

INTERNATIONAL CENTRE FOR AUTOMOTIVE TECHNOLOGY
 [A Division of NATRiP Implementation Society (NATIS), Govt. of India]

Non-Transferable

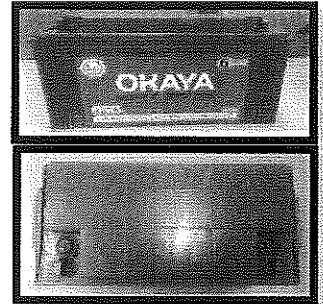
TEST REPORT

C T O B M 5 0 8 5





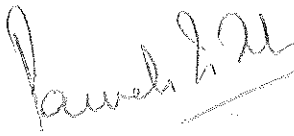
Date: 30.03.2017

- 1.0 **NAME AND ADDRESS OF THE CUSTOMER:** M/s. OKAYA POWER PVT.LTD,
D-7,Udyog Nagar, Rohtak Road, New Delhi 110041
- 2.0 **NAME AND ADDRESS OF THE MANUFACTURER:** M/s. Fujikawa Power
vill. Handa kundi,Tenhsil Nalagarh, Distt.Solan,Himachal
Pardesh
- 3.0 **CUSTOMER LETTER REF:** IOCS No. CCTNOKAYMBEEG49952 Dated 13-Feb-2017

- 4.0 **DESCRIPTION OF DEVICE UNDER TEST (DUT):**
 DUT Name : Battery Module, 12 V
 Battery Type : Lead Acid Battery
 Battery Capacity(Ah) : 100 Ah (Ah in 5 hrs)
 Id/Model No. : OW ER 125T
 Quantity : 06 Nos.(ICAT/CNG-LPG/49952/01-06)
 Trade Name : Okaya
 Drawing No. : DW-812-00






- 5.0 **OBJECTIVE OF THE TEST:** To validate the Safety Requirements of Traction Batteries as per AIS: 048 published in 2009.
- 6.0 **TEST RESULTS:** Innovation • Service • Excellence
Please refer the Test requirements and Results in **Annexure-I** of this report.
- 7.0 **CONCLUSION:**
The battery specified in **Sr. No. 4.0** of this test report met all the test requirements when tested as per AIS: 048 published in March 2009.

Prepared By	Checked By		Approved By	 Page 1 of 7 + Dwg (1) [49952]
 UDIT KAUL Asst. Manager	 MAHENDAR PAL Sr. Manager		 PAMELA TIKKU Sr. General Manager	

DISCLAIMER

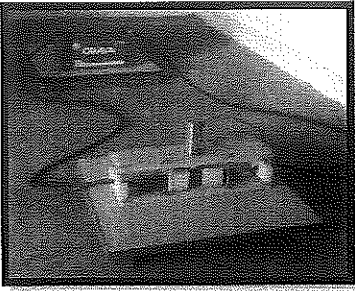
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2. ICAT issues Test reports/ Extension reports/ Developmental Reports in compliance to Motor Vehicle Act/ Central Motor Vehicle Rules and their provisions as amended from time to time or any other statutory orders under which ICAT is authorized. Other Rules/Acts are outside the purview/scope of the Test reports/Extension reports/ Developmental test reports
3. Test(s) on prototype/ vehicle(s)/ sample(s) is/are carried out on the basis of standard procedures as notified under specific rules/ requested by the applicant. Results of such tests are property of bearer of Test Reports/ Extension Reports / Developmental test reports. These results cannot be disclosed unless specifically so ordered by Government, Court, etc
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8. Further, ICAT has the right, but not under obligation to initiate cancellation / withdrawal of the Test report/Extension/ Developmental test report is/are issued, in case of any fraud, misrepresentation, when it surfaces and comes in the knowledge of ICAT
9. No extract, abridgment or abstraction from this test report may be published or used to advertise the product without the written consent of the Director, ICAT, who reserves the absolute right to agree or reject all or any of the details of any items of publicity for which consent may be sought
10. The appropriate local court at Gurgaon shall have the jurisdiction in respect of any dispute, claim or liability arising out of this report.




Innovation • Service • Excellence


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UDIT KAUL Asst. Manager		MAHENDAR PAL Sr. Manager	




Annexure – I

1.0 TEST REQUIREMENTS AND RESULTS:


Cl. No.	Test	Test Requirements	Observations/Results
2.1 Electrical Tests			
2.1.1	<p>Short Circuit test (Test ID:ICAT/CNG-LPG/49952/01)</p>	 <p>Battery Condition: Fully charged (100% SOC), contained at ambient temperature. Apply a hard short in less than one second to the battery module 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</p> <p>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>	<p>Ambient temperature : 25°C</p> <p>Conductor of ≤ 5mΩ was used and short was applied for 10 minutes.</p> <p>No physical damage, explosion or melting observed.</p> <p>Satisfactory.</p>




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UDIT KAUL Asst. Manager		MAHENDAR PAL Sr. Manager	

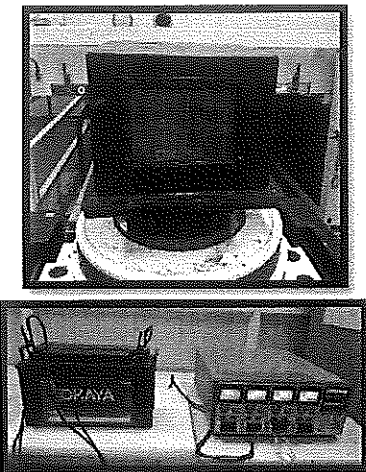
<p>2.1.2</p>	<p>Over Charge test (Test ID:ICAT/ CNG-LPG/49952/02)</p>	 <p>Battery Condition: Fully charged (100% SOC), contained at ambient temperature at $27\pm 5^{\circ}\text{C}$. Duration: 10 hours The battery is to be overcharged at a constant charging current of 0.1 (C_{10}).</p> <p>Acceptance Criteria: 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 11.12 A for 10 hours.</p> <p>No physical damage, melting or explosion observed.</p> <p>Satisfactory.</p>
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<p>UDIT KAUL Asst. Manager</p>		<p>MAHENDAR PAL Sr. Manager</p>	



2.2 Mechanical Tests


<p>2.2.1</p>	<p>Vibration test (Test ID: ICAT/ CNG-LPG/49952/03)</p>	 <p>Battery Condition: Fully charged (100% SOC), contained at ambient temperature, firmly held on the vibration table in vehicle mounting position. Axis: Vertical and Horizontal axis, with 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 $I = 0.2 \times \text{Battery capacity}(C_5)$</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.</p> <p>Immediately after the test, battery was discharged at 20.0A And deterioration observed was not more than 10%.</p> <p>No physical damage or explosion observed.</p> <p>Satisfactory.</p>
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<p>UDIT KAUL Asst. Manager</p>		<p>MAHENDAR PAL Sr. Manager</p>	

2.2.2	<p>Shock test (Test ID: ICAT/CNG-LPG/49952/04)</p>	 <p>Battery Condition: Fully charged (100% SOC), contained at ambient temperature not exceeding 30°C, firmly held on the vibration table in vehicle mounting position. Axis: Vertical and Horizontal axis, with 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 $I = 0.2 \times \text{Battery capacity}(C_5)$ 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 was discharged at 20.0A and deterioration observed was not more than 10%.</p> <p>No physical damage or explosion observed.</p> <p>Satisfactory.</p>
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UDIT KAUL Asst. Manager		MAHENDAR PAL Sr. Manager	

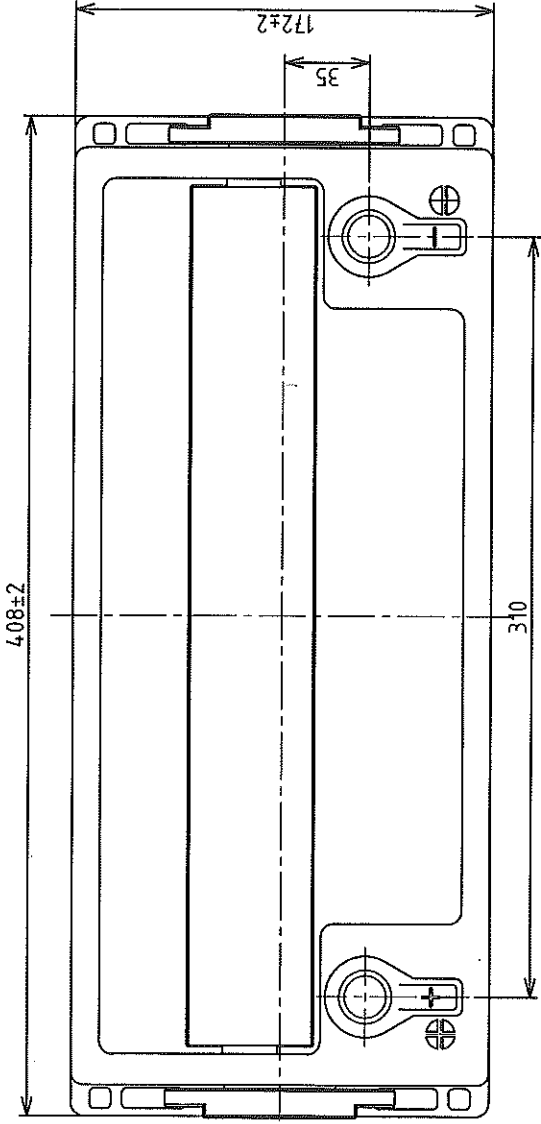
<p>2.2.3</p>	<p>Roll-Over Test (Battery Module) (Test ID: ICAT/CNG-LPG/49952/05)</p>	 <p>Rotate the battery module one complete revolution in one direction, for one minute in a continuous, slow-roll fashion, and observe leakage, if any. Then rotate the battery module in 90° increments in same direction for one full revolution. Hold the battery module for one hour at each position.</p> <p>Acceptance Criteria: The volume of electrolyte spilled in each position shall not be more than 25 ml per module.</p>	<p>Spillage observed was less than 25ml in each position.</p> <p>Satisfactory.</p>
<p>2.2.4</p>	<p>Penetration Test (Test ID: ICAT/CNG-LPG/49952/06)</p>	 <p>The battery module shall be penetrated with a mild steel (conductive) pointed rod, which will be electrically insulated from the test fixture. Rate of penetration: 8 cm/s. Diameter of Rod: 20mm Orientation of penetration: perpendicular to the electrode plates. Minimum Depth of penetration: Through three cells or 100 mm The battery should be observed, with the rod remaining in place, for a minimum of one hour after the test.</p> <p>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 three cells 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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<p><i>UDIT KAUL</i> Asst. Manager</p>		<p><i>MAHENDAR PAL</i> Sr. Manager</p>	

Test report no:- CTOBM5085

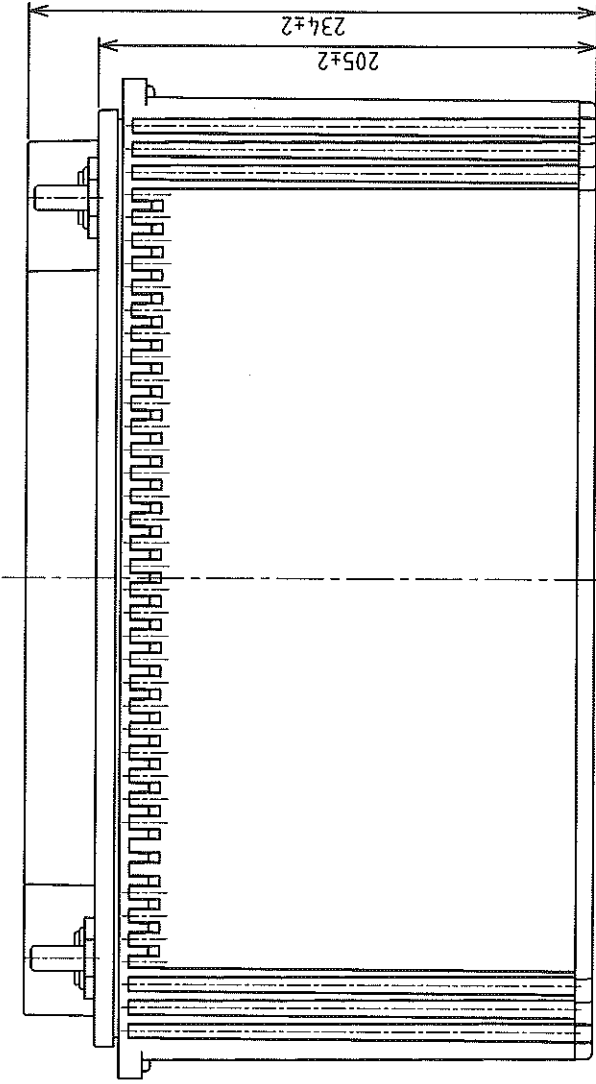
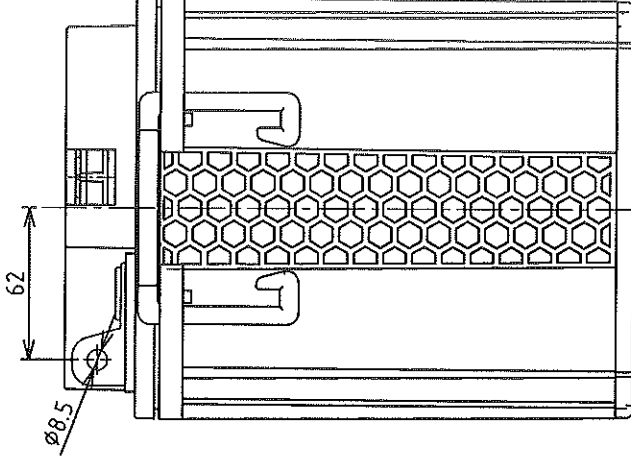
Dated:- 30.03.2017

MARK	REV. NO	DESCRIPTION	REVISED BY	DATE
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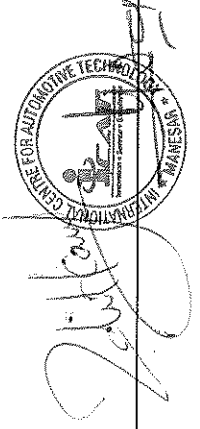


NOTE:

1. CONTAINER MATERIAL : POLYPROPYLENE.
2. TYPE OF BATTERY: LEAD ACID BATTERY-TUBULAR.
3. NOMINAL VOLTAGE : 12 Volt.
4. CAPACITY (AH) : 100Ah @ C5 CORRECTED AT 30°C.
5. DRY WEIGHT (±3% Kg) : 22 Kg.
6. NET WEIGHT-ACID FILLED (±3% Kg) : 31 Kg.
7. ELECTROLYTE VOL. (APPROX) : -8 Ltr.
8. TERMINAL POLARITY: RIGHT.
9. SUITABLE APPLICATION: ELECTRIC VEHICLE.
10. BATTERY DIMENSION (mm): LENGTH: 408 ± 2 mm
 WIDTH: 172 ± 2 mm
 HEIGHT: 205 ± 2 mm
 TOTAL HEIGHT: 234 ± 2 mm



DESIGN	DRAWN	CHECKED	APPROVED	DATE	SCALE	PART MATL.	DESCRIPTION	PART WEIGHT	FUJIKAWA POWER
DARVEH	DARVEH			18.12.2016	1:1	P.P.C.P.	100AH@C5	SEE NOTE	JHANDAKUNDI,NALAGARI
UNSPECIFIED TOLERANCE					REVISION				
UNSPECIFIED DRAFT ANGLE 15°-30°					SPECIFICATION NO.				
UNSPECIFIED RADIUS 0.2					REVISION				
ALL DIMENSIONS ARE IN MM					SP. MS - 1069				
IF IN DOUBT PLEASE ASK					PART NAME				
DO NOT SCALE THE DRG.					E-Rickshaw Battery				
SHEET					DRG NO.				
1/01					DW-812-00				
1/01					SHEET				
					01 OF 01				



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