

TEST REPORT

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

Report No..... : S17103103

Date of Issue..... : 2017-10-10

Tested by (name + signature)..... : Steven

Approved by (name + signature) :

Total number of pages : 55 pages

CB Testing Laboratory :

Test Specification

Standard : EN 60950-1:2006+A11+A1+A12+A2

Test procedure : CE-LVD

Non-standard test method : N/A

Test item description.....: Control Box

Trade Mark.....: N/A

Model and/or type reference.....: CTB-B

Electric Ratings..... : I/P: 100-240Vac, 50/60Hz, 5A

O/P: 24Vdc Max., 3.5A Max.

Duty cycle: 2 minutes ON, 18 minutes OFF

Manufacturer's name :

Address :

List of Attachments (including a total number of pages in each attachment):

- **Photo documentation** (5 pages)
- **Diagrams** (9 pages)
- **Schematics + PWB** (2 pages)
- **Working sketch** (1 page) _____

Summary of testing:

The product fulfils the requirements of EN 60950-1:2006+A11:2009+A1:2010+A12:2012+A2:2013

Tests performed (name of test and test clause):
Complete tests.

Testing location:

All tests as described in Test Case and Measurement Sections were performed at the laboratory described on page 1.

Copy marking plate (example):

The use of certification marks on a product must be authorized by the respective NCBs that own these marks.

Control Box

Model No.: CTB-B

I/P: 100-240V-, 50/60HZ, 5A

0/P:24Vrrr 3.5Amax.**Duty cycle: 2 minutes ON, 18 minutes OFF**

Note: The artwork above may be only a draft.

Test item particulars

Equipment mobility....	<input checked="" type="checkbox"/> movable <input type="checkbox"/> hand-held <input type="checkbox"/> transportable <input type="checkbox"/> stationary <input type="checkbox"/> for building-in <input type="checkbox"/> direct plug-in
Connection to the mains	<input type="checkbox"/> pluggable equipment <input checked="" type="checkbox"/> type A <input type="checkbox"/> type B <input type="checkbox"/> permanent connection <input type="checkbox"/> detachable power supply cord <input type="checkbox"/> non-detachable power supply cord <input type="checkbox"/> not directly connected to the mains
Operating condition	<input type="checkbox"/> continuous <input checked="" type="checkbox"/> rated operating / resting time: 2 minutes ON, 18 minutes OFF
Access location.....	<input checked="" type="checkbox"/> operator accessible <input type="checkbox"/> restricted access location <input type="checkbox"/> built-in equipment, considered in the end system.
Over voltage category (OVC)	<input type="checkbox"/> OVC I <input checked="" type="checkbox"/> OVC II <input type="checkbox"/> OVC III <input type="checkbox"/> OVC IV <input type="checkbox"/> other:
Mains supply tolerance (%) or absolute mains supply values	-10%, +10% <input type="checkbox"/> Yes (only for Norway) <input checked="" type="checkbox"/> No
Tested for IT power systems	N/A
IT testing, phase-phase voltage (V).....	<input checked="" type="checkbox"/> Class I <input type="checkbox"/> Class II <input type="checkbox"/> Class III
Class of equipment	f 1 Not classified

Considered current rating of protective device as part of the building installation (A).....	16A
Pollution degree (PD)	<input type="checkbox"/> PD1 <input checked="" type="checkbox"/> PD2 PD3
IP protection class	IPX0
Mass of equipment (kg).....	0.0673 Up to
Altitude during operation (m)	2000
Altitude of test laboratory (m).....	below 100

Possible test case **verdicts:**

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

Testing

Date of receipt of test item..... : 2017-09-29
Date(s) of performance of test..... : 2017-09-30 to 2017-10-10
-Test object does not meet the requirement

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 point is used as the decimal separator.

General product information:

The unit is a control box for use with lifting column, and supply power to lifting column as an adapter, consists of a power board and a control board and all components were mounted on PWB and housed with plastics enclosure. The product was submitted and evaluated for use at the maximum ambient temperature (Tma) permitted by the manufacturer's specification of: 40°C

- The means of connection to the mains supply is: Pluggable A, Detachable power cord
- The product is intended for use on the following power systems: TN
- The following accessible locations (with circuit/schematic designation) are within a limited current circuit: Secondary GND
- The following circuit locations (with circuit/schematic designation) were investigated as a limited power source (LPS): DC output
- The following are available from the Applicant upon request: Installation (Safety) Instructions/ Manual
- Unless otherwise specified, all tests are performed on the equipment with installed F1 fuse, by Sunny East Enterprise Co., Ltd. Type TSP, rated T5A/250V, representing worse case among all fuses submitted under this investigation.

EN 60950-1			
Clause	Requirement - Test	Result - Remark	Verdict

GENERAL

1.5	Components		P
1.5.1	General		P
	Comply with I EC 60950 or relevant component standard	Critical applicable components were agencies approved, (see appended table 1.5.1)	P
1.5.2	Evaluation and testing of components	Components which are certified to I EC and/or national standards are used correctly within their ratings. Components not covered by I EC standards are tested under the conditions present in the equipment.	P
1.5.3	Thermal Controls	No thermal controls	N/A
1.5.4	Transformers	Transformer used are suitable for their intended application and comply with the relevant requirements of the standard and particularly Annex C.	P
1.5.5	Interconnecting cables	DC cables are approved by UL	P
1.5.6	Capacitors in primary circuits	CY1 bridging reinforced insulation between primary and secondary. Capacitors are certified according to I EC 60384-14.	P
1.5.7	Resistors bridging insulation	Not used	N/A
1.5.7.1	Resistors bridging functional, basic or supplementary insulation	Not used	N/A
1.5.7.2	Resistors bridging double or reinforced insulation between a.c. mains and other circuits	Not used	N/A
1.5.7.3	Resistors bridging double or reinforced insulation between a.c. mains and antenna or coaxial cable	Not used	N/A
1.5.8	Components in equipment intended for IT power system	Not used	N/A
1.5.9	Surge suppressors	Not used	N/A
1.5.9.1	General		N/A
1.5.9.2	Protection of VDRs		N/A
1.5.9.3	Bridging of functional insulation by a VDR		N/A
1.5.9.4	Bridging of basic insulation by a VDR		N/A
1.5.9.5	Bridging of supplementary, double or reinforced insulation by a VDR		N/A

1.6	Power interface		P
1.6.1	AC Power distribution systems	TN	P
1.6.2	Input current	Highest load according to 1.2.2.1. For this equipment is the operation with the maximum specified by the manual instruction. See appended table 1.6.2.	P
1.6.3	Voltage limit of hand-held equipment	This appliance is not handheld equipment.	N/A
1.6.4	Neutral conductor	Class I construction. Phase conductors separated to body by	P

EN 60950-1			
Clause	Requirement - Test	Result - Remark	Verdict

basic insulation

1.7	Marking and instructions		P
1.7.1	Power rating and identification marking	The required marking is located on the outside surface of the equipment.	P
1.7.1.1	Power rating marking	See below	—
	Multiple mains supply connections	No multiple mains supply	N/A
	Rated voltage or voltage range(s) (V)	AC100-240V-	P
	Symbol of nature of supply for d.c	— — —	P
	Rated frequency (Hz)	50/60	P
	Rated current (A)	16A	P
	Where symbols are used, they shall conform to ISO 7000 or I EC 60417 where appropriate symbols exist.	Graphical symbols complies with the standards.	P
1.7.1.2	Identification markings		P
	Manufacturer's name or trade-mark or identification mark		P
	Model identification or type reference	CTB-B	P
	Symbol for Class II equipment only	Class I equipment	N/A
	Other markings and symbols	The additional marking does not give rise to misunderstandings.	P
1.7.2	Safety instructions	English safety instruction provided.	P
1.7.2.1	General		P
1.7.2.2	Disconnect devices	Power plug	P
1.7.2.3	Overcurrent protective device	Unit provides appropriate overcurrent protective device inside the equipment.	P
1.7.2.4	IT power distribution systems		N/A
1.7.2.5	Operator access with a tool	No such access required.	N/A
1.7.2.6	Ozone	Ozone not used or generated.	N/A
1.7.3	Short duty cycles	Equipment is designed for continuous operation.	N/A
1.7.4	Supply voltage adjustment.....	No voltage selector (Power supply has a wide range input circuit).	N/A
	Methods and means of adjustment; reference to installation instructions		N/A
1.7.5	Power outlets on the equipment.....	No standard power outlet.	N/A
1.7.6	Fuse identification (marking, special fusing characteristics, cross-reference)	Fuse identification is marked adjacent to the fuse on the PCB.	P
1.7.7.1	Protective earthing and bonding terminals		P
1.7.7.2	Terminals for a.c. mains supply conductors		P
	- terminals intended exclusively for connection of the AC MAINS SUPPLY neutral conductor, if any, shall be indicated by the capital letter N; and	The symbol N adjacent to wiring terminal.	P
	- on three-phase equipment, if incorrect phase rotation could cause overheating or other hazard, terminals intended for connection of the AC MAINS SUPPLY line conductors shall be marked in such a way that, in conjunction with any installation instructions, the sequence of phase rotation is	Single phase equipment	N/A

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Clause	Requirement - Test	Result - Remark	Verdict
	unambiguous.		
1.7.7.3	Terminals for d.c. mains supply conductors	The polarity is marked	P
1.7.8	Controls and indicators	See below.	P
1.7.8.1	Identification, location and marking	See below.	P
1.7.8.2	Colours	Not used	N/A
1.7.8.3	Symbols according to EC 417	There are no switches in the equipment.	N/A
1.7.8.4	Markings using figures	No indicators for different positions.	N/A
1.7.9	Isolation of multiple power sources	Only one connection supplying hazardous voltages and energy levels to the equipment.	N/A
1.7.10	Thermostats and other regulating devices	Such devices not used	N/A
1.7.11	Durability	The label was subjected to the permanence of marking test. The label was rubbed with cloth soaked with water for 15 sec. and then again for 15 sec. with the cloth soaked with petroleum spirit . After this test there was no damage to the label . The marking on the label did not fade. There was neither curling nor lifting of the label edge.	P
1.7.12	Removable parts	No such parts.	N/A
1.7.13	Replaceable batteries	No replaceable batteries.	N/A
	Language(s)	Not used.	—
1.7.14	Equipment for restricted access locations	Equipment not intended for installation in restricted access locations .	N/A

2	PROTECTION FROM HAZARDS		P
2.1	Protection against electric shock and energy hazard	s	P
2.1.1	Protection in operator access areas	See below	P
2.1.1.1	Access to energized parts	No access with test finger/ pin/probe to any hazardous parts at final assembly.	P
	Test by inspection	Verified.	P
	Test with test finger (Figure 2A)	Verified.	P
	Test with test pin (Figure 2B)	Verified.	P
	Test with test probe (Figure 2C).....	Verified.	P
2.1.1.2	Battery compartments	No battery compartment	N/A
2.1.1.3	Access to ELV wiring	No ELV wiring.	N/A
	Working voltage (V); distance (mm) through insulation	(see appended table 2.10.5)	—
2.1.1.4	Access to hazardous voltage circuit wiring	All accessible parts are separated from internal wiring at hazardous voltage by double or reinforced insulation.	P
2.1.1.5	Energy hazards	Outputs < 240 VA (see appended table 2.1.1.5)	P
2.1.1.6	Manual controls	No hazards	P
2.1.1.7	Discharge of capacitors in equipment	No risk of electric shock	P

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Clause	Requirement - Test	Result - Remark	Verdict
	Time-constant (s); measured voltage (V):	See appended table 2.1.1.7.	—
2.1.1.8	Energy hazards- d.c. mains supply	No hazardous energy	N/A
	a) Capacitor connected to the d.c. mains supply..... :		—
	b) Internal battery connected to the d.c. mains supply..... :		—
2.1.1.9	Audio amplifiers	No audio amplifiers	N/A
2.1.2	Protection in service access areas	No service access area	N/A
2.1.3	Protection in restricted access locations	Equipment not intended for installation in restricted access locations	N/A

2.2	Safety extra-low voltage (SELV) circuits		P
2.2.1	General requirements	The secondary circuits were tested as SELV. See subclauses 2.2.2 to 2.2.4.	P
???	Voltages under normal conditions (V)	Within SELV limits. (See appended table	P
2.2.3	Voltages under fault conditions (V)..... :	Single fault conditions: < 60Vdc. See enclosed test results.	P
2.2.4	Connection of SELV circuits to other circuits	SELV circuits are only connected to limited current circuits.	P
2.3	TNV circuits		N/A
2.3.1	Limits	No TNV circuits in the equipment.	N/A
	Type of TNV circuits		—
2.3.2	Separation from other circuits and from accessible parts		N/A
2.3.2.1	General requirements		N/A
2.3.2.2	Protection by basic insulation		N/A
2.3.2.3	Protection by earthing		N/A
2.3.2.4	Protection by other constructions		N/A
2.3.3	Separation from hazardous voltages		N/A
	Insulation employed..... :		—
2.3.4	Connection of TNV circuits to other circuits		N/A
	Insulation employed..... :		—
2.3.5	Test for operating voltages generated externally		N/A

2.4	Limited current circuits		P
2.4.1	General requirements	The component CY1 is bridging primary to secondary was considered as limited current circuit	P
2.4.2	Limit values	See appended table 2.4.	P
	Frequency (Hz)		—
	Measured current (mA)		—
	Measured voltage (V)		—
	Measured circuit capacitance (nF or uF)		—
2.4.3	Connection of limited current circuits to other circuits		N/A

2.5	Limited power source		P
	a) Inherently limited output		N/A
	b) Impedance limited output		N/A

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Clause	Requirement - Test	Result - Remark	Verdict

	c) Regulating network limited output under normal operating and single fault condition	DC output complies with limited power source.	P
	d) Overcurrent protective device limited output		N/A
	Max. output voltage (V), max. output current (A), max. apparent power (VA).....:	See appended table 2.5.	—
	Current rating of overcurrent protective device (A)		—

2.6	Provisions for earthing and bonding		N/A
2.6.1	Protective earthing		N/A
2.6.2	Functional earthing		N/A
2.6.3	Protective earthing and bonding conductors		N/A
2.6.3.1	General		N/A
2.6.3.2	Size of protective earthing conductors		—
2.6.3.3	Size of protective bonding conductors		N/A
	Rated current (A), cross-sectional area (mm ²), AWG		—
2.6.3.4	Resistance of earthing conductors and their terminations; resistance (W), voltage drop (V), test current (A), duration (min)		—
2.6.3.5	Colour of insulation		—
2.6.4	Terminals		N/A
2.6.4.1	General		N/A
2.6.4.2	Protective earthing and bonding terminals		N/A
2.6.4.3	Separation of the protective earthing conductor from protective bonding conductors		N/A
2.6.5	Integrity of protective earthing		N/A
2.6.5.1	Interconnection of equipment		N/A
2.6.5.2	Components in protective earth and bonding conductors		N/A
2.6.5.3	Disconnection of protective earth		N/A
2.6.5.4	Parts that can be removed by an operator		N/A
2.6.5.5	Parts removed during servicing		N/A
2.6.5.6	Corrosion resistance		N/A
2.6.5.7	Screws for protective bonding		N/A
2.6.5.8	Reliance on telecommunication network or cable distribution system		N/A

2.7	Overcurrent and earth fault protection in primary circuits		P
2.7.1	Basic requirements	Protective device is integrated in the equipment, see also 5.3.	P
	Instructions when protection relies on building installation		N/A
2.7.2	This subclause has been declared Void'.		N/A
2.7.3	Short circuit backup protection	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	Only one fuse provided.	N/A
2.7.6	Warning to service personnel	No service work necessary.	N/A

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Clause	Requirement - Test	Result - Remark	Verdict
2.8	Safety interlocks		P
2.8.1	General principles		P
2.8.2	Protection requirements		P
2.8.3	Inadvertent reactivation		P
2.8.4	Fail safe operation		P
2.8.5	Moving parts	No moving parts	N/A
2.8.6	Overriding		N/A
2.8.7	Switches and relays		N/A
2.8.7.1	Contact gap (mm):		N/A
2.8.7.2	Overload test		N/A
2.8.7.3	Endurance test		N/A
2.8.7.4	Electric strength test: test voltage (V):		N/A
2.8.8	Mechanical actuators		N/A

2.9	Insulation		P
2.9.1	Properties of insulating materials	Neither natural rubber, materials containing asbestos nor hygroscopic materials are used as insulation. No driving belts or couplings used.	P
2.9.2	Humidity treatment		P
	Humidity (%),Temperature (°C)	93%Rh, 30°C, 48 hrs	P
2.9.3	Grade of insulation	Insulation complies with subclauses 2.10, 4.5.1 and 5.2.	P
2.9.4	Separation from hazardous voltages		P
	Method(s) used.....:	SELV separated from primary by reinforced or double insulation (Method 1).	—

2.10	Clearances, creepage distances and distances through insulation		P
2.10.1	General	See sub-clauses 2.10.3, 2.10.4 and 2.10.5.	P
2.10.1.1	Frequency.....:	Considered	P
2.10.1.2	Pollution degrees.....	Pollution degree 2	P
2.10.1.3	Reduced values for functional insulation	Functional insulation Line to Neutral complies with 2.10.3 & 2.10.4. Other functional insulations comply with 5.3.4 c).	P
2.10.1.4	Intervening unconnected conductive parts	Considered	P
2.10.1.5	Insulation with varying dimensions	No such transformer used.	N/A
2.10.1.6	Special separation requirements	No TNV circuits.	N/A
2.10.1.7	Insulation in circuits generating starting pulses	No such circuits	N/A
2.10.2	Determination of working voltage	See appended table 2.10.2.	P
2.10.2.1	General		P
2.10.2.2	RMS working voltage	Considered.	P
2.10.2.3	Peak working voltage	Considered.	P
2.10.3	Clearances		P
2.10.3.1	General		P
2.10.3.2	Mains transient voltages		P
	a) AC mains supply.....:	Overvoltage Category II (2500V _{peak})	P

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Clause	Requirement - Test	Result - Remark	Verdict
	b) Earthed d.c. mains supplies	No earthed d.c. mains supplies	N/A
	c) Unearthed d.c. mains supplies.....	Assumed to be equal to the mains transient voltage.	N/A
	d) Battery operation	No battery used.	N/A
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 appended table 2.10.3 and 2.10.4)	P
2.10.3.5	Clearances in circuits having starting pulses	(see appended table 2.10.3 and 2.10.4)	N/A
2.10.3.6	Transients from a.c. mains supply.....		N/A
2.10.3.7	Transients from d.c. mains supply.....		N/A
2.10.3.8	Transients from telecommunication networks and cable distribution systems.....		N/A
2.10.3.9	Measurement of transient voltage levels	Measurement not relevant.	N/A
	a) Transients from a mains supply		N/A
	For an a.c. mains supply.....		N/A
	For a d.c. mains supply		N/A
	b) Transients from a telecommunication network :		N/A
2.10.4	Creepage distances		P
2.10.4.1	General		P
2.10.4.2	Material group and comparative tracking index		P
	CTI tests.....	Material group 1Mb is assumed to be used.	-
2.10.4.3	Minimum creepage distances		(see appended table 2.10.3 and 2.10.4)
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	No such potted components.	N/A
2.10.5.4	Semiconductor devices	Approved optocoupler used.	P
2.10.5.5	Cemented joints	Not applied	N/A
2.10.5.6	Thin sheet material - General	Not used	N/A
2.10.5.7	Separable thin sheet material	The polyester tape used in transformer.	P
2.10.5.8	Non-separable thin sheet material	No such insulation.	N/A
2.10.5.9	Thin sheet material - standard test procedure		N/A
	Electric strength test	(see appended table 2.10.5)	N/A
2.10.5.10	Thin sheet material - alternative test procedure		N/A
	Electric strength test	(see appended table 2.10.5)	-
2.10.5.11	Insulation in wound components		P
2.10.5.12	Wire in wound components		P
	Working voltage	See appended table 2.10.2.	P
	a) Basic insulation not under stress		P
	b) Basic, supplementary, reinforced insulation:		P
	c) Compliance with Annex U		P
	Two wires in contact inside wound component; angle between 45° and 90° ... :	Sleeve is used as additional protection.	P
2.10.5.13	Wire with solvent-based enamel in wound components	No such wound components.	N/A
	Electric strength test		-
	Routine test		N/A
2.10.5.14	Additional insulation in wound components		N/A

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Clause	Requirement - Test	Result - Remark	Verdict

	Working voltage		N/A
	- Basic insulation not under stress.....		N/A
	- Supplementary, reinforced insulation		N/A
2.10.6	Construction of printed boards		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	(see appended table 2.10.3 and 2.10.4)	N/A
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		N/A
	Distance through insulation	(see appended table 2.10.5)	N/A
	Number of insulation layers (pes).....		N/A
2.10.7	Component external terminations	(see appended table 2.10.3 and 2.10.4)	P
2.10.8	Tests on coated printed boards and coated components		N/A
2.10.8.1	Sample preparation and preliminary inspection		N/A
2.10.8.2	Thermal conditioning		N/A
2.10.8.3	Electric strength test		N/A
2.10.8.4	Abrasion resistance test		N/A
2.10.9	Thermal cycling		N/A
2.10.10	Test for Pollution Degree 1 environment and insulating compound		N/A
2.10.11	Tests for semiconductor devices and cemented joints		N/A
2.10.12	Enclosed and sealed parts		N/A

3	WIRING, CONNECTIONS AND SUPPLY		P
3.1	General		P
3.1.1	Current rating and overcurrent protection	Adequate cross sectional areas on internal wiring.	P
3.1.2	Protection against mechanical damage	Wiring, connections and supply are adequately fixed to prevent excessive strain on wire and terminals and avoiding damage to the insulation of conductors.	P
3.1.3	Securing of internal wiring	Internal wiring is secured against excessive strain, loosening of terminals and damage to the conductor insulation.	P
3.1.4	Insulation of conductors	The insulation of the individual conductors suitable for the application and the working voltage.	P
3.1.5	Beads and ceramic insulators	Not used.	N/A
3.1.6	Screws for electrical contact pressure	Not used.	N/A
3.1.7	Insulating materials in electrical connections	No contact pressure through insulating material.	N/A
3.1.8	Self-tapping and spaced thread screws	No self-tapping screws are used	N/A
3.1.9	Termination of conductors	Terminations cannot become	P

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Clause	Requirement - Test	Result - Remark	Verdict
		displaced so that clearances and creepage distances can be reduced.	
	10 N pull test	Not loosening	P
3.1.10	Sleeving on wiring	Sleeves are used as supplementary	P
3.2	Connection to a mains supply		P
3.2.1	Type of connection	See below	P
3.2.1.1	Connection to an a.c. mains supply	Appliance inlet	P
3.2.1.2	Connection to a d.c. mains supply	Not connection to a d.c. mains supply	N/A
3.2.2	Multiple supply connections	No multiple supply connections	N/A
3.2.3	Provision for permanent connection		P
	Number of conductors, diameter of cable and conduits (mm)..... :		P
3.2.4	Appliance inlet	Approved appliance inlet used	P
3.2.5	Power supply cords	Approved power supply cords used	N/A
3.2.5.1	Type..... :	H03 VV-F or H03 WH2-F	—
	Rated current (A), cross-sectional area (mm ²), AWG :	5A, 3x0.75mm ² , 18AWG	—
3.2.5.2	DC power supply cords		N/A
3.2.6	Cord anchorage and strain relief		N/A
	Mass of equipment (kg), pull (N) :		—
	Longitudinal displacement (mm)		—
3.2.7	Protection against mechanical damage		N/A
3.2.8	Cord guard		N/A
	D(mm)		—
	Test: mass (g)		—
	Radius of curvature of cord (mm)..... :		—
3.2.9	Supply wiring space		N/A
3.3	Wiring terminals for external mains supply conductors	No wiring	N/A
3.3.1	Wring terminals		N/A
3.3.2	Connection of non-detachable power supply cords		N/A
3.3.3	Screws terminals		N/A
3.3.4	Conductor sizes to be connected		N/A
	Rated current (A), cord/cable type, cross-sectional area (mm ²) :		N/A
3.3.5	Wring terminal sizes		N/A
	Nominal thread diameter (mm)		N/A
3.3.6	Wring terminal design		N/A
3.3.7	Grouping of wiring terminals		N/A
3.3.8	Stranded wire		N/A
3.4	Disconnection from the a.c. mains supply		P
3.4.1	General requirements		P
3.4.2	Type of disconnect device	Appliance coupler	P
3.4.3	Permanently connected equipment	No permanently connected equipment	N/A
3.4.4	Parts which remain energized		N/A
3.4.5	Switches in flexible cords		N/A
3.4.6	Number of poles - single-phase and d.c.		N/A

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Clause	Requirement - Test	Result - Remark	Verdict
	equipment		
3.4.7	Number of poles - three-phase equipment		N/A
3.4.8	Switches as disconnect devices		N/A
3.4.9	Plugs as disconnect devices		N/A
3.4.10	Interconnected equipment		N/A
3.4.11	Multiple power sources		N/A
3.5	Interconnection of equipment		P
3.5.1	General requirements		P
3.5.2	Type of interconnection circuits	SELV circuit	P
3.5.3	ELV circuits as interconnection circuits	No ELV interconnection	N/A
3.5.4	Data ports for additional equipment	No data ports	N/A
4	PHYSICAL REQUIREMENTS		P
4.1	Stability and mechanical hazards		N/A
	Angle of 10°		N/A
	Test: force (N)		N/A
4.2	Mechanical strength		P
4.2.1	General		P
	Rack-mounted equipment.	(see Annex DD)	N/A
4.2.2	Components and parts 10N ± 1N; 5s	No hazard.	P
4.2.3	Internal enclosures 30 N ± 3 N; 5 s	No internal enclosure.	N/A
4.2.4	External enclosures 250 N ± 10 N; 5 s	No hazard.	P
4.2.5	Impact test	Unit is classified as transportable equipment and therefore this test is not applicable.	N/A
4.2.6	Drop test	Transportable equipment, No hazard after 1 m drop.	P
4.2.7	Stress relief test	Test is carried out at 70°C / 7h. No risk of shrinkage or distortion on enclosures due to release of internal stresses.	P
4.2.8	Mechanical strength of cathode ray tubes	No CRT used.	N/A
	Picture tube separately certified		—
4.2.9	High pressure lamps	No high pressure lamp provided	N/A
4.2.10	Wall or ceiling mounted equipment		N/A
4.3	Design and construction		P
4.3.1	Edges and corners	All edges and corners are rounded and smooth	P
4.3.2	Handles and manual controls ; force (N)	No knobs, grips, handles, lever, etc.	N/A
4.3.3	Adjustment of accessible control devices	No hazardous adjustable controls	N/A
4.3.4	Securing of parts	Parts are adequately secure	N/A
4.3.5	Connection by plugs and sockets		N/A
4.3.6	Torque test for direct plug-in equipment		N/A
	Torque :		N/A
	Compliance with the relevant mains plug standard..... :		N/A
4.3.7	Heating elements in earthed equipment	No heating element	N/A
4.3.8	Batteries	No batteries	N/A
	- Overcharging of a rechargeable battery		N/A
	- Unintentional charging of a non-rechargeable		N/A

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Clause	Requirement - Test	Result - Remark	Verdict
	battery		
	- Reverse charging of a rechargeable battery		N/A
	- Excessive discharging rate for any battery		N/A
4.3.9	Resistance to oil and grease	Insulation is not exposed to oil, grease etc.	N/A
4.3.10	Dust, powder, liquid and gas	The equipment does not generate dust , powder, does not contain liquid or gas.	N/A
4.3.11	Containers for liquids and gases	No container for liquid or gas	N/A
4.3.12	Flammable liquids	No flammable liquid	N/A
	Quantity of liquid (l)..... :		N/A
	Flash point (°C)..... :		N/A
4.3.13	Radiation		N/A
4.3.13.1	General		N/A
4.3.13.2	Ionizing radiation		N/A
	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/A
	Part, property, retention after test, flammability classification :		N/A
4.3.13.4	Human exposure to ultraviolet (UV) radiation.:	No UV radiation	N/A
4.3.13.5	Laser (including LEDs)	No laser	N/A
4.3.13.5.1	Lasers (including laser diodes)		N/A
	Laser class :		—
4.3.13.5.2	Light emitting diodes (LEDs)	No LED	N/A
4.3.13.6	Other types :		N/A
4.4	Protection against hazardous moving parts		N/A
4.4.1	General	No moving parts	N/A
4.4.2	Operator access areas		N/A
4.4.3	Restricted access locations		N/A
4.4.4	Service access areas		N/A
4.5	THERMAL REQUIREMENTS		P
4.5.1	General		P
4.5.2	Temperature tests		P
	Normal load condition per Annex L :	Equipment loaded with normal output current.	—
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/A
4.6.1	Top and side openings		N/A
	Dimensions (mm)		—
4.6.2	Bottoms of fire enclosures		N/A
	Construction of the bottom, dimensions (mm):		—
4.6.3	Doors and covers		N/A
4.6.4	Openings in transportable equipment		N/A
4.6.4.1	Constructional design measures		N/A
	Dimensions (mm)..... :		—

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Clause	Requirement - Test	Result - Remark	Verdict
4.6.4.2	Evaluation measures for larger openings		N/A
4.6.4.3	Use of metallized parts		N/A
4.6.5	Adhesives for constructional purposes		N/A
	Conditioning temperature (°C), time (weeks):		—
4.7	Resistance to fire		P
4.7.1	Reducing the risk of ignition and spread of flame	No excessive temperatures. No easily burning materials employed. Metal enclosure provided. Safety relevant components used within their specified temperature limits	P
	Method 1, selection and application of components wiring and materials	Using of materials with adequate flammability class (see appended table 4.7)	P
	Method 2, application of all of simulated fault condition tests	(see appended table 5.3)	P
4.7.2	Conditions for fire enclosures	The unit provide fire enclosure	P
4.7.2.1	Parts requiring a fire enclosure	The fire enclosure is required to coverall parts	P
4.7.2.2	Parts not requiring a fire enclosure	The fire enclosure is required to coverall parts	N/A
4.7.3	Materials		P
4.7.3.1	General	Components and materials have adequate flammability classification.	P
4.7.3.2	Material for fire enclosures	(see appended table 1.5.1)	P
4.7.3.3	Flammability of materials and components outside a fire enclosure	PVC insulated output cable	P
4.7.3.4	Materials for components and other parts inside fire enclosures	PCB rated min. V-0, bobbin material rated V-0, approved by UL	P
4.7.3.5	Materials for air filter assemblies	No air filter provided	N/A
4.7.3.6	Materials used in high-voltage components	No high voltage components Provided. No parts exceeding 4kV	N/A
5	Electrical requirements and simulated abnormal conditions		P
5.1	Touch current and protective bonding conductor current		P
5.1.1	General		P
5.1.2	Configuration of equipment under test (EUT)	See below	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/A
5.1.2.3	Simultaneous multiple connections to an a.c. mains supply		N/A
5.1.3	Test circuit	Using figure 5A	P
5.1.4	Application of measuring instrument	Using measuring instrument in 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)	0,25mA to unearthed accessible parts (output)	—

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Clause	Requirement - Test	Result - Remark	Verdict
	Measured protective conductor current (mA):		N/A
	Max. allowed protective conductor current (mA)..... :		N/A
5.1.7	Equipment with touch current exceeding 3,5 mA		N/A
5.1.7.1	General.....		N/A
5.7.1.2	Simultaneous multiple connections to the supply		N/A
5.1.8	Touch currents to telecommunication networks and cable distribution systems and from telecommunication networks	No TNV circuits	N/A
5.1.8.1	Limitation of the touch current to a telecommunication network or to a cable distribution system		N/A
	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
	a) EUT with earthed telecommunication ports:		N/A
	b) EUT whose telecommunication ports have no reference to protective earth		N/A
5.2	Electric strength		P
5.2.1	General	(see appended table 5.2) Based on the electric strength test the use of the insulating materials within the equipment is satisfactory	P
5.2.2	Test procedure	No insulation breakdown detected during the test	P
5.3	Abnormal operating and fault conditions		P
5.3.1	Protection against overload and abnormal operation	(see appended table 5.3)	P
5.3.2	Motors		N/A
5.3.3	Transformers	(see appended Annex C)	P
5.3.4	Functional insulation	By short-circuited, results see appended table 5.3.	P
5.3.5	Electromechanical components	No electromechanical component	N/A
5.3.6	Audio amplifiers in ITE	Audio amplifiers not used.	N/A
5.3.7	Simulation of faults		N/A
5.3.8	Unattended equipment	The unit is intended for rated operation. There is no thermal sensor or cut-off for operational condition.	N/A
5.3.9	Compliance criteria for abnormal operating and fault conditions		P
5.3.9.1	During the tests	No fire or molten metal occurred and no deformation of enclosure during the tests	P
5.3.9.2	After the tests	No reduction of clearance and creepage distance. Electric strength test is made on basic, supplementary and reinforced insulation after test	P

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Clause	Requirement - Test	Result - Remark	Verdict
6	CONNECTION TO TELECOMMUNICATION NETWORKS		N/A
6.1	Protection of telecommunication network service personnel, and users of other equipment connected to the telecommunication network, from hazards in the equipment		N/A
6.1.1	Protection from hazardous voltages		N/A
6.1.2	Separation of the telecommunication network from earth		N/A
6.1.2.1	Requirements		N/A
	Supply voltage (V)		N/A
	Current in the test circuit (mA)		N/A
6.1.2.2	Exclusions		N/A
6.2	Protection of equipment users from voltages on the telecommunication networks		N/A
6.2.1	Separation requirements		N/A
6.2.2	Electric strength test procedure		N/A
6.2.2.1	Impulse test		N/A
6.2.2.2	Steady-state test		N/A
6.2.2.3	Compliance criteria		N/A
6.3	Protection of telecommunication wiring system from overheating		N/A
	Maximum continuous output current (A)		N/A
7	CONNECTION TO CABLE DISTRIBUTION SYSTEMS <i>Not to be connected to cable distribution system</i>		N/A
7.1	General		N/A
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/A
7.3	Protection of equipment users from overvoltages on the cable distribution system		N/A
7.4	Insulation between primary circuits and cable distribution systems		N/A
7.4.1	General		N/A
7.4.2	Voltage surge test		N/A
7.4.3	Impulse test		N/A

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Clause	Requirement - Test	Result - Remark	Verdict
A	ANNEX A, TESTS FOR RESISTANCE TO HEAT AND FIRE		P
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)	Approved materials are used. See list of critical components.	P
A.1.1	Samples		—
	Wall thickness (mm)		—
A.1.2	Conditioning of samples; temperature (°C)...		N/A
A.1.3	Mounting of samples.....		N/A
A.1.4	Test flame (see I EC 60695-11 -3)		N/A
	Flame A, B, C or D..... :		—
A.1.5	Test procedure		N/A
A.1.6	Compliance criteria		N/A
	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) <i>UL recognized material V-0 enclosure used.</i>		P
A.2.1	Samples, material.....		—
	Wall thickness (mm)		—
A.2.2	Conditioning of samples; temperature (°C)...		N/A
A.2.3	Mounting of samples.....		N/A
A.2.4	Test flame (see I EC 60695-11 -4)		N/A
	Flame A, BorC..... :		—
A.2.5	Test procedure		N/A
A.2.6	Compliance criteria		N/A
	Sample 1 burning time (s)		—
	Sample 2 burning time (s)		—
	Sample 3 burning time (s)		—
A.2.7	Alternative test ace. to I EC 60695-11-5, cl. 5 and 9		N/A
	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
A.3.1	Mounting of samples		N/A
A.3.2	Test procedure		N/A
A.3.3	Compliance criterion		N/A
B	ANNEX B, MOTOR TESTS UNDER ABNORMAL CONDITIONS		N/A
B.1	General requirements	No motor	N/A
	Position		N/A
	Manufacturer		N/A
	Type		N/A
	Rated voltage (V) or current (A)		N/A
B.2	Test conditions		N/A
B.3	Maximum temperatures		N/A
B.4	Running overload test		N/A
B.5	Locked motor overload test		N/A
	Test duration (days)		N/A
	Electric strength test: test voltage (V)		N/A
B.6	Running overload test for DC motor in secondary circuits		N/A

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Clause	Requirement - Test	Result - Remark	Verdict
B.7	Locked motor overload test for DC motor in secondary circuits		N/A
B.7.1	(in the EUT) Test time (0.5h)		N/A
B.7.2	(on a wooden board) Test time (h)		N/A
B.7.3	Electric Strength test		N/A
B.8	Test for motors with capacitors		N/A
B.9	Test for three phase motors		N/A
B.10	Test for series motors		N/A
	Test voltage (V).....		N/A

C	ANNEX C, TRANSFORMERS		P
	Position	Inside enclosure, on the PCB	—
	Manufacturer	Refer to specification	—
	Rated values	240Vac/SELV	—
	Method of protection	Primary current limitation	—
C.1	Overload test	(see appended table 5.3)	P
C.2	Insulation	(see appended table 5.2)	P
	Protection from displacement of windings.... :	Use of triple insulated wire (secondary) does not require special precaution. On primary margin tape is used for protection of displacement.	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/A

ANNEX E, TEMPERATURE RISE OF A WINDING (see 1.4.13) | N/A

ANNEX F, MEASUREMENT OF CLEARANCES AND CREEPAGE DISTANCES (see 2.10 and Annex G)

G	ANNEX G, ALTERNATIVE METHOD FOR DETERMINING MINIMUM CLEARANCES <i>Alternative method not used</i>		N/A
G.1	Clearances		N/A
G.1.1	General		N/A
G.1.2	Summary of the procedure for determining minimum clearances		N/A
G.2	Determination of mains transient voltage (V)		N/A
G.2.1	AC mains supply		N/A
G.2.2	Earthed d.c. mains supplies.....		N/A
G.2.3	Unearthed d.c. mains supplies		N/A
G.2.4	Battery operation.....		N/A
G.3	Determination of telecommunication network transient voltage (V).....		N/A
G.4	Determination of required withstand voltage (V)		N/A
G.4.1	Mains transients and internal repetitive peaks:		N/A
G.4.2	Transients from telecommunication networks:		N/A
G.4.3	Combination of transients		N/A
G.4.4	Transients from cable distribution systems		N/A
G.5	Measurement of transient voltages (V)		N/A
	a) Transients from a mains supply		N/A

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Clause	Requirement - Test	Result - Remark	Verdict
	For an a.c. mains supply		N/A
	For a d.c. mains supply		N/A
	b) Transients from a telecommunication network		N/A
G.6	Determination of minimum clearances.....		N/A
H	ANNEX H, IONIZING RADIATION		N/A
	Ionizing radiation		—
	Measured radiation		—
	Measured high voltage (kV)		—
	Measured focus voltage (kV)		—
	CRT markings.....		—
	Certified by		—
	Standard used		—
J	ANNEX J, TABLE OF ELECTROCHEMICAL POTENTIALS (see 2.6.5.6)		N/A
	Metal(s) used.....		—
K	ANNEX K, THERMAL CONTROLS (see 1.5.3 and 5.3.8) <i>No thermal controls</i>		N/A
K.1	Making and breaking capacity		N/A
K.2	Thermostat reliability		N/A
K.3	Thermostat endurance test		N/A
K.4	Temperature limiter endurance		N/A
K.5	Thermal cut-out reliability		N/A
K.6	Stability of operation		N/A
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/A
L.2	Adding machines and cash registers		N/A
L.3	Erasers		N/A
L.4	Pencil sharpeners		N/A
L.5	Duplicators and copy machines		N/A
L.6	Motor-operated files		N/A
L.7	Other business equipment	Rated load, as specified by manufacturer	P
M	ANNEX M, CRITERIA FOR TELEPHONE RINGING SIGNALS (see 2.3.1) <i>No telephone ringing signals generated</i>		N/A
M.1	Introduction		N/A
M.2	Method A		N/A
M.3	Method B		N/A
M.3.1	Ringling signal		N/A
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)		N/A
M.3.2	Tripping device and monitoring voltage.....		N/A
M.3.2.1	Conditions for use of a tripping device or a monitoring voltage		N/A
M.3.2.2	Tripping device		N/A
M.3.2.3	Monitoring voltage (V).....		N/A
N	ANNEX N, IMPULSE TEST GENERATORS		N/A

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Clause	Requirement - Test	Result - Remark	Verdict
N.1	ITU-T impulse test generators		N/A
N.2	IEC 60065 impulse test generator		N/A
P ANNEX P. NORMAT VE REFERENCES			—
Q	ANNEX Q, Voltage dependent resistors (VDRs) (see 1.5.9.1)		N/A
	a) Preferred climatic categories..... :		—
	b) Maximum continuous voltage.....		—
	c) Pulse current		—
R	ANNEX R, EXAMPLES OF REQUIREMENTS FOR QUALITY CONTROL PROGRAMMES (No quality control programmes used)		N/A
R.1	Minimum separation distances for unpopulated coated printed boards (see 2.10.6.2)		N/A
R.2	Reduced clearances (see 2.10.3)		N/A
S	ANNEX S, PROCEDURE FOR IMPULSE TESTING (see 6.2.2.3) <i>No TNV circuits.</i>		N/A
S.1	Test equipment		N/A
S.2	Test procedure		N/A
S.3	Examples of waveforms during impulse testing		N/A
T	ANNEX T, GUIDANCE ON PROTECTION AGAINST INGRESS OF WATER (see 1.1.2) <i>IP20 equipment</i>		N/A
U	ANNEX U, INSULATED WINDING WRES FOR USE WTHOUT INTERLEAVED INSULATION (see 2.10.5.4)		P
(A2)	This annex specifies winding wires whose insulation may be used to provide BASIC INSULATION, SUPPLEMENTARY INSULATION, DOUBLE INSULATION or REINFORCED INSULATION in wound components without interleaved insulation.	All used insulated wired are already approved to Annex U. No additional tests considered required.	—
V	ANNEX V, AC POWER DISTRIBUTION SYSTEMS (see 1.6.1)		P
V.1	Introduction		P
V.2	TN power distribution systems		P
W	ANNEX W, SUMMATION OF TOUCH CURRENTS	<i>No TNV</i>	N/A
W.1	Touch current from electronic circuits		N/A
W.1.1	Floating circuits		N/A
W.1.2	Earthed circuits		N/A
W.2	Interconnection of several equipments		N/A
W.2.1	Isolation		N/A
W.2.2	Common return, isolated from earth		N/A
W.2.3	Common return, connected to protective earth		N/A
X	ANNEX X, MAXIMUM HEATING EFFECT IN TRA	NSFORMER TESTS	P
X.1	Determination of maximum input current	Input current was measured and recorded (see appended table 5.3).	P
X.2	Overload test procedure		P
Y	ANNEX Y, ULTRAVIOLET LIGHT CONDITIONING TEST (see 4.3.13.3) Equipment will not be exposed to ultraviolet light.		N/A

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Clause	Requirement - Test	Result - Remark	Verdict
Y.1	Test apparatus		N/A
Y.2	Mounting of test samples.....		N/A
Y.3	Carbon-arc light-exposure apparatus		N/A
Y.4	Xenon-arc light exposure apparatus.....:		N/A
Z	ANNEX Z, OVERVOLTAGE CATEGORIES (see 2.10.3.2 and Clause G.2)		N/A
ZD	Annex ZD (informative) IEC and CENELEC code designations for flexible cords		N/A
AA	ANNEX AA, MANDREL TEST (see 2.10.5.8) <i>Non-separable thin sheet material not applied</i>		N/A
BB	<u>ANNEX BB, CHANGES IN THE SECOND EDITION</u>		
CC	ANNEX CC, Evaluation of integrated circuit (IC) current limiters		N/A
CC.1	General		N/A
CC.2	Test program 1.....		N/A
CC.3	Test program 2.....		N/A
DD	ANNEX DD, Requirements for the mounting means of rack-mounted equipment		N/A
DD.1	General		N/A
DD.2	Mechanical strength test, variable N.....:		N/A
DD.3	Mechanical strength test, 250N, including end stops		N/A
DD.4	Compliance.....:		N/A
EE	ANNEX EE, Household and home/office document /media shredders		N/A
EE.1	General		N/A
EE.2	Markings and instructions		N/A
	Use of markings or symbols		N/A
	Information of user instructions, maintenance and/or servicing instructions.....		N/A
EE.3	Inadvertent reactivation test		N/A
EE.4	Disconnection of power to hazardous moving parts.....:		N/A
	Use of markings or symbols		N/A
EE.5	Protection against hazardous moving parts		N/A
	Test with test finger (Figure 2A).....:		N/A
	Test with wedge probe (Figure EE1 and EE2):		N/A

ATTACHMENT TO TEST REPORT EN 60950-1 EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES

Information technology equipment - Safety
-PART 1: GENERAL REQUIREMENTS

CENELEC COMMON MODIFICATIONS -EN 60950-1:2006/A11:2009/A1:2010/A12:2011/A2:20		
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 2.2.3 Note 2.2.4 Note 2.3.2.1 Note 2 2.3.4 Note 2 2.7.1 Note 2.10.3.2 Note 2 3.2.1.1 Note 3.2.4 Note 3 4.3.6 Note 1 & 2 4.7 Note 4 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 6.2.2 Note 6.2.2.1 Note 2 7.1 Note 3 7.2 Note	P
General (A1)	In I EC 60950-1:2005/A1 delete all the "country" notes 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	N/A
1.1.1(A1)	Replace the text on 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.	N/A
1.2.3(A1)	Add the following definition: 1.2.3.Z1 PORTABLE SOUND SYSTEM Small battery powered audio equipment: - whose prime purpose is to listen to recorded or broadcasted sound; and - that uses headphones or earphones that can be worn in or around the ears; and - that allows the user to walk around NOTE Examples are mini-disk or CD players; MP3 audio players or similar equipment.	N/A
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/A
1.3.Z1 (A12)	Delete the addition of 1.3.Z1 in EN 60950-1:2006	N/A
1.2.3 (A12)	Delete the addition of 1.3.Z1 in EN 60950-1:2006/A1:2010	N/A
1.7.2.1	Delete NOTE Z1 and the addition for Portable Sound System in EN 60950-1:2006 and in EN 60950-1:2006/A1:2010	N/A

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Add the following clause and annex to the existing standard and amendments		N/A
ZX(A12)	Protection against excessive sound pressure from personal music players	N/A
ZX.1(A12)	General	N/A
ZX.2(A12)	Equipment Requirements	N/A
ZX.3(A12)	Warning	N/A
ZX.4(A12)	Requirements for listening devices (headphones and earphones)	N/A
ZX.5(A12)	Measurement methods	N/A
1.5.1	Add the following NOTE: NOTE Z1 The use of certain substances in electrical and electronic equipment is restricted within the EL): see Directive 2002/95/EC	P
1.7.2.1	Add the following paragraph at the end of the subclause: In addition, for PORTABLE SOUND SYSTEM, the instructions shall include a warning that excessive sound pressure from earphones and headphones can cause hearing loss.	N/A
2.7.1	Replace the subclause as follows: Basic requirements To protect against excessive current, shortcircuits 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, shortcircuit 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/A
3.2.3	Delete the NOTE in Table 3A, and delete also in this table the conduit sizes in parentheses. Deleted	N/A
3.2.5.1	Replace "60245 I EC 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 j Over 10 up to and including 16 j (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/A
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/A
4.3.13.6	Add the following NOTE: NOTE Z1 Attention is drawn to 1999/519/EC: Council Recommendation on the limitation of	N/A

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	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.	
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 uSv/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/A
Bibliography	Additional EN standards. IEC 60908 NOTE Harmonized as EN 60908	—
Bibliography	Additional EN standards.	—

ZA | **NORMATIVE REFERENCES TO INTERNATIONAL PUBLICATIONS WITH THEIR CORRESPONDING EUROPEAN PUBLICATIONS**

ZB	Special national conditions	—
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/A
1.2.13.14 (A11)	In Norway and Sweden, for requirements see 1.7.2.1 and 7.3 of this annex.	N/A
1.5.7.1 (A11)	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/A
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/A
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/A
1.7.2.1 (A2)	In Denmark, 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 Denmark: "Apparatets stikprop skal tilsluttes en stikkontakt med jord, som giver forbindelse til stikproppens jord. " In Finland: " Laite on liitettava suojakoskettimilla varustettuun pistorasiaan " In Norway: " Apparatet ma tilkoples jordet stikkontakt " In Sweden: "Apparaten skall anslutas till jordat uttag"	N/A
1.7.2.1 (A11)	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). " 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	N/A

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	<p>insulation shall withstand a dielectric strength of 1,5 kVr.m.s., 50 Hz or 60 Hz, fori 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 til koplet et kabel-TV nett, kan forarsake bra nn fa re. For a unnga 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 ar kopplad till skyddsjord via jordat vagguttag och/eller via annan utrustning och samtidigt ar kopplad till kabel-TV nat kan i vissa fall medfira risk fir brand. Fir att undvika detta skall vid anslutning av utrustningen till kabel-TV nat galvanisk isolator finnas mellan utrustningen och kabel-TV natet."</p>	
1.7.5 (A2)	<p>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, DK1-1d,DK1 -5a or DK1 -7a, with the exception for STATIONARY EQUIPMENT where the socket-outlets shall be in accordance with Standard Sheet DK 1-1 b, DK 1-1c, DK 1-1dorDK1-5a. 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</p>	N/A
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/A
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/A
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/A
2.6.3.3	In the United Kingdom, the current rating of the circuit shall betaken as 13 A, not 16 A	N/A
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/A
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/A
3.2.1.1 (A2)	<p>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 sheetDK2-1aorDK2-5a. If a single-phase equipment having a RATED CURRENT exceeding 13 A or if a polyphase equipment is provided with a supply cord with a plug, this plug shall be in accordance with the standard sheets DK6-1a in DS 60884-2-D1 or EN 60309-2. Justification the Heavy Current Regulations, 6c</p>	N/A
3.2.1.1	<p>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 sheetDK2-1aorDK2-5a. 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</p>	N/A


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	accordance with the Heavy Current Regulations, Section 107-2-D1 or EN 60309-2.	
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/A
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 S11768:1994 and essentially means an approved plug conforming to BS 1363 or an approved conversion plug	N/A
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/A
3.2.4	In Switzerland, for requirements see 3.2.1.1 of this annex	N/A
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/A
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/A
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 BS1363: Parti, 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/A
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/A
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/A
6.1.2.1	In Finland, Norway and Sweden, add the following text between the first and second	N/A

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(A1)	<p>paragraph of the compliance clause: If this insulation is solid, including insulation forming part of a component, it shall at least consist of either</p> <ul style="list-style-type: none"> - 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. <p>Alternatively for components, there is no distance through insulation requirements for the insulation consisting of an insulating compound completely filling the casing, so that CLEARANCES and CREEPAGE DISTANCES do not exist, if the component passes the electric strength test in accordance with the compliance clause below and in addition</p> <ul style="list-style-type: none"> - 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. <p>It is permitted to bridge this insulation with an optocoupler complying with 2.10.5.4b. It is permitted to bridge this insulation with a capacitor complying with EN 60384-14:2005, subclause Y2.</p> <p>A capacitor classified Y3 according to EN 60384-14:2005, may bridge this insulation under the following conditions:</p> <ul style="list-style-type: none"> - 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. 	
6.1.2.2	<p>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</p>	N/A
7.2	<p>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</p>	N/A
7.3	<p>In Norway, for installation conditions see EN 60728-11:2005.</p>	N/A
7.3(A11)	<p>In Norway and Sweden, for requirements see 1.2.12.14 and 1.7.2.1 of this annex.</p>	N/A
ANNEX ZC	<p>A-deviations</p>	-
1.5.1(A11)	<p>Sweden (Ordinance 1990:944) Add the following: NOTE In Sweden, switches containing mercury are not permitted DELETED in A11</p>	N/A
1.5.1	<p>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</p>	N/A
1.7.2.1 (A11)	<p>Denmark (Heavy Current Regulations) Supply cords of CLASS I EQUIPMENT, which is delivered without a plug, must be</p>	N/A

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	<p>provided with a visible tag with the following text: Vigtigt! Lederen med grøn/gul isolation ma kun tilsluttes en klemme masrket</p>  <p>eller</p> <p>If essential for the safety of the equipment, the tag must in addition be provided with a diagram, which shows the connection of the other conductors, or be provided with the following text: "For tilslutning af de Øvrige ledere, se medfølgende installationsvejledning." DELETED in A11</p>	
1.7.2.1	<p>Germany (Gesetz ubertechnische 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.</p>	N/A
1.7.5 (A11)	<p>Denmark (Heavy Current Regulations) With the exception of CLASS II EQUIPMENT provided with a socket outlet in accordance with the Heavy Current Regulations, Section 107-2- D1, Standard Sheet DK 1-4a, CLASS II EQUIPMENT shall not be fitted with socketoutlets for providing power to other equipment DELETED in A11</p>	N/A
1.7.1.3	<p>Switzerland (Ordinance on chemical hazardous nrisk reduction SR 814.81, Annex 2.15 Batteries) Annex 2.15 of SR 814.81 applies for batteries</p>	N/A
5.1.7.1 (A11)	<p>Denmark (Heavy Current Regulations, Chapter 707, clause 707.4) TOUCH CURRENT measurement results exceeding 3,5 mA r.m.s. are permitted only for PERMANENTLY CONNECTED EQUIPMENT and PLUGGABLE EQUIPMENT TYPE B DELETED in A11</p>	N/A

1.5.1	TABLE: List of critical components					P
Object/part name	Manufacturer/ trademark	Type/ model	Technical data	Standard	Mark(s) of conformity	
Enclosure	CHIMEI CORPORATION	PA-765A(+)	V-0, 80 degree C, Min. thickness 2.1mm	UL94, UL746	UL& Tested with equipment	
Fuse(F1)	SUNNY EAST ENTERPRISE CO LTD	TSP	AC 250V, 5A	DIN EN 60127-3 (VDE 0820-3) DIN EN 60127-1 (VDE 0820-1) IEC/EN 60127-1	VDE	
- Alternate	Dongguan Better Electronics Technology Co., Ltd.	334/332	AC 250V, 5A	DIN EN 60127-3 (VDE 0820-3) DIN EN 60127-1 (VDE 0820-1) IEC/EN 60127-1 IEC/EN	VDE	
- Alternate	DONGGUAN HONGDA ELECTRONIC TECHNOLOGY CO LTD	31TD	AC 250V, 5A	DIN EN 60127-3 (VDE 0820-3) DIN EN 60127-1 (VDE 0820-1) IEC/EN 60127-1 IEC/EN 60127-3	VDE	
- Alternate	CONQUER ELECTRONICS CO LTD	MST	AC 250V, 5A	DIN EN 60127-3 (VDE 0820-3) DIN EN 60127-1 (VDE 0820-1) IEC/EN 60127-1 IEC/EN	VDE	
- Alternate	SHENZHEN LANSON ELECTRONICS CO LTD	3K	AC 250V, 5A	DIN EN 60127-3 (VDE 0820-3) DIN EN 60127-1 (VDE 0820-1) IEC/EN 60127-1 IEC/EN 60127-3	VDE	
X2 Capacitor (Cxi)	ULTRA TECH XIPHI ENTERPRISE CO LTD	HQX	0.47uF, 275V	DIN EN 60384-14/A1 (VDE 0565-1-1/A1) IEC/EN 60384-14 IEC/EN 60384-1	VDE	
- Alternate	WIN DAY ELECTRONIC INDUSTRIAL CO LTD	MPX	0.47uF, 275V	DIN EN 60384-14/A1 (VDE 0565-1-1/A1) IEC/EN 60384-14 IEC/EN 60384-1	VDE	
- Alternate	SHANTOU HIGH-NEW TECHNOLOGY DEVELOPMNT ZONE SONGTIAN ENTERPRISE CO LTD	MPX	0.47uF, 275V	DIN EN 60384-14/A1 (VDE 0565-1-1/A1) IEC/EN 60384-14 IEC/EN 60384-1	VDE	
Bridge Diodes(BDI)	~	~	600V, MIN 6A	~	~	

Electrolytic Capacitor	-	«	220UF, 400 V, 105	-	~
Transistor (Q1)	-	«	800V, MIN12.6A	-	~
Insulation sheet onHS	SHENZHEN NUODE SITE TECHNOLOGY CO LTD	NDST-CP120 NDST-SB- 110.NDST-SP -001, NDST-SPT	V-0, 150 degree C	UL94, UL746	UL
-Alternate	DONGGUAN AOBOTEDAORE TECHNOLOGY CO., LTD	ABTCP800AB TS B900ABTST6 00	V-0, 150 degree C	UL94, UL746	UL
Label	Various	Various	Min. 80 degree C, apply for plastic enclosure	EN 60950-1	UL& Tested with equipment
Wiring, internal secondary ELV/SELV circuits	Various	Various	1015	EN 60950-1	UL& Tested with equipment
Adhesive Glue	Various	Various	V-0, 105 degree C	EN 60950-1	UL& Tested with equipment
Connectors and Receptacles (Secondary Circuits)	Various	METAL/PLAS TIC	Copper alloy pins housed in bodies of plastic rated min. V-2.	EN 60950-1	UL& Tested with equipment
Y2 Capacitor(Cy1, Cy2)	TDK CORPORATION	CS	AC 250V,2200pf, -25-85 degree C	DIN EN 60384-14 (VDE 0565-1-1) I EC/EN 60384-14	VDE
- Alternate	XIAMEN WANMING ELECTRONICS CO LTD	HM	AC 250V,2200pf, -40-125 degree C	DIN EN 60384-14 (VDE 0565-1-1) I EC/EN 60384-14	VDE
Y2 Capacitor (Cy3,Cy4)	TDK CORPORATION	CS	AC 250V,2200pf, -25-85 degree C	DIN EN 60384-14 (VDE 0565-1-1) I EC/EN 60384-14	VDE
- Alternate	XIAMEN WANMING ELECTRONICS CO LTD	HM	AC 250V,2200pf, -40-125 degree C	DIN EN 60384-14 (VDE 0565-1-1) I EC/EN 60384-14	VDE
PWB	Various	Various	Min. V-1, MOT min. 105 degree C	UL94	UL& Tested with equipment
Optical Isolator (U1 U2 U3)	EVERLIGHT ELECTRONICS CO LTD	EL817	200mw, Ctr=50% Min	I EC/EN 60747-5-5 DIN EN 60747-5-5 (0884-5)	VDE

- Alternate	SHARP CORP ELECTRONIC COMPONENTS AND DEVICES BU	PC817	200mw, Ctr=50% Min	IEC/EN 60747-5-5 DIN EN 60747-5-5 (0884-5)	VDE
	COSMO ELECTRONICS CORP	K1010	200mw, Ctr=50% Min	IEC/EN 60747-5-5 DIN EN 60747-5-5 (0884-5)	VDE
	BRIGHT LED ELECTRONICS CORP	BPC-817	200mw, Ctr=50% Min	IEC/EN 60747-5-5 DIN EN 60747-5-5 (0884-5)	VDE
Thermistor (Rt1)	THINKING ELECTRONIC INDUSTRIAL CO LTD	SCK-037	240Vac, 7A	UL1434	UL
Thermistor (Rt2)	THINKING ELECTRONIC INDUSTRIAL CO LTD	TTC03-104	100K	UL1434	UL
AC Inlet	ZHEJIANGLECI ELECTRONICS CO LTD	DB-14	AC 250V, 10A	IEC/EN 60320-1 DIN EN 60320-1 (VDE 0625-1)	VDE
- Alternate	YUEQINGYANHUI ELECTRONIC CO LTD	DB-14	AC 250V, 10A	IEC/EN 60320-1 DIN EN 60320-1 (VDE 0625-1)	VDE
Relay	NINGBOSONGLE RELAY CO LTD	SRD-24VDC-S LC	10A 125/250Vac, 10A28/30Vdc 105C	EN 61810-1	TUV
Bridging Capacitor (TVR1)	ULTRA TECH XIPHI ENTERPRISE CO LTD	HQX	0.47uF, 275V	DIN EN 60384-14/A1 (VDE 0565-1-1/A1) IEC/EN 60384-14 IEC/EN 60384-1	VDE
- Alternate	WIN DAY ELECTRONIC INDUSTRIAL CO LTD	MPX	0.47uF, 275V	DIN EN 60384-14/A1 (VDE 0565-1-1/A1) IEC/EN 60384-14 IEC/EN 60384-1	VDE
TRANSFORMER(T1&T2)					
T1	HAINING DECALONG ELECTRONICS CO LTD	ATR0457	~	~	
T2	HAINING DECALONG ELECTRONICS CO LTD	ATR0460	~	~	
Insulation System	HAINING DECALONG ELECTRONICS CO LTD	DECALONG 130-TM	Class B	UL1446	UL
Core	Various	Various	Overall size see specification	~	

Coil	ZHEJIANG HONGBO TECHNOLOGY CO LTD	XUEW/130	130 degree C	UL1446	UL
- Alternate	HANGZHOU WEIFENG ELECTRONIC CO LTD	UEWF-@	130 degree C	UL1446	UL
Bobbin	SUMITOMO BAKELITE CO LTD	PM-9820/PM-9630	150 degree C, V-0	UL94	UL
Insulation Tape	DONGGUAN SHIN YAHUA ELECTRONIC MATERIAL CO LTD	CT	130 degree C Minimum 2 layers	UL510A	UL
- Alternate	JINGJIANGJINGYI ADHESIVE PRODUCT CO LTD	JY25-A (B)	130 degree C, Minimum 2 layers	UL510A	UL
Varnish	SUZHOU TAIHU ELECTRIC ADVANCED MATERIAL CO LTD	T-4260(A)	130 degree C	UL1446	UL
Tubing	CHANGYUAN ELECTRONICS GROUP CO LTD	CB-TT-L	200 degree C	UL224	UL
- Alternate	SHENZHENWOER HEAT-SHRINKABLE MATERIAL CO LTD	WF	200 degree C	UL224	UL
Triple Insulation Wire	E&BTECHNOLOGY CO LTD	E&B-XXXB	130 degree C	UL 2353	UL
INDUCTOR (LF1)					
- Magnet Wire	CHANGZHOU DAYANGWRE& CABLE CO LTD	XUEW/130	130 degree C	UL1446	UL
- Alternate	SHANGHAI ASIA PACIFIC ELECTRIC CO LTD	UEW	130 degree C	UL1446	UL
- Alternate	ZHEJIANG HONGBO TECHNOLOGY CO LTD	XUEW/130	130 degree C	UL1446	UL
- Alternate	YONGSHANG GROUP NANJING COPPER WIRE STOCK CO LTD	XUEW	130 degree C	UL1446	UL
Triple Insulation Wre	DAH JIN TECHNOLOGY CO LTD	TLW-B	Max 1000v Peak	UL 2353	UL
- Alternate	SUZHOU YUSHENG ELECTRONIC CO LTD	TIW-B+@	Max 1000v Peak	UL 2353	UL
- Alternate	FURUKAWA ELECTRIC CO LTD	TEX-E	Max 1000v Peak	UL 2353	UL
INDUCTOR (LF2)					

Magnet Wire	CHANGZHOU DAYANGWIRE& CABLE CO LTD	XUEW/130	130 degree C	UL1446	UL
- Alternate	SHANGHAI ASIA PACIFIC ELECTRIC CO LTD	UEW	130 degree C	UL1446	UL
- Alternate	ZHEJIANG HONGBO TECHNOLOGY CO LTD	XUEW/130	130 degree C	UL1446	UL
- Alternate	YONGSHANG GROUP NANJING COPPER WIRE STOCK CO LTD	XUEW	130 degree C	UL1446	UL

1.6.2 TABLE: electrical data (in normal conditions)						P
fuse#	I rated (A)	U (Va.c.)	P(W)	I (A)	I fuse (A) Rated	condition/status
F1	5	100	—	1.127	5	at 50Hz output 24V/3.5A
F1	5	120	—	1.052	5	
F1	5	220	—	0.519	5	
F1	5	230	—	0.486	5	
F1	5	240	—	0.454	5	
F1	5	100	—	1.131	5	at 60Hz output 24V/3.5A
F1	5	120	—	1.049	5	
F1	5	220	—	0.522	5	
F1	5	230	—	0.485	5	
F1	5	240	—	0.458	5	

2.1.1.5 TABLE: Energy hazards, Maximum Output Voltage, Current and Volt-ampere					P
The sample was connected to 264 Vac and 60 Hz. With the unit operating normally, a variable resistor was connected across the points noted beside. The current through the resistor and voltage across the resistor were monitored using suitable meters. The resistance was adjusted to obtain maximum VA at a voltage exceeding 2 V.					
Output Tested	Max. Volts	Max. Amps.	Max. VA	Hazard Energy Yes/No	
24Vdc/3.5A	24.18	3.89	94.06	No	

2.1.1.7 TABLE: Discharge of capacitors in the primary circuit					
Measurement location	Fuse In/out	Switch	Time Constant	Measured voltage after 1 sec.	Condition
Lto N	In	—	0.2	0	No load

2.2 TABLE: evaluation of voltage limiting components in SELV circuits				P
The unit was connected to 264Vac, and 60 Hz. The outputs were loaded to the rated value. The voltage at each secondary winding was recorded. If the voltage exceeded 42.4 Vpk or 60 V dc, the measurement were taken again after the next component in series with the secondary until the voltage measured was less 42.4 Vpk or 60 Vdc.				
Transformer Designation	Location	Maximum Voltage (Vpk/dc)	Voltage Limiting Component	

T1	Pin 6-Pin 7	128.7Vpk	Diode
	Pin 7 - after diode	24.2	—
Fault test performed on voltage limiting components		Voltage measured (V) in SELV circuits (V peak or V d.c.)	
With diode shorted		0	
supplementary information: Supplied by 264V/60Hz.			

2.4 TABLE: Limited current circuit	
The unit was connected to 264Vac 60 Hz. A 2000 Ohms non-inductive resistor and a switch were connected between the user accessible part of a limited current circuit and either pole of the limited current circuit or earth. A storage oscilloscope was connected across the points under consideration. The switch was closed and voltages on resistor were measured.	
Limit values	70 mA
Circuit(s) tested	CY1
Measured working voltage:	216.7 Vrms; 365.2 Vpk
Measured frequency	100 kHz
Measured current through 20000	6,95 V pk : 2000 0 = 3,475mA pk
Measured capacitance	2200 pF
Comments: The dielectric test was performed on the unit (see table dielectric testing) before the above measurements were done.	

2.5 TABLE: Limited power source				
The maximum available output power was measured at nominal condition and with single fault conditions.				
The unit was connected to main nominal input voltage (240 Vac)				
Location of measurement	Condition	Voltage (V)	Test Current in (A)	Calculated Power (W)
24Vdc/3.5A	Max Load	24.18	3.89	94.06
24Vdc/3.5A	Single fault: Primary current shunt shorted	Unit switched off immediately.		
Comments: Output of the unit fulfills requirements for limited power source.				

2.6.3.4	Table: ground continue test	N/A
Location	Resistance measured (mΩ)	Comments
—	—	—
Note(s): Class II construction.		

2.9.1,2.9.2, &5.2.2 TABLE: Humidity test

A humidity chamber **was** maintained **within 1°C of temperature "t" at a temperature** of 25°C. The unit and any other separate **components were brought to a temperature between t and t + 4°C They were then placed in the** chamber and held at a relative **humidity of 93% for a period of 48 hours. Prior to conditioning,** parts of the unit (covers) which could be removed without the use of tools were removed and separately placed in the **chamber.** During **conditioning, cable entrances and/or a conduit** openings were left open. **During this treatment, the unit** was not energized.

While **still in the humidity chamber, but after all parts have** been placed back on the unit, a dielectric potential was applied **and maintained for a period of one minute** between the **points indicated below.** During this test, **all switching devices (switches, relays, triacs, etc.) in the primary circuit** were closed.

Location	<u>Insulation type</u>	Potential used
----------	------------------------	----------------

Primary circuit and secondary circuit	Reinforce	3000Vac
Primary circuit and Enclosure	Reinforce	3000Vac
Comment: There was no breakdown.		

2.10.3 and 2.10.4	TABLE: clearance and creepage distance measurements					P
clearance cl and creepage distance dcr at/of:	Up (V)	U r.m.s. (V)	required cl (mm)	cl (mm)	Required dcr (mm)	dcr (mm)
Primary to Primary before fuse (basic)	340	240	1.5	2.8	2,5	2.8
Primary to Primary after fuse (functional)	340	240	See table 5.3			
Primary to enclosure (Reinforced)	574	276	4.6	>6.0	5.6	>6.0
Primary to Secondary (Reinforced) transformer	574	276	4.6	>6.0	5.6	>6.0
Primary to Secondary (Reinforced) on PCB	574	276	4.6	>6.0	5.6	>6.0
CY1 on PCB: pri - sec	360	244	4.0	>7.0	5.0	>7.0
Secondary to secondary	—	—	See table 5.3			
# triple insulated wire used on secondary winding; core bottom covered by insulating foil. In addition whole transformer is wrapped with two layers of insulating tape.						

2.10.5	TABLE: Distance through insulation measurements				P
Distance through insulation (DTI) at/of:	U peak (V)	U rms (V)	Test voltage (V)	Required DTI (mm)	DTI (mm)
Enclosure	—	240	3000	0.4	2.1
Supplementary information: RI= reinforced insulation					

2.10.3, 4.2.2, 4.2.3, 4.2.4	TABLE: Steady force test (internal spacings push test)			P
Components and parts, other than parts serving as an enclosure, are subjected to a steady force of 10 N ±1 N. Parts of an enclosure located in Operator Access Area, which are protected by a cover or door, are subjected to a steady force of 30 N ± 3 N for a period of 5 s, applied by means of a straight unjointed version of the test finger, to the part on or within the equipment. External enclosures are subjected to a steady force of 250 N ± 10 N for a period of 5 s, applied in turn to the top, bottom and sides of the enclosure fitted to the equipment, by means of a suitable test tool providing contact over a circular plane surface 30 mm in diameter. However, this test is not applied to the bottom of an enclosure of equipment having a mass of more than 18 kg.				
Part	Thickness	Force	Observation	
Components	—	10 N	Pass	
Enclosure	2,1 mm	250 N	Pass	

Supplementary information:

4.5	TABLE: temperature rise measurements			
	test voltage (Va.c.)..... :	90	264	—
	Frequency (Hz)	60	60	—
	tamb1 (°C)	40	40	—
	tamb2 (°C)	40	40	—
	Temperature rise dT of part/at:	Measured T (°C)		allowed Tmax (°C)
	Enclosure top near transformer	58,6	56,4	95
	Enclosure side near transformer	56,7	57,5	95
	Enclosure bottom near transformer	61,7	59,2	95
	Bobbin of transformer T1	91,5	90,3	150
	Transformer winding T1	93,7	94,4	110
	Bobbin of transformer T2	92,9	91,7	150
	Transformer winding T2	86,8	85,2	110
	Power PCB under transformer	92,6	91,7	130
	Control board PCB near heatsink	87,3	86,4	130
	Primary electrolytic capacitor	68,2	69,3	105
	Secondary electrolytic capacitor	67,3	66,2	105
	CY1 body	81,8	80,2	125
	Inductor LF1: Winding	62,8	62,1	150
	Inductor LF1: Bobbin	61,2	60,7	110
	Inductor LF2: Winding	59,6	59,2	150
	Inductor LF2: Bobbin	58,4	58,3	110
	Internal wire	67,9	65,7	105
	Test duration (h:min)	3:30	3:30	—
Comment: Above measured temperatures are the absolute temperatures in X at maximum ambient. The printed circuit board is rated 130X. Test was performed until stable conditions were reached.				

4.5.5	TABLE: ball pressure test of thermoplastics		P
	Allowed impression diameter (mm)	<2mm	
	Part	Test temperature(°C)	Impression diameter (mm)
	Transformer T1 Bobbin	125	0,8
	PWB	125	0,9
	Enclosure	70	1,1
Supplementary information:			

4.7 TABLE: Resistance to fire					
Part	Manufacturer of material	Type of material	Thickness (mm)	Flammability class	Evidence
Enclosure	See table 1.5.1	See table 1.5.1	See table 1.5.1	V-0	See table 1.5.1
Bobbin	See table 1.5.1	See table 1.5.1	See table 1.5.1	V-0	See table 1.5.1
Supplementary information: UL approved .					

5.1.6	TABLE: touch current measurement			P
	Measured between	Measured (mA)	Limit (mA)	Comments
	Primary circuit and output terminal	0.01	0.25	264Va.c./60Hz
	Primary circuit and enclosure	0.01	0.25	264Va.c./60Hz
Comments:				
The tests were performed at 264 Vac and 60 Hz with Figure 5A measurement circuit .				
The test was performed with the unit connected to line and neutral. The outputs were earthed during the test.				
Test performed for information only.				

5.2	TABLE: electric strength measurements		P
	test voltage applied between:	test voltage (V)	Breakdown
	Primary circuit and secondary circuit	3000Vac	No
	Primary circuit and Enclosure	3000Vac	No
	Secondary circuit and core of transformer	3000Vac	No
	each layer of insulating tape	3000Vac	No
Comments: Dielectric strength test performed after humidity treatment.			

5.3	TABLE: fault condition tests					P
	ambient temp	erature (°C)	25±5°C		--	
	rated marking	s of power supp	v :	100-240 Vac	~	
component No.	fault	test voltage (Vac)	test time	fuse No.	Fuse current (A)	Result
SELV reliability Testing						
Capacitor EC11	Short circuit	240V/50Hz	1s	F1	0	Unit shutdown instantly. No defect. No hazard.
Output terminals	Short circuit	240V/50HZ	1s	F1	0	Unit shutdown instantly. No defect. No hazard.
Method C - functional insulation (clause 5.3.4)						
Capacitor EC2	Short circuit	240V/50HZ	1s	F1	<6	Fuse opened instantly. No hazard.
Capacitor EC3	Short circuit	240V/50HZ	1s	F1	<6	Fuse opened instantly. No hazard.
Diode bridge DB1	Short circuit	240V/50HZ	1s	F1	<6	Fuse opened instantly. No hazard.
Annex C Transformer overloac /short (clause 5.3.3)						
Transformer T1	Short circuit	240V/50HZ	10min	F1	0	Unit shutdown instantly. No defect. No hazard. T1:51,2°C
Transformer T1	Overload	240V/50HZ	3hrs12min	F1	0.18	Unit switched off when additional current up to 3.9A.
Comments: There was no flame, extensive smoke or melted metal.						

Attachment - Photo documentation

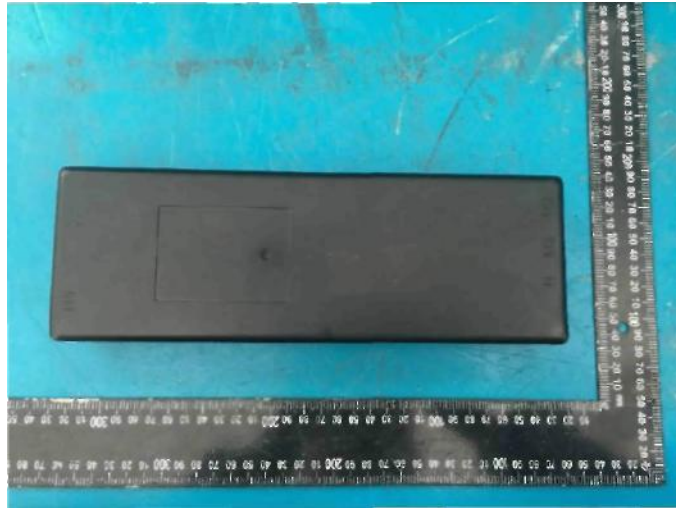


Fig.1 -Top view



Fig.2 - Bottom view

Attachment - Photo documentation



Fig.3 - Front view



Fig.4- Back view

Attachment - Photo documentation**Fig.5-** Internal view

Fig.6- Top view of Power Board

Attachment - Photo documentation

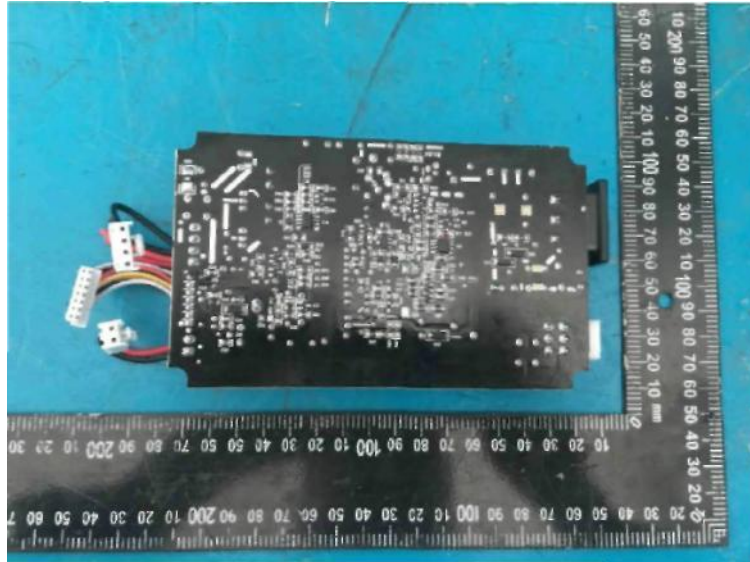


Fig.7 - Bottom view of Power Board



Fig.8 - Top view of Control Board

Attachment - Photo documentation



Fig.9 - Bottom view of Control Board

