



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005  
& ANSI/NCSL Z540-1-1994

OHM-LABS, INC.  
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CALIBRATION

Valid To: October 31, 2020

Certificate Number: 2481.01

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following calibrations<sup>1</sup>

I. Electrical – DC/Low Frequency

Parameter/Equipment	Range <sup>3</sup>	CMC <sup>2</sup> (±)	Comments
DC High Voltage Ratio, Applied Voltage  (100 to 1 000 000):1	(0.1 to 150) kV	0.004 % of ratio	High voltage bridge - Ohm-Labs HV-B
DC Voltage – Measure	(0 to 100) V (100 to 1000) V	50 $\mu$ V/V + 0.60 mV 50 $\mu$ V/V + 10 mV	Measurement with multimeter
	(0.1 to 20) kV (20 to 150) kV	70 $\mu$ V/V + 0.20 V 60 $\mu$ V/V + 1.0 V	Ohm-Labs HVS w/ DC meter
Resistance – Measure	0 $\Omega$	5 n $\Omega$	V-I Method with null detector
	(0.9 to 11) $\mu\Omega$ (9 to 110) $\mu\Omega$	25 $\mu\Omega/\Omega$ 12 $\mu\Omega/\Omega$	Comparison to 3000 A with current comparator bridge and range extenders
	(90 to 1100) $\mu\Omega$ (0.9 to 11) m $\Omega$	3.0 $\mu\Omega/\Omega$ 1.9 $\mu\Omega/\Omega$	
	(9 to 110) m $\Omega$ (90 to 1100) m $\Omega$	1.0 $\mu\Omega/\Omega$ 0.5 $\mu\Omega/\Omega$	

Parameter/Equipment	Range <sup>3</sup>	CMC <sup>2</sup> (±)	Comments
Resistance – Measure (cont)	1 Ω	0.20 μΩ/Ω	Comparison with current comparator bridge
	(0.9 to 11) Ω	0.30 μΩ/Ω	
	(9 to 110) Ω	0.50 μΩ/Ω	
	(90 to 1100) Ω	0.70 μΩ/Ω	
	(0.9 to 11) kΩ	0.50 μΩ/Ω	
	10 kΩ	0.30 μΩ/Ω	
	(9 to 110) kΩ	0.60 μΩ/Ω	
	(90 to 1100) kΩ	1.5 μΩ/Ω	
	(0.9 to 11) MΩ	4.0 μΩ/Ω	
	(9 to 110) MΩ	4.0 μΩ/Ω	
(90 to 1100) MΩ	14 μΩ/Ω		
(0.9 to 11) GΩ	20 μΩ/Ω		
(9 to 110) GΩ	35 μΩ/Ω		
(90 to 1100) GΩ	80 μΩ/Ω		
(0.9 to 11) TΩ	0.02 % of rdg		
(9 to 110) TΩ	0.050 % of rdg		
(90 to 1100) TΩ	0.20 % of rdg		
(0.9 to 11) PΩ	0.50 % of rdg		
AC Voltage – Measure, 50 & 60 Hz	(0 to 10) V (10 to 100) V (100 to 750) V	0.02 % of rdg + 2 mV 0.02 % of rdg + 20 mV 0.02 % of rdg + 0.2 V	Measurement with 3458A meter
AC Voltage – Measure, 50 & 60 Hz	(0.10 to 1) kV (1 to 10) kV (10 to 80) kV	0.03 % of rdg + 20 mV 0.03 % of rdg + 0.2 V 0.03 % of rdg + 2 V	High voltage bridge and AC voltage meter
	(80 to 100) kV	0.03 % of rdg + 2 V	Inductive divider and AC voltage meter
AC High Voltage Ratio – Applied Voltage  (100 to 100 000):1	(0.1 to 80) kV at 50 or 60 Hz  (80 to 100) kV at 50 or 60 Hz	0.05 % of ratio  0.05 % of ratio	High voltage bridge and AC voltage meters  Inductive voltage divider and AC voltage meters



Parameter/Range	Frequency	CMC <sup>2</sup> (±)	Comments
AC Voltage, Measure – AC – DC Difference			
(0.1 to 1.0) A	50 Hz to 10 kHz 10 kHz to 100 kHz	30 μA/A 45 μA/A	Comparison with coaxial AC current shunts using thermal voltage converters
(1.0 to 10) A	50 Hz to 10 kHz 10 kHz to 100 kHz	40 μA/A 50 μA/A	
(10 to 100) A	50 Hz to 10 kHz 10 kHz to 100 kHz	60 μA/A 90 μA/A	
10 Ω to 5 kΩ	10 Hz to 10 kHz 10 kHz to 100 kHz 100 kHz to 1 MHz	25 μΩ/Ω 30 μΩ/Ω 70 μΩ/Ω	Comparison with coaxial AC resistors using thermal voltage converters
(5 to 20) kΩ	10 Hz to 10 kHz 10 kHz to 100 kHz 100 kHz to 1 MHz	25 μΩ/Ω 35 μΩ/Ω 90 μΩ/Ω	
(20 to 100) kΩ	10 Hz to 10 kHz 10 kHz to 100 kHz	35 μΩ/Ω 50 μΩ/Ω	
(0.1 to 1) MΩ	10 Hz to 10 kHz 10 kHz to 100 kHz	50 μΩ/Ω 70 μΩ/Ω	

## II. Thermodynamic

Parameter/Equipment	Range	CMC <sup>2</sup> (±)	Comments
Temperature – Measure	(18 to 30) °C (0 to 200) °C	0.02 °C 0.2 °C	Comparison with calibrated thermometer

<sup>1</sup> This laboratory offers commercial calibration service.

<sup>2</sup> Calibration and Measurement Capability Uncertainty (CMC) is the smallest uncertainty of measurement that a laboratory can achieve within its scope of accreditation when performing more or less routine calibrations of nearly ideal measurement standards or nearly ideal measuring equipment. CMCs represent expanded uncertainties expressed at approximately the 95 % level of confidence, usually using a coverage factor of  $k = 2$ . The actual measurement uncertainty of a specific calibration performed by the laboratory may be greater than the CMC due to the behavior of the customer's device and to influences from the circumstances of the specific calibration.

<sup>3</sup> Where ranges are not specified, the CMC stated is for the cardinal points only.



## Accredited Laboratory

A2LA has accredited

**OHM-LABS, INC.**

*Pittsburgh, PA*

for technical competence in the field of

**Calibration**

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005 *General requirements for the competence of testing and calibration laboratories*. This laboratory also meets the requirements of ANSI/NCSLI Z540-1-1994 and R205 – Specific Requirements: Calibration Laboratory Accreditation Program. 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*).



Presented this 24<sup>th</sup> day of July 2018.

A handwritten signature in black ink, written over a horizontal line.

President and CEO  
For the Accreditation Council  
Certificate Number 2481.01  
Valid to October 31, 2020

*For the calibrations to which this accreditation applies, please refer to the laboratory's Calibration Scope of Accreditation.*