



|                     |                     |                      |                                   |
|---------------------|---------------------|----------------------|-----------------------------------|
| ULR Number          | CC2428240000140740F | Certificate Number   | RPL-CF-2024-THER-CSRF-1195-C-2370 |
| Date of Calibration | 10.12.2024          | Recommended due date | 10.03.2025                        |

## Thermal - Temperature

## Calibration Certificate

## For

## TUS Sensor (N-Type Thermocouple)

Laboratory certifies that the equipment has been calibrated in accordance with a quality system registered to ISO 9001:2015 and confirms to ISO/IEC 17025:2017 and laboratory applicable procedures.

The measurement expanded uncertainty is expressed at 95% confidence level with a coverage factor equal to two ( $k=2$ ).

Laboratory measurement standards are traceable through unbroken chain of comparison to National and / or to International Standards.

Calibration of all equipment, meters used are traceable to National Standards / International Standards and their calibration are current.

This calibration report contains the results of calibration and / or other relevant data about the calibration.

This report applies only to the item identified and shall not be reproduced except in full, without specific written approval from the Laboratory.

No statement of compliance with specifications is made or implied on this report. However, the results are reviewed to establish where any measurement results exceed the manufacturers specification and communicate results by means of this report.



Lab QR Code



Certificate QR Code

| Calibration Procedure                 | As Received Conditions | As Shipped Condition |
|---------------------------------------|------------------------|----------------------|
| Comparison Method /RPL-L03-DI-025-002 | Satisfactory           | Cleaned & Calibrated |

| Calibrated By  | Reviewed & Approved By   Authorized Signatory |                |                     |
|----------------|-----------------------------------------------|----------------|---------------------|
| Identification | RPL-TM-02                                     | Identification | Jayasree Manikandan |





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|                                    |            |                      |            |
|------------------------------------|------------|----------------------|------------|
| Date of Performance of Calibration | 10.12.2024 | Date of Issue        | 13.12.2024 |
|                                    |            | Recommended Due Date | 10.03.2025 |

|                                         |                                                                                                                  |                        |                   |
|-----------------------------------------|------------------------------------------------------------------------------------------------------------------|------------------------|-------------------|
| Name & Contact information of Customer: | Bay - Forge Private Limited,<br>Vedanthangal Road, Palayanoor PO,<br>Maduranthakam Taluk, Kanchipuram - 603 308. | Date of Receipt        | 09.12.2024        |
|                                         |                                                                                                                  | CSRF Number            | RPL/SRF/2024/1195 |
|                                         |                                                                                                                  | Location-Calibrated at | In House          |

## Description of the Unit Under Calibration (UUC)

|             |                                  |                   |                                                    |
|-------------|----------------------------------|-------------------|----------------------------------------------------|
| Description | TUS Sensor (N-Type Thermocouple) | Model             | --                                                 |
| Range       | 102 to 540 °C                    | Serial No         | RV3B301                                            |
| Least Count | --                               | Identification No | TT-143                                             |
| Make        | EBRAM Srl                        | Accuracy          | ±1.1°C (or) ±0.4% of Reading, whichever is greater |
| Location    | --                               | Operating Range   | 102 to 540 °C                                      |
| Material    | Ni.Cr / Ni Al                    |                   |                                                    |

|                                                |                                       |
|------------------------------------------------|---------------------------------------|
| Condition of unit under calibration on receipt | Satisfactory                          |
| Method used - Reva Phoenix Document Number     | Comparison Method /RPL-L03-DI-025-002 |
| Reference Standard (International / National)  | EURAMET cg-8 / V-3.0, AMS2750H        |

|                       |                   |       |      |     |      |            |         |
|-----------------------|-------------------|-------|------|-----|------|------------|---------|
| Environmental Details | Temperature       | Start | 25.3 | End | 25.3 | Difference | 0.2 °C  |
|                       | Relative Humidity |       | 58.4 |     | 58.2 |            | 0.2 %RH |

## Details of Traceability - Master Equipment / Standard used for Calibration

| Sl. No. | Description Master Equipment / Standard used for calibration | Metrological Traceability to National / International Standards |
|---------|--------------------------------------------------------------|-----------------------------------------------------------------|
| 1       | Digital Thermometer                                          | TSC/23-24/19796-1 Valid till 06.03.2025                         |
| 2       | SSPRT with Precision Multimeter                              | TSC/23-24/19796-2 Valid till 06.03.2025                         |

|                |           |                                               |                     |
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Discipline : Thermal - Temperature

## Calibration Results (As Found)

| Sr.No. | Nominal Temperature | True Value (Master) | Observed Value (UUC) |                  | Error / Deviation | Error Allowed (±) | Expanded Uncertainty (±) |  |
|--------|---------------------|---------------------|----------------------|------------------|-------------------|-------------------|--------------------------|--|
|        |                     |                     | Readings in (mV)     | Readings in (°C) |                   |                   |                          |  |
|        | °C                  | °C                  | mV                   | °C               | °C                | °C                | °C                       |  |
| 1      | 102.00              | 102.016             | 2.829                | 101.86           | -0.156            | 1.10              | 0.070                    |  |
| 2      | 200.00              | 199.978             | 5.905                | 199.76           | -0.218            | 1.10              | 0.070                    |  |
| 3      | 300.00              | 299.964             | 9.330                | 299.69           | -0.274            | 1.20              | 0.070                    |  |
| 4      | 400.00              | 400.017             | 12.961               | 399.64           | -0.377            | 1.60              | 0.070                    |  |
| 5      | 500.00              | 500.033             | 16.725               | 499.39           | -0.643            | 2.00              | 0.100                    |  |
| 6      | 540.00              | 540.051             | 18.258               | 539.27           | -0.781            | 2.16              | 0.100                    |  |

## Remarks :

1. UUC is defined as Unit Under Calibration
2. Temperature Scale : International Temperature Scale 1990 (ITS-90)
3. Any limitations or restrictions of calibration : Nil
4. The results are provided as observed without any adjustments
5. The above calibration readings were taken as per customer requirement
6. Sensor calibration pass or fail statement : PASS
7. mV to °C Conversion or Vice Versa is in compliance to ASTM E230
8. Uncertainty of Measurement (at 95.45% confidence level with coverage factor k=2)
9. Type of Calibration : Re-calibration

## Digital Signature of Laboratory:

REVA PHOENIX LABS AND CONSULTANTS  
PRIVATE LIMITED

Date: 07/01/2025 17:33:46 +05:30

Reason: Calibration Certificate

Location: Chennai

|                |           |                                               |                     |      |
|----------------|-----------|-----------------------------------------------|---------------------|------|
| Calibrated By  |           | Reviewed & Approved By   Authorized Signatory |                     | m.21 |
| Identification | RPL-TM-02 | Identification                                | Jayasree Manikandan |      |





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**Mandatory Annexure to Calibration Certificate**

- Calibration Certificate includes all the information as agreed with Customer and as necessary for the interpretation of the results and all information required by the method used, including, additions to deviations, or exclusions.
- All issued reports are retained as technical records by our Laboratory as per ISO/IEC 17025: 2017 requirements.
- Metrological traceability to National | International Standards as per ISO/IEC 17025: 2017 requirements is and Calibration reports do not contain any recommendation on Calibration interval, except where agreed.
- Laboratory is responsible for all the information provided in the report, except when information is provided by the customer. Data provided, where applicable, is clearly identified, as they can affect the validity of results.
- Measurement Uncertainty reported is at approximately 95% confidence level with  $k=2$ ; Unit of measurement result and measurement uncertainty are same as that of range selected, unless otherwise indicated in certificate.
- Calibration Certificate is issued in accordance with the terms and conditions laid down by NABL which has assessed our measurement capability and its traceability to recognized National | International standards.
- Metrological traceability of Masters to National / International Standard is established by unbroken chain of calibration.
- Calibration Certificate pertains only to the particular item(s) submitted and reported for calibration and shall not be reproduced except in full, without the written approval from our Laboratory.
- Results reported in Calibration Certificate are valid at the time of and stated conditions of measurement of UUC.
- Error(s), if any, in the Calibration Certificate, shall be brought to the notice of Laboratory within 30 days from the date of issue. Amendments to Certificate will not be entertained thereafter.
- Calibration Certificate is issued based on Customer requirements for Scientific and Industrial purposes and not meant for other purpose and shall not be produced in the court of law.
- Legal Aspects: Calibration of Weights, Density of solids, Load cell, UTM, Pressure Dead Weight Tester, Pressure Gauge. Liquid-in-glass Thermometer done by our Laboratory is meant for scientific and industrial purpose only. However, if used for commercial trading, additional recognition/ approval shall be complied as required by Department of Legal Metrology, Regulatory body, etc.
- Laboratory is not liable for any change in the reported data and performance specification on account of malfunctioning of Standards | Equipment covered by this Certificate due to damage caused to it after the issue of this Certificate.
- Any corrections | changes | erasing | modifications | unauthorized Seal, Stamp or Signature on this Calibration Certificate invalidate this Certificate.
- Unless otherwise specified, the measurement data reported is considered 'As found data - without any adjustments.'
- Decision Rule: No conformity statement (Pass | Fail | Accepted | Rejected) is provided, unless otherwise indicated on report.
- NABL Guideline 133 is adopted for the use of NABL Symbol.
- This report pertains only to the sample | equipment submitted and shall not be reproduced in part or full, without explicit written permission from our Laboratory.
- Only Digital calibration Certificate in soft, valid and prepared as per ISO/IEC 17025:20217 requirement is issued.

**Scope of Accreditation:**

Please contact our Laboratory to get a copy of our ISO/IEC 17025: 2017 Accredited Certificate and Scope of Calibration. You may also download the same directly from NABL Website.

|                |           |                                               |                     |
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JAYASREE REVA PHOENIX METROLOGY PVT.LTD.

जयश्री रेवा फीनिक्स मेट्रोलोजी प्राइवेट लिमिटेड

CALIBRATION | INSPECTION | TESTING | TRAINING | SERVICES

ISO/IEC 17025:2017 ACCREDITED & ISO 9001:2015 CERTIFIED LABORATORY



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**For any further information, assistance or feedback; please contact:**

Director | Managing Director

Reva Phoenix Labs & Consultants Private Limited

Reva Phoenix Complex, No.14, 4th Street, Rajarajeswari Nagar,

Madipakkam, Chennai 600 091, Tamil Nadu, India

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E mail: enquiry@revaphoenix.com | Website: www.revacalibration.com

### Our Accredited Calibration Laboratories:

- Acceleration, Speed & Vibration, Acoustics
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- Mechanical - Dimension - Basic Measuring Instrument, Gauge etc.
- Mechanical - Dimension - Precision Instruments
- Electro Technical - Time & Frequency, Simulation, Electrical Equipment, AC & DC
- Fluid Flow, Air & Water - Flow Measuring Devices
- Mechanical - Force, Push Pull, UTM, Durometer, Mobile Force Measuring System
- Mechanical - Hardness Testing Machines
- Mechanical - Impact Testing Machine
- Mechanical - Mass & Volume, Weighing Scale & Balance, Weights
- Optical Metrology, Lux Meter & Lamp
- Mechanical - Pressure Indicating Devices
- Thermal - Temperature, Specific Heat & Humidity
- Torque - Generating | Measuring Devices, Torque Wrench, Torque Sensors

### Calibration Services

Mechanical | Dimension – All Basic & Precision Equipment | CMM Calibration | Pressure – Upto 4000 Bar | Torque – upto 3000 Nm | Mass E1 | Volume – Micro Pipette | Electro-Technical MFC & Oscilloscope | Thermal – Furnace Mapping & Pyrometer upto 1750°C | Force | Optics | Light Source | Lux Meter (1 to 2,00,000 Lux) | Acceleration | Speed | Tachometer | Rubber Hardness Tester | Fluid Flow | Anemometer | Acoustics | Mechanical Calibration | Rockwell | Brinell | Vickers | Micro-Vickers | UTM Calibration | UTM CTM TTM | Impact Testing Machine Calibration | Force Gauge | Push Pull Gauge | Leeb's Hardness | Portable Hardness Tester | Dynamic Hardness Tester | E1 Calibration | Density & Viscosity | Air Flow Meters | pH Meter | Conductivity Meter | Lab Master Equipment Calibration | Gauss | Reference Magnet | 3 Energy & Power | Liquid Flow Meter | Vibration | Portable Vibration Calibrator | Torque Sensor Upto 2000 Nm

|                |           |                                               |                     |
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m.21

- End of Calibration Certificate -

Page No : 05 of 05

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