



Ref. Certif. No.

JPTUV-116934

IEC SYSTEM FOR MUTUAL RECOGNITION OF TEST CERTIFICATES FOR ELECTRICAL EQUIPMENT  
(IECEE) CB SCHEME

## CB TEST CERTIFICATE

Product	Switching Power Supply
Name and address of the applicant	ABB Power Electronics (Shanghai) Co., Ltd Floor 1, Building #58, 461 Hongcao Road, Shanghai, P.R. China
Name and address of the manufacturer	ABB Power Electronics Inc. 601 Shiloh Road Plano, Texas 75074, USA
Name and address of the factory	See additional page(s)
Ratings and principal characteristics	Rated Input: 100-240 Vac, 47-63 Hz (or 50/60 Hz), 5 A Rated Output: 24 Vdc, 16.7 A, 5 Vsb, 1 A, Max. 400 W Protection Class: Class I
Trademark (if any)	GE (Optional)
Customer's Testing Facility (CTF) Stage used	CTF Stage 2
Model / Type Ref.	SP812, CAR0424FP
Additional information (if necessary may also be reported on page 2)	For model differences, refer to the test report.
A sample of the product was tested and found to be in conformity with	IEC 62368-1:2018 See Test Report for National Differences
As shown in the Test Report Ref. No. which forms part of this Certificate	60393564 001

This CB Test Certificate is issued by the National Certification Body



**TÜVRheinland**®

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Date: 2020-12-04

Signature:

Mark Chen

1. Lineage Power China Co., Ltd.  
1353 Chenqiao Road  
Fengpu Industrial Park  
Fengxian  
201401 Shanghai, P.R. China
2. Lineage Power Matamoros, S.A. de C.V.  
Poniente 2 No. 3 entre Norte  
7 y Limite del, Fraccionamiento  
Ciudad Industrial (CIMA)  
Matamoros Tamaulipas, México CP. 87499, MEXICO

**Additional information (if necessary)**

Report Ref. No. : 60393564 001

Date: 2020-12-04

Signature:



Mark Chen



Test Report issued under the responsibility of:



**TEST REPORT**

**IEC 62368-1**

**Audio/video, information and communication technology equipment  
Part 1: Safety requirements**

**Report Number**..... : 60393564 001  
**Date of issue**..... : 2020-12-03  
**Total number of pages**..... : 69 (excluding attachments, refer to page 3)

**Name of Testing Laboratory  
preparing the Report** ..... : TÜV Rheinland Shanghai Co. Ltd.

**Applicant's name** ..... : ABB Power Electronics (Shanghai) Co., Ltd.  
**Address**..... : Floor 1, Building #58, 461 Hongcao Road, Shanghai, P. R. China

**Test specification:**  
**Standard**..... : IEC 62368-1: 2018  
**Test procedure**..... : CB Scheme  
**Non-standard test method** ..... : N/A

**Test Report Form No.**..... : IEC62368\_1C  
**Test Report Form(s) Originator ..** : UL(US)  
**Master TRF**..... : Dated 2019-01-17

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**This report is not valid as a CB Test Report unless signed by an approved CB Testing Laboratory and appended to a CB Test Certificate issued by an NCB in accordance with IECEE 02.**

**General disclaimer:**

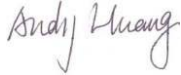


The test results presented in this report relate only to the object tested.  
This report shall not be reproduced, except in full, without the written approval of the Issuing CB Testing Laboratory. The authenticity of this Test Report and its contents can be verified by contacting the NCB, responsible for this Test Report.

<b>Test item description</b> ..... :	Switching Power Supply
<b>Trade Mark</b> ..... :	 (GE) (Optional)
<b>Manufacturer</b> ..... :	ABB Power Electronics Inc. 601 Shiloh Road Plano, Texas 75074, USA
<b>Model/Type reference</b> ..... :	SP812,CAR0424FP
<b>Ratings</b> ..... :	Input: 100-240 Vac, 47-63 Hz (or 50/60 Hz), 5 A; Output: 24 Vdc, 16.7 A, 5 Vsb, 1 A, Max. 400 W.

**Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):**

<input checked="" type="checkbox"/>	<b>CB Testing Laboratory:</b>	TÜV Rheinland Shanghai Co. Ltd.
<b>Testing location/ address</b> ..... :		No.177, 178, Lane 777 West Guangzhong Road, Jing'an District, Shanghai, China
<b>Tested by (name, function, signature)</b> ..... :		See below Stage 2
<b>Approved by (name, function, signature)</b> . :		See below Stage 2

<input type="checkbox"/>	<b>Testing procedure: CTF Stage 1:</b>	N/A
<b>Testing location/ address</b> ..... :		
<b>Tested by (name, function, signature)</b> ..... :		
<b>Approved by (name, function, signature)</b> . :		

<input checked="" type="checkbox"/>	<b>Testing procedure: CTF Stage 2:</b>	ABB Power Electronics (Shanghai) Co., Ltd.
<b>Testing location/ address</b> ..... :		Floor 1, Building #58, 461 Hongcao Road, Shanghai, P. R. China
<b>Tested by (name + signature)</b> ..... :		Andy Huang / Expert 
<b>Witnessed by (name, function, signature)</b> :		Keith Wei / Technical Expert 
<b>Approved by (name, function, signature)</b> . :		Sunny Sun / Technical Reviewer 

<input type="checkbox"/>	<b>Testing procedure: CTF Stage 3:</b>	N/A
<input type="checkbox"/>	<b>Testing procedure: CTF Stage 4:</b>	N/A
<b>Testing location/ address</b> ..... :		
<b>Tested by (name, function, signature)</b> ..... :		
<b>Witnessed by (name, function, signature)</b> :		
<b>Approved by (name, function, signature)</b> . :		
<b>Supervised by (name, function, signature):</b>		

<p><b>List of Attachments (including a total number of pages in each attachment):</b></p> <ul style="list-style-type: none"> <li>- ATTACHMENT – National Differences (29 pages)</li> <li>- ATTACHMENT – Other National Differences (9 pages)</li> <li>- ATTACHMENT – Photo Documentation (6 pages)</li> </ul> <p>Note: Total number of pages in each attachment is indicated in individual attachment.</p>	
<p><b>Summary of testing:</b></p>	
<p><b>Tests performed (name of test and test clause):</b></p> <p>This report is based on original UL CBTR KAS140814029 and KAS140814029-1 with following changes:</p> <ul style="list-style-type: none"> <li>- Change standard to “IEC 62368-1:2018 (Third Edition)”.</li> </ul> <p>No technical changes have been found by construction review at the provided sample and/or other administrative modifications except:</p> <ul style="list-style-type: none"> <li>- Update the address of license holder and factories per applicant’s request.</li> </ul> <p>Following additional tests and evaluations per the requirements of the new standard and/or considered necessary were conducted in this report:</p> <ul style="list-style-type: none"> <li>- Check and update certificate validity of critical components (Cl. 4.1.2),</li> <li>- Steady State Voltage and Current conditions (Cl. 5.2.2.2),</li> <li>- Highest working frequency measurement (Cl. 5.4.1.8),</li> <li>- Solid insulation (Cl. 5.4.4.9)</li> <li>- Stored discharge on capacitors (Cl. 5.5.2.2),</li> <li>- Earthed accessible conductive part test (Cl. 5.7.2.2, 5.7.4),</li> <li>- Protective Conductor Current (Cl. 5.7.5)</li> <li>- Electrical power source (PS) measurements for classification (Cl. 6.2.2)</li> </ul> <p>Except stated above, all test data are derived from original CB test report.</p> <p>All applicable tests as described in test cases and appended tables were performed. See test case and appended table for details.</p> <p>The test samples are pre-production sample without serial number.</p> <p>The equipment has been evaluated for ambient temperature as below:</p> <ol style="list-style-type: none"> <li>1) Supplied by AC input terminal, DC fan on top chassis, full load with Max. Temp. 50°C, and 2.5%/C de-rating to 70°C;</li> <li>2) Supplied by AC inlet, DC fan on front plant, full load with Max. Temp. 50°C, and 2.5%/C de-rating to 60°C.</li> </ol>	<p><b>Testing location:</b></p> <p>ABB Power Electronics (Shanghai) Co., Ltd.  Floor 1, Building #58, 461 Hongcao Road, Shanghai, P.R. China</p>
<p><b>Summary of compliance with National Differences (List of countries addressed):</b></p> <p><b>List of countries addressed</b></p> <p>EU Group Differences, EU Special National Conditions, US, CA</p> <p>Explanation of used codes: US=United States of America, CA=Canada.</p>	

**The product fulfils the requirements of**  
IEC 62368-1:2018 and EN IEC 62368-1:2020+A11:2020.

Other National Differences  
European Group Differences and National Differences

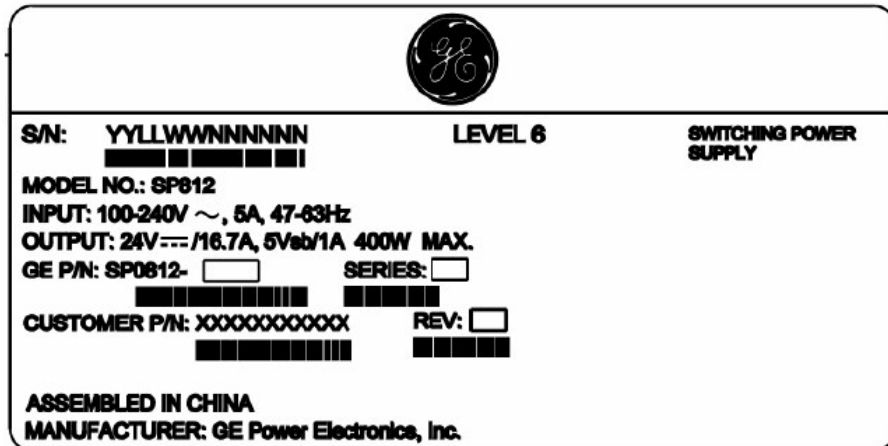
**The product fulfils the requirements of**  
EN 62368-1:2014+A11:2017

Note(s):  
Countries outside the CB Scheme membership may also accept this report.

**Copy of marking plate:**

The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBs that own these marks.

< Representative >



Notes:

- 1, The above labels are draft of artwork for marking plates pending approval by National Certification Bodies and it shall not be affixed to products prior to such an approval.
- 2, The manufacturer "GE Power Electronics, Inc." on above labels could be replaced by "ABB Power Electronics Inc."

<b>Test item particulars:</b>	
<b>Product group .....</b>	<input type="checkbox"/> end product <input checked="" type="checkbox"/> built-in component
<b>Classification of use by .....</b>	<input type="checkbox"/> Ordinary person <input type="checkbox"/> Children likely present <input checked="" type="checkbox"/> Instructed person <input type="checkbox"/> Skilled person
<b>Supply connection .....</b>	<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 type="checkbox"/> ES3
<b>Supply tolerance .....</b>	<input checked="" type="checkbox"/> +10%/-10% <input type="checkbox"/> +20%/-15% <input type="checkbox"/> +    %/ -    % <input type="checkbox"/> None
<b>Supply connection – type .....</b>	<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 type="checkbox"/> pluggable equipment type B - <input type="checkbox"/> non-detachable supply cord <input type="checkbox"/> appliance coupler <input type="checkbox"/> permanent connection <input type="checkbox"/> mating connector <input checked="" type="checkbox"/> other: investigated in the end system/equipment
<b>Considered current rating of protective device .....</b>	<input checked="" type="checkbox"/> 16 A or 20 A; Location: <input checked="" type="checkbox"/> building <input type="checkbox"/> equipment <input type="checkbox"/> N/A
<b>Equipment mobility .....</b>	<input type="checkbox"/> movable <input type="checkbox"/> hand-held <input type="checkbox"/> transportable <input type="checkbox"/> direct plug-in <input type="checkbox"/> stationary <input checked="" type="checkbox"/> for building-in <input type="checkbox"/> wall/ceiling-mounted <input type="checkbox"/> SRME/rack-mounted <input type="checkbox"/> other:
<b>Overvoltage category (OVC) .....</b>	<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:
<b>Class of equipment .....</b>	<input checked="" type="checkbox"/> Class I <input type="checkbox"/> Class II <input type="checkbox"/> Class III <input type="checkbox"/> Not classified <input type="checkbox"/>
<b>Special installation location .....</b>	<input checked="" type="checkbox"/> N/A <input type="checkbox"/> restricted access area <input type="checkbox"/> outdoor location <input type="checkbox"/>
<b>Pollution degree (PD) .....</b>	<input type="checkbox"/> PD 1 <input checked="" type="checkbox"/> PD 2 <input type="checkbox"/> PD 3
<b>Manufacturer’s specified T<sub>ma</sub> .....</b>	Supplied by AC input terminal, full load with Max. Temp. 50°C, and 2.5%/C de-rating to 70°C; Supplied by AC inlet, full load with Max. Temp. 50°C, and 2.5%/C de-rating to 60°C.
<b>IP protection class .....</b>	<input checked="" type="checkbox"/> IPX0 <input type="checkbox"/> IP ____
<b>Power systems .....</b>	<input checked="" type="checkbox"/> TN <input type="checkbox"/> TT <input type="checkbox"/> IT - 230 V <sub>L-L</sub> <input type="checkbox"/> not AC mains
<b>Altitude during operation (m) .....</b>	<input type="checkbox"/> 2000 m or less <input checked="" type="checkbox"/> 4000 m



<b>Altitude of test laboratory (m) .....</b> : <input checked="" type="checkbox"/> 2000 m or less <input type="checkbox"/> m	
<b>Mass of equipment (kg) .....</b> : Approx. 0.73 kg	
<b>Possible test case verdicts:</b>	
<b>- test case does not apply to the test object...:</b> N/A	
<b>- test object does meet the requirement .....</b> : P (Pass)	
<b>- test object does not meet the requirement...:</b> F (Fail)	
<b>Testing:</b>	
<b>Date of receipt of test item .....</b> : 2015-02-11 (original UL CBTR KAS140814029) 2015-06-02(original UL CBTR KAS140814029-1) 2020-06-25 (this report)	
<b>Date (s) of performance of tests.....</b> : 2015-02-12 to 2015-04-15 (original UL CBTR KAS140814029) 2015-06-02 to 2015-06-15(original UL CBTR KAS140814029-1)  2020-06-30 to 2020-07-02 (this report)	
<b>General remarks:</b>	
"(See Enclosure #)" refers to additional information appended to the report. "(See appended table)" refers to a table appended to the report. <b>Throughout this report a <input type="checkbox"/> comma / <input checked="" type="checkbox"/> point is used as the decimal separator.</b>	
<b>Manufacturer's Declaration per sub-clause 4.2.5 of IEC60950-1:</b>	
The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided.....	<input checked="" type="checkbox"/> <b>Yes</b> <input type="checkbox"/> <b>Not applicable</b>
<b>When differences exist; they shall be identified in the General product information section.</b>	
<b>Name and address of factory (ies).....</b> :	1. Lineage Power China Co., Ltd. 1353 Chenqiao Road, Fengpu Industrial Park, Fengxian 201401 Shanghai, P. R. China  2. Lineage Power Matamoros, S.A. de C.V. Poniente 2 No. 3 entre Norte 7 y Limite del, Fraccionamiento Ciudad Industrial (CIMA) Matamoros Tamaulipas, México CP. 87499, MEXICO
<b>General product information and other remarks:</b>	
The product covered by this report is AC/DC switching power supply (building-in type) for general use with Class I information technology equipment. They consist of electronic packages and wound parts mounted on a printed circuit board housed in a metal enclosure.  Reinforced/Double Insulation is provided between primary circuit and secondary circuit. Basic Insulation is provided between primary circuit and PE.	
<b>Model Differences</b>	
The models SP812, CAR0424FP are same except for model name, and model SP812 was chose for test. Both models have two different constructions:	
3) Supplied by AC input terminal, DC fan on top chassis, full load with Max. Temp. 50°C, and 2.5%/C de-rating to 70°C;	
4) Supplied by AC inlet, DC fan on front plant, full load with Max. Temp. 50°C, and 2.5%/C de-rating to	

60°C.

**Additional Information:**

- The product is built-in type Power Supply intended for incorporation in information technology equipment, the overall compliance shall be investigated in the complete end system/equipment, in particular as:
  - Fire enclosure
  - Mechanical enclosure
  - Electrical enclosure
- Some components are **pre-certified**, which have been evaluated according to the relevant requirements of IEC 62368-1, are employed in this product. Their suitability of use has been checked according to subclause 4.1.1 and 4.1.2.
- The product is to be operated up to 4000m above sea level, the minimum clearances were multiplied by the factor given in Table A.2 of IEC 60664-1: 1.29.
- Optional conformal coating, R/C (QMJU2), rated V-0, manufactured by Humiseal, part number 1A33 or UV40, minimum 0.0254mm, and 0.0508mm respectively, may be provided on the printed circuit board to add additional product robustness with functional insulation. The coating has not been evaluated to reduce pollution Degree from a safety spacing perspectives.

<b>OVERVIEW OF ENERGY SOURCES AND SAFEGUARDS</b>				
<b>Clause</b>	<b>Possible Hazard</b>			
5	Electrically-caused injury			
Class and Energy Source (e.g. ES3: Primary circuit)	Body Part (e.g. Ordinary)	Safeguards		
		B	S	R
ES3: Primary circuits and secondary circuits	Instructed person	N/A	N/A	Metal Enclosure, Transformers, Opto-couplers
ES1: Output circuits	Instructed person	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 <sup>st</sup> S	2 <sup>nd</sup> S
PS3: > 100 Watt circuit (Primary circuits, secondary circuits and output)	Combustible materials within equipment fire enclosure	See 6.3.1	See 6.4.6	N/A
7	Injury caused by hazardous substances			
Class and Energy Source (e.g. Ozone)	Body Part (e.g., Skilled)	Safeguards		
		B	S	R
--	Instructed person	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: Equipment mass < 7 kg	N/A	N/A	N/A	N/A
MS1: Sharp edge and corners	N/A	N/A	N/A	N/A
MS3: Moving parts (DC fan)	Ordinary, Instructed, Skilled	N/A	N/A	Enclosure
9	Thermal burn			
Class and Energy Source (e.g. TS1: Keyboard caps)	Body Part (e.g., Ordinary)	Safeguards		
		B	S	R
To be determined by end-product use	--	--	--	--
10	Radiation			
Class and Energy Source (e.g. RS1: PMP sound output)	Body Part (e.g., Ordinary)	Safeguards		
		B	S	R
--	--	--	--	--
Supplementary Information: "B" – Basic Safeguard; "S" – Supplementary Safeguard; "R" – Reinforced Safeguard				

ENERGY SOURCE DIAGRAM

Optional. Manufacturers are to provide the energy sources diagram identify declared energy sources and identifying the demarcations are between power sources. Recommend diagram be provided included in power supply and multipart systems.

Insert diagram below. Example diagram designs are; Block diagrams; image(s) with layered data; mechanical drawings

ES     PS     MS     TS     RS

“SEE OVERVIEW OF ENERGY SOURCES AND SAFEGUARDS”

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
<b>4</b>	<b>GENERAL REQUIREMENTS</b>		P
4.1.1	Acceptance of materials, components and subassemblies	See appended tables 4.1.2	P
4.1.2	Use of components	Components which are certified to IEC and/or national standards are used correctly within their ratings. Components not covered by IEC standards are tested under the conditions present in the equipment. See also Annex G	P
4.1.3	Equipment design and construction	No accessible part which could cause injury. However, the equipment is a building-in type and evaluation is also to be made during the final system approval.	P
4.1.4	Specified ambient temperature for outdoor use (°C) ..... :	Built-in equipment, Shall be investigated in the end system/equipment	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	Shall be investigated in the end system/equipment	N/A
4.4.3.1	General	Shall be investigated in the end system/equipment	N/A
4.4.3.2	Steady force tests	Shall be investigated in the end system/equipment	N/A
4.4.3.3	Drop tests		N/A
4.4.3.4	Impact tests	Shall be investigated in the end system/equipment	N/A
4.4.3.5	Internal accessible safeguard tests	Shall be investigated in the end system/equipment	N/A
4.4.3.6	Glass impact tests	No glass used.	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	No thermoplastic material used as a safeguard.	N/A
4.4.3.9	Air comprising a safeguard	Shall be investigated in the end system/equipment	N/A

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
4.4.3.10	Accessibility, glass, safeguard effectiveness	Shall be investigated in the end system/equipment	N/A
4.4.4	Displacement of a safeguard by an insulating liquid	No such liquid used	N/A
4.4.5	Safety interlocks	No safety interlocks used.	N/A
<b>4.5</b>	<b>Explosion</b>		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 above	N/A
<b>4.6</b>	<b>Fixing of conductors</b>		P
	Fix conductors not to defeat a safeguard		P
	Compliance is checked by test .....	(See Clause T.2)	P
<b>4.7</b>	<b>Equipment for direct insertion into mains socket-outlets</b>		N/A
4.7.2	Mains plug part complies with relevant standard . :	Not such equipment.	N/A
4.7.3	Torque (Nm) .....		N/A
<b>4.8</b>	<b>Equipment containing coin/button cell batteries</b>		N/A
4.8.1	General	No such batteries contained.	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
<b>4.9</b>	<b>Likelihood of fire or shock due to entry of conductive object</b>		N/A
<b>4.10</b>	<b>Component requirements</b>		P
4.10.1	Disconnect Device	(See Annex L)	P
4.10.2	Switches and relays	(See Annex G)	P

<b>5</b>	<b>ELECTRICALLY-CAUSED INJURY</b>		P
<b>5.2</b>	<b>Classification and limits of electrical energy sources</b>		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

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
5.2.2.3	Capacitance limits..... :	(See appended table 5.2)	P
5.2.2.4	Single pulse limits..... :		N/A
5.2.2.5	Limits for repetitive pulses ..... :		N/A
5.2.2.6	Ringings signals		N/A
5.2.2.7	Audio signals		N/A
<b>5.3</b>	<b>Protection against electrical energy sources</b>		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		P
5.3.1 b)	Skilled persons not unintentional contact ES3 bare conductors		P
5.3.2.1	Accessibility to electrical energy sources and safeguards	ES3 source are not accessible. Double or reinforced safeguard is provided between ES3 and accessible ES1 part. Also, the equipment is a building-in type and evaluation is also to be made during the end system/equipment.	P
	Accessibility to outdoor equipment bare parts		N/A
5.3.2.2	Contact requirements	Shall be investigated in the end system/equipment	N/A
	Test with test probe from 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	No such terminals intended to be used by ordinary person.	N/A
<b>5.4</b>	<b>Insulation materials and requirements</b>		P
5.4.1.2	Properties of insulating material		P
5.4.1.3	Material is non-hygroscopic		P
5.4.1.4	Maximum operating temperature for insulating materials..... :	(See appended table)	P
5.4.1.5	Pollution degrees..... :	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	No such transformer used	N/A
5.4.1.7	Insulation in circuits generating starting pulses	No such starting pulse generated.	N/A

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
5.4.1.8	Determination of working voltage..... :	See appended tables 5.4.2.2, 5.4.2.4 and 5.4.3	P
5.4.1.9	Insulating surfaces	Considered	P
5.4.1.10	Thermoplastic parts on which conductive metallic parts are directly mounted	Ball pressure test according to subclause 5.4.1.10.3 applied.	P
5.4.1.10.2	Vicat test..... :		N/A
5.4.1.10.3	Ball pressure test..... :	Ball pressure test according to subclause 5.4.1.10.3 applied.	P
5.4.2	Clearances		P
5.4.2.1	General requirements		P
	Clearances in circuits connected to AC Mains, Alternative method		N/A
5.4.2.2	Procedure 1 for determining clearance		P
	Temporary overvoltage ..... :	2000V <sub>peak</sub>	—
5.4.2.3	Procedure 2 for determining clearance		P
5.4.2.3.2.2	a.c. mains transient voltage ..... :	2500V <sub>peak</sub>	—
5.4.2.3.2.3	d.c. mains transient voltage ..... :	See above	—
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 ..... :		N/A
5.4.2.5	Multiplication factors for clearances and test voltages ..... :	1.29 for altitude 4000m	P
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..... :	IIIb	—
5.4.3.4	Creepage distances measurement..... :	(See appended table 5.4.3)	P
5.4.4	Solid insulation		P
5.4.4.1	General requirements		P
5.4.4.2	Minimum distance through insulation ..... :	(See appended table 5.4.4.2)	P
5.4.4.3	Insulating compound forming solid insulation	Approved optocouplers used	P
5.4.4.4	Solid insulation in semiconductor devices		P
5.4.4.5	Insulating compound forming cemented joints	Approved optocouplers used	P
5.4.4.6	Thin sheet material		P
5.4.4.6.1	General requirements		P
5.4.4.6.2	Separable thin sheet material	(See appended table 5.4.9)	P
	Number of layers (pcs) ..... :	2 layers min.	P



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Clause	Requirement + Test	Result - Remark	Verdict
5.4.4.6.3	Non-separable thin sheet material		N/A
	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) .....	>30 kHz	P
	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 ( $M\Omega$ ) .....		N/A
	Electric strength test .....		N/A
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	Certified optocouplers used	N/A
5.4.8	Humidity conditioning		P
	Relative humidity (%), temperature ( $^{\circ}C$ ), duration (h) .....	93%Rh, 40 $^{\circ}C$ , 120hrs	—
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		N/A
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

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Clause	Requirement + Test	Result - Remark	Verdict
	Rated operating voltage $U_{op}$ (V)..... :		—
	Nominal voltage $U_{peak}$ (V) ..... :		—
	Max increase due to variation $\Delta U_{sp}$ ..... :		—
	Max increase due to ageing $\Delta U_{sa}$ ..... :		—
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
<b>5.5</b>	<b>Components as safeguards</b>		P
5.5.1	General		P
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 G.12)	P
5.5.5	Relays	No relay as safeguard	N/A
5.5.6	Resistors	See appended table 4.1.2	P
5.5.7	SPDs	See appended table 4.1.2	P
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)..... :		—
<b>5.6</b>	<b>Protective conductor</b>		P
5.6.2	Requirement for protective conductors		P
<b>5.6</b>	<b>Protective conductor</b>		P
5.6.2	Requirement for protective conductors	See below.	P
5.6.2.1	General requirements	Shall be investigated in the end system/equipment	N/A
5.6.2.2	Colour of insulation	Shall be investigated in the end system/equipment	N/A
5.6.3	Requirement for protective earthing conductors	Shall be investigated in the end system/equipment	N/A
	Protective earthing conductor size (mm <sup>2</sup> ) ..... :		—
	Protective earthing conductor serving as a reinforced safeguard		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Protective earthing conductor serving as a double safeguard		N/A
5.6.4	Requirements for protective bonding conductors	No such protective bonding conductors	N/A
5.6.4.1	Protective bonding conductors		N/A
	Protective bonding conductor size (mm <sup>2</sup> )..... :		—
5.6.4.2	Protective current rating (A) ..... :		N/A
5.6.5	Terminals for protective conductors		N/A
5.6.5.1	Terminal size for connecting protective earthing conductors (mm)..... :		N/A
	Terminal size for connecting protective bonding conductors (mm) ..... :		N/A
5.6.5.2	Corrosion	No combination above the line in Annex N is used.	P
5.6.6	Resistance of the protective bonding system	See below	P
5.6.6.1	Requirements	Compliance checked.	P
5.6.6.2	Test Method ..... :	See appended table 5.6.6	P
5.6.6.3	Resistance ( $\Omega$ ) or voltage drop ..... :	See appended table 5.6.6	P
5.6.7	Reliable connection of a protective earthing conductor	The equipment is not permanently connected equipment.	N/A
5.6.8	Functional earthing		N/A
	Conductor size (mm <sup>2</sup> )..... :		N/A
	Class II with functional earthing marking ..... :		N/A
	Appliance inlet cl & cr (mm) ..... :		N/A
<b>5.7</b>	<b>Prospective touch voltage, touch current and protective conductor current</b>		P
5.7.2	Measuring devices and networks		P
5.7.2.1	Measurement of touch current	(See appended tables 5.2.2.2 and 5.7.2.2, 5.7.4)	P
5.7.2.2	Measurement of voltage	(See appended table 5.2.2.2)	P
5.7.3	Equipment set-up, supply connections and earth connections	Clause 4, 5.3 and 5.4 of IEC 60990:1999 applied.	P
5.7.4	Unearthed accessible parts..... :		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	Less than 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	No external circuits.	N/A
5.7.7.1	Touch current from coaxial cables		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
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
<b>5.8</b>	<b>Backfeed safeguard in battery backed up supplies</b>		N/A
	Mains terminal ES..... :		N/A
	Air gap (mm)..... :		N/A

<b>6</b>	<b>ELECTRICALLY- CAUSED FIRE</b>		P
<b>6.2</b>	<b>Classification of PS and PIS</b>		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
<b>6.3</b>	<b>Safeguards against fire under normal operating and abnormal operating conditions</b>		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 .....	The equipment is a building-in type, evaluation is to be made during the final system approval.	N/A
<b>6.4</b>	<b>Safeguards against fire under single fault conditions</b>		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..... :		P
	Special conditions for temperature limited by fuse		N/A
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	Proper fireproof materials are used. See appended tables 4.1.2 and Annex G.	P
6.4.7	Separation of combustible materials from a PIS	Built-in equipment.	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
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	Built-in equipment.	N/A
6.4.8.2	Fire enclosure and fire barrier material properties		N/A
6.4.8.2.1	Requirements for a fire barrier		N/A
6.4.8.2.2	Requirements for a fire enclosure		N/A
6.4.8.3	Constructional requirements for a fire enclosure and a fire barrier		N/A
6.4.8.3.1	Fire enclosure and fire barrier openings		N/A
6.4.8.3.2	Fire barrier dimensions		N/A
6.4.8.3.3	Top openings and properties		N/A
	Openings dimensions (mm) ..... :		N/A
6.4.8.3.4	Bottom openings and properties		N/A
	Openings dimensions (mm) ..... :		N/A
	Flammability tests for the bottom of a fire enclosure		N/A
	Instructional Safeguard..... :		N/A
6.4.8.3.5	Side openings and properties		N/A
	Openings dimensions (mm) ..... :		N/A
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 ..... :		N/A
<b>6.5</b>	<b>Internal and external wiring</b>		P
6.5.1	General requirements		P
6.5.2	Requirements for interconnection to building wiring ..... :		N/A
6.5.3	Internal wiring size (mm <sup>2</sup> ) for socket-outlets..... :		N/A
<b>6.6</b>	<b>Safeguards against fire due to the connection to additional equipment</b>		N/A

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

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Clause	Requirement + Test	Result - Remark	Verdict

<b>8</b>	<b>MECHANICALLY-CAUSED INJURY</b>		P
<b>8.2</b>	<b>Mechanical energy source classifications</b>		P
<b>8.3</b>	<b>Safeguards against mechanical energy sources</b>		P
<b>8.4</b>	<b>Safeguards against parts with sharp edges and corners</b>		P
8.4.1	Safeguards	Accessible edges and corners of the equipment are rounded and are classified as MS1.  However the equipment is a building-in type and evaluation is to be made during the end system/equipment.	P
	Instructional Safeguard..... :		N/A
8.4.2	Sharp edges or corners		N/A
<b>8.5</b>	<b>Safeguards against moving parts</b>		P
8.5.1	Fingers, jewellery, clothing, hair, etc., contact with MS2 or MS3 parts	The rotating part of the build-in DC fans are protected by the enclosure, which considered no accessible to the user.	P
	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

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Clause	Requirement + Test	Result - Remark	Verdict
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
8.5.5	High pressure lamps		N/A
	Explosion test ..... :		N/A
8.5.5.3	Glass particles dimensions (mm) ..... :		N/A
<b>8.6</b>	<b>Stability of equipment</b>		N/A
8.6.1	General	Shall be investigated in the end system/equipment	N/A
	Instructional safeguard ..... :		N/A
8.6.2	Static stability		N/A
8.6.2.2	Static stability test..... :		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
<b>8.7</b>	<b>Equipment mounted to wall, ceiling or other structure</b>		N/A
8.7.1	Mount means type ..... :		N/A
8.7.2	Test methods		N/A
	Test 1, additional downwards force (N) ..... :		N/A
	Test 2, number of attachment points and test force (N)..... :		N/A
	Test 3 Nominal diameter (mm) and applied torque (Nm) ..... :		N/A
<b>8.8</b>	<b>Handles strength</b>		N/A
8.8.1	General		N/A
8.8.2	Handle strength test		N/A
	Number of handles..... :		—
	Force applied (N)..... :		—
<b>8.9</b>	<b>Wheels or casters attachment requirements</b>		N/A
8.9.2	Pull test		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
<b>8.10</b>	<b>Carts, stands and similar carriers</b>		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
8.10.5	Mechanical stability		N/A
	Force applied (N).....		—
8.10.6	Thermoplastic temperature stability		N/A
<b>8.11</b>	<b>Mounting means for slide-rail mounted equipment (SRME)</b>		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
<b>8.12</b>	<b>Telescoping or rod antennas</b>		N/A
	Button/ball diameter (mm) .....		—

<b>9</b>	<b>THERMAL BURN INJURY</b>		N/A
<b>9.2</b>	<b>Thermal energy source classifications</b>		N/A
<b>9.3</b>	<b>Touch temperature limits</b>		N/A
9.3.1	Touch temperatures of accessible parts.....	The equipment is a building-in type and evaluation is to be made during the end system/equipment.	N/A
9.3.2	Test method and compliance		N/A
<b>9.4</b>	<b>Safeguards against thermal energy sources</b>		N/A
<b>9.5</b>	<b>Requirements for safeguards</b>		N/A
9.5.1	Equipment safeguard		N/A
9.5.2	Instructional safeguard .....		N/A
<b>9.6</b>	<b>Requirements for wireless power transmitters</b>		
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



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Clause	Requirement + Test	Result - Remark	Verdict
<b>10</b>	<b>RADIATION</b>		N/A
<b>10.2</b>	<b>Radiation energy source classification</b>		N/A
10.2.1	General classification		N/A
	Lasers .....		—
	Lamps and lamp systems .....		—
	Image projectors .....		—
	X-Ray.....		—
	Personal music player.....		—
<b>10.3</b>	<b>Safeguards against laser radiation</b>		N/A
	The standard(s) equipment containing laser(s) comply.....		N/A
<b>10.4</b>	<b>Safeguards against optical radiation from lamps and lamp systems (including LED types)</b>		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
<b>10.5</b>	<b>Safeguards against X-radiation</b>		N/A
10.5.1	Requirements		N/A
	Instructional safeguard for skilled persons.....		—
10.5.3	Maximum radiation (pA/kg) .....		—
<b>10.6</b>	<b>Safeguards against acoustic energy sources</b>		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

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Clause	Requirement + Test	Result - Remark	Verdict
10.6.5	Protection of persons		N/A
	Instructional safeguards .....		N/A
10.6.6	Requirements for listening devices (headphones, earphones, etc.)		N/A
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>B</b>	<b>NORMAL OPERATING CONDITION TESTS, ABNORMAL OPERATING CONDITION TESTS AND SINGLE FAULT CONDITION TESTS</b>		P
<b>B.1</b>	<b>General</b>		P
B.1.5	Temperature measurement conditions	(See appended table B.1.5)	P
<b>B.2</b>	<b>Normal operating conditions</b>		P
B.2.1	General requirements .....	(See Test Item Particulars and appended test tables)	P
	Audio Amplifiers and equipment with audio amplifiers .....	No audio amplifier	N/A
B.2.3	Supply voltage and tolerances		P
B.2.5	Input test .....	(See appended table B.2.5)	P
<b>B.3</b>	<b>Simulated abnormal operating conditions</b>		P
B.3.1	General	See appended table B.3 & B.4.	P
B.3.2	Covering of ventilation openings	See appended table B.3 & B.4.	P
	Instructional safeguard .....		N/A
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	See appended table B.3 & B.4.	P
B.3.6	Reverse battery polarity	No battery within the EUT.	N/A
B.3.7	Audio amplifier abnormal operating conditions	Not such equipment.	N/A
B.3.8	Safeguards functional during and after abnormal operating conditions .....	All safeguards remained effectively.	P
<b>B.4</b>	<b>Simulated single fault conditions</b>		P
B.4.1	General		P
B.4.2	Temperature controlling device	No such device used.	N/A
B.4.3	Blocked motor test	(See appended table B.4)	P

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Clause	Requirement + Test	Result - Remark	Verdict
B.4.4	Functional insulation	See the following details.	P
B.4.4.1	Short circuit of clearances for functional insulation	(See appended table B.4)	P
B.4.4.2	Short circuit of creepage distances for functional insulation	(See appended table B.4)	P
B.4.4.3	Short circuit of functional insulation on coated printed boards	No coated printed boards within the equipment.	N/A
B.4.5	Short-circuit and interruption of electrodes in tubes and semiconductors	(See appended table B.4)	P
B.4.6	Short circuit or disconnection of passive components	(See appended table B.4)	P
B.4.7	Continuous operation of components	The equipment is continuous operating type and no such components intended for short time operation or intermittent operation.	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	No battery involved in the equipment.	N/A
<b>C</b>	<b>UV RADIATION</b>		N/A
<b>C.1</b>	<b>Protection of materials in equipment from UV radiation</b>		N/A
C.1.2	Requirements	No such UV generated from the equipment.	N/A
C.1.3	Test method		N/A
<b>C.2</b>	<b>UV light conditioning test</b>		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
<b>D</b>	<b>TEST GENERATORS</b>		N/A
<b>D.1</b>	<b>Impulse test generators</b>		N/A
<b>D.2</b>	<b>Antenna interface test generator</b>		N/A
<b>D.3</b>	<b>Electronic pulse generator</b>		N/A
<b>E</b>	<b>TEST CONDITIONS FOR EQUIPMENT CONTAINING AUDIO AMPLIFIERS</b>		N/A
<b>E.1</b>	<b>Electrical energy source classification for audio signals</b>		N/A
	Maximum non-clipped output power (W) .....		—
	Rated load impedance ( $\Omega$ ) .....		—
	Open-circuit output voltage (V) .....		—
	Instructional safeguard .....		—
<b>E.2</b>	<b>Audio amplifier normal operating conditions</b>		N/A
	Audio signal source type .....		—

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Clause	Requirement + Test	Result - Remark	Verdict
	Audio output power (W) .....		—
	Audio output voltage (V) .....		—
	Rated load impedance ( $\Omega$ ) .....		—
	Requirements for temperature measurement		N/A
E.3	Audio amplifier abnormal operating conditions		N/A
<b>F</b>	<b>EQUIPMENT MARKINGS, INSTRUCTIONS, AND INSTRUCTIONAL SAFEGUARDS</b>		P
<b>F.1</b>	<b>General</b>		P
	Language .....	English	—
<b>F.2</b>	<b>Letter symbols and graphical symbols</b>		P
F.2.1	Letter symbols according to IEC60027-1		P
F.2.2	Graphic symbols according to IEC, ISO or manufacturer specific		P
<b>F.3</b>	<b>Equipment markings</b>		P
F.3.1	Equipment marking locations	Equipment marking is located on the exterior surface and is easily visible.	P
F.3.2	Equipment identification markings	See the following details.	P
F.3.2.1	Manufacturer identification .....	See copy of marking plate.	P
F.3.2.2	Model identification .....	See copy of marking plate.	P
F.3.3	Equipment rating markings	See the following details.	P
F.3.3.1	Equipment with direct connection to mains	Not directly connection to mains	N/A
F.3.3.2	Equipment without direct connection to mains		P
F.3.3.3	Nature of the supply voltage .....	See copy of marking plate.	P
F.3.3.4	Rated voltage .....	See copy of marking plate.	P
F.3.3.5	Rated frequency .....	See copy of marking plate.	P
F.3.3.6	Rated current or rated power .....	See copy of marking plate.	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	See below.	P
F.3.5.1	Mains appliance outlet and socket-outlet markings .....	No such devices within the equipment.	N/A
F.3.5.2	Switch position identification marking .....	No such switches within the equipment.	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
F.3.5.3	Replacement fuse identification and rating markings ..... :	The fuse is located within the equipment and not replaceable by an ordinary person or an instructed person.  The fuse information is marked on PWB near fuse	P
	Instructional safeguards for neutral fuse..... :		N/A
F.3.5.4	Replacement battery identification marking ..... :	No replacement battery used.	N/A
F.3.5.5	Neutral conductor terminal		N/A
F.3.5.6	Terminal marking location	See markings specified in F.3.6.1 and F.3.6.2 are not placed on removable parts such as screws, removable washers, or other parts.	P
F.3.6	Equipment markings related to equipment classification	See the following details.	P
F.3.6.1	Class I equipment	See the following details.	P
F.3.6.1.1	Protective earthing conductor terminal..... :		N/A
F.3.6.1.2	Protective bonding conductor terminals ..... :	Not identified.	N/A
F.3.6.2	Equipment class marking ..... :	Class I equipment.	N/A
F.3.6.3	Functional earthing terminal marking ..... :		N/A
F.3.7	Equipment IP rating marking ..... :	Shall be investigated in the end system/equipment	N/A
F.3.8	External power supply output marking ..... :		N/A
F.3.9	Durability, legibility and permanence of marking	All marking labels are suitable for surface they are applied upon and passed durability test.	P
F.3.10	Test for permanence of markings	The label was subjected to the permanence of marking test, 15 sec. with water and 15 sec. with petroleum spirit.  After each test, the marking remained legible.	P
<b>F.4</b>	<b>Instructions</b>		P
	a) Information prior to installation and initial use		P
	b) Equipment for use in locations where children not likely to be present		N/A
	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	Shall be investigated in the end system/equipment	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	f) Instructions for audio equipment terminals	No such terminals provided.	N/A
	g) Protective earthing used as a safeguard		P
	h) Protective conductor current exceeding ES2 limits		N/A
	i) Graphic symbols used on equipment		N/A
	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
	m) Installation instructions for outdoor equipment		N/A
<b>F.5</b>	Instructional safeguards		N/A
<b>G</b>	<b>COMPONENTS</b>		P
<b>G.1</b>	<b>Switches</b>		N/A
G.1.1	General	No switch used	N/A
G.1.2	Ratings, endurance, spacing, maximum load		N/A
G.1.3	Test method and compliance		N/A
<b>G.2</b>	<b>Relays</b>		P
G.2.1	Requirements	Approved relay used. See appended table 4.1.2.	P
G.2.2	Overload test		N/A
G.2.3	Relay controlling connectors supplying power to other equipment		N/A
G.2.4	Test method and compliance		N/A
<b>G.3</b>	<b>Protective devices</b>		P
G.3.1	Thermal cut-offs	No thermal cut-off provided within the equipment.	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	No thermal link provided within the equipment.	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 PTC thermistor provided within the equipment.	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
G.3.4	Overcurrent protection devices	See General product information - Markings and Instructions	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)	N/A
<b>G.4</b>	<b>Connectors</b>		P
G.4.1	Spacings	See table 5.4.2, 5.4.3	P
G.4.2	Mains connector configuration.....		N/A
G.4.3	Plug is shaped that insertion into mains socket-outlets or appliance coupler is unlikely		N/A
<b>G.5</b>	<b>Wound components</b>		P
G.5.1	Wire insulation in wound components	See G.5.3	P
G.5.1.2	Protection against mechanical stress	Separated by tube and the margin tapes between windings.	P
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		N/A
G.5.2.4	No insulation breakdown		P
G.5.3	Transformers		P
G.5.3.1	Compliance method.....	See G.5.3.2 and G.5.3.3	P
	Position .....	(See appended table 4.1.2)	P
	Method of protection .....	Over current protection by circuit design	P
G.5.3.2	Insulation		P
	Protection from displacement of windings .....		—
G.5.3.3	Transformer overload tests	See appended table B.3	P
G.5.3.3.1	Test conditions	Tested in the complete equipment	P
G.5.3.3.2	Winding temperatures	(See appended table B.3)	P
G.5.3.3.3	Winding temperatures - alternative test method	Alternative test method was not considered.	N/A
G.5.3.4	Transformers using FIW		N/A
G.5.3.4.1	General		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	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
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 .....		—
<b>G.6</b>	<b>Wire Insulation</b>		P
G.6.1	General		P
G.6.2	Enamelled winding wire insulation	Solvent-based enamel winding is not considered as basic insulation	N/A
<b>G.7</b>	<b>Mains supply cords</b>		N/A
G.7.1	General requirements	No power supply cord provided	N/A
	Type .....	See above	—
G.7.2	Cross sectional area (mm <sup>2</sup> or AWG).....		N/A
G.7.3	Cord anchorages and strain relief for non-detachable power supply cords		N/A
G.7.3.2	Cord strain relief		N/A



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Clause	Requirement + Test	Result - Remark	Verdict
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
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
<b>G.8</b>	<b>Varistors</b>		P
G.8.1	General requirements	Approved varistors used	P
G.8.2	Safeguards against fire	Control fire spread of 6.4.1 is chosen, and metallic enclosure used	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
<b>G.9</b>	<b>Integrated circuit (IC) current limiters</b>		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
<b>G.10</b>	<b>Resistors</b>		N/A
G.10.1	General	No such resistors	N/A
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

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Clause	Requirement + Test	Result - Remark	Verdict
<b>G.11</b>	<b>Capacitors and RC units</b>		P
G.11.1	General requirements	(see appended table 4.1.2) X and Y-capacitor used as safeguard and complied with IEC/EN 60384-14.	P
G.11.2	Conditioning of capacitors and RC units	At least 21 days at $40 \pm 2^\circ\text{C}$ and $93 \pm 3\%$ RH.	P
G.11.3	Rules for selecting capacitors	The selection followed with tables G.9 and G.12.	P
<b>G.12</b>	<b>Optocouplers</b>		P
	Optocouplers comply with IEC 60747-5-5 with specifics	The optocoupler used in the equipment and complied with IEC/EN 60747-5-5 or the requirements of 5.4. (see appended table 4.1.2)	P
	Type test voltage $V_{\text{ini,a}}$ .....	See above	—
	Routine test voltage, $V_{\text{ini,b}}$ .....	See above	—
<b>G.13</b>	<b>Printed boards</b>		P
G.13.1	General requirements	See below	P
G.13.2	Uncoated printed boards	The insulation between conductors on the outer surfaces of an uncoated printed board or over the outer surface of coated printed boards complied with the minimum clearance and creepage requirements.	P
G.13.3	Coated printed boards	No coated printed board used.	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
<b>G.14</b>	<b>Coating on components terminals</b>		N/A
G.14.1	Requirements .....	No coating on component terminals considered to affect creepage or clearances.	N/A
<b>G.15</b>	<b>Pressurized liquid filled components</b>		N/A
G.15.1	Requirements	No pressurized liquid filled components used.	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
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
<b>G.16</b>	<b>IC including capacitor discharge function (ICX)</b>		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
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
<b>H</b>	<b>CRITERIA FOR TELEPHONE RINGING SIGNALS</b>		N/A
<b>H.1</b>	<b>General</b>		N/A
<b>H.2</b>	<b>Method A</b>		N/A
<b>H.3</b>	<b>Method B</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
<b>J</b>	<b>INSULATED WINDING WIRES FOR USE WITHOUT INTERLEAVED INSULATION</b>		P
<b>J.1</b>	<b>General</b>		P
	Winding wire insulation ..... :	Approved triple insulation wire used as reinforced insulation	—

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Clause	Requirement + Test	Result - Remark	Verdict
	Solid round winding wire, diameter (mm)..... :	See above	N/A
	Solid square and rectangular (flatwise bending) winding wire, cross-sectional area (mm <sup>2</sup> ) ..... :		N/A
<b>J.2/J.3</b>	Tests and Manufacturing		—
<b>K</b>	<b>SAFETY INTERLOCKS</b>		N/A
<b>K.1</b>	<b>General requirements</b>		N/A
	Instructional safeguard..... :		N/A
<b>K.2</b>	<b>Components of safety interlock safeguard mechanism</b>		N/A
<b>K.3</b>	<b>Inadvertent change of operating mode</b>		N/A
<b>K.4</b>	<b>Interlock safeguard override</b>		N/A
<b>K.5</b>	<b>Fail-safe</b>		N/A
K.5.1	Under single fault condition		N/A
<b>K.6</b>	<b>Mechanically operated safety interlocks</b>		N/A
K.6.1	Endurance requirement		N/A
K.6.2	Test method and compliance ..... :		N/A
<b>K.7</b>	<b>Interlock circuit isolation</b>		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
<b>L</b>	<b>DISCONNECT DEVICES</b>		P
<b>L.1</b>	<b>General requirements</b>	Appliance coupler is considered as disconnect device.	P
<b>L.2</b>	<b>Permanently connected equipment</b>	The EUT is not permanently connected equipment	N/A
<b>L.3</b>	<b>Parts that remain energized</b>	When the equipment is disconnected from mains, no remaining parts at hazardous voltage in the equipment.	P
<b>L.4</b>	<b>Single-phase equipment</b>	The disconnect device disconnects both poles simultaneously.	P
<b>L.5</b>	<b>Three-phase equipment</b>		N/A
<b>L.6</b>	<b>Switches as disconnect devices</b>		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
<b>L.7</b>	<b>Plugs as disconnect devices</b>		N/A
<b>L.8</b>	<b>Multiple power sources</b>		N/A
	Instructional safeguard..... :		N/A
<b>M</b>	<b>EQUIPMENT CONTAINING BATTERIES AND THEIR PROTECTION CIRCUITS</b>		N/A
<b>M.1</b>	<b>General requirements</b>		N/A
<b>M.2</b>	<b>Safety of batteries and their cells</b>		N/A
M.2.1	Batteries and their cells comply with relevant IEC standards..... :		N/A
<b>M.3</b>	<b>Protection circuits for batteries provided within the equipment</b>		N/A
M.3.1	Requirements		N/A
M.3.2	Test method		N/A
	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
<b>M.4</b>	<b>Additional safeguards for equipment containing a portable secondary lithium battery</b>		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
<b>M.5</b>	<b>Risk of burn due to short-circuit during carrying</b>		N/A
M.5.1	Requirement		N/A
M.5.2	Test method and compliance		N/A
<b>M.6</b>	<b>Safeguards against short-circuits</b>		N/A
M.6.1	External and internal faults		N/A
M.6.2	Compliance		N/A
<b>M.7</b>	<b>Risk of explosion from lead acid and NiCd batteries</b>		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
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 <sup>3</sup> /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
	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
<b>M.8</b>	<b>Protection against internal ignition from external spark sources of batteries with aqueous electrolyte</b>		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 <sup>3</sup> /s).....		—
M.8.2.3	Correction factors .....		—
M.8.2.4	Calculation of distance $d$ (mm) .....		—
<b>M.9</b>	<b>Preventing electrolyte spillage</b>		N/A
M.9.1	Protection from electrolyte spillage		N/A
M.9.2	Tray for preventing electrolyte spillage		N/A
<b>M.10</b>	<b>Instructions to prevent reasonably foreseeable misuse</b>		N/A
	Instructional safeguard.....		N/A
<b>N</b>	<b>ELECTROCHEMICAL POTENTIALS</b>		N/A
	Material(s) used .....		—
<b>O</b>	<b>MEASUREMENT OF CREEPAGE DISTANCES AND CLEARANCES</b>		P
	Value of $X$ (mm) .....	Considered.	—
<b>P</b>	<b>SAFEGUARDS AGAINST CONDUCTIVE OBJECTS</b>		N/A
<b>P.1</b>	<b>General</b>	See the following details.	N/A
<b>P.2</b>	<b>Safeguards against entry or consequences of entry of a foreign object</b>		N/A
P.2.1	General		N/A
P.2.2	Safeguards against entry of a foreign object	The equipment is a building-in type and evaluation is to be made during the final system approval.	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Location and Dimensions (mm) .....	See above	—
P.2.3	Safeguards against the consequences of entry of a foreign object	See above	N/A
P.2.3.1	Safeguard requirements	See above	N/A
	The ES3 and PS3 keep-out volume in Figure P.3 not applicable to transportable equipment	See above	N/A
	Transportable equipment with metalized plastic parts .....	Not transportable equipment.	N/A
P.2.3.2	Consequence of entry test .....	See above	N/A
<b>P.3</b>	<b>Safeguards against spillage of internal liquids</b>		N/A
P.3.1	General	No liquids in the equipment	N/A
P.3.2	Determination of spillage consequences	See above	N/A
P.3.3	Spillage safeguards	See above	N/A
P.3.4	Compliance	See above	N/A
<b>P.4</b>	<b>Metallized coatings and adhesives securing parts</b>		N/A
P.4.1	General	No such construction	N/A
P.4.2	Tests	See above	N/A
	Conditioning, T <sub>c</sub> (°C) .....	See above	—
	Duration (weeks) .....	See above	—
<b>Q</b>	<b>CIRCUITS INTENDED FOR INTERCONNECTION WITH BUILDING WIRING</b>		N/A
<b>Q.1</b>	<b>Limited power sources</b>	Not LPS.	N/A
Q.1.1	Requirements	See above	N/A
	a) Inherently limited output	See above	N/A
	b) Impedance limited output	See above	N/A
	c) Regulating network limited output	See above	N/A
	d) Overcurrent protective device limited output	See above	N/A
	e) IC current limiter complying with G.9	See above	N/A
Q.1.2	Test method and compliance .....	See above	N/A
	Current rating of overcurrent protective device (A) .....	See above	N/A
<b>Q.2</b>	<b>Test for external circuits – paired conductor cable</b>	No such circuit within the EUT	N/A
	Maximum output current (A) .....	See above	N/A
	Current limiting method .....	See above	—
<b>R</b>	<b>LIMITED SHORT CIRCUIT TEST</b>		N/A
<b>R.1</b>	<b>General</b>		N/A
<b>R.2</b>	<b>Test setup</b>		N/A
	Overcurrent protective device for test .....		—
<b>R.3</b>	<b>Test method</b>		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Cord/cable used for test .....		—
<b>R.4</b>	<b>Compliance</b>		N/A
<b>S</b>	<b>TESTS FOR RESISTANCE TO HEAT AND FIRE</b>		N/A
<b>S.1</b>	<b>Flammability test for fire enclosures and fire barrier materials of equipment where the steady state power does not exceed 4 000 W</b>		N/A
	Samples, material .....	Metallic enclosure used. Also built-in product, fire enclosure shall be evaluated in ending products	—
	Wall thickness (mm) .....	See above	—
	Conditioning (°C) .....	See above	—
	Test flame according to IEC 60695-11-5 with conditions as set out	See above	N/A
	- Material not consumed completely	See above	N/A
	- Material extinguishes within 30s	See above	N/A
	- No burning of layer or wrapping tissue	See above	N/A
<b>S.2</b>	<b>Flammability test for fire enclosure and fire barrier integrity</b>		N/A
	Samples, material .....		—
	Wall thickness (mm) .....		—
	Conditioning (°C) .....		—
<b>S.3</b>	<b>Flammability test for the bottom of a fire enclosure</b>		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) .....		—
<b>S.4</b>	<b>Flammability classification of materials</b>		N/A
<b>S.5</b>	<b>Flammability test for fire enclosures and fire barrier materials of equipment where the steady state power exceeding 4 000 W</b>		N/A
	Samples, material .....		—
	Wall thickness (mm) .....		—
	Conditioning (°C) .....		—
<b>T</b>	<b>MECHANICAL STRENGTH TESTS</b>		P
<b>T.1</b>	<b>General</b>		P
<b>T.2</b>	<b>Steady force test, 10 N .....</b>	(See appended table T.2)	P
<b>T.3</b>	<b>Steady force test, 30 N .....</b>	built-in product, fire enclosure shall be evaluated in ending products	N/A
<b>T.4</b>	<b>Steady force test, 100 N .....</b>	See above	N/A
<b>T.5</b>	<b>Steady force test, 250 N .....</b>	See above	N/A



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Clause	Requirement + Test	Result - Remark	Verdict
<b>T.6</b>	<b>Enclosure impact test</b>	See above	N/A
	Fall test	See above	N/A
	Swing test	See above	N/A
<b>T.7</b>	<b>Drop test .....</b> :	See above	N/A
<b>T.8</b>	<b>Stress relief test .....</b> :	See above	N/A
<b>T.9</b>	<b>Glass Impact Test .....</b> :	See above	N/A
<b>T.10</b>	<b>Glass fragmentation test</b>		N/A
	Number of particles counted .....	See above	N/A
<b>T.11</b>	<b>Test for telescoping or rod antennas</b>		N/A
	Torque value (Nm) .....	See above	N/A
<b>U</b>	<b>MECHANICAL STRENGTH OF CATHODE RAY TUBES (CRT) AND PROTECTION AGAINST THE EFFECTS OF IMPLOSION</b>		N/A
<b>U.1</b>	<b>General</b>		N/A
	Instructional safeguard:	See above	N/A
<b>U.2</b>	<b>Test method and compliance for non-intrinsically protected CRTs</b>		N/A
<b>U.3</b>	<b>Protective screen</b>		N/A
<b>V</b>	<b>DETERMINATION OF ACCESSIBLE PARTS</b>		N/A
<b>V.1</b>	<b>Accessible parts of equipment</b>		N/A
V.1.1	General	The equipment for building-in. It should be evaluated for the final system.	N/A
V.1.2	Surfaces and openings tested with jointed test probes	See above	N/A
V.1.3	Openings tested with straight unjointed test probes	See above	N/A
V.1.4	Plugs, jacks, connectors tested with blunt probe	See above	N/A
V.1.5	Slot openings tested with wedge probe	See above	N/A
V.1.6	Terminals tested with rigid test wire	See above	N/A
<b>V.2</b>	<b>Accessible part criterion</b>		N/A
<b>X</b>	<b>ALTERNATIVE METHOD FOR DETERMINING CLEARANCES FOR INSULATION IN CIRCUITS CONNECTED TO AN AC MAINS NOT EXCEEDING 420 V PEAK (300 V RMS)</b>		N/A
	Clearance.....		N/A
<b>Y</b>	<b>CONSTRUCTION REQUIREMENTS FOR OUTDOOR ENCLOSURES</b>		N/A
<b>Y.1</b>	<b>General</b>	The equipment for building-in. It should be evaluated for the final system.	N/A
<b>Y.2</b>	<b>Resistance to UV radiation</b>		N/A
<b>Y.3</b>	<b>Resistance to corrosion</b>		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
<b>Y.3</b>	<b>Resistance to corrosion</b>		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
Y.3.4	Test procedure..... :		N/A
Y.3.5	Compliance		N/A
<b>Y.4</b>	<b>Gaskets</b>		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
<b>Y.5</b>	<b>Protection of equipment within an outdoor enclosure</b>		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
<b>Y.6</b>	<b>Mechanical strength of enclosures</b>		N/A
Y.6.1	General		N/A
Y.6.2	Impact test..... :		N/A

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

5.2 TABLE: Classification of electrical energy sources							P
Supply Voltage	Location (e.g. circuit designation)	Test conditions	Parameters				ES Class
			U (V)	I (mA)	Type <sup>1)</sup>	Additional Info <sup>2)</sup>	
264VAC	Primary input circuit	Normal	264Vac	--	SS	63Hz	ES3
		Abnormal	--	--	--	--	
		Single fault –SC	--	--	--	--	
264VAC	Vout(+) 24 V to EGND	Normal	16.7Vdc	--	SS	63Hz	ES1
		Abnormal	--	--	--	--	
		Single fault L500 shorted	13.7Vdc	--	SS	63Hz	
264VAC	Vout(-) 24 V to EGND	Normal	16.5Vdc	--	SS	63Hz	ES1
		Abnormal	--	--	--	--	
		Single fault L500 shorted	14.3Vdc	--	SS	63Hz	
264VAC	Vout(+) 5 V to EGND	Normal	9.2Vdc	--	SS	63Hz	ES1
		Abnormal	--	--	--	--	
		Single fault L500 shorted	9.8Vdc	--	SS	63Hz	
264VAC	Vout(-) 5 V to EGND	Normal	16.3Vdc	--	SS	63Hz	ES1
		Abnormal	--	--	--	--	
		Single fault L500 shorted	15.3Vdc	--	SS	63Hz	

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	Peak voltage (V)	RMS voltage (V)	Frequency (Hz)	Comments	
T1 pin 1-pin 7	356	169	--		
T1 pin 1-pin 8	368	170	--		
T1 pin 1-pin 9	356	169	--		
T1 pin 1-pin 10	362	169	--		
T1 pin 1-pin 11	370	169	--		
T1 pin 2-pin 7	408	169	--		
T1 pin 2-pin 8	378	169	--		
T1 pin 2-pin 9	402	170	--		

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Clause	Requirement + Test		Result - Remark	Verdict
T1 pin 2-pin 10	378	169	--	
T1 pin 2-pin 11	356	169	--	
T1 pin 4-pin 7	434	331	--	
T1 pin 4-pin 8	476	332	--	
T1 pin 4-pin 9	440	332	--	
T1 pin 4-pin 10	465	332	--	
T1 pin 4-pin 11	496	333	--	
T1 pin 6-pin 7	<b>560</b>	<b>356</b>	>30, <100	The Max R.M.S and Max.Vpeak
T1 pin 6-pin 8	552	343	--	
T1 pin 6-pin 9	552	346	--	
T1 pin 6-pin 10	544	344	--	
T1 pin 6-pin 11	544	341	--	
T300 pin 1-pin 3	436	203	--	
T300 pin 1-pin 4	460	217	--	
T300 pin 1-pin 5	436	203	--	
T300 pin 1-pin 6	<b>480</b>	<b>233</b>	>30, <100	The Max R.M.S and Max.Vpeak
T300 pin 2-pin 3	316	173	--	
T300 pin 2-pin 4	300	167	--	
T300 pin 2-pin 5	316	173	--	
T300 pin 2-pin 6	296	164	--	
T301 pin 2-pin 6	412	245	--	
T301 pin 2-pin 7	404	236	--	
T301 pin 2-pin 9	376	170	--	
T301 pin 2-pin 10	360	169	--	
T301 pin 4-pin 6	<b>420</b>	<b>254</b>	>30, <100	The Max R.M.S and Max.Vpeak
T301 pin 4-pin 7	408	246	--	
T301 pin 4-pin 9	360	170	--	
T301 pin 4-pin 10	360	169	--	
U601 pin 1-pin 3	364	170	--	
U601 pin 1-pin 4	362	170	--	
U601 pin 2-pin 3	362	170	--	
U601 pin 2-pin 4	362	170	--	
U602 pin 1-pin 3	360	171	--	

IEC 62368-1				
Clause	Requirement + Test	Result - Remark		Verdict
U602 pin 1-pin 4	360	171	--	
U602 pin 2-pin 3	360	171	--	
U602 pin 2-pin 4	360	171	--	
U600 pin 1-pin 3	364	169	--	
U600 pin 1-pin 4	364	169	--	
U600 pin 2-pin 3	364	169	--	
U600 pin 2-pin 4	364	169	--	
C600primary to secondary	364	170	--	
Supplementary information:				

5.4.1.10.2 TABLE: Vicat softening temperature of thermoplastics				N/A
Method .....			-	—
Object/ Part No./Material	Manufacturer/trademark	Thickness (mm)	T softening (°C)	
-	-	-	-	
Supplementary information:				

5.4.1.10.3 TABLE: Ball pressure test of thermoplastics					P
Allowed impression diameter (mm) .....				≤ 2 mm	—
Object/Part No./Material	Manufacturer/trademark	Thickness (mm)	Test temperature (°C)	Impression diameter (mm)	
AC terminal	See table 4.1.2	See table 4.1.2	125	1.1	
Supplementary information:					

5.4.2, 5.4.3 TABLE: Minimum Clearances/Creepage distance								P
Clearance (cl) and creepage distance (cr) at/of/between:	U <sub>p</sub> (V)	U <sub>rms</sub> (V)	Freq <sup>1)</sup> (Hz)	Required cl (mm)	cl (mm)	E.S. <sup>2)</sup> (V)	Required cr (mm)	cr (mm)
Basic /supplementary								
Between L and N	420	250	--	2.0	5.0	--	2.9	5.0
Different poles of fuse F1 under PCB	420	250	--	2.0	3.0	--	2.9	3.0
Different poles of fuse F2 under PCB	420	250	--	2.0	3.0	--	2.9	3.0
Between L and G	420	250	--	2.0	4.0	--	2.9	4.0
Primary trace to earthed trace	420	250	--	2.0	3.2	--	2.9	3.2
Primary trace to earthed trace under C5	420	250	--	2.0	4.0	--	2.9	4.0

IEC 62368-1								
Clause	Requirement + Test			Result - Remark				Verdict
BDA1 body to metal enclosure	420	250	--	2.0	4.0	--	2.9	4.0
RV1 body to metal enclosure	420	250	--	2.0	3.9	--	2.9	3.9
Primary trace to earthed trace under SG1	420	250	--	2.0	5.0	--	2.9	5.0
CR201 body to metal enclosure	420	250	--	2.0	3.0	--	2.9	3.0
T301 core to secondary component	420	254	--	2.0	3.4	--	2.9	3.4
T1 core to secondary heat sink (HS1)	560	356	--	2.0	8.0	--	3.7	8.0
Reinforced:								
Opto-coupler primary trace to secondary trace (U600, U601, U602)	420	250	--	4.0	8.0	--	5.7	8.0
Y-cap primary trace to secondary trace (C600)	420	250	--	4.0	8.0	--	5.7	8.0
Primary trace to secondary trace under T300	<b>480</b>	<b>233</b>	>30, <100	4.0	6.8	--	6.0	6.8
Primary trace to secondary trace under T301	<b>420</b>	<b>254</b>	>30, <100	4.0	8.4	--	5.7	8.4
Primary trace to secondary trace under T1	<b>560</b>	<b>356</b>	>30, <100	4.0	10.0	--	7.3	10.0
Primary trace to secondary trace	420	250	--	4.0	6.0	--	5.7	6.0
C600 primary Pin to T300 Core	480	233	--	4.0	6.1	--	6.0	6.1
Supplementary information:								
1) Only for frequency above 30 kHz								
2) The product is to be operated up to 4000m above sea level, the minimum clearances were multiplied by the factor given in Table A.2 of IEC 60664-1: 1.29.								

5.4.4.2	TABLE: Minimum distance through insulation				P
Distance through insulation (DTI) at/of	Peak voltage (V)	Insulation	Required DTI (mm)	Measured DTI (mm)	

IEC 62368-1				
Clause	Requirement + Test	Result - Remark		Verdict
Optical Isolator	≤420	--	0.4	≥0.4
Mylar between power bard and metallic chassis	≤420	--	0.4	≥0.4
Supplementary information: See appended table 4.1.2				

5.4.4.9	TABLE: Solid insulation at frequencies >30 kHz						N/A
Insulation material	$E_P$	Frequency (kHz)	$K_R$	Thickness $d$ (mm)	Insulation	$V_{PW}$ (Vpk)	
Supplementary information:							

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	
<b>ON COMPLETE SYSTEM:</b>					
Basic/Supplemental – Primary to earthed chassis	DC		2500	No	
Reinforced – Primary to SELV secondary	DC		4000	No	
<b>Safety Insulator:</b>					
1 layer insulation tape 1K7170 on T300 for R/I	DC		4000	No	
1 layer insulation tape PZ on T1/T301 for R/I	DC		4000	No	
Supplementary information:					

5.5.2.2	TABLE: Stored discharge on capacitors					P
Location	Supply voltage (V)	Operating and fault condition <sup>1)</sup>	Switch position	Measured voltage (Vpk)	ES Class	
L to N	264	Normal	--	0	ES1	
L to N	264	R1 open	--	0	ES1	
Supplementary information: X-capacitors installed for testing: see table 4.1.2 <input checked="" type="checkbox"/> bleeding resistor rating: R1=R2=R3=R4=200Kohm, 1/4W <input type="checkbox"/> 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
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IEC 62368-1				
Clause	Requirement + Test	Result - Remark	Verdict	
Location	Test current (A)	Duration (min)	Voltage drop (V)	Resistance ( $\Omega$ )
Metallic chassis	40	2	0.12	0.003
Metallic chassis	32	2	0.714	0.022
Supplementary information: Shall be investigated in the end system/equipment				

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)	
Output +/- to GND	Normal	264	--	Max. 0.186	--	ES1
Output +/- to GND	According to IEC 60990 cl 6.2.2.2	264	--	Max. 0.189	--	ES1
Supplementary information:						

5.7.5	TABLE: Earthed accessible conductive part				P
Supply voltage (V) .....	264				—
Phase(s) .....	[X] Single Phase; [ ] Three Phase: [ ] Delta [ ] Wye				
Power Distribution System .....	<input checked="" type="checkbox"/> TN <input type="checkbox"/> TT <input type="checkbox"/> IT				
Location	Fault Condition No in IEC 60990 clause 6.2.2	Touch current (mA)	Comment		
Metallic chassis	Normal	1.30	--		
Metallic chassis	According to IEC 60990 cl 6.1 & cl 6.2.2	Max. 1.30	--		
Supplementary Information: ES2 limit: 7.07 mA peak					

5.8	TABLE: Backfeed safeguard in battery backed up supplies					N/A
Location	Supply voltage (V)	Operating and fault condition	Time (s)	Open-circuit voltage (V)	Touch current (A)	ES Class
Supplementary information:						
Abbreviation: SC= short circuit, OC= open circuit						

6.2.2	TABLE: Power source circuit classifications					P
Location	Operating and fault condition	Voltage (V)	Current (A)	Max. Power <sup>1)</sup> (W)	Time (S)	PS class
All components located within the equipment	Normal	264	--	>100	>5	PS3



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Clause	Requirement + Test	Result - Remark	Verdict

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	
All primary circuits are considered as arcing PIS.	-	-	-	Yes	
Supplementary information:					
An Arcing PIS requires a minimum of 50 V (peak) a.c. or d.c. An Arcing PIS is established when the product of the open circuit voltage ( $V_p$ ) and normal operating condition rms current ( $I_{rms}$ ) is greater than 15.					

6.2.3.2	TABLE: Determination of resistive PIS			P
Location	Operating and fault condition	Dissipate power (W)		Arcing PIS? Yes / No
All components located within the equipment are considered as resistive PIS.	-	-		Yes
Supplementary information:				

8.5.5	TABLE: High pressure lamp				N/A
Lamp manufacturer	Lamp type	Explosion method	Longest axis of glass particle (mm)	Particle found beyond 1 m Yes / No	
Supplementary information:					

9.6	TABLE: Temperature measurements for wireless power transmitters								N/A
Supply voltage (V) .....		-						—	
Max. transmit power of transmitter (W) .....		-						—	
Foreign objects	w/o receiver and direct contact		with receiver and direct contact		with receiver and at distance of 2 mm		with receiver and at distance of 5 mm		
	Object (°C)	Ambient (°C)	Object (°C)	Ambient (°C)	Object (°C)	Ambient (°C)	Object (°C)	Ambient (°C)	
Supplementary information:									
No such wireless power transmitter									

5.4.1.4, 9.3, B.1.5, B.2.6	TABLE: Temperature measurements	P
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IEC 62368-1					
Clause	Requirement + Test			Result - Remark	Verdict
<b>&lt;For product supplied by AC terminal&gt;</b>					
Supply voltage (V) .....	See below				—
Ambient temperature during test $T_{amb}$ (°C) .....	See below				—
Maximum measured temperature $T$ of part/at:	$T$ (°C)				Allowed $T_{max}$ (°C)
Input voltage	90 V, 47 Hz	264 V, 60 Hz	90 V, 50 Hz	264V, 63 Hz	--
AC terminal	73.8	62.4	82.1	78.0	105
RV3 body	74.4	62.8	82.5	78.2	85
L1 coil	83.3	64.7	85.5	79.0	155
C5 body	83.8	63.9	85.1	78.6	125
L2 coil	100.5	63.4	87.6	77.1	155
C9 body	88.5	65.0	87.8	79.3	125
PCB near CR201	93.7	65.3	87.8	79.3	130
K1 body	82.8	66.4	83.2	81.3	85
C4 body	77.0	65.3	85.2	80.4	125
C254 body	74.3	66.2	85.1	81.3	125
C3 body	74.3	66.8	85.7	82.8	100
RV4 body	72.5	65.6	82.5	82.0	85
BDA1 body	72.5	67.7	85.5	83.4	105
L200 coil	88.5	70.4	93.6	82.1	155
PCB near Q3	72.2	61.7	81.0	77.4	130
T301 core	57.0	55.0	74.2	74.0	90
T301 coil	59.1	56.6	75.7	75.6	90
L300 coil	73.5	69.1	80.8	78.9	130
RV2 body	69.8	63.7	82.5	80.2	85
T300 coil	83.7	81.0	88.7	88.6	90
T300 core	73.7	72.2	87.2	86.4	90
C600 body	70.5	68.3	84.9	83.7	125
T1 coil	93.4	91.7	109.0	108.0	110
T1 core	82.3	80.6	98.2	97.2	110
U601 body	55.0	54.4	74.5	74.2	100
U602 body	54.9	54.5	73.9	73.6	100
U600 body	54.9	54.5	73.6	73.4	100
PCB near US1	74.1	72.9	85.7	85.0	130

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Clause	Requirement + Test	Result - Remark			Verdict
L500 coil	60.3	60.0	76.1	75.7	130
C411 body	56.8	56.6	74.5	74.2	105
C410 body	54.8	54.8	73.2	73.0	105
PCB near IC1	95.9	89.9	108.3	105.8	130
PCB near IC17	54.2	54.4	73.7	73.5	130
Fan body	53.2	53.7	73.0	72.9	130
Output connector	52.4	52.7	71.8	71.8	125
PCB near output	56.7	56.5	74.1	73.8	130
Enclosure	59.7	56.1	75.4	74.0	Ref.
Mylar sheet	64.8	59.8	78.4	76.5	115
Ambient	50.1	50.6	70.0	70.1	--

**Supplementary information:**

The temperatures were measured under worst normal mode defined in Annex B.2.5.

<sup>1)</sup> Limited for maximum ambient temperature of 50°C or 70°C condition.

Operated in the most unfavorable way of operation given in the operating instructions until steady conditions established.

5.4.1.4, 9.3, B.1.5, B.2.6	TABLE: Temperature measurements <For product supplied by AC inlet>				P
Supply voltage (V) .....	See below				—
Ambient temperature during test $T_{amb}$ (°C) .....	See below				—
Maximum measured temperature $T$ of part/at:	$T$ (°C)				Allowed $T_{max}$ (°C)
Input voltage	90 V, 47 Hz	264 V, 60 Hz	90 V*, 50 Hz	264V*, 63 Hz	--
AC inlet	62.3	60.2	65.3	64.2	70
AC terminal	58.2	55.5	65.9	63.6	85
Fan body	55.8	74.0	64.7	62.7	130
L1 coil	78.1	67.8	82.2	72.6	155
C5 body	80.3	67.0	83.1	71.9	125
L2 coil	93.4	65.3	89.0	70.1	155
PCB near CR201	84.7	67.3	86.9	72.2	130
K1 body	74.8	66.5	74.7	71.6	85
C4 body	74.1	67.4	80.2	72.3	125
C254 body	71.7	67.2	78.8	72.1	125
RV3 body	68.5	64.8	74.9	70.3	85

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Clause	Requirement + Test	Result - Remark			Verdict	
C3 body		68.3	67.8	77.5	72.9	100
RV4 body		65.7	64.9	74.7	70.4	85
BDA1 body		65.9	64.8	74.6	70.3	105
L200 coil		83.3	71.5	88.9	75.8	155
PCB near Q3		75.9	66.7	80.4	71.8	130
T301 core		60.4	59.9	69.5	68.2	90
T301 coil		59.2	58.8	68.4	67.2	90
L300 coil		73.9	73.5	79.2	76.6	130
RV2 body		64.1	63.3	73.2	69.1	85
T300 coil		87.5	85.9	88.7	86.5	90
T300 core		79.7	81.5	87.4	84.7	90
C600 body		67.3	68.6	75.9	72.9	125
T1 coil		92.6	94.2	103.0	87.5	110
T1 core		73.8	75.0	84.1	75.3	110
U601 body		58.9	60.1	69.7	68.0	100
U602 body		58.4	59.7	68.8	67.0	100
U600 body		58.7	59.9	69.3	67.4	100
PCB near US1		75.0	76.6	81.4	78.1	130
L500 coil		68.6	70.3	75.4	73.0	130
PCB near IC1		58.2	59.2	68.6	67.3	130
PCB near IC17		90.8	91.8	100.4	91.9	130
C411 body		58.1	59.2	66.7	65.3	105
C410 body		56.7	57.9	65.9	64.3	105
Output connector		57.5	57.6	65.5	64.5	125
PCB near output		57.4	58.3	66.2	65.1	130
Enclosure		60.4	59.8	69.4	66.1	Ref.
Mylar sheet		56.8	55.9	66.2	63.6	115
C9 body		110.3	75.7	106.3	78.2	125
Ambient		50.0	50.0	60.0	60.0	--
<b>Supplementary information:</b>						
The temperatures were measured under worst normal mode defined in Annex B.2.5.						
1) Limited for maximum ambient temperature of 50°C or 60°C condition.						
*output from full loading to 75% loading when operate temperature was 60°C						

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Clause	Requirement + Test	Result - Remark	Verdict

B.2.5 TABLE: Input test							P
U (V)	I (A)	I <sub>rated</sub> (A)	P (W)	P <sub>rated</sub> (W)	Fuse #	I <sub>fuse</sub> (A)	Condition/status
90/47Hz	5.13	--	460.7	--	F1/F2	5.13	Maximum Normal Load
90/63Hz	5.14	--	460.4	--	F1/F2	5.14	Maximum Normal Load
100/47Hz	4.55	5	455.5	--	F1/F2	4.55	Maximum Normal Load
100/63Hz	4.56	5	456.1	--	F1/F2	4.56	Maximum Normal Load
240/47Hz	1.83	5	436.7	--	F1/F2	1.83	Maximum Normal Load
240/63Hz	1.83	5	437.0	--	F1/F2	1.83	Maximum Normal Load
264/47Hz	1.66	--	435.4	--	F1/F2	1.66	Maximum Normal Load
264/63Hz	1.67	--	435.9	--	F1/F2	1.67	Maximum Normal Load

**Supplementary information:** The steady state input current did not exceed the rated current at the rated voltage by more than 10 percent under maximum normal load.  
Maximum Normal Load – DC output: 24Vdc, 16.7A; 5Vsb,1A; 400W Max.

B.3, B.4 TABLE: Abnormal operating and fault condition tests							P
Ambient temperature T <sub>amb</sub> (°C)..... :					50 if no other specified.		—
Power source for EUT: Manufacturer, model/type, output rating :					--		—
Component No.	Condition	Supply voltage (V)	Test time	Fuse no.	Fuse current (A)	Observation	
For product supplied by AC terminal:							
BDA1	s-c	240 Vac	< 1 s	F1/F2	0	F1, F2 Fuse opened, no hazards	
CR201	s-c	240 Vac	< 1 s	F1/F2	0	F1, F2 Fuse opened, no hazards	
IC 200 PIN 2-5	s-c	240 Vac	10min	F1/F2	0.11	IC200 damaged, total repeat three times no hazards	
IC 200 PIN 3-6	s-c	240 Vac	10min	F1/F2	0.18	Unit shut down, recoverable. No damage, no hazards.	
Q200 D-G	s-c	240 Vac	< 1 s	F1/F2	0	F1, F2 Fuse opened, Q200 damaged, no hazards	

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Clause	Requirement + Test	Result - Remark	Verdict

B.3, B.4		TABLE: Abnormal operating and fault condition tests					P
Ambient temperature $T_{amb}$ (°C)..... :		50 if no other specified.				—	
Power source for EUT: Manufacturer, model/type, outputrating :		--				—	
Component No.	Condition	Supply voltage (V)	Test time	Fuse no.	Fuse current (A)	Observation	
Q200 D-S	s-c	240 Vac	< 1 s	F1/F2	0	F1,F2 Fuse opened,Q200 damaged, no hazards	
Q200 G-S	s-c	240 Vac	10min	F1/F2	0.18	Unit shut down, recoverable. No damage, no hazards	
Q3 D-G	s-c	240 Vac	< 1 s	F1/F2	0	F1,F2 Fuse opened,Q3 damaged, no hazards	
Q3 D-S	s-c	240 Vac	< 1 s	F1/F2	0	F1,F2 Fuse opened,Q3 damaged, no hazards	
Q3 G-S	s-c	240 Vac	10min	F1/F2	0.18	Unit shut down, recoverable. No damage, no hazards	
Q301 D-G	s-c	240 Vac	< 1 s	F1/F2	0	F1,F2 Fuse opened,Q301 damaged, no hazards	
Q301 D-S	s-c	240 Vac	< 1 s	F1/F2	0	F1,F2 Fuse opened,Q301 damaged, no hazards	
Q301 G-S	s-c	240 Vac	10min	F1/F2	0.18	Unit shut down, recoverable. No damage, no hazards	
T300 PIN 1-2	s-c	240 Vac	10min	F1/F2	0.18	Unit shut down, recoverable. No damage, no hazards	
T300 PIN 3-5	s-c	240 Vac	10min	F1/F2	0.18	Unit shut down, recoverable. No damage, no hazards	
T300 PIN 4-6	s-c	240 Vac	10min	F1/F2	0.18	Unit shut down, recoverable. No damage, no hazards	
Q402 D-G	s-c	240 Vac	10min	F1/F2	1.83	Unit normal working. No damage, no hazards	
Q402 D-S	s-c	240 Vac	10min	F1/F2	1.83	Unit normal working. no damage, no hazards	
Q402 G-S	s-c	240 Vac	240 Vac	10min	1.83	Unit normal working. No damage, no hazards	
IC 405 PIN 2-5	s-c	240 Vac	240 Vac	10min	1.83	Unit normal working. No damage, no hazards	
IC 405PIN 6-3	s-c	240 Vac	240 Vac	10min	1.83	Unit normal working. No damage, no hazards	
Q504 D-G	s-c	240 Vac	10min	F1/F2	0.18	PIC900 damaged, repeat three times. no hazards	
Q504 D-S	s-c	240 Vac	10min	F1/F2	0.18	PIC900 damaged, repeat three times. no hazards	
Q504 G-S	s-c	240 Vac	10min	F1/F2	0.18	PIC900 damaged, repeat three times. no hazards	
C410	s-c	240 Vac	10min	F1/F2	0.18	Unit shut down, recoverable. No damage, no hazards	

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Clause	Requirement + Test	Result - Remark	Verdict

B.3, B.4		TABLE: Abnormal operating and fault condition tests					P
Ambient temperature $T_{amb}$ (°C)..... :		50 if no other specified.				—	
Power source for EUT: Manufacturer, model/type, output rating :		--				—	
Component No.	Condition	Supply voltage (V)	Test time	Fuse no.	Fuse current (A)	Observation	
IC 401 PIN 2-5	s-c	240 Vac	10min	F1/F2	0.18	Unit shut down, recoverable. No damage, no hazards	
IC 401 PIN 6-3	s-c	240 Vac	10min	F1/F2	0.18	Unit shut down, recoverable. No damage, no hazards	
T301 PIN 2-4	s-c	240 Vac	10min	F1/F2	0.18	Unit shut down, recoverable. No damage, no hazards	
T301 PIN 6-7	s-c	240 Vac	10min	F1/F2	0.18	Unit shut down, recoverable. No damage, no hazards	
T301 PIN 9-10	s-c	240 Vac	10min	F1/F2	0.18	Unit shut down, recoverable. No damage, no hazards	
U600 PIN 1-2	s-c	240 Vac	10min	F1/F2	0.18	Unit shut down, recoverable. No damage, no hazards	
U600 PIN 3-4	s-c	240 Vac	10min	F1/F2	0.18	Unit shut down, recoverable. No damage, no hazards	
U600 PIN 1	O-C	240 Vac	10min	F1/F2	0.18	Unit shut down, recoverable. No damage, no hazards	
U600 PIN 3	O-C	240 Vac	10min	F1/F2	0.18	Unit shut down, recoverable. No damage, no hazards	
U602 PIN 1-2	s-c	240 Vac	10min	F1/F2	1.83	Unit normal working. no damage, no hazards	
U602 PIN 3-4	s-c	240 Vac	10min	F1/F2	1.83	Unit normal working. no damage, no hazards	
U602 PIN 1	O-C	240 Vac	10min	F1/F2	1.83	Unit normal working. no damage, no hazards	
U602 PIN 3	O-C	240 Vac	10min	F1/F2	1.83	Unit normal working. no damage, no hazards	
Q904 D-G	s-c	240 Vac	10min	F1/F2	0.18	PIC900damaged, repeat three times, no hazards	
Q904 D-S	s-c	240 Vac	10min	F1/F2	0.18	PIC900damaged, repeat three times, no hazards	
Q904 G-S	s-c	240 Vac	10min	F1/F2	0.18	PIC900damaged, repeat three times, no hazards	
IC 17 PIN BBA-GND	s-c	240 Vac	10min	F1/F2	0.18	Unit shut down, recoverable. No damage, no hazards	
IC 17 PIN BBA-GND S	s-c	240 Vac	10min	F1/F2	0.18	Unit shut down, recoverable. No damage, no hazards	
IC 17 PIN DRAIN VCC	s-c	240 Vac	10min	F1/F2	0.18	Unit shut down, recoverable. No damage, no hazards	

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

B.3, B.4		TABLE: Abnormal operating and fault condition tests					P
Ambient temperature $T_{amb}$ (°C)..... :		50 if no other specified.				—	
Power source for EUT: Manufacturer, model/type, outputrating :		--				—	
Component No.	Condition	Supply voltage (V)	Test time	Fuse no.	Fuse current (A)	Observation	
T1 PIN 1-2	s-c	240 Vac	10min	F1/F2	0.18	Unit shut down, recoverable. No damage, no hazards	
T1 PIN 4-6	s-c	240 Vac	10min	F1/F2	0.18	Unit shut down, recoverable. No damage, no hazards	
T1 PIN 7-8	s-c	240 Vac	10min	F1/F2	0.18	Unit shut down, recoverable. No damage, no hazards	
T1 PIN 9-11	s-c	240 Vac	10min	F1/F2	0.18	Unit shut down, recoverable. No damage, no hazards	
Q1 D-G	s-c	240 Vac	10min	F1/F2	0.18	Unit shut down, recoverable. No damage, no hazards	
Q1 D-S	s-c	240 Vac	10min	F1/F2	0.18	Unit shut down, recoverable. No damage, no hazards	
Q1 G-S	s-c	240 Vac	10min	F1/F2	0.18	Unit shut down, recoverable. No damage, no hazards	
IC1 PIN 4-13	s-c	240 Vac	10min	F1/F2	0.18	Unit shut down, recoverable. No damage, no hazards	
IC1 PIN 10-14	s-c	240 Vac	10min	F1/F2	0.18	Unit shut down, recoverable. No damage, no hazards	
T301 PIN 2-4	s-c	240 Vac	10min	F1/F2	0.18	Unit shut down, recoverable. No damage, no hazards	
T301 PIN 9-10	s-c	240 Vac	10min	F1/F2	0.18	Unit shut down, recoverable. No damage, no hazards	
T301 PIN 6-7	s-c	240 Vac	10min	F1/F2	0.18	Unit shut down, recoverable. No damage, no hazards	
T1 PIN 1-2	s-c	240 Vac	10min	F1/F2	0.18	Unit shut down, recoverable. No damage, no hazards	
T1 PIN 4-6	s-c	240 Vac	10min	F1/F2	0.18	Unit shut down, recoverable. No damage, no hazards	
T1 PIN 7-8	s-c	240 Vac	10min	F1/F2	0.18	Unit shut down, recoverable. No damage, no hazards	
T1 PIN 9-11	s-c	240 Vac	10min	F1/F2	0.18	Unit shut down, recoverable. No damage, no hazards	



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

B.3, B.4		TABLE: Abnormal operating and fault condition tests					P
Ambient temperature $T_{amb}$ (°C)..... :		50 if no other specified.					—
Power source for EUT: Manufacturer, model/type, outputrating :		--					—
Component No.	Condition	Supply voltage (V)	Test time	Fuse no.	Fuse current (A)	Observation	
T300	o-l	240 Vac	4hrs and 42min	F1/F2	1.831 to 1.893 to 2.041to 0.182	The max loading to1.5A, Unit shut down when the loading to 1.6A. and output loading the normal load. no damage, no hazards. The maximum temperature were: T301 coil: 60.2°C; T301 core: 59.3°C, T300 core: 79.8°C; T300 coil: 88.7°C, T1 coil: 97.3 T1 core: 86.4, Ambient: 51.7°C; no damage; no hazards.	
Opening	blocked	240 Vac	2hrs and 25min	F1/F2	1.831	Normal working. no damage, no hazards The maximum temperature were: T301 coil: 68.2°C; T301 core: 67.5°C, T300 core: 81.5°C; T300 coil: 91.3°C, T1 coil: 116.2°C; T1 core: 103.4°C, Ambient: 50.2°C; no damage; no hazards.	
Fan	locked	240 Vac	2hrs and 24min	F1/F2	1.836	Normal working. no damage, no hazards The maximum temperature were: T301 coil: 70.0°C; T301 core: 69.7°C, T300 core: 80.9°C,; T300 coil: 86.3°C T1 coil: 116.8°C; T1 core: 104.4°C, Ambient: 50.0°C; no damage; no hazards.	

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

B.3, B.4		TABLE: Abnormal operating and fault condition tests					P
Ambient temperature $T_{amb}$ (°C)..... :		50 if no other specified.					—
Power source for EUT: Manufacturer, model/type, output rating :		--					—
Component No.	Condition	Supply voltage (V)	Test time	Fuse no.	Fuse current (A)	Observation	
5V	o-l	240	4hrs01 mins	F1/F2	1.831 to 1.836 to 1.842 to 1.801	The max loading to 3.6A, 5Vbs Unit shut down when the loading to 3.7A. no damage, no hazards. The maximum temperature were: T301 coil: 64.8°C; T301 core: 63.8°C, T300 core: 72.9°C; T300 coil: 82.1°C, T1 coil: 99.5°C; T1 core: 85.8°C, Ambient: 51.2°C; no damage; no hazards.	
24V	o-l	240	4hrs56 mins	F1/F2	1.831 to 1.872 to 2.039 to 0.186	The max loading to 18.8A, Unit shut down when the loading to 18.9A. no damage, no hazards. The maximum temperature were: T301 coil: 59.6°C; T301 core: 58.4°C, T300 core: 78.0°C; T300 coil: 89.5°C, T1 coil: 96.2°C, T1 core: 86.1°C, Ambient: 51.3°C; no damage; no hazards.	
For product supplied by AC inlet:							
T300	o-l	240	6hrs56 mins	F1,F2	1.831 to 1.893 to 2.041 to 0.182	The max loading to 1.5A, Unit shut down when the loading to 1.6A. and output loading the normal load. no damage, no hazards. The maximum temperature were: T301 coil: 60.1°C; T301 core: 59.5°C, T300 core: 82.1°C; T300 coil: 95.1°C, T1 coil: 95.0°C, T1 core: 89.0°C, Ambient: 50.6°C; no damage ; no hazards.	

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

B.3, B.4		TABLE: Abnormal operating and fault condition tests					P
Ambient temperature $T_{amb}$ (°C)..... :		50 if no other specified.					—
Power source for EUT: Manufacturer, model/type, output rating :		--					—
Component No.	Condition	Supply voltage (V)	Test time	Fuse no.	Fuse current (A)	Observation	
Opening	blocked	240	2hrs45 mins;	F1,F2	1.831	Normal working. no damage, no hazards The maximum temperature were: T301 coil: 95.6°C; T301 core: 93.8°C, T300 core: 106.0°C; T300 coil: 114.6°C, T1 coil: 122.3°C; T1 core: 115.6°C, Ambient: 50.0°C; no damage; no hazards.	
Fan	locked	240	1hrs24 mins	F1,F2	1.836	Normal working. no damage, no hazards The maximum temperature were: T301 coil: 94.0°C; T301 core: 92.0°C, T300 core: 115.8°C; T300 coil: 118.3°C, T1 coil: 138.7°C; T1 core: 129.2°C, Ambient: 49.9°C; no damage; no hazards.	
5V	o-l	240	4hrs01 mins	F1,F2	1.846 to 1.884 to 1.887 to 0.22	The max loading to 3.6A, Unit shut down when the loading to 3.7A. no damage, no hazards. The maximum temperature were: T301 coil: 60.0°C; T301 core: 54.4°C, T300 core: 84.3°C; T300 coil: 93.7°C, T1 coil: 105.0°C; T1 core: 99.5°C, Ambient: 50.4°C; no damage; no hazards.	

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

<b>B.3, B.4</b>	<b>TABLE: Abnormal operating and fault condition tests</b>					<b>P</b>
Ambient temperature $T_{amb}$ (°C)..... :					50 if no other specified.	—
Power source for EUT: Manufacturer, model/type, output rating :					--	—
Component No.	Condition	Supply voltage (V)	Test time	Fuse no.	Fuse current (A)	Observation
24V	o-l	240	6hrs56 mins	F1,F2	1.885 to 1.962 to 2.045 to 0.179	The max loading to 18.8A, Unit shut down when the loading to 18.9A. no damage, no hazards. The maximum temperature were: T301 coil: 58.2°C; T301 core: 57.4°C, T300 core: 81.9°C; T300 coil: 95.1°C, T1 coil: 94.9°C, T1 core: 85.8°C, Ambient: 50.0°C; no damage; no hazards.

**Supplementary information:**

- 1) Whenever the abnormal test caused fuses to open, the fuse body was intact.
- 2) In fault column, where s-c=short-circuited and o-l=overload, o-c = open circuit.
- 3) Test items where components were damaged were repeated twice with same outcome.
- 4) Transformer overload is considered during output overload test.
- 5) In Observation column,  
 NH = No hazard;  
 CT = Constant temperatures were obtained;  
 IP = Internal protection operated (component indicated);  
 CD = Components damaged (damaged components indicated);  
 NB = No indication of dielectric breakdown;  
 NC = Cheesecloth remained intact;  
 NT = Tissue paper remained intact.

<b>M.3</b>	<b>TABLE: Protection circuits for batteries provided within the equipment</b>					<b>N/A</b>
Is it possible to install the battery in a reverse polarity position?.. :					—	
Equipment Specification	Charging					
	Voltage (V)			Current (A)		
Manufacturer/type	Battery specification					
	Non-rechargeable batteries		Rechargeable batteries			
	Discharging current (A)	Unintentional charging current (A)	Charging		Discharging current (A)	Reverse charging current (A)
			Voltage (V)	Current (A)		

IEC 62368-1							
Clause	Requirement + Test				Result - Remark		Verdict
Note: The tests of M.3.2 are applicable only when above appropriate data is not available.							
Specified battery temperature (°C) .....							
Component No.	Fault condition	Charge/discharge mode	Test time	Temp. (°C)	Current (A)	Voltage (V)	Observation
Supplementary information: Abbreviation: SC= short circuit; OC= open circuit NL= no chemical leakage; NS= no spillage of liquid; NE= no explosion; NF= no emission of flame or expulsion of molten metal.							

M.4.2	TABLE: Charging safeguards for equipment containing a secondary lithium battery					N/A
Maximum specified charging voltage (V) .....						—
Maximum specified charging current (A) .....						—
Highest specified charging temperature (°C) .....						
Lowest specified charging temperature (°C) .....						
Battery manufacturer/type	Operating and fault condition	Measurement			Observation	
		Charging voltage (V)	Charging current (A)	Temp. (°C)		
Supplementary information: Abbreviation: SC= short circuit; OC= open circuit; MSCV= maximum specified charging voltage; MSCC= maximum specified charging current; HSCT= highest specified charging temperature; LSCT= lowest specified charging temperature						

Q.1	TABLE: Circuits intended for interconnection with building wiring (LPS)						N/A
Output Circuit	Condition	U <sub>oc</sub> (V)	Time (s)	I <sub>sc</sub> (A)		S (VA)	
				Meas.	Limit	Meas.	Limit
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-
Supplementary Information: No LPS circuits							

T.2, T.3, T.4, T.5	TABLE: Steady force test						P
Part/Location	Material	Thickness (mm)	Probe	Force (N)	Test Duration (s)	Observation	
All components other	--	N/A	N/A	10	5	Neither conductors are loosened, detached, nor are safeguards defeated	
Supplementary information: Built-in equipment, other steady force test shall be performed on ending product.							

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

T.6, T.9	TABLE: Impact test			N/A
Location/part	Material	Thickness (mm)	Height (mm)	Observation

Supplementary information: Built-in equipment, shall be evaluated on ending product.

T.7	TABLE: Drop test			N/A
Location/part	Material	Thickness (mm)	Height (mm)	Observation

Supplementary information:

T.8	TABLE: Stress relief test				N/A
Location/Part	Material	Thickness (mm)	Oven Temperature (°C)	Duration (h)	Observation

Supplementary information:-

X	TABLE: Alternative method for determining minimum clearances distances			N/A
Clearance distanced between:	Peak of working voltage (V)	Required cl (mm)	Measured cl (mm)	

Supplementary information:

**List of test equipment used:**

A completed list of used test equipment shall be provided in the Test Reports when a Manufacturer Testing Laboratory according to TMP/CTF stage 1 or WMT/CTF stage 2 procedure has been used.

<b>Manufacturer</b>	<b>Instr. No. (Bar Code)</b>	<b>Instrument Type</b>	<b>Make &amp; Model</b>	<b>Next Calibration date</b>
EXTECH	1290427	Withstand Voltage/Insulation Tester	7430	12/30/2020
EXTECH	1331756	Touch Current Tester	7630	08/19/2021
Agilent	MY53008185	Digital Multimeter	34401A	12/30/2020
Chroma	62050PA01073	DC Power Supply	62050P-100-100	12/30/2020
Chroma	632010001960	DC Electronic Load	63201	12/30/2020
Chroma	6314A0004271	DC Electronic Load	6314A	12/30/2020
Chroma	62050PA01069	DC Power Supply	62050P-100-100	12/30/2020
Chroma	632010001959	DC Electronic Load	63201	12/30/2020
Chroma	646038000281	Programmable AC Source	6460	12/30/2020
Tektronix	C070499	High Voltage Probe	P6015A	01/03/2021
Chroma	662023001329	Digital Power Meter	66202	12/30/2020
Chroma	662023001327	Digital Power Meter	66202	12/30/2020
EXTECH	140502410	Clamp Meter	MA1500	12/30/2020
Fluke	28630874WS	Multimeter	117C	12/30/2020
Keysight	MY56311348	Oscilloscope	DSOX3024T	03/13/2021
Cybertek	D1760000141	High Voltage Differential Probe	DP6150	03/13/2021
BYXAS	--	Digital Stop Watch	WDC-100	01/01/2021
Cybertek	D1760000196	High Voltage Differential Probe	DP6150	03/13/2021
Omega	2-11	Thermocouple	Type T	01/03/2021
Omega	040	Thermocouple	Type T	01/03/2021
ESPEC	8063141055	Chamber	SETH-102L	12/30/2020
AGILENT	MY44080057	Data Acquisition/Switch Unit	34970A	12/30/2020
AGILENT	MY57000314	Data Acquisition/Switch Unit	34970A	03/13/2021
HTC	--	Humid & Temp. Dig	HTC-1	12/30/2020
Chroma	615110000292	Programmable AC Source	61511	12/30/2020
Chroma	64300708	Programmable AC Source	6430	12/30/2020
Chroma	6210PE01241	Programmable DC Source	62012P-100-50	12/30/2020
HP	2933A-04790	System Power Supply	6032A	12/30/2020
Agilent	MY44083640	Data Acquisition/Switch Unit	34970A	12/30/2020
Agilent	MY44065294	Data Acquisition/Switch Unit	34970A	12/30/2020
Chroma	6314A0002647	DC Electronic Load	6314A	12/30/2020
--	Output shunt	Shunt	200A/50mV	12/30/2020

<b>Manufacturer</b>	<b>Instr. No. (Bar Code)</b>	<b>Instrument Type</b>	<b>Make &amp; Model</b>	<b>Next Calibration date</b>
HP	2518A-00776	System Power Supply	6038A	12/30/2020
Taicang Pujiang	Input Shunt 3	Shunt	FL-27	12/30/2020
YOKOGAWA	66YA1442	Shunt	2215	12/30/2020
Taicang Pujiang	Output Shunt 22	Shunt	FL-27	12/30/2020
Jiangbai	Input shunt 1	Shunt	FL-2	12/30/2020
Jiangbai	Input shunt 2	Shunt	FL-2	12/30/2020
Agilent	MY41000361	Telecom DC Power Supply	E4356A	12/30/2020
Simpson	10-866030	Leakage Current Tester	228	08/19/2021
Voltech	100008201492	Power Analyzer	PM1000+	08/19/2021
Setra	FL2361	Electronic Scales	BL-500F	09/05/2021
--	SHPS01005	Chamber	--	12/30/2020
--	113639	Chamber	--	12/30/2020
TSI	90830054	Anemoscope	8710	09/17/2021
Sorenson	9922B1010	Power Supply	DCS8-350	12/30/2020
YINHE	201600007	Chamber	SDJ65PA	12/30/2020
YOMA	15101004	Chamber	MHZ-04	12/30/2020
iDRC	840520	AC Power Source	CF-500EP	12/30/2020
Chroma	62150EB0694	DC Power Source	62150H-600	12/30/2020
Chroma	62150EB0692	DC Power Source	62150H-600	12/30/2020
Chroma	63206AL00072	DC Power Load	63206A-150-600	03/13/2021
EA	1514080001	DC Power Source	EA-CPS8080-510	12/30/2020
EA	1514080004	DC Power Source	EA-CPS8080-510	12/30/2020
Chroma	63206AL00070	DC Power Load	63206A-150-600	03/13/2021

-- End of Main Test Report --



IEC62368_1 - ATTACHMENT																																							
Clause	Requirement + Test	Result - Remark	Verdict																																				
<b>ATTACHMENT TO TEST REPORT</b> <b>IEC 62368-1</b> <b>EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES</b> (Audio/video, information and communication technology equipment - Part 1: Safety requirements)																																							
<b>Differences according to.....: EN 62368-1:2014+A11:2017</b>																																							
	<b>CENELEC COMMON MODIFICATIONS (EN)</b>		P																																				
	Clauses, subclauses, notes, tables, figures and annexes which are additional to those in IEC 62368-1:2014 are prefixed "Z".		P																																				
CONTENTS	<b>Add</b> 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																																				
	<b>Delete</b> all the "country" notes in the reference document (IEC 62368-1:2014) according to the following list:		P																																				
	<table border="1" style="width: 100%; border-collapse: collapse;"> <tbody> <tr> <td style="width: 15%;">0.2.1</td> <td style="width: 15%;">Note</td> <td style="width: 15%;">1</td> <td style="width: 15%;">Note 3</td> <td style="width: 15%;">4.1.15</td> <td style="width: 15%;">Note</td> </tr> <tr> <td>4.7.3</td> <td>Note 1 and 2</td> <td>5.2.2.2</td> <td>Note</td> <td>5.4.2.3.2.2 Table 13</td> <td>Note c</td> </tr> <tr> <td>5.4.2.3.2.4</td> <td>Note 1 and 3</td> <td>5.4.2.5</td> <td>Note 2</td> <td>5.4.5.1</td> <td>Note</td> </tr> <tr> <td>5.5.2.1</td> <td>Note</td> <td>5.5.6</td> <td>Note</td> <td>5.6.4.2.1</td> <td>Note 2 and 3</td> </tr> <tr> <td>5.7.5</td> <td>Note</td> <td>5.7.6.1</td> <td>Note 1 and 2</td> <td>10.2.1 Table 39</td> <td>Note 2, 3 and 4</td> </tr> <tr> <td>10.5.3</td> <td>Note 2</td> <td>10.6.2.1</td> <td>Note 3</td> <td>F.3.3.6</td> <td>Note 3</td> </tr> </tbody> </table>	0.2.1	Note	1	Note 3	4.1.15	Note	4.7.3	Note 1 and 2	5.2.2.2	Note	5.4.2.3.2.2 Table 13	Note c	5.4.2.3.2.4	Note 1 and 3	5.4.2.5	Note 2	5.4.5.1	Note	5.5.2.1	Note	5.5.6	Note	5.6.4.2.1	Note 2 and 3	5.7.5	Note	5.7.6.1	Note 1 and 2	10.2.1 Table 39	Note 2, 3 and 4	10.5.3	Note 2	10.6.2.1	Note 3	F.3.3.6	Note 3		
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	For special national conditions, see Annex ZB.		P																																				
1	<b>Add</b> the following note: NOTE Z1 The use of certain substances in electrical and electronic equipment is restricted within the EU: see Directive 2011/65/EU.		N/A																																				

IEC62368_1B - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
4.Z1	<p><b>Add</b> 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. <b>mains</b>, 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 <b>pluggable equipment type B</b> or <b>permanently connected equipment</b>, 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 <b>pluggable equipment type A</b> the building installation shall be regarded as providing protection in accordance with the rating of the wall socket outlet.</p>	See below.	N/A
5.4.2.3.2.4	<p><b>Add</b> the following to the end of this subclause:</p> <p>The requirement for interconnection with <b>external circuit</b> is in addition given in EN 50491-3:2009.</p>	No external circuits.	N/A
10.2.1	<p>Add the following to <sup>c)</sup> and <sup>d)</sup> in table 39:</p> <p>For additional requirements, see 10.5.1.</p>	No such radiation from the equipment.	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
10.5.1	<p><b>Add</b> the following after the first paragraph:  <i>For RS 1 compliance is checked by measurement under the following conditions:</i></p> <p><i>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 presets 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.</i></p> <p>NOTE Z1 Soldered joints and paint lockings are examples of adequate locking.</p> <p><i>The dose-rate is determined by means of a radiation monitor with an effective area of 10 cm<sup>2</sup>, at any point 10 cm from the outer surface of the apparatus.</i></p> <p><i>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.</i></p> <p><i>For RS1, the dose-rate shall not exceed 1 μSv/h taking account of the background level.</i></p> <p>NOTE Z2 These values appear in Directive 96/29/Euratom of 13 May 1996.</p>	No such x-radiation generated from the equipment.	N/A
10.6.1	<p><b>Add</b> the following paragraph to the end of the subclause:  EN 71-1:2011, 4.20 and the related tests methods and measurement distances apply.</p>	No such x-radiation generated from the equipment.	N/A
10.Z1	<p><b>Add</b> the following new subclause after 10.6.5.  <b>10.Z1 Non-ionizing radiation from radio frequencies in the range 0 to 300 GHz</b></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).</p> <p>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>	No such consideration for the purpose of personal music players.	N/A
G.7.1	<p><b>Add</b> the following note:  NOTE Z1 The harmonized code designations corresponding to the IEC cord types are given in Annex ZD.</p>		N/A

IEC62368_1B - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
Bibliography	<p><b>Add</b> the following standards:</p> <p><b>Add</b> 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>		N/A
<b>ZB</b>	<b>ANNEX ZB, SPECIAL NATIONAL CONDITIONS (EN)</b>		P
4.1.15	<p><b>Denmark, Finland, Norway and Sweden</b></p> <p>To the end of the subclause the following is added:</p> <p><b>Class I pluggable equipment type A</b> 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 <b>accessible</b> parts, have a marking stating that the equipment shall be connected to an earthed <b>mains</b> socket-outlet.</p> <p>The marking text in the applicable countries shall be as follows:</p> <p>In <b>Denmark</b>: "Apparatets stikprop skal tilsluttes en stikkontakt med jord som giver forbindelse til stikproppens jord."</p> <p>In <b>Finland</b>: "Laite on liitettävä suojakoskettimilla varustettuun pistorasiaan"</p> <p>In <b>Norway</b>: "Apparatet må tilkoples jordet stikkontakt"</p> <p>In <b>Sweden</b>: "Apparaten skall anslutas till jordat uttag"</p>	The marking text must be provided when marketed in applicable countries.	N/A
4.7.3	<p><b>United Kingdom</b></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>	The equipment is not direct plug-in equipment.	N/A

IEC62368_1B - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
5.2.2.2	<p><b>Denmark</b></p> <p>After the 2nd paragraph add the following: A warning (marking <b>safeguard</b>) for high <b>touch current</b> is required if the <b>touch current</b> exceeds the limits of 3,5 mA a.c. or 10 mA d.c.</p>	No high touch current.	N/A
5.4.11.1 and Annex G	<p><b>Finland and Sweden</b></p> <p>To the end of the subclause the following is added: For separation of the telecommunication network from earth the following is applicable: If this insulation is solid, including insulation forming part of a component, it shall at least consist of either</p> <ul style="list-style-type: none"> <li>• two layers of thin sheet material, each of which shall pass the electric strength test below, or</li> <li>• one layer having a distance through insulation of at least 0,4 mm, which shall pass the electric strength test below.</li> </ul> <p>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"> <li>• 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), and</li> <li>• is subject to routine testing for electric strength during manufacturing, using a test voltage of 1,5kV.</li> </ul> <p>It is permitted to bridge this insulation with a capacitor complying with EN 60384-14:2005, subclass Y2.</p> <p>A capacitor classified Y3 according to EN 60384-14:2005, may bridge this insulation under the following conditions:</p> <ul style="list-style-type: none"> <li>• the insulation requirements are satisfied by having a capacitor classified Y3 as defined by EN 60384-14, which in addition to the Y3 testing, is tested with an impulse test of 2,5 kV defined in 5.4.11;</li> <li>• the additional testing shall be performed on all the test specimens as described in EN 60384-14;</li> </ul> <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>	No TNV circuits.	N/A
5.5.2.1	<p><b>Norway</b></p> <p>After the 3rd paragraph the following is added: Due to the IT power system used, capacitors are required to be rated for the applicable line-to-line voltage (230 V).</p>	Considered.	P

## IEC62368\_1B - ATTACHMENT

Clause	Requirement + Test	Result - Remark	Verdict
5.5.6	<b>Finland, Norway and Sweden</b> To the end of the subclause the following is added: Resistors used as <b>basic safeguard</b> or bridging <b>basic insulation</b> in <b>class I pluggable equipment type A</b> shall comply with G.10.1 and the test of G.10.2.	Resistors comply with G.10.1 and the test of G.10.2	P
5.6.1	<b>Denmark</b> <b>Add</b> to the end of the subclause 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. <i>Justification:</i> In Denmark an existing 13 A socket outlet can be protected by a 20 A fuse.	Considered.	P
5.6.4.2.1	<b>Ireland and United Kingdom</b> After the indent for <b>pluggable equipment type A</b> , the following is added: – the <b>protective current rating</b> is taken to be 13 A, this being the largest rating of fuse used in the <b>mains plug</b> .	Considered.	P
5.6.5.1	To the second paragraph the following is added: 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 mm <sup>2</sup> to 1,5 mm <sup>2</sup> in cross-sectional area.	See above.	N/A
5.7.5	<b>Denmark</b> To the end of the subclause the following is added: The installation instruction shall be affixed to the equipment if the <b>protective conductor current</b> exceeds the limits of 3,5 mA a.c. or 10 mA d.c.	No high protective conductor current.	N/A

## IEC62368\_1B - ATTACHMENT

Clause	Requirement + Test	Result - Remark	Verdict
5.7.6.1	<p><b>Norway and Sweden</b></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:  “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):  “Apparater som er koplet til beskyttelsesjord via nettplugg og/eller via annet jordtilkøpet utstyr – og er tilkøpet et koaksialbasert kabel-TV nett, kan forårsake brannfare. For å unngå dette skal det ved tilkopling av 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>	Not such system.	N/A
5.7.6.2	<p><b>Denmark</b></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>	No external circuits.	N/A

## IEC62368\_1B - ATTACHMENT

Clause	Requirement + Test	Result - Remark	Verdict
B.3.1 and B.4	<p><b>Ireland and United Kingdom</b></p> <p>The following is applicable:</p> <p>To protect against excessive currents and short-circuits in the primary circuit of <b>direct plug-in equipment</b>, 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 <b>direct plug-in equipment</b>, until the requirements of Annexes B.3.1 and B.4 are met</p>	The equipment is not direct plug-in equipment.	N/A
G.4.2	<p><b>Denmark</b></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 CURRENT exceeding 13 A or if a poly-phase equipment is provided with a supply cord with a plug, this plug shall be in accordance with the standard sheets DK 6-1a in DS 60884-2-D1 or EN 60309-2.</p> <p>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>	No socket-outlets used.	N/A
G.4.2	<p><b>United Kingdom</b></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>	The equipment is not direct plug-in equipment.	N/A



IEC62368_1B - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
G.7.1	<p><b>United Kingdom</b></p> <p>To the first paragraph the following is added: 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>		N/A
G.7.1	<p><b>Ireland</b></p> <p>To the first paragraph the following is added: 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>		N/A
G.7.2	<p><b>Ireland and United Kingdom</b></p> <p>To the first paragraph the following is added: A power supply cord with a conductor of 1,25 mm<sup>2</sup> is allowed for equipment which is rated over 10 A and up to and including 13 A.</p>		N/A
<b>ZC</b>	<b>ANNEX ZC, NATIONAL DEVIATIONS (EN)</b>		N/A
10.5.2	<p><b>Germany</b></p> <p>The following requirement applies: 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><b>NOTE</b> Contact address: Physikalisch-Technische Bundesanstalt, Bundesallee 100, D-38116 Braunschweig, Tel.: Int+49-531-592-6320, Internet: <a href="http://www.ptb.de">http://www.ptb.de</a></p>	No CRT within the equipment.	N/A

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Clause	Requirement + Test	Result - Remark	Verdict

<b>ATTACHMENT TO TEST REPORT</b> <b>IEC 62368-1</b> <b>EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES</b> (Audio/video, information and communication technology equipment - Part 1: Safety requirements)			
<b>Differences according to</b> .....: EN IEC 62368-1:2020+A11:2020			
<b>Attachment Form No.</b> .....: EU_GD_IEC62368_1C			
<b>Attachment Originator</b> .....: UL(Demko)			
<b>Master Attachment</b> .....: 2020-03-10			
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	<b>CENELEC COMMON MODIFICATIONS (EN)</b>		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
<b>1</b>	<b>Modification to Clause 3 .</b>		N/A
<b>3.3.19</b>	<b>Sound exposure</b> <i>Replace 3.3.19 of IEC 62368-1 with the following definitions:</i>		N/A
<b>3.3.19.1</b>	<b>momentary exposure level, MEL</b> 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.  Note 1 to entry: MEL is measured as A-weighted levels in dB. Note 2 to entry: See B.3 of EN 50332-3:2017 for additional information.		N/A
<b>3.3.19.3</b>	<b>sound exposure, E</b>  A-weighted sound pressure ( $p$ ) squared and integrated over a stated period of time, $T$  Note 1 to entry: The SI unit is Pa <sup>2</sup> s.  $E = \int_0^T p(t)^2 dt$		N/A
<b>3.3.19.4</b>	<b>sound exposure level, SEL</b>		N/A


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	<p>logarithmic measure of sound exposure relative to a reference value, <math>E_0</math>, typically the 1 kHz threshold of hearing in humans.</p> <p>Note 1 to entry: <math>SEL</math> 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>		
<b>3.3.19.5</b>	<p><b>digital signal level relative to full scale, dBFS</b></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
<b>2</b>	<b>Modification to Clause 10</b>		N/A
<b>10.6</b>	<p><b>Safeguards against acoustic energy sources</b></p> <p>Replace 10.6 of IEC 62368-1 with the following:</p>		N/A
<b>10.6.1.1</b>	<p><b>Introduction</b></p> <p><b>Safeguard</b> 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 <b>ordinary person</b>, that:</p> <ul style="list-style-type: none"> <li>– is designed to allow the user to listen to audio or audiovisual content / material; and</li> <li>– uses a listening device, such as headphones or earphones that can be worn in or on or around the ears; and</li> <li>– 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.).</li> </ul>		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	<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.</p> <p>These requirements are valid for music or video mode only.</p> <p>The requirements do not apply to:</p> <ul style="list-style-type: none"> <li>– professional equipment;</li> </ul> <p>NOTE 3 Professional equipment is equipment sold through special sales channels. All products sold through normal electronics stores are considered not to be professional equipment.</p> <ul style="list-style-type: none"> <li>– hearing aid equipment and other devices for assistive listening;</li> <li>– the following type of analogue personal music players: <ul style="list-style-type: none"> <li>• long distance radio receiver (for example, a multiband radio receiver or world band radio receiver, an AM radio receiver), and</li> <li>• cassette player/recorder;</li> </ul> </li> </ul> <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> <ul style="list-style-type: none"> <li>– a player while connected to an external amplifier that does not allow the user to walk around while in use.</li> </ul> <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>		

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Clause	Requirement + Test	Result - Remark	Verdict
10.6.1.2	<p><b>Non-ionizing radiation from radio frequencies in the range 0 to 300 GHz</b></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).</p> <p>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>	No such consideration for the purpose of personal music players.	N/A
10.6.2	<b>Classification of devices without the capacity to estimate sound dose</b>		N/A
10.6.2.1	<p><b>General</b></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 <math>L_{Aeq, T}</math>, 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 <math>L_{Aeq, T}</math>) measured over the duration of the 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, <math>T</math> becomes the duration of the song.</p> <p>NOTE Classical music, acoustic music and broadcast typically has an average sound pressure (long term <math>L_{Aeq, T}</math>) which is much lower than the average programme simulation noise. Therefore, if the player is capable to analyse the 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.</p> <p>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>		N/A
10.6.2.2	<p><b>RS1 limits (to be superseded, see 10.6.3.2)</b></p> <p>RS1 is a class 1 acoustic energy source that does not exceed the following:</p> <ul style="list-style-type: none"> <li>– 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</li> </ul>		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	<p>listening device is known by other means such as setting or automatic detection, the <math>L_{Aeq,T}</math> acoustic output shall be <math>\leq 85</math> dB when playing the fixed "programme simulation noise" described in EN 50332-1.</p> <p>– 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 <math>\leq 27</math> mV (analogue interface) or -25 dBFS (digital interface) when playing the fixed "programme simulation noise" described in EN 50332-1.</p> <p>– The RS1 limits will be updated for all devices as per 10.6.3.2.</p>		
10.6.2.3	<p><b>RS2 limits (to be superseded, see 10.6.3.3)</b></p> <p>RS2 is a class 2 acoustic energy source that does not exceed the following:</p> <p>– 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 <math>L_{Aeq,T}</math> acoustic output shall be <math>\leq 100</math> dB(A) when playing the fixed "programme simulation noise" as described in EN 50332-1.</p> <p>– 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 <math>\leq 150</math> mV (analogue interface) or -10 dBFS (digital interface) when playing the fixed "programme simulation noise" as described in EN 50332-1.</p>		N/A
10.6.2.4	<p><b>RS3 limits</b></p> <p>RS3 is a class 3 acoustic energy source that exceeds RS2 limits.</p>		N/A
10.6.3	<b>Classification of devices (new)</b>		N/A
10.6.3.1	<p><b>General</b></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><b>RS1 limits (new)</b></p> <p>RS1 is a class 1 acoustic energy source that does not exceed the following:</p> <p>– for equipment provided as a package (player with its listening device), and with a proprietary</p>		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	<p>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 <math>L_{Aeq,T}</math> acoustic output shall be <math>\leq 80</math> dB when playing the fixed "programme simulation noise" described in EN 50332-1.</p> <p>– 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 <math>\leq 15</math> mV (analogue interface) or -30 dBFS (digital interface) when playing the fixed "programme simulation noise" described in EN 50332-1.</p>		
<b>10.6.3.3</b>	<p><b>RS2 limits (new)</b></p> <p>RS2 is a class 2 acoustic energy source that does not exceed the following:</p> <p>– 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 <math>\leq 80</math> dB when playing the fixed "programme simulation noise" described in EN 50332-1.</p> <p>– 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 <math>\leq 15</math> mV (analogue interface) or -30 dBFS (digital interface) when playing the fixed "programme simulation noise" described in EN 50332-1.</p>		N/A
<b>10.6.4</b>	<b>Requirements for maximum sound exposure</b>		N/A
<b>10.6.4.1</b>	<p><b>Measurement methods</b></p> <p>All volume controls shall be turned to maximum during tests.</p> <p>Measurements shall be made in accordance with EN 50332-1 or EN 50332-2 as applicable.</p>		N/A
<b>10.6.4.2</b>	<p><b>Protection of persons</b></p> <p>Except as given below, protection requirements for parts <b>accessible to ordinary persons, instructed persons</b> and <b>skilled persons</b> are given in 4.3.</p> <p>NOTE 1 Volume control is not considered a <b>safeguard</b>.</p>		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	<p>Between RS2 and an <b>ordinary person</b>, the <b>basic safeguard</b> may be replaced by an <b>instructional safeguard</b> in accordance with Clause F.5, except that the <b>instructional safeguard</b> shall be placed on the equipment, or on the packaging, or in the instruction manual.</p> <p>Alternatively, the <b>instructional safeguard</b> may be given through the equipment display during use.</p> <p>The elements of the <b>instructional safeguard</b> shall be as follows:</p> <ul style="list-style-type: none"> <li>– element 1a: the symbol , IEC 60417-6044 (2011-01)</li> <li>– element 2: “High sound pressure” or equivalent wording</li> <li>– element 3: “Hearing damage risk” or equivalent wording</li> <li>– element 4: “Do not listen at high volume levels for long periods.” or equivalent wording</li> </ul> <p>An <b>equipment safeguard</b> shall prevent exposure of an <b>ordinary person</b> to an RS2 source without intentional physical action from the <b>ordinary person</b> 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 <b>skilled person</b> shall not be unintentionally exposed to RS3.</p>		
<b>10.6.5</b>	<b>Requirements for dose-based systems</b>		N/A
<b>10.6.5.1</b>	<b>General requirements</b>		N/A
	<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>		



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	<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 races, etc.</p>		
10.6.5.2	<p><b>Dose-based warning and requirements</b></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><b>Exposure-based requirements</b></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</p>		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	<p>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>		
<b>10.6.6</b>	<b>Requirements for listening devices (headphones, earphones, etc.)</b>		N/A
<b>10.6.6.1</b>	<p><b>Corded listening devices with analogue input</b></p> <p>With 94 dB <math>L_{Aeq}</math> 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 <math>\geq 75</math> 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
<b>10.6.6.2</b>	<p><b>Corded listening devices with digital input</b></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 <math>L_{Aeq,T}</math> acoustic output of the listening device shall be <math>\leq 100</math> dB with an input signal of -10 dBFS.</p>		N/A
<b>10.6.6.3</b>	<p><b>Cordless listening devices</b></p> <p>In cordless mode,</p> <ul style="list-style-type: none"> <li>– with any playing and transmitting device playing the fixed programme simulation noise described in EN 50332-1; and</li> <li>– respecting the cordless transmission standards, where an air interface standard exists that specifies the equivalent acoustic level; and</li> <li>– 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 <math>L_{Aeq,T}</math> acoustic</li> </ul>		N/A

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Clause	Requirement + Test				Result - Remark	Verdict
	output of the listening device shall be $\leq 100$ dB with an input signal of -10 dBFS.					
<b>10.6.6.4</b>	<b>Measurement method</b>  <i>Measurements shall be made in accordance with EN 50332-2 as applicable.</i>					N/A
<b>3</b>	<b>Modification to the whole document</b>					P
	<b>Delete</b> 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
	10.6.4	Note 3	F.3.3.6	Note 3	Y.4.1	Note
	Y.4.5	Note				
<b>4</b>	<b>Modification to Clause 1</b>					N/A
<b>1</b>	<b>Add the following note:</b>  <i>NOTE Z1 The use of certain substances in electrical and electronic equipment is restricted within the EU: see Directive 2011/65/EU.</i>					N/A
<b>5</b>	<b>Modification to 4.Z1</b>					N/A

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Clause	Requirement + Test	Result - Remark	Verdict
<b>4.Z1</b>	<p><b>Add the following new subclause after 4.9:</b></p> <p>To protect against excessive current, short-circuits and earth faults in circuits connected to an a.c. <b>mains</b>, 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 <b>pluggable equipment type B</b> or <b>permanently connected equipment</b>, 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 <b>pluggable equipment type A</b> the building installation shall be regarded as providing protection in accordance with the rating of the wall socket outlet.</p>		N/A
<b>6</b>	<b>Modification to 5.4.2.3.2.4</b>		N/A
<b>5.4.2.3.2.4</b>	<p><b>Add the following to the end of this subclause:</b></p> <p>The requirement for interconnection with <b>external circuit</b> is in addition given in EN 50491-3:2009.</p>	No external circuits.	N/A
<b>7</b>	<b>Modification to 10.2.1</b>		N/A
<b>10.2.1</b>	<p>Add the following to <sup>c)</sup> and <sup>d)</sup> in table 39:</p> <p>For additional requirements, see 10.5.1.</p>	No such radiation from the equipment.	N/A
<b>8</b>	<b>Modification to 10.5.1</b>		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
10.5.1	<p><b>Add the following after the first paragraph:</b></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 cm<sup>2</sup>, 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	<b>Modification to G.7.1</b>		N/A
G.7.1	<p><b>Add the following note:</b></p> <p>NOTE Z1 The harmonized code designations corresponding to the IEC cord types are given in Annex ZD.</p>		N/A
10	<b>Modification to Bibliography</b>		N/A

IEC62368_1C- ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
	<p><b>Add</b> 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>		N/A
<b>11</b>	<b>ADDITION OF ANNEXES</b>		P
<b>ZB</b>	<b>ANNEX ZB, SPECIAL NATIONAL CONDITIONS (EN)</b>		P
<b>4.1.15</b>	<p><b>Denmark, Finland, Norway and Sweden</b></p> <p>To the end of the subclause the following is added:  <b>Class I pluggable equipment type A</b> 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 <b>accessible</b> parts, have a marking stating that the equipment shall be connected to an earthed <b>mains</b> socket-outlet.</p> <p>The marking text in the applicable countries shall be as follows:</p> <p>In <b>Denmark</b>: "Apparatets stikprop skal tilsluttes en stikkontakt med jord som giver forbindelse til stikproppens jord."            In <b>Finland</b>: "Laite on liitettävä suojakoskettimilla varustettuun pistorasiaan"            In <b>Norway</b>: "Apparatet må tilkoples jordet stikkontakt"            In <b>Sweden</b>: "Apparaten skall anslutas till jordat uttag"</p>	The marking text must be provided when marketed in applicable countries.	N/A

IEC62368_1C- ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
<b>4.7.3</b>	<p><b>United Kingdom</b></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>	The equipment is not direct plug-in equipment.	N/A
<b>5.2.2.2</b>	<p><b>Denmark</b></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>	No high touch current.	N/A
<b>5.4.11.1 and Annex G</b>	<p><b>Finland and Sweden</b></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"> <li>• two layers of thin sheet material, each of which shall pass the electric strength test below, or</li> <li>• one layer having a distance through insulation of at least 0,4 mm, which shall pass the electric strength test below.</li> </ul> <p>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"> <li>• 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),</li> </ul> <p>and</p> <ul style="list-style-type: none"> <li>• is subject to routine testing for electric strength during manufacturing, using a test voltage of 1,5</li> </ul>	No TNV circuits.	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	<p>kV.</p> <p>It is permitted to bridge this insulation with a capacitor complying with EN 60384-14:2005, subclass Y2.</p> <p>A capacitor classified Y3 according to EN 60384-14:2005, may bridge this insulation under the following conditions:</p> <ul style="list-style-type: none"> <li>the insulation requirements are satisfied by having a capacitor classified Y3 as defined by EN 60384-14, which in addition to the Y3 testing, is tested with an impulse test of 2,5 kV defined in 5.4.11;</li> <li>the additional testing shall be performed on all the test specimens as described in EN 60384-14;</li> </ul> <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><b>Norway</b></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>	Considered.	P
5.5.6	<p><b>Finland, Norway and Sweden</b></p> <p>To the end of the subclause the following is added:</p> <p>Resistors used as <b>basic safeguard</b> or bridging <b>basic insulation</b> in <b>class I pluggable equipment type A</b> shall comply with G.10.1 and the test of G.10.2.</p>	Resistors comply with G.10.1 and the test of G.10.2	P
5.6.1	<p><b>Denmark</b></p> <p><b>Add</b> 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</p>	Considered.	P



IEC62368_1C- ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
	protected by a 20 A fuse.		
5.6.4.2.1	<p><b>Ireland and United Kingdom</b></p> <p>After the indent for <b>pluggable equipment type A</b>, the following is added:</p> <p>– the <b>protective current rating</b> is taken to be 13 A, this being the largest rating of fuse used in the <b>mains</b> plug.</p>	Considered.	P
5.6.4.2.1	<p><b>France</b></p> <p>After the indent for <b>pluggable equipment type A</b>, the following is added:</p> <p>– in certain cases, the <b>protective current rating</b> of the circuit supplied from the mains is taken as 20 A instead of 16 A.</p>	Considered.	P
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 mm<sup>2</sup> to 1,5 mm<sup>2</sup> in cross-sectional area.</p>	See above.	N/A
5.6.8	<p><b>Norway</b></p> <p>To the end of the subclause the following is added: Equipment connected with an earthed mains plug is classified as <b>class I equipment</b>. See the Norway marking requirement in 4.1.15. The symbol IEC 60417-6092, as specified in F.3.6.2, is accepted.</p>	Considered.	P
5.7.6	<p><b>Denmark</b></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 <b>protective conductor current</b> exceeds the limits of 3,5 mA a.c. or 10 mA d.c.</p>	No high protective conductor current.	N/A
5.7.6.2	<p><b>Denmark</b></p> <p>To the end of the subclause the following is added:</p> <p>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>	See above.	N/A
5.7.7.1	<p><b>Norway and Sweden</b></p> <p>To the end of the subclause the following is added:</p> <p>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.</p>	Not such system.	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	<p>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 jordtilkoplede utstyr – og er tilkoplede et koaksialbasert kabel-TV nett, kan forårsake brannfare.</p> <p>For å unngå dette skal det ved tilkopling av apparater til kabel-TV nett installeres en galvanisk isolator mellom apparatet og kabel-TV nettet.”</p> <p>Translation to Swedish:</p> <p>”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>		
<b>8.5.4.2.3</b>	<b>United Kingdom</b>		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	<p>Add the following after the 2<sup>nd</sup> dash bullet in 3<sup>rd</sup> 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>		
<b>B.3.1 and B.4</b>	<p><b>Ireland and United Kingdom</b></p> <p>The following is applicable:</p> <p>To protect against excessive currents and short-circuits in the primary circuit of <b>direct plug-in equipment</b>, 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 <b>direct plug-in equipment</b>, until the requirements of Annexes B.3.1 and B.4 are met</p>	The equipment is not direct plug-in equipment.	N/A
<b>G.4.2</b>	<p><b>Denmark</b></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 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>	No socket-outlets used.	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	<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>		
<b>G.4.2</b>	<p><b>United Kingdom</b></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>	The equipment is not direct plug-in equipment.	N/A
<b>G.7.1</b>	<p><b>United Kingdom</b></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>		N/A
<b>G.7.1</b>	<p><b>Ireland</b></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>		N/A
<b>G.7.2</b>	<p><b>Ireland and United Kingdom</b></p> <p>To the first paragraph the following is added:</p> <p>A power supply cord with a conductor of 1,25 mm<sup>2</sup> is allowed for equipment which is rated over 10 A</p>		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	and up to and including 13 A.		

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Clause	Requirement + Test	Result - Remark	Verdict
<b>ZC</b>	<b>ANNEX ZC, NATIONAL DEVIATIONS (EN)</b>		N/A
<b>10.5.2</b>	<p><b>Germany</b></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></p> <p>German ministerial decree against ionizing radiation (Röntgenverordnung), in force since 2002-07-01, implementing the European Directive 96/29/EURATOM.</p> <p><b>NOTE</b> Contact address:            Physikalisch-Technische Bundesanstalt, Bundesallee 100, D-38116 Braunschweig,            Tel.: Int+49-531-592-6320, Internet: <a href="http://www.ptb.de">http://www.ptb.de</a></p>	No CRT within the equipment.	N/A

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Clause	Requirement + Test	Result - Remark	Verdict

<b>ZD</b>	<b>IEC and CENELEC CODE DESIGNATIONS FOR FLEXIBLE CORDS (EN)</b>		N/A																																																				
	<table border="1"> <thead> <tr> <th rowspan="2">Type of flexible cord</th> <th colspan="2">Code designations</th> </tr> <tr> <th>IEC</th> <th>CENELEC</th> </tr> </thead> <tbody> <tr> <td colspan="3"><b>PVC insulated cords</b></td> </tr> <tr> <td>Flat twin tinsel cord</td> <td>60227 IEC 41</td> <td>H03VH-Y</td> </tr> <tr> <td>Light polyvinyl chloride sheathed flexible cord</td> <td>60227 IEC 52</td> <td>H03VV-F H03VVH2-F</td> </tr> <tr> <td>Ordinary polyvinyl chloride sheathed flexible cord</td> <td>60227 IEC 53</td> <td>H05VV-F H05VVH2-F</td> </tr> <tr> <td colspan="3"><b>Rubber insulated cords</b></td> </tr> <tr> <td>Braided cord</td> <td>60245 IEC 51</td> <td>H03RT-F</td> </tr> <tr> <td>Ordinary tough rubber sheathed flexible cord</td> <td>60245 IEC 53</td> <td>H05RR-F</td> </tr> <tr> <td>Ordinary polychloroprene sheathed flexible cord</td> <td>60245 IEC 57</td> <td>H05RN-F</td> </tr> <tr> <td>Heavy polychloroprene sheathed flexible cord</td> <td>60245 IEC 66</td> <td>H07RN-F</td> </tr> <tr> <td colspan="3"><b>Cords having high flexibility</b></td> </tr> <tr> <td>Rubber insulated and sheathed cord</td> <td>60245 IEC 86</td> <td>H03RR-H</td> </tr> <tr> <td>Rubber insulated, crosslinked PVC sheathed cord</td> <td>60245 IEC 87</td> <td>H03RV4-H</td> </tr> <tr> <td>Crosslinked PVC insulated and sheathed cord</td> <td>60245 IEC 88</td> <td>H03V4V4-H</td> </tr> <tr> <td colspan="3"><b>Cords insulated and sheathed with halogen-free thermoplastic compounds</b></td> </tr> <tr> <td>Light halogen-free thermoplastic insulated and sheathed flexible cords</td> <td></td> <td>H03Z1Z1-F H03Z1Z1H2-F</td> </tr> <tr> <td>Ordinary halogen-free thermoplastic insulated and sheathed flexible cords</td> <td></td> <td>H05Z1Z1-F H05Z1Z1H2-F</td> </tr> </tbody> </table>	Type of flexible cord	Code designations		IEC	CENELEC	<b>PVC insulated cords</b>			Flat twin tinsel cord	60227 IEC 41	H03VH-Y	Light polyvinyl chloride sheathed flexible cord	60227 IEC 52	H03VV-F H03VVH2-F	Ordinary polyvinyl chloride sheathed flexible cord	60227 IEC 53	H05VV-F H05VVH2-F	<b>Rubber insulated cords</b>			Braided cord	60245 IEC 51	H03RT-F	Ordinary tough rubber sheathed flexible cord	60245 IEC 53	H05RR-F	Ordinary polychloroprene sheathed flexible cord	60245 IEC 57	H05RN-F	Heavy polychloroprene sheathed flexible cord	60245 IEC 66	H07RN-F	<b>Cords having high flexibility</b>			Rubber insulated and sheathed cord	60245 IEC 86	H03RR-H	Rubber insulated, crosslinked PVC sheathed cord	60245 IEC 87	H03RV4-H	Crosslinked PVC insulated and sheathed cord	60245 IEC 88	H03V4V4-H	<b>Cords insulated and sheathed with halogen-free thermoplastic compounds</b>			Light halogen-free thermoplastic insulated and sheathed flexible cords		H03Z1Z1-F H03Z1Z1H2-F	Ordinary halogen-free thermoplastic insulated and sheathed flexible cords		H05Z1Z1-F H05Z1Z1H2-F	N/A
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Clause	Requirement + Test	Result - Remark	Verdict

**ATTACHMENT TO TEST REPORT IEC 62368-1 3rd Ed.  
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

**Attachment Form No.**..... : US\_CA\_ND\_IEC62368\_1C

**Attachment Originator** ..... : UL(US)

**Master Attachment** ..... : Date 2020-02-06

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**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.	In accordance with the National Electrical Code (NEC) and the Canadian Electrical Code (CEC) part 1 CAN/CSA C22.1, ANSI/NFPA 70, and unless marked or otherwise identified, the Standard for Electronic Computer/Data-Processing Equipment, ANSI/NFPA 75.	P
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.		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.		N/A
1 (DV.5)	Additional requirements apply to some forms of power distribution equipment, including sub-assemblies.		N/A
4.1 (4.1.17)	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.	The equipment is a building-in type and evaluation is to be made during the final system approval.	N/A



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Clause	Requirement + Test	Result - Remark	Verdict
	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.	See above.	N/A
4.6 (4.6.2)	Wire-wrap terminals have special construction and performance requirements.		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.	No such batteries.	N/A
5.4.2.3.2 (5.4.2.3.2.1)	Surge Arrestors and Transient Voltage Surge Suppressors installed external to the equipment are required to comply with the appropriate NEC and CEC requirements.		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.		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.	The equipment is a building-in type and evaluation is to be made during the final system approval.	N/A
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.	No TNV circuits within the equipment.	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.	No such parts.	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.	DC output connector is provided. See copy of marking plate.	P
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.	The equipment is a building-in type and evaluation is to be made during the final system approval.	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.	No power supply cord provided	N/A
	Power supply cords are required to have attachment plugs rated not less than 125 percent of the rated current of the equipment.	No power supply cord provided	N/A
	Flexible power supply cords are required to be compatible with Article 400 of the NEC, and Tables 11 and 12 of the CEC.	See above.	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	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 above.	N/A
	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."	See above.	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.	No ringing signal	N/A
Annex H.4	For circuits with other than ringing signals and with voltages exceeding 42.4 V <sub>peak</sub> or 60 V <sub>d.c.</sub> , 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.	No ringing signal	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
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 <sup>3</sup> (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

IEC62368_1C- ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
	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.	No flammable liquids within the equipment.	N/A
Annex DVA (6.4.8)	For ITE room applications, enclosures with combustible material measuring greater than 0.9 m <sup>2</sup> (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.	No such application.	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 such parts.	N/A
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).	No such parts.	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."	Single phase only.	N/A
Annex DVA (F.3.3.6)	Equipment identified for ITE (computer) room installation is required to be marked with the rated current.	Not such application.	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.	No such parts.	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.	No standard supply outlets, receptacles, medium-base or smaller lampholders provided.	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

IEC62368_1C- ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
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.	No such parts.	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.	No such parts.	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.	No such parts.	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).	No such parts.	N/A
Annex DVA (G.7)	Flexible cords used outdoors are required to have the suffix "W" marked on the flexible cord.	No such parts.	N/A
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.	Not such application.	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.	Not applicable for the equipment.	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 such application.	N/A
Annex DVC (1)	Additional requirements apply for equipment intended for mounting under kitchen cabinets.	Not such application.	N/A

IEC62368_1C- ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
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.	UL approved components used. Refer to table 4.1.2 of IEC 62368-1 test report for details.	P
Annex DVH	Equipment for permanent connection to the mains supply is subjected to additional requirements.	The equipment is a building-in type and evaluation is to be made during the final system approval.	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.	See above	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.	See above	N/A
	Wire binding screws are not permitted to attach conductors larger than 10 AWG (5.3 mm <sup>2</sup> ).	No wire binding screws.	N/A
Annex DVH (DVH.4)	Permanently connected equipment is required to have a suitable wiring compartment and wire bending space.	The equipment is a building-in type and evaluation is to be made during the final system approval.	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.	The equipment not connected to a centralized d.c. power system.	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.	No TNV circuits within the equipment.	N/A

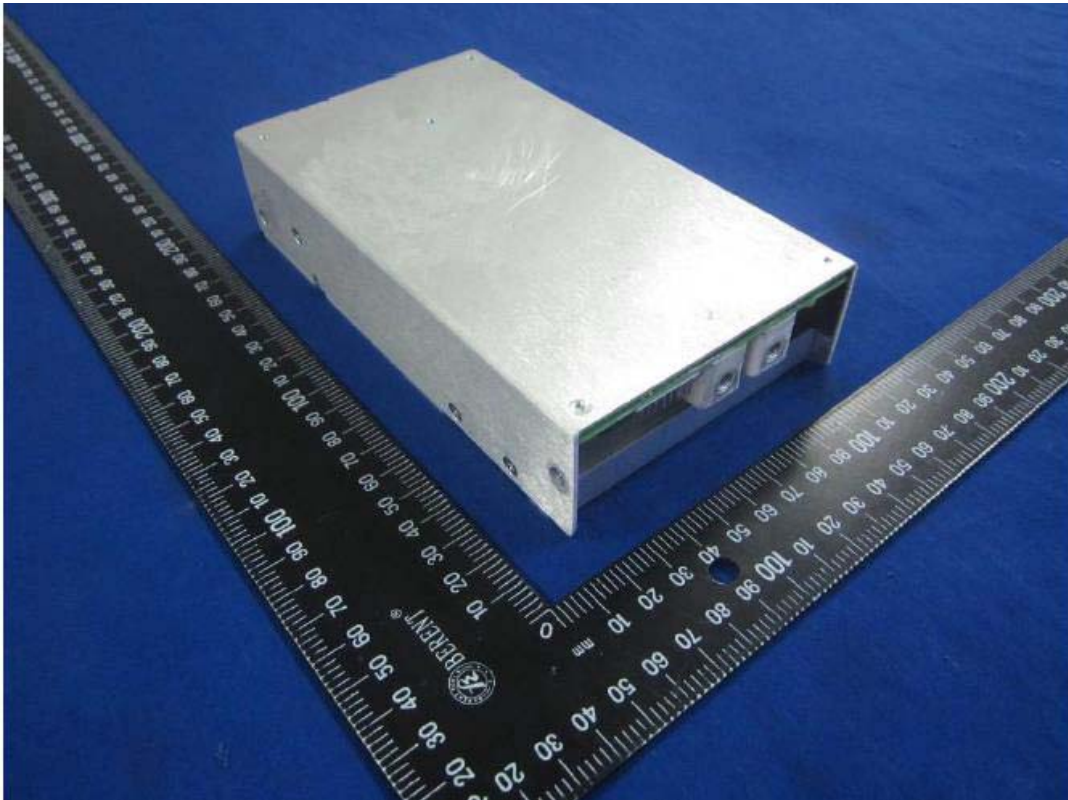
IEC62368_1C- ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
Annex DVJ (10.6.1)	Equipment connected to a telecommunication and cable distribution networks and supplied with an earphone intended to be held against, or in the ear is required to comply with special acoustic pressure requirements.	No TNV circuits within the equipment.	N/A

**ATTACHMENT Photo Documentation**

Report No.: 60393564 001  
Type Designation: SP812, CAR0424FP



Picture 1 – Overview (With AC input terminal)



Picture 2 – Overview (With AC input terminal)

**ATTACHMENT**

**Photo Documentation**

Report No.: 60393564 001

Type Designation: SP812, CAR0424FP



Picture 3 – Internal View

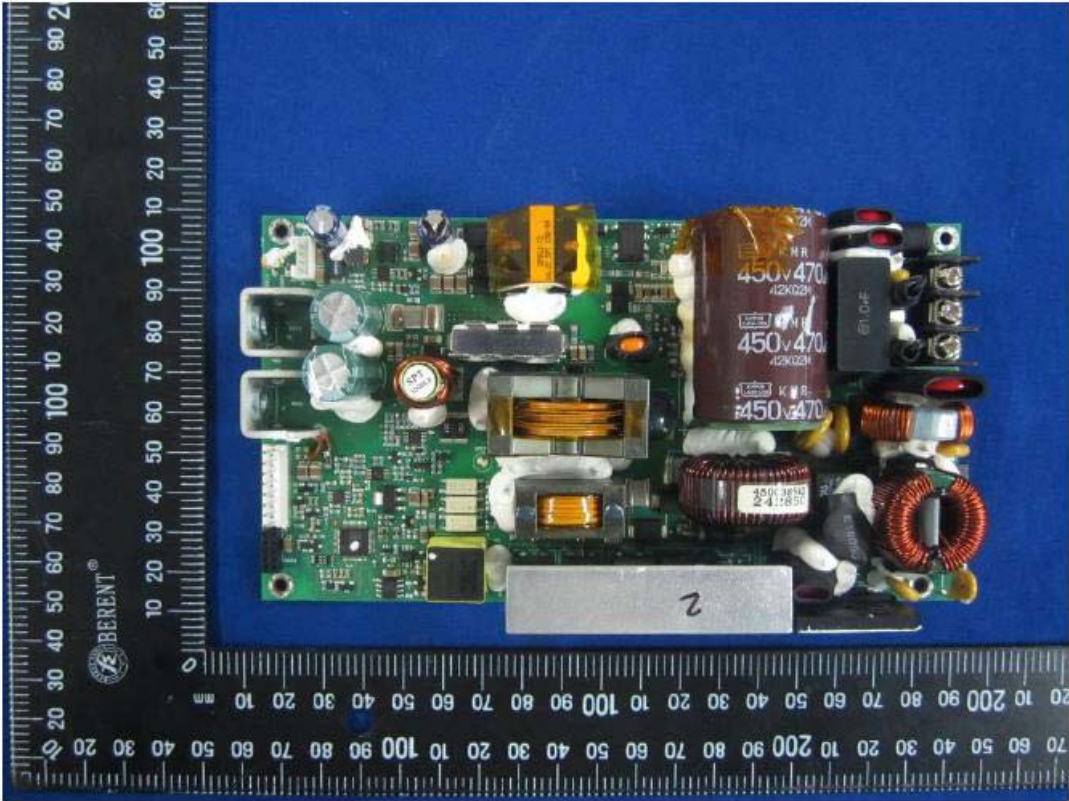


Picture 4 – Internal View



**ATTACHMENT Photo Documentation**

Report No.: 60393564 001  
Type Designation: SP812, CAR0424FP



Picture 5 – Component side view of PCB

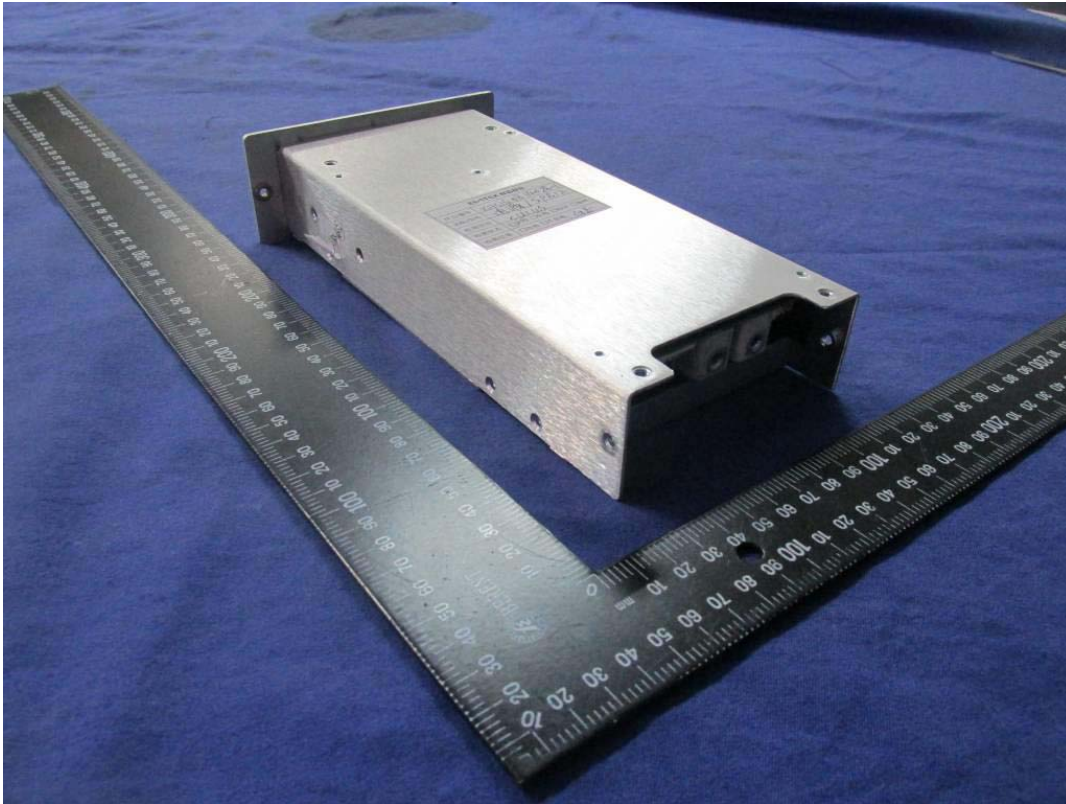


Picture 6 – Trace side view of PCB

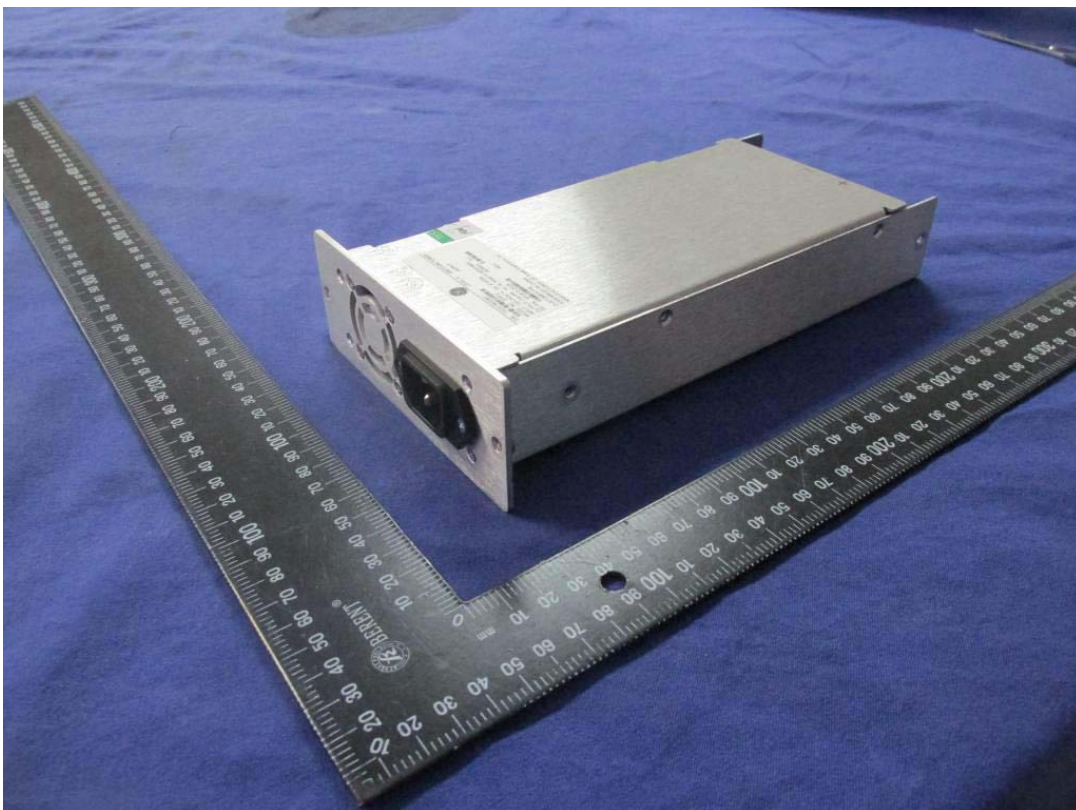
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Type Designation: SP812, CAR0424FP



Picture 7 – Overall view (With AC input terminal)

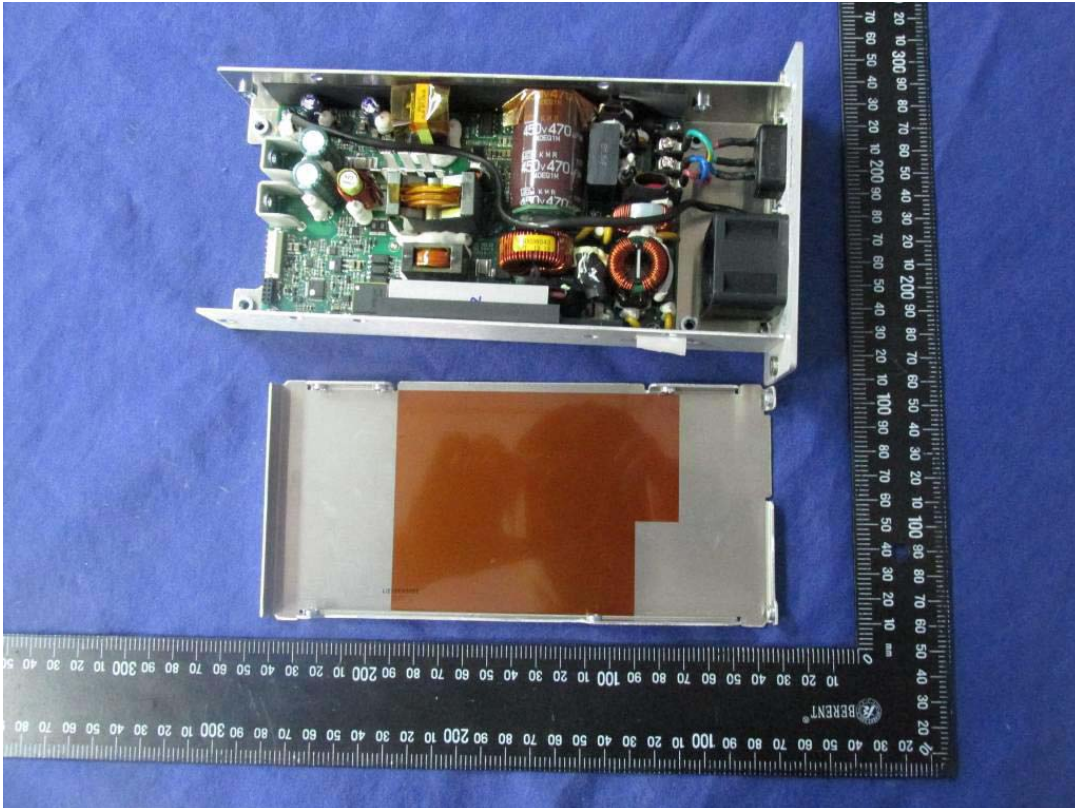


Picture 8 – Overall view (With AC input terminal)

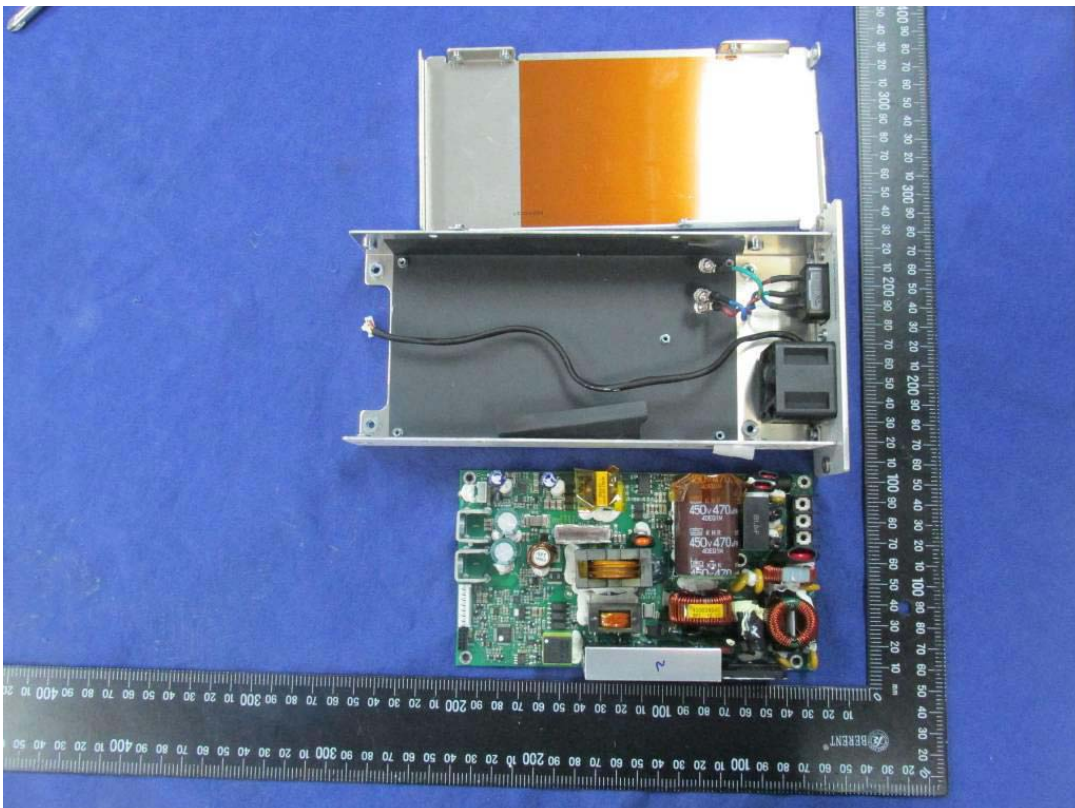
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Picture 9 – Component side view of PCB



Picture 10 – Component side view of PCB

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Picture 11 – Component side view of PCB



Picture 12 – Component side view of PCB