中国认可
国际互认
检测
TESTING
CNAS L0220

Test Report issued under the responsibility of:

intertek
Total Quality. Assured.

TEST REPORT
IEC 62109-1
Safety of Power Converter for use in Photovoltaic Power Systems
Part 1: General requirements

Report Number. ..... :	191012003GZU-003
Date of issue ..... :	11 Nov., 2019, Revision 1:13 April 2020
Total number of pages ..... :	9 pages
Name of Testing Laboratory preparing the Report ..... :	Intertek Testing Services Shenzhen Ltd. Guangzhou Branch Block E, No.7-2 Guang Dong Software Science Park, Caipin Road, Guangzhou Science City, GETDD, Guangzhou, China
Applicant's name ..... :	Shenzhen SOFAR SOLAR Co., Ltd.
Address ..... :	401, Building 4, AnTongDa Industrial Park, District 68, XingDong Community, XinAn Street, BaoAn District, Shenzhen, China
Test specification:	
Standard ..... :	IEC/EN 62109-1:2010 (First Edition)
Test procedure ..... :	CE-LVD
Non-standard test method ..... :	N/A
Test Report Form No. ..... :	IEC62109_1B
Test Report Form(s) Originator .... :	VDE Testing and Certification Institute
Master TRF ..... :	Dated 2016-04

If this Test Report Form is used by non-IECEE members, the IECEE/IEC logo and the reference to the CB Scheme procedure shall be removed.

This report is not valid as a CB Test Report unless signed by an approved CB Testing Laboratory and appended to a CB Test Certificate issued by an NCB in accordance with IECEE 02.

General disclaimer:

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 CB Testing Laboratory. The authenticity of this Test Report and its contents can be verified by contacting the NCB, responsible for this Test Report.

Test item description ..... :	Solar Grid-tied Inverter
Trade Mark ..... :	SOFAR SOLAR
Manufacturer ..... :	Same as applicant
Model/Type reference ..... :	SOFAR 3.3KTL-X, SOFAR 4.4KTL-X, SOFAR 5KTL-X, SOFAR 5.5KTL-X, SOFAR 6.6KTL-X, SOFAR 8.8KTL-X, SOFAR 11KTL-X, SOFAR 12KTL-X

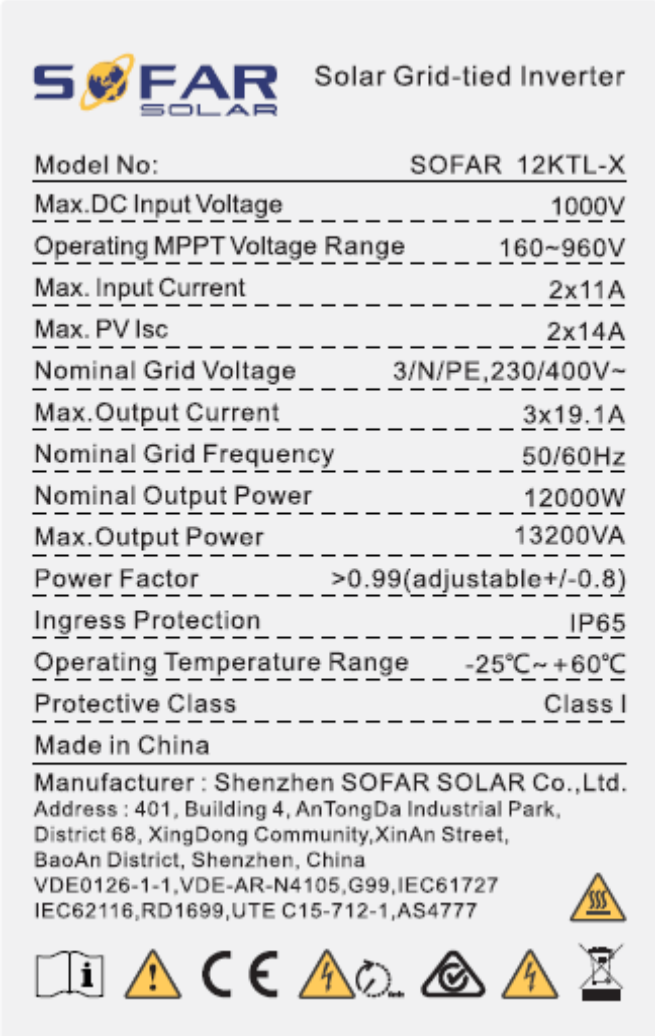
Ratings	MODEL	SOFAR 3.3KTL-X	SOFAR 4.4KTL-X	SOFAR 5KTL-X	SOFAR 5.5KTL-X	SOFAR 6.6KTL-X
	Max PV voltage	1000Vdc				
	MPPT Voltage range	160-960Vdc				
	Max. input current	11/11A				
	PV Isc	14/14A				
	Max power (VA)	3300	4400	5000	5500	6600
	Max output current	3×4.8 A	3×6.4 A	3×8.0A	3×8.0 A	3×9.6 A
	Output voltage	3W/N/PE 230Vac/400Vac				
	Nominal Frequency	50 Hz				
	Power Factor	0.8 Leading to 0.8 Lagging				
	Ambient Temperature	-25℃ - +60℃				
	Protection Degree	IP65				
	Protection Class	Class I				
	MODEL	SOFAR 8.8KTL-X	SOFAR 11KTL-X	SOFAR 12KTL-X		
	Max PV voltage	1000Vdc				
	MPPT Voltage range	160-960Vdc				
	Max. input current	11/11A				
	PV Isc	14/14A				
	Max power (VA)	8800	11000	13200		
	Max output current	3×12.8 A	3×15.9 A	3×19.1 A		
	Output voltage	3W/N/PE 230Vac/400Vac				
	Nominal Frequency	50 Hz				
	Power Factor	0.8 Leading to 0.8 Lagging				
	Ambient Temperature	-25℃ - +60℃				
	Protection Degree	IP65				
	Protection Class	Class I				
	Software Version	V 1.00				

Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):			
☒	**Testing Laboratory:**	Intertek Testing Services Shenzhen Ltd. Guangzhou Branch	
Testing location/ address .....:		Block E, No.7-2 Guang Dong Software Science Park, Caipin Road, Guangzhou Science City, GETDD, Guangzhou, China	
☐	**Associated CB Testing Laboratory:**	N/A	
Testing location/ address .....:		N/A	
Tested by (name, function, signature).....:		Jason Fu Technical Team Leader	
Approved by (name, function, signature)...:		Tommy Zhong Technical Manager	
☐	**Testing procedure: CTF Stage 1:**	N/A	
Testing location/ address .....:		N/A	
Tested by (name, function, signature).....:		N/A	
Approved by (name, function, signature)...:		N/A	
☐	**Testing procedure: CTF Stage 2:**	N/A	
Testing location/ address .....:		N/A	
Tested by (name + signature).....:		N/A	
Witnessed by (name, function, signature) .:		N/A	
Approved by (name, function, signature)...:		N/A	
☐	**Testing procedure: CTF Stage 3:**	N/A	
☐	**Testing procedure: CTF Stage 4:**	N/A	
Testing location/ address .....:		N/A	
Tested by (name, function, signature).....:		N/A	
Witnessed by (name, function, signature) .:		N/A	
Approved by (name, function, signature)...:		N/A	
Supervised by (name, function, signature) :		N/A	

List of Attachments (including a total number of pages in each attachment): N/A	
Summary of testing:	
Tests performed (name of test and test clause): All applicable tests	**Testing location:** Intertek Testing Services Shenzhen Ltd. Guangzhou Branch Block E, No.7-2 Guang Dong Software Science Park, Caipin Road, Guangzhou Science City, GETDD, Guangzhou, China
Summary of compliance with National Differences (List of countries addressed): N/A ☒ **The product fulfils the requirements of** IEC/EN 62109-1:2010 (First Edition)	

Copy of marking plate:

The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBs that own these marks.



Note:

1. The above markings are the minimum requirements required by the safety standard. For the final production samples, the additional markings which do not give rise to misunderstanding may be added.
2. Label is attached on the side surface of enclosure and visible after installation.
3. The other model labels are identical with label above, except the model name and rating.

Test item particulars :	
Equipment mobility :	☐ movable ☐ hand-held ☐ stationary ☒ fixed ☐ transportable ☐ for building-in
Connection to the mains :	☐ pluggable equipment ☐ direct plug-in ☒ permanent connection ☐ for building-in
Environmental category :	☒ outdoor ☐ indoor unconditional ☐ indoor conditional
Over voltage category Mains :	☐ OVC I ☐ OVC II ☒ OVC III ☐ OVC IV
Over voltage category DC :	☐ OVC I ☒ OVC II ☐ OVC III ☐ OVC IV
Mains supply tolerance (%) :	-90 / +110 %
Tested for power systems :	TN systems
IT testing, phase-phase voltage (V) :	- - -
Class of equipment :	☒ Class I ☐ Class II ☐ Class III ☐ Not classified
Mass of equipment (kg) :	Max. 22kg
Pollution degree :	Outside PD3; Inside PD2
IP protection class :	IP 65
:	
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 was not evaluated for the requirement :	N/E
- test object does not meet the requirement :	F (Fail)
Testing :	
Date of receipt of test item :	31 Mar., 2020
Date (s) of performance of tests :	31 Mar., 2020 – 06 Apr., 2020

General remarks:

"(See Enclosure #)" refers to additional information appended to the report.
"(See appended table)" refers to a table appended to the report.

Throughout this report a ☐ comma / ☒ point is used as the decimal separator.

Revision 1:

This report is based on original report No. 191012003GZU-004, dated 11 Nov., 2019 to have following addition

1, Added below alternative DC switch in critical components list

Manufacturer	Type
Santon International bv	XBE+3410/2, XBE3410/2, XBHP3410/2

After checking the specification and certificate, no tests are required on this addition.

This report shall be used together with report No. 191012003GZU-003 and 191012003GZU-004

Manufacturer's Declaration per sub-clause 4.2.5 of IECEE 02:

The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided..... :	☐ **Yes** ☒ **Not applicable**

When differences exist; they shall be identified in the General product information section.

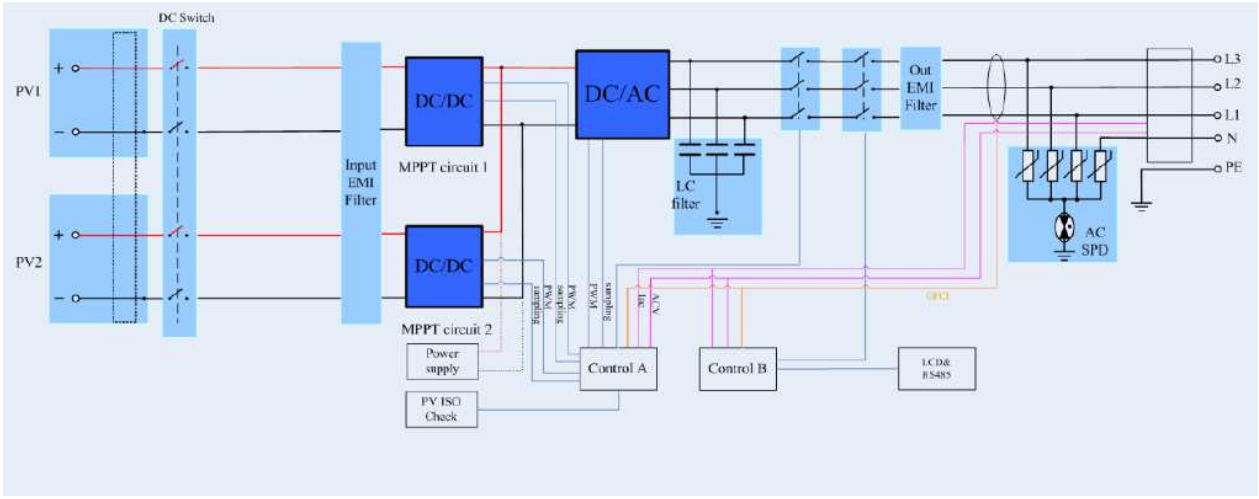
Name and address of factory (ies) .....:	Dongguan SOFAR SOLAR Co., Ltd. 1F-6F, Building E, No.1 JinQi Road, Bihu Industrial Park, Wulian Village, Fenggang Town, Dongguan City

General product information:

Product covered by this report is grid-connected PV inverter for indoor or outdoor installation. The connection to the DC input and AC output are through terminal. The structure of the unit complied with the IP 65 requirement.

The inverters intended to operate at ambient temperature -25℃ - +60℃, which will be specified in the user manual, however, the inverters will output full power when operated at 45℃, if operated at high than 45℃ temperature, the output power would be derated.

The topology diagram as following:



Model differences:

All models have identical mechanical and electrical construction except some parameter of the software architecture in order to control the max output power. The detailed difference as following:

Model	SOFAR 8.8KTL-X, SOFAR 11KTL-X, SOFAR 12KTL-X		SOFAR 3.3KTL-X, SOFAR 4.4KTL-X, SOFAR 5KTL-X, SOFAR 5.5KTL-X, SOFAR 6.6KTL-X	
Componets	Specification	Numbers	Specification	Numbers
Inverter Chock	NPS226060*2+NPF226060*1 2.0Φ*2P*42Ts L=0.73mH	3	NPS226060*2 2.2Φ*1P*67Ts L=1.24mH	3
Bus capacitor	75μF/600V	4	75μF/600V	2

Other than special notice, the model SOFAR 12KTL-X is as the representative test models in this report.

IEC 62109-1			
Clause	Requirement – Test	Result – Remark	Verdict

14	TABLE: list of critical components				P
object/part No.	manufacturer/ trademark	type/model	technical data	standard	mark(s) of conformity[1])
DC switch	Santon International B.V.	XBE+3410/2	1000Vdc,16A, 800Vdc, 25A, 500Vdc, 50A IP66, Max. 85℃	EN 60947-3:2009+A1+A2	DEKRA: 71-107724
(Alternative)	Santon International B.V.	XBE3410/2	1000Vdc,10A, 800Vdc, 15A, 500Vdc, 45A IP66, Max. 85℃	EN 60947-3:2009+A1+A2	TUV R 50423069
(Alternative)	Santon International B.V.	XBHP3410/2	1000Vdc,20A, 800Vdc, 30A, 500Vdc, 45A IP66, Max. 85℃	EN 60947-3:2009+A1+A2	TUV R 50423069
[1]) an asterisk indicates a mark which assures the agreed level of surveillance					

(End of Report)