




TEST REPORT IEC 62368-1 Audio/video, information and communication technology equipment Part 1: Safety requirements	
Report Number.....	: 58631
Date of issue	: 2025-01-29
Total number of pages	: 106
Name of Testing Laboratory preparing the Report	Eurofins E&E UK – London Laboratory
Applicant's name	Linea Research Ltd
Address	Units 1 & 2 Aylesford Court, Works Road, Letchworth Garden City Herts., SG6 1LP. United Kingdom
Test specification:	
Standard	: IEC 62368-1:2018
Test procedure.....	: Eurofins E&E UK – London Laboratory
Non-standard test method.....	: N/A
TRF template used	: IECEE OD-2020-F1:2020, Ed.1.3
Test Report Form No.....	: IEC62368_1E
Test Report Form(s) Originator.....	: UL(US)
Master TRF	: Dated 2021-02-04
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General disclaimer:	
The test results presented in this report relate only to the object tested.	



Test item description	Amplifier	
Trade Mark(s)		
Manufacturer	Linea Research Ltd	
Model/Type reference	44M20; 44C20; 44M10; 44C10; 44M06; 44C06; 48M10; 44M03; 48M06; 48M03; 88C10; 88C06; 88C03; 48M20; 48C20; 88C20	
Ratings	20kW max, 100-230V ~ 50-60Hz Class I	
Testing Laboratory:		
Eurofins E&E UK – London Laboratory		
Testing location/ address	15 Chelsea Fields Estate, Western Road, London, SW19 2QA, United Kingdom	
Tested by (name, function, signature)	Richard Newman Test Engineer	
Approved by (name, function, signature) ..	Peter Cross, Laboratory Manager	

List of Attachments (including a total number of pages in each attachment):	
Photo Attachment: (8 pages)	Page 65
Differences for Europe: (23 pages)	Page 73
Differences for US/CAN: (7 pages)	Page 96
Differences for Japan ¹⁾ (4 pages)	Page 103
Summary of testing: Clause 4.1.15 Instructions	
The instructions and safety information must be given in the language of the country in which the product is marketed	
Clause G.7 Mains supply cords	
A VDE certified Neutrik 32A power inlet is provided for the user to connect the apparatus to the mains supply using the supplied VDE certified Neutrik connector and a suitably approved mains cable.	
Unless otherwise defined in this Test Report the Decision Rule applied to all measured results, is a 'constrained simple acceptance' pass/fail criteria, which takes into account a confidence level of 95% (k=2) and false acceptance of 2.5%.	
Tests performed (name of test and test clause):	Testing location:
Clause 4: General requirements	Eurofins E&E UK – London Laboratory 15 Chelsea Fields Estate, Western Road, London, SW19 2QA, United Kingdom
Clause 5: Electrically-caused injury	
Clause 6: Electrically-caused fire	
Clause 8: Mechanically-caused injury	
Clause 9: Thermal burn injury	
Summary of compliance with National Differences (List of countries addressed):	
The product fulfils the requirements of IEC 62368-1:2018 (ed. 3) with National Differences for USA/Canada.	
The product also fulfils the requirements of European Group Differences and National Differences according to EN IEC 62368-1:2020 + A11:2020	
National differences for Japan according to IEC 62368-1:2014 are attached for additional information.	

Statement concerning the uncertainty of the measurement systems used for the tests

(may be required by the product standard or client)

Internal procedure used for type testing through which traceability of the measuring uncertainty has been established:

Procedure number, issue date and title:

Calculations leading to the reported values are on file with the NCB and testing laboratory that conducted the testing.

Statement not required by the standard used for type testing

(Note: When IEC or ISO standard requires a statement concerning the uncertainty of the measurement systems used for tests, this should be reported above. The informative text in parenthesis should be delete in both cases after selecting the applicable option)

Copy of marking plates:



Logo

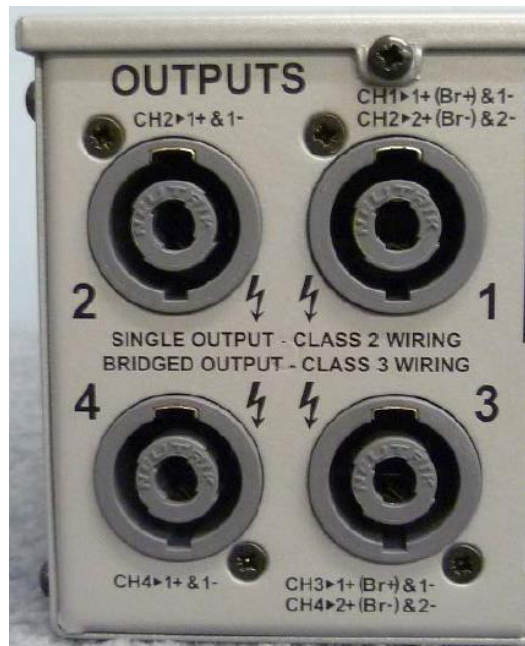


(model dependent)



Mains inlet markings

Copy of marking plates (continued):



Speaker output markings model dependent

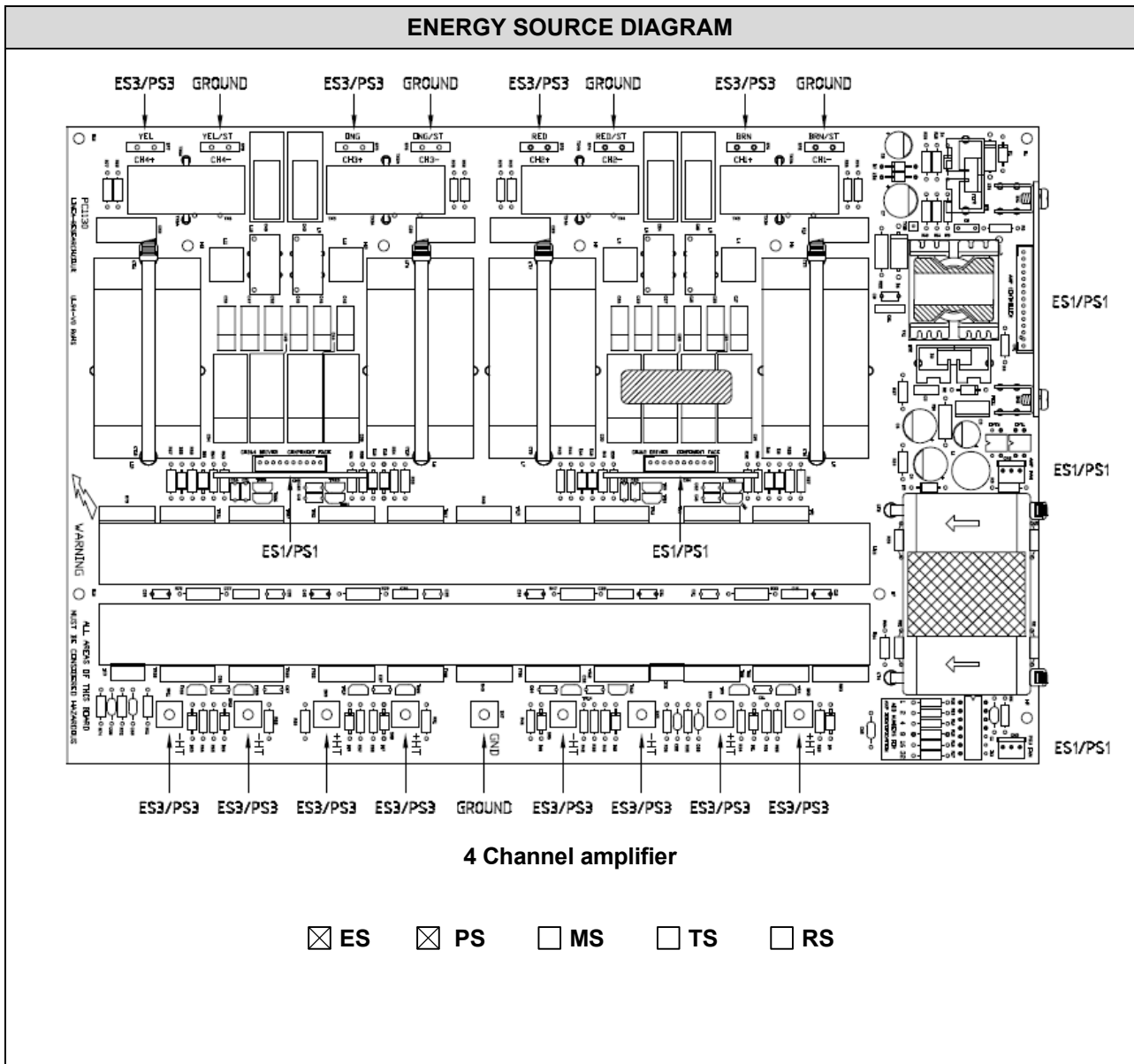


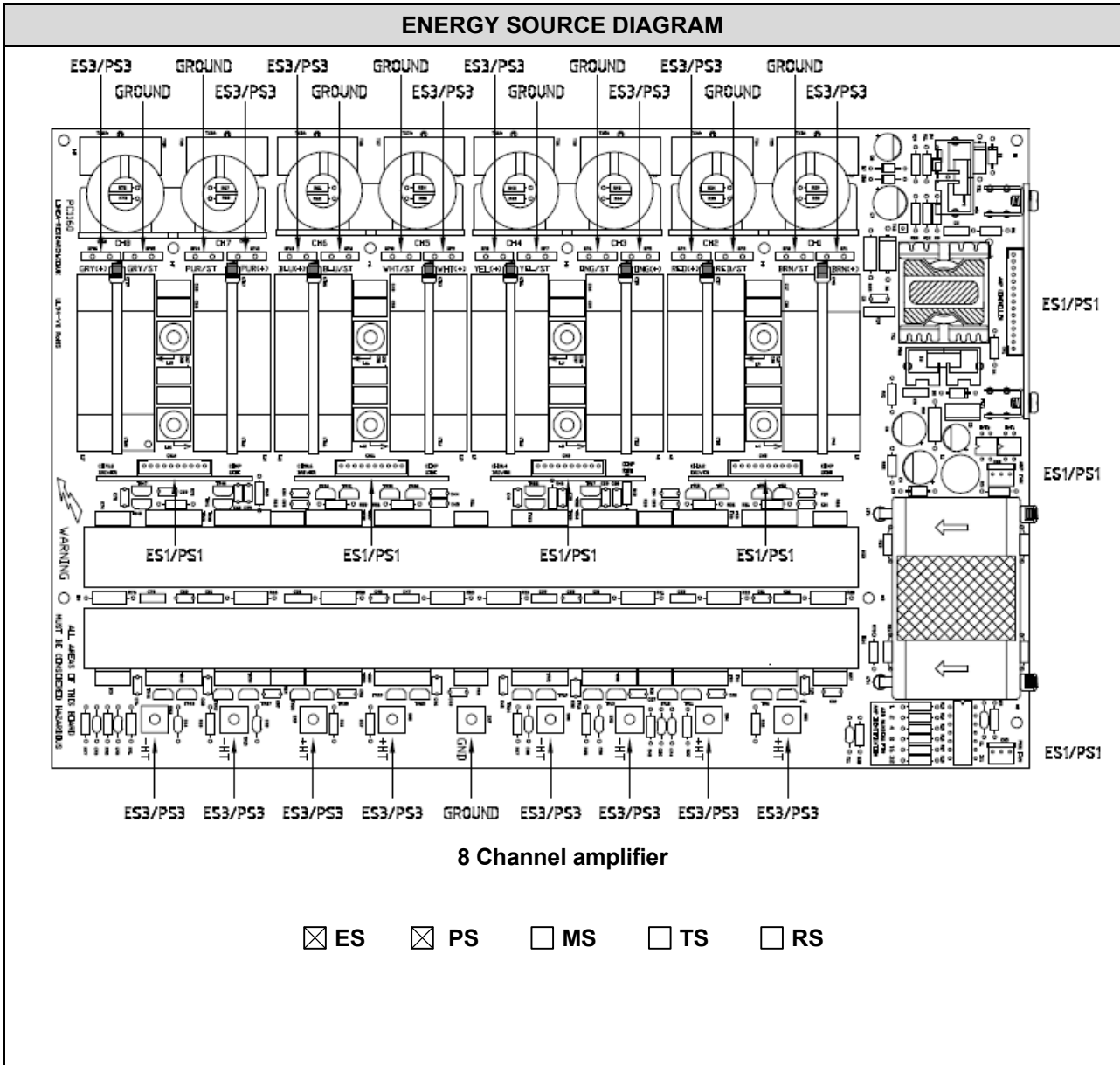
Safety warning label

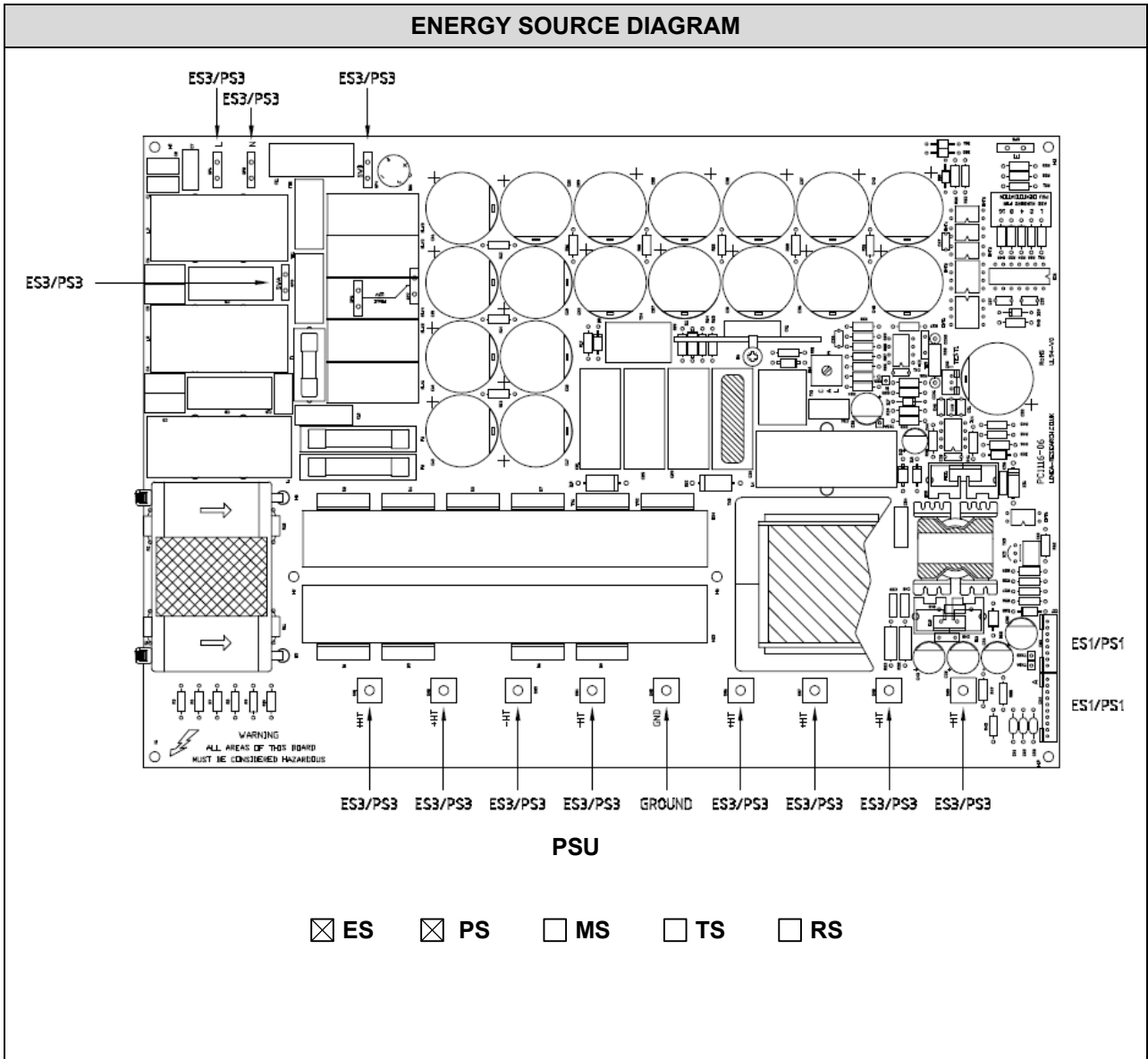
Test item particulars:	
Product group	<input checked="" type="checkbox"/> end product <input type="checkbox"/> built-in component
Classification of use by	<input checked="" type="checkbox"/> Ordinary person <input type="checkbox"/> Children likely present <input type="checkbox"/> Instructed person <input type="checkbox"/> Skilled person
Supply connection	<input checked="" type="checkbox"/> AC mains <input type="checkbox"/> DC mains <input type="checkbox"/> not mains connected: <input type="checkbox"/> ES1 <input type="checkbox"/> ES2 <input checked="" type="checkbox"/> ES3
Supply tolerance	<input checked="" type="checkbox"/> +10%/-10% <input type="checkbox"/> +20%/-15% <input type="checkbox"/> + %/ - % <input type="checkbox"/> None
Supply connection – type	<input type="checkbox"/> pluggable equipment type A - <input type="checkbox"/> non-detachable supply cord <input type="checkbox"/> appliance coupler <input type="checkbox"/> direct plug-in <input checked="" type="checkbox"/> pluggable equipment type B - <input type="checkbox"/> non-detachable supply cord <input checked="" type="checkbox"/> appliance coupler <input type="checkbox"/> permanent connection <input type="checkbox"/> mating connector <input type="checkbox"/> other:
Considered current rating of protective device	<input checked="" type="checkbox"/> 32 A; (UK/EUR) or 30A (USA/CAN) Location: <input checked="" type="checkbox"/> building <input type="checkbox"/> equipment <input type="checkbox"/> N/A
Equipment mobility	<input type="checkbox"/> movable <input type="checkbox"/> hand-held <input type="checkbox"/> transportable <input type="checkbox"/> direct plug-in <input type="checkbox"/> stationary <input type="checkbox"/> for building-in <input type="checkbox"/> wall/ceiling-mounted <input checked="" type="checkbox"/> rack-mounted <input type="checkbox"/> other:
Overvoltage 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:
Class of equipment	<input checked="" type="checkbox"/> Class I <input type="checkbox"/> Class II <input type="checkbox"/> Class III <input type="checkbox"/> Not classified <input type="checkbox"/>
Special installation location	<input checked="" type="checkbox"/> N/A <input type="checkbox"/> restricted access area <input type="checkbox"/> outdoor location <input type="checkbox"/>
Pollution degree (PD)	<input type="checkbox"/> PD 1 <input checked="" type="checkbox"/> PD 2 <input type="checkbox"/> PD 3
Manufacturer's specified T_{ma}	40 °C <input type="checkbox"/> Outdoor: minimum °C
IP protection class	<input checked="" type="checkbox"/> IPX0 <input type="checkbox"/> IP__
Power systems	<input checked="" type="checkbox"/> TN <input type="checkbox"/> TT <input checked="" type="checkbox"/> IT - 230 V _{L-L} <input type="checkbox"/> not AC mains
Altitude during operation (m)	<input checked="" type="checkbox"/> 2000 m or less <input type="checkbox"/> m
Altitude of test laboratory (m)	<input checked="" type="checkbox"/> 2000 m or less <input type="checkbox"/> m
Mass of equipment (kg)	12.5 kg

Possible test case verdicts: - test case does not apply to the test object.....: N/A - test object does meet the requirement.....: P (Pass) - test object does not meet the requirement.....: F (Fail)	
Testing: Date of receipt of test item: 2021-05-13 Date (s) of performance of tests: 2021-06-09 – 2021-06-25	
General remarks: "(See Enclosure #)" refers to additional information appended to the report. "(See appended table)" refers to a table appended to the report. Throughout this report a <input type="checkbox"/> comma / <input checked="" type="checkbox"/> point is used as the decimal separator.	
Name and address of factory (ies) :	Linea Research Ltd. Units 1 & 2 Aylesford Court Works Road Letchworth Garden City Herts SG6 1LP United Kingdom
General product information and other remarks: The Linea Research 44M series, 48M series, 44C series and 88C series models are high-power amplifiers for professional use. The model 44M20 tested in this report has an audio output rating of 5kW per channel into a 2Ω load in normal mode or 10kW for a pair of channels into a 4Ω load when in bridge mode. The only differences between the models are external presentation not affecting safety. Note that the high input power rating of 20kW is to allow for music power peaks. These peaks are only for fractions of seconds. The product is designed to deliver much more peak power on music than it can sustain on a sine-wave. It is important for the professional installers to be aware of this peak rating so that mains distribution cables can be sized accordingly and thus not compromise performance. NOTE: C3, C4 and C10 are NOT fitted to production models. TX4 does not provide isolation, both primary and secondary are 'hot'. C34 & C24 are connected to protective earth via PCB grounds GND & LTGND 1 respectively, which are directly connected to the base of the metal enclosure via chassis studs. Weight and dimensions: 12.5kg, W 483mm, H 93mm, D 357mm	

OVERVIEW OF ENERGY SOURCES AND SAFEGUARDS				
Clause	Possible Hazard			
5	Electrically-caused injury			
Class and Energy Source (e.g. ES3: Primary circuit)	Body Part (e.g. Ordinary)	Safeguards		
		B	S	R
ES3 mains input primary wiring	Ordinary	Earthed metal enclosure Insulation sheet beneath PSU PCB	Instructional safeguard for grounding in safety instructions and on equipment. R3 and R6 safeguard to gnd. Y1 Caps C1, C2, C5, C6, C24 & C34	Distances on PCB, TX2 & TX3. & approved components R7 – R10 discharge for capacitors
ES1 secondary circuit	Ordinary	N/A	N/A	N/A
6	Electrically-caused fire			
Class and Energy Source (e.g. PS2: 100 Watt circuit)	Material part (e.g. Printed board)	Safeguards		
		B	1 st S	2 nd S
PS3 Primary circuit	PCB and primary components	See 6.3	Single fault tests IEC approved components,	Metal enclosure VW-1 wiring, V-0 PCB V-0 or VTM-0 sheet under PSU PCB
PS1 secondary circuits	PCB circuits and signal circuits	N/A	N/A	N/A
7	Injury caused by hazardous substances			
Class and Energy Source (e.g. Ozone)	Body Part (e.g., Skilled)	Safeguards		
		B	S	R
N/A	N/A	N/A	N/A	N/A
8	Mechanically-caused injury			
Class and Energy Source (e.g. MS3: Plastic fan blades)	Body Part (e.g. Ordinary)	Safeguards		
		B	S	R
MS1: Edges and corners	Ordinary	N/A	N/A	N/A
MS2: Equipment mass >7kg	Ordinary	Rack mounted	N/A	N/A
MS2: Rack mount ≤ 2m	Ordinary	See 8.7.2	User instructions	N/A
MS1: Plastic fan blades	Ordinary	N/A	N/A	N/A
9	Thermal burn			
Class and Energy Source (e.g. TS1: Keyboard caps)	Body Part (e.g., Ordinary)	Safeguards		
		B	S	R
TS1 Accessible parts	Ordinary	See 9.3.1 touch temperatures	N/A	N/A
10	Radiation			
Class and Energy Source (e.g. RS1: PMP sound output)	Body Part (e.g., Ordinary)	Safeguards		
		B	S	R
RS1 LED indicators	Ordinary	N/A	N/A	N/A
Supplementary Information: “B” – Basic Safeguard; “S” – Supplementary Safeguard; “R” – Reinforced Safeguard				







IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
4	GENERAL REQUIREMENTS		P
4.1.1	Acceptance of materials, components and subassemblies		P
4.1.2	Use of components		P
4.1.3	Equipment design and construction		P
4.1.4	Specified ambient temperature for outdoor use (°C) :	Not outdoor	N/A
4.1.5	Constructions and components not specifically covered		N/A
4.1.8	Liquids and liquid filled components (LFC)		N/A
4.1.15	Markings and instructions	(See Annex F)	P
4.4.3	Safeguard robustness		P
4.4.3.1	General		P
4.4.3.2	Steady force tests	(See Annex T.5)	P
4.4.3.3	Drop tests		N/A
4.4.3.4	Impact tests	(See Annex T6)	P
4.4.3.5	Internal accessible safeguard tests		N/A
4.4.3.6	Glass impact tests		N/A
4.4.3.7	Glass fixation tests		N/A
	Glass impact test (1J)		N/A
	Push/pull test (10 N)		N/A
4.4.3.8	Thermoplastic material tests		N/A
4.4.3.9	Air comprising a safeguard	(See Annex T.5)	P
4.4.3.10	Accessibility, glass, safeguard effectiveness		N/A
4.4.4	Displacement of a safeguard by an insulating liquid		N/A
4.4.5	Safety interlocks		N/A
4.5	Explosion		P
4.5.1	General		P
4.5.2	No explosion during normal/abnormal operating condition	(See Clause B.2, B.3)	P
	No harm by explosion during single fault conditions	(See Clause B.4)	P
4.6	Fixing of conductors		P
	Fix conductors not to defeat a safeguard		P
	Compliance is checked by test..... :	(See Annex T.2) 10N force	P
4.7	Equipment for direct insertion into mains socket-outlets		N/A
4.7.2	Mains plug part complies with relevant standard .. :		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
4.7.3	Torque (Nm)		N/A
4.8	Equipment containing coin/button cell batteries		N/A
4.8.1	General		N/A
4.8.2	Instructional safeguard		N/A
4.8.3	Battery compartment door/cover construction		N/A
	Open torque test		N/A
4.8.4.2	Stress relief test		N/A
4.8.4.3	Battery replacement test		N/A
4.8.4.4	Drop test		N/A
4.8.4.5	Impact test		N/A
4.8.4.6	Crush test		N/A
4.8.5	Compliance		N/A
	30N force test with test probe		N/A
	20N force test with test hook		N/A
4.9	Likelihood of fire or shock due to entry of conductive object		P
4.10	Component requirements		P
4.10.1	Disconnect Device	(See Annex L)	P
4.10.2	Switches and relays	(See Annex G)	P

5	ELECTRICALLY-CAUSED INJURY		P
5.2	Classification and limits of electrical energy sources		P
5.2.2	ES1, ES2 and ES3 limits		P
5.2.2.2	Steady-state voltage and current limits	(See appended table 5.2)	P
5.2.2.3	Capacitance limits		N/A
5.2.2.4	Single pulse limits		N/A
5.2.2.5	Limits for repetitive pulses		N/A
5.2.2.6	Ringling signals		N/A
5.2.2.7	Audio signals		N/A
5.3	Protection against electrical energy sources		P
5.3.1	General Requirements for accessible parts to ordinary, instructed and skilled persons		P
5.3.1 a)	Accessible ES1/ES2 derived from ES2/ES3 circuits	Derived ES1 circuit separated from ES3 by reinforced insulation	P
5.3.1 b)	Skilled persons not unintentional contact ES3 bare conductors		P

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Clause	Requirement + Test	Result - Remark	Verdict
5.3.2.1	Accessibility to electrical energy sources and safeguards	Ordinary and instructed persons cannot access bare parts of ES3. Skilled persons cannot contact bare parts of ES3 unintentionally.	P
	Accessibility to outdoor equipment bare parts		N/A
5.3.2.2	Contact requirements		P
	Test with test probe from Annex V	See annex V	—
5.3.2.2 a)	Air gap – electric strength test potential (V)		N/A
5.3.2.2 b)	Air gap – distance (mm)		N/A
5.3.2.3	Compliance		N/A
5.3.2.4	Terminals for connecting stripped wire		N/A
5.4	Insulation materials and requirements		P
5.4.1.2	Properties of insulating material		P
5.4.1.3	Material is non-hygrosopic		P
5.4.1.4	Maximum operating temperature for insulating materials	<100°C	P
5.4.1.5	Pollution degrees	Pollution degree 2	P
5.4.1.5.2	Test for pollution degree 1 environment and for an insulating compound		N/A
5.4.1.5.3	Thermal cycling test		N/A
5.4.1.6	Insulation in transformers with varying dimensions		N/A
5.4.1.7	Insulation in circuits generating starting pulses		N/A
5.4.1.8	Determination of working voltage	(See appended table 5.4.1.8)	P
5.4.1.9	Insulating surfaces		P
5.4.1.10	Thermoplastic parts on which conductive metallic parts are directly mounted		N/A
5.4.1.10.2	Vicat test.....	Approved components	N/A
5.4.1.10.3	Ball pressure test		N/A
5.4.2	Clearances		P
5.4.2.1	General requirements		P
	Clearances in circuits connected to AC Mains, Alternative method	(See Annex X)	P
5.4.2.2	Procedure 1 for determining clearance		N/A
	Temporary overvoltage		—
5.4.2.3	Procedure 2 for determining clearance		N/A
5.4.2.3.2.2	a.c. mains transient voltage		—
5.4.2.3.2.3	d.c. mains transient voltage		—

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Clause	Requirement + Test	Result - Remark	Verdict
5.4.2.3.2.4	External circuit transient voltage.....:		—
5.4.2.3.2.5	Transient voltage determined by measurement		—
5.4.2.4	Determining the adequacy of a clearance using an electric strength test	(See appended table 5.4.2)	N/A
5.4.2.5	Multiplication factors for clearances and test voltages	Not over 2000m	N/A
5.4.2.6	Clearance measurement	(See appended table 5.4.2)	P
5.4.3	Creepage distances		P
5.4.3.1	General		P
5.4.3.3	Material group	IIIa/IIIb	—
5.4.3.4	Creepage distances measurement	(See appended table 5.4.3)	P
5.4.4	Solid insulation	Approved components in ES3 circuit	P
5.4.4.1	General requirements		P
5.4.4.2	Minimum distance through insulation		N/A
5.4.4.3	Insulating compound forming solid insulation		N/A
5.4.4.4	Solid insulation in semiconductor devices		N/A
5.4.4.5	Insulating compound forming cemented joints		N/A
5.4.4.6	Thin sheet material		N/A
5.4.4.6.1	General requirements		N/A
5.4.4.6.2	Separable thin sheet material		N/A
	Number of layers (pcs)		N/A
5.4.4.6.3	Non-separable thin sheet material	TIW winding wire	P
	Number of layers (pcs)		N/A
5.4.4.6.4	Standard test procedure for non-separable thin sheet material		N/A
5.4.4.6.5	Mandrel test		N/A
5.4.4.7	Solid insulation in wound components		N/A
5.4.4.9	Solid insulation at frequencies >30 kHz, E_P , K_R , d , V_{PW} (V)		N/A
	Alternative by electric strength test, tested voltage (V), K_R:		N/A
5.4.5	Antenna terminal insulation		N/A
5.4.5.1	General		N/A
5.4.5.2	Voltage surge test		N/A
5.4.5.3	Insulation resistance (M Ω).....:		N/A
	Electric strength test		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
5.4.6	Insulation of internal wire as part of supplementary safeguard		N/A
5.4.7	Tests for semiconductor components and for cemented joints		N/A
5.4.8	Humidity conditioning		N/A
	Relative humidity (%), temperature (°C), duration (h)		—
5.4.9	Electric strength test		P
5.4.9.1	Test procedure for type test of solid insulation.....	(See appended table 5.4.9)	P
5.4.9.2	Test procedure for routine test	Method 3, No breakdown during tests	P
5.4.10	Safeguards against transient voltages from external circuits		N/A
5.4.10.1	Parts and circuits separated from external circuits		N/A
5.4.10.2	Test methods		N/A
5.4.10.2.1	General		N/A
5.4.10.2.2	Impulse test		N/A
5.4.10.2.3	Steady-state test.....		N/A
5.4.10.3	Verification for insulation breakdown for impulse test		N/A
5.4.11	Separation between external circuits and earth		N/A
5.4.11.1	Exceptions to separation between external circuits and earth		N/A
5.4.11.2	Requirements		N/A
	SPDs bridge separation between external circuit and earth		N/A
	Rated operating voltage U_{op} (V).....		—
	Nominal voltage U_{peak} (V).....		—
	Max increase due to variation ΔU_{sp}		—
	Max increase due to ageing ΔU_{sa}		—
5.4.11.3	Test method and compliance		N/A
5.4.12	Insulating liquid		N/A
5.4.12.1	General requirements		N/A
5.4.12.2	Electric strength of an insulating liquid		N/A
5.4.12.3	Compatibility of an insulating liquid		N/A
5.4.12.4	Container for insulating liquid		N/A
5.5	Components as safeguards		P
5.5.1	General		P

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Clause	Requirement + Test	Result - Remark	Verdict
5.5.2	Capacitors and RC units		P
5.5.2.1	General requirement		P
5.5.2.2	Safeguards against capacitor discharge after disconnection of a connector	(See appended table 5.5.2.2)	P
5.5.3	Transformers		P
5.5.4	Optocouplers	(See sub-clause 5.4 or Clause G.12)	P
5.5.5	Relays	(See sub-clause 5.4)	P
5.5.6	Resistors	4 bleeder resistors in series (R7, 8, 9 & 10) comply with cr/cl requirements. The EUT complies with clause 5.5.2.2 with one resistor open or short circuit. R3 & R6 comply with cr/cl requirements.	P
5.5.7	SPDs		N/A
5.5.8	Insulation between the mains and an external circuit consisting of a coaxial cable		N/A
5.5.9	Safeguards for socket-outlets in outdoor equipment		N/A
	RCD rated residual operating current (mA)		—
5.6	Protective conductor		P
5.6.2	Requirement for protective conductors		P
5.6.2.1	General requirements		P
5.6.2.2	Colour of insulation	Green/Yellow	P
5.6.3	Requirement for protective earthing conductors	Mains cord not supplied	-
	Protective earthing conductor size (mm ²)		—
	Protective earthing conductor serving as a reinforced safeguard		N/A
	Protective earthing conductor serving as a double safeguard		N/A
5.6.4	Requirements for protective bonding conductors		P
5.6.4.1	Protective bonding conductors		P
	Protective bonding conductor size (mm ²).	2.5mm ²	—
5.6.4.2	Protective current rating (A).....	32A (UK/EUR) 30A (USA/CAN)	P
5.6.5	Terminals for protective conductors		N/A
5.6.5.1	Terminal size for connecting protective earthing conductors (mm).....		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Terminal size for connecting protective bonding conductors (mm)		N/A
5.6.5.2	Corrosion		P
5.6.6	Resistance of the protective bonding system		P
5.6.6.1	Requirements		P
5.6.6.2	Test Method		P
5.6.6.3	Resistance (Ω) or voltage drop	(See appended table 5.6.6)	P
5.6.7	Reliable connection of a protective earthing conductor	Type B pluggable connection	P
5.6.8	Functional earthing		N/A
	Conductor size (mm ²)		N/A
	Class II with functional earthing marking		N/A
	Appliance inlet cl & cr (mm)		N/A
5.7	Prospective touch voltage, touch current and protective conductor current		P
5.7.2	Measuring devices and networks		P
5.7.2.1	Measurement of touch current		P
5.7.2.2	Measurement of voltage		P
5.7.3	Equipment set-up, supply connections and earth connections		P
5.7.4	Unearthed accessible parts	(See appended table 5.7.4)	P
5.7.5	Earthed accessible conductive parts	(See appended table 5.7.5)	P
5.7.6	Requirements when touch current exceeds ES2 limits		N/A
	Protective conductor current (mA)		N/A
	Instructional Safeguard		N/A
5.7.7	Prospective touch voltage and touch current associated with external circuits		N/A
5.7.7.1	Touch current from coaxial cables		N/A
5.7.7.2	Prospective touch voltage and touch current associated with paired conductor cables		N/A
5.7.8	Summation of touch currents from external circuits		N/A
	a) Equipment connected to earthed external circuits, current (mA)		N/A
	b) Equipment connected to unearthed external circuits, current (mA)		N/A
5.8	Backfeed safeguard in battery backed up supplies		N/A
	Mains terminal ES	(See appended table 5.8)	N/A
	Air gap (mm)		N/A

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict

6	ELECTRICALLY- CAUSED FIRE		P
6.2	Classification of PS and PIS		P
6.2.2	Power source circuit classifications	(See appended table 6.2.2)	P
6.2.3	Classification of potential ignition sources		P
6.2.3.1	Arcing PIS	(See appended table 6.2.3.1)	P
6.2.3.2	Resistive PIS	(See appended table 6.2.3.2)	P
6.3	Safeguards against fire under normal operating and abnormal operating conditions		P
6.3.1	No ignition and attainable temperature value less than 90 % defined by ISO 871 or less than 300 °C for unknown materials	(See appended table B.1.5 and B.3)	P
	Combustible materials outside fire enclosure		N/A
6.4	Safeguards against fire under single fault conditions		P
6.4.1	Safeguard method		P
6.4.2	Reduction of the likelihood of ignition under single fault conditions in PS1 circuits		N/A
6.4.3	Reduction of the likelihood of ignition under single fault conditions in PS2 and PS3 circuits		P
6.4.3.1	Supplementary safeguards		P
6.4.3.2	Single Fault Conditions		N/A
	Special conditions for temperature limited by fuse		P
6.4.4	Control of fire spread in PS1 circuits		N/A
6.4.5	Control of fire spread in PS2 circuits		N/A
6.4.5.2	Supplementary safeguards		N/A
6.4.6	Control of fire spread in PS3 circuits	IEC approved components, VW-1 wiring, V-0 PCB, metal enclosure.	P
6.4.7	Separation of combustible materials from a PIS		N/A
6.4.7.2	Separation by distance		N/A
6.4.7.3	Separation by a fire barrier		N/A
6.4.8	Fire enclosures and fire barriers		P
6.4.8.2	Fire enclosure and fire barrier material properties	Metal enclosure	P
6.4.8.2.1	Requirements for a fire barrier		N/A
6.4.8.2.2	Requirements for a fire enclosure		P
6.4.8.3	Constructional requirements for a fire enclosure and a fire barrier		P
6.4.8.3.1	Fire enclosure and fire barrier openings		P

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Clause	Requirement + Test	Result - Remark	Verdict
6.4.8.3.2	Fire barrier dimensions		N/A
6.4.8.3.3	Top openings and properties	No top openings	N/A
	Openings dimensions (mm)..... :		N/A
6.4.8.3.4	Bottom openings and properties	Lower rear openings adjacent to PS1 circuits. No Hazard referring to trajectory diagram Fig 44.	P
	Openings dimensions (mm)..... :	7mm x 10mm	P
	Flammability tests for the bottom of a fire enclosure	(See Clause S.3)	N/A
	Instructional Safeguard..... :		N/A
6.4.8.3.5	Side openings and properties	Side openings adjacent to PS3 circuits. No Hazard referring to trajectory diagram Fig 44.	P
	Openings dimensions (mm)..... :	7mm x 10mm at rearside	P
6.4.8.3.6	Integrity of a fire enclosure, condition met: a), b) or c)..... :		N/A
6.4.8.4	Separation of a PIS from a fire enclosure and a fire barrier distance (mm) or flammability rating..... :		N/A
6.4.9	Flammability of insulating liquid..... :	No insulating liquid	N/A
6.5	Internal and external wiring		P
6.5.1	General requirements	VW-1	P
6.5.2	Requirements for interconnection to building wiring..... :	Does not provide power to wiring systems	N/A
6.5.3	Internal wiring size (mm ²) for socket-outlets..... :	No socket outlets	N/A
6.6	Safeguards against fire due to the connection to additional equipment		N/A

7	INJURY CAUSED BY HAZARDOUS SUBSTANCES		N/A
7.2	Reduction of exposure to hazardous substances		N/A
7.3	Ozone exposure		N/A
7.4	Use of personal safeguards or personal protective equipment (PPE)		N/A
	Personal safeguards and instructions..... :		—
7.5	Use of instructional safeguards and instructions		N/A
	Instructional safeguard (ISO 7010)..... :		—
7.6	Batteries and their protection circuits		N/A

8	MECHANICALLY-CAUSED INJURY		P
8.2	Mechanical energy source classifications		P

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Clause	Requirement + Test	Result - Remark	Verdict
8.3	Safeguards against mechanical energy sources		P
8.4	Safeguards against parts with sharp edges and corners		P
8.4.1	Safeguards		P
	Instructional Safeguard		N/A
8.4.2	Sharp edges or corners		P
8.5	Safeguards against moving parts		N/A
8.5.1	Fingers, jewellery, clothing, hair, etc., contact with MS2 or MS3 parts		N/A
	MS2 or MS3 part required to be accessible for the function of the equipment		N/A
	Moving MS3 parts only accessible to skilled person		N/A
8.5.2	Instructional safeguard.....		N/A
8.5.4	Special categories of equipment containing moving parts		N/A
8.5.4.1	General		N/A
8.5.4.2	Equipment containing work cells with MS3 parts		N/A
8.5.4.2.1	Protection of persons in the work cell		N/A
8.5.4.2.2	Access protection override		N/A
8.5.4.2.2.1	Override system		N/A
8.5.4.2.2.2	Visual indicator		N/A
8.5.4.2.3	Emergency stop system		N/A
	Maximum stopping distance from the point of activation (m).....		N/A
	Space between end point and nearest fixed mechanical part (mm)		N/A
8.5.4.2.4	Endurance requirements		N/A
	Mechanical system subjected to 100 000 cycles of operation		N/A
	- Mechanical function check and visual inspection		N/A
	- Cable assembly		N/A
8.5.4.3	Equipment having electromechanical device for destruction of media		N/A
8.5.4.3.1	Equipment safeguards		N/A
8.5.4.3.2	Instructional safeguards against moving parts		N/A
8.5.4.3.3	Disconnection from the supply		N/A
8.5.4.3.4	Cut type and test force (N).....		N/A
8.5.4.3.5	Compliance		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
8.5.5	High pressure lamps		N/A
	Explosion test.....:		N/A
8.5.5.3	Glass particles dimensions (mm).....:		N/A
8.6	Stability of equipment		P
8.6.1	General		P
	Instructional safeguard.....:		N/A
8.6.2	Static stability		N/A
8.6.2.2	Static stability test.....:	Rack mounted	N/A
8.6.2.3	Downward force test		N/A
8.6.3	Relocation stability		N/A
	Wheels diameter (mm).....:		—
	Tilt test		N/A
8.6.4	Glass slide test		N/A
8.6.5	Horizontal force test.....:		N/A
8.7	Equipment mounted to wall, ceiling or other structure		P
8.7.1	Mount means type.....:	Rack mounted (MS2)	P
8.7.2	Test methods		P
	Test 1, additional downwards force (N).....:		N/A
	Test 2, number of attachment points and test force (N).....:	4 attachment points 122.5N per fixing point	P
	Test 3 Nominal diameter (mm) and applied torque (Nm).....:		N/A
8.8	Handles strength		N/A
8.8.1	General		N/A
8.8.2	Handle strength test		N/A
	Number of handles.....:		—
	Force applied (N).....:		—
8.9	Wheels or casters attachment requirements		N/A
8.9.2	Pull test		N/A
8.10	Carts, stands and similar carriers		N/A
8.10.1	General		N/A
8.10.2	Marking and instructions.....:		N/A
8.10.3	Cart, stand or carrier loading test		N/A
	Loading force applied (N).....:		N/A
8.10.4	Cart, stand or carrier impact test		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
8.10.5	Mechanical stability		N/A
	Force applied (N)		—
8.10.6	Thermoplastic temperature stability		N/A
8.11	Mounting means for slide-rail mounted equipment (SRME)		N/A
8.11.1	General		N/A
8.11.2	Requirements for slide rails		N/A
	Instructional Safeguard		N/A
8.11.3	Mechanical strength test		N/A
8.11.3.1	Downward force test, force (N) applied		N/A
8.11.3.2	Lateral push force test		N/A
8.11.3.3	Integrity of slide rail end stops		N/A
8.11.4	Compliance		N/A
8.12	Telescoping or rod antennas		N/A
	Button/ball diameter (mm)	No telescoping rod antennas	—

9	THERMAL BURN INJURY		P
9.2	Thermal energy source classifications		P
9.3	Touch temperature limits		P
9.3.1	Touch temperatures of accessible parts	(See appended table)	P
9.3.2	Test method and compliance		P
9.4	Safeguards against thermal energy sources		N/A
9.5	Requirements for safeguards		N/A
9.5.1	Equipment safeguard		N/A
9.5.2	Instructional safeguard		N/A
9.6	Requirements for wireless power transmitters		N/A
9.6.1	General		N/A
9.6.2	Specification of the foreign objects		N/A
9.6.3	Test method and compliance		N/A


10	RADIATION		P
10.2	Radiation energy source classification		P
10.2.1	General classification		P
	Lasers		—
	Lamps and lamp systems		—




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Clause	Requirement + Test	Result - Remark	Verdict
	Image projectors		—
	X-Ray		—
	Personal music player		—
10.3	Safeguards against laser radiation		N/A
	The standard(s) equipment containing laser(s) comply		N/A
10.4	Safeguards against optical radiation from lamps and lamp systems (including LED types)		N/A
10.4.1	General requirements		N/A
	Instructional safeguard provided for accessible radiation level needs to exceed		N/A
	Risk group marking and location		N/A
	Information for safe operation and installation		N/A
10.4.2	Requirements for enclosures		N/A
	UV radiation exposure		N/A
10.4.3	Instructional safeguard		N/A
10.5	Safeguards against X-radiation		N/A
10.5.1	Requirements		N/A
	Instructional safeguard for skilled persons		—
10.5.3	Maximum radiation (pA/kg).....		—
10.6	Safeguards against acoustic energy sources		N/A
10.6.1	General		N/A
10.6.2	Classification		N/A
	Acoustic output $L_{Aeq,T}$, dB(A).....		N/A
	Unweighted RMS output voltage (mV).....		N/A
	Digital output signal (dBFS).....		N/A
10.6.3	Requirements for dose-based systems		N/A
10.6.3.1	General requirements		N/A
10.6.3.2	Dose-based warning and automatic decrease		N/A
10.6.3.3	Exposure-based warning and requirements		N/A
	30 s integrated exposure level (MEL30)		N/A
	Warning for MEL \geq 100 dB(A)		N/A
10.6.4	Measurement methods		N/A
10.6.5	Protection of persons		N/A
	Instructional safeguards		N/A
10.6.6	Requirements for listening devices (headphones,		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	earphones, etc.)		
10.6.6.1	Corded listening devices with analogue input		N/A
	Listening device input voltage (mV)..... :		N/A
10.6.6.2	Corded listening devices with digital input		N/A
	Max. acoustic output $L_{Aeq,T}$, dB(A)..... :		N/A
10.6.6.3	Cordless listening devices		N/A
	Max. acoustic output $L_{Aeq,T}$, dB(A)..... :		N/A

B	NORMAL OPERATING CONDITION TESTS, ABNORMAL OPERATING CONDITION TESTS AND SINGLE FAULT CONDITION TESTS		P
B.1	General		P
B.1.5	Temperature measurement conditions	(See appended table B.1.5)	P
B.2	Normal operating conditions		P
B.2.1	General requirements..... :	(See Test Item Particulars and appended test tables)	P
	Audio Amplifiers and equipment with audio amplifiers..... :	(See Annex E)	P
B.2.3	Supply voltage and tolerances		P
B.2.5	Input test..... :	(See appended table B.2.5)	P
B.3	Simulated abnormal operating conditions		P
B.3.1	General		N/A
B.3.2	Covering of ventilation openings		P
	Instructional safeguard..... :	'Do not block any ventilation openings'	P
B.3.3	DC mains polarity test		N/A
B.3.4	Setting of voltage selector		N/A
B.3.5	Maximum load at output terminals		N/A
B.3.6	Reverse battery polarity		N/A
B.3.7	Audio amplifier abnormal operating conditions		P
B.3.8	Safeguards functional during and after abnormal operating conditions..... :	(See appended table B.3)	P
B.4	Simulated single fault conditions		P
B.4.1	General		P
B.4.2	Temperature controlling device		N/A
B.4.3	Blocked motor test		N/A
B.4.4	Functional insulation		P
B.4.4.1	Short circuit of clearances for functional insulation		P

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Clause	Requirement + Test	Result - Remark	Verdict
B.4.4.2	Short circuit of creepage distances for functional insulation		P
B.4.4.3	Short circuit of functional insulation on coated printed boards		N/A
B.4.5	Short-circuit and interruption of electrodes in tubes and semiconductors		N/A
B.4.6	Short circuit or disconnection of passive components		P
B.4.7	Continuous operation of components		N/A
B.4.8	Compliance during and after single fault conditions :	(See appended table B.4)	P
B.4.9	Battery charging and discharging under single fault conditions		N/A
C	UV RADIATION		N/A
C.1	Protection of materials in equipment from UV radiation		N/A
C.1.2	Requirements		N/A
C.1.3	Test method		N/A
C.2	UV light conditioning test		N/A
C.2.1	Test apparatus..... :		N/A
C.2.2	Mounting of test samples		N/A
C.2.3	Carbon-arc light-exposure test		N/A
C.2.4	Xenon-arc light-exposure test		N/A
D	TEST GENERATORS		N/A
D.1	Impulse test generators		N/A
D.2	Antenna interface test generator		N/A
D.3	Electronic pulse generator		N/A
E	TEST CONDITIONS FOR EQUIPMENT CONTAINING AUDIO AMPLIFIERS		P
E.1	Electrical energy source classification for audio signals		P
	Maximum non-clipped output power (W)..... :	2000W. Amplifier auto limits beyond this power (sine wave). See note on page 8 of this report.	—
	Rated load impedance (Ω) :	2 Ω	—
	Open-circuit output voltage (V)..... :	64V (RMS)	—
	Instructional safeguard :	See Clause F.5	—
E.2	Audio amplifier normal operating conditions		P
	Audio signal source type :	sinewave	—
	Audio output power (W)..... :	250W (1/8 th power)	—

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Clause	Requirement + Test	Result - Remark	Verdict
	Audio output voltage (V)	23V (RMS)	—
	Rated load impedance (Ω)	2 Ω	—
	Requirements for temperature measurement	(See Table B.1.5)	P
E.3	Audio amplifier abnormal operating conditions	(See Table B.3, B.4)	P
F	EQUIPMENT MARKINGS, INSTRUCTIONS, AND INSTRUCTIONAL SAFEGUARDS		P
F.1	General		P
	Language		—
F.2	Letter symbols and graphical symbols		P
F.2.1	Letter symbols according to IEC60027-1		P
F.2.2	Graphic symbols according to IEC, ISO or manufacturer specific		P
F.3	Equipment markings		P
F.3.1	Equipment marking locations		P
F.3.2	Equipment identification markings		P
F.3.2.1	Manufacturer identification		P
F.3.2.2	Model identification	44M20 (see also page 2)	P
F.3.3	Equipment rating markings		P
F.3.3.1	Equipment with direct connection to mains		P
F.3.3.2	Equipment without direct connection to mains		N/A
F.3.3.3	Nature of the supply voltage	~	P
F.3.3.4	Rated voltage	100-230V	P
F.3.3.5	Rated frequency	50-60Hz	P
F.3.3.6	Rated current or rated power	20kW max (also see note on page 8)	P
F.3.3.7	Equipment with multiple supply connections		N/A
F.3.4	Voltage setting device		N/A
F.3.5	Terminals and operating devices		P
F.3.5.1	Mains appliance outlet and socket-outlet markings	No socket outlet	N/A
F.3.5.2	Switch position identification marking	ON	P
F.3.5.3	Replacement fuse identification and rating markings	2 identical factory fitted 20A fuses in parallel fuse-holders. No hazard as the fuses are not accessible and cannot be replaced incorrectly by user.	P
	Instructional safeguards for neutral fuse		N/A
F.3.5.4	Replacement battery identification marking	No battery	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
F.3.5.5	Neutral conductor terminal	Not permanently connected	N/A
F.3.5.6	Terminal marking location	Not on removable parts	P
F.3.6	Equipment markings related to equipment classification		P
F.3.6.1	Class I equipment		P
F.3.6.1.1	Protective earthing conductor terminal : 		P
F.3.6.1.2	Protective bonding conductor terminals :		N/A
F.3.6.2	Equipment class marking :	Class I	N/A
F.3.6.3	Functional earthing terminal marking :		N/A
F.3.7	Equipment IP rating marking :		N/A
F.3.8	External power supply output marking :		N/A
F.3.9	Durability, legibility and permanence of marking		P
F.3.10	Test for permanence of markings	15s with water and petrol. Screen printed markings also tested	P
F.4	Instructions		P
	a) Information prior to installation and initial use		P
	b) Equipment for use in locations where children not likely to be present	Evaluated using V1 probe	P
	c) Instructions for installation and interconnection		P
	d) Equipment intended for use only in restricted access area		N/A
	e) Equipment intended to be fastened in place	Instructions for rack mounting included	P
	f) Instructions for audio equipment terminals		P
	g) Protective earthing used as a safeguard	Warning to connect power cord to socket with earthing connector is included in safety instructions and marked on the equipment	P
	h) Protective conductor current exceeding ES2 limits		N/A
	i) Graphic symbols used on equipment	  Explained in instructions	P
	j) Permanently connected equipment not provided with all-pole mains switch		N/A
	k) Replaceable components or modules providing safeguard function		N/A
	l) Equipment containing insulating liquid		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	m) Installation instructions for outdoor equipment	Not outdoor	N/A
F.5	Instructional safeguards		P
G	COMPONENTS		P
G.1	Switches		P
G.1.1	General		P
G.1.2	Ratings, endurance, spacing, maximum load		P
G.1.3	Test method and compliance	Approved switch	N/A
G.2	Relays		P
G.2.1	Requirements		P
G.2.2	Overload test	Approved relay	N/A
G.2.3	Relay controlling connectors supplying power to other equipment		N/A
G.2.4	Test method and compliance	UL approved for 100,000 cycles. Glow wire test carried out at 750°C.	P
G.3	Protective devices		P
G.3.1	Thermal cut-offs		N/A
	Thermal cut-outs separately approved according to IEC 60730 with conditions indicated in a) & b)		N/A
	Thermal cut-outs tested as part of the equipment as indicated in c)		N/A
G.3.1.2	Test method and compliance		N/A
G.3.2	Thermal links		N/A
G.3.2.1	a) Thermal links tested separately according to IEC 60691 with specifics		N/A
	b) Thermal links tested as part of the equipment		N/A
G.3.2.2	Test method and compliance		N/A
G.3.3	PTC thermistors		N/A
G.3.4	Overcurrent protection devices	F1 T8AH F2/F3. 2 x 20A fuses in parallel.	P
G.3.5	Safeguards components not mentioned in G.3.1 to G.3.4		N/A
G.3.5.1	Non-resettable devices suitably rated and marking provided		N/A
G.3.5.2	Single faults conditions..... :	(See appended table B.4)	P
G.4	Connectors		P
G.4.1	Spacings		P

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Clause	Requirement + Test	Result - Remark	Verdict
G.4.2	Mains connector configuration	Approved connector	P
G.4.3	Plug is shaped that insertion into mains socket-outlets or appliance coupler is unlikely		P
G.5	Wound components		P
G.5.1	Wire insulation in wound components	Approved TIW used in main transformer	P
G.5.1.2	Protection against mechanical stress		N/A
G.5.2	Endurance test		N/A
G.5.2.1	General test requirements		N/A
G.5.2.2	Heat run test		N/A
	Test time (days per cycle)		—
	Test temperature (°C).....		—
G.5.2.3	Wound components supplied from the mains	Mains input filter chokes	P
G.5.2.4	No insulation breakdown		P
G.5.3	Transformers		P
G.5.3.1	Compliance method.....	Tested in appliance	P
	Position	TX2, TX3	P
	Method of protection.....		—
G.5.3.2	Insulation		—
	Protection from displacement of windings.....	Windings are fastened	—
G.5.3.3	Transformer overload tests	Conducted as maximum audio test	P
G.5.3.3.1	Test conditions	Maximum audio output test using speaker output loaded to maximum available output power just before self-limiting by the amplifier	P
G.5.3.3.2	Winding temperatures		P
G.5.3.3.3	Winding temperatures – alternative test method		N/A
G.5.3.4	Transformers using FIW		N/A
G.5.3.4.1	General		N/A
	FIW wire nominal diameter.....		—
G.5.3.4.2	Transformers with basic insulation only		N/A
G.5.3.4.3	Transformers with double insulation or reinforced insulation.....		N/A
G.5.3.4.4	Transformers with FIW wound on metal or ferrite core		N/A
G.5.3.4.5	Thermal cycling test and compliance		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
G.5.3.4.6	Partial discharge test		N/A
G.5.3.4.7	Routine test		N/A
G.5.4	Motors		N/A
G.5.4.1	General requirements		N/A
G.5.4.2	Motor overload test conditions		N/A
G.5.4.3	Running overload test		N/A
G.5.4.4.2	Locked-rotor overload test		N/A
	Test duration (days) :		—
G.5.4.5	Running overload test for DC motors		N/A
G.5.4.5.2	Tested in the unit		N/A
G.5.4.5.3	Alternative method		N/A
G.5.4.6	Locked-rotor overload test for DC motors		N/A
G.5.4.6.2	Tested in the unit		N/A
	Maximum Temperature :		N/A
G.5.4.6.3	Alternative method		N/A
G.5.4.7	Motors with capacitors		N/A
G.5.4.8	Three-phase motors		N/A
G.5.4.9	Series motors		N/A
	Operating voltage :		—
G.6	Wire Insulation		P
G.6.1	General		P
G.6.2	Enamelled winding wire insulation		N/A
G.7	Mains supply cords		N/A
G.7.1	General requirements	Detachable cord (see summary of testing)	—
	Type..... :		—
G.7.2	Cross sectional area (mm ² or AWG) :		—
G.7.3	Cord anchorages and strain relief for non-detachable power supply cords	Detachable cord	—
G.7.3.2	Cord strain relief		N/A
G.7.3.2.1	Requirements		N/A
	Strain relief test force (N)..... :		N/A
G.7.3.2.2	Strain relief mechanism failure		N/A
G.7.3.2.3	Cord sheath or jacket position, distance (mm) :		N/A
G.7.3.2.4	Strain relief and cord anchorage material		N/A
G.7.4	Cord Entry		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
G.7.5	Non-detachable cord bend protection		N/A
G.7.5.1	Requirements		N/A
G.7.5.2	Test method and compliance		N/A
	Overall diameter or minor overall dimension, D (mm)		—
	Radius of curvature after test (mm).....		—
G.7.6	Supply wiring space		N/A
G.7.6.1	General requirements		N/A
G.7.6.2	Stranded wire		N/A
G.7.6.2.1	Requirements		N/A
G.7.6.2.2	Test with 8 mm strand		N/A
G.8	Varistors		N/A
G.8.1	General requirements		N/A
G.8.2	Safeguards against fire		N/A
G.8.2.1	General		N/A
G.8.2.2	Varistor overload test		N/A
G.8.2.3	Temporary overvoltage test		N/A
G.9	Integrated circuit (IC) current limiters		N/A
G.9.1	Requirements		N/A
	IC limiter output current (max. 5A)		—
	Manufacturers' defined drift		—
G.9.2	Test Program		N/A
G.9.3	Compliance		N/A
G.10	Resistors		P
G.10.1	General	4 bleeder resistors in series (R7, 8, 9 & 10) comply with cr/cl requirements. The EUT complies with clause 5.5.2.2 with one resistor open or short circuit. R3 & R6 comply with cr/cl requirements	P
G.10.2	Conditioning		N/A
G.10.3	Resistor test		N/A
G.10.4	Voltage surge test		N/A
G.10.5	Impulse test		N/A
G.10.6	Overload test		N/A
G.11	Capacitors and RC units		P

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Clause	Requirement + Test	Result - Remark	Verdict
G.11.1	General requirements	Approved capacitors	P
G.11.2	Conditioning of capacitors and RC units		N/A
G.11.3	Rules for selecting capacitors		N/A
G.12	Optocouplers		P
	Optocouplers comply with IEC 60747-5-5 with specifics		P
	Type test voltage $V_{ini,a}$		—
	Routine test voltage, $V_{ini,b}$		—
G.13	Printed boards		P
G.13.1	General requirements		P
G.13.2	Uncoated printed boards		P
G.13.3	Coated printed boards		N/A
G.13.4	Insulation between conductors on the same inner surface		N/A
G.13.5	Insulation between conductors on different surfaces		N/A
	Distance through insulation		N/A
	Number of insulation layers (pcs)		—
G.13.6	Tests on coated printed boards		N/A
G.13.6.1	Sample preparation and preliminary inspection		N/A
G.13.6.2	Test method and compliance		N/A
G.14	Coating on components terminals		N/A
G.14.1	Requirements		N/A
G.15	Pressurized liquid filled components		N/A
G.15.1	Requirements		N/A
G.15.2	Test methods and compliance		N/A
G.15.2.1	Hydrostatic pressure test		N/A
G.15.2.2	Creep resistance test		N/A
G.15.2.3	Tubing and fittings compatibility test		N/A
G.15.2.4	Vibration test		N/A
G.15.2.5	Thermal cycling test		N/A
G.15.2.6	Force test		N/A
G.15.3	Compliance		N/A
G.16	IC including capacitor discharge function (ICX)		N/A
G.16.1	Condition for fault tested is not required		N/A
	ICX with associated circuitry tested in equipment		N/A
	ICX tested separately		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
G.16.2	Tests		N/A
	Smallest capacitance and smallest resistance specified by ICX manufacturer for impulse test..... :		—
	Mains voltage that impulses to be superimposed on :		—
	Largest capacitance and smallest resistance for ICX tested by itself for 10000 cycles test :		—
G.16.3	Capacitor discharge test..... :		N/A
H	CRITERIA FOR TELEPHONE RINGING SIGNALS		N/A
H.1	General		N/A
H.2	Method A		N/A
H.3	Method B		N/A
H.3.1	Ringling signal		N/A
H.3.1.1	Frequency (Hz) :		—
H.3.1.2	Voltage (V) :		—
H.3.1.3	Cadence; time (s) and voltage (V) :		—
H.3.1.4	Single fault current (mA):..... :		—
H.3.2	Tripping device and monitoring voltage		N/A
H.3.2.1	Conditions for use of a tripping device or a monitoring voltage		N/A
H.3.2.2	Tripping device		N/A
H.3.2.3	Monitoring voltage (V) :		N/A
J	INSULATED WINDING WIRES FOR USE WITHOUT INTERLEAVED INSULATION		P
J.1	General		P
	Winding wire insulation..... :	Approved TIW used in mains transformer TX3. (Refer to TX3 transformer data)	—
	Solid round winding wire, diameter (mm) :	0.5mm	P
	Solid square and rectangular (flatwise bending) winding wire, cross-sectional area (mm ²)..... :		N/A
J.2/J.3	Tests and Manufacturing		—
K	SAFETY INTERLOCKS		N/A
K.1	General requirements		N/A
	Instructional safeguard :		N/A
K.2	Components of safety interlock safeguard mechanism		N/A
K.3	Inadvertent change of operating mode		N/A
K.4	Interlock safeguard override		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
K.5	Fail-safe		N/A
K.5.1	Under single fault condition		N/A
K.6	Mechanically operated safety interlocks		N/A
K.6.1	Endurance requirement		N/A
K.6.2	Test method and compliance		N/A
K.7	Interlock circuit isolation		N/A
K.7.1	Separation distance for contact gaps & interlock circuit elements		N/A
	In circuit connected to mains, separation distance for contact gaps (mm)..... :		N/A
	In circuit isolated from mains, separation distance for contact gaps (mm)..... :		N/A
	Electric strength test before and after the test of K.7.2		N/A
K.7.2	Overload test, Current (A)		N/A
K.7.3	Endurance test		N/A
K.7.4	Electric strength test		N/A
L	DISCONNECT DEVICES		P
L.1	General requirements		P
L.2	Permanently connected equipment		N/A
L.3	Parts that remain energized		N/A
L.4	Single-phase equipment		P
L.5	Three-phase equipment		N/A
L.6	Switches as disconnect devices		N/A
L.7	Plugs as disconnect devices	Mains plug or appliance coupler must be readily operable – In safety instructions	P
L.8	Multiple power sources		N/A
	Instructional safeguard		N/A
M	EQUIPMENT CONTAINING BATTERIES AND THEIR PROTECTION CIRCUITS		N/A
M.1	General requirements		N/A
M.2	Safety of batteries and their cells		N/A
M.2.1	Batteries and their cells comply with relevant IEC standards		N/A
M.3	Protection circuits for batteries provided within the equipment		N/A
M.3.1	Requirements		N/A
M.3.2	Test method		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Overcharging of a rechargeable battery		N/A
	Excessive discharging		N/A
	Unintentional charging of a non-rechargeable battery		N/A
	Reverse charging of a rechargeable battery		N/A
M.3.3	Compliance		N/A
M.4	Additional safeguards for equipment containing a portable secondary lithium battery		N/A
M.4.1	General		N/A
M.4.2	Charging safeguards		N/A
M.4.2.1	Requirements		N/A
M.4.2.2	Compliance..... :		N/A
M.4.3	Fire enclosure..... :		N/A
M.4.4	Drop test of equipment containing a secondary lithium battery		N/A
M.4.4.2	Preparation and procedure for the drop test		N/A
M.4.4.3	Drop, Voltage on reference and dropped batteries (V); voltage difference during 24 h period (%): :		N/A
M.4.4.4	Check of the charge/discharge function		N/A
M.4.4.5	Charge / discharge cycle test		N/A
M.4.4.6	Compliance		N/A
M.5	Risk of burn due to short-circuit during carrying		N/A
M.5.1	Requirement		N/A
M.5.2	Test method and compliance		N/A
M.6	Safeguards against short-circuits		N/A
M.6.1	External and internal faults		N/A
M.6.2	Compliance		N/A
M.7	Risk of explosion from lead acid and NiCd batteries		N/A
M.7.1	Ventilation preventing explosive gas concentration		N/A
	Calculated hydrogen generation rate :		N/A
M.7.2	Test method and compliance		N/A
	Minimum air flow rate, Q (m ³ /h)..... :		N/A
M.7.3	Ventilation tests		N/A
M.7.3.1	General		N/A
M.7.3.2	Ventilation test – alternative 1		N/A
	Hydrogen gas concentration (%)..... :		N/A
M.7.3.3	Ventilation test – alternative 2		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Obtained hydrogen generation rate..... :		N/A
M.7.3.4	Ventilation test – alternative 3		N/A
	Hydrogen gas concentration (%)..... :		N/A
M.7.4	Marking..... :		N/A
M.8	Protection against internal ignition from external spark sources of batteries with aqueous electrolyte		N/A
M.8.1	General		N/A
M.8.2	Test method		N/A
M.8.2.1	General		N/A
M.8.2.2	Estimation of hypothetical volume V_z (m ³ /s)..... :		—
M.8.2.3	Correction factors..... :		—
M.8.2.4	Calculation of distance d (mm)..... :		—
M.9	Preventing electrolyte spillage		N/A
M.9.1	Protection from electrolyte spillage		N/A
M.9.2	Tray for preventing electrolyte spillage		N/A
M.10	Instructions to prevent reasonably foreseeable misuse		N/A
	Instructional safeguard..... :		N/A
N	ELECTROCHEMICAL POTENTIALS		N/A
	Material(s) used..... :		—
O	MEASUREMENT OF CREEPAGE DISTANCES AND CLEARANCES		P
	Value of X (mm)..... :	1mm	—
P	SAFEGUARDS AGAINST CONDUCTIVE OBJECTS		P
P.1	General	Rack mounting only	P
P.2	Safeguards against entry or consequences of entry of a foreign object		P
P.2.1	General		P
P.2.2	Safeguards against entry of a foreign object	See P.2.3	N/A
	Location and Dimensions (mm)..... :	7mm x 10mm at rearside	—
P.2.3	Safeguards against the consequences of entry of a foreign object		P
P.2.3.1	Safeguard requirements	No bare conductive parts of ES3 or PS3 circuits within the projected volume	P
	The ES3 and PS3 keep-out volume in Figure P.3 not applicable to transportable equipment	Not transportable	N/A
	Transportable equipment with metalized plastic parts..... :		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
P.2.3.2	Consequence of entry test..... :		N/A
P.3	Safeguards against spillage of internal liquids		N/A
P.3.1	General		N/A
P.3.2	Determination of spillage consequences		N/A
P.3.3	Spillage safeguards		N/A
P.3.4	Compliance		N/A
P.4	Metallized coatings and adhesives securing parts		N/A
P.4.1	General		N/A
P.4.2	Tests		N/A
	Conditioning, T _c (°C)		—
	Duration (weeks)		—
Q	CIRCUITS INTENDED FOR INTERCONNECTION WITH BUILDING WIRING		N/A
Q.1	Limited power sources		N/A
Q.1.1	Requirements		N/A
	a) Inherently limited output		N/A
	b) Impedance limited output		N/A
	c) Regulating network limited output		N/A
	d) Overcurrent protective device limited output		N/A
	e) IC current limiter complying with G.9		N/A
Q.1.2	Test method and compliance		N/A
	Current rating of overcurrent protective device (A) :		N/A
Q.2	Test for external circuits – paired conductor cable		N/A
	Maximum output current (A)		N/A
	Current limiting method		—
R	LIMITED SHORT CIRCUIT TEST		N/A
R.1	General	Earthing on main PCB is not protective bonding. For EMC only.	N/A
R.2	Test setup		N/A
	Overcurrent protective device for test		—
R.3	Test method		N/A
	Cord/cable used for test		—
R.4	Compliance		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
S	TESTS FOR RESISTANCE TO HEAT AND FIRE		N/A
S.1	Flammability test for fire enclosures and fire barrier materials of equipment where the steady state power does not exceed 4 000 W		N/A
	Samples, material		—
	Wall thickness (mm)		—
	Conditioning (°C)		—
	Test flame according to IEC 60695-11-5 with conditions as set out		N/A
	- Material not consumed completely		N/A
	- Material extinguishes within 30s		N/A
	- No burning of layer or wrapping tissue		N/A
S.2	Flammability test for fire enclosure and fire barrier integrity		N/A
	Samples, material		—
	Wall thickness (mm)		—
	Conditioning (°C)		—
S.3	Flammability test for the bottom of a fire enclosure		N/A
S.3.1	Mounting of samples		N/A
S.3.2	Test method and compliance		N/A
	Mounting of samples		—
	Wall thickness (mm)		—
S.4	Flammability classification of materials		N/A
S.5	Flammability test for fire enclosure materials of equipment with a steady state power exceeding 4 000 W		N/A
	Samples, material		—
	Wall thickness (mm)		—
	Conditioning (°C)		—
T	MECHANICAL STRENGTH TESTS		P
T.1	General		P
T.2	Steady force test, 10 N	(See appended table T.2)	P
T.3	Steady force test, 30 N		N/A
T.4	Steady force test, 100 N		N/A
T.5	Steady force test, 250 N	(See appended table T.5)	P
T.6	Enclosure impact test	(See appended table T.6)	P
	Fall test		N/A
	Swing test		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
T.7	Drop test		N/A
T.8	Stress relief test		N/A
T.9	Glass Impact Test		N/A
T.10	Glass fragmentation test		N/A
	Number of particles counted.....		N/A
T.11	Test for telescoping or rod antennas		N/A
	Torque value (Nm)		N/A
U	MECHANICAL STRENGTH OF CATHODE RAY TUBES (CRT) AND PROTECTION AGAINST THE EFFECTS OF IMPLOSION		N/A
U.1	General		N/A
	Instructional safeguard :		N/A
U.2	Test method and compliance for non-intrinsically protected CRTs		N/A
U.3	Protective screen		N/A
V	DETERMINATION OF ACCESSIBLE PARTS		P
V.1	Accessible parts of equipment		P
V.1.1	General		P
V.1.2	Surfaces and openings tested with jointed test probes	Tested with V1 and V2 probes	P
V.1.3	Openings tested with straight unjointed test probes		P
V.1.4	Plugs, jacks, connectors tested with blunt probe		P
V.1.5	Slot openings tested with wedge probe		N/A
V.1.6	Terminals tested with rigid test wire		P
V.2	Accessible part criterion		P
X	ALTERNATIVE METHOD FOR DETERMINING CLEARANCES FOR INSULATION IN CIRCUITS CONNECTED TO AN AC MAINS NOT EXCEEDING 420 V PEAK (300 V RMS)		P
	Clearance.....	(See appended table X)	P
Y	CONSTRUCTION REQUIREMENTS FOR OUTDOOR ENCLOSURES		N/A
Y.1	General		N/A
Y.2	Resistance to UV radiation		N/A
Y.3	Resistance to corrosion		N/A
Y.3	Resistance to corrosion		N/A
Y.3.1	Metallic parts of outdoor enclosures are resistant to effects of water-borne contaminants by		N/A
Y.3.2	Test apparatus		N/A
Y.3.3	Water – saturated sulphur dioxide atmosphere		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
Y.3.4	Test procedure		N/A
Y.3.5	Compliance		N/A
Y.4	Gaskets		N/A
Y.4.1	General		N/A
Y.4.2	Gasket tests		N/A
Y.4.3	Tensile strength and elongation tests		N/A
	Alternative test methods		N/A
Y.4.4	Compression test		N/A
Y.4.5	Oil resistance		N/A
Y.4.6	Securing means		N/A
Y.5	Protection of equipment within an outdoor enclosure		N/A
Y.5.1	General		N/A
Y.5.2	Protection from moisture		N/A
	Relevant tests of IEC 60529 or Y.5.3		N/A
Y.5.3	Water spray test		N/A
Y.5.4	Protection from plants and vermin		N/A
Y.5.5	Protection from excessive dust		N/A
Y.5.5.1	General		N/A
Y.5.5.2	IP5X equipment		N/A
Y.5.5.3	IP6X equipment		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
Y.6	Mechanical strength of enclosures	Not outdoor	N/A
Y.6.1	General		N/A
Y.6.2	Impact test :		N/A

5.2		TABLE: Classification of electrical energy sources					P
Supply Voltage	Location (e.g. circuit designation)	Test conditions	Parameters				ES Class
			U (V)	I (A)	Type ¹⁾	Additional Info ²⁾	
240	Mains SP1 SP2 and SW A, SW B	Normal	240	-	SS	AC	ES3
240	SM1 – SM9	Normal	150V	-	SS	DC	ES3
240	CN3	Normal	3.3	2.8	SS	DC	ES1
240	CN4	Normal	5.6	2	SS	DC	ES1
Supplementary information:							
1) Type: Steady state (SS), Capacitance (CP), Single pulse (SP), Repetitive pulses (RP), etc.							
2) Additional Info: Frequency, Pulse duration, Pulse off time, Capacitance value, etc.							

5.4.1.8		TABLE: Working voltage measurement				P
Location		RMS voltage (V)	Peak voltage (V)	Frequency (Hz)	Comments	
Live to earth (B) PCB tracks		240	340	50	Basic insulation	
Neutral to earth (B) PCB tracks		240	340	50	Basic insulation	
Live to Neutral (B) PCB tracks		240	340	50	Basic insulation	
TX2 Pri – sec PSU		332	368	96kHz	Reinforced	
TX3 Pri – sec PSU		228	364	96kHz	Reinforced	
Opt 1		238	381	“	Reinforced	
Opt 2		237	377	“	Reinforced	
Opt 3		249	392	“	Reinforced	
Opt 4		251	298	“	Reinforced	
Opt 5		250	395	“	Reinforced	
Opt 6		244	384	“	Reinforced	
Supplementary information:						
TX1 is a potted current transformer not providing isolation.						

5.4.1.10.2	TABLE: Vicat softening temperature of thermoplastics	N/A
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5.4.1.10.3	TABLE: Ball pressure test of thermoplastics	N/A
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5.4.2, 5.4.3 TABLE: Minimum Clearances/Creepage distance								
Clearance (cl) and creepage distance (cr) at/of/between:	U _p (V)	U _{rms} (V)	Freq ¹⁾ (Hz)	Required cl (mm)	cl (mm)	E.S. ²⁾ (V)	Required cr (mm)	cr (mm)
Live to Earth (PCB tracks)	340	240	-	*	*	-	2.5	3.5
Neutral to Earth (PCB tracks)	340	240	-	*	*	-	2.5	3.5
Across Live to Neutral (PCB tracks)	340	240	-	*	*	-	2.5	3.5
TX2 Pri-sec (external)	368	332	96	*	*	-	5.6	7.0
TX3 Pri-sec (external)	364	228	96	*	*	-	5.0	13.7
Opt 1	381	238	-	*	*	-	5.0	8.4
Opt 2	377	237	-	*	*	-	5.0	8.4
Opt 3	392	249	-	*	*	-	5.0	8.4
Opt 4	298	251	-	*	*	-	5.0	8.4
Opt 5	395	250	-	*	*	-	5.0	8.4
Opt 6	384	244	-	*	*	-	5.0	8.4
Supplementary information:								
* See Table X								
1) Only for frequency above 30 kHz								
2) Complete Electric Strength voltage (E.S. (V) when 5.4.2.4 applied)								

5.4.4.2	TABLE: Minimum distance through insulation	N/A
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5.4.4.9	TABLE: Solid insulation at frequencies >30 kHz	N/A
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5.4.9 TABLE: Electric strength tests			P
Test voltage applied between:	Voltage shape (Surge, Impulse, AC, DC, etc.)	Test voltage (V)	Breakdown Yes / No
Between mains poles (primary fuse removed)	AC	1500	No
Between parts separated by basic or supplementary insulation	DC	2121	No
Between parts separated by double or reinforced insulation	DC	4242	No
Supplementary information:			

5.5.2.2 TABLE: Stored discharge on capacitors					P
Location	Supply voltage (V)	Operating and fault condition ¹⁾	Switch position	Measured voltage (Vpk)	ES Class
C7, C11	264	Normal	On	0V	1
C7, C11	264	One bleed resistor O/C or S/C	On	0V	1
Supplementary information:					
X-capacitors installed for testing: C7 (47nF), C11 (1µF)					
[X] bleeding resistor rating: 4 x 75K = 300K					
[] ICX:					
1) Normal operating condition (e.g., normal operation, or open fuse), SC= short circuit, OC= open circuit					

5.6.6 TABLE: Resistance of protective conductors and terminations				P
Location	Test current (A)	Duration (min)	Voltage drop (V)	Resistance (Ω)
Metal enclosure	60	4	0.256	.004
Metal enclosure	64	6	0.292	.005
Supplementary information:				
Power supply PCB grounds are bolted directly to studs on base of metal enclosure				

5.7.4 TABLE: Unearthed accessible parts						P
Location	Operating and fault conditions	Supply Voltage (V)	Parameters			ES class
			Voltage (V _{rms} or V _{pk})	Current (A _{rms} or A _{pk})	Freq. (Hz)	
Unearthed control knobs and audio socket release tabs	Normal	264	0.005mV (pk)	0.001mA (pk)	50	1
	Normal	90	0.002mV (pk)	0.001mA (pk)	60	1
Pins on 'link' (line in) sockets	Normal	264	0.011mV (pk)	0.022mA (pk)	50	1
	Normal	90	0.008mV (pk)	0.016mA (pk)	60	1
Supplementary information:						
Abbreviation: SC= short circuit; OC= open circuit						

5.7.5	TABLE: Earthed accessible conductive part			P
Supply voltage (V)	264V 50Hz and 105.3V 60Hz			—
Phase(s)	[X] Single Phase; [] Three Phase: [] Delta [] Wye			
Power Distribution System	<input checked="" type="checkbox"/> TN <input type="checkbox"/> TT <input checked="" type="checkbox"/> IT			
Location	Fault Condition No in IEC 60990 clause 6.2.2	Touch current (mA)	Comment	
Earthed metal	1a (e-open, normal)	U1: 673mV, 1.35mA U2: 670mV, 1.34mA	264V 50Hz	
		U1: 164mV, 0.328mA U2: 154mV, 0.308mA	90V 50Hz	
		U1: 280mV, 0.560mA U2: 264mV, 0.528mA	132V 60Hz	
		U1: 198mV, 0.396mA U2: 182mV, 0.364mA	90V 60Hz	
	1b (e-open, reverse)	U1: 680mV, 1.36mA U2: 672mV, 1.33mA	264V 50Hz	
		U1: 314mV, 0.628mA U2: 297mV, 0.594mA	90V 50Hz	
		U1: 518mV, 1.04mA U2: 506mV, 1.02mA	132V 60Hz	
		U1: 370mV, 0.740mA U2: 348mV, 0.696mA	90V 60Hz	
Supplementary Information:				

5.8	TABLE: Backfeed safeguard in battery backed up supplies	N/A
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6.2.2		TABLE: Power source circuit classifications					
Location	Operating and fault condition	Voltage (V)	Current (A)	Max. Power ¹⁾ (W)	Time (S)	PS class	
Mains SP1 SP2 and SW A, SW B	Normal	240	-	-	-	PS3	
SM1 – SM9	Normal	150	3.7	550	5	PS3	
CN3	Normal	3.3	2.8	9.2	3	PS1	
CN4	Normal	5.6	2	11.2	3	PS1	
Supplementary information:							
Abbreviation: SC= short circuit; OC= open circuit							
1) Measured after 3 s for PS1 and measured after 5 s for PS2 and PS3.							

6.2.3.1		TABLE: Determination of Arcing PIS				P
Location	Open circuit voltage after 3 s (Vpk)	Measured r.m.s current (A)	Calculated value	Arcing PIS? Yes / No		
Supplementary information:						
All conductors and devices >50V are considered as arcing PIS.						
Components mounted on V-0 PCBs & enclosure made of metal						

6.2.3.2		TABLE: Determination of resistive PIS			P
Location	Operating and fault condition	Dissipate power (W)		Arcing PIS? Yes / No	
Supplementary information:					
Abbreviation: SC= short circuit; OC= open circuit					
All conductors and devices are considered as resistive PIS.					
Components mounted on V-0 PCBs & enclosure made of metal.					

8.5.5	TABLE: High pressure lamp	N/A
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9.6	TABLE: Temperature measurements for wireless power transmitters	N/A
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5.4.1.4, 9.3, B.1.5, B.2.6	TABLE: Temperature measurements				P
Supply voltage (V)..... :	264 (50Hz)	198 (50Hz)	132 (60Hz)	90 (60Hz)	—
Ambient temperature during test T_{amb} (°C) :	20	20	21	21	—
Maximum measured temperature T of part/at:	T (°C)				Allowed T_{max} (°C)
Mains inlet socket*	50.3	56.7	55.4	55.6	85
Internal mains wiring*	57.8	57.2	56.9	57.1	105
L2 mains input choke*	53.3	55.2	54.9	55.4	70
RLY4 relay*	53.9	56.4	56.6	57.9	85
X cap*	53.0	55.0	54.0	55.2	110
C19*	58.5	50.2	58.8	59.5	105
C25*	55.5	58.2	55.1	56.6	105
L4*	57.1	53.2	50.4	50.6	70
TX2*	58.0	52.6	51.0	50.4	70
TX3*	58.8	55.2	51.1	52.0	70
TX1*	57.1	51.7	51.4	50.5	70
L8*	60.1	58.6	59.1	57.0	70
C14*	63.5	64.3	63.1	62.4	105
PCB near output chokes*	76.0	79.4	79.9	77.0	130
Switch*	44.2	49.3	49.0	48.7	125
Knob	5.0	5.0	7.0	7.5	60
Top accessible†	17.2	16.9	16.6	16.0	40
Rear accessible†	21.5	22.1	20.3	21.6	40
Front accessible†	15.5	17.6	14.3	16.3	40
Supplementary information: * Corrected for 40°C T _{ma} , † Corrected for 25°C ambient					

B.2.5		TABLE: Input test							P
U (V)	Hz	I (A)	I rated (A)	P (W)	P rated (W)	Fuse No	I fuse (A)	Condition/status	
198	50	3.20	-	437	-	-	-	Normal	
207		3.19	-	456	-	-	-		
220		3.19	-	472	-	-	-		
230		3.13	-	489	20kW max	F2/F3	2 x 20		
240		3.12	-	533	-	-	-		
253		3.09	-	560	-	-	-		
264		2.98	-	578	-	-	-		
90	60	5.49	-	453	-	-	-	Normal	
120		5.27	-	479	20kW max	F2/F3	2 x 20		
132		5.21	-	511	-	-	-		
Supplementary information: Note: Two identical fuses fitted in parallel.									

B.3, B.4		TABLE: Abnormal operating and fault condition tests					P
Ambient temperature T _{amb} (°C)..... :					21		—
Power source for EUT: Manufacturer, model/type, output rating .. :					-		—
Component No.	Condition	Supply voltage (V)	Test time	Fuse no.	Fuse current (A)	Observation	
TX2	Full power	90/264	4hrs	-	-	Temp reached 90.2°C. Max allowed 150°C (A). No hazard	
Speaker terminals	S/C	90/264	½ hr	-	-	TX2 reached 53.6°C. Amplifier shut down. No hazards	
Blocked ventilation holes (rear)	Normal	90/264	4hrs	-	-	TX2 reached 102°C. Max allowed 150°C. Amplifier cycled shutdown and restart. No hazards.	

B.3, B.4		TABLE: Abnormal operating and fault condition tests (Continued)					P
Ambient temperature T _{amb} (°C)..... :		21					—
Power source for EUT: Manufacturer, model/type, outputrating .. :		-					—
Component No.	Condition	Supply voltage (V)	Test time	Fuse no.	Fuse current (A)	Observation	
Main PSU section							
HT1 - GND	S/C	90/264	-	-	-	Shut down, no hazards were observed	
D6	S/C	90/264	-	-	-	Shut down, no hazards were observed	
C25	S/C	90/264	-	-	-	(90V & 264V) Shut down, no hazards were observed	
D10	S/C	90/264	-	-	-	(90V & 264V) Shut down, no hazards were observed	
C43	S/C	90/264	-	-	-	(90V & 264V) No operation, no hazards were observed	
D4	S/C	90/264	-	F2/F3*	2 x 20	(90V & 264V) No operation, F2/F3 blows instantly. No hazards were observed	
Auxiliary PSU							
C38	S/C	90/264	-	-	-	No operation. No hazards observed	
C52	S/C	90/264	-	-	-	No operation. No hazards observed	
D25	S/C	90/264	-	-	-	No operation. No hazards observed	
C55	S/C	90/264	-	F1	8	F1 blows. No hazard	
BR1 1 leg	S/C	90/264	-	F1	8	F1 blows. No hazard	
Supplementary information: *Two identical fuses fitted in parallel.							

M.3	TABLE: Protection circuits for batteries provided within the equipment	N/A
-----	--	-----

M.4.2	TABLE: Charging safeguards for equipment containing a secondary lithium battery	N/A
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Q.1	TABLE: Circuits intended for interconnection with building wiring (LPS)	N/A
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





T.2, T.3, T.4, T.5	TABLE: Steady force test						P
Location/Part	Material	Thickness (mm)	Probe	Force (N)	Test Duration (s)	Observation	
Mains input wiring	PVC	-	-	10	5	No hazard	
Outer enclosure	Steel	1.2	30mm	250	5	No hazard	
Supplementary information:							


















T.6, T.9	TABLE: Impact test				P
Location/Part	Material	Thickness (mm)	Height (mm)	Observation	
Outer enclosure	Steel	1.2mm	1300	No damage	
Supplementary information:					



T.7	TABLE: Drop test	N/A
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T.8	TABLE: Stress relief test	N/A
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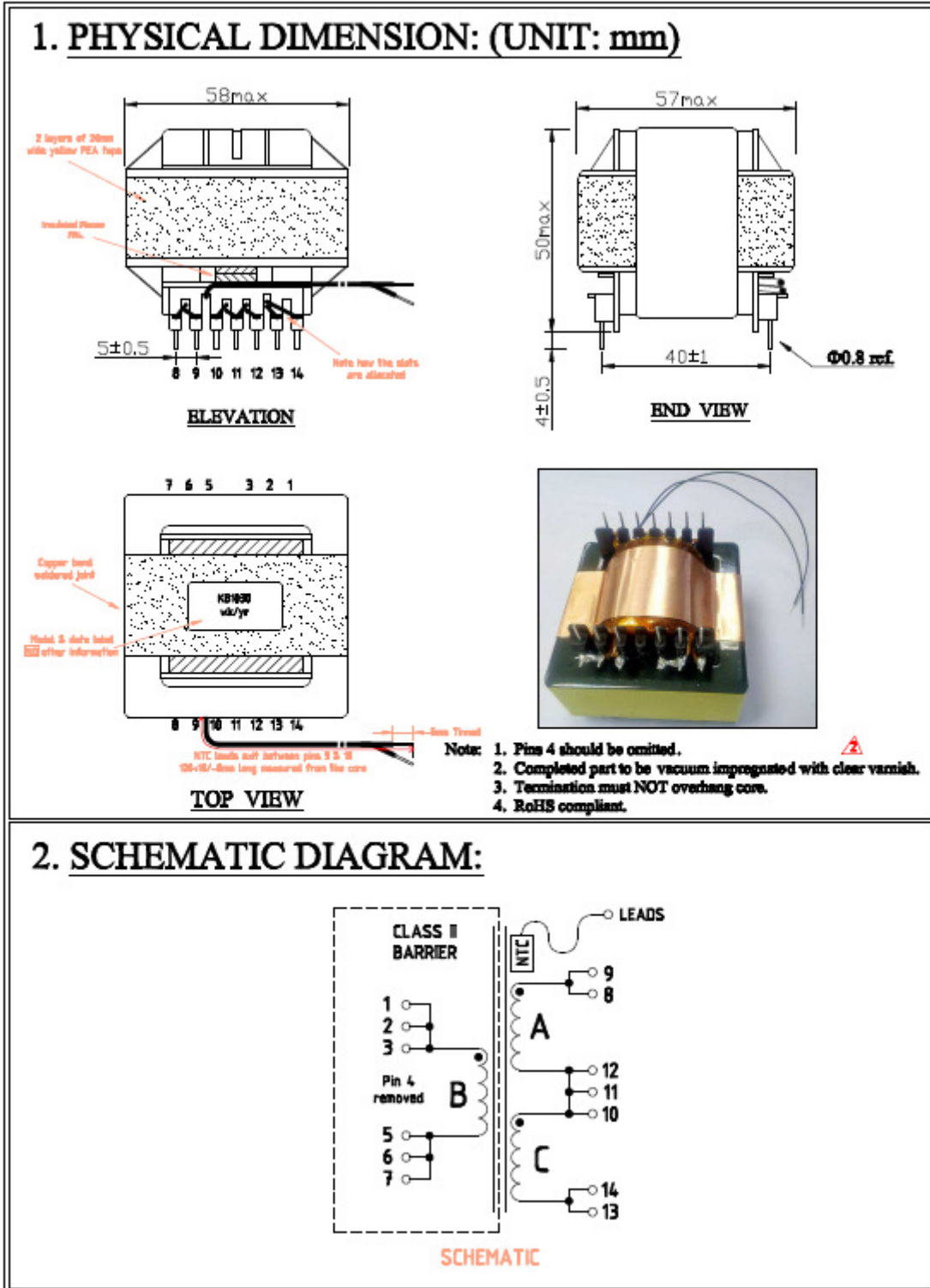
X	TABLE: Alternative method for determining minimum clearances distances			P
Clearance distanced between:	Peak of working voltage (V)	Required cl (mm)	Measured cl (mm)	
Live to earth (B) PCB tracks	340	2.0	2.5	
Neutral to earth (B) PCB tracks	340	2.0	2.5	
Live to Neutral (B) PCB tracks	340	2.0	2.5	
TX2 Pri - sec PSU	368	4.0	5.0	
TX3 Pri – sec PSU	364	4.0	5.0	
Opt 1	381	4.0	5.0	
Opt 2	377	4.0	5.0	
Opt 3	392	4.0	5.0	
Opt 4	298	4.0	5.0	
Opt 5	395	4.0	5.0	
Opt 6	384	4.0	5.0	
Supplementary information:				

4.1.2	TABLE: List of critical components				P
Object / Part No.	Manufacturer / Trademark	Type / Model	Technical Data	Standard	Mark(s) Of Conformity
Mains inlet	Neutrik	NAC3MP-HC	250Vac 32A	IEC/EN 61984 UL1977	 40022413  E135070
Mains inlet (alt)	Interchangeable	Interchangeable	250Vac 32A	IEC/EN 61984 UL1977	---
Mains connector	Neutrik	NAC3FC-HC	250Vac 32A	IEC/EN 61984 UL1977	 40022413  E135070
Mains connector (alt)	Interchangeable	Interchangeable	250Vac 32A	IEC/EN 61984 UL1977	---
Mains switch	Arcoelectric	8550	10(6)A 250Vac	IEC/EN 61058 UL61058-1	 148185-02  E45221
Mains switch (alt)	Interchangeable	Interchangeable	10(6)A 250Vac	IEC/EN 61058 UL61058-1	---
Relay RLY1 – RLY5	Schrack	RT314012	16A 250Vac	IEC/EN 60947 UL508	 40007571  E214025
Relay RLY1 – RLY5 (alt)	Interchangeable	Interchangeable	16A 250Vac	IEC/EN 60947 UL508	---
X caps, C7, C8, C9, C11, C12	Kemet	46K / R46 series.	10nF – 1uF 275 - 300Vac	IEC/EN 60384-14 UL1414	 V4413  E97797
X caps, C7, C8, C9, C11, C12 (alt)	Interchangeable	Interchangeable	10nF – 1uF 275 - 300Vac	IEC/EN 60384-14 UL1414	---
Y2 caps, C1, C2	Kemet	ERK610 series	100pF – 10nF 275 - 300Vac	IEC/EN 60384-14 UL1414	 40001991 / 92  E356389
Y2 caps, C1, C2 (alt)	Interchangeable	Interchangeable	100pF – 10nF 275 - 300Vac	IEC/EN 60384-14 UL1414	---
Y2 caps, C1, C2 (alt.)	Kemet	F881 series	100pF – 10nF 275 - 300Vac	IEC/EN 60384-14 UL 60384-14	 03 CA08.00185  E97797
Y2 caps, C1, C2 (alt)	Interchangeable	Interchangeable	100pF – 10nF 275 - 300Vac	IEC/EN 60384-14 UL 60384-14	---
Y2 cap, C24	Kemet	F881/R41 series	100pF – 10nF 275 - 300Vac	IEC/EN 60384-14 UL1414	 CA08.0018 5  E97797
Y2 cap, C24 (alt)	Interchangeable	Interchangeable	100pF – 10nF 275 - 300Vac	IEC/EN 60384-14 UL1414	---
Y2 caps, C5, C6, C34	TDK/Epcos	B32021 series	100pF – 10nF 275 - 300Vac	IEC/EN 60384-14 UL1414	 40018909  E97863
Y2 caps, C5, C6, C34 (alt)	Interchangeable	Interchangeable	100pF – 10nF 275 - 300Vac	IEC/EN 60384-14 UL1414	---

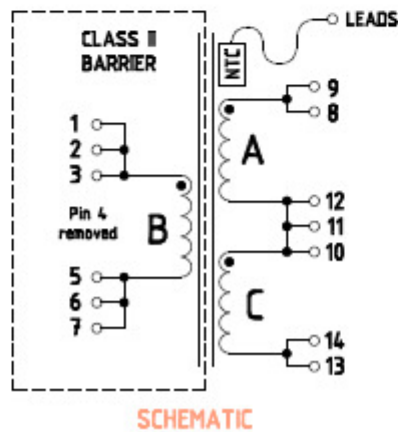
Object / Part No.	Manufacturer / Trademark	Type / Model	Technical Data	Standard	Mark(s) Of Conformity
Fuse F1	Littelfuse	215 series	T8AH 250V	IEC/EN 60127 UL248-14	 40013521  E10480
Fuse F1 (alt)	Cooper Bussmann	S505-8	T8AH 250V	IEC/EN 60127 UL248-14	 40014091  E19180
Fuse F1 (alt)	Interchangeable	Interchangeable	T8AH 250V	IEC/EN 60127 UL248-14	---
Fuse F2,F3	Littelfuse	505 series	20A 500V	IEC/EN 60127 UL248-14	 J 50521465  US E10480
Fuse F2,F3 (alt)	Interchangeable	Interchangeable	20A 500V	IEC/EN 60127 UL248-14	---
Opto Isolator Opt 1, Opt 2	Broadcom/ Avago	HCNW137	5000V	IEC/EN 60747-5-5 UL1577	 40009376  E55361
Opto Isolator Opt 1, Opt 2 (alt)	Interchangeable	Interchangeable	5000V	IEC/EN 60747-5-5 UL1577	---
Opto Isolator Opt 3, Opt 4, Opt 5	Isocom	ISP627	5,300V	IEC/EN 60747-5-5 UL1577	 40028086  E91231
Opto Isolator Opt 3, Opt 4, Opt 5 (alt)	Interchangeable	Interchangeable	5,300V	IEC/EN 60747-5-5 UL1577	---
Opto Isolator Opt 6	Isocom	TLP621	5,300V	IEC/EN 60747-5-5 UL1577	 40028086  E91231
Opto Isolator Opt 6 (alt)	Interchangeable	Interchangeable	5,300V	IEC/EN 60747-5-5 UL1577	---
TX2	Art Electric	KB1030	Isolation transformer	IEC/EN 62368-1 IEC/EN 60065 UL 62368-1 UL 60065	Tested in appliance
TX3	Art Electric	KB1031	Isolation transformer	IEC/EN 62368-1 IEC/EN 60065 UL 62368-1 UL 60065	Tested in appliance
L1	Art Electric	KA1028	Differential choke	IEC/EN 62368-1 IEC/EN 60065 UL 62368-1 UL 60065	Tested in appliance
L2, L3	Art Electric	KA1027	Common mode choke	IEC/EN 62368-1 IEC/EN 60065 UL 62368-1 UL 60065	Tested in appliance
Fan x 2	Jamicon	JF0638B1S M-R	12V 	IEC/EN 62368-1 UL507	 B038493  US E156480
Fan x 2 (alt)	Interchangeable	Interchangeable	12V 	IEC/EN 62368-1 UL507	---
PCB material	Honya	HY-01	UL94 V-0	UL796	 E336576

Object / Part No.	Manufacturer / Trademark	Type / Model	Technical Data	Standard	Mark(s) Of Conformity
PCB material (alt)	Interchangeable	Interchangeable	UL94 V-0	UL796	---
Power Supply PCB insulator	Formex	GK series	115°C 2kV min VTM-0 ($\leq 0.25\text{mm}$) V-0 ($\geq 0.4\text{mm}$)	UL756	 E121855
Power Supply PCB insulator (alt)	Interchangeable	Interchangeable	115°C 2kV min VTM-0 or V-0	UL756	---
Internal wiring	Top Cables	Style 1015	600V VW-1	UL758	 E194780
Internal wiring	Interchangeable	Interchangeable	600V VW-1	UL758	---
Bleed resistors R7,8,9,10	-	-	75k Ω x4 Cr, Cl =8.7mm	IEC/EN 62368-1 UL 62368-1	This report
Resistors R3,R6 (Y cap discharge)	-	-	1M Ω x2 Cr, Cl =8.7mm	IEC/EN 62368-1 UL 62368-1	This report
Supplementary information:					

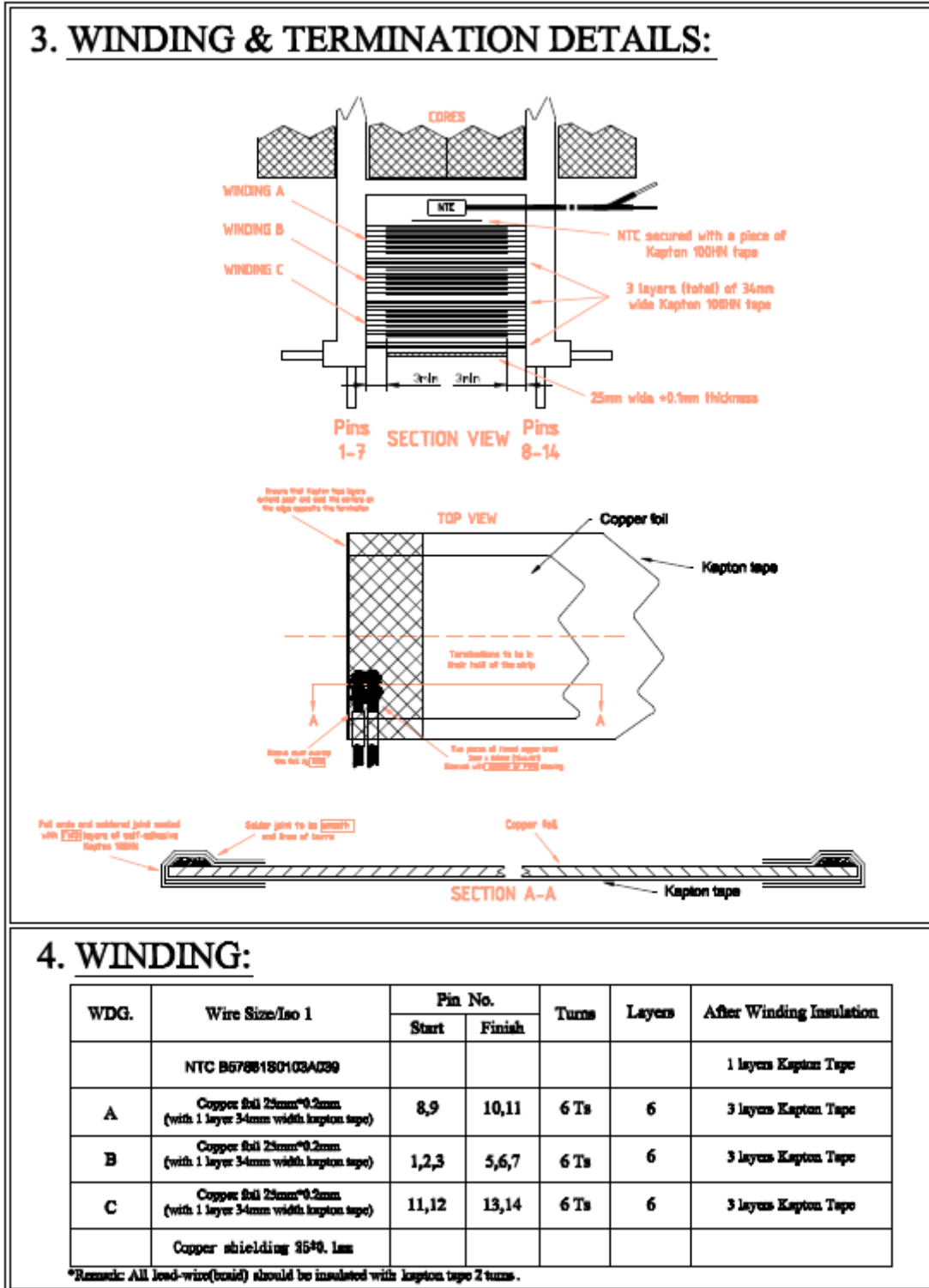
Transformer data TX2 (KB1030)



2. SCHEMATIC DIAGRAM:



Transformer data TX2 (KB1030) cont.




Transformer data TX2 (KB1030) cont.

5. ELECTRICAL CHARACTERISTIC:

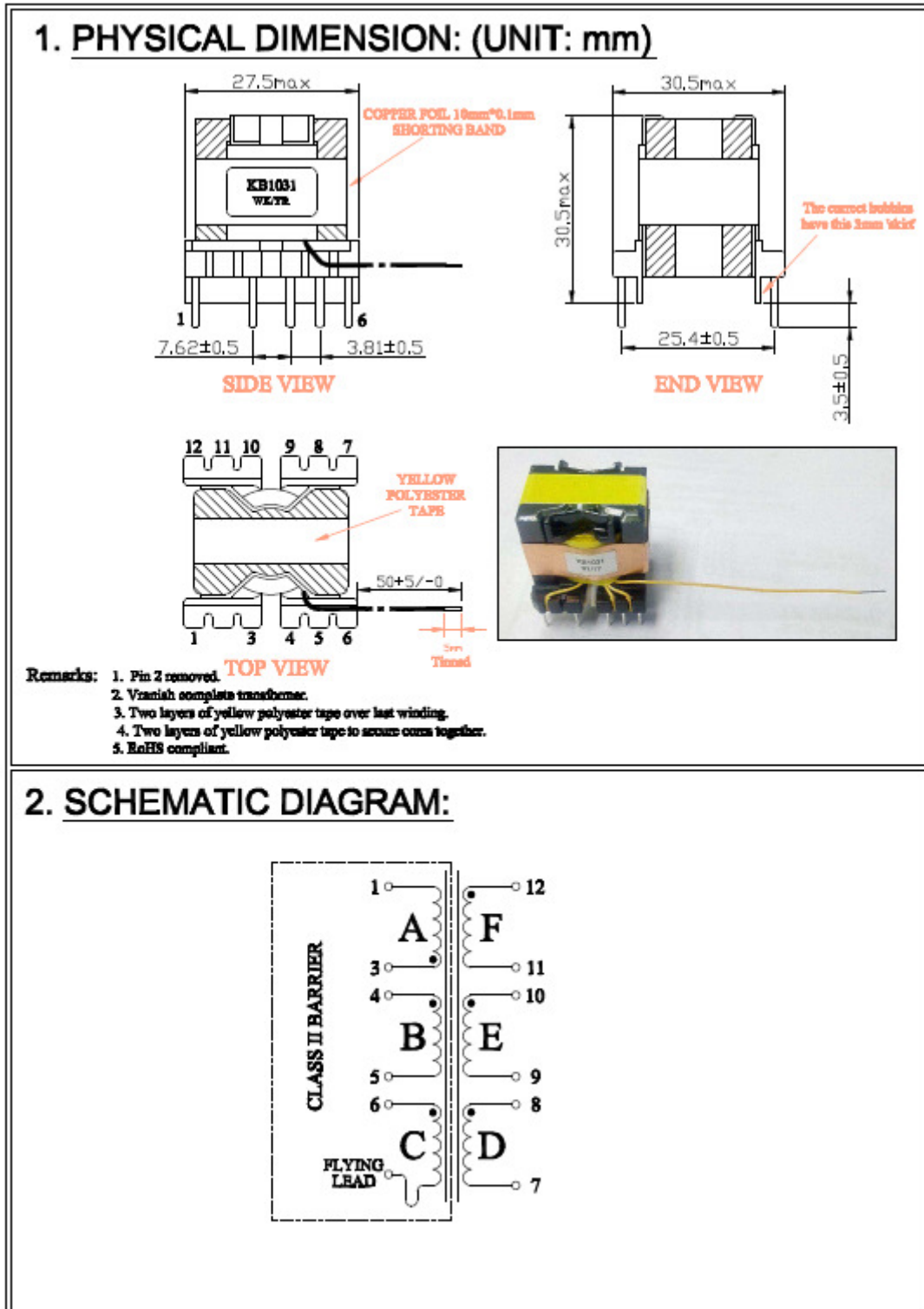
	DESCRIPTION	TERMINALS	CONDITIONS
1. H I P O T	1. Pri. To Sec. 2. Pri. To Core 3. Pri. To Pri	T1-7 Vs T8-14 T1-7 Vs Core T8-14 Vs Core	AC 3500V 50Hz for 3 sec. (Leakage Current 1mA max.) AC 1500V 50Hz for 3 sec. (Leakage Current 1mA max.) AC 1500V 50Hz for 3 sec. (Leakage Current 1mA max.)
2. I N D.	4. Inductance 5. Leakage Inductance	L1-7=288uH±30%.	10KHz at 100mV a. c.(Series)
3. R E S I S T A N C E	6. D.C. Resistance (at 25°C)	R R R R R R	Ω max. Ω max. Ω max. Ω max. Ω max. Ω max.

Transformer data TX2 (KB1030) cont.

MATERIAL LIST

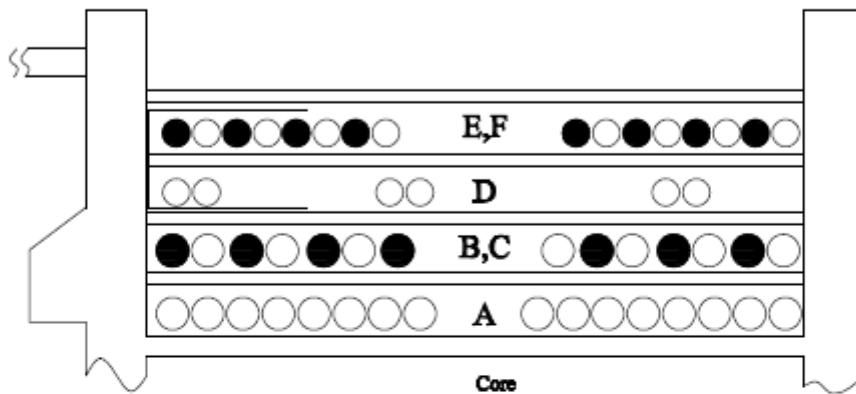
Item	Description	Raw Material	Supplier/Manufacturers
1	Ferrite Core	E55/28/25-3C94 Or E55/28/25-N87	Ferroxcube Epcos;
2	Bobbin	"Zytel" Polyamide 66 (FR50)	E I Dupont DE Nemours & Co. Inc. [UL No.:E41938(M)] or equivalent UL Listed Materials
3	Copper Foil	Width 25mm* thickness 0.2mm	Various manufacturers
4	Copper Shielding	Width 25mm* thickness 0.1mm	Various manufacturers
5	Insulation Adhesive Tape (only wrapping core) 	Polyester/Polyethylene Terephthalate Film Adhesive Tape #35660, 130°C	Symbio Inc. [UL No.:E50292(5)] or equivalent UL Listed Materials
6	Insulating Adhesive Tape (Wrapping all windings)	Polyimide Film adhesive insulating tape 200°C (#KA180)	Symbio Inc. [UL No.:E50292(5)] or E225558 Class F E.I.S. Listed Materials
7	NTC Thermistor	B5786150103A039	Epcos
8	Tinned braid wire	Width 2mm x thickness 0.5mm (16x40.1mm)	Various manufacturers
9	Insulated Pieces	Glass Epoxy laminate FR-4 UL 94V-0 130°C Cat: KB-6160 series & KB-6150 series	KINGBOARD LAMINATES HOLDINGS LTD [UL No.: E123995] or equivalent UL Listed Materials
10	Label	Matte White PET TC/S333/BG50#WH (MZ0097)	AVERY (CHINA) CO LTD [UL No.:MH20558] or equivalent UL Listed Materials
11	Insulating Varnish	80361F5	ELANTAS ZHUHAI CO LTD. [UL No.: E314793]
12	Soldering	Lead-Free	Nihon Genma Hong Kong Co., Ltd or Yik Shing Tat Industrial Co.,Ltd or equivalent

Transformer data TX3 (KB1031)



Transformer data TX3 (KB1031) cont.

3. SECTIONAL VIEW CONSTRUCTION:



4. WINDING:

WDG.	Wire Size	Pin No.		Turns	Layers	After Winding Insulation
		Start	Finish			
A	∅ 0.5mm ; TEX-E	3	1	18 T _s	1	2 layer PE Tape
B	∅ 0.5mm ; TEX-E	4	5	8 T _s	1	2 layer PE Tape
C	∅ 0.5mm ; TEX-E	6	F	8 T _s		
D	2X ∅ 0.5mm ; 155°C min	8	7	3 T _s	1	2 layers PE Tape
E	∅ 0.50mm ; 155°C min	10	9	8 T _s	1	2 layer PE Tape
F	∅ 0.50mm ; 155°C min	12	11	8 T _s		

• Remark: Terminations 3,4,7,8,9,10,11,12 with Teflon tube.

Transformer data TX3 (KB1031) cont.

5. ELECTRICAL CHARACTERISTIC:

	DESCRIPTION	TERMINALS	CONDITIONS
1. H I P O T	1. Pri. To Sec. 2. Pri. To Core 3. Sec. To Core 4. Pri. To Pri. 5. Sec. To Sec.	T 1-6 Vs T 7-12 T 1-6 Vs Core T 7-12 Vs Core T 4 Vs T3,6 T 9 Vs T7,12	AC 3.5 KV for 3 sec. (Leakage Current 1mA max.) AC 1.5 KV for 3 sec. (Leakage Current 1mA max.) AC 1.5 KV for 3 sec. (Leakage Current 1mA max.) AC 1.0 KV for 3 sec. (Leakage Current / mA max.) AC 1.0 KV for 3 sec. (Leakage Current / mA max.)
2. I N D.	6. Inductance 7. Leakage Inductance	L1-3 = 102uH ±10%	10KHz at 100mV a. c. (Measured by WAYNE KERR 3245B)
3. R E S I S T A N C E	8. D.C. Resistance (at 25°C)	R R R R R R	Ω max. Ω max. Ω max. Ω max. Ω max. Ω max.

Transformer data TX3 (KB1031) cont.

MATERIAL LIST

Item	Description	Raw Material	Supplier/Manufacturers
1	Ferrite Core	PQ2625, PL-7	Samwha
2	Bobbin	Phenolic: T357, T375J, PM-9820 UL 94V-0 150°C	Chang Chun Plastics Co., Ltd. [UL No.:E59481(S)] Sumitomo Bakelite Co., Ltd. [UL No.:E41429(M)] or equivalent UL Listed Materials
3	Triple Insulation Wire	TEX-E 130°C	The Furukawa Electric Co., Ltd. [UL No. :E206440]
4	Copper Wire	Polyurethane Enameled Copper Wire MW-79; 155°C or Polyurethane Enamelled Copper Wire MW-82,(P180) 180°C	Pacific-Thai Electric Wire & Cable Co., Ltd. [UL No.:E142108(S)] or Tai-I Copper (GuangZhou) Co.,Ltd [UL No.:E85640] or Elektrisola Hangzhou Co., Ltd. [UL No.:E258243]
5	Adhesive Insulating Tape	Polyethylene-Terephthalate film insulating tape with acrylic adhesive, Cat. No. MY130 / 35660 rated 130 C.	Symbio Inc. [UL No.:E50292(S)] or E225558 Class F E.I.S. Listed Materials
6	Copper Foil	Variable size	Various manufacturers
7	Insulated Tube	Polytetrafluoroethylene (PTFE)- Teflon; TFL,TFS,TFT 200°C	Great Holding Industrial Co., Ltd. [UL No.:156256(L)] or E225558 Class F E.I.S. Listed Materials
8	Insulated Varnish	80361FS	ELANTAS ZHUHAI CO LTD. [UL No.: E314793]
9	Label	Matte White PET TC/S333/BG50#WH (MZ0097)	AVERY (CHINA) CO LTD [UL No.:MH20558] or equivalent UL Listed Materials
10	Soldering	Lead-Free	Nihon Genma Hong Kong Co., Ltd or Yik Shing Tat Industrial Co.,Ltd or equivalent

Safety sheet (packed with product)
IMPORTANT SAFETY INSTRUCTIONS
(Fr) CONSIGNES DE SÉCURITÉ IMPORTANTES

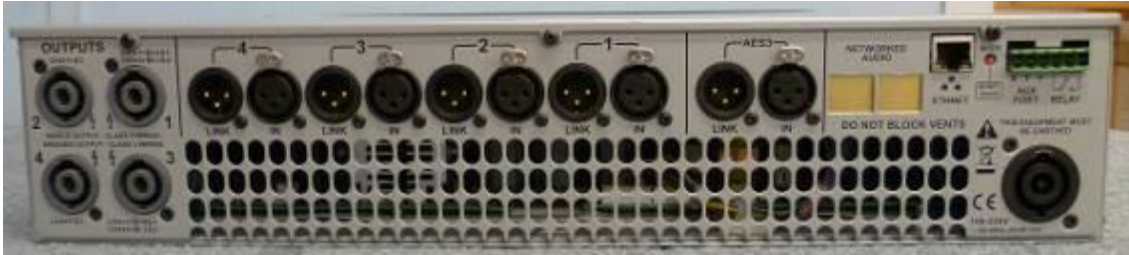
1. Read these instructions.
(Fr) Lisez ces instructions
2. Keep these instructions.
(Fr) Conservez ces instructions.
3. Heed all warnings.
(Fr) Respectez tous les avertissements.
4. Follow all instructions.
(Fr) Suivez toutes les instructions.
5. Do not use this apparatus near water.
(Fr) Ne pas utiliser cet appareil près de l'eau.
6. Clean only with dry cloth.
(Fr) Nettoyer uniquement avec un chiffon sec.
7. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
(Fr) Ne pas bloquer les ouvertures de ventilation. Installer conformément aux instructions du fabricant.
8. Do not install near any heat sources such as radiators, heat registers, stoves or other apparatus (including amplifiers) that produce heat.
(Fr) Ne pas installer près de sources de chaleur telles que radiateurs, registres de chaleur, poêles ou autres appareils (y compris les amplificateurs) qui produisent de la chaleur
9. Do not defeat the safety purpose of the polarized or grounding type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
(Fr) Ne supprimez pas le dispositif de sécurité de la fiche polarisée ou mise à la terre. Une fiche polarisée possède deux lames dont l'une est plus large que l'autre. Une prise de terre a eu deux lames et une troisième broche de terre. La lame large ou la troisième broche sont fournies pour votre sécurité. Si la fiche fournie ne rentre pas dans votre prise, consultez un électricien pour remplacer la prise obsolète
10. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles and the point where they exit from the apparatus.
(Fr) Protéger le cordon d'alimentation soit écrasé ou pincé, particulièrement au niveau des fiches, des prises et le point où ils sortent de l'appareil.
11. Only use attachments / accessories specified by the manufacturer.
(Fr) Utilisez uniquement les accessoires spécifiés par le fabricant.
12. Use only with the cart, tripod, bracket or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart / apparatus combination to avoid injury from tip-over.
(Fr) Utilisez uniquement le chariot, le trépied, le support ou la table spécifiés par le fabricant, ou vendu avec l'appareil. Quand un chariot est utilisé, soyez prudent lorsque vous déplacez l'ensemble chariot / appareil afin d'éviter toute blessure en cas de chute.
13. Unplug this apparatus during lightning storms or when unused for long periods of time.
(Fr) Débranchez cet appareil pendant les orages ou lorsqu'il n'est pas utilisé pendant de longues périodes de temps.
14. Refer all servicing to qualified service personnel. Service is required when the apparatus has been damaged in any way, such as power-supply cord or plug damaged, liquid has been spilled or objects have fallen into the apparatus, this apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
(Fr) Adressez-vous à un personnel qualifié. Une réparation est requise lorsque l'appareil a été endommagé de quelque façon que ce soit le cordon d'alimentation ou la fiche endommagé, du liquide a été renversé ou des objets sont tombés dans l'appareil, cet appareil a été exposé à la pluie ou à l'humidité, ne fonctionne pas normalement, ou s'il est tombé.
15. The apparatus shall not be exposed to dripping or splashing and no objects filled with liquids, such as vases, shall be placed on the apparatus.
(Fr) Le dispositif ne doit pas être exposé à des gouttes ou des éclaboussures et aucun objet rempli de liquides, tels que des vases, doit être placé sur l'appareil
16. Permanent disconnection from the mains supply is to be achieved by removing the supplied cord connector from the back of the unit. This connector must remain readily operable.
(Fr) Déconnexion permanente de l'alimentation secteur doit être atteint en supprimant le connecteur du cordon fourni à l'arrière de l'unité. Ce connecteur doit être facilement utilisable


SAFETY WARNINGS
(Fr) AVERTISSEMENT DE SECURITE

1. THIS PRODUCT MUST BE EARTHED. Use only a flexible cable or cord with a green and yellow core which must be connected to the protective earthing terminal of a suitable mains plug or the earthing terminal of the installation.
(Fr) CE PRODUIT DOIT ÊTRE MIS À LA TERRE. Utilisez uniquement un câble souple avec un noyau vert ou vert / jaune qui doit être relié à la borne de terre de connecteur d'alimentation ou la borne de terre de l'installation
2. THIS PRODUCT IS DESIGNED FOR PERMANENT INSTALLATION. It must be fitted in to a 19" rack enclosure and not operated unless so installed. The rack enclosure should be open at the front and back to allow free ventilation and movement of air through the product.
(Fr) CE PRODUIT EST CONÇU POUR UNE INSTALLATION PERMANENTE. Il doit être installé dans un boîtier rack 19". Le rack devrait être ouvert à l'avant et l'arrière pour permettre la ventilation et le mouvement d'air libre à travers le produit
3. Do not remove any covers, loosen any fixings or allow items to enter any aperture.
(Fr) Ne retirez pas les couvercles, ne desserrez pas les fixations et ne laissez aucune pièce s'introduire dans les ouvertures.
4. The rear of the product may get hot. Avoid direct skin contact during operation and for at least 5 minutes after power has been isolated.
(Fr) Le radiateur arrière de cet appareil devient chaud. Évitez tout contact direct avec la peau pendant le fonctionnement et au moins 5 minutes après la mise hors tension de l'appareil.



General appearance of amplifier



Front & rear views of representative **M** variant



Front & rear views of representative **C** variant



4 channel with Dante card fitted



4 channel without Dante card fitted



8 channel with Dante card fitted



8 channel without Dante card fitted

Internal views of amplifier with top cover removed



Internal view with top plate removed



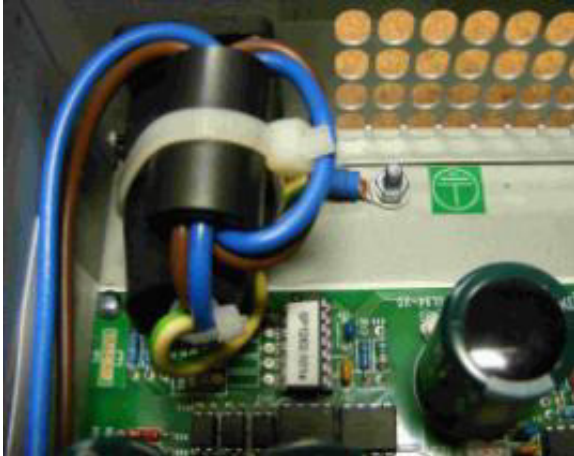
Photographs

Report No: 58631

Mains input filter chokes



Mains inlet and earth wiring



Mains inlet wiring (with optional ferrite)



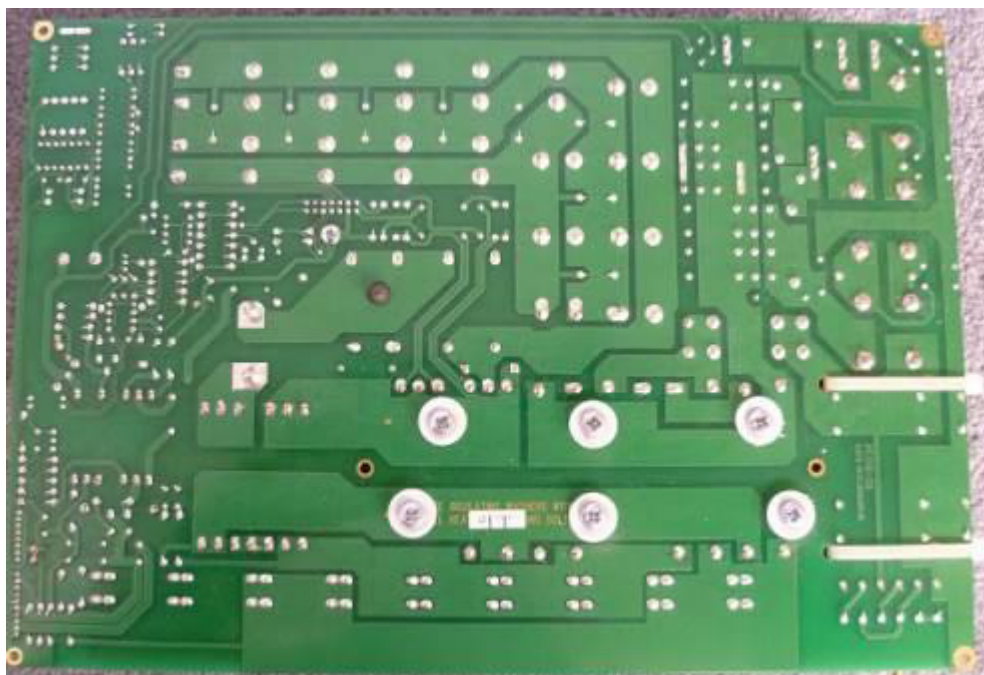
Wiring to mains switch



Wiring at rear of speaker connectors



Power supply PCB component side



Power supply PCB print side



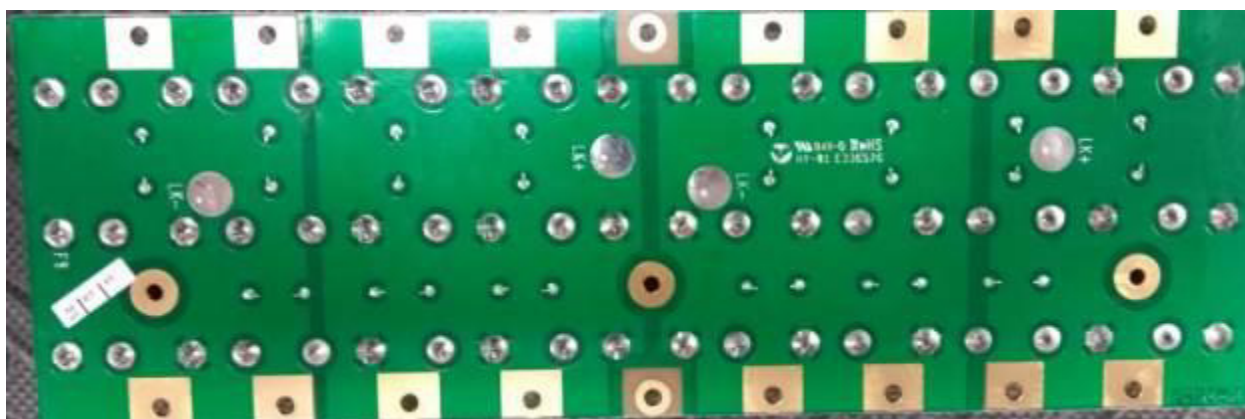
or block top side (full)

Capacit

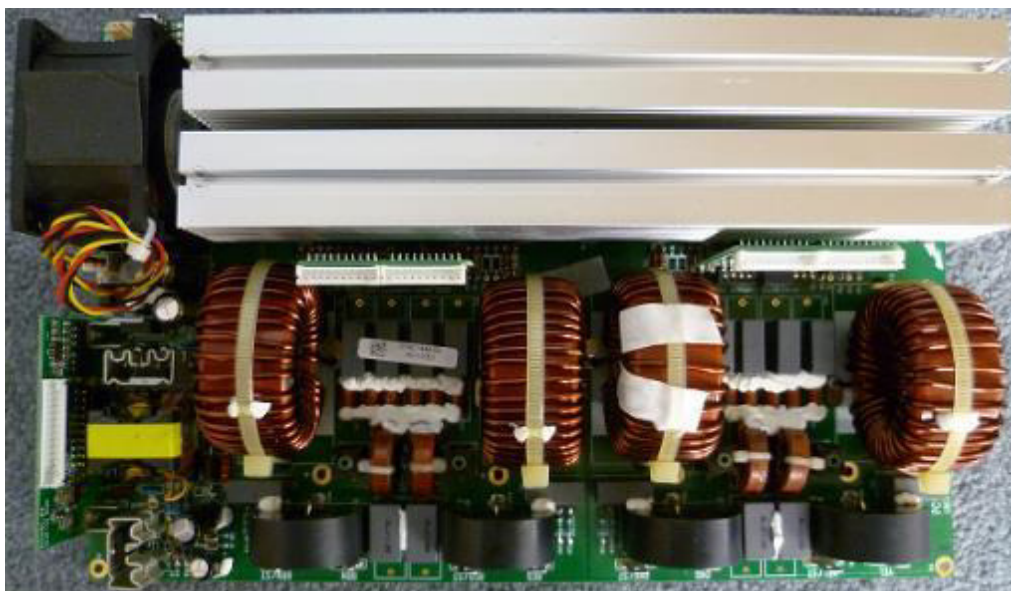


or block top side (partial)

Capacit



Capacitor block PCB print side



4 channel amplifier PCB



8 channel amplifier PCB

IEC62368_1E - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
ATTACHMENT TO TEST REPORT IEC 62368-1 EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES (AUDIO/VIDEO, INFORMATION AND COMMUNICATION TECHNOLOGY EQUIPMENT - PART 1: SAFETY REQUIREMENTS)			
Differences according to : EN IEC 62368-1:2020+A11:2020			
Attachment Form No. : EU_GD_IEC62368_1E			
Attachment Originator..... : UL(Demko)			
Master Attachment : 2021-02-04			
Copyright © 2021 IEC System for Conformity Testing and Certification of Electrical Equipment (IECEE), Geneva, Switzerland. All rights reserved.			
	CENELEC COMMON MODIFICATIONS (EN)		P
	Clause numbers in the cells that are shaded light grey are clause references in EN IEC 62368-1:2020+A11:2020. All other clause numbers in that column, except for those in the paragraph below, refers to IEC 62368-1:2018. Clauses, subclauses, notes, tables, figures and annexes which are additional to those in IEC 62368-1:2018 are prefixed "Z".		P
	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 Annex ZD (informative) IEC and CENELEC code designations for flexible cords		P
1	Modification to Clause 3 .		
3.3.19	Sound exposure <i>Replace 3.3.19 of IEC 62368-1 with the following definitions:</i>		N/A


IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
3.3.19.1	<p>momentary exposure level, <i>MEL</i></p> <p>metric for estimating 1 s sound exposure level from the HD 483-1 S2 test signal applied to both channels, based on EN 50332-1:2013, 4.2.</p> <p>Note 1 to entry: MEL is measured as A-weighted levels in dB.</p> <p>Note 2 to entry: See B.3 of EN 50332-3:2017 for additional information.</p>		N/A
3.3.19.3	<p>sound exposure, <i>E</i></p> <p>A-weighted sound pressure (<i>p</i>) squared and integrated over a stated period of time, <i>T</i></p> <p>Note 1 to entry: The SI unit is Pa² s.</p> $E = \int_0^T p(t)^2 dt$		N/A
3.3.19.4	<p>sound exposure level, <i>SEL</i></p> <p>logarithmic measure of sound exposure relative to a reference value, <i>E₀</i>, typically the 1 kHz threshold of hearing in humans.</p> <p>Note 1 to entry: <i>SEL</i> is measured as A-weighted levels in dB.</p> $SEL = 10 \lg \left(\frac{E}{E_0} \right) \text{ dB}$ <p>Note 2 to entry: See B.4 of EN 50332-3:2017 for additional information.</p>		N/A
3.3.19.5	<p>digital signal level relative to full scale, dBFS</p> <p>levels reported in dBFS are always r.m.s. Full scale level, 0 dBFS, is the level of a dc-free 997-Hz sine wave whose undithered positive peak value is positive digital full scale, leaving the code corresponding to negative digital full scale unused</p> <p>Note 1 to entry: It is invalid to use dBFS for non-r.m.s. levels. Because the definition of full scale is based on a sine wave, the level of signals with a crest factor lower than that of a sine wave may exceed 0 dBFS. In particular, square wave signals may reach +3,01 dBFS.</p>		N/A
2	Modification to Clause 10		

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
10. 6	Safeguards against acoustic energy sources Replace 10.6 of IEC 62368-1 with the following:		N/A
10. 6. 1. 1	<p>Introduction</p> <p>Safeguard requirements for protection against long-term exposure to excessive sound pressure levels from personal music players closely coupled to the ear are specified below. Requirements for earphones and headphones intended for use with personal music players are also covered. A personal music player is a portable equipment intended for use by an ordinary person, that:</p> <ul style="list-style-type: none"> – is designed to allow the user to listen to audio or audiovisual content / material; and – uses a listening device, such as headphones or earphones that can be worn in or on or around the ears; and – has a player that can be body worn (of a size suitable to be carried in a clothing pocket) and is intended for the user to walk around with while in continuous use (for example, on a street, in a subway, at an airport, etc.). <p>EXAMPLES Portable CD players, MP3 audio players, mobile phones with MP3 type features, PDAs or similar equipment.</p> <p>Personal music players shall comply with the requirements of either 10.6.2 or 10.6.3.</p> <p>NOTE 1 Protection against acoustic energy sources from telecom applications is referenced to ITU-T P.360.</p> <p>NOTE 2 It is the intention of the Committee to allow the alternative methods for now, but to only use the dose measurement method as given in 10.6.5 in future. Therefore, manufacturers are encouraged to implement 10.6.5 as soon as possible.</p> <p>Listening devices sold separately shall comply with the requirements of 10.6.6. These requirements are valid for music or video mode only. The requirements do not apply to:</p> <ul style="list-style-type: none"> – professional equipment; <p>NOTE 3 Professional equipment is equipment sold through special sales channels. All products sold through normal electronics stores are considered not to be professional equipment.</p> <ul style="list-style-type: none"> – hearing aid equipment and other devices for assistive listening; – the following type of analogue personal music 		N/A

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
	<p>players:</p> <ul style="list-style-type: none"> · long distance radio receiver (for example, a multiband radio receiver or world band radio receiver, an AM radio receiver), and · cassette player/recorder; <p>NOTE 4 This exemption has been allowed because this technology is falling out of use and it is expected that within a few years it will no longer exist. This exemption will not be extended to other technologies.</p> <p>– a player while connected to an external amplifier that does not allow the user to walk around while in use.</p> <p>For equipment that is clearly designed or intended primarily for use by children, the limits of the relevant toy standards may apply.</p> <p>The relevant requirements are given in EN 71-1:2011, 4.20 and the related tests methods and measurement distances apply.</p>		
10.6.1.2	<p>Non-ionizing radiation from radio frequencies in the range 0 to 300 GHz</p> <p>The amount of non-ionizing radiation is regulated by European Council Recommendation 1999/519/EC of 12 July 1999 on the limitation of exposure of the general public to electromagnetic fields (0 Hz to 300 GHz). For intentional radiators, ICNIRP guidelines should be taken into account for Limiting Exposure to Time-Varying Electric, Magnetic, and Electromagnetic Fields (up to 300 GHz). For hand-held and body mounted devices, attention is drawn to EN 50360 and EN 50566.</p>		N/A
10.6.2	Classification of devices without the capacity to estimate sound dose		N/A
10.6.2.1	<p>General</p> <p>This standard is transitioning from short-term based (30 s) requirements to long-term based (40 hour) requirements. These clauses remain in effect only for devices that do not comply with sound dose estimation as stipulated in EN 50332-3.</p> <p>For classifying the acoustic output $L_{Aeq,T}$, measurements are based on the A-weighted equivalent sound pressure level over a 30 s period.</p> <p>For music where the average sound pressure (long term $L_{Aeq,T}$) measured over the duration of the</p>		N/A

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
	<p>song is lower than the average produced by the programme simulation noise, measurements may be done over the duration of the complete song. In this case, T becomes the duration of the song.</p> <p>NOTE Classical music, acoustic music and broadcast 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 content 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 does not exceed the required limit. For example, if the player is set with the programme simulation noise to 85 dB, but the average music level of the song is only 65 dB, 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 dB.</p>		
10.6.2.2	<p>RS1 limits (to be superseded, see 10.6.3.2)</p> <p>RS1 is a class 1 acoustic energy source that does not exceed the following:</p> <ul style="list-style-type: none"> – for equipment provided as a package (player with its listening device), and with a proprietary connector between the player and its listening device, or where the combination of player and listening device is known by other means such as setting or automatic detection, the $L_{Aeq,T}$ acoustic output shall be ≤ 85 dB when playing the fixed “programme simulation noise” described in EN 50332-1. – for equipment provided with a standardized connector (for example, a 3,5 phone jack) that allows connection to a listening device for general use, the unweighted r.m.s. output voltage shall be ≤ 27 mV (analogue interface) or -25 dBFS (digital interface) when playing the fixed “programme simulation noise” described in EN 50332-1. – The RS1 limits will be updated for all devices as per 10.6.3.2. 		N/A
10.6.2.3	<p>RS2 limits (to be superseded, see 10.6.3.3)</p> <p>RS2 is a class 2 acoustic energy source that does not exceed the following:</p> <ul style="list-style-type: none"> – for equipment provided as a package (player with its listening device), and with a proprietary connector between the player and its listening device, or when the combination of player and listening device is known by other means such as setting or automatic 130 detection, the $L_{Aeq,T}$ acoustic output shall be ≤ 100 dB(A) when playing the fixed “programme simulation noise” as described in EN 50332-1. – for equipment provided with a standardized 		N/A

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
	connector (for example, a 3,5 phone jack) that allows connection to a listening device for general use, the unweighted r.m.s. output voltage shall be ≤ 150 mV (analogue interface) or -10 dBFS (digital interface) when playing the fixed "programme simulation noise" as described in EN 50332-1.		
10.6.2.4	<p>RS3 limits</p> <p>RS3 is a class 3 acoustic energy source that exceeds RS2 limits.</p>		N/A
10.6.3	Classification of devices (new)		N/A
10.6.3.1	<p>General</p> <p>Previous limits (10.6.2) created abundant false negative and false positive PMP sound level warnings. New limits, compliant with The Commission Decision of 23 June 2009, are given below.</p>		N/A
10.6.3.2	<p>RS1 limits (new)</p> <p>RS1 is a class 1 acoustic energy source that does not exceed the following:</p> <ul style="list-style-type: none"> – for equipment provided as a package (player with its listening device), and with a proprietary connector between the player and its listening device, or where the combination of player and listening device is known by other means such as setting or automatic detection, the $L_{Aeq,T}$ acoustic output shall be ≤ 80 dB when playing the fixed "programme simulation noise" described in EN 50332-1. – for equipment provided with a standardized connector (for example, a 3,5 phone jack) that allows connection to a listening device for general use, the unweighted r.m.s. output voltage shall be ≤ 15 mV (analogue interface) or -30 dBFS (digital interface) when playing the fixed "programme simulation noise" described in EN 50332-1. 		N/A
10.6.3.3	<p>RS2 limits (new)</p> <p>RS2 is a class 2 acoustic energy source that does not exceed the following:</p> <ul style="list-style-type: none"> – for equipment provided as a package (player with its listening device), and with a proprietary connector between the player and its listening device, or where the combination of player and listening device is known by other means such as setting or automatic detection, the weekly sound exposure level, as described in EN 50332-3, shall be ≤ 80 dB when playing the fixed "programme 		N/A

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
	simulation noise" described in EN 50332-1. – for equipment provided with a standardized connector (for example, a 3,5 phone jack) that allows connection to a listening device for general use, the unweighted r.m.s. output level, integrated over one week, as described in EN50332-3, shall be ≤ 15 mV (analogue interface) or -30 dBFS (digital interface) when playing the fixed "programme simulation noise" described in EN 50332-1.		
10.6.4	Requirements for maximum sound exposure		N/A
10.6.4.1	Measurement methods All volume controls shall be turned to maximum during tests. Measurements shall be made in accordance with EN 50332-1 or EN 50332-2 as applicable.		N/A
10.6.4.2	Protection of persons Except as given below, protection requirements for parts accessible to ordinary persons, instructed persons and skilled persons are given in 4.3. NOTE 1 Volume control is not considered a safeguard. Between RS2 and an ordinary person, the basic safeguard may be replaced by an instructional safeguard in accordance with Clause F.5, except that the instructional safeguard shall be placed on the equipment, or on the packaging, or in the instruction manual. Alternatively, the instructional safeguard may be given through the equipment display during use. The elements of the instructional safeguard shall be as follows: – element 1a: the symbol  , IEC 60417-6044 (2011-01) – element 2: "High sound pressure" or equivalent wording – element 3: "Hearing damage risk" or equivalent wording – element 4: "Do not listen at high volume levels for long periods." or equivalent wording An equipment safeguard shall prevent exposure		N/A

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
	<p>of an ordinary person to an RS2 source without intentional physical action from the ordinary person and shall automatically return to an output level not exceeding what is specified for an RS1 source when the power is switched off.</p> <p>The equipment shall provide a means to actively inform the user of the increased sound level when the equipment is operated with an output exceeding RS1. Any means used shall be acknowledged by the user before activating a mode of operation which allows for an output exceeding RS1. The acknowledgement does not need to be repeated more than once every 20 h of cumulative listening time.</p> <p>NOTE 2 Examples of means include visual or audible signals. Action from the user is always needed.</p> <p>NOTE 3 The 20 h listening time is the accumulative listening time, independent of how often and how long the personal music player has been switched off.</p> <p>A skilled person shall not be unintentionally exposed to RS3.</p>		
10.6.5	Requirements for dose-based systems		N/A
10.6.5.1	<p>General requirements</p> <p>Personal music players shall give the warnings as provided below when tested according to EN 50332-3, using the limits from this clause.</p> <p>The manufacturer may offer optional settings to allow the users to modify when and how they wish to receive the notifications and warnings to promote a better user experience without defeating the safeguards. This allows the users to be informed in a method that best meets their physical capabilities and device usage needs. If such optional settings are offered, an administrator (for example, parental restrictions, business/educational administrators, etc.) shall be able to lock any optional settings into a specific configuration.</p> <p>The personal music player shall be supplied with easy to understand explanation to the user of the dose management system, the risks involved, and how to use the system safely. The user shall be made aware that other sources may significantly contribute to their sound exposure, for example work, transportation, concerts, clubs, cinema, car</p>		N/A

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
	races, etc.		
10.6.5.2	<p>Dose-based warning and requirements</p> <p>When a dose of 100 % <i>CSD</i> is reached, and at least at every 100 % further increase of <i>CSD</i>, the device shall warn the user and require an acknowledgement. In case the user does not acknowledge, the output level shall automatically decrease to compliance with class RS1.</p> <p>The warning shall at least clearly indicate that listening above 100 % <i>CSD</i> leads to the risk of hearing damage or loss.</p>		N/A
10.6.5.3	<p>Exposure-based requirements</p> <p>With only dose-based requirements, cause and effect could be far separated in time, defying the purpose of educating users about safe listening practice. In addition to dose-based requirements, a PMP shall therefore also put a limit to the short-term sound level a user can listen at.</p> <p>The exposure-based limiter (EL) shall automatically reduce the sound level not to exceed 100 dB(A) or 150 mV integrated over the past 180 s, based on methodology defined in EN 50332-3.</p> <p>The EL settling time (time from starting level reduction to reaching target output) shall be 10 s or faster.</p> <p>Test of EL functionality is conducted according to EN 50332-3, using the limits from this clause. For equipment provided as a package (player with its listening device), the level integrated over 180 s shall be 100 dB or lower. For equipment provided with a standardized connector, the unweighted level integrated over 180 s shall be no more than 150 mV for an analogue interface and no more than -10 dBFS for a digital interface.</p> <p>NOTE In case the source is known not to be music (or test signal), the EL may be disabled.</p>		N/A

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
10.6.6	Requirements for listening devices (headphones, earphones, etc.)		N/A
10.6.6.1	<p>Corded listening devices with analogue input</p> <p>With 94 dB L_{Aeq} acoustic pressure output of the listening device, and with the volume and sound settings in the listening device (for example, built-in volume level control, additional sound features like equalization, etc.) set to the combination of positions that maximize the measured acoustic output, the input voltage of the listening device when playing the fixed “programme simulation noise” as described in EN 50332-1 shall be ≥ 75 mV.</p> <p>NOTE The values of 94 dB and 75 mV correspond with 85 dB and 27 mV or 100 dB and 150 mV.</p>		N/A
10.6.6.2	<p>Corded listening devices with digital input</p> <p>With any playing device playing the fixed “programme simulation noise” described in EN 50332-1, and with the volume and sound settings in the listening device (for example, built-in volume level control, additional sound features like equalization, etc.) set to the combination of positions that maximize the measured acoustic output, the $L_{Aeq,T}$ acoustic output of the listening device shall be ≤ 100 dB with an input signal of -10 dBFS.</p>		N/A
10.6.6.3	<p>Cordless listening devices</p> <p>In cordless mode,</p> <ul style="list-style-type: none"> – with any playing and transmitting device playing the fixed programme simulation noise described in EN 50332-1; and – respecting the cordless transmission standards, where an air interface standard exists that specifies the equivalent acoustic level; and – with volume and sound settings in the receiving device (for example, built-in volume level control, additional sound features like equalization, etc.) set to the combination of positions that maximize the measured acoustic output for the above mentioned programme simulation noise, the $L_{Aeq,T}$ acoustic output of the listening device shall be ≤ 100 dB with an input signal of -10 dBFS. 		N/A
10.6.6.4	<p>Measurement method</p> <p><i>Measurements shall be made in accordance with EN 50332-2 as applicable.</i></p>		N/A

IEC 62368-1						
Clause	Requirement + Test				Result - Remark	Verdict
3	Modification to the whole document					
	Delete all the "country" notes in the reference document according to the following list:					P
	0.2.1	Note 1 and 2	1	Note 4 and 5	3.3.8.1	Note 2
	3.3.8.3	Note 1	4.1.15	Note	4.7.3	Note 1 and 2
	5.2.2.2	Note	5.4.2.3.2.2 Table 12	Note c	5.4.2.3.2.4	Note 1 and 3
	5.4.2.3.2.4 Table 13	Note 2	5.4.2.5	Note 2	5.4.5.1	Note
	5.4.10.2.1	Note	5.4.10.2.2	Note	5.4.10.2.3	Note
	5.5.2.1	Note	5.5.6	Note	5.6.4.2.1	Note 2 and 3 and 4
	5.6.8	Note 2	5.7.6	Note	5.7.7.1	Note 1 and Note 2
	8.5.4.2.3	Note	10.2.1 Table 39	Note 3 and 4 and 5	10.5.3	Note 2
	10.6.1	Note 3	F.3.3.6	Note 3	Y.4.1	Note
	Y.4.5	Note				
4	Modification to Clause 1					
1	Add the following note: <i>NOTE Z1 The use of certain substances in electrical and electronic equipment is restricted within the EU: see Directive 2011/65/EU.</i>					Noted

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
5	Modification to 4.Z1		
4. Z1	<p>Add the following new subclause after 4.9:</p> <p>To protect against excessive current, short-circuits and earth faults in circuits connected to an a.c. mains, 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):</p> <p>a) except as detailed in b) and c), protective devices necessary to comply with the requirements of B.3.1 and B.4 shall be included as parts of the equipment;</p> <p>b) for components in series with the mains input to the equipment such as the supply cord, appliance coupler, r.f.i. filter and switch, short-circuit and earth fault protection may be provided by protective devices in the building installation;</p> <p>c) it is permitted for pluggable equipment type B or permanently connected equipment, to rely on dedicated overcurrent and short-circuit protection in the building installation, provided that the means of protection, e.g. fuses or circuit breakers, is fully specified in the installation instructions.</p> <p>If reliance is placed on protection in the building installation, the installation instructions shall so state, except that for pluggable equipment type A the building installation shall be regarded as providing protection in accordance with the rating of the wall socket outlet.</p>		P
6	Modification to 5.4.2.3.2.4		
5. 4. 2. 3. 2. 4	<p>Add the following to the end of this subclause:</p> <p>The requirement for interconnection with external circuit is in addition given in EN 50491-3:2009.</p>		N/A
7	Modification to 10.2.1		
10. 2. 1	<p>Add the following to ^{c)} and ^{d)} in table 39:</p> <p>For additional requirements, see 10.5.1.</p>		N/A

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
8	Modification to 10.5.1		
10.5.1	<p>Add the following after the first paragraph:</p> <p>For RS 1 compliance is checked by measurement under the following conditions:</p> <p>In addition to the normal operating conditions, all controls adjustable from the outside by hand, by any object such as a tool or a coin, and those internal adjustments or pre-sets which are not locked in a reliable manner, are adjusted so as to give maximum radiation whilst maintaining an intelligible picture for 1 h, at the end of which the measurement is made.</p> <p>NOTE Z1 Soldered joints and paint lockings are examples of adequate locking.</p> <p>The dose-rate is determined by means of a radiation monitor with an effective area of 10 cm², at any point 10 cm from the outer surface of the apparatus.</p> <p>Moreover, the measurement shall be made under fault conditions causing an increase of the high voltage, provided an intelligible picture is maintained for 1 h, at the end of which the measurement is made.</p> <p>For RS1, the dose-rate shall not exceed 1 μSv/h taking account of the background level.</p> <p>NOTE Z2 These values appear in Directive 96/29/Euratom of 13 May 1996.</p>		N/A
9	Modification to G.7.1		
G.7.1	<p>Add the following note:</p> <p>NOTE Z1 The harmonized code designations corresponding to the IEC cord types are given in Annex ZD.</p>		P

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
10	Modification to Bibliography		P
	<p>Add the following notes for the standards indicated:</p> <p>IEC 60130-9 NOTE Harmonized as EN 60130-9. IEC 60269-2 NOTE Harmonized as HD 60269-2. IEC 60309-1 NOTE Harmonized as EN 60309-1. IEC 60364 NOTE some parts harmonized in HD 384/HD 60364 series. IEC 60601-2-4 NOTE Harmonized as EN 60601-2-4. IEC 60664-5 NOTE Harmonized as EN 60664-5. IEC 61032:1997 NOTE Harmonized as EN 61032:1998 (not modified). IEC 61508-1 NOTE Harmonized as EN 61508-1. IEC 61558-2-1 NOTE Harmonized as EN 61558-2-1. IEC 61558-2-4 NOTE Harmonized as EN 61558-2-4. IEC 61558-2-6 NOTE Harmonized as EN 61558-2-6. IEC 61643-1 NOTE Harmonized as EN 61643-1. IEC 61643-21 NOTE Harmonized as EN 61643-21. IEC 61643-311 NOTE Harmonized as EN 61643-311. IEC 61643-321 NOTE Harmonized as EN 61643-321. IEC 61643-331 NOTE Harmonized as EN 61643-331.</p>		P
11	ADDITION OF ANNEXES		P
ZB	ANNEX ZB, SPECIAL NATIONAL CONDITIONS (EN)		P
4.1.15	<p>Denmark, Finland, Norway and Sweden</p> <p>To the end of the subclause the following is added: Class I pluggable equipment type A intended for connection to other equipment or a network shall, if safety relies on connection to reliable earthing or if surge suppressors are connected between the network terminals and accessible parts, have a marking stating that the equipment shall be connected to an earthed mains socket-outlet.</p> <p>The marking text in the applicable countries shall be as follows:</p> <p>In Denmark: "Apparatets stikprop skal tilsluttes en stikkontakt med jord som giver forbindelse til stikproppens jord." In Finland: "Laitte on liitettävä suojakoskettimilla varustettuun pistorasiaan" In Norway: "Apparatet må tilkoples jordet stikkontakt" In Sweden: "Apparaten skall anslutas till jordat uttag"</p>	<p>Marked</p> <p><i>(note: Type B attachment, so marking not required by standard)</i></p>	N/A

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
4.7.3	<p>United Kingdom</p> <p>To the end of the subclause the following is added:</p> <p>The torque test is performed using a socket-outlet complying with BS 1363, and the plug part shall be assessed to the relevant clauses of BS 1363. Also see Annex G.4.2 of this annex</p>		N/A
5.2.2.2	<p>Denmark</p> <p>After the 2nd paragraph add the following:</p> <p>A warning (marking safeguard) for high touch current is required if the touch current exceeds the limits of 3,5 mA a.c. or 10 mA d.c.</p>		N/A
5.4.11.1 and Annex G	<p>Finland and Sweden</p> <p>To the end of the subclause the following is added:</p> <p>For separation of the telecommunication network from earth the following is applicable:</p> <p>If this insulation is solid, including insulation forming part of a component, it shall at least consist of either</p> <ul style="list-style-type: none"> · 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>If this insulation forms part of a semiconductor component (e.g. an optocoupler), there is no distance through insulation requirement for the insulation consisting of an insulating compound completely filling the casing, so that clearances and creepage distances do not exist, if the component passes the electric strength test in accordance with the compliance clause below and in addition</p> <ul style="list-style-type: none"> · passes the tests and inspection criteria of 5.4.8 with an electric strength test of 1,5 kV multiplied by 1,6 (the electric strength test of 5.4.9 shall be performed using 1,5 kV), <p>and</p> <ul style="list-style-type: none"> · is subject to routine testing for electric strength during manufacturing, using a test voltage of 1,5 kV. 		N/A

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
	<p>It is permitted to bridge this insulation with a capacitor complying with EN 60384-14:2005, subclass Y2.</p> <p>A capacitor classified Y3 according to EN 60384-14:2005, may bridge this insulation under the following conditions:</p> <ul style="list-style-type: none"> 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 5.4.11; the additional testing shall be performed on all the test specimens as described in EN 60384-14; <p>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.</p>		
5.5.2.1	<p>Norway</p> <p>After the 3rd paragraph the following is added:</p> <p>Due to the IT power system used, capacitors are required to be rated for the applicable line-to-line voltage (230 V).</p>		P
5.5.6	<p>Finland, Norway and Sweden</p> <p>To the end of the subclause the following is added:</p> <p>Resistors used as basic safeguard or bridging basic insulation in class I pluggable equipment type A shall comply with G.10.1 and the test of G.10.2.</p>		N/A
5.6.1	<p>Denmark</p> <p>Add to the end of the subclause</p> <p>Due to many existing installations where the socket-outlets can be protected with fuses with higher rating than the rating of the socket-outlets the protection for pluggable equipment type A shall be an integral part of the equipment.</p> <p><i>Justification:</i></p> <p>In Denmark an existing 13 A socket outlet can be protected by a 20 A fuse.</p>		N/A

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
5.6.4.2.1	<p>Ireland and United Kingdom</p> <p>After the indent for pluggable equipment type A, the following is added: – the protective current rating is taken to be 13 A, this being the largest rating of fuse used in the mains plug.</p>		N/A
5.6.4.2.1	<p>France</p> <p>After the indent for pluggable equipment type A, the following is added: – in certain cases, the protective current rating of the circuit supplied from the mains is taken as 20 A instead of 16 A.</p>		N/A
5.6.5.1	<p>To the second paragraph the following is added:</p> <p>The range of conductor sizes of flexible cords to be accepted by terminals for equipment with a rated current over 10 A and up to and including 13 A is: 1,25 mm² to 1,5 mm² in cross-sectional area.</p>		N/A
5.6.8	<p>Norway</p> <p>To the end of the subclause the following is added: Equipment connected with an earthed mains plug is classified as class I equipment. See the Norway marking requirement in 4.1.15. The symbol IEC 60417-6092, as specified in F.3.6.2, is accepted.</p>		N/A
5.7.6	<p>Denmark</p> <p>To the end of the subclause the following is added:</p> <p>The installation instruction shall be affixed to the equipment if the protective conductor current exceeds the limits of 3,5 mA a.c. or 10 mA d.c.</p>		N/A

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
5.7.6.2	<p>Denmark</p> <p>To the end of the subclause the following is added: The warning (marking safeguard) for high touch current is required if the touch current or the protective current exceed the limits of 3,5 mA .</p>		N/A
5.7.7.1	<p>Norway and Sweden</p> <p>To the end of the subclause the following is added: The screen of the television 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 needs to be isolated from the screen of a cable distribution system.</p> <p>It is however accepted to provide the insulation external to the equipment by an adapter or an interconnection cable with galvanic isolator, which may be provided by a retailer, for example.</p> <p>The user manual shall then have the following or similar information in Norwegian and Swedish language respectively, depending on in what country the equipment is intended to be used in:</p> <p>“Apparatus connected to the protective earthing of the building installation through the mains connection or through other apparatus with a connection to protective earthing – and to a television distribution system using coaxial cable, may in some circumstances create a fire hazard. Connection to a television distribution system therefore has to be provided through a device providing electrical isolation below a certain frequency range (galvanic isolator, see EN 60728-11)”</p> <p>NOTE In Norway, due to regulation for CATV-installations, and in Sweden, a galvanic isolator shall provide electrical insulation below 5 MHz. The insulation shall withstand a dielectric strength of 1,5 kV r.m.s., 50 Hz or 60 Hz, for 1 min.</p> <p>Translation to Norwegian (the Swedish text will also be accepted in Norway):</p> <p>“Apparater som er koplet til beskyttelsesjord via nettplugg og/eller via annet jordtilkoplet utstyr – og er tilkoplet et koaksialbasert kabel-TV nett, kan forårsake brannfare. For å unngå dette skal det ved tilkopling av</p>	Not TV	N/A

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
	<p>apparater til kabel-TV nett installeres en galvanisk isolator mellom apparatet og kabel-TV nettet.”</p> <p>Translation to Swedish: ”Apparater 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 apparaten till kabel-TV nät galvanisk isolator finnas mellan apparaten och kabel-TV nätet.”.</p>		
8.5.4.2.3	<p>United Kingdom</p> <p>Add the following after the 2nd dash bullet in 3rd paragraph:</p> <p>An emergency stop system complying with the requirements of IEC 60204-1 and ISO 13850 is required where there is a risk of personal injury.</p>		N/A
B. 3.1 and B. 4	<p>Ireland and United Kingdom</p> <p>The following is applicable:</p> <p>To protect against excessive currents and short-circuits in the primary circuit of direct plug-in equipment, tests according to Annexes B.3.1 and B.4 shall be conducted using an external miniature circuit breaker complying with EN 60898-1, Type B, rated 32A. If the equipment does not pass these tests, suitable protective devices shall be included as an integral part of the direct plug-in equipment, until the requirements of Annexes B.3.1 and B.4 are met</p>		N/A
G.4.2	<p>Denmark</p> <p>To the end of the subclause the following is added:</p> <p>Supply cords of single phase appliances having a rated current not exceeding 13 A shall be provided with a plug according to DS 60884-2-D1:2011.</p> <p>CLASS I EQUIPMENT provided with socket-outlets with earth contacts or which are intended to be used in locations where protection against indirect contact is required according to the wiring rules shall be provided with a plug in accordance with standard sheet DK 2-1a or DK 2-5a.</p> <p>If a single-phase equipment having a RATED</p>	No cord supplied. See summary of testing	N/A

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
	<p>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 DK 6-1a in DS 60884-2-D1 or EN 60309-2.</p> <p>Mains socket outlets intended for providing power to Class II apparatus with a rated current of 2,5 A shall be in accordance DS 60884-2-D1:2011 standard sheet DKA 1-4a.</p> <p>Other current rating socket outlets shall be in compliance with Standard Sheet DKA 1-3a or DKA 1-1c.</p> <p>Mains socket-outlets with earth shall be in compliance with DS 60884-2-D1:2011 Standard Sheet DK 1-3a, DK 1-1c, DK1-1d, DK 1-5a or DK 1-7a</p> <p><i>Justification:</i> Heavy Current Regulations, Section 6c</p>		
G.4.2	<p>United Kingdom</p> <p>To the end of the subclause the following is added:</p> <p>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.</p>		N/A
G.7.1	<p>United Kingdom</p> <p>To the first paragraph the following is added:</p> <p>Equipment 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 shall be fitted with a 'standard plug' in accordance with the Plugs and Sockets etc. (Safety) Regulations 1994, Statutory Instrument 1994 No. 1768, unless exempted by those regulations.</p> <p>NOTE "Standard plug" is defined in SI 1768:1994 and essentially means an approved plug conforming to BS 1363 or an approved conversion plug.</p>	No cord supplied. (See summary of testing)	N/A

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
G.7.1	<p>Ireland</p> <p>To the first paragraph the following is added:</p> <p>Apparatus which is fitted with a flexible cable or cord shall be provided with a plug in accordance with Statutory Instrument 525: 1997, "13 A Plugs and Conversion Adapters for Domestic Use Regulations: 1997. S.I. 525 provides for the recognition of a standard of another Member State which is equivalent to the relevant Irish Standard</p>	No cord supplied. (See summary of testing)	N/A
G.7.2	<p>Ireland and United Kingdom</p> <p>To the first paragraph the following is added:</p> <p>A power supply cord with a conductor of 1,25 mm² is allowed for equipment which is rated over 10 A and up to and including 13 A.</p>		N/A

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict

ZC	ANNEX ZC, NATIONAL DEVIATIONS (EN)		
10.5.2	<p>Germany</p> <p>The following requirement applies:</p> <p>For the operation of any cathode ray tube intended for the display of visual images operating at an acceleration voltage exceeding 40 kV, authorization is required, or application of type approval (Bauartzulassung) and marking.</p> <p><i>Justification:</i> German ministerial decree against ionizing radiation (Röntgenverordnung), in force since 2002-07-01, implementing the European Directive 96/29/EURATOM.</p> <p>NOTE Contact address: Physikalisch-Technische Bundesanstalt, Bundesallee 100, D-38116 Braunschweig, Tel.: Int+49-531-592-6320, Internet: http://www.ptb.de</p>		N/A

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict

ZD	IEC and CENELEC CODE DESIGNATIONS FOR FLEXIBLE CORDS (EN)		P																																																					
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IEC62368_1E ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
ATTACHMENT TO TEST REPORT IEC 62368-1 U.S.A. AND CANADA NATIONAL DIFFERENCES (AUDIO/VIDEO, INFORMATION AND COMMUNICATION TECHNOLOGY EQUIPMENT – PART 1: SAFETY REQUIREMENTS)			
Differences according to: CSA/UL 62368-1:2019			
TRF template used:: IECEE OD-2020-F3, Ed. 1.1			
Attachment Form No.: US_CA_ND_IEC62368_1E			
Attachment Originator: UL(US)			
Master Attachment: Dated 2021-02-04			
Copyright © 2021 IEC System for Conformity Testing and Certification of Electrical Equipment (IECEE), Geneva, Switzerland. All rights reserved.			
IEC 62368-1 - US and Canadian National Differences Special National Conditions based on Regulations and Other National Differences			
1 (1DV.1) (1.3)	All equipment is to be designed to allow installation in accordance with the National Electrical Code (NEC), ANSI/NFPA 70, the Canadian Electrical Code (CEC), Part 1, CAN/CSA C22.1, and when applicable, the National Electrical Safety Code, IEEE C2. Also, for such equipment marked or otherwise identified, installation is allowed per the Standard for the Protection of Information Technology Equipment, ANSI/NFPA 75.		—
1 (1DV.2.1)	This standard includes additional requirements for equipment used for entertainment purposes intended for installation in general patient care areas of health care facilities. See Annex DVB.	Not healthcare equipment	N/A
1 (1DV.2.2)	This standard includes additional requirements for equipment intended for mounting under cabinets. See Annex DVC.		N/A
1 (1DV.2.3)	IEC 62368-3 clause 5 for DC power transfer at ES1 or ES2 voltage levels is considered informative. IEC 62368-3 clause 6 for remote power feeding telecommunication (RFT) circuits is considered normative (see ITU K.50). Alternatively, equipment with RFT circuits are given in either UL 2391 or CSA/UL 60950-21. RFT-C circuits are not permitted unless the RFT-C circuit complies with RFT-V limits ($\leq 200V$ per conductor to earth).		N/A
1 (1DV.3)	For protection against direct lightning strikes, reference is made to NFPA 780 and CAN/CSA-B72 for additional requirements.		—

IEC62368_1E ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
1 (DV.5)	Additional requirements apply to some forms of power distribution equipment, including sub-assemblies.		—
4.1 (4.1.17)	<i>For lengths exceeding 3.05 m, external interconnecting cable assemblies are required to be a suitable cable type (e.g., DP, CL2) specified in the NEC.</i>		N/A
	<i>For lengths 3.05 m or less, external interconnecting cable assemblies that are not types specified in the NEC generally are required to have special construction features and identification markings.</i>		N/A
4.6 (4.6.2)	Wire-wrap terminals have special construction and performance requirements.	No wire-wrap terminals	N/A
4.8 (4.8.3, 4.8.4.5, 4.8.5)	Coin / button cell batteries have modified special construction and performance requirements.		N/A
5.4.2.3.2 (5.4.2.3.2.1)	<i>Surge Arrestors and Transient Voltage Surge Suppressors installed external to the equipment are required to comply with the appropriate NEC and CEC requirements.</i>		N/A
5.5.9	Receptacles, rated 125-V, single phase, 15- or 20-A accessible to either ordinary, instructed, or skilled persons are required to be provided with GFCI Protection for Personnel if the equipment containing the receptacles is installed outdoors. The protection devices are required to comply with UL 943, and CAN/CSA C22.2 No.144.	Not outdoor equipment	N/A
5.6.3	Protective earthing conductors comply with the minimum conductor sizes in Table G.7, except as required by Table G.7ADV.1 for cord connected equipment, or Annex DVH for permanently connected equipment.		P

IEC62368_1E ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
5.7.8 (5.7.8.1)	Equipment intended to receive telecommunication ringing signals is required to comply with a special touch current measurement tests.		N/A
6.5.1	PS3 wiring outside a fire enclosure is required to comply with single fault testing in B.4, or be current limited per one of the permitted methods.		N/A
Annex F (F.3.3.9)	Output terminals provided for supply of other equipment, except mains supply, are required to be marked with a maximum rating or reference to equipment permitted to be connected.	No such terminals	N/A
Annex F (F.3.7)	Outdoor Enclosures are required to be classified and marked in accordance with UL 50 or 50E, or CAN/CSA C22.2 No. 94.1 or 94.2.	Not outdoor equipment	N/A
Annex G (G.7)	Permanent connection of equipment to the mains supply by a power supply cord is not permitted, except for certain equipment, such as ATMs.		N/A
	Power supply cords are required to have attachment plugs rated not less than 125 percent of the rated current of the equipment.	See summary of testing, main report	—
	Flexible power supply cords are required to be compatible with Article 400 of the NEC, and Tables 11 and 12 of the CEC.	See summary of testing, main report	—
	Minimum cord length is required to be 1.5 m, with certain constructions such as external power supplies allowed to consider both input and output cord lengths into the requirement. Power supply cords are required to be no longer than 4.5 m in length if used in ITE Rooms.	See summary of testing, main report	—
	Power supply cords for outdoor equipment are required to be suitable outdoor use type as required by Section 400.4 of the NEC and Rule 4-012 of the CEC, i.e., marked "W."	Not outdoor equipment	N/A
Annex H.2	Continuous ringing signals under normal operating conditions up to 16 mA only are permitted if the equipment is subjected to special installation and performance restrictions.		N/A
Annex H.4	For circuits with other than ringing signals and with voltages exceeding 42.4 V _{peak} or 60 V _{d.c.} , the maximum acceptable current through a 2000 ohm resistor (or greater) connected across the voltage source with other loads disconnected is 7.1 mA peak or 30 mA d.c. under normal operating conditions.		N/A
Annex Q (Q.3)	Equipment with paired conductor and/or coax communications cables/wiring connected to building wiring are required to have special voltage, current, power and marking requirements.		N/A

IEC62368_1E ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
Annex DVA (1)	Equipment that is designed such that it may be powered from a separate electrical service, is required to meet applicable requirements for service equipment for control and protection of services and their installation and complies with Article 230 of the National Electrical Code (NEC), NFPA 70 and Section 6 of the Canadian Electrical Code, Part I, CSA C22.1.		N/A
	Equipment intended for use in spaces used for environmental air (plenums) are subjected to special flammability requirements for heat and visible smoke release.		N/A
	For ITE room applications, automated information storage systems with combustible media greater than 0.76 m ³ (27 cu ft) are required to have a provision for connection of either automatic sprinklers or a gaseous agent extinguishing system with an extended discharge.		N/A
	Consumer products designed or intended primarily for children 12 years of age or younger are subject to additional requirements in accordance with U.S. and Canadian Regulations.		N/A
	Baby monitors are required to additionally comply with ASTM F2951, Consumer Safety Specification for Baby Monitors.		N/A
	Storage batteries and battery management equipment, other than associated with lead-acid batteries, and including battery backup systems that are not an integral part of stationary AV and ICT equipment, such as provided in separate cabinets, are required to be certified (listed) to the appropriate standard(s) for such storage batteries and equipment.		N/A
Annex DVA (5.6)	For Pluggable Equipment Type A, the protection in the installation is assumed to be 20A.		N/A
Annex DVA (6.3)	The maximum quantity of flammable liquid stored in equipment is required to comply with NFPA 30.		N/A
Annex DVA (6.4.8)	For ITE room applications, enclosures with combustible material measuring greater than 0.9 m ² (10 sq ft) or a single dimension greater than 1.8 m (6 ft) are required to have a flame spread rating of 50 or less. For equipment with the same dimensions for other applications, an external surface that is not a fire enclosure requires a minimum flammability classification of V-1.		N/A
Annex DVA (10.3)	Equipment with lasers is required to meet the U.S. Code of Federal Regulations 21 CFR 1040 (and the Canadian Radiation Emitting Devices Act, REDR C1370).	No lasers	N/A

IEC62368_1E ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
Annex DVA (10.5)	Equipment that produces ionizing radiation is required to comply with the U.S. Code of Federal Regulations, 21 CFR 1020 (and the Canadian Radiation Emitting Devices Act, REDR C1370).		N/A
Annex DVA (F.3.3.4)	Equipment for use on a.c. mains supply systems with a neutral and more than one phase conductor (e.g. 120/240 V, 3-wire) require a special marking format for electrical ratings. Additional considerations apply for voltage ratings that exceed the attachment cap rating or that are lower than the "Normal Operating Condition" in Table 2 of CAN/CSA C22.2 No. 235."	Not three phase	N/A
Annex DVA (F.3.3.6)	Equipment identified for ITE (computer) room installation is required to be marked with the rated current.		N/A
Annex DVA (G.1)	Vertically-mounted disconnect switches and circuit breakers are required to have the "on" position indicated by the handle in the up position.		N/A
Annex DVA (G.3.4)	Suitable NEC/CEC branch circuit protection rated at the maximum circuit rating is required for all standard supply outlets and receptacles (such as supplied in power distribution units) if the supply branch circuit protection is not suitable.		N/A
	Where a fuse is used to provide Class 2 or Class 3 current limiting, it is not operator-accessible unless it is non- interchangeable.		N/A
Annex DVA (G.4.2)	Equipment with isolated ground (earthing) receptacles is required to comply with NEC 250.146(D) and CEC 10-400 and 10-612.		N/A
Annex DVA (G.4.3)	Interconnection of units by conductors supplied by a limited power source, or a Class 2 circuit defined in the NEC/CEC may have field wiring connections other than specified in DVH.3, such as wire-wrap and crimp-on types, if the limited power source and Class 2 circuits are separated from all other circuits by barriers, routing or fixing.		N/A
Annex DVA (G.5.3)	Power distribution transformers distributing power at 100 volts or more, and rated 10 kVA or more, require special transformer overcurrent protection.		N/A
Annex DVA (G.5.4)	Motor control devices are required for cord-connected equipment with a mains-connected motor if the equipment is rated more than 12 A, or if the equipment has a nominal voltage rating greater than 120 V, or if the motor is rated more than 1/3 hp (locked rotor current over 43 A).		N/A
Annex DVA (G.7)	Flexible cords used outdoors are required to have the suffix "W" marked on the flexible cord.	Not outdoor equipment	N/A

IEC62368_1E ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
Annex DVA (M)	For ITE room applications, equipment with battery systems capable of supplying 750 VA for five minutes are required to have a battery disconnect means that may be connected to the ITE room remote power-off circuit.		N/A
Annex DVA (Q)	If applicable per NEC 725.121(C), some limited power sources supplied from AV/ICT equipment are required to have a label indicating the maximum voltage and maximum current, or maximum voltage and nominal current output for each connection point. Where multiple connection points have the same rating, a single label is permitted to be used.		N/A
	Wiring terminals intended to supply Class 2 outputs in accordance with the NEC or CEC Part 1 are required to be marked with the voltage rating and "Class 2" or equivalent. The marking is located adjacent to the terminals and visible during wiring.		N/A
	Applicable parts of Chapter 8 of the NEC, and Rules 54 and 60 of the CEC, may be applicable to ITE installed outdoors with connections to communication systems.		N/A
Annex DVB (1)	Additional requirements apply for equipment used for entertainment purposes intended for installation in general patient care areas of health care facilities.	Not healthcare equipment	N/A
Annex DVC (1)	Additional requirements apply for equipment intended for mounting under kitchen cabinets.	Not kitchen equipment	N/A
Annex DVE (4.1.1)	Some equipment, components, sub-assemblies and materials associated with the risk of fire, electric shock, or personal injury are required to have component or material ratings in accordance with the applicable national (U.S. and Canadian) component or material requirements. These equipment and components include: appliance couplers, attachment plugs, battery backup systems, circuit breakers, communication circuit accessories, connectors (used for current interruption of non-LPS circuits), direct plug-in equipment, electrochemical capacitor modules (energy storage modules with ultracapacitors), enclosures (outdoor), flexible cords and cables, fuses (branch circuit), ground-fault current interrupters, interconnecting cables, modular data centers, power supply cords, some power distribution equipment, printed wiring, protectors for communications circuits, receptacles, surge protective devices, vehicle battery adapters, wire connectors, and wire and cables.		P

IEC62368_1E ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
Annex DVH	Equipment for permanent connection to the mains supply is subjected to additional requirements.		N/A
Annex DVH (DVH.1)	Wiring methods (terminals, leads, etc.) used for the connection of the equipment to the mains are required to be in accordance with the NEC/CEC.		N/A
Annex DVH (DVH.3.2)	Terminals for permanent wiring, including protective earthing terminals, are required to be suitable for U.S./Canadian wire gauge sizes, rated 125 percent of the equipment rating, and be specially marked when specified.		N/A
	Wire binding screws are not permitted to attach conductors larger than 10 AWG (5.3 mm ²).		N/A
Annex DVH (DVH.4)	Permanently connected equipment is required to have a suitable wiring compartment and wire bending space.		N/A
Annex DVH (DVH 5.5)	Equipment connected to a centralized d.c. power system, and having one pole of the DC mains input terminal connected to the main protective earthing terminal in the equipment, is required to comply with special earthing, wiring, marking and installation instruction requirements.		N/A
Annex DVI (6.7)	Equipment intended for connection to telecommunication network outside plant cable is required to be protected against overvoltage from power line crosses.	Not telecommunication equipment.	N/A
Annex DVJ (10.6.1)	Equipment connected to a telecommunication and cable distribution networks and supplied with an earphone intended to be held against, or in the ear is required to comply with special acoustic pressure requirements.		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
ATTACHMENT TO TEST REPORT IEC 62368-1 (JAPAN) NATIONAL DIFFERENCES (AUDIO/VIDEO, INFORMATION AND COMMUNICATION TECHNOLOGY EQUIPMENT – PART 1: SAFETY REQUIREMENTS)			
Differences according to : J62368-1 (2020)			
TRF template used: : IECEE OD-2020-F3, Ed. 1.1			
Attachment Form No. : JP_ND_IEC62368_1D			
Attachment Originator..... : UL (JP)			
Master Attachment : Date 2021-02-04			
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	National Differences		—
4.1.2	Where the component, or a characteristic of a component, is a safeguard or a part of a safeguard, components shall comply with the requirements of this standard or, where specified in a requirements clause, with the safety aspects of the relevant JIS component standards or IEC component standards, or components shall have properties equivalent to or better than these.		P
5.6.1	Mains socket-outlet and appliance outlet shall comply with Clause G.4.2A if they are incorporated as part of the equipment.		N/A
5.6.2.1	Mains connection of class 0I equipment: Instructional safeguard in accordance with Clause F.3.6.1A; Mains plug having a lead wire for protective earthing connection of class 0I equipment; Independent main protective earthing terminal installed by ordinary person.		N/A
5.6.2.2	This requirement does not apply to internal conductor of the cord set that is covered by the sheath of mains cord and is formed together with mains plug and appliance connector.		N/A
5.6.3	In case of class 0I equipment using power supply cord having two conductors (no earthing conductor), the conductor of protective earthing lead wire shall comply with either of the following: – use of annealed copper wire with 1.6 mm diameter or corrosion-inhibiting metal wire having size and strength that are equivalent to or more than the above copper wire – single core cord or single core cab tire cable with 1.25 mm ² or more cross-sectional area		N/A

IEC 62368-1 ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
5.7.3	For class 0I equipment that is provided with mains socket-outlet in the configuration as specified in JIS C 8282 series or JIS C 8303, or otherwise being considered to comply with relevant regulations, or that is provided with mains appliance outlet as specified in JIS C 8283-2-2 for the purpose of interconnection, the measurement is conducted on the system of the interconnected equipment having a single connection to the mains.		N/A
5.7.4	In case of class 0I equipment, touch current shall not exceed 1.41 mA peak or for sinusoidal wave, 1.0 mA r.m.s. when measured using the network specified in Figure 4 of IEC 60990.		N/A
6.4.3.3	A fuse complying with JIS C 6575 series or a fuse having equivalent characteristics shall open within 1 s. For Class A fuse of JIS C 6575, replace “2.1 times” by “1.35 times” and in case of Class B fuse of JIS C 6575, replace “2.1 times” by “1.6 times”. A fuse not complying with JIS C 6575 series shall be tested with the breaking capacity taken into account.		P
8.5.4.2.1	Only three-phase stationary equipment rated more than 200 V ac can be considered as being for use in locations where children are not likely to be present, when complying with Clause F.4.		N/A
8.5.4.2.2	For equipment installed where children may be present, an instructional safeguard shall be provided by easily understandable wording in accordance with Clause F.5, except that element 3 is optional.	No hazardous moving parts	N/A
8.5.4.2.4	The media destruction device is tested according to Clause V.1.2 with applicable jointed test probes to the opening. And then the wedge probe per Figure V.4 shall not contact any moving part.		N/A
8.5.4.2.5	The wedge probe of Figure V.4 and applicable jointed test probes specified in Clause V.1.2 shall not contact any moving part. Instructional safeguard shall not be used instead of equipment safeguard for preventing access to hazardous moving parts.		N/A
9.2.6, Table 38	Handles, Knobs, grips, etc. and external surfaces either held, touched or worn against the body in normal use (> 1 min) ^{b,c}		P
F.3.5.1	Instructional safeguard of class 0I equipment in accordance with Clause F.5 when a mains socket-outlet as specified in JIS C 8282 series, JIS C 8303 or relevant regulation to which class I equipment can be connected is provided in accordance with Clause G.4.2A except for the cases where the socket-outlet is accessible only to skilled persons.		N/A

IEC 62368-1 ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
F.3.5.3	If the fuse is necessary for the safeguard function, the symbols indicating pre-arcing time-current characteristic.		P
F.3.6.1A	Marking for class 0I equipment The requirements of Clauses F.3.6.1.1 and F.3.6.1.3 shall be applied to class 0I equipment. For class 0I equipment, a marking of instructions and instructional safeguard shall be provided regarding the earthing connection.		N/A
F.3.6.2.1	Symbols, IEC 60417-5172 (2003-02) or IEC 60417-6092 (2011-10), shall not be used for class I equipment or class 0I equipment.		N/A
F.4	Instruction for audio equipment with terminals classified as ES3 in accordance with Table E.1, and for other equipment with terminals marked in accordance with F.3.6.1 and F.3.6.1A. Installation instruction for the protective earthing connection for class 0I equipment provided with independent main protective earthing terminal, where the cord for the protective earthing connection is not provided within the package for the equipment.		N/A
G.3.2.1	The thermal link when tested as a separate component, shall comply with the requirements of JIS C 6691 or have properties equivalent to or better than that.	No thermal links	N/A
G.3.4	Except for devices covered by Clause G.3.5, overcurrent protective devices used as a safeguard shall comply with the relevant part of JIS C 6575 (corresponding to IEC60127) or shall have equivalent characteristics. If there are no applicable IEC standards, overcurrent protective devices used as a safeguard shall comply with their applicable IEC standards.		P
G.4.1	This requirement is not applicable to Clauses G.4.2 and G.4.2A.		-
G.4.2	Mains connector shall comply with JIS C 8282 series, JIS C 8283 series, JIS C 8285, JIS C 8303 or IEC 60309 series. Mains plugs and socket-outlets shall comply with JIS C 8282 series, JIS C 8303, IEC 60309 series, or have equivalent or better performance. A power supply cord set provided with appliance connector that can fit appliance inlet complying with JIS C 8283-1 shall comply with JIS C 8286. Construction preventing mechanical stress not to transmit to the soldering part of inlet terminal. Consideration for an equipment rated not more than 125 V provided with Type C14 and C18 appliance coupler complying with JIS C 8283 series.	No cord supplied. See summary of testing	-
G.4.2A	Mains socket-outlet and interconnection coupler provided with the class II, class I and class 0I equipment respectively.		N/A

IEC 62368-1 ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
G.7.1	A mains supply cord need not include the protective earthing conductor for class 0I equipment provided with independent protective earthing conductor.		N/A
G.8.3.3	Withstand $1,71 \times 1.1 \times U_0$ for 5 s.		N/A