

CALIBRATION CERTIFICATE

SUBJECT: CALIBRATION OF DIGITAL THERMOMETER	CERTIFICATE NO.: ML/THE/1381/01/2023-24	
	Certificate Issue Date 23/09/2023	Page 1 of 1



1. **Scope**
- 1.1 Service Request Details
Calibration
- 1.1.1 Service Request No.
ML/1381/23-24
- 1.1.2 Service Request Finalized On
18/09/2023
- 1.1.3 Unique Lab Report Number (ULR No.)
CC266423000027461F
- 1.1.4 Discipline / Group
Thermal / Temperature
- 1.1.5 Name & Address of Organization
NOBEL MICROPATH LABORATORY
G3, Ground floor, Infinity Tower, near Railway Station, Surat, Gujarat, India, 395003.

1.2 **Item Details**

1.2.1 Condition of the Item Working

1.2.2 Nomenclature	Digital Thermometer		
Manufacturer	--	Model No.	---
ID No.	DTM-01	Sr.No.	---
Range	-50 to 50 °C	Type	Digital
Least Count	0.1 °C	Accuracy	---
Department	--	Location	---

1.3 Item Received On

Dt. 20/09/2023

1.4 **Details of Test Equipments Used**

Instrument Name	UID No.	Certificate No.	Make	Due Date
PRT Sensor With Temp.Display Unit	ML/MPRT/001	GEC/NB/7475-T	Fluke	07/11/2023

Source in Use: ML/MTB/001

1.4.1 Operating Procedures Used:

ML/SOP/THE/002

1.4.2 Reference Standard:

DKD-R-5-1

1.5 Date of Calibration:

21-September-2023

1.6 Recommended Due Date of Calibration:

20-September-2024

1.7 **OBSERVATIONS:**

1.7.1 Laboratory Ambient: Temperature: 25.3 °C (25±4)

Humidity: 51.4 %RH (50±20)

1.7.2 Parameter: Temperature (°C)

CALIBRATION RESULTS					
Sr. No.	Calibration Point	Measured Value on Master (A)	Measured Value on IUC (B)	Error (B - A)	(±) Expanded Uncertainty
1	-30	-30.015	-30.0	0.02	0.29 °C
2	0	0.054	0.0	-0.05	0.29 °C
3	45	45.094	45.0	-0.09	0.29 °C

Note: The value mentioned above is the mean of 5 readings.

1.8 **General Remarks:**

- The reported uncertainty is the expanded uncertainty in measurement obtained by multiplying the standard uncertainty by the coverage factor k=2, which corresponds to a coverage probability of approximately 95.45% for a normal distribution.
- Uncertainty to be calculated at Max Error / Full Range of IUC
- Any anomalies/Discrepancies in the certificate should be brought to our notice within 30 days from the date of Issue Certificate.
- IUC* (Instrument Under Calibration)
- The Measurements are metrologically traceable to applicable national /International Standards.
- Any hand written corrections (except @) or photocopies of the report invalidates this certificate.
- The results related to the Item calibrated.

Calibrated By: Dhruv Patel, Calibration Engineer

AUTHORISED SIGNATORY

Ranjit Rohit / Dhruv Patel
Technical Director / Quality Manager

B-209 & B-210 2nd Floor, "B" Wing, Matrix Calibration Business Hub, Opp. Taluka Seva Sadan, Balitha.

Vapi-396 195 Gujarat (India) Cell:098253 17475, Off. 097238 20990 Form-21, Amend. 05 Dt.. 01-01-2022

Website : www.matrixlab.in, E-mail : info@matrixlab.co.in, matrixvapi@rediffmail.com

CERTIFICATE



CC-2727

CALIBRATION CERTIFICATE

ULR-CC272722000020410F

Certificate No.	Date of Calibration	Suggested Next Due Date*	Certificate Issue Date	Page
GEC/NB/7475-T	07/11/2022	07/11/2023	08/11/2022	1 of 1

- 1.0 Name & Address of Customer : Matrix Lab. B-209-210, 2nd Floor, 'B' Wing, M Cube, The Business Hub, Opp. Taluka Seva Sadan, Balitha, Vapi-396191 Gujarat (India).
Date: 31/10/2022
- 2.0 Customer's Reference & Date : Gate Pass / Letter No.: - - - - - Date of Item received: 31/10/2022
- 3.0 Work Order No. & Date : W/22-23/2035/034501
- 4.0 Details of Unit Under Calibration (UUC) :
Nomenclature of UUC : PRT Sensor with Temperature Display Unit
Calibrated Range : -80 to 600°C Resolution : 0.001 °C
Type of Sensor : PRT Sensor [4W] Serial No. of indicator: 38820022
Serial No. of sensor: 05586 Model No. of Indicator: 1586A
Model No. of sensor: 5609 Identification No.: ML/MPRT/001
Make of Sensor: Fluke Make of Indicator: Fluke
At the time of receipt: Satisfactory Job Code No.: T/109207
- 5.0 Condition of UUC : Calibration Points : -80, -25, 0, 200, 400, 600°C
- 6.0 Location of Calibration : Thermal Lab
- 7.0 Details of Ref. Standard & Traceability :

Sr. No.	Nomenclature of Standard	Range / LC	Lab ID & Sr. No.	Uncertainty / Accuracy	Certificate No	Calibration Date	Traceability
1	Reference PRT Temperature Sensor (Fluke - 5626)	-200°C to 670°C	GEC/T/048 & 4324	±0.00600°C to ±0.00900°C	FL/C/TH/2609202 2-C011	26/09 to 04/10/2022 (Valid up to 04/10/2023)	NABL Lab No. CC-2739
2	High Precision thermometer read-out (Fluke Chub E-4)	-270°C to 1800°C	GEC/T/018 & A85775	±0.02% to 0.004% (Ω)	AJPL/2022/0480	17/07/2022 (Valid up to 17/07/2023)	NABL Lab No. CC-2020

- 8.0 Calibration Environment : Temperature (25°C ± 4°C): 25.6 °C Relative Humidity (30-75%): 48.3 %RH
- 9.0 Calibration Method : The Instrumental Correction of UUC was determined by inserting the UUC, into the Temperature bath along with PRT Sensor with High Precision Thermometer readout [Chub E-4] at the same immersion length.
(Lab's Standard Operating Procedure: SOP/T/001)
Compliance requirement and criteria of Thermal calibration based on following reference documents : IS : 6274-1971 Reaffirmed 2002 & NABL 129.
- 10.0 Uncertainty of Measurement : Refer Clause 11.0
(The Uncertainty of Measurement is expressed at a confidence level of 95%, Coverage factor k = 2 & Degree of freedom $v_{eff} = \infty$)
- 11.0 Calibration Result :

Sr. No.	Calibration Point In °C	Corrected Standard Reading* In °C	Measured Value by UUC* In °C	Correction (C-D) In °C	Uncertainty of Measurement(±) In °C
A	B	C	D	E	F
1	-80	-79.6901	-79.745	+0.0549	0.04
2	-25	-24.9937	-25.014	+0.0203	0.04
3	0	0.0134	0.004	+0.0094	0.04
4	200	199.9616	199.895	+0.0666	0.05
5	400	399.9893	399.820	+0.1693	0.05
6	600	599.9568	599.646	+0.3108	0.05

- 12.0 General remark:
- 12.1 Calibration is performed w.r.t Temperature Scale: ITS -90.
- 12.2 As received and as left data is same, No correction have been made.
- 12.3 Depth of Immersion of UUC & Ref. Standard sensor: 150 & 210 mm
- 12.4 The reference readings are pertaining to RTPW value 100.0449 Ω, R0 value 100.0672 Ω
- 12.5 *All readings are average of five readings.
- 12.6 Calibration points mentioned as per the requisition of Customer.
- 12.7 Standard Readings are corrected for calibration corrections arise due to certificate value of PRT sensor.
- 12.8 The Values have been rounded off as per IS: 2-1960 wherever applicable.
- 12.9 The user should determine the suitability of the instrument for its intended use.
- 12.10 NABL Accreditation Lab Code No. CC-2727.
- 12.11 Master Calibration Equipment used for calibration has minimum accuracy of four times greater than that of the UUC calibrated.
- 12.12 *Suggested next due date of calibration is based on customers requirement at their own discretion

— END —

Calibrated By

A. K. Shahu / R. N. Basera
(Calibration Engineer)



Authorized Signatory

Pritesh Ladva
(Lab Incharge)

Divyesh Ladva
(Technical Manager)

Note : This certificate is issued subject to condition stated overleaf