

Test Report

Applicant: Tescom Elektronik Sanayi ve Ticaret A.S.

Product: UPS

Trademark: TESCOM

Model No: LEO+ 1200VA , LEO+ 1500VA , LEO+ 2200VA

Prepared by: Shenzhen Most Technology Service Co., Ltd.

The safety testing has been performed on the submitted samples and found in compliance with the council LVD directive 2014/35/EU.

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**TEST REPORT
EN 62040-1
Uninterruptible power systems (UPS) –
Part 1: General and safety requirements for UPS**

Report Number..... : MTSC21030260

Date of issue..... : 2021-04-09

Total number of pages 50

Applicant's name : Tescom Elektronik Sanayi ve Ticaret A.S.

Address..... : Merkez: Dudullu OSB 2.Cadde No:7 Umraniye, Istanbul / TURKEY

Test specification:

Standard : EN 62040-1:2008 + A1:2013

Test procedure : LVD

Non-standard test method : N/A

Test Report Form No. : IEC62040_1C

Test Report Form(s) Originator : TÜV Rheinland Japan Ltd.

Master TRF : Dated 2014-01

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Test item description..... : UPS

Trade Mark..... : TESCOM

Manufacturer : EAST Group Co., Ltd.
No.6 Northern Industry Road, Songshan Lake Sci. & Tech.
Industrial Park, Dongguan City, Guangdong Province, China

Model/Type reference : LEO+ 1200VA , LEO+ 1500VA , LEO+ 2200VA

Ratings..... : See model list (page 8 and 9)

Testing procedure and testing location:		
<input checked="" type="checkbox"/>	Testing Laboratory:	Shenzhen Most Technology Service Co., Ltd.
Testing location/ address :		No.5, 2nd Langshan Road, North District, Hi-tech Industry Park, Nanshan, Shenzhen, Guangdong, China
<input type="checkbox"/>	Associated Testing Laboratory:	
Testing location/ address :		
Tested by (name + signature) :	Jay Luo	
Approved by (name + signature) :	Yvette Zhou	
<hr/>		
<input type="checkbox"/>	Testing procedure: TMP	
Testing location/ address :		
Tested by (name + signature) :		
Approved by (name + signature) :		
<hr/>		
<input type="checkbox"/>	Testing procedure: WMT	
Testing location/ address :		
Tested by (name + signature) :		
Witnessed by (name + signature) :		
Approved by (name + signature) :		
<hr/>		
<input type="checkbox"/>	Testing procedure: SMT	
Testing location/ address :		
Tested by (name + signature) :		
Approved by (name + signature) :		
Supervised by (name + signature) .. :		

<p>List of Attachments (including a total number of pages in each attachment):</p> <p>1. Photos (5 pages)</p>													
<p>Summary of testing: From the result of our tests on the submitted samples, we conclude they comply with the requirements of the standards</p>													
<p>Tests performed (name of test and test clause):</p> <table border="1"> <thead> <tr> <th>Clause(s)</th> <th>Test(s)</th> </tr> </thead> <tbody> <tr> <td>4</td> <td>General conditions for tests</td> </tr> <tr> <td>5</td> <td>Fundamental design requirements</td> </tr> <tr> <td>6</td> <td>Wiring, connections and supply</td> </tr> <tr> <td>7</td> <td>Physical requirements</td> </tr> <tr> <td>8</td> <td>Electrical requirements and simulated abnormal conditions</td> </tr> </tbody> </table>	Clause(s)	Test(s)	4	General conditions for tests	5	Fundamental design requirements	6	Wiring, connections and supply	7	Physical requirements	8	Electrical requirements and simulated abnormal conditions	<p>Testing location: No.5, 2nd Langshan Road, North District, Hi-tech Industry Park, Nanshan, Shenzhen, Guangdong, China</p>
Clause(s)	Test(s)												
4	General conditions for tests												
5	Fundamental design requirements												
6	Wiring, connections and supply												
7	Physical requirements												
8	Electrical requirements and simulated abnormal conditions												
<p>Summary of compliance with National Differences List of countries addressed:</p> <p>N/A</p> <p><input checked="" type="checkbox"/> The product fulfils the requirements of <u>EN 62040-1:2008 + A1:2013</u></p>													

Copy of marking plate

UPS(UNINTERRUPTIBLE POWER SUPPLY)

BRAND: TESCOM

MODEL: LEO+ 2200VA

CAPACITY: 2200VA/1200W

INPUT: 220-240V/50HZ

OUTPUT: 220-240V/50HZ



900960153



8 680530 761736



UPS(UNINTERRUPTIBLE POWER SUPPLY)

BRAND: TESCOM

MODEL: LEO+ 1500VA

CAPACITY: 1500VA/900W

INPUT: 220-240V/50HZ

OUTPUT: 220-240V/50HZ







900960150



8 680530 761729



<p>Before working on this circuit</p> <ul style="list-style-type: none">- Isolate Uninterruptible Power System (UPS)-Then check for Hazardous Voltage between all terminals including the protective earth  <p>Risk of Voltage Backfeed</p>	
 <p>Contains sealed lead acid battery.</p>  <p>The lead acid battery may cause chemical hazard.</p> <p>Battery must be recycled.</p> <p>For disposal instruction for the battery, see the user's manual.</p>	 <p>CAUTION:</p> <p>This UPS is energized from the battery supply even when the input AC is disconnected.</p> <p>Risk of electric shock and chemical hazard.</p>

Test item particulars	UPS
Equipment mobility	<input checked="" type="checkbox"/> movable <input type="checkbox"/> transportable <input type="checkbox"/> stationary <input type="checkbox"/> for building-in
Connection to the mains	<input checked="" type="checkbox"/> pluggable equipment <input checked="" type="checkbox"/> type A <input type="checkbox"/> type B <input type="checkbox"/> permanent connection <input type="checkbox"/> detachable power supply cord <input checked="" type="checkbox"/> non-detachable power supply cord
Operating condition	<input checked="" type="checkbox"/> continuous <input type="checkbox"/> rated operating / resting time:
Access location	<input checked="" type="checkbox"/> operator accessible <input type="checkbox"/> restricted access location
Over voltage category (OVC)	<input type="checkbox"/> OVC I <input checked="" type="checkbox"/> OVC II <input type="checkbox"/> OVC III <input type="checkbox"/> OVC IV <input type="checkbox"/> other:
Mains supply tolerance (%) or absolute mains supply values	±10%
Tested for IT power systems	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
IT testing, phase-phase voltage (V)	
Class of equipment	<input checked="" type="checkbox"/> Class I <input type="checkbox"/> Class II <input type="checkbox"/> Not classified
Considered current rating of protective device as part of the building installation (A)	16A
Pollution degree (PD)	<input type="checkbox"/> PD 1 <input checked="" type="checkbox"/> PD 2 <input type="checkbox"/> PD 3
IP protection class	IP20
Elevation during operation (m)	Up to 2000m
Elevation of test laboratory (m)	Below 2000m
Mass of equipment (kg)	Approx.: 4.5Kg
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	2021-03-22
Date (s) of performance of tests	2021-03-22 to 2021-04-09

General remarks:

The test results presented in this report relate only to the object tested.
 This report shall not be reproduced, except 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.

Manufacturer's Declaration per sub-clause 4.2.5 of IEC 60335-1:

The application for obtaining a Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided :
 Yes
 Not applicable

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

Name and address of factory (ies) : Same as applicant

General product information:

These products are UPS, electronic components mounted on PWB; external enclosure is plastic material of V-0 grade, secured by screws.

All models are identical in electrical, mechanical, physical construction except model number, input/output rating, battery and parameter of components in secondary circuit, detail information see below model list.

Model list:

Model	Input	Output	Battery	Enclosure material
LEO+ 1200VA	220-240Vac, 1Φ+N+PE, 50/60Hz, 6.0A	220-240Vac, 1Φ+N+PE, 50/60Hz, 3.3A, 1200VA/720W	12*2=24Vdc, 7.0AH*2 Battery box install inside UPS	Plastic or metal
LEO+ 1500VA	220-240Vac, 1Φ+N+PE, 50/60Hz, 8.0A	220-240Vac, 1Φ+N+PE, 50/60Hz, 4.2A, 1500VA/900W	12*2=24Vdc, 8.0AH*2 Battery box install inside UPS	Plastic or metal
LEO+ 2200VA	220-240Vac, 1Φ+N+PE, 50/60Hz, 10.0A	220-240Vac, 1Φ+N+PE, 50/60Hz, 5.5A, 2200VA/1200W	12*2=24Vdc, 9.0AH*2 Battery box install inside UPS	Metal

Max. ambient operating temperature: 40°C


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

4	GENERAL CONDITIONS FOR TESTS		P
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	Components, Which are certified to IEC and/or national standards, are applied correctly within their ratings. Components not covered by IEC standards are tested under the conditions present in the equipment.	P
1.5.3/RD	Thermal controls		N/A
1.5.4/RD	Transformers	Transformers used are suitable for their intended application and comply with the relevant requirements of the standard and particularly Annex C	P
1.5.5/RD	Interconnecting cables		P
1.5.6/RD	Capacitors bridging insulation	Comply with EN 60384-14	P
1.5.7/RD	Resistors bridging insulation		N/A
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		N/A
1.5.7.3/RD	Resistors bridging double or reinforced insulation between a.c. mains and antenna or coaxial cable	No such resistor	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 power system.	P
1.6.2/RD	Input current	(see appended table 4.6)	P
4.6 1.6.4/RD	Neutral conductor	Neutral is insulated from the body with Reinforced insulation through the equipment.	P

4.7	Marking and instructions		P
4.7.1	General		P

IEC 62040-1			
Clause	Requirement + Test	Result - Remark	Verdict
4.7.2 1.7.1/RD	Power rating	All required markings are affixed on labels located on the rear enclosure of UPS	P
	Input rated voltage/range (V).....:	220-240	P
	Input rated current/range (A)	See model list	P
	Input symbol for nature of supply (d.c.)	Only one mains supply connections.	N/A
	Input rated frequency/range (Hz)	50/60Hz	P
	Number of Input phases and neutral	~	P
	Output rated voltage/range (V)	220-240	P
	Output rated current/range (A)	See model list	P
	Output rated power factor, if less than unity, or active power and apparent power or active power and rated current	0.4	P
	Number of output phases and neutral	One phase with 220-240V~	P
	Output rated active power (W or kW)	See model list	P
	Output rated apparent power (VA or kVA)	See model list	P
	Output symbol for nature of supply (d.c.)	~	P
	Output rated frequency/range (Hz)	50/60Hz	P
	Ambient operating temperature range (°C).....:	0°C-40°C	P
	Rated short-time withstand current (I_{cw}) or rated conditional short-circuit current (I_{cc})		N/A
	Manufacturer's name or trademark or identification mark	EAST Group Co., Ltd.	P
	Type/model or type reference	LEO+ 1200VA , LEO+ 1500VA , LEO+ 2200VA	P
	Symbol for Class II equipment only	Class I equipment	N/A
	Other symbols	Additional symbols or marking do not give rise to misunderstanding.	P
	Certification marks		N/A
	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"		P
4.7.3	Safety instructions	See below.	P
4.7.3.1	General	See below.	P

IEC 62040-1			
Clause	Requirement + Test	Result - Remark	Verdict
4.7.3.2	Installation	User manual inform adequate information to users and there are such words in user manuals	P
	Location in a restricted access location only ... :		N/A
	Permanent connector UPS..... :		N/A
	Pluggable type A or Pluggable type B UPS :	Pluggable type A	P
4.7.3.3	Operation..... :	The UPS is intended for operation by a layperson	P
4.7.3.4	Maintenance	Stated in user's manual	P
4.7.3.5	Distribution related backfeed..... :		P
4.7.4 1.7.4/RD	Main voltage adjustment	Full range voltage design, no Voltage adjustment.	P
	Methods and means of adjustment; reference to installation instructions		--
4.7.5 1.7.5/RD	Power outlets..... :		P
4.7.6 1.7.6/RD	Fuse identification (marking, special fusing characteristics, cross-reference)	There is a marking located adjacent to each fuse to indicate the specification of the fuse	P
4.7.7 1.7.7/RD	Wiring terminals	Refer below.	P
1.7.7.1/RD	Protective earthing and bonding terminals	The protective earthing wiring terminal is indicated by the symbol (IEC60417)	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..... :	Only connector to a.c. mains supply	
4.7.8	Battery terminals		P
4.7.9 1.7.8/RD	Controls and indicators	See below.	P
1.7.8.1/RD	Identification, location and marking		P
1.7.8.2/RD	Colours	Colours are acceptable due to only used for information (no safety involved even if disregarded).	P
1.7.8.3/RD	Symbols	Symbol  on the functional switch	P
1.7.8.4/RD	Markings using figures		N/A

IEC 62040-1			
Clause	Requirement + Test	Result - Remark	Verdict
4.7.10 1.7.9/RD	Isolation of multiple power sources	Warning label provided on the UPS, that both AC and DC sources must be disconnected before service.	P
4.7.11 1.7.2.4/RD	IT power systems		N/A
4.7.12	Protection in building installation		P
	Rated short-time withstand current (<i>I_{cw}</i>)		P
	Rated conditional short circuit current (<i>I_{cc}</i>)		P
	a) If higher <i>I_{cp}</i> stated ≤ 10 kA		P
	a) If higher <i>I_{cp}</i> stated > 10 kA		N/A
4.7.13 5.1/RD	High leakage current (mA)	Leakage current of the equipment does not exceed 3.5mA.	N/A
4.7.14 1.7.10/RD	Thermostats and other regulating devices	No device is intended to be adjusted during in installation or normal operation mode	N/A
4.7.15 1.7.2.1/RD and 1.7.8.1/RD	Language(s)	English	—
4.7.16 1.7.11/RD	Durability of markings	The marking plate was subjected to the permanence of marking test. The marking plate 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 marking plate. The marking on the label did not fade.	P
4.7.17 1.7.12/RD	Removable parts		N/A
4.7.18 1.7.13/RD	Replaceable batteries	Replaceable by server person. The required warning is in the safety manual	P
	Language(s)	English	—
4.7.19 1.7.2.5/RD	Operator access with a tool.....	There is no operator access with a tool in normal operation mode	N/A

IEC 62040-1			
Clause	Requirement + Test	Result - Remark	Verdict
4.7.20	Battery	There is a battery warning label in the battery compartment to show the following information --- battery type --- nominal voltage of total battery --- nominal capacity of total battery --- warning label denoting an energy or electrical shock and chemical hazard and reference See label in Annex Photos	P
	Clearly legible information	Warning label containing below described information placed on enclosure of UPS and battery compartment. Information clearly legible.	P
	Battery type (lead-acid, NiCd, etc.) and number of blocks or cells	See tabel 4.5	P
	Nominal voltage of total battery (V)		P
	Nominal capacity of total battery (optional)		P
	Warning label		P
	Instructions		P
2.1.1.5/RD	Protection against energy hazards		P
4.7.21 1.7.2.4/RD	Installation instructions	No special attention is needed	N/A

5	FUNDAMENTAL DESIGN REQUIREMENTS		P
5.1	Protection against electric shock and energy hazards	See below.	P
5.1.1 2.1.1/RD	Protection for UPS intended to be used in operator access areas		P

IEC 62040-1			
Clause	Requirement + Test	Result - Remark	Verdict
2.1.1.1/RD	Access to energized parts	There is adequate protection against operator contact with bare parts at ELV or hazardous voltage or parts separated from these with basic or functional insulation only (except protective earth), also after operator detachable parts are removed and doors and covers are opened. No hazardous voltages exceeding 1000V a.c. or 1500V d.c. ref. Sub-clause 2.10. Checked by test finger and test pin.	P
	Test by inspection	Complies.	P
	Test with test finger (Figure 2A)	Complies.	P
	Test with test pin (Figure 2B)	Complies.	P
	Test with test probe (Figure 2C)	No TNV circuits within the equipment.	N/A
2.1.1.2/RD	Battery compartments	No battery compartments provided and no TNV circuits within the equipment	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)	—
2.1.1.4/RD	Access to hazardous voltage circuit wiring	No internal wiring at hazardous voltage circuit accessible to the operator.	N/A
2.1.1.5/RD	Energy hazards	No energy hazard in operator access area. Checked by means of the test finger. (see appended table 2.1.1.5)	P
2.1.1.6/RD	Manual controls	No conductive shafts of operating knobs, handles, levers and the like in operator access areas.	N/A
2.1.1.7/RD	Discharge of capacitors in equipment		P
	Measured voltage (V); time-constant (s)	26V, after 1s	—
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 in information technology equipment		N/A

IEC 62040-1			
Clause	Requirement + Test	Result - Remark	Verdict
5.1.2 2.1.1.5 c) /RD	Protection for UPS intended to be used in service access areas	No energy hazard in operator access area. Checked by means of the test finger. (see appended table 2.1.1.5)	P
	Hazardous energy level		P
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		--
5.1.4	Backfeed protection	(see appended table 5.7)	P
	Shock hazard after de-energization of a.c. input for UPS		P
	Measured voltage (V); time-constant (s)		—
	Description of the construction		N/A
	Air gap is employed for backfeed protection		N/A
5.1.5	Emergency switching (disconnect) device	Pluggable equipment type A, no emergency-switching device for the load required.	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)	P
2.2.3/RD	Voltages under fault conditions (V)	(See appended table 5.2.1)	P
2.2.4/RD	Connection of SELV circuits to other circuits ..		N/A
5.2.2 2.3/RD	Telephone network voltage circuits - TNV		N/A
2.3.1/RD	Limits		N/A
	Type of TNV circuits		—
2.3.2/RD	Separation of TNV circuits 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		—

IEC 62040-1			
Clause	Requirement + Test	Result - Remark	Verdict
2.3.5/RD	Test for operating voltages generated externally		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		—
	Frequency (Hz)..... :		—
	Measured current (mA) :		—
	Measured voltage (V) :		—
	Measured circuit capacitance (nF or μF)..... :		—
2.4.3/RD	Connection of limited current circuits to other circuits		N/A
5.2.4 3.5/RD	External signaling circuits		N/A
3.5.1/RD	General requirements		N/A
3.5.2/RD	Types of interconnection circuits :		N/A
3.5.3/RD	ELV circuits as interconnection circuits		N/A
3.5.4/RD	Data ports for additional equipment		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) . :		—
	Use of integrated circuit (IC) current limiters		—

5.3	Protective earthing and bonding		P
5.3.1	General		P
2.6/RD	Provisions for earthing and bonding	See below.	P
2.6.1/RD	Protective earthing	UPS are class I equipment, connection of relevant conductive parts to the PE terminal (appliance inlet) via green/yellow insulated wires.	P
2.6.2/RD	Functional earthing	All earthing is separated from parts at hazardous voltages	P

IEC 62040-1			
Clause	Requirement + Test	Result - Remark	Verdict
2.6.3/RD	Protective earthing conductors and protective bonding conductors		P
2.6.3.1/RD	General		P
2.6.3.2/RD	Size of protective earthing conductors	Size of protective earthing conductors comply with the requirements in table 3B/RD	P
	Rated current (A), cross-sectional area (mm ²), AWG		—
2.6.3.3/RD	Size of protective bonding conductors	Size of protective earthing conductors comply with the requirements in table 3B/RD Same as 2.6.3.1/RD	P
	Rated current (A), cross-sectional area (mm ²), AWG		—
	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)	Resistance of the protective bonding conductor is less than 0.1 Ω See table 5.3 2.6.3.3/RD Ground continuity Test	P
2.6.3.5/RD	Colour of insulation.....	The insulation of the protective earthing conductor in power cord supplied with equipment and the protective bonding conductor is green-and yellow	P
2.6.4/RD	Terminals	See below.	N/A
2.6.4.1/RD	General	Appliance inlet as protective earth terminal.	N/A
2.6.4.2/RD	Protective earthing and bonding terminals	The earthing terminal in the appliance inlet is regarded as the main protective earthing terminal	N/A
	Rated current (A), type, nominal thread diameter (mm)	4.0mm	—
2.6.4.3/RD	Separation of the protective earthing conductor from protective bonding conductors	The earthing terminal in the appliance inlet is regarded as the main protective earthing terminal Separate wiring terminals are provided to protective earthing conductor and protective bonding conductor	P
2.6.5/RD	Integrity of protective earthing	See below.	P

IEC 62040-1			
Clause	Requirement + Test	Result - Remark	Verdict
2.6.5.1/RD	Interconnection of equipment	This unit has its own earthing connection. PE terminals of outlets reliably connected to PE terminal of unit	P
2.6.5.2/RD	Components in protective earthing conductors and protective bonding conductors	No switch or overcurrent protective device in protective bonding conductors.	P
2.6.5.3/RD	Disconnection of protective earth		P
2.6.5.4/RD	Parts that can be removed by an operator	Earthing connected before and disconnected after hazardous voltage. No other operator removable parts.	P
2.6.5.5/RD	Parts removed during servicing	The relevant potential hazard is removed at the same time when protective earthing connection is disconnected for servicing	P
2.6.5.6/RD	Corrosion resistance	All safety earthing connections in compliance with Annex J.	P
2.6.5.7/RD	Screws for protective bonding	Self-tapping screws are used to provided protective bonding connection and is threaded into more than twice the pitch of the screw thread	P
2.6.5.8/RD	Reliance on telecommunication network or cable distribution system	Protective earthing does not rely on a TNV circuit	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		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		P
3.4/RD	Disconnection from the mains supply		P
3.4.1/RD	General requirement		P
3.4.2/RD	Disconnect devices	AC inlet used	P
3.4.3/RD	Permanently connected equipment		N/A
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		P

IEC 62040-1			
Clause	Requirement + Test	Result - Remark	Verdict
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	UPS under test receives power from single AC source.	N/A
5.4.2	Disconnect devices	Ungrounded battery, the internal battery DC supply of the UPS can be disconnected by the quick connectors of the battery and the appliance coupler of the external battery pack in both poles.	P

5.5	Overcurrent and earth fault protection		P
5.5.1	General		P
2.7.3/RD	Short-circuit backup protection	Building installation is considered as providing. Shortcircuit backup protection.	P
2.7.4/RD	Number and location of protective devices :	Over current protection by one fuse in equipment Protection devices considered to provide sufficient protection against earth faults.	P
2.7.5/RD	Protection by several devices	Only one protection device provided.	N/A
2.7.6/RD	Warning to service personnel :	No double-pole fusing inside this pluggable equipment type A UPS.	N/A
5.5.2	Basic requirements	Equipment relies on circuit breaker in the equipment in regard to L to N short-circuit. Over current protection is provided by the built-in circuit breaker.	P
5.5.3	Battery circuit protection	See below	P
5.5.3.1	Overcurrent and earth fault protection		P
5.5.3.2	Location of protective device	Battery supplies are protected by fuses located adjacent to the batteries before any components which may fail short-circuited, such as capacitors, semi-conductor	P
5.5.3.3	Rating of protective device	See below.	P
5.3.1/RD	Protection against overload and abnormal operation	(see appended table 8.3)	P
5.5.4	Short-time withstand current		P

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Clause	Requirement + Test	Result - Remark	Verdict
5.5.4.1	General		P
5.5.4.2	Modes of operation		P
5.5.4.3	Test procedure		P
5.5.4.3.1	General application		P
	Rated UPS output current/(r.m.s) (A)	<16	—
	Prospective test current/(r.m.s) (A)	3000	—
	Typical power factor	0.4	—
	Initial asymmetric peak current ration (I _{pk} / I _{cw}) ..	1.42	—
	Minimum duration of prospective test current (cycles 50/60 Hz)	1.5	
5.5.4.3.2	Exemption from testing		N/A

5.6	Protection of personnel – Safety interlocks		N/A
5.6.1	Operator protection		N/A
2.8/RD	General principles		N/A
2.8.1/RD	Protection requirements		N/A
2.8.2/RD	Inadvertent reactivation		N/A
2.8.3/RD	Fail-safe operation		N/A
2.8.4/RD	Protection against extreme hazard		N/A
2.8.5/RD	Moving parts		N/A
2.8.6/RD	Overriding		N/A
2.8.7/RD	Switches, relays and their related circuits		N/A
2.8.7.1/RD	Separation distances for contact gaps and their related circuits		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
5.6.2.5	Component access		N/A
2.8.3/RD	Fail-safe operation		N/A
5.6.2.6	Moving parts		N/A
5.6.2.7	Capacitor banks		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
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	50/60Hz	P
2.10.1.2/RD	Pollution degrees	Pollution Degree 2.	P
2.10.1.3/RD	Reduced values for functional insulation	The functional insulation complied with clause 5.3.4.	P
2.10.1.4/RD	Intervening unconnected conductive parts	Considered.	—
2.10.1.5/RD	Insulation with varying dimensions	No such transformer used.	N/A
2.10.1.6/RD	Special separation requirements	Special separation is not used.	N/A
2.10.1.7/RD	Insulation in circuits generating starting pulses	The circuit will not generate starting pulse.	N/A
2.10.2/RD	Determination of working voltage	(See appended table 5.7)	P
2.10.2.1/RD	General	Refer below:	—
2.10.2.2/RD	RMS working voltage	(See appended table 5.7)	P
2.10.2.3/RD	Peak working voltage	(See appended table 5.7)	P
2.10.3/RD	Clearances	(See appended table 5.7)	
2.10.3.1/RD	General	Refer below:	—
2.10.3.2/RD	Mains transient voltages	2500V peak	P
	a) AC mains supply	220-240V	P
	b) Earthed d.c. mains supplies		N/A
	c) Unearthed d.c. mains supplies		N/A
	d) Battery operation	12Vx2=24V	P
2.10.3.3/RD	Clearances in primary circuits	(see appended table 5.7)	P
2.10.3.4/RD	Clearances in secondary circuits	(see appended table 5.7)	P
2.10.3.5/RD	Clearances in circuits having starting pulses	The circuit will not generate starting pulse.	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
2.10.3.6/R D	Transients from a.c. mains supply	Considered.	P
2.10.3.7/R D	Transients from d.c. mains supply	Not connected to d.c mains supply.	N/A
2.10.3.8/R D	Transients from telecommunication networks and cable distribution systems	Not connected to telecommunication networks and cable distribution systems.	N/A
2.10.3.9/R D	Measurement of transient voltage levels	See below.	—
	a) Transients from a mains supply	Measurement not relevant.	N/A
	For an a.c. mains supply		N/A
	For a d.c. mains supply		N/A
	b) Transients from a telecommunication network :	Not connected to telecommunication networks.	N/A
2.10.4/RD	Creepage distances	(see appended table 5.7)	
2.10.4.1/R D	General	Considered.	P
2.10.4.2/R D	Material group and comparative tracking index	See below.	P
	CTI tests	Material group IIIb is assumed.	—
2.10.4.3/R D	Minimum creepage distances	(see appended table 5.7)	P
2.10.5 /RD	Solid insulation	Considered.	P
2.10.5.1/R D	General		P
2.10.5.2/R D	Distances through insulation	(see appended table 5.7)	P
2.10.5.3/R D	Insulating compound as solid insulation		N/A
2.10.5.4/R D	Semiconductor devices		P
2.10.5.5/R D	Cemented joints	Not used cemented joints.	N/A
2.10.5.6/R D	Thin sheet material – General	Two layers insulation tape used as reinforced insulation for transformers	P
2.10.5.7/R D	Separable thin sheet material	Two layers insulation tape used as reinforced insulation for transformers	P
	Number of layers (pcs)	2 layers (test 1 layer)	—
2.10.5.8/R D	Non-separable thin sheet material	Not used.	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
2.10.5.9/R D	Thin sheet material – standard test procedure	The clause 2.10.5.10 is used.	N/A
	Electric strength test	(see appended table 8.2)	—
2.10.5.10 /RD	Thin sheet material – alternative test procedure	refer to Annex C	P
	Electric strength test	(see appended table 8.2)	—
2.10.5.11 /RD	Insulation in wound components	See cl.2.10.5.12.	P
2.10.5.12 /RD	Wire in wound components		N/A
	Working voltage		—
	a) Basic insulation not under stress		N/A
	b) Basic, supplementary, reinforced insulation :		N/A
	c) Compliance with Annex U		N/A
	Two wires in contact inside wound component; angle between 45° and 90°		N/A
2.10.5.13 /RD	Wire with solvent-based enamel in wound components	No wire with solvent-based enamel in wound components.	N/A
	Electric strength test	(see appended table 8.2)	—
	Routine test		N/A
2.10.5.14 /RD	Additional insulation in wound components	No additional insulation used	N/A
	Working voltage		—
	- Basic insulation not under stress		N/A
	- Supplementary, reinforced insulation		N/A
2.10.6/RD	Construction of printed boards	See below.	—
2.10.6.1/R D	Uncoated printed boards	(See appended table 5.7)	P
2.10.6.2/R D	Coated printed boards	No special coating in order to reduce distances.	N/A
2.10.6.3/R D	Insulation between conductors on the same inner surface of a printed board		N/A
2.10.6.4/R D	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	No special coating in order to reduce distance.	N/A
2.10.8/RD	Tests on coated printed boards and coated components		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
2.10.8.1/R D	Sample preparation and preliminary inspection		N/A
2.10.8.2/R D	Thermal conditioning		N/A
2.10.8.3/R D	Electric strength test		—
2.10.8.4/R D	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
6.1	General		P
6.1.1	Introduction		P
3.1/RD	General		P
3.1.1/RD	Current rating and overcurrent protection	All wirings meet the requirement	P
3.1.2/RD	Protection against mechanical damage	Wires do not touch sharp edges and heatsinks, which could damage the insulation and cause hazard.	P
3.1.3/RD	Securing of internal wiring	Internal wirings are routed, supported, clamped, secured in place	P
3.1.4/RD	Insulation of conductors		P
3.1.5/RD	Beads and ceramic insulators	Not used.	N/A
3.1.6/RD	Screws for electrical contact pressure	All screws for electrical contact pressure are threaded into more than two complete threads	P
3.1.7/RD	Insulating materials in electrical connections	There is not non-metallic material to be used in electrical connections in EUT	N/A
3.1.8/RD	Self-tapping and spaced thread screws	No self- tapping or spaced thread screws used for connection of current-carrying parts.	N/A
3.1.9/RD	Termination of conductors		P
	10 N pull test		P

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Clause	Requirement + Test	Result - Remark	Verdict
3.1.10/RD	Sleeving on wiring		P
6.1.2	Dimensions and rating of busbars and insulated conductors		P

6.2	Connection to power		P
6.2.1	General provisions for connection to power		P
3.2.2/RD	Multiple supply connections	Single supply connection	N/A
3.2.3/RD	Permanently connected equipment		P
	Number of conductors, diameter of cable and conduits (mm)		—
3.2.4/RD	Appliance inlets		P
3.2.5/RD	Power supply cords		N/A
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		P
	More than one supply connection		P

6.3	Wiring terminals for external power conductors		P
3.3/RD	Wiring terminals for connection of external conductors		P
3.3.1/RD	Wiring terminals		P
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		P
	Rated current (A), cord/cable type, cross-sectional area (mm ²).....	<6A, 0.75mm ²	—
3.3.5/RD	Wiring terminal sizes		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	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

7.2 4.1/RD	Stability		P
	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		P
	Swing test		P
4.2.6/RD	Drop test; height (mm)		N/A
4.2.7/RD	Stress relief test		P
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) .:		N/A

7.4	Construction details		P
7.4.1	Introduction		P
4.3.1/RD	Edges and corners		P
4.3.2/RD	Handles and manual controls; force (N).....:		N/A
4.3.3/RD	Adjustable controls		N/A
4.3.4/RD	Securing of parts	No loosening of parts impairing creepage distances or clearances is likely to occur.	P

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Clause	Requirement + Test	Result - Remark	Verdict
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		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
4.4.4/RD	Protection in service access areas		N/A
4.4.5/RD	Protection against moving fan blades		N/A
4.4.5.1/RD	General		N/A
	Not considered to cause pain or injury. a)		N/A
	Is considered to cause pain, not injury. b)		N/A
	Considered to cause injury. c)		N/A
4.4.5.2	Protection for users		N/A
	Use of symbol or warning		N/A
4.4.5.3	Protection for service persons		N/A
	Use of symbol or warning		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		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 7.4)	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	See below.	P
	Method 1, selection and application of components wiring and materials	Use of materials with the required flammability classes.	P
	Method 2, application of all of simulated fault condition tests		N/A
4.7.2/RD	Conditions for a fire enclosure	See below.	P

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Clause	Requirement + Test	Result - Remark	Verdict
4.7.2.1/RD	Parts requiring a fire enclosure	With having the following components: Components in primary circuits Insulated wiring The fire enclosure is required.	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	PCB rated accordingly. For details see table 4.3.	P
4.7.3.2/RD	Materials for fire enclosures	Metal enclosure with thermoplastic front panel. For details see table 4.3.	P
4.7.3.3/RD	Materials for components and other parts outside fire enclosures	See subclause 4.7.2/RD.	N/A
4.7.3.4/RD	Materials for components and other parts inside fire enclosures	Internal components except small parts are V-2, HF-2 or better. Batteries have a flammability class of V-1 (or better).	P
4.7.3.5/RD	Materials for air filter assemblies	No air filters provided.	N/A
4.7.3.6/RD	Materials used in high-voltage components	No high voltage components provided.	N/A

7.6	Battery location		P
7.6.1	Battery location and installation	Separate battery rooms	P
7.6.2	Accessibility and maintainability		P
7.6.3	Distance	The batteries are fixed in place and the temperature of mounting parts meet requirement of less than 45 degree temperature rise	P
7.6.4	Case insulation		P
7.6.5	Wiring		P
7.6.6	Electrolyte spillage		P
7.6.7	Ventilation		P
7.6.8	Charging voltage	Contact, connections and wiring are protected against effects of ambient tem., moisture, gas, vapour and mechanical stress.	P

7.7	Temperature rise		P
4.5/RD	Thermal requirements		P

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Clause	Requirement + Test	Result - Remark	Verdict
4.5.1/RD	General		P
4.5.2/RD	Temperature tests	(see appended table 7.4)	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 :		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		N/A
8.2 5.2/RD	Electric strength		P
5.2.1/RD	General	(see appended table 8.2)	P
5.2.2/RD	Test procedure	(see appended table 8.2)	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)	P
5.3.2/RD	Motors		N/A
5.3.3/RD	Transformers	See appended Annex C.	P
5.3.4/RD	Functional insulation..... :	EUT meet the requirement	P
5.3.5/RD	Electromechanical components	No electromechanical component (except for approved relays) provided.	N/A
5.3.9/RD	Compliance criteria for abnormal operating and fault conditions		P
5.3.9.1/RD	During the tests	---No fire occurs ---EUT do not emit molten metal ---Enclosures do not deform	P
5.3.9.2/RD	After the tests	No hazards	P
8.3.2	Simulation of faults		P
8.3.3	Conditions for tests		N/A
9 6/RD	Connection to telecommunication networks		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
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		N/A
3.5.1/RD	General requirements		N/A
3.5.2/RD	Types of interconnection circuits		N/A
3.5.3/RD	ELV circuits as interconnection 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		—
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

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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
2.10.3.3/RD	Clearances in primary circuits		N/A
2.10.3.4/RD	Clearances in secondary circuits		N/A
2.10.4/RD	Creepage distances		N/A
2.10.4.1/RD	General		N/A
2.10.4.2/RD	Material group and comparative tracking index		N/A
	CTI tests		—
2.10.4.3/RD	Minimum creepage distances		N/A
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
M.3.2.3/RD	Monitoring voltage (V)		N/A

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

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Clause	Requirement + Test	Result - Remark	Verdict
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)		—
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

IEC 62040-1			
Clause	Requirement + Test	Result - Remark	Verdict
	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
	Position	Primary and secondary	—
	Manufacturer	See table 4.5	—
	Type	See table 4.5	—
	Rated values	See table 4.5	—
	Method of protection.....		—
C.1/RD	Overload test		P
C.2/RD	Insulation		P
	Protection from displacement of windings.....		N/A

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 Annex E/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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IEC 62040-1			
Clause	Requirement + Test	Result - Remark	Verdict
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
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
I	Annex I, Backfeed protection test		P
I.1	General		P
I.2	Test for pluggable UPS		P
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)		P
J/RD	Annex J, Table of electrochemical potentials (see 2.6.5.6/RD)		P
	Metal(s) used		—

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Clause	Requirement + Test	Result - Remark	Verdict
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
L.3	Reference inductive-resistive load		—
L.4	Reference capacitive-resistive loads		P
L.5	Reference non-linear load		P
L.5.1	General		P
L.5.2	Test method		P
L.5.3	Connection of the non-linear reference load		—

M	Annex M, Ventilation of battery compartments		P
M.1	General		P
M.2	Normal conditions		P
M.3	Blocked conditions		P
M.4	Overcharge conditions		P

N	Annex N, Minimum and maximum cross-sections of copper conductors suitable for connection (see 6.3)		P
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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)		P
V.1/RD	Introduction		P
V.2/RD	TN power distribution systems		P
V.3/RD	TT power distribution systems		N/A
V.4/RD	IT power distribution systems		N/A

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

4.6, 1.6.2/RD	TABLE: Electrical Data (in normal conditions)					P
fuse #	I rated (A)	U (V)	P (W)	I (A)	I fuse (A)	condition/status
For model: 3000VA						
JP27, JP28	--	198V/50Hz	1246	9.24	9.24	Normal operation at rated load
	10.0	220V/50Hz	1253	8.34	8.34	Normal operation at rated load
	10.0	240V/50Hz	1277	7.82	7.82	Normal operation at rated load
	--	264V/50Hz	1325	7.38	7.38	Normal operation at rated load
	--	198V/60Hz	1244	9.22	9.22	Normal operation at rated load
	10.0	220V/60Hz	1255	8.35	8.35	Normal operation at rated load
	10.0	240V/60Hz	1275	7.80	7.80	Normal operation at rated load
	--	264V/60Hz	1320	7.36	7.36	Normal operation at rated load
For model: 1750VA						
JP27, JP28	--	198V/50Hz	998	8.11	8.11	Normal operation at rated load
	8.0	220V/50Hz	1020	7.92	7.92	Normal operation at rated load
	8.0	240V/50Hz	1045	7.65	7.65	Normal operation at rated load
	--	264V/50Hz	1102	7.42	7.42	Normal operation at rated load
	--	198V/60Hz	993	8.09	8.09	Normal operation at rated load
	8.0	220V/60Hz	1015	7.90	7.90	Normal operation at rated load
	8.0	240V/60Hz	1038	7.61	7.61	Normal operation at rated load
	--	264V/60Hz	1097	7.40	7.40	Normal operation at rated load
Supplementary information:--						

5.1.1 2.1.1.5/RD	TABLE: Max. V, A, VA Test				N/A
Voltage (rated) (V)	Current (rated) (A)	Voltage (max.) (V)	Current (max.) (A)	VA (max.) (VA)	
--	--	--	--	--	
--	--	--	--	--	
Supplementary information:					

5.1.1 2.1.1.5/RD	TABLE: Stored Energy		N/A
Capacitance C (µF)	Voltage U (V)	Energy E (J)	

IEC 62040-1			
Clause	Requirement + Test	Result - Remark	Verdict
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Supplementary information:			

5.1.1 2.1.1.7/ RD	TABLE: discharge of capacitors in the primary circuit			N/A
Condition	τ calculated (s)	τ measured (s)	t u→ 0V (s)	Comments
--	--	--	--	--
--	--	--	--	--
Supplementary information:				

5.2.1 2.2/RD	TABLE: Evaluation Of Voltage Limiting Components In SELV Circuits			N/A
Component (measured between)	max. voltage (V) (normal operation)		Voltage Limiting Components	
	V peak	V d.c.		
--	--	--	--	
Fault test performed on voltage limiting components	Voltage measured (V) in SELV circuits (V peak or V d.c.)			
--	--			
Supplementary information:				

5.2.5 2.5/RD	TABLE: Limited Power Sources				N/A	
Circuit output tested:						
Note: Measured Uoc (V) with all load circuits disconnected:						
Components	Sample No.	Uoc (V)	Isc (A)		VA	
			Meas.	Limit	Meas.	Limit
Supplementary information: Sc=Short circuit, Oc=Open circuit						

IEC 62040-1			
Clause	Requirement + Test	Result - Remark	Verdict
5.7 2.10.2/RD	Table: Working Voltage Measurement		P
Location	RMS voltage (V)	Peak voltage (V)	Comments
Primary to Secondary	240	340	
Primary to enclosure	240	340	
Output to enclosure	240	340	
supplementary information:			

5.7 2.10.3/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)	
Functional:							
Different polarity across fuse	340	240	1.5	4.0	2.5	4.0	
Basic:							
Transformer primary to core	340	240	2.0	6.0	2.5	7.0	
Transformer secondary to core	340	240	2.0	6.0	2.5	7.0	
Reinforced:							
Primary to Secondary	340	240	4.0	11.0	5.0	11.0	
Transformer primary to secondary	340	240	4.0	11.0	5.0	11.0	
Primary to enclosure	340	240	4.0	11.0	5.0	11.0	
Output to enclosure	340	240	4.0	8.0	5.0	8.0	
Supplementary information:							

5.7 2.10.5.2/ 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)	
Insulation tape	240	3000AC	2 layers	2 layers	
Transformer Bobbin	240	3000AC	0.4mm	1.0mm	
Plastic enclosure	240	3000AC	0.4mm	1.5mm	
Supplementary information:					

IEC 62040-1

Clause	Requirement + Test	Result - Remark	Verdict
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7.7 4.5/RD	TABLE: Heating Test		P
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	Supply voltage (V)	198V/60Hz	264V/50Hz	24dc Battery	—
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	Ambient (°C)	40.0	40.0	40.0	—
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Thermocouple Locations	max. temperature measured, (°C)			Limit (°C)
AC socket	52.8	54.8	57.0	85
Internal wire	54.1	55.8	58.1	105
X capacitance	54.9	57.2	59.9	100
AC joint	57.2	58.8	60.6	85
C1	57.1	58.8	61.2	105
RLY4	58.9	64.2	66.6	85
L1 winding	53.8	55.6	58.2	130
PCB near Q3	61.1	63.3	66.6	130
C42	65.4	66.6	70.0	105
T winding	64.7	67.9	71.1	120
T bobbin	74.5	79.5	83.2	120
Battery	55.5	57.7	61.2	Ref.
Battery wire	44.4	45.4	46.3	105
Output socket	53.1	54.6	59.9	85
Output wire	58.1	59.8	65.0	105
Plastic enclosure	43.8	42.1	42.7	95

Supplementary information:

	TABLE: Heating test, resistance method		
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	Test voltage (V)	--	—
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	Ambient, t ₁ (°C)	--	—
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	Ambient, t ₂ (°C)	--	—
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Temperature rise of winding	R ₁ (Ω)	R ₂ (Ω)	ΔT (K)	Max. dT (K)	Insulation class
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Supplementary information:

7.4 4.5.5/RD	TABLE: Ball Pressure Test of Thermoplastics		P
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	Allowed impression diameter (mm)		—
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IEC 62040-1			
Clause	Requirement + Test	Result - Remark	Verdict
Part	Test temperature (°C)	Impression diameter (mm)	
Transformer Bobbin	125	1.0	
Supplementary information:			

5.7 2.10.5	TABLE: Dielectric Strength			P
Test voltage applied between:		Test potential applied (V)	Breakdown / flashover (Yes/No)	
Primary to SELV		3000Vac	No	
Input L/N to front Panel		3000Vac	No	
Input L/N to earth		1500Vac	No	
Output L/N to earth		1500Vac	No	
Supplementary information:				

7.5 4.7/RD	TABLE: Resistance to fire					P
Part	Manufacturer of material	Type of material	Thickness (mm)	Flammability class	Evidence	
PCB	Kingboard Laminates Ltd	KB series	1.0mm	V-0	UL E123995	
Plastic enclosure	Shenzhen Xin Quan Plastic Co., Ltd	PA765	Min.1.5	V-0	UL E56070	
Supplementary information:						

8 5.1/RD	TABLE: touch current measurement				P
Measured between:	Measured (mA)	Limit (mA)	Comments/conditions		
Input L/N to plastic enclosure (with metal foil)	0.0	0.25	Switch "E" closed		
Output L/N and plastic enclosure (with metal foil)	0.01	0.25	Switch "E" closed		
Input L/N and earthing	0.06	3.5	Switch "E" opened		
Output L/N and earthing	0.08	3.5	Switch "E" opened		
Supplementary information:--					

8.3 5.3/RD	TABLE: Fault condition tests			P
	Ambient temperature (°C) :	--	—	

IEC 62040-1							
Clause	Requirement + Test					Result - Remark	Verdict
	Power source for EUT: Manufacturer, model/type, output rating :					--	—
Component No.	Fault	Supply voltage (V)	Test time	Fuse #	Fuse current (A)	Observation	
Ventilation	Blocked	240V/60Hz	1.5hs	JP27, JP28	7.82	Normal operation, no damage. No hazards. Max. temperature: Transformer winding: 96.3°C Ambient: 24.6°C	
Q3 (Pin 1-2)	S-C	24Vdc Battery	1s	JP27, JP28	--	UPS shutdown immediately, recoverable when the fault removed. No hazard	
C1	S-C	240V/60Hz	1s	JP27, JP28	0	UPS shutdown immediately, JP27, JP28 opened. No hazard	
Transformer output	S-C	240V/60Hz	1h20mins	JP27, JP28	2.11	Normal output, battery charger circuit shut down No damaged. No hazard. Max. temperature: Transformer winding: 62.3°C Ambient: 25.4°C	
Transformer output	Overload	240V/60Hz	1h40mins	JP27, JP28	7.82 to 7.93 to 0.04	Unit shutdown when the current load to 0.92A, recoverable when the fault removed. No hazards. Max. temperature: TX2 winding: 103.4°C Ambient: 24.6°C	
Supplementary information:							

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> $A \geq Q/360 \text{ [m}^2\text{]}$ <p style="text-align: center;">with $Q = 0.054 * n * I * C$</p> <p>where:</p> <p>Q : airflow in m³/h n : number of battery cells I : constant factor (0,2A/100Ah for valve regulated lead acid batteries) C : is the battery nominal capacity in Ah at the 10h discharge rate</p> <p>With the specific data for the UPS the following dimension for the ventilation openings is required:</p> <p>n : ? C : ?</p> $A \geq (0.054 * n * 0.2 A/100 Ah * C)/360$ $A \geq ? \text{ m}^2$	N/A
	Verdict	
	The size of ventilation openings in battery cabinet exceeds the required airflow by far (as well as the UPS).	

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

4.5	TABLE: Critical components information					P
Object / part No.	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity ¹⁾	
Power plug	Shenzhen HongPu Electron Co., Ltd	XTH-005	250VAC, 16A	VDE 0620-1	VDE 40026370	
-Alternative	Ching Cheng Wire Material Co., Ltd.	EL-202	250VAC, 16A	VDE 0620-1	VDE 40004661	
-Alternative	Ching Cheng Wire Material co.,Ltd	EL210	250VAC, 13A	BSI 1363	KM39096	
-Alternative	Ching Cheng Wire Material Co.	EL-211	250VAC, 16A	VDE 0620-1	VDE 40004661	
Power cord	Shenzhen Baohing Electric Wire &cable Manufacture Co., Ltd	H05VV-F	3x0.75mm ²	EN 50525-2-11	VDE 103727	
-Alternative	SHENZHEN BAOHING ELECTRIC WIRE AND CABIE MANUFACTURE CO.,LTD	H05VV-F	3x0.75mm ²	EN 50525-2-11	VDE 131689	
-Alternative	YUHAO ELECTRIC MANUFACTURE CO.,LTD	H05VV-F	3x0.75mm ²	EN 50525-2-11	VDE 40027906	
Appliance outlet	Chaozhou Nanke Electronic Industry Co., Ltd.	XD-108-D	10A, 250VAC	EN 62040-1	Tested with appliance	
-Alternative	Chaozhou Nanke Electronic Industry Co., Ltd.	XD-108-E	10A, 250VAC	EN 62040-1	Tested with appliance	
-Alternative	Dong guanYuanJu Electronic Industry Co., Ltd.	XD-111-J	13A, 250VAC	EN 62040-1	Tested with appliance	
Plastic	SHENZHEN XIN QUAN Plastic Co., Ltd	PA765	130°C, V-0	UL 94 UL 746	UL E56070	
AC Inlet	Rong Feng Electronic Industry Co., Ltd.	SS-7B	10A, 250VAC	EN 60320-1	VDE 40028101	
-Alternative	Chaozhou Nanke Electronic Industry Co., Ltd.	XD-102	10A 250VAC	EN 60320-1	VDE 40023560	
Internal wire	SunPu Technology Co., Ltd.	1500	105°C, 500V, 18AWG	UL 758	UL E89980	
AC Fuse (for 3000VA)	XC Electronics(shenzhen) Gorp., Ltd.	5F	10A, 250V	IEC60127-1 IEC60127-2	VDE 40009610	
Relay	SHENZHEN GOLDEN ELECTRICALAPPLIANCES CO LTD	GJ-1C-24L	10A, 250VAC	EN 61810	TUV R50079239	

IEC 62040-1					
Clause	Requirement + Test			Result - Remark	Verdict
-Alternative	SHENZHEN GOLDEN ELECTRICALAPPLIANCES CO LTD	GH-1C-24L	10A, 250VAC	EN 61810	TUV R50079239
-Alternative	Wang rong Electronics(shenzhen)CO., Ltd.	RD-124D-E	10A, 277VAC	EN 61810	TUV R50244311
-Alternative	SONGCHUAN PRECISION CO.,LTD.	833H-1C-C-DC24V	10A 240VAC 10A 24VDC	EN 61810	TUV R9754206
X-capacitor	Jimson Electronics (Xiamen) Co., Ltd	MKP	X2, 2.2uF, 100°C	IEC 60384-14	VDE 40000463
PCB	Kingboard Laminates Ltd	KB series	94V-0, 130°C, Min. 1.0mm	UL 94 UL 746	UL E123995
-Alternative	Interchangeable	Interchangeable	94V-0, 130°C, Min. 1.0mm	UL 94 UL 746	UL
Transformer	Yangzhou Jinying Electric Appliance Co., Ltd.	3000VA	Class B	EN 62040-1	Tested with appliance
-Bobbin	E I Dupont De Nemours & Co., Inc	101L	PA, 94V-2, thickness 0.8mm	UL 94, UL 746	UL E41938
-Primary winding	XUZHOU SHENGBAO INDUSTRY CO LTD	UEW	155°C	UL 1466	UL E194766
-Secondary winding	XUZHOU SHENGBAO INDUSTRY CO LTD	UEW	155°C	UL 1466	UL E194766
-Insulation tape	JINGJIANG JINGYANG INSULATING PRODUCT CO LTD	PZ	130°C, V-0	UL 510	UL E309872
-Primary & secondary lead wire	Zhong Shan City Senbao Electric Co., Ltd	1015	300V, 105°C 20AWG	UL 758	UL E199818
-Thermal fuse	Aupo Electronics Ltd	A2	115°C 2A-F 250V	IEC 60691	VDE 40008720
-Varnish	Guangzhou Better New Materials Co., Ltd	MW35-C	200°C	UL 1446	UL E230067
Battery (for 1000-1200VA)	SHENZHEN RITAR POWER CO., LTD	RT1270E	12V, 7AH	UL 1989	UL MH26539
Battery(for 1500-1750VA)	SHENZHEN LEOCH BATTERIES TECHNOLOGY CO LTD	DJW12-8.0	12V, 8.0AH	UL 1989	UL MH26539

IEC 62040-1					
Clause	Requirement + Test			Result - Remark	Verdict
Battery(for 2000-3000VA)	SHENZHEN LEOCH BATTERIES TECHNOLOGY CO LTD	DJW12-9.0	12V, 9.0AH	UL 1989	UL MH26886
Supplementary information: 1) Provided evidence ensures the agreed level of compliance. See OD-CB2039.					

Attachment: Photos of the product:

Photo 1

Description: Overview



Photo 2

Description: Overview



Photo 3

Description: Overview



Photo 4

Description: Internal view

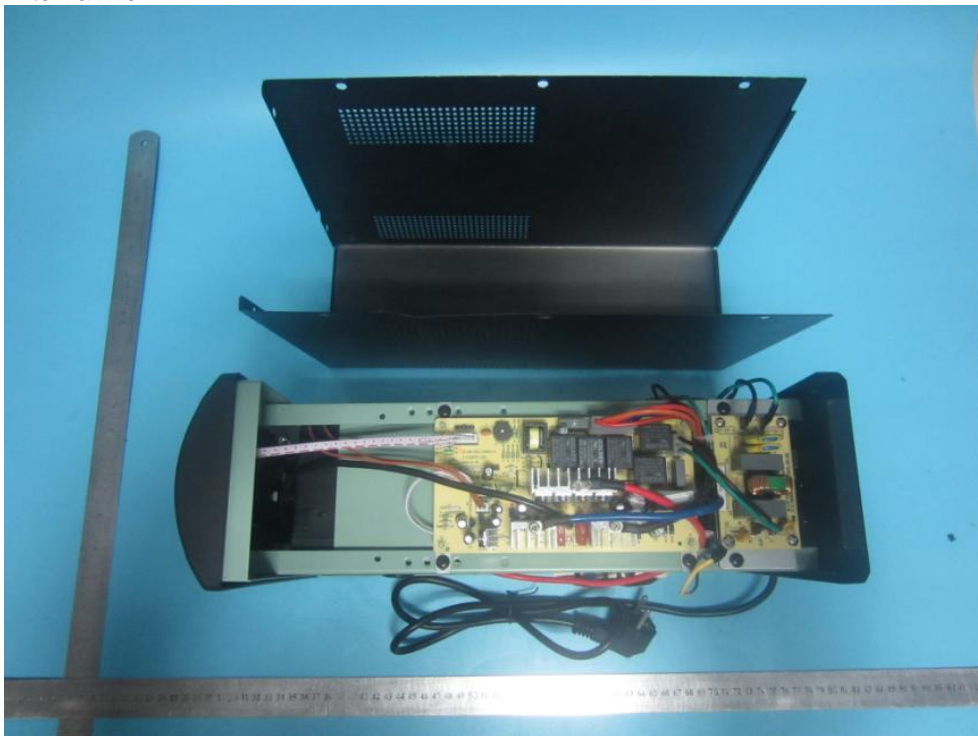


Photo 5

Description: Appliance outlet



Photo 6

Description: PCB view

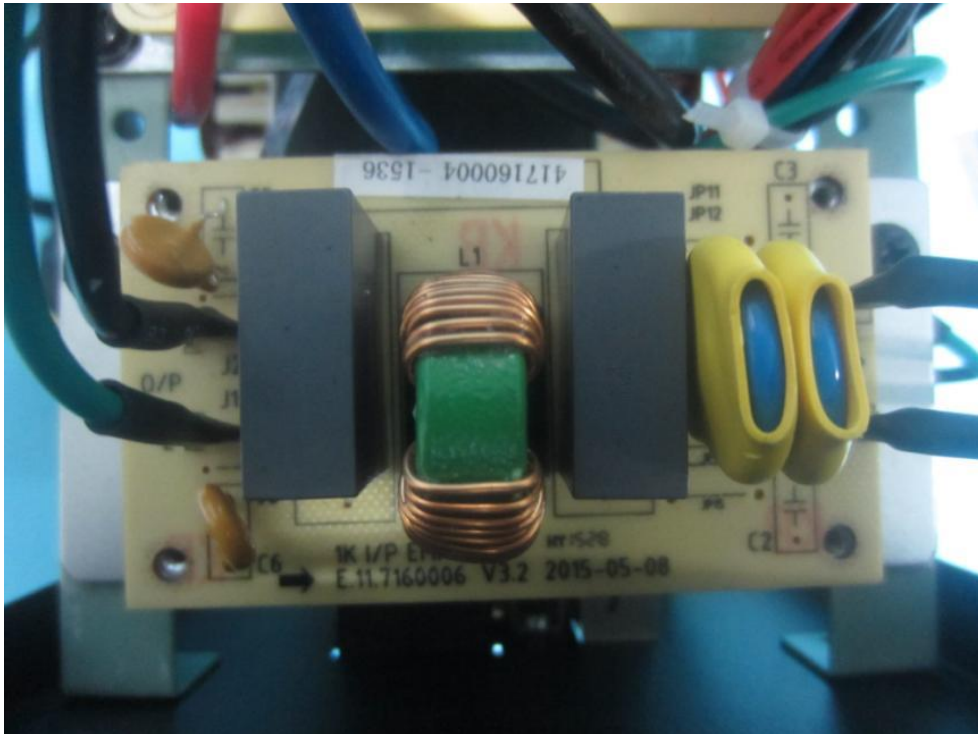


Photo 7

Description: PCB view

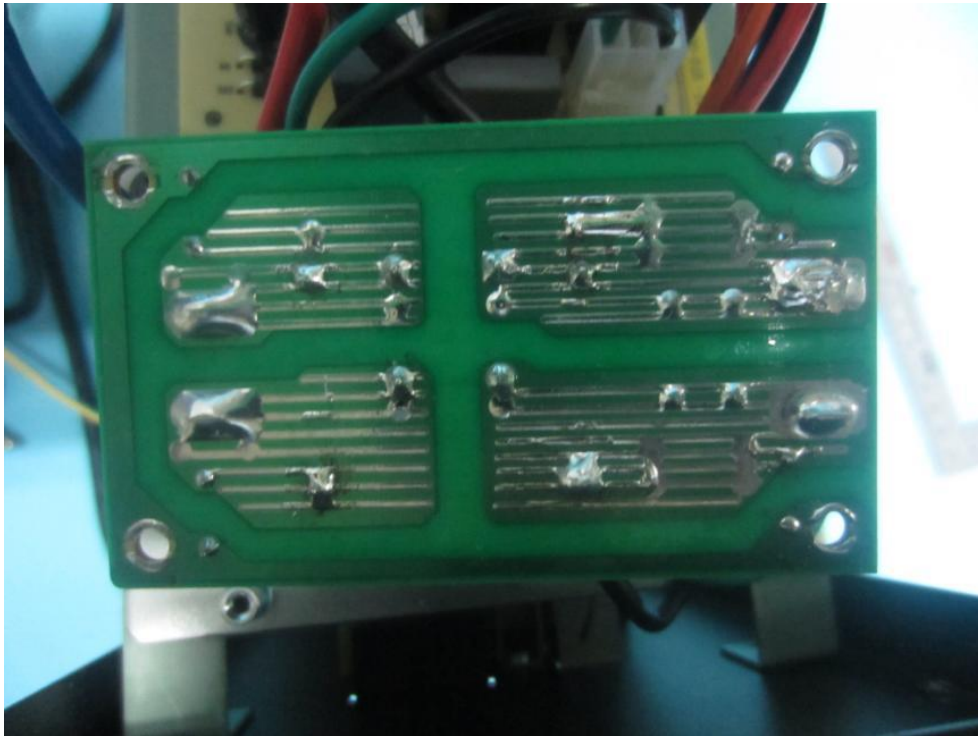


Photo 8

Description: PCB view

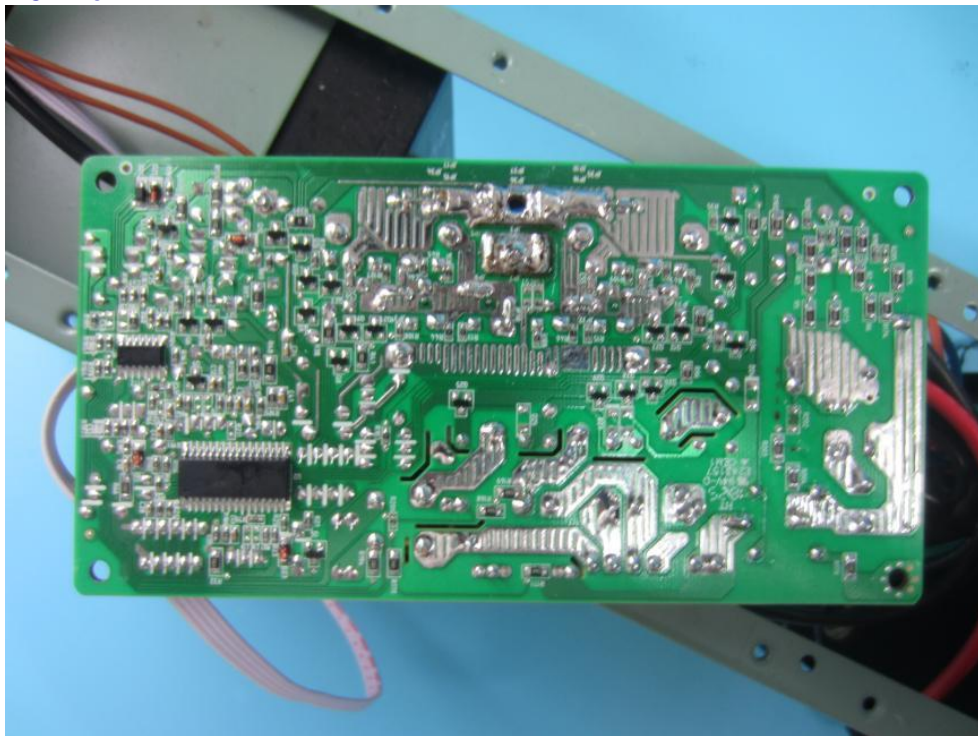


Photo 9

Description: PCB view

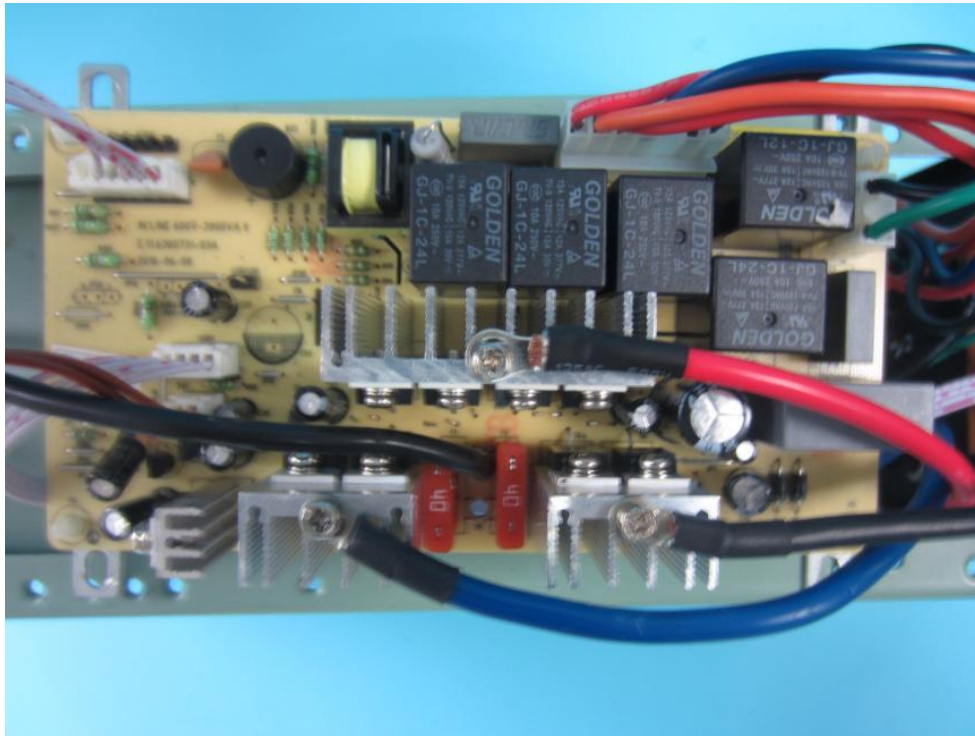


Photo 10

Description: Battery view



---The End of Report---