
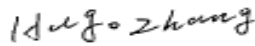





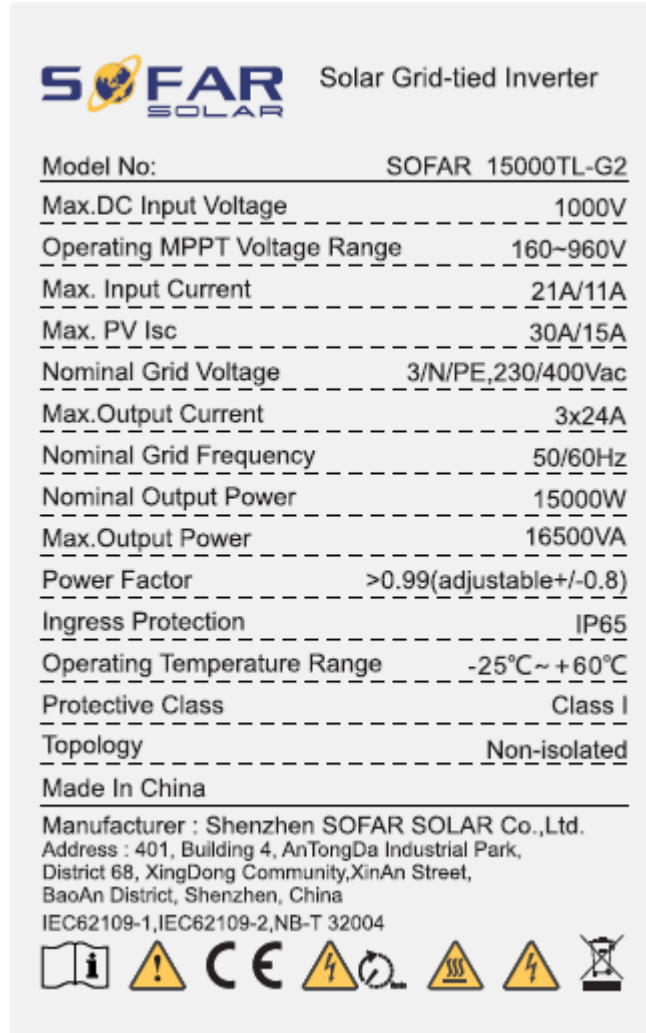
<p><b>TEST REPORT</b> <b>IEC 61683</b></p> <p><b>Photovoltaic systems – Power conditioners – Procedure for measuring efficiency</b></p>	
<b>Report Number.</b> .....	2219 / 0190-3
<b>Date of issue</b> .....	19/06/2019
<b>Total number of pages</b> .....	17
<b>Applicant's name</b> .....	Shenzhen SOFAR SOLAR Co., Ltd.
<b>Address</b> .....	401, Building 4, AnTongDa Industrial Park, District 68, XingDong Community, XinAn Street, BaoAn District, Shenzhen City, Guangdong Province, P.R. China
<b>Test specification:</b>	
<b>Standard</b> .....	IEC 61683:1999 (First Edition)
<b>Test procedure</b> .....	Characteristic Examination
<b>Non-standard test method</b> .....	N/A
<b>Test Report Form No.</b> .....	IEC61683A
<b>Test Report Form(s) Originator</b> .....	TÜV SÜD Product Service GmbH
<b>Master TRF</b> .....	Dated 2014-10
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<b>General disclaimer:</b>	
<p>The test results presented in this report relate only to the object tested.</p> <p>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.</p>	

<b>Test item description</b> ..... :	Solar Grid-tied Inverter
<b>Trade Mark</b> ..... :	
<b>Manufacturer</b> ..... :	Shenzhen SOFAR SOLAR Co., Ltd.
<b>Model/Type reference</b> ..... :	SOFAR 15000TL-G2, SOFAR 12000TL-G2, SOFAR 10000TL-G2
<b>Ratings</b> ..... :	<p>SOFAR 15000TL-G2          DC input: 160-960V Max.21A /11A          Full load DC Voltage Range: 500V-850V          AC output: 3/N/PE 230/400Vac, 50Hz, Max. 3x24A, 15000W</p> <p>SOFAR 12000TL-G2          DC input: 160-960V Max.21A /11A          Full load DC Voltage Range: 500V-850V          AC output: 3/N/PE 230/400Vac, 50Hz, Max. 3x20A, 12000W</p> <p>SOFAR 10000TL-G2          DC input: 160-960V Max.21A /11A          Full load DC Voltage Range: 350V-850V          AC output: 3/N/PE 230/400Vac, 50Hz, Max. 3x16.5A, 10000W</p> <p><b>Serial Number:</b> SN1CS015K3G061  <b>Firmware version:</b> V0.21</p>

<b>Testing procedure and testing location:</b>		
<input type="checkbox"/>	<b>CB Testing Laboratory:</b>	
<b>Testing location/ address.....:</b>		
<input type="checkbox"/>	<b>Associated CB Testing Laboratory:</b>	
<input checked="" type="checkbox"/>	<b>Testing procedure: TMP/CTF Stage 1:</b>	Shenzhen SOFAR SOLAR Co., Ltd.
<b>Testing location/ address.....:</b>		401, Building 4, AnTongDa Industrial Park, District 68, XingDong Community, XinAn Street, BaoAn District, Shenzhen City, Guangdong Province, P.R. China
<b>Tested by (name + signature) .....</b>	Hugo zhang (Project Engineer)	
	Roger Hu (Project Engineer)	
<b>Approved by (name + signature).....:</b>	Jacobo Tevar (Technical Reviewer)	
<input type="checkbox"/>	<b>Testing procedure: WMT/CTF Stage 2:</b>	
<input type="checkbox"/>	<b>Testing procedure: SMT/CTF Stage 3 or 4:</b>	

<b>List of Attachments (including a total number of pages in each attachment):</b>		
50Hz		
Attachment #	Description	Pages
Attachment I	Pictures of the EUT and Electrical Schemes	12pages
Attachment II	Testing Information	5 pages
<b>Summary of testing:</b>		
<p><b>Tests performed (name of test and test clause):</b></p> <p>The equipment has been tested according to the standard: IEC 61683:1999. Testing has been carried out at 50Hz.</p> <p>All applicable tests according to the above specified standard have been carried out.</p> <p>From the result of inspection and tests on the submitted sample, we conclude that it complies with the requirements of the standard.</p>	<p><b>Testing location:</b></p> <p>Shenzhen SOFAR SOLAR Co., Ltd. 401, Building 4, AnTongDa Industrial Park, District 68, XingDong Community, XinAn Street, BaoAn District, Shenzhen City, Guangdong Province, P.R. China (All clauses)</p>	
<b>Summary of compliance with National Differences</b>		
<p><b>List of countries addressed</b></p> <p>No National Differences are addressed to this test report</p>		

**Copy of marking plate(representative):**



**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. Labels of other models are as the same wit SOFAR 15000TL-G2's except the parameters of rating.



<b>Test item particulars</b> ..... : Solar Grid-tied Inverter (Three Phase Inverter)	
<b>Classification of installation and use</b> ..... : Fixed(permanent connection)	
<b>Supply Connection</b> ..... : DC; PV	
..... : AC; Grid connection	
<b>Possible test case verdicts:</b>	
- test case does not apply to the test object..... : N/A	
- test object does meet the requirement..... : P (Pass)	
- test object does not meet the requirement..... : F (Fail)	
<b>Testing</b> ..... : CTF Stage 1 procedure	
<b>Date of receipt of test item</b> ..... : N/A	
<b>Date (s) of performance of tests</b> ..... : From 08/05/2019 to 13/05/2019	
<b>General remarks:</b>	
<p>"(See Enclosure #)" refers to additional information appended to the report.          "(See appended table)" refers to a table appended to the report.</p> <p>This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <a href="http://www.sgs.com/terms_and_conditions.htm">www.sgs.com/terms_and_conditions.htm</a> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <a href="http://www.sgs.com/terms_e-document.htm">www.sgs.com/terms_e-document.htm</a>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested.</p>	
<b>Throughout this report a <input type="checkbox"/> comma / <input checked="" type="checkbox"/> point is used as the decimal separator.</b>	
<b>Manufacturer's Declaration per sub-clause 4.2.5 of IECCE 02:</b>	
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 .....	<input type="checkbox"/> <b>Yes</b> <input checked="" type="checkbox"/> <b>Not applicable</b>
<b>When differences exist; they shall be identified in the General product information section.</b>	
<b>Name and address of factory (ies)</b> ..... : Dongguan SOFAR SOLAR Co.,Ltd. 1F - 6F, Building E, No. 1 JinQi Road, Bihu Industrial Park, Wulian Village, Fenggang Town, Dongguan City,Guangdong Province,P.R. China.	

**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 connectors.

The Solar inverter converts DC voltage into AC voltage.

The input and output are protected by varistors to Earth. The unit is providing EMC filtering at the output toward mains. The unit does not provide galvanic separation from input to output (transformerless). The output is switched off redundant by the high power switching bridge and a two relays. This assures that the opening of the output circuit can operate in case of one error.

**Equipment Under Testing:**

- SOFAR 15000TL-G2
- SOFAR 12000TL-G2
- SOFAR 10000TL-G2

Model Number	SOFAR 15000TL-G2	SOFAR 12000TL-G2	SOFAR 10000TL-G2
Max. input voltage	1000Vd.c.		
Max. input current	21A/11A		
Operating MPPT voltage range	160V-960V		
Rated voltage	600V		
Full load DC Voltage Range	500V-850V	500V-850V	350V-850V
Rated grid voltage	3/N/PE 230/400Va.c		
Rated grid frequency	50Hz		
Rated output power	15000W	12000W	10000W
Max. output current	3 x 24A	3 x 20A	3 x 16.5A
Power factor	0.8 leading to 0.8 lagging		
Ambient temperature	-25 °C ~60 °C		
Ingress protection	IP65		
Protective class	Class I		

The variants models have been included in this test report without tests because the following features don't change regarding to the tested model:

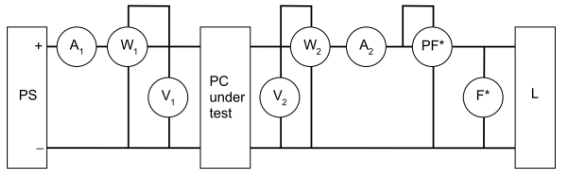
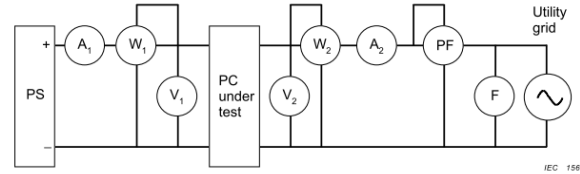
- Same connection system and hardware topology
- Same control algorithm.
- Same Firmware Version

IEC 61683: 1999			
Clause	Requirement – Test	Measuring result – Remark	Verdict
4	Efficiency measurement conditions		P
	Efficiency is measured under the conditions in the following clauses.		P
	Specific conditions may be excluded by mutual agreement when those conditions are outside the manufacturer's allowable operating range.		P
4.1	DC power source for testing		P
	For power conditioners operating with fixed input voltage, the d.c. power source is a storage battery or constant voltage power source to maintain the input voltage.		N/A
	For power conditioners that employ maximum power point tracking (MPPT) and shunt-type power conditioners, either a photovoltaic array or a photovoltaic array simulator is utilized.		P
4.2	Temperature		P
	All measurements are to be made at an ambient temperature of $25\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$ .		N/A
	Other ambient temperatures may be allowed by mutual agreement. However, the temperature used must be clearly stated in all documentation.	By mutual agreement all measurements at 50 Hz have been carried out at $25^{\circ}\text{C} \pm 5^{\circ}\text{C}$	P
4.3	Output voltage and frequency		P
	The output voltage and frequency are maintained at the manufacturer's stated nominal values.	L/N/PE 230Vac, 50Hz	P
4.4	Input voltage		P
	Measurements performed in each of the following tests are repeated at three power conditioner input voltages: a) manufacturer's minimum rated input voltage; b) the inverter's nominal voltage or the average of its rated input range; c) 90 % of the inverter's maximum input voltage.		P
	In the case where a power conditioner is to be connected with a battery at its input terminals, only the nominal or rated input voltage may be applied.		N/A
4.5	Ripple and distortion		P
	Record input voltage and current ripple for each measurement. Also record output voltage and current distortion (if a.c.) or ripple (if d.c.). Ensure that these measurements remain within the manufacturer's specified values.		P
4.6	Resistive loads/utility grid		P
	At unity power factor, or at the intrinsic power factor of grid-connected inverters without power		P



IEC 61683: 1999			
Clause	Requirement – Test	Measuring result – Remark	Verdict
	factor adjustment, measure the efficiency for power levels of 10 %, 25 %, 50 %, 75 %, 100 % and 120 % of the inverter's rating.		
	Stand-alone inverters are also measured at a power level of 5 % of rated. The power conditioner test is conducted with a specified resistive and reactive grid impedance.		N/A
4.7	Reactive loads		N/A
	For stand-alone inverters, measure the efficiency with a load which provides a power factor equal to the manufacturer's specified minimum level (or 0,25, whichever is greater) and at power levels of 25 %, 50 % and 100 % of rated VA.		N/A
	Repeat for power factors of 0,5 and 0,75 (do not go below the manufacturer's specified minimum PF) and power levels of 25 %, 50 %, and 100 % of rated VA.		N/A
4.8	Resistive plus non-linear loads		N/A
	For stand-alone inverters, measure the efficiency with a fixed non-linear load (total harmonic distortion (THD) = $(80 \pm 5)$ %) equal to $(25 \pm 5)$ % of the inverter's rated VA plus sufficient resistive load in parallel to achieve a total load of 25 %, 50 % and 100 % of rated VA.		N/A
	Repeat the measurements with a fixed non-linear load equivalent to $(50 \pm 5)$ % of the inverter's rated VA plus sufficient resistive load in parallel to achieve a total load of 50% and 100% of rated VA.		N/A
	The type of non-linear load must be clearly stated in all documentation.		N/A
4.9	Complex loads		N/A
	When a non-linear plus a sufficient reactive load condition is specified for stand-alone inverters, measure the efficiency with a fixed non-linear load (THD = $(80 \pm 5)$ %) equal to $(50 \pm 5)$ % of the inverter's rated VA plus a sufficient reactive load (PF = 0,5) in parallel to achieve a total load of 50 % and 100 % of rated VA.		N/A
	The type of complex load is clearly stated in all documentation.		N/A
5	Efficiency calculations		P
5.1	Rated output efficiency		P
5.2	Partial output efficiency		P
5.3	Energy efficiency		P

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Clause	Requirement – Test	Measuring result – Remark	Verdict
5.4	Efficiency tolerances		P
6	Conditions of loading for output ports		P
6.1	Test circuit		P
	Figure 1a is applied to standard-alone power conditioners		N/A
	 <p>Figure 1a – Stand-alone type</p> <p>IEC 1566/99</p>		N/A
	Figure 1b is applied to utility-interactive power conditioners		P
	 <p>Figure 1b – Utility-interactive type</p> <p>IEC 1567/99</p> <p>PC power conditioner  PS variable voltage-current d.c. power supply  A<sub>1</sub> DC ammeter  A<sub>2</sub> AC or d.c. ammeter  W<sub>1</sub> DC wattmeter  W<sub>2</sub> AC or d.c. wattmeter  L load  F frequency meter  V<sub>1</sub> DC voltmeter  V<sub>2</sub> AC or d.c. voltmeter  PF power factor meter</p>		P
6.2	Measurement procedure		P
7	Loss measurement		P
7.1	No-load loss		P
7.2	Standby loss		P
Annex A	Power conditioner description		P
Annex B	Power efficiency and conversion factor		P
Annex C	Weighted-average energy efficiency		P
Annex D	Derivation of efficiency tolerance in table 2		P

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Clause	Requirement – Test	Measuring result – Remark	Verdict
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TABLE	Efficiency recording and efficient calculation sheet								
power conditioner type	Grid-connected								
Model:	SOFAR 15000TL-G2								
Parameters of power conditioner	Minimum full load input voltage:500V Nominal voltage:600V 90% of the inverter's maximum input voltage:765V Rated output voltage: 230Vac Rated output frequency:50Hz Rated output power: <b>15000W</b>								
PV input voltage	a) Manufacturer's minimum rated input voltage 500V( $\pm 7.5V$ )								
Temperature ( $^{\circ}C$ )	25 $^{\circ}C \pm 5^{\circ}C$								
Operating period for energy measurement (min)	1.5								
Percentage of rated output VA	/	10%	25%	50%	75%	100%	120%*	/	/
Input voltage (V)	/	496.1	496.2	499.5	499.1	500.8	/	/	/
Input voltage ripple (V)	/	0.9	0.9	1.1	0.9	1.1	/	/	/
Input current (A)	/	3.1	7.8	15.4	23.2	30.8	/	/	/
Input current ripple (mA)	/	52.8	64.1	75.7	85.1	107.7	/	/	/
Input power (Pi) (W)	/	1547	3862	7713	11563	15435	/	/	/
Output power (Po) (W)	/	1489	3763	7532	11277	15028	/	/	/
Output efficiency(%)	/	96.24	97.43	97.65	97.53	97.36	/	/	/
Input energy (Wi) (Wh)	/	38.68	96.56	192.82	289.06	385.89	/	/	/
Output energy (Wo) (Wh)	/	37.22	94.08	188.29	281.92	375.70	/	/	/
Energy efficiency(%)	/	96.23	97.43	97.65	97.53	97.37	/	/	/
PV input voltage	b) The inverter's nominal voltage 600V( $\pm 9.0V$ )								
Temperature ( $^{\circ}C$ )	25 $^{\circ}C \pm 5^{\circ}C$								
Operating period for energy measurement (min)	1.5								
Percentage of rated output VA	/	10%	25%	50%	75%	100%	120%*	/	/
Input voltage (V)	/	598.6	604.9	599.3	599.8	599.1	/	/	/
Input voltage ripple (V)	/	1.0	1.0	1.0	0.9	1.0	/	/	/

IEC 61683: 1999									
Clause	Requirement – Test						Measuring result – Remark		Verdict
Input current (A)	/	2.6	6.4	13.0	19.2	25.7	/	/	/
Input current ripple (mA)	/	18.5	18.5	21.2	21.8	21.1	/	/	/
Input power (Pi) (W)	/	1547	3856	7714	11563	15412	/	/	/
Output power (Po) (W)	/	1502	3780	7572	11338	15047	/	/	/
Output efficiency(%)	/	97.14	98.03	98.16	98.05	97.63	/	/	/
Input energy (Wi) (Wh)	/	38.67	96.39	192.85	289.10	385.30	/	/	/
Output energy (Wo) (Wh)	/	37.55	94.49	189.30	283.44	376.18	/	/	/
Energy efficiency(%)	/	97.12	98.02	98.16	98.04	97.71	/	/	/
PV input voltage	c) 90% of the inverter's maximum input voltage 765V(±11.5V)								
Temperature (°C)	25°C ± 5°C								
Operating period for energy measurement (min)	1.5								
Percentage of rated output VA	/	10%	25%	50%	75%	100%	120%*	/	/
Input voltage (V)	/	766.7	768.0	760.0	766.5	763.7	/	/	/
Input voltage ripple (V)		1.3	1.0	1.0	1.0	1.1	/	/	/
Input current (A)	/	2.0	5.0	10.2	15.1	20.2	/	/	/
Input current ripple (mA)		18.2	18.4	21.3	22.2	26.0	/	/	/
Input power (Pi) (W)	/	1546	3864	7704	11569	15430	/	/	/
Output power (Po) (W)	/	1475	3755	7526	11282	15029	/	/	/
Output efficiency(%)	/	95.40	97.17	97.55	97.51	97.41	/	/	/
Input energy (Wi) (Wh)	/	38.66	96.60	192.89	289.25	385.74	/	/	/
Output energy (Wo) (Wh)	/	36.88	93.87	188.17	282.06	375.73	/	/	/
Energy efficiency(%)	/	95.40	97.17	97.55	97.51	97.41	/	/	/
Remark:									
*If limited by design, inverter is not capable to operate with the 120% of rated output load, test under this condition is waived;									

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Clause	Requirement – Test	Measuring result – Remark	Verdict
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<b>TABLE</b>		Efficiency recording and efficient calculation sheet							
power conditioner type	Grid-connected								
Model:	SOFAR 12000TL-G2								
Parameters of power conditioner	Minimum full load input voltage:500V Nominal voltage:600V 90% of the inverter's maximum input voltage: 765V Rated output voltage: 230Vac Rated output frequency:50Hz Rated output power: <b>12000W</b>								
PV input voltage	a) Manufacturer's minimum rated input voltage 500V( $\pm 7.5V$ )								
Temperature ( $^{\circ}C$ )	25 $^{\circ}C \pm 5^{\circ}C$								
Operating period for energy measurement (min)	1.5								
Percentage of rated output VA	/	10%	25%	50%	75%	100%	120%*	/	/
Input voltage (V)	/	504.3	497.6	498.4	500.0	498.7	/	/	/
Input voltage ripple (V)	/	0.8	0.2	0.8	1.0	0.9	/	/	/
Input current (A)	/	2.5	6.2	12.4	18.5	24.8	/	/	/
Input current ripple (mA)	/	48.2	65.8	72.0	82.8	96.2	/	/	/
Input power (Pi) (W)	/	1237	3090	6172	9252	12320	/	/	/
Output power (Po) (W)	/	1185	2998	6029	9033	12015	/	/	/
Output efficiency(%)	/	95.81	97.25	97.65	97.64	97.53	/	/	/
Input energy (Wi) (Wh)	/	30.93	77.25	154.37	231.31	308.01	/	/	/
Output energy (Wo) (Wh)	/	29.63	75.13	150.74	225.84	300.40	/	/	/
Energy efficiency(%)	/	95.81	97.24	97.65	97.64	97.53	/	/	/
PV input voltage	b) The inverter's nominal voltage 600V( $\pm 9.0V$ )								
Temperature ( $^{\circ}C$ )	25 $^{\circ}C \pm 5^{\circ}C$								
Operating period for energy measurement (min)	1								
Percentage of rated output VA	/	10%	25%	50%	75%	100%	120%*	/	/
Input voltage (V)	/	606.5	602.4	596.9	600.8	598.5	/	/	/

IEC 61683: 1999									
Clause	Requirement – Test						Measuring result – Remark		Verdict
Input voltage ripple (V)	/	0.9	0.8	1.0	0.9	0.9	/	/	/
Input current (A)	/	2.0	5.1	10.3	15.4	20.6	/	/	/
Input current ripple (mA)	/	20.2	20.7	20.3	21.5	28.1	/	/	/
Input power (Pi) (W)	/	1238	3091	6175	9265	12341	/	/	/
Output power (Po) (W)	/	1198	3026	6045	9068	12065	/	/	/
Output efficiency(%)	/	96.69	97.92	97.90	97.88	97.76	/	/	/
Input energy (Wi) (Wh)	/	30.96	77.27	154.38	231.62	308.54	/	/	/
Output energy (Wo) (Wh)	/	29.93	75.66	151.13	226.70	301.62	/	/	/
Energy efficiency(%)	/	96.68	97.91	97.89	97.88	97.76	/	/	/
PV input voltage	c) 90% of the inverter's maximum input voltage 765V(±11.5V)								
Temperature (°C)	25°C ± 5°C								
Operating period for energy measurement (min)	1								
Percentage of rated output VA	/	10%	25%	50%	75%	100%	120%*	/	/
Input voltage (V)	/	763.7	765.0	765.2	763.1	761.5	/	/	/
Input voltage ripple (V)	/	1.0	0.8	0.9	1.0	1.0	/	/	/
Input current (A)	/	1.6	4.0	8.1	12.1	16.2	/	/	/
Input current ripple (mA)	/	18.9	18.9	21.2	20.8	23.1	/	/	/
Input power (Pi) (W)	/	1237	3092	6175	9244	12340	/	/	/
Output power (Po) (W)	/	1171	2998	6025	9025	12037	/	/	/
Output efficiency(%)	/	94.64	96.96	97.57	97.63	97.55	/	/	/
Input energy (Wi) (Wh)	/	30.93	77.29	154.39	231.10	308.49	/	/	/
Output energy (Wo) (Wh)	/	29.26	74.94	150.63	225.61	300.93	/	/	/
Energy efficiency(%)	/	94.62	96.96	97.57	97.63	97.55	/	/	/
Remark:									
*If limited by design, inverter is not capable to operate with the 120% of rated output load, test under this condition is waived;									

## IEC 61683: 1999

Clause	Requirement – Test	Measuring result – Remark	Verdict
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TABLE	Efficiency recording and efficient calculation sheet								
power conditioner type	Grid-connected								
Model:	SOFAR 10000TL-G2								
Parameters of power conditioner	Minimum full load input voltage:350V Nominal voltage:600V 90% of the inverter's maximum input voltage: 765V Rated output voltage: 230Vac Rated output frequency:50Hz Rated output power: <b>10000W</b>								
PV input voltage	a) Manufacturer's minimum rated input voltage 350(±5.3V)								
Temperature (°C)	25°C ± 5°C								
Operating period for energy measurement (min)	1.5								
Percentage of rated output VA	/	10%	25%	50%	75%	100%	120%*	/	/
Input voltage (V)	/	347.1	349.2	346.2	346.2	352.3	/	/	/
Input voltage ripple (V)	/	0.2	1.0	0.9	0.5	1.0	/	/	/
Input current (A)	/	3.0	7.4	14.9	22.4	29.2	/	/	/
Input current ripple (mA)	/	65.5	110.0	128.9	152.7	178.7	/	/	/
Input power (Pi) (W)	/	1035	2593	5163	7740	10288	/	/	/
Output power (Po) (W)	/	972	2492	5000	7508	9972	/	/	/
Output efficiency(%)	/	93.91	96.08	96.84	97.00	96.93	/	/	/
Input energy (Wi) (Wh)	/	25.88	64.83	129.09	193.50	257.17	/	/	/
Output energy (Wo) (Wh)	/	24.30	62.29	125.02	187.71	249.27	/	/	/
Energy efficiency(%)	/	93.90	96.08	96.84	97.00	96.94	/	/	/
PV input voltage	b) The inverter's nominal voltage 600V(±9.0V)								
Temperature (°C)	25°C ± 5°C								
Operating period for energy measurement (min)	1.5								
Percentage of rated output VA	/	10%	25%	50%	75%	100%	120%*	/	/
Input voltage (V)	/	589.8	596.1	602.2	596.1	599.4	/	/	/

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Clause	Requirement – Test						Measuring result – Remark		Verdict
Input voltage ripple (V)	/	0.8	0.9	0.8	0.1	2.1	/	/	/
Input current (A)	/	1.7	4.3	8.5	12.9	17.1	/	/	/
Input current ripple (mA)	/	24.1	21.6	22.7	20.3	22.6	/	/	/
Input power (Pi) (W)	/	1030	2574	5141	7706	10265	/	/	/
Output power (Po) (W)	/	981	2501	5041	7539	10040	/	/	/
Output efficiency(%)	/	95.21	97.49	98.06	97.83	97.80	/	/	/
Input energy (Wi) (Wh)	/	25.75	64.34	128.53	192.66	256.64	/	/	/
Output energy (Wo) (Wh)	/	24.52	62.72	126.04	188.47	251.00	/	/	/
Energy efficiency(%)	/	95.22	97.58	98.06	97.83	97.80	/	/	/
PV input voltage	c) 90% of the inverter's maximum input voltage 765V(±11.5V)								
Temperature (°C)	25°C ± 5°C								
Operating period for energy measurement (min)	1.5								
Percentage of rated output VA	/	10%	25%	50%	75%	100%	120%*	/	/
Input voltage (V)	/	764.9	763.1	766.1	763.5	761.6	/	/	/
Input voltage ripple (V)	/	0.8	0.8	0.9	1.0	1.0	/	/	/
Input current (A)	/	1.3	3.4	6.7	10.1	13.5	/	/	/
Input current ripple (mA)	/	19.3	20.2	19.4	20.1	24.3	/	/	/
Input power (Pi) (W)	/	1025	2557	5130	7710	10274	/	/	/
Output power (Po) (W)	/	957	2470	4999	7524	10028	/	/	/
Output efficiency(%)	/	93.41	96.57	97.44	97.60	97.61	/	/	/
Input energy (Wi) (Wh)	/	25.63	63.93	128.25	192.73	256.85	/	/	/
Output energy (Wo) (Wh)	/	23.94	61.73	124.97	188.10	250.71	/	/	/
Energy efficiency(%)	/	93.43	96.57	97.44	97.60	97.61	/	/	/
Remark:									
*If limited by design, inverter is not capable to operate with the 120% of rated output load, test under this condition is waived;									



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Clause	Requirement – Test	Measuring result – Remark	Verdict
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<b>TABLE</b>	No load loss	<b>P</b>
power conditioner type	Utility-interactive	
SOFAR 15000TL-G2		
Measure input voltage (V)	600.2	
Measured input power(W)	14.010	
SOFAR 12000TL-G2		
Measure input voltage (V)	600.2	
Measured input power(W)	14.070	
SOFAR 10000TL-G2		
Measure input voltage (V)	600.2	
Measured input power(W)	14.050	
Remark: No load loss is measured when the power conditioner works at rated input voltage and it's load is disconnected.		
<b>TABLE</b>	Standby loss	<b>P</b>
power conditioner type	Utility-interactive	
SOFAR 15000TL-G2		
Measure input voltage (V)	229.9	
Measured input power(W)	611.000	
SOFAR 12000TL-G2		
Measure input voltage (V)	229.5	
Measured input power(W)	618.000	
SOFAR 10000TL-G2		
Measure input voltage (V)	229.8	
Measured input power(W)	612.000	
Remark: Standby loss is measured when the power conditioner works at rated input voltage and in standby mode.		

--- End of test report---