



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

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CALIBRATION

Valid To: August 31, 2028

Certificate Number: 4924.01

In recognition of the successful completion of the A2LA evaluation process, (including an assessment of the organization's compliance with R205 – A2LA's Calibration Program Requirements), accreditation is granted to this laboratory to perform the following calibrations^{1, 7}:

I. Electrical – DC/Low Frequency

Parameter/Equipment	Range	CMC ^{2, 4} (±)	Comments
DC Voltage – Measure ³	(0 to 10) V (10 to 100) V	0.0008 % + 0.23 mV 0.0081 % + 2.3 mV	Martel 3001 calibrator
DC Voltage – Generate ³	(0 to 100) mV (0.1 to 1) V (1 to 10) V (10 to 100) V	0.007 % + 3.5 µV 12 µV 0.0005 % + 0.12 mV 0.0047 % + 1.2 mV	Martel 3001 calibrator
DC Current – Measure ³	(0 to 50) mA	0.0072 % + 1.2 µA	Martel 3001 calibrator
DC Current – Generate ³	(0 to 100) mA	0.0077 % + 1.2 µA	Martel 3001 calibrator

Parameter/Equipment	Range	CMC ² (±)	Comments
Electrical Simulation of Thermocouple Indicators ³ –			
Type J	(-100 to -30) °C (-30 to 760) °C (760 to 1200) °C	0.27 °C 0.29 °C 0.33 °C	Martel 3001 calibrator
Type K	(-100 to -25) °C (-25 to 120) °C (120 to 1000) °C (1000 to 1372) °C	0.31 °C 0.25 °C 0.34 °C 0.50 °C	
Type N	(-100 to -25) °C (-25 to 410) °C (410 to 1300) °C	0.33 °C 0.31 °C 0.37 °C	
Type R	(-20 to 250) °C (250 to 400) °C (400 to 1000) °C (1000 to 1767) °C	0.69 °C 0.46 °C 0.43 °C 0.52 °C	
Type S	(-20 to 250) °C (250 to 1000) °C (1000 to 1400) °C (1400 to 1767) °C	0.68 °C 0.46 °C 0.48 °C 0.55 °C	
Type T	(-250 to -150) °C (-150 to 0) °C (0 to 400) °C	0.75 °C 0.33 °C 0.25 °C	

Parameter/Equipment	Range	CMC ² (±)	Comments
Electrical Simulation of Thermocouple Indicators ³ –			
Type J	(-100 to 100) °C (100 to 1200) °C	0.44 °C 0.37 °C	Tegam 945A calibrator
Type K	(-100 to 0) °C (0 to 1372) °C	0.61 °C 0.54 °C	
Type N	(-100 to 0) °C (0 to 300) °C (300 to 1000) °C (1000 to 1300) °C	0.55 °C 0.46 °C 0.39 °C 0.47 °C	
Type R	(100 to 400) °C (400 to 1000) °C (1000 to 1767) °C	1.1 °C 0.98 °C 0.91 °C	
Type S	(100 to 400) °C (400 to 1000) °C (1000 to 1767) °C	1.0 °C 0.92 °C 0.82 °C	
Type T	(-100 to 0) °C (0 to 100) °C (100 to 400) °C	0.75 °C 0.68 °C 0.63 °C	
Electrical Simulation of RTD Indicators – Measuring Equipment ³			
Pt 385, 100 Ω	(-200 to 800) °C	0.06 °C	
Pt 385, 1000 Ω	(-200 to 630) °C	0.11 °C	

Parameter/Equipment	Range	CMC ² (±)	Comments
Electrical Simulation of RTD Indicators – Measure ³			
Pt 385, 100 Ω	(-200 to -80) °C (-80 to 100) °C (100 to 300) °C (300 to 400) °C (400 to 630) °C (630 to 800) °C	0.015 °C 0.023 °C 0.029 °C 0.030 °C 0.038 °C 0.044 °C	Martel 3001 calibrator
Pt 385, 1000 Ω	(-200 to 0) °C (0 to 100) °C (100 to 300) °C (300 to 400) °C (400 to 630) °C	0.017 °C 0.021 °C 0.028 °C 0.030 °C 0.038 °C	

II. Thermodynamics

Parameter/Equipment	Range	CMC ^{2, 5, 6} (±)	Comments
Temperature – Measuring Equipment ³			
System Accuracy Tests – Thermocouples			
Type N	(0 to 275) °C (275 to 1200) °C	0.94 °C 1.5 °C or 0.12 % <i>T</i>	Process calibrator, reference thermocouples, AMS 2750, AIAG CQI-9
Type T	(-100 to 0) °C (0 to 370) °C	0.59 °C 0.55 °C or 0.12 % <i>T</i>	

Parameter/Equipment	Range	CMC ^{2, 5, 6} ($\pm$)	Comments
Temperature – Measure ³ (Ovens, Furnaces, Freezers, & Chambers) Thermocouples: Type J Type K Type N Type S Type T	 (0 to 275) °C (275 to 1200) °C (0 to 275) °C (275 to 1200) °C (0 to 275) °C (275 to 1200) °C (0 to 1200) °C (-100 to 0) °C (0 to 370) °C	 0.89 °C 1.1 °C or 0.12 % T 0.80 °C 1.1 °C or 0.12 % T 0.94 °C 1.5 °C or 0.12 % T 1.3 °C 0.59 °C 0.55 °C or 0.12 % T	 Process calibrator, reference thermocouples Process calibrator, reference thermocouples, AMS 2750, AIAG CQI-9
Temperature Uniformity Surveys – Thermocouples: Type K	 (0 to 275) °C (275 to 1200) °C	 0.77 °C 1.1 °C or 0.12 % T	 Process calibrator, reference thermocouples, AMS 2750, AIAG CQI-9
IR Thermometers ³	(50 to 500) °C (500 to 1200) °C	2.5 °C + 0.004 °C/°C 4.2 °C + 0.004 °C/°C	Blackbody calibrator $\epsilon = 0.95$ $\lambda = (8 \text{ to } 14) \mu\text{m}$ Blackbody calibrator $\epsilon = 0.98$ $\lambda = (0.9 \text{ to } 7.9) \mu\text{m}$

¹ This laboratory offers commercial 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.
- ⁴ 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.
- ⁵ In the statement of CMC, T is the numerical value of the nominal temperature measure in °C.
- ⁶ The type of instrument or material being calibrated is defined by the parameter. This indicates the laboratory is capable of calibrating instruments that measure or generate the values in the ranges indicated for the listed measurement parameter.
- ⁷ This scope meets A2LA's *P112 Flexible Scope Policy*.