TEST REPORT

Applicant	:	VOLTRONIC POWER(SHENZHEN)TECHNOLOGY CORP.
Address	:	1st Floor, Building 1, HengChangRong Industrial Park, Private Industrial Zone, Shilongzai Community, Shiyan Street, BaoAn District, Shenzhen, China
Manufacturer	:	VOLTRONIC POWER(SHENZHEN)TECHNOLOGY CORP.
Address	:	1st Floor, Building 1, HengChangRong Industrial Park, Private Industrial Zone, Shilongzai Community, Shiyan Street, BaoAn District, Shenzhen, China
Product Name	:	Uninterruptible Power Supply
Trade Mark	:	Voltronic Power Advancing Power
Model No.	:	VESTA 1500, VESTA 1000
Ratings	:	See the copy of marking plate
Standard	:	Uninterruptible power systems(UPS) Part 1: General and safety requirements for UPS EN 62040-1: 2008+A1:2013
Date of Receiver	:	April 24, 2012
Date of Test	:	April 26, 2012 to April 30, 2012
Date of Issue	:	May 04, 2016
Test Report Form No	:	NTCS-IEC62040-1-A2-E
Test Result	:	Pass *

This Test Report is Issued Under the Authority of :

Compiled by

Peanut / Engineer

Approved by

Dongguan NTC Co., Ltd. Nore Testing Center TESTED

Han Song / Manager

*Remarks:

The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of Dongguan Nore Testing Center Co., Ltd. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

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Revision History of This Test Report

Report Number	Description	Issued Date
NTC1207657S	Initial Issue	2014-05-14
NTC1207657S-3	Update Low Voltage Directive	2016-05-04

Copy of marking plate:

Voltronic Power
Advancing Power

Uninterruptible power supply
Model: VESTA 1500
Input: 220-240Vac, 50/60Hz, 9.7A Max, 1Φ
Output: 220-240Vac, 50/60Hz, 1Φ
Capacity: 1500VA/900W
Icw≤1kA
Manufacturer: VOLTRONIC POWER TECHNOLOGY（SHENZHEN）CORP.
Address: 1st Floor, Building 1, HengChangRong Industrial Park, Private Industrial Zone, Shilongzai community, Shiyan Street, BaoAn District, Shenzhen, China
****
MADE IN CHINA

Voltronic Power
Advancing Power

Uninterruptible power supply
Model: VESTA 1000
Input: 220-240Vac, 50/60Hz, 6.5A, 1Φ
Output: 220-240Vac, 50/60Hz, 1Φ
Capacity: 1000VA/600W
Icw≤1kA
Manufacturer: VOLTRONIC POWER TECHNOLOGY（SHENZHEN）CORP.
Address: 1st Floor, Building 1, HengChangRong Industrial Park, Private Industrial Zone, Shilongzai community, Shiyan Street, BaoAn District, Shenzhen, China
****
MADE IN CHINA

Caution:

. Lead-acid battery inside of the enclosure.
. The lead-acid battery may cause chemical hazard.
. The battery presents a risk of energy hazard.==>
The battery may present a risk of electric shock or energy hazard.
. For more battery information, please see users manual.

Achtung:

. Blei-Akku ist im Gerät eingebaut.
. Diese Akkus können bei unsachgemäßer Behandlung chemische Gefahren hervorrufen.
. Der Akku birgt eine Gefahr durch sehr hohe Kurzschlußströme.
. Entsorgungsanleitung und Informationen zum Akku, entnehmen Sie bitte dem Handbuch.

Pb

Pb

Summary of testing:

The submitted samples were found to comply with the above standard.

- Tests performed on the bench (details see table 7.7)
- Maximum ambient temperature: +40°C
- Tested for moderate conditions
- Evaluation for use on elevations not exceeding 1500m.

Test item particulars ..... :	
Equipment mobility ..... :	☒ movable ☐ hand-held ☐ transportable ☐ stationary ☐ for building-in ☐ direct plug-in
Connection to the mains ..... :	☒ pluggable equipment ☒ type A ☐type B ☐permanent connection ☒detachable power supply cord ☐ non-detachable power supply cord ☐ not directly connected to the mains
Operating condition ..... :	☒ continuous ☐ rated operating / resting time:
Access location ..... :	☒ operator accessible ☐restricted access location
Over voltage category (OVC) ..... :	☐OVC I ☒OVC II ☐ OVC III ☐OVC IV ☐other:
Mains supply tolerance (%) or absolute mains supply values ..... :	220Vac(-10%), 240Vac(+10%) of input voltage considered
Tested for IT power systems ..... :	☒Yes (only for Norway) ☐ No
IT testing, phase-phase voltage (V) ..... :	230Vac for Norway only.
Class of equipment ..... :	☒Class I ☐ Class II ☐Class III ☐Not classified
Considered current rating of protective device as part of the building installlation (A) ..... :	16A
Pollution degree (PD) ..... :	☐ PD 1 ☒ PD 2 ☐ PD 3
IP protection class ..... :	IPX0
Altitude during operation (m) ..... :	Up to 1500m
Altitude of test laboratory (m) ..... :	below 1500m
Mass of equipment (kg) ..... :	Approximately 11.1Kg

Possible test case verdicts:

- test case does not apply to the test object ..... :	N (N/A)
- test object does meet the requirement ..... :	P (Pass)
- test object does not meet the requirement ..... :	F (Fail)

General remarks:

"(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 is used as the decimal separator.

Standard EN 62040-1: 2008+ Am 1:2013 is to be used in conjunction with EN 60950-1:2006+A11:2009+A1:2010 +A12:2011+A2:2013, which is referred to in this TRF by “RD”.

General product information:

This kind of UPS were designed as off-line UPS of high efficiency and performance;
Working condition for: Ambient temperature: 0℃ to +40℃

All models are identical except for the model name, reted for external battery and some parts (see table 4.5).

Name and address of factory (ies)：
Factory name: VOLTRONIC POWER(SHENZHEN)TECHNOLOGY CORP.

Address of factory: 1st Floor, Building 1, HengChangRong Industrial Park, Private Industrial Zone, Shilongzai Community, Shiyan Street, BaoAn District, Shenzhen, China

IEC 62040-1			
Clause	Requirement + Test	Result - Remark	Verdict
4	GENERAL CONDITIONS FOR TESTS		**P**
4.5	Components	Components, which were found to affect safety aspects, comply with the requirements of this standard or within the safety aspects of the relevant IEC component standards.	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	No thermal controls used.	N
1.5.4/RD	Transformers	Transformers used are suitable for their intended application and comply with the relevant requirements of the standard.	P
1.5.5/RD	Interconnecting cables	Between lines: X2 capacitor according to IEC 60384-14: 1993 with 21 days damp heat test was used.	P
1.5.6/RD	Capacitors bridging insulation	Between lines: X2 capacitor according to IEC 60384-14: 1993 with 21 days damp heat test was used.	P
1.5.7/RD	Resistors bridging insulation	See below.	P
1.5.7.1/RD	Resistors bridging functional, basic or supplementary insulation	Bleeder resistors bridging functional insulation.	P
1.5.7.2/RD	Resistors bridging double or reinforced insulation between a.c. mains and other circuits	No such resistors used.	N
1.5.7.3/RD	Resistors bridging double or reinforced insulation between a.c. mains and antenna or coaxial cable	No such resistors used.	N
1.5.8/RD	Components in equipment for IT power systems	230Vac considered, for Norway only.	P

4.6	Power interface		P
1.6.1/RD	AC power distribution systems	TN power system considered.	P

IEC 62040-1			
Clause	Requirement + Test	Result - Remark	Verdict
1.6.2/RD	Input current	Equipment is the charging of empty battery and operation with the maximum specified output load. (see appended table 4.6)	P
4.6 1.6.4/RD	Neutral conductor	Basic insulation for rated voltage between earthed parts and line and neutral conductors. Output neutral is not isolated from the input neutral.	P
4.7	Marking and instructions		P
4.7.1	General	See below.	P
4.7.2 1.7.1/RD	Power rating	The required marking is located on the outside surface of the equipment.	P
	Input rated voltage/range (V) .....:	See the copy of marking plate	P
	Input rated current/range (A).....:	See the copy of marking plate	P
	Input symbol for nature of supply (d.c.) .....:	AC source.	N
	Input rated frequency/range (Hz) .....:	See the copy of marking plate	P
	Number of Input phases and neutral.....:	See the copy of marking plate	P
	Output rated voltage/range (V) .....:	See the copy of marking plate	P
	Output rated current/range (A) .....:	Not marked.	N
	Output rated power factor, if less than unity, or active power and apparent power or active power and rated current .....:	See the copy of marking plate	P
	Number of output phases and neutral.....:	See the copy of marking plate	P
	Output rated active power (W or kW) .....:	See the copy of marking plate	P
	Output rated apparent power (VA or kVA) .....:	See the copy of marking plate	P
	Output symbol for nature of supply (d.c.) .....:	No such d.c. output.	N
	Output rated frequency/range (Hz) .....:	See the copy of marking plate	P
	Ambient operating temperature range (°C).....:	0-40℃	P
	Rated short-time withstand current (I_{cw}) or rated conditional short-circuit current (I_{cc})	Icw≤1kA	P
	Manufacturer's name or trademark or identification mark .....:	See the copy of marking plate	P
	Type/model or type reference .....:	See page 1.	P
	Symbol for Class II equipment only .....:	Class I equipment	N

IEC 62040-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Other symbols .....:	Additional symbols or marking do not give rise to misunderstanding.	P
	Certification marks .....:	CE	P
	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" .....:	No such construction and text not required for this unit.	N
4.7.3	Safety instructions	See below	P
4.7.3.1	General	The instruction contains information for operation, installation, servicing, transport, storage and technical data and so on.	P
4.7.3.2	Installation .....:	Installation instructions are available to the user in User's Manual.	P
	Location in a restricted access location only ...:	No a restricted access location.	N
	Permanent connector UPS .....:	Not an permanent equipment	N
	Pluggable type A or Pluggable type B UPS ....:	Pluggable type A UPS	P
4.7.3.3	Operation.....:	The suitable information list in the user's manual when operate the UPS.	P
4.7.3.4	Maintenance.....:	The instruction of maintenance is only included in the user's manual.	P
4.7.3.5	Distribution related backfeed.....:	Not permanently connected UPS.	N
4.7.4 1.7.4/RD	Main voltage adjustment .....:	No such construction.	N
	Methods and means of adjustment; reference to installation instructions .....:	See above.	N
4.7.5 1.7.5/RD	Power outlets.....:	For detail see appended table 4.5	P
4.7.6 1.7.6/RD	Fuse identification (marking, special fusing characteristics, cross-reference) .....:	Marking (T10A, 250V) is located adjacent to fuseholder.	P
4.7.7 1.7.7/RD	Wiring terminals	See below.	P
1.7.7.1/RD	Protective earthing and bonding terminals .....:	Approved AC inlet and outlet used. The earthing terminal is marked with the standard earthing symbol (60417-2-IEC-5019) near the terminal.	P

IEC 62040-1			
Clause	Requirement + Test	Result - Remark	Verdict
1.7.7.2/RD	Terminals for a.c. mains supply conductors..... :	The equipment without a non-detachable power supply cords.	N
1.7.7.3/RD	Terminals for d.c. mains supply conductors..... :	Supply by AC source only.	N
4.7.8	Battery terminals ..... :	Polarity of battery terminals is indicated according to IEC 60417, Nos. 5005 and 5006 (+ and -) on the batteries.	P
4.7.9 1.7.8/RD	Controls and indicators	See below.	P
1.7.8.1/RD	Identification, location and marking ..... :	LED provided to indicate the working condition, located on the front panel. A corresponding statement was provided in the User's manual.	P
1.7.8.2/RD	Colours .....:	Colors are acceptable due to only used for information (no safety involved even if disregarded).	P
1.7.8.3/RD	Symbols .....:	The switch is marked (IEC 60417-1 No. 5010).	P
1.7.8.4/RD	Markings using figures .....:	No controls affecting safety are using figures.	N
4.7.10 1.7.9/RD	Isolation of multiple power sources .....:	Only one external supply of hazardous voltage of energy (via appliance inlet).	N
4.7.11 1.7.2.4/RD	IT power systems	230Vac IT power system for Norway only.	N
4.7.12	Protection in building installation	The protection does not rely upon building installation. The protection is provided by input fuse used in AC inlet.	N
	Rated short-time withstand current (*I*cw) .....:		N
	Rated conditional short circuit current (*I*cc) .....:		N
	a) If higher Icp stated ≤ 10 kA		N
	a) If higher Icp stated > 10 kA		N
4.7.13 5.1/RD	High leakage current (mA) .....:	Leakage current of the equipment does not exceed 3.5mA.	N
4.7.14 1.7.10/RD	Thermostats and other regulating devices	Neither thermostats nor other regulating devices provided.	N
4.7.15 1.7.2.1/RD and 1.7.8.1/RD	Language(s) .....:	Instructions and markings are in a language acceptable for the country where the equipment is to be used. English user's manual and marking are provided.	P

IEC 62040-1			
Clause	Requirement + Test	Result - Remark	Verdict
4.7.16 1.7.11/RD	Durability of markings	The markings were 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	Marking is not on the removable parts.	P
4.7.18 1.7.13/RD	Replaceable batteries	Internal battery used only, it is not placed in an operator access area. It could not be replaceable by user. The required warning is in the safety manual.	N
	Language(s) .....:	English	—
4.7.19 1.7.2.5/RD	Operator access with a tool.....:	All areas containing hazard(s) are inaccessible to the operator.	P
4.7.20	Battery	Pluggable equipment type A UPS with integral batteries.	P
	Clearly legible information .....:	Warning label attached on the outside surface of battery pack. Information clearly legible	P
	Battery type (lead-acid, NiCd, etc.) and number of blocks or cells .....:	Lead-Acid type battery.	P
	Nominal voltage of total battery (V) .....:	Stated on rating user's manual.	P
	Nominal capacity of total battery (optional) .....:	Stated on rating user's manual.	P

IEC 62040-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Warning label ..... :	Warning language with information: CAUTION: For operation read user's manual including safaty warnings first! This unit may be opened by authorized technicians only! Lead acid battery in the inside of the enclosure! Lead acid battery may present a risk of eclectric shock and energy hazards. Risk of explosion if battery replaced by an incorrect type. For battery information, see user's manual. For disposal instructions of the battery, see user's manual. See installation instructions before connecting to the supplly. WARNING: ISOLATE UNINTERRUPTIBLE POWER SUPPLY (UPS) BEFORE WORKING ON THIS CIRCUIT.	P
	Instructions ..... :	User's manual stated volage, battery cell, ampere-hour rating, charging time and method of protection required on installation to coordinate with UPS protection device.	P
2.1.1.5/RD	Protection against energy hazards	Considered.	P
4.7.21 1.7.2.4/RD	Installation instructions	Detailed information regarding power distribution system, special attention to maintenace circuits and external interfaces are shown in instructions.	P

5	FUNDAMENTAL DESIGN REQUIREMENTS		P
5.1	Protection against electric shock and energy hazards	Considered.	P
5.1.1 2.1.1/RD	Protection for UPS intended to be used in operator access areas	See below.	P
2.1.1.1/RD	Access to energized parts	Checked by test finger, test probe and test pin. No accessible hazard energized parts.	P
	Test by inspection ..... :	Complies	P
	Test with test finger (Figure 2A) ..... :	Complies	P

IEC 62040-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Test with test pin (Figure 2B) ..... :	Complies	P
	Test with test probe (Figure 2C) ..... :	Complies.	P
2.1.1.2/RD	Battery compartments	No hazards TNV circuits inside battery compartments.	N
2.1.1.3/RD	Access to ELV wiring	No internal wiring at ELV accessible to the operator.	N
	Working voltage (Vpeak or Vrms); minimum distance through insulation (mm)		—
2.1.1.4/RD	Access to hazardous voltage circuit wiring	No operator accessible hazardous voltage circuit wiring.	P
2.1.1.5/RD	Energy hazards ..... :	No energy hazard at operator accessible SELV interfaces.	P
2.1.1.6/RD	Manual controls	Manual controls such as push button were separated from hazardous voltages.	P
2.1.1.7/RD	Discharge of capacitors in equipment	See below.	P
	Measured voltage (V); time-constant (s)..... :	(see appended table 5.1.1)	—
2.1.1.8/RD	Energy hazards – d.c. mains supply	No operator accessible external point of disconnection the internal battery. The equipment is not connected to d.c. mains supply.	N
	a) Capacitor connected to the d.c. mains supply ..:	No operator accessible external point of disconnection the internal battery.	N
	b) Internal battery connected to the d.c. mains supply ..... :	AC source supplied only.	N
2.1.1.9/RD	Audio amplifiers in information technology equipment ..... :	Not such equipment.	N
5.1.2 2.1.1.5 c) /RD	Protection for UPS intended to be used in service access areas	Checked by inspection, unintentional contact is unlikely during service operations.	N
	Hazardous energy level ..... :		N
5.1.3 2.1.1.5 c) /RD	Protection for UPS intended to be used in restricted access areas	Not for restricted access area	N
	Hazardous energy level ..... :		N
5.1.4	Backfeed protection	See below	P
	Shock hazard after de-energization of a.c. input for UPS	Backfeed protection provided to the UPS by relay.	P
	Measured voltage (V); time-constant (s)..... :	(see appended table 5.1.4)	—

IEC 62040-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Description of the construction .....:	The backfeed protection is achieved through the backfeed relays (RY01, RY05).	P
	Air gap is employed for backfeed protection		P
5.1.5	Emergency switching (disconnect) device	Not mandatory for pluggable UPS.	N
5.2	Requirements for auxiliary circuits		P
5.2.1 2.2/RD	Safety extra low voltage circuit - SELV	See below.	P
2.2.1/RD	General requirements	Shall not exceed the SELV limited value under normal condition.	P
2.2.2/RD	Voltages under normal conditions (V) .....:	Not exceed 42,4 V peak or 60 V d.c.	P
2.2.3/RD	Voltages under fault conditions (V) .....:	Not exceed the limited value.	P
2.2.4/RD	Connection of SELV circuits to other circuits ..:	SELV circuit is separated from the HAZARDOUS VOLTAGE circuit BY REINFORCED INSULATION.	P
5.2.2 2.3/RD	Telephone network voltage circuits - TNV	See below.	P
2.3.1/RD	Limits	The unit generates only signals within the limits of SELV circuits.	P
	Type of TNV circuits.....:	TNV-1 circuit and TNV-3 circuit	—
2.3.2/RD	Separation of TNV circuits from other circuits and from accessible parts	Separated by basic insulation.	P
2.3.2.1/RD	General requirements	The voltages of the SELV CIRCUITS and accessible conductive parts do not exceed the limits (specified in 2.3.1 b) for TNV-1 CIRCUITS and TNV-3 CIRCUITS under normal operating conditions.	P
2.3.2.2/RD	Protection by basic insulation		P
2.3.2.3/RD	Protection by earthing		P
2.3.2.4/RD	Protection by other constructions .....:	Separated by basic insulation.	P
2.3.3/RD	Separation from hazardous voltages	See below	P
	Insulation employed .....:	Separated by basic insulation.	P
2.3.4/RD	Connection of TNV circuits to other circuits	Not connect to other circuits.	N
	Insulation employed .....:		—

IEC 62040-1			
Clause	Requirement + Test	Result - Remark	Verdict
2.3.5/RD	Test for operating voltages generated externally	All compliance clause 2.2.2/RD on normal and single fault condition.	P
5.2.3 2.4/RD	Limited current circuits	See below.	P
2.4.1/RD	General requirements	The measured value does not exceed the limited.	P
2.4.2/RD	Limit values	(See appended table 5.2.3)	—
	Frequency (Hz)..... :	(See appended table 5.2.3)	—
	Measured current (mA) ..... :	(See appended table 5.2.3)	—
	Measured voltage (V) ..... :	(See appended table 5.2.3)	—
	Measured circuit capacitance (nF or µF) ..... :	(See appended table 5.2.3)	—
2.4.3/RD	Connection of limited current circuits to other circuits	USB and RS232 terminals maybe connect to other SELV circuits.	P
5.2.4 3.5/RD	External signaling circuits	USB and RS232 terminals used.	P
3.5.1/RD	General requirements	Considered.	P
3.5.2/RD	Types of interconnection circuits ..... :	SELV circuits.	P
3.5.3/RD	ELV circuits as interconnection circuits	No such ELV circuits.	N
3.5.4/RD	Data ports for additional equipment	USB and RS232 terminals used.	P
5.2.5 2.5/RD	Limited power source	The RS232 and USB as the signal terminals only.	N
	a) Inherently limited output		N
	b) Impedance limited output		N
	c) Regulating network limited output under normal operating and single fault condition		N
	d) Overcurrent protective device limited output		N
	Max. output voltage (V), max. output current (A), max. apparent power (VA) ..... :		N
	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	Class I appliance provide with earthing and bonding connection.	P
2.6/RD	Provisions for earthing and bonding	See below.	P

IEC 62040-1			
Clause	Requirement + Test	Result - Remark	Verdict
2.6.1/RD	Protective earthing	Relevant earthing conductive parts reliably connected to PE Pin of AC inlet.	P
2.6.2/RD	Functional earthing	No functional earthing	N
2.6.3/RD	Protective earthing conductors and protective bonding conductors	Reliable connection of relevant conductive parts to the PE terminal (via green and yellow insulated wires).	P
2.6.3.1/RD	General	Compliance checked. Protective bonding conductors have sufficient current-carring capacity.	P
2.6.3.2/RD	Size of protective earthing conductors	Approved AC inlet used.	P
	Rated current (A), cross-sectional area (mm^2), AWG ..... :	(See appended table 4.5)	—
2.6.3.3/RD	Size of protective bonding conductors	See below	P
	Rated current (A), cross-sectional area (mm^2), AWG ..... :	Min. 18AWG	—
	Protective current rating (A), cross-sectional area (mm^2), AWG ..... :	Min. 18AWG	—
2.6.3.4/RD	Resistance of earthing conductors and their terminations; resistance (Ω), voltage drop (V), test current (A), duration (min) ..... :	Measured the resistance across the protective conductor not exceed 0.1Ω. (See appended table 5.3)	P
2.6.3.5/RD	Colour of insulation..... :	The insulation of wire be green and yellow	P
2.6.4/RD	Terminals	See below.	P
2.6.4.1/RD	General	See below.	P
2.6.4.2/RD	Protective earthing and bonding terminals	Adequate protective earth connection, see also Subclause 2.6.3.4/RD and 3.3/RD.	P
	Rated current (A), type, nominal thread diameter (mm) ..... :	Same above.	—
2.6.4.3/RD	Separation of the protective earthing conductor from protective bonding conductors	Separate PE and protective bonding by conductor.	P
2.6.5/RD	Integrity of protective earthing	See below.	P
2.6.5.1/RD	Interconnection of equipment	This unit has it's 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	There are no switches or overcurrent protective devices in the protective earthing / bonding conductors.	P

IEC 62040-1			
Clause	Requirement + Test	Result - Remark	Verdict
2.6.5.3/RD	Disconnection of protective earth	Approved appliance inlet used.	P
2.6.5.4/RD	Parts that can be removed by an operator	Approved inlet, earthing connected before and disconnected after hazardous voltage. No other operator removable parts.	P
2.6.5.5/RD	Parts removed during servicing	It is not necessary to disconnect earthing except for the removal of the earthed part itself.	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	No such screws used.	N
2.6.5.8/RD	Reliance on telecommunication network or cable distribution system	Protective earthing is not rely on telecommunicatin network or cable distribtion system.	N
5.3.2 2.6.1/RD	Protective earthing	Reliable connection of relevant conductive parts to the PE terminal (via green and yellow insulated wires)	P
2.10/RD	Clearances, creepage distances and distances through insulation	(See appended table 5.7)	P
4.2/RD	Mechanical strength	Earthed or unearthed conductive enclosures do not bridge parts between which a hazardous energy level exists and not contact a bare part at hazardous voltage.	P
5.2/RD	Electric strength	(See appended table 5.7)	P
5.3.3	Protective bonding	Refer to 2.6.3.4/RD	P
5.4	AC and d.c. power isolation		P
5.4.1	General	Disconnection from the mains supply considered.	P
3.4/RD	Disconnection from the mains supply	Disconnection from the mains supply by appliance coupler.	P
3.4.1/RD	General requirement	See below.	P
3.4.2/RD	Disconnect devices	Appliance coupler as disconnect device.	P
3.4.3/RD	Permanently connected equipment	Not a permanently equipment.	N
3.4.4/RD	Parts which remain energized	After fuse activation battery back up still remains.	P
3.4.5/RD	Switches in flexible cords	No such switch used.	N

IEC 62040-1			
Clause	Requirement + Test	Result - Remark	Verdict
3.4.6/RD	Number of poles - single-phase and d.c. equipment	Single-phase equipment.	P
3.4.7/RD	Number of poles - three-phase equipment	Single-phase equipment.	N
3.4.8/RD	Switches as disconnect devices	See below.	N
3.4.9/RD	Plugs as disconnect devices		N
3.4.10/RD	Interconnected equipment	It unlikely to be contacted hazardous parts while AC inlet disconnected under being serviced.	P
3.4.11/RD	Multiple power sources	Only one external supply of hazardous voltage or energy (via power plug).	N
5.4.2	Disconnect devices	Appliance coupler as disconnect device.	P
5.5	Overcurrent and earth fault protection		P
5.5.1	General	See below.	P
2.7.3/RD	Short-circuit backup protection	Building installation is considered as providing short-circuit backup protection.	P
2.7.4/RD	Number and location of protective devices ..... :	Over current protection by one built-in curent fuse. Protection devices in the building installation considered to provide sufficient protection against earth faults.	P
2.7.5/RD	Protection by several devices	Only one protective device provided.	N
2.7.6/RD	Warning to service personnel ..... :	With for the mains socket being of non-reversible type, hazard may be still present in the equipment after the input current FUSE opens. However, as it is considered that the plug to the mains will be disconnected during service work. No markings were needed.	P
5.5.2	Basic requirements	Equipment relies on 16A rated input fuse or circuit breaker of the wall outlet installation protection of the building installation in regard to L, N short circuit and for L to PE earth fault. Over current protection is provided by the built-in device AC fuse.	P

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Clause	Requirement + Test	Result - Remark	Verdict
5.5.3	Battery circuit protection	Unearthed battery outside the UPS. Protection by two built-in curent fuse.	P
5.5.3.1	Overcurrent and earth fault protection	See below.	P
5.5.3.2	Location of protective device	There was no hazardous conditions under any simulated fault conditions. The current fuse is located the AC inlet. For the charger circuit there are no hazardous conditions under simulated fault conditions.	P
5.5.3.3	Rating of protective device	The rating of the protective devices inside the UPS indicated in the user's manual, and provides adequate safety protection during abnormal and/or fault conditions.	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
5.5.4.1	General		N
5.5.4.2	Modes of operation		N
5.5.4.3	Test procedure		N
5.5.4.3.1	General application		N
	Rated UPS output current/(r.m.s) (A) ..... :		--
	Prospective test current/(r.m.s) (A) ..... :		--
	Typical power factor ..... :		--
	Initial asymmetric peak current ration (*I*pk / *I*cw) . :		--
	Minimum durating of prospective test current (cycles 50/60 Hz) ..... :		--
5.5.4.3.2	Exemption from testing	Icw≤1kA	P
5.6	Protection of personnel – Safety interlocks		N
5.6.1	Operator protection	See below.	N
2.8/RD	General principles	No safety interlock circuits.	N
2.8.1/RD	Protection requirements		N
2.8.2/RD	Inadvertent reactivation		N
2.8.3/RD	Fail-safe operation		N
2.8.4/RD	Protection against extreme hazard		N

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Clause	Requirement + Test	Result - Remark	Verdict
2.8.5/RD	Moving parts		N
2.8.6/RD	Overriding		N
2.8.7/RD	Switches, relays and their related circuits		N
2.8.7.1/RD	Separation distances for contact gaps and their related circuits ..... :		N
2.8.7.2/RD	Overload test		N
2.8.7.3/RD	Endurance test		N
2.8.7.4/RD	Electric strength test		N
2.8.8/RD	Mechanical actuators		N
5.6.2	Service person protection	See below.	P
5.6.2.1	Introduction	Considered.	P
5.6.2.2	Covers	It is unlikely that during the removal of any covers service personnel may touch hazardous voltage or energy.	P
5.6.2.3	Location and guarding of parts	Only the exchange of the battery is considered as possible servicing. A risk of injury is unlikely for the service personnel.	P
5.6.2.4	Parts on doors	No doors used and the UPS is designed with only screwed enclosure parts.	N
5.6.2.5	Component access	No component access during operation mode necessary.	N
2.8.3/RD	Fail-safe operation	No inadvertent reactivation	N
5.6.2.6	Moving parts	No hazardous moving parts.	P
5.6.2.7	Capacitor banks	The capacitors provided can produce energy level way below 20 joules.	P
5.6.2.8	Internal batteries	Internal batteries used in the equipment.	P

5.7 2.10/RD	Clearances, creepage distances and distances through insulation		P
2.10.1/RD	General	See 2.10.3/RD, 2.10.4/RD and 2.10.5/RD.	P
2.10.1.1/RD	Frequency ..... :	Considered.	P
2.10.1.2/RD	Pollution degrees ..... :	Pollution degrees 2.	P
2.10.1.3/RD	Reduced values for functional insulation	Not reduced values for functional insulation which comply with 5.3.4/RD a) and c).	P

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Clause	Requirement + Test	Result - Remark	Verdict
2.10.1.4/RD	Intervening unconnected conductive parts	Considered.	P
2.10.1.5/RD	Insulation with varying dimensions	No reduction of distances considered.	N
2.10.1.6/RD	Special separation requirements	Not special separation requirements.	N
2.10.1.7/RD	Insulation in circuits generating starting pulses	No such circuit generating starting pulses.	N
2.10.2/RD	Determination of working voltage	See below.	P
2.10.2.1/RD	General	See below.	P
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)	P
2.10.3.1/RD	General	Annex F/RD and minimum clearances considered.	P
2.10.3.2/RD	Mains transient voltages	Normal transient volteges considered.	P
	a) AC mains supply ..... :	Equipment is Overvoltage Category II.	P
	b) Earthed d.c. mains supplies ..... :	Not intended for d.c. mains supplies	N
	c) Unearthed d.c. mains supplies ..... :	Not intended for d.c. mains supplies	N
	d) Battery operation ..... :	Internal battery considered.	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	No circuits having starting pulses.	N
2.10.3.6/RD	Transients from a.c. mains supply ..... :	Normal transient volteges considered.	P
2.10.3.7/RD	Transients from d.c. mains supply ..... :	Not connected to d.c. mains supply.	N
2.10.3.8/RD	Transients from telecommunication networks and cable distribution systems ..... :	No telecommunication networks and cable distribution systems	N
2.10.3.9/RD	Measurement of transient voltage levels		N
	a) Transients from a mains supply		N
	For an a.c. mains supply ..... :		N

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Clause	Requirement + Test	Result - Remark	Verdict
	For a d.c. mains supply ..... :		N
	b) Transients from a telecommunication network :		N
2.10.4/RD	Creepage distances	(see appended table 5.7)	N
2.10.4.1/RD	General	See below.	P
2.10.4.2/RD	Material group and comparative tracking index	Material IIIb is used.	P
	CTI tests ..... :	CTI rating of all materials of at least 100.	--
2.10.4.3/RD	Minimum creepage distances	(see appended table 5.7)	P
2.10.5 /RD	Solid insulation	Solid or laminated insulating materials having adequate thickness are provided.	P
2.10.5.1/RD	General	See below.	P
2.10.5.2/RD	Distances through insulation	(see appended table 5.7)	P
2.10.5.3/RD	Insulating compound as solid insulation	(see appended table 4.5)	P
2.10.5.4/RD	Semiconductor devices	Optocouplers used.	P
2.10.5.5/RD	Cemented joints	No cemented joint.	N
2.10.5.6/RD	Thin sheet material – General	Tapes used in transformers, but the transformer not as a isolation transformer.	P
2.10.5.7/RD	Separable thin sheet material	Tapes used in transformers.	P
	Number of layers (pcs) ..... :	At least 2 layers.	—
2.10.5.8/RD	Non-separable thin sheet material	No non-separable thin sheet material.	N
2.10.5.9/RD	Thin sheet material – standard test procedure	Tapes used in transformers.	P
	Electric strength test	(see appended table 5.7)	—
2.10.5.10 /RD	Thin sheet material – alternative test procedure		N
	Electric strength test		—
2.10.5.11 /RD	Insulation in wound components	No such components.	N
2.10.5.12 /RD	Wire in wound components	No such components.	N
	Working voltage ..... :		—

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Clause	Requirement + Test	Result - Remark	Verdict
	a) Basic insulation not under stress ..... :		N
	b) Basic, supplementary, reinforced insulation :		N
	c) Compliance with Annex U ..... :		N
	Two wires in contact inside wound component; angle between 45° and 90° ..... :		N
2.10.5.13 /RD	Wire with solvent-based enamel in wound components	No such components.	N
	Electric strength test		—
	Routine test		N
2.10.5.14 /RD	Additional insulation in wound components	No such components	N
	Working voltage ..... :		—
	- Basic insulation not under stress ..... :		N
	- Supplementary, reinforced insulation ..... :		N
2.10.6/RD	Construction of printed boards	See below.	P
2.10.6.1/RD	Uncoated printed boards	Uncoated printed boards used.	P
2.10.6.2/RD	Coated printed boards	No such boards used.	N
2.10.6.3/RD	Insulation between conductors on the same inner surface of a printed board	No such boards used.	N
2.10.6.4/RD	Insulation between conductors on different layers of a printed board	No such boards used.	N
	Distance through insulation		N
	Number of insulation layers (pcs) ..... :		N
2.10.7/RD	Component external terminations	No such construction.	N
2.10.8/RD	Tests on coated printed boards and coated components	No coated printed boards and components.	N
2.10.8.1/RD	Sample preparation and preliminary inspection		N
2.10.8.2/RD	Thermal conditioning		N
2.10.8.3/RD	Electric strength test		—
2.10.8.4/RD	Abrasion resistance test		N
2.10.9/RD	Thermal cycling		N
2.10.10/RD	Test for Pollution Degree 1 environment and insulating compound	Approved opto-couplers provided. (see appended table 4.5)	P
2.10.11/RD	Tests for semiconductor devices and cemented joints	No such device used.	N

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Clause	Requirement + Test	Result - Remark	Verdict
2.10.12/RD	Enclosed and sealed parts	Approved opto-couplers provided. (see appended table 4.5)	P
6	Wiring, connections and supply		P
6.1	General		P
6.1.1	Introduction	Considered.	P
3.1/RD	General	See below	P
3.1.1/RD	Current rating and overcurrent protection	All internal wires are UL recognized wiring which is PVC insulated. Internal wiring gauge is suitable for current intended to be carried. Internal wiring for primary power distribution protected against overcurrent by built-in input fuse and breakers.	P
3.1.2/RD	Protection against mechanical damage	Wires do not touch sharp edges which could damage the insulation and cause hazard.	P
3.1.3/RD	Securing of internal wiring	Internal wires were secured by stud terminals and quick connect terminals and cable ties so that a loosening or excessive strain on the terminal connection is unlikely, no damage of conductor insulation.	P
3.1.4/RD	Insulation of conductors	The insulation of the individual conductors was suitable for the application and the working voltage.	P
3.1.5/RD	Beads and ceramic insulators	No such parts used.	N
3.1.6/RD	Screws for electrical contact pressure	Screws for electrical contact pressure engage at least two complete threads into metal plate. No screws of insulating material used for electrical connection.	P
3.1.7/RD	Insulating materials in electrical connections	All current carrying and safety earthing connections are metal to metal.	P
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

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Clause	Requirement + Test	Result - Remark	Verdict
3.1.9/RD	Termination of conductors	All conductors are reliably secured by use of solder-pins or glue or other mechanical fixing means.	P
	10 N pull test	Break away or pivot on its terminal is unlikely	P
3.1.10/RD	Sleeving on wiring	Heat-shrunk tube used to provide supplementary insulation of internal wire, it will not slip as the enough length.	P
6.1.2	Dimensions and rating of busbars and insulated conductors	The choice of cross-sections and ratings of conductors by manufacturer inside the UPS is applicable.	P
6.2	Connection to power		P
6.2.1	General provisions for connection to power	See below.	P
3.2.2/RD	Multiple supply connections	Only one supply connections.	N
3.2.3/RD	Permanently connected equipment	Not an permanently connected equipment. It's a pluggable equipment type A equipment.	N
	Number of conductors, diameter of cable and conduits (mm) ..... :		—
3.2.4/RD	Appliance inlets	Approved appliance inlet used.	P
3.2.5/RD	Power supply cords	Approved power cord set with suitable electrical ratings for use in the UPS.	P
3.2.5.1/RD	AC power supply cords	Approved power supply cords for final used. (See appended table 4.5)	P
	Type ..... :	PVC insulated power cord type H05VV-F.	—
	Rated current (A), cross-sectional area (mm²), AWG ..... :	3G 0.75mm^2 with a rating of at least 10A.	—
3.2.5.2/RD	DC power supply cords	Not connected to DC power supply.	N
3.2.6/RD	Cord anchorages and strain relief	Dismountable power cord used only.	N
	Mass of equipment (kg), pull (N) ..... :		—
	Longitudinal displacement (mm) ..... :		—
3.2.7/RD	Protection against mechanical damage	No parts under this unit likely to damage the power supply cord. Enclosure without sharp edges.	P

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Clause	Requirement + Test	Result - Remark	Verdict
3.2.8/RD	Cord guards	Appliance inlet and outlets used.	N
	Diameter or minor dimension D (mm); test mass (g) ..... :		—
	Radius of curvature of cord (mm)..... :		—
6.2.2	Means of connection ..... :	Appliance inlet used.	P
	More than one supply connection ..... :	Single voltage range supply connection.	N
6.3	Wiring terminals for external power conductors		N
3.3/RD	Wiring terminals for connection of external conductors	See below	N
3.3.1/RD	Wiring terminals	Not permanently connected equipment.	N
3.3.2/RD	Connection of non-detachable power supply cords		N
3.3.3/RD	Screw terminals		N
3.3.4/RD	Conductor sizes to be connected		N
	Rated current (A), cord/cable type, cross-sectional area (mm^2)..... :		—
3.3.5/RD	Wiring terminal sizes		N
	Rated current (A), type, nominal thread diameter (mm) ..... :		—
3.3.6/RD	Wiring terminal design		N
3.3.7/RD	Grouping of wiring terminals		N
3.3.8/RD	Stranded wire		N
7	Physical requirements		P
7.1	Enclosure	The frame or chassis not be used to carry current. And provided adequate protection against risk of fire, electric shock, injury to persons and hazardous energy level.	P
7.2 4.1/RD	Stability		P
	Angle of 10°	The UPS do not overbalance when tilted to an angle of 10 degree. The unit is not considered to be floor-standing.	P
	Test force (N) ..... :		N

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Clause	Requirement + Test	Result - Remark	Verdict
7.3 4.2/RD	Mechanical strength		P
4.2.1/RD	General	Enclosure and chassis of metal material. Tests performed and passed. After the tests, unit complied with the requirements of sub-clauses 2.1.1/RD, 2.6.1/RD, 2.10/RD, and 4.4.1/RD.	P
4.2.2/RD	Steady force test, 10 N	10N applied to components.	P
4.2.3/RD	Steady force test, 30 N	No such compartments.	N
4.2.4/RD	Steady force test, 250 N	250N applied to outer enclosure.	P
4.2.5/RD	Impact test	Applied to outer enclosure. No hazard as a result from steel ball impact test.	P
	Fall test	No hazard as a result from steel ball impact test.	P
	Swing test	No hazard as result from steel sphere ball swung test.	P
4.2.6/RD	Drop test; height (mm) ..... :	Not required for this equipment.	N
4.2.7/RD	Stress relief test	After the test at 76°C, 7h, no shrinkage, distortion or loosening of any enclosure part was noticeable on the equipment.	P
4.2.8/RD	Cathode ray tubes	Not cathode ray tubes	N
	Picture tube separately certified ..... :	Not picture tube	—
4.2.9/RD	High pressure lamps	Not high pressure lamps	N
4.2.10/RD	Wall or ceiling mounted equipment; force (N) . :	Not wall or ceiling mounted equipment	N

7.4	Construction details		P
7.4.1	Introduction	Considered.	P
4.3.1/RD	Edges and corners	Edges and corners of the enclosure are rounded.	P
4.3.2/RD	Handles and manual controls; force (N)..... :	15N, no loosening.	P
4.3.3/RD	Adjustable controls	No such construction.	N
4.3.4/RD	Securing of parts	Mechanical fixings in such a way designed that they withstand mechanical stress occurring in normal use.	P
4.3.5/RD	Connection by plugs and sockets	No mismatch of connectors, plugs or sockets possible.	P

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Clause	Requirement + Test	Result - Remark	Verdict
4.3.7/RD	Heating elements in earthed equipment	The internal UL approved battery considered. No hazardou.	P
4.3.11/RD	Containers for liquids or gases	No such parts.	N
4.4/RD	Protection against hazardous moving parts	No hazardous moving parts.	P
4.4.1/RD	General	DC fan located at secondary circuit. The enclosure of the unit provide as fan guard. Test finger applied to penings. No fan blade accessible.	P
4.4.2/RD	Protection in operator access areas ..... :	See above	P
4.4.3/RD	Protection in restricted access locations ..... :	The battery terminals considered.	P
4.4.4/RD	Protection in service access areas	(See 4.4.1/RD)	P
4.4.5/RD	Protection against moving fan blades	Protection against moving fan blades by metal meshes.	P
4.4.5.1/RD	General		P
	Not considered to cause pain or injury. a) ..... :		N
	Is considered to cause pain, not injury. b) ..... :		N
	Considered to cause injury. c) ..... :		P
4.4.5.2	Protection for users	Protection against moving fan blades by metal meshes.	P
	Use of symbol or warning ..... :		N
4.4.5.3	Protection for service persons	Protection against moving fan blades by metal meshes.	P
	Use of symbol or warning ..... :		N
4.5/RD	Thermal requirements	(See appended table 7.7)	P
4.5.1/RD	General	See below.	P
4.5.2/RD	Temperature tests	(See appended table 7.7)	P
	Normal load condition per Annex L ..... :		P
4.5.3/RD	Temperature limits for materials	(See appended table 7.7)	P
4.5.4/RD	Touch temperature limits	(See appended table 7.7)	P
4.5.5/RD	Resistance to abnormal heat ..... :	(see appended table 7.7)	P
7.4.2	Openings	Suitable construction prevent vertical access to bare parts of hazardous voltage. (See appended table 7.4.2)	P
7.4.3	Gas Concentration	No internal batteries used in the equipment.	N
7.4.4	Equipment movement	No castors provided.	N

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Clause	Requirement + Test	Result - Remark	Verdict
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	(see appended table 7.5)	P
	Method 2, application of all of simulated fault condition tests	A fire enclosure is provided. (see appended table 7.5)	N
4.7.2/RD	Conditions for a fire enclosure	See below.	P
4.7.2.1/RD	Parts requiring a fire enclosure	Internal components required a fire enclosure.	P
4.7.2.2/RD	Parts not requiring a fire enclosure	The fire enclosure is required to cover all parts.	N
4.7.3/RD	Materials	See below.	P
4.7.3.1/RD	General	PCB rated V-0. (See appended table 4.5)	P
4.7.3.2/RD	Materials for fire enclosures	Metal enclosure or plastic fire enclosures is V-0. (See appended table 4.5)	P
4.7.3.3/RD	Materials for components and other parts outside fire enclosures	No materials for components and other parts outside fire enclosures except the power cord sets.	N
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 HB (or better).	P
4.7.3.5/RD	Materials for air filter assemblies	No air filter assemblies	N
4.7.3.6/RD	Materials used in high-voltage components	No high-voltage components.	N
7.6	Battery location		P
7.6.1	Battery location and installation	The internal battery used. For installation, see user's manual or relatived document from the manufacture.	P
7.6.2	Accessibility and maintainability	For detail see user's manual or relatived document from the manufacture.	P
7.6.3	Distance	The temperature of the electrolyte and the gas emission are within the limits of this standard.	P
7.6.4	Case insulation	Insulation meet the requirement of this standards.	P

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Clause	Requirement + Test	Result - Remark	Verdict
7.6.5	Wiring	UL approved wirings. The protection of connecting wiring complies with subclause 6, details see there.	P
7.6.6	Electrolyte spillage	Sealed maintenance free battery, the emission of electrolyte is unlikely.	P
7.6.7	Ventilation	Comply with Annex M.2	P
7.6.8	Charging voltage	Protective circuit to prevent excessive charging voltages occurring under any single fault condition. See sub-clause 8.3.	P
7.7	Temperature rise		P
4.5/RD	Thermal requirements		P
4.5.1/RD	General	Considered.	P
4.5.2/RD	Temperature tests	(see appended table 7.7)	P
	Normal load condition per Annex L ..... :		P
4.5.3/RD	Temperature limits for materials	(see appended table 7.7)	P
4.5.4/RD	Touch temperature limits	(see appended table 7.7)	P
4.5.5/RD	Resistance to abnormal heat ..... :	(see appended table 7.7)	P
8	Electrical requirements and simulated abnormal conditions		P
8.1	General provisions for earth leakage		P
5.1.1/RD	General	Considered.	P
5.1.7/RD	Equipment with touch current exceeding 3,5 mA	No touch current exceeding 3.5mA.	N
8.2 5.2/RD	Electric strength		P
5.2.1/RD	General	(see appended table 5.7)	P
5.2.2/RD	Test procedure	(see appended table 5.7)	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	DC motor used for DC fan only. (see appended Annex B)	P

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Clause	Requirement + Test	Result - Remark	Verdict
5.3.3/RD	Transformers	Transformers not as isolation parts. (see appended Annex C)	P
5.3.4/RD	Functional insulation..... :	Complies with point c) in clause 5.3.4/RD.	P
5.3.5/RD	Electromechanical components	No electromechanical components except for approved magnetic contactor and relays provided.	N
5.3.9/RD	Compliance criteria for abnormal operating and fault conditions	Compliance checked. During the test, no fire propagated beyond the equipment, no molten metal was emitted. After the test, electric strength tests were passed.	P
5.3.9.1/RD	During the tests	No fire or molten metal occurred and no deformation of enclosure during the tests	P
5.3.9.2/RD	After the tests	No reduction of clearance and creepage distance. Electric strength test is made on basic, supplementary and reinforced insulation after test.	P
8.3.2	Simulation of faults	(see appended table 8.3)	P
8.3.3	Conditions for tests	The equipment was tested under normal use and foreseeable misuse conditions. (see appended table 8.3)	P

9 6/RD	Connection to telecommunication networks		**P**
6.1/RD	Protection of telecommunication network service persons, and users of other equipment connected to the network, from hazards in the equipment		P
6.1.1/RD	Protection from hazardous voltages		P
6.1.2/RD	Separation of the telecommunication network from earth		P
6.1.2.1/RD	Requirements	No bridging components between RJ45, USB and earth, only creepage and clearance distance applied	P
	Supply voltage (V) ..... :		—
	Current in the test circuit (mA) ..... :		—
6.1.2.2/RD	Exclusions ..... :		N
6.2/RD	Protection of equipment users from overvoltages on telecommunication networks		P

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Clause	Requirement + Test	Result - Remark	Verdict
6.2.1/RD	Separation requirements	Basic insulation between RJ45, USB and accessible parts and SELV interfaces and earthing.	P
6.2.2/RD	Electric strength test procedure	See subclause 6.2.2.2/RD	P
6.2.2.1/RD	Impulse test		N
6.2.2.2/RD	Steady-state test	For details see sub-clause 6.1.2.1/RD	P
6.2.2.3/RD	Compliance criteria	Complied for test of subclause 6.2.2.2/RD	P
6.3/RD	Protection of the telecommunication wiring system from overheating		P
	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 ..... :	TNV-1 circuits, TNV-3 circuits.	--
3.5.3/RD	ELV circuits as interconnection circuits	No such ELV circuits.	N
3.5.4/RD	Data ports for additional equipment	USB and RS232 terminals are SELV circuits. No other additional equipment prrovided.	N
2.1.3/RD	Protection in restricted access locations	No restricted access locations.	N
2.3/RD	TNV circuits		P
2.3.1/RD	Limits	when telephone ringing signals are present, voltages such that the signal complies with the criteria of either Clause M.2 or Clause M.3	P
	Type of TNV circuits ..... :	TNV-1 circuits, TNV-3 circuits.	--
2.3.2/RD	Separation from other circuits and from accessible parts	See below.	P
2.3.2.1/RD	General requirements	Separated by BASIC INSULATION.	P
2.3.2.2/RD	Protection by basic insulation	The voltages of the SELV circuits and accessible conductive parts do not exceed the limits specified in 2.3.1 for TNV-1 circuits and TNV-3 circuits under normal operating conditions.	P
2.3.2.3/RD	Protection by earthing		N
2.3.2.4/RD	Protection by other constructions ..... :		P

IEC 62040-1			
Clause	Requirement + Test	Result - Remark	Verdict
2.3.3/RD	Separation from hazardous voltages		N
	Insulation employed ..... :		—
2.3.4/RD	Connection of TNV circuits to other circuits	The TNV circuits not connection to other circuits under normal used condition.	N
	Insulation employed ..... :		—
2.3.5/RD	Test for operating voltages generated externally		
2.6.5.8/RD	Reliance on telecommunication network or cable distribution system	Protective Earthing does not rely on a telecommunication network or a cable distribution system.	N
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
2.10.4/RD	Creepage distances	See below.	P
2.10.4.1/RD	General	Considered.	P
2.10.4.2/RD	Material group and comparative tracking index	Material IIIb is used.	P
	CTI tests ..... :	CTI rating of all materials of at least 100.	—
2.10.4.3/RD	Minimum creepage distances	(see appended table 5.7)	P

M/RD	Annex M, CRITERIA FOR TELEPHONE RINGING SIGNALS (see 2.3.1/RD)		N
M.1/RD	Introduction		N
M.2 /RD	Method A		N
M.3/RD	Method B		N
M.3.1/RD	Ringing signal		N
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
M.3.2.1/RD	Conditions for use of a tripping device or a monitoring voltage		—
M.3.2.2/RD	Tripping device		N
M.3.2.3/RD	Monitoring voltage (V) ..... :		N

A/RD	Annex A, Tests for resistance to heat and fire	N

IEC 62040-1			
Clause	Requirement + Test	Result - Remark	Verdict
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.1.1/RD	Samples ..... :		—
	Wall thickness (mm) ..... :		—
A.1.2/RD	Conditioning of samples; temperature (°C) ..... :		N
A.1.3/RD	Mounting of samples ..... :		N
A.1.4/RD	Test flame (see IEC 60695-11-3)		N
	Flame A, B, C or D ..... :		—
A.1.5/RD	Test procedure		N
A.1.6/RD	Compliance criteria		N
	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.2.1/RD	Samples, material..... :		—
	Wall thickness (mm) ..... :		—
A.2.2/RD	Conditioning of samples; temperature (°C) ..... :		N
A.2.3/RD	Mounting of samples ..... :		N
A.2.4/RD	Test flame (see IEC 60695-11-4)		N
	Flame A, B or C ..... :		—
A.2.5/RD	Test procedure		N
A.2.6/RD	Compliance criteria		N
	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
	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.3.1/RD	Mounting of samples		N
A.3.2/RD	Test procedure		N
A.3.3/RD	Compliance criterion		N

B/RD	Annex B, Motor tests under abnormal conditions (see 4.7.2.2/RD and 5.3.2/RD)		N
B.1/RD	General requirements		N

IEC 62040-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Position ..... :		—
	Manufacturer ..... :		—
	Type ..... :		—
	Rated values ..... :		—
B.2/RD	Test conditions		N
B.3/RD	Maximum temperatures		N
B.4/RD	Running overload test		N
B.5/RD	Locked-rotor overload test		N
	Test duration (days) ..... :		—
	Electric strength test: test voltage (V) ..... :		—
B.6/RD	Running overload test for d.c. motors in secondary circuits		N
B.6.1/RD	General		N
B.6.2/RD	Test procedure		N
B.6.3/RD	Alternative test procedure		N
B.6.4/RD	Electric strength test; test voltage (V) ..... :		N
B.7/RD	Locked-rotor overload test for d.c. motors in secondary circuits		N
B.7.1/RD	General		N
B.7.2/RD	Test procedure		N
B.7.3/RD	Alternative test procedure		N
B.7.4/RD	Electric strength test; test voltage (V) ..... :		N
B.8/RD	Test for motors with capacitors		N
B.9/RD	Test for three-phase motors		N
B.10/RD	Test for series motors		N
	Operating voltage (V) ..... :		—

C/RD	Annex C, Transformers (see 1.5.4/RD and 5.3.3/RD)		P
	Position ..... :	Transformers	—
	Manufacturer ..... :	(See appened table 4.5)	—
	Type ..... :	(See appened table 4.5)	—
	Rated values ..... :	(See appened table 4.5)	—
	Method of protection..... :	By thermal link	—
C.1/RD	Overload test	(See appened table 4.5)	P
C.2/RD	Insulation	Transformers not as isolation parts.	N
	Protection from displacement of windings ..... :	By insulation tapes	N

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

D/RD	Annex D, Measuring instruments for touch current tests (see 5.1.4/RD)		P
D.1/RD	Measuring instrument	Measuring instrument according to figure D.1 was used.	P
D.2/RD	Alternative measuring instrument		N

E/RD	Annex E, Temperature rise of a winding (see Annex E/RD)		P

F/RD	Annex F, Measurements of clearances and creepage distance (see 2.10/RD and Annex G/RD)		P

G/RD	Annex G, Alternative method for determining minimum clearances		N
G.1/RD	Clearances		N
G.1.1/RD	General		N
G.1.2/RD	Summary of the procedure for determining minimum clearances		N
G.2/RD	Determination of mains transient voltage (V)		N
G.2.1/RD	AC mains supply ..... :		N
G.2.2/RD	Earthed d.c. mains supplies ..... :		N
G.2.3/RD	Unearthed d.c. mains supplies ..... :		N
G.2.4/RD	Battery operation ..... :		N
G.3/RD	Determination of telecommunication network transient voltage (V) ..... :		N
G.4/RD	Determination of required withstand voltage (V)		N
G.4.1/RD	Mains transients and internal repetitive peaks :		N
G.4.2/RD	Transients from telecommunication networks . :		N
G.4.3/RD	Combination of transients		N
G.4.4/RD	Transients from cable distribution systems		N
G.5/RD	Measurement of transient voltages (V)		N
	a) Transients from a mains supply		N
	For an a.c. mains supply		N
	For a d.c. mains supply		N
	b) Transients from a telecommunication network		N
G.6/RD	Determination of minimum clearances ..... :		N

H	Annex H, Guidance on protection against ingress of water and foreign objects (see IEC 60529)		N

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

I	Annex I, Backfeed protection test		P
I.1	General	Considered.	P
I.2	Test for pluggable UPS	Backfeed relay provided.	P
I.3	Test for permanently connected UPS		N
I.4	Load-induced change of reference potential		N
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

J/RD	Annex J, Table of electrochemical potentials (see 2.6.5.6/RD)		P
	Metal(s) used ..... :	Metals which the combination electrochemical potential is less than 0.6V.	—

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

L	Annex L, Reference loads		P
L.1	General	Backfeed relays provided. Even in case of a single fault the protection circuit acts within less than 1s and the open circuit voltage of pin terminal of plug are less than 30Vrms (42.4Vp or 60Vdc).	P
L.2	Reference resistive load		N
L.3	Reference inductive-resistive load		N
L.4	Reference capacitive-resistive loads	Worst case loads specified by the manufacturer maintained during the relevant tests.	P
L.5	Reference non-linear load		N
L.5.1	General		N
L.5.2	Test method		N

IEC 62040-1			
Clause	Requirement + Test	Result - Remark	Verdict
L.5.3	Connection of the non-linear reference load		—
M	Annex M, Ventilation of battery compartments		P
M.1	General	Sufficient openings and a suitable arrangement of components are provided in such a way that a local concentration of hydrogen and oxygen is not possible. No requirement regarding the separation of operational arcing parts from battery vents/valves.	P
M.2	Normal conditions	See above.	P
M.3	Blocked conditions	(See appended table 8.3)	P
M.4	Overcharge conditions		N
N	Annex N, Minimum and maximum cross-sections of copper conductors suitable for connection (see 6.3)		P
U/RD	Annex U, Insulated winding wires for use without interleaved insulation (see 2.10.5.4/RD)		N
			—
V/RD	Annex V, AC POWER DISTRIBUTION SYSTEMS (see 1.6.1/RD)		P
V.1/RD	Introduction	See below.	P
V.2/RD	TN power distribution systems	See sub-clause 1.6.1/RD.	P
V.3/RD	TT power distribution systems		N
V.4/RD	IT power distribution systems	230Vac considered for Norway only.	P

4.5	TABLE: Critical components information				
Object / part No.	**Manufacturer/ trademark**	**Type / model**	**Technical data**	**Standard**	**Mark(s) of conformity[1])**
Battery (for model VESTA 1000)	SHENZHEN LEOCH BATTERIES TECHNOLOGY CO LTD	DJW12-7.0	12V, 7AH	UL1989	UL MH26866
Alternative	TOPLITE (GUANGZHOU) TECHNOLOGY BATTERY CO LTD	NPW36-12	12V, 36W	UL1989	UL MH29104
Alternative	SHENZHEN RITAR POWER CO LTD	RT1270	12V, 7AH	UL1989	UL MH28539
Alternative	CSB BATTERY CO LTD	GP 1272 GP 1272 FR	12V, 28W	UL1989	UL MH14533
Alternative	CSB BATTERY CO LTD	UPS 123607 UPS 123607F2 UPS 123607F2F1	12V, 36W	UL1989	UL MH14533
Alternative	CSB BATTERY CO LTD	UPS 12360	12V, 36W	UL1989	UL MH14533
Alternative	CSB BATTERY CO LTD	HR 1234W	12V, 34W	UL1989	UL MH14533
Alternative	FUJIAN MINHUA POWER SOURCE CO LTD	MS7-12	12V, 7AH	UL1989	UL MH47104
Alternative	SHENZHEN LEOCH BATTERIES TECHNOLOGY CO LTD	DJW12-7.0L LP12-7.0	12V 7AH	UL1989	UL MH49797
Alternative	SHENZHEN CENTER POWER TECHNOLOGY CO LTD	CP1270E	12V, 7AH	UL 1989	UL MH25860
Alternative	SHENZHEN CENTER POWER TECHNOLOGY CO LTD	CP1270	12V, 7AH	UL 1989	UL MH25860
Alternative	B&B BATTERY (USA) INC	BP 7-12	12V 7AH	UL1989	UL MH19884
Alternative	B&B BATTERY (USA) INC	HR 9-12	12V 36W	UL1989	UL MH19884
Alternative	PANASONIC	LC-R127P2P	12V 7AH	UL1989	UL MH13723

Alternative	CASTON	GT12-7 GT12-7.2 GT12-7.5	12V 7AH	UL1989	UL MH1992
Alternative	CHAMPION	NP7-12	12V 7AH	UL1989	UL MH28022
Battery (for model VESTA 1500)	TOPLITE (GUANGZHOU) TECHNOLOGY BATTERY CO LTD(YUASA)	NPW45-12	12V,9AH	UL 1989	UL MH29104
Alternative	SHENZHEN LEOCH BATTERIES TECHNOLOGY CO LTD	DJW12-9.0	12V 9AH	UL1989	UL MH26866
Alternative	SHENZHEN RITAR POWER CO LTD	RT1290	12V 9AH	UL 1989	UL MH28539
Alternative	CSB BATTERY CO LTD	HR1234W	12V,34W	UL 1989	UL MH14533
Alternative	CSB BATTERY CO LTD	HR1234W FR	12V,34W	UL 1989	UL MH14533
Alternative	CSB BATTERY CO LTD	UPS 12460	12V 45W	UL 1989	UL MH14533
Alternative	CSB BATTERY CO LTD	UPS 12460F2 UPS 12460F2 FR	12V 45W	UL 1989	UL MH14533
Alternative	CSB BATTERY CO LTD	UPS12580	12V, 10AH	UL 1989	UL MH14533
Alternative	FUJIAN MINHUA POWER SOURCE CO LTD	MS9-12	12V 9AH	UL 1989	UL MH47104
Alternative	TOPLITE (GUANGZHOU) TECHNOLOGY BATTERY CO LTD(YUASA)	NPW53-12	12V, 53W	UL 1989	UL MH29104
Alternative	B&B BATTERY (USA) INC	HR 9-12	12V 36W	UL1989	UL MH19884
Alternative	SHENZHEN LEOCH BATTERIES TECHNOLOGY CO LTD	LP12-9.0	12V 9AH	UL1989	UL MH49797
Alternative	TOPLITE (GUANGZHOU) TECHNOLOGY BATTERY CO LTD(YUASA)	TP9-12	12V 9AH	UL 1989	UL MH29104

Alternative	TOPLITE (GUANGZHOU) TECHNOLOGY BATTERY CO LTD	REW45-12 REW45-12 FR UXW460-12	12V 9AH	UL 1989	UL MH29104
Alternative	PANASONIC	UP-RW1245	12V 9AH	UL 1989	UL MH13723
Alternative	CASTON	GT12-9HR GT12-9 GT12-9E	12V 9AH	UL 1989	UL MH19926
Alternative	Vision	CP1290	12V 9AH	UL 1989	UL MH25860
Alternative	CHAMPION	NP9-12	12V 9AH	UL 1989	UL MH28022
Battery lead wire	YONG HAO ELECTRICAL INDUSTRY CO LTD	1015	VW-1, 600V, 10AWG, 105℃	UL 758	UL: E240426
(Alternative)	Various	1015	VW-1, Min. 600V, 10AWG, 105℃	UL 758	UL
Internal AC wire (connect to inlet and outlet)	YONG HAO ELECTRICAL INDUSTRY CO LTD	1015	VW-1, 600V, 18AWG, 105℃	UL 758	UL: E240426
(Alternative)	Various	1015	VW-1, Min. 600V, Min. 18AWG, 105℃	UL 758	UL
Earthing wire	Various	Various	VW-1, Min. 600V, Min. 18AWG, 105℃	UL 758	UL
Input fuse	Hollyland Company Limited	50T	T10A, 250V	IEC/EN 601271	VDE: 40014460 UL: E156471
(Alternative)	Hollyland Company Limited	50CT	10A 250V	EN 60127-1 EN 60127-2	VDE 40014896
(Alternative)	Suzhou Littelfuse OVS Ltd.	215-Series	10A 250V	EN 60127-1 EN60127-2	VDE 40013521
(Alternative)	DONGGUAN BETTER ELECTRONICS TECHNOLOGY CO LTD	522-Serie(s)	T10A 250V	EN 60127-1 EN 60127-2	VDE 40019022
Appliance inlet (with fuse holder)	Rich Bay Co., Ltd.	R-3016	250VAC, 10A	EN 60320-1 UL 498	VDE: 40031354 UL: E242265
(Alternative)	Rich Bay Co., Ltd.	R-3016	10A，250VAC	EN 60320-1 UL 498	VDE: 40031354 UL: E242265

(Alternative)	RongFeng Ind. Co., Ltd.	RF-2004	10A，250VAC	EN 60320-1 UL 498	TUV R50237561 UL E188361
Appliance outlet	Rong Feng Industrial Co., Ltd.	742W-2P	250VAC, 10A	IEC/EN 60320	VDE 40029805
(Alternative)	Rich Bay Co., Ltd.	R-302G2	250VAC, 10A	IEC/EN 60320	VDE 40029358
(Alternative)	Various	Various	250VAC, 10A	IEC/EN 60320	VDE/TUV
Appliance outlet	Rich Bay Co., Ltd.	R-302G4	250VAC, 10A	IEC/EN 60320	VDE 40029358
(Alternative)	Rong Feng Industrial Co., Ltd.	742W-4P	250VAC, 10A	IEC/EN 60320	VDE 40029805
(Alternative)	Shenzhen Delikang Electronics Technology Co. Ltd.	CDJ-3-2	250VAC, 10A	IEC/EN 60320	VDE 40019151
(Alternative)	Various	Various	250VAC, 10A	IEC/EN 60320	VDE/TUV
Enclosure	LG CHEMICAL LTD	AF310, AF310HT, AF312C, AF312A	V-0, 70℃, Min 2.5mm thickness	UL 94 UL 746C	UL E67171
(Alternative)	CHEIL INDUSTRIES INC CHEMICALS DIV	VH-0815(+)	V-0,85℃ Min:thickness 2.0mm	UL 94 UL 746C	UL E115797
(Alternative)	CHI MEI CORPORATION	PA-765A(+)	V-0, 80℃ Min.thickness 2.1mm	UL 94 UL 746C	UL E56070
All PCB	Various	Various	V-0, 130℃	UL 94	UL
Input Relay (RY01, RY05)	SHENZHEN GOLDEN ELECTRICAL APPLIANCES CO., LTD.	GH-1A-12LF-G	10A, 250VAC	EN 61810-1:2004	TUV: R 50164162 UL: E321783
(Alternative)	Song Chuan Precision Co. Ltd.	110-1AH-F	22A 250VAC	EN 61810-1	VDE 40025801
(Alternative)	Taiwan Shori Electric Co., Ltd.	S3H-12-1A	10A, 277VAC	EN 61810-1	TUV R 50025857
(Alternative)	SHENZHEN GOLDEN ELECTRICAL APPLIANCES CO., LTD.	GH-1A-12L	10A, 277VAC	EN 61810-1	TUV R 50158866
(Alternative)	Shenzhen Shanghe Electronics Co., Ltd.	PAH-1A-12S	10A, 277VAC	EN 61810-1	TUV: R50167849, UL: E329158

(Alternative)	Xiamen Hongfa Electroacoustics Co., Ltd.	HF3FA	10A, 250VAC	EN 61810-1	VDE: 40023708 UL: E134517
(Alternative)	Yonglin	YL303H-S	10A 250VAC	EN 61810-1 UL 508	TUV R50230259 UL E233840
Booster, Buck and Output Relays (RY02, RY03, RY04)	Shenzhen Shanghe Electronics Co., Ltd.	PAH-1C-12S	10A, 250VAC Min	UL 508	UL E329158
(Alternative)	SHENZHEN GOLDEN ELECTRICAL APPLIANCES CO LTD DONGGUAN BRANCH	GH-1C-12L	10A 250VAC Min	UL 508	UL E321783
(Alternative)	SHENZHEN GOLDEN ELECTRICAL APPLIANCES CO., LTD.	GH-1C-12LF2	10A, 250VAC Min	UL 508	UL E321783
(Alternative)	YUEQING JIAJIE ELECTRIC CO LTD	JQX-14FF312VDC 1A	10A, 250VAC	UL 508	UL E246444
(Alternative)	DONGGUAN WANHUI INDUSTRIAL CO LTD	JQC-3F-12VDC-1H	10A, 250VAC	UL 508	UL E164376
(Alternative)	Xiamen Hongfa Electroacoustics Co., Ltd.	HF3FA	10A, 277VAC	UL 508	UL E134517
(Alternative)	SONG CHUAN PRECISION CO LTD	899B-1CH-F-C	10A, 277VAC	UL 508	UL E88991
(Alternative)	YUEQING JIAJIE ELECTRIC CO LTD	JQX-14FF312VDC 1C	10A, 250VAC	UL 508	UL E246444
(Alternative)	DONGGUAN WANHUI INDUSTRIAL CO LTD	JQC-3F-12VDC-1Z	10A, 250VAC	UL 508	UL E164376
(Alternative)	TAIWAN SHORI ELECTRIC CO LTD	S3H-12-1C	7A, 240VAC	UL 508	UL E188091
(Alternative)	TAIWAN SHORI ELECTRIC CO LTD	S3H-12-1A	10A, 277VAC	UL 508	UL E188091
(Alternative)	RAYEX ELECTRONICS CO LTD	LEG-1C-12-H	10A, 250VAC	UL 508	UL E126157 TUV R09754097

(Alternative)	SHENZHEN GOLDEN ELECTRICAL APPLIANCES CO LTD	GH-1A-12L	15A, 125VAC 10A, 277VAC	UL 508	UL E321783
(Alternative)	SHENZHEN SHANGHE ELECTRONICS CO LTD	PAH-1A-12S	10A, 277VAC	UL 508	UL E329158
(Alternative)	DAOXIAN CHUANGLIAN ELECTRIC CO LTD	JA-SS-112M	10A, 250VAC	UL 508	UL E314914
(Alternative)	Yonglin	YL303H-S	10A 250VAC	EN 61810-1 UL 508	TUV R50230259 UL E233840
AVR Transformer VESTA 1500	VOLTRONIC POWER	41-040038 Z41-040038	CLASS B	--	Test in the equipment
Alternative	Dar Plus	41-040038	CLASS B	--	Test in the equipment
Alternative	MYLAR	41-040038	CLASS B	--	Test in the equipment
Alternative	CHUAN SHUN	41-040038	CLASS B	--	Test in the equipment
Alternative	GuangHua	41-040038	CLASS B	--	Test in the equipment
Alternative	NRE	41-040038	CLASS B	--	Test in the equipment
Alternative	Haoying	41-040038	CLASS B	--	Test in the equipment
Alternative	JQH	41-040038	CLASS B	--	Test in the equipment
Alternative	Friendship electronic(DONG GUAN) CO., LTD.	41-040038	CLASS B	--	Test in the equipment
Alternative	RongChyuan	41-040038	CLASS B	--	Test in the equipment
Alternative	DONGGUAN CITY HUAZHAN HARDWARE TECHNOTOGY CO.,LTD	41-040038	CLASS B	--	Test in the equipment
AVR Transformer VESTA 1000	VOLTRONIC POWER	41-040247 Z41-040247	CLASS B	--	Test in the equipment
Alternative	Dar Plus	41-040247	CLASS B	--	Test in the equipment
Alternative	MYLAR	41-040247	CLASS B	--	Test in the equipment

Alternative	CHUAN SHUN	41-040247	CLASS B	--	Test in the equipment
Alternative	GuangHua	41-040247	CLASS B	--	Test in the equipment
Alternative	NRE	41-040247	CLASS B	--	Test in the equipment
Alternative	Haoying	41-040247	CLASS B	--	Test in the equipment
Alternative	JQH	41-040247	CLASS B	--	Test in the equipment
Alternative	Friendship electronic(DONG GUAN) CO., LTD.	41-040247	CLASS B	--	Test in the equipment
Alternative	RongChyuan	41-040247	CLASS B	--	Test in the equipment
Alternative	DONGGUAN CITY HUAZHAN HARDWARE TECHNOTOGY CO.,LTD	41-040247	CLASS B	--	Test in the equipment
--Winding	Various	Various	Min.130℃	--	UL
--Bobbin	E I DUPONT DE NEMOURS & CO INC	101L	V-2, Min. 130℃, Min. 0.71mm thickness.	UL 94	UL: E41938
(Alternative)	SUMITOMO BAKELITE CO LTD	PM-9820	V-0, 150℃, Min. 0.70mm thickness.	UL 94	UL E41429
(Alternative)	CHANG CHUN PLASTICS CO LTD	T375J T375HF	Phenolic, V-0, 150℃, Min. 0.71mm thickness.	UL 94	UL E59481
Alternative	SUMITOMO BAKELITE CO LTD	PM-9820 PM 9630	150℃	UL 94	UL E41429
Alternative	CHANG CHUN PLASTICS CO LTD	T375J T375HF	150℃	UL 94	UL E59481
Alternative	E I DUPONT DE NEMOURS & CO INC	FR530 FR530 L	150℃	UL 94	UL E41938
--Insulation tape	JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO LTD	PZ, CT	130℃	UL 510	UL: E165111
(Alternative)	3M COMPANY ELECTRICAL MARKETS DIV (EMD)	1350F-1	Min. 130℃	UL 510	UL: E17385
(Alternative)	SYMBIO INC	35660	130℃	UL 510	UL: E50292

(Alternative)	SHENZHEN XINHUAHUI PLASTIC & INSULATION MATERIAL CO LTD	HMT803	130℃	UL 510	UL: E328315
(Alternative)	SUZHOU MAILADUONA ELECTRIC MATERIAL CO LTD	JY312(#)	130℃	UL 510	UL E188295
(Alternative)	Various	Various	Min. 130℃	UL 510	UL
--Primary lead wire	Various	1015	Min. 16AWG, Min. 600V, 105℃	UL 758	UL
--Secondary lead wire	Various	1015	Min. 10AWG, Min. 600V, 105℃	UL 758	UL
--Thermal Link	Aupo Electronics Ltd.	BF172	AC 250V, 10A, 172℃	IEC/EN 60691, UL 60691	VDE/TUV, UL: E140847
(Alternative)	AUPO ELECTRONICS LTD	BF-150	150℃	UL 60691	UL E140847
(Alternative)	AUPO ELECTRONICS LTD	BF-130	130℃	UL 60691	UL E140847
(Alternative)	AUPO ELECTRONICS LTD	A8	150℃	UL 60691	UL E140847
(Alternative)	DONGGUAN KAIN ELECTRONIC SCI & TECH CO,LTD	KI67 (X)	130℃	UL 60691	UL E322299
(Alternative)	CHANGZHOU AINUO ELECTRONICS TECHNICAL CO LTD	KW-130 1T	130℃	UL 60691	UL E258861
(Alternative)	DONG YANG ELECTRONICS CO LTD	DF167S	AC 250V, 10A, 167℃	IEC/EN 60691, UL 60691	VDE/TUV, UL: E117626
Current Transformer (CT1AX)	VOLTRONIC POWER	41-020001 Z41-020001	CLASS B	--	Test in the equipment
Alternative	RongChyuan	41-020001	CLASS B	--	Test in the equipment
Alternative	CLICK	41-020001	CLASS B	--	Test in the equipment
Alternative	PRO	41-020001	CLASS B	--	Test in the equipment

Alternative	JEPULS	41-020001	CLASS B	--	Test in the equipment
Alternative	Haoying	41-020001	CLASS B	--	Test in the equipment
Alternative	JQH	41-020001	CLASS B	--	Test in the equipment
Alternative	JMR	41-020001	CLASS B		Test in the equipment
Alternative	Friendship electronic(DONG GUAN) CO., LTD.	41-020001	CLASS B	--	Test in the equipment
Alternative	DINGMEI ELECTRONICS CO LTD	41-020001	CLASS B	--	Test in the equipment
--Winding	Various	Various	Min. 130℃	--	UL
--Bobbin	Sumitomo	PM-9820	Phenolic, V-0, 150℃	UL 94	UL
Alternative	EI DUPONG DE NEMOURS	101L	V-2, Min. 130℃, Min. 0.71mm thickness.	UL 94	UL: E41938
Alternative	CHANG CHUN PLASTICS CO LTD	T375J T375HF	Phenolic, V-0, 150℃, Min. 0.71mm thickness.	UL 94	UL E59481
Alternative	SUMITOMO BAKELITE CO LTD	PM-9820 PM 9630	150℃	UL 94	UL E41429
Alternative	CHANG CHUN PLASTICS CO LTD	T375J T375HF	150℃	UL 94	UL E59481
Alternative	E I DUPONT DE NEMOURS & CO INC	FR530 FR530 L	150℃	UL 94	UL E41938
--Insulation tape	SHENZHEN XINHUAHUI PLASTIC & INSULATION MATERIAL CO LTD	HMT803	Min. 130℃	UL 510	UL: E328315
(Alternative)	JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO LTD	PZ, CT	Min. 130℃	UL 510	UL E165111
(Alternative)	3M COMPANY ELECTRICAL MARKETS DIV (EMD)	1350F-1	Min. 130℃	UL 510	UL E17385
(Alternative)	SYMBIO INC	35660	Min. 130℃	UL 510	UL E50292

(Alternative)	SHENZHEN XINHUAHUI PLASTIC & INSULATION MATERIAL CO LTD	HMT803	Min. 130℃	UL 510	UL E328315
(Alternative)	SUZHOU MAILADUONA ELECTRIC MATERIAL CO LTD	JY312(#)	130℃	UL 510	UL E188295
(Alternative)	Various	Various	Min. 130℃	UL 510	UL
X capacitor (C11)	WINDAY ELECTRONIC INDUSTRIAL CO LTD	MPX	Max. 0.1uF Min. 250V 110℃	IEC 60384-14 UL 1414	VDE 40030283 UL E302125
Alternative	WINDAY ELECTRONIC INDUSTRIAL CO LTD	MPX	Max. 0.1uF Min. 250V 110℃	IEC 60384-14 UL 1414	VDE 40018071 UL E302125
Alternative	SHENZHEN JINGHAO CAPACITOR CO LTD	CBB62B	Max. 0.1uF Min. 250V 110℃	IEC 60384-14 UL 1414	VDE 40018690 UL E252286
Alternative	FARAD ELECTRONICS CO LTD	PXK	Max. 0.1uF Min. 250V 100℃	IEC 60384-14 UL 1414	VDE 40030152
Alternative	FARAD ELECTRONICS CO LTD	PXK	Max. 0.1uF Min. 250V 100℃	IEC 60384-14 UL 1414	VDE 40014111 UL E247953
Alternative	XIAMEN FARATRONIC CO LTD	MKP62	Max. 0.1uF Min. 250V 110℃	IEC 60384-14 UL 1414	UL E186600 VDE 40000358
Alternative	EPCOS ELECTRONIC COMPONENTS SA	B3292#	Max. 0.1uF Min. 250V 110℃	IEC 60384-14	VDE 40010694
Alternative	GUANGDONG FENGMING ELECTRONIC TECH CO LTD	MKP-X2	Max. 0.1uF, Min.250V, 110℃	IEC 60384-14 UL 1414	VDE 40025702 UL E345487
X capacitor (C34)	WINDAY ELECTRONIC INDUSTRIAL CO LTD	MPX	Max. 0.47uF Min. 250V 110℃	IEC 60384-14 UL 1414	VDE 40018071 UL E302125
Alternative	WINDAY ELECTRONIC INDUSTRIAL CO LTD	MPX	Max. 0.47uF Min. 250V 110℃	IEC 60384-14 UL 1414	VDE 40030283 UL E302125

Alternative	SHENZHEN JINGHAO CAPACITOR CO LTD	CBB62B	Max.0.47uF Min.250V 110℃	IEC 60384-14 UL 1414	VDE 40018690 UL E252286
Alternative	FARAD ELECTRONICS CO LTD	PXK	Max.0.47uF Min.250V 100℃	IEC 60384-14 UL 1414	VDE 40014111 UL E247953
Alternative	XIAMEN FARATRONIC CO LTD	MKP62	Max.0.47uF Min.250V 110℃	IEC 60384-14 UL 1414	VDE 40000358 UL E186600
Alternative	EPCOS ELECTRONIC COMPONENTS SA	B3292#	Max.0.47uF Min.250V 110℃	IEC 60384-14 UL 1414	VDE 40010694 UL E97863
Alternative	GUANGDONG FENGMING ELECTRONIC TECH CO LTD	MKP-X2	Max.0.47uF Min.250V 110℃	IEC 60384-14 UL 1414	VDE 40025702 UL E345487
Optocoupler (U5, U7, U10, U11 for VESTA 1500) (U5, U11 for VESTA 1000)	Cosmo Electronics Corps	K1010 KPC817	Dti=0.5mm Int. dcr=5.3mm Ext. dcr=8mm 100℃	IEC 60747-5-2 IEC 60950-1	VDE: 101347
(Alternative)	Everlight Electronics Co Ltd	EL817	Dti=0.5mm Int. dcr=6.0mm Ext. dcr=7.7mm 110℃	IEC 60747-5-2 IEC 60950-1	VDE: 132249
(Alternative)	LITE-ON TECHNOLOGY CORP	LTV-817	Dti=0.5mm Int. dcr=6.0mm Ext. dcr=7.7mm 110℃	IEC 60747 IEC 60950-1	UL E113898 VDE 40015248
Inverter MOSFET (Q1-Q8)	Various	Various	Min. 100A, 55V	--	--
DC fan (Only for VESTA 1500)	ADDA CORPORATION	AD0612MX	12VDC, 0.14A	UL507 EN 60950-1	UL E132139 TUV R50068602
(Alternative)	KAIMEI CLECTRONIC CORP	JF0625H1L-012CXXXR	12VDC, 0.14A	UL507 EN 60950-1	UL E156480 TUV R09552030
(Alternative)	DONGGUAN HESEN INDUSTRY CO LTD	HDH0612LA	12VDC, 0.14A	UL507	UL E355626
(Alternative)	YATE LOON ELECTRONICS CO LTD	D60SH-12	12VDC, 0.14A	UL507 EN 60950-1	UL E189702 TUV R09954588
(Alternative)	CROWN PRECISION & ELECTRONICS CO LTD	AGE06025	12VDC, 0.12A	UL507 EN 60950-1	UL:E315824 TUV: B120376547

(Alternative)	ADDA CORPORATION	AD0812XB-A7BGP	12VDC, 0.55A	UL507	UL E132139
DC Fuse(F1/F2/F3)	POSSING ELECTRONIC CO LTD	ATP-30NS	30A,32V	UL 275	UL AU2646
Alternative	POSSING ELECTRONIC CO LTD	ATP-40NS	40A,32V	UL 275	UL AU2646
Alternative	DONGGUAN BETTER ELECTRONICS TECHNOLOGY CO LTD	718 2400 000	40A 32V	UL 275	UL E300003
Alternative	DONGGUAN BETTER ELECTRONICS TECHNOLOGY CO LTD	718 2300 000	30A,32V	UL 275	UL E300003
Bleeder resistance	--	--	Max. 1M ohm 1/4W	--	--
Power cord sets					
Cable cord	Yong Hao Electricity Industry Co., Ltd	H05VV-F	3G*0.75mm2	--	VDE
(Alternative)	Dura Hexa trans Co (DHT)	H05VV-F	3G*0.75mm2	--	VDE
(Alternative)	QUEEN PUO Electric CO., LTD	H05VV-F	3G*0.75mm2	--	VDE
(Alternative)	Various	H05VV-F	3G*0.75mm2	--	VDE
Connector	Yong Hao Electricity Industry Co., Ltd	YH-E-006	10A, 250VAC	--	VDE
(Alternative)	Dura Hexa trans Co (DHT)	DHT35	10A, 250VAC	--	VDE
(Alternative)	QUEEN PUO Electric CO., LTD	QP007	10A, 250VAC	--	VDE
(Alternative)	Various	Various	Min. 10A, 250VAC	--	VDE
Plug	Yong Hao Electricity Industry Co., Ltd	YH-E-007	10A, 250VAC	--	VDE
(Alternative)	Dura Hexa trans Co (DHT)	DHT33	10A, 250VAC	--	VDE
(Alternative)	QUEEN PUO Electric CO., LTD	QP015	10A, 250Vac	--	VDE
(Alternative)	Yong Hao Electricity Industry Co., Ltd	YH-E-005	16A, 250VAC	--	VDE
(Alternative)	Dura Hexa trans Co (DHT)	DHT86	16A, 250VAC	--	VDE
(Alternative)	Various	Various	Min. 10A, 250VAC	--	VDE

(Alternative)	Luen Tai(IP'S)Electrical Mfy Xin Nan Shui Mun village Ping Wu Town Shenzhen Guangdong China	9518	13A, 250VAC	BS1363	BSi: KM 40790
Supplementary information: For transformer, the factory can be CLICK, RongChyuan, Friendship and others, but the specification is controlled by VOLTRONIC.					

4.6, 1.6.2/RD	**TABLE: Electrical Data (in normal conditions)**					**P**
fuse #	**I rated (A)**	**U (V)**	**P (W)**	**P (VA)**	**I fuse (A)**	**condition/status**
For Model: VESTA 1500						
Current fuse	--	198V/ 50Hz	1039.6	1529.0	7.722	Rated output load
Current fuse	9.7	220V/ 50Hz	1048.5	1542.6	7.012	Rated output load
Current fuse	9.7	240V/ 50Hz	1046.3	1538.6	6.411	Rated output load
Current fuse	--	254.4/ 50Hz	1041.0	1531.0	6.018	Rated output load
Current fuse	--	198V/ 60Hz	1039.1	1528.2	7.718	Rated output load
Current fuse	9.7	220V/ 60Hz	1048.2	1542.0	7.009	Rated output load
Current fuse	9.7	240V/ 60Hz	1045.4	1537.9	6.408	Rated output load
Current fuse	--	254.4V/ 60Hz	1040.3	1530.2	6.015	Rated output load
For Model: VESTA 1500						
Current fuse	--	198V/ 50Hz	698	1006	5.08	Rated output load
Current fuse	--	198V/ 60Hz	681	1012	5.11	Rated output load
Current fuse	6.5	220V/ 50Hz	691	1004	4.56	Rated output load
Current fuse	6.5	220V/ 60Hz	675	1008	4.58	Rated output load
Current fuse	6.5	240V/ 50Hz	682	1017	4.24	Rated output load
Current fuse	6.5	240V/ 60Hz	686	1021	4.25	Rated output load

Current fuse	--	254.4V/ 50Hz	687	1022	3.87	Rated output load
Current fuse	--	254.4V/ 60Hz	690	1027	3.89	Rated output load
Supplementary information:						

5.1.1 2.1.1.5/RD	**TABLE: Max. V, A, VA Test**				**N**
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**
Capacitance C (μF)	**Voltage U (V)**	**Energy E (J)**
--	--	--
--	--	--
Supplementary information:		

5.1.1 2.1.1.7/ RD	**TABLE: discharge of capacitors in the primary circuit**			**P**
Condition	**τ calculated (s)**	**τ measured (s)**	**t u→ 0V (s)**	**Comments**
Unit on	--	0.608	--	Vpeak=380V, 37% of Vpeak = 140.6V, No load applied
Supplementary information:				

5.1.4	**TABLE: Backfeed protection**			**P**
Condition	**Voltage measured (V)**			**Comments**
	L-N	L-G	N-G	
No load	0.092	1.64	1.56	Battery mode, normal
Full load	0.264	3.64	2.88	Battery mode, normal
No load	0.068	1.22	1.08	Battery mode, Q1AP (D-S) short
Full load	0.102	1.86	1.74	Battery mode, Q1AP (D-S) short
Supplementary information:				

5.2.1 2.2/RD	TABLE: Evaluation Of Voltage Limiting Components In SELV Circuits	N

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:

According to the design of the equipment, the RS232 and USB as signal terminals only and no any voltages exceeding the SELV voltage which isolation by photocouplers, no test is necessary.

5.2.3 2.4/RD	TABLE: limited current circuits	P

Location	Voltage (V)	Current (mA)	Freq. (kHz)	Limit (mA)	Comments
L-N	0.046	0.023	44.7	31.29	Normal
L-PE	0.056	0.028	46.5	32.55	Normal
N-PE	0.056	0.028	49.2	34.44	Normal
L-N	0.052	0.026	46.3	32.41	D3 short
L-PE	0.068	0.034	47.5	33.25	D3 short
N-PE	0.064	0.032	48.4	33.88	D3 short

Supplementary information:
Sc=Short circuit, Oc=Open circuit

5.2.5 2.5/RD	TABLE: Limited Power Sources	N

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
The RS232 and USB port as signal transferred terminals only, no test is necessary.

5.3 2.6.3.4/RD	TABLE: provisions for protective earthing	P

Location	Resistance measured (mΩ)	Comments
PE pole to PE contact of most distance.	18.8	Test with current 32A, 2min
Note(s):		

5.7 2.10.2/RD	Table: Working Voltage Measurement	P

Location	RMS voltage (V)	Peak voltage (V)	Comments
--	--	--	--
--	--	--	--
supplementary information:			
Due to the design of the equipment no any voltages exceeding the supply voltage for isolation components (e.g. photocouplers) inside the unit. The voltages 420Vpeak and 250Vr.m.s are considered:			

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)
Two poles of current fuse	<420	<250	2.0	>2.0	2.5	>2.5
L to N	<420	<250	2.0	>2.0	2.5	>2.5
Primary circuits to PE	<420	<250	2.0	>2.0	2.5	>2.5
Primary traces to secondary traces, under U5, U11	<420	<250	4.0	4.1	5.0	6.0
Primary traces to secondary traces, under U7, U10	<420	<250	4.0	4.1	5.0	5.6
Primary circuits to non-conductive parts	<420	<250	4.0	>4.0	5.0	>5.0
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)
Mylar sheet	<420	3000Vac	0.4	Min. 0.4 #
Optocouplers	<420	3000Vac	0.4	Min. 0.4 #
Plastic enclosure	<420	3000Vac	0.4	> 0.4 #
Supplementary information: # refer to table 4.5 for detail information.				

5.7 2.10.5/RD	TABLE: Dielectric Strength	P

Test voltage applied between:	Test potential applied (V)	Breakdown / flashover (Yes/No)
L/N to PE	AC1500	No
Primary to non-conductive parts	AC3000	No
Input to USB terminal	AC3000	No
Input to RS232 terminal	AC3000	No
Supplementary information:		

7.4.2	TABLE: openings	P

Location	Size (mm)	Comments
Top	--	No openings
Front	--	No openings
Bottom	--	No openings
Rear	--	DC Fans with metal meshes provided, no hazardous live parts exposed to the openings.
Side	Round openings diameter is 3.02mm, 280 pieces; Square openings (1) size: length is 18mm, width is less than 1mm, 30 pieces; Square openings (2) size: length is 51mm, width is less than 1mm, 36 pieces;	One type round openings and two types square openings provided. No hazardous live parts exposed to the openings.
Supplementary information:		

7.7 4.5/RD	TABLE: Heating Test		P
	Test voltage (V)..... :		—
	Ambient (^{o}C)..... :		—

Thermocouple Locations	max. temperature measured, (^{o}C)						max. temperature limit, (^{o}C)
	198V/ 60Hz		254.4/ 50Hz		Stored energy mode		
	@	#	@	#	@	#	
Inlet	35.9	47.8	34.9	47.0	35.6	47.6	70
Input wire	34.0	45.9	33.3	45.4	35.4	47.4	105
CN4 body	43.0	54.9	38.1	50.2	42.1	54.1	--
C34 body	36.6	48.5	34.2	46.3	44.3	56.3	100
RY05 coil	79.6	91.5	66.2	78.3	66.2	78.2	155

RY01 coil	103.2	115.1	78.0	90.1	78.0	90.0	155
RY03 coil	56.7	68.6	75.0	87.1	75.0	87.0	155
RY02 coil	115.6	127.5	64.5	76.6	64.5	76.5	155
CT1 AX coil	42.0	53.9	44.6	56.7	45.6	57.6	105
RY04 coil	71.0	82.9	74.6	86.7	74.6	86.6	155
C11 body	40.4	52.3	42.3	54.4	43.7	55.7	105
PCB near Q1	44.0	55.9	40.7	52.8	75.5	87.5	130
C21 body	40.3	52.2	39.3	51.4	49.1	61.1	105
PCB near D7	47.9	59.8	46.2	58.3	51.8	63.8	130
PCB near U2	59.0	70.9	59.6	71.7	59.6	71.6	130
Main transformer primary lead wire	47.9	59.8	46.6	58.7	60.2	72.2	105
Main transformer second lead wire	38.6	50.5	37.1	49.2	48.8	60.8	105
Main transformer primary winding	69.9	81.8	68.1	80.2	79.0	91.0	142
Main transformer second winding	74.5	86.4	71.3	83.4	105.5	117.5	142
Main transformer core	66.7	78.6	66.6	78.7	69.4	81.4	--
Battery wire	29.4	41.3	29.5	41.6	43.2	55.2	105
Battery body	28.3	40.2	29.1	41.2	32.6	44.6	--
Outlet	31.0	42.9	31.1	43.2	35.7	47.7	70
Enclosure inside under main transformer	53.7	65.6	53.8	65.9	54.0	66.0	--
Enclosure inside up main transformer	42.8	54.7	39.6	51.7	41.5	53.5	--
Enclosure outside up main transformer	37.9	49.8	36.9	49.0	37.7	49.7	95
Ambient(°C)	28.1	40.0	27.9	40.0	27.9	40.0	--

Supplementary information:

@ mean the temperatures were measured; # mean the temperatures which shift to 40°C conditioin.

	TABLE: Heating test, resistance method		
	Test voltage (V)..... :	--	—
	Ambient, t_1 (°C) ..... :	--	—
	Ambient, t_2 (°C) ..... :	--	—

Temperature rise of winding	**R_1 (Ω)**	**R_2 (Ω)**	**ΔT (K)**	**Max. dT (K)**	**Insulation class**
--	--	--	--	--	--
--	--	--	--	--	--

Supplementary information:

7.7 4.5.5/RD	TABLE: Ball Pressure Test of Thermoplastics		P
Allowed impression diameter (mm) .....:			—
Part	Test temperature (°C)	Impression diameter (mm)	
Bobbin of main transformer	125	1.3	
Bobbin of transformer CT1 AX	125	1.1	
Supplementary information:			

7.5 4.7/RD	TABLE: Resistance to fire				P
Part	Manufacturer of material	Type of material	Thickness (mm)	Flammability class	Evidence
--	--	--	--	--	--
--	--	--	--	--	--
Supplementary information: refer to table 4.5 for detail information.					

8 5.1/RD	TABLE: touch current measurement		P
Measured between:	Measured (mA)	Limit (mA)	Comments/conditions
L/N to non-conductive parts	0.005	0.25	Used a simpson Meter 228
L/N to metal enclosure	0.220	3.5	Used a simpson Meter 228
L/N to RS232/USB terminal	0.220	0.25	Used a simpson Meter 228
Supplementary information:			

8.3 5.3/RD	TABLE: Fault condition tests						P
	Ambient temperature (°C) .....:						—
	Power source for EUT: Manufacturer, model/type, output rating .....:						—
Com-ponent No.	Fault	Supply voltage (V)	Test time	Fuse #	Fuse current (A)	Observation	
Ventilation	Block	240	7h 20min	Current fuse	6.018	Normal working, no damaged, no hazard. The max. temperature were: CT1 AX coil: 92.7℃; PCB near Q1: 96.5℃; PCB near D7: 89.0℃; PCB near U2: 89.0℃; Main transformer primary wiring: 127.9℃; Main transformer second winding: 109.1℃; Ambient: 28.1℃.	

Ventilation	Block	Stored energy mode	30min	--	--	Normal working, no damaged, no hazard. The max. temperature were: CT1 AX coil: 93.4℃; PCB near Q1: 94.0℃; PCB near D7: 86.9℃; PCB near U2: 107.4℃; Main transformer primary wiring: 128.9℃; Main transformer second winding: 109.6℃; Ambient: 27.7℃.
Fan	Stalled	240	7h 30min	Current fuse	6.272	Normal working, no damaged, no hazard. The max. temperature were: CT1 AX coil: 90.7℃; PCB near Q1: 94.5℃; PCB near D7: 87.0℃; PCB near U2: 105.8℃; Main transformer primary wiring: 125.9℃; Main transformer second winding: 107.1℃; Ambient: 27.8℃.
Fan	Stalled	Stored energy mode	30min	--	--	Normal working, no damaged, no hazard. The max. temperature were: CT1 AX coil: 91.4℃; PCB near Q1: 92.0℃; PCB near D7: 84.9℃; PCB near U2: 105.4℃; Main transformer primary wiring: 126.9℃; Main transformer second winding: 107.6℃; Ambient: 28.2℃.
Output	s-c	240	10min	Current fuse	0.942	The unit alarmed and then shutdown, no hazards.
Output	s-c	Stored energy mode	10min	--	--	The unit alarmed and then shutdown, no hazards.
Ouput	o-l	240	6h 30min	Current fuse	6.018 to 6.508 to 6.624 to 6.732 to 6.819 to 0.982	Unit alarmed when output load exceed the rated and unit shutdown when load at 6.741A. No damage, no hazard. The max. temperature were: CT1 AX coil: 90.8℃; PCB near Q1: 96.8℃; PCB near D7: 88.7℃; PCB near U2: 106.9℃; Main transformer primary wiring: 94.3℃; Main transformer second winding: 107.6℃; Ambient: 26.9℃.

Ouput	o-l	Stored energy mode	10min	--	--	Unit alarmed when output load exceed 1.2 time the rated and then shutdown. No damage, no hazard.
Q7 (D-S)	s-c	240	10min	Current fuse	--	Unit shutdown immediately. No hazard.
Q7 (D-S)	s-c	Stored energy mode	10min	--	--	Unit shutdown immediately. No hazard.
Supplementary information:						

C.2/RD	**TABLE: transformers**						N
Loc.	Tested insulation	Working voltage peak / V (2.10.2)	Working voltage rms / V (2.10.2)	Required electric strength (5.2)	Required clearance / mm (2.10.3)	Required creepage distance / mm (2.10.4)	Required distance thr. insul. (2.10.5)
--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--
Loc.	Tested insulation			Test voltage/ V	Measured clearance / mm	Measured creepage dist./ mm	Measured distance thr. insul. / mm; number of layers
--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--
Supplementary information:							

M	**Ventilation of battery compartments**	**P**
	The required dimension for the ventilation openings will be calculated with the following formula:	
	A ≥ Q/360 [m²] with Q = 0.054 * n * I * C where: 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	
	With the specific data for the UPS the following dimension for the ventilation openings is required:	
	n : 6 cells per battery (total: 12) **C** : 9 Ah **A ≥ (0.054 * n * 0.2 A/100 Ah * C)/360**	

	A ≥ 0.324 **cm²**	
	Verdict	
	The size of ventilation openings in battery cabinet exceeds the required airflow by far (as well as the UPS).	

Photo documentation

Photo 1

For Model: VESTA 1500

Photo 2

For Model: VESTA 1500

Photo 3
For Model: VESTA 1500

Photo 4
For Model: VESTA 1500

Photo 5
For Model: VESTA 1500

Photo 6
For Model: VESTA 1500

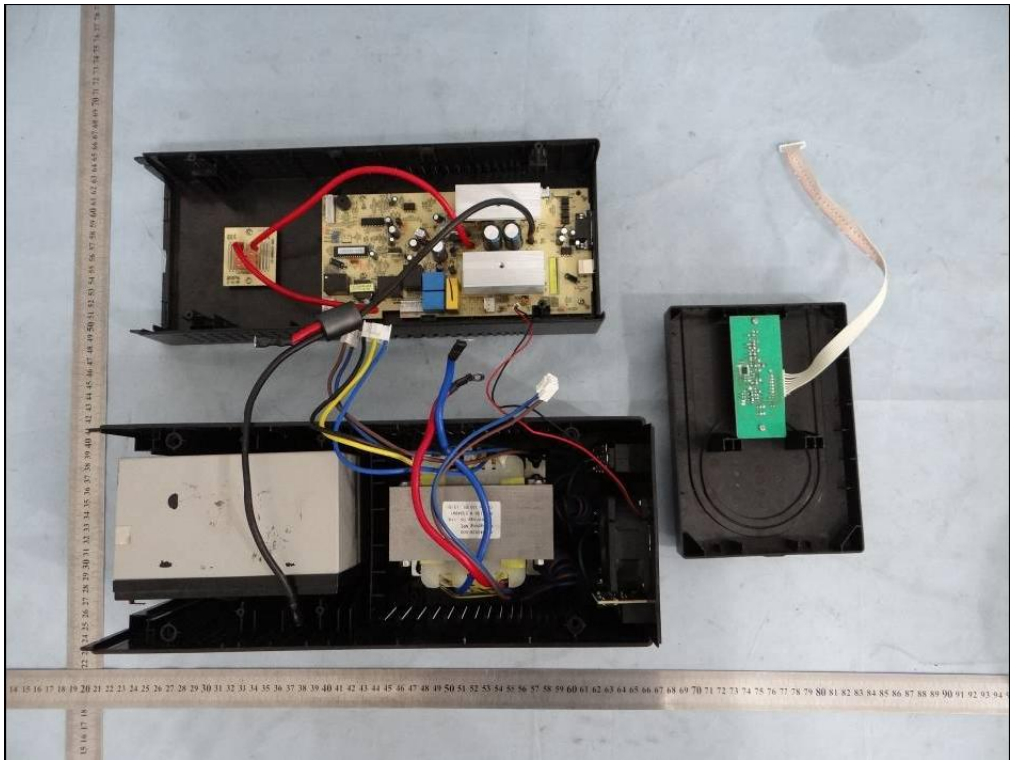


Photo 7
For Model: VESTA 1500

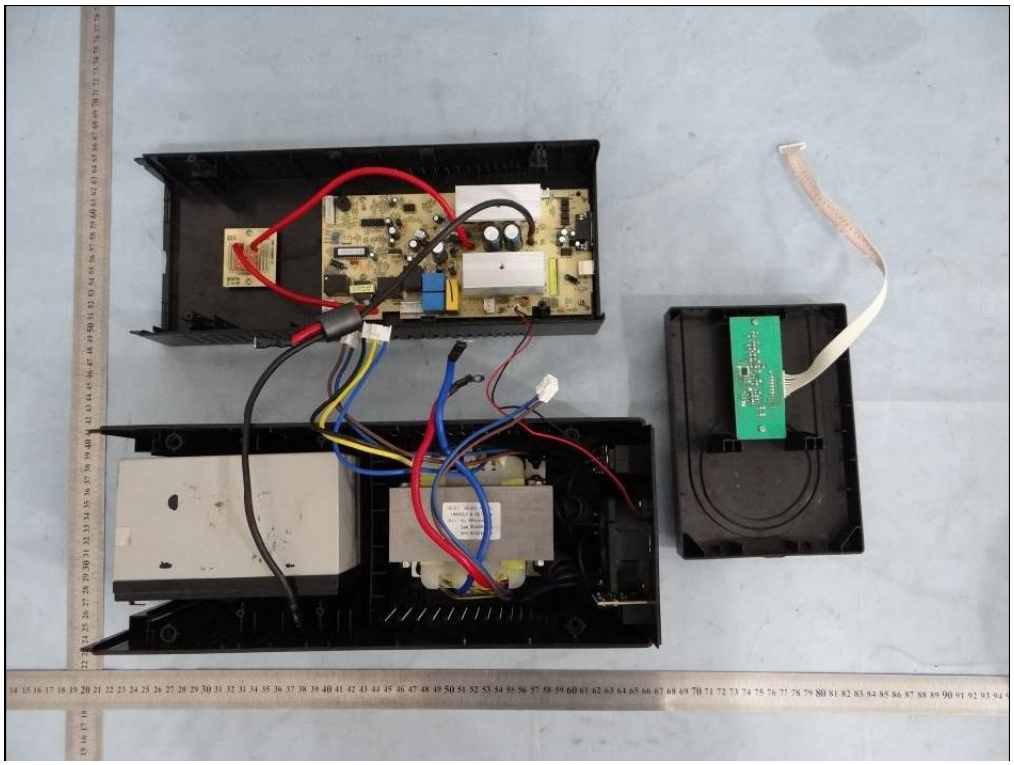


Photo 8
For Model: VESTA 1500

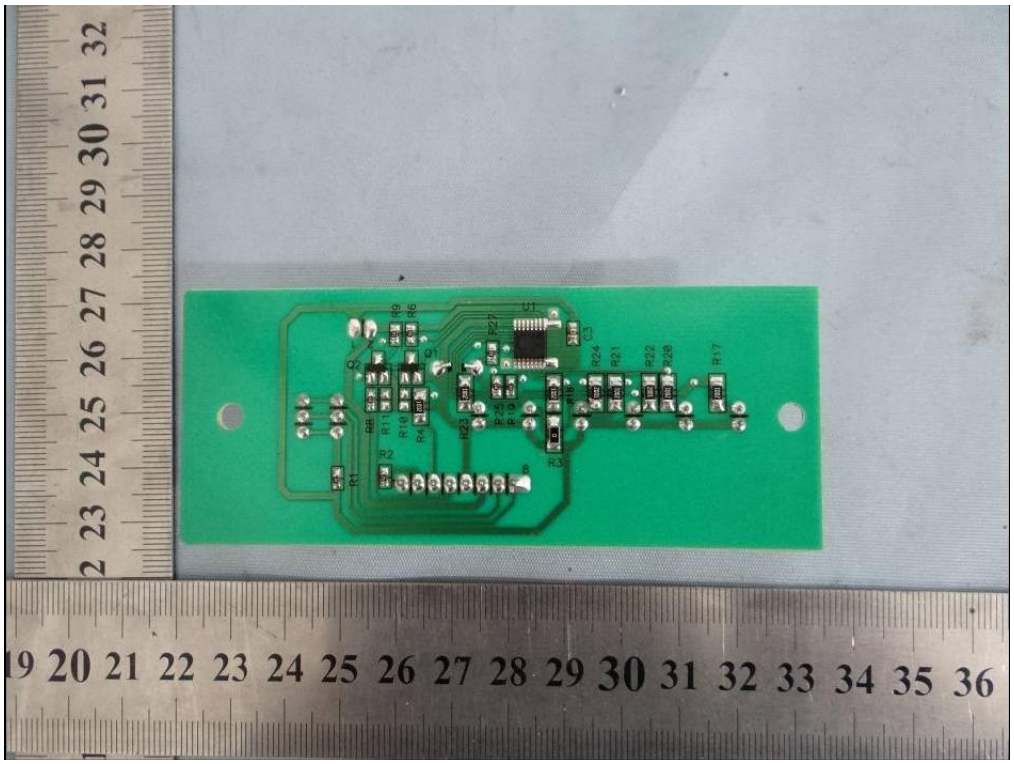


Photo 9
For Model: VESTA 1500

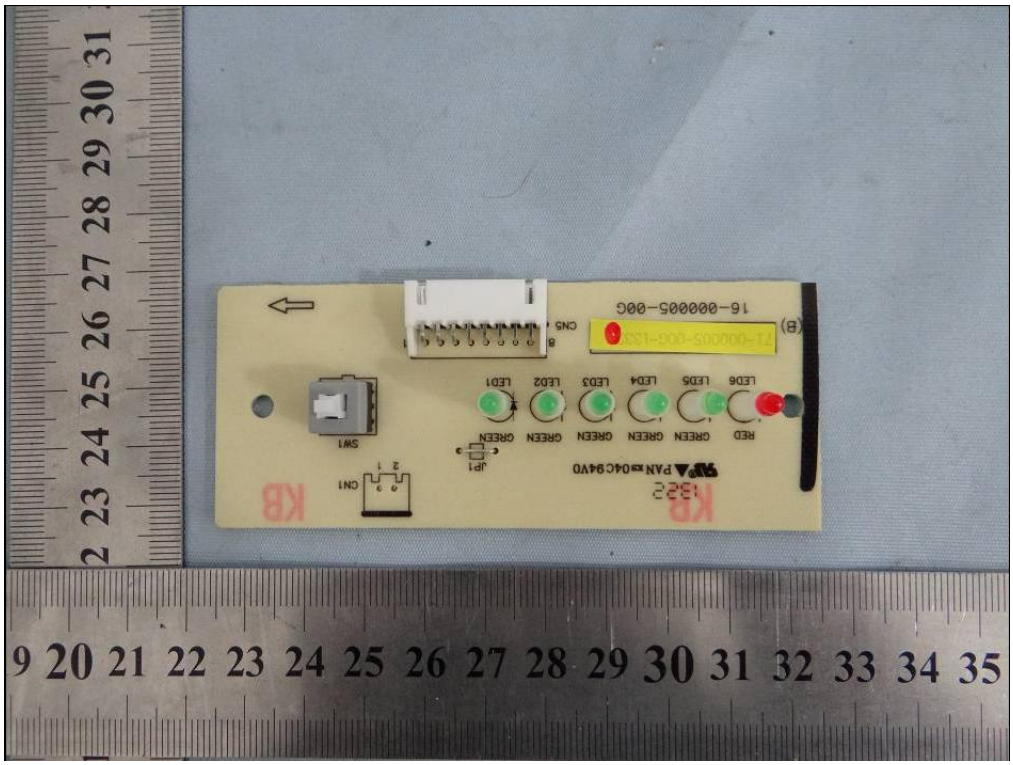


Photo 10
For Model: VESTA 1500

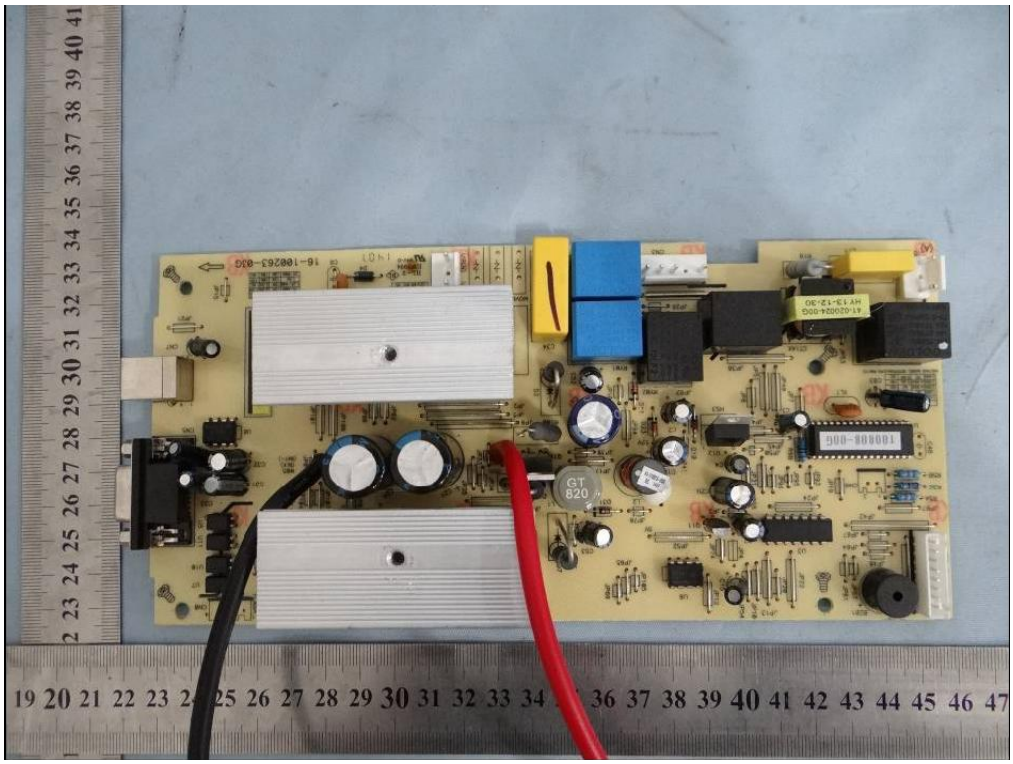


Photo 11
For Model: VESTA 1500

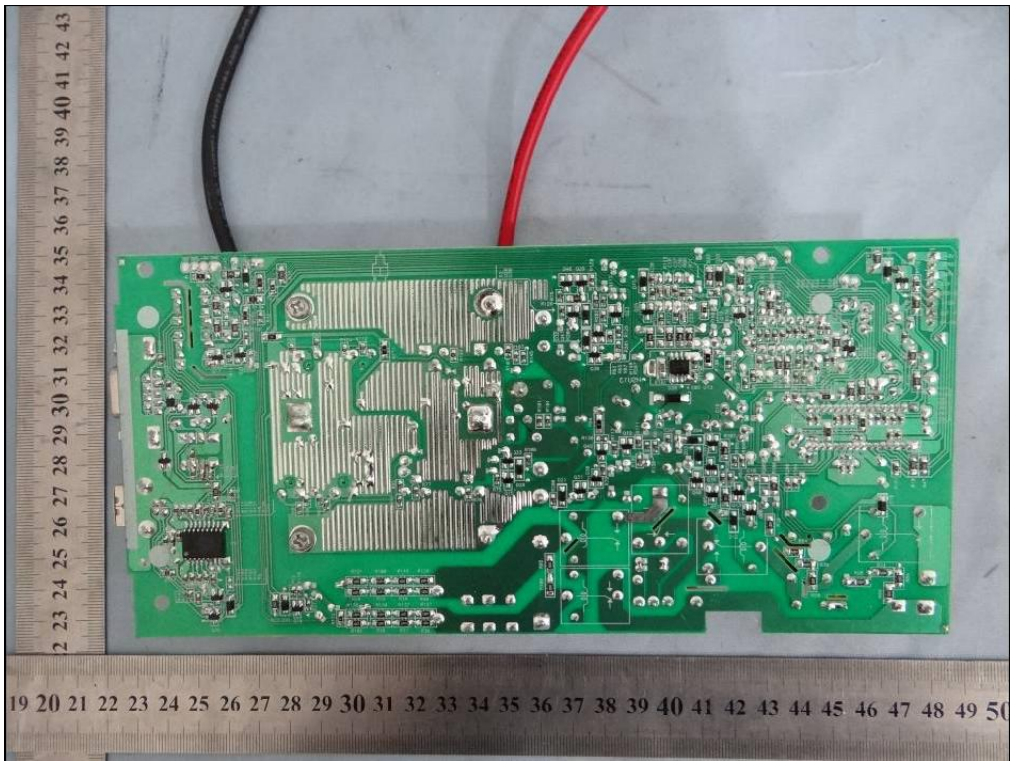


Photo 12

Photo 13
For Model: VESTA 1000

Photo 14
For Model: VESTA 1000

Photo 15
For Model: VESTA 1000

Photo 16
For Model: VESTA 1000

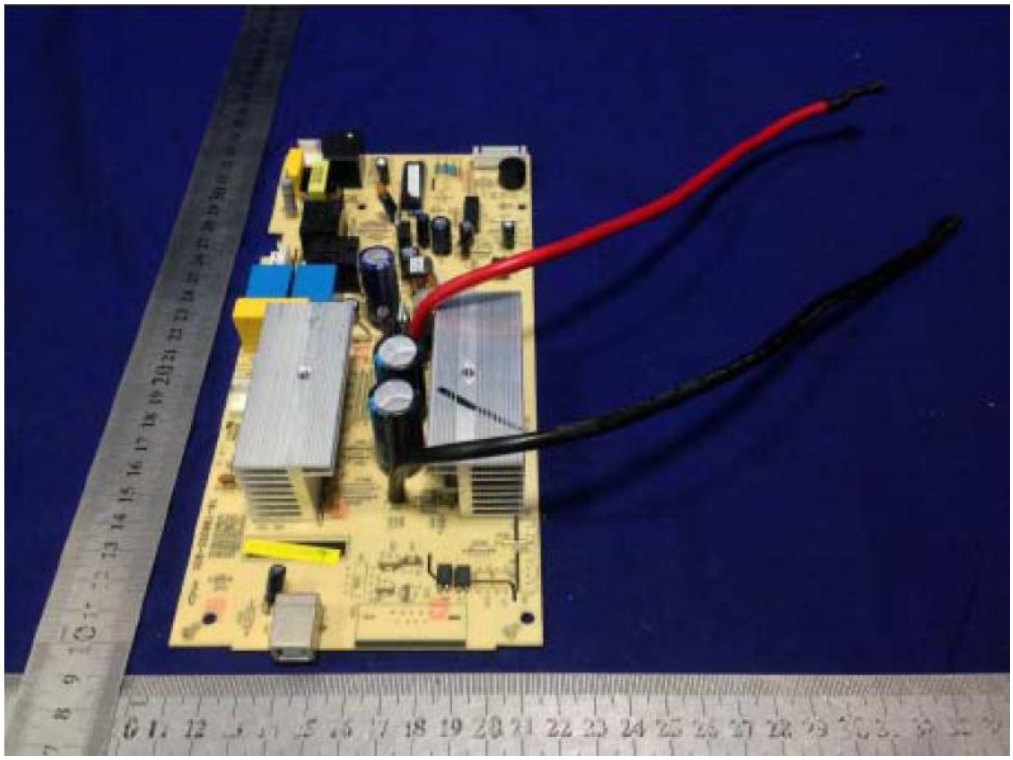
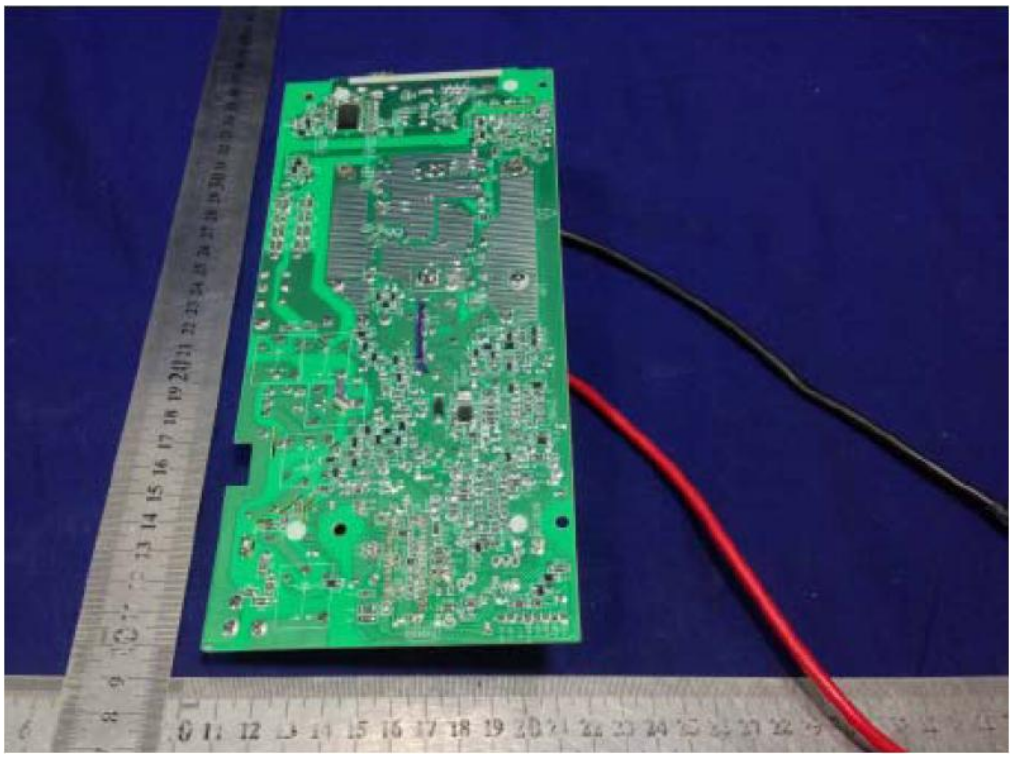


Photo 17
For Model: VESTA 1000



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