CTC advanced GmbH

Untertürkheimerstr. 6-10
D-66117 Saarbrücken
Phone : +49 (0)681 598 - 0 / Fax: - 9075

Laboratory for Product Safety

Accredited testing laboratory

Deutsche Akkreditierungsstelle D-PL-12076-01-01

TEST REPORT

IEC/EN 62368-1

Audio/video, information and communication technology equipment

Part 1: Safety – Requirements

Report Reference No. ..... :	1-1467/20-6-2
Test Item ..... :	Apollo MAX APM01.BL.ENG V1-0 Apollo APM01.BL.ENG V1-1
Test result ..... :	The test item passed

Remark: This test report is electronically signed and valid without handwriting signature. For verification of the electronical signatures, the public keys can be requested at the testing laboratory.

Tested by (printed name and signature) ..... :	Karsten Huppert (Testing Manager)	Digital unterschrieben von Karsten Huppert DN: cn=Karsten Huppert, o=CTC Advanced, ou=ABC-YYMMDD, email=karsten.huppert@ctcadvanced.com, c=DE Datum: 2023.02.09 06:40:09 +01'00'
Approved by (printed name and signature) ..... :	Sebastien Scheidler (Lab Manager)	Sébastien Scheidler cn=Sébastien Scheidler, o=CTC advanced GmbH, ou=SHE-211117, email=sebastien.scheidler@ctcadvanced.com, c=DE 2023.02.09 17:30:28 +01'00'
Date of issue ..... :	2023-02-08	
Testing Laboratory ..... :	CTC advanced GmbH	
Address ..... :	Untertürkheimerstr. 6-10 DE-66117 Saarbrücken	
Applicant's name ..... :	Payter B.V.	
Address ..... :	Rozenlaan 115 3051 LP Rotterdam NETHERLANDS	
Manufacturer's name ..... :	Same as applicant	
Address ..... :		
Test specification .....:		
Standard ..... :	IEC 62368-1: 2014 (2.Edition) and Cor. 1: 2015 EN 62368-1: 2014/AC: 2015/A11: 2017/AC:2017	

Test procedure..... :	CE, AA WC 34
Non-standard test method..... :	N/A
Test Report Form No. ..... :	SAF-CE62368-2V3
Test Report Form(s) Originator ..... :	CTC advanced GmbH
Master TRF..... :	Dated 2022-04-14

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.

Notes and Disclaimer

The test results of this test report relate exclusively to the test item specified in this test report. CTC advanced GmbH does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item.

The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written approval of CTC advanced GmbH.

The testing service provided by CTC advanced GmbH has been rendered under the current "General Terms and Conditions for CTC advanced GmbH".

CTC advanced GmbH will not be liable for any loss or damage resulting from false, inaccurate, inappropriate or incomplete product information provided by the customer.

Under no circumstances does the CTC advanced GmbH test report include any endorsement or warranty regarding the functionality, quality or performance of any other product or service provided.

Under no circumstances does the CTC advanced GmbH test report include or imply any product or service warranties from CTC advanced GmbH, including, without limitation, any implied warranties of merchantability, fitness for purpose, or non-infringement, all of which are expressly disclaimed by CTC advanced GmbH.

All rights and remedies regarding vendor’s products and services for which CTC advanced GmbH has prepared this test report shall be provided by the party offering such products or services and not by CTC advanced GmbH.

In no case this test report can be considered as a Letter of Approval.

Accredited Testing Laboratory

The testing laboratory (area of testing) is accredited according to DIN EN ISO/IEC 17025 (2005) by the Deutsche Akkreditierungsstelle GmbH (DAkkS). The accreditation is valid for the scope of testing procedures as stated in the accreditation certificate with the registration number: D-PL-12076-01-01.

Accreditation Certificate

Note: The current certificate including annex is published on our website or may be received from CTC advanced on request.

Test item description .....:	Contactless Payment Terminal
Trade Mark ..... :	payter
Model/Type reference..... :	Apollo MAX APM01.BL.ENG V1-0 Apollo APM01.BL.ENG V1-1
Ratings..... :	12-24VDC (8 - 42VDC)

Additional information:

The EUT was tested under the following conditions:

- Temperature in the range of 15 – 35°C unless otherwise specified
- A relevant humidity in the range of 25-75% r.H.
- An air pressure in range of 86kPa to 106kPa

Summary of testing:
The sample(s) tested complies with the requirements of IEC 62368-1: 2014 (2. Ed.)/Cor.1:2015 and EN 62368-1: 2014/AC: 2015/A11: 2017/AC: 2017.

Summary of compliance with National Differences:
The following group and/or national deviations were considered: EU, EFTA

Country abbreviations according to ISO 3166-1:

AR	Argentina	AT	Austria	AU	Australia
BE	Belgium	BG	Bulgaria	BR	Brazil
CA	Canada	CH	Switzerland	CN	China
CY	Cyprus	CZ	The Czech Republic	DE	Germany
DK	Denmark	EE	Estonia	ES	Spain
FI	Finland	FR	France	GB	United Kingdom
GR	Greece	HU	Hungary	HR	Croatia
IE	Ireland	IL	Israel	IT	Italy
IS	Iceland	IN	India	JP	Japan
KR	Rep. of Korea	LI	Liechtenstein	LT	Lithuania
LV	Latvia	LU	Luxembourg	MT	Malta
MY	Malaysia	NL	Netherlands	NO	Norway
NZ	New Zealand	PL	Poland	PT	Portugal
RS	Serbia	RU	Russian federation	SE	Sweden
SG	Singapore	SK	Slovakia	SI	Slovenia
TR	Turkey	UA	Ukraine	AE	United Arab Emirates
US	United States of America	ZA	South Africa		

Other country abbreviations:

EU	European Union	(AT, BE, BG, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, LT, LV, LU, MT, IE, IT, NL, PL, PT, RS, SE, SK, SI)
EFTA	European Free Trade Association	(NO, CH, IS, LI)

The following abbreviations were used in this test report:

AC: Alternating Current	DC: Direct Current	PE: Protective earth
PRI: Primary circuit	SEC: Secondary circuit	PS: Power Supply
GND: Ground	PCB: Printed circuit board	BAT: Battery
EUT: Equipment under Test	OC: Open Circuit	SC: Short Circuit
PIS: Potential Ignition Source	PIS-A: PIS arcing	PIS-R: PIS resistive
PABX: Private Automatic Branch eXchange		PoE: Power over Ethernet
ID: According table 14		

Copy of marking plates:

TEST ITEM PARTICULARS:	
Classification of use by .....:	☒ Ordinary person ☒ Instructed person ☒ Skilled person ☒ Children likely to be present
Supply Connection .....:	☐ AC Mains ☐ DC Mains ☒ External Circuit - not Mains connected - ☒ ES1 ☐ ES2 ☐ ES3
Supply % Tolerance .....:	☐ +10%/-10% ☒ +20%/-15% ☐ +____%/ -_____% ☐ None
Supply Connection – Type .....:	☐ pluggable equipment type A - ☐ non-detachable supply cord ☐ appliance coupler ☐ direct plug-in ☐ mating connector ☐ pluggable equipment type B - ☐ non-detachable supply cord ☐ appliance coupler ☒ permanent connection ☐ mating connector ☐ other:_____
Considered current rating of protective device as part of building or equipment installation .....:	_____ A; Installation location: ☐ building; ☐ equipment; ☒ N/A
Equipment mobility .....:	☐ movable ☐ hand-held ☐ transportable ☒ stationary ☐ for building-in ☐ direct plug-in ☐ rack-mounting ☐ wall-mounted
Over voltage category (OVC) .....:	☒ OVC I ☐ OVC II ☐ OVC III ☐ OVC IV ☐ other: _____
Class of equipment .....:	☐ Class I ☐ Class II ☒ Class III ☐ Class II with functional earthing ☐ Not classifed
Access location .....:	☐ restricted access area ☒ N/A
Pollution degree (PD) .....:	☐ PD 1 ☒ PD 2 ☐ PD 3
Manufacturer's specified maxium operating ambient.....:	+55 °C
IP protection class .....:	☒ IPX0 ☐ IP50
Power Systems .....:	☐ TN ☐ TT ☐ IT - ____ V $_{L-L;}$ ☒ dc mains ☐ N/A
Altitude during operation (m) .....:	☒ 2000 m or less ☐ _____ m
Altitude of test laboratory (m) .....:	☒ 2000 m or less ☐ _____ m
Mass of equipment (kg) .....:	☒ 0,3kg

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)

The decision whether PASS / FAIL is based on detailed results of measurements performed with calibrated measuring equipment.

The measurement uncertainty is taken into account in accordance to ILAC-G9: 09/2019 chapter 4.2.2, the guard band is taken as 1x the measurement uncertainty

Testing.....:

Date of receipt of test item .....: 2023-01-09

Date (s) of performance of tests .....: 2023-01-11 – 2023-02-02

General remarks:

"(See Enclosure #)" refers to additional information appended to the report.
"(See appended table)" refers to a table appended to the report.

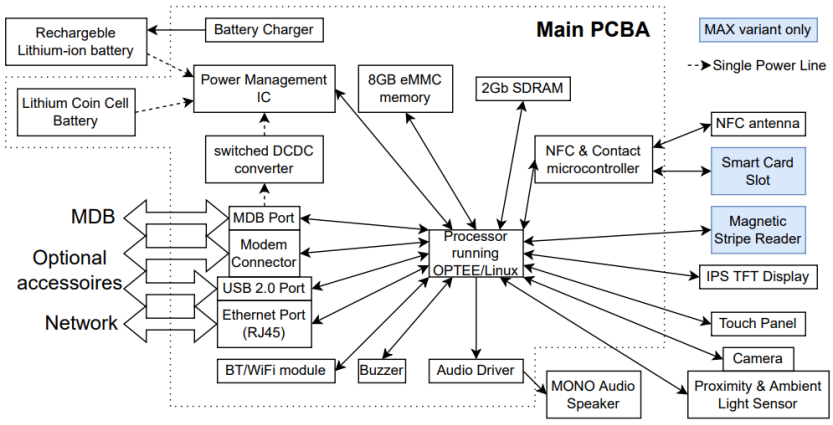
Throughout this report a ☐ comma / ☒ point is used as the decimal separator.

General product information and other remarks:

The EUT: Apollo Max APM01.BL.ENG V1-0 and Apollo APM01.BL.ENG V1-1, are a cashless payment terminals. They are electrical identic and there is no risk of impact.

The differences between the two models (Apollo Max APM01.BL.ENG V1-0 and Apollo APM01.BL.ENG V1-1) as shown in the Block Diagram below are:
the Apollo MAX has a Smart Card Slot and a magnetic Stripe Reader

Apollo (MAX) Block Diagram



Optional accessoires can include a 4G modem containing FCC ID: N7NRC76B / IC: 2417C-RC76B

The differences between two models are not considered safety relevant. Tests were conducted on Apollo Max APM01.BL.ENG V1-0.

The manufacturer specified also that the Wallplug PSU is not part of the test.

The following Attachments are integral part of this test report:

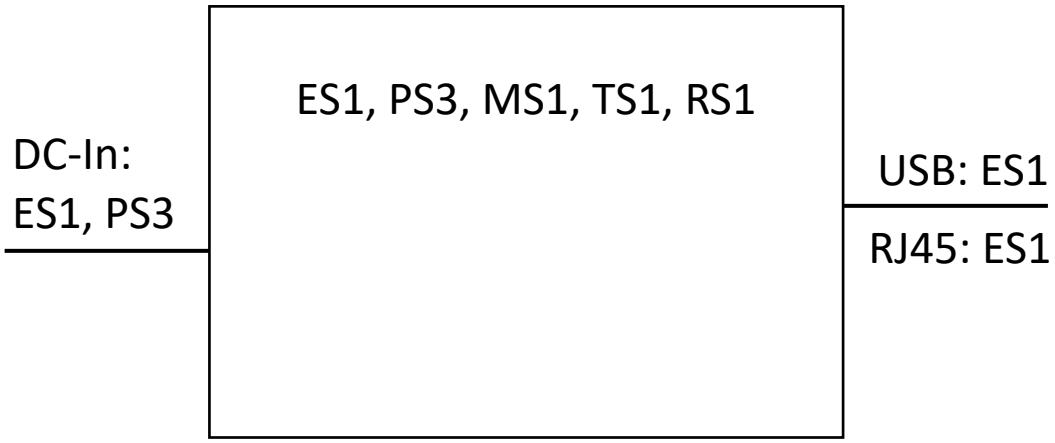
- Annex 1: Photo documentation

ENERGY SOURCE IDENTIFICATION AND CLASSIFICATION TABLE:	
(Note 1: Identify the following six (6) energy source forms based on the origin of the energy.) (Note 2: The identified classification e.g., ES2, TS1, should be with respect to its ability to cause pain or injury on the body or its ability to ignite a combustible material. Any energy source can be declared Class 3 as a worse case classification e.g. PS3, ES3.	
Electrically-caused injury (Clause 5): (Note: Identify type of source, list sub-assembly or circuit designation and corresponding energy source classification) Example: +5 V dc input ES1	
Source of electrical energy	**Corresponding classification (ES)**
Battery	ES1
Button cell	ES1
DC-In	ES1
USB	ES1
RJ45	ES1
Electrically-caused fire (Clause 6): (Note: List sub-assembly or circuit designation and corresponding energy source classification) Example: Battery pack (maximum 85 watts): PS2	
Source of power or PIS	**Corresponding classification (PS)**
Battery	PS1
Button cell	PS1
DC-In	PS3
USB	PS1
RJ45	PS1
Injury caused by hazardous substances (Clause 7) (Note: Specify hazardous chemicals, whether produces ozone or other chemical construction not addressed as part of the component evaluation.) Example: Liquid in filled component Glycol	
Source of hazardous substances	**Corresponding chemical**
No hazardous Substances	N/A
Mechanically-caused injury (Clause 8) (Note: List moving part(s), fan, special installations, etc. & corresponding MS classification based on Table 35.) Example: Wall mount unit MS2	
Source of kinetic/mechanical energy	**Corresponding classification (MS)**
Enclosure mass	MS1
Thermal burn injury (Clause 9) (Note: Identify the surface or support, and corresponding energy source classification based on type of part, location, operating temperature and contact time in Table 38.) Example: Hand-held scanner – thermoplastic enclosure TS1	
Source of thermal energy	**Corresponding classification (TS)**
Enclosure	TS1

ENERGY SOURCE IDENTIFICATION AND CLASSIFICATION TABLE:	
Radiation (Clause 10) (Note: List the types of radiation present in the product and the corresponding energy source classification.) Example: DVD – Class 1 Laser Product RS1	
Type of radiation	**Corresponding classification (RS)**
LED	RS1

ENERGY SOURCE DIAGRAM
Indicate which energy sources are included in the energy source diagram. Insert diagram below

☒ **ES** ☒ **PS** ☒ **MS** ☒ **TS** ☐ **RS**



OVERVIEW OF EMPLOYED SAFEGUARDS				
Clause	**Possible Hazard**			
5.1	Electrically-caused injury			
Body Part (e.g. Ordinary)	Energy Source (ES3: Primary Filter circuit)	Safeguards		
		Basic	Supplementary	Reinforced (Enclosure)
Battery	ES1	N/A	N/A	N/A
Button cell	ES1	N/A	N/A	N/A
Ordinary, instructed, skilled	ES1: DC in	N/A	N/A	N/A
Ordinary, instructed, skilled	ES1: USB	N/A	N/A	N/A
Ordinary, instructed, skilled	ES1: RJ45	N/A	N/A	N/A
6.1	Electrically-caused fire			
Material part (e.g. mouse enclosure)	Energy Source (PS2: 100 Watt circuit)	Safeguards		
		Basic	Supplementary	Reinforced
Enclosure	PS3: DC in	V-0	Reduction of likelihood of ignition	N/A
	PS1: RJ45	N/A	N/A	N/A
	PS1: USB	N/A	N/A	N/A
7.1	Injury caused by hazardous substances			
Body Part (e.g., skilled)	Energy Source (hazardous material)	Safeguards		
		Basic	Supplementary	Reinforced
Ordinary, instructed, skilled	No hazardous substances	N/A	N/A	N/A
8.1	Mechanically-caused injury			
Body Part (e.g. Ordinary)	Energy Source (MS3:High Pressure Lamp)	Safeguards		
		Basic	Supplementary	Reinforced (Enclosure)
Ordinary, instructed, skilled	MS1: enclosure mass	N/A	N/A	N/A
9.1	Thermal Burn			
Body Part (e.g., Ordinary)	Energy Source (TS2)	Safeguards		
		Basic	Supplementary	Reinforced
Ordinary, instructed, skilled	TS1: Enclosure	N/A	N/A	N/A
10.1	Radiation			
Body Part (e.g., Ordinary)	Energy Source (Output from audio port)	Safeguards		
		Basic	Supplementary	Reinforced
Ordinary, instructed, skilled	RS1: LED	N/A	N/A	N/A
Supplementary Information:				
(1) See attached energy source diagram for additional details. (2) “N” – Normal Condition; “A” – Abnormal Condition; “S” Single Fault				

IEC/EN 62368-1			
Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
4	**GENERAL REQUIREMENTS**		**P**
4.1.1	Acceptance of materials, components and subassemblies		P
4.1.2	Use of components	Certified components are used in accordance with their ratings, certifications and they comply with applicable parts of this standard. Components not covered by IEC standards, have been tested under the conditions occurring in the equipment, using applicable parts of IEC 62368-1. See appended table 4.1.2.	P
4.1.3	Equipment design and construction		P
4.1.15	Markings and instructions ..... :	See copying of marking plate	P
4.4.4	Safeguard robustness	ES1	N/A
4.4.4.2	Steady force tests ..... :		N/A
4.4.4.3	Drop tests ..... :		N/A
4.4.4.4	Impact tests ..... :		N/A
4.4.4.5	Internal accessible safeguard enclosure and barrier tests ..... :		N/A
4.4.4.6	Glass Impact tests ..... :		N/A
4.4.4.7	Thermoplastic material tests ..... :	See appended table T	P
4.4.4.8	Air comprising a safeguard ..... :	See appended table T	P
4.4.4.9	Accessibility and safeguard effectiveness		P
4.5	Explosion	No explosion	P
4.6	Fixing of conductors		N/A
4.6.1	Fix conductors not to defeat a safeguard		N/A
4.6.2	10 N force test applied to ..... :		N/A
4.7	Equipment for direct insertion into mains socket - outlets	No plug-in equipment	N/A
4.7.2	Mains plug part complies with the relevant standard ..... :		N/A
4.7.3	Torque (Nm) ..... :		N/A
4.8	Products containing coin/button cell batteries	professional equipment	N/A
4.8.1	General		N/A
	These requirements apply to equipment, including remote controls, that:		—
	– are likely to be accessible to children, taking into account information given by the manufacturer; and		N/A
	– include lithium coin / button cell batteries with		N/A

IEC/EN 62368-1			
Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
	a diameter of 32 mm or less		
4.8.2	Instructional safeguard		N/A
	– element 1a: not available		—
	– element 2: “Do not ingest battery, Chemical Burn Hazard” or equivalent wording		N/A
	– element 3: the following or equivalent text [The remote control supplied with] This product contains a coin / button cell battery. If the coin/button cell battery is swallowed, it can cause severe internal burns in just 2 hours and can lead to death.		N/A
	– element 4: the following or equivalent text Keep new and used batteries away from children. If the battery compartment does not close securely, stop using the product and keep it away from children. If you think batteries might have been swallowed or placed inside any part of the body, seek immediate medical attention.		N/A
4.8.3	Battery Compartment Construction	No battery compartment	N/A
	Means to reduce the possibility of children removing the battery ..... :		—
4.8.4	Battery Compartment Mechanical Tests..... :		N/A
4.8.4.1	Test sequence		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 (hand held)		N/A
4.8.5	Battery Accessibility		N/A
4.9	Likelihood of fire or shock due to entry of conductive object ..... :	PS1 and ES1 circuits only	N/A

5	**ELECTRICALLY-CAUSED INJURY**		P
5.2.1	Electrical energy source classifications.....:	See appended table 5.2	P
5.2.2	ES1, ES2 and ES3 limits	ES1	P
5.2.2.2	Steady-state voltage and current.....:		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 .....:	No ringing signals	N/A
5.2.2.7	Audio signals .....:	No audio signal	N/A
5.3	Protection against electrical energy sources		P

IEC/EN 62368-1			
Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
5.3.1	General Requirements for accessible parts to ordinary, instructed and skilled persons		P
5.3.2.1	Accessibility to electrical energy sources and safeguards	No user access to energy sources	P
5.3.2.2	Contact requirements		N/A
	a) Test with test probe from Annex V .....:		N/A
	b) Electric strength test potential (V).....:		N/A
	c) Air gap (mm) .....:		N/A
5.3.2.3	Compliance criteria	See Clause T.3	P
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		N/A
5.4.1.3	Humidity conditioning..... :	Natural rubber, materials containing asbestos and hygroscopic material not used as insulation material	N/A
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 degree.....:	2	—
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		N/A
5.4.1.6	Insulation in transformers with varying dimensions		N/A
5.4.1.7	Insulation in circuits generating starting pulses		N/A
5.4.1.8	Determination of working voltage	See appended table 5.4.2.2, 5.4.1.8	P
5.4.1.9	Insulating surfaces		N/A
5.4.1.10	Thermoplastic parts on which conductive metallic parts are directly mounted		N/A
5.4.1.10.2	Vicat softening temperature .....:		N/A
5.4.1.10.3	Ball pressure .....:		N/A
5.4.2	Clearances		N/A
5.4.2.2	Determining clearance using peak working voltage		N/A
5.4.2.3	Determining clearance using required withstand voltage .....:		N/A
	a) a.c. mains transient voltage .....:		—
	b) d.c. mains transient voltage .....:		—
	c) external circuit transient voltage .....:		—
	d) transient voltage determined by measurement..... :		—
5.4.2.4	Determining the adequacy of a clearance using an electric strength test		N/A
5.4.2.5	Multiplication factors for clearances and test voltages .....:		N/A

IEC/EN 62368-1			
Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
5.4.2.6	Compliance criteria		N/A
5.4.3	Creepage distances .....:		N/A
5.4.3.1	General		N/A
5.4.3.3	Material Group .....:		—
5.4.4	Solid insulation		P
5.4.4.2	Minimum distance through insulation .....:		N/A
5.4.4.3	Insulation compound forming solid insulation		N/A
5.4.4.4	Solid insulation in semiconductor devices		N/A
5.4.4.5	Cemented joints		N/A
5.4.4.6	Thin sheet material		N/A
5.4.4.6.1	General requirements		N/A
5.4.4.6.2	Separable thin sheet material		N/A
	Number of layers (pcs) .....:		N/A
5.4.4.6.3	Non-separable thin sheet material		N/A
5.4.4.6.4	Standard test procedure for non-separable thin sheet material ..... :		N/A
5.4.4.6.5	Mandrel test		N/A
5.4.4.7	Solid insulation in wound components		N/A
5.4.4.9	Solid insulation at frequencies >30 kHz..... :		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
	Insulation resistance (MΩ) ..... :		—
5.4.6	Insulation of internal wire as part of supplementary safeguard ..... :		N/A
5.4.7	Tests for semiconductor components and for cemented joints		N/A
5.4.8	Humidity conditioning		N/A
	Relative humidity (%) ..... :		—
	Temperature (°C) .....:		—
	Duration (h) ..... :		—
5.4.9	Electric strength test ..... :	Only ES1 circuits	N/A
5.4.9.1	Test procedure for a solid insulation type test		N/A
5.4.9.2	Test procedure for routine tests		N/A
5.4.10	Protection against transient voltages between external circuit	Only ES1 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

IEC/EN 62368-1			
Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
5.4.11	Separation between external circuits and earth :	No connection to earth	N/A
5.4.11.1	Exceptions to separation between external circuits and earth..... :		N/A
5.4.11.2	Requirements		N/A
	Rated operating voltage Uop (V) ..... :		—
	Nominal voltage Upeak (V)..... :		—
	Max increase due to variation Usp ..... :		—
	Max increase due to ageing ΔUsa ..... :		—
	Uop= Upeak + Δ Usp + ΔUsa ..... :		—
5.5	Components as safeguards		N/A
5.5.1	General		N/A
5.5.2	Capacitors and RC units		N/A
5.5.2.1	General requirement		N/A
5.5.2.2	Safeguards against capacitor discharge after disconnection of a connector ..... :		N/A
5.5.3	Transformers		N/A
5.5.4	Optocouplers		N/A
5.5.5	Relays		N/A
5.5.6	Resistors		N/A
5.5.7	SPD's		N/A
5.5.7.1	Use of an SPD connected to reliable earthing		N/A
5.5.7.2	Use of an SPD between mains and protective earth		N/A
5.5.8	Insulation between the mains and external circuit consisting of a coaxial cable ..... :		N/A
5.6	Protective conductor	No protective conductor	N/A
5.6.2	Requirement for protective conductors		N/A
5.6.2.1	General requirements		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 (mm2) ..... :		—
5.6.4	Requirement for protective bonding conductors		N/A
5.6.4.1	Protective bonding conductors		N/A
	Protective bonding conductor size (mm2). ..... :		—
	Protective current rating (A) ..... :		—
5.6.4.3	Current limiting and overcurrent protective devices		N/A
5.6.5	Terminals for protective conductors		N/A
5.6.5.1	Requirement		N/A
	Conductor size (mm2), nominal thread diameter (mm)..... :		N/A

IEC/EN 62368-1			
Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
5.6.5.2	Corrosion		N/A
5.6.6	Resistance of the protective system		N/A
5.6.6.1	Requirements		N/A
5.6.6.2	Test Method Resistance (Ω) ..... :		N/A
5.6.7	Reliable earthing		N/A
5.7	Prospective touch voltage, touch current and protective conductor current	See appended table 5.7	N/A
5.7.2	Measuring devices and networks		N/A
5.7.2.1	Measurement of touch current ..... :		N/A
5.7.2.2	Measurement of prospective touch voltage		N/A
5.7.3	Equipment set-up, supply connections and earth connections		N/A
	System of interconnected equipment (separate connections/single connection) ..... :		—
	Multiple connections to mains (one connection at a time/simultaneous connections) ..... :		—
5.7.4	Earthed conductive accessible parts ..... :		N/A
5.7.5	Protective conductor current		N/A
	Supply Voltage (V) ..... :		—
	Measured current (mA) ..... :		—
	Instructional Safeguard ..... :		N/A
5.7.6	Prospective touch voltage and touch current due to external circuits		N/A
5.7.6.1	Touch current from coaxial cables		N/A
5.7.6.2	Prospective touch voltage and touch current from external circuits		N/A
5.7.7	Summation of touch currents from external circuits		N/A
	a) Equipment with earthed external circuits Measured current (mA) ..... :		N/A
	b) Equipment whose external circuits are not referenced to earth. Measured current (mA) .... :		N/A
6	Electrically- caused fire		P
6.2	Classification of power sources (PS) and potential ignition sources (PIS)	PS3, no PIS	P
6.2.2	Power source circuit classifications	See appended table 6.2.2, Q.1, Q.2, 6.5.3, 6.6	P
6.2.2.1	General		P
6.2.2.2	Power measurement for worst-case load fault . :		P
6.2.2.3	Power measurement for worst-case power source fault ..... :		P
6.2.2.4	PS1 ..... :		P

IEC/EN 62368-1			
Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
6.2.2.5	PS2 ..... :		N/A
6.2.2.6	PS3 ..... :		N/A
6.2.3	Classification of potential ignition sources	No PIS	N/A
6.2.3.1	Arcing PIS ..... :	V < 50V	N/A
6.2.3.2	Resistive PIS ..... :	See appended table 6.2.3.2	N/A
6.3	Safeguards against fire under normal operating and abnormal operating conditions		P
6.3.1 (a)	No ignition and attainable temperature value less than 90 % defined by ISO 871 or less than 300 °C for unknown materials..... :		P
6.3.1 (b)	Combustible materials outside fire enclosure		N/A
6.3.2	Compliance criteria	See appended table 5.4.1.4, 6.3.2, 9.0, B.2.6	P
6.4	Safeguards against fire under single fault conditions		P
6.4.1	Safeguard Method	Reduce the likelihood of ignition (6.4.2 and 6.4.3.) Control fire spread (6.4.4, 6.4.5 and 6.4.6)	P
6.4.2	Reduction of the likelihood of ignition under single fault conditions in PS1 circuits		P
6.4.3	Reduction of the likelihood of ignition under single fault conditions in PS2 and PS3 circuits		P
6.4.3.1	General		P
6.4.3.2	Supplementary Safeguards		N/A
	Special conditions if conductors on printed boards are opened or peeled		N/A
6.4.3.3	Single Fault Conditions..... :		P
	Special conditions for temperature limited by fuse		N/A
6.4.4	Control of fire spread in PS1 circuits		P
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 circuit		N/A
6.4.7	Separation of combustible materials from a PIS		N/A
6.4.7.1	General ..... :		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		N/A
6.4.8.1	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

IEC/EN 62368-1			
Clause	**Requirement + Test**	**Result - Remark**	**Verdict**
6.4.8.3	Constructional requirements for a fire enclosure and a fire barrier		N/A
6.4.8.3.1	Fire enclosure and fire barrier openings		N/A
6.4.8.3.2	Fire barrier dimensions		N/A
6.4.8.3.3	Top Openings in Fire Enclosure: dimensions (mm) ..... :	No fire enclosure	N/A
	Needle Flame test		N/A
6.4.8.3.4	Bottom Openings in Fire Enclosure, condition met a), b) and/or c) dimensions (mm) ..... :		N/A
	Flammability tests for the bottom of a fire enclosure ..... :		N/A
6.4.8.3.5	Integrity of the fire enclosure, condition met: a), b) or c)..... :		N/A
6.4.8.4	Separation of PIS from fire enclosure and fire barrier distance (mm) or flammability rating ..... :		N/A
6.5	Internal and external wiring	No wiring	N/A
6.5.1	Requirements		N/A
6.5.2	Cross-sectional area (mm2) ..... :		—
6.5.3	Requirements for interconnection to building wiring..... :		N/A
6.6	Safeguards against fire due to connection to additional equipment		N/A
	External port limited to PS2 or complies with Clause Q.1		N/A
7	**INJURY CAUSED BY HAZARDOUS SUBSTANCES**		P
7.2	Reduction of exposure to hazardous substances		N/A
7.3	Ozone exposure		N/A
7.4	Use of personal safeguards (PPE)		N/A
	Personal safeguards and instructions.....:		—
7.5	Use of instructional safeguards and instructions		N/A
	Instructional safeguard (ISO 7010) .....:		—
7.6	Batteries ..... :	See appended table Annex M	P
8	**MECHANICALLY-CAUSED INJURY**		P
8.1	General	MS1	P
8.2	Mechanical energy source classifications		P
8.3	Safeguards against mechanical energy sources		N/A
8.4	Safeguards against parts with sharp edges and corners	No sharp edges and corners	P
8.4.1	Safeguards		N/A
8.5	Safeguards against moving parts	No moving parts	N/A

8.5.1	MS2 or MS3 part required to be accessible for the function of the equipment		N/A
8.5.2	Instructional Safeguard ..... :		—
8.5.4	Special categories of equipment comprising moving parts		N/A
8.5.4.1	Large data storage equipment		N/A
8.5.4.2	Equipment having electromechanical device for destruction of media		N/A
8.5.4.2.1	Safeguards and Safety Interlocks..... :		N/A
8.5.4.2.2	Instructional safeguards against moving parts		N/A
	Instructional Safeguard ..... :		—
8.5.4.2.3	Disconnection from the supply		N/A
8.5.4.2.4	Probe type and force (N)..... :		N/A
8.5.5	High Pressure Lamps		N/A
8.5.5.1	Energy Source Classification		N/A
8.5.5.2	High Pressure Lamp Explosion Test ..... :		N/A
8.6	Stability	MS1 only	N/A
8.6.1	Product classification		N/A
	Instructional Safeguard ..... :		—
8.6.2	Static stability		N/A
8.6.2.2	Static stability test		N/A
	Applied Force .....:		—
8.6.2.3	Downward Force Test		N/A
8.6.3	Relocation stability test		N/A
	Unit configuration during 10° tilt.....:		—
8.6.4	Glass slide test		N/A
8.6.5	Horizontal force test (Applied Force) .....:		N/A
	Position of feet or movable parts .....:		—
8.7	Equipment mounted to wall or ceiling	“Use only materials provided with the terminal” (see User manual)	P
8.7.1	Mounting Means (Length of screws (mm) and mounting surface) .....:		N/A
8.7.2	Direction and applied force .....:		N/A
8.8	Handles strength	No handles	N/A
8.8.1	Classification		N/A
8.8.2	Applied Force .....:		N/A
8.9	Wheels or casters attachment requirements	No wheels or casters	N/A
8.9.1	Classification		N/A
8.9.2	Applied force.....:		—
8.10	Carts, stands and similar carriers		N/A
8.10.1	General		N/A
8.10.2	Marking and instructions		N/A

	Instructional Safeguard .....:		—
8.10.3	Cart, stand or carrier loading test and compliance		N/A
	Applied force.....:		—
8.10.4	Cart, stand or carrier impact test		N/A
8.10.5	Mechanical stability		N/A
	Applied horizontal force (N) .....:		—
8.10.6	Thermoplastic temperature stability (°C) .....:		N/A
8.11	Mounting means for rack mounted equipment	Not rack mounted	N/A
8.11.1	General		N/A
8.11.2	Product Classification		N/A
8.11.3	Mechanical strength test, variable *N* .....:		N/A
8.11.4	Mechanical strength test 250N, including end stops		N/A
8.12	Telescoping or rod antennas		N/A
	Button/Ball diameter (mm) .....:		—

9	**THERMAL BURN INJURY**	See appended table 5.4.1.4, 6.3.2, 9.0, B.2.6	**P**
9.2	Thermal energy source classifications	TS1	P
9.3	Safeguard against thermal energy sources		P
9.4	Requirements for safeguards		P
9.4.1	Equipment safeguard		P
9.4.2	Instructional safeguard .....:		N/A

10	**RADIATION**		**P**
10.2	Radiation energy source classification		P
10.2.1	General classification		P
10.2.2	RS1	LED	P
10.2.3	RS2		N/A
10.2.4	RS3		N/A
10.3	Protection against laser radiation	No laser	N/A
	Laser radiation that exists equipment:		—
	Normal, abnormal, single-fault.....:		N/A
	Instructional safeguard.....:		—
	Tool .....:		—
10.4	Protection against visible, infrared, and UV radiation	No protection	N/A
10.4.1	General		N/A
10.4.1.a)	RS3 for Ordinary and instructed persons:		N/A
10.4.1.b)	RS3 accessible to a skilled person:		N/A
	Personal safeguard (PPE) instructional safeguard ..... :		—
10.4.1.c)	Equipment visible, IR, UV does not exceed		N/A

	RS1 .....:		
10.4.1.d)	Normal, abnormal, single-fault conditions .....:		N/A
10.4.1.e)	Enclosure material employed as safeguard is opaque:		N/A
10.4.1.f)	UV attenuation:		N/A
10.4.1.g)	Materials resistant to degradation UV..... :		N/A
10.4.1.h)	Enclosure containment of optical radiation .....:		N/A
10.4.1.i)	Exempt Group under normal operating conditions:		N/A
10.4.2	Instructional safeguard:		N/A
10.5	Protection against x-radiation		N/A
10.5.1	X- radiation energy source that exists equipment:		N/A
	Normal, abnormal, single fault conditions		N/A
	Equipment safeguards ..... :		N/A
	Instructional safeguard for skilled person .....:		N/A
10.5.3	Most unfavourable supply voltage to give maximum radiation..... :		—
	Abnormal and single-fault condition.....:		N/A
	Maximum radiation (pA/kg) .....:		N/A
10.6	Protection against acoustic energy sources		N/A
10.6.1	General		N/A
10.6.2	Classification		N/A
	Acoustic output, dB(A) .....:		N/A
	Output voltage, unweighted r.m.s. .....:		N/A
10.6.4	Protection of persons		N/A
	Instructional safeguards.....:		N/A
	Equipment safeguard prevent ordinary person to RS2 .....:		—
	Means to actively inform user of increase sound pressure .....:		—
	Equipment safeguard prevent ordinary person to RS2 ..... :		—
10.6.5	Requirements for listening devices (headphones, earphones, etc.)		N/A
10.6.5.1	Corded passive listening devices with analog input		N/A
	Input voltage with 94 dB(A) L_{Aeq} acoustic pressure output .....:		—
10.6.5.2	Corded listening devices with digital input		N/A
	Maximum dB(A) .....:		—
10.6.5.3	Cordless listening device		N/A
	Maximum dB(A) .....:		—

B	**NORMAL OPERATING CONDITION TESTS, ABNORMAL OPERATING CONDITION TESTS AND SINGLE FAULT CONDITION TESTS**		**P**
B.2	Normal Operating Conditions		P
B.2.1	General requirements .....:		N/A
	Audio Amplifiers and equipment with audio amplifiers.....:		N/A
B.2.2	Supply frequency		N/A
B.2.3	Supply voltage and tolerances		N/A
B.2.5	Input test .....:	See appended table B.2.5	N/A
B.2.6	Operating temperature measurement conditions		P
B.2.6.1	General		P
B.2.6.2	Operating temperature dependent heating/cooling		P
B.2.6.3	Operating temperature independent heating/cooling	See appended table 5.4.1.4, 6.3.2, 9.0, B.2.6	P
B.2.7	Battery charging and discharging under normal operating conditions	See appended table M4	P
B.3	Simulated abnormal operating conditions	See appended table B.3	N/A
B.3.1	General requirements .....:		N/A
B.3.2	Covering of ventilation openings	No ventilation openings	N/A
B.3.3	D.C. mains polarity test	No D.C. mains	N/A
B.3.4	Setting of voltage selector.....:	No voltage selector	N/A
B.3.5	Maximum load at output terminals.....:	No output terminals	N/A
B.3.6	Reverse battery polarity	Fixed battery installation	N/A
B.3.7	Abnormal operating conditions as specified in Clause E.2.	No audio amplifier	N/A
B.3.8	Safeguards functional during and after abnormal operating conditions		N/A
B.4	Simulated single fault conditions	See appended table B.4	P
B.4.2	Temperature controlling device open or short-circuited.....:	No temperature controlling device	N/A
B.4.3	Motor tests	No motor	N/A
B.4.3.1	Motor blocked or rotor locked increasing the internal ambient temperature .....:		N/A
B.4.4	Short circuit of 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		P
B.4.5	Short circuit and interruption of electrodes in tubes and semiconductors	See appended table B.4	P
B.4.6	Short circuit or disconnect of passive components		P
B.4.7	Continuous operation of components	Not such components	N/A
B.4.8	Class 1 and Class 2 energy sources within limits during and after single fault conditions		P

B.4.9	Battery charging and discharging under single fault conditions ..... :		P

C	**UV RADIATION**	No 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 apparatus		N/A
C.2.4	Xenon-arc light exposure apparatus		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**	No audio amplifier	N/A
E.1	Audio amplifier normal operating conditions		N/A
	Audio signal voltage (V) ..... :		—
	Rated load impedance (Ω) ..... :		—
E.2	Audio amplifier abnormal operating conditions		N/A

F	**EQUIPMENT MARKINGS, INSTRUCTIONS, AND INSTRUCTIONAL SAFEGUARDS**		P

F.1	**General requirements**		P
	Instructions – Language ..... :	EN	P

F.2	**Letter symbols and graphical symbols**		N/A
F.2.1	Letter symbols according to IEC60027-1		N/A
F.2.2	Graphic symbols IEC, ISO or manufacturer specific		N/A

F.3	**Equipment markings**		P
F.3.1	Equipment marking locations		P
F.3.2	Equipment identification markings		P
F.3.2.1	Manufacturer identification ..... :		P
F.3.2.2	Model identification ..... :		P
F.3.3	Equipment rating markings		P
F.3.3.1	Equipment with direct connection to mains		N/A
F.3.3.2	Equipment without direct connection to mains	DC in	P

F.3.3.3	Nature of supply voltage ..... :	DC in	P
F.3.3.4	Rated voltage..... :	12 – 24V	P
F.3.3.4	Rated frequency..... :		N/A
F.3.3.6	Rated current or rated power..... :		N/A
F.3.3.7	Equipment with multiple supply connections		N/A
F.3.4	Voltage setting device		N/A
F.3.5	Terminals and operating devices		P
F.3.5.1	Mains appliance outlet and socket-outlet markings..... :		N/A
F.3.5.2	Switch position identification marking..... :		N/A
F.3.5.3	Replacement fuse identification and rating markings..... :		N/A
F.3.5.4	Replacement battery identification marking..... :		N/A
F.3.5.5	Terminal marking location		N/A
F.3.6	Equipment markings related to equipment classification		N/A
F.3.6.1	Class I Equipment	Class III equipment	N/A
F.3.6.1.1	Protective earthing conductor terminal		N/A
F.3.6.1.2	Neutral conductor terminal		N/A
F.3.6.1.3	Protective bonding conductor terminals		N/A
F.3.6.2	Class II equipment (IEC60417-5172)		N/A
F.3.6.2.1	Class II equipment with or without functional earth		N/A
F.3.6.2.2	Class II equipment with functional earth terminal marking		N/A
F.3.7	Equipment IP rating marking ..... :		N/A
F.3.8	External power supply output marking		N/A
F.3.9	Durability, legibility and permanence of marking	Label	P
F.3.10	Test for permanence of markings		N/A
F.3.10.1	General		N/A
F.3.10.2	Testing procedure (water)		N/A
F.3.10.3	Petroleum spirit		N/A
F.3.10.4	Compliance criteria		N/A

F.4	**Instructions**		P
	a) Equipment for use in locations where children not likely to be present - marking		N/A
	b) Instructions given for installation or initial use		P
	c) Equipment intended to be fastened in place		N/A
	d) Equipment intended for use only in restricted access area		N/A
	e) Audio equipment terminals classified as ES3 and other equipment with terminals marked in accordance F.3.6.1		N/A
	f) Protective earthing employed as safeguard		N/A
	g) Protective earthing conductor current exceeding ES 2 limits		N/A

	h) Symbols used on equipment		N/A
	i) Permanently connected equipment not provided with all-pole mains switch		N/A
	j) Replaceable components or modules providing safeguard function		N/A

F.5	**Instructional safeguards**		N/A
	Where “instructional safeguard” is referenced in the test report it specifies the required elements, location of marking and/or instruction		N/A

G	**COMPONENTS**		N/A

G.1	**Switches**	No switch	N/A
G.1.1	General requirements		N/A
G.1.2	Ratings, endurance, spacing, maximum load		N/A

G.2	**Relays**	No relay	N/A
G.2.1	General requirements		N/A
G.2.2	Overload test		N/A
G.2.3	Relay controlling connectors supply power		N/A
G.2.4	Mains relay, modified as stated in G.2		N/A

G.3	**Protection Devices**	No protection device	N/A
G.3.1	Thermal cut-offs	No thermal cut-off	N/A
G.3.1.1a) &b)	Thermal cut-outs separately approved according to IEC 60730 with conditions indicated in a) & b)		N/A
G.3.1.1c)	Thermal cut-outs tested as part of the equipment as indicated in c)		N/A
G.3.1.2	Thermal cut-off connections maintained and secure		N/A
G.3.2	Thermal links	No thermal link	N/A
G.3.2.1a)	Thermal links separately tested with IEC 60691		N/A
G.3.2.1b)	Thermal links tested as part of the equipment		N/A
	Aging hours (H) ..... :		N/A
	Single Fault Condition ..... :		N/A
	Test Voltage (V) and Insulation Resistance (Ω) .:		N/A
G.3.3	PTC Thermistors	No PTC	N/A
G.3.4	Overcurrent protection devices	No overcurrent protection device	N/A
G.3.5	Safeguards components not mentioned in G.3.1 to G.3.5		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**		N/A

G.4.1	Spacings		N/A
G.4.2	Mains connector configuration ..... :		N/A
G.4.3	Plug is shaped that insertion into mains socket-outlets or appliance coupler is unlikely		N/A

G.5	**Wound Components**	No wound components	N/A
G.5.1	Wire insulation in wound components		N/A
G.5.1.2 a)	Two wires in contact inside wound component, angle between 45° and 90°		N/A
G.5.1.2 b)	Construction subject to routine testing		N/A
G.5.2	Endurance test on wound components		N/A
G.5.2.1	General test requirements		N/A
G.5.2.2	Heat run test		N/A
	Time (s)..... :		N/A
	Temperature (°C)..... :		N/A
G.5.2.3	Wound Components supplied by mains		N/A

G.5.3	**Transformers**		N/A
G.5.3.1	Requirements applied (IEC61204-7, IEC61558-1/-2, and/or IEC62368-1) ..... :		N/A
	Position ..... :		N/A
	Method of protection ..... :		N/A
G.5.3.2	Insulation		N/A
	Protection from displacement of windings ..... :		N/A
G.5.3.3	Overload test.....:		N/A
G.5.3.3.1	Test conditions		N/A
G.5.3.3.2	Winding Temperatures testing in the unit		N/A
G.5.3.3.3	Winding Temperatures - Alternative test method		N/A

G.5.4	**Motors**	No motor	N/A
G.5.4.1	General requirements		N/A
	Position ..... :		N/A
G.5.4.2	Test conditions		N/A
G.5.4.3	Running overload test		N/A
G.5.4.4	Locked-rotor overload test		N/A
	Test duration (days) ..... :		N/A
G.5.4.5	Running overload test for d.c. motors in secondary circuits		N/A
G.5.4.5.2	Tested in the unit		N/A
	Electric strength test (V)..... :		N/A
G.5.4.5.3	Tested on the Bench - Alternative test method; test time (h) ..... :		N/A
	Electric strength test (V)..... :		N/A
G.5.4.6	Locked-rotor overload test for d.c. motors in secondary circuits		N/A

G.5.4.6.2	Tested in the unit		N/A
	Maximum Temperature ..... :		N/A
	Electric strength test (V) ..... :		N/A
G.5.4.6.3	Tested on the bench - Alternative test method; test time (h) ..... :		N/A
	Electric strength test (V)..... :		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 ..... :		N/A

G.6	**Wire Insulation**	In ES1 circuits only	N/A
G.6.1	General		N/A
G.6.2	Solvent-based enamel wiring insulation		N/A

G.7	**Mains supply cords**	No mains cord	N/A
G.7.1	General requirements		N/A
	Type ..... :		N/A
	Rated current (A) ..... :		N/A
	Cross-sectional area (mm^2), (AWG) ..... :		N/A
G.7.2	Compliance and test method		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 comprised of polymeric 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	Mass (g) ..... :		N/A
	Diameter (m) ..... :		N/A
	Temperature (°C) ..... :		N/A
G.7.6	Supply wiring space		N/A
G.7.6.2	Stranded wire		N/A
G.7.6.2.1	Test with 8 mm strand		N/A

G.8	**Varistors**	No varistor	N/A
G.8.1	General requirements		N/A
G.8.2	Safeguard against shock		N/A
G.8.3	Safeguard against fire		N/A
G.8.3.2	Varistor overload test ..... :		N/A

G.8.3.3	Temporary overvoltage ..... :		N/A

G.9	**Integrated Circuit (IC) Current Limiters**	Not such device	N/A
G.9.1 a)	Manufacturer defines limit at max. 5A.		N/A
G.9.1 b)	Limiters do not have manual operator or reset		N/A
G.9.1 c)	Supply source does not exceed 250 VA ..... :		N/A
G.9.1 d)	IC limiter output current (max. 5A) ..... :		N/A
G.9.1 e)	Manufacturers' defined drift ..... :		N/A
G.9.2	Test Program 1		N/A
G.9.3	Test Program 2		N/A
G.9.4	Test Program 3		N/A

G.10	**Resistors**		N/A
G.10.1	General requirements		N/A
G.10.2	Resistor test		N/A
G.10.3	Test for resistors serving as safeguards between the mains and an external circuit consisting of a coaxial cable		N/A
G.10.3.1	General requirements		N/A
G.10.3.2	Voltage surge test		N/A
G.10.3.3	Impulse test		N/A

G.11	**Capacitor and RC units**	No mains	N/A
G.11.1	General requirements		N/A
G.11.2	Conditioning of capacitors and RC units		N/A
G.11.3	Rules for selecting capacitors		N/A

G.12	**Optocouplers**	No optocoupler	N/A
	Optocouplers comply with IEC 60747-5-5:2007 Spacing or Electric Strength Test (specify option and test results) ..... :		N/A
	Type test voltage Vini ..... :		N/A
	Routine test voltage, Vini,b ..... :		N/A

G.13	**Printed boards**	In functional insulation	P
G.13.1	General requirements		N/A
G.13.2	Uncoated printed boards		P
G.13.3	Coated printed boards		N/A
G.13.4	Insulation between conductors on the same inner surface		N/A
	Compliance with cemented joint requirements (Specify construction) ..... :		N/A
G.13.5	Insulation between conductors on different surfaces		N/A
	Distance through insulation..... :		N/A

	Number of insulation layers (pcs) ..... :		N/A
G.13.6	Tests on coated printed boards		N/A
G.13.6.1	Sample preparation and preliminary inspection		N/A
G.13.6.2a)	Thermal conditioning		N/A
G.13.6.2b)	Electric strength test		N/A
G.13.6.2c)	Abrasion resistance test		N/A

G.14	**Coating on components terminals**	No coating on components terminals	N/A
G.14.1	Requirements .....:		N/A

G.15	**Liquid filled components**	No liquid filled components	N/A
G.15.1	General requirements		N/A
G.15.2	Requirements		N/A
G.15.3	Compliance and test methods		N/A
G.15.3.1	Hydrostatic pressure test		N/A
G.15.3.2	Creep resistance test		N/A
G.15.3.3	Tubing and fittings compatibility test		N/A
G.15.3.4	Vibration test		N/A
G.15.3.5	Thermal cycling test		N/A
G.15.3.6	Force test		N/A
G.15.4	Compliance		N/A

G.16	**IC including capacitor discharge function (ICX)**	Not such component	N/A
a)	Humidity treatment in accordance with sc5.4.8 – 120 hours		N/A
b)	Impulse test using circuit 2 with Uc = to transient voltage ..... :		N/A
C1)	Application of ac voltage at 110% of rated voltage for 2.5 minutes		N/A
C2)	Test voltage ..... :		N/A
D1)	10,000 cycles on and off using capacitor with smallest capacitance resistor with largest resistance specified by manufacturer		N/A
D2)	Capacitance ..... :		N/A
D3)	Resistance ..... :		N/A

H	**CRITERIA FOR TELEPHONE RINGING SIGNALS**	No connection to telecommunication networks	N/A
H.1	General		N/A
H.2	Method A		N/A
H.3	Method B		N/A
H.3.1	Ringing signal		N/A
H.3.1.1	Frequency (Hz) .....:		N/A
H.3.1.2	Voltage (V) .....:		N/A

H.3.1.3	Cadence; time (s) and voltage (V) .....:		N/A
H.3.1.4	Single fault current (mA): .....:		N/A
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 complied with		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**	No wound components	N/A
	General requirements		N/A

K	**SAFETY INTERLOCKS**	No safety interlock	N/A
K.1	General requirements		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
	Compliance.....:		N/A
K.6	Mechanically operated safety interlocks		N/A
K.6.1	Endurance requirement		N/A
K.6.2	Compliance and Test method.....:		N/A
K.7	Interlock circuit isolation		N/A
K.7.1	Separation distance for contact gaps & interlock circuit elements (type and circuit location) .....:		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**	No disconnection device	N/A
L.1	General requirements		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

M	**EQUIPMENT CONTAINING BATTERIES AND THEIR PROTECTION CIRCUITS**		P
M.1	**General requirements**	See appended table M.1 – M.3	P

M.2	**Safety of batteries and their cells**		P

M.2.1	Requirements		P
M.2.2	Compliance and test method (identify method) ...:		P

M.3	**Protection circuits**	See appended table M.1 – M.3	P
M.3.1	Requirements		P
M.3.2	Tests		P
	- Overcharging of a rechargeable battery		P
	- Unintentional charging of a non-rechargeable battery		P
	- Reverse charging of a rechargeable battery		P
	- Excessive discharging rate for any battery		P
M.3.3	Compliance ..... :		P

M.4	**Additional safeguards for equipment containing secondary lithium battery**	See appended table M.4	**P**
M.4.1	General		P
M.4.2	Charging safeguards		P
M.4.2.1	Charging operating limits		P
M.4.2.2a)	Charging voltage, current and temperature..... :		P
M.4.2.2 b)	Single faults in charging circuitry ..... :		P
M.4.3	Fire Enclosure	See appended table 4.1.2	P
M.4.4	Endurance of equipment containing a secondary lithium battery	Stationary Equipment	P
M.4.4.2	Preparation		P
M.4.4.3	Drop and charge/discharge function tests		P
	Drop		P
	Charge		P
	Discharge		P
M.4.4.4	Charge-discharge cycle test		P
M.4.4.5	Result of charge-discharge cycle test		P

M.5	**Risk of burn due to short circuit during carrying**	Fixed installation of the battery	N/A
M.5.1	Requirement		N/A
M.5.2	Compliance and Test Method (Test of P.2.3)		N/A

M.6	**Prevention of short circuits and protection from other effects of electric current**	See appended table 4.1.2, B.3 and B.4	P
M.6.1	Short circuits		P
M.6.1.1	General requirements		P
M.6.1.2	Compliance criteria		P
M.6.2	Leakage current (mA) .....:	ES1	N/A

M.7	**Risk of explosion from lead acid and NiCd batteries**	No lead acid and NiCd batteries	N/A

M.7.1	Ventilation preventing explosive gas concentration		N/A
M.7.2	Compliance and test method		N/A

M.8	**Protection against internal ignition from external spark sources of lead acid batteries**	No lead acid batteries	N/A
M.8.1	General requirements		N/A
M.8.2	Test method		N/A
M.8.2.1	General requirements		N/A
M.8.2.2	Estimation of hypothetical volume *Vz* (m^3/s) .....:		N/A
M.8.2.3	Correction factors .....:		N/A
M.8.2.4	Calculation of distance *d* (mm) .....:		N/A

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 (Determination of compliance: inspection, data review; or abnormal testing) .....:**		N/A

N	**ELECTROCHEMICAL POTENTIALS**		N/A
	Metal(s) used .....:		N/A

O	**MEASUREMENT OF CREEPAGE DISTANCES AND CLEARANCES**	ES1 circuits only	N/A
	Figures O.1 to O.20 of this Annex applied.....:		N/A

P	**SAFEGUARDS AGAINST ENTRY OF FOREIGN OBJECTS AND SPILLAGE OF INTERNAL LIQUIDS**		P
P.1	General requirements		P
P.2.2	Safeguards against entry of foreign object		P
	Location and Dimensions (mm) ..... :	No openings	P
P.2.3	Safeguard against the consequences of entry of foreign object		N/A
P.2.3.1	Safeguards against the entry of a foreign object	No PIS	N/A
	Openings in transportable equipment	No transportable equipment	N/A
	Transportable equipment with metalized plastic parts .....:		N/A
P.2.3.2	Openings in transportable equipment in relation to metallized parts of a barrier or enclosure (identification of supplementary safeguard) .....:		N/A
P.3	Safeguards against spillage of internal liquids	No liquid	N/A
P.3.1	General requirements		N/A

P.3.2	Determination of spillage consequences		N/A
P.3.3	Spillage safeguards		N/A
P.3.4	Safeguards effectiveness		N/A
P.4	Metallized coatings and adhesive securing parts		N/A
P.4.2 a)	Conditioning testing		N/A
	Tc (°C) .....:		N/A
	Tr (°C) .....:		N/A
	Ta (°C) .....:		N/A
P.4.2 b)	Abrasion testing .....:		N/A
P.4.2 c)	Mechanical strength testing ..... :		N/A

Q	**CIRCUITS INTENDED FOR INTERCONNECTION WITH BUILDING WIRING**	No interconnection with building wiring	N/A
Q.1	Limited power sources	See appended table 6.2.2, Q.1, Q.2, 6.5.3, 6.6	N/A
Q.1.1 a)	Inherently limited output		N/A
Q.1.1 b)	Impedance limited output		N/A
Q.1.1 c)	- Regulating network limited output under normal operating and simulated single fault condition		N/A
Q.1.1 d)	Overcurrent protective device limited output		N/A
Q.1.1 e)	IC current limiter complying with G.9		N/A
Q.1.2	Compliance and test method		N/A
Q.2	Test for external circuits – paired conductor cable		N/A
	Maximum output current (A) ..... :		N/A
	Current limiting method..... :		N/A

R	**LIMITED SHORT CIRCUIT TEST**		N/A
R.1	General requirements		N/A
R.2	Determination of the overcurrent protective device and circuit		N/A
R.3	Test method Supply voltage (V) and short-circuit current (A)). ..... :		N/A

S	**TESTS FOR RESISTANCE TO HEAT AND FIRE**	No fire enclosure	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 ..... :		N/A
	Wall thickness (mm) ..... :		N/A
	Conditioning (°C) ..... :		N/A
	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 ..... :		N/A
	Wall thickness (mm) ..... :		N/A
	Conditioning (°C) ..... :		N/A
	Test flame according to IEC 60695-11-5 with conditions as set out		N/A
	Test specimen does not show any additional hole		N/A
S.3	Flammability test for the bottom of a fire enclosure		N/A
	Samples, material ..... :		N/A
	Wall thickness (mm) ..... :		N/A
	Cheesecloth did not ignite		N/A
S.4	Flammability classification of materials		N/A
S.5	Flammability test for fire enclosures and fire barrier materials of equipment where the steady state power exceed 4 000 W		N/A
	Samples, material ..... :		N/A
	Wall thickness (mm) ..... :		N/A
	Conditioning (test condition), (°C)..... :		N/A
	Test flame according to IEC 60695-11-20 with conditions as set out		N/A
	After every test specimen was not consumed completely		N/A
	After fifth flame application, flame extinguished within 1 min		N/A

T	**MECHANICAL STRENGTH TESTS**	See appended table T	P
T.1	General requirements		P
T.2	Steady force test, 10 N ..... :	Enclosure	P
T.3	Steady force test, 30 N ..... :	Enclosure	P
T.4	Steady force test, 100 N ..... :	Enclosure	P
T.5	Steady force test, 250 N ..... :	Enclosure	P
T.6	Enclosure impact test	ES1 circuits only	N/A
	Fall test		N/A
	Swing test		N/A
T.7	Drop test ..... :	Fixed installation	N/A
T.8	Stress relief test ..... :		P
T.9	Impact Test (glass)	No glass	N/A
	Impact energy (J) ..... :		N/A
	Height (m)..... :		N/A
T.10	Glass fragmentation test..... :		N/A

T.11	Test for telescoping or rod antennas	No rod antennas	N/A
	Torque value (Nm) .....:		N/A

U	**MECHANICAL STRENGTH OF CATHODE RAY TUBES (CRT) AND PROTECTION AGAINST THE EFECTS OF IMPLOSION**	No CRTs	N/A
U.1	General requirements		N/A
U.2	Compliance and test method for non-intrinsically protected CRTs		N/A
U.3	Protective Screen ..... :		N/A

V	**DETERMINATION OF ACCESSIBLE PARTS (FINGERS, PROBES AND WEDGES)**	Enclosure	P
V.1	Accessible parts of equipment		P
V.1.1	General		P
V.1.2	Test method 1 – Surfaces and openings tested with jointed test probes		P
V.1.3	Test method 2 – Openings tested with straight unjointed test probes		P
V.1.4	Test method 3 – Plugs, jacks, connectors	No plugs, jacks, connectors	N/A
V.1.5	Test method 4 – Slot openings	No slot openings	N/A
V.1.6	Test method 5 – Terminals intended to be used by an ordinary person		N/A
V.2	Accessible part criterion		P

	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".		
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:		P
	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.		P

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

4.Z1	**Add** the following new subclause after 4.9: 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): 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; b) for components in series with the mains input to the equipment such as the supply cord, appliance coupler, r.f.i. filter and switch, short-circuit and earth fault protection may be provided by protective devices in the building installation; c) it is permitted for **pluggable equipment type B** or **permanently connected equipment**, to rely on dedicated overcurrent and short-circuit protection in the building installation, provided that the means of protection, e.g. fuses or circuit breakers, is fully specified in the installation instructions. If reliance is placed on protection in the building installation, the installation instructions shall so state, except that for **pluggable equipment type A** the building installation shall be regarded as providing protection in accordance with the rating of the wall socket outlet.		N/A
5.4.2.3.2.4	**Add** the following to the end of this subclause: The requirement for interconnection with **external circuit** is in addition given in EN 50491-3:2009.		N/A
10.2.1	Add the following to [c] and [d] in table 39: For additional requirements, see 10.5.1.		N/A

10.5.1	**Add** the following after the first paragraph: *For RS 1 compliance is checked by measurement under the following conditions:* *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.* NOTE Z1 Soldered joints and paint lockings are examples of adequate locking. *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.* *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.* *For RS1, the dose-rate shall not exceed 1 µSv/h taking account of the background level.* NOTE Z2 These values appear in Directive 96/29/Euratom of 13 May 1996.		N/A
10.6.1	**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
10.Z1	**Add** the following new subclause after 10.6.5. **10.Z1 Non-ionizing radiation from radio frequencies in the range 0 to 300 GHz** The amount of non-ionizing radiation is regulated by European Council Recommendation 1999/519/EC of 12 July 1999 on the limitation of exposure of the general public to electromagnetic fields (0 Hz to 300 GHz). For intentional radiators, ICNIRP guidelines should be taken into account for Limiting Exposure to Time-Varying Electric, Magnetic, and Electromagnetic Fields (up to 300 GHz). For hand-held and body-mounted devices, attention is drawn to EN 50360 and EN 50566	See testreport: 1-1467/20-05-03 CTC-Advanced	P
G.7.1	**Add** the following note: NOTE Z1 The harmonized code designations corresponding to the IEC cord types are given in Annex ZD.		N/A

Bibliography	**Add** the following standards: **Add** the following notes for the standards indicated: 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
ZB	**ANNEX ZB, SPECIAL NATIONAL CONDITIONS (EN)**		N/A
4.1.15	**Denmark, Finland, Norway** and **Sweden** 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. The marking text in the applicable countries shall be as follows: In **Denmark**: “Apparatets stikprop skal tilsluttes en stikkontakt med jord som giver forbindelse til stikproppens jord.” In **Finland**: "Laite on liitettävä suojakoskettimilla varustettuun pistorasiaan" In **Norway**: “Apparatet må tilkoples jordet stikkontakt” In **Sweden**: “Apparaten skall anslutas till jordat uttag”		N/A
4.7.3	**United Kingdom** To the end of the subclause the following is added: 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		N/A

5.2.2.2	**Denmark** 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.		N/A
5.4.11.1 and Annex G	**Finland and Sweden** 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 • 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. 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 • 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. It is permitted to bridge this insulation with a capacitor complying with EN 60384-14:2005, subclass Y2.		N/A
	A capacitor classified Y3 according to EN 60384-14:2005, may bridge this insulation under the following conditions: • the insulation requirements are satisfied by having a capacitor classified Y3 as defined by EN 60384-14, which in addition to the Y3 testing, is tested with an impulse test of 2,5 kV defined in 5.4.11; • the additional testing shall be performed on all the test specimens as described in EN 60384-14; the impulse test of 2,5 kV is to be performed before the endurance test in EN 60384-14, in the sequence of tests as described in EN 60384-14.		N/A

5.5.2.1	**Norway** 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).		N/A
5.5.6	**Finland, Norway** and **Sweden** 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.		N/A
5.6.1	**Denmark** **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. *Justification:* In Denmark an existing 13 A socket outlet can be protected by a 20 A fuse.		N/A
5.6.4.2.1	**Ireland and United Kingdom** 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.		N/A
5.6.5.1	To the second paragraph the following is added: The range of conductor sizes of flexible cords to be accepted by terminals for equipment with a rated current over 10 A and up to and including 13 A is: 1,25 mm^2 to 1,5 mm^2 in cross-sectional area.		N/A
5.7.5	**Denmark** 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.		N/A

5.7.6.1	**Norway and Sweden** 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. 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. 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)” 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. Translation to Norwegian (the Swedish text will also be accepted in Norway): “Apparater som er koplet til beskyttelsesjord via nettplugg og/eller via annet jordtilkoplet utstyr – og er tilkoplet et koaksialbasert kabel-TV nett, kan forårsake brannfare. For å unngå dette skal det ved tilkopling av apparater til kabel-TV nett installeres en galvanisk isolator mellom apparatet og kabel-TV nettet.”		N/A
	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.”.		N/A

5.7.6.2	**Denmark** 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 .		N/A
B.3.1 and B.4	**Ireland and United Kingdom** The following is applicable: 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		N/A
G.4.2	**Denmark** To the end of the subclause the following is added: 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. CLASS I EQUIPMENT provided with socket-outlets with earth contacts or which are intended to be used in locations where protection against indirect contact is required according to the wiring rules shall be provided with a plug in accordance with standard sheet DK 2-1a or DK 2-5a. If a single-phase equipment having a RATED CURRENT exceeding 13 A or if a poly-phase equipment is provided with a supply cord with a plug, this plug shall be in accordance with the standard sheets DK 6-1a in DS 60884-2-D1 or EN 60309-2.		N/A
	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. Other current rating socket outlets shall be in compliance with Standard Sheet DKA 1-3a or DKA 1-1c. 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 *Justification:* Heavy Current Regulations, Section 6c		N/A

G.4.2	**United Kingdom** To the end of the subclause the following is added: The plug part of direct plug-in equipment shall be assessed to BS 1363: Part 1, 12.1, 12.2, 12.3, 12.9, 12.11, 12.12, 12.13, 12.16, and 12.17, except that the test of 12.17 is performed at not less than 125 °C. Where the metal earth pin is replaced by an Insulated Shutter Opening Device (ISOD), the requirements of clauses 22.2 and 23 also apply.		N/A
G.7.1	**United Kingdom** 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. NOTE "Standard plug" is defined in SI 1768:1994 and essentially means an approved plug conforming to BS 1363 or an approved conversion plug.		N/A
G.7.1	**Ireland** 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		N/A
G.7.2	**Ireland and United Kingdom** To the first paragraph the following is added: A power supply cord with a conductor of 1,25 mm^2 is allowed for equipment which is rated over 10 A and up to and including 13 A.		N/A

ZC	ANNEX ZC, NATIONAL DEVIATIONS (EN)		N/A
10.5.2	**Germany** 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. *Justification:* German ministerial decree against ionizing radiation (Röntgenverordnung), in force since 2002-07-01, implementing the European Directive 96/29/EURATOM. **NOTE** Contact address: Physikalisch-Technische Bundesanstalt, Bundesallee 100, D-38116 Braunschweig, Tel.: Int +49-531-592-6320, Internet: http://www.ptb.de		N/A
F.1	**Italy:** The following requirements shall be fulfilled: • The power consumption in Watts (W) shall be indicated on TV receivers and in their instruction for use (Measurement according to EN 60555-2). Note/Nota *EN 60555-2 has since been replaced by IEC 60107-1:1997.*	No TV	N/A
	• TV receivers shall be provided with an instruction for use, schematic diagrams and adjustments procedure in Italian language.		N/A
	• Marking for controls and terminals shall be in Italian language. Abbreviation and international symbols are allowed provided that they are explained in the instruction for use.		N/A
	• The ECC manufacturers are bound to issue a conformity declaration according to the above requirements in the instruction manual. The correct statement for conformity to be written in the instruction manual, shall be: *Questo apparecchio è fabbricato nella CEE nel rispetto delle disposizioni del* *D.M. marzo 1992 ed è in particolare conforme alle prescrizioni dell'art. 1 dello* *stesso D.M.*		N/A
	• The first importers of TV receivers manufactured outside EEC are bound to submit the TV receivers for previous conformity certification to the Italian Post Ministry (PP.TT). The TV receivers shall have on the backcover the certification number in the following form: D.M. 26/03/1992 xxxxx/xxxxx/S or T or pT S for stereo T for Teletext pT for retrofitable teletext		N/A

	Justification: Ministerial Decree of 26 March 1992 : National rules for television receivers trade. NOTE/NOTA: *Ministerial decree above contains additional, but not safety relevant requirements*		—

4.1.2	TABLE: List of critical components				P
Object / part No.	**Manufacturer/ trademark**	**Type / model**	**Technical data**	**Standard**	**Mark(s) of conformity[1]**
Enclosure	SABIC Innovative Plastics B V	C2950	>1.5mm V-0 85°C	UL94	UL (E45329)
PCB-Slot	Shenzen Hoada Circuit	HD-1	130°C V-0	UL796	UL (E355345)
PCB-Main	Suntak Multilayer	STM-5	130°C V-0	UL796	UL (E207844)
Fuse	Littlefuse	466 Serie	3A	Tested in application	UL (E10480)
Opto coupler	Vishay	SFH6186-3	5300VAC V-0 -40°C to +85°C	UL 1577 EN 60747-5-5	UL (E52744) VDE (091888) BSI, FIMKO
Li-ion Battery	Dongguan Sairi Industry CO., LTD	ICR 10440	300mAh 3.7V	IEC 62133-2:2017 + A1:2021	SG ITS-30553 221201056SZN-001
Supplementary information: 1) Provided evidence ensures the agreed level of compliance. See OD-CB2039.					

4.8.4, 4.8.5	**TABLE: Lithium coin/button cell batteries mechanical tests**	N/A

(The following mechanical tests are conducted in the sequence noted.)

4.8.4.2	**TABLE: Stress Relief test**		—
Part	Material	Oven Temperature (°C)	Comments

4.8.4.3	**TABLE: Battery replacement test**		—
Battery part no. .....:			—
Battery Installation/withdrawal		Battery Installation/Removal Cycle	Comments
		1	
		2	
		3	
		4	
		5	
		6	
		8	
		9	
		10	

4.8.4.4	**TABLE: Drop test**		—
Impact Area	Drop Distance	Drop No.	Observations
		1	
		2	
		3	

4.8.4.5	**TABLE: Impact**		—
Impacts per surface	Surface tested	Impact energy (Nm)	Comments

4.8.4.6	**TABLE: Crush test**		—
Test position	Surface tested	Crushing Force (N)	Duration force applied (s)

Supplementary information:

4.8.5	TABLE: Lithium coin/button cell batteries mechanical test result	N/A

Test position	Surface tested	Force (N)	Duration force applied (s)

Supplementary information:

5.2	Table: Classification of electrical energy sources	P

5.2.2.2 – Steady State Voltage and Current conditions

No.	Supply Voltage	Location (e.g. circuit designation)	Test conditions	Parameters			ES Class
				U (Vrms or Vpk)	I (Apk or Arms)	Hz	
1	12V DC		Normal	12.01V	--		ES1
			Abnormal				
			Single fault – SC/OC				
2	24V DC		Normal	24.02	--		ES1
			Abnormal				
			Single fault – SC/OC				
3	Battery		Normal	4.2	--		ES1
			Abnormal				
			Single fault – SC/OC				
4	Button cell		Normal	3.3	--		ES1
			Abnormal				
			Single fault – SC/OC				

5.2.2.3 - Capacitance Limits

No.	Supply Voltage	Location (e.g. circuit designation)	Test conditions	Parameters		ES Class
				Capacitance, nF	Upk (V)	
			Normal			
			Abnormal			
			Single fault – SC/OC			

5.2.2.4 - Single Pulses

No.	Supply	Location (e.g.	Test conditions	Parameters	ES Class

	Voltage	circuit designation)		Duration (ms)	Upk (V)	Ipk (mA)	
			Normal				
			Abnormal				
			Single fault – SC/OC				

5.2.2.5 - Repetitive Pulses

No.	Supply Voltage	Location (e.g. circuit designation)	Test conditions	Parameters			ES Class
				Off time (ms)	Upk (V)	Ipk (mA)	
			Normal				
			Abnormal				
			Single fault – SC/OC				

Test Conditions:

Normal –

Abnormal -

Supplementary information: SC=Short Circuit, OC=Short Circuit

5.4.1.4, 6.3.2, 9.0, B.2.6	TABLE: Temperature measurements					P
	Supply voltage (V) .....:	12	24			—
	Ambient T_{min} (°C) .....:	25	25			—
	Ambient T_{max} (°C) .....:	25	25			—
	Tma (°C) .....:	55	55			—

Maximum measured temperature T of part/at:	T (°C)				Allowed T_{max} (°C)
Ambient	25.0	25.0			--
PCB near U1	35.8	35.3			100
PCB near U14	39.5	39.3			100
BAT (secondary)	35.3	34.7			--
Button cell	30.3	28.4			70
Modem PCB	31.4	29.2			100
Enc card reader	28.6	27.9			77
Enc top	27.1	26.3			77
Enc bottom	29.7	27.9			77
Enc rear	28.9	27.4			77
Enc display	32.0	30.9			77

Supplementary information:

Temperature T of winding:	t_1 (°C)	R_1 (Ω)	t_2 (°C)	R_2 (Ω)	T (°C)	Allowed T_{max} (°C)	Insulation class

Supplementary information:

Supplementary information:
Note 1: Tma should be considered as directed by appliable requirement
Note 2: Tma is not included in assessment of Touch Temperatures (Clause 9)

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

5.4.1.10.3	TABLE: Ball pressure test of thermoplastics		N/A
Allowed impression diameter (mm) ..... :		≤ 2 mm	—
Object/Part No./Material	Manufacturer/trademark	Test temperature (°C)	Impression diameter (mm)
Supplementary information:			

5.4.2.2, 5.4.2.4 and 5.4.3	TABLE: Minimum Clearances/Creepage distance						N/A
Clearance (cl) and creepage distance (cr) at/of/between:	Up (V)	U r.m.s. (V)	Frequency (kHz)[1]	Required cl (mm)	cl (mm) [2]	Required[3] cr (mm)	cr (mm)
Supplementary information:							
Note 1: Only for frequency above 30 kHz Note 2: See table 5.4.2.4 if this is based on electric strength test Note 3: Provide Material Group							

5.4.2.3	TABLE: Minimum Clearances distances using required withstand voltage		N/A
	Overvoltage Category (OV):		
	Pollution Degree:		
Clearance distanced between:	Required withstand voltage	Required cl (mm)	Measured cl (mm)

5.4.2.3	**TABLE: Minimum Clearances distances using required withstand voltage**			N/A
	Overvoltage Category (OV):			
	Pollution Degree:			
Clearance distanced between:		Required withstand voltage	Required cl (mm)	Measured cl (mm)
Supplementary information:				

5.4.2.4	**TABLE: Clearances based on electric strength test**			N/A
Test voltage applied between:		Required cl (mm)	Test voltage (kV) peak/ r.m.s. / d.c.	Breakdown Yes / No
Supplementary information:				

5.4.4.2, 5.4.4.5 c) 5.4.4.9	**TABLE: Distance through insulation measurements**				N/A
Distance through insulation di at/of:	Peak voltage (V)	Frequency (kHz)	Material	Required DTI (mm)	DTI (mm)
Supplementary information:					

5.4.9	TABLE: Electric strength tests			N/A
Test voltage applied between:		Voltage shape (AC, DC)	Test voltage (V)	Breakdown Yes / No
Functional:				
Basic/supplementary:				
Reinforced:				
Routine Tests:				
Supplementary information:				

5.5.2.2	TABLE: Stored discharge on capacitors				N/A
Supply Voltage (V), Hz	Test Location	Operating Condition (N, S)	Switch position On or off	Measured Voltage (after 2 seconds)	ES Classification
Supplementary information:					

X-capacitors installed for testing are:
[ ] bleeding resistor rating:
[ ] ICX:
Notes:
A. Test Location:
Phase to Neutral; Phase to Phase; Phase to Earth; and/or Neutral to Earth
B. Operating condition abbreviations:
N – Normal operating condition (e.g., normal operation, or open fuse); S –Single fault condition

5.6.6.2	TABLE: Resistance of protective conductors and terminations				N/A
Accessible part		Test current (A)	Duration (min)	Voltage drop (V)	Resistance (Ω)
Supplementary information:					

5.7.2.2, 5.7.4	TABLE: Earthed accessible conductive part		N/A
Supply voltage .....:			—
Location		Test conditions specified in 6.1 of IEC 60990 or Fault Condition No in IEC 60990 clause 6.2.2.1 through 6.2.2.8, except for 6.2.2.7	Touch current (mA)
		1	
		2*	
		3	
		4	
		5	
		6	
		8	
Supplementary Information:			

Notes:
[1] Supply voltage is the anticipated maximum Touch Voltage

[2] Earthed neutral conductor [Voltage differences less than 1% or more]

[3] Specify method used for measurement as described in IEC 60990 sub-clause 4.3

[4] IEC60990, sub-clause 6.2.2.7, Fault 7 not applicable.

[5] (*) IEC60990, sub-clause 6.2.2.2 is not applicable if switch or disconnect device (e.g., appliance coupler) provided.

6.2.2	Table: Electrical power sources (PS) measurements for classification				P
Source	Description	Measurement	Max Power after 3 s	Max Power after 5 s*)	PS Classification
A		Power (W) :	5.84		PS1
		V_A (V) :	2.78		
		I_A (A) :	2.10		
B		Power (W) :	0.13		PS1
		V_A (V) :	1.43		
		I_A (A) :	0.09		
C		Power (W) :		>100	PS3*1
		V_A (V) :	24		
		I_A (A) :			
D		Power (W) :			
		V_A (V) :			
		I_A (A) :			
Supplementary Information:					
(*) Measurement taken only when limits at 3 seconds exceed PS1 limits					
(PS3*1) PS3 is a circuit whose power source exceeds PS2 limits, or any circuit whose power source has not been classified					

6.2.3.1	Table: Determination of Potential Ignition Sources (Arcing PIS)			N/A
Location	Open circuit voltage After 3 s (Vp)	Measured r.m.s current (Irms)	Calculated value (V_p x I_{rms})	Arcing PIS? Yes / No
Supplementary information:				
An Arcing PIS requires a minimum of 50 V (peak) a.c. or d.c. An Arcing PIS is established when the product of the open circuit voltage (V_p) and normal operating condition rms current (I_{rms}) is greater than 15.				

6.2.3.2	Table: Determination of Potential Ignition Sources (Resistive PIS)				P
Circuit Location (x-y)	Operating Condition (Normal / Describe Single Fault)	Measured wattage or VA During first 30 s (W / VA)	Measured wattage or VA After 30 s (W / VA)	Protective Circuit, Regulator, or PTC Operated? Yes / No (Comment)	Resistive PIS? Yes/No
DC in	NC	4.62		No	No
DC in	SFC	5.92[1]		No	No
Supplementary Information:					
A combination of voltmeter, VA and ammeter IA may be used instead of a wattmeter. If a separate voltmeter and ammeter are used, the product of (VA x IA) is used to determine Resistive PIS classification. A Resistive PIS: (a) dissipates more than 15 W, measured after 30 s of normal operation, or (b) under single fault conditions has either a power exceeding 100 W measured immediately after the introduction of the fault if electronic circuits, regulators or PTC devices are used, or has an available power exceeding 15 W measured 30 s after introduction of the fault. [1] SC C129 (see B.4)					

8.5.5	TABLE: High Pressure Lamp	N/A
Description	Values	Energy Source Classification
Lamp type .....:		—
Manufacturer.....:		—
Cat no.....:		—
Pressure (cold) (MPa) .....:		MS_
Pressure (operating) (MPa).....:		MS_
Operating time (minutes).....:		—
Explosion method .....:		—
Max particle length escaping enclosure (mm).:		MS_
Max particle length beyond 1 m (mm) .....:		MS_
Overall result .....:		
Supplementary information:		

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
Supplementary information:								
Equipment may be have rated current or rated power or both. Both should be measured								

B.3	TABLE: Abnormal operating condition tests							N/A
Ambient temperature (°C) .....:								—
Power source for EUT: Manufacturer, model/type, output rating ..:								—
Component No.	Abnormal Condition	Supply voltage, (V)	Test time (ms)	Fuse no.	Fuse current, (A)	T-couple	Temp. (°C)	Observation
Supplementary information:								
Test table is provided to record abnormal and fault conditions for all applicable energy sources including Thermal burn injury. Column “Abnormal/Fault.” Specify if test condition by indicating “Abnormal” then the condition for a Clause B.3 test or “Single Fault” then the condition for Clause B.4.								

B.4	TABLE: Fault condition tests								N/A
Ambient temperature (°C) .....:									—
Power source for EUT: Manufacturer, model/type, output rating ..:									—
Component No.	Fault Condition	Supply voltage, (V)	Test time (ms)	Fuse no.	Fuse current, (A)	T-couple	Temp. (°C)	Observation	
Supplementary information:									

Annex M.3	TABLE: Batteries									P
The tests of Annex M are applicable only when appropriate battery data is not available										
Is it possible to install the battery in a reverse polarity position? .....:										
	Non-rechargeable batteries			Rechargeable batteries						
	Discharging		Un-intentional charging	Charging		Discharging		Reversed charging		
	Meas. current	Manuf. Specs.		Meas. current	Manuf. Specs.	Meas. current	Manuf. Specs.	Meas. current	Manuf. Specs.	
Max. current during normal condition				0.116A		0.241A				
Max. current during fault condition				No charching (SC U7 Pin 4 & Pin 3)		--				
Test results:									Verdict	
- Chemical leaks								No	P	
- Explosion of the battery								No	P	
- Emission of flame or expulsion of molten metal								No	P	
- Electric strength tests of equipment after completion of tests										
Supplementary information:										

Annex M.3	**TABLE: Batteries**	**P**
The tests of Annex M are applicable only when appropriate battery data is not available		
Is it possible to install the battery in a reverse polarity position? .....:		

Button cell	Non-rechargeable batteries			Rechargeable batteries					
	Discharging		Un-intentional charging	Charging		Discharging		Reversed charging	
	Meas. current	Manuf. Specs.		Meas. current	Manuf. Specs.	Meas. current	Manuf. Specs.	Meas. current	Manuf. Specs.
Max. current during normal condition	0.09A								
Max. current during fault condition									

Test results:		Verdict
- Chemical leaks	No	P
- Explosion of the battery	No	P
- Emission of flame or expulsion of molten metal	No	P
- Electric strength tests of equipment after completion of tests		
Supplementary information:		

Annex M.4	**Table: Additional safeguards for equipment containing secondary lithium batteries**	**P**

Battery/Cell No.	Test conditions	Measurements			Observation
		U	I (A)	Temp (C)	
	Normal				
	Abnormal				
	Single fault –SC/OC				
	Normal				
	Abnormal				
	Single fault – SC/OC				
Supplementary Information:					

Battery identification	Charging at T_{lowest} (°C)	Observation	Charging at $T_{highest}$ (°C)	Observation
	0.1		45.0	
Supplementary Information:				

Annex Q.1	**TABLE: Circuits intended for interconnection with building wiring (LPS)**	**P**

Note: Measured UOC (V) with all load circuits disconnected:

Output Circuit	Components	U_{oc} (V)	I_{sc} (A)		S (VA)	
			Meas.	Limit	Meas.	Limit
Open circuit	Battery, 3.7V	4.00	0.00	8	0.00	<100
Load	Battery, 3.7V	3.81	0.50	8	1.90	<100
Load	Battery, 3.7V	3.56	1.00	8	3.56	<100
Load	Battery, 3.7V	3.29	1.50	8	4.94	<100
Load	Battery, 3.7V	2.90	2.00	8	5.80	<100
Load	Battery, 3.7V	2.78	2.10	8	5.84	<100
Short circuit	Battery, 3.7V	0.00	15.72	8	0.00	<100

Supplementary Information:

SC=Short circuit, OC=Open circuit

Annex Q.1	**TABLE: Circuits intended for interconnection with building wiring (LPS)**	**P**

Note: Measured UOC (V) with all load circuits disconnected:

Output Circuit	Components	U_{oc} (V)	I_{sc} (A)		S (VA)	
			Meas.	Limit	Meas.	Limit
Open circuit	Button cell, 3V	3.00	0.00	8	0.00	<100
Load	Button cell, 3V	2.72	0.006	8	0.02	<100
Load	Button cell, 3V	1.43	0.09	8	0.13	<100
Load	Button cell, 3V	0.06	0.16	8	0.01	<100
Short circuit	Button cell, 3V	0.00	0.24	8	0.00	<100

Supplementary Information:

SC=Short circuit, OC=Open circuit

T.2, T.3, T.4, T.5	TABLE: Steady force test	P

Part/Location	Material	Thickness (mm)	Force (N)	Test Duration (sec)	Observation
T.2	Wires inside the EUT	--	10N	5	P
T.3	Fire enclosure	--	30N	5	P
T.4	--	--	100N	5	P
T.5	Enclosure	--	250N	5	P
Supplementary information:					

T.6, T.9	TABLE: Impact tests	P

Part/Location	Material	Thickness (mm)	Vertical distance (mm)	Observation
T.6	Enclosure	--	1300mm, 500g	P
Supplementary information:				

T.7	TABLE: Drop tests	N/A

Part/Location	Material	Thickness (mm)	Drop Height (mm)	Observation
Supplementary information:				

T.8	TABLE: Stress relief test	P

Part/Location	Material	Thickness (mm)	Oven Temperature (°C)	Duration (h)	Observation
T.8	Enclosure	--	70°C	7h	P
Supplementary information:					

List of test equipment			
No.	Equipment	Inv. No.	Next Calibration
1	Multimeter	300003200	13.05.2023
2	Multimeter	400000231	21.08.2023
3	Multimeter	400000710	12.05.2023
4	Multimeter	300005378	15.05.2023
5	Temperature recorder	300002746	03.10.2023
6	Temp & Humidity logger	400001305	23.03.2023
7	DC Power Supply	400000305	--
8	Temperature Test Chamber	300004779	30.09.2024
9	Push & pull dynamometer 100N	400000875	02.11.2023
10	Push & pull dynamometer 250N	400000876	17.10.2023
11	Steel ball 500 g	400000568	09.11.2023

Annex 1: Photo documentation

Photo 1

Photo 2

Photo 3

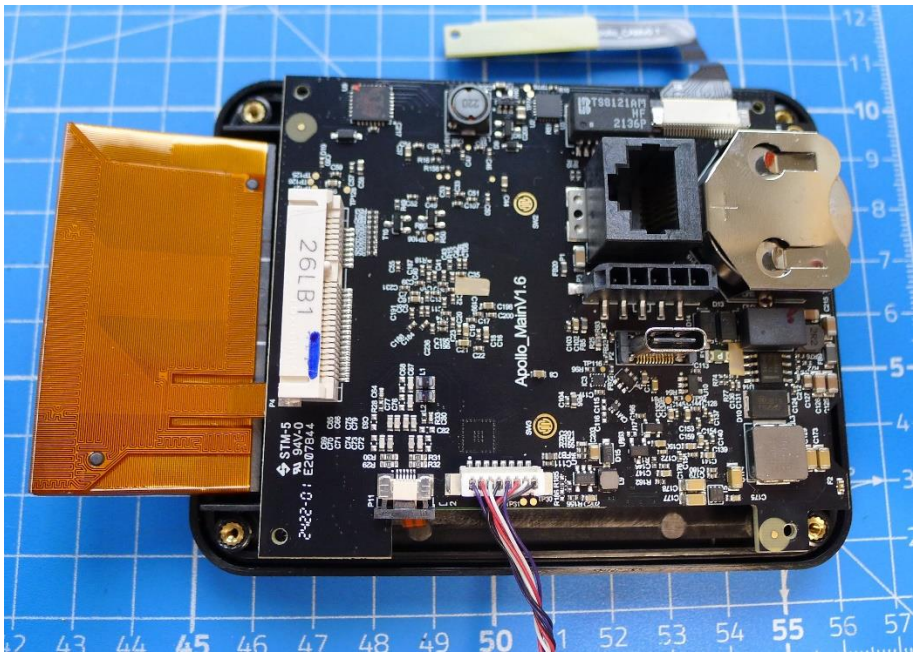


Photo 4

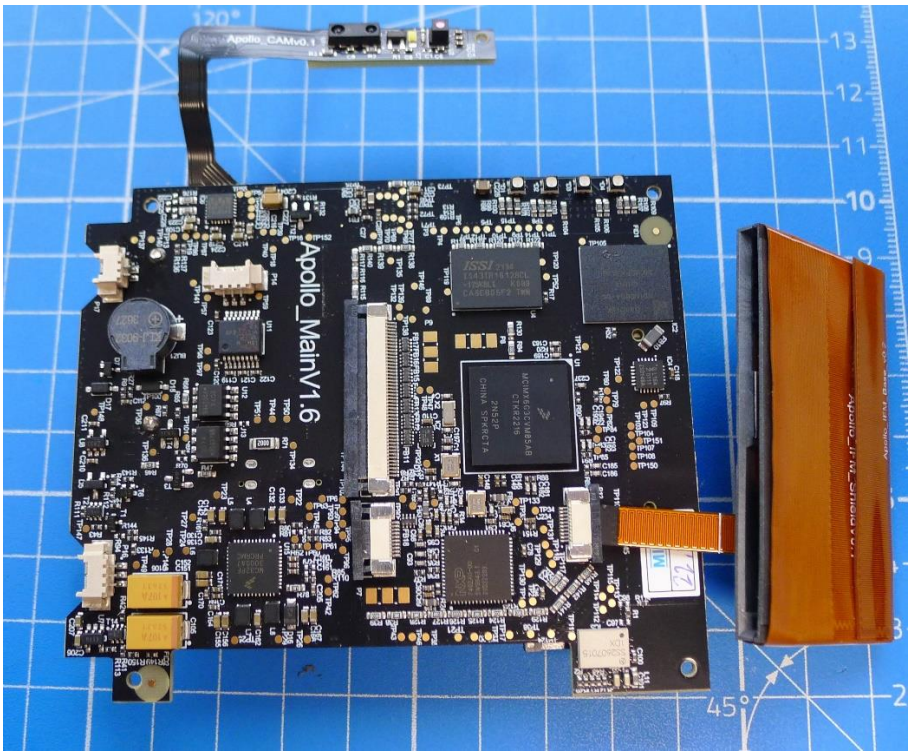


Photo 5

Photo 6

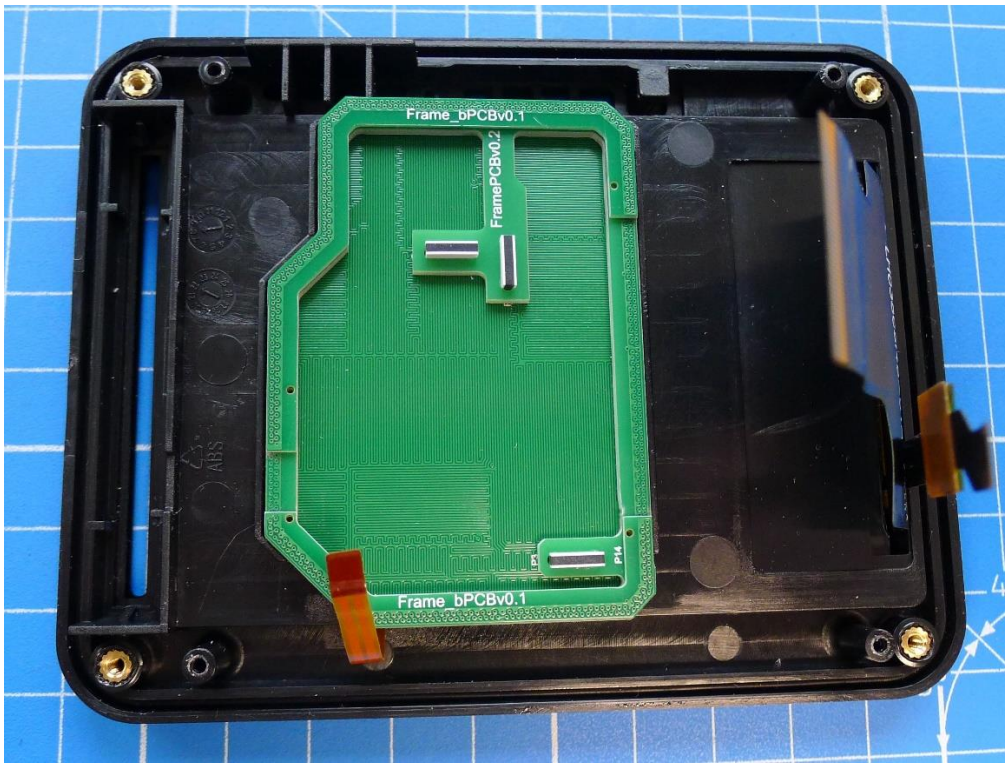


Photo 9