CERTIFICATE OF CALIBRATION

ISSUED BY AVON-DYNAMIC CALIBRATION

Date of Issue 15 February 2024

Certificate Number K846762



0199



For: SIGNATROL LTD UNIT E2 GREEN LANE BUSINESS PARK TEWKESBURY GL20 8SJ Approved Signatory Mr. M. Hyde

CALIBRATE MEASURE INNOVATE

Manufacturer: AOIP Date of Receipt: 05/02/2024

Model Number: TC6622 Specification: Manufacturer

<u>Inventory Number:</u> CE1142 <u>Calibrated by:</u> ZHUSSAIN

Serial Number: 2002Z A 36 0145 A Next Calibration Due: 15 February 2025

<u>Description:</u> TEMPERATURE CALIBRATOR

Page 1 of 3

Report: This instrument has been calibrated to the stated specification, unless otherwise stated. The

recorded measurements were correct when taken within the conditions stated. The calibration

was carried out using standards which are subject to regular periodic verification and are

traceable to National Standards.

<u>Laboratory Conditions</u> Temperature: 20.0 ± 3°C

Humidity: 50%rh $\pm 20\%$ rh

Comment :- Calibrations marked ## (Not UKAS Accredited) in this Certificate have been included for

completeness.

<u>Calibration Code A</u> All prime parameters were found to be within the stated specification with no adjustment

necessary.

Compliance Statement:

Conformity / Non-Conformity statements are based on simple acceptance rule (ILAC-G8:09/2019)

where, Acceptance Limit (AL) equals Tolerance Limit (TL). Provided that the Tolerance

Uncertainty Ratio (TUR) 1:1.

Date of Calibration: 15 February 2024

The results stated on this certificate relate only to the equipment calibrated.

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k = 2, providing a coverage probability of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

This certificate is issued in accordance with the laboratory accreditation requirements of the United Kingdom Accreditation Service. It provides traceability of measurement to the SI system of units and/or to units of measurement realised at the National Physical Laboratory or other recognised national metrology institutes. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory.

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UKAS ACCREDITED CALIBRATION LABORATORY No 0199

REPORT

The unit under test was allowed to stabilise for 24 hours in the laboratory environment prior to testing. Results: As received. No adjustments were necessary.

RTD Source:	4 Wire connection				
Range	Set Temperature	Measured Resistance	Calculated Temperature	Specification	Uncertainty of Measurement
PT100	-200.00 °C	18.522 Ω	-199.99 °C	± 0.104 °C	± 0.050 °C
	-150.00 °C	39.726 Ω	-149.99 °C	± 0.098 °C	± 0.050 °C
	-100.00 °C	60.258 Ω	-99.99 °C	± 0.092 °C	± 0.050 °C
	-70.00 °C	72.336 Ω	-69.99 °C	± 0.088 °C	± 0.050 °C
	-40.00 °C	84.271 Ω	-39.99 °C	± 0.085 °C	± 0.050 °C
	-25.00 °C	90.190 Ω	-25.01 °C	± 0.083 °C	± 0.050 °C
	0.00 °C	100.000 Ω	0.00 °C	± 0.080 °C	± 0.050 °C
	4.00 °C	101.559 Ω	3.99 °C	± 0.080 °C	± 0.050 °C
	25.00 °C	109.735 Ω	25.00 °C	± 0.083 °C	± 0.050 °C
	50.00 °C	119.401 Ω	50.01 °C	± 0.086 °C	± 0.050 °C
	100.00 °C	138.507 Ω	100.00 °C	± 0.092 °C	± 0.050 °C
	121.10 °C	146.485 Ω	121.11 °C	± 0.095 °C	± 0.050 °C
	134.00 °C	151.335 Ω	134.00 °C	± 0.096 °C	± 0.050 °C
	150.00 °C	157.324 Ω	150.00 °C	± 0.098 °C	± 0.050 °C
	200.00 °C	175.855 Ω	200.00 °C	± 0.104 °C	± 0.050 °C
	250.00 °C	194.094 Ω	249.99 °C	± 0.110 °C	± 0.050 °C
	300.00 °C	212.058 Ω	300.01 °C	± 0.116 °C	± 0.050 °C
	400.00 °C	247.087 Ω	399.99 °C	± 0.128 °C	± 0.050 °C
<u>Range</u>	Set Temperature	Measured Resistance	Calculated Temperature	<u>Specification</u>	Uncertainty of Measurement
PT1000	-200.00 °C	185.221 Ω	-200.00 °C	± 0.144 °C	± 0.0043 Ω
	-150.00 °C	397.238 Ω	-150.00 °C	± 0.138 °C	± 0.00016 kΩ
	-100.00 °C	602.538 Ω	-100.01 °C	± 0.132 °C	± 0.00019 kΩ
	-70.00 °C	723.335 Ω	-70.00 °C	± 0.128 °C	± 0.00021 kΩ
	-40.00 °C	842.693 Ω	-40.00 °C	± 0.125 °C	± 0.00023 kΩ
	-25.00 °C	901.913 Ω	-25.00 °C	± 0.123 °C	± 0.00023 kΩ
	0.00 °C	1000.043 Ω	0.01 °C	± 0.120 °C	± 0.00025 kΩ
	4.00 °C	1015.621 Ω	4.00 °C	± 0.120 °C	± 0.00031 kΩ
	25.00 °C	1097.337 Ω	24.99 °C	± 0.123 °C	± 0.00032 kΩ
	50.00 °C	1193.962 Ω	50.00 °C	± 0.126 °C	± 0.00033 kΩ
	100.00 °C	1385.045 Ω	100.00 °C	± 0.132 °C	± 0.00036 kΩ
	121.10 °C	1464.841 Ω	121.10 °C	± 0.135 °C	± 0.00037 kΩ
	134.00 °C	1513.342 Ω	134.00 °C	± 0.136 °C	± 0.00038 kΩ
	150.00 °C	1573.253 Ω	150.00 °C	± 0.138 °C	± 0.00038 kΩ
	200.00 °C	1758.541 Ω	199.99 °C	± 0.144 °C	± 0.00041 kΩ
	250.00 °C	1940.980 Ω	250.00 °C	± 0.150 °C	± 0.00044 kΩ
	300.00 °C	2120.528 Ω	300.00 °C	± 0.156 °C	± 0.00046 kΩ
	400.00 °C	2470.934 Ω	400.00 °C	± 0.168 °C	± 0.00051 kΩ

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor $\kappa = 2$, providing a coverage probability of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

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Certificate Number K846762 Page 3 of 3

UKAS ACCREDITED CALIBRATION LABORATORY No 0199

RTD Measurement: 4 Wire connection							
<u>Range</u>	Set Temperature	Applied Resistance	Calculated Temperature	Specification	Uncertainty of Measurement		
PT100	-200.00 °C	18.521 Ω	-200.01 °C	± 0.074 °C	± 0.080 °C		
	-150.00 °C	39.723 Ω	-150.01 °C	± 0.068 °C	± 0.080 °C		
	-100.00 °C	60.256 Ω	-100.01 °C	± 0.062 °C	± 0.080 °C		
	-70.00 °C	72.335 Ω	-70.01 °C	± 0.058 °C	± 0.080 °C		
	-40.00 °C	84.271 Ω	-40.01 °C	± 0.055 °C	± 0.080 °C		
	-25.00 °C	90.192 Ω	-25.01 °C	± 0.053 °C	± 0.080 °C		
	0.00 °C	100.000 Ω	-0.01 °C	± 0.050 °C	± 0.080 °C		
	4.00 °C	101.562 Ω	3.99 °C	± 0.050 °C	± 0.080 °C		
	25.00 °C	109.734 Ω	24.99 °C	± 0.053 °C	± 0.080 °C		
	50.00 °C	119.398 Ω	49.99 °C	± 0.056 °C	± 0.080 °C		
	100.00 °C	138.506 Ω	99.99 °C	± 0.062 °C	± 0.080 °C		
	121.10 °C	146.483 Ω	121.09 °C	± 0.065 °C	± 0.080 °C		
	134.00 °C	151.334 Ω	134.00 °C	± 0.066 °C	± 0.080 °C		
	150.00 °C	157.325 Ω	150.00 °C	± 0.068 °C	± 0.080 °C		
	200.00 °C	175.856 Ω	200.00 °C	± 0.074 °C	± 0.080 °C		
	250.00 °C	194.098 Ω	250.00 °C	± 0.080 °C	± 0.080 °C		
	300.00 °C	212.052 Ω	300.00 °C	± 0.086 °C	± 0.080 °C		
	400.00 °C	247.095 Ω	400.00 °C	± 0.098 °C	± 0.080 °C		
_	- · - ·	A lil D i - t	Displayed Tapanapatura	Charification	Uncertainty of Massurement		
<u>Range</u>	Set Temperature	Applied Resistance	Displayed Temperature	<u>Specification</u>	Uncertainty of Measurement		
<u>Range</u> PT1000	<u>Set Temperature</u> -200.00 °C	Applied Resistance 185.200Ω	-200.00 °C	± 0.074 °C	± 0.0043 Ω		
	-200.00 °C -150.00 °C -100.00 °C	185.200 Ω	-200.00 °C -150.00 °C -100.00 °C	± 0.074 °C ± 0.068 °C ± 0.062 °C	± 0.0043 Ω		
	-200.00 °C -150.00 °C -100.00 °C -70.00 °C	185.200 Ω 0.39723 kΩ	-200.00 °C -150.00 °C -100.00 °C -70.00 °C	± 0.074 °C ± 0.068 °C ± 0.062 °C ± 0.058 °C	± 0.0043 Ω ± 0.00016 kΩ		
	-200.00 °C -150.00 °C -100.00 °C	185.200 Ω 0.39723 kΩ 0.60256 Ω	-200.00 °C -150.00 °C -100.00 °C	± 0.074 °C ± 0.068 °C ± 0.062 °C	± 0.0043 Ω ± 0.00016 kΩ ± 0.00019 kΩ		
	-200.00 °C -150.00 °C -100.00 °C -70.00 °C	185.200 Ω 0.39723 kΩ 0.60256 Ω 0.72335 Ω	-200.00 °C -150.00 °C -100.00 °C -70.00 °C	± 0.074 °C ± 0.068 °C ± 0.062 °C ± 0.058 °C	± 0.0043 Ω ± 0.00016 kΩ ± 0.00019 kΩ ± 0.00021 kΩ		
	-200.00 °C -150.00 °C -100.00 °C -70.00 °C -40.00 °C -25.00 °C 0.00 °C	185.200 Ω 0.39723 kΩ 0.60256 Ω 0.72335 Ω 0.84271 Ω 0.90192 Ω 1.00000 Ω	-200.00 °C -150.00 °C -100.00 °C -70.00 °C -40.00 °C -24.99 °C 0.00 °C	± 0.074 °C ± 0.068 °C ± 0.062 °C ± 0.058 °C ± 0.055 °C ± 0.053 °C ± 0.050 °C	\pm 0.0043 Ω \pm 0.00016 kΩ \pm 0.00019 kΩ \pm 0.00021 kΩ \pm 0.00023 kΩ \pm 0.00025 kΩ		
	-200.00 °C -150.00 °C -100.00 °C -70.00 °C -40.00 °C -25.00 °C 0.00 °C 4.00 °C	185.200 Ω 0.39723 kΩ 0.60256 Ω 0.72335 Ω 0.84271 Ω 0.90192 Ω 1.00000 Ω 1.01562 Ω	-200.00 °C -150.00 °C -100.00 °C -70.00 °C -40.00 °C -24.99 °C 0.00 °C 4.00 °C	± 0.074 °C ± 0.068 °C ± 0.062 °C ± 0.058 °C ± 0.055 °C ± 0.053 °C ± 0.050 °C	\pm 0.0043 Ω \pm 0.00016 kΩ \pm 0.00019 kΩ \pm 0.00021 kΩ \pm 0.00023 kΩ \pm 0.00023 kΩ \pm 0.00025 kΩ \pm 0.00031 kΩ		
	-200.00 °C -150.00 °C -100.00 °C -70.00 °C -40.00 °C -25.00 °C 0.00 °C 4.00 °C 25.00 °C	185.200 Ω 0.39723 kΩ 0.60256 Ω 0.72335 Ω 0.84271 Ω 0.90192 Ω 1.00000 Ω	-200.00 °C -150.00 °C -100.00 °C -70.00 °C -40.00 °C -24.99 °C 0.00 °C 4.00 °C 25.00 °C	± 0.074 °C ± 0.068 °C ± 0.062 °C ± 0.055 °C ± 0.053 °C ± 0.050 °C ± 0.053 °C ± 0.053 °C	\pm 0.0043 Ω \pm 0.00016 kΩ \pm 0.00019 kΩ \pm 0.00021 kΩ \pm 0.00023 kΩ \pm 0.00025 kΩ		
	-200.00 °C -150.00 °C -100.00 °C -70.00 °C -40.00 °C -25.00 °C 4.00 °C 25.00 °C 50.00 °C	185.200 Ω 0.39723 kΩ 0.60256 Ω 0.72335 Ω 0.84271 Ω 0.90192 Ω 1.00000 Ω 1.01562 Ω	-200.00 °C -150.00 °C -100.00 °C -70.00 °C -40.00 °C -24.99 °C 0.00 °C 4.00 °C 25.00 °C 50.00 °C	± 0.074 °C ± 0.068 °C ± 0.062 °C ± 0.055 °C ± 0.053 °C ± 0.050 °C ± 0.053 °C ± 0.056 °C	\pm 0.0043 Ω \pm 0.00016 kΩ \pm 0.00019 kΩ \pm 0.00021 kΩ \pm 0.00023 kΩ \pm 0.00023 kΩ \pm 0.00025 kΩ \pm 0.00031 kΩ		
	-200.00 °C -150.00 °C -100.00 °C -70.00 °C -40.00 °C -25.00 °C 4.00 °C 25.00 °C 50.00 °C	185.200 Ω 0.39723 kΩ 0.60256 Ω 0.72335 Ω 0.84271 Ω 0.90192 Ω 1.00000 Ω 1.01562 Ω 1.09735 Ω	-200.00 °C -150.00 °C -100.00 °C -70.00 °C -40.00 °C -24.99 °C 0.00 °C 4.00 °C 25.00 °C 50.00 °C	± 0.074 °C ± 0.068 °C ± 0.062 °C ± 0.055 °C ± 0.053 °C ± 0.050 °C ± 0.053 °C ± 0.053 °C	\pm 0.0043 Ω \pm 0.00016 kΩ \pm 0.00019 kΩ \pm 0.00021 kΩ \pm 0.00023 kΩ \pm 0.00025 kΩ \pm 0.00031 kΩ \pm 0.00032 kΩ		
	-200.00 °C -150.00 °C -100.00 °C -70.00 °C -40.00 °C -25.00 °C 4.00 °C 25.00 °C 50.00 °C	185.200 Ω 0.39723 kΩ 0.60256 Ω 0.72335 Ω 0.84271 Ω 0.90192 Ω 1.00000 Ω 1.01562 Ω 1.09735 Ω 1.19397 Ω	-200.00 °C -150.00 °C -100.00 °C -70.00 °C -40.00 °C -24.99 °C 0.00 °C 4.00 °C 25.00 °C 50.00 °C	± 0.074 °C ± 0.068 °C ± 0.062 °C ± 0.055 °C ± 0.053 °C ± 0.050 °C ± 0.053 °C ± 0.056 °C	$\begin{array}{c} \pm 0.0043 \Omega \\ \pm 0.00016 k\Omega \\ \pm 0.00019 k\Omega \\ \pm 0.00021 k\Omega \\ \pm 0.00023 k\Omega \\ \pm 0.00023 k\Omega \\ \pm 0.00025 k\Omega \\ \pm 0.00031 k\Omega \\ \pm 0.00032 k\Omega \\ \pm 0.00033 k\Omega \\ \end{array}$		
	-200.00 °C -150.00 °C -100.00 °C -70.00 °C -40.00 °C -25.00 °C 4.00 °C 25.00 °C 50.00 °C 100.00 °C 121.10 °C 134.00 °C	185.200 Ω 0.39723 kΩ 0.60256 Ω 0.72335 Ω 0.84271 Ω 0.90192 Ω 1.00000 Ω 1.01562 Ω 1.09735 Ω 1.19397 Ω 1.38506 Ω 1.46483 Ω 1.51334 Ω	-200.00 °C -150.00 °C -100.00 °C -70.00 °C -40.00 °C -24.99 °C 0.00 °C 4.00 °C 25.00 °C 50.00 °C 100.01 °C 121.11 °C 134.01 °C	± 0.074 °C ± 0.068 °C ± 0.062 °C ± 0.055 °C ± 0.053 °C ± 0.050 °C ± 0.053 °C ± 0.056 °C ± 0.062 °C ± 0.066 °C	± 0.0043 Ω ± 0.00016 kΩ ± 0.00019 kΩ ± 0.00021 kΩ ± 0.00023 kΩ ± 0.00025 kΩ ± 0.00031 kΩ ± 0.00032 kΩ ± 0.00032 kΩ ± 0.00033 kΩ ± 0.00033 kΩ ± 0.00036 kΩ ± 0.00037 kΩ ± 0.00038 kΩ		
	-200.00 °C -150.00 °C -100.00 °C -70.00 °C -40.00 °C -25.00 °C 4.00 °C 4.00 °C 25.00 °C 50.00 °C 100.00 °C 121.10 °C 134.00 °C	185.200 Ω 0.39723 kΩ 0.60256 Ω 0.72335 Ω 0.84271 Ω 0.90192 Ω 1.00000 Ω 1.01562 Ω 1.09735 Ω 1.19397 Ω 1.38506 Ω 1.46483 Ω 1.51334 Ω 1.57325 Ω	-200.00 °C -150.00 °C -100.00 °C -70.00 °C -40.00 °C -24.99 °C 0.00 °C 4.00 °C 25.00 °C 50.00 °C 100.01 °C 121.11 °C 134.01 °C	± 0.074 °C ± 0.068 °C ± 0.062 °C ± 0.055 °C ± 0.053 °C ± 0.050 °C ± 0.050 °C ± 0.056 °C ± 0.062 °C ± 0.066 °C ± 0.068 °C	$\begin{array}{c} \pm \ 0.0043 \ \Omega \\ \pm \ 0.00016 \ k\Omega \\ \pm \ 0.00019 \ k\Omega \\ \pm \ 0.00021 \ k\Omega \\ \pm \ 0.00023 \ k\Omega \\ \pm \ 0.00025 \ k\Omega \\ \pm \ 0.00025 \ k\Omega \\ \pm \ 0.00031 \ k\Omega \\ \pm \ 0.00032 \ k\Omega \\ \pm \ 0.00038 \ k\Omega \end{array}$		
	-200.00 °C -150.00 °C -100.00 °C -70.00 °C -40.00 °C -25.00 °C 4.00 °C 25.00 °C 50.00 °C 100.00 °C 121.10 °C 134.00 °C 150.00 °C 250.00 °C	185.200 Ω 0.39723 kΩ 0.60256 Ω 0.72335 Ω 0.84271 Ω 0.90192 Ω 1.00000 Ω 1.01562 Ω 1.09735 Ω 1.19397 Ω 1.38506 Ω 1.46483 Ω 1.51334 Ω 1.57325 Ω 1.75856 kΩ	-200.00 °C -150.00 °C -100.00 °C -70.00 °C -40.00 °C -24.99 °C 0.00 °C 4.00 °C 25.00 °C 50.00 °C 100.01 °C 121.11 °C 134.01 °C 150.01 °C 200.01 °C	± 0.074 °C ± 0.068 °C ± 0.062 °C ± 0.055 °C ± 0.055 °C ± 0.050 °C ± 0.050 °C ± 0.053 °C ± 0.056 °C ± 0.065 °C ± 0.066 °C ± 0.068 °C ± 0.074 °C	$\begin{array}{c} \pm 0.0043 \Omega \\ \pm 0.00016 k\Omega \\ \pm 0.00019 k\Omega \\ \pm 0.00021 k\Omega \\ \pm 0.00023 k\Omega \\ \pm 0.00023 k\Omega \\ \pm 0.00025 k\Omega \\ \pm 0.00031 k\Omega \\ \pm 0.00032 k\Omega \\ \pm 0.00032 k\Omega \\ \pm 0.00038 k\Omega \\ \pm 0.00037 k\Omega \\ \pm 0.00038 k\Omega \\ \pm 0.000341 k\Omega \end{array}$		
	-200.00 °C -150.00 °C -100.00 °C -70.00 °C -40.00 °C -25.00 °C 4.00 °C 25.00 °C 50.00 °C 100.00 °C 121.10 °C 134.00 °C 150.00 °C 250.00 °C 250.00 °C	185.200 Ω 0.39723 kΩ 0.60256 Ω 0.72335 Ω 0.84271 Ω 0.90192 Ω 1.00000 Ω 1.01562 Ω 1.09735 Ω 1.19397 Ω 1.38506 Ω 1.46483 Ω 1.51334 Ω 1.57325 Ω 1.75856 kΩ 1.94098 kΩ	-200.00 °C -150.00 °C -100.00 °C -70.00 °C -40.00 °C -24.99 °C 0.00 °C 4.00 °C 25.00 °C 50.00 °C 100.01 °C 121.11 °C 134.01 °C 150.01 °C 250.01 °C 250.01 °C	± 0.074 °C ± 0.068 °C ± 0.062 °C ± 0.055 °C ± 0.055 °C ± 0.050 °C ± 0.050 °C ± 0.056 °C ± 0.066 °C ± 0.066 °C ± 0.068 °C ± 0.074 °C ± 0.080 °C	± 0.0043 Ω ± 0.00016 kΩ ± 0.00019 kΩ ± 0.00023 kΩ ± 0.00023 kΩ ± 0.00025 kΩ ± 0.00031 kΩ ± 0.00032 kΩ ± 0.00032 kΩ ± 0.00038 kΩ ± 0.00038 kΩ ± 0.00038 kΩ ± 0.00038 kΩ ± 0.00038 kΩ ± 0.00038 kΩ ± 0.00041 kΩ ± 0.00044 kΩ		
	-200.00 °C -150.00 °C -100.00 °C -70.00 °C -40.00 °C -25.00 °C 4.00 °C 25.00 °C 50.00 °C 100.00 °C 121.10 °C 134.00 °C 150.00 °C 250.00 °C	185.200 Ω 0.39723 kΩ 0.60256 Ω 0.72335 Ω 0.84271 Ω 0.90192 Ω 1.00000 Ω 1.01562 Ω 1.09735 Ω 1.19397 Ω 1.38506 Ω 1.46483 Ω 1.51334 Ω 1.57325 Ω 1.75856 kΩ	-200.00 °C -150.00 °C -100.00 °C -70.00 °C -40.00 °C -24.99 °C 0.00 °C 4.00 °C 25.00 °C 50.00 °C 100.01 °C 121.11 °C 134.01 °C 150.01 °C 200.01 °C	± 0.074 °C ± 0.068 °C ± 0.062 °C ± 0.055 °C ± 0.055 °C ± 0.050 °C ± 0.050 °C ± 0.053 °C ± 0.056 °C ± 0.065 °C ± 0.066 °C ± 0.068 °C ± 0.074 °C	± 0.0043 Ω ± 0.00016 kΩ ± 0.00019 kΩ ± 0.00021 kΩ ± 0.00023 kΩ ± 0.00025 kΩ ± 0.00031 kΩ ± 0.00032 kΩ ± 0.00032 kΩ ± 0.00038 kΩ ± 0.00037 kΩ ± 0.00038 kΩ ± 0.00038 kΩ ± 0.00038 kΩ ± 0.00038 kΩ ± 0.00038 kΩ		

Standard Used ADC2830 ADC2473

Procedure Reference: CLI055 & CLI131.

-End of Report-

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor $\kappa = 2$, providing a coverage probability of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

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