



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

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CALIBRATION

Valid To: September 30, 2024

Certificate Number: 3040.01

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following calibrations^{1, 5}:

I. Dimensional

Parameter/Equipment	Range	CMC ² (±)	Comments
Calipers ³ – Dial, Digital, Vernier 500 µin Graduation 1000 µin Graduation	Up to 40 in	410 µin + 8 µin/in 570 µin + 9.1 µin/in	Gage blocks
Micrometers ³ – Outside 50 µin Graduation 100 µin Graduation 1000 µin Graduation Inside 1000 µin Graduation	Up to 48 in Up to 40 in	51 µin + 3.9 µin/in 96 µin + 5.3 µin/in 580 µin + 0.7 µin/in 590 µin + 2.7 µin/in 50 µin + 10 µin/in	Gage blocks Gage blocks ULM
Depth 1000 µin Graduation	Up to 12 in	600 µin + 0.26 µin/in	Gage blocks with surface plate

Parameter/Equipment	Range	CMC ² (±)	Comments
Micrometers ³ (cont) – 3-Point Bore 50 μin Graduation 200 μin Graduation Bench 10 μin Graduation	Up to 3 in Up to 2 in	140 μin + 0.1 μin/in 220 μin + 0.1 μin/in 17 μin	Setting rings Gage blocks
Indicators – 50 μin Graduation 100 μin Graduation 500 μin Graduation 1000 μin Graduation	Up to 4 in	51 μin + 0.2 μin/in 71 μin + 0.2 μin/in 290 μin + 0.04 μin/in 580 μin + 0.02 μin/in	ULM
Pin Gages ³	Up to 1 in	22 μin	ULM and gage blocks
Cylindrical Rings	Up to 8 in	21 μin + 0.8 μin/in	ULM with master ring
Height Gage ³ – 50 μin Graduation 500 μin Graduation 1000 μin Graduation	Up to 48 in	370 μin + 1.1 μin/in 470 μin + 1.1 μin/in 690 μin + 0.61 μin/in	Gage blocks with surface plate
Length Standards	Up to 32 in	20 μin + 1.2 μin/in	ULM and gage blocks

II. Electrical – DC/Low Frequency

Parameter/Equipment	Range	CMC ^{2,4} (±)	Comments
DC Voltage ³ – Generate	(0 to 320) mV (0.32 to 3.2) V (3.2 to 32) V (32 to 320) V (320 to 1050) V	20 μV 0.0019 V 0.0021 V 0.020 V 0.065 V	Fluke 5502A
DC Current ³ – Generate	(0 to 320) μA 320 μA to 3.2 mA (3.2 to 32) mA (32 to 320) mA (0.32 to 1.0) A (1.0 to 3.0) A (3.0 to 11) A (11 to 20) A (0 to 500) A (500 to 1000) A	0.069 μA 0.057 μA 0.058 mA 0.036 mA 0.42 mA 1.2 mA 6.5 mA 25 mA 2.1 A 4.6 A	Fluke 5502A With 50 turn coil
Resistance ³ – Generate	(0 to 10.999) Ω (11 to 33) Ω (33 to 110) Ω (110 to 330) Ω (330 to 1100) Ω (1.1 to 3.3) kΩ (3.3 to 11) kΩ (11 to 33) kΩ (33 to 110) kΩ (110 to 330) kΩ (330 to 1100) kΩ (1.1 to 3.3) MΩ (3.3 to 11) MΩ (11 to 33) MΩ (110 to 330) MΩ (330 to 1100) MΩ	11 mΩ 19 mΩ 25 mΩ 0.047 Ω 0.12 Ω 0.47 Ω 20 Ω 3.7 Ω 13 Ω 49 Ω 170 Ω 0.6 kΩ 6.8 kΩ 33 kΩ 1.6 MΩ 17 MΩ	Fluke 5502A

Parameter/Range	Frequency	CMC ^{2,4} (±)	Comments
AC Voltage ³ – Generate			
(0 to 33) mV	(10 to 45) Hz (45 to 10 000) Hz (10 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 500) kHz	0.046 mV 0.05 mV 0.074 mV 0.086 mV 0.16 mV 1.7 mV	Fluke 5502A
(33 to 330) mV	(10 to 45) Hz (45 to 10 000) Hz (10 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 500) kHz	0.19 mV 0.11 mV 0.23 mV 0.34 mV 0.86 mV 1.8 mV	
(330 to 3300) mV	(10 to 45) Hz (45 to 10 000) Hz (10 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 500) kHz	1.6 mV 1.1 mV 2.2 mV 3.1 mV 7.1 mV 16 mV	
(3.3 to 33) V	(10 to 45) Hz (45 to 10 000) Hz (10 to 20) kHz (20 to 50) kHz (50 to 100) kHz	12 mV 9.6 mV 22 mV 31 mV 71 mV	
(33 to 330) V	(45 to 1000) Hz (1 to 10) kHz (10 to 20) kHz (20 to 50) kHz (50 to 100) kHz	0.18 V 0.25 V 0.28 V 0.37 V 0.56 V	
(330 to 1020) V	45 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz	0.52 V 0.82 V 0.94 V	



Parameter/Range	Frequency	CMC ^{2, 4} (±)	Comments	
AC Current ³ – Generate				
(29 to 330) µA	(10 to 20) Hz (20 to 45) Hz (45 to 1000) Hz (1 to 5) kHz (5 to 10) kHz (10 to 30) kHz	0.76 µA 0.59 µA 0.51 µA 1.1 µA 2.8 µA 5.7 µA	Fluke 5502A	
(0.33 to 3.29) mA	(10 to 20) Hz (20 to 45) Hz (45 to 1000) Hz (1 to 5) kHz (5 to 10) kHz (10 to 30) kHz	6.8 µA 3.5 µA 4.6 µA 6.8 µA 17 µA 35 µA		
(3.3 to 32.9) mA	(10 to 20) Hz (20 to 45) Hz (45 to 1000) Hz (1 to 5) kHz (5 to 10) kHz (10 to 30) kHz	61 µA 32 µA 16 µA 29 µA 69 µA 0.14 mA		
(33 to 329) mA	(10 to 20) Hz (20 to 45) Hz (45 to 1000) Hz (1 to 5) kHz (5 to 10) kHz (10 to 30) kHz	0.1 mA 0.34 mA 0.2 mA 0.43 mA 0.78 mA 1.5 mA		
(0.33 to 1.09) A	(10 to 45) Hz (45 to 1000) Hz (1 to 5) kHz (5 to 10) kHz	3 mA 0.65 mA 7.5 mA 32 mA		
(1.1 to 2.99) A	(10 to 45) Hz (45 to 1000) Hz (1 to 5) kHz (5 to 10) kHz	5.6 mA 2.1 mA 19 mA 80 mA		
(3 to 10.9) A	(10 to 45) Hz (45 to 1000) Hz (1 to 5) kHz	8.9 mA 13 mA 330 mA		
(11 to 20.5) A	(10 to 45) Hz (45 to 1000) Hz (1 to 5) kHz	29 mA 35 mA 610 mA		
(0 to 150) A	(10 to 100) Hz	7.6 mA		
(150 to 1000) A	(10 to 100) Hz	2.1 mA		With 50 turn coil



III. Mechanical

Parameter/Equipment	Range	CMC ² (±)	Comments
Torque –			
Manual Torque Wrenches ³	(2 to 24) lbf·in	0.02 lbf·in + 0.0071 lbf·in /lbf·in	ISO 6789:2003 manually applied and measured with a transducer
	(20 to 24) lbf·in	1.5 lbf·in + 0.0032 lbf·in/lbf·in	
	(20 to 200) lbf·ft	0.3 lbf·ft + 0.0019 lbf·ft/lbf·ft	
	(200 to 2000) lbf·ft	0.7 lbf·ft + 0.0013 lbf·ft/lbf·ft	
Hydraulic Torque Wrenches ³	(50 to 500) lbf·ft	0.38 lbf·ft + 0.0014 lbf·ft/lbf·ft	Hydraulic pressure measured and compared to torque measured by transducers
	(500 to 5000) lbf·ft	5.2 lbf·ft + 0.0014 lbf·ft/lbf·ft	
	(2000 to 20 000) lbf·ft	8.6 lbf·ft + 0.0076 lbf·ft /lbf·ft	
	(20 001 to 40 000) lbf·ft	27 lbf·ft + 0.0009 lbf·ft/lbf·ft	
Pneumatic Torque Gun ³	(0 to 5000) lbf·ft	2.7 lbf·ft + 0.016 lbf·ft/lbf·ft	Pneumatic pressure set and torque measured with transducer
Electronic Torque Gun ³	(0 to 5000) lbf·ft	1.8 lbf·ft + 0.0024 lbf·ft/lbf·ft	Digital torque set and torque measured with transducer
Torque Multiplier ³	(0 to 20 000) lbf·ft	11 lbf·ft + 0.006 lbf·ft/lbf·ft	Input and output torque measured with torque transducers
Torque Transducers	(2 to 24) lbf·in	0.011 lbf·in + 0.000 18 lbf·in/lbf·in	Torque arm with weights
	(24 to 240) lbf·in	0.14 lbf·in + 0.0029 lbf·in/lbf·in	
	(20 to 200) lbf·ft	0.056 lbf·ft + 0.000 27 lbf·ft/lbf·ft	
	(200 to 2000) lbf·ft	0.64 lbf·ft + 0.000 27 lbf·ft/lbf·ft	



Parameter/Equipment	Range	CMC ² (±)	Comments
Torque – (cont) Torque Transducers	(2000 to 20 000) lbf·ft	4.4 lbf·ft + 0.000 23 lbf·ft/lbf·ft	Torque arm with weights
Pressure ³ – Hydraulic Gauges	(0 to 300) psig (300 to 3000) psig (3001 to 10 000) psig (10 000 to 30 000) psig (600 to 6000) psig (3000 to 30 000) psig	0.12 psig + 77 µpsig/psig 0.9 psig + 41 µpsig/psig 3.1 psig + 59 µpsig/psig 42 psig + 1.3 µpsig/psig 0.33 psig + 250 µpsig/psig 1.7 psig + 150 µpsig/psig	Comparison with standard hydraulic pressure gage Fluke RPM4-E-DWT

IV. Thermodynamics

Parameter/Equipment	Range	CMC ² (±)	Comments
Infrared Thermometer (Non-Contact)	(35 to 500) °C	0.4 °C + 0.37 % of rdg	Fluke 4181 blackbody

¹ This laboratory offers commercial calibration service and field calibration service.

² 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.

³ Field calibration service is available for this calibration. Please note the actual measurement uncertainties achievable on a customer's site can normally be expected to be larger than the CMC found on the A2LA Scope. Allowance must be made for aspects such as the environment at the place of calibration and for other possible adverse effects such as those caused by transportation of the calibration equipment. The usual allowance for the actual uncertainty introduced by the item being calibrated, (e.g., resolution) must also be considered and this, on its own, could result in the actual measurement uncertainty achievable on a customer's site being larger than the CMC.

⁴The 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.

⁵ This scope meets A2LA's *P112 Flexible Scope Policy*.





Accredited Laboratory

A2LA has accredited

ALLTITE, INC.

Wichita, KS

for technical competence in the field of

Calibration

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 *General requirements for the competence of testing and calibration laboratories*. This laboratory also meets the requirements of ANSI/NCCL 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 12th day of October 2022.

A blue ink signature of the Vice President of Accreditation Services.

Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 3040.01
Valid to September 30, 2024

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