



TEST REPORT

IEC 62109-1

Safety of power converters for use in photovoltaic power system - Part 1: General requirements

Report reference number: CTKE-ESH-P26030753-1

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Testing laboratory name.....: BUREAU VERITAS LCIE CHINA COMPANY LIMITED

Address: Building 4, No. 518, Xinzhuang Road, Caohejing Songjiang High-Tech Park, Shanghai, P.R.China (201612)

Accreditation.....:



Applicant's name.....: ARCTECH SOLAR HOLDING CO.,LTD

Address: No. 190, Huayang Road, Kunshan City, Jiangsu Province, China

Test specification

Standard: IEC 62109-1:2010, EN 62109-1:2010, DIN EN 62109-1:2011

Test procedure.....: Certificate of compliance

Test report form number.....: IEC62109-1_11

Master TRF.....: BUREAU VERITAS LCIE CHINA COMPANY LIMITED

Test item description: PV Microinverter

Trademark.....:



Model / Type.....: ARCTECH-M600W, ARCTECH-M700W, ARCTECH-M800W,
ARCTECH-M900W, ARCTECH-M1000W

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Model / Type..... :	ARCTECH- M600W	ARCTECH- M700W	ARCTECH- M800W	P2ARCTECH- M900W	ARCTECH- M1000W
MPPT voltage range:	16-60 Vdc				
Max. Continue PV current.....:	2*13A	2*14A	2*15A	2*16A	2*17A
Rated grid voltage	230V/ 240Vac, 50Hz				
Max. Continue Output current....:	2,61A	3,04A	3,48A	3,91A	4,35A
Max. Continuous Output power.:	600VA	700VA	800VA	900VA	1000VA

Testing Location.....:	BUREAU VERITAS LCIE CHINA COMPANY LIMITED		
Address	Building 4, No. 518, Xinzhuan Road, Caohejing Songjiang High-Tech Park, Shanghai, P.R.China (201612)		
Tested by (name and signature)	Damon Qian Test Engineer		
Approved by (name and signature)	Robin Wu Project Manager		
Manufacturer's name	ARCTECH SOLAR HOLDING CO.,LTD		
Manufacturer's address	No. 190, Huayang Road, Kunshan City, Jiangsu Province, China		
Factory's name	Wuxi VaySunic New Energy Technology Co., Ltd.		
Factory's address	Building 1-218, No.6 Junshan Road, Xinwu District, Wuxi, Jiangsu, China		

Document History			
Date	Internal reference	Modification / Change / Status	Revision
2026-03-09	Damon Qian	This is a copy report. The test data and result was based on previous test report CKNI-ESH-P23040726-1-R2 dated on 2024-12-11.	0
Supplementary information:			

Test item particulars

Equipment mobility: ☒ movable ☐ hand-held ☐ stationary
☒ fixed ☐ transportable ☐ for building-in

Connection to the mains: ☐ pluggable equipment ☐ direct plug-in
☒ permanent/lockable connection
☐ for building-in

Connection to PV: ☒ pluggable equipment ☐ direct plug-in
☐ permanent/lockable connection
☐ for building-in

Environmental category: ☒ outdoor ☐ indoor unconditional ☐ indoor conditional

Over voltage category Mains.....: ☐ OVC I ☐ OVC II ☒ OVC III ☐ OVC IV

Over voltage category PV.....: ☐ OVC I ☒ OVC II ☐ OVC III ☐ OVC IV

Operating condition.....: ☒ Continuous ☐ Short-time

Mains supply tolerance (%): According to the specification:
operating range: $230 \pm 10\%$

Tested for IT power systems: TN

IT testing, phase-phase voltage (V): N/A

Class of equipment: ☒ Class I ☐ Class II ☐ Class III
☐ Not classified

Mass of equipment (kg): 3,26Kg

Pollution degree: 3

Protection against ingress of water: IP67 according to IEC 60529

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

Date of receipt of test item.....: 2023-05-14

Date (s) of performance of tests.....: 2023-06-03 to 2023-08-21

General remarks

The test results presented in this report relate only to the object tested.
This report must not be reproduced in part or in full without the written approval of the issuing testing laboratory.
"(see Enclosure #)" refers to additional information appended to the report.
"(see appended table)" refers to a table appended to the report.

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

Conformity statements are decided in accordance with IEC GUIDE 115:2021 Procedure 2 (accuracy method), unless otherwise normatively specified or contractually agreed.

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Copy of marking plate

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

 ARCTECH Powered by VaySunic		PV Microinverter Model:ARCTECH - M600W		ARCTECH Powered by VaySunic	
Maximum Input Voltage	63VDC	Maximum Continuous Output Power	600VA		
MPPT Voltage Range	16-60VDC	Nominal Output Voltage	230/240VAC		
Maximum Input Current	2*13A	Maximum Continuous Output Current	2.61A		
Maximum Input Short Circuit Current	2*25A	Nominal Output Frequency	50Hz		
Output Power Factor	>0.99(default)	Peak Efficiency	96.8%		
Enclosure	IP67	Protection Class	I		
Ambient Temperature Range	-40°C to +65°C		Made in China		
Work Order Number 		Equipment Number 		     	

 ARCTECH Powered by VaySunic		PV Microinverter Model:ARCTECH - M700W		ARCTECH Powered by VaySunic	
Maximum Input Voltage	63VDC	Maximum Continuous Output Power	700VA		
MPPT Voltage Range	16-60VDC	Nominal Output Voltage	230/240VAC		
Maximum Input Current	2*14A	Maximum Continuous Output Current	3.04A		
Maximum Input Short Circuit Current	2*25A	Nominal Output Frequency	50Hz		
Output Power Factor	>0.99(default)	Peak Efficiency	96.8%		
Enclosure	IP67	Protection Class	I		
Ambient Temperature Range	-40°C to +65°C		Made in China		
Work Order Number 		Equipment Number 		     	

ARCTECH
— Powered by VaySunic —

PV Microinverter
Model:ARCTECH - M800W

ARCTECH Powered
by VaySunic

Maximum Input Voltage	63VDC	Maximum Continuous Output Power	800VA
MPPT Voltage Range	16-60VDC	Nominal Output Voltage	230/240VAC
Maximum Input Current	2*15A	Maximum Continuous Output Current	3.48A
Maximum Input Short Circuit Current	2*25A	Nominal Output Frequency	50Hz
Output Power Factor	>0.99(default)	Peak Efficiency	96.8%
Enclosure	IP67	Protection Class	I
Ambient Temperature Range	-40°C to +65°C	Made in China	

Work Order Number

Equipment Number



ARCTECH
— Powered by VaySunic —

PV Microinverter
Model:ARCTECH - M900W

ARCTECH Powered
by VaySunic

Maximum Input Voltage	63VDC	Maximum Continuous Output Power	900VA
MPPT Voltage Range	16-60VDC	Nominal Output Voltage	230/240VAC
Maximum Input Current	2*16A	Maximum Continuous Output Current	3.91A
Maximum Input Short Circuit Current	2*25A	Nominal Output Frequency	50Hz
Output Power Factor	>0.99(default)	Peak Efficiency	96.6%
Enclosure	IP67	Protection Class	I
Ambient Temperature Range	-40°C to +65°C	Made in China	

Work Order Number

Equipment Number





ARCTECH
— Powered by VaySonic —

PV Microinverter
Model: ARCTECH - M1000W

ARCTECH Powered
by VaySonic

Maximum Input Voltage	63VDC	Maximum Continuous Output Power	1000VA
MPPT Voltage Range	16-60VDC	Nominal Output Voltage	230/240VAC
Maximum Input Current	2*17A	Maximum Continuous Output Current	4.35A
Maximum Input Short Circuit Current	2*25A	Nominal Output Frequency	50Hz
Output Power Factor	>0.99(default)	Peak Efficiency	96.6%
Enclosure	IP67	Protection Class	I
Ambient Temperature Range	-40°C to +65°C	Made in China	

Work Order Number

Equipment Number



General product information:

Dimension of EUT: 275 × 222 × 36,5. (W × H × D)

The Solar converter converts DC voltage into AC voltage.

The input and output are protected by varistors to earth. The unit is providing EMC filtering at the output toward mains. The unit provide galvanic separation from input to output (transformer). The output is switched off redundant by relay. This assures that the opening of the output circuit will also operate in case of one error.

PCB versions: V1.0.0

Software version: V0.13

The test was performed on model ARCTECH-M1000W are valid for model ARCTECH-M600W, ARCTECH-M700W, ARCTECH-M800W, ARCTECH-M900W, since it is identical in hardware and power derated by software and just different in communication parts

The appearance color of the micro inverter is optional

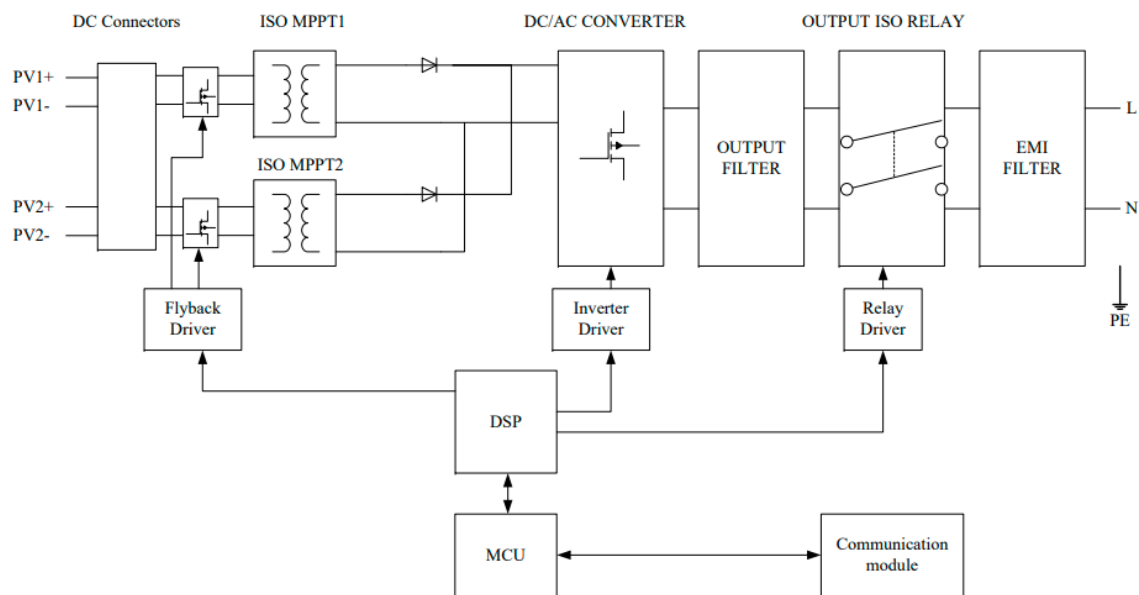
Description of the electrical circuit:

The internal control is issued by master controller(U1). The master controller can control relay, measures voltage, frequency, AC current with injected DC, insulation resistance.

The voltage and frequency measurement is achieved with resistors in serial which are connected directly to line and neutral.

The unit provides one relay in the AC output. The relay is tested before each start up. In addition the power bridge can be stopped by controller.

Block diagram of the utility interactive inverter:



Information for Production testing to be done by the manufacturer:

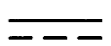
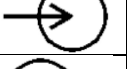
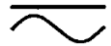
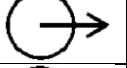
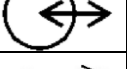
None

Summary of testing:

The EUT was tested to the standard IEC 62109-1:2010, EN 62109-1:2010,

All tests were performed on ARCTECH-M1000W, Except for CI 4.2.2.6.

1. Input (DC) to output (AC) (DVC-C circuits) is separated by basic insulation (isolated transformer) and provide reinforced insulation between the circuits itself.
Input (DC) and output (AC) (DVC-C circuits) to earth is separated by basic insulation.
2. The EUT is rated class I and shall be properly bonded to the main protective earthing terminal in the final installation.
3. The EUT has been evaluated for use in a Pollution Degree III (reduction from pollution degree 3 to 2 because of enclosure IP67; clause 6.2, table 5) environment and a maximum altitude of 2000m. The unit is specified for outdoor and indoor (unconditioned) use.
4. The enclosure fulfils the requirements of an electrical, mechanical and fire enclosure.
5. The EUT was evaluated for a maximum ambient of 65°C. The temperature test was performed without forced air cooling.
6. Marking - The unit provides the following markings:

Symbol No.	Symbol	Symbol used	Symbol No.	Symbol	Symbol used	Symbol No.	Symbol	Symbol used
1		☐	9		☒	17		☐
2		☐	10		☐	18		☐
3		☐	11		☐	19		☐
4		☐	12		☐	20		☐
5		☐	13		☒	21		☐
6		☐	14		☒	22		☐
7		☒	15		☒	--	--	--
8		☐	16		☐	--	--	--

IEC 62109-1			
Clause	Requirement + Test		Verdict
4	General testing requirements		P
4.1	General	Compliance with this standard was verified by investigation of the EUT and the respective documentation and testing according to the applicable requirements of this standard.	P
4.2	General conditions for testing		P
4.2.1	Sequence of tests	In the course of testing, the EUT was inspected regarding creation of possible hazards in the meaning of this standard.	P
4.2.2	Reference test conditions		P
4.2.2.1	Environmental conditions	Tests were performed within the environmental limits of 15 - 40°C ambient temperature, 5 -75% humidity and 75 – 106kPa air pressure. No frost, dew, percolating water, rain and solar radiation was present.	P
4.2.2.2	State of equipment	Each test was performed on a representative EUT which was assembled within the specified unfavourable conditions of the manufacturer.	P
4.2.2.3	Position of equipment	The EUT was installed in accordance with the manufacturer specified most unfavourable instructions.	P
4.2.2.4	Accessories	No accessories present in the meaning of this clause.	N/A
4.2.2.5	Covers and removable parts	No covers and removable parts present which can be removed without using a tool.	N/A
4.2.2.6	Mains supply	Tests were carried out, where applicable, with the most unfavourable conditions where the outcome was considered to be significant.	P
4.2.2.7	Supply ports other than the mains	Tests were carried out, where applicable, with the most unfavourable conditions where the outcome was considered to be significant.	P
4.2.2.7.1	Photovoltaic supply sources	Supply sources were chosen in regard to the max. values of the PV source in the end use, specified by the limits which are stated on the type label.	P
4.2.2.7.2	Battery inputs	The EUT is not intended to be supplied from battery banks.	N/A

IEC 62109-1			
Clause	Requirement + Test		Verdict
4.2.2.8	Conditions of loading for output ports	Output ports were loaded to the most unfavourable condition.	P
4.2.2.9	Earthing terminals	Protective earth for the case was connected. Functional earthing terminals do not exist.	P
4.2.2.10	Controls	No user adjustable control provided. Only service personal is permitted to open the unit.	P
4.2.2.11	Available short circuit current	Adequate sources were used during testing.	P
4.3	Thermal testing		P
4.3.1	General	See following subchapters	P
4.3.2	Maximum temperatures	Components and parts meet their specified temperature limits.	P
4.3.2.1	General		P
4.3.2.2	Touch temperatures	(see appended table)	P
4.3.2.3	Temperature limits for mounting surfaces	(see appended table)	P
4.4	Testing in single fault condition		P
4.4.1	General	The EUT and its technical documentation were reviewed and applicable single faults were performed.	P
4.4.2	Test conditions and duration for testing under fault conditions		P
4.4.2.1	General	Considered.	P
4.4.2.2	Duration of tests		P
	The equipment shall be operated until further change as a result of the applied fault is unlikely	Considered.	P
	If a non-resettable, manual, or automatically resetting protective device or circuit operates		P
	– automatic reset devices or circuits:		N/A
	– manual reset devices or circuits:		N/A
	– non-resettable devices or circuits:		P
4.4.3	Pass/fail criteria for testing under fault conditions		P
4.4.3.1	Protection against shock hazard		P
	a) by making measurements, compliance is checked by the test of 7.5.2 (without humidity preconditioning) for basic insulation	Dielectric strength test was performed after fault condition testing. (see appended table)	P
	b) by performing a dielectric strength test as per 7.5.2 (without humidity preconditioning) in the following cases:	Dielectric strength test was performed after fault condition testing.	P
	i) on reinforced or double Insulation, using the test level for basic insulation, and	(see appended table)	P

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Clause	Requirement + Test		Verdict
	ii) on basic insulation in protective class I equipment, using the test level for basic insulation,	(see appended table)	P
	c) by inspection to ensure a fuse connected between the protective earthing terminal and the protective earthing conductor in the test setup has not opened;		P
	d) by inspection of the enclosure to ensure that no damage	(see appended table)	P
4.4.3.2	Protection against the spread of fire		P
	There shall be no emission of molten metal, burning insulation, or flaming or glowing particles from the fire enclosure	No emission of molten metal, burning insulation, or flaming or glowing particles from the fire enclosure was determined during the tests.	P
4.4.3.3	Protection against other hazards	Considered.	P
4.4.3.4	Protection against parts expulsion hazards	The enclosure provides adequate rigidity. No hazard occurred and is expected.	P
4.4.4	Single fault conditions to be applied		P
4.4.4.1	Component fault tests	Applicable faults were considered by reference of the EUT and the technical documentation.	P
	The following faults are simulated:		P
	a) Short circuit or open circuit of relevant components.	(see appended table)	P
	b) Short circuit or open circuit of any components or insulation where failure could adversely affect supplementary insulation or reinforced insulation.	(see appended table)	P
	c) In addition, where required by Method 2 of 9.1.1, components that could result in a fire hazard are to be overloaded unless they comply with the requirements of 9.1.3.	Method 1 was applied. Refer also to clause 9.1.1.	N/A
4.4.4.2	Equipment or parts for short-term or intermittent operation	No such parts present.	N/A
4.4.4.3	Motors	No such parts present.	N/A
4.4.4.4	Transformer short circuit tests	(see appended table)	P
4.4.4.5	Output short circuit		P
	the highest of the RMS current values measured or calculated over a time period as follows:	(see appended table)	P
	a) for AC signals, 3 cycles of the nominal AC frequency for the port under consideration	An internal software limit for the output current is provided which causes an immediate shut down.	P
	b) for all signals, the duration of the short circuit from the time the short circuit is applied		N/A
	c) for short circuit tests that result in a continuous non-zero value, the steady-state RMS value		N/A

IEC 62109-1			
Clause	Requirement + Test		Verdict
4.4.4.6	Backfeed current test for equipment with more than one source of supply	(see appended table)	P
	In addition to the requirements of 4.4.3, the short-circuit currents are to be recorded and if they exceed the maximum rated current for the port		N/A
4.4.4.7	Output overload	Overload tests due to short circuit tests are determined as not necessary because no overload possible that could lead to a worse result than the shorts did.	N/A
	If overcurrent protection is provided by a current-sensitive device or circuit		N/A
	For equipment in which the output voltage is designed to collapse when a specified overload current is reached		N/A
4.4.4.8	Cooling system failure		N/A
	a) air-intakes shall be blocked or partially blocked;	(see appended table)	N/A
	b) cooling fans shall be stopped or disconnected, one at a time;	(see appended table)	N/A
	c) cooling by circulation of water or other coolant shall be stopped or partially restricted.	No coolant is provided.	N/A
4.4.4.9	Heating devices	No heating devices provided.	N/A
	a) timers which limit the heating period shall be overridden to energize the heating circuit continuously;		N/A
	b) temperature control devices or circuits shall have single fault conditions applied such that control over the heater is lost.		N/A
4.4.4.10	Safety interlock systems	No interlock systems provided in the meaning of this clause.	N/A
4.4.4.11	Reverse d.c. connections	DC wiring terminals and AC wiring terminal is provided. The installation instructions describe the correct assembling. Tests were performed. The unit shows an error message and will not start. Fault current through protective diodes. (see appended table)	P
4.4.4.12	Voltage selector mismatch	No voltage selector provided. The EUT is an auto ranging type.	N/A
4.4.4.13	Mis-wiring with incorrect phase sequence or polarity	Miswiring with incorrect phase sequence or polarity cannot result in a hazard.	N/A
4.4.4.14	Printed wiring board short-circuit test	(see appended table)	P
4.5	Humidity preconditioning		P

IEC 62109-1			
Clause	Requirement + Test		Verdict
4.5.1	General	The EUT was subjected to following test conditions.	P
4.5.2	Conditions		P
	Humidity: 92,5 % RH $\pm$ 2,5 % RH; temperature: 40 °C $\pm$ 2 °C; 48hr	(see appended table)	P
4.6	Backfeed voltage protection		P
	Under normal and single-fault conditions, hazardous voltage or energy shall not be present on the terminals of each source		P
4.6.1	Backfeed tests under normal conditions	(see appended table)	P
4.6.2	Backfeed tests under single-fault conditions		N/A
4.6.3	Compliance with backfeed tests	(see appended table)	P
	– 15 s for sources that are permanently connected;		N/A
	– 1 s for sources that are cord-connected or use connectors that can be opened without the use of a tool.		P
4.7	Electrical ratings tests		P
4.7.1	Input ratings	The input/output current/power does not exceed the rated input current/power by more than 10%.	P
4.7.1.1	Measurement requirements for DC input ports	(see appended table)	P
4.7.2	Output ratings	(see appended table)	P

5	Marking and documentation		P
5.1	Marking		P
5.1.1	General		P
	Except for marking of internal parts, these markings shall be visible from the exterior after installation, or be visible after removing a cover or opening a door without the aid of a tool	Present. The type label is located on the outer surface of the enclosure.	P
	For rack- or panel-mounted equipment, markings are permitted to be on a surface	No rack or panel mounted equipment.	N/A
	Graphic symbols may be used and shall be in accordance with Annex C or IEC 60417 as applicable	Considered.	P
5.1.2	Durability of markings		P
	The markings are rubbed quickly by hand, without undue pressure, for 30 s with a cloth soaked with the specified cleaning agent	No loosening or curled edges after the test visible.	P
	The markings shall be clearly legible after the above treatment, and adhesive labels shall not have worked loose or become curled at the edges.		P
5.1.3	Identification		P
	a) the name or trade mark of the manufacturer or supplier;		P

IEC 62109-1			
Clause	Requirement + Test		Verdict
	b) a model number, name or other means to identify the equipment,		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.		P
5.1.4	Equipment ratings	Reference to Marking	P
	– input voltage, type of voltage (a.c. or d.c.), frequency, and maximum continuous current for each input;		P
	– output voltage, type of voltage (a.c. or d.c.), frequency, maximum continuous current, and for a.c. outputs, either the power or power factor for each output;		P
	– the ingress protection (IP) rating as in 6.3 below.	IP67	P
5.1.5	Fuse identification	F801, F800	P
	Marking shall be located adjacent to each fuse or fuseholder, or on the fuseholder, or in another location provided		P
	For fuses not located in operator access areas and for soldered-in fuses located in operator access areas		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		P
	The symbols in Annex C may be used, and where there is insufficient space, symbol 9 of Annex C may be used		P
	A multiple-voltage unit shall be marked to indicate the particular voltage		N/A
	A unit with d.c. terminals shall be plainly marked indicating the polarity of the connections, with:		P
	– the signs “+” for positive and “–” for negative; or		P
	– a pictorial representation illustrating the proper polarity where the correct polarity can be unambiguously determined from the representation.	Terminals are marked with the signs “+” and “-” instead.	N/A
5.1.6.1	Protective conductor terminals		P
	– symbol 7 of Annex C; or	The symbol 7 is attached to the PE connector. The letters “PE” are attached to the PE connector.	P
	– the letters “PE”; or	The symbol 7 is attached to the PE connector.	P
	– the color coding green-yellow.		P
5.1.7	Switches and circuit-breakers	No switches or circuit breakers present.	N/A

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Clause	Requirement + Test		Verdict
	The on and off-positions of switches and circuit breakers shall be clearly marked		N/A
5.1.8	Class II equipment	Protective class I equipment.	N/A
	Equipment using Class II protective means throughout shall be marked with symbol 12 of Annex C.		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.		N/A
5.1.9	Terminal boxes for external connections	No terminal boxes present.	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 instructions. Symbol 9 of Annex C 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, whether upper case or lower case, and shall contrast in color with the background.		P
	– Symbols or text that are moulded, stamped or engraved in a material shall have a character height of at least 2,0 mm, whether upper case or lower case, and if not contrasting in color from the background, shall have a depth or raised height of at least 0,5 mm.		P
	If it is necessary to refer to the instruction manual		P
5.2.2	Content for warning markings		P
5.2.2.1	Ungrounded heatsinks and similar parts	No ungrounded heatsinks or similar parts present.	N/A
	marked with symbol 13 of Annex C, or equivalent		N/A
5.2.2.2	Hot surfaces	No temperatures present which are over the touch temperature limits	P
	exceeds the temperature limits specified in 4.3.2 shall be marked with symbol 14 of Annex C.		N/A
5.2.2.3	Coolant		N/A
	A unit containing coolant that exceeds 70 °C		N/A
	The documentation shall provide a warning regarding the risk of burns from hot coolant, and either:		N/A
	a) a statement that coolant system servicing is to be done only by service personnel, or		N/A

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Clause	Requirement + Test		Verdict
	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	The unit is marked with the Symbol 21 of Annex C.	P
5.2.2.5	Motor guarding		N/A
	Where required by 8.2 a marking shall be provided		N/A
5.2.3	Sonic hazard markings and instructions	No sonic hazard can happen during the normal use of this inverter according to the user instruction	N/A
	a) be marked to warn the operator of the sonic pressure hazard; or		N/A
	b) be provided with installation instructions		N/A
5.2.4	Equipment with multiple sources of supply		N/A
	shall be marked with symbol 13 of Annex C and the manual shall contain the information required in 5.3.4.		N/A
5.2.5	Excessive touch current		P
	shall be marked with symbol 15 of Annex C. See also 5.3.2 for information to be provided in the installation manual.	The unit is marked with the symbol 15 of Annex C.	P
5.3	Documentation		P
5.3.1	General		P
	a) explanations of equipment markings, including symbols used;		P
	b) location and function of terminals and controls;		P
	c) all ratings or specifications that are necessary to safely install and operate the PCE, including the following:		P
	– Environmental category as per 6.1		P
	– Wet locations classification 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	No photovoltaic array present.	N/A

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Clause	Requirement + Test		Verdict
5.3.1.1	Language	The English version of the manual was reviewed.	P
	acceptable in the country where the equipment is to be installed	Responsibility of the manufacturer.	P
5.3.1.2	Format		P
	In general, the documentation shall be provided in printed form and is to be delivered with the equipment		P
	For equipment which requires the use of a computer for both installation and operation		N/A
5.3.2	Information related to installation		P
	a) assembly, location, and mounting requirements;		P
	b) ratings and means of connection to each source of supply and any requirements related to wiring and external controls, color 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;		N/A
	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;		N/A
	i) tightening torque to be applied to wiring terminals;		P
	j) values of backfeed short-circuit currents available from the PCE on input and output conductors under fault conditions, if those currents exceed the max. rated current of the circuit, as per 4.4.4.6;		N/A
	k) for each input to the PCE, the maximum value of short-circuit current available from the source, for which the PCE is designed; and		P
	l) compatibility with RCD and RCM;		N/A
	m) instructions for protective earthing of the PCE, including the information required by 7.3.6.3.7 if a second protective earthing conductor is to be installed;		P

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Clause	Requirement + Test		Verdict
	n) where required by 7.3.8, the installation instructions shall include the following or equivalent wording: "This product can cause current with a d.c. component. Where a residual current operated protective (RCD) or monitoring (RCM) device is used for protection in case of direct or indirect contact, only an RCD or RCM of Type B is allowed on the supply side of this product."		N/A
	o) for PCE intended to charge batteries, the battery nominal voltage rating, size, and type;		N/A
	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 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
	– intervals and instructions for any preventive maintenance that is required to maintain safety (for example air filter replacement or periodic re-tightening of terminals);		N/A
	– 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;		N/A
	– instructions for safe cleaning (if recommended);		N/A
	– 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.		N/A
5.3.4.1	Battery maintenance	No batteries by the meaning of this clause provided.	N/A
	– Servicing of batteries should be performed or supervised by personnel knowledgeable about batteries and the required precautions.		N/A
	– When replacing batteries, replace with the same type and number of batteries or battery packs.		N/A

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Clause	Requirement + Test		Verdict
	– General instructions regarding removal and installation of batteries.		N/A
	– CAUTION: Do not dispose of batteries in a fire. The batteries may explode.		N/A
	– CAUTION: Do not open or damage batteries. Released electrolyte is harmful to the skin and eyes. It may be toxic.		N/A
	– 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: a) Remove watches, rings, or other metal objects. b) Use tools with insulated handles. c) Wear rubber gloves and boots. d) Do not lay tools or metal parts on top of batteries. e) Disconnect charging source prior to connecting or disconnecting battery terminals. f) Determine if battery is inadvertently grounded.		N/A

6	Environmental requirements and conditions		P
	The manufacturer shall rate the PCE for the following environmental conditions:		P
6.1	Environmental categories and minimum environmental conditions		P
6.1.1	Outdoor	The EUT (inverter) is intended for outdoor use.	P
6.1.2	Indoor, unconditioned	Indoor, unconditioned use is the most unfavourable condition.	P
6.1.3	Indoor, conditioned	Indoor, unconditioned use is the most unfavourable condition.	P
6.2	Pollution degree	PD3. The EUT provides an IP67 enclosure and the pollution degree was reduced by table 5.	P
6.3	Ingress protection		P
	The manufacturer's stated ingress protection rating shall comply with Table 4 and shall be verified in accordance with IEC 60529.	The manufacturer specifies IP67 according to IEC 60529.	P
6.4	UV exposure	No external plastic parts which affect safety are present.	N/A
6.5	Temperature and humidity	The maximum ambient temperature was specified to -40°C to +65°C. Humidity 0-100% (conditioned and unconditioned)	P

7	Protection against electric shock and energy hazards		P
7.1	General	Considered.	P

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Clause	Requirement + Test		Verdict
7.2	Fault conditions	Considered. Refer also to clause 4.4.	P
7.3	Protection against electric shock		P
7.3.1	General		P
7.3.2	Decisive voltage classification		P
7.3.2.1	Use of decisive voltage class (DVC)		P
	– the working voltage limits of Table 6, and	Refer to 7.3.2.2.	P
	– the applicable protective measures of 7.3.2.4.	Refer to 7.3.2.4.	P
7.3.2.2	Limits of DVC		P
7.3.2.3	Short-term limits of accessible voltages under fault conditions		P
7.3.2.4	Requirements for protection	I	P
	Protection shall be provided that ensures that no single fault		P
	Accessible earthed conductive parts shall be separated from DVC-B and DVC-C circuits by at least basic insulation.		P
7.3.2.5	Connection to PELV and SELV circuits		P
	– the PELV or SELV classification of the external circuit is not changed, and	Part of the investigation of the final installation.	N/A
	– the DVC classification of the external port of the PCE is not changed.	Part of the investigation of the final installation.	N/A
7.3.2.6	Working voltage and DVC		P
7.3.2.6.1	General	Worst case combinations were considered.	P
7.3.2.6.2	AC working voltage (see Figure 2)	(see appended table)	P
	The DVC is that of the lowest voltage row of Table 6 for which both of the following conditions are satisfied. - $U_{AC} \leq U_{ACL}$ - $U_{ACP} \leq U_{ACPL}$	Considered. For specification of DVC refer to clause 7.3.2.4.	P
7.3.2.6.3	DC working voltage (see Figure 3)	(see appended table)	P
	The DVC is that of the lowest voltage row of Table 6 for which both of the following conditions are satisfied. - $U_{DC} \leq U_{DCL}$ - $U_{DCP} \leq 1,17 \times U_{DCL}$	Considered. For specification of DVC refer to clause 7.3.2.4.	P
7.3.2.6.4	Pulsating working voltage (see Figure 4)		P
	The DVC is that of the lowest voltage row of Table 6 for which both of the following conditions are satisfied. - $U_{AC}/U_{ACL} + U_{DC}/U_{DCL} \leq 1$ - $U_{ACP}/U_{ACPL} + U_{DC}/(1,17 \times U_{DCL}) \leq 1$	Considered. For specification of DVC refer to clause 7.3.2.4.	P
7.3.3	Protective separation		P
	- double or reinforced insulation, or		P

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Clause	Requirement + Test		Verdict
	- protective screening, or	Protective screening was not used.	N/A
	- protective impedance comprising limitation of current per 7.3.5.3.1 and of discharged energy per 7.3.5.3.2, or		N/A
	- limitation of voltage according to 7.3.5.4.	Voltage limitation was not used.	N/A
7.3.4	Protection against direct contact		P
7.3.4.1	General	Protection against direct contact to DVC C circuits is ensured by the enclosure.	P
	Open type sub-assemblies and devices do not require protective measures against direct contact	The whole EUT has an enclosure.	N/A
	the instructions provided with the equipment shall indicate that such measures must be provided in the end equipment or in the installation.	No instructions required.	N/A
7.3.4.2	Protection by means of enclosures and barriers		P
7.3.4.2.1	General	All life parts are provided within the enclosure. The enclosure was tested according to clause 7.3.4.2.2.	P
	Parts of enclosures and barriers that provide protection in accordance with these requirements shall not be removable without the use of a tool	The enclosure cannot be opened or removed without help of a tool to get access to hazardous life parts.	P
7.3.4.2.2	Access probe criteria		P
	a) decisive voltage classification A, (DVC A) - the probe may touch the live parts;	No DVC A circuits present which could be touched.	P
	b) decisive voltage classification B, (DVC B) - the probe shall have adequate clearance to live parts, based on the clearance for functional insulation	All hazardous life parts and circuits which were specified for DVC C are not accessible. Tests according to clause 7.3.4.2.3 were performed.	P
	c) decisive voltage classification C, (DVC C) - the probe shall have adequate clearance to live parts, based on the clearance for basic insulation	All hazardous life parts and circuits which were specified for DVC C are not accessible. Tests according to clause 7.3.4.2.3 were performed.	P
7.3.4.2.3	Access probe tests		P
	a) Inspection; and	Considered.	P
	b) Tests with the test finger (Figure D.1) and test pin (Figure D.2) of Annex D, the results of which shall comply with the requirements of 7.3.4.2.1 a), b), and c) as applicable.	Considered.	P
	The floor-standing equipment having a mass exceeding 40 kg is not tilted.	No floor standing equipment.	N/A
	Equipment intended for building-in or rack mounting, or for incorporation in larger equipment,	The EUT is not a built-in or rack mounted equipment.	N/A

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Clause	Requirement + Test		Verdict
	c) Openings preventing the entry of the jointed test finger (Figure D.1 of Annex D) during test b) above, are further tested by means of a straight unjointed test finger (Figure D.3 of Annex D), applied with a force of 30 N.		P
	If the unjointed finger enters, the test with the jointed finger is repeated	No further test was necessary.	N/A
	d) In addition to a) to c) above, top surfaces of enclosures shall be tested with the IP3X probe of IEC 60529.	IP67 protection according IEC60529.	P
7.3.4.2.4	Service access areas		N/A
	live parts of DVC B or C that may be unintentionally touched when making adjustments shall be protected against contact by the finger probe of Figure D.1 of Annex D.	The EUT will be fully disconnected during installation/maintenance.	N/A
7.3.4.3	Protection by means of insulation of live parts	All hazardous parts are protected by the enclosure. See clause 7.3.4.2.	N/A
	Where the requirements of 7.3.4.2 are not met, live parts shall be provided with insulation if:		N/A
	– their working voltage is greater than the maximum limit of decisive voltage class A, or		N/A
	– for a DVC A or B circuit, protective separation from adjacent circuits of DVC C is not provided (see note 2) under Table 7).		N/A
	Any conductive part, which is not separated from DVC-B or DVC-C parts by at least basic insulation		N/A
	As an alternative to solid or liquid insulation, a clearance according to 7.3.7.4, shown by LB and LR in Figure 5, may be provided.		N/A
	Three cases are considered:		N/A
	Case a) Accessible parts are conductive and are connected to earth by protective bonding.		N/A
	Cases b) and c) Accessible parts are non-conductive (case b)) or conductive but not connected to earth by protective bonding (case c)).		N/A
7.3.5	Protection in case of direct contact		P
7.3.5.1	General	For accessible circuits DVC-A is used.	P
	it shall be ensured that in the event of error or polarity reversal of connectors no voltages that exceed DVC-A are present on circuits that are not protected against direct contact.		P
7.3.5.2	Protection using decisive voltage class A		P
	if the circuit has protective separation from circuits of DVC-B or DVC-C in accordance with 7.3.3.	Reinforced insulation between DVC-C and DVC-A was used.	P
7.3.5.3	Protection by means of protective impedance	Protective impedance provided. Refer also to clause 7.3.3.	P

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Clause	Requirement + Test		Verdict
	if any connection to circuits of DVC-B or DVC-C is through protective impedance, and the accessible circuit or part is otherwise provided with protective separation from circuits of DVC-B or DVC-C according to 7.3.3.		P
7.3.5.3.1	Limitation of current through protective impedance	No protective impedance provided.	N/A
	The current available through protective impedance to earth and between simultaneously accessible parts, measured at the accessible live parts, shall not exceed a value of 3,5 mA a.c. or 10 mA d.c. under normal and single-fault conditions.		N/A
7.3.5.3.2	Limitation of discharging energy through protective impedance		N/A
	The discharging energy available between simultaneously accessible parts protected by protective impedance shall not exceed the charging voltage and capacitance limits given in Table 9,		N/A
7.3.5.4	Protection by means of limited voltages		N/A
	That portion of a circuit that has its voltage reduced to DVC-A by a voltage divider		N/A
	This type of protection shall not be used in case of protective class II or unearthed circuits		N/A
7.3.6	Protection against indirect contact		P
7.3.6.1	General	Protection is given by class I equipment with protective earth connection and protective bonding which is separated from hazardous parts and circuits by basic insulation. Refer also to clause 7.3.6.3.	P
	This protection shall comply with the requirements for protective class I (basic insulation plus protective earthing), protective class II (double or reinforced insulation) or protective class III (limitation of voltages).	Protection class I	P
7.3.6.2	Insulation between live parts and accessible conductive parts	Protection is ensured by adequate clearance and creepage distances according clauses 7.3.7.4 and 7.3.7.5.	P
7.3.6.3	Protective class I - Protective bonding and earthing	Class I equipment.	P
7.3.6.3.1	General	The accessible conductive parts are reliably bonded to protective earth.	P
	except bonding is not required for:	Exception not used.	N/A
	a) accessible conductive parts that are protected by one of the measures in 7.3.5.2 to 7.3.5.4, or		N/A
	b) accessible conductive parts that are separated from live parts of DVC-B or -C using double or reinforced insulation.	Exception not used.	N/A

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Clause	Requirement + Test		Verdict
7.3.6.3.2	Requirements for protective bonding	Protective bonding of accessible conductive parts is achieved either via screw connection or through dedicated protective bonding conductors.	P
	a) through direct metallic contact;		P
	b) through other conductive parts which are not removed when the PCE or sub-units are used as intended;		P
	c) through dedicated protective bonding conductors;		N/A
	d) through other metallic components of the PCE.		P
	For moving or removable parts, hinges or sliding contacts designed and maintained to have a low resistance	No such connections used.	N/A
	Metal ducts of flexible or rigid construction and metallic sheaths shall not be used as protective bonding conductors, unless the device or material has been investigated as suitable for protective bonding purposes.	No such connections used.	N/A
7.3.6.3.3	Rating of protective bonding		P
	Protective bonding shall withstand the highest thermal and dynamic stresses	The protective bonding conductors have suitable cross sectional areas with an adequate current carrying capacity.	P
	Protective bonding shall meet following requirements:		P
	a) For PCE with an overcurrent protective device rating of 16 A or less, the impedance of the protective bonding means shall not exceed 0,1 Ω during or at the end of the test below.	(see appended table)	P
	b) For PCE with an overcurrent protective device rating of more than 16 A, the voltage drop in the protective bonding test shall not exceed 2,5 V during or at the end of the test below.	(see appended table)	N/A
	As alternative to a) and b) the protective bonding may be designed according to the requirements for the external protective earthing conductor in 7.3.6.3.5	Alternative method not used.	N/A
	The impedance of protective bonding means shall be checked by passing a test current through the bond for a period of time as specified below.		P
	a) for pluggable equipment type A, the overcurrent protective device is that provided external to the equipment.		N/A
	b) for pluggable equipment type B and fixed equipment, the maximum rating of the overcurrent protective device specified in the equipment installation instructions to be provided external to the equipment;	(see appended table)	P

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Clause	Requirement + Test		Verdict
	c) for a circuit or part of the equipment for which an overcurrent protective device is provided as part of the equipment, the rating of the provided overcurrent device.		N/A
7.3.6.3.3.1	Test current, duration, and acceptance criteria		P
	a) For PCE with an overcurrent protective device rating of 16 A or less		P
	b) For PCE with an overcurrent protective device rating of more than 16 A		N/A
	c) During and after the test, there shall be no melting, loosening, or other damage		N/A
	As an alternative to Table 10, where the time-current characteristic of the overcurrent protective device that limits the fault current in the protective bonding means is known		N/A
7.3.6.3.4	Protective bonding impedance (routine test)		P
	the test current may be reduced to any convenient value greater than 10 A sufficient to allow measurement or calculation of the impedance of the protective bonding means;	See summary of testing.	P
	the test duration may be reduced to no less than 2 s.	See summary of testing.	P
	For equipment subject to the type test in 7.3.6.3.3.1a), the impedance during the routine test shall not exceed 0,1Ω		P
	For equipment subject to the type test in 7.3.6.3.3.1b) the impedance during the routine test shall not exceed 2,5 V divided by the test current required by 7.3.6.3.3.1b).		N/A
7.3.6.3.5	External protective earthing conductor		P
	A protective earthing conductor shall be connected at all times when power is supplied to PCE of protective class I.		P
	Unless local wiring regulations state otherwise, the protective earthing conductor cross-sectional area shall be determined from Table 11 or by calculation according to IEC 60364-5-54.	The external protective earthing conductor is not part of the EUT. The protective earthing conductor will be at least the size of the input power conductors. This is sufficiently described in the installation instructions.	P
	If the external protective earthing conductor is routed through a plug and socket, or similar means of disconnection	Within the EUT no devices are present in where the protective earthing conductor will be routed through by installation. The earthing conductor is not part of the EUT. This shall be considered in the final installation.	P

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Clause	Requirement + Test		Verdict
	The cross-sectional area of every protective earthing conductor which does not form part of the supply cable or cable enclosure shall, in any case, be not less than:		N/A
	2,5 mm² if mechanical protection is provided;		N/A
	4 mm² if mechanical protection is not provided.		N/A
	For cord-connected equipment, provisions shall be made so that the protective earthing conductor in the cord shall, in the case of failure of the strain-relief mechanism, be the last conductor to be interrupted.		N/A
7.3.6.3.6	Means of connection for the external protective earthing conductor		P
7.3.6.3.6.1	General		P
	The means of connection for the external protective earthing conductor shall be located near the terminals	Protective earth is located adjacent to the AC conductors.	P
	The means of connection shall be corrosion resistant and shall be suitable for the connection of cables	Approved AC connector used. Refer also to "List of safety critical components".	P
	The means of connection for the protective earthing conductor shall not be used as a part of the mechanical assembly	Considered.	P
	A separate means of connection shall be provided for each external protective earthing conductor.	Only one connector provided and required.	N/A
	Connection and bonding points shall be so designed that their current-carrying capacity is not impaired by mechanical, chemical, or electrochemical influences.	The connection materials of protective earthing and bonding were investigated and were deemed to be not impaired by electrochemical influences.	P
	The means of connection for the protective earthing conductor shall be permanently marked with:		P
	– symbol 7 of Annex C; or	Symbol 7 is provided as a marking adjacent to the PE connector. The color-coding green-yellow was used instead.	P
	– the color coding green-yellow.	Symbol 7 was used instead. The color-coding green-yellow was used as a marking of the PE connector.	P
7.3.6.3.7	Touch current in case of failure of the protective earthing conductor		P
	For pluggable equipment type A, the touch current measured in accordance with 7.5.4 shall not exceed 3,5 mA a.c. or 10 mA d.c.	The EUT is not an equipment with type A connection.	N/A
	For all other PCE, one or more of the following measures shall be applied, unless the touch current measured in accordance with 7.5.4 does not exceed 3,5 mA a.c. or 10 mA d.c.	The measured touch current does not exceed 3,5mA. Additional precautions have been taken.	P
	a) Permanently connected wiring,		N/A

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Clause	Requirement + Test		Verdict
	a cross-section of the protective earthing conductor of at least 10 mm² if copper, or 16 mm² if aluminum; or	Present.	P
	automatic disconnection of the supply in case of discontinuity of the protective earthing conductor; or		N/A
	provision of an additional terminal for a second protective earthing conductor of the same cross-sectional area as the original protective earthing conductor and installation instructions requiring a second protective earthing conductor to be installed. or		N/A
	b) Connection with an industrial connector according to IEC 60309 and a minimum protective earthing conductor cross-section of 2,5 mm ² as part of a multi-conductor power cable. Adequate strain relief shall be provided.	Wiring terminals used instead.	N/A
	In addition, the caution symbol 15 of Annex C shall be fixed to the product and the installation manual shall provide		N/A
	When it is intended and allowed to connect two or more PCEs in parallel using one common protective earthing conductor,		N/A
	unless one of the measures in a) or b) above is used.		N/A
	The maximum number of parallel PCEs is used in the testing and has to be stated in the installation manual.		N/A
7.3.6.4	Protective class II - Double or reinforced insulation	The EUT is a class I equipment.	N/A
	Equipment or parts of equipment designed for protective class II shall have insulation between live parts and accessible surfaces in accordance with 7.3.4.3.		N/A
	The following requirements also apply:		N/A
	equipment designed to protective class II shall not have means of connection for the external protective earthing conductor.		N/A
	metal-encased equipment of protective class II may have provision on its enclosure for the connection of an equipotential bonding conductor;		N/A
	equipment of protective class II may have provision for the connection of an earthing conductor for functional reasons or for the damping of overvoltages; it shall, however, be insulated as though it is a live part;		N/A
	equipment employing protective class II shall be marked according to 5.1.8.		N/A
7.3.7	Insulation including clearance and creepage distances		P
7.3.7.1	General	Considered.	P

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Clause	Requirement + Test		Verdict
7.3.7.1.1	Pollution degree	According to clause 5.2, PD 2 was assumed to be used due to the enclosure meets the requirements of clause 6.2, table 5.	P
7.3.7.1.2	Overvoltage category and Impulse withstand voltage rating		P
	The concept of overvoltage categories is applied to each separate circuit in the PCE, including mains circuits, PV circuits, and other circuits, whether connected to or isolated from the mains and PV circuits, as follows:		P
	a) For equipment or circuits energized from the mains, four categories are considered:	OVC III was assumed to be used. (4000V)	P
	category IV applies to equipment permanently connected at the origin of an installation (upstream of the main distribution board).		N/A
	category III applies to fixed equipment downstream of, and including, the main distribution board.		P
	category II applies to equipment not permanently connected to the installation.		N/A
	category I applies to equipment connected to a circuit where measures have been taken to reduce transient overvoltages to a low level.		N/A
	b) For PV circuits in general		P
	c) For PCE with galvanic isolation	The EUT does provide galvanic isolation between the PV and main circuits.	P
	– The magnitude of impulses from the mains circuit on the PV circuit		N/A
	– The rating to be used on the PV circuit is the higher of the value in b) and the value calculated above.		N/A
	– The magnitude of impulses from the PV circuit on the mains circuit		N/A
	– The rating to be used on the mains circuit is the higher of the value in a) and the value calculated above.		N/A
	d) For PCE not providing galvanic isolation between the mains and PV circuits	The EUT does provide galvanic isolation between the PV and the main circuits.	N/A
	e) For other circuits the impulse withstand voltage rating:	No other circuits provided.	N/A
	for circuits connected to the mains without galvanic isolation		N/A
	for circuits connected to the PV circuit without galvanic isolation		N/A

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Clause	Requirement + Test		Verdict
	where isolation is provided by means of isolation transformers, optocouplers, or similar galvanic isolation devices, between a considered circuit and an adjacent mains or PV circuit		N/A
	f) The overvoltage categories determined as above apply from circuits to earth.	For functional insulation between circuits of the same OVC was reduced by one value.	P
	g) Application of means to reduce impulse voltages	Reduced values were not considered.	N/A
7.3.7.1.3	Supply earthing systems		P
	Three basic types of earthing system are described in IEC 60364-1. They are:	TN system provided in the final installation.	P
	TN system:		P
	TT system:		P
	IT system:		N/A
7.3.7.1.4	Insulation voltages	Considered.	P
7.3.7.2	Insulation between a circuit and its surroundings		P
7.3.7.2.1	General		P
	For creepage distances, the r.m.s. value of the working voltage is used.	(see appended table)	P
7.3.7.2.2	Circuits connected directly to the mains	For circuits directly connected to the mains the working voltage was used.	P
7.3.7.2.3	Circuits other than mains circuits		P
	Clearances and solid insulation between circuits other than the mains and their surroundings	For PV circuits the maximum rated PV open circuit voltage was used.	P
7.3.7.2.4	Insulation between circuits	Considered.	P
7.3.7.3	Functional insulation	Functional insulation was verified by fault condition tests (short).	P
7.3.7.4	Clearance distances		P
7.3.7.4.1	Determination	(see appended table)	P
	Clearances for use in altitudes above 2 000 m shall be calculated with a correction factor according to Table A.2 of IEC 60664-1	The EUT is intended to be used up to 2000m altitude.	P
7.3.7.4.2	Electric field homogeneity	An inhomogeneous electric field is considered to be used for the determination of separations. Therefore table 13 was applied.	P
7.3.7.4.3	Clearance to conductive enclosures	Deformation tests were performed. Because of the rigidity of the enclosure no distances got reduced.	P
7.3.7.5	Creepage distances		P

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Clause	Requirement + Test		Verdict
7.3.7.5.1	General	Considered. (see appended table)	P
7.3.7.5.2	Voltage	(see appended table)	P
7.3.7.5.3	Materials	(see appended table)	P
	CTI	CTI IIIb was assumed to be used for other materials as the PCBs.	P
7.3.7.6	Coating	Coating is provided.	P
7.3.7.7	PWB spacings for functional insulation	Functional insulation was verified by performing short circuit tests according to 4.4.4.14. No reduced spacings were used. For the material and its specifications for the PCB refer to "List of safety critical components".	P
	the PWB has flammability rating of V-0 (see IEC 60695-11-10)	Refer to "List of safety critical components".	P
	the PWB base material has a minimum CTI of 175	Refer to "List of safety critical components".	P
	the equipment complies with the PWB short-circuit test (see 4.4.4.14).	Refer to clause 4.4.4.14.	P
7.3.7.8	Solid insulation		P
7.3.7.8.1	General	Considered. (see appended table)	P
7.3.7.8.2	Requirements for electrical withstand capability of solid insulation	Already approved materials used for insulations.	P
7.3.7.8.2.1	Basic, supplemental, reinforced, and double insulation		P
	Solid insulation shall withstand the applicable impulse withstand voltage test (7.5.1) and the a.c. or d.c. voltage test (7.5.2)	Only approved equipment and materials are use.	P
7.3.7.8.2.2	Functional insulation	Refer to clause 7.3.7.3.	P
7.3.7.8.3	Thin sheet or tape material		P
7.3.7.8.3.1	General	Only approved materials were used. See list of critical components.	P
	Insulation consisting of thin (less than 0,7 mm) sheet or tape materials is permitted		P
	Where more than one layer of insulation is used, there is no requirement for all layers to be of the same material.		P
7.3.7.8.3.2	Material thickness not less than 0,2 mm		P
	Basic or supplementary insulation	Considered.	P
	Double insulation		N/A
	Reinforced insulation		N/A

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Clause	Requirement + Test		Verdict
7.3.7.8.3.3	Material thickness less than 0,2 mm		P
	Basic or supplementary insulation	Considered.	P
	Double insulation	Considered.	P
	Reinforced insulation	Considered.	P
7.3.7.8.3.4	Compliance		P
	Compliance is checked by the tests described in 7.5.1 to 7.5.3	Refer to clause 7.5.1 and 7.5.3.	P
7.3.7.8.4	Printed wiring boards (PWBs)		P
7.3.7.8.4.1	General		P
	Insulation between conductor layers in double-sided single-layer PWBs, multi-layer PWBs and metal core PWBs	Considered.	P
	For the inner layers of multi-layer PWBs, the insulation between adjacent tracks on the same layer shall be treated as:	Considered.	P
	a creepage distance for pollution degree 1 and a clearance as in air		N/A
	as solid insulation	Considered.	P
7.3.7.8.4.2	Use of coating materials	Coating materials not provided.	N/A
	Type 1 protection		N/A
	Type 2 protection		N/A
7.3.7.8.5	Wound components	Wound components meet the requirements of 7.3.7.8.1 and 7.3.7.8.2 and were tested according the dielectric strength test according to clause 3.5.2. The transformers shall be tested to a routine dielectric strength test. This shall be verified by the manufacturer.	P
7.3.7.8.6	Potting materials	Considered.	P
7.3.7.9	Insulation requirements above 30 kHz	Considered. The distances required in Annex G are below the distances required for clearances according table 13.	P
7.3.8	Residual Current Detection (RCD) or Monitoring (RCM) device compatibility		N/A
	Pluggable type A PCE shall be designed so that, under normal and single-fault conditions, any resulting d.c. component in the residual current does not exceed the d.c. current withstand requirements in IEC 60755 and IEC 62020 for RCD and RCM of type A.		N/A

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Clause	Requirement + Test		Verdict
	PCE that is pluggable type B or fixed equipment, may have a d.c. residual current component present in excess of the d.c. current withstand requirements in IEC 60755 and IEC 62020 for RCD and RCM of type A, if the information required by 5.3.2 item l) is provided in the installation instructions.		N/A
7.3.9	Protection against shock hazard due to stored energy		P
7.3.9.1	Operator access area	The EUT is intended to be installed in a service access location. The DC and AC wiring compartments can only be opened by help of a tool.	N/A
	In the case of plugs, connectors, or similar devices that can be disconnected without the use of a tool	The EUT is intended to be installed in an operator access location. But the EUT does not provide means for connection to the EUT to get in direct contact to hazardous voltages. Special DC and AC connectors are provided which can only be removed by help of a tool.	P
7.3.9.2	Service access areas		P
	Capacitors within a PCE shall be discharged to a voltage less than DVC A (see 7.3.2.2), or an energy level below the limits specified in 7.3.5.3.2, within 10 s after the removal of power from the PCE.	The EUT is not intended for operator access. The voltage and power do not discharge within 10s in the unit due to the DC link capacitors. A statement is placed on the outside of the enclosure. Adequate warning statements are provided in the installation instructions.	P
	For energy storage devices (such as batteries or ultracapacitors) the intended function of which is to maintain charge even with the PCE off and disconnected from external sources	No hazardous charge present for the intended function.	N/A
7.4	Protection against energy hazards		P
7.4.1	Determination of hazardous energy level		P
	A hazardous energy level is considered to exist if:		P
	a) the voltage is 2 V or more, and power available after 60 s exceeds 240 VA. Or		P
	b) the stored energy in a capacitor is at a voltage, U of 2 V or more, and the stored energy, E, calculated from the following equation, exceeds 20 J:		N/A
7.4.2	Operator access areas		P
	Equipment shall be so designed that there is no risk of energy hazard in operator access areas from accessible circuits.	Operator accessible parts of the EUT are the enclosure and the user interface These circuits provide non-hazardous energy levels	P
7.4.3	Service access areas		P

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Clause	Requirement + Test		Verdict
	Energy storage devices within a PCE shall be discharged to an energy level less than 20 J, as in 7.4.1, within 10 s after the removal of power from the PCE.	The voltage and power do not discharge in 10s within the unit. A statement is placed on the outside of the enclosure. Adequate warning statements are provided in the installation instructions.	P
	For energy storage devices (such as batteries or ultracapacitors), The warning symbol 21 of Annex C shall be placed.	Unintentional contact to bare parts is not likely to occur.	P
7.5	Electrical tests related to shock hazard		P
7.5.1	Impulse voltage test (type test)	Test was applied wherever it was required by this standard.	P
	The impulse voltage test is performed with a voltage having a 1,2/50 μ s waveform	(see appended table)	P
7.5.2	Voltage test (dielectric strength test) (type test and routine test)		P
7.5.2.1	Purpose of test	Considered. Routine test are in the responsibility of the manufacturer.	P
7.5.2.2	Value and type of test voltage	(see appended table)	P
7.5.2.3	Humidity pre-conditioning	Considered.	P
7.5.2.4	Performing the voltage test	(see appended table)	P
7.5.2.5	Duration of the a.c. or d.c. voltage test		P
	The duration of the test shall be at least 60 s for the type test and 1 s for the routine test.	Considered.	P
7.5.2.6	Verification of the a.c. or d.c. voltage test	(see appended table)	P
7.5.3	Partial discharge test (type test or sample test)	The working voltage across any reinforced solid insulation does not exceed the limit of 700V and the voltage stress on the insulation is not greater than 1kV per mm. Refer to clause 7.3.2.6.	P
7.5.4	Touch current measurement (type test)		P
	The touch current shall be measured if required by 7.3.6.3.7 and shall not be greater than 3,5 mA a.c. or 10 mA d.c.		P
	or special measures of protection as given in 7.3.6.3.7 are required.		P
7.5.5	Equipment with multiple sources of supply		N/A
8	Protection against mechanical hazards		P
8.1	General	Edges, corners and the like are smooth and rounded. No hazard is expected.	P

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Clause	Requirement + Test		Verdict
8.2	Moving parts	No moving parts are provided.	N/A
8.2.1	Protection of service persons		N/A
8.3	Stability	The EUT is intended to be fixed.	P
	a) Equipment other than hand-held equipment		N/A
	b) Equipment which has both a height of 1 m or more and a mass of 25 kg or more, and all floor-standing equipment, has a force applied at its top, or at a height of 2 m if the equipment has a height of more than 2 m.		P
	c) Floor-standing equipment has a force of 800 N applied downwards		P
	1) all horizontal working surfaces;		P
	2) other surfaces providing an obvious ledge and which are not more than 1 m above floor level.		P
8.4	Provisions for lifting and carrying	Weight of the unit is below 18kg.	N/A
	If more than one handle or grip is fitted, the force is distributed between the handles or grips in the same proportion as in normal use.	The device cannot be carried without the help of a fork-lift truck.	N/A
8.5	Wall mounting	Adequate provisions are provided. The correct mounting is stated in the installation instructions.	P
8.6	Expelled parts	The event of expelled parts is not likely to occur due to the rigidity of the enclosure. No hazard is expected in normal operation.	N/A

9	Protection against fire hazards		P
9.1	Resistance to fire	The EUT provides a metal enclosure which contains all necessary parts and circuits requiring a fire enclosure.	P
9.1.1	Reducing the risk of ignition and spread of flame	All relevant components and materials which affect safety are sufficiently flammability retardant. Refer also to the "List of safety critical components".	P
	Method 1 – Selection and application of components, wiring and materials	Method 1 was used. Possible faults were simulated. (see appended table)	P
	Method 2 – Application of all of the simulated fault tests in 4.4.4.1 a), b), and c).	Method 1 was used.	N/A
9.1.2	Conditions for a fire enclosure		P
9.1.2.1	Parts requiring a fire enclosure		P
	Except where Method 2 is used, or as permitted in 9.1.2.2, the following require a fire enclosure:	Fire enclosure is provided.	P

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Clause	Requirement + Test		Verdict
	– components in mains circuits;		P
	– components in secondary circuits supplied by power sources which exceed the limits for a limited power source as specified in 9.2;	No secondary circuits which exceed the limits present.	N/A
	– components in secondary circuits supplied by a limited power source as specified in 9.2, but not mounted on material of flammability class V-1;	PCBs have minimum V-0 material. Refer also to “List of safety critical components”.	P
	– components within a power supply unit or assembly having a limited power output complying with the criteria for a limited power source as specified in 9.2;		N/A
	– components having unenclosed arcing parts, such as open switch and relay contacts and commutators, in a circuit at hazardous voltage or at a hazardous energy level; and		P
	– insulated wiring, except as permitted in 9.1.2.2.		P
9.1.2.2	Parts not requiring a fire enclosure	The EUT requires a fire enclosure.	N/A
	The following do not require a fire enclosure:		N/A
	– wiring and cables insulated with PVC, TFE, PTFE, FEP, neoprene or polyimide;		N/A
	– plugs and connectors forming part of a power supply cord or interconnecting cable;		N/A
	– components, including connectors, meeting the requirements of 9.1.3.2, which fill an opening in a fire enclosure;		N/A
	– connectors in secondary circuits supplied by power sources which are limited to a maximum of 15 VA under normal operating conditions and after a single fault in the equipment;		N/A
	– connectors in secondary circuits supplied by a limited power source as specified in 9.2,		N/A
	– other components in secondary circuits:		N/A
	• supplied by a limited power source as specified in 9.2, and mounted on materials of flammability class C.1;		N/A
	• supplied by internal or external power sources which are limited to a maximum of 15 VA under normal operating conditions and after a single fault in the equipment and mounted on material of flammability class HB;		N/A
	• complying with Method 2 of 9.1.1.		N/A
9.1.3	Materials requirements for protection against fire hazard		P
9.1.3.1	General	Refer to “List of safety critical components”.	P
	Materials of flammability classes VTM-0, VTM-1 and VTM-2 are considered to be equivalent to materials of FLAMMABILITY classes V-0, V-1 and V-2		P

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Clause	Requirement + Test		Verdict
	Where material of flammability class HB or flammability class HBF, is required, material passing the glow-wire test at 550 °C according to IEC 60695-2-11		P
	Where it is not practical to protect components against overheating under fault conditions		P
	Polymeric materials that serve as the outer enclosure and have surface area greater than 1 m ² or a single dimension larger than 2 m		P
9.1.3.2	Materials for fire enclosures	Refer to "List of safety critical components".	P
	The material of a fire enclosure, in the thinnest significant wall thickness used, shall be classified as flammability class 5VB according to IEC 60695-11-20 or shall pass the 5VB test in the end product.	The enclosure is made of metal	N/A
	a) the sample shall not release either flaming drops or particles capable of igniting the surgical cotton, and		N/A
	b) the sample shall not continue to burn for more than 1 min after the fifth application of the test flame, and		N/A
	c) there shall be no openings greater than 25 mm after the test.		N/A
	Materials for components that fill an opening in a fire enclosure shall:		P
	– be of at least V-1 class material and no larger than 100 mm in any dimension; or		P
	– be of at least V-2 class material and either		P
	– no larger than 25 mm in any dimension, or		P
	– no larger than 100 mm in any dimension and located at least 100 mm from any part that is a source of fire hazard, or		P
	– be of at least V-2 class material and there is a barrier or device(s) that forms a barrier made of a V-10 class material between the part and a source of fire hazard, or		P
	– comply with a relevant IEC component standard		P
	Plastic materials of a fire enclosure shall be located more than 13 mm through air from parts	No arcing can occur.	N/A
	Plastic materials of a fire enclosure located less than 13 mm through air from non-arcing parts		P
	Metals, ceramic materials and glass shall be considered to comply without test.		P
9.1.3.3	Materials for components and other parts inside fire enclosures	Refer to "List of safety critical components".	P
	Inside fire enclosures, materials for components and other parts, shall comply with one of the following:		P
	– be of flammability class V-2 or flammability class HF-2; or		P

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Clause	Requirement + Test		Verdict
	– meet the flammability requirements of a relevant IEC component standard		P
	The above requirement does not apply to any of the following:		P
	– electrical components which do not present a fire hazard under abnormal operating conditions		P
	– materials and components within an enclosure of 0,06 m ³ or less		P
	– one or more layers of thin insulating material		P
	– electronic components		P
	– wiring, cables and connectors insulated with PVC, TFE, PTFE, FEP, neoprene or polyimide		P
	– individual clamps (not including helical wraps or other continuous forms), lacing tape, twine and cable ties used with wiring harnesses;		P
	– the following parts, provided that they are separated from electrical parts by at least 13 mm of air or by a solid barrier of material of flammability class V-1:		P
	other small parts which would contribute negligible fuel to a fire		P
	tubing for air or any fluid systems, containers for powders or liquids and foamed plastic parts, provided that they are of flammability class HB.		P
9.1.3.4	Materials for air filter assemblies	No air filter assemblies present.	N/A
	Air filter assemblies shall be constructed of materials of flammability class V-2, or flammability class HF-2.		N/A
	This requirement does not apply to the following constructions:		N/A
	– air filter assemblies in air circulating systems		N/A
	– air filter assemblies located inside or outside a fire enclosure		N/A
	– air filter frames constructed of materials of flammability class HB		N/A
	– air filter assemblies located externally to the fire enclosure		N/A
9.1.4	Openings in fire enclosures		P
9.1.4.1	General		P
9.1.4.2	Side openings treated as bottom openings		P
	Where a portion of the side of a fire enclosure falls within the area traced out by the 5° angle in Figure 14		P
9.1.4.3	Openings in the bottom of a fire enclosure		P
	The location and size of the bottom or barrier shall cover area D in Figure 14		P
	The following constructions are considered to satisfy the requirement without test:		P

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Clause	Requirement + Test		Verdict
	- no opening in the bottom of a fire enclosure;		P
	- openings in the bottom of any size under an internal barrier, screen or the like		P
	- openings in the bottom, each not larger than 40 mm ²		P
	- baffle plate construction		P
	- metal bottoms of fire enclosures		P
	- metal bottom screens having a mesh		P
9.1.4.4	Equipment for use in a closed electrical operating area		P
9.1.4.5	Doors or covers in fire enclosures	No door or cover provided which allow access to an operator access location.	N/A
	– the door or cover shall be provided with a safety interlock; or		N/A
	– a door or cover, intended to be routinely opened by the user, shall comply with both of the following conditions:		N/A
	• it shall not be removable from other parts of the fire enclosure by the user; and		N/A
	• it shall be provided with a means to keep it closed during normal operation.		N/A
9.1.4.6	Additional requirements for openings in transportable equipment	The EUT is not transportable. It will be fixed in normal use.	N/A
	The following measures provide acceptable protection:		N/A
	– providing openings that do not exceed 1 mm in width regardless of length; or		N/A
	– providing a screen having a mesh with nominal openings not greater than 2 mm between center lines and constructed with a thread or wire diameter of not less than 0,45 mm; or		N/A
	– providing internal barriers.		N/A
	Additionally, where metallized parts of a plastic barrier or enclosure		N/A
	– access by a foreign metallic object; or		N/A
	– there shall be a barrier between the bare conductive parts and the enclosure; or		N/A
	– fault testing shall be carried out		N/A
9.2	Limited power sources		P
9.2.1	General	The user interface provides limited power source.	P
	A limited power source shall comply with one of the following:		P
	– the output is inherently limited in conformity with Table 22; or		N/A

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Clause	Requirement + Test		Verdict
	– an impedance limits the output in conformity with Table 22.		N/A
	– an overcurrent protective device is used and the output is limited in conformity with Table 23; or		N/A
	– a regulating network limits the output in conformity with Table 22, both under normal operating conditions and after any single fault; or	(see appended table)	P
	– a regulating network limits the output in conformity with Table 22 under normal operating conditions, and one of the above protective means is used in addition to limit the output under single fault conditions.		N/A
9.2.2	Limited power source tests		P
9.3	Short-circuit and overcurrent protection	An internal protective device is present.	P
9.3.1	General		P
9.3.2	Number and location of overcurrent protective devices	The installation instructions state the required types of overcurrent protection for the DC input and the AC output.	P
	If a protective device interrupts a neutral conductor	Considered in the installation.	N/A
	Where a protective device or related set of devices require manual replacement or resetting and interrupt more than one conductor	Considered in the installation.	N/A
	For pluggable equipment type B or fixed equipment, and for PV circuits	The type and characteristic of the internal overcurrent protection is sufficiently described in the installation instructions.	P
	For pluggable equipment type A	The EUT is not pluggable type A.	N/A
9.3.3	Short-circuit co-ordination (backup protection)	The type and characteristic of the internal overcurrent protection device is described in the installation instructions. Refer also to “List of safety critical components”.	P

10	Protection against sonic pressure hazards		N/A
10.1	General	The EUT was considered to be not hazardous.	N/A
10.2	Sonic pressure and sound level	Considered.	N/A
10.2.1	Hazardous noise levels		N/A
	If the measured sound pressure exceeds 80 dBA above a reference sound pressure of 20 µP, at a measurement distance of 1 m		N/A

11	Protection against liquid hazards		N/A
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Clause	Requirement + Test		Verdict
11.1	Liquid containment, pressure and leakage	No liquid containment system present as integral part of the EUT.	N/A
	There shall be no leakage of liquid onto live parts as a result of:		N/A
	a) Normal operation, including condensation;		N/A
	b) Servicing of the equipment; or		N/A
	c) Inadvertent loosening or detachment of hoses or other cooling system parts over time		N/A
11.2	Fluid pressure and leakage		N/A
11.2.1	Maximum pressure		N/A
11.2.2	Leakage from parts		N/A
11.2.3	Overpressure safety device		N/A
	The over pressure safety device shall:		N/A
	a) be connected as close as possible to the liquid-containing parts of the system		N/A
	b) be installed so as to provide easy access for inspection, maintenance and repair;		N/A
	c) only be adjustable via the use of a tool;		N/A
	d) have its discharge opening so located and directed that the released material is not directed towards any person;		N/A
	e) have its discharge opening so located and directed that operation of the device will not deposit liquid on parts that may cause a hazard;		N/A
	f) have adequate discharge capacity;		N/A
	g) have no shut-off valve between it and the parts that it is intended to protect.		N/A
11.3	Oil and grease	IP67 enclosure. The internal parts and circuits are not exposed to oil or grease.	N/A

12	Chemical hazards		N/A
12.1	General	No chemical hazards expected.	N/A

13	Physical requirements		P
13.1	Handles and manual controls		P
	Handles, knobs, grips, levers and the like shall be reliably fixed so that they will not work loose in normal use	All such means are properly fixed to the EUT. Loosening is not possible.	P
	If the shape of these parts is such that an axial pull is unlikely to be applied in normal use, the force is:		N/A
	– 15 N for the operating means of electrical components; and		N/A

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Clause	Requirement + Test		Verdict
	– 20 N in other cases.		N/A
	If the shape is such that an axial pull is likely to be applied, the force is:		N/A
	– 30 N for the operating means of electrical components; and		N/A
	– 50 N in other cases.	As worst case condition 50N was applied.	P
13.1.1	Adjustable controls	No adjustable controls present which could arise in hazard in case of incorrect setting.	N/A
13.2	Securing of parts	All parts are well secured. Screws engage at least two complete threads.	P
13.3	Provisions for external connections		P
13.3.1	General	Considered.	P
13.3.2	Connection to an a.c. mains supply		P
13.3.2.1	General	Wiring terminals are used for the AC connection.	P
13.3.2.2	Permanently connected equipment		N/A
	Permanently connected equipment shall be provided with		N/A
	Permanently connected equipment having a set of terminals or leads		N/A
	Conduit and cable entries and knock-outs for supply connections		N/A
13.3.2.3	Appliance inlets		N/A
13.3.2.4	Power supply cords	See CDF list	P
	– if rubber insulated		P
	– if PVC insulated		P
	– include, for equipment required to have protective earthing		P
	– have conductors with cross-sectional areas		N/A
13.3.2.5	Cord anchorages and strain relief		P
	Pull (N)		N/A
13.3.2.6	Protection against mechanical damage	No sharp points or cutting edges are present.	P
13.3.3	Wiring terminals for connection of external conductors	Adequate wiring terminals present. See critical component list for further information.	P
13.3.3.1	Wiring terminals		P
13.3.3.2	Screw terminals	No screw terminals used.	N/A
13.3.3.3	Wiring terminal sizes		P
13.3.3.4	Wiring terminal design		N/A
13.3.3.5	Grouping of wiring terminals		N/A

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Clause	Requirement + Test		Verdict
13.3.3.6	Stranded wire		N/A
13.3.4	Supply wiring space		P
13.3.5	Wire bending space for wires 10 mm ² and greater		P
13.3.6	Disconnection from supply sources	A statement is given in the installation instructions.	P
13.3.7	Connectors, plugs and sockets	The EUT provide means for special connection. Misconnection is not likely to occur.	N/A
13.3.8	Direct plug-in equipment	The EUT is not a direct plug-in equipment.	N/A
	The additional torque which has to be applied to the socket-outlet shall not exceed 0,25 N·m.		N/A
13.4	Internal wiring and connections		P
13.4.1	General		P
13.4.2	Routing	The wires are routed away from sharp edges, moving parts, screw threads and the like. No damaging is expected in normal use.	P
	If a metal clamp is used for conductors having thermoplastic insulation less than 0,8 mm thick		N/A
13.4.3	Color coding	The colors green or yellow or both are not used for wires other than protective bonding conductors.	P
13.4.4	Splices and connections		P
	A soldered joint, other than a component on a PWB	All connections are proper arranged and secured.	P
	When stranded internal wiring is connected to a wire-binding screw	All connections are proper arranged and secured.	P
	When screw terminal connections are used	All connections are proper arranged and secured.	P
	The end of a stranded conductor	All connections are proper arranged and secured.	P
13.4.5	Interconnections between parts of the PCE		P
	Cable assemblies and flexible cords provided for interconnection between sections of equipment or between units of a system	No parts inside which can be removed without help of a tool. The interconnecting cables are in such way provided that physical damage can be excluded.	P
13.5	Openings in enclosures	The EUT is specified to be used in only one orientation.	P
13.5.1	Top and side openings		P
	Dimension	IP67 enclosure. It is unlikely that objects will enter the enclosure.	P

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Clause	Requirement + Test		Verdict
13.6	Polymeric materials	The enclosure consists of metal	N/A
13.6.1	General		N/A
13.6.1.1	Thermal index or capability		N/A
13.6.2	Polymers serving as enclosures or barriers preventing access to hazards		N/A
13.6.2.1	Stress relief test		N/A
13.6.3	Polymers serving as solid insulation		N/A
13.6.3.1	Resistance to arcing		N/A
13.6.4	UV resistance		N/A
13.7	Mechanical resistance to deflection, impact, or drop		P
13.7.1	General	The EUT provide a metal enclosure with adequate rigidity.	P
13.7.2	250 N deflection test for metal enclosures		P
13.7.3	7 J impact test for polymeric enclosures	No polymeric enclosure provided.	N/A
13.7.4	Drop test	The EUT is fixed in the final installation.	N/A
13.8	Thickness requirements for metal enclosures		N/A
13.8.1	General	The enclosure complies with clause 13.7.	N/A
13.8.2	Cast metal		N/A
13.8.3	Sheet metal		N/A

14	Components		P
14.1	General	Refer to "List of safety critical components".	P
14.2	Motor overtemperature protection	No motors are provided.	N/A
14.3	Overtemperature protection devices	No overtemperature protection device is provided in the sense of this clause.	N/A
	The number of operations is as follows:		N/A
	a) Self-resetting overtemperature protection devices are caused to operate 200 times.		N/A
	b) Non-self-resetting overtemperature protection devices, except thermal fuses, are reset after each operation and thus caused to operate 10 times.		N/A
	c) Non-resetting overtemperature protective devices are caused to operate once.		N/A
14.4	Fuse holders	The whole EUT is not intended to be opened by an operator.	N/A
14.5	Mains voltage selecting devices	No mains voltage selecting device present.	N/A

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Clause	Requirement + Test		Verdict
14.6	Printed circuit boards	PCBs meet the required flammable requirements. Refer also to "List of safety critical components".	P
14.7	Circuits or components used as transient overvoltage limiting devices	OVCs were specified for the conditions in which the EUT is located. No components are present to reduce the transients and the level of overvoltage categories.	N/A
14.8	Batteries	No battery provided.	N/A
14.8.1	Battery enclosure ventilation		N/A
14.8.1.1	Ventilation requirements		N/A
14.8.1.2	Ventilation testing		N/A
	During and at the conclusion of the test, the maximum hydrogen gas concentration shall not be more than 2 % by volume at periods of 2, 4, 6, and 7 h during the test.		N/A
14.8.1.3	Ventilation instructions		N/A
14.8.2	Battery mounting		N/A
	a) Metallic racks and trays		N/A
	b) The materials used for nonmetallic racks and trays or for a polymeric enclosure or compartment housing a non-sealed or valve-regulated battery		N/A
	The battery mounting means		N/A
	A metallic battery rack or tray intended to support one or more storage batteries		N/A
14.8.3	Electrolyte spillage		N/A
14.8.4	Battery connections		N/A
14.8.5	Battery maintenance instructions		N/A
14.8.6	Battery accessibility and maintainability		N/A
15	Software and firmware performing safety functions		P

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Clause	Requirement + Test	Verdict
Annex A	Measurement of clearances and creepage distances (normative)	P

Annex B	Programmable equipment (normative)		P
B.1	Software or firmware that performs safety critical functions (normative)	The safety relevant software parts were tested via hardware fault tests. (see appended table)	P
B.2	Evaluation of controls employing software		P
B.2.1	Risk analysis		P

Annex C	Symbols to be used in equipment markings (normative)	P
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Annex D	Test probes for determining access (informative)	P
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Annex E	RCDs (informative)		N/A
E.1	Selection of RCD type in AC circuits		N/A

Annex F	Altitude correction for clearances (informative)	N/A
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Annex G	Clearance and creepage distance determination for frequencies greater than 30 kHz (informative)		P
G.1	Clearances	The values affect not the calculated distances of clause 7.3.7.	P
G.2	Creepage distances	The values affect not the calculated distances of clause 7.3.7.	P

Annex H	Measuring instrument for touch current measurements (see 7.5.4) (informative)		P
H.1	Measuring instrument	H.1 Measuring instrument was used for measurement.	P
H.2	Alternative measuring instrument		N/A

Annex I	Examples of protection, insulation, and overvoltage category requirements for PCE (informative)		P
I.1	Numerical example	Considered.	P
I.2	Illustrative examples	Considered.	P

Annex J	Ultraviolet light conditioning test (see 13.6.4) (normative)		N/A
J.1	General	Test was not used for evaluation throughout this report.	N/A

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Clause	Requirement + Test		Verdict
J.2	Mounting of test samples		N/A
J.3	Carbon-arc light-exposure apparatus		N/A
J.4	Xenon-arc light-exposure apparatus		N/A

TEST RESULTS

4.2.2.6		TABLE: mains supply electrical data in normal condition				P
4.7		TABLE: Electrical Rating Tests (in normal conditions)				
Input voltage [V d.c.]	Input current [A d.c.]	Input power [W d.c.]	Output voltage [V a.c.]	Output current [A a.c.]	Output power [W a.c.]	
ARCTECH-M1000W						
33,23*2	17,82*2	981,27	207,71	4,49	921,22	
33,21*2	19,73*2	1086,23	230,53	4,30	985,02	
33,40*2	19,23*2	1071,18	253,28	3,86	971,61	
40,15*2	14,18*2	949,92	207,64	4,48	926,49	
40,15*2	15,74*2	1054,21	230,48	4,23	968,47	
40,13*2	17,31*2	1158,18	253,33	4,22	1062,58	
48,15*2	12,48*2	1000,55	207,76	4,49	926,87	
48,14*2	12,91*2	1036,87	230,45	4,22	966,61	
48,14*2	14,23*2	1143,61	253,30	4,22	1062,32	
ARCTECH-M900W						
33,18*2	17,71*2	980,17	207,68	4,32	890,21	
33,16*2	17,78*2	985,31	230,51	3,91	895,51	
33,19*2	17,57*2	975,06	253,22	3,55	892,72	
40,18*2	14,24*2	957,79	207,70	4,28	882,48	
40,18*2	14,27*2	961,01	230,42	3,88	889,04	
40,08*2	14,20*2	953,85	253,27	3,52	885,85	
48,14*2	11,89*2	954,99	207,71	4,30	887,05	
48,14*2	11,96*2	961,59	230,41	3,92	896,16	
48,17*2	11,75*2	948,50	253,21	3,52	886,91	
ARCTECH-M800W						
33,19*2	15,66*2	868,18	207,62	3,85	791,84	
33,18*2	15,62*2	867,78	230,34	3,49	797,05	
33,20*2	15,51*2	862,10	253,12	3,16	794,03	
40,19*2	12,62*2	849,69	207,62	3,82	786,64	
40,19*2	12,65*2	852,08	230,40	3,46	792,09	
40,09*2	12,75*2	856,90	253,16	3,18	798,73	
48,15*2	10,47*2	841,36	207,62	3,81	785,62	
48,15*2	10,76*2	864,81	230,41	3,54	809,22	
48,16*2	10,45*2	843,40	253,11	3,15	791,63	
ARCTECH-M700W						
33,12*2	13,47*2	747,78	207,00	3,35	688,37	
33,19*2	13,45*2	748,03	230,22	3,04	693,17	

33,21*2	13,36*2	743,89	253,03	2,75	690,15
40,20*2	10,94*2	736,40	207,56	3,33	685,93
40,20*2	10,94*2	737,84	230,26	3,02	689,51
40,10*2	10,90*2	733,16	253,09	2,74	686,51
48,15*2	9,10*2	731,18	207,52	3,33	685,46
48,15*2	9,26*2	744,80	230,25	3,06	698,92
48,16*2	9,20*2	741,71	253,05	2,78	697,98
ARCTECH-M600W					
33,21*2	11,63*2	645,40	207,43	2,92	598,68
33,20*2	11,24*2	624,74	230,14	2,56	582,95
33,22*2	11,33*2	631,05	252,96	2,35	588,65
40,21*2	9,33*2	627,68	207,43	2,86	587,23
40,20*2	9,46*2	636,09	230,23	2,62	596,42
40,10*2	9,28*2	623,15	253,02	2,34	585,24
48,18*2	7,89*2	634,00	207,46	2,90	595,60
48,16*2	7,91*2	634,11	230,22	2,62	597,14
48,17*2	7,87*2	633,59	252,99	2,39	597,06
Supplementary information:					

4.3	TABLE: Thermal testing				P
	Test voltage (Vdc)	48	48	45	—
	Test current (Idc)	11,2	11,1to 0,7	9,7	—
	Test voltage (Vac)	230	230	207	—
	Test current (Iac)	4,4	4,4 to 0,3A	4,59	—
	t _{amb1} (°C)	50	50	65	—
	t _{amb2} (°C)	51,7	66,3	51,5	—
maximum temperature T of part/at:		T (°C)			T _{max} (°C)
1. EC202		83,6	85,9	83,5	105
2. CX805		89,4	89,2	90,3	110
3. CY804		85,9	86,7	86,6	110
4. L801		89,4	88,9	90,3	--
5. L802		91,6	91,2	93,1	--
6. PCB near U305		88,0	88,2	89,0	135
7. PCB near U303		90,9	90,8	92,0	135
8. PCB near MS800		113,1	113,6	123,2	135
9. PCB near MS801		108,1	107,8	117,2	135
10. PCB near S101		119,1	114,9	117,6	135
11. PCB near S200		109,8	102,4	111,2	135
12. T2 core		109,6	104,8	107,9	--
13. T2 coil		122,9	117,5	121,9	130
14. T3 core		108,7	104,9	108,9	--
15. T3 coil		120,6	115,5	121,3	130
16. K800		85,1	87,0	85,5	105
17. PCB near T2		107,5	104,9	107,2	135
18. PCB near Q800		117,6	115,5	125,6	135
19. AC cable		57,3	69,7	57,3	85
20. AC connectors		61,0	72,0	60,9	85
21. DC connectors		60,4	72,1	59,9	85
22. Mounting port		76,9	81,4	77,6	90
23. Top side of enclosure		87,0	87,7	87,3	100
24. Bottom side of enclosure		84,6	87,3	84,8	100
25. Right side of enclosure		78,7	83,3	79,1	100
26. Left side of enclosure		77,0	81,7	77,0	100
27. rear side of enclosure		78,7	83,0	78,9	100
28. Top side of enclosure		76,2	81,5	76,0	100
29. ambient		51,7	66,3	51,5	--

Supplementary information:

The above temperatures are recorded at t_{amb1}. The values measured are subtracted with t_{amb1} and t_{amb2} (°C) added. Therefore, above measured temperatures are the absolute temperatures in °C at maximum ambient.

4.3	TABLE: Thermal testing				P
	Test voltage (Vdc)	45	43	42	—
	Test current (Idc)	10,3	10,2	14,2	—
	Test voltage (Vac)	253	207	253	—
	Test current (Iac)	3,5	3,9	4,4	—
	t _{amb1} (°C)	50	50	50	—
	t _{amb2} (°C)	51,4	51,8	51,4	—
maximum temperature T of part/at:		T (°C)			T _{max} (°C)
1. EC202		83,5	83,4	83,9	105
2. CX805		87,7	90,3	88,9	110
3. CY804		85,3	86,6	85,4	110
4. L801		88,6	89,9	88,4	--
5. L802		90,0	92,8	90,9	--
6. PCB near U305		86,7	89,1	87,6	135
7. PCB near U303		89,0	92,3	90,4	135
8. PCB near MS800		104,4	124,0	114,8	135
9. PCB near MS801		100,2	117,5	108,5	135
10. PCB near S101		113,1	118,4	123,3	135
11. PCB near S200		102,5	110,6	110,6	135
12. T2 core		105,6	109,1	110,8	--
13. T2 coil		117,9	122,5	125,0	130
14. T3 core		105,8	109,5	109,9	--
15. T3 coil		115,0	123,9	125,1	130
16. K800		84,6	85,5	85,4	105
17. PCB near T2		105,3	108,6	111,5	135
18. PCB near Q800		108,2	125,7	116,4	135
19. AC cable		57,3	57,6	57,1	85
20. AC connectors		61,0	61,1	61,1	85
21. DC connectors		60,5	60,4	60,6	85
22. Mounting port		76,7	77,8	77,1	90
23. Top side of enclosure		86,2	87,5	87,5	100
24. Bottom side of enclosure		84,3	84,9	85,9	100
25. Right side of enclosure		79,4	80,6	79,7	100
26. Left side of enclosure		76,3	77,4	76,5	100
27. rear side of enclosure		78,6	79,3	79,0	100
28. Top side of enclosure		76,1	76,2	76,3	100
29. ambient		51,4	51,8	51,4	--

Supplementary information: The above temperatures are recorded at t_{amb1}. The values measured are subtracted with t_{amb1} and t_{amb2} (°C) added. Therefore, above measured temperatures are the absolute temperatures in °C at maximum ambient.

4.4.2, 4.4.4, 9.3		TABLE: Fault Condition Tests						P
		Ambient temperature (°C)				25		—
		Power source for EUT: Manufacturer, model/type, output rating				Reference equipment list		—
Component No.	Fault	Test condition		Test time	fuse no. (AC)	Fault condition		Result
		AC [V/A]	DC [V/A]			AC [V/A]	DC [V/A]	
EC2	Short	230V/4,35A	PVA:48V/1 1,6A PVB:48V/1 1,2A	10min	F800,F8 01	230V/0A	PVA:0,01V/ 17,9A PVB:0,01V/ 17,8A	Unit shut down no damage, the LED display red, no damage, no hazard, no fire
D4	Short	230V/4,43A	PVA:48V/1 1,7A PVB:48V/1 1,2A	10min	F800,F8 01	230V/0A	PVA:0,01V/ 17,6A PVB:0,01V/ 17,8A	Unit shut down no damage, the LED display red, no damage, no hazard, no fire
MS100,S to D	Short	230V/4,36A	PVA:48V/1 1,7A PVB:48,01 V/11,3A	10min	F800,F8 01	230V/0A	PVA:0,01V/ 17,6A PVB:0,01V/ 17,8A	Unit shut down no damage, the LED display red, no damage, no hazard, no fire
MS100 S to D	open	230V/4,36A	PVA:48,01 V/11,6A PVB:48V/1 1,3A	10min	F800,F8 01	230V/0A	PVA:48V/7, 8A PVB:48V/7, 4A	Unit shut down no damage, the LED display red, no damage, no hazard, no fire
K800,PIN2 to PIN3 short,	Short before start up	230V/4,35A	PVA:48V/1 1,7A PVB:48V/1 1,2A	10min	F800,F8 01	230V/0A	PVA:48V/0, 01A PVB:48V/0, 01A	Unit shut down no damage, the LED display red, no damage, no hazard, no fire
K800,PIN4 to PIN5 short	Short before start up	230V/4,36A	PVA:47,8V/ /11,6A PVB:48,01 V/11,3A	10min	F800,F8 01	230V/0A	PVA:48V/0, 01A PVB:48V/0, 01A	Unit shut down no damage, the LED display red, no damage, no hazard, no fire
CY806,PIN1 to PIN2	Short	230V/4,42A	PVA:48V/1 1,6A PVB:48V/1 1,3A	10min	F800,F8 01	230V/0A	PVA:48V/0, 01A PVB:48V/0, 01A	Unit shut down no damage, the LED display red, no damage, no hazard, no fire
CX807,PIN1 to PIN2 short	Short	230V/4,42A	PVA:48,01 V/11,6A PVB:48V/1 1,2A	10min	F800,F8 01	230V/0A	PVA:48V/0, 01A PVB:48V/0, 01A	Unit shut down no damage, the LED display red, no damage, no hazard, no fire
R433,PIN1 to PIN2	Short	230V/4,37A	PVA:48V/1 1,6A PVB:48,01 V/11,2A	10min	F800,F8 01	230V/0A	PVA:48V/0, 01A PVB:48V/0, 01A	Unit shut down no damage, the LED display red, no damage, no hazard, no fire
MR1,PIN1 to PIN2	Short	230V/4,35A	PVA:48V/1 1,6A PVB:48V/1 1,2A	10min	F800,F8 01	230V/0A	PVA:48V/0, 01A PVB:48V/0, 01A	Unit shut down no damage, the LED display red, no damage, no hazard, no fire
R1,PIN1 to PIN2 t	Short	230V/4,35A	PVA:48V/1 1,6A PVB:48V/1 1,2A	10min	F800,F8 01	230V/0A	PVA:0,01V/ 17,9A PVB:0,01V/ 17,8A	Unit shut down no damage, the LED display red, no damage, no hazard, no fire
T2,PIN1 to PIN2	Short	230V/4,43A	PVA:48V/1 1,7A PVB:48V/1 1,2A	10min	F800,F8 01	230V/0A	PVA:48V/0, 01A PVB:48V/0, 01A	Unit shut down no damage, the LED display red, no damage, no hazard, no fire
T5,PIN9 to	Short	230V/4,36A	PVA:48V/1	10min	F800,F8	230V/0A	PVA:48V/0,	Unit shut down no damage, the

PIN10			1,7A PVB:48,01 V/11,3A		01		01A PVB:48V/0, 01A	LED display red, no damage, no hazard, no fire
L to N	Short	230V/4,36A	PVA:48,01 V/11,6A PVB:48V/1 1,3A	10min	F800,F8 01	0V/63A	PVA:48V/0, 01A PVB:48V/0, 01A	Unit shut down no damage, the LED display red, no damage, no hazard, no fire
L – N	Overlo ad	230V/4,35A	PVA:48V/1 1,7A PVB:48V/1 1,2A	90min	F800,F8 01	230V/4,8A	PVA:48V/11 ,7A PVB:48V/11 ,2A	Unit normal operation no damage, the LED display red, no damage, no hazard, no fire
Temperature sensors	Out of control	230V/4,36A	PVA:47,8V /11,6A PVB:48,01 V/11,3A	10min	F800,F8 01	230V/0A	PVA:0,01V/ 17,6A PVB:0,01V/ 17,8A	Unit shut down no damage, the LED display red, no damage, no hazard, no fire
Input + and -	Mismat ch (only single- phase units)	230V/4,42A	PVA:48V/1 1,6A PVB:48V/1 1,3A	10min	F800,F8 01	230V/0A	PVA:0,3V/1 7,4A PVB:0,2V/1 7,6A	Unit shut down no damage, the LED display red, no damage, no hazard, no fire
L and N	Mismat ch (only single- phase units)	230V/4,42A	PVA:48,01 V/11,6A PVB:48V/1 1,2A	10min	F800,F8 01	230V/4,8A	PVA:48V/11 ,6A PVB:48V/11 ,2A	Unit normal operation no damage, the LED display red, no damage, no hazard, no fire
C709	Short	230V/4,35A	PVA:48V/1 1,6A PVB:48V/1 1,2A	10min	F800,F8 01	230V/0A	PVA:48V/0, 01A PVB:48V/0, 01A	Unit shut down no damage, the LED display red, no damage, no hazard, no fire
C402	Short	230V/4,43A	PVA:48V/1 1,7A PVB:48V/1 1,2A	10min	F800,F8 01	230V/0A	PVA:48V/0, 01A PVB:48V/0, 01A	Unit shut down no damage, the LED display red, no damage, no hazard, no fire

Supplementary information:

7.3.2	TABLE: Decisive voltage class (DVC) TABLE: DVC and Working Voltage Measurement Tests			P
Location	rms voltage(V)	peak voltage (V)	Classification	
Transformer T5				
Pin1 to Pin2	25,7	118,4	DVC-C	
Pin3 to Pin4	13,7	73,6	DVC-B	
Pin9 to Pin10	12,8	61,6	DVC-B	
Transformer T2				
Pin1 to Pin2	44,7	136	DVC-C	
Pin3 to Pin4	49,7	102	DVC-C	
Optical coupler U300				
Pin1 to Pin2	0,6	4,4	DVC-A	
Optical coupler U303				
Pin1 to Pin2	0,1	6,2	DVC-A	
Pin3 to Pin4	4,7	19.2	DVC-A	
Optical coupler U305				
Pin1 to Pin2	0,1	27,2	DVC-A	
Pin3 to Pin4	0,1	5,4	DVC-A	
Supplementary information:				

7.3.5.3.1, 7.3.6.3.6, 7.5.4	Limitation of current through protective impedance TABLE: Touch Current Test			p
Condition		Measured voltage (U2)	Calculated current (mA)	Limit (mA)
Metal enclosure → Earth		0,18	0,37	3,5
Supplementary information: Humidity preconditioning according to 4.5 was performed before this test The touch current shall be measured if required by 7.3.6.3.7 and shall not be greater than 3.5 mA a.c. or 10 mA d.c. or special measures of protection as given in 7.3.6.3.7 are required. For type tests on PCE for which WET LOCATIONS requirements apply according to 6.1, the humidity pre-conditioning of 4.5 shall be performed immediately prior to the Touch current test. Compliance is checked by the following type test. The PCE shall be set up without any connection to the earth and shall be operated at rated voltage. Under these conditions, the touch current shall be measured between the means of connection for the external PROTECTIVE EARTHING CONDUCTOR and the external PROTECTIVE EARTHING CONDUCTOR itself with the probe of Figure 4 of IEC 60990				

7.3.5.3.2, 7.3.9	TABLE: Discharge Test			P
Measurement location		Initial voltage (Vpk)	Time to decay to 60V or limit of 7.3.5.4 (s)	Inverter status
L to N:		380	0,22	Feeding power to grid
L to N:		336	0,24	Stand by
PV+ to PV-		56	0,01	Feeding power to grid
PV+ to PV-		56	0,23	Stand by
Supplementary information:				
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				

7.3.6.3.3	TABLE: Ground Continue Test				P
Location		Test current (A)	resistance measured (Ω)	Voltage Drop (V)	Time (min)
Metal enclosure		32	0,003	0,096	2
Supplementary information:					

7.3.7	TABLE: Clearance And Creepage Distance Measurements					P
clearance cl and creepage distance dcr at/of:	U r.m.s. (V)	U peak (V)	required cl (mm)	cl (mm)	required cr (mm)	dcr (mm)
Mains to PE OVCIll 230 V a.c.(BI)	230	--	3,0	4,1	3,0	>3,0
PV to PE 65 V d.c. .(BI)	--	65	1,5	1,8	1,5	>1,8
Supplementary information: * Verified by fault condition tests according to clause 7.3.7.7 ** Non PCB values are based on pollution degree II and material group 3b.						

7.5.1	TABLE: Impulse Voltage Tests		P
Test voltage applied between:		Test potential applied (V)	Breakdown / flashover (Yes/No)
AC to PE (basic insulation)		4000	NO
DC to AC (basic insulation)		4000	NO
DC to SELV (basic insulation)		800	NO
AC to SELV (reinforced)		6000	NO
Supplementary information:			

7.5.2	TABLE: Dielectric Strength Tests		P
Test voltage applied between:		Test potential applied (V.a.c.)	Breakdown / flashover (Yes/No)
AC to PE (basic insulation)		1500	NO
DC to PE (basic insulation)		80	NO
AC to DC (reinforced)		3000	NO
Supplementary information:			

14	TABLE: list of critical components				P
object/part No,	manufacturer/ trademark	type/model	technical data	standard	mark(s) of conformity ¹⁾
DC connector	QC SOLAR	QC4.3	30A -40°C ~+85°C IEC1500V/UL1000V	IEC62852/ UL6703	TUV: B 17 09 77362 004 UL: E340004
(Alternate)	NIU-Power	A4-P	V-0, - 40°C~90°C,150 0V	IEC62852/ UL6703	TÜV B 113121 0002/ETL 5022566
(Alternate)	STAUBLI ELECTRICAL CONNECTOR S AG	PV-ADBP4-S2/6, PV-ADSP4-S2/6	TUV 1250V/UL1500V -40°C +85°C 22.5A- 45A (2.5 mm ² -10mm ² cable)	IEC62852/ UL6703	R60127181/ UL E343181
(Alternate)	Wuxi Betteri	BC03A,B	30A 1000V -40°C~+85°C	EN 62852/UL6 703	TUV B 085127 0012/ CSA 2685077
DC cable	QC SOLAR	4.0 mm 2 (12AWG) CABLE	VW-1- 40°C~90°C,150 0V	IEC62930/ UL4703	B 077362 0010/UL E335336
(Alternate)	YONGHAO	4.0 mm 2 (12AWG) CABLE	VW-1- 40°C~90°C,150 0V	IEC62930/ UL4703	TÜV 50082664 019/UL E483912
(Alternate)	XINHONGYE	4.0 mm 2 (12AWG) CABLE	VW-1- 40°C~90°C,150 0V	IEC62930/ UL4703	TÜV Rheinland/U L E332548
(Alternate)	Suzhou Baohing	4.0 mm 2 (12AWG) CABLE	VW-1- 40°C~90°C,150 0V	EN 50618/UL 44	R 50310426/E 329163
AC connector	Suzhou Exceedconn	MIBBF15	250V,12A 4 kV - 40°C~+85°C	EN61984	B 077046 0073
(Alternate)	Wuxi Betteri	BC05A	300V,12A 4 kV - 40°C~+85°C	PPP 59015A:20 13/ ANSI/UL 6703-2017	TUV B 085127 0010/ CSA 80159635
AC cable	Suzhou Baohing	TC-ER 3C*16AWG	600V -40°C ~ +90°C	UL 1277	E335648
(Alternate)	3Q WIRE & CABLE	TC-ER AWG16 3C	600V -40°C ~ +90°C	UL 1277	E361095
CABLE GLAND	BANGNAI	BN-PG7L-6.5	Waterproof:IP68 CABLE RANGE 3-6.5	EN 62444/ UL 514B	CNB316031 0-00145- E/E492547
(Alternate)	RONGWEI	RNCU-PG7X-L	Waterproof:IP68 CABLE RANGE 4-6.5	UL 514B	E347211
RELAY K800	Tyco Electronics	RTE44012	8A 250VAC -40°C~80°C	EN 61810- 1/UL 61810-1	VDE 40007571/E 214025

(Alternate)	Hongfa	HF115F/012-2HS4	8A 250VAC -40°C~80°C	EN 61810-1/UL 61810-1	VDE 116934/E134517
(Alternate)	SONG CHUAN	507N-2AH-FV/12VDC	8A 250VAC -40°C~80°C	EN 61810-1/UL 61810-1	VDE 116934 / E134517
FUSE F800/F801	SET	SPT478T10A300 V	10A 300VAC time delay - 55°C~125°C	EN 60127/UL 248-14	40049409/E 345932
(Alternate)	LANSON	SMT 10A 300V	10A 300VAC time delay - 55°C~125°C	IEC60127	J50398486
Thermal Fuse F802	SET	Y7	5A 250VAC Tf.150°C	EN 60691/UL 60691	40017057/E 214712
(Alternate)	LANSON	TT150 150° 5A	5A 250VAC Tf.150°C	TUV EN60691	R50525109
X2-CAP CX802/CX803/CX807	Xiamen Faratronic	C42Q2684K	684K 305V 10% -40°C~110°C	EN 60384/UL 60384	VDE 40000358/E186600
(Alternate)	HJC	MKP-684K0305AB115 1US	684K 305V 10% -40°C~110°C	EN 60384/UL 60384	SE-ENEC-2002895R2/E149075
(Alternate)	SONGTIAN	X2Q2684KQ1351 80120060ES0	684K 305V 10% -40°C~110°C	EN 60384/UL 60384	40034679/E 208107
(Alternate)	JURCC	104K310VAC	104K 310V 10% -40°C~110°C	IEC 6084-14:2023/UL 60384	40034920/E 343072
X2-CAP CX804/CX805/CX806	Xiamen Faratronic	C4BQ2394K	394K 305V 10% -40°C~110°C	EN 60384/UL 60384	SE/0366-6B/E186600
(Alternate)	HJC	MKP-394K0305AB115 1US	394K 305V 10% -40°C~110°C	EN 60384/UL 60384	SE-ENEC-2002895R2/E149075
(Alternate)	SONGTIAN	X2-MKP 394K	394K 305V 10% -40°C~110°C	EN 60384/UL 60384	E208107
Y2-CAP CY801/CY802/CX801	Xiamen Faratronic	C43Q1102K	102K 300V 10% -40°C~110°C	EN 60384/UL 60384	SE/0366-2D/E186600
(Alternate)	HJC	Y2X1102K0300A B1102	102K 300V 10% -40°C~110°C	EN 60384/UL 60384	SE-ENEC-2001313R2/E149075
(Alternate)	SONGTIAN	Y2Q1102KN1A51 30090040EV0	102K 300V 10% -40°C~110°C	EN60384/UL 60384	40056386/E 208107
Y2-CAP Y803/CY804	Xiamen Faratronic	C43Q1472K	472K 300V 10% -40°C~110°C	EN 60384/UL 60384	SE/0366-2D/E186600
(Alternate)	HJC	Y2X1472K0300A B1102	472K 300V 10% -40°C~110°C	EN 60384/UL 60384	SE-ENEC-2001313R2/E149075
(Alternate)	SONGTIAN	Y2Q1472KN1A51 30110050EV0	472K 300V 10% -40°C~110°C	EN60384/UL 60384	40056386/E 208107
Y1 Cap CY807/CY808/CY3	TDK	CD45-E2GA222M	X1: AC.440V Y1: AC.400V -25°C ~ +125°C	EN 60384/UL60384	ENEC-01048/E378 61
(Alternate)	SONGTIAN	Q11E1D222MN0 B0N0N0	X1: AC.500V Y1: AC.500V	EN60384/UL 60384	40025754/E 208107

			-25°C ~ +125°C		
mylar	SICHUAN DONGFANG INSULATING MATERIAL CO LTD	DFR3738A	V-0	IEC 60695 IEC 60112	E199019
(Alternate)	CHENGDU KANGLONGXI N PLASTICS CO LTD	FRPC-1860B	V-0	IEC 60695 IEC 60112	E315185
Opto-coupler G300/G302	Everlight Electronics	ELM3053 (TA)	photo triac, SOP4, 600V Vdrm, non-zero cross - 40~+110°C	EN 60747 EN 62368/UL1 577	VDE 40028116/E 214129
(Alternate)	LITE-ON	LTV-3053	photo triac, SOP4, 600V Vdrm, non-zero cross - 40~+110°C	UL1577	E113898
Opto-coupler G303	Everlight Electronics	ELD207(TA)	photo transistor, Bvceo 80V, CTR 100~200% -55 to 110°C	EN 60747 EN 62368/UL1 577	VDE 40028116/E 214129
(Alternate)	LITE-ON	LTV-207	photo transistor, Bvceo 80V, CTR 100~200% -55 to 110°C	UL1577	E113898
Opto-coupler G305	ON SEMI	FOD817ASD	photo transistor, Bvceo 80V, CTR 80~160% -55 to 110°C	EN 60747	VDE 40026857
(Alternate)	Everlight Electronics	EL817S1(A)	photo transistor, Bvceo 80V, CTR 80~160% -55 to 110°C	EN 60747 EN 62368/UL1 577	VDE 132249/E21 4129
(Alternate)	LITE-ON	LTV-817S-TA1	photo transistor, Bvceo 80V, CTR 80~160% -55 to 110°C	UL1577	E113898
Opto-coupler G306	LITE-ON	EL357NC	photo transistor, Bvceo 80V, CTR 200~400% -55 to 110°C	EN 60747 EN 62368/UL1 577	VDE 132249/E21 4129
GDT GS1	Bencent	B8G600M	600V,10KA,	EN 61643/UL1 449	B 104564 0001/UL E337906
(Alternate)	SET	SE601M-L	D.C.Spark-over Voltage (100V/s) 600V 10kA((± 5 times)	IEC61643/ UL 1449	64.105.23.3 1022.01/E5 13446
(Alternate)	BESTBRIGHT	2RM600L-8	600V,10KA,	UL1449	E465643
MAIN DSP U1	TI	TMS320F280025 PNS	100Mhz 3.1V - 3.5V 128KB C2000 32MCU	UL 60730	UL-US- 2346776-0
MOV VR801/VR802	SET	SFV14D271K	Varistor Voltage 270V 85°C, 6kV/3kA	EN 61051/UL1 449	J 50234703/E 322662
(Alternate)	FTR	FTR14D271KZ-C3.5Z4	14D,270V, 125°C,	UL1449/VD E	E507891/40 051843

(Alternate)	SONGTIAN	STE14D271K3EA 5FQB0R0	14D,270V, -40~105°C,	IEC61051 IEC60950 /UL1449	40023049/E 330837
MOV VR805	SET	SFV14D331KT	Varistor Voltage 330V 125°C, I _{max} 6kA	EN 61051/UL1 449	J 50234703/E 322662
(Alternate)	FTR	FTR14D331KJW- C3.5Z3	14D,330V, 125°C,	UL1449/VD E	E507891/40 051843
(Alternate)	SONGTIAN	STE14D331K3EA 5FQB0R0	14D,330V, -40~105°C,	IEC61051 IEC60950 /UL1449	40023049/E 330837
MOV VR803/VR804	SET	SFV14D621K	Varistor Voltage 620V 85°C, I _{max} 6kA	EN 61051/UL1 449	J 50234703/E 322662
(Alternate)	FTR	FTR14D621KZ	14D,620V 125°C,	UL1449/VD E	E507891/40 051843
(Alternate)	SONGTIAN	STE14D621K1EN 0FQB0R0	14D,620V, -40~105°C,	IEC61051 IEC60950 /UL1449	40023049/E 330837
PCB	DAYANG	IDY-M	V-0, 135°C,	UL 796	E360224
(Alternate)	FANLISHENG	YFL-D、FLS-D (ASP 1)	V-0, Max Area Diam mm50.8mm Max oper Temp130°C	UL 796	E471141
(Alternate)	CHENG YI	CY-M	V-0, 135°C,	UL 796	E225328
POTTING COMPOUND	Beginor	BESIL 8230	V-0, 105°C, min.thickness 3.0-3.3mm	UL94	E340199
(Alternate)	Encapsil	1400Gel	V-0, 150°C, min.thickness 3mm	UL94	E502051
Antenna plastic shell	Sabic	945AU	V-0, Weather resistant and UV resistant	UL94	UL E121562
Aluminum die- casting bottom shell	Ningbo Zhongpu	5052 3mm thick	--	--	Test with unit
Aluminum cover plate	CiXi Tianle	ADC12 2mm thick	--	--	Test with unit
Main Transformer T1/T2/T3/T4	JiangSu SunLord FuJun New Energy Co.,Ltd.	PQ3415E 3.0uH	--	--	Test with unit
-Bobbin PQ34	SUMITOMO	PM9820 UL94V-0	150°C	D495	E41429
- CORE	SUMITOMO	PM9630 UL94V-0	150°C	D495	E41429
-Core PQ3415E	KaiYuan	Ferrite Core	KP95	--	--
-TAPE	LianFeng	CT-280/PF-301	NH9	--	--
-Solder	BDK	Sn	BP96	--	--
-Triple insulated wire	YuSheng	TIW-B	130°C	UL 60950-1	E332529
-CLIP	KaiZhongHeD ong		130°C	--	E357240

-Tape	YaHua	CT-280	130°C	IEC 60112	E165111
-COPPER WIRE	ELEKTRISOL A HANGZHOU CO LTD	PF-301	180°C	--	E258243
-Copper foil	SanPin	Cu	--	--	--
-Solder	Alan&har VV dl I ldl	Sn99.3% Cu0.7	--	--	--
-EPOXY	EATTO	E-500	130°C	--	E218090
-CLIP	JINJI	SK7	--	--	--
-EPOXY	ZHIHENG	E-500	--	--	--
(Alternate T1/T2/T3/T4)	GLORIA TECHNOLOG Y LLC	HTS-PQ34B	--	--	Test with unit
-CORE	ZHEJIANG HAINING LIANFENG MAGNET INDUSTRY CO., LTD.	PQ3415	NH9 CORE LOSS(Mw/cm ³) PL1≤580 @100KHz 200mT 25±2°C PL2≤500 @100KHz 200mT 100±2°C	--	--
-BOBBIN	CHANG CHUN PLASTICS CO LTD	PQ-3401 T200HF	94V-0 150°C	D495	E59481
-TRIPLE INSULATED WIRE	E&B TECHNOLOG Y CO.,LTD	E&B-XXXB	130°C	UL 60950-1	E315265
-COPPER FOIL	DONGGUAN SHIN YAHUA ELECTRONIC MATERIAL CO LTD	0.25t*4mm	--	--	--
-TAPE	DONGGUAN SHIN YAHUA ELECTRONIC MATERIAL CO LTD	TYPE ·CT*(c)(g)	130°C	IEC 60112	E324093
		TYPE:PF*(d)(g)	180°C		
-EPOXY	DONGGUAN EATTO ELECTRONIC MATERIAL CO LTD	3300/3300ZH	--	D495	E218090
Auxiliary transformer T5	JiangSu SunLord FuJun New Energy Co.,Ltd.	DEP130008	--	--	Test with unit
Bobbin EP13	SUMITOMO	PM9820 UL94V-0	150°C	D495	E41429

	SUMITOMO	PM9630 UL94V-0	150°C		E41429
Core Ferrite core EP13	TDG	TP4/TP4A	--		--
	LianFeng	NH2C	--		--
Wire 2UEW/F	SAINT	MW79#	155°C	UL 60950-1	E194410
	JinTian	MW79#	155°C		E227047
Main Transformer T1/T2/T3/T4	LangLi	MW79#	155°C	--	E222214
	YuSheng	TIW-B	130°C		E332529
Tape	YaHua	CT-280 Yellow	130°C	IEC 60112	E165111
	YaHua	PF-301 Brown	180°C		E165111
	Jing Yi	JY-25A Yellow	130°C		E246950
Varnish	TaiHu	T-4260(a)	155°C		E228349
-EPOXY	EATTO	E-500	130°C	--	E218090
Solder	WanShan	Sn Cu0.6	--		--
(Alternate T5)	GLORIA TECHNOLOGY LLC	HTS-EP13X	--	--	Test with unit
-COPPER WIRE	ELEKTRISOL A HANGZHOU CO LTD	MW77-C	180°C	--	E258243
-CORE	SUNSHINE ELECTRONIC TECHNOLOGY CO.,LTD.	EP13	SSP-4	--	--
	HENGDIAN GROUP DMEGC MAGNETICS CO., LTD	EP13	DMR40	--	--
	Or equivalent	EP13	PC40		--
-BOBBIN	SUMITOMO BAKELITE CO.,LTD	EP13 PM-9630	150°C	UL94	E41429
-TRIPLE INSULATED WIRE	SUZHOU YUSHENG ELECTRONIC CO LTD	TIW-B RATING THERMAL:130°C	130°C	UL 60950-1	E332529
-MARGIN TAPF	DONGGUAN SHIN YAHUA ELECTRONIC MATERIAL CO LTD	TYPE:WF*(c)(h) RATING THERMAL:130°C	130°C	--	E324093
-TAPE	DONGGUAN SHIN YAHUA ELECTRONIC MATERIAL CO LTD	TYPE:CT*(c)(g)	130°C	IEC 60112	E324093
		TYPE:PF*(d)(q)	180°C		

-SLEEVEING	CHANGYUAN ELECTRONIC S GROUP CO LTD OR EQUIVALENT	TYPE:CB-TT-L	200°C	--	E180908
-EPOXY	DONGGUAN EATTO ELECTRONIC MATERIAL CO LTD	E-500 RATING THERMAL:130°C	130°C	D495	E218090
-VARNISH	SUZHOU TAIHU ELECTRIC ADVANCED MATERIAL CO LTD	T-4260(a	130°C	--	E228349
Inductance L1/L2	JiangSu SunLord FuJun New Energy Co.,Ltd.	DT140011-093	--	--	Test with unit
-PCB	KINGBOARD	FR-4	130°C	UL 796	E123995
-CORE	TDG	T14*9*7C TN100B	--		--
	KEFENG	T14*9*7CFN100	--		--
-WIRE	JINTIAN	2UEW+NY/F	155°C	UL 60950-1	E227047
	SAINT	2UEW+NY/F	155°C		E194410
	TONGGUAN	2UEW+NY/F	155°C		E217937
-EPOXY	EATTO	E-500	130°C		E218090
-SOLDER	WANSHAN	Sn Cu0.7	--	--	--
(Alternate L1/L2)	GLORIA TECHNOLOG Y LLC	HLE-T14B	--	--	Test with unit
-CORE	Yuefeng Electronic Material Co., Ltd	T14*9*7 TN100B	--	--	--
	HENGDIAN GROUP DMEGC MAGNETICS CO.,LTD	T14*9*7 TN100B	--	--	--
	OR EQUIVALENT	T14*9*7 DMR85H	--	--	--
-WIRE	DONGGUAN YIDA INDUSTRIAL CO LTD	NW79-C(UEW-F)	155°C	UL 60950-1	E344055
-FIBER BOARD	KINGBOARD LAMINATES HOLDINGS LTD/OR EQUIVALENT	FR-4.0	--	UL 796	E123995
-VARNISH	SUZHOU TAIHU ELECTRIC	T-4260(a)	--	--	E228349

	ADVANCED MATERIAL CO LTD				
-EPOXY	DONGGUAN EATTO ELECTRONIC MATERIAL CO.,LTD	E- 500/OR2006AB(1)	--	D495	E218090
-SOLDER	SHENZHEN HUAJUN METAL PRODUCTS CO.LTD/OR EQUIVALENT	Sn99.7%-Cu0.3%	--	--	--
(Alternate L1/L2)	JiangSu SunLord FuJun New Energy Co.,Ltd.	DT160019-093		--	Test with unit
CORE OF INDUCTANCE	KUNSHAN ZHUOQI ELECTRONIC S CO LTD	T16*12*8C	Z2K	N/A	N/A
	TDG HOLDING CO.,LTD.	T16*12*8C	TN200B	N/A	N/A
	CAREFULGR OUP	T16*12*8C	FN200	N/A	N/A
WIRE OF INDUCTANCE	NINGBO JINTIAN NEW MATERIAL CO LTD	xEIW/180, QZY- x/180	180°C	OBMW2	E227047
	SHANDONG SAINT ELECTRIC CO LTD	*EIW,QZY- */180,MW30-C	180°C	OBMW2	E194410
	SHENZHEN DARUN SCIENCE AND TECHNOLOG Y CO LTD	QZYB-*/180	180°C	OBMW2	E508179
PCB OF INDUCTANCE	KINGBOARD LAMINATES HOLDINGS LTD	FR-4	HF-140 & 130°C	QMTS2 UL94	E123995
SOLDER OF INDUCTANCE	SUZHOU WANSHAN TIN INDUSTRY CO. LTD	SN CU0.7	N/A	N/A	N/A
EPOXY OF INDUCTANCE	DONGGUAN EATTO ELECTRONIC S MATERIAL CO LTD	E-500 (XX)	130°C	QMFZ2	E218090
(Alternate L1/L2)	DONG GUAN TOP NATION ELECTRONIC LIMITED	T14*8*7	--	--	Test with unit

-CORE	T14*8*7-CE	NiZn	--	--	--
-WIRE	NINGBO JINTIAN NEW MATERIAL CO LTD	xUEW/155,QA- x/155	155°C	UL 60950-1	E227047
	HENG YA ELECTRIC(D ONGGUAN)LT D	TYA1- U155(U EW/QA-F) (155°C)	155°C		E197768
	SHANDONG SAINT ELECTRIC CO LTD	*UEW/155,QA- */155	155°C		E194410
-EPOXY	DONG GUAN SHI PAI HUA CHUANG MATERIAL FTY	H907@@	--	D495	E304477
		3300A-2006 3300B-2006	--		
-PCB	KINGBOARD LAMINATES HOLDINGS LTD	KB-6150 FR- 4.0(1.0t;1.6tref)	--	UL 796	E123995
-SOLDER		Pb<1000ppm	--	--	--
Inductance L800	JiangSu SunLord FuJun New Energy Co.,Ltd.	DT220006	--	--	Test with unit
-PCB	KINGBOARD	FR-4	130°C	UL 796	E41429
-Ferrite Core T22*14*8C	TIANMING	M10K	--	--	--
	KAITONG	R10	--	--	--
-wire	JINGTIAN	2UEW-F	155°C	UL 60950-1	E227047
	SAINT	2UEW-F	155°C		E194410
-varnish	TAIHU	T-4260(a)	130°C		E228349
-EPOXY	EATTO	E-500	130°C	--	E218090
-Solder	WanShan	Sn99.3% Cu0.7%	--	--	NA
(Alternate L800)	GLORIA TECHNOLOG Y LLC	T22	--	--	Test with unit
-CORE	YUEFENG ELECTRONIC MATERIAL CO.,LTD	T22*14*8 TN100B	--	--	--
	TDG HOLDING CO.,LTD	T22*14*8TN100B	--	--	--
	HENGDIAN GROUP DMEGC	ORTN80G	--	--	--
	MAGNETICS	T22*14*8 DN85H	--	--	--

	CO., LTD				
-FIBER BOARD	KINGBOARD LAMINATES HOLDINGS LTD/OR EQUIVALENT	FR-4.0	--	UL 796	E123995
-WIRE	DONGGUAN YIDA INDUSTRIAL CO LTD	NW79-C(UEW-F) 155°C	155°C	UL 60950-1	E344055
-VARNISH	SUZHOU TAIHU ELECTRIC ADVANCED MATERIAL CO LTD	T-4260(a)	--		E228349
-SOLDER	SHENZHEN HUAJUN METAL PRODUCTS CO.LTD/OR EQUIVALENT	Sn99.7%-Cu0.3%	--	--	--
-EPOXY	DONGGUAN EATTO ELECTRONIC MATERIAL CO.,LTD	E-500 OR 2006AB(1)	--	D495	E218090
Inductance L801	JiangSu SunLord FuJun New Energy Co.,Ltd.	DT200028-093 T19.5*10.8*7.8	--	--	Test with unit
BASE	KINGBOARD	FR-4	130°C	UL 796	E123995
CORE	DAYOU	17.6*12.2*6.51K1 07 CASE19.5*10.8*7 .8	--	--	--
	CAREFUL	17.6*12.2*6.51K1 07 CASE19.5*10.8*7 .8	--	--	--
WIRE	SAINT	2UEWF-NY MW 79-C	155°C		E194410
	JinTian	2UEWF-NY MW 79-C	155°C		E227047
	TONGGUAN	2UEWF-NY MW 79-C	155°C		E217937
SOLDER	WANSHAN	Sn Cu0.7	NA		/
-EPOXY	EATTO	E-500	130°C	--	E218090
(Alternate L801)	DONG GUAN TOP NATION ELECTRONIC LIMITED	T12.5*17.5*6	--	--	Test with unit
-CORE	T12.5*17.5*6 Cergen,XUME NG	1K107B	--	--	--

-CASE	NANTONG ORIENT PLASTICS CO LTD	3080 G(zz)	--	--	E332375
-WIRE	NINGBO JINTIAN NEW MATERIAL CO LTD	xUEW/155,QA-x/155	155°C	UL 60950-1	E227047
	HENG YA ELECTRIC(DONGGUAN) LTD	TYA1-U155(U EW/QA-F) (155°C)	155°C		E197768
	SHANDONG SAINT ELECTRIC CO LTD	*UEW/155,QA-*/155 (155°C)	155°C		E194410
-EPOXY	DONG GUAN SHI PAI HUA CHUANG MATERIAL FTY	H907@@	--	--	E304477
	DONGGUAN EATTO ELECTRONIC MATERIAL CO LTD	3300A-2006 3300B-2006			
-PCB	KINGBOARD LAMINATES HOLDINGS LTD	KB-6150 FR-4.0(1.0t;1.6tref)	--	UL 796	E123995
-SOLDER		Pb<1000ppm	--	--	--
Inductance L802/803	JiangSu SunLord FuJun New Energy Co.,Ltd.	DT200012 KS080125 0.9*30TS 122.5uH	--	--	Test with unit
BASE	KINGBOARD	FR-4	130°C	UL 796	E123995
CORE	KEDA	KS080125	--		/
	POCO	NPS080125	--		/
WIRE	SAINT	2UEW-F MW 79-C	155°C	UL 60950-1	E194410
	JinTian	2UEW-F MW 79-C	155°C		E227047
	TONGGUAN	2UEW-F MW 79-C	155°C		E217937
SOLDER	WANSHAN	Sn Cu0.7	--	--	--
EPOXY	DONGGUAN EATTO ELECTRONIC MATERIAL CO.,LTD	2006AB(1) OR E500	--	D495	E218090

ANNEX NO. 1

IP TEST REPORT



Test Report

Report No.: KEYS241210047001IP-01

Date: Dec. 13, 2024

Page 1 of 11

TEST REPORT EN 60529 Degrees of protection provided by enclosures(IP code)	
Report Number.....	KEYS241210047001IP-01
Total number of pages.....	11 pages
Tested by (name + signature).....	Echo Zhong 
Approved by (name + signature)....	Jason Zhan 
Testing Laboratory Name.....	Guangdong KEYS Testing Technology Co., Ltd.
Address.....	Building 1, No.18, Shihuan Road, Dongcheng Subdistrict, Dongguan, Guangdong, China
Applicant's name.....	Wuxi Vaysunic New Energy Technology Co., Ltd.
Address.....	Building 1-218, No.6 Junshan Road, Xinwu District, Wuxi, Jiangsu, China
Manufacturer's name.....	Wuxi Vaysunic New Energy Technology Co., Ltd.
Address.....	Building 1-218, No.6 Junshan Road, Xinwu District, Wuxi, Jiangsu, China
Test specification:	
Standard.....	☐ IEC 60529:1989+AMD1:1999+AMD2:2013 ☒ EN 60529:1991 + A1:2000 + A2:2013
Test procedure.....	Safety report
Non-standard test method.....	N/A
Test item description.....	PV Microinverter
Trade Mark.....	
Model/Type reference.....	VM1000WE-P2, VM600BE-P2, VM700BE-P2, VM800BE-P2, VM900BE-P2, VM1000BE-P2, VM600WE-P2, VM700WE-P2, VM900WE-P2, VM800WE-P2
IP degrees.....	IP67



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Guangdong KEYS Testing Technology Co., Ltd.

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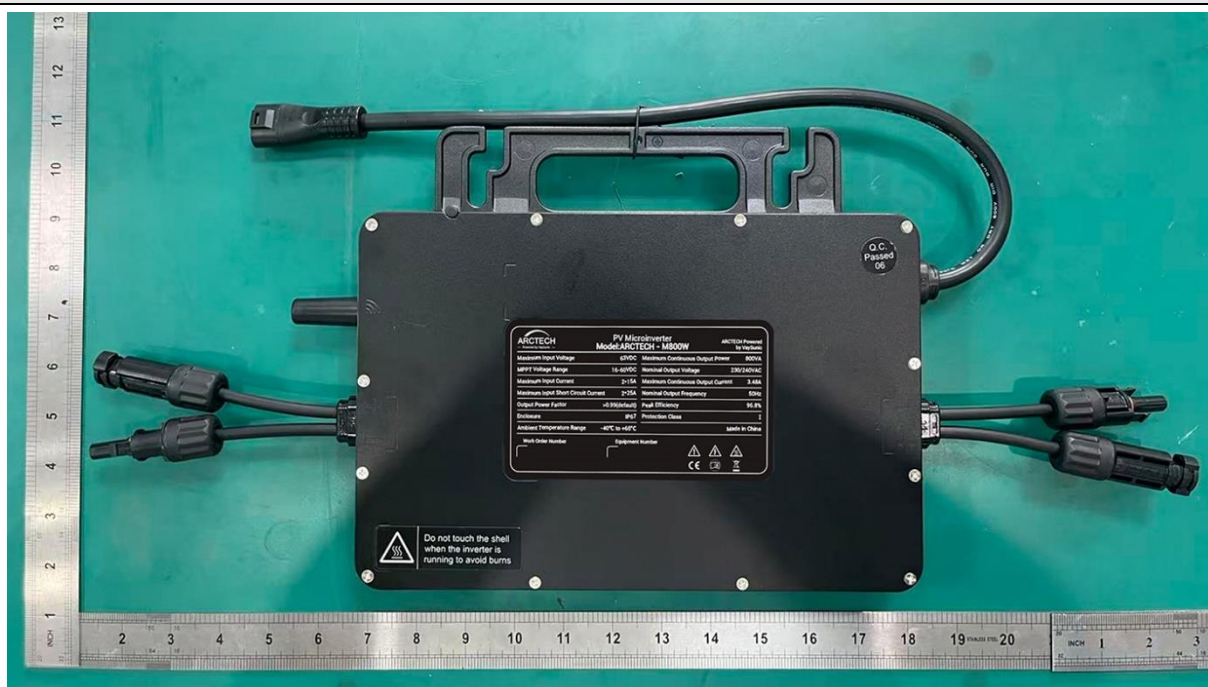
ANNEX NO. 2

PICTURES OF THE UNIT

Front enclosure view



Back enclosure view



Top enclosure view



Left enclosure view



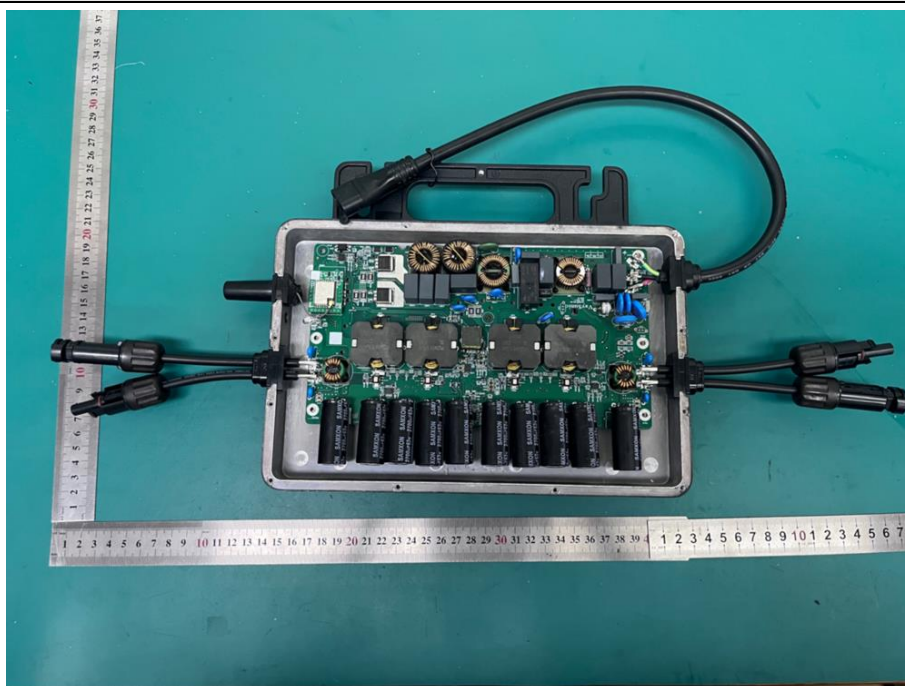
Right enclosure view



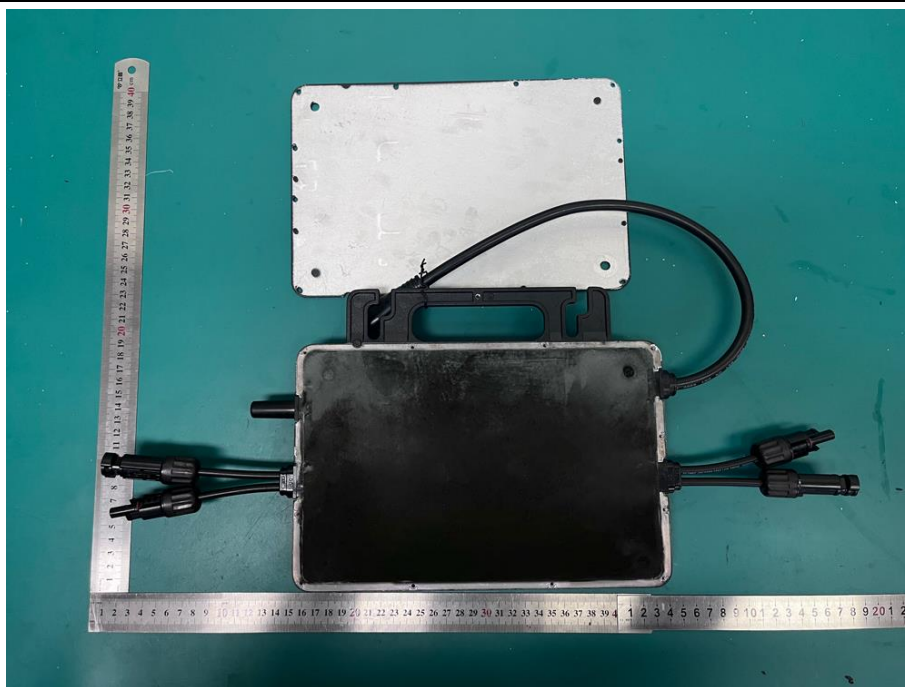
Bottom enclosure view



Internal view



Enclosure open(After internal potted)



Earth connection



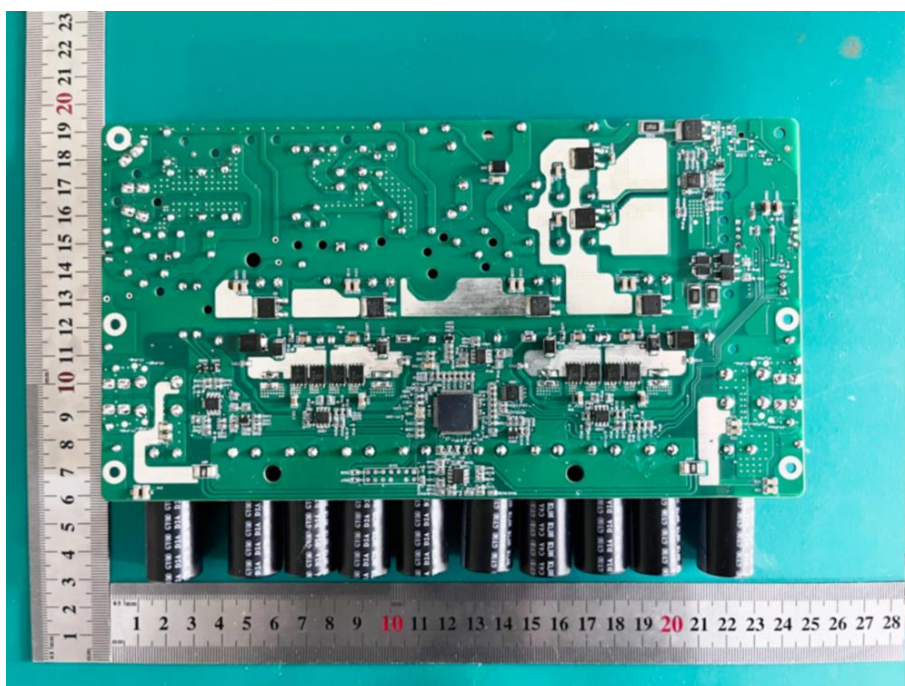
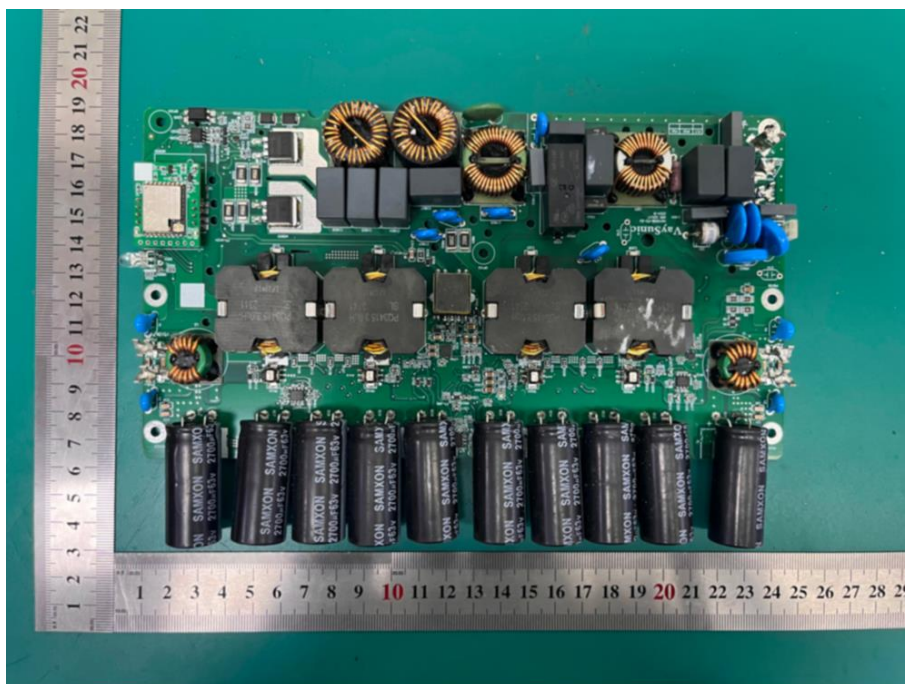
DC connectors



AC connectors



PCB photo component side



ANNEX NO. 3

TEST EQUIPMENT LIST

No,	Equipment	Internal No,	Type/characteristics	Manufacturer	Last Calibration	Due Data
1	Oscilloscope	A4089036SH	DL850	YOKOGAWA	29/May/23	28/May/24
2	High voltage differential probe	A4089026SH	P5200A	Tektronix	21/Dec/22	20/Dec/23
3	Current probe	A4089037SH	960 30	YOKOGAWA	29/Aug/22	28/Aug/23
4	Current probe	A4089038SH	960 30	YOKOGAWA	29/Aug/22	28/Aug/23
5	Current probe	A4089039SH	960 30	YOKOGAWA	29/Aug/22	28/Aug/23
6	AC power supply	A7040057SH	61512	Chroma	Monitored by Power Analyzer	
7	AC power supply	A7040077SH	MX-30	AMETEK		
8	Programmable DC source	A7040058SH	62150H-1000S	Chroma		
9	Programmable DC source	A7040059SH	62150H-1000S	Chroma		
10	Programmable DC source	A7040069SH	62150H-1000S	Chroma		
11	Programmable DC source	A7040074SH	62150H-1000S	Chroma		
12	Programmable DC source	A7040075SH	62150H-1000S	Chroma		
13	Programmable DC source	A7040076SH	62150H-1000S	Chroma		
14	Programmable DC source	A7040070SH	62150H-1000S	Chroma		
15	Power Analyzer	A1240096SH	WT3000	YOKOGAWA	29/Aug/22	28/Aug/23
18	Load cabinet	A7150083SH	WSTF-LDJ60K/300	shanghai wen shun	-	-
19	Load cabinet	A7150084SH	WSTF-LDJ45K/0385	shanghai wen shun	-	-
20	Load cabinet	A7150085SH	WSTF-LDJ45K/0385	shanghai wen shun	-	-
21	Load cabinet	A7150075SH	WSTF-RC25k/0,3D 0,001kVA-25kVA	shanghai wen shun	-	-
22	Temperature recorder	A7440037SH	G820	GRAPHIEC	29/Aug/22	28/Aug/23
23	Load cabinet(for flicker)	A7150090SH	200Ω , 250V;1200W	shanghai wen shun	-	-
24	Variable resistor	A7150076SH	BX8-67	LingOu	-	-
25	walk-in chamber	D1080023SH	MHK-1872AK	TERCHY	29/Aug/22	28/Aug/23
26	temperature & humidity meter	B4200078SH	314	center	03/Jun/23	02/Jun/24

END OF TEST REPORT