

Prüfbericht-Nr.: <i>Test Report No.:</i>		50297428 003		Auftrags-Nr.: <i>Order No.:</i>		244418179		Seite 1 von 19 <i>Page 1 of 19</i>																																									
Kunden-Referenz-Nr.: <i>Client Reference No.:</i>		2104110		Auftragsdatum: <i>Order date:</i>		11.04.2022																																											
Auftraggeber: <i>Client:</i>		AISWEI Technology (Shanghai) Co., Ltd. Room 905B, 757 Mengzi Road, Huangpu District, Shanghai																																															
Prüfgegenstand: <i>Test item:</i>		Grid-Connected PV Inverter																																															
Bezeichnung / Typ-Nr.: <i>Identification / Type No.:</i>		ASW5000-S, ASW4000-S, ASW3680-S, ASW3000-S																																															
Auftrags-Inhalt: <i>Order content:</i>		TUV Bauart approval																																															
Prüfgrundlage: <i>Test specification:</i>		EN 62109-1: 2010 IEC 62109-1: 2010, EN 62109-2: 2011, IEC 62109-2: 2011																																															
Wareneingangsdatum: <i>Date of receipt:</i>		19.04.2022																																															
Prüfmuster-Nr.: <i>Test sample No.:</i>		A003245608-001																																															
Prüfzeitraum: <i>Testing period:</i>		19.04.2022 - 20.04.2022																																															
Ort der Prüfung: <i>Place of testing:</i>		TÜV Rheinland (Shanghai) Co.,Ltd.																																															
Prüflaboratorium: <i>Testing laboratory:</i>		TÜV Rheinland (Shanghai) Co.,Ltd.																																															
Prüfergebnis*: <i>Test result*:</i>		Pass																																															
geprüft von / tested by:				kontrolliert von / reviewed by:																																													
21.04.2022		Rafer Xu/ PE		21.04.2022		Yin Yue / TC																																											
Datum <i>Date</i>	Name / Stellung <i>Name / Position</i>	Unterschrift <i>Signature</i>		Datum <i>Date</i>	Name / Stellung <i>Name / Position</i>	Unterschrift <i>Signature</i>																																											
Sonstiges / Other:																																																	
Differences:																																																	
<ul style="list-style-type: none"> - This test report was based on the test reports 50297428 001~002. - This report is for changing the name and address of license holder. See the following pages for details. 																																																	
Zustand des Prüfgegenstandes bei Anlieferung: <i>Condition of the test item at delivery:</i>				Prüfmuster vollständig und unbeschädigt <i>Test item complete and undamaged</i>																																													
<table border="0"> <tr> <td>* Legende:</td> <td>1 = sehr gut</td> <td>2 = gut</td> <td>3 = befriedigend</td> <td>4 = ausreichend</td> <td>5 = mangelhaft</td> <td colspan="4"></td> </tr> <tr> <td></td> <td>P(ass) = entspricht o.g. Prüfgrundlage(n)</td> <td>F(ail) = entspricht nicht o.g. Prüfgrundlage(n)</td> <td>N/A = nicht anwendbar</td> <td>N/T = nicht getestet</td> <td colspan="5"></td> </tr> <tr> <td>Legend:</td> <td>1 = very good</td> <td>2 = good</td> <td>3 = satisfactory</td> <td>4 = sufficient</td> <td>5 = poor</td> <td colspan="4"></td> </tr> <tr> <td></td> <td>P(ass) = passed a.m. test specification(s)</td> <td>F(ail) = failed a.m. test specification(s)</td> <td>N/A = not applicable</td> <td>N/T = not tested</td> <td colspan="5"></td> </tr> </table>										* Legende:	1 = sehr gut	2 = gut	3 = befriedigend	4 = ausreichend	5 = mangelhaft						P(ass) = entspricht o.g. Prüfgrundlage(n)	F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	N/A = nicht anwendbar	N/T = nicht getestet						Legend:	1 = very good	2 = good	3 = satisfactory	4 = sufficient	5 = poor						P(ass) = passed a.m. test specification(s)	F(ail) = failed a.m. test specification(s)	N/A = not applicable	N/T = not tested					
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<p>Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. <i>This test report only relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.</i></p>																																																	

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

Report

Report Reference No.: 50297428 003
Date of issue: See cover page
Total number of pages: See cover page

CB Testing Laboratory: **TÜV Rheinland (Shanghai) Co., Ltd.**

Address: No. 177, Lane 777, West Guangzhong Road, Jing'an District, Shanghai 200072, P. R. China

Applicant's name: **AISWEI Technology (Shanghai) Co., Ltd.**

Address: Room 905B, 757 Mengzi Road, Huangpu District, Shanghai

Test specification

Standard: IEC 62109-1: 2010 (First Edition)
Test procedure: TÜV Rheinland Bauart Mark Approval
Non-standard test method: N/A

Test Report Form No.: IEC62109_1B

TRF Originator: VDE Testing and Certification Institute

Master TRF: Dated 2016-04

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Test item description: Grid-connected PV Inverter

Trade Mark:



Manufacturer: Same as the applicant

Model/Type reference: ASW5000-S, ASW4000-S, ASW3680-S, ASW3000-S

Ratings: See copy of marking label and model list.

Testing procedure and testing location:
<input checked="" type="checkbox"/> Testing Laboratory: Testing location/ address : <input type="checkbox"/> Associated CB Laboratory: Testing location/ address : Tested by (name + signature) : See cover page Approved by (+ signature)..... : See cover page
<input type="checkbox"/> Testing procedure: TMP Testing location/ address : Tested by (name + signature) : Approved by (+ signature)..... :
<input type="checkbox"/> Testing procedure: WMT Testing location/ address : Tested by (name + signature) : Witnessed by (+ signature) : Approved by (+ signature)..... :
<input type="checkbox"/> Testing procedure: SMT Testing location/ address : Tested by (name + signature) : Approved by (+ signature)..... : Supervised by (+ signature) :
<input type="checkbox"/> Testing procedure: RMT Testing location/ address : Tested by (name + signature) : Approved by (+ signature)..... : Supervised by (+ signature) :

List of Attachments (including a total number of pages in each attachment):		
None.		
Summary of testing:		
Tests performed (name of test and test clause): None.	Testing location: The laboratory described on cover page.	
Summary of compliance with National Differences:		
List of countries addressed: None.		
<input checked="" type="checkbox"/> The product fulfils the requirements of		
IEC 62109-1: 2010, EN 62109-1: 2010, IEC 62109-2: 2011, EN 62109-2: 2011		
History of amendments and modifications:		
Test Report No.	Date dd.mm.yyyy	Remark(s)
50297428 001	20.11.2019	Original report of IEC 62109-1/EN 62109-1/IEC 62109-2/ EN 62109-2
50297428 002	27.11.2020	Update the CDF Changed the shape and position of the LCD and the color of the front cover plate

Copy of marking plate:

Model: ASW5000-S

Max. input voltage	d.c. 580V
MPP voltage range	d.c. 80-550V
Max. input current	d.c. 2×12A
Isc PV(absolute maximum)	d.c. 2×18A
Rated grid voltage	a.c. 220/230V
Rated grid frequency	50/60Hz
Max. AC output active power	5000W ^{*1}
Max. AC output apparent power	5000VA ^{*1*2}
Max. continuous output current	a.c. 22.7A ^{*3}
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)

*1, For VDE AR-N 4105, Pmax=4600W, Smax=4600VA

*2, For AS/NZS 4777.2, Sn=Smax=5000VA

*3, For AS/NZS 4777.2, Iac max=21.7A,
Supported DRM0, DRM5, DRM6, DRM7, DRM8



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 532-00432-03 Made in China


Model: ASW4000-S

Max. input voltage	d.c. 580V
MPP voltage range	d.c. 80-550V
Max. input current	d.c. 2×12A
Isc PV(absolute maximum)	d.c. 2×18A
Rated grid voltage	a.c. 220/230V
Rated grid frequency	50/60Hz
Max. AC output active power	4000W
Max. AC output apparent power	4000VA ^{*1}
Max. continuous output current	a.c. 20A
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)

*1, For AS/NZS 4777.2, Sn=Smax=4000VA

Supported DRM0, DRM5, DRM6, DRM7, DRM8



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Model: ASW3680-S

Max. input voltage	d.c. 580V
MPP voltage range	d.c. 80-550V
Max. input current	d.c. 2×12A
Isc PV(absolute maximum)	d.c. 2×18A
Rated grid voltage	a.c. 220/230V
Rated grid frequency	50/60Hz
Max. AC output active power	3680W
Max. AC output apparent power	3680VA ^{*1}
Max. continuous output current	a.c. 16A
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)

*1, For AS/NZS 4777.2, Sn=Smax=3680VA
Supported DRM0,DRM5,DRM6,DRM7,DRM8



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Model: ASW3000-S

Max. input voltage	d.c. 580V
MPP voltage range	d.c. 80-550V
Max. input current	d.c. 2×12A
Isc PV(absolute maximum)	d.c. 2×18A
Rated grid voltage	a.c. 220/230V
Rated grid frequency	50/60Hz
Max. AC output active power	3000W
Max. AC output apparent power	3000VA ^{*1}
Max. continuous output current	a.c. 15A
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)

*1, For AS/NZS 4777.2, Sn=Smax=3000VA
Supported DRM0,DRM5,DRM6,DRM7,DRM8



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Test item particulars	
Equipment mobility	<input type="checkbox"/> movable <input type="checkbox"/> hand-held <input type="checkbox"/> stationary <input checked="" type="checkbox"/> fixed <input type="checkbox"/> transportable <input type="checkbox"/> for building-in
Connection to the mains	<input type="checkbox"/> pluggable equipment <input type="checkbox"/> direct plug-in <input checked="" type="checkbox"/> permanent connection <input type="checkbox"/> for building-in
Environmental category.....	<input checked="" type="checkbox"/> outdoor <input type="checkbox"/> indoor unconditional <input type="checkbox"/> indoor conditional
Over voltage category Mains	<input type="checkbox"/> OVC I <input type="checkbox"/> OVC II <input checked="" type="checkbox"/> OVC III <input type="checkbox"/> OVC IV
Over voltage category PV	<input type="checkbox"/> OVC I <input checked="" type="checkbox"/> OVC II <input type="checkbox"/> OVC III <input type="checkbox"/> OVC IV
Mains supply tolerance (%).....	According to the specified supply range.
Tested for power systems	TN
IT testing, phase-phase voltage (V)	N/A
Class of equipment.....	<input checked="" type="checkbox"/> Class I <input type="checkbox"/> Class II <input type="checkbox"/> Class III <input type="checkbox"/> Not classified
Mass of equipment (kg).....	See model list on the following pages.
Pollution degree	<input type="checkbox"/> PD 1 <input checked="" type="checkbox"/> PD 2 (inside) <input checked="" type="checkbox"/> PD 3 (outside)
IP protection class	IP65
Testing	
Date of receipt of test item(s)	See cover page.
Dates tests performed	See cover page.
Possible test case verdicts:	
- test case does not apply to the test object	N/A
- test object does meet the requirement.....	Pass (P)
- test object was not evaluated for the requirement ..:	N/E
- test object does not meet the requirement.....	Fail (F)

General remarks:

"(see Attachment #)" refers to additional information appended to the report.

"(see appended table)" refers to a table appended to the report.

The tests results presented in this report relate only to the object tested.

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List of test equipment must be kept on file and available for review.

Additional test data and/or information provided in the attachments to this report.

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

Determination of the test results includes consideration of measurement uncertainty from the test equipment and methods.

Manufacturer's Declaration per sub-clause 6.2.5 of IEC60060-2:

The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided.....:

Yes
 Not applicable

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

Name and address of factory (ies):

AISWEI New Energy Technology (Yangzhong) Co., Ltd.
 No. 588, Gangxing Road, Yangzhong, Jiangsu, 212214 P. R. China

General product information:
Description of changes:

- This report is for changing the name and address of license holder.

For the above described change(s) the following was considered to be necessary:

Change	Testing	Remark(s)
01	N/A	No additional test necessary

<u>Model list:</u>					
Model or Type designation		ASW5000-S	ASW4000-S	ASW3680-S	ASW3000-S
PV input	V _{MAX} PV [Vd.c.]	580			
	I _{sc} PV [Ad.c.]	2 x 18			
	MPP Voltage Range [Vd.c.]	80 – 550			
	MPP Full Power Voltage Range [Vd.c.]	220 - 500	180 - 500	165 - 500	140 - 500
	Max. Input Current [Ad.c.]	2 x 12			
	MPPT tracking	2			
	Back-feed Current [A]	0			
	Overvoltage Category (OVC)	II			
AC output	Rated Output Voltage [Va.c.]	220 / 230			
	Rated Output Frequency [Hz]	50 / 60			
	Rated Output Power [W]	5000	4000	3680	3000
	Max. Output Apparent Power [VA]	5000	4000	3680	3000
	Max. Output Current [Aa.c.]	22.7 (21.7)	20.0	16.0	15.0
	Power Factor cosφ [λ]	1 (default), 0.8 leading to 0.8 lagging			
	Overvoltage Category (OVC)	III			
System	Type of inverter	Non-isolated			
	Protective Class	Class I			
	Enclosure Protection (IP)	IP65			
	Operating Temperature Range [°C]	-25 to 60 (> 40 derating)			
	Pollution degree (PD)	PD2 (inside), PD 3 (outside)			
	Weight [kg]	12			
	Size (W x H x D) [mm]	376 x 355 x 145			
Note(s): the value with “()” is for the setting of models to Australia and New Zealand markets.					

<u>Throughout the test report following abbreviations may be used:</u>			
- input	i/p	- Test repeated, similar result(3 times)	TRSR
- output	o/p	- No indication of dielectric breakdown	NB
- short-circuited	s-c	- Cheesecloth remained intact	NC
- overloaded	o-l	- Tissue paper remained intact	NT
- open-circuited	o-c	- No hazards	NH
- normal conditions	N.C.	- The PCE can recover to operate automatically after removing the abnormal condition	RO
- single fault conditions	SFC	- functional insulation	FI
- between parts of opposite polarity	BOP	- basic insulation	BI
- internal protection operated	IPO	- supplementary insulation	SI
- Component damage (list damaged component)	CD	- double insulation	DI
- No component damaged	NCD	- reinforced insulation	RI
- Power Conversion Equipment	PCE	- Equipment Under Test	EUT
Indicate used abbreviations (if any)			

IEC 62109-1			
Clause	Requirement – Test	Result – Remark	Verdict
5	MARKING AND DOCUMENTATION		P
5.1	Marking		P
5.1.1	General		P
	Equipment shall bear markings as specified in 5.1 and 5.2	The marking label is on the outer surface of the enclosure.	P
	Graphic symbols may be used and shall be in accordance with Annex C or IEC 60417 as applicable.	All used graphic symbols are in accordance with Annex C.	P
	Graphic symbols shall be explained in the documentation provided with the PCE.	The explanations are provided in the user manual.	P
5.1.2	Durability of markings		P
	Markings required by this clause to be located on the PCE shall remain clear and legible under conditions of NORMAL USE and resist the effects of cleaning agents specified by the manufacturer	The labels were subjected to the permanence of marking test. The labels were rubbed with the cloth soaked with petroleum spirit for 30 s.	P
	Markings required by this clause to be located on the PCE shall remain clear and legible under conditions of NORMAL USE and resist the effects of cleaning agents specified by the manufacturer	After this test there was no damage to the labels. The marking on the labels did not fade. There was no curling or lifting of the label's edges.	P
5.1.3	Identification		P
	The equipment shall, as a minimum, be permanently marked with:	See below.	
	a) the name or trade mark of the manufacturer or supplier	See copy of marking plate.	P
	b) model number, name or other means to identify the equipment	See above.	P
	c) a serial number, code or other marking allowing identification of manufacturing location and the manufacturing batch or date within a three month time period.	See above.	P
5.1.4	Equipment ratings		P
	Unless otherwise specified in another part of IEC 62109, the following ratings, as applicable shall be marked on the equipment:	See below	P
	– input voltage, type of voltage (a.c. or d.c.), frequency, and max. continuous current for each input	See model list.	P
	– output voltage, type of voltage (a.c. or d.c.), frequency, max. continuous current, and for a.c. outputs, either the power or power factor for each output	See above.	P
	– the ingress protection (IP) rating as in 6.3 below	See clause 6.3	P

IEC 62109-1			
Clause	Requirement – Test	Result – Remark	Verdict
5.1.5	Fuse identification	See below	N/A
	Marking shall be located adjacent to each fuse or fuse holder, or on the fuse holder, or in another location provided that it is obvious to which fuse the marking applies, giving the fuse current rating and where fuses of different voltage rating value could be fitted, the fuse voltage rating.	No fuse used.	N/A
	Where fuses with special fusing characteristics such as time delay or breaking capacity are necessary, the type shall also be indicated	Over current protection that will be presented in the installation and was provided during testing.	N/A
	For fuses not located in operator access areas and for soldered-in fuses located in operator access areas, it is permitted to provide an unambiguous cross-reference (for example, F1, F2, etc.) to the servicing instructions which shall contain the relevant information.	See above.	N/A
5.1.6	Terminals, Connections, and Controls		P
	If necessary for safety, an indication shall be given of the purpose of Terminals, connectors, controls, and indicators, and their various positions, including any connections for coolant fluids such as water and drainage. The symbols in Annex C may be used, and where there is insufficient space, symbol 9 of Annex C may be used.	Relevant symbol, indicator or information are available.	P
	Push-buttons and actuators of emergency stop devices, and indicator lamps used only to indicate a warning of danger or the need for urgent action shall be colored red.	No such device.	N/A
	A multiple-voltage unit shall be marked to indicate the particular voltage for which it is set when shipped from the factory. The marking is allowed to be in the form of a paper tag or any other nonpermanent material.		N/A
	A unit with d.c. terminals shall be plainly marked indicating the polarity of the connections, with:		P
	– the sign “+” for positive and “-“ for negative; or	The “+” and “-“ marking provided adjacent to the PV input connectors.	P
	– a pictorial representation illustrating the proper polarity where the correct polarity can be unambiguously determined from the representation	No pictorial representation illustration used.	N/A
5.1.6.1	Protective Conductor Terminals		P
	The means of connection for the protective earthing conductor shall be marked with:		P

IEC 62109-1			
Clause	Requirement – Test	Result – Remark	Verdict
	– symbol 7 of Annex C; or	Symbol 7 of Table C.1 marked adjacent to the PE terminal.	P
	– the letters “PE“; or	See above.	N/A
	– the color coding green-yellow.		P
5.1.7	Switches and circuit-breakers		P
	The on and off-positions of switches and circuits breakers shall be clearly marked. If a push-button switch is used as the power switch, symbols 10 and 16 of Annex C may be used to indicate the on-position, or symbols 11 and 17 to indicate the off-position, with the pair of symbols (10 and 16, or 11 and 17) close together.	The letter “ON” and “OFF” is clearly marked.	P
5.1.8	Class II Equipment	Class I Equipment.	N/A
	Equipment using Class II protective means throughout shall be marked with symbol 12 of Annex C. Equipment which is only partially protected by DOUBLE INSULATION or REINFORCED INSULATION shall not bear symbol 12 of Table Annex C.	See above.	N/A
	Where such equipment has provision for the connection of an earthing conductor for functional reasons (see 7.3.6.4) it shall be marked with symbol 6 of Annex C	See above.	N/A
5.1.9	Terminal boxes for External Connections		N/A
	Where required by note 1 of Table 2 as a result of high temperatures of terminals or parts in the wiring compartment, there shall be a marking, visible beside the terminal before connection, of either:	Not used.	N/A
	a) the minimum temperature Rating and size of the cable to be connected to the TERMINALS; or		N/A
	b) a marking to warn the installer to consult the installation instruction. Symbol 9 of Table D-1 is an acceptable marking		N/A
5.2	Warning markings		P
5.2.1	Visibility and legibility requirements for warning markings		P
	Warning markings shall be legible, and shall have minimum dimensions as follows:		P
	– Printed symbols shall be at least 2,75 mm high		P
	– Printed text characters shall be at least 1.5 mm high and shall contrast in color with the background		P

IEC 62109-1			
Clause	Requirement – Test	Result – Remark	Verdict
	– Symbols or text that are moulded, stamped or engraved in a material shall have a character height of at least 2,0 mm, and if not contrasting in color from the background, shall have a depth or raised height of at least 0,5 mm.	No such symbols.	N/A
	If it is necessary to refer to the instruction manual to preserve the protection afforded by the equipment, the equipment shall be marked with symbol 9 of Annex C		P
	Symbol 9 of Annex C is not required to be used adjacent to symbols that are explained in the manual		P
5.2.2	Content for warning markings		P
5.2.2.1	Ungrounded heatsinks and similar parts		P
	An ungrounded heat sink or other part that may be mistaken for a grounded part and involves a risk of electric shock in accordance with 7.3 shall be marked with symbol 13 of Annex C, or equivalent. The marking may be on or adjacent to the heatsink and shall be clearly visible when the PCE is disassembled to the extent that a risk of contact with the heatsink exists.	Marked with symbol 13 of Table C.1.	P
5.2.2.2	Hot Surfaces		P
	A part of the PCE that exceeds the temperature limits specified in 4.3.2 shall be marked with symbol 14 of Annex C or equivalent.	Marked with symbol 14 of Table C.1.	P
5.2.2.3	Coolant		N/A
	A unit containing coolant that exceeds 70 °C shall be legibly marked externally where readily visible after installation with symbol 15 of Annex C. The documentation shall provide a warning regarding the risk of burns from hot coolant, and either:	Not used.	N/A
	a) statement that coolant system servicing is to be done only by SERVICE PERSONNEL, or		N/A
	b) instructions for safe venting, draining, or otherwise working on the cooling system, if these operations can be performed without OPERATOR access to HAZARDS internal to the equipment		N/A
5.2.2.4	Stored energy		P
	Where required by 7.3.9.2 or 7.4.2 the PCE shall be marked with Symbol 21 of Annex C and the time to discharge capacitors to safe voltage and energy levels shall accompany the symbol.	Marked with Symbol 21 of Table C.1 and the time to discharge capacitors to safe voltage and energy levels accompany the symbol.	P
5.2.2.5	Motor guarding		N/A

IEC 62109-1			
Clause	Requirement – Test	Result – Remark	Verdict
	Where required by 8.2 a marking shall be provided where it is visible to service personnel before removal of a guard, warning of the hazard and giving instructions for safe servicing (for example disconnection of the source before removing the guard).		N/A
5.2.3	Sonic hazard markings and instructions	No such hazard.	N/A
	If required by 10.2.1 a PCE shall:		N/A
	a) be marked to warn the operator of the sonic pressure hazard; or		N/A
	b) be provided with installation instructions that specify how the installer can ensure that the sound pressure level from equipment at its point of use after installation, will not reach a value, which could cause a hazard. These instructions shall include the measured sound pressure level, and shall identify readily available and practicable protective materials or measures which may be used.		N/A
5.2.4	Equipment with multiple sources of supply		P
	A PCE with connections for multiple energy sources shall be marked with symbol 13 of Annex C and the manual shall contain the information required in 5.3.4.	Marked with symbol 13 of Annex C and explain in user manual.	P
	The symbol shall be located on the outside of the unit or shall be prominently visible behind any cover giving access to hazardous parts.	See above.	P
5.2.5	Excessive touch current		P
	Where required by 7.3.6.3.7 the PCE shall be marked with symbol 15 of Annex C. See also 5.3.2 for information to be provided in the installation manual.	Marked with symbol 15 of Table C.1 and relevant information is provided in user's manual.	P
5.3	Documentation		P
5.3.1	General		P
	The documentation provided with the PCE shall provide the information needed for the safe operation, installation, and (where applicable) maintenance of the equipment. The documentation shall include the items required in 5.3.2 through 5.3.4, and the following:	All related informations provided in the user's maunal.	P
	a) explanations of equipment makings, including symbols used		P
	b) location and function of terminals and controls		P

IEC 62109-1			
Clause	Requirement – Test	Result – Remark	Verdict
	c) all ratings or specifications that are necessary to safely install and operate the PCE, including the following environmental ratings along with an explanation of their meaning and any resulting installation requirements:		P
	– ENVIRONMENTAL CATEGORY as per 6.1		P
	– WET LOCATIONS classification for the intended external environment as per 6.1		P
	– POLLUTION DEGREE classification for the intended external environment as per 6.2		P
	– INGRESS PROTECTION rating as per 6.3		P
	– Ambient temperature and relative humidity ratings		P
	– MAXIMUM altitude rating		P
	– OVERVOLTAGE CATEGORY assigned to each input and output port as per 7.3.7.1.2, accompanied by guidance regarding how to ensure that the installation complies with the required overvoltage categories;		P
	d) a warning that when the photovoltaic array is exposed to light, it supplies a d.c. voltage to the PCE		P
5.3.1.1	Language		P
	Instructions related to safety shall be in a language that is acceptable in the country where the equipment is to be installed.	Instruction related to safety is in English.	P
5.3.1.2	Format		P
	In general, the documentation must be provided in printed form and is to be delivered with the equipment.	The printed form is available and is delivered with the PCE.	P
	For equipment which requires the use of a computer for both installation and operation, documentation may be provided in electronic format without accompanying printed format.	See above.	N/A
5.3.2	Information related to installation		P
	The documentation shall include installation and where applicable, specific commissioning instructions and, if necessary for safety, warnings against hazards which could arise during installation or commissioning of the equipment. The information provided shall include:	All below related informations provided in the user's manual.	P
	a) assembly, location, and mounting requirements:		P

IEC 62109-1			
Clause	Requirement – Test	Result – Remark	Verdict
	b) ratings and means of connection to each source of supply and any requirements related to wiring and external controls, colour coding of leads, disconnection means, or overcurrent protection needed, including instructions that the installation position shall not prevent access to the disconnection means;		P
	c) ratings and means of connection of any outputs from the PCE, and any requirements related to wiring and external controls, color coding of leads, or overcurrent protection needed;		P
	d) explanation of the pin-out of connectors for external connections, unless the connector is used for a standard purpose (e.g. RS 232)		P
	e) ventilation requirements;		P
	f) requirements for special services, for example cooling liquid;		N/A
	g) instructions and information relating to sound pressure level if required by 10.2.1;	No hazardous sound level.	P
	h) where required by 14.8.1.3, instructions for the adequate ventilation of the room or location in which PCE containing vented or valve-regulated batteries is located, to prevent the accumulation of hazardous gases;	No battery used in the PCE.	P
	i) tightening torque to be applied to wiring terminals;		P
	j) values of back-feed short-circuit currents available from the PCE on input and output conductors under fault conditions, if those currents exceeds the max. rated current of the circuit, as per 4.4.4.6;	No backfeed current available.	P
	k) for each input to the PCE, the max value of short-circuit current available from the source, for which the PCE is designed; and		P
	l) compatibility with RCD and RCM;	RCMU built in PCE.	P
	m) instructions for protective earthing, including the information required by 7.3.6.3.7 if a second protective earthing conductor is to be installed:		P
	n) where required by 7.3.8, the installation instructions shall include the following or equivalent wording:		P

IEC 62109-1			
Clause	Requirement – Test	Result – Remark	Verdict
	“This product can cause a d.c. current in the external protective earthing conductor. Where a residual current-operated protective (RCD) or monitoring (RCM) device is used for protection in a case of direct or indirect contact, only an RCD or RCM of Type B is allowed on the supply side of this product.”		P
	o) for PCE intended to charge batteries, the battery nominal voltage rating, size, and type	PCE is not intended to charge battery.	P
	p) PV array configuration information, such as ratings, whether the array is to be grounded or floating, any external protection devices needed, etc.		P
5.3.3	Information related to operation		P
	Instructions for use shall include any operating instructions necessary to ensure safe operation, including the following, as applicable:	All related information provided in the user's manual.	P
	– Instructions for adjustment of controls including the effects of adjustment;		P
	– Instructions for interconnection to accessories and other equipment, including indication of suitable accessories, detachable parts and any special materials;		P
	– Warnings regarding the risk of burns from surfaces permitted to exceed the temperature limits of 4.3.2 and required operator actions to reduce the risk; and		P
	– Instructions, that if the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.		P
5.3.4	Information related to maintenance		P
	Maintenance instructions shall include the following:	All related information provided in the service manual.	
	– Intervals and instructions for any preventive maintenance that is required to maintain safety (for example air filter replacement or periodic re-tightening of terminals);		P
	– Instructions for accessing operator access areas, if any are present, including a warning not to enter other areas of the equipment;		P
	– Part numbers and instructions for obtaining any required operator replaceable parts;		P
	– Instructions for safe cleaning (if recommended)		P

IEC 62109-1			
Clause	Requirement – Test	Result – Remark	Verdict
	<ul style="list-style-type: none"> – Where there is more than one source of supply energizing the PCE, information shall be provided in the manual to indicate which disconnect device or devices are required to be operated in order to completely isolate the equipment. 		P
5.3.4.1	Battery maintenance		N/A
	Where required by 14.8.5, the documentation shall include the applicable items from the following list of instructions regarding maintenance of batteries:	The PCE is Grid Interactive inverter without battery energy storage function.	N/A
	<ul style="list-style-type: none"> – Servicing of batteries should be performed or supervised by personnel knowledgeable about batteries and the required precautions 		N/A
	<ul style="list-style-type: none"> – When replacing batteries, replace with the same type and number of batteries or battery packs 		N/A
	<ul style="list-style-type: none"> – General instructions regarding removal and installation of batteries 		N/A
	<ul style="list-style-type: none"> – CAUTION: Do not dispose of batteries in a fire. The batteries may explode. 		N/A
	<ul style="list-style-type: none"> – CAUTION: Do not open or damage batteries. Released electrolyte is harmful to the skin and eyes. It may be toxic. 		N/A
	<ul style="list-style-type: none"> – CAUTION: A battery can present a risk of electrical shock and high short-circuit current. The following precautions should be observed when working on batteries: 		N/A
	a) Remove watches, rings, or other metal objects.		N/A
	b) Use tools with insulated handles.		N/A
	c) Wear rubber gloves and boots.		N/A
	d) Do not lay tools or metal parts on top of batteries		N/A
	e) Disconnect charging source prior to connecting or disconnecting battery terminals		N/A
	f) Determine if battery is inadvertently grounded. If inadvertently grounded, remove source from ground. Contact with any part of a grounded battery can result in electrical shock. The likelihood of such shock can be reduced if such grounds are removed during installation and maintenance (applicable to equipment and remote battery supplies not having a grounded supply circuit).		N/A

- End of Test Report -