सीएसआईआर - केंद्रीयविद्युतरसायनअनुसंधान संस्थान
CSIR - Central Electrochemical Research Institute
कारैकुडी /Karaikudi -630003
CSIR-Battery Performance Testing and Evaluation Centre
☎ 04565-241423 ✉ director@cecri.res.in 🌐 www.cecri.res.in

Dated: 14.09.2022	Report No: CSIRBPTEC/Mesha/060/01/2022	Customer Specification

Manufacturer	: Mesha Energy Solutions Pvt. Ltd., Yeshvanthpur, Bangalore Bangalore -560022
Test item	: *12 V 200 Ah power battery with META incorporated*
Identification	: *NA* Serial No : NA
Receipt No.: NA	Date of receipt : 05.04.2022
Testing laboratory and its address:	Battery Performance Testing and Evaluation Centre *CSIR-Central Electrochemical Research Institute* *Karaikudi 630 003, Tamilnadu.* *India*
Test specification:	**Customer specification**
Test Result:	*The test item passed / failed the test specification(s).*
Other Aspects:	*Nil*
This test report relates to the test sample submitted.	

Tested by:	Approved by / Authorized Signatory:	Issued by:
P. Seenichamy	Sundar Mayavan	Sundar Mayavan
Date: 14/09/2022	Date: 14/9/2022	Date: 14/9/2022

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TEST REPORT

Report No .....:	**CSIR-BPTEC/Mesha/060/01/2022**
Date of issue ..... :	14.09.2022
Total number of pages .....:	7
Testing Laboratory .....:	**Battery Performance Testing and Evaluation Centre**
Address .....:	CSIR- Central Electrochemical Research Institute Karaikudi – 630 003, Tamilnadu, India
Manufacturer's name .....:	**Mesha Energy Solutions Pvt. Ltd.,**
Address	Mesha Energy Solutions Pvt. Ltd., Yeshvanthpur, Bangalore Bangalore -560022.
Test specification:	
Standard..... :	Customer specification
Test procedure ..... :	Compliance Report
Non-standard test method.....	N/A
Test Report Form No..... :	NA
Test Report Form(s) Originator :	NA
Master TRF..... ... :	NA
Test item description .....:	12 V 200 Ah power battery with META incorporated
Trade Mark..... :	NA
Model/Type reference .....:	NA
Ratings .....:	12 V/ 200Ah
Other Documents submitted.....:	*NA*

Tested by:	**Approved by / Authorized Signatory:**	**Issued by:**
P. Seenichamy	Sundar Mayavan	Sundar Mayavan
Date: 11/09/2022	**Date:** 14/9/22	**Date:** 14/9/22

Dated: 14.09.2022	Report No: CSIRBPTEC/Mesha/060/01/2022	Customer Specification

TEST SUMMARY:

Description	Measurement/ testing	Page No.
UPS Simulation	Test protocol provided by the customer: •Charging: In the CCCV mode at 30A (C/6.7) and change to 60A (C/3.33) •Discharge: Load profile based on loads representing, lights, fans, refrigerator, and mixer.	6

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Table – List of Attachments		
Attachment No.	**Attachment Description**	**No. of pages in Attachment**
NA		

General remarks:

The test results presented in this report relate only to the object tested.

This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.

Test item particulars ..... .:

Classification of installation and use..... :

Connection to the mains..... :

Possible test case verdicts:

- test case does not apply to the test object ..... : N/A
- test object does meet the requirement ..... : P (Pass)
- test object does not meet the requirement .....: F (Fail)

Testing..... :

Date of receipt of test item .....: 24.06.2019

Date(s) of performance of tests..... :

Laboratory conditions ..... :

Ambient Temperature..... : 27 ^{0}C

Ambient Humidity ..... : 50-60 %

Dated: 14.09.2022	Report No: CSIRBPTEC/Mesha/060/01/2022	Customer Specification

General product information:

1) Application details / Description of the product: Test protocol for UPS load simulation with 12V, 200Ah tubular flooded lead acid battery

2) Differences between the models: NA

Model No. tested with-in the family series: NA

Family Series Model No.s: NA

3) Options:

The equipment was tested without any optional accessory installed. Hence, this report does not cover parameters that are influenced by the installation of optional accessory that might affect safety in the meaning of this standard.

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Dated: 14.09.2022 | Report No: CSIRBPTEC/Mesha/060/01/2022 | Customer Specification

Cl. No.	Test / Requirement name	Test result/ observation	Verdict
1	Test Method		
	UPS simulation *(as per **customer specification**)*		

1. Test specifications

1. Charging mode:

a. CC-CV Mode

b. Maximum Voltage: 15V

c. CC Mode Current: 30A

d. Charging duration: 7 Hours, Indication is the minimum constant current would be close to 7.5A.

2. Discharging mode: As per load profile given below, Cut-off voltage 10.5 V

Time duration for each segment	Current	cumulative time
13mimutes	15A	13m
18minutes	24A	31m
6minutes	34A	37m
3seconds	60A	37m3s
57seconds	53A	38m
1minute	34A	39m
3seconds	60A	39m3s
57seconds	53A	40m
1minute	34A	41m
3seconds	60A	41m3s
57seconds	53A	42m
1minute	34A	43m
3seconds	60A	43m3s
57seconds	53A	44m
1minute	34A	45m
3seconds	60A	45m3s
57seconds	53A	46m
1minute	34A	47m
3seconds	60A	47m3s
57seconds	53A	48m
1minute	34A	49m
3seconds	70A	49m3s
57seconds	63A	50m
1minute	44A	51m
3seconds	70A	51m3s
57seconds	63A	52m
1minute	44A	53m

3seconds	70A	53m3s	
57seconds	63A	54m	
1minute	44A	55m	
3seconds	70A	55m3s	
57seconds	63A	56m	
1minute	44A	57m	
3seconds	70A	57m3s	
57seconds	63A	58m	
1minute	44A	59m	
3seconds	70A	59m3s	
57seconds	63A	60m	
15minute	44A	75m	
15minutes	34A	90m	
30minutes	44A	120m	
15minutes	34A	135m	
20minutes	44A	155m	
15minutes	34A	170m	
20minutes	44A	190m	
Till 10.5V Cut off	34A	190 minutes to 10.5V cut off	

During simulation run, cycle is repeated till the battery cut-off voltage is 10.5 V. After discharge the battery is charged for continuous cycles.

1.1 **Observation**

- The 12V/200 Ah battery has completed 250 cycles (as per discharge load profile supplied by the customer).
- The average Ah input during charge is between 168-175 Ah over a period of 250 cycles.
- The average Ah output during discharge is between 147-155 Ah over a period of 250 cycles.
- The battery shows fairly stable discharge and charge characteristics over a test period of 250 cycles. Table 1 shows the charge input and discharge output at various cycles.

Cycle	Charge Input (Ah)	Discharge output (Ah)
1	175	147
50	170	157
100	168	152
150	168	148
200	172	153
250	170	155

Table 1: Table shows the charge input and discharge output at various cycles.

---------END OF THE TEST REPORT---------