

CERTIFICATE OF CALIBRATION

ISSUED BY: LAMBDA CALIBRATION LTD

DATE OF ISSUE: 27 January 2016 CERTIFICATE No: 381858



Page 1 of 3

APPROVED SIGNATORY

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Lambda
CALIBRATION LTD

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Lancashire PR6 0BL
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Customer: DJB Labcare Ltd
Address: 20 Howard Way, Interchange Park,
Milton Keynes
MK16 9QS

Item Number: 13070037 (4046)
Description: Digital Thermometer
Model/Range: TMD-56
Manufacturer: Amprobe
Date of Cal: 27 Jan 2016
Calibrated by: Mohammed Abid
Procedure Name: Amprobe, Digital Thermometer, TMD-56 (DJB Labcare)
Rev/Basis: 02:E-650, Based on BS EN 60584.1
Temp/Humidity: 20.0°C ± 2°C <80%rh

The Results on the following pages are: As Found

All Measurements are Traceable to National Standards.

Note 1: The unit under test was calibrated using a multifunction calibrator.

Note 2: Where the reported value lies within the specified tolerances then this will be indicated by the word "PASS", if outside then by the word "FAIL".

Note 3: Values quoted in the "UUT Indicated Value" column are not necessarily quoted to the same resolution as the actual displayed value on the UUT.

Note 4: Any supplied test leads have been checked as part of the Visual/Operational test but have not been used during calibration.

Note 5: Temperature indicating instruments that contain an internal reference junction for use with thermocouples are calibrated with the reference junction enabled.

Engineers' Notes:

Standard(s) Used: LMMC-02 / LMMC-04 / LMMC-10 / LMMC-14

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: 0495

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381858

Page 2 of 3

| Parameter | UUT Range | UUT Indicated Value | Applied Value | Acceptance Limits Low | Acceptance Limits High | Pass/Fail |
|--|-----------|---------------------|---------------|-----------------------|------------------------|-----------|
| Visual/Operational Test | | | | | | |
| Result of Operator Evaluation | | | | | | PASS |
| Measurement of Thermocouples (Electrical Simulation) | | | | | | |
| Channel T1 | | | | | | |
| Type T | | | | | | |
| | | -190.0°C | -190.0 | -190.8 | -189.2 | PASS |
| | | -80.0°C | -80.2 | -80.3 | -79.7 | PASS |
| | | -50.0°C | -50.1 | -50.3 | -49.7 | PASS |
| | | -30.0°C | -29.8 | -30.3 | -29.7 | PASS |
| | | -10.0°C | -10.0 | -10.3 | -9.7 | PASS |
| | | 0.0°C | 0.0 | -0.3 | 0.3 | PASS |
| | | 4.0°C | 3.9 | 3.7 | 4.3 | PASS |
| | | 37.0°C | 37.0 | 36.7 | 37.3 | PASS |
| | | 50.0°C | 50.0 | 49.7 | 50.3 | PASS |
| | | 100.0°C | 100.1 | 99.7 | 100.3 | PASS |
| | | 150.0°C | 150.0 | 149.6 | 150.4 | PASS |
| | | 200.0°C | 200.1 | 199.6 | 200.4 | PASS |
| | | 250.0°C | 250.0 | 249.6 | 250.4 | PASS |
| | | 300.0°C | 300.0 | 299.6 | 300.4 | PASS |
| | | 390.0°C | 390.1 | 389.5 | 390.5 | PASS |
| | | 100.0°F | 100.2 | 99.3 | 100.7 | PASS |
| Type K | | | | | | |
| | | 0.0°C | 0.0 | -0.3 | 0.3 | PASS |
| | | 500.0°C | 500.0 | 499.4 | 500.6 | PASS |
| | | 1000.0°C | 1000.0 | 999.2 | 1000.8 | PASS |
| Type J | | | | | | |
| | | 20.0°C | 20.0 | 19.7 | 20.3 | PASS |
| | | 1100.0°C | 1100.3 | 1099.2 | 1100.8 | PASS |
| Type E | | | | | | |
| | | 20.0°C | 20.0 | 19.7 | 20.3 | PASS |
| | | 900.0°C | 900.2 | 899.3 | 900.8 | PASS |
| Type N | | | | | | |
| | | 20.0°C | 20.0 | 19.6 | 20.4 | PASS |
| | | 1100.0°C | 1100.4 | 1099.1 | 1101.0 | PASS |
| Type R | | | | | | |
| | | 500.0°C | 500.0 | 497.8 | 502.3 | PASS |
| | | 1100.0°C | 1100.0 | 1097.5 | 1102.6 | PASS |
| Type S | | | | | | |
| | | 500.0°C | 500.0 | 497.8 | 502.3 | PASS |
| | | 1100.0°C | 1100.0 | 1097.5 | 1102.6 | PASS |

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Page 3 of 3

| Parameter | UUT Range | UUT Indicated Value | Applied Value | Acceptance Low | Limits High | Pass/Fail |
|------------|-----------|---------------------|---------------|----------------|-------------|-----------|
| Channel T2 | | | | | | |
| Type T | | -190.0°C | -189.9 | -190.8 | -189.2 | PASS |
| | | -80.0°C | -80.1 | -80.3 | -79.7 | PASS |
| | | -50.0°C | -50.0 | -50.3 | -49.7 | PASS |
| | | -30.0°C | -29.9 | -30.3 | -29.7 | PASS |
| | | -10.0°C | -10.0 | -10.3 | -9.7 | PASS |
| | | 0.0°C | 0.0 | -0.3 | 0.3 | PASS |
| | | 4.0°C | 4.0 | 3.7 | 4.3 | PASS |
| | | 37.0°C | 37.0 | 36.7 | 37.3 | PASS |
| | | 50.0°C | 50.0 | 49.7 | 50.3 | PASS |
| | | 100.0°C | 100.1 | 99.7 | 100.3 | PASS |
| | | 150.0°C | 150.0 | 149.6 | 150.4 | PASS |
| | | 200.0°C | 200.1 | 199.6 | 200.4 | PASS |
| | | 250.0°C | 250.0 | 249.6 | 250.4 | PASS |
| | | 300.0°C | 300.1 | 299.6 | 300.4 | PASS |
| | | 390.0°C | 390.1 | 389.5 | 390.5 | PASS |
| | | 100.0°F | 100.1 | 99.3 | 100.7 | PASS |
| Type K | | 0.0°C | 0.0 | -0.3 | 0.3 | PASS |
| | | 500.0°C | 500.1 | 499.4 | 500.6 | PASS |
| | | 1000.0°C | 1000.0 | 999.2 | 1000.8 | PASS |
| Type J | | 20.0°C | 20.0 | 19.7 | 20.3 | PASS |
| | | 1100.0°C | 1100.2 | 1099.2 | 1100.8 | PASS |
| Type E | | 20.0°C | 20.0 | 19.7 | 20.3 | PASS |
| | | 900.0°C | 900.2 | 899.3 | 900.8 | PASS |
| Type N | | 20.0°C | 20.0 | 19.6 | 20.4 | PASS |
| | | 1100.0°C | 1100.4 | 1099.1 | 1101.0 | PASS |
| Type R | | 500.0°C | 500.0 | 497.8 | 502.3 | PASS |
| | | 1100.0°C | 1100.0 | 1097.5 | 1102.6 | PASS |
| Type S | | 500.0°C | 500.0 | 497.8 | 502.3 | PASS |
| | | 1100.0°C | 1100.0 | 1097.5 | 1102.6 | PASS |

End of Calibration Data

Estimated Uncertainty of Measurement:

Electrical Simulation of Thermocouples

| | | |
|---------|-------------------|-------------------|
| Type: B | +500°C to +1820°C | ±(0.56°C + 2 LSD) |
| Type: C | +0°C to +2320°C | ±(0.42°C + 2 LSD) |
| Type: E | -250°C to +1000°C | ±(0.46°C + 2 LSD) |
| Type: J | -210°C to +1200°C | ±(0.27°C + 2 LSD) |
| Type: K | -200°C to -250°C | ±(0.58°C + 2 LSD) |
| Type: K | -200°C to +1300°C | ±(0.29°C + 2 LSD) |
| Type: L | -200°C to +900°C | ±(0.28°C + 2 LSD) |
| Type: N | -200°C to +1300°C | ±(0.34°C + 2 LSD) |
| Type: R | +0°C to +1767°C | ±(0.53°C + 2 LSD) |
| Type: S | +0°C to +1767°C | ±(0.50°C + 2 LSD) |
| Type: T | -250°C to -200°C | ±(0.60°C + 2 LSD) |
| Type: T | -200°C to +400°C | ±(0.29°C + 2 LSD) |