



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017  
& ANSI/NCSL Z540-1-1994

LIBERTY TEST EQUIPMENT, INC  
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CALIBRATION

Valid To: June 30, 2021

Certificate Number: 4926.01

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following calibrations<sup>1,4</sup>:

I. Electrical – DC/Low Frequency

Parameter/Equipment	Range	CMC <sup>2,3</sup> (±)	Comments
DC Voltage – Generate	Up to 220 mV (0.22 to 2.2) V (2.2 to 11) V (11 to 22) V (22 to 220) V (220 to 1100) V	8.2 μV/V + 0.4 μV 5.4 μV/V 3.8 μV/V 3.8 μV/V 5.4 μV/V 7.1 μV/V	Fluke 5730A-05
DC Voltage – Measure	Up to 100 mV (0.1 to 1) V (1 to 10) V (10 to 100) V (100 to 1000) V	10 μV/V + 0.3 μV 7.2 μV/V 6.8 μV/V 10 μV/V 22 μV/V	Keysight 3458A-02
DC Current – Generate	Up to 220 μA (0.22 to 2.2) mA (2.2 to 22) mA (22 to 220) mA (0.22 to 2.2) A	42 μA/A + 6.0 nA 40 μA/A 38 μA/A 95 μA/A 0.10 mA/A	Fluke 5730A-05

Parameter/Equipment	Range	CMC <sup>2,3</sup> (±)	Comments
DC Current – Measure	(10 to 100) $\mu$ A (0.1 to 1) mA (1 to 10) mA (10 to 100) mA (0.1 to 1) A	31 $\mu$ A/A + 0.8 nA 36 $\mu$ A/A 35 $\mu$ A/A 52 $\mu$ A/A 0.14 mA/A	Fluke 5730A-05 Agilent 3458A-02
Resistance – Generate  Fixed Points	0 $\Omega$ 1 $\Omega$ 1.9 $\Omega$ 10 $\Omega$ 19 $\Omega$ 100 $\Omega$ 190 $\Omega$ 1 k $\Omega$ 1.9 k $\Omega$ 10 k $\Omega$ 19 k $\Omega$ 100 k $\Omega$ 190 k $\Omega$ 1 M $\Omega$ 1.9 M $\Omega$ 10 M $\Omega$ 19 M $\Omega$ 100 M $\Omega$	41 $\mu\Omega$ 0.10 m $\Omega$ 0.10 m $\Omega$ 39 $\mu\Omega$ 0.19 m $\Omega$ 0.19 m $\Omega$ 0.32 m $\Omega$ 1.5 m $\Omega$ 3.2 m $\Omega$ 15 m $\Omega$ 32 m $\Omega$ 0.15 $\Omega$ 0.30 $\Omega$ 4.1 $\Omega$ 24 $\Omega$ 72 $\Omega$ 0.39 k $\Omega$ 3.2 k $\Omega$	Fluke 5730A-05
Resistance – Measure	Up to 10 $\Omega$ (10 to 100) $\Omega$ (0.1 to 1.0) k $\Omega$ (1.0 to 10) k $\Omega$ (10 to 100) k $\Omega$ (0.1 to 1.0) M $\Omega$ (1 to 10) M $\Omega$ (10 to 100) M $\Omega$	17 $\mu\Omega/\Omega$ + 50 $\mu\Omega$ 19 $\mu\Omega/\Omega$ 13 $\mu\Omega/\Omega$ 16 $\mu\Omega/\Omega$ 13 $\mu\Omega/\Omega$ 19 $\mu\Omega/\Omega$ 63 $\mu\Omega/\Omega$ 0.57 m $\Omega/\Omega$	Keysight 3458A-02

Parameter/Range	Frequency	CMC <sup>2,3</sup> (±)	Comments
AC Voltage – Generate			
Up 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 (0.5 to 1) MHz	0.48 mV/V + 4.0 μV 0.38 mV/V + 4.0 μV 0.38 mV/V + 4.0 μV 0.48 mV/V + 4.0 μV 0.83 mV/V + 5.0 μV 1.7 mV/V + 10 μV 2.9 mV/V + 20 μV 5.9 mV/V + 20 μV	Fluke 5730A-05
(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 (0.5 to 1) MHz	0.46 mV/V 0.30 mV/V 0.29 mV/V 0.42 mV/V 0.79 mV/V 1.6 mV/V 2.5 mV/V 4.0 mV/V	
(22 to 220) 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 (0.5 to 1) MHz	0.31 mV/V 0.13 mV/V 0.10 mV/V 0.16 mV/V 0.41 mV/V 0.78 mV/V 1.6 mV/V 3.0 mV/V	
(0.22 to 2.2) V	(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 (0.5 to 1) MHz	0.27 mV/V 0.10 mV/V 48 μV/V 75 μV/V 0.10 mV/V 0.39 mV/V 1.1 mV/V 1.9 mV/V	

Parameter/Range	Frequency	CMC <sup>2,3</sup> (±)	Comments
AC Voltage – Generate (cont)			
(2.2 to 22) V	(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 (0.5 to 1) MHz	0.27 mV/V 0.10 mV/V 47 μV/V 75 μV/V 0.10 mV/V 0.30 mV/V 1.1 mV/V 1.7 mV/V	Fluke 5730A-05
(22 to 220) V	(10 to 20) Hz (20 to 40) Hz 40 Hz to 20 kHz (20 to 50) kHz (50 to 100) kHz	0.27 mV/V 0.10 mV/V 57 μV/V 88 μV/V 0.17 mV/V	
AC Voltage – Measure			
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	2.0 mV/V + 3.0 μV 0.5 mV/V + 11 μV 0.6 mV/V + 11 μV 3.7 mV/V + 11 μV 6.1 mV/V + 11 μV 51 mV/V + 20 μV	Keysight 3458A-02
(10 to 100) 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 300 kHz to 1 MHz	0.40 mV/V 0.33 mV/V 0.46 mV/V 1.9 mV/V 2.1 mV/V 5.0 mV/V 4.4 mV/V	

Parameter/Range	Frequency	CMC <sup>2,3</sup> ( $\pm$ )	Comments
AC Voltage – Measure (cont)			
(0.1 to 1) 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	0.37 mV/V 0.30 mV/V 3.5 mV/V 0.77 mV/V 1.4 mV/V 4.7 mV/V 14 mV/V	Keysight 3458A-02
(1 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	0.40 mV/V 0.30 mV/V 0.42 mV/V 0.77 mV/V 1.2 mV/V 4.4 mV/V 14 mV/V	
(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	0.59 mV/V 0.52 mV/V 0.67 mV/V 0.84 mV/V 2.2 mV/V 4.9 mV/V 16 mV/V	
(100 to 1000) V	(1 to 40) Hz 40 Hz to 1 kHz (1 to 20) kHz (20 to 50) kHz (50 to 100) kHz	0.72 mV/V 0.64 mV/V 0.81 mV/V 1.4 mV/V 3.2 mV/V	

<sup>1</sup> This laboratory offers commercial calibration service and field 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> The stated measured values are determined using the indicated instrument (see Comments). This capability is suitable for the calibration of the devices intended to measure or generate the measured value in the ranges indicated. CMCs are expressed as either a specific value that covers the full range or as a percent or fraction of the reading plus a fixed floor specification.

<sup>4</sup>This scope meets A2LA's *P112 Flexible Scope Policy*.