



| दिनांक/Date | अगले अंशांकन हेतु अनुशंसित तिथि<br>Recommended date for the next calibration | पृष्ठ/Page | पृष्ठों की संख्या/No of pages |
|-------------|--|------------|-------------------------------|
| 12 07 2023  | 12 07 2024   | 1          | 4                             |

- Calibrated for : Biomedical Metrology Section National Physical Laboratory, New Delhi, 110012  
Customer Ref. No. Nil  
Date: 10-07-2023
- Description and Identification of Item under Calibration : Defibrillator Analyser  
Model No.: 7000DP, Sr. No.: 3819017  
Make: Fluke Biomedical
- Environmental Conditions : Temperature: (25 ±2) °C  
Relative Humidity: (50 ±10) %
- Standard(s) used (with Associated uncertainty) : 1. Digital Storage Oscilloscope (Model No.: TBS 2072; Sr. No.: C020293; Make: Tektronix);  
(-182.8 to -582.4) mV ±1.5 mV (k=2.32) ;  
(215.8 to 2207) mV ±(1.5 to 2.0) mV (k=2.02 to 2.32);  
Time (sec): (19.994 ±1 x 10<sup>-3</sup>) µs (k=2)  
2. High Voltage Divider (Model No.: VD 15-8.3-A-LB-AL;  
Sr. No.: 170313, Make: Ross Engg. Corp.),  
(1000:1) 0.9975 ±0.1 % (k=2.1)  
3. Digital Multimeter (Model No. 8846A; Sr.No.: 3641001; Make: Fluke);  
(19.0009 ±0.0003) Ω (k=2)  
4. Defibrillator (Model No.: TEC5621; S. No.: 01273; Make: Nihon Kohden);  
(9.5 ±0.1) J (k=2.16)  
(19.3 ±0.1) J (k=2.00)  
(48.2 ±0.2) J (k=2.13)  
(97.1 ±0.3) J (k=2.00)  
(146.1 ±0.5) J (k=2.06)  
(259.5 ±0.8) J (k=2.05)
- Traceability of standard(s) used : The standards used for calibration are traceable to National Standards, which realize the units of quantities according to the International System of Units (SI)
- Principle /Methodology of calibration and Calibration Procedure number : Calibration procedure as specified in Sub-Div # 3.03/ Doc3/CP #2

आशंकितकर्ता

Calibrated by :

VINOD KUMAR TANWAR

जाँचकर्ता

Checked by :

VED VARUN AGRAWAL

प्रभारी वैज्ञानिक

Scientist-in-charge :

Dr. RAJESH

जारीकर्ता

Issued by :



| दिनांक/Date | अगले अंशांकन हेतु अनुशंसित तिथि<br>Recommended date for the next calibration | पृष्ठ/Page | पृष्ठों की संख्या/No of pages |
|-------------|--|------------|-------------------------------|
| 12 07 2023  | 12 07 2024   | 2          | 4                             |

7. Result(s):

Table 1: This is Table 1

| Sr. No. | Energy applied (J) to UUC | Calculated (J) level | Measured Energy (J) level of UUC | Energy correction (J) (Ecalculated-Emeasured) | Uncertainty (J) | Coverage Factor (k) |
|---------|---------------------------|----------------------|----------------------------------|---|-----------------|---------------------|
| 1       | 10                        | 9.500000             | 9.600000                         | (-) 0.1                                       | ±0.1            | 2                   |
| 2       | 20                        | 19.300000            | 19.400000                        | (-) 0.1                                       | ±0.1            | 2                   |
| 3       | 50                        | 48.200000            | 48.400000                        | (-) 0.2                                       | ±0.2            | 2                   |
| 4       | 100                       | 97.100000            | 97.400000                        | (-) 0.3                                       | ±0.3            | 2                   |
| 5       | 150                       | 146.100000           | 146.400000                       | (-) 0.3                                       | ±0.5            | 2                   |
| 6       | 270                       | 259.500000           | 260.300000                       | (-) 0.8                                       | ±0.9            | 2                   |

Table 2: This is Table 2

| Sr. No. | Discharge Time                        | Calculated Discharge Time (ms) | Measured Discharge Time (ms) | Uncertainty (J) | Coverage Factor (k) |
|---------|---------------------------------------|--------------------------------|------------------------------|-----------------|---------------------|
| 1       | Discharge Time (Positive Pulse Width) | 6.600000                       | 6.400000                     | ±0.1            | 2.170000            |
| 2       | Discharge Time (Negative Pulse Width) | 4.400000                       | 4.500000                     | ±0.1            | 2.000000            |

Table 3: This is Table 3

| Sr. No. | Defibrillator Analyser Load Resistance (Ω) | Expected Value (Ω) | Measured Value (Ω) | Uncertainty (Ω) | Coverage Factor (k) |
|---------|--|--------------------|--------------------|-----------------|---------------------|
| 1       | 50   | 50                 | 50.017900          | ±0.00041        | 2.050000            |

Table 4: This is Table 4

| Sr. No. | Defibrillator Analyser Load Resistance (Ω) | Expected Value (Ω) | Measured Value (Ω) | Uncertainty (Ω) | Coverage Factor (k) |
|---------|--|--------------------|--------------------|-----------------|---------------------|
| 1       | 50   | 50                 | 51.012800          | ±0.0005         | 2.110000            |

आशंकितकर्ता

Calibrated by :

VINOD KUMAR TANWAR

जाँचकर्ता

Checked by :

VED VARUN AGRAWAL

प्रभारी वैज्ञानिक

Scientist-in-charge :

Dr. RAJESH

जारीकर्ता

Issued by :



| दिनांक/Date | अगले अंशांकन हेतु अनुशंसित तिथि<br>Recommended date for the next calibration | पृष्ठ/Page | पृष्ठों की संख्या/No of pages |
|-------------|--|------------|-------------------------------|
| 12 07 2023  | 12 07 2024   | 3          | 4                             |

The expanded uncertainty in wavelength measurement at NPL. is  $\pm 0.5$  m.

The reported uncertainty is at Coverage factor 1-2, which corresponds to a coverage probability of approximately 95% for a normal distribution

8. Date(s) for calibration: 12.07.2023

9. Remark(s):  
 (i) The measured values of peak wavelength are representation of the nearest reference Standard spectral lines as shown by the Spectrometer at the interval of each 0.1 mm.  
 (ii) NPL identification No. of the Spectrometer for wavelength measurement is 402/0PT/202



आशंकितकर्ता

Calibrated by :

VINOD KUMAR TANWAR

जाँचकर्ता

Checked by :

VED VARUN AGRAWAL

प्रभारी वैज्ञानिक

Scientist-in-charge :

Dr. RAJESH

जारिकर्ता

Issued by :

## नोट

1. यह प्रमाण पत्र सी एस आई आर-राष्ट्रीय भौतिक प्रयोगशाला, भारत जारी किया गया है जो कि विज्ञान एवं प्रौद्योगिकी मंत्रालय, भारत सरकार के अधीन वैज्ञानिक व औद्योगिक अनुसंधान परिषद् की संघटक इकाई है एवम् भारत का राष्ट्रीय मापिकी संस्थान(NMI) भी है ।
2. यह प्रमाण पत्र केवल अंशांकन हेतु जमा किए गए मापिकी हेतु संदर्भित है।
3. इस प्रमाण पत्र की प्रतिलिपी, पूर्ण प्रमाण पत्र के अतिरिक्त, तैयार नहीं की जा सकती है, जब तक कि निदेशक, सी एस आई आर-राष्ट्रीय भौतिक प्रयोगशाला, नई दिल्ली से अनुमोदित सार के प्रकाशन हेतु लिखित अनुमति प्राप्त नहीं की गयी हो।
4. उस प्रमाण पत्र में प्रतिवेदित परीक्षण परिणाम केवल मापन की वर्णित परिस्थलियाँ एवं समय हेतु मान्य है।



## NOTE

1. This certificate is issued by CSIR-National Physical Laboratory of India (NPLI) which is a constituent unit of the Council of Scientific & Industrial Research, the Ministry of Science and Technology, Government of India and is also National Metrology Institute (NMI) of India.
2. This certificate refers only to the particular item (s) submitted for calibration.
3. This certificate shall not be reproduced, except in full, unless written permission for the publication of an approved abstract has been obtained from the Director, CSIR- National Physical Laboratory. New Delhi.
4. The calibration results reported in this certificate are valid at the time and under the stated conditions of measurement.