



TEST REPORT

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PRODUCT: Solar Grid-tied Inverter

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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)

This report is for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence, provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents. Unless specific mention, the uncertainty of measurement has been explicitly taken into account to declare the compliance or non-compliance to the specification.

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)°C

Rate of temperature change:1°C/min

Test duration: 16h

4.1 TEST REQUIREMENTS

After test, the sample should no external physical damage.

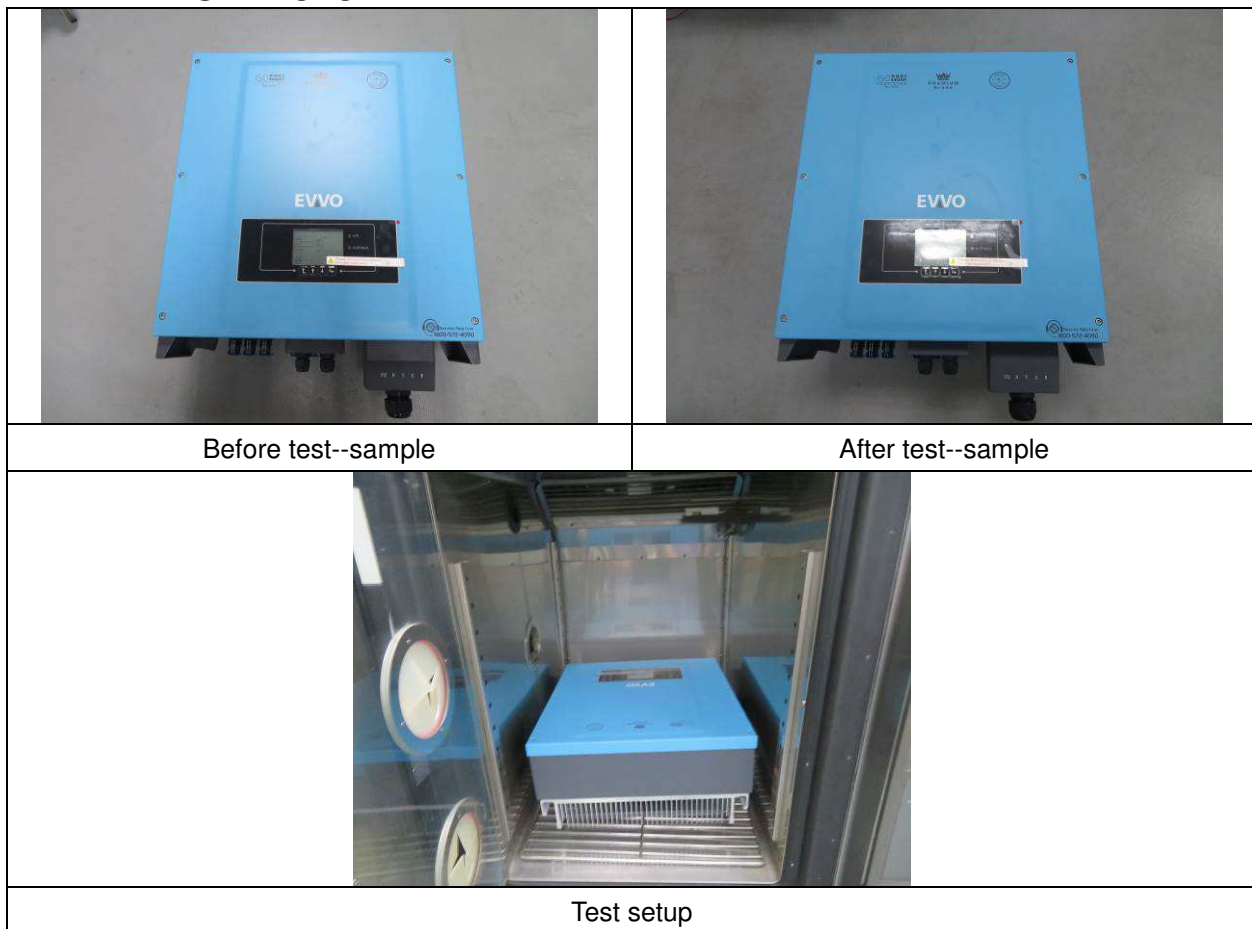
4.2 TEST RESULT

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)°C

Rate of temperature change:1°C/min

Test duration: 16h

Recovery: 1h

5.3 TEST REQUIREMENTS

After test, the sample should no external physical damage.

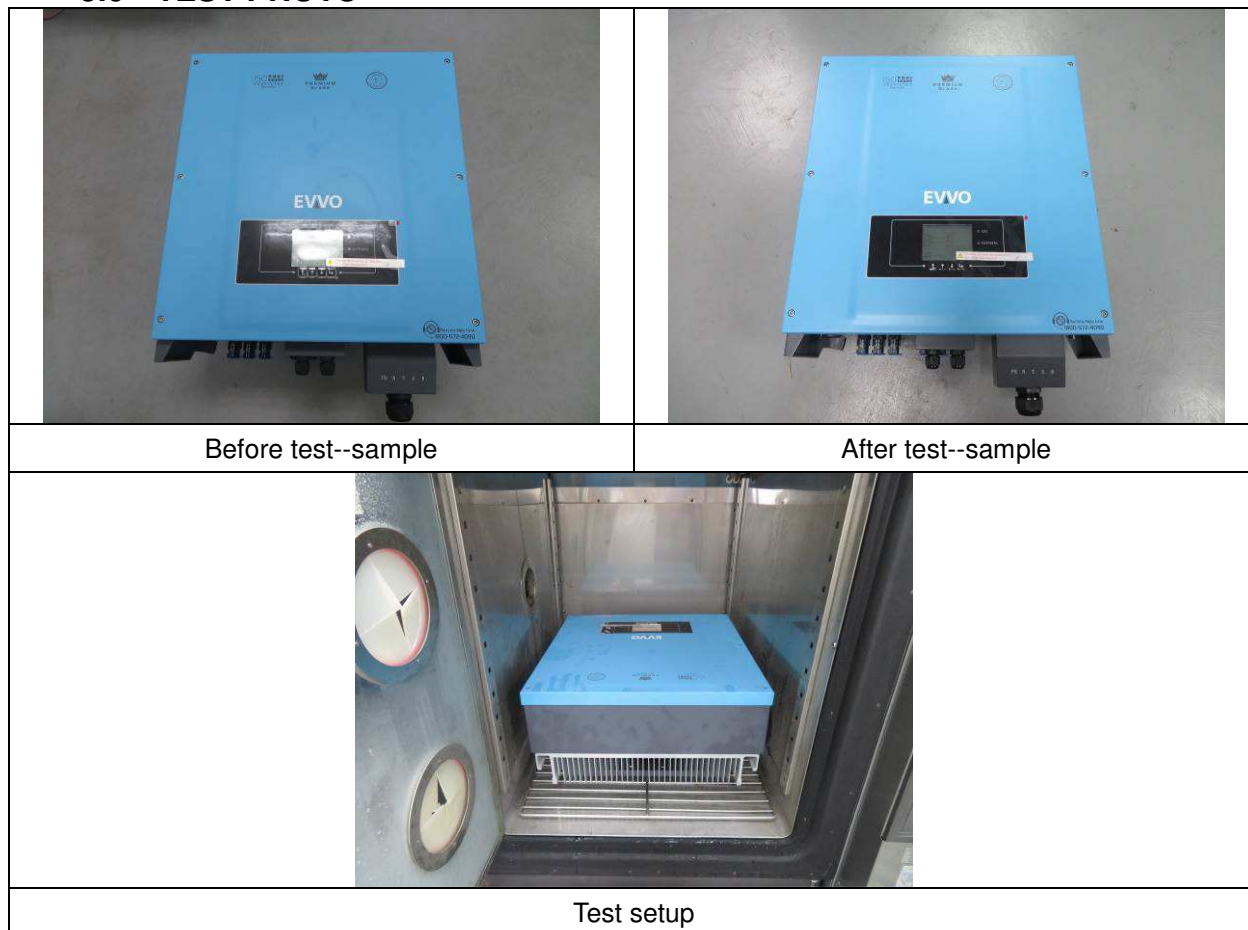
5.4 TEST RESULT

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



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: $(-25 \pm 2)^\circ\text{C}$
 high temperature extreme: $(60 \pm 2)^\circ\text{C}$
 Rate of temperature change: $1^\circ\text{C}/\text{min}$
 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.

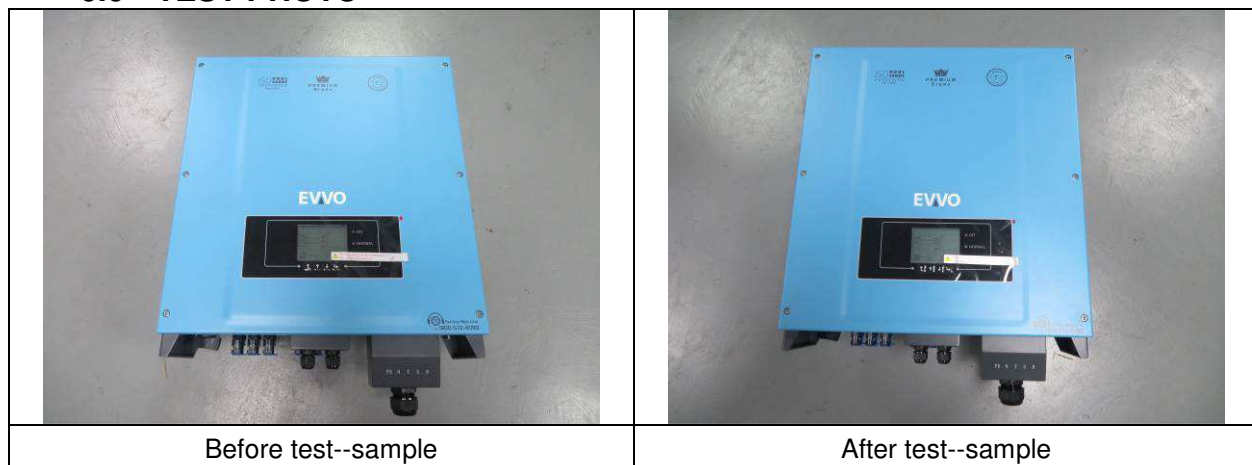
6.4 TEST RESULT

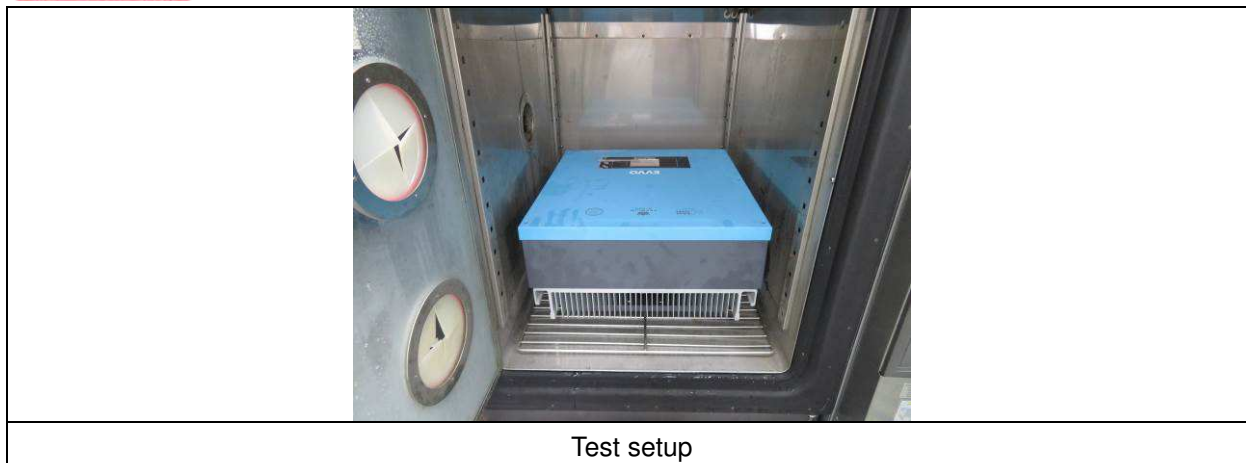
Sample No.	Test result
GZ190604/001-Q04N01GZ84	After test, the sample no external physical damage.

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





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:

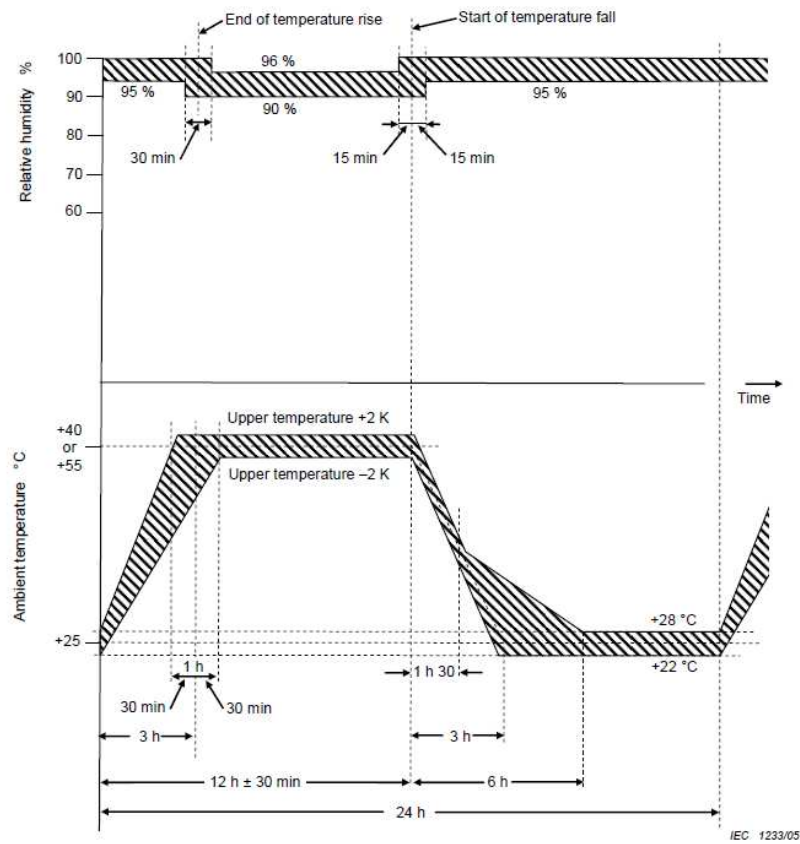


Figure 2a – Test Db – Test cycle – Variant 1

Upper temperature:55°C
 Number of cycles: 1

7.3 TEST REQUIREMENTS

After test, the sample should no external physical damage.

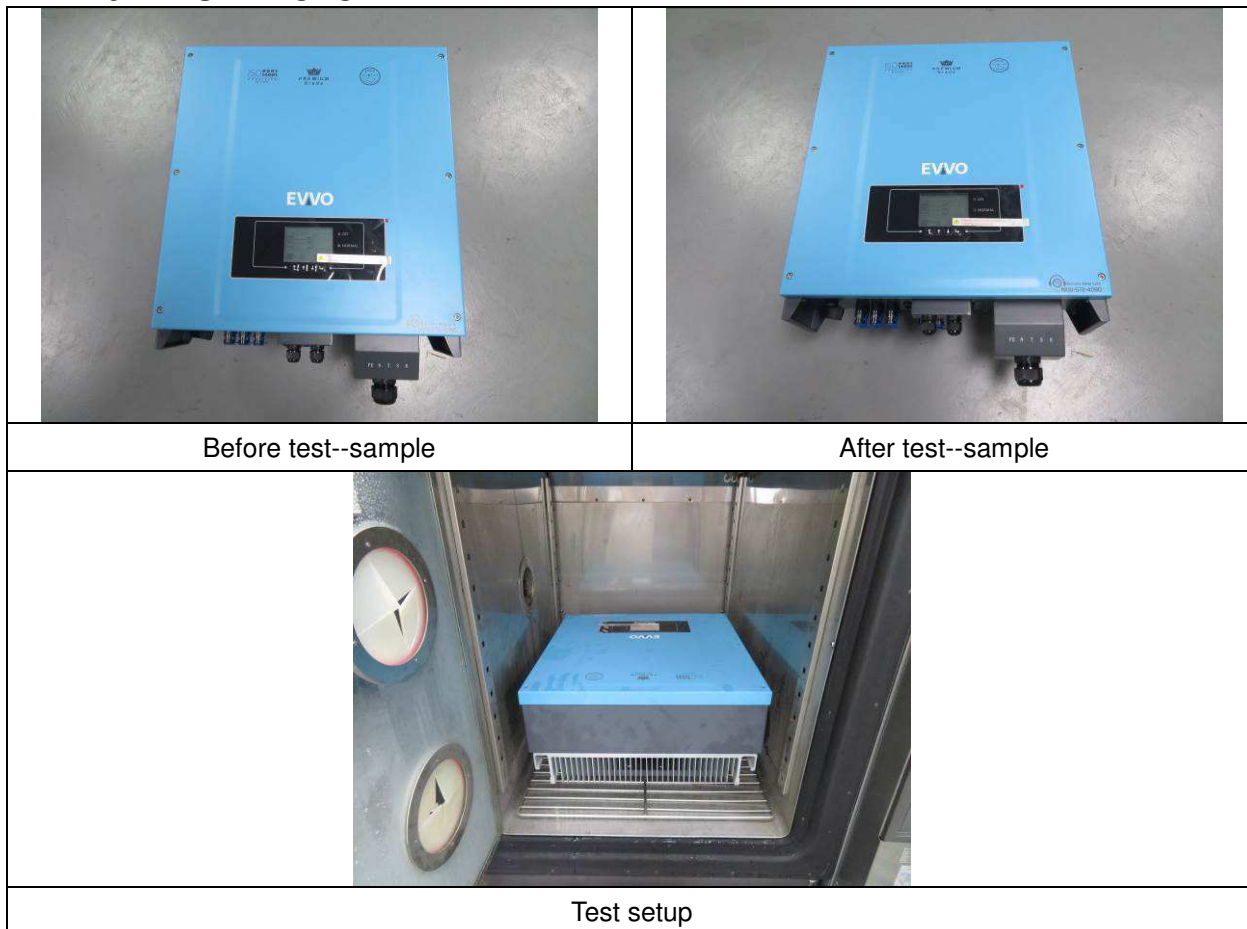
7.4 TEST RESULT

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



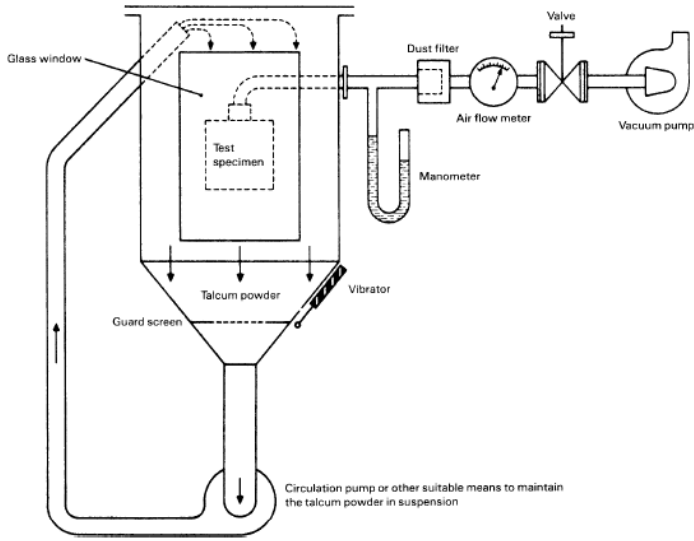
8 PROTECTION OF ELECTRICAL EQUIPMENT AGAINST FOREIGN OBJECTS, WATER AND ACCESS (IP65)

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	<p>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.</p> 
14.2.5	Test for second characteristic numeral 5 for protection against water	<p>Nozzles: 6.3 mm diameter, Distance: 2.5 m to 3 m, Water flow rate is 12.5 l/min ± 5%, Duration: 1min/m², at least 3min Water pressure:30kPa</p>

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.

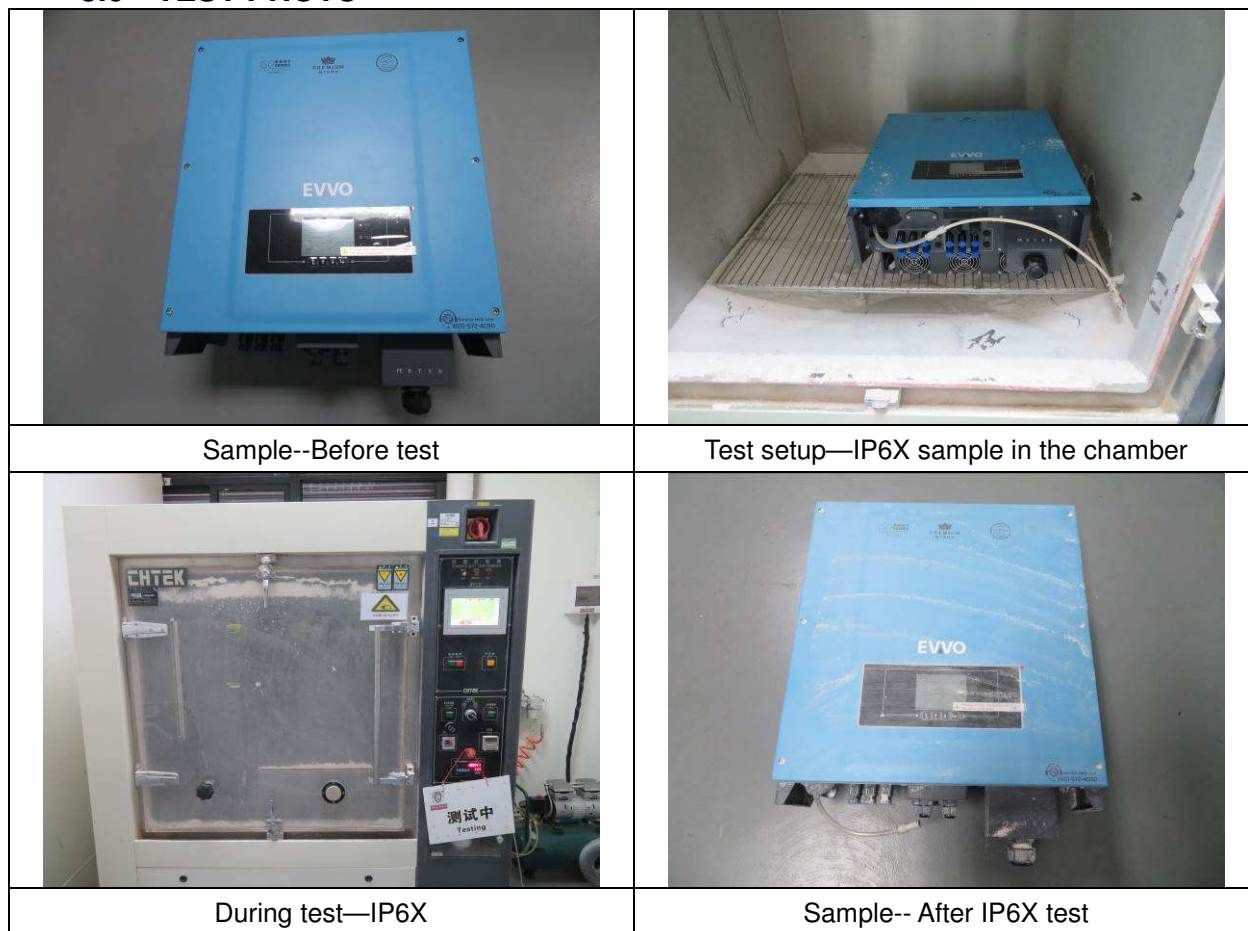
8.4 TEST RESULT

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





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REPORT NO.:190502828RT-3



During test--IPX5



During test--IPX5



Sample-- After IPX5 test



After test—IP65



9 PHOTOGRAPHS OF DUT



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