TEST REPORT

REPORT NO.: 190502828RT-3

PRODUCT: Solar Grid-tied Inverter

RECEIVED: 2019.06.04

TESTED: 2019.06.04~2019.06.17

ISSUED: 2019.07.08

APPLICANT: EVOLVE ENERGY GROUP CO., LIMITED

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1 REGULATION

PRODUCT:	Solar Grid-tied Inverter
PART NO.:	EVVO 20000TLG23P, EVVO 25000TLG23P;EVVO 30000TLG23P,EVVO 33000TLG23P
MANUFACTURER:	EVOLVE ENERGY GROUP CO., LIMITED
APPLICANT:	EVOLVE ENERGY GROUP CO., LIMITED
TESTED:	2019.06.04~2019.06.17
STANDARDS:	IEC 60068-2-1:2007; IEC 60068-2-2:2007; IEC 60068-2-14:2009; IEC 60068-2-30:2005;IEC60529:2001

The above equipment has been tested by Bureau Veritas Consumer Products Services (Guangzhou) Co., Ltd，Science City Branch, The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's Reliability characteristics under the conditions specified in this report.

PREPARED BY : Mike Zhu , **DATE:** 2019.07.08

(Mike Zhu / Project Engineer)

VERIFIED BY : Jet Ruan , **DATE:** 2019.7.8

(Jet Ruan / Project Manager)

2 SUMMARY OF TEST RESULTS

TEST ITEMS	STANDARD	SAMPLE NO.	TEST RESULT
Low temperature test	IEC 60068-2-1:2007	GZ190604/001-Q04N01GZ84	Refer to section 4.4
High temperature test	IEC 60068-2-2:2007		Refer to section 5.4
Change of temperature test	IEC 60068-2-14:2009		Refer to section 6.4
Damp heat cyclic test	IEC 60068-2-30:2005		Refer to section 7.4
Protection of electrical equipment against foreign objects, water and access (IP65)	IEC60529:2001	GZ190604/001-Q04N04GZ84	Refer to section 8.4

3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	Solar Grid-tied Inverter
PART NO.	EVVO 20000TLG23P, EVVO 25000TLG23P;EVVO 30000TLG23P,EVVO 33000TLG23P

4 LOW TEMPERATURE TEST

Reference to: IEC 60068-2-1:2007

4.1 TEST SAMPLE NO. AND TEST DATE

Sample No.	GZ190604/001-Q04N01GZ84
Sample quantity	1 PCS
Test date	2019.06.04~2019.06.05

4.2 TEST CONDITIONS

Temperature:(-25±2)℃
Rate of temperature change:1℃/min
Test duration: 16h

4.1 TEST REQUIREMENTS

After test, the sample should no external physical damage.

4.2 TEST RESULT

Sample No.	Test result
GZ190604/001-Q04N01GZ84	After test, the sample no external physical damage.

4.3 TEST EQUIPMENTS

EQUIPMENT NAME	EQUIPMENT MODE	EQUIPMENT NO.	CALIBRATION DUE
Temperature (&humidity) chamber	SETH-Z-042U	BVGZ-RT-0030	2020.02.21

4.4 TEST PHOTO

Before test--sample

After test--sample

Test setup

5 HIGH TEMPERATURE TEST

Reference to: IEC 60068-2-2:2007

5.1 TEST SAMPLE NO. AND TEST DATE

Sample No.	GZ190604/001-Q04N01GZ84
Sample quantity	1 PCS
Test date	2019.06.05~2019.06.06

5.2 TEST CONDITIONS

Temperature:(60±2)℃
Rate of temperature change:1℃/min
Test duration: 16h
Recovery: 1h

5.3 TEST REQUIREMENTS

After test, the sample should no external physical damage.

5.4 TEST RESULT

Sample No.	Test result
GZ190604/001-Q04N01GZ84	After test, the sample no external physical damage.

5.5 TEST EQUIPMENTS

EQUIPMENT NAME	EQUIPMENT MODE	EQUIPMENT NO.	CALIBRATION DUE
Temperature(&humidity)chamber	SETH-Z-042U	BVGZ-RT-0030	2020.02.21

5.6 TEST PHOTO

Before test--sample

After test--sample

Test setup

6 CHANGE OF TEMPERATURE TEST

Reference to: IEC 60068-2-14:2009

6.1 TEST SAMPLE NO. AND TEST DATE

Sample No.	GZ190604/001-Q04N01GZ84
Sample quantity	1 PCS
Test date	2019.06.07

6.2 TEST CONDITIONS

Low temperature extreme:(-25±2)℃
high temperature extreme:(60±2)℃
Rate of temperature change:1℃/min
Dwell time: 3h for each temperature extremes
Number of cycles: 1 cycle

6.3 TEST REQUIREMENTS

After test, the sample should no external physical damage.

6.4 TEST RESULT

Sample No.	Test result
GZ190604/001-Q04N01GZ84	After test, the sample no external physical damage.

6.5 TEST EQUIPMENTS

EQUIPMENT NAME	EQUIPMENT MODE	EQUIPMENT NO.	CALIBRATION DUE
Temperature(&humidity)chamber	SETH-Z-042U	BVGZ-RT-0030	2020.02.21

6.6 TEST PHOTO

	
Before test--sample	After test--sample

Test setup

7 DAMP HEAT CYCLIC TEST

Reference to: IEC 60068-2-30:2005

7.1 TEST SAMPLE NO. AND TEST DATE

Sample No.	GZ190604/001-Q04N01GZ84
Sample quantity	1 PCS
Test date	2019.06.07~2019.06.08

7.2 TEST CONDITIONS

Temperature parameter and relative humidity according to figure 2a:

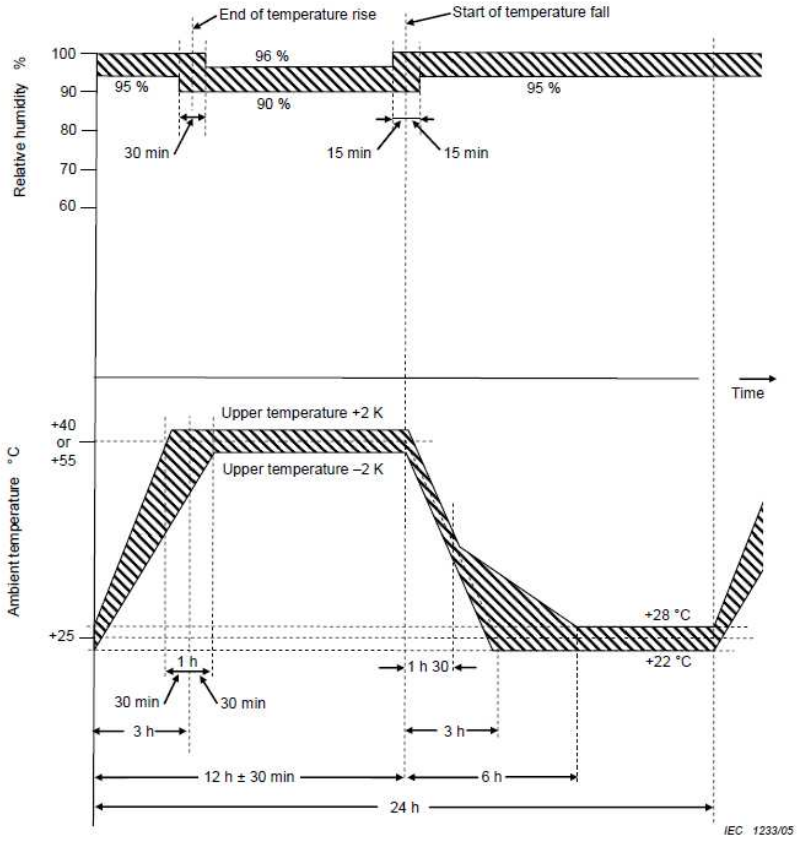


Figure 2a – Test Db – Test cycle – Variant 1

Upper temperature:55℃
Number of cycles: 1

7.3 TEST REQUIREMENTS

After test, the sample should no external physical damage.

7.4 TEST RESULT

Sample No.	Test result
GZ190604/001-Q04N01GZ84	After test, the sample no external physical damage.

7.5 TEST EQUIPMENTS

EQUIPMENT NAME	EQUIPMENT MODE	EQUIPMENT NO.	CALIBRATION DUE
Temperature(&humidity)chamber	SETH-Z-042U	BVGZ-RT-0030	2020.02.21

7.6 TEST PHOTO

Before test--sample

After test--sample

Test setup

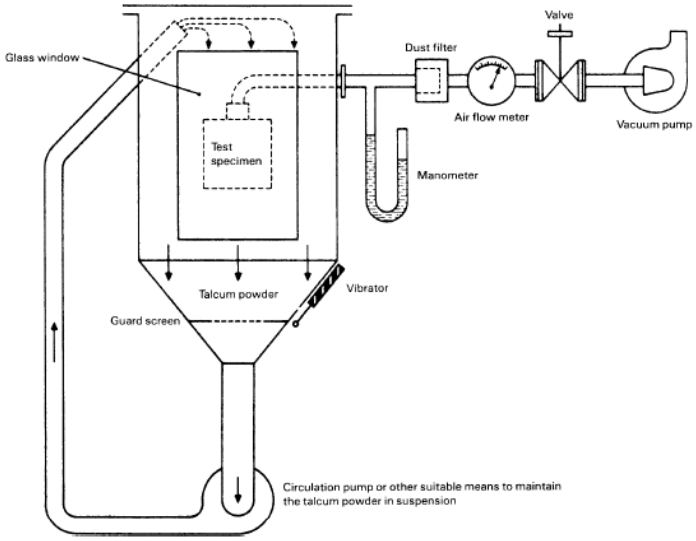
8 PROTECTION OF ELECTRICAL EQUIPMENT AGAINST FOREIGN OBJECTS, WATER AND ACCESS (IP65)

Reference to: IEC 60529:2001

8.1 TEST SAMPLE NO. AND TEST DATE

Sample No.	GZ190604/001-Q04N04GZ84;
Sample quantity	1 PCS
Test date	2019.06.11~2019.06.17

8.2 TEST CONDITIONS

Clauses	Title	Test Conditions
12.2	Test for first characteristic numeral 6 for protection against access to hazardous parts	The protection is satisfactory if the rigid steel rod $1.0^{+0.05}$mm diameter of the probe does not pass through any opening.
13.4	Test for first characteristic numeral 6 for protection against solid foreign objects	The test is made using a dust chamber incorporating the basic principles shown in below figure, whereby the power circulation pump to maintain the talcum powder in suspension in a closed test chamber, the amount of talcum powder to be used is 2 kg per cubic meter of the test chamber volume, the test period is 8 hours. 
14.2.5	Test for second characteristic numeral 5 for protection against water	Nozzles: 6.3 mm diameter, Distance: 2.5 m to 3 m, Water flow rate is 12.5 l/min±5%, Duration: 1min/m^2, at least 3min Water pressure:30kPa

8.3 TEST REQUIREMENTS

Clauses	Title	Test Requirements
12.2	Test for first characteristic numeral 6 for protection against access to hazardous parts	Test wire is not access to hazardous parts.
13.6.2	Test for first characteristic numeral 6 for protection against solid foreign objects	There is no dust be observed.
14.3	Test for second characteristic numeral 5 for protection against water	There is no water be observed.

8.4 TEST RESULT

Clauses	Title	Test Results
12.2	Test for first characteristic numeral 6 for protection against access to hazardous parts	Pass
13.6.2	Test for first characteristic numeral 6 for protection against solid foreign objects	Pass
14.3	Test for second characteristic numeral 5 for protection against water	Pass

8.5 TEST EQUIPMENTS

EQUIPMENT NAME	EQUIPMENT MODE	EQUIPMENT NO.	CALIBRATION DUE
Dust Resistance Test Chamber	CH-7139-CF-T	BVGZ-RT-0036	2019.06.13
IP1X dust test needle	IP1X	BVGZ-SAF-0102	2019.09.26
Spray test device	PS-2	BVGZ-SAF-0054	2020.04.25

8.6 TEST PHOTO

<table>
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<tr><td>Sample--Before test</td><td>Test setup—IP6X sample in the chamber</td></tr>
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<tr><td>During test—IP6X</td><td>Sample-- After IP6X test</td></tr>
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During test--IPX5	During test--IPX5
	
Sample-- After IPX5 test	After test—IP65

9 PHOTOGRAPHS OF DUT

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