

**EN 60950-1:2006+A11:2009+A1:2010+A12:2011+A2:2013**  
**Test Report For**

**Magnizon Power Systems LTD**

71-75, Shelton Street, London, Greater London, WC2H 9JQ, UNITED  
KINGDOM Registered in UNITED KINGDOM, Number 11983678

Product Name:	MUOD Series Outdoor UPS
Model/Type No.:	MUOD1K, MUOD2K, MUOD3K, MUOD6K, MUOD10K
Prepared By:	Shenzhen Hongcai Testing Technology Co., Ltd. 1st-3rd Floor, Building C, Shuanghuan Xin Yi Dai Hi-Tech Industrial Park, No.8 Baoqing Road, Baolong Industrial Zone, Longgang District, Shenzhen, Guangdong, China Tel: +86-755-86337020 Fax: + 86-755-86337028
Report Number:	HCT18CR-0211S
Tested Date:	April 12-24, 2018
Issued Date:	April 24, 2018
Tested By:	Toby Zhang / <i>Toby Zhang</i>

Reviewed By:

*Lucky Zhang*

Lucky Zhang

Technical Supervisor

Approved By:



*Joseph Li*

Joseph Li

Technical Manager

Note: This test report is limited to the above client company and the product model only. It may not be duplicated without prior written consent of Shenzhen Hongcai Testing Technology Co., Ltd.

<b>TEST REPORT</b> <b>EN 60950-1</b> <b>Information technology equipment – Safety –</b> <b>Part 1: General requirements</b>	
Report Reference No.....	HCT18CR-0211S
Tested by (name + signature) .....	Toby Zhang <i>Toby Zhang</i>
Reviewed by (name + signature).....	Lucky Zhang <i>Lucky Zhang</i>
Date of issue .....	April 29, 2018
Testing Laboratory.....	<b>Shenzhen Hongcai Testing Technology Co.,Ltd.</b>
Address .....	1st-3rd Floor, Building C, Shuanghuan Xin Yi Dai Hi-Tech Industrial Park, No.8 Baoqing Road, Baolong Industrial Zone, Longgang District, Shenzhen City, P.R.China
Applicant's name .....	<b>Magnizon Power Systems LTD</b>
Address .....	71-75, Shelton Street, London, Greater London, WC2H 9JQ, UNITED KINGDOM Registered in UNITED KINGDOM, Number 11983678
<b>Test specification:</b>	
Standard.....	EN 60950-1:2006+A11:2009+A1:2010+A12:2011+A2:2013
Non-standard test method.....	N/A
Test Report Form No. ....	IEC60950_1F
Test Report Form(s) Originator .....	SGS Fimko Ltd
Master TRF .....	Dated 2014-02
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Test item description .....	<b>MUOD Series Outdoor UPS</b>
Trade Mark .....	Magnizon
Manufacturer .....	Magnizon Power Systems LTD JAFZA LB11, 1st floor, Office 32, Jebel Ali Free Zone, Dubai-U.A.E, PO Box no:263819
Model/Type reference .....	MUOD1K, MUOD2K, MUOD3K, MUOD6K, MUOD10K
Ratings .....	Input:220-240V~, 36.4A, 50/60Hz Output:220-240V~, 6KVA, 4.8W

<b>Test item particulars</b> .....:	
Equipment mobility .....	<input type="checkbox"/> movable <input type="checkbox"/> hand-held <input type="checkbox"/> transportable <input checked="" type="checkbox"/> stationary <input type="checkbox"/> for building-in <input type="checkbox"/> direct plug-in
Connection to the mains .....	<input checked="" type="checkbox"/> pluggable equipment <input checked="" type="checkbox"/> type A <input type="checkbox"/> type B <input type="checkbox"/> permanent connection <input type="checkbox"/> detachable power supply cord <input type="checkbox"/> non-detachable power supply cord <input type="checkbox"/> not directly connected to the mains
Operating condition.....:	<input checked="" type="checkbox"/> continuous <input type="checkbox"/> rated operating / resting time:
Access location .....	<input checked="" type="checkbox"/> operator accessible <input type="checkbox"/> restricted access location
Over voltage category (OVC) .....	<input type="checkbox"/> OVC I <input checked="" type="checkbox"/> OVC II <input type="checkbox"/> OVC III <input type="checkbox"/> OVC IV <input type="checkbox"/> other: not directly connected to the mains
Mains supply tolerance (%) or absolute mains supply values .....	±10% (requested by client)
Tested for IT power systems .....	<input type="checkbox"/> Yes(only for Norway) <input checked="" type="checkbox"/> No
IT testing, phase-phase voltage (V) .....	N/A
Class of equipment .....	<input checked="" type="checkbox"/> Class I <input type="checkbox"/> Class II <input type="checkbox"/> Class III <input type="checkbox"/> Not classified
Considered current rating of protective device as part of the building installation (A) .....	16
Pollution degree (PD) .....	<input type="checkbox"/> PD 1 <input checked="" type="checkbox"/> PD 2 <input type="checkbox"/> PD 3
IP protection class .....	--
Altitude during operation (m) .....	Up to 2000m
Altitude of test laboratory (m) .....	Below 2000m
Mass of equipment (kg) .....	Approx. Kg
<b>Possible test case verdicts:</b>	
- test case does not apply to the test object .....	: N (Not apply)
- test object does meet the requirement.....	: P (Pass)
- test object does not meet the requirement .....	: F (Fail)
<b>Testing</b> .....	
Date of receipt of test item.....	: March 24, 2018
Date(s) of performance of tests.....	: March 12-24, 2018
<b>General remarks:</b>	
The test results presented in this report relate only to the object tested. This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory. “(See Enclosure #)” refers to additional information appended to the report. “(See appended table)” refers to a table appended to the report.	
<b>Note: This TRF includes EN Group Differences together with National Differences and Special National Conditions, if any. All Differences are located in the Appendix to the main body of this TRF.</b>	
Throughout this report a comma (point) is used as the decimal separator.	

### General product information

1. The equipment is class I, UPS used in information technology equipment;
2. All models are identical to each other except for secondary windings of transformer, secondary components, output ratings and output terminal construction.
3. Due to the similarity between models, the following models were selected for electrical and Mechanical tests in order to represent the whole series.  
-- MUOD6K (max voltage, max current, max power).
4. Manufacturer declared the product operating temperature 35°C.


### Copy of marking plate:



### Note:

- Marking label was stucked on front external enclosure.
- The above marking are the minimum requirements required by the safety standard. For the final production sample, the marking which do not give rise to misunderstanding may be add.
- Other model markings are the same as MUOD6K, except the model number.
- The height dimension of CE mark should not less than 5mm, the height dimension of WEEE symbol should not less than 7mm.
- As declared by the applicant the authorized EEA representative or importer was not decided at the time of application, but will be marked on the products before placing them on the market.

EN 60950-1			
Clause	Requirement	Remark	Result
1	GENERAL		P
1.5	Components		P
1.5.1	General		P
	Comply with IEC60950-1 or relevant component standard	(see appended table 1.5.1)	P
1.5.2	Evaluation and testing of components	Components which are certified according to IEC and/or national standards are used correctly within their ratings. Components not covered by IEC standards are tested under the conditions present in the equipment.	P
1.5.3	Thermal controls		N
1.5.4	Transformers	Transformers used are suitable for their intended application and comply with the relevant requirements of the standard and particularly Annex C.	P
1.5.5	Interconnecting cables		N
1.5.6	Capacitors bridging insulation		N
1.5.7	Resistors bridging insulation		N
1.5.7.1	Resistors bridging functional, basic or supplementary insulation		N
1.5.7.2	Resistors bridging double or reinforced insulation between a.c. mains and other circuits		N
1.5.7.3	Resistors bridging double or reinforced insulation between a.c. mains and antenna or coaxial cable		N
1.5.8	Components in equipment for IT power systems		N
1.5.9	Surge suppressors	No surge suppressors used.	N
1.5.9.1	General	Refer below:	—
1.5.9.2	Protection of VDRs	No VDRs used.	N
1.5.9.3	Bridging of functional insulation by a VDR		N
1.5.9.4	Bridging of basic insulation by a VDR		N
1.5.9.5	Bridging of supplementary, double or reinforced insulation by a VDR		N
1.6	Power interface		P
1.6.1	AC power distribution systems	TN	P
1.6.2	Input current	(See appended table 1.6.2)	P

EN 60950-1			
Clause	Requirement	Remark	Result
1.6.3	Voltage limit of hand-held equipment	The equipment is not hand-held equipment	N
1.6.4	Neutral conductor		P
1.7	Marking and instructions		P
1.7.1	Power rating and identification markings	Refer below:	—
1.7.1.1	Power rating marking		P
	Multiple mains supply connections.....:		N
	Rated voltage(s) or voltage range(s) (V) .....	100-240V~	P
	Symbol for nature of supply, for d.c.only .....		N
	Rated frequency or rated frequency range (Hz).....:	50/60Hz	P
	Rated current (mA or A) .....	36.4A	P
1.7.1.2	Identification markings		P
	Manufacturer's name or trade-mark or identification mark .....	See Copy of marking plate	P
	Model identification or type reference .....	See Copy of marking plate	P
	Symbol for Class II equipment only .....		P
	Other markings and symbols .....		P
1.7.2	Safety instructions and marking		P
1.7.2.1	General		P
1.7.2.2	Disconnect devices	AC plug serves as disconnect devices	P
1.7.2.3	Overcurrent protective device		N
1.7.2.4	IT power distribution systems		N
1.7.2.5	Operator access with a tool		N
1.2.7.6	Ozone	No ozone occur.	N
1.7.3	Short duty cycles	Continuous operation	N
1.7.4	Supply voltage adjustment .....	No this device	N
	Methods and means of adjustment; reference to installation instructions .....		—
1.7.5	Power outlets on the equipment .....		N
1.7.6	Fuse identification (marking, special fusing characteristics, cross-reference) .....	Fuse (F1) marking provided	P
1.7.7	Wiring terminals		N
1.7.7.1	Protective earthing and bonding terminals .....	Class II equipment without earth connection.	N
1.7.7.2	Terminals for a.c. mains supply conductors	Direct plug-in equipment	N

EN 60950-1			
Clause	Requirement	Remark	Result
1.7.7.3	Terminals for d.c. mains supply conductors	No d.c. mains supply	N
1.7.8	Controls and indicators	No controls and indicators	N
1.7.8.1	Identification, location and marking .....	Marking for power switch located on switch body	N
1.7.8.2	Colours .....		N
1.7.8.3	Symbols according to IEC 60417 .....		N
1.7.8.4	Markings using figures .....		N
1.7.9	Isolation of multiple power sources .....		N
1.7.10	Thermostats and other regulating devices .....	No such regulating devices	N
1.7.11	Durability	The label was subjected to the permanence of marking test. The label was rubbed with cloth soaked with water for 15 sec. And then again for 15 sec. With the cloth soaked with petroleum spirit. After this test there was no damage to the label. The marking on the label did not fade.	P
1.7.12	Removable parts		N
1.7.13	Replaceable batteries .....	No battery provided.	N
	Language(s) .....		—
1.7.14	Equipment for restricted access locations.....		N

2	PROTECTION FROM HAZARDS		P
2.1	Protection from electric shock and energy hazards		P
2.1.1	Protection in operator access areas	No access with test finger and test pin to any parts with only basic insulation to ELV or hazardous voltage.	P
2.1.1.1	Access to energized parts		P
	Test by inspection .....		P
	Test with test finger (Figure 2A) .....		P
	Test with test pin (Figure 2B) .....		N
	Test with test probe (Figure 2C) .....	No TNV.	N
2.1.1.2	Battery compartments	No battery compartment.	N
2.1.1.3	Access to ELV wiring	No ELV wiring	N
	Working voltage (V <sub>peak</sub> or V <sub>rms</sub> ); minimum distance through insulation (mm)		—
2.1.1.4	Access to hazardous voltage circuit wiring	No hazardous voltage circuit wiring	N

EN 60950-1			
Clause	Requirement	Remark	Result
2.1.1.5	Energy hazards .....	The energy does not exceed 240VA between any two points in accessible connector of secondary circuit. (see appended table 2.1.1.5.)	P
2.1.1.6	Manual controls	No manual controls	N
2.1.1.7	Discharge of capacitors in equipment	No such capacitors	P
	Measured voltage (V); time-constant (s) .....		—
2.1.1.8	Energy hazards – d.c. mains supply	AC mains supply	P
	a) Capacitor connected to the d.c. mains supply :		P
	b) Internal battery connected to the d.c. mains supply .....		N
2.1.1.9	Audio amplifiers .....		N
2.1.2	Protection in service access areas		N
2.1.3	Protection in restricted access locations		N
2.2	SELV circuits		P
2.2.1	General requirements		P
2.2.2	Voltages under normal conditions (V) .....	All accessible voltage are less than 42.4Vp or 60Vdc and are classified as SELV.	P
2.2.3	Voltages under fault conditions (V) .....	Under fault conditions voltages never exceed 71V peak and 120Vdc and do not exceed 42.4V peak or 60 Vdc	P
2.2.4	Connection of SELV circuits to other circuits .....		P
2.3	TNV circuits		N
2.3.1	Limits	No TNV circuits	N
	Type of TNV circuits .....		—
2.3.2	Separation from other circuits and from accessible parts		N
2.3.2.1	General requirements		N
2.3.2.2	Protection by basic insulation		N
2.3.2.3	Protection by earthing		N
2.3.2.4	Protection by other constructions .....		N
2.3.3	Separation from hazardous voltages		N
	Insulation employed .....		—
2.3.4	Connection of TNV circuits to other circuits	No connection of TNV circuits to other circuits	N



EN 60950-1			
Clause	Requirement	Remark	Result
	Insulation employed .....		—
2.3.5	Test for operating voltages generated externally		N
2.4	Limited current circuits		P
2.4.1	General requirements		P
2.4.2	Limit values		P
	Frequency (Hz).....	(See appended table 2.4.1)	—
	Measured current (mA) .....	(See appended table 2.4.1)	—
	Measured voltage (V).....	(See appended table 2.4.1)	—
	Measured circuit capacitance (nF or $\mu$ F) .....		—
2.4.3	Connection of limited current circuits to other circuits		N
2.5	Limited power sources		N
	a) Inherently limited output		N
	b) Impedance limited output		N
	c) Regulating network limited output under normal operating and single fault condition	A regulating network limits the output in compliance with table 2B both under normal operating conditions and after any single fault.	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	N
2.6	Provisions for earthing and bonding		P
2.6.1	Protective earthing	Class I equipment	P
2.6.2	Functional earthing		N
2.6.3	Protective earthing and protective bonding conductors		N
2.6.3.1	General		N
2.6.3.2	Size of protective earthing conductors		N
	Rated current (A), cross-sectional area ( $\text{mm}^2$ ), AWG.....		—
2.6.3.3	Size of protective bonding conductors		N
	Rated current (A), cross-sectional area ( $\text{mm}^2$ ), AWG.....		—

EN 60950-1			
Clause	Requirement	Remark	Result
	Protective current rating (A), cross-sectional area (mm <sup>2</sup> ), AWG.....:		—
2.6.3.4	Resistance of earthing conductors and their terminations; resistance ( $\Omega$ ), voltage drop (V), test current (A), duration (min).....:	32A, 1Mins, 0.06 $\Omega$	P
2.6.3.5	Colour of insulation.....:		P
2.6.4	Terminals		P
2.6.4.1	General		P
2.6.4.2	Protective earthing and bonding terminals		P
	Rated current (A), type, nominal thread diameter (mm).....:		—
2.6.4.3	Separation of the protective earthing conductor from protective bonding conductors		N
2.6.5	Integrity of protective earthing		P
2.6.5.1	Interconnection of equipment		P
2.6.5.2	Components in protective earthing conductors and protective bonding conductors		N
2.6.5.3	Disconnection of protective earth		N
2.6.5.4	Parts that can be removed by an operator		N
2.6.5.5	Parts removed during servicing		N
2.6.5.6	Corrosion resistance		N
2.6.5.7	Screws for protective bonding		N
2.6.5.8	Reliance on telecommunication network or cable distribution system		N
2.7	Overcurrent and earth fault protection in primary circuits		P
2.7.1	Basic requirements	Fuse resistor used as an integral part of equipment	P
	Instructions when protection relies on building installation	Pluggable equipment type A.	N
2.7.2	Faults not simulated in 5.3.7		P
2.7.3	Short-circuit backup protection		P
2.7.4	Number and location of protective devices.....:	Only one Fuse resistor	P
2.7.5	Protection by several devices		N
2.7.6	Warning to service personnel.....:		N
2.8	Safety interlocks		N
2.8.1	General principles	No safety interlocks.	N
2.8.2	Protection requirements		N
2.8.3	Inadvertent reactivation		N

EN 60950-1			
Clause	Requirement	Remark	Result
2.8.4	Fail-safe operation		N
2.8.5	Moving parts		N
2.8.6	Overriding		N
2.8.7	Switches and relays		N
2.8.7.1	Contact gaps (mm) .....		N
2.8.7.2	Overload test		N
2.8.7.3	Endurance test		N
2.8.7.4	Electric strength test		N
2.8.8	Mechanical actuators		N

2.9	Electrical insulation		P
2.9.1	Properties of insulating materials	No natural rubber hygroscopic materials or asbestos are used	P
2.9.2	Humidity conditioning	Performed at 40°C, 93%, 120h	P
	Relative humidity (%), temperature (°C) .....	See above	—
2.9.3	Grade of insulation	The adequate levels of safety insulation provided and maintained to comply with the requirements of this standard.	P
2.9.4	Separation from hazardous voltages		P
	Method(s) used .....	Method 1 Primary circuit separated from secondary circuit by double insulation or reinforced insulation	—

2.10	Clearances, creepage distances and distances through insulation		P
2.10.1	General		P
2.10.1.1	Frequency .....	Less than 30KHz	P
2.10.1.2	Pollution degrees .....	2	P
2.10.1.3	Reduced values for functional insulation		P
2.10.1.4	Intervening unconnected conductive parts	No such parts	N
2.10.1.5	Insulation with varying dimensions	No scuh transformer used	N
2.10.1.6	Special separation requirements		N
2.10.1.7	Insulation in circuits generating starting pulses	No such circuits	N
2.10.2	Determination of working voltage		P

EN 60950-1			
Clause	Requirement	Remark	Result
2.10.2.1	General	The rms and the peak voltage were measured with unit connected to a 240V TN power system. Pollution Degree 2 and Overvoltage Category II considered.	P
2.10.2.2	RMS working voltage	(See appended table 2.10.2)	P
2.10.2.3	Peak working voltage	(See appended table 2.10.2)	P
2.10.3	Clearances	See below	P
2.10.3.1	General	Considered	P
2.10.3.2	Mains transient voltages		P
	a) AC mains supply .....	240V a.c. and Overvoltage Category II	P
	b) Earthed d.c. mains supplies .....		N
	c) Unearthed d.c. mains supplies .....		N
	d) Battery operation .....		N
2.10.3.3	Clearances in primary circuits	(See appended table 2.10.3 and 2.10.4)	P
2.10.3.4	Clearances in secondary circuits	Sub-clause 5.3.4 considered.	P
2.10.3.5	Clearances in circuits having starting pulses	No such circuits	N
2.10.3.6	Transients from a.c. mains supply .....	Normal transient voltage considered (overvoltage category II for primary circuit).	N
2.10.3.7	Transients from d.c. mains supply .....		N
2.10.3.8	Transients from telecommunication networks and cable distribution systems .....		N
2.10.3.9	Measurement of transient voltage levels		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	Creepage distances		P
2.10.4.1	General		P
2.10.4.2	Material group and comparative tracking index		P
	CTI tests .....	Group IIIb	—
2.10.4.3	Minimum creepage distances	(See appended table 2.10.3 and 2.10.4)	P
2.10.5	Solid insulation		P
2.10.5.1	General		P

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Clause	Requirement	Remark	Result
2.10.5.2	Distances through insulation	(See appended table 2.10.5)	P
2.10.5.3	Insulating compound as solid insulation		N
2.10.5.4	Semiconductor devices	Approved optocoupler used	P
2.10.5.5	Cemented joints	No such construction	N
2.10.5.6	Thin sheet material – General		P
2.10.5.7	Separable thin sheet material		P
	Number of layers (pcs).....:	3 layers	—
2.10.5.8	Non-separable thin sheet material		N
2.10.5.9	Thin sheet material – standard test procedure		N
	Electric strength test		—
2.10.5.10	Thin sheet material – alternative test procedure	(see appended table 5.2)	P
	Electric strength test		—
2.10.5.11	Insulation in wound components		P
2.10.5.12	Wire in wound components		P
	Working voltage .....		P
	a) Basic insulation not under stress .....		N
	b) Basic, supplementary, reinforced insulation .....		N
	c) Compliance with Annex U .....		P
	Two wires in contact inside wound component; angle between 45° and 90° .....	Physical separation in the form of insulating sheet material to relieve mechanical stress at the crossover point.	P
2.10.5.13	Wire with solvent-based enamel in wound components		N
	Electric strength test		—
	Routine test		—
2.10.5.14	Additional insulation in wound components		N
	Working voltage .....		—
	- Basic insulation not under stress .....		—
	- Supplementary, reinforced insulation .....		—
2.10.6	Construction of printed boards	See below	P
2.10.6.1	Uncoated printed boards	(see appended table 2.10.3 and 2.10.4)	P
2.10.6.2	Coated printed boards	No coated printed boards	N
2.10.6.3	Insulation between conductors on the same inner surface of a printed board		N
2.10.6.4	Insulation between conductors on different layers of a printed board		N

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Clause	Requirement	Remark	Result
	Distance through insulation		N
	Number of insulation layers (pcs).....:		N
2.10.7	Component external terminations		N
2.10.8	Tests on coated printed boards and coated components		N
2.10.8.1	Sample preparation and preliminary inspection		N
2.10.8.2	Thermal conditioning		N
2.10.8.3	Electric strength test		N
2.10.8.4	Abrasion resistance test		N
2.10.9	Thermal cycling		N
2.10.10	Test for Pollution Degree 1 environment and insulating compound		N
2.10.11	Tests for semiconductor devices and cemented joints		N
2.10.12	Enclosed and sealed parts		N
3	WIRING, CONNECTIONS AND SUPPLY		P
3.1	General		P
3.1.1	Current rating and overcurrent protection	Internal wires are UL recognized and having gauge suitable for current intended to be carried	P
3.1.2	Protection against mechanical damage	Wireways are smooth and free from edges.	P
3.1.3	Securing of internal wiring	Wires are secured by soldering method and additionally fixed by enough glue	P
3.1.4	Insulation of conductors		P
3.1.5	Beads and ceramic insulators		N
3.1.6	Screws for electrical contact pressure		N
3.1.7	Insulating materials in electrical connections		N
3.1.8	Self-tapping and spaced thread screws		N
3.1.9	Termination of conductors	All conductors are reliable secured.	P
	10 N pull test	Force of 10 N applied to the termination points of the conductors.	P
3.1.10	Sleeving on wiring		N
3.2	Connection to a mains supply		P

EN 60950-1			
Clause	Requirement	Remark	Result
3.2.1	Means of connection		P
3.2.1.1	Connection to an a.c. mains supply	A plug provided	P
3.2.1.2	Connection to a d.c. mains supply		N
3.2.2	Multiple supply connections		N
3.2.3	Permanently connected equipment		N
	Number of conductors, diameter of cable and conduits (mm) .....		—
3.2.4	Appliance inlets		N
3.2.5	Power supply cords		P
3.2.5.1	AC power supply cords		N
	Type .....		—
	Rated current (A), cross-sectional area (mm <sup>2</sup> ), AWG .....		—
3.2.5.2	DC power supply cords		N
3.2.6	Cord anchorages and strain relief		P
	Mass of equipment (kg), pull (N) .....	30	—
	Longitudinal displacement (mm) .....	No obvious displacement for cord.	—
3.2.7	Protection against mechanical damage		N
3.2.8	Cord guards		N
	Diameter or minor dimension D (mm); test mass (g) .....		—
	Radius of curvature of cord (mm) .....		—
3.2.9	Supply wiring space		N

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

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Clause	Requirement	Remark	Result
3.4	Disconnection from the mains supply		P
3.4.1	General requirement		P
3.4.2	Disconnect devices	AC plug used	P
3.4.3	Permanently connected equipment		N
3.4.4	Parts which remain energized	When AC plug is disconnected no hazardous voltage in the equipment.	P
3.4.5	Switches in flexible cords		N
3.4.6	Number of poles – single-phase and d.c. equipment	AC plug disconnects both poles simultaneously.	P
3.4.7	Number of poles – three-phase equipment	Single-phase	N
3.4.8	Switches as disconnect devices		N
3.4.9	Plugs as disconnect devices		P
3.4.10	Interconnected equipment		N
3.4.11	Multiple power sources		N
3.5	Interconnection of equipment		P
3.5.1	General requirements	This power supply is not considered for connection to TNV.	P
3.5.2	Types of interconnection circuits .....	Interconnection circuits of SELV through the connector. No ELV interconnection circuits.	P
3.5.3	ELV circuits as interconnection circuits		N
3.5.4	Data ports for additional equipment		N
4	PHYSICAL REQUIREMENTS		P
4.1	Stability		N
	Angle of 10°		N
	Test force (N) .....		N
4.2	Mechanical strength		P
4.2.1	General	See below. Tested with each source of plastic material used for enclosure. After tests, unit complies with the requirements of sub-clauses 2.1.1 and 2.10.	P
	Rack-mounted equipment.		N
4.2.2	Steady force test, 10 N		P



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Clause	Requirement	Remark	Result
4.2.3	Steady force test, 30 N		N
4.2.4	Steady force test, 250 N		P
4.2.5	Impact test		N
	Fall test		N
	Swing test		N
4.2.6	Drop test; height (mm) .....	Subjected to three drops from 1m height to hard wood surface. After the test, no damage to insulation, no energy hazards or damage to the enclosure integrity was observed.	N
4.2.7	Stress relief test	No indication of shrinkage or distortion on enclosures due to the stress relief test (92.1 degree C/7 h).	P
4.2.8	Cathode ray tubes	No CRT	N
	Picture tube separately certified .....		N
4.2.9	High pressure lamps	No such lamps	N
4.2.10	Wall or ceiling mounted equipment; force (N) .....		N
4.2.11	Rotating solid media		N
	Test to cover on the door.....		N

4.3	Design and construction		P
4.3.1	Edges and corners	Edges and corners are smooth	P
4.3.2	Handles and manual controls; force (N) .....		N
4.3.3	Adjustable controls		N
4.3.4	Securing of parts	Mechanical fixings in such a way designed that they will withstand mechanical stress occurring in normal use.	P
4.3.5	Connection by plugs and sockets	Mismatch of connectors either not possible or does not result in any hazard.	P
4.3.6	Direct plug-in equipment		N
	Torque .....	not exceed 0.25 Nm	—
	Compliance with the relevant mains plug standard .....		N
4.3.7	Heating elements in earthed equipment	No heating elements	N
4.3.8	Batteries		N
	- Overcharging of a rechargeable battery		N

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Clause	Requirement	Remark	Result
	- Unintentional charging of a non-rechargeable battery		N
	- Reverse charging of a rechargeable battery		N
	- Excessive discharging rate for any battery		N
4.3.9	Oil and grease		N
4.3.10	Dust, powders, liquids and gases		N
4.3.11	Containers for liquids or gases		N
4.3.12	Flammable liquids .....		N
	Quantity of liquid (l) .....		N
	Flash point (°C) .....		N
4.3.13	Radiation		P
4.3.13.1	General		P
4.3.13.2	Ionizing radiation		N
	Measured radiation(pA/kg) .....		—
	Measured high-voltage (kV) .....		—
	Measured focus voltage (kV).....		—
	CRT markings.....		—
4.3.13.3	Effect of ultraviolet (UV) radiation on materials		N
	Part, property, retention after test, flammability classification .....		N
4.3.13.4	Human exposure to ultraviolet (UV) radiation .....		N
4.3.13.5	Lasers (including laser diodes) and LEDs		N
4.3.13.5.1	Lasers (including laser diodes)		N
	Laser class .....		—
4.3.13.5.2	Light emitting diodes (LEDs)		N
4.3.13.6	Other types .....		N

4.4	Protection against hazardous moving parts		N
4.4.1	General		N
4.4.2	Protection in operator access areas .....		N
	Household and home/office document/media shredders		N
4.4.3	Protection in restricted access locations .....		N
4.4.4	Protection in service access areas		N
4.4.5	Protection against moving fan blades		N
4.4.5.1	General		N
	Not considered to cause pain or injury. A).....		N

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Clause	Requirement	Remark	Result
	Is considered to cause pain, not injury. B) .....		N
	Considered to cause injury. C) .....		N
4.4.5.2	Protection for users		N
	Use of symbol or warning .....		N
4.4.5.3	Protection for service persons		N
	Use of symbol or warning .....		N
4.5	Thermal requirements		P
4.5.1	General		P
4.5.2	Temperature tests	(see appended table 4.5)	P
	Normal load condition per Annex L .....	(see appended table 4.5)	—
4.5.3	Temperature limits for materials	(see appended table 4.5)	P
4.5.4	Touch temperature limits	(see appended table 4.5)	P
4.5.5	Resistance to abnormal heat .....		P
4.6	Openings in enclosures		N
4.6.1	Top and side openings		N
	Dimensions (mm) .....		—
4.6.2	Bottoms of fire enclosures		N
	Construction of the bottom, dimensions (mm) ...		—
4.6.3	Doors or covers in fire enclosures	No such parts	N
4.6.4	Openings in transportable equipment		N
4.6.4.1	Constructional design measures		N
	Dimensions (mm) .....		—
4.6.4.2	Evaluation measures for larger openings		N
4.6.4.3	Use of metallized parts		N
4.6.5	Adhesives for constructional purposes		N
	Conditioning temperature (°C), time (weeks) .....		—
4.7	Resistance to fire		P
4.7.1	Reducing the risk of ignition and spread of flame	No excessive temperatures. No easily burning materials employed. Fire enclosure provided.	P
	Method 1, selection and application of components wiring and materials	(see appended table 4.7)	P
	Method 2, application of all of simulated fault condition tests		N

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Clause	Requirement	Remark	Result
4.7.2	Conditions for a fire enclosure	Refer below:	N
4.7.2.1	Parts requiring a fire enclosure	Class V-0	N
4.7.2.2	Parts not requiring a fire enclosure		N
4.7.3	Materials		P
4.7.3.1	General	See table 1.5.1	P
4.7.3.2	Materials for fire enclosures		P
4.7.3.3	Materials for components and other parts outside fire enclosures		N
4.7.3.4	Materials for components and other parts inside fire enclosures		P
4.7.3.5	Materials for air filter assemblies	No air filters in the equipment.	N
4.7.3.6	Materials used in high-voltage components	No high voltage component.	N
5	ELECTRICAL REQUIREMENTS AND SIMULATED ABNORMAL CONDITIONS		P
5.1	Touch current and protective conductor current		P
5.1.1	General		P
5.1.2	Configuration of equipment under test (EUT)	EUT has only one mains connection	P
5.1.2.1	Single connection to an a.c. mains supply		P
5.1.2.2	Redundant multiple connections to an a.c. mains supply		N
5.1.2.3	Simultaneous multiple connections to an a.c. mains supply		N
5.1.3	Test circuit		P
5.1.4	Application of measuring instrument	See Annex D	P
5.1.5	Test procedure	The touch current was measured from mains to DC output connector, to inlet earth pin and to a 100 mm × 200 mm metal foil wrapped on accessible non-conductive parts (plastic enclosure)	P
5.1.6	Test measurements		P
	Supply voltage (V) .....	264V~	—
	Measured touch current (mA) .....	Enclosure with metal foil: 0.01mA; Output cord connector: 0.16mA	—
	Max. allowed touch current (mA) .....	0.25mA	—
	Measured protective conductor current (mA) .....		—
	Max. allowed protective conductor current (mA) .....		—

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Clause	Requirement	Remark	Result
5.1.7	Equipment with touch current exceeding 3,5mA		N
5.1.7.1	General .....		N
5.1.7.2	Simultaneous multiple connections to the supply		N
5.1.8	Touch currents to telecommunication networks and cable distribution systems and from telecommunication networks		N
5.1.8.1	Limitation of the touch current to a telecommunication network or to a cable distribution system		N
	Supply voltage (V) .....		—
	Measured touch current (mA) .....		—
	Max. allowed touch current (mA) .....		—
5.1.8.2	Summation of touch currents from telecommunication networks		N
	a) EUT with earthed telecommunication ports .....		N
	b) EUT whose telecommunication ports have no reference to protective earth		N
5.2	Electric strength		P
5.2.1	General		P
5.2.2	Test procedure	(See appended table 5.2)	P
5.3	Abnormal operating and fault conditions		P
5.3.1	Protection against overload and abnormal operation	(See appended table 5.3)	P
5.3.2	Motors		N
5.3.3	Transformers	(see appended Annex C and table 5.3)	P
5.3.4	Functional insulation .....	(See appended table 5.3.)	P
5.3.5	Electromechanical components	No electromechanical component.	N
5.3.6	Audio amplifiers in ITE .....	No audio amplifiers.	N
5.3.7	Simulation of faults	(See appended table 5.3.)	P
5.3.8	Unattended equipment		N
5.3.9	Compliance criteria for abnormal operating and fault conditions	No fire propagated beyond the equipment. No molten metal was emitted.	P
5.3.9.1	During the tests	No hazard	P
5.3.9.2	After the tests	No hazard	P
6	CONNECTION TO TELECOMMUNICATION NETWORKS		N

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Clause	Requirement	Remark	Result
6.1	Protection of telecommunication network service persons, and users of other equipment connected to the network, from hazards in the equipment		N
6.1.1	Protection from hazardous voltages		N
6.1.2	Separation of the telecommunication network from earth		N
6.1.2.1	Requirements		N
	Supply voltage (V) .....		—
	Current in the test circuit (mA) .....		—
6.1.2.2	Exclusions .....		N
6.2	Protection of equipment users from overvoltages on telecommunication networks		N
6.2.1	Separation requirements		N
6.2.2	Electric strength test procedure		N
6.2.2.1	Impulse test		N
6.2.2.2	Steady-state test		N
6.2.2.3	Compliance criteria		N
6.3	Protection of the telecommunication wiring system from overheating		N
	Max. output current (A) .....		—
	Current limiting method .....		—
7	CONNECTION TO CABLE DISTRIBUTION SYSTEMS		N
7.1	General		N
7.2	Protection of cable distribution system service persons, and users of other equipment connected to the system, from hazardous voltages in the equipment		N
7.3	Protection of equipment users from overvoltages on the cable distribution system		N
7.4	Insulation between primary circuits and cable distribution systems		N
7.4.1	General		N
7.4.2	Voltage surge test		N
7.4.3	Impulse test		N
A	ANNEX A, TESTS FOR RESISTANCE TO HEAT AND FIRE		
A.1	Flammability test for fire enclosures of movable equipment having a total mass exceeding 18 kg, and of stationary equipment (see 4.7.3.2)		N
A.1.1	Samples .....		—

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Clause	Requirement	Remark	Result
	Wall thickness (mm).....:		—
A.1.2	Conditioning of samples; temperature (°C) .....		N
A.1.3	Mounting of samples .....		N
A.1.4	Test flame (see IEC 60695-11-3)		N
	Flame A, B, C or D .....		—
A.1.5	Test procedure		N
A.1.6	Compliance criteria		N
	Sample 1 burning time (s).....:		—
	Sample 2 burning time (s).....:		—
	Sample 3 burning time (s).....:		—
A.2	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 and 4.7.3.4)		N
A.2.1	Samples, material .....	No tests required.	—
	Wall thickness (mm).....:		—
A.2.2	Conditioning of samples; temperature (°C) .....		N
A.2.3	Mounting of samples .....		N
A.2.4	Test flame (see IEC 60695-11-4)		N
	Flame A, B or C .....		—
A.2.5	Test procedure		N
A.2.6	Compliance criteria		N
	Sample 1 burning time (s).....:		—
	Sample 2 burning time (s).....:		—
	Sample 3 burning time (s).....:		—
A.2.7	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	Hot flaming oil test (see 4.6.2)		N
A.3.1	Mounting of samples		N
A.3.2	Test procedure		N
A.3.3	Compliance criterion		N
B	ANNEX B, MOTOR TESTS UNDER ABNORMAL CONDITIONS (see 4.7.2.2 and 5.3.2)		
B.1	General requirements		N
	Position .....		—

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

C	ANNEX C, TRANSFORMERS (see 1.5.4 and 5.3.3)		P
	Position .....	T1	—
	Manufacturer .....	(See appended 1.5.1)	—
	Type .....	(See appended 1.5.1)	—
	Rated values .....	(See appended 1.5.1)	—
	Method of protection .....	Inherent	—
C.1	Overload test		P
C.2	Insulation		P
	Protection from displacement of windings.....		P
D	ANNEX D, MEASURING INSTRUMENTS FOR TOUCH-CURRENT TESTS (see5.1.4)		



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Clause	Requirement	Remark	Result
D.1	Measuring instrument		P
D.2	Alternative measuring instrument		N
E	ANNEX E, TEMPERATURE RISE OF A WINDING (see 1.4.13)		N
F	ANNEX F, MEASUREMENT OF CLEARANCES AND CREEPAGE DISTANCES (see 2.10 and Annex G)		P
G	ANNEX G, ALTERNATIVE METHOD FOR DETERMINING MINIMUM CLEARANCES		N
G.1	Clearances		N
G.1.1	General		N
G.1.2	Summary of the procedure for determining minimum clearances		N
G.2	Determination of mains transient voltage (V)		N
G.2.1	AC mains supply .....		N
G.2.2	Earthed d.c. mains supplies .....		N
G.2.3	Unearthed d.c. mains supplies .....		N
G.2.4	Battery operation .....		N
G.3	Determination of telecommunication network transient voltage (V) .....		N
G.4	Determination of required withstand voltage (V)		N
G.4.1	Mains transients and internal repetitive peaks .....		N
G.4.2	Transients from telecommunication networks .....		N
G.4.3	Combination of transients		N
G.4.4	Transients from cable distribution systems		N
G.5	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	Determination of minimum clearances .....		N
H	ANNEX H, IONIZING RADIATION (see 4.3.13)		N
J	ANNEX J, TABLE OF ELECTROCHEMICAL POTENTIALS (see 2.6.5.6)		N
	Metal(s) used.....		—

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Clause	Requirement	Remark	Result
K	ANNEXK, THERMAL CONTROLS (see 1.5.3 and 5.3.8)		N
K.1	Making and breaking capacity		N
K.2	Thermostat reliability; operating voltage (V) .....		N
K.3	Thermostat endurance test; operating voltage (V) :		N
K.4	Temperature limiter endurance; operating voltage (V) .....		N
K.5	Thermal cut-out reliability		N
K.6	Stability of operation		N
L	ANNEX L, NORMAL LOAD CONDITIONS FOR SOME TYPES OF ELECTRICAL BUSINESS EQUIPMENT (see 1.2.2.1 and 4.5.2)		N
L.1	Typewriters		N
L.2	Adding machines and cash registers		N
L.3	Erasers		N
L.4	Pencil sharpeners		N
L.5	Duplicators and copy machines		N
L.6	Motor-operated files		N
L.7	Other business equipment		N
M	ANNEXM, CRITERIA FOR TELEPHONE RINGING SIGNALS (see 2.3.1)		N
M.1	Introduction		N
M.2	Method A		N
M.3	Method B		N
M.3.1	Ringing signal		N
M.3.1.1	Frequency (Hz) .....		—
M.3.1.2	Voltage (V) .....		—
M.3.1.3	Cadence; time (s), voltage (V) .....		—
M.3.1.4	Single fault current (mA) .....		—
M.3.2	Tripping device and monitoring voltage .....		N
M.3.2.1	Conditions for use of a tripping device or a monitoring voltage		N
M.3.2.2	Tripping device		N
M.3.2.3	Monitoring voltage (V) .....		N
N	ANNEX N, IMPULSE TEST GENERATORS (see 1.5.7.2, 1.5.7.3, 2.10.3.9, 6.2.2.1, 7.3.2, 7.4.3 and ClauseG.5)		N
N.1	ITU-T impulse test generators		N

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Clause	Requirement	Remark	Result
N.2	IEC 60065 impulse test generator		N
P	ANNEX P, NORMATIVE REFERENCES		—
Q	ANNEX Q, Voltage dependent resistors (VDRs) (see 1.5.9.1)		N
	a) Preferred climatic categories .....		N
	b) Maximum continuous voltage .....		N
	c) Pulse current .....		N
R	ANNEX R, EXAMPLES OF REQUIREMENTS FOR QUALITY CONTROL PROGRAMMES		N
R.1	Minimum separation distances for unpopulated coated printed boards (see 2.10.6.2)		N
R.2	Reduced clearances (see 2.10.3)		N
S	ANNEX S, PROCEDURE FOR IMPULSE TESTING (see 6.2.2.3)		N
S.1	Test equipment		N
S.2	Test procedure		N
S.3	Examples of waveforms during impulse testing		N
T	ANNEX T, GUIDANCE ON PROTECTION AGAINST INGRESS OF WATER (see 1.1.2)		N
			—
U	ANNEX U, INSULATED WINDING WIRES FOR USE WITHOUT INTERLEAVED INSULATION (see 2.10.5.4)		N
			—
V	ANNEX V, AC POWER DISTRIBUTION SYSTEMS (see 1.6.1)		P
V.1	Introduction		P
V.2	TN power distribution systems		P
W	ANNEX W, SUMMATION OF TOUCH CURRENTS		N
W.1	Touch current from electronic circuits		N
W.1.1	Floating circuits		N
W.1.2	Earthed circuits		N
W.2	Interconnection of several equipments		N
W.2.1	Isolation		N

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Clause	Requirement	Remark	Result
W.2.2	Common return, isolated from earth		N
W.2.3	Common return, connected to protective earth		N
X	ANNEX X, MAXIMUM HEATING EFFECT IN TRANSFORMER TESTS (see clause C.1)		N
X.1	Determination of maximum input current		N
X.2	Overload test procedure		N
Y	ANNEX Y, ULTRAVIOLET LIGHT CONDITIONING TEST (see 4.3.13.3)		N
Y.1	Test apparatus .....		N
Y.2	Mounting of test samples .....		N
Y.3	Carbon-arc light-exposure apparatus .....		N
Y.4	Xenon-arc light exposure apparatus .....		N
Z	ANNEX Z, OVERVOLTAGE CATEGORIES (see 2.10.3.2 and Clause G.2)		P
AA	ANNEX AA, MANDREL TEST (see 2.10.5.8)		N
BB	ANNEX BB, CHANGES IN THE SECOND EDITION		—
CC	Annex CC, Evaluation of integrated circuit (IC) current limiters		N
CC.1	General		N
CC.2	Test program 1.....		N
CC.3	Test program 2.....		N
DD	ANNEX DD, Requirements for the mounting means of rack-mounted equipment		N
DD.1	General		N
DD.2	Mechanical strength test, variable N.....		N
DD.3	Mechanical strength test, 250N, including end stops.....		N
DD.4	Compliance.....		N
EE	ANNEX EE, Household and home/office document/media shredders		N
EE.1	General		N
EE.2	Markings and instructions		N
	Use of markings or symbols.....		N
	Information of user instructions, maintenance and/or servicing instructions.....		N
EE.3	Inadvertent reactivation test.....		N

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Clause	Requirement	Remark	Result
EE.4	Disconnection of power to hazardous moving parts:		N
	Use of markings or symbols.....:		N
EE.5	Protection against hazardous moving parts		N
	Test with test finger (Figure 2A) .....:		N
	Test with wedge probe (Figure EE1 and EE2) .....:		N



NATIONAL DIFFERENCES			
Clause	Requirement	Remark	Result

<b>ATTACHMENT TO TEST REPORT IEC 60950-1</b> <b>EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES</b> Information technology equipment – Safety –	
PART 1: GENERAL REQUIREMENTS	
Differences according to .....	EN 60950-1:2006/A11:2009/A1:2010/A12:2011/A2:2013
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Attachment Originator .....	SGS Fimko Ltd
Master Attachment .....	Date 2013-09
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<b>EN 60950-1:2006/A11:2009/A1:2010/A12:2011/A2:2013 – CENELEC COMMON MODIFICATIONS</b>
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IEC 60950-1, GROUP DIFFERENCES (CENELEC common modifications EN)		
	Clauses, subclauses, notes, tables and figures which are additional to those in IEC60950-1 and it's amendmets are prefixed "Z"	--
Contents  (A2:2013)	Add the following annexes: Annex ZA (normative) Normative references to international publications with their corresponding European publications Annex ZB (normative) Special national conditions Annex ZD (informative) IEC and CENELEC code designations for flexible cords	--
General	Delete all the "country" notes in the reference document (IEC 60950-1:2005) according to the following list: 1.4.8 Note 2    1.5.1    Note 2 & 3    1.5.7.1    Note 1.5.8 Note 2    1.5.9.4    Note    1.7.2.1    Note 4, 5 & 6 2.2.3 Note    2.2.4    Note    2.3.2    Note 2.3.2.1 Note 2    2.3.4    Note 2    2.6.3.3    Note 2 & 3 2.7.1 Note    2.10.3.2    Note 2    2.10.5.13    Note 3 3.2.1.1 Note    3.2.4    Note 3.    2.5.1    Note 2 4.3.6 Note 1 & 2    4.7    Note 4    4.7.2.2    Note 4.7.3.1 Note 2    5.1.7.1    Note 3 & 4    5.3.7    Note 1 6    Note 2 & 5    6.1.2.1    Note 2    6.1.2.2    Note 6.2.2 Note    6.2.2.1    Note 2    6.2.2.2    Note 7.1 Note 3    7.2    Note    7.3    Note 1 & 2 G.2.1 Note 2    Annex H    Note 2	--
General (A1:2010)	Delete all the "country" notes in the reference document (IEC 60950-1:2005/A1:2010) according to the following list: 1.5.7.1    Note    6.1.2.1    Note 2 6.2.2.1    Note 2    EE.3    Note	--

NATIONAL DIFFERENCES			
Clause	Requirement	Remark	Result
<b>IEC 60950-1, GROUP DIFFERENCES (CENELEC common modifications EN)</b>			
General (A2:2013)	Delete all the "country" notes in the reference document (IEC 60950-1:2005/A2:2013) according to the following list: 2.7.1 Note *                      2.10.3.1 Note 2 6.2.2. Note * Note of secretary: Text of Common Modification remains unchanged.		--
1.1.1 (A1:2010)	<b>Replace</b> the text of NOTE 3 by the following. NOTE 3 The requirements of EN 60065 may also be used to meet safety requirements for multimedia equipment. See IEC Guide 112, Guide on the safety of multimedia equipment. For television sets EN 60065 applies.		--
1.3.Z1	Add the following subclause: 1.3.Z1 Exposure to excessive sound pressure The apparatus shall be so designed and constructed as to present no danger when used for its intended purpose, either in normal operating conditions or under fault conditions, particularly providing protection against exposure to excessive sound pressures from headphones or earphones. NOTE Z1 A new method of measurement is described in EN 50332-1, Sound system equipment: Headphones and earphones associated with portable audio equipment - Maximum sound pressure level measurement methodology and limit considerations - Part 1: General method for "one package equipment", and in EN 50332-2, Sound system equipment: Headphones and earphones associated with portable audio equipment - Maximum sound pressure level measurement methodology and limit considerations - Part 2: Guidelines to associate sets with headphones coming from different manufacturers.		P
(A12:2011)	In EN 60950-1:2006/A12:2011 Delete the addition of 1.3.Z1 / EN 60950-1:2006 Delete the definition 1.2.3.Z1 / EN 60950-1:2006 /A1:2010		P
1.5.1  (Added info*)	Add the following NOTE: NOTE Z1 The use of certain substances in electrical and electronic equipment is restricted within the EU: see Directive 2002/95/EC. New Directive 2011/65/11 *		P
1.7.2.1 (A1:2010)	In addition, for a PORTABLE SOUND SYSTEM, the instructions shall include a warning that excessive sound pressure from earphones and headphones can cause hearing loss.		P
1.7.2.1 (A12:2011)	In EN 60950-1:2006/A12:2011 Delete NOTE Z1 and the addition for Portable Sound System. Add the following clause and annex to the existing standard and amendments.		P
	<b>Zx Protection against excessive sound pressure from personal music players</b>		N


NATIONAL DIFFERENCES			
Clause	Requirement	Remark	Result
	<p><b>Zx.1 General</b></p> <p>This sub-clause specifies requirements for protection against excessive sound pressure from personal music players that are closely coupled to the ear. It also specifies requirements for earphones and headphones intended for use with personal music players.</p> <p>A personal music player is a portable equipment for personal use, that:</p> <ul style="list-style-type: none"> <li>is designed to allow the user to listen to recorded or broadcast sound or video; and</li> <li>primarily uses headphones or earphones that can be worn in or on or around the ears; and</li> <li>allows the user to walk around while in use.</li> </ul> <p>NOTE 1 Examples are hand-held or body-worn portable CD players, MP3 audio players, mobile phones with MP3 type features, PDA's or similar equipment.</p> <p>A personal music player and earphones or headphones intended to be used with personal music players shall comply with the requirements of this sub-clause.</p> <p>The requirements in this sub-clause are valid for music or video mode only.</p> <p>The requirements do not apply:</p> <ul style="list-style-type: none"> <li>while the personal music player is connected to an external amplifier; or</li> <li>while the headphones or earphones are not used.</li> </ul> <p>NOTE 2 An external amplifier is an amplifier which is not part of the personal music player or the listening device, but which is intended to play the music as a standalone music player.</p> <p>The requirements do not apply to:</p> <ul style="list-style-type: none"> <li>hearing aid equipment and professional equipment;</li> </ul> <p>NOTE 3 Professional equipment is equipment sold through special sales channels. All products sold through normal electronics stores are considered not to be professional equipment.</p>		N
	<p>analogue personal music players (personal music players without any kind of digital processing of the sound signal) that are brought to the market before the end of 2015.</p> <p>NOTE 4 This exemption has been allowed because this technology is falling out of use and it is expected that within a few years it will no longer exist. This exemption will not be extended to other technologies.</p> <p>For equipment which is clearly designed or intended for use by young children, the limits of EN 71-1 apply.</p>		N



NATIONAL DIFFERENCES			
Clause	Requirement	Remark	Result
	<p><b>Zx.2 Equipment requirements</b>            No safety provision is required for equipment that complies with the following:                equipment provided as a package (personal music player with its listening device), where the acoustic output <math>L_{Aeq,T}</math> is <math>\leq 85</math> dBA measured while playing the fixed “programme simulation noise” as described in EN 50332-1; and                a personal music player provided with an analogue electrical output socket for a listening device, where the electrical output is <math>\leq 27</math> mV measured as described in EN 50332-2, while playing the fixed “programme simulation noise” as described in EN 50332-1.</p> <p>NOTE 1 Wherever the term acoustic output is used in this clause, the 30 s A-weighted equivalent sound pressure level <math>L_{Aeq,T}</math> is meant. See also Zx.5 and Annex Zx.</p> <p>All other equipment shall:            a) protect the user from unintentional acoustic outputs exceeding those mentioned above; and            b) have a standard acoustic output level not exceeding those mentioned above, and automatically return to an output level not exceeding those mentioned above when the power is switched off; and</p>		N

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NATIONAL DIFFERENCES			
Clause	Requirement	Remark	Result
	<p>c) provide a means to actively inform the user of the increased sound pressure when the equipment is operated with an acoustic output exceeding those mentioned above. Any means used shall be acknowledged by the user before activating a mode of operation which allows for an acoustic output exceeding those mentioned above. The acknowledgement does not need to be repeated more than once every 20 h of cumulative listening time; and</p> <p>NOTE 2 Examples of means include visual or audible signals. Action from the user is always required.</p> <p>NOTE 3 The 20 h listening time is the accumulative listening time, independent how often and how long the personal music player has been switched off.</p> <p>d) have a warning as specified in Zx.3; and</p> <p>e) not exceed the following:</p> <ol style="list-style-type: none"> <li>1) equipment provided as a package (player with its listening device), the acoustic output shall be <math>\leq 100</math> dBA measured while playing the fixed "programme simulation noise" described in EN 50332-1; and</li> <li>2) a personal music player provided with an analogue electrical output socket for a listening device, the electrical output shall be <math>\leq 150</math> mV measured as described in EN 50332-2, while playing the fixed "programme simulation noise" described in EN 50332-1.</li> </ol> <p>For music where the average sound pressure (long term <math>L_{Aeq,T}</math>) measured over the duration of the song is lower than the average produced by the programme simulation noise, the warning does not need to be given as long as the average sound pressure of the song is below the basic limit of 85 dBA. In this case T becomes the duration of the song.</p> <p>NOTE 4 Classical music typically has an average sound pressure (long term <math>L_{Aeq,T}</math>) which is much lower than the average programme simulation noise. Therefore, if the player is capable to analyse the song and compare it with the programme simulation noise, the warning does not need to be given as long as the average sound pressure of the song is below the basic limit of 85 dBA.</p> <p>For example, if the player is set with the programme simulation noise to 85 dBA, but the average music level of the song is only 65 dBA, there is no need to give a warning or ask an acknowledgement as long as the average sound level of the song is not above the basic limit of 85 dBA.</p>		N

NATIONAL DIFFERENCES			
Clause	Requirement	Remark	Result
	<p><b>Zx.3 Warning</b>            The warning shall be placed on the equipment, or on the packaging, or in the instruction manual and shall consist of the following:                the symbol of Figure 1 with a minimum height of 5 mm; and                the following wording, or similar:            “To prevent possible hearing damage, do not listen at high volume levels for long periods.”</p>  <p style="text-align: center;"><b>Figure 1 – Warning label (IEC 60417-6044)</b></p> <p>Alternatively, the entire warning may be given through the equipment display during use, when the user is asked to acknowledge activation of the higher level.</p>		N
	<p><b>Zx.4 Requirements for listening devices (headphones and earphones)</b></p>		N
	<p><b>Zx.4.1 Wired listening devices with analogue input</b>            With 94 dBA sound pressure output <math>L_{Aeq,T}</math>, the input voltage of the fixed “programme simulation noise” described in EN 50332-2 shall be <math>\geq 75</math> mV.             This requirement is applicable in any mode where the headphones can operate (active or passive), including any available setting (for example built-in volume level control).             NOTE The values of 94 dBA – 75 mV correspond with 85dBA – 27 mV and 100 dBA – 150 mV.</p>		N
	<p><b>Zx.4.2 Wired listening devices with digital input</b>            With any playing device playing the fixed “programme simulation noise” described in EN 50332-1 (and respecting the digital interface standards, where a digital interface standard exists that specifies the equivalent acoustic level), the acoustic output <math>L_{Aeq,T}</math> of the listening device shall be <math>\leq 100</math> dBA.             This requirement is applicable in any mode where the headphones can operate, including any available setting (for example built-in volume level control, additional sound feature like equalization, etc.).             NOTE An example of a wired listening device with digital input is a USB headphone.</p>		N

NATIONAL DIFFERENCES			
Clause	Requirement	Remark	Result
	<p><b>Zx.4.3 Wireless listening devices</b>            In wireless mode:            with any playing and transmitting device playing the fixed programme simulation noise described in EN 50332-1; and            respecting the wireless transmission standards, where an air interface standard exists that specifies the equivalent acoustic level; and            with volume and sound settings in the listening device (for example built-in volume level control, additional sound feature like equalization, etc.) set to the combination of positions that maximize the measured acoustic output for the abovementioned programme simulation noise, the acoustic output <math>L_{Aeq,T}</math> of the listening device shall be <math>\leq 100</math> dBA.</p> <p>NOTE An example of a wireless listening device is a Bluetooth headphone.</p>		N
	<p><b>Zx.5 Measurement methods</b>            Measurements shall be made in accordance with EN 50332-1 or EN 50332-2 as applicable. Unless stated otherwise, the time interval T shall be 30 s.</p> <p>NOTE Test method for wireless equipment provided without listening device should be defined.</p>		N
2.7.1	<p>Replace the subclause as follows:            Basic requirements            To protect against excessive current, short-circuits and earth faults in PRIMARY CIRCUITS, protective devices shall be included either as integral parts of the equipment or as parts of the building installation, subject to the following, a), b) and c):            a) except as detailed in b) and c), protective devices necessary to comply with the requirements of 5.3 shall be included as parts of the equipment;            b) for components in series with the mains input to the equipment such as the supply cord, appliance coupler, r.f.i. filter and switch, short-circuit and earth fault protection may be provided by protective devices in the building installation;</p>		N

NATIONAL DIFFERENCES			
Clause	Requirement	Remark	Result
	<p>c) it is permitted for PLUGGABLE EQUIPMENT TYPE B or PERMANENTLY CONNECTED EQUIPMENT, to rely on dedicated overcurrent and short-circuit protection in the building installation, provided that the means of protection, e.g. fuses or circuit breakers, is fully specified in the installation instructions.</p> <p>If reliance is placed on protection in the building installation, the installation instructions shall so state, except that for PLUGGABLE EQUIPMENT TYPE A the building installation shall be regarded as providing protection in accordance with the rating of the wall socket outlet.</p>		
2.7.2	This subclause has been declared 'void'.		N
3.2.3	Delete the NOTE in Table 3A, and delete also in this table the conduit sizes in parentheses.		N
3.2.5.1	<p>Replace "60245 IEC 53" by "H05 RR-F";  "60227 IEC 52" by "H03 VV-F or H03 VVH2-F";  "60227 IEC 53" by "H05 VV-F or H05 VVH2-F2".</p> <p>In Table 3B, replace the first four lines by the following:</p> <p>Up to and including 6   0,75<sup>a)</sup>    Over 6 up to and including 10   (0,75)<sup>b)</sup> 1,0   Over  10 up to and including 16   (1,0)<sup>c)</sup> 1,5  </p> <p>In the conditions applicable to Table 3B delete the words "in some countries" in condition<sup>a)</sup>.</p> <p>In NOTE 1, applicable to Table 3B, delete the second sentence.</p>		N
3.2.5.1 (A2:2013)	NOTE Z1 The harmonised code designations corresponding to the IEC cord types are given in Annex ZD		N
3.3.4	<p>In Table 3D, delete the fourth line: conductor sizes for 10 to 13 A, and replace with the following:</p> <p>Over 10 up to and including 16   1,5 to 2,5   1,5 to 4   </p> <p>Delete the fifth line: conductor sizes for 13 to 16 A</p>		N
4.3.13.6 (A1:2010)	<p>Replace the existing NOTE by the following:</p> <p>NOTE Z1 Attention is drawn to:</p> <p>1999/519/EC: Council Recommendation on the limitation of exposure of the general public to electromagnetic fields 0 Hz to 300 GHz, and</p> <p>2006/25/EC: Directive on the minimum health and safety requirements regarding the exposure of workers to risks arising from physical agents (artificial optical radiation).</p>		N

NATIONAL DIFFERENCES			
Clause	Requirement	Remark	Result
	Standards taking into account mentioned Recommendation and Directive which demonstrate compliance with the applicable EU Directive are indicated in the OJEC.		--
Annex H	<p>Replace the last paragraph of this annex by:</p> <p>At any point 10 cm from the surface of the OPERATOR ACCESS AREA, the dose rate shall not exceed 1 <math>\mu</math>Sv/h (0,1 mR/h) (see NOTE). Account is taken of the background level.</p> <p>Replace the notes as follows:</p> <p>NOTE These values appear in Directive 96/29/Euratom.</p> <p>Delete NOTE 2.</p>		N
Bibliography	Additional EN standards.		
<b>ZA</b>	<b>NORMATIVE REFERENCES TO INTERNATIONAL PUBLICATIONS WITH THEIR CORRESPONDING EUROPEAN PUBLICATIONS</b>		—

<b>ZB ANNEX (normative)</b>			
<b>SPECIAL NATIONAL CONDITIONS (EN)</b>			
1.2.4.1	In <b>Denmark</b> , certain types of Class I appliances (see 3.2.1.1) may be provided with a plug not establishing earthing conditions when inserted into Danish socket-outlets.		N
1.2.13.14 (A11:2009)	In <b>Norway</b> and <b>Sweden</b> , for requirements see 1.7.2.1 and 7.3 of this annex.		N
1.5.7.1 (A11:2009)	In <b>Finland, Norway</b> and <b>Sweden</b> , resistors bridging BASIC INSULATION in CLASS I PLUGGABLE EQUIPMENT TYPE A must comply with the requirements in 1.5.7.1. In addition when a single resistor is used, the resistor must withstand the resistor test in 1.5.7.2.		N
1.5.8	In <b>Norway</b> , due to the IT power system used (see annex V, Figure V.7), capacitors are required to be rated for the applicable line-to-line voltage (230 V).		N
1.5.9.4	In <b>Finland, Norway</b> and <b>Sweden</b> , the third dashed sentence is applicable only to equipment as defined in 6.1.2.2 of this annex.		N

NATIONAL DIFFERENCES			
Clause	Requirement	Remark	Result
1.7.2.1	<p>In <b>Finland, Norway and Sweden</b>, CLASS I PLUGGABLE EQUIPMENT TYPE A intended for connection to other equipment or a network shall, if safety relies on connection to protective earth or if surge suppressors are connected between the network terminals and accessible parts, have a marking stating that the equipment must be connected to an earthed mains socket-outlet.</p> <p>The marking text in the applicable countries shall be as follows:</p> <p>In Finland: "Laitte on liitettävä suojakoskettimilla varustettuun pistorasiaan"</p> <p>In Norway: "Apparatet må tilkoples jordet stikkontakt"</p> <p>In Sweden: "Apparaten skall anslutas till jordat uttag"</p>		N
1.7.2.1 (A11:2009)	<p>In <b>Norway and Sweden</b>, the screen of the cable distribution system is normally not earthed at the entrance of the building and there is normally no equipotential bonding system within the building. Therefore the protective earthing of the building installation need to be isolated from the screen of a cable distribution system.</p> <p>It is however accepted to provide the insulation external to the equipment by an adapter or an interconnection cable with galvanic isolator, which may be provided by e.g. a retailer.</p> <p>The user manual shall then have the following or similar information in Norwegian and Swedish language respectively, depending on in what country the equipment is intended to be used in:</p> <p>"Equipment connected to the protective earthing of the building installation through the mains connection or through other equipment with a connection to protective earthing – and to a cable distribution system using coaxial cable, may in some circumstances create a fire hazard. Connection to a cable distribution system has therefore to be provided through a device providing electrical isolation below a certain frequency range (galvanic isolator, see EN 60728-11)."</p>		

NATIONAL DIFFERENCES			
Clause	Requirement	Remark	Result
	<p>NOTE In Norway, due to regulation for installations of cable distribution systems, and in Sweden, a galvanic isolator shall provide electrical insulation below 5 MHz. The insulation shall withstand a dielectric strength of 1,5 kV r.m.s., 50 Hz or 60 Hz, for 1 min.</p> <p>Translation to Norwegian (the Swedish text will also be accepted in Norway):            "Utstyr som er koplet til beskyttelsesjord via nettplugg og/eller via annet jordtilkoplet utstyr – og er tilkoplet et kabel-TV nett, kan forårsake brannfare. For å unngå dette skal det ved tilkopling av utstyret til kabel-TV nettet installeres en galvanisk isolator mellom utstyret og kabel-TV nettet."</p> <p>Translation to Swedish:            "Utrustning som är kopplad till skyddsjord via jordat vägguttag och/eller via annan utrustning och samtidigt är kopplad till kabel-TV nät kan i vissa fall medföra risk för brand. För att undvika detta skall vid anslutning av utrustningen till kabel-TV nät galvanisk isolator finnas mellan utrustningen och kabel-TV nätet."</p>		N
1.7.2.1 (A2:2013)	<p>In <b>Denmark</b>, CLASS I PLUGGABLE EQUIPMENT TYPE A intended for connection to other equipment or a network shall, if safety relies on connection to protective earth or if surge suppressors are connected between the network terminals and accessible parts, have a marking stating that the equipment must be connected to an earthed mains socket-outlet.</p> <p>The marking text in <b>Denmark</b> shall be as follows:            In <b>Denmark</b>: "Apparatets stikprop skal tilsluttes en stikkontakt med jord, som giver forbindelse til stikproppens jord."</p>		N
1.7.5  1.7.5 (A11:2009)	<p>In <b>Denmark</b>, socket-outlets for providing power to other equipment shall be in accordance with the Heavy Current Regulations, Section 107-2-D1, Standard Sheet DK 1-3a, DK 1-5a or DK 1-7a, when used on Class I equipment. For STATIONARY EQUIPMENT the socket-outlet shall be in accordance with Standard Sheet DK 1-1b or DK 1-5a.</p> <p>For <b>CLASS II EQUIPMENT</b> the socket outlet shall be in accordance with Standard Sheet DKA 1-4a.</p>		N



NATIONAL DIFFERENCES			
Clause	Requirement	Remark	Result
1.7.5 (A2:2013)	<p>In <b>Denmark</b>, socket-outlets for providing power to other equipment shall be in accordance with the DS 60884-2-D1:2011.</p> <p>For class I equipment the following Standard Sheets are applicable: DK 1-3a, DK 1-1c, DK 1-1d, DK 1-5a or DK 1-7a, with the exception for STATIONARY EQUIPMENT where the socket-outlets shall be in accordance with Standard Sheet DK 1-1b, DK 1-1c, DK 1-1d or DK 1-5a.</p> <p>Socket outlets intended for providing power to Class II apparatus with a rated current of 2,5 A shall be in accordance with DS 60884-2-D1 standard sheet DKA 1-4a. Other current rating socket outlets shall be in compliance with by DS 60884-2-D1 Standard Sheet DKA 1-3a or DKA 1-3b.</p> <p>Justification the Heavy Current Regulations, 6c</p>		N
2.2.4	In <b>Norway</b> , for requirements see 1.7.2.1, 6.1.2.1 and 6.1.2.2 of this annex.		N
2.3.2	In <b>Finland, Norway and Sweden</b> there are additional requirements for the insulation. See 6.1.2.1 and 6.1.2.2 of this annex.		N
2.3.4	In <b>Norway</b> , for requirements see 1.7.2.1, 6.1.2.1 and 6.1.2.2 of this annex.		N
2.6.3.3	In the <b>United Kingdom</b> , the current rating of the circuit shall be taken as 13 A, not 16 A.		N
2.7.1	In the <b>United Kingdom</b> , to protect against excessive currents and short-circuits in the PRIMARY CIRCUIT of DIRECT PLUG-IN EQUIPMENT, tests according to 5.3 shall be conducted, using an external protective device rated 30 A or 32 A. If these tests fail, suitable protective devices shall be included as integral parts of the DIRECT PLUG-IN EQUIPMENT, so that the requirements of 5.3 are met.		N
2.10.5.13	In <b>Finland, Norway and Sweden</b> , there are additional requirements for the insulation, see 6.1.2.1 and 6.1.2.2 of this annex.		N
3.2.1.1	<p>In <b>Switzerland</b>, supply cords of equipment having a RATED CURRENT not exceeding 10 A shall be provided with a plug complying with SEV 1011 or IEC 60884-1 and one of the following dimension sheets:</p> <p>SEV 6532-2.1991 Plug Type 15 3P+N+PE 250/400 V, 10 A</p>		N

NATIONAL DIFFERENCES			
Clause	Requirement	Remark	Result
	<p>SEV 6533-2.1991 Plug Type 11 L+N 250 V, 10 A</p> <p>SEV 6534-2.1991 Plug Type 12 L+N+PE 250 V, 10 A</p> <p>In general, EN 60309 applies for plugs for currents exceeding 10 A. However, a 16 A plug and socket-outlet system is being introduced in Switzerland, the plugs of which are according to the following dimension sheets, published in February 1998: SEV 5932-2.1998: Plug Type 25 , 3L+N+PE 230/400 V, 16 A</p> <p>SEV 5933-2.1998: Plug Type 21, L+N, 250 V, 16A</p> <p>SEV 5934-2.1998: Plug Type 23, L+N+PE .250 V, 16 A</p>		
3.2.1.1	<p>In <b>Denmark</b>, supply cords of single-phase equipment having a rated current not exceeding 13 A shall be provided with a plug according to the Heavy Current Regulations, Section 107-2-D1.</p> <p>CLASS I EQUIPMENT provided with socket-outlets with earth contacts or which are intended to be used in locations where protection against indirect contact is required according to the wiring rules shall be provided with a plug in accordance with standard sheet DK 2-1a or DK 2-5a.</p> <p>If poly-phase equipment and single-phase equipment having a RATED CURRENT exceeding 13 A is provided with a supply cord with a plug, this plug shall be in accordance with the Heavy Current Regulations, Section 107-2-D1 or EN 60309-2.</p>		N
3.2.1.1 (A2:2013)	<p>In <b>Denmark</b>, supply cords of single-phase equipment having a rated current not exceeding 13 A shall be provided with a plug according to DS 60884-2-D1.</p> <p>CLASS I EQUIPMENT provided with socket-outlets with earth contacts or which are intended to be used in locations where protection against indirect contact is required according to the wiring rules shall be provided with a plug in accordance with standard sheet DK 2-1a or DK 2-5a.</p> <p>If a single-phase equipment having a RATED CURRENT exceeding 13 A or if a poly-phase equipment is provided with a supply cord with a plug, this plug shall be in accordance with the standard sheets DK 6-1a in DS 60884-2-D1 or EN 60309-2.</p> <p>Justification the Heavy Current Regulations, 6c</p>		N

NATIONAL DIFFERENCES			
Clause	Requirement	Remark	Result
3.2.1.1	<p>In <b>Spain</b>, supply cords of single-phase equipment having a rated current not exceeding 10 A shall be provided with a plug according to UNE 20315:1994.</p> <p>Supply cords of single-phase equipment having a rated current not exceeding 2,5 A shall be provided with a plug according to UNE-EN 50075:1993.</p> <p>CLASS I EQUIPMENT provided with socket-outlets with earth contacts or which are intended to be used in locations where protection against indirect contact is required according to the wiring rules, shall be provided with a plug in accordance with standard UNE 20315:1994.</p> <p>If poly-phase equipment is provided with a supply cord with a plug, this plug shall be in accordance with UNE-EN 60309-2.</p>		N
3.2.1.1	<p>In the <b>United Kingdom</b>, apparatus which is fitted with a flexible cable or cord and is designed to be connected to a mains socket conforming to BS 1363 by means of that flexible cable or cord and plug, shall be fitted with a 'standard plug' in accordance with Statutory Instrument 1768:1994 - The Plugs and Sockets etc. (Safety) Regulations 1994, unless exempted by those regulations.</p> <p>NOTE 'Standard plug' is defined in SI 1768:1994 and essentially means an approved plug conforming to BS 1363 or an approved conversion plug.</p>		N
3.2.1.1	<p>In <b>Ireland</b>, apparatus which is fitted with a flexible cable or cord and is designed to be connected to a mains socket conforming to I.S. 411 by means of that flexible cable or cord and plug, shall be fitted with a 13 A plug in accordance with Statutory Instrument 525:1997 - National Standards Authority of Ireland (section 28) (13 A Plugs and Conversion Adaptors for Domestic Use) Regulations 1997.</p>		N
3.2.4	<p>In <b>Switzerland</b>, for requirements see 3.2.1.1 of this annex.</p>		N
3.2.5.1	<p>In the <b>United Kingdom</b>, a power supply cord with conductor of 1,25 mm<sup>2</sup> is allowed for equipment with a rated current over 10 A and up to and including 13 A.</p>		N
3.3.4	<p>In the <b>United Kingdom</b>, the range of conductor sizes of flexible cords to be accepted by terminals for equipment with a RATED CURRENT of over 10 A up to and including 13 A is:</p> <ul style="list-style-type: none"> <li>• 1,25 mm<sup>2</sup> to 1,5 mm<sup>2</sup> nominal cross-sectional area.</li> </ul>		N

NATIONAL DIFFERENCES			
Clause	Requirement	Remark	Result
4.3.6	In the <b>United Kingdom</b> , the torque test is performed using a socket outlet complying with BS 1363 part 1:1995, including Amendment 1:1997 and Amendment 2:2003 and the plug part of DIRECT PLUG-IN EQUIPMENT shall be assessed to BS 1363: Part 1, 12.1, 12.2, 12.3, 12.9, 12.11, 12.12, 12.13, 12.16 and 12.17, except that the test of 12.17 is performed at not less than 125 °C. Where the metal earth pin is replaced by an Insulated Shutter Opening Device (ISOD), the requirements of clauses 22.2 and 23 also apply.		N
4.3.6	In <b>Ireland</b> , DIRECT PLUG-IN EQUIPMENT is known as plug similar devices. Such devices shall comply with Statutory Instrument 526:1997 - National Standards Authority of Ireland (Section 28) (Electrical plugs, plug similar devices and sockets for domestic use) Regulations, 1997.		N
5.1.7.1	In <b>Finland, Norway and Sweden</b> TOUCH CURRENT measurement results exceeding 3,5 mA r.m.s. are permitted only for the following equipment: <ul style="list-style-type: none"> <li>• STATIONARY PLUGGABLE EQUIPMENT TYPE A that <ul style="list-style-type: none"> <li>is intended to be used in a RESTRICTED ACCESS LOCATION where equipotential bonding has been applied, for example, in a telecommunication centre; and</li> <li>has provision for a permanently connected PROTECTIVE EARTHING CONDUCTOR; and</li> <li>is provided with instructions for the installation of that conductor by a SERVICE PERSON;</li> </ul> </li> <li>• STATIONARY PLUGGABLE EQUIPMENT TYPE B;</li> <li>• STATIONARY PERMANENTLY CONNECTED EQUIPMENT.</li> </ul>		N

NATIONAL DIFFERENCES			
Clause	Requirement	Remark	Result
6.1.2.1 (A1:2010)	<p>In <b>Finland, Norway and Sweden</b>, add the following text between the first and second paragraph of the compliance clause:</p> <p>If this insulation is solid, including insulation forming part of a component, it shall at least consist of either</p> <ul style="list-style-type: none"> <li>- two layers of thin sheet material, each of which shall pass the electric strength test below, or</li> <li>- one layer having a distance through insulation of at least 0,4 mm, which shall pass the electric strength test below.</li> </ul> <p>Alternatively for components, there is no distance through insulation requirements for the insulation consisting of an insulating compound completely filling the casing, so that CLEARANCES and CREEPAGE DISTANCES do not exist, if the component passes the electric strength test in accordance with the compliance clause below and in addition</p> <ul style="list-style-type: none"> <li>- passes the tests and inspection criteria of 2.10.11 with an electric strength test of 1,5 kV multiplied by 1,6 (the electric strength test of 2.10.10 shall be performed using 1,5 kV), and</li> <li>- is subject to ROUTINE TESTING for electric strength during manufacturing, using a test voltage of 1,5 kV.</li> </ul>		N
	<p>It is permitted to bridge this insulation with an optocoupler complying with 2.10.5.4 b).</p> <p>It is permitted to bridge this insulation with a capacitor complying with EN 60384-14:2005, subclass Y2.</p> <p>A capacitor classified Y3 according to EN 60384-14:2005, may bridge this insulation under the following conditions:</p> <ul style="list-style-type: none"> <li>- the insulation requirements are satisfied by having a capacitor classified Y3 as defined by EN 60384-14, which in addition to the Y3 testing, is tested with an impulse test of 2,5 kV defined in EN 60950-1:2006, 6.2.2.1;</li> <li>- the additional testing shall be performed on all the test specimens as described in EN 60384-14:</li> <li>- the impulse test of 2,5 kV is to be performed before the endurance test in EN 60384-14, in the sequence of tests as described in EN 60384-14.</li> </ul>		N

NATIONAL DIFFERENCES			
Clause	Requirement	Remark	Result
6.1.2.2	In <b>Finland, Norway</b> and <b>Sweden</b> , the exclusions are applicable for PERMANENTLY CONNECTED EQUIPMENT, PLUGGABLE EQUIPMENT TYPE B and equipment intended to be used in a RESTRICTED ACCESS LOCATION where equipotential bonding has been applied, e.g. in a telecommunication centre, and which has provision for a permanently connected PROTECTIVE EARTHING CONDUCTOR and is provided with instructions for the installation of that conductor by a SERVICE PERSON.		N
7.2	In <b>Finland, Norway</b> and <b>Sweden</b> , for requirements see 6.1.2.1 and 6.1.2.2 of this annex.  The term TELECOMMUNICATION NETWORK in 6.1.2 being replaced by the term CABLE DISTRIBUTION SYSTEM.		N
7.3	In <b>Norway</b> and <b>Sweden</b> , for requirements see 1.2.13.14 and 1.7.2.1 of this annex.		N
7.3 (A11:2009)	In <b>Norway</b> , for installation conditions see EN 60728-11:2005.		N

HONGCAI TESTING

EN 60950-1			
Clause	Requirement	Remark	Result

5.1	TABLE: List of critical components					P
Object / part No.	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity	
PCB (PFC PSDR)	Interchangeable	Interchangeable	PCB FR-4 2S 2oz 215*315.5mm	UL 94	UL	
Current fuse (F4)	COOPER Bussmann	BS88 80FE	80A 690Vac /500Vdc TIME12.7*77	UL 248 IEC/EN 60127-2	UL	
Current fuse (F2)	Littelfuse	KLK D30	FUSE LITTEL KLK D30 30A 600Vdc	UL 248 IEC/EN 60127-2	UL	
Electrolytic Capacitors (C1)	Interchangeable	Interchangeable	CAP MKP 2.2uF 275VAC K -X2 31*13.7*25- 27.5mm	--	Tested with appliance	
Electrolytic Capacitors (C6、C7、C8、 C9)	Interchangeable	Interchangeable	CAP EL-AL 680uF 450V M RAD 35*65mm 105°C" CD294"	--	Tested with appliance	
Transformer (TX1)	Interchangeable	Interchangeable	TX 1352 49:49:49 FER EE-16	--	Tested with appliance	
Line Choke (L301、L302)	Interchangeable	Interchangeable	CHOKE 330uH 1.7D*2 IRONPOWDER DT200-35B DM	--	Tested with appliance	
Diode (D308、 D310)	FAIRCHILD	RHRG30120	30A 1200V TO- 247	--	Tested with appliance	
IGBT (Q314、 Q315、Q316、 Q318)	FAIRCHILD	FGL60N100BNT D	60A 1000V N TUBE TO-264	--	Tested with appliance	
SCR (Q305)	IXYS	CLA50E1200HB	50A 1200V TUBE TO-247	--	Tested with appliance	
SCR (Q301、 Q302)	VISAY	40TPS12APBF	35A 1200V TUBE TO-247	--	Tested with appliance	
PCB (INV PSDR)	Interchangeable	Interchangeable	PCB FR-4 2S 2oz 174.5*315.5mm	UL 94	UL	

EN 60950-1					
Clause	Requirement			Remark	Result
Electrolytic Capacitors (C207)	Jianghai Capacitor Co., Ltd	CBB20R	CAP MPP 20uF 275V J BULK AXI 100	IEC 60384-16	UL
Line Choke (L201、L202)	Interchangeable	Interchangeable	CHOKE 300uH 1.7D*2 IRONPOWDER DT200-35B DM	--	Tested with appliance
Diode (D203、D204)	FAIRCHILD	RHRP15120	15A 1200V TO-220	--	Tested with appliance
IGBT (Q201、Q202、Q203、Q204)	FAIRCHILD	FGL40N120AND	64A 1200V N TUBE TO-264	--	Tested with appliance
RELAY (RY2、RY6)	SONG CHUAN	832A-1C-F-C	RELAY 12VDC 30A 250VAC	UL508&873	UL
Transformer (TX3)	Interchangeable	Interchangeable	TX 1352 49:49:49 FER EE-16	--	Tested with appliance
MOSFET(Q3)	TOSHIBA/	2SK2962	1A 100V N TAP TO-92M	--	Tested with appliance
Wire Stock	Interchangeable	Interchangeable	65*0.254mm 12AWG	UL1015	UL
Supplementary information:					



EN 60950-1			
Clause	Requirement	Remark	Result

1.6.2	TABLE: Electrical data					P
Fuse #	I <sub>rated</sub> (A)	U (V)	P (KW)	I (A)	I <sub>fuse</sub> (A)	Condition/status
F1	--	198/50	4.25	32.65	32.65	Loading: 4KW Lamp
F1	--	198/60	4.23	32.61	32.61	Loading: 4KW Lamp
F1	36.4	220/50	4.18	31.85	31.85	Loading: 4KW Lamp
F1	36.4	220/60	4.17	31.62	31.62	Loading: 4KW Lamp
F1	36.4	240/50	4.19	31.50	31.50	Loading: 4KW Lamp
F1	36.4	240/60	4.18	31.46	31.46	Loading: 4KW Lamp
F1	--	264/50	4.21	30.32	30.32	Loading: 4KW Lamp
F1	--	264/60	4.20	30.35	30.35	Loading: 4KW Lamp
Supplementary information:						

2.1.1.5 c) 1)	TABLE: max. V, A, VA test				N/A
Voltage (rated) (V)	Current (rated) (A)	Voltage (max.) (V)	Current (max.) (A)	VA (max.) (VA)	
--	---	--	--	--	
supplementary information:					
Supplied by 240V/60Hz					

2.1.1.5 c) 2)	TABLE: stored energy		N
Capacitance C (μF)	Voltage U (V)	Energy E (J)	
—	—	—	
supplementary information:			

2.1.1.7	Discharge test			<input checked="" type="checkbox"/> P <input type="checkbox"/> F <input type="checkbox"/> N/A
Condition	τ calculated (ms)	τ measured (ms)	Voltage measured after 1 second	Comments
At input plug pin	7	23	8V	Plug pin measured:V <sub>peak</sub> , 37%V <sub>peak</sub> =137.64 V

EN 60950-1			
Clause	Requirement	Remark	Result

Note(s): Supply voltage: 264V Overall capacity: 0.047uF Discharge resistor: MΩ

Pass: time constant <1s, if C<=0.1μ no test required

Under +10% or +6% of the highest Rated Voltage.

Test was repeated with all switches in all possible positions.

Sample No.: 1#	Ambient Temperature (°C) 24.5
Test date: 2018.4.12	Relative Humidity (%) 66.7

<b>2.2.2</b>	<b>Voltages under Normal Conditions</b>	<input checked="" type="checkbox"/> P <input type="checkbox"/> F <input type="checkbox"/> N/A
--------------	---	---

Component (measured between)	max. Voltage (normal operation)		Voltage Limiting Components
	V peak	V d.c.	
TX1(FC 1623) Pin A – Pin B	32	--	
	--		

Note: Under Voltage:

Any two conductors of the SELV CIRCUIT or CIRCUITS shall not exceed 42.4 V peak, or 60 V d.c., under normal operating conditions.

Sample No.: 1#	Ambient Temperature (°C) 24.7
Test date: 2018.4.13	Relative Humidity (%) 68.2

<b>2.2.3</b>	<b>Voltages under fault Conditions</b>	<input type="checkbox"/> P <input type="checkbox"/> F <input checked="" type="checkbox"/> N/A
--------------	--	---

Component (measured between)	max. Voltage (normal operation)		Voltage Limiting Components
	V peak	V d.c.	
		--	
	--		

Note: Under Voltage:

Any two conductors of the SELV CIRCUIT or CIRCUITS shall not exceed 42.4 V peak, or 60 V d.c., under normal operating conditions.

Sample No.:	Ambient Temperature (°C)
Test date:	Relative Humidity (%)

<b>2.4.2</b>	<b>TABLE: limited current circuit measurement</b>	P
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Location	Voltage (V)	Current (mA)	Freq. (KHz)	Limit (mA)
CY1	/	0.1	/	0.7

supplementary information:

EN 60950-1			
Clause	Requirement	Remark	Result

2.5	TABLE: limited power sources		N
Circuit output tested:			
Measured Uoc (V) with all load circuits disconnected:			
		I <sub>sc</sub> (A)	VA
		Meas.	Limit
		Meas.	Limit
	Normal condition Uoc=V	--	≤ 8.0 A
	Single fault: D5 S-C *)	--	≤ 8.0 A
		--	≤ 100 VA
		--	≤ 100 VA
supplementary information:			
S-C=Short circuit, o-c=open circuit.			
*) Unit shut down.			

2.10.2	Table: working voltage measurement		P
Location	RMS voltage (V)	Peak voltage (V)	Comments
TX1 Pin 1 to 3(FC1623)	240	460	
TX1 Pin 4 to 5(FC1623)	240	465	
CT201 Pin 1 to 2	250	480	
CT201 Pin 1 to 3	250	485	
CT201 Pin 1 to 5	<b>252</b>	<b>495</b>	<b>Max. RMS and Vpeak</b>
CT201 Pin 1 to 6	250	485	
CT201 Pin 4 to 2	248	485	
CT201 Pin 4 to 3	246	486	
CT201 Pin 4 to 5	246	485	
CT201 Pin 4 to 6	248	486	
TX2 Pin 1 to 3	245	470	
TX2 Pin 4 to 5	245	465	
TX1 Pin 1 to 3(BCK 4201)	250	465	
TX1 Pin 4 to 5(BCK 4201)	250	470	
P4 Pin1 to 3	240	430	
P4 Pin1 to 4	238	425	
P4 Pin2 to 3	238	425	
P4 Pin2 to 4	240	430	
CY1	250	435	

EN 60950-1			
Clause	Requirement	Remark	Result

supplementary information:

2.10.3 and 2.10.4	TABLE: Clearance and creepage distance measurements						P
Clearance (cl) and creepage distance (cr) at/of/between:	U peak (V)	U r.m.s. (V)	Required cl (mm)	cl (mm)	Required cr (mm)	cr (mm)	
L to N before F1	420	240	2.0	>3.0	2.4	>3.0	
Trance between F1 pins	420	240	2.0	>5.0	2.4	>5.0	
Primary to secondary trace of CY1,	435	250	4.0	>5.5	5.0	>5.5	
Primary to secondary side of P4	425	240	4.0	>5.5	4.8	>5.5	
Primary to secondary side of TX1	465	240	4.2	>8.0	4.8	>8.0	
Primary to secondary side of TX2	470	245	4.2	>8.0	4.9	>8.0	
Primary to secondary side of CT201	495	252	4.2	>8.0	5.0	>8.0	
TX1 secondary Pin to core	465	240	4.2	>8.0	4.8	>8.0	
TX2 secondary Pin to core	470	245	4.2	>8.0	4.9	>8.0	
CT201 secondary Pin to core	485	252	4.2	>8.0	5.0	>8.0	
Supplementary information:							

2.10.5	TABLE: Distance through insulation measurements					P
Distance through insulation (DTI) at/of:	U peak (V)	U rms (V)	Test voltage (V)	Required DTI (mm)	DTI (mm)	
Enclosure	495	252	3000	0.4	Min.1.5	
Supplementary information:						

EN 60950-1										
Clause	Requirement			Remark						Result
4.3.8	TABLE: Batteries								N	
The tests of 4.3.8 are applicable only when appropriate battery data is not available				--						--
Is it possible to install the battery in a reverse polarity position?				--						--
	Non-rechargeable batteries			Rechargeable batteries						
	Discharging		Un-intentional charging	Charging		Discharging		Reversed charging		
	Meas. current	Manuf. Specs.		Meas. current	Manuf. Specs.	Meas. current	Manuf. Specs.	Meas. current	Manuf. Specs.	
Max. current during normal condition	—	—	—	—	—	—	—	—	—	
Max. current during fault condition	—	—	—	—	—	—	—	—	—	
Test results:									Verdict	
- Chemical leaks				—						—
- Explosion of the battery				—						—
- Emission of flame or expulsion of molten metal				—						—
- Electric strength tests of equipment after completion of tests				—						—
Supplementary information:										

4.5	TABLE: Thermal requirements				P	
	Supply voltage (V).....	220V-240V/60Hz		220V/50Hz		—
Maximum measured temperature T of part/at::		T (°C)				Allowed T <sub>max</sub> (°C)
Test condition		220V/60Hz <sup>1)</sup> Normal working	240V/60Hz <sup>2)</sup> Normal working	220V/60Hz <sup>1)</sup> Locked fan	220V/60Hz <sup>2)</sup> Stifled air port	--
101 Input wire		30.2	30.1	30.2	29.6	80
102 Internal wire		30.0	29.8	30.2	32.5	80
103 Enclosure inside		29.7	29.5	32.6	36.8	95
104 C42 body		34.6	34.3	34.8	48.9	105
105 PCB near Q5		36.3	36.1	36.5	55.0	130
106 PCB near D12		41.1	40.6	41.4	68.1	130
107 TX1 winding(FC1623)		38.9	38.5	39.2	59.8	110

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Clause	Requirement	Remark			Result	
108	TX1 core (FC1623)	38.1	36.8	38.4	60.0	110
109	PCB near TX1 (FC1623)	38.0	37.6	38.2	55.9	130
110	C10 body	32.8	32.6	32.9	42.3	105
111	PCB near U5	35.5	35.6	35.7	46.0	130
112	C15 body	39.7	39.3	40.0	60.1	105
113	C04 body	29.9	29.7	29.9	34.7	105
114	L01	31.8	31.9	32.0	38.3	120
115	PCB near MOV04	30.8	30.3	30.8	35.4	130
116	PCB near D901	34.3	34.1	34.6	41.5	130
117	C917	33.4	33.2	33.8	40.5	105
118	PCB near Q901	34.6	34.5	34.9	41.6	130
119	TX1 winding(BCK 4201)	35.1	35.0	35.2	42.0	110
120	TX1 core (BCK 4201)	35.4	35.2	35.6	42.4	110
201	PCB near (BCK 4201)	46.0	46.2	46.3	64.4	130
202	C910 body	32.3	32.1	32.6	39.6	105
203	C2 body	33.7	33.5	34.0	43.1	105
204	PCB near U903	28.0	28.3	30.2	27.6	130
205	TX2 winding(T1601)	31.7	31.5	31.8	39.8	110
206	TX2 core(T1601)	32.0	32.2	32.1	41.4	110
207	PCB near TX2(T1601)	31.9	31.6	32.0	41.4	130
209	PCB near Q316	33.9	33.7	33.9	43.9	130
210	CT301	33.1	33.3	33.3	41.5	110
211	L301	35.7	35.4	36.1	42.4	120
212	C3 body	34.2	34.1	34.6	42.6	105
213	CT201 winding	33.0	32.8	33.2	37.6	110
214	CT201 core	33.0	33.1	33.2	38.0	110
215	PCB near CT201	33.0	33.2	33.2	38.1	130
216	C207 body	32.8	32.5	33.0	38.8	105
217	L202	33.7	33.6	34.0	39.2	120
218	PCB near Q204	34.4	34.2	34.8	39.4	130
219	Enclosure outside	33.9	33.5	34.4	36.4	95
220	C5 body	34.3	34.1	34.7	39.6	105
208	Ambient	27.5	27.2	28.3	26.8	---
Supplementary information:						

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Clause	Requirement	Remark	Result

Temperature T of winding:	t <sub>1</sub> (°C)	R <sub>1</sub> (Ω)	t <sub>2</sub> (°C)	R <sub>2</sub> (Ω)	T (°C)	Allowed T <sub>max</sub> (°C)	Insulation class
—	—	—	—	—	—	—	—

Supplementary information  
 1) represent vertical;  
 2) represent horizontal;  
 3) operating temperature 35°C

4.5.5	TABLE: Ball pressure test of thermoplastic parts	P
	Allowed impression diameter (mm) .....: ≤2mm	—

Part	Test temperature (°C)	Impression diameter (mm)
T1 bobbin	125	0.8
Enclosure plastic	125	1.0

Supplementary information:

4.7	TABLE: Resistance to fire	P			
Part	Manufacturer of material	Type of material	Thickness (mm)	Flammability class	Evidence
--	--	--	--	--	--

Supplementary information:  
See appended table 1.5.1

5.1	TABLE: touch current measurement	P	
Measured between:	Measured (mA)	Limit (mA)	Comments/conditions
L/N to enclosure	0.01	0.25	—
L/N to output terminal	0.02	0.25	—

supplementary information:  
Supply with 220V/60Hz.

EN 60950-1			
Clause	Requirement	Remark	Result

5.2	TABLE: Electric strength tests, impulse tests and voltage surge tests			P
Test voltage applied between:		Voltage shape (AC, DC, impulse, surge)	Test voltage (V)	Breakdown Yes / No
Input and output for unit		AC	3000	No
Primary circuit to enclosure with metal foil		AC	3000	No
Transformer primary to secondary		AC	3000	No
Insulation tape		AC	3000	No
Supplementary information: Test after humidity treatment, heating test, and each fault condition test of 5.3.				

5.3	TABLE: Fault condition tests					P
Ambient temperature (°C).....:					25.0	—
Power source for EUT: Manufacturer, model/type, output rating .....					See below	—
Component No.	Fault	Supply voltage (V)	Test time	Fuse #	Fuse current (A)	Observation
C04	s-c	220	1s	F1	0	After s-c, the unit shutdown immediately, F1 opened no hazard.
C3	s-c	220	1s	F1	0	After s-c, the unit shutdown immediately, F1 opened no hazard.
Q314 pin(G-S)	s-c	220	1s	F1	0	After s-c, the unit shutdown immediately, F1 opened no hazard.
Q314 pin(D-G)	s-c	220	1s	F1	0	After s-c, the unit shutdown immediately, F1 opened no hazard.
CT201 pin1 to pin3	s-c	220	10mins	F1	0	After s-c, the unit shutdown immediately, F1 opened no hazard.
CT201 pin4 to pin5	s-c	220	10mins	F1	0	After s-c, the unit shutdown immediately, F1 opened no hazard.
TX1(FC162 3) pin1 to pin3	s-c	220	10mins	F1	0	After s-c, the unit shutdown immediately, F1 opened no hazard.
TX1(FC162 3) pin4 to pin5	s-c	220	10mins	F1	0	After s-c, the unit shutdown immediately, F1 opened no hazard.
TX1 (BCK 4201) pin1 to pin3	s-c	220	10mins	F1	0	After s-c, the unit shutdown immediately, F1 opened no hazard.
TX1 (BCK 4201) pin4 to pin5	s-c	220	10mins	F1	0	After s-c, the unit shutdown immediately, F1 opened no hazard.



EN 60950-1							
Clause	Requirement					Remark	Result
TX2(T1601) pin1 to pin3	s-c	220	10mins	F1	0	After s-c, the unit shutdown immediately, F1 opened no hazard.	
TX2(T1601) pin4 to pin5	s-c	220	10mins	F1	0	After s-c, the unit shutdown immediately, F1 opened no hazard.	
C10	s-c	220	10mins	F1	0	After s-c, the unit shutdown immediately, F1 opened no hazard.	
Q9	s-c	220	10mins	F1	0	After s-c, the unit shutdown immediately, F1 opened no hazard.	
C42	s-c	220	10mins	F1	0	After s-c, the unit shutdown immediately, F1 opened no hazard.	
TX	s-c	220	10mins	F1	0	After s-c, the unit shutdown immediately, F1 opened no hazard.	
D20	s-c	220	10mins	F1	0	After s-c, the unit shutdown immediately, F1 opened no hazard.	
C49	s-c	220	10mins	F1	0	After s-c, the unit shutdown immediately, F1 opened no hazard.	
Q5	s-c	220	10mins	F1	0	After s-c, the unit shutdown immediately, F1 opened no hazard.	
C15	s-c	220	10mins	F1	0	After s-c, the unit shutdown immediately, F1 opened no hazard.	
U5	s-c	220	10mins	F1	0	After s-c, the unit shutdown immediately, F1 opened no hazard.	
C207	s-c	220	10mins	F1	0	After s-c, the unit shutdown immediately, F1 opened no hazard.	
Q204	s-c	220	10mins	F1	0	After s-c, the unit shutdown immediately, F1 opened no hazard.	
Q314	s-c	220	10mins	F1	0	After s-c, the unit shutdown immediately, F1 opened no hazard.	
Supplementary information: In fault column, s-c=short-circuited, o-c= open-circuited, o-l=over-loaded.							

EN 60950-1			
Clause	Requirement	Remark	Result

C.2	TABLE: transformers T1						P
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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)
Primary winding to secondary pin	RI	495	252	3000V	4.8	5.2	0.4
Core to secondary pin	RI	495	252	3000V	4.8	5.2	0.4
Loc.	Tested insulation			Test voltage / V	Measured clearance / mm	Measured creepage dist. / mm	Measured distance thr. insul. / mm; number of layers
Primary winding to secondary pin	RI			3000Vac	>5.5	>5.5	TIW used.
Core to secondary pin	RI			3000Vac	>5.5	>5.5	TIW used.

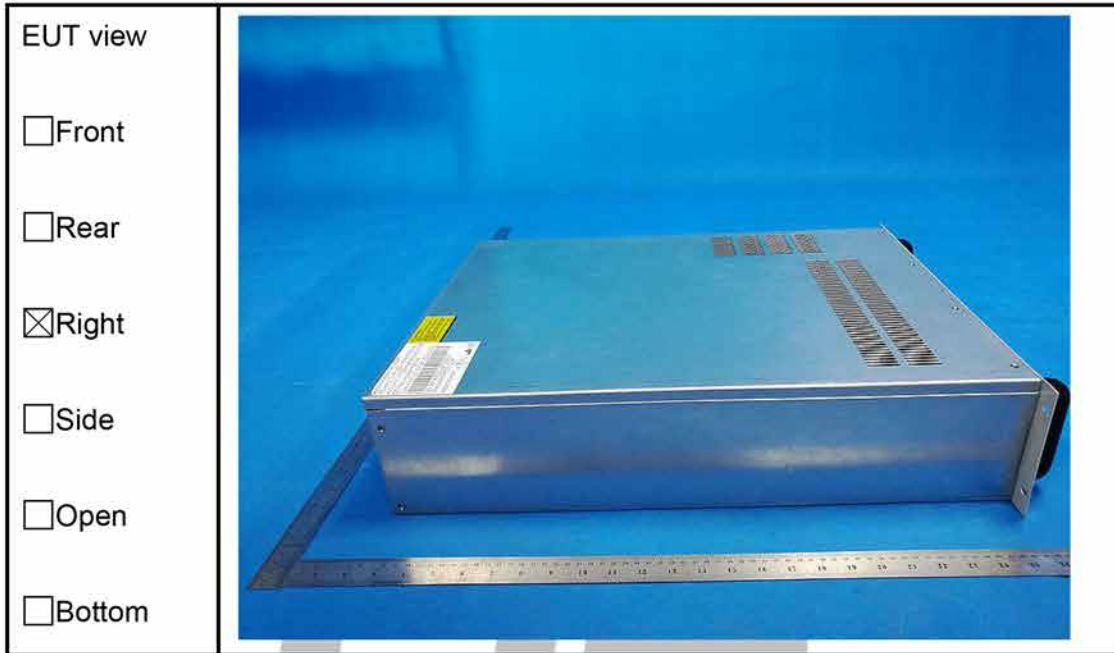
supplementary information:

Note:

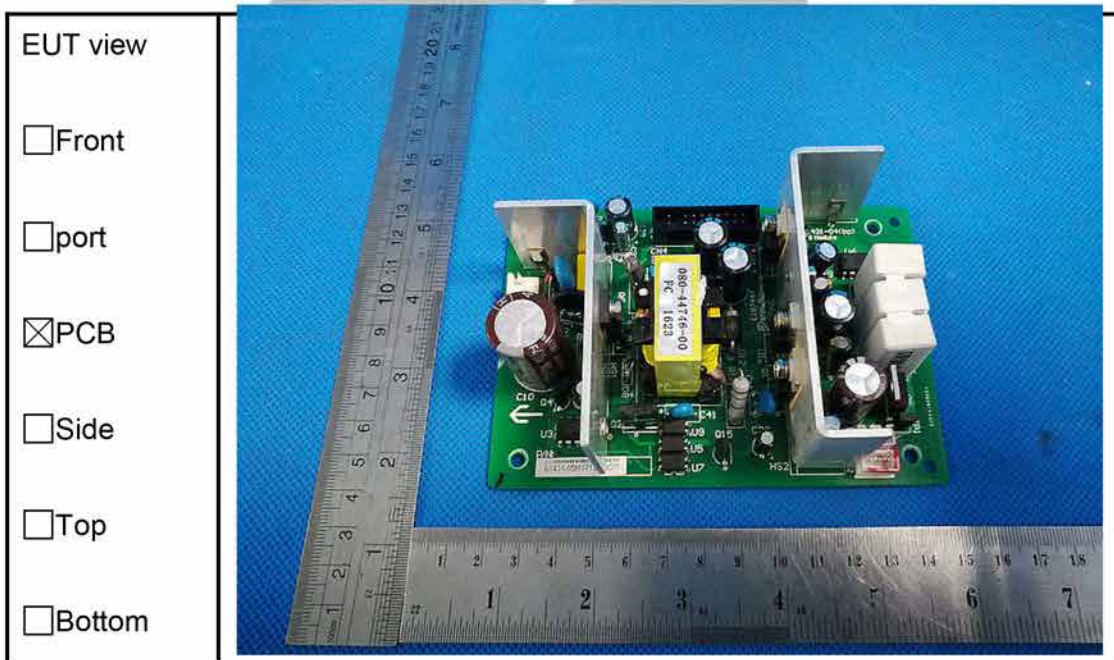
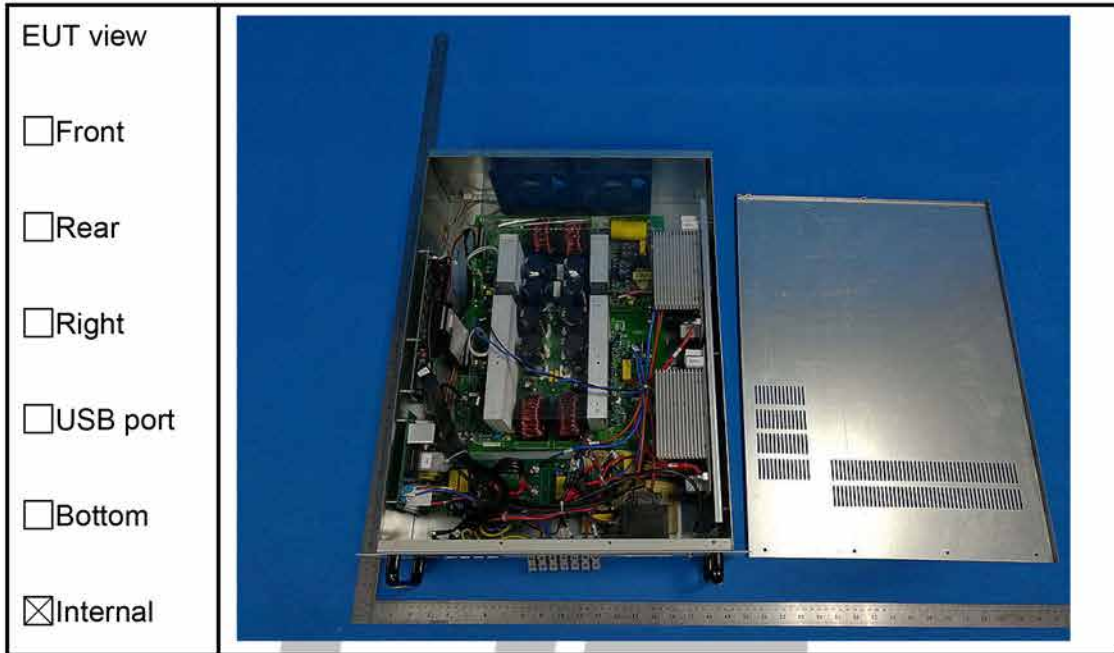
1. Concentric windings on phenolic bobbin.
2. Core of T1 is considered as primary.
3. Concentric windings on single bobbin. Two layers insulation tape between primary and secondary windings. Only the secondary windings are triple insulated wire, the rest are ordinary enamelled wire. Tube used to separate primary windings and secondary triple insulated wires where crossing.

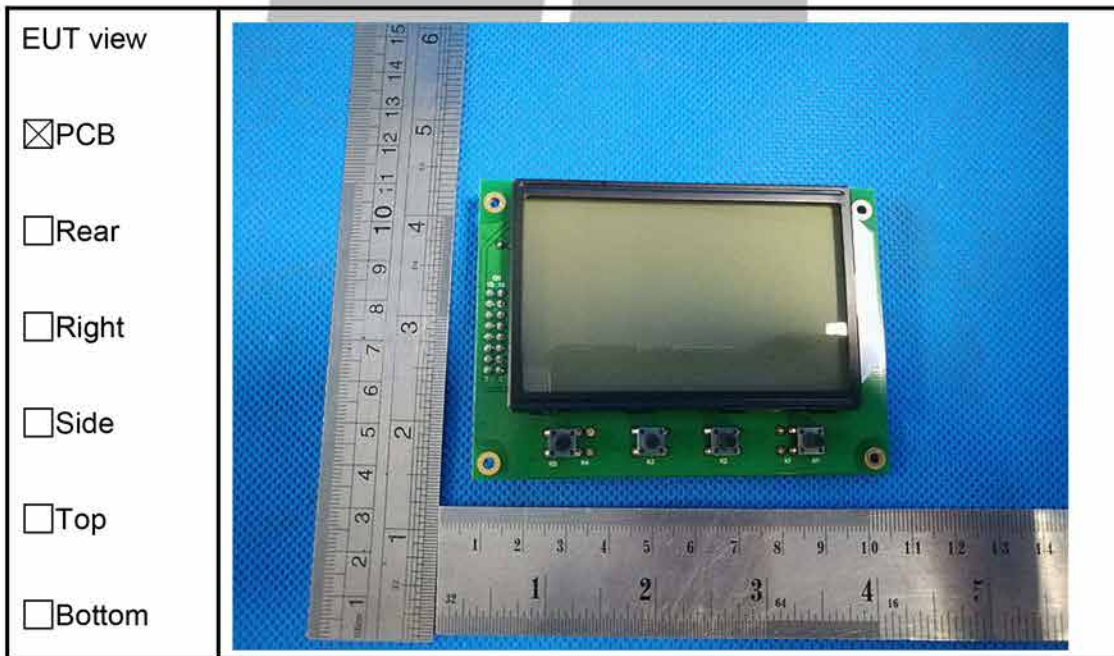
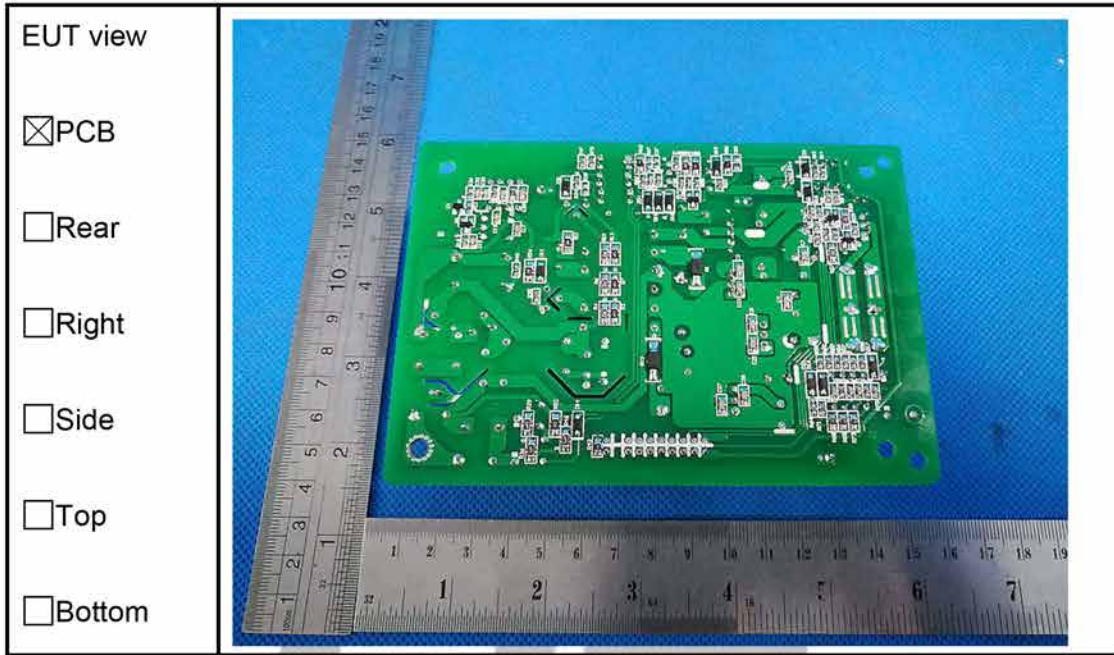
**Attachment I Photos of Product**

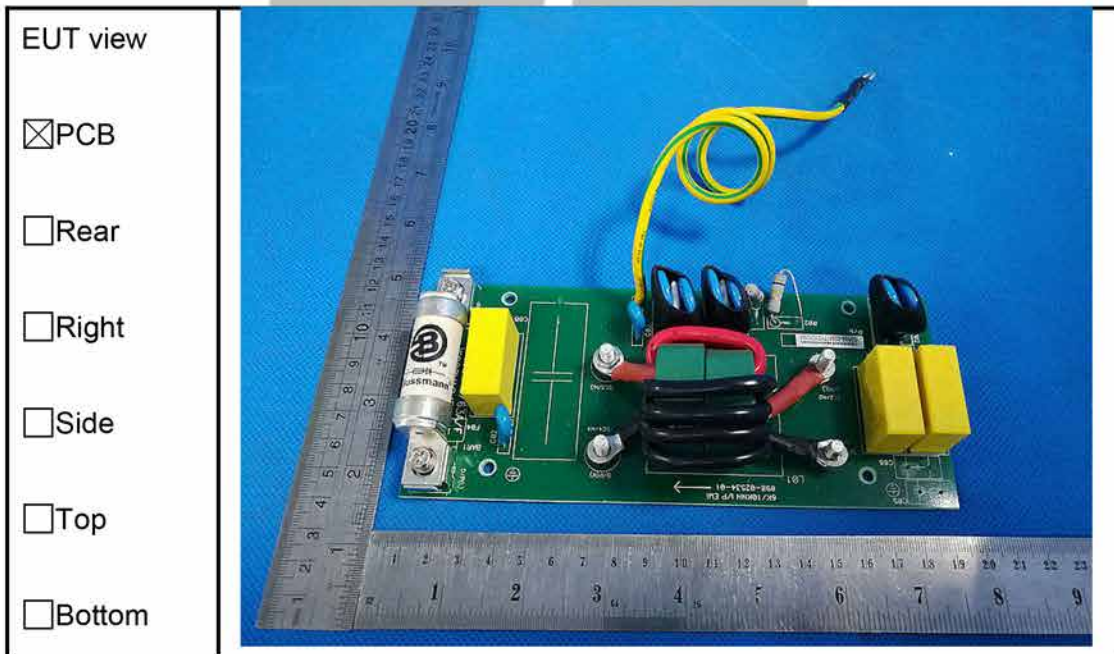
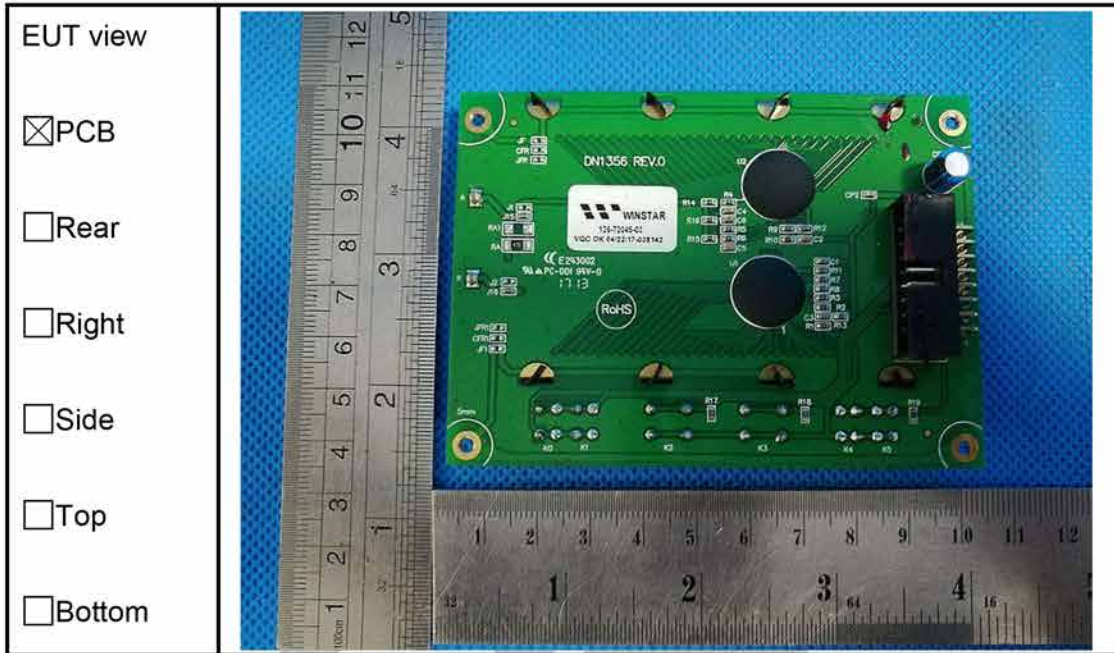




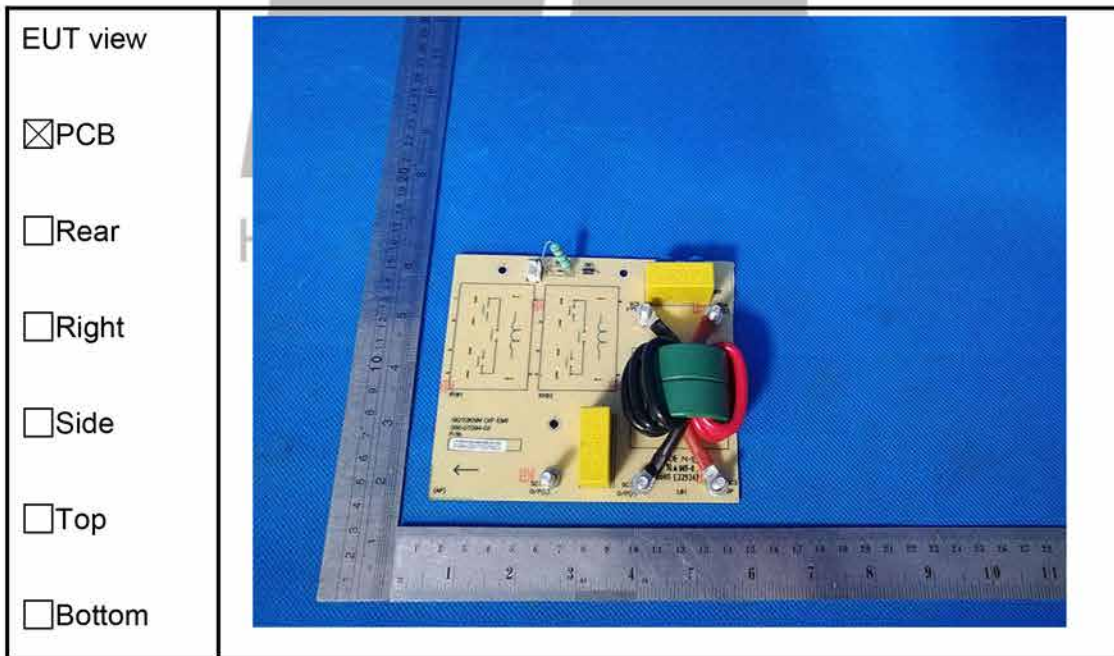
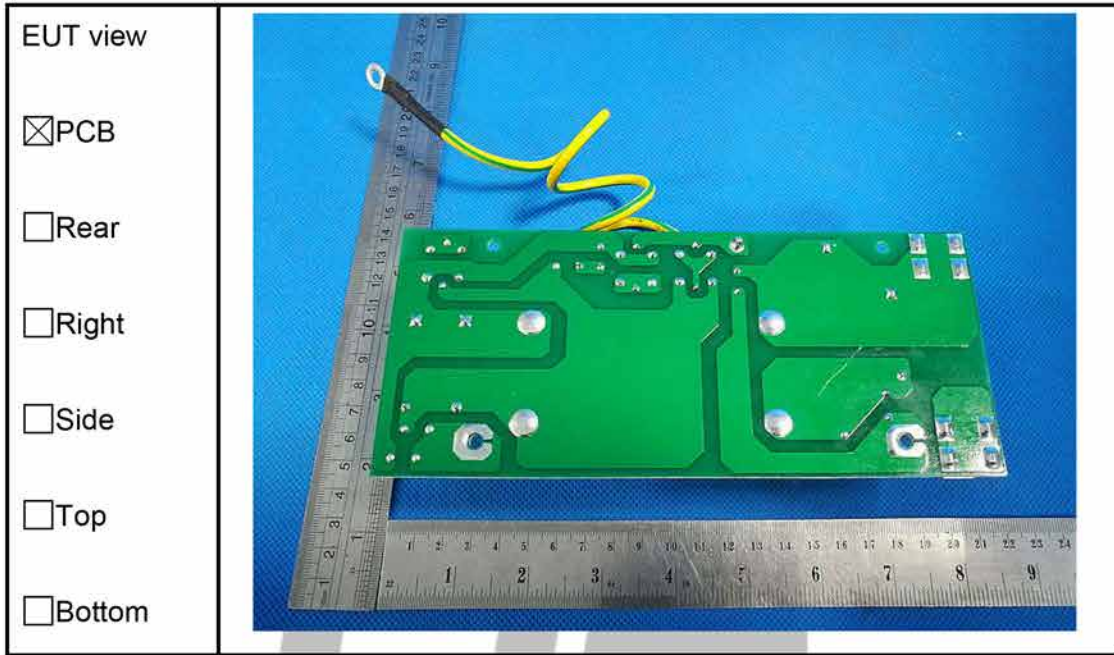


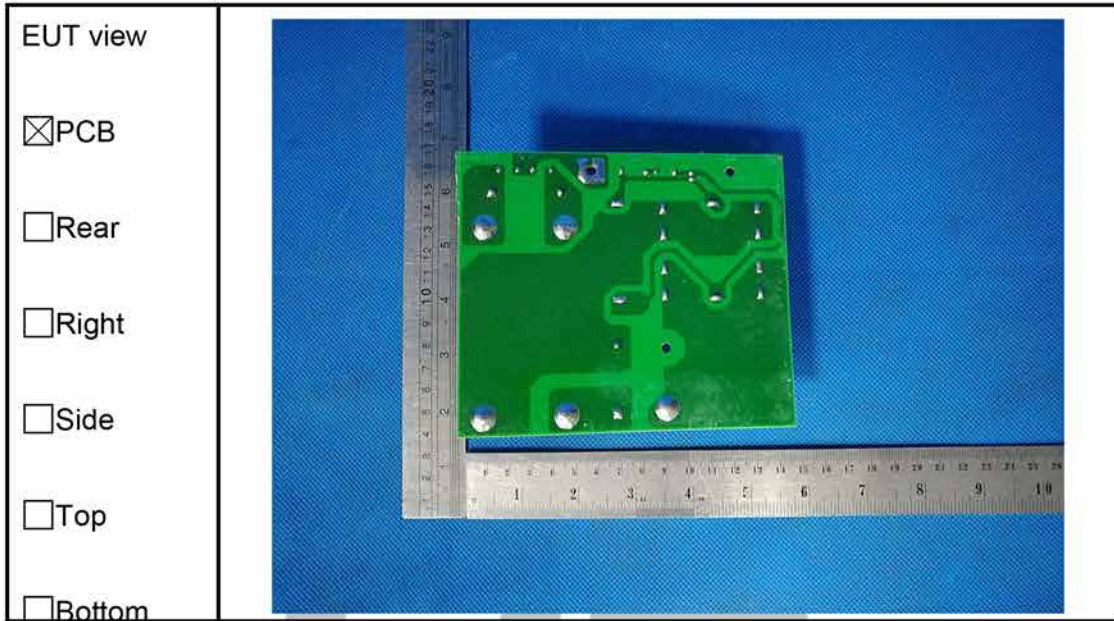


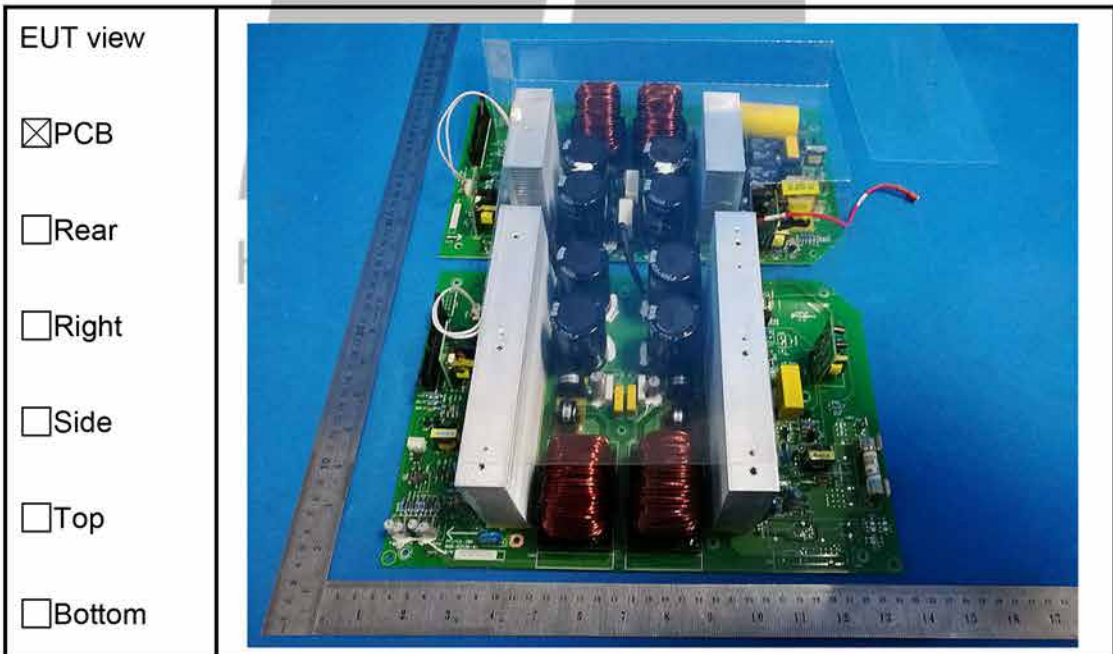
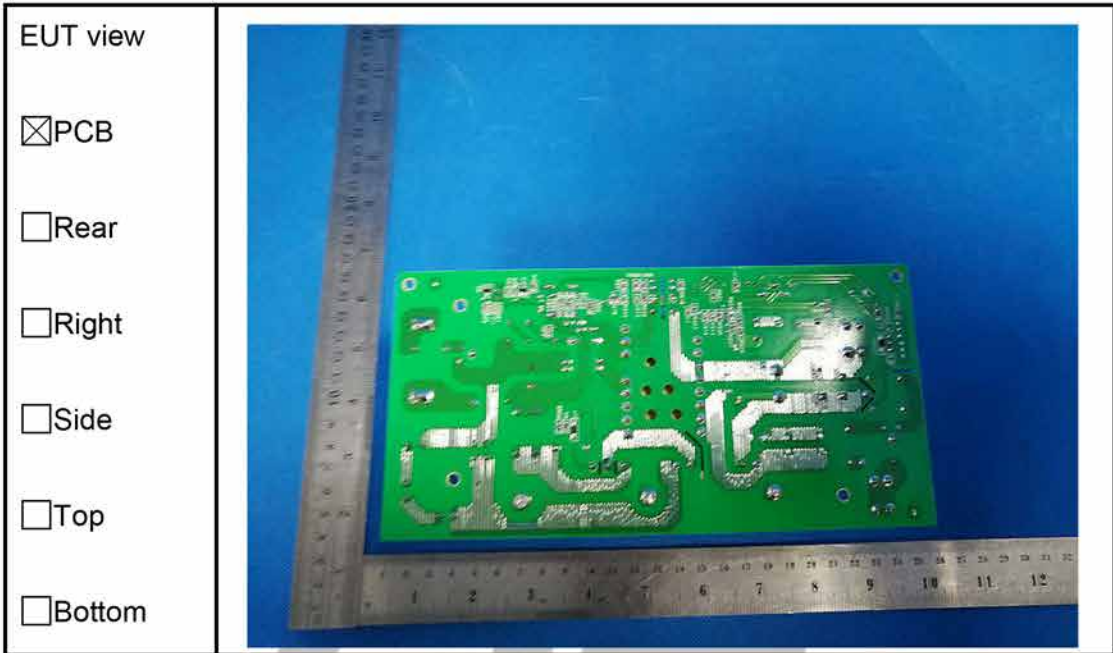


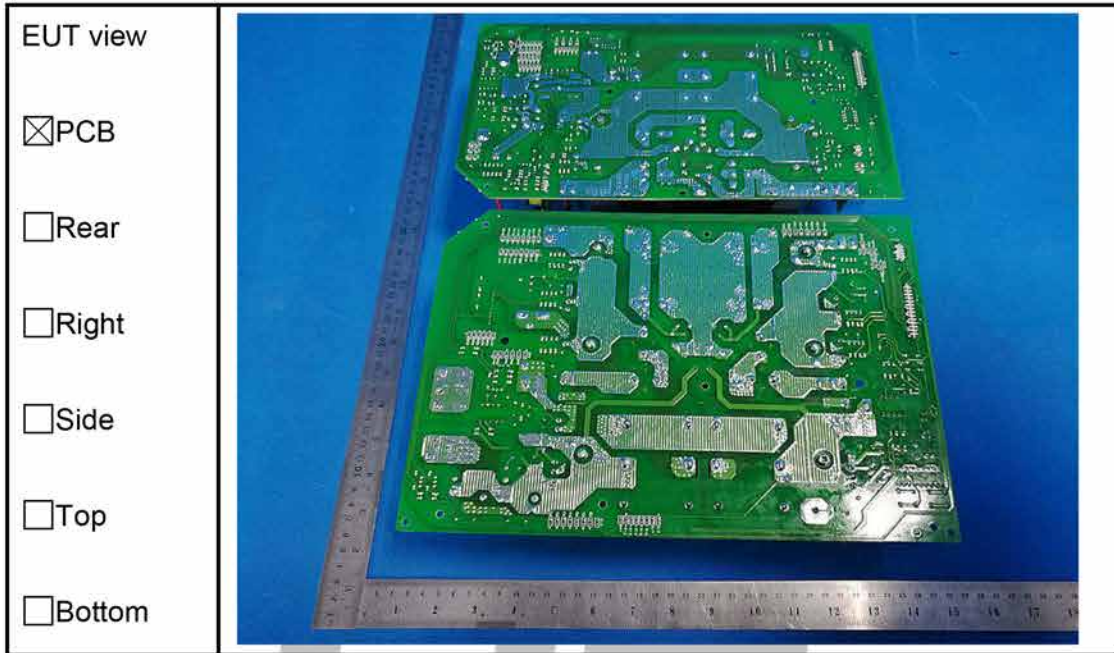












----- End of Report -----