



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

CONTROLS SERVICE, INC.
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CALIBRATION

Valid To: July 31, 2025

Certificate Number: 1740.01

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following calibrations^{1, 6}:

I. Electrical – DC/Low Frequency

Parameter/Equipment	Range	CMC ^{2, 4} (±)	Comments
DC Voltage – Generate	(-11 to 11) V	0.0035 % + 3 μV	Ectron 1140A
	100 V	0.0033 % + 1.2 mV	Fluke 7526A
DC Voltage – Generate ³	(0 to 100) mV (0.1 to 1.1) V (1.1 to 15) V	0.012 % + 6 μV 0.012 % + 59 μV 0.012 % + 0.58 mV	Fluke 75x calibrator
DC Voltage – Measure	(-11 to 11) V	0.0035 % + 3 μV	Ectron 1140A
	100 V	0.0052 % + 2.1 mV	Fluke 7526A
DC Voltage – Measure ³	(0 to 100) mV (0.1 to 3) V (3 to 30) V (30 to 300) V	0.023 % + 6 μV 0.023 % + 60 μV 0.023 % + 0.6 mV 0.057 % + 60 mV	Fluke 75x calibrator
DC Current – Generate	(0 to 100) mA	0.0049 % + 0.0012 mA	Fluke 7526A

Parameter/Equipment	Range	CMC ^{2,4} (\pm)	Comments
DC Current – Generate ³ Source Simulate	(0 to 22) mA (0 to 22) mA	0.013 % + 4 μ A 0.024 % + 81 μ A	Fluke 75x calibrator
DC Current – Measure	(0 to 50) mA	0.01 % + 0.001 mA	Fluke 7526A
DC Current – Measure ³	(0 to 30) mA (30 to 100) mA	0.013 % + 6 μ A 0.012 % + 27 μ A	Fluke 75x calibrator
Resistance – Generate	(5 to 400) Ω (400 to 4000) Ω	0.015 Ω 0.3 Ω	Fluke 7526A
Resistance – Generate ³	(0 to 10) Ω (10 to 100) Ω (0.10 to 1.0) k Ω (1.0 to 10) k Ω	0.012 % + 0.012 Ω 0.011 % + 0.024 Ω 0.023 % + 0.24 Ω 0.023 % + 3.5 Ω	Fluke 75x calibrator
Resistance – Generate ³	(20 to 1121) Ω	0.023 % + 0.13 m Ω	General resistance decade box
Resistance – Measure	(0 to 400) Ω (400 to 4000) Ω	0.0021 % + 0.004 Ω 0.0021 % + 0.04 Ω	Fluke 7526A
Resistance – Measure ³	(0 to 10) Ω (10 to 100) Ω (0.10 to 1.0) k Ω (1.0 to 10) k Ω	0.062 % + 0.058 Ω 0.058 % + 0.059 Ω 0.057 % + 0.59 Ω 0.12 % + 12 Ω	Fluke 75x calibrator
Electrical Calibration of Thermocouples – Measure Type B Type C Type E Type J Type K	(600 to 1800) $^{\circ}$ C (0 to 2316) $^{\circ}$ C (-200 to 1000) $^{\circ}$ C (-100 to 1200) $^{\circ}$ C (-100 to 1372) $^{\circ}$ C	0.39 $^{\circ}$ C 0.39 $^{\circ}$ C 0.15 $^{\circ}$ C 0.14 $^{\circ}$ C 0.16 $^{\circ}$ C	Fluke 7526A

Parameter/Equipment	Range	CMC ² (±)	Comments
Electrical Calibration of Thermocouples – Measure (cont)			
Type N	(-100 to 1300) °C	0.15 °C	Fluke 7526A
Type R	(100 to 1767) °C	0.33 °C	
Type S	(100 to 1767) °C	0.34 °C	
Type T	(-200 to 400) °C	0.19 °C	
Electrical Calibration of Thermocouples – Measure ³			
Type B	(600 to 800) °C (800 to 1000) °C (1000 to 1820) °C	1.8 °C 1.4 °C 1.3 °C	Fluke 75x calibrator
Type C	(0 to 800) °C (800 to 1200) °C (1200 to 1800) °C (1800 to 2316) °C	0.97 °C 1.2 °C 1.6 °C 2.6 °C	
Type E	(-200 to -100) °C (-100 to 600) °C (600 to 1000) °C	0.85 °C 0.62 °C 0.72 °C	
Type J	(-100 to 800) °C (800 to 1200) °C	0.62 °C 0.84 °C	
Type K	(-100 to 400) °C (400 to 1200) °C (1200 to 1372) °C	0.63 °C 0.84 °C 0.84 °C	
Type N	(-100 to 900) °C (900 to 1300) °C	0.84 °C 0.96 °C	
Type R	(0 to 100) °C (100 to 1767) °C	2.0 °C 1.4 °C	
Type S	(0 to 200) °C (200 to 1400) °C (1400 to 1767) °C	2.0 °C 1.3 °C 1.5 °C	
Type T	(-200 to 0) °C (0 to 400) °C	0.95 °C 0.62 °C	

Parameter/Equipment	Range	CMC ² (±)	Comments
Electrical Calibration of Thermocouple Indicators –			
Type B	(600 to 1800) °C	0.39 °C	Fluke 7526A
Type C	(0 to 2316) °C	0.39 °C	
Type E	(-200 to 1000) °C	0.15 °C	
Type J	(-100 to 1200) °C	0.14 °C	
Type K	(-100 to 1372) °C	0.16 °C	
Type N	(-100 to 1300) °C	0.15 °C	
Type R	(100 to 1767) °C	0.33 °C	
Type S	(100 to 1767) °C	0.34 °C	
Type T	(-200 to 400) °C	0.19 °C	
Electrical Calibration of Thermocouple Indicators ³ –			
Type B	(600 to 800) °C (800 to 1820) °C	1.4 °C 1.2 °C	Fluke 75x calibrator
Type C	(0 to 800) °C (800 to 1200) °C (1200 to 1800) °C (1800 to 2316) °C	0.96 °C 1.1 °C 1.3 °C 1.8 °C	
Type E	(-200 to 600) °C (600 to 1000) °C	0.62 °C 0.51 °C	
Type J	(-100 to 800) °C (800 to 1200) °C	0.51 °C 0.62 °C	
Type K	(-100 to 1372) °C	0.62 °C	
Type N	(-100 to 900) °C (900 to 1300) °C	0.84 °C 0.62 °C	
Type R	(0 to 100) °C (100 to 1767) °C	1.5 °C 1.3 °C	
Type S	(0 to 200) °C (200 to 1400) °C (1400 to 1767) °C	1.5 °C 1.3 °C 1.4 °C	
Type T	(-200 to 0) °C (0 to 400) °C	0.73 °C 0.62 °C	

Parameter/Equipment	Range	CMC ² (±)	Comments
Electrical Calibration of RTDs – Measure			
100 Ω, Pt (3916)	(-200 to 630) °C	0.033 °C	Fluke 7526A
100 Ω, Pt (385)	(-200 to 800) °C	0.039 °C	
100 Ω, Pt (3926)	(-200 to 630) °C	0.033 °C	
Electrical Calibration of RTDs – Measure ³			
100 Ω, Pt (3916)	(-200 to 100) °C (100 to 630) °C	0.083 °C 0.21 °C	Fluke 75x calibrator
100 Ω, Pt (385)	(-200 to 100) °C (100 to 800) °C	0.083 °C 0.24 °C	
100 Ω, Pt (3926)	(-200 to 100) °C (100 to 630) °C	0.094 °C 0.22 °C	
Electrical Calibration of RTD Indicators –			
100 Ω, Pt (3916)	(-200 to 630) °C	0.05 °C	Fluke 7526A
100 Ω, Pt (385)	(-200 to 800) °C	0.05 °C	
100 Ω, Pt (3926)	(-200 to 630) °C	0.05 °C	
Electrical Calibration of RTD Indicators ³ –			
100 Ω, Pt (3916)	(-200 to 100) °C (100 to 630) °C	0.06 °C 0.16 °C	Fluke 75x calibrator
100 Ω, Pt (385)	(-200 to 100) °C (100 to 800) °C	0.06 °C 0.16 °C	
100 Ω, Pt (3926)	(-200 to 100) °C (100 to 630) °C	0.06 °C 0.16 °C	

II. Mechanical

Parameter/Equipment	Range	CMC ^{2,5} (±)	Comments
Pressure – Measure ³	(0 to 1000) psi (0 to 10) inH ₂ O (0 to 200) inH ₂ O	0.5 psi 0.07 inH ₂ O 0.28 % + 0.07 inH ₂ O	Fluke module 750P08 Dwyer manometer Meriam manometer

III. Thermodynamics

Parameter/Equipment	Range	CMC ^{2,5} (±)	Comments
Temperature – Measure PRT	(-200 to 300) °C	0.083 °C	Fluke 7526A w/ SPRT
Temperature – Measure ³ Type J Type K Type N Type T Temp/RH Meter	(0 to 800) °C (0 to 1200) °C (0 to 1200) °C (-196 to 260) °C (-30 to 20) °C (20 to 120) °C	1.2 °C 1.6 °C 1.5 °C 1.1 °C 0.44 °C 0.0024 °C/°C + 0.23 °C	Fluke 75X w/ SLE T/C Fluke 75X w/ SLE T/C Fluke 75X w/ SLE T/C Fluke 75X w/ SLE T/C Vaisala temp/RH meter
Thermal Processing Equipment ³ – System Accuracy Test (SAT) Type J Type K Type N Type T	(0 to 800) °C (0 to 1200) °C (0 to 1200) °C (-196 to 260) °C	1.2 °C 1.6 °C 1.5 °C 1.1 °C	(AMS2750 and AIAG CQI-9, CQI-11, CQI-12) Fluke 75X w/ SLE T/C Fluke 75X w/ SLE T/C Fluke 75X w/ SLE T/C Fluke 75X w/ SLE T/C

Parameter/Equipment	Range	CMC ² (±)	Comments
Thermal Processing Equipment – Temperature Uniformity Surveys (TUS) ³			(AMS2750 and AIAG CQI-9, CQI-11, CQI-12)
Type J	(38 to 815) °C	1.4 °C	Datalogger/recorder w/ SLE T/C's
Type K	(38 to 1260) °C	1.5 °C	
Type N	(38 to 1260) °C	1.5 °C	
Type T	(-185 to 38) °C	0.9 °C	
Relative Humidity – Controllers, Indicators, Recorders, and Transmitters ³	(11 to 90) % RH (90 to 95) % RH	1.7 % RH 2.4 % RH	Vaisala humidity calibrator

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. CMC's 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 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.

⁶ This scope meets A2LA's *PI12 Flexible Scope Policy*.



Accredited Laboratory

A2LA has accredited

CONTROLS SERVICE, INC.

Livonia, MI

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 6th day of September 2023

A blue ink signature of Mr. Trace McInturff, written over a horizontal line.

Mr. Trace McInturff, Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 1740.01
Valid to July 31, 2025

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