

# CERTIFICATE OF CALIBRATION

ISSUED BY: LAMBDA CALIBRATION LTD

DATE OF ISSUE: 27<sup>th</sup> March 2018

CERTIFICATE No: 491208



**Lambda**  
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APPROVED SIGNATORY

*A Kelly*  
A Kelly D Pilkington  
D Whalley C Reed R Armitage

Customer: DJB Labcare Ltd, Milton Keynes, MK16 9QS  
Item No: 1632  
Description: Calibrator  
Model/Range: TC303  
Manufacturer: Beamex  
Date of Cal: 26/3/2018  
Basis: E-2000  
Equipment Used: Multifunction Calibrator (LMMC-02), Longscale Multiimeter (LVD-33), Thermocouple Thermometer (LTHE-22), Thermocouple Probe (LTP-18)  
Temp/Humidity: 20°C ± 2°C, <80%rh

### Visual /Operational Checks:

Case Condition	Satisfactory
Operation of Switches & Display	Satisfactory
Leads Condition	Satisfactory
Battery	Does not hold charge

### Summary of Results:

Pre Calibration Status	Results reported as found
Post Calibration Status	Results reported as found
Adjustments	No
Repairs	No
Other Comments	-

Measured results and measurement uncertainties are detailed on the following pages.

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.

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## Reference Temperature Error

The UUT was left overnight to equilibrate. The UUT reading from a calibrated thermocouple probe was compared to that from a laboratory reference probe.

UUT reported temperature: 19.9°C

Reference probe reported temperature: 19.75°C

UUT reference temperature error: +0.15°C

## Measurement Mode:

The UUT was set to T-Type thermocouple, reference temperature set to 0°C, and voltages equivalent to the set point temperatures were applied.

Applied Simulation Temperature (°C)	Applied Voltage (mV)	UUT Display (°C)
-190.0	-5.439	-190.0
-80.0	-2.788	-80.0
-50.0	-1.819	-50.0
-30.0	-1.121	-30.0
-10.0	-0.388	-10.2
0.0	0.000	0.0
4.0	0.156	4.0
37.0	1.486	37.0
50.0	2.036	50.0
100.0	4.279	100.0
150.0	6.704	150.0
200.0	9.288	200.0
250.0	12.013	250.0
300.0	14.862	300.0
390.0	20.255	390.0

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## Simulation Mode

The UUT was set to T Type thermocouple simulate, with reference temperature set to 0°C. The UUT output voltage was measured.

UUT Setting (°C)	Nominal Output (mV)	Measured Output (mV)	Equivalent Temperature (°C)
-190.0	-5.439	-5.4383	-189.98
-80.0	-2.788	-2.7876	-79.99
-50.0	-1.819	-1.8176	-49.97
-30.0	-1.121	-1.1196	-29.97
-10.0	-0.383	-0.3823	-9.99
0.0	0.000	0.0005	0.01
4.0	0.156	0.1557	4.01
37.0	1.486	1.4874	37.03
50.0	2.036	2.0371	50.04
100.0	4.279	4.2797	100.03
150.0	6.704	6.7036	149.99
200.0	9.288	9.2879	200.00
250.0	12.013	12.0441	250.01
300.0	14.862	14.8624	300.01
390.0	20.255	20.2548	390.00

## Estimated Uncertainty of Measurement:

Simulated Temperature:  $\pm 0.13^{\circ}\text{C}$

Reference Junction Measurement:  $\pm 0.12^{\circ}\text{C}$