中国认可
国际互认
检测
TESTING
CNAS L3110

# TEST REPORT

| | | |
|---|---|---|
| **Report No.** | : | WTF22D10214191R1Y002 |
| **Applicant** | : | Mid Ocean Brands B.V. |
| **Address** | : | 7/F., Kings Tower, 111 King Lam Street, Cheung Sha Wan, Kowloon, Hong Kong |
| **Manufacturer** | : | 114628 |
| **Address** | : | -- |
| **Product** | : | Wireless mouse |
| **Model(s)** | : | MO8827, MO8412, MO9747 |
| **Total pages.** | : | 69 pages and 4 pages of photo. |
| **Standards** | : | ☒ EN IEC 62368-1:2020+A11:2020<br>Audio/video, information and communication technology equipment - Part 1:Safety requirements |
| **Date of Receipt sample** | : | 2022-10-28 |
| **Date of Test** | : | 2022-10-28 to 2022-11-21 |
| **Date of Issue** | : | 2022-12-26 |
| **Test Result** | : | **Pass** |

Remarks:
The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.


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Compiled by:

Lucas Cao / Project Engineer

Approved by:

Sam Qi / Designated Reviewer

| | |
|---|---|
| Test Item description ..... | Wireless mouse |
| Trade Mark(s) ..... | MOB |
| Model/Type reference ..... | MO8827, MO8412, MO9747 |
| Ratings ..... | -- |

**Remark:**
Whether parts of tests for the product have been subcontracted to other labs:
☐ Yes ☒ No
If Yes, list the related test items and lab information:
Test items: --
Lab information: --

**Summary of testing:**

| **Tests performed (name of test and test clause):** | **Testing location:** |
|---|---|
| - EN IEC 62368-1:2020+A11:2020<br>The submitted samples were found to comply with the requirements of above specification. | No. 77, Houjie Section, Guantai Road, Houjie Town, Dongguan City, Guangdong, China |

**Summary of compliance with National Differences (List of countries addressed):**
List of countries addressed: National Differences and Group Differences for CENELEC countries were checked.

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

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

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

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

**Information on uncertainty of measurement:**

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

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

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

**Copy of marking plate:**

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


**Remark:**

1. The above markings are the minimum requirements required by the safety standard. For the final production, the additional markings which donot give rise to misunderstanding may be added.
2. The CE,UKCA marking and WEEE symbol should be at least 5.0mm and 7.0mm respectively in height.
3. According to the EU directives which have been aligned with EU NLF (new legislative framework), both of manufacturer and importer's name and address shall be affixed on the product or, where that is not possible, on its packaging or in a document accompanying the product before the product is placed on the EU market.

| Test item particulars: | |
|---|---|
| **Product group** | ☒ end product ☐ built-in component |
| **Classification of use by** | ☒ Ordinary person ☒ Children likely present<br>☐ Instructed person<br>☐ Skilled person |
| **Supply connection** | ☐ AC mains ☐ DC mains<br>☒ not mains connected:<br>☒ ES1 ☐ ES2 ☐ ES3 |
| **Supply tolerance** | ☐ +10%/-10%<br>☐ +20%/-15%<br>☐ +__%/ -__%<br>☒ None |
| **Supply connection – type** | ☐ pluggable equipment type A -<br>☐ non-detachable supply cord<br>☐ appliance coupler<br>☐ direct plug-in<br>☐ pluggable equipment type B -<br>☐ non-detachable supply cord<br>☐ appliance coupler<br>☐ permanent connection<br>☐ mating connector ☒ other: not Mains connected |
| **Considered current rating of protective device** | ☐ UK: 13 A; Others: 16 A |
| | Location: ☐ building ☐ equipment<br>☒ N/A |
| **Equipment mobility** | ☒ movable ☒ hand-held ☒ transportable<br>☐ direct plug-in ☐ stationary ☐ for building-in<br>☐ wall/ceiling-mounted ☐ SRME/rack-mounted<br>☐ other: ___ |
| **Overvoltage category (OVC)** | ☐ OVC I ☐ OVC II ☐ OVC III<br>☐ OVC IV ☒ other: not Mains connected |
| **Class of equipment** | ☐ Class I ☐ Class II ☒ Class III<br>☐ Not classified ☐ ___ |
| **Special installation location** | ☒ N/A ☐ restricted access area<br>☐ outdoor location ☐ ___ |
| **Pollution degree (PD)** | ☐ PD 1 ☒ PD 2 ☐ PD 3 |
| **Manufacturer's specified $T_{ma}$** | 45°C ☐ Outdoor: minimum ___°C |
| **IP protection class** | ☒ IPX0 ☐ IP___ |
| **Power systems** | ☐ TN ☐ TT ☐ IT - ___V $_{L-L}$<br>☒ not Mains connected |
| **Altitude during operation (m)** | ☒ 2000 m or less ☐ _5000_m |
| **Altitude of test laboratory (m)** | ☒ 2000 m or less ☐ ___ m |
| **Mass of equipment (kg)** | Approximately: 0.047kg |

| |
|---|
| **Possible test case verdicts:**<br>**- test case does not apply to the test object....:** N/A<br>**- test object does meet the requirement.....:** P (Pass)<br>**- test object does not meet the requirement....:** F (Fail) |
| **Testing:**<br>**Date of receipt of test item .....:** 2022-10-28<br>**Date (s) of performance of tests .....:** 2022-10-28 to 2022-11-21 |
| |
| **General remarks:** |
| "(see Enclosure #)" refers to additional information appended to the report.<br>"(see appended table)" refers to a table appended to the report.<br>**Throughout this report a ☐ comma / ☒ point is used as the decimal separator.** |
| **General Product Information:** |
| **Product Description:**<br>1. The EUT covered by this report is a Wireless mouse used as information apparatus. It is supplied by internal dry battery.<br>2. The manufacturer specified maximum ambient temperature is 45°C.<br>3. The specified altitude is up to and including 2000 m above sea level.<br>**Description of changes:**<br>This report was based on original report WTF22D10214191Y002, including following changes:<br>1. Delete the model MO9785.<br>2. Change the test model MO9785 to MO8827.<br>No additional testing is required for above changes. |
| **Model Differences**<br>1. All these models are same as each other only except for the model name, appearance in colour.<br>2. The model MO8827 was selected for all testing. |
| **Additional application considerations**<br>N/A |

| **OVERVIEW OF ENERGY SOURCES AND SAFEGUARDS** | | | | |
|---|---|---|---|---|
| **Clause** | **Possible Hazard** | | | |
| 5 | Electrically-caused injury | | | |
| Class and Energy Source (e.g. ES3: Primary circuit) | Body Part (e.g. Ordinary) | Safeguards | | |
| | | B | S | R |
| Ordinary person | ES1: All circuit | N/A | N/A | N/A |
| 6 | Electrically-caused fire | | | |
| Class and Energy Source | Material part | Safeguards | | |

| | | | | |
|---|---|---|---|---|
| (e.g. PS2: 100 Watt circuit) | (e.g. Printed board) | B | 1st S | 2nd S |
| All components/materials | PS1: All circuit | N/A | N/A | N/A |
| 7 | Injury caused by hazardous substances | | | |
| Class and Energy Source (e.g. Ozone) | Body Part (e.g., Skilled) | Safeguards | | |
| | | B | S | R |
| N/A | N/A | N/A | N/A | N/A |
| 8 | Mechanically-caused injury | | | |
| Class and Energy Source (e.g. MS3: Plastic fan blades) | Body Part (e.g. Ordinary) | Safeguards | | |
| | | B | S | R |
| MS1: Mass of the unit <7kg | Ordinary | N/A | N/A | N/A |
| MS1: Smooth Edges and corners | Ordinary | N/A | N/A | N/A |
| 9 | Thermal burn | | | |
| Class and Energy Source (e.g. TS1: Keyboard caps) | Body Part (e.g., Ordinary) | Safeguards | | |
| | | B | S | R |
| TS1: Plastic enclosure | Ordinary | N/A | N/A | N/A |
| TS3: Internal parts/circuits | Ordinary | N/A | N/A | Enclosure |
| 10 | Radiation | | | |
| Class and Energy Source (e.g. RS1: PMP sound output) | Body Part (e.g., Ordinary) | Safeguards | | |
| | | B | S | R |
| RS1: LED for indicating | Ordinary | N/A | N/A | N/A |
| Supplementary Information:<br>"B" – Basic Safeguard; "S" – Supplementary Safeguard; "R" – Reinforced Safeguard | | | | |

| ENERGY SOURCE DIAGRAM |
|---|
| Indicate which energy sources are included in the energy source diagram. Insert diagram below |
| ☒ ES ☒ PS ☒ MS ☒ TS ☒ RS<br>**See details in ENERGY SOURCE IDENTIFICATION AND CLASSIFICATION TABLE** |

| EN IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| **4** | **GENERAL REQUIREMENTS** | | P |
| 4.1.1 | Acceptance of materials, components and subassemblies | (See appended table 4.1.2) | P |
| 4.1.2 | Use of components | Components which are certified to IEC and/or national standards are used correctly within their ratings. Components not covered by IEC standards are tested under the conditions present in the equipment. See also Annex G | P |
| 4.1.3 | Equipment design and construction | Evaluation of safeguards regarding preventing access to ES3 parts, limiting the source supplying outputs to fulfill ES1, and protection in regard to risk of ignition, mechanical-caused injury and thermal burn considered. | P |
| 4.1.4 | Specified ambient temperature for outdoor use ($^{o}$C) .....: | Indoor use only | N/A |
| 4.1.5 | Constructions and components not specifically covered | No constructions and components. | N/A |
| 4.1.8 | Liquids and liquid filled components (LFC) | No such parts. | N/A |
| 4.1.15 | Markings and instructions | (See Annex F) | P |
| 4.4.3 | Safeguard robustness | See below | P |
| 4.4.3.1 | General | | P |
| 4.4.3.2 | Steady force tests | (See Annex T.2 T.4and T.5). | P |
| 4.4.3.3 | Drop tests | (See Annex T.7) | P |
| 4.4.3.4 | Impact tests | (See Annex T.6) | P |
| 4.4.3.5 | Internal accessible safeguard tests | The external enclosure cannot be opened without damaging the product. | N/A |
| 4.4.3.6 | Glass impact tests | No such glass used. | N/A |
| 4.4.3.7 | Glass fixation tests | No such parts. | N/A |
| | Glass impact test (1J) | | N/A |
| | Push/pull test (10 N) | | N/A |
| 4.4.3.8 | Thermoplastic material tests | (See Annex T.8) | P |

| EN IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 4.4.3.9 | Air comprising a safeguard | | N/A |
| 4.4.3.10 | Accessibility, glass, safeguard effectiveness | After tests of 4.4.3.2, 4.4.3.3, 4.4.3.4and 4.4.3.8, no safeguard damaged. Class 3 energy sources do not become accessible to an ordinary person or to an instructed person and all other safeguards do remain effective. | P |
| 4.4.4 | Displacement of a safeguard by an insulating liquid | No such liquid. | N/A |
| 4.4.5 | Safety interlocks | No such parts. | N/A |
| **4.5** | **Explosion** | | P |
| 4.5.1 | General | No explosion occurs during normal/abnormal operation and single fault conditions | P |
| 4.5.2 | No explosion during normal/abnormal operating condition | (See Clause B.2, B.3) | P |
| | No harm by explosion during single fault conditions | (See Clause B.4) | P |
| **4.6** | **Fixing of conductors** | See below | P |
| | Fix conductors not to defeat a safeguard | | P |
| | Compliance is checked by test.....: | (See Clause T.2) | P |
| **4.7** | **Equipment for direct insertion into mains socket–outlets** | | N/A |
| 4.7.2 | Mains plug part complies with relevant standard ...: | | N/A |
| 4.7.3 | Torque (Nm) .....: | | N/A |
| **4.8** | **Equipment containing coin/button cell batteries** | | N/A |
| 4.8.1 | General | | N/A |
| 4.8.2 | Instructional safeguard .....: | | N/A |
| 4.8.3 | Battery compartment door/cover construction | | N/A |
| | Open torque test | | N/A |
| 4.8.4.2 | Stress relief test | | N/A |
| 4.8.4.3 | Battery replacement test | | N/A |
| 4.8.4.4 | Drop test | | N/A |
| 4.8.4.5 | Impact test | | N/A |
| 4.8.4.6 | Crush test | | N/A |
| 4.8.5 | Compliance | | N/A |

| EN IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | 30N force test with test probe | | N/A |
| | 20N force test with test hook | | N/A |
| **4.9** | **Likelihood of fire or shock due to entry of conductive object** | | N/A |
| **4.10** | **Component requirements** | | N/A |
| 4.10.1 | Disconnect Device | | N/A |
| 4.10.2 | Switches and relays | | N/A |
| **5** | **ELECTRICALLY-CAUSED INJURY** | | P |
| **5.2** | **Classification and limits of electrical energy sources** | | P |
| 5.2.2 | ES1, ES2 and ES3 limits | | P |
| 5.2.2.2 | Steady-state voltage and current limits .....: | (See appended table 5.2) | P |
| 5.2.2.3 | Capacitance limits .....: | No capacitance | N/A |
| 5.2.2.4 | Single pulse limits.....: | No single pulse introduced | N/A |
| 5.2.2.5 | Limits for repetitive pulses .....: | No repetitive pulses introduced | N/A |
| 5.2.2.6 | Ringing signals | No such ringing signals within the EUT | N/A |
| 5.2.2.7 | Audio signals | No audio signals used | N/A |
| **5.3** | **Protection against electrical energy sources** | | P |
| 5.3.1 | General Requirements for accessible parts to ordinary, instructed and skilled persons | See only 4.3 and 5.3 to 5.5 which applies to protection between the accessible parts and hazardous parts of other circuits. | P |
| 5.3.1 a) | Accessible ES1/ES2 derived from ES2/ES3 circuits | | P |
| 5.3.1 b) | Skilled persons not unintentional contact ES3 bare conductors | | N/A |
| 5.3.2.1 | Accessibility to electrical energy sources and safeguards | Only ES1 circuit can be accessed for this product | P |
| | Accessibility to outdoor equipment bare parts | | N/A |
| 5.3.2.2 | Contact requirements | | N/A |
| | Test with test probe from Annex V | | - |
| 5.3.2.2 a) | Air gap – electric strength test potential (V) .....: | | N/A |
| 5.3.2.2 b) | Air gap – distance (mm) .....: | | N/A |
| 5.3.2.3 | Compliance | | N/A |
| 5.3.2.4 | Terminals for connecting stripped wire | | N/A |

| EN IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| **5.4** | **Insulation materials and requirements** | | P |
| 5.4.1.2 | Properties of insulating material | No insulation as a safeguard. | N/A |
| 5.4.1.3 | Material is non-hygroscopic | | N/A |
| 5.4.1.4 | Maximum operating temperature for insulating materials .....: | (See appended table 5.4.1.4, 9.3, B.1.5, B.2.6, B.3, B.4) | P |
| 5.4.1.5 | Pollution degrees.....: | PD2 considered | P |
| 5.4.1.5.2 | Test for pollution degree 1 environment and for an insulating compound | | N/A |
| 5.4.1.5.3 | Thermal cycling test | | N/A |
| 5.4.1.6 | Insulation in transformers with varying dimensions | | N/A |
| 5.4.1.7 | Insulation in circuits generating starting pulses | | N/A |
| 5.4.1.8 | Determination of working voltage .....: | | N/A |
| 5.4.1.9 | Insulating surfaces | | N/A |
| 5.4.1.10 | Thermoplastic parts on which conductive metallic parts are directly mounted | | N/A |
| 5.4.1.10.2 | Vicat test .....: | | N/A |
| 5.4.1.10.3 | Ball pressure test.....: | | N/A |
| 5.4.2 | Clearances | | N/A |
| 5.4.2.1 | General requirements | | N/A |
| | Clearances in circuits connected to AC Mains, Alternative method | | N/A |
| 5.4.2.2 | Procedure 1 for determining clearance | | N/A |
| | Temporary overvoltage .....: | | — |
| 5.4.2.3 | Procedure 2 for determining clearance | | N/A |
| 5.4.2.3.2.2 | a.c. mains transient voltage .....: | | — |
| 5.4.2.3.2.3 | d.c. mains transient voltage .....: | | — |
| 5.4.2.3.2.4 | External circuit transient voltage.....: | | — |
| 5.4.2.3.2.5 | Transient voltage determined by measurement .....: | | — |
| 5.4.2.4 | Determining the adequacy of a clearance using an electric strength test .....: | | N/A |
| 5.4.2.5 | Multiplication factors for clearances and test voltages .....: | | N/A |
| 5.4.2.6 | Clearance measurement.....: | | N/A |
| 5.4.3 | Creepage distances | | N/A |

| EN IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 5.4.3.1 | General | | N/A |
| 5.4.3.3 | Material group.....: | | — |
| 5.4.3.4 | Creepage distances measurement .....: | | N/A |
| 5.4.4 | Solid insulation | | N/A |
| 5.4.4.1 | General requirements | | N/A |
| 5.4.4.2 | Minimum distance through insulation .....: | | N/A |
| 5.4.4.3 | Insulating compound forming solid insulation | | N/A |
| 5.4.4.4 | Solid insulation in semiconductor devices | | N/A |
| 5.4.4.5 | Insulating compound forming cemented joints | | N/A |
| 5.4.4.6 | Thin sheet material | | N/A |
| 5.4.4.6.1 | General requirements | | N/A |
| 5.4.4.6.2 | Separable thin sheet material | | N/A |
| | Number of layers (pcs) .....: | | N/A |
| 5.4.4.6.3 | Non-separable thin sheet material | | N/A |
| | Number of layers (pcs) .....: | | N/A |
| 5.4.4.6.4 | Standard test procedure for non-separable thin sheet material.....: | | N/A |
| 5.4.4.6.5 | Mandrel test | | N/A |
| 5.4.4.7 | Solid insulation in wound components | | N/A |
| 5.4.4.9 | Solid insulation at frequencies >30 kHz, $E_P$, $K_R$, $d$, $V_{PW}$ (V).....: | | N/A |
| | Alternative by electric strength test, tested voltage (V), $K_R$.....: | | N/A |
| 5.4.5 | Antenna terminal insulation | | N/A |
| 5.4.5.1 | General | | N/A |
| 5.4.5.2 | Voltage surge test | | N/A |
| 5.4.5.3 | Insulation resistance (MΩ) .....: | | N/A |
| | Electric strength test.....: | | N/A |
| 5.4.6 | Insulation of internal wire as part of supplementary safeguard | | N/A |
| 5.4.7 | Tests for semiconductor components and for cemented joints | | N/A |
| 5.4.8 | Humidity conditioning | | N/A |

| EN IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | Relative humidity (%), temperature (°C), duration (h) .....: | | — |
| 5.4.9 | Electric strength test | | N/A |
| 5.4.9.1 | Test procedure for type test of solid insulation.....: | | N/A |
| 5.4.9.2 | Test procedure for routine test | | N/A |
| 5.4.10 | Safeguards against transient voltages from external circuits | | N/A |
| 5.4.10.1 | Parts and circuits separated from external circuits | | N/A |
| 5.4.10.2 | Test methods | | N/A |
| 5.4.10.2.1 | General | | N/A |
| 5.4.10.2.2 | Impulse test .....: | | N/A |
| 5.4.10.2.3 | Steady-state test .....: | | N/A |
| 5.4.10.3 | Verification for insulation breakdown for impulse test.....: | | N/A |
| 5.4.11 | Separation between external circuits and earth | | N/A |
| 5.4.11.1 | Exceptions to separation between external circuits and earth | | N/A |
| 5.4.11.2 | Requirements | | N/A |
| | SPDs bridge separation between external circuit and earth | | N/A |
| | Rated operating voltage $U_{op}$ (V) .....: | | — |
| | Nominal voltage $U_{peak}$ (V) .....: | | — |
| | Max increase due to variation $\Delta U_{sp}$ .....: | | — |
| | Max increase due to ageing $\Delta U_{sa}$ .....: | | — |
| 5.4.11.3 | Test method and compliance .....: | | N/A |
| 5.4.12 | Insulating liquid | | N/A |
| 5.4.12.1 | General requirements | | N/A |
| 5.4.12.2 | Electric strength of an insulating liquid.....: | | N/A |
| 5.4.12.3 | Compatibility of an insulating liquid .....: | | N/A |
| 5.4.12.4 | Container for insulating liquid.....: | | N/A |
| **5.5** | **Components as safeguards** | | N/A |
| 5.5.1 | General | | N/A |
| 5.5.2 | Capacitors and RC units | | N/A |
| 5.5.2.1 | General requirement | | N/A |

| EN IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 5.5.2.2 | Safeguards against capacitor discharge after disconnection of a connector .....: | | N/A |
| 5.5.3 | Transformers | | N/A |
| 5.5.4 | Optocouplers | | N/A |
| 5.5.5 | Relays | | N/A |
| 5.5.6 | Resistors | | N/A |
| 5.5.7 | SPDs | | N/A |
| 5.5.8 | Insulation between the mains and an external circuit consisting of a coaxial cable .....: | | N/A |
| 5.5.9 | Safeguards for socket-outlets in outdoor equipment | | N/A |
| | RCD rated residual operating current (mA).....: | | — |
| **5.6** | **Protective conductor** | | N/A |
| 5.6.2 | Requirement for protective conductors | | N/A |
| 5.6.2.1 | General requirements | | N/A |
| 5.6.2.2 | Colour of insulation | | N/A |
| 5.6.3 | Requirement for protective earthing conductors | | N/A |
| | Protective earthing conductor size ($mm^2$) .....: | | — |
| | Protective earthing conductor serving as a reinforced safeguard | | N/A |
| | Protective earthing conductor serving as a double safeguard | | N/A |
| 5.6.4 | Requirements for protective bonding conductors | | N/A |
| 5.6.4.1 | Protective bonding conductors | | N/A |
| | Protective bonding conductor size ($mm^2$).....: | | — |
| 5.6.4.2 | Protective current rating (A) .....: | | N/A |
| 5.6.5 | Terminals for protective conductors | | N/A |
| 5.6.5.1 | Terminal size for connecting protective earthing conductors (mm) .....: | | N/A |
| | Terminal size for connecting protective bonding conductors (mm) .....: | | N/A |
| 5.6.5.2 | Corrosion | | N/A |
| 5.6.6 | Resistance of the protective bonding system | | N/A |
| 5.6.6.1 | Requirements | | N/A |
| 5.6.6.2 | Test Method .....: | | N/A |

| EN IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 5.6.6.3 | Resistance (Ω) or voltage drop .....: | | N/A |
| 5.6.7 | Reliable connection of a protective earthing conductor | | N/A |
| 5.6.8 | Functional earthing | | N/A |
| | Conductor size ($mm^2$) .....: | | N/A |
| | Class II with functional earthing marking .....: | | N/A |
| | Appliance inlet cl & cr (mm).....: | | N/A |
| **5.7** | **Prospective touch voltage, touch current and protective conductor current** | | N/A |
| 5.7.2 | Measuring devices and networks | | N/A |
| 5.7.2.1 | Measurement of touch current | | N/A |
| 5.7.2.2 | Measurement of voltage | | N/A |
| 5.7.3 | Equipment set-up, supply connections and earth connections | | N/A |
| 5.7.4 | Unearthed accessible parts.....: | | N/A |
| 5.7.5 | Earthed accessible conductive parts.....: | | N/A |
| 5.7.6 | Requirements when touch current exceeds ES2 limits | | N/A |
| | Protective conductor current (mA) .....: | | N/A |
| | Instructional Safeguard .....: | | N/A |
| 5.7.7 | Prospective touch voltage and touch current associated with external circuits | | N/A |
| 5.7.7.1 | Touch current from coaxial cables | | N/A |
| 5.7.7.2 | Prospective touch voltage and touch current associated with paired conductor cables | | N/A |
| 5.7.8 | Summation of touch currents from external circuits | | N/A |
| | a) Equipment connected to earthed external circuits, current (mA) .....: | | N/A |
| | b) Equipment connected to unearthed external circuits, current (mA) .....: | | N/A |
| **5.8** | **Backfeed safeguard in battery backed up supplies** | | N/A |
| | Mains terminal ES .....: | No battery used | N/A |
| | Air gap (mm).....: | | N/A |

| | | |
|---|---|---|
| **6** | **ELECTRICALLY- CAUSED FIRE** | P |
| **6.2** | **Classification of PS and PIS** | P |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 6.2.2 | Power source circuit classifications .....: | (See appended table 6.2.2) | P |
| 6.2.3 | Classification of potential ignition sources | Only PS1 | N/A |
| 6.2.3.1 | Arcing PIS .....: | | N/A |
| 6.2.3.2 | Resistive PIS .....: | | N/A |
| **6.3** | **Safeguards against fire under normal operating and abnormal operating conditions** | | P |
| 6.3.1 | No ignition and attainable temperature value less than 90 % defined by ISO 871 or less than 300 °C for unknown materials .....: | (See appended table B.1.5 and B.3) | P |
| | Combustible materials outside fire enclosure .....: | | N/A |
| **6.4** | **Safeguards against fire under single fault conditions** | | P |
| 6.4.1 | Safeguard method | Method by control of fire spread applied, Fire enclosure provided. | 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 | | N/A |
| 6.4.3.1 | Supplementary safeguards | | N/A |
| 6.4.3.2 | Single Fault Conditions .....: | | N/A |
| | Special conditions for temperature limited by fuse | | N/A |
| 6.4.4 | Control of fire spread in PS1 circuits | | P |
| 6.4.5 | Control of fire spread in PS2 circuits | Only PS1 | N/A |
| 6.4.5.2 | Supplementary safeguards | | N/A |
| 6.4.6 | Control of fire spread in PS3 circuits | Only PS1 | N/A |
| 6.4.7 | Separation of combustible materials from a PIS | | N/A |
| 6.4.7.2 | Separation by distance | | N/A |
| 6.4.7.3 | Separation by a fire barrier | | N/A |
| 6.4.8 | Fire enclosures and fire barriers | Only PS1,no fire enclosures and barriers required | N/A |
| 6.4.8.2 | Fire enclosure and fire barrier material properties | | N/A |
| 6.4.8.2.1 | Requirements for a fire barrier | | N/A |
| 6.4.8.2.2 | Requirements for a fire enclosure | | N/A |
| 6.4.8.3 | Constructional requirements for a fire enclosure and a fire barrier | | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 6.4.8.3.1 | Fire enclosure and fire barrier openings | | N/A |
| 6.4.8.3.2 | Fire barrier dimensions | | N/A |
| 6.4.8.3.3 | Top openings and properties | No openings. | N/A |
| | Openings dimensions (mm) .....: | | N/A |
| 6.4.8.3.4 | Bottom openings and properties | No openings. | N/A |
| | Openings dimensions (mm) .....: | | N/A |
| | Flammability tests for the bottom of a fire enclosure | | N/A |
| | Instructional Safeguard .....: | | N/A |
| 6.4.8.3.5 | Side openings and properties | No openings. | N/A |
| | Openings dimensions (mm) .....: | | N/A |
| 6.4.8.3.6 | Integrity of a fire enclosure, condition met: a), b) or c).....: | | N/A |
| 6.4.8.4 | Separation of a PIS from a fire enclosure and a fire barrier distance (mm) or flammability rating.....: | | N/A |
| 6.4.9 | Flammability of insulating liquid.....: | | N/A |
| **6.5** | **Internal and external wiring** | | P |
| 6.5.1 | General requirements | | P |
| 6.5.2 | Requirements for interconnection to building wiring .....: | No such wire used | N/A |
| 6.5.3 | Internal wiring size ($mm^2$) for socket-outlets .....: | | N/A |
| **6.6** | **Safeguards against fire due to the connection to additional equipment** | | N/A |
| **7** | **INJURY CAUSED BY HAZARDOUS SUBSTANCES** | | N/A |
| **7.2** | **Reduction of exposure to hazardous substances** | | N/A |
| **7.3** | **Ozone exposure** | | N/A |
| **7.4** | **Use of personal safeguards or personal protective equipment (PPE)** | | N/A |
| | Personal safeguards and instructions .....: | | — |
| **7.5** | **Use of instructional safeguards and instructions** | | N/A |
| | Instructional safeguard (ISO 7010) .....: | | — |
| **7.6** | **Batteries and their protection circuits** | | N/A |
| **8** | **MECHANICALLY-CAUSED INJURY** | | P |
| **8.2** | **Mechanical energy source classifications** | | P |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| **8.3** | **Safeguards against mechanical energy sources** | | P |
| **8.4** | **Safeguards against parts with sharp edges and corners** | | P |
| 8.4.1 | Safeguards | | N/A |
| | Instructional Safeguard .....: | | N/A |
| 8.4.2 | Sharp edges or corners | The sharp edges and corners of the equipment are considered as MS1. | P |
| **8.5** | **Safeguards against moving parts** | | N/A |
| 8.5.1 | Fingers, jewellery, clothing, hair, etc., contact with MS2 or MS3 parts | No moving parts. | N/A |
| | MS2 or MS3 part required to be accessible for the function of the equipment | See above. | N/A |
| | Moving MS3 parts only accessible to skilled person | | N/A |
| 8.5.2 | Instructional safeguard.....: | | N/A |
| 8.5.4 | Special categories of equipment containing moving parts | | N/A |
| 8.5.4.1 | General | | N/A |
| 8.5.4.2 | Equipment containing work cells with MS3 parts | | N/A |
| 8.5.4.2.1 | Protection of persons in the work cell | | N/A |
| 8.5.4.2.2 | Access protection override | | N/A |
| 8.5.4.2.2.1 | Override system | | N/A |
| 8.5.4.2.2.2 | Visual indicator | | N/A |
| 8.5.4.2.3 | Emergency stop system | | N/A |
| | Maximum stopping distance from the point of activation (m).....: | | N/A |
| | Space between end point and nearest fixed mechanical part (mm) .....: | | N/A |
| 8.5.4.2.4 | Endurance requirements | | N/A |
| | Mechanical system subjected to 100 000 cycles of operation | | N/A |
| | - Mechanical function check and visual inspection | | N/A |
| | - Cable assembly.....: | | N/A |
| 8.5.4.3 | Equipment having electromechanical device for destruction of media | | N/A |
| 8.5.4.3.1 | Equipment safeguards | | N/A |
| 8.5.4.3.2 | Instructional safeguards against moving parts.....: | | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.5.4.3.3 | Disconnection from the supply | | N/A |
| 8.5.4.3.4 | Cut type and test force (N) ..... : | | N/A |
| 8.5.4.3.5 | Compliance | | N/A |
| 8.5.5 | High pressure lamps | No high pressure lamps used. | N/A |
| | Explosion test ..... : | | N/A |
| 8.5.5.3 | Glass particles dimensions (mm) ..... : | | N/A |
| **8.6** | **Stability of equipment** | | N/A |
| 8.6.1 | General | MS1: Mass of the unit | N/A |
| | Instructional safeguard ..... : | | N/A |
| 8.6.2 | Static stability | | N/A |
| 8.6.2.2 | Static stability test ..... : | | N/A |
| 8.6.2.3 | Downward force test | | N/A |
| 8.6.3 | Relocation stability | | N/A |
| | Wheels diameter (mm) ..... : | | — |
| | Tilt test | | N/A |
| 8.6.4 | Glass slide test | | N/A |
| 8.6.5 | Horizontal force test ..... : | | N/A |
| **8.7** | **Equipment mounted to wall, ceiling or other structure** | | N/A |
| 8.7.1 | Mount means type ..... : | | N/A |
| 8.7.2 | Test methods | | N/A |
| | Test 1, additional downwards force (N) ..... : | | N/A |
| | Test 2, number of attachment points and test force (N) ..... : | | N/A |
| | Test 3 Nominal diameter (mm) and applied torque (Nm) ..... : | | N/A |
| **8.8** | **Handles strength** | | N/A |
| 8.8.1 | General | No handles | N/A |
| 8.8.2 | Handle strength test | | N/A |
| | Number of handles ..... : | | — |
| | Force applied (N) ..... : | | — |
| **8.9** | **Wheels or casters attachment requirements** | | N/A |
| 8.9.2 | Pull test | No such parts | N/A |
| **8.10** | **Carts, stands and similar carriers** | | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.10.1 | General | No carts, stands or similar carriers | N/A |
| 8.10.2 | Marking and instructions .....: | | N/A |
| 8.10.3 | Cart, stand or carrier loading test | | N/A |
| | Loading force applied (N).....: | | N/A |
| 8.10.4 | Cart, stand or carrier impact test | | N/A |
| 8.10.5 | Mechanical stability | | N/A |
| | Force applied (N).....: | | — |
| 8.10.6 | Thermoplastic temperature stability | | N/A |
| **8.11** | **Mounting means for slide-rail mounted equipment (SRME)** | | N/A |
| 8.11.1 | General | No such parts | N/A |
| 8.11.2 | Requirements for slide rails | | N/A |
| | Instructional Safeguard .....: | | N/A |
| 8.11.3 | Mechanical strength test | | N/A |
| 8.11.3.1 | Downward force test, force (N) applied .....: | | N/A |
| 8.11.3.2 | Lateral push force test | | N/A |
| 8.11.3.3 | Integrity of slide rail end stops | | N/A |
| 8.11.4 | Compliance | | N/A |
| **8.12** | **Telescoping or rod antennas** | | N/A |
| | Button/ball diameter (mm).....: | No such parts | — |

| | | | |
|---|---|---|---|
| **9** | **THERMAL BURN INJURY** | | P |
| **9.2** | **Thermal energy source classifications** | | P |
| **9.3** | **Touch temperature limits** | | P |
| 9.3.1 | Touch temperatures of accessible parts .....: | (See appended table 5.4.1.4, 9.3, B.1.5, B.2.6) | P |
| 9.3.2 | Test method and compliance | See B.1.6 & B.2.3 | P |
| **9.4** | **Safeguards against thermal energy sources** | | P |
| **9.5** | **Requirements for safeguards** | | P |
| 9.5.1 | Equipment safeguard | Enclosure provided to limit the transfer of thermal energy of internal parts under normal operating conditions and abnormal operating conditions. | P |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 9.5.2 | Instructional safeguard.....: | Instructional safeguard is not required. | N/A |
| **9.6** | **Requirements for wireless power transmitters** | | N/A |
| 9.6.1 | General | No wireless power transmitters | N/A |
| 9.6.2 | Specification of the foreign objects | | N/A |
| 9.6.3 | Test method and compliance.....: | | N/A |
| **10** | **RADIATION** | | P |
| **10.2** | **Radiation energy source classification** | | P |
| 10.2.1 | General classification | See below | P |
| | Lasers.....: | | — |
| | Lamps and lamp systems.....: | RS1: LED only for indicating use which is considered as low power application. | — |
| | Image projectors.....: | | — |
| | X-Ray.....: | | — |
| | Personal music player .....: | | — |
| **10.3** | **Safeguards against laser radiation** | | N/A |
| | The standard(s) equipment containing laser(s) comply .....: | No laser radiation | N/A |
| **10.4** | **Safeguards against optical radiation from lamps and lamp systems (including LED types)** | | P |
| 10.4.1 | General requirements | LED indication light: Classed as RS1 (Exempt Group) | P |
| | Instructional safeguard provided for accessible radiation level needs to exceed | | N/A |
| | Risk group marking and location .....: | | N/A |
| | Information for safe operation and installation | | N/A |
| 10.4.2 | Requirements for enclosures | | N/A |
| | UV radiation exposure.....: | | N/A |
| 10.4.3 | Instructional safeguard .....: | | N/A |
| **10.5** | **Safeguards against X-radiation** | | N/A |
| 10.5.1 | Requirements | No X-radiation | N/A |
| | Instructional safeguard for skilled persons.....: | | — |
| 10.5.3 | Maximum radiation (pA/kg) .....: | | — |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| **10.6** | **Safeguards against acoustic energy sources** | | N/A |
| 10.6.1 | General | No such equipment | N/A |
| 10.6.2 | Classification | | N/A |
| | Acoustic output $L_{Aeq,T}$, dB(A).....: | | N/A |
| | Unweighted RMS output voltage (mV).....: | | N/A |
| | Digital output signal (dBFS) .....: | | N/A |
| 10.6.3 | Requirements for dose-based systems | | N/A |
| 10.6.3.1 | General requirements | | N/A |
| 10.6.3.2 | Dose-based warning and automatic decrease | | N/A |
| 10.6.3.3 | Exposure-based warning and requirements | | N/A |
| | 30 s integrated exposure level (MEL30).....: | | N/A |
| | Warning for MEL ≥ 100 dB(A).....: | | N/A |
| 10.6.4 | Measurement methods | | N/A |
| 10.6.5 | Protection of persons | | N/A |
| | Instructional safeguards .....: | | N/A |
| 10.6.6 | Requirements for listening devices (headphones, earphones, etc.) | | N/A |
| 10.6.6.1 | Corded listening devices with analogue input | | N/A |
| | Listening device input voltage (mV) .....: | | N/A |
| 10.6.6.2 | Corded listening devices with digital input | | N/A |
| | Max. acoustic output $L_{Aeq,T}$, dB(A) .....: | | N/A |
| 10.6.6.3 | Cordless listening devices | | N/A |
| | Max. acoustic output $L_{Aeq,T}$, dB(A) .....: | | N/A |

| | | | |
|---|---|---|---|
| **B** | **NORMAL OPERATING CONDITION TESTS, ABNORMAL OPERATING CONDITION TESTS AND SINGLE FAULT CONDITION TESTS** | | P |
| **B.1** | **General** | | P |
| B.1.5 | Temperature measurement conditions | (See appended table B.1.5) | P |
| **B.2** | **Normal operating conditions** | | P |
| B.2.1 | General requirements.....: | (See Test Item Particulars and appended test tables) | P |
| | Audio Amplifiers and equipment with audio amplifiers .....: | Not such equipment. | N/A |
| B.2.3 | Supply voltage and tolerances | Rated voltage 3Vdc | P |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| B.2.5 | Input test.....: | (See appended table B.2.5) | P |
| **B.3** | **Simulated abnormal operating conditions** | | P |
| B.3.1 | General | (See appended table B.3) | P |
| B.3.2 | Covering of ventilation openings | No openings | N/A |
| | Instructional safeguard.....: | | N/A |
| B.3.3 | DC mains polarity test | Not supplied by D.C. mains | N/A |
| B.3.4 | Setting of voltage selector | No voltage selector used. | N/A |
| B.3.5 | Maximum load at output terminals | | N/A |
| B.3.6 | Reverse battery polarity | | P |
| B.3.7 | Audio amplifier abnormal operating conditions | Not such equipment. | N/A |
| B.3.8 | Safeguards functional during and after abnormal operating conditions .....: | During an abnormal operating condition that does not lead to a single fault condition, all safeguards are remained effective. After restoration of normal operating conditions, all safeguards are compliant with applicable requirements. For those abnormal operating conditions lead to single fault conditions, see Clause B.4. | P |
| **B.4** | **Simulated single fault conditions** | | P |
| B.4.1 | General | | P |
| B.4.2 | Temperature controlling device | No such device used. | N/A |
| B.4.3 | Blocked motor test | No motors used. | N/A |
| B.4.4 | Functional insulation | See below. | P |
| B.4.4.1 | Short circuit of clearances for functional insulation | (See appended table B.4) | P |
| B.4.4.2 | Short circuit of creepage distances for functional insulation | (See appended table B.4) | P |
| B.4.4.3 | Short circuit of functional insulation on coated printed boards | No coated printed boards used. | N/A |
| B.4.5 | Short-circuit and interruption of electrodes in tubes and semiconductors | (See appended table B.4) | P |
| B.4.6 | Short circuit or disconnection of passive components | (See appended table B.4) | P |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 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 | Compliance during and after single fault conditions .....: | (See appended table B.4) | P |
| B.4.9 | Battery charging and discharging under single fault conditions | No such battery | N/A |
| **C** | **UV RADIATION** | | N/A |
| **C.1** | **Protection of materials in equipment from UV radiation** | | N/A |
| C.1.2 | Requirements | No such UV generated from the equipment. | N/A |
| C.1.3 | Test method | | N/A |
| **C.2** | **UV light conditioning test** | | N/A |
| C.2.1 | Test apparatus .....: | | N/A |
| C.2.2 | Mounting of test samples | | N/A |
| C.2.3 | Carbon-arc light-exposure test | | N/A |
| C.2.4 | Xenon-arc light-exposure test | | N/A |
| **D** | **TEST GENERATORS** | | N/A |
| **D.1** | **Impulse test generators** | | N/A |
| **D.2** | **Antenna interface test generator** | | N/A |
| **D.3** | **Electronic pulse generator** | | N/A |
| **E** | **TEST CONDITIONS FOR EQUIPMENT CONTAINING AUDIO AMPLIFIERS** | | N/A |
| **E.1** | **Electrical energy source classification for audio signals** | | N/A |
| | Maximum non-clipped output power (W) .....: | | — |
| | Rated load impedance (Ω) .....: | | — |
| | Open-circuit output voltage (V) .....: | | — |
| | Instructional safeguard.....: | | — |
| **E.2** | **Audio amplifier normal operating conditions** | | N/A |
| | Audio signal source type .....: | | — |
| | Audio output power (W).....: | | — |
| | Audio output voltage (V).....: | | — |
| | Rated load impedance (Ω) .....: | | — |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | Requirements for temperature measurement | | N/A |
| E.3 | Audio amplifier abnormal operating conditions | | N/A |
| **F** | **EQUIPMENT MARKINGS, INSTRUCTIONS, AND INSTRUCTIONAL SAFEGUARDS** | | P |
| **F.1** | **General** | | P |
| | Language .....: | English | — |
| **F.2** | **Letter symbols and graphical symbols** | | P |
| F.2.1 | Letter symbols according to IEC60027-1 | Letter symbols for quantities and units are complied with IEC 60027-1. | P |
| F.2.2 | Graphic symbols according to IEC, ISO or manufacturer specific | Graphical symbols are complied with IEC 60417, ISO 3864-2, ISO 7000 or ISO 7010. | P |
| **F.3** | **Equipment markings** | | P |
| F.3.1 | Equipment marking locations | The required marking is located on the enclosure of the equipment and is easily visible. | P |
| F.3.2 | Equipment identification markings | See copy of marking plate. | P |
| F.3.2.1 | Manufacturer identification .....: | See copy of marking plate | P |
| F.3.2.2 | Model identification .....: | See copy of marking plate | P |
| F.3.3 | Equipment rating markings | Unit didn't direct connection to the mains, it need not be marked with any electrical rating. | N/A |
| F.3.3.1 | Equipment with direct connection to mains | | N/A |
| F.3.3.2 | Equipment without direct connection to mains | | N/A |
| F.3.3.3 | Nature of the supply voltage.....: | | N/A |
| F.3.3.4 | Rated voltage .....: | | N/A |
| F.3.3.5 | Rated frequency.....: | | N/A |
| F.3.3.6 | Rated current or rated power .....: | | N/A |
| F.3.3.7 | Equipment with multiple supply connections | | N/A |
| F.3.4 | Voltage setting device | No voltage setting device. | N/A |
| F.3.5 | Terminals and operating devices | See below. | N/A |
| F.3.5.1 | Mains appliance outlet and socket-outlet markings .....: | No outlet used. | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| F.3.5.2 | Switch position identification marking .....: | No switch used. | N/A |
| F.3.5.3 | Replacement fuse identification and rating markings.....: | | N/A |
| | Instructional safeguards for neutral fuse .....: | | N/A |
| F.3.5.4 | Replacement battery identification marking .....: | No such battery on the equipment. See sub-clause F.5 | N/A |
| F.3.5.5 | Neutral conductor terminal | | N/A |
| F.3.5.6 | Terminal marking location | | N/A |
| F.3.6 | Equipment markings related to equipment classification | | 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 | Protective bonding conductor terminals .....: | | N/A |
| F.3.6.2 | Equipment class marking .....: | | N/A |
| F.3.6.3 | Functional earthing terminal marking .....: | | N/A |
| F.3.7 | Equipment IP rating marking.....: | IPX0 | N/A |
| F.3.8 | External power supply output marking .....: | | N/A |
| F.3.9 | Durability, legibility and permanence of marking | Marking is considered to be legible and easily discernible. See also the following details. | P |
| F.3.10 | Test for permanence of markings | The label was subjected to the permanence of marking test. The label was rubbed with cloth soaked with water for 15 sec. And then again for 15 sec. With the cloth soaked with petroleum spirit. After this test there was no damage to the label. The marking on the label did not fade. There was no curling and lifting of the label edge. After each test, the marking remained legible. | P |
| **F.4** | **Instructions** | | P |
| | a) Information prior to installation and initial use | Provided in the manual. | P |
| | b) Equipment for use in locations where children not likely to be present | Not such equipment | N/A |
| | c) Instructions for installation and interconnection | Not such equipment | P |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | d) Equipment intended for use only in restricted access area | Not such equipment | N/A |
| | e) Equipment intended to be fastened in place | Not such equipment | N/A |
| | f) Instructions for audio equipment terminals | No such terminals provided. | N/A |
| | g) Protective earthing used as a safeguard | | N/A |
| | h) Protective conductor current exceeding ES2 limits | | N/A |
| | i) Graphic symbols used on equipment | | N/A |
| | j) Permanently connected equipment not provided with all-pole mains switch | Not permanently connected equipment. | N/A |
| | k) Replaceable components or modules providing safeguard function | No such markings. | N/A |
| | l) Equipment containing insulating liquid | No such liquid. | N/A |
| | m) Installation instructions for outdoor equipment | Not such equipment | N/A |
| **F.5** | Instructional safeguards | | N/A |
| **G** | **COMPONENTS** | | P |
| **G.1** | **Switches** | | N/A |
| G.1.1 | General | No switches | N/A |
| G.1.2 | Ratings, endurance, spacing, maximum load | | N/A |
| G.1.3 | Test method and compliance | | N/A |
| **G.2** | **Relays** | | N/A |
| G.2.1 | Requirements | No relays | N/A |
| G.2.2 | Overload test | | N/A |
| G.2.3 | Relay controlling connectors supplying power to other equipment | | N/A |
| G.2.4 | Test method and compliance | | N/A |
| **G.3** | **Protective devices** | | N/A |
| G.3.1 | Thermal cut-offs | No thermal cut-offs | N/A |
| | Thermal cut-outs separately approved according to IEC 60730 with conditions indicated in a) & b) | | N/A |
| | Thermal cut-outs tested as part of the equipment as indicated in c) | | N/A |
| G.3.1.2 | Test method and compliance | | N/A |
| G.3.2 | Thermal links | No thermal-links | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| G.3.2.1 | a) Thermal links tested separately according to IEC 60691 with specifics | | N/A |
| | b) Thermal links tested as part of the equipment | | N/A |
| G.3.2.2 | Test method and compliance | | N/A |
| G.3.3 | PTC thermistors | No PTC thermistor provided as safeguard within the equipment. | N/A |
| G.3.4 | Overcurrent protection devices | | N/A |
| G.3.5 | Safeguards components not mentioned in G.3.1 to G.3.4 | | N/A |
| G.3.5.1 | Non-resettable devices suitably rated and marking provided | | N/A |
| G.3.5.2 | Single faults conditions.....: | | N/A |
| **G.4** | **Connectors** | | N/A |
| G.4.1 | Spacings | | N/A |
| G.4.2 | Mains connector configuration .....: | | N/A |
| G.4.3 | Plug is shaped that insertion into mains socket-outlets or appliance coupler is unlikely | | N/A |
| **G.5** | **Wound components** | | N/A |
| G.5.1 | Wire insulation in wound components | | N/A |
| G.5.1.2 | Protection against mechanical stress | | N/A |
| G.5.2 | Endurance test | | N/A |
| G.5.2.1 | General test requirements | | N/A |
| G.5.2.2 | Heat run test | | N/A |
| | Test time (days per cycle) .....: | | — |
| | Test temperature (°C).....: | | — |
| G.5.2.3 | Wound components supplied from the mains | | N/A |
| G.5.2.4 | No insulation breakdown | | N/A |
| G.5.3 | Transformers | | N/A |
| G.5.3.1 | Compliance method .....: | | N/A |
| | Position.....: | | N/A |
| | Method of protection.....: | | N/A |
| G.5.3.2 | Insulation | | N/A |
| | Protection from displacement of windings.....: | | — |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| G.5.3.3 | Transformer overload tests | | N/A |
| G.5.3.3.1 | Test conditions | | N/A |
| G.5.3.3.2 | Winding temperatures | | N/A |
| G.5.3.3.3 | Winding temperatures - alternative test method | | N/A |
| G.5.3.4 | Transformers using FIW | | N/A |
| G.5.3.4.1 | General | | N/A |
| | FIW wire nominal diameter.....: | | — |
| G.5.3.4.2 | Transformers with basic insulation only | | N/A |
| G.5.3.4.3 | Transformers with double insulation or reinforced insulation .....: | | N/A |
| G.5.3.4.4 | Transformers with FIW wound on metal or ferrite core | | N/A |
| G.5.3.4.5 | Thermal cycling test and compliance | | N/A |
| G.5.3.4.6 | Partial discharge test | | N/A |
| G.5.3.4.7 | Routine test | | N/A |
| G.5.4 | Motors | No motors | N/A |
| G.5.4.1 | General requirements | | N/A |
| G.5.4.2 | Motor overload test conditions | | N/A |
| G.5.4.3 | Running overload test | | N/A |
| G.5.4.4.2 | Locked-rotor overload test | | N/A |
| | Test duration (days) .....: | | — |
| G.5.4.5 | Running overload test for DC motors | | N/A |
| G.5.4.5.2 | Tested in the unit | | N/A |
| G.5.4.5.3 | Alternative method | | N/A |
| G.5.4.6 | Locked-rotor overload test for DC motors | | N/A |
| G.5.4.6.2 | Tested in the unit | | N/A |
| | Maximum Temperature .....: | | N/A |
| G.5.4.6.3 | Alternative method | | N/A |
| G.5.4.7 | Motors with capacitors | | N/A |
| G.5.4.8 | Three-phase motors | | N/A |
| G.5.4.9 | Series motors | | N/A |
| | Operating voltage .....: | | — |
| **G.6** | **Wire Insulation** | | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| G.6.1 | General | | N/A |
| G.6.2 | Enamelled winding wire insulation | | N/A |
| **G.7** | **Mains supply cords** | | N/A |
| G.7.1 | General requirements | | N/A |
| | Type.....: | | — |
| G.7.2 | Cross sectional area ($mm^2$ or AWG).....: | | N/A |
| G.7.3 | Cord anchorages and strain relief for non-detachable power supply cords | | N/A |
| G.7.3.2 | Cord strain relief | | N/A |
| G.7.3.2.1 | Requirements | | N/A |
| | Strain relief test force (N) .....: | | N/A |
| G.7.3.2.2 | Strain relief mechanism failure | | N/A |
| G.7.3.2.3 | Cord sheath or jacket position, distance (mm).....: | | N/A |
| G.7.3.2.4 | Strain relief and cord anchorage material | | N/A |
| G.7.4 | Cord Entry | | N/A |
| G.7.5 | Non-detachable cord bend protection | | N/A |
| G.7.5.1 | Requirements | | N/A |
| G.7.5.2 | Test method and compliance | | N/A |
| | Overall diameter or minor overall dimension, *D* (mm) .....: | | — |
| | Radius of curvature after test (mm).....: | | — |
| G.7.6 | Supply wiring space | | N/A |
| G.7.6.1 | General requirements | | N/A |
| G.7.6.2 | Stranded wire | | N/A |
| G.7.6.2.1 | Requirements | | N/A |
| G.7.6.2.2 | Test with 8 mm strand | | N/A |
| **G.8** | **Varistors** | | N/A |
| G.8.1 | General requirements | No varistors used | N/A |
| G.8.2 | Safeguards against fire | | N/A |
| G.8.2.1 | General | | N/A |
| G.8.2.2 | Varistor overload test | | N/A |
| G.8.2.3 | Temporary overvoltage test | | N/A |
| **G.9** | **Integrated circuit (IC) current limiters** | | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| G.9.1 | Requirements | No such IC | N/A |
| | IC limiter output current (max. 5A) .....: | | — |
| | Manufacturers' defined drift .....: | | — |
| G.9.2 | Test Program | | N/A |
| G.9.3 | Compliance | | N/A |
| **G.10** | **Resistors** | | N/A |
| G.10.1 | General | The bleeder resistors used after X - capacitor, not relied upon as safeguard, no test necessary. See 5.5.6. | N/A |
| G.10.2 | Conditioning | | N/A |
| G.10.3 | Resistor test | | N/A |
| G.10.4 | Voltage surge test | | N/A |
| G.10.5 | Impulse test | | N/A |
| G.10.6 | Overload test | | N/A |
| **G.11** | **Capacitors and RC units** | | N/A |
| G.11.1 | General requirements | | N/A |
| G.11.2 | Conditioning of capacitors and RC units | | N/A |
| G.11.3 | Rules for selecting capacitors | | N/A |
| **G.12** | **Optocouplers** | | N/A |
| | Optocouplers comply with IEC 60747-5-5 with specifics | | N/A |
| | Type test voltage $V_{ini,a}$ .....: | | — |
| | Routine test voltage, $V_{ini,b}$ .....: | | — |
| **G.13** | **Printed boards** | | P |
| G.13.1 | General requirements | See the following details. | P |
| G.13.2 | Uncoated printed boards | The insulation between conductors on the outer surfaces of an uncoated printed board complied with the minimum clearance and creepage requirements | P |
| G.13.3 | Coated printed boards | No coated printed board or multilayer board applied for within the equipment. | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| G.13.4 | Insulation between conductors on the same inner surface | | N/A |
| G.13.5 | Insulation between conductors on different surfaces | | N/A |
| | Distance through insulation .....: | | N/A |
| | Number of insulation layers (pcs) .....: | | — |
| G.13.6 | Tests on coated printed boards | | N/A |
| G.13.6.1 | Sample preparation and preliminary inspection | | N/A |
| G.13.6.2 | Test method and compliance | | N/A |
| **G.14** | **Coating on components terminals** | | N/A |
| G.14.1 | Requirements .....: | No such coating | N/A |
| **G.15** | **Pressurized liquid filled components** | | N/A |
| G.15.1 | Requirements | No such liquid | N/A |
| G.15.2 | Test methods and compliance | | N/A |
| G.15.2.1 | Hydrostatic pressure test | | N/A |
| G.15.2.2 | Creep resistance test | | N/A |
| G.15.2.3 | Tubing and fittings compatibility test | | N/A |
| G.15.2.4 | Vibration test | | N/A |
| G.15.2.5 | Thermal cycling test | | N/A |
| G.15.2.6 | Force test | | N/A |
| G.15.3 | Compliance | | N/A |
| **G.16** | **IC including capacitor discharge function (ICX)** | | N/A |
| G.16.1 | Condition for fault tested is not required | No such ICX | N/A |
| | ICX with associated circuitry tested in equipment | | N/A |
| | ICX tested separately | | N/A |
| G.16.2 | Tests | | N/A |
| | Smallest capacitance and smallest resistance specified by ICX manufacturer for impulse test.....: | | — |
| | Mains voltage that impulses to be superimposed on .....: | | — |
| | Largest capacitance and smallest resistance for ICX tested by itself for 10000 cycles test .....: | | — |
| G.16.3 | Capacitor discharge test.....: | | N/A |
| **H** | **CRITERIA FOR TELEPHONE RINGING SIGNALS** | | N/A |
| **H.1** | **General** | | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| **H.2** | **Method A** | | N/A |
| **H.3** | **Method B** | | N/A |
| H.3.1 | Ringing signal | No telephone ringing signal generated within the equipment. | N/A |
| H.3.1.1 | Frequency (Hz) .....: | | — |
| H.3.1.2 | Voltage (V) .....: | | — |
| H.3.1.3 | Cadence; time (s) and voltage (V) .....: | | — |
| H.3.1.4 | Single fault current (mA):.....: | | — |
| H.3.2 | Tripping device and monitoring voltage | | N/A |
| H.3.2.1 | Conditions for use of a tripping device or a monitoring voltage | | N/A |
| H.3.2.2 | Tripping device | | N/A |
| H.3.2.3 | Monitoring voltage (V) .....: | | N/A |
| **J** | **INSULATED WINDING WIRES FOR USE WITHOUT INTERLEAVED INSULATION** | | N/A |
| **J.1** | **General** | | N/A |
| | Winding wire insulation.....: | | — |
| | Solid round winding wire, diameter (mm).....: | | N/A |
| | Solid square and rectangular (flatwise bending) winding wire, cross-sectional area ($mm^2$) .....: | | N/A |
| **J.2/J.3** | Tests and Manufacturing | | — |
| **K** | **SAFETY INTERLOCKS** | | N/A |
| **K.1** | **General requirements** | | N/A |
| | Instructional safeguard.....: | No safety interlock provided. | N/A |
| **K.2** | **Components of safety interlock safeguard mechanism** | | N/A |
| **K.3** | **Inadvertent change of operating mode** | | N/A |
| **K.4** | **Interlock safeguard override** | | N/A |
| **K.5** | **Fail-safe** | | N/A |
| K.5.1 | Under single fault condition | | N/A |
| **K.6** | **Mechanically operated safety interlocks** | | N/A |
| K.6.1 | Endurance requirement | | N/A |
| K.6.2 | Test method and compliance .....: | | N/A |
| **K.7** | **Interlock circuit isolation** | | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| K.7.1 | Separation distance for contact gaps & interlock circuit elements | | N/A |
| | In circuit connected to mains, separation distance for contact gaps (mm) .....: | | N/A |
| | In circuit isolated from mains, separation distance for contact gaps (mm) .....: | | N/A |
| | Electric strength test before and after the test of K.7.2 .....: | (See appended table 5.4.9) | N/A |
| K.7.2 | Overload test, Current (A) .....: | | N/A |
| K.7.3 | Endurance test | | N/A |
| K.7.4 | Electric strength test | | N/A |
| **L** | **DISCONNECT DEVICES** | | N/A |
| **L.1** | **General requirements** | | N/A |
| **L.2** | **Permanently connected equipment** | | N/A |
| **L.3** | **Parts that remain energized** | | N/A |
| **L.4** | **Single-phase equipment** | | N/A |
| **L.5** | **Three-phase equipment** | | N/A |
| **L.6** | **Switches as disconnect devices** | | N/A |
| **L.7** | **Plugs as disconnect devices** | | N/A |
| **L.8** | **Multiple power sources** | | N/A |
| | Instructional safeguard.....: | | N/A |
| **M** | **EQUIPMENT CONTAINING BATTERIES AND THEIR PROTECTION CIRCUITS** | | N/A |
| **M.1** | **General requirements** | | N/A |
| **M.2** | **Safety of batteries and their cells** | | N/A |
| M.2.1 | Batteries and their cells comply with relevant IEC standards.....: | No battery used | N/A |
| **M.3** | **Protection circuits for batteries provided within the equipment** | | N/A |
| M.3.1 | Requirements | | N/A |
| M.3.2 | Test method | | N/A |
| | Overcharging of a rechargeable battery | | N/A |
| | Excessive discharging | | N/A |
| | Unintentional charging of a non-rechargeable battery | | N/A |
| | Reverse charging of a rechargeable battery | | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| M.3.3 | Compliance | | N/A |
| **M.4** | **Additional safeguards for equipment containing a portable secondary lithium battery** | | N/A |
| M.4.1 | General | | N/A |
| M.4.2 | Charging safeguards | | N/A |
| M.4.2.1 | Requirements | | N/A |
| M.4.2.2 | Compliance .....: | | N/A |
| M.4.3 | Fire enclosure.....: | | N/A |
| M.4.4 | Drop test of equipment containing a secondary lithium battery | | N/A |
| M.4.4.2 | Preparation and procedure for the drop test | | N/A |
| M.4.4.3 | Drop, Voltage on reference and dropped batteries (V); voltage difference during 24 h period (%): .....: | | N/A |
| M.4.4.4 | Check of the charge/discharge function | | N/A |
| M.4.4.5 | Charge / discharge cycle test | | N/A |
| M.4.4.6 | Compliance | | N/A |
| **M.5** | **Risk of burn due to short-circuit during carrying** | | N/A |
| M.5.1 | Requirement | | N/A |
| M.5.2 | Test method and compliance | | N/A |
| **M.6** | **Safeguards against short-circuits** | | N/A |
| M.6.1 | External and internal faults | | N/A |
| M.6.2 | Compliance | | N/A |
| **M.7** | **Risk of explosion from lead acid and NiCd batteries** | | N/A |
| M.7.1 | Ventilation preventing explosive gas concentration | | N/A |
| | Calculated hydrogen generation rate .....: | | N/A |
| M.7.2 | Test method and compliance | | N/A |
| | Minimum air flow rate, $Q$ ($m^3/h$).....: | | N/A |
| M.7.3 | Ventilation tests | | N/A |
| M.7.3.1 | General | | N/A |
| M.7.3.2 | Ventilation test – alternative 1 | | N/A |
| | Hydrogen gas concentration (%).....: | | N/A |
| M.7.3.3 | Ventilation test – alternative 2 | | N/A |
| | Obtained hydrogen generation rate .....: | | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| M.7.3.4 | Ventilation test – alternative 3 | | N/A |
| | Hydrogen gas concentration (%).....: | | N/A |
| M.7.4 | Marking.....: | | N/A |
| **M.8** | **Protection against internal ignition from external spark sources of batteries with aqueous electrolyte** | | N/A |
| M.8.1 | General | | N/A |
| M.8.2 | Test method | | N/A |
| M.8.2.1 | General | | N/A |
| M.8.2.2 | Estimation of hypothetical volume $V_z$ ($m^3$/s) .....: | | — |
| M.8.2.3 | Correction factors .....: | | — |
| M.8.2.4 | Calculation of distance *d* (mm) .....: | | — |
| **M.9** | **Preventing electrolyte spillage** | | N/A |
| M.9.1 | Protection from electrolyte spillage | | N/A |
| M.9.2 | Tray for preventing electrolyte spillage | | N/A |
| **M.10** | Instructions to prevent reasonably foreseeable misuse | | N/A |
| | Instructional safeguard.....: | | N/A |
| **N** | **ELECTROCHEMICAL POTENTIALS** | | N/A |
| | Material(s) used.....: | Pollution degree considered | — |
| **O** | **MEASUREMENT OF CREEPAGE DISTANCES AND CLEARANCES** | | N/A |
| | Value of *X* (mm) .....: | | — |
| **P** | **SAFEGUARDS AGAINST CONDUCTIVE OBJECTS** | | N/A |
| **P.1** | **General** | | N/A |
| **P.2** | **Safeguards against entry or consequences of entry of a foreign object** | | N/A |
| P.2.1 | General | Only PS1, ES1 | N/A |
| P.2.2 | Safeguards against entry of a foreign object | | — |
| | Location and Dimensions (mm) .....: | | — |
| P.2.3 | Safeguards against the consequences of entry of a foreign object | | N/A |
| P.2.3.1 | Safeguard requirements | | N/A |
| | The ES3 and PS3 keep-out volume in Figure P.3 not applicable to transportable equipment | Not transportable equipment | N/A |
| | Transportable equipment with metalized plastic parts.....: | Not transportable equipment | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| P.2.3.2 | Consequence of entry test .....: | | N/A |
| **P.3** | **Safeguards against spillage of internal liquids** | | N/A |
| P.3.1 | General | No such liquids. | N/A |
| P.3.2 | Determination of spillage consequences | | N/A |
| P.3.3 | Spillage safeguards | | N/A |
| P.3.4 | Compliance | | N/A |
| **P.4** | **Metallized coatings and adhesives securing parts** | | N/A |
| P.4.1 | General | No such construction. | N/A |
| P.4.2 | Tests | | N/A |
| | Conditioning, $T_C$ (°C) .....: | | — |
| | Duration (weeks) .....: | | — |
| **Q** | **CIRCUITS INTENDED FOR INTERCONNECTION WITH BUILDING WIRING** | | N/A |
| **Q.1** | **Limited power sources** | | N/A |
| Q.1.1 | Requirements | | N/A |
| | a) Inherently limited output | | N/A |
| | b) Impedance limited output | | N/A |
| | c) Regulating network limited output | | N/A |
| | d) Overcurrent protective device limited output | | N/A |
| | e) IC current limiter complying with G.9 | | N/A |
| Q.1.2 | Test method and compliance .....: | | N/A |
| | Current rating of overcurrent protective device (A) .....: | | N/A |
| **Q.2** | **Test for external circuits – paired conductor cable** | | N/A |
| | Maximum output current (A) .....: | | N/A |
| | Current limiting method .....: | | — |
| **R** | **LIMITED SHORT CIRCUIT TEST** | | N/A |
| **R.1** | **General** | No such consideration. | N/A |
| **R.2** | **Test setup** | | N/A |
| | Overcurrent protective device for test .....: | | — |
| **R.3** | **Test method** | | N/A |
| | Cord/cable used for test .....: | | — |
| **R.4** | **Compliance** | | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| **S** | **TESTS FOR RESISTANCE TO HEAT AND FIRE** | | N/A |
| **S.1** | **Flammability test for fire enclosures and fire barrier materials of equipment where the steady state power does not exceed 4 000 W** | | N/A |
| | Samples, material.....: | | — |
| | Wall thickness (mm).....: | | — |
| | Conditioning (°C).....: | | — |
| | Test flame according to IEC 60695-11-5 with conditions as set out | | N/A |
| | - Material not consumed completely | | N/A |
| | - Material extinguishes within 30s | | N/A |
| | - No burning of layer or wrapping tissue | | N/A |
| **S.2** | **Flammability test for fire enclosure and fire barrier integrity** | | N/A |
| | Samples, material.....: | | — |
| | Wall thickness (mm).....: | | — |
| | Conditioning (°C).....: | | — |
| **S.3** | **Flammability test for the bottom of a fire enclosure** | | N/A |
| S.3.1 | Mounting of samples | | N/A |
| S.3.2 | Test method and compliance | | N/A |
| | Mounting of samples .....: | | — |
| | Wall thickness (mm).....: | | — |
| **S.4** | **Flammability classification of materials** | | N/A |
| **S.5** | **Flammability test for fire enclosure materials of equipment with a steady state power exceeding 4 000 W** | | N/A |
| | Samples, material.....: | | — |
| | Wall thickness (mm).....: | | — |
| | Conditioning (°C).....: | | — |
| **T** | **MECHANICAL STRENGTH TESTS** | | P |
| **T.1** | **General** | | P |
| **T.2** | **Steady force test, 10 N .....:** | (See appended table T.2) | P |
| **T.3** | **Steady force test, 30 N .....:** | | N/A |
| **T.4** | **Steady force test, 100 N .....:** | | N/A |
| **T.5** | **Steady force test, 250 N .....:** | (See appended table T.5) | P |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| **T.6** | **Enclosure impact test** | | P |
| | Fall test | | P |
| | Swing test | | P |
| **T.7** | **Drop test .....:** | | N/A |
| **T.8** | **Stress relief test .....:** | (See appended table T.8) | P |
| **T.9** | **Glass Impact Test .....:** | No such glass | N/A |
| **T.10** | **Glass fragmentation test** | | N/A |
| | Number of particles counted.....: | No such glass | N/A |
| **T.11** | **Test for telescoping or rod antennas** | | N/A |
| | Torque value (Nm) .....: | No such antennas provided within the equipment. | N/A |
| **U** | **MECHANICAL STRENGTH OF CATHODE RAY TUBES (CRT) AND PROTECTION AGAINST THE EFFECTS OF IMPLOSION** | | N/A |
| **U.1** | **General** | | N/A |
| | Instructional safeguard **:** | No CRT provided within the equipment. | N/A |
| **U.2** | **Test method and compliance for non-intrinsically protected CRTs** | | N/A |
| **U.3** | **Protective screen** | | N/A |
| **V** | **DETERMINATION OF ACCESSIBLE PARTS** | | N/A |
| **V.1** | **Accessible parts of equipment** | | N/A |
| V.1.1 | General | | N/A |
| V.1.2 | Surfaces and openings tested with jointed test probes | | N/A |
| V.1.3 | Openings tested with straight unjointed test probes | | N/A |
| V.1.4 | Plugs, jacks, connectors tested with blunt probe | | N/A |
| V.1.5 | Slot openings tested with wedge probe | | N/A |
| V.1.6 | Terminals tested with rigid test wire | | N/A |
| **V.2** | **Accessible part criterion** | | N/A |
| **X** | **ALTERNATIVE METHOD FOR DETERMINING CLEARANCES FOR INSULATION IN CIRCUITS CONNECTED TO AN AC MAINS NOT EXCEEDING 420 V PEAK (300 V RMS)** | | N/A |
| | Clearance .....: | | N/A |
| **Y** | **CONSTRUCTION REQUIREMENTS FOR OUTDOOR ENCLOSURES** | | N/A |
| **Y.1** | **General** | Indoor equipment | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| **Y.2** | **Resistance to UV radiation** | | N/A |
| **Y.3** | **Resistance to corrosion** | | N/A |
| **Y.3** | **Resistance to corrosion** | | N/A |
| Y.3.1 | Metallic parts of outdoor enclosures are resistant to effects of water-borne contaminants by .....: | | N/A |
| Y.3.2 | Test apparatus | | N/A |
| Y.3.3 | Water – saturated sulphur dioxide atmosphere | | N/A |
| Y.3.4 | Test procedure.....: | | N/A |
| Y.3.5 | Compliance | | N/A |
| **Y.4** | **Gaskets** | | N/A |
| Y.4.1 | General | | N/A |
| Y.4.2 | Gasket tests | | N/A |
| Y.4.3 | Tensile strength and elongation tests | | N/A |
| | Alternative test methods.....: | | N/A |
| Y.4.4 | Compression test | | N/A |
| Y.4.5 | Oil resistance | | N/A |
| Y.4.6 | Securing means | | N/A |
| **Y.5** | **Protection of equipment within an outdoor enclosure** | | N/A |
| Y.5.1 | General | | N/A |
| Y.5.2 | Protection from moisture | | N/A |
| | Relevant tests of IEC 60529 or Y.5.3.....: | | N/A |
| Y.5.3 | Water spray test | | N/A |
| Y.5.4 | Protection from plants and vermin | | N/A |
| Y.5.5 | Protection from excessive dust | | N/A |
| Y.5.5.1 | General | | N/A |
| Y.5.5.2 | IP5X equipment | | N/A |
| Y.5.5.3 | IP6X equipment | | N/A |
| **Y.6** | **Mechanical strength of enclosures** | | N/A |
| Y.6.1 | General | | N/A |
| Y.6.2 | Impact test.....: | | N/A |

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

**ATTACHMENT TO TEST REPORT**

IEC 62368-1

EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES

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

**Differences according to** .....: EN IEC 62368-1:2020+A11:2020

**Attachment Form No**. .....: EU_GD_IEC62368_1E

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

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



| | | | |
|---|---|---|---|
| | **CENELEC COMMON MODIFICATIONS (EN)** | | P |
| | Clause numbers in the cells that are shaded light grey are clause references in EN IEC 62368-1:2020+A11:2020. All other clause numbers in that column, except for those in the paragraph below, refers to IEC 62368-1:2018.<br><br>Clauses, subclauses, notes, tables, figures and annexes which are additional to those in IEC 62368-1:2018 are prefixed “Z”. | | P |
| | Add the following annexes:<br>Annex ZA (normative) — Normative references to international publications with their corresponding European publications<br>Annex ZB (normative) — Special national conditions<br>Annex ZC (informative) — A-deviations<br>Annex ZD (informative) — IEC and CENELEC code designations for flexible cords | | P |
| **1** | **Modification to Clause 3.** | | N/A |
| **3.3.19** | **Sound exposure**<br>*Replace 3.3.19 of IEC 62368-1 with the following definitions:* | | N/A |
| **3.3.19.1** | **momentary exposure level, MEL**<br>metric for estimating 1 s sound exposure level from the HD 483-1 S2 test signal applied to both channels, based on EN 50332-1:2013, 4.2.<br><br>Note 1 to entry: MEL is measured as A-weighted levels in dB.<br>Note 2 to entry: See B.3 of EN 50332-3:2017 for additional information. | Not such equipment | N/A |

| EN IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| **3.3.19.3** | **sound exposure, E**<br>A-weighted sound pressure ($p$) squared and integrated over a stated period of time, $T$<br><br>Note 1 to entry: The SI unit is $Pa^2$ s.<br>$E = \int_0^T p(t)^2 \, dt$ | | N/A |
| **3.3.19.4** | **sound exposure level, SEL**<br>logarithmic measure of sound exposure relative to a reference value, *E0*, typically the 1 kHz threshold of hearing in humans.<br><br>Note 1 to entry: *SEL* is measured as A-weighted levels in dB.<br>$SEL = 10 \lg\left(\frac{E}{E_0}\right)$ dB<br><br>Note 2 to entry: See B.4 of EN 50332-3:2017 for additional information. | | N/A |
| **3.3.19.5** | **digital signal level relative to full scale, dBFS**<br>levels reported in dBFS are always r.m.s. Full scale level, 0 dBFS, is the level of a dc-free 997-Hz sine wave whose undithered positive peak value is positive digital full scale, leaving the code corresponding to negative digital full scale unused<br><br>Note 1 to entry: It is invalid to use dBFS for non-r.m.s. levels. Because the definition of full scale is based on a sine wave, the level of signals with a crest factor lower than that of a sine wave may exceed 0 dBFS. In particular, square wave signals may reach +3,01 dBFS. | | N/A |
| **2** | **Modification to Clause 10** | | N/A |
| **10.6** | **Safeguards against acoustic energy sources**<br>Replace 10.6 of IEC 62368-1 with the following: | | N/A |
| **10.6.1.1** | **Introduction**<br>**Safeguard** requirements for protection against long-term exposure to excessive sound pressure levels from personal music players closely coupled to the ear are specified below. Requirements for earphones and headphones intended for use with personal music players are also covered.<br>A personal music player is a portable equipment intended for use by an **ordinary person**, that:<br><br>– is designed to allow the user to listen to audio or audiovisual content / material; and | Not such equipment | N/A |

| EN IEC 62368-1 | | | |
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| Clause | Requirement + Test | Result - Remark | Verdict |
| | – uses a listening device, such as headphones or earphones that can be worn in or on or around the ears; and<br>– has a player that can be body worn (of a size suitable to be carried in a clothing pocket) and is intended for the user to walk around with while in continuous use (for example, on a street, in a subway, at an airport, etc.).<br><br>EXAMPLES Portable CD players, MP3 audio players, mobile phones with MP3 type features, PDAs or similar equipment.<br><br>Personal music players shall comply with the requirements of either 10.6.2 or 10.6.3.<br><br>NOTE 1 Protection against acoustic energy sources from telecom applications is referenced to ITU-T P.360.<br><br>NOTE 2 It is the intention of the Committee to allow the alternative methods for now, but to only use the dose measurement method as given in 10.6.5 in future. Therefore, manufacturers are encouraged to implement 10.6.5 as soon as possible.<br><br>Listening devices sold separately shall comply with the requirements of 10.6.6.<br>These requirements are valid for music or video mode only.<br>The requirements do not apply to:<br>– professional equipment;<br><br>NOTE 3Professional equipment is equipment sold through special sales channels. All products sold through normal electronics stores are considered not to be professional equipment.<br><br>– hearing aid equipment and other devices for assistive listening;<br>– the following type of analogue personal music players:<br>• long distance radio receiver (for example, a multiband radio receiver or world band radio receiver, an AM radio receiver), and<br>• cassette player/recorder;<br><br>NOTE 4 This exemption has been allowed because this technology is falling out of use and it is expected that within a few years it will no longer exist. This exemption will not be extended to other technologies.<br><br>– a player while connected to an external amplifier that does not allow the user to walk around while in use. | | |

| EN IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | For equipment that is clearly designed or intended primarily for use by children, the limits of the relevant toy standards may apply.<br><br>The relevant requirements are given in EN 71-1:2011, 4.20 and the related tests methods and measurement distances apply. | | |
| **10.6.1.2** | **Non-ionizing radiation from radio frequencies in the range 0 to 300 GHz**<br>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).<br>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. | | N/A |
| **10.6.2** | **Classification of devices without the capacity to estimate sound dose** | | N/A |
| **10.6.2.1** | **General**<br>This standard is transitioning from short-term based (30 s) requirements to long-term based (40 hour) requirements. These clauses remain in effect only for devices that do not comply with sound dose estimation as stipulated in EN 50332-3.<br><br>For classifying the acoustic output *L*Aeq,*T* , measurements are based on the A-weighted equivalent sound pressure level over a 30 s period.<br><br>For music where the average sound pressure (long term *L*Aeq,*T*) measured over the duration of the song is lower than the average produced by the programme simulation noise, measurements may be done over the duration of the complete song. In this case, *T* becomes the duration of the song.<br><br>NOTE Classical music, acoustic music and broadcast typically has an average sound pressure (long term *L*Aeq,*T*) which is much lower than the average programme simulation noise. Therefore, if the player is capable to analyse the content and compare it with the programme simulation noise, the warning does not need to be given as long as the average sound pressure of the song does not exceed the required limit.<br>For example, if the player is set with the programme simulation noise to 85 dB, but the average music level of the song is only 65 dB, there is no need to give a warning or ask an acknowledgement as long as the average sound level of the song is not above the basic limit of 85 | No such part in this equipment | N/A |

| EN IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | dB. | | |
| **10.6.2.2** | **RS1 limits (to be superseded, see 10.6.3.2)**<br><br>RS1 is a class 1 acoustic energy source that does not exceed the following:<br>– for equipment provided as a package (player with its listening device), and with a proprietary connector between the player and its listening device, or where the combination of player and listening device is known by other means such as setting or automatic detection, the *L*Aeq,*T* acoustic output shall be ≤ 85 dB when playing the fixed "programme simulation noise" described in EN 50332-1.<br>– for equipment provided with a standardized connector (for example, a 3,5 phone jack) that allows connection to a listening device for general use, the unweighted r.m.s. output voltage shall be ≤ 27 mV (analogue interface) or -25 dBFS (digital interface) when playing the fixed "programme simulation noise" described in EN 50332-1.<br>– The RS1 limits will be updated for all devices as per 10.6.3.2. | | N/A |
| **10.6.2.3** | **RS2 limits (to be superseded, see 10.6.3.3)**<br><br>RS2 is a class 2 acoustic energy source that does not exceed the following:<br>– for equipment provided as a package (player with its listening device), and with a proprietary connector between the player and its listening device, or when the combination of player and listening device is known by other means such as setting or automatic 130 detection, the *L*Aeq,*T* acoustic output shall be ≤ 100 dB(A) when playing the fixed "programme simulation noise" as described in EN 50332-1.<br>– for equipment provided with a standardized connector (for example, a 3,5 phone jack) that allows connection to a listening device for general use, the unweighted r.m.s. output voltage shall be ≤ 150 mV (analogue interface) or -10 dBFS (digital interface) when playing the fixed "programme simulation noise" as described in EN 50332-1. | | N/A |
| **10.6.2.4** | **RS3 limits**<br>RS3 is a class 3 acoustic energy source that exceeds RS2 limits. | | N/A |
| **10.6.3** | **Classification of devices (new)** | | N/A |
| **10.6.3.1** | **General**<br>Previous limits (10.6.2) created abundant false negative and false positive PMP sound level warnings. New limits, compliant with The Commission Decision of 23 June 2009, are given below. | Not such equipment | N/A |

| EN IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| **10.6.3.2** | **RS1 limits (new)**<br>RS1 is a class 1 acoustic energy source that does not exceed the following:<br>– for equipment provided as a package (player with its listening device), and with a proprietary connector between the player and its listening device, or where the combination of player and listening device is known by other means such as setting or automatic detection, the *L*Aeq,*T* acoustic output shall be ≤ 80 dB when playing the fixed "programme simulation noise" described in EN 50332-1.<br>– for equipment provided with a standardized connector (for example, a 3,5 phone jack) that allows connection to a listening device for general use, the unweighted r.m.s. output voltage shall be ≤ 15 mV (analogue interface) or -30 dBFS (digital interface) when playing the fixed "programme simulation noise" described in EN 50332-1. | | N/A |
| **10.6.3.3** | **RS2 limits (new)**<br>RS2 is a class 2 acoustic energy source that does not exceed the following:<br>– for equipment provided as a package (player with its listening device), and with a proprietary connector between the player and its listening device, or where the combination of player and listening device is known by other means such as setting or automatic detection, the weekly sound exposure level, as described in EN 50332-3, shall be ≤ 80 dB when playing the fixed "programme simulation noise" described in EN 50332-1.<br>– for equipment provided with a standardized connector (for example, a 3,5 phone jack) that allows connection to a listening device for general use, the unweighted r.m.s. output level, integrated over one week, as described in EN50332-3, shall be ≤ 15 mV (analogue interface) or -30 dBFS (digital interface) when playing the fixed "programme simulation noise" described in EN 50332-1. | | N/A |
| **10.6.4** | **Requirements for maximum sound exposure** | | N/A |
| **10.6.4.1** | **Measurement methods**<br>All volume controls shall be turned to maximum during tests.<br><br>Measurements shall be made in accordance with EN 50332-1 or EN 50332-2 as applicable. | Not such equipment | N/A |
| **10.6.4.2** | **Protection of persons**<br>Except as given below, protection requirements for parts **accessible** to **ordinary persons**, **instructed persons** and **skilled persons** are given in 4.3.<br><br>NOTE 1 Volume control is not considered a **safeguard.** | | N/A |

| EN IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | Between RS2 and an **ordinary person**, the **basic safeguard** may be replaced by an **instructional safeguard** in accordance with Clause F.5, except that the **instructional safeguard** shall be placed on the equipment, or on the packaging, or in the instruction manual.<br>Alternatively, the **instructional safeguard** may be given through the equipment display during use.<br><br>The elements of the **instructional safeguard** shall be as follows:<br><br>– element 1a: the symbol  , IEC 60417-6044 (2011-01)<br>– element 2: “High sound pressure” or equivalent wording<br>– element 3: “Hearing damage risk” or equivalent wording<br>– element 4: “Do not listen at high volume levels for long periods.” or equivalent wording<br><br>An **equipment safeguard** shall prevent exposure of an **ordinary person** to an RS2 source without intentional physical action from the **ordinary person** and shall automatically return to an output level not exceeding what is specified for an RS1 source when the power is switched off.<br><br>The equipment shall provide a means to actively inform the user of the increased sound level when the equipment is operated with an output exceeding RS1. Any means used shall be acknowledged by the user before activating a mode of operation which allows for an output exceeding RS1. The acknowledgement does not need to be repeated more than once every 20 h of cumulative listening time.<br><br>NOTE 2 Examples of means include visual or audible signals. Action from the user is always needed.<br><br>NOTE 3 The 20 h listening time is the accumulative listening time, independent of how often and how long the personal music player has been switched off.<br><br>A **skilled person** shall not be unintentionally exposed to RS3. | | |
| **10.6.5** | **Requirements for dose-based systems** | | N/A |
| **10.6.5.1** | **General requirements**<br>Personal music players shall give the warnings as provided below when tested according to EN 50332-3, using the limits from this clause. | Not such equipment | N/A |

| EN IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | The manufacturer may offer optional settings to allow the users to modify when and how they wish to receive the notifications and warnings to promote a better user experience without defeating the safeguards. This allows the users to be informed in a method that best meets their physical capabilities and device usage needs. If such optional settings are offered, an administrator (for example, parental restrictions, business/educational administrators, etc.) shall be able to lock any optional settings into a specific configuration.<br><br>The personal music player shall be supplied with easy to understand explanation to the user of the dose management system, the risks involved, and how to use the system safely. The user shall be made aware that other sources may significantly contribute to their sound exposure, for example work, transportation, concerts, clubs, cinema, car races, etc. | | |
| **10.6.5.2** | **Dose-based warning and requirements**<br>When a dose of 100 % *CSD* is reached, and at least at every 100 % further increase of *CSD*, the device shall warn the user and require an acknowledgement. In case the user does not acknowledge, the output level shall automatically decrease to compliance with class RS1.<br><br>The warning shall at least clearly indicate that listening above 100 % *CSD* leads to the risk of hearing damage or loss. | | N/A |
| **10.6.5.3** | **Exposure-based requirements**<br>With only dose-based requirements, cause and effect could be far separated in time, defying the purpose of educating users about safe listening practice. In addition to dose-based requirements, a PMP shall therefore also put a limit to the short-term sound level a user can listen at.<br><br>The exposure-based limiter (EL) shall automatically reduce the sound level not to exceed 100 dB(A) or 150 mV integrated over the past 180 s, based on methodology defined in EN 50332-3.<br>The EL settling time (time from starting level reduction to reaching target output) shall be 10 s or faster.<br><br>Test of EL functionality is conducted according to EN 50332-3, using the limits from this clause. For equipment provided as a package (player with its listening device), the level integrated over 180 s shall be 100 dB or lower. For equipment provided with a standardized connector, the unweighted level integrated over 180 s shall be no more than | | N/A |

| EN IEC 62368-1 | | | |
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| Clause | Requirement + Test | Result - Remark | Verdict |
| | 150 mV for an analogue interface and no more than -10 dBFS for a digital interface.<br><br>NOTE In case the source is known not to be music (or test signal), the EL may be disabled. | | |
| **10.6.6** | **Requirements for listening devices (headphones, earphones, etc.)** | | N/A |
| **10.6.6.1** | **Corded listening devices with analogue input**<br>With 94 dB *L*Aeq acoustic pressure output of the listening device, and with the volume and sound settings in the listening device (for example, built-in volume level control, additional sound features like equalization, etc.) set to the combination of positions that maximize the measured acoustic output, the input voltage of the listening device when playing the fixed “programme simulation noise” as described in EN 50332-1 shall be ≥ 75 mV.<br><br>NOTE The values of 94 dB and 75 mV correspond with 85 dB and 27 mV or 100 dB and 150 mV. | Not such equipment | N/A |
| **10.6.6.2** | **Corded listening devices with digital input**<br>With any playing device playing the fixed “programme simulation noise” described in EN 50332-1, and with the volume and sound settings in the listening device (for example, built-in volume level control, additional sound features like equalization, etc.) set to the combination of positions that maximize the measured acoustic output, the *L*Aeq,*T* acoustic output of the listening device shall be ≤ 100 dB with an input signal of -10 dBFS. | | N/A |
| **10.6.6.3** | **Cordless listening devices**<br>In cordless mode,<br>– with any playing and transmitting device playing the fixed programme simulation noise described in EN 50332-1; and<br>– respecting the cordless transmission standards, where an air interface standard exists that specifies the equivalent acoustic level; and<br>– with volume and sound settings in the receiving device (for example, built-in volume level control, additional sound features like equalization, etc.) set to the combination of positions that maximize the measured acoustic output for the above mentioned programme simulation noise, the *L*Aeq,*T* acoustic output of the listening device shall be ≤ 100 dB with an input signal of -10 dBFS. | | N/A |
| **10.6.6.4** | **Measurement method**<br>*Measurements shall be made in accordance with EN 50332-2 as applicable.* | | N/A |
| **3** | **Modification to the whole document** | | P |

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

| | | | |
|---|---|---|---|
| | **Delete** all the “country” notes in the reference document according to the following list:<br><br>0.2.1 Note 1 and 2; 1 Note 4 and 5; 3.3.8.1 Note 2<br>3.3.8.3 Note 1; 4.1.15 Note; 4.7.3 Note 1 and 2<br>5.2.2.2 Note; 5.4.2.3.2.2 Table 12 Note c; 5.4.2.3.2.4 Note 1 and 3<br>5.4.2.3.2.4 Table 13 Note 2; 5.4.2.5 Note 2; 5.4.5.1 Note<br>5.4.10.2.1 Note; 5.4.10.2.2 Note; 5.4.10.2.3 Note<br>5.5.2.1 Note; 5.5.6 Note; 5.6.4.2.1 Note 2 and 3 and 4<br>5.6.8 Note 2; 5.7.6 Note; 5.7.7.1 Note 1 and Note 2<br>8.5.4.2.3 Note; 10.2.1 Table 39 Note 3 and 4 and 5; 10.5.3 Note 2<br>~~10.6.1~~ Note 3; F.3.3.6 Note 3; Y.4.1 Note<br>Y.4.5 Note | | P |
| **4** | **Modification to Clause 1** | | P |
| **1** | **Add** the following note:<br>*NOTE Z1 The use of certain substances in electrical and electronic equipment is restricted within the EU: see Directive 2011/65/EU.* | | P |
| **5** | **Modification to 4.Z1** | | P |

| EN IEC 62368-1 | | | |
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| Clause | Requirement + Test | Result - Remark | Verdict |
| **4.Z1** | **Add** the following new subclause after 4.9:<br>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):<br>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;<br>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;<br>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.<br><br>If reliance is placed on protection in the building installation, the installation instructions shall so state, except that for **pluggable equipment type A** the building installation shall be regarded as providing protection in accordance with the rating of the wall socket outlet. | | N/A |
| **6** | **Modification to 5.4.2.3.2.4** | | N/A |
| **5.4.2.3.2.4** | **Add** the following to the end of this subclause:<br>The requirement for interconnection with **external circuit** is in addition given in EN 50491-3:2009. | No connection to external circuit. | N/A |
| **7** | **Modification to 10.2.1** | | N/A |
| **10.2.1** | **Add** the following to c) and d) in table 39: For additional requirements, see 10.5.1. | Added. The equipment is a low power AC ADAPTER, it does incorporate only non-intentional radiators, but does not contain radio transmitters; the typical usage, installation and physical characteristics make the equipment inherently compliant with all applicable EMF exposure levels (EN 62479: 2010 clause 4.1 Route A). | N/A |
| **8** | **Modification to 10.5.1** | | N/A |

| EN IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| **10.5.1** | **Add** the following after the first paragraph:<br>For RS 1 compliance is checked by measurement under the following conditions:<br><br>In addition to the normal operating conditions, all controls adjustable from the outside by hand, by any object such as a tool or a coin, and those internal adjustments or pre-sets which are not locked in a reliable manner, are adjusted so as to give maximum radiation whilst maintaining an intelligible picture for 1 h, at the end of which the measurement is made.<br><br>NOTE Z1 Soldered joints and paint lockings are examples of adequate locking.<br><br>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.<br><br>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.<br><br>For RS1, the dose-rate shall not exceed 1 µSv/h taking account of the background level.<br><br>NOTE Z2 These values appear in Directive 96/29/Euratom of 13 May 1996. | | N/A |
| **9** | **Modification to G.7.1** | | N/A |
| **G.7.1** | **Add** the following note:<br>NOTE Z1 The harmonized code designations corresponding to the IEC cord types are given in Annex ZD. | | N/A |
| **10** | **Modification to Bibliography** | | N/A |

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

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| | **Add** the following notes for the standards indicated:<br>IEC 60130-9 NOTE Harmonized as EN 60130-9.<br>IEC 60269-2 NOTE Harmonized as HD 60269-2.<br>IEC 60309-1 NOTE Harmonized as EN 60309-1.<br>IEC 60364 NOTE some parts harmonized in HD 384/HD 60364 series.<br>IEC 60601-2-4 NOTE Harmonized as EN 60601-2-4.<br>IEC 60664-5 NOTE Harmonized as EN 60664-5.<br>IEC 61032:1997 NOTE Harmonized as EN 61032:1998 (not modified).<br>IEC 61508-1 NOTE Harmonized as EN 61508-1.<br>IEC 61558-2-1 NOTE Harmonized as EN 61558-2-1.<br>IEC 61558-2-4 NOTE Harmonized as EN 61558-2-4.<br>IEC 61558-2-6 NOTE Harmonized as EN 61558-2-6.<br>IEC 61643-1 NOTE Harmonized as EN 61643-1.<br>IEC 61643-21 NOTE Harmonized as EN 61643-21.<br>IEC 61643-311 NOTE Harmonized as EN 61643-311.<br>IEC 61643-321 NOTE Harmonized as EN 61643-321.<br>IEC 61643-331 NOTE Harmonized as EN 61643-331. | | P |
| **11** | **ADDITION OF ANNEXES** | | -- |
| **ZB** | **ANNEX ZB, SPECIAL NATIONAL CONDITIONS (EN)** | | P |
| **4.1.15** | **Denmark, Finland, Norway** and **Sweden**<br>To the end of the subclause the following is added:<br>**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.<br><br>The marking text in the applicable countries shall be as follows:<br><br>In **Denmark**: “Apparatets stikprop skal tilsluttes en stikkontakt med jord som giver forbindelse til stikproppens jord.”<br>In **Finland**: "Laite on liitettävä suojakoskettimilla varustettuun pistorasiaan"<br>In **Norway**: “Apparatet må tilkoples jordet stikkontakt”<br>In **Sweden**: “Apparaten skall anslutas till jordat uttag” | Class II equipment | N/A |

| EN IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| **4.7.3** | **United Kingdom**<br>To the end of the subclause the following is added:<br><br>The torque test is performed using a socket-outlet complying with BS 1363, and the plug part shall be assessed to the relevant clauses of BS 1363. Also see Annex G.4.2 of this annex | | N/A |
| **5.2.2.2** | **Denmark**<br>After the 2nd paragraph add the following:<br><br>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. | No high touch current measured. | N/A |
| **5.4.11.1 and Annex G** | **Finland and Sweden**<br>To the end of the subclause the following is added:<br><br>For separation of the telecommunication network from earth the following is applicable:<br><br>If this insulation is solid, including insulation forming part of a component, it shall at least consist of either<br>• two layers of thin sheet material, each of which shall pass the electric strength test below, or<br><br>• one layer having a distance through insulation of at least 0,4 mm, which shall pass the electric strength test below.<br><br>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<br><br>• 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),<br><br>and<br><br>• is subject to routine testing for electric strength during manufacturing, using a test voltage of 1,5 kV.<br><br>It is permitted to bridge this insulation with a capacitor complying with EN 60384-14:2005, subclass Y2. | No TNV circuits. | N/A |

| EN IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | A capacitor classified Y3 according to EN 60384-14:2005, may bridge this insulation under the following conditions:<br>• 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;<br>• the additional testing shall be performed on all the test specimens as described in EN 60384-14;<br>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. | | |
| **5.5.2.1** | **Norway**<br>After the 3rd paragraph the following is added:<br>Due to the IT power system used, capacitors are required to be rated for the applicable line-to-line voltage (230 V). | | N/A |
| **5.5.6** | **Finland, Norway** and **Sweden**<br>To the end of the subclause the following is added:<br>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 resistors. | N/A |
| **5.6.1** | **Denmark**<br>**Add** to the end of the subclause<br>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.<br>*Justification:*<br>In Denmark an existing 13 A socket outlet can be protected by a 20 A fuse. | No such equipment. | N/A |
| **5.6.4.2.1** | **Ireland and United Kingdom**<br>After the indent for **pluggable equipment type A**, the following is added:<br>– the **protective current rating** is taken to be 13 A, this being the largest rating of fuse used in the **mains** plug. | Approved mains plug used (see appended table 4.1.2) | N/A |

| EN IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| **5.6.4.2.1** | **France**<br>After the indent for **pluggable equipment type A**, the following is added:<br>– in certain cases, the **protective current rating** of the circuit supplied from the mains is taken as 20 A instead of 16 A. | | N/A |
| **5.6.5.1** | To the second paragraph the following is added:<br>The range of conductor sizes of flexible cords to be accepted by terminals for equipment with a rated current over 10 A and up to and including 13 A is: 1,25 $mm^2$ to 1,5 $mm^2$ in cross-sectional area. | | N/A |
| **5.6.8** | **Norway**<br>To the end of the subclause the following is added:<br>Equipment connected with an earthed mains plug is classified as **class I equipment**. See the Norway marking requirement in 4.1.15. The symbol IEC 60417-6092, as specified in F.3.6.2, is accepted. | | N/A |
| **5.7.6** | **Denmark**<br>To the end of the subclause the following is added:<br><br>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. | No high protective conductor current. | N/A |
| **5.7.6.2** | **Denmark**<br>To the end of the subclause the following is added:<br>The warning (marking safeguard) for high touch current is required if the touch current or the protective current exceed the limits of 3,5 mA . | | P |
| **5.7.7.1** | **Norway and Sweden**<br>To the end of the subclause the following is added:<br>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.<br>Therefore the protective earthing of the building installation needs to be isolated from the screen of a cable distribution system.<br><br>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.<br><br>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: | Not such system. | N/A |

| EN IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | "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)"<br><br>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.<br><br>Translation to Norwegian (the Swedish text will also be accepted in Norway):<br><br>"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."<br><br>Translation to Swedish:<br>"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." | | |
| **8.5.4.2.3** | **United Kingdom**<br>Add the following after the 2nd dash bullet in 3rd paragraph:<br><br>An emergency stop system complying with the requirements of IEC 60204-1 and ISO 13850 is required where there is a risk of personal injury. | No external circuits. | N/A |

| EN IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| **B.3.1 and B.4** | **Ireland and United Kingdom**<br>The following is applicable:<br><br>To protect against excessive currents and short-circuits in the primary circuit of **direct plug-in equipment**, tests according to Annexes B.3.1 and B.4 shall be conducted using an external miniature circuit breaker complying with EN 60898-1, Type B, rated 32A. If the equipment does not pass these tests, suitable protective devices shall be included as an integral part of the **direct plug-in equipment**, until the requirements of Annexes B.3.1 and B.4 are met | | N/A |
| **G.4.2** | **Denmark**<br>To the end of the subclause the following is added:<br><br>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.<br><br>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.<br><br>If a single-phase equipment having a RATED CURRENT exceeding 13 A or if a polyphase equipment is provided with a supply cord with a plug, this plug shall be in accordance with the standard sheets DK 6-1a in DS 60884-2-D1 or EN 60309-2.<br><br>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.<br><br>Other current rating socket outlets shall be in compliance with Standard Sheet DKA 1-3a or DKA 1-1c.<br><br>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<br><br>*Justification:*<br>Heavy Current Regulations, Section 6c | | N/A |

| EN IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| **G.4.2** | **United Kingdom**<br>To the end of the subclause the following is added:<br><br>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. | Direct plug-in equipment | N/A |
| **G.7.1** | **United Kingdom**<br>To the first paragraph the following is added:<br><br>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.<br><br>NOTE "Standard plug" is defined in SI 1768:1994 and essentially means an approved plug conforming to BS 1363 or an approved conversion plug. | Direct plug-in equipment | N/A |
| **G.7.1** | **Ireland**<br>To the first paragraph the following is added:<br><br>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 | Direct plug-in equipment | N/A |
| **G.7.2** | **Ireland and United Kingdom**<br>To the first paragraph the following is added:<br><br>A power supply cord with a conductor of 1,25 $mm^2$ is allowed for equipment which is rated over 10 A and up to and including 13 A. | Direct plug-in equipment | N/A |
| **ZC** | **ANNEX ZC, NATIONAL DEVIATIONS (EN)** | | N/A |

| EN IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| **10.5.2** | **Germany**<br>The following requirement applies:<br><br>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.<br><br>*Justification*:<br>German ministerial decree against ionizing radiation (Röntgenverordnung), in force since 2002-07-01, implementing the European Directive 96/29/EURATOM.<br><br>**NOTE** Contact address:<br>Physikalisch-Technische Bundesanstalt, Bundesallee 100, D-38116 Braunschweig, Tel.: Int+49-531-592-6320, Internet: http://www.ptb.de | No CRT within the equipment. | N/A |

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

| | | |
|---|---|---|
| **ZD** | **IEC and CENELEC CODE DESIGNATIONS FOR FLEXIBLE CORDS (EN)** | N/A |

N/A

| Type of flexible cord | Code designations | |
|---|---|---|
| | IEC | CENELEC |
| **PVC insulated cords** | | |
| Flat twin tinsel cord | 60227 IEC 41 | H03VH-Y |
| Light polyvinyl chloride sheathed flexible cord | 60227 IEC 52 | H03VV-F<br>H03VVH2-F |
| Ordinary polyvinyl chloride sheathed flexible cord | 60227 IEC 53 | H05VV-F<br>H05VVH2-F |
| **Rubber insulated cords** | | |
| Braided cord | 60245 IEC 51 | H03RT-F |
| Ordinary tough rubber sheathed flexible cord | 60245 IEC 53 | H05RR-F |
| Ordinary polychloroprene sheathed flexible cord | 60245 IEC 57 | H05RN-F |
| Heavy polychloroprene sheathed flexible cord | 60245 IEC 66 | H07RN-F |
| **Cords having high flexibility** | | |
| Rubber insulated and sheathed cord | 60245 IEC 86 | H03RR-H |
| Rubber insulated, crosslinked PVC sheathed cord | 60245 IEC 87 | H03RV4-H |
| Crosslinked PVC insulated and sheathed cord | 60245 IEC 88 | H03V4V4-H |
| **Cords insulated and sheathed with halogen-free thermoplastic compounds** | | |
| Light halogen-free thermoplastic insulated and sheathed flexible cords | | H03Z1Z1-F<br>H03Z1Z1H2-F |
| Ordinary halogen-free thermoplastic insulated and sheathed flexible cords | | H05Z1Z1-F<br>H05Z1Z1H2-F |

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

| 5.2 | TABLE: Classification of electrical energy sources | | | | | | P |
|---|---|---|---|---|---|---|---|
| Supply Voltage | Location (e.g. circuit designation) | Test conditions | Parameters | | | | ES Class |
| | | | U (V) | I (mA) | Type[1)] | Additional Info [2)] | |
| 3Vdc | The EUT is designed to be supplied by Internal dry battery | Normal | <60Vdc | -- | SS | -- | ES1 (declare) |
| | | Abnormal | -- | -- | -- | -- | |
| | | Single fault | -- | -- | -- | -- | |
| Supplementary information: | | | | | | | |

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

| 5.4.1.10.2 | TABLE: Vicat softening temperature of thermoplastics | | | N/A |
|---|---|---|---|---|
| Method ..... : | ISO 306 / B50 | | | — |
| Object/ Part No./Material | Manufacturer/trademark | Thickness (mm) | T softening (°C) | |
| -- | -- | -- | -- | |
| Supplementary information: | | | | |
| | | | | |

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

| 5.4.2, 5.4.3 | TABLE: Minimum Clearances/Creepage distance | | | | | | | | N/A |
|---|---|---|---|---|---|---|---|---|---|
| Clearance (cl) and creepage distance (cr) at/of/between: | $U_p$ (V) | $U_{rms}$ (V) | Freq [1)] (kHz) | Required cl (mm) | cl (mm) | E.S. [2)] (V) | Required cr (mm) | cr (mm) | |
| -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Supplementary information: | | | | | | | | | |

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

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

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

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

| 5.5.2.2 | TABLE: Stored discharge on capacitors | | | | N/A |
|---|---|---|---|---|---|
| Location | Supply voltage (V) | Operating and fault condition [1)] | Switch position | Measured voltage (Vpk) | ES Class |
| -- | -- | -- | -- | -- | -- |
| Supplementary information: | | | | | |
| X-capacitors installed for testing:<br>☐ bleeding resistor rating:<br>☐ ICX: | | | | | |

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

| 5.6.6 | TABLE: Resistance of protective conductors and terminations | | | | N/A |
|---|---|---|---|---|---|
| Location | | Test current (A) | Duration (min) | Voltage drop (V) | Resistance (Ω) |
| -- | | -- | -- | -- | -- |
| Supplementary information: | | | | | |
| | | | | | |

| 5.7.4 | TABLE: Unearthed accessible parts | | | | | N/A |
|---|---|---|---|---|---|---|
| Location | Operating and fault conditions | Supply Voltage (V) | Parameters | | | ES class |
| | | | Voltage ($V_{rms}$ or $V_{pk}$) | Current ($A_{rms}$ or $A_{pk}$) | Freq. (Hz) | |
| -- | -- | -- | -- | -- | -- | -- |
| Supplementary information: | | | | | | |
| | | | | | | |

| 5.7.5 | TABLE: Earthed accessible conductive part | | | N/A |
|---|---|---|---|---|
| Supply voltage (V).....: | | | | — |
| Phase(s) .....: | [] Single Phase; [ ] Three Phase: [ ] Delta [ ] Wye | | | |
| Power Distribution System .....: | ☐ TN ☐ TT ☐ IT | | | |
| Location | Fault Condition No in IEC 60990 clause 6.2.2 | Touch current (mA) | Comment | |
| -- | -- | -- | -- | |
| Supplementary Information: | | | | |
| | | | | |

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

| 6.2.2 | TABLE: Power source circuit classifications | | | | | P |
|---|---|---|---|---|---|---|
| Location | Operating and fault condition | Voltage (V) | Current (A) | Max. Power[1)] (W) | Time (S) | PS class |
| | | | | | | |

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

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Dry battery | Normal condition | <15 | -- | -- | -- | PS1 (declare) | |
| | Signal fault | -- | -- | -- | -- | | |
| | Signal fault | -- | -- | -- | -- | | |
| Supplementary information: | | | | | | | |
| Abbreviation: SC= short circuit | | | | | | | |

| 6.2.3.1 | TABLE: Determination of Arcing PIS | | | N/A |
|---|---|---|---|---|
| Location | Open circuit voltage after 3 s (Vpk) | Measured r.m.s current (A) | Calculated value | Arcing PIS? Yes / No |
| -- | -- | -- | -- | -- |
| Supplementary information: | | | | |
| | | | | |

| 6.2.3.2 | TABLE: Determination of resistive PIS | | N/A |
|---|---|---|---|
| Location | Operating and fault condition | Dissipate power (W) | Arcing PIS? Yes / No |
| -- | -- | -- | -- |
| Supplementary information: | | | |
| | | | |

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

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

| 9.6 | TABLE: Temperature measurements for wireless power transmitters | | | | | | | | N/A |
|---|---|---|---|---|---|---|---|---|---|
| Supply voltage (V) ..... : | | | | | | | | | — |
| Max. transmit power of transmitter (W) ..... : | | | | | | | | | — |
| | w/o receiver and direct contact | | with receiver and direct contact | | with receiver and at distance of 2 mm | | with receiver and at distance of 5 mm | | |
| Foreign objects | Object ($^{o}$C) | Ambient ($^{o}$C) | Object ($^{o}$C) | Ambient ($^{o}$C) | Object ($^{o}$C) | Ambient ($^{o}$C) | Object ($^{o}$C) | Ambient ($^{o}$C) | |
| -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Supplementary information: | | | | | | | | | |
| | | | | | | | | | |

| 5.4.1.4, 9.3, B.1.5, B.2.6 | TABLE: Temperature measurements | | | | P |
|---|---|---|---|---|---|
| Supply voltage (V)..... : | 3Vdc | -- | -- | -- | — |
| Ambient temperature during test $T_{amb}$ (°C) .... : | 45.0 | -- | -- | -- | — |
| Maximum measured temperature *T* of part/at: | *T* (°C) | | | | Allowed $T_{max}$ (°C) |
| Internal wire | 47.6 | -- | -- | -- | 80 |
| PCB near C1 | 49.4 | -- | -- | -- | 130 |
| PCB near U1 | 52.1 | -- | -- | -- | 130 |
| PCB near D3 | 49.4 | -- | -- | -- | 130 |
| Enclosure inside | 48.6 | -- | -- | -- | Ref. |
| Ambient | 45.0 | -- | -- | -- | -- |
| Accessible part | | | | | |
| Plastic outside | 27.7 | -- | -- | -- | 77 |
| Ambient | 25.0 | -- | -- | -- | -- |

| 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:

1. Tma should be considered as directed by 66pplicable requirement.
2. Tma is not included in assessment of Touch Temperatures (Clause 9).
3. The temperatures were measured under worst case normal mode as described in B.2.5 at voltages as

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

above.

4. With a specified maximum ambient temperature and test temperature of 45°C.

5. When tested for touch temperature limit of clause 9, the ambient was conducted between 20-30°C.

| B.2.5 | TABLE: Input test | | | | | | | P |
|---|---|---|---|---|---|---|---|---|
| U (V) | Hz | I (A) | I rated (A) | P (W) | P rated (W) | Fuse No | I fuse (A) | Condition/status |
| 3 | dc | 0.021 | -- | 0.063 | -- | -- | -- | Normal working |
| Supplementary information: | | | | | | | | |
| The maximum measured current under rated voltage did not exceed 110% of the rated current. | | | | | | | | |

| B.3, B.4 | TABLE: Abnormal operating and fault condition tests | | | | | P |
|---|---|---|---|---|---|---|
| Ambient temperature $T_{amb}$ (°C) .....: | | | 25°C, if not specified | | | — |
| Power source for EUT: Manufacturer, model/type, outputrating...: | | | -- | | | — |
| Component No. | Condition | Supply voltage (V) | Test time | Fuse no. | Fuse current (A) | Observation |
| Battery | Reverse | 3 | 10min | -- | -- | Unit does't work, No damage, no hazards |
| C1 | SC | 3.0 | 10min | -- | -- | Unit shutdown immediately, No damage, no hazards |
| R1 | SC | 3.0 | 10min | -- | -- | Unit shutdown immediately, No damage, no hazards |
| U1 pin1-7 | SC | 3.0 | 10min | -- | -- | Unit shutdown immediately, No damage, no hazards |
| 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.<br>1) S-C: Short-circuited;<br>2) The test result shown all safeguards remained effective and didn't lead to a single fault condition during abnormal operating condition; In addition all safeguards complied with applicable requirements in this standard after restoration of normal operating conditions.<br>3) The test result showed no Class 1 or 2 energy source become Class 3 level during and after single fault condition. | | | | | | |

| M.3 | TABLE: Protection circuits for batteries provided within the equipment | | N/A |
|---|---|---|---|
| Is it possible to install the battery in a reverse polarity position?.....: | | -- | — |
| Equipment Specification | Charging | | |

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

| | Voltage (V) | | Current (A) | | | |
|---|---|---|---|---|---|---|
| | -- | | -- | | | |
| | Battery specification | | | | | |
| | Non-rechargeable batteries | | Rechargeable batteries | | | |
| Manufacturer/type | Discharging current (A) | Unintentional charging current (A) | Charging | | Discharging current (A) | Reverse charging current (A) |
| | | | Voltage (V) | Current (A) | | |
| -- | -- | -- | -- | -- | -- | -- |
| Note: The tests of M.3.2 are applicable only when above appropriate data is not available. | | | | | | |
| Specified battery temperature (°C) .....: | -- | | | | | |

| Component No. | Fault condition | Charge/ discharge mode | Test time | Temp. (°C) | Current (A) | Voltage (V) | Observation |
|---|---|---|---|---|---|---|---|
| -- | -- | -- | -- | -- | -- | -- | -- |
| Supplementary information: | | | | | | | |
| Abbreviation: SC= short circuit; OC= open circuit NL= no chemical leakage; NS= no spillage of liquid; NE= no explosion; NF= no emission of flame or expulsion of molten metal. | | | | | | | |

| M.4.2 | TABLE: Charging safeguards for equipment containing a secondary lithium battery | N/A |
|---|---|---|
| Maximum specified charging voltage (V).....: | -- | — |
| Maximum specified charging current (A) .....: | -- | — |
| Highest specified charging temperature (°C) .....: | -- | -- |
| Lowest specified charging temperature (°C) .....: | -- | -- |

| Battery manufacturer/type | Operating and fault condition | Measurement | | | Observation |
|---|---|---|---|---|---|
| | | Charging voltage (V) | Charging current (A) | Temp. (°C) | |
| -- | -- | -- | -- | -- | -- |
| Supplementary information: | | | | | |
| Abbreviation: SC= short circuit; OC= open circuit; MSCV= maximum specified charging voltage; MSCC= maximum specified charging current; HSCT= highest specified charging temperature; LSCT= lowest specified charging temperature | | | | | |

| Q.1 | TABLE: Circuits intended for interconnection with building wiring (LPS) | | | | | | N/A |
|---|---|---|---|---|---|---|---|
| Output Circuit | Condition | $U_{oc}$ (V) | Time (s) | $I_{sc}$ (A) | | S (VA) | |
| | | | | Meas. | Limit | Meas. | Limit |
| -- | -- | -- | -- | -- | -- | -- | -- |

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

| Supplementary Information: |
|---|
| |

| T.2, T.3, T.4, T.5 | TABLE: Steady force test | | | | | P |
|---|---|---|---|---|---|---|
| Part/Location | Material | Thickness (mm) | Probe | Force (N) | Test Duration (s) | Observation |
| Internal components (T.2) | -- | -- | Figure V.2 | 10 | 5 | No reduction the clearances and creepage distances |
| Enclosure bottom (T.5) | Plastic* | See table 4.1.2 | -- | 250 | 5 | No cracking, no damage. |
| Enclosure top (T.5) | Plastic* | See table 4.1.2 | -- | 250 | 5 | No cracking, no damage. |
| Enclosure side (T.5) | Plastic* | See table 4.1.2 | -- | 250 | 5 | No cracking, no damage. |
| Supplementary information: | | | | | | |
| *Tests were performed on product with each source listed in table 4.1.2. | | | | | | |

| T.6, T.9 | TABLE: Impact test | | | P |
|---|---|---|---|---|
| Location/Part | Material | Thickness (mm) | Height (mm) | Observation |
| Enclosure bottom (T.6) | Plastic* | See table 4.1.2 | 1300 | No cracking, no damage. |
| Enclosure top (T.6) | Plastic* | See table 4.1.2 | 1300 | No cracking, no damage. |
| Enclosure side (T.6) | Plastic* | See table 4.1.2 | 1300 | No cracking, no damage. |
| Supplementary information: | | | | |
| *Test was performed on product with each source listed in table 4.1.2. | | | | |

| T.7 | TABLE: Drop test | | | P |
|---|---|---|---|---|
| Location/part | Material | Thickness (mm) | Height (mm) | Observation |
| Enclosure bottom (T.7) | Plastic* | See table 4.1.2 | 1000 | No cracking, no damage. |
| Enclosure top (T.7) | Plastic* | See table 4.1.2 | 1000 | No cracking, no damage. |
| Enclosure | Plastic* | See table 4.1.2 | 1000 | No cracking, no damage. |

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

| | | | | |
|---|---|---|---|---|
| side (T.7) | | | | |
| Supplementary information: | | | | |
| | | | | |

| T.8 | TABLE: Stress relief test | | | | | P |
|---|---|---|---|---|---|---|
| Location/Part | Material | Thickness (mm) | Oven Temperature (°C) | Duration (h) | Observation | |
| Enclosure | Plastic* | See table 4.1.2 | 70°C | 7h | No distortion, no softening, no cracking. | |
| Supplementary information: | | | | | | |
| *Test was performed on product with each source listed in table 4.1.2. | | | | | | |

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

| 4.1.2 | TABLE: Critical components information | | | | P |
|---|---|---|---|---|---|
| Object / part No. | Manufacturer/ trademark | Type / model | Technical data | Standard | Mark(s) of conformity[1)] |
| Plastic enclosure | FORMOSA CHEMICALS & FIBRE CORP PLASTICS DIV | AC310(+) | V-2, 60°C, min. thickness 0.8mm. | UL 94 | UL E162823 |
| PCB | Interchangeable | Interchangeable | Min. V-1 , 130°C | UL 796<br>UL 94 | UL |
| Internal wire | Interchangeable | Interchangeable | Min. 30AWG , 80°C | UL 796<br>UL 94 | UL |
| Supplementary information: | | | | | |
| Supplementary information:<br>[1)] License available upon request. Provided evidence ensures the agreed level of compliance. See OD-CB2039. | | | | | |

# Photo Documentation

Reference No.: WTF22D10214191R1Y002

Figure 1: Overall view

Figure 2: Overall view

# Photo Documentation

Reference No.: WTF22D10214191R1Y002


Figure 3: Internal view

Figure 4: Internal view

# Photo Documentation

Reference No.: WTF22D10214191R1Y002

Figure 5: Internal view

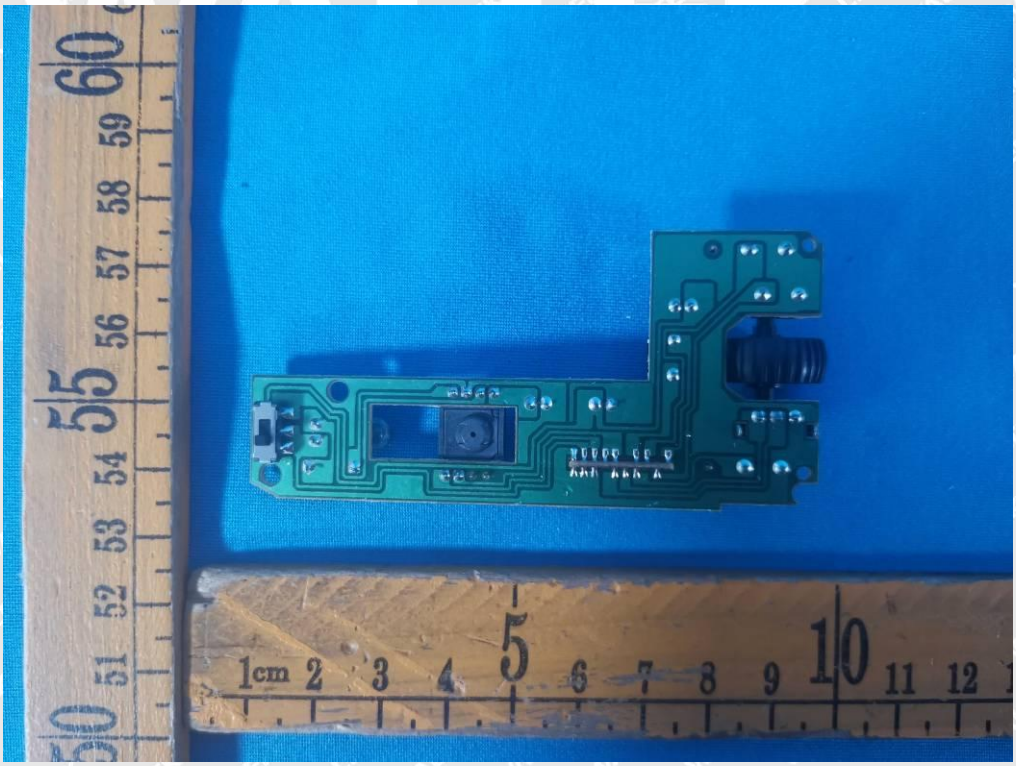

Figure 6: PCB view

# Photo Documentation

Reference No.: WTF22D10214191R1Y002

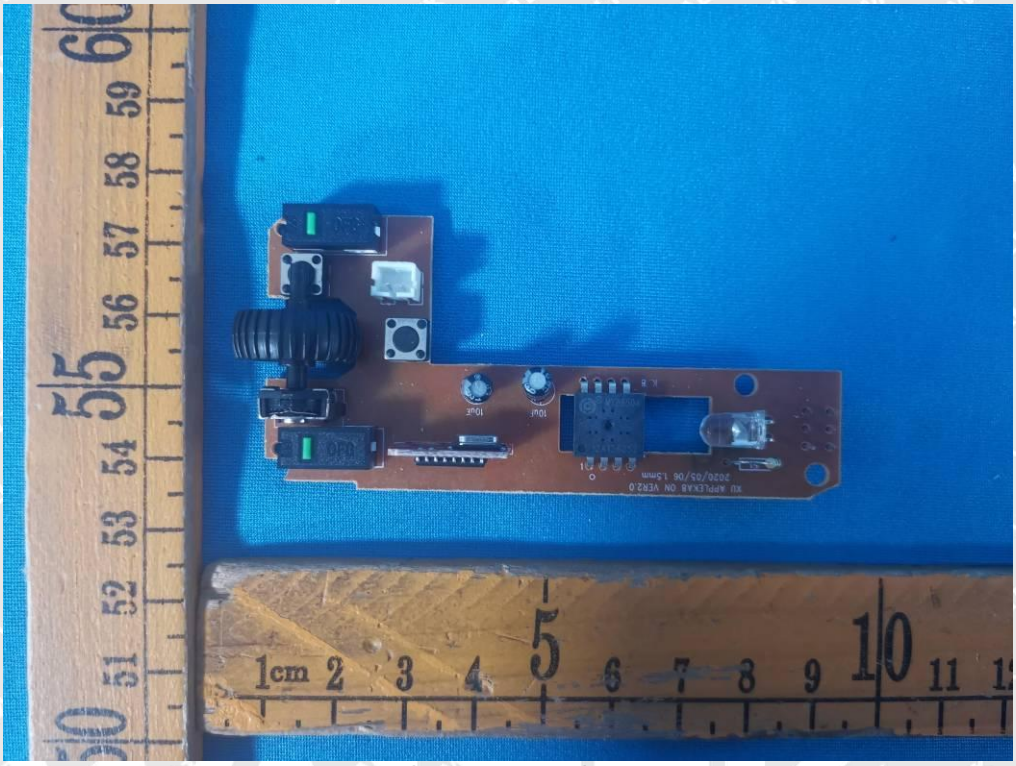

Figure 7: PCB view

====== End of Report ======

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TESTING
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# TEST REPORT

| | | |
|---|---|---|
| **Report No.** | : | WTF22D10214191Y002 |
| **Applicant** | : | Mid Ocean Brands B.V. |
| **Address** | : | 7/F., Kings Tower, 111 King Lam Street, Cheung Sha Wan, Kowloon, Hong Kong |
| **Manufacturer** | : | 114628 |
| **Address** | : | -- |
| **Product** | : | Wireless mouse |
| **Model(s)** | : | MO8827, MO8412, MO9747, MO9785 |
| **Total pages.** | : | 69 pages and 4 pages of photo. |
| **Standards** | : | ☒ EN IEC 62368-1:2020+A11:2020<br>Audio/video, information and communication technology equipment - Part 1:Safety requirements |
| **Date of Receipt sample** | : | 2022-10-28 |
| **Date of Test** | : | 2022-10-28 to 2022-11-21 |
| **Date of Issue** | : | 2022-11-22 |
| **Test Result** | : | **Pass** |

Remarks:
The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.


**Prepared By:**
**Waltek Testing Group Co., Ltd.**
Address: No. 77, Houjie Section, Guantai Road, Houjie Town, Dongguan City, Guangdong, China
Tel: +86-769-2267 6998
Fax: +86-769-2267 6828


Compiled by:

Lucas Cao / Project Engineer

Approved by:

Sam Qi / Designated Reviewer

| | |
|---|---|
| Test Item description | Wireless mouse |
| Trade Mark(s) | MOB |
| Model/Type reference | MO8827, MO8412, MO9747, MO9785 |
| Ratings | -- |

**Remark:**
Whether parts of tests for the product have been subcontracted to other labs:
☐ Yes ☒ No
If Yes, list the related test items and lab information:
Test items: --
Lab information: --

**Summary of testing:**

| **Tests performed (name of test and test clause):** | **Testing location:** |
|---|---|
| - EN IEC 62368-1:2020+A11:2020<br>The submitted samples were found to comply with the requirements of above specification. | No. 77, Houjie Section, Guantai Road, Houjie Town, Dongguan City, Guangdong, China |

**Summary of compliance with National Differences (List of countries addressed):**
List of countries addressed: National Differences and Group Differences for CENELEC countries were checked.

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

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

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

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

**Information on uncertainty of measurement:**

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

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

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

**Copy of marking plate:**

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


**Remark:**

1. The above markings are the minimum requirements required by the safety standard. For the final production, the additional markings which donot give rise to misunderstanding may be added.
2. The CE,UKCA marking and WEEE symbol should be at least 5.0mm and 7.0mm respectively in height.
3. According to the EU directives which have been aligned with EU NLF (new legislative framework), both of manufacturer and importer's name and address shall be affixed on the product or, where that is not possible, on its packaging or in a document accompanying the product before the product is placed on the EU market.

| Test item particulars: | |
|---|---|
| **Product group** | ☒ end product ☐ built-in component |
| **Classification of use by** | ☒ Ordinary person ☒ Children likely present<br>☐ Instructed person<br>☐ Skilled person |
| **Supply connection** | ☐ AC mains ☐ DC mains<br>☒ not mains connected:<br>☒ ES1 ☐ ES2 ☐ ES3 |
| **Supply tolerance** | ☐ +10%/-10%<br>☐ +20%/-15%<br>☐ +__%/ -__%<br>☒ None |
| **Supply connection – type** | ☐ pluggable equipment type A -<br>☐ non-detachable supply cord<br>☐ appliance coupler<br>☐ direct plug-in<br>☐ pluggable equipment type B -<br>☐ non-detachable supply cord<br>☐ appliance coupler<br>☐ permanent connection<br>☐ mating connector ☒ other: not Mains connected |
| **Considered current rating of protective device** | ☐ UK: 13 A; Others: 16 A |
| | Location: ☐ building ☐ equipment<br>☒ N/A |
| **Equipment mobility** | ☒ movable ☒ hand-held ☒ transportable<br>☐ direct plug-in ☐ stationary ☐ for building-in<br>☐ wall/ceiling-mounted ☐ SRME/rack-mounted<br>☐ other: ___ |
| **Overvoltage category (OVC)** | ☐ OVC I ☐ OVC II ☐ OVC III<br>☐ OVC IV ☒ other: not Mains connected |
| **Class of equipment** | ☐ Class I ☐ Class II ☒ Class III<br>☐ Not classified ☐ ___ |
| **Special installation location** | ☒ N/A ☐ restricted access area<br>☐ outdoor location ☐ ___ |
| **Pollution degree (PD)** | ☐ PD 1 ☒ PD 2 ☐ PD 3 |
| **Manufacturer's specified $T_{ma}$** | 45°C ☐ Outdoor: minimum ___°C |
| **IP protection class** | ☒ IPX0 ☐ IP___ |
| **Power systems** | ☐ TN ☐ TT ☐ IT - ___V $_{L-L}$<br>☒ not Mains connected |
| **Altitude during operation (m)** | ☒ 2000 m or less ☐ _5000_m |
| **Altitude of test laboratory (m)** | ☒ 2000 m or less ☐ ___ m |
| **Mass of equipment (kg)** | Approximately: 0.047kg |

| |
|---|
| **Possible test case verdicts:**<br>**- test case does not apply to the test object ....:** N/A<br>**- test object does meet the requirement.....:** P (Pass)<br>**- test object does not meet the requirement ....:** F (Fail) |
| **Testing:**<br>**Date of receipt of test item .....:** 2022-10-28<br>**Date (s) of performance of tests .....:** 2022-10-28 to 2022-11-21 |
| |
| **General remarks:** |
| "(see Enclosure #)" refers to additional information appended to the report.<br>"(see appended table)" refers to a table appended to the report.<br>**Throughout this report a ☐ comma / ☒ point is used as the decimal separator.** |
| **General Product Information:** |
| **Product Description:**<br>1. The EUT covered by this report is a Wireless mouse used as information apparatus. It is supplied by internal dry battery.<br>2. The manufacturer specified maximum ambient temperature is 45°C.<br>3. The specified altitude is up to and including 2000 m above sea level. |
| **Model Differences**<br>1. All these models are same as each other only except for the model name, appearance in colour.<br>2. The model MO9785 was selected for all testing. |
| **Additional application considerations**<br>N/A |

| **OVERVIEW OF ENERGY SOURCES AND SAFEGUARDS** | | | | |
|---|---|---|---|---|
| **Clause** | **Possible Hazard** | | | |
| 5 | Electrically-caused injury | | | |
| Class and Energy Source (e.g. ES3: Primary circuit) | Body Part (e.g. Ordinary) | Safeguards | | |
| | | B | S | R |
| Ordinary person | ES1: All circuit | N/A | N/A | N/A |
| 6 | Electrically-caused fire | | | |
| Class and Energy Source (e.g. PS2: 100 Watt circuit) | Material part (e.g. Printed board) | Safeguards | | |
| | | B | 1st S | 2nd S |
| All components/materials | PS1: All circuit | N/A | N/A | N/A |
| 7 | Injury caused by hazardous substances | | | |
| Class and Energy Source | Body Part | Safeguards | | |

| | | | | |
|---|---|---|---|---|
| (e.g. Ozone) | (e.g., Skilled) | B | S | R |
| N/A | N/A | N/A | N/A | N/A |
| 8 | Mechanically-caused injury | | | |
| Class and Energy Source (e.g. MS3: Plastic fan blades) | Body Part (e.g. Ordinary) | Safeguards | | |
| | | B | S | R |
| MS1: Mass of the unit <7kg | Ordinary | N/A | N/A | N/A |
| MS1: Smooth Edges and corners | Ordinary | N/A | N/A | N/A |
| MS3:Wall-mount | Ordinary | N/A | N/A | See 8.7.1 |
| 9 | Thermal burn | | | |
| Class and Energy Source (e.g. TS1: Keyboard caps) | Body Part (e.g., Ordinary) | Safeguards | | |
| | | B | S | R |
| TS1: Plastic enclosure | Ordinary | N/A | N/A | N/A |
| TS3: Internal parts/circuits | Ordinary | N/A | N/A | Enclosure |
| 10 | Radiation | | | |
| Class and Energy Source (e.g. RS1: PMP sound output) | Body Part (e.g., Ordinary) | Safeguards | | |
| | | B | S | R |
| RS1: LED for indicating | Ordinary | N/A | N/A | N/A |
| Supplementary Information:<br>"B" – Basic Safeguard; "S" – Supplementary Safeguard; "R" – Reinforced Safeguard | | | | |

| ENERGY SOURCE DIAGRAM |
|---|
| Indicate which energy sources are included in the energy source diagram. Insert diagram below |
| ☒ ES ☒ PS ☒ MS ☒ TS ☒ RS<br>**See details in ENERGY SOURCE IDENTIFICATION AND CLASSIFICATION TABLE** |

| EN IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| **4** | **GENERAL REQUIREMENTS** | | P |
| 4.1.1 | Acceptance of materials, components and subassemblies | (See appended table 4.1.2) | P |
| 4.1.2 | Use of components | Components which are certified to IEC and/or national standards are used correctly within their ratings. Components not covered by IEC standards are tested under the conditions present in the equipment. See also Annex G | P |
| 4.1.3 | Equipment design and construction | Evaluation of safeguards regarding preventing access to ES3 parts, limiting the source supplying outputs to fulfill ES1, and protection in regard to risk of ignition, mechanical-caused injury and thermal burn considered. | P |
| 4.1.4 | Specified ambient temperature for outdoor use ($^{o}$C) .....: | Indoor use only | N/A |
| 4.1.5 | Constructions and components not specifically covered | No constructions and components. | N/A |
| 4.1.8 | Liquids and liquid filled components (LFC) | No such parts. | N/A |
| 4.1.15 | Markings and instructions | (See Annex F) | P |
| 4.4.3 | Safeguard robustness | See below | P |
| 4.4.3.1 | General | | P |
| 4.4.3.2 | Steady force tests | (See Annex T.2 T.4and T.5). | P |
| 4.4.3.3 | Drop tests | (See Annex T.7) | P |
| 4.4.3.4 | Impact tests | (See Annex T.6) | P |
| 4.4.3.5 | Internal accessible safeguard tests | The external enclosure cannot be opened without damaging the product. | N/A |
| 4.4.3.6 | Glass impact tests | No such glass used. | N/A |
| 4.4.3.7 | Glass fixation tests | No such parts. | N/A |
| | Glass impact test (1J) | | N/A |
| | Push/pull test (10 N) | | N/A |
| 4.4.3.8 | Thermoplastic material tests | (See Annex T.8) | P |

| EN IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 4.4.3.9 | Air comprising a safeguard | | N/A |
| 4.4.3.10 | Accessibility, glass, safeguard effectiveness | After tests of 4.4.3.2, 4.4.3.3, 4.4.3.4and 4.4.3.8, no safeguard damaged. Class 3 energy sources do not become accessible to an ordinary person or to an instructed person and all other safeguards do remain effective. | P |
| 4.4.4 | Displacement of a safeguard by an insulating liquid | No such liquid. | N/A |
| 4.4.5 | Safety interlocks | No such parts. | N/A |
| **4.5** | **Explosion** | | P |
| 4.5.1 | General | No explosion occurs during normal/abnormal operation and single fault conditions | P |
| 4.5.2 | No explosion during normal/abnormal operating condition | (See Clause B.2, B.3) | P |
| | No harm by explosion during single fault conditions | (See Clause B.4) | P |
| **4.6** | **Fixing of conductors** | See below | P |
| | Fix conductors not to defeat a safeguard | | P |
| | Compliance is checked by test.....: | (See Clause T.2) | P |
| **4.7** | **Equipment for direct insertion into mains socket–outlets** | | N/A |
| 4.7.2 | Mains plug part complies with relevant standard ...: | | N/A |
| 4.7.3 | Torque (Nm) .....: | | N/A |
| **4.8** | **Equipment containing coin/button cell batteries** | | N/A |
| 4.8.1 | General | | N/A |
| 4.8.2 | Instructional safeguard .....: | | N/A |
| 4.8.3 | Battery compartment door/cover construction | | N/A |
| | Open torque test | | N/A |
| 4.8.4.2 | Stress relief test | | N/A |
| 4.8.4.3 | Battery replacement test | | N/A |
| 4.8.4.4 | Drop test | | N/A |
| 4.8.4.5 | Impact test | | N/A |
| 4.8.4.6 | Crush test | | N/A |
| 4.8.5 | Compliance | | N/A |

| EN IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | 30N force test with test probe | | N/A |
| | 20N force test with test hook | | N/A |
| **4.9** | **Likelihood of fire or shock due to entry of conductive object** | | N/A |
| **4.10** | **Component requirements** | | N/A |
| 4.10.1 | Disconnect Device | | N/A |
| 4.10.2 | Switches and relays | | N/A |
| **5** | **ELECTRICALLY-CAUSED INJURY** | | P |
| **5.2** | **Classification and limits of electrical energy sources** | | P |
| 5.2.2 | ES1, ES2 and ES3 limits | | P |
| 5.2.2.2 | Steady-state voltage and current limits .....: | (See appended table 5.2) | P |
| 5.2.2.3 | Capacitance limits .....: | No capacitance | N/A |
| 5.2.2.4 | Single pulse limits.....: | No single pulse introduced | N/A |
| 5.2.2.5 | Limits for repetitive pulses .....: | No repetitive pulses introduced | N/A |
| 5.2.2.6 | Ringing signals | No such ringing signals within the EUT | N/A |
| 5.2.2.7 | Audio signals | No audio signals used | N/A |
| **5.3** | **Protection against electrical energy sources** | | P |
| 5.3.1 | General Requirements for accessible parts to ordinary, instructed and skilled persons | See only 4.3 and 5.3 to 5.5 which applies to protection between the accessible parts and hazardous parts of other circuits. | P |
| 5.3.1 a) | Accessible ES1/ES2 derived from ES2/ES3 circuits | | P |
| 5.3.1 b) | Skilled persons not unintentional contact ES3 bare conductors | | N/A |
| 5.3.2.1 | Accessibility to electrical energy sources and safeguards | Only ES1 circuit can be accessed for this product | P |
| | Accessibility to outdoor equipment bare parts | | N/A |
| 5.3.2.2 | Contact requirements | | N/A |
| | Test with test probe from Annex V | | - |
| 5.3.2.2 a) | Air gap – electric strength test potential (V) .....: | | N/A |
| 5.3.2.2 b) | Air gap – distance (mm) .....: | | N/A |
| 5.3.2.3 | Compliance | | N/A |
| 5.3.2.4 | Terminals for connecting stripped wire | | N/A |

| EN IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| **5.4** | **Insulation materials and requirements** | | P |
| 5.4.1.2 | Properties of insulating material | No insulation as a safeguard. | N/A |
| 5.4.1.3 | Material is non-hygroscopic | | N/A |
| 5.4.1.4 | Maximum operating temperature for insulating materials .....: | (See appended table 5.4.1.4, 9.3, B.1.5, B.2.6, B.3, B.4) | P |
| 5.4.1.5 | Pollution degrees.....: | PD2 considered | P |
| 5.4.1.5.2 | Test for pollution degree 1 environment and for an insulating compound | | N/A |
| 5.4.1.5.3 | Thermal cycling test | | N/A |
| 5.4.1.6 | Insulation in transformers with varying dimensions | | N/A |
| 5.4.1.7 | Insulation in circuits generating starting pulses | | N/A |
| 5.4.1.8 | Determination of working voltage .....: | | N/A |
| 5.4.1.9 | Insulating surfaces | | N/A |
| 5.4.1.10 | Thermoplastic parts on which conductive metallic parts are directly mounted | | N/A |
| 5.4.1.10.2 | Vicat test .....: | | N/A |
| 5.4.1.10.3 | Ball pressure test.....: | | N/A |
| 5.4.2 | Clearances | | N/A |
| 5.4.2.1 | General requirements | | N/A |
| | Clearances in circuits connected to AC Mains, Alternative method | | N/A |
| 5.4.2.2 | Procedure 1 for determining clearance | | N/A |
| | Temporary overvoltage .....: | | — |
| 5.4.2.3 | Procedure 2 for determining clearance | | N/A |
| 5.4.2.3.2.2 | a.c. mains transient voltage .....: | | — |
| 5.4.2.3.2.3 | d.c. mains transient voltage .....: | | — |
| 5.4.2.3.2.4 | External circuit transient voltage.....: | | — |
| 5.4.2.3.2.5 | Transient voltage determined by measurement .....: | | — |
| 5.4.2.4 | Determining the adequacy of a clearance using an electric strength test .....: | | N/A |
| 5.4.2.5 | Multiplication factors for clearances and test voltages .....: | | N/A |
| 5.4.2.6 | Clearance measurement.....: | | N/A |
| 5.4.3 | Creepage distances | | N/A |

| EN IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 5.4.3.1 | General | | N/A |
| 5.4.3.3 | Material group.....: | | — |
| 5.4.3.4 | Creepage distances measurement .....: | | N/A |
| 5.4.4 | Solid insulation | | N/A |
| 5.4.4.1 | General requirements | | N/A |
| 5.4.4.2 | Minimum distance through insulation .....: | | N/A |
| 5.4.4.3 | Insulating compound forming solid insulation | | N/A |
| 5.4.4.4 | Solid insulation in semiconductor devices | | N/A |
| 5.4.4.5 | Insulating compound forming cemented joints | | N/A |
| 5.4.4.6 | Thin sheet material | | N/A |
| 5.4.4.6.1 | General requirements | | N/A |
| 5.4.4.6.2 | Separable thin sheet material | | N/A |
| | Number of layers (pcs) .....: | | N/A |
| 5.4.4.6.3 | Non-separable thin sheet material | | N/A |
| | Number of layers (pcs) .....: | | N/A |
| 5.4.4.6.4 | Standard test procedure for non-separable thin sheet material.....: | | N/A |
| 5.4.4.6.5 | Mandrel test | | N/A |
| 5.4.4.7 | Solid insulation in wound components | | N/A |
| 5.4.4.9 | Solid insulation at frequencies >30 kHz, $E_P$, $K_R$, $d$, $V_{PW}$ (V).....: | | N/A |
| | Alternative by electric strength test, tested voltage (V), $K_R$.....: | | N/A |
| 5.4.5 | Antenna terminal insulation | | N/A |
| 5.4.5.1 | General | | N/A |
| 5.4.5.2 | Voltage surge test | | N/A |
| 5.4.5.3 | Insulation resistance (MΩ) .....: | | N/A |
| | Electric strength test.....: | | N/A |
| 5.4.6 | Insulation of internal wire as part of supplementary safeguard | | N/A |
| 5.4.7 | Tests for semiconductor components and for cemented joints | | N/A |
| 5.4.8 | Humidity conditioning | | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | Relative humidity (%), temperature (°C), duration (h) .....: | | — |
| 5.4.9 | Electric strength test | | N/A |
| 5.4.9.1 | Test procedure for type test of solid insulation.....: | | N/A |
| 5.4.9.2 | Test procedure for routine test | | N/A |
| 5.4.10 | Safeguards against transient voltages from external circuits | | N/A |
| 5.4.10.1 | Parts and circuits separated from external circuits | | N/A |
| 5.4.10.2 | Test methods | | N/A |
| 5.4.10.2.1 | General | | N/A |
| 5.4.10.2.2 | Impulse test .....: | | N/A |
| 5.4.10.2.3 | Steady-state test .....: | | N/A |
| 5.4.10.3 | Verification for insulation breakdown for impulse test.....: | | N/A |
| 5.4.11 | Separation between external circuits and earth | | N/A |
| 5.4.11.1 | Exceptions to separation between external circuits and earth | | N/A |
| 5.4.11.2 | Requirements | | N/A |
| | SPDs bridge separation between external circuit and earth | | N/A |
| | Rated operating voltage $U_{op}$ (V) .....: | | — |
| | Nominal voltage $U_{peak}$ (V) .....: | | — |
| | Max increase due to variation $\Delta U_{sp}$ .....: | | — |
| | Max increase due to ageing $\Delta U_{sa}$ .....: | | — |
| 5.4.11.3 | Test method and compliance .....: | | N/A |
| 5.4.12 | Insulating liquid | | N/A |
| 5.4.12.1 | General requirements | | N/A |
| 5.4.12.2 | Electric strength of an insulating liquid.....: | | N/A |
| 5.4.12.3 | Compatibility of an insulating liquid .....: | | N/A |
| 5.4.12.4 | Container for insulating liquid.....: | | N/A |
| **5.5** | **Components as safeguards** | | N/A |
| 5.5.1 | General | | N/A |
| 5.5.2 | Capacitors and RC units | | N/A |
| 5.5.2.1 | General requirement | | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 5.5.2.2 | Safeguards against capacitor discharge after disconnection of a connector .....: | | N/A |
| 5.5.3 | Transformers | | N/A |
| 5.5.4 | Optocouplers | | N/A |
| 5.5.5 | Relays | | N/A |
| 5.5.6 | Resistors | | N/A |
| 5.5.7 | SPDs | | N/A |
| 5.5.8 | Insulation between the mains and an external circuit consisting of a coaxial cable .....: | | N/A |
| 5.5.9 | Safeguards for socket-outlets in outdoor equipment | | N/A |
| | RCD rated residual operating current (mA).....: | | — |
| **5.6** | **Protective conductor** | | N/A |
| 5.6.2 | Requirement for protective conductors | | N/A |
| 5.6.2.1 | General requirements | | N/A |
| 5.6.2.2 | Colour of insulation | | N/A |
| 5.6.3 | Requirement for protective earthing conductors | | N/A |
| | Protective earthing conductor size ($mm^2$) .....: | | — |
| | Protective earthing conductor serving as a reinforced safeguard | | N/A |
| | Protective earthing conductor serving as a double safeguard | | N/A |
| 5.6.4 | Requirements for protective bonding conductors | | N/A |
| 5.6.4.1 | Protective bonding conductors | | N/A |
| | Protective bonding conductor size ($mm^2$).....: | | — |
| 5.6.4.2 | Protective current rating (A) .....: | | N/A |
| 5.6.5 | Terminals for protective conductors | | N/A |
| 5.6.5.1 | Terminal size for connecting protective earthing conductors (mm) .....: | | N/A |
| | Terminal size for connecting protective bonding conductors (mm) .....: | | N/A |
| 5.6.5.2 | Corrosion | | N/A |
| 5.6.6 | Resistance of the protective bonding system | | N/A |
| 5.6.6.1 | Requirements | | N/A |
| 5.6.6.2 | Test Method .....: | | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 5.6.6.3 | Resistance (Ω) or voltage drop .....: | | N/A |
| 5.6.7 | Reliable connection of a protective earthing conductor | | N/A |
| 5.6.8 | Functional earthing | | N/A |
| | Conductor size ($mm^2$) .....: | | N/A |
| | Class II with functional earthing marking .....: | | N/A |
| | Appliance inlet cl & cr (mm).....: | | N/A |
| **5.7** | **Prospective touch voltage, touch current and protective conductor current** | | N/A |
| 5.7.2 | Measuring devices and networks | | N/A |
| 5.7.2.1 | Measurement of touch current | | N/A |
| 5.7.2.2 | Measurement of voltage | | N/A |
| 5.7.3 | Equipment set-up, supply connections and earth connections | | N/A |
| 5.7.4 | Unearthed accessible parts.....: | | N/A |
| 5.7.5 | Earthed accessible conductive parts.....: | | N/A |
| 5.7.6 | Requirements when touch current exceeds ES2 limits | | N/A |
| | Protective conductor current (mA) .....: | | N/A |
| | Instructional Safeguard .....: | | N/A |
| 5.7.7 | Prospective touch voltage and touch current associated with external circuits | | N/A |
| 5.7.7.1 | Touch current from coaxial cables | | N/A |
| 5.7.7.2 | Prospective touch voltage and touch current associated with paired conductor cables | | N/A |
| 5.7.8 | Summation of touch currents from external circuits | | N/A |
| | a) Equipment connected to earthed external circuits, current (mA) .....: | | N/A |
| | b) Equipment connected to unearthed external circuits, current (mA) .....: | | N/A |
| **5.8** | **Backfeed safeguard in battery backed up supplies** | | N/A |
| | Mains terminal ES .....: | No battery used | N/A |
| | Air gap (mm).....: | | N/A |

| | | |
|---|---|---|
| **6** | **ELECTRICALLY- CAUSED FIRE** | P |
| **6.2** | **Classification of PS and PIS** | P |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 6.2.2 | Power source circuit classifications .....: | (See appended table 6.2.2) | P |
| 6.2.3 | Classification of potential ignition sources | Only PS1 | N/A |
| 6.2.3.1 | Arcing PIS .....: | | N/A |
| 6.2.3.2 | Resistive PIS .....: | | N/A |
| **6.3** | **Safeguards against fire under normal operating and abnormal operating conditions** | | P |
| 6.3.1 | No ignition and attainable temperature value less than 90 % defined by ISO 871 or less than 300 °C for unknown materials .....: | (See appended table B.1.5 and B.3) | P |
| | Combustible materials outside fire enclosure .....: | | N/A |
| **6.4** | **Safeguards against fire under single fault conditions** | | P |
| 6.4.1 | Safeguard method | Method by control of fire spread applied, Fire enclosure provided. | 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 | | N/A |
| 6.4.3.1 | Supplementary safeguards | | N/A |
| 6.4.3.2 | Single Fault Conditions .....: | | N/A |
| | Special conditions for temperature limited by fuse | | N/A |
| 6.4.4 | Control of fire spread in PS1 circuits | | P |
| 6.4.5 | Control of fire spread in PS2 circuits | Only PS1 | N/A |
| 6.4.5.2 | Supplementary safeguards | | N/A |
| 6.4.6 | Control of fire spread in PS3 circuits | Only PS1 | N/A |
| 6.4.7 | Separation of combustible materials from a PIS | | N/A |
| 6.4.7.2 | Separation by distance | | N/A |
| 6.4.7.3 | Separation by a fire barrier | | N/A |
| 6.4.8 | Fire enclosures and fire barriers | Only PS1,no fire enclosures and barriers required | N/A |
| 6.4.8.2 | Fire enclosure and fire barrier material properties | | N/A |
| 6.4.8.2.1 | Requirements for a fire barrier | | N/A |
| 6.4.8.2.2 | Requirements for a fire enclosure | | N/A |
| 6.4.8.3 | Constructional requirements for a fire enclosure and a fire barrier | | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 6.4.8.3.1 | Fire enclosure and fire barrier openings | | N/A |
| 6.4.8.3.2 | Fire barrier dimensions | | N/A |
| 6.4.8.3.3 | Top openings and properties | No openings. | N/A |
| | Openings dimensions (mm) .....: | | N/A |
| 6.4.8.3.4 | Bottom openings and properties | No openings. | N/A |
| | Openings dimensions (mm) .....: | | N/A |
| | Flammability tests for the bottom of a fire enclosure | | N/A |
| | Instructional Safeguard .....: | | N/A |
| 6.4.8.3.5 | Side openings and properties | No openings. | N/A |
| | Openings dimensions (mm) .....: | | N/A |
| 6.4.8.3.6 | Integrity of a fire enclosure, condition met: a), b) or c).....: | | N/A |
| 6.4.8.4 | Separation of a PIS from a fire enclosure and a fire barrier distance (mm) or flammability rating.....: | | N/A |
| 6.4.9 | Flammability of insulating liquid.....: | | N/A |
| **6.5** | **Internal and external wiring** | | P |
| 6.5.1 | General requirements | | P |
| 6.5.2 | Requirements for interconnection to building wiring .....: | No such wire used | N/A |
| 6.5.3 | Internal wiring size ($mm^2$) for socket-outlets .....: | | N/A |
| **6.6** | **Safeguards against fire due to the connection to additional equipment** | | N/A |
| **7** | **INJURY CAUSED BY HAZARDOUS SUBSTANCES** | | N/A |
| **7.2** | **Reduction of exposure to hazardous substances** | | N/A |
| **7.3** | **Ozone exposure** | | N/A |
| **7.4** | **Use of personal safeguards or personal protective equipment (PPE)** | | N/A |
| | Personal safeguards and instructions .....: | | — |
| **7.5** | **Use of instructional safeguards and instructions** | | N/A |
| | Instructional safeguard (ISO 7010) .....: | | — |
| **7.6** | **Batteries and their protection circuits** | | N/A |
| **8** | **MECHANICALLY-CAUSED INJURY** | | P |
| **8.2** | **Mechanical energy source classifications** | | P |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| **8.3** | **Safeguards against mechanical energy sources** | | P |
| **8.4** | **Safeguards against parts with sharp edges and corners** | | P |
| 8.4.1 | Safeguards | | N/A |
| | Instructional Safeguard .....: | | N/A |
| 8.4.2 | Sharp edges or corners | The sharp edges and corners of the equipment are considered as MS1. | P |
| **8.5** | **Safeguards against moving parts** | | N/A |
| 8.5.1 | Fingers, jewellery, clothing, hair, etc., contact with MS2 or MS3 parts | No moving parts. | N/A |
| | MS2 or MS3 part required to be accessible for the function of the equipment | See above. | N/A |
| | Moving MS3 parts only accessible to skilled person | | N/A |
| 8.5.2 | Instructional safeguard.....: | | N/A |
| 8.5.4 | Special categories of equipment containing moving parts | | N/A |
| 8.5.4.1 | General | | N/A |
| 8.5.4.2 | Equipment containing work cells with MS3 parts | | N/A |
| 8.5.4.2.1 | Protection of persons in the work cell | | N/A |
| 8.5.4.2.2 | Access protection override | | N/A |
| 8.5.4.2.2.1 | Override system | | N/A |
| 8.5.4.2.2.2 | Visual indicator | | N/A |
| 8.5.4.2.3 | Emergency stop system | | N/A |
| | Maximum stopping distance from the point of activation (m).....: | | N/A |
| | Space between end point and nearest fixed mechanical part (mm) .....: | | N/A |
| 8.5.4.2.4 | Endurance requirements | | N/A |
| | Mechanical system subjected to 100 000 cycles of operation | | N/A |
| | - Mechanical function check and visual inspection | | N/A |
| | - Cable assembly.....: | | N/A |
| 8.5.4.3 | Equipment having electromechanical device for destruction of media | | N/A |
| 8.5.4.3.1 | Equipment safeguards | | N/A |
| 8.5.4.3.2 | Instructional safeguards against moving parts.....: | | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.5.4.3.3 | Disconnection from the supply | | N/A |
| 8.5.4.3.4 | Cut type and test force (N) ..... : | | N/A |
| 8.5.4.3.5 | Compliance | | N/A |
| 8.5.5 | High pressure lamps | No high pressure lamps used. | N/A |
| | Explosion test ..... : | | N/A |
| 8.5.5.3 | Glass particles dimensions (mm) ..... : | | N/A |
| **8.6** | **Stability of equipment** | | N/A |
| 8.6.1 | General | MS1: Mass of the unit | N/A |
| | Instructional safeguard ..... : | | N/A |
| 8.6.2 | Static stability | | N/A |
| 8.6.2.2 | Static stability test ..... : | | N/A |
| 8.6.2.3 | Downward force test | | N/A |
| 8.6.3 | Relocation stability | | N/A |
| | Wheels diameter (mm) ..... : | | — |
| | Tilt test | | N/A |
| 8.6.4 | Glass slide test | | N/A |
| 8.6.5 | Horizontal force test ..... : | | N/A |
| **8.7** | **Equipment mounted to wall, ceiling or other structure** | | N/A |
| 8.7.1 | Mount means type ..... : | | N/A |
| 8.7.2 | Test methods | | N/A |
| | Test 1, additional downwards force (N) ..... : | | N/A |
| | Test 2, number of attachment points and test force (N) ..... : | | N/A |
| | Test 3 Nominal diameter (mm) and applied torque (Nm) ..... : | | N/A |
| **8.8** | **Handles strength** | | N/A |
| 8.8.1 | General | No handles | N/A |
| 8.8.2 | Handle strength test | | N/A |
| | Number of handles ..... : | | — |
| | Force applied (N) ..... : | | — |
| **8.9** | **Wheels or casters attachment requirements** | | N/A |
| 8.9.2 | Pull test | No such parts | N/A |
| **8.10** | **Carts, stands and similar carriers** | | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.10.1 | General | No carts, stands or similar carriers | N/A |
| 8.10.2 | Marking and instructions .....: | | N/A |
| 8.10.3 | Cart, stand or carrier loading test | | N/A |
| | Loading force applied (N).....: | | N/A |
| 8.10.4 | Cart, stand or carrier impact test | | N/A |
| 8.10.5 | Mechanical stability | | N/A |
| | Force applied (N).....: | | — |
| 8.10.6 | Thermoplastic temperature stability | | N/A |
| **8.11** | **Mounting means for slide-rail mounted equipment (SRME)** | | N/A |
| 8.11.1 | General | No such parts | N/A |
| 8.11.2 | Requirements for slide rails | | N/A |
| | Instructional Safeguard .....: | | N/A |
| 8.11.3 | Mechanical strength test | | N/A |
| 8.11.3.1 | Downward force test, force (N) applied .....: | | N/A |
| 8.11.3.2 | Lateral push force test | | N/A |
| 8.11.3.3 | Integrity of slide rail end stops | | N/A |
| 8.11.4 | Compliance | | N/A |
| **8.12** | **Telescoping or rod antennas** | | N/A |
| | Button/ball diameter (mm).....: | No such parts | — |

| | | | |
|---|---|---|---|
| **9** | **THERMAL BURN INJURY** | | P |
| **9.2** | **Thermal energy source classifications** | | P |
| **9.3** | **Touch temperature limits** | | P |
| 9.3.1 | Touch temperatures of accessible parts .....: | (See appended table 5.4.1.4, 9.3, B.1.5, B.2.6) | P |
| 9.3.2 | Test method and compliance | See B.1.6 & B.2.3 | P |
| **9.4** | **Safeguards against thermal energy sources** | | P |
| **9.5** | **Requirements for safeguards** | | P |
| 9.5.1 | Equipment safeguard | Enclosure provided to limit the transfer of thermal energy of internal parts under normal operating conditions and abnormal operating conditions. | P |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 9.5.2 | Instructional safeguard.....: | Instructional safeguard is not required. | N/A |
| **9.6** | **Requirements for wireless power transmitters** | | N/A |
| 9.6.1 | General | No wireless power transmitters | N/A |
| 9.6.2 | Specification of the foreign objects | | N/A |
| 9.6.3 | Test method and compliance.....: | | N/A |
| **10** | **RADIATION** | | P |
| **10.2** | **Radiation energy source classification** | | P |
| 10.2.1 | General classification | See below | P |
| | Lasers.....: | | — |
| | Lamps and lamp systems.....: | RS1: LED only for indicating use which is considered as low power application. | — |
| | Image projectors.....: | | — |
| | X-Ray.....: | | — |
| | Personal music player .....: | | — |
| **10.3** | **Safeguards against laser radiation** | | N/A |
| | The standard(s) equipment containing laser(s) comply .....: | No laser radiation | N/A |
| **10.4** | **Safeguards against optical radiation from lamps and lamp systems (including LED types)** | | P |
| 10.4.1 | General requirements | LED indication light: Classed as RS1 (Exempt Group) | P |
| | Instructional safeguard provided for accessible radiation level needs to exceed | | N/A |
| | Risk group marking and location .....: | | N/A |
| | Information for safe operation and installation | | N/A |
| 10.4.2 | Requirements for enclosures | | N/A |
| | UV radiation exposure.....: | | N/A |
| 10.4.3 | Instructional safeguard .....: | | N/A |
| **10.5** | **Safeguards against X-radiation** | | N/A |
| 10.5.1 | Requirements | No X-radiation | N/A |
| | Instructional safeguard for skilled persons.....: | | — |
| 10.5.3 | Maximum radiation (pA/kg) .....: | | — |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| **10.6** | **Safeguards against acoustic energy sources** | | N/A |
| 10.6.1 | General | No such equipment | N/A |
| 10.6.2 | Classification | | N/A |
| | Acoustic output $L_{Aeq,T}$, dB(A).....: | | N/A |
| | Unweighted RMS output voltage (mV).....: | | N/A |
| | Digital output signal (dBFS) .....: | | N/A |
| 10.6.3 | Requirements for dose-based systems | | N/A |
| 10.6.3.1 | General requirements | | N/A |
| 10.6.3.2 | Dose-based warning and automatic decrease | | N/A |
| 10.6.3.3 | Exposure-based warning and requirements | | N/A |
| | 30 s integrated exposure level (MEL30).....: | | N/A |
| | Warning for MEL ≥ 100 dB(A).....: | | N/A |
| 10.6.4 | Measurement methods | | N/A |
| 10.6.5 | Protection of persons | | N/A |
| | Instructional safeguards .....: | | N/A |
| 10.6.6 | Requirements for listening devices (headphones, earphones, etc.) | | N/A |
| 10.6.6.1 | Corded listening devices with analogue input | | N/A |
| | Listening device input voltage (mV) .....: | | N/A |
| 10.6.6.2 | Corded listening devices with digital input | | N/A |
| | Max. acoustic output $L_{Aeq,T}$, dB(A) .....: | | N/A |
| 10.6.6.3 | Cordless listening devices | | N/A |
| | Max. acoustic output $L_{Aeq,T}$, dB(A) .....: | | N/A |

| | | | |
|---|---|---|---|
| **B** | **NORMAL OPERATING CONDITION TESTS, ABNORMAL OPERATING CONDITION TESTS AND SINGLE FAULT CONDITION TESTS** | | P |
| **B.1** | **General** | | P |
| B.1.5 | Temperature measurement conditions | (See appended table B.1.5) | P |
| **B.2** | **Normal operating conditions** | | P |
| B.2.1 | General requirements.....: | (See Test Item Particulars and appended test tables) | P |
| | Audio Amplifiers and equipment with audio amplifiers .....: | Not such equipment. | N/A |
| B.2.3 | Supply voltage and tolerances | Rated voltage 3Vdc | P |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| B.2.5 | Input test.....: | (See appended table B.2.5) | P |
| **B.3** | **Simulated abnormal operating conditions** | | P |
| B.3.1 | General | (See appended table B.3) | P |
| B.3.2 | Covering of ventilation openings | No openings | N/A |
| | Instructional safeguard.....: | | N/A |
| B.3.3 | DC mains polarity test | Not supplied by D.C. mains | N/A |
| B.3.4 | Setting of voltage selector | No voltage selector used. | N/A |
| B.3.5 | Maximum load at output terminals | | N/A |
| B.3.6 | Reverse battery polarity | | P |
| B.3.7 | Audio amplifier abnormal operating conditions | Not such equipment. | N/A |
| B.3.8 | Safeguards functional during and after abnormal operating conditions .....: | During an abnormal operating condition that does not lead to a single fault condition, all safeguards are remained effective. After restoration of normal operating conditions, all safeguards are compliant with applicable requirements. For those abnormal operating conditions lead to single fault conditions, see Clause B.4. | P |
| **B.4** | **Simulated single fault conditions** | | P |
| B.4.1 | General | | P |
| B.4.2 | Temperature controlling device | No such device used. | N/A |
| B.4.3 | Blocked motor test | No motors used. | N/A |
| B.4.4 | Functional insulation | See below. | P |
| B.4.4.1 | Short circuit of clearances for functional insulation | (See appended table B.4) | P |
| B.4.4.2 | Short circuit of creepage distances for functional insulation | (See appended table B.4) | P |
| B.4.4.3 | Short circuit of functional insulation on coated printed boards | No coated printed boards used. | N/A |
| B.4.5 | Short-circuit and interruption of electrodes in tubes and semiconductors | (See appended table B.4) | P |
| B.4.6 | Short circuit or disconnection of passive components | (See appended table B.4) | P |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 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 | Compliance during and after single fault conditions .....: | (See appended table B.4) | P |
| B.4.9 | Battery charging and discharging under single fault conditions | No such battery | N/A |
| **C** | **UV RADIATION** | | N/A |
| **C.1** | **Protection of materials in equipment from UV radiation** | | N/A |
| C.1.2 | Requirements | No such UV generated from the equipment. | N/A |
| C.1.3 | Test method | | N/A |
| **C.2** | **UV light conditioning test** | | N/A |
| C.2.1 | Test apparatus .....: | | N/A |
| C.2.2 | Mounting of test samples | | N/A |
| C.2.3 | Carbon-arc light-exposure test | | N/A |
| C.2.4 | Xenon-arc light-exposure test | | N/A |
| **D** | **TEST GENERATORS** | | N/A |
| **D.1** | **Impulse test generators** | | N/A |
| **D.2** | **Antenna interface test generator** | | N/A |
| **D.3** | **Electronic pulse generator** | | N/A |
| **E** | **TEST CONDITIONS FOR EQUIPMENT CONTAINING AUDIO AMPLIFIERS** | | N/A |
| **E.1** | **Electrical energy source classification for audio signals** | | N/A |
| | Maximum non-clipped output power (W) .....: | | — |
| | Rated load impedance (Ω) .....: | | — |
| | Open-circuit output voltage (V) .....: | | — |
| | Instructional safeguard.....: | | — |
| **E.2** | **Audio amplifier normal operating conditions** | | N/A |
| | Audio signal source type .....: | | — |
| | Audio output power (W).....: | | — |
| | Audio output voltage (V).....: | | — |
| | Rated load impedance (Ω) .....: | | — |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | Requirements for temperature measurement | | N/A |
| E.3 | Audio amplifier abnormal operating conditions | | N/A |
| **F** | **EQUIPMENT MARKINGS, INSTRUCTIONS, AND INSTRUCTIONAL SAFEGUARDS** | | P |
| **F.1** | **General** | | P |
| | Language .....: | English | — |
| **F.2** | **Letter symbols and graphical symbols** | | P |
| F.2.1 | Letter symbols according to IEC60027-1 | Letter symbols for quantities and units are complied with IEC 60027-1. | P |
| F.2.2 | Graphic symbols according to IEC, ISO or manufacturer specific | Graphical symbols are complied with IEC 60417, ISO 3864-2, ISO 7000 or ISO 7010. | P |
| **F.3** | **Equipment markings** | | P |
| F.3.1 | Equipment marking locations | The required marking is located on the enclosure of the equipment and is easily visible. | P |
| F.3.2 | Equipment identification markings | See copy of marking plate. | P |
| F.3.2.1 | Manufacturer identification .....: | See copy of marking plate | P |
| F.3.2.2 | Model identification .....: | See copy of marking plate | P |
| F.3.3 | Equipment rating markings | Unit didn't direct connection to the mains, it need not be marked with any electrical rating. | N/A |
| F.3.3.1 | Equipment with direct connection to mains | | N/A |
| F.3.3.2 | Equipment without direct connection to mains | | N/A |
| F.3.3.3 | Nature of the supply voltage.....: | | N/A |
| F.3.3.4 | Rated voltage .....: | | N/A |
| F.3.3.5 | Rated frequency.....: | | N/A |
| F.3.3.6 | Rated current or rated power .....: | | N/A |
| F.3.3.7 | Equipment with multiple supply connections | | N/A |
| F.3.4 | Voltage setting device | No voltage setting device. | N/A |
| F.3.5 | Terminals and operating devices | See below. | N/A |
| F.3.5.1 | Mains appliance outlet and socket-outlet markings .....: | No outlet used. | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| F.3.5.2 | Switch position identification marking .....: | No switch used. | N/A |
| F.3.5.3 | Replacement fuse identification and rating markings.....: | | N/A |
| | Instructional safeguards for neutral fuse .....: | | N/A |
| F.3.5.4 | Replacement battery identification marking .....: | No such battery on the equipment. See sub-clause F.5 | N/A |
| F.3.5.5 | Neutral conductor terminal | | N/A |
| F.3.5.6 | Terminal marking location | | N/A |
| F.3.6 | Equipment markings related to equipment classification | | 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 | Protective bonding conductor terminals .....: | | N/A |
| F.3.6.2 | Equipment class marking .....: | | N/A |
| F.3.6.3 | Functional earthing terminal marking .....: | | N/A |
| F.3.7 | Equipment IP rating marking.....: | IPX0 | N/A |
| F.3.8 | External power supply output marking .....: | | N/A |
| F.3.9 | Durability, legibility and permanence of marking | Marking is considered to be legible and easily discernible. See also the following details. | P |
| F.3.10 | Test for permanence of markings | The label was subjected to the permanence of marking test. The label was rubbed with cloth soaked with water for 15 sec. And then again for 15 sec. With the cloth soaked with petroleum spirit. After this test there was no damage to the label. The marking on the label did not fade. There was no curling and lifting of the label edge. After each test, the marking remained legible. | P |
| **F.4** | **Instructions** | | P |
| | a) Information prior to installation and initial use | Provided in the manual. | P |
| | b) Equipment for use in locations where children not likely to be present | Not such equipment | N/A |
| | c) Instructions for installation and interconnection | Not such equipment | P |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | d) Equipment intended for use only in restricted access area | Not such equipment | N/A |
| | e) Equipment intended to be fastened in place | Not such equipment | N/A |
| | f) Instructions for audio equipment terminals | No such terminals provided. | N/A |
| | g) Protective earthing used as a safeguard | | N/A |
| | h) Protective conductor current exceeding ES2 limits | | N/A |
| | i) Graphic symbols used on equipment | | N/A |
| | j) Permanently connected equipment not provided with all-pole mains switch | Not permanently connected equipment. | N/A |
| | k) Replaceable components or modules providing safeguard function | No such markings. | N/A |
| | l) Equipment containing insulating liquid | No such liquid. | N/A |
| | m) Installation instructions for outdoor equipment | Not such equipment | N/A |
| **F.5** | Instructional safeguards | | N/A |
| **G** | **COMPONENTS** | | P |
| **G.1** | **Switches** | | N/A |
| G.1.1 | General | No switches | N/A |
| G.1.2 | Ratings, endurance, spacing, maximum load | | N/A |
| G.1.3 | Test method and compliance | | N/A |
| **G.2** | **Relays** | | N/A |
| G.2.1 | Requirements | No relays | N/A |
| G.2.2 | Overload test | | N/A |
| G.2.3 | Relay controlling connectors supplying power to other equipment | | N/A |
| G.2.4 | Test method and compliance | | N/A |
| **G.3** | **Protective devices** | | N/A |
| G.3.1 | Thermal cut-offs | No thermal cut-offs | N/A |
| | Thermal cut-outs separately approved according to IEC 60730 with conditions indicated in a) & b) | | N/A |
| | Thermal cut-outs tested as part of the equipment as indicated in c) | | N/A |
| G.3.1.2 | Test method and compliance | | N/A |
| G.3.2 | Thermal links | No thermal-links | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| G.3.2.1 | a) Thermal links tested separately according to IEC 60691 with specifics | | N/A |
| | b) Thermal links tested as part of the equipment | | N/A |
| G.3.2.2 | Test method and compliance | | N/A |
| G.3.3 | PTC thermistors | No PTC thermistor provided as safeguard within the equipment. | N/A |
| G.3.4 | Overcurrent protection devices | | N/A |
| G.3.5 | Safeguards components not mentioned in G.3.1 to G.3.4 | | N/A |
| G.3.5.1 | Non-resettable devices suitably rated and marking provided | | N/A |
| G.3.5.2 | Single faults conditions.....: | | N/A |
| **G.4** | **Connectors** | | N/A |
| G.4.1 | Spacings | | N/A |
| G.4.2 | Mains connector configuration .....: | | N/A |
| G.4.3 | Plug is shaped that insertion into mains socket-outlets or appliance coupler is unlikely | | N/A |
| **G.5** | **Wound components** | | N/A |
| G.5.1 | Wire insulation in wound components | | N/A |
| G.5.1.2 | Protection against mechanical stress | | N/A |
| G.5.2 | Endurance test | | N/A |
| G.5.2.1 | General test requirements | | N/A |
| G.5.2.2 | Heat run test | | N/A |
| | Test time (days per cycle) .....: | | — |
| | Test temperature (°C).....: | | — |
| G.5.2.3 | Wound components supplied from the mains | | N/A |
| G.5.2.4 | No insulation breakdown | | N/A |
| G.5.3 | Transformers | | N/A |
| G.5.3.1 | Compliance method .....: | | N/A |
| | Position.....: | | N/A |
| | Method of protection.....: | | N/A |
| G.5.3.2 | Insulation | | N/A |
| | Protection from displacement of windings.....: | | — |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| G.5.3.3 | Transformer overload tests | | N/A |
| G.5.3.3.1 | Test conditions | | N/A |
| G.5.3.3.2 | Winding temperatures | | N/A |
| G.5.3.3.3 | Winding temperatures - alternative test method | | N/A |
| G.5.3.4 | Transformers using FIW | | N/A |
| G.5.3.4.1 | General | | N/A |
| | FIW wire nominal diameter.....: | | — |
| G.5.3.4.2 | Transformers with basic insulation only | | N/A |
| G.5.3.4.3 | Transformers with double insulation or reinforced insulation .....: | | N/A |
| G.5.3.4.4 | Transformers with FIW wound on metal or ferrite core | | N/A |
| G.5.3.4.5 | Thermal cycling test and compliance | | N/A |
| G.5.3.4.6 | Partial discharge test | | N/A |
| G.5.3.4.7 | Routine test | | N/A |
| G.5.4 | Motors | No motors | N/A |
| G.5.4.1 | General requirements | | N/A |
| G.5.4.2 | Motor overload test conditions | | N/A |
| G.5.4.3 | Running overload test | | N/A |
| G.5.4.4.2 | Locked-rotor overload test | | N/A |
| | Test duration (days) .....: | | — |
| G.5.4.5 | Running overload test for DC motors | | N/A |
| G.5.4.5.2 | Tested in the unit | | N/A |
| G.5.4.5.3 | Alternative method | | N/A |
| G.5.4.6 | Locked-rotor overload test for DC motors | | N/A |
| G.5.4.6.2 | Tested in the unit | | N/A |
| | Maximum Temperature .....: | | N/A |
| G.5.4.6.3 | Alternative method | | N/A |
| G.5.4.7 | Motors with capacitors | | N/A |
| G.5.4.8 | Three-phase motors | | N/A |
| G.5.4.9 | Series motors | | N/A |
| | Operating voltage .....: | | — |
| **G.6** | **Wire Insulation** | | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| G.6.1 | General | | N/A |
| G.6.2 | Enamelled winding wire insulation | | N/A |
| **G.7** | **Mains supply cords** | | N/A |
| G.7.1 | General requirements | | N/A |
| | Type.....: | | — |
| G.7.2 | Cross sectional area ($mm^2$ or AWG).....: | | N/A |
| G.7.3 | Cord anchorages and strain relief for non-detachable power supply cords | | N/A |
| G.7.3.2 | Cord strain relief | | N/A |
| G.7.3.2.1 | Requirements | | N/A |
| | Strain relief test force (N) .....: | | N/A |
| G.7.3.2.2 | Strain relief mechanism failure | | N/A |
| G.7.3.2.3 | Cord sheath or jacket position, distance (mm).....: | | N/A |
| G.7.3.2.4 | Strain relief and cord anchorage material | | N/A |
| G.7.4 | Cord Entry | | N/A |
| G.7.5 | Non-detachable cord bend protection | | N/A |
| G.7.5.1 | Requirements | | N/A |
| G.7.5.2 | Test method and compliance | | N/A |
| | Overall diameter or minor overall dimension, *D* (mm) .....: | | — |
| | Radius of curvature after test (mm).....: | | — |
| G.7.6 | Supply wiring space | | N/A |
| G.7.6.1 | General requirements | | N/A |
| G.7.6.2 | Stranded wire | | N/A |
| G.7.6.2.1 | Requirements | | N/A |
| G.7.6.2.2 | Test with 8 mm strand | | N/A |
| **G.8** | **Varistors** | | N/A |
| G.8.1 | General requirements | No varistors used | N/A |
| G.8.2 | Safeguards against fire | | N/A |
| G.8.2.1 | General | | N/A |
| G.8.2.2 | Varistor overload test | | N/A |
| G.8.2.3 | Temporary overvoltage test | | N/A |
| **G.9** | **Integrated circuit (IC) current limiters** | | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| G.9.1 | Requirements | No such IC | N/A |
| | IC limiter output current (max. 5A) .....: | | — |
| | Manufacturers' defined drift .....: | | — |
| G.9.2 | Test Program | | N/A |
| G.9.3 | Compliance | | N/A |
| **G.10** | **Resistors** | | N/A |
| G.10.1 | General | The bleeder resistors used after X - capacitor, not relied upon as safeguard, no test necessary. See 5.5.6. | N/A |
| G.10.2 | Conditioning | | N/A |
| G.10.3 | Resistor test | | N/A |
| G.10.4 | Voltage surge test | | N/A |
| G.10.5 | Impulse test | | N/A |
| G.10.6 | Overload test | | N/A |
| **G.11** | **Capacitors and RC units** | | N/A |
| G.11.1 | General requirements | | N/A |
| G.11.2 | Conditioning of capacitors and RC units | | N/A |
| G.11.3 | Rules for selecting capacitors | | N/A |
| **G.12** | **Optocouplers** | | N/A |
| | Optocouplers comply with IEC 60747-5-5 with specifics | | N/A |
| | Type test voltage $V_{ini,a}$ .....: | | — |
| | Routine test voltage, $V_{ini,b}$ .....: | | — |
| **G.13** | **Printed boards** | | P |
| G.13.1 | General requirements | See the following details. | P |
| G.13.2 | Uncoated printed boards | The insulation between conductors on the outer surfaces of an uncoated printed board complied with the minimum clearance and creepage requirements | P |
| G.13.3 | Coated printed boards | No coated printed board or multilayer board applied for within the equipment. | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| G.13.4 | Insulation between conductors on the same inner surface | | N/A |
| G.13.5 | Insulation between conductors on different surfaces | | N/A |
| | Distance through insulation .....: | | N/A |
| | Number of insulation layers (pcs) .....: | | — |
| G.13.6 | Tests on coated printed boards | | N/A |
| G.13.6.1 | Sample preparation and preliminary inspection | | N/A |
| G.13.6.2 | Test method and compliance | | N/A |
| **G.14** | **Coating on components terminals** | | N/A |
| G.14.1 | Requirements .....: | No such coating | N/A |
| **G.15** | **Pressurized liquid filled components** | | N/A |
| G.15.1 | Requirements | No such liquid | N/A |
| G.15.2 | Test methods and compliance | | N/A |
| G.15.2.1 | Hydrostatic pressure test | | N/A |
| G.15.2.2 | Creep resistance test | | N/A |
| G.15.2.3 | Tubing and fittings compatibility test | | N/A |
| G.15.2.4 | Vibration test | | N/A |
| G.15.2.5 | Thermal cycling test | | N/A |
| G.15.2.6 | Force test | | N/A |
| G.15.3 | Compliance | | N/A |
| **G.16** | **IC including capacitor discharge function (ICX)** | | N/A |
| G.16.1 | Condition for fault tested is not required | No such ICX | N/A |
| | ICX with associated circuitry tested in equipment | | N/A |
| | ICX tested separately | | N/A |
| G.16.2 | Tests | | N/A |
| | Smallest capacitance and smallest resistance specified by ICX manufacturer for impulse test.....: | | — |
| | Mains voltage that impulses to be superimposed on .....: | | — |
| | Largest capacitance and smallest resistance for ICX tested by itself for 10000 cycles test .....: | | — |
| G.16.3 | Capacitor discharge test.....: | | N/A |
| **H** | **CRITERIA FOR TELEPHONE RINGING SIGNALS** | | N/A |
| **H.1** | **General** | | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| **H.2** | **Method A** | | N/A |
| **H.3** | **Method B** | | N/A |
| H.3.1 | Ringing signal | No telephone ringing signal generated within the equipment. | N/A |
| H.3.1.1 | Frequency (Hz) .....: | | — |
| H.3.1.2 | Voltage (V) .....: | | — |
| H.3.1.3 | Cadence; time (s) and voltage (V) .....: | | — |
| H.3.1.4 | Single fault current (mA):.....: | | — |
| H.3.2 | Tripping device and monitoring voltage | | N/A |
| H.3.2.1 | Conditions for use of a tripping device or a monitoring voltage | | N/A |
| H.3.2.2 | Tripping device | | N/A |
| H.3.2.3 | Monitoring voltage (V) .....: | | N/A |
| **J** | **INSULATED WINDING WIRES FOR USE WITHOUT INTERLEAVED INSULATION** | | N/A |
| **J.1** | **General** | | N/A |
| | Winding wire insulation.....: | | — |
| | Solid round winding wire, diameter (mm).....: | | N/A |
| | Solid square and rectangular (flatwise bending) winding wire, cross-sectional area ($mm^2$) .....: | | N/A |
| **J.2/J.3** | Tests and Manufacturing | | — |
| **K** | **SAFETY INTERLOCKS** | | N/A |
| **K.1** | **General requirements** | | N/A |
| | Instructional safeguard.....: | No safety interlock provided. | N/A |
| **K.2** | **Components of safety interlock safeguard mechanism** | | N/A |
| **K.3** | **Inadvertent change of operating mode** | | N/A |
| **K.4** | **Interlock safeguard override** | | N/A |
| **K.5** | **Fail-safe** | | N/A |
| K.5.1 | Under single fault condition | | N/A |
| **K.6** | **Mechanically operated safety interlocks** | | N/A |
| K.6.1 | Endurance requirement | | N/A |
| K.6.2 | Test method and compliance .....: | | N/A |
| **K.7** | **Interlock circuit isolation** | | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| K.7.1 | Separation distance for contact gaps & interlock circuit elements | | N/A |
| | In circuit connected to mains, separation distance for contact gaps (mm) .....: | | N/A |
| | In circuit isolated from mains, separation distance for contact gaps (mm) .....: | | N/A |
| | Electric strength test before and after the test of K.7.2 .....: | (See appended table 5.4.9) | N/A |
| K.7.2 | Overload test, Current (A) .....: | | N/A |
| K.7.3 | Endurance test | | N/A |
| K.7.4 | Electric strength test | | N/A |
| **L** | **DISCONNECT DEVICES** | | N/A |
| **L.1** | **General requirements** | | N/A |
| **L.2** | **Permanently connected equipment** | | N/A |
| **L.3** | **Parts that remain energized** | | N/A |
| **L.4** | **Single-phase equipment** | | N/A |
| **L.5** | **Three-phase equipment** | | N/A |
| **L.6** | **Switches as disconnect devices** | | N/A |
| **L.7** | **Plugs as disconnect devices** | | N/A |
| **L.8** | **Multiple power sources** | | N/A |
| | Instructional safeguard.....: | | N/A |
| **M** | **EQUIPMENT CONTAINING BATTERIES AND THEIR PROTECTION CIRCUITS** | | N/A |
| **M.1** | **General requirements** | | N/A |
| **M.2** | **Safety of batteries and their cells** | | N/A |
| M.2.1 | Batteries and their cells comply with relevant IEC standards.....: | No battery used | N/A |
| **M.3** | **Protection circuits for batteries provided within the equipment** | | N/A |
| M.3.1 | Requirements | | N/A |
| M.3.2 | Test method | | N/A |
| | Overcharging of a rechargeable battery | | N/A |
| | Excessive discharging | | N/A |
| | Unintentional charging of a non-rechargeable battery | | N/A |
| | Reverse charging of a rechargeable battery | | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| M.3.3 | Compliance | | N/A |
| **M.4** | **Additional safeguards for equipment containing a portable secondary lithium battery** | | N/A |
| M.4.1 | General | | N/A |
| M.4.2 | Charging safeguards | | N/A |
| M.4.2.1 | Requirements | | N/A |
| M.4.2.2 | Compliance .....: | | N/A |
| M.4.3 | Fire enclosure.....: | | N/A |
| M.4.4 | Drop test of equipment containing a secondary lithium battery | | N/A |
| M.4.4.2 | Preparation and procedure for the drop test | | N/A |
| M.4.4.3 | Drop, Voltage on reference and dropped batteries (V); voltage difference during 24 h period (%): .....: | | N/A |
| M.4.4.4 | Check of the charge/discharge function | | N/A |
| M.4.4.5 | Charge / discharge cycle test | | N/A |
| M.4.4.6 | Compliance | | N/A |
| **M.5** | **Risk of burn due to short-circuit during carrying** | | N/A |
| M.5.1 | Requirement | | N/A |
| M.5.2 | Test method and compliance | | N/A |
| **M.6** | **Safeguards against short-circuits** | | N/A |
| M.6.1 | External and internal faults | | N/A |
| M.6.2 | Compliance | | N/A |
| **M.7** | **Risk of explosion from lead acid and NiCd batteries** | | N/A |
| M.7.1 | Ventilation preventing explosive gas concentration | | N/A |
| | Calculated hydrogen generation rate .....: | | N/A |
| M.7.2 | Test method and compliance | | N/A |
| | Minimum air flow rate, $Q$ ($m^3/h$).....: | | N/A |
| M.7.3 | Ventilation tests | | N/A |
| M.7.3.1 | General | | N/A |
| M.7.3.2 | Ventilation test – alternative 1 | | N/A |
| | Hydrogen gas concentration (%).....: | | N/A |
| M.7.3.3 | Ventilation test – alternative 2 | | N/A |
| | Obtained hydrogen generation rate .....: | | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| M.7.3.4 | Ventilation test – alternative 3 | | N/A |
| | Hydrogen gas concentration (%).....: | | N/A |
| M.7.4 | Marking.....: | | N/A |
| **M.8** | **Protection against internal ignition from external spark sources of batteries with aqueous electrolyte** | | N/A |
| M.8.1 | General | | N/A |
| M.8.2 | Test method | | N/A |
| M.8.2.1 | General | | N/A |
| M.8.2.2 | Estimation of hypothetical volume $V_z$ ($m^3$/s) .....: | | — |
| M.8.2.3 | Correction factors .....: | | — |
| M.8.2.4 | Calculation of distance *d* (mm) .....: | | — |
| **M.9** | **Preventing electrolyte spillage** | | N/A |
| M.9.1 | Protection from electrolyte spillage | | N/A |
| M.9.2 | Tray for preventing electrolyte spillage | | N/A |
| **M.10** | Instructions to prevent reasonably foreseeable misuse | | N/A |
| | Instructional safeguard.....: | | N/A |
| **N** | **ELECTROCHEMICAL POTENTIALS** | | N/A |
| | Material(s) used.....: | Pollution degree considered | — |
| **O** | **MEASUREMENT OF CREEPAGE DISTANCES AND CLEARANCES** | | N/A |
| | Value of *X* (mm) .....: | | — |
| **P** | **SAFEGUARDS AGAINST CONDUCTIVE OBJECTS** | | N/A |
| **P.1** | **General** | | N/A |
| **P.2** | **Safeguards against entry or consequences of entry of a foreign object** | | N/A |
| P.2.1 | General | Only PS1, ES1 | N/A |
| P.2.2 | Safeguards against entry of a foreign object | | — |
| | Location and Dimensions (mm) .....: | | — |
| P.2.3 | Safeguards against the consequences of entry of a foreign object | | N/A |
| P.2.3.1 | Safeguard requirements | | N/A |
| | The ES3 and PS3 keep-out volume in Figure P.3 not applicable to transportable equipment | Not transportable equipment | N/A |
| | Transportable equipment with metalized plastic parts.....: | Not transportable equipment | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| P.2.3.2 | Consequence of entry test .....: | | N/A |
| **P.3** | **Safeguards against spillage of internal liquids** | | N/A |
| P.3.1 | General | No such liquids. | N/A |
| P.3.2 | Determination of spillage consequences | | N/A |
| P.3.3 | Spillage safeguards | | N/A |
| P.3.4 | Compliance | | N/A |
| **P.4** | **Metallized coatings and adhesives securing parts** | | N/A |
| P.4.1 | General | No such construction. | N/A |
| P.4.2 | Tests | | N/A |
| | Conditioning, $T_C$ (°C) .....: | | — |
| | Duration (weeks) .....: | | — |
| **Q** | **CIRCUITS INTENDED FOR INTERCONNECTION WITH BUILDING WIRING** | | N/A |
| **Q.1** | **Limited power sources** | | N/A |
| Q.1.1 | Requirements | | N/A |
| | a) Inherently limited output | | N/A |
| | b) Impedance limited output | | N/A |
| | c) Regulating network limited output | | N/A |
| | d) Overcurrent protective device limited output | | N/A |
| | e) IC current limiter complying with G.9 | | N/A |
| Q.1.2 | Test method and compliance .....: | | N/A |
| | Current rating of overcurrent protective device (A) .....: | | N/A |
| **Q.2** | **Test for external circuits – paired conductor cable** | | N/A |
| | Maximum output current (A) .....: | | N/A |
| | Current limiting method .....: | | — |
| **R** | **LIMITED SHORT CIRCUIT TEST** | | N/A |
| **R.1** | **General** | No such consideration. | N/A |
| **R.2** | **Test setup** | | N/A |
| | Overcurrent protective device for test .....: | | — |
| **R.3** | **Test method** | | N/A |
| | Cord/cable used for test .....: | | — |
| **R.4** | **Compliance** | | N/A |

| EN IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| **S** | **TESTS FOR RESISTANCE TO HEAT AND FIRE** | | N/A |
| **S.1** | **Flammability test for fire enclosures and fire barrier materials of equipment where the steady state power does not exceed 4 000 W** | | N/A |
| | Samples, material.....: | | — |
| | Wall thickness (mm).....: | | — |
| | Conditioning (°C).....: | | — |
| | Test flame according to IEC 60695-11-5 with conditions as set out | | N/A |
| | - Material not consumed completely | | N/A |
| | - Material extinguishes within 30s | | N/A |
| | - No burning of layer or wrapping tissue | | N/A |
| **S.2** | **Flammability test for fire enclosure and fire barrier integrity** | | N/A |
| | Samples, material.....: | | — |
| | Wall thickness (mm).....: | | — |
| | Conditioning (°C).....: | | — |
| **S.3** | **Flammability test for the bottom of a fire enclosure** | | N/A |
| S.3.1 | Mounting of samples | | N/A |
| S.3.2 | Test method and compliance | | N/A |
| | Mounting of samples .....: | | — |
| | Wall thickness (mm).....: | | — |
| **S.4** | **Flammability classification of materials** | | N/A |
| **S.5** | **Flammability test for fire enclosure materials of equipment with a steady state power exceeding 4 000 W** | | N/A |
| | Samples, material.....: | | — |
| | Wall thickness (mm).....: | | — |
| | Conditioning (°C).....: | | — |
| **T** | **MECHANICAL STRENGTH TESTS** | | P |
| **T.1** | **General** | | P |
| **T.2** | **Steady force test, 10 N .....:** | (See appended table T.2) | P |
| **T.3** | **Steady force test, 30 N .....:** | | N/A |
| **T.4** | **Steady force test, 100 N .....:** | | N/A |
| **T.5** | **Steady force test, 250 N .....:** | (See appended table T.5) | P |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| **T.6** | **Enclosure impact test** | | P |
| | Fall test | | P |
| | Swing test | | P |
| **T.7** | **Drop test .....:** | | N/A |
| **T.8** | **Stress relief test .....:** | (See appended table T.8) | P |
| **T.9** | **Glass Impact Test .....:** | No such glass | N/A |
| **T.10** | **Glass fragmentation test** | | N/A |
| | Number of particles counted.....: | No such glass | N/A |
| **T.11** | **Test for telescoping or rod antennas** | | N/A |
| | Torque value (Nm) .....: | No such antennas provided within the equipment. | N/A |
| **U** | **MECHANICAL STRENGTH OF CATHODE RAY TUBES (CRT) AND PROTECTION AGAINST THE EFFECTS OF IMPLOSION** | | N/A |
| **U.1** | **General** | | N/A |
| | Instructional safeguard **:** | No CRT provided within the equipment. | N/A |
| **U.2** | **Test method and compliance for non-intrinsically protected CRTs** | | N/A |
| **U.3** | **Protective screen** | | N/A |
| **V** | **DETERMINATION OF ACCESSIBLE PARTS** | | N/A |
| **V.1** | **Accessible parts of equipment** | | N/A |
| V.1.1 | General | | N/A |
| V.1.2 | Surfaces and openings tested with jointed test probes | | N/A |
| V.1.3 | Openings tested with straight unjointed test probes | | N/A |
| V.1.4 | Plugs, jacks, connectors tested with blunt probe | | N/A |
| V.1.5 | Slot openings tested with wedge probe | | N/A |
| V.1.6 | Terminals tested with rigid test wire | | N/A |
| **V.2** | **Accessible part criterion** | | N/A |
| **X** | **ALTERNATIVE METHOD FOR DETERMINING CLEARANCES FOR INSULATION IN CIRCUITS CONNECTED TO AN AC MAINS NOT EXCEEDING 420 V PEAK (300 V RMS)** | | N/A |
| | Clearance .....: | | N/A |
| **Y** | **CONSTRUCTION REQUIREMENTS FOR OUTDOOR ENCLOSURES** | | N/A |
| **Y.1** | **General** | Indoor equipment | N/A |

| EN IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| **Y.2** | **Resistance to UV radiation** | | N/A |
| **Y.3** | **Resistance to corrosion** | | N/A |
| **Y.3** | **Resistance to corrosion** | | N/A |
| Y.3.1 | Metallic parts of outdoor enclosures are resistant to effects of water-borne contaminants by .....: | | N/A |
| Y.3.2 | Test apparatus | | N/A |
| Y.3.3 | Water – saturated sulphur dioxide atmosphere | | N/A |
| Y.3.4 | Test procedure.....: | | N/A |
| Y.3.5 | Compliance | | N/A |
| **Y.4** | **Gaskets** | | N/A |
| Y.4.1 | General | | N/A |
| Y.4.2 | Gasket tests | | N/A |
| Y.4.3 | Tensile strength and elongation tests | | N/A |
| | Alternative test methods.....: | | N/A |
| Y.4.4 | Compression test | | N/A |
| Y.4.5 | Oil resistance | | N/A |
| Y.4.6 | Securing means | | N/A |
| **Y.5** | **Protection of equipment within an outdoor enclosure** | | N/A |
| Y.5.1 | General | | N/A |
| Y.5.2 | Protection from moisture | | N/A |
| | Relevant tests of IEC 60529 or Y.5.3.....: | | N/A |
| Y.5.3 | Water spray test | | N/A |
| Y.5.4 | Protection from plants and vermin | | N/A |
| Y.5.5 | Protection from excessive dust | | N/A |
| Y.5.5.1 | General | | N/A |
| Y.5.5.2 | IP5X equipment | | N/A |
| Y.5.5.3 | IP6X equipment | | N/A |
| **Y.6** | **Mechanical strength of enclosures** | | N/A |
| Y.6.1 | General | | N/A |
| Y.6.2 | Impact test.....: | | N/A |

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

**ATTACHMENT TO TEST REPORT**

IEC 62368-1

EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES

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

**Differences according to** .....: EN IEC 62368-1:2020+A11:2020

**Attachment Form No**. .....: EU_GD_IEC62368_1E

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

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



| | | | |
|---|---|---|---|
| | **CENELEC COMMON MODIFICATIONS (EN)** | | P |
| | Clause numbers in the cells that are shaded light grey are clause references in EN IEC 62368-1:2020+A11:2020. All other clause numbers in that column, except for those in the paragraph below, refers to IEC 62368-1:2018.<br><br>Clauses, subclauses, notes, tables, figures and annexes which are additional to those in IEC 62368-1:2018 are prefixed “Z”. | | P |
| | Add the following annexes:<br>Annex ZA (normative) — Normative references to international publications with their corresponding European publications<br>Annex ZB (normative) — Special national conditions<br>Annex ZC (informative) — A-deviations<br>Annex ZD (informative) — IEC and CENELEC code designations for flexible cords | | P |
| **1** | **Modification to Clause 3.** | | N/A |
| **3.3.19** | **Sound exposure**<br>*Replace 3.3.19 of IEC 62368-1 with the following definitions:* | | N/A |
| **3.3.19.1** | **momentary exposure level, MEL**<br>metric for estimating 1 s sound exposure level from the HD 483-1 S2 test signal applied to both channels, based on EN 50332-1:2013, 4.2.<br><br>Note 1 to entry: MEL is measured as A-weighted levels in dB.<br>Note 2 to entry: See B.3 of EN 50332-3:2017 for additional information. | Not such equipment | N/A |

| EN IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| **3.3.19.3** | **sound exposure, E**<br>A-weighted sound pressure ($p$) squared and integrated over a stated period of time, $T$<br><br>Note 1 to entry: The SI unit is $Pa^2$ s.<br>$E = \int_0^T p(t)^2 \, dt$ | | N/A |
| **3.3.19.4** | **sound exposure level, SEL**<br>logarithmic measure of sound exposure relative to a reference value, *E0*, typically the 1 kHz threshold of hearing in humans.<br><br>Note 1 to entry: *SEL* is measured as A-weighted levels in dB.<br>$SEL = 10 \lg\left(\frac{E}{E_0}\right)$ dB<br><br>Note 2 to entry: See B.4 of EN 50332-3:2017 for additional information. | | N/A |
| **3.3.19.5** | **digital signal level relative to full scale, dBFS**<br>levels reported in dBFS are always r.m.s. Full scale level, 0 dBFS, is the level of a dc-free 997-Hz sine wave whose undithered positive peak value is positive digital full scale, leaving the code corresponding to negative digital full scale unused<br><br>Note 1 to entry: It is invalid to use dBFS for non-r.m.s. levels. Because the definition of full scale is based on a sine wave, the level of signals with a crest factor lower than that of a sine wave may exceed 0 dBFS. In particular, square wave signals may reach +3,01 dBFS. | | N/A |
| **2** | **Modification to Clause 10** | | N/A |
| **10.6** | **Safeguards against acoustic energy sources**<br>Replace 10.6 of IEC 62368-1 with the following: | | N/A |
| **10.6.1.1** | **Introduction**<br>**Safeguard** requirements for protection against long-term exposure to excessive sound pressure levels from personal music players closely coupled to the ear are specified below. Requirements for earphones and headphones intended for use with personal music players are also covered.<br>A personal music player is a portable equipment intended for use by an **ordinary person**, that:<br><br>– is designed to allow the user to listen to audio or audiovisual content / material; and | Not such equipment | N/A |

| EN IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | – uses a listening device, such as headphones or earphones that can be worn in or on or around the ears; and<br>– has a player that can be body worn (of a size suitable to be carried in a clothing pocket) and is intended for the user to walk around with while in continuous use (for example, on a street, in a subway, at an airport, etc.).<br><br>EXAMPLES Portable CD players, MP3 audio players, mobile phones with MP3 type features, PDAs or similar equipment.<br><br>Personal music players shall comply with the requirements of either 10.6.2 or 10.6.3.<br><br>NOTE 1 Protection against acoustic energy sources from telecom applications is referenced to ITU-T P.360.<br><br>NOTE 2 It is the intention of the Committee to allow the alternative methods for now, but to only use the dose measurement method as given in 10.6.5 in future. Therefore, manufacturers are encouraged to implement 10.6.5 as soon as possible.<br><br>Listening devices sold separately shall comply with the requirements of 10.6.6.<br>These requirements are valid for music or video mode only.<br>The requirements do not apply to:<br>– professional equipment;<br><br>NOTE 3Professional equipment is equipment sold through special sales channels. All products sold through normal electronics stores are considered not to be professional equipment.<br><br>– hearing aid equipment and other devices for assistive listening;<br>– the following type of analogue personal music players:<br>• long distance radio receiver (for example, a multiband radio receiver or world band radio receiver, an AM radio receiver), and<br>• cassette player/recorder;<br><br>NOTE 4 This exemption has been allowed because this technology is falling out of use and it is expected that within a few years it will no longer exist. This exemption will not be extended to other technologies.<br><br>– a player while connected to an external amplifier that does not allow the user to walk around while in use. | | |

| EN IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | For equipment that is clearly designed or intended primarily for use by children, the limits of the relevant toy standards may apply.<br><br>The relevant requirements are given in EN 71-1:2011, 4.20 and the related tests methods and measurement distances apply. | | |
| **10.6.1.2** | **Non-ionizing radiation from radio frequencies in the range 0 to 300 GHz**<br>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).<br>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. | | N/A |
| **10.6.2** | **Classification of devices without the capacity to estimate sound dose** | | N/A |
| **10.6.2.1** | **General**<br>This standard is transitioning from short-term based (30 s) requirements to long-term based (40 hour) requirements. These clauses remain in effect only for devices that do not comply with sound dose estimation as stipulated in EN 50332-3.<br><br>For classifying the acoustic output *L*Aeq,*T* , measurements are based on the A-weighted equivalent sound pressure level over a 30 s period.<br><br>For music where the average sound pressure (long term *L*Aeq,*T*) measured over the duration of the song is lower than the average produced by the programme simulation noise, measurements may be done over the duration of the complete song. In this case, *T* becomes the duration of the song.<br><br>NOTE Classical music, acoustic music and broadcast typically has an average sound pressure (long term *L*Aeq,*T*) which is much lower than the average programme simulation noise. Therefore, if the player is capable to analyse the content and compare it with the programme simulation noise, the warning does not need to be given as long as the average sound pressure of the song does not exceed the required limit.<br>For example, if the player is set with the programme simulation noise to 85 dB, but the average music level of the song is only 65 dB, there is no need to give a warning or ask an acknowledgement as long as the average sound level of the song is not above the basic limit of 85 | No such part in this equipment | N/A |

| EN IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | dB. | | |
| **10.6.2.2** | **RS1 limits (to be superseded, see 10.6.3.2)**<br><br>RS1 is a class 1 acoustic energy source that does not exceed the following:<br>– for equipment provided as a package (player with its listening device), and with a proprietary connector between the player and its listening device, or where the combination of player and listening device is known by other means such as setting or automatic detection, the *L*Aeq,*T* acoustic output shall be ≤ 85 dB when playing the fixed "programme simulation noise" described in EN 50332-1.<br>– for equipment provided with a standardized connector (for example, a 3,5 phone jack) that allows connection to a listening device for general use, the unweighted r.m.s. output voltage shall be ≤ 27 mV (analogue interface) or -25 dBFS (digital interface) when playing the fixed "programme simulation noise" described in EN 50332-1.<br>– The RS1 limits will be updated for all devices as per 10.6.3.2. | | N/A |
| **10.6.2.3** | **RS2 limits (to be superseded, see 10.6.3.3)**<br><br>RS2 is a class 2 acoustic energy source that does not exceed the following:<br>– for equipment provided as a package (player with its listening device), and with a proprietary connector between the player and its listening device, or when the combination of player and listening device is known by other means such as setting or automatic 130 detection, the *L*Aeq,*T* acoustic output shall be ≤ 100 dB(A) when playing the fixed "programme simulation noise" as described in EN 50332-1.<br>– for equipment provided with a standardized connector (for example, a 3,5 phone jack) that allows connection to a listening device for general use, the unweighted r.m.s. output voltage shall be ≤ 150 mV (analogue interface) or -10 dBFS (digital interface) when playing the fixed "programme simulation noise" as described in EN 50332-1. | | N/A |
| **10.6.2.4** | **RS3 limits**<br>RS3 is a class 3 acoustic energy source that exceeds RS2 limits. | | N/A |
| **10.6.3** | **Classification of devices (new)** | | N/A |
| **10.6.3.1** | **General**<br>Previous limits (10.6.2) created abundant false negative and false positive PMP sound level warnings. New limits, compliant with The Commission Decision of 23 June 2009, are given below. | Not such equipment | N/A |

| EN IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| **10.6.3.2** | **RS1 limits (new)**<br>RS1 is a class 1 acoustic energy source that does not exceed the following:<br>– for equipment provided as a package (player with its listening device), and with a proprietary connector between the player and its listening device, or where the combination of player and listening device is known by other means such as setting or automatic detection, the *L*Aeq,*T* acoustic output shall be ≤ 80 dB when playing the fixed "programme simulation noise" described in EN 50332-1.<br>– for equipment provided with a standardized connector (for example, a 3,5 phone jack) that allows connection to a listening device for general use, the unweighted r.m.s. output voltage shall be ≤ 15 mV (analogue interface) or -30 dBFS (digital interface) when playing the fixed "programme simulation noise" described in EN 50332-1. | | N/A |
| **10.6.3.3** | **RS2 limits (new)**<br>RS2 is a class 2 acoustic energy source that does not exceed the following:<br>– for equipment provided as a package (player with its listening device), and with a proprietary connector between the player and its listening device, or where the combination of player and listening device is known by other means such as setting or automatic detection, the weekly sound exposure level, as described in EN 50332-3, shall be ≤ 80 dB when playing the fixed "programme simulation noise" described in EN 50332-1.<br>– for equipment provided with a standardized connector (for example, a 3,5 phone jack) that allows connection to a listening device for general use, the unweighted r.m.s. output level, integrated over one week, as described in EN50332-3, shall be ≤ 15 mV (analogue interface) or -30 dBFS (digital interface) when playing the fixed "programme simulation noise" described in EN 50332-1. | | N/A |
| **10.6.4** | **Requirements for maximum sound exposure** | | N/A |
| **10.6.4.1** | **Measurement methods**<br>All volume controls shall be turned to maximum during tests.<br><br>Measurements shall be made in accordance with EN 50332-1 or EN 50332-2 as applicable. | Not such equipment | N/A |
| **10.6.4.2** | **Protection of persons**<br>Except as given below, protection requirements for parts **accessible** to **ordinary persons**, **instructed persons** and **skilled persons** are given in 4.3.<br><br>NOTE 1 Volume control is not considered a **safeguard.** | | N/A |

| EN IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | Between RS2 and an **ordinary person**, the **basic safeguard** may be replaced by an **instructional safeguard** in accordance with Clause F.5, except that the **instructional safeguard** shall be placed on the equipment, or on the packaging, or in the instruction manual.<br>Alternatively, the **instructional safeguard** may be given through the equipment display during use.<br><br>The elements of the **instructional safeguard** shall be as follows:<br><br>– element 1a: the symbol  , IEC 60417-6044 (2011-01)<br>– element 2: “High sound pressure” or equivalent wording<br>– element 3: “Hearing damage risk” or equivalent wording<br>– element 4: “Do not listen at high volume levels for long periods.” or equivalent wording<br><br>An **equipment safeguard** shall prevent exposure of an **ordinary person** to an RS2 source without intentional physical action from the **ordinary person** and shall automatically return to an output level not exceeding what is specified for an RS1 source when the power is switched off.<br><br>The equipment shall provide a means to actively inform the user of the increased sound level when the equipment is operated with an output exceeding RS1. Any means used shall be acknowledged by the user before activating a mode of operation which allows for an output exceeding RS1. The acknowledgement does not need to be repeated more than once every 20 h of cumulative listening time.<br><br>NOTE 2 Examples of means include visual or audible signals. Action from the user is always needed.<br><br>NOTE 3 The 20 h listening time is the accumulative listening time, independent of how often and how long the personal music player has been switched off.<br><br>A **skilled person** shall not be unintentionally exposed to RS3. | | |
| **10.6.5** | **Requirements for dose-based systems** | | N/A |
| **10.6.5.1** | **General requirements**<br>Personal music players shall give the warnings as provided below when tested according to EN 50332-3, using the limits from this clause. | Not such equipment | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | The manufacturer may offer optional settings to allow the users to modify when and how they wish to receive the notifications and warnings to promote a better user experience without defeating the safeguards. This allows the users to be informed in a method that best meets their physical capabilities and device usage needs. If such optional settings are offered, an administrator (for example, parental restrictions, business/educational administrators, etc.) shall be able to lock any optional settings into a specific configuration.<br><br>The personal music player shall be supplied with easy to understand explanation to the user of the dose management system, the risks involved, and how to use the system safely. The user shall be made aware that other sources may significantly contribute to their sound exposure, for example work, transportation, concerts, clubs, cinema, car races, etc. | | |
| **10.6.5.2** | **Dose-based warning and requirements**<br>When a dose of 100 % *CSD* is reached, and at least at every 100 % further increase of *CSD*, the device shall warn the user and require an acknowledgement. In case the user does not acknowledge, the output level shall automatically decrease to compliance with class RS1.<br><br>The warning shall at least clearly indicate that listening above 100 % *CSD* leads to the risk of hearing damage or loss. | | N/A |
| **10.6.5.3** | **Exposure-based requirements**<br>With only dose-based requirements, cause and effect could be far separated in time, defying the purpose of educating users about safe listening practice. In addition to dose-based requirements, a PMP shall therefore also put a limit to the short-term sound level a user can listen at.<br><br>The exposure-based limiter (EL) shall automatically reduce the sound level not to exceed 100 dB(A) or 150 mV integrated over the past 180 s, based on methodology defined in EN 50332-3.<br>The EL settling time (time from starting level reduction to reaching target output) shall be 10 s or faster.<br><br>Test of EL functionality is conducted according to EN 50332-3, using the limits from this clause. For equipment provided as a package (player with its listening device), the level integrated over 180 s shall be 100 dB or lower. For equipment provided with a standardized connector, the unweighted level integrated over 180 s shall be no more than | | N/A |

| EN IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | 150 mV for an analogue interface and no more than -10 dBFS for a digital interface.<br><br>NOTE In case the source is known not to be music (or test signal), the EL may be disabled. | | |
| **10.6.6** | **Requirements for listening devices (headphones, earphones, etc.)** | | N/A |
| **10.6.6.1** | **Corded listening devices with analogue input**<br>With 94 dB *L*Aeq acoustic pressure output of the listening device, and with the volume and sound settings in the listening device (for example, built-in volume level control, additional sound features like equalization, etc.) set to the combination of positions that maximize the measured acoustic output, the input voltage of the listening device when playing the fixed “programme simulation noise” as described in EN 50332-1 shall be ≥ 75 mV.<br><br>NOTE The values of 94 dB and 75 mV correspond with 85 dB and 27 mV or 100 dB and 150 mV. | Not such equipment | N/A |
| **10.6.6.2** | **Corded listening devices with digital input**<br>With any playing device playing the fixed “programme simulation noise” described in EN 50332-1, and with the volume and sound settings in the listening device (for example, built-in volume level control, additional sound features like equalization, etc.) set to the combination of positions that maximize the measured acoustic output, the *L*Aeq,*T* acoustic output of the listening device shall be ≤ 100 dB with an input signal of -10 dBFS. | | N/A |
| **10.6.6.3** | **Cordless listening devices**<br>In cordless mode,<br>– with any playing and transmitting device playing the fixed programme simulation noise described in EN 50332-1; and<br>– respecting the cordless transmission standards, where an air interface standard exists that specifies the equivalent acoustic level; and<br>– with volume and sound settings in the receiving device (for example, built-in volume level control, additional sound features like equalization, etc.) set to the combination of positions that maximize the measured acoustic output for the above mentioned programme simulation noise, the *L*Aeq,*T* acoustic output of the listening device shall be ≤ 100 dB with an input signal of -10 dBFS. | | N/A |
| **10.6.6.4** | **Measurement method**<br>*Measurements shall be made in accordance with EN 50332-2 as applicable.* | | N/A |
| **3** | **Modification to the whole document** | | P |

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

| | | | |
|---|---|---|---|
| | **Delete** all the "country" notes in the reference document according to the following list:<br><br>0.2.1 Note 1 and 2; 1 Note 4 and 5; 3.3.8.1 Note 2<br>3.3.8.3 Note 1; 4.1.15 Note; 4.7.3 Note 1 and 2<br>5.2.2.2 Note; 5.4.2.3.2.2 Table 12 Note c; 5.4.2.3.2.4 Note 1 and 3<br>5.4.2.3.2.4 Table 13 Note 2; 5.4.2.5 Note 2; 5.4.5.1 Note<br>5.4.10.2.1 Note; 5.4.10.2.2 Note; 5.4.10.2.3 Note<br>5.5.2.1 Note; 5.5.6 Note; 5.6.4.2.1 Note 2 and 3 and 4<br>5.6.8 Note 2; 5.7.6 Note; 5.7.7.1 Note 1 and Note 2<br>8.5.4.2.3 Note; 10.2.1 Table 39 Note 3 and 4 and 5; 10.5.3 Note 2<br>~~10.6.1~~ Note 3; F.3.3.6 Note 3; Y.4.1 Note<br>Y.4.5 Note | | P |
| **4** | **Modification to Clause 1** | | P |
| **1** | **Add** the following note:<br>*NOTE Z1 The use of certain substances in electrical and electronic equipment is restricted within the EU: see Directive 2011/65/EU.* | | P |
| **5** | **Modification to 4.Z1** | | P |

| EN IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| **4.Z1** | **Add** the following new subclause after 4.9:<br>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):<br>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;<br>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;<br>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.<br><br>If reliance is placed on protection in the building installation, the installation instructions shall so state, except that for **pluggable equipment type A** the building installation shall be regarded as providing protection in accordance with the rating of the wall socket outlet. | | N/A |
| **6** | **Modification to 5.4.2.3.2.4** | | N/A |
| **5.4.2.3.2.4** | **Add** the following to the end of this subclause:<br>The requirement for interconnection with **external circuit** is in addition given in EN 50491-3:2009. | No connection to external circuit. | N/A |
| **7** | **Modification to 10.2.1** | | N/A |
| **10.2.1** | **Add** the following to c) and d) in table 39: For additional requirements, see 10.5.1. | Added. The equipment is a low power AC ADAPTER, it does incorporate only non-intentional radiators, but does not contain radio transmitters; the typical usage, installation and physical characteristics make the equipment inherently compliant with all applicable EMF exposure levels (EN 62479: 2010 clause 4.1 Route A). | N/A |
| **8** | **Modification to 10.5.1** | | N/A |

| EN IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| **10.5.1** | **Add** the following after the first paragraph:<br>For RS 1 compliance is checked by measurement under the following conditions:<br><br>In addition to the normal operating conditions, all controls adjustable from the outside by hand, by any object such as a tool or a coin, and those internal adjustments or pre-sets which are not locked in a reliable manner, are adjusted so as to give maximum radiation whilst maintaining an intelligible picture for 1 h, at the end of which the measurement is made.<br><br>NOTE Z1 Soldered joints and paint lockings are examples of adequate locking.<br><br>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.<br><br>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.<br><br>For RS1, the dose-rate shall not exceed 1 µSv/h taking account of the background level.<br><br>NOTE Z2 These values appear in Directive 96/29/Euratom of 13 May 1996. | | N/A |
| **9** | **Modification to G.7.1** | | N/A |
| **G.7.1** | **Add** the following note:<br>NOTE Z1 The harmonized code designations corresponding to the IEC cord types are given in Annex ZD. | | N/A |
| **10** | **Modification to Bibliography** | | N/A |

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

| | | | |
|---|---|---|---|
| | **Add** the following notes for the standards indicated:<br>IEC 60130-9 NOTE Harmonized as EN 60130-9.<br>IEC 60269-2 NOTE Harmonized as HD 60269-2.<br>IEC 60309-1 NOTE Harmonized as EN 60309-1.<br>IEC 60364 NOTE some parts harmonized in HD 384/HD 60364 series.<br>IEC 60601-2-4 NOTE Harmonized as EN 60601-2-4.<br>IEC 60664-5 NOTE Harmonized as EN 60664-5.<br>IEC 61032:1997 NOTE Harmonized as EN 61032:1998 (not modified).<br>IEC 61508-1 NOTE Harmonized as EN 61508-1.<br>IEC 61558-2-1 NOTE Harmonized as EN 61558-2-1.<br>IEC 61558-2-4 NOTE Harmonized as EN 61558-2-4.<br>IEC 61558-2-6 NOTE Harmonized as EN 61558-2-6.<br>IEC 61643-1 NOTE Harmonized as EN 61643-1.<br>IEC 61643-21 NOTE Harmonized as EN 61643-21.<br>IEC 61643-311 NOTE Harmonized as EN 61643-311.<br>IEC 61643-321 NOTE Harmonized as EN 61643-321.<br>IEC 61643-331 NOTE Harmonized as EN 61643-331. | | P |
| **11** | **ADDITION OF ANNEXES** | | -- |
| **ZB** | **ANNEX ZB, SPECIAL NATIONAL CONDITIONS (EN)** | | P |
| **4.1.15** | **Denmark, Finland, Norway** and **Sweden**<br>To the end of the subclause the following is added:<br>**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.<br><br>The marking text in the applicable countries shall be as follows:<br><br>In **Denmark**: “Apparatets stikprop skal tilsluttes en stikkontakt med jord som giver forbindelse til stikproppens jord.”<br>In **Finland**: "Laite on liitettävä suojakoskettimilla varustettuun pistorasiaan"<br>In **Norway**: “Apparatet må tilkoples jordet stikkontakt”<br>In **Sweden**: “Apparaten skall anslutas till jordat uttag” | Class II equipment | N/A |

| EN IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| **4.7.3** | **United Kingdom**<br>To the end of the subclause the following is added:<br><br>The torque test is performed using a socket-outlet complying with BS 1363, and the plug part shall be assessed to the relevant clauses of BS 1363. Also see Annex G.4.2 of this annex | | N/A |
| **5.2.2.2** | **Denmark**<br>After the 2nd paragraph add the following:<br><br>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. | No high touch current measured. | N/A |
| **5.4.11.1 and Annex G** | **Finland and Sweden**<br>To the end of the subclause the following is added:<br><br>For separation of the telecommunication network from earth the following is applicable:<br><br>If this insulation is solid, including insulation forming part of a component, it shall at least consist of either<br>• two layers of thin sheet material, each of which shall pass the electric strength test below, or<br><br>• one layer having a distance through insulation of at least 0,4 mm, which shall pass the electric strength test below.<br><br>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<br><br>• 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),<br><br>and<br><br>• is subject to routine testing for electric strength during manufacturing, using a test voltage of 1,5 kV.<br><br>It is permitted to bridge this insulation with a capacitor complying with EN 60384-14:2005, subclass Y2. | No TNV circuits. | N/A |

| EN IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | A capacitor classified Y3 according to EN 60384-14:2005, may bridge this insulation under the following conditions:<br>• 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;<br>• the additional testing shall be performed on all the test specimens as described in EN 60384-14;<br>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. | | |
| **5.5.2.1** | **Norway**<br>After the 3rd paragraph the following is added:<br>Due to the IT power system used, capacitors are required to be rated for the applicable line-to-line voltage (230 V). | | N/A |
| **5.5.6** | **Finland, Norway** and **Sweden**<br>To the end of the subclause the following is added:<br>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 resistors. | N/A |
| **5.6.1** | **Denmark**<br>**Add** to the end of the subclause<br>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.<br>*Justification:*<br>In Denmark an existing 13 A socket outlet can be protected by a 20 A fuse. | No such equipment. | N/A |
| **5.6.4.2.1** | **Ireland and United Kingdom**<br>After the indent for **pluggable equipment type A**, the following is added:<br>– the **protective current rating** is taken to be 13 A, this being the largest rating of fuse used in the **mains** plug. | Approved mains plug used (see appended table 4.1.2) | N/A |

| EN IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| **5.6.4.2.1** | **France**<br>After the indent for **pluggable equipment type A**, the following is added:<br>– in certain cases, the **protective current rating** of the circuit supplied from the mains is taken as 20 A instead of 16 A. | | N/A |
| **5.6.5.1** | To the second paragraph the following is added:<br>The range of conductor sizes of flexible cords to be accepted by terminals for equipment with a rated current over 10 A and up to and including 13 A is: 1,25 $mm^2$ to 1,5 $mm^2$ in cross-sectional area. | | N/A |
| **5.6.8** | **Norway**<br>To the end of the subclause the following is added:<br>Equipment connected with an earthed mains plug is classified as **class I equipment**. See the Norway marking requirement in 4.1.15. The symbol IEC 60417-6092, as specified in F.3.6.2, is accepted. | | N/A |
| **5.7.6** | **Denmark**<br>To the end of the subclause the following is added:<br><br>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. | No high protective conductor current. | N/A |
| **5.7.6.2** | **Denmark**<br>To the end of the subclause the following is added:<br>The warning (marking safeguard) for high touch current is required if the touch current or the protective current exceed the limits of 3,5 mA . | | P |
| **5.7.7.1** | **Norway and Sweden**<br>To the end of the subclause the following is added:<br>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.<br>Therefore the protective earthing of the building installation needs to be isolated from the screen of a cable distribution system.<br><br>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.<br><br>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: | Not such system. | N/A |

| EN IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | "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)"<br><br>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.<br><br>Translation to Norwegian (the Swedish text will also be accepted in Norway):<br><br>"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."<br><br>Translation to Swedish:<br>"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." | | |
| **8.5.4.2.3** | **United Kingdom**<br>Add the following after the 2nd dash bullet in 3rd paragraph:<br><br>An emergency stop system complying with the requirements of IEC 60204-1 and ISO 13850 is required where there is a risk of personal injury. | No external circuits. | N/A |

| EN IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| **B.3.1 and B.4** | **Ireland and United Kingdom**<br>The following is applicable:<br><br>To protect against excessive currents and short-circuits in the primary circuit of **direct plug-in equipment**, tests according to Annexes B.3.1 and B.4 shall be conducted using an external miniature circuit breaker complying with EN 60898-1, Type B, rated 32A. If the equipment does not pass these tests, suitable protective devices shall be included as an integral part of the **direct plug-in equipment**, until the requirements of Annexes B.3.1 and B.4 are met | | N/A |
| **G.4.2** | **Denmark**<br>To the end of the subclause the following is added:<br><br>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.<br><br>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.<br><br>If a single-phase equipment having a RATED CURRENT exceeding 13 A or if a polyphase equipment is provided with a supply cord with a plug, this plug shall be in accordance with the standard sheets DK 6-1a in DS 60884-2-D1 or EN 60309-2.<br><br>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.<br><br>Other current rating socket outlets shall be in compliance with Standard Sheet DKA 1-3a or DKA 1-1c.<br><br>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<br><br>*Justification:*<br>Heavy Current Regulations, Section 6c | | N/A |

| EN IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| **G.4.2** | **United Kingdom**<br>To the end of the subclause the following is added:<br><br>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. | Direct plug-in equipment | N/A |
| **G.7.1** | **United Kingdom**<br>To the first paragraph the following is added:<br><br>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.<br><br>NOTE "Standard plug" is defined in SI 1768:1994 and essentially means an approved plug conforming to BS 1363 or an approved conversion plug. | Direct plug-in equipment | N/A |
| **G.7.1** | **Ireland**<br>To the first paragraph the following is added:<br><br>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 | Direct plug-in equipment | N/A |
| **G.7.2** | **Ireland and United Kingdom**<br>To the first paragraph the following is added:<br><br>A power supply cord with a conductor of 1,25 $mm^2$ is allowed for equipment which is rated over 10 A and up to and including 13 A. | Direct plug-in equipment | N/A |
| **ZC** | **ANNEX ZC, NATIONAL DEVIATIONS (EN)** | | N/A |

| EN IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| **10.5.2** | **Germany**<br>The following requirement applies:<br><br>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.<br><br>*Justification*:<br>German ministerial decree against ionizing radiation (Röntgenverordnung), in force since 2002-07-01, implementing the European Directive 96/29/EURATOM.<br><br>**NOTE** Contact address:<br>Physikalisch-Technische Bundesanstalt, Bundesallee 100, D-38116 Braunschweig, Tel.: Int+49-531-592-6320, Internet: http://www.ptb.de | No CRT within the equipment. | N/A |

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

| | | |
|---|---|---|
| **ZD** | **IEC and CENELEC CODE DESIGNATIONS FOR FLEXIBLE CORDS (EN)** | N/A |

N/A

| Type of flexible cord | Code designations | |
|---|---|---|
| | IEC | CENELEC |
| **PVC insulated cords** | | |
| Flat twin tinsel cord | 60227 IEC 41 | H03VH-Y |
| Light polyvinyl chloride sheathed flexible cord | 60227 IEC 52 | H03VV-F<br>H03VVH2-F |
| Ordinary polyvinyl chloride sheathed flexible cord | 60227 IEC 53 | H05VV-F<br>H05VVH2-F |
| **Rubber insulated cords** | | |
| Braided cord | 60245 IEC 51 | H03RT-F |
| Ordinary tough rubber sheathed flexible cord | 60245 IEC 53 | H05RR-F |
| Ordinary polychloroprene sheathed flexible cord | 60245 IEC 57 | H05RN-F |
| Heavy polychloroprene sheathed flexible cord | 60245 IEC 66 | H07RN-F |
| **Cords having high flexibility** | | |
| Rubber insulated and sheathed cord | 60245 IEC 86 | H03RR-H |
| Rubber insulated, crosslinked PVC sheathed cord | 60245 IEC 87 | H03RV4-H |
| Crosslinked PVC insulated and sheathed cord | 60245 IEC 88 | H03V4V4-H |
| **Cords insulated and sheathed with halogen-free thermoplastic compounds** | | |
| Light halogen-free thermoplastic insulated and sheathed flexible cords | | H03Z1Z1-F<br>H03Z1Z1H2-F |
| Ordinary halogen-free thermoplastic insulated and sheathed flexible cords | | H05Z1Z1-F<br>H05Z1Z1H2-F |

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

| 5.2 | TABLE: Classification of electrical energy sources | | | | | | P |
|---|---|---|---|---|---|---|---|
| Supply Voltage | Location (e.g. circuit designation) | Test conditions | Parameters | | | | ES Class |
| | | | U (V) | I (mA) | Type[1)] | Additional Info [2)] | |
| 3Vdc | The EUT is designed to be supplied by Internal dry battery | Normal | <60Vdc | -- | SS | -- | ES1 (declare) |
| | | Abnormal | -- | -- | -- | -- | |
| | | Single fault | -- | -- | -- | -- | |
| Supplementary information: | | | | | | | |

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

| 5.4.1.10.2 | TABLE: Vicat softening temperature of thermoplastics | | N/A |
|---|---|---|---|
| Method ..... : | ISO 306 / B50 | | — |
| Object/ Part No./Material | Manufacturer/trademark | Thickness (mm) | T softening (°C) |
| -- | -- | -- | -- |
| Supplementary information: | | | |
| | | | |

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

| 5.4.2, 5.4.3 | TABLE: Minimum Clearances/Creepage distance | | | | | | | | N/A |
|---|---|---|---|---|---|---|---|---|---|
| Clearance (cl) and creepage distance (cr) at/of/between: | $U_p$ (V) | $U_{rms}$ (V) | Freq [1)] (kHz) | Required cl (mm) | cl (mm) | E.S. [2)] (V) | Required cr (mm) | cr (mm) | |
| -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Supplementary information: | | | | | | | | | |

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

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

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

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

| 5.5.2.2 | TABLE: Stored discharge on capacitors | | | | N/A |
|---|---|---|---|---|---|
| Location | Supply voltage (V) | Operating and fault condition [1)] | Switch position | Measured voltage (Vpk) | ES Class |
| -- | -- | -- | -- | -- | -- |
| Supplementary information: | | | | | |
| X-capacitors installed for testing:<br>☐ bleeding resistor rating:<br>☐ ICX: | | | | | |

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

| 5.6.6 | TABLE: Resistance of protective conductors and terminations | | | | N/A |
|---|---|---|---|---|---|
| Location | | Test current (A) | Duration (min) | Voltage drop (V) | Resistance (Ω) |
| -- | | -- | -- | -- | -- |
| Supplementary information: | | | | | |
| | | | | | |

| 5.7.4 | TABLE: Unearthed accessible parts | | | | | N/A |
|---|---|---|---|---|---|---|
| Location | Operating and fault conditions | Supply Voltage (V) | Parameters | | | ES class |
| | | | Voltage ($V_{rms}$ or $V_{pk}$) | Current ($A_{rms}$ or $A_{pk}$) | Freq. (Hz) | |
| -- | -- | -- | -- | -- | -- | -- |
| Supplementary information: | | | | | | |
| | | | | | | |

| 5.7.5 | TABLE: Earthed accessible conductive part | | | N/A |
|---|---|---|---|---|
| Supply voltage (V) .....: | | | | — |
| Phase(s) .....: | [] Single Phase; [ ] Three Phase: [ ] Delta [ ] Wye | | | |
| Power Distribution System .....: | ☐ TN ☐ TT ☐ IT | | | |
| Location | | Fault Condition No in IEC 60990 clause 6.2.2 | Touch current (mA) | Comment |
| -- | | -- | -- | -- |
| Supplementary Information: | | | | |
| | | | | |

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

| 6.2.2 | TABLE: Power source circuit classifications | | | | | P |
|---|---|---|---|---|---|---|
| Location | Operating and fault condition | Voltage (V) | Current (A) | Max. Power[1)] (W) | Time (S) | PS class |
| | | | | | | |

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

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Dry battery | Normal condition | <15 | -- | -- | -- | PS1 (declare) |
| | Signal fault | -- | -- | -- | -- | |
| | Signal fault | -- | -- | -- | -- | |
| Supplementary information: | | | | | | | |
| Abbreviation: SC= short circuit | | | | | | | |

| 6.2.3.1 | TABLE: Determination of Arcing PIS | | | N/A |
|---|---|---|---|---|
| Location | Open circuit voltage after 3 s (Vpk) | Measured r.m.s current (A) | Calculated value | Arcing PIS? Yes / No |
| -- | -- | -- | -- | -- |
| Supplementary information: | | | | |
| | | | | |

| 6.2.3.2 | TABLE: Determination of resistive PIS | | N/A |
|---|---|---|---|
| Location | Operating and fault condition | Dissipate power (W) | Arcing PIS? Yes / No |
| -- | -- | -- | -- |
| Supplementary information: | | | |
| | | | |

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

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

| 9.6 | TABLE: Temperature measurements for wireless power transmitters | | | | | | | | N/A |
|---|---|---|---|---|---|---|---|---|---|
| Supply voltage (V) ..... : | | | | | | | | | — |
| Max. transmit power of transmitter (W) ..... : | | | | | | | | | — |
| | w/o receiver and direct contact | | with receiver and direct contact | | with receiver and at distance of 2 mm | | with receiver and at distance of 5 mm | | |
| Foreign objects | Object ($^{o}$C) | Ambient ($^{o}$C) | Object ($^{o}$C) | Ambient ($^{o}$C) | Object ($^{o}$C) | Ambient ($^{o}$C) | Object ($^{o}$C) | Ambient ($^{o}$C) | |
| -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Supplementary information: | | | | | | | | | |
| | | | | | | | | | |

| 5.4.1.4, 9.3, B.1.5, B.2.6 | TABLE: Temperature measurements | | | | P |
|---|---|---|---|---|---|
| Supply voltage (V)..... : | 3Vdc | -- | -- | -- | — |
| Ambient temperature during test $T_{amb}$ (°C) .... : | 45.0 | -- | -- | -- | — |
| Maximum measured temperature *T* of part/at: | *T* (°C) | | | | Allowed $T_{max}$ (°C) |
| Internal wire | 47.6 | -- | -- | -- | 80 |
| PCB near C1 | 49.4 | -- | -- | -- | 130 |
| PCB near U1 | 52.1 | -- | -- | -- | 130 |
| PCB near D3 | 49.4 | -- | -- | -- | 130 |
| Enclosure inside | 48.6 | -- | -- | -- | Ref. |
| Ambient | 45.0 | -- | -- | -- | -- |
| Accessible part | | | | | |
| Plastic outside | 27.7 | -- | -- | -- | 77 |
| Ambient | 25.0 | -- | -- | -- | -- |

| 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:

1. Tma should be considered as directed by 66pplicable requirement.
2. Tma is not included in assessment of Touch Temperatures (Clause 9).
3. The temperatures were measured under worst case normal mode as described in B.2.5 at voltages as

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

above.

4. With a specified maximum ambient temperature and test temperature of 45°C.

5. When tested for touch temperature limit of clause 9, the ambient was conducted between 20-30°C.

| B.2.5 | TABLE: Input test | | | | | | | P |
|---|---|---|---|---|---|---|---|---|
| U (V) | Hz | I (A) | I rated (A) | P (W) | P rated (W) | Fuse No | I fuse (A) | Condition/status |
| 3 | dc | 0.021 | -- | 0.063 | -- | -- | -- | Normal working |
| Supplementary information: | | | | | | | | |
| The maximum measured current under rated voltage did not exceed 110% of the rated current. | | | | | | | | |

| B.3, B.4 | TABLE: Abnormal operating and fault condition tests | | | | | P |
|---|---|---|---|---|---|---|
| Ambient temperature $T_{amb}$ (°C) .....: | | | 25°C, if not specified | | | — |
| Power source for EUT: Manufacturer, model/type, outputrating...: | | | -- | | | — |
| Component No. | Condition | Supply voltage (V) | Test time | Fuse no. | Fuse current (A) | Observation |
| Battery | Reverse | 3 | 10min | -- | -- | Unit does't work, No damage, no hazards |
| C1 | SC | 3.0 | 10min | -- | -- | Unit shutdown immediately, No damage, no hazards |
| R1 | SC | 3.0 | 10min | -- | -- | Unit shutdown immediately, No damage, no hazards |
| U1 pin1-7 | SC | 3.0 | 10min | -- | -- | Unit shutdown immediately, No damage, no hazards |
| 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.<br>1) S-C: Short-circuited;<br>2) The test result shown all safeguards remained effective and didn't lead to a single fault condition during abnormal operating condition; In addition all safeguards complied with applicable requirements in this standard after restoration of normal operating conditions.<br>3) The test result showed no Class 1 or 2 energy source become Class 3 level during and after single fault condition. | | | | | | |

| M.3 | TABLE: Protection circuits for batteries provided within the equipment | N/A |
|---|---|---|
| Is it possible to install the battery in a reverse polarity position?.....: | -- | — |
| Equipment Specification | Charging | |

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

| | Voltage (V) | | Current (A) | | | |
|---|---|---|---|---|---|---|
| | -- | | -- | | | |
| | Battery specification | | | | | |
| | Non-rechargeable batteries | | Rechargeable batteries | | | |
| Manufacturer/type | Discharging current (A) | Unintentional charging current (A) | Charging | | Discharging current (A) | Reverse charging current (A) |
| | | | Voltage (V) | Current (A) | | |
| -- | -- | -- | -- | -- | -- | -- |
| Note: The tests of M.3.2 are applicable only when above appropriate data is not available. | | | | | | |
| Specified battery temperature (°C) .....: | | | -- | | | |

| Component No. | Fault condition | Charge/ discharge mode | Test time | Temp. (°C) | Current (A) | Voltage (V) | Observation |
|---|---|---|---|---|---|---|---|
| -- | -- | -- | -- | -- | -- | -- | -- |
| Supplementary information: | | | | | | | |
| Abbreviation: SC= short circuit; OC= open circuit NL= no chemical leakage; NS= no spillage of liquid; NE= no explosion; NF= no emission of flame or expulsion of molten metal. | | | | | | | |

| **M.4.2** | **TABLE: Charging safeguards for equipment containing a secondary lithium battery** | | N/A |
|---|---|---|---|
| Maximum specified charging voltage (V).....: | | -- | — |
| Maximum specified charging current (A) .....: | | -- | — |
| Highest specified charging temperature (°C) .....: | | -- | -- |
| Lowest specified charging temperature (°C) .....: | | -- | -- |

| Battery manufacturer/type | Operating and fault condition | Measurement | | | Observation |
|---|---|---|---|---|---|
| | | Charging voltage (V) | Charging current (A) | Temp. (°C) | |
| -- | -- | -- | -- | -- | -- |
| Supplementary information: | | | | | |
| Abbreviation: SC= short circuit; OC= open circuit; MSCV= maximum specified charging voltage; MSCC= maximum specified charging current; HSCT= highest specified charging temperature; LSCT= lowest specified charging temperature | | | | | |

| **Q.1** | **TABLE: Circuits intended for interconnection with building wiring (LPS)** | | | | | | N/A |
|---|---|---|---|---|---|---|---|
| Output Circuit | Condition | $U_{oc}$ (V) | Time (s) | $I_{sc}$ (A) | | S (VA) | |
| | | | | Meas. | Limit | Meas. | Limit |
| -- | -- | -- | -- | -- | -- | -- | -- |

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

| Supplementary Information: |
|---|
| |

| T.2, T.3, T.4, T.5 | TABLE: Steady force test | | | | | P |
|---|---|---|---|---|---|---|
| Part/Location | Material | Thickness (mm) | Probe | Force (N) | Test Duration (s) | Observation |
| Internal components (T.2) | -- | -- | Figure V.2 | 10 | 5 | No reduction the clearances and creepage distances |
| Enclosure bottom (T.5) | Plastic* | See table 4.1.2 | -- | 250 | 5 | No cracking, no damage. |
| Enclosure top (T.5) | Plastic* | See table 4.1.2 | -- | 250 | 5 | No cracking, no damage. |
| Enclosure side (T.5) | Plastic* | See table 4.1.2 | -- | 250 | 5 | No cracking, no damage. |
| Supplementary information: | | | | | | |
| *Tests were performed on product with each source listed in table 4.1.2. | | | | | | |

| T.6, T.9 | TABLE: Impact test | | | P |
|---|---|---|---|---|
| Location/Part | Material | Thickness (mm) | Height (mm) | Observation |
| Enclosure bottom (T.6) | Plastic* | See table 4.1.2 | 1300 | No cracking, no damage. |
| Enclosure top (T.6) | Plastic* | See table 4.1.2 | 1300 | No cracking, no damage. |
| Enclosure side (T.6) | Plastic* | See table 4.1.2 | 1300 | No cracking, no damage. |
| Supplementary information: | | | | |
| *Test was performed on product with each source listed in table 4.1.2. | | | | |

| T.7 | TABLE: Drop test | | | P |
|---|---|---|---|---|
| Location/part | Material | Thickness (mm) | Height (mm) | Observation |
| Enclosure bottom (T.7) | Plastic* | See table 4.1.2 | 1000 | No cracking, no damage. |
| Enclosure top (T.7) | Plastic* | See table 4.1.2 | 1000 | No cracking, no damage. |
| Enclosure | Plastic* | See table 4.1.2 | 1000 | No cracking, no damage. |

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

| | | | | |
|---|---|---|---|---|
| side (T.7) | | | | |
| Supplementary information: | | | | |
| | | | | |

| T.8 | TABLE: Stress relief test | | | | | P |
|---|---|---|---|---|---|---|
| Location/Part | Material | Thickness (mm) | Oven Temperature (°C) | Duration (h) | Observation | |
| Enclosure | Plastic* | See table 4.1.2 | 70°C | 7h | No distortion, no softening, no cracking. | |
| Supplementary information: | | | | | | |
| *Test was performed on product with each source listed in table 4.1.2. | | | | | | |

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

| 4.1.2 | TABLE: Critical components information | | | | P |
|---|---|---|---|---|---|
| Object / part No. | Manufacturer/ trademark | Type / model | Technical data | Standard | Mark(s) of conformity[1)] |
| Plastic enclosure | FORMOSA CHEMICALS & FIBRE CORP PLASTICS DIV | AC310(+) | V-2, 60°C, min. thickness 0.8mm. | UL 94 | UL E162823 |
| PCB | Interchangeable | Interchangeable | Min. V-1 , 130°C | UL 796<br>UL 94 | UL |
| Internal wire | Interchangeable | Interchangeable | Min. 30AWG , 80°C | UL 796<br>UL 94 | UL |
| Supplementary information: | | | | | |
| Supplementary information:<br>[1)] License available upon request. Provided evidence ensures the agreed level of compliance. See OD-CB2039. | | | | | |

# Photo Documentation

Reference No.: WTF22D10214191Y002

Figure 1: Overall view

Figure 2: Overall view

# Photo Documentation

Reference No.: WTF22D10214191Y002

Figure 3: Internal view

Figure 4: Internal view

# Photo Documentation

Reference No.: WTF22D10214191Y002

Figure 5: Internal view

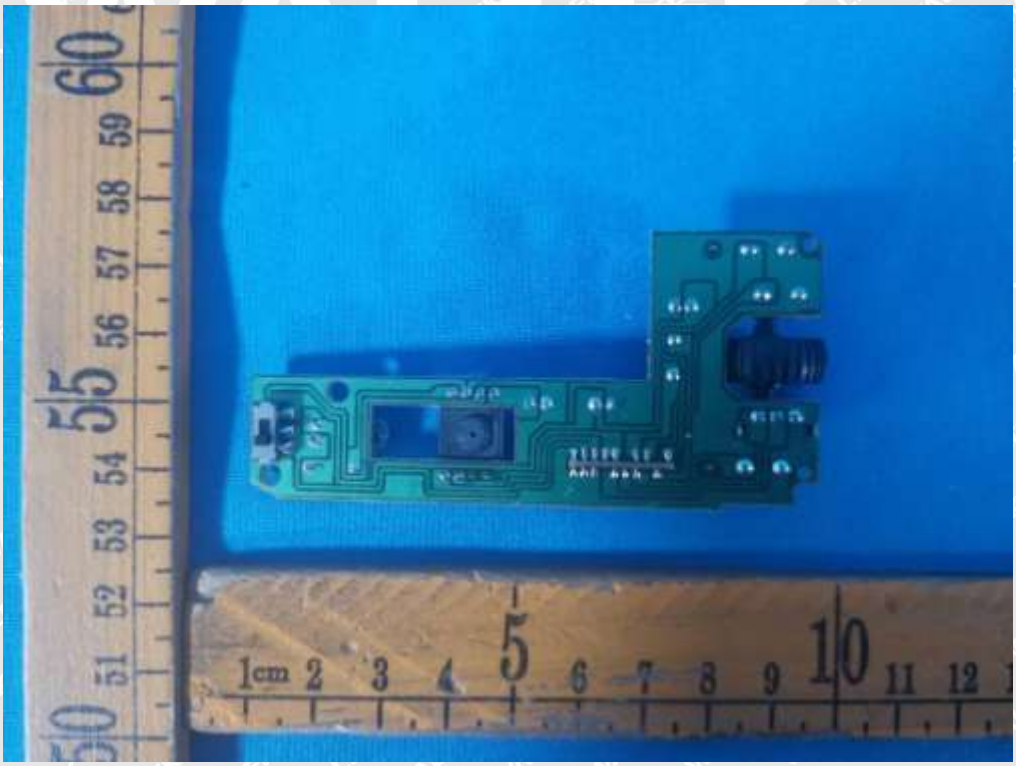

Figure 6: PCB view

# Photo Documentation

Reference No.: WTF22D10214191Y002

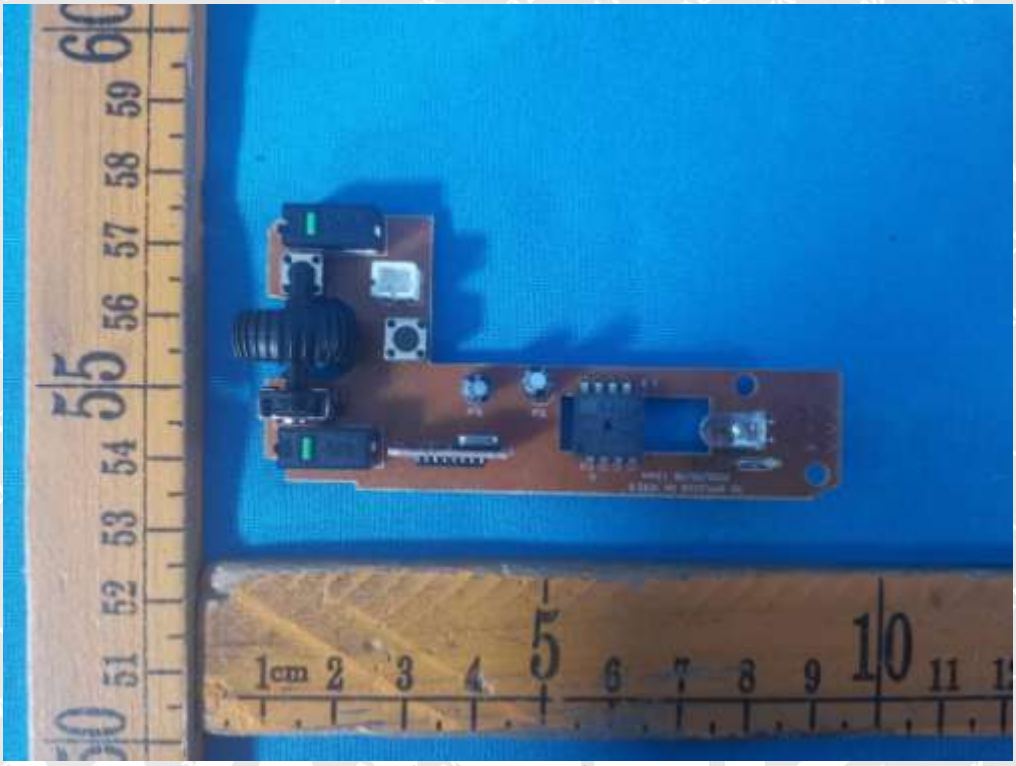

Figure 7: PCB view

====== End of Report ======

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CNAS L3110

# TEST REPORT

| | | |
|---|---|---|
| **Report No.** | : | WTF22D10214191Y001 |
| **Applicant** | : | Mid Ocean Brands B.V. |
| **Address** | : | 7/F., Kings Tower, 111 King Lam Street, Cheung Sha Wan, Kowloon, Hong Kong |
| **Manufacturer** | : | 114628 |
| **Address** | : | -- |
| **Product** | : | EU plug(Adapter) |
| **Model(s)** | : | MO8827, MO8412, MO9747, MO9785 |
| **Total pages.** | : | 84 pages and 5 pages of photo. |
| **Standards** | : | ☒ EN IEC 62368-1:2020+A11:2020<br>Audio/video, information and communication technology equipment - Part 1:Safety requirements |
| **Date of Receipt sample** | : | 2022-10-28 |
| **Date of Test** | : | 2022-10-28 to 2022-11-21 |
| **Date of Issue** | : | 2022-11-22 |
| **Test Result** | : | **Pass** |

Remarks:
The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.


**Prepared By:**
**Waltek Testing Group Co., Ltd.**
Address: No. 77, Houjie Section, Guantai Road, Houjie Town, Dongguan City, Guangdong, China
Tel: +86-769-2267 6998
Fax: +86-769-2267 6828


Compiled by:

Lucas Cao/ Project Engineer

Approved by:

Sam Qi / Designated Reviewer

| | |
|---|---|
| Test Item description ..... | EU plug(Adapter) |
| Trade Mark(s) ..... | MOB |
| Model/Type reference ..... | MO8827, MO8412, MO9747, MO9785 |
| Ratings ..... | Input: 100-240Va.c., 50/60Hz, 0.15A<br>Output: 5Vdc, 1A |

**Remark:**

Whether parts of tests for the product have been subcontracted to other labs:

☐ Yes ☒ No

If Yes, list the related test items and lab information:

Test items: --

Lab information: --

**Summary of testing:**

| **Tests performed (name of test and test clause):** | **Testing location:** |
|---|---|
| - EN IEC 62368-1:2020+A11:2020<br>The submitted samples were found to comply with the requirements of above specification. | No. 77, Houjie Section, Guantai Road, Houjie Town, Dongguan City, Guangdong, China |

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

List of countries addressed: National Differences and Group Differences for CENELEC countries were checked.

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

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

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

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

**Information on uncertainty of measurement:**

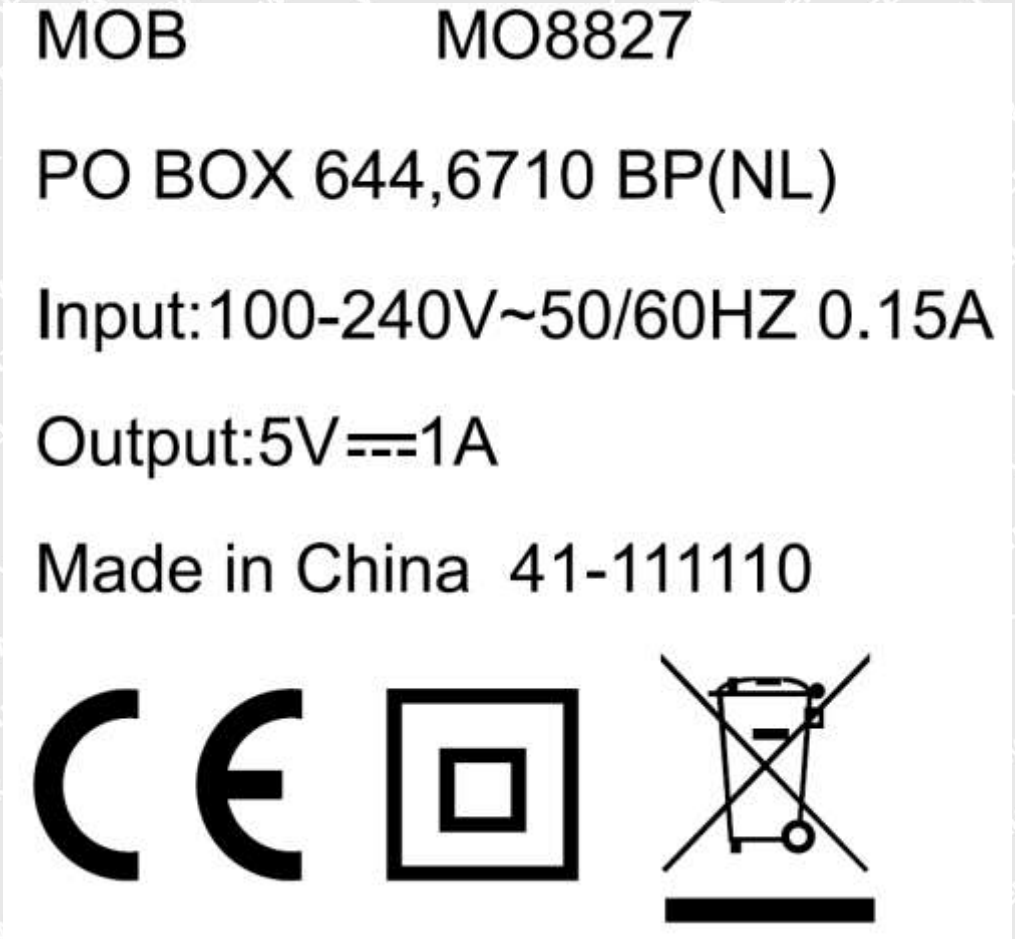
The uncertainties of measurement are calculated by the laboratory based on application of criteria given by OD-5014 for test equipment and application of test methods, decision sheets and operational procedures of IECEE.

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

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

**Copy of marking plate:**

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




**Remark:**

1. The above markings are the minimum requirements required by the safety standard. For the final production, the additional markings which donot give rise to misunderstanding may be added.
2. The CE marking and WEEE symbol should be at least 5.0mm and 7.0mm respectively in height.
3. According to the EU directives which have been aligned with EU NLF (new legislative framework), both of manufacturer and importer's name and address shall be affixed on the product or, where that is not possible, on its packaging or in a document accompanying the product before the product is placed on the EU market.

| Test item particulars: | |
|---|---|
| **Product group** | ☒ end product ☐ built-in component |
| **Classification of use by** | ☒ Ordinary person ☒ Children likely present<br>☐ Instructed person<br>☐ Skilled person |
| **Supply connection** | ☒ AC mains ☐ DC mains<br>☐ not mains connected:<br>☐ ES1 ☐ ES2 ☐ ES3 |
| **Supply tolerance** | ☒ +10%/-10%<br>☐ +20%/-15%<br>☐ +__%/ -__%<br>☐ None |
| **Supply connection – type** | ☒ pluggable equipment type A -<br>☐ non-detachable supply cord<br>☐ appliance coupler<br>☒ direct plug-in<br>☐ pluggable equipment type B -<br>☐ non-detachable supply cord<br>☐ appliance coupler<br>☐ permanent connection<br>☐ mating connector ☐ other: not Mains connected |
| **Considered current rating of protective device** | ☒ UK: 13 A; Others: 16 A |
| | Location: ☐ building ☒ equipment<br>☐ N/A |
| **Equipment mobility** | ☐ movable ☐ hand-held ☐ transportable<br>☒ direct plug-in ☐ stationary ☐ for building-in<br>☐ wall/ceiling-mounted ☐ SRME/rack-mounted<br>☐ other: ___ |
| **Overvoltage category (OVC)** | ☐ OVC I ☒ OVC II ☐ OVC III<br>☐ OVC IV ☐ other: not Mains connected |
| **Class of equipment** | ☐ Class I ☒ Class II ☐ Class III<br>☐ Not classified ☐ ___ |
| **Special installation location** | ☒ N/A ☐ restricted access area<br>☐ outdoor location ☐ ___ |
| **Pollution degree (PD)** | ☐ PD 1 ☒ PD 2 ☐ PD 3 |
| **Manufacturer's specified $T_{ma}$** | 45°C ☐ Outdoor: minimum ___°C |
| **IP protection class** | ☒ IPX0 ☐ IP___ |
| **Power systems** | ☒ TN ☐ TT ☐ IT - ___V $_{L-L}$<br>☐ not AC mains |
| **Altitude during operation (m)** | ☒ 2000 m or less ☐ _5000_m |
| **Altitude of test laboratory (m)** | ☒ 2000 m or less ☐ ___ m |
| **Mass of equipment (kg)** | :0.021kg |

| |
|---|
| **Possible test case verdicts:**<br>**- test case does not apply to the test object....:** N/A<br>**- test object does meet the requirement.....:** P (Pass)<br>**- test object does not meet the requirement....:** F (Fail) |
| **Testing:**<br>**Date of receipt of test item .....:** 2022-10-28<br>**Date (s) of performance of tests .....:** 2022-10-28 to 2022-11-21 |
| |
| **General remarks:** |
| ”(see Enclosure #)” refers to additional information appended to the report.<br>“(see appended table)” refers to a table appended to the report.<br>**Throughout this report a ☐ comma / ☒ point is used as the decimal separator.** |
| **General Product Information:** |
| **Product Description:**<br>1. The equipment is class II EU plug(Adapter) for the use in information technology and audio/video equipment, for indoor use only.<br>2. The EU plug(Adapter)’s top enclosure is secured to the bottom enclosure by ultrasonic welding.<br>3. The test samples are pre-production sample without serial numbers.<br>4. Specified maximum ambient temperature is 45°C.<br>5. The equipment was evaluated for a maximum operating altitude of 2000m.<br>6. The models are in compliance with the requirements of LPS (Annex Q).<br>7. The European plug provided in the equipment has been tested according to EN 50075:1990. |
| **Model Differences**<br>1. All these models are same as each other only except for the model name, appearance in colour.<br>2. The model MO9785 was selected for all testing. |
| **Additional application considerations**<br>**N/A** |

| OVERVIEW OF ENERGY SOURCES AND SAFEGUARDS | | | | |
|---|---|---|---|---|
| **Clause** | **Possible Hazard** | | | |
| 5 | Electrically-caused injury | | | |
| Class and Energy Source (e.g. ES3: Primary circuit) | Body Part (e.g. Ordinary) | Safeguards | | |
| | | B | S | R |
| ES3: All circuits except for output circuits | Ordinary | N/A | N/A | Enclosure, See 5.4.2, 5.4.3 and 5.5.3 |
| ES1: Output circuits and Secondary output terminal | Ordinary | N/A | N/A | N/A |
| 6 | Electrically-caused fire | | | |
| Class and Energy Source (e.g. PS2: 100 Watt circuit) | Material part (e.g. Printed board) | Safeguards | | |
| | | B | 1st S | 2nd S |
| PS3: All primary circuits inside the equipment enclosure | Enclosure | See 6.3 | V-0 | N/A |
| PS3 circuits | PCB | See 6.3 | V-1 or better | N/A |
| PS3 circuits | Plastic materials not part of PS3 circuit | See 6.3 | V-2 or better | N/A |
| PS3 circuits | The other components / materials | See 6.3 | See 6.4.5, 6.4.6 | N/A |
| 7 | Injury caused by hazardous substances | | | |
| Class and Energy Source (e.g. Ozone) | Body Part (e.g., Skilled) | Safeguards | | |
| | | B | S | R |
| N/A | N/A | N/A | N/A | N/A |
| 8 | Mechanically-caused injury | | | |
| Class and Energy Source (e.g. MS3: Plastic fan blades) | Body Part (e.g. Ordinary) | Safeguards | | |
| | | B | S | R |
| MS1: Mass of the unit <7kg | Ordinary | N/A | N/A | N/A |
| MS1: Smooth Edges and corners | Ordinary | N/A | N/A | N/A |
| 9 | Thermal burn | | | |
| Class and Energy Source (e.g. TS1: Keyboard caps) | Body Part (e.g., Ordinary) | Safeguards | | |
| | | B | S | R |
| TS1: Plastic enclosure | Ordinary | N/A | N/A | N/A |
| TS3: Internal parts/circuits | Ordinary | N/A | N/A | Enclosure |
| 10 | Radiation | | | |
| Class and Energy Source | Body Part | Safeguards | | |

| | | | | |
|---|---|---|---|---|
| (e.g. RS1: PMP sound output) | (e.g., Ordinary) | B | S | R |
| N/A | -- | -- | -- | -- |
| Supplementary Information:<br>“B” – Basic Safeguard; “S” – Supplementary Safeguard; “R” – Reinforced Safeguard | | | | |

| ENERGY SOURCE DIAGRAM |
|---|
| Indicate which energy sources are included in the energy source diagram. Insert diagram below |
| ☒ ES ☒ PS ☒ MS ☒ TS ☒ RS<br>SEE THE OVERVIEW OF ENERGY SOURCES AND SAFEGUARDS FOR DETAIL |

| EN IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| **4** | **GENERAL REQUIREMENTS** | | P |
| 4.1.1 | Acceptance of materials, components and subassemblies | (See appended table 4.1.2) | P |
| 4.1.2 | Use of components | Components which are certified to IEC and/or national standards are used correctly within their ratings. Components not covered by IEC standards are tested under the conditions present in the equipment. See also Annex G | P |
| 4.1.3 | Equipment design and construction | Evaluation of safeguards regarding preventing access to ES3 parts, limiting the source supplying outputs to fulfill ES1, and protection in regard to risk of ignition, mechanical-caused injury and thermal burn considered. | P |
| 4.1.4 | Specified ambient temperature for outdoor use (°C) .....: | Indoor use only | N/A |
| 4.1.5 | Constructions and components not specifically covered | No constructions and components. | N/A |
| 4.1.8 | Liquids and liquid filled components (LFC) | No such parts. | N/A |
| 4.1.15 | Markings and instructions | (See Annex F) | P |
| 4.4.3 | Safeguard robustness | See below | P |
| 4.4.3.1 | General | | P |
| 4.4.3.2 | Steady force tests | (See Annex T.2 and T.4). | P |
| 4.4.3.3 | Drop tests | (See Annex T.7) | P |
| 4.4.3.4 | Impact tests | | N/A |
| 4.4.3.5 | Internal accessible safeguard tests | The external enclosure cannot be opened without damaging the product. | N/A |
| 4.4.3.6 | Glass impact tests | No such glass used. | N/A |
| 4.4.3.7 | Glass fixation tests | No such parts. | N/A |
| | Glass impact test (1J) | | N/A |
| | Push/pull test (10 N) | | N/A |
| 4.4.3.8 | Thermoplastic material tests | (See Annex T.8) | P |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 4.4.3.9 | Air comprising a safeguard | (See Annex T) | P |
| 4.4.3.10 | Accessibility, glass, safeguard effectiveness | After tests of 4.4.3.2, 4.4.3.3, and 4.4.3.8, no safeguard damaged. Class 3 energy sources do not become accessible to an ordinary person or to an instructed person and all other safeguards do remain effective. | P |
| 4.4.4 | Displacement of a safeguard by an insulating liquid | No such liquid. | N/A |
| 4.4.5 | Safety interlocks | No such parts. | N/A |
| **4.5** | **Explosion** | | P |
| 4.5.1 | General | No explosion occurs during normal/abnormal operation and single fault conditions | P |
| 4.5.2 | No explosion during normal/abnormal operating condition | (See Clause B.2, B.3) | P |
| | No harm by explosion during single fault conditions | (See Clause B.4) | P |
| **4.6** | **Fixing of conductors** | See below | P |
| | Fix conductors not to defeat a safeguard | | P |
| | Compliance is checked by test.....: | (See Clause T.2) | P |
| **4.7** | **Equipment for direct insertion into mains socket–outlets** | | P |
| 4.7.2 | Mains plug part complies with relevant standard ...: | The dimension and construction of the injection part of plug was tested and in compliance with:<br>For European plug: EN 50075:1990 | P |
| 4.7.3 | Torque (Nm) .....: | EU plug: Max. 0.007Nm | P |
| **4.8** | **Equipment containing coin/button cell batteries** | | N/A |
| 4.8.1 | General | | N/A |
| 4.8.2 | Instructional safeguard.....: | | N/A |
| 4.8.3 | Battery compartment door/cover construction | | N/A |
| | Open torque test | | N/A |
| 4.8.4.2 | Stress relief test | | N/A |
| 4.8.4.3 | Battery replacement test | | N/A |
| 4.8.4.4 | Drop test | | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 4.8.4.5 | Impact test | | N/A |
| 4.8.4.6 | Crush test | | N/A |
| 4.8.5 | Compliance | | N/A |
| | 30N force test with test probe | | N/A |
| | 20N force test with test hook | | N/A |
| **4.9** | **Likelihood of fire or shock due to entry of conductive object** | | P |
| **4.10** | **Component requirements** | | P |
| 4.10.1 | Disconnect Device | (See Annex L) | P |
| 4.10.2 | Switches and relays | No switches and relays used | N/A |
| **5** | **ELECTRICALLY-CAUSED INJURY** | | P |
| **5.2** | **Classification and limits of electrical energy sources** | | P |
| 5.2.2 | ES1, ES2 and ES3 limits | | P |
| 5.2.2.2 | Steady-state voltage and current limits .....: | (See appended table 5.2) | P |
| 5.2.2.3 | Capacitance limits .....: | (See appended table 5.2) | P |
| 5.2.2.4 | Single pulse limits.....: | No single pulse introduced | N/A |
| 5.2.2.5 | Limits for repetitive pulses .....: | No repetitive pulses introduced | N/A |
| 5.2.2.6 | Ringing signals | No such ringing signals within the EUT | N/A |
| 5.2.2.7 | Audio signals | No audio signals used | N/A |
| **5.3** | **Protection against electrical energy sources** | | P |
| 5.3.1 | General Requirements for accessible parts to ordinary, instructed and skilled persons | See only 4.3 and 5.3 to 5.5 which applies to protection between the accessible parts and hazardous parts of other circuits. | P |
| 5.3.1 a) | Accessible ES1/ES2 derived from ES2/ES3 circuits | | P |
| 5.3.1 b) | Skilled persons not unintentional contact ES3 bare conductors | | N/A |
| 5.3.2.1 | Accessibility to electrical energy sources and safeguards | Only ES1 circuit can be accessed for this product | P |
| | Accessibility to outdoor equipment bare parts | | N/A |
| 5.3.2.2 | Contact requirements | No openings allowing entry of a probe. No access with test probe to any ES3 circuit or parts. | P |
| | Test with test probe from Annex V | | - |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 5.3.2.2 a) | Air gap – electric strength test potential (V) .....: | No such air gap | N/A |
| 5.3.2.2 b) | Air gap – distance (mm) .....: | No such air gap | N/A |
| 5.3.2.3 | Compliance | | N/A |
| 5.3.2.4 | Terminals for connecting stripped wire | No stripped wire used. | N/A |
| **5.4** | **Insulation materials and requirements** | | P |
| 5.4.1.2 | Properties of insulating material | The choice and application have taken into account as specified in this Clause 5 and Annex T and natural rubber, hygroscopic materials or asbestos are not used as insulation. | P |
| 5.4.1.3 | Material is non-hygroscopic | (See sub-clause 5.4.8) | P |
| 5.4.1.4 | Maximum operating temperature for insulating materials .....: | (See appended table 5.4.1.4, 9.3, B.1.5, B.2.6, B.3, B.4) | P |
| 5.4.1.5 | Pollution degrees.....: | PD2 considered | N/A |
| 5.4.1.5.2 | Test for pollution degree 1 environment and for an insulating compound | PD2 is applied. No insulating compound applied (however see 5.5.4). | N/A |
| 5.4.1.5.3 | Thermal cycling test | See above | N/A |
| 5.4.1.6 | Insulation in transformers with varying dimensions | No such transformer. | N/A |
| 5.4.1.7 | Insulation in circuits generating starting pulses | No such starting pulses. | N/A |
| 5.4.1.8 | Determination of working voltage .....: | (See appended table 5.4.1.8) | P |
| 5.4.1.9 | Insulating surfaces | | P |
| 5.4.1.10 | Thermoplastic parts on which conductive metallic parts are directly mounted | | N/A |
| 5.4.1.10.2 | Vicat test.....: | | N/A |
| 5.4.1.10.3 | Ball pressure test.....: | (See appended table 5.4.1.10.3) | P |
| 5.4.2 | Clearances | The highest value of 5.4.2.2 and 5.4.2.3 used. | P |
| 5.4.2.1 | General requirements | | P |
| | Clearances in circuits connected to AC Mains, Alternative method | (See Annex X) | P |
| 5.4.2.2 | Procedure 1 for determining clearance | | P |
| | Temporary overvoltage .....: | Temporary overvoltage 2000Vpeak assumed. | — |
| 5.4.2.3 | Procedure 2 for determining clearance | | P |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 5.4.2.3.2.2 | a.c. mains transient voltage .....: | Overvoltage category II, 2500V peak | — |
| 5.4.2.3.2.3 | d.c. mains transient voltage .....: | No d.c. mains. | — |
| 5.4.2.3.2.4 | External circuit transient voltage.....: | No such transient voltage | — |
| 5.4.2.3.2.5 | Transient voltage determined by measurement .....: | No need to conduct this test | — |
| 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 .....: | Up to 2000m, factor :1.0 | P |
| 5.4.2.6 | Clearance measurement.....: | (See appended table 5.4.2 and 5.4.3) | P |
| 5.4.3 | Creepage distances | (See appended table 5.4.2 and 5.4.3) | P |
| 5.4.3.1 | General | | P |
| 5.4.3.3 | Material group.....: | IIIb assumed | — |
| 5.4.3.4 | Creepage distances measurement .....: | (See appended table 5.4.2 and 5.4.3) | P |
| 5.4.4 | Solid insulation | See below | P |
| 5.4.4.1 | General requirements | | P |
| 5.4.4.2 | Minimum distance through insulation .....: | (See appended table 5.4.4.2) | P |
| 5.4.4.3 | Insulating compound forming solid insulation | See below only. | N/A |
| 5.4.4.4 | Solid insulation in semiconductor devices | Approved optocoupler used. Requirements of G.12 met, see table 4.1.2 for listed component used | P |
| 5.4.4.5 | Insulating compound forming cemented joints | No such construction within the EUT | N/A |
| 5.4.4.6 | Thin sheet material | See below | P |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 5.4.4.6.1 | General requirements | - At least two layers insulation tape used between transformer T1 primary winding and secondary winding are used for reinforced insulation and are not expected to be subject to handling or abrasion during ordinary or instructed person servicing.<br>- At least two layers insulation tape used between transformer T1 core and secondary winding are used for reinforced insulation and are not expected to be subject to handling or abrasion during ordinary or instructed person servicing. | P |
| 5.4.4.6.2 | Separable thin sheet material | Where two layers are provided as reinforced insulation any one layer passed the electric strength test for reinforced insulation | P |
| | Number of layers (pcs) .....: | 2 | P |
| 5.4.4.6.3 | Non-separable thin sheet material | No non-separable thin sheet | N/A |
| | Number of layers (pcs) .....: | | N/A |
| 5.4.4.6.4 | Standard test procedure for non-separable thin sheet material.....: | | N/A |
| 5.4.4.6.5 | Mandrel test | | N/A |
| 5.4.4.7 | Solid insulation in wound components | See G.5.3 and G.6.1 only. | P |
| 5.4.4.9 | Solid insulation at frequencies >30 kHz, $E_P$, $K_R$, $d$, $V_{PW}$ (V).....: | (See appended Table 5.4.4.9) | P |
| | Alternative by electric strength test, tested voltage (V), $K_R$.....: | | N/A |
| 5.4.5 | Antenna terminal insulation | No such antenna terminal used. | P |
| 5.4.5.1 | General | | N/A |
| 5.4.5.2 | Voltage surge test | Surge test with 50 discharges at a maximum rate of 12/min from a 1 nF capacitor charged to 10kV performed. | P |
| 5.4.5.3 | Insulation resistance (MΩ) .....: | Input to output: >100 MΩ | P |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | Electric strength test.....: | (See appended table 5.4.9) | P |
| 5.4.6 | Insulation of internal wire as part of supplementary safeguard | No such insulation of internal wire as part of supplementary safeguard. | N/A |
| 5.4.7 | Tests for semiconductor components and for cemented joints | No tests necessary –see only 5.4.4.4. | N/A |
| 5.4.8 | Humidity conditioning | | P |
| | Relative humidity (%), temperature (°C), duration (h) .....: | 95%, 40°C, 120h | — |
| 5.4.9 | Electric strength test | (See appended table 5.4.9) | P |
| 5.4.9.1 | Test procedure for type test of solid insulation.....: | (See appended table 5.4.9) | P |
| 5.4.9.2 | Test procedure for routine test | | P |
| 5.4.10 | Safeguards against transient voltages from external circuits | No such external circuits | N/A |
| 5.4.10.1 | Parts and circuits separated from external circuits | | N/A |
| 5.4.10.2 | Test methods | | N/A |
| 5.4.10.2.1 | General | | N/A |
| 5.4.10.2.2 | Impulse test.....: | | N/A |
| 5.4.10.2.3 | Steady-state test .....: | | N/A |
| 5.4.10.3 | Verification for insulation breakdown for impulse test.....: | | N/A |
| 5.4.11 | Separation between external circuits and earth | No such external circuit. | N/A |
| 5.4.11.1 | Exceptions to separation between external circuits and earth | | N/A |
| 5.4.11.2 | Requirements | | N/A |
| | SPDs bridge separation between external circuit and earth | | N/A |
| | Rated operating voltage $U_{op}$ (V) .....: | | — |
| | Nominal voltage $U_{peak}$ (V) .....: | | — |
| | Max increase due to variation $\Delta U_{sp}$ .....: | | — |
| | Max increase due to ageing $\Delta U_{sa}$ .....: | | — |
| 5.4.11.3 | Test method and compliance.....: | | N/A |
| 5.4.12 | Insulating liquid | No such liquid | N/A |
| 5.4.12.1 | General requirements | | N/A |
| 5.4.12.2 | Electric strength of an insulating liquid.....: | | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 5.4.12.3 | Compatibility of an insulating liquid .....: | | N/A |
| 5.4.12.4 | Container for insulating liquid .....: | | N/A |
| **5.5** | **Components as safeguards** | | P |
| 5.5.1 | General | | P |
| 5.5.2 | Capacitors and RC units | Approved Y type capacitors provided. | P |
| 5.5.2.1 | General requirement | | P |
| 5.5.2.2 | Safeguards against capacitor discharge after disconnection of a connector .....: | | N/A |
| 5.5.3 | Transformers | (See Annex G.5.3) | P |
| 5.5.4 | Optocouplers | | N/A |
| 5.5.5 | Relays | | N/A |
| 5.5.6 | Resistors | | N/A |
| 5.5.7 | SPDs | | N/A |
| 5.5.8 | Insulation between the mains and an external circuit consisting of a coaxial cable .....: | No such external circuits. | N/A |
| 5.5.9 | Safeguards for socket-outlets in outdoor equipment | | N/A |
| | RCD rated residual operating current (mA).....: | | — |
| **5.6** | **Protective conductor** | | N/A |
| 5.6.2 | Requirement for protective conductors | | N/A |
| 5.6.2.1 | General requirements | Class II equipment | N/A |
| 5.6.2.2 | Colour of insulation | | N/A |
| 5.6.3 | Requirement for protective earthing conductors | | N/A |
| | Protective earthing conductor size ($mm^2$) .....: | | — |
| | Protective earthing conductor serving as a reinforced safeguard | | N/A |
| | Protective earthing conductor serving as a double safeguard | | N/A |
| 5.6.4 | Requirements for protective bonding conductors | | N/A |
| 5.6.4.1 | Protective bonding conductors | | N/A |
| | Protective bonding conductor size ($mm^2$).....: | | — |
| 5.6.4.2 | Protective current rating (A) .....: | | N/A |
| 5.6.5 | Terminals for protective conductors | | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 5.6.5.1 | Terminal size for connecting protective earthing conductors (mm) .....: | | N/A |
| | Terminal size for connecting protective bonding conductors (mm) .....: | | N/A |
| 5.6.5.2 | Corrosion | | N/A |
| 5.6.6 | Resistance of the protective bonding system | | N/A |
| 5.6.6.1 | Requirements | | N/A |
| 5.6.6.2 | Test Method .....: | | N/A |
| 5.6.6.3 | Resistance (Ω) or voltage drop .....: | | N/A |
| 5.6.7 | Reliable connection of a protective earthing conductor | | N/A |
| 5.6.8 | Functional earthing | | N/A |
| | Conductor size ($mm^2$) .....: | | N/A |
| | Class II with functional earthing marking .....: | | N/A |
| | Appliance inlet cl & cr (mm).....: | | N/A |
| **5.7** | **Prospective touch voltage, touch current and protective conductor current** | | P |
| 5.7.2 | Measuring devices and networks | | P |
| 5.7.2.1 | Measurement of touch current | (See appended table 5.2) | P |
| 5.7.2.2 | Measurement of voltage | (See appended table 5.2) | P |
| 5.7.3 | Equipment set-up, supply connections and earth connections | Clause 4, 5.3 and 5.4 of IEC 60990:1999 applied. | P |
| 5.7.4 | Unearthed accessible parts.....: | (See appended table 5.7.4) | P |
| 5.7.5 | Earthed accessible conductive parts.....: | Class II equipment | N/A |
| 5.7.6 | Requirements when touch current exceeds ES2 limits | | N/A |
| | Protective conductor current (mA) .....: | | N/A |
| | Instructional Safeguard .....: | | N/A |
| 5.7.7 | Prospective touch voltage and touch current associated with external circuits | No external circuits. | N/A |
| 5.7.7.1 | Touch current from coaxial cables | | N/A |
| 5.7.7.2 | Prospective touch voltage and touch current associated with paired conductor cables | | N/A |
| 5.7.8 | Summation of touch currents from external circuits | No external circuits. | N/A |
| | a) Equipment connected to earthed external circuits, current (mA) .....: | | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | b) Equipment connected to unearthed external circuits, current (mA) .....: | | N/A |
| **5.8** | **Backfeed safeguard in battery backed up supplies** | | N/A |
| | Mains terminal ES .....: | No battery used | N/A |
| | Air gap (mm).....: | | N/A |
| **6** | **ELECTRICALLY- CAUSED FIRE** | | P |
| **6.2** | **Classification of PS and PIS** | | P |
| 6.2.2 | Power source circuit classifications .....: | (See appended table 6.2.2) | P |
| 6.2.3 | Classification of potential ignition sources | All conductors are considered as PIS. | P |
| 6.2.3.1 | Arcing PIS .....: | (See appended table 6.2.3.1) | P |
| 6.2.3.2 | Resistive PIS .....: | (See appended table 6.2.3.2) | P |
| **6.3** | **Safeguards against fire under normal operating and abnormal operating conditions** | | P |
| 6.3.1 | No ignition and attainable temperature value less than 90 % defined by ISO 871 or less than 300 °C for unknown materials .....: | (See appended table B.1.5 and B.3) | P |
| | Combustible materials outside fire enclosure .....: | | N/A |
| **6.4** | **Safeguards against fire under single fault conditions** | | P |
| 6.4.1 | Safeguard method | Method by control of fire spread applied, Fire enclosure provided. | 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 | | N/A |
| 6.4.3.1 | Supplementary safeguards | | N/A |
| 6.4.3.2 | Single Fault Conditions .....: | | N/A |
| | Special conditions for temperature limited by fuse | | N/A |
| 6.4.4 | Control of fire spread in PS1 circuits | | P |
| 6.4.5 | Control of fire spread in PS2 circuits | See 6.4.6 | P |
| 6.4.5.2 | Supplementary safeguards | Safeguards checked as part of 6.4.6. | P |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 6.4.6 | Control of fire spread in PS3 circuits | Compliance detailed as follows:<br>- Printed board: rated min. V-1<br>- All other components: at least V-2 except for parts mounted on min. V-1 material or small parts of combustible material (with mass less than 4g) or components complying to relevant IEC standard<br>- Isolating transformer: complying with G.5.3.<br>- Fire enclosure rated V-0 used. | P |
| 6.4.7 | Separation of combustible materials from a PIS | Fire enclosure rated V-0 used. | N/A |
| 6.4.7.2 | Separation by distance | | N/A |
| 6.4.7.3 | Separation by a fire barrier | No specific barrier provided. | N/A |
| 6.4.8 | Fire enclosures and fire barriers | Fire enclosure rated V-0 used. | P |
| 6.4.8.2 | Fire enclosure and fire barrier material properties | | P |
| 6.4.8.2.1 | Requirements for a fire barrier | No fire barrier used. | N/A |
| 6.4.8.2.2 | Requirements for a fire enclosure | Fire enclosure rated V-0 used. | P |
| 6.4.8.3 | Constructional requirements for a fire enclosure and a fire barrier | | P |
| 6.4.8.3.1 | Fire enclosure and fire barrier openings | See below | P |
| 6.4.8.3.2 | Fire barrier dimensions | No fire barrier used. | N/A |
| 6.4.8.3.3 | Top openings and properties | No openings. | N/A |
| | Openings dimensions (mm) .....: | | N/A |
| 6.4.8.3.4 | Bottom openings and properties | No openings. | N/A |
| | Openings dimensions (mm) .....: | | N/A |
| | Flammability tests for the bottom of a fire enclosure | | N/A |
| | Instructional Safeguard .....: | | N/A |
| 6.4.8.3.5 | Side openings and properties | No openings. | N/A |
| | Openings dimensions (mm) .....: | | N/A |
| 6.4.8.3.6 | Integrity of a fire enclosure, condition met: a), b) or c).....: | No enclosure can be opened by an ordinary person | N/A |
| 6.4.8.4 | Separation of a PIS from a fire enclosure and a fire barrier distance (mm) or flammability rating.....: | Fire enclosure rated V-0 used. | P |
| 6.4.9 | Flammability of insulating liquid.....: | | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| **6.5** | **Internal and external wiring** | | N/A |
| 6.5.1 | General requirements | | N/A |
| 6.5.2 | Requirements for interconnection to building wiring .....: | No such wire used | N/A |
| 6.5.3 | Internal wiring size ($mm^2$) for socket-outlets .....: | | N/A |
| **6.6** | **Safeguards against fire due to the connection to additional equipment** | | P |
| **7** | **INJURY CAUSED BY HAZARDOUS SUBSTANCES** | | N/A |
| **7.2** | **Reduction of exposure to hazardous substances** | | N/A |
| **7.3** | **Ozone exposure** | | N/A |
| **7.4** | **Use of personal safeguards or personal protective equipment (PPE)** | | N/A |
| | Personal safeguards and instructions .....: | | — |
| **7.5** | **Use of instructional safeguards and instructions** | | N/A |
| | Instructional safeguard (ISO 7010) .....: | | — |
| **7.6** | **Batteries and their protection circuits** | | N/A |
| **8** | **MECHANICALLY-CAUSED INJURY** | | P |
| **8.2** | **Mechanical energy source classifications** | | P |
| **8.3** | **Safeguards against mechanical energy sources** | | P |
| **8.4** | **Safeguards against parts with sharp edges and corners** | | P |
| 8.4.1 | Safeguards | | N/A |
| | Instructional Safeguard .....: | | N/A |
| 8.4.2 | Sharp edges or corners | The sharp edges and corners of the equipment are considered as MS1. | P |
| **8.5** | **Safeguards against moving parts** | | N/A |
| 8.5.1 | Fingers, jewellery, clothing, hair, etc., contact with MS2 or MS3 parts | No moving parts. | N/A |
| | MS2 or MS3 part required to be accessible for the function of the equipment | See above. | N/A |
| | Moving MS3 parts only accessible to skilled person | | N/A |
| 8.5.2 | Instructional safeguard.....: | | N/A |
| 8.5.4 | Special categories of equipment containing moving parts | | N/A |
| 8.5.4.1 | General | | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.5.4.2 | Equipment containing work cells with MS3 parts | | N/A |
| 8.5.4.2.1 | Protection of persons in the work cell | | N/A |
| 8.5.4.2.2 | Access protection override | | N/A |
| 8.5.4.2.2.1 | Override system | | N/A |
| 8.5.4.2.2.2 | Visual indicator | | N/A |
| 8.5.4.2.3 | Emergency stop system | | N/A |
| | Maximum stopping distance from the point of activation (m) .....: | | N/A |
| | Space between end point and nearest fixed mechanical part (mm) .....: | | N/A |
| 8.5.4.2.4 | Endurance requirements | | N/A |
| | Mechanical system subjected to 100 000 cycles of operation | | N/A |
| | - Mechanical function check and visual inspection | | N/A |
| | - Cable assembly.....: | | N/A |
| 8.5.4.3 | Equipment having electromechanical device for destruction of media | | N/A |
| 8.5.4.3.1 | Equipment safeguards | | N/A |
| 8.5.4.3.2 | Instructional safeguards against moving parts.....: | | N/A |
| 8.5.4.3.3 | Disconnection from the supply | | N/A |
| 8.5.4.3.4 | Cut type and test force (N).....: | | N/A |
| 8.5.4.3.5 | Compliance | | N/A |
| 8.5.5 | High pressure lamps | No high pressure lamps used. | N/A |
| | Explosion test .....: | | N/A |
| 8.5.5.3 | Glass particles dimensions (mm) .....: | | N/A |
| **8.6** | **Stability of equipment** | | N/A |
| 8.6.1 | General | MS1: Mass of the unit | N/A |
| | Instructional safeguard.....: | | N/A |
| 8.6.2 | Static stability | | N/A |
| 8.6.2.2 | Static stability test.....: | | N/A |
| 8.6.2.3 | Downward force test | | N/A |
| 8.6.3 | Relocation stability | | N/A |
| | Wheels diameter (mm).....: | | — |
| | Tilt test | | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.6.4 | Glass slide test | | N/A |
| 8.6.5 | Horizontal force test .....: | | N/A |
| **8.7** | **Equipment mounted to wall, ceiling or other structure** | | N/A |
| 8.7.1 | Mount means type.....: | No wall or ceiling | N/A |
| 8.7.2 | Test methods | | N/A |
| | Test 1, additional downwards force (N).....: | | N/A |
| | Test 2, number of attachment points and test force (N).....: | | N/A |
| | Test 3 Nominal diameter (mm) and applied torque (Nm).....: | | N/A |
| **8.8** | **Handles strength** | | N/A |
| 8.8.1 | General | No handles | N/A |
| 8.8.2 | Handle strength test | | N/A |
| | Number of handles.....: | | — |
| | Force applied (N).....: | | — |
| **8.9** | **Wheels or casters attachment requirements** | | N/A |
| 8.9.2 | Pull test | No such parts | N/A |
| **8.10** | **Carts, stands and similar carriers** | | N/A |
| 8.10.1 | General | No carts, stands or similar carriers | N/A |
| 8.10.2 | Marking and instructions.....: | | N/A |
| 8.10.3 | Cart, stand or carrier loading test | | N/A |
| | Loading force applied (N).....: | | N/A |
| 8.10.4 | Cart, stand or carrier impact test | | N/A |
| 8.10.5 | Mechanical stability | | N/A |
| | Force applied (N).....: | | — |
| 8.10.6 | Thermoplastic temperature stability | | N/A |
| **8.11** | **Mounting means for slide-rail mounted equipment (SRME)** | | N/A |
| 8.11.1 | General | No such parts | N/A |
| 8.11.2 | Requirements for slide rails | | N/A |
| | Instructional Safeguard.....: | | N/A |
| 8.11.3 | Mechanical strength test | | N/A |
| 8.11.3.1 | Downward force test, force (N) applied.....: | | N/A |
| 8.11.3.2 | Lateral push force test | | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.11.3.3 | Integrity of slide rail end stops | | N/A |
| 8.11.4 | Compliance | | N/A |
| **8.12** | **Telescoping or rod antennas** | | N/A |
| | Button/ball diameter (mm).....: | No such parts | — |
| **9** | **THERMAL BURN INJURY** | | P |
| **9.2** | **Thermal energy source classifications** | | P |
| **9.3** | **Touch temperature limits** | | P |
| 9.3.1 | Touch temperatures of accessible parts .....: | (See appended table 5.4.1.4, 9.3, B.1.5, B.2.6) | P |
| 9.3.2 | Test method and compliance | See B.1.6 & B.2.3 | P |
| **9.4** | **Safeguards against thermal energy sources** | | P |
| **9.5** | **Requirements for safeguards** | | P |
| 9.5.1 | Equipment safeguard | Enclosure provided to limit the transfer of thermal energy of internal parts under normal operating conditions and abnormal operating conditions. | P |
| 9.5.2 | Instructional safeguard.....: | Instructional safeguard is not required. | N/A |
| **9.6** | **Requirements for wireless power transmitters** | | N/A |
| 9.6.1 | General | No wireless power transmitters | N/A |
| 9.6.2 | Specification of the foreign objects | | N/A |
| 9.6.3 | Test method and compliance.....: | | N/A |
| **10** | **RADIATION** | | N/A |
| **10.2** | **Radiation energy source classification** | | N/A |
| 10.2.1 | General classification | | N/A |
| | Lasers.....: | | — |
| | Lamps and lamp systems.....: | | — |
| | Image projectors.....: | | — |
| | X-Ray.....: | | — |
| | Personal music player .....: | | — |
| **10.3** | **Safeguards against laser radiation** | | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | The standard(s) equipment containing laser(s) comply .....: | No laser radiation | N/A |
| **10.4** | **Safeguards against optical radiation from lamps and lamp systems (including LED types)** | | N/A |
| 10.4.1 | General requirements | | N/A |
| | Instructional safeguard provided for accessible radiation level needs to exceed | | N/A |
| | Risk group marking and location .....: | | N/A |
| | Information for safe operation and installation | | N/A |
| 10.4.2 | Requirements for enclosures | | N/A |
| | UV radiation exposure.....: | | N/A |
| 10.4.3 | Instructional safeguard .....: | | N/A |
| **10.5** | **Safeguards against X-radiation** | | N/A |
| 10.5.1 | Requirements | No X-radiation | N/A |
| | Instructional safeguard for skilled persons.....: | | — |
| 10.5.3 | Maximum radiation (pA/kg) .....: | | — |
| **10.6** | **Safeguards against acoustic energy sources** | | N/A |
| 10.6.1 | General | No such equipment | N/A |
| 10.6.2 | Classification | | N/A |
| | Acoustic output $L_{Aeq,T}$, dB(A).....: | | N/A |
| | Unweighted RMS output voltage (mV).....: | | N/A |
| | Digital output signal (dBFS) .....: | | N/A |
| 10.6.3 | Requirements for dose-based systems | | N/A |
| 10.6.3.1 | General requirements | | N/A |
| 10.6.3.2 | Dose-based warning and automatic decrease | | N/A |
| 10.6.3.3 | Exposure-based warning and requirements | | N/A |
| | 30 s integrated exposure level (MEL30).....: | | N/A |
| | Warning for MEL ≥ 100 dB(A).....: | | N/A |
| 10.6.4 | Measurement methods | | N/A |
| 10.6.5 | Protection of persons | | N/A |
| | Instructional safeguards .....: | | N/A |
| 10.6.6 | Requirements for listening devices (headphones, earphones, etc.) | | N/A |
| 10.6.6.1 | Corded listening devices with analogue input | | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | Listening device input voltage (mV) .....: | | N/A |
| 10.6.6.2 | Corded listening devices with digital input | | N/A |
| | Max. acoustic output $L_{Aeq,T}$, dB(A) .....: | | N/A |
| 10.6.6.3 | Cordless listening devices | | N/A |
| | Max. acoustic output $L_{Aeq,T}$, dB(A) .....: | | N/A |
| **B** | **NORMAL OPERATING CONDITION TESTS, ABNORMAL OPERATING CONDITION TESTS AND SINGLE FAULT CONDITION TESTS** | | P |
| **B.1** | **General** | | P |
| B.1.5 | Temperature measurement conditions | (See appended table B.1.5) | P |
| **B.2** | **Normal operating conditions** | | P |
| B.2.1 | General requirements.....: | (See Test Item Particulars and appended test tables) | P |
| | Audio Amplifiers and equipment with audio amplifiers .....: | Not such equipment. | N/A |
| B.2.3 | Supply voltage and tolerances | Rated voltage ± 10 % | P |
| B.2.5 | Input test.....: | (See appended table B.2.5) | P |
| **B.3** | **Simulated abnormal operating conditions** | | P |
| B.3.1 | General | (See appended table B.3) | P |
| B.3.2 | Covering of ventilation openings | No openings | N/A |
| | Instructional safeguard .....: | | N/A |
| B.3.3 | DC mains polarity test | Not supplied by D.C. mains | N/A |
| B.3.4 | Setting of voltage selector | No voltage selector used. | N/A |
| B.3.5 | Maximum load at output terminals | (See appended table B.3) | P |
| B.3.6 | Reverse battery polarity | No such battery | N/A |
| B.3.7 | Audio amplifier abnormal operating conditions | Not such equipment. | N/A |
| B.3.8 | Safeguards functional during and after abnormal operating conditions .....: | During an abnormal operating condition that does not lead to a single fault condition, all safeguards are remained effective. After restoration of normal operating conditions, all safeguards are compliant with applicable requirements. For those abnormal operating conditions lead to single fault conditions, see Clause B.4. | P |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| **B.4** | **Simulated single fault conditions** | | P |
| B.4.1 | General | | P |
| B.4.2 | Temperature controlling device | No such device used. | N/A |
| B.4.3 | Blocked motor test | No motors used. | N/A |
| B.4.4 | Functional insulation | See below. | P |
| B.4.4.1 | Short circuit of clearances for functional insulation | (See appended table B.4) | P |
| B.4.4.2 | Short circuit of creepage distances for functional insulation | (See appended table B.4) | P |
| B.4.4.3 | Short circuit of functional insulation on coated printed boards | No coated printed boards used. | N/A |
| B.4.5 | Short-circuit and interruption of electrodes in tubes and semiconductors | (See appended table B.4) | P |
| B.4.6 | Short circuit or disconnection of passive components | (See appended table B.4) | P |
| B.4.7 | Continuous operation of components | The EUT is continuous operating type and no such components intended for short time operation or intermittent operation | N/A |
| B.4.8 | Compliance during and after single fault conditions .....: | (See appended table B.4) | P |
| B.4.9 | Battery charging and discharging under single fault conditions | No such battery | N/A |
| **C** | **UV RADIATION** | | N/A |
| **C.1** | **Protection of materials in equipment from UV radiation** | | N/A |
| C.1.2 | Requirements | No such UV generated from the equipment. | N/A |
| C.1.3 | Test method | | N/A |
| **C.2** | **UV light conditioning test** | | N/A |
| C.2.1 | Test apparatus .....: | | N/A |
| C.2.2 | Mounting of test samples | | N/A |
| C.2.3 | Carbon-arc light-exposure test | | N/A |
| C.2.4 | Xenon-arc light-exposure test | | N/A |
| **D** | **TEST GENERATORS** | | P |
| **D.1** | **Impulse test generators** | | N/A |
| **D.2** | **Antenna interface test generator** | | P |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| **D.3** | **Electronic pulse generator** | | N/A |
| **E** | **TEST CONDITIONS FOR EQUIPMENT CONTAINING AUDIO AMPLIFIERS** | | N/A |
| **E.1** | **Electrical energy source classification for audio signals** | | N/A |
| | Maximum non-clipped output power (W) .....: | (See appended table B.2.5) | — |
| | Rated load impedance (Ω) .....: | (See appended table 4.1.2) | — |
| | Open-circuit output voltage (V) .....: | (See appended table B.2.5) | — |
| | Instructional safeguard .....: | Provided in the manual | — |
| **E.2** | **Audio amplifier normal operating conditions** | | N/A |
| | Audio signal source type .....: | (See appended table B.2.5) | — |
| | Audio output power (W).....: | (See appended table B.2.5) | — |
| | Audio output voltage (V).....: | (See appended table B.2.5) | — |
| | Rated load impedance (Ω) .....: | (See appended table 4.1.2) | — |
| | Requirements for temperature measurement | (See appended table 5.4.1.4, 9.3, B.1.5, B.2.6, B.3, B.4) | N/A |
| E.3 | Audio amplifier abnormal operating conditions | (See appended table B.3) | N/A |
| **F** | **EQUIPMENT MARKINGS, INSTRUCTIONS, AND INSTRUCTIONAL SAFEGUARDS** | | P |
| **F.1** | **General** | | P |
| | Language .....: | English | — |
| **F.2** | **Letter symbols and graphical symbols** | | P |
| F.2.1 | Letter symbols according to IEC60027-1 | Letter symbols for quantities and units are complied with IEC 60027-1. | P |
| F.2.2 | Graphic symbols according to IEC, ISO or manufacturer specific | Graphical symbols are complied with IEC 60417, ISO 3864-2, ISO 7000 or ISO 7010. | P |
| **F.3** | **Equipment markings** | | P |
| F.3.1 | Equipment marking locations | The required marking is located on the enclosure of the equipment and is easily visible. | P |
| F.3.2 | Equipment identification markings | See copy of marking plate. | P |
| F.3.2.1 | Manufacturer identification .....: | See copy of marking plate | P |
| F.3.2.2 | Model identification .....: | See copy of marking plate | P |
| F.3.3 | Equipment rating markings | See the following details. | P |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| F.3.3.1 | Equipment with direct connection to mains | The equipment is direct connected to AC mains, see F.3.3.3 to F.3.3.6. | P |
| F.3.3.2 | Equipment without direct connection to mains | | N/A |
| F.3.3.3 | Nature of the supply voltage.....: | See copy of marking plate | P |
| F.3.3.4 | Rated voltage .....: | See copy of marking plate | P |
| F.3.3.5 | Rated frequency.....: | See copy of marking plate | P |
| F.3.3.6 | Rated current or rated power .....: | See copy of marking plate | P |
| F.3.3.7 | Equipment with multiple supply connections | Only one mains supply connection provided. | N/A |
| F.3.4 | Voltage setting device | No voltage setting device. | N/A |
| F.3.5 | Terminals and operating devices | See below. | P |
| F.3.5.1 | Mains appliance outlet and socket-outlet markings .....: | No outlet used. | N/A |
| F.3.5.2 | Switch position identification marking .....: | No switch used. | N/A |
| F.3.5.3 | Replacement fuse identification and rating markings.....: | Current fuse F1 used, marking provided on PCB adjacent to them:<br>F1: T3.15A/250Vac,<br>However, the fuse is not intended to be replaceable. | P |
| | Instructional safeguards for neutral fuse .....: | | N/A |
| F.3.5.4 | Replacement battery identification marking .....: | No such battery on the equipment. See sub-clause F.5 | N/A |
| F.3.5.5 | Neutral conductor terminal | | N/A |
| F.3.5.6 | Terminal marking location | | P |
| F.3.6 | Equipment markings related to equipment classification | See below. | P |
| 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 | Protective bonding conductor terminals .....: | | N/A |
| F.3.6.2 | Equipment class marking .....: |  | P |
| F.3.6.3 | Functional earthing terminal marking .....: | | N/A |
| F.3.7 | Equipment IP rating marking.....: | IPX0 | N/A |
| F.3.8 | External power supply output marking.....: | See copy of marking plate | P |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| F.3.9 | Durability, legibility and permanence of marking | Marking is considered to be legible and easily discernible. See also the following details. | P |
| F.3.10 | Test for permanence of markings | The label was subjected to the permanence of marking test. The label was rubbed with cloth soaked with water for 15 sec. And then again for 15 sec. With the cloth soaked with petroleum spirit. After this test there was no damage to the label. The marking on the label did not fade. There was no curling and lifting of the label edge. After each test, the marking remained legible. | P |
| **F.4** | **Instructions** | | P |
| | a) Information prior to installation and initial use | Provided in the manual. | P |
| | b) Equipment for use in locations where children not likely to be present | Not such equipment | N/A |
| | c) Instructions for installation and interconnection | Not such equipment | N/A |
| | d) Equipment intended for use only in restricted access area | Not such equipment | N/A |
| | e) Equipment intended to be fastened in place | Not such equipment | N/A |
| | f) Instructions for audio equipment terminals | No such terminals provided. | N/A |
| | g) Protective earthing used as a safeguard | Class II equipment | N/A |
| | h) Protective conductor current exceeding ES2 limits | Class II equipment | N/A |
| | i) Graphic symbols used on equipment | See user manual | P |
| | j) Permanently connected equipment not provided with all-pole mains switch | Not permanently connected equipment. | N/A |
| | k) Replaceable components or modules providing safeguard function | No such markings. | N/A |
| | l) Equipment containing insulating liquid | No such liquid. | N/A |
| | m) Installation instructions for outdoor equipment | Not such equipment | N/A |
| **F.5** | Instructional safeguards | | N/A |
| **G** | **COMPONENTS** | | P |
| **G.1** | **Switches** | | N/A |
| G.1.1 | General | No switches | N/A |
| G.1.2 | Ratings, endurance, spacing, maximum load | | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| G.1.3 | Test method and compliance | | N/A |
| **G.2** | **Relays** | | N/A |
| G.2.1 | Requirements | No relays | N/A |
| G.2.2 | Overload test | | N/A |
| G.2.3 | Relay controlling connectors supplying power to other equipment | | N/A |
| G.2.4 | Test method and compliance | | N/A |
| **G.3** | **Protective devices** | | P |
| G.3.1 | Thermal cut-offs | No thermal cut-offs | N/A |
| | Thermal cut-outs separately approved according to IEC 60730 with conditions indicated in a) & b) | | N/A |
| | Thermal cut-outs tested as part of the equipment as indicated in c) | | N/A |
| G.3.1.2 | Test method and compliance | | N/A |
| G.3.2 | Thermal links | No thermal-links | N/A |
| G.3.2.1 | a) Thermal links tested separately according to IEC 60691 with specifics | | N/A |
| | b) Thermal links tested as part of the equipment | | N/A |
| G.3.2.2 | Test method and compliance | | N/A |
| G.3.3 | PTC thermistors | No PTC thermistor provided as safeguard within the equipment. | N/A |
| G.3.4 | Overcurrent protection devices | | N/A |
| G.3.5 | Safeguards components not mentioned in G.3.1 to G.3.4 | Approved fusing resistors used as over current protection device in power supply boards. See appended table 4.1.2 for details. | P |
| G.3.5.1 | Non-resettable devices suitably rated and marking provided | The test is carried out three times. No failure | P |
| G.3.5.2 | Single faults conditions.....: | | N/A |
| **G.4** | **Connectors** | | N/A |
| G.4.1 | Spacings | | N/A |
| G.4.2 | Mains connector configuration .....: | | N/A |
| G.4.3 | Plug is shaped that insertion into mains socket-outlets or appliance coupler is unlikely | | N/A |
| **G.5** | **Wound components** | | P |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| G.5.1 | Wire insulation in wound components | Approved triple insulated wires used for secondary winding of transformer | P |
| G.5.1.2 | Protection against mechanical stress | Separated by tubes, and insulating tapes between windings. | P |
| G.5.2 | Endurance test | | N/A |
| G.5.2.1 | General test requirements | | N/A |
| G.5.2.2 | Heat run test | | N/A |
| | Test time (days per cycle) .....: | | — |
| | Test temperature (°C).....: | | — |
| G.5.2.3 | Wound components supplied from the mains | | N/A |
| G.5.2.4 | No insulation breakdown | | N/A |
| G.5.3 | Transformers | | P |
| G.5.3.1 | Compliance method .....: | The transformer meets the requirements given in G.5.3.2 and G.5.3.3. | P |
| | Position.....: | T1 | P |
| | Method of protection.....: | See G.5.3.2 and G.5.3.3. | P |
| G.5.3.2 | Insulation | Primary windings and secondary windings (triple insulated wires used) are separated by Reinforced insulation (The core is considered as primary part as it is not isolated from Primary) | P |
| | Protection from displacement of windings.....: | By bobbin and insulating tape | — |
| G.5.3.3 | Transformer overload tests | (See appended table B.3) | P |
| G.5.3.3.1 | Test conditions | Tested in the complete equipment as an SMPS. | P |
| G.5.3.3.2 | Winding temperatures | (See appended tables B.3&B.4) | P |
| G.5.3.3.3 | Winding temperatures - alternative test method | Alternative test method was not considered. | N/A |
| G.5.3.4 | Transformers using FIW | No FIW | N/A |
| G.5.3.4.1 | General | | N/A |
| | FIW wire nominal diameter.....: | | — |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| G.5.3.4.2 | Transformers with basic insulation only | | N/A |
| G.5.3.4.3 | Transformers with double insulation or reinforced insulation .....: | | N/A |
| G.5.3.4.4 | Transformers with FIW wound on metal or ferrite core | | N/A |
| G.5.3.4.5 | Thermal cycling test and compliance | | N/A |
| G.5.3.4.6 | Partial discharge test | | N/A |
| G.5.3.4.7 | Routine test | | N/A |
| G.5.4 | Motors | No motors | N/A |
| G.5.4.1 | General requirements | | N/A |
| G.5.4.2 | Motor overload test conditions | | N/A |
| G.5.4.3 | Running overload test | | N/A |
| G.5.4.4.2 | Locked-rotor overload test | | N/A |
| | Test duration (days) .....: | | — |
| G.5.4.5 | Running overload test for DC motors | | N/A |
| G.5.4.5.2 | Tested in the unit | | N/A |
| G.5.4.5.3 | Alternative method | | N/A |
| G.5.4.6 | Locked-rotor overload test for DC motors | | N/A |
| G.5.4.6.2 | Tested in the unit | | N/A |
| | Maximum Temperature .....: | | N/A |
| G.5.4.6.3 | Alternative method | | N/A |
| G.5.4.7 | Motors with capacitors | | N/A |
| G.5.4.8 | Three-phase motors | | N/A |
| G.5.4.9 | Series motors | | N/A |
| | Operating voltage .....: | | — |
| **G.6** | **Wire Insulation** | | P |
| G.6.1 | General | Triple insulated wire used in T1 secondary windings used as reinforced safeguard in the isolating transformer that has separately complied with Annex J. | P |
| G.6.2 | Enamelled winding wire insulation | Solvent-based enamel winding is not considered basic insulation. | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| **G.7** | **Mains supply cords** | | N/A |
| G.7.1 | General requirements | | N/A |
| | Type.....: | | — |
| G.7.2 | Cross sectional area ($mm^2$ or AWG).....: | | N/A |
| G.7.3 | Cord anchorages and strain relief for non-detachable power supply cords | | N/A |
| G.7.3.2 | Cord strain relief | | N/A |
| G.7.3.2.1 | Requirements | | N/A |
| | Strain relief test force (N) .....: | | N/A |
| G.7.3.2.2 | Strain relief mechanism failure | | N/A |
| G.7.3.2.3 | Cord sheath or jacket position, distance (mm).....: | | N/A |
| G.7.3.2.4 | Strain relief and cord anchorage material | | N/A |
| G.7.4 | Cord Entry | | N/A |
| G.7.5 | Non-detachable cord bend protection | | N/A |
| G.7.5.1 | Requirements | | N/A |
| G.7.5.2 | Test method and compliance | | N/A |
| | Overall diameter or minor overall dimension, *D* (mm) .....: | | — |
| | Radius of curvature after test (mm).....: | | — |
| G.7.6 | Supply wiring space | | N/A |
| G.7.6.1 | General requirements | | N/A |
| G.7.6.2 | Stranded wire | | N/A |
| G.7.6.2.1 | Requirements | | N/A |
| G.7.6.2.2 | Test with 8 mm strand | | N/A |
| **G.8** | **Varistors** | | P |
| G.8.1 | General requirements | No varistors used | N/A |
| G.8.2 | Safeguards against fire | | N/A |
| G.8.2.1 | General | | N/A |
| G.8.2.2 | Varistor overload test | | N/A |
| G.8.2.3 | Temporary overvoltage test | | N/A |
| **G.9** | **Integrated circuit (IC) current limiters** | | N/A |
| G.9.1 | Requirements | No such IC | N/A |
| | IC limiter output current (max. 5A) .....: | | — |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | Manufacturers' defined drift .....: | | — |
| G.9.2 | Test Program | | N/A |
| G.9.3 | Compliance | | N/A |
| **G.10** | **Resistors** | | N/A |
| G.10.1 | General | The bleeder resistors used after X - capacitor, not relied upon as safeguard, no test necessary. See 5.5.6. | N/A |
| G.10.2 | Conditioning | | N/A |
| G.10.3 | Resistor test | | N/A |
| G.10.4 | Voltage surge test | | N/A |
| G.10.5 | Impulse test | | N/A |
| G.10.6 | Overload test | | N/A |
| **G.11** | **Capacitors and RC units** | | P |
| G.11.1 | General requirements | Y1-capacitor used as Reinforced safeguard both complied with IEC/EN 60384-14. | P |
| G.11.2 | Conditioning of capacitors and RC units | (See appended table 4.1.2) | P |
| G.11.3 | Rules for selecting capacitors | The selection followed with tables G.9 and G.12. Y1 capacitor bridging Reinforced insulation with rated voltage at least 250V tested with impulse 8kV peak and 4kVrms | P |
| **G.12** | **Optocouplers** | | N/A |
| | Optocouplers comply with IEC 60747-5-5 with specifics | | N/A |
| | Type test voltage $V_{ini,a}$ .....: | | — |
| | Routine test voltage, $V_{ini,b}$ .....: | | — |
| **G.13** | **Printed boards** | | P |
| G.13.1 | General requirements | See the following details. | P |
| G.13.2 | Uncoated printed boards | The insulation between conductors on the outer surfaces of an uncoated printed board complied with the minimum clearance and creepage requirements | P |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| G.13.3 | Coated printed boards | No coated printed board or multilayer board applied for within the equipment. | N/A |
| G.13.4 | Insulation between conductors on the same inner surface | | N/A |
| G.13.5 | Insulation between conductors on different surfaces | | N/A |
| | Distance through insulation.....: | | N/A |
| | Number of insulation layers (pcs) .....: | | — |
| G.13.6 | Tests on coated printed boards | | N/A |
| G.13.6.1 | Sample preparation and preliminary inspection | | N/A |
| G.13.6.2 | Test method and compliance | | N/A |
| **G.14** | **Coating on components terminals** | | N/A |
| G.14.1 | Requirements .....: | No such coating | N/A |
| **G.15** | **Pressurized liquid filled components** | | N/A |
| G.15.1 | Requirements | No such liquid | N/A |
| G.15.2 | Test methods and compliance | | N/A |
| G.15.2.1 | Hydrostatic pressure test | | N/A |
| G.15.2.2 | Creep resistance test | | N/A |
| G.15.2.3 | Tubing and fittings compatibility test | | N/A |
| G.15.2.4 | Vibration test | | N/A |
| G.15.2.5 | Thermal cycling test | | N/A |
| G.15.2.6 | Force test | | N/A |
| G.15.3 | Compliance | | N/A |
| **G.16** | **IC including capacitor discharge function (ICX)** | | N/A |
| G.16.1 | Condition for fault tested is not required | No such ICX | N/A |
| | ICX with associated circuitry tested in equipment | | N/A |
| | ICX tested separately | | N/A |
| G.16.2 | Tests | | N/A |
| | Smallest capacitance and smallest resistance specified by ICX manufacturer for impulse test.....: | | — |
| | Mains voltage that impulses to be superimposed on .....: | | — |
| | Largest capacitance and smallest resistance for ICX tested by itself for 10000 cycles test .....: | | — |
| G.16.3 | Capacitor discharge test.....: | | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| **H** | **CRITERIA FOR TELEPHONE RINGING SIGNALS** | | N/A |
| **H.1** | **General** | | N/A |
| **H.2** | **Method A** | | N/A |
| **H.3** | **Method B** | | N/A |
| H.3.1 | Ringing signal | No telephone ringing signal generated within the equipment. | N/A |
| H.3.1.1 | Frequency (Hz) .....: | | — |
| H.3.1.2 | Voltage (V) .....: | | — |
| H.3.1.3 | Cadence; time (s) and voltage (V) .....: | | — |
| H.3.1.4 | Single fault current (mA):.....: | | — |
| H.3.2 | Tripping device and monitoring voltage | | N/A |
| H.3.2.1 | Conditions for use of a tripping device or a monitoring voltage | | N/A |
| H.3.2.2 | Tripping device | | N/A |
| H.3.2.3 | Monitoring voltage (V) .....: | | N/A |
| **J** | **INSULATED WINDING WIRES FOR USE WITHOUT INTERLEAVED INSULATION** | | P |
| **J.1** | **General** | | P |
| | Winding wire insulation.....: | | — |
| | Solid round winding wire, diameter (mm).....: | | N/A |
| | Solid square and rectangular (flatwise bending) winding wire, cross-sectional area ($mm^2$) .....: | | N/A |
| **J.2/J.3** | Tests and Manufacturing | | — |
| **K** | **SAFETY INTERLOCKS** | | N/A |
| **K.1** | **General requirements** | | N/A |
| | Instructional safeguard .....: | No safety interlock provided. | N/A |
| **K.2** | **Components of safety interlock safeguard mechanism** | | N/A |
| **K.3** | **Inadvertent change of operating mode** | | N/A |
| **K.4** | **Interlock safeguard override** | | N/A |
| **K.5** | **Fail-safe** | | N/A |
| K.5.1 | Under single fault condition | | N/A |
| **K.6** | **Mechanically operated safety interlocks** | | N/A |
| K.6.1 | Endurance requirement | | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| K.6.2 | Test method and compliance .....: | | N/A |
| **K.7** | **Interlock circuit isolation** | | N/A |
| K.7.1 | Separation distance for contact gaps & interlock circuit elements | | N/A |
| | In circuit connected to mains, separation distance for contact gaps (mm) .....: | | N/A |
| | In circuit isolated from mains, separation distance for contact gaps (mm) .....: | | N/A |
| | Electric strength test before and after the test of K.7.2 .....: | (See appended table 5.4.9) | N/A |
| K.7.2 | Overload test, Current (A) .....: | | N/A |
| K.7.3 | Endurance test | | N/A |
| K.7.4 | Electric strength test | | N/A |
| **L** | **DISCONNECT DEVICES** | | P |
| **L.1** | **General requirements** | Plug portion considered as disconnect device. | P |
| **L.2** | **Permanently connected equipment** | | N/A |
| **L.3** | **Parts that remain energized** | No parts remain energized after the plug portion disconnected | P |
| **L.4** | **Single-phase equipment** | The plug portion disconnects both poles simultaneously. | P |
| **L.5** | **Three-phase equipment** | | N/A |
| **L.6** | **Switches as disconnect devices** | | N/A |
| **L.7** | **Plugs as disconnect devices** | Plug portion considered as disconnect device. | P |
| **L.8** | **Multiple power sources** | Single power source | N/A |
| | Instructional safeguard .....: | | N/A |
| **M** | **EQUIPMENT CONTAINING BATTERIES AND THEIR PROTECTION CIRCUITS** | | N/A |
| **M.1** | **General requirements** | | N/A |
| **M.2** | **Safety of batteries and their cells** | | N/A |
| M.2.1 | Batteries and their cells comply with relevant IEC standards.....: | No battery used | N/A |
| **M.3** | **Protection circuits for batteries provided within the equipment** | | N/A |
| M.3.1 | Requirements | | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| M.3.2 | Test method | | N/A |
| | Overcharging of a rechargeable battery | | N/A |
| | Excessive discharging | | N/A |
| | Unintentional charging of a non-rechargeable battery | | N/A |
| | Reverse charging of a rechargeable battery | | N/A |
| M.3.3 | Compliance | | N/A |
| **M.4** | **Additional safeguards for equipment containing a portable secondary lithium battery** | | N/A |
| M.4.1 | General | | N/A |
| M.4.2 | Charging safeguards | | N/A |
| M.4.2.1 | Requirements | | N/A |
| M.4.2.2 | Compliance .....: | | N/A |
| M.4.3 | Fire enclosure.....: | | N/A |
| M.4.4 | Drop test of equipment containing a secondary lithium battery | | N/A |
| M.4.4.2 | Preparation and procedure for the drop test | | N/A |
| M.4.4.3 | Drop, Voltage on reference and dropped batteries (V); voltage difference during 24 h period (%): .....: | | N/A |
| M.4.4.4 | Check of the charge/discharge function | | N/A |
| M.4.4.5 | Charge / discharge cycle test | | N/A |
| M.4.4.6 | Compliance | | N/A |
| **M.5** | **Risk of burn due to short-circuit during carrying** | | N/A |
| M.5.1 | Requirement | | N/A |
| M.5.2 | Test method and compliance | | N/A |
| **M.6** | **Safeguards against short-circuits** | | N/A |
| M.6.1 | External and internal faults | | N/A |
| M.6.2 | Compliance | | N/A |
| **M.7** | **Risk of explosion from lead acid and NiCd batteries** | | N/A |
| M.7.1 | Ventilation preventing explosive gas concentration | | N/A |
| | Calculated hydrogen generation rate .....: | | N/A |
| M.7.2 | Test method and compliance | | N/A |
| | Minimum air flow rate, $Q$ ($m^3/h$).....: | | N/A |
| M.7.3 | Ventilation tests | | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| M.7.3.1 | General | | N/A |
| M.7.3.2 | Ventilation test – alternative 1 | | N/A |
| | Hydrogen gas concentration (%).....: | | N/A |
| M.7.3.3 | Ventilation test – alternative 2 | | N/A |
| | Obtained hydrogen generation rate .....: | | N/A |
| M.7.3.4 | Ventilation test – alternative 3 | | N/A |
| | Hydrogen gas concentration (%).....: | | N/A |
| M.7.4 | Marking.....: | | N/A |
| **M.8** | **Protection against internal ignition from external spark sources of batteries with aqueous electrolyte** | | N/A |
| M.8.1 | General | | N/A |
| M.8.2 | Test method | | N/A |
| M.8.2.1 | General | | N/A |
| M.8.2.2 | Estimation of hypothetical volume $V_Z$ ($m^3$/s) .....: | | — |
| M.8.2.3 | Correction factors .....: | | — |
| M.8.2.4 | Calculation of distance *d* (mm) .....: | | — |
| **M.9** | **Preventing electrolyte spillage** | | N/A |
| M.9.1 | Protection from electrolyte spillage | | N/A |
| M.9.2 | Tray for preventing electrolyte spillage | | N/A |
| **M.10** | Instructions to prevent reasonably foreseeable misuse | | N/A |
| | Instructional safeguard.....: | | N/A |
| **N** | **ELECTROCHEMICAL POTENTIALS** | | N/A |
| | Material(s) used.....: | Pollution degree considered | — |
| **O** | **MEASUREMENT OF CREEPAGE DISTANCES AND CLEARANCES** | | P |
| | Value of *X* (mm) .....: | Considered. | — |
| **P** | **SAFEGUARDS AGAINST CONDUCTIVE OBJECTS** | | P |
| **P.1** | **General** | | P |
| **P.2** | **Safeguards against entry or consequences of entry of a foreign object** | | P |
| P.2.1 | General | | P |
| P.2.2 | Safeguards against entry of a foreign object | No openings. | — |
| | Location and Dimensions (mm) .....: | | — |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| P.2.3 | Safeguards against the consequences of entry of a foreign object | | N/A |
| P.2.3.1 | Safeguard requirements | | N/A |
| | The ES3 and PS3 keep-out volume in Figure P.3 not applicable to transportable equipment | Not transportable equipment | N/A |
| | Transportable equipment with metalized plastic parts.....: | Not transportable equipment | N/A |
| P.2.3.2 | Consequence of entry test .....: | | N/A |
| **P.3** | **Safeguards against spillage of internal liquids** | | N/A |
| P.3.1 | General | No such liquids. | N/A |
| P.3.2 | Determination of spillage consequences | | N/A |
| P.3.3 | Spillage safeguards | | N/A |
| P.3.4 | Compliance | | N/A |
| **P.4** | **Metallized coatings and adhesives securing parts** | | N/A |
| P.4.1 | General | No such construction. | N/A |
| P.4.2 | Tests | | N/A |
| | Conditioning, $T_C$ (°C) .....: | | — |
| | Duration (weeks) .....: | | — |
| **Q** | **CIRCUITS INTENDED FOR INTERCONNECTION WITH BUILDING WIRING** | | P |
| **Q.1** | **Limited power sources** | (See appended table Q.1) | P |
| Q.1.1 | Requirements | | N/A |
| | a) Inherently limited output | | N/A |
| | b) Impedance limited output | A regulating network limits the output in compliance with table Q.1 both under normal operating conditions and after any single fault. | P |
| | c) Regulating network limited output | | N/A |
| | d) Overcurrent protective device limited output | | N/A |
| | e) IC current limiter complying with G.9 | | N/A |
| Q.1.2 | Test method and compliance .....: | (See appended table Q.1) | P |
| | Current rating of overcurrent protective device (A) .....: | (See appended table Q.1) | P |
| **Q.2** | **Test for external circuits – paired conductor cable** | No such circuit for connection to the EUT | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | Maximum output current (A) .....: | | N/A |
| | Current limiting method .....: | | — |
| **R** | **LIMITED SHORT CIRCUIT TEST** | | N/A |
| **R.1** | **General** | No such consideration. | N/A |
| **R.2** | **Test setup** | | N/A |
| | Overcurrent protective device for test .....: | | — |
| **R.3** | **Test method** | | N/A |
| | Cord/cable used for test .....: | | — |
| **R.4** | **Compliance** | | N/A |
| **S** | **TESTS FOR RESISTANCE TO HEAT AND FIRE** | | N/A |
| **S.1** | **Flammability test for fire enclosures and fire barrier materials of equipment where the steady state power does not exceed 4 000 W** | | N/A |
| | Samples, material.....: | Approved fire enclosure with V-0 material used. | — |
| | Wall thickness (mm) .....: | | — |
| | Conditioning (°C) .....: | | — |
| | Test flame according to IEC 60695-11-5 with conditions as set out | | N/A |
| | - Material not consumed completely | | N/A |
| | - Material extinguishes within 30s | | N/A |
| | - No burning of layer or wrapping tissue | | N/A |
| **S.2** | **Flammability test for fire enclosure and fire barrier integrity** | | N/A |
| | Samples, material.....: | | — |
| | Wall thickness (mm) .....: | | — |
| | Conditioning (°C) .....: | | — |
| **S.3** | **Flammability test for the bottom of a fire enclosure** | | N/A |
| S.3.1 | Mounting of samples | | N/A |
| S.3.2 | Test method and compliance | | N/A |
| | Mounting of samples .....: | | — |
| | Wall thickness (mm) .....: | | — |
| **S.4** | **Flammability classification of materials** | | N/A |
| **S.5** | **Flammability test for fire enclosure materials of equipment with a steady state power exceeding 4 000 W** | | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | Samples, material.....: | | — |
| | Wall thickness (mm).....: | | — |
| | Conditioning (°C).....: | | — |
| **T** | **MECHANICAL STRENGTH TESTS** | | P |
| **T.1** | **General** | | P |
| **T.2** | **Steady force test, 10 N .....:** | (See appended table T.2) | P |
| **T.3** | **Steady force test, 30 N .....:** | | N/A |
| **T.4** | **Steady force test, 100 N .....:** | (See appended table T.4) | P |
| **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 .....:** | (See appended table T.7) | P |
| **T.8** | **Stress relief test .....:** | (See appended table T.8) | P |
| **T.9** | **Glass Impact Test .....:** | No such glass | N/A |
| **T.10** | **Glass fragmentation test** | | N/A |
| | Number of particles counted.....: | No such glass | N/A |
| **T.11** | **Test for telescoping or rod antennas** | | N/A |
| | Torque value (Nm) .....: | No such antennas provided within the equipment. | N/A |
| **U** | **MECHANICAL STRENGTH OF CATHODE RAY TUBES (CRT) AND PROTECTION AGAINST THE EFFECTS OF IMPLOSION** | | N/A |
| **U.1** | **General** | | N/A |
| | Instructional safeguard **:** | No CRT provided within the equipment. | N/A |
| **U.2** | **Test method and compliance for non-intrinsically protected CRTs** | | N/A |
| **U.3** | **Protective screen** | | N/A |
| **V** | **DETERMINATION OF ACCESSIBLE PARTS** | | P |
| **V.1** | **Accessible parts of equipment** | | P |
| V.1.1 | General | | P |
| V.1.2 | Surfaces and openings tested with jointed test probes | | P |
| V.1.3 | Openings tested with straight unjointed test probes | | N/A |
| V.1.4 | Plugs, jacks, connectors tested with blunt probe | | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| V.1.5 | Slot openings tested with wedge probe | | N/A |
| V.1.6 | Terminals tested with rigid test wire | | N/A |
| **V.2** | **Accessible part criterion** | | P |
| **X** | **ALTERNATIVE METHOD FOR DETERMINING CLEARANCES FOR INSULATION IN CIRCUITS CONNECTED TO AN AC MAINS NOT EXCEEDING 420 V PEAK (300 V RMS)** | | P |
| | Clearance .....: | (See appended table X) | P |
| **Y** | **CONSTRUCTION REQUIREMENTS FOR OUTDOOR ENCLOSURES** | | N/A |
| **Y.1** | **General** | Indoor equipment | N/A |
| **Y.2** | **Resistance to UV radiation** | | N/A |
| **Y.3** | **Resistance to corrosion** | | N/A |
| **Y.3** | **Resistance to corrosion** | | N/A |
| Y.3.1 | Metallic parts of outdoor enclosures are resistant to effects of water-borne contaminants by .....: | | N/A |
| Y.3.2 | Test apparatus | | N/A |
| Y.3.3 | Water – saturated sulphur dioxide atmosphere | | N/A |
| Y.3.4 | Test procedure.....: | | N/A |
| Y.3.5 | Compliance | | N/A |
| **Y.4** | **Gaskets** | | N/A |
| Y.4.1 | General | | N/A |
| Y.4.2 | Gasket tests | | N/A |
| Y.4.3 | Tensile strength and elongation tests | | N/A |
| | Alternative test methods.....: | | N/A |
| Y.4.4 | Compression test | | N/A |
| Y.4.5 | Oil resistance | | N/A |
| Y.4.6 | Securing means | | N/A |
| **Y.5** | **Protection of equipment within an outdoor enclosure** | | N/A |
| Y.5.1 | General | | N/A |
| Y.5.2 | Protection from moisture | | N/A |
| | Relevant tests of IEC 60529 or Y.5.3.....: | | N/A |
| Y.5.3 | Water spray test | | N/A |
| Y.5.4 | Protection from plants and vermin | | N/A |
| Y.5.5 | Protection from excessive dust | | N/A |
| Y.5.5.1 | General | | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| Y.5.5.2 | IP5X equipment | | N/A |
| Y.5.5.3 | IP6X equipment | | N/A |
| **Y.6** | **Mechanical strength of enclosures** | | N/A |
| Y.6.1 | General | | N/A |
| Y.6.2 | Impact test.....: | | N/A |

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

| | | | |
|---|---|---|---|
| **ATTACHMENT TO TEST REPORT**<br>IEC 62368-1<br>EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES<br>**(Audio/video, information and communication technology equipment - Part 1: Safety requirements)** | | | |
| **Differences according to**.....: EN IEC 62368-1:2020+A11:2020 | | | |
| **Attachment Form No**. .....: EU_GD_IEC62368_1E<br>**Attachment Originator .....**: UL(Demko)<br>**Master Attachment** .....: 2021-02-04 | | | |
| **Copyright © 2021 IEC System for Conformity Testing and Certification of Electrical Equipment (IECEE), Geneva, Switzerland. All rights reserved.** | | | |
| | **CENELEC COMMON MODIFICATIONS (EN)** | | P |
| | Clause numbers in the cells that are shaded light grey are clause references in EN IEC 62368-1:2020+A11:2020. All other clause numbers in that column, except for those in the paragraph below, refers to IEC 62368-1:2018.<br><br>Clauses, subclauses, notes, tables, figures and annexes which are additional to those in IEC 62368-1:2018 are prefixed “Z”. | | P |
| | Add the following annexes:<br>Annex ZA (normative) Normative references to international publications with their corresponding European publications<br>Annex ZB (normative) Special national conditions<br>Annex ZC (informative) A-deviations<br>Annex ZD (informative) IEC and CENELEC code designations for flexible cords | | P |
| **1** | **Modification to Clause 3.** | | N/A |
| **3.3.19** | **Sound exposure**<br>*Replace 3.3.19 of IEC 62368-1 with the following definitions:* | | N/A |
| **3.3.19.1** | **momentary exposure level, MEL**<br>metric for estimating 1 s sound exposure level from the HD 483-1 S2 test signal applied to both channels, based on EN 50332-1:2013, 4.2.<br><br>Note 1 to entry: MEL is measured as A-weighted levels in dB.<br>Note 2 to entry: See B.3 of EN 50332-3:2017 for additional information. | Not such equipment | N/A |

| EN IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| **3.3.19.3** | **sound exposure, E**<br>A-weighted sound pressure ($p$) squared and integrated over a stated period of time, $T$<br><br>Note 1 to entry: The SI unit is $Pa^2$ s.<br>$E = \int_0^T p(t)^2 \, dt$ | | N/A |
| **3.3.19.4** | **sound exposure level, SEL**<br>logarithmic measure of sound exposure relative to a reference value, *E0*, typically the 1 kHz threshold of hearing in humans.<br><br>Note 1 to entry: *SEL* is measured as A-weighted levels in dB.<br>$SEL = 10 \lg\left(\frac{E}{E_0}\right)$ dB<br><br>Note 2 to entry: See B.4 of EN 50332-3:2017 for additional information. | | N/A |
| **3.3.19.5** | **digital signal level relative to full scale, dBFS**<br>levels reported in dBFS are always r.m.s. Full scale level, 0 dBFS, is the level of a dc-free 997-Hz sine wave whose undithered positive peak value is positive digital full scale, leaving the code corresponding to negative digital full scale unused<br><br>Note 1 to entry: It is invalid to use dBFS for non-r.m.s. levels. Because the definition of full scale is based on a sine wave, the level of signals with a crest factor lower than that of a sine wave may exceed 0 dBFS. In particular, square wave signals may reach +3,01 dBFS. | | N/A |
| **2** | **Modification to Clause 10** | | N/A |
| **10.6** | **Safeguards against acoustic energy sources**<br>Replace 10.6 of IEC 62368-1 with the following: | | N/A |
| **10.6.1.1** | **Introduction**<br>**Safeguard** requirements for protection against long-term exposure to excessive sound pressure levels from personal music players closely coupled to the ear are specified below. Requirements for earphones and headphones intended for use with personal music players are also covered.<br>A personal music player is a portable equipment intended for use by an **ordinary person**, that:<br><br>– is designed to allow the user to listen to audio or | Not such equipment | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | audiovisual content / material; and<br>– uses a listening device, such as headphones or earphones that can be worn in or on or around the ears; and<br>– has a player that can be body worn (of a size suitable to be carried in a clothing pocket) and is intended for the user to walk around with while in continuous use (for example, on a street, in a subway, at an airport, etc.).<br><br>EXAMPLES Portable CD players, MP3 audio players, mobile phones with MP3 type features, PDAs or similar equipment.<br><br>Personal music players shall comply with the requirements of either 10.6.2 or 10.6.3.<br><br>NOTE 1 Protection against acoustic energy sources from telecom applications is referenced to ITU-T P.360.<br><br>NOTE 2 It is the intention of the Committee to allow the alternative methods for now, but to only use the dose measurement method as given in 10.6.5 in future. Therefore, manufacturers are encouraged to implement 10.6.5 as soon as possible.<br><br>Listening devices sold separately shall comply with the requirements of 10.6.6.<br>These requirements are valid for music or video mode only.<br>The requirements do not apply to:<br>– professional equipment;<br><br>NOTE 3Professional equipment is equipment sold through special sales channels. All products sold through normal electronics stores are considered not to be professional equipment.<br><br>– hearing aid equipment and other devices for assistive listening;<br>– the following type of analogue personal music players:<br>• long distance radio receiver (for example, a multiband radio receiver or world band radio receiver, an AM radio receiver), and<br>• cassette player/recorder;<br><br>NOTE 4 This exemption has been allowed because this technology is falling out of use and it is expected that within a few years it will no longer exist. This exemption will not be extended to other technologies.<br><br>– a player while connected to an external amplifier that does not allow the user to walk around while in | | |

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| | use.<br><br>For equipment that is clearly designed or intended primarily for use by children, the limits of the relevant toy standards may apply.<br><br>The relevant requirements are given in EN 71-1:2011, 4.20 and the related tests methods and measurement distances apply. | | |
| **10.6.1.2** | **Non-ionizing radiation from radio frequencies in the range 0 to 300 GHz**<br>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).<br>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. | | N/A |
| **10.6.2** | **Classification of devices without the capacity to estimate sound dose** | | N/A |
| **10.6.2.1** | **General**<br>This standard is transitioning from short-term based (30 s) requirements to long-term based (40 hour) requirements. These clauses remain in effect only for devices that do not comply with sound dose estimation as stipulated in EN 50332-3.<br><br>For classifying the acoustic output *L*Aeq,*T* , measurements are based on the A-weighted equivalent sound pressure level over a 30 s period.<br><br>For music where the average sound pressure (long term *L*Aeq,*T*) measured over the duration of the song is lower than the average produced by the programme simulation noise, measurements may be done over the duration of the complete song. In this case, *T* becomes the duration of the song.<br><br>NOTE Classical music, acoustic music and broadcast typically has an average sound pressure (long term *L*Aeq,*T*) which is much lower than the average programme simulation noise. Therefore, if the player is capable to analyse the content and compare it with the programme simulation noise, the warning does not need to be given as long as the average sound pressure of the song does not exceed the required limit.<br>For example, if the player is set with the programme simulation noise to 85 dB, but the average music level of the song is only 65 dB, there is no need to give a warning or ask an acknowledgement as long as the average sound | No such part in this equipment | N/A |

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| | level of the song is not above the basic limit of 85 dB. | | |
| **10.6.2.2** | **RS1 limits (to be superseded, see 10.6.3.2)**<br><br>RS1 is a class 1 acoustic energy source that does not exceed the following:<br>– for equipment provided as a package (player with its listening device), and with a proprietary connector between the player and its listening device, or where the combination of player and listening device is known by other means such as setting or automatic detection, the *L*Aeq,*T* acoustic output shall be ≤ 85 dB when playing the fixed "programme simulation noise" described in EN 50332-1.<br>– for equipment provided with a standardized connector (for example, a 3,5 phone jack) that allows connection to a listening device for general use, the unweighted r.m.s. output voltage shall be ≤ 27 mV (analogue interface) or -25 dBFS (digital interface) when playing the fixed "programme simulation noise" described in EN 50332-1.<br>– The RS1 limits will be updated for all devices as per 10.6.3.2. | | N/A |
| **10.6.2.3** | **RS2 limits (to be superseded, see 10.6.3.3)**<br><br>RS2 is a class 2 acoustic energy source that does not exceed the following:<br>– for equipment provided as a package (player with its listening device), and with a proprietary connector between the player and its listening device, or when the combination of player and listening device is known by other means such as setting or automatic 130 detection, the *L*Aeq,*T* acoustic output shall be ≤ 100 dB(A) when playing the fixed "programme simulation noise" as described in EN 50332-1.<br>– for equipment provided with a standardized connector (for example, a 3,5 phone jack) that allows connection to a listening device for general use, the unweighted r.m.s. output voltage shall be ≤ 150 mV (analogue interface) or -10 dBFS (digital interface) when playing the fixed "programme simulation noise" as described in EN 50332-1. | | N/A |
| **10.6.2.4** | **RS3 limits**<br>RS3 is a class 3 acoustic energy source that exceeds RS2 limits. | | N/A |
| **10.6.3** | **Classification of devices (new)** | | N/A |
| **10.6.3.1** | **General**<br>Previous limits (10.6.2) created abundant false negative and false positive PMP sound level warnings. New limits, compliant with The Commission Decision of 23 June 2009, are given | Not such equipment | N/A |

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| | below. | | |
| **10.6.3.2** | **RS1 limits (new)**<br>RS1 is a class 1 acoustic energy source that does not exceed the following:<br>– for equipment provided as a package (player with its listening device), and with a proprietary connector between the player and its listening device, or where the combination of player and listening device is known by other means such as setting or automatic detection, the *L*Aeq,*T* acoustic output shall be ≤ 80 dB when playing the fixed “programme simulation noise” described in EN 50332-1.<br>– for equipment provided with a standardized connector (for example, a 3,5 phone jack) that allows connection to a listening device for general use, the unweighted r.m.s. output voltage shall be ≤ 15 mV (analogue interface) or -30 dBFS (digital interface) when playing the fixed “programme simulation noise” described in EN 50332-1. | | N/A |
| **10.6.3.3** | **RS2 limits (new)**<br>RS2 is a class 2 acoustic energy source that does not exceed the following:<br>– for equipment provided as a package (player with its listening device), and with a proprietary connector between the player and its listening device, or where the combination of player and listening device is known by other means such as setting or automatic detection, the weekly sound exposure level, as described in EN 50332-3, shall be ≤ 80 dB when playing the fixed "programme simulation noise" described in EN 50332-1.<br>– for equipment provided with a standardized connector (for example, a 3,5 phone jack) that allows connection to a listening device for general use, the unweighted r.m.s. output level, integrated over one week, as described in EN50332-3, shall be ≤ 15 mV (analogue interface) or -30 dBFS (digital interface) when playing the fixed “programme simulation noise” described in EN 50332-1. | | N/A |
| **10.6.4** | **Requirements for maximum sound exposure** | | N/A |
| **10.6.4.1** | **Measurement methods**<br>All volume controls shall be turned to maximum during tests.<br><br>Measurements shall be made in accordance with EN 50332-1 or EN 50332-2 as applicable. | Not such equipment | N/A |
| **10.6.4.2** | **Protection of persons**<br>Except as given below, protection requirements for parts **accessible** to **ordinary persons**, **instructed persons** and **skilled persons** are given in 4.3. | | N/A |

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| | NOTE 1 Volume control is not considered a **safeguard.**<br><br>Between RS2 and an **ordinary person**, the **basic safeguard** may be replaced by an **instructional safeguard** in accordance with Clause F.5, except that the **instructional safeguard** shall be placed on the equipment, or on the packaging, or in the instruction manual.<br>Alternatively, the **instructional safeguard** may be given through the equipment display during use.<br><br>The elements of the **instructional safeguard** shall be as follows:<br><br>– element 1a: the symbol  , IEC 60417-6044 (2011-01)<br>– element 2: “High sound pressure” or equivalent wording<br>– element 3: “Hearing damage risk” or equivalent wording<br>– element 4: “Do not listen at high volume levels for long periods.” or equivalent wording<br><br>An **equipment safeguard** shall prevent exposure of an **ordinary person** to an RS2 source without intentional physical action from the **ordinary person** and shall automatically return to an output level not exceeding what is specified for an RS1 source when the power is switched off.<br><br>The equipment shall provide a means to actively inform the user of the increased sound level when the equipment is operated with an output exceeding RS1. Any means used shall be acknowledged by the user before activating a mode of operation which allows for an output exceeding RS1. The acknowledgement does not need to be repeated more than once every 20 h of cumulative listening time.<br><br>NOTE 2 Examples of means include visual or audible signals. Action from the user is always needed.<br><br>NOTE 3 The 20 h listening time is the accumulative listening time, independent of how often and how long the personal music player has been switched off.<br><br>A **skilled person** shall not be unintentionally exposed to RS3. | | |
| **10.6.5** | **Requirements for dose-based systems** | | N/A |
| **10.6.5.1** | **General requirements**<br>Personal music players shall give the warnings as | Not such equipment | N/A |

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| | provided below when tested according to EN 50332-3, using the limits from this clause.<br><br>The manufacturer may offer optional settings to allow the users to modify when and how they wish to receive the notifications and warnings to promote a better user experience without defeating the safeguards. This allows the users to be informed in a method that best meets their physical capabilities and device usage needs. If such optional settings are offered, an administrator (for example, parental restrictions, business/educational administrators, etc.) shall be able to lock any optional settings into a specific configuration.<br><br>The personal music player shall be supplied with easy to understand explanation to the user of the dose management system, the risks involved, and how to use the system safely. The user shall be made aware that other sources may significantly contribute to their sound exposure, for example work, transportation, concerts, clubs, cinema, car races, etc. | | |
| **10.6.5.2** | **Dose-based warning and requirements**<br>When a dose of 100 % *CSD* is reached, and at least at every 100 % further increase of *CSD*, the device shall warn the user and require an acknowledgement. In case the user does not acknowledge, the output level shall automatically decrease to compliance with class RS1.<br><br>The warning shall at least clearly indicate that listening above 100 % *CSD* leads to the risk of hearing damage or loss. | | N/A |
| **10.6.5.3** | **Exposure-based requirements**<br>With only dose-based requirements, cause and effect could be far separated in time, defying the purpose of educating users about safe listening practice. In addition to dose-based requirements, a PMP shall therefore also put a limit to the short-term sound level a user can listen at.<br><br>The exposure-based limiter (EL) shall automatically reduce the sound level not to exceed 100 dB(A) or 150 mV integrated over the past 180 s, based on methodology defined in EN 50332-3.<br>The EL settling time (time from starting level reduction to reaching target output) shall be 10 s or faster.<br><br>Test of EL functionality is conducted according to EN 50332-3, using the limits from this clause. For equipment provided as a package (player with its listening device), the level integrated over 180 s shall be 100 dB or lower. For equipment provided | | N/A |

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| | with a standardized connector, the unweighted level integrated over 180 s shall be no more than 150 mV for an analogue interface and no more than -10 dBFS for a digital interface.<br><br>NOTE In case the source is known not to be music (or test signal), the EL may be disabled. | | |
| **10.6.6** | **Requirements for listening devices (headphones, earphones, etc.)** | | N/A |
| **10.6.6.1** | **Corded listening devices with analogue input**<br>With 94 dB *L*Aeq acoustic pressure output of the listening device, and with the volume and sound settings in the listening device (for example, built-in volume level control, additional sound features like equalization, etc.) set to the combination of positions that maximize the measured acoustic output, the input voltage of the listening device when playing the fixed “programme simulation noise” as described in EN 50332-1 shall be ≥ 75 mV.<br><br>NOTE The values of 94 dB and 75 mV correspond with 85 dB and 27 mV or 100 dB and 150 mV. | Not such equipment | N/A |
| **10.6.6.2** | **Corded listening devices with digital input**<br>With any playing device playing the fixed “programme simulation noise” described in EN 50332-1, and with the volume and sound settings in the listening device (for example, built-in volume level control, additional sound features like equalization, etc.) set to the combination of positions that maximize the measured acoustic output, the *L*Aeq,*T* acoustic output of the listening device shall be ≤ 100 dB with an input signal of -10 dBFS. | | N/A |
| **10.6.6.3** | **Cordless listening devices**<br>In cordless mode,<br>– with any playing and transmitting device playing the fixed programme simulation noise described in EN 50332-1; and<br>– respecting the cordless transmission standards, where an air interface standard exists that specifies the equivalent acoustic level; and<br>– with volume and sound settings in the receiving device (for example, built-in volume level control, additional sound features like equalization, etc.) set to the combination of positions that maximize the measured acoustic output for the above mentioned programme simulation noise, the *L*Aeq,*T* acoustic output of the listening device shall be ≤ 100 dB with an input signal of -10 dBFS. | | N/A |
| **10.6.6.4** | **Measurement method**<br>*Measurements shall be made in accordance with EN 50332-2 as applicable.* | | N/A |
| **3** | **Modification to the whole document** | | P |

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| | **Delete** all the "country" notes in the reference document according to the following list: | | P |

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| 0.2.1 | Note 1 and 2 | 1 | Note 4 and 5 | 3.3.8.1 | Note 2 |
| 3.3.8.3 | Note 1 | 4.1.15 | Note | 4.7.3 | Note 1 and 2 |
| 5.2.2.2 | Note | 5.4.2.3.2.2 Table 12 | Note c | 5.4.2.3.2.4 | Note 1 and 3 |
| 5.4.2.3.2.4 Table 13 | Note 2 | 5.4.2.5 | Note 2 | 5.4.5.1 | Note |
| 5.4.10.2.1 | Note | 5.4.10.2.2 | Note | 5.4.10.2.3 | Note |
| 5.5.2.1 | Note | 5.5.6 | Note | 5.6.4.2.1 | Note 2 and 3 and 4 |
| 5.6.8 | Note 2 | 5.7.6 | Note | 5.7.7.1 | Note 1 and Note 2 |
| 8.5.4.2.3 | Note | 10.2.1 Table 39 | Note 3 and 4 and 5 | 10.5.3 | Note 2 |
| ~~10.6.1~~ | Note 3 | F.3.3.6 | Note 3 | Y.4.1 | Note |
| Y.4.5 | Note | | | | |

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| **4** | **Modification to Clause 1** | | P |
| **1** | **Add** the following note:<br>*NOTE Z1 The use of certain substances in electrical and electronic equipment is restricted within the EU: see Directive 2011/65/EU.* | | P |
| **5** | **Modification to 4.Z1** | | P |

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| Clause | Requirement + Test | Result - Remark | Verdict |
| **4.Z1** | **Add** the following new subclause after 4.9:<br>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):<br>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;<br>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;<br>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.<br><br>If reliance is placed on protection in the building installation, the installation instructions shall so state, except that for **pluggable equipment type A** the building installation shall be regarded as providing protection in accordance with the rating of the wall socket outlet. | | P |
| **6** | **Modification to 5.4.2.3.2.4** | | N/A |
| **5.4.2.3.2.4** | **Add** the following to the end of this subclause:<br>The requirement for interconnection with **external circuit** is in addition given in EN 50491-3:2009. | No connection to external circuit. | N/A |
| **7** | **Modification to 10.2.1** | | N/A |
| **10.2.1** | **Add** the following to c) and d) in table 39: For additional requirements, see 10.5.1. | Added. The equipment is a low power AC ADAPTER, it does incorporate only non-intentional radiators, but does not contain radio transmitters; the typical usage, installation and physical characteristics make the equipment inherently compliant with all applicable EMF exposure levels (EN 62479: 2010 clause 4.1 Route A). | N/A |
| **8** | **Modification to 10.5.1** | | N/A |

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| **10.5.1** | **Add** the following after the first paragraph:<br>For RS 1 compliance is checked by measurement under the following conditions:<br><br>In addition to the normal operating conditions, all controls adjustable from the outside by hand, by any object such as a tool or a coin, and those internal adjustments or pre-sets which are not locked in a reliable manner, are adjusted so as to give maximum radiation whilst maintaining an intelligible picture for 1 h, at the end of which the measurement is made.<br><br>NOTE Z1 Soldered joints and paint lockings are examples of adequate locking.<br><br>The dose-rate is determined by means of a radiation monitor with an effective area of 10 $cm^2$, at any point 10 cm from the outer surface of the apparatus.<br><br>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.<br><br>For RS1, the dose-rate shall not exceed 1 μSv/h taking account of the background level.<br><br>NOTE Z2 These values appear in Directive 96/29/Euratom of 13 May 1996. | | N/A |
| **9** | **Modification to G.7.1** | | N/A |
| **G.7.1** | **Add** the following note:<br>NOTE Z1 The harmonized code designations corresponding to the IEC cord types are given in Annex ZD. | | N/A |
| **10** | **Modification to Bibliography** | | N/A |

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| | **Add** the following notes for the standards indicated:<br>IEC 60130-9 NOTE Harmonized as EN 60130-9.<br>IEC 60269-2 NOTE Harmonized as HD 60269-2.<br>IEC 60309-1 NOTE Harmonized as EN 60309-1.<br>IEC 60364 NOTE some parts harmonized in HD 384/HD 60364 series.<br>IEC 60601-2-4 NOTE Harmonized as EN 60601-2-4.<br>IEC 60664-5 NOTE Harmonized as EN 60664-5.<br>IEC 61032:1997 NOTE Harmonized as EN 61032:1998 (not modified).<br>IEC 61508-1 NOTE Harmonized as EN 61508-1.<br>IEC 61558-2-1 NOTE Harmonized as EN 61558-2-1.<br>IEC 61558-2-4 NOTE Harmonized as EN 61558-2-4.<br>IEC 61558-2-6 NOTE Harmonized as EN 61558-2-6.<br>IEC 61643-1 NOTE Harmonized as EN 61643-1.<br>IEC 61643-21 NOTE Harmonized as EN 61643-21.<br>IEC 61643-311 NOTE Harmonized as EN 61643-311.<br>IEC 61643-321 NOTE Harmonized as EN 61643-321.<br>IEC 61643-331 NOTE Harmonized as EN 61643-331. | | P |
| **11** | **ADDITION OF ANNEXES** | | -- |
| **ZB** | **ANNEX ZB, SPECIAL NATIONAL CONDITIONS (EN)** | | P |
| **4.1.15** | **Denmark, Finland, Norway** and **Sweden**<br>To the end of the subclause the following is added:<br>**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.<br><br>The marking text in the applicable countries shall be as follows:<br><br>In **Denmark**: “Apparatets stikprop skal tilsluttes en stikkontakt med jord som giver forbindelse til stikproppens jord.”<br>In **Finland**: "Laite on liitettävä suojakoskettimilla varustettuun pistorasiaan"<br>In **Norway**: “Apparatet må tilkoples jordet stikkontakt”<br>In **Sweden**: “Apparaten skall anslutas till jordat uttag” | Class II equipment | N/A |

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| **4.7.3** | **United Kingdom**<br>To the end of the subclause the following is added:<br><br>The torque test is performed using a socket-outlet complying with BS 1363, and the plug part shall be assessed to the relevant clauses of BS 1363. Also see Annex G.4.2 of this annex | | P |
| **5.2.2.2** | **Denmark**<br>After the 2nd paragraph add the following:<br><br>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. | No high touch current measured. | N/A |
| **5.4.11.1 and Annex G** | **Finland and Sweden**<br>To the end of the subclause the following is added:<br><br>For separation of the telecommunication network from earth the following is applicable:<br><br>If this insulation is solid, including insulation forming part of a component, it shall at least consist of either<br>• two layers of thin sheet material, each of which shall pass the electric strength test below, or<br><br>• one layer having a distance through insulation of at least 0,4 mm, which shall pass the electric strength test below.<br><br>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<br><br>• 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),<br><br>and<br><br>• is subject to routine testing for electric strength during manufacturing, using a test voltage of 1,5 kV.<br><br>It is permitted to bridge this insulation with a capacitor complying with EN 60384-14:2005, subclass Y2. | No TNV circuits. | N/A |

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| | A capacitor classified Y3 according to EN 60384-14:2005, may bridge this insulation under the following conditions:<br>• 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;<br>• the additional testing shall be performed on all the test specimens as described in EN 60384-14;<br>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. | | |
| **5.5.2.1** | **Norway**<br>After the 3rd paragraph the following is added:<br>Due to the IT power system used, capacitors are required to be rated for the applicable line-to-line voltage (230 V). | | N/A |
| **5.5.6** | **Finland, Norway** and **Sweden**<br>To the end of the subclause the following is added:<br>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 resistors. | N/A |
| **5.6.1** | **Denmark**<br>**Add** to the end of the subclause<br>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.<br>*Justification:*<br>In Denmark an existing 13 A socket outlet can be protected by a 20 A fuse. | No such equipment. | N/A |
| **5.6.4.2.1** | **Ireland and United Kingdom**<br>After the indent for **pluggable equipment type A**, the following is added:<br>– the **protective current rating** is taken to be 13 A, this being the largest rating of fuse used in the **mains** plug. | Approved mains plug used (see appended table 4.1.2) | N/A |

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| Clause | Requirement + Test | Result - Remark | Verdict |
| **5.6.4.2.1** | **France**<br>After the indent for **pluggable equipment type A**, the following is added:<br>– in certain cases, the **protective current rating** of the circuit supplied from the mains is taken as 20 A instead of 16 A. | | N/A |
| **5.6.5.1** | To the second paragraph the following is added:<br>The range of conductor sizes of flexible cords to be accepted by terminals for equipment with a rated current over 10 A and up to and including 13 A is: 1,25 $mm^2$ to 1,5 $mm^2$ in cross-sectional area. | | N/A |
| **5.6.8** | **Norway**<br>To the end of the subclause the following is added:<br>Equipment connected with an earthed mains plug is classified as **class I equipment**. See the Norway marking requirement in 4.1.15. The symbol IEC 60417-6092, as specified in F.3.6.2, is accepted. | | N/A |
| **5.7.6** | **Denmark**<br>To the end of the subclause the following is added:<br><br>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. | No high protective conductor current. | N/A |
| **5.7.6.2** | **Denmark**<br>To the end of the subclause the following is added:<br>The warning (marking safeguard) for high touch current is required if the touch current or the protective current exceed the limits of 3,5 mA . | | P |
| **5.7.7.1** | **Norway and Sweden**<br>To the end of the subclause the following is added:<br>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.<br>Therefore the protective earthing of the building installation needs to be isolated from the screen of a cable distribution system.<br><br>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.<br><br>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: | Not such system. | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | "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)"<br><br>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.<br><br>Translation to Norwegian (the Swedish text will also be accepted in Norway):<br><br>"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."<br><br>Translation to Swedish:<br>"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." | | |
| **8.5.4.2.3** | **United Kingdom**<br>Add the following after the 2nd dash bullet in 3rd paragraph:<br><br>An emergency stop system complying with the requirements of IEC 60204-1 and ISO 13850 is required where there is a risk of personal injury. | No external circuits. | N/A |

| EN IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| **B.3.1 and B.4** | **Ireland and United Kingdom**<br>The following is applicable:<br><br>To protect against excessive currents and short-circuits in the primary circuit of **direct plug-in equipment**, tests according to Annexes B.3.1 and B.4 shall be conducted using an external miniature circuit breaker complying with EN 60898-1, Type B, rated 32A. If the equipment does not pass these tests, suitable protective devices shall be included as an integral part of the **direct plug-in equipment**, until the requirements of Annexes B.3.1 and B.4 are met | | P |
| **G.4.2** | **Denmark**<br>To the end of the subclause the following is added:<br><br>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.<br><br>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.<br><br>If a single-phase equipment having a RATED CURRENT exceeding 13 A or if a polyphase equipment is provided with a supply cord with a plug, this plug shall be in accordance with the standard sheets DK 6-1a in DS 60884-2-D1 or EN 60309-2.<br><br>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.<br><br>Other current rating socket outlets shall be in compliance with Standard Sheet DKA 1-3a or DKA 1-1c.<br><br>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<br><br>*Justification:*<br>Heavy Current Regulations, Section 6c | | N/A |

| EN IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| **G.4.2** | **United Kingdom**<br>To the end of the subclause the following is added:<br><br>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. | Direct plug-in equipment | N/A |
| **G.7.1** | **United Kingdom**<br>To the first paragraph the following is added:<br><br>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.<br><br>NOTE "Standard plug" is defined in SI 1768:1994 and essentially means an approved plug conforming to BS 1363 or an approved conversion plug. | Direct plug-in equipment | N/A |
| **G.7.1** | **Ireland**<br>To the first paragraph the following is added:<br><br>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 | Direct plug-in equipment | N/A |
| **G.7.2** | **Ireland and United Kingdom**<br>To the first paragraph the following is added:<br><br>A power supply cord with a conductor of 1,25 $mm^2$ is allowed for equipment which is rated over 10 A and up to and including 13 A. | Direct plug-in equipment | N/A |
| **ZC** | **ANNEX ZC, NATIONAL DEVIATIONS (EN)** | | N/A |

| EN IEC 62368-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| **10.5.2** | **Germany**<br>The following requirement applies:<br><br>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.<br><br>*Justification*:<br>German ministerial decree against ionizing radiation (Röntgenverordnung), in force since 2002-07-01, implementing the European Directive 96/29/EURATOM.<br><br>**NOTE** Contact address:<br>Physikalisch-Technische Bundesanstalt, Bundesallee 100, D-38116 Braunschweig, Tel.: Int+49-531-592-6320, Internet: http://www.ptb.de | No CRT within the equipment. | N/A |

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

| ZD | IEC and CENELEC CODE DESIGNATIONS FOR FLEXIBLE CORDS (EN) | P |
|---|---|---|

P

| Type of flexible cord | Code designations | |
|---|---|---|
| | IEC | CENELEC |
| **PVC insulated cords** | | |
| Flat twin tinsel cord | 60227 IEC 41 | H03VH-Y |
| Light polyvinyl chloride sheathed flexible cord | 60227 IEC 52 | H03VV-F<br>H03VVH2-F |
| Ordinary polyvinyl chloride sheathed flexible cord | 60227 IEC 53 | H05VV-F<br>H05VVH2-F |
| **Rubber insulated cords** | | |
| Braided cord | 60245 IEC 51 | H03RT-F |
| Ordinary tough rubber sheathed flexible cord | 60245 IEC 53 | H05RR-F |
| Ordinary polychloroprene sheathed flexible cord | 60245 IEC 57 | H05RN-F |
| Heavy polychloroprene sheathed flexible cord | 60245 IEC 66 | H07RN-F |
| **Cords having high flexibility** | | |
| Rubber insulated and sheathed cord | 60245 IEC 86 | H03RR-H |
| Rubber insulated, crosslinked PVC sheathed cord | 60245 IEC 87 | H03RV4-H |
| Crosslinked PVC insulated and sheathed cord | 60245 IEC 88 | H03V4V4-H |
| **Cords insulated and sheathed with halogen-free thermoplastic compounds** | | |
| Light halogen-free thermoplastic insulated and sheathed flexible cords | | H03Z1Z1-F<br>H03Z1Z1H2-F |
| Ordinary halogen-free thermoplastic insulated and sheathed flexible cords | | H05Z1Z1-F<br>H05Z1Z1H2-F |

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

| 5.2 | TABLE: Classification of electrical energy sources | | | | | | P |
|---|---|---|---|---|---|---|---|
| Supply Voltage | Location (e.g. circuit designation) | Test conditions | Parameters | | | | ES Class |
| | | | U (V) | I (mA) | Type[1)] | Additional Info [2)] | |
| 264Va.c. 60Hz | Output "+" to "-" | Normal | 5.16Vdc | -- | SS | -- | ES1 |
| | | Abnormal | 5.12Vdc | -- | SS | -- | |
| | | Single fault (DB1 SC)* | 0 | -- | SS | -- | |
| | | Single fault (EC1 SC)* | 0 | -- | SS | -- | |
| 264Va.c, 60Hz | Output "+/-" to earth | Normal | -- | 0.216 | SS | 60Hz | ES1 |
| | | Abnormal | -- | 0.232 | SS | 60Hz | |
| | | Single fault (DB1 SC)* | -- | 0.232 | SS | 60Hz | |
| | | Single fault (EC1 SC)* | -- | 0.232 | SS | 60Hz | |
| 264Va.c, 60Hz | Accessible enclosure with metal foil to earth | Normal | -- | 0.06 | SS | 60Hz | ES1 |
| | | Abnormal | -- | 0.08 | SS | 60Hz | |
| | | Single fault (DB1 SC)* | -- | 0.08 | SS | 60Hz | |
| | | Single fault (EC1 SC)* | -- | 0.08 | SS | 60Hz | |

Supplementary information:

1) Type: Steady state (SS), Capacitance (CP), Single pulse (SP), Repetitive pulses (RP), etc.

2) Additional Info: Frequency, Pulse duration, Pulse off time, Capacitance value, etc.

3) Test Conditions:

Normal –Full load and no load.

Abnormal - Overload output

SC= short circuit; OC= open circuit

*: F1 open immediately. No hazards.

| 5.4.1.8 | TABLE: Working voltage measurement | | | P |
|---|---|---|---|---|
| Location | RMS voltage (V) | Peak voltage (V) | Frequency (Hz) | Comments |
| T1 pin 1-5 | 230 | 392 | 75.8K | -- |
| T1 pin 2-5 | **265** | **544** | 75.8K | Max. Vpeak and Vrms voltage |
| T1 pin 3-5 | 236 | 400 | 75.8K | -- |

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

| | | | | |
|---|---|---|---|---|
| T1 pin 4-5 | 237 | 452 | 75.8K | -- |
| T1 pin 1-6 | 231 | 408 | 75.8K | -- |
| T1 pin 2-6 | 262 | 532 | 75.8K | -- |
| T1 pin 3-6 | 236 | 400 | 75.8K | -- |
| T1 pin 4-6 | 236 | 428 | 75.8K | -- |
| CY1 primary to secondary | 235 | 404 | 60 | -- |
| Supplementary information: | | | | |
| Supply voltage: 240V, 60Hz, the test result represented the worst condition. | | | | |

| **5.4.1.10.2** | **TABLE: Vicat softening temperature of thermoplastics** | | | N/A |
|---|---|---|---|---|
| Method .....: | ISO 306 / B50 | | | — |
| Object/ Part No./Material | Manufacturer/trademark | Thickness (mm) | T softening (°C) | |
| -- | -- | -- | -- | |
| Supplementary information: | | | | |
| | | | | |

| **5.4.1.10.3** | **TABLE: Ball pressure test of thermoplastics** | | | | P |
|---|---|---|---|---|---|
| Allowed impression diameter (mm) .....: | ≤ 2 mm | | | | — |
| Object/Part No./Material | Manufacturer/trademark | Thickness (mm) | Test temperature (°C) | Impression diameter (mm) | |
| Plug holder, Type 945(GG) | SABIC INNOVATIVE PLASTICS US L LC | 2.0 | 125 | 1.0 | |
| Supplementary information: | | | | | |
| Other materials of transformer are no need to conduct this test. | | | | | |

| **5.4.2, 5.4.3** | **TABLE: Minimum Clearances/Creepage distance** | | | | | | | P |
|---|---|---|---|---|---|---|---|---|
| Clearance (cl) and creepage distance (cr) at/of/between: | $U_p$ (V) | $U_{rms}$ (V) | Freq [1] (kHz) | Required cl (mm) | cl (mm) | E.S. [2] (V) | Required cr (mm) | cr (mm) |
| L- N before fuse | 420 | 240 | 0.06 | 1.5 | 5.5 | -- | 2.4 | 5.5 |
| Across fuse F1 | 420 | 240 | 0.06 | 1.5 | 2.4 | -- | 2.4 | 2.4 |
| Primary live parts to enclosure outside | 420 | 240 | 0.06 | 3.0 | 8.1 | -- | 4.8 | 8.1 |
| CY1 primary pin to secondary pin | 420 | 240 | 0.06 | 3.0 | 5.1 | -- | 4.8 | 5.1 |

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

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Primary trace to secondary trace under T1 | 544 | 265 | 75.8 | 3.0 | 6.9 | -- | 5.3 | 6.9 |
| Primary winding to secondary winding of T1 | 544 | 265 | 75.8 | 3.0 | 6.9 | -- | 5.3 | 6.9 |
| Core to secondary winding of T1 | 544 | 265 | 75.8 | 3.0 | 6.9 | -- | 5.3 | 6.9 |

Supplementary information:

1) Only for frequency above 30 kHz.
2) Complete Electric Strength voltage (E.S. (V) when 5.4.2.4 applied).
3) The core of T1 considered as primary part, the insulation between secondary to core is reinforced insulation.
4) Unless otherwise specified, the worst case conditions of Cl. & Cr. in above mentioned locations have been considered and listed.
5) Provide Material Group: IIIb.
6) BI: basic insulation; SI: supplementary insulation; DI: double insulation; RI: reinforced insulation.

| 5.4.4.2 | TABLE: Minimum distance through insulation | | | P |
|---|---|---|---|---|
| Distance through insulation (DTI) at/of | Peak voltage (V) | Insulation | Required DTI (mm) | Measured DTI (mm) |
| Enclosure | 544 | Reinforce insulation | 0.4 | 1) |
| Insulation tape used for transformer (T1) | 544 | Reinforce insulation | ≥ 2 layers | Not required* |

Supplementary information:

*See also sub-clause 5.4.4.9;
1) See appended table 4.1.2 for details.

| 5.4.4.9 | TABLE: Solid insulation at frequencies >30 kHz | | | | | P |
|---|---|---|---|---|---|---|
| Insulation material | $E_P$ | Frequency (kHz) | $K_R$ | Thickness $d$ (mm) | Insulation | $V_{PW}$ (Vpk) |
| Plastic Enclosure | -- | 75.8 | 0.30 | 2.0 | Reinforced insulation | 544 |
| Insulation tape used for transformer | -- | 75.8 | 0.34 | 0.05 | Reinforced insulation | 544 |
| Transformer Bobbin | -- | 75.8 | 0.53 | 0.75 | Reinforced insulation | 544 |
| TIW for transformer | -- | 75.8 | 0.34 | -- | Reinforced | 544 |

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

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | | | insulation | |

Supplementary information:

The bobbin of transformer material is phenolic. All sources of each material have been considered to conduct test, see table 4.1.2 for details.

According to clause 5.4.4.9:

For plastic enclosure alternate method is used, required electric strength test voltage: 1.2*2*544/0.30=4352Vpeak ($K_R$=0.30 for other material).

For Insulation tape used for transformer alternate method is used, required electric strength test voltage: 1.2*2*544/0.34=3840Vpeak ($K_R$=0.34 for Other thin foil materials).

For transformer bobbin alternate method is used, required electric strength test voltage: 1.2*2*544/0.53=2463.4Vpeak ($K_R$=0.53 for Phenolic).

For TIW for transformer alternate method is used, required electric strength test voltage: 1.2*2*544/0.34=3840Vpeak ($K_R$=0.34 for Other thin foil materials).

| **5.4.9** | **TABLE: Electric strength tests** | | P |
|---|---|---|---|
| Test voltage applied between: | Voltage shape (Surge, Impulse, AC, DC, etc.) | Test voltage (V) | Breakdown Yes / No |
| Functional: | | | |
| -- | -- | -- | -- |
| Basic/supplementary: | | | |
| Different polarity of mains (Fuse opened) | DC | 2500 | No |
| Reinforced: | | | |
| L-N input to plastic enclosure wrapped by metal foil | DC | 4000 | No |
| L-N input to secondary terminal | DC | 4000 | No |
| Transformer T1 primary winding to secondary winding (All sources) | DC | 4000 | No |
| Transformer T1 core to secondary winding (All sources) | DC | 4000 | No |
| One layer of insulation tape of transformer T1 (All sources) | DC | 4000 | No |
| Routine Tests: | | | |
| -- | -- | -- | -- |
| Supplementary information: | | | |
| Core of transformer T1 was considered as primary part. Test after humidity treatment, heating test, and for unit primary to secondary, primary to plastic enclosure electric strength after each fault condition test. All source means all materials listed in table 4.1.2 are considered. | | | |

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

| 5.5.2.2 | TABLE: Stored discharge on capacitors | | | | N/A |
|---|---|---|---|---|---|
| Location | Supply voltage (V) | Operating and fault condition [1)] | Switch position | Measured voltage (Vpk) | ES Class |
| -- | -- | -- | -- | -- | -- |
| -- | -- | -- | -- | -- | -- |
| -- | -- | -- | -- | -- | -- |
| Supplementary information: | | | | | |
| X-capacitors installed for testing:<br>☐ bleeding resistor rating:<br>☐ ICX: | | | | | |

| 5.6.6 | TABLE: Resistance of protective conductors and terminations | | | N/A |
|---|---|---|---|---|
| Location | Test current (A) | Duration (min) | Voltage drop (V) | Resistance (Ω) |
| -- | -- | -- | -- | -- |
| Supplementary information: | | | | |
| | | | | |

| 5.7.4 | TABLE: Unearthed accessible parts | | | | | P |
|---|---|---|---|---|---|---|
| Location | Operating and fault conditions | Supply Voltage (V) | Parameters | | | ES class |
| | | | Voltage ($V_{rms}$ or $V_{pk}$) | Current ($A_{rms}$ or $A_{pk}$) | Freq. (Hz) | |
| Output terminal "+/-" to earth | Normal | 264Vac / 60Hz | -- | 0.216mApk | 60 | ES1 |
| | Abnormal: overload (See table B.3, B.4 for details) | 264Vac / 60Hz | -- | 0.232mApk | 60 | ES1 |
| | Single fault: SC/ OC (Refer to fault condition on table B.3, B.4, output shutdown) | 264Vac / 60Hz | -- | 0.232mApk | 60 | ES1 |
| | Single fault: SC (Refer to fault condition on table B.3, B.4, F1 open) | 264Vac / 60Hz | -- | 0.232mApk | 60 | ES1 |

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

| Supplementary information: |
|---|
| Abbreviation: SC= short circuit; OC= open circuit |

| 5.7.5 | TABLE: Earthed accessible conductive part | | | N/A |
|---|---|---|---|---|
| Supply voltage (V).....: | | | | — |
| Phase(s) .....: | [] Single Phase; [ ] Three Phase: [ ] Delta [ ] Wye | | | |
| Power Distribution System .....: | ☐ TN ☐ TT ☐ IT | | | |
| Location | | Fault Condition No in IEC 60990 clause 6.2.2 | Touch current (mA) | Comment |
| -- | | -- | -- | -- |
| Supplementary Information: | | | | |
| | | | | |

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

| 6.2.2 | TABLE: Power source circuit classifications | | | | | P |
|---|---|---|---|---|---|---|
| Location | Operating and fault condition | Voltage (V) | Current (A) | Max. Power[1)] (W) | Time (S) | PS class |
| Output | Normal condition | 5.12 | 1.2 | 6.144 | 3s | PS1 |
| | Signal fault (DB1 SC) | 0* | 0* | 0* | 3S | PS1 |
| | Signal fault (EC1 SC) | 0* | 0* | 0* | 3S | PS1 |
| Supplementary information: | | | | | | |
| Abbreviation: SC= short circuit; OC= open circuit<br>[1)] Measured after 3 s for PS1 and measured after 5 s for PS2 and PS3.<br>* FR1 open, no hazard. | | | | | | |

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

| 6.2.3.1 | TABLE: Determination of Arcing PIS | | | | P |
|---|---|---|---|---|---|
| Location | | Open circuit voltage after 3 s (Vpk) | Measured r.m.s current (A) | Calculated value | Arcing PIS? Yes / No |
| All primary circuits/components | | -- | -- | - | Yes (declaration) |
| Supplementary information: | | | | | |
| All primary and secondary circuit are considered as arcing PIS<br>An Arcing PIS requires a minimum of 50 V (peak) a.c. or d.c. An Arcing PIS is established when the product of the open circuit voltage ($V_p$) and normal operating condition rms current ($I_{rms}$) is greater than 15. | | | | | |

| 6.2.3.2 | TABLE: Determination of resistive PIS | | | P |
|---|---|---|---|---|
| Location | | Operating and fault condition | Dissipate power (W) | Arcing PIS? Yes / No |
| All primary circuits/components | | -- | -- | Yes (declaration) |
| Supplementary information: | | | | |
| All primary and secondary circuit are considered as resistive PIS<br>A combination of voltmeter, VA and ammeter IA may be used instead of a wattmeter.<br>If a separate voltmeter and ammeter are used, the product of (VA x IA) is used to determine Resistive PIS classification.<br>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. | | | | |

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

| 9.6 | TABLE: Temperature measurements for wireless power transmitters | | | | N/A |
|---|---|---|---|---|---|
| Supply voltage (V) ..... : | | | | | — |
| Max. transmit power of transmitter (W) : | | | | | — |
| Foreign objects | w/o receiver and direct contact | with receiver and direct contact | with receiver and at distance of 2 mm | with receiver and at distance of 5 mm | |

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

| | Object (°C) | Ambient (°C) | Object (°C) | Ambient (°C) | Object (°C) | Ambient (°C) | Object (°C) | Ambient (°C) |
|---|---|---|---|---|---|---|---|---|
| -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Supplementary information: | | | | | | | | |
| | | | | | | | | |

| 5.4.1.4, 9.3, B.1.5, B.2.6 | TABLE: Temperature measurements | | | | P |
|---|---|---|---|---|---|
| Supply voltage (V) .....: | 90Vac/ 50Hz | 90Vac/ 50Hz | 264Vac/ 50Hz | 264Vac/ 50Hz | — |
| Ambient temperature during test $T_{amb}$ (°C) .....: | 25.0 | 25.0 | 25.0 | 25.0 | — |
| Maximum measured temperature *T* of part/at: | *T* (°C) | | | | Allowed $T_{max}$ (°C) |
| -- | Horizontal | Vertical | Horizontal | Vertical | -- |
| Plug holder（external） | 60.2 | 63.0 | 62.2 | 60.2 | 120 |
| Plug holder（interior） | 64.6 | 67.0 | 66.0 | 64.5 | 120 |
| EC1 body | 87.2 | 89.8 | 91.8 | 88.4 | 105 |
| EC3 body | 79.3 | 80.4 | 85.0 | 82.1 | 105 |
| L1 winding | 78.8 | 79.9 | 80.9 | 78.4 | 130 |
| T1 winding | 97.2 | 98.3 | 104.6 | 100.3 | 110 |
| T1 core | 91.1 | 92.6 | 98.3 | 94.5 | Ref. |
| CY1 body | 82.9 | 83.7 | 88.4 | 85.3 | 125 |
| PCB near DB1 | 91.3 | 93.5 | 89.7 | 87.1 | 130 |
| PCB near U1 | 102.9 | 104.1 | 108.6 | 105.3 | 130 |
| PCB near D3 | 103.9 | 106.5 | 113.8 | 108.8 | 130 |
| Enclosure inside (Top, near T1) | 81.6 | 82.5 | 86.8 | 83.8 | 120 |
| Ambient | 45.0 | 45.0 | 45.0 | 45.0 | -- |
| Enclosure outside (Top, near T1) | 59.2 | 53.8 | 58.0 | 54.3 | 77 |
| Ambient | 25.0 | 25.0 | 25.0 | 25.0 | -- |

| 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: | | | | | | | |
| 1. Tma should be considered as directed by appliable requirement.<br>2. Tma is not included in assessment of Touch Temperatures (Clause 9). | | | | | | | |

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

3. The temperatures were measured under worst case normal mode as described in B.2.5 at voltages as above.
4. With a specified maximum ambient temperature and test temperature of 45°C, the maximum permitted temperatures are calculated as follows:

   Winding components (providing safety isolation): Class 130 (B) Tmax = 120°C - 10°C = 110°C.
5. When tested for touch temperature limit of clause 9, the ambient was conducted between 20-30°C.
6. Horizontal means the adaptor is plugged into horizontal socket-outlet; Vertical means the adaptor is plugged into vertical wall socket-outlet.

| **B.2.5** | **TABLE: Input test** | | | | | | | P |
|---|---|---|---|---|---|---|---|---|
| U (V) | Hz | I (A) | I rated (A) | P (W) | P rated (W) | Fuse No | I fuse (A) | Condition/status |
| 90 | 50 | 0.126 | -- | 6.9 | -- | F1 | 0.126 | Max. normal load |
| 90 | 60 | 0.128 | -- | 6.9 | -- | F1 | 0.128 | Max. normal load |
| 100 | 50 | 0.115 | 0.15 | 6.8 | -- | F1 | 0.115 | Max. normal load |
| 100 | 60 | 0.118 | 0.15 | 6.8 | -- | F1 | 0.118 | Max. normal load |
| 240 | 50 | 0.065 | 0.15 | 7.2 | -- | F1 | 0.065 | Max. normal load |
| 240 | 60 | 0.065 | 0.15 | 7.2 | -- | F1 | 0.065 | Max. normal load |
| 264 | 50 | 0.062 | -- | 7.2 | -- | F1 | 0.062 | Max. normal load |
| 264 | 60 | 0.063 | -- | 7.3 | -- | F1 | 0.063 | Max. normal load |
| Supplementary information: | | | | | | | | |
| The maximum measured current under rated voltage did not exceed 110% of the rated current. | | | | | | | | |

| **B.3, B.4** | **TABLE: Abnormal operating and fault condition tests** | | | | | | P |
|---|---|---|---|---|---|---|---|
| Ambient temperature $T_{amb}$ (°C) .....: | | | | | 25°C, if not specified | | — |
| Power source for EUT: Manufacturer, model/type, outputrating ..: | | | | | -- | | — |
| Component No. | Condition | Supply voltage (V) | Test time | Fuse no. | Fuse current (A) | Observation | |
| T1 | OL | 264 | 2H 11min | FR1 | 0.063 → 0.068 → 0.001 | Unit normal load, Transformer output overload 1.2A Max, over 1.2A shut down, immediately, no hazard. No damage, no hazard<br>Touch voltage (+ to -): 5.12V.<br>Touch current (output +/- to earth): 0.232m Apeak;<br>Touch current (plastic enclosure with metal foil to | |

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

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | | | | earth): 0.08mApeak.<br>T1 winding:116.0°C<br>T1 core: 109.8°C<br>PCB near U1: 122.3°C<br>Ambient: 45.0°C<br>Enclosure outside (Top, near T1): 66.1°C<br>Ambient:25.0°C |
| Output | OL | 264 | 2H 57min | FR1 | 0.063 → 0.068 → 0.001 | Unit normal load, Transformer output overload 1.2A Max, over 1.2A shut down, immediately, no hazard. No damage, no hazard<br>Touch voltage (+ to -): 5.12V.<br>Touch current (output +/- to earth): 0.232m Apeak;<br>Touch current (plastic enclosure with metal foil to earth): 0.08mApeak.<br>T1 winding:112.0°C<br>T1 core: 104.3°C<br>PCB near U1: 119.7°C<br>Ambient: 45.0°C<br>Enclosure outside (Top, near T1): 64.0°C<br>Ambient:25.0°C |
| Output | SC | 264 | 10 mins | FR1 | 0.001 | Unit shutdown immediately, and recoverable, no hazard exist.<br>Touch voltage (+ to -): 0V.<br>Touch current (output +/- to earth): 0.232m Apeak;<br>Touch current (plastic enclosure with metal foil to earth): 0.08mApeak. |
| DB1 | SC | 264v | 10min | FR1 | 0 | Fuse FR1 opened immediately. No hazard.<br>NT, NC, NB.<br>Touch voltage (+ to -): 0V.<br>Touch current (output +/- to earth): 0.232m Apeak;<br>Touch current (plastic enclosure with metal foil to earth): 0.08mApeak. |

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

| | | | | | | |
|---|---|---|---|---|---|---|
| EC1 | SC | 264v | 10min | FR1 | 0 | Fuse FR1 opened immediately. No hazard.<br>NT, NC, NB.<br>Touch voltage (+ to -): 0V.<br>Touch current (output +/- to earth): 0.232m Apeak;<br>Touch current (plastic enclosure with metal foil to earth): 0.08mApeak. |
| T1 pin1-2 | SC | 264v | 10min | FR1 | 0.001 | Unit shutdown immediately, and recoverable, no hazard exist.<br>Touch voltage (+ to -): 0V.<br>Touch current (output +/- to earth): 0.232m Apeak;<br>Touch current (plastic enclosure with metal foil to earth): 0.08mApeak. |
| T1 pin3-4 | SC | 264v | 10min | FR1 | 0.001 | Unit shutdown immediately, and recoverable, no hazard exist.<br>Touch voltage (+ to -): 0V.<br>Touch current (output +/- to earth): 0.232m Apeak;<br>Touch current (plastic enclosure with metal foil to earth): 0.08mApeak. |
| T1 pin5-6 | SC | 264v | 10min | FR1 | 0.001 | Unit shutdown immediately, and recoverable, no hazard exist.<br>Touch voltage (+ to -): 0V.<br>Touch current (output +/- to earth): 0.232m Apeak;<br>Touch current (plastic enclosure with metal foil to earth): 0.08mApeak. |
| U1 pin1-7 | SC | 264v | 10min | FR1 | 0.001 | Unit shutdown immediately, and recoverable, no hazard exist.<br>Touch voltage (+ to -): 0V.<br>Touch current (output +/- to earth): 0.232m Apeak;<br>Touch current (plastic |

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

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | | | | enclosure with metal foil to earth): 0.08mApeak. |
| U1 pin4-5 | SC | 264v | 10min | FR1 | 0.001 | Unit shutdown immediately, and recoverable, no hazard exist.<br>Touch voltage (+ to -): 0V.<br>Touch current (output +/- to earth): 0.232m Apeak;<br>Touch current (plastic enclosure with metal foil to earth): 0.08mApeak. |
| EC3 | SC | 264v | 10min | FR1 | 0.001 | Unit shutdown immediately, and recoverable, no hazard exist.<br>Touch voltage (+ to -): 0V.<br>Touch current (output +/- to earth): 0.232m Apeak;<br>Touch current (plastic enclosure with metal foil to earth): 0.08mApeak. |
| R7 | SC | 264v | 10min | FR1 | 0.001 | Unit shutdown immediately, and recoverable, no hazard exist.<br>Touch voltage (+ to -): 0V.<br>Touch current (output +/- to earth): 0.232m Apeak;<br>Touch current (plastic enclosure with metal foil to earth): 0.08mApeak. |

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.

1) S-C: Short-circuited; O-C: Open-circuited; O-L: Overloaded.

2) The test result shown all safeguards remained effective and didn’t lead to a single fault condition during abnormal operating condition; In addition all safeguards complied with applicable requirements in this standard after restoration of normal operating conditions.

3) The test result showed no Class 1 or 2 energy source become Class 3 level during and after single fault condition.

4) The overload condition for transformer is applied according to annex G.5.3.3.

Winding Limit for winding of transformer T1: 175°C -10°C=165°C

Limit temperature:

Plastic material: 87°C,

5) NC - Cheesecloth remained intact, NT - Tissue paper remained intact, NB - No indication of dielectric

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

breakdown.
6) Tests were performed on product with each source of fuse listed in table 4.1.2.

| **M.3** | **TABLE: Protection circuits for batteries provided within the equipment** | | N/A |
|---|---|---|---|
| Is it possible to install the battery in a reverse polarity position?.....: | | -- | — |

| Equipment Specification | Charging | |
|---|---|---|
| | Voltage (V) | Current (A) |
| | -- | -- |

| Manufacturer/type | Battery specification | | | | | |
|---|---|---|---|---|---|---|
| | Non-rechargeable batteries | | Rechargeable batteries | | | |
| | Discharging current (A) | Unintentional charging current (A) | Charging | | Discharging current (A) | Reverse charging current (A) |
| | | | Voltage (V) | Current (A) | | |
| -- | -- | -- | -- | -- | -- | -- |

Note: The tests of M.3.2 are applicable only when above appropriate data is not available.

| Specified battery temperature (°C) .....: | -- | |
|---|---|---|

| Component No. | Fault condition | Charge/ discharge mode | Test time | Temp. (°C) | Current (A) | Voltage (V) | Observation |
|---|---|---|---|---|---|---|---|
| -- | -- | -- | -- | -- | -- | -- | -- |

Supplementary information:

Abbreviation: SC= short circuit; OC= open circuit NL= no chemical leakage; NS= no spillage of liquid; NE= no explosion; NF= no emission of flame or expulsion of molten metal.

| **M.4.2** | **TABLE: Charging safeguards for equipment containing a secondary lithium battery** | N/A |
|---|---|---|
| Maximum specified charging voltage (V).....: | -- | — |
| Maximum specified charging current (A) .....: | -- | — |
| Highest specified charging temperature (°C) .....: | -- | -- |
| Lowest specified charging temperature (°C) .....: | -- | -- |

| Battery manufacturer/type | Operating and fault condition | Measurement | | | Observation |
|---|---|---|---|---|---|
| | | Charging voltage (V) | Charging current (A) | Temp. (°C) | |
| -- | -- | -- | -- | -- | -- |

Supplementary information:

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

Abbreviation: SC= short circuit; OC= open circuit; MSCV= maximum specified charging voltage; MSCC= maximum specified charging current; HSCT= highest specified charging temperature; LSCT= lowest specified charging temperature

| **Q.1** | **TABLE: Circuits intended for interconnection with building wiring (LPS)** | | | | | | P |
|---|---|---|---|---|---|---|---|
| Output Circuit | Condition | $U_{oc}$ (V) | Time (s) | $I_{sc}$ (A) | | S (VA) | |
| | | | | Meas. | Limit | Meas. | Limit |
| Output | Normal conditions | 5.16 | 5 | 1.2 | 8 | 6.144 | 100 |
| Output | Single fault (R7SC) | 0* | 5 | 0* | 8 | 0* | 100 |
| Supplementary Information: | | | | | | | |
| SC=Short circuit; OC=Open circuit.<br>*: Unit shutdown immediately and recoverable, no hazard. | | | | | | | |

| **T.2, T.3, T.4, T.5** | **TABLE: Steady force test** | | | | | P |
|---|---|---|---|---|---|---|
| Part/Location | Material | Thickness (mm) | Probe | Force (N) | Test Duration (s) | Observation |
| Internal components (T.2) | -- | -- | Figure V.2 | 10 | 5 | No reduction the clearances and creepage distances |
| Enclosure bottom (T.4 | Plastic* | See table 4.1.2 | -- | 100 | 5 | No cracking, no damage. |
| Enclosure top (T.4) | Plastic* | See table 4.1.2 | -- | 100 | 5 | No cracking, no damage. |
| Enclosure side (T.4) | Plastic* | See table 4.1.2 | -- | 100 | 5 | No cracking, no damage. |
| Supplementary information: | | | | | | |
| *Tests were performed on product with each source listed in table 4.1.2. | | | | | | |

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

| T.6, T.9 | TABLE: Impact test | | | | N/A |
|---|---|---|---|---|---|
| Location/Part | Material | Thickness (mm) | Height (mm) | Observation | |
| -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | -- | |
| -- | -- | -- | -- | -- | |
| Supplementary information: | | | | | |
| *Test was performed on product with each source listed in table 4.1.2. | | | | | |

| T.7 | TABLE: Drop test | | | | P |
|---|---|---|---|---|---|
| Location/part | Material | Thickness (mm) | Height (mm) | Observation | |
| Enclosure bottom | Plastic* | See table 4.1.2 | 1000 | No cracking, no damage. | |
| Enclosure top | Plastic* | See table 4.1.2 | 1000 | No cracking, no damage. | |
| Enclosure side | Plastic* | See table 4.1.2 | 1000 | No cracking, no damage. | |
| Supplementary information: | | | | | |
| *Tests were performed on product with each source listed in table 4.1.2. | | | | | |

| T.8 | TABLE: Stress relief test | | | | P |
|---|---|---|---|---|---|
| Location/Part | Material | Thickness (mm) | Oven Temperature (°C) | Duration (h) | Observation |
| Enclosure | Plastic* | See table 4.1.2 | 97°C | 7h | No distortion, no softening, no cracking. |
| Supplementary information: | | | | | |
| *Test was performed on product with each source listed in table 4.1.2. | | | | | |

| X | TABLE: Alternative method for determining minimum clearances distances | | P |
|---|---|---|---|
| Clearance distanced between: | Peak of working voltage (V) | Required cl (mm) | Measured cl (mm) |
| -- | -- | -- | -- |
| Supplementary information: | | | |
| See Table 5.4.2, 5.4.3 | | | |

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

| 4.1.2 | TABLE: Critical components information | | | | P |
|---|---|---|---|---|---|
| Object / part No. | Manufacturer/ trademark | Type / model | Technical data | Standard | Mark(s) of conformity[1)] |
| Enclosure (Plug holder) | Sabic Innovative Plastics B V | 940(f1) | V-0, 120°C min. thickness 2.0mm | UL94 | UL E45329 |
| PCB | Tian Feng Wei Electronic Co., Ltd | T-V0 | V-0,130°C | UL796 | UL E340994 |
| Alternative | Interchargeable | interchangeable | Mn V-1,130°C | UL796 | UL |
| Fuse resistor (FR1) | Shenzhen Great Electronics Co., Ltd | RXF-1W | 4.7R, 1/4W | UL 1412 | UL E301541 |
| Bridge Rectifiers (BD1) | CENPAK ELECTRONICS | SMD Bring ABS210, | 2A1000V | EN IEC 62368-1 | Tested with appliance |
| Transformer(T1) | Shenzhen Baijunda Electronic Co., Ltd | T-18W-25 | Class B | EN IEC 62368-1 | Tested with appliance |
| -Bobbin | Chang Chun Plastics Co Ltd | T375J | Phenolic,V-0, 150°C Thickness 0.75mm Min. | UL94 | UL E59481 |
| -Tape | JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO.,LTD | PZ | 130°C | UL510 | UL E165111 |
| -TUBE | CHANGYUAN | CB-TT-T | 200°C | UL 224 | UL E180908 |
| -TRIPLE WIRE | SHENZHENDARUN SCIENCE ANDTECHNOLOGY CO LTD | DRTIW-B, DRTIW-F | 130°C, reinforced insulation | IEC/EN 60950-1 | UL E335841 VDE 40032470 |
| -WIRE | SHANTOU SHENGANG | UEW/155 | 155°C | UL1446 | UL E239508 |
| Alternative | SHANTOU SHENGANG | XUEW orQA-x | 155°C | UL1446 | UL E324388 |
| Y-capacitor | Macrofar Electronics Technology (HK) Limited | XAY/HY | Max.1000pF, Min.250VAC, 125°C, Y1 type | EN 60384-14 | TUV R50326364 UL E481054 |
| Supplementary information: | | | | | |
| Supplementary information: [1)] License available upon request. Provided evidence ensures the agreed level of compliance. See OD-CB2039. | | | | | |

| EN 50075 (partially) | | | |
|---|---|---|---|
| Clause | Requirement – Test | Result – Remark | Verdict |

**European Plug Test Report**

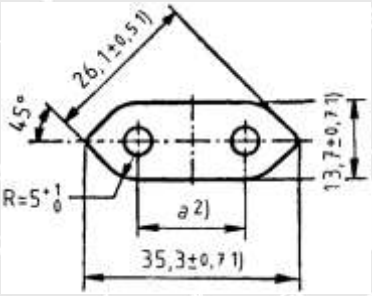
| | | | |
|---|---|---|---|
| **6** | **Marking** | | P |
| | Appliances shall be marked as follows: | Incorporated with Power adapter | — |
| | Rated current in amperes (A) | Refer to marking label of final appliance. | N/A |
| | Rated Voltage in volts (V) | As above | N/A |
| | Symbol for nature of supply (~) | As above | N/A |
| | Name, trade mark or identification mark of manufacturer or responsible vendor | EU plug of Power adapter) for model: ILINC65W | P |
| | Type reference | Incorporated plug portion of adaptor | P |

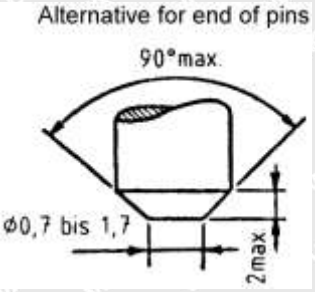
| | | | | |
|---|---|---|---|---|
| **7** | **Dimensions** | | | P |
| | Plugs shall comply with Standard Sheet 1 | | (see attached drawing) | — |
| | Between two pins (pin base) | 18.0 - 19.2 mm | 18.03 mm | P |
| | Between two pins (pin top) | 17.0 - 18.0 mm | 17.60 mm | P |
| | Diameter of pin (metallic part) | 4 $^{\pm 0.06}$ mm | 3.95 mm | P |
| | Diameter of pin (pin base) | Max. 4.0 mm | 3.95 mm | P |
| | Diameter of pin (middle part) | Max. 3.8 mm | 3.49 mm | P |
| | Pin length | 19 $^{\pm 0.5}$ mm | 18.53 mm | P |
| | Length of pin except metal part | 10 $^{+1/-0}$ mm | 10.13 mm | P |
| | Shape of pin top | | Round shape | P |
| | Length of plug base | 35.3 $^{\pm 0.7}$ mm | 35.15 mm | P |
| | Width of plug base | 13.7 $^{\pm 0.7}$ mm | 14.02 mm | P |
| | Diagonal dimension of plug base | 26.1 $^{\pm 0.5}$ mm | 26.25 mm | P |
| | within a distance of 18mm | ≥18 mm | 19.746 mm | P |
| | Angle | 45° | 45 ° | P |
| | Radius | R 5 -0, +1 mm | 5.49 mm | P |

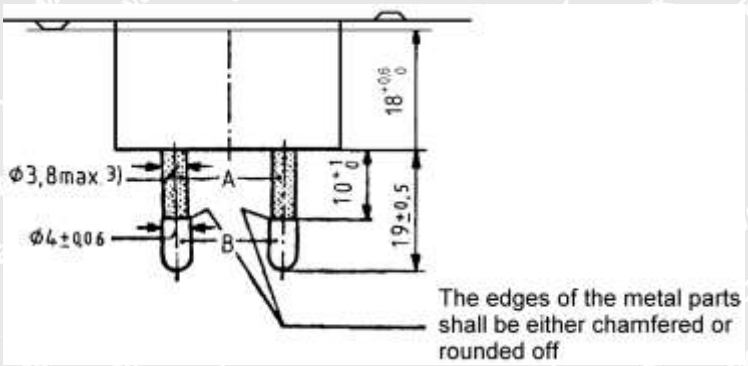
| EN 50075 (partially) | | | |
|---|---|---|---|
| Clause | Requirement – Test | Result – Remark | Verdict |
| **8.** | **Protection against electric shock** | | P |
| 8.1 | Live parts of the plug not accessible (standard test finger) | Protected by enclosure of the equipment | P |
| 8.2 | No connection between one plug-pin and socket outlet | Checked by gauge of Fig.4 | P |
| 8.3 | External parts of insulating material | External parts except pins are insulating material. | P |
| **9** | **Construction** | | P |
| 9.1 | Plugs not replaceable | Incorporated with adaptor | P |
| 9.2 | Switches, fuses, lampholders not incorporated | Not incorporated | P |
| 9.3 | Solid pins | (see clause 13) | P |
| | Adequate mechanical strength | As above | P |
| 9.4 | Pins locked against rotation | (see clause 13.1 and 13.4) | P |
| | Adequate fixed into the body | Each pin shaft is designed with ridges to lock into the pin holder | P |
| 9.5 | Kind of connection | Leads are soldered to the plug pin terminal | P |
| 9.6 | Easily to be withdrawn from socket-outlet | The equipment provides sufficient gripping surface | P |
| **10** | **Resistance to humidity** | | P |
| | -Humidity treatment for 48 hours | Test with adaptor | P |
| **11** | **Insulation resistance and electric strength** | | P |
| 11.1 | Insulation resistance (500 V, min 5 MΩ) | Pins against body: 100MΩ<br>Each pin against body: 100MΩ<br>Required: 7MΩ.Pin against Pin: 100MΩ<br>Required: 2MΩ | P |
| 11.2 | Electric strength (2,000 V) | Pins against body: 4,200V<br>Each pin against body: 4,200V<br>Pin against Pin: 2,100V | P |
| **13** | **Mechanical strength** | | P |
| 13.1 | Pressed with 150 N for 5 min | No deformation or deviation from the dimensions | P |

| EN 50075 (partially) | | | |
|---|---|---|---|
| Clause | Requirement – Test | Result – Remark | Verdict |
| 13.2 | Tumbling barrel | Test according to clause 24.2 of DIN VDE 0620-2-1 and also pass the test according to DIN VDE 0620-101:1992 clause 7, figure 2.<br>Weight of adapter: 21g<br>Number of falls: 1000 times | P |
| | No damages after the test | | P |
| | Requirements of clause 7 and 8.2 still fulfilled | Deformations allowed according to the equipment standard | P |
| 13.3 | Rubbing test of plug-pins: 10,000 cycles, 4 N | See test below | P |
| | No damage of the pins | No visible damage | P |
| 13.4 | Pull test at 70°C with 40 N | See test below | P |
| | Pins not more than 1 mm displaced | Displacement: 0.5mm | P |
| **14** | **Resistance to heat and to ageing** | | P |
| 14.1 | Sufficient resistant to heat | Incorparated with adaptor | P |
| 14.1.1 | After 1 h in heating cabinet at 100°C no damage shown | Test with adaptor | P |
| 14.1.2 | After 1h in heating cabinet at 80°C and a force of 20 N through the jaws no damage shown | Performed a 125°C ball pressure test at the material of plug portion which maintains live part in position.Max. 1.05mm measured after 1 hour | P |
| 14.2 | Aging test | See test below | P |
| | - at 70°C for 168h | 70°C for 168h applied. | P |
| | - at room temperature for 96h | | P |
| | No traces of cloth at a force of 5N | Material does not soften | P |
| | No damage leads to non-compliance | No visible damage | P |
| **15** | **Current-carrying parts and connections resistance to heat and to ageing** | | P |
| 15.1 | Connections withstand the mechanical stresses occurring in normal use | See below | P |
| 15.2 | Contact pressure not through isolating material | Complied | P |
| 15.3 | Current carrying parts of copper | Copper content:62.2% No rolled sheet used | P |
| | No electroplated coating when part is subjected to mechanical wear | No electroplated coating | P |

| EN 50075 (partially) | | | |
|---|---|---|---|
| Clause | Requirement – Test | Result – Remark | Verdict |
| | Other metals having a mechanical strength, an electrical conductivity and a resistance to corrosion | No such materials used. | N/A |
| **16** | **Creepage distances, clearances and distances through insulation** | | P |
| | Live parts of different polarity: 3 mm | >3mm | P |
| | Through insulation between live parts and accessible surfaces: 1.5 mm | >1.5mm | P |
| **17** | **Resistance of insulating material to abnormal heat and fire** | | P |
| | Insulating material not unduly affected by abnormal heat and by fire | Glow wire test performed on plug portion with: 750°C<br>Other parts test with: 650°C | P |
| **7** | **Dimensions** | | P |




A = Insulating collar

B = metal pin

1) These dimensions shall not be exceeded within a distance of 18mm from the engagement face of the plug.

2) Dimension a is:
18mm to 19.2mm in the plane of the engagement face
17mm to 18mm at the ends of the pins

3) This dimension may be increased to 4mm within a distance of 4mm from the engagement face of the plug.

# Photo Documentation

Report No.: WTF22D10214191Y001

Figure 1 Overall view for MO8827

Figure 2 Overall view for MO8827

# Photo Documentation

Report No.: WTF22D10214191Y001

Figure 3 Overall view for MO9785

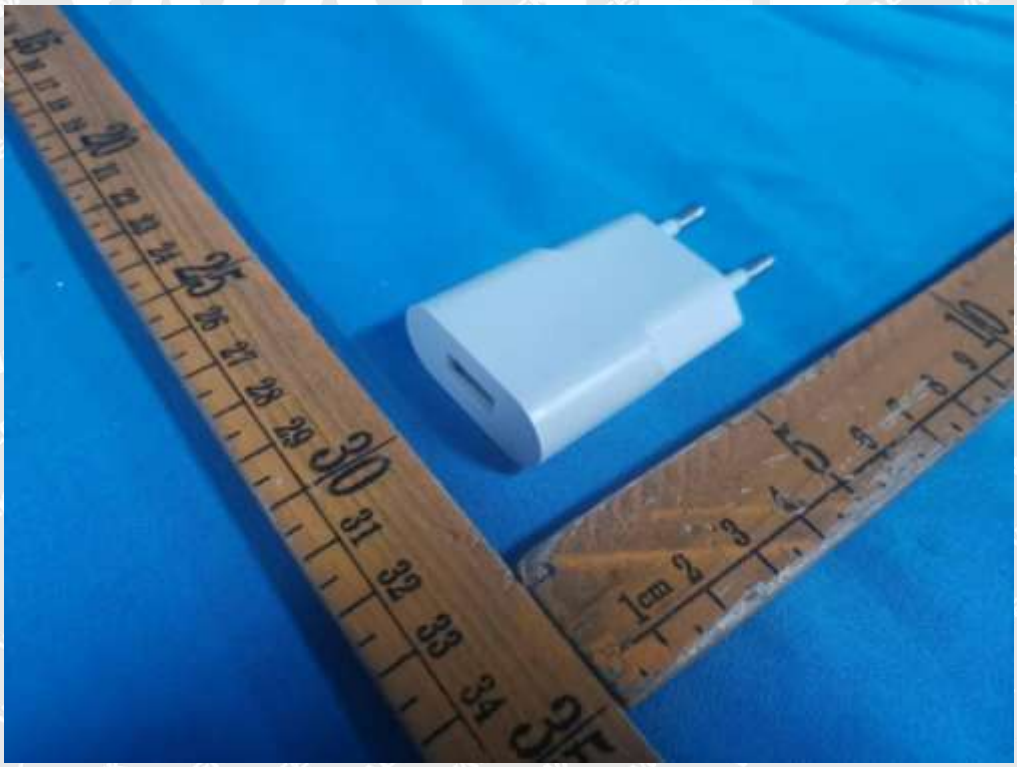


Figure 4 Overall view for MO9785

# Photo Documentation

Report No.: WTF22D10214191Y001

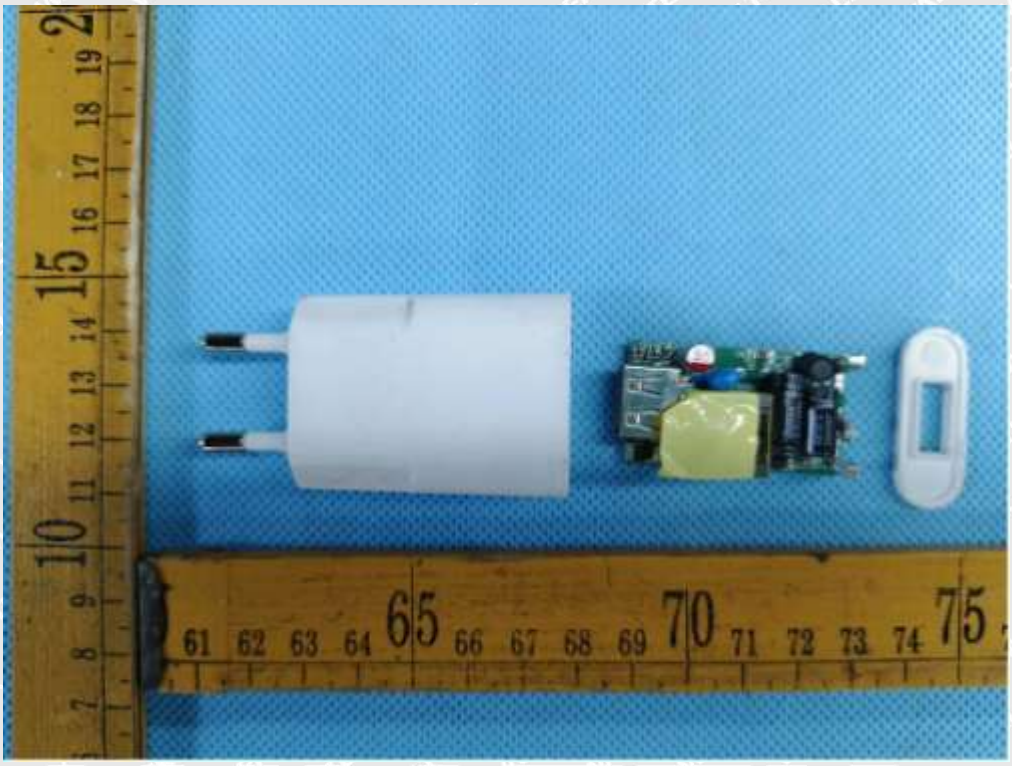


Figure 5 Internal view

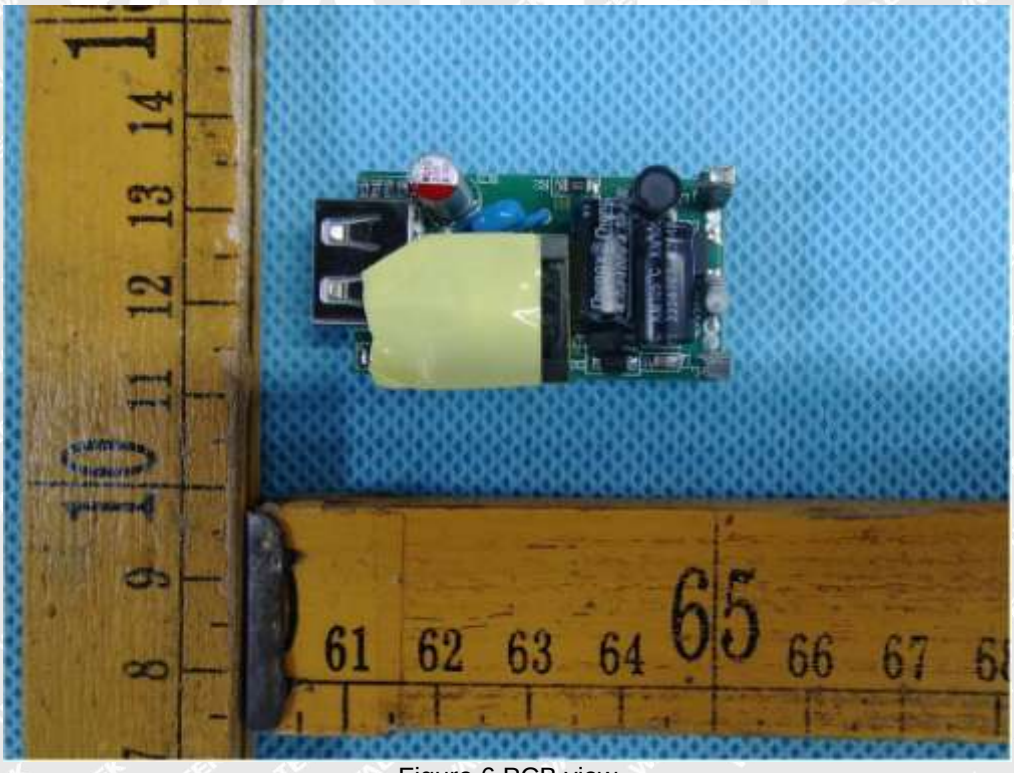


Figure 6 PCB view

# Photo Documentation

Report No.: WTF22D10214191Y001

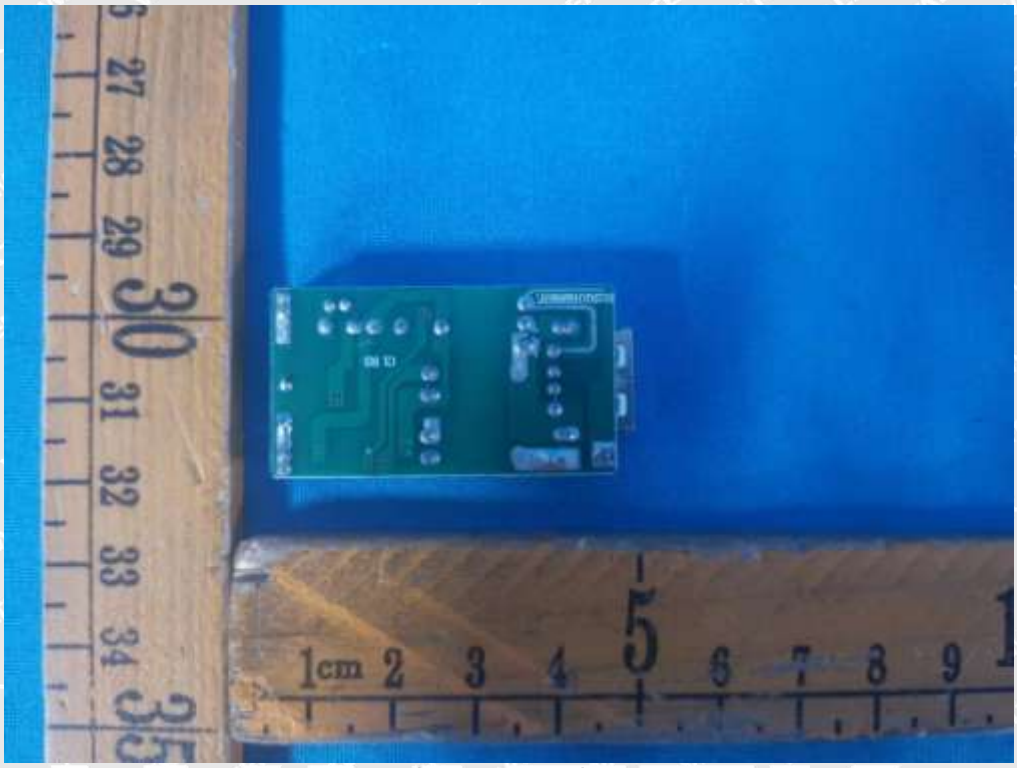



Figure 7 PCB view

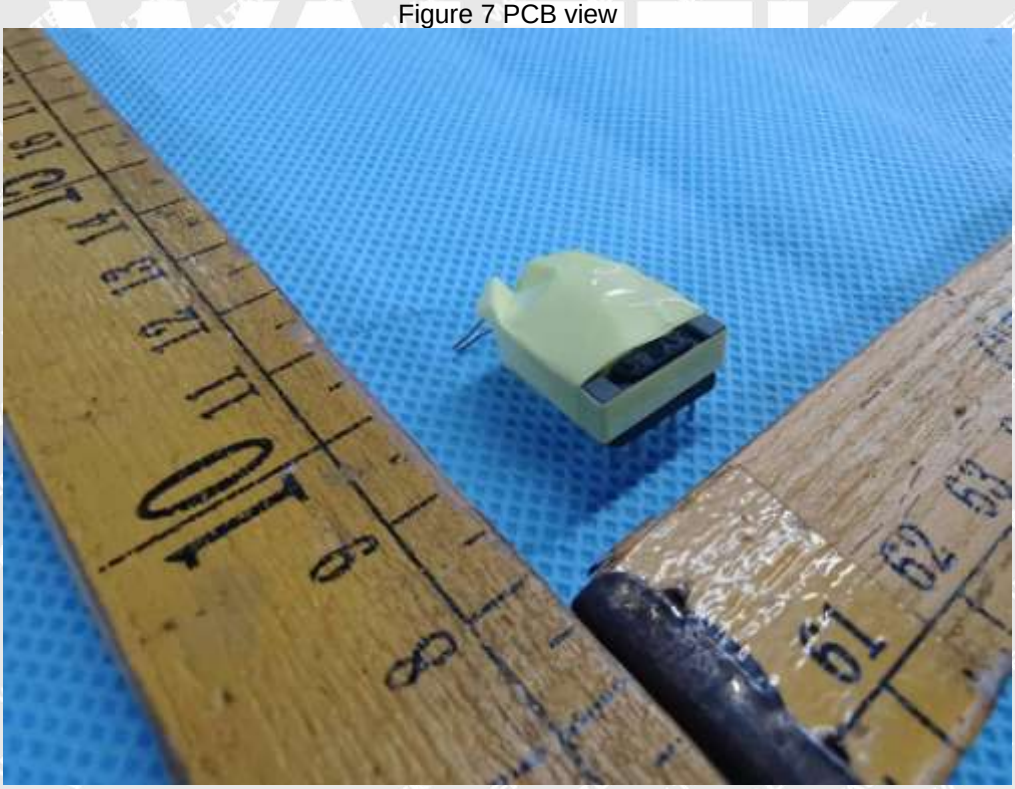


Figure 8 Transformer view

# Photo Documentation

Report No.: WTF22D10214191Y001

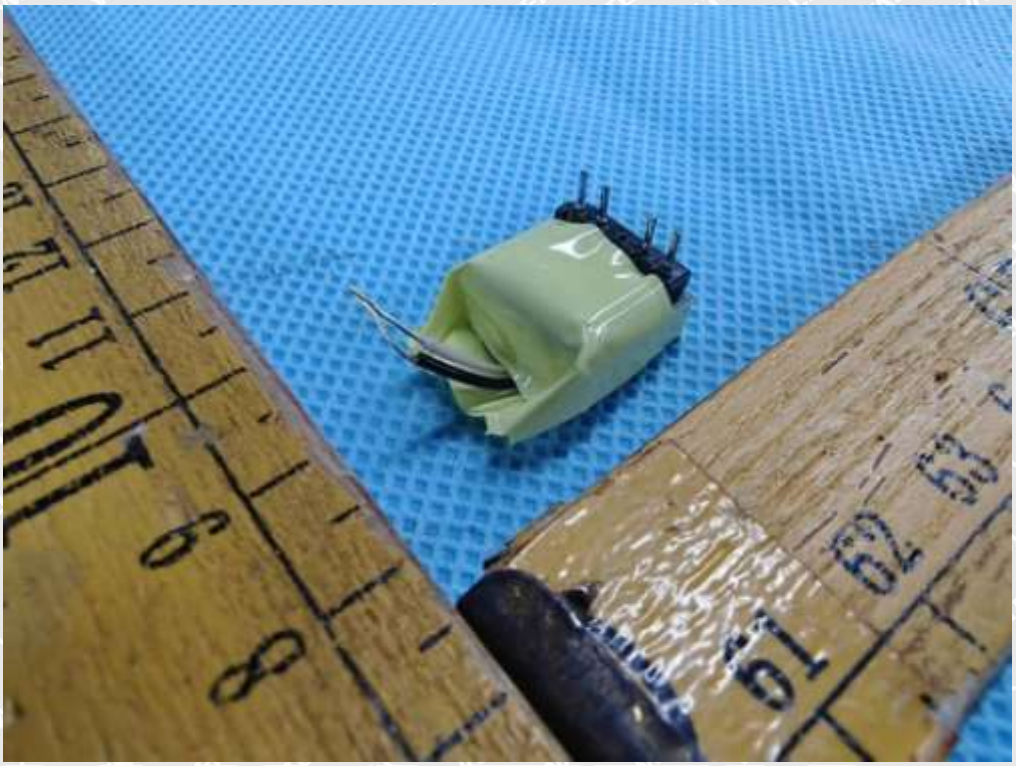


Figure 9 Transformer view

====== End of Report ======