



केन्द्रीय विद्युत अनुसंधान संस्थान

(भारत सरकार की सोसाइटी, विद्युत मंत्रालय)

प्रो सर सी. वी. रामन रोड, सदाशिवनगर डाक घर, पो. बा. सं. 8066, बेंगलूर - 560 080

CENTRAL POWER RESEARCH INSTITUTE

(A Govt of India Society under Min. of Power)

Prof. Sir C.V. Raman Road, Sadashivanagar P.O., P.B. No. 8066, Bangalore - 560 080, India

वेबसाइट/website : <http://www.cpri.in>

ENERGY EFFICIENCY AND RENEWABLE ENERGY DIVISION

Phone/Tele fax: 080-22702165 email: sudhir@cpri.in

CPRI/ERED/INV/REP/T0104

24/09/2018.

To,

M/s System Level Solutions (INDIA) Pvt. Ltd.,
Plot No: 32, Zone D-4 Phase 1, G.I.D.C. Estate,
Vithal Udyognagar - 388 121, Anand, Gujarat

Dear Sir,

Please find the enclosed test report for the following:

1.5 kW Grid Tied Micro String Solar Inverter as per IEC 60068-2-30: 2005, IEC 60068-2-14: 2009, IEC 60068-2-1: 2007, IEC 60068-2-2:2007- 1 No.

Please acknowledge the receipt of the test report. Thank you for utilizing our services.

Corrections, if any, in the report may please be brought to our notice within 45 days from the date of issue of the report.

Kindly make arrangement to take back the equipment tested within 15 days, failing which the same will be disposed of.

Thanking you,

Yours Sincerely,

(R. Sudhir Kumar)
Head of Division

CENTRAL POWER RESEARCH INSTITUTE

TEST REPORT



CPRI

Test Report Number: CPRIBLRERED18T0104

Date: 24.09.2018

Name and address of the Customer : M/s System Level Solutions (India) Pvt. Ltd.,
Plot No. 32, Zone D-4 Phase 1, G.I.D.C Estate,
Vithul Udyognagar, Anand, Gujarat - 388121

Name & Address of the Manufacturer : M/s System Level Solutions (India) Pvt. Ltd.,
Plot No. 32, Zone D-4 Phase 1, G.I.D.C Estate,
Vithul Udyognagar, Anand, Gujarat - 388121

Particulars of the sample tested : 1.5 kW Solar grid tied inverter
Condition of the sample on receipt : Physical condition is good
Type : Utility interactive type
Description of test sample : 1.5 kW Micro string solar inverter
Serial Number : 1114A4050125
Number of samples tested : One
Date(s) of test(s) : 11/07/2018 to 10/09/2018
CPRI Sample Code No(s) : ERED1819S0183

Particulars of the test conducted : Environmental tests as per standards
IEC 60068-2-30: 2005, IEC 60068-2-14: 2009
IEC 60068-2-1: 2007, IEC 60068-2-2: 2007

Test accordance with Standard/specification : IEC 60068-2-30: 2005, IEC 60068-2-14: 2009
IEC 60068-2-1: 2007, IEC 60068-2-2: 2007

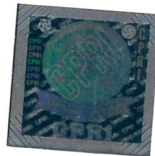
Sampling Plan : NA
Customer's Requirement : Environmental tests as per standards
IEC 60068-2-30: 2005, IEC 60068-2-14: 2009
IEC 60068-2-1: 2007, IEC 60068-2-2: 2007

Deviation if any : Nil
Name of the witnessing persons : Nil


Customer Representative : Nil
Other than Customer Representative : Nil
Test subcontracted with : Nil
Address of the laboratory : Nil

Documents constituting this report (in words)

Number of sheets : Ten
Number of oscillograms : Nil
Number of graphs : Four
Number of photos : Three
Number of test circuit diagrams : Nil
Number of drawings : Nil




(K. Jeykishan Kumar)
Test Engineer


(R. Sudhir Kumar)
Head of Division
Approved By

CENTRAL POWER RESEARCH INSTITUTE

TEST REPORT



CPRI

Test Report Number: CPRI BLRERED18T0104

Date: 24.09.2018

1. Description of the Power Conditioning Unit (As per manufacturer)

Sl. No.	Particulars	Details
1	Model	MSI 1500
2	Power rating	1.5 kW
3	Input voltage range (DC)	22V – 55V DC, 48.75V nominal
4	Input Current range (DC)	40 A
5	Dimension	32.2 cm x 27.8 cm x 8.0 cm (WxHxD)
6	Weight	7.5 Kg

2. Particulars of environmental test conducted

1	Cold test IEC 60068-2-1: 2007	Cold test as per IEC 60068-2-1: 2007 Test Ab Cl. 5.2 & Cl. 6.0 -10 °C ± 2 °C for 2 hours No. of cycles : One
2	Dry Heat Test IEC 60068-2-2: 2007	Dry Heat Test as per IEC 60068-2-2: 2007 Test Bb Cl. 5.2 & Cl. 6.0 + 55 °C ± 2 °C for 2 hours No. of cycles : One
3	Change of temperature test IEC 60068-2-14: 2009	Change of temperature test – IEC 60068-2-14: 2009. Test Nb Cl. 8. 0 -10 °C ± 2 °C for 3 hour & +55 °C ± 2 °C for 3 hour No. of cycles : Five
4	Damp Heat Cyclic Test IEC 60068-2-30: 2005	Damp Heat Cyclic Test (12 h+12 h cycle) IEC 60068-2-30: 2005 Test Db Cl. 7.3 25 °C to 55 °C ± 2 °C variant-1 (12 h + 12 h cycle) No. of cycles : One

Jeykishan
24/09/18

(K. Jeykishan Kumar)
Test Engineer

CENTRAL POWER RESEARCH INSTITUTE

TEST REPORT



Test Report Number: CPRIBLRERED18T0104

Date: 24.09.2018

TEST RESULTS

The test sample was mounted in the working space of environmental test chamber at ambient temperature. A view of the test sample is as shown in Photographs

1. COLD TEST

(As per IEC 60068- 2-1 Ed.6.0 B: 2007 Test Ab Cl. 5.2 & Cl. 6).

The test sample was mounted within the working space in environmental test chamber at ambient temperature.

1	Examination before Environmental Conditioning	
1.1	Physical Damages	EUT in good condition at the beginning of the test
1.2	EUT Working Condition	EUT was working fine before the cold test
2	Cold Test Specification	
Figure.01		
2.1	EUT Operating Condition	Powered OFF
2.2	Test Temperature	-10°C
2.3	Dwell Time	2 Hours
2.4	No of cycles	1 Cycle
3	Post Check :Examination after Environmental Conditioning	
3.1	Physical Damages	No physical damage observed
3.2	Functional test	Input voltage(DC) = 48.78 V Input current(DC) = 30.83 A
3.3	EUT Working Condition	EUT was working satisfactorily after the cold test

(Handwritten Signature)
24/09/18

(K. Jeykishan Kumar)
Test Engineer

CENTRAL POWER RESEARCH INSTITUTE

TEST REPORT



Test Report Number: CPRIBLRERED18T0104

Date: 24.09.2018

TEST RESULTS

2. DRY HEAT TEST

(As per IEC 60068-2-2 Ed.5.0 B: 2007 Test Bb Cl. 5.2 & Cl. 6.0)

The test sample was mounted within the working space in environmental test chamber at ambient temperature.

1	Examination before Environmental Conditioning	
1.1	Physical Damages	EUT in good condition at the beginning of the test
1.2	EUT Working Condition	EUT was working fine before the dry heat test
2	Dry Heat Test Specification	
Figure.02		
2.1	EUT Operating Condition	Powered OFF
2.2	Test Temperature	+55°C
2.3	Dwell Time	2 Hours
2.4	No of cycles	1 Cycle
3	After testing :Examination after Environmental Conditioning	
3.1	Physical Damages	No physical damage observed
3.2	Functional test	Input voltage(DC) = 48.72 V Input current(DC) = 0.055 A
3.3	EUT Working Condition	EUT was working satisfactorily after the Dry Heat test


 (K. Jeykishan Kumar)
 Test Engineer

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TEST RESULTS

3. CHANGE OF TEMPERATURE TEST

(As per IEC 60068- 2- 14 Ed. 6.0 B: 2009 Test Nb Cl. 8.0)

1	Examination before Environmental Conditioning	
1.1	Physical Damages	EUT in good condition at the beginning of the test
1.2	EUT Working Condition	EUT was working fine before the change of temperature test
2	Change of Temperature Test Specification	
Figure.03		
2.1	EUT Operating Condition	Powered OFF *
2.2	Test Temperature	Upper: +55°C Lower :-10°C
2.3	Dwell Time	3 hour at each temperature level
2.4	No of cycles	5 Cycles
3	Post Check :Examination after Environmental Conditioning	
3.1	Physical Damages	No physical damage observed
3.2	Functional test	Input voltage(DC) = 48.75 V Input current(DC) = 24.00 A
3.3	EUT Working Condition	EUT was working satisfactorily after the Change of Temperature test

K. Jeykishan
24/09/18
(K. Jeykishan Kumar)
Test Engineer

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TEST REPORT



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Date: 24.09.2018

TEST RESULTS

4. DAMP HEAT CYCLIC TEST

(As per IEC 60068 2-30 Ed.3.0 B: 2005 Variant 1)

1	Examination before Environmental Conditioning	
1.1	Physical Damages	EUT in good condition at the beginning of the test
1.2	EUT Working Condition	EUT was working fine before the damp heat cyclic test
2	Damp Heat Cyclic Test Specification	

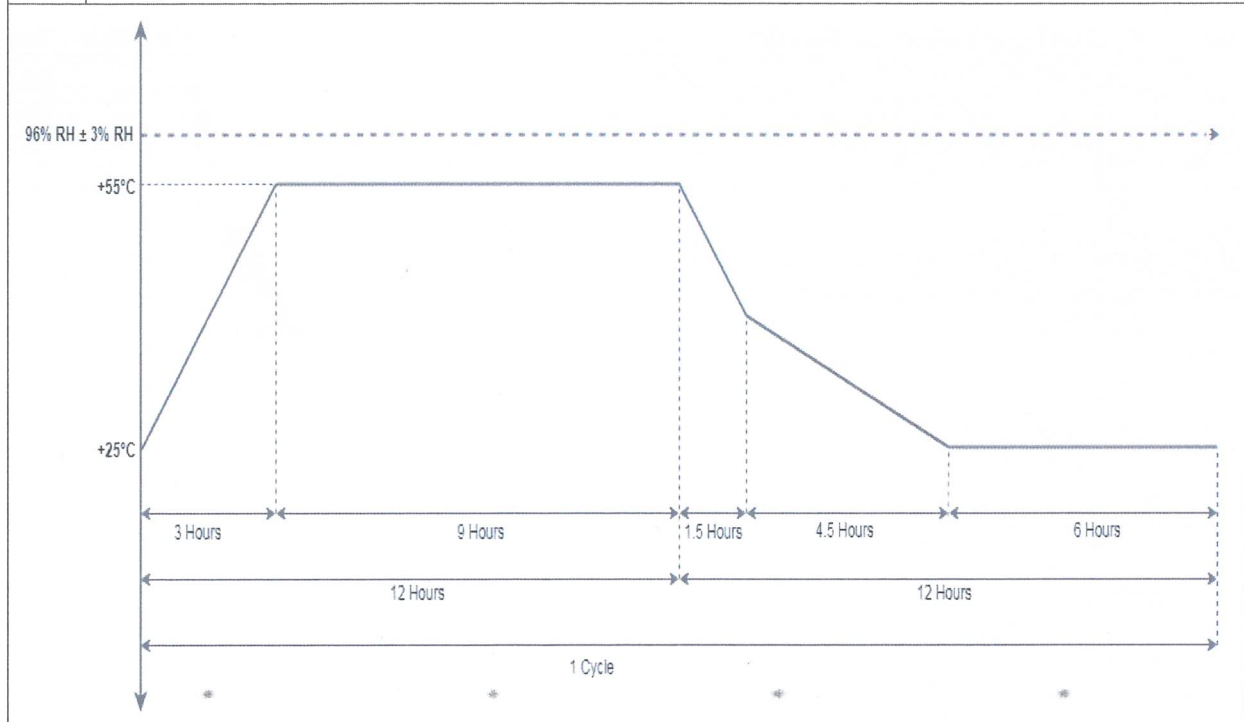


Figure.04

2.1	EUT Operating Condition	Powered OFF
2.2	Test Temperatures	+55°C and +25°C
2.3	One cycle duration	12 hours + 12 hours
2.4	No of cycles	1 Cycle
2.5	Total test duration	24 Hours
3	Examination after environmental conditioning	
3.1	Physical Damages	No physical damage observed
3.2	Functional test	Input voltage(DC) = 49.00 V Input current(DC) = 14.70 A
3.3	EUT Working Condition	EUT was working satisfactorily after the damp heat cyclic test

K. Jeykishan
24/09/18

(K. Jeykishan Kumar)
Test Engineer

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TEST REPORT

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Date: 24.09.2018



TEST RESULTS

5. INSULATION RESISTANCE TEST

Insulation Resistance test was conducted after the completion of the entire tests mentioned above with megger at a voltage of 500 V (DC).

Sl. No.	Test Description	Measured Values
1	Between shorted Inverter Terminals (shorted +ve and -ve) and grounded enclosure (Body)	> 10 GΩ

K. Jeykishan Kumar
24/09/18

(K. Jeykishan Kumar)
Test Engineer

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TEST REPORT



CPRI

Test Report Number: CPRI BLRERED18T0104

Date: 24.09.2018

Details of the equipment used for testing

1. Test chamber

1	Work Space	1m (H) x 1m (W) x 1m (D)
2	Temperature range	- 40 °C to 180 °C
3	Accuracy (Temp)	± 1.0 °C
4	Humidity Range	10 % RH to 98 % RH
5	Accuracy (RH)	±3 % RH
6	Air velocity inside the chamber	(0.85 to 1.00) m/s
7	Serial No.	KLS/0316/12-13
8	Model No.	KEW/EC-40
9	Calibration date	15.05.2018
10	Calibration due date	14.05.2019

2. Digital Anemometer

1	Make	PACER INSTRUMENTS
2	Model	DA 400
3	Serial No.	1014112
4	Calibration date	26.12.2017
5	Calibration due date	26.12.2018

J. Jeykishan
24/09/18

(K. Jeykishan Kumar)
Test Engineer

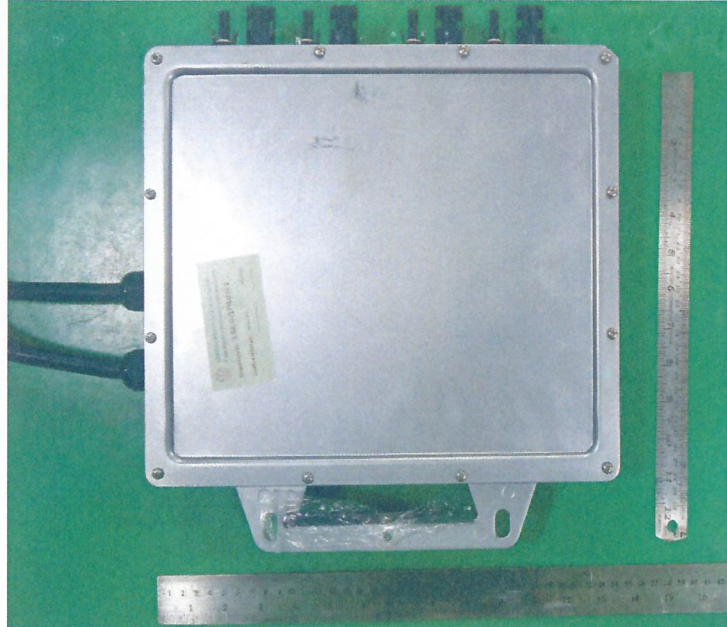
Test Report Number: CPRIBLRERED18T0104

Date: 24.09.2018

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Photos of the equipment under test

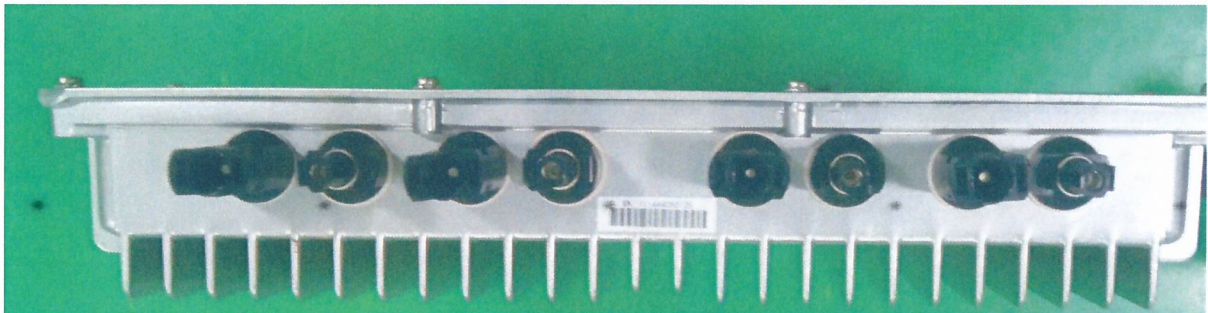
1.Top side view of inverter



2.Nameplate of inverter



3.Side view of inverter



Jeykishan
24/09/18
(K. Jeykishan Kumar)
Test Engineer

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TEST REPORT



CPRI

Test Report Number: CPRIBLRERED18T0104

Date: 24.09.2018

NOTE

- a) The test results are only for the Item tested.
- b) Publication or reproduction of the test report/certificate in any form other than by complete set of the whole test report/Certificate and the language written is not permitted without the written consent of CPRI.
- c) Any corrections/erasure invalidates the test report/certificate.
- d) NABL has accredited this laboratory as per ISO/IEC 17025-2005 standard, vide certificate no.TC-5452 (Relevant number of NABL certificate of accreditation for testing (Electrical) for the tests carried out.
- e) Any anomaly/discrepancy in the test report/certificate should be brought to the notice of CPRI within 45 days from the date of issue.

Jeykishan
24/09/18

(K. Jeykishan Kumar)
Test Engineer