


TEST REPORT IEC 62040-1 Uninterruptible power systems (UPS) – Part 1: General and safety requirements for UPS	
Report Reference No.....	161008062GZU-004
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Testing Laboratory	Intertek Testing Services Shenzhen Ltd. Guangzhou Branch
Address	Block E, No.7-2 Guang Dong Software Science Park, Caipin Road, Guangzhou Science City, GETDD, Guangzhou, China
Applicant's name.....	Shenzhen SOFARSOLAR Co., Ltd.
Address	5L,Fourth Building,Antongda Industrial Park,Liuxian Avenue No.1,Xinan Street,Baoan District,Shenzhen,China.
Test specification:	
Standard.....	IEC 62040-1:2008
Test procedure	SAA
Non-standard test method.....	N/A
Test Report Form No.....	IEC62040_1A
Test Report Form(s) Originator	TÜV Rheinland Japan Ltd.
Master TRF	Dated 2009-11
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Test item description	AC-coupled Storage Converter
Trade Mark	
Manufacturer	Same as applicant
Model/Type reference	ME 3000SP

Rating.....:	Battery Type: Lead-acid, Lithium-ion Battery Voltage Range: 42-58Vdc Max. Charging Current: 60A Max. Discharging Current: 60A Max. Charging & Discharging Power: 3000VA Nominal Grid Voltage: 230Vac Nominal output Voltage (stand-alone): 230Vac Max. output Current: 13A Nominal Grid frequency: 50Hz Power factor: 1 (adjustable +/-0.8) Ingress protection: IP65 Operating Temperature Range: -25°C - 60°C Protective Class: Class I
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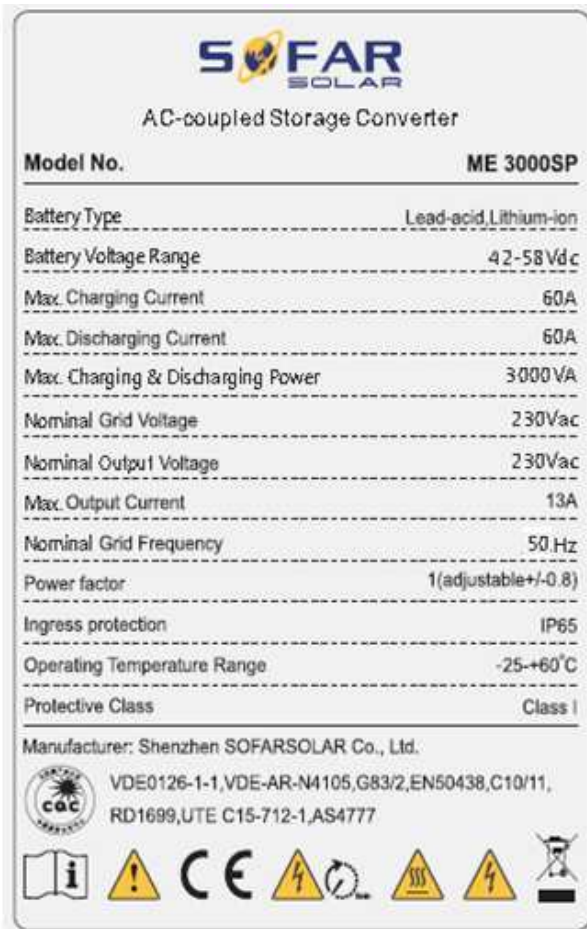
Testing procedure and testing location:	
<input checked="" type="checkbox"/> Testing Laboratory: Testing location/ address:	Intertek Testing Services Shenzhen Ltd. Guangzhou Branch Block E, No.7-2 Guang Dong Software Science Park, Caipin Road, Guangzhou Science City, GETDD, Guangzhou, China
<input type="checkbox"/> Associated CB Laboratory: Testing location/ address:	N/A N/A
Tested by (name + signature).....:	Jason Fu <i>Jason</i>
Approved by (+ signature):	Tommy Zhong <i>Tommy</i>
<input type="checkbox"/> Testing procedure: TMP Tested by (name + signature).....: Approved by (+ signature): Testing location/ address:	N/A
<input type="checkbox"/> Testing procedure: WMT Tested by (name + signature).....: Witnessed by (+ signature): Approved by (+ signature): Testing location/ address:	N/A
<input type="checkbox"/> Testing procedure: SMT Tested by (name + signature).....: Approved by (+ signature): Supervised by (+ signature).....: Testing location/ address:	N/A
<input type="checkbox"/> Testing procedure: RMT Tested by (name + signature).....: Approved by (+ signature): Supervised by (+ signature).....: Testing location/ address:	N/A

Summary of testing:

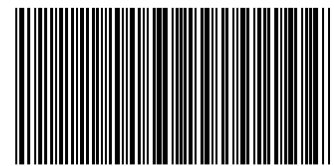
<p>Tests performed (name of test and test clause):</p> <p>All applicable tests</p>	<p>Testing location:</p> <p>Intertek Testing Services Shenzhen Ltd. Guangzhou Branch Block E, No.7-2 Guang Dong Software Science Park, Caipin Road, Guangzhou Science City, GETDD, Guangzhou, China</p>
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Summary of compliance with National Differences:
N/A

Copy of marking plate(representative):



S/N



9990123456789

Note:

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

Test item particulars	
Equipment mobility	<input type="checkbox"/> movable <input type="checkbox"/> hand-held <input type="checkbox"/> stationary <input checked="" type="checkbox"/> fixed <input type="checkbox"/> transportable <input type="checkbox"/> for building-in
Connection to the mains	<input type="checkbox"/> pluggable equipment <input type="checkbox"/> direct plug-in <input checked="" type="checkbox"/> permanent connection <input type="checkbox"/> for building-in
Environmental category	<input checked="" type="checkbox"/> outdoor <input type="checkbox"/> indoor unconditional <input type="checkbox"/> indoor conditional
Over voltage category Mains	<input type="checkbox"/> OVC I <input type="checkbox"/> OVC II <input checked="" type="checkbox"/> OVC III <input type="checkbox"/> OVC IV
Over voltage category PV	<input type="checkbox"/> OVC I <input checked="" type="checkbox"/> OVC II (battery circuits) <input type="checkbox"/> OVC III <input type="checkbox"/> OVC IV
Mains supply tolerance (%).....	-90 / +110 %
Tested for power systems.....	TN systems
IT testing, phase-phase voltage (V).....	N/A
Class of equipment	<input checked="" type="checkbox"/> Class I <input type="checkbox"/> Class II <input type="checkbox"/> Class III <input type="checkbox"/> Not classified
Mass of equipment (kg)	Approx. 16kg
Pollution degree	Outside PD3; Inside PD2
IP protection class	IP 65
Testing	
Date of receipt of test item(s).....	08 Oct 2016
Dates tests performed.....	08 Oct 2016 to 17 Nov 2016
Possible test case verdicts:	
test case does not apply to the test object	N/A
test object does meet the requirement.....	Pass (P)
test object was not evaluated for the requirement	N/E
test object does not meet the requirement.....	Fail (F)

General remarks:

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

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"(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 point is used as the decimal separator.

Standard IEC 62040-1:2008 is to be used in conjunction with IEC 60950-1:2005, which is referred to in this TRF as "RD".

When determining the test conclusion, the Measurement Uncertainty of test has been considered.

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General product information:

The equipment under test is single phase energy storage inverter. They are responsible for converting the direct current generated by battery into single-phase 230V, 50 Hz. It is basic insulation between grid and battery. Two mechanical disconnection device (relay) and high frequency isolated transformer are provided between grid and battery on line and neutral conductor

The inverters intended to operate at ambient temperature -25°C - $+60^{\circ}\text{C}$, which will be specified in the user manual, however, the inverters will output full power when operated at 45°C , if operated at higher than 45°C temperature, the output power would be derate.

The equipment have three working mode. Charge mode, Discharge mode, Stand-alone mode :

Charge mode: The AC voltage from mains charges the battery provided in the final system.

Discharge mode: The inverter converts the energy from the battery to 230Va.c.,50 Hz voltage and connected to AC mains. In this mode the inverter works as grid connected inverter.

Stand-alone mode: The inverter converter the energy from the battery to 230Va.c.,50 Hz voltage and feed the general load. In this mode the inverter worked as stand-alone inverter.


IEC 62040-1			
Clause	Requirement + Test	Result - Remark	Verdict

4	GENERAL CONDITIONS FOR TESTS		P
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4.5	Components		P
	Comply with IEC 62040-1 or relevant component standard	(see appended table 4.5)	P
1.5.2/RD	Evaluation and testing of components	Certified components are used in accordance with their ratings, certifications and they comply with applicable parts of this standard. Components not certified are used in accordance with their ratings and they comply with applicable parts of IEC 62040-1 and the relevant component standard. Components, for which no relevant IEC-standard exists, have been tested under the conditions occurring in the equipment, using applicable parts of IEC 62040-1.	P
1.5.3/RD	Thermal controls		N/A
1.5.4/RD	Transformers	Transformer used is suitable for their intended applications and comply with relevant parts of this standard	P
1.5.5/RD	Interconnecting cables	No output cord	N/A
1.5.6/RD	Capacitors bridging insulation	X2 capacitors and Y2 capacitors according to IEC 60384-14.	P
1.5.7/RD	Resistors bridging insulation	Refer to below.	P
1.5.7.1/RD	Resistors bridging functional, basic or supplementary insulation		N/A
1.5.7.2/RD	Resistors bridging double or reinforced insulation between a.c. mains and other circuits		P
1.5.7.3/RD	Resistors bridging double or reinforced insulation between a.c. mains and antenna or coaxial cable		N/A
1.5.8/RD	Components in equipment for IT power systems		N/A

4.6	Power interface		P
1.6.1/RD	AC power distribution systems	TN	P
1.6.2/RD	Input current	(see appended table 4.6, 1.6.2/RD)	P

IEC 62040-1			
Clause	Requirement + Test	Result - Remark	Verdict
4.6 1.6.4/RD	Neutral conductor	Neutral is insulated from body throughout the equipment as if it is line conductor. Output neutral conductor is isolated to input line conductor.	P

4.7	Marking and instructions		P
4.7.1	General		P
4.7.2	Power rating	The marking label is on outside of equipment.	P
	Input rated voltage/range (V)	Refer to page 4	P
	Input rated current/range (A)	Refer to page 4	P
	Input symbol for nature of supply (d.c.)		N/A
	Input rated frequency/range (Hz)		N/A
1.7.1/RD	Number of Input phases and neutral	1/N/PE	P
	Output rated voltage/range (V)	Refer to page 4	P
	Output rated current/range (A)	Refer to page 4	P
	Output rated power factor, (if less than unity, or active power and apparent power or active power and rated current)	Refer to page 4	P
1.7.1/RD	Number of output phases and neutral	1/N/PE	P
	Output rated active power (W)	Refer to page 4	P
	Output rated apparent power (VA)	Refer to page 4	P
	Output symbol for nature of supply (d.c.)	Refer to page 4	P
	Output rated frequency/range (Hz)	For AC output, 50Hz	P
	Ambient operating temperature range (°C)	-25°C to +60°C	P
	Manufacturer's name or trademark or identification mark		P
	Type/model or type reference	ME 3000SP	P
	Symbol for Class II equipment only	Class I equipment	N/A
	Other symbols	The additional marking does not give rise to misunderstandings.	P
	Certification marks		P

IEC 62040-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Instructions for units with automatic bypass/maintenance bypass, additional input a.c. supply, or external batteries, having text "See installation instructions before connecting to the supply"	The equivalent words were printed on the enclosure	P
4.7.3	Safety instructions		P
4.7.3.1	General		P
4.7.3.2	Installation		P
	Location in a restricted access location only ... :		N/A
	Permanent connector UPS		P
	Pluggable type A or Pluggable type B UPS :		N/A
4.7.3.3	Operation..... :	See Manual	P
4.7.3.4	Maintenance..... :	See Manual	P
4.7.3.5	Distribution related backfeed..... :		N/A
4.7.4 1.7.4/RD	Main voltage adjustment	No voltage selector	N/A
	Methods and means of adjustment; reference to installation instructions		N/A
4.7.5 1.7.5/RD	Power outlets..... :		N/A
4.7.6 1.7.6/RD	Fuse identification (marking, special fusing characteristics, cross-reference)	The current fuse is located in DC input and it is marked	P
4.7.7 1.7.7/RD	Wiring terminals		P
1.7.7.1/RD	Protective earthing and bonding terminals	The earthing terminal is marked with the standard earthing symbol (60417-2-IEC-5019) near the terminal.	P
1.7.7.2/RD	Terminals for a.c. mains supply conductors		P
1.7.7.3/RD	Terminals for d.c. mains supply conductors		P
4.7.8	Battery terminals	Polarity of battery terminals is indicated according to IEC 60417(+ and -) on the batteries. Indicated with red cooler (+) for positive side and black color (-) for negative side.	P
4.7.9 1.7.8/RD	Controls and indicators		P
1.7.8.1/RD	Identification, location and marking		N/A
1.7.8.2/RD	Colours		N/A

IEC 62040-1			
Clause	Requirement + Test	Result - Remark	Verdict
1.7.8.3/RD	Symbols according to IEC 60417.....:		N/A
1.7.8.4/RD	Markings using figures	No controls affecting safety are using figures.	N/A
4.7.10 1.7.9/RD	Isolation of multiple power sources		N/A
4.7.11 1.7.2.4/RD	IT power systems	No such parts.	N/A
4.7.12	Protection in building installation	Permanently connected equipment relies on the building installation for short-circuit protection or overcurrent protection.	P
4.7.13 5.1/RD	High leakage current (mA)		N/A
4.7.14 1.7.10/RD	Thermostats and other regulating devices		N/A
4.7.15 1.7.2.1/RD and 1.7.8.1/RD	Language(s)	in English	—
4.7.16 1.7.11/RD	Durability of markings	The label was subjected to the permanence of marking test. The label was rubbed with cloth soaked with water for 15s and then again for 15s with the cloth soaked with petroleum spirit. After this test there was no damage to the label. The marking of the label did not fade. There was neither curling nor lifting of the label edge.	P
4.7.17 1.7.12/RD	Removable parts	No marking is placed on removable parts.	N/A
4.7.18 1.7.13/RD	Replaceable batteries	See manual for details	P
	Language(s)		—
4.7.19 1.7.2.5/RD	Operator access with a tool.....:		N/A
4.7.20	Battery		P
	Clearly legible information		P
	Battery type		P
	Nominal voltage of total battery (V)		P
	Nominal capacity of total battery (optional)	Stated in manual	P

IEC 62040-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Warning label		P
	Instructions		P
2.1.1.5/RD	Protection against energy hazards	(see appended tables 5.1.1, 2.1.1.5/RD)	P
4.7.21 1.7.2.4/RD	Installation instructions		P

5	FUNDAMENTAL DESIGN REQUIREMENTS		P
5.1	Protection against electric shock and energy hazards		P
5.1.1 2.1.1/RD	Protection for UPS intended to be used in operator access areas		P
2.1.1.1/RD	Access to energized parts	No access with test finger and test pin to any hazardous parts.	P
	Test by inspection		P
	Test with test finger (Figure 2A)		P
	Test with test pin (Figure 2B)		P
	Test with test probe (Figure 2C)		N/A
2.1.1.2/RD	Battery compartments		N/A
2.1.1.3/RD	Access to ELV wiring	No internal wiring at ELV accessible to the operator.	N/A
	Working voltage (V _{peak} or V _{rms}); minimum distance through insulation (mm)	(see appended table 5.7 and 2.10.2/RD)	—
2.1.1.4/RD	Access to hazardous voltage circuit wiring		N/A
2.1.1.5/RD	Energy hazards		P
2.1.1.6/RD	Manual controls		N/A
2.1.1.7/RD	Discharge of capacitors in equipment		P
	Measured voltage (V); time-constant (s).....	Voltage and energy on the DC terminal is 35.7 Vdc, 247s	—
2.1.1.8/RD	Energy hazards – d.c. mains supply		N/A
	a) Capacitor connected to the d.c. mains supply ..		N/A
	b) Internal battery connected to the d.c. mains supply		N/A
2.1.1.9/RD	Audio amplifiers		N/A
5.1.2 2.1.1.5 c) /RD	Protection for UPS intended to be used in service access areas		P
	Hazardous energy level		P

IEC 62040-1			
Clause	Requirement + Test	Result - Remark	Verdict
5.1.3 2.1.1.5 c) /RD	Protection for UPS intended to be used in restricted access areas		N/A
	Hazardous energy level		N/A
5.1.4	Backfeed protection	Backfeed protection prevents load capacitors to discharge via input terminal.	P
	Shock hazard after de-energization of a.c. input for UPS		P
	Measured voltage (V); time-constant (s)..... :	0V	P
	Description of the construction	The backfeed protection is achieved through the backfeed relay RY1 and RY2, and the converter transformer which provides basic insulation between the primary and secondary circuits.	P
5.1.5	Emergency switching device		N/A

5.2	Requirements for auxiliary circuits		P
5.2.1 2.2/RD	Safety extra low voltage circuit - SELV		P
2.2.1/RD	General requirements		P
2.2.2/RD	Voltages under normal conditions (V)	(See appended table 5.2.1 and 2.2.2/RD)	P
2.2.3/RD	Voltages under fault conditions (V)	(See appended table 5.2.1 and 2.2.3/RD)	P
2.2.4/RD	Connection of SELV circuits to other circuits .. :	SELV circuits are only connected to other SELV circuits.	P
5.2.2 2.3/RD	Telephone network voltage circuits - TNV	No TNV circuit.	N/A
2.3.1/RD	Limits		N/A
	Type of TNV circuits..... :		N/A
2.3.2/RD	Separation from other circuits and from accessible parts		N/A
2.3.2.1/RD	General requirements		N/A
2.3.2.2/RD	Protection by basic insulation		N/A
2.3.2.3/RD	Protection by earthing		N/A
2.3.2.4/RD	Protection by other constructions		N/A
2.3.3/RD	Separation from hazardous voltages		N/A

IEC 62040-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Insulation employed		N/A
2.3.4/RD	Connection of TNV circuits to other circuits		N/A
	Insulation employed		N/A
2.3.5/RD	Test for operating voltages generated externally		N/A
	Test with test probe (Figure 2C)		N/A
5.2.3 2.4/RD	Limited current circuits		N/A
2.4.1/RD	General requirements		N/A
2.4.2/RD	Limit values		N/A
	Frequency (Hz)		N/A
	Measured current (mA)		N/A
	Measured voltage (V)		N/A
	Measured circuit capacitance (nF or μ F)		N/A
2.4.3/RD	Connection of limited current circuits to other circuits		N/A
5.2.4 3.5/RD	External signalling circuits		N/A
3.5.1/RD	General requirements	Refer to below.	P
3.5.2/RD	Types of interconnection circuits	SELV.	P
3.5.3/RD	ELV circuits as interconnection circuits	No ELV interconnection circuits.	N/A
3.5.4/RD	Data ports for additional equipment	No data ports.	N/A
5.2.5 2.5/RD	Limited power source		N/A
	a) Inherently limited output		N/A
	b) Impedance limited output		N/A
	c) Regulating network limited output under normal operating and single fault condition		N/A
	d) Overcurrent protective device limited output		N/A
	Max. output voltage (V), max. output current (A), max. apparent power (VA)		—
	Current rating of overcurrent protective device (A)		—
5.3	Protective earthing and bonding		P
5.3.1	General	Screw terminal used.	P

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Clause	Requirement + Test	Result - Remark	Verdict
2.6/RD	Provisions for earthing and bonding	Reliable connection of relevant conductive parts to the PE terminal (via green/yellow insulated wires).	P
2.6.1/RD	Protective earthing		P
2.6.2/RD	Functional earthing		N/A
2.6.3/RD	Protective earthing and protective bonding conductors		P
2.6.3.1/RD	General		P
2.6.3.2/RD	Size of protective earthing conductors		P
	Rated current (A), cross-sectional area (mm ²), AWG..... :	According to table 3B.	—
2.6.3.3/RD	Size of protective bonding conductors	Clause 2.6.3.4/RD was complied	P
	Rated current (A), cross-sectional area (mm ²), AWG..... :	Complying with the test in 2.6.3.4/RD	—
	Protective current rating (A), cross-sectional area (mm ²), AWG..... :		—
2.6.3.4/RD	Resistance of earthing conductors and their terminations; resistance (Ω), voltage drop (V), test current (A), duration (min)..... :	(See appended table 5.3.1, 2.6.3.4/RD)	P
2.6.3.5/RD	Colour of insulation..... :	Green and yellow	P
2.6.4/RD	Terminals		P
2.6.4.1/RD	General		P
2.6.4.2/RD	Protective earthing and bonding terminals		P
	Rated current (A), type, nominal thread diameter (mm)..... :	Complying with the test in 2.6.3.4/RD	—
2.6.4.3/RD	Separation of the protective earthing conductor from protective bonding conductors		N/A
2.6.5/RD	Integrity of protective earthing		P
2.6.5.1/RD	Interconnection of equipment		N/A
2.6.5.2/RD	Components in protective earthing conductors and protective bonding conductors		N/A
2.6.5.3/RD	Disconnection of protective earth		N/A
2.6.5.4/RD	Parts that can be removed by an operator		N/A
2.6.5.5/RD	Parts removed during servicing		N/A
2.6.5.6/RD	Corrosion resistance		P
2.6.5.7/RD	Screws for protective bonding	All the screws used slip washer when connecting.	P

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Clause	Requirement + Test	Result - Remark	Verdict
2.6.5.8/RD	Reliance on telecommunication network or cable distribution system		N/A
5.3.2 2.6.1/RD	Protective earthing		P
2.10/RD	Clearances, creepage distances and distances through insulation		P
4.2/RD	Mechanical strength	Fixed by screws on the metal enclosure	P
5.2/RD	Electric strength		P
5.3.3	Protective bonding		P

5.4	AC and d.c. power isolation		P
5.4.1	General	The circuit breakers are installed in DC input and AC output for disconnection means.	P
3.4/RD	Disconnection from the mains supply	The circuit breaker outside	P
3.4.1/RD	General requirement		N/A
3.4.2/RD	Disconnect devices	The circuit breaker outside used as disconnect devices	P
3.4.3/RD	Permanently connected equipment		P
3.4.4/RD	Parts which remain energized		N/A
3.4.5/RD	Switches in flexible cords		N/A
3.4.6/RD	Number of poles - single-phase and d.c. equipment		N/A
3.4.7/RD	Number of poles - three-phase equipment		N/A
3.4.8/RD	Switches as disconnect devices		N/A
3.4.9/RD	Plugs as disconnect devices		N/A
3.4.10/RD	Interconnected equipment		N/A
3.4.11/RD	Multiple power sources		N/A
5.4.2	Disconnect devices	The circuit breaker outside used as disconnect devices	P

5.5	Overcurrent and earth fault protection		P
5.5.1	General		P
2.7.3/RD	Short-circuit backup protection	The building installation is considered as providing short-circuit backup protection.	P

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Clause	Requirement + Test	Result - Remark	Verdict
2.7.4/RD	Number and location of protective devices :	Over current protection by one built-in input breaker. Protection devices in the building installation considered as providing sufficient protection against earth faults.	P
2.7.5/RD	Protection by several devices		N/A
2.7.6/RD	Warning to service personnel :		N/A
5.5.2	Basic requirements		P
5.5.3	Battery circuit protection		P
5.5.3.1	Overcurrent and earth fault protection		P
5.5.3.2	Location of protective device	The approved current fuse was used.	P
5.5.3.3	Rating of protective device	See component list for details	P
5.3.1/RD	Protection against overload and abnormal operation	(see appended table 8.3 and 5.3.1/RD)	P

5.6	Protection of personnel – Safety interlocks		N/A
5.6.1	Operator protection	No Safety interlocks.	N/A
2.8/RD	Safety interlocks		N/A
2.8.1/RD	General principles		N/A
2.8.2/RD	Protection requirements		N/A
2.8.3/RD	Inadvertent reactivation		N/A
2.8.4/RD	Fail-safe operation		N/A
2.8.5/RD	Moving parts		N/A
2.8.6/RD	Overriding		N/A
2.8.7/RD	Switches and relays		N/A
2.8.7.1/RD	Contact gaps (mm) :		N/A
2.8.7.2/RD	Overload test		N/A
2.8.7.3/RD	Endurance test		N/A
2.8.7.4/RD	Electric strength test		N/A
2.8.8/RD	Mechanical actuators		N/A
5.6.2	Service person protection		N/A
5.6.2.1	Introduction		N/A
5.6.2.2	Covers		N/A
5.6.2.3	Location and guarding of parts		N/A
5.6.2.4	Parts on doors		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
5.6.2.5	Component access		N/A
2.8.3/RD	Inadvertent reactivation		N/A
5.6.2.6	Moving parts		N/A
5.6.2.7	Capacitor banks		N/A
5.6.2.8	Internal batteries		N/A

5.7 2.10/RD	Clearances, creepage distances and distances through insulation		P
2.10.1/RD	General		P
2.10.1.1/RD	Frequency		P
2.10.1.2/RD	Pollution degrees	Outside PD3; Inside PD2	P
2.10.1.3/RD	Reduced values for functional insulation	The functional insulation complied with clause 5.3.4/RD.	P
2.10.1.4/RD	Intervening unconnected conductive parts	Considered.	P
2.10.1.5/RD	Insulation with varying dimensions	No reduced distance is considered.	N/A
2.10.1.6/RD	Special separation requirements		N/A
2.10.1.7/RD	Insulation in circuits generating starting pulses		N/A
2.10.2/RD	Determination of working voltage	(See appended table 5.7 and 2.10.2/RD)	P
2.10.2.1/RD	General		P
2.10.2.2/RD	RMS working voltage		P
2.10.2.3/RD	Peak working voltage		P
2.10.3/RD	Clearances		P
2.10.3.1/RD	General		P
2.10.3.2/RD	Mains transient voltages	4000V	P
	a) AC mains supply	230V	P
	b) Earthed d.c. mains supplies		N/A
	c) Unearthed d.c. mains supplies		P
	d) Battery operation		P
2.10.3.3/RD	Clearances in primary circuits	(See appended table 5.7 and 2.10.4/RD)	P
2.10.3.4/RD	Clearances in secondary circuits	(See appended table 5.7 and 2.10.4/RD)	P
2.10.3.5/RD	Clearances in circuits having starting pulses		N/A
2.10.3.6/RD	Transients from a.c. mains supply	Considered.	P
2.10.3.7/RD	Transients from d.c. mains supply		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
2.10.3.8/RD	Transients from telecommunication networks and cable distribution systems		N/A
2.10.3.9/RD	Measurement of transient voltage levels		N/A
	a) Transients from a mains supply		N/A
	For an a.c. mains supply		N/A
	For a d.c. mains supply		N/A
	b) Transients from a telecommunication network		N/A
2.10.4/RD	Creepage distances	(See appended table 5.7 and 2.10.4/RD)	P
2.10.4.1/RD	General		P
2.10.4.2/RD	Material group and comparative tracking index		P
	CTI tests	Material group IIIb is assumed to be used	—
2.10.4.3/RD	Minimum creepage distances	(See appended table 5.7 and 2.10.4/RD)	P
2.10.5 /RD	Solid insulation		P
2.10.5.1/RD	General		P
2.10.5.2/RD	Distances through insulation	(See appended table 5.7 and 2.10.5/RD)	P
2.10.5.3/RD	Insulating compound as solid insulation		N/A
2.10.5.4/RD	Semiconductor devices		N/A
2.10.5.5/RD	Cemented joints		P
2.10.5.6/RD	Thin sheet material – General		P
2.10.5.7/RD	Separable thin sheet material		P
	Number of layers (pcs)	3	—
2.10.5.8/RD	Non-separable thin sheet material		N/A
2.10.5.9/RD	Thin sheet material – standard test procedure		N/A
	Electric strength test		—
2.10.5.10 /RD	Thin sheet material – alternative test procedure		P
	Electric strength test	(see appended table 8.2)	—
2.10.5.11 /RD	Insulation in wound components		N/A
2.10.5.12 /RD	Wire in wound components		P
	Working voltage		—
	a) Basic insulation not under stress		N/A
	b) Basic, supplementary, reinforced insulation :		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	c) Compliance with Annex U		P
	Two wires in contact inside wound component; angle between 45° and 90°		P
2.10.5.13 /RD	Wire with solvent-based enamel in wound components		N/A
	Electric strength test		—
	Routine test		N/A
2.10.5.14 /RD	Additional insulation in wound components		N/A
	Working voltage		—
	- Basic insulation not under stress		N/A
	- Supplementary, reinforced insulation		N/A
2.10.6/RD	Construction of printed boards		N/A
2.10.6.1/RD	Uncoated printed boards		N/A
2.10.6.2/RD	Coated printed boards		N/A
2.10.6.3/RD	Insulation between conductors on the same inner surface of a printed board		N/A
2.10.6.4/RD	Insulation between conductors on different layers of a printed board		N/A
	Distance through insulation		N/A
	Number of insulation layers (pcs)		N/A
2.10.7/RD	Component external terminations	Coatings not used over terminations to increase effective creepage and clearance distances.	N/A
2.10.8/RD	Tests on coated printed boards and coated components	No special coating in order to reduce distance.	N/A
2.10.8.1/RD	Sample preparation and preliminary inspection		N/A
2.10.8.2/RD	Thermal conditioning		N/A
2.10.8.3/RD	Electric strength test		—
2.10.8.4/RD	Abrasion resistance test		N/A
2.10.9/RD	Thermal cycling		N/A
2.10.10/RD	Test for Pollution Degree 1 environment and insulating compound		N/A
2.10.11/RD	Tests for semiconductor devices and cemented joints		N/A
2.10.12/RD	Enclosed and sealed parts		N/A
6	Wiring, connections and supply		P

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Clause	Requirement + Test	Result - Remark	Verdict
6.1	General		P
6.1.1	Introduction		P
3.1/RD	General		P
3.1.1/RD	Current rating and overcurrent protection		P
3.1.2/RD	Protection against mechanical damage	Wire ways are smooth and free from edges. Wires are adequately fixed to prevent excessive strain on wire and terminals and avoiding damage to the insulation of the conductors.	P
3.1.3/RD	Securing of internal wiring	Connected by soldering and "hooked in" before soldering, provided that the hole through which the conductor is passed is not unduly large. Or fixed by glue after soldering or fixed by screws with gasket.	P
3.1.4/RD	Insulation of conductors	Insulation on internal conductors is considered to be of adequate quality and suitable for the application and the working voltage involved.	P
3.1.5/RD	Beads and ceramic insulators		N/A
3.1.6/RD	Screws for electrical contact pressure		N/A
3.1.7/RD	Insulating materials in electrical connections		N/A
3.1.8/RD	Self-tapping and spaced thread screws		N/A
3.1.9/RD	Termination of conductors		P
	10 N pull test		P
3.1.10/RD	Sleeving on wiring		P
6.1.2	Dimensions and rating of busbars and insulated conductors		N/A

6.2	Connection to power		P
6.2.1	General provisions for connection to power		P
3.2.2/RD	Multiple supply connections		P
3.2.3/RD	Permanently connected equipment		P
	Number of conductors, diameter of cable and conduits (mm) :	The installation manual require min 4mm ² wire	—
3.2.4/RD	Appliance inlets		N/A
3.2.5/RD	Power supply cords		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
3.2.5.1/RD	AC power supply cords		N/A
	Type		—
	Rated current (A), cross-sectional area (mm ²), AWG		—
3.2.5.2/RD	DC power supply cords		N/A
3.2.6/RD	Cord anchorages and strain relief		N/A
	Mass of equipment (kg), pull (N)		—
	Longitudinal displacement (mm)		—
3.2.7/RD	Protection against mechanical damage		N/A
3.2.8/RD	Cord guards		N/A
	Diameter or minor dimension D (mm); test mass (g)		—
	Radius of curvature of cord (mm)		—
6.2.2	Means of connection		N/A
	More than one supply connection		N/A

6.3	Wiring terminals for external power conductors		N/A
3.3/RD	Wiring terminals for connection of external conductors		N/A
3.3.1/RD	Wiring terminals		N/A
3.3.2/RD	Connection of non-detachable power supply cords		N/A
3.3.3/RD	Screw terminals		N/A
3.3.4/RD	Conductor sizes to be connected		N/A
	Rated current (A), cord/cable type, cross-sectional area (mm ²)		—
3.3.5/RD	Wiring terminal sizes		N/A
	Rated current (A), type, nominal thread diameter (mm)		—
3.3.6/RD	Wiring terminal design		N/A
3.3.7/RD	Grouping of wiring terminals		N/A
3.3.8/RD	Stranded wire		N/A

7	Physical requirements		P
7.1	Enclosure		P

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Clause	Requirement + Test	Result - Remark	Verdict

7.2 4.1/RD	Stability		N/A
	Angle of 10°		N/A
	Test force (N) :		N/A

7.3 4.2/RD	Mechanical strength		P
4.2.1/RD	General		P
4.2.2/RD	Steady force test, 10 N		—
4.2.3/RD	Steady force test, 30 N		N/A
4.2.4/RD	Steady force test, 250 N		P
4.2.5/RD	Impact test		P
	Fall test		N/A
	Swing test		N/A
4.2.6/RD	Drop test; height (mm) :		N/A
4.2.7/RD	Stress relief test		—
4.2.8/RD	Cathode ray tubes		N/A
	Picture tube separately certified :		—
4.2.9/RD	High pressure lamps		N/A
4.2.10/RD	Wall or ceiling mounted equipment; force (N) . :		P

7.4	Construction details		P
7.4.1	Introduction		P
4.3.1/RD	Edges and corners	The outer surface of the EUT is smooth	P
4.3.2/RD	Handles and manual controls; force (N) :	No such device within the EUT	N/A
4.3.3/RD	Adjustable controls	No such device within the EUT	N/A
4.3.4/RD	Securing of parts	Enclosure was fixed by screws	P
4.3.5/RD	Connection by plugs and sockets		P
4.3.7/RD	Heating elements in earthed equipment		N/A
4.3.11/RD	Containers for liquids or gases		N/A
4.4/RD	Protection against hazardous moving parts	No hazardous moving parts within the EUT	N/A
4.4.1/RD	General		N/A
4.4.2/RD	Protection in operator access areas :		N/A
4.4.3/RD	Protection in restricted access locations :		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
4.4.4/RD	Protection in service access areas		N/A
4.5/RD	Thermal requirements		P
4.5.1/RD	General		P
4.5.2/RD	Temperature tests		P
	Normal load condition per Annex L :	Operated in the most unfavourable way of operation given in the operating instructions until steady conditions established	P
4.5.3/RD	Temperature limits for materials	(see appended table 7.4 and 4.5.5/RD)	P
4.5.4/RD	Touch temperature limits	(see appended table 7.4 and 4.5.5/RD)	P
4.5.5/RD	Resistance to abnormal heat :	(see appended table 7.4 and 4.5.5/RD)	P
7.4.2	Openings		P
7.4.3	Gas Concentration		N/A
7.4.4	Equipment movement		N/A

7.5 4.7/RD	Resistance to fire		P
4.7.1/RD	Reducing the risk of ignition and spread of flame		P
	Method 1, selection and application of components wiring and materials	Fire enclosure is provided	P
	Method 2, application of all of simulated fault condition tests		N/A
4.7.2/RD	Conditions for a fire enclosure		P
4.7.2.1/RD	Parts requiring a fire enclosure		P
4.7.2.2/RD	Parts not requiring a fire enclosure		N/A
4.7.3/RD	Materials		P
4.7.3.1/RD	General		P
4.7.3.2/RD	Materials for fire enclosures		P
4.7.3.3/RD	Materials for components and other parts outside fire enclosures		N/A
4.7.3.4/RD	Materials for components and other parts inside fire enclosures	See component list for details	P
4.7.3.5/RD	Materials for air filter assemblies	No such device within the EUT	N/A
4.7.3.6/RD	Materials used in high-voltage components	No such device within the EUT	N/A

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Clause	Requirement + Test	Result - Remark	Verdict

7.6	Battery location		P
7.6.1	Battery location and installation	The batteries are separated from EUT	P
7.6.2	Accessibility and maintainability	See manual for details	P
7.6.3	Distance		N/A
7.6.4	Case insulation		N/A
7.6.5	Wiring		N/A
7.6.6	Electrolyte spillage		N/A
7.6.7	Ventilation		N/A
7.6.8	Charging voltage	Rated 42-58Vdc	P

7.7	Temperature rise		P
4.5/RD	Thermal requirements		P
4.5.1/RD	General		P
4.5.2/RD	Temperature tests	(see appended table 7.7 and 4.5.2/RD)	P
	Normal load condition per Annex L :		P
4.5.3/RD	Temperature limits for materials		P
4.5.4/RD	Touch temperature limits		P
4.5.5/RD	Resistance to abnormal heat :	(see appended table 7.7 and 4.5.5/RD)	P

8	Electrical requirements and simulated abnormal conditions		P
8.1	General provisions for earth leakage		P
5.1.1/RD	General		P
5.1.7/RD	Equipment with touch current exceeding 3,5 mA	1.392 mA a.c. max.	N/A

8.2 5.2/RD	Electric strength		P
5.2.1/RD	General		P
5.2.2/RD	Test procedure	(see appended table 8.2 and 5.2.2/RD)	P

8.3	Abnormal operating and fault conditions		P
8.3.1	General		P
5.3.1/RD	Protection against overload and abnormal operation	(see appended table 8.3 and 5.3.1/RD)	P

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Clause	Requirement + Test	Result - Remark	Verdict
5.3.2/RD	Motors		N/A
5.3.3/RD	Transformers	(see appended Annex C)	P
5.3.4/RD	Functional insulation	Methods a), b) and c)	P
5.3.5/RD	Electromechanical components		N/A
5.3.9/RD	Compliance criteria for abnormal operating and fault conditions		N/A
8.3.2	Simulation of faults	(see appended table 8.3 and 5.3.1/RD)	P
8.3.3	Conditions for tests		P

9 6/RD	Connection to telecommunication networks		N/A
6.1/RD	Protection of telecommunication network service persons, and users of other equipment connected to the network, from hazards in the equipment		N/A
6.1.1/RD	Protection from hazardous voltages		N/A
6.1.2/RD	Separation of the telecommunication network from earth		N/A
6.1.2.1/RD	Requirements		N/A
	Supply voltage (V)		—
	Current in the test circuit (mA)		—
6.1.2.2/RD	Exclusions		N/A
6.2/RD	Protection of equipment users from overvoltages on telecommunication networks		N/A
6.2.1/RD	Separation requirements		N/A
6.2.2/RD	Electric strength test procedure		N/A
6.2.2.1/RD	Impulse test		N/A
6.2.2.2/RD	Steady-state test		N/A
6.2.2.3/RD	Compliance criteria		N/A
6.3/RD	Protection of the telecommunication wiring system from overheating		N/A
	Max. output current (A)		—
3.5/RD	Interconnection of equipment		P
3.5.1/RD	General requirements		P
3.5.2/RD	Types of interconnection circuits	SELV circuits	P
3.5.3/RD	ELV circuits as interconnection circuits	No ELV circuits	N/A
3.5.4/RD	Data ports for additional equipment		N/A
2.1.3/RD	Protection in restricted access locations		N/A
2.3.1/RD	Limits		N/A
	Type of TNV circuits		—

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Clause	Requirement + Test	Result - Remark	Verdict
2.3.2/RD	Separation from other circuits and from accessible parts		N/A
2.3.2.1/RD	General requirements		N/A
2.3.2.2/RD	Protection by basic insulation		N/A
2.3.2.3/RD	Protection by earthing		N/A
2.3.2.4/RD	Protection by other constructions		N/A
2.3.3/RD	Separation from hazardous voltages		N/A
	Insulation employed		—
2.3.4/RD	Connection of TNV circuits to other circuits		N/A
	Insulation employed		—
2.3.5/RD	Test for operating voltages generated externally		N/A
2.6.5.8/RD	Reliance on telecommunication network or cable distribution system		N/A
2.10.3.3/RD	Clearances in primary circuits	(see appended table 5.7 and 2.10.4/RD)	P
2.10.3.4/RD	Clearances in secondary circuits	(see appended table 5.7 and 2.10.4/RD)	P
2.10.4/RD	Creepage distances		P
2.10.4.1/RD	General		P
2.10.4.2/RD	Material group and comparative tracking index	Material group IIIb is assumed to be used	P
	CTI tests		—
2.10.4.3/RD	Minimum creepage distances	(see appended table 5.7 and 2.10.4/RD)	P
M/RD	ANNEX M, CRITERIA FOR TELEPHONE RINGING SIGNALS (see 2.3.1/RD)		N/A
M.1/RD	Introduction		N/A
M.2 /RD	Method A		N/A
M.3/RD	Method B		N/A
M.3.1/RD	Ringling signal		N/A
M.3.1.1/RD	Frequency (Hz)		—
M.3.1.2/RD	Voltage (V)		—
M.3.1.3/RD	Cadence; time (s), voltage (V)		—
M.3.1.4/RD	Single fault current (mA)		—
M.3.2/RD	Tripping device and monitoring voltage		N/A
M.3.2.1/RD	Conditions for use of a tripping device or a monitoring voltage		—
M.3.2.2/RD	Tripping device		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

M.3.2.3/RD	Monitoring voltage (V)		N/A
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A/RD	Annex A, Tests for resistance to heat and fire		N/A
A.1/RD	Flammability test for fire enclosures of movable equipment having a total mass exceeding 18 kg, and of stationary equipment (see 4.7.3.2/RD)		N/A
A.1.1/RD	Samples		—
	Wall thickness (mm)		—
A.1.2/RD	Conditioning of samples; temperature (°C)		N/A
A.1.3/RD	Mounting of samples		N/A
A.1.4/RD	Test flame (see IEC 60695-11-3)		N/A
	Flame A, B, C or D		—
A.1.5/RD	Test procedure		N/A
A.1.6/RD	Compliance criteria		N/A
	Sample 1 burning time (s)		—
	Sample 2 burning time (s)		—
	Sample 3 burning time (s)		—
A.2/RD	Flammability test for fire enclosures of movable equipment having a total mass not exceeding 18 kg, and for material and components located inside fire enclosures (see 4.7.3.2/RD and 4.7.3.4/RD)		N/A
A.2.1/RD	Samples, material		—
	Wall thickness (mm)		—
A.2.2/RD	Conditioning of samples; temperature (°C)		N/A
A.2.3/RD	Mounting of samples		N/A
A.2.4/RD	Test flame (see IEC 60695-11-4)		N/A
	Flame A, B or C		—
A.2.5/RD	Test procedure		N/A
A.2.6/RD	Compliance criteria		N/A
	Sample 1 burning time (s)		—
	Sample 2 burning time (s)		—
	Sample 3 burning time (s)		—
A.2.7/RD	Alternative test acc. to IEC 60695-11-5, cl. 5 and 9		N/A
	Sample 1 burning time (s)		—
	Sample 2 burning time (s)		—
	Sample 3 burning time (s)		—

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Clause	Requirement + Test	Result - Remark	Verdict

A.3/RD	Hot flaming oil test (see 4.6.2/RD)		N/A
A.3.1/RD	Mounting of samples		N/A
A.3.2/RD	Test procedure		N/A
A.3.3/RD	Compliance criterion		N/A

B/RD	Annex B, Motor tests under abnormal conditions (see 4.7.2.2/RD and 5.3.2/RD)		N/A
B.1/RD	General requirements		N/A
	Position		—
	Manufacturer		—
	Type		—
	Rated values		—
B.2/RD	Test conditions		N/A
B.3/RD	Maximum temperatures		N/A
B.4/RD	Running overload test		N/A
B.5/RD	Locked-rotor overload test		N/A
	Test duration (days)		—
	Electric strength test: test voltage (V)		—
B.6/RD	Running overload test for d.c. motors in secondary circuits		N/A
B.6.1/RD	General		N/A
B.6.2/RD	Test procedure		N/A
B.6.3/RD	Alternative test procedure		N/A
B.6.4/RD	Electric strength test; test voltage (V)		N/A
B.7/RD	Locked-rotor overload test for d.c. motors in secondary circuits		N/A
B.7.1/RD	General		N/A
B.7.2/RD	Test procedure		N/A
B.7.3/RD	Alternative test procedure		N/A
B.7.4/RD	Electric strength test; test voltage (V)		N/A
B.8/RD	Test for motors with capacitors		N/A
B.9/RD	Test for three-phase motors		N/A
B.10/RD	Test for series motors		N/A
	Operating voltage (V)		—

C/RD	Annex C, Transformers (see 1.5.4/RD and 5.3.3/RD)		P
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Clause	Requirement + Test	Result - Remark	Verdict

	Position	TX1 (on main board) Isolated transformer	—
	Manufacturer	Bo Luo Da Xin Electronic Co.,Ltd / Huizhou Baohui Electronic Co.,Ltd	—
	Type	See component list for details	—
	Rated values	See component list for details	—
	Method of protection		—
C.1/RD	Overload test	Class B	P
C.2/RD	Insulation	With external over current protection	P
	Protection from displacement of windings	By insulating tape and bobbin	P

D/RD	Annex D, Measuring instruments for touch current tests (see 5.1.4/RD)		P
D.1/RD	Measuring instrument		P
D.2/RD	Alternative measuring instrument		N/A

E/RD	Annex E, Temperature rise of a winding (see 1.4.13/RD)		N/A
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F/RD	Annex F, Measurements of clearances and creepage distance (see 2.10/RD and Annex G/RD)		P
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G/RD	Annex G, Alternative method for determining minimum clearances		N/A
G.1/RD	Clearances		N/A
G.1.1/RD	General		N/A
G.1.2/RD	Summary of the procedure for determining minimum clearances		N/A
G.2/RD	Determination of mains transient voltage (V)		N/A
G.2.1/RD	AC mains supply		N/A
G.2.2/RD	Earthed d.c. mains supplies		N/A
G.2.3/RD	Unearthed d.c. mains supplies		N/A
G.2.4/RD	Battery operation		N/A
G.3/RD	Determination of telecommunication network transient voltage (V)		N/A
G.4/RD	Determination of required withstand voltage (V)		N/A
G.4.1/RD	Mains transients and internal repetitive peaks :		N/A
G.4.2/RD	Transients from telecommunication networks . :		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

G.4.3/RD	Combination of transients		N/A
G.4.4/RD	Transients from cable distribution systems		N/A
G.5/RD	Measurement of transient voltages (V)		N/A
	a) Transients from a mains supply		N/A
	For an a.c. mains supply		N/A
	For a d.c. mains supply		N/A
	b) Transients from a telecommunication network		N/A
G.6/RD	Determination of minimum clearances :		N/A

H	Annex H, Guidance on protection against ingress of water and foreign objects (see IEC 60529)		N/A
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I	Annex I, Backfeed protection test		P
I.1	General		P
I.2	Test for pluggable UPS		N/A
I.3	Test for permanently connected UPS		N/A
I.4	Load-induced change of reference potential		N/A
I.5	Solid-state backfeed protection (see clause 7.1-7.5 of IEC 62040-2 and clause 7.1-7.2 of IEC 62040-3)		N/A

J/RD	Annex J, Table of electrochemical potentials (see 2.6.5.6/RD)		N/A
	Metal(s) used :		—

K/RD	Annex K, Thermal controls (see 1.5.3/RD and 5.3.8/RD)		N/A
K.1/RD	Making and breaking capacity		N/A
K.2 /RD	Thermostat reliability; operating voltage (V) ... :		N/A
K.3/RD	Thermostat endurance test; operating voltage (V) :		N/A
K.4/RD	Temperature limiter endurance; operating voltage (V) :		N/A
K.5/RD	Thermal cut-out reliability		N/A
K.6/RD	Stability of operation		N/A

L	Annex L, Reference loads		P
L.1	General		P
L.2	Reference resistive load		P

IEC 62040-1			
Clause	Requirement + Test	Result - Remark	Verdict
L.3	Reference inductive-resistive load		—
L.4	Reference capacitive-resistive loads		N/A
L.5	Reference non-linear load		N/A
L.5.1	Test method		N/A
L.5.2	Connection of the non-linear reference load		—
M	Annex M, Ventilation of battery compartments		N/A
M.1	General		N/A
M.2	Normal conditions		N/A
M.3	Blocked conditions		N/A
M.4	Overcharge conditions		N/A
N	Annex N, Minimum and maximum cross-sections of copper conductors suitable for connection (see 6.3)		N/A
U/RD	Annex U, Insulated winding wires for use without interleaved insulation (see 2.10.5.4/RD)		N/A
			—
V/RD	Annex V, AC POWER DISTRIBUTION SYSTEMS (see 1.6.1/RD)		N/A
V.1/RD	Introduction		N/A
V.2/RD	TN power distribution systems		N/A

IEC 62040-1			
Clause	Requirement + Test	Result - Remark	Verdict

4.5	TABLE: List of critical components				P
object/part No.	manufacturer/ trademark	type/model	technical data	standard	mark(s) of conformity ¹⁾
Enclosure	Various	Various	Metal, AL 5052 456*358*14.2m m (W / D / H) IP65	IEC/EN 62109-1 IEC/EN 62109-2 IEC/EN 62040-1	Tested with appliance
Battery input connector	SHENZHEN SUCCEED ELECTRONICS TECHNOLOGY CO.,LTD	TD100-01-2P-C	2pin, 600V ,101A, 35*56*71	EN 60998 UL 486A IEC/EN 62109-1 IEC/EN 62109-2 IEC/EN 62040-1	CE UL* Tested with appliance
Internal wiring (for DC-in)	Various	10269	8AWG, 600 V, 105°C or better	UL 758	UL*
Internal wiring (for AC-out)	Various	1015	12AWG, 600 V, 105°C or better	UL 758	UL*
PCB	SHANTOU LUCKY STAR PCB CO.,LTD.	WS888	130°C, V-0, CTI:min.175	UL94 IEC/EN 62109-1 IEC/EN 62109-2 IEC/EN 62040-1	UL* Tested with appliance
(Alternative)	Various	Various	130°C, V-0, CTI:min.175	UL94	UL*
DC-LINK Capacitor (EC2,EC3,ECF3 2)	Unielecs Co.,LTD	LLN2W681M356 0	680µF, 450V, 105°C	IEC/EN 62109-1 IEC/EN 62109-2 IEC/EN 62040-1	Tested with appliance
DC-LINK Capacitor (CF383)	Xiamen FARA Electronic Co.,Ltd	C3D2H606KF0A C00	60µF, 500V, 105°C	IEC/EN 62109-1 IEC/EN 62109-2 IEC/EN 62040-1	Tested with appliance
Y capacitor (C11, C12, C13, C19, C20, C21, C51, C56, C70, C71)	Shantou High- New Technology Dev. Zone Songtian Enterprise Co., Ltd	G14F1D103MN0 BOSO	Y2, 10nF, 250Vac, 125°C	IEC 60384-14	VDE*
(Alternative)	Shantou High- New Technology Dev. Zone Songtian Enterprise Co., Ltd	CEY210Y5V1E4 72MB	Y2, 4.7nF, 250Vac, 125°C	IEC 60384-14	VDE*
(Alternative)	Various	Various	Y2, 10nF/4.7nF, 250Vac, 125°C	IEC 60384-14	VDE or other EU certificate
X capacitor (C15, CF397)	Xiamen FARA Electronic Co.,Ltd	MKP62	X2, min 275VAC,2.2µF, 100°C	IEC 60384-14	VDE*

IEC 62040-1					
Clause	Requirement + Test			Result - Remark	Verdict
(Alternative)	Various	Various	X2, min 275VAC, 2.2μ, 100°C	IEC 60384-14	VDE or other EU certificate
Varistor (MOV1 · MOV3)	Thinking Electronic Industrial Co.Ltd	TVR20561KSY	560VDC, I _{max} : 6.5 KA, Max.: 85°C	IEC 61051-1 IEC 61051-2 IEC 61051-2-2	VDE*
Insulation sheet under IGBT	BERGQUIST CO	K-10	150°C, V-0, min. 1.3mm thickness.	UL 94	UL*
Current transducer (HCT2)	LEM	CASR 15-NP	IPN: ±15A; V _{out} : ±5V Max.: 85°C	IEC/EN 62109-1 IEC/EN 62109-2 IEC/EN 62040-1	Tested with appliance
(Alternative)	VAC	T60404-N4646-X662	IPN: ±15A; V _{out} : ±5V Max.: 85°C	IEC/EN 62109-1 IEC/EN 62109-2 IEC/EN 62040-1	Tested with appliance
Boost chock	Bo Luo Da Xin Electronic Co., Ltd	SH-L028	0.816mH, Class F	IEC/EN 62109-1 IEC/EN 62109-2 IEC/EN 62040-1	Tested with appliance
(Alternative)	Huizhou Baohui Electronics Technology Co., Ltd	SH-L028	0.816mH, Class F	IEC/EN 62109-1 IEC/EN 62109-2 IEC/EN 62040-1	Tested with appliance
- Lead wire of the boost chock	Various	1015	10AWG, 600V, 105°C or better	UL 758 IEC/EN 62109-1 IEC/EN 62109-2 IEC/EN 62040-1	UL* Tested with appliance
- Winding of the boost chock	Various	Various	155°C or above	UL 1446 IEC/EN 62109-1 IEC/EN 62109-2 IEC/EN 62040-1	UL* Tested with appliance
- Tube	SHENZHEN WAHCHANGWEI INDUSTRIAL CO.,LTD	SGS-25	600V, 200°C	UL 224 IEC/EN 62109-1 IEC/EN 62109-2 IEC/EN 62040-1	UL* Tested with appliance
Varnish	WU JIANG TAIHU INSULATING MATERIAL CO LTD	T-4260(a)	155°C	UL 1446 IEC/EN 62109-1 IEC/EN 62109-2 IEC/EN 62040-1	UL* Tested with appliance
Inv chock	Bo Luo Da Xin Electronic Co., Ltd	SH-L029	0.9mH, Class F	IEC/EN 62109-1 IEC/EN 62109-2 IEC/EN 62040-1	Tested with appliance
(Alternative)	Huizhou Baohui Electronics Technology Co., Ltd	SH-L029	0.9mH, Class F	IEC/EN 62109-1 IEC/EN 62109-2 IEC/EN 62040-1	Tested with appliance
- Lead wire of the Inv chock	Various	1015	10AWG, 600V, 105°C or better	UL 758 IEC/EN 62109-1 IEC/EN 62109-2 IEC/EN 62040-1	UL* Tested with appliance

IEC 62040-1					
Clause	Requirement + Test			Result - Remark	Verdict
- Winding of the Inv chock	Various	Various	155°C or above	UL 1446 IEC/EN 62109-1 IEC/EN 62109-2 IEC/EN 62040-1	UL* Tested with appliance
- Tube	SHENZHEN WAHCHANGWEI INDUSTRIAL CO.,LTD	SGS-25	600V, 200°C	UL 224 IEC/EN 62109-1 IEC/EN 62109-2 IEC/EN 62040-1	UL* Tested with appliance
Varnish	WU JIANG TAIHU INSULATING MATERIAL CO LTD	T-4260(a)	155°C	UL 1446 IEC/EN 62109-1 IEC/EN 62109-2 IEC/EN 62040-1	UL* Tested with appliance
AC Filter	Bo Luo Da Xin Electronic Co., Ltd	NSP080060	12µH, Class B	IEC/EN 62109-1 IEC/EN 62109-2 IEC/EN 62040-1	Tested with appliance
(Alternative)	Huizhou Baohui Electronics Technology Co., Ltd	NSP080060	12µH, Class B	IEC/EN 62109-1 IEC/EN 62109-2 IEC/EN 62040-1	Tested with appliance
AC Filter	Bo Luo Da Xin Electronic Co., Ltd	NSP080060	1.8mH, Class B	IEC/EN 62109-1 IEC/EN 62109-2 IEC/EN 62040-1	Tested with appliance
(Alternative)	Huizhou Baohui Electronics Technology Co., Ltd	NSP080060	1.8mH, Class B	IEC/EN 62109-1 IEC/EN 62109-2 IEC/EN 62040-1	Tested with appliance
- Wire	Various	Various	130°C or batter	UL 1446 IEC/EN 62109-1 IEC/EN 62109-2 IEC/EN 62040-1	UL* Tested with appliance
- VARNISH	WUJIANGTAIHU INSULATING MATERIAL COLTD	T-4260(a)	130°C	UL 1446 IEC/EN 62109-1 IEC/EN 62109-2 IEC/EN 62040-1	UL* Tested with appliance
- Spacer	KINGBOARDLAMINATES(MACAO COMMERCIAL OFFSHORE)LTD	FR-4	130°C	UL 746E IEC/EN 62109-1 IEC/EN 62109-2 IEC/EN 62040-1	UL* Tested with appliance
High frequency isolated transformer	Bo Luo Da Xin Electronic Co., Ltd	SH-T011	EE65, Class F	IEC/EN 62109-1 IEC/EN 62109-2 IEC/EN 62040-1	Tested with appliance
(Alternative)	Huizhou Baohui Electronics Technology Co., Ltd	SH-T011	EE65, Class F	IEC/EN 62109-1 IEC/EN 62109-2 IEC/EN 62040-1	Tested with appliance
- Winding	Various	Various	155°C or above	UL 1446	UL*

IEC 62040-1					
Clause	Requirement + Test			Result - Remark	Verdict
- Insulation tape	Jingjiang Yahua Pressure Sensitive Glue Co Ltd	PF-	180°C	UL 510 IEC/EN 62109-1 IEC/EN 62109-2 IEC/EN 62040-1	UL* Tested with appliance
(Alternative)	Various	Various	180°C	UL 510	UL*
- Tube	SHENZHEN WAHCHANGWEI INDUSTRIAL CO.,LTD	SGS-25	600V, 200°C	UL 224 IEC/EN 62109-1 IEC/EN 62109-2 IEC/EN 62040-1	UL* Tested with appliance
- PRESS BOARDS	E I DUPONT DE NEMOURS & CO INC	NOMEX410	220°C	UL 746D IEC/EN 62109-1 IEC/EN 62109-2 IEC/EN 62040-1	UL* Tested with appliance
Varnish	WU JIANG TAIHU INSULATING MATERIAL CO LTD	T-4260(a)	155°C	UL 1446 IEC/EN 62109-1 IEC/EN 62109-2 IEC/EN 62040-1	UL* Tested with appliance
IGBT (Q2, Q3, Q7, Q8, Q14, Q19)	Fairchild Semiconductor Corporation	FGA40N65SMD	650V, 40A	IEC/EN 62109-1 IEC/EN 62109-2 IEC/EN 62040-1	Tested with appliance
(Alternative)	ST Microelectronics	STGWT40H65D FB	650V, 40A	IEC/EN 62109-1 IEC/EN 62109-2 IEC/EN 62040-1	Tested with appliance
(Alternative)	IXYS CORPORATION	IXXH40N65B4H 1	650V, 40A	IEC/EN 62109-1 IEC/EN 62109-2 IEC/EN 62040-1	Tested with appliance
IGBT (QD1, QD2, QD3, QD4)	Infineon Semiconductor Corporation	IKW40N65H5	650V, 46A	IEC/EN 62109-1 IEC/EN 62109-2 IEC/EN 62040-1	Tested with appliance
MOSFET (Q54, Q59, Q60, Q61, Q62, Q63, Q64, Q65)	Fairchild Semiconductor Corporation	FDP027N08B	80V, 120A	IEC/EN 62109-1 IEC/EN 62109-2 IEC/EN 62040-1	Tested with appliance
(Alternative)	ST Microelectronics	STP270N8F7	80V, 180A	IEC/EN 62109-1 IEC/EN 62109-2 IEC/EN 62040-1	Tested with appliance
(Alternative)	IXYS CORPORATION	IXTP230N075T2	75V, 115A	IEC/EN 62109-1 IEC/EN 62109-2 IEC/EN 62040-1	Tested with appliance
Relay (RYB1,RYB2,RY B3)	Panasonic Corporation Ise Factory	ALFG2PF12	31A, 250Vac, 12Vdc, 85°C	IEC/EN 61810-1	VDE*
(Alternative)	Xiamen Hongfa Electroacoustics Co., Ltd.	HF161F-W/12-HT	31A, 250Vac, 12Vdc, 85°C	IEC/EN 61810-1	VDE*
AC output terminal	Shenzhen teng da xing Electron Co.,Ltd	PA12H-3P	3P, 500V, 41A	EN 60998-1	VDE*

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Clause	Requirement + Test			Result - Remark	Verdict
Transformer (TX1 in communication board)	Huizhou Baohui Electronics Technology Co., Ltd	SH-T010	Class B	IEC/EN 62109-1 IEC/EN 62109-2 IEC/EN 62040-1	Tested with appliance
(Alternative)	Bo Luo Da Xin Electronic Co., Ltd	SH-T010	Class B	IEC/EN 62109-1 IEC/EN 62109-2 IEC/EN 62040-1	Tested with appliance
- Bobbin of the transformer	CHANG CHUN PLASTICS CO LTD	PM-9820 PM-9830	150°C, V-0	IEC/EN 62109-1 IEC/EN 62109-2 IEC/EN 62040-1	UL* Tested with appliance
(Alternative)	Chang Chun Plastics Co Ltd	T375J	V-0, 150°C	IEC/EN 62109-1 IEC/EN 62109-2 IEC/EN 62040-1	UL* Tested with appliance
- Insulating tape of the transformer	Jingjiang Yahua Pressure Sensitive Glue Co Ltd	CT	130°C	UL 510	UL*
(Alternative)	Various	Various	130°C or above	UL 510	UL*
- Margin Tape	Jingjiang Yahua Pressure Sensitive Glue Co Ltd	WF	130°C	UL 510	UL*
(Alternative)	Various	Various	130°C or above	UL 510	UL*
- Magnet wire of the transformer	Tai-I Electric Wire & Cable Co Ltd	UEW	130°C	UL 1446	UL*
(Alternative)	Various	Various	130°C or above	UL 1446	UL*
- Varnishes	Suzhou Taihu Electric Advanced Material Co Ltd	T-4260(a)	130°C	UL 1446	UL*
(Alternative)	Various	Various	130°C or above	UL 1446	UL*
Optocoupler (U3, U4, U5, U6, U8, U9)	Lite-On Technology Corporation	LTV816SB-V	Di ≥ 0.4mm Internall External di ≥ 8.0mm, AC5000V, reinforced Insulation 100°C	EN 60747-5-5	VDE*
(Alternative)	Fairchild Semiconductor Corporation	FOD817	Di ≥ 0.4mm Internal di ≥ 7.0mm External di ≥ 7.0mm, AC 5000V, reinforced Insulation 110°C	EN 60747-5-5	VDE*

IEC 62040-1					
Clause	Requirement + Test			Result - Remark	Verdict
(Alternative)	Everlight Electronics	EL817	Di ≥ 0.4mm Internall di ≥ 7.6mm External di ≥ 7.6mm, AC 5000V, reinforced Insulation 110°C	EN 60747-5-5	VDE*
DC fuse	Shenzhen victors industrial CO.,LTD	VBS1727	150Vdc, 100A	UL 248 IEC/EN 62109-1 IEC/EN 62109-2 IEC/EN 62040-1	UL* Tested with appliance
LCD panel	BAYER MATERIALSCIE NCE AG	6557 + (z)(f1)	V-0, 3.0mm thickness, Anti-UV	UL 746D IEC/EN 62109-1 IEC/EN 62109-2	UL* Tested with appliance
¹⁾ an asterisk indicates a mark which assures the agreed level of surveillance					

IEC 62040-1			
Clause	Requirement + Test	Result - Remark	Verdict

4.6 and 1.6.2/RD	TABLE: Electrical data (in normal conditions)						P
U (V)	I (A)	I _{rated} (A)	P (W)	Fuse #	I _{fuse} (A)	Condition/status	
48.01	59.23	60	3009.02	--	--	Charging of empty batteries	
Supplementary information:							

5.1.1 and 2.1.1.7/RD	TABLE: discharge of capacitors in the primary circuit					P
Condition	τ calculated (s)	V measured (after 5mins)	t _{u→0V} (s)	Comments		
Batteries input	--	33.2Vdc	--	--		
Note(s):						

5.2.1 and 2.2.2/RD	TABLE: SELV measurement (under normal conditions)				P
Location	Voltage (max.) (V)		Voltage Limitation Component	Supplementary information:NA	
	V peak	V d.c.			
Communication port	--	5.76	--		
DRM port	--	6.52	--		

5.2.1 and 2.2.3/RD	TABLE: SELV measurement (under fault conditions)			P
Location	Voltage (max.) (V)	Comments		
Communication port	0 Vdc	S/C		
DRM port	0 Vdc	S/C		
Supplementary information:				

5.3.1 and 2.6.3.4/RD	TABLE: Resistance of earthing measurement		P
Location	voltage drop (V)	Comments	
Between Earthing Conductors and Their Terminals	0.5V	12V, 50A, 2min	
Supplementary information:			

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Clause	Requirement + Test	Result - Remark	Verdict

5.3.18.3 and 5.3.1/RD		TABLE: Abnormal operating and fault conditions				P
		Ambient temperature (°C)		25	—	
		Model		ME 3000SP	—	
No.	Component No.	fault	Test voltage	Duration	Result	
1	BAT input	Reverse polarity	Input 50Vdc Output 230Vac	10min	The PCE do not work, DC fuse opened. No hazards	
2	AC output	Reverse polarity	Input 50Vdc Output 230Vac	10min	Inverter work normal.	
2	EC2 in communication board	S/C	Input 50Vdc Output 230Vac	10min	The PCE shutdown immediately, and disconnect from the grid. No hazards	
3	C196	S/C	Input 50Vdc Output 230Vac	10min	The PCE can operate normally, but the communication fails. No hazards	
4	C197	S/C	Input 50Vdc Output 230Vac	10min	The PCE switch off immediately, and disconnect from the grid, error code "ID17, ID18, ID19" display. No hazards	
5	RYB1	S/C	Input 50Vdc Output 230Vac	10min	The PCE check relay fail before power on, error code "ID55, ID77" display. No hazards	
6	HCT (12-13)	S/C)	Input 50Vdc Output 230Vac	10min	The PCE switch off immediately, and disconnect from the grid, error code "ID10" display. No hazards	
7	Q2 (C-G)	S/C	Input 50Vdc Output 230Vac	10min	The PCE shutdown immediately, components Q2,Q8, R26,R27, Q4, Q24 damaged. No hazards	
8	Q2 (C-E)	S/C	Input 50Vdc Output 230Vac	10min	The PCE shutdown immediately, components Q8, C17, R44, Q3, C10, R25, Q7, R37 damaged. No hazards	
9	Q3 (C-G)	S/C	Input 50Vdc Output 230Vac	10min	The PCE shutdown immediately, components Q3, R28, R29, Q5, and U23 damaged. No hazards	

IEC 62040-1			
Clause	Requirement + Test	Result - Remark	Verdict

5.3.18.3 and 5.3.1/RD		TABLE: Abnormal operating and fault conditions				P
		Ambient temperature (°C)		25	—	
		Model		ME 3000SP	—	
No.	Component No.	fault	Test voltage	Duration	Result	
10	Q3 (C-E)	S/C	Input 50Vdc Output 230Vac	10min	The PCE shutdown immediately, components Q7, C16, R39, R37, R38, Q8, C17, and R44 damaged. No hazards	
11	Q14	S/C	Input 50Vdc Output 230Vac	10min	The PCE shutdown immediately, components Q14, R80, R73, and Q15 damaged. No hazards	
12	QD2 (C-G)	S/C	Input 50Vdc Output 230Vac	10min	The PCE shutdown immediately, components QD2, R76, R78, Q18, QD3 and U30 damaged. No hazards	
13	QD2 (C-E)	S/C	Input 50Vdc Output 230Vac	10min	The PCE shutdown immediately, components QD3, R96, R94, Q21, QD4 and U33 damaged. No hazards	
14	QD1 (C-E)	S/C	Input 50Vdc Output 230Vac	10min	The PCE shutdown immediately, components QD4, R93, R95, and QD2 damaged. No hazards	
15	QD1 (C-G)	S/C	Input 50Vdc Output 230Vac	10min	The PCE shutdown immediately, components QD1, Q18, R76, and R83 damaged. No hazards	
16	EC2 in main board	S/C	Input 50Vdc Output 230Vac	10min	The PCE shutdown immediately, components Q14, Q19, Q2, Q8, QD1 and QD3 damaged. No hazards	
17	RD1	O/C	Input 50Vdc Output 230Vac	10min	The PCE switch off immediately, and disconnect from the grid, error code "ID29, ID25" display. No hazards	
18	RD5	O/C	Input 50Vdc Output 230Vac	10min	The PCE switch off immediately, and disconnect from the grid, error code "ID29, ID25" display. No hazards	
19	Q54 (D-S)	S/C	Input 50Vdc Output 230Vac	10min	The PCE shutdown immediately, components Q62, Q63, R104, C63, R105 and Q64 damaged. No hazards	

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Clause	Requirement + Test	Result - Remark	Verdict

5.3.18.3 and 5.3.1/RD		TABLE: Abnormal operating and fault conditions				P
		Ambient temperature (°C)		25	—	
		Model		ME 3000SP	—	
No.	Component No.	fault	Test voltage	Duration	Result	
20	Q60 (D-S)	S/C	Input 50Vdc Output 230Vac	10min	The PCE shutdown immediately, components Q64, Q65, R106, C65, R103 and Q66 damaged. No hazards	
21	C39	S/C	Input 50Vdc Output 230Vac	10min	The PCE shutdown immediately, components RT618, D5 and D8 damaged. No hazards	
22	EC9	S/C	Input 55Vdc Output 230Vac	10min	The PCE shutdown immediately, and disconnect from the grid. No hazards	
23	EC11	S/C	Input 50Vdc Output 230Vac	10min	The PCE shutdown immediately, and disconnect from the grid. No hazards	
24	EC13	S/C	Input 50Vdc Output 230Vac	10min	The PCE shutdown immediately, and disconnect from the grid. No hazards	
25	EC18	S/C	Input 50Vdc Output 230Vac	10min	The PCE shutdown immediately, and disconnect from the grid. No hazards	
26	Q24 (G-D)	S/C	Input 50Vdc Output 230Vac	10min	The PCE shutdown immediately, components Q24, R127 and U6 damaged. No hazards	
27	Q24 (D-S)	S/C	Input 50Vdc Output 230Vac	10min	The PCE shutdown immediately, components Q24, R137, R138, and R135 damaged. No hazards	
28	ECF31	S/C	Input 50Vdc Output 230Vac	10min	The PCE switch off immediately, and disconnect from the grid, error "communication fails" display. No hazards	
29	AC output	O/L	Input 50Vdc Output 230Vac	2h	The PCE is adjusted by connecting a variable resistor to achieve max current output and the max power output, since the temperature achieve stable. No hazards	

IEC 62040-1			
Clause	Requirement + Test	Result - Remark	Verdict

5.3.18.3 and 5.3.1/RD		TABLE: Abnormal operating and fault conditions			P
		Ambient temperature (°C)	25		—
		Model	ME 3000SP		—
No.	Component No.	fault	Test voltage	Duration	Result
Supplementary information and remarks: S-C: Short circuit, O-C: Open circuit During the test: Fire do not propagates beyond the EUT; Equipment do not emitt molten metal; Enclosures do not deform to cause non-compliance with the standard. Pass the dielectric test.					

5.7 and 2.10.4/RD		TABLE: Clearance and creepage distance measurements					P
clearance cl and creepage distance dcr at / of:	Up (V)	U r.m.s. (V)	required cl (mm)	cl (mm)	required dcr (mm)	dcr (mm)	
Battery input "+" and "+" on PCB (BI)	60Vdc	60Vdc	0.2	1.15	0.2	1.15	
The pin of DC fuse on PCB (BI)	60Vdc	60Vdc	0.2	3.21	0.2	3.21	
Between main board and metal enclosure (BI)	326V	60Vdc 230 Vac	3.0	3.75	3.0	3.75	
The live parts across Y capacitor C51,C56 on PCB to earthed enclosure (BI)	326V	60Vdc 230 Vac	3.0	6.00	3.0	6.00	
The live parts across Y capacitor C11,C211 on PCB to earthed enclosure (BI)	326V	60Vdc 230 Vac	3.0	7.93	3.0	7.93	
The live parts across MOV1, MOV3 on PCB to earthed enclosure (BI)	326V	230 Vac	3.0	4.57	3.0	4.57	
The live parts across IGBT to earthed screws (BI)	326V	230 Vac	3.0	5.93	3.0	5.93	
The live parts across Y capacitor C12,C20,C13,C19 on PCB to earthed enclosure (BI)	326V	230 Vac	3.0	4.83	3.0	4.83	
The live parts across isolated optocoupler U13,U14,U15,U16,U18,U19 to accessible part (RS 485, CAN, DRM0) (RI)	326V	230 Vac	5.5	5.62	5.5	5.62	
The accessible parts (CTa,CTb,CTc, NTC) across series resistor to separate AC circuits (RI)	326V	230 Vac	5.5	5.60	5.5	5.60	
Remarks: 1) FI: function insulation BI: Basic insulation SI: Supplementary insulation RI: Reinforced insulation 2) A force of 10 N applied to the internal components and 250 N applied to the enclosure for measure							

IEC 62040-1			
Clause	Requirement + Test	Result - Remark	Verdict

5.7 and 2.10.4/RD	TABLE: Clearance and creepage distance measurements						P
clearance cl and creepage distance dcr at / of:	Up (V)	U r.m.s. (V)	required cl (mm)	cl (mm)	required dcr (mm)	dcr (mm)	
3) For battery circuit, system voltage is 60V and overvoltage Category is OVCII, impulse voltage corresponding to battery circuit is 500V. 4) For AC main circuit, nominal voltage is 230V and overvoltage category is OVC III, impulse voltage is corresponding to main circuit is 4000V. 5) The PCE enclosure is rated IP65 and the pollution degree inside enclosure is reduced from PD3 to PD2. 7) The disconnection devices are two relays, clearance between contacts of each relay rated min.1,5 mm. The isolated transformer and relay used for basic insulation according to IEC 62109-2 Clause 4.4.4.15.2.2.							

5.7 and 2.10.5.1 /RD	TABLE: Distance through insulation measurements				P
distance through insulation di at/of:	U r.m.s. (V)	test voltage (V)	required di (mm)	di (mm)	
Communication isolated optocoupler	230c	6000Vpk	--	certified	

8.2 and 5.2.2/RD	Electric strength				P
test voltage applied between:	test voltage (V)	impulse withstand voltage (V)	partial discharge extinction voltage (V)	result	
Battery input and Ground (BI)	800Vac	500V	N/A	No breakdown	
Battery input and communication output port(RI)	1500Vac	800V	N/A	No breakdown	
AC mains output and Ground (BI)	1500Vac	4000V	N/A	No breakdown	
AC mains and communication output port and accessible parts (CTa, CTb, CTc, NTC)(RI)	3000Vac	6000V	N/A	No breakdown	

7.7 and 4.5.5/RD	TABLE: Ball pressure test of thermoplastic parts		P
	Allowed impression diameter (mm)	≤ 2 mm	—
Part	Test temperature (°C)	Impression diameter (mm)	
Bobbin	125	0.86	

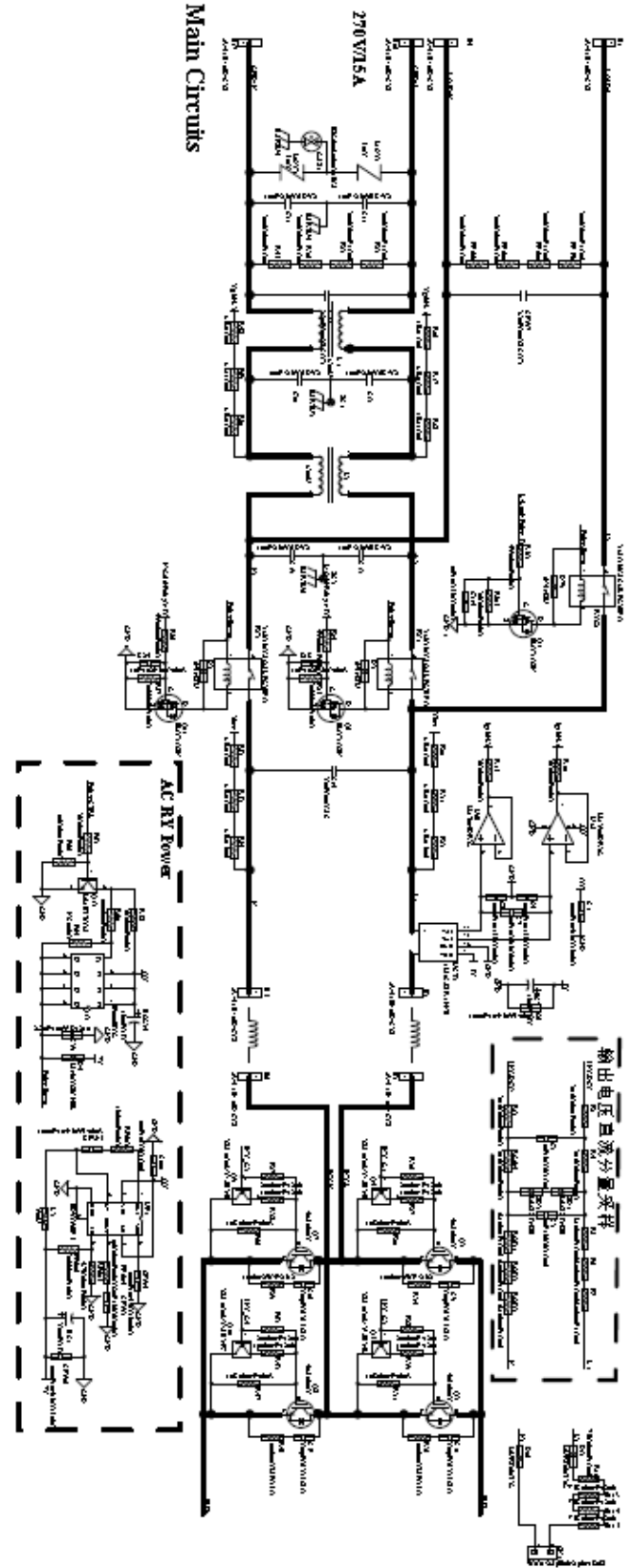
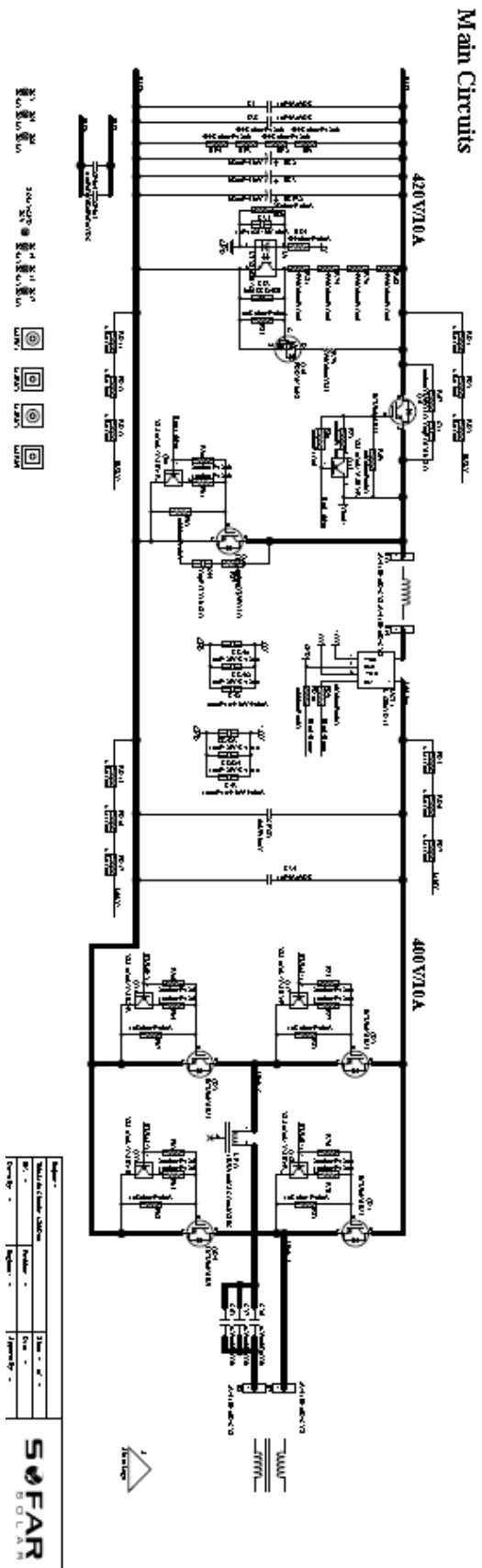
IEC 62040-1			
Clause	Requirement + Test	Result - Remark	Verdict
	AC output connector	125	1.63
	Batteries input connector	125	1.74

7.7 and 4.5.2/RD		TABLE: Thermal requirements		P
temperature t of part/at:		t (C)		permitted t (C)
Test condition	Discharging power & charging power	3013.72W	Derating to 1300.45W	--
Ambient		45.8	59.5	--
Input lead wires		75.0	90.7	105
Y capacitor C51		75.7	91.8	125
Filter capacitor CF370		92.3	101.7	110
PF18 (the lead wire of high frequency isolated transformer)		109.4	124.1	130
PF19 (the lead wire of high frequency isolated transformer)		100.1	115.7	130
Filter Chock L4		83.6	98.7	110
Transformer TX2		102.8	106.3	110
Transformer TX1		89.4	103.8	110
Winding of transformer TX1		89.7	104.2	110
Y capacitor C70		93.1	108.7	110
PCB under D15		91.2	106.7	130
Boost inductor		95.9	108.7	130
Bus capacitor ECF32		83.3	95.8	105
DC-Link capacitor CF383		77.4	90.4	105
Chock LF12		85.6	98.6	110
Inv inductor		104.4	112.1	130
PCB under Q9		91.0	104.2	130
The lead wire of Inv inductor		80.3	93.2	105
Current sensor HCT2		74.4	82.5	85
Relay RY1		75.4	82.1	85
X capacitor CF397		72.8	86.0	100
AC chock L2		77.2	90.6	110

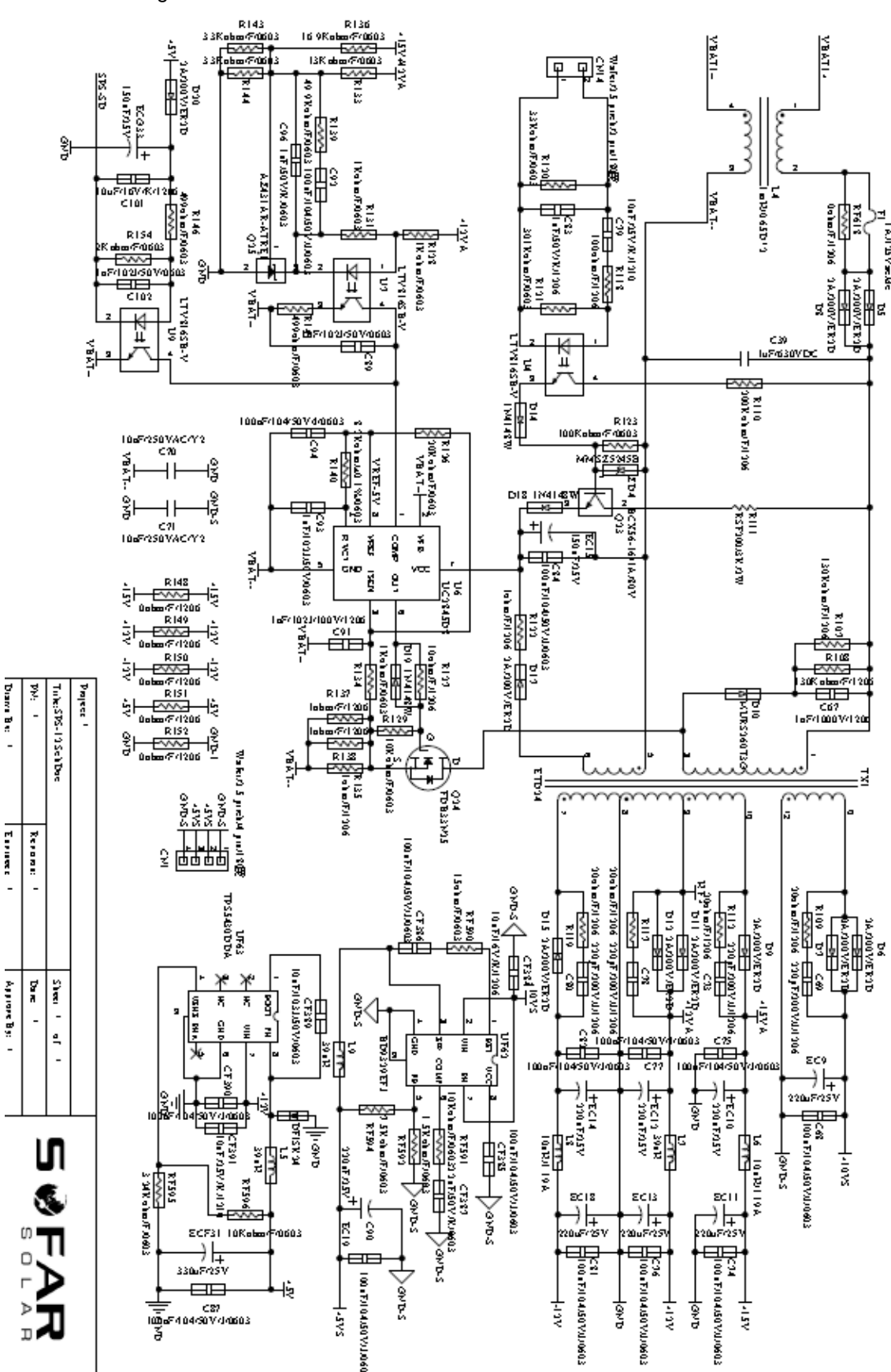
IEC 62040-1			
Clause	Requirement + Test	Result - Remark	Verdict
Y capacitor C12	74.9	88.4	125
Varistor MOV1	67.7	81.9	85
Output L wire	66.9	79.5	105
Output terminal	61.3	71.4	90
Internal ambient	86.6	101.6	Ref
Isolated optocoupler U14	63.7	76.9	100
Press Key	57.1	67.5	85
Mounting surface	69.4	81.9	90
Enclosure, Top	67.9	81.8	100
LCD Display	62.6	74.7	85
Input terminal	58.7	68.7	90
PCB under Q16	89.1	105.6	130
PCB under Q65	88.8	105.4	130
PCB under Q59	90.7	107.1	130
PCB under Q63	91.9	108.3	130
Note: 1, Test for a discharging and charging cycle to achieve temperature stable. 2, Used of battery supply			

IEC 62040-1			
Clause	Requirement + Test	Result - Remark	Verdict
M	Ventilation of battery compartments		N/A
	<p>The required dimension for the ventilation openings will be calculated with the following formula:</p> $A > K1 * Q$ <p>with $Q = (0.054 \text{ m}^3/\text{Ah}) * n * I * C$</p> <p>where:</p> <p>K1 : constant factor of 28 h * cm²/m³</p> <p>Q : airflow in m³/h</p> <p>n : number of battery cells</p> <p>I : constant factor (0,2A/100Ah for valve regulated lead acid batteries)</p> <p>C : nominal capacity of the battery</p>		N/A
	<p>With the specific data for the UPS the following dimension for the ventilation openings is required:</p> <p>n : ?</p> <p>C : ?</p> $A > 28 \text{ h} * \text{cm}^2/\text{m}^3 * (0.054 \text{ m}^3/\text{Ah}) * n * 0.2 \text{ A}/100 \text{ Ah} * C$ $A > ? \text{ cm}^2$		
		Verdict	
	The size of ventilation openings in battery cabinet exceeds the required airflow by far (as well as the UPS).		

Appendix 1: Circuit Diagram



Appendix 1: Circuit Diagram



Project :	TRF55-1353-Dev
Rev. :	Rev001
Drawn By :	Esquivel
Sheet :	1 of 1
Date :	
Approved By :	



Appendix 2: Photos



Overview



Overview

Appendix 2: Photos



Top view



Heatsink view

Appendix 2: Photos



Terminal view

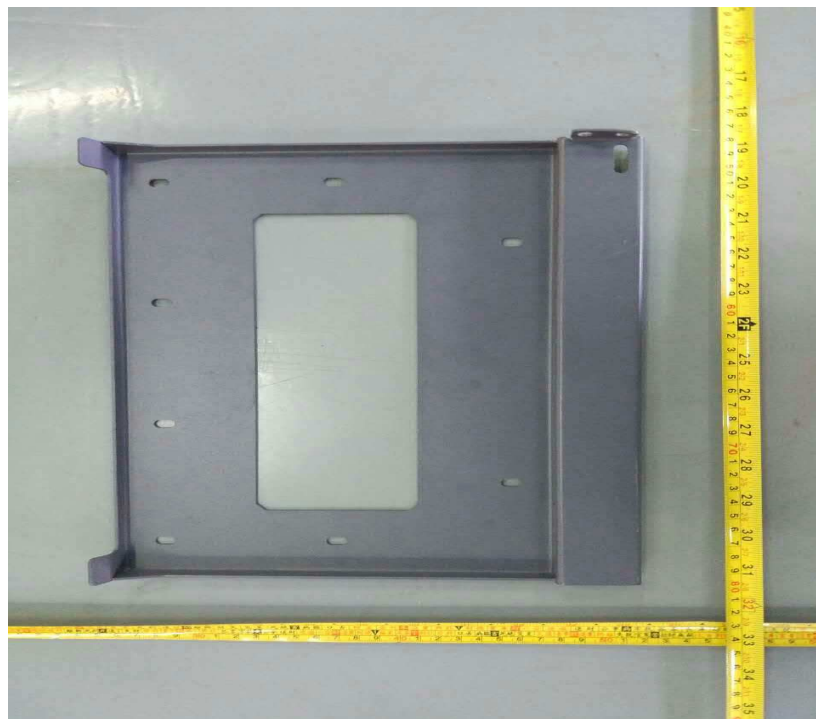


Terminal view

Appendix 2: Photos



Bracket view



Bracket view

Appendix 2: Photos

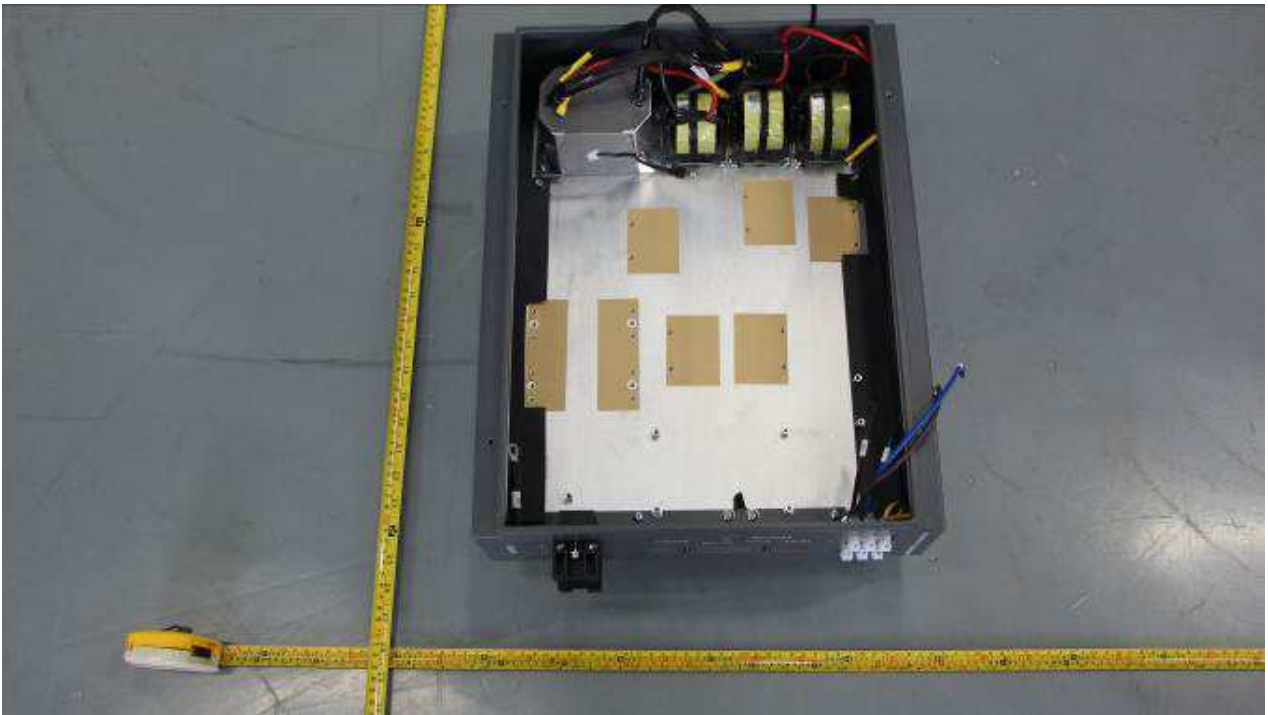


Inside view



Inside view

Appendix 2: Photos

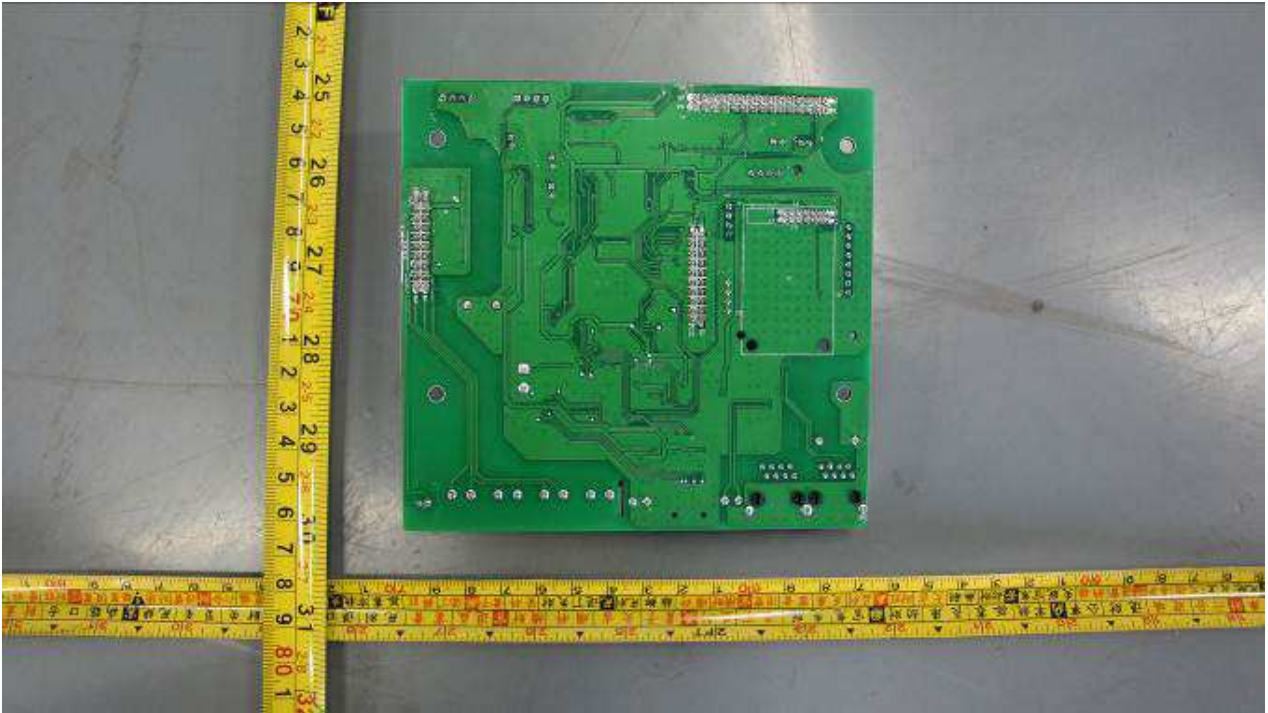


Inside view



Communication board view

Appendix 2: Photos

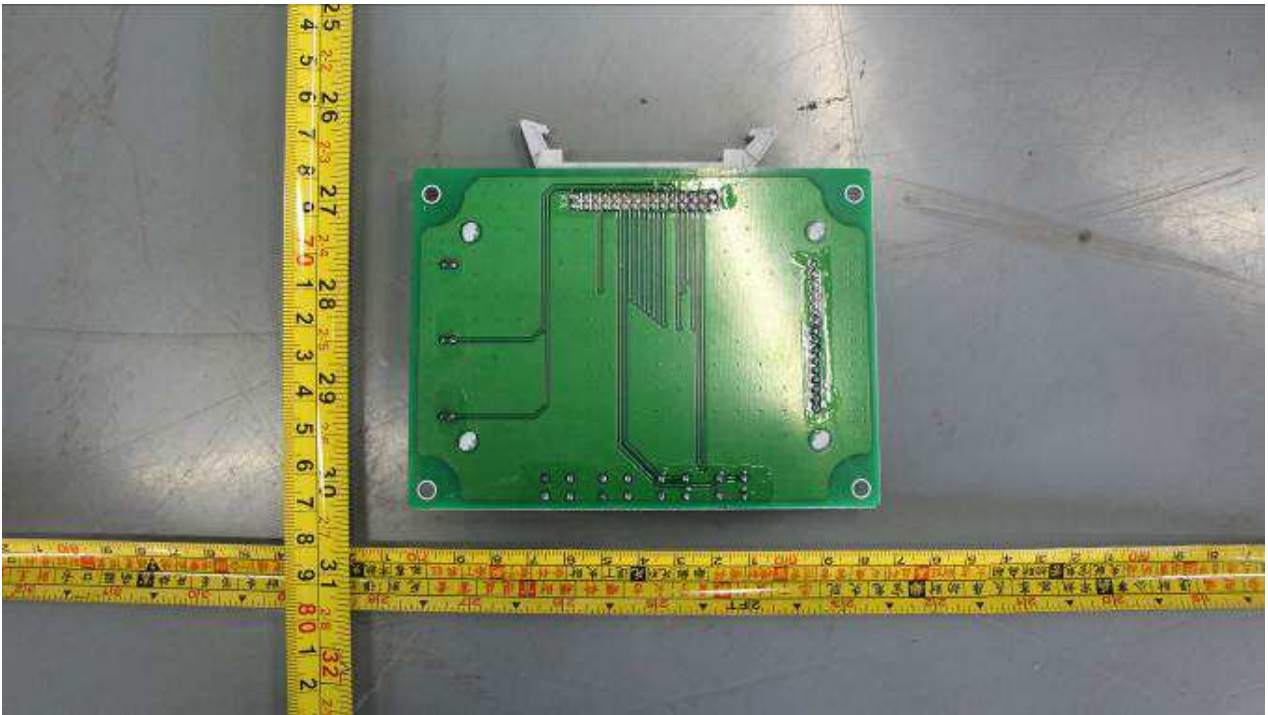


Soldered view

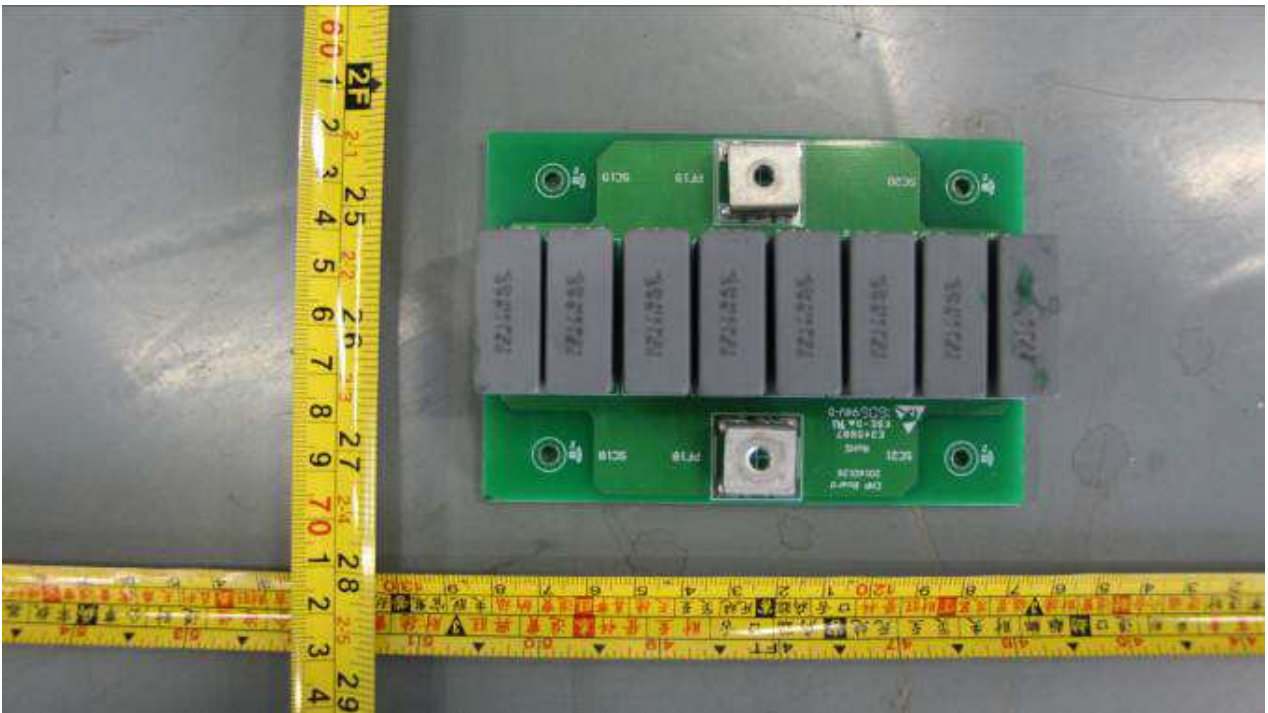


LCD display view

Appendix 2: Photos

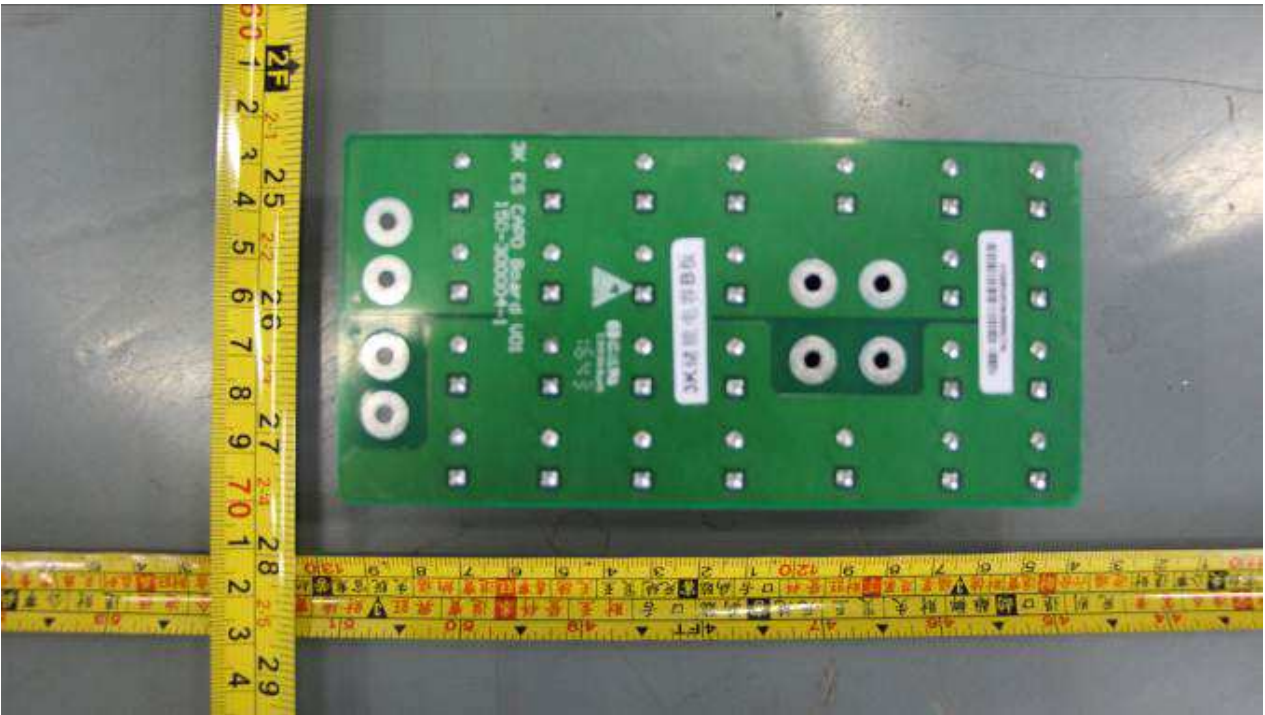


LCD display view



Capacitor A board view

Appendix 2: Photos

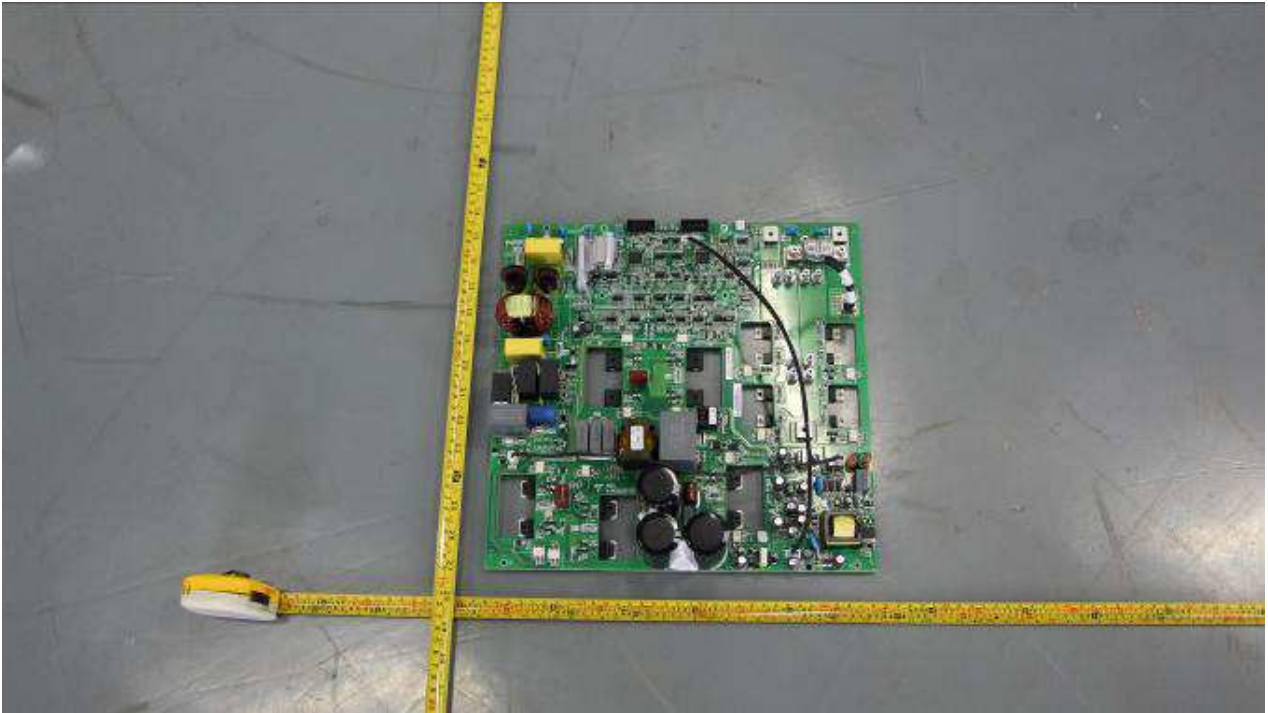


Soldered view

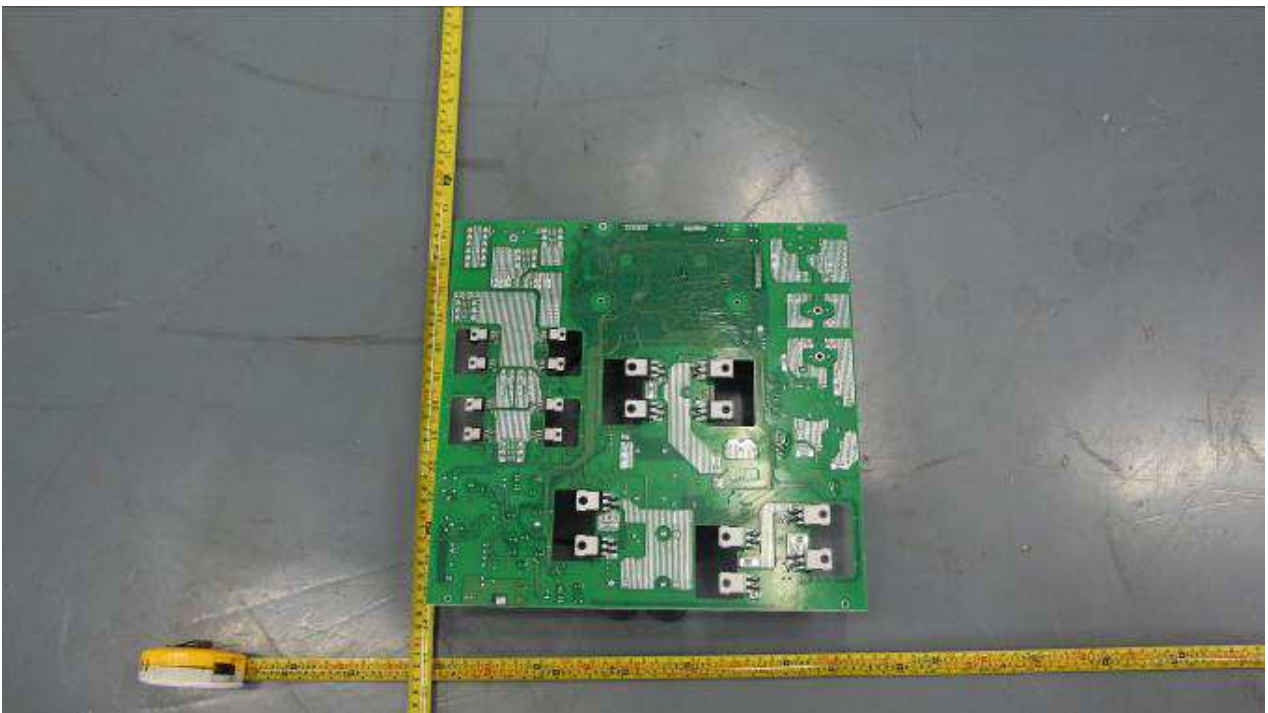


Capacitor B board view

Appendix 2: Photos



Main board view



Soldered view

Appendix 2:
Photos



Battery used for test



Battery used for test

-----End of report-----