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TC Ltd for Temperature Sensing, Measurement and Control

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CERTIFICATE OF CALIBRATION

Date of Issue: 4. January 2021
Customer: Univ. Granada - Centro Instrum. Cientifica Campus Univ. Fuentenueva
Address: Po Del Profesor Juan Ossorio, S/N
 18071 Granada, Granada (Espana)
Order Number: 33525
Our Reference: M28217
Date Received: 10. December 2020
Type: T 230mm x 3.0mm
Product Code: 12-T-160-118-3.0-2I-3P2LA-2MTRS B50TX/SSB-F40-F11TX
 Mineral Insulated Metal Sheathed Thermocouple

Ambient Temp:
20°C +/- 2°C

Approved Signatory:

Certificate Number:
20-2028-001
Revision_0

Calibration Procedure:

The thermocouple was calibrated by comparison with a reference resistance thermometer. The calibration took place in a Dry block. All measurements are traceable to recognised national standards. The thermocouple wires were referenced to 0°C with the cold junction of the unit under test at ambient. All resistance / voltage outputs were measured on a precision digital multimeter. All tests were carried out in a controlled environment using devices having known and traceable values. The temperature measurements are traceable to ITS-90. The thermocouple voltages were converted using IEC60584-1:2013.

| Serial Number | Reference Temperature (°C) | UUT (µV) | Equivalent Value (°C) | Error (°C) |
|---------------|-------------------------------|-------------|--------------------------|---------------|
| M28217-A-001 | -80.01 | -2790.3 | -80.07 | -0.06 |
| M28217-A-001 | 20.00 | 786.6 | 19.95 | -0.05 |

Uncertainty: +/-0.57°C at -80°C and +/-0.43°C at 20°C

The depth of immersion of the UUT was a minimum of 150mm.

Calibration date: 4. January 2021 **Calibrated by:** Aaron Payne

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

Note: It is the user's responsibility to determine the long-term drift and the uncertainty under the conditions of use

This certificate is issued in accordance with the laboratory accreditation requirements of the United Kingdom Accreditation Service (UKAS). It provides traceability of measurement to the SI system of units and/or to units of measurement realised at the National Physical Laboratory (NPL), National Institute of Standards and Technology (NIST) 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.