



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005
& ANSI/NCSL Z540-1-1994

THERMOTRON INDUSTRIES,
 A VENTUREDYNE, LTD., COMPANY
 291 Kollen Park Drive
 Holland, MI 49423
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CALIBRATION

Valid To: September 30, 2018

Certificate Number: 1917.01

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following calibrations¹:

I. Electrical – DC/Low Frequency

Parameter/Equipment	Range	CMC ^{2,4,5} (±)	Comments
DC Voltage – Generate ³	(0 to 200) mV 200 mV to 2 V (2 to 20) V	0.015 % + 0.58 mV 0.015 % + 0.63 mV 0.015 % + 3.8 mV	Transcat 23894E
DC Voltage – Measure ³	(0 to 10) V	35 µV/V + 3.5 mV	Agilent 34401A
DC Current – Generate ³	(0 to 24) mA	0.015 % + 9.7 µA	Transcat 23894E
DC Current – Measure ³	(0 to 100) mA 100 mA to 1 A	0.1 % + 0.58 mA 0.1 % + 0.63 mA	Agilent 34401A
Electrical Simulation of Thermocouple Indicating Systems ³ –			
Type T	(-200 to -47) °C (-47 to 399) °C	0.68 °C 0.4 °C	Omega CL-27 or Transcat 23700T
Type J	(-210 to -47) °C (-47 to 760) °C	0.68 °C 0.4 °C	
Type K	(-200 to -46) °C (-46 to 1372) °C	0.68 °C 0.4 °C	

Parameter/Equipment	Range	CMC ² (±)	Comments
Electrical Simulation of RTD Indicating Systems ³ –			
100 Ω	(-200 to 800) °C	0.4 °C	Fluke 712 or Omega CL-27
1000 Ω	(-200 to 630) °C	0.4 °C	

Parameter/Range	Frequency	CMC ^{2,4,5} (±)	Comments
Thermotron PTS Only AC Voltage – Measure ³			
(0 to 1) V	10 Hz to 20 kHz	0.06 % + 4.9 mV	Agilent 34401A
(1 to 10) V	10 Hz to 20 kHz	0.06 % + 3.5 mV	
AC Voltage – Measure ³			
(0 to 3) V	(20 to 50) Hz 50 Hz to 10 kHz (10 to 20) kHz (20 to 50) kHz	1 % + 7.6 mV 0.2 % + 1.9 mV 0.5 % + 4.0 mV 2 % + 18 mV	Fluke 45
(3 to 30) V	(20 to 50) Hz 50 Hz to 10 kHz (10 to 20) kHz (20 to 50) kHz	1 % + 76 mV 0.2 % + 19 mV 0.5 % + 40 mV 2.4 % + 160 mV	

II. Thermodynamics

Parameter/Equipment	Range	CMC ² (±)	Comments
Temperature – Measure ³	(-80 to -46) °C (-46 to 260) °C	0.75 °C 0.52 °C	Omega CL-27 or Transcat 23700T with type T thermocouple

Parameter/Equipment	Range	CMC ² (±)	Comments
Relative Humidity – Measuring Equipment ³	11.3 % RH 33.1 % RH 75.5 % RH 97.6 % RH	1.4 % RH 1.3 % RH 1.6 % RH 2.1 % RH	Vaisala HMK-15 with: LiCl MgCl ₂ NaCl K ₂ SO ₄
Relative Humidity – Measure ³	(10 to 90) % RH (90 to 95) % RH	1.8 % RH 2.9 % RH	Vaisala HM -70 with HMP-77 humidity probe

III. Time & Frequency

Parameter/Equipment	Range	CMC ^{2,4} (±)	Comments
Frequency – Measure ³	(40 to 100) Hz 100 Hz to 100 kHz	0.01 % + 0.066 Hz 0.01 % + 35 Hz	Agilent 34401A

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 and this laboratory meets A2LA R104 – *General Requirements: Accreditation of Field Testing and Field Calibration Laboratories* for these calibrations. 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 In the statement of CMC, a percent represents a % of reading unless otherwise noted.

⁵ 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.



Accredited Laboratory

A2LA has accredited

THERMOTRON INDUSTRIES, A VENTUREDYNE, LTD., COMPANY

Holland, MI

for technical competence in the field of

Calibration

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005 *General requirements for the competence of testing and calibration laboratories*. This laboratory also meets the requirements of ANSI/NCSLI Z540-1-1994 and any additional program requirements in the field of calibration. 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 8 January 2009).

Presented this 30th day of June 2016.



A handwritten signature in blue ink, appearing to read "J. C. Bunt".

Senior Director of Quality and Communications
For the Accreditation Council
Certificate Number 1917.01
Valid to September 30, 2018

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