

Scope of Accreditation For Anmar Metrology, Inc.

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In recognition of a successful assessment to ISO/IEC 17025:2005 and ANSI/NCSL Z540.3:2006 to the following Calibration and Measurement Capabilities, accreditation has been granted to **Anmar Metrology, Inc.** for the following:

Accreditation granted through: **September 1, 2018**

Calibration

Electrical – Current¹

Calibration Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Remarks
DC Current - Source	Up to 330 μ A 330 μ A to 3.3mA 3.3 to 33 mA 33 to 330 mA 330 mA to 1.1 A 1.1 to 3 A	0.21uA/mA + 0.02 μ A 30uA/A + 0.05 μ A 82uA/A + 0.25 μ A 85uA/A + 2.5 μ A 0.19mA/A + 40 μ A 0.39mA/A + 40 μ A	Compared to Multifunction Calibrator
AC Current – Source	29 μ A to 330 μ A 10 to 20 Hz 20 to 45 Hz 45 Hz to 1 kHz 1 to 5 kHz 5 to 10 kHz 10 to 30 kHz 330 μ A to 3.3 mA 10 to 20 Hz 20 to 45 Hz 45 Hz to 1 kHz 1 to 5 kHz 5 to 10 kHz 10 to 30 kHz	2.8nA/uA+ 0.1 μ A 2.6nA/uA + 0.1 μ A 2.5nA/uA + 0.1 μ A 3.3nA/uA + 0.15 μ A 7.9nA/uA + 0.2 μ A 14nA/uA + 0.4 μ A 3uA/mA + 0.15 μ A 2.7uA/mA + 0.15 μ A 2.7uA/mA + 0.15 μ A 3uA/mA + 0.2 μ A 4.7uA/mA + 0.3 μ A 8.2uA/mA + 0.6 μ A	
AC Current – Source	3.3 mA to 33 mA 10 to 20 Hz 20 to 45 Hz 45 Hz to 1 kHz 1 to 5 kHz 5 to 10 kHz 10 to 30 kHz	3.8uA/mA + 2 μ A 2.3uA/mA + 2 μ A 2.2uA/mA + 2 μ A 2.2uA/mA + 2 μ A 3.0uA/mA + 3 μ A 4.1uA/mA + 4 μ A	Compared to Multifunction Calibrator

Calibration Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Remarks
	33 mA to 330 mA 10 to 20 Hz 20 to 45 Hz 45 Hz to 1 kHz 1 to 5 kHz 5 to 10 kHz 10 to 30 kHz	3.3uA/mA + 20 μA 1.4uA/mA + 20 μA 2.6uA/mA + 20 μA 2.7uA/mA + 50 μA 3.0uA/mA + 100 μA 4.0uA/mA + 200 μA	
	330 mA to 1.1 A 10 to 45 Hz 45 Hz to 1 kHz 1 to 5 kHz 5 to 10 kHz	1.6mA/A + 100 μA 0.91mA/A + 100 μA 6.5mA/A + 1000 μA 20mA/A + 5000 μA	

Electrical – Resistance¹

Calibration Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Remarks
Resistance - Source	(0 to 11) Ω	150μΩ/Ω + 0.001 Ω	Compared to Multifunction Calibrator
	(11 to 33) Ω	97μΩ/Ω + 0.0015 Ω	
	(33 to 110) Ω	25μΩ/Ω + 0.0014 Ω	
	(110 to 330) Ω	34μΩ/Ω + 0.002 Ω	
	(0.33 to 1.1) kΩ	22μΩ/Ω + 0.002 Ω	
	(1.1 to 3.3) kΩ	25μΩ/Ω + 0.02 Ω	
	(3.3 to 11) kΩ	22μΩ/Ω + 0.02 Ω	
	(11 to 33) kΩ	22μmΩ/Ω + 0.2 Ω	
	(33 to 110) kΩ	26μΩ/Ω + 0.2 Ω	
	(110 to 330) kΩ	29μΩ/Ω + 2 Ω	
	(0.33 to 1.1) MΩ	28μΩ/Ω + 2 Ω	
	(1.1 to 3.3) MΩ	190μΩ/Ω + 30 Ω	
	(3.3 to 11) MΩ	0.11Ω/Ω + 50 Ω	
	(11 to 33) MΩ	0.23Ω/Ω + 2.5 k Ω	
(33 to 110) MΩ	5.5Ω/Ω + 3 k Ω		

Electrical – Voltage¹

Calibration Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Remarks
DC Volts - Source	Up to 330 mV	19uV/V + 1 μV	Compared to Multifunction Calibrator
	(0.33 to 3.3) V	20uV/V + 2 μV	
	(3.3 to 33) V	12uV/V + 20 μV	
	(33 to 330) V	25uV/V + 150 μV	
	(330 to 1 000) V	24uV/V + 1 500 μV	
AC Volts – Source	(1 to 33) mV	0.85mV/V + 6 μV 0.27mV/V + 6 μV 0.29mV/V + 6 μV 0.88mV/V + 6 μV 2.8mV/V + 12 μV 6.5mV/V + 50 μV	Compared to Multifunction Calibrator
	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			

Calibration Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Remarks
	(33 to 330) mV 10 to 45 Hz	0.5mV/V + 8 μV	
	45 Hz to 10 kHz	0.16mV/V + 8 μV	
	10 to 20 kHz	0.17mV/V + 8 μV	
	20 to 50 kHz	0.31mV/V + 8 μV	
	50 to 100 kHz	0.65mV/V + 32 μV	
	100 to 500 kHz	1.7mV/V + 70 μV	
	(0.33 to 3.3) V 10 to 45 Hz	0.24mV/V + 50 μV	
	45 Hz to 10 kHz	0.13mV/V + 60 μV	
	10 to 20 kHz	0.17mV/V + 60 μV	
	20 to 50 kHz	0.26mV/V + 50 μV	
	50 to 100 kHz	0.57mV/V + 130 μV	
	100 to 500 kHz	2.1mV/V + 600 μV	
	(3.3 to 33) V 10 to 45 Hz	0.40mV/V + 650 μV	
	45 Hz to 10 kHz	0.14mV/V + 600 μV	
	10 to 20 kHz	0.22mV/V + 600 μV	
	20 to 50 kHz	0.30mV/V + 600 μV	
	50 to 100 kHz	0.73mV/V + 1.6 mV	
	(33 to 330) V 45 Hz to 1 kHz	0.17mV/V + 2 mV	
	1 to 10 kHz	0.18mV/V + 6 mV	
	10 to 20 kHz	0.22mV/V + 6 mV	
	20 to 50 kHz	0.35m /V 6 mV	
	50 to 100 kHz	1.6mV/V + 50 mV	
	(330 to 1 020) V 45 Hz to 1 kHz	0.24mV/V + 10 mV	
	1 to 5 kHz	0.20mV/V + 10 mV	
	5 to 10 kHz	0.24mV/V + 10 mV	

Calibration and Measurement Capability (CMC) is expressed in terms of the measurement parameter, measurement range, expanded uncertainty of measurement and remarks. 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) Based on an accredited calibration by the manufacturer and used at the temperature the Multifunction Calibrator was calibrated ($t_{cal} \pm 5 \text{ }^\circ\text{C}$) and assuming the instrument is zeroed at least every seven days or when the ambient temperature changes more than $5 \text{ }^\circ\text{C}$.

Approved by:


 R. Douglas Leonard
 Chief Technical Officer

 Date: June 16, 2015