





**BUREAU
VERITAS**

Test Report No: RD2106WDG0248



Certificate # 2951.01

| | |
|--|--|
| Test Report No.: RD2106WDG0248 | |
| Applicant's name : | Particle Industries, Inc |
| Address : | 126 Post St, 4th floor, San Francisco, CA 94108 USA |
| Test item description: | 802.11b/g/n WICED Module |
| Model/Type reference : | WM-N-BM-14-S, P1 |
| Testing laboratory | |
| Name : | Bureau Veritas Shenzhen Co., Ltd. Dongguan Branch |
| Address : | No. 96, Guantai Road (Houjie Section), Houjie Town, Dongguan City, Guangdong Province, 523942, People's Republic of China |
| Test specification | |
| Standard : | <input type="checkbox"/> IEC 62368-1:2014 (Second Edition) <input checked="" type="checkbox"/> EN 62368-1:2014 + A11: 2017 <input checked="" type="checkbox"/> BS EN 62368-1:2014+A11:2017 |
| Test Result : | The sample satisfies to the clauses examined. |
| Prepared By : | |
|  <hr style="width: 20%; margin: auto;"/> | |
| <u>2021-08-25</u> Date | |
| Scar Li Engineer / Safety Department | |
| Approved By: | |
|  <hr style="width: 20%; margin: auto;"/> | |
| <u>2021-08-25</u> Date | |
| Jetter Yang Senior Engineer / Safety Department | |
| <p><i>This report is governed by, and incorporates by reference, CPS Conditions of Service as posted at the date of issuance of this report at https://www.cps.bureauveritas.com/terms-conditions and is intended for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. Measurement uncertainty is only provided upon request for accredited tests. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence or if you require measurement uncertainty; provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute you unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents.</i></p> | |



TEST REPORT

Report Number..... : RD2106WDG0248

Date of issue : 2021-08-25

Total number of pages : 61

Testing laboratory : Bureau Veritas Shenzhen Co., Ltd. Dongguan Branch

Test location/Address : No. 96, Guantai Road (Houjie Section), Houjie Town,
Dongguan City, Guangdong Province, 523942, People's
Republic of China

Applicant's name : Particle Industries, Inc

Address..... : 126 Post St, 4th floor, San Francisco, CA 94108 USA

Test specification:

Standard : IEC 62368-1:2014 (Second Edition)
 EN 62368-1:2014 + A11: 2017
 BS EN 62368-1:2014+A11:2017

Non-standard test method : N/A

Test Report Form No. : IEC/EN 62368-1(ed. 2.0)_DG_V202102

Test Report Form(s) Originator..... : BV_DG

Master TRF : Dated 2021-02

Manufacturer : Particle Industries, Inc

Address..... : 126 Post St, 4th floor, San Francisco, CA 94108 USA

Factory : Universal Global Technology (Kunshan) Co., Ltd

Address..... : No.497, Huangpujiang Road, Qiandeng, Kunshan, Jiangsu
Province, P.R. C 215341

Test item description..... : 802.11b/g/n WICED Module

Trade Mark..... : Particle

Model/Type reference..... : WM-N-BM-14-S, P1

Ratings..... : 3.3Vdc, 100mA



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Copy of marking plate:

For building-in equipment, it will be verified in end product

Note 1: The instruction sheet and marking should be translated to the language where the product will be sold.

Note 2: To comply with RED Directive 2014/53/EU, the manufacturer has the responsibility to put manufacturer name / trade mark and their address, batch number on the equipment. And the importer also has the responsibility to put their name / trade mark and address on the equipment before place the equipment on the market.



| TEST ITEM PARTICULARS: | |
|---|---|
| Classification of use by | <input type="checkbox"/> Ordinary person <input type="checkbox"/> Instructed person <input checked="" type="checkbox"/> Skilled person <input type="checkbox"/> Children likely to be present |
| Supply Connection | <input type="checkbox"/> AC Mains <input type="checkbox"/> DC Mains <input checked="" type="checkbox"/> External Circuit - 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"/> +____%/ -____% <input checked="" type="checkbox"/> None (manufacturer declares) |
| 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"/> mating connector <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 supply |
| Considered current rating of protective device as part of building or equipment installation..... | ____--____ A; Installation location: <input type="checkbox"/> building; <input type="checkbox"/> equipment |
| Equipment mobility..... | <input type="checkbox"/> movable <input type="checkbox"/> hand-held <input type="checkbox"/> transportable <input type="checkbox"/> stationary <input checked="" type="checkbox"/> for building-in <input type="checkbox"/> direct plug-in <input type="checkbox"/> rack-mounting <input type="checkbox"/> wall-mounted |
| Over voltage 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 supply |
| Class of equipment | <input type="checkbox"/> Class I <input type="checkbox"/> Class II <input checked="" type="checkbox"/> Class III |
| Access location | <input type="checkbox"/> restricted access location <input checked="" type="checkbox"/> N/A |
| Pollution degree (PD) | <input type="checkbox"/> PD 1 <input checked="" type="checkbox"/> PD 2 <input type="checkbox"/> PD 3 |
| Manufacturer's specified maximum operating ambient: | 85°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} |
| Altitude during operation (m) | <input checked="" type="checkbox"/> 2000 m or less <input type="checkbox"/> ____ m |
| Altitude of test laboratory (m) | <input checked="" type="checkbox"/> 2000 m or less <input type="checkbox"/> ____ m |
| Mass of equipment (kg) | <input checked="" type="checkbox"/> Approx. 0.0016kg |



| | |
|---|--------------------------------|
| 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 | June 21, 2021 |
| Date (s) of performance of tests | June 21, 2021 to June 29, 2021 |
| 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> | |
| GENERAL PRODUCT INFORMATION: | |
| Product Description | |
| <ol style="list-style-type: none"> 1. The equipment is “802.11b/g/n WICED Module” which is supplied by DC source. 2. This is a built-in circuit board, without any enclosure, all electronic components are mounted on the PCB. 3. Operated temperature max. +85°C. 4. Physical size: approximate 28mm x 20mm x 2.0mm. 5. The equipment will consider more in the end product. | |
| Model Differences | |
| - WM-N-BM-14-S and P1 are identical to each other except model name for trading purpose. The model WM-N-BM-14-S was selected to conduct all tests in this report. | |
| Test conditions: | |
| <p>All tests were measured under the following case and the load conditions declared by manufacturer:</p> <ul style="list-style-type: none"> - The EUT was operated under normal conditions. | |



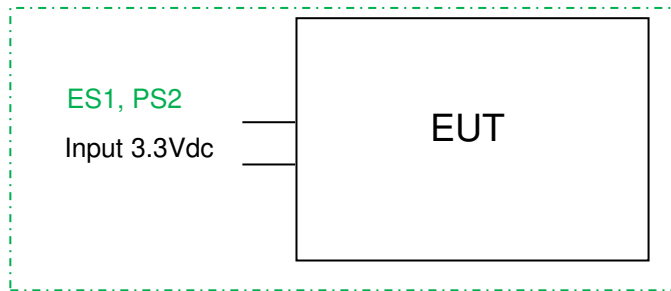
| ENERGY SOURCE IDENTIFICATION AND CLASSIFICATION TABLE: | |
|---|--|
| (Note 1: Identify the following six (6) energy source forms based on the origin of the energy.) (Note 2: The identified classification e.g., ES2, TS1, should be with respect to its ability to cause pain or injury on the body or its ability to ignite a combustible material. Any energy source can be declared Class 3 as a worse case classification e.g. PS3, ES3.) | |
| Electrically-caused injury (Clause 5): (Note: Identify type of source, list sub-assembly or circuit designation and corresponding energy source classification) Example: +5 V dc input | |
| | ES1 |
| Source of electrical energy | Corresponding classification (ES) |
| All parts of unit (+3.3Vdc input) | ES1 |
| Electrically-caused fire (Clause 6): (Note: List sub-assembly or circuit designation and corresponding energy source classification) Example: Battery pack (maximum 85 watts): | |
| | PS2 |
| Source of power or PIS | Corresponding classification (PS) |
| All parts of unit | PS2 (manufacturer declares) |
| Injury caused by hazardous substances (Clause 7) (Note: Specify hazardous chemicals, whether produces ozone or other chemical construction not addressed as part of the component evaluation.) Example: Liquid in filled component | |
| | Glycol |
| Source of hazardous substances | Corresponding chemical |
| N/A | N/A |
| Mechanically-caused injury (Clause 8) (Note: List moving part(s), fan, special installations, etc. & corresponding MS classification based on Table 35.) Example: Wall mount unit | |
| | MS2 |
| Source of kinetic/mechanical energy | Corresponding classification (MS) |
| Evaluated in the end product | Evaluated in the end product |
| Thermal burn injury (Clause 9) (Note: Identify the surface or support, and corresponding energy source classification based on type of part, location, operating temperature and contact time in Table 38.) Example: Hand-held scanner – thermoplastic enclosure | |
| | TS1 |
| Source of thermal energy | Corresponding classification (TS) |
| Evaluated in the end product | Evaluated in the end product |
| Radiation (Clause 10) (Note: List the types of radiation present in the product and the corresponding energy source classification.) Example: DVD – Class 1 Laser Product | |
| | RS1 |
| Type of radiation | Corresponding classification (RS) |
| N/A | N/A |



ENERGY SOURCE DIAGRAM

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

ES **PS** **MS** **TS** **RS**



ES1: All parts of equipment;
PS2: All parts of equipment;



| OVERVIEW OF EMPLOYED SAFEGUARDS | | | | |
|--|---|---|--|---------------------------|
| Clause | Possible Hazard | | | |
| 5.1 | Electrically-caused injury | | | |
| Body Part (e.g. Ordinary) | Energy Source (ES3: Primary Filter circuit) | Safeguards | | |
| | | Basic | Supplementary | Reinforced |
| Ordinary | ES1: all parts of unit | N/A | N/A | N/A |
| 6.1 | Electrically-caused fire | | | |
| Material part (e.g. mouse enclosure) | Energy Source (PS2: 100 Watt circuit) | Safeguards | | |
| | | Basic | Supplementary | Reinforced |
| All combustible materials around all circuit within unit | PS2: all parts of unit | No ignition and attainable high temperature value | Control fire spread, min. V-1 PCB used | N/A |
| 7.1 | Injury caused by hazardous substances | | | |
| Body Part (e.g., skilled) | Energy Source (hazardous material) | Safeguards | | |
| | | Basic | Supplementary | Reinforced |
| Ordinary | N/A | N/A | N/A | N/A |
| 8.1 | Mechanically-caused injury | | | |
| Body Part (e.g. Ordinary) | Energy Source (MS3:High Pressure Lamp) | Safeguards | | |
| | | Basic | Supplementary | Reinforced (Enclosure) |
| Evaluated in the end product | Evaluated in the end product | -- | -- | -- |
| 9.1 | Thermal Burn | | | |
| Body Part (e.g., Ordinary) | Energy Source (TS2) | Safeguards | | |
| | | Basic | Supplementary | Reinforced |
| Evaluated in the end product | Evaluated in the end product | -- | -- | -- |
| 10.1 | Radiation | | | |
| Body Part (e.g., Ordinary) | Energy Source (Output from audio port) | Safeguards | | |
| | | Basic | Supplementary | Reinforced |
| N/A | N/A | -- | -- | -- |
| Supplementary Information: | | | | |
| (1) See attached energy source diagram for additional details. | | | | |
| (2) "N" – Normal Condition; "A" – Abnormal Condition; "S" Single Fault | | | | |



| IEC/EN 62368-1 | | | |
|-----------------------|---|--|----------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 4 | GENERAL REQUIREMENTS | | P |
| 4.1.1 | Acceptance of materials, components and subassemblies | See appended table 4.1.2 | P |
| 4.1.2 | Use of components | Components which are certified to IEC and/or national standards are used correctly within their ratings. Components not covered by IEC standards are tested under the conditions present in the equipment. | P |
| 4.1.3 | Equipment design and construction | Building-in equipment, it shall be evaluated in the end product. | N/A |
| 4.1.15 | Markings and instructions | (See Annex F) | N/A |
| 4.4.4 | Safeguard robustness | Building-in equipment, it shall be evaluated in the end product. | N/A |
| 4.4.4.2 | Steady force tests | Building-in equipment, it shall be evaluated in the end product. | N/A |
| 4.4.4.3 | Drop tests | Building-in equipment, it shall be evaluated in the end product. | N/A |
| 4.4.4.4 | Impact tests | Building-in equipment, it shall be evaluated in the end product. | N/A |
| 4.4.4.5 | Internal accessible safeguard enclosure and barrier tests | No such part | N/A |
| 4.4.4.6 | Glass Impact tests..... | No such part | N/A |
| 4.4.4.7 | Thermoplastic material tests | Building-in equipment, it shall be evaluated in the end product. | N/A |
| 4.4.4.8 | Air comprising a safeguard | Building-in equipment, it shall be evaluated in the end product. | N/A |
| 4.4.4.9 | Accessibility and safeguard effectiveness | Building-in equipment, it shall be evaluated in the end product. | N/A |
| 4.5 | Explosion | | N/A |
| 4.6 | Fixing of conductors | Building-in equipment, it shall be evaluated in the end product. | N/A |
| 4.6.1 | Fix conductors not to defeat a safeguard | Building-in equipment, it shall be evaluated in the end product. | N/A |
| 4.6.2 | 10 N force test applied to | Building-in equipment, it shall be evaluated in the end product. | N/A |
| 4.7 | Equipment for direct insertion into mains socket - outlets | Not such equipment | N/A |
| 4.7.2 | Mains plug part complies with the relevant | Not such equipment | N/A |



| IEC/EN 62368-1 | | | |
|----------------|--|---------------------------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | standard | | |
| 4.7.3 | Torque (Nm) | Not such equipment | N/A |
| 4.8 | Products containing coin/button cell batteries | No coin/ button batteries used. | N/A |
| 4.8.2 | Instructional safeguard | | N/A |
| 4.8.3 | Battery Compartment Construction | | N/A |
| | Means to reduce the possibility of children removing the battery | | — |
| 4.8.4 | Battery Compartment Mechanical Tests | | N/A |
| 4.8.5 | Battery Accessibility | | N/A |
| 4.9 | Likelihood of fire or shock due to entry of conductive object | | N/A |

| 5 | ELECTRICALLY-CAUSED INJURY | | P |
|----------|---|---------------------------------------|----------|
| 5.2.1 | Electrical energy source classifications | All parts complied with ES1 | P |
| 5.2.2 | ES1, ES2 and ES3 limits | All parts complied with ES1 | P |
| 5.2.2.2 | Steady-state voltage and current | (See appended table 5.2) | P |
| 5.2.2.3 | Capacitance limits..... | No such capacitance | N/A |
| 5.2.2.4 | Single pulse limits | No such pulse | N/A |
| 5.2.2.5 | Limits for repetitive pulses | No such pulse | N/A |
| 5.2.2.6 | Ringling signals | No such ringing signal, (See Annex H) | N/A |
| 5.2.2.7 | Audio signals | No such audio signals | N/A |
| 5.3 | Protection against electrical energy sources | All parts complied with ES1 | N/A |
| 5.3.1 | General Requirements for accessible parts to ordinary, instructed and skilled persons | | N/A |
| 5.3.2.1 | Accessibility to electrical energy sources and safeguards | | N/A |
| 5.3.2.2 | Contact requirements | | N/A |
| | a) Test with test probe from Annex V | | N/A |
| | b) Electric strength test potential (V)..... | | N/A |
| | c) Air gap (mm) | | N/A |
| 5.3.2.4 | Terminals for connecting stripped wire | | N/A |
| 5.4 | Insulation materials and requirements | | N/A |
| 5.4.1.2 | Properties of insulating material | ES1 electrical energy source used | N/A |
| 5.4.1.3 | Humidity conditioning | No hygroscopic material used | N/A |



| IEC/EN 62368-1 | | | |
|-----------------------|---|---|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 5.4.1.4 | Maximum operating temperature for insulating materials | All parts complied with ES1 | N/A |
| 5.4.1.5 | Pollution degree | Pollution degree 2 | — |
| 5.4.1.5.2 | Test for pollution degree 1 environment and for an insulating compound | | N/A |
| 5.4.1.5.3 | Thermal cycling | No such device | N/A |
| 5.4.1.6 | Insulation in transformers with varying dimensions | No such device | N/A |
| 5.4.1.7 | Insulation in circuits generating starting pulses | No such pules occurred | N/A |
| 5.4.1.8 | Determination of working voltage | Class III equipment and all electrical circuits of EUT are ES1 | N/A |
| 5.4.1.9 | Insulating surfaces | No such construction | N/A |
| 5.4.1.10 | Thermoplastic parts on which conductive metallic parts are directly mounted | No such part | N/A |
| 5.4.1.10.2 | Vicat softening temperature | | N/A |
| 5.4.1.10.3 | Ball pressure | | N/A |
| 5.4.2 | Clearances | Class III equipment and all electrical circuits of EUT are ES1, only the functional insulation inside the EUT | N/A |
| 5.4.2.2 | Determining clearance using peak working voltage | | N/A |
| 5.4.2.3 | Determining clearance using required withstand voltage | | N/A |
| | a) a.c. mains transient voltage..... | | — |
| | b) d.c. mains transient voltage | | — |
| | c) external circuit transient voltage | | — |
| | d) transient voltage determined by measurement... | | — |
| 5.4.2.4 | Determining the adequacy of a clearance using an electric strength test | | N/A |
| 5.4.2.5 | Multiplication factors for clearances and test voltages..... | Only considered less the 2000m in this report | N/A |
| 5.4.3 | Creepage distances..... | Class III equipment and all electrical circuits of EUT are ES1, only the functional insulation inside the EUT | N/A |
| 5.4.3.1 | General | | N/A |
| 5.4.3.3 | Material Group | Group IIIb | — |



| IEC/EN 62368-1 | | | |
|-----------------------|--|---|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 5.4.4 | Solid insulation | Class III equipment and all electrical circuits of EUT are ES1, and there is no critical insulation. | N/A |
| 5.4.4.2 | Minimum distance through insulation | No such part | N/A |
| 5.4.4.3 | Insulation compound forming solid insulation | No such part | N/A |
| 5.4.4.4 | Solid insulation in semiconductor devices | No such part | N/A |
| 5.4.4.5 | Cemented joints | No such part | N/A |
| 5.4.4.6 | Thin sheet material | No such part | N/A |
| 5.4.4.6.1 | General requirements | No such part | N/A |
| 5.4.4.6.2 | Separable thin sheet material | No such part | N/A |
| | Number of layers (pcs) | No such part | N/A |
| 5.4.4.6.3 | Non-separable thin sheet material | No such part | N/A |
| 5.4.4.6.4 | Standard test procedure for non-separable thin sheet material | No such part | N/A |
| 5.4.4.6.5 | Mandrel test | No such part | N/A |
| 5.4.4.7 | Solid insulation in wound components | No such part | N/A |
| 5.4.4.9 | Solid insulation at frequencies >30 kHz | No such part | N/A |
| 5.4.5 | Antenna terminal insulation | No such device | N/A |
| 5.4.5.1 | General | No such device | N/A |
| 5.4.5.2 | Voltage surge test | No such device | N/A |
| | Insulation resistance (MΩ) | No such device | — |
| 5.4.6 | Insulation of internal wire as part of supplementary safeguard | Class III equipment and all electrical circuits of EUT are ES1, only the functional insulation inside the EUT | N/A |
| 5.4.7 | Tests for semiconductor components and for cemented joints | No semiconductor components and for cemented joints | N/A |
| 5.4.8 | Humidity conditioning | Class III equipment and all electrical circuits of EUT are ES1, only the functional insulation inside the EUT | N/A |
| | Relative humidity (%) | | — |
| | Temperature (°C) | | — |
| | Duration (h) | | — |



| IEC/EN 62368-1 | | | |
|-----------------------|--|---|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 5.4.9 | Electric strength test..... : | Class III equipment and all electrical circuits of EUT are ES1, only the functional insulation inside the EUT | N/A |
| 5.4.9.1 | Test procedure for a solid insulation type test | Class III equipment and all electrical circuits of EUT are ES1, only the functional insulation inside the EUT | N/A |
| 5.4.9.2 | Test procedure for routine tests | Class III equipment and all electrical circuits of EUT are ES1, only the functional insulation inside the EUT | N/A |
| 5.4.10 | Protection against transient voltages between external circuit | The EUT does not intend to be connected directly such external circuits | N/A |
| 5.4.10.1 | Parts and circuits separated from external circuits | | N/A |
| 5.4.10.2 | Test methods | | N/A |
| 5.4.10.2.1 | General | | N/A |
| 5.4.10.2.2 | Impulse test..... : | No transient voltage from the external circuit | N/A |
| 5.4.10.2.3 | Steady-state test : | No transient voltage from the external circuit | N/A |
| 5.4.11 | Insulation between external circuits and earthed circuitry : | The EUT does not intend to be connected directly such external circuits | N/A |
| 5.4.11.1 | Exceptions to separation between external circuits and earth | The EUT does not intend to be connected directly such external circuits | N/A |
| 5.4.11.2 | Requirements | | N/A |
| | Rated operating voltage U_{op} (V) | | — |
| | Nominal voltage U_{peak} (V) | | — |
| | Max increase due to variation U_{sp} | | — |
| | Max increase due to ageing ΔU_{sa} | | — |
| | $U_{op} = U_{peak} + \Delta U_{sp} + \Delta U_{sa}$ | | — |
| 5.5 | Components as safeguards | | N/A |
| 5.5.1 | General | See below | N/A |
| 5.5.2 | Capacitors and RC units | No such component | N/A |
| 5.5.2.1 | General requirement | No such component | N/A |



| IEC/EN 62368-1 | | | |
|----------------|--|-------------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 5.5.2.2 | Safeguards against capacitor discharge after disconnection of a connector | No such component | N/A |
| 5.5.3 | Transformers | No such component | N/A |
| 5.5.4 | Optocouplers | No such component | N/A |
| 5.5.5 | Relays | No such component | N/A |
| 5.5.6 | Resistors | No such component | N/A |
| 5.5.7 | SPD's | No such component | N/A |
| 5.5.7.1 | Use of an SPD connected to reliable earthing | | N/A |
| 5.5.7.2 | Use of an SPD between mains and protective earth | | N/A |
| 5.5.8 | Insulation between the mains and external circuit consisting of a coaxial cable..... | No such device | N/A |
| 5.6 | Protective conductor | | N/A |
| 5.6.2 | Requirement for protective conductors | No such device | 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 | No such device | N/A |
| | Protective earthing conductor size (mm ²) | | — |
| 5.6.4 | Requirement for protective bonding conductors | No such device | N/A |
| 5.6.4.1 | Protective bonding conductors | No such device | N/A |
| | Protective bonding conductor size (mm ²)..... | | — |
| | Protective current rating (A) | | — |
| 5.6.4.3 | Current limiting and overcurrent protective devices | No such device | N/A |
| 5.6.5 | Terminals for protective conductors | No such device | N/A |
| 5.6.5.1 | Requirement | | N/A |
| | Conductor size (mm ²), nominal thread diameter (mm). | | N/A |
| 5.6.5.2 | Corrosion | | N/A |
| 5.6.6 | Resistance of the protective system | No such device | N/A |
| 5.6.6.1 | Requirements | | N/A |
| 5.6.6.2 | Test Method Resistance (Ω) | | N/A |
| 5.6.7 | Reliable earthing | No such device | N/A |
| 5.7 | Prospective touch voltage, touch current and protective conductor current | | N/A |



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|----------------|--|--|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 5.7.2 | Measuring devices and networks | Supplied by ES1 electrical energy source | N/A |
| 5.7.2.1 | Measurement of touch current | Supplied by ES1 electrical energy source | N/A |
| 5.7.2.2 | Measurement of prospective touch voltage | Supplied by ES1 electrical energy source | N/A |
| 5.7.3 | Equipment set-up, supply connections and earth connections | Supplied by ES1 electrical energy source | N/A |
| | System of interconnected equipment (separate connections/single connection) | Supplied by ES1 electrical energy source | — |
| | Multiple connections to mains (one connection at a time/simultaneous connections) | Supplied by ES1 electrical energy source | — |
| 5.7.4 | Earthed conductive accessible parts..... | Supplied by ES1 electrical energy source | N/A |
| 5.7.5 | Protective conductor current | No protective conductor | N/A |
| | Supply Voltage (V) | No protective conductor | — |
| | Measured current (mA) | No protective conductor | — |
| | Instructional Safeguard | No protective conductor | N/A |
| 5.7.6 | Prospective touch voltage and touch current due to external circuits | See below | N/A |
| 5.7.6.1 | Touch current from coaxial cables | The equipment does not intend to be connected to coaxial cable | N/A |
| 5.7.6.2 | Prospective touch voltage and touch current from external circuits | The equipment does not intend to be connected to such external circuit | N/A |
| 5.7.7 | Summation of touch currents from external circuits | The equipment does not intend to be connected to such external circuit | N/A |
| | a) Equipment with earthed external circuits Measured current (mA) | The equipment does not intend to be connected to such external circuit | N/A |
| | b) Equipment whose external circuits are not referenced to earth. Measured current (mA)..... | The equipment does not intend to be connected to such external circuit | N/A |

| | | | |
|----------|---|-------------------|----------|
| 6 | ELECTRICALLY- CAUSED FIRE | | P |
| 6.2 | Classification of power sources (PS) and potential ignition sources (PIS) | | P |
| 6.2.2 | Power source circuit classifications | See below | P |
| 6.2.2.1 | General | PS2 for all parts | P |



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|-----------------------|--|---|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 6.2.2.2 | Power measurement for worst-case load fault ...: | (See appended table 6.2.2) | P |
| 6.2.2.3 | Power measurement for worst-case power source fault | (See appended table 6.2.2) | P |
| 6.2.2.4 | PS1 | | N/A |
| 6.2.2.5 | PS2 | (See appended table 6.2.2) | P |
| 6.2.2.6 | PS3 | | N/A |
| 6.2.3 | Classification of potential ignition sources | See below | P |
| 6.2.3.1 | Arcing PIS | | N/A |
| 6.2.3.2 | Resistive PIS | (See appended table 6.2.3.2) | P |
| 6.3 | Safeguards against fire under normal operating and abnormal operating conditions | | P |
| 6.3.1 (a) | No ignition and attainable temperature value less than 90 % defined by ISO 871 or less than 300 °C for unknown materials.....: | (See appended table 5.4.1.4, 6.3.2, 9.0, B.2.6) | P |
| 6.3.1 (b) | Combustible materials outside fire enclosure | No such materials used | N/A |
| 6.4 | Safeguards against fire under single fault conditions | | P |
| 6.4.1 | Safeguard Method | Control fire spread considered | P |
| 6.4.2 | Reduction of the likelihood of ignition under single fault conditions in PS1 circuits | | N/A |
| 6.4.3 | Reduction of the likelihood of ignition under single fault conditions in PS2 and PS3 circuits | No such methods considered. | N/A |
| 6.4.3.1 | General | No such methods considered. | N/A |
| 6.4.3.2 | Supplementary Safeguards | No such methods considered. | N/A |
| | Special conditions if conductors on printed boards are opened or peeled | | N/A |
| 6.4.3.3 | Single Fault Conditions | No such methods considered. | N/A |
| | Special conditions for temperature limited by fuse | | N/A |
| 6.4.4 | Control of fire spread in PS1 circuits | | N/A |
| 6.4.5 | Control of fire spread in PS2 circuits | See below | P |
| 6.4.5.2 | Supplementary safeguards | All components mounted on min. V-1 PCB | P |
| 6.4.6 | Control of fire spread in PS3 circuit | No PS3 circuits inside EUT. | N/A |
| 6.4.7 | Separation of combustible materials from a PIS | No such combustible material used | N/A |
| 6.4.7.1 | General | | N/A |
| 6.4.7.2 | Separation by distance | | N/A |



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|-----------------------|---|------------------------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 6.4.7.3 | Separation by a fire barrier | | N/A |
| 6.4.8 | Fire enclosures and fire barriers | Evaluated in the end product | N/A |
| 6.4.8.1 | Fire enclosure and fire barrier material properties | | N/A |
| 6.4.8.2.1 | Requirements for a fire barrier | | N/A |
| 6.4.8.2.2 | Requirements for a fire enclosure | | N/A |
| 6.4.8.3 | Constructional requirements for a fire enclosure and a fire barrier | | N/A |
| 6.4.8.3.1 | Fire enclosure and fire barrier openings | | N/A |
| 6.4.8.3.2 | Fire barrier dimensions | | N/A |
| 6.4.8.3.3 | Top Openings in Fire Enclosure: dimensions (mm) | | N/A |
| | Needle Flame test | | N/A |
| 6.4.8.3.4 | Bottom Openings in Fire Enclosure, condition met a), b) and/or c) dimensions (mm) | | N/A |
| | Flammability tests for the bottom of a fire enclosure | | N/A |
| 6.4.8.3.5 | Integrity of the fire enclosure, condition met: a), b) or c)..... | | N/A |
| 6.4.8.4 | Separation of PIS from fire enclosure and fire barrier distance (mm) or flammability rating | | N/A |
| 6.5 | Internal and external wiring | | N/A |
| 6.5.1 | Requirements | No such part | N/A |
| 6.5.2 | Cross-sectional area (mm ²) | | — |
| 6.5.3 | Requirements for interconnection to building wiring..... | | N/A |
| 6.6 | Safeguards against fire due to connection to additional equipment | | N/A |
| | External port limited to PS2 or complies with Clause Q.1 | No such part | N/A |

| | | | |
|----------|---|--------------------------------------|----------|
| 7 | INJURY CAUSED BY HAZARDOUS SUBSTANCES | | P |
| 7.2 | Reduction of exposure to hazardous substances | No hazardous substances exposure. | P |
| 7.3 | Ozone exposure | The equipment doesn't produces ozone | N/A |



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|----------------|--|--|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 7.4 | Use of personal safeguards (PPE) | The equipment doesn't produces hazardous substance | N/A |
| | Personal safeguards and instructions.....: | | — |
| 7.5 | Use of instructional safeguards and instructions | The equipment doesn't produces hazardous substance | N/A |
| | Instructional safeguard (ISO 7010).....: | | — |
| 7.6 | Batteries.....: | See annex M | N/A |

| 8 | MECHANICALLY-CAUSED INJURY | | N/A |
|-----------|---|------------------------------|------------|
| 8.1 | General | See below | N/A |
| 8.2 | Mechanical energy source classifications | Evaluated in the end product | N/A |
| 8.3 | Safeguards against mechanical energy sources | Evaluated in the end product | N/A |
| 8.4 | Safeguards against parts with sharp edges and corners | Evaluated in the end product | N/A |
| 8.4.1 | Safeguards | | N/A |
| 8.5 | Safeguards against moving parts | Evaluated in the end product | N/A |
| 8.5.1 | MS2 or MS3 part required to be accessible for the function of the equipment | | N/A |
| 8.5.2 | Instructional Safeguard.....: | | — |
| 8.5.4 | Special categories of equipment comprising moving parts | | N/A |
| 8.5.4.1 | Large data storage equipment | | N/A |
| 8.5.4.2 | Equipment having electromechanical device for destruction of media | | N/A |
| 8.5.4.2.1 | Safeguards and Safety Interlocks.....: | | N/A |
| 8.5.4.2.2 | Instructional safeguards against moving parts | | N/A |
| | Instructional Safeguard.....: | | — |
| 8.5.4.2.3 | Disconnection from the supply | | N/A |
| 8.5.4.2.4 | Probe type and force (N).....: | | N/A |
| 8.5.5 | High Pressure Lamps | | N/A |
| 8.5.5.1 | Energy Source Classification | | N/A |
| 8.5.5.2 | High Pressure Lamp Explosion Test.....: | | N/A |
| 8.6 | Stability | Evaluated in the end product | N/A |
| 8.6.1 | Product classification | | N/A |



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|-----------------------|---|------------------------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | Instructional Safeguard | | — |
| 8.6.2 | Static stability | | N/A |
| 8.6.2.2 | Static stability test | | N/A |
| | Applied Force..... | | — |
| 8.6.2.3 | Downward Force Test | | N/A |
| 8.6.3 | Relocation stability test | | N/A |
| | Unit configuration during 10° tilt | | — |
| 8.6.4 | Glass slide test | | N/A |
| 8.6.5 | Horizontal force test (Applied Force) | | N/A |
| | Position of feet or movable parts | | — |
| 8.7 | Equipment mounted to wall or ceiling | Evaluated in the end product | N/A |
| 8.7.1 | Mounting Means (Length of screws (mm) and mounting surface) | | N/A |
| 8.7.2 | Direction and applied force..... | | N/A |
| 8.8 | Handles strength | Evaluated in the end product | N/A |
| 8.8.1 | Classification | | N/A |
| 8.8.2 | Applied Force | | N/A |
| 8.9 | Wheels or casters attachment requirements | Evaluated in the end product | N/A |
| 8.9.1 | Classification | | N/A |
| 8.9.2 | Applied force | | — |
| 8.10 | Carts, stands and similar carriers | Evaluated in the end product | N/A |
| 8.10.1 | General | | N/A |
| 8.10.2 | Marking and instructions | | N/A |
| | Instructional Safeguard | | — |
| 8.10.3 | Cart, stand or carrier loading test and compliance | | N/A |
| | Applied force | | — |
| 8.10.4 | Cart, stand or carrier impact test | | N/A |
| 8.10.5 | Mechanical stability | | N/A |
| | Applied horizontal force (N)..... | | — |
| 8.10.6 | Thermoplastic temperature stability (°C) | | N/A |
| 8.11 | Mounting means for rack mounted equipment | Evaluated in the end product | N/A |
| 8.11.1 | General | | N/A |



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|----------------|--|------------------------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.11.2 | Product Classification | | N/A |
| 8.11.3 | Mechanical strength test, variable <i>N</i> | | N/A |
| 8.11.4 | Mechanical strength test 250N, including end stops | | N/A |
| 8.12 | Telescoping or rod antennas..... | Evaluated in the end product | N/A |
| | Button/Ball diameter (mm)..... | | — |

| 9 | THERMAL BURN INJURY | | N/A |
|----------|--|-------------------------------|------------|
| 9.2 | Thermal energy source classifications | Evaluated in the end product. | N/A |
| 9.3 | Safeguard against thermal energy sources | | N/A |
| 9.4 | Requirements for safeguards | | N/A |
| 9.4.1 | Equipment safeguard | | N/A |
| 9.4.2 | Instructional safeguard | | N/A |

| 10 | RADIATION | | N/A |
|-----------|--|--------------|------------|
| 10.2 | Radiation energy source classification | No such part | N/A |
| 10.2.1 | General classification | | N/A |
| 10.3 | Protection against laser radiation | No such part | N/A |
| | Laser radiation that exists equipment: | | — |
| | Normal, abnormal, single-fault | | N/A |
| | Instructional safeguard..... | | — |
| | Tool | | — |
| 10.4 | Protection against visible, infrared, and UV radiation | No such part | N/A |
| 10.4.1 | General | | N/A |
| 10.4.1.a) | RS3 for Ordinary and instructed persons..... | | N/A |
| 10.4.1.b) | RS3 accessible to a skilled person | | N/A |
| | Personal safeguard (PPE) instructional safeguard | | — |
| 10.4.1.c) | Equipment visible, IR, UV does not exceed RS1 | | N/A |
| 10.4.1.d) | Normal, abnormal, single-fault conditions | | N/A |
| 10.4.1.e) | Enclosure material employed as safeguard is opaque | | N/A |



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|-----------------------|--|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 10.4.1.f) | UV attenuation..... : | | N/A |
| 10.4.1.g) | Materials resistant to degradation UV : | | N/A |
| 10.4.1.h) | Enclosure containment of optical radiation : | | N/A |
| 10.4.1.i) | Exempt Group under normal operating conditions : | | N/A |
| 10.4.2 | Instructional safeguard..... : | | N/A |
| 10.5 | Protection against x-radiation | No such part | N/A |
| 10.5.1 | X- radiation energy source that exists equipment : | | N/A |
| | Normal, abnormal, single fault conditions | | N/A |
| | Equipment safeguards : | | N/A |
| | Instructional safeguard for skilled person : | | N/A |
| 10.5.3 | Most unfavourable supply voltage to give maximum radiation..... : | | — |
| | Abnormal and single-fault condition : | | N/A |
| | Maximum radiation (pA/kg) : | | N/A |
| 10.6 | Protection against acoustic energy sources | No such part | N/A |
| 10.6.1 | General | | N/A |
| 10.6.2 | Classification | | N/A |
| | Acoustic output, dB(A) : | | N/A |
| | Output voltage, unweighted r.m.s. : | | N/A |
| 10.6.4 | Protection of persons | | N/A |
| | Instructional safeguards : | | N/A |
| | Equipment safeguard prevent ordinary person to RS2 : | | — |
| | Means to actively inform user of increase sound pressure : | | — |
| | Equipment safeguard prevent ordinary person to RS2 : | | — |
| 10.6.5 | Requirements for listening devices (headphones, earphones, etc.) | | N/A |
| 10.6.5.1 | Corded passive listening devices with analog input | | N/A |
| | Input voltage with 94 dB(A) L_{Aeq} acoustic pressure output : | | — |
| 10.6.5.2 | Corded listening devices with digital input | | N/A |
| | Maximum dB(A)..... : | | — |



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|----------------|---------------------------|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 10.6.5.3 | Cordless listening device | | N/A |
| | Maximum dB(A).....: | | — |

| B | NORMAL OPERATING CONDITION TESTS, ABNORMAL OPERATING CONDITION TESTS AND SINGLE FAULT CONDITION TESTS | | P |
|----------|--|--|----------|
| B.2 | Normal Operating Conditions | See below | P |
| B.2.1 | General requirements..... : | According to the standard | P |
| | Audio Amplifiers and equipment with audio amplifiers | No such part | N/A |
| B.2.3 | Supply voltage and tolerances | 3.3Vdc and no tolerance | P |
| B.2.5 | Input test..... : | (See appended table B.2.5) | P |
| B.3 | Simulated abnormal operating conditions | | N/A |
| B.3.1 | General requirements..... : | See below | N/A |
| B.3.2 | Covering of ventilation openings | Evaluated in the end product | N/A |
| B.3.3 | D.C. mains polarity test | The EUT is not directly connected to mains | N/A |
| B.3.4 | Setting of voltage selector | No such device | N/A |
| B.3.5 | Maximum load at output terminals | No such part | N/A |
| B.3.6 | Reverse battery polarity | No such battery used | N/A |
| B.3.7 | Abnormal operating conditions as specified in Clause E.2. | No such part | N/A |
| B.3.8 | Safeguards functional during and after abnormal operating conditions | | N/A |
| B.4 | Simulated single fault conditions | | P |
| B.4.2 | Temperature controlling device open or short-circuited | No such device | N/A |
| B.4.3 | Motor tests | No motor used | N/A |
| B.4.3.1 | Motor blocked or rotor locked increasing the internal ambient temperature | No motor used | N/A |
| B.4.4 | Short circuit of functional insulation | (See appended table B.4) | P |
| B.4.4.1 | Short circuit of clearances for functional insulation | (See appended table B.4) | P |
| B.4.4.2 | Short circuit of creepage distances for functional insulation | (See appended table B.4) | P |
| B.4.4.3 | Short circuit of functional insulation on coated printed boards | No such part | N/A |



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|-----------------------|---|---|------------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| B.4.5 | Short circuit and interruption of electrodes in tubes and semiconductors | (See appended table B.4) | P |
| B.4.6 | Short circuit or disconnect of passive components | No such part | N/A |
| B.4.7 | Continuous operation of components | The EUT is continuous operating type and no such components intended for short time operation or intermittent operation | N/A |
| B.4.8 | Class 1 and Class 2 energy sources within limits during and after single fault conditions | Complied | P |
| B.4.9 | Battery charging under single fault conditions ... : | No such battery used | N/A |
| C | UV RADIATION | | N/A |
| C.1 | Protection of materials in equipment from UV radiation | Evaluated in the end product | N/A |
| C.1.2 | Requirements | | N/A |
| C.1.3 | Test method | | N/A |
| C.2 | UV light conditioning test | | N/A |
| C.2.1 | Test apparatus | | N/A |
| C.2.2 | Mounting of test samples | | N/A |
| C.2.3 | Carbon-arc light-exposure apparatus | | N/A |
| C.2.4 | Xenon-arc light exposure apparatus | | N/A |
| D | TEST GENERATORS | | N/A |
| D.1 | Impulse test generators | Evaluated in the end product | 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 | Audio amplifier normal operating conditions | Evaluated in the end product | N/A |
| | Audio signal voltage (V) | | — |
| | Rated load impedance (Ω) | | — |
| E.2 | Audio amplifier abnormal operating conditions | | N/A |
| F | EQUIPMENT MARKINGS, INSTRUCTIONS, AND INSTRUCTIONAL SAFEGUARDS | | N/A |
| F.1 | General requirements | Evaluated in the end product | N/A |
| | Instructions – Language | | — |
| F.2 | Letter symbols and graphical symbols | Evaluated in the end product | N/A |
| F.2.1 | Letter symbols according to IEC60027-1 | | N/A |



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|----------------|---|--|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| F.2.2 | Graphic symbols IEC, ISO or manufacturer specific | | N/A |
| F.3 | Equipment markings | | N/A |
| F.3.1 | Equipment marking locations | Evaluated in the end product | N/A |
| F.3.2 | Equipment identification markings | Evaluated in the end product | N/A |
| F.3.2.1 | Manufacturer identification | | — |
| F.3.2.2 | Model identification | | — |
| F.3.3 | Equipment rating markings | | N/A |
| F.3.3.1 | Equipment with direct connection to mains | The EUT is not directly connected to mains | N/A |
| F.3.3.2 | Equipment without direct connection to mains | Evaluated in the end product | N/A |
| F.3.3.3 | Nature of supply voltage | | — |
| F.3.3.4 | Rated voltage | | — |
| F.3.3.4 | Rated frequency | | — |
| F.3.3.6 | Rated current or rated power | | — |
| F.3.3.7 | Equipment with multiple supply connections | Evaluated in the end product | N/A |
| F.3.4 | Voltage setting device | Evaluated in the end product | N/A |
| F.3.5 | Terminals and operating devices | Evaluated in the end product | N/A |
| F.3.5.1 | Mains appliance outlet and socket-outlet markings | | N/A |
| F.3.5.2 | Switch position identification marking | | N/A |
| F.3.5.3 | Replacement fuse identification and rating markings | | N/A |
| F.3.5.4 | Replacement battery identification marking | | N/A |
| F.3.5.5 | Terminal marking location | | N/A |
| F.3.6 | Equipment markings related to equipment classification | Evaluated in the end product | N/A |
| F.3.6.1 | Class I Equipment | | N/A |
| F.3.6.1.1 | Protective earthing conductor terminal | | N/A |
| F.3.6.1.2 | Neutral conductor terminal | | N/A |
| F.3.6.1.3 | Protective bonding conductor terminals | | N/A |
| F.3.6.2 | Class II equipment (IEC60417-5172) | | N/A |
| F.3.6.2.1 | Class II equipment with or without functional earth | | N/A |



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|-----------------------|---|------------------------------|----------------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| F.3.6.2.2 | Class II equipment with functional earth terminal marking | | N/A |
| F.3.7 | Equipment IP rating marking | Evaluated in the end product | — |
| F.3.8 | External power supply output marking | Evaluated in the end product | N/A |
| F.3.9 | Durability, legibility and permanence of marking | Evaluated in the end product | N/A |
| F.3.10 | Test for permanence of markings | Evaluated in the end product | N/A |
| F.4 | Instructions | | N/A |
| | a) Equipment for use in locations where children not likely to be present - marking | Evaluated in the end product | N/A |
| | b) Instructions given for installation or initial use | | N/A |
| | c) Equipment intended to be fastened in place | | N/A |
| | d) Equipment intended for use only in restricted access area | | N/A |
| | e) Audio equipment terminals classified as ES3 and other equipment with terminals marked in accordance F.3.6.1 | | N/A |
| | f) Protective earthing employed as safeguard | | N/A |
| | g) Protective earthing conductor current exceeding ES2 limits | | N/A |
| | h) Symbols used on equipment | | N/A |
| | i) Permanently connected equipment not provided with all-pole mains switch | | N/A |
| | j) Replaceable components or modules providing safeguard function | | N/A |
| F.5 | Instructional safeguards | | N/A |
| | Where “instructional safeguard” is referenced in the test report it specifies the required elements, location of marking and/or instruction | | N/A |
| G | COMPONENTS | | N/A |
| G.1 | Switches | | N/A |
| G.1.1 | General requirements | No switch used | N/A |
| G.1.2 | Ratings, endurance, spacing, maximum load | | N/A |
| G.2 | Relays | | N/A |
| G.2.1 | General requirements | No relay used | N/A |
| G.2.2 | Overload test | | N/A |
| G.2.3 | Relay controlling connectors supply power | | N/A |



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|-----------------------|--|----------------------------------|------------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| G.2.4 | Mains relay, modified as stated in G.2 | | N/A |
| G.3 | Protection Devices | | N/A |
| G.3.1 | Thermal cut-offs | No protection device used | N/A |
| G.3.1.1a) &b) | Thermal cut-outs separately approved according to IEC 60730 with conditions indicated in a) & b) | | N/A |
| G.3.1.1c) | Thermal cut-outs tested as part of the equipment as indicated in c) | | N/A |
| G.3.1.2 | Thermal cut-off connections maintained and secure | | N/A |
| G.3.2 | Thermal links | | N/A |
| G.3.2.1a) | Thermal links separately tested with IEC 60691 | No such device | N/A |
| G.3.2.1b) | Thermal links tested as part of the equipment | No such device | N/A |
| | Aging hours (H) | | — |
| | Single Fault Condition | | — |
| | Test Voltage (V) and Insulation Resistance (Ω) . : | | — |
| G.3.3 | PTC Thermistors | No such device | N/A |
| G.3.4 | Overcurrent protection devices | No such device | N/A |
| G.3.5 | Safeguards components not mentioned in G.3.1 to G.3.5 | | N/A |
| G.3.5.1 | Non-resettable devices suitably rated and marking provided | | N/A |
| G.3.5.2 | Single faults conditions.....: | | N/A |
| G.4 | Connectors | | N/A |
| G.4.1 | Spacings | No connector used | 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 part used, (See Annex J) | N/A |
| G.5.1.2 a) | Two wires in contact inside wound component, angle between 45° and 90° | | N/A |
| G.5.1.2 b) | Construction subject to routine testing | | N/A |
| G.5.2 | Endurance test on wound components | | N/A |
| G.5.2.1 | General test requirements | | N/A |
| G.5.2.2 | Heat run test | | N/A |
| | Time (s) | | — |



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|-----------------------|---|--------------------------|------------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | Temperature (°C) | | — |
| G.5.2.3 | Wound Components supplied by mains | | N/A |
| G.5.3 | Transformers | | N/A |
| G.5.3.1 | Requirements applied (IEC61204-7, IEC61558-1/-2, and/or IEC62368-1) | No transformer used | N/A |
| | Position | | — |
| | Method of protection | | — |
| G.5.3.2 | Insulation | | N/A |
| | Protection from displacement of windings | | — |
| G.5.3.3 | Overload test | (See appended table B.3) | N/A |
| G.5.3.3.1 | Test conditions | | N/A |
| G.5.3.3.2 | Winding Temperatures testing in the unit | | N/A |
| G.5.3.3.3 | Winding Temperatures - Alternative test method | | N/A |
| G.5.4 | Motors | | N/A |
| G.5.4.1 | General requirements | No motor used | N/A |
| | Position | | — |
| G.5.4.2 | Test conditions | | N/A |
| G.5.4.3 | Running overload test | | N/A |
| G.5.4.4 | Locked-rotor overload test | | N/A |
| | Test duration (days) | | — |
| G.5.4.5 | Running overload test for d.c. motors in secondary circuits | | N/A |
| G.5.4.5.2 | Tested in the unit | | N/A |
| | Electric strength test (V) | | — |
| G.5.4.5.3 | Tested on the Bench - Alternative test method; test time (h) | | N/A |
| | Electric strength test (V) | | — |
| G.5.4.6 | Locked-rotor overload test for d.c. motors in secondary circuits | | N/A |
| G.5.4.6.2 | Tested in the unit | | N/A |
| | Maximum Temperature | | N/A |
| | Electric strength test (V) | | N/A |
| G.5.4.6.3 | Tested on the bench - Alternative test method; test time (h) | | N/A |



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|----------------|---|-------------------------------------|------------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | Electric strength test (V) | | N/A |
| G.5.4.7 | Motors with capacitors | | N/A |
| G.5.4.8 | Three-phase motors | | N/A |
| G.5.4.9 | Series motors | | N/A |
| | Operating voltage | | — |
| G.6 | Wire Insulation | | N/A |
| G.6.1 | General | Only ES1 circuit existed in the EUT | N/A |
| G.6.2 | Solvent-based enamel wiring insulation | No such part used for insulation | N/A |
| G.7 | Mains supply cords | | N/A |
| G.7.1 | General requirements | Class III equipment, no such part | N/A |
| | Type..... | | — |
| | Rated current (A) | | — |
| | Cross-sectional area (mm ²), (AWG) | | — |
| G.7.2 | Compliance and test method | | N/A |
| G.7.3 | Cord anchorages and strain relief for non-detachable power supply cords | | N/A |
| G.7.3.2 | Cord strain relief | | N/A |
| G.7.3.2.1 | Requirements | | N/A |
| | Strain relief test force (N) | | — |
| G.7.3.2.2 | Strain relief mechanism failure | | N/A |
| G.7.3.2.3 | Cord sheath or jacket position, distance (mm).... | | — |
| G.7.3.2.4 | Strain relief comprised of polymeric material | | N/A |
| G.7.4 | Cord Entry | (See appended table 5.4.11.1) | N/A |
| G.7.5 | Non-detachable cord bend protection | | N/A |
| G.7.5.1 | Requirements | | N/A |
| G.7.5.2 | Mass (g) | | — |
| | Diameter (m) | | — |
| | Temperature (°C) | | — |
| G.7.6 | Supply wiring space | | N/A |
| G.7.6.2 | Stranded wire | | N/A |
| G.7.6.2.1 | Test with 8 mm strand | | N/A |
| G.8 | Varistors | | N/A |



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|-----------------------|---|--------------------------|------------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| G.8.1 | General requirements | No varistor used | N/A |
| G.8.2 | Safeguard against shock | | N/A |
| G.8.3 | Safeguard against fire | | N/A |
| G.8.3.2 | Varistor overload test | (See appended table B.3) | N/A |
| G.8.3.3 | Temporary overvoltage | (See appended table B.3) | N/A |
| G.9 | Integrated Circuit (IC) Current Limiters | | N/A |
| G.9.1 a) | Manufacturer defines limit at max. 5A. | No such device used | N/A |
| G.9.1 b) | Limiters do not have manual operator or reset | | N/A |
| G.9.1 c) | Supply source does not exceed 250 VA | | — |
| G.9.1 d) | IC limiter output current (max. 5A) | | — |
| G.9.1 e) | Manufacturers' defined drift | | — |
| G.9.2 | Test Program 1 | | N/A |
| G.9.3 | Test Program 2 | | N/A |
| G.9.4 | Test Program 3 | | N/A |
| G.10 | Resistors | | N/A |
| G.10.1 | General requirements | No such component | N/A |
| G.10.2 | Resistor test | | N/A |
| G.10.3 | Test for resistors serving as safeguards between the mains and an external circuit consisting of a coaxial cable | | N/A |
| G.10.3.1 | General requirements | | N/A |
| G.10.3.2 | Voltage surge test | | N/A |
| G.10.3.3 | Impulse test | | N/A |
| G.11 | Capacitor and RC units | | N/A |
| G.11.1 | General requirements | No such component | 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 60747-5-5:2007 Spacing or Electric Strength Test (specify option and test results) | No such component | N/A |
| | Type test voltage Vini | | — |
| | Routine test voltage, Vini,b | | — |
| G.13 | Printed boards | | N/A |



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|-----------------------|--|---|------------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| G.13.1 | General requirements | Only the functional insulation requirement on the PCB | 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 |
| | Compliance with cemented joint requirements (Specify construction).....: | | — |
| G.13.5 | Insulation between conductors on different surfaces | | N/A |
| | Distance through insulation | (See appended table 5.4.4.5) | 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.13.6.2a) | Thermal conditioning | | N/A |
| G.13.6.2b) | Electric strength test | | N/A |
| G.13.6.2c) | Abrasion resistance test | | N/A |
| G.14 | Coating on components terminals | | N/A |
| G.14.1 | Requirements | No such coating used | N/A |
| G.15 | Liquid filled components | | N/A |
| G.15.1 | General requirements | No such component used | N/A |
| G.15.2 | Requirements | | N/A |
| G.15.3 | Compliance and test methods | | N/A |
| G.15.3.1 | Hydrostatic pressure test | | N/A |
| G.15.3.2 | Creep resistance test | | N/A |
| G.15.3.3 | Tubing and fittings compatibility test | | N/A |
| G.15.3.4 | Vibration test | | N/A |
| G.15.3.5 | Thermal cycling test | | N/A |
| G.15.3.6 | Force test | | N/A |
| G.15.4 | Compliance | | N/A |
| G.16 | IC including capacitor discharge function (ICX) | | N/A |
| a) | Humidity treatment in accordance with sc5.4.8 – 120 hours | No such component used | N/A |
| b) | Impulse test using circuit 2 with $U_c =$ to transient voltage | | N/A |



| IEC/EN 62368-1 | | | |
|-----------------------|---|--------------------------|------------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| C1) | Application of ac voltage at 110% of rated voltage for 2.5 minutes | | N/A |
| C2) | Test voltage | | — |
| D1) | 10,000 cycles on and off using capacitor with smallest capacitance resistor with largest resistance specified by manufacturer | | N/A |
| D2) | Capacitance | | — |
| D3) | Resistance | | — |
| H | CRITERIA FOR TELEPHONE RINGING SIGNALS | | N/A |
| H.1 | General | No such ringing signal | N/A |
| H.2 | Method A | No such ringing signal | N/A |
| H.3 | Method B | No such ringing signal | N/A |
| H.3.1 | Ringling signal | | N/A |
| H.3.1.1 | Frequency (Hz) | | — |
| H.3.1.2 | Voltage (V) | | — |
| H.3.1.3 | Cadence; time (s) and voltage (V) | | — |
| H.3.1.4 | Single fault current (mA): | | — |
| H.3.2 | Tripping device and monitoring voltage | No such ringing signal | N/A |
| H.3.2.1 | Conditions for use of a tripping device or a monitoring voltage complied with | | N/A |
| H.3.2.2 | Tripping device | | N/A |
| H.3.2.3 | Monitoring voltage (V) | | — |
| J | INSULATED WINDING WIRES FOR USE WITHOUT INTERLEAVED INSULATION | | N/A |
| | General requirements | No such part used | N/A |
| K | SAFETY INTERLOCKS | | N/A |
| K.1 | General requirements | No such device | N/A |
| K.2 | Components of safety interlock safeguard mechanism | (See Annex G) | N/A |
| K.3 | Inadvertent change of operating mode | | N/A |
| K.4 | Interlock safeguard override | | N/A |
| K.5 | Fail-safe | | N/A |
| | Compliance | (See appended table B.4) | N/A |
| K.6 | Mechanically operated safety interlocks | | N/A |
| K.6.1 | Endurance requirement | | N/A |



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| Clause | Requirement + Test | Result - Remark | Verdict |
| K.6.2 | Compliance and Test method | | N/A |
| K.7 | Interlock circuit isolation | | N/A |
| K.7.1 | Separation distance for contact gaps & interlock circuit elements (type and circuit location) | | N/A |
| K.7.2 | Overload test, Current (A) | | N/A |
| K.7.3 | Endurance test | | N/A |
| K.7.4 | Electric strength test | (See appended table 5.4.11) | N/A |
| L | DISCONNECT DEVICES | | N/A |
| L.1 | General requirements | No such device used | N/A |
| L.2 | Permanently connected equipment | | N/A |
| L.3 | Parts that remain energized | | N/A |
| L.4 | Single phase equipment | | N/A |
| L.5 | Three-phase equipment | | N/A |
| L.6 | Switches as disconnect devices | | N/A |
| L.7 | Plugs as disconnect devices | | N/A |
| L.8 | Multiple power sources | | N/A |
| M | EQUIPMENT CONTAINING BATTERIES AND THEIR PROTECTION CIRCUITS | | N/A |
| M.1 | General requirements | No such battery used | N/A |
| M.2 | Safety of batteries and their cells | No such battery used | N/A |
| M.2.1 | Requirements | No such battery used | N/A |
| M.2.2 | Compliance and test method (identify method) .. : | No such battery used | N/A |
| M.3 | Protection circuits | No such battery used | N/A |
| M.3.1 | Requirements | No such battery used | N/A |
| M.3.2 | Tests | No such battery used | N/A |
| | - Overcharging of a rechargeable battery | | N/A |
| | - Unintentional charging of a non-rechargeable battery | | N/A |
| | - Reverse charging of a rechargeable battery | | N/A |
| | - Excessive discharging rate for any battery | | N/A |
| M.3.3 | Compliance | No such battery used | N/A |
| M.4 | Additional safeguards for equipment containing secondary lithium battery | No such battery used | N/A |
| M.4.1 | General | No such battery used | N/A |
| M.4.2 | Charging safeguards | No such battery used | N/A |



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|-----------------------|---|----------------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| M.4.2.1 | Charging operating limits | | N/A |
| M.4.2.2a) | Charging voltage, current and temperature | | — |
| M.4.2.2 b) | Single faults in charging circuitry | | — |
| M.4.3 | Fire Enclosure | No such battery used | N/A |
| M.4.4 | Endurance of equipment containing a secondary lithium battery | No such battery used | N/A |
| M.4.4.2 | Preparation | No such battery used | N/A |
| M.4.4.3 | Drop and charge/discharge function tests | No such battery used | N/A |
| | Drop | No such battery used | N/A |
| | Charge | No such battery used | N/A |
| | Discharge | No such battery used | N/A |
| M.4.4.4 | Charge-discharge cycle test | No such battery used | N/A |
| M.4.4.5 | Result of charge-discharge cycle test | No such battery used | N/A |
| M.4.4.6 | Compliance criteria | No such battery used | N/A |
| M.5 | Risk of burn due to short circuit during carrying | No such battery used | N/A |
| M.5.1 | Requirement | No such battery used | N/A |
| M.5.2 | Compliance and Test Method (Test of P.2.3) | No such battery used | N/A |
| M.6 | Prevention of short circuits and protection from other effects of electric current | No such battery used | N/A |
| M.6.1 | Short circuits | No such battery used | N/A |
| M.6.1.1 | General requirements | No such battery used | N/A |
| M.6.1.2 | Test method to simulate an internal fault | No such battery used | N/A |
| M.6.2 | Leakage current (mA) | No such battery used | N/A |
| M.7 | Risk of explosion from lead acid and NiCd batteries | No such battery used | N/A |
| M.7.1 | Ventilation preventing explosive gas concentration | No such battery used | N/A |
| M.7.2 | Compliance and test method | No such battery used | N/A |
| M.8 | Protection against internal ignition from external spark sources of lead acid batteries | No such battery used | N/A |
| M.8.1 | General requirements | No such battery used | N/A |
| M.8.2 | Test method | No such battery used | N/A |
| M.8.2.1 | General requirements | No such battery used | N/A |
| M.8.2.2 | Estimation of hypothetical volume Vz (m ³ /s)..... : | | — |



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|-----------------------|---|------------------------------|------------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| M.8.2.3 | Correction factors..... : | | — |
| M.8.2.4 | Calculation of distance d (mm) : | | — |
| M.9 | Preventing electrolyte spillage | | N/A |
| M.9.1 | Protection from electrolyte spillage | | N/A |
| M.9.2 | Tray for preventing electrolyte spillage | | N/A |
| M.10 | Instructions to prevent reasonably foreseeable misuse (Determination of compliance: inspection, data review; or abnormal testing) : | | N/A |
| N | ELECTROCHEMICAL POTENTIALS | | N/A |
| | Metal(s) used : | | — |
| O | MEASUREMENT OF CREEPAGE DISTANCES AND CLEARANCES | | N/A |
| | Figures O.1 to O.20 of this Annex applied..... : | | — |
| P | SAFEGUARDS AGAINST ENTRY OF FOREIGN OBJECTS AND SPILLAGE OF INTERNAL LIQUIDS | | N/A |
| P.1 | General requirements | Evaluated in the end product | N/A |
| P.2.2 | Safeguards against entry of foreign object | | N/A |
| | Location and Dimensions (mm) : | | — |
| P.2.3 | Safeguard against the consequences of entry of foreign object | | N/A |
| P.2.3.1 | Safeguards against the entry of a foreign object | | N/A |
| | Openings in transportable equipment | | N/A |
| | Transportable equipment with metalized plastic parts : | | N/A |
| P.2.3.2 | Openings in transportable equipment in relation to metallized parts of a barrier or enclosure (identification of supplementary safeguard) : | | N/A |
| P.3 | Safeguards against spillage of internal liquids | | N/A |
| P.3.1 | General requirements | | N/A |
| P.3.2 | Determination of spillage consequences | | N/A |
| P.3.3 | Spillage safeguards | | N/A |
| P.3.4 | Safeguards effectiveness | | N/A |
| P.4 | Metallized coatings and adhesive securing parts | | N/A |
| P.4.2 a) | Conditioning testing | | N/A |
| | Tc (°C)..... : | | — |
| | Tr (°C) : | | — |



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|-----------------------|--|--------------------------------|------------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | Ta (°C)..... : | | — |
| P.4.2 b) | Abrasion testing : | (See G.13.6.2) | N/A |
| P.4.2 c) | Mechanical strength testing : | (See Annex T) | N/A |
| Q | CIRCUITS INTENDED FOR INTERCONNECTION WITH BUILDING WIRING | | N/A |
| Q.1 | Limited power sources | See below | N/A |
| Q.1.1 a) | Inherently limited output | No such part | N/A |
| Q.1.1 b) | Impedance limited output | No such part | N/A |
| | - Regulating network limited output under normal operating and simulated single fault condition | No such part | N/A |
| Q.1.1 c) | Overcurrent protective device limited output | No such part | N/A |
| Q.1.1 d) | IC current limiter complying with G.9 | No such part | N/A |
| Q.1.2 | Compliance and test method | | N/A |
| Q.2 | Test for external circuits – paired conductor cable | | N/A |
| | Maximum output current (A) : | (See appended table Annex Q.1) | — |
| | Current limiting method..... : | | — |
| R | LIMITED SHORT CIRCUIT TEST | | N/A |
| R.1 | General requirements | | N/A |
| R.2 | Determination of the overcurrent protective device and circuit | | N/A |
| R.3 | Test method Supply voltage (V) and short-circuit current (A). : | | N/A |
| S | TESTS FOR RESISTANCE TO HEAT AND FIRE | | N/A |
| S.1 | Flammability test for fire enclosures and fire barrier materials of equipment where the steady state power does not exceed 4 000 W | | N/A |
| | Samples, material : | | — |
| | Wall thickness (mm)..... : | | — |
| | Conditioning (°C)..... : | | — |
| | Test flame according to IEC 60695-11-5 with conditions as set out | | N/A |
| | - Material not consumed completely | | N/A |
| | - Material extinguishes within 30s | | N/A |
| | - No burning of layer or wrapping tissue | | N/A |
| S.2 | Flammability test for fire enclosure and fire barrier integrity | | N/A |



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|-----------------------|--|------------------------------|------------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | Samples, material | | — |
| | Wall thickness (mm)..... | | — |
| | Conditioning (°C)..... | | — |
| | Test flame according to IEC 60695-11-5 with conditions as set out | | N/A |
| | Test specimen does not show any additional hole | | N/A |
| S.3 | Flammability test for the bottom of a fire enclosure | | N/A |
| | Samples, material | | — |
| | Wall thickness (mm)..... | | — |
| | Cheesecloth did not ignite | | N/A |
| S.4 | Flammability classification of materials | | N/A |
| S.5 | Flammability test for fire enclosures and fire barrier materials of equipment where the steady state power does not exceed 4 000 W | | N/A |
| | Samples, material | | — |
| | Wall thickness (mm)..... | | — |
| | Conditioning (test condition), (°C) | | — |
| | Test flame according to IEC 60695-11-20 with conditions as set out | | N/A |
| | After every test specimen was not consumed completely | | N/A |
| | After fifth flame application, flame extinguished within 1 min | | N/A |
| T | MECHANICAL STRENGTH TESTS | | N/A |
| T.1 | General requirements | Evaluated in the end product | N/A |
| T.2 | Steady force test, 10 N | | N/A |
| T.3 | Steady force test, 30 N | | N/A |
| T.4 | Steady force test, 100 N | | N/A |
| T.5 | Steady force test, 250 N | | N/A |
| T.6 | Enclosure impact test | | N/A |
| | Fall test | | N/A |
| | Swing test | | N/A |
| T.7 | Drop test | | N/A |
| T.8 | Stress relief test | | N/A |



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|-----------------------|---|------------------------------|------------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| T.9 | Impact Test (glass) | | N/A |
| T.9.1 | General requirements | | N/A |
| T.9.2 | Impact test and compliance | | N/A |
| | Impact energy (J)..... : | | — |
| | Height (m) : | | — |
| T.10 | Glass fragmentation test : | No such part | N/A |
| T.11 | Test for telescoping or rod antennas | No such part | N/A |
| | Torque value (Nm) : | | — |
| U | MECHANICAL STRENGTH OF CATHODE RAY TUBES (CRT) AND PROTECTION AGAINST THE EFFECTS OF IMPLOSION | | N/A |
| U.1 | General requirements | No cathode ray tube used | N/A |
| U.2 | Compliance and test method for non-intrinsically protected CRTs | | N/A |
| U.3 | Protective Screen : | (See Annex T) | N/A |
| V | DETERMINATION OF ACCESSIBLE PARTS (FINGERS, PROBES AND WEDGES) | | N/A |
| V.1 | Accessible parts of equipment | Evaluated in the end product | N/A |
| V.2 | Accessible part criterion | | N/A |



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|----------------|--------------------|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |

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

Differences according to : EN 62368-1:2014+A11:2017

Attachment Form No. : EU_GD_IEC62368_1D_II

Attachment Originator : Nemko AS

Master Attachment..... : Date 2021-02-04

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| | CENELEC COMMON MODIFICATIONS (EN) | P | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-------------|--|----------|--------------|-------------------------|-----------------|--------|------|-------|--------------|---------|------|-------------------------|--------|-------------|--------------|---------|--------|---------|------|---------|------|-------|------|-----------|--------------|-------|------|---------|--------------|--------------------|-----------------|--------|--------|----------|--------|---------|--------|---|
| | Clauses, subclauses, notes, tables, figures and annexes which are additional to those in IEC 62368-1:2014 are prefixed "Z". | P | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Contents | <p>Add the following annexes:</p> <p>Annex ZA (normative) Normative references to international publications with their corresponding European publications</p> <p>Annex ZB (normative) Special national conditions</p> <p>Annex ZC (informative) A-deviations</p> <p>Annex ZD (informative) IEC and CENELEC code designations for flexible cords</p> | P | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | <p>Delete all the "country" notes in the reference document (IEC 62368-1:2014) according to the following list:</p> <table border="1"> <tbody> <tr> <td>0.2.1</td> <td>Note</td> <td>1</td> <td>Note 3</td> <td>4.1.15</td> <td>Note</td> </tr> <tr> <td>4.7.3</td> <td>Note 1 and 2</td> <td>5.2.2.2</td> <td>Note</td> <td>5.4.2.3.2.2 Table 13</td> <td>Note c</td> </tr> <tr> <td>5.4.2.3.2.4</td> <td>Note 1 and 3</td> <td>5.4.2.5</td> <td>Note 2</td> <td>5.4.5.1</td> <td>Note</td> </tr> <tr> <td>5.5.2.1</td> <td>Note</td> <td>5.5.6</td> <td>Note</td> <td>5.6.4.2.1</td> <td>Note 2 and 3</td> </tr> <tr> <td>5.7.5</td> <td>Note</td> <td>5.7.6.1</td> <td>Note 1 and 2</td> <td>10.2.1 Table 39</td> <td>Note 2, 3 and 4</td> </tr> <tr> <td>10.5.3</td> <td>Note 2</td> <td>10.6.2.1</td> <td>Note 3</td> <td>F.3.3.6</td> <td>Note 3</td> </tr> </tbody> </table> | 0.2.1 | Note | 1 | Note 3 | 4.1.15 | Note | 4.7.3 | Note 1 and 2 | 5.2.2.2 | Note | 5.4.2.3.2.2 Table 13 | Note c | 5.4.2.3.2.4 | Note 1 and 3 | 5.4.2.5 | Note 2 | 5.4.5.1 | Note | 5.5.2.1 | Note | 5.5.6 | Note | 5.6.4.2.1 | Note 2 and 3 | 5.7.5 | Note | 5.7.6.1 | Note 1 and 2 | 10.2.1 Table 39 | Note 2, 3 and 4 | 10.5.3 | Note 2 | 10.6.2.1 | Note 3 | F.3.3.6 | Note 3 | P |
| 0.2.1 | Note | 1 | Note 3 | 4.1.15 | Note | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4.7.3 | Note 1 and 2 | 5.2.2.2 | Note | 5.4.2.3.2.2 Table 13 | Note c | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5.4.2.3.2.4 | Note 1 and 3 | 5.4.2.5 | Note 2 | 5.4.5.1 | Note | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5.5.2.1 | Note | 5.5.6 | Note | 5.6.4.2.1 | Note 2 and 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5.7.5 | Note | 5.7.6.1 | Note 1 and 2 | 10.2.1 Table 39 | Note 2, 3 and 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10.5.3 | Note 2 | 10.6.2.1 | Note 3 | F.3.3.6 | Note 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | For special national conditions, see Annex ZB. | N/A | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |



| IEC/EN 62368-1 | | | |
|----------------|--|---|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 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 | N/A |
| 4.Z1 | Add the following new subclause after 4.9: To protect against excessive current, short-circuits and earth faults in circuits connected to an a.c. mains , protective devices shall be included either as integral parts of the equipment or as parts of the building installation, subject to the following, a), b) and c): a) except as detailed in b) and c), protective devices necessary to comply with the requirements of B.3.1 and B.4 shall be included as parts of the equipment; b) for components in series with the mains input to the equipment such as the supply cord, appliance coupler, r.f.i. filter and switch, short-circuit and earth fault protection may be provided by protective devices in the building installation; c) it is permitted for pluggable equipment type B or permanently connected equipment , to rely on dedicated overcurrent and short-circuit protection in the building installation, provided that the means of protection, e.g. fuses or circuit breakers, is fully specified in the installation instructions. If reliance is placed on protection in the building installation, the installation instructions shall so state, except that for pluggable equipment type A the building installation shall be regarded as providing protection in accordance with the rating of the wall socket outlet. | The equipment does not intend to connected to mains | N/A |
| 5.4.2.3.2.4 | Add the following to the end of this subclause: The requirement for interconnection with external circuit is in addition given in EN 50491-3:2009. | No such interconnection | N/A |
| 10.2.1 | Add the following to ^{c)} and ^{d)} in table 39: For additional requirements, see 10.5.1. | Added | N/A |



| IEC/EN 62368-1 | | | |
|----------------|---|---------------------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 10.5.1 | <p>Add the following after the first paragraph: <i>For RS 1 compliance is checked by measurement under the following conditions:</i></p> <p><i>In addition to the normal operating conditions, all controls adjustable from the outside by hand, by any object such as a tool or a coin, and those internal adjustments or presets which are not locked in a reliable manner, are adjusted so as to give maximum radiation whilst maintaining an intelligible picture for 1 h, at the end of which the measurement is made.</i></p> <p>NOTE Z1 Soldered joints and paint lockings are examples of adequate locking.</p> <p><i>The dose-rate is determined by means of a radiation monitor with an effective area of 10 cm², at any point 10 cm from the outer surface of the apparatus.</i></p> <p><i>Moreover, the measurement shall be made under fault conditions causing an increase of the high-voltage, provided an intelligible picture is maintained for 1 h, at the end of which the measurement is made.</i></p> <p><i>For RS1, the dose-rate shall not exceed 1 μSv/h taking account of the background level.</i></p> <p>NOTE Z2 These values appear in Directive 96/29/Euratom of 13 May 1996.</p> | Added | N/A |
| 10.6.1 | <p>Add the following paragraph to the end of the subclause: EN 71-1:2011, 4.20 and the related tests methods and measurement distances apply.</p> | Added | N/A |
| 10.Z1 | <p>Add the following new subclause after 10.6.5. 10.Z1 Non-ionizing radiation from radio frequencies in the range 0 to 300 GHz</p> <p>The amount of non-ionizing radiation is regulated by European Council Recommendation 1999/519/EC of 12 July 1999 on the limitation of exposure of the general public to electromagnetic fields (0 Hz to 300 GHz).</p> <p>For intentional radiators, ICNIRP guidelines should be taken into account for Limiting Exposure to Time-Varying Electric, Magnetic, and Electromagnetic Fields (up to 300 GHz). For hand-held and body-mounted devices, attention is drawn to EN 50360 and EN 50566</p> | No such radiation | N/A |
| G.7.1 | <p>Add the following note: NOTE Z1 The harmonized code designations corresponding to the IEC cord types are given in Annex ZD.</p> | No mains supply cord used | N/A |



| IEC/EN 62368-1 | | | |
|-----------------------|---|-----------------------------------|------------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| Bibliography | <p>Add the following standards:</p> <p>Add the following notes for the standards indicated:</p> <p>IEC 60130-9 NOTE Harmonized as EN 60130-9.</p> <p>IEC 60269-2 NOTE Harmonized as HD 60269-2.</p> <p>IEC 60309-1 NOTE Harmonized as EN 60309-1.</p> <p>IEC 60364 NOTE some parts harmonized in HD 384/HD 60364 series.</p> <p>IEC 60601-2-4 NOTE Harmonized as EN 60601-2-4.</p> <p>IEC 60664-5 NOTE Harmonized as EN 60664-5.</p> <p>IEC 61032:1997 NOTE Harmonized as EN 61032:1998 (not modified).</p> <p>IEC 61508-1 NOTE Harmonized as EN 61508-1.</p> <p>IEC 61558-2-1 NOTE Harmonized as EN 61558-2-1.</p> <p>IEC 61558-2-4 NOTE Harmonized as EN 61558-2-4.</p> <p>IEC 61558-2-6 NOTE Harmonized as EN 61558-2-6.</p> <p>IEC 61643-1 NOTE Harmonized as EN 61643-1.</p> <p>IEC 61643-21 NOTE Harmonized as EN 61643-21.</p> <p>IEC 61643-311 NOTE Harmonized as EN 61643-311.</p> <p>IEC 61643-321 NOTE Harmonized as EN 61643-321.</p> <p>IEC 61643-331 NOTE Harmonized as EN 61643-331.</p> | | N/A |
| ZB | ANNEX ZB, SPECIAL NATIONAL CONDITIONS (EN) | | N/A |
| 4.1.15 | <p>Denmark, Finland, Norway and Sweden</p> <p>To the end of the subclause the following is added:</p> <p>Class I pluggable equipment type A intended for connection to other equipment or a network shall, if safety relies on connection to reliable earthing or if surge suppressors are connected between the network terminals and accessible parts, have a marking stating that the equipment shall be connected to an earthed mains socket-outlet.</p> <p>The marking text in the applicable countries shall be as follows:</p> <p>In Denmark: "Apparatets stikprop skal tilsluttes en stikkontakt med jord som giver forbindelse til stikproppens jord."</p> <p>In Finland: "Laite on liitettävä suojakoskettimilla varustettuun pistorasiaan"</p> <p>In Norway: "Apparatet må tilkoples jordet stikkontakt"</p> <p>In Sweden: "Apparaten skall anslutas till jordat uttag"</p> | Class III equipment, no such part | N/A |



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Test Report No: RD2106WDG0248

| IEC/EN 62368-1 | | | |
|-----------------------|--|-----------------------------------|----------------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 4.7.3 | United Kingdom To the end of the subclause the following is added: The torque test is performed using a socket-outlet complying with BS 1363, and the plug part shall be assessed to the relevant clauses of BS 1363. Also see Annex G.4.2 of this annex | Class III equipment, no such part | N/A |
| 5.2.2.2 | Denmark After the 2nd paragraph add the following: A warning (marking safeguard) for high touch current is required if the touch current exceeds the limits of 3,5 mA a.c. or 10 mA d.c. | Class III equipment | N/A |



| IEC/EN 62368-1 | | | |
|----------------------|---|------------------------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 5.4.11.1 and Annex G | <p>Finland and Sweden</p> <p>To the end of the subclause the following is added:</p> <p>For separation of the telecommunication network from earth the following is applicable:</p> <p>If this insulation is solid, including insulation forming part of a component, it shall at least consist of either</p> <ul style="list-style-type: none"> • two layers of thin sheet material, each of which shall pass the electric strength test below, or • one layer having a distance through insulation of at least 0,4 mm, which shall pass the electric strength test below. <p>If this insulation forms part of a semiconductor component (e.g. an optocoupler), there is no distance through insulation requirement for the insulation consisting of an insulating compound completely filling the casing, so that clearances and creepage distances do not exist, if the component passes the electric strength test in accordance with the compliance clause below and in addition</p> <ul style="list-style-type: none"> • passes the tests and inspection criteria of 5.4.8 with an electric strength test of 1,5 kV multiplied by 1,6 (the electric strength test of 5.4.9 shall be performed using 1,5 kV), and • is subject to routine testing for electric strength during manufacturing, using a test voltage of 1,5kV. <p>It is permitted to bridge this insulation with a capacitor complying with EN 60384-14:2005, subclass Y2.</p> <p>A capacitor classified Y3 according to EN 60384-14:2005, may bridge this insulation under the following conditions:</p> <ul style="list-style-type: none"> • the insulation requirements are satisfied by having a capacitor classified Y3 as defined by EN 60384-14, which in addition to the Y3 testing, is tested with an impulse test of 2,5 kV defined in 5.4.11; • the additional testing shall be performed on all the test specimens as described in EN 60384-14; 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. | No telecommunication network | N/A |



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Test Report No: RD2106WDG0248

| IEC/EN 62368-1 | | | |
|----------------|---|-----------------------------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 5.5.2.1 | Norway After the 3rd paragraph the following is added: Due to the IT power system used, capacitors are required to be rated for the applicable line-to-line voltage (230 V). | Class III equipment | N/A |
| 5.5.6 | Finland, Norway and Sweden To the end of the subclause the following is added: Resistors used as basic safeguard or bridging basic insulation in class I pluggable equipment type A shall comply with G.10.1 and the test of G.10.2. | No such resistor used | N/A |
| 5.6.1 | Denmark Add to the end of the subclause Due to many existing installations where the socket-outlets can be protected with fuses with higher rating than the rating of the socket-outlets the protection for pluggable equipment type A shall be an integral part of the equipment. <i>Justification:</i> In Denmark an existing 13 A socket outlet can be protected by a 20 A fuse. | Class III equipment, no such part | 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, no such part | 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. | Class III equipment, no such part | N/A |
| 5.7.5 | Denmark To the end of the subclause the following is added: The installation instruction shall be affixed to the equipment if the protective conductor current exceeds the limits of 3,5 mA a.c. or 10 mA d.c. | Class III equipment, no such part | N/A |



| IEC/EN 62368-1 | | | |
|-----------------------|--|------------------------|----------------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 5.7.6.1 | <p>Norway and Sweden</p> <p>To the end of the subclause the following is added:</p> <p>The screen of the television distribution system is normally not earthed at the entrance of the building and there is normally no equipotential bonding system within the building. Therefore the protective earthing of the building installation needs to be isolated from the screen of a cable distribution system.</p> <p>It is however accepted to provide the insulation external to the equipment by an adapter or an interconnection cable with galvanic isolator, which may be provided by a retailer, for example.</p> <p>The user manual shall then have the following or similar information in Norwegian and Swedish language respectively, depending on in what country the equipment is intended to be used in:</p> <p>“Apparatus connected to the protective earthing of the building installation through the mains connection or through other apparatus with a connection to protective earthing – and to a television distribution system using coaxial cable, may in some circumstances create a fire hazard. Connection to a television distribution system therefore has to be provided through a device providing electrical isolation below a certain frequency range (galvanic isolator, see EN 60728-11)”</p> <p>NOTE In Norway, due to regulation for CATV-installations, and in Sweden, a galvanic isolator shall provide electrical insulation below 5 MHz. The insulation shall withstand a dielectric strength of 1,5 kV r.m.s., 50 Hz or 60 Hz, for 1 min.</p> <p>Translation to Norwegian (the Swedish text will also be accepted in Norway):</p> <p>“Apparater som er koplet til beskyttelsesjord via nettplugg og/eller via annet jordtilkoplet utstyr – og er tilkoplet et koaksialbasert kabel-TV nett, kan forårsake brannfare. For å unngå dette skal det ved tilkopling av apparater til kabel-TV nett installeres en galvanisk isolator mellom apparatet og kabel-TV nettet.”</p> | Not such equipment | N/A |



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Test Report No: RD2106WDG0248

| IEC/EN 62368-1 | | | |
|-----------------------|--|-----------------------------------|----------------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | Translation to Swedish: "Apparater som är kopplad till skyddsjord via jordat vägguttag och/eller via annan utrustning och samtidigt är kopplad till kabel-TV nät kan i vissa fall medföra risk för brand. För att undvika detta skall vid anslutning av apparaten till kabel-TV nät galvanisk isolator finnas mellan apparaten och kabel-TV nätet." | | N/A |
| 5.7.6.2 | Denmark To the end of the subclause the following is added: The warning (marking safeguard) for high touch current is required if the touch current or the protective current exceed the limits of 3,5 mA . | Class III equipment | N/A |
| B.3.1 and B.4 | Ireland and United Kingdom The following is applicable: To protect against excessive currents and short-circuits in the primary circuit of direct plug-in equipment , tests according to Annexes B.3.1 and B.4 shall be conducted using an external miniature circuit breaker complying with EN 60898-1, Type B, rated 32A. If the equipment does not pass these tests, suitable protective devices shall be included as an integral part of the direct plug-in equipment , until the requirements of Annexes B.3.1 and B.4 are met | Class III equipment, no such part | N/A |



| IEC/EN 62368-1 | | | |
|-----------------------|---|-----------------------------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| G.4.2 | <p>Denmark</p> <p>To the end of the subclause the following is added:</p> <p>Supply cords of single phase appliances having a rated current not exceeding 13 A shall be provided with a plug according to DS 60884-2-D1:2011.</p> <p>CLASS I EQUIPMENT provided with socket-outlets with earth contacts or which are intended to be used in locations where protection against indirect contact is required according to the wiring rules shall be provided with a plug in accordance with standard sheet DK 2-1a or DK 2-5a.</p> <p>If a single-phase equipment having a RATED CURRENT exceeding 13 A or if a poly-phase equipment is provided with a supply cord with a plug, this plug shall be in accordance with the standard sheets DK 6-1a in DS 60884-2-D1 or EN 60309-2.</p> <p>Mains socket outlets intended for providing power to Class II apparatus with a rated current of 2,5 A shall be in accordance DS 60884-2-D1:2011 standard sheet DKA 1-4a.</p> <p>Other current rating socket outlets shall be in compliance with Standard Sheet DKA 1-3a or DKA 1-1c.</p> <p>Mains socket-outlets with earth shall be in compliance with DS 60884-2-D1:2011 Standard Sheet DK 1-3a, DK 1-1c, DK1-1d, DK 1-5a or DK 1-7a</p> <p><i>Justification:</i> Heavy Current Regulations, Section 6c</p> | Class III equipment, no such part | N/A |
| G.4.2 | <p>United Kingdom</p> <p>To the end of the subclause the following is added:</p> <p>The plug part of direct plug-in equipment shall be assessed to BS 1363: Part 1, 12.1, 12.2, 12.3, 12.9, 12.11, 12.12, 12.13, 12.16, and 12.17, except that the test of 12.17 is performed at not less than 125 °C. Where the metal earth pin is replaced by an Insulated Shutter Opening Device (ISOD), the requirements of clauses 22.2 and 23 also apply.</p> | Class III equipment, no such part | N/A |



| IEC/EN 62368-1 | | | |
|-----------------------|--|-----------------------------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| G.7.1 | <p>United Kingdom</p> <p>To the first paragraph the following is added: Equipment which is fitted with a flexible cable or cord and is designed to be connected to a mains socket conforming to BS 1363 by means of that flexible cable or cord shall be fitted with a 'standard plug' in accordance with the Plugs and Sockets etc (Safety) Regulations 1994, Statutory Instrument 1994 No. 1768, unless exempted by those regulations.</p> <p>NOTE "Standard plug" is defined in SI 1768:1994 and essentially means an approved plug conforming to BS 1363 or an approved conversion plug.</p> | Class III equipment, no such part | N/A |
| G.7.1 | <p>Ireland</p> <p>To the first paragraph the following is added: Apparatus which is fitted with a flexible cable or cord shall be provided with a plug in accordance with Statutory Instrument 525: 1997, "13 A Plugs and Conversion Adapters for Domestic Use Regulations: 1997. S.I. 525 provides for the recognition of a standard of another Member State which is equivalent to the relevant Irish Standard</p> | Class III equipment, no such part | N/A |
| G.7.2 | <p>Ireland and United Kingdom</p> <p>To the first paragraph the following is added: A power supply cord with a conductor of 1,25 mm² is allowed for equipment which is rated over 10 A and up to and including 13 A.</p> | Class III equipment, no such part | N/A |
| ZC | ANNEX ZC, NATIONAL DEVIATIONS (EN) | | N/A |
| 10.5.2 | <p>Germany</p> <p>The following requirement applies: For the operation of any cathode ray tube intended for the display of visual images operating at an acceleration voltage exceeding 40 kV, authorization is required, or application of type approval (Bauartzulassung) and marking.</p> <p><i>Justification:</i> German ministerial decree against ionizing radiation (Röntgenverordnung), in force since 2002-07-01, implementing the European Directive 96/29/EURATOM.</p> <p>NOTE Contact address: Physikalisch-Technische Bundesanstalt, Bundesallee 100, D-38116 Braunschweig, Tel.: Int +49-531-592-6320, Internet: http://www.ptb.de</p> | No cathode ray tube used | N/A |



| IEC/EN 62368-1 | | | |
|----------------|--------------------|-----------------|---------|
| 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 | |
| PCB material | TRIPOD (WUXI) ELECTRONIC CO LTD | 2-9 | V-0, 130°C | UL 796 | UL | |
| Or | Interchangeable | -- | V-1 or better, min. 105°C | UL796 or UL 94 | UL | |
| -Description ²): | | Interchangeability based on specified rating | | | | |
| Supplementary information: | | | | | | |
| 1) Provided evidence ensures the agreed level of compliance. See OD-CB2039. | | | | | | |
| 2) Description line content is optional. Main line description needs to clearly detail the component used for testing | | | | | | |

| 4.8.4, 4.8.5 | TABLE: Lithium coin/button cell batteries mechanical tests | | | N/A |
|---|--|------------------------------------|--------------|-----|
| (The following mechanical tests are conducted in the sequence noted.) | | | | |
| 4.8.4.2 | TABLE: Stress Relief test | | | — |
| Part | Material | Oven Temperature (°C) | Comments | |
| -- | -- | -- | -- | |
| 4.8.4.3 | TABLE: Battery replacement test | | | — |
| Battery part no.....: | | -- | — | |
| Battery Installation/withdrawal | | Battery Installation/Removal Cycle | Comments | |
| | | 1 | -- | |
| | | 2 | -- | |
| | | 3 | -- | |
| | | 4 | -- | |
| | | 5 | -- | |
| | | 6 | -- | |
| | | 8 | -- | |
| | | 9 | -- | |
| | | 10 | -- | |
| 4.8.4.4 | TABLE: Drop test | | | — |
| Impact Area | Drop Distance | Drop No. | Observations | |
| -- | -- | 1 | -- | |



| IEC/EN 62368-1 | | | |
|-------------------------------|--------------------------|---------------------------|-----------------------------------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| -- | -- | 2 | -- |
| -- | -- | 3 | -- |
| 4.8.4.5 | TABLE: Impact | | — |
| Impacts per surface | Surface tested | Impact energy (Nm) | Comments |
| -- | -- | -- | -- |
| 4.8.4.6 | TABLE: Crush test | | — |
| Test position | Surface tested | Crushing Force (N) | Duration force applied (s) |
| -- | -- | -- | -- |
| Supplementary information: -- | | | |

| | | | |
|-------------------------------|---|------------------|-----------------------------------|
| 4.8.5 | TABLE: Lithium coin/button cell batteries mechanical test result | | N/A |
| Test position | Surface tested | Force (N) | Duration force applied (s) |
| -- | -- | -- | -- |
| Supplementary information: -- | | | |

| 5.2 | Table: Classification of electrical energy sources | | | | | P | |
|---|---|-------------------------------------|----------------------|--------------------|--------------------|----------|----------|
| 5.2.2.2 – Steady State Voltage and Current conditions | | | | | | | |
| No. | Supply Voltage | Location (e.g. circuit designation) | Test conditions | Parameters | | | ES Class |
| | | | | U (Vrms or Vpk) | I (Apk or Arms) | Hz | |
| 1 | 3.3Vdc | All circuits | Normal | 3.3Vdc | -- | -- | ES1 |
| | | | Abnormal | -- | -- | -- | |
| | | | Single fault – SC/OC | -- | -- | -- | |
| 5.2.2.3 - Capacitance Limits | | | | | | | |
| No. | Supply Voltage | Location (e.g. circuit designation) | Test conditions | Parameters | | ES Class | |
| | | | | Capacitance, nF | Upk (V) | | |
| -- | -- | -- | Normal | -- | -- | -- | |
| | | | Abnormal | -- | -- | | |
| | | | Single fault – SC/OC | -- | -- | | |



| IEC/EN 62368-1 | | | |
|----------------|--------------------|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |

5.2.2.4 - Single Pulses

| No. | Supply Voltage | Location (e.g. circuit designation) | Test conditions | Parameters | | | ES Class |
|-----|----------------|-------------------------------------|----------------------|---------------|---------|----------------------|----------|
| | | | | Duration (ms) | Upk (V) | l _{pk} (mA) | |
| -- | -- | -- | Normal | -- | -- | -- | -- |
| | | | Abnormal | -- | -- | -- | |
| | | | Single fault – SC/OC | -- | -- | -- | |

5.2.2.5 - Repetitive Pulses

| No. | Supply Voltage | Location (e.g. circuit designation) | Test conditions | Parameters | | | ES Class |
|-----|----------------|-------------------------------------|----------------------|---------------|---------|----------------------|----------|
| | | | | Off time (ms) | Upk (V) | l _{pk} (mA) | |
| -- | -- | -- | Normal | -- | -- | -- | -- |
| | | | Abnormal | -- | -- | -- | |
| | | | Single fault – SC/OC | -- | -- | -- | |

Test Conditions:
 Normal –
 Abnormal -
 Supplementary information: SC=Short Circuit, OC=Open Circuit

| 5.4.1.4, 6.3.2, 9.0, B.2.6 | TABLE: Temperature measurements | | | | P |
|--|---------------------------------|---------------|----|----|-------------------------------|
| Supply voltage (V) | 3.3Vdc | | -- | | — |
| Ambient T _{min} (°C)..... | -- | -- | -- | -- | — |
| Ambient T _{max} (°C)..... | -- | -- | -- | -- | — |
| T _{ma} (°C) | -- | -- | -- | -- | — |
| Maximum measured temperature T of part/at: | T (°C) | | | | Allowed T _{max} (°C) |
| Calculated value for T _{ma} : | -- | Shift to 85°C | -- | -- | -- |
| Ambient temperature during test (T _{amb}): | 25.5 | -- | -- | -- | -- |
| PCB near U7 | 36.5 | 96.0 | -- | -- | 105 |
| PCB near U1 | 39.6 | 99.1 | -- | -- | 105 |
| PCB near U5 | 36.9 | 96.4 | -- | -- | 105 |
| Metal heat-sink | 34.9 | 94.4 | -- | -- | 105 |



| IEC/EN 62368-1 | | | |
|----------------|--------------------|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |

Supplementary information: --

| Temperature T of winding: | t ₁ (°C) | R ₁ (Ω) | t ₂ (°C) | R ₂ (Ω) | T (°C) | Allowed T _{max} (°C) | Insulation class |
|---------------------------|---------------------|--------------------|---------------------|--------------------|--------|-------------------------------|------------------|
| -- | -- | -- | -- | -- | -- | -- | -- |

Supplementary information:

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)

| 5.4.1.10.2 | TABLE: Vicat softening temperature of thermoplastics | | N/A |
|-------------------------------|--|------------------|-----|
| Penetration (mm)..... : | -- | | — |
| Object/ Part No./Material | Manufacturer/t rademark | T softening (°C) | |
| -- | -- | -- | |
| supplementary information: -- | | | |

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

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

| 5.4.2.3 | TABLE: Minimum Clearances distances using required withstand voltage | | | N/A |
|------------------------------|--|-------------|------------------|-----|
| | Overvoltage Category (OV): | | | -- |
| | Pollution Degree: | | | 2 |
| Clearance distanced between: | Required withstand | Required cl | Measured cl (mm) | |



| IEC/EN 62368-1 | | | |
|-------------------------------|--------------------|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | voltage | (mm) | |
| -- | -- | -- | -- |
| Supplementary information: -- | | | |

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

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

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

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



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|----------------|--------------------|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |

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

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

Supplementary information: --

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

Supplementary Information:
 Notes:
 [1] Supply voltage is the anticipated maximum Touch Voltage
 [2] Earthed neutral conductor [Voltage differences less than 1% or more]
 [3] Specify method used for measurement as described in IEC 60990 sub-clause 4.3
 [4] IEC60990, sub-clause 6.2.2.7, Fault 7 not applicable.
 [5] (*) IEC60990, sub-clause 6.2.2.2 is not applicable if switch or disconnect device (e.g., appliance coupler) provided.



| IEC/EN 62368-1 | | | |
|----------------|--------------------|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |

| 6.2.2 | Table: Electrical power sources (PS) measurements for classification | | | | P |
|-------------------|--|----------------------|---------------------|----------------------------------|-------------------|
| Source | Description | Measurement | Max Power after 3 s | Max Power after 5 s [*] | PS Classification |
| Input of the unit | Normal | Power (W) : | -- | -- | PS2 (declared) |
| | | V _A (V) : | -- | -- | |
| | | I _A (A) : | -- | -- | |

Supplementary Information:

(*) Measurement taken only when limits at 3 seconds exceed PS1 limits

| 6.2.3.1 | Table: Determination of Potential Ignition Sources (Arcing PIS) | | | | N/A |
|----------|---|--|---|----------------------|-----|
| Location | Open circuit voltage After 3 s (V _p) | Measured r.m.s current (I _{rms}) | Calculated value (V _p × I _{rms}) | Arcing PIS? Yes / No | |
| -- | --- | -- | -- | -- | |

Supplementary information:

An Arcing PIS requires a minimum of 50 V (peak) a.c. or d.c. An Arcing PIS is established when the product of the open circuit voltage (V_p) and normal operating condition rms current (I_{rms}) is greater than 15.

| 6.2.3.2 | Table: Determination of Potential Ignition Sources (Resistive PIS) | | | | P |
|------------------------|--|---|--|--|-----------------------|
| Circuit Location (x-y) | Operating Condition (Normal / Describe Single Fault) | Measured wattage or VA During first 30 s (W / VA) | Measured wattage or VA After 30 s (W / VA) | Protective Circuit, Regulator, or PTC Operated? Yes / No (Comment) | Resistive PIS? Yes/No |
| The whole unit | -- | -- | -- | -- | Yes (declared) |

Supplementary Information:

A combination of voltmeter, VA and ammeter IA may be used instead of a wattmeter.

If a separate voltmeter and ammeter are used, the product of (VA × IA) is used to determine Resistive PIS classification.

A Resistive PIS: (a) dissipates more than 15 W, measured after 30 s of normal operation, or (b) under single fault conditions has either a power exceeding 100 W measured immediately after the introduction of the fault if electronic circuits, regulators or PTC devices are used, or has an available power exceeding 15 W measured 30 s after introduction of the fault.



| IEC/EN 62368-1 | | | |
|----------------|--------------------|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |

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

| B.2.5 | TABLE: Input test | | | | | | P |
|------------------------------|-------------------|--------------|-------|-------------|---------|------------|--|
| U (V) | I (mA) | I rated (mA) | P (W) | P rated (W) | Fuse No | I fuse (A) | Condition/status |
| 3.3Vdc | 70 | 100 | 0.231 | -- | -- | -- | The EUT was operated under normal conditions |
| Supplementary information:-- | | | | | | | |

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



| IEC/EN 62368-1 | | | |
|----------------|--------------------|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |

| B.4 | TABLE: Fault condition tests | | | | | | | P |
|--|-------------------------------------|---------------------|----------------|----------|-------------------|-----------------------------------|--|--|
| Ambient temperature (°C) : | | | | | | 25.0°C, if no otherwise specified | | — |
| Power source for EUT: Manufacturer, model/type, output rating: | | | | | | -- | | — |
| Component No. | Fault Condition | Supply voltage, (V) | Test time (ms) | Fuse no. | Fuse current, (A) | T-couple | Temp. (°C) | Observation |
| U1 pin A8-A9 | Shorted | 3.3Vdc | 30mins | -- | -- | -- | -- | The unit work normally, no hazards, no damage. |
| U5 pin J2-B1 | Shorted | 3.3Vdc | 1H04mins | -- | -- | Type K | Metal heat-sink: 76.4 Ambient: 25.6 | The unit work normally, no hazards, no damage. |
| C4 | Shorted | 3.3 Vdc | 30mins | -- | -- | -- | -- | The unit work normally, no hazards, no damage. |
| Supplementary information: -- | | | | | | | | |

| Annex M | TABLE: Batteries | | | | | | | | N/A |
|---|----------------------------|---------------|-------------------------|------------------------|---------------|---------------|---------------|-------------------|---------------|
| The tests of Annex M are applicable only when appropriate battery data is not available | | | | | | | | | N/A |
| Is it possible to install the battery in a reverse polarity position? | | | | | | | No | | -- |
| | Non-rechargeable batteries | | | Rechargeable batteries | | | | | |
| | Discharging | | Un-intentional charging | Charging | | Discharging | | Reversed charging | |
| | Meas. current | Manuf. Specs. | | Meas. current | Manuf. Specs. | Meas. current | Manuf. Specs. | Meas. current | Manuf. Specs. |
| Max. current during normal condition | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Max. current during fault condition | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Test results: | | | | | | | | | Verdict |
| - Chemical leaks | | | | | | | | | N/A |
| - Explosion of the battery | | | | | | | | | N/A |



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|-------------------------------|--|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| - | Emission of flame or expulsion of molten metal | -- | N/A |
| - | Electric strength tests of equipment after completion of tests | -- | N/A |
| Supplementary information: -- | | | |

| Annex M.4 | | Table: Additional safeguards for equipment containing secondary lithium batteries | | | N/A |
|-------------------------------|--------------------------------------|---|---------------------------------------|-------------|-------------|
| Battery/Cell No. | Test conditions | Measurements | | | Observation |
| | | U | I (mA) | Temp (C) | |
| -- | -- | -- | -- | -- | -- |
| Supplementary Information:-- | | | | | |
| Battery identification | Charging at T _{lowest} (°C) | Observation | Charging at T _{highest} (°C) | Observation | |
| -- | -- | -- | -- | -- | -- |
| Supplementary Information: -- | | | | | |

| Annex Q.1 | TABLE: Circuits intended for interconnection with building wiring (LPS) | | | | N/A | |
|---|---|---------------------|---------------------|-------|--------|-------|
| Note: Measured UOC (V) with all load circuits disconnected: | | | | | | |
| Output Circuit | Components | U _{oc} (V) | I _{sc} (A) | | S (VA) | |
| | | | Meas. | Limit | Meas. | Limit |
| -- | -- | -- | -- | ≤8.0 | -- | ≤100 |
| Supplementary Information: SC=Short circuit, OC=Open circuit | | | | | | |

| T.2, T.3, T.4, T.5 | TABLE: Steady force test | | | | | N/A |
|--|--------------------------|----------------|-----------|---------------------|-------------|-----|
| Part/Location | Material | Thickness (mm) | Force (N) | Test Duration (sec) | Observation | |
| -- | -- | -- | -- | -- | -- | -- |
| Supplementary information: Evaluated in the end product | | | | | | |



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| 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:
Evaluated in the end product

| | | | |
|------------|--------------------------|--|------------|
| T.7 | TABLE: Drop tests | | N/A |
|------------|--------------------------|--|------------|

| Part/Location | Material | Thickness (mm) | Drop Height (mm) | Observation |
|---------------|----------|----------------|------------------|-------------|
| -- | -- | -- | -- | -- |

Supplementary information:
Evaluated in the end product

| | | | |
|------------|----------------------------------|--|------------|
| T.8 | TABLE: Stress relief test | | N/A |
|------------|----------------------------------|--|------------|

| Part/Location | Material | Thickness (mm) | Oven Temperature (°C) | Duration (h) | Observation |
|---------------|----------|----------------|-----------------------|--------------|-------------|
| -- | -- | -- | -- | -- | -- |

Supplementary information:
Evaluated in the end product



Product photos

