**Calibration Certificate**

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| --- | --- | --- | --- |
| DUT Name: | Battery Tester | Certificate No.: |  |
| Manufacturer: | NEWARE | Calibration Date: |  |
| Model: |  | Calibration Due: |  |
| Serial Number: |  | Data Type: |  |
| Asset No.: |  | Location: |  |
| Temperature: |  | Relative Humidity: |  |

1. Main Standards Used

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Standard Name | Characteristics | Asset No. | Certificate No. | Due Date |
|  |  |  |  |  |
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|  |  |  |  |  |

1. Uncertainty Budget
2. T.U.R. Table

| # | Point | U95% Standard | T.U. R. | Spec | Acceptance |
| --- | --- | --- | --- | --- | --- |
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1. Uncertainty Budget Table\*

|  |  |
| --- | --- |
| Voltage: |  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Uncertainty Contributors | Value | Sensitivity Coefficient | Unit | Type | Distribution | Coverage Factor | Std Uncertainty | Significance |
|  |  |  |  |  |  |  |  |  |
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|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| Tester Resolution |  | 1 | V | B | Rectangular | √12 |  |  |
| Repeatability of Reading |  | 1 | V | A | Standard | 1 |  |  |
|  |  |  |  | Combined Uncertainty | | |  |  |
|  |  |  |  | Coverage Factor | |  |  |  |
|  |  |  |  | Expanded Uncertainty | | |  |  |

|  |  |
| --- | --- |
| Current: |  |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Uncertainty Contributors | Value | Sensitivity Coefficient | Unit | Type | Distribution | Coverage Factor | | Std Uncertainty | Significance |
|  |  |  |  |  |  |  | |  |  |
|  |  |  |  |  |  |  | |  |  |
| Tester Resolution |  | 1 | A | B | Rectangular | √12 | |  |  |
| Repeatability of Reading |  | 1 | A | A | Standard | 1 | |  |  |
|  |  |  |  | Combined Uncertainty | | | |  |  |
|  |  |  |  | Coverage Factor | | |  |  |  |
|  |  |  |  | Expanded Uncertainty | | | |  |  |

1. Data Sheet
2. Charging Voltage

| CHN | Range  (V) | Indication  (V) | Measured Value(V) | Error  (mV) | Acceptance  (mV) | Uncertainty  (mV) | Conclusion |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 1-1 | 5 | 0.5001 | 0.5002 | -0.1 | ±2.5 | 0.3 | P |
|  |  |  |  |  |  |  |  |

1. Discharging Voltage

| CHN | Range  (V) | Indication  (V) | Measured Value(V) | Error  (mV) | Acceptance  (mV) | Uncertainty  (mV) | Conclusion |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 1-1 | 5 | 0.5001 | 0.5002 | -0.1 | ±2.5 | 0.3 | P |
|  |  |  |  |  |  |  |  |

1. Charging Current

| CHN | Range  (A) | Indication  (A) | Measured Value(A) | Error  (mA) | Acceptance  (mA) | Uncertainty  (mA) | Conclusion |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 1-1 | 6 | 0.05993 | 0.05990 | 0.03 | ±3.00 | 0.14 | P |

1. Discharging Current

| CHN | Range  (A) | Indication  (A) | Measured Value(A) | Error  (mA) | Acceptance  (mA) | Uncertainty  (mA) | Conclusion |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 1-1 | 6 | 0.60000 | 0.60000 | 0.00 | ±3.00 | 0.14 | P |

1. **Comments**
2. Measurement uncertainties are given in the pages above, where applicable. They are calculated in accordance with the method described in NIST TN 1297. All uncertainties are reported at a coverage factor of 2 (k=2) for an approximately 95% confidence unless specified.
3. This calibration is traceable to the International System of Units (SI), through National Institute of Metrology (NIM) that is signatory to the CIPM Mutual Recognition Arrangement.
4. The Data Type in this certificate could be interpreted as:
   1. As Found. Calibration data collected before the unit is adjusted and/or repaired.
   2. As Left. Calibration data collected after the unit is adjusted and/or repaired.
5. The acceptance limit denotes the guard band imposed on specifications to ensure a probability of false accept (PFA) of 2% or less.
6. Uncertainties are evaluated simultaneously when a calibration point is finished. Above data is presented for reference.
7. Conclusion column indicates compliance or otherwise with specification taking into account the measurement uncertainty. Three conditions are indicated as follows:
   1. P or PASS. The measurement result is inside the acceptance limit with a guard band strategy considered to ensure probability of false accept (PFA) of 2% or less.
   2. P\* or PASS\*. The measurement result is inside the specification limit but outside the above acceptance limit.
   3. F or Fail. The calibration point does not comply with the state specification.
8. This certificate applies to only the item identified and shall not be reproduced other than in full, without the specific written approval by Newell Laboratories. Calibration certificates without signatures are not valid.

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| Calibration Technician |  | Technical Manager |
|  |  |  |
| Approval Director |
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