

Fiberroad Technology CO., Ltd**LVD REPORT**

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|-------------------|---|
| Prepared For: | Fiberroad Technology CO., Ltd 4/F, Building 7, Longbi Industry Park, Bantian, Longgang District, Shenzhen, P.R. China |
| Product Name: | Industrial Ethernet Switch |
| Trad Mark: | Fiberroad |
| Model : | FR-6N3104 |
| Additional Model: | FR-6N1102, FR-6N1008, FR-6N1104, FR-6N3102, FR-6N3204, FR-6N3208, FR-6N3216, FR-6N3008, FR-6N3016 |
| Prepared By : | BST Testing (Shenzhen) Co.,Ltd. No.7, New Era Industrial Zone, Guantian, Bao'an District, Shenzhen, Guangdong, China |
| Test Date: | Oct. 08, 2021-Oct. 15, 2021 |
| Date of Report : | Oct. 15, 2021 |
| Report No.: | BSTXD211021101301SR |



| LVD Report | |
|--|---|
| EN62368-1:2014+A11:2017 Information technology equipment - Safety - | |
| Part 1: General requirements | |
| Testing laboratory | : BST Testing (Shenzhen) Co.,Ltd. |
| Address | : No.7,New Era Industrial Zone, Guantian, Bao'an District, Shenzhen, Guangdong, China |
| Testing location | : BST Testing (Shenzhen) Co.,Ltd. |
| Applicant | : FIBERROAD TECHNOLOGY CO., LTD |
| Address | : 4/F, Building 7, Longbi Industry Park, Bantian, Longgang District, Shenzhen, P.R. China |
| Standard | : EN62368-1:2014+A11:2017 |
| Test Result | : Compliance with EN62368-1:2014+A11:2017 |
| Procedure deviation | : N.A. |
| Non-standard test method | : N.A. |
| Type of test object | : Industrial Ethernet Switch |
| Trademark | : N.A. |
| Model/type reference | : FR-6N3104 |
| Rating | : Input: DC 9-56 V, 2W |
| Manufacturer | : FIBERROAD TECHNOLOGY CO., LTD |
| Address | : 4/F, Building 7, Longbi Industry Park, Bantian, Longgang District, Shenzhen, P.R. China |
| Test item particulars : | |
| Equipment mobility | : Direct-plug equipment |
| Operation condition | : Continuous |
| Class of equipment | : Class II |
| Protection against ingress of water . | : IPX5 |



Possible test case verdicts :

test case does not apply to the test object : N(.A.)

test object does meet the requirement : P(ass)

test object does not meet the requirement : F(ail)

**Name and address of the testing laboratory : BST Testing (Shenzhen) Co.,Ltd.
3F,Weames Technology Building,No. 10 Kefa Road,
Science Park,Nanshan District,Shenzhen,Guangdong,China**

Test by : Adam Chen Oct. 15, 2021
Signature Date

Technician
Title

Review by : Adam Chen Oct. 15, 2021
Date

Project Engineer
Title

Approved by : Adam Chen Oct. 15, 2021
Signature Date

Manager
Name and Title

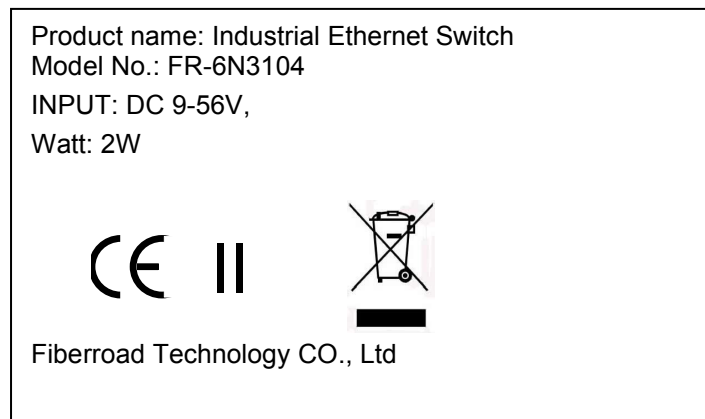




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| General remarks: "(see remark #)" refers to a remark appended to the report. "(see appended table)" refers to a table appended to the report. Throughout this report a comma is used as the decimal separator. The test results presented in this report relate only to the object tested. This report shall not be reproduced except in full without the written approval of the testing laboratory. | Attached with: A. photo documentation Remark: |
|---|---|



Artwork of Marking Label





| EN62368-1:2014+A11:2017 | | | |
|-------------------------|--|--|---------|
| Clause | Requirement – Test | Result – Remark | Verdict |
| 1 | GENERAL | | -- |
| 1.5 | Components | | P |
| 1.5.1 | General | | P |
| | Comply with IEC 62368 or relevant component standard | (See appended table 1.5.1) | P |
| 1.5.2 | Evaluation and testing of components | Certified components are used in accordance with their ratings, certifications and they comply with applicable parts of this standard. Components not certified are used in accordance with their ratings and they comply with applicable parts of IEC 62368 and the relevant component standard. Components, for which no relevant IEC-standard exists, have been tested under the conditions occurring in the equipment, using applicable parts of EN62368-1:2014+A11:2017 | P |
| 1.5.3 | Thermal controls | No thermal controls device | N |
| 1.5.4 | Transformers | See annex C | P |
| 1.5.5 | Interconnecting cables | | P |
| 1.5.6 | Capacitors bridging insulation | | N |
| 1.5.7 | Resistors bridging insulation | | N |
| 1.5.7.1 | Resistors bridging functional, basic or supplementary insulation | | N |
| 1.5.7.2 | Resistors bridging double or reinforced insulation between a.c. mains and other circuits | | N |
| 1.5.7.3 | Resistors bridging double or reinforced insulation between a.c. mains and antenna or coaxial cable | | N |
| 1.5.8 | Components in equipment for IT power systems | | N |
| 1.5.9 | Surge suppressors | No such components | N |
| 1.5.9.1 | General | | N |
| 1.5.9.2 | Protection of VDRs | | N |
| 1.5.9.3 | Bridging of functional insulation by a VDR | | N |
| 1.5.9.4 | Bridging of basic insulation by a VDR | | N |
| 1.5.9.5 | Bridging of supplementary, double or reinforced insulation by a VDR | | N |



| EN62368-1:2014+A11:2017 | | | |
|-------------------------|--------------------|-----------------|---------|
| Clause | Requirement – Test | Result – Remark | Verdict |

| | | | |
|-------|--------------------------------------|------------------------------|---|
| 1.6 | Power interface | | P |
| 1.6.1 | AC power distribution systems | TN power distribution system | P |
| 1.6.2 | Input current | (see appended table 1.6.2) | P |
| 1.6.3 | Voltage limit of hand-held equipment | Not hand-held equipment | N |
| 1.6.4 | Neutral conductor | | N |

| | | | |
|---------|---|---|---|
| 1.7 | Marking and instructions | | P |
| 1.7.1 | Power rating | | P |
| | Rated voltage(s) or voltage range(s) (V) | AC 100-240V | N |
| | Symbol for nature of supply, for d.c. only..... | AC | N |
| | Rated frequency or rated frequency range (Hz) | / | P |
| | Rated current (mA or A) | 0.5A | P |
| | Manufacturer's name or trademark or identification mark | See marking label | P |
| | Model identification or type reference..... | ATS520I | P |
| | Symbol for Class II equipment only | Class III Symbol is applied to the label. | P |
| | Other markings and symbols | Other symbols do not give rise to misunderstanding. | P |
| 1.7.2 | Safety instructions and marking | | P |
| 1.7.2.1 | General | | P |
| 1.7.2.2 | Disconnect devices | The plug of direct plug-in equipment used as disconnect device. | P |
| 1.7.2.3 | Overcurrent protective device | | N |
| 1.7.2.4 | IT power distribution systems | | N |
| 1.7.2.5 | Operator access with a tool | | N |
| 1.7.2.6 | Ozone | | N |
| 1.7.3 | Short duty cycles | Continuous operation | N |
| 1.7.4 | Supply voltage adjustment | No voltage adjustment | N |
| | Methods and means of adjustment; reference to installation instructions..... | | N |
| 1.7.5 | Power outlets on the equipment | No standard power outlets | N |
| 1.7.6 | Fuse identification (marking, special fusing characteristics, cross-reference | No fuse in the primary but a resistor (FU1) as the function of the fuse | P |
| 1.7.7 | Wiring terminals | | N |
| 1.7.7.1 | Protective earthing and bonding terminals | Class II equipment. | N |



| EN62368-1:2014+A11:2017 | | | |
|-------------------------|--|--|---------|
| Clause | Requirement – Test | Result – Remark | Verdict |
| 1.7.7.2 | Terminals for a.c. mains supply conductors | | N |
| 1.7.7.3 | Terminals for d.c. mains supply conductors | | N |
| 1.7.8 | Controls and indicators | | P |
| 1.7.8.1 | Identification, location and marking | The markings and indication of controls and indicators are located that indication of function is clearly. | P |
| 1.7.8.2 | Colours | No safety related indicator used. | N |
| 1.7.8.3 | Symbols according to IEC 60417 | | N |
| 1.7.8.4 | Markings using figures | | N |
| 1.7.9 | Isolation of multiple power sources | No multiple power sources | N |
| 1.7.10 | Thermostats and other regulating devices ...: | | N |
| 1.7.11 | Durability | | P |
| 1.7.12 | Removable parts | | N |
| 1.7.13 | Replaceable batteries | No batteries | N |
| | Language..... | English | P |
| 1.7.14 | Equipment for restricted access locations..... | | N |

| | | | |
|---------|---|---|----|
| 2 | PROTECTION FROM HAZARDS | | -- |
| 2.1 | Protection from electric shock and energy hazards | | P |
| 2.1.1 | Protection in operator access areas | | P |
| 2.1.1.1 | Access to energized parts | | P |
| | Test by inspection | All accessible circuits are SELV circuits | P |
| | Test with test finger (Figure 2A) | | P |
| | Test with test pin (Figure 2B) | | P |
| | Test with test probe (Figure 2C) | No TUV | N |
| 2.1.1.2 | Battery compartments | No battery compartments | N |
| 2.1.1.3 | Access to ELV wiring | No ELV circuit | N |
| | Working voltage (V); minimum distance (mm) through insulation | | N |
| 2.1.1.4 | Access to hazardous voltage circuit wiring | | N |
| 2.1.1.5 | Energy hazards | No accessible energy hazards | P |
| 2.1.1.6 | Manual controls | | N |
| 2.1.1.7 | Discharge of capacitors in equipment | No X capacitor | N |
| | Time-constant (s); measured voltage (V) | | N |
| 2.1.1.8 | Energy hazards – d.c. mains supply | | N |



| EN62368-1:2014+A11:2017 | | | |
|-------------------------|--------------------|-----------------|---------|
| Clause | Requirement – Test | Result – Remark | Verdict |

| | | | |
|---------|--|---|---|
| | a) Capacitor connected to the d.c. mains supply | | N |
| | b) Internal battery connected to the d.c. mains supply | | N |
| 2.1.1.9 | Audio amplifiers | | N |
| 2.1.2 | Protection in service access areas | No bare parts operating at hazardous voltages in a service access area. | N |
| 2.1.3 | Protection in restricted access locations | The unit is not limited to be used in restricted access locations. | N |

| | | | |
|-------|--|------------------------------|---|
| 2.2 | SELV circuits | | P |
| 2.2.1 | General requirements | | P |
| 2.2.2 | Voltages under normal conditions (V)..... | <42.4Vp or 60V d.c. | P |
| 2.2.3 | Voltages under fault conditions (V)..... | <42.4Vp or 60V d.c. | P |
| 2.2.4 | Connection of SELV circuits to other circuits... | Connect to SELV circuit only | P |

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|---------|--|-----------------|---|
| 2.3 | TNV circuits | | N |
| 2.3.1 | Limits | No TNV circuits | N |
| | Type of TNV circuits..... | | N |
| 2.3.2 | Separation from other circuits and from accessible parts | | N |
| 2.3.2.1 | General requirements | | N |
| 2.3.2.2 | Protection by basic insulation | | N |
| 2.3.2.3 | Protection by earthing | | N |
| 2.3.2.4 | Protection by other constructions..... | | N |
| 2.3.3 | Separation from hazardous voltages | | N |
| | Insulation employed..... | | N |
| 2.3.4 | Connection of TNV circuits to other circuits | | N |
| | Insulation employed..... | | N |
| 2.3.5 | Test for operating voltages generated externally | | N |

| | | | |
|-------|--------------------------|--|----|
| 2.4 | Limited current circuits | | N |
| 2.4.1 | General requirements | | N |
| 2.4.2 | Limit values | | N |
| | Frequency (Hz)..... | | -- |



| EN62368-1:2014+A11:2017 | | | |
|-------------------------|--------------------|-----------------|---------|
| Clause | Requirement – Test | Result – Remark | Verdict |

| | | | |
|-------|--|--|----|
| | Measured current (mA)..... | | N |
| | Measured voltage (V)..... | | N |
| | Measured circuit capacitance (nF or μ F)..... | | -- |
| 2.4.3 | Connection of limited current circuits to other circuits | | N |

| | | | |
|-----|--|--|----|
| 2.5 | Limited power sources | | P |
| | a) Inherently limited output | | P |
| | b) Impedance limited output | | N |
| | c) Regulating network limited output under normal operating and single fault condition | | P |
| | d) Overcurrent protective device limited output | | N |
| | Max. output voltage (V), max. output current (A), max. apparent power (VA)..... | | P |
| | Current rating of overcurrent protective device (A) | | -- |

| | | | |
|---------|--|---------------------|---|
| 2.6 | Provisions for earthing and bonding | | N |
| 2.6.1 | Protective earthing | Class II equipment. | N |
| 2.6.2 | Functional earthing | | N |
| 2.6.3 | Protective earthing and protective bonding conductors | | N |
| 2.6.3.1 | General | | N |
| 2.6.3.2 | Size of protective earthing conductors | | N |
| | Rated current (A), cross-sectional area (mm^2), AWG..... | | — |
| 2.6.3.3 | Size of protective bonding conductors | | N |
| | Rated current (A), cross-sectional area (mm^2), AWG..... | | — |
| 2.6.3.4 | Resistance of earthing conductors and their terminations, resistance (Ω), voltage drop (V), test current (A), duration (min)..... | | N |
| 2.6.3.5 | Colour of insulation..... | | N |
| 2.6.4 | Terminals | | N |
| 2.6.4.1 | General | | N |
| 2.6.4.2 | Protective earthing and bonding terminals | | N |



| EN62368-1:2014+A11:2017 | | | |
|-------------------------|--------------------|-----------------|---------|
| Clause | Requirement – Test | Result – Remark | Verdict |

| | | | |
|---------|--|--|----|
| | Rated current (A), type, nominal thread diameter (mm)..... | | -- |
| 2.6.4.3 | Separation of the protective earthing conductor from protective bonding conductors | | N |
| 2.6.5 | Integrity of protective earthing | | N |
| 2.6.5.1 | Interconnection of equipment | | N |
| 2.6.5.2 | Components in protective earthing conductors and protective bonding conductors | | N |
| 2.6.5.3 | Disconnection of protective earth | | N |
| 2.6.5.4 | Parts that can be removed by an operator | | N |
| 2.6.5.5 | Parts removed during servicing | | N |
| 2.6.5.6 | Corrosion resistance | | N |
| 2.6.5.7 | Screws for protective bonding | | N |
| 2.6.5.8 | Reliance on telecommunication network or cable distribution system | | N |

| | | | |
|-------|--|---|---|
| 2.7 | Overcurrent and earth fault protection in primary circuits | | P |
| 2.7.1 | Basic requirements | | P |
| | Instructions when protection relies on building installation | | N |
| 2.7.2 | Faults not simulated in 5.3.7 | | N |
| 2.7.3 | Short-circuit backup protection | By building installation | P |
| 2.7.4 | Number and location of protective devices | One protective device "FU1" is located in Line. | P |
| 2.7.5 | Protection by several devices | Only one protective device is provided. | N |
| 2.7.6 | Warning to service personnel..... | Not intended for any service or repair. | N |

| | | | |
|-------|--------------------------|----------------------|---|
| 2.8 | Safety interlocks | | N |
| 2.8.1 | General principles | No safety interlocks | N |
| 2.8.2 | Protection requirements | | N |
| 2.8.3 | Inadvertent reactivation | | N |
| 2.8.4 | Fail-safe operation | | N |
| 2.8.5 | Moving parts | | N |
| 2.8.6 | Overriding | | N |



| EN62368-1:2014+A11:2017 | | | |
|-------------------------|--------------------|-----------------|---------|
| Clause | Requirement – Test | Result – Remark | Verdict |

| | | | |
|---------|-------------------------|--|---|
| 2.8.7 | Switches and relays | | N |
| 2.8.7.1 | Contact gaps (mm) | | N |
| 2.8.7.2 | Overload test | | N |
| 2.8.7.3 | Endurance test | | N |
| 2.8.7.4 | Electric strength test | | N |
| 2.8.8 | Mechanical actuators | | N |

| | | | |
|-------|---|---|---|
| 2.9 | Electrical insulation | | P |
| 2.9.1 | Properties of insulating materials | | P |
| 2.9.2 | Humidity conditioning | 48Hours | P |
| | Relative humidity (%), temperature (°C) | 93%, 30°C | P |
| 2.9.3 | Grade of insulation | The adequate levels of safety insulation is provided and maintained to comply with the requirements of this standard. | P |
| 2.9.4 | Separation from hazardous voltages | | P |
| | Method(s) used | Method 1 | P |

| | | | |
|----------|---|--|---|
| 2.10 | Clearances, creepage distances and distances through insulation | | P |
| 2.10.1 | General | | P |
| 2.10.1.1 | Frequency.....: | | P |
| 2.10.1.2 | Pollution degrees.....: | Pollution Degree 2 | P |
| 2.10.1.3 | Reduced values for functional insulation | | N |
| 2.10.1.4 | Intervening unconnected conductive parts | | N |
| 2.10.1.5 | Insulation with varying dimensions | | N |
| 2.10.1.6 | Special separation requirements | | N |
| 2.10.1.7 | Insulation in circuits generating starting pulses | | N |
| 2.10.2 | Determination of working voltage | (See appended table 2.10.3 and 2.10.4) | P |
| 2.10.2.1 | General | (See appended table 2.10.3 and 2.10.4) | P |
| 2.10.2.2 | RMS working voltage | | P |
| 2.10.2.3 | Peak working voltage | | P |
| 2.10.3 | Clearances | | P |
| 2.10.3.1 | General | | P |



| EN62368-1:2014+A11:2017 | | | |
|-------------------------|---|--|---------|
| Clause | Requirement – Test | Result – Remark | Verdict |
| 2.10.3.2 | Mains transient voltages | | P |
| | a) AC mains supply | | P |
| | b) Earthed d.c. mains supplies | | N |
| | c) Unearthed d.c. mains supplies | | N |
| | d) Battery operation | | N |
| 2.10.3.3 | Clearances in primary circuits | (see appended table 2.10.3 and 2.10.4) | P |
| 2.10.3.4 | Clearances in secondary circuits | | N |
| 2.10.3.5 | Clearances in circuits having starting pulses | | N |
| 2.10.3.6 | Transients from a.c. mains supply | 2500Vp | P |
| 2.10.3.7 | Transients from d.c. mains supply | | N |
| 2.10.3.8 | Transients from telecommunication networks and cable distribution systems | | N |
| 2.10.3.9 | Measurement of transient voltage levels | | N |
| | a) Transients from a mains supply | | N |
| | For an a.c. mains supply | | N |
| | For a d.c. mains supply | | N |
| | b) Transients from a telecommunication network | | N |
| 2.10.4 | Creepage distances | | P |
| 2.10.4.1 | General | | P |
| 2.10.4.2 | Material group and comparative tracking index | | P |
| | CTI tests | Material group IIIb are assumed to be used | P |
| 2.10.4.3 | Minimum creepage distances | (see appended table 2.10.3 and 2.10.4) | P |
| 2.10.5 | Solid insulation | | P |
| 2.10.5.1 | General | | P |
| 2.10.5.2 | Distances through insulation | | N |
| 2.10.5.3 | Insulating compound as solid insulation | | N |
| 2.10.5.4 | Semiconductor devices | | N |
| 2.10.5.5 | Cemented joints | | N |
| 2.10.5.6 | Thin sheet material - General | | P |
| 2.10.5.7 | Separable thin sheet material | Insulating tapes on the transformer. | P |
| | Number of layers (pcs)..... | Two layers | P |



| EN62368-1:2014+A11:2017 | | | |
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| Clause | Requirement – Test | Result – Remark | Verdict |
| 2.10.5.8 | Non-separable thin sheet material | | N |
| 2.10.5.9 | Thin sheet material – standard test procedure | | N |
| | Electric strength test | | N |
| 2.10.5.10 | Thin sheet material – alternative test procedure | | P |
| | Electric strength test | (see appended table 2.10.5) | P |
| 2.10.5.11 | Insulation in wound components | | P |
| 2.10.5.12 | Wire in wound components | Use with triple insulation wire. | P |
| | Working voltage | | P |
| | a) Basic insulation not under stress | | N |
| | b) Basic, supplementary, reinforced insulation | Reinforced insulation | P |
| | c) Compliance with Annex U | | N |
| | Two wires in contact inside wound components; angle between 45° and 90° | | N |
| 2.10.5.13 | Wire with solvent-based enamel in wound components | | N |
| | Electric strength test | | N |
| | Routine test | | N |
| 2.10.5.14 | Additional insulation in wound components | | N |
| | Working voltage | | N |
| | - Basic insulation not under stress | | N |
| | - Supplementary, reinforced insulation | | N |
| 2.10.6 | Construction of printed boards | | P |
| 2.10.6.1 | Uncoated printed boards | (see appended table 2.10.3 and 2.10.4) | P |
| 2.10.6.2 | Coated printed boards | | N |
| 2.10.6.3 | Insulation between conductors on the same inner surface of a printed board | | N |
| 2.10.6.4 | Insulation between conductors on different layers of a printed board | | N |
| | Distance through insulation | | N |
| | Number of insulation layers (pcs) | | N |
| 2.10.7 | Component external terminations | | N |
| 2.10.8 | Tests on coated printed boards and coated components | | N |



| EN62368-1:2014+A11:2017 | | | |
|-------------------------|--------------------|-----------------|---------|
| Clause | Requirement – Test | Result – Remark | Verdict |

| | | | |
|----------|---|--|---|
| 2.10.8.1 | Sample preparation and preliminary inspection | | N |
| 2.10.8.2 | Thermal conditioning | | N |
| 2.10.8.3 | Electric strength test | | N |
| 2.10.8.4 | Abrasion resistance test | | N |
| 2.10.9 | Thermal cycling | | N |
| 2.10.10 | Test for Pollution Degree 1 environment and insulating compound | | N |
| 2.10.11 | Tests for semiconductor devices and cemented joints | | N |
| 2.10.12 | Enclosed and sealed parts: | No enclosed or hermetically sealed components. | N |

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|--------|--|--|---|
| 3 | WIRING, CONNECTIONS AND SUPPLY | | P |
| 3.1 | General | | P |
| 3.1.1 | Current rating and overcurrent protection | | P |
| 3.1.2 | Protection against mechanical damage | | P |
| 3.1.3 | Securing of internal wiring | | P |
| 3.1.4 | Insulation of conductors | | P |
| 3.1.5 | Beads and ceramic insulators | | N |
| 3.1.6 | Screws for electrical contact pressure | | N |
| 3.1.7 | Insulating materials in electrical connections | | N |
| 3.1.8 | Self-tapping and spaced thread screws | | N |
| 3.1.9 | Termination of conductors | | P |
| | 10 N pull test | | P |
| 3.1.10 | Sleeving on wiring | | N |

| | | | |
|---------|---|--|---|
| 3.2 | Connection to a mains supply- | | P |
| 3.2.1 | Means of connection | Direct plug-in equipment. | P |
| 3.2.1.1 | Connection to an a.c. mains supply | | P |
| 3.2.1.2 | Connection to a d.c. mains supply | The equipment is not for connection to a d.c. mains supply. | N |
| 3.2.2 | Multiple supply connections | Only one supply connection. | N |
| 3.2.3 | Permanently connected equipment | The equipment is not intended for permanent connection to the mains. | N |
| | Number of conductors, diameter of cable and conduits (mm) | | N |



| EN62368-1:2014+A11:2017 | | | |
|-------------------------|--------------------|-----------------|---------|
| Clause | Requirement – Test | Result – Remark | Verdict |

| | | | |
|---------|---|--|---|
| 3.2.4 | Appliance inlets | | N |
| 3.2.5 | Power supply cords | | N |
| 3.2.5.1 | AC power supply cords | | N |
| | Type | | N |
| | Rated current (A), cross-sectional area (mm ²), AWG | | N |
| 3.2.5.2 | DC power supply cords | | N |
| 3.2.6 | Cord anchorages and strain relief | | N |
| | Mass of equipment (kg), pull (N) | | N |
| | Longitudinal displacement (mm) | | N |
| 3.2.7 | Protection against mechanical damage | | N |
| 3.2.8 | Cord guards | | N |
| | Diameter or minor dimension D (mm); test mass (g) | | N |
| | Radius of curvature of cord (mm) | | N |
| 3.2.9 | Supply wiring space | | N |

| | | | |
|-------|---|--|---|
| 3.3 | Wiring terminals for connection of external conductors | | N |
| 3.3.1 | Wiring terminals | | N |
| 3.3.2 | Connection of non-detachable power supply cords | | N |
| 3.3.3 | Screw terminals | | N |
| 3.3.4 | Conductor sizes to be connected | | N |
| | Rated current (A), cord/cable type, cross-sectional area (mm ²) | | N |
| 3.3.5 | Wiring terminal sizes | | N |
| | Rated current (A), type, nominal thread diameter (mm) | | N |
| 3.3.6 | Wiring terminals design | | N |
| 3.3.7 | Grouping of wiring terminals | | N |
| 3.3.8 | Stranded wire | | N |

| | | | |
|-------|-------------------------------------|---|---|
| 3.4 | Disconnection from the mains supply | | P |
| 3.4.1 | General requirement | | P |
| 3.4.2 | Disconnect devices | The plug of direct plug-in equipment used as disconnect device. | P |



| EN62368-1:2014+A11:2017 | | | |
|-------------------------|--------------------|-----------------|---------|
| Clause | Requirement – Test | Result – Remark | Verdict |

| | | | |
|--------|---|---|---|
| 3.4.3 | Permanently connected equipment | Not permanently connected equipment. | N |
| 3.4.4 | Parts which remain energized | | N |
| 3.4.5 | Switches in flexible cords | | N |
| 3.4.6 | Number of poles – single-phase and d.c. equipment | The disconnect device disconnects both poles simultaneously. | P |
| 3.4.7 | Number of poles – three-phase equipment | Single-phase equipment | N |
| 3.4.8 | Switches as disconnect devices | | N |
| 3.4.9 | Plugs as disconnect devices | Direct plug-in equipment. There is no power supply cord used. | N |
| 3.4.10 | Interconnected equipment | No interconnection of hazardous voltages or energy levels. | N |
| 3.4.11 | Multiple power sources | One power source only. | N |

| | | | |
|-------|--|-------------------|---|
| 3.5 | Interconnection of equipment | | P |
| 3.5.1 | General requirements | | P |
| 3.5.2 | Types of interconnection circuits..... | SELV circuit only | P |
| 3.5.3 | ELV circuits as interconnection circuits | No ELV circuit | N |
| 3.5.4 | Data ports for additional equipment | | N |

| | | | |
|-----|-----------------------|--|---|
| 4 | PHYSICAL REQUIREMENTS | | P |
| 4.1 | Stability | | N |
| | Angle of 10° | | N |
| | Test force (N) | | N |

| | | | |
|-------|------------------------------|--|---|
| 4.2 | Mechanical strength | | P |
| 4.2.1 | General | | P |
| 4.2.2 | Steady force test, 10 N | 10N applied to components. | P |
| 4.2.3 | Steady force test, 30 N | No internal enclosure. | N |
| 4.2.4 | Steady force test, 250 N | 250N applied to outer enclosure. No energy or other hazards. | P |
| 4.2.5 | Impact test | | N |
| | Fall test | | N |
| | Swing test | | N |
| 4.2.6 | Drop test; height (mm) | No damage after 1m drop. | P |
| 4.2.7 | Stress relief test | 70 °C/7h | P |



| EN62368-1:2014+A11:2017 | | | |
|-------------------------|--|--------------------|---------|
| Clause | Requirement – Test | Result – Remark | Verdict |
| 4.2.8 | Cathode ray tubes | | N |
| | Picture tube separately certified | | N |
| 4.2.9 | High pressure lamps | No such component. | N |
| 4.2.10 | Wall or ceiling mounted equipment; force (N) | | N |
| 4.3 | Design and construction | | P |
| 4.3.1 | Edges and corners | Smooth | P |
| 4.3.2 | Handles and manual controls; force (N) | | N |
| 4.3.3 | Adjustable controls | | N |
| 4.3.4 | Securing of parts | | P |
| 4.3.5 | Connection by plugs and sockets | | N |
| 4.3.6 | Direct plug-in equipment | | P |
| | Torque | 0.04Nm. | P |
| | Compliance with the relevant mains plug standard | | P |
| 4.3.7 | Heating elements in earthed equipment | | N |
| 4.3.8 | Batteries | | N |
| | - Overcharging of a rechargeable battery | | N |
| | - Unintentional charging of a non-rechargeable battery | | N |
| | - Reverse charging of a rechargeable battery | | N |
| | - Excessive discharging rate for any battery | | N |
| 4.3.9 | Oil and grease | | N |
| 4.3.10 | Dust, powders, liquids and gases | | N |
| 4.3.11 | Containers for liquids or gases | | N |
| 4.3.12 | Flammable liquids | | N |
| | Quantity of liquid (l) | | N |
| | Flash point (°C) | | -- |
| 4.3.13 | Radiation | | N |
| 4.3.13.1 | General | | N |
| 4.3.13.2 | Ionizing radiation | | N |
| | Measured radiation (pA/kg) | | -- |
| | Measured high-voltage (kV) | | -- |
| | Measured focus voltage (kV) | | -- |
| | CRT markings | | -- |



| EN62368-1:2014+A11:2017 | | | |
|-------------------------|--------------------|-----------------|---------|
| Clause | Requirement – Test | Result – Remark | Verdict |

| | | | |
|----------|---|--|----|
| 4.3.13.3 | Effect of ultraviolet (UV) radiation on materials | | N |
| | Part, property, retention after test, flammability classification | | N |
| 4.3.13.4 | Human exposure to ultraviolet (UV) radiation | | -- |
| 4.3.13.5 | Laser (including LEDs) | LED used | P |
| | Laser class | Class 1 | -- |
| 4.3.13.6 | Other types | The equipment does not generate other type of radiation. | N |

| | | | |
|-------|---|---------------------------|---|
| 4.4 | Protection against hazardous moving parts | | N |
| 4.4.1 | General | No hazardous moving parts | N |
| 4.4.2 | Protection in operator access areas | | N |
| 4.4.3 | Protection in restricted access locations | | N |
| 4.4.4 | Protection in service access areas | | N |

| | | | |
|-------|---|----------------------------|---|
| 4.5 | Thermal requirements | | P |
| 4.5.1 | General | | P |
| 4.5.2 | Temperature tests | (see appended table 4.5) | P |
| | Normal load condition per Annex L | | P |
| 4.5.3 | Temperature limits for materials | (see appended table 4.5) | P |
| 4.5.4 | Touch temperature limits | (see appended table 4.5) | P |
| 4.5.5 | Resistance to abnormal heat | (see appended table 4.5.5) | P |

| | | | |
|---------|---|--|---|
| 4.6 | Openings in enclosures | | N |
| 4.6.1 | Top and side openings | | N |
| | Dimensions (mm) | | N |
| 4.6.2 | Bottoms of fire enclosures | | N |
| | Construction of the bottom, dimensions (mm) | | N |
| 4.6.3 | Doors or covers in fire enclosures | | N |
| 4.6.4 | Openings in transportable equipment | | N |
| 4.6.4.1 | Constructional design measures | | N |
| | Dimensions (mm) | | N |
| 4.6.4.2 | Evaluation measures for larger openings | | N |



| EN62368-1:2014+A11:2017 | | | |
|-------------------------|--------------------|-----------------|---------|
| Clause | Requirement – Test | Result – Remark | Verdict |

| | | | |
|---------|---|--|---|
| 4.6.4.3 | Use of metallized parts | | N |
| 4.6.5 | Adhesives for constructional purposes | | N |
| | Conditioning temperature (°C), time (weeks) | | N |

| | | | |
|---------|--|---|---|
| 4.7 | Resistance to fire | | P |
| 4.7.1 | Reducing the risk of ignition and spread of flame | | P |
| | Method 1, selection and application of components wiring and materials | Materials with suitable flammability classification are used. | P |
| | Method 2, application of all of simulated fault condition tests | | N |
| 4.7.2 | Conditions for a fire enclosure | | P |
| 4.7.2.1 | Parts requiring a fire enclosure | The fire enclosure is required to cover all parts. | P |
| 4.7.2.2 | Parts not requiring a fire enclosure | | N |
| 4.7.3 | Materials | | P |
| 4.7.3.1 | General | | P |
| 4.7.3.2 | Materials for fire enclosures | | P |
| 4.7.3.3 | Materials for components and other parts outside fire enclosures | | N |
| 4.7.3.4 | Materials for components and other parts inside fire enclosures | | P |
| 4.7.3.5 | Materials for air filter assemblies | No air filters provided. | N |
| 4.7.3.6 | Materials used in high-voltage components | | N |

| | | | |
|---------|---|---------------------------------------|---|
| 5 | ELECTRICAL REQUIREMENTS AND SIMULATED ABNORMAL CONDITIONS | | P |
| 5.1 | Touch current and protective conductor current | | P |
| 5.1.1 | General | | P |
| 5.1.2 | Configuration of equipment under test (EUT) | | P |
| 5.1.2.1 | Single connection to an a.c. mains supply | | P |
| 5.1.2.2 | Redundant multiple connections to an a.c. mains supply | | N |
| 5.1.2.3 | Simultaneous multiple connections to an a.c. mains supply | | N |
| 5.1.3 | Test circuit | Test circuit as in Figure 5A is used. | P |
| 5.1.4 | Application of measuring instrument | Measuring instrument as in Annex D | P |



| EN62368-1:2014+A11:2017 | | | |
|-------------------------|--------------------|-----------------|---------|
| Clause | Requirement – Test | Result – Remark | Verdict |

| | | | |
|---------|---|---------|----|
| 5.1.5 | Test procedure | | P |
| 5.1.6 | Test measurements | | P |
| | Supply voltage (V) | 265V | -- |
| | Measured touch current (mA) | 0.05mA | -- |
| | Max. allowed touch current (mA) | 0.25 mA | -- |
| | Measured protective conductor current (mA) | | -- |
| | Max. allowed protective conductor current (mA) | | -- |
| 5.1.7 | Equipment with touch current exceeding 3.5 mA | | N |
| 5.1.7.1 | General | | N |
| 5.1.7.2 | Simultaneous multiple connections to the supply | | N |
| 5.1.8 | Touch currents to telecommunication networks and cable distribution systems and from telecommunication networks | | N |
| 5.1.8.1 | Limitation of the touch current to a telecommunication network or to a cable distribution system | | N |
| | Supply voltage (V) | | -- |
| | Measured touch current (mA) | | -- |
| | Max. allowed touch current (mA) | | -- |
| 5.1.8.2 | Summation of touch currents from telecommunication networks | | N |
| | a) EUT with earthed telecommunication ports | | N |
| | b) EUT whose telecommunication ports have no reference to protective earth | | N |

| | | | |
|-------|-------------------|--------------------------|---|
| 5.2 | Electric strength | | P |
| 5.2.1 | General | | P |
| 5.2.2 | Test procedure | (see appended table 5.2) | P |

| | | | |
|-------|--|--------------------------|---|
| 5.3 | Abnormal operating and fault conditions | | P |
| 5.3.1 | Protection against overload and abnormal operation | (see appended table 5.3) | P |
| 5.3.2 | Motors | No motors | N |



| EN62368-1:2014+A11:2017 | | | |
|-------------------------|--------------------|-----------------|---------|
| Clause | Requirement – Test | Result – Remark | Verdict |

| | | | |
|---------|---|---|---|
| 5.3.3 | Transformers | Transformer constructed in accordance with the applicable Clause and Annex C. | P |
| 5.3.4 | Functional insulation | Complies with a) and c). | P |
| 5.3.5 | Electromechanical components | No electromechanical component provided. | N |
| 5.3.6 | Audio amplifiers in ITE | | N |
| 5.3.7 | Simulation of faults | Results see appended table 5.3. | P |
| 5.3.8 | Unattended equipment | The equipment does not have any thermostats, temperature limiters, or thermal cut-outs. | N |
| 5.3.9 | Compliance criteria for abnormal operating and fault conditions | No flames emitted, no molten material emitted and no hazards. | P |
| 5.3.9.1 | During the tests | | P |
| 5.3.9.2 | After the tests | | P |

| | | | |
|---------|---|--|---|
| 6 | CONNECTION TO TELECOMMUNICATION NETWORKS | | N |
| 6.1 | Protection of telecommunication network service persons, and users of other equipment connected to the network, from hazards in the equipment | | N |
| 6.1.1 | Protection from hazardous voltages | | N |
| 6.1.2 | Separation of the telecommunication network from earth | | N |
| 6.1.2.1 | Requirements | | N |
| | Supply voltage (V) | | N |
| | Current in the test circuit (mA) | | N |
| 6.1.2.2 | Exclusions | | N |

| | | | |
|---------|--|--|---|
| 6.2 | Protection of equipment users from over voltages on telecommunication networks | | N |
| 6.2.1 | Separation requirements | | N |
| 6.2.2 | Electric strength test procedure | | N |
| 6.2.2.1 | Impulse test | | N |
| 6.2.2.2 | Steady-state test | | N |
| 6.2.2.3 | Compliance criteria | | N |

| | | | |
|-----|--|--|---|
| 6.3 | Protection of the telecommunication wiring system from overheating | | N |
| | Max. output current (A) | | N |
| | Current limiting method | | N |



| EN62368-1:2014+A11:2017 | | | |
|-------------------------|--------------------|-----------------|---------|
| Clause | Requirement – Test | Result – Remark | Verdict |

| | | | |
|-------|---|--|---|
| 7 | CONNECTION TO CABLE DISTRIBUTION SYSTEMS | | N |
| 7.1 | General | | N |
| 7.2 | Protection of cable distribution system service persons, and users of other equipment connected to the system, from hazardous voltages in the equipment | | N |
| 7.3 | Protection of equipment users from overvoltages on the cable distribution system | | N |
| 7.4 | Insulation between primary circuits and cable distribution systems | | N |
| 7.4.1 | General | | N |
| 7.4.2 | Voltage surge test | | N |
| 7.4.3 | Impulse test | | N |

| | | | |
|-------|--|--|---|
| A | ANNEX A, TESTS FOR RESISTANCE TO HEAT AND FIRE | | N |
| A.1 | Flammability test for fire enclosures of movable equipment having a total mass exceeding 18 kg, and of stationary equipment (see 4.7.3.2) | | N |
| A.1.1 | Samples | | N |
| | Wall thickness (mm) | | N |
| A.1.2 | Conditioning of samples; temperature (°C) .. | | N |
| A.1.3 | Mounting of samples | | N |
| A.1.4 | Test flame (see IEC 60695-11-3) | | N |
| | Flame A, B, C or D | | N |
| A.1.5 | Test procedure | | N |
| A.1.6 | Compliance criteria | | N |
| | Sample 1 burning time (s) | | N |
| | Sample 2 burning time (s) | | N |
| | Sample 3 burning time (s) | | N |
| A.2 | Flammability test for fire enclosures of movable equipment having a total mass not exceeding 18 kg, and for material and components located inside fire enclosures (see 4.7.3.2 and 4.7.3.4) | | N |
| A.2.1 | Samples, material | | N |
| | Wall thickness (mm) | | N |
| A.2.2 | Conditioning of samples; temperature (°C) .. | | N |
| A.2.3 | Mounting of samples | | N |
| A.2.4 | Test flame (see IEC 60695-11-4) | | N |
| | Flame A, B or C | | N |



| EN62368-1:2014+A11:2017 | | | |
|-------------------------|--|-----------------|---------|
| Clause | Requirement – Test | Result – Remark | Verdict |
| A.2.5 | Test procedure | | N |
| A.2.6 | Compliance criteria | | N |
| | Sample 1 burning time (s) | | N |
| | Sample 2 burning time (s) | | N |
| | Sample 3 burning time (s) | | N |
| A.2.7 | Alternative test acc. to IEC 60695-11-5, cl. 5 and 9 | | N |
| | Sample 1 burning time (s) | | N |
| | Sample 2 burning time (s) | | N |
| | Sample 3 burning time (s) | | N |
| A.3 | Hot flaming oil test (see 4.6.2) | | N |
| A.3.1 | Mounting of samples | | N |
| A.3.2 | Test procedure | | N |
| A.3.3 | Compliance criterion | | N |

| | | | |
|-------|--|--|---|
| B | ANNEX B, MOTOR TESTS UNDER ABNORMAL CONDITIONS (see 4.7.2.2 and 5.3.2) | | N |
| B.1 | General requirements | | N |
| | Position | | N |
| | Manufacturer | | N |
| | Type | | N |
| | Rated values | | N |
| B.2 | Test conditions | | N |
| B.3 | Maximum temperatures | | N |
| B.4 | Running overload test | | N |
| B.5 | Locked-rotor overload test | | N |
| | Test duration (days) | | N |
| | Electric strength test: test voltage (V) | | N |
| B.6 | Running overload test for d.c. motors in secondary circuits | | N |
| B.6.1 | General | | N |
| B.6.2 | Test procedure | | N |
| B.6.3 | Alternative test procedure | | N |
| B.6.4 | Electric strength test; test voltage (V) | | N |
| B.7 | Locked-rotor overload test for d.c. motors in secondary circuits | | N |



| EN62368-1:2014+A11:2017 | | | |
|-------------------------|--|--|---------|
| Clause | Requirement – Test | Result – Remark | Verdict |
| B.7.1 | General | | N |
| B.7.2 | Test procedure | | N |
| B.7.3 | Alternative test procedure | | N |
| B.7.4 | Electric strength test; test voltage (V) | | N |
| B.8 | Test for motors with capacitors | | N |
| B.9 | Test for three-phase motors | | N |
| B.10 | Test for series motors | | N |
| | Operating voltage (V) | | N |
| C | ANNEX C, TRANSFORMERS (see 1.5.4 and 5.3.3) | | P |
| | Position | TR1 | -- |
| | Manufacturer | See transformer specification for details. | -- |
| | Type | See transformer specification for details. | -- |
| | Rated values | See transformer specification for details. | -- |
| | Method of protection | Inherently | -- |
| C.1 | Overload test | (see appended table 5.3) | P |
| C.2 | Insulation | | P |
| | Protection from displacement of windings | Bobbin and tapes | P |
| D | ANNEX D, MEASURING INSTRUMENTS FOR TOUCH-CURRENT TESTS (see 5.1.4) | | P |
| D.1 | Measuring instrument | | P |
| D.2 | Alternative measuring instrument | | N |
| E | ANNEX E, TEMPERATURE RISE OF A WINDING (see 1.4.13) | | N |
| F | ANNEX F, MEASUREMENT OF CLEARANCES AND CREEPAGE DISTANCES (see 2.10 and Annex G) | | P |
| G | ANNEX G, ALTERNATIVE METHOD FOR DETERMINING MINIMUM CLEARANCES | | N |
| G.1 | Clearances | | N |
| G.1.1 | General | | N |



| EN62368-1:2014+A11:2017 | | | |
|-------------------------|--------------------|-----------------|---------|
| Clause | Requirement – Test | Result – Remark | Verdict |

| | | | |
|-------|--|--|---|
| G.1.2 | Summary of the procedure for determining minimum clearances | | N |
| G.2 | Determination of mains transient voltage (V) | | N |
| G.2.1 | AC mains supply | | N |
| G.2.2 | Earthed d.c. mains supplies | | N |
| G.2.3 | Unearthed d.c. mains supplies | | N |
| G.2.4 | Battery operation | | N |
| G.3 | Determination of telecommunication network transient voltage (V) | | N |
| G.4 | Determination of required withstand voltage (V) | | N |
| G.4.1 | Mains transients and internal repetitive peaks | | N |
| G.4.2 | Transients from telecommunication networks | | N |
| G.4.3 | Combination of transients | | N |
| G.4.4 | Transients from cable distribution systems | | N |
| G.5 | Measurement of transient voltages (V) | | N |
| | a) Transients from a mains supply | | N |
| | For an a.c. mains supply | | N |
| | For a d.c. mains supply | | N |
| | b) Transients from a telecommunication network | | N |
| G.6 | Determination of minimum clearances | | N |

| | | | |
|---|--|--|---|
| H | ANNEX H, IONIZING RADIATION (see 4.3.13) | | N |
|---|--|--|---|

| | | | |
|---|--|--|---|
| J | ANNEX J, TABLE OF ELECTROCHEMICAL POTENTIALS (see 2.6.5.6) | | N |
| | Metal(s) used | | N |

| | | | |
|-----|--|--|---|
| K | ANNEX K, THERMAL CONTROLS (see 1.5.3 and 5.3.8) | | N |
| K.1 | Making and breaking capacity | | N |
| K.2 | Thermostat reliability; operating voltage (V) | | N |
| K.3 | Thermostat endurance test; operating voltage (V) | | N |



| EN62368-1:2014+A11:2017 | | | |
|-------------------------|--------------------|-----------------|---------|
| Clause | Requirement – Test | Result – Remark | Verdict |

| | | | |
|-----|--|--|---|
| K.4 | Temperature limiter endurance; operating voltage (V) | | N |
| K.5 | Thermal cut-out reliability | | N |
| K.6 | Stability of operation | | N |

| | | | |
|-----|---|--|---|
| L | ANNEX L, NORMAL LOAD CONDITIONS FOR SOME TYPES OF ELECTRICAL BUSINESS EQUIPMENT (see 1.2.2.1 and 4.5.1) | | P |
| L.1 | Typewriters | | N |
| L.2 | Adding machines and cash registers | | N |
| L.3 | Erasers | | N |
| L.4 | Pencil sharpeners | | N |
| L.5 | Duplicators and copy machines | | N |
| L.6 | Motor-operated files | | N |
| L.7 | Other business equipment | | P |

| | | | |
|---------|---|--|---|
| M | ANNEX M, CRITERIA FOR TELEPHONE RINGING SIGNALS (see 2.3.1) | | N |
| M.1 | Introduction | | N |
| M.2 | Method A | | N |
| M.3 | Method B | | N |
| M.3.1 | Ringling signal | | N |
| M.3.1.1 | Frequency (Hz) | | N |
| M.3.1.2 | Voltage (V) | | N |
| M.3.1.3 | Cadence; time (s), voltage (V) | | N |
| M.3.1.4 | Single fault current (mA) | | N |
| M.3.2 | Tripping device and monitoring voltage | | N |
| M.3.2.1 | Conditions for use of a tripping device or a monitoring voltage | | N |
| M.3.2.2 | Tripping device | | N |
| M.3.2.3 | Monitoring voltage (V) | | N |

| | | | |
|-----|---|--|---|
| N | ANNEX N, IMPULSE TEST GENERATORS (see 1.5.7.2, 1.5.7.3, 2.10.3.9, 6.2.2.1, 7.3.2, 7.4.3 and Clause G.5) | | N |
| N.1 | ITU-T impulse test generators | | N |
| N.2 | IEC 60065 impulse test generator | | N |

| | | | |
|---|---|--|---|
| Q | ANNEX Q, Voltage dependent resistors (VDRs) (see 1.5.9.1) | | N |
|---|---|--|---|



| EN62368-1:2014+A11:2017 | | | |
|-------------------------|--|--------------------------|---------|
| Clause | Requirement – Test | Result – Remark | Verdict |
| | a) Preferred climatic categories | | N |
| | b) Maximum continuous voltage | | N |
| | c) Pulse current | | N |
| R | ANNEX R, EXAMPLES OF REQUIREMENTS FOR QUALITY CONTROL PROGRAMMES | | N |
| R.1 | Minimum separation distances for unpopulated coated printed boards (see 2.10.6.2) | | N |
| R.2 | Reduced clearances (see 2.10.3) | | N |
| S | ANNEX S, PROCEDURE FOR IMPULSE TESTING (see 6.2.2.3) | | N |
| S.1 | Test equipment | | N |
| S.2 | Test procedure | | N |
| S.3 | Examples of waveforms during impulse testing | | N |
| T | ANNEX T, GUIDANCE ON PROTECTION AGAINST INGRESS OF WATER (see 1.1.2) | | N |
| | | See separate test report | N |
| U | ANNEX U, INSULATED WINDING WIRES FOR USE WITHOUT INTERLEAVED INSULATION (see 2.10.5.4) | | P |
| | | See separate test report | P |
| V | ANNEX V, AC POWER DISTRIBUTION SYSTEMS (see 1.6.1) | | P |
| V.1 | Introduction | | P |
| V.2 | TN power distribution systems | | P |
| W | ANNEX W, SUMMATION OF TOUCH CURRENTS | | N |
| W.1 | Touch current from electronic circuits | | N |
| W.1.1 | Floating circuits | | N |
| W.1.2 | Earthed circuits | | N |
| W.2 | Interconnection of several equipments | | N |
| W.2.1 | Isolation | | N |



| EN62368-1:2014+A11:2017 | | | |
|-------------------------|--------------------|-----------------|---------|
| Clause | Requirement – Test | Result – Remark | Verdict |

| | | | |
|-------|--|--|---|
| W.2.2 | Common return, isolated from earth | | N |
| W.2.3 | Common return, connected to protective earth | | N |

| | | | |
|-----|---|--|---|
| X | ANNEX X, MAXIMUM HEATING EFFECT IN TRANSFORMER TESTS (see clause C.1) | | P |
| X.1 | Determination of maximum input current | | N |
| X.2 | Overload test procedure | | P |

| | | | |
|-----|---|--|---|
| Y | ANNEX Y, ULTRAVIOLET LIGHT CONDITIONING TEST (see 4.3.13.3) | | N |
| Y.1 | Test apparatus | | N |
| Y.2 | Mounting of test samples | | N |
| Y.3 | Carbon-arc light-exposure apparatus | | N |
| Y.4 | Xenon-arc light exposure apparatus | | N |

| | | | |
|----|---|--|---|
| Z | ANNEX Z, OVERVOLTAGE CATEGORIES (see 2.10.3.2 and Clause G.2) | | P |
| AA | ANNEX AA, MANDREL TEST (see 2.10.5.8) | | N |

| | | | |
|----|---|--|---|
| BB | ANNEX BB, CHANGES IN THE SECOND EDITION | | P |
|----|---|--|---|

| EN62368-1:2014+A11:2017 – CENELEC COMMON MODIFICATIONS | | | |
|--|---|--|---|
| Contents | Add the following annexes: Annex ZA (normative) Normative references to international publications with their corresponding European publications Annex ZB (normative) Special national conditions Annex ZC (informative) A-deviations | | P |
| General | Delete all the “country” notes in the reference document according to the following list: 1.4.8 Note 2 1.5.1 Note 2 & 3 1.5.7.1 Note 1.5.8 Note 2 1.5.9.4 Note 1.7.2.1 Note 4, 5 & 6 2.2.3 Note 2.2.4 Note 2.3.2 Note 2.3.2.1 Note 2 2.3.4 Note 2 2.6.3.3 Note 2 & 3 2.7.1 Note 2.10.3.2 Note 2 2.10.5.13 Note 3 3.2.1.1 Note 3.2.4 Note 3. 2.5.1 Note 2 4.3.6 Note 1 & 2 4.7 Note 4 4.7.2.2 Note 4.7.3.1 Note 2 5.1.7.1 Note 3 & 4 5.3.7 Note 1 6 Note 2 & 5 6.1.2.1 Note 2 6.1.2.2 Note 6.2.2 Note 6. 2.2.1 Note 2 6.2.2.2 Note 7.1 Note 3 7.2 Note 7.3 Note 1 & 2 G.2.1 Note 2 Annex H Note 2 | | P |



| EN62368-1:2014+A11:2017 | | | |
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| Clause | Requirement – Test | Result – Remark | Verdict |
| 1.3.Z1 | <p>Add the following subclause:</p> <p>1.3.Z1 Exposure to excessive sound pressure</p> <p>The apparatus shall be so designed and constructed as to present no danger when used for its intended purpose, either in normal operating conditions or under fault conditions, particularly providing protection against exposure to excessive sound pressures from headphones or earphones.</p> <p>NOTE Z1 A new method of measurement is described in EN 50332-1, Sound system equipment:</p> <p>Headphones and earphones associated with portable audio equipment - Maximum sound pressure level measurement methodology and limit considerations - Part 1: General method for “one package equipment”, and in EN 50332-2, Sound system equipment: Headphones and earphones associated with portable audio equipment - Maximum sound pressure level measurement methodology and limit considerations - Part 2: Guidelines to associate sets with headphones coming from different manufacturers.</p> | | N |
| 1.5.1 | <p>Add the following NOTE:</p> <p>NOTE Z1 The use of certain substances in electrical and electronic equipment is restricted within the EU: see Directive 2002/95/EC</p> | | P |
| 1.7.2.1 | <p>Add the following NOTE:</p> <p>NOTE Z1 In addition, the instructions shall include, as far as applicable, a warning that excessive sound pressure from earphones and headphones can cause hearing loss</p> | | N |
| 2.7.1 | <p>Replace the subclause as follows:</p> <p>Basic requirements</p> <p>To protect against excessive current, short-circuits and earth faults in PRIMARY CIRCUITS, protective devices shall be included either as integral parts of the equipment or as parts of the building installation, subject to the following, a), b) and c):</p> <p>a) except as detailed in b) and c), protective devices necessary to comply with the requirements of 5.3 shall be included as parts of the equipment;</p> <p>b) for components in series with the mains input to the equipment such as the supply cord, appliance coupler, r.f.i. filter and switch, short-circuit and earth fault protection may be provided by protective devices in the building installation;</p> <p>c) it is permitted for PLUGGABLE EQUIPMENT TYPE B or PERMANENTLY CONNECTED EQUIPMENT, to rely on dedicated overcurrent and short-circuit protection in the building installation, provided that the means of protection, e.g. fuses or circuit breakers, is fully specified in the installation instructions.</p> <p>If reliance is placed on protection in the building installation, the installation instructions shall so state, except that for PLUGGABLE EQUIPMENT TYPE A the building installation shall be regarded as providing protection in accordance with the rating of the wall socket outlet.</p> | | P |
| 2.7.2 | This subclause has been declared ‘void’. | | N |
| 3.2.3 | Delete the NOTE in Table 3A, and delete also in this table the conduit sizes in parentheses. | | N |



| EN62368-1:2014+A11:2017 | | | | | | | | | | | | | | | |
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| Clause | Requirement – Test | Result – Remark | Verdict | | | | | | | | | | | | |
| 3.2.5.1 | <p>Replace “60245 IEC 53” by “H05 RR-F”; “60227 IEC 52” by “H03 VV-F or H03 VVH2-F”; “60227 IEC 53” by “H05 VV-F or H05 VVH2-F2”.</p> <p>In Table 3B, replace the first four lines by the following:</p> <table border="1"> <tr> <td>Up to and including 6</td> <td></td> <td>0,75 ^{a)}</td> <td></td> </tr> <tr> <td>Over 6 up to and including 10</td> <td>(0,75) ^{b)}</td> <td>1,0</td> <td></td> </tr> <tr> <td>Over 10 up to and including 16</td> <td>(1,0) ^{c)}</td> <td>1,5</td> <td></td> </tr> </table> <p>In the conditions applicable to Table 3B delete the words “in some countries” in condition ^{a)}.</p> <p>In NOTE 1, applicable to Table 3B, delete the second sentence.</p> | Up to and including 6 | | 0,75 ^{a)} | | Over 6 up to and including 10 | (0,75) ^{b)} | 1,0 | | Over 10 up to and including 16 | (1,0) ^{c)} | 1,5 | | | N |
| Up to and including 6 | | 0,75 ^{a)} | | | | | | | | | | | | | |
| Over 6 up to and including 10 | (0,75) ^{b)} | 1,0 | | | | | | | | | | | | | |
| Over 10 up to and including 16 | (1,0) ^{c)} | 1,5 | | | | | | | | | | | | | |
| 3.3.4 | <p>In Table 3D, delete the fourth line: conductor sizes for 10 to 13 A, and replace with the following:</p> <table border="1"> <tr> <td>Over 10 up to and including 16</td> <td>1,5 to 2,5</td> <td>1,5 to 4</td> </tr> </table> <p>Delete the fifth line: conductor sizes for 13 to 16 A.</p> | Over 10 up to and including 16 | 1,5 to 2,5 | 1,5 to 4 | | N | | | | | | | | | |
| Over 10 up to and including 16 | 1,5 to 2,5 | 1,5 to 4 | | | | | | | | | | | | | |
| 4.3.13.6 | <p>Add the following NOTE:</p> <p>NOTE Z1 Attention is drawn to 1999/519/EC: Council Recommendation on the limitation of exposure of the general public to electromagnetic fields 0 Hz to 300 GHz. Standards taking into account this Recommendation which demonstrate compliance with the applicable EU Directive are indicated in the OJEC.</p> | | N | | | | | | | | | | | | |
| Annex H | <p>Replace the last paragraph of this annex by:</p> <p>At any point 10 cm from the surface of the OPERATOR ACCESS AREA, the dose rate shall not exceed 1 μSv/h (0,1 mR/h) (see NOTE). Account is taken of the background level.</p> <p>Replace the notes as follows:</p> <p>NOTE These values appear in Directive 96/29/Euratom.</p> <p>Delete NOTE 2.</p> | | N | | | | | | | | | | | | |
| Biblio-graphy | Additional EN standards. | | — | | | | | | | | | | | | |

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| ZA | NORMATIVE REFERENCES TO INTERNATIONAL PUBLICATIONS WITH THEIR CORRESPONDING EUROPEAN PUBLICATIONS | — |
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| ZB | SPECIAL NATIONAL CONDITIONS | N |
| 1.2.4.1 | In Denmark , certain types of Class I appliances (see 3.2.1.1) may be provided with a plug not establishing earthing conditions when inserted into Danish socket-outlets. | N |
| 1.5.7.1 | In Finland, Norway and Sweden , resistors bridging BASIC INSULATION in CLASS I PLUGGABLE EQUIPMENT TYPE A must comply with the requirements in 1.5.7.2. | N |
| 1.5.8 | In Norway , due to the IT power system used (see annex V, Figure V.7), capacitors are required to be rated for the applicable line-to-line voltage (230 V). | N |
| 1.5.9.4 | In Finland, Norway and Sweden , the third dashed sentence is applicable only to equipment as defined in 6.1.2.2 of this annex. | N |



| EN62368-1:2014+A11:2017 | | | |
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| Clause | Requirement – Test | Result – Remark | Verdict |
| 1.7.2.1 | In Finland, Norway and Sweden , CLASS I PLUGGABLE EQUIPMENT TYPE A intended for connection to other equipment or a network shall, if safety relies on connection to protective earth or if surge suppressors are connected between the network terminals and accessible parts, have a marking stating that the equipment must be connected to an earthed mains socket-outlet. The marking text in the applicable countries shall be as follows: In Finland: "Laite on liitettävä suojamaadoituskoskettimilla varustettuun pistorasiaan" In Norway: "Apparatet må tilkoples jordet stikkontakt" In Sweden: "Apparaten skall anslutas till jordat uttag" | | N |
| 1.7.5 | In Denmark , socket-outlets for providing power to other equipment shall be in accordance with the Heavy Current Regulations, Section 107-2-D1, Standard Sheet DK 1-3a, DK 1-5a or DK 1-7a, when used on Class I equipment. For STATIONARY EQUIPMENT the socket-outlet shall be in accordance with Standard Sheet DK 1-1b or DK 1-5a. | | N |
| 2.2.4 | In Norway , for requirements see 1.7.2.1, 6.1.2.1 and 6.1.2.2 of this annex. | | N |
| 2.3.2 | In Finland, Norway and Sweden there are additional requirements for the insulation. See 6.1.2.1 and 6.1.2.2 of this annex. | | N |
| 2.3.4 | In Norway , for requirements see 1.7.2.1, 6.1.2.1 and 6.1.2.2 of this annex. | | N |
| 2.6.3.3 | In the United Kingdom , the current rating of the circuit shall be taken as 13 A, not 16 A. | | N |
| 2.7.1 | In the United Kingdom , to protect against excessive currents and short-circuits in the PRIMARY CIRCUIT of DIRECT PLUG-IN EQUIPMENT, tests according to 5.3 shall be conducted, using an external protective device rated 30 A or 32 A. If these tests fail, suitable protective devices shall be included as integral parts of the DIRECT PLUG-IN EQUIPMENT, so that the requirements of 5.3 are met. | | N |
| 2.10.5.13 | In Finland, Norway and Sweden , there are additional requirements for the insulation, see 6.1.2.1 and 6.1.2.2 of this annex. | | N |
| 3.2.1.1 | In Switzerland , supply cords of equipment having a RATED CURRENT not exceeding 10 A shall be provided with a plug complying with SEV 1011 or IEC 60884-1 and one of the following dimension sheets: SEV 6532-2.1991 Plug Type 15 3P+N+PE 250/400 V, 10 A SEV 6533-2.1991 Plug Type 11 L+N 250 V, 10 A SEV 6534-2.1991 Plug Type 12 L+N+PE 250 V, 10 A In general, EN 60309 applies for plugs for currents exceeding 10 A. However, a 16 A plug and socket-outlet system is being introduced in Switzerland, the plugs of which are according to the following dimension sheets, published in February 1998: SEV 5932-2.1998 Plug Type 25 3L+N+PE 230/400 V, 16 A SEV 5933-2.1998 Plug Type 21 L+N 250 V, 16 A SEV 5934-2.1998 Plug Type 23 L+N+PE 250 V, 16 A | | N |





| EN62368-1:2014+A11:2017 | | | |
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| Clause | Requirement – Test | Result – Remark | Verdict |
| 3.2.1.1 | <p>In Denmark, supply cords of single-phase equipment having a rated current not exceeding 13 A shall be provided with a plug according to the Heavy Current Regulations, Section 107-2-D1.</p> <p>CLASS I EQUIPMENT provided with socket-outlets with earth contacts or which are intended to be used in locations where protection against indirect contact is required according to the wiring rules shall be provided with a plug in accordance with standard sheet DK 2-1a or DK 2-5a.</p> <p>If poly-phase equipment and single-phase equipment having a RATED CURRENT exceeding 13 A is provided with a supply cord with a plug, this plug shall be in accordance with the Heavy Current Regulations, Section 107-2-D1 or EN 60309-2.</p> | | N |
| 3.2.1.1 | <p>In Spain, supply cords of single-phase equipment having a rated current not exceeding 10 A shall be provided with a plug according to UNE 20315:1994.</p> <p>Supply cords of single-phase equipment having a rated current not exceeding 2,5 A shall be provided with a plug according to UNE-EN 50075:1993.</p> <p>CLASS I EQUIPMENT provided with socket-outlets with earth contacts or which are intended to be used in locations where protection against indirect contact is required according to the wiring rules, shall be provided with a plug in accordance with standard UNE 20315:1994.</p> <p>If poly-phase equipment is provided with a supply cord with a plug, this plug shall be in accordance with UNE-EN 60309-2.</p> | | N |
| 3.2.1.1 | <p>In the United Kingdom, apparatus 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 and plug, shall be fitted with a 'standard plug' in accordance with Statutory Instrument 1768:1994 - The Plugs and Sockets etc. (Safety) Regulations 1994, unless exempted by those regulations.</p> <p>NOTE 'Standard plug' is defined in SI 1768:1994 and essentially means an approved plug conforming to BS 1363 or an approved conversion plug.</p> | | N |
| 3.2.1.1 | <p>In Ireland, apparatus which is fitted with a flexible cable or cord and is designed to be connected to a mains socket conforming to I.S. 411 by means of that flexible cable or cord and plug, shall be fitted with a 13 A plug in accordance with Statutory Instrument 525:1997 - National Standards Authority of Ireland (section 28) (13 A Plugs and Conversion Adaptors for Domestic Use) Regulations 1997.</p> | | N |
| 3.2.4 | In Switzerland , for requirements see 3.2.1.1 of this annex. | | N |
| 3.2.5.1 | In the United Kingdom , a power supply cord with conductor of 1,25 mm ² is allowed for equipment with a rated current over 10 A and up to and including 13 A. | | N |
| 3.3.4 | <p>In the United Kingdom, the range of conductor sizes of flexible cords to be accepted by terminals for equipment with a RATED CURRENT of over 10 A up to and including 13 A is:</p> <ul style="list-style-type: none"> • 1,25 mm² to 1,5 mm² nominal cross-sectional area. | | N |
| 4.3.6 | <p>In the United Kingdom, the torque test is performed using a socket outlet complying with BS 1363 part 1:1995, including Amendment 1:1997 and Amendment 2:2003 and the plug part of DIRECT PLUG-IN EQUIPMENT shall be assessed to BS 1363: Part 1, 12.1, 12.2, 12.3, 12.9, 12.11, 12.12, 12.13, 12.16 and 12.17, except that the test of 12.17 is performed at not less than 125 °C. Where the metal earth pin is replaced by an Insulated Shutter Opening Device (ISOD), the requirements of clauses 22.2 and 23 also apply.</p> | | N |



| EN62368-1:2014+A11:2017 | | | |
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| Clause | Requirement – Test | Result – Remark | Verdict |
| 4.3.6 | In Ireland , DIRECT PLUG-IN EQUIPMENT is known as plug similar devices. Such devices shall comply with Statutory Instrument 526:1997 - National Standards Authority of Ireland (Section 28) (Electrical plugs, plug similar devices and sockets for domestic use) Regulations, 1997. | | N |
| 5.1.7.1 | In Finland, Norway and Sweden TOUCH CURRENT measurement results exceeding 3,5 mA r.m.s. are permitted only for the following equipment: <ul style="list-style-type: none"> • STATIONARY PLUGGABLE EQUIPMENT TYPE A that <ul style="list-style-type: none"> ○ is intended to be used in a RESTRICTED ACCESS LOCATION where equipotential bonding has been applied, for example, in a telecommunication centre; and ○ has provision for a permanently connected PROTECTIVE EARTHING CONDUCTOR; and ○ is provided with instructions for the installation of that conductor by a SERVICE PERSON; • STATIONARY PLUGGABLE EQUIPMENT TYPE B; • STATIONARY PERMANENTLY CONNECTED EQUIPMENT. | | N |
| 6.1.2.1 | In Finland, Norway and Sweden , add the following text between the first and second paragraph of the compliance clause: <p>If this insulation is solid, including insulation forming part of a component, it shall at least consist of either</p> <ul style="list-style-type: none"> - two layers of thin sheet material, each of which shall pass the electric strength test below, or - one layer having a distance through insulation of at least 0,4 mm, which shall pass the electric strength test below. <p>If this insulation forms part of a semiconductor component (e.g. an optocoupler), there is no distance through insulation requirement for the insulation consisting of an insulating compound completely filling the casing, so that CLEARANCES and CREEPAGE DISTANCES do not exist, if the component passes the electric strength test in accordance with the compliance clause below and in addition</p> <ul style="list-style-type: none"> - passes the tests and inspection criteria of 2.10.11 with an electric strength test of 1,5 kV multiplied by 1,6 (the electric strength test of 2.10.10 shall be performed using 1,5 kV), and - is subject to ROUTINE TESTING for electric strength during manufacturing, using a test voltage of 1,5 kV. <p>It is permitted to bridge this insulation with a capacitor complying with EN 132400:1994, subclass Y2.</p> <p>A capacitor classified Y3 according to EN 132400:1994, may bridge this insulation under the following conditions:</p> <ul style="list-style-type: none"> - the insulation requirements are satisfied by having a capacitor classified Y3 as defined by EN 132400, which in addition to the Y3 testing, is tested with an impulse test of 2,5 kV defined in EN62368-1:2014+A11:2017 - the additional testing shall be performed on all the test specimens as described in EN 132400; - the impulse test of 2,5 kV is to be performed before the endurance test in EN 132400, in the sequence of tests as described in EN 132400. | | N |



| EN62368-1:2014+A11:2017 | | | |
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| Clause | Requirement – Test | Result – Remark | Verdict |
| 6.1.2.2 | In Finland, Norway and Sweden , the exclusions are applicable for PERMANENTLY CONNECTED EQUIPMENT, PLUGGABLE EQUIPMENT TYPE B and equipment intended to be used in a RESTRICTED ACCESS LOCATION where equipotential bonding has been applied, e.g. in a telecommunication centre, and which has provision for a permanently connected PROTECTIVE EARTHING CONDUCTOR and is provided with instructions for the installation of that conductor by a SERVICE PERSON. | | N |
| 7.2 | In Finland, Norway and Sweden , for requirements see 6.1.2.1 and 6.1.2.2 of this annex. The term TELECOMMUNICATION NETWORK in 6.1.2 being replaced by the term CABLE DISTRIBUTION SYSTEM. | | N |
| 7.3 | In Norway and Sweden , there are many buildings where the screen of the coaxial cable is normally not connected to the earth in the building installation. | | N |
| 7.3 | In Norway , for installation conditions see EN 60728-11:2005. | | N |

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| ZC | A-DEVIATIONS (informative) | | P |
| 1.5.1 | Sweden (Ordinance 1990:944) Add the following: NOTE In Sweden, switches containing mercury are not permitted. | | N |
| 1.5.1 | Switzerland (Ordinance on environmentally hazardous substances SR 814.081, Annex 1.7, Mercury - Annex 1.7 of SR 814.81 applies for mercury.) Add the following: NOTE In Switzerland, switches containing mercury such as thermostats, relays and level controllers are not allowed. | | N |
| 1.7.2.1 | Denmark (Heavy Current Regulations) Supply cords of CLASS I EQUIPMENT, which is delivered without a plug, must be provided with a visible tag with the following text: <p style="text-align: center;">Vigtigt! Lederen med grøn/gul isolation må kun tilsluttes en klemme mærket</p>  eller  If essential for the safety of the equipment, the tag must in addition be provided with a diagram, which shows the connection of the other conductors, or be provided with the following text: "For tilslutning af de øvrige ledere, se medfølgende installationsvejledning." | | N |
| 1.7.2.1 | Germany (Gesetz über technische Arbeitsmittel und Verbraucherprodukte (Geräte- und Produktsicherheitsgesetz – GPSG) [Law on technical labour equipment and consumer products], of 6th January 2004, Section 2, Article 4, Clause (4), Item 2). If for the assurance of safety and health certain rules during use, amending or maintenance of a technical labour equipment or readymade consumer product are to be followed, a manual in German language has to be delivered when placing the product on the market. Of this requirement, rules for use even only by SERVICE PERSONS are not exempted. | | P |



| EN62368-1:2014+A11:2017 | | | |
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| Clause | Requirement – Test | Result – Remark | Verdict |
| 1.7.5 | Denmark (Heavy Current Regulations) With the exception of CLASS II EQUIPMENT provided with a socket outlet in accordance with the Heavy Current Regulations, Section 107-2-D1, Standard Sheet DK 1-4a, CLASS II EQUIPMENT shall not be fitted with socket-outlets for providing power to other equipment. | | N |
| 1.7.13 | Switzerland (Ordinance on chemical hazardous risk reduction SR 814.81, Annex 2.15 Batteries) Annex 2.15 of SR 814.81 applies for batteries. | | N |
| 5.1.7.1 | Denmark (Heavy Current Regulations, Chapter 707, clause 707.4) TOUCH CURRENT measurement results exceeding 3,5 mA r.m.s. are permitted only for PERMANENTLY CONNECTED EQUIPMENT and PLUGGABLE EQUIPMENT TYPE B. | | N |



| EN 50075 | | | |
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| Clause | Requirement – Test | Result – Remark | Verdict |
| 1 | Plug portion | | -- |
| | CEE 7 Standard Sheet | | P |
| | EN 50075 | | P |
| 2 | Dimensions | | -- |
| | Checking dimensions by measuring and by gauges according to Standard sheet | | P |
| | The edges of the metal-pins, Chamfered or rounded off? | Rounded-off | P |
| 3 | Protection against electric shock | | -- |
| a | Test finger (75N, 1 min in 35°C) or Applicable appliance standard | | P |
| b | Single pole insertion. Checked with gauge:Fig 4 or C19A or C19B (CEE 7) | | P |
| c | Compression test 150 N, 5 min. | | P |
| d | External parts made of insulating material | | P |
| 4 | Construction | | -- |
| a | Test on pins which are not solid | | N |
| b | Pins shall be locked against rotation 0.4 Nm 1 min. | | P |
| c | Pins shall be adequately fixed in the body 1 min. Temperature 70°C 40 N for plugs ≤ 2.5 A 50 N for plugs > 2.5 A | 40N | P |
| d | Pins of copper or copper alloy min 58% copper or equivalent | 58% copper | P |
| e | Plug shall not impose undue strain on fixed socket-outlets, 0.25 Nm | | P |
| f | Abrasion test on the insulating sleeves 20 000 movements | | P |
| 5 | Resistance of insulating material to abnormal heat, to fire and to tracking | | -- |
| a | Compression test 1 h in 80°C | | P |
| b | Glow-wire test 750°C | | P |
| c | Resistance to tracking 175V (other than ordinary) | | N |



| EN62368-1:2014+A11:2017 | | | |
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| Clause | Requirement - Test | Result - Remark | Verdict |
| 12.1 | Dimensions (Checked according to figure 4) | | P |
| 12.2 | Outline of plug shall not exceed the dimension shown in Figure 4a) for a distance of not less than 6.35mm from the engagement surface | | P |
| | Pin disposition, length and body outline shall be checked by use of the gauge shown in Figure 5 | | P |
| 12.3 | L/N pin was more than 9.5mm from the periphery of the plug measured along the engagement surface | | P |
| 12.4 | A fuse link complying with BS 1362:1973 | | N |
| 12.5 | For non-rewireable plugs, the fuse link is retained by means of a fuse carrier, this device shall be either: <ul style="list-style-type: none"> - non-detachable during normal replacement of the fuse-link; - readily identifiable in relation to its plug by means of marking. | | N |
| 12.6 | The base and cover of non-rewireable plugs shall be permanently attached to each other, such that the flexible cord cannot be separated without making the plug permanently useless. | | N |
| 12.7 | After the test in clause 16. Use test probe 11 of BS 3042:1992 is applied a force 30N. During and after the test, it was not possible to touch the live parts. | | P |
| 12.8 | Appliance was complied with clause 15.2. | | N |
| 12.9 | Plug pins shall be constructed of brass. | | P |
| | Plug pins and ISODs complied with 12.9.1. | | P |
| | For non-solid plug shall comply with 12.9.2. | | N |
| | All seams and joints of non-solid plug pins shall be closed over their entire length. | | N |
| | For solid pins: Apply a force of 1100N at a rate not exceeding 10mm/min. After this test the plug was fit the gauge to fig.5. | | P |
| | For ISODs: Apply a force of 400 + 10/0N at a rate 10+/-2mm/min. Deflection not exceeds 1.5mm. After this test the plug was fit the gauge to fig.5. | | N |



| EN62368-1:2014+A11:2017 | | | |
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| Clause | Requirement - Test | Result - Remark | Verdict |
| | <p>Plug pins and ISODs shall have adequate mechanical strength to ensure that they cannot be distorted by twisting.</p> <p>Apply a torque $1 \text{ Nm} \pm 10\%$ for 60s.</p> <p>After each pin has been separately twisted, the plug was fit the gauge in fig. 5.</p> <p>Repeated with opposite direction.</p> | | P |
| 12.10 | <p>Terminals of earthing and neutral plug pin shall be formed as one piece with or shall be permanently connected to the pin in such a way that efficient electrical connection is made that cannot work loose in use. This connection shall not be made by means of a screw.</p> | | N |
| 12.11 | <p>Plug shall be so designed that when fully assembled the pins are adequately retained in position such that there is no likelihood of them becoming detached from the plug during normal use.</p> | | P |
| | <p>Each pin is subjected for 60s to a pull of 100N without jerks in the direction of the major axis.</p> <p>The plug is mounted using the steel plate shown in fig.7. The apparatus is placed within an oven and the pull is applied at least 1 h after the plug body has attained the test temperature of $70^{\circ}\text{C} \pm 5^{\circ}\text{C}$ while maintained at this temperature.</p> <p>After the test, the plug pin shall fit into the gauge and comply with 12.2.1.</p> | | P |
| 12.12 | <p>The degree of flexibility of mounting of the plug pins or the angular movement of the pins in the base shall be not greater than $3^{\circ}30'$. See fig.8.</p> | | P |
| | <p>Test procedure refers to standard. During each test, the declination from the horizontal measured on the scale was not exceed $3^{\circ}30'$ and comply with 12.2.1.</p> | | P |
| 12.13 | <p>Suitable means shall be provided for withdrawing the plug without subjecting the flexible cord to stress.</p> | | N |
| 12.14 | <p>Non-rewirable plugs shall be fitted with flexible cords in accordance with 19.4.</p> | | N |
| 12.15 | <p>Conductive component parts of plugs shall be so located and separated that, in normal use, they cannot be displaced so as to affect adversely the safety or proper operation of the plug.</p> | | P |
| 12.16 | <p>Live and neutral plug pins shall be fitted with insulating sleeves. See fig.4. Sleeves shall not be fitted to any earthing plug pin.</p> | | P |



| EN62368-1:2014+A11:2017 | | | |
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| Clause | Requirement - Test | Result - Remark | Verdict |
| 12.17 | Plug pin sleeves shall have adequate electric strength, resistance to abrasion and resistance to deformation due to overheating of pins. | | P |
| | During the test of sub-clause 12.17.2, no breakdown or flashover occurred. | | P |
| | 12.17.3 (abrasion test – 10 000 times in each direction), 20 000 movements at a rate of 25 movements to 30 movements per min. (fig.9). After the test, the sleeve shall show no damage and also shall not have been penetrated or creased. | | P |
| | 12.17.4 (pressure test at high temperature) (fig.10) Pin on the apparatus with a force of 2.5N on the specimen, then placed in a heating cabinet at 200°C for a period of 120 minutes. The thickness of the insulation remaining at the point of impression is measured and shall not have been reduced by more than 50%. | | P |

| No. | Name | Manufacturer | Model | Specification | Standard | Certificate |
|-----|----------------------|---|-------------------|-----------------------------------|-------------------------|---------------------|
| 1 | PCB | GOLDENMAX INTERNATIONAL TECHNOLOGY (ZHUHAI) LTD | 22F-4.0 | V-0; 130°C; min. thickness: 1.6mm | UL 94 | UL 330731 |
| 2 | Plug | Zhongshan KejIN Power Supply Cord Co.,Ltd. | KJ-128 | 250V~15A | EN62368-1:2014+A11:2017 | VDE 10040175 |
| 3 | Power cord | Zhongshan KejIN Power Supply Cord Co.,Ltd. | H03VVH2-F | 2*0.75mm2 | EN62368-1:2014+A11:2017 | VDE 40013045 |
| 4 | End -Plug | Yueqing Xingci Electronic Technology Co.,Ltd. | KJ-18 | 250V~5A | EN62368-1:2014+A11:2017 | VDE 40013046 |
| 5 | Heat shrinkable tube | SHENZHEN WOER HEAT-SHRINKABLE MATERIAL CO LTD | RSFR-H | 600V, 125°C | EN62368-1:2014+A11:2017 | UL E203950 |
| 6 | Transformer 1 | Shenzhen Coto Technology Electronics Co., Ltd. | ZH-P60-A1-T1-120W | ZH-P60-A2-T1 | IEC/EN 60065 | Test with apparatus |



| | | | |
|-------------------------|--------------------|-----------------|---------|
| EN62368-1:2014+A11:2017 | | | |
| Clause | Requirement - Test | Result - Remark | Verdict |

| No. | Name | Manufacturer | Model | Specification | Standard | Certificate |
|-----|---------------|--|-------------------|--------------------------|--|-----------------------|
| 7 | Transformer 2 | Shenzhen Coto Technology Electronics Co., Ltd. | ZH-P60-A1-T2-120W | ZH-P60-A2-T1 | IEC/EN 60065 | Tested with appliance |
| 8 | Transformer 3 | Shenzhen Coto Technology Electronics Co., Ltd. | UU10.5-50mh | UU10.5-50mh | EN62368-1:2014+A11:2017 | Tested with appliance |
| 9 | X-capacitor | TENTA ELECTRIC INDUSTRIAL CO. LTD | MEX | 0.22uF/275V X2, 100°C | IEC/EN 60384-14 | VDE 119119 |
| 10 | Y-Capacitor | JYA-NAY CO., LTD | Y1 | 2200pF,400V | EN62368-1:2014+A11:2017 | E201384 |
| 11 | Thermistor | Nanjing Shiheng electronics co.,ltd | NTC 5D-11 | 4A | EN62368-1:2014+A11:2017 | Tested with appliance |
| 12 | Switch | Yueqing1 Qiyang Electronics Co.,Ltd. | KCD1 | 6A ,250VAC | EN62368-1:2014+A11:2017 | CQC 14001104808 |
| 13 | X-capacitor 2 | Tenta Electric Industrial Co.,Ltd. | 0.01uF, K X2, | 275VAC 40/100/21 | DIN EN 60384-14(VDE 0565-1-1):2014-04; EN 60384-14:2013-08, IEC 60384-14(ed.4) | VDE 119119 |



| EN62368-1:2014+A11:2017 | | | |
|-------------------------|--------------------|-----------------|---------|
| Clause | Requirement - Test | Result - Remark | Verdict |

| No. | Name | Manufacturer | Model | Specification | Standard | Certificate |
|-----|----------|---|-------|---------------|-------------------------|-----------------------------|
| 14 | Terminal | Yueqing Xingci Electronic Technology Co.,Ltd. | DB-8 | 250V~2.5A | EN62368-1:2014+A11:2017 | CQC 20180102040751 66 |

| 1.6.2 | TABLE: electrical data (in normal conditions) | | | | | | P |
|---|---|-----------|-------|--------|-------------|----------------------|---|
| fuse # | I rated (A) | U (V) | P (W) | I (mA) | I fuse (mA) | condition/status | |
| FU1 | -- | 90V/50Hz | 3.5 | 61.2 | 61.2 | Load condition: 0.6A | |
| FU1 | -- | 90V/60Hz | 3.6 | 61.5 | 61.5 | Load condition: 0.6A | |
| FU1 | 0.2 | 100V/50Hz | 3.8 | 59.1 | 59.1 | Load condition: 0.6A | |
| FU1 | 0.2 | 100V/60Hz | 3.8 | 60.0 | 60.0 | Load condition: 0.6A | |
| FU1 | 0.2 | 250V/50Hz | 4.6 | 37.7 | 37.7 | Load condition: 0.6A | |
| FU1 | 0.2 | 250V/60Hz | 4.6 | 37.5 | 37.5 | Load condition: 0.6A | |
| FU1 | -- | 265V/50Hz | 5.0 | 39.2 | 39.2 | Load condition: 0.6A | |
| FU1 | -- | 265V/60Hz | 4.9 | 38.9 | 38.9 | Load condition: 0.6A | |
| Supplementary information: Rated input: 100-250Vac, 1.0A, 50-60Hz. | | | | | | | |

| 2.10.3 and 2.10.4 | TABLE: clearance and creepage distance measurements | | | | | | P |
|--|---|--------------|------------------|---------|------------------|---------|---|
| clearance (cl) and creepage distance (cr) at/of/between: | U peak (V) | U r.m.s. (V) | required cl (mm) | cl (mm) | required cr (mm) | cr (mm) | |
| Two terminals of FU1 | 355 | 250 | 2.0 | >2.0 | 2.5 | >2.5 | |
| Primary traces of TR1 to secondary trace (Pin1-Pin5) | 366 | 230 | 4.0 | >4.0 | 4.6 | >4.6 | |
| Primary traces of TR1 to secondary trace (Pin1-Pin8) | 390 | 234 | 4.0 | >4.0 | 4.7 | >4.7 | |
| Primary traces of TR1 to secondary trace (Pin2-Pin5) | 378 | 237 | 4.0 | >4.0 | 4.8 | >4.8 | |
| Primary traces of TR1 to secondary trace (Pin2-Pin8) | 389 | 236 | 4.0 | >4.0 | 4.8 | >4.8 | |
| Primary traces of TR1 to secondary trace (Pin3-Pin5) | 382 | 224 | 4.0 | >4.0 | 4.5 | >4.5 | |
| Primary traces of TR1 to secondary trace (Pin3-Pin8) | 360 | 224 | 4.0 | >4.0 | 4.5 | >4.5 | |



| EN62368-1:2014+A11:2017 | | | | | | |
|--|--------------------|--------------|------------------|-----------------|------------------|---------|
| Clause | Requirement - Test | | | Result - Remark | | Verdict |
| clearance (cl) and creepage distance (cr) at/of/between: | U peak (V) | U r.m.s. (V) | required cl (mm) | cl (mm) | required cr (mm) | cr (mm) |
| Primary traces of TR1 to secondary trace (Pin4-Pin5) | 358 | 224 | 4.0 | >4.0 | 4.5 | >4.5 |
| Primary traces of TR1 to secondary trace (Pin4-Pin8) | 369 | 224 | 4.0 | >4.0 | 4.5 | >4.5 |
| Primary traces of IC1 to secondary trace (Pin1-Pin3) | 358 | 226 | 4.0 | >4.0 | 4.6 | >4.6 |
| Primary traces of IC1 to secondary trace (Pin1-Pin4) | 359 | 225 | 4.0 | >4.0 | 4.5 | >4.5 |
| Primary traces of IC1 to secondary trace (Pin2-Pin3) | 358 | 224 | 4.0 | >4.0 | 4.5 | >4.5 |
| Primary traces of IC1 to secondary trace (Pin2-Pin4) | 360 | 223 | 4.0 | >4.0 | 4.5 | >4.5 |
| Live parts to enclosure | 390 | 237 | 4.0 | >4.0 | 4.8 | >4.8 |
| Supplementary information: | | | | | | |

| 2.10.5 | TABLE: distance through insulation measurements | | | | | P |
|--|---|-----------|------------------|-------------------|----------|---|
| distance through insulation (DTI) at/of: | U peak (V) | U rms (V) | test voltage (V) | required DTI (mm) | DTI (mm) | |
| Plastic enclosure | 390 | 237 | 3000Vac | 0.4 | 2.5 | |
| Bobbin of transformer TR1 | 390 | 237 | 3000Vac | 0.4 | 0.9 | |
| Supplementary information: | | | | | | |



| EN62368-1:2014+A11:2017 | | | |
|-------------------------|--------------------|-----------------|---------|
| Clause | Requirement - Test | Result - Remark | Verdict |

| | | | | | | | | | | |
|---|------------------|-------------------------|------------------------|---------------|---------------|---------------|-------------------|---------------|----|--|
| 4.3.8 | TABLE: batteries | | | | | | | | N | |
| The tests of 4.3.8 are applicable only when appropriate battery data is not available | | -- | | | | | | -- | | |
| Is it possible to install the battery in a reverse polarity position? | | -- | | | | | | -- | | |
| Non-rechargeable batteries | | | Rechargeable batteries | | | | | | | |
| Discharging | | Un-intentional charging | Charging | | Discharging | | Reversed charging | | | |
| Meas. current | Manuf. Specs. | | Meas. current | Manuf. Specs. | Meas. current | Manuf. Specs. | Meas. current | Manuf. Specs. | | |
| Max. current during normal condition | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Max. current during fault condition | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| Test results: | | | | | | | | Verdict | | |
| - Chemical leaks | | -- | | | | | | -- | | |
| - Explosion of the battery | | -- | | | | | | -- | | |
| - Emission of flame or expulsion of molten metal | | -- | | | | | | -- | | |
| - Electric strength tests of equipment after completion of tests | | -- | | | | | | -- | | |
| Supplementary information: | | | | | | | | | | |

| | | | | | | | | | | |
|--|-----------------------------|------|--------|------|------|----|-------------------|--|---|--|
| 4.5 | TABLE: thermal requirements | | | | | | | | P | |
| supply voltage (V) | | 90V | 90V | 265V | 265V | -- | --- | | | |
| ambient Tmin (°C) | | -- | -- | -- | -- | -- | --- | | | |
| ambient Tmax (°C) | | -- | -- | -- | -- | -- | --- | | | |
| Maximum measured temperature T of part/at: | | | T (°C) | | | | allowed Tmax (°C) | | | |
| Test condition: horizontal location | | | | | | | | | | |
| 1. Plug holder (inside) | | 30.1 | 45.1 | 31.5 | 47.0 | -- | 120 | | | |
| 2. PCB under D1 | | 51.5 | 66.5 | 51.0 | 66.5 | -- | 105 | | | |
| 3. C2 body | | 55.2 | 70.2 | 57.7 | 73.2 | -- | 105 | | | |



| EN62368-1:2014+A11:2017 | | | |
|-------------------------|--------------------|-----------------|---------|
| Clause | Requirement - Test | Result - Remark | Verdict |

| Maximum measured temperature T of part/at: | T (°C) | | | | | allowed T _{max} (°C) |
|--|--------|------|------|------|----|-------------------------------|
| 4. Winding of T1 | 60.8 | 75.8 | 59.6 | 75.1 | -- | 110 |
| 5. Core of T1 | 57.9 | 72.9 | 57.0 | 72.5 | -- | -- |
| 6. PCB under T1 | 52.3 | 67.3 | 53.2 | 68.7 | -- | 105 |
| 7. IC1 body | 50.4 | 65.4 | 51.2 | 66.7 | -- | 100 |
| 8. Enclosure inside near T1 | 42.1 | 57.1 | 41.6 | 57.1 | -- | 80 |
| 9. Enclosure outside near T1 | 37.6 | 52.6 | 37.1 | 52.6 | -- | 70 |
| 10. Ambient | 25.0 | 40.0 | 24.5 | 40.0 | -- | -- |

Test condition: vertical location

| | | | | | | |
|------------------------------|------|------|------|------|----|-----|
| 1. Plug holder (inside) | 28.1 | 43.6 | 27.5 | 42.7 | -- | 120 |
| 2. PCB under D1 | 50.5 | 66.0 | 49.0 | 64.2 | -- | 105 |
| 3. C2 body | 53.2 | 68.7 | 55.7 | 70.9 | -- | 105 |
| 4. Winding of T1 | 59.6 | 75.1 | 59.6 | 74.8 | -- | 110 |
| 5. Core of T1 | 56.0 | 71.5 | 57.5 | 72.7 | -- | -- |
| 6. PCB under T1 | 52.0 | 67.5 | 53.2 | 68.4 | -- | 105 |
| 7. IC1 body | 49.4 | 64.9 | 51.2 | 66.4 | -- | 100 |
| 8. Enclosure inside near T1 | 42.1 | 57.6 | 41.6 | 56.8 | -- | 80 |
| 9. Enclosure outside near T1 | 37.6 | 53.1 | 37.1 | 52.3 | -- | 70 |
| 10. Ambient | 24.5 | 40.0 | 24.8 | 40.0 | -- | -- |

| temperature T of winding: | t ₁ (°C) | R ₁ (Ω) | t ₂ (°C) | R ₂ (Ω) | T (°C) | allowed T _{max} (°C) | insulation class |
|---------------------------|---------------------|--------------------|---------------------|--------------------|--------|-------------------------------|------------------|
| -- | -- | -- | -- | -- | -- | -- | -- |

| | | |
|-------|--|---|
| 4.5.5 | TABLE: ball pressure test of thermoplastic parts | P |
| | allowed impression diameter (mm): ≤ 2 mm | — |

| part | test temperature (°C) | impression diameter (mm) |
|---------------------------|-----------------------|--------------------------|
| Bobbin of transformer TR1 | 125 | 0.8 |
| Plug holder | 125 | 1.1 |

Supplementary information:



| | | | |
|-------------------------|--------------------|-----------------|---------|
| EN62368-1:2014+A11:2017 | | | |
| Clause | Requirement - Test | Result - Remark | Verdict |

| 4.7 | TABLE: resistance to fire | | | | N |
|----------------------------|---------------------------|------------------|----------------|--------------------|----------|
| part | manufacturer of material | type of material | thickness (mm) | flammability class | evidence |
| -- | -- | -- | -- | -- | -- |
| -- | -- | -- | -- | -- | -- |
| Supplementary information: | | | | | |

| 5.2 | TABLE: electric strength tests, impulse tests and voltage surge tests | | | P |
|--|---|------------------|--------------------|---|
| test voltage applied between: | voltage shape (AC, DC, impulse, surge) | test voltage (V) | breakdown Yes / No | |
| Line/Neutral and secondary circuits (insulation paper removed) | AC | 3000 | No breakdown | |
| Line/Neutral and user accessible area (insulation paper removed) | AC | 3000 | No breakdown | |
| Transformer: primary and secondary pins | AC | 3000 | No breakdown | |
| Transformer: secondary pins and core | AC | 3000 | No breakdown | |
| One layer insulation tape of transformer | AC | 3000 | No breakdown | |
| supplementary information | | | | |

| 5.3 | TABLE: fault condition tests | | | | | P |
|---------------------------|---|--------------------|-----------|----------|------------------|--|
| | ambient temperature (°C) | | See below | | | — |
| | power source for EUT: manufacturer, model/type, output rating | | -- | | | — |
| component No. | fault | supply voltage (V) | test time | fuse No. | fuse current (A) | Observation |
| D1 | Short circuit | 250 | 1s. | FU1 | 0.037→0 | FU1 damaged immediately, test repeat for ten times, no hazard. |
| C1 | Short circuit | 250 | 1s. | FU1 | 0.037→0 | FU1 damaged immediately, test repeat for ten times, no hazard. |
| IC1: pin 1-2 | Short circuit | 250 | 1s. | FU1 | 0.037→0 | FU1 damaged immediately, test repeat for ten times, no hazard. |
| IC1: pin 4-3 | Short circuit | 250 | 5min. | FU1 | 0.037→0.005 | Unit shutdown immediately, no hazard. |
| Transformer (TR1) pin 1-2 | Short circuit | 250 | 5min. | FU1 | 0.037→0.005 | Unit shutdown immediately, no hazard. |



| EN62368-1:2014+A11:2017 | | | | | | |
|----------------------------|--------------------|--------------------|-----------|-----------------|------------------------|---|
| Clause | Requirement - Test | | | Result - Remark | | Verdict |
| component No. | fault | supply voltage (V) | test time | fuse No. | fuse current (A) | Observation |
| Transformer (TR1) pin 5-8 | Short circuit | 250 | 1s. | FU1 | 0.037→0 | FU1 damaged immediately, test repeat for ten times, no hazard. |
| Output terminal | Short circuit | 250 | 5 min. | FU1 | 0.037→0.005 | Unit shutdown immediately, no hazard. |
| Transformer output | Overload | 250 | 3h. | FU1 | 0.037→0.055 → 0.005 | Maximum temperature of T1 winding: 92.6C, enclosure outside: 51.8°C, ambient: 24.5°C, no damage, no hazard. |
| Supplementary information: | | | | | | |

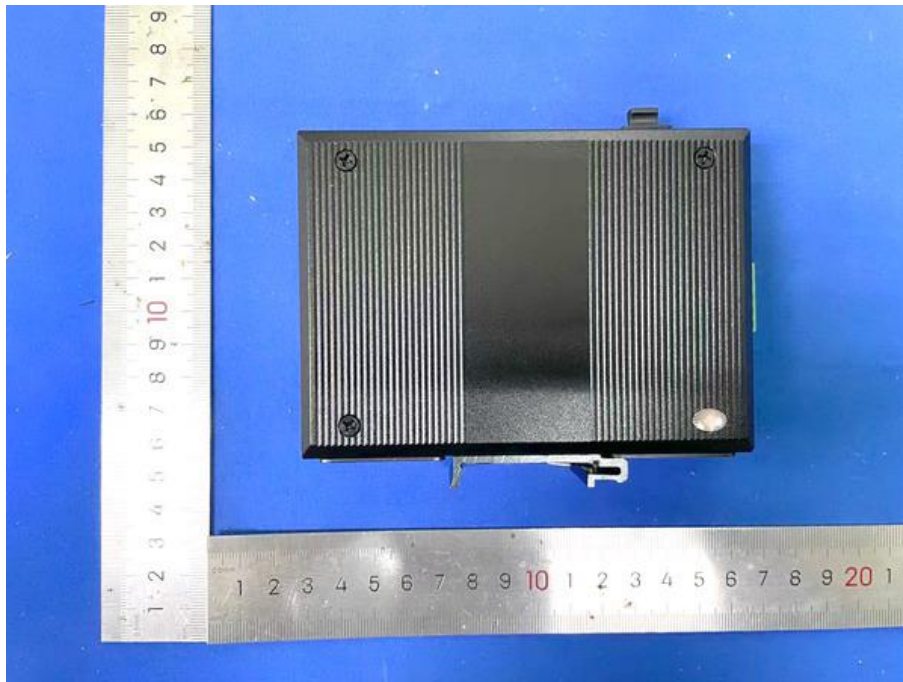


ANNEX A:

Photo-documentation



View of product



View of unit 1



2

END REPORT