

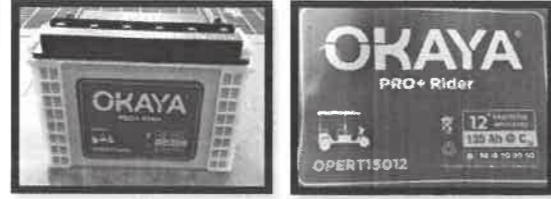
परीक्षण रिपोर्ट
TEST REPORT

परीक्षण रिपोर्ट संख्या/Test Report No: C T O G T 7 5 5 6





तिथि /Date: 27.02.2024

- 1.0 ग्राहक का नाम और पता: : M/s. Okaya Power Pvt. Limited
NAME AND ADDRESS OF THE CUSTOMER D8, Udyog Nagar, Rohtak Road, New Delhi-110041,India
- 2.0 निर्माता का नाम और पता /NAME AND ADDRESS OF THE MANUFACTURER : M/s. Sunoxx International
Vill. Panjhera, Nalagarh-Swarghat Road, Tehsil Nalagarh, Distt. Solan(Himachal Pradesh)-174101
- 2.1 ग्राहक पत्र संदर्भ /CUSTOMER REFERENCE : CCTNCLNPSMEEL171349 Dated 07-Nov-2023

3.0 DESCRIPTION OF TEST PROPERTY	
डीयूटी का नाम /DUT Name	Battery Pack
बैटरी का प्रकार /Battery Type	Lead Acid
बैटरी क्षमता /Battery Capacity(C5)	108Ah @ C5
भाग सं. /Part No/Model No.	OPERT15012
नाम मात्र वोल्टेज / Nominal Voltage	12V
मात्रा / Quantity	06 Nos
ट्रेड का नाम / Trade Name	OKAYA
चित्र सं. / Drawing No.	DW-1581-0
वाहन की श्रेणी/ Category of vehicle	E-Rickshaw



- 4.0 नमूना प्राप्त करने के तिथि /DATE OF RECEIPT OF TEST PROPERTY: 21.12.2023
- 5.0 नमूना की स्थिति /CONDITION OF SAMPLE: No physical damage observed.
- 6.0 परीक्षण उद्देश्य /TEST OBJECTIVE: To validate the safety requirements of traction Battery pack as per AIS:048 as amended upto date.
- 7.0 परीक्षण विधि /TEST METHOD: Test method referred from AIS:048:2009 as amended upto date .
- 8.0 परीक्षण विधि से कोई विचलन या वहीष्करण /ANY DEVIATION OR EXCLUSION FROM TEST METHOD: No
- 9.0 कार्यात्मक सत्यापन /FUNCTIONAL VERIFICATION: Functional verification done and Battery pack was found satisfactory.
- 10.0 निष्कर्ष /CONCLUSION: The Battery pack specified in Sr.No.3.0 of this test report met all the test requirements when tested as per AIS:048 as amended upto date as mentioned in Annexure-I of this report.
- 11.0 परीक्षण विवरण TEST DESCRIPTION: Please refer the Annexure-I of this report.
- 12.0 परीक्षण की प्रदर्शन के तिथि / DATE OF PERFORMANCE OF TEST: Please refer the Annexure-I of this report.

Prepared By	Checked & Authorized By	Approved By	
			 <p>Page 01 of 06 +Drw. [171349]</p>
AMIT KUMAR Senior Technical Asst.	UDIT KAUL Dy. Manager	SONU KR SUDRANIA Manager	

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तिथि / Date 27.02.2024

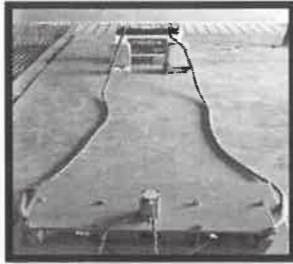
13.0 परीक्षण का स्थान / LOCATION OF TEST: ICAT CENTRE-I & CENTRE-II.




14.0 परीक्षण अवधि/ Test Duration: 11.01.2024 to 21.02.2024


15.0 परीक्षण परिणाम / TEST RESULTS: Please refer the Test requirements and Results in Annexure-I of this report.




Annexure-I


1.0 TEST REQUIREMENTS AND RESULTS:




Cl. No.	Test	Test Description	Observations/Results
2.1 Electrical Tests			
2.1.1	Short Circuit test (Test ID:ICAT/EEL /171349/01) Date of Test : 11.01.2024	 <p>Battery Pack Condition: Battery pack fully charged (100% SOC), contained at ambient temperature. Apply a hard short in less than one second to the battery with a conductor specified in the standard. Test Duration: 10 minutes, or until another condition occurs which prevents completion of test (i.e. component melting, etc.) Lab temperature: Not exceeding 30°C Acceptance Criteria: After 2 hours of observation: At the end of the test, there shall be no: a) Physical damage to the casing or mechanical parts. b) Melting of components. c) Fire or explosion. It is acceptable for the battery to become dry at the end of the test.</p>	Ambient temperature : 27°C Conductor of $\leq 5m\Omega$ was used and short was applied for 10 minutes. No physical damage, explosion or melting observed. Satisfactory.

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2.1.2	<p>Over Charge test (Test ID: ICAT/ EEL /171349/02) Date of Test : 08.02.2024</p>	 <p>Battery Pack Condition : Battery Pack fully charged (100% SOC), contained at ambient temperature at 27±5°C. Duration: 10 hours The battery is to be overcharged at a constant charging current of 0.1 (C₁₀).</p> <p>Acceptance Criteria: At the end of the test, there shall be no: a) Physical damage to the casing or other mechanical parts. b) Melting of components. c) Fire or explosion.</p>	<p>Battery was charged with 12A for 10 hours.</p> <p>No physical damage, melting or explosion observed.</p> <p>Satisfactory</p>
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2.2	Mechanical Tests		
2.2.1	<p>Vibration test (Test ID: ICAT/EEL /171349/06) Date of test: 21.02.2024</p>	 <p>Battery Pack Condition: Battery pack fully charged (100% SOC), contained at ambient temperature, firmly held on the vibration table in vehicle mounting position. Vibration test will be carried out in three-axis viz. in the vertical axis, horizontal axis and battery positioned in longitudinal direction. Acceleration: 3 g (sinusoidal vibration) Frequency: 30-150 Hz Sweep rate: 1 octave per minute Duration: 2 hours in each axis Immediately after the test, discharge the battery at room temperature not exceeding 30°C, at the rate of I = 0.2 x Battery capacity(C₅)</p> <p>Acceptance Criteria: During test, there shall be no electrolyte loss. The deterioration of battery rated capacity during discharging shall not be more than 10%. At the end of the test, there shall be no: a) Physical damage to the casing or other mechanical parts b) Fire or explosion</p>	<p>No electrolyte loss observed during test. Immediately after the test, Battery Pack was discharged at 21.6A and deterioration observed was not more than 10%.</p> <p>No physical damage or explosion observed.</p> <p>Satisfactory</p>



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तिथि /Date 27.02.2024

<p>2.2.2</p>	<p>Shock test (Test ID: ICAT/ EEL /171349/04) Date of Test : 09.02.2024</p>	 <p>Battery Pack Condition: Battery pack fully charged (100% SOC), contained at ambient temperature not exceeding 30°C, firmly held on the vibration table in vehicle mounting position. Shock test will be carried out in three-axis viz. in the vertical axis, horizontal axis and battery positioned in longitudinal direction. Acceleration: 30 g (half-sine wave) No. of shocks: 10 in each axis Duration: 15 ms of each shock Immediately after the test, discharge the battery at room temperature, at the rate of $I = 0.2 \times \text{Battery capacity}(C_5)$</p> <p>Acceptance Criteria: The deterioration of battery rated capacity during discharging shall not be more than 10%. At the end of the test, there shall be no: a) Physical damage to the casing or other mechanical parts b) Fire or explosion.</p>	<p>Immediately after the test, Battery Pack was discharged at 21.6A and deterioration observed was not more than 10%.</p> <p>No physical damage or explosion observed.</p> <p>Satisfactory.</p>
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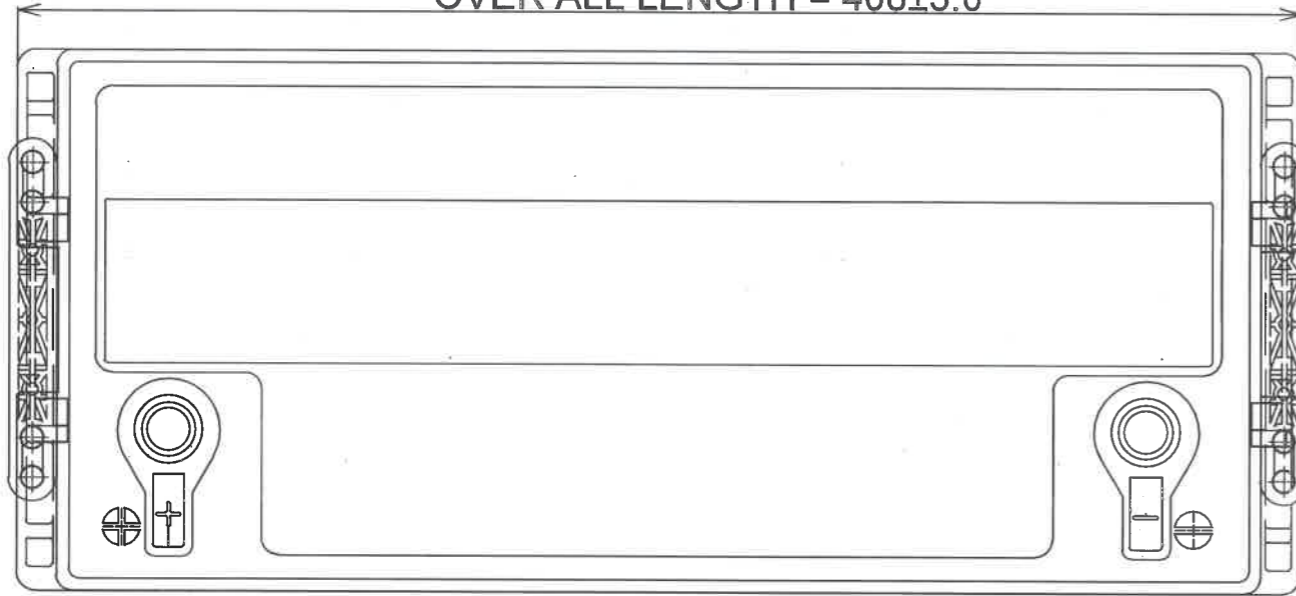
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<p>2.2.3</p>	<p>Roll-Over Test (Test ID:ICAT/ EEL /171349/01) Date of test : 12.01.2024</p>	 <p>Rotate the Battery Pack one complete revolution in one direction, for one minute in a continuous, slow-roll fashion, and observe leakage, if any. Then rotate the battery pack in 90° increments in same direction for one full revolution. Hold the battery module for one hour at each position. Acceptance Criteria: The volume of electrolyte spilled in each position shall not be more than 25 ml per module.</p>	<p>The volume of electrolyte spilled in each position is less than 25 ml per module</p> <p>Satisfactory</p>
<p>2.2.4</p>	<p>Penetration Test (Test ID:ICAT/ EEL /171349/05) Date of Test : 09.02.2024</p>	 <p>The Battery Pack shall be penetrated with a mild steel (conductive) pointed rod, which will be electrically insulated from the test fixture. The test will be carried out with 100% SOC of the Battery pack . Rate of penetration: 8 cm/s. Diameter of Rod: 3mm/20mm Orientation of penetration: perpendicular to the electrode plates. Minimum Depth of penetration: Through cells or 100 mm. The Battery pack should be observed, with the rod remaining in place, for a minimum of one hour after the test. Acceptance Criteria: At the end of the test, there shall be no: a) Melting of components. b) Fire or explosion..</p>	<p>After penetration, up to a depth through Battery Pack with a pointed mild steel rod of diameter 20mm, electrically insulated from the test fixture, no explosion, no fire and no melting observed.</p> <p>Satisfactory</p>

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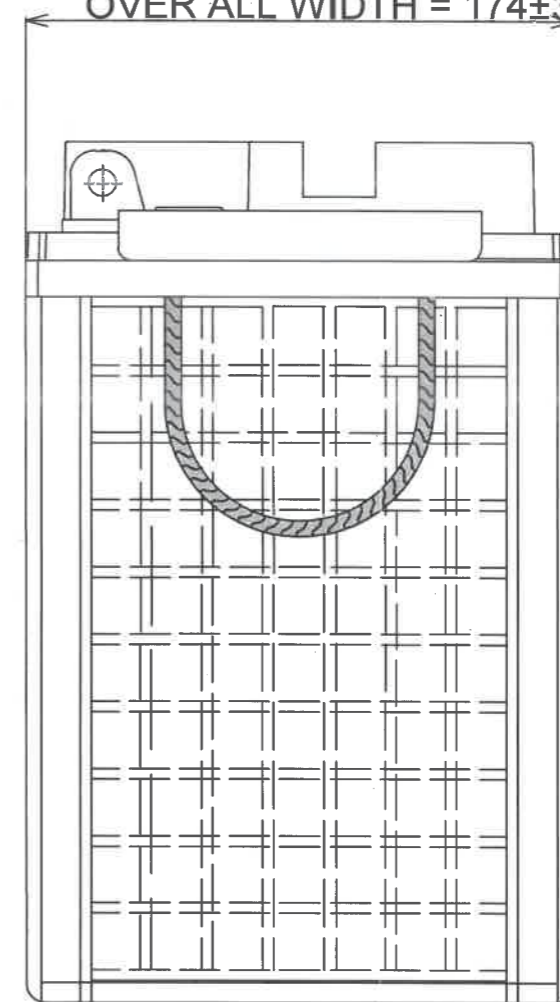
MARK	REV.NO.	DESCRIPTION	REVISED BY	DATE
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OVER ALL LENGTH = 408±3.0



- NOTE:-
 CONTAINER MATERIAL : POLYPROPYLENE
 1. TYPE OF BATTERY : LEAD ACID BATTERY -TUBULAR
 2. NOMINAL VOLTAGE : 12
 3. CAPACITY (Ah) : 135Ah@C20 CORRECTED AT 30°C
 4. TERMINAL POLARITY : RIGHT
 5. SUITABLE APPLICATION : ELECTRIC VEHICLE

OVER ALL WIDTH = 174±3.0



OVER ALL HEIGHT = 274±3.0

HEIGHT UPTO TERMINAL = 271±3.0

DESIGN	DRAWN	CHECKED	APPROVED	DATE	SCALE	PART MATL./MATL.CODE	DESCRIPTION	WEIGHT	OKAYA POWER LTD		
NARINDER	SANDEEP	RAJESH	M.SHETTY	29-02-24	1:1	---	SEE NOTE	---	D-7, UDYOG NAGAR, ROHTAK ROAD NEW DELHI		
UNSPECIFIED TOLERANCE						SPECIFICATION .NO. SP.MS.-1840-A		REVISION 00		DRG.NO. DW-1581-A	SHEET 01 OF 01
UNDER 4	±0.15		UNSPECIFIED DRAFT ANGLE 15°~30°		PART NAME. FINISHED BATTERY FOR OPERT 15012						
OVER 4 UNDER 16	±0.2		UNSPECIFIED RADIUS 0.2								
OVER 16 UNDER 63	±0.3		ALL DIMENSIONS ARE IN mm								
OVER 63 UNDER 250	±0.5		IF IN DOUBT PLEASE ASK								
OVER 250	±0.8		DO NOT SCALE THE DRG.								
ANGLE	±0.5°										