

Test Report issued under the responsibility of:



**TEST REPORT
IEC 61683**

**Photovoltaic systems – Power conditioners –
Procedure for measuring efficiency**

Report Number.....: **GZES230200310801**
Date of issue.....: **2023/02/25**
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Name of Testing Laboratory preparing the Report.....: **Guangzhou SGS-CSTC Standards Technical Services Co., Ltd. Guangzhou Branch**

Address.....: **198 Kezhu Road, Science City, Economic & Technology Development Area, Guangzhou, Guangdong, China**

Applicant's name.....: **AISWEI Technology Co., Ltd.**
Address.....: **Room 905B, 757 Mengzi Road, Huangpu District, 200023 Shanghai, P.R. China.**

Test specification:
Standard.....: **IEC 61683:1999 (First Edition)**
Test procedure.....: **SGS-CSTC**
Non-standard test method.....: **N/A**


Test Report Form No.....: **IEC 61683B**
Test Report Form(s) Originator.....: **TÜV SÜD Product Service GmbH**
Master TRF.....: **Dated 2017-11**

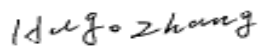

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Test item description	PV Grid-tied Inverter
Trade Mark	
Manufacturer	AISWEI Technology Co., Ltd.
Address	Room 905B, 757 Mengzi Road, Huangpu District, 200023 Shanghai, P.R. China
Model/Type reference.....	ASW50K-LT-G2 Pro, ASW45K-LT-G2 Pro, ASW40K-LT-G2 Pro ASW50K-LT-G2, ASW45K-LT-G2, ASW40K-LT-G2 ASW36K-LT-G2, ASW33K-LT-G2, ASW30K-LT-G2
Ratings	Refer to the rating on page 6 to page 8 of this report Serial Number: HT00500022170144 CN-01 5 <i>(The Equipment parameters are changed by software)</i> Software version: Main DSP Software Version: V610-03038-04 Slave DSP Software Version: V610-60009-00 Safety package (Flash) Version: V61011004-02

Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):		
Testing Laboratory:	SGS-CSTC Standards Technical Services Co., Ltd Guangzhou Branch	
Testing location/ address	198 Kezhu Road, Science City, Economic & Technology Development Area, Guangzhou, Guangdong, China	
Tested by (name, function, signature)	Hugo Zhang (Project Engineer)	
Approved by (name, function, signature	Michael Tong (Technical Reviewer)	


List of Attachments (including a total number of pages in each attachment):		
50/60 Hz		
Attachment #	Description	Pages
Attachment I	Pictures of the EUT and Electrical Schemes	10 pages
Attachment II	Testing Information	5 pages
Summary of testing:		
<p>Tests performed (name of test and test clause):</p> <p>The equipment has been tested according to the standard: IEC 61683:1999. Testing has been carried out at 50/60 Hz</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>Note1: Output voltage is 3W/N/PE 230 Va.c.</p> <p>Note2: This report refers to original version GZES220701399803 to update the following contents: With the power grid frequency of 60Hz, all models of tests were newly added.</p>		<p>Testing location:</p> <p>See page 2</p>
Summary of compliance with National Differences		
No National Differences are addressed to this test report		





Copy of marking plate(representative):



Model: ASW50K-LT-G2

Max. input voltage	d.c. 1100V
MPP voltage range	d.c. 200-1000V
Max. input current	d.c. 5x26A
Isc PV(absolute maximum)	d.c. 5x40A
Rated grid voltage	3/N/PE ~ 230/400V
Rated grid frequency	50/60Hz
Rated AC output active power	50kW
Max. AC output apparent power	50kVA
Max. continuous output current	a.c. 80A
Adjustable cos(φ)	0.8ind...0.8cap
Operating temperature range	-25...+60°C
Topology	Non-isolated
Ingress protection	IP65
Protective class	I
Overvoltage category	II(PV), III(MAINS)



AISWEI Technology (Shanghai) Co., Ltd.
 Hotline: +86 400 801 9996
 Web: www.solplanet.net
 Add.: Room 905B, 757 Mengzi Road, Huangpu District, Shanghai,
 200023, China
 532-00574-02 Made in China

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 with **ASW50K-LT-G2** s except the parameters of rating.
4. As declared by the applicant, the importer (and manufacturer, if it is different)'s name, registered trade name or registered trademark and the postal address will be marked on the products before being place on the market. The contact details shall be in a language easily understood by end-users and market surveillance authorities.



Test item particulars: Three Phase Inverter	
Classification of installation and use: Fixed (permanent connection)	
Supply Connection: DC; PV	
.....: AC; Grid connection	
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 does not meet the requirement: F (Fail)	
Testing: CTF Stage 1 procedure	
Date of receipt of test item: N/A	
Date (s) of performance of tests: 2021/09/26 to 2021/10/25	
.....: 2022/06/20 to 2022/06/24	
.....: 2022/08/26 to 2022/09/23	
General remarks:	
"(See Enclosure #)" refers to additional information appended to the report. "(See appended table)" refers to a table appended to the report.	
<p>This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at www.sgs.com/terms_and_conditions.htm and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at www.sgs.com/terms_e-document.htm. 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>	
Throughout this report a <input type="checkbox"/> comma / <input checked="" type="checkbox"/> point is used as the decimal separator.	
Manufacturer's Declaration per sub-clause 4.2.5 of IECCE 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	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> Not applicable
When differences exist; they shall be identified in the General product information section.	
Name and address of factory (ies) : AISWEI New Energy Technology (Yangzhong) Co., Ltd. No.588 Gangxing Road, Yangzhong, Jiangsu P.R.China	

General product information:

ASW LT-G2 series inverter is a three-phase transformerless string inverter with three to five independent MPPTs. It converts the direct current (DC) generated by the photovoltaic (PV) module into a three-phase alternating current (AC) and feeds it into the utility grid.

Equipment Under Testing:

- ASW50K-LT-G2 Pro
- ASW45K-LT-G2 Pro
- ASW40K-LT-G2 Pro
- ASW50K-LT-G2
- ASW45K-LT-G2
- ASW40K-LT-G2
- ASW36K-LT-G2
- ASW33K-LT-G2
- ASW30K-LT-G2

Product Model	ASW30K-LT-G2	ASW33K-LT-G2	ASW36K-LT-G2
Input (DC)			
Max. PV modules power	45000 W	49500 W	54000 W
Max. input voltage/ Rated input voltage	1100 V / 630 V		
MPP Voltage Range	200 ~1000 V		
Full load DC voltage range	400 ~ 935 V	440 ~ 935 V	470 ~ 935 V
Intitial feed-in voltage	250 V		
Min input voltage	200 V		
Max. DC input current	3*26 A		
Isc PV, absolute max.	3*40 A		
Number of MPP trackers	3		
Strings per MPP tracker	2		
Output (AC)			
Rated output power	30000 W	33000 W	36000 W
Max. output active power	30000 W	33000 W	36000 W
Max. output apparent power	30000 VA	33000VA	36000VA
Rated AC Output Current ⁽¹⁾	43.5 A	47.8 A	52.2 A
Rated AC Voltage	230 /400 V (3 /N/PE)		
Rated AC Frequency	50/60 Hz		
Adjustable displacement power factor	0.8 ind – 0.80 cap		
Topology	Transformerless		
Operating temperature range	-25 ~ 60 °C		
Degree of protection	IP65		

⁽¹⁾ The rated current is calculated from rated power and voltage as the reference current value.

All of the models included in this test report share the same features:

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

Product Model	ASW40K-LT-G2	ASW45K-LT-G2	ASW50K-LT-G2
Input (DC)			
Max. PV modules power	60000 W	67500 W	75000 W
Max. input voltage/ Rated input voltage	1100 V / 630 V		
MPP Voltage Range	200 ~1000 V		
Full load DC voltage range	400 ~ 935 V	440 ~ 935 V	400 ~ 935 V
Intitial feed-in voltage	250 V		
Min input voltage	200 V		
Max. DC input current	4*26 A		5*26 A
Isc PV, absolute max.	4*40 A		5*40 A
Number of MPP trackers	4		5
Strings per MPP tracker	2		
Output (AC)			
Rated output power	40000 W	45000 W	50000 W
Max. output active power	40000 W	45000 W	50000 W
Max. output apparent power	40000 VA	45000 VA	50000 VA
Rated AC Output Current ⁽¹⁾	60.0 A	65.2 A	72.5 A
Rated AC Voltage	230 /400 (3 /N/PE)		
Rated AC Frequency	50/60 Hz		
Adjustable displacement power factor	0.8 ind – 0.80 cap		
Topology	Transformerless		
Operating temperature range	-25 ~ 60 °C		
Degree of protection	IP65		

⁽¹⁾ The rated current is calculated from rated power and voltage as the reference current value.

All of the models included in this test report share the same features:

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

Product Model	ASW40K-LT-G2 Pro	ASW45K-LT-G2 Pro	ASW50K-LT-G2 Pro
Input (DC)			
Max. PV modules power	60000 W	67500 W	75000 W
Max. input voltage/ Rated input voltage	1100 V / 630 V		
MPP Voltage Range	200 ~1000 V		
Full load DC voltage range	400 ~ 935 V	400 ~ 935 V	400 ~ 935 V
Intitial feed-in voltage	250 V		
Min input voltage	200 V		
Max. DC input current	4*32 A		5*32 A
Isc PV, absolute max.	4*48 A		5*48 A
Number of MPP trackers	4		5
Strings per MPP tracker	2		
Output (AC)			
Rated output power	40000 W	45000 W	50000 W
Max. output active power	40000 W	45000 W	50000 W
Max. output apparent power	44000 VA	49500 VA	55000 VA
Rated AC Output Current ⁽¹⁾	60.0 A	65.2 A	72.5 A
Rated AC Voltage	230 /400 (3 /N/PE)		
Rated AC Frequency	50/60 Hz		
Adjustable displacement power factor	0.8 ind – 0.80 cap		
Topology	Transformerless		
Operating temperature range	-25 ~ 60 °C		
Degree of protection	IP65		

⁽¹⁾ The rated current is calculated from rated power and voltage as the reference current value.

All of the models included in this test report share the same features:

- 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 °C ± 2 °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 50/60Hz have been carried out at 25°C±5°C	P
4.3	Output voltage and frequency		P
	The output voltage and frequency are maintained at the manufacturer's stated nominal values.	3~ /N/PE, 400V, 50/60Hz	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.).		P

IEC 61683: 1999			
Clause	Requirement – Test	Measuring result – Remark	Verdict
	Ensure that these measurements remain within the manufacturer's specified values.		
4.6	Resistive loads/utility grid		P
	At unity power factor, or at the intrinsic power factor of grid-connected inverters without power factor adjustment, measure the efficiency for power levels of 10 %, 25 %, 50 %, 75 %, 100 % and 120 % of the inverter's rating.		P
	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		N/A

IEC 61683: 1999			
Clause	Requirement – Test	Measuring result – Remark	Verdict
	of 50 % and 100 % of rated VA.		
	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
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 A₁ DC ammeter A₂ AC or d.c. ammeter W₁ DC wattmeter W₂ AC or d.c. wattmeter L load F frequency meter V₁ DC voltmeter V₂ 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

IEC 61683: 1999			
Clause	Requirement – Test	Measuring result – Remark	Verdict
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

TABLE		Efficiency recording and efficient calculation sheet of 50 Hz							
power conditioner type	Grid-connected								
Model:	ASW50K-LT-G2 Pro								
Parameters of power conditioner	Minimum input voltage:200 V Nominal voltage: 630 V Maximum input voltage: 1000 V MPPT voltage range with full power: 400 ~ 935 V Rated output voltage: 3~ /N/PE, 230 / 400 V Rated output frequency: 50 Hz Rated output power: 50 kW Note1: According to the user manual, the minimum input voltage is 200 V. However, under this voltage, the inverter can't output full power. So, for this test, 400 V have been used instead of 200 V. The customer declares that the maximum input voltage for this test should be the maximum MPPT voltage. So, for this test, 90% of 1000 V have been used instead of 90% of 1100 V.								
PV input voltage	a) Manufacturer's minimum input voltage 400 V (±6.0 V)								
Temperature (°C)	25 °C ± 5 °C								
Operating period for energy measurement (min)	2								
Percentage of rated output VA	/	10%	25%	50%	75%	100%	120%(*)	/	/
Input voltage (V)	/	405.2	401	400.7	401.8	401.4	/	/	/
Input voltage ripple (mV)	/	10	11	11	8	10	/	/	/
Input current (A)	/	12.6	31.9	64.1	95.9	123.6	/	/	/
Input current ripple (mA)	/	19	23	16	13	18	/	/	/
Input power (Pi) (kW)	/	5.122	12.782	25.663	38.535	52.071	/	/	/
Output power (Po) (kW)	/	4.989	12.491	25.027	37.455	50.352	/	/	/
Output efficiency (%)	/	97.4	97.7	97.5	97.2	96.7	/	/	/
Input energy (Wi) (Wh)	/	172.2	430.4	869.2	1301.1	1746.7	/	/	/
Output energy (Wo) (Wh)	/	167.8	421.0	848.6	1265.0	1692.7	/	/	/
Energy efficiency(%)	/	97.4	97.8	97.6	97.2	96.9	/	/	/
Remark: (*) If limited by design, inverter is not capable to operate with the 120% of rated output load, test under this condition is waived;									

PV input voltage	b) The inverter's nominal voltage 630 V (± 9.45 V)								
Temperature ($^{\circ}$ C)	25 $^{\circ}$ C \pm 5 $^{\circ}$ C								
Operating period for energy measurement (min)	2								
Percentage of rated output VA	/	10%	25%	50%	75%	100%	120%(*)	/	/
Input voltage (V)	/	628.7	624.2	622.2	627.8	623.6	/	/	/
Input voltage ripple (mV)	/	11	13	9	9	7	/	/	/
Input current (A)	/	8.0	20.5	40.8	61.1	82.3	/	/	/
Input current ripple (mA)	/	39	33	21	18	14	/	/	/
Input power (Pi) (kW)	/	5.045	12.701	25.393	38.366	51.314	/	/	/
Output power (Po) (kW)	/	4.936	12.521	24.952	37.558	50.141	/	/	/
Output efficiency (%)	/	97.8	98.6	98.3	97.9	97.7	/	/	/
Input energy (Wi) (Wh)	/	169.2	426.4	854.1	1289.0	1722.9	/	/	/
Output energy (Wo) (Wh)	/	165.2	420.7	840.1	1263.1	1683.4	/	/	/
Energy efficiency(%)	/	97.6	98.7	98.4	98.0	97.7	/	/	/
Remark: (*) If limited by design, inverter is not capable to operate with the 120% of rated output load, test under this condition is waived;									

PV input voltage	c) 90% of the inverter's maximum input voltage 900 V (± 13.5 V)								
Temperature ($^{\circ}$ C)	25 $^{\circ}$ C \pm 5 $^{\circ}$ C								
Operating period for energy measurement (min)	2								
Percentage of rated output VA	/	10%	25%	50%	75%	100%	120%(*)	/	/
Input voltage (V)	/	891.3	888.1	889.9	894.0	891.2	/	/	/
Input voltage ripple (mV)		4	6	6	6	8	/	/	/
Input current (A)	/	5.9	14.4	28.4	43.4	57.4	/	/	/
Input current ripple (mA)		26	34	25	22	38	/	/	/
Input power (Pi) (kW)	/	5.289	12.794	25.231	38.472	51.172	/	/	/
Output power (Po) (kW)	/	5.040	12.411	24.523	37.391	49.600	/	/	/
Output efficiency(%)	/	95.3	97.0	97.2	97.2	96.9	/	/	/
Input energy (Wi) (Wh)	/	177.9	429.6	849.4	1291.3	1727.5	/	/	/
Output energy (Wo) (Wh)	/	169.2	417.2	826.4	1255.7	1675.5	/	/	/
Energy efficiency(%)	/	95.1	97.1	97.3	97.2	97.0	/	/	/
Remark: (*) If limited by design, inverter is not capable to operate with the 120% of rated output load, test under this condition is waived;									

TABLE		Efficiency recording and efficient calculation sheet of 50 Hz							
power conditioner type	Grid-connected								
Model:	ASW45K-LT-G2 Pro								
Parameters of power conditioner	Minimum input voltage:200 V Nominal voltage: 630 V Maximum input voltage: 1000 V MPPT voltage range with full power: 400 ~ 935 V Rated output voltage: 3~ /N/PE, 230 / 400 V Rated output frequency: 50 Hz Rated output power: 45 kW Note1: According to the user manual, the minimum input voltage is 200 V. However, under this voltage, the inverter can't output full power. So, for this test, 400 V have been used instead of 200 V. The customer declares that the maximum input voltage for this test should be the maximum MPPT voltage. So, for this test, 1000 V have been used instead of 1100 V.								
PV input voltage	a) Manufacturer's minimum input voltage 400 V (±6.0 V)								
Temperature (°C)	25 °C ± 5 °C								
Operating period for energy measurement (min)	2								
Percentage of rated output VA	/	10%	25%	50%	75%	100%	120%(*)	/	/
Input voltage (V)	/	404.7	402.4	401.5	403.2	403.1	/	/	/
Input voltage ripple (mV)	/	13	11	10	9	9	/	/	/
Input current (A)	/	11.5	28.3	57.4	86.1	115.4	/	/	/
Input current ripple (mA)	/	27	24	16	12	19	/	/	/
Input power (Pi) (kW)	/	4.659	11.403	23.062	34.697	46.501	/	/	/
Output power (Po) (kW)	/	4.476	11.089	22.439	33.655	45.095	/	/	/
Output efficiency(%)	/	96.1	97.2	97.3	97.0	97.0	/	/	/
Input energy (Wi) (Wh)	/	158.7	384.6	775.3	1165.1	1561.0	/	/	/
Output energy (Wo) (Wh)	/	152.6	374.3	754.8	1133.0	1515.8	/	/	/
Energy efficiency(%)	/	96.2	97.3	97.4	97.2	97.1	/	/	/
Remark: (*) If limited by design, inverter is not capable to operate with the 120% of rated output load, test under this condition is waived.									

PV input voltage	b) The inverter's nominal voltage 630 V (± 9.45 V)								
Temperature ($^{\circ}$ C)	25 $^{\circ}$ C \pm 5 $^{\circ}$ C								
Operating period for energy measurement (min)	2								
Percentage of rated output VA	/	10%	25%	50%	75%	100%	120%(*)	/	/
Input voltage (V)	/	623.3	627.1	632.7	628	630.6	/	/	/
Input voltage ripple (mV)	/	72	10	10	8	8	/	/	/
Input current (A)	/	7.3	18.3	36.2	55.0	73.1	/	/	/
Input current ripple (mA)	/	64	27	23	19	15	/	/	/
Input power (Pi) (kW)	/	4.574	11.465	22.907	34.569	46.111	/	/	/
Output power (Po) (kW)	/	4.433	11.210	22.436	33.922	44.947	/	/	/
Output efficiency(%)	/	96.9	97.8	97.9	98.1	97.5	/	/	/
Input energy (Wi) (Wh)	/	153.6	385.8	769.9	1160.8	1543.8	/	/	/
Output energy (Wo) (Wh)	/	148.5	377.3	754.7	1138.8	1506.3	/	/	/
Energy efficiency(%)	/	96.7	97.8	98.0	98.1	97.6	/	/	/
Remark: (*) If limited by design, inverter is not capable to operate with the 120% of rated output load, test under this condition is waived.									

PV input voltage	c) 90% of the inverter's maximum input voltage 900 V (± 13.5 V)								
Temperature ($^{\circ}$ C)	25 $^{\circ}$ C \pm 5 $^{\circ}$ C								
Operating period for energy measurement (min)	2								
Percentage of rated output VA	/	10%	25%	50%	75%	100%	120%(*)	/	/
Input voltage (V)	/	889.5	889.7	898.9	892.3	893.1	/	/	/
Input voltage ripple (mV)	/	4	6	6	6	7	/	/	/
Input current (A)	/	5.2	13.0	25.7	38.5	51.4	/	/	/
Input current ripple (mA)	/	28	34	20	23	20	/	/	/
Input power (Pi) (kW)	/	4.692	11.586	23.123	34.344	45.945	/	/	/
Output power (Po) (kW)	/	4.449	11.224	22.466	33.365	44.554	/	/	/
Output efficiency(%)	/	94.8	96.9	97.2	97.1	97.0	/	/	/
Input energy (Wi) (Wh)	/	157.4	389.2	778.0	1155.0	1548.7	/	/	/
Output energy (Wo) (Wh)	/	149.9	377.3	756.3	1123.6	1503.1	/	/	/
Energy efficiency(%)	/	95.2	96.9	97.2	97.3	97.1	/	/	/
Remark: (*) If limited by design, inverter is not capable to operate with the 120% of rated output load, test under this condition is waived.									

TABLE		Efficiency recording and efficient calculation sheet of 50 Hz							
power conditioner type	Grid-connected								
Model:	ASW40K-LT-G2 Pro								
Parameters of power conditioner	Minimum rated input voltage:200 V Nominal voltage: 630 V Maximum input voltage: 1000 V MPPT voltage range with full power: 400 ~ 935 V Rated output voltage: 3~ /N/PE, 230 / 400 V Rated output frequency: 50 Hz Rated output power: 40 kW Note1: According to the user manual, the minimum input voltage is 200 V. However, under this voltage, the inverter can't output full power. So, for this test, 400 V have been used instead of 200 V. The customer declares that the maximum input voltage for this test should be the maximum MPPT voltage. So, for this test, 1000 V have been used instead of 1100 V.								
PV input voltage	a) Manufacturer's minimum input voltage 400 V (±6.0 V)								
Temperature (°C)	25 °C ± 5 °C								
Operating period for energy measurement (min)	2								
Percentage of rated output VA	/	10%	25%	50%	75%	100%	120%(*)	/	/
Input voltage (V)	/	405.5	402.0	400.8	401.0	402.4	/	/	/
Input voltage ripple (mV)	/	3	5	8	9	10	/	/	/
Input current (A)	/	10.2	25.4	51.4	77.1	103.0	/	/	/
Input current ripple (mA)	/	65	68	129	177	123	/	/	/
Input power (Pi) (kW)	/	4.147	10.217	20.587	30.917	41.463	/	/	/
Output power (Po) (kW)	/	3.963	9.914	20.009	30.000	40.181	/	/	/
Output efficiency(%)	/	95.6	97.0	97.2	97.0	96.9	/	/	/
Input energy (Wi) (Wh)	/	139.6	345.2	692.0	1039.9	1393.7	/	/	/
Output energy (Wo) (Wh)	/	133.4	335.4	673.2	1010.1	1352.6	/	/	/
Energy efficiency(%)	/	95.6	97.2	97.3	97.1	97.1	/	/	/
Remark: (*) If limited by design, inverter is not capable to operate with the 120% of rated output load, test under this condition is waived;									

PV input voltage	b) The inverter's nominal voltage 630 V (± 9.45 V)								
Temperature ($^{\circ}$ C)	25 $^{\circ}$ C \pm 5 $^{\circ}$ C								
Operating period for energy measurement (min)	2								
Percentage of rated output VA	/	10%	25%	50%	75%	100%	120%(*)	/	/
Input voltage (V)	/	621.8	626.5	623.9	631.9	630.3	/	/	/
Input voltage ripple (mV)	/	58	9	9	8	8	/	/	/
Input current (A)	/	6.6	16.4	32.5	48.5	65.1	/	/	/
Input current ripple (mA)	/	68	23	26	18	16	/	/	/
Input power (Pi) (kW)	/	4.091	10.289	20.295	30.660	41.051	/	/	/
Output power (Po) (kW)	/	3.950	10.047	19.868	29.955	40.061	/	/	/
Output efficiency(%)	/	96.6	97.6	97.9	97.7	97.6	/	/	/
Input energy (Wi) (Wh)	/	137.7	346.1	682.9	1029.9	1383.5	/	/	/
Output energy (Wo) (Wh)	/	133.9	338.4	669.4	1007.8	1352.8	/	/	/
Energy efficiency(%)	/	97.2	97.8	98.0	97.9	97.8	/	/	/
Remark: (*) If limited by design, inverter is not capable to operate with the 120% of rated output load, test under this condition is waived;									

PV input voltage	c) 90% of the inverter's maximum input voltage 900 V (± 13.5 V)								
Temperature ($^{\circ}$ C)	25 $^{\circ}$ C \pm 5 $^{\circ}$ C								
Operating period for energy measurement (min)	2								
Percentage of rated output VA	/	10%	25%	50%	75%	100%	120%(*)	/	/
Input voltage (V)	/	888.1	889.3	898.0	905.8	892.4	/	/	/
Input voltage ripple (mV)	/	5	6	5	6	7	/	/	/
Input current (A)	/	4.7	11.4	22.4	34.3	46.1	/	/	/
Input current ripple (mA)	/	29	40	21	29	20	/	/	/
Input power (Pi) (kW)	/	4.207	10.164	20.104	31.023	41.161	/	/	/
Output power (Po) (kW)	/	3.960	9.809	19.508	30.123	39.915	/	/	/
Output efficiency(%)	/	94.1	96.5	97.0	97.1	97.0	/	/	/
Input energy (Wi) (Wh)	/	141.1	341.4	674.4	1041.2	1394.4	/	/	/
Output energy (Wo) (Wh)	/	133.9	330.5	655.9	1011.5	1353.5	/	/	/
Energy efficiency(%)	/	94.9	96.8	97.3	97.1	97.1	/	/	/
Remark: (*)If limited by design, inverter is not capable to operate with the 120% of rated output load, test under this condition is waived;									

TABLE		Efficiency recording and efficient calculation sheet of 50 Hz							
power conditioner type	Grid-connected								
Model:	ASW50K-LT-G2								
Parameters of power conditioner	Minimum rated input voltage:200 V Nominal voltage: 630 V Maximum input voltage: 1000 V MPPT voltage range with full power: 400 ~ 935 V Rated output voltage: 3~ /N/PE, 230 / 400 V Rated output frequency: 50 Hz Rated output power: 50 kW Note1: According to the user manual, the minimum input voltage is 200 V. However, under this voltage, the inverter can't output full power. So, for this test, 400 V have been used instead of 200 V. The customer declares that the maximum input voltage for this test should be the maximum MPPT voltage. So, for this test, 1000 V have been used instead of 1100 V.								
PV input voltage	a) Manufacturer's minimum rated input voltage 400 V (± 6.0 V)								
Temperature (°C)	25 °C \pm 5 °C								
Operating period for energy measurement (min)	2								
Percentage of rated output VA	/	10%	25%	50%	75%	100%	120%(*)	/	/
Input voltage (V)	/	403.9	402.8	402.1	402.5	402.7	/	/	/
Input voltage ripple (V)	/	0.326	0.087	0.165	0.229	0.313	/	/	/
Input current (A)	/	12.5	30.9	62.2	93.5	124.5	/	/	/
Input current ripple (A)	/	0.374	0.44	0.529	0.751	1010	/	/	/
Input power (Pi) (kW)	/	5.048	12.461	25.026	37.635	50.129	/	/	/
Output power (Po) (kW)	/	4.838	12.094	24.295	36.397	48.289	/	/	/
Output efficiency (%)	/	95.8	97.1	97.1	96.7	96.3	/	/	/
Input energy (Wi) (Wh)	/	168.3	415.4	834.2	1254.5	1671.0	/	/	/
Output energy (Wo) (Wh)	/	161.3	402.9	810.1	1210.8	1610.5	/	/	/
Energy efficiency(%)	/	95.8	97.0	97.1	96.5	96.4	/	/	/
Remark: (*) If limited by design, inverter is not capable to operate with the 120% of rated output load, test under this condition is waived;									

PV input voltage	b) The inverter's nominal voltage 630 V (±9.45 V)								
Temperature (°C)	25 °C ± 5 °C								
Operating period for energy measurement (min)	2								
Percentage of rated output VA	/	10%	25%	50%	75%	100%	120%(*)	/	/
Input voltage (V)	/	624.3	625.5	625.5	625.8	625.2	/	/	/
Input voltage ripple (V)	/	0.282	0.303	0.273	0.394	0.265	/	/	/
Input current (A)	/	7.9	20.1	40.0	60.0	80.2	/	/	/
Input current ripple (A)	/	0.056	0.039	0.082	0.102	0.089	/	/	/
Input power (Pi) (kW)	/	4.961	12.545	25.004	37.579	50.167	/	/	/
Output power (Po) (kW)	/	4.805	12.297	24.48	36.696	48.882	/	/	/
Output efficiency (%)	/	96.9	98.0	97.9	97.7	97.4	/	/	/
Input energy (Wi) (Wh)	/	165.8	418.2	833.5	1252.6	1672.2	/	/	/
Output energy (Wo) (Wh)	/	160.5	409.2	815.5	1225.5	1634.2	/	/	/
Energy efficiency(%)	/	96.8	97.8	97.8	97.8	97.7	/	/	/
Remark: (*) If limited by design, inverter is not capable to operate with the 120% of rated output load, test under this condition is waived;									

PV input voltage	c) 90% of the inverter's maximum input voltage 900 V (± 13.5 V)								
Temperature ($^{\circ}$ C)	25 $^{\circ}$ C \pm 5 $^{\circ}$ C								
Operating period for energy measurement (min)	2								
Percentage of rated output VA	/	10%	25%	50%	75%	100%	120%(*)	/	/
Input voltage (V)	/	891.1	891.7	891.4	891.5	891.4	/	/	/
Input voltage ripple (V)		0.139	0.128	0.405	0.408	0.526	/	/	/
Input current (A)	/	5.6	14.3	27.9	42.1	55.8	/	/	/
Input current ripple (A)		0.174	0.385	0.112	0.109	0.061	/	/	/
Input power (Pi) (kW)	/	4.977	12.719	24.883	37.514	49.729	/	/	/
Output power (Po) (kW)	/	4.740	12.311	24.167	36.378	48.141	/	/	/
Output efficiency(%)	/	95.2	96.8	97.1	97.0	96.8	/	/	/
Input energy (Wi) (Wh)	/	165.9	424.0	829.4	1250.5	1657.6	/	/	/
Output energy (Wo) (Wh)	/	158.0	410.2	805.5	1215.7	1604.4	/	/	/
Energy efficiency(%)	/	95.2	96.7	97.1	97.2	96.8	/	/	/
Remark: (*) If limited by design, inverter is not capable to operate with the 120% of rated output load, test under this condition is waived;									

TABLE		Efficiency recording and efficient calculation sheet of 50 Hz							
power conditioner type	Grid-connected								
Model:	ASW45K-LT-G2								
Parameters of power conditioner	Minimum rated input voltage:200 V Nominal voltage: 630 V Maximum input voltage: 1000 V MPPT voltage range with full power: 440 ~ 935 V Rated output voltage: 3~ /N/PE, 230 / 400 V Rated output frequency: 50 Hz Rated output power: 45 kW Note1: According to the user manual, the minimum input voltage is 200 V. However, under this voltage, the inverter can't output full power. So, for this test, 400 V have been used instead of 200 V. The customer declares that the maximum input voltage for this test should be the maximum MPPT voltage. So, for this test, 1000 V have been used instead of 1100 V.								
PV input voltage	a) Manufacturer's minimum rated input voltage 440 V (±6.6 V)								
Temperature (°C)	25 °C ± 5 °C								
Operating period for energy measurement (min)	2								
Percentage of rated output VA	/	10%	25%	50%	75%	100%	120%(*)	/	/
Input voltage (V)	/	434.1	443.6	440.4	439.7	436.8	/	/	/
Input voltage ripple (V)	/	0.417	0.358	0.402	0.440	0.400	/	/	/
Input current (A)	/	10.3	24.9	50.6	76.3	102.7	/	/	/
Input current ripple (A)	/	0.329	0.338	0.477	0.612	0.881	/	/	/
Input power (Pi) (kW)	/	4.477	11.063	22.287	33.532	44.867	/	/	/
Output power (Po) (kW)	/	4.298	10.771	21.679	32.528	43.276	/	/	/
Output efficiency(%)	/	96.0	97.4	97.3	97.0	96.5	/	/	/
Input energy (Wi) (Wh)	/	149.2	368.8	742.9	1117.7	1495.6	/	/	/
Output energy (Wo) (Wh)	/	143.3	358.6	722.3	1086.4	1441.2	/	/	/
Energy efficiency(%)	/	96.0	97.2	97.2	97.2	96.4	/	/	/
Remark: (*) If limited by design, inverter is not capable to operate with the 120% of rated output load, test under this condition is waived;									

PV input voltage	b) The inverter's nominal voltage 630 V (± 9.45 V)								
Temperature ($^{\circ}$ C)	25 $^{\circ}$ C \pm 5 $^{\circ}$ C								
Operating period for energy measurement (min)	2								
Percentage of rated output VA	/	10%	25%	50%	75%	100%	120%(*)	/	/
Input voltage (V)	/	624.3	624.6	624.9	624.5	624.9	/	/	/
Input voltage ripple (V)	/	0.424	0.355	0.339	0.315	0.474	/	/	/
Input current (A)	/	7.2	17.8	35.7	53.7	71.7	/	/	/
Input current ripple (A)	/	0.077	0.314	0.074	0.103	0.078	/	/	/
Input power (Pi) (kW)	/	4.484	11.144	22.314	33.527	44.775	/	/	/
Output power (Po) (kW)	/	4.346	10.899	21.847	32.749	43.641	/	/	/
Output efficiency(%)	/	96.9	97.8	97.9	97.7	97.5	/	/	/
Input energy (Wi) (Wh)	/	149.5	371.5	743.8	1117.6	1492.5	/	/	/
Output energy (Wo) (Wh)	/	144.9	363.2	728.2	1096.3	1452.1	/	/	/
Energy efficiency(%)	/	96.9	97.8	97.9	98.1	97.3	/	/	/
Remark: (*) If limited by design, inverter is not capable to operate with the 120% of rated output load, test under this condition is waived;									

PV input voltage	c) 90% of the inverter's maximum input voltage 900 V (± 13.5 V)								
Temperature (°C)	25°C ± 5°C								
Operating period for energy measurement (min)	2								
Percentage of rated output VA	/	10%	25%	50%	75%	100%	120%(*)	/	/
Input voltage (V)	/	898.5	890	893.8	892.6	890.8	/	/	/
Input voltage ripple (V)	/	0.440	0.179	0.310	0.304	0.748	/	/	/
Input current (A)	/	5.0	12.7	25.0	37.6	50.3	/	/	/
Input current ripple (A)	/	0.038	0.351	0.053	0.124	0.063	/	/	/
Input power (Pi) (kW)	/	4.475	11.268	22.381	33.552	44.821	/	/	/
Output power (Po) (kW)	/	4.253	10.9	21.726	32.554	43.405	/	/	/
Output efficiency(%)	/	95.0	96.7	97.1	97.0	96.8	/	/	/
Input energy (Wi) (Wh)	/	149.2	375.6	746.0	1118.4	1494.0	/	/	/
Output energy (Wo) (Wh)	/	141.8	363.5	724.3	1084.6	1445.5	/	/	/
Energy efficiency(%)	/	95.0	96.8	97.1	97.0	96.8	/	/	/
Remark: (*) If limited by design, inverter is not capable to operate with the 120% of rated output load, test under this condition is waived.									

TABLE		Efficiency recording and efficient calculation sheet of 50 Hz							
power conditioner type	Grid-connected								
Model:	ASW40K-LT-G2								
Parameters of power conditioner	Minimum rated input voltage:200 V Nominal voltage: 630 V Maximum input voltage: 1000 V MPPT voltage range with full power: 400 ~ 935 V Rated output voltage: 3~ /N/PE, 230 / 400 V Rated output frequency: 50 Hz Rated output power: 40 kW Note1: According to the user manual, the minimum input voltage is 200 V. However, under this voltage, the inverter can't output full power. So, for this test, 400 V have been used instead of 200 V. The customer declares that the maximum input voltage for this test should be the maximum MPPT voltage. So, for this test, 1000 V have been used instead of 1100 V.								
PV input voltage	a) Manufacturer's minimum rated input voltage 400 V (±6.0 V)								
Temperature (°C)	25 °C ± 5 °C								
Operating period for energy measurement (min)	2								
Percentage of rated output VA	/	10%	25%	50%	75%	100%	120%(*)	/	/
Input voltage (V)	/	403.2	403.8	397.8	400.2	404.9	/	/	/
Input voltage ripple (V)	/	0.276	0.278	0.652	0.528	0.713	/	/	/
Input current (A)	/	9.8	24.4	50.0	74.7	98.3	/	/	/
Input current ripple (A)	/	0.309	0.36	0.468	0.658	0.868	/	/	/
Input power (Pi) (kW)	/	3.943	9.833	19.899	29.890	39.800	/	/	/
Output power (Po) (kW)	/	3.767	9.517	19.300	28.922	38.314	/	/	/
Output efficiency(%)	/	95.5	96.8	97.0	96.8	96.3	/	/	/
Input energy (Wi) (Wh)	/	131.4	327.8	663.2	996.3	1326.7	/	/	/
Output energy (Wo) (Wh)	/	125.5	317.2	643.7	964.3	1275.5	/	/	/
Energy efficiency(%)	/	95.5	96.8	97.1	96.8	96.1	/	/	/
Remark: (*) If limited by design, inverter is not capable to operate with the 120% of rated output load, test under this condition is waived;									

PV input voltage	b) The inverter's nominal voltage 630 V (± 9.45 V)								
Temperature ($^{\circ}$ C)	25 $^{\circ}$ C \pm 5 $^{\circ}$ C								
Operating period for energy measurement (min)	2								
Percentage of rated output VA	/	10%	25%	50%	75%	100%	120%(*)	/	/
Input voltage (V)	/	625.6	627	623.3	623.1	622.5	/	/	/
Input voltage ripple (V)	/	0.424	0.283	0.516	0.433	0.479	/	/	/
Input current (A)	/	6.4	15.9	31.8	47.8	63.9	/	/	/
Input current ripple (A)	/	0.034	0.118	0.036	0.054	0.058	/	/	/
Input power (Pi) (kW)	/	3.981	9.947	19.819	29.799	39.771	/	/	/
Output power (Po) (kW)	/	3.848	9.724	19.400	29.124	38.809	/	/	/
Output efficiency(%)	/	96.7	97.8	97.9	97.7	97.6	/	/	/
Input energy (Wi) (Wh)	/	132.7	331.6	660.6	993.3	1325.7	/	/	/
Output energy (Wo) (Wh)	/	128.3	324.1	646.9	971.1	1295.2	/	/	/
Energy efficiency(%)	/	96.7	97.7	97.9	97.8	97.7	/	/	/
Remark: (*) If limited by design, inverter is not capable to operate with the 120% of rated output load, test under this condition is waived;									

PV input voltage	c) 90% of the inverter's maximum input voltage 900 V (± 13.5 V)								
Temperature ($^{\circ}$ C)	25 $^{\circ}$ C \pm 5 $^{\circ}$ C								
Operating period for energy measurement (min)	2								
Percentage of rated output VA	/	10%	25%	50%	75%	100%	120%(*)	/	/
Input voltage (V)	/	897.8	900.6	898.2	896.6	899.0	/	/	/
Input voltage ripple (V)	/	0.604	0.135	0.702	0.240	0.710	/	/	/
Input current (A)	/	4.5	11.1	22.2	33.3	44.3	/	/	/
Input current ripple (A)	/	0.024	0.172	0.040	0.108	0.102	/	/	/
Input power (Pi) (kW)	/	3.996	10.018	19.980	29.851	39.845	/	/	/
Output power (Po) (kW)	/	3.786	9.685	19.400	29.004	38.685	/	/	/
Output efficiency(%)	/	94.7	96.7	97.1	97.2	97.1	/	/	/
Input energy (Wi) (Wh)	/	133.2	333.9	666.0	995.0	1328.2	/	/	/
Output energy (Wo) (Wh)	/	126.2	322.8	646.5	966.8	1285.3	/	/	/
Energy efficiency(%)	/	94.7	96.7	97.1	97.2	96.8	/	/	/
Remark: (*)If limited by design, inverter is not capable to operate with the 120% of rated output load, test under this condition is waived;									

TABLE		Efficiency recording and efficient calculation sheet of 50 Hz							
power conditioner type	Grid-connected								
Model:	ASW36K-LT-G2								
Parameters of power conditioner	Minimum rated input voltage:200 V Nominal voltage: 630 V Maximum input voltage: 1000 V MPPT voltage range with full power: 470 ~ 935 V Rated output voltage: 3~ /N/PE, 230 / 400 V Rated output frequency: 50 Hz Rated output power: 36 kW Note1: According to the user manual, the minimum input voltage is 200 V. However, under this voltage, the inverter can't output full power. So, for this test, 400 V have been used instead of 200 V. The customer declares that the maximum input voltage for this test should be the maximum MPPT voltage. So, for this test, 1000 V have been used instead of 1100 V.								
PV input voltage	a) Manufacturer's minimum rated input voltage 470 V (± 7.05 V)								
Temperature ($^{\circ}$ C)	25 $^{\circ}$ C \pm 5 $^{\circ}$ C								
Operating period for energy measurement (min)	2								
Percentage of rated output VA	/	10%	25%	50%	75%	100%	120%(*)	/	/
Input voltage (V)	/	476.0	473.5	472.3	469.2	471.5	/	/	/
Input voltage ripple (V)	/	0.263	0.140	0.500	0.508	0.305	/	/	/
Input current (A)	/	7.6	18.7	37.8	57.3	76.3	/	/	/
Input current ripple (A)	/	0.256	0.284	0.364	0.527	0.713	/	/	/
Input power (Pi) (kW)	/	3.603	8.864	17.856	26.883	35.966	/	/	/
Output power (Po) (kW)	/	3.464	8.633	17.399	26.134	34.884	/	/	/
Output efficiency(%)	/	96.1	97.4	97.4	97.2	97.0	/	/	/
Input energy (Wi) (Wh)	/	120.1	295.5	595.2	896.1	1198.9	/	/	/
Output energy (Wo) (Wh)	/	115.5	287.7	579.9	871.2	1166.8	/	/	/
Energy efficiency(%)	/	96.2	97.4	97.4	97.2	97.3	/	/	/
Remark: (*) If limited by design, inverter is not capable to operate with the 120% of rated output load, test under this condition is waived;									

PV input voltage	b) The inverter's nominal voltage 630 V (± 9.45 V)								
Temperature ($^{\circ}$ C)	25 $^{\circ}$ C \pm 5 $^{\circ}$ C								
Operating period for energy measurement (min)	2								
Percentage of rated output VA	/	10%	25%	50%	75%	100%	120%(*)	/	/
Input voltage (V)	/	628.4	624.6	625.8	624.9	624.5	/	/	/
Input voltage ripple (V)	/	0.244	0.546	0.323	0.189	0.599	/	/	/
Input current (A)	/	5.7	14.3	28.5	43.0	57.4	/	/	/
Input current ripple (A)	/	0.065	0.054	0.080	0.048	0.088	/	/	/
Input power (Pi) (kW)	/	3.596	8.909	17.863	26.843	35.837	/	/	/
Output power (Po) (kW)	/	3.481	8.716	17.500	26.277	34.979	/	/	/
Output efficiency(%)	/	96.8	97.8	98.0	97.9	97.6	/	/	/
Input energy (Wi) (Wh)	/	119.9	297.0	595.4	894.8	1194.6	/	/	/
Output energy (Wo) (Wh)	/	116.0	290.5	583.2	875.3	1168.3	/	/	/
Energy efficiency(%)	/	96.7	97.8	98.0	97.8	97.8	/	/	/
Remark: (*) If limited by design, inverter is not capable to operate with the 120% of rated output load, test under this condition is waived;									

PV input voltage	c) 90% of the inverter's maximum input voltage 900 V (± 13.5 V)								
Temperature ($^{\circ}$ C)	25 $^{\circ}$ C \pm 5 $^{\circ}$ C								
Operating period for energy measurement (min)	2								
Percentage of rated output VA	/	10%	25%	50%	75%	100%	120%(*)	/	/
Input voltage (V)	/	892.8	894.1	897.7	896.3	898.4	/	/	/
Input voltage ripple (V)	/	0.404	0.321	0.149	0.408	0.681	/	/	/
Input current (A)	/	4.0	10.1	19.9	30.0	39.0	/	/	/
Input current ripple (A)	/	0.027	0.038	0.061	0.045	0.071	/	/	/
Input power (Pi) (kW)	/	3.595	9.037	17.904	26.905	35.046	/	/	/
Output power (Po) (kW)	/	3.390	8.725	17.401	26.180	34.023	/	/	/
Output efficiency(%)	/	94.3	96.5	97.2	97.3	97.1	/	/	/
Input energy (Wi) (Wh)	/	119.8	301.1	596.8	896.8	1168.2	/	/	/
Output energy (Wo) (Wh)	/	113.0	290.8	580.1	872.8	1130.6	/	/	/
Energy efficiency(%)	/	94.3	96.6	97.2	97.3	96.8	/	/	/
Remark: (*)If limited by design, inverter is not capable to operate with the 120% of rated output load, test under this condition is waived;									

TABLE		Efficiency recording and efficient calculation sheet of 50 Hz							
power conditioner type	Grid-connected								
Model:	ASW33K-LT-G2								
Parameters of power conditioner	Minimum rated input voltage:200 V Nominal voltage: 630 V Maximum input voltage: 1000 V MPPT voltage range with full power: 440 ~ 935 V Rated output voltage: 3~ /N/PE, 230 / 400 V Rated output frequency: 50 Hz Rated output power: 33 kW Note1: According to the user manual, the minimum input voltage is 200 V. However, under this voltage, the inverter can't output full power. So, for this test, 400 V have been used instead of 200 V. The customer declares that the maximum input voltage for this test should be the maximum MPPT voltage. So, for this test, 1000 V have been used instead of 1100 V.								
PV input voltage	a) Manufacturer's minimum rated input voltage 440 V (± 6.6 V)								
Temperature ($^{\circ}$ C)	25 $^{\circ}$ C \pm 5 $^{\circ}$ C								
Operating period for energy measurement (min)	2								
Percentage of rated output VA	/	10%	25%	50%	75%	100%	120%(*)	/	/
Input voltage (V)	/	443.1	439.0	440.0	441.3	439.0	/	/	/
Input voltage ripple (V)	/	0.610	0.206	0.164	0.514	0.173	/	/	/
Input current (A)	/	7.4	18.5	37.2	55.7	74.7	/	/	/
Input current ripple (A)	/	0.311	0.371	0.443	0.639	0.84	/	/	/
Input power (Pi) (kW)	/	3.297	8.113	16.347	24.583	32.789	/	/	/
Output power (Po) (kW)	/	3.159	7.872	15.903	23.892	31.759	/	/	/
Output efficiency(%)	/	95.8	97.0	97.3	97.2	96.9	/	/	/
Input energy (Wi) (Wh)	/	109.9	270.4	544.9	819.4	1093.0	/	/	/
Output energy (Wo) (Wh)	/	105.3	262.4	530.7	796.5	1053.8	/	/	/
Energy efficiency(%)	/	95.8	97.0	97.4	97.2	96.4	/	/	/
Remark: (*) If limited by design, inverter is not capable to operate with the 120% of rated output load, test under this condition is waived;									

PV input voltage	b) The inverter's nominal voltage 630 V (± 9.45 V)								
Temperature ($^{\circ}$ C)	25 $^{\circ}$ C \pm 5 $^{\circ}$ C								
Operating period for energy measurement (min)	2								
Percentage of rated output VA	/	10%	25%	50%	75%	100%	120%(*)	/	/
Input voltage (V)	/	627.2	628.2	626.9	623.5	625.2	/	/	/
Input voltage ripple (V)	/	0.503	0.321	0.376	0.630	0.561	/	/	/
Input current (A)	/	5.2	13.0	26.1	39.4	52.5	/	/	/
Input current ripple (A)	/	0.073	0.114	0.076	0.044	0.116	/	/	/
Input power (Pi) (kW)	/	3.291	8.168	16.351	24.595	32.823	/	/	/
Output power (Po) (kW)	/	3.173	7.980	15.999	24.051	32.033	/	/	/
Output efficiency(%)	/	96.4	97.7	97.8	97.8	97.6	/	/	/
Input energy (Wi) (Wh)	/	109.7	272.3	545	819.8	1094.1	/	/	/
Output energy (Wo) (Wh)	/	105.7	266.0	533.2	801.7	1069.3	/	/	/
Energy efficiency(%)	/	96.4	97.7	97.8	97.8	97.7	/	/	/
Remark: (*) If limited by design, inverter is not capable to operate with the 120% of rated output load, test under this condition is waived;									

PV input voltage	c) 90% of the inverter's maximum input voltage 900 V (± 13.5 V)								
Temperature ($^{\circ}\text{C}$)	25 $^{\circ}\text{C} \pm 5^{\circ}\text{C}$								
Operating period for energy measurement (min)	2								
Percentage of rated output VA	/	10%	25%	50%	75%	100%	120%(*)	/	/
Input voltage (V)	/	907.8	893.0	899.0	904.4	902.3	/	/	/
Input voltage ripple (V)	/	0.826	0.145	0.259	0.734	0.105	/	/	/
Input current (A)	/	3.6	9.3	18.3	27.3	36.4	/	/	/
Input current ripple (A)	/	0.054	0.380	0.077	0.037	0.081	/	/	/
Input power (Pi) (kW)	/	3.292	8.283	16.407	24.649	32.871	/	/	/
Output power (Po) (kW)	/	3.092	8.008	15.936	23.969	31.917	/	/	/
Output efficiency(%)	/	93.9	96.7	97.1	97.2	97.1	/	/	/
Input energy (Wi) (Wh)	/	109.7	276.1	546.9	821.6	1095.7	/	/	/
Output energy (Wo) (Wh)	/	103.0	266.9	531.2	798.7	1060.2	/	/	/
Energy efficiency(%)	/	93.9	96.7	97.1	97.2	96.8	/	/	/
Remark: (*)If limited by design, inverter is not capable to operate with the 120% of rated output load, test under this condition is waived;									

TABLE		Efficiency recording and efficient calculation sheet of 50 Hz							
power conditioner type	Grid-connected								
Model:	ASW30K-LT-G2								
Parameters of power conditioner	Minimum rated input voltage:200 V Nominal voltage: 630 V Maximum input voltage: 1000 V MPPT voltage range with full power: 400 ~ 935 V Rated output voltage: 3~ /N/PE, 230 / 400 V Rated output frequency: 50 Hz Rated output power: 30 kW Note1: According to the user manual, the minimum input voltage is 200 V. However, under this voltage, the inverter can't output full power. So, for this test, 400 V have been used instead of 200 V. The customer declares that the maximum input voltage for this test should be the maximum MPPT voltage. So, for this test, 1000 V have been used instead of 1100 V.								
PV input voltage	a) Manufacturer's minimum rated input voltage 400 V (±6.0 V)								
Temperature (°C)	25 °C ± 5 °C								
Operating period for energy measurement (min)	2								
Percentage of rated output VA	/	10%	25%	50%	75%	100%	120%(*)	/	/
Input voltage (V)	/	397.8	402.3	400.9	402.1	410.0	/	/	/
Input voltage ripple (V)	/	0.110	0.406	0.232	0.497	0.165	/	/	/
Input current (A)	/	7.2	17.8	36.1	54.0	70.9	/	/	/
Input current ripple (A)	/	0.345	0.401	0.485	0.672	0.889	/	/	/
Input power (Pi) (kW)	/	3.000	7.374	14.874	22.354	30.045	/	/	/
Output power (Po) (kW)	/	2.856	7.149	14.487	21.699	29.067	/	/	/
Output efficiency(%)	/	95.2	96.9	97.4	97.1	96.7	/	/	/
Input energy (Wi) (Wh)	/	100.0	245.8	495.8	745.1	1001.5	/	/	/
Output energy (Wo) (Wh)	/	95.2	238.3	481.9	723.1	968.7	/	/	/
Energy efficiency(%)	/	95.2	96.9	97.2	97.0	96.7	/	/	/
Remark: (*) If limited by design, inverter is not capable to operate with the 120% of rated output load, test under this condition is waived;									

PV input voltage	b) The inverter's nominal voltage 630 V (± 9.45 V)								
Temperature ($^{\circ}$ C)	25 $^{\circ}$ C \pm 5 $^{\circ}$ C								
Operating period for energy measurement (min)	2								
Percentage of rated output VA	/	10%	25%	50%	75%	100%	120%(*)	/	/
Input voltage (V)	/	623.3	623.9	624.7	626.5	628.5	/	/	/
Input voltage ripple (V)	/	0.221	0.224	0.532	0.489	0.346	/	/	/
Input current (A)	/	4.8	12.0	23.8	35.6	47.5	/	/	/
Input current ripple (A)	/	0.039	0.054	0.069	0.083	0.105	/	/	/
Input power (Pi) (kW)	/	2.990	7.468	14.847	22.325	29.830	/	/	/
Output power (Po) (kW)	/	2.882	7.301	14.550	21.883	29.149	/	/	/
Output efficiency(%)	/	96.4	97.8	98.0	98.0	97.7	/	/	/
Input energy (Wi) (Wh)	/	99.7	248.9	494.9	744.6	994.3	/	/	/
Output energy (Wo) (Wh)	/	96.1	243.3	485.0	729.0	971.7	/	/	/
Energy efficiency(%)	/	96.4	97.8	98.0	97.9	97.7	/	/	/
Remark: (*) If limited by design, inverter is not capable to operate with the 120% of rated output load, test under this condition is waived;									

PV input voltage	c) 90% of the inverter's maximum input voltage 900 V (± 13.5 V)								
Temperature (°C)	25°C ± 5°C								
Operating period for energy measurement (min)	2								
Percentage of rated output VA	/	10%	25%	50%	75%	100%	120%(*)	/	/
Input voltage (V)	/	897.1	903.0	899.3	896.2	902.9	/	/	/
Input voltage ripple (V)	/	0.135	0.462	0.244	0.147	0.606	/	/	/
Input current (A)	/	3.3	8.3	16.6	25.0	33.1	/	/	/
Input current ripple (A)	/	0.026	0.362	0.093	0.076	0.058	/	/	/
Input power (Pi) (kW)	/	2.991	7.528	14.959	22.374	29.874	/	/	/
Output power (Po) (kW)	/	2.799	7.257	14.513	21.740	29.021	/	/	/
Output efficiency(%)	/	93.6	96.4	97.0	97.2	97.1	/	/	/
Input energy (Wi) (Wh)	/	99.0	250.9	498.6	745.8	995.8	/	/	/
Output energy (Wo) (Wh)	/	93.2	241.9	483.9	724.9	967.3	/	/	/
Energy efficiency(%)	/	94.1	96.4	97.1	97.2	97.1	/	/	/
Remark: (*) If limited by design, inverter is not capable to operate with the 120% of rated output load, test under this condition is waived;									

TABLE		Efficiency recording and efficient calculation sheet of 60 Hz									
power conditioner type		Grid-connected									
Model:		ASW50K-LT-G2 Pro									
Parameters of power conditioner		Minimum input voltage:200 V Nominal voltage: 630 V Maximum input voltage: 1000 V MPPT voltage range with full power: 400 ~ 935 V VRated output voltage: 3~ /N/PE, 230 / 400 V Rated output frequency: 60 Hz Rated output power: 50 kW Note1: According to the user manual, the minimum input voltage is 200 V. However,under this voltage, the inverter can't output full power. So, for this test, 400 V have been used instead of 200 V. The customer declares that the maximum input voltage for this test should be the maximum MPPT voltage. So, for this test, 90% of 1000 V have been used instead of 90% of 1100 V.									
PV input voltage		a) Manufacturer's minimum input voltage 400 V (±6.0 V)									
Temperature (°C)		25 °C ± 5 °C									
Operating period for energy measurement (min)		2									
Percentage of ratedoutput VA		/	10%	25%	50%	75%	100%	120%(*)	/	/	
Input voltage (V)		/	402.1	396.4	404.0	397.1	400.9	/	/	/	
Input voltage ripple (mV)		/	47	41	72	71	60	/	/	/	
Input current (A)		/	12.3	31.6	61.7	93.7	124.4	/	/	/	
Input current ripple (mA)		/	18	53	116	102	179	/	/	/	
Input power (Pi) (kW)		/	5.089	12.825	25.480	38.300	51.417	/	/	/	
Output power (Po) (kW)		/	4.952	12.517	24.919	37.227	49.874	/	/	/	
Output efficiency (%)		/	97.3	97.6	97.8	97.2	97.0	/	/	/	
Input energy (Wi) (Wh)		/	169.6	427.5	849.3	1276.7	1713.9	/	/	/	
Output energy (Wo) (Wh)		/	165.1	417.2	830.6	1240.9	1662.5	/	/	/	
Energy efficiency(%)		/	97.3	97.6	97.8	97.2	97.0	/	/	/	
Remark: (*) If limited by design, inverter is not capable to operate with the 120% of rated output load, test under this condition is waived;											

PV input voltage	b) The inverter's nominal voltage 630 V (± 9.45 V)								
Temperature ($^{\circ}$ C)	25 $^{\circ}$ C \pm 5 $^{\circ}$ C								
Operating period for energy measurement (min)	2								
Percentage of rated output VA	/	10%	25%	50%	75%	100%	120%(*)	/	/
Input voltage (V)	/	631.9	635.7	629.5	626.8	634.6	/	/	/
Input voltage ripple (mV)	/	79	101	65	74	86	/	/	/
Input current (A)	/	8.0	19.8	39.4	60.0	79.1	/	/	/
Input current ripple (mA)	/	14	20	43	82	102	/	/	/
Input power (Pi) (kW)	/	5.149	12.757	25.112	38.404	51.361	/	/	/
Output power (Po) (kW)	/	5.025	12.566	24.786	37.636	50.180	/	/	/
Output efficiency (%)	/	97.6	98.5	98.7	98.0	97.7	/	/	/
Input energy (Wi) (Wh)	/	171.6	425.2	837.1	1280.1	1712.0	/	/	/
Output energy (Wo) (Wh)	/	167.5	418.9	826.2	1254.5	1672.7	/	/	/
Energy efficiency(%)	/	97.6	98.5	98.7	98.0	97.7	/	/	/
Remark: (*) If limited by design, inverter is not capable to operate with the 120% of rated output load, test under this condition is waived;									

PV input voltage	c) 90% of the inverter's maximum input voltage 900 V (± 13.5 V)								
Temperature ($^{\circ}$ C)	25 $^{\circ}$ C \pm 5 $^{\circ}$ C								
Operating period for energy measurement (min)	2								
Percentage of rated output VA	/	10%	25%	50%	75%	100%	120%(*)	/	/
Input voltage (V)	/	894.5	907.6	904.3	899.3	900.5	/	/	/
Input voltage ripple (mV)	/	104	114	106	148	109	/	/	/
Input current (A)	/	5.6	13.8	27.6	41.4	55.6	/	/	/
Input current ripple (mA)	/	10	21	36	64	67	/	/	/
Input power (Pi) (kW)	/	5.273	12.934	25.584	38.342	51.968	/	/	/
Output power (Po) (kW)	/	5.041	12.546	24.996	37.269	50.097	/	/	/
Output efficiency(%)	/	95.6	97.0	97.7	97.2	96.4	/	/	/
Input energy (Wi) (Wh)	/	175.8	431.1	852.8	1278.1	1732.3	/	/	/
Output energy (Wo) (Wh)	/	168.0	418.2	833.2	1242.3	1669.9	/	/	/
Energy efficiency(%)	/	95.6	97.0	97.7	97.2	96.4	/	/	/
Remark: (*) If limited by design, inverter is not capable to operate with the 120% of rated output load, test under this condition is waived;									

TABLE		Efficiency recording and efficient calculation sheet of 60 Hz							
power conditioner type	Grid-connected								
Model:	ASW45K-LT-G2 Pro								
Parameters of power conditioner	Minimum input voltage:200 V Nominal voltage: 630 V Maximum input voltage: 1000 V MPPT voltage range with full power: 400 ~ 935 V Rated output voltage: 3~ /N/PE, 230 / 400 V Rated output frequency: 60 Hz Rated output power: 45 kW Note1: According to the user manual, the minimum input voltage is 200 V. However, under this voltage, the inverter can't output full power. So, for this test, 400 V have been used instead of 200 V. The customer declares that the maximum input voltage for this test should be the maximum MPPT voltage. So, for this test, 1000 V have been used instead of 1100 V.								
PV input voltage	a) Manufacturer's minimum input voltage 400 V (±6.0 V)								
Temperature (°C)	25 °C ± 5 °C								
Operating period for energy measurement (min)	2								
Percentage of rated output VA	/	10%	25%	50%	75%	100%	120%(*)	/	/
Input voltage (V)	/	400.6	398.1	396.6	401.1	398.4	/	/	/
Input voltage ripple (mV)	/	75	72	77	52	53	/	/	/
Input current (A)	/	11.2	28.1	56.6	83.9	112.4	/	/	/
Input current ripple (mA)	/	14	37	80	103	199	/	/	/
Input power (Pi) (kW)	/	4.645	11.525	23.029	34.536	46.163	/	/	/
Output power (Po) (kW)	/	4.482	11.203	22.454	33.638	44.778	/	/	/
Output efficiency(%)	/	96.5	97.2	97.5	97.4	97.0	/	/	/
Input energy (Wi) (Wh)	/	154.8	384.2	767.6	1151.2	1538.8	/	/	/
Output energy (Wo) (Wh)	/	149.4	373.4	748.5	1121.3	1492.6	/	/	/
Energy efficiency(%)	/	96.5	97.2	97.5	97.4	97.0	/	/	/
Remark: (*) If limited by design, inverter is not capable to operate with the 120% of rated output load, test under this condition is waived.									

PV input voltage	b) The inverter's nominal voltage 630 V (± 9.45 V)								
Temperature ($^{\circ}$ C)	25 $^{\circ}$ C \pm 5 $^{\circ}$ C								
Operating period for energy measurement (min)	2								
Percentage of rated output VA	/	10%	25%	50%	75%	100%	120%(*)	/	/
Input voltage (V)	/	635.0	630.6	630.2	635.5	624.9	/	/	/
Input voltage ripple (mV)	/	100	102	72	90	94	/	/	/
Input current (A)	/	7.0	17.9	35.5	53.4	71.5	/	/	/
Input current ripple (mA)	/	11	21	47	62	92	/	/	/
Input power (Pi) (kW)	/	4.609	11.611	22.878	34.727	45.864	/	/	/
Output power (Po) (kW)	/	4.471	11.286	22.351	33.928	44.671	/	/	/
Output efficiency(%)	/	97.0	97.2	97.7	97.7	97.4	/	/	/
Input energy (Wi) (Wh)	/	153.6	386.6	763.4	1157.6	1528.8	/	/	/
Output energy (Wo) (Wh)	/	149.0	376.2	745.0	1130.9	1489.0	/	/	/
Energy efficiency(%)	/	97.0	97.3	97.6	97.7	97.4	/	/	/
Remark: (*) If limited by design, inverter is not capable to operate with the 120% of rated output load, test under this condition is waived.									

PV input voltage	c) 90% of the inverter's maximum input voltage 900 V (± 13.5 V)								
Temperature ($^{\circ}$ C)	25 $^{\circ}$ C \pm 5 $^{\circ}$ C								
Operating period for energy measurement (min)	2								
Percentage of rated output VA	/	10%	25%	50%	75%	100%	120%(*)	/	/
Input voltage (V)	/	897.1	907.1	904.3	906.2	894.6	/	/	/
Input voltage ripple (mV)	/	109	94	97	170	120	/	/	/
Input current (A)	/	5.0	12.3	24.7	37.2	49.8	/	/	/
Input current ripple (mA)	/	9	15	39	71	97	/	/	/
Input power (Pi) (kW)	/	4.739	11.624	22.949	34.697	46.220	/	/	/
Output power (Po) (kW)	/	4.526	11.182	22.329	33.726	44.556	/	/	/
Output efficiency(%)	/	95.5	96.2	97.3	97.2	96.4	/	/	/
Input energy (Wi) (Wh)	/	157.8	387.5	764.2	1156.6	1540.7	/	/	/
Output energy (Wo) (Wh)	/	150.9	372.7	744.3	1124.2	1485.2	/	/	/
Energy efficiency(%)	/	95.6	96.2	97.4	97.2	96.4	/	/	/
Remark: (*) If limited by design, inverter is not capable to operate with the 120% of rated output load, test under this condition is waived.									

TABLE		Efficiency recording and efficient calculation sheet of 60 Hz							
power conditioner type	Grid-connected								
Model:	ASW40K-LT-G2 Pro								
Parameters of power conditioner	Minimum rated input voltage:200 V Nominal voltage: 630 V Maximum input voltage: 1000 V MPPT voltage range with full power: 400 ~ 935 V Rated output voltage: 3~ /N/PE, 230 / 400 V Rated output frequency: 60 Hz Rated output power: 40 kW Note1: According to the user manual, the minimum input voltage is 200 V. However, under this voltage, the inverter can't output full power. So, for this test, 400 V have been used instead of 200 V. The customer declares that the maximum input voltage for this test should be the maximum MPPT voltage. So, for this test, 1000 V have been used instead of 1100 V.								
PV input voltage	a) Manufacturer's minimum input voltage 400 V (±6.0 V)								
Temperature (°C)	25 °C ± 5 °C								
Operating period for energy measurement (min)	2								
Percentage of rated output VA	/	10%	25%	50%	75%	100%	120%(*)	/	/
Input voltage (V)	/	403.6	403.3	398.5	397.2	397.2	/	/	/
Input voltage ripple (mV)	/	66	78	41	68	56	/	/	/
Input current (A)	/	11.2	28.1	56.8	84.8	112.5	/	/	/
Input current ripple (mA)	/	19	47	85	154	115	/	/	/
Input power (Pi) (kW)	/	4.708	11.685	23.293	34.710	46.255	/	/	/
Output power (Po) (kW)	/	4.520	11.335	22.640	33.669	44.683	/	/	/
Output efficiency(%)	/	96.0	97.0	97.2	97.0	96.6	/	/	/
Input energy (Wi) (Wh)	/	156.9	389.5	777.2	1157.0	1543.4	/	/	/
Output energy (Wo) (Wh)	/	150.7	377.8	754.7	1122.3	1489.4	/	/	/
Energy efficiency(%)	/	96.0	97.0	97.1	97.0	96.5	/	/	/
Remark: (*) If limited by design, inverter is not capable to operate with the 120% of rated output load, test under this condition is waived;									

PV input voltage	b) The inverter's nominal voltage 630 V (± 9.45 V)								
Temperature ($^{\circ}$ C)	25 $^{\circ}$ C \pm 5 $^{\circ}$ C								
Operating period for energy measurement (min)	2								
Percentage of rated output VA	/	10%	25%	50%	75%	100%	120%(*)	/	/
Input voltage (V)	/	629.0	627.8	631.9	636.1	633.3	/	/	/
Input voltage ripple (mV)	/	90	87	105	94	90	/	/	/
Input current (A)	/	7.2	18.0	35.7	53.6	70.7	/	/	/
Input current ripple (mA)	/	11	28	46	94	81	/	/	/
Input power (Pi) (kW)	/	4.660	11.547	23.058	34.957	45.975	/	/	/
Output power (Po) (kW)	/	4.502	11.293	22.574	34.083	44.780	/	/	/
Output efficiency(%)	/	96.6	97.8	97.9	97.5	97.4	/	/	/
Input energy (Wi) (Wh)	/	155.3	384.9	768.6	1165.2	1532.5	/	/	/
Output energy (Wo) (Wh)	/	150.1	376.4	752.5	1136.1	1492.7	/	/	/
Energy efficiency(%)	/	96.6	97.8	97.9	97.5	97.4	/	/	/
Remark: (*) If limited by design, inverter is not capable to operate with the 120% of rated output load, test under this condition is waived;									

PV input voltage	c) 90% of the inverter's maximum input voltage 900 V (\pm 13.5 V)								
Temperature ($^{\circ}$ C)	25 $^{\circ}$ C \pm 5 $^{\circ}$ C								
Operating period for energy measurement (min)	2								
Percentage of rated output VA	/	10%	25%	50%	75%	100%	120%(*)	/	/
Input voltage (V)	/	898.7	892.6	891.9	892.7	899.1	/	/	/
Input voltage ripple (mV)	/	148	140	109	162	98	/	/	/
Input current (A)	/	5.1	12.6	25.3	37.8	49.7	/	/	/
Input current ripple (mA)	/	9	16	40	73	50	/	/	/
Input power (Pi) (kW)	/	4.783	11.661	23.272	34.710	46.031	/	/	/
Output power (Po) (kW)	/	4.539	11.241	22.598	33.773	44.650	/	/	/
Output efficiency(%)	/	94.9	96.4	97.1	97.3	97.0	/	/	/
Input energy (Wi) (Wh)	/	159.4	388.7	775.7	1157.0	1534.4	/	/	/
Output energy (Wo) (Wh)	/	151.3	374.7	753.3	1125.8	1488.3	/	/	/
Energy efficiency(%)	/	94.9	96.4	97.1	97.3	97.0	/	/	/
Remark: (*)If limited by design, inverter is not capable to operate with the 120% of rated output load, test under this condition is waived;									

TABLE		Efficiency recording and efficient calculation sheet of 60 Hz							
power conditioner type	Grid-connected								
Model:	ASW50K-LT-G2								
Parameters of power conditioner	Minimum rated input voltage:200 V Nominal voltage: 630 V Maximum input voltage: 1000 V MPPT voltage range with full power: 400 ~ 935 V Rated output voltage: 3~ /N/PE, 230 / 400 V Rated output frequency: 60 Hz Rated output power: 60 kW Note1: According to the user manual, the minimum input voltage is 200 V. However, under this voltage, the inverter can't output full power. So, for this test, 400 V have been used instead of 200 V. The customer declares that the maximum input voltage for this test should be the maximum MPPT voltage. So, for this test, 1000 V have been used instead of 1100 V.								
PV input voltage	a) Manufacturer's minimum rated input voltage 400 V (± 6.0 V)								
Temperature ($^{\circ}$ C)	25 $^{\circ}$ C \pm 5 $^{\circ}$ C								
Operating period for energy measurement (min)	2								
Percentage of rated output VA	/	10%	25%	50%	75%	100%	120%(*)	/	/
Input voltage (V)	/	405.8	405.5	401.9	402.4	401.6	/	/	/
Input voltage ripple (mV)	/	102	107	102	108	103	/	/	/
Input current (A)	/	125	31.1	64	94.6	123.9	/	/	/
Input current ripple (mA)	/	162	162	161	160	163	/	/	/
Input power (Pi) (kW)	/	5.074	12.459	25.201	37.484	49.77	/	/	/
Output power (Po) (kW)	/	4.857	12.093	24.467	36.308	48.339	/	/	/
Output efficiency (%)	/	95.7	97.1	97.1	96.9	97.1	/	/	/
Input energy (Wi) (Wh)	/	200.8	420.2	1464.2	1264.1	1661.8	/	/	/
Output energy (Wo) (Wh)	/	192.2	408.3	1423	1225.9	1616.9	/	/	/
Energy efficiency(%)	/	95.7	97.2	97.2	97.0	97.3	/	/	/
Remark: (*) If limited by design, inverter is not capable to operate with the 120% of rated output load, test under this condition is waived;									

PV input voltage	b) The inverter's nominal voltage 630 V (±9.45 V)								
Temperature (°C)	25 °C ± 5 °C								
Operating period for energy measurement (min)	2								
Percentage of rated output VA	/	10%	25%	50%	75%	100%	120%(*)	/	/
Input voltage (V)	/	634.2	629.5	630.9	628.4	628.3	/	/	/
Input voltage ripple (mV)	/	102	107	106	108	105	/	/	/
Input current (A)	/	8.1	19.9	39.7	59.7	79.7	/	/	/
Input current ripple (mA)	/	159	145	146	146	146	/	/	/
Input power (Pi) (kW)	/	5.144	12.553	25.040	37.479	50.017	/	/	/
Output power (Po) (kW)	/	4.983	12.279	24.573	36.754	48.929	/	/	/
Output efficiency (%)	/	96.9	97.8	98.1	98.1	97.8	/	/	/
Input energy (Wi) (Wh)	/	170.4	419.1	834.7	1259.7	1670.0	/	/	/
Output energy (Wo) (Wh)	/	166.6	410.5	820.8	1236.7	1636.6	/	/	/
Energy efficiency(%)	/	97.8	97.9	98.3	98.2	98.0	/	/	/
Remark: (*) If limited by design, inverter is not capable to operate with the 120% of rated output load, test under this condition is waived;									

PV input voltage	c) 90% of the inverter's maximum input voltage 900 V (± 13.5 V)								
Temperature (°C)	25 °C ± 5 °C								
Operating period for energy measurement (min)	2								
Percentage of rated output VA	/	10%	25%	50%	75%	100%	120%(*)	/	/
Input voltage (V)	/	904.2	909.1	904.0	902.4	893.7	/	/	/
Input voltage ripple (mV)		106	106	105	105	107	/	/	/
Input current (A)	/	5.8	14.0	27.4	41.5	55.6	/	/	/
Input current ripple (mA)		145	145	144	146	146	/	/	/
Input power (Pi) (kW)	/	5.231	12.713	24.799	37.429	49.717	/	/	/
Output power (Po) (kW)	/	4.983	12.337	24.129	36.387	48.239	/	/	/
Output efficiency(%)	/	95.3	97.0	97.3	97.2	97.0	/	/	/
Input energy (Wi) (Wh)	/	170.4	424.5	826.6	1249.7	1660.0	/	/	/
Output energy (Wo) (Wh)	/	166.6	412.4	805.7	1215.4	1612.7	/	/	/
Energy efficiency(%)	/	97.8	97.1	97.5	97.3	97.2	/	/	/
Remark: (*) If limited by design, inverter is not capable to operate with the 120% of rated output load, test under this condition is waived;									

TABLE		Efficiency recording and efficient calculation sheet of 60 Hz							
power conditioner type	Grid-connected								
Model:	ASW45K-LT-G2								
Parameters of power conditioner	Minimum rated input voltage:200 V Nominal voltage: 630 V Maximum input voltage: 1000 V MPPT voltage range with full power: 440 ~ 935 V Rated output voltage: 3~ /N/PE, 230 / 400 V Rated output frequency: 60 Hz Rated output power: 45 kW Note1: According to the user manual, the minimum input voltage is 200 V. However, under this voltage, the inverter can't output full power. So, for this test, 400 V have been used instead of 200 V. The customer declares that the maximum input voltage for this test should be the maximum MPPT voltage. So, for this test, 1000 V have been used instead of 1100 V.								
PV input voltage	a) Manufacturer's minimum rated input voltage 440 V (±6.6 V)								
Temperature (°C)	25 °C ± 5 °C								
Operating period for energy measurement (min)	2								
Percentage of rated output VA	/	10%	25%	50%	75%	100%	120%(*)	/	/
Input voltage (V)	/	445.2	442.6	442.7	433.9	446.2	/	/	/
Input voltage ripple (mV)	/	246	244	242	233	99.4	/	/	/
Input current (A)	/	8.8	25.3	51.5	78.5	98.9	/	/	/
Input current ripple (mA)	/	179	182	175	173	158	/	/	/
Input power (Pi) (kW)	/	3.931	11.121	22.349	33.430	44.361	/	/	/
Output power (Po) (kW)	/	3.765	10.792	21.738	32.452	43.025	/	/	/
Output efficiency(%)	/	95.8	97.0	97.3	97.1	97.0	/	/	/
Input energy (Wi) (Wh)	/	131.0	371.3	746.2	1116.2	1481.2	/	/	/
Output energy (Wo) (Wh)	/	125.8	360.7	726.5	1084.0	1439.2	/	/	/
Energy efficiency(%)	/	96.0	97.1	97.4	97.1	97.2	/	/	/
Remark: (*) If limited by design, inverter is not capable to operate with the 120% of rated output load, test under this condition is waived;									

PV input voltage	b) The inverter's nominal voltage 630 V (± 9.45 V)								
Temperature ($^{\circ}$ C)	25 $^{\circ}$ C \pm 5 $^{\circ}$ C								
Operating period for energy measurement (min)	2								
Percentage of rated output VA	/	10%	25%	50%	75%	100%	120%(*)	/	/
Input voltage (V)	/	638.9	640.2	628.0	631.3	628.4	/	/	/
Input voltage ripple (mV)	/	108	104	105	102	103	/	/	/
Input current (A)	/	6.7	17.1	35.5	53.3	71.5	/	/	/
Input current ripple (mA)	/	163	161	160	161	159	/	/	/
Input power (Pi) (kW)	/	4.256	10.915	22.281	33.633	44.942	/	/	/
Output power (Po) (kW)	/	4.106	10.715	21.877	32.986	43.988	/	/	/
Output efficiency(%)	/	96.5	98.2	98.2	98.1	97.9	/	/	/
Input energy (Wi) (Wh)	/	142.1	363.8	742.7	1123.0	1500.6	/	/	/
Output energy (Wo) (Wh)	/	137.2	357.8	730.9	1102.6	1472.0	/	/	/
Energy efficiency(%)	/	96.6	98.4	98.4	98.2	98.1	/	/	/
Remark: (*) If limited by design, inverter is not capable to operate with the 120% of rated output load, test under this condition is waived;									

PV input voltage	c) 90% of the inverter's maximum input voltage 900 V (± 13.5 V)								
Temperature ($^{\circ}$ C)	25 $^{\circ}$ C \pm 5 $^{\circ}$ C								
Operating period for energy measurement (min)	2								
Percentage of rated output VA	/	10%	25%	50%	75%	100%	120%(*)	/	/
Input voltage (V)	/	893.4	894.8	910.4	899.8	895.0	/	/	/
Input voltage ripple (mV)	/	105	105	107	105	104	/	/	/
Input current (A)	/	5.0	12.7	24.9	37.2	50.3	/	/	/
Input current ripple (mA)	/	160	164	163	161	161	/	/	/
Input power (Pi) (kW)	/	4.472	11.377	22.657	33.437	45.008	/	/	/
Output power (Po) (kW)	/	4.271	11.029	22.044	32.517	43.698	/	/	/
Output efficiency(%)	/	95.5	96.9	97.3	97.2	97.1	/	/	/
Input energy (Wi) (Wh)	/	149.3	380.5	756.5	1116.4	1502.8	/	/	/
Output energy (Wo) (Wh)	/	142.8	369.3	737.7	1087.1	1460.5	/	/	/
Energy efficiency(%)	/	95.6	97.1	97.5	97.4	97.2	/	/	/
Remark: (*) If limited by design, inverter is not capable to operate with the 120% of rated output load, test under this condition is waived.									

TABLE		Efficiency recording and efficient calculation sheet of 60 Hz							
power conditioner type	Grid-connected								
Model:	ASW40K-LT-G2								
Parameters of power conditioner	Minimum rated input voltage:200 V Nominal voltage: 630 V Maximum input voltage: 1000 V MPPT voltage range with full power: 400 ~ 935 V Rated output voltage: 3~ /N/PE, 230 / 400 V Rated output frequency: 60 Hz Rated output power: 40 kW Note1: According to the user manual, the minimum input voltage is 200 V. However, under this voltage, the inverter can't output full power. So, for this test, 400 V have been used instead of 200 V. The customer declares that the maximum input voltage for this test should be the maximum MPPT voltage. So, for this test, 1000 V have been used instead of 1100 V.								
PV input voltage	a) Manufacturer's minimum rated input voltage 400 V (±6.0 V)								
Temperature (°C)	25 °C ± 5 °C								
Operating period for energy measurement (min)	2								
Percentage of rated output VA	/	10%	25%	50%	75%	100%	120%(*)	/	/
Input voltage (V)	/	415.8	403.6	401.3	403.1	403.8	/	/	/
Input voltage ripple (mV)	/	245	256	258	237	253	/	/	/
Input current (A)	/	9.8	25.4	52.7	76.8	100.4	/	/	/
Input current ripple (mA)	/	179	175	183	173	181	/	/	/
Input power (Pi) (kW)	/	4.087	10.268	21.151	30.937	40.492	/	/	/
Output power (Po) (kW)	/	3.898	9.934	20.491	29.955	39.110	/	/	/
Output efficiency(%)	/	95.4	96.7	96.9	96.8	96.6	/	/	/
Input energy (Wi) (Wh)	/	136.7	344.3	706.2	1032.9	1356.5	/	/	/
Output energy (Wo) (Wh)	/	130.6	331.8	685.0	1001.7	1311.5	/	/	/
Energy efficiency(%)	/	95.5	96.4	97.0	97.0	96.7	/	/	/
Remark: (*) If limited by design, inverter is not capable to operate with the 120% of rated output load, test under this condition is waived;									

PV input voltage	b) The inverter's nominal voltage 630 V (± 9.45 V)								
Temperature ($^{\circ}\text{C}$)	25 $^{\circ}\text{C} \pm 5$ $^{\circ}\text{C}$								
Operating period for energy measurement (min)	2								
Percentage of rated output VA	/	10%	25%	50%	75%	100%	120%(*)	/	/
Input voltage (V)	/	633.1	634.9	631.5	628.8	629.8	/	/	/
Input voltage ripple (mV)	/	249	247	247	235	237	/	/	/
Input current (A)	/	6.6	16.5	32.9	49.6	65.0	/	/	/
Input current ripple (mA)	/	178	171	179	171	177	/	/	/
Input power (Pi) (kW)	/	4.200	10.465	20.782	31.178	40.931	/	/	/
Output power (Po) (kW)	/	4.061	10.241	20.359	30.512	40.035	/	/	/
Output efficiency(%)	/	96.7	97.9	98.0	97.9	97.8	/	/	/
Input energy (Wi) (Wh)	/	139.4	349.8	698.7	1052.7	1391.7	/	/	/
Output energy (Wo) (Wh)	/	135.9	344.2	687.5	1034.6	1362.9	/	/	/
Energy efficiency(%)	/	97.5	98.4	98.4	98.3	97.9	/	/	/
Remark: (*) If limited by design, inverter is not capable to operate with the 120% of rated output load, test under this condition is waived;									

PV input voltage	c) 90% of the inverter's maximum input voltage 900 V (± 13.5 V)								
Temperature (°C)	25°C ± 5°C								
Operating period for energy measurement (min)	2								
Percentage of rated output VA	/	10%	25%	50%	75%	100%	120%(*)	/	/
Input voltage (V)	/	904.1	891.1	890.4	890.8	903.0	/	/	/
Input voltage ripple (mV)	/	249	242	247	246	249	/	/	/
Input current (A)	/	4.4	11.2	22.4	33.5	44.0	/	/	/
Input current ripple (mA)	/	178	170	176	181	171	/	/	/
Input power (Pi) (kW)	/	3.957	9.990	19.959	29.808	39.728	/	/	/
Output power (Po) (kW)	/	3.757	9.692	19.428	29.002	38.606	/	/	/
Output efficiency(%)	/	94.9	97.0	97.3	97.3	97.2	/	/	/
Input energy (Wi) (Wh)	/	132.4	335.8	666.4	995.2	1326.5	/	/	/
Output energy (Wo) (Wh)	/	125.8	326.4	649.0	969.2	1290.5	/	/	/
Energy efficiency(%)	/	95.0	97.2	97.4	97.4	97.3	/	/	/
Remark: (*)If limited by design, inverter is not capable to operate with the 120% of rated output load, test under this condition is waived;									

TABLE		Efficiency recording and efficient calculation sheet of 60 Hz							
power conditioner type	Grid-connected								
Model:	ASW36K-LT-G2								
Parameters of power conditioner	Minimum rated input voltage:200 V Nominal voltage: 630 V Maximum input voltage: 1000 V MPPT voltage range with full power: 470 ~ 935 V Rated output voltage: 3~ /N/PE, 230 / 400 V Rated output frequency: 60 Hz Rated output power: 36 kW Note1: According to the user manual, the minimum input voltage is 200 V. However, under this voltage, the inverter can't output full power. So, for this test, 400 V have been used instead of 200 V. The customer declares that the maximum input voltage for this test should be the maximum MPPT voltage. So, for this test, 1000 V have been used instead of 1100 V.								
PV input voltage	a) Manufacturer's minimum rated input voltage 470 V (± 7.05 V)								
Temperature ($^{\circ}$ C)	25 $^{\circ}$ C \pm 5 $^{\circ}$ C								
Operating period for energy measurement (min)	2								
Percentage of rated output VA	/	10%	25%	50%	75%	100%	120%(*)	/	/
Input voltage (V)	/	472.7	474.4	472.2	472.1	472.2	/	/	/
Input voltage ripple (mV)	/	250	265	271	247	212	/	/	/
Input current (A)	/	7.7	19.6	38.9	58.9	78.7	/	/	/
Input current ripple (mA)	/	179	173	181	170	175	/	/	/
Input power (Pi) (kW)	/	3.658	9.286	18.364	27.796	37.172	/	/	/
Output power (Po) (kW)	/	3.515	9.026	17.897	27.005	36.043	/	/	/
Output efficiency(%)	/	96.1	97.2	97.5	97.2	97.0	/	/	/
Input energy (Wi) (Wh)	/	123.4	313.3	615.9	931.0	1245.0	/	/	/
Output energy (Wo) (Wh)	/	117.3	301.7	598.0	903.0	1205.6	/	/	/
Energy efficiency(%)	/	95.1	96.3	97.1	97.0	96.8	/	/	/
Remark: (*) If limited by design, inverter is not capable to operate with the 120% of rated output load, test under this condition is waived;									

PV input voltage	b) The inverter's nominal voltage 630 V (± 9.45 V)								
Temperature ($^{\circ}$ C)	25 $^{\circ}$ C \pm 5 $^{\circ}$ C								
Operating period for energy measurement (min)	2								
Percentage of rated output VA	/	10%	25%	50%	75%	100%	120%(*)	/	/
Input voltage (V)	/	630.5	635.1	632.8	629.1	627.1	/	/	/
Input voltage ripple (mV)	/	212	212	241	246	255	/	/	/
Input current (A)	/	6.0	14.9	29.4	44.4	59.5	/	/	/
Input current ripple (mA)	/	175	175	177	178	187	/	/	/
Input power (Pi) (kW)	/	3.774	9.474	18.611	27.936	37.318	/	/	/
Output power (Po) (kW)	/	3.654	9.269	18.241	27.354	36.401	/	/	/
Output efficiency(%)	/	96.8	97.8	98.0	97.9	97.5	/	/	/
Input energy (Wi) (Wh)	/	125.3	315.1	618.5	930.4	1238.8	/	/	/
Output energy (Wo) (Wh)	/	122.1	310.2	609.5	914.2	1216.4	/	/	/
Energy efficiency(%)	/	97.4	98.4	98.5	98.3	98.2	/	/	/
Remark: (*) If limited by design, inverter is not capable to operate with the 120% of rated output load, test under this condition is waived;									

PV input voltage	c) 90% of the inverter's maximum input voltage 900 V (± 13.5 V)								
Temperature ($^{\circ}$ C)	25 $^{\circ}$ C \pm 5 $^{\circ}$ C								
Operating period for energy measurement (min)	2								
Percentage of rated output VA	/	10%	25%	50%	75%	100%	120%(*)	/	/
Input voltage (V)	/	896.1	890.2	893.1	895.5	897.0	/	/	/
Input voltage ripple (mV)	/	261	263	263	208	250	/	/	/
Input current (A)	/	4.2	10.1	21.0	31.2	41.5	/	/	/
Input current ripple (mA)	/	185	185	185	188	176	/	/	/
Input power (Pi) (kW)	/	3.728	9.437	18.742	27.973	37.266	/	/	/
Output power (Po) (kW)	/	3.518	9.123	18.223	27.257	36.243	/	/	/
Output efficiency(%)	/	94.4	96.7	97.2	97.4	97.3	/	/	/
Input energy (Wi) (Wh)	/	123.8	313.5	623.9	934.0	1242.2	/	/	/
Output energy (Wo) (Wh)	/	117.8	304.7	608.8	911.6	1210.3	/	/	/
Energy efficiency(%)	/	95.2	97.2	97.6	97.6	97.4	/	/	/
Remark: (*)If limited by design, inverter is not capable to operate with the 120% of rated output load, test under this condition is waived;									

TABLE		Efficiency recording and efficient calculation sheet of 60 Hz							
power conditioner type	Grid-connected								
Model:	ASW33K-LT-G2								
Parameters of power conditioner	Minimum rated input voltage:200 V Nominal voltage: 630 V Maximum input voltage: 1000 V MPPT voltage range with full power: 440 ~ 935 V Rated output voltage: 3~ /N/PE, 230 / 400 V Rated output frequency: 60 Hz Rated output power: 33 kW Note1: According to the user manual, the minimum input voltage is 200 V. However, under this voltage, the inverter can't output full power. So, for this test, 400 V have been used instead of 200 V. The customer declares that the maximum input voltage for this test should be the maximum MPPT voltage. So, for this test, 1000 V have been used instead of 1100 V.								
PV input voltage	a) Manufacturer's minimum rated input voltage 440 V (± 6.6 V)								
Temperature ($^{\circ}$ C)	25 $^{\circ}$ C \pm 5 $^{\circ}$ C								
Operating period for energy measurement (min)	2								
Percentage of rated output VA	/	10%	25%	50%	75%	100%	120%(*)	/	/
Input voltage (V)	/	439.6	444.2	444.0	443.6	443.3	/	/	/
Input voltage ripple (mV)	/	261	264	265	266	271	/	/	/
Input current (A)	/	7.6	19.3	38.1	57.4	75.9	/	/	/
Input current ripple (mA)	/	173	174	176	182	181	/	/	/
Input power (Pi) (kW)	/	3.348	8.550	16.937	25.445	33.657	/	/	/
Output power (Po) (kW)	/	3.210	8.296	16.491	24.748	32.623	/	/	/
Output efficiency(%)	/	95.9	97.0	97.4	97.3	96.9	/	/	/
Input energy (Wi) (Wh)	/	112.8	286.9	568.1	851.7	1124.2	/	/	/
Output energy (Wo) (Wh)	/	107.3	277.3	550.9	826.8	1089.7	/	/	/
Energy efficiency(%)	/	95.1	96.7	97.0	97.1	96.9	/	/	/
Remark: (*) If limited by design, inverter is not capable to operate with the 120% of rated output load, test under this condition is waived;									

PV input voltage	b) The inverter's nominal voltage 630 V (± 9.45 V)								
Temperature ($^{\circ}\text{C}$)	25 $^{\circ}\text{C} \pm 5$ $^{\circ}\text{C}$								
Operating period for energy measurement (min)	2								
Percentage of rated output VA	/	10%	25%	50%	75%	100%	120%(*)	/	/
Input voltage (V)	/	636.6	631.7	632.5	629.2	628.9	/	/	/
Input voltage ripple (mV)	/	271	265	259	245	237	/	/	/
Input current (A)	/	5.4	13.7	27.1	40.8	54.4	/	/	/
Input current ripple (mA)	/	179	179	177	168	172	/	/	/
Input power (Pi) (kW)	/	3.459	8.657	17.132	25.647	34.186	/	/	/
Output power (Po) (kW)	/	3.337	8.459	16.756	25.100	33.389	/	/	/
Output efficiency(%)	/	96.5	97.7	97.8	97.9	97.7	/	/	/
Input energy (Wi) (Wh)	/	115.4	287.6	571.0	853.7	1138.0	/	/	/
Output energy (Wo) (Wh)	/	112.3	282.6	561.9	839.3	1115.9	/	/	/
Energy efficiency(%)	/	97.3	98.3	98.4	98.3	98.1	/	/	/
Remark: (*) If limited by design, inverter is not capable to operate with the 120% of rated output load, test under this condition is waived;									

PV input voltage	c) 90% of the inverter's maximum input voltage 900 V (± 13.5 V)								
Temperature ($^{\circ}\text{C}$)	25 $^{\circ}\text{C} \pm 5^{\circ}\text{C}$								
Operating period for energy measurement (min)	2								
Percentage of rated output VA	/	10%	25%	50%	75%	100%	120%(*)	/	/
Input voltage (V)	/	903.4	904.7	893.5	894.8	898.3	/	/	/
Input voltage ripple (mV)	/	214	197	234	228	238	/	/	/
Input current (A)	/	3.8	9.5	19.3	28.8	38.2	/	/	/
Input current ripple (mA)	/	175	180	179	184	177	/	/	/
Input power (Pi) (kW)	/	3.413	8.616	17.273	25.771	34.284	/	/	/
Output power (Po) (kW)	/	3.212	8.334	16.773	25.057	33.300	/	/	/
Output efficiency(%)	/	94.1	96.7	97.1	97.2	97.1	/	/	/
Input energy (Wi) (Wh)	/	114.6	286.3	573.4	858.4	1140.5	/	/	/
Output energy (Wo) (Wh)	/	108.8	278.1	560.0	837.9	1111.9	/	/	/
Energy efficiency(%)	/	94.9	97.1	97.7	97.6	97.5	/	/	/
Remark: (*)If limited by design, inverter is not capable to operate with the 120% of rated output load, test under this condition is waived;									

TABLE		Efficiency recording and efficient calculation sheet of 60 Hz							
power conditioner type	Grid-connected								
Model:	ASW30K-LT-G2								
Parameters of power conditioner	Minimum rated input voltage:200 V Nominal voltage: 630 V Maximum input voltage: 1000 V MPPT voltage range with full power: 400 ~ 935 V Rated output voltage: 3~ /N/PE, 230 / 400 V Rated output frequency: 60 Hz Rated output power: 30 kW Note1: According to the user manual, the minimum input voltage is 200 V. However, under this voltage, the inverter can't output full power. So, for this test, 400 V have been used instead of 200 V. The customer declares that the maximum input voltage for this test should be the maximum MPPT voltage. So, for this test, 1000 V have been used instead of 1100 V.								
PV input voltage	a) Manufacturer's minimum rated input voltage 400 V (± 6.0 V)								
Temperature ($^{\circ}$ C)	25 $^{\circ}$ C \pm 5 $^{\circ}$ C								
Operating period for energy measurement (min)	2								
Percentage of rated output VA	/	10%	25%	50%	75%	100%	120%(*)	/	/
Input voltage (V)	/	401.6	403.7	403.2	403.3	406.8	/	/	/
Input voltage ripple (mV)	/	249	248	240	237	238	/	/	/
Input current (A)	/	7.8	19.2	38.0	57.0	74.8	/	/	/
Input current ripple (mA)	/	181	180	176	176	176	/	/	/
Input power (Pi) (kW)	/	3.133	7.762	15.308	22.976	30.438	/	/	/
Output power (Po) (kW)	/	2.980	7.524	14.907	22.314	29.421	/	/	/
Output efficiency(%)	/	95.1	96.9	97.4	97.1	96.7	/	/	/
Input energy (Wi) (Wh)	/	104.6	260.3	514.3	769.5	1018.0	/	/	/
Output energy (Wo) (Wh)	/	99.6	251.6	498.1	746.5	984.3	/	/	/
Energy efficiency(%)	/	95.2	96.7	96.9	97.0	96.7	/	/	/
Remark: (*) If limited by design, inverter is not capable to operate with the 120% of rated output load, test under this condition is waived;									

PV input voltage	b) The inverter's nominal voltage 630 V (± 9.45 V)								
Temperature ($^{\circ}$ C)	25 $^{\circ}$ C \pm 5 $^{\circ}$ C								
Operating period for energy measurement (min)	2								
Percentage of rated output VA	/	10%	25%	50%	75%	100%	120%(*)	/	/
Input voltage (V)	/	635.4	633.5	637.6	629.1	632.2	/	/	/
Input voltage ripple (mV)	/	233	227	226	233	239	/	/	/
Input current (A)	/	5.1	12.2	24.3	37.2	48.6	/	/	/
Input current ripple (mA)	/	179	183	181	178	176	/	/	/
Input power (Pi) (kW)	/	3.209	7.730	15.487	23.397	30.707	/	/	/
Output power (Po) (kW)	/	3.095	7.578	15.188	22.956	30.006	/	/	/
Output efficiency(%)	/	96.5	98.0	98.1	98.1	97.7	/	/	/
Input energy (Wi) (Wh)	/	106.4	258.9	522.0	781.2	1026.6	/	/	/
Output energy (Wo) (Wh)	/	103.7	254.8	513.4	766.8	1006.9	/	/	/
Energy efficiency(%)	/	97.4	98.4	98.3	98.2	98.1	/	/	/
Remark: (*) If limited by design, inverter is not capable to operate with the 120% of rated output load, test under this condition is waived;									

PV input voltage	c) 90% of the inverter's maximum input voltage 900 V (± 13.5 V)								
Temperature (°C)	25°C ± 5°C								
Operating period for energy measurement (min)	2								
Percentage of rated output VA	/	10%	25%	50%	75%	100%	120%(*)	/	/
Input voltage (V)	/	892.6	902.5	891.9	897.2	903.0	/	/	/
Input voltage ripple (mV)	/	243	248	252	255	256	/	/	/
Input current (A)	/	3.5	8.8	17.6	25.7	34.3	/	/	/
Input current ripple (mA)	/	178	179	176	169	168	/	/	/
Input power (Pi) (kW)	/	3.120	7.973	15.729	23.041	30.945	/	/	/
Output power (Po) (kW)	/	2.920	7.688	15.255	22.391	30.098	/	/	/
Output efficiency(%)	/	93.6	96.4	97.0	97.2	97.3	/	/	/
Input energy (Wi) (Wh)	/	102.3	265.0	521.9	768.2	1034.9	/	/	/
Output energy (Wo) (Wh)	/	97.6	258.1	509.9	749.3	1007.7	/	/	/
Energy efficiency(%)	/	95.4	97.4	97.7	97.5	97.4	/	/	/
Remark: (*) If limited by design, inverter is not capable to operate with the 120% of rated output load, test under this condition is waived;									

TABLE	No load loss of 50Hz	P
power conditioner type	Utility-interactive	
ASW50K-LT-G2 Pro		
Measure input voltage (V)	630.4	
Measured input power (W)	46.9	
ASW45K-LT-G2 Pro		
Measure input voltage (V)	630.5	
Measured input power (W)	46.8	
ASW40K-LT-G2 Pro		
Measure input voltage (V)	630.5	
Measured input power (W)	46.0	
ASW50K-LT-G2		
Measure input voltage (V)	631.1	
Measured input power (W)	13	
ASW45K-LT-G2		
Measure input voltage (V)	631.1	
Measured input power (W)	14	
ASW40K-LT-G2		
Measure input voltage (V)	631.1	
Measured input power (W)	13	
ASW36K-LT-G2		
Measure input voltage (V)	631.1	
Measured input power (W)	13	
ASW33K-LT-G2		
Measure input voltage (V)	631.1	
Measured input power (W)	13	
ASW30K-LT-G2		
Measure input voltage (V)	631.1	
Measured input power (W)	13	
Remark: No load loss is measured when the power conditioner works at rated input voltage and it's load is disconnected.		

TABLE	No load loss of 60 Hz	P
power conditioner type	Utility-interactive	
ASW50K-LT-G2 Pro		
Measure input voltage (V)	631.2	
Measured input power (W)	4.1	
ASW45K-LT-G2 Pro		
Measure input voltage (V)	630.1	
Measured input power (W)	3.2	
ASW40K-LT-G2 Pro		
Measure input voltage (V)	634.5	
Measured input power (W)	3.6	
ASW50K-LT-G2		
Measure input voltage (V)	634.2	
Measured input power (W)	2.0	
ASW45K-LT-G2		
Measure input voltage (V)	634.1	
Measured input power (W)	2.8	
ASW40K-LT-G2		
Measure input voltage (V)	633.2	
Measured input power (W)	3.1	
ASW36K-LT-G2		
Measure input voltage (V)	634.8	
Measured input power (W)	2.0	
ASW33K-LT-G2		
Measure input voltage (V)	634.8	
Measured input power (W)	2.3	
ASW30K-LT-G2		
Measure input voltage (V)	634.8	
Measured input power (W)	2.4	
Remark: No load loss is measured when the power conditioner works at rated input voltage and it's load is disconnected.		

TABLE	Standby loss of 50 Hz	P
power conditioner type	Utility-interactive	
ASW50K-LT-G2 Pro		
Measure input voltage (V)	230.0	
Measured input power (W)	-7.7	
ASW45K-LT-G2 Pro		
Measure input voltage (V)	230.0	
Measured input power (W)	-7.7	
ASW40K-LT-G2 Pro		
Measure input voltage (V)	230.0	
Measured input power (W)	-7.7	
ASW50K-LT-G2		
Measure input voltage (V)	230.0	
Measured input power (W)	-1	
ASW45K-LT-G2		
Measure input voltage (V)	229.9	
Measured input power (W)	-1	
ASW40K-LT-G2		
Measure input voltage (V)	229.9	
Measured input power (W)	-1	
ASW36K-LT-G2		
Measure input voltage (V)	229.9	
Measured input power (W)	-1	
ASW33K-LT-G2		
Measure input voltage (V)	229.9	
Measured input power (W)	-1	
ASW30K-LT-G2		
Measure input voltage (V)	229.9	
Measured input power (W)	-1	
Remark: Standby loss is measured when the power conditioner works at rated input voltage and in standby mode.		

TABLE	Standby loss of 60 Hz	P
power conditioner type	Utility-interactive	
ASW50K-LT-G2 Pro		
Measure input voltage (V)	230.2	
Measured input power (W)	-5.6	
ASW45K-LT-G2 Pro		
Measure input voltage (V)	230.1	
Measured input power (W)	-5.0	
ASW40K-LT-G2 Pro		
Measure input voltage (V)	230.4	
Measured input power (W)	-7.2	
ASW50K-LT-G2		
Measure input voltage (V)	230.1	
Measured input power (W)	-5.5	
ASW45K-LT-G2		
Measure input voltage (V)	229.8	
Measured input power (W)	-5.1	
ASW40K-LT-G2		
Measure input voltage (V)	230.0	
Measured input power (W)	-5.2	
ASW36K-LT-G2		
Measure input voltage (V)	230.4	
Measured input power (W)	-6.1	
ASW33K-LT-G2		
Measure input voltage (V)	230.1	
Measured input power (W)	-5.4	
ASW30K-LT-G2		
Measure input voltage (V)	230.3	
Measured input power (W)	-5.4	
Remark: Standby loss is measured when the power conditioner works at rated input voltage and in standby mode.		

--- End of test report---

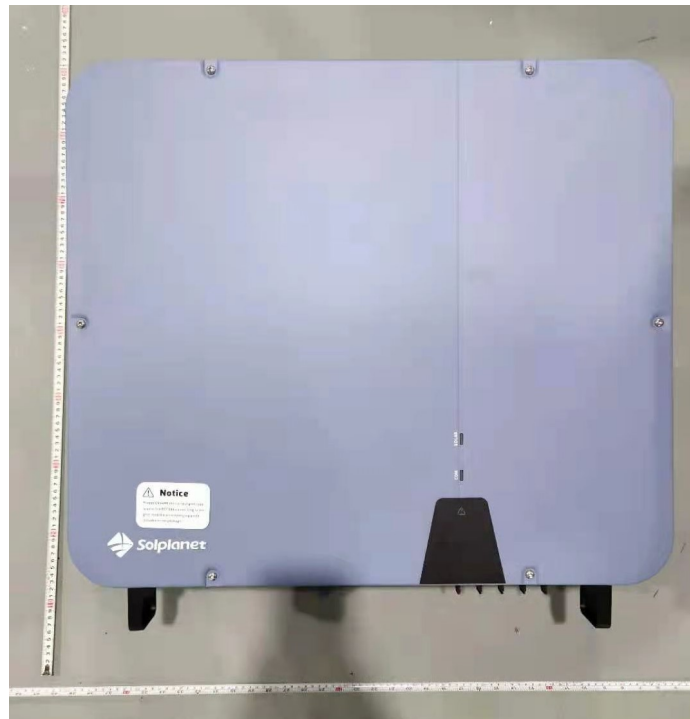
ATTACHMENT I

(Pictures of the EUT and Electrical Schemes)

1 PICTURES

Model: ASW50K-LT-G2 Pro, ASW45K-LT-G2 Pro, ASW40K-LT-G2 Pro
ASW50K-LT-G2, ASW45K-LT-G2, ASW40K-LT-G2
ASW36K-LT-G2, ASW33K-LT-G2, ASW30K-LT-G2

Front view



Back Side



Connection interface



Top Side



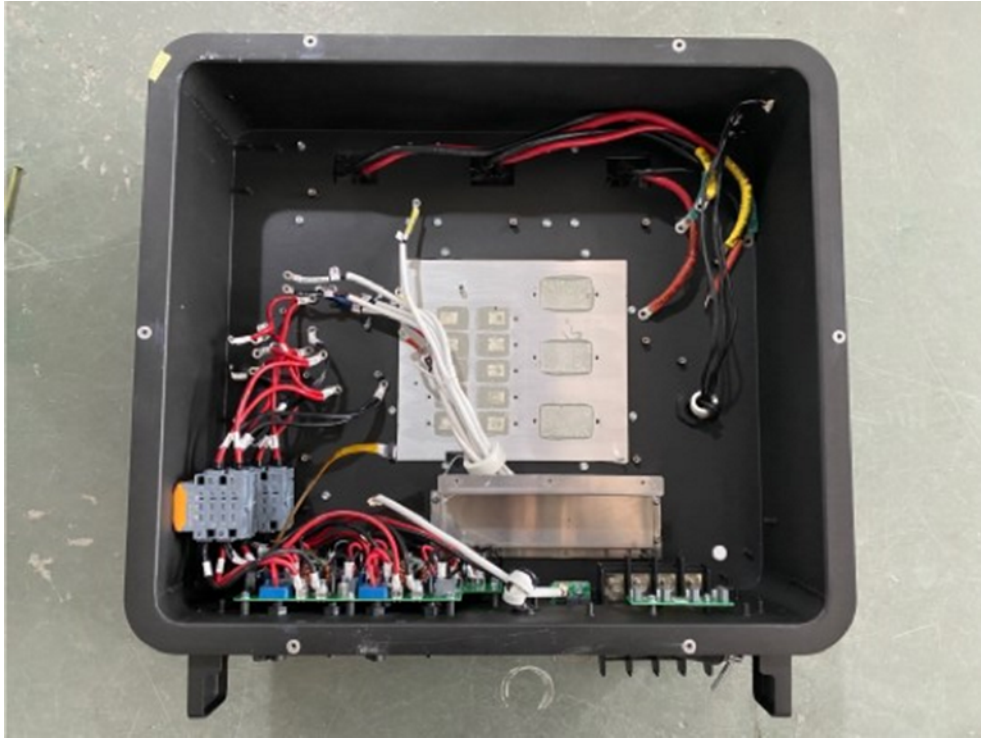
Left Side



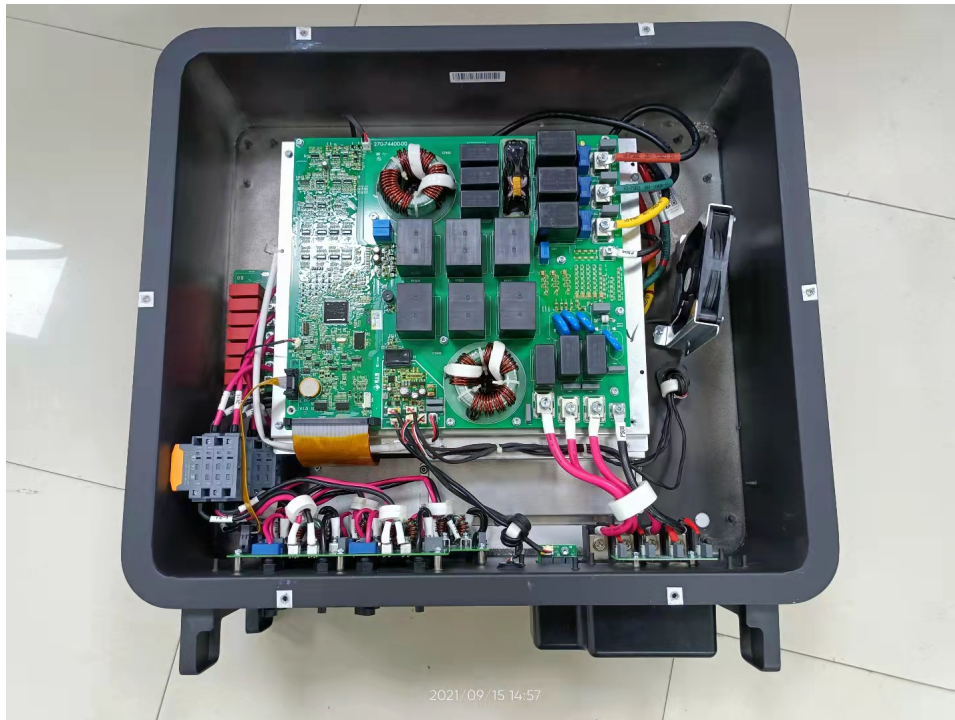
Right side



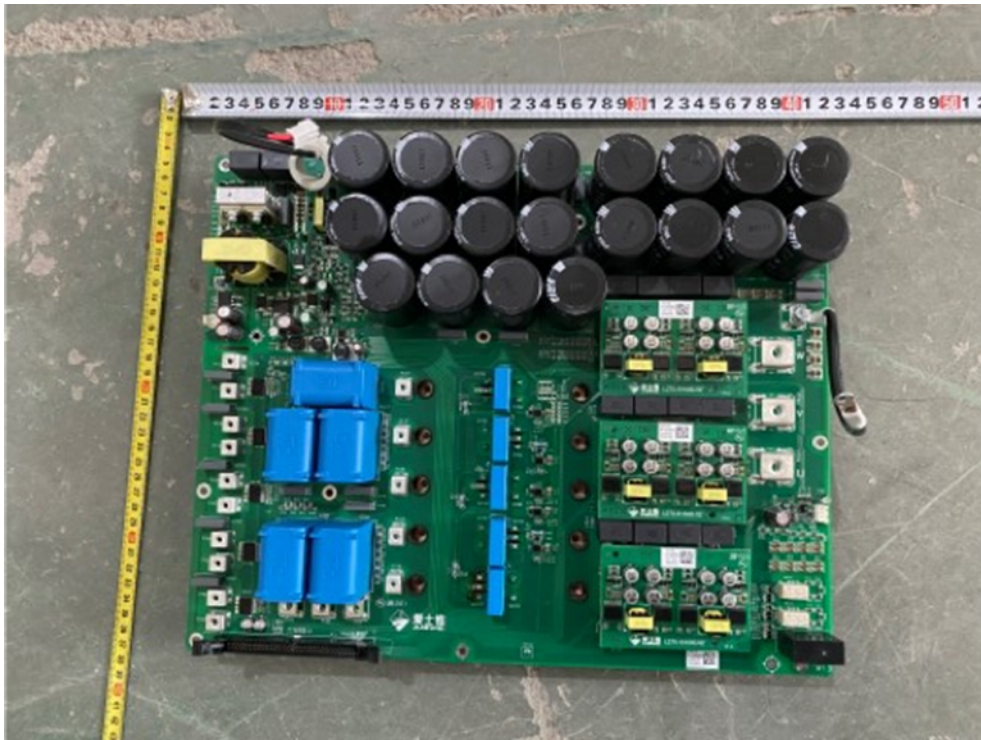
Internal 1



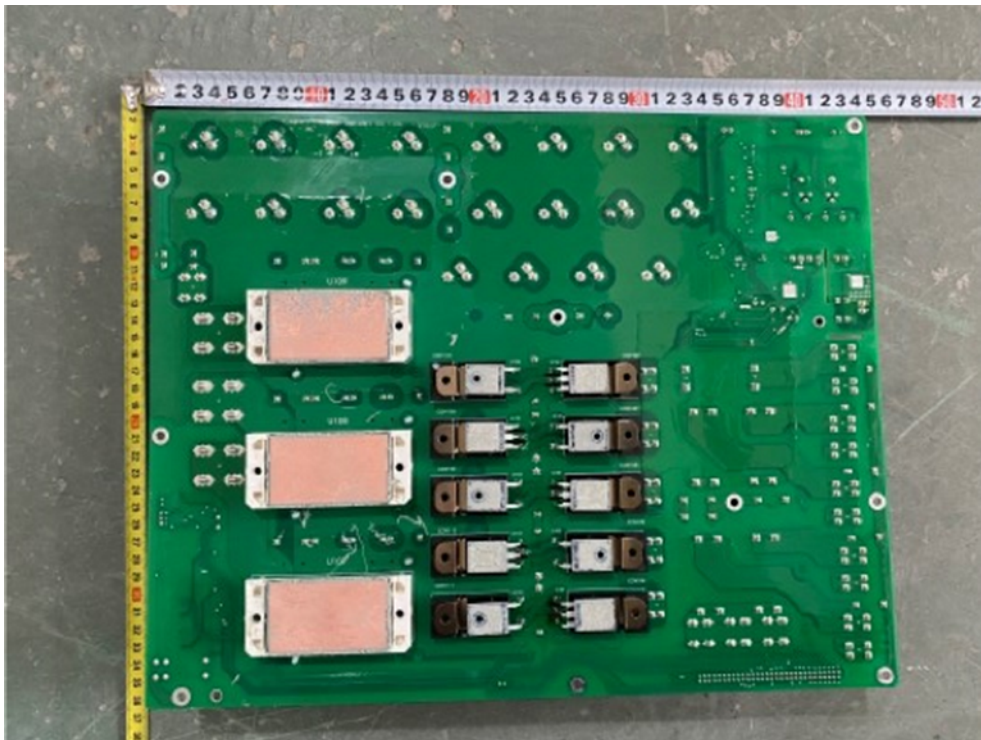
Internal 2



Front side of Power board



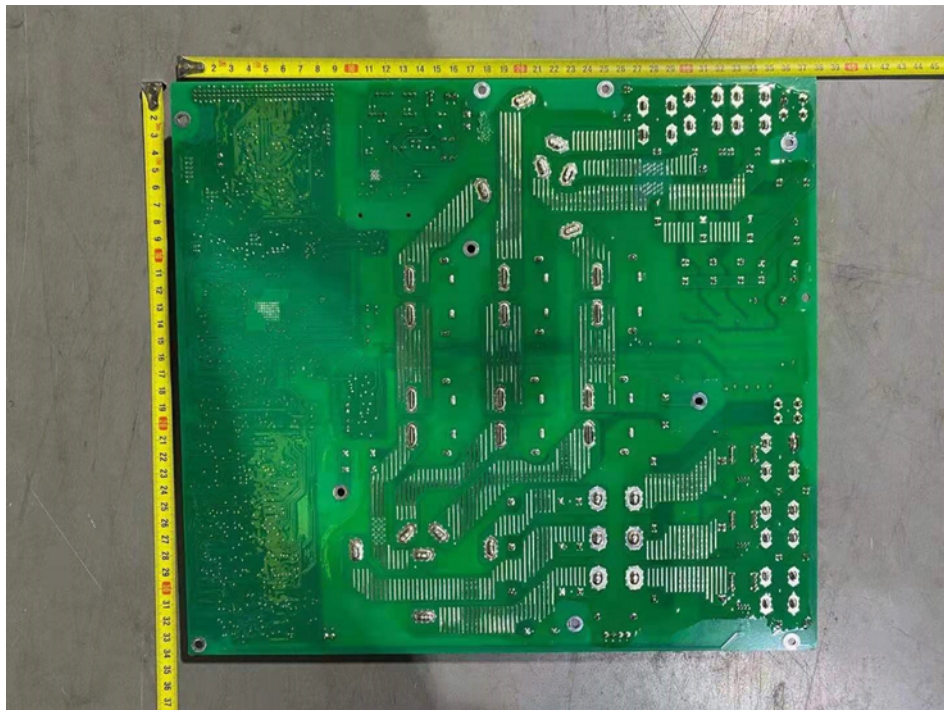
Back side of Power board



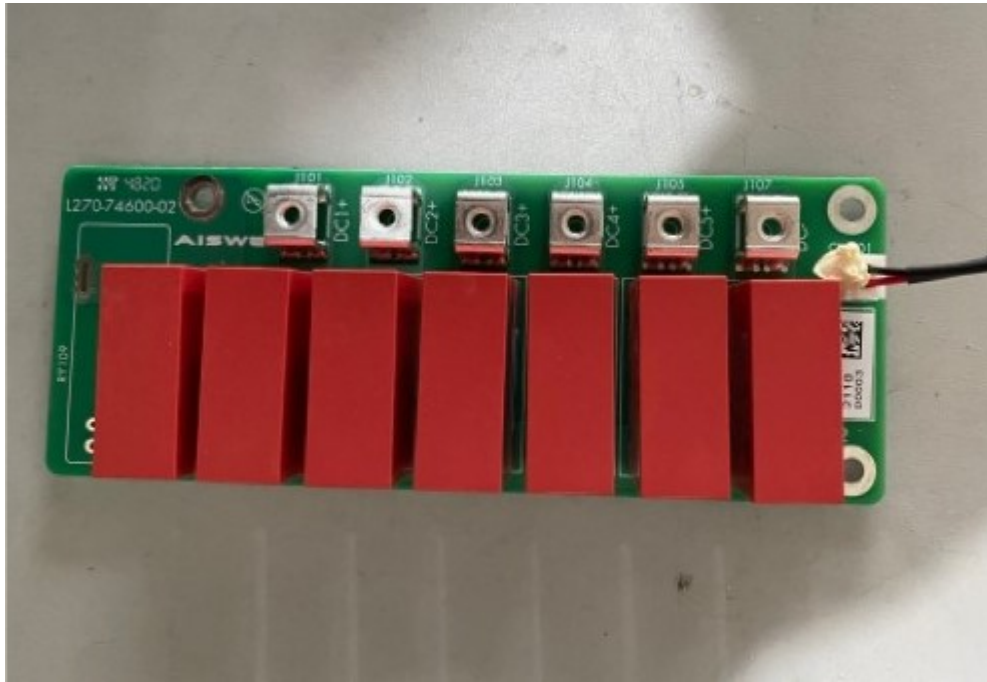
Front side of I/O board



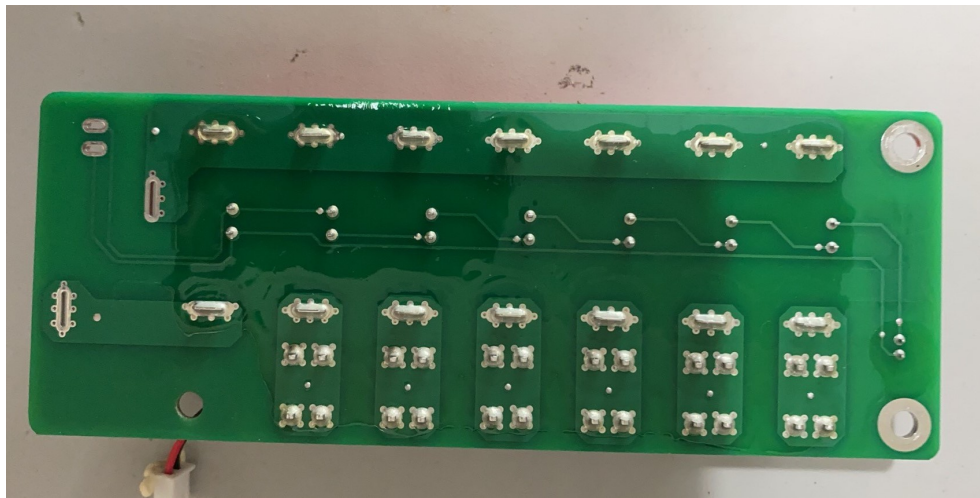
Back Side of I/O board



Front side of SPD board



Back Side of SPD board



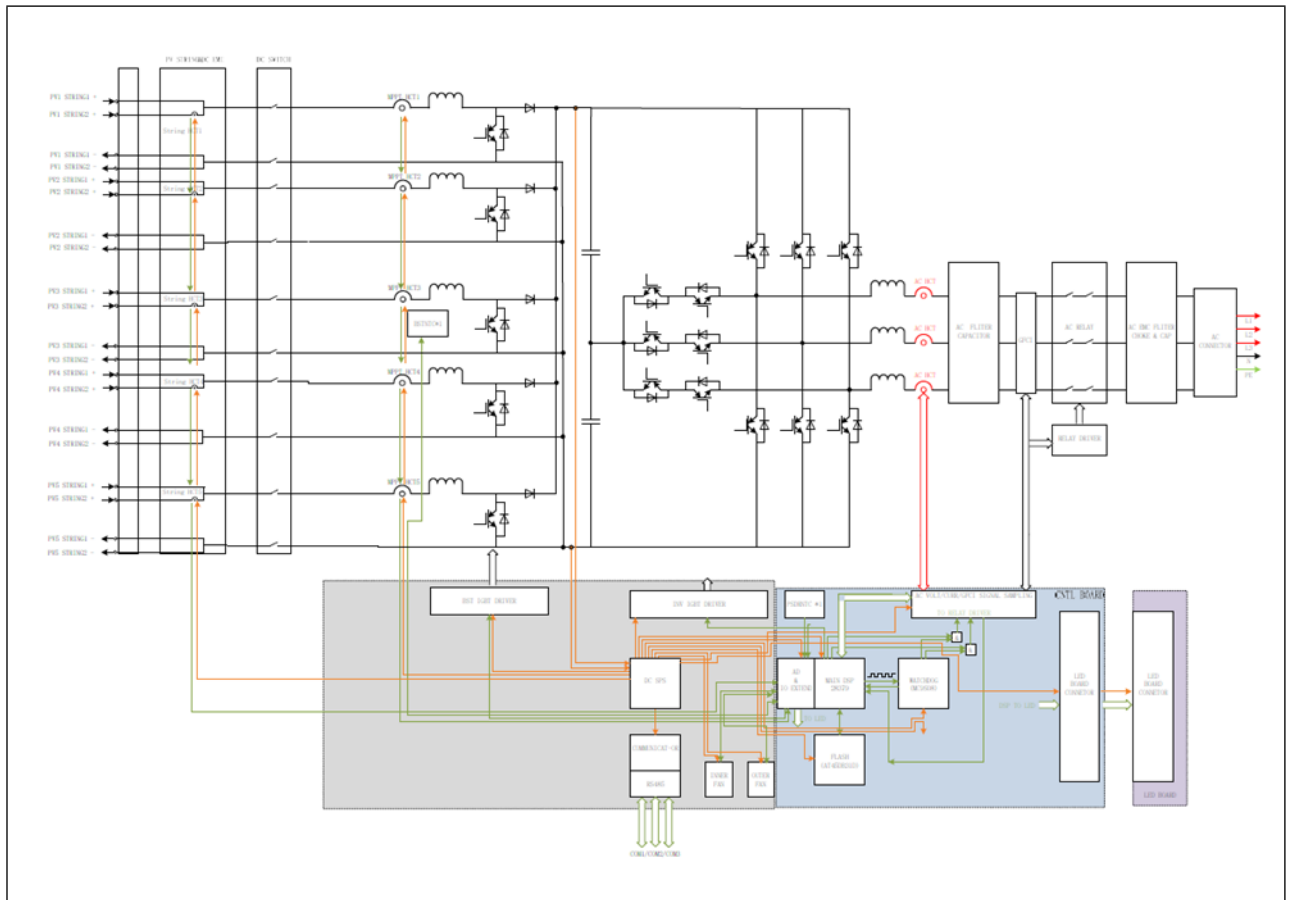
EUT SN.



EUT Software revision

Hardware version: PSDR board: 270-13300-00, IO&CNTL board: 270-74400-00
Main DSP Software version: V610-03038-04
Slave DSP Software version: V610-60009-00
Safety package (Flash) version: V610-11004-02

2 ELECTRICAL SCHEMES



ATTACHMENT II

(Testing information)

1 TESTING CIRCUIT

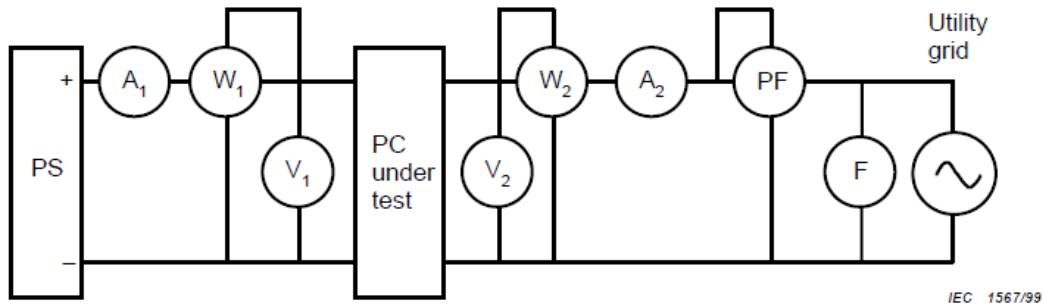


Figure 1b – Utility-interactive type

- | | |
|---|-------------------------------------|
| PC power conditioner | L load |
| PS variable voltage-current d.c. power supply | F frequency meter |
| A ₁ DC ammeter | V ₁ DC voltmeter |
| A ₂ AC or d.c. ammeter | V ₂ AC or d.c. voltmeter |
| W ₁ DC wattmeter | PF power factor meter |
| W ₂ AC or d.c. wattmeter | |

Current and voltage clamps have been connected to the inverter input/output for all the tests.
 All the tests and checks have been performed in accordance with the reference standard under testing.

2 TESTING EQUIPMENT

From	No.	Equipment Name	Trademark / Model	Equipment No.	Calibration Period
SGS	1	Digital Oscilloscope	Tektronix/ MDO3022	GZE007-41	2021/10/20 to 2022/10/19
	2	Differential probe	Tektronix/ P5210A	GZE007-25	2022/01/20 to 2023/01/19
	3	Current probe	CA/PAC 12	GZE007-31	2021/10/28 to 2022/10/27
	4	Power Analyzer	Yokogawa/ WT3000	GZE006-72	2021/06/30 to 2022/06/29 2022/06/23 to 2023/06/22
	5	Temperature & Humidity meter	HUATO/ S520-EX	GZE020-68	2021/08/18 to 2022/08/17 2022/09/08 to 2023/09/07

Items	Specifications
1) PV array simulator	
a) Voltage range	0 – 1500 Vdc
b) Current range	0 – 100 A
2) AC Source	
a) Output wiring	Three phase
b) Output capacity	100 kVA
c) Output voltage	0 - 300 Vrms
d) Output frequency	30 - 100 Hz
e) Voltage stability	/
f) Output voltage distortion	/
3) Power Analyzer	
a) Voltage range	0 – 1000 Vdc, 0 – 1000 Va.c.
b) Current range	0 – 50 A
c) Frequency range (accuracy)	0 – 999.99 kHz (0.005%)
d) Measurement items	Voltage (V) Current (A) Active power (W) Reactive power (Var) Volt-ampere (VA) Power factor (PF) Frequency (Hz) Electric energy (Wh)
4) Digital Oscilloscope	
a) Sampling speed	2.5GS/s
b) Recording device	Memory record and USB reading
c) Time accuracy	± 10 ppm
5) AC load	
a) Resistive load	Capacity: 68.33 kW
b) Inductive load	Capacity: 68.33 kVAr
c) Capacitive load	Capacity: 68.33 kVAr

3 MEASUREMENT UNCERTAINTY

Magnitude	Uncertainty
Voltage measurement uncertainty	±1.5 %
Current measurement uncertainty	±2.0 %
Frequency measurement uncertainty	±0.2 %
Time measurement uncertainty	±0.2 %
Power measurement uncertainty	±2.5 %
Phase Angle	±1°
Temperature	±3° C
<p>Note1: Measurements uncertainties showed in this table are maximum allowable uncertainties. The measurement uncertainties associated with other parameters measured during the tests are in the laboratory at disposal of the solicitant.</p>	