Technical Report No.: 64.290.16.00044.02

Rev. 00

Dated: 2017-12-18

Client:	Name: Shenzhen Kstar New Energy Company Limited Address: The 9th Floor, R&D Building, Kstar Industrial Park, Guangming Hi-tech Industrial Zone, 518107 Shenzhen, Guangdong Province, PEOPLE'S REPUBLIC OF CHINA
Manufacturing place:	Manufacturer's Name: Shenzhen Kstar New Energy Company Limited Address: The 9th Floor, R&D Building, Kstar Industrial Park, Guangming Hi-tech Industrial Zone, 518107 Shenzhen, Guangdong Province, PEOPLE'S REPUBLIC OF CHINA Factory's name: Shenzhen KSTAR Science & Technology Co., Ltd. Guangming Branch Address: Kstar High Tech Park, Guangming High, Technology Town, Gongming Street, Baoan District, 518107 Shenzhen City, Guangdong Province, PEOPLE'S REPUBLIC OF CHINA
Test subject:	Product: PV grid-interactive inverter Type: KSG-30K, KSG-36K-HV, KSG-50K, KSG-60K, KSG-60K-HV
Test specification:	IEC 62109-1(ed.1); IEC 62109-2(ed.1); IEC 61727(ed.2); IEC 62116(ed.2);
Purpose of examination:	Test according to the test specification
Test result:	The test results show that the presented product is in compliance with the specified requirements.

Telephone : +86 20 3832 0668
Telefax : +86 20 3832 0478

http://www.tuv-sud.cn

TÜV SÜD Certification and Testing (China) Co., Ltd.
Guangzhou Branch, TÜV SÜD Group
5F, Communication Building, 163 Pingyun Rd, Huangpu Ave. West, Guangzhou 510656, P. R. China

1 Description of the test subject

1.1 Function

(1) The unit is non-isolated (transformerless) PV grid-interactive DC-AC inverter for connection with public low voltage grid, for outdoor or indoor use.

(2) The unit shall be used at specified ambient range. Temperature: -25 °C ~ +60 °C, Auto-derating after 45 °C; Altitude: < 2000 m; Overvoltage category: II(DC side), III(AC side); Relative humidity range: 4 % ~ 100 %.

(3) The PV grid-interactive inverter provides six disconnection relays, two for each line conductor. The internal control is redundant built. It consists of one main DSP (U27) and another slave DSP (U20). Both DSP can open relays independently and communicate with each other.

(4) For this standard test, the inverter is designed to be operated with a fixed Cos phi=1 settings inside. The power factor can be adjustable via RS 485 communication port and it's adjustable range is not evaluated in this report.

(5) The grid connection protection system is evaluated according to IEC 61727:2004. Clause 5.3 of IEC 61727:2004 islanding protection test is performed according to IEC 62116:2014.

(6) In order to protect the PCE, user and installer, external DC and AC circuit breakers shall be equipped at the end-use application.

(7) Low voltage electrical installations shall comply with national and local regulation.

(8) The setting of rated frequency and protection are described in the user manual.

1.2 Consideration of the foreseeable misuse

☐Not applicable

☒Covered through the applied standard

☐Covered by the following comment

☐Covered by attached risk analysis

1.3 Technical Data

Model	KSG-30K	KSG-36K-HV	KSG-50K	KSG-60K	KSG-60K-HV
Vmax PV	1000 Vd.c.	1000 Vd.c.	1000 Vd.c.	1000 Vd.c.	1000 Vd.c.
Isc PV	28 Ad.c. x 3	28 Ad.c. x 3	38 Ad.c. x 3	42 Ad.c. x 3	42 Ad.c. x 3
MPPT range (full load)	480 ~ 800 Vd.c.	550 ~ 800 Vd.c.	480 ~ 800 Vd.c.	500 ~ 800 Vd.c.	550 ~ 800 Vd.c.
MPPT tracker / strings	3 / 2	3 / 2	3 / 4	3 / 4	3 / 4
Nominal AC voltage	3/N/PE, 230/400 Va.c.	3~PE, 480 Va.c.	3/N/PE, 230/400 Va.c.	3/N/PE, 230/400 Va.c.	3~PE, 480 Va.c.
Nominal Frequency	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz
Max. Continuous output current	44 Aa.c.	44 Aa.c.	72 Aa.c.	87 Aa.c.	72 Aa.c.

Telephone : +86 20 3832 0668
Telefax : +86 20 3832 0478
http://www.tuv-sud.cn

TÜV SÜD Certification and Testing (China) Co., Ltd.
Guangzhou Branch, TÜV SÜD Group
5F, Communication Building, 163 Pingyun Rd, Huangpu Ave. West, Guangzhou 510656, P. R. China

Nominal output power	30 kW	36 kW	50 kW	60 kW	60 kW
Max. Continuous output power	33 kVA	40 kVA	55 kVA	66 kVA	66 kVA
Power factor (full load)	>0,99	>0,99	>0,99	>0,99	>0,99
Protective class	I	I	I	I	I
Ingress protection	IP65	IP65	IP65	IP65	IP65
Temperature	-25 °C ~ +60 °C	-25 °C ~ +60 °C	-25 °C ~ +60 °C	-25 °C ~ +60 °C	-25 °C ~ +60 °C

2 Order

2.1 Date of Purchase Order, Customer's Reference

5 December 2017

2.2 Receipt of Test Sample, Location

27 November 2015

TÜV SÜD Certification and Testing (China) Co., Ltd. Guangzhou Branch

5F, Communication Building, 163 Pingyun Rd, Huangpu Ave. West, Guangzhou 510656, P. R. China

2.3 Date of Testing

10 January 2016 to 13 May 2016 and 8 December 2017 to 15 December 2017

2.4 Location of Testing

TÜV SÜD Certification and Testing (China) Co., Ltd. Guangzhou Branch

5F, Communication Building, 163 Pingyun Rd, Huangpu Ave. West, Guangzhou 510656, P. R. China

2.5 Points of Non-compliance or Exceptions of the Test Procedure

N/A

3 Test Results

3.1 Positive Test Results

Grid code compliance (IEC 61727:2004; IEC 62116:2014)

4 Remark

4.1 Remarks to Factory

The assembly of the product has to comply with the documentation (CDF). Before the implementa-

Telephone : +86 20 3832 0668
Telefax : +86 20 3832 0478
http://www.tuv-sud.cn

TÜV SÜD Certification and Testing (China) Co., Ltd.
Guangzhou Branch, TÜV SÜD Group
5F, Communication Building, 163 Pingyun Rd, Huangpu Ave. West, Guangzhou 510656, P. R. China

tion of safety relevant modifications to the product into the ongoing production the product must be retested for assessment. The results must be implemented to the documentation and if necessary the certificate must be updated.

4.2 The user manual has been examined according to the minimum requirements described in the product standard. The manufacturer is responsible for the accuracy of further particulars as well as of the composition and layout.

4.3 When the product is placed on the market, it must be accompanied with safety instructions written in official language of the country. The instructions shall give information regarding safe operation, installation and maintenance.

4.4 According to the EU decision 768/2008/EC, the name and address of manufacturer (an EU-based importer or authorized representative if the manufacturer is not based in EU) shall be affixed on the product or, where that is not possible, on its packaging or in a document accompanying the product before the product is placed on EU market.

4.5 The manufacturer/ Importer has to ensure the appliance placing on the EU market conforms to the applicable EU directives which provide the affixing of the CE marking, such as LVD, EMC, RoHS, ErP, and so on.

4.6 For safety IEC/EN 62109-1 and EIC/EN 62109-2 test, refer to TUV test report No.: 64.290.16.00045.03, part 1 and part 2.

4.7 This report is based on original report No.: 64.290.16.00044.01 (Certificate No.: Z2 16 05 75386 039), with the parameters of 60 Hz added. Original test report and certificates are cancelled.

5 Documentation

- CDF
- Photo documentation

Notes: Safety report for IEC 62109-1(ed.1) and IEC 62109-2(ed.1) are referred to Report No.: 64.290.16.00045.03.

6 Summary

The test specifications are met.

TÜV SÜD Certification and Testing (China) Co., Ltd. Guangzhou Branch

TÜV SÜD Group

Engineer: Max Fang, Kennen Wang **Technical Report checked:**

Max Fang
Kennen Wang
Project Handler

Billy Qiu
Designated Reviewer

..... End of Technical Report .....

Telephone : +86 20 3832 0668
Telefax : +86 20 3832 0478

http://www.tuv-sud.cn

TÜV SÜD Certification and Testing (China) Co., Ltd.
Guangzhou Branch, TÜV SÜD Group
5F, Communication Building, 163 Pingyun Rd, Huangpu Ave. West, Guangzhou 510656, P. R. China