



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..... : LIVSAF_CB.48233

Date of issue : November 6, 2022

Total number of pages : 105

**Name of Testing Laboratory
preparing the Report :** Hermon Laboratories Ltd.

Applicant's name : LiveU Inc.

Address : 2 University Plaza Drive, Suite 505, Hackensack,
New Jersey 07601, USA

Test specification:

Standard : IEC 62368-1:2018 (Ed.3)

Test procedure..... : CB Scheme

Non-standard test method..... : N/A

TRF template used. : IECEE OD-2020-F1:2020, Ed.1.4

Test Report Form No..... : IEC62368_1E

Test Report Form(s) Originator.... : UL(US)

Master TRF : Dated 2022-04-14

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The test results presented in this report relate only to the object tested.

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Test item description	Live Video Uplink System	
Trade Mark		
Manufacturer	LiveU Ltd.	
Model/Type reference	1) LU300S-XXXX-XXXX-XXXX-XXXX-XXXX 2) LU300S-VM-XXXX-XXXX-XXXX-XXXX-XXXX / LU300S-AB-XXXX-XXXX-XXXX-XXXX-XXXX 3) LU-SOLO-PRO-XXXX-XXXX-XXXX-XXXX-XXXX	
Ratings	1) 12-19VDC, 4.2-2.7A from external charger, and/or 7.2V, 6.7Ah, 48.2Wh from internal battery 2) 12-19VDC, 4.2-2.7A from external charger or battery, and/or 7.4V, 4000mAh, 29.6Wh from internal battery 3) 20VDC, 3.25A, 45W from external USB-C charger, and/or 7.2V, 6.7Ah, 48.2Wh from internal battery	
Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):		
<input checked="" type="checkbox"/>	CB Testing Laboratory:	Hermon Laboratories Ltd.
Testing location/ address		HaTachana road, P. O. Box 23, Binyamina 30500, Israel
Tested by (name, function, signature)		Mr. Ilan Benihass Team Leader, Product Safety 
Approved by (name, function, signature) ..		Mr. Michael Brun Product Safety Group Manager 
<input type="checkbox"/>	Testing procedure: CTF Stage 1:	
Testing location/ address		
Tested by (name, function, signature)		
Approved by (name, function, signature) ..		
<input type="checkbox"/>	Testing procedure: CTF Stage 2:	
Testing location/ address		
Tested by (name + signature)		
Witnessed by (name, function, signature) . :		
Approved by (name, function, signature) ..		
<input type="checkbox"/>	Testing procedure: CTF Stage 3:	
<input type="checkbox"/>	Testing procedure: CTF Stage 4:	
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):**Appendix A** – Equipment used for testing (1 page)**Appendix B** – Photo Documentation (10 page)**Summary of testing:****Tests performed (name of test and test clause):****For LIVSAF_CB.45656**

Name of test:	Test clause:
Safeguard robustness	4.4.4
Classification and limits of electrical energy sources	5.2
Electrical power sources (PS) measurements for classification	6.2.2
Temperature measurements	5.4.1.4, 6.3.2, 9.0, B.2.6
Input test	B.2.5
Abnormal operating condition tests	B.3
Simulated single fault conditions	B.4
Test for the permanence of markings	F.3.10
Equipment containing batteries and their protection circuits	M
Limited power sources	Q.1

Not required for LIVSAF_CB.48233**Testing location:**

Hermon Laboratories Ltd.

HaTachana road, P. O. Box 23, Binyamina
30500, Israel**Summary of compliance with National Differences:****List of countries addressed:**

EU Group differences, Canada (CA), United States (US).

☒ **The product fulfils the requirements of EN 62368-1:2020+A11:2020, UL 62368-1:2019 and CSA C22.2 No. 62368-1:19**

Use of uncertainty of measurement for decisions on conformity (decision rule) :

☒ No decision rule is specified by the IEC standard, when comparing the measurement result with the applicable limit according to the specification in that standard. The decisions on conformity are made without applying the measurement uncertainty ("simple acceptance" decision rule, previously known as "accuracy method").

☐ Other:... (to be specified, for example when required by the standard or client, or if national accreditation requirements apply)

Information on uncertainty of measurement:

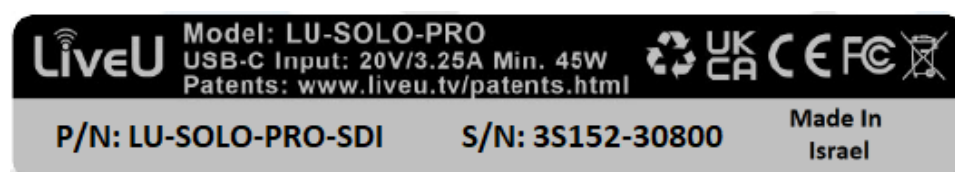
The uncertainties of measurement are calculated by the laboratory based on application of criteria given by OD-5014 for test equipment and application of test methods, decision sheets and operational procedures of IECEE.

IEC Guide 115 provides guidance on the application of measurement uncertainty principles and applying the decision rule when reporting test results within IECEE scheme, noting that the reporting of the measurement uncertainty for measurements is not necessary unless required by the test standard or customer.

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

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.

1) LU300S-5G2) LU300S-VM-5G3) LU-SOLO-PRO-SDI

Test item particulars:	
Product group	<input checked="" type="checkbox"/> end product <input type="checkbox"/> built-in component
Classification of use by	<input checked="" type="checkbox"/> Ordinary person <input checked="" type="checkbox"/> Children likely present <input checked="" type="checkbox"/> Instructed person <input checked="" type="checkbox"/> Skilled person
Supply connection	<input type="checkbox"/> AC mains <input type="checkbox"/> DC mains <input checked="" type="checkbox"/> not mains connected: <input checked="" type="checkbox"/> ES1 <input type="checkbox"/> ES2 <input type="checkbox"/> ES3
Supply tolerance	<input type="checkbox"/> +10%/-10% <input type="checkbox"/> +20%/-15% <input type="checkbox"/> +5%/ -5% <input checked="" type="checkbox"/> None
Supply connection – type	<input type="checkbox"/> pluggable equipment type A - <input type="checkbox"/> non-detachable supply cord <input type="checkbox"/> appliance coupler <input type="checkbox"/> direct plug-in <input type="checkbox"/> pluggable equipment type B - <input type="checkbox"/> non-detachable supply cord <input type="checkbox"/> appliance coupler <input type="checkbox"/> permanent connection <input type="checkbox"/> mating connector <input checked="" type="checkbox"/> other: DC powered by internal battery and/or external safety approved power supply and/or external battery
Considered current rating of protective device	<input checked="" type="checkbox"/> Location: <input type="checkbox"/> building <input checked="" type="checkbox"/> equipment <input type="checkbox"/> N/A
Equipment mobility	<input type="checkbox"/> movable <input checked="" type="checkbox"/> hand-held <input checked="" type="checkbox"/> transportable <input type="checkbox"/> direct plug-in <input type="checkbox"/> stationary <input type="checkbox"/> for building-in <input type="checkbox"/> wall/ceiling-mounted <input type="checkbox"/> SRME/rack-mounted <input type="checkbox"/> other:
Overvoltage category (OVC)	<input type="checkbox"/> OVC I <input type="checkbox"/> OVC II <input type="checkbox"/> OVC III <input type="checkbox"/> OVC IV <input checked="" type="checkbox"/> other: DC powered
Class of equipment	<input type="checkbox"/> Class I <input type="checkbox"/> Class II <input checked="" type="checkbox"/> Class III <input type="checkbox"/> Not classified <input type="checkbox"/>
Special installation location	<input checked="" type="checkbox"/> N/A <input type="checkbox"/> restricted access area <input type="checkbox"/> outdoor location <input type="checkbox"/>
Pollution degree (PD)	<input type="checkbox"/> PD 1 <input checked="" type="checkbox"/> PD 2 <input type="checkbox"/> PD 3
Manufacturer's specified T_{ma}	-5 to 45°C <input type="checkbox"/> Outdoor: minimum °C
IP protection class	<input checked="" type="checkbox"/> IPX0 <input type="checkbox"/> IP__
Power systems	<input type="checkbox"/> TN <input type="checkbox"/> TT <input type="checkbox"/> IT - V _{L-L} <input checked="" type="checkbox"/> not AC mains
Altitude during operation (m)	<input checked="" type="checkbox"/> 2000 m or less (using external charger). <input checked="" type="checkbox"/> 5000 m or less (powered from battery only)
Altitude of test laboratory (m)	<input checked="" type="checkbox"/> 2000 m or less <input type="checkbox"/> m
Mass of equipment (kg)	1, 3) 1.0kg 2) 1.1kg (including mounting plates)

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	Not required for LIVSAF_CB.48233 January 9, 2022 for LIVSAF_CB.45656
Date (s) of performance of tests	Not required for LIVSAF_CB.48233 January 11-27, 2022 for LIVSAF_CB.45656
General remarks:	
<p>"(See Enclosure #)" refers to additional information appended to the report. "(See appended table)" refers to a table appended to the report.</p> <p>Throughout this report a <input type="checkbox"/> comma / <input checked="" type="checkbox"/> point is used as the decimal separator.</p>	
Manufacturer's Declaration per sub-clause 4.2.5 of IEC62368-1:	
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 type="checkbox"/> Yes <input checked="" type="checkbox"/> Not applicable
When differences exist; they shall be identified in the General product information section.	
Name and address of factory (ies)	LiveU Ltd. 5 Hagavish St., Kfar Saba, 4442211, Israel
General product information and other remarks:	
<p>The EUTs, model (1) LU300S, (2) LU300S-VM / LU300S-AB and (3) LU-SOLO-PRO, are live video broadcast devices.</p> <p>Models (1) LU300S and (3) LU-SOLO-PRO mainly consists of a metal enclosure housing PCBs which are powered by similar internal rechargeable lithium battery (7.2VDC, 6.7Ah). Both EUTs are intended to be carried in a cloth bag.</p> <p>Model (2) LU300S-VM / LU300S-AB mainly consists of a metal enclosure housing PCBs which are powered by internal rechargeable lithium battery (7.4VDC, 4000mAh, 29.6Wh), or by external camera battery (16.8VDC, 7A max). EUT is intended to be carried between a camera and its battery, which are attached to each other by special mounting plates.</p> <p>All units (1-3) are enclosed in a fire enclosure in screen-up orientation, based on metal enclosure from the sides and bottom, and PCB on the top (PCB of the user interface).</p> <p>The internal battery at models (1) LU300S and (2) LU300S-VM / LU300S-AB can be charged and operated by external similar AC/DC adapter (16VDC, 4.07A), which provided with equipment (safety approved and LPS).</p> <p>The internal battery at model (3) LU-SOLO-PRO can be powered by external AC/DC adapter with USB type C (20VDC, 3.25A), which provided with equipment (safety approved and LPS).</p> <p>All EUTs (1-3) contains various data communication ports (Coax, Ethernet, HDMI and micro-USB), all of which are considered as external circuits which are installed wholly within the same building structure and not intended for connection to exposed outdoor lines.</p>	

All EUTs (1-3) are enclosed inside metal and plastic enclosure that is intend for indoor and outdoor use without environmental conditions, in the temperature range of -5 to +45°C, functions as mechanical protection and include circuits which are classified as ES1 (not exceed ES1 limits of 60VDC, 42.4Vpeak under normal and fault conditions).

Tested product details:

Model	Serial number	Hardware version	Software release
(1) LU300S-5G	Sample	A2	N/A
(2) LU300S-VM-5G / LU300S-AB-5G	Sample	A2	N/A
(3) LU-SOLO-PRO-SDI	Sample	A2	N/A

Report History:

November 6, 2022	LIVSAF_CB.48233	<ol style="list-style-type: none"> 1. Model family names of all models (1-3) were updated with new formula. (No changes in design and construction) 2. Model families (1-3) labels and general photos were updated accordingly. 3. Applicant details were changed to LiveU Inc. instead of LiveU Ltd. LiveU address was updated accordingly. 4. Due to those changes, no tests are required. 5. Minor editorial change for better clarity.
May 8, 2022	LIVSAF_CB.45656	Original report

Model Differences:

- The suffixes (XXXX, where X can be A-Z, 0-9 or blank) represents different system configurations SW / Video Interface / Modems, following customer or country demand (worst case configurations were tested):

- 1) Model LU300S-5G considered as worst-case configurations of LU300S-XXXX-XXXX-XXXX-XXXX-XXXX family.
- 2) Model LU300S-VM-5G considered as worst-case configurations of LU300S-VM-XXXX-XXXX-XXXX-XXXX-XXXX family.
- 3) Model LU-SOLO-PRO-SDI considered as worst-case configurations of LU-SOLO-PRO-XXXX-XXXX-XXXX-XXXX-XXXX family.

- Model families (2) LU300S-VM-XXXX-XXXX-XXXX-XXXX-XXXX and LU300S-AB-XXXX-XXXX-XXXX-XXXX-XXXX are electronically, electrically, and mechanically identical except for the external mounting plates mechanical design of plates plastic enclosure. VM represents IDX Company mounting plates while AB represents Anton Bauer mounting plates.

- Models (1) LU300S and (2) LU300S-VM are electrically identical, except for the internal battery and enclosure mechanics. Models 1 and 2 mechanics are different so that the (2) LU300S-VM has different battery cover (due to smaller battery dimensions) and includes external brackets for attaching the external battery and camera.

- Models (1) LU300S and model (3) LU-SOLO-PRO are electrically and mechanically identical consist similar PCB boards, same internal rechargeable lithium battery (7.2VDC, 6.7Ah), and same enclosure and differ by internal processor, external power source and input power connector (model (1) has DC jack and powered by external AC/DC adapter and model (3) have USB type C connector and powered by external AC/DC USB type C power adapter).

Additional application considerations – (Considerations used to test a component or sub-assembly):

- Model (1) LU300S was tested as representatives of the worst-case assemblies between the (1) LU300S and (2) LU300S-VM models since (1) LU300S contains larger battery (in capacity and power aspects).
- Model (3) LU-SOLO-PRO was fully tested.
- Heating and fault tests were performed on model (1) LU300S which is considered as representative of the worst-case assembly option for these tests (stronger battery) between models (1) LU300S and (2) LU300S-VM, however, selective temperature and fault tests were performed on the (2) LU300S-VM since it has a bracket for external battery connection.
- SDI IN port (Coax) intended for transmission of video and/or audio signals in the short term and not between separate buildings or between outdoor antennas and buildings.
- All EUTs are hand-held, transportable, intended for indoor or outdoor use without environmental conditions, and shall not be interconnected with ungrounded outdoor equipment exposed to overvoltage or lightning.
- In model (2) LU300S-VM / LU300S-AB, the external battery is evaluated as PS3. For this purpose, it is assumed that the operation is only with the screen-up orientation in order to fulfil the fire enclosure requirements.

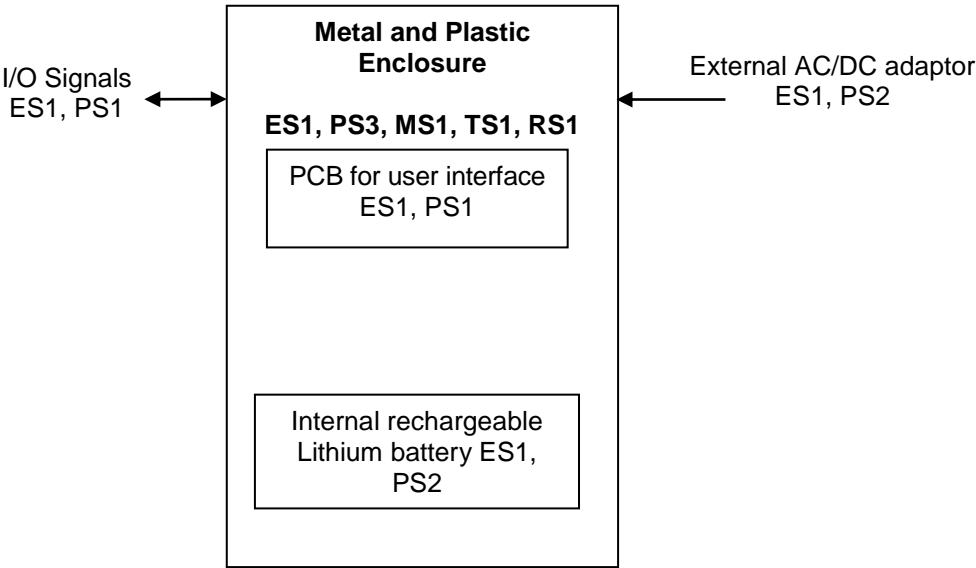
OVERVIEW OF ENERGY SOURCES AND SAFEGUARDS				
Clause	Possible Hazard			
5	Electrically-caused injury			
Class and Energy Source (e.g. ES3: Primary circuit)	Body Part (e.g. Ordinary)	Safeguards		
		B	S	R
1) LU300S				
ES1: Internal secondary circuits which are powered by 7.2VDC from internal rechargeable Lithium battery ES1: Circuits which are powered by 12-19VDC from external AC/DC adapter (charger)	Ordinary person / Instructed person / Skilled person	N/A	N/A	N/A
2) LU300S-VM				
ES1: Internal secondary circuits which are powered by 7.4VDC from internal rechargeable Lithium battery ES1: Circuits which are powered by 12-19VDCfrom external AC/DC adapter (charger) ES1: Circuits which are powered by 16.8VDC max from an external battery	Ordinary person / Instructed person / Skilled person	N/A	N/A	N/A
3) LU-SOLO-PRO				
ES1: Internal secondary circuits which are powered by 7.2VDC from internal rechargeable Lithium battery ES1: Circuits which are powered by 20VDC from external AC/DC adapter (charger)	Ordinary person / Instructed person / 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
1) LU300S				
PS2: Output of internal Lithium battery pack 7.2VDC, 6.7Ah, 48.2Wh	Enclosure and internal Components	Protection circuits in battery	Protection circuits in EUT	-
PS2: External safety approved AC/DC power adapter that provides 16VDC, 4.07A	External AC/DC adapter (charger) output	Normal temperatures below ignition temperatures	All components mounted on V-1 class material or better. No ignition during single	-

			fault condition	
2) LU300S-VM				
PS3: Output of external battery 16.8VDC, 7A	Circuits connected to External battery	Normal temperatures below ignition temperatures	All components mounted on V-1 class material or better. No ignition during single fault condition. Safety approved battery	Fire enclosure (screen-up orientation)
PS2: Output of internal Lithium battery pack 7.4VDC, 4Ah, 29.6Wh	Enclosure and internal Components	Protection circuits in battery	Protection circuits in EUT	-
PS2: External safety approved AC/DC power adapter that provides 16VDC, 4.07A	External AC/DC adapter (charger) output	Normal temperatures below ignition temperatures	All components mounted on V-1 class material or better. No ignition during single fault condition	-
3) LU-SOLO-PRO				
PS2: Output of internal Lithium battery pack 7.2VDC, 6.7Ah, 48.2Wh	Enclosure and internal Components	Protection circuits in battery	Protection circuits in EUT	-
PS2: External safety approved AC/DC type C power adapter that provides 20VDC, 3.25A	External AC/DC adapter (charger) output	Normal temperatures below ignition temperatures	All components mounted on V-1 class material or better. No ignition during single fault condition	-
7	Injury caused by hazardous substances			
Class and Energy Source (e.g. Ozone)	Body Part (e.g., Skilled)	Safeguards		
		B	S	R
Ordinary person / Instructed person / Skilled person	Internal battery pack (used for all models 1-3)	Protection circuits in the battery and in EUT	Plastic wrap	Enclosure
8	Mechanically-caused injury			
Class and Energy Source	Body Part	Safeguards		

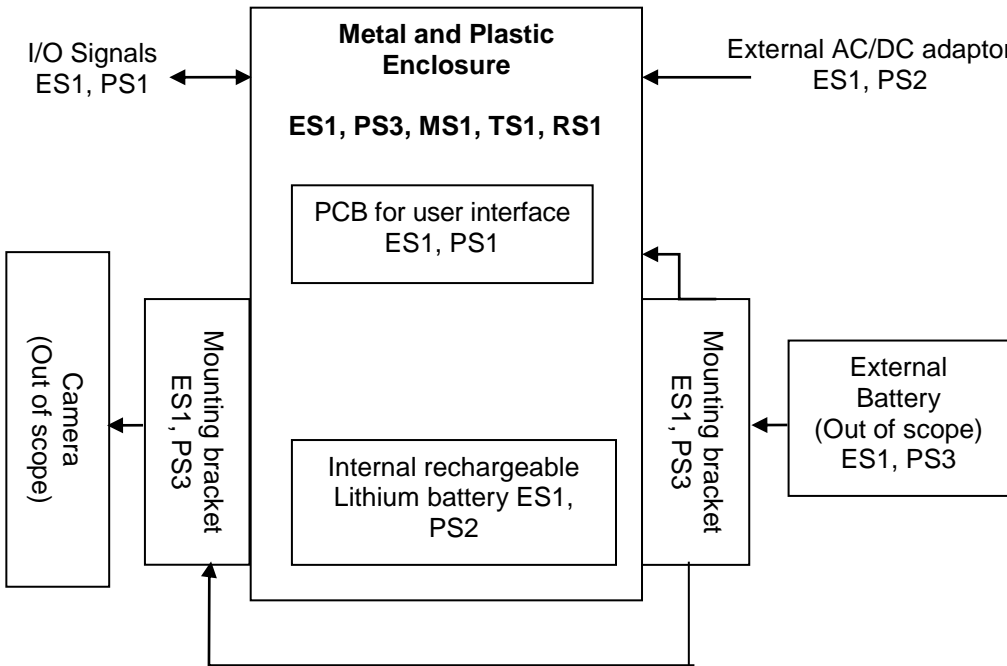
(e.g. MS3: Plastic fan blades)	(e.g. Ordinary)	B	S	R
1-3) MS1: Equipment mass	Ordinary person / Instructed person / Skilled person	N/A	N/A	N/A
1-3) MS1: Sharp edges and corners	Ordinary person / Instructed person / Skilled person	N/A	N/A	N/A
9	Thermal burn			
Class and Energy Source (e.g. TS1: Keyboard caps)	Body Part (e.g., Ordinary)	Safeguards		
		B	S	R
1-3) TS1: Accessible enclosure surfaces	Ordinary person / Instructed person / Skilled person	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
1-3) RS1: LED and display indicators	Ordinary person / Instructed person / Skilled person	N/A	N/A	N/A
Supplementary Information:				
“B” – Basic Safeguard; “S” – Supplementary Safeguard; “R” – Reinforced Safeguard				

ENERGY SOURCE DIAGRAM
<p>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.</p> <p>Insert diagram below. Example diagram designs are; Block diagrams; image(s) with layered data; mechanical drawings</p>
<div>X ES X PS X MS X TS X RS</div>

For model (1) LU300S and (3) LU-SOLO-PRO



For model (2) LU300S-VM



IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
4	GENERAL REQUIREMENTS		P
4.1.1	Acceptance of materials, components and subassemblies	See appended table 4.1.2	P
4.1.2	Use of components	All safety critical components are certified or were tested according to this standard. Certified components are used in accordance with their ratings, certifications and they comply with applicable parts of this standard.	P
4.1.3	Equipment design and construction	Considered	P
4.1.4	Specified ambient temperature for outdoor use (°C) :	Not for permanent outdoor use	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	1) LU300S-5G and 2) LU300S-VM-5G EUTs are safety class III, the equipment, powered by 7.2/7.4VDC from internal rechargeable Lithium battery which can be charged by external AC/DC adaptor. The adaptor provides 16VDC considered as ES1/PS2. 3) LU-SOLO-PRO-SDI EUT is safety class III, powered by 7.4VDC from internal rechargeable Lithium battery which can be charged by external AC/DC type C adaptor. The adaptor provides 20VDC considered as ES1/PS2. 2) LU300S-VM-5G Output of external battery 16.8VDC is evaluated as ES1/PS3 1-3) all models EUTs are transportable and hand-held.	P
4.4.3.1	General		P
4.4.3.2	Steady force tests	Tested according to T.4	P

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
4.4.3.3	Drop tests	Tested as part of Annex M requirements (see also T.7)	P
4.4.3.4	Impact tests	Considered as hand-held and transportable equipment	N/A
4.4.3.5	Internal accessible safeguard tests	No such accessible internal solid safeguards	N/A
4.4.3.6	Glass impact tests	No parts made of glass are using as safeguard	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	EUTs classified as class III equipment. Test is not required for PS3 energy source. Safety approved plastic parts are adequate for their use – inspected by material datasheet	P
4.4.3.9	Air comprising a safeguard	No such safeguard in use	N/A
4.4.3.10	Accessibility, glass, safeguard effectiveness	All safeguards remained effective	P
4.4.4	Displacement of a safeguard by an insulating liquid	No such liquids	N/A
4.4.5	Safety interlocks	No such interlocks	N/A
4.5	Explosion		P
4.5.1	General	No explosion occurs during normal/abnormal operation and single fault conditions	P
4.5.2	No explosion during normal/abnormal operating condition	See Clause B.2, B.3	P
	No harm by explosion during single fault conditions	See Clause B.4	P
4.6	Fixing of conductors		P
	Fix conductors not to defeat a safeguard	EUTs classified as class III equipment. All the conductors are adequately terminated	P
	Compliance is checked by test :	Conductors cannot defeat safeguards Tested to comply	P
4.7	Equipment for direct insertion into mains socket-outlets		N/A
4.7.2	Mains plug part complies with relevant standard .. :	Not a direct plug-in equipment	N/A
4.7.3	Torque (Nm) :	As above	N/A
4.8	Equipment containing coin/button cell batteries		N/A
4.8.1	General	No coin/button cell batteries	N/A

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
4.8.2	Instructional safeguard		N/A
4.8.3	Battery compartment door/cover construction		N/A
	Open torque test		N/A
4.8.4.2	Stress relief test		N/A
4.8.4.3	Battery replacement test		N/A
4.8.4.4	Drop test		N/A
4.8.4.5	Impact test		N/A
4.8.4.6	Crush test		N/A
4.8.5	Compliance		N/A
	30N force test with test probe		N/A
	20N force test with test hook		N/A
4.9	Likelihood of fire or shock due to entry of conductive object		P
4.10	Component requirements		N/A
4.10.1	Disconnect Device	1, 2) EUTs are Safety class III equipment powered by up to 19VDCmax from r external charger (AC/DC adapter). 3) EUT is Safety class III equipment powered by up to 20VDC max from r external charger (AC/DC adapter). Evaluated as ES1. Safeguards and disconnect device are not required	N/A
4.10.2	Switches and relays	No such parts which affect safety	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	EUTs are safety class III. powered by: 1) LU300S-5G ES1: Internal secondary circuits which are powered by 7.2VDC from internal rechargeable Lithium battery ES1: Circuits which are powered by 12-19VDC from external AC/DC adapter (charger)	P

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
		2) LU300S-VM-5G ES1: Internal secondary circuits which are powered by 7.4VDC from internal rechargeable Lithium battery ES1: Circuits which are powered by 12-19VDC from external AC/DC adapter (charger) ES1: Circuits which are powered by 16.8VDC max from an external battery 3) LU-SOLO-PRO-SDI ES1: Internal secondary circuits which are powered by 7.2VDC from internal rechargeable Lithium battery ES1: Circuits which are powered by 20VDC from external AC/DC adapter (USB-C charger)	
5.2.2.2	Steady-state voltage and current limits	See appended table 5.2	P
5.2.2.3	Capacitance limits	Electrical energy source is not a capacitor	N/A
5.2.2.4	Single pulse limits	Electrical energy source is not a single pulse	N/A
5.2.2.5	Limits for repetitive pulses	Electrical energy source is not a repetitive pulses	N/A
5.2.2.6	Ringing signals	Electrical energy source is not an analogue telephone ringing signal	N/A
5.2.2.7	Audio signals	No input for audio signals, only earphones connection for audio output. Electrical energy source is not comprised of audio signals	N/A
5.3	Protection against electrical energy sources		N/A
5.3.1	General Requirements for accessible parts to ordinary, instructed and skilled persons	Classified as ES1 circuits. Safeguards not required for ES1	N/A
5.3.1 a)	Accessible ES1/ES2 derived from ES2/ES3 circuits	No ES2 or ES3 circuits	N/A
5.3.1 b)	Skilled persons not unintentional contact ES3 bare conductors		N/A
5.3.2.1	Accessibility to electrical energy sources and safeguards		N/A
	Accessibility to outdoor equipment bare parts		N/A

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
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	Electrical energy source is classified as ES1 – Safeguard is not required. Internal circuits are considered secondary safe which do not require insulating material. Functional insulation only is provided in EUTs.	N/A
5.4.1.3	Material is non-hygroscopic	Hygroscopic materials are not used as insulation	N/A
5.4.1.4	Maximum operating temperature for insulating materials	Insulation materials not in use	N/A
5.4.1.5	Pollution degrees	Pollution degree 2	N/A
5.4.1.5.2	Test for pollution degree 1 environment and for an insulating compound	Pollution degree 2 applies	N/A
5.4.1.5.3	Thermal cycling test	As above	N/A
5.4.1.6	Insulation in transformers with varying dimensions	No transformers	N/A
5.4.1.7	Insulation in circuits generating starting pulses	No such circuits	N/A
5.4.1.8	Determination of working voltage	1) LU300S-5G 7.2VDC from internal rechargeable Lithium battery. 12-19VDC from external AC/DC adapter (charger). 2) LU300S-VM-5G 7.4VDC from internal rechargeable Lithium battery. 12-19VDC from external AC/DC adapter (charger) or from external battery. 3) LU-SOLO-PRO-SDI 7.2VDC from internal rechargeable Lithium battery. 20VDC from external AC/DC adapter (charger).	P
5.4.1.9	Insulating surfaces	No insulating surfaces which accessible	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
5.4.1.10	Thermoplastic parts on which conductive metallic parts are directly mounted	No such parts	N/A
5.4.1.10.2	Vicat test.....:		N/A
5.4.1.10.3	Ball pressure test		N/A
5.4.2	Clearances	Electrical energy source classified as ES1 – Safeguards are not required (no basic, supplementary or reinforced insulation) All circuits are secondary, provided with functional insulation. No special requirements for clearances at functional insulation	P
5.4.2.1	General requirements		P
	Clearances in circuits connected to AC Mains, Alternative method		N/A
5.4.2.2	Procedure 1 for determining clearance		N/A
	Temporary overvoltage		—
5.4.2.3	Procedure 2 for determining clearance		N/A
5.4.2.3.2.2	a.c. mains transient voltage		—
5.4.2.3.2.3	d.c. mains transient voltage		—
5.4.2.3.2.4	External circuit transient voltage.....		—
5.4.2.3.2.5	Transient voltage determined by measurement		—
5.4.2.4	Determining the adequacy of a clearance using an electric strength test		N/A
5.4.2.5	Multiplication factors for clearances and test voltages		N/A
5.4.2.6	Clearance measurement	As above	N/A
5.4.3	Creepage distances	Electrical energy sources are classified as ES1 – Safeguards are not required (no basic, supplementary or reinforced insulation). All circuits are secondary provided with functional insulation. No special requirements for creepages at functional insulation	P
5.4.3.1	General		P
5.4.3.3	Material group	Material group IIIb is assumed to be used	—

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Clause	Requirement + Test	Result - Remark	Verdict
5.4.3.4	Creepage distances measurement	No special requirements for creepages at functional insulation	P
5.4.4	Solid insulation	Electrical energy source classified as ES1 – Safeguards are not required (no basic, supplementary, or reinforced insulation). Functional insulation only provided in EUTs	N/A
5.4.4.1	General requirements		N/A
5.4.4.2	Minimum distance through insulation		N/A
5.4.4.3	Insulating compound forming solid insulation		N/A
5.4.4.4	Solid insulation in semiconductor devices		N/A
5.4.4.5	Insulating compound forming cemented joints	No such 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
	Number of layers (pcs)		N/A
5.4.4.6.4	Standard test procedure for non-separable thin sheet material		N/A
5.4.4.6.5	Mandrel test		N/A
5.4.4.7	Solid insulation in wound components	No such components	N/A
5.4.4.9	Solid insulation at frequencies >30 kHz, E_P , K_R , d , V_{PW} (V)		N/A
	Alternative by electric strength test, tested voltage (V), K_R		N/A
5.4.5	Antenna terminal insulation	The EUTs include internal Cellular modules. No external antenna terminals	N/A
5.4.5.1	General		N/A
5.4.5.2	Voltage surge test		N/A
5.4.5.3	Insulation resistance (M Ω)		N/A
	Electric strength test		N/A
5.4.6	Insulation of internal wire as part of supplementary safeguard	No supplementary safeguards are in use	N/A
5.4.7	Tests for semiconductor components and for cemented joints	No such devices or cemented joints	N/A
5.4.8	Humidity conditioning	Hygroscopic materials are not used as insulation	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Relative humidity (%), temperature (°C), duration (h)		—
5.4.9	Electric strength test	Electrical energy source classified as ES1 – Safeguards are not required (no basic, supplementary or reinforced insulation). Functional insulation only provided in EUTs.	N/A
5.4.9.1	Test procedure for type test of solid insulation.....		N/A
5.4.9.2	Test procedure for routine test		N/A
5.4.10	Safeguards against transient voltages from external circuits	EUTs contain various data communication ports (Coax, Ethernet, HDMI and mini-USB) which considered as external circuits which installed wholly within the same building structure and not intended for connection to exposed outdoor lines. Transients are not considered for such EUTs. Appropriate warning provided at manual.	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	No such parts	N/A
5.4.11.1	Exceptions to separation between external circuits and earth		N/A
5.4.11.2	Requirements		N/A
	SPDs bridge separation between external circuit and earth		N/A
	Rated operating voltage U_{op} (V)		—
	Nominal voltage U_{peak} (V)		—
	Max increase due to variation ΔU_{sp}		—
	Max increase due to ageing ΔU_{sa}		—
5.4.11.3	Test method and compliance		N/A
5.4.12	Insulating liquid		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
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		N/A
5.5.1	General	Electrical energy source classified as ES1 – Safeguards are not required (no basic, supplementary or reinforced insulation). Functional insulation only provided in EUTs. Components are not used as safeguard.	N/A
5.5.2	Capacitors and RC units	No such capacitors and RC units which used as safeguards	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	No such transformers which used as safeguards	
5.5.4	Optocouplers	No such components which used as safeguards	N/A
5.5.5	Relays	As above	N/A
5.5.6	Resistors	As above	N/A
5.5.7	SPDs	As above	N/A
5.5.8	Insulation between the mains and an external circuit consisting of a coaxial cable	Class III equipment. Not connected to mains.	N/A
5.5.9	Safeguards for socket-outlets in outdoor equipment	No socket-outlets	N/A
	RCD rated residual operating current (mA)		—
5.6	Protective conductor		N/A
5.6.2	Requirement for protective conductors	Protective earthing conductors not required. Electrical energy sources are classified as ES1 – Safeguards not required. No provision for earthing	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	As above	N/A
	Protective earthing conductor size (mm ²)		—

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Clause	Requirement + Test	Result - Remark	Verdict
	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	No Protective bonding conductors in use at EUTs	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	No Protective earthing terminals	N/A
5.6.5.1	Terminal size for connecting protective earthing conductors (mm)..... :		N/A
	Terminal size for connecting protective bonding conductors (mm) :		N/A
5.6.5.2	Corrosion		N/A
5.6.6	Resistance of the protective bonding system	No Protective earthing and 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	No earthing requirement	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		N/A
5.7.2	Measuring devices and networks	DC powered. No direct connection to the mains supply	N/A
5.7.2.1	Measurement of touch current		N/A
5.7.2.2	Measurement of voltage		N/A
5.7.3	Equipment set-up, supply connections and earth connections		N/A
5.7.4	Unearthed accessible parts :		N/A
5.7.5	Earthed accessible conductive parts :		N/A
5.7.6	Requirements when touch current exceeds ES2 limits		N/A
	Protective conductor current (mA) :		N/A
	Instructional Safeguard..... :		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
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	No mains	N/A
	Air gap (mm).....		N/A

6	ELECTRICALLY- CAUSED FIRE		P
6.2	Classification of PS and PIS		P
6.2.2	Power source circuit classifications	1) LU300S-5G PS2: Output of internal Lithium battery pack 7.2VDC, 6.7Ah, 48.2Wh PS2: External safety approved AC/DC power adapter that provides 16VDC, 4.07A 2) LU300S-VM-5G PS3: Output of external battery 16.8VDC, 7A PS2: Output of internal Lithium battery pack 7.4VDC, 4Ah, 29.6Wh PS2: External safety approved AC/DC power adapter that provides 16VDC, 4.07A 3) LU-SOLO-PRO-SDI PS2: Output of internal Lithium battery pack 7.2VDC, 6.7Ah, 48.2Wh PS2: External safety approved AC/DC type C power adapter that provides 20VDC, 3.25A	P
6.2.3	Classification of potential ignition sources	See appended table 6.2.2	P
6.2.3.1	Arcing PIS	The components are in secondary circuits (<50V peak). No arcing PIS	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
6.2.3.2	Resistive PIS	The components in power circuits dissipate less than 15W under normal conditions and is <100W in a single fault (<15W after 30s), except for external battery, which can be >100W under single fault	P
6.3	Safeguards against fire under normal operating and abnormal operating conditions		P
6.3.1	No ignition and attainable temperature value less than 90 % defined by ISO 871 or less than 300 °C for unknown materials	See appended table 5.4.1.5, 6.3.2, 9.0, B.2.6	P
	Combustible materials outside fire enclosure	No such parts	N/A
6.4	Safeguards against fire under single fault conditions		P
6.4.1	Safeguard method	Control of fire spread method was used	P
6.4.2	Reduction of the likelihood of ignition under single fault conditions in PS1 circuits	This method is not used	N/A
6.4.3	Reduction of the likelihood of ignition under single fault conditions in PS2 and PS3 circuits	As above	N/A
6.4.3.1	Supplementary safeguards		N/A
6.4.3.2	Single Fault Conditions		N/A
	Special conditions for temperature limited by fuse		N/A
6.4.4	Control of fire spread in PS1 circuits	No PS1	N/A
6.4.5	Control of fire spread in PS2 circuits	All accessible circuits meet the requirements of Annex Q	P
6.4.5.2	Supplementary safeguards	All components in PS2 circuits are mounted on V-1 class material or better and do not ignite during single fault conditions. See appended table B.4	P
6.4.6	Control of fire spread in PS3 circuits	Fire enclosure is provided (when using in screen-up orientation)	P
6.4.7	Separation of combustible materials from a PIS	1, 3) No PIS 2) Mounting plates plastic parts are at least V-0. Wires comply with relevant standards. See appended table 4.1.2.	P
6.4.7.2	Separation by distance		N/A
6.4.7.3	Separation by a fire barrier		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
6.4.8	Fire enclosures and fire barriers	1, 3) Powered from sources which are evaluated as PS2. No fire ignition during single fault conditions - fire enclosure is not required 2) Powered from sources which are evaluated as PS2 or PS3. No fire ignition during single fault conditions. Fire enclosure is provided (top part in the PCB of the user interface, which is classified as PS1)	P
6.4.8.2	Fire enclosure and fire barrier material properties		P
6.4.8.2.1	Requirements for a fire barrier	Enclosure is made of metal and V-1 min class material. See appended table 4.1.2	N/A
6.4.8.2.2	Requirements for a fire enclosure	As above	P
6.4.8.3	Constructional requirements for a fire enclosure and a fire barrier	Comply with fire enclosure in screen-up orientation	P
6.4.8.3.1	Fire enclosure and fire barrier openings		P
6.4.8.3.2	Fire barrier dimensions	No fire barriers are used	N/A
6.4.8.3.3	Top openings and properties	No top openings in screen-up orientation	N/A
	Openings dimensions (mm)..... :		N/A
6.4.8.3.4	Bottom openings and properties	Bottom openings (in screen-up orientation have largest dimension of 2.8mm (not exceeding 3mm in any dimension)	P
	Openings dimensions (mm)..... :	2.8mm	P
	Flammability tests for the bottom of a fire enclosure	Metal bottom	N/A
	Instructional Safeguard..... :		N/A
6.4.8.3.5	Side openings and properties	Enclosure cannot be opened by ordinary person	N/A
	Openings dimensions (mm)..... :		N/A
6.4.8.3.6	Integrity of a fire enclosure, condition met: a), b) or c)..... :	Fire enclosure made of metal	P
6.4.8.4	Separation of a PIS from a fire enclosure and a fire barrier distance (mm) or flammability rating..... :	1-3) Metal enclosure parts and V-1 PCB are using as fire enclosure 2) Mounting plates are V-0 rated	N/A
6.4.9	Flammability of insulating liquid..... :	No such insulating liquid	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
6.5	Internal and external wiring		P
6.5.1	General requirements	All internal wiring considered adequate for their application use	P
6.5.2	Requirements for interconnection to building wiring :	No such wiring	N/A
6.5.3	Internal wiring size (mm ²) for socket-outlets..... :	No socket-outlets	N/A
6.6	Safeguards against fire due to the connection to additional equipment		P

7	INJURY CAUSED BY HAZARDOUS SUBSTANCES		P
7.2	Reduction of exposure to hazardous substances		P
7.3	Ozone exposure		N/A
7.4	Use of personal safeguards or personal protective equipment (PPE)		N/A
	Personal safeguards and instructions :	Not required	—
7.5	Use of instructional safeguards and instructions		N/A
	Instructional safeguard (ISO 7010)..... :	Not required	—
7.6	Batteries and their protection circuits		P

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
8.4.1	Safeguards	All edges and corners are judged to be well rounded and do not present any hazard. Safeguards are not required	N/A
	Instructional Safeguard..... :		N/A
8.4.2	Sharp edges or corners		N/A
8.5	Safeguards against moving parts		N/A
8.5.1	Fingers, jewellery, clothing, hair, etc., contact with MS2 or MS3 parts	Internal secondary DC fans are classified as MS1. Fans are guarded by the enclosure	N/A
	MS2 or MS3 part required to be accessible for the function of the equipment		N/A
	Moving MS3 parts only accessible to skilled person		N/A
8.5.2	Instructional safeguard..... :	Safeguards are not required	N/A
8.5.4	Special categories of equipment containing moving parts	No such equipment	N/A
8.5.4.1	General	As above	N/A
8.5.4.2	Equipment containing work cells with MS3 parts	As above	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
8.5.4.2.1	Protection of persons in the work cell		N/A
8.5.4.2.2	Access protection override		N/A
8.5.4.2.2.1	Override system		N/A
8.5.4.2.2.2	Visual indicator		N/A
8.5.4.2.3	Emergency stop system		N/A
	Maximum stopping distance from the point of activation (m).....:		N/A
	Space between end point and nearest fixed mechanical part (mm)		N/A
8.5.4.2.4	Endurance requirements		N/A
	Mechanical system subjected to 100 000 cycles of operation		N/A
	- Mechanical function check and visual inspection		N/A
	- Cable assembly		N/A
8.5.4.3	Equipment having electromechanical device for destruction of media		N/A
8.5.4.3.1	Equipment safeguards		N/A
8.5.4.3.2	Instructional safeguards against moving parts		N/A
8.5.4.3.3	Disconnection from the supply		N/A
8.5.4.3.4	Cut type and test force (N).....:		N/A
8.5.4.3.5	Compliance		N/A
8.5.5	High pressure lamps	No 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	EUTs masses are less than 7 kg. MS1 classification, tests are not required.	N/A
	Instructional safeguard.....:	No stability requirements	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

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Clause	Requirement + Test	Result - Remark	Verdict
8.7.1	Mount means type	Not for wall or ceiling mounting	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	EUTs are not intended to be carried by handles	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	No wheels or casters	N/A
8.10	Carts, stands and similar carriers		N/A
8.10.1	General	No carts, stands and similar carriers	N/A
8.10.2	Marking and instructions		N/A
8.10.3	Cart, stand or carrier loading test		N/A
	Loading force applied (N)		N/A
8.10.4	Cart, stand or carrier impact test		N/A
8.10.5	Mechanical stability		N/A
	Force applied (N)		—
8.10.6	Thermoplastic temperature stability		N/A
8.11	Mounting means for slide-rail mounted equipment (SRME)		N/A
8.11.1	General	Not intended for rack mounting	N/A
8.11.2	Requirements for slide rails		N/A
	Instructional Safeguard		N/A
8.11.3	Mechanical strength test		N/A
8.11.3.1	Downward force test, force (N) applied		N/A
8.11.3.2	Lateral push force test		N/A
8.11.3.3	Integrity of slide rail end stops		N/A
8.11.4	Compliance		N/A
8.12	Telescoping or rod antennas		N/A
	Button/ball diameter (mm)	No telescoping rod antennas	—

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Clause	Requirement + Test	Result - Remark	Verdict
9	THERMAL BURN INJURY		P
9.2	Thermal energy source classifications		P
9.3	Touch temperature limits		P
9.3.1	Touch temperatures of accessible parts	Classified as TS1 for external surfaces which are permanently in contact with body or occasionally touched. Safeguards are not required.	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	As above	N/A
9.5.2	Instructional safeguard.....		N/A
9.6	Requirements for wireless power transmitters		N/A
9.6.1	General	No wireless power transmitters	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	EUTs do not include laser, visible, infra-red, ultraviolet, x-ray, and acoustic energies. LEDs / LCD display used for indicating only Classified as RS1.	P
	Lasers	No lasers	—
	Lamps and lamp systems.....	No lamps	—
	Image projectors	No image projectors	—
	X-Ray.....	No X-Ray	—
	Personal music player	No music player	—
10.3	Safeguards against laser radiation		N/A
	The standard(s) equipment containing laser(s) comply	No lasers	N/A
10.4	Safeguards against optical radiation from lamps and lamp systems (including LED types)		N/A
10.4.1	General requirements	No visible, infrared, and UV radiation	N/A
	Instructional safeguard provided for accessible radiation level needs to exceed		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	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	No x-radiation	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	The EUTs are not defined as personal music player and not closely coupled to the ear or earphones and headphones intended for use with personal music players	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
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

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Clause	Requirement + Test	Result - Remark	Verdict
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		
B.2.1	General requirements	See Test Item particulars and appended test tables	P
	Audio Amplifiers and equipment with audio amplifiers	No audio amplifiers in use at EUTs	N/A
B.2.3	Supply voltage and tolerances	Considered	P
B.2.5	Input test	Not connected to the mains, test is not required. However, tested for rated voltage – see appended table B.2.5	P
B.3	Simulated abnormal operating conditions		P
B.3.1	General	No such abnormal operation conditions which are relevant for the EUT	P
B.3.2	Covering of ventilation openings	See appended table B.3	P
	Instructional safeguard	Not required	N/A
B.3.3	DC mains polarity test	Not connected to DC mains	N/A
B.3.4	Setting of voltage selector	As above	N/A
B.3.5	Maximum load at output terminals	No output terminals	N/A
B.3.6	Reverse battery polarity	Impossible due to the design of battery connector	P
B.3.7	Audio amplifier abnormal operating conditions	No audio amplifier	N/A
B.3.8	Safeguards functional during and after abnormal operating conditions	Safeguards remain effective	P
B.4	Simulated single fault conditions		P
B.4.1	General		P
B.4.2	Temperature controlling device	See appended table B.4	P
B.4.3	Blocked motor test	See appended table B.4	P
B.4.4	Functional insulation	See appended table B.4	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	Uncoated	N/A
B.4.5	Short-circuit and interruption of electrodes in tubes and semiconductors	No such components	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
B.4.6	Short circuit or disconnection of passive components	See appended table B.4	P
B.4.7	Continuous operation of components	No such parts	N/A
B.4.8	Compliance during and after single fault conditions :	Accessible parts do not exceed their energy source class. No hazards or flames were noted during the tests	P
B.4.9	Battery charging and discharging under single fault conditions	Comply, see Annex M	P
C	UV RADIATION		N/A
C.1	Protection of materials in equipment from UV radiation		N/A
C.1.2	Requirements	EUTs do not produce UV radiation	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)..... :	No audio amplifiers in EUTs	—
	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	No effected safety	N/A
F.2.2	Graphic symbols according to IEC, ISO or manufacturer specific	Comply	P
F.3	Equipment markings		P
F.3.1	Equipment marking locations	Marking on equipment enclosure	P
F.3.2	Equipment identification markings	Provided	P
F.3.2.1	Manufacturer identification	LiveU	P
F.3.2.2	Model identification	1) LU300S-XXXX-XXXX-XXXX-XXXX-XXXX 2) LU300S-VM-XXXX-XXXX-XXXX-XXXX-XXXX / LU300S-AB-XXXX-XXXX-XXXX-XXXX-XXXX 3) LU-SOLO-PRO-XXXX-XXXX-XXXX-XXXX-XXXX	P
F.3.3	Equipment rating markings	See below	P
F.3.3.1	Equipment with direct connection to mains	No connection to AC or DC mains, no power rating label is required	N/A
F.3.3.2	Equipment without direct connection to mains	External PS rating is marked on the label - Comply with B.2.5	P
F.3.3.3	Nature of the supply voltage	The nature of the supply voltage is marked by appropriate symbol immediately follow the equipment voltage rating	P
F.3.3.4	Rated voltage.....	1-2) 12-19VDC 3) 20VDC	P
F.3.3.5	Rated frequency	DC products (through safety approved adapter)	N/A
F.3.3.6	Rated current or rated power.....	1-2) 4.2-2.7A 3) 3.25A	P
F.3.3.7	Equipment with multiple supply connections	Single connection	N/A
F.3.4	Voltage setting device	No voltage setting device	N/A
F.3.5	Terminals and operating devices	No mains terminals or operating devices	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
F.3.5.1	Mains appliance outlet and socket-outlet markings	As above	N/A
F.3.5.2	Switch position identification marking	The On/Off switch not used as a disconnect device	N/A
F.3.5.3	Replacement fuse identification and rating markings	No replacement fuse	N/A
	Instructional safeguards for neutral fuse	No hazards	N/A
F.3.5.4	Replacement battery identification marking	1-3) Internal batteries. Not possible to replace it by an incorrect type of battery. 2) External battery ratings are marked on the mounting plates.	P
F.3.5.5	Neutral conductor terminal	No terminals for mains supply	N/A
F.3.5.6	Terminal marking location	No terminals for mains supply	N/A
F.3.6	Equipment markings related to equipment classification	Class III equipment	N/A
F.3.6.1	Class I equipment	As above	N/A
F.3.6.1.1	Protective earthing conductor terminal		N/A
F.3.6.1.2	Protective bonding conductor terminals		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	IPX0	N/A
F.3.8	External power supply output marking	Not such outputs	N/A
F.3.9	Durability, legibility and permanence of marking	Inspected	P
F.3.10	Test for permanence of markings	Tested	P
F.4	Instructions		P
	Information prior to installation and initial use	Provided	P
	Equipment for use in locations where children not likely to be present	No such locations. Statement is not required	N/A
	Instructions for installation and interconnection	Provided	P
	Equipment intended for use only in restricted access area	Not intended for restricted access area	N/A
	Equipment intended to be fastened in place	No such parts	N/A
	Instructions for audio equipment terminals	No such parts	N/A
	Protective earthing used as a safeguard	Class III equipment – no earth	N/A
	Protective conductor current exceeding ES2 limits	ES1 equipment	N/A
	Graphic symbols used on equipment	Not effecting safety	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Permanently connected equipment not provided with all-pole mains switch	No such parts	N/A
	Replaceable components or modules providing safeguard function	No such parts	N/A
	Equipment containing insulating liquid	No such parts	N/A
	Installation instructions for outdoor equipment	Not meant for permanent outdoor installation	N/A
F.5	Instructional safeguards		P
G	COMPONENTS		P
G.1	Switches		N/A
G.1.1	General	No such parts which affect safety	N/A
G.1.2	Ratings, endurance, spacing, maximum load		
G.1.3	Test method and compliance		
G.2	Relays		N/A
G.2.1	Requirements	No such parts	N/A
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	Safety is not rely on such components	N/A
	Thermal cut-outs separately approved according to IEC 60730 with conditions indicated in a) & b)		N/A
	Thermal cut-outs tested as part of the equipment as indicated in c)		N/A
G.3.1.2	Test method and compliance		N/A
G.3.2	Thermal links		N/A
G.3.2.1	a) Thermal links tested separately according to IEC 60691 with specifics		N/A
	b) Thermal links tested as part of the equipment		N/A
G.3.2.2	Test method and compliance		N/A
G.3.3	PTC thermistors		N/A
G.3.4	Overcurrent protection devices	Safety approved fuses are used	P
G.3.5	Safeguards components not mentioned in G.3.1 to G.3.4	No such components	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

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Clause	Requirement + Test	Result - Remark	Verdict
G.4	Connectors		N/A
G.4.1	Spacings	Classified as ES1. No such connectors.	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		N/A
G.5.1	Wire insulation in wound components	No such components	N/A
G.5.1.2	Protection against mechanical stress		N/A
G.5.2	Endurance test		N/A
G.5.2.1	General test requirements		N/A
G.5.2.2	Heat run test		N/A
	Test time (days per cycle) :		—
	Test temperature (°C) :		—
G.5.2.3	Wound components supplied from the mains		N/A
G.5.2.4	No insulation breakdown		N/A
G.5.3	Transformers	No such transformers	N/A
G.5.3.1	Compliance method..... :		N/A
	Position :		N/A
	Method of protection :		N/A
G.5.3.2	Insulation		N/A
	Protection from displacement of windings :		—
G.5.3.3	Transformer overload tests		N/A
G.5.3.3.1	Test conditions		N/A
G.5.3.3.2	Winding temperatures		N/A
G.5.3.3.3	Winding temperatures - alternative test method		N/A
G.5.3.4	Transformers using FIW	No such transformers	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

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Clause	Requirement + Test	Result - Remark	Verdict
G.5.4.1	General requirements	Secondary, un-accessible, certified DC fans	N/A
G.5.4.2	Motor overload test conditions		N/A
G.5.4.3	Running overload test		N/A
G.5.4.4.2	Locked-rotor overload test		N/A
	Test duration (days) :		—
G.5.4.5	Running overload test for DC motors		N/A
G.5.4.5.2	Tested in the unit		N/A
G.5.4.5.3	Alternative method		N/A
G.5.4.6	Locked-rotor overload test for DC motors		N/A
G.5.4.6.2	Tested in the unit		N/A
	Maximum Temperature :		N/A
G.5.4.6.3	Alternative method		N/A
G.5.4.7	Motors with capacitors		N/A
G.5.4.8	Three-phase motors		N/A
G.5.4.9	Series motors		N/A
	Operating voltage :		—
G.6	Wire Insulation		N/A
G.6.1	General	No such wires	N/A
G.6.2	Enamelled winding wire insulation		N/A
G.7	Mains supply cords		N/A
G.7.1	General requirements	Not connected to mains	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

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Clause	Requirement + Test	Result - Remark	Verdict
	Overall diameter or minor overall dimension, D (mm)		—
	Radius of curvature after test (mm)		—
G.7.6	Supply wiring space		N/A
G.7.6.1	General requirements		N/A
G.7.6.2	Stranded wire		N/A
G.7.6.2.1	Requirements		N/A
G.7.6.2.2	Test with 8 mm strand		N/A
G.8	Varistors		N/A
G.8.1	General requirements	No Varistors	N/A
G.8.2	Safeguards against fire		N/A
G.8.2.1	General		N/A
G.8.2.2	Varistor overload test		N/A
G.8.2.3	Temporary overvoltage test		N/A
G.9	Integrated circuit (IC) current limiters		N/A
G.9.1	Requirements	No circuit (IC) current limiters	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	No resistors used as safeguards	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		N/A
G.11.1	General requirements	Not current limited circuits	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		N/A
	Optocouplers comply with IEC 60747-5-5 with specifics	No optocouplers	N/A
	Type test voltage $V_{ini,a}$		—
	Routine test voltage, $V_{ini,b}$		—

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Clause	Requirement + Test	Result - Remark	Verdict
G.13	Printed boards	Electrical energy source classified as ES1 – Safeguards not required (no basic, supplementary or reinforced insulation). Functional insulation only provided in EUTs.	N/A
G.13.1	General requirements		N/A
G.13.2	Uncoated printed boards		N/A
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 :	No such components	N/A
G.15	Pressurized liquid filled components		N/A
G.15.1	Requirements	No such components	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	No such components	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 :		—

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Clause	Requirement + Test	Result - Remark	Verdict
	Largest capacitance and smallest resistance for ICX tested by itself for 10000 cycles test		—
G.16.3	Capacitor discharge test		N/A
H	CRITERIA FOR TELEPHONE RINGING SIGNALS		N/A
H.1	General		N/A
H.2	Method A		N/A
H.3	Method B		N/A
H.3.1	Ringling signal	No telephone ringing signals	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		N/A
J.1	General		N/A
	Winding wire insulation	No such windings wires	—
	Solid round winding wire, diameter (mm)		N/A
	Solid square and rectangular (flatwise bending) winding wire, cross-sectional area (mm ²)		N/A
J.2/J.3	Tests and Manufacturing		—
K	SAFETY INTERLOCKS		N/A
K.1	General requirements		N/A
	Instructional safeguard	No safety interlocks	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

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Clause	Requirement + Test	Result - Remark	Verdict
K.7.1	Separation distance for contact gaps & interlock circuit elements		N/A
	In circuit connected to mains, separation distance for contact gaps (mm)..... :		N/A
	In circuit isolated from mains, separation distance for contact gaps (mm)..... :		N/A
	Electric strength test before and after the test of K.7.2 :		N/A
K.7.2	Overload test, Current (A) :		N/A
K.7.3	Endurance test		N/A
K.7.4	Electric strength test		N/A
L	DISCONNECT DEVICES		N/A
L.1	General requirements	1-3) Safety class III equipment powered by up to 19VDC from internal Lithium battery or external charger (AC/DC adapter). Evaluated as ES1. Safeguards and disconnect device are not required	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		P
M.1	General requirements		P
M.2	Safety of batteries and their cells		P
M.2.1	Batteries and their cells comply with relevant IEC standards :	1,3) Battery pack is safety approved to IEC 62133 1-3) Cells are safety approved to UL 1642 and IEC 62133	P

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Clause	Requirement + Test	Result - Remark	Verdict
M.3	Protection circuits for batteries provided within the equipment	1-3) Protection circuits are: a. An integral part of the battery. b. A charger within the unit based on IC, setting a constant charging voltage and current c. Reverse charging is avoided by mechanical design of battery connector	P
M.3.1	Requirements	Comply	P
M.3.2	Test method	See appended table B.4	P
	Overcharging of a rechargeable battery	Tested	P
	Excessive discharging	Tested	P
	Unintentional charging of a non-rechargeable battery	Battery is rechargeable	N/A
	Reverse charging of a rechargeable battery	Reverse charging is avoided by mechanical design of battery connector (for both EUTs) and of external battery (for LU300S-VM / LU300S-AB)	N/A
M.3.3	Compliance	No chemical leaks, explosion nor emission of flame of molten metal. See appended Table B.4	P
M.4	Additional safeguards for equipment containing a portable secondary lithium battery		P
M.4.1	General		P
M.4.2	Charging safeguards	<u>For all models</u> Charging safeguards are such that under normal, abnormal and single fault conditions the charging voltage and current do not exceed the battery maximum specified charging voltage and current. The battery charging circuit stops charging when the temperature of the battery exceeds the declared temperature range.	P

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Clause	Requirement + Test	Result - Remark	Verdict
M.4.2.1	Requirements	The charging voltage did not exceed the maximum, voltage that specified by the manufacturer: 1) 0 to 45°C, 8.4V, 3.4A 2) 0 to 45°C, 8.4V, 3.7A 3) 0 to 45°C, 8.4V, 3.4A	P
M.4.2.2	Compliance..... :	See appended Table B.4 and M.4	P
M.4.3	Fire enclosure :	Material of enclosure is metal and V-1. Complies with fire enclosure requirements	P
M.4.4	Drop test of equipment containing a secondary lithium battery		P
M.4.4.2	Preparation and procedure for the drop test	Considered	P
M.4.4.3	Drop, Voltage on reference and dropped batteries (V); voltage difference during 24 h period (%)..... :	Hand-held equipment. Height of 1m drop. No damage to equipment and internal components.	P
M.4.4.4	Check of the charge/discharge function	The charge/discharge function operated normally after the test	P
M.4.4.5	Charge / discharge cycle test	Inspected	P
M.4.4.6	Compliance	Inspected	P
M.5	Risk of burn due to short-circuit during carrying		N/A
M.5.1	Requirement	Batteries are not accessible to user (cannot be carried without EUTs)	N/A
M.5.2	Test method and compliance		N/A
M.6	Safeguards against short-circuits		P
M.6.1	External and internal faults	<u>For all models</u> Battery terminals are provided with overcurrent protection.	P
M.6.2	Compliance	See appended Table B.4	P
M.7	Risk of explosion from lead acid and NiCd batteries		N/A
M.7.1	Ventilation preventing explosive gas concentration	Lithium batteries. No lead acid and NiCd batteries.	N/A
	Calculated hydrogen generation rate :		N/A
M.7.2	Test method and compliance		N/A
	Minimum air flow rate, Q (m³/h) :		N/A
M.7.3	Ventilation tests		N/A
M.7.3.1	General		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
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	As above	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_2 (m ³ /s).....		—
M.8.2.3	Correction factors		—
M.8.2.4	Calculation of distance d (mm)		—
M.9	Preventing electrolyte spillage		P
M.9.1	Protection from electrolyte spillage	Batteries are wrapped with external shrink. Internal and external (in LU300S / LU300S-VM) protection circuits prevent charging/discharging in excessive current / voltage / temperature. Leakage of the electrolyte from the battery is unlikely	P
M.9.2	Tray for preventing electrolyte spillage	Leakage of the electrolyte from the batteries is unlikely	N/A
M.10	Instructions to prevent reasonably foreseeable misuse	No hazards by foreseeable misuse	N/A
	Instructional safeguard		N/A
N	ELECTROCHEMICAL POTENTIALS		N/A
	Material(s) used	Considered	—
O	MEASUREMENT OF CREEPAGE DISTANCES AND CLEARANCES		N/A
	Value of X (mm).....	No protective earth	—
P	SAFEGUARDS AGAINST CONDUCTIVE OBJECTS		P
P.1	General	Basic safeguard (person is not expected to insert foreign objects into the equipment), and supplementary safeguard (comply with P.2.2)	P

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Clause	Requirement + Test	Result - Remark	Verdict
P.2	Safeguards against entry or consequences of entry of a foreign object		P
P.2.1	General		P
P.2.2	Safeguards against entry of a foreign object		P
	Location and Dimensions (mm) :	Maximal opening dimension is 4.2mm on the sides	—
P.2.3	Safeguards against the consequences of entry of a foreign object	This method is not used	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	No internal liquids except for batteries	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	No such parts	N/A
P.4.2	Tests		N/A
	Conditioning, T _c (°C) :		—
	Duration (weeks)..... :		—
Q	CIRCUITS INTENDED FOR INTERCONNECTION WITH BUILDING WIRING		P
Q.1	Limited power sources	1-3) USB and HDMI ports were evaluated. External safety approved AC/DC adaptor evaluated as Limited Power Source (LPS) up to 100W	P
Q.1.1	Requirements		P
	a) Inherently limited output	See appended table Q.1	P
	b) Impedance limited output		N/A
	c) Regulating network limited output		N/A
	d) Overcurrent protective device limited output		N/A
	e) IC current limiter complying with G.9		N/A
Q.1.2	Test method and compliance :		N/A
	Current rating of overcurrent protective device (A) :		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
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	Nu such parts	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		P
S.1	Flammability test for fire enclosures and fire barrier materials of equipment where the steady state power does not exceed 4 000 W		P
	Samples, material	Fire enclosures are provided (metal and V-1 min) for EUTs. Approved materials are used.	—
	Wall thickness (mm)		—
	Conditioning (°C)		—
	Test flame according to IEC 60695-11-5 with conditions as set out		N/A
	- Material not consumed completely		N/A
	- Material extinguishes within 30s		N/A
	- No burning of layer or wrapping tissue		N/A
S.2	Flammability test for fire enclosure and fire barrier integrity		N/A
	Samples, material		—
	Wall thickness (mm)		—
	Conditioning (°C)		—
S.3	Flammability test for the bottom of a fire enclosure		N/A
S.3.1	Mounting of samples		N/A
S.3.2	Test method and compliance		N/A
	Mounting of samples		—
	Wall thickness (mm)		—
S.4	Flammability classification of materials		N/A
S.5	Flammability test for fire enclosures and fire barrier materials of equipment where the steady state power exceeding 4 000 W		N/A
	Samples, material		—
	Wall thickness (mm)		—

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Clause	Requirement + Test	Result - Remark	Verdict
	Conditioning (°C)		—
T	MECHANICAL STRENGTH TESTS		P
T.1	General		P
T.2	Steady force test, 10 N		N/A
T.3	Steady force test, 30 N	No accessible internal solid safeguards	N/A
T.4	Steady force test, 100 N	See appended table T.2, T.3, T.4, T.5	P
T.5	Steady force test, 250 N	Not required for transportable / hand-held equipment	N/A
T.6	Enclosure impact test	As above	N/A
	Fall test		N/A
	Swing test		N/A
T.7	Drop test	See appended table T.7	P
T.8	Stress relief test.....	Test is not required for PS3 energy source	N/A
T.9	Glass Impact Test	No parts made of glass are used as safeguards	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)	No telescoping or rod antennas	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 :	No CRT	N/A
U.2	Test method and compliance for non-intrinsically protected CRTs		N/A
U.3	Protective screen		N/A
V	DETERMINATION OF ACCESSIBLE PARTS		P
V.1	Accessible parts of equipment		P
V.1.1	General	Considered	P
V.1.2	Surfaces and openings tested with jointed test probes	Considered	P
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		P

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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	Not required	N/A
Y	CONSTRUCTION REQUIREMENTS FOR OUTDOOR ENCLOSURES		N/A
Y.1	General	EUTs not defined for permanent outdoor installation.	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

Summary of Group & National Differences

List of Countries:	Group Differences	National Differences	List of Countries:	Group Differences	National Differences
AU=Australia	--	--	IL=Israel	--	--
AT=Austria	--	--	IS=Iceland	--	--
BE=Belgium	--	--	IT=Italy	--	--
BG=Bulgaria	--	--	JP=Japan	--	--
CA=Canada	--	YES ¹⁾	KR=Korea, Republic	--	--
CH=Switzerland	--	--	LT=Lithuania	--	--
CN=China	--	--	LU=Luxembourg	--	--
CZ=Czech Republic	--	--	LV=Latvia	--	--
DK=Denmark	--	YES ²⁾	MT=Malta	--	--
DE=Germany	--	YES ³⁾	NL=The Netherlands	--	--
EE=Estonia	--	--	NO=Norway	--	YES ⁸⁾
ES=Spain	--	--	NZ=New Zealand	--	--
FI=Finland	--	YES ⁴⁾	PL=Poland	--	--
FR=France	--	YES ⁵⁾	PT=Portugal	--	--
GB=United Kingdom	--	YES ⁶⁾	RO=Romania	--	--
GR=Greece	--	--	SE=Sweden	--	YES ⁹⁾
HU=Hungary	--	--	SK=Slovakia	--	--
HR=Croatia	--	--	SI=Slovenia	--	--
IE=Ireland	--	YES ⁷⁾	US=United States	--	YES ¹⁰⁾

Notes:

- 1) National differences from latest attachment to test report. Canada national standard (CAN/CSA C22.2 No. 62368-1:19)
- 2) National differences from latest attachment to test report. Denmark national standard (DS/EN IEC 62368-1:2020+A11:2020)
- 3) National differences from latest attachment to test report. Germany national standard (EN IEC 62368-1:2020+A11:2020)
- 4) National differences from latest attachment to test report. Finland national standard (EN IEC 62368-1:2020+A11:2020)
- 5) National differences from latest attachment to test report. France national standard (EN IEC 62368-1:2020+A11:2020)
- 6) National differences from latest attachment to test report. United Kingdom national standard (EN IEC 62368-1:2020+A11:2020)
- 7) National differences from latest attachment to test report. Ireland national standard (EN IEC 62368-1:2020+A11:2020)
- 8) National differences from latest attachment to test report. Norway national standard (EN IEC 62368-1:2020+A11:2020)
- 9) National differences from latest attachment to test report. Sweden national standard (EN IEC 62368-1:2020+A11:2020)
- 10) National differences from latest attachment to test report. United States national standard (UL 62368-1:2019)

IEC 62368-1			
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 62368-1:2020+A11:2020			
Attachment Form No.: EU_GD_IEC62368_1E			
Attachment Originator: UL(Demko)			
Master Attachment: 2021-02-04			
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	CENELEC COMMON MODIFICATIONS (EN)		P
	Clause numbers in the cells that are shaded light grey are clause references in EN IEC 62368-1:2020+A11:2020. All other clause numbers in that column, except for those in the paragraph below, refers to IEC 62368-1:2018. Clauses, subclauses, notes, tables, figures and annexes which are additional to those in IEC 62368-1:2018 are prefixed "Z".		P
	Add the following annexes: Annex ZA (normative) Normative references to international publications with their corresponding European publications Annex ZB (normative) Special national conditions Annex ZC (informative) A-deviations Annex ZD (informative) IEC and CENELEC code designations for flexible cords		P
1	Modification to Clause 3.		P
3.3.19	Sound exposure Replace 3.3.19 of IEC 62368-1 with the following definitions:		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.	No sound input, only earphones output connection	N/A
3.3.19.3	sound exposure, E A-weighted sound pressure (p) squared and integrated over a stated period of time, T Note 1 to entry: The SI unit is $\text{Pa}^2 \text{s}$. $E = \int_0^T p(t)^2 dt$		N/A


IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
3.3.19.4	<p>sound exposure level, SEL</p> <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>		N/A
3.3.19.5	<p>digital signal level relative to full scale, dBFS</p> <p>levels reported in dBFS are always r.m.s. Full scale level, 0 dBFS, is the level of a dc-free 997-Hz sine wave whose undithered positive peak value is positive digital full scale, leaving the code corresponding to negative digital full scale unused</p> <p>Note 1 to entry: It is invalid to use dBFS for non-r.m.s. levels. Because the definition of full scale is based on a sine wave, the level of signals with a crest factor lower than that of a sine wave may exceed 0 dBFS. In particular, square wave signals may reach +3,01 dBFS.</p>		N/A
2	Modification to Clause 10		P
10.6	<p>Safeguards against acoustic energy sources</p> <p>Replace 10.6 of IEC 62368-1 with the following:</p>		N/A

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
10.6.1.1	<p>Introduction</p> <p>Safeguard requirements for protection against long-term exposure to excessive sound pressure levels from personal music players closely coupled to the ear are specified below. Requirements for earphones and headphones intended for use with personal music players are also covered. A personal music player is a portable equipment intended for use by an ordinary person, that:</p> <ul style="list-style-type: none"> – is designed to allow the user to listen to audio or audiovisual content / material; and – uses a listening device, such as headphones or earphones that can be worn in or on or around the ears; and – has a player that can be body worn (of a size suitable to be carried in a clothing pocket) and is intended for the user to walk around with while in continuous use (for example, on a street, in a subway, at an airport, etc.). <p>EXAMPLES Portable CD players, MP3 audio players, mobile phones with MP3 type features, PDAs or similar equipment.</p> <p>Personal music players shall comply with the requirements of either 10.6.2 or 10.6.3.</p> <p>NOTE 1 Protection against acoustic energy sources from telecom applications is referenced to ITU-T P.360.</p> <p>NOTE 2 It is the intention of the Committee to allow the alternative methods for now, but to only use the dose measurement method as given in 10.6.5 in future. Therefore, manufacturers are encouraged to implement 10.6.5 as soon as possible.</p> <p>Listening devices sold separately shall comply with the requirements of 10.6.6. These requirements are valid for music or video mode only. The requirements do not apply to:</p> <ul style="list-style-type: none"> – professional equipment; <p>NOTE 3 Professional equipment is equipment sold through special sales channels. All products sold through normal electronics stores are considered not to be professional equipment.</p> <ul style="list-style-type: none"> – hearing aid equipment and other devices for assistive listening; – the following type of analogue personal music 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; 	No acoustic energy	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	<p>NOTE 4 This exemption has been allowed because this technology is falling out of use and it is expected that within a few years it will no longer exist. This exemption will not be extended to other technologies.</p> <p>– a player while connected to an external amplifier that does not allow the user to walk around while in use.</p> <p>For equipment that is clearly designed or intended primarily for use by children, the limits of the relevant toy standards may apply.</p> <p>The relevant requirements are given in EN 71-1:2011, 4.20 and the related tests methods and measurement distances apply.</p>		N/A
10.6.1.2	<p>Non-ionizing radiation from radio frequencies in the range 0 to 300 GHz</p> <p>The amount of non-ionizing radiation is regulated by European Council Recommendation 1999/519/EC of 12 July 1999 on the limitation of exposure of the general public to electromagnetic fields (0 Hz to 300 GHz). For intentional radiators, ICNIRP guidelines should be taken into account for Limiting Exposure to Time-Varying Electric, Magnetic, and Electromagnetic Fields (up to 300 GHz). For hand-held and body mounted devices, attention is drawn to EN 50360 and EN 50566.</p>	See separate EMC/Radio test report	P
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>	No acoustic energy sources	N/A

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
	<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>		
10.6.2.2	<p>RS1 limits (to be superseded, see 10.6.3.2)</p> <p>RS1 is a class 1 acoustic energy source that does not exceed the following:</p> <ul style="list-style-type: none"> – for equipment provided as a package (player with its listening device), and with a proprietary connector between the player and its listening device, or where the combination of player and listening device is known by other means such as setting or automatic detection, the $L_{Aeq,T}$ acoustic output shall be ≤ 85 dB when playing the fixed “programme simulation noise” described in EN 50332-1. – for equipment provided with a standardized connector (for example, a 3,5 phone jack) that allows connection to a listening device for general use, the unweighted r.m.s. output voltage shall be ≤ 27 mV (analogue interface) or -25 dBFS (digital interface) when playing the fixed “programme simulation noise” described in EN 50332-1. – The RS1 limits will be updated for all devices as per 10.6.3.2. 	Comply	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> <ul style="list-style-type: none"> – for equipment provided as a package (player with its listening device), and with a proprietary connector between the player and its listening device, or when the combination of player and listening device is known by other means such as setting or automatic detection, the $L_{Aeq,T}$ acoustic output shall be ≤ 100 dB(A) when playing the fixed “programme simulation noise” as described in EN 50332-1. – for equipment provided with a standardized 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. 	No RS2	N/A

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
10.6.2.4	RS3 limits RS3 is a class 3 acoustic energy source that exceeds RS2 limits.	No RS3	N/A
10.6.3	Classification of devices (new)		N/A
10.6.3.1	General 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.	No sound input, only earphones output connection	N/A
10.6.3.2	RS1 limits (new) RS1 is a class 1 acoustic energy source that does not exceed the following: – for equipment provided as a package (player with its listening device), and with a proprietary connector between the player and its listening device, or where the combination of player and listening device is known by other means such as setting or automatic detection, the $L_{Aeq,T}$ acoustic output shall be ≤ 80 dB when playing the fixed “programme simulation noise” described in EN 50332-1. – for equipment provided with a standardized connector (for example, a 3,5 phone jack) that allows connection to a listening device for general use, the unweighted r.m.s. output voltage shall be ≤ 15 mV (analogue interface) or -30 dBFS (digital interface) when playing the fixed “programme simulation noise” described in EN 50332-1.		N/A
10.6.3.3	RS2 limits (new) RS2 is a class 2 acoustic energy source that does not exceed the following: – 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. – 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.		N/A
10.6.4	Requirements for maximum sound exposure		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
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> <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> <p>– element 1a: the symbol , IEC 60417-6044 (2011-01)</p> <p>– element 2: “High sound pressure” or equivalent wording</p> <p>– element 3: “Hearing damage risk” or equivalent wording</p> <p>– element 4: “Do not listen at high volume levels for long periods.” or equivalent wording</p> <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>		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	<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>		N/A
10.6.5	Requirements for dose-based systems		N/A
10.6.5.1	<p>General requirements</p> <p>Personal music players shall give the warnings as provided below when tested according to EN 50332-3, using the limits from this clause.</p> <p>The manufacturer may offer optional settings to allow the users to modify when and how they wish to receive the notifications and warnings to promote a better user experience without defeating the safeguards. This allows the users to be informed in a method that best meets their physical capabilities and device usage needs. If such optional settings are offered, an administrator (for example, parental restrictions, business/educational administrators, etc.) shall be able to lock any optional settings into a specific configuration.</p> <p>The personal music player shall be supplied with easy to understand explanation to the user of the dose management system, the risks involved, and how to use the system safely. The user shall be made aware that other sources may significantly contribute to their sound exposure, for example work, transportation, concerts, clubs, cinema, car races, etc.</p>	No personal players	N/A

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

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
10.6.6.2	Corded listening devices with digital input With any playing device playing the fixed "programme simulation noise" described in EN 50332-1, and with the volume and sound settings in the listening device (for example, built-in volume level control, additional sound features like equalization, etc.) set to the combination of positions that maximize the measured acoustic output, the $L_{Aeq,T}$ acoustic output of the listening device shall be ≤ 100 dB with an input signal of -10 dBFS.		N/A
10.6.6.3	Cordless listening devices In cordless mode, – with any playing and transmitting device playing the fixed programme simulation noise described in EN 50332-1; and – respecting the cordless transmission standards, where an air interface standard exists that specifies the equivalent acoustic level; and – with volume and sound settings in the receiving device (for example, built-in volume level control, additional sound features like equalization, etc.) set to the combination of positions that maximize the measured acoustic output for the above mentioned programme simulation noise, the $L_{Aeq,T}$ acoustic output of the listening device shall be ≤ 100 dB with an input signal of -10 dBFS.		N/A
10.6.6.4	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

IEC 62368-1							
Clause	Requirement + Test			Result - Remark		Verdict	
	Delete all the “country” notes in the reference document according to the following list:					P	
	0.2.1	Note 1 and 2	1	Note 4 and 5	3.3.8.1		Note 2
	3.3.8.3	Note 1	4.1.15	Note	4.7.3		Note 1 and 2
	5.2.2.2	Note	5.4.2.3.2.2 Table 12	Note c	5.4.2.3.2.4		Note 1 and 3
	5.4.2.3.2.4 Table 13	Note 2	5.4.2.5	Note 2	5.4.5.1		Note
	5.4.10.2.1	Note	5.4.10.2.2	Note	5.4.10.2.3		Note
	5.5.2.1	Note	5.5.6	Note	5.6.4.2.1		Note 2 and 3 and 4
	5.6.8	Note 2	5.7.6	Note	5.7.7.1		Note 1 and Note 2
	8.5.4.2.3	Note	10.2.1 Table 39	Note 3 and 4 and 5	10.5.3		Note 2
	10.6.4	Note 3	F.3.3.6	Note 3	Y.4.1		Note
	Y.4.5	Note					
4	Modification to Clause 1					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.			Added		P	
5	Modification to 4.Z1					N/A	

IEC 62368-1			
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>	No connection to mains	N/A
6	Modification to 5.4.2.3.2.4		P
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>	Considered	P
7	Modification to 10.2.1		P
10.2.1	<p>Add the following to ^{c)} and ^{d)} in table 39:</p> <p>For additional requirements, see 10.5.1.</p>	Added	P
8	Modification to 10.5.1		N/A
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>	No such radiation	N/A

IEC 62368-1																																			
Clause	Requirement + Test	Result - Remark	Verdict																																
	<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>																																		
9	Modification to G.7.1		P																																
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>	Added	P																																
10	Modification to Bibliography		P																																
	<p>Add the following notes for the standards indicated:</p> <table><tr><td>IEC 60130-9</td><td>NOTE Harmonized as EN 60130-9.</td></tr><tr><td>IEC 60269-2</td><td>NOTE Harmonized as HD 60269-2.</td></tr><tr><td>IEC 60309-1</td><td>NOTE Harmonized as EN 60309-1.</td></tr><tr><td>IEC 60364</td><td>NOTE some parts harmonized in HD 384/HD 60364 series.</td></tr><tr><td>IEC 60601-2-4</td><td>NOTE Harmonized as EN 60601-2-4.</td></tr><tr><td>IEC 60664-5</td><td>NOTE Harmonized as EN 60664-5.</td></tr><tr><td>IEC 61032:1997</td><td>NOTE Harmonized as EN 61032:1998 (not modified).</td></tr><tr><td>IEC 61508-1</td><td>NOTE Harmonized as EN 61508-1.</td></tr><tr><td>IEC 61558-2-1</td><td>NOTE Harmonized as EN 61558-2-1.</td></tr><tr><td>IEC 61558-2-4</td><td>NOTE Harmonized as EN 61558-2-4.</td></tr><tr><td>IEC 61558-2-6</td><td>NOTE Harmonized as EN 61558-2-6.</td></tr><tr><td>IEC 61643-1</td><td>NOTE Harmonized as EN 61643-1.</td></tr><tr><td>IEC 61643-21</td><td>NOTE Harmonized as EN 61643-21.</td></tr><tr><td>IEC 61643-311</td><td>NOTE Harmonized as EN 61643-311.</td></tr><tr><td>IEC 61643-321</td><td>NOTE Harmonized as EN 61643-321.</td></tr><tr><td>IEC 61643-331</td><td>NOTE Harmonized as EN 61643-331.</td></tr></table>		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
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IEC 61643-331	NOTE Harmonized as EN 61643-331.																																		
11	ADDITION OF ANNEXES		P																																
ZB	ANNEX ZB, SPECIAL NATIONAL CONDITIONS (EN)		N/A																																

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
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: "Laite on liitettävä suojakoskettimilla varustettuun pistorasiaan" In Norway: "Apparatet må tilkoples jordet stikkontakt" In Sweden: "Apparaten skall anslutas till jordat uttag"</p>	Class III equipment	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>	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>	Class III equipment	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. 	No telecommunication networks	N/A

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
	<p>If this insulation forms part of a semiconductor component (e.g. an optocoupler), there is no distance through insulation requirement for the insulation consisting of an insulating compound completely filling the casing, so that clearances and creepage distances do not exist, if the component passes the electric strength test in accordance with the compliance clause below and in addition</p> <ul style="list-style-type: none"> • passes the tests and inspection criteria of 5.4.8 with an electric strength test of 1,5 kV multiplied by 1,6 (the electric strength test of 5.4.9 shall be performed using 1,5 kV), <p>and</p> <ul style="list-style-type: none"> • is subject to routine testing for electric strength during manufacturing, using a test voltage of 1,5 kV. <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>	Class III equipment	N/A
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>	No such resistors	N/A

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
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. <i>Justification:</i> In Denmark an existing 13 A socket outlet can be protected by a 20 A fuse.	No socket-outlets	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.	Class III equipment	N/A
5.6.4.2.1	France 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.	As above	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.	As above	N/A
5.6.8	Norway 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.	Not such equipment	N/A
5.7.6	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.	Class III equipment	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 .	As above	N/A

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
5.7.7.1	<p>Norway and Sweden</p> <p>To the end of the subclause the following is added: The screen of the television distribution system is normally not earthed at the entrance of the building and there is normally no equipotential bonding system within the building. Therefore the protective earthing of the building installation needs to be isolated from the screen of a cable distribution system.</p> <p>It is however accepted to provide the insulation external to the equipment by an adapter or an interconnection cable with galvanic isolator, which may be provided by a retailer, for example.</p> <p>The user manual shall then have the following or similar information in Norwegian and Swedish language respectively, depending on in what country the equipment is intended to be used in:</p> <p>“Apparatus connected to the protective earthing of the building installation through the mains connection or through other apparatus with a connection to protective earthing – and to a television distribution system using coaxial cable, may in some circumstances create a fire hazard. Connection to a television distribution system therefore has to be provided through a device providing electrical isolation below a certain frequency range (galvanic isolator, see EN 60728-11)”</p> <p>NOTE In Norway, due to regulation for CATV-installations, and in Sweden, a galvanic isolator shall provide electrical insulation below 5 MHz. The insulation shall withstand a dielectric strength of 1,5 kV r.m.s., 50 Hz or 60 Hz, for 1 min.</p>	Not such equipment	N/A
	<p>Translation to Norwegian (the Swedish text will also be accepted in Norway):</p> <p>“Apparater som er koplet til beskyttelsesjord via nettplugg og/eller via annet jordtilkoplet utstyr – og er tilkoplet et koaksialbasert kabel-TV nett, kan forårsake brannfare. For å unngå dette skal det ved tilkopling av 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>		

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
8.5.4.2.3	<p>United Kingdom</p> <p>Add the following after the 2nd dash bullet in 3rd paragraph:</p> <p>An emergency stop system complying with the requirements of IEC 60204-1 and ISO 13850 is required where there is a risk of personal injury.</p>	added	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>	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>Class III equipment</p> <p>No socket-outlets</p>	N/A

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
	<p>Mains socket-outlets with earth shall be in compliance with DS 60884-2-D1:2011 Standard Sheet DK 1-3a, DK 1-1c, DK1-1d, DK 1-5a or DK 1-7a</p> <p><i>Justification:</i> Heavy Current Regulations, Section 6c</p>		
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>	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>	Class III equipment	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>	As above	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>	Class III equipment	N/A
ZC	ANNEX ZC, NATIONAL DEVIATIONS (EN)		N/A

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
10.5.2	<p>Germany</p> <p>The following requirement applies:</p> <p>For the operation of any cathode ray tube intended for the display of visual images operating at an acceleration voltage exceeding 40 kV, authorization is required, or application of type approval (Bauartzulassung) and marking.</p> <p><i>Justification:</i> German ministerial decree against ionizing radiation (Röntgenverordnung), in force since 2002-07-01, implementing the European Directive 96/29/EURATOM.</p> <p>NOTE Contact address: Physikalisch-Technische Bundesanstalt, Bundesallee 100, D-38116 Braunschweig, Tel.: Int+49-531-592-6320, Internet: http://www.ptb.de</p>	No cathode ray tube	N/A
ZD	IEC and CENELEC CODE DESIGNATIONS FOR FLEXIBLE CORDS (EN)		N/A

IEC 62368-1																																																								
Clause	Requirement + Test	Result - Remark	Verdict																																																					
	<table><tr><th rowspan="2">Type of flexible cord</th><th colspan="2">Code designations</th></tr><tr><th>IEC</th><th>CENELEC</th></tr><tr><td colspan="3">PVC insulated cords</td></tr><tr><td>Flat twin tinsel cord</td><td>60227 IEC 41</td><td>H03VH-Y</td></tr><tr><td>Light polyvinyl chloride sheathed flexible cord</td><td>60227 IEC 52</td><td>H03VV-F H03VVH2-F</td></tr><tr><td>Ordinary polyvinyl chloride sheathed flexible cord</td><td>60227 IEC 53</td><td>H05VV-F H05VVH2-F</td></tr><tr><td colspan="3">Rubber insulated cords</td></tr><tr><td>Braided cord</td><td>60245 IEC 51</td><td>H03RT-F</td></tr><tr><td>Ordinary tough rubber sheathed flexible cord</td><td>60245 IEC 53</td><td>H05RR-F</td></tr><tr><td>Ordinary polychloroprene sheathed flexible cord</td><td>60245 IEC 57</td><td>H05RN-F</td></tr><tr><td>Heavy polychloroprene sheathed flexible cord</td><td>60245 IEC 66</td><td>H07RN-F</td></tr><tr><td colspan="3">Cords having high flexibility</td></tr><tr><td>Rubber insulated and sheathed cord</td><td>60245 IEC 86</td><td>H03RR-H</td></tr><tr><td>Rubber insulated, crosslinked PVC sheathed cord</td><td>60245 IEC 87</td><td>H03RV4-H</td></tr><tr><td>Crosslinked PVC insulated and sheathed cord</td><td>60245 IEC 88</td><td>H03V4V4-H</td></tr><tr><td colspan="3">Cords insulated and sheathed with halogen-free thermoplastic compounds</td></tr><tr><td>Light halogen-free thermoplastic insulated and sheathed flexible cords</td><td></td><td>H03Z1Z1-F H03Z1Z1H2-F</td></tr><tr><td>Ordinary halogen-free thermoplastic insulated and sheathed flexible cords</td><td></td><td>H05Z1Z1-F H05Z1Z1H2-F</td></tr></table>		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 66	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	N/A
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	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																																																						

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

**ATTACHMENT TO TEST REPORT IEC 62368-1 3TH 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_IEC623681E

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

Master Attachment: Dated 2021-02-04

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**IEC 62368-1 - US and Canadian National Differences
Special National Conditions based on Regulations and Other National Differences**

1 (1.3) (1DV.1)	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.	Comply	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.	The equipment does not intend for entertainment purposes	N/A
1 (1DV.2.2)	This standard includes additional requirements for equipment intended for mounting under cabinets. See Annex DVC.	The equipment does not intend for mounting under cabinets	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).	Considered	P
1 (1.4) (1DV.3)	For protection against direct lightning strikes, reference is made to NFPA 780 and CAN/CSA-B72 for additional requirements.	EUTs not defined for permanent outdoor installation	N/A
1 (1.5) (1DV.5)	Additional requirements apply to some forms of power distribution equipment, including sub-assemblies.	Considered	P
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.	DC powered by external safety approved adaptor	N/A

IEC 62368-1			
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.	As above	N/A
4.6 (4.6.2)	Wire-wrap terminals have special construction and performance requirements.	No such wire-wrap	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 coin/button 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.	Class III equipment	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.	Class III equipment	N/A
5.6.3	Protective earthing conductors comply with the minimum conductor sizes in Table G.7, except as required by Table G.7ADV.1 for cord connected equipment, or Annex DVH for permanently connected equipment.	Class III equipment	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.	Not connected to telecommunication networks	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.	1, 3) No PS3 outside fire enclosure 2) See appended table B.4	P
Annex F (F.3.3.9)	Output terminals provided for supply of other equipment, except mains supply, are required to be marked with a maximum rating or reference to equipment permitted to be connected.	No terminals	N/A
Annex F (F.3.7)	Outdoor Enclosures are required to be classified and marked in accordance with UL 50 or 50E, or CAN/CSA C22.2 No. 94.1 or 94.2.	Indoor equipment	N/A
Annex G (G.7)	Permanent connection of equipment to the mains supply by a power supply cord is not permitted, except for certain equipment, such as ATMs.	Not connected to the mains	N/A
	Power supply cords are required to have attachment plugs rated not less than 125 percent of the rated current of the equipment.	As above	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.	As 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.	DC powered. No direct mains connections except of safety approved charger	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."	As 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 such ringing signals	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.	As above	N/A
Annex Q (Q.3)	Equipment with paired conductor and/or coax communications cables/wiring connected to building wiring shall be marked or labeled to identify the Maximum Rated Voltage and Maximum Rated Current per conductor that the external circuit port(s) is intended to source into the cabling and load equipment during normal use. If the equipment has outputs that have different ratings, the equipment shall clearly identify the ratings for the different outputs in a manner the user will know each circuits rating. The equipment shall also be provided with a marking or readily available information regarding how many conductors from each type of external circuit port(s) are used to carry current.	Considered	P
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.	DC powered by external safety approved adaptor	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.	Not for environmental air	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.	Equipment is not automated information storage systems	N/A

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
	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.	Equipment not intended for children	N/A
	Baby monitors are required to additionally comply with ASTM F2951, Consumer Safety Specification for Baby Monitors.	Equipment is not baby monitor	N/A
	Storage batteries and battery management equipment, other than associated with lead-acid batteries, and including battery backup systems that are not an integral part of stationary AV and ICT equipment, such as provided in separate cabinets, are required to be certified (listed) to the appropriate standard(s) for such storage batteries and equipment.	No such batteries	N/A
Annex DVA (5.6)	For Pluggable Equipment Type A, the protection in the installation is assumed to be 20A.	No connection to Mains	N/A
Annex DVA (6.3)	The maximum quantity of flammable liquid stored in equipment is required to comply with NFPA 30.	No such flammable liquid stored in 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.	Not for ITE room applications	N/A
Annex DVA (10.3)	Equipment with lasers is required to meet the U.S. Code of Federal Regulations 21 CFR 1040 (and the Canadian Radiation Emitting Devices Act, REDR C1370).	No lasers	N/A
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).	Equipment does not produce ionizing radiation	P
Annex DVA (F.3.3.4)	Equipment for use on a.c. mains supply systems with a neutral and more than one phase conductor (e.g. 120/240 V, 3-wire) require a special marking format for electrical ratings. Additional considerations apply for voltage ratings that exceed the attachment cap rating or that are lower than the "Normal Operating Condition" in Table 2 of CAN/CSA C22.2 No. 235."	Not connected to Mains	N/A
Annex DVA (F.3.3.6)	Equipment identified for ITE (computer) room installation is required to be marked with the rated current.	Comply	P
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.	Not vertically mounted	N/A

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
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.	Class III equipment	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.	No such fuse which used for protection for supply outlets and receptacles	N/A
Annex DVA (G.4.2)	Equipment with isolated ground (earthing) receptacles is required to comply with NEC 250.146(D) and CEC 10-400 and 10-612.	DC product. Earthing is not required	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 transformers	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 motors	N/A
Annex DVA (G.7)	Flexible cords used outdoors are required to have the suffix "W" marked on the flexible cord.	No such cords Indoor equipment	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 for ITE room applications	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.	No such components	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.	No such wiring terminals	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.	Indoor equipment	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.	Equipment not used for entertainment purposes	N/A
Annex DVC (1)	Additional requirements apply for equipment intended for mounting under kitchen cabinets.	No used for mounting under kitchen cabinets	N/A

IEC 62368-1			
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.	Considered. See appended table 4.1.2	P
Annex DVH	Equipment for permanent connection to the mains supply is subjected to additional requirements.	No such equipment	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.	Not connected to the mains	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.	No such terminals	N/A
	Wire binding screws are not permitted to attach conductors larger than 10 AWG (5.3 mm ²).	Wire binding screws are not used	N/A
Annex DVH (DVH.4)	Permanently connected equipment is required to have a suitable wiring compartment and wire bending space.	Not considered as permanently connected equipment	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.	Not connected to DC mains	N/A
Annex DVI (6.7)	Equipment intended for connection to telecommunication network outside plant cable is required to be protected against overvoltage from power line crosses.	Not intended for connection to telecommunication network	N/A
Annex DVJ (10.6.1)	Equipment connected to a telecommunication and cable distribution networks and supplied with an earphone intended to be held against, or in the ear is required to comply with special acoustic pressure requirements.	As above	N/A

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Clause	Requirement + Test	Result - Remark	Verdict

4.1.2	TABLE: List of critical components					P
Object / part No.	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity ¹	
- Description:						
For all models (1-3)						
Plastic enclosure parts	Covestro	Macrolon 2805	Polycarbonate, thickness 2.4 mm. Flammability V-2	UL 94	UL (E41613)	
Metal enclosure parts	LiveU	Aluminum	Thickness 2.0mm min. Opening dimension 4.2mm max	IEC/EN/UL 62368-1	Evaluated and accepted	
Internal plastic plate (on which the battery is glued)	Sabic Innovative Plastics	Lexan 500R	Thickness 1.3 mm Flammability V-0	UL 94	UL (E45329)	
PCB	Various	Various	Flammability rating V-1 or better, 105°C	IEC 60603-2 UL 94 UL 796	UL or equivalent	
Fuse F1 (Backplane battery fuse)	Littelfuse (or alternate)	452 series 005.MRL (or equivalent)	125V, 5A. Operation temp: - 55 to 125°C	UL 248-1 UL 248-14	UL (E10480) (or equivalent)	
DC fan (2 provided)	Sunon	MC30100V2-0000-F99	Fan, 5VDC, 0.38W min. 4.6 CFM	UL 507 EN 60950-1	UL (E77551) TUV	
Internal wires	Various	Various	Polyethylene insulated, Tin plated copper wires, min 24 AWG, 600V, 125°C	IEC 60332 or IEC/TS 60695-11-21 or equivalent	UL, TUV (or equivalent)	
1) LU300S						
Battery pack	Epsilor	30010000A	Battery pack, 2S2P, 7.2V, 6.7Ah, 48.2Wh. Charging 3.4A, 8.4V, 0 to 45°C. Discharge - 10 to +60°C	IEC 62133	CB by UL (DK-95508-UL)	
Battery cells	Samsung SDI	INR18650-35E	Lithium ion cylindrical cell, rechargeable, 3.6V, 3.48Ah. Charging voltage 4.2V (12V max), charging current 1.7A (2.0A max). Operation temp: charge 0 to 45°C, discharge - 10 to 60°C	UL 1642 IEC 62133	UL (MH21015) Dekra (NL-53895)	

IEC 62368-1					
Clause	Requirement + Test		Result - Remark		Verdict
External AC/DC adaptor	Adapter Technology	ATS065S-P160	Input: 100-240Vac, 50-60Hz, 1.4A Output: 16VDC, 4.07A, LPS	IEC/UL/EN 62368-1 CSA-C22.2#62368-1 AS/NZS 60950.1 J60950-1 (H27), J55022 (H22), J3000 (H25)	UL (E225703) CB by UL (DK-71427-UL) NEMKO GS (GS-1802-347478-000) SAA (certificate SAA-162530-EA) JET (JET6174-61010-2130)
2) LU300S-VM / LU300S-AB					
External AC/DC adaptor	Adapter Technology	ATS065S-P160	Input: 100-240Vac, 50-60Hz, 1.4A Output: 16VDC, 4.07A, LPS	IEC/UL/EN 62368-1 CSA-C22.2#62368-1 AS/NZS 60950.1 J60950-1 (H27), J55022 (H22), J3000 (H25)	UL (E225703) CB by UL (DK-71427-UL) NEMKO GS (GS-1802-347478-000) SAA (certificate SAA-162530-EA) JET (JET6174-61010-2130)
Battery pack	HighPower Tech	HF623-ID528	Battery pack, 2S1P, 7.4V, 4Ah, 29.6Wh. Charging 2A (4A max), 8.4V, 0 to 45°C. Discharge -10 to +60°C	IEC/UL/EN 62368-1	Evaluated with appliance
Battery cells	Springpower Technology Shenzhen	537482	Lithium ion (pouch) cell, 3.65V, charging voltage 4.2V, charging current 4A max. Operation temp: charge 0 to 45°C, discharge -10 to 60°C	UL 1642 IEC 62133-2	UL (MH46844) SGS Fimko (FI-40585)

IEC 62368-1					
Clause	Requirement + Test		Result - Remark		Verdict
Heat shrink	Various	Various	Heat shrink	VW-1, or equivalent	UL, TUV (or equivalent)
Mounting plates	IDX Company	A-MT2V P-V2	Mounting plates for external battery and camera, 16.8VDC, 7A max.	IEC/UL/EN 62368-1	Evaluated with appliance
	Sabic	Lexan FR Resin 940	Polycarbonate resin. UL 94 V-0, outdoor stability f1. Deflection temperature 132°C, Vicat 151°C, RTI 120°C	UL 94 UL 746C	UL (E121562-220904)
	Sabic	Ultem Resin 1010	Polyether Imide, UL 94 V-0. Deflection temperature 198°C, Vicat 218°C, RTI 170°C	UL 94 UL 746	UL (E121562-101048269)
	SOC Corp	ULTSC-7A	Cartridge type fuse, 5x20mm, 125V, 7A, interrupting rating 10kA	UL 248-1 UL 248-14	UL (E39265)
Mounting plates (alternative)	Anton Bauer	QR-A200, QR-DSR	Mounting plates for external battery and camera, 16.8VDC, 7A max	IEC/UL/EN 62368-1	Evaluated with appliance
	Sabic	Lexan FR Resin 940	Polycarbonate resin. UL 94 V-0, outdoor stability f1. Deflection temperature 132°C, Vicat 151°C, RTI 120°C	UL 94 UL 746C	UL (E121562)
	Sabic	Ultem Resin 1010	Polyether Imide, UL 94 V-0. Deflection temperature 198°C, Vicat 218°C, RTI 170°C	UL 94 UL 746	UL (E121562)
	Polymer Resources	PC-G20	Polycarbonate (PC) filled with 20% glass fiber, Flammability V-0 (3mm), RTI 80°C. Deflection temperature 141°C	UL 94 UL 746	UL (E113219)
	SOC Corp	ULTSC-7A	Cartridge type fuse, 5x20mm, 125V, 7A, interrupting rating 10kA	UL 248-1 UL 248-14	UL (E39265)
3) LU-SOLO-PRO					

IEC 62368-1					
Clause	Requirement + Test		Result - Remark		Verdict
External AC-DC USB type C LPS power adapter	FSP GROUP INC	FSP065	Input:100-240VAC, 50-60Hz, 1.7A Output: 5V,3A, 15W 12V, 3A, 36W 20V,3.25A, 65W	UL 62368-1 EN 62368-1:2014+A11 IEC 62368-1:2014	UL (E190414) TUV (cert. 50457475) CB by TUV (JPTUV-104437)
Battery pack	Epsilor	30010000A	Battery pack, 2S2P, 7.2V, 6.7Ah, 48.2Wh. Charging 3.4A, 8.4V, 0 to 45°C. Discharge - 10 to +60°C	IEC 62133	CB by UL (DK-95508-UL)
Battery cells	Samsung SDI	INR18650-35E	Lithium ion cylindrical cell, rechargeable, 3.6V, 3.48Ah. Charging voltage 4.2V (12V max), charging current 1.7A (2.0A max). Operation temp: charge 0 to 45°C, discharge - 10 to 60°C	UL 1642 IEC 62133	UL (MH21015) Dekra (NL-53895)
Supplementary information:					
1) Provided evidence ensures the agreed level of compliance. See OD-CB2039.					

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

5.2		TABLE: Classification of electrical energy sources						P
Supply Voltage	Location (e.g. circuit designation)	Test conditions	Parameters				ES Class	
			U (V)	I (mA)	Type ¹⁾	Additional Info ²⁾		
1) LU300S-5G								
7.2 VDC	Circuits which are powered from internal rechargeable Lithium battery	Normal	Max 8.4VDC	-	SS	-	ES1	
		Abnormal						
		Single fault – SC/OC						
12-19VDC	Circuits which are powered from external AC/DC adapter (charger)	Normal	Max 19VDC	-	SS	-	ES1	
		Abnormal						
		Single fault – SC/OC						
2) LU300S-VM-5G								
16.8VDC max	Circuits which are powered from an external battery	Normal	Max 16.8VDC	-	SS	-	ES1	
		Abnormal						
		Single fault – SC/OC						
7.4 VDC	Circuits which are powered from internal rechargeable Lithium battery	Normal	Max 8.4VDC	-	SS	-	ES1	
		Abnormal						
		Single fault – SC/OC						
12-19VDC	Circuits which are powered from external AC/DC adapter (charger)	Normal	Max 19VDC	-	SS	-	ES1	
		Abnormal						
		Single fault – SC/OC						
3) LU-SOLO-PRO-SDI								
20VDC	Circuits which are powered from external AC/DC to USB type C adapter	Normal	Max 20VDC	-	SS	-	ES1	
		Abnormal						
		Single fault – SC/OC						
7.2 VDC	Circuits which are powered from	Normal	Max 8.4VDC	-	SS	-	ES1	
		Abnormal						

IEC 62368-1							
Clause	Requirement + Test			Result - Remark			Verdict
	internal rechargeable Lithium battery	Single fault – SC/OC					
<p>Supplementary information:</p> <p>1) Type: Steady state (SS), Capacitance (CP), Single pulse (SP), Repetitive pulses (RP), etc.</p> <p>2) Additional Info: Frequency, Pulse duration, Pulse off time, Capacitance value, etc.</p> <p>Test Conditions:</p> <p>Normal, Abnormal, Single fault – SC/OC (SC=Short Circuit, OC=Short Circuit)</p>							

IEC 62368-1							
Clause	Requirement + Test			Result - Remark		Verdict	
5.4.1.4, 6.3.2, 9.0, B.2.6	TABLE: Temperature measurements					P	
	Supply voltage (V)	19VDC from external adapter		7.2/ 7.4VDC from internal battery		—	
	Ambient T _{min} (°C)	24		24		—	
	Ambient T _{max} (°C)	24	Calculated to	24	Calculated to	—	
	T _{ma} (°C)		45		45	—	
Maximum measured temperature T of part/at:		T (°C)				Allowed T _{max} (°C)	
1) LU300S-5G							
Internal ambient (between cards)		42.9	63.9	42.2	63.2	-	
Internal ambient (near the battery)		34.3	55.3	34.4	55.4	60*	
Internal battery		32.7	53.7	32.4	53.4	60*	
LCD Screen		25	-	25.2	-	71	
Top enclosure		33.9	-	33.8	-	70	
Bottom enclosure		28.1	-	28.1	-	70	
Plastic grill (at the bottom)		35.1	-	35.3	-	94	
2) LU300S-VM-5G mounting plates							
Plastic panel for external battery connection		30.1	-	29	-	77	
Internal wires at external plastic adapter for battery connection		42.8	63.8	41	62	120	
Plastic panel for external camera connection		29.5	-	29	-	77	
Internal wires at external plastic adapter for camera connection		40.8	61.8	40.4	61.4	120	
Internal battery		33.8	54.8	33.7	54.7	60*	
Internal ambient (near the battery)		34.3	55.3	34.3	55.3	60*	
Internal ambient (between cards)		42.9	63.9	42.9	63.9	-	
Supplementary information: Measured at charging method, each USB port was loaded by 0.5A.							
Temperature measurment performed while LU300S was whitin it's carrying bag (worst case except for mounting plates temperatures).							
* Battery charging temerature 0-45°C; Battery dischare temerature -10 – 60°C.							
Charging was interrupted while internal battery ambient above 45°C.							
Discharging was interrupted while internal battery ambient above 60°C.							
Temperature T of winding:	t ₁ (°C)	R ₁ (Ω)	t ₂ (°C)	R ₂ (Ω)	T (°C)	Allowed T _{max} (°C)	Insulation class

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

Supplementary information:

Note 1: T_{ma} should be considered as directed by applicable requirement

Note 2: T_{ma} is not included in assessment of Touch Temperatures (Clause 9)

5.4.1.4, 6.3.2, 9.0, B.2.6	TABLE: Temperature measurements					P
	Supply voltage (V)	20VDC from external adapter		7.2VDC from internal battery		—
	Ambient T _{min} (°C)	24		24		—
	Ambient T _{max} (°C)	24	Calculated to	24	Calculated to	—
	T _{ma} (°C)		45		45	—
Maximum measured temperature T of part/at:		T (°C)				Allowed T _{max} (°C)

3) LU-SOLO-PRO-SDI

Internal ambient (between cards)	42.5	63.5	42.5	63.5	-
Internal ambient (near the battery)	33.2	54.2	33.2	54.2	60*
Internal battery	32.5	53.5	32.5	53.5	60*
LCD Screen	24.9	-	24.9	-	71
Top enclosure	33.8	-	33.8	-	70
Bottom enclosure	28.6	-	28.6	-	70
Plastic grill (at the bottom)	36.8	-	36.8	-	94

Supplementary information: Measured at charging method, each USB port was loaded by 0.5A.

Temperature measurement performed while EUT was within its carrying bag (worst case except for mounting plates temperatures).

* Battery charging temperature 0-45°C; Battery discharge temperature -10 – 60°C.

Charging was interrupted while internal battery ambient above 45°C.

Discharging was interrupted while internal battery ambient above 60°C.

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:

Note 1: T_{ma} should be considered as directed by applicable requirement

Note 2: T_{ma} is not included in assessment of Touch Temperatures (Clause 9)

5.4.1.8	TABLE: Working voltage measurement				N/A
Location	RMS voltage (V)	Peak voltage (V)	Frequency (Hz)	Comments	

IEC 62368-1				
Clause	Requirement + Test		Result - Remark	Verdict
Supplementary information:				

5.4.1.10.2	TABLE: Vicat softening temperature of thermoplastics			N/A
Penetration (mm).....:		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				N/A
Allowed impression diameter (mm)				≤ 2 mm	—
Object/Part No./Material	Manufacturer/trademark	Thickness (mm)	Test temperature (°C)	Impression diameter (mm)	
Supplementary information:					

5.4.2, 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)	Freq ¹⁾ (Hz)	Required cl (mm)	cl (mm)	E.S. ²⁾ (V)	Required cr (mm)	cr (mm)
Supplementary information:								
1) Only for frequency above 30 kHz								
2) Complete Electric Strength voltage (E.S. (V) when 5.4.2.4 applied)								

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

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

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

5.4.9	TABLE: Electric strength tests			N/A
Test voltage applied between:		Voltage shape (Surge, Impulse, 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
Location	Supply voltage (V)	Operating and fault condition ¹⁾	Switch position	Measured voltage (Vpk)	ES Class	

Supplementary information:

X-capacitors installed for testing:

☐ bleeding resistor rating:

☐ ICX:

1) Normal operating condition (e.g., normal operation, or open fuse), SC= short circuit, OC= open circuit

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)	

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

Supplementary information:

5.7.4	TABLE: Unearthed accessible parts					N/A
Location	Operating and fault conditions	Supply Voltage (V)	Parameters			ES class
			Voltage (V_{rms} or V_{pk})	Current (I_{rms} or A_{pk})	Freq. (Hz)	
Supplementary information:						
Abbreviation: SC= short circuit; OC= open circuit						

5.7.5	TABLE: Earthed accessible conductive part			N/A
Supply voltage (V)				—
Phase(s)		<input type="checkbox"/> Single Phase; <input type="checkbox"/> Three Phase: <input type="checkbox"/> Delta <input type="checkbox"/> Wye		
Power Distribution System		<input type="checkbox"/> TN <input type="checkbox"/> TT <input type="checkbox"/> IT		
Location		Fault Condition No in IEC 60990 clause 6.2.2	Touch current (mA)	Comment
Supplementary Information:				

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
1) LU300S-5G						
External AC/DC adapter (charger) output, safety approved as LPS	Full load – overload	16VDC	4.07A	65W	5	PS2
Output of internal lithium battery pack	Short	8.2VDC	3.9A	32W	5	PS2
2) LU300S-VM-5G						
External AC/DC adapter (charger) output, safety approved as LPS	Full load – overload	16VDC	4.07A	65W	5	PS2
Output of internal lithium battery pack	Short	7.4VDC	5.9A	44W	5	PS2
Circuits connected to External battery output	Normal and fault conditions	Max 16.8VDC	7A	118W	5	PS3
3) LU-SOLO-PRO-SDI						
External AC/DC to USB type C power adapter approved as LPS	Full load – overload	20VDC	3.25A	65W	5	PS2
Output of internal lithium battery pack	Short	8.2VDC	3.9A	32W	5	PS2
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.						

IEC 62368-1				
Clause	Requirement + Test		Result - Remark	Verdict
6.2.3.1	TABLE: Determination of Potential Ignition Sources (Arcing PIS)			N/A
Location	Open circuit voltage after 3s (V _{pk})	Measured r.m.s current (A)	Calculated value (V _p x I _{rms})	Arcing PIS? Yes / No
<p>Supplementary information:</p> <p>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.</p>				

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
1, 3) LU300S-5G and LU-SOLO-PRO-SDI cells connection inside battery	Normal	-	0.08Ax8.2V=0.7W	No	No
	Fault	4.0Vx7.4A=29W	-	Yes	No
2) LU300S-VM-5G cells connection inside battery	Normal	-	0.08Ax7.4=0.6W	No	No
	Fault	6.8Vx6.0A=41W	-	Yes	No
<p>Supplementary Information:</p> <p>A combination of voltmeter, VA and ammeter IA may be used instead of a wattmeter.</p> <p>If a separate voltmeter and ammeter are used, the product of (VA x IA) is used to determine Resistive PIS classification.</p> <p>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.</p>					

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:									

B.2.5	TABLE: Input test							P
U (V)	I (A)	I rated (A)	P (W)	P rated (W)	Fuse No	I fuse (A)	Condition/status	
1) LU300S-5G *								
10.8	2.9	4.2	32.5	-	-	-	Maximum load	
12	2.85	42	34.2	-	-	-	Maximum load	
19	1.95	2.7	37.0	-	-	-	Maximum load	
20.9	1.7	2.7	35.5	-	-	-	Maximum load	
3) LU-SOLO-PRO-SDI								
20	1.7	3.25	34	45	-	-	Maximum load	
Supplementary information: Measured at charging method, each USB port was loaded by 0.5A.								
* Tested on LU300S-5G (1) as a representative of worst case (larger battery) between LU300S-5G (1) and LU300S-VM-5G (2)								

B.3, B.4		TABLE: Abnormal operating and fault condition tests					P
Ambient temperature T _{amb} (°C)					23°C		—
Power source for EUT: Manufacturer, model/type, outputrating...					Itech Electronic, IT6512D, 1800W		—
Component No.	Condition	Supply voltage (V)	Test time	Fuse no.	Fuse current (A)	Observation	
1) LU300S-5G *							
Ventilation openings	Abnormal - Blocked	12/19VDC	1h	-	-	No Hazards 39°C max enclosure temp No overheat	
One DC fan	Stalled	12/19VDC	2h	-	-	Internal battery reached up to 38°C. Enclosure temp 36.5°C. No hazards No overheat	
U20	SC	12/19VDC	2h	-	-	Internal battery reached up to 49°C.	

IEC 62368-1						
Clause	Requirement + Test			Result - Remark		Verdict
	both DC fans disconnected					Enclosure temp 50°C. No hazards No overheat
Q16 (battery protection circuit)	SC	19VDC	1h	-	-	Charging current to battery stops, voltage on battery is 10V, no heating, no hazards
Battery output of LU300S	SC	19VDC	1h	-	-	Current to battery stops, no over heating, no hazards
D40 external power adapter input	SC	19VDC	1m	-	-	Fuse blew immediately, no hazards
2) LU300S-VM-5G						
Battery output of LU300S-VM	SC	19VDC	1h	-	-	Current to battery stops, no over heating, no hazards
C500 (power input of external battery to LU300S-VM)	SC	16.8VDC	1h	-	7A	External wires temperatures arrived at 45.4°C. No hazards
Output terminal to external camera (LU300S-VM)	SC	16.8VDC	1h	-	7A	External wires temperatures arrived at 34.9°C. No hazards
3) LU-SOLO-PRO-SDI						
Power input USB Type C connector	SC	20VDC	1h	-	-	No Hazards
Ventilation openings	Abnormal - Blocked	20VDC	1h	-	-	No Hazards 38°C max enclosure temp No overheat
One DC fan	Stalled	20VDC	2h	-	-	Internal battery reached up to 38.2°C. Enclosure temp 36°C. No hazards No overheat
Q16 (battery protection circuit)	SC	19VDC	1h	-	-	Charging current to battery stops, voltage on battery is 10V, no heating, no hazards
Supplementary information:						
Abbreviation: SC= short circuit; OC= open circuit						
* Tested on LU300S-5G (1) as a representative of worst case (larger battery) between LU300S-5G (1) and LU300S-VM-5G (2)						

IEC 62368-1									
Clause		Requirement + Test				Result - Remark			Verdict
M.3		TABLE: Protection circuits for batteries provided within the equipment							P
Is it possible to install the battery in a reverse polarity position?						Prevented by connector design			—
Equipment Specification		Charging							
		Voltage (V)				Current (A)			
		Models 1, 3) 7.2VDC Model 2) 7.4VDC				Models 1, 3) 6.7Ah Model 2) 4Ah			
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)				
1, 3) Epsilor battery pack model 3001000A		-	-	8.4VDC	3.4A	3.4A	-		
2) HighPower battery pack model HF623-ID528		-	-	8.4VDC	4A	5.6A	-		
Note: The tests of M.3.2 are applicable only when above appropriate data is not available.									
Specified battery temperature (°C).....:						Charge: 0 - 45°C			
						Dischare: -10 – 60°C.			
Component No.	Fault condition	Charge/ discharge mode	Test time	Temp. (°C)	Current (A)	Voltage (V)	Observation		
1, 3) Epsilor battery pack model 3001000A	SC	CC-CV	-	-	3.9A	8.2VDC	NL NF NE		
2) HighPower battery pack model HF623-ID528	SC	CC-CV	-	-	5.9A	7.4VDC	NL NF NE		
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.									

IEC 62368-1					
Clause	Requirement + Test			Result - Remark	Verdict
M.4.2	TABLE: Charging safeguards for equipment containing a secondary lithium battery				P
Maximum specified charging voltage (V)				1-3) 8.4VDC	—
Maximum specified charging current (A)				1, 3) 3.4A 2) 2A	—
Highest specified charging temperature (°C)				1-3) 45°C	
Lowest specified charging temperature (°C)				1-3) 0°C	
Battery manufacturer/type	Operating and fault condition	Measurement			Observation
		Charging voltage (V)	Charging current (A)	Temp. (°C)	
1, 3) Epsilor battery pack model 3001000A	Normal	8.2V	1.9A	-	No charging below 0°C.
	Abnormal	8.2V	0.27A	-	No charging above 45°C.
	Single fault – SC/OC	8.2V	1.9A	-	No hazards.
2) HighPower battery pack model HF623-ID528	Normal	7.4V	1.9A	-	No charging below 0°C.
	Abnormal	7.4V	0.27A	-	No charging above 40°C.
	Single fault – SC/OC	7.4V	1.9A	-	No hazards.
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)					P
Output Circuit	Components	U _{oc} (V)	I _{sc} (A)		S (VA)	
			Meas.	Limit	Meas.	Limit
All models (1-3)						
Line USB out	Connector	4.98VDC	2.1A	< 8A	< 100	< 100
HDMI out	Connector	4.99VDC	0.17A	< 8A	< 100	< 100
Supplementary Information:						

T.2, T.3, T.4, T.5	TABLE: Steady force test					P
Part/Location	Material	Thickness (mm)	Force (N)	Test Duration (sec)	Observation	
All models (1-3)	Plastic	>1.5	100	5	No hazards, No damage	
Supplementary information:						

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

T.6, T.9	TABLE: Impact tests			N/A
Part/Location	Material	Thickness (mm)	Vertical distance (mm)	Observation
Supplementary information:				

T.7	TABLE: Drop tests			P
Part/Location	Material	Thickness (mm)	Drop Height (mm)	Observation
For all models (1-3)				
Enclosure	Plastic	2.4	1000	No damage to enclosure after 3 drops. Battery voltage was inspected for 24h compared to reference battery. No change in voltage.
Supplementary information:				

T.8	TABLE: Stress relief test				N/A
Part/Location	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:				

Appendix A – Equipment used for testing

Equipment calibration

Hermon Laboratories is accredited by A2LA for calibration according to present requirements of ISO/IEC 17025 and NCSL Z540-1. The accreditation is granted to perform calibration of parameters that are listed in the Scope of Hermon Laboratories Accreditation. Hermon Laboratories calibrates its reference and transfer standards by calibration laboratories accredited to ISO/IEC 17025 by a mutually recognized Accreditation Body or by a recognized national metrology institute. All reference and transfer standards used in the calibration system are traceable to national or international standards.

In-house calibration of all test and measurement equipment is performed on a regular basis according to Hermon Laboratories calibration procedures, manufacturer calibration/verification procedures or procedures defined in the relevant standards. The Hermon Laboratories test and measurement equipment is calibrated within the tolerances specified by the manufacturers and/or by the relevant standards.

For LIVSAF_CB.45656

HL No	Equipment description	Manufacturer	Model	Ser. No.	Last Cal./Chk.	Next Cal./Chk.
2772	HygroThermometer, Min/Max Memory	Delta TRAK	13301	NA	14-Dec-21	14-Dec-22
5201	Multimeter, TRUE RMS	Fluke	Fluke 287	33500022	11-May-21	11-May-22
5528	Clamp On Ammeter, 40A DC / AC pk	AMPROBE	LH41A	18090054	27-Jun-21	27-Jun-22
3132	Data Logger Hydra	Fluke	2625A	5834602	16-Jan-22	16-Jan-23
5543	High power and Programmable Switching Power supply	Itech Electronic	IT6512D	8025570437 47020052	15-Jun-21	15-Jun-22
3898	Temperature & Humidity chamber, Temp. from -73 to +190 °C, Humidity from 10 to 98% RH	Cincinnati Sub-Zero	ZPHS-16-2-2-H/AC	ZP0941951	04-May-21	04-May-22
3124	Digital Force Gauges, Capacity 50.00 kg, Resolution 0.01 kg	SHIMPO	FGC-50B	G9506F004	02-Nov-21	02-Nov-22
5413	Digital Stopwatch	Shenzhen Huibo Industrial & Trading Co. Ltd.	PC396	NA	11-Aug-21	11-Aug-22

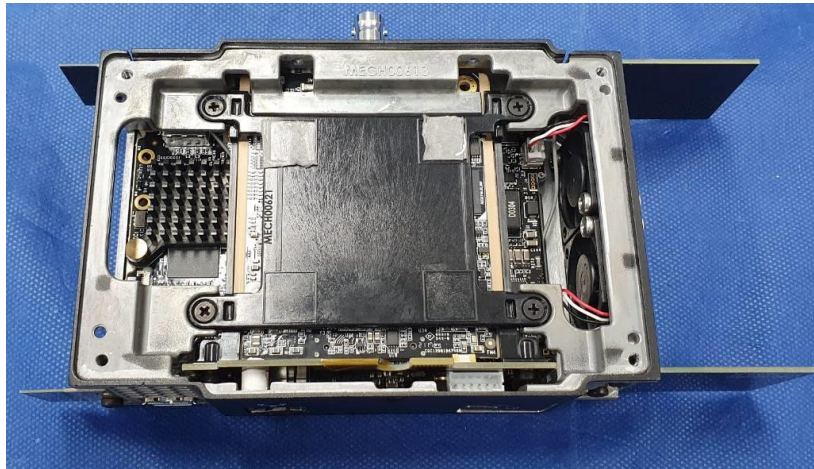
Not required for LIVSAF_CB.48233

Appendix B - Photo Documentation

Photograph 1, 2, 3
General view - LU300S-5G



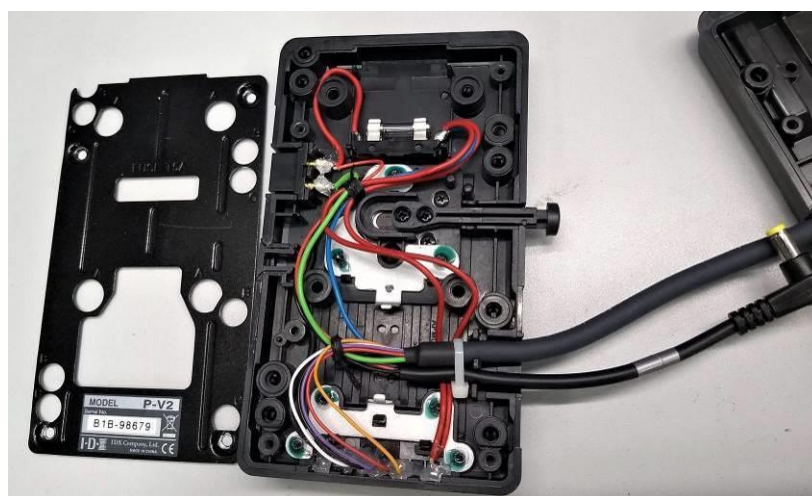
Photograph 4, 5
Internal view - LU300S-5G



Photograph 6, 7, 8
General view - LU300S-VM-5G



Photograph 9, 10, 11, 12 ,13
Mounting Plates assemblies options - LU300S-VM-5G





Photograph 14, 15
V mounting battery



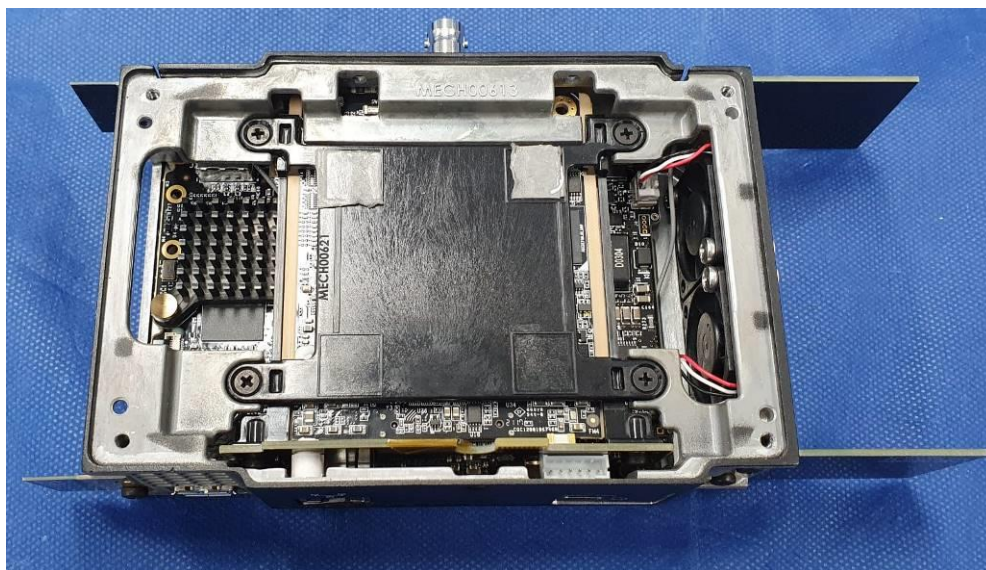
Photograph 16, 17
AB mounting battery



New Photograph 18, 19, 20, 21
General view - LU-SOLO-PRO-SDI



Photograph 22, 23
Internal view LU-SOLO-PRO-SDI



Photograph 24, 25, 26
External AC-DC Power adapter

For LU300S-5G / LU300S-VM-5G



For LU-SOLO-PRO-SDI



Photograph 27, 28
Internal batteries

LU300S-5G / LU-SOLO-PRO-SDI



LU300S-VM-5G



End of Test Report