

IEC**IECEE**

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Ref. Certif. No.

JPTUV-119734

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: 100-240Vac, 50/60Hz, 15-10A Rated Output: Refer to the test report for details. Protection Class: Class I
Trademark (if any)	GE (Optional)
Customer's Testing Facility (CTF) Stage used	CTF Stage 2
Model / Type Ref.	CAR2012TEXXXXXXX, CAR2012TEXX5XXXX (Refer to the test report for the definition of variables)
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	60403013 001

This CB Test Certificate is issued by the National Certification Body



TÜV Rheinland Japan Ltd.
Global Technology Assessment Center
4-25-2 Kita-Yamata, Tsuzuki-ku
Yokohama 224-0021, Japan
Phone + 81 45 914-3888
Fax + 81 45 914-3354
Mail: info@jpn.tuv.com
Web : www.tuv.com

Date: 2021-02-08

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. : 60403013 001

Date: 2021-02-08

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.....: 60403013 001
Date of issue: 2021-02-08
Total number of pages: 83 (excluding attachments, see page 3 for details.)

**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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If this Test Report Form is used by non-IECEE members, the IECEE/IEC logo and the reference to the CB Scheme procedure shall be removed.

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.

Test item description:	Switching Power Supply	
Trade Mark:	 (GE) (optional)	
Manufacturer	ABB Power Electronics Inc. 601 Shiloh Road Plano, Texas 75074, USA	
Model/Type reference:	CAR2012TEXXXXXXX, CAR2012TEXX5XXXX (For variable X refer to page 7)	
Ratings:	Input: 100-240Vac, 50/60Hz, 15-10A; Output: See page 7 for detail.	
Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):		
<input checked="" type="checkbox"/>	CB Testing Laboratory:	TÜV Rheinland Shanghai Co., Ltd.
Testing location/ address	No.177, 178, Lane 777 West Guangzhong Road, Jing'an District, Shanghai, China	
Tested by (name, function, signature) :		
Approved by (name, function, signature) .. :		
<input type="checkbox"/>	Testing procedure: CTF Stage 1:	N/A
Testing location/ address		
Tested by (name, function, signature) :		
Approved by (name, function, signature) .. :		
<input checked="" type="checkbox"/>	Testing procedure: CTF Stage 2:	ABB Power Electronics (Shanghai) Co., Ltd.
Testing location/ address	Floor 1, Building #58, 461 Hongcao Road, Shanghai, China	
Tested by (name + signature) :	Andy Huang	
Witnessed by (name, function, signature) . . :	Tim Song, Technical expert	
Approved by (name, function, signature) .. :	Roy Chen, Technical reviewer	
<input type="checkbox"/>	Testing procedure: CTF Stage 3:	N/A
<input type="checkbox"/>	Testing procedure: CTF Stage 4:	N/A
Testing location/ address		
Tested by (name, function, signature) :		
Witnessed by (name, function, signature) . . :		
Approved by (name, function, signature) .. :		
Supervised by (name, function, signature) :		

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

- ATTACHMENT – National Differences (28 pages)
- ATTACHMENT – Other National Differences (9 pages)
- ATTACHMENT – Photo Documentation (9 pages)

Note: Total number of pages in each attachment is indicated in individual attachment.

Summary of testing:**Tests performed (name of test and test clause):**

- This report is based on original CBTR 17041289 001, 17041289 002 with following changes:
 - Update test standard to IEC 62368-1:2018
 - Update the address of applicant, manufacturer and factories per applicant's request;
- No technical changes have been found by construction review at the provided sample and/or other administrative modifications except:
 - Update the address of applicant, manufacturer and factories per applicant's request.
- Following additional tests and evaluations per the requirements of the new standard and/or considered necessary were conducted in this report:
 - Check and update certificate validity of critical components (Cl. 4.1.2),
 - Steady State Voltage and Current conditions (Cl. 5.2.2.2),
 - Highest working frequency measurement (Cl. 5.4.1.8),
 - Humidity conditioning (Cl. 5.4.8)
 - Electric strength test (Cl. 5.4.9)
 - Stored discharge on capacitors (Cl. 5.5.2.2),
 - Electrical power source (PS) measurements for classification (Cl. 6.2.2)
- Except stated above, all test data are derived from original CB test report.
- All applicable tests as described in Test Case and Measurement Sections were performed on representative model CAR2012TEBXXZOP1 and CAR2012TEBX5Z01A. (See measurement section for details).
- The test samples are pre-production without serial numbers.

Testing location:

ABB Power Electronics (Shanghai) Co., Ltd.
Floor 1, Building #58, 461 Hongcao Road, Shanghai, China

Summary of compliance with National Differences (List of countries addressed):**List of countries addressed**

EU Group Differences, EU Special National Conditions US, CA
Explanation of used codes: US=United States of America, CA=Canada.

The product fulfils the requirements of


IEC 62368-1:2018, EN IEC 62368-1:2020+A11:2020 and CSA/UL 62368-1:2019

Other National Requirements requested by applicant:


EN 62368-1:2014 + A11:2017

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.



LEVEL 6



S/N: 

INPUT:100-240VAC 15-10A, 50/60Hz


O/P:12VDC/108A, 3.3Vsb/4A, 1300W@100-180V~

O/P:12VDC/167A, 3.3Vsb/4A, 2000W@180-240V~


MODEL:CAR2012TEBXXZ0P1 REV:

CUST P/N:



LEVEL 6



S/N: 

INPUT:100-240VAC 15-10A, 50/60Hz

O/P:12VDC/108A, 5Vsb/3A, 1300W@100-180V~

O/P:12VDC/167A, 5Vsb/3A, 2000W@180-240V~

MODEL:CAR2012TEBX5Z01A REV:

CUST P/N:

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.

Test item particulars:		
Product group	<input type="checkbox"/> end product	<input checked="" type="checkbox"/> built-in component
Classification of use by	<input type="checkbox"/> Ordinary person	<input type="checkbox"/> Children likely present
	<input checked="" type="checkbox"/> Instructed person	<input checked="" type="checkbox"/> Skilled person
Supply connection	<input checked="" type="checkbox"/> AC mains	<input type="checkbox"/> DC mains
	<input type="checkbox"/> not mains connected:	
	<input type="checkbox"/> ES1	<input type="checkbox"/> ES2 <input type="checkbox"/> ES3
Supply tolerance	<input checked="" type="checkbox"/> +10%/-10%	<input type="checkbox"/> +20%/-15%
	<input type="checkbox"/> + %/ - %	<input type="checkbox"/> None
Supply connection – type	<input checked="" type="checkbox"/> pluggable equipment type A -	
	<input type="checkbox"/> non-detachable supply cord	
	<input checked="" 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 type="checkbox"/> other:	
Considered current rating of protective device	Location: <input type="checkbox"/> building <input type="checkbox"/> equipment	
	<input checked="" type="checkbox"/> N/A	
Equipment mobility	<input type="checkbox"/> movable	<input type="checkbox"/> hand-held <input type="checkbox"/> transportable
	<input type="checkbox"/> direct plug-in	<input type="checkbox"/> stationary <input checked="" type="checkbox"/> for building-in
	<input type="checkbox"/> wall/ceiling-mounted	<input type="checkbox"/> SRME/rack-mounted
	<input type="checkbox"/> other:	
Overvoltage category (OVC)	<input type="checkbox"/> OVC I	<input checked="" type="checkbox"/> OVC II <input type="checkbox"/> OVC III
	<input type="checkbox"/> OVC IV	<input type="checkbox"/> other:
Class of equipment	<input checked="" type="checkbox"/> Class I	<input type="checkbox"/> Class II <input type="checkbox"/> Class III
	<input type="checkbox"/> Not classified:	
Special installation location	<input type="checkbox"/> N/A	<input checked="" type="checkbox"/> restricted access area
	<input type="checkbox"/> outdoor location <input type="checkbox"/>	
Pollution degree (PD)	<input type="checkbox"/> PD 1	<input checked="" type="checkbox"/> PD 2 <input type="checkbox"/> PD 3
Manufacturer’s specified T_{ma}	See general product information for details.	
IP protection class	<input checked="" type="checkbox"/> IPX0	<input type="checkbox"/> IP__
Power systems	<input checked="" type="checkbox"/> TN <input checked="" type="checkbox"/> TT	<input checked="" type="checkbox"/> IT - 230 V _{L-L} <input type="checkbox"/> not AC mains
Altitude during operation (m)	<input type="checkbox"/> 2000 m or less	<input checked="" type="checkbox"/> 3000 m or less
Altitude of test laboratory (m)	<input checked="" type="checkbox"/> 2000 m or less	<input type="checkbox"/> m
Mass of equipment (kg)	Approx. 1.96 kg	

Possible test case verdicts:	
- test case does not apply to the test object ..: N/A	
- test object does meet the requirement.....: P (Pass)	
- test object does not meet the requirement ..: F (Fail)	
Testing:	
Date of receipt of test item	2014.07.10 (original CB) 2015.05.04 (1 st modification report) 2020.05.25
Date (s) of performance of tests	2014.07.10 to 2014.08.10 (original CB) 2015.05.04 to 2015.05.10 (1 st modification report) 2020.05.25 to 2021.01.11
General remarks:	
"(See Enclosure #)" refers to additional information appended to the report. "(See appended table)" refers to a table appended to the report.	
Throughout this report a <input type="checkbox"/> comma / <input checked="" type="checkbox"/> point is used as the decimal separator.	
Manufacturer's Declaration per sub-clause 4.2.5 of IEC60335-1:	
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"/> Yes <input type="checkbox"/> Not applicable
When differences exist; they shall be identified in the General product information section.	
Name and address of factory (ies) ..:	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

General product information and other remarks:

- The equipment is an open-frame, AC/DC switching power supply (building-in type) for general use with Class I information technology equipment
- The equipment shall be reliably earthed in end system
- Optional conformal coating, R/C (QMJU2), rated V-0, manufactured by Humiseal, part number 1A33 and 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.
- The manufacturer specified maximum ambient temperature as 50 °C, 60 °C or 70 °C according to output load. Output load condition specified by the manufacturer:

Model	Input rating	Output load	Ambient
CAR2012TEXXXXXXX	100-180Vac	12Vdc/ 108A, 3.3Vsb/ 4A	50°C
		12Vdc/81A, 3.3Vsb/ 4A	60°C
		12Vdc/ 54A, 3.3Vsb/ 4A	70°C
	180-240Vac	12Vdc/ 167A, 3.3Vsb/ 4A	50°C
		12Vdc/ 125.25A, 3.3Vsb/ 4A	60°C
		12Vdc/ 83.5A, 3.3Vsb/ 4A	70°C
CAR2012TEXX5XXXX	100-180Vac	12Vdc/ 108A, 5Vsb/ 3A	50°C
		12Vdc/ 81A, 5Vsb/ 3A	60°C
		12Vdc/ 54A, 5Vsb/ 3A	70°C
	180-240Vac	12Vdc/ 167A, 5Vsb/ 3A	50°C
		12Vdc/ 125.25A, 5Vsb/ 3A	60°C
		12Vdc/ 83.5A, 5Vsb/ 3A	70°C

Model differences:

- The models CAR2012TEXXXXXXX are identical to CAR2012TEXX5XXXX except model name, output rating and component T4.

Definition of variables:

Variable:	Range of variable:	Content:
CAR2012TEXXXXXXX		
X	Each can be 0-9, A-Z, -, _ or blank, except the third X can not be 5	No technical difference and only with different model name.
CAR2012TEXX5XXXX		
X	Each can be 0-9, A-Z, -, _ or blank	No technical difference and only with different model name.

OVERVIEW OF ENERGY SOURCES AND SAFEGUARDS				
Clause	Possible Hazard			
5	Electrically-caused injury			
Class and Energy Source (e.g. ES3: Primary circuit)	Body Part (e.g. Ordinary)	Safeguards		
		B	S	R
ES3: Primary circuits	Instructed, Skilled person	N/A	N/A	Provided, see clause 5 for details.
ES1: Output connector	Instructed, Skilled 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 st S	2 nd S
PS3: > 100 Watt circuit	Combustible materials	See 6.3.1 (a) (N)	See 6.4.6 (N, A, S)	N/A
7	Injury caused by hazardous substances			
Class and Energy Source (e.g. Ozone)	Body Part (e.g., Skilled)	Safeguards		
		B	S	R
N/A	N/A	N/A	N/A	N/A
8	Mechanically-caused injury			
Class and Energy Source (e.g. MS3: Plastic fan blades)	Body Part (e.g. Ordinary)	Safeguards		
		B	S	R
MS1: 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)	Instructed, Skilled person	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
N/A(for building-in)	N/A	N/A	N/A	N/A
10	Radiation			
Class and Energy Source (e.g. RS1: PMP sound output)	Body Part (e.g., Ordinary)	Safeguards		
		B	S	R
RS1: Indicating LED	N/A	N/A	N/A	N/A
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

“SEE OVERVIEW OF ENERGY SOURCES AND SAFEGUARDS”

ES PS MS TS RS

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
4	GENERAL REQUIREMENTS		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		N/A
4.4.3.2	Steady force tests		N/A
4.4.3.3	Drop tests		N/A
4.4.3.4	Impact tests		N/A
4.4.3.5	Internal accessible safeguard tests		N/A
4.4.3.6	Glass impact tests		N/A
4.4.3.7	Glass fixation tests		N/A
	Glass impact test (1J)		N/A
	Push/pull test (10 N)		N/A
4.4.3.8	Thermoplastic material tests		N/A
4.4.3.9	Air comprising a safeguard		N/A
4.4.3.10	Accessibility, glass, safeguard effectiveness		N/A
4.4.4	Displacement of a safeguard by an insulating liquid		N/A
4.4.5	Safety interlocks		N/A
4.5	Explosion		P
4.5.1	General		P

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
4.5.2	No explosion during normal/abnormal operating condition	See Clause B.2, B.3	P
	No harm by explosion during single fault conditions	See Clause B.4	P
4.6	Fixing of conductors		P
	Fix conductors not to defeat a safeguard		P
	Compliance is checked by test.....:		P
4.7	Equipment for direct insertion into mains socket-outlets		N/A
4.7.2	Mains plug part complies with relevant standard ...:		N/A
4.7.3	Torque (Nm).....:		N/A
4.8	Equipment containing coin/button cell batteries		N/A
4.8.1	General		N/A
4.8.2	Instructional safeguard.....:		N/A
4.8.3	Battery compartment door/cover construction		N/A
	Open torque test		N/A
4.8.4.2	Stress relief test		N/A
4.8.4.3	Battery replacement test		N/A
4.8.4.4	Drop test		N/A
4.8.4.5	Impact test		N/A
4.8.4.6	Crush test		N/A
4.8.5	Compliance		N/A
	30N force test with test probe		N/A
	20N force test with test hook		N/A
4.9	Likelihood of fire or shock due to entry of conductive object		N/A
4.10	Component requirements		N/A
4.10.1	Disconnect Device	Shall be investigated in the end system/equipment	N/A
4.10.2	Switches and relays	Shall be investigated in the end system/equipment	N/A

5	ELECTRICALLY-CAUSED INJURY		P
5.2	Classification and limits of electrical energy sources		P
5.2.2	ES1, ES2 and ES3 limits	See below.	P
5.2.2.2	Steady-state voltage and current limits.....:	See appended table	P
5.2.2.3	Capacitance limits.....:		N/A
5.2.2.4	Single pulse limits.....:		N/A
5.2.2.5	Limits for repetitive pulses.....:		N/A
5.2.2.6	Ringing signals		N/A
5.2.2.7	Audio signals		N/A
5.3	Protection against electrical energy sources		P

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
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		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		N/A
5.4	Insulation materials and requirements		P
5.4.1.2	Properties of insulating material		P
5.4.1.3	Material is non-hygroscopic	See subclause 5.4.8.	P
5.4.1.4	Maximum operating temperature for insulating materials..... :	See appended table 5.4.1.4, 6.3.2, 9.0, B.2.6	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 transformers within the equipment.	N/A
5.4.1.7	Insulation in circuits generating starting pulses	No such circuits within the equipment.	N/A
5.4.1.8	Determination of working voltage..... :	See appended table.	P
5.4.1.9	Insulating surfaces		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..... :	The phenolic materials used as bobbin in transformers are acceptable without test.	P
5.4.2	Clearances		P

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
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		—
5.4.2.3	Procedure 2 for determining clearance		P
5.4.2.3.2.2	a.c. mains transient voltage.....	2500V _{peak}	—
5.4.2.3.2.3	d.c. mains transient voltage		—
5.4.2.3.2.4	External circuit transient voltage	No such transient	—
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	Not applicable.	N/A
5.4.2.5	Multiplication factors for clearances and test voltages.....	Specified the equipment to be operated up to 3000 m above sea level. Multiplication factor 1.14 applied for clearances according to Table 17.	P
5.4.2.6	Clearance measurement.....		P
5.4.3	Creepage distances	See appended table	P
5.4.3.1	General	See below.	P
5.4.3.3	Material group	Material group IIIb is assumed.	—
5.4.3.4	Creepage distances measurement.....		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.	P
5.4.4.3	Insulating compound forming solid insulation	Approved optocoupler used.	P
5.4.4.4	Solid insulation in semiconductor devices	Approved optocoupler used.	P
5.4.4.5	Insulating compound forming cemented joints	Not used cemented joints	N/A
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
5.4.4.6.3	Non-separable thin sheet material	No such material used	N/A
	Number of layers (pcs)	No such material used	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		P
5.4.4.9	Solid insulation at frequencies >30 kHz, E_P , K_R , d , V_{PW} (V).....		P

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
	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	Approved optocoupler used.	N/A
5.4.8	Humidity conditioning		P
	Relative humidity (%), temperature ($^{\circ}C$), duration (h)	95 %, 40 $^{\circ}C$, 120 h	—
5.4.9	Electric strength test	See appended table.	P
5.4.9.1	Test procedure for type test of solid insulation	Compliance was checked immediately following temperature test in subclause 5.4.1.4.	P
5.4.9.2	Test procedure for routine test	No routine tests under consideration this time.	N/A
5.4.10	Safeguards against transient voltages from external circuits	No such 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	Shall be investigated in the end system/equipment	N/A
5.4.11.1	Exceptions to separation between external circuits and earth		N/A
5.4.11.2	Requirements		N/A
	SPDs bridge separation between external circuit and earth		N/A
	Rated operating voltage U_{op} (V)		—
	Nominal voltage U_{peak} (V)		—
	Max increase due to variation ΔU_{sp}		—
	Max increase due to ageing ΔU_{sa}		—
5.4.11.3	Test method and compliance		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
5.4.12	Insulating liquid		N/A
5.4.12.1	General requirements		N/A
5.4.12.2	Electric strength of an insulating liquid.....:		N/A
5.4.12.3	Compatibility of an insulating liquid.....:		N/A
5.4.12.4	Container for insulating liquid.....:		N/A
5.5	Components as safeguards		P
5.5.1	General	See the following details.	P
5.5.2	Capacitors and RC units	X and Y capacitors are IEC 60384-14 approval components and complied with Annex G.11.	P
5.5.2.1	General requirement	See below.	P
5.5.2.2	Safeguards against capacitor discharge after disconnection of a connector	See appended table.	P
5.5.3	Transformers		P
5.5.4	Optocouplers		P
5.5.5	Relays		P
5.5.6	Resistors		P
5.5.7	SPDs		N/A
5.5.8	Insulation between the mains and an external circuit consisting of a coaxial cable.....:		N/A
5.5.9	Safeguards for socket-outlets in outdoor equipment		N/A
	RCD rated residual operating current (mA)		—
5.6	Protective conductor		N/A
5.6.2	Requirement for protective conductors	Shall be investigated in the end system/equipment	N/A
5.6.2.1	General requirements	Shall be investigated in the end system/equipment	N/A
5.6.2.2	Colour of insulation		N/A
5.6.3	Requirement for protective earthing conductors		N/A
	Protective earthing conductor size (mm ²)		—
	Protective earthing conductor serving as a reinforced safeguard		N/A
	Protective earthing conductor serving as a double safeguard		N/A
5.6.4	Requirements for protective bonding conductors		N/A
5.6.4.1	Protective bonding conductors		N/A
	Protective bonding conductor size (mm ²).....:		—
5.6.4.2	Protective current rating (A)		N/A
5.6.5	Terminals for protective conductors		N/A

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

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Clause	Requirement + Test	Result - Remark	Verdict

6	ELECTRICALLY- CAUSED FIRE		P
6.2	Classification of PS and PIS		P
6.2.2	Power source circuit classifications		P
6.2.3	Classification of potential ignition sources		P
6.2.3.1	Arcing PIS		P
6.2.3.2	Resistive PIS		P
6.3	Safeguards against fire under normal operating and abnormal operating conditions		P
6.3.1	No ignition and attainable temperature value less than 90 % defined by ISO 871 or less than 300 °C for unknown materials	No ignition and such temperature attained within the plastic fire enclosure. (see appended table 5.4.1.4, 6.3.2, 9.0, B.2.6)	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
6.4	Safeguards against fire under single fault conditions		P
6.4.1	Safeguard method		P
6.4.2	Reduction of the likelihood of ignition under single fault conditions in PS1 circuits		N/A
6.4.3	Reduction of the likelihood of ignition under single fault conditions in PS2 and PS3 circuits		P
6.4.3.1	Supplementary safeguards		P
6.4.3.2	Single Fault Conditions		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
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

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Clause	Requirement + Test	Result - Remark	Verdict
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
6.5	Internal and external wiring		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 ²) for socket-outlets		N/A
6.6	Safeguards against fire due to the connection to additional equipment		N/A

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

8	MECHANICALLY-CAUSED INJURY		P
8.2	Mechanical energy source classifications		P
8.3	Safeguards against mechanical energy sources		P
8.4	Safeguards against parts with sharp edges and corners		P

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Clause	Requirement + Test	Result - Remark	Verdict
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
8.5	Safeguards against moving parts		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
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

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Clause	Requirement + Test	Result - Remark	Verdict
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
8.6	Stability of equipment		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
8.7	Equipment mounted to wall, ceiling or other structure		N/A
8.7.1	Mount means type	Shall be investigated in the end system/equipment	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
8.8	Handles strength		N/A
8.8.1	General	Shall be investigated in the end system/equipment	N/A
8.8.2	Handle strength test		N/A
	Number of handles		—
	Force applied (N).....		—
8.9	Wheels or casters attachment requirements		N/A
8.9.2	Pull test	Shall be investigated in the end system/equipment	N/A
8.10	Carts, stands and similar carriers		N/A
8.10.1	General	Shall be investigated in the end system/equipment	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
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
8.11	Mounting means for slide-rail mounted equipment (SRME)		N/A
8.11.1	General	Shall be investigated in the end system/equipment	N/A
8.11.2	Requirements for slide rails		N/A
	Instructional Safeguard		N/A
8.11.3	Mechanical strength test		N/A
8.11.3.1	Downward force test, force (N) applied		N/A
8.11.3.2	Lateral push force test		N/A
8.11.3.3	Integrity of slide rail end stops		N/A
8.11.4	Compliance		N/A
8.12	Telescoping or rod antennas		N/A
	Button/ball diameter (mm)		—

9	THERMAL BURN INJURY		N/A
9.2	Thermal energy source classifications		N/A
9.3	Touch temperature limits		N/A
9.3.1	Touch temperatures of accessible parts	No accessible surfaces.	N/A
9.3.2	Test method and compliance		N/A
9.4	Safeguards against thermal energy sources		N/A
9.5	Requirements for safeguards		N/A
9.5.1	Equipment safeguard		N/A
9.5.2	Instructional safeguard		N/A
9.6	Requirements for wireless power transmitters		N/A
9.6.1	General		N/A
9.6.2	Specification of the foreign objects		N/A
9.6.3	Test method and compliance		N/A

10	RADIATION		P
10.2	Radiation energy source classification		P
10.2.1	General classification	Indicating LED considered as RS1 without tests.	P

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

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

B	NORMAL OPERATING CONDITION TESTS, ABNORMAL OPERATING CONDITION TESTS AND SINGLE FAULT CONDITION TESTS		P
B.1	General		P
B.1.5	Temperature measurement conditions		P
B.2	Normal operating conditions		P
B.2.1	General requirements	See appended tables.	P
	Audio Amplifiers and equipment with audio amplifiers		N/A
B.2.3	Supply voltage and tolerances		P
B.2.5	Input test.....	See appended tables.	P
B.3	Simulated abnormal operating conditions		P
B.3.1	General	See appended tables.	P
B.3.2	Covering of ventilation openings		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.	P
B.3.6	Reverse battery polarity		N/A
B.3.7	Audio amplifier abnormal operating conditions		N/A
B.3.8	Safeguards functional during and after abnormal operating conditions	All safeguards remained effectively.	P
B.4	Simulated single fault conditions		P
B.4.1	General		P
B.4.2	Temperature controlling device		N/A
B.4.3	Blocked motor test		N/A
B.4.4	Functional insulation		P
B.4.4.1	Short circuit of clearances for functional insulation		P
B.4.4.2	Short circuit of creepage distances for functional insulation		P
B.4.4.3	Short circuit of functional insulation on coated printed boards		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
B.4.5	Short-circuit and interruption of electrodes in tubes and semiconductors		P
B.4.6	Short circuit or disconnection of passive components		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:		P
B.4.9	Battery charging and discharging under single fault conditions		N/A
C	UV RADIATION		N/A
C.1	Protection of materials in equipment from UV radiation		N/A
C.1.2	Requirements		N/A
C.1.3	Test method		N/A
C.2	UV light conditioning test		N/A
C.2.1	Test apparatus		N/A
C.2.2	Mounting of test samples		N/A
C.2.3	Carbon-arc light-exposure test		N/A
C.2.4	Xenon-arc light-exposure test		N/A
D	TEST GENERATORS		N/A
D.1	Impulse test generators		N/A
D.2	Antenna interface test generator		N/A
D.3	Electronic pulse generator		N/A
E	TEST CONDITIONS FOR EQUIPMENT CONTAINING AUDIO AMPLIFIERS		N/A
E.1	Electrical energy source classification for audio signals		N/A
	Maximum non-clipped output power (W)		—
	Rated load impedance (Ω)		—
	Open-circuit output voltage (V)		—
	Instructional safeguard		—
E.2	Audio amplifier normal operating conditions		N/A
	Audio signal source type		—
	Audio output power (W)		—
	Audio output voltage (V).....		—
	Rated load impedance (Ω)		—
	Requirements for temperature measurement		N/A
E.3	Audio amplifier abnormal operating conditions		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
F	EQUIPMENT MARKINGS, INSTRUCTIONS, AND INSTRUCTIONAL SAFEGUARDS		P
F.1	General		P
	Language	English	—
F.2	Letter symbols and graphical symbols		P
F.2.1	Letter symbols according to IEC60027-1		P
F.2.2	Graphic symbols according to IEC, ISO or manufacturer specific		P
F.3	Equipment markings		P
F.3.1	Equipment marking locations		P
F.3.2	Equipment identification markings		P
F.3.2.1	Manufacturer identification	See copy of marking plate	P
F.3.2.2	Model identification	See copy of marking plate	P
F.3.3	Equipment rating markings		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		N/A
F.3.3.3	Nature of the supply voltage		—
F.3.3.4	Rated voltage	See copy of marking plate	—
F.3.3.5	Rated frequency		—
F.3.3.6	Rated current or rated power	See copy of marking plate	—
F.3.3.7	Equipment with multiple supply connections	Single supply connection	N/A
F.3.4	Voltage setting device		N/A
F.3.5	Terminals and operating devices		N/A
F.3.5.1	Mains appliance outlet and socket-outlet markings		N/A
F.3.5.2	Switch position identification marking		N/A
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		N/A
F.3.5.5	Neutral conductor terminal		N/A
F.3.5.6	Terminal marking location		N/A
F.3.6	Equipment markings related to equipment classification	See below	P

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Clause	Requirement + Test	Result - Remark	Verdict
F.3.6.1	Class I equipment	Shall be investigated in the end system/equipment	N/A
F.3.6.1.1	Protective earthing conductor terminal		N/A
F.3.6.1.2	Protective bonding conductor terminals	Shall be investigated in the end system/equipment	N/A
F.3.6.2	Equipment class marking		N/A
F.3.6.3	Functional earthing terminal marking		N/A
F.3.7	Equipment IP rating marking	This equipment is classified as IPX0.	N/A
F.3.8	External power supply output marking	Shall be investigated in the end system/equipment	N/A
F.3.9	Durability, legibility and permanence of marking		P
F.3.10	Test for permanence of markings		P
F.4	Instructions		P
	a) Information prior to installation and initial use	Relevant safety caution texts and installation instruction are available.	P
	b) Equipment for use in locations where children not likely to be present		N/A
	c) Instructions for installation and interconnection		N/A
	d) Equipment intended for use only in restricted access area		P
	e) Equipment intended to be fastened in place		N/A
	f) Instructions for audio equipment terminals		N/A
	g) Protective earthing used as a safeguard	Shall be investigated in the end system/equipment	N/A
	h) Protective conductor current exceeding ES2 limits		N/A
	i) Graphic symbols used on equipment	See copy of marking plate	P
	j) Permanently connected equipment not provided with all-pole mains switch		N/A
	k) Replaceable components or modules providing safeguard function		N/A
	l) Equipment containing insulating liquid		N/A
	m) Installation instructions for outdoor equipment		N/A
F.5	Instructional safeguards		P
G	COMPONENTS		P
G.1	Switches		N/A
G.1.1	General	No such switch as disconnect devices are provided within the equipment.	N/A
G.1.2	Ratings, endurance, spacing, maximum load		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
G.1.3	Test method and compliance		N/A
G.2	Relays		P
G.2.1	Requirements	Approved relay used.	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
G.3	Protective devices		P
G.3.1	Thermal cut-offs		N/A
	Thermal cut-outs separately approved according to IEC 60730 with conditions indicated in a) & b)		N/A
	Thermal cut-outs tested as part of the equipment as indicated in c)		N/A
G.3.1.2	Test method and compliance		N/A
G.3.2	Thermal links		N/A
G.3.2.1	a) Thermal links tested separately according to IEC 60691 with specifics	No thermal link is provided within the equipment.	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	No PTC thermistor is provided within the equipment.	N/A
G.3.4	Overcurrent protection devices	Approved fuse used.	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		N/A
G.4	Connectors		P
G.4.1	Spacings		N/A
G.4.2	Mains connector configuration	Approved appliance inlet used.	P
G.4.3	Plug is shaped that insertion into mains socket-outlets or appliance coupler is unlikely		N/A
G.5	Wound components		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 tape 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)		—

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Clause	Requirement + Test	Result - Remark	Verdict
	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	The transformer meets the requirements given in subclauses 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
	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

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Clause	Requirement + Test	Result - Remark	Verdict
G.5.4.6.2	Tested in the unit		N/A
	Maximum Temperature		N/A
G.5.4.6.3	Alternative method		N/A
G.5.4.7	Motors with capacitors		N/A
G.5.4.8	Three-phase motors		N/A
G.5.4.9	Series motors		N/A
	Operating voltage		—
G.6	Wire Insulation		P
G.6.1	General	The triple insulated wire is used as reinforced safeguard in the transformer that complied with Annex J.	P
G.6.2	Enamelled winding wire insulation	Insulation is not relied on solvent-based enamel.	N/A
G.7	Mains supply cords		N/A
G.7.1	General requirements	No power supply cord provided	N/A
	Type		—
G.7.2	Cross sectional area (mm ² 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
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, <i>D</i> (mm).....		—
	Radius of curvature after test (mm)		—
G.7.6	Supply wiring space		N/A
G.7.6.1	General requirements		N/A
G.7.6.2	Stranded wire		N/A
G.7.6.2.1	Requirements		N/A
G.7.6.2.2	Test with 8 mm strand		N/A
G.8	Varistors		P

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Clause	Requirement + Test	Result - Remark	Verdict
G.8.1	General requirements	See below	P
G.8.2	Safeguards against fire	Approved varistor used in primary circuit. See appended tables 4.1.2.	P
G.8.2.1	General		N/A
G.8.2.2	Varistor overload test		N/A
G.8.2.3	Temporary overvoltage test		N/A
G.9	Integrated circuit (IC) current limiters		N/A
G.9.1	Requirements		N/A
	IC limiter output current (max. 5A)		—
	Manufacturers' defined drift		—
G.9.2	Test Program		N/A
G.9.3	Compliance		N/A
G.10	Resistors		N/A
G.10.1	General		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
G.11	Capacitors and RC units		P
G.11.1	General requirements	X Capacitor used as basic safeguard complied with IEC/EN/UL 60384-14. See appended table 4.1.2.	P
G.11.2	Conditioning of capacitors and RC units	Approved capacitor used.	N/A
G.11.3	Rules for selecting capacitors	The appropriate capacitor subclass is selected from those listed in Table G.8.	N/A
G.12	Optocouplers		P
	Optocouplers comply with IEC 60747-5-5 with specifics	The optocouplers used in the equipment are complied with IEC/EN 60747-5-5. See appended table 4.1.2.	P
	Type test voltage $V_{ini,a}$		—
	Routine test voltage, $V_{ini,b}$		—
G.13	Printed boards		P
G.13.1	General requirements	See the following details.	P

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Clause	Requirement + Test	Result - Remark	Verdict
G.13.2	Uncoated printed boards	The insulation between conductors on the outer surfaces of an uncoated printed board complied with the minimum clearance and creepage distance requirements.	P
G.13.3	Coated printed boards		N/A
G.13.4	Insulation between conductors on the same inner surface		N/A
G.13.5	Insulation between conductors on different surfaces		N/A
	Distance through insulation.....:		N/A
	Number of insulation layers (pcs)		—
G.13.6	Tests on coated printed boards		N/A
G.13.6.1	Sample preparation and preliminary inspection		N/A
G.13.6.2	Test method and compliance		N/A
G.14	Coating on components terminals		N/A
G.14.1	Requirements		N/A
G.15	Pressurized liquid filled components		N/A
G.15.1	Requirements		N/A
G.15.2	Test methods and compliance		N/A
G.15.2.1	Hydrostatic pressure test		N/A
G.15.2.2	Creep resistance test		N/A
G.15.2.3	Tubing and fittings compatibility test		N/A
G.15.2.4	Vibration test		N/A
G.15.2.5	Thermal cycling test		N/A
G.15.2.6	Force test		N/A
G.15.3	Compliance		N/A
G.16	IC including capacitor discharge function (ICX)		N/A
G.16.1	Condition for fault tested is not required		N/A
	ICX with associated circuitry tested in equipment		N/A
	ICX tested separately		N/A
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

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Clause	Requirement + Test	Result - Remark	Verdict
H	CRITERIA FOR TELEPHONE RINGING SIGNALS		N/A
H.1	General		N/A
H.2	Method A		N/A
H.3	Method B		N/A
H.3.1	Ringling signal		N/A
H.3.1.1	Frequency (Hz)		—
H.3.1.2	Voltage (V)		—
H.3.1.3	Cadence; time (s) and voltage (V)		—
H.3.1.4	Single fault current (mA):		—
H.3.2	Tripping device and monitoring voltage		N/A
H.3.2.1	Conditions for use of a tripping device or a monitoring voltage		N/A
H.3.2.2	Tripping device		N/A
H.3.2.3	Monitoring voltage (V)		N/A
J	INSULATED WINDING WIRES FOR USE WITHOUT INTERLEAVED INSULATION		P
J.1	General		P
	Winding wire insulation	The triple insulated wire is used as reinforced safeguard in the transformer that had been evaluated with Annex J.	—
	Solid round winding wire, diameter (mm).....		P
	Solid square and rectangular (flatwise bending) winding wire, cross-sectional area (mm ²)		P
J.2/J.3	Tests and Manufacturing		—
K	SAFETY INTERLOCKS		N/A
K.1	General requirements		N/A
	Instructional safeguard		N/A
K.2	Components of safety interlock safeguard mechanism		N/A
K.3	Inadvertent change of operating mode		N/A
K.4	Interlock safeguard override		N/A
K.5	Fail-safe		N/A
K.5.1	Under single fault condition		N/A
K.6	Mechanically operated safety interlocks		N/A
K.6.1	Endurance requirement		N/A
K.6.2	Test method and compliance		N/A
K.7	Interlock circuit isolation		N/A
K.7.1	Separation distance for contact gaps & interlock circuit elements		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	In circuit connected to mains, separation distance for contact gaps (mm)		N/A
	In circuit isolated from mains, separation distance for contact gaps (mm)		N/A
	Electric strength test before and after the test of K.7.2		N/A
K.7.2	Overload test, Current (A)		N/A
K.7.3	Endurance test		N/A
K.7.4	Electric strength test		N/A
L	DISCONNECT DEVICES		N/A
L.1	General requirements	Shall be investigated in the end system/equipment	N/A
L.2	Permanently connected equipment		N/A
L.3	Parts that remain energized		N/A
L.4	Single-phase equipment		N/A
L.5	Three-phase equipment		N/A
L.6	Switches as disconnect devices		N/A
L.7	Plugs as disconnect devices		N/A
L.8	Multiple power sources		N/A
	Instructional safeguard		N/A
M	EQUIPMENT CONTAINING BATTERIES AND THEIR PROTECTION CIRCUITS		N/A
M.1	General requirements		N/A
M.2	Safety of batteries and their cells		N/A
M.2.1	Batteries and their cells comply with relevant IEC standards.....		N/A
M.3	Protection circuits for batteries provided within the equipment		N/A
M.3.1	Requirements		N/A
M.3.2	Test method		N/A
	Overcharging of a rechargeable battery		N/A
	Excessive discharging		N/A
	Unintentional charging of a non-rechargeable battery		N/A
	Reverse charging of a rechargeable battery		N/A
M.3.3	Compliance		N/A
M.4	Additional safeguards for equipment containing a portable secondary lithium battery		N/A
M.4.1	General		N/A
M.4.2	Charging safeguards		N/A
M.4.2.1	Requirements		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
M.4.2.2	Compliance		N/A
M.4.3	Fire enclosure		N/A
M.4.4	Drop test of equipment containing a secondary lithium battery		N/A
M.4.4.2	Preparation and procedure for the drop test		N/A
M.4.4.3	Drop, Voltage on reference and dropped batteries (V); voltage difference during 24 h period (%):		N/A
M.4.4.4	Check of the charge/discharge function		N/A
M.4.4.5	Charge / discharge cycle test		N/A
M.4.4.6	Compliance		N/A
M.5	Risk of burn due to short-circuit during carrying		N/A
M.5.1	Requirement		N/A
M.5.2	Test method and compliance		N/A
M.6	Safeguards against short-circuits		N/A
M.6.1	External and internal faults		N/A
M.6.2	Compliance		N/A
M.7	Risk of explosion from lead acid and NiCd batteries		N/A
M.7.1	Ventilation preventing explosive gas concentration		N/A
	Calculated hydrogen generation rate		N/A
M.7.2	Test method and compliance		N/A
	Minimum air flow rate, Q (m ³ /h)		N/A
M.7.3	Ventilation tests		N/A
M.7.3.1	General		N/A
M.7.3.2	Ventilation test – alternative 1		N/A
	Hydrogen gas concentration (%)		N/A
M.7.3.3	Ventilation test – alternative 2		N/A
	Obtained hydrogen generation rate		N/A
M.7.3.4	Ventilation test – alternative 3		N/A
	Hydrogen gas concentration (%)		N/A
M.7.4	Marking.....		N/A
M.8	Protection against internal ignition from external spark sources of batteries with aqueous electrolyte		N/A
M.8.1	General		N/A
M.8.2	Test method		N/A
M.8.2.1	General		N/A
M.8.2.2	Estimation of hypothetical volume V _Z (m ³ /s).....		—
M.8.2.3	Correction factors.....		—
M.8.2.4	Calculation of distance d (mm)		—

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Clause	Requirement + Test	Result - Remark	Verdict
M.9	Preventing electrolyte spillage		N/A
M.9.1	Protection from electrolyte spillage		N/A
M.9.2	Tray for preventing electrolyte spillage		N/A
M.10	Instructions to prevent reasonably foreseeable misuse		N/A
	Instructional safeguard		N/A
N	ELECTROCHEMICAL POTENTIALS		N/A
	Material(s) used		—
O	MEASUREMENT OF CREEPAGE DISTANCES AND CLEARANCES		P
	Value of X (mm)	Considered.	—
P	SAFEGUARDS AGAINST CONDUCTIVE OBJECTS		N/A
P.1	General	Built-in equipment.	N/A
P.2	Safeguards against entry or consequences of entry of a foreign object		N/A
P.2.1	General		N/A
P.2.2	Safeguards against entry of a foreign object		N/A
	Location and Dimensions (mm)		—
P.2.3	Safeguards against the consequences of entry of a foreign object		N/A
P.2.3.1	Safeguard requirements		N/A
	The ES3 and PS3 keep-out volume in Figure P.3 not applicable to transportable equipment		N/A
	Transportable equipment with metalized plastic parts		N/A
P.2.3.2	Consequence of entry test		N/A
P.3	Safeguards against spillage of internal liquids		N/A
P.3.1	General		N/A
P.3.2	Determination of spillage consequences		N/A
P.3.3	Spillage safeguards		N/A
P.3.4	Compliance		N/A
P.4	Metallized coatings and adhesives securing parts		N/A
P.4.1	General		N/A
P.4.2	Tests		N/A
	Conditioning, T _c (°C)		—
	Duration (weeks)		—
Q	CIRCUITS INTENDED FOR INTERCONNECTION WITH BUILDING WIRING		N/A
Q.1	Limited power sources	Built-in equipment.	N/A
Q.1.1	Requirements		N/A
	a) Inherently limited output		N/A
	b) Impedance limited output		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	c) Regulating network limited output		N/A
	d) Overcurrent protective device limited output		N/A
	e) IC current limiter complying with G.9		N/A
Q.1.2	Test method and compliance		N/A
	Current rating of overcurrent protective device (A)		N/A
Q.2	Test for external circuits – paired conductor cable		N/A
	Maximum output current (A)		N/A
	Current limiting method		—
R	LIMITED SHORT CIRCUIT TEST		N/A
R.1	General		N/A
R.2	Test setup		N/A
	Overcurrent protective device for test		—
R.3	Test method		N/A
	Cord/cable used for test		—
R.4	Compliance		N/A
S	TESTS FOR RESISTANCE TO HEAT AND FIRE		N/A
S.1	Flammability test for fire enclosures and fire barrier materials of equipment where the steady state power does not exceed 4 000 W		N/A
	Samples, material		—
	Wall thickness (mm).....		—
	Conditioning (°C).....		—
	Test flame according to IEC 60695-11-5 with conditions as set out		N/A
	- Material not consumed completely		N/A
	- Material extinguishes within 30s		N/A
	- No burning of layer or wrapping tissue		N/A
S.2	Flammability test for fire enclosure and fire barrier integrity		N/A
	Samples, material		—
	Wall thickness (mm).....		—
	Conditioning (°C).....		—
S.3	Flammability test for the bottom of a fire enclosure		N/A
S.3.1	Mounting of samples		N/A
S.3.2	Test method and compliance		N/A
	Mounting of samples		—
	Wall thickness (mm).....		—
S.4	Flammability classification of materials		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
S.5	Flammability test for fire enclosures and fire barrier materials of equipment where the steady state power exceeding 4 000 W		N/A
	Samples, material		—
	Wall thickness (mm).....		—
	Conditioning (°C).....		—
T	MECHANICAL STRENGTH TESTS		P
T.1	General		P
T.2	Steady force test, 10 N		P
T.3	Steady force test, 30 N		N/A
T.4	Steady force test, 100 N		N/A
T.5	Steady force test, 250 N		N/A
T.6	Enclosure impact test		N/A
	Fall test		N/A
	Swing test		N/A
T.7	Drop test		N/A
T.8	Stress relief test		N/A
T.9	Glass Impact Test.....		N/A
T.10	Glass fragmentation test		N/A
	Number of particles counted		N/A
T.11	Test for telescoping or rod antennas		N/A
	Torque value (Nm)		N/A
U	MECHANICAL STRENGTH OF CATHODE RAY TUBES (CRT) AND PROTECTION AGAINST THE EFFECTS OF IMPLOSION		N/A
U.1	General		N/A
	Instructional safeguard:		N/A
U.2	Test method and compliance for non-intrinsically protected CRTs		N/A
U.3	Protective screen		N/A
V	DETERMINATION OF ACCESSIBLE PARTS		N/A
V.1	Accessible parts of equipment		N/A
V.1.1	General		N/A
V.1.2	Surfaces and openings tested with jointed test probes		N/A
V.1.3	Openings tested with straight unjointed test probes		N/A
V.1.4	Plugs, jacks, connectors tested with blunt probe		N/A
V.1.5	Slot openings tested with wedge probe		N/A
V.1.6	Terminals tested with rigid test wire		N/A
V.2	Accessible part criterion		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
X	ALTERNATIVE METHOD FOR DETERMINING CLEARANCES FOR INSULATION IN CIRCUITS CONNECTED TO AN AC MAINS NOT EXCEEDING 420 V PEAK (300 V RMS)		N/A
	Clearance..... :		N/A
Y	CONSTRUCTION REQUIREMENTS FOR OUTDOOR ENCLOSURES		N/A
Y.1	General		N/A
Y.2	Resistance to UV radiation		N/A
Y.3	Resistance to corrosion		N/A
Y.3	Resistance to corrosion		N/A
Y.3.1	Metallic parts of outdoor enclosures are resistant to effects of water-borne contaminants by		N/A
Y.3.2	Test apparatus		N/A
Y.3.3	Water – saturated sulphur dioxide atmosphere		N/A
Y.3.4	Test procedure..... :		N/A
Y.3.5	Compliance		N/A
Y.4	Gaskets		N/A
Y.4.1	General		N/A
Y.4.2	Gasket tests		N/A
Y.4.3	Tensile strength and elongation tests		N/A
	Alternative test methods..... :		N/A
Y.4.4	Compression test		N/A
Y.4.5	Oil resistance		N/A
Y.4.6	Securing means		N/A
Y.5	Protection of equipment within an outdoor enclosure		N/A
Y.5.1	General		N/A
Y.5.2	Protection from moisture		N/A
	Relevant tests of IEC 60529 or Y.5.3..... :		N/A
Y.5.3	Water spray test		N/A
Y.5.4	Protection from plants and vermin		N/A
Y.5.5	Protection from excessive dust		N/A
Y.5.5.1	General		N/A
Y.5.5.2	IP5X equipment		N/A
Y.5.5.3	IP6X equipment		N/A
Y.6	Mechanical strength of enclosures		N/A
Y.6.1	General		N/A
Y.6.2	Impact test..... :		N/A

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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)	Type1)	Additional Info ²⁾	
264 Vac, 60 Hz	Input port	Normal	264	--	SS	--	ES3
		Abnormal	--	--	--	--	
		Single fault	--	--	--	--	
264 Vac, 60 Hz	T1 pin 1- pin 2	Normal	23.8 V _{kp}	--	SS	--	ES1
		Abnormal	--	--	--	--	
		Single fault	--	--	--	--	
264 Vac, 60 Hz	T2 pin 3/5-pin 4/6	Normal	40.2 V _{kp}	--	SS	--	ES1
		Abnormal	--	--	--	--	
		Single fault	--	--	--	--	
264 Vac, 60 Hz	T3 pin 3/5-pin 4/6	Normal	40.6 V _{kp}	--	SS	--	ES1
		Abnormal	--	--	--	--	
		Single fault	--	--	--	--	
264 Vac, 60 Hz	T4 pin 5 - pin 6 after C401	Normal	18.2 V _{kp}	--	SS	--	ES1
		Abnormal	--	--	--	--	
		Single fault – C401 SC	5.1 V _{kp}	--	SS	--	
264 Vac, 60 Hz	T4 pin 7-pin 10 after C60	Normal	13.2 V _{kp}	--	SS	--	ES1
		Abnormal	--	--	--	--	
		Single fault – C60SC	12.6 V _{kp}	--	--	--	
264 Vac, 60 Hz	Output port + & - to GND	Normal	45 Vdc	--	SS	--	ES1
		Abnormal	--	--	--	--	
		Single fault	--	--	--	--	

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.

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Clause	Requirement + Test	Result - Remark	Verdict

5.4.1.8	TABLE: Working voltage measurement			P
Location	RMS voltage (V)	Peak voltage (V)	Frequency (Hz)	Comments
For model: CAR2012TEBXXZOP1				
T1 pin 3 to pin 1	167	372	--	--
T1 pin 3 to pin 2	167	376	--	--
T1 pin 4 to pin 1	167	376	--	--
T1 pin 4 to pin 2	167	380	>30 k,<100 k	Max V_{rms} & V_{peak} for T1
T2 pin 1-pin 3/5	172	548	--	--
T2 pin 1-pin 4/6	171	548	--	--
T2 pin 2-pin 3/5	224	596	--	--
T2 pin 2-pin 4/6	224	596	>30 k,<100 k	Max V_{rms} & V_{peak} for T2
T3 pin 1-pin 3/5	252	552	>30 k,<100 k	Max V_{rms} & V_{peak} for T3
T3 pin 1-pin 4/6	233	400	--	--
T3 pin 2-pin 3/5	172	548	--	--
T3 pin 2-pin 4/6	171	412	--	--
T101 pin 2 to pin 1	221	511	--	--
T101 pin 3 to pin 1	216	509	--	--
T101 pin 4 to pin 1	214	509	--	--
T101 pin 5 to pin 1	216	510	--	--
T101 pin 2 to pin 6	223	516	--	--
T101 pin 3 to pin 6	221	514	--	--
T101 pin 4 to pin 6	226	519	>30 k,<100 k	Max V_{rms} & V_{peak} for T101
T101 pin 5 to pin 6	220	515	--	--
T102 pin 2 to pin 1	215	509	--	--
T102 pin 3 to pin 1	211	507	--	--
T102 pin 4 to pin 1	214	509	--	--
T102 pin 5 to pin 1	212	505	--	--
T102 pin 2 to pin 6	221	511	>30 k,<100 k	Max V_{rms} & V_{peak} for T102
T102 pin 3 to pin 6	218	510	--	--
T102 pin 4 to pin 6	212	510	--	--
T102 pin 5 to pin 6	210	511	--	--
T4 pin 1-pin 5	315	432	--	--
T4 pin 1-pin 6	315	468	--	--
T4 pin 1-pin 7	315	432	--	--

IEC 62368-1				
Clause	Requirement + Test		Result - Remark	Verdict
T4 pin 1-pin 8	315	492	--	--
T4 pin 1-pin 9	315	432	--	--
T4 pin 1-pin 10	316	468	--	--
T4 pin 2-pin 5	324	580	--	--
T4 pin 2-pin 6	323	564	--	--
T4 pin 2-pin 7	326	584	>30 k,<100 k	Max V_{rms} & V_{peak} for T4
T4 pin 2-pin 8	322	580	--	--
T4 pin 2-pin 9	324	584	--	--
T4 pin 2-pin 10	322	572	--	--
T4 pin 3-pin 5	166	376	--	--
T4 pin 3-pin 6	166	368	--	--
T4 pin 3-pin 7	168	372	--	--
T4 pin 3-pin 8	166	384	--	--
T4 pin 3-pin 9	166	368	--	--
T4 pin 3-pin 10	166	388	--	--
T4 pin 4-pin 5	166	400	--	--
T4 pin 4-pin 6	166	372	--	--
T4 pin 4-pin 7	166	400	--	--
T4 pin 4-pin 8	166	376	--	--
T4 pin 4-pin 9	166	400	--	--
T4 pin 4-pin 10	167	384	--	--
Y-cap C302 pri. To sec.	167	376	--	--
U8 pin 1 to 3	161	372	--	--
U8 pin 1 to 4	160	372	--	--
U8 pin pin 2 to 3	162	374	--	--
U8 pin pin 2 to 4	161	374	--	--
U406 pin 1 to 3	158	360	--	--
U406 pin 1 to 4	157	362	--	--
U406 pin 2 to 3	159	362	--	--
U406 pin 2 to 4	158	360	--	--
U410 pin 1 to 3	162	362	--	--
U410 pin 1 to 4	164	364	--	--
U410 pin 2 to 3	162	362	--	--
U410 pin 2 to 4	164	362	--	--

IEC 62368-1				
Clause	Requirement + Test		Result - Remark	Verdict
U411 pin 1 to 3	156	352	--	--
U411 pin 1 to 4	157	353	--	--
U411 pin 2 to 3	156	352	--	--
U411 pin 2 to 4	154	351	--	--
For model: CAR2012TEBX5Z01A				
T1 pin 3 to pin 1	165	368	--	--
T1 pin 3 to pin 2	165	372	--	--
T1 pin 4 to pin 1	166	376	>30 k,<100 k	Max V_{rms} & V_{peak} for T1
T1 pin 4 to pin 2	165	372	--	--
T2 pin 1-pin 3/5	173	560	--	--
T2 pin 1-pin 4/6	172	564	--	--
T2 pin 2-pin 3/5	227	572	--	--
T2 pin 2-pin 4/6	246	580	>30 k,<100 k	Max V_{rms} & V_{peak} for T2
T3 pin 1-pin 3/5	257	560	>30 k,<100 k	Max V_{rms} & V_{peak} for T3
T3 pin 1-pin 4/6	237	408	--	--
T3 pin 2-pin 3/5	172	556	--	--
T3 pin 2-pin 4/6	171	424	--	--
T101 pin 2 to pin 1	218	506	--	--
T101 pin 3 to pin 1	220	492	--	--
T101 pin 4 to pin 1	222	512	--	--
T101 pin 5 to pin 1	232	494	--	--
T101 pin 2 to pin 6	249	524	>30 k,<100 k	Max V_{rms} & V_{peak} for T101
T101 pin 3 to pin 6	226	508	--	--
T101 pin 4 to pin 6	218	506	--	--
T101 pin 5 to pin 6	221	524	--	--
T102 pin 2 to pin 1	220	492	--	--
T102 pin 3 to pin 1	218	496	--	--
T102 pin 4 to pin 1	224	500	--	--
T102 pin 5 to pin 1	237	508	--	--
T102 pin 2 to pin 6	246	520	>30 k,<100 k	Max V_{rms} & V_{peak} for T102
T102 pin 3 to pin 6	231	516	--	--
T102 pin 4 to pin 6	211	510	--	--
T102 pin 5 to pin 6	222	514	--	--
T4 pin 1-pin 5	318	444	--	--

IEC 62368-1				
Clause	Requirement + Test		Result - Remark	Verdict
T4 pin 1-pin 6	317	472	--	--
T4 pin 1-pin 7	317	444	--	--
T4 pin 1-pin 8	318	504	--	--
T4 pin 1-pin 9	318	444	--	--
T4 pin 1-pin 10	318	476	--	--
T4 pin 2-pin 5	326	584	--	--
T4 pin 2-pin 6	326	584	>30 k,<100 k	Max V_{rms} & V_{peak} for T4
T4 pin 2-pin 7	327	580	--	--
T4 pin 2-pin 8	324	580	--	--
T4 pin 2-pin 9	326	584	--	--
T4 pin 2-pin 10	324	580	--	--
T4 pin 3-pin 5	166	372	--	--
T4 pin 3-pin 6	165	380	--	--
T4 pin 3-pin 7	165	368	--	--
T4 pin 3-pin 8	166	384	--	--
T4 pin 3-pin 9	166	372	--	--
T4 pin 3-pin 10	166	376	--	--
T4 pin 4-pin 5	166	408	--	--
T4 pin 4-pin 6	164	378	--	--
T4 pin 4-pin 7	165	404	--	--
T4 pin 4-pin 8	164	382	--	--
T4 pin 4-pin 9	165	408	--	--
T4 pin 4-pin 10	165	384	--	--
Y-cap C302 pri. To sec.	167	376	--	--
U8 pin 1 to 3	163	374	--	--
U8 pin 1 to 4	162	372	--	--
U8 pin pin 2 to 3	161	376	--	--
U8 pin pin 2 to 4	162	372	--	--
U406 pin 1 to 3	159	361	--	--
U406 pin 1 to 4	156	369	--	--
U406 pin 2 to 3	156	367	--	--
U406 pin 2 to 4	158	367	--	--
U410 pin 1 to 3	161	362	--	--
U410 pin 1 to 4	164	363	--	--

IEC 62368-1				
Clause	Requirement + Test		Result - Remark	Verdict
U410 pin 2 to 3	162	362	--	--
U410 pin 2 to 4	163	364	--	--
U411 pin 1 to 3	157	357	--	--
U411 pin 1 to 4	153	351	--	--
U411 pin 2 to 3	156	352	--	--
U411 pin 2 to 4	154	355	--	--
Supplementary information: Test voltage is 240V/60Hz.				

5.4.1.10.2 TABLE: Vicat softening temperature of thermoplastics				N/A
Method			ISO 306 / B50	—
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)	
Output connector	See table 4.1.2	See table 4.1.2	125	1.1	
Supplementary information:					
The phenolic materials used are acceptable without test.					

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

5.4.2, 5.4.3 TABLE: Minimum Clearances/Creepage distance								P
Clearance (cl) and creepage distance (cr) at/of/between:	U _p (V)	U _{rms} (V)	Freq ¹⁾ (Hz)	Required cl (mm)	cl (mm)	E.S. ²⁾ (V)	Required cr (mm)	cr (mm)
Basic/supplementary:								
Primary components (with 10N) to appliance inlet PE pin	≤420	≤250	--	1.5 (1.14 × 1.27) for 5.4.2.2 1.8 (1.14 × 1.5) for 5.4.2.3	See below	--	2.5	See below
L to N before fuse	≤420	≤250	--	1.8	4.0	--	2.5	4.0
Different poles of fuse F1 under PCB	≤420	≤250	--	1.8	3.4	--	2.5	3.4
Different poles of fuse F2 under PCB	≤420	≤250	--	1.8	3.4	--	2.5	3.4
Primary trace to earthed trace under C108	≤420	≤250	--	1.8	3.0	--	2.5	3.0
Primary trace to earthed trace under C16, C22	≤420	≤250	--	1.8	5.9	--	2.5	5.9
Primary trace to earthed trace under C109	≤420	≤250	--	1.8	5.8	--	2.5	5.8
Primary trace to earthed trace under C202	≤420	≤250	--	1.8	5.0	--	2.5	5.0
Primary trace to earthed trace under GT2	≤420	≤250	--	1.8	4.8	--	2.5	4.8
Primary trace of F1 to earthed trace	≤420	≤250	--	1.8	2.8	--	2.5	2.8
Primary trace to earthed trace under C57	≤420	≤250	--	1.8	4.5	--	2.5	4.5
Primary trace to earthed trace under C41, C23	≤420	≤250	--	1.8	4.7	--	2.5	4.7
Primary trace to earthed heat sink HS1	≤420	≤250	--	1.8	5.0	--	2.5	5.0
Primary solder pin of T2 to earthed trace	≤420	≤250	--	1.8	4.8	--	2.5	4.8
Primary solder pin of BR3, BR4 to earthed heat sink HS1	≤420	≤250	--	1.8	2.8	--	2.5	2.8
Primary C8 to earthed heat sink HS1	≤420	≤250	--	1.8	3.0	--	2.5	3.0
Primary RT1 to top metal enclosure	≤420	≤250	--	1.8	3.4	--	2.5	3.4

IEC 62368-1								
Clause	Requirement + Test			Result - Remark				Verdict
Primary TZ1 to top metal enclosure	≤420	≤250	--	1.8	4.2	--	2.5	4.2
Primary L20 and trace of L20 to front metal enclosure	≤420	≤250	--	1.8	3.5	--	2.5	3.5
Primary BDA1 to earthed metal part for fixing fan	≤420	≤250	--	1.8	2.5	--	2.5	5.0
Core of T4 to secondary trace on control board	584	326	--	1.8	3.3	--	3.3	6.0
T4 Primary winding / pin to core (int. & ext.)	584	327	-- ³⁾	1.8	4.0	--	3.3	4.0
T4 secondary winding / pin to core (int. & ext.)	584	327	-- ³⁾	1.8	4.0	--	3.3	4.0
Reinforce/Double insulation:								
Primary components/traces (with 10N) to secondary components/traces (with 10N)	≤420	≤250	--	2.9 (1.14 × 2.54) for 5.4.2.2 3.5 (1.48 × 3.0) for 5.4.2.3	See below	--	5.0	See below
Primary trace to secondary trace of U8, U406, U410, U411, U8(control board)	≤420	≤250	--	3.5	6.8	--	5.0	6.8
Primary trace to secondary trace under T101, T102(drive board)	524	≤250	--	3.5	10.2	--	5.0	10.2
Primary trace of CR111 to secondary trace of C101(drive board)	≤420	≤250	--	3.5	7.0	--	5.0	7.0
Primary J102 to secondary J101	≤420	≤250	--	3.5	5.8	--	5.0	5.8
Primary trace to secondary trace under T1	≤420	≤250	--	3.5	11.2	--	5.0	11.2
Primary trace to secondary trace under T4	584	327	-- ³⁾	3.5	8.4	--	5.0	8.4
Primary winding of T4 to secondary C404	584	327	-- ³⁾	3.5	6.5	--	5.0	14.0
T1 Primary winding / pin to secondary winding / pin (int. & ext.)	≤420	≤250	-- ³⁾	3.5	5.4	--	5.0	5.4

IEC 62368-1								
Clause	Requirement + Test			Result - Remark				Verdict
T1 Primary winding / pin to core (int. & ext.)	≤420	≤250	-- ³⁾	3.5	5.4	--	5.0	5.4
T2, T3 Primary winding / pin to secondary winding / pin (int. & ext.)	596	257	-- ³⁾	3.5	8.5	--	5.2	8.5
T2, T3 Primary winding / pin to core (int. & ext.)	596	257	-- ³⁾	3.5	8.5	--	5.2	8.5
T4 Primary winding / pin to secondary winding / pin (int. & ext.)	584	327	-- ³⁾	3.5	8.0	--	5.0	8.0
T101, T102 Primary winding / pin to secondary winding / pin (int. & ext.)	524	≤250	-- ³⁾	3.5	5.3	--	5.0	5.3
T101, T102 Primary winding / pin to core (int. & ext.)	524	≤250	-- ³⁾	3.5	5.3	--	5.0	5.3
Supplementary information: ¹⁾ Only for frequency above 30 kHz ²⁾ Complete Electric Strength voltage (E.S. (V) when 5.4.2.4 applied) ³⁾ See table 5.4.1.8. Note 1. Core of transformer T1, T2, T3, T101 and T102 considered as secondary part. Note 2. Core of T4 considered as intermediate part. Note 3. Heat shrinkable tube used for DC fan wires, secondary LED wires, F1, F2, C2, RT1 and C8. Note 4. Mylar sheet provided between PCB and metal enclosure as basic insulation. Note 5. Insulation tape adhered to top of metal enclosure as basic insulation. Note 6. Glued components: F1, F2, C2, RT1, C57, TZ1, TZ2, TZ3, C8 and all wires solder to PCB. Note 7. Mylar sheet provided between driver board and Q8, Q10. Note 8. For the equipment intended to be used in a level up to 3000m, multiplication factor (1.14) for clearance described in IEC 60664 IEC 60664-1 table A.2 considered.								

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)	
Opto-coupler	≤420	RI	0.4	See table 4.1.2	
Supplementary information:					

5.4.4.9	TABLE: Solid insulation at frequencies >30 kHz					P
Insulation material	E_P	Frequency (kHz)	K_R	Thickness d (mm)	Insulation	V_{PW} (Vpk)
Bobbin	17	>30, <100	0.71	0.4	RI	See table 5.4.1.8
Supplementary information: $V_W > 1.2 \times 2 \times V_{PW} / 1.41$						

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
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
Basic/supplementary:			
L to N (fuse opened)	DC	2500	No
L/N to metal enclosure	DC	2500	No
T4 primary winding to core	DC	2500	No
T4 secondary winding to core	DC	2500	No
Insulation tape adhered to top of metal enclosure	DC	2500	No
BRG3 and BRG4 pin to body	DC	2500	No
BRG3 and BRG4 pin to earthed heat sink HS1	DC	2500	No
Different poles of GT2	DC	2500	No
Mylar sheet between PCB and metal enclosure	DC	2500	No
Reinforced:			
L/N to output terminal	DC	4000	No
L/N to plastic enclosure with metal foil	DC	4000	No
T1 primary winding to secondary	DC	4000	No
T1 primary winding to core	DC	4000	No
T101 primary winding to secondary	DC	4000	No
T101 primary winding to core	DC	4000	No
T102 primary winding to secondary	DC	4000	No
T102 primary winding to core	DC	4000	No
T2 primary winding to secondary	DC	4000	No
T2 primary winding to core	DC	4000	No
T3 primary winding to secondary	DC	4000	No
T3 primary winding to core	DC	4000	No
T4 primary winding to secondary	DC	4000	No
One layer insulation tape used in T4	DC	4000	No
Mylar sheet provided between driver board and Q8, Q10	DC	4000	No
Supplementary information:			

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

5.5.2.2	TABLE: Stored discharge on capacitors					P
Location	Supply voltage (V)	Operating and fault condition ¹⁾	Switch position	Measured voltage (V _{pk})	ES Class	
Phase to Neutral	264Vac, 60Hz	N	No switch	0	ES1	
Phase to Neutral	264Vac, 60Hz	S (R114 OC)	No switch	0	ES1	
Supplementary information:						
<input checked="" type="checkbox"/> X-capacitors installed for testing: See table 4.1.2						
<input checked="" type="checkbox"/> bleeding resistor rating: See table 4.1.2						
<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				N/A
Location	Test current (A)	Duration (min)	Voltage drop (V)	Resistance (Ω)	
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)	
Supplementary information: Refer to table 5.2 for details.						

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

5.7.5	TABLE: Earthed accessible conductive part				P
Supply voltage (V):	264 VAC, 60 Hz			—	
Phase(s) :	[×] 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	Condition	Touch current (mA)	Comment	
Metal chassis	No 1: loss of protective earth connection (see Figure 6 of IEC 60990)	"e" open with Normal polarity:	1.6	--	
	No 1: loss of protective earth connection(see Figure 6 of IEC 60990)	"e" open with Reverse polarity:	1.6	--	
	No 2*: neutral open (see Figure 6 of IEC 60990)	"n" open with Normal polarity:	Not used	--	
	No 2*: neutral open (see Figure 6 of IEC 60990)	"n" open with Reverse polarity:	Not used	--	
	No 3: for IT systems, tested with each phase conductor faulted to earth, one at a time (see Figure 9 of IEC 60990)	"g" closed with Normal polarity:	Not used	--	
	No 3: for IT systems, tested with each phase conductor faulted to earth, one at a time (see Figure 9 of IEC 60990)	"g" closed with Reverse polarity:	Not used	--	
	No 4: for Three-phase EQUIPMENT, tested with each phase conductor open, one at a time (see Figure 11 of IEC 60990)	"I" 1 open "I" 2 open "I" 3 open	Not used	--	
	No 5: for Single-phase EQUIPMENT for use on IT power systems or on three-phase delta systems (see Figure 9 of IEC 60990)	"g" closed with Normal polarity "I" 1 open "I" 2 open "I" 3 open	Not used	--	
	No 5: for Single-phase EQUIPMENT for use on IT power systems or on three-phase delta systems (see Figure 9 of IEC 60990)	"g" closed with Reverse polarity "I" 1 open "I" 2 open "I" 3 open	Not used	--	
	No 6: for Three-phase EQUIPMENT for use on centre-earthed delta supply systems, tested on a delta supply system with each delta-leg centre-earthed, one at a time (see Figure 14 of IEC 60990)	"g" closed	Not used	--	
No 8: for incidentally connected parts	--	Not used	--		
Supplementary information: Less than ES2 limits.					

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						

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

6.2.2	TABLE: Power source circuit classifications					P
Location	Operating and fault condition	Voltage (V)	Current (A)	Max. Power ¹⁾ (W)	Time (S)	PS class
All components located within the equipment	Normal	264	--	>100	after 5 s	PS3
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	
1)	1)	1)	1)	Yes	
Supplementary information: 1) All components located within the EUT are considered as arcing PIS.					

6.2.3.2	TABLE: Determination of resistive PIS			P
Location	Operating and fault condition	Dissipate power (W)		Arcing PIS? Yes / No
1)	1)	1)		Yes
Supplementary information: 1) All components located within the EUT are considered as resistive PIS. Abbreviation: SC= short circuit; OC= open circuit				

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:					

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

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:									

IEC 62368-1					
Clause	Requirement + Test	Result - Remark			Verdict
5.4.1.4, 9.3, B.1.5, B.2.6	TABLE: Temperature measurements			P	
Supply voltage (V)	90 *	180 **	264**	—	
Ambient temperature during test T_{amb} (°C)	See below.			—	
Maximum measured temperature T of part/at:	T (°C)			Allowed T_{max} (°C)	
For model CAR2012TEBXXZOP1 (Ambient at 50°C)					
AC inlet	63.8	57.6	54.1	155	
Input wire	69.4	60.9	56.5	105	
C22 body	63.9	58.5	54.9	125	
C16 body	72.2	76.3	72.7	125	
C109 body	62.8	57.9	54.6	125	
C108 body	57.4	55.3	52.9	125	
C7 body	58.9	55.6	53.2	105	
L20 coil	81.0	64.0	57.3	130	
L18 coil	83.8	65.1	58.1	130	
C59 body	53.2	52.7	51.2	105	
PCB near BR4	82.6	70.5	64.1	130	
RT1 body	64.1	59.7	56.3	130	
K200 body	58.6	56.2	53.8	85	
TZ1 body	69.6	59.9	55.5	85	
TZ3 body	67.9	60.7	56.8	85	
C23 body	58.4	56.2	53.8	105	
L12 coil	85.7	71.9	63.9	130	
PCB near Q24	98.2	74.7	66.5	130	
BDA1 body	72.2	67.6	63.0	105	
BDA2 body	74.4	68.4	63.5	105	
Fan body	64.0	60.7	57.6	For reference	
PCB near U415	76.6	68.4	63.6	130	
U8 body	72.6	65.6	61.2	100	
U406 body	72.1	65.3	60.9	100	
U411 body	72.0	65.2	61.0	100	
U410 body	71.6	65.0	60.7	100	
T4 coil	74.1	69.5	65.2	110	

IEC 62368-1					
Clause	Requirement + Test	Result - Remark			Verdict
Maximum measured temperature T of part/at:		T (°C)			Allowed T _{max} (°C)
T4 core		73.3	67.8	63.5	110
PCB near Q8		76.6	68.5	63.3	130
L5 coil		94.1	107.5	103.3	130
T102 coil		71.3	65.8	61.8	90
T101 coil		75.5	69.3	68.6	90
C57 body		72.9	65.9	61.5	105
C6 body		77.0	75.2	70.0	105
C302 body		81.0	79.0	73.4	105
PCB near CR25		92.0	99.4	93.8	130
L13 coil		84.4	82.1	76.3	130
T1 coil		80.7	78.2	72.5	90
T2 coil		88.1	95.9	91.0	130
L14 coil		85.8	94.0	89.3	130
L15 coil		88.4	100.3	95.6	130
PCB near Q15		94.3	111.3	106.2	130
PCB near Q20		92.2	106.9	101.6	130
T3 coil		104.2	125.3	119.3	130
L17 coil		90.6	102.3	96.3	130
L16 coil		92.3	105.4	99.6	130
C35 body		88.7	100.5	95.5	105
C65 body		88.6	99.2	93.5	105
Output terminal		90.5	107.4	102.5	120
Mylar sheet		79.5	85.3	80.4	105
Plastic enclosure		53.3	52.1	51.5	Ref.
Ambient		50.2	50.1	50.4	--
For model CAR2012TEBXXZOP1 (Ambient at 70°C, with 155°C AC Inlet SCHURTER AG/1681 series)					
AC inlet		77.7	76.4	73.3	155
Input wire		79.9	77.8	74.4	105
C22 body		77.7	76.8	73.7	125
C16 body		85.0	86.1	81.4	125
C109 body		77.1	76.5	73.7	125
C108 body		75.6	75.8	73.1	125
C7 body		76.2	75.8	73.1	105

IEC 62368-1					
Clause	Requirement + Test	Result - Remark			Verdict
Maximum measured temperature T of part/at:		T (°C)			Allowed T _{max} (°C)
L20 coil		81.5	77.8	74.5	130
L18 coil		82.3	78.3	74.7	130
C59 body		74.1	74.8	72.3	105
PCB near BR4		87.6	82.6	78.7	130
RT1 body		79.4	77.8	75.0	130
K200 body		76.8	76.3	73.9	85
TZ1 body		78.5	76.6	74.1	85
TZ3 body		79.8	78.3	75.5	85
C23 body		76.4	75.9	73.4	105
L12 coil		86.6	83.0	78.7	130
PCB near Q24		88.7	83.8	79.6	130
BDA1 body		81.8	80.8	77.3	105
BDA2 body		82.8	81.4	77.8	105
Fan body		78.8	78.4	75.6	Ref.
PCB near U415		85.3	83.3	80.0	130
U8 body		82.7	81.1	78.0	100
U406 body		82.2	80.8	77.6	100
U411 body		82.2	80.8	77.6	100
U410 body		81.9	80.5	77.3	100
T4 coil		85.2	83.4	80.2	110
T4 core		84.6	82.6	79.3	110
PCB near Q8		84.0	82.1	78.7	130
L5 coil		91.0	94.1	90.6	130
T102 coil		82.2	80.9	77.7	90
T101 coil		84.8	84.0	80.7	90
C57 body		82.6	81.0	77.7	105
C6 body		83.7	82.8	79.2	105
C302 body		85.4	84.8	81.0	105
PCB near CR25		91.5	93.0	89.2	130
L13 coil		88.1	87.1	83.3	130
T1 coil		85.2	84.4	80.7	90
T2 coil		89.8	91.4	87.8	130
L14 coil		88.3	89.8	86.3	130

IEC 62368-1					
Clause	Requirement + Test	Result - Remark			Verdict
Maximum measured temperature T of part/at:		T (°C)			Allowed T _{max} (°C)
L15 coil		89.8	92.0	88.4	130
PCB near Q15		92.3	96.0	92.2	130
PCB near Q20		91.3	94.3	90.5	130
T3 coil		97.0	101.7	97.8	130
L17 coil		90.0	91.9	88.1	130
L16 coil		90.4	92.8	89.0	130
C35 body		89.9	92.2	88.5	105
C65 body		89.0	90.9	87.2	105
Output terminal		90.0	93.6	90.2	120
Mylar sheet		85.9	87.3	83.4	105
Plastic enclosure		72.8	73.8	71.5	Ref.
Ambient		70.3	69.9	70.6	--
For model CAR2012TEBX5Z01A (Ambient at 50°C)					
AC inlet		66.2	64.8	58.6	155
Input wire		69.9	65.8	58.7	105
C22 body		75.3	68.1	60.7	125
C16 body		86.8	69.6	61.8	125
C109 body		72.3	65.8	60.9	125
C108 body		67.5	63.9	60.1	125
C7 body		67.5	64.9	58.9	105
L20 coil		93.4	68.6	67.5	130
L18 coil		96.4	69.2	65.8	130
C59 body		66.6	62.0	59.5	105
PCB near BR4		90.3	74.4	76.7	130
RT1 body		76.5	70.8	66.5	130
K200 body		68.3	72.7	61.1	85
TZ1 body		68.4	64.3	60.7	85
TZ3 body		82.5	71.5	62.6	85
C23 body		64.1	63.7	66.9	105
L12 coil		91.5	75.9	72.8	130
PCB near Q24		97.1	75.8	71.3	130
BDA1 body		80.2	76.5	67.0	105
BDA2 body		83.1	77.1	70.4	105

IEC 62368-1					
Clause	Requirement + Test	Result - Remark			Verdict
Maximum measured temperature T of part/at:		T (°C)			Allowed T _{max} (°C)
Fan body		73.6	68.6	69.4	For reference
PCB near U415		82.0	71.9	69.0	130
U8 body		79.7	73.4	67.8	100
U406 body		79.3	73.0	67.8	100
U411 body		79.5	73.4	67.8	100
U410 body		81.0	77.2	67.5	100
T4 coil		83.1	78.0	72.1	110
T4 core		80.1	77.7	69.2	110
PCB near Q8		100.5	111.4	103.3	130
L5 coil		79.0	74.0	75.3	130
T102 coil		81.8	75.7	69.1	90
T101 coil		84.1	82.0	70.6	90
C57 body		80.2	80.7	68.1	105
C6 body		84.2	81.6	75.1	105
C302 body		87.5	84.7	77.7	105
PCB near CR25		88.8	86.0	79.4	130
L13 coil		90.9	86.7	80.8	130
T1 coil		87.0	82.6	78.1	90
T2 coil		98.2	100.6	102.4	130
L14 coil		90.6	94.3	89.1	130
L15 coil		92.0	99.5	102.5	130
PCB near Q15		100.8	113.1	104.2	130
PCB near Q20		97.3	113.3	107.1	130
T3 coil		104.6	125.0	116.0	130
L17 coil		100.5	107.8	106.2	130
L16 coil		102.8	109.7	107.1	130
C35 body		94.4	102.6	99.2	105
C65 body		95.1	102.3	97.2	105
Output terminal		94.2	108.8	95.9	120
Mylar sheet		89.0	89.6	72.3	105
Plastic enclosure		57.9	60.0	54.5	Ref.
Ambient		50.1	50.9	50.0	--
For model CAR2012TEBX5Z01A (Ambient at 70°C, with 155°C AC Inlet SCHURTER AG/1681 series)					

IEC 62368-1				
Clause	Requirement + Test	Result - Remark		Verdict
Maximum measured temperature T of part/at:		T (°C)		Allowed T _{max} (°C)
AC inlet	72.4	71.3	71.8	155
Input wire	73.4	71.8	71.3	105
C22 body	75.3	72.4	72.4	125
C16 body	77.7	73.3	72.9	125
C109 body	74.4	72.1	72.0	125
C108 body	73.0	71.6	71.5	125
C7 body	72.3	71.2	70.9	105
L20 coil	76.4	72.9	72.2	130
L18 coil	77.1	73.0	72.6	130
C59 body	70.9	70.5	71.1	105
PCB near BR4	86.8	78.1	76.3	130
RT1 body	79.7	74.9	74.9	130
K200 body	74.2	72.7	72.0	85
TZ1 body	72.8	71.3	71.0	85
TZ3 body	78.6	74.7	74.3	85
C23 body	72.9	71.7	71.0	105
L12 coil	83.5	78.8	74.4	130
PCB near Q24	83.8	78.4	75.4	130
BDA1 body	78.8	76.0	75.4	105
BDA2 body	79.7	76.5	75.9	105
Fan body	76.0	73.2	72.6	Ref.
PCB near U415	80.9	76.6	76.5	130
U8 body	79.2	75.6	74.3	100
U406 body	78.7	74.9	74.1	100
U411 body	79.1	75.4	74.4	100
U410 body	81.0	77.3	76.8	100
T4 coil	80.4	77.2	76.4	110
T4 core	80.1	77.0	75.9	110
PCB near Q8	87.6	88.3	88.8	130
L5 coil	78.5	75.1	74.1	130
T102 coil	81.3	77.5	76.6	90
T101 coil	82.7	79.8	79.4	90
C57 body	79.4	76.0	74.8	105

IEC 62368-1					
Clause	Requirement + Test	Result - Remark		Verdict	
Maximum measured temperature T of part/at:		T (°C)		Allowed T _{max} (°C)	
C6 body		80.2	77.1	76.9	105
C302 body		81.9	78.9	78.0	105
PCB near CR25		82.9	79.7	79.9	130
L13 coil		84.3	80.8	80.7	130
T1 coil		81.4	78.4	77.7	90
T2 coil		88.6	87.5	87.6	130
L14 coil		84.5	83.3	82.9	130
L15 coil		85.5	84.8	84.2	130
PCB near Q15		89.4	90.1	89.7	130
PCB near Q20		87.3	87.0	87.0	130
T3 coil		90.0	92.3	91.2	130
L17 coil		88.1	87.5	87.7	130
L16 coil		88.8	89.5	89.5	130
C35 body		85.9	85.5	84.7	105
C65 body		85.5	85.4	85.3	105
Output terminal		85.1	85.8	85.9	120
Mylar sheet		82.9	80.3	81.4	105
Plastic enclosure		71.1	71.1	71.1	Ref.
Ambient		70.1	70.0	70.1	--
For model CAR2012TEBXXZOP1(Ambient at 60C, with 70°C AC Inlet)					
AC inlet		65.4	64.0	62.7	70
Input wire		69.7	66.6	64.4	105
C22 body		66.4	64.6	63.0	125
C16 body		69.0	65.6	63.4	125
C109 body		67.2	65.0	63.6	125
C108 body		66.9	64.9	63.3	125
C7 body		68.6	67.1	64.8	125
L20 coil		80.3	71.6	66.3	130
L18 coil		72.9	73.5	72.1	130
C59 body		63.4	62.9	62.1	105
PCB near BR4		82.5	75.8	70.9	130
RT1 body		71.1	67.7	65.4	130
K200 body		66.5	64.7	63.5	85

IEC 62368-1				
Clause	Requirement + Test	Result - Remark		Verdict
Maximum measured temperature T of part/at:		T (°C)		Allowed T _{max} (°C)
TZ1 body	66.7	64.4	62.7	85
TZ3 body	71.6	68.4	64.1	85
C23 body	68.2	65.7	64.0	105
L12 coil	80.4	74.2	69.3	130
PCB near Q24	81.4	74.6	70.3	130
BDA1 body	75.9	73.8	70.6	105
BDA2 body	75.4	73.4	70.5	105
Fan body	69.8	68.4	66.7	130
PCB near U415	77.3	74.2	71.4	130
U405 body	74.8	71.9	69.2	100
U406 body	74.9	72.0	69.2	100
U411 body	75.0	72.1	69.3	100
U410 body	75.2	72.2	69.4	100
T4 coil	79.0	78.0	76.9	110
T4 core	78.6	77.8	76.8	110
PCB near Q8	76.1	72.9	69.9	130
L5 coil	90.8	98.5	95.5	130
T102 coil	75.7	73.3	70.8	110
T101 coil	76.3	74.1	72.1	110
C57 body	75.1	72.4	69.6	105
C6 body	77.7	76.7	73.6	105
C302 body	79.3	78.2	74.9	105
PCB near CR25	81.6	81.7	78.3	130
L13 coil	84.1	85.3	82.1	130
T1 coil	78.2	78.2	75.2	110
T2 coil	87.7	93.8	91.0	110
L14 coil	79.8	80.9	78.3	130
L15 coil	87.3	92.8	90.1	130
PCB near Q15	84.8	87.5	84.4	130
PCB near Q20	87.7	95.3	92.3	130
T3 coil	96.2	107.5	105.9	110
L17 coil	86.9	93.6	90.7	130
L16 coil	91.6	103.0	100.0	130

IEC 62368-1				
Clause	Requirement + Test	Result - Remark		Verdict
Maximum measured temperature T of part/at:		T (°C)		Allowed T _{max} (°C)
C35 body	84.0	88.5	85.6	105
C65 body	84.9	90.4	87.4	105
Output terminal	84.1	91.6	88.8	120
Mylar sheet	76.7	76.5	74.0	105
Plastic enclosure	62.2	61.8	61.6	Ref.
Ambient	60.7	60.3	60.6	--
For model: CAR2012TEBX5Z01A(Ambient at 60C, with 70°C AC Inlet)				
AC inlet	65.1	63.8	62.6	70
Input wire	69.3	66.7	64.3	105
C22 body	66.1	64.4	62.8	125
C16 body	68.5	65.5	63.3	125
C109 body	66.8	65.1	63.4	125
C108 body	66.5	64.8	63.1	125
C7 body	68.2	66.5	64.6	125
L20 coil	79.1	71.5	66.1	130
L18 coil	73.0	73.7	72.6	130
C59 body	63.2	62.8	61.9	105
PCB near BR4	81.7	75.9	70.6	130
RT1 body	70.7	67.6	65.1	130
K200 body	66.2	64.7	63.2	85
TZ1 body	66.2	64.3	62.5	85
TZ3 body	70.9	66.9	63.9	85
C23 body	67.8	65.6	63.7	105
L12 coil	79.8	74.4	69.0	130
PCB near Q24	80.8	74.7	70.0	130
BDA1 body	75.4	73.7	70.3	105
BDA2 body	75.0	73.5	70.3	105
Fan body	69.5	68.5	66.6	130
PCB near U415	76.9	74.3	71.1	130
U405 body	74.3	72.0	69.0	100
U406 body	74.4	71.9	68.9	100
U411 body	74.6	72.0	69.0	100
U410 body	74.7	72.2	69.1	100

IEC 62368-1					
Clause	Requirement + Test	Result - Remark		Verdict	
Maximum measured temperature T of part/at:		T (°C)		Allowed T _{max} (°C)	
T4 coil		78.5	77.3	75.1	110
T4 core		78.2	77.0	75.0	110
PCB near Q8		75.6	72.9	69.5	130
L5 coil		90.5	98.4	94.8	130
T102 coil		75.3	73.0	70.1	110
T101 coil		75.9	73.6	70.5	110
C57 body		74.6	72.4	69.2	105
C6 body		77.3	76.8	73.3	105
C302 body		78.9	78.2	74.5	105
PCB near CR25		81.2	81.7	77.9	130
L13 coil		83.8	85.2	81.6	130
T1 coil		77.9	78.1	74.8	110
T2 coil		87.4	94.2	90.5	110
L14 coil		79.5	81.1	77.8	130
L15 coil		86.8	93.3	89.6	130
PCB near Q15		84.4	87.7	84.0	130
PCB near Q20		87.2	95.6	91.7	130
T3 coil		96.0	106.2	105.3	110
L17 coil		86.5	93.9	90.1	130
L16 coil		91.5	103.0	99.3	130
C35 body		83.5	88.7	85.0	105
C65 body		84.5	90.6	86.8	105
Output terminal		83.4	91.9	88.2	120
Mylar sheet		76.2	76.6	73.5	105
Plastic enclosure		61.6	62.2	61.2	Ref.
Ambient		60.1	60.1	60.3	--
Supply voltage (V)		90V	90V	--	--
Test condition		Stand-by (5Vsb)	Stand-by (3.3Vsb)	--	--
AC inlet		51.6	51.1	--	155
Input wire		52.1	51.3	--	105
C22 body		50.7	50.9	--	125
C16 body		50.7	50.7	--	125
C109 body		51.2	51.4	--	125

IEC 62368-1				
Clause	Requirement + Test	Result - Remark		Verdict
Maximum measured temperature T of part/at:		T (°C)		Allowed T _{max} (°C)
C108 body	50.7	51.5	--	125
C7 body	50.9	51.7	--	105
L20 coil	50.5	51.1	--	130
L18 coil	50.7	51.3	--	130
C59 body	50.8	51.5	--	105
PCB near BR4	53.8	55.0	--	130
RT1 body	53.6	54.7	--	130
K200 body	52.4	53.3	--	85
TZ1 body	50.8	51.9	--	85
TZ3 body	51.5	52.3	--	85
C23 body	52.0	53.1	--	105
L12 coil	57.7	59.4	--	130
PCB near Q24	56.9	56.8	--	130
BDA1 body	56.8	57.1	--	105
BDA2 body	60.5	60.8	--	105
Fan body	60.4	60.9	--	Ref.
PCB near U415	65.9	66.5	--	130
U8 body	59.0	59.6	--	100
U406 body	59.9	60.4	--	100
U411 body	60.0	60.5	--	100
U410 body	60.3	60.8	--	100
T4 coil	69.4	67.4	--	110
T4 core	66.9	70.4	--	110
PCB near Q8	64.5	65.0	--	130
L5 coil	72.0	72.4	--	130
T102 coil	66.0	66.4	--	90
T101 coil	68.3	68.6	--	90
C57 body	59.9	59.5	--	105
C6 body	63.1	63.6	--	105
C302 body	64.2	64.6	--	105
PCB near CR25	65.6	66.1	--	130
L13 coil	69.8	69.3	--	130
T1 coil	66.4	66.8	--	90

IEC 62368-1							
Clause	Requirement + Test			Result - Remark			Verdict
Maximum measured temperature T of part/at:		T (°C)				Allowed T _{max} (°C)	
T2 coil		71.9	72.5	--	130		
L14 coil		69.4	69.9	--	130		
L15 coil		74.0	73.7	--	130		
PCB near Q15		71.3	70.9	--	130		
PCB near Q20		71.1	70.6	--	130		
T3 coil		74.0	73.5	--	130		
L17 coil		73.6	73.2	--	130		
L16 coil		72.2	71.7	--	130		
C35 body		70.3	69.9	--	105		
C65 body		68.1	67.9	--	105		
Output terminal		65.8	65.5	--	120		
Mylar sheet		64.1	64.7	--	105		
Plastic enclosure		50.8	50.8	--	Ref.		
Ambient		49.4	49.5	--	--		
Temperature T of winding:	t ₁ (°C)	R ₁ (Ω)	--	R ₂ (Ω)	T (°C)	Allowed T _{max} (°C)	Insulation class
--	--	--	--	--	--	--	--
Supplementary information:							
*When testing at 90V:							
Load with 12Vdc/ 108A, 3.3Vsb/ 4A at ambient 50°C for model CAR2012TEBXXZOP1;							
Load with 12Vdc/ 81A, 3.3Vsb/ 4A at ambient 60°C for model CAR2012TEBXXZOP1;							
Load with 12Vdc/ 54A, 3.3Vsb/ 4A at ambient 70°C for model CAR2012TEBXXZOP1;							
Load with 12Vdc/ 108A, 5Vsb/ 3A at ambient 50°C for model CAR2012TEBX5Z01A;							
Load with 12Vdc/ 81A, 5Vsb/ 3A at ambient 60°C for model CAR2012TEBX5Z01A;							
Load with 12Vdc/ 54A, 5Vsb/ 3A at ambient 70°C for model CAR2012TEBX5Z01A.							
*When testing at 180V and 264V:							
Load with 12Vdc/ 167A, 3.3Vsb/ 4A at ambient 50°C for model CAR2012TEBXXZOP1;							
Load with 12Vdc/ 125.5A, 3.3Vsb/ 4A at ambient 60°C for model CAR2012TEBXXZOP1;							
Load with 12Vdc/ 83.5A, 3.3Vsb/ 4A at ambient 70°C for model CAR2012TEBXXZOP1;							
Load with 12Vdc/ 167A, 5Vsb/ 3A at ambient 50°C for model CAR2012TEBX5Z01A;							
Load with 12Vdc/ 125.5A, 5Vsb/ 3A at ambient 60°C for model CAR2012TEBX5Z01A;							
Load with 12Vdc/ 83.5A, 5Vsb/ 3A at ambient 70°C for model CAR2012TEBX5Z01A							

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

B.2.5		TABLE: Input test							P
U (V)	Hz	I (A)	I rated (A)	P (W)	P rated (W)	Fuse No	I fuse (A)	Condition/status	
For model: CAR2012TEBXXZOP1									
90	50	16.76	--	1505	--	F1, F2	16.76	12Vdc/108A; 3.3Vsb/4A	
90	60	16.79	--	1505	--	F1, F2	16.79	12Vdc/108A; 3.3Vsb/4A	
100	50	14.83	15-10	1479	--	F1, F2	14.83	12Vdc/108A; 3.3Vsb/4A	
100	60	14.86	15-10	1480	--	F1, F2	14.86	12Vdc/108A; 3.3Vsb/4A	
180	50	7.89	15-10	1413	--	F1, F2	7.89	12Vdc/108A; 3.3Vsb/4A	
180	60	7.90	15-10	1412	--	F1, F2	7.90	12Vdc/108A; 3.3Vsb/4A	
180	50	12.38	15-10	2225	--	F1, F2	12.38	12Vdc/167A; 3.3Vsb/4A	
180	60	12.39	15-10	2226	--	F1, F2	12.39	12Vdc/167A; 3.3Vsb/4A	
240	50	11.21	15-10	2194	--	F1, F2	11.21	12Vdc/167A; 3.3Vsb/4A	
240	60	11.20	15-10	2196	--	F1, F2	11.20	12Vdc/167A; 3.3Vsb/4A	
264	50	9.18	--	2185	--	F1, F2	9.18	12Vdc/167A; 3.3Vsb/4A	
264	60	9.20	--	2192	--	F1, F2	9.20	12Vdc/167A; 3.3Vsb/4A	
For model :CAR2012TEBX5Z01A									
90	50	16.70	--	1501	--	F1, F2	16.70	12Vdc/108A; 5Vsb/3A	
90	60	16.72	--	1501	--	F1, F2	16.72	12Vdc/108A; 5Vsb/3A	
100	50	14.91	15-10	1484	--	F1, F2	14.91	12Vdc/108A; 5Vsb/3A	
100	60	14.90	15-10	1485	--	F1, F2	14.90	12Vdc/108A; 5Vsb/3A	
180	50	7.88	15-10	1414	--	F1, F2	7.88	12Vdc/108A; 5Vsb/3A	
180	60	7.90	15-10	1417	--	F1, F2	7.90	12Vdc/108A; 5Vsb/3A	
180	50	12.39	15-10	2229	--	F1, F2	12.39	12Vdc/167A; 5Vsb/3A	
180	60	12.40	15-10	2230	--	F1, F2	12.40	12Vdc/167A; 5Vsb/3A	
240	50	11.24	15-10	2202	--	F1, F2	11.24	12Vdc/167A; 5Vsb/3A	
240	60	11.25	15-10	2202	--	F1, F2	11.25	12Vdc/167A; 5Vsb/3A	
264	50	9.19	--	2194	--	F1, F2	9.19	12Vdc/167A; 5Vsb/3A	
264	60	9.21	--	2196	--	F1, F2	9.21	12Vdc/167A; 5Vsb/3A	
Supplementary information:									
The measured input current at rated voltage shall be less than or equal to 110 % of rated current.									
Refer to "Summary of testing:" for output load condition.									

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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).....:		25 °C, if not specified					—
Power source for EUT: Manufacturer, model/type, outputrating ..:		--					—
Component No.	Condition	Supply voltage (V)	Test time	Fuse no.	Fuse current (A)	Observation	
For model: CAR2012TEBXXZOP1							
Opening	Blocked	240	1hrs32 mins	F1, F2	9.16	Normal working , the maximum temperature were: T4 coil: 78.4°C, T4 core: 76.8°C, T101 coil: 80.6°C, T102 coil: 78.2°C, T1 coil: 83.4°C, T2 coil: 102.7°C, T3 coil: 129.2°C, Ambient: 49.2°C No damage, no hazards.	
Fan	Locked	240	5hrs25 mins	F1, F2	9.21	12V output shut down, no damage, no hazards.The maximum temperature were: T4 coil: 126.5°C, T4 core: 123.1°C, T101 coil: 74.1°C, T102 coil: 68.1°C, T1 coil: 68.8°C, T2 coil: 80.2°C, T3 coil: 67.6°C, Ambient: 50.2°C	
3.3Vsb	O-L	240	4hrs55 mins	F1, F2	9.2 0to 9.21 to 9.32 to 0.46	The maximum output current: 4.5A, the unit shut down when load added to 4.6A, recoverable, no damage, no hazards.The maximum temperature were: T4 coil: 66.3°C, T4 core: 64.8°C, T101 coil: 67.6°C, T102 coil: 65.6°C, T1 coil: 75.3°C, T2 coil: 120°C, T3 coil: 89.6°C, Ambient: 50.5°C	
12V	O-L	240	5hrs30 mins	F1, F2	9.2 to 9.8 to 10.5 to 0.45	The maximum output current: 188A, the Unit shut down when load added to 190A, recoverable, no damage, no hazards. The maximum temperature were: T4 coil: 73.5°C, T4 core: 71.1°C, T101 coil: 68.0°C, T102 coil: 67.9°C, T1 coil: 81.4°C, T2 coil: 128.9°C, T3 coil: 96.8°C, Ambient: 51.1°C	

IEC 62368-1						
Clause	Requirement + Test			Result - Remark		Verdict
T4 pin 7-pin 10	O-L	240	6hrs06 mins	F1, F2	9.2 to 9.3to 9.4to 0.35	The transformer maximum output current: 2.5A, the unit shut down when load added to 2.7A, recoverable, no damage, no hazards.The maximum temperature were: T4 coil: 121.9°C, T4 core: 119.5°C, T101 coil: 93.0°C, T102 coil: 84.0°C, T1 coil: 83.5°C, T2 coil: 114.6°C, T3 coil: 98.6°C, Ambient: 49.6°C
Stand-by 3.3Vsb	O-L	240	4hrs27 mins	F1,F2	0.412 to 0.424to 0.428to 0.386	The transformer maximum output current: 4.5A, the unit shut down when load added to 4.6A, recoverable, no damage, no hazards. The maximum temperature were: T4 coil: 69.4°C, T4 core: 66.8°C, T101 coil: 68.3°C, T102 coil: 66.0°C, T1 coil: 66.5°C, T2 coil: 72.1°C, T3 coil: 74.3°C, Ambient: 49.5°C
For model: CAR2012TEBX5Z01A						
Opening	Blocked	240	2hrs16 mins	F1, F2	9.2	Normal working , the maximum temperature were: T4 coil: 78.5°C, T4 core: 77.6°C, T101 coil: 88.3°C, T102 coil: 77.1°C, T1 coil: 86.7°C, T2 coil: 108.1°C, T3 coil: 123.9°C, Ambient: 50.8°C No damage, no hazards.
Fan	Locked	240	2hrs04 mins	F1, F2	9.3	12V output shut down, no damage, no hazards. The maximum temperature were: T4 coil: 93.7°C,T4 core: 87.6°C, T101 coil: 84.6°C, T102 coil:81.7°C, T1 coil: 59.7°C, T2 coil:70.9°C, T3 coil:57.1°C, Ambient: 50.0°C.
5Vsb	O-L	240	6hrs01 mins	F1, F2	9.2 to 9.21 to 9.3 to 0.46	The maximum output current: 3.5A, when load added to 3.6A, unit shut down, recoverable, no damage, no hazards. The maximum temperature were: T4 coil: 62.6°C, T4 core: 61.8°C, T101 coil: 67.2°C, T102 coil: 63.8°C, T1 coil: 68.0°C, T2 coil: 90.6°C, T3 coil : 101.5°C, Ambient: 49.9°C

IEC 62368-1						
Clause	Requirement + Test				Result - Remark	Verdict
12V	O-L	240	6hrs56 mins	F1, F2	9.2 to 9.8 to 10.5 to 0.45	The maximum output current: 189A, when load added to 190A, unit shut down, recoverable, no damage, no hazards. The maximum temperature were: T4 coil: 70.6°C, T4 core: 67.8°C, T101 coil: 68.6°C, T102 coil: 65.0°C, T1 coil: 76.2°C, T2 coil: 103.6°C, T3 coil: 121.4°C, Ambient: 50.4°C
T4 pin 7-pin 10	O-L	240	7hrs34 mins	F1, F2	9.2 to 9.3to 9.4to 0.35	The transformer maximum output current: 2.5A, the unit shut down, when load added to 2.7A, recoverable, no damage, no hazards. The maximum temperature were: T4 coil: 103.6°C, T4 core: 95.0°C, T101 coil: 82.7°C; T102 coil: 80.9°C, T1 coil: 77.1°C, T2 coil: 95.8°C, T3 coil: 106.6°C, Ambient: 50.6°C
Stand-by 5Vsb	O-L	240	4hrs44 mins	F1,F2	0.420 to 0.426 to 0.430 to 0.382	The transformer maximum output current: 3.4A, the Unit shut down, when load added to 3.5A, recoverable, no damage, no hazards. The maximum temperature were: T4 coil: 70.2°C, T4 core: 67.5°C, T101 coil: 68.1°C, T102 coil: 64.7°C, T1 coil: 65.8°C, T2 coil: 71.9°C, T3 coil: 75.2°C, Ambient: 49.2°C
BR3 pin ~ -pin +	S-C	240	1sec	F1, F2	0	F1, F2 Fuse opened immediately, no hazards.
BR4 pin ~ -pin +	S-C	240	1sec	F1, F2	0	F1, F2 Fuse opened immediately, no hazards.
BDA1	S-C	240	1sec	F1, F2	0	F1, F2 Fuse opened immediately, no hazards.
BDA2	S-C	240	1sec	F1, F2	0	F1, F2 Fuse opened immediately, no hazards.
C6	S-C	240	1sec	F1, F2	0	F1, F2 Fuse opened immediately, no hazards.
Q24 G-S	S-C	240	10min	F1, F2	0.12	Unit shut down, recoverable, no damage, no hazards.
Q24 D-S	S-C	240	1sec	F1, F2	0	F1, F2 Fuse opened immediately, Q24 damaged, no hazards.

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Clause	Requirement + Test				Result - Remark	Verdict
Q24 G-D	S-C	240	1sec	F1, F2	0	F1, F2 Fuse opened immediately, Q24 damaged, no hazards.
Q26 G-S	S-C	240	10min	F1, F2	0.12	Unit shut down, recoverable, no damage, no hazards.
Q26 D-S	S-C	240	1sec	F1, F2	0	F1, F2 Fuse opened immediately, Q26 damaged, no hazards.
Q26 G-D	S-C	240	1sec	F1, F2	0	F1, F2 Fuse opened immediately, Q26 damaged, no hazards.
Q7 G-S	S-C	240	10min	F1, F2	0.12	Unit shut down, recoverable, no damage, no hazards.
Q7 D-S	S-C	240	1sec	F1, F2	0	F1, F2 Fuse opened immediately, Q7 damaged, no hazards.
Q7 G-D	S-C	240	1sec	F1, F2	0	F1, F2 Fuse opened immediately, Q7 damaged, no hazards.
Q9 G-S	S-C	240	10min	F1, F2	0.12	Unit shut down, recoverable, no damage, no hazards.
Q9 D-S	S-C	240	1sec	F1, F2	0	F1, F2 Fuse opened immediately, Q9 damaged, no hazards.
Q9 G-D	S-C	240	1sec	F1, F2	0	F1, F2 Fuse opened immediately, Q9 damaged, no hazards.
U415 pin VCC to GND	S-C	240	10min	F1, F2	0.12	Unit shut down, recoverable, no damage, no hazards.
U415 pin FBB to DRAIN	S-C	240	30min	F1, F2	9.19	Unit working normally, no hazards.
U415 pin BBA to DRAIN	S-C	240	10min	F1, F2	0	F1, F2 Fuse opened immediately, U415 damaged, no hazards.
U412 pin 1-19	S-C	240	10min	F1, F2	0.12	Unit shut down, recoverable, no damage, no hazards.
U412 pin 4-17	S-C	240	10min	F1, F2	0	F1, F2 Fuse opened immediately, U415 damaged, no hazards.
T2 pin 3-4	S-C	240	10min	F1, F2	0.12	Unit shut down, recoverable, no damage, no hazards.
T3 pin 3-4	S-C	240	10min	F1, F2	0.12	Unit shut down, recoverable, no damage, no hazards.
T4 pin 1-2	S-C	240	10min	F1, F2	0.12	Unit shut down, recoverable, no damage, no hazards.

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Clause	Requirement + Test				Result - Remark	Verdict
T4 pin 3-4	S-C	240	10min	F1, F2	0.12	Unit shut down, recoverable, no damage, no hazards.
T4 pin 5-6	S-C	240	10min	F1, F2	0.12	Unit shut down, recoverable, no damage, no hazards.
T4 pin 8-9	S-C	240	10min	F1, F2	0.12	Unit shut down, recoverable, no damage, no hazards.
T4 pin 7-10	S-C	240	10min	F1, F2	0.12	Unit shut down, recoverable, no damage, no hazards.
T101 pin 1-6	S-C	240	10min	F1, F2	0.12	Unit shut down, recoverable, no damage, no hazards.
T101 pin 2-5	S-C	240	10min	F1, F2	0.12	Unit shut down, recoverable, no damage, no hazards.
T101 pin 3-4	S-C	240	10min	F1, F2	0.12	Unit shut down, recoverable, no damage, no hazards.
T102 pin 1-6	S-C	240	10min	F1, F2	0.12	Unit shut down, recoverable, no damage, no hazards.
T102 pin 2-5	S-C	240	10min	F1, F2	0.12	Unit shut down, recoverable, no damage, no hazards.
T102 pin 3-4	S-C	240	10min	F1, F2	0.12	Unit shut down, recoverable, no damage, no hazards.
U8 pin 1-2	S-C	240	10min	F1, F2	0.12	Unit shut down, recoverable, no damage, no hazards.
U8 pin 1	O-C	240	10min	F1, F2	0.12	Unit shut down, recoverable, no damage, no hazards.
U8 pin 3-4	S-C	240	10min	F1, F2	0.12	Unit shut down, recoverable, no damage, no hazards.
U8 pin 3	O-C	240	10min	F1, F2	0.12	Unit shut down, recoverable, no damage, no hazards.
U410 pin 1-2	S-C	240	10min	F1, F2	0.12	Unit shut down, recoverable, no damage, no hazards.
U410 pin 1	O-C	240	10min	F1, F2	0.12	Unit shut down, recoverable, no damage, no hazards.
U410 pin 3-4	S-C	240	30min	F1, F2	9.19	Unit normal working, no hazards.
U410 pin 3	O-C	240	30min	F1, F2	9.19	Unit normal working, no hazards.
U8 pin 1-2	S-C	240	30min	F1, F2	9.19	Unit normal working, no hazards.
U8 pin 1	O-C	240	30min	F1, F2	9.19	Unit normal working, no hazards.
U8 pin 3-4	S-C	240	30min	F1, F2	9.19	Unit normal working, no hazards.

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Clause	Requirement + Test				Result - Remark	Verdict
U8 pin 3	O-C	240	30min	F1, F2	9.19	Unit normal working, no hazards.
U406 pin 1-2	S-C	240	30min	F1, F2	9.19	Unit normal working, no hazards.
U406 pin 1	O-C	240	30min	F1, F2	9.19	Unit normal working, no hazards.
U406 pin 3-4	S-C	240	30min	F1, F2	9.19	Unit normal working, no hazards.
U406 pin 3	O-C	240	30min	F1, F2	9.19	Unit normal working, no hazards.
Q6 G-S	S-C	240	10min	F1, F2	0.12	Unit shut down, recoverable, no damage, no hazards.
Q6 D-S	S-C	240	10min	F1, F2	0.12	Unit shut down, recoverable, no damage, no hazards.
Q6 G-D	S-C	240	10min	F1, F2	0.12	Unit shut down, recoverable, no damage, no hazards.
Q13 G-S	S-C	240	10min	F1, F2	0.12	Unit shut down, recoverable, no damage, no hazards.
Q13 D-S	S-C	240	10min	F1, F2	0.12	Unit shut down, recoverable, no damage, no hazards.
Q13 G-D	S-C	240	10min	F1, F2	0.12	Unit shut down, recoverable, no damage, no hazards.
Q16 G-S	S-C	240	10min	F1, F2	0.12	Unit shut down, recoverable, no damage, no hazards.
Q16 D-S	S-C	240	10min	F1, F2	0.12	Unit shut down, recoverable, no damage, no hazards.
Q16 G-D	S-C	240	10min	F1, F2	0.12	Unit shut down, recoverable, no damage, no hazards.
Q40 G-S	S-C	240	10min	F1, F2	0.12	Unit shut down, recoverable, no damage, no hazards.
Q40 D-S	S-C	240	10min	F1, F2	0.12	Unit shut down, recoverable, no damage, no hazards.
Q40 G-D	S-C	240	10min	F1, F2	0.12	Unit shut down, recoverable, no damage, no hazards.
Supplementary information:						
<ol style="list-style-type: none"> 1. o-l: Overloaded, s-c: Short-circuited; o-c: Open-circuited 2. The test result shown all safeguards remained effective and didn't lead to a single fault condition during abnormal operating condition; besides, all safeguards complied with applicable requirements in this standard after restoration of normal operating conditions. 3. The overloaded condition is according to annex G.5.3.3. 4. The tests cause the fuse F1, F2 opened has been repeated 3 times with the same result obtained. 5. Test items where components were damaged were repeated twice with same outcome. 						

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Clause	Requirement + Test	Result - Remark	Verdict

M.3	TABLE: Protection circuits for batteries provided within the equipment						N/A
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)				
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 _{oc} (V)	Time (s)	I _{sc} (A)		S (VA)	
				Meas.	Limit	Meas.	Limit
Supplementary Information:							

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Clause	Requirement + Test	Result - Remark	Verdict

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:								

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

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:

Inst Code	Manufacture	Instr. No. (Bar Code)	Testing Area	Instrument Type	Make & Model	Calibration Dates	
						Last	Due
1	EXTECH	1290427	58#1F	Withstand Voltage/Insulation Tester	7430	12/30/2020	12/29/2021
2	EXTECH	1331756	58#1F	Touch Current Tester	7630	08/20/2020	08/19/2021
3	Agilent	MY53008185	58#1F	Digital Multimeter	34401A	12/30/2020	12/29/2021
4	Chroma	62050PA01073	58#1F	DC Power Supply	62050P-100-100	12/30/2020	12/29/2021
5	Chroma	632010001960	58#1F	DC Electronic Load	63201	12/30/2020	12/29/2021
6	Chroma	6314A0004271	58#1F	DC Electronic Load	6314A	12/30/2020	12/29/2021
7	Chroma	62050PA01069	58#1F	DC Power Supply	62050P-100-100	12/30/2020	12/29/2021
8	Chroma	632010001959	58#1F	DC Electronic Load	63201	12/30/2020	12/29/2021
9	Chroma	646038000281	58#1F	Programmable AC Source	6460	12/30/2020	12/29/2021
10	Tektronix	C070499	58#1F	High Voltage Probe	P6015A	01/04/2021	01/03/2022
11	Chroma	662023001329	58#1F	Digital Power Meter	66202	12/30/2020	12/29/2021
12	Chroma	662023001327	58#1F	Digital Power Meter	66202	12/30/2020	12/29/2021
13	EXTECH	140502410	58#1F	Clamp Meter	MA1500	12/30/2020	12/29/2021
14	Fluke	28630874WS	58#1F	Multimeter	117C	12/30/2020	12/29/2021
15	Keysight	MY56311348	58#1F	Oscilloscope	DSOX3024T	03/14/2020	03/13/2021
16	Cybertek	D1760000141	58#1F	High Voltage Differential Probe	DP6150	03/14/2020	03/13/2021
17	BYXAS	--	58#1F	Digital Stop Watch	WDC-100	01/04/2021	01/03/2022
18	Cybertek	D1760000196	58#1F	High Voltage Differential Probe	DP6150	03/14/2020	03/13/2021
19	SATA	--	58#1F	Tapeline	3m	--	--
20	Omega	2-11	58#1F	Thermocouple	Type T	01/04/2021	01/03/2022
21	Omega	040	58#1F	Thermocouple	Type T	01/04/2021	01/03/2022
22	ESPEC	8063141055	58#1F	Chamber	SETH-102L	12/30/2020	12/29/2021
23	AGILENT	MY44080057	58#1F	Data Acquisition/Switch Unit	34970A	12/30/2020	12/29/2021
24	--	--	58#1F	Meter ruler	0-1000mm	--	--
25	--	--	58#1F	Meter ruler	0-1000mm	--	--
26	--	--	58#1F	Angle square	600*400mm	--	--
27	--	--	58#1F	Angle square	600*400mm	--	--
28	MITUTOYO	YF11060256	58#1F	Digital Caliper	0-300mm	--	--
29	AGILENT	MY57000314	58#1F	Data Acquisition/Switch Unit	34970A	03/14/2020	03/13/2021
30	HTC	--	58#1F	Humid & Temp. Dig	HTC-1	12/30/2020	12/29/2021
31	Chroma	615110000292	58#1F	Programmable AC Source	61511	12/30/2020	12/29/2021

Inst Code	Manufacture	Instr. No. (Bar Code)	Testing Area	Instrument Type	Make & Model	Calibration Dates	
						Last	Due
32	Chroma	64300708	50#6F	Programmable AC Source	6430	12/30/2020	12/29/2021
33	Chroma	6210PE01241	50#6F	Programmable DC Source	62012P-100-50	12/30/2020	12/29/2021
34	HP	2933A-04790	50#6F	System Power Supply	6032A	12/30/2020	12/29/2021
35	Agilent	MY44083640	50#6F	Data Acquisition/Switch Unit	34970A	12/30/2020	12/29/2021
36	Agilent	MY44065294	50#6F	Data Acquisition/Switch Unit	34970A	12/30/2020	12/29/2021
37	Chroma	6314A0002647	50#6F	DC Electronic Load	6314A	12/30/2020	12/29/2021
38	--	Output shunt	50#6F	Shunt	200A/50mV	12/30/2020	12/29/2021
39	HP	2518A-00776	50#6F	System Power Supply	6038A	12/30/2020	12/29/2021
40	Taicang Pujiang	Input Shunt 3	50#6F	Shunt	FL-27	12/30/2020	12/29/2021
41	YOKOGAWA	66YA1442	50#6F	Shunt	2215	12/30/2020	12/29/2021
42	Taicang Pujiang	Output Shunt 22	50#6F	Shunt	FL-27	12/30/2020	12/29/2021
43	Jiangbai	Input shunt 1	50#6F	Shunt	FL-2	12/30/2020	12/29/2021
44	Jiangbai	Input shunt 2	50#6F	Shunt	FL-2	12/30/2020	12/29/2021
45	Agilent	MY41000361	50#6F	Telecom DC Power Supply	E4356A	12/30/2020	12/29/2021
46	Simpson	10-866030	58#1F	Leakage Current Tester	228	08/20/2020	08/19/2021
47	Voltech	100008201492	58#1F	Power Analyzer	PM1000+	08/20/2020	08/19/2021
48	Setra	FL2361	58#1F	Electronic Scales	BL-500F	09/06/2020	09/05/2021
49	--	SHPS01005	50#6F	Chamber	--	12/30/2020	12/29/2021
50	--	113639	50#6F	Chamber	--	12/30/2020	12/29/2021
51	Sorenson	9922B1010	50#6F	Power Supply	DCS8-350	12/30/2020	12/29/2021
52	YINHE	201600007	58#1F	Chamber	SDJ65PA	12/30/2020	12/29/2021
53	YOMA	15101004	58#1F	Chamber	MHZ-04	12/30/2020	12/29/2021
54	iDRC	840520	58#1F	AC Power Source	CF-500EP	12/30/2020	12/29/2021
55	Chroma	62150EB0694	58#1F	DC Power Source	62150H-600	12/30/2020	12/29/2021
56	Chroma	62150EB0692	58#1F	DC Power Source	62150H-600	12/30/2020	12/29/2021
57	Chroma	63206AL00072	58#1F	DC Power Load	63206A-150-600	03/14/2020	03/13/2021
58	EA	1514080001	58#1F	DC Power Source	EA-CPS8080-510	12/30/2020	12/29/2021
59	EA	1514080004	58#1F	DC Power Source	EA-CPS8080-510	12/30/2020	12/29/2021
60	Chroma	63206AL00070	58#1F	DC Power Load	63206A-150-600	03/14/2020	03/13/2021

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ATTACHMENT TO TEST REPORT
IEC 62368-1
EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES
 (Audio/video, information and communication technology equipment - Part 1: Safety requirements)

Differences according to.....: EN IEC 62368-1:2020+A11:2020
Attachment Form No.: EU_GD_IEC62368_1C
Attachment Originator: UL(Demko)
Master Attachment: 2020-03-10

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CENELEC COMMON MODIFICATIONS (EN)		P								
	<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.</p> <p>Clauses, subclauses, notes, tables, figures and annexes which are additional to those in IEC 62368-1:2018 are prefixed "Z".</p>	P								
	<p>Add the following annexes:</p> <table border="0"> <tr> <td>Annex ZA (normative)</td> <td>Normative references to international publications with their corresponding European publications</td> </tr> <tr> <td>Annex ZB (normative)</td> <td>Special national conditions</td> </tr> <tr> <td>Annex ZC (informative)</td> <td>A-deviations</td> </tr> <tr> <td>Annex ZD (informative)</td> <td>IEC and CENELEC code designations for flexible cords</td> </tr> </table>	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
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Annex ZC (informative)	A-deviations									
Annex ZD (informative)	IEC and CENELEC code designations for flexible cords									
1	Modification to Clause 3 .	N/A								
3.3.19	Sound exposure <i>Replace 3.3.19 of IEC 62368-1 with the following definitions:</i>	N/A								
3.3.19.1	momentary exposure level, MEL 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								
3.3.19.3	sound exposure, E A-weighted sound pressure (<i>p</i>) squared and integrated over a stated period of time, <i>T</i> Note 1 to entry: The SI unit is Pa ² s. $E = \int_0^T p(t)^2 dt$	N/A								
3.3.19.4	sound exposure level, SEL	N/A								

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	<p>logarithmic measure of sound exposure relative to a reference value, E_0, typically the 1 kHz threshold of hearing in humans.</p> <p>Note 1 to entry: <i>SEL</i> is measured as A-weighted levels in dB.</p> $SEL = 10 \lg \left(\frac{E}{E_0} \right) \text{ dB}$ <p>Note 2 to entry: See B.4 of EN 50332-3:2017 for additional information.</p>		
3.3.19.5	<p>digital signal level relative to full scale, dBFS</p> <p>levels reported in dBFS are always r.m.s. Full scale level, 0 dBFS, is the level of a dc-free 997-Hz sine wave whose undithered positive peak value is positive digital full scale, leaving the code corresponding to negative digital full scale unused</p> <p>Note 1 to entry: It is invalid to use dBFS for non-r.m.s. levels. Because the definition of full scale is based on a sine wave, the level of signals with a crest factor lower than that of a sine wave may exceed 0 dBFS. In particular, square wave signals may reach +3,01 dBFS.</p>		N/A
2	Modification to Clause 10		N/A
10.6	<p>Safeguards against acoustic energy sources</p> <p>Replace 10.6 of IEC 62368-1 with the following:</p>		N/A
10.6.1.1	<p>Introduction</p> <p>Safeguard requirements for protection against long-term exposure to excessive sound pressure levels from personal music players closely coupled to the ear are specified below. Requirements for earphones and headphones intended for use with personal music players are also covered. A personal music player is a portable equipment intended for use by an ordinary person, that:</p> <ul style="list-style-type: none"> – is designed to allow the user to listen to audio or audiovisual content / material; and – uses a listening device, such as headphones or earphones that can be worn in or on or around the ears; and – has a player that can be body worn (of a size suitable to be carried in a clothing pocket) and is intended for the user to walk around with while in continuous use (for example, on a street, in a subway, at an airport, etc.). 		N/A


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	<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"> – professional equipment; <p>NOTE 3 Professional equipment is equipment sold through special sales channels. All products sold through normal electronics stores are considered not to be professional equipment.</p> <ul style="list-style-type: none"> – hearing aid equipment and other devices for assistive listening; – the following type of analogue personal music players: <ul style="list-style-type: none"> • long distance radio receiver (for example, a multiband radio receiver or world band radio receiver, an AM radio receiver), and • cassette player/recorder; <p>NOTE 4 This exemption has been allowed because this technology is falling out of use and it is expected that within a few years it will no longer exist. This exemption will not be extended to other technologies.</p> <ul style="list-style-type: none"> – a player while connected to an external amplifier that does not allow the user to walk around while in use. <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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10.6.1.2	<p>Non-ionizing radiation from radio frequencies in the range 0 to 300 GHz</p> <p>The amount of non-ionizing radiation is regulated by European Council Recommendation 1999/519/EC of 12 July 1999 on the limitation of exposure of the general public to electromagnetic fields (0 Hz to 300 GHz).</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	Classification of devices without the capacity to estimate sound dose		N/A
10.6.2.1	<p>General</p> <p>This standard is transitioning from short-term based (30 s) requirements to long-term based (40 hour) requirements. These clauses remain in effect only for devices that do not comply with sound dose estimation as stipulated in EN 50332-3.</p> <p>For classifying the acoustic output $L_{Aeq,T}$, measurements are based on the A-weighted equivalent sound pressure level over a 30 s period.</p> <p>For music where the average sound pressure (long term $L_{Aeq,T}$) measured over the duration of the song is lower than the average produced by the programme simulation noise, measurements may be done over the duration of the complete song. In this case, T becomes the duration of the song.</p> <p>NOTE Classical music, acoustic music and broadcast typically has an average sound pressure (long term $L_{Aeq,T}$) which is much lower than the average programme simulation noise. Therefore, if the player is capable to analyse the content and compare it with the programme simulation noise, the warning does not need to be given as long as the average sound pressure of the song does not exceed the required limit.</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>RS1 limits (to be superseded, see 10.6.3.2)</p> <p>RS1 is a class 1 acoustic energy source that does not exceed the following:</p> <ul style="list-style-type: none"> – for equipment provided as a package (player with its listening device), and with a proprietary connector between the player and its listening device, or where the combination of player and 		N/A

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	<p>listening device is known by other means such as setting or automatic detection, the $L_{Aeq,T}$ acoustic output shall be ≤ 85 dB when playing the fixed "programme simulation noise" described in EN 50332-1.</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 ≤ 27 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>RS2 limits (to be superseded, see 10.6.3.3)</p> <p>RS2 is a class 2 acoustic energy source that does not exceed the following:</p> <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 $L_{Aeq,T}$ acoustic output shall be ≤ 100 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 ≤ 150 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>RS3 limits</p> <p>RS3 is a class 3 acoustic energy source that exceeds RS2 limits.</p>		N/A
10.6.3	Classification of devices (new)		N/A
10.6.3.1	<p>General</p> <p>Previous limits (10.6.2) created abundant false negative and false positive PMP sound level warnings. New limits, compliant with The Commission Decision of 23 June 2009, are given below.</p>		N/A
10.6.3.2	<p>RS1 limits (new)</p> <p>RS1 is a class 1 acoustic energy source that does not exceed the following:</p> <p>– for equipment provided as a package (player with its listening device), and with a proprietary</p>		N/A

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	<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 $L_{Aeq,T}$ acoustic output shall be ≤ 80 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 ≤ 15 mV (analogue interface) or -30 dBFS (digital interface) when playing the fixed "programme simulation noise" described in EN 50332-1.</p>		
10.6.3.3	<p>RS2 limits (new)</p> <p>RS2 is a class 2 acoustic energy source that does not exceed the following:</p> <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 ≤ 80 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 ≤ 15 mV (analogue interface) or -30 dBFS (digital interface) when playing the fixed "programme simulation noise" described in EN 50332-1.</p>		N/A
10.6.4	Requirements for maximum sound exposure		N/A
10.6.4.1	<p>Measurement methods</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
10.6.4.2	<p>Protection of persons</p> <p>Except as given below, protection requirements for parts accessible to ordinary persons, instructed persons and skilled persons are given in 4.3.</p> <p>NOTE 1 Volume control is not considered a safeguard.</p>		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	<p>Between RS2 and an ordinary person, the basic safeguard may be replaced by an instructional safeguard in accordance with Clause F.5, except that the instructional safeguard shall be placed on the equipment, or on the packaging, or in the instruction manual.</p> <p>Alternatively, the instructional safeguard may be given through the equipment display during use.</p> <p>The elements of the instructional safeguard shall be as follows:</p> <ul style="list-style-type: none"> – element 1a: the symbol , IEC 60417-6044 (2011-01) – element 2: “High sound pressure” or equivalent wording – element 3: “Hearing damage risk” or equivalent wording – element 4: “Do not listen at high volume levels for long periods.” or equivalent wording <p>An equipment safeguard shall prevent exposure of an ordinary person to an RS2 source without intentional physical action from the ordinary person and shall automatically return to an output level not exceeding what is specified for an RS1 source when the power is switched off.</p> <p>The equipment shall provide a means to actively inform the user of the increased sound level when the equipment is operated with an output exceeding RS1. Any means used shall be acknowledged by the user before activating a mode of operation which allows for an output exceeding RS1. The acknowledgement does not need to be repeated more than once every 20 h of cumulative listening time.</p> <p>NOTE 2 Examples of means include visual or audible signals. Action from the user is always needed.</p> <p>NOTE 3 The 20 h listening time is the accumulative listening time, independent of how often and how long the personal music player has been switched off.</p> <p>A skilled person shall not be unintentionally exposed to RS3.</p>		
10.6.5	Requirements for dose-based systems		N/A
10.6.5.1	<p>General requirements</p> <p>Personal music players shall give the warnings as provided below when tested according to EN 50332-3, using the limits from this clause.</p>		N/A

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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>Dose-based warning and requirements</p> <p>When a dose of 100 % <i>CSD</i> is reached, and at least at every 100 % further increase of <i>CSD</i>, the device shall warn the user and require an acknowledgement. In case the user does not acknowledge, the output level shall automatically decrease to compliance with class RS1.</p> <p>The warning shall at least clearly indicate that listening above 100 % <i>CSD</i> leads to the risk of hearing damage or loss.</p>		N/A
10.6.5.3	<p>Exposure-based requirements</p> <p>With only dose-based requirements, cause and effect could be far separated in time, defying the purpose of educating users about safe listening practice. In addition to dose-based requirements, a PMP shall therefore also put a limit to the short-term sound level a user can listen at.</p> <p>The exposure-based limiter (EL) shall automatically reduce the sound level not to exceed 100 dB(A) or 150 mV integrated over the past 180 s, based on methodology defined in EN 50332-3.</p> <p>The EL settling time (time from starting level reduction to reaching target output) shall be 10 s or faster.</p> <p>Test of EL functionality is conducted according to EN 50332-3, using the limits from this clause. For</p>		N/A

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

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	output of the listening device shall be ≤ 100 dB with an input signal of -10 dBFS.																																																														
10.6.6.4	Measurement method <i>Measurements shall be made in accordance with EN 50332-2 as applicable.</i>		N/A																																																												
3	Modification to the whole document		P																																																												
	<p>Delete all the “country” notes in the reference document according to the following list:</p> <table border="1"> <tbody> <tr> <td>0.2.1</td> <td>Note 1 and 2</td> <td>1</td> <td>Note 4 and 5</td> <td>3.3.8.1</td> <td>Note 2</td> </tr> <tr> <td>3.3.8.3</td> <td>Note 1</td> <td>4.1.15</td> <td>Note</td> <td>4.7.3</td> <td>Note 1 and 2</td> </tr> <tr> <td>5.2.2.2</td> <td>Note</td> <td>5.4.2.3.2.2 Table 12</td> <td>Note c</td> <td>5.4.2.3.2.4</td> <td>Note 1 and 3</td> </tr> <tr> <td>5.4.2.3.2.4 Table 13</td> <td>Note 2</td> <td>5.4.2.5</td> <td>Note 2</td> <td>5.4.5.1</td> <td>Note</td> </tr> <tr> <td>5.4.10.2.1</td> <td>Note</td> <td>5.4.10.2.2</td> <td>Note</td> <td>5.4.10.2.3</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 and 4</td> </tr> <tr> <td>5.6.8</td> <td>Note 2</td> <td>5.7.6</td> <td>Note</td> <td>5.7.7.1</td> <td>Note 1 and Note 2</td> </tr> <tr> <td>8.5.4.2.3</td> <td>Note</td> <td>10.2.1 Table 39</td> <td>Note 3 and 4 and 5</td> <td>10.5.3</td> <td>Note 2</td> </tr> <tr> <td>10.6.1</td> <td>Note 3</td> <td>F.3.3.6</td> <td>Note 3</td> <td>Y.4.1</td> <td>Note</td> </tr> <tr> <td>Y.4.5</td> <td>Note</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	0.2.1	Note 1 and 2	1	Note 4 and 5	3.3.8.1	Note 2	3.3.8.3	Note 1	4.1.15	Note	4.7.3	Note 1 and 2	5.2.2.2	Note	5.4.2.3.2.2 Table 12	Note c	5.4.2.3.2.4	Note 1 and 3	5.4.2.3.2.4 Table 13	Note 2	5.4.2.5	Note 2	5.4.5.1	Note	5.4.10.2.1	Note	5.4.10.2.2	Note	5.4.10.2.3	Note	5.5.2.1	Note	5.5.6	Note	5.6.4.2.1	Note 2 and 3 and 4	5.6.8	Note 2	5.7.6	Note	5.7.7.1	Note 1 and Note 2	8.5.4.2.3	Note	10.2.1 Table 39	Note 3 and 4 and 5	10.5.3	Note 2	10.6.1	Note 3	F.3.3.6	Note 3	Y.4.1	Note	Y.4.5	Note						P
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4	Modification to Clause 1		N/A																																																												
1	<p>Add the following note:</p> <p><i>NOTE Z1 The use of certain substances in electrical and electronic equipment is restricted within the EU: see Directive 2011/65/EU.</i></p>		N/A																																																												
5	Modification to 4.Z1		N/A																																																												

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Clause	Requirement + Test	Result - Remark	Verdict
4.Z1	<p>Add the following new subclause after 4.9:</p> <p>To protect against excessive current, short-circuits and earth faults in circuits connected to an a.c. mains, protective devices shall be included either as integral parts of the equipment or as parts of the building installation, subject to the following, a), b) and c):</p> <p>a) except as detailed in b) and c), protective devices necessary to comply with the requirements of B.3.1 and B.4 shall be included as parts of the equipment;</p> <p>b) for components in series with the mains input to the equipment such as the supply cord, appliance coupler, r.f.i. filter and switch, short-circuit and earth fault protection may be provided by protective devices in the building installation;</p> <p>c) it is permitted for pluggable equipment type B or permanently connected equipment, to rely on dedicated overcurrent and short-circuit protection in the building installation, provided that the means of protection, e.g. fuses or circuit breakers, is fully specified in the installation instructions.</p> <p>If reliance is placed on protection in the building installation, the installation instructions shall so state, except that for pluggable equipment type A the building installation shall be regarded as providing protection in accordance with the rating of the wall socket outlet.</p>		N/A
6	Modification to 5.4.2.3.2.4		N/A
5.4.2.3.2.4	<p>Add the following to the end of this subclause:</p> <p>The requirement for interconnection with external circuit is in addition given in EN 50491-3:2009.</p>	No external circuits.	N/A
7	Modification to 10.2.1		N/A
10.2.1	<p>Add the following to ^{c)} and ^{d)} in table 39:</p> <p>For additional requirements, see 10.5.1.</p>	No such radiation from the equipment.	N/A
8	Modification to 10.5.1		N/A

IEC62368_1C- ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
10.5.1	<p>Add the following after the first paragraph:</p> <p>For RS 1 compliance is checked by measurement under the following conditions:</p> <p>In addition to the normal operating conditions, all controls adjustable from the outside by hand, by any object such as a tool or a coin, and those internal adjustments or pre-sets which are not locked in a reliable manner, are adjusted so as to give maximum radiation whilst maintaining an intelligible picture for 1 h, at the end of which the measurement is made.</p> <p>NOTE Z1 Soldered joints and paint lockings are examples of adequate locking.</p> <p>The dose-rate is determined by means of a radiation monitor with an effective area of 10 cm², at any point 10 cm from the outer surface of the apparatus.</p> <p>Moreover, the measurement shall be made under fault conditions causing an increase of the high voltage, provided an intelligible picture is maintained for 1 h, at the end of which the measurement is made.</p> <p>For RS1, the dose-rate shall not exceed 1 μSv/h taking account of the background level.</p> <p>NOTE Z2 These values appear in Directive 96/29/Euratom of 13 May 1996.</p>		N/A
9	Modification to G.7.1		N/A
G.7.1	<p>Add the following note:</p> <p>NOTE Z1 The harmonized code designations corresponding to the IEC cord types are given in Annex ZD.</p>		N/A
10	Modification to Bibliography		N/A

IEC62368_1C- ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
	<p>Add the following notes for the standards indicated:</p> <p>IEC 60130-9 NOTE Harmonized as EN 60130-9. IEC 60269-2 NOTE Harmonized as HD 60269-2. IEC 60309-1 NOTE Harmonized as EN 60309-1. IEC 60364 NOTE some parts harmonized in HD 384/HD 60364 series. IEC 60601-2-4 NOTE Harmonized as EN 60601-2-4. IEC 60664-5 NOTE Harmonized as EN 60664-5. IEC 61032:1997 NOTE Harmonized as EN 61032:1998 (not modified). IEC 61508-1 NOTE Harmonized as EN 61508-1. IEC 61558-2-1 NOTE Harmonized as EN 61558-2-1. IEC 61558-2-4 NOTE Harmonized as EN 61558-2-4. IEC 61558-2-6 NOTE Harmonized as EN 61558-2-6. IEC 61643-1 NOTE Harmonized as EN 61643-1. IEC 61643-21 NOTE Harmonized as EN 61643-21. IEC 61643-311 NOTE Harmonized as EN 61643-311. IEC 61643-321 NOTE Harmonized as EN 61643-321. IEC 61643-331 NOTE Harmonized as EN 61643-331.</p>		N/A
11	ADDITION OF ANNEXES		P
ZB	ANNEX ZB, SPECIAL NATIONAL CONDITIONS (EN)		P
4.1.15	<p>Denmark, Finland, Norway and Sweden</p> <p>To the end of the subclause the following is added: Class I pluggable equipment type A intended for connection to other equipment or a network shall, if safety relies on connection to reliable earthing or if surge suppressors are connected between the network terminals and accessible parts, have a marking stating that the equipment shall be connected to an earthed mains socket-outlet.</p> <p>The marking text in the applicable countries shall be as follows:</p> <p>In Denmark: "Apparatets stikprop skal tilsluttes en stikkontakt med jord som giver forbindelse til stikproppens jord." In Finland: "Laitte on liitettävä suojakoskettimilla varustettuun pistorasiaan" In Norway: "Apparatet må tilkoples jordet stikkontakt" In Sweden: "Apparaten skall anslutas till jordat uttag"</p>	<p>The marking text must be provided when marketed in applicable countries.</p>	N/A

IEC62368_1C- ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
4.7.3	<p>United Kingdom</p> <p>To the end of the subclause the following is added:</p> <p>The torque test is performed using a socket-outlet complying with BS 1363, and the plug part shall be assessed to the relevant clauses of BS 1363. Also see Annex G.4.2 of this annex</p>	The equipment is not direct plug-in equipment.	N/A
5.2.2.2	<p>Denmark</p> <p>After the 2nd paragraph add the following:</p> <p>A warning (marking safeguard) for high touch current is required if the touch current exceeds the limits of 3,5 mA a.c. or 10 mA d.c.</p>	No high touch current.	N/A
5.4.11.1 and Annex G	<p>Finland and Sweden</p> <p>To the end of the subclause the following is added:</p> <p>For separation of the telecommunication network from earth the following is applicable:</p> <p>If this insulation is solid, including insulation forming part of a component, it shall at least consist of either</p> <ul style="list-style-type: none"> • two layers of thin sheet material, each of which shall pass the electric strength test below, or • one layer having a distance through insulation of at least 0,4 mm, which shall pass the electric strength test below. <p>If this insulation forms part of a semiconductor component (e.g. an optocoupler), there is no distance through insulation requirement for the insulation consisting of an insulating compound completely filling the casing, so that clearances and creepage distances do not exist, if the component passes the electric strength test in accordance with the compliance clause below and in addition</p> <ul style="list-style-type: none"> • passes the tests and inspection criteria of 5.4.8 with an electric strength test of 1,5 kV multiplied by 1,6 (the electric strength test of 5.4.9 shall be performed using 1,5 kV), <p>and</p> <ul style="list-style-type: none"> • is subject to routine testing for electric strength during manufacturing, using a test voltage of 1,5 	No TNV circuits.	N/A

IEC62368_1C- ATTACHMENT			
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"> • the insulation requirements are satisfied by having a capacitor classified Y3 as defined by EN 60384-14, which in addition to the Y3 testing, is tested with an impulse test of 2,5 kV defined in 5.4.11; • the additional testing shall be performed on all the test specimens as described in EN 60384-14; <p>the impulse test of 2,5 kV is to be performed before the endurance test in EN 60384-14, in the sequence of tests as described in EN 60384-14.</p>		
5.5.2.1	<p>Norway</p> <p>After the 3rd paragraph the following is added:</p> <p>Due to the IT power system used, capacitors are required to be rated for the applicable line-to-line voltage (230 V).</p>	Considered.	P
5.5.6	<p>Finland, Norway and Sweden</p> <p>To the end of the subclause the following is added:</p> <p>Resistors used as basic safeguard or bridging basic insulation in class I pluggable equipment type A shall comply with G.10.1 and the test of G.10.2.</p>	Resistors comply with G.10.1 and the test of G.10.2	P
5.6.1	<p>Denmark</p> <p>Add to the end of the subclause</p> <p>Due to many existing installations where the socket-outlets can be protected with fuses with higher rating than the rating of the socket-outlets the protection for pluggable equipment type A shall be an integral part of the equipment.</p> <p><i>Justification:</i></p> <p>In Denmark an existing 13 A socket outlet can be protected by a 20 A fuse.</p>	Considered.	P

IEC62368_1C- ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
5.6.4.2.1	<p>Ireland and United Kingdom</p> <p>After the indent for pluggable equipment type A, the following is added: – the protective current rating is taken to be 13 A, this being the largest rating of fuse used in the mains plug.</p>	Considered.	P
5.6.4.2.1	<p>France</p> <p>After the indent for pluggable equipment type A, the following is added: – in certain cases, the protective current rating of the circuit supplied from the mains is taken as 20 A instead of 16 A.</p>	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 mm² to 1,5 mm² in cross-sectional area.</p>	See above.	N/A
5.6.8	<p>Norway</p> <p>To the end of the subclause the following is added: Equipment connected with an earthed mains plug is classified as class I equipment. See the Norway marking requirement in 4.1.15. The symbol IEC 60417-6092, as specified in F.3.6.2, is accepted.</p>	Considered.	P
5.7.6	<p>Denmark</p> <p>To the end of the subclause the following is added:</p> <p>The installation instruction shall be affixed to the equipment if the protective conductor current exceeds the limits of 3,5 mA a.c. or 10 mA d.c.</p>	No high protective conductor current.	N/A
5.7.6.2	<p>Denmark</p> <p>To the end of the subclause the following is added: The warning (marking safeguard) for high touch current is required if the touch current or the protective current exceed the limits of 3,5 mA .</p>	See above.	N/A
5.7.7.1	<p>Norway and Sweden</p> <p>To the end of the subclause the following is added: The screen of the television distribution system is normally not earthed at the entrance of the building and there is normally no equipotential bonding system within the building. Therefore the protective earthing of the building</p>	Not such system.	N/A

IEC62368_1C- ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
	<p>installation needs to be isolated from the screen of a cable distribution system.</p> <p>It is however accepted to provide the insulation external to the equipment by an adapter or an interconnection cable with galvanic isolator, which may be provided by a retailer, for example.</p> <p>The user manual shall then have the following or similar information in Norwegian and Swedish language respectively, depending on in what country the equipment is intended to be used in:</p> <p>“Apparatus connected to the protective earthing of the building installation through the mains connection or through other apparatus with a connection to protective earthing – and to a television distribution system using coaxial cable, may in some circumstances create a fire hazard. Connection to a television distribution system therefore has to be provided through a device providing electrical isolation below a certain frequency range (galvanic isolator, see EN 60728-11)”</p> <p>NOTE In Norway, due to regulation for CATV-installations, and in Sweden, a galvanic isolator shall provide electrical insulation below 5 MHz. The insulation shall withstand a dielectric strength of 1,5 kV r.m.s., 50 Hz or 60 Hz, for 1 min.</p> <p>Translation to Norwegian (the Swedish text will also be accepted in Norway):</p> <p>“Apparater som er koplet til beskyttelsesjord via nettplugg og/eller via annet jordtilkoplet utstyr – og er tilkoplet et koaksialbasert kabel-TV nett, kan forårsake brannfare.</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>		
8.5.4.2.3	<p>United Kingdom</p> <p>Add the following after the 2nd dash bullet in 3rd</p>		N/A

IEC62368_1C- ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
	<p>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.3.1 and B.4	<p>Ireland and United Kingdom</p> <p>The following is applicable:</p> <p>To protect against excessive currents and short-circuits in the primary circuit of direct plug-in equipment, tests according to Annexes B.3.1 and B.4 shall be conducted using an external miniature circuit breaker complying with EN 60898-1, Type B, rated 32A. If the equipment does not pass these tests, suitable protective devices shall be included as an integral part of the direct plug-in equipment, until the requirements of Annexes B.3.1 and B.4 are met</p>	The equipment is not direct plug-in equipment.	N/A
G.4.2	<p>Denmark</p> <p>To the end of the subclause the following is added:</p> <p>Supply cords of single phase appliances having a rated current not exceeding 13 A shall be provided with a plug according to DS 60884-2-D1:2011.</p> <p>CLASS I EQUIPMENT provided with socket-outlets with earth contacts or which are intended to be used in locations where protection against indirect contact is required according to the wiring rules shall be provided with a plug in accordance with standard sheet DK 2-1a or DK 2-5a.</p> <p>If a single-phase equipment having a RATED CURRENT exceeding 13 A or if a polyphase equipment is provided with a supply cord with a plug, this plug shall be in accordance with the standard sheets DK 6-1a in DS 60884-2-D1 or EN 60309-2.</p> <p>Mains socket outlets intended for providing power to Class II apparatus with a rated current of 2,5 A shall be in accordance DS 60884-2-D1:2011 standard sheet DKA 1-4a.</p> <p>Other current rating socket outlets shall be in compliance with Standard Sheet DKA 1-3a or DKA 1-1c.</p> <p>Mains socket-outlets with earth shall be in</p>	No socket-outlets used.	N/A

IEC62368_1C- ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
	<p>compliance with DS 60884-2-D1:2011 Standard Sheet DK 1-3a, DK 1-1c, DK1-1d, DK 1-5a or DK 1-7a</p> <p><i>Justification:</i> Heavy Current Regulations, Section 6c</p>		
G.4.2	<p>United Kingdom</p> <p>To the end of the subclause the following is added:</p> <p>The plug part of direct plug-in equipment shall be assessed to BS 1363: Part 1, 12.1, 12.2, 12.3, 12.9, 12.11, 12.12, 12.13, 12.16, and 12.17, except that the test of 12.17 is performed at not less than 125 °C. Where the metal earth pin is replaced by an Insulated Shutter Opening Device (ISOD), the requirements of clauses 22.2 and 23 also apply.</p>	The equipment is not direct plug-in equipment.	N/A
G.7.1	<p>United Kingdom</p> <p>To the first paragraph the following is added:</p> <p>Equipment which is fitted with a flexible cable or cord and is designed to be connected to a mains socket conforming to BS 1363 by means of that flexible cable or cord shall be fitted with a 'standard plug' in accordance with the Plugs and Sockets etc. (Safety) Regulations 1994, Statutory Instrument 1994 No. 1768, unless exempted by those regulations.</p> <p>NOTE "Standard plug" is defined in SI 1768:1994 and essentially means an approved plug conforming to BS 1363 or an approved conversion plug.</p>		N/A
G.7.1	<p>Ireland</p> <p>To the first paragraph the following is added:</p> <p>Apparatus which is fitted with a flexible cable or cord shall be provided with a plug in accordance with Statutory Instrument 525: 1997, "13 A Plugs and Conversion Adapters for Domestic Use Regulations: 1997. S.I. 525 provides for the recognition of a standard of another Member State which is equivalent to the relevant Irish Standard</p>		N/A
G.7.2	<p>Ireland and United Kingdom</p> <p>To the first paragraph the following is added:</p> <p>A power supply cord with a conductor of 1,25 mm² is allowed for equipment which is rated over 10 A and up to and including 13 A.</p>		N/A

IEC62368_1C- ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
ZC	ANNEX ZC, NATIONAL DEVIATIONS (EN)		N/A
10.5.2	<p>Germany</p> <p>The following requirement applies:</p> <p>For the operation of any cathode ray tube intended for the display of visual images operating at an acceleration voltage exceeding 40 kV, authorization is required, or application of type approval (Bauartzulassung) and marking.</p> <p><i>Justification:</i></p> <p>German ministerial decree against ionizing radiation (Röntgenverordnung), in force since 2002-07-01, implementing the European Directive 96/29/EURATOM.</p> <p>NOTE Contact address: Physikalisch-Technische Bundesanstalt, Bundesallee 100, D-38116 Braunschweig, Tel.: Int+49-531-592-6320, Internet: http://www.ptb.de</p>	No CRT within the equipment.	N/A

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Clause	Requirement + Test	Result - Remark	Verdict

ZD	IEC and CENELEC CODE DESIGNATIONS FOR FLEXIBLE CORDS (EN)		N/A
	Type of flexible cord	Code designations	
		IEC	CENELEC
	PVC insulated cords		
	Flat twin tinsel cord	60227 IEC 41	H03VH-Y
	Light polyvinyl chloride sheathed flexible cord	60227 IEC 52	H03VV-F H03VVH2-F
	Ordinary polyvinyl chloride sheathed flexible cord	60227 IEC 53	H05VV-F H05VVH2-F
	Rubber insulated cords		
	Braided cord	60245 IEC 51	H03RT-F
	Ordinary tough rubber sheathed flexible cord	60245 IEC 53	H05RR-F
	Ordinary polychloroprene sheathed flexible cord	60245 IEC 57	H05RN-F
	Heavy polychloroprene sheathed flexible cord	60245 IEC 86	H07RN-F
	Cords having high flexibility		
	Rubber insulated and sheathed cord	60245 IEC 86	H03RR-H
	Rubber insulated, crosslinked PVC sheathed cord	60245 IEC 87	H03RV4-H
	Crosslinked PVC insulated and sheathed cord	60245 IEC 88	H03V4V4-H
	Cords insulated and sheathed with halogen-free thermoplastic compounds		
	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

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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

IEC62368_1C- ATTACHMENT			
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 _{peak} or 60 V _{d.c.} , the maximum acceptable current through a 2000 ohm resistor (or greater) connected across the voltage source with other loads disconnected is 7.1 mA peak or 30 mA d.c. under normal operating conditions.	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 ³ (27 cu ft) are required to have a provision for connection of either automatic sprinklers or a gaseous agent extinguishing system with an extended discharge.		N/A
	Consumer products designed or intended primarily for children 12 years of age or younger are subject to additional requirements in accordance with U.S. and Canadian Regulations.		N/A
	Baby monitors are required to additionally comply with ASTM F2951, Consumer Safety Specification for Baby Monitors.		N/A

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 ² (10 sq ft) or a single dimension greater than 1.8 m (6 ft) are required to have a flame spread rating of 50 or less. For equipment with the same dimensions for other applications, an external surface that is not a fire enclosure requires a minimum flammability classification of V-1.	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 ²).	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

IEC62368_1 - ATTACHMENT																																							
Clause	Requirement + Test	Result - Remark	Verdict																																				
ATTACHMENT TO TEST REPORT IEC 62368-1 EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES (Audio/video, information and communication technology equipment - Part 1: Safety requirements)																																							
Differences according to.....: EN 62368-1:2014+A11:2017																																							
	CENELEC COMMON MODIFICATIONS (EN)		P																																				
	Clauses, subclauses, notes, tables, figures and annexes which are additional to those in IEC 62368-1:2014 are prefixed "Z".		P																																				
CONTENTS	Add the following annexes: Annex ZA (normative) Normative references to international publications with their corresponding European publications Annex ZB (normative) Special national conditions Annex ZC (informative) A-deviations Annex ZD (informative) IEC and CENELEC code designations for flexible cords		P																																				
	Delete all the "country" notes in the reference document (IEC 62368-1:2014) according to the following list: <table border="1" data-bbox="337 961 1312 1417"> <tbody> <tr> <td>0.2.1</td> <td>Note</td> <td>1</td> <td>Note 3</td> <td>4.1.15</td> <td>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		P
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	For special national conditions, see Annex ZB.		P																																				
1	Add 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>Add the following new subclause after 4.9:</p> <p>To protect against excessive current, short-circuits and earth faults in circuits connected to an a.c. mains, protective devices shall be included either as integral parts of the equipment or as parts of the building installation, subject to the following, a), b) and c):</p> <p>a) except as detailed in b) and c), protective devices necessary to comply with the requirements of B.3.1 and B.4 shall be included as parts of the equipment;</p> <p>b) for components in series with the mains input to the equipment such as the supply cord, appliance coupler, r.f.i. filter and switch, short-circuit and earth fault protection may be provided by protective devices in the building installation;</p> <p>c) it is permitted for pluggable equipment type B or permanently connected equipment, to rely on dedicated overcurrent and short-circuit protection in the building installation, provided that the means of protection, e.g. fuses or circuit breakers, is fully specified in the installation instructions.</p> <p>If reliance is placed on protection in the building installation, the installation instructions shall so state, except that for pluggable equipment type A the building installation shall be regarded as providing protection in accordance with the rating of the wall socket outlet.</p>	See below.	N/A
5.4.2.3.2.4	<p>Add the following to the end of this subclause:</p> <p>The requirement for interconnection with external circuit is in addition given in EN 50491-3:2009.</p>	No external circuits.	N/A
10.2.1	<p>Add the following to ^{c)} and ^{d)} in table 39:</p> <p>For additional requirements, see 10.5.1.</p>	No such radiation from the equipment.	N/A

IEC62368_1B - ATTACHMENT

Clause	Requirement + Test	Result - Remark	Verdict
10.5.1	<p>Add the following after the first paragraph: <i>For RS 1 compliance is checked by measurement under the following conditions:</i> <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 cm², 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>Add 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>Add the following new subclause after 10.6.5. 10.Z1 Non-ionizing radiation from radio frequencies in the range 0 to 300 GHz</p> <p>The amount of non-ionizing radiation is regulated by European Council Recommendation 1999/519/EC of 12 July 1999 on the limitation of exposure of the general public to electromagnetic fields (0 Hz to 300 GHz).</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>Add 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>Add the following standards:</p> <p>Add the following notes for the standards indicated:</p> <p>IEC 60130-9 NOTE Harmonized as EN 60130-9. IEC 60269-2 NOTE Harmonized as HD 60269-2. IEC 60309-1 NOTE Harmonized as EN 60309-1. IEC 60364 NOTE some parts harmonized in HD 384/HD 60364 series. IEC 60601-2-4 NOTE Harmonized as EN 60601-2-4. IEC 60664-5 NOTE Harmonized as EN 60664-5. IEC 61032:1997 NOTE Harmonized as EN 61032:1998 (not modified). IEC 61508-1 NOTE Harmonized as EN 61508-1. IEC 61558-2-1 NOTE Harmonized as EN 61558-2-1. IEC 61558-2-4 NOTE Harmonized as EN 61558-2-4. IEC 61558-2-6 NOTE Harmonized as EN 61558-2-6. IEC 61643-1 NOTE Harmonized as EN 61643-1. IEC 61643-21 NOTE Harmonized as EN 61643-21. IEC 61643-311 NOTE Harmonized as EN 61643-311. IEC 61643-321 NOTE Harmonized as EN 61643-321. IEC 61643-331 NOTE Harmonized as EN 61643-331.</p>		N/A
ZB	ANNEX ZB, SPECIAL NATIONAL CONDITIONS (EN)		P
4.1.15	<p>Denmark, Finland, Norway and Sweden</p> <p>To the end of the subclause the following is added:</p> <p>Class I pluggable equipment type A intended for connection to other equipment or a network shall, if safety relies on connection to reliable earthing or if surge suppressors are connected between the network terminals and accessible parts, have a marking stating that the equipment shall be connected to an earthed mains socket-outlet.</p> <p>The marking text in the applicable countries shall be as follows:</p> <p>In Denmark: "Apparatets stikprop skal tilsluttes en stikkontakt med jord som giver forbindelse til stikproppens jord." In Finland: "Laite on liitettävä suojakoskettimilla varustettuun pistorasiaan" In Norway: "Apparatet må tilkoples jordet stikkontakt" In Sweden: "Apparaten skall anslutas till jordat uttag"</p>	The marking text must be provided when marketed in applicable countries.	N/A
4.7.3	<p>United Kingdom</p> <p>To the end of the subclause the following is added:</p> <p>The torque test is performed using a socket-outlet complying with BS 1363, and the plug part shall be assessed to the relevant clauses of BS 1363. Also see Annex G.4.2 of this annex</p>	The equipment is not direct plug-in equipment.	N/A

IEC62368_1B - ATTACHMENT

Clause	Requirement + Test	Result - Remark	Verdict
5.2.2.2	<p>Denmark</p> <p>After the 2nd paragraph add the following: 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
5.4.11.1 and Annex G	<p>Finland and Sweden</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"> • two layers of thin sheet material, each of which shall pass the electric strength test below, or • one layer having a distance through insulation of at least 0,4 mm, which shall pass the electric strength test below. <p>If this insulation forms part of a semiconductor component (e.g. an optocoupler), there is no distance through insulation requirement for the insulation consisting of an insulating compound completely filling the casing, so that clearances and creepage distances do not exist, if the component passes the electric strength test in accordance with the compliance clause below and in addition</p> <ul style="list-style-type: none"> • passes the tests and inspection criteria of 5.4.8 with an electric strength test of 1,5 kV multiplied by 1,6 (the electric strength test of 5.4.9 shall be performed using 1,5 kV), and • is subject to routine testing for electric strength during manufacturing, using a test voltage of 1,5kV. <p>It is permitted to bridge this insulation with a capacitor complying with EN 60384-14:2005, subclass Y2.</p> <p>A capacitor classified Y3 according to EN 60384-14:2005, may bridge this insulation under the following conditions:</p> <ul style="list-style-type: none"> • the insulation requirements are satisfied by having a capacitor classified Y3 as defined by EN 60384-14, which in addition to the Y3 testing, is tested with an impulse test of 2,5 kV defined in 5.4.11; • the additional testing shall be performed on all the test specimens as described in EN 60384-14; <p>the impulse test of 2,5 kV is to be performed before the endurance test in EN 60384-14, in the sequence of tests as described in EN 60384-14.</p>	No TNV circuits.	N/A
5.5.2.1	<p>Norway</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	<p>Finland, Norway and Sweden</p> <p>To the end of the subclause the following is added: Resistors used as basic safeguard or bridging basic insulation in class I pluggable equipment type A shall comply with G.10.1 and the test of G.10.2.</p>	Resistors comply with G.10.1 and the test of G.10.2	P
5.6.1	<p>Denmark</p> <p>Add 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.</p>	Considered.	P
5.6.4.2.1	<p>Ireland and United Kingdom</p> <p>After the indent for pluggable equipment type A, the following is added: – the protective current rating is taken to be 13 A, this being the largest rating of fuse used in the mains plug.</p>	Considered.	P
5.6.5.1	<p>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 mm² to 1,5 mm² in cross-sectional area.</p>	See above.	N/A
5.7.5	<p>Denmark</p> <p>To the end of the subclause the following is added: The installation instruction shall be affixed to the equipment if the protective conductor current exceeds the limits of 3,5 mA a.c. or 10 mA d.c.</p>	No high protective conductor current.	N/A

IEC62368_1B - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
5.7.6.1	<p>Norway and Sweden</p> <p>To the end of the subclause the following is added: The screen of the television distribution system is normally not earthed at the entrance of the building and there is normally no equipotential bonding system within the building. Therefore the protective earthing of the building installation needs to be isolated from the screen of a cable distribution system.</p> <p>It is however accepted to provide the insulation external to the equipment by an adapter or an interconnection cable with galvanic isolator, which may be provided by a retailer, for example.</p> <p>The user manual shall then have the following or similar information in Norwegian and Swedish language respectively, depending on in what country the equipment is intended to be used in: “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 tilkøpling 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>Denmark</p> <p>To the end of the subclause the following is added: The warning (marking safeguard) for high touch current is required if the touch current or the protective current exceed the limits of 3,5 mA .</p>	No external circuits.	N/A

IEC62368_1B - ATTACHMENT

Clause	Requirement + Test	Result - Remark	Verdict
B.3.1 and B.4	<p>Ireland and United Kingdom</p> <p>The following is applicable:</p> <p>To protect against excessive currents and short-circuits in the primary circuit of direct plug-in equipment, tests according to Annexes B.3.1 and B.4 shall be conducted using an external miniature circuit breaker complying with EN 60898-1, Type B, rated 32A. If the equipment does not pass these tests, suitable protective devices shall be included as an integral part of the direct plug-in equipment, until the requirements of Annexes B.3.1 and B.4 are met</p>	The equipment is not direct plug-in equipment.	N/A
G.4.2	<p>Denmark</p> <p>To the end of the subclause the following is added:</p> <p>Supply cords of single phase appliances having a rated current not exceeding 13 A shall be provided with a plug according to DS 60884-2-D1:2011.</p> <p>CLASS I EQUIPMENT provided with socket-outlets with earth contacts or which are intended to be used in locations where protection against indirect contact is required according to the wiring rules shall be provided with a plug in accordance with standard sheet DK 2-1a or DK 2-5a.</p> <p>If a single-phase equipment having a RATED 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>United Kingdom</p> <p>To the end of the subclause the following is added:</p> <p>The plug part of direct plug-in equipment shall be assessed to BS 1363: Part 1, 12.1, 12.2, 12.3, 12.9, 12.11, 12.12, 12.13, 12.16, and 12.17, except that the test of 12.17 is performed at not less than 125 °C. Where the metal earth pin is replaced by an Insulated Shutter Opening Device (ISOD), the requirements of clauses 22.2 and 23 also apply.</p>	The equipment is not direct plug-in equipment.	N/A

IEC62368_1B - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
G.7.1	<p>United Kingdom</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>Ireland</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>Ireland and United Kingdom</p> <p>To the first paragraph the following is added: A power supply cord with a conductor of 1,25 mm² is allowed for equipment which is rated over 10 A and up to and including 13 A.</p>		N/A
ZC	ANNEX ZC, NATIONAL DEVIATIONS (EN)		N/A
10.5.2	<p>Germany</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>NOTE Contact address: Physikalisch-Technische Bundesanstalt, Bundesallee 100, D-38116 Braunschweig, Tel.: Int +49-531-592-6320, Internet: http://www.ptb.de</p>	No CRT within the equipment.	N/A



Figure 1. over view

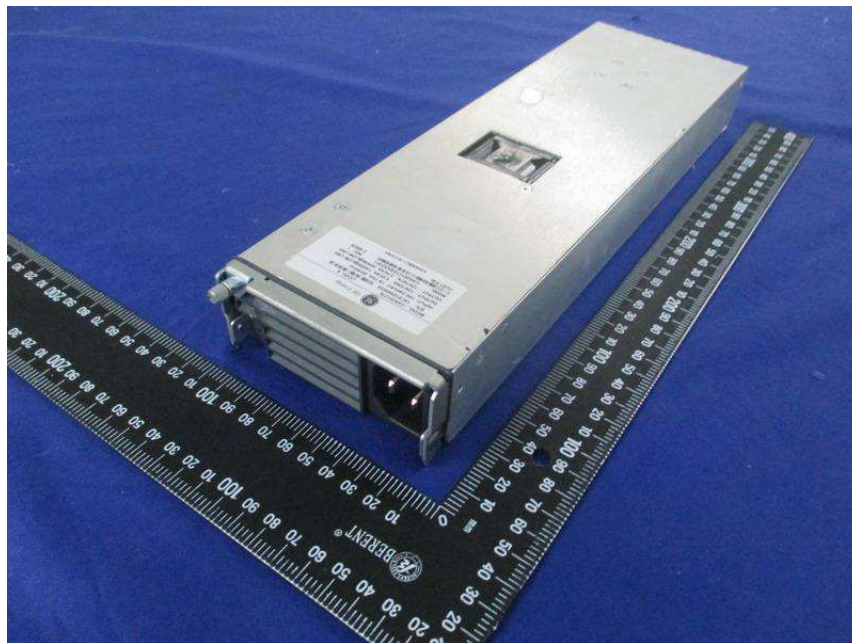


Figure 2. over view

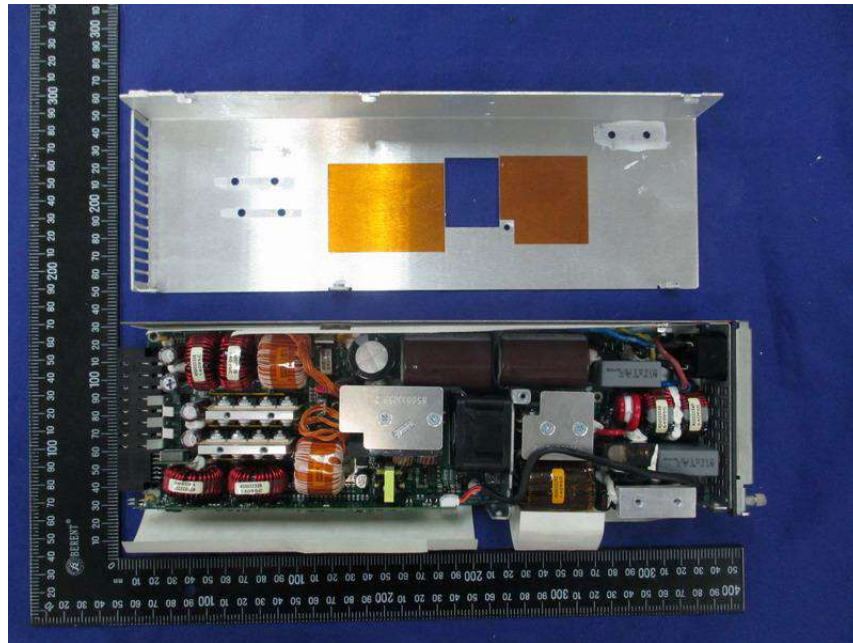


Figure 3. Internal view with enclosure open

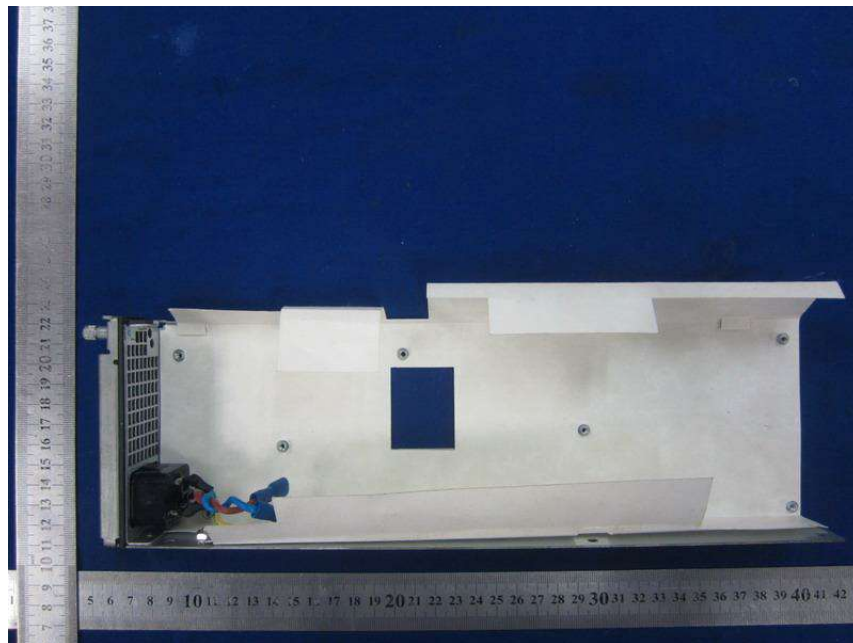


Figure 4. Mylar sheet provided between PCB and enclosure

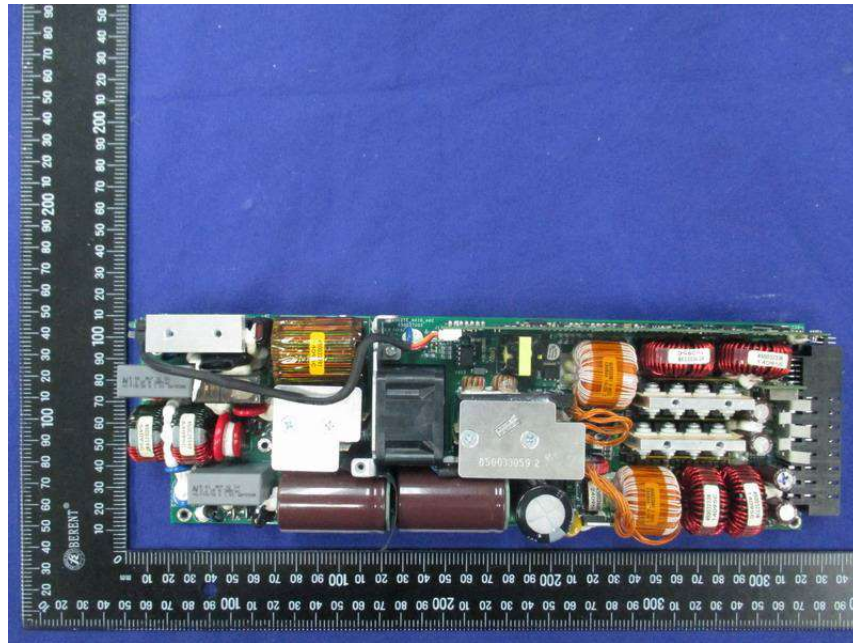


Figure 5. power board



Figure 6. power board

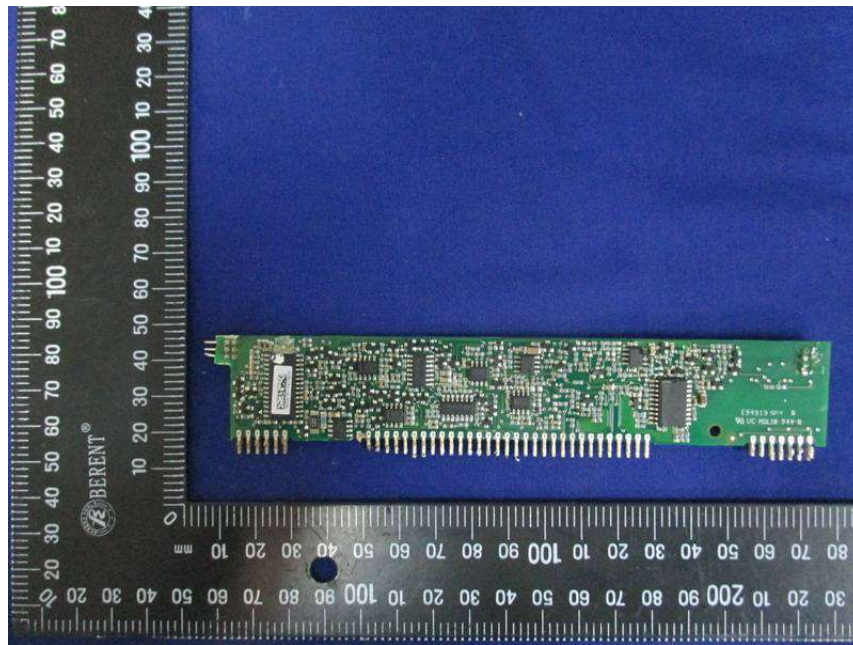


Figure 7. control board

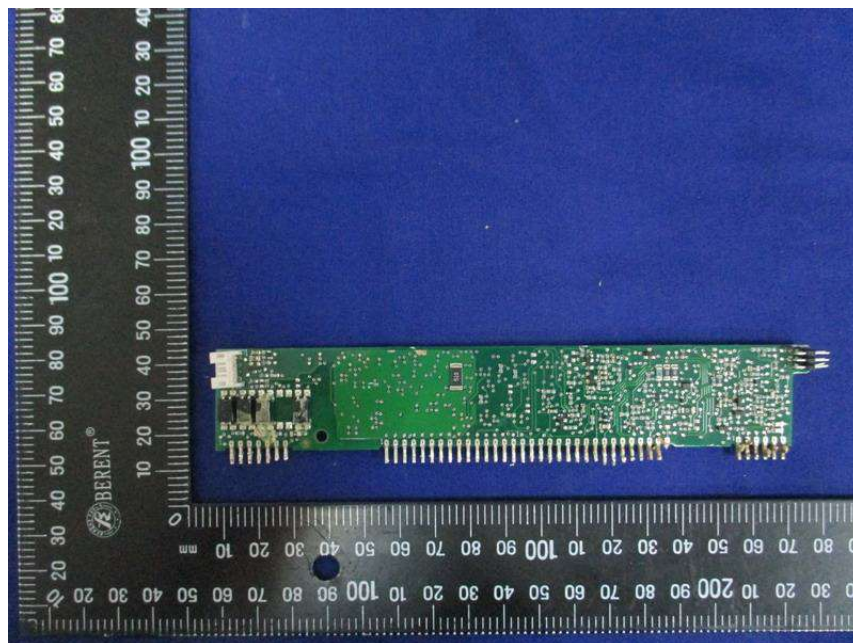


Figure 8. Control board

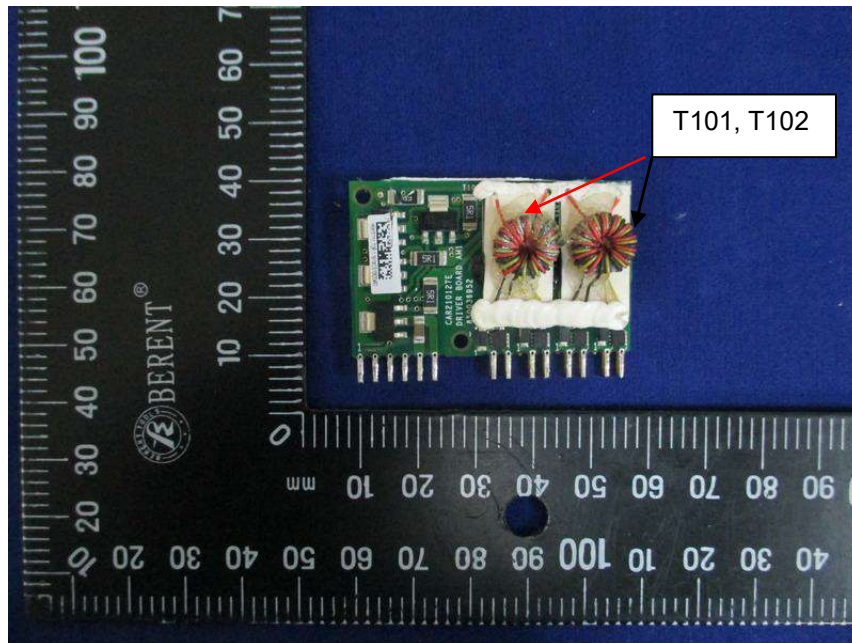


Figure 9. drive board

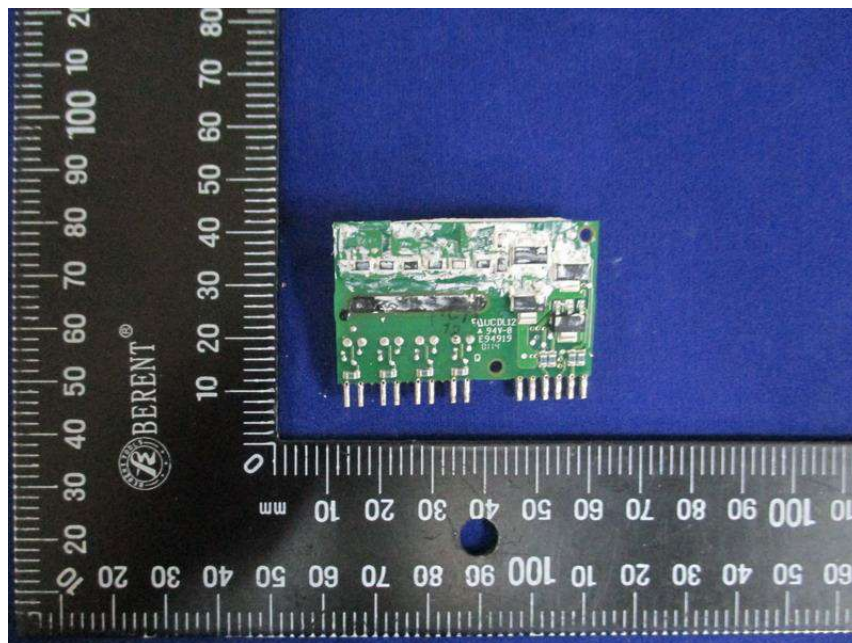


Figure 10. drive board



Figure 11. over view of T1

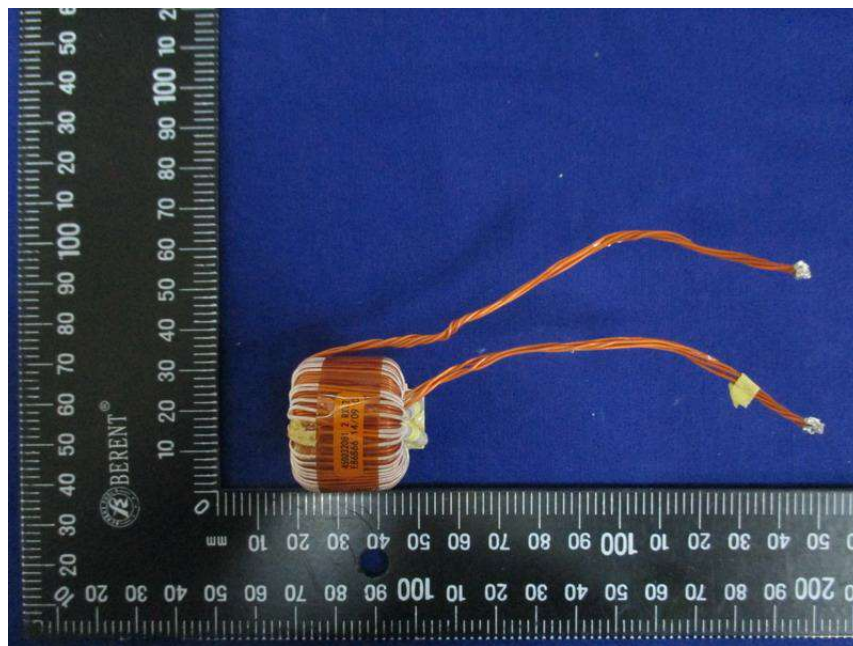


Figure 12. over view of T2, T3

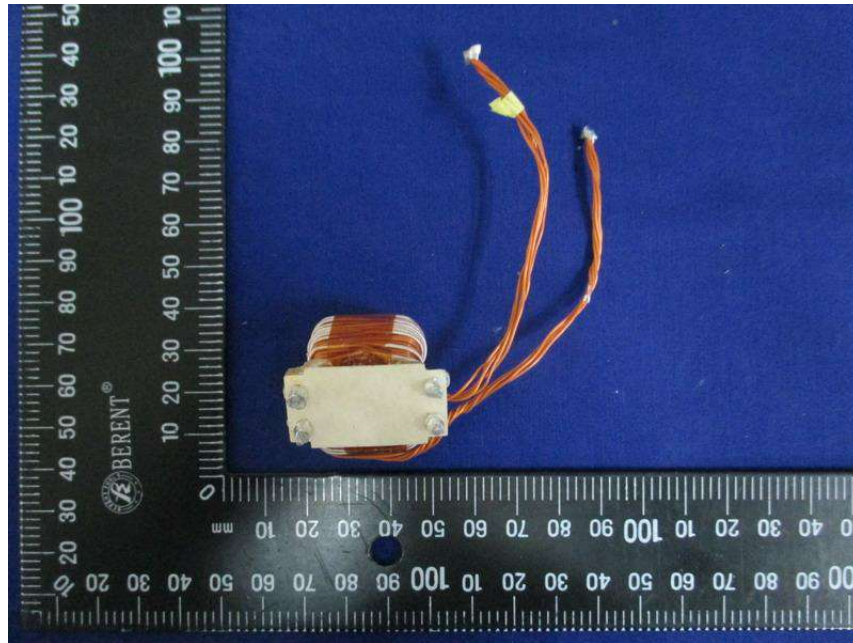


Figure 13. over view of T2, T3

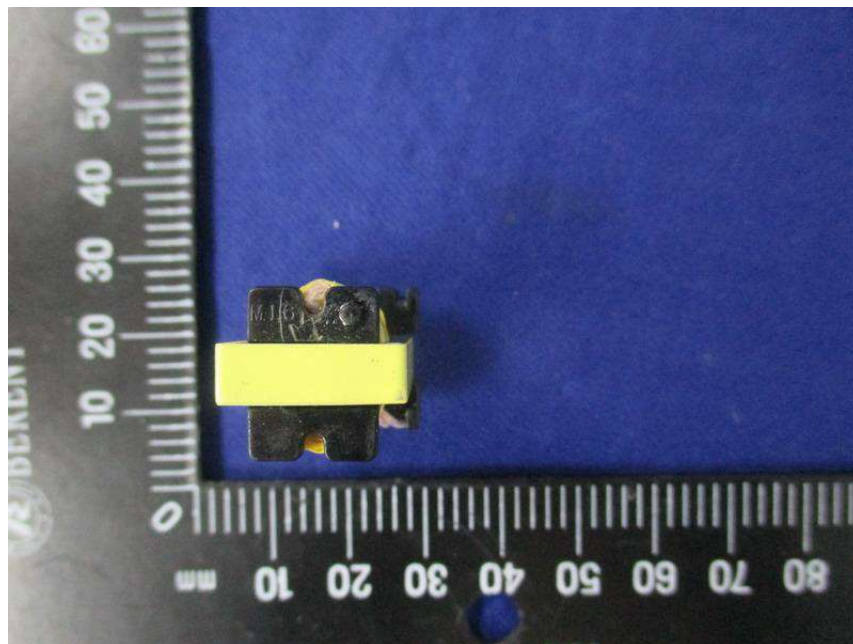


Figure 14. over view of T4

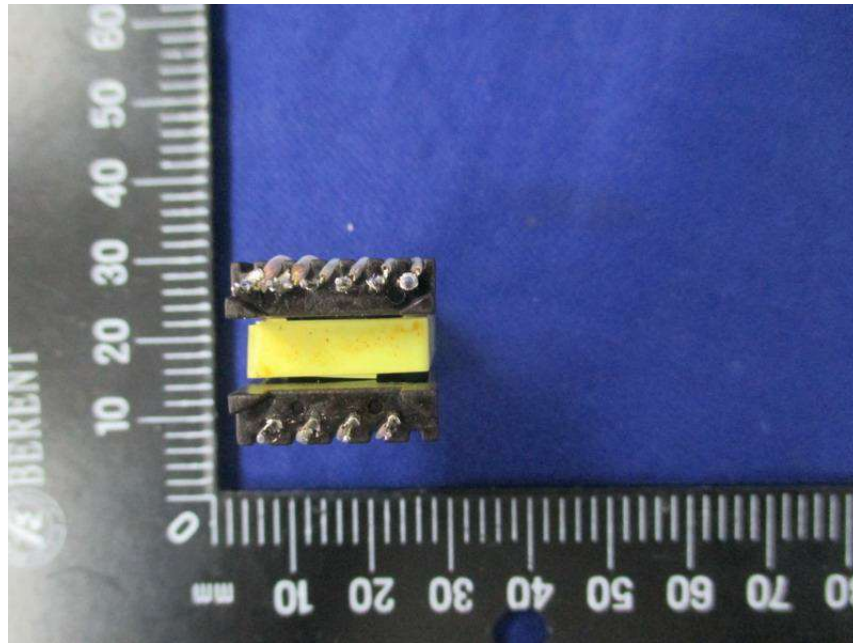


Figure 15. over view of T4

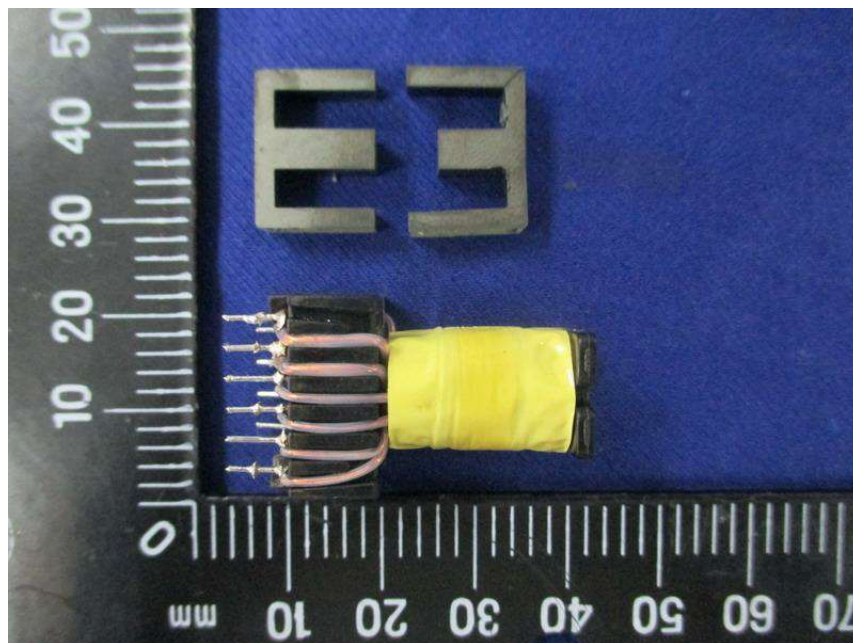


Figure 16. internal view of T4

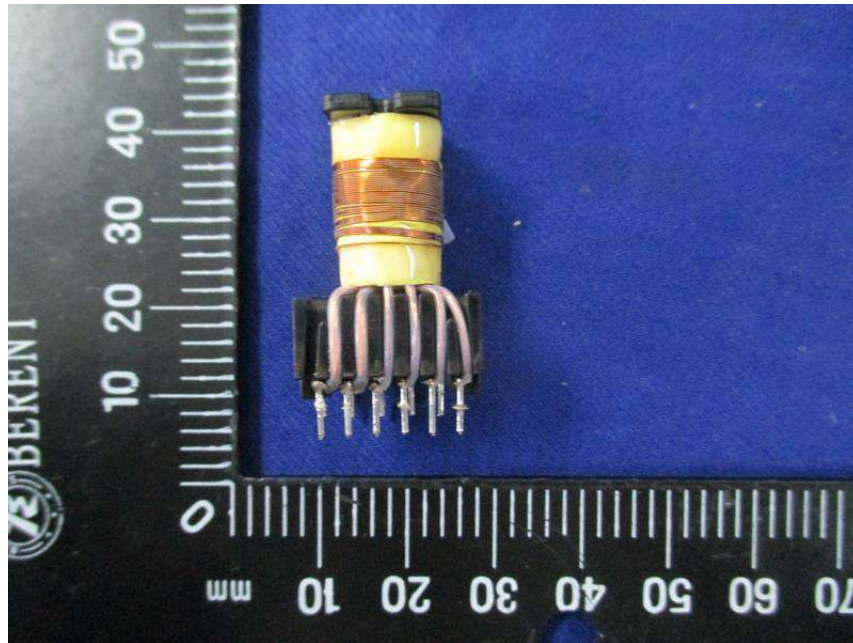


Figure 17. 4.0mm margin tape provided both at top and bottom of all windings