TEST REPORT

Report No.:	NTEK-2012NT1122106S
Product:	150W Enclosed Power Supply
Model No.:	ESE150-12M, ESE150-24M, ESE150-36M, ESE150-48M
Applicant:	Eaglerise Electronics (Foshan) Co., Ltd.
Address:	No. 4, East Huanzhen Road, Beijiao, Shunde, Foshan, Guangdong, 528000, China
Issued by:	Shenzhen NTEK Testing Technology Co., Ltd.
Lab Location:	1/F, Building E, Fenda Science Park, Sanwei Community, Xixiang Street, Bao'an District, Shenzhen P.R. China
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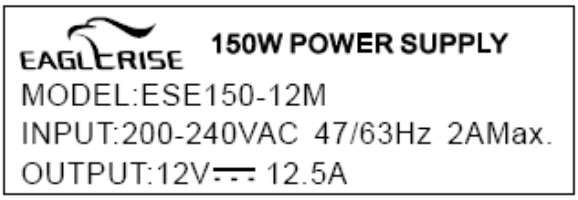
TEST REPORT

IEC/EN 60950-1
Information technology equipment – Safety – Part 1: General requirements

Report Number. .....:	NTEK-2012NT1122106S	
Tested by (name + signature) .....:	Coco Li	Coco Li
Approved by (name + signature).....:	Ethan Chen	Ethan chen
Date of issue.....:	November 29, 2012	
Total number of pages	47 pages	
Testing Laboratory.....:	Shenzhen NTEK Testing Technology Co., Ltd.	
Address .....:	1/F, Building E, Fenda Science Park, Sanwei Community, Xixiang Street, Bao'an District, Shenzhen P.R. China	
Applicant's name.....:	Eaglerise Electronics (Foshan) Co., Ltd.	
Address .....:	No. 4, East Huanzhen Road, Beijiao, Shunde, Foshan, Guangdong, 528000, China	
Manufacturer's name……..:	(Same as above)	
Test specification:		
Standard .....:	☐ IEC 60950-1:2005 (2nd Edition) + A1:2009 ☒ EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011	
Test procedure .....:	CE-LVD	
Non-standard test method……..:	N/A	
Test Report Form No.....:	IECEN60950-1/V0	
Test Report Form(s) Originator .....:	NTEK	
Master TRF.....:	2010-06	

Test item description .....:	150W Enclosed Power Supply
Model/Type reference .....:	ESE150-12M, ESE150-24M, ESE150-36M, ESE150-48M
Ratings .....:	input: AC 200-240V, 47/63Hz, 2A output: 12V⎓, 12.5A

Copy of marking plate



Test item particulars .....:	
Equipment mobility .....:	[] movable [] hand-held [] transportable [] stationary [×]for building-in [] direct plug-in
Connection to the mains.....:	[] pluggable equipment [] type A [] type B [×] permanent connection [] detachable power supply cord [] non-detachable power supply cord [] not directly connected to the mains
Operating condition .....:	[×] continuous [] rated operating / resting time:
Access location .....:	[×] operator accessible [] restricted access location
Over voltage category (OVC) .....:	[] OVC I [×] OVC II [] OVC III [] OVC IV [] other:
Mains supply tolerance (%) or absolute mains supply values .....:	N/A
Tested for IT power systems .....:	[] Yes [×] No
IT testing, phase-phase voltage (V) .....:	
Class of equipment .....:	[×] Class I [] Class II [] Class III [] Not classified
Considered current rating of protective device as part of the building installlation (A) .....:	N/A
Pollution degree (PD) .....:	[] PD 1 [×] PD 2 [] PD 3
IP protection class .....:	IPX0
Altitude during operation (m) .....:	<2000m
Altitude of test laboratory (m) .....:	<2000m
Possible test case verdicts:	
- test case does not apply to the test object .....:	N/A (or N)
- test object does meet the requirement .....:	P (Pass)
- test object does not meet the requirement.....:	F (Fail)

Testing .....:	
Date of receipt of test item .....:	November 22, 2012
Date(s) of performance of tests .....:	November 22, 2012 to November 29, 2012

General remarks:

The test results presented in this report relate only to the object tested.
This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.
"(see Enclosure #)" refers to additional information appended to the report.
"(see appended table)" refers to a table appended to the report.

Throughout this report a ☐ comma / ☒ point is used as the decimal separator.

General product information:

Brief description of the test sample:

The equipment is a building-in type switching power supply for general use in information technology equipment. All models are exactly the same except for model designation.

EUT is just a building-in component, it should be installed by qualified service personnel only. After installation in the end system, compliance shall be investigated again and the final system assembly should comply with the relevant standards still.

Power cord set not provided, should be investigated with the final system.

Max. operating temperature (Tma) was 40°C, declared by the manufacturer.

Abbreviations used in the report:

- Normal conditions	N.C.	- single fault conditions	S.F.C
- functional insulation	OP	- basic insulation	BI
- double insulation	DI	- supplementary insulation	SI
- between parts of opposite polarity	BOP	- reinforced insulation	RI

Indicate used abbreviations (if any):

IEC/EN 60950-1			
Clause	Requirment + Test	Result + Remark	Verdict
1	**GENERAL**		P
1.5	**Components**		P
1.5.1	General	(see appended table 1.5.1)	P
	Comply with IEC 60950-1 or relevant component standard	Components that were found to affect safety aspects comply with the requirements of this standard or within the safety aspects of the relevant IEC component standards.	P
1.5.2	Evaluation and testing of components	Components that are certified 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	No thermal controls provided.	N
1.5.4	Transformers	Transformer is suitable for its intended application and comply with the relevant requirements of the standard and particularly Annex C.	P
1.5.5	Interconnecting cables	Compliance has to be evaluated for the final system.	N
1.5.6	Capacitors bridging insulation	Between line and ground: Y capacitors according to IEC 60384-14	P
1.5.7	Resistors bridging insulation	No bridging resistors.	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	TN systems only.	N
1.5.9	Surge suppressors		N
1.5.9.1	General		N
1.5.9.2	Protection of VDRs		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

IEC/EN 60950-1			
Clause	Requirment + Test	Result + Remark	Verdict
1.6	**Power interface**		P
1.6.1	AC power distribution systems	TN systems only.	P
1.6.2	Input current	Highest load according to 1.2.2.1 for this equipment is the operation of the equipment at maximum specified DC load. Results see appended table.	P
1.6.3	Voltage limit of hand-held equipment	This appliance is not a hand-held equipment.	N
1.6.4	Neutral conductor	Basic insulation and components for rated voltage between earthed parts and primary phases.	P

1.7	**Marking and instructions**		P
1.7.1	Power rating and identification markings	See below	P
1.7.1.1	Power rating marking		P
	Multiple mains supply connections.....:		N
	Rated voltage(s) or voltage range(s) (V) .....:	200-240V	P
	Symbol for nature of supply, for d.c. only.....:		P
	Rated frequency or rated frequency range (Hz) ...:	47/63Hz	P
	Rated current (mA or A) .....:	2A	N
1.7.1.2	Identification markings		P
	Manufacturer's name or trade-mark or identification mark .....:	See marking plate	P
	Model identification or type reference .....:	See marking plate	P
	Symbol for Class II equipment only .....:		N
	Other markings and symbols .....:	Additional symbols or marking does not give rise to misunderstanding.	P
1.7.2	Safety instructions and marking	Installation instruction with directions to maintain the requirements of IEC 60950 with installation in end system. Included are directions regarding the maximum output, maximum output ratings.	P
1.7.2.1	General		P
1.7.2.2	Disconnect devices		N
1.7.2.3	Overcurrent protective device		N

IEC/EN 60950-1			
Clause	Requirment + Test	Result + Remark	Verdict
1.7.2.4	IT power distribution systems	For TN system only.	N
1.7.2.5	Operator access with a tool		N
1.7.2.6	Ozone		N
1.7.3	Short duty cycles	Continuous operation.	N
1.7.4	Supply voltage adjustment ..... :	Full range voltage design, no necessary adjustment.	N
	Methods and means of adjustment; reference to installation instructions ..... :		N
1.7.5	Power outlets on the equipment ..... :	No standard power outlet.	N
1.7.6	Fuse identification (marking, special fusing characteristics, cross-reference) ..... :	Marking adjacent to fuses on PCB: F5AL 250V	P
1.7.7	Wiring terminals	See below	N
1.7.7.1	Protective earthing and bonding terminals ..... :		P
1.7.7.2	Terminals for a.c. mains supply conductors	Protective bonding terminal marking if shown adjacent to hole of PE screw according to IEC 60417-1-IEC-5019.	P
1.7.7.3	Terminals for d.c. mains supply conductors	No such terminals provided.	N
1.7.8	Controls and indicators		P
1.7.8.1	Identification, location and marking ..... :		P
1.7.8.2	Colours ..... :		P
1.7.8.3	Symbols according to IEC 60417..... :		P
1.7.8.4	Markings using figures ..... :		N
1.7.9	Isolation of multiple power sources ..... :	Single power source.	N
1.7.10	Thermostats and other regulating devices ..... :	Not used.	N
1.7.11	Durability	After rubbing test there was no damage to the label. The marking on the label did not fade. There was neither curling nor lifting of the label edge.	P
1.7.12	Removable parts	No removable parts provided.	N
1.7.13	Replaceable batteries ..... :	No battery.	N
	Language(s) ..... :		—
1.7.14	Equipment for restricted access locations ..... :	Not limited for use in restricted access locations.	N

2	**PROTECTION FROM HAZARDS**	P
2.1	Protection from electric shock and energy hazards	P

IEC/EN 60950-1			
Clause	Requirment + Test	Result + Remark	Verdict
2.1.1	Protection in operator access areas	The accessibility of hazardous or ELV are prevented with in the final system. The inspection with test pin and test finger should therefore be conducted with the approval of the end system. Installation instruction requires, that the requirements of the IEC 60950-1 must be observed to the installation.	N
2.1.1.1	Access to energized parts		N
	Test by inspection .....:		N
	Test with test finger (Figure 2A) .....:		N
	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		N
	Working voltage (Vpeak or Vrms); minimum distance through insulation (mm)		—
2.1.1.4	Access to hazardous voltage circuit wiring	Compliance shall be investigated in the final system assembly.	N
2.1.1.5	Energy hazards .....:	The energy of each output may exceed 240VA between two points of the output connector of secondary circuit. However, prevention of bridging those points shall be prevented in the end system. Results see appended table 2.1.1.5.	N
2.1.1.6	Manual controls		N
2.1.1.7	Discharge of capacitors in equipment		N
	Measured voltage (V); time-constant (s) .....:		—
2.1.1.8	Energy hazards – d.c. mains supply		N
	a) Capacitor connected to the d.c. mains supply .:		N
	b) Internal battery connected to the d.c. mains supply .....:		N
2.1.1.9	Audio amplifiers .....:	No audio amplifier.	N
2.1.2	Protection in service access areas	This equipment is for building-in. compliance shall be investigated in the final system assembly.	N
2.1.3	Protection in restricted access locations		N

IEC/EN 60950-1			
Clause	Requirment + Test	Result + Remark	Verdict
2.2	**SELV circuits**		P
2.2.1	General requirements	See below.	P
2.2.2	Voltages under normal conditions (V) .....:	Between any conductor of the SELV circuit 42.4V peak or 60Vd.c. are not exceeded.	P
2.2.3	Voltages under fault conditions (V) .....:	Single fault did not cause excessive voltage in accessible SELV circuits. Limits of 42.4V peak, or 60V d.c. for longer than 0.2s. the voltage shall not exceed 71V peak and 120Vd.c. Results see appended table 2.2.2.	P
2.2.4	Connection of SELV circuits to other circuits .....:	No direct connection between SELV and any primary circuits inside. However, compliance has to be evaluated for the final system.	P
2.3	**TNV circuits** *No 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		N
	Insulation employed.....:		—
2.3.5	Test for operating voltages generated externally		N
2.4	**Limited current circuits** *the output may be connected to accessible parts in the final system assembly but didn't connect to the primary circuit by inside bridging Y capacitor.*		N
2.4.1	General requirements		N
2.4.2	Limit values		N
	Frequency (Hz).....:	(see appended table)	—

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Clause	Requirment + Test	Result + Remark	Verdict
	Measured current (mA) .....:		—
	Measured voltage (V) .....:		—
	Measured circuit capacitance (nF or μF).....:		—
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		N
	d) Overcurrent protective device limited output		N
	Max. output voltage (V), max. output current (A), max. apparent power (VA) .....:	(see appended table 2.5)	—
	Current rating of overcurrent protective device (A) .:		—
	Use of integrated circuit (IC) current limiters		N
2.6	**Provisions for earthing and bonding**		P
2.6.1	Protective earthing		P
2.6.2	Functional earthing		N
2.6.3	Protective earthing and protective bonding conductors		P
2.6.3.1	General		N
2.6.3.2	Size of protective earthing conductors	No power cord provided.	N
	Rated current (A), cross-sectional area (mm^2), AWG .....:		—
2.6.3.3	Size of protective bonding conductors	Evaluation by test. Rated current below 16A.	N
	Rated current (A), cross-sectional area (mm^2), AWG .....:		—
	Protective current rating (A), cross-sectional area (mm^2), AWG .....:		—
2.6.3.4	Resistance of earthing conductors and their terminations; resistance (Ω), voltage drop (V), test current (A), duration (min) .....:		P
2.6.3.5	Colour of insulation.....:		N
2.6.4	Terminals		P
2.6.4.1	General		P

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Clause	Requirment + Test	Result + Remark	Verdict
2.6.4.2	Protective earthing and bonding terminals	The PE pin of appliance inlet considered as protective earthing termianal. It connected to the metal chassis first.	P
	Rated current (A), type, nominal thread diameter (mm) .....:	4/6A, Φ2.9mm. Evaluation by test in 2.6.3.4.	—
2.6.4.3	Separation of the protective earthing conductor from protective bonding conductors	Separate wiring terminal provided.	P
2.6.5	Integrity of protective earthing	See below.	P
2.6.5.1	Interconnection of equipment	The equipment has its own earthing connection. Any other units interconnected to it via the DC output connector shall provide SELV only.	P
2.6.5.2	Components in protective earthing conductors and protective bonding conductors	No switch or overcurrent protective device in protective eatthing or protective bonding conductor.	P
2.6.5.3	Disconnection of protective earth	It is not possible to disconnect earth without disconnecting mains as an appliacne inlet is used.	P
2.6.5.4	Parts that can be removed by an operator	Ditto.	N
2.6.5.5	Parts removed during servicing	Ditto.	N
2.6.5.6	Corrosion resistance	All part comprising the connectrion are plated and metal to metal with comply with annex J.	P
2.6.5.7	Screws for protective bonding	Only ISO thread screw used in meta chassis for protective bonding. No self-tapping or spaced thread screws.	P
2.6.5.8	Reliance on telecommunication network or cable distribution system	No TNV	N

2.7	**Overcurrent and earth fault protection in primary circuits**		P
2.7.1	Basic requirements	Equipment relies on 16A rated fuse or circuit breaker of the wall outlet installation protection of the building installation in regard to L to N short circuit. Over current protection is provided by one built-in fuse.	P

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Clause	Requirment + Test	Result + Remark	Verdict
	Instructions when protection relies on building installation	Not applicable for pluggable equipment type A.	N
2.7.2	Faults not simulated in 5.3.7		P
2.7.3	Short-circuit backup protection	Pluggable equipment type A, the building installation is considered as providing short circuit backup protection.	P
2.7.4	Number and location of protective devices .....:	Over current protection by one built-in fuse	P
2.7.5	Protection by several devices	Single fuse only.	N
2.7.6	Warning to service personnel.....:	This equipment is for building-in. Compliance shall be evaluated in the final system.	N
2.8	**Safety interlocks** *No safety interlock.*		N
2.8.1	General principles		N
2.8.2	Protection requirements		N
2.8.3	Inadvertent reactivation		N
2.8.4	Fail-safe operation		N
	Protection against extreme hazard		N
2.8.5	Moving parts		N
2.8.6	Overriding		N
2.8.7	Switches, relays and their related circuits		N
2.8.7.1	Separation distances for contact gaps and their related circuits (mm) .....:		N
2.8.7.2	Overload test		N
2.8.7.3	Endurance test		N
2.8.7.4	Electric strength test	(see appended table 5.2)	N
2.8.8	Mechanical actuators		N
2.9	**Electrical insulation**		
2.9.1	Properties of insulating materials	Natural rubber, asbestos or hygroscopic materials are not used.	P
2.9.2	Humidity conditioning	48h	P
	Relative humidity (%), temperature (°C) .....:	25°C, 95%	—

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Clause	Requirment + Test	Result + Remark	Verdict
2.9.3	Grade of insulation	The adequate levels of safety insulation is provided and maintained to comply with the requirements of this standard.	P
2.9.4	Separation from hazardous voltages	SELV output circuit separated from hazardous voltages by double insulation or reinforced insulation	P
	Method(s) used .....:		—
2.10	**Clearances, creepage distances and distances through insulation**		P
2.10.1	General	See 2.10.3, 2.10.4, 2.10.5.	P
2.10.1.1	Frequency .....:		P
2.10.1.2	Pollution degrees .....:	Pollution degree 2	P
2.10.1.3	Reduced values for functional insualtion	See cl. 5.3.4	P
2.10.1.4	Intervening unconnected conductive parts		N
2.10.1.5	Insulation with varying dimensions		N
2.10.1.6	Special separation requirements		N
2.10.1.7	Insulation in circuits generating starting pulses		N
2.10.2	Determination of working voltage	(see appended table 2.10.2)	P
2.10.2.1	General	Requirements considered	P
2.10.2.2	RMS working voltage	Vrms=235 V	P
2.10.2.3	Peak working voltage	Vpeak=512V	P
2.10.3	Clearances	See below, Annex G was not considered.	P
2.10.3.1	General		P
2.10.3.2	Mains transient voltages	Overvoltage Category II is considered	P
	a) AC mains supply .....:	2500Vpk considered.	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	See clause 5.3.4 for functional insulation	N
2.10.3.5	Clearances in circuits having starting pulses		N
2.10.3.6	Transients from a.c. mains supply .....:		N
2.10.3.7	Transients from d.c. mains supply .....:		N

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Clause	Requirment + Test	Result + Remark	Verdict
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 suplply		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	(see appended table 2.10.3 and 2.10.4)	P
2.10.4.1	General		P
2.10.4.2	Material group and caomparative tracking index		P
	CTI tests .....:	Material Group IIIb (100≤CTI< 175)	—
2.10.4.3	Minimum creepage distances		P
2.10.5	Solid insulation		P
2.10.5.1	General	See below.	P
2.10.5.2	Distances through insulation	See table 2.10.5	P
2.10.5.3	Insulating compound as solid insulation		N
2.10.5.4	Semiconductor devices		N
2.10.5.5.	Cemented joints		N
2.10.5.6	Thin sheet material – General		P
2.10.5.7	Separable thin sheet material		P
	Number of layers (pcs) .....:		—
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		P
	Electric strength test	(see appended table 5.2)	—
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, supplemetary, reinforced insulation .....:		N
	c) Compliance with Annex U .....:		P
	Two wires in contact inside wound component; angle between 45° and 90° .....:		P
2.10.5.13	Wire with solvent-based enamel in wound components		N

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Clause	Requirment + Test	Result + Remark	Verdict
	Electric strength test		—
	Routine test		N
2.10.5.14	Additional insulation in wound components		N
	Working voltage .....:		N
	- Basic insulation not under stress .....:		N
	- Supplemetary, reinforced insulation .....:		N
2.10.6	Construction of printed boards		P
2.10.6.1	Uncoated printed boards		P
2.10.6.2	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
	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	Not used.	N
2.10.10	Test for Pollution Degree 1 environment and insulating compound		N
2.10.11	Tests for semiconductor devices and cemented joints	2.10.5.4 a) and 2.10.5.5 c) not apply	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		P
3.1.2	Protection against mechanical damage		N
3.1.3	Securing of internal wiring		N
3.1.4	Insulation of conductors		N
3.1.5	Beads and ceramic insulators	Not used	N
3.1.6	Screws for electrical contact pressure	Screws engage at least two complete threads into metal insert. No screws of insulating material used.	P

IEC/EN 60950-1			
Clause	Requirment + Test	Result + Remark	Verdict
3.1.7	Insulating materials in electrical connections		N
3.1.8	Self-tapping and spaced thread screws		P
3.1.9	Termination of conductors		N
	10 N pull test		N
3.1.10	Sleeving on wiring		N
3.2	**Connection to a mains supply** *building-in component, compliance has to be evaluated again in the final system.*		N
3.2.1	Means of connection		N
3.2.1.1	Connection to an a.c. mains supply		N
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		N
3.2.5.1	AC power supply cords		N
	Type ..... :		—
	Rated current (A), cross-sectional area (mm^2), AWG ..... :		—
3.2.5.2	DC power supply cords		N
3.2.6	Cord anchorages and strain relief		N
	Mass of equipment (kg), pull (N) ..... :		—
	Longitudinal displacement (mm) ..... :		—
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** *No wiring terminals for supply connection.*		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

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Clause	Requirment + Test	Result + Remark	Verdict
	Rated current (A), cord/cable type, cross-sectional area (mm^2).....:		—
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
3.4	**Disconnection from the mains supply**		P
3.4.1	General requirement		P
3.4.2	Disconnect devices		P
3.4.3	Permanently connected equipment	Not permanently connected equipment.	N
3.4.4	Parts which remain energized	No parts remain energized after plug removed.	P
3.4.5	Switches in flexible cords		N
3.4.6	Number of poles - single-phase and d.c. equipment		N
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	Direct pulg-in, no power cord used.	N
3.4.10	Interconnected equipment	No interconnections using hazardous voltages.	N
3.4.11	Multiple power sources		N
3.5	**Interconnection of equipment**		P
3.5.1	General requirements	See below.	P
3.5.2	Types of interconnection circuits .....:	SELV circuits and limited current circuits	P
3.5.3	ELV circuits as interconnection circuits	No ELV interconnection.	N
3.5.4	Data ports for additional equipment		N
4	**PHYSICAL REQUIREMENTS**		N
4.1	Stability *Eqiupment is for building-in . Compliance shall be evaluated for the final system.*		N
	Angle of 10°		N
	Test force (N) .....:		N

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Clause	Requirment + Test	Result + Remark	Verdict
4.2	**Mechanical strength**		P
4.2.1	General		P
	Rack-mounted equipment.	(see Annex DD)	N
4.2.2	Steady force test, 10 N	Built-in unit, compliance has to be evaluated in the final assembly. However, after tests, unit complied with the requirement of sub-clauses 2.1.1, 2.6.1 and 2.10.	P
4.2.3	Steady force test, 30 N	30N applied to metal chassis.	P
4.2.4	Steady force test, 250 N	The unit is for building-in. compliance has to be evaluated in the final system. However, a rigid metal construction was provided at all sides and 250N test applied to inlet side.	N
4.2.5	Impact test	The unit is for building-in, it has to be evaluated in the final system assembly.	N
	Fall test		N
	Swing test		N
4.2.6	Drop test; height (mm) .....:		N
4.2.7	Stress relief test		N
4.2.8	Cathode ray tubes	No CRT provided.	N
	Picture tube separately certified .....:		N
4.2.9	High pressure lamps	No high pressure lamps provided.	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	Building-in component. Compliance must be evaluated for the final system. However no sharp edges or corners provided at the chassis.	N
4.3.2	Handles and manual controls; force (N) ..... :	No handles or manual controls provided.	N
4.3.3	Adjustable controls	Full range voltage design, no controls provided.	N

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Clause	Requirment + Test	Result + Remark	Verdict
4.3.4	Securing of parts	Electrical and mechanical connections can be expected to with standard usual mechanical stress. For the protection of wiring solder pins and mechanical clamping terminals were used.	P
4.3.5	Connection by plugs and sockets		N
4.3.6	Direct plug-in equipment	Not direct plug-in equipment	N
	Torque .....:		—
	Compliance with the relevant mains plug standard .....:		N
4.3.7	Heating elements in earthed equipment	No heating elements provided.	N
4.3.8	Batteries	No batteries provided.	N
	- Overcharging of a rechargeable battery		N
	- 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	No oil or grease provided.	N
4.3.10	Dust, powders, liquids and gases	The equipment in intended use not considered to be exposed to dust, powders, liquids and gases.	P
4.3.11	Containers for liquids or gases	No container for liquids or gases provided.	N
4.3.12	Flammable liquids .....:	No flammable liquids provided.	N
	Quantity of liquid (l) .....:		N
	Flash point (°C) .....:		N
4.3.13	Radiation		P
4.3.13.1	General	No risk due to radiation.	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	No UV radiation	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 laser diodes)		N
	Laser class .....:		—

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Clause	Requirment + Test	Result + Remark	Verdict
4.3.13.5.2	Light emitting diodes (LEDs)		N
4.3.13.6	Other types .....:		N

4.4	**Protection against hazardous moving parts** *No 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	(see Annex EE)	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
	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		P
	Normal load condition per Annex L .....:		—
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 .....:	No thermoplastic material at hazardous voltages.	N

4.6	**Openings in enclosures** *Building-in equipment. Compliance shall be investigated for the final system.*		N
4.6.1	Top and side openings	The inlet side intended to be exposed to user. Therefore side opening of fan guard exposed to user, no hazard parts in vertical 5° projection area. Other openings have to be evaluated for the final assembly.	N
	Dimensions (mm) .....:		—

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Clause	Requirment + Test	Result + Remark	Verdict
4.6.2	Bottoms of fire enclosures	Compliance has to be investigated for the end system.	N
	Construction of the bottomm, dimensions (mm) .:		—
4.6.3	Doors or covers in fire enclosures		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	Compliance has to be demonstrated for the final equipment.	N
	Method 1, selection and application of components wiring and materials	Components are selected with	P
	Method 2, application of all of simulated fault condition tests	See above.	N
4.7.2	Conditions for a fire enclosure	See below.	N
4.7.2.1	Parts requiring a fire enclosure	With having the following parts: ♦ components in primary ♦ components in secondary (not supplied by LPS) ♦ insulated wiring The fire enclosure is required. However, with this equipment for building-in, the meeting of the requirements has to be observed during the assembly into the final system.	N
4.7.2.2	Parts not requiring a fire enclosure	Ditto	N
4.7.3	Materials		P
4.7.3.1	General	Equipment is for building-in compliance shall be evaluated for the final system. However, the enclosure is made of metal.	P
4.7.3.2	Materials for fire enclosures	Ditto.	P

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Clause	Requirment + Test	Result + Remark	Verdict
4.7.3.3	Materials for components and other parts outside fire enclosures	See sub-clause 4.7.2.	N
4.7.3.4	Materials for components and other parts inside fire enclosures	Internal components except small parts are V-2 or better.	P
4.7.3.5	Materials for air filter assemblies	No air filter assemblies.	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	See sub-clauses 5.1.2 to 5.1.6.	N
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	Equipment of figure 5A used.	P
5.1.4	Application of measuring instrument	Using measuring instrument in annex D.	P
5.1.5	Test procedure	The touch current was measured from primary to PE terminal (earth opened), and from input to output of main PCB. However, compliance shall be evaluated for the final system.	P
5.1.6	Test measurements	See below.	P
	Supply voltage (V) .....:	See appended table 5.1.6.	—
	Measured touch current (mA) .....:		—
	Max. allowed touch current (mA) .....:		—
	Measured protective conductor current (mA) .....:		—
	Max. allowed protective conductor current (mA)...:		—
5.1.7	Equipment with touch current exceeding 3,5 mA		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	No TNV circuits.	N

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Clause	Requirment + Test	Result + Remark	Verdict
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	(see appended table 5.2)	P
5.2.2	Test procedure		P
5.3	**Abnormal operating and fault conditions**		P
5.3.1	Protection against overload and abnormal operation		P
5.3.2	Motors	No motor	N
5.3.3	Transformers	With the shorted and overload output of the transformers, no high temperature of the transformer was recorded. Results of the short-circuit tests see appended table 5.3 and Annex C.	P
5.3.4	Functional insulation.....:	Method c). Test results see appended table 5.3.	P
5.3.5	Electromechanical components	No electromechanical component provided.	N
5.3.6	Audio amplifiers in ITE .....:	No audio amplifier.	N
5.3.7	Simulation of faults	Results see appended table.	P
5.3.8	Unattended equipment	None of the listed components was provided.	N
5.3.9	Compliance criteria for abnormal operating and fault conditions	No fire propagated beyond the equipment. No molten metal was emitted. Electric Strength tests performed after abnormal and fault tests.	P
5.3.9.1	During the tests	No fire, emission of molten metal or deformation was noted during the tests.	P

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Clause	Requirment + Test	Result + Remark	Verdict
5.3.9.2	After the tests	Electric Strength tests performed after abnormal and fault tests.	P
6	**CONNECTION TO TELECOMMUNICATION NETWORKS** *compliance has to be evaluated for the end system*		N
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	(see appended table 5.2)	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	(see appended table 5.2)	N
6.2.2.2	Steady-state test	(see appended table 5.2)	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	(see appended table 5.2)	N
7.4.3	Impulse test	(see appended table 5.2)	N

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Clause	Requirment + Test	Result + Remark	Verdict
A	**ANNEX A, TESTS FOR RESISTANCE TO HEAT AND FIRE**		N
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 ..... :		—
	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 ..... :		—
	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		
A.3.3	Compliance criterion		N

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Clause	Requirment + Test	Result + Remark	Verdict
B	**ANNEX B, MOTOR TESTS UNDER ABNORMAL CONDITIONS (see 4.7.2.2 and 5.3.2)**		N
B.1	General requirements		N
	Position .....:		—
	Manufacturer .....:		—
	Type .....:		—
	Rated values .....:		—
B.2	Test conditions		N
B.3	Maximum temperatures	(see appended table 5.3)	N
B.4	Running overload test	(see appended table 5.3)	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	(see appended table 5.3)	N
B.9	Test for three-phase motors	(see appended table 5.3)	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 .....:	Refer to appended table 1.5.1	—
	Type .....:	Refer to appended table 1.5.1	—
	Rated values .....:	Class B	—
	Method of protection .....:	Circuit protection or fuse protection.	—

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Clause	Requirment + Test	Result + Remark	Verdict
C.1	Overload test	(See appended table 5.3)	P
C.2	Insulation	(See appended table "2.10.3 and 2.10.4", 5.2 & C.2)	P
	Protection from displacement of windings .....:		P
D	**ANNEX D, MEASURING INSTRUMENTS FOR TOUCH-CURRENT TESTS (see 5.1.4)**		P
D.1	Measuring instrument	Figure D.1 used	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)**		P

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Clause	Requirment + Test	Result + Remark	Verdict
	Metal(s) used ..... :		—
K	**ANNEX K, 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	(see appended table 5.3)	N
L	**ANNEX L, NORMAL LOAD CONDITIONS FOR SOME TYPES OF ELECTRICAL BUSINESS EQUIPMENT (see 1.2.2.1 and 4.5.2)**		P
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	Continuous operation at rated output load.	P
M	**ANNEX M, 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

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Clause	Requirment + Test	Result + Remark	Verdict
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 Clause G.5)**		N
N.1	ITU-T impulse test generators		N
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
		See separate test report	—
U	**ANNEX U, INSULATED WINDING WIRES FOR USE WITHOUT INTERLEAVED INSULATION (see 2.10.5.4)**		P
		See separate test report	—
V	**ANNEX V, AC POWER DISTRIBUTION SYSTEMS (see 1.6.1)**		P
V.1	Introduction	See below.	P
V.2	TN power distribution systems	TN power considered.	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

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Clause	Requirment + Test	Result + Remark	Verdict
W.2.1	Isolation		N
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	Considered.	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

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Clause	Requirment + Test	Result + Remark	Verdict
EE.3	Inadvertent reactivation test.....:		N
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

IEC/EN 60950-1			
Clause	Requirment + Test	Result + Remark	Verdict

EN 60950-1:2006 – COMMON MODIFICATIONS		
Contents	Add the following annexes: Annex ZA (normative) Normative references to international publications with their corresponding European publications Annex ZB (normative) Special national conditions Annex ZC (informative) A-deviations	P
General	Delete all the “country” notes in the reference document 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	P
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
1.5.1	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	P
1.7.2.1	Add the following NOTE: NOTE Z1 In addition, the instructions shall include, as far as applicable, a warning that excessive sound pressure from earphones and headphones can cause hearing loss	N
2.7.1	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;	N

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Clause	Requirment + Test	Result + Remark	Verdict
	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. 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.		
2.7.2	This subclause has been declared 'void'.		P
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	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". In Table 3B, replace the first four lines by the following: | Up to and including 6 | | 0,75 [a] | | Over 6 up to and including 10 | (0,75) [b] 1,0 | | Over 10 up to and including 16 | (1,0) [c] 1,5 | In the conditions applicable to Table 3B delete the words "in some countries" in condition [a]. In NOTE 1, applicable to Table 3B, delete the second sentence.		N
3.3.4	In Table 3D, delete the fourth line: conductor sizes for 10 to 13 A, and replace with the following: | Over 10 up to and including 16 | 1,5 to 2,5 | 1,5 to 4 | Delete the fifth line: conductor sizes for 13 to 16 A.		N
4.3.13.6	Add the following NOTE: NOTE Z1 Attention is drawn to 1999/519/EC: Council Recommendation on the limitation of exposure of the general public to electromagnetic fields 0 Hz to 300 GHz. Standards taking into account this Recommendation which demonstrate compliance with the applicable EU Directive are indicated in the OJEC.		N
Annex H	Replace the last paragraph of this annex by: At any point 10 cm from the surface of the OPERATOR ACCESS AREA, the dose rate shall not exceed 1 µSv/h (0,1 Mr/h) (see NOTE). Account is taken of the background level. Replace the notes as follows: NOTE These values appear in Directive 96/29/Euratom. Delete NOTE 2.		N
Biblio-graphy	Additional EN standards.		—

ZA	NORMATIVE REFERENCES TO INTERNATIONAL PUBLICATIONS WITH THEIR CORRESPONDING EUROPEAN PUBLICATIONS	—
ZB	SPECIAL NATIONAL CONDITIONS	N
1.2.4.1	In **Denmark**, 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

IEC/EN 60950-1			
Clause	Requirment + Test	Result + Remark	Verdict
1.5.7.1	In **Finland**, **Norway** and **Sweden**, resistors bridging BASIC INSULATION in CLASS I PLUGGABLE EQUIPMENT TYPE A must comply with the requirements in 1.5.7.2.		N
1.5.8	In **Norway**, 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 **Finland**, **Norway** and **Sweden**, the third dashed sentence is applicable only to equipment as defined in 6.1.2.2 of this annex.		N
1.7.2.1	In **Finland**, **Norway** and **Sweden**, 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. The marking text in the applicable countries shall be as follows: In Finland : « Laite on liitettävä suojamaadoituskoskettimilla varustettuun pistorasiaan » In Norway: “Apparatet må tilkoples jordet stikkontakt” In Sweden: “Apparaten skall anslutas till jordat uttag”		N
1.7.5	In **Denmark**, 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.		N
2.2.4	In **Norway**, for requirements see 1.7.2.1, 6.1.2.1 and 6.1.2.2 of this annex.		N
2.3.2	In **Finland**, **Norway** and **Sweden** 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 **Norway**, 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 **United Kingdom**, the current rating of the circuit shall be taken as 13 A, not 16 A.		N
2.7.1	In the **United Kingdom**, 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 **Finland**, **Norway** and **Sweden**, 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	In **Switzerland**, 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: SEV 6532-2.1991 Plug Type 15 3P+N+PE 250/400 V, 10 A SEV 6533-2.1991 Plug Type 11 L+N 250 V, 10 A SEV 6534-2.1991 Plug Type 12 L+N+PE 250 V, 10 A 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 SEV 5933-2.1998 Plug Type 21 L+N 250 V, 16 A SEV 5934-2.1998 Plug Type 23 L+N+PE 250 V, 16 A		N

IEC/EN 60950-1			
Clause	Requirment + Test	Result + Remark	Verdict
3.2.1.1	In **Denmark**, supply cords of single-phase equipment having a rated current not exceeding13 A shall be provided with a plug according to the Heavy Current Regulations, Section 107-2-D1. 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. 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.		N
3.2.1.1	In **Spain**, 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. 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. 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. If poly-phase equipment is provided with a supply cord with a plug, this plug shall be in accordance with UNE-EN 60309-2.		N
3.2.1.1	In the **United Kingdom**, 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. NOTE 'Standard plug' is defined in SI 1768:1994 and essentially means an approved plug conforming to BS 1363 or an approved conversion plug.		N
3.2.1.1	In **Ireland**, 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.		N
3.2.4	In **Switzerland**, for requirements see 3.2.1.1 of this annex.		N
3.2.5.1	In the **United Kingdom**, a power supply cord with conductor of 1,25 mm2 is allowed for equipment with a rated current over 10 A and up to and including 13 A.		N
3.3.4	In the **United Kingdom**, 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: • 1,25 mm^2 to 1,5 mm^2 nominal cross-sectional area.		N
4.3.6	In the **United Kingdom**, 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

IEC/EN 60950-1			
Clause	Requirment + Test	Result + Remark	Verdict
4.3.6	In **Ireland**, 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 **Finland**, **Norway** and **Sweden** TOUCH CURRENT measurement results exceeding 3,5 Ma r.m.s. are permitted only for the following equipment: • STATIONARY PLUGGABLE EQUIPMENT TYPE A that ○ is intended to be used in a RESTRICTED ACCESS LOCATION where equipotential bonding has been applied, for example, in a telecommunication centre; and ○ has provision for a permanently connected PROTECTIVE EARTHING CONDUCTOR; and ○ is provided with instructions for the installation of that conductor by a SERVICE PERSON; • STATIONARY PLUGGABLE EQUIPMENT TYPE B; • STATIONARY PERMANENTLY CONNECTED EQUIPMENT.		N
6.1.2.1	In **Finland**, **Norway** and **Sweden**, add the following text between the first and second paragraph of the compliance clause: If this insulation is solid, including insulation forming part of a component, it shall at least consist of either - two layers of thin sheet material, each of which shall pass the electric strength test below, or - one layer having a distance through insulation of at least 0,4 mm, which shall pass the electric strength test below. If this insulation forms part of a semiconductor component (e.g. an optocoupler), there is no distance through insulation requirement 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 - 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 - is subject to ROUTINE TESTING for electric strength during manufacturing, using a test voltage of 1,5 Kv. It is permitted to bridge this insulation with a capacitor complying with EN 132400:1994, subclass Y2. A capacitor classified Y3 according to EN 132400:1994, may bridge this insulation under the following conditions: - the insulation requirements are satisfied by having a capacitor classified Y3 as defined by EN 132400, 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; - the additional testing shall be performed on all the test specimens as described in EN 132400; - the impulse test of 2,5 Kv is to be performed before the endurance test in EN 132400, in the sequence of tests as described in EN 132400.		N

IEC/EN 60950-1			
Clause	Requirment + Test	Result + Remark	Verdict
6.1.2.2	In **Finland**, **Norway** and **Sweden**, 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 **Finland**, **Norway** and **Sweden**, 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 **Norway** and **Sweden**, there are many buildings where the screen of the coaxial cable is normally not connected to the earth in the building installation.		N
7.3	In **Norway**, for installation conditions see EN 60728-11:2005.		N
ZC	A-DEVIATIONS (informative) (EN 60950-1/A11)		N
1.5.1	**Switzerland** (Ordinance on environmentally hazardous substances SR 814.081, Annex 1.7, Mercury - Annex 1.7 of SR 814.81 applies for mercury.) Add the following: NOTE In Switzerland, switches containing mercury such as thermostats, relays and level controllers are not allowed.		N
1.7.2.1	**Germany** (Gesetz über technische Arbeitsmittel und Verbraucherprodukte (Geräte- und Produktsicherheitsgesetz – GPSG) [Law on technical labour equipment and consumer products], of 6th January 2004, Section 2, Article 4, Clause (4), Item 2). If for the assurance of safety and health certain rules during use, amending or maintenance of a technical labour equipment or readymade consumer product are to be followed, a manual in German language has to be delivered when placing the product on the market. Of this requirement, rules for use even only by SERVICE PERSONS are not exempted.		N
1.7.13	**Switzerland** (Ordinance on chemical hazardous risk reduction SR 814.81, Annex 2.15 Batteries) Annex 2.15 of SR 814.81 applies for batteries.		N
ZD	A-DEVIATIONS (informative) (EN 60950-1/A12)		N
1.3.Z1	Delete the addition of 1.3.Z1		N
1.2.3	Delete the definition 1.2.3.Z1		N
1.7.2.1	Delete NOTE Z1 and the addition for Portable Sound System		N
Zx	Protection against excessive sound pressure from personal music players *See seprated test report in accordance with EN 50332-1 or EN 50332-2 as applicable.*		N
Zx.1	General		N
	A personal music player is a portable equipment for personal use, that: − is designed to allow the user to listen to recorded or broadcast sound or video; and − primarily uses headphones or earphones that can be worn in or on or around the ears; and − allows the user to walk around while in use.		N

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Clause	Requirment + Test	Result + Remark	Verdict
	The requirements in this sub-clause are valid for music or video mode only.		N
	The requirements do not apply: - while the personal music player is connected to an external amplifier; or - while the headphones or earphones are not used. 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. The requirements do not apply to: − hearing aid equipment and professional equipment; 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.		N
Zx.2	Equipment requirements		N
Zx.3	Warning		N
	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.		N
	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.		N
Zx.4	Requirements for listening devices (headphones and earphones)		N
Zx.5	Measurement methods		N

IEC/EN 60950-1			
Clause	Requirment + Test	Result + Remark	Verdict

- Tube	(Various)	(Various)	300V, 200°C, VW-1	UL 224	UL approved

1.6.2	TABLE: Electrical data (in normal conditions)					P
U (V)	I (A)	Irated (A)	P (W)	Fuse #	Ifuse (A)	Condition/status
200V/50Hz	1.25	2	189.4	F1	1.75	Loaded with maximum normal load DC 12V, 12.5A
240V/50Hz	1.22	2	188.2	F1	1.72	Loaded with maximum normal load DC 12V, 12.5A

1

2.4.2	TABLE: limited current circuit measurement					N
Location	Voltage (V)	Current (mA)	Freq. (kHz)	Limit (mA)	Comments	

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)
Fuse Link two pins (F1)	339	240	2.0	>2.5	2.4	>2.5
Pri. Circuit to enclosure outside surface	339	240	4.0	>5mm	4.8	>5mm
Transformer Pri. Winding/Core to Sec. circuit (T1)	512	240	4.4	>5mm	4.8	>5mm
Pri. components to Sec. components (with 10N force)	512	240	4.4	6.5	4.8	6.5
Supplementary information: working voltage measured any transformer pins and between Y cap. two pins Vrms=235 V; Vpeak=512V FI: Functional insulation; BI: Basic insulation; SI: Supplementary insulation; RI: Reinforced insulation.						

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)
Transformer (T1) bobbin	512	240	3000	0.4	Min.0.6

4.3.8	TABLE: Batteries		N
The tests of 4.3.8 are applicable only when appropriate battery data is not available			--

IEC/EN 60950-1			
Clause	Requirment + Test	Result + Remark	Verdict

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		N
- Explosion of the battery		N
- Emission of flame or expulsion of molten metal		N
- Electric strength tests of equipment after completion of tests		N

4.5	TABLE: Thermal requirements		P
	Supply voltage (V) .....:	254.4V/50Hz	—
	Ambient Tmin (°C) .....:	--	—
	Ambient Tmax (°C) .....:	--	—
Maximum measured temperature T of part/at:		T (°C)	Allowed Tmax (°C)
Inductor winding		49.2	110-(40-25)=95
VR1		42.8	85-(40-25)=70
E-cap (C2)		77.4	105-(40-25)=90
E-cap (C20)		58.7	105-(40-25)=90
Winding (T1)		82.4	110-(40-25)=95
PCB near T1		77.2	130-(40-25)=115
Y-cap (CY1)		59.2	125-(40-25)=110
Y-cap (CY3)		55.1	125-(40-25)=110
Opto-coupler		55.4	100-(40-25)=85
Enclosure inside near T1		48.6	Ref.
Ambient		24.8	--

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Clause	Requirment + Test	Result + Remark	Verdict

Temperature T of winding:	t1 (°C)	R1 (Ω)	t2 (°C)	R2 (Ω)	T (°C)	Allowed Tmax (°C)	Insulation class
--	--	--	--	--	--	--	--
Operating temperature (Tma) was 40°C.							

4.5.2	TABLE: ball pressure test of thermoplastic parts		**P**
	allowed impression diameter (mm) :	≤ 2 mm	—
Part		Test temperature (°C)	Impression diameter (mm)
Transformer bobbin		125	1.0

5.1.6	**TABLE: touch current measurement**			**P**
Condition	L→ terminal A (mA)	N → terminal A (mA)	Limit (mA)	Comments
To output	0.08	0.08	0.25	--

5.2	**TABLE: Electric strength tests, impulse tests and voltage surge tests**	**P**
Test voltage applied between:	Test voltage (V)	Breakdown
Line and neutral after fuse (F1) disconnected	AC 1500	No
Input and output	AC 3000	No
Primary winding and secondary winding of transformer T1	AC 3000	No

IEC/EN 60950-1			
Clause	Requirment + Test	Result + Remark	Verdict

5.3	**TABLE: Fault condition tests**		**P**
	ambient temperature (°C) .....:	24.8°C	—
	model/type of power supply .....:	--	—
	manufacturer of power supply .....:	--	—
	rated markings of power supply .....:	--	—

No.	Component no.	Fault	Test voltage (V)	Test time	Fuse no.	Fuse current (A)	Result
1	BD1	s-c	240V	1s	F1	0	F1 opened immediately, no hazard
2	VR1	s-c	240V	1s	F1	0	F1 opened immediately, no hazard.
3	D8	s-c	240V	1s	F1	0	Unit shut down immediately. Recoverable when the fault remove, no hazard.
4	T1 output	s-c	240V	1min	F1	0	Unit shut down immediately. Recoverable when the fault remove, no hazard.
5	C2	s-c	240V	1min	F1	0	Unit shut down immediately. Recoverable when the fault remove, no hazard.
6	U2 (output)	s-c	240V	1min	F1	0	Unit shut down immediately. Recoverable when the fault remove, no hazard.
7	output	s-c	240V	1min	F1	0	Unit shut down immediately. Recoverable when the fault remove, no hazard.
8	output	Over-load	240V	140min	F1	--	Operated until unit input shutdown, recoverable after removal of fault.
Supplementary information							
s-c = short-circuited. o-c = open-circuited. o-l=overloaded.							