CERTIFICATE OF ACCREDITATION

ANSI-ASQ National Accreditation Board

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

This is to certify that

Anmar Metrology, Inc.
7726 Arjons Drive
San Diego, CA 92126

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.

L2214
Certificate Number

ANAB Approval

Certificate Valid: 05/03/2018-09/01/2020
Version No. 002 Issued: 05/03/2018

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).

ANSI-ASQ National Accreditation Board

SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005, ANSI/NCSL Z540-1-1994 (R2002) AND ANSI/NCSL Z540.3-2006 (R2013)

Anmar Metrology, Inc.
7726 Arjons Drive
San Diego, CA 92126
Martin Bakker
858-621-2630

CALIBRATION

Valid to: **September 1, 2020** Certificate Number: **L2214**

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
DC Current - Source	Up to 330 µA 330 µA to 3.3mA (3.3 to 33) mA (33 to 330) mA 330 mA to 1.1 A (1.1 to 3) A	0.23 µA/mA + 0.02 µA 20 µA/A + 0.05 µA 82 µA/A + 0.25 µA 79 µA/A + 2.5 µA 0.16 mA/A + 40 µA 0.3 mA/A + 40 µA	Compared to Multifunction Calibrator
AC Current – Source	29 µA to 330 µA (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 µA 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	 1.7 nA/µA+ 0.1 µA 1.2 nA/µA + 0.1 µA 1 nA/µA + 0.1 µA 2.4 nA/µA + 0.15 µA 6.2 nA/µA + 0.2 µA 13 nA/µA + 0.4 µA 1.7 µA/mA + 0.15 µA 0.99 µA/mA + 0.15 µA 0.8 µA/mA + 0.15 µA 1.6 µA/mA + 0.2 µA 3.9 µA/mA + 0.3 µA 7.8 µA/mA + 0.6 µA	

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
AC Current – Source	3.3 mA to 33 mA		Compared to Multifunction Calibrator
	(10 to 20) Hz	1.6 µA/mA + 2 µA	
	(20 to 45) Hz	0.76 µA/mA + 2 µA	
	45 Hz to 1 kHz	0.43 µA/mA + 2 µA	
	(1 to 5) kHz	0.69 µA/mA + 2 µA	
	(5 to 10) kHz	1.6 µA/mA + 3 µA	
	(10 to 30) kHz	3.3 µA/mA + 4 µA	
	33 mA to 330 mA		
	(10 to 20) Hz	1.6 µA/mA + 20 µA	
	(20 to 45) Hz	0.74 µA/mA + 20 µA	
	45 Hz to 1 kHz	0.39 µA/mA + 20 µA	
	(1 to 5) kHz	0.81 µA/mA + 50 µA	
	(5 to 10) kHz	1.6 µA/mA + 100 µA	
	(10 to 30) kHz	3.2 µA/mA + 200 µA	
	330 mA to 1.1 A		
	(10 to 45) Hz	1.5 mA/A + 100 µA	
	45 Hz to 1 kHz	0.4 mA/A + 100 µA	
	(1 to 5) kHz	4.7 mA/A + 1 000 µA	
	(5 to 10) kHz	20 mA/A + 5 000 µA	
Resistance - Source	(0 to 11) Ω	33 µΩ/Ω + 0.001 Ω	
	(11 to 33) Ω	30 µΩ/Ω + 0.001 5 Ω	
	(33 to 110) Ω	23 µΩ/Ω + 0.0014 Ω	
	(110 to 330) Ω	31 µΩ/Ω + 0.002 Ω	
	(0.33 to 1.1) kΩ	23 µΩ/Ω + 0.002 Ω	
	(1.1 to 3.3) kΩ	30 µΩ/Ω + 0.02 Ω	
	(3.3 to 11) kΩ	23 µΩ/Ω + 0.02 Ω	
	(11 to 33) kΩ	33 µmΩ/Ω + 0.2 Ω	
	(33 to 110) kΩ	76 µΩ/Ω + 0.2 Ω	
	(110 to 330) kΩ	41 µΩ/Ω + 2 Ω	
	(0.33 to 1.1) MΩ	28 µΩ/Ω + 2 Ω	
	(1.1 to 3.3) MΩ	160 µΩ/Ω + 30 Ω	
	(3.3 to 11) MΩ	0.11 Ω/Ω + 50 Ω	
	(11 to 33) MΩ	0.21 Ω/Ω + 2.5 k Ω	
	(33 to 110) MΩ	4.3 Ω/Ω + 3 k Ω	
DC Volts - Source	Up to 330 mV	26 µV/V + 1 µV	
	(0.33 to 3.3) V	17 µV/V + 2 µV	
	(3.3 to 33) V	17 µV/V + 20 µV	
	(33 to 330) V	20 µV/V + 150 µV	
	(330 to 1 000) V	22 µV/V + 1 500 µV	

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
AC Volts - Source	(1 to 33) mV		Compared to Multifunction Calibrator
	(10 to 45) Hz	0.92 mV/V + 6 µV	
	45 Hz to 10 kHz	0.3 mV/V + 6 µV	
	(10 to 20) kHz	0.32 mV/V + 6 µV	
	(20 to 50) kHz	0.91 mV/V + 6 µV	
	(50 to 100) kHz	2.9 mV/V + 12 µV	
	(100 to 500) kHz	6.6 mV/V + 50 µV	
	(33 to 330) mV		
	(10 to 45) Hz	0.5 mV/V+ 8 µV	
	45 Hz to 10 kHz	0.089 mV/V + 8 µV	
	(10 to 20) kHz	0.09 mV/V + 8 µV	
	(20 to 50) kHz	0.14 mV/V + 8 µV	
	(50 to 100) kHz	0.21 mV/V + 32 µV	
	(100 to 500) kHz	0.78 mV/V + 70 µV	
	(0.33 to 3.3) V		
	(10 to 45) Hz	0.53 mV/V + 50 µV	
	45 Hz to 10 kHz	0.13 mV/V + 60 µV	
	(10 to 20) kHz	0.16 mV/V + 60 µV	
	(20 to 50) kHz	0.26 mV/V + 50 µV	
	(50 to 100) kHz	0.55 mV/V + 130 µV	
	(100 to 500) kHz	2.1 mV/V + 600 µV	
	(3.3 to 33) V		
	(10 to 45) Hz	0.47 mV/V + 650 µV	
	45 Hz to 10 kHz	0.14 mV/V + 600 µV	
	(10 to 20) kHz	0.23 mV/V + 600 µV	
	(20 to 50) kHz	0.31 mV/V + 600 µV	
	(50 to 100) kHz	0.74 mV/V + 1.6 mV	
	(33 to 330) V		
	45 Hz to 1 kHz	0.18 mV/V + 2 mV	
	(1 to 10) kHz	0.19 mV/V + 6 mV	
	(10 to 20) kHz	0.22 mV/V + 6 mV	
	(20 to 50) kHz	0.38 mV/V + 6 mV	
	(50 to 100) kHz	2 mV/V + 50 mV	
AC Volts - Source	(330 to 1 020) V		
	45 Hz to 1 kHz	0.24 mV/V + 10 mV	
	(1 to 5) kHz	0.2 mV/V + 10 mV	
	(5 to 10) kHz	0.24 mV/V + 10 mV	

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. This scope is formatted as part of a single document including Certificate of Accreditation No. L2214.