



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

CONTROL AUTOMATION TECHNOLOGIES CORP  
 101 N Chestnut St. Ste 210  
 Winston-Salem, NC 27101  
 Rob Igoe Phone: 336 725 6020 x 111/302

CALIBRATION

Valid To: April 30, 2024

Certificate Number: 1486.01

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following calibrations<sup>1, 5</sup>:

I. Electrical – DC/Low Frequency

Parameter/Equipment	Range	CMC <sup>2, 3</sup> (±)	Comments
DC Voltage – Generate	Up to 330 mV 330 mV to 3.3 V (3.3 to 33) V (33 to 330) V (100 to 1000) V	0.82 $\mu$ V + 0.02 $\mu$ V/ $\mu$ V 57 $\mu$ V + 9 $\mu$ V/ $\mu$ V 0.63 mV + 0.01 mV/mV 17 mV + 0.014 mV/mV 21 mV + 0.02 mV/mV	Fluke 5520A
DC Voltage – Measure	(10 to 100) mV (0.1 to 1) V (1 to 10) V (10 to 100) V (100 to 1000) V	11 $\mu$ V/V + 0.3 $\mu$ V 10 $\mu$ V/V + 0.3 $\mu$ V 10 $\mu$ V/V + 0.5 $\mu$ V 12 $\mu$ V/V + 30 $\mu$ V 13 $\mu$ V/V + 100 $\mu$ V	Agilent 3458A
DC Current – Generate	Up to 330 $\mu$ A 330 $\mu$ A to 3.3 mA (3.3 to 33) mA (33 to 330) mA 330 mA to 1.1 A (1.1 to 3) A  (3 to 11) A (11 to 20.5) A	0.016 $\mu$ A + 0.000 12 $\mu$ A/ $\mu$ A 0.2 $\mu$ A + 0.1 $\mu$ A/ $\mu$ A 0.002 mA + 0.000 08 mA/mA 0.02 mA + 0.000 08 mA/mA 0.8 mA + 0.16 mA/mA 1.1 mA + 0.3 mA/mA  0.0082 A + 0.0004 A/A 0.17 A + 0.000 78 A/A	Fluke 5520A

Parameter/Equipment	Range	CMC <sup>2,3</sup> ( $\pm$ )	Comments
DC Current – Generate (cont)	(20.5 to 150) A	0.58 % + 0.16 A	Fluke 5520A w/ 10 coil
	(150 to 1000) A	0.60 % + 0.58 A	Fluke 5520A w/ 50 coil
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	25 $\mu$ A/A + 0.8 nA 25 $\mu$ A/A + 5 nA 25 $\mu$ A/A + 50 nA 40 $\mu$ A/A + 0.5 $\mu$ A 0.012 % + 10 $\mu$ A	Agilent 3458A
Resistance – Generate	Up to 10.9999 $\Omega$ (11 to 32.9999) $\Omega$ (33 to 109.9999) $\Omega$ (110 to 329.9999) $\Omega$ (0.33 to 1.099 999) k $\Omega$ (1.1 to 3.299 999) k $\Omega$ (33 to 10.999 99) k $\Omega$ (1 to 32.999 99) k $\Omega$ (33 to 109.999) k $\Omega$ (110 to 329.999) k $\Omega$	48 $\mu\Omega/\Omega$ + 1.0 m $\Omega$ 35 $\mu\Omega/\Omega$ + 2.0 m $\Omega$ 33 $\mu\Omega/\Omega$ + 2.0 m $\Omega$ 33 $\mu\Omega/\Omega$ + 4.0 m $\Omega$ 32 $\mu\Omega/\Omega$ + 13 m $\Omega$ 32 $\mu\Omega/\Omega$ + 13 m $\Omega$ 32 $\mu\Omega/\Omega$ + 30 m $\Omega$ 32 $\mu\Omega/\Omega$ + 0.30 $\Omega$ 33 $\mu\Omega/\Omega$ + 0.30 $\Omega$ 37 $\mu\Omega/\Omega$ + 2.0 $\Omega$	Fluke 5520A, 4-wire
	(0.33 to 1.099 99) M $\Omega$ (1.1 to 3.299 00) M $\Omega$ (3.3 to 10.9999) M $\Omega$ (11 to 32.9999) M $\Omega$ (33 to 109.9999) M $\Omega$ (110 to 329.9999) M $\Omega$ (330 to 1100) M $\Omega$	37 $\mu\Omega/\Omega$ + 2.2 $\Omega$ 70 $\mu\Omega/\Omega$ + 39 $\Omega$ 0.016 % + 63 $\Omega$ 0.029 % + 2.5 k $\Omega$ 0.06 % + 3.0 k $\Omega$ 0.4 % + 0.10 M $\Omega$ 1.7 % + 0.50 M $\Omega$	Fluke 5520A, 2-wire
Resistance – Measure	(0 to 10) $\Omega$ (10 to 100) $\Omega$ 100 $\Omega$ to 100 k $\Omega$ 100 k $\Omega$ to 1 M $\Omega$ (1 to 10) M $\Omega$ (10 to 100) M $\Omega$ 100 M $\Omega$ to 1 G $\Omega$	19 $\mu\Omega/\Omega$ + 0.05 m $\Omega$ 15 $\mu\Omega/\Omega$ + 0.5 m $\Omega$ 13 $\mu\Omega/\Omega$ + 0.5 m $\Omega$ 18 $\mu\Omega/\Omega$ + 2 $\Omega$ 59 $\mu\Omega/\Omega$ + 100 $\Omega$ 0.058 % + 1 k $\Omega$ 1.8 % + 10 k $\Omega$	Agilent 3458A

Parameter/Equipment	Range	CMC <sup>2</sup> (±)	Comments
Electrical Calibration of Thermocouple Indicating Devices –			
Type B	(600 to 1820) °C	0.52 °C	Fluke 5520A
Type C	(0 to 2316) °C	0.98 °C	
Type E	(230 to 1000) °C	0.60 °C	
Type J	(-210 to 1200) °C	0.50 °C	
Type K	(-200 to 1372) °C	0.49 °C	
Type R	(0 to 1767) °C	0.69 °C	
Type S	(0 to 1767) °C	0.63 °C	
Type T	(-250 to 400) °C	0.74 °C	

Parameter/Range	Frequency	CMC <sup>2,3</sup> (±)	Comments
Capacitance – Generate			
(0.19 to 10.9999) nF	(10 to 1000) Hz	0.61 % + 0.01 nF	Fluke 5520A
(11 to 109.999) nF	(10 to 1000) Hz	0.31 % + 0.1 nF	
(110 to 329.999) nF	(10 to 1000) Hz	0.31 % + 0.3 nF	
(0.33 to 1.099 99) µF	(10 to 600) Hz	0.31 % + 1 nF	
(1.1 to 3.299 99) µF	(10 to 300) Hz	0.31 % + 3 nF	
(3.3 to 10.9999) µF	(10 to 150) Hz	0.31 % + 10 nF	
(11 to 32.9999) µF	(10 to 120) Hz	0.49 % + 30 nF	
(33 to 109.999) µF	(10 to 80) Hz	0.56 % + 100 nF	
(110 to 329.999) µF	(0 to 50) Hz	0.56 % + 300 nF	
330 µF to 10.999 mF	(0 to 2) Hz	0.56 % + 10 µF	
(11 to 32.9999) mF	(0 to 0.60) Hz	0.91 % + 30 µF	
(33 to 110) mF	(0 to 0.20) Hz	1.4 % + 100 µF	

Parameter/Equipment	Range	CMC <sup>2</sup> (±)	Comments
Electrical Calibration of RTD Indicators –			
Pt 385, 100 Ω	(-200 to 0) °C	0.042 °C	Fluke 5520A
	(> 0 to 100) °C	0.056 °C	
	(> 100 to 300) °C	0.072 °C	
	(> 300 to 400) °C	0.079 °C	
	(> 400 to 630) °C	0.094 °C	
	(> 630 to 800) °C	0.18 °C	

Parameter/Equipment	Range	CMC <sup>2</sup> (±)	Comments
Electrical Calibration of RTD Indicators – (cont)			
Pt 385, 100 Ω	(-200 to 0) °C (> 0 to 100) °C (> 100 to 300) °C (> 300 to 400) °C (> 400 to 630) °C (> 630 to 800) °C	0.042 °C 0.056 °C 0.072 °C 0.079 °C 0.094 °C 0.18 °C	Fluke 5520A
Pt 385, 200 Ω	(-200 to 0) °C (> 0 to 100) °C (> 100 to 260) °C (> 260 to 300) °C (> 300 to 400) °C (> 400 to 600) °C (> 600 to 630) °C	0.035 °C 0.034 °C 0.042 °C 0.094 °C 0.10 °C 0.11 °C 0.13 °C	
Pt 385, 500 Ω	(-200 to -80) °C (> -80 to 100) °C (> 100 to 260) °C (> 260 to 400) °C (> 400 to 600) °C (> 600 to 630) °C	0.035 °C 0.042 °C 0.049 °C 0.064 °C 0.071 °C 0.087 °C	
Pt 385, 1 kΩ	(-200 to -80) °C (> -80 to 0) °C (> 0 to 100) °C (> 100 to 260) °C (> 260 to 300) °C (> 300 to 600) °C (> 600 to 630) °C	0.028 °C 0.028 °C 0.034 °C 0.042 °C 0.049 °C 0.056 °C 0.18 °C	
PtNi 385, 120 Ω	(-80 to 100) °C (> 100 to 260) °C	0.064 °C 0.11 °C	

Parameter/Range	Frequency	CMC <sup>2,3</sup> (±)	Comments
AC Voltage – Generate  (1 to 33) mV	(10 to 45) Hz 45 Hz to 10 kHz (10 to 20) kHz	950 μV/V + 6 μV 190 μV/V + 6 μV 240 μV/V + 6 μV	Fluke 5520A

Parameter/Range	Frequency	CMC <sup>2,3</sup> ( $\pm$ )	Comments
AC Voltage – Generate (cont)			
(1 to 33) mV	(20 to 50) kHz (50 to 100) kHz (100 to 500) kHz	1.2 mV/V + 6 $\mu$ V 4 mV/V + 12 $\mu$ V 9.3 mV/V + 50 $\mu$ V	Fluke 5520A
(33 to 330) mV	(10 to 45) Hz 45 Hz to 10 kHz (10 to 20) kHz (20 to 50) kHz (50 to 100) kHz	350 $\mu$ V/V + 8 $\mu$ V 170 $\mu$ V/V + 8 $\mu$ V 190 $\mu$ V/V + 8 $\mu$ V 410 $\mu$ V/V + 8 $\mu$ V 930 $\mu$ V/V + 32 $\mu$ V	
330 mV to 3.3 V	(10 to 45) Hz 45 Hz to 10 kHz (10 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 500) kHz	350 $\mu$ V/V + 50 $\mu$ V 180 $\mu$ V/V + 60 $\mu$ V 220 $\mu$ V/V + 60 $\mu$ V 350 $\mu$ V/V + 50 $\mu$ V 810 $\mu$ V/V + 130 $\mu$ V 2.8 mV/V + 600 $\mu$ V	
(3.3 to 33) V	(10 to 45) Hz 45 Hz to 10 kHz (10 to 20) kHz (20 to 50) kHz (50 to 100) kHz	360 $\mu$ V/V + 650 $\mu$ V 200 $\mu$ V/V + 600 $\mu$ V 470 $\mu$ V/V + 600 $\mu$ V 420 $\mu$ V/V + 600 $\mu$ V 1 mV/V + 1.6 mV	
(33 to 330) V	45 Hz to 1 kHz (1 to 10) kHz (10 to 20) kHz (20 to 50) kHz (50 to 100) kHz	240 $\mu$ V/V + 2 mV 230 $\mu$ V/V + 6 mV 290 $\mu$ V/V + 6 mV 350 $\mu$ V/V + 6 mV 2.5 mV/V + 50 mV	
(330 to 1020) V	45 Hz to 10 kHz	8.2 mV/V + 10 mV	
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	0.03 % + 3 $\mu$ V 0.02 % + 2 $\mu$ V 0.03 % + 2 $\mu$ V 0.12 % + 2 $\mu$ V 0.58 % + 2 $\mu$ V 4.6 % + 2 $\mu$ V	Agilent 3458A, synchronous sub-sampled mode

Parameter/Range	Frequency	CMC <sup>2, 3</sup> ( $\pm$ )	Comments
AC Voltage – Measure (cont)			
10 mV 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 (1 to 2) MHz	80 $\mu$ V/V + 0.4 mV 80 $\mu$ V/V + 0.2 mV 0.02 % + 0.2 mV 0.03 % + 0.2 mV 0.09 % + 0.2 mV 0.35 % + 1 mV 1.2 % + 1 mV 1.7 % + 1 mV	Agilent 3458A, synchronous sub-sampled mode
(10 to 100) V	(1 to 40) Hz 40 Hz to 1 kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz 300 kHz to 1 MHz	0.02 % + 4 mV 0.02 % + 2 mV 0.04 % + 2 mV 0.14 % + 2 mV 0.46 % + 10 mV 1.7 % + 10 mV	
(100 to 1000) V	(1 to 40) Hz 40 Hz to 1 kHz (1 to 20) kHz	0.05 % + 40 mV 0.05 % + 20 mV 0.07 % + 20 mV	
AC Current – Measure			
Up to 100 $\mu$ A	(10 to 20) Hz (20 to 45) Hz 45 Hz to 1 kHz	0.46 % + 0.03 $\mu$ A 0.18 % + 0.03 $\mu$ A 0.078 % + 0.03 $\mu$ A	Agilent 3458A
100 $\mu$ A to 100 mA	(10 to 20) Hz (20 to 45) Hz (45 to 100) Hz 100 Hz to 5 kHz	0.46 % + 20 $\mu$ A 0.17 % + 20 $\mu$ A 0.073 % + 20 $\mu$ A 0.042 % + 20 $\mu$ A	
100 mA to 1 A	(10 to 20) Hz (20 to 45) Hz (45 to 100) Hz 100 Hz to 5 kHz	0.46 % + 200 $\mu$ A 0.19 % + 200 $\mu$ A 0.10 % + 200 $\mu$ A 0.12 % + 200 $\mu$ A	

Parameter/Range	Frequency	CMC <sup>2,3</sup> (±)	Comments
AC Current – Generate  (29 to 330) µA 330 µA to 3.3 mA (3.3 to 33) mA (33 mA to 330) mA 330 mA to 1.1 A (1.1 to 3) A (3 to 11) A  (11 to 20.5) A	40 Hz to 1 kHz	0.22 % + 0.1 µA 0.13 % + 0.15 µA 0.08 % + 2 µA 0.08 % + 20 µA 0.08 % + 100 µA 0.09 % + 100 µA 0.13 % + 2 mA	Fluke 5520A
(20.5 to 150) A (150 to 350) A (20.5 to 150) A (150 to 1000) A	(45 to 100) Hz 100 Hz to 1 kHz (1 to 5) kHz  (45 to 65) Hz (45 to 65) Hz (65 to 440) Hz (65 to 440) Hz	0.16 % + 5.1 mA 0.19 % + 5.1 mA 3.5 % + 5.1 mA  0.38 % + 0.029 A 1.0 % + 0.031 A 1.0 % + 0.031 A 1.0 % + 0.12 A	Fluke 5520A w/ coil

## II. Mechanical

Parameter/Equipment	Range	CMC <sup>2,4</sup> (±)	Comments
Vacuum – Measure	(1 to 30) in·Hg	0.000 52 in·Hg + 0.000 16 in·Hg /in·Hg	Pressurements T3550/3 DWT
Pressure – Measure  Pneumatic	(5 to 400) in·H <sub>2</sub> O	0.007 in·H <sub>2</sub> O + 0.000 16 in·H <sub>2</sub> O/in·H <sub>2</sub> O	Pressurements T3550/3 DWT
Hydraulic	(10 to 10 000) psig	0.17 psi + 0.000 16 psi/psi	Pressurements W2200-3-P DWT

### III. Thermodynamics

Parameter/Equipment	Range	CMC <sup>2, 4</sup> (±)	Comments
Temperature – Measure	(-197 to 660) °C	0.0032 °C + 0.000 027 °C/°C	2560 thermometer, 5699 PRT
	(> 660 to 1200) °C	2.2 °C + 0.0027 °C/°C	2560 thermometer, Type-B thermocouple
Temperature – Measuring Equipment	(-80 to 110) °C	0.0092 °C + 0.000 02 °C/°C	2560 thermometer, 5699, PRT, calibration baths
	(> 110 to 300) °C	0.024 °C + 0.000 051 °C/°C	
Relative Humidity – Measuring Equipment	(10 to 95) % RH	0.63 % RH	Thunder Scientific 2500S humidity generator

### IV. Time & Frequency

Parameter/Equipment	Range	CMC <sup>2, 4</sup> (±)	Comments
Frequency – Measuring Equipment	5 Hz to 10 MHz	25 parts in 10 <sup>6</sup> Hz	Fluke 5520A
Frequency – Measure	5 Hz to 10 MHz	25 parts in 10 <sup>7</sup> Hz	Agilent 53131A

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

<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 measurands stated are generated using the indicated instrument (see Comments). This capability is suitable for the calibration of the devices intended to measure the measurand in the ranges indicated. CMC's are expressed as either a specific value that covers the full range or as a fraction of the reading plus a fixed floor specification.



<sup>4</sup> 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.

<sup>5</sup> This scope meets A2LA's *P112 Flexible Scope Policy*.



# Accredited Laboratory

A2LA has accredited

## CONTROL AUTOMATION TECHNOLOGIES CORP

Winston-Salem, NC

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/NCSL 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 15<sup>th</sup> day of August 2022.

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

Vice President, Accreditation Services  
For the Accreditation Council  
Certificate Number 1486.01  
Valid to April 30, 2024

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