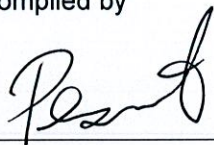


## TEST REPORT

Applicant : FOSHAN UNIPOWER ELECTRONIC CO., LTD  
Address : Block 7, No.115, 1st Zhangcha Road, Foshan, Guangdong Province, P.R. China  
Manufacturer : FOSHAN UNIPOWER ELECTRONIC CO., LTD  
Address : Block 7, No.115, 1st Zhangcha Road, Foshan, Guangdong Province, P.R. China  
Product Name : UPS  
Trade Mark : SVC  
  
Model No. : V-3000, V-2000  
Ratings : Model for V-3000: Input: 220-240Vac, 50/60Hz, 15A  
Output: 220-240Vac, 50/60Hz, 3000VA/1800W  
Model for V-2000: Input: 220-240Vac, 50/60Hz, 10A  
Output: 220-240Vac, 50/60Hz, 2000VA/1200W  
  
Standard : Uninterruptible power systems(UPS)  
Part 1: General and safety requirements for UPS  
EN 62040-1: 2008+A1:2013  
  
Date of Receiver : March 09, 2015  
Date of Test : March 10, 2015 to March 17, 2015  
Date of Issue : March 18, 2015  
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



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.

## Revision History of This Test Report

[illegible]

Copy of marking plate:

**UPS**



**Model: V-2000**

**Input: 220-240Vac, 50/60Hz, 10A, 1Φ**

**Output: 220-240Vac, 50/60Hz, 2000VA, 1200W, 1Φ**

**FOSHAN UNIPOWER ELECTRONIC CO., LTD.**

**UPS**



**Model: V-3000**

**Input: 220-240Vac, 50/60Hz, 15A, 1Φ**

**Output: 220-240Vac, 50/60Hz, 3000VA, 1800W, 1Φ**

**FOSHAN UNIPOWER ELECTRONIC CO., LTD.**

## CAUTION

**Risk of electric shock!**


**No user serviceable parts inside, refer servicing only to qualified service personnel. Do not remove cover!**

**Lead-acid batteries inside the enclosure. It may cause chemical hazard. The batteries may present a risk of electric shock and energy hazards.**

**For battery source and dispose, see user's manual.**

**Risk of explosion battery is replaced by and incorrect type.**

Note:

- The **CE** marking and  symbol maybe marked on other outer surface of the plastic enclosure and should be at least 5.0mm and 7.0mm respectively in height.
- The above markings are the minimum requirements required by the safety standard. For the final production samples, the additional markings which do not give rise to misunderstanding may be added.

### Summary of testing:

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

- Tests performed on the bench
- Maximum ambient temperature: +40°C
- Tested for moderate conditions
- Evaluation for use on elevations not exceeding 1000m (see Note of subclause 1.2)

**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 ..... : -10% to 6%

Tested for IT power systems ..... : ☐ Yes (only for Norway) ☒ No

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

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

Considered current rating of protective device as part of the building installation (A) ..... : 16A

Pollution degree (PD) ..... : ☐ PD 1 ☒ PD 2 ☐ PD 3

IP protection class ..... : IP20

Altitude during operation (m) ..... : Up to 1000m

Altitude of test laboratory (m) ..... : below 1000m

Mass of equipment (kg) ..... : Approximately 21.5kg

**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(point) is used as the decimal separator.

Standard EN 62040-1:2008 is to be used in conjunction with EN 60950-1:2006, which is referred to in this TRF by "RD".

**General product information:**

These equipments were general designed for using with information technology equipment.

These models are identical in circuit diagram and main PCB layout and with the same construction.

The main difference was shown in table 4.5 and rated marking plate.

All tests are performed on model V-3000 to represent the other similar models.

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	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. (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
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	The interconnecting cable is carrying only SELV voltage on a low energy level.	P
1.5.6/RD	Capacitors bridging insulation	X2 capacitors provided between lines, and Y2 capacitors provided between line and earth.	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	TN power system.	N
4.6	Power interface		P
1.6.1/RD	AC power distribution systems	For connection to TN power system.	P
1.6.2/RD	Input current	(see appended table 4.6)	P



IEC 62040-1			
Clause	Requirement + Test	Result - Remark	Verdict
4.6 1.6.4/RD	Neutral conductor	Neutral conductor is basic insulated from earth and body of the equipment.	P
4.7	Marking and instructions		P
4.7.1	General	Required marking was located on the outside of the equipment.	P
4.7.2 1.7.1/RD	Power rating	See the copy of marking plate	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 input	N
	Input rated frequency/range (Hz) .....	See the copy of marking plate	P
	Number of Input phases and neutral .....	1 $\phi$ with neutral	P
	Output rated voltage/range (V) .....	See the copy of marking plate	P
	Output rated current/range (A) .....		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 .....	1 $\phi$ with neutral	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.) .....	AC output	N
	Output rated frequency/range (Hz) .....	See the copy of marking plate	P
	Ambient operating temperature range ( $^{\circ}\text{C}$ ) .....	0-40 $^{\circ}\text{C}$	P
	Rated short-time withstand current ( $I_{cw}$ ) or rated conditional short-circuit current ( $I_{cc}$ ) .....		N
	Manufacturer's name or trademark or identification mark .....	See the copy of marking plate	P
	Type/model or type reference .....	See the copy of marking plate	P
	Symbol for Class II equipment only .....	Class I equipment	N
	Other symbols .....	Additional symbols or marking do not give rise to misunderstanding.	P
	Certification marks .....	CE	P

IEC 62040-1			
Clause	Requirement + Test	Result - Remark	Verdict
	INSTRUCTIONS FOR UNITS WITH AUTOMATIC BYPASS/MAINTENANCE BYPASS, ADDITIONAL INPUT A.C. SUPPLY, OR EXTERNAL BATTERIES, HAVING TEXT "SEE INSTALLATION INSTRUCTIONS BEFORE CONNECTING TO THE SUPPLY" .....		N
4.7.3	Safety instructions		P
4.7.3.1	General	The instruction contains information for operation, installation, servicing, transport, storage and technical data.	P
4.7.3.2	Installation .....	Installation instructions are available to the user in User 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 equipment is intended to be operated by layperson.	P
4.7.3.4	Maintenance..... :	The instruction of maintenance is only included in the user manual.	P
4.7.3.5	Distribution related backfeed..... :	Not permanently connected equipment	N
4.7.4 1.7.4/RD	Main voltage adjustment .....	No voltage selector.	N
	Methods and means of adjustment; reference to installation instructions .....		N
4.7.5 1.7.5/RD	Power outlets..... :	For standard power supply outlet, marking was placed beside to shown the maximum load that is permitted to be connected to it.	P
4.7.6 1.7.6/RD	Fuse identification (marking, special fusing characteristics, cross-reference) .....	Marking required	P
4.7.7 1.7.7/RD	Wiring terminals	See below	P
1.7.7.1/RD	Protective earthing and bonding terminals .....	The earth terminal is marked with the standard earth symbol near the terminal	P
1.7.7.2/RD	Terminals for a.c. mains supply conductors..... :	Power plug used.	N

IEC 62040-1			
Clause	Requirement + Test	Result - Remark	Verdict
1.7.7.3/RD	Terminals for d.c. mains supply conductors..... :	Supply by AC source only.	N
4.7.8	Battery terminals ..... :	Internal battery used The marking “+” and “-” for indication of polarity of battery provided.	P
4.7.9 1.7.8/RD	Controls and indicators	See below	P
1.7.8.1/RD	Identification, location and marking ..... :	LCD provided to indicate the working condition, located on the top 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 ..... :	Symbol for 'standby' (No. 5009) provided on button on the front panel of enclosure	P
1.7.8.4/RD	Markings using figures ..... :		N
4.7.10 1.7.9/RD	Isolation of multiple power sources ..... :	Provided in the user manual.	N
4.7.11 1.7.2.4/RD	IT power systems	TN power distribution systems	N
4.7.12	Protection in building installation	The protection does not rely upon building installation. The protection is provided by input breaker.	N
	Rated short-time withstand current ( $I_{cw}$ ) ..... :		N
	Rated conditional short circuit current ( $I_{cc}$ ) ..... :		N
	a) If higher $I_{cp}$ stated $\leq 10$ kA		N
	a) If higher $I_{cp}$ 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	No thermostats and other regulating devices	N
4.7.15 1.7.2.1/RD and 1.7.8.1/RD	Language(s) ..... :	LCD provided to indicate the working condition, located on the top panel. A corresponding statement was provided in the User's Manual.	P



IEC 62040-1			
Clause	Requirement + Test	Result - Remark	Verdict
4.7.16 1.7.11/RD	Durability of markings	The marking withstands required tests	P
4.7.17 1.7.12/RD	Removable parts	No required markings placed on removable parts.	P
4.7.18 1.7.13/RD	Replaceable batteries	Detailed instructions provided in the user's manual.	P
	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 containing below described information placed on enclosure of UPS or user manual.	P
	Battery type (lead-acid, NiCd, etc.) and number of blocks or cells .....	Lead acid	P
	Nominal voltage of total battery (V) .....	(see appended table 4.5)	P
	Nominal capacity of total battery (optional) .....	(see appended table 4.5)	P
	Warning label .....	Considered	P
	Instructions .....	Instructed the replacement of battery type and numbers, terminal torque, personnel knowledgeable about batteries and required precautions and relevant cautions or warnings. Warning label denote energy or electrical shock and chemical hazard and reference to the maintenance, handling and disposal requirements.	P
2.1.1.5/RD	Protection against energy hazards	No energy hazard at operator accessible SELV interfaces.	P
4.7.21 1.7.2.4/RD	Installation instructions	Detailed information regarding power distribution system, special attention to external interfaces.	P

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

IEC 62040-1			
Clause	Requirement + Test	Result - Remark	Verdict
2.1.1.1/RD	Access to energized parts	Checked by test finger and test pin. No accessible hazard energized parts.	P
	Test by inspection .....	Not accessible	P
	Test with test finger (Figure 2A) .....	Not accessible	P
	Test with test pin (Figure 2B) .....	Not accessible	P
	Test with test probe (Figure 2C) .....	Not accessible	P
2.1.1.2/RD	Battery compartments	No TNV circuits inside battery compartment.	P
2.1.1.3/RD	Access to ELV wiring	No ELV wiring in operator accessible area.	N
	Working voltage ( $V_{peak}$ or $V_{rms}$ ); minimum distance through insulation (mm)		--
2.1.1.4/RD	Access to hazardous voltage circuit wiring	Insulation of internal wiring not operator accessible.	N
2.1.1.5/RD	Energy hazards .....	No energy hazard at operator accessible SELV interfaces.	P
2.1.1.6/RD	Manual controls	No conductive controls or handles or alike provided.	N
2.1.1.7/RD	Discharge of capacitors in equipment	No risk of electric shock.	P
	Measured voltage (V); time-constant (s) .....	(see appended table 2.1.1.7/RD)	--
2.1.1.8/RD	Energy hazards – d.c. mains supply	Not connected to DC mains supply.	N
	a) Capacitor connected to the d.c. mains supply ...:		N
	b) Internal battery connected to the d.c. mains supply .....		N
2.1.1.9/RD	Audio amplifiers in information technology equipment .....	No audio amplifier	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 appended table 5.1.4)	P
	Shock hazard after de-energization of a.c. input for UPS	See appended table 5.2.1 and Subclause 2.2.3/RD	P

IEC 62040-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Measured voltage (V); time-constant (s) .....		--
	Description of the construction .....	For pluggable UPS, backfeed protection achieved by the operation of relays and the relative circuits provided in the a.c. input line.	P
	Air gap is employed for backfeed protection	The relay provides a contact gap of 1.9 mm minimum between each contact.	P
5.1.5	Emergency switching (disconnect) device	Pluggable equipment type A, no emergency switching device for the load required.	N

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	The secondary circuits were tested as SELV.	P
2.2.2/RD	Voltages under normal conditions (V) .....	Not exceed 42.4V peak or 60Vdc in SELV circuit under normal operation.	P
2.2.3/RD	Voltages under fault conditions (V) .....	Single fault cause did not excessive voltage in accessible SELV circuits.	P
2.2.4/RD	Connection of SELV circuits to other circuits ..	To SELV only	N
5.2.2 2.3/RD	Telephone network voltage circuits - TNV	No TNV circuit	N
2.3.1/RD	Limits		N
	Type of TNV circuits .....		--
2.3.2/RD	Separation of TNV circuits from other circuits and from accessible parts		N
2.3.2.1/RD	General requirements		N
2.3.2.2/RD	Protection by basic insulation		N
2.3.2.3/RD	Protection by earthing		N
2.3.2.4/RD	Protection by other constructions .....		N
2.3.3/RD	Separation from hazardous voltages		N
	Insulation employed .....		--
2.3.4/RD	Connection of TNV circuits to other circuits		N
	Insulation employed .....		--
2.3.5/RD	Test for operating voltages generated externally		N
5.2.3 2.4/RD	Limited current circuits	(See appended table 5.2.3)	P

IEC 62040-1			
Clause	Requirement + Test	Result - Remark	Verdict
2.4.1/RD	General requirements		P
2.4.2/RD	Limit values	(See appended table 5.2.3)	--
	Frequency (Hz)..... :		--
	Measured current (mA) ..... :		--
	Measured voltage (V) ..... :		--
	Measured circuit capacitance (nF or $\mu$ F) ..... :		--
2.4.3/RD	Connection of limited current circuits to other circuits	SELV circuits as limited current circuit connected to primary via bridging components	P
5.2.4 3.5/RD	External signaling circuits		N
3.5.1/RD	General requirements		N
3.5.2/RD	Types of interconnection circuits ..... :		N
3.5.3/RD	ELV circuits as interconnection circuits		N
3.5.4/RD	Data ports for additional equipment		N
5.2.5 2.5/RD	Limited power source	No such circuit	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) ..... :		--
	Current rating of overcurrent protective device (A) .. :		--
	Use of integrated circuit (IC) current limiters	No such IC used	--

5.3	Protective earthing and bonding		P
5.3.1	General		P
2.6/RD	Provisions for earthing and bonding	Reliable connection of relevant conductive parts to the PE terminal (Power plug) via green/yellow insulated wires.	P
2.6.1/RD	Protective earthing	Relevant earthing conductive parts reliably connected to PE Pin of Power plug.	P
2.6.2/RD	Functional earthing		P
2.6.3/RD	Protective earthing conductors and protective bonding conductors	Protective bonding conductors have sufficient current-carrying capacity.	P

IEC 62040-1			
Clause	Requirement + Test	Result - Remark	Verdict
2.6.3.1/RD	General	Compliance checked. Protective bonding conductors have sufficient current-carrying capacity.	P
2.6.3.2/RD	Size of protective earthing conductors	See sub-clause 2.6.3.4/RD, rated current below 16A.	N
	Rated current (A), cross-sectional area (mm <sup>2</sup> ), AWG..... :		—
2.6.3.3/RD	Size of protective bonding conductors	Evaluation by test of sub-clause 2.6.3.4, rated current below 16A.	P
	Rated current (A), cross-sectional area (mm <sup>2</sup> ), AWG..... :	Comply with 2.6.3.4/RD	—
	Protective current rating (A), cross-sectional area (mm <sup>2</sup> ), AWG..... :	Comply with 2.6.3.4/RD	—
2.6.3.4/RD	Resistance of earthing conductors and their terminations; resistance (Ω), voltage drop (V), test current (A), duration (min)..... :	(See appended table 5.3)	P
2.6.3.5/RD	Colour of insulation..... :	Yellow-and-Green	P
2.6.4/RD	Terminals		P
2.6.4.1/RD	General	Power plug as protective earth terminal.	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)..... :	Comply with 2.6.3.4/RD	—
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. (Power plug). Green wire terminal of outlet connector to metal chassis by weld.	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	Power plug is considered as possible disconnection. AC input power is cut off before removal of earth pin.	P
2.6.5.4/RD	Parts that can be removed by an operator	Plug, earthing connected before and disconnected after hazardous voltage. No other operator removable parts.	P
2.6.5.5/RD	Parts removed during servicing	Protective earthed parts cannot be removed in a way which impairs safety.	P
2.6.5.6/RD	Corrosion resistance	No risk of corrosion.	P
2.6.5.7/RD	Screws for protective bonding	Adequate connection of protective bonding	p
2.6.5.8/RD	Reliance on telecommunication network or cable distribution system	Protective earthing is not rely on telecommunication network or cable distribution system.	N
5.3.2 2.6.1/RD	Protective earthing	Reliable connection of relevant conductive parts to the PE terminal (via green/ yellow insulated wires)	P
2.10/RD	Clearances, creepage distances and distances through insulation		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		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 with power plug	P
3.4.1/RD	General requirement	See below.	P
3.4.2/RD	Disconnect devices	Power plug provided as disconnect device.	P
3.4.3/RD	Permanently connected equipment	Not a permanently equipment.	N



IEC 62040-1			
Clause	Requirement + Test	Result - Remark	Verdict
3.4.4/RD	Parts which remain energized	Adequate protection provided to service personnel during backup mode.	P
3.4.5/RD	Switches in flexible cords	None provided.	N
3.4.6/RD	Number of poles - single-phase and d.c. equipment	The disconnect device disconnects both poles simultaneously.	P
3.4.7/RD	Number of poles - three-phase equipment	Single-phase equipment.	N
3.4.8/RD	Switches as disconnect devices	No switches provided.	N
3.4.9/RD	Plugs as disconnect devices		P
3.4.10/RD	Interconnected equipment	No interconnected equipment	N
3.4.11/RD	Multiple power sources	EUT is pluggable type and receives power from the AC mains and - in case of AC mains failure - from the built-in batteries. No marking required.	N
5.4.2	Disconnect devices	Refer to cl.3.4.2/RD	P

5.5	Overcurrent and earth fault protection		P
5.5.1	General		P
2.7.3/RD	Short-circuit backup protection	Pluggable equipment type A. Building installation is considered as providing short-circuit backup protection.	P
2.7.4/RD	Number and location of protective devices ..... :	Over current protector provided in live conductor	P
2.7.5/RD	Protection by several devices	Only one protection device provided.	N
2.7.6/RD	Warning to service personnel ..... :	No double-pole fusing inside this pluggable equipment type A UPS. Stated in the user's manual.	P
5.5.2	Basic requirements	Equipment relies on over current protector or circuit breaker of the wall outlet protection of the building installation in regard to L to N short-circuit.	P
5.5.3	Battery circuit protection	Protection against over current by circuit breaker and DC fuses.	P
5.5.3.1	Overcurrent and earth fault protection		P

IEC 62040-1			
Clause	Requirement + Test	Result - Remark	Verdict
5.5.3.2	Location of protective device	For internal battery bank, the protective devices are directly located behind the supply wire of the DC utility. For the charger circuit, there was no hazardous conditions under any simulated fault conditions.	P
5.5.3.3	Rating of protective device	Protection against overcurrent by two or three fuses (parallel) in the plus pole of the battery supply circuit of the UPS.	P
5.3.1/RD	Protection against overload and abnormal operation	(see appended table 8.3)	P

5.5.4	Short-time withstand current	1φ with neutral	N
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 duration of prospective test current (cycles 50/60 Hz) .....		--
5.5.4.3.2	Exemption from testing		P

5.6	Protection of personnel – Safety interlocks		P
5.6.1	Operator protection	No safety interlocks.	N
2.8/RD	General principles		N
2.8.1/RD	Protection requirements	No safety interlocks.	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
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

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Clause	Requirement + Test	Result - Remark	Verdict
2.8.7.4/RD	Electric strength test		N
2.8.8/RD	Mechanical actuators		N
5.6.2	Service person protection	No adjustments or measurements inside the equipment are necessary while the unit is energized.	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	A risk of injury is unlikely for the service personnel.	P
5.6.2.4	Parts on doors	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	Unintentional contact with the moving parts is not likely.	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	The terminals of the battery connections are isolated and covered so that it is unlikely to bridge the terminals of the battery during servicing or its replacement.	P

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 ..... :	Considered	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/RD	N
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

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Clause	Requirement + Test	Result - Remark	Verdict
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 appended table 5.7)	P
2.10.2.1/RD	General		P
2.10.2.2/RD	RMS working voltage		P
2.10.2.3/RD	Peak working voltage		P
2.10.3/RD	Clearances		P
2.10.3.1/RD	General		P
2.10.3.2/RD	Mains transient voltages	Normal transient voltage considered.	P
	a) AC mains supply .....	2500V <sub>peak</sub>	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.	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
2.10.3.5/RD	Clearances in circuits having starting pulses	The circuit will not generating starting pulse.	N
2.10.3.6/RD	Transients from a.c. mains supply .....	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 .....	Not connected to telecommunication networks and cable distribution systems	N
2.10.3.9/RD	Measurement of transient voltage levels	Normal transient voltage considered.	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
2.10.4/RD	Creepage distances	(see appended table 5.7)	P
2.10.4.1/RD	General	Considered.	P

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Clause	Requirement + Test	Result - Remark	Verdict
2.10.4.2/RD	Material group and comparative tracking index		P
	CTI tests ..... :	Material group IIIb is assumed to be used.	P
2.10.4.3/RD	Minimum creepage distances	(see appended table 5.7)	P
2.10.5 /RD	Solid insulation	Solid insulating materials having adequate thickness are provided.	P
2.10.5.1/RD	General	Considered.	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	Thin sheet material in form of polyester tape used in transformer.	P
2.10.5.7/RD	Separable thin sheet material	Tapes used in transformers.	P
	Number of layers (pcs) ..... :	3 layers	--
2.10.5.8/RD	Non-separable thin sheet material	Not used.	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 ..... :		--
	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

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Clause	Requirement + Test	Result - Remark	Verdict
2.10.5.13/RD	Wire with solvent-based enamel in wound components	No wire with solvent-based enamel in wound components.	N
	Electric strength test		—
	Routine test		N
2.10.5.14/RD	Additional insulation in wound components	No additional insulation used.	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		--
	Number of insulation layers (pcs) .....		--
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	No special insulation in order to reduce distance.	N
2.10.10/RD	Test for Pollution Degree 1 environment and insulating compound		N
2.10.11/RD	Tests for semiconductor devices and cemented joints	Approved opto-couplers provided. No other parts to be tested. (see appended table 4.5)	P
2.10.12/RD	Enclosed and sealed parts		N



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Clause	Requirement + Test	Result - Remark	Verdict
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	Adequate cross sectional areas on internal wiring.	P
3.1.2/RD	Protection against mechanical damage	Wire ways are smooth and free from edges. Wires are adequately fixed to prevent excessive strain on wire and terminals and avoiding damage to the insulation of the conductors.	P
3.1.3/RD	Securing of internal wiring	Internal wirings is secured against excessive strain, loosening of terminals and damage to the conductor insulation.	P
3.1.4/RD	Insulation of conductors	Insulation on internal conductors is considered to be of adequate quality and suitable for the application and the working voltage involved.	P
3.1.5/RD	Beads and ceramic insulators	No beads or similar ceramic insulators on conductors	N
3.1.6/RD	Screws for electrical contact pressure	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 and spaced thread screws used.	N
3.1.9/RD	Termination of conductors	Terminations can not become displaced so that clearances and creepage distances can be reduced.	P
	10 N pull test	Break away or pivot on its terminal is unlikely	P
3.1.10/RD	Sleeving on wiring	Sleeves are used as supplementary insulation.	P
6.1.2	Dimensions and rating of busbars and insulated conductors		N

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Clause	Requirement + Test	Result - Remark	Verdict
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	Single supply connection.	N
3.2.3/RD	Permanently connected equipment	Not 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	No appliance inlets use	N
3.2.5/RD	Power supply cords	Certified detachable power supply cord with plug provided.	P
3.2.5.1/RD	AC power supply cords	Certified power cord used.	P
	Type .....	(See appended table 4.5)	--
	Rated current (A), cross-sectional area (mm <sup>2</sup> ), AWG .....	3X0.75 mm <sup>2</sup> , 14AWG, 3C	--
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	Cord anchorages used. No more than 2mm longitudinal displacement after strain relief test.	P
	Mass of equipment (kg), pull (N) .....	100N	--
	Longitudinal displacement (mm) .....	1.4mm	--
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
3.2.8/RD	Cord guards		P
	Diameter or minor dimension D (mm); test mass (g) .....		--
	Radius of curvature of cord (mm).....		--
6.2.2	Means of connection .....	Pluggable UPS type A.	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	No external power conductor provided	N
3.3.1/RD	Wiring terminals		N
3.3.2/RD	Connection of non-detachable power supply cords		N

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Clause	Requirement + Test	Result - Remark	Verdict
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 <sup>2</sup> )..... :		--
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°		P
	Test force (N) ..... :		N

7.3 4.2/RD	Mechanical strength		P
4.2.1/RD	General	Tests performed and passed. Results see below. 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	10 N applied to all 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. No energy or other hazards.	P
4.2.5/RD	Impact test	No hazard as a result from steel ball impact test.	P
	Fall test	No hazard as a result from steel ball impact test.	P

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Clause	Requirement + Test	Result - Remark	Verdict
	Swing test	No hazard as a result from steel sphere ball swung test.	P
4.2.6/RD	Drop test; height (mm) ..... :	No required for this equipment.	N
4.2.7/RD	Stress relief test	70°C, 7hours	P
4.2.8/RD	Cathode ray tubes	No cathode ray tube.	N
	Picture tube separately certified ..... :		—
4.2.9/RD	High pressure lamps	No high pressure lamp provided.	N
4.2.10/RD	Wall or ceiling mounted equipment; force (N) . :	Not for wall or ceiling mounting.	N

7.4	Construction details		P
7.4.1	Introduction		P
4.3.1/RD	Edges and corners	Edges and corners of the enclosure are rounded and smoothed.	P
4.3.2/RD	Handles and manual controls; force (N)..... :		P
4.3.3/RD	Adjustable controls	No adjustable controls.	N
4.3.4/RD	Securing of parts	Mechanical fixings in such a way designed that they will withstand mechanical stress occurring in normal use.	P
4.3.5/RD	Connection by plugs and sockets	No mismatch of connectors.	P
4.3.7/RD	Heating elements in earthed equipment	No heating elements provided.	N
4.3.11/RD	Containers for liquids or gases	No containers for liquid or gases in the equipment	N
4.4/RD	Protection against hazardous moving parts	No such parts.	P
4.4.1/RD	General	Test finger applied to openings. No accessible.	P
4.4.2/RD	Protection in operator access areas ..... :	No service access areas	P
4.4.3/RD	Protection in restricted access locations ..... :	No service access areas	P
4.4.4/RD	Protection in service access areas	No service access areas	P
4.4.5/RD	Protection against moving fan blades	No service access areas	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

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Clause	Requirement + Test	Result - Remark	Verdict
4.4.5.2	Protection for users	Protection against by metal enclosure	P
	Use of symbol or warning ..... :		N
4.4.5.3	Protection for service persons	Protection against by metal enclosure	P
	Use of symbol or warning ..... :		N
4.5/RD	Thermal requirements		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 ..... :	See Annex L	--
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 7.4)	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	For the ventilation of the lead-acid battery refer to table M	P
7.4.4	Equipment movement	No castors provided.	N

7.5	Resistance to fire		P
4.7/RD			
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. (see appended table 7.5)	P
	Method 2, application of all of simulated fault condition tests		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	Components and materials have adequate flammability classification.	P
4.7.3.2/RD	Materials for fire enclosures	V-1 or better	P

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Clause	Requirement + Test	Result - Remark	Verdict
4.7.3.3/RD	Materials for components and other parts outside fire enclosures	No parts outside the fire enclosure.	N
4.7.3.4/RD	Materials for components and other parts inside fire enclosures	Internal components except small parts are minimum V-2 material. Batteries have a flammability class of HB or better.	P
4.7.3.5/RD	Materials for air filter assemblies	No air filters in the equipment.	N
4.7.3.6/RD	Materials used in high-voltage components	No parts exceeding 4kV.	N

7.6	Battery location		P
7.6.1	Battery location and installation	Maintenance free batteries used inside the UPS. The batteries are connected by quick connect terminals (no necessary tightening).	P
7.6.2	Accessibility and maintainability	No requirements declared by the battery manufacturer.	P
7.6.3	Distance	The temperature of the electrolyte and the gas emission are within the limits of this standard (see appropriate subclauses).	P
7.6.4	Case insulation	No Ni-Cd battery used inside.	P
7.6.5	Wiring	The protection of connection wiring complies with subclause 3/RD.	P
7.6.6	Electrolyte spillage	Sealed maintenance free batteries provided with an unlikely emission of electrolyte (VRLA type).	P
7.6.7	Ventilation	For the ventilation of the lead-acid battery refer to table M.	P
7.6.8	Charging voltage	Protected against excessive voltages under normal and single fault conditions.	P

7.7	Temperature rise		P
4.5/RD	Thermal requirements		P
4.5.1/RD	General		P
4.5.2/RD	Temperature tests	(see appended table 7.7)	P
	Normal load condition per Annex L ..... :		--
4.5.3/RD	Temperature limits for materials	(see appended table 7.7)	P



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Clause	Requirement + Test	Result - Remark	Verdict
4.5.4/RD	Touch temperature limits	(see appended table 7.7)	P
4.5.5/RD	Resistance to abnormal heat ..... :	(see appended table 7.4)	P
8	Electrical requirements and simulated abnormal conditions		P
8.1	General provisions for earth leakage		P
5.1.1/RD	General	(see appended table 8)	P
5.1.7/RD	Equipment with touch current exceeding 3,5 mA	The touch current does not exceed 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	Only fan motor in the equipment.	P
5.3.3/RD	Transformers	(see appended Annex C/RD)	P
5.3.4/RD	Functional insulation..... :	By short-circuit	P
5.3.5/RD	Electromechanical components	No such electromechanical components that will cause hazard	N
5.3.9/RD	Compliance criteria for abnormal operating and fault conditions	See below	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 distances. Electric strength test is made on functional, basic and reinforced insulation.	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.	P

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Clause	Requirement + Test	Result - Remark	Verdict
9 6/RD	Connection to telecommunication networks		N
6.1/RD	Protection of telecommunication network service persons, and users of other equipment connected to the network, from hazards in the equipment		N
6.1.1/RD	Protection from hazardous voltages		N
6.1.2/RD	Separation of the telecommunication network from earth	No telecommunication network circuits	N
6.1.2.1/RD	Requirements		N
	Supply voltage (V) .....	1.5kV	—
	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		N
6.2.1/RD	Separation requirements		N
6.2.2/RD	Electric strength test procedure		N
6.2.2.1/RD	Impulse test		N
6.2.2.2/RD	Steady-state test		N
6.2.2.3/RD	Compliance criteria		N
6.3/RD	Protection of the telecommunication wiring system from overheating		N
	Max. output current (A) .....		--
3.5/RD	Interconnection of equipment		N
3.5.1/RD	General requirements		N
3.5.2/RD	Types of interconnection circuits .....		N
3.5.3/RD	ELV circuits as interconnection circuits		N
3.5.4/RD	Data ports for additional equipment		N
2.1.3/RD	Protection in restricted access locations		N
2.3.1/RD	Limits		N
	Type of TNV circuits .....		--
2.3.2/RD	Separation from other circuits and from accessible parts		N
2.3.2.1/RD	General requirements		N
2.3.2.2/RD	Protection by basic insulation		N
2.3.2.3/RD	Protection by earthing		N
2.3.2.4/RD	Protection by other constructions .....		N
2.3.3/RD	Separation from hazardous voltages		N
	Insulation employed .....		--
2.3.4/RD	Connection of TNV circuits to other circuits		N
	Insulation employed .....		--
2.3.5/RD	Test for operating voltages generated externally		N

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Clause	Requirement + Test	Result - Remark	Verdict
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		N
2.10.3.4/RD	Clearances in secondary circuits		N
2.10.4/RD	Creepage distances	Considered.	N
2.10.4.1/RD	General		N
2.10.4.2/RD	Material group and comparative tracking index		N
	CTI tests .....		—
2.10.4.3/RD	Minimum creepage distances		N

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
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

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Clause	Requirement + Test	Result - Remark	Verdict
	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
	Position .....		--
	Manufacturer .....		--
	Type .....		--
	Rated values .....		--
B.2/RD	Test conditions		N
B.3/RD	Maximum temperatures		N
B.4/RD	Running overload test		N

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Clause	Requirement + Test	Result - Remark	Verdict
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 .....	(See appended table 4.5)	—
	Manufacturer .....	(See appended table 4.5)	—
	Type .....	(See appended table 4.5)	—
	Rated values .....	(See appended table 4.5)	—
	Method of protection.....	Inherent impedance	—
C.1/RD	Overload test		P
C.2/RD	Insulation		P
	Protection from displacement of windings .....	By insulation tapes	P
D/RD	Annex D, Measuring instruments for touch current tests (see 5.1.4/RD)		P
D.1/RD	Measuring instrument	As in figure D.1 used.	P
D.2/RD	Alternative measuring instrument	Not used.	N
E/RD	Annex E, Temperature rise of a winding (see Annex E/RD)		N
F/RD	Annex F, Measurements of clearances and creepage distance (see 2.10/RD and Annex G/RD)		P

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

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
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I	Annex I, Backfeed protection test		P
I.1	General		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	(See appended table 5.1.4)	P
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
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IEC 62040-1			
Clause	Requirement + Test	Result - Remark	Verdict

	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		P
L.2	Reference resistive load		N
L.3	Reference inductive-resistive load		--
L.4	Reference capacitive-resistive loads		N
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	Worst case power factors as specified by the manufacturer maintained during the relevant tests.	--

M	Annex M, Ventilation of battery compartments		P
M.1	General	Sufficient openings and a suitable arrangement of components (circuit breaker) 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 appended table M	P
M.3	Blocked conditions	Block test applied, see appended table 8.3	P
M.4	Overcharge conditions	See appended table M.	P



IEC 62040-1			
Clause	Requirement + Test	Result - Remark	Verdict
N	Annex N, Minimum and maximum cross-sections of copper conductors suitable for connection (see 6.3)		N
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		N

4.5	TABLE: Critical components information					P
Object / part No.	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity <sup>1)</sup>	
- Description:	Whole unit					
Plastic material of front panel	CHI MEI CORPORATION	PA-765A(+)	V-0, 85℃, Min. 2.1mm thickness	UL94	UL: E56070	
(Alternative)	LG CHEMICAL LTD.	AF312	V-0, 85℃, Min. thickness 2.1mm	UL94	UL: E67171	
Enclosure	Various	Various	Metal, min. 1.5 mm thickness	EN62040-1	Tested with appliance	
Plug of power cord	YANG HAO ELECTRICAL INDUSTRY Co., Ltd.	YH-E-005	250 16A	VDE0620-1	VDE:40029538	
Flexible cable of power cord	YANG HAO ELECTRICAL INDUSTRY Co., Ltd.	H05VV-F	3X0.75 mm <sup>2</sup> Max. Length 2m	VDE0281	VDE:40027125	
(Alternative)	Shenzhen Tongyuan Industrial Co., Ltd.	H05VV-F	3X0.75 mm <sup>2</sup> Max. Length 2m	VDE0281	VDE:101980	
(Alternative)	Shenzhen Dongju Wire & Cable Co., Ltd.	H05VV-F	3X0.75 mm <sup>2</sup> Max. Length 2m	VDE0281	VDE:129988	
Circuit breaker (for model V-3000)	KUOYUN W L ENTERPR SE CO LTD	88	250V15A	UL 1077	UL: E155159	
Circuit breaker (for model V-2000)	KUOYUN W L ENTERPR SE CO LTD	88	250V10A	UL 1077	UL: E155159	
Internal wire of input and output	SANSHUI CITY HENGDA ELECTRICAL CO., LTD.	1015	16-18AWG, 600V, 105℃	UL 758	UL: E229361	
Battery wire	SANSHUI CITY HENGDA ELECTRICAL CO., LTD.	1015	12AWG, 105℃ 600V	UL 758	UL: E229361	
Earth wire	SANSHUI CITY HENGDA ELECTRICAL CO., LTD.	1015	16AWG, 600V, 105℃	UL 758	UL: E229361	
Main transformer (for model V-3000)	CHUAN SHUN ELECTRIC INDUSTRIAL CO., LTD.	4B2KB-13360-E2L	Class H insulation 180℃	EN62040-1	Tested with appliance	
(Alternative) (for model V-3000)	FOSHAN OULI ELECTRONIC CO LTD.	4B2KB-13360-E2L	Class H insulation 180℃	EN62040-1	Tested with appliance	
Main transformer (for model V-2000)	FOSHAN OULI ELECTRONIC CO LTD.	4B2KB-11470-E2L	Class H insulation 180℃	EN62040-1	Tested with appliance	
(Alternative) (for model V-2000)	CHUAN SHUN ELECTRIC INDUSTRIAL CO., LTD.	4B2KB-11470-E2L	Class H insulation 180℃	EN62040-1	Tested with appliance	

- Bobbin	E I dupont Nemours co., Ltd	ZYTEL 101L	133*60/114*70	UL	UL E41938(M)
- Magnet wire	Roshow group co ltd	AL WIRE	0.5Φ -2.2Φ	UL	UL E215691
(Alternative)	JIANGXI QIAN CI WIRE&CABLE CO LTD	EI/AI	Class H insulation 180℃	UL	UL E333672
- Insulation tape	YAHUA STICKING TAPE CO.,LTD	No.1350f-1	0.09*3ts	UL	UL E165111
(Alternative)	JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO LTD	CP-3002	180C	UL	UL E165111
Socket outlet (3 PCS)	RICH BRY Co., Ltd.	RG-02	250V 16A	VDE0620-1	VDE 82796
Fan	YATE LOON ELECTRONICS CO.,LTD	D80BH-12	0.18A, 12Vd.c.	EN60950	TUV :R 9954588
Battery (4 PCS) (for model V-3000)	SHEN ZHEN LEOCH BATTERIES TECHNOLOGY CO LTD	DJW Series	DJW12V-9	UL1989	UL:MH26866
Battery (2 PCS) (for model V-2000)	SHEN ZHEN LEOCH BATTERIES TECHNOLOGY CO LTD	DJW Series	DJW12V-9	UL1989	UL:MH26866
Heat-shrinkable tube	Various	Various	600V, 125 °C, VW-1	UL 224	UL
<b>- Description:</b>	<b>EMI board</b>				
Bleed resistor (MOV1)	Various	Various	100K /3W	EN62040-1	Tested with appliance
X-capacitor (C2)	GUANGZHOU YES ELECTRONIC TECHNOLOGY CO	MKP-X2	0.1μF, 275V, 100℃ min.	UL 60384-14	UL E355933
Inductor (L1)	FOSHAN OULI ELECTRONIC CO LTD.	L2209-015	Class B insulation 130℃	EN62040-1	Tested with appliance
(Alternative)	ZHUHAI CHANGXIAN CHEMICAL TECHNOGY CO LTD	L2209-015	Class B insulation 130℃	EN62040-1	Tested with appliance
X-capacitor (C1)	GUANGZHOU YES ELECTRONIC TECHNOLOGY CO	MKP-X2	0.1μF, 280V, 100℃ min.	IEC 60384-14 VDE0565	UL E355933: VDE40035535

Y-capacitor (C3, C5)	ANSHAN KELFAT ELECTRONIC CERAMIC TECHNICAL CO LTD	CT7	472M/400V, 100°C min.	UL 60384-14	UL E232980
<b>- Description:</b>	<b>Main board</b>				
Relay (RY200, RY201, RY202, RY203, RY204)	NINGBO YINZHOU YONGLIN ELECTRICAL EQUIPMENT CO., LTD.	YL-224-C-S-24VDC	Contact: 30A, 250V; Coil: 24Vdc	EN61810-1 EN60255-23	UL: E233840
X capacitor (C211, C201)	LIAO NING DIYA CAPACITOR CO LTD	MKP-X2	0.1μF, 280V/250V, 100°C min.	UL 60384-14	UL E355933
Opto-coupler	Sharp Corporation	PC817	Dti>0.4mm, 115°C min.	EN60747-5-2,	VDE: 40008087
Electrolyte capacitor (EC202, EC203, EC204)	Various	Various	35V, 2200μF, 105°C min.	EN62040-1	Tested with appliance
Current transformer (CT-1)	CHUAN SHUN ELECTRIC INDUSTRIAL CO., LTD.	FCS2401-08	130°C	EN62040-1	Tested with appliance
Alternative	FOSHAN OULI ELECTRIC CO., LTD.	FCS2401-08	130°C	EN62040-1	Tested with appliance
Alternative	CHENG ANG ELECTRIC CO., LTD.	FCS2401-08	130°C	EN62040-1	Tested with appliance
DC Fuse (F2, F3, F4)	CHE YEN INDUSTRIAL CO., LTD.	ATY-N	F40A, 32Vd.c.	UL248	UL: E208387
(Alternative)	Various	Various	F40A, 32Vd.c.	UL248	UL
PCB	Nanhai Mei Wah Printed Circuit Based Co., Inc.	RXD-11	V-0, 130°C	UL796	UL E185472
(Alternative)	FOSHAN CITY FENG SHAN TIAN ELECTRIC ASSISTANT LTD.	RXD-11	V-0, 130°C	UL796	UL E355240
(Alternative)	Various	Various	V-0, 130°C	UL796	UL
<b>Supplementary information:</b>					
<b>1) Provided evidence ensures the agreed level of compliance.</b>					

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	
Model: V-2000							
Circuit breaker	---	198V/50Hz	1473	2063.1	10.42	Rated maximum output load	
Circuit	---	198V/60Hz	1522	2088.9	10.55	Rated maximum output load	

breaker						
Circuit breaker	10	220V/ 50Hz	1457	2090.0	9.50	Rated maximum output load
Circuit breaker	10	220V/ 60Hz	1454	2074.6	9.43	Rated maximum output load
Circuit breaker	10	240V/ 50Hz	1438	2066.4	8.61	Rated maximum output load
Circuit breaker	10	240V/ 60Hz	1406	2071.2	8.63	Rated maximum output load
Circuit breaker	---	254V/ 50Hz	1455	2110.7	8.31	Rated maximum output load
Circuit breaker	---	254V/ 60Hz	1405	2095.5	8.25	Rated maximum output load
Model: V-3000						
Circuit breaker	---	198V/ 50Hz	2300	3025.4	15.28	Rated maximum output load
Circuit breaker	---	198V/ 60Hz	2240	3023.4	15.27	Rated maximum output load
Circuit breaker	15	220V/ 50Hz	2297	3097.6	14.08	Rated maximum output load
Circuit breaker	15	220V/ 60Hz	2300	3053.6	13.88	Rated maximum output load
Circuit breaker	15	240V/ 50Hz	2222	3072.0	12.80	Rated maximum output load
Circuit breaker	15	240V/ 60Hz	2266	3057.6	12.74	Rated maximum output load
Circuit breaker	---	254V/ 50Hz	2210	3053.1	12.02	Rated maximum output load
Circuit breaker	---	254V/ 60Hz	2231	3055.6	12.03	Rated maximum 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 2.1.1.7/ RD	TABLE: discharge of capacitors in the primary circuit				P
Condition	$\tau$ calculated (s)	$\tau$ measured (s)	t u→ 0V (s)	Comments	
L-N	---	0.68	2.48	U=372V, 37%U=137.6V, After 1s the voltage=92V.	
Supplementary information: Test for pluggable type A UPS.					

5.1.4	TABLE: Backfeed protection test				P
Condition	Voltage measured (V)			Comments	
	L-N	L-G	N-G		
No load	0.03	0.976	0.825	Battery mode, normal condition	
Full load	0.02	0.837	0.792	Battery mode, normal condition	
No load	0.01	0.858	0.858	Battery mode, Fault condition (N206 Pin2-3 short circuit)	
Full load	0.01	0.584	0.583	Battery mode, Fault condition (N206 Pin2-3 short circuit)	
Supplementary information:					

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

5.2.3 2.4/RD	TABLE: limited current circuits					P
Location	Voltage (V)	Current (mA)	Freq. (kHz)	Limit (mA)	Comments	
Battery mode						

L-N	0.03	0.015	47.85	0.7	Normal condition
L-PE	0.05	0.025	49.02	0.7	Normal condition
N-PE	0.06	0.030	49.02	0.7	Normal condition
L-N	0.22	0.110	15.34k	10.74	Short-circuited R13
L-PE	0.08	0.040	15.34k	10.74	Short-circuited R13
N-PE	0.07	0.035	15.34k	10.74	Short-circuited R13
L-N	0.16	0.080	48.54	0.7	Short-circuited R220
L-PE	0.07	0.035	15.34k	10.74	Short-circuited R220
N-PE	0.07	0.035	15.34k	10.74	Short-circuited R220
<b>Supplementary information:</b> Using the measuring instrument of Annex D and test connect a non-inductive resistor of 2 000Ω.					

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

5.3 2.6.3.4/RD	TABLE: provisions for protective earthing		P
Location		Resistance measured(mΩ)	Comments
PE pole to PE terminal of appliance outlet		54	Test with current 32A, 2min Resistance not exceed 100 mΩ.
supplementary information:			

5.7 2.10.2/RD	Table: Working Voltage Measurement			P
Location		RMS voltage (V)	Peak voltage (V)	Comments
X-Cap. C4 Pri to Sec.		186	340	
X-Cap. C5 Pri to Sec.		120	184	
supplementary information:				
Due to the design of the equipment, no voltages exceed the supply voltage inside the unit. Following voltages are considered: 420Vpeak and 250Vr.m.s.				



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)
Primary circuits to PE through:	<420	<250	2.0	See below	2.5	See below
- appliance plug				>4.5		>4.5
- appliance outlet				>5.0		>5.0
- under C4				3.8		3.8
- under C5				3.8		3.8
Air gap of backfeed relay RY200, RY205.	<420	<250	1.9	>1.9	2.5	>2.5
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)	
Plastic enclosure	<420	3000Vac	0.4	>0.4	
Supplementary information: Approved component, for details refer to table 4.5					

5.7 2.10.5	TABLE: Dielectric Strength		P
Test voltage applied between:	Test potential applied (V)	Breakdown / flashover (Yes/No)	
Primary circuits to PE	AC1500	No	
Primary circuits to enclosure	AC3000	No	
Supplementary information:			

7.7 4.5/RD	TABLE: Heating Test			P
	Test voltage (V)..... :	See below		—
	Ambient (°C)..... :	See below		—
Thermocouple Locations		max. temperature measured, (°C)		max. temperature limit, (°C)
Test Voltage		198V/50Hz	254V/50Hz	Battery mode
Input wire inside		67.2	58.9	68.1
Breaker body		85.4	74.4	86.6
				100

X-Cap. C2 body (On EMI board)	87.5	91.2	79.8	100
Y-Cap. C5 body (On EMI board)	93.0	78.3	89.5	125
L1 coil (On EMI board)	101.0	111.1	94.3	130
X-Cap. C2 body (On EMI board)	91.1	86.7	85.4	100
Relay RY200 coil	88.4	74.9	89.1	90
X-Cap. C210 body	77.9	67.3	77.9	100
Relay RY205 coil	86.7	75.8	87.0	90
X-Cap. C211 body	84.7	72.7	85.0	100
Relay RY202 coil	84.4	70.4	85.4	90
Relay RY203 coil	81.4	74.9	80.8	90
Relay RY204 coil	93.1	78.0	94.4	110
Main Transformer primary wire	62.3	58.2	63.0	105
Main Transformer primary winding	62.8	58.4	63.6	130
Main Transformer secondary wire	55.4	52.5	56.4	105
Main Transformer secondary winding	63.9	59.7	64.7	130
Main Transformer core	70.3	68.9	71.2	---
Transformer CT-1 coil	89.6	73.5	90.7	130
Transformer CT-1 core	85.0	70.3	85.7	--
PCB under T1	79.5	66.8	80.6	130
PCB under F3	64.1	54.8	65.2	130
E-Cap. EC203 body	63.1	52.7	63.6	105
PCB under M201	76.3	54.2	77.0	130
PCB under M203	77.5	55.0	78.2	130
Battery wire	58.1	53.7	58.9	105
Battery body ( By the side of Main Transformer )	53.0	48.3	53.9	80
Output wire inside	62.7	57.7	63.1	105
Output socket near "L"	55.0	52.4	55.9	70
Enclosure front inside ( near Main Transformer )	57.1	51.6	57.9	95
Enclosure top outside ( near Main Transformer )	46.7	45.1	47.0	70
Enclosure side outside ( near Main Transformer )	44.3	44.7	45.2	70
Enclosure bottom outside ( near Main Transformer )	58.1	55.7	59.0	70
Ambient(°C)	40.0	40.0	40.0	--

**Supplementary information:**

TABLE: Heating test, resistance method					
Test voltage (V)..... :	--	—			
Ambient, t <sub>1</sub> (°C) ..... :	--	—			
Ambient, t <sub>2</sub> (°C) ..... :	--	—			
Temperature rise of winding	R <sub>1</sub> (Ω)	R <sub>2</sub> (Ω)	ΔT (K)	Max. dT (K)	Insulation class
<b>Supplementary information:</b> The temperatures were measured under worst case normal mode defined in 1.2.2.1/RD and as described in sub-clause 1.6.2/RD and at voltages as described above. With a specified maximum ambient temperature and test temperature of 40 °C, the maximum permitted temperatures are calculated as follows:  Winding components (providing safety isolation): - Class B                      T <sub>max</sub> = 120 °C - 10 °C = 110 °C					

7.4 4.5.5/RD	TABLE: Ball Pressure Test of Thermoplastics		P
Allowed impression diameter (mm) ..... :		≤2mm	—
Part		Test temperature (°C)	Impression diameter (mm)
Transformer bobbin of Main transformer		125	1.2
Transformer bobbin of CT-1		125	1.2
Supplementary information:			

7.4.2	TABLE: openings		P
Location	Size (mm)	Comments	
Top	---	No openings	
Side	Φ=2.92 mm	Circular openings, 560 provided on the each side. Comply with Figure 4C in 4.6.1/RD, no hazardous live parts exposed to the openings.	
Bottom	---	No openings	
Front	---	No openings	
Back	---	No openings provided except the holes for ventilation fans	
Supplementary information:			

<b>7.5</b> <b>4.7/RD</b>	<b>TABLE: Resistance to fire</b>					<b>P</b>
Part	Manufacturer of material	Type of material	Thickness (mm)	Flammability class	Evidence	
Plastic enclosure	CHI MEI CORPORATION	PA-765A(+)	Min. 2.1	V-0	UL: E56070	
Plastic enclosure	LG CHEMICAL LTD.	AF312	Min.2.1	V-0	UL: E67171	
<b>Supplementary information:</b>						

<b>8</b> <b>5.1/RD</b>	<b>TABLE: touch current measurement</b>			<b>P</b>
Measured between:	Measured (mA)	Limit (mA)	Comments/conditions	
L/N (Input mode)	0.47	3.5	To metal enclosure (Earthing)	
L/N (Input mode)	0.01	0.25	To non-conductive parts	
L/N (Battery mode)	0.01	3.5	To metal enclosure (Earthing)	
L/N (Battery mode)	0.01	0.25	To non-conductive parts	
<b>Supplementary information:</b>				

<b>8.3</b> <b>5.3/RD</b>	<b>TABLE: Fault condition tests</b>					<b>P</b>
	Ambient temperature (°C) .....				40°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	2h30min	Circuit breaker	12.74	Apparatus normal operation, until temperature stable, no hazards, no damage. The max. temperature: Main Transformer primary winding :62.5°C; Main Transformer secondary winding:63.7°C; Transformer CT-1 coil:77.0°C.
Fan	Lock	240	3h	Circuit breaker	12.74	Apparatus normal operation, until temperature stable, no hazards, no damage. The max. temperature: Main Transformer primary winding :66.0°C; Main Transformer secondary winding:67.6°C; Transformer CT-1 coil:78.1°C.
Ouput	S-C	240	10min	Circuit breaker	--	Apparatus shutdown immediately, No damage, no hazards.

Ouput	S-C	Stored energy mode	10min	Circuit breaker	--	Apparatus shutdown immediately, No damage, no hazards.
Ouput	O-L	240	1.2h	Circuit breaker	--	Unit alarmed when increased the output to 1.1 times the rated, and shutdown when increased the output to 1.2 times the rated. No hazard.
Ouput	O-L	Stored energy mode	1.0h	Circuit breaker	--	Unit alarmed when increased the output to 1.1 times the rated and shutdown until the empty of battery. No hazard.
M201 PinD-S	S-C	240	10min	F1	0.45	Apparatus shutdown immediately, M201A, M201B, M201C damage, no hazards.
M202C PinD-S	S-C	240	10min	F1	0.45	Apparatus shutdown immediately, M201A, M201B, M201C damage, no hazards.
EC203	S-C	240	10min	F1	0.12	Apparatus shutdown immediately, DC fuses open, no hazards.
Main T RED to BLK	S-C	240	10min	F1	0.45	Apparatus shutdown immediately, No damage, no hazards.

**Supplementary information:**

C.2/RD	TABLE: transformers							P
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:**

C.2/RD	TABLE: transformers	P
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**Transformer:**

Construction/winding diagram:

M	Ventilation of battery compartments	P
	<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>with <math>Q = 0.054 * n * I * C</math></p> <p>where:</p> <p><b>Q</b> : airflow in m<sup>3</sup>/h</p> <p><b>n</b> : number of battery cells</p> <p><b>I</b> : constant factor (0,2A/100Ah for valve regulated lead acid batteries)</p> <p><b>C</b> : 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><b>n</b> : 6 cells per battery (total: 24 for model V-3000) (total: 12 for model V-2000)</p> <p><b>C</b> : 9 Ah</p> $A \geq (0.054 * n * 0.2 \text{ A/100 Ah} * C)/360$ <p><math>A \geq 0.648 \text{ cm}^2</math> for model V-3000</p> <p><math>A \geq 0.324 \text{ cm}^2</math> for model V-2000</p> <p><b>Verdict</b></p> <p>The size of ventilation openings in battery cabinet exceeds the required airflow by far (as well as the UPS).</p>	

**Photo documentation**

Photo 1



Photo 2





Photo 3



Photo 4



Photo 5

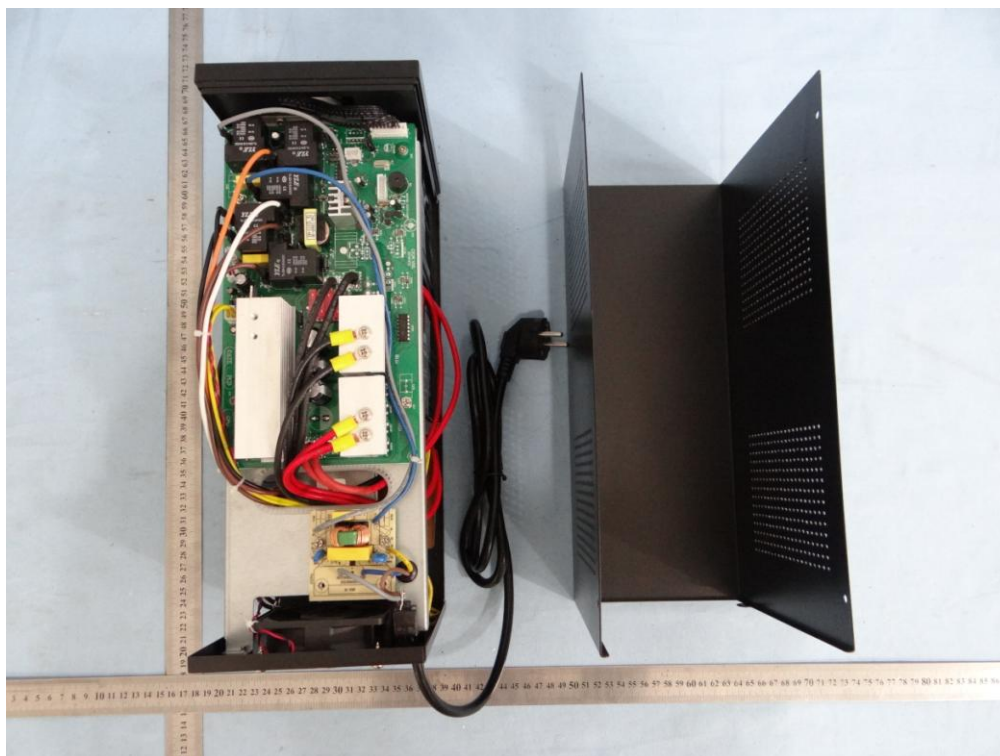


Photo 6

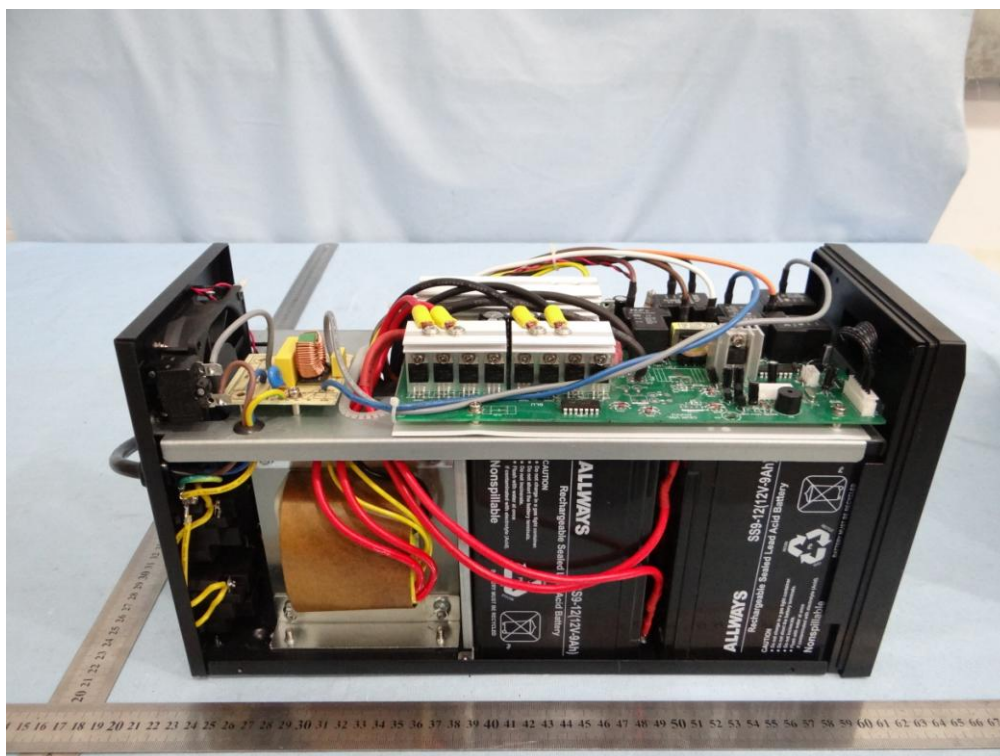




Photo 7

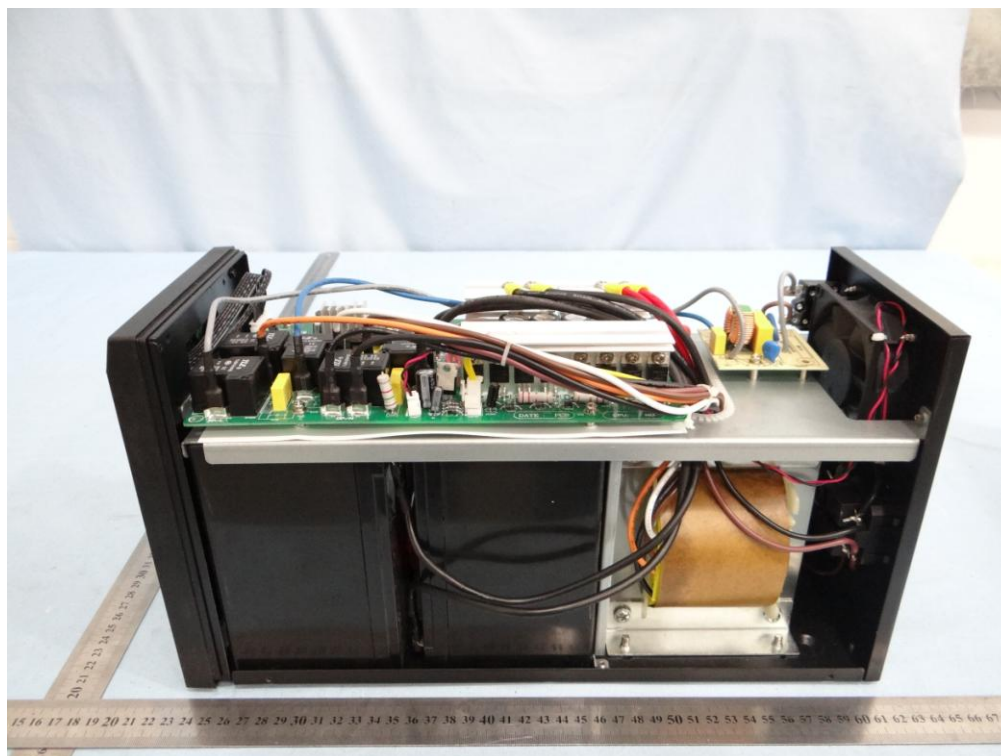


Photo 8

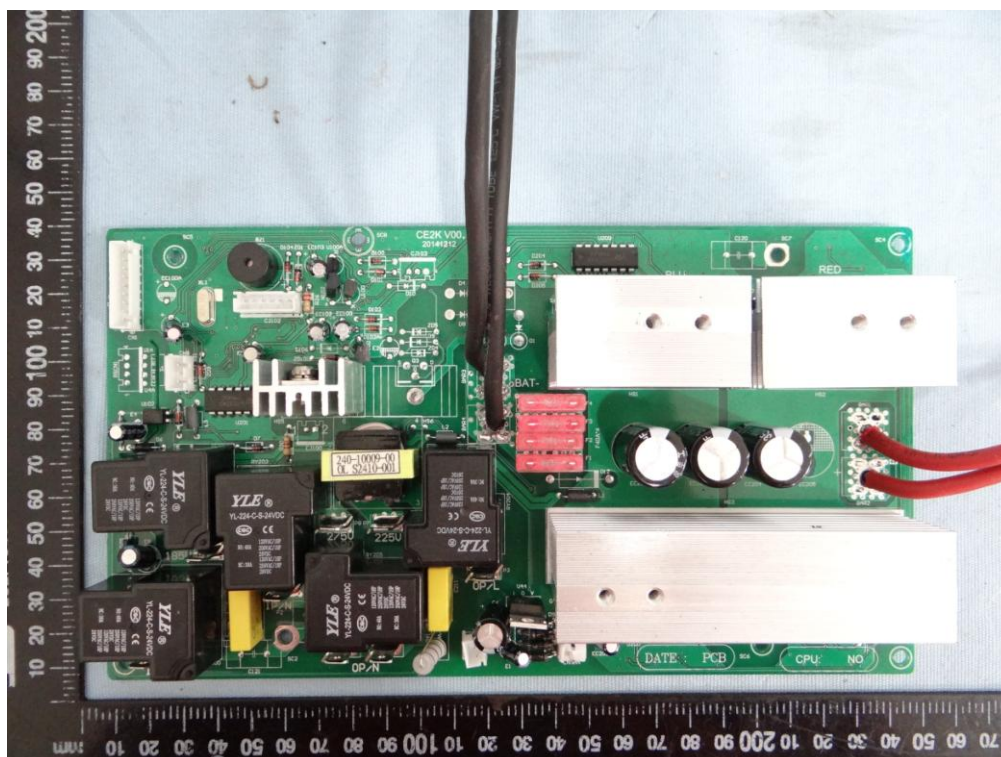


Photo 9

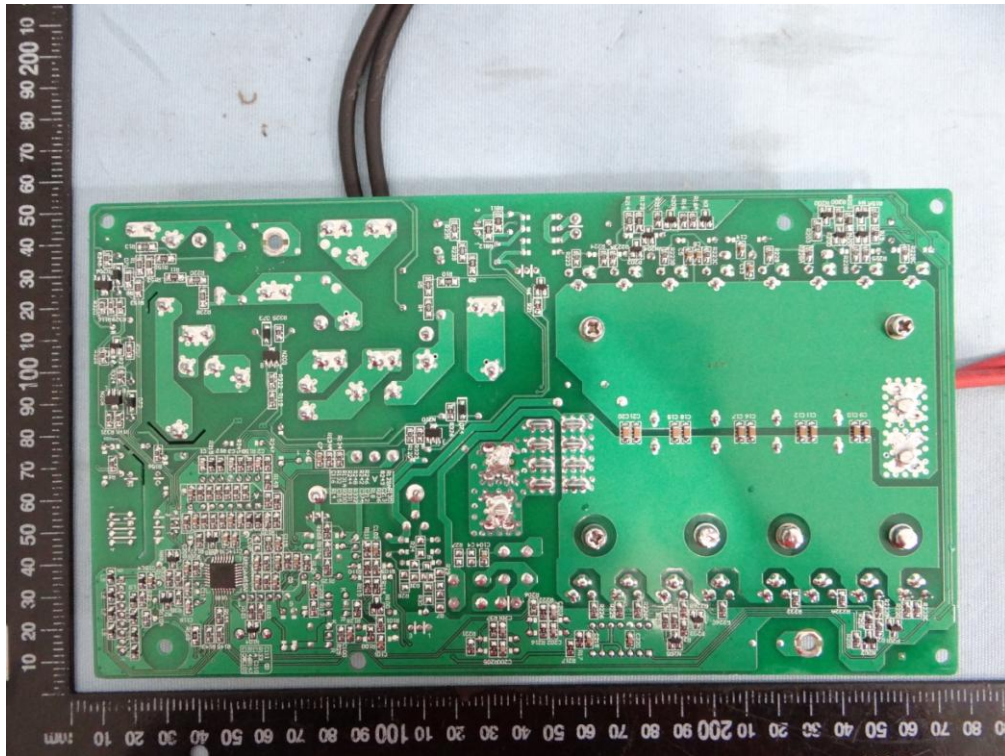


Photo 10

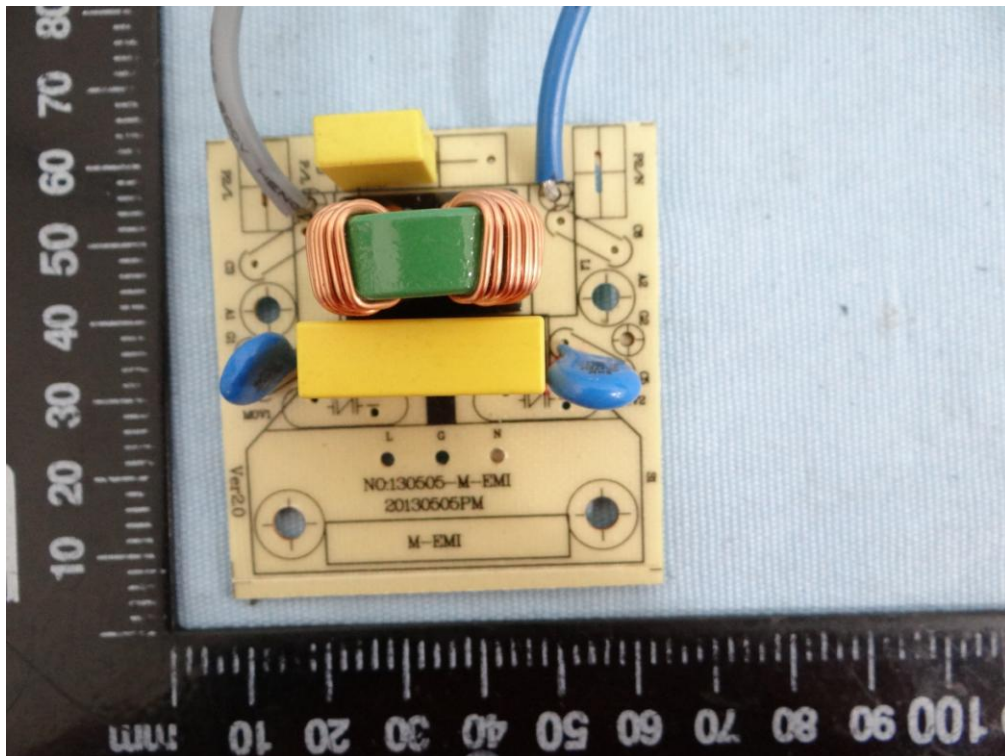




Photo 11

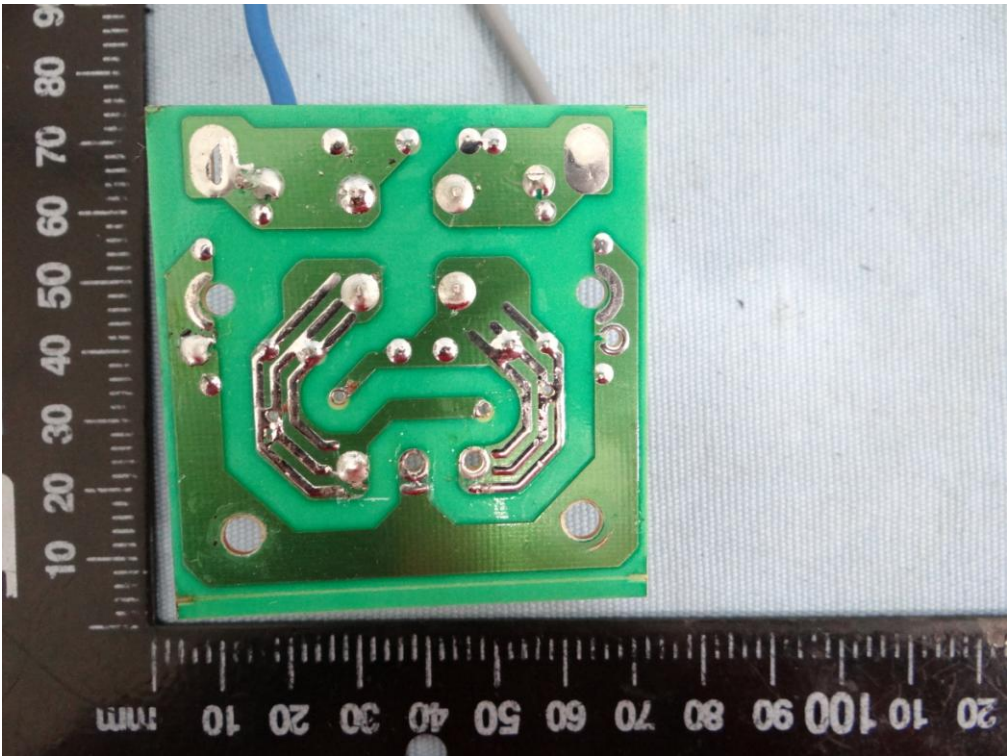


Photo 12

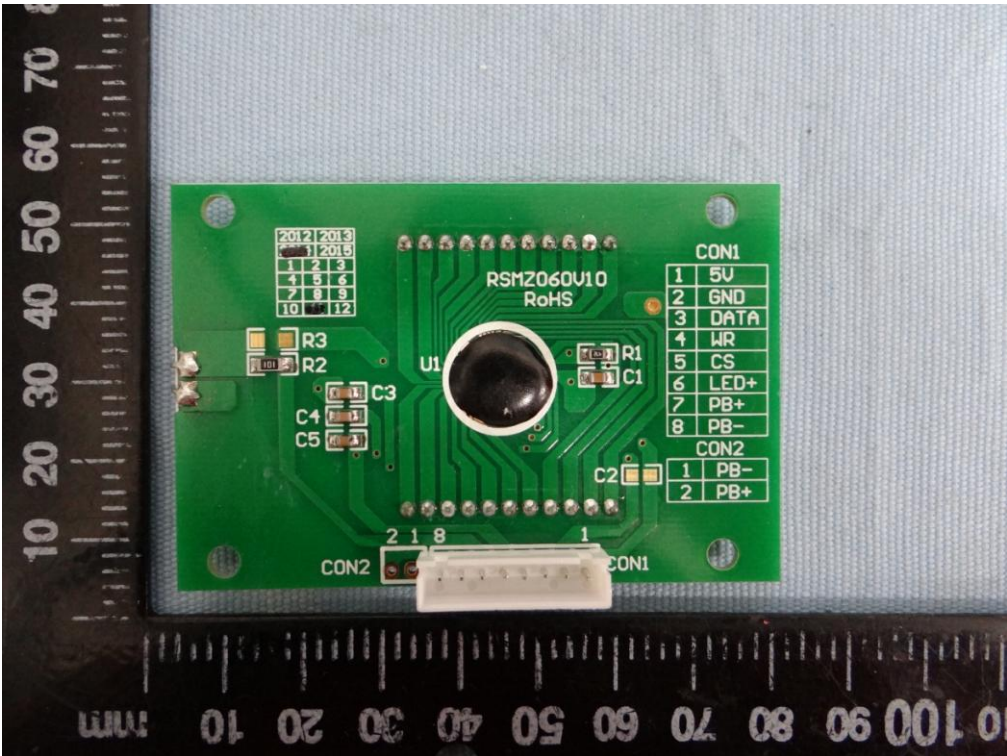


Photo 13

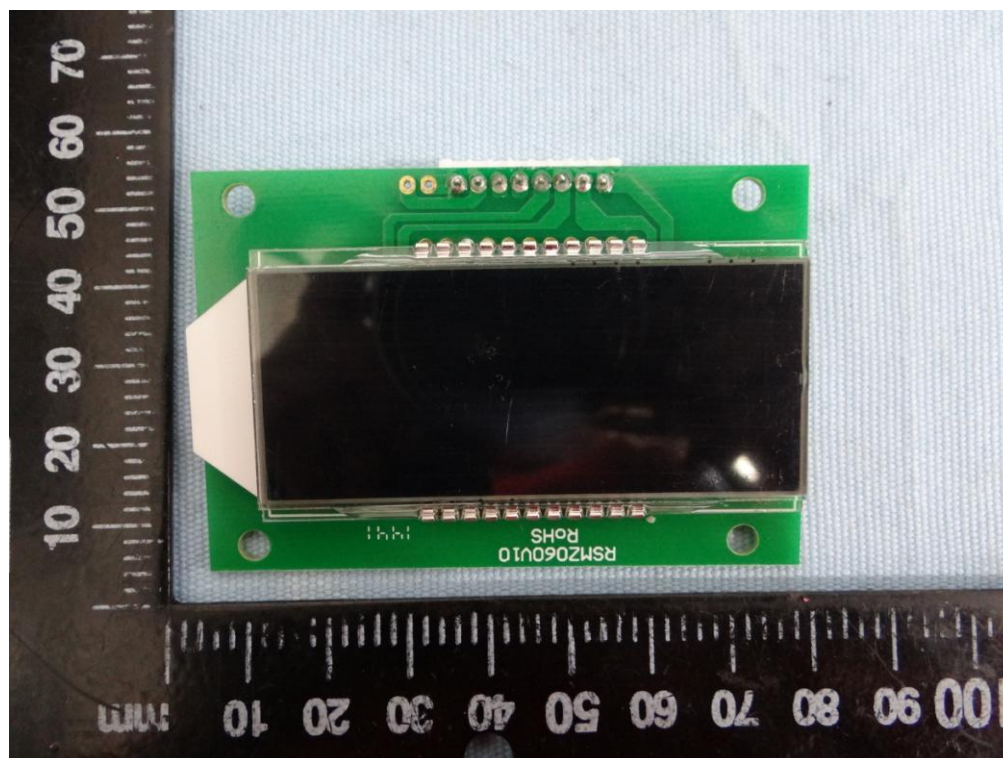


Photo 14

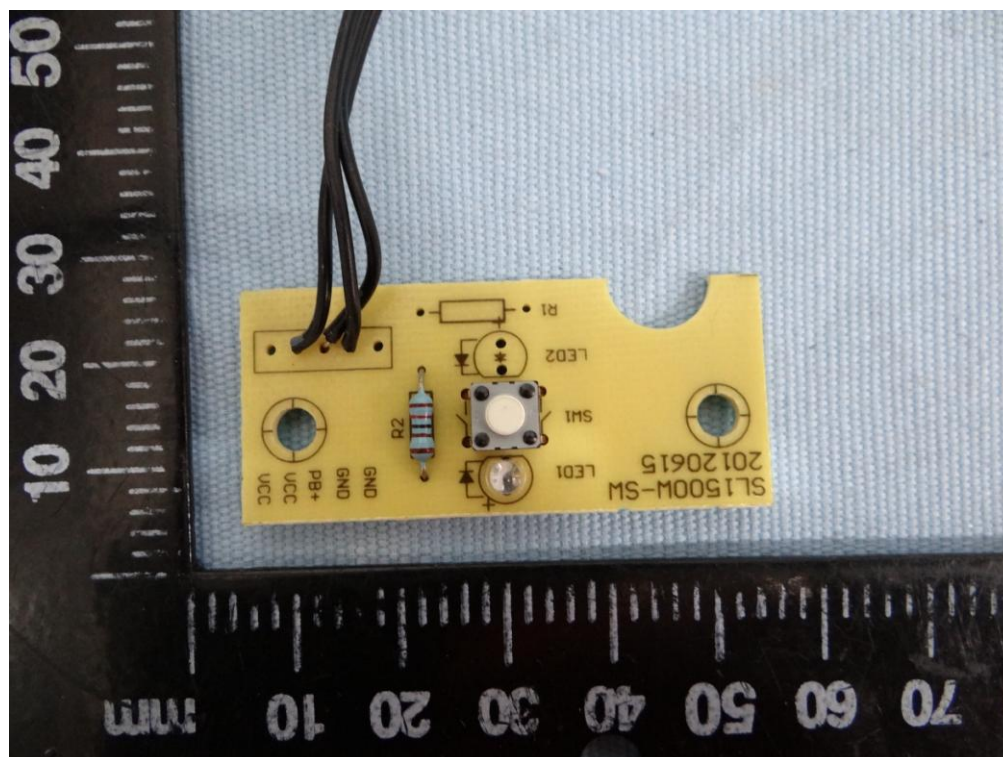
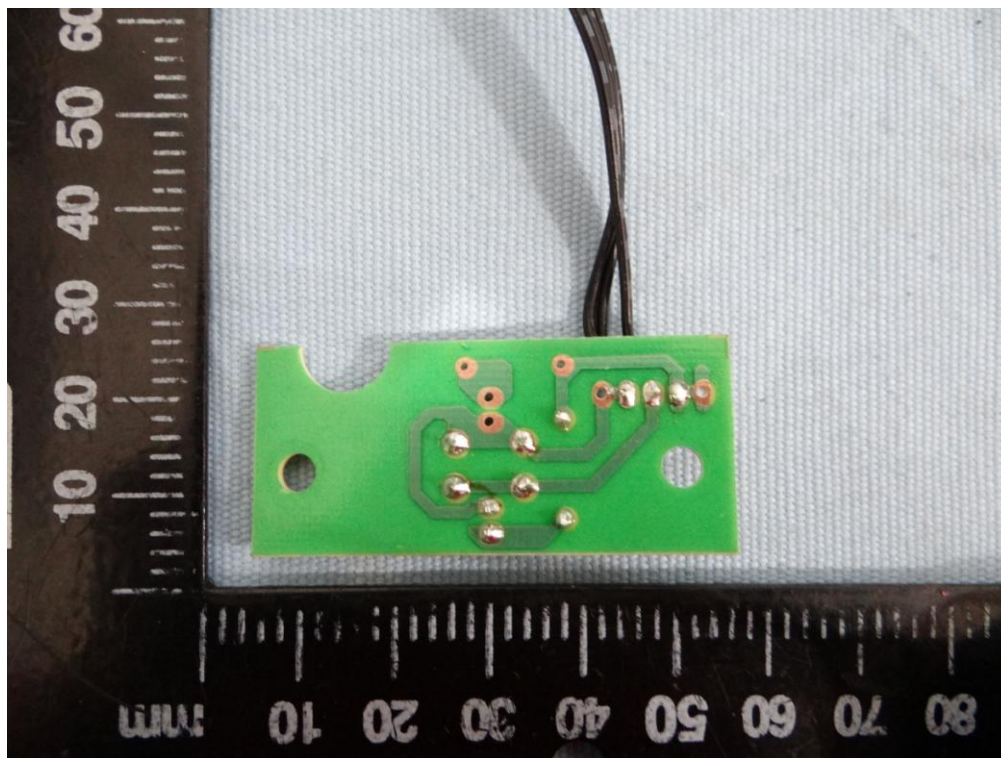




Photo 15



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