MΩ to 109.9999 MΩ 110 MΩ to 329.9999 MΩ 330 MΩ to 1100 MΩ	190 μΩ/Ω + 2.5 kΩ 0.039 % + 3 kΩ 0.26 % + 100 kΩ 1.1 % + 500 kΩ	
DC Resistance - Measure <sup>4</sup>	0 Ω to 10 Ω 10 Ω to 100 Ω 100 Ω to 1 kΩ 1 kΩ to 10 kΩ 10 kΩ to 100 kΩ 100 kΩ to 1 MΩ 1 MΩ to 10 MΩ 10 MΩ to 100 MΩ 100 MΩ to 1 GΩ	40 μΩ/Ω + 0.05 mΩ 30 μΩ/Ω + 0.5 mΩ 200 μΩ/Ω + 0.5 mΩ 200 μΩ/Ω + 5 mΩ 230 μΩ/Ω + 50 mΩ 18 μΩ/Ω + 2 Ω 61 μΩ/Ω + 0.1 kΩ 0.05 % + 1 kΩ 0.79 % + 10 kΩ	Direct measurement method with HP3458A multimeter
AC Voltage – Generate <sup>3</sup>	1 mV to 32.999 mV (10 Hz to 45 Hz) (45 Hz to 10 kHz) (10 kHz to 20 kHz) (20 kHz to 50 kHz) (50 kHz to 100 kHz) (100 kHz to 500 kHz)  33 mV to 329.999 mV (10 Hz to 45 Hz) (45 Hz to 10 kHz) (10 kHz to 20 kHz) (20 kHz to 50 kHz) (50 kHz to 100 kHz) (100 kHz to 500 kHz)  0.33 V to 3.29999 V (10 Hz to 45 Hz) (45 Hz to 10 kHz) (10 kHz to 20 kHz) (20 kHz to 50 kHz) (50 kHz to 100 kHz) (100 kHz to 500 kHz)  3.3 V to 32.9999 V (10 Hz to 45 Hz) (45 Hz to 10 kHz) (1 kHz to 20 kHz) (20 kHz to 50 kHz) (50 kHz to 100 kHz)  33 V to 329.999 V (45 Hz to 1 kHz) (1 kHz to 10 kHz) (10 kHz to 20 kHz)	630 μV/V + 6 μV 90 μV/V + 6 μV 130 μV/V + 6 μV 730 μV/V + 6 μV 0.26 % + 12 μV 0.6 % + 50 μV  510 μV/V + 8 μV 110 μV/V + 8 μV 170 μV/V + 8 μV 340 μV/V + 8 μV 590 μV/V + 32 μV 0.15 %+ 70 μV  720 μV/V + 50 μV 180 μV/V + 60 μV 160 μV/V + 60 μV 260 μV/V + 50 μV 530 μV/V + 0.13 mV 0.18 % + 0.6 mV  710 μV/V + 650 μV 130 μV/V + 600 μV 210 μV/V + 600 μV 300 μV/V + 600 μV 710 μV/V + 1.6 mV  170 μV/V + 2 mV 170 μV/V + 6 mV 200 μV/V + 6 mV	Direct measurement method using Fluke 5522A as a source

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AC Voltage – Generate <sup>3</sup> (cont'd.)	(20 kHz to 50 kHz) (50 kHz to 100 kHz)	230 $\mu$ V/V + 50 mV 0.15 % + 50 mV	
	330 V to 1020 V (45 Hz to 1 kHz) (1 kHz to 5 kHz) (5 kHz to 10 kHz)	280 $\mu$ V/V + 10 mV 830 $\mu$ V/V + 10 mV 1.6 % + 10 mV	
AC Voltage – Measure <sup>4</sup>	10 mV to 100 mV (10 Hz to 40 Hz) (40 Hz to 1 kHz) (1 kHz to 20 kHz) (20 kHz to 50 kHz) (50 kHz to 100 kHz) (100 kHz to 300 kHz) (300 kHz to 1 MHz) (1 MHz to 4 MHz) (4 MHz to 8 MHz) (8 MHz to 10 MHz)	0.019 % + 4 $\mu$ V 0.0076 % + 2 $\mu$ V 0.064 % + 2 $\mu$ V 0.059 % + 2 $\mu$ V 0.094 % + 2 $\mu$ V 0.3 % + 10 $\mu$ V 0.99 % + 10 $\mu$ V 4.0 % + 70 $\mu$ V 4.0 % + 70 $\mu$ V 15 % + 100 $\mu$ V	Direct measurement method with HP3458A multimeter in synchronous sub-sample mode
	100 mV to 1 V (10 Hz to 40 Hz) (40 Hz to 1 kHz) (1 kHz to 20 kHz) (20 kHz to 50 kHz) (50 kHz to 100 kHz) (100 kHz to 300 kHz) (300 kHz to 1 MHz) (1 MHz to 4 MHz) (4 MHz to 8 MHz) (8 MHz to 10 MHz)	0.007 % + 40 $\mu$ V 0.0075 % + 20 $\mu$ V 0.014 % + 20 $\mu$ V 0.03 % + 20 $\mu$ V 0.08 % + 20 $\mu$ V 0.3 % + 100 $\mu$ V 0.99 % + 100 $\mu$ V 4 % + 700 $\mu$ V 4 % + 800 $\mu$ V 15 % + 1 mV	
	1 V to 10 V (10 Hz to 40 Hz) (40 Hz to 1 kHz) (1 kHz to 20 kHz) (20 kHz to 50 kHz) (50 kHz to 100 kHz) (100 kHz to 300 kHz) (300 kHz to 1 MHz)	0.007 % + 0.4 mV 0.0072 % + 0.2 mV 0.014 % + 0.2 mV 0.03 % + 0.2 mV 0.08 % + 0.2 mV 0.3 % + 1 mV 0.99 % + 1 mV	
	10 V to 100 V (10 Hz to 40 Hz) (40 Hz to 1 kHz) (1 kHz to 20 kHz) (20 kHz to 50 kHz) (50 kHz to 100 kHz)	0.02 % + 4 mV 0.026 % + 2 mV 0.02 % + 2 mV 0.035 % + 2 mV 0.12 % + 2 mV	

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AC Voltage – Measure <sup>4</sup> (cont'd.)	(100 kHz to 300 kHz) (300 kHz to 1 MHz)	0.4 % + 10 mV 1.5 % + 10 mV	
	100 V to 700 V (10 Hz to 40 Hz) (40 Hz to 1 kHz)	0.04 % + 40 mV 0.04 % + 20 mV	
AC Current – Generate <sup>3</sup>	29 µA to 329.99 µA (10 Hz to 20 Hz) (20 Hz to 45 Hz) (45 Hz to 1 kHz) (1 kHz to 5 kHz) (5 kHz to 10 kHz) (10 kHz to 30 kHz)	0.16 % + 0.1 µA 0.11 % + 0.1 µA 0.091 % + 0.1 µA 0.22 % + 0.15 µA 0.64 % + 0.2 µA 2.8 % + 0.4 µA	Direct measurement method using Fluke 5522A as a source
	330 µA to 3.29999 mA (10 Hz to 20 Hz) (20 Hz to 45 Hz) (45 Hz to 1 kHz) (1 kHz to 5 kHz) (5 kHz to 10 kHz) (10 kHz to 30 kHz)	0.16 % + 0.15 µA 0.096 % + 0.15 µA 0.078 % + 0.15 µA 0.16 % + 0.2 µA 0.39 % + 0.3 µA 0.77 % + 0.6 µA	
	3.3 mA to 32.9999 mA (10 Hz to 20 Hz) (20 Hz to 45 Hz) (45 Hz to 1 kHz) (1 kHz to 5 kHz) (5 kHz to 10 kHz) (10 kHz to 30 kHz)	0.15 % + 2 µA 0.39 % + 2 µA 0.03 % + 2 µA 0.061 % + 2 µA 0.15 % + 3 µA 0.32 % + 4 µA	
	33 mA to 329.999 mA (10 Hz to 20 Hz) (20 Hz to 45 Hz) (45 Hz to 1 kHz) (1 kHz to 5 kHz) (5 kHz to 10 kHz) (10 kHz to 30 kHz)	0.14 % + 20 µA 0.07 % + 20 µA 0.03 % + 20 µA 0.058 % + 50 µA 0.15 % + 100 µA 0.3 % + 200 µA	
	330 mA to 2.99999 A (10 Hz to 45 Hz) (45 Hz to 1 kHz) (1 kHz to 5 kHz) (5 kHz to 10 kHz)	0.14 % + 100 µA 0.06 % + 100 µA 0.47 % + 1 mA 1.9 % + 5 mA	
	3 A to 20.5 A (45 Hz to 100 Hz) (100 Hz to 1 kHz)	0.095 % + 5 mA 0.12 % + 5 mA	

Commented [HA1]: Above 1 kHz removed during assessment per lab request (not demonstrated)

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	(1 kHz to 5 kHz)	2.3 % + 5 mA	
AC Current – Measure <sup>4</sup>	5 µA to 100 µA (10 Hz to 20 Hz) (20 Hz to 45 Hz) (45 Hz to 100 Hz) (100 Hz to 1 kHz)  100 µA to 1 mA (10 Hz to 20 Hz) (20 Hz to 45 Hz) (45 Hz to 100 Hz) (100 Hz to 1 kHz) (1 kHz to 20 kHz) (20 kHz to 50 kHz) (50 kHz to 100 kHz)  1 mA to 10 mA (10 Hz to 20 Hz) (20 Hz to 45 Hz) (45 Hz to 100 Hz) (100 Hz to 1 kHz) (1 kHz to 20 kHz) (20 kHz to 50 kHz) (50 kHz to 100 kHz)  10 mA to 100 mA (10 Hz to 20 Hz) (20 Hz to 45 Hz) (45 Hz to 100 Hz) (100 Hz to 1 kHz) (1 kHz to 20 kHz) (20 kHz to 50 kHz) (50 kHz to 100 kHz)  100 mA to 1 A (10 Hz to 20 Hz) (20 Hz to 45 Hz) (45 Hz to 100 Hz) (100 Hz to 1 kHz) (1 kHz to 20 kHz) (20 kHz to 50 kHz)	0.4 % + 0.03 µA 0.17 % + 0.03 µA 0.061 % + 0.03 µA 0.061 % + 0.03 µA  0.4 % + 0.2 µA 0.15 % + 0.2 µA 0.065 % + 0.2 µA 0.037 % + 0.2 µA 0.068 % + 0.2 µA 0.4 % + 0.4 µA 0.55 % + 1.5 µA  0.4 % + 2 µA 0.15 % + 2 µA 0.06 % + 2 µA 0.03 % + 2 µA 0.06 % + 2 µA 0.4 % + 4 µA 0.55 % + 15 µA  0.4 % + 20 µA 0.15 % + 20 µA 0.06 % + 20 µA 0.03 % + 20 µA 0.06 % + 20 µA 0.4 % + 40 µA 0.55 % + 150 µA  0.04 % + 0.2 mA 0.16 % + 0.2 mA 0.08 % + 0.2 mA 0.1 % + 0.2 mA 0.3 % + 0.2 mA 0.96 % + 0.4 mA	Direct measurement method with HP3458A multimeter in synchronous sub-sample mode
Capacitance – Generate <sup>3,5</sup>	220.0 pF to 399.9 pF (10 Hz to 10 kHz)  0.4 nF to 1.0999 nF (10 Hz to 10 kHz)	0.18 % + 10 pF  0.2 % + 0.01 nF	Direct measurement method using Fluke 5522A as a source



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Capacitance – Generate <sup>3,5</sup> continued	1.1 nF to 3.2999 nF (10 Hz to 3 kHz)	0.5 % + 0.01 nF	Direct measurement method using Fluke 5522A as a source
	3.3 nF to 10.9999 nF (10 Hz to 1 kHz)	0.18 % + 0.01 nF	
	11 nF to 32.9999 nF (10 Hz to 1 kHz)	0.2 % + 0.1 nF	
	33 nF to 109.999 nF (10 Hz to 1 kHz)	0.18 % + 0.1 nF	
	110 nF to 329.999 nF (10 Hz to 1 kHz)	0.18 % + 0.3 nF	
	0.33 µF to 1.09999 µF (10 Hz to 600 Hz)	0.18 % + 1 nF	
	1.1 µF to 3.29999 µF (10 Hz to 300 Hz)	0.18 % + 3 nF	
	3.3 µF to 10.9999 µF (10 Hz to 150 Hz)	0.21 % + 10 nF	
	11 µF to 32.9999 µF (10 Hz to 120 Hz)	0.3 % + 30 nF	
	33 µF to 109.999 µF (10 Hz to 80 Hz)	0.47 % + 100 nF	
	110 µF to 329.999 µF (0 Hz to 50 Hz)	0.33 % + 300 nF	
	0.33 mF to 1.09999 mF (0 Hz to 20 Hz)	0.34 % + 1 µF	
	1.1 mF to 3.29999 mF (0 Hz to 6 Hz)	0.33 % + 3 µF	
	3.3 mF 10.9999 mF (0 Hz to 2 Hz)	0.34 % + 10 µF	
	11 mF to 32.9999 mF (0 Hz to 0.6 Hz)	0.57 % + 30 µF	
33 mF to 110 mF (0 Hz to 0.2 Hz)	0.82 % + 100 µF		



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<sup>1</sup>The uncertainty covered by the Calibration and Measurement Capability (CMC) is expressed as the expanded uncertainty having a coverage probability of approximately 95 %. It is the smallest measurement uncertainty that a laboratory can achieve within its scope of accreditation when performing calibrations of a best existing device. The measurement uncertainty reported on a calibration certificate may be greater than that provided in the CMC due to the behavior of the calibration item and other factors that may contribute to the uncertainty of a specific calibration.

<sup>2</sup>When uncertainty is stated in relative terms (such as percent, a multiplier expressed as a decimal fraction or in scientific notation), it is in relation to instrument reading or instrument output, as appropriate, unless otherwise indicated.

<sup>3</sup>Capability is suitable for the calibration of measuring devices in the stated ranges.

<sup>4</sup>Capability is suitable for the calibration of devices intended to generate the indicated quantity in the stated ranges.

<sup>5</sup>Stated uncertainties are valid for the ranges of frequencies given, but the actual frequency applied by the calibrator may be dependent on the measurement device under calibration.