APPLICATION FOR LOW VOLTAGE DIRECTIVE

On Behalf of

ShenZhen HuanSheng Machinery Co., Ltd

cutting plotter

Model: MK330, MK630, MK1200, MK1500

Prepared For : **ShenZhen HuanSheng Machinery Co., Ltd**
Building #17, 228 Industrial Zone, HengGang, ShenZhen, China.

Prepared By : **Shenzhen Anbotek Compliance Laboratory Limited**
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Date of Test:	**Jul. 30, 2016 to Aug. 17, 2016**
Date of Report:	**Aug. 18, 2016**
Report Number:	**R0116071038S**

TEST REPORT **EN 60950-1** **Information technology equipment – Safety –** **Part 1: General requirements**		
Reference No.	:	R0116071038S
Compiled by (+ signature)	:	James Lv .....
Approved by (+ signature)	:	Jason Xia .....
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Contents	:	56 pages (including 4 pages of photo)
Testing laboratory		
Name	:	Shenzhen Anbotek Compliance Laboratory Limited
Address	:	1/F., Building 1, SEC Industrial Park, No.0409 Qianhai Road, Nanshan District, Shenzhen, Guangdong, China
Testing location	:	Same as above
Client		
Name	:	ShenZhen HuanSheng Machinery Co., Ltd
Address	:	Building #17, 228 Industrial Zone, HengGang, ShenZhen, China.
Test specification		
Standard	:	EN 60950-1:2006+A11:2009+A1:2010+A12:2011+A2:2013
Test procedure	:	Compliance with EN 60950-1:2006+A11:2009+A1:2010+A12:2011+A2:2013
Procedure deviation	:	N
Non-standard test method	:	N
Test item		
Description	:	cutting plotter
Trademark	:	N/A
Model and/or type reference.....	:	MK330, MK630, MK1200, MK1500
Manufacturer	:	ShenZhen HuanSheng Machinery Co., Ltd
Address	:	Building #17, 228 Industrial Zone, HengGang, ShenZhen, China.
Factory.....	:	Same as above
Address	:	Same as above
Rating(s).....	:	100-120V AC, 50/60Hz, 2.0A; 200-240V AC, 50/60Hz, 1.0A

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 ☐ built-in component, consider in end system
Operating condition :	☒ Continuous ☐ Rated operating / resting time:
Over voltage category (OVC) :	☐ OVC I ☒ OVC II ☐ OVC III ☐ OVC IV ☐ Other:
Mains supply tolerance (%) or absolute mains supply values :	-10%, +10% according to client's requirement
Tested for IT power systems :	☐ Yes ☒ No
IT testing, phase-phase voltage (V) :	N
Class of equipment :	☒ Class I ☐ Class II ☐ Class III ☐ Not classified
Considered current rating of protective device as part of the building installlation (A) :	16A (20A for CA and US)
Pollution degree (PD) :	☐ PD 1 ☒ PD 2 ☐ PD 3
IP protection class :	IPX0
Altitude during operation (m) :	2000
Altitude of test laboratory (m) :	<500
Possible test case verdicts:	
- test case does not apply to the test object :	N(Not applicable)
- test object does meet the requirement :	P (Pass)
- test object does not meet the requirement :	F (Fail)
Testing :	
Date of receipt of test item :	Jul. 30, 2016
Date(s) of performance of tests :	Jul. 30, 2016 to Aug. 17, 2016

General remarks

This test report shall not be reproduced except in full without the written approval of the testing laboratory.

The test results presented in this report relate only to the item tested.

"(see remark #)" refers to a remark appended to the report.

"(see appended table)" refers to a table appended to the report.

Throughout this report a comma is used as the decimal separator.

Remark:

1. The maximum operational ambient temperature is +35°C.
2. Clearance was evaluated for altitude up to 2000m above sea level.
3. The EUT is an cutting plotter, all electronic components mounted on Min. V-1 PCB and enclosed in metal enclosure.
4. All application test performed on model MK1200.

Copy of marking plate (s):

Product: cutting plotter

Model: MK1200

Rating: 100-120V~ 50/60Hz 2.0A; 200-240V~ 50/60Hz 1.0A

ShenZhen HuanSheng Machinery Co., Ltd

Made in China

EN 60950-1			
Clause	Requirement – Test	Result - Remark	Verdict
1	GENERAL		P
1.5	Components		P
1.5.1	General		P
	Comply with IEC 60950-1 or relevant component standard	(see appended table 1.5.1)	P
1.5.2	Evaluation and testing of components		P
1.5.3	Thermal controls		P
1.5.4	Transformers		P
1.5.5	Interconnecting cables		P
1.5.6	Capacitors bridging insulation		P
1.5.7	Resistors bridging insulation		P
1.5.7.1	Resistors bridging functional, basic or supplementary insulation		P
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		P
1.5.9.1	General		P
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
1.6	Power interface		P
1.6.1	AC power distribution systems	TN, TT power distribution systems	P
1.6.2	Input current	(see appended table 1.6.2)	P
1.6.3	Voltage limit of hand-held equipment	The EUT is not hand-held equipment	N
1.6.4	Neutral conductor	Basic insulation provided	P
1.7.1	Power rating and identification markings		P
1.7.1.1	Power rating marking		P
	Multiple mains supply connections .....:		N

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Clause	Requirement – Test	Result - Remark	Verdict
	Rated voltage(s) or voltage range(s) (V)..... :	See label	P
	Symbol for nature of supply, for d.c. only..... :	~	P
	Rated frequency or rated frequency range (Hz) .. :	See label	P
	Rated current (mA or A)..... :	See label	P
1.7.1.2	Identification markings		P
	Manufacturer's name or trade-mark or identification mark ..... :	See label	P
	Model identification or type reference ..... :	MK330, MK630, MK1200, MK1500	P
	Symbol for Class II equipment only..... :	Class I equipment.	N
	Other markings and symbols ..... :	Additional symbol or marking does not give rise to misunderstanding used.	P
1.7.1.3	Use of graphical symbols		P
1.7.2	Safety instructions and marking	Installation instruction provided	P
1.7.2.1	General		P
1.7.2.2	Disconnect devices	Mains supply plug	P
1.7.2.3	Overcurrent protective device	Pluggable equipment type A	N
1.7.2.4	IT power distribution systems		N
1.7.2.5	Operator access with a tool	No such area	N
1.7.2.6	Ozone	No ozone	N
1.7.3	Short duty cycles	Continuous operation	N
1.7.4	Supply voltage adjustment ..... :	No such device	N
	Methods and means of adjustment; reference to installation instructions ..... :		N
1.7.5	Power outlets on the equipment ..... :	No such device	N
1.7.6	Fuse identification (marking, special fusing characteristics, cross-reference) ..... :	Thermer link used within the transformer primary winding	P
1.7.7	Wiring terminals	No wiring terminal	N
1.7.7.1	Protective earthing and bonding terminals ..... :	No such terminals	N
1.7.7.2	Terminals for a.c. mains supply conductors		N
1.7.7.3	Terminals for d.c. mains supply conductors	No such terminals	N
1.7.8	Controls and indicators		N
1.7.8.1	Identification, location and marking ..... :		N
1.7.8.2	Colours ..... :	Not used	N

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Clause	Requirement – Test	Result - Remark	Verdict
1.7.8.3	Symbols according to IEC 60417 ..... :	No such symbols	N
1.7.8.4	Markings using figures ..... :	No figures	N
1.7.9	Isolation of multiple power sources ..... :	Only one power sources	N
1.7.10	Thermostats and other regulating devices ..... :	No such regulating device	N
1.7.11	Durability	Rubbing test for 15 s with water then for 15 s with petroleum spirit	P
1.7.12	Removable parts		N
1.7.13	Replaceable batteries ..... :	No batteries	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	Considered for the front panel	P
2.1.1.1	Access to energized parts	Cannot access to energized parts	P
	Test by inspection .....:	The concerned hazardous parts are not accessible	P
	Test with test finger (Figure 2A) .....:	Hazardous live parts are not accessible	P
	Test with test pin (Figure 2B) .....:	Hazardous live parts are not accessible	P
	Test with test probe (Figure 2C) .....:	No TNV circuit within the equipment	N
2.1.1.2	Battery compartments	No battery compartment within the equipment	N
2.1.1.3	Access to ELV wiring	No internal wiring at ELV	N
	Working voltage (Vpeak or Vrms); minimum distance through insulation (mm)	(See appended tables 2.10.2 and 2.10.5)	--
2.1.1.4	Access to hazardous voltage circuit wiring		N
2.1.1.5	Energy hazards:		N
2.1.1.6	Manual controls	No such control	N
2.1.1.7	Discharge of capacitors in equipment	No such capacitors	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

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Clause	Requirement – Test	Result - Remark	Verdict
2.1.1.9	Audio amplifiers .....:	See cl. 2.1.1.1	N
2.1.2	Protection in service access areas	No services access areas	N
2.1.3	Protection in restricted access locations	Equipment not intended to used in restricted access locations	N
2.2	SELV circuits		P
2.2.1	General requirements		P
2.2.2	Voltages under normal conditions (V) :		P
2.2.3	Voltages under fault conditions (V) .....:		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		N
	Insulation employed.....:		--
2.3.5	Test for operating voltages generated externally		N
2.4	Limited current circuits		P
2.4.1	General requirements		N
2.4.2	Limit values		N
	Frequency (Hz) .....:		--
	Measured current (mA) .....:		--
	Measured voltage (V).....:		--
	Measured circuit capacitance (nF or µF) .....:		--
2.4.3	Connection of limited current circuits to other circuits		N

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Clause	Requirement – Test	Result - Remark	Verdict
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
	Use of integrated circuit (IC) current limiters		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	(See Annex CC)	
2.6	Provisions for earthing and bonding		P
2.6.1	Protective earthing		P
2.6.2	Functional earthing		P
	Use of symbol for functional earthing .....:		P
2.6.3	Protective earthing and protective bonding conductors		N
2.6.3.1	General		P
2.6.3.2	Size of protective earthing conductors		P
	Rated current (A), cross-sectional area (mm^2), AWG..... :	16A	--
2.6.3.3	Size of protective bonding conductors		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) ..... :	0.02Ω, 0.32V,	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) ..... :	Comply with 2.6.3.4	--
2.6.4.3	Separation of the protective earthing conductor from protective bonding conductors		N

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Clause	Requirement – Test	Result - Remark	Verdict
2.6.5	Integrity of protective earthing		p
2.6.5.1	Interconnection of equipment		N
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		P
2.6.5.7	Screws for protective bonding		P
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 used as an integral part of the equipment	P
	Instructions when protection relies on building installation	Pluggable equipment type A	N
2.7.2	Faults not simulated in 5.3.7	Void	N
2.7.3	Short-circuit backup protection	Building installation is considered as the short-circuit backup protection	P
2.7.4	Number and location of protective devices .....:	Thermer link provided on transformer primary winding	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
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 and 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

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Clause	Requirement – Test	Result - Remark	Verdict
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	48h	P
	Relative humidity (%), temperature (°C) .....:	93%RH, 30°C	--
2.9.3	Grade of insulation	Reinforced, double, supplementary, basic and functional insulation	P
2.9.4	Separation from hazardous voltages		P
	Method(s) used .....:	Reinforced, double insulation between the primary circuit and secondary circuit	--
2.10	Clearances, creepage distances and distances through insulation		P
2.10.1	General		P
2.10.1.1	Frequency		P
2.10.1.2	Pollution degrees		P
2.10.1.3	Reduced values for functional insualtion		P
2.10.1.4	Intervening unconnected conductive parts		P
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		P
2.10.2.1	General		P
2.10.2.2	RMS working voltage		P
2.10.2.3	Peak working voltage		P
2.10.3	Clearances		P
2.10.3.1	General		P
2.10.3.2	Mains transient voltages		P
	a) AC mains supply ····· :	2500Vp	P
	b) Earthed d.c. mains supplies ····· :		N
	c) Unearthed d.c. mains supplies ····· :		N

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Clause	Requirement – Test	Result - Remark	Verdict
	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		P
2.10.3.5	Clearances in circuits having starting pulses		P
2.10.3.6	Transients from a.c. mains supply ..... :		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 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		P
2.10.4.1	General		P
2.10.4.2	Material group and caomparative tracking index		P
	CTI tests ..... :	Assumed as material group IIIa and 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
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	No such devices	N
2.10.5.5	Cemented joints		N
2.10.5.6	Thin sheet material		P
2.10.5.7	Separable thin sheet material		P
	Number of layers (pcs)..... :	2	--
2.10.5.8	Non-separable thin sheet material		N
2.10.5.9	Thin sheet material – standard test procedure		P
	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		N

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Clause	Requirement – Test	Result - Remark	Verdict
2.10.5.12	Wire in wound components	Varnished wire used in T1	P
	Working voltage ..... :	(see appended table 2.10.2)	P
	a) Basic insulation not under stress ..... :		N
	b) Basic, supplemetary, reinforced insulation ..... :		P
	c) Compliance with Annex U.....:		P
	Two wires in contact inside wound component; angle between 45° and 90°.....:	Separated by insulation tape	P
2.10.5.13	Wire with solvent-based enamel in wound components		N
	Electric strength test		N
	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	No such PCB	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		N
2.10.6.3	Insulation between conductors on the same inner surface of a printed board	(see appended table 2.10.3 and 2.10.4)	P
2.10.6.4	Insulation between conductors on different layers of a printed board		P
	Distance through insulation	Min. 0.4mm	P
	Number of insulation layers (pcs)..... :	2	P
2.10.7	Component external terminations	No such Components	N
2.10.8	Tests on coated printed boards and coated components	No such PCB and 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		N

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Clause	Requirement – Test	Result - Remark	Verdict
	joints		
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	The cross-sectional area of internal wires is adequate for the current they are intended to be carried	P
3.1.2	Protection against mechanical damage		P
3.1.3	Securing of internal wiring		P
3.1.4	Insulation of conductors		P
3.1.5	Beads and ceramic insulators		N
3.1.6	Screws for electrical contact pressure	No screws are used as electrical connections	N
3.1.7	Insulating materials in electrical connections		P
3.1.8	Self-tapping and spaced thread screws	No such screws	N
3.1.9	Termination of conductors		P
	10 N pull test		P
3.1.10	Sleeving on wiring		N
3.2	Connection to a mains supply		P
3.2.1	Means of connection		P
3.2.1.1	Connection to an a.c. mains supply	AC inlet	P
3.2.1.2	Connection to a d.c. mains supply	Not connected to d.c. mains supply	N
3.2.2	Multiple supply connections	Only one supply connections	N
3.2.3	Permanently connected equipment	Not such equipment	N
	Number of conductors, diameter of cable and conduits (mm) ..... :		--
3.2.4	Appliance inlets		P
3.2.5	Power supply cords		P
3.2.5.1	AC power supply cords		P
	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

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Clause	Requirement – Test	Result - Remark	Verdict
	Mass of equipment (kg), pull (N) ..... :		--
	Longitudinal displacement (mm) ..... :		--
3.2.7	Protection against mechanical damage		P
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	No such 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^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	AC inlet	P
3.4.3	Permanently connected equipment	No such equipment	N
3.4.4	Parts which remain energized		N
3.4.5	Switches in flexible cords		P
3.4.6	Number of poles – single-phase and d.c. equipment	Single-phase equipment, disconnect devices disconnected both poles simultaneously	P
3.4.7	Number of poles – three-phase equipment		N
3.4.8	Switches as disconnect devices		N
3.4.9	Plugs as disconnect devices	Mains plug as part of equipment used as	P

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Clause	Requirement – Test	Result - Remark	Verdict
		disconnect devices	
3.4.10	Interconnected equipment	No such equipment	N
3.4.11	Multiple power sources	Only one power source	N
3.5	Interconnection of equipment		P
3.5.1	General requirements		P
3.5.2	Types of interconnection circuits ..... :	Connect to SELV circuits	P
3.5.3	ELV circuits as interconnection circuits	No ELV circuit	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 Annex DD)	P
4.2.2	Steady force test, 10 N	Tested on Internal components	P
4.2.3	Steady force test, 30 N		N
4.2.4	Steady force test, 250 N		P
4.2.5	Impact test		P
	Fall test		P
	Swing test		P
4.2.6	Drop test; height (mm) ..... :		N
4.2.7	Stress relief test	Metal enclosure.	N
4.2.8	Cathode ray tubes		N
	Picture tube separately certified ..... :		N
4.2.9	High pressure lamps	No high pressure lamps in the equipment.	N
4.2.10	Wall or ceiling mounted equipment; force (N) ..... :	Not intended to be mounted on a wall or ceiling.	N
4.2.11	Rotating solid media		N
	Test to cover on the door ..... :		N
4.3	Design and construction		P

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Clause	Requirement – Test	Result - Remark	Verdict
4.3.1	Edges and corners	The outer surface of the equipment is smooth	P
4.3.2	Handles and manual controls; force (N)..... :		N
4.3.3	Adjustable controls	No adjustable controls	N
4.3.4	Securing of parts		N
4.3.5	Connection by plugs and sockets		N
4.3.6	Direct plug-in equipment		N
	Torque ..... :		--
	Compliance with the relevant mains plug standard ..... :		N
4.3.7	Heating elements in earthed equipment	No such elements	N
4.3.8	Batteries	No batteries	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 and grease	N
4.3.10	Dust, powders, liquids and gases	No dust, powders, liquids and gases	N
4.3.11	Containers for liquids or gases	No such containers	N
4.3.12	Flammable liquids ..... :	No flammable liquid	N
	Quantity of liquid (l) ..... :		N
	Flash point (°C) ..... :		N
4.3.13	Radiation		N
4.3.13.1	General		N
4.3.13.2	Ionizing radiation	No 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 ultraviolet 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

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Clause	Requirement – Test	Result - Remark	Verdict
	Laser class ..... :		--
4.3.13.5.2	Light emitting diodes (LEDs)		--
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 ..... :	Cannot access to the moving fan blades	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 ..... :	(see appended table 4.5.5)	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 bottomm, dimensions (mm) . :		--
4.6.3	Doors or covers in fire enclosures		N

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Clause	Requirement – Test	Result - Remark	Verdict
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		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
4.7.2	Conditions for a fire enclosure		P
4.7.2.1	Parts requiring a fire enclosure	With below components/parts: - Components in primary circuit - Insulating wiring The fire enclosure required	P
4.7.2.2	Parts not requiring a fire enclosure		N
4.7.3	Materials		P
4.7.3.1	General	(see appended table 1.5.1)	P
4.7.3.2	Materials for fire enclosures	(see appended table 1.5.1)	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	(see appended table 1.5.1)	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 components	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)		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.		N

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Clause	Requirement – Test	Result - Remark	Verdict
	mains supply		
5.1.3	Test circuit		P
5.1.4	Application of measuring instrument	Annex D	P
5.1.5	Test procedure		P
5.1.6	Test measurements		P
	Supply voltage (V) ..... :	264V	--
	Measured touch current (mA) ..... :	(see appended table 5.1.6)	--
	Max. Allowed touch current (mA) ..... :	(see appended table 5.1.6)	--
	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		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	(see appended table 5.2)	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	(see appended Annex B)	N
5.3.3	Transformers	(see appended Annex C)	P
5.3.4	Functional insulation..... :	Short circuit	P

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Clause	Requirement – Test	Result - Remark	Verdict
5.3.5	Electromechanical components		N
5.3.6	Audio amplifiers in ITE ..... :		N
5.3.7	Simulation of faults		P
5.3.8	Unattended equipment		N
5.3.9	Compliance criteria for abnormal operating and fault conditions		P
5.3.9.1	During the tests		P
5.3.9.2	After the tests		P
6	CONNECTION TO TELECOMMUNICATION NETWORKS		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	Not connect to telecommunication networks	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	Not connect to cable distribution system	N
7.2	Protection of cable distribution system service persons, and users of other equipment connected to the system, from hazardous		N

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Clause	Requirement – Test	Result - Remark	Verdict
	voltages in the equipment		
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		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) ..... :		--

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Clause	Requirement – Test	Result - Remark	Verdict
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)		N
B.1	General requirements		N
	Position ..... :	Inside enclosure	--
	Manufacturer ..... :	(see appended table 1.5.1)	--
	Type ..... :	(see appended table 1.5.1)	--
	Rated values ..... :	(see appended table 1.5.1)	--
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	(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

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Clause	Requirement – Test	Result - Remark	Verdict
	Operating voltage (V) ..... :		--
C	ANNEX C, TRANSFORMERS (see 1.5.4 and 5.3.3)		P
	Position ..... :	T101	--
	Manufacturer ..... :	(see appended table 1.5.1)	--
	Type ..... :	(see appended table 1.5.1)	--
	Rated values ..... :	(see appended table 1.5.1)	--
	Method of protection..... :	Inherent	--
C.1	Overload test	(see appended table 5.3)	P
C.2	Insulation	(see appended table 5.2)	P
	Protection from displacement of windings..... :	By bobbin and insulation tape	P
D	ANNEX D, MEASURING INSTRUMENTS FOR TOUCH-CURRENT TESTS (see 5.1.4)		P
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

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Clause	Requirement – Test	Result - Remark	Verdict
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 ..... :	Steel	--
K	ANNEX K, THERMAL CONTROLS (see 1.5.3 and 5.3.8)		N
K.1	Making and breaking capacity	No thermostat and temperatrue limiter used for thermal control circuit	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	Operated in the most unfavourable way of operation given in the operating instructions until steady conditions established	N

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Clause	Requirement – Test	Result - Remark	Verdict
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
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
	- Preferred climatic categories ..... :	Considered	P
	- Maximum continuous voltage ..... :		P
	Body of the VDR Test according to IEC60695-11-5 ..... :		P
	Body of the VDR. Flammability class of material (min V-1) ..... :		P
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

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Clause	Requirement – Test	Result - Remark	Verdict
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)		P
		(see appended table 1.5.1)	--
V	ANNEX V, AC POWER DISTRIBUTION SYSTEMS (see 1.6.1)		P
V.1	Introduction	TN, TT	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
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)		P
X.1	Determination of maximum input current		P
X.2	Overload test procedure		P
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)		N

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Clause	Requirement – Test	Result - Remark	Verdict
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 ..... :		
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
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

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Clause	Requirement – Test	Result - Remark	Verdict

ATTACHMENT TO TEST REPORT IEC 60950-1
EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES
Information technology equipment – Safety –
Part 1: General requirements

Differences according to..... : EN 60950-1:2006/A11:2009/A1:2010/A12:2011/A2:2013

Attachment Form No..... : EU_GD_IEC60950_1E

Master Attachment ..... : Date 2013-09

EN 60950-1:2006/A11:2009/A1:2010/A12:2011/A2:2013 – CENELEC COMMON MODIFICATIONS

IEC 60950-1, GROUP DIFFERENCES (CENELEC common modifications EN)			
Clause	Requirement + Test	Result - Remark	Verdict
	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		P
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		P
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**		P

EN 60950-1:2006+A11:2009+A1:2010+A12:2011+A2:2013			
Clause	Requirement – Test	Result - Remark	Verdict
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.		P
1.1.1 (A1:2010)	Replace 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.		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.		N
(A12:2011)	In EN 60950-1:2006/A12:2011 Delete the addition of 1.3.Z1 / EN 60950-1:2006 Delete the definition of 1.2.3.Z1 / EN 60950-1:2006/A1:2010		N
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 *		N
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.		N
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.		N
	Zx Protection against excessive sound pressure from personal music		--

EN 60950-1:2006+A11:2009+A1:2010+A12:2011+A2:2013			
Clause	Requirement – Test	Result - Remark	Verdict
	players		
	Zx.1 General 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. 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 users headphones or earphones that can be worn in or on or around the ear; and allows the user to walk around while in use. 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. 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. The requirements in this sub-clause are valid for musci or video mode only. The requirements do not apply: while the personal music player is connected to an external amplifier; or while the headphone 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 sale s channels. All products sold through normal electronics stores are considered not to professional equipment. 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.		N
	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. For equipment which is clearly designed or		N

EN 60950-1:2006+A11:2009+A1:2010+A12:2011+A2:2013			
Clause	Requirement – Test	Result - Remark	Verdict
	intended for use by young children, the limits of EN 71-1 apply.		
	Zx.2 Equipment requirements 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 $L_{Aeq,T}$, is ≤ 85 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 ≤ 27 mV measured as described in EN 50332-2, while playing the fixed "programme simulation noise" as described in EN 50332-1. NOTE 1 Wherever the term acoustic acoustic output is used in this clause, the 30 s A-weighted equipment sound pressure level $L_{Aeq,T}$, is meant. See also Zx.5 and Annex Zx. 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 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 NOTE 2 Examples of means include visual or audible signals. Action from the user is always required. 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. d) have a warning as specified in Zx.3; and e) not exceed the following: 1) equipment provided as a package (player with Its listening device), the acoustic output shall be ≤ 100 dBA measured while playing the fixed "programme simulation noise" described in EN 50332-1; and 2) a personal music player provided with an analogue electrical output socket for a listening device, the electrical output shall be ≤ 150 mV measured as described in EN 50332-2, while playing the fixed "programme simulation noise"		N

EN 60950-1:2006+A11:2009+A1:2010+A12:2011+A2:2013			
Clause	Requirement – Test	Result - Remark	Verdict
	described in EN 50332-1. For music where the average sound pressure (long term $L_{Aeq,T}$) 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. NOTE 4 Classical music typically has an average sound pressure (long term $L_{Aeq,T}$) 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. 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.		
	Zx.3 Warning 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.”  **Figure 1 – Warning label (IEC 60417-6044)** 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)		--
	Zx.4.1 Wired listening devices with analogue input With 94 dBA sound pressure output $L_{Aeq,T}$, the input voltage of the fixed “programme simulation noise” described in EN 50332-2 shall be ≥ 75 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).		N

EN 60950-1:2006+A11:2009+A1:2010+A12:2011+A2:2013			
Clause	Requirement – Test	Result - Remark	Verdict
	NOTE The values of 94 dBA – 75 mV correspond with 85dBA – 27 mV and 100 dBA – 150 mV.		
	Zx.4.2 Wired listening devices with digital input 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 $L_{Aeq,T}$ of the listening device shall be ≤ 100 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.		N
	Zx.4.3 Wireless listening devices 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 LAeq,T of the listening device shall be ≤ 100 dBA. NOTE An example of a wireless listening device is a Bluetooth headphone.		N
	Zx.5 Measurement methods 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. NOTE Test method for wireless equipment provided without listening device should be defined.		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		P

EN 60950-1:2006+A11:2009+A1:2010+A12:2011+A2:2013			
Clause	Requirement – Test	Result - Remark	Verdict
	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;		
	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.		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	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 (A1:2010)	**Replace** the existing NOTE by the following: NOTE Z1 Attention is drawn to: 1999/519/EC: Council Recommendation on the limitation of exposure of the general public to		N

EN 60950-1:2006+A11:2009+A1:2010+A12:2011+A2:2013			
Clause	Requirement – Test	Result - Remark	Verdict
	electromagnetic fields 0 Hz to 300 GHz, and 2006/25/EC: Directive on the minimum health and safety requirements regarding the exposure of workers to risks arising from physical agents (artifical optical radiation).		
	Standards taking into account mentioned Recommendation and Directive 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
Bibliography	Additional EN standards.		—
ZA	**NORMATIVE REFERENCES TO INTERNATIONAL PUBLICATIONS WITH THEIR CORRESPONDING EUROPEAN PUBLICATIONS**		—

1.1 ZB ANNEX (normative)

1.2 SPECIAL NATIONAL CONDITIONS (EN)

Clause	Requirement + Test	Result - Remark	Verdict
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
1.2.13.14	In **Norway** and **Sweden**, for requirements see 1.7.2.1 and 7.3 of this annex.		N
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 1.5.7.1. 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 **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		N

EN 60950-1:2006+A11:2009+A1:2010+A12:2011+A2:2013			
Clause	Requirement – Test	Result - Remark	Verdict
1.7.2.1 (A11:2009)	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 suojakoskettimilla varustettuun pistorasiaan" In **Norway**: “Apparatet må tilkoples jordet stikkontakt” In **Sweden**: “Apparaten skall anslutas till jordat uttag” In **Norway** and **Sweden**, 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. 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. 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: “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).”		

EN 60950-1:2006+A11:2009+A1:2010+A12:2011+A2:2013			
Clause	Requirement – Test	Result - Remark	Verdict
	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. 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.” 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.”		N
1.7.2.1 (A2:2013)	In **Denmark**, 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 **Denmark** shall be as follows: In **Denmark**: “Apparatets stikprop skal tilsluttes en stikkontakt med jord, som giver forbindelse til stikproppens jord.”		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. For **CLASS II EQUIPMENT** the socket outlet shall be in accordance with Standard Sheet DKA 1-4a.		N

EN 60950-1:2006+A11:2009+A1:2010+A12:2011+A2:2013			
Clause	Requirement – Test	Result - Remark	Verdict
1.7.5 (A2:2013)	In **Denmark**, socket-outlets for providing power to other equipment shall be in accordance with the DS 60884-2-D1:2011. 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. 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. Justification the Heavy Current Regulations, 6c		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.		P
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

EN 60950-1:2006+A11:2009+A1:2010+A12:2011+A2:2013			
Clause	Requirement – Test	Result - Remark	Verdict
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, 16A SEV 5934-2.1998: Plug Type 23, L+N+PE 250V, 16 A		N
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

EN 60950-1:2006+A11:2009+A1:2010+A12:2011+A2:2013			
Clause	Requirement – Test	Result - Remark	Verdict
3.2.1.1 (A2:2013)	In **Denmark**, 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. 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 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. Justification the Heavy Current Regulations, 6c		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

EN 60950-1:2006+A11:2009+A1:2010+A12:2011+A2:2013			
Clause	Requirement – Test	Result - Remark	Verdict
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 mm^2 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
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

EN 60950-1:2006+A11:2009+A1:2010+A12:2011+A2:2013			
Clause	Requirement – Test	Result - Remark	Verdict
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 (A1:2010)	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. 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 - 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.		N

EN 60950-1:2006+A11:2009+A1:2010+A12:2011+A2:2013			
Clause	Requirement – Test	Result - Remark	Verdict
	It is permitted to bridge this insulation with an optocoupler complying with 2.10.5.4 b). It is permitted to bridge this insulation with a capacitor complying with EN 60384-14:2005, subclass Y2. A capacitor classified Y3 according to EN 60384-14:2005, may bridge this insulation under the following conditions: - 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; - the additional testing shall be performed on all the test specimens as described in EN 60384-14; - 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.		N
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 (A11:2009)	In **Norway** and **Sweden**, for requirements see 1.2.13.14 and 1.7.2.1 of this annex.		N

Tables

Attachment No. 1

Annex ZD
(informative)

IEC and CENELEC code designations for flexible cords

Type of flexible cord	Code designations	
	IEC	CENELEC
PVC insulated cords		
Flat twin tinsel cord	60227 IEC 41	H03VH-Y
Light polyvinyl chloride sheathed flexible cord	60227 IEC 52	H03VV-F H03VVH2-F
Ordinary polyvinyl chloride sheathed flexible cord	60277 IEC 53	H05VV-F H05VVH2-F
Rubber insulated cords		
Braided cord	60245 IEC 51	H03RT-F
Ordinary tough rubber sheathed flexible cord	60245 IEC 53	H05RR-F
Ordinary polychloroprene sheathed flexible cord	60245 IEC 57	H05RN-F
Heavy polychloroprene sheathed flexible cord	60245 IEC 66	H07RN-F
Cords having high flexibility		
Rubber insulated and sheathed cord	60245 IEC 86	H03RR-H
Rubber insulated, crosslinked PVC sheathed cord	60245 IEC 87	H03RV4-H
Crosslinked PVC insulated and sheathed cord	60245 IEC 88	H03V4V4-H

Note: Before placing the products in the different countries, the manufacturer must ensure that:

1. Operating Instructions, Ratings Labels and Warnings Labels written in an Accepted or Official Language of the county in question.

2. The equipment complies with the National Standards and/or Electrical Codes of the country in question.

Tables

1.5.1	TABLE: List of critical components				P
Object/part No.	Manufacturer/ trademark	Type/model	Technical data	Standard (Edition / year)	Mark(s) of conformity[1])
AC inlet	Zhejiang LECI Electronics	DB-14	205Vac, 10A, 70℃	EN 60320-1	VDE
PCB	Various	Various	MinV-1, 105°C	UL 796	UL
Input wire	Various	Various	18AWG, Max. 80℃	UL	UL
Secondary lead wire	Various	Various	18AWG, Max. 80℃	UL	UL
Connector	Various	Various	Min V-1 80℃	UL 1059	UL
X2-Capacitor (CX1)	Tenta Electric Industrial Co. Ltd.	MEX	Minimum 275 V, maximum 0.33 uF, minimum 100 degree C.	IEC/EN 60384-14 K 60384-14	VDE119119
Y1-Capacitor (CY1)	Shantou High-new Technology Dev.Zone Songtian Enterprise Co.,Ltd	CD	Max1000pF, min400V, 125°C	IEC 60384-14	VDE40025754
Opto-Coupler	Everlight Electronics Co., Ltd.	EL817	Int. cr=6.0mm, Ext. cr=7.7mm, Dti≥0.5mm, 110°C	IEC/EN 60747-5-2:2003	VDE 132249
Transformer	ShenZhen Lightking Tech Group CO., LTD	EC4045-WS-8+8	ClassB	EN60950-1	Test with appliance
-Bobbin	CHANGCHUN PLASTIC CO., LTD	PHENOLIC T375J	V-0, 150℃	UL94	UL E59481
-TIW	TA YA ELECTRIC WIRE & CABLE CO., LTD	TILW-E	130℃	UL2353	UL E225803
-Insulation tape	JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO., LTD	CT-280B	130℃	UL510	UL E165111
-WIRE	SHANGTOU SHENGANG ELECTRICAL INDUSTRIAL	XEW/130	130℃	UL1446	UL E239508
1) An asterisk indicates a mark which assures the agreed level of surveillance.					

Tables

1.6.2	TABLE: electrical data test (in normal conditions)					P
fuse #	I rated (A)	U (V)	P (W)	I (A)	Ifuse (A)	condition
F1	--	90V/50Hz	95.1	1.18	1.18	Normal operation
F1	2.0	100V/50Hz	94.2	1.06	1.06	Normal operation
F1	2.0	120V/50Hz	93.1	0.88	0.88	Normal operation
F1	--	132V/50Hz	92.3	0.78	0.78	Normal operation
F1	--	180V/50Hz	89.6	0.55	0.55	Normal operation
F1	1.0	200V/50Hz	88.1	0.50	0.50	Normal operation
F1	1.0	240V/50Hz	87.5	0.44	0.44	Normal operation
F1	--	264V/50Hz	86.9	0.38	0.38	Normal operation
F1	--	90V/50Hz	95.3	1.20	1.20	Normal operation
F1	2.0	100V/50Hz	94.2	1.08	1.08	Normal operation
F1	2.0	120V/50Hz	93.3	0.89	0.89	Normal operation
F1	--	132V/50Hz	92.2	0.78	0.78	Normal operation
F1	--	180V/50Hz	89.7	0.56	0.56	Normal operation
F1	1.0	200V/50Hz	88.2	0.50	0.50	Normal operation
F1	1.0	240V/50Hz	87.6	0.43	0.43	Normal operation
F1	--	264V/50Hz	86.8	0.39	0.39	Normal operation
Remark:						

2.1.1.5 c) 1)	TABLE: max. V, A, VA test				N
Voltage (rated) (V)	Current (rated) (A)	Voltage (max.) (V)	Current (max.) (A)	VA (max.) (VA)	
Remark:					

2.1.1.5 c) 2)	TABLE: stored energy	N
Capacitance C (µF)	Voltage U (V)	Energy E (J)
--	--	--
Remark:		

Tables

2.2	TABLE: evaluation of voltage limiting components in SELV circuits			P
Location	Voltage measurement (V)		Comments	
Component (measured between)		max. voltage (V) (normal operation)		Voltage Limiting Components
Transformer	Location	V peak	V d.c.	
Transformer	Secondary pins	15.8	--	Transformer
Fault test performed on voltage limiting components		Voltage measured (V) in SELV circuits (V peak or V d.c.)		
--		--		
Remark:				

2.5	TABLE: limited power source measurement			N
Condition	Output voltage (Uoc) (V)	Output current (Isc) (A)	Apparent power (S) (VA)	
Normal condition	--	--	--	
Single fault		I_{sc} (A)		VA	
		Meas.	Limit	Meas.	Limit
--		--	--	--	--
Remark: SC=Short circuit, OC=Open circuit				

2.10.2	TABLE: Working voltage measurement				P
Component	From	To	V rms	V peak	Remark
Transformer	Pri. pin	Sec. pin	**239**	**338**	*
optocoupler	Pri. pin	Sec. pin	153	276	
Y capacitor	Pri. pin	Sec. pin	138	245	
Remark: *: Max. Vrms, Vpeak					

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)
Basic/supplementary:						
Primary to earthed metal enclosure	<420	<250	2.0	3.6	2.5	3.6
Transformer: Primary to Core	<420	<250	2.0	3.6	2.5	3.6

Tables

Transformer: Secondary to Core	<420	<250	2.0	3.6	2.5	3.6
Reinforced:						
Transformer: Primary to Secondary	<420	<250	4.0	5.9	5.0	5.9
Supplementary information: 1) Note The correction factor of clearance is 1.0 for high altitude 2000m .						

2.10.5	**TABLE: Distance through insulation measurements**				**P**
distance through insulation di at/of:	U peak (V)	U rms (V)	Test voltage (V)	Required DTI (mm)	DTI (mm)
1. Insulation tape wrapped on transformer, Reinforced, 2 layers (one layer tested)	338	239	AC 3000V	At least 2 layers	3 layers
2. Transformer bobbin	338	239	AC 3000V	0.4	0.8
Remark:					

4.3.8	**TABLE: Batteries**									**N**
The tests of 4.3.8 are applicable only when appropriate battery data is not available										N
Is it possible to install the battery in a reverse polarity position?										N
	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:						See below				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
Supplementary information:										

Tables

4.5	TABLE: Thermal requirements			P
	Supply voltage (V) ..... :	90V/60Hz	264V/50Hz	—
	Ambient T_{min} (°C) ..... :	--	--	—
	Ambient T_{max} (°C) ..... :	35.0	35.0	—
Maximum measured temperature T of part/at:		T (°C)		Allowed T_{max} (°C)
AC inlet		46.5	48.3	70
Transformer winding		82.5	81.3	110
Transformer core		80.1	79.6	110
Optocoupler body		72.3	70.6	100
Y capacitor		69.8	68.2	125
PCB on control board		69.6	70.3	130
Metal enclosure near Transformer		56.5	57.2	70
Button		41.8	42.5	95
Ambient		35.0	35.0	--

4.5.5	TABLE: Ball pressure test of thermoplastics		P
	required impression diameter (mm) ..... :	≤ 2 mm	---
part		test temperature (°C)	impression diameter (mm)
AC inlet		125	1.1
Remark:			

4.7	TABLE: Resistance to fire				P
Part	Manufacturer of material	Type of material	Thickness (mm)	Flammability class	Evidence
Refer to table 1.5.1 for details					
Supplementary information:					

5.1.6	TABLE: Touch current measurement			P
Condition	L → terminal A (mA)	N → terminal A (mA)	Limit (mA)	Comments
L&N to Metal enclosure	0.63	0.63	3.5	--
L&N to output	0.01	0.01	0.25	--
Input: 264V/ 60Hz				

Tables

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 to output terminal(D/R)	DC	4240	No
Primary and secondary of transformer (D/R)	DC	3000	No
Primary and core of transformer (B)	AC	1500	No
Secondary and core of transformer (B)	AC	1500	No
Input to Metal enclosure(B)	AC	1500	No
Supplementary information:			

5.3.5	TABLE: Fault condition tests		P
	ambient temperature (°C).....	25℃-30℃	--
	model/type of power supply	See below	--
	manufacturer of power supply	See page 1	--
	rated markings of power supply	See rating label	--

No.	Component No.	Fault	Test voltage (V)	Test time	Fuse #.	Fuse current (A)	Result
1	D10	SC	240V/ 50Hz	<1s	F1	>4.2	F1 opened immediately, NB, NH.
2	D1	SC	240V/ 50Hz	<1s	F1	>4.2	F1 opened immediately, NB, NH.
3	C1	SC	240V/ 50Hz	<1s	F1	>4.2	F1 opened immediately, NB, NH.
4	Output ternimal	SC	240V/ 50Hz	10mins	F1	0.1	Unit shutdown immediately, recoverable when fault removed, NCD, NB, NH.
5	35V Output	OL	240V/ 50Hz	3hrs 35mins	F1	Max. 0.9	Unit shutdwon when loading 2.6A, recoverable when fault removed, NCD, NB, NH. Measured maximum temperature: Transformer winding: 96.2℃ Ambient: 25.6℃
6	12V Output	OL	240V/ 50Hz	3hrs 20mins	F1	Max. 0.7	Unit shutdwon when loading 1.3A, recoverable when fault removed, NCD, NB, NH. Measured maximum temperature: Transformer winding: 89.4℃ Ambient: 25.4℃

Tables

7	5V Output	OL	240V/ 50Hz	3hrs 42mins	F1	Max. 0.6	Unit shutdwon when loading 1.1A, recoverable when fault removed, NCD, NB, NH. Measured maximum temperature: Transformer winding: 87.6℃ Ambient: 25.5℃
Remark: 1) SC: short-circuit. 2) OC: open-circuit 3) OL: overload 4) #: Denoted that the test was also performed on all alternate material of transformers, and all results were same. 5) The Hi-pot test conducted successfully after the completion of the fault condition.							

Photos

Photo 1 [√] front [ ] rear [ ] right side [ ] left side [ ] top [ ] bottom [ ] internal	

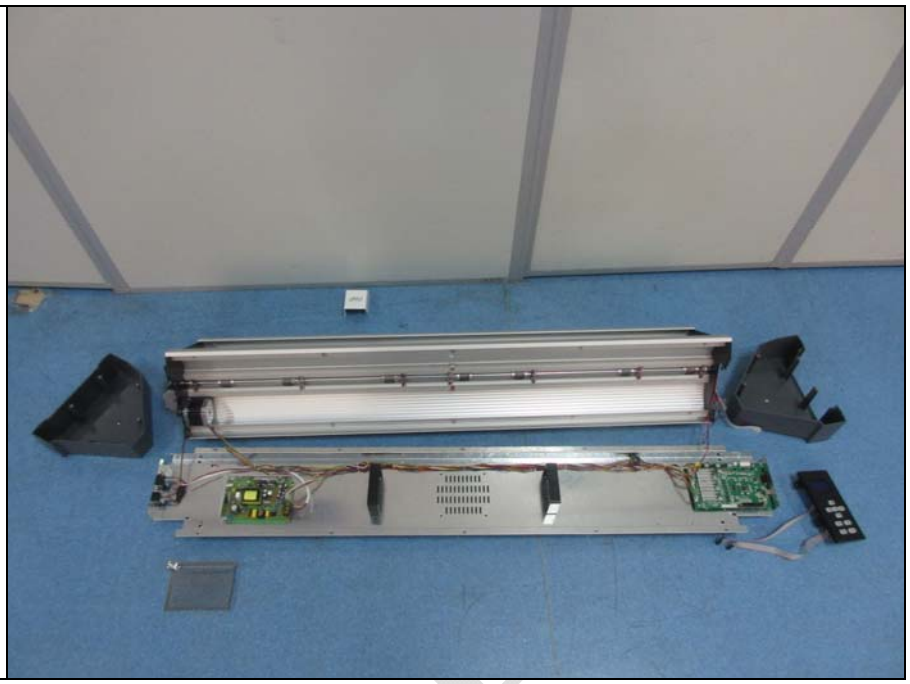
Photo 2 [ ] front [√] rear [ ] right side [ ] left side [ ] top [ ] bottom [ ] internal	

Photos

Photo 3 [ ] front [ ] rear [ ] right side [√] left side [ ] top [ ] bottom [ ] internal	

Photo 4 [ ] front [ ] rear [√] right side [ ] left side [ ] top [ ] bottom [ ] internal	

Photos

Photo 5 [ ] front [ ] rear [ ] right side [ ] left side [ ] top [ ] bottom [√] internal	

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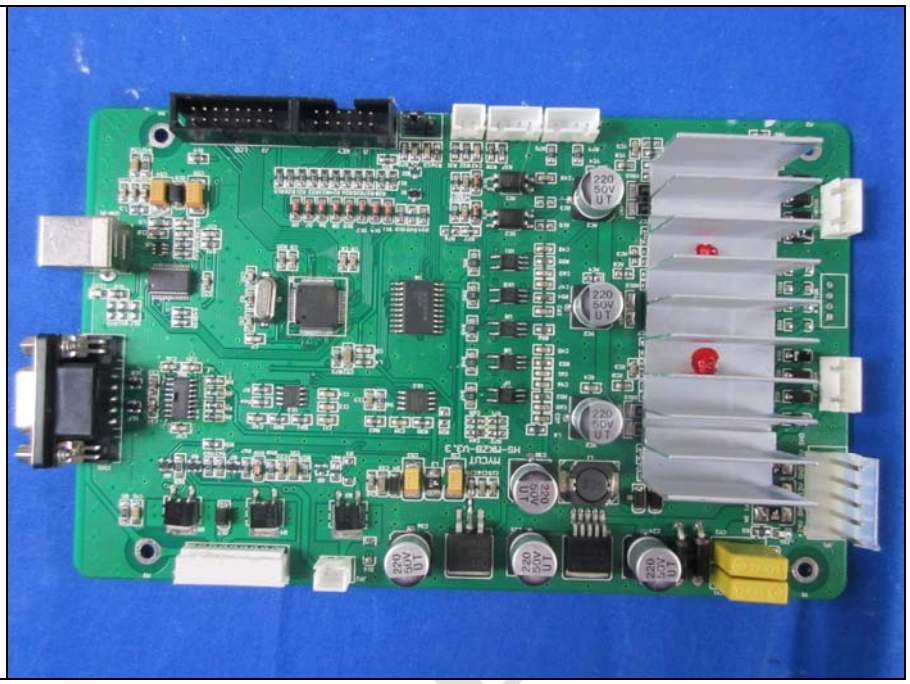
Photos

Photo 7 [ ] front [ ] rear [ ] right side [ ] left side [ ] top [ ] bottom [√] internal	

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