



TEST REPORT
IEC 60598-1
Luminaires
Part 1: General requirements and tests

Report Number.....: LCS190326017BS

Date of issue.....: July 23, 2019

Total number of pages.....: 91 pages

Name of Testing Laboratory

preparing the Report.....: Shenzhen Southern LCS Compliance Testing Laboratory Ltd.

Applicant's name.....: Shenzhen Sonoff Technologies Co., Ltd.

Address.....: Building 8, Room 1001, Lianhua Industrial Park, Longyuan Road,
Hualian Community, Longhua St., Longhua Dist, Shenzhen,
Guangdong, China

Test specification:

Standard.....: IEC 60598-1:2014+A1:2017

Test procedure.....: Type test

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

Test Report Form No.....: N/A

Test Report Form(s) Originator.....: N/A

Master TRF.....: N/A

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Shenzhen Southern LCS Compliance Testing Laboratory Ltd.

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| | | |
|---|--|---|
| Test item description.....: | Wi-Fi Smart Lamp Holder | |
| Trade Mark.....: |  (Sonoff) | |
| Manufacturer.....: | Shenzhen Sonoff Technologies Co., Ltd. | |
| Address.....: | Building 8, Room 1001, Lianhua Industrial Park, Longyuan Road, Hualian Community, Longhua St., Longhua Dist, Shenzhen, Guangdong, China | |
| Model/Type reference.....: | SlampherR2 | |
| Ratings.....: | 100-240V~, 50/60Hz Max. Load: 450W, 2A, ta45°C E27: 250V~, T170, 2A | |
| <input checked="" type="checkbox"/> Testing Laboratory: | | |
| Testing location/ address.....: | Shenzhen Southern LCS Compliance Testing Laboratory Ltd. B Area, 1-2F, Building B, Zhongyu Green High-tech Industrial Park, Wenge Road, Heshuikou, Gongming Street, Guangming New District, Shenzhen, China | |
| Tested by.....: | Lisa Zeng (Engineer) |   |
| Check by.....: | Eko Yang (Director) | |
| Approved by.....: | Jesse Liu (Manager) | |
| List of Attachments (including a total number of pages in each attachment): Attachment No. 1: 1 pages of European group differences and national differences according to EN 60598-1:2015+A1:2018 Attachment No. 2: 22 pages of report IEC/EN 61347-2-13. Attachment No. 3: 25 pages of report IEC/EN 60238. Attachment No. 4: 4 pages of report IEC 60061-1:2018 and IEC 60061-3:2018. Attachment No. 5: 3 pages of photo documentation. | | |
| Summary of testing: | | |
| Tests performed (name of test and test clause): IEC 60598-1:2014+A1:2017 IEC 61347-2-13:2014+A1:2016 IEC 61347-1:2015+A1:2017 IEC 60238: 2016+A1:2017 EN 60598-1:2015+A1:2018 EN 61347-2-13:2014+A1:2017; EN 61347-1:2015; EN 60238:2018, A1:2018; EN 62493:2015 | Testing location: Shenzhen Southern LCS Compliance Testing Laboratory Ltd. B Area, 1-2F, Building B, Zhongyu Green High-tech Industrial Park, Wenge Road, Heshuikou, Gongming Street, Guangming New District, Shenzhen, China | |
| Summary of compliance with National Differences: | | |
| List of countries addressed <input checked="" type="checkbox"/> The product fulfils the requirements of Germany and European Group differences | | |

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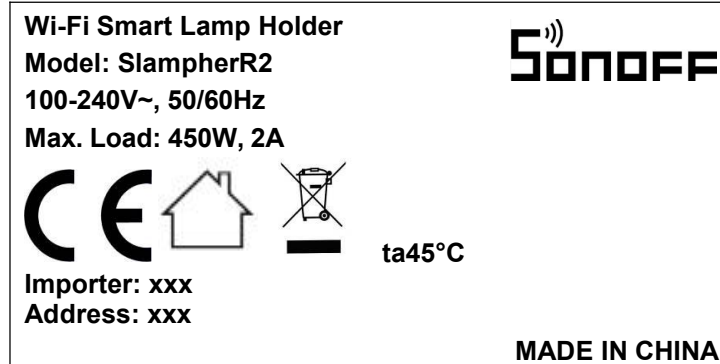
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EN 60598-1:2015+A1:2018

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.

Marking located on the enclosure:**Marking Located on the lampholder:****E27 250V~, T170, 2A****Remarks:**

Height of CE mark at least 5mm, height of WEEE symbol should not less than 7mm, height of other marks at least 5mm, height of letters and numerals at least 2mm.

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| Test item particulars..... : | | | | | | | | | |
|--|--|---------------|------------------|---------------|---------|------|----------------|---|------------------|
| Classification of installation and use.....: Semi-luminaires, use indoor only | | | | | | | | | |
| Supply Connection.....: E27 Lamp cap | | | | | | | | | |
| Protection Class.....: Class II | | | | | | | | | |
| Degree of Protection..... : IP20 | | | | | | | | | |
| Possible test case verdicts: | | | | | | | | | |
| - test case does not apply to the test object..... : N/A | | | | | | | | | |
| - test object does meet the requirement..... : P (Pass) | | | | | | | | | |
| - test object does not meet the requirement..... : F (Fail) | | | | | | | | | |
| Testing..... : | | | | | | | | | |
| Date of receipt of test item..... : April 15, 2019 | | | | | | | | | |
| Date (s) of performance of tests..... : April 15, 2019 - May 15, 2019 | | | | | | | | | |
| General remarks: | | | | | | | | | |
| This report shall not be reproduced except in full without the written approval of the testing laboratory. The test results presented in this report relate only to the item tested. "(See Enclosure #)" refers to additional information appended to the report. "(See appended table)" refers to a table appended to the report. Clause numbers between brackets refer to clauses in IEC/EN 60598-1. | | | | | | | | | |
| Throughout this report a <input checked="" type="checkbox"/> comma / <input type="checkbox"/> point is used as the decimal separator. | | | | | | | | | |
| 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. | | | | | | | | | |
| Modified Information | | | | | | | | | |
| <table border="1"><thead><tr><th>Version</th><th>Report No.</th><th>Revision Date</th><th>Summary</th></tr></thead><tbody><tr><td>V1.0</td><td>LCS190326017BS</td><td>/</td><td>Original Version</td></tr></tbody></table> | | Version | Report No. | Revision Date | Summary | V1.0 | LCS190326017BS | / | Original Version |
| Version | Report No. | Revision Date | Summary | | | | | | |
| V1.0 | LCS190326017BS | / | Original Version | | | | | | |
| Manufacturer's Declaration per sub-clause 4.2.5 of IECCE 02: | | | | | | | | | |
| The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided.....: | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> Not applicable | | | | | | | | |
| When differences exist; they shall be identified in the General product information section. | | | | | | | | | |
| Name and address of factory (ies)..... : Same as manufacturer | | | | | | | | | |

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**General Product Information and other remarks:**

1. The product under test is a semi-luminaries equipped with a E27 lamp cap.
2. The product connects the lighting sources by a E27 lamp holder.
3. The luminaries including a electronic switch which disconnect the circuit via a certified relay, the details refer to the report LCS190422047AS.
4. The enclosure of the luminaries fixed by two independent screws
5. The electronic switching device has indicated loading type, when replace the lighting source of lamp should refer to the instruction to select appropriate type load.
6. The luminaries is a class II semi-luminaries, and suitable for direct mounting on normally flammable surfaces.

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| IEC 60598-1 | | | |
|-------------|---|---|----------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 0 | GENERAL TEST REQUIREMENTS | | P |
| 0.1 | Information for luminaire design considered..... : | Standard Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | — |
| 0.3 | More sections applicable..... : | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | — |
| 0.5 | Components | (see Annex 1) | — |
| 0.7 | Information for luminaire design in light sources standards | | — |
| 0.7.2 | Light source safety standard | | — |
| | Luminaire design in the light source safety standard | | N/A |

| | | | |
|----------|--|---|----------|
| 2 | CLASSIFICATION | | P |
| 2.2 | Type of protection | Class II | — |
| 2.3 | Degree of protection..... : | IP20 | — |
| 2.4 | Luminaire suitable for direct mounting on normally flammable surfaces..... : | Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | — |
| 2.5 | Luminaire for normal use | Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | — |
| | Luminaire for rough service | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | — |

| | | | |
|----------|---------------------------------------|---|----------|
| 3 | MARKING | | P |
| 3.2 | Mandatory markings | | P |
| | Position of the marking | | P |
| | Format of symbols/text | | P |
| 3.3 | Additional information | | P |
| | Language of instructions | English | P |
| 3.3.1 | Combination luminaires | | N/A |
| 3.3.2 | Nominal frequency in Hz | 50/60Hz | P |
| 3.3.3 | Operating temperature | ta45°C | P |
| 3.3.4 | Symbol or warning notice | | N/A |
| 3.3.5 | Wiring diagram | | N/A |
| 3.3.6 | Special conditions | | N/A |
| 3.3.7 | Metal halide lamp luminaire – warning | | N/A |
| 3.3.8 | Limitation for semi-luminaires | No such limitation for replace lighting source, it connect to the lighting source by a E27 lamp holder. | N/A |

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| IEC 60598-1 | | | |
|-------------|--|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 3.3.9 | Power factor and supply current | | P |
| 3.3.10 | Suitability for use indoors | Use indoor only | P |
| 3.3.11 | Luminaires with remote control | | N/A |
| 3.3.12 | Clip-mounted luminaire – warning | | N/A |
| 3.3.13 | Specifications of protective shields | | N/A |
| 3.3.14 | Symbol for nature of supply | ~ | P |
| 3.3.15 | Rated current of socket outlet | | N/A |
| 3.3.16 | Rough service luminaire | | N/A |
| 3.3.17 | Mounting instruction for type Y, type Z and some type X attachments | | N/A |
| 3.3.18 | Non-ordinary luminaires with PVC cable | | N/A |
| 3.3.19 | Protective conductor current in instruction if applicable | | N/A |
| 3.3.20 | Provided with information if not intended to be mounted within arm's reach | | N/A |
| 3.3.21 | Non-replaceable and non-user replaceable light sources information provided | | N/A |
| | Cautionary symbol | | N/A |
| 3.3.22 | Controllable luminaires, classification of insulation provided | | N/A |
| 3.3.23 | Luminaire without controlgear provided with necessary information for selection of appropriate component | | N/A |
| 3.3.24 | If not supplied with terminal block, information on the packaging | | N/A |
| 3.4 | Test with water | | P |
| | Test with hexane | | P |
| | Legible after test | | P |
| | Label attached | | P |

| | | | |
|------------|---|-------------------|-----|
| 4 | CONSTRUCTION | | P |
| 4.2 | Components replaceable without difficulty | | N/A |
| 4.3 | Wireways smooth and free from sharp edges | | P |
| 4.4 | Lampholders | | P |
| 4.4.1 | Integral lampholder | | N/A |
| 4.4.2 | Wiring connection | Solder connection | P |

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| IEC 60598-1 | | | |
|-------------|--|--------------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 4.4.3 | Lampholder for end-to-end mounting | | N/A |
| *4.4.4 | Positioning | No such lampholder | N/A |
| | - pressure test (N) | | — |
| | After test the lampholder comply with relevant standard sheets and show no damage | | N/A |
| | After test on single-capped lampholder the lampholder have not moved from its position and show no permanent deformation | | N/A |
| | - bending test (N) | | — |
| | After test the lampholder have not moved from its position and show no permanent deformation | | N/A |
| 4.4.5 | Peak pulse voltage | | N/A |
| 4.4.6 | Centre contact | | N/A |
| 4.4.7 | Parts in rough service luminaires resistant to tracking | | N/A |
| 4.4.8 | Lamp connectors | | N/A |
| 4.4.9 | Caps and bases correctly used | | N/A |
| 4.4.10 | Light source for lampholder or connection according IEC 60061 not connected another way | | P |
| 4.5 | Starter holders | | N/A |
| | Starter holder in luminaires other than class II | | N/A |
| | Starter holder class II construction | | N/A |
| 4.6 | Terminal blocks | | N/A |
| | Tails | | N/A |
| | Unsecured blocks | | N/A |
| 4.7 | Terminals and supply connections | | N/A |
| 4.7.1 | Contact to metal parts | | N/A |
| 4.7.2 | Test 8 mm live conductor | | N/A |
| | Test 8 mm earth conductor | | N/A |
| 4.7.3 | Terminals for supply conductors | | N/A |
| 4.7.3.1 | Welded method and material | | N/A |
| | - stranded or solid conductor | | N/A |
| | - spot welding | | N/A |
| | - welding between wires | | N/A |
| | - Type Z attachment | | N/A |
| | - mechanical test according to 15.8.2 | | N/A |

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| IEC 60598-1 | | | |
|-------------|--|---|------------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | - electrical test according to 15.9 | | N/A |
| | - heat test according to 15.9.2.3 and 15.9.2.4 | | N/A |
| 4.7.4 | Terminals other than supply connection | | N/A |
| 4.7.5 | Heat-resistant wiring/sleeves | | N/A |
| 4.7.6 | Multi-pole plug | | N/A |
| | - test at 30 N | | N/A |
| 4.8 | Switches | | P |
| | - adequate rating | Integral electronic switch disconnection method by a relay | P |
| | - adequate fixing | | P |
| | - polarized supply | The disconnection component of the electronic switch is a certified relay, which is in the live side of supply. | N/A |
| | - compliance with IEC 61058-1 for electronic switches | See attachment | P |
| 4.9 | Insulating lining and sleeves | | N/A |
| 4.9.1 | Retainment | | N/A |
| | Method of fixing.....: | | — |
| 4.9.2 | Insulated linings and sleeves: | | N/A |
| | Resistant to a temperature > 20 °C to the wire temperature or | | N/A |
| | a) & c) Insulation resistance and electric strength | | N/A |
| | b) Ageing test. Temperature (°C).....: | | N/A |
| 4.10 | Double or reinforced insulation | | P |
| 4.10.1 | No contact, mounting surface – accessible metal parts – wiring of basic insulation | | P |
| | Safe installation fixed luminaires | | P |
| | Capacitors and switches | | N/A |
| | Interference suppression capacitors according to IEC 60384-14 | | N/A |
| 4.10.2 | Assembly gaps: | | P |
| | - not coincidental | | P |
| | - no straight access with test probe | | P |
| 4.10.3 | Retainment of insulation: | | P |

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| IEC 60598-1 | | | |
|-------------|--|------------------------|----------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | - fixed | | P |
| | - unable to be replaced; luminaire inoperative | | P |
| | - sleeves retained in position | | N/A |
| | - lining in lampholder | | N/A |
| 4.11 | Electrical connections and current-carrying parts | | P |
| 4.11.1 | Contact pressure | | N/A |
| 4.11.2 | Screws: | | N/A |
| | - self-tapping screws | | N/A |
| | - thread-cutting screws | | N/A |
| 4.11.3 | Screw locking: | | N/A |
| | - spring washer | | N/A |
| | - rivets | | N/A |
| 4.11.4 | Material of current-carrying parts | | P |
| 4.11.5 | No contact to wood or mounting surface | | P |
| 4.11.6 | Electro-mechanical contact systems | | N/A |
| 4.12 | Screws and connections (mechanical) and glands | | P |
| 4.12.1 | Screws not made of soft metal | | P |
| | Screws of insulating material | | N/A |
| | Torque test: torque (Nm); part.....: | Fixed enclosure; 0,6Nm | P |
| | Torque test: torque (Nm); part.....: | | N/A |
| | Torque test: torque (Nm); part.....: | | N/A |
| 4.12.2 | Screws with diameter < 3 mm screwed into metal | | N/A |
| *4.12.4 | Locked connections: | | N/A |
| | - fixed arms; torque (Nm).....: | | N/A |
| | - lampholder; torque (Nm).....: | | N/A |
| | - push-button switches; torque 0,8 Nm.....: | | N/A |
| 4.12.5 | Screwed glands; force (Nm).....: | | N/A |
| 4.13 | Mechanical strength | | P |
| 4.13.1 | Impact tests: | | P |
| | - fragile parts; energy (Nm).....: | | N/A |
| | - other parts; energy (Nm).....: | 0,35Nm, no damage | P |
| | 1) live parts | | P |
| | 2) linings | | N/A |

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|-------------|---|---------------------|------------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | 3) protection | | P |
| | 4) covers | | P |
| 4.13.3 | Straight test finger | 30N | P |
| 4.13.4 | Rough service luminaires | | N/A |
| | - IP54 or higher | | N/A |
| | a) fixed | | N/A |
| | b) hand-held | | N/A |
| | c) delivered with a stand | | N/A |
| | d) for temporary installations and suitable for mounting on a stand | | N/A |
| 4.13.6 | Tumbling barrel | | N/A |
| 4.14 | Suspensions, fixings and means of adjusting | | N/A |
| 4.14.1 | Mechanical load: | | N/A |
| | A) four times the weight | | N/A |
| | B) torque 2,5 Nm | | N/A |
| | C) bracket arm; bending moment (Nm)..... : | | N/A |
| | D) load track-mounted luminaires | | N/A |
| | E) clip-mounted luminaires, glass-shelve. Thickness (mm) | | N/A |
| | Metal rod. diameter (mm) | | N/A |
| | Fixed luminaire or independent control gear without fixing devices | | N/A |
| 4.14.2 | Load to flexible cables | | -- |
| | Mass (kg) | | — |
| | Stress in conductors (N/mm ²) | | N/A |
| | Mass (kg) of semi-luminaire | E27 lamp cap; 2.0Kg | — |
| | Bending moment (Nm) of semi-luminaire | | N/A |
| 4.14.3 | Adjusting devices: | | N/A |
| | - flexing test; number of cycles..... : | | N/A |
| | - strands broken..... : | | N/A |
| | - electric strength test afterwards | | N/A |
| 4.14.4 | Telescopic tubes: cords not fixed to tube; no strain on conductors | | N/A |
| 4.14.5 | Guide pulleys | | N/A |

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| IEC 60598-1 | | | |
|-------------|--|------------------------------|------------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 4.14.6 | Strain on socket-outlets | | N/A |
| 4.15 | Flammable materials | | P |
| | - glow- wire test 650°C..... : | See Test Table 13.3.2) | P |
| | - spacing ≥ 30 mm | | N/A |
| | - screen withstanding test of 13.3.1 | | N/A |
| | - screen dimensions | | N/A |
| | - no fiercely burning material | | P |
| | - thermal protection | | N/A |
| | - electronic circuits exempted | | N/A |
| 4.15.2 | Luminaires made of thermoplastic material with lamp control gear | | N/A |
| | a) construction | | N/A |
| | b) temperature sensing control | | N/A |
| | c) surface temperature | | N/A |
| 4.16 | Luminaires for mounting on normally flammable surfaces | | P |
| | No lamp control gear..... : | (compliance with Section 12) | N/A |
| | Provided with adaptor for a track meet the requirements for direct mounting on normally flammable surfaces | | N/A |
| 4.16.1 | Lamp control gear spacing: | | P |
| | - spacing 35 mm | | N/A |
| | - spacing 10 mm | | P |
| 4.16.2 | Thermal protection: | | N/A |
| | - in lamp control gear | | N/A |
| | - external | | N/A |
| | - fixed position | | N/A |
| | - temperature marked lamp control gear | | N/A |
| 4.16.3 | Design to satisfy the test of 12.6 | (see clause 12.6) | N/A |
| 4.17 | Drain holes | | N/A |
| | Clearance at least 5 mm | | N/A |
| 4.18 | Resistance to corrosion | | N/A |
| 4.18.1 | - rust-resistance | | N/A |
| *4.18.2 | - season cracking in copper | | N/A |
| 4.18.3 | - corrosion of aluminium | | N/A |
| 4.19 | Igniters compatible with ballast | | N/A |

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|--------------|--|-----------------|------------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| *4.20 | Rough service vibration | | N/A |
| 4.21 | Protective shield | | N/A |
| 4.21.1 | Shield fitted if tungsten halogen lamps or metal halide lamps | | N/A |
| | Shield of glass if tungsten halogen lamps | | N/A |
| 4.21.2 | Particles from a shattering lamp not impair safety | | N/A |
| 4.21.3 | No direct path | | N/A |
| 4.21.4 | Impact test on shield | | N/A |
| | Glow-wire test on lamp compartment.....: See Test Table 13.3.2) | | N/A |
| 4.22 | Attachments to lamps not cause overheating or damage | | N/A |
| 4.23 | Semi-luminaires comply Class II | | P |
| 4.24 | Photobiological hazards | | N/A |
| *4.24.1 | No excessive UV radiation if tungsten halogen lamps and metal halide lamps (Annex P) | | N/A |
| 4.24.2 | Retinal blue light hazard | | N/A |
| | Luminaires with E_{thr} : | | N/A |
| | a) Fixed luminaires | | N/A |
| | - distance x m, borderline between RG1 and RG2... : | | N/A |
| | - marking and instruction according 3.2.23 | | N/A |
| | b) Portable and handheld luminaires | | N/A |
| | - marking according 3.2.23 if RG1 exceeded at 200 mm according to IEC/TR 62778 | | N/A |
| | Portable luminaires for children IEC 60598-2-10 and Mains socket outlet nightlights IEC 60598-2-12 not exceed RG1 at 200 mm according to IEC/62778 | | N/A |
| 4.25 | Mechanical hazard | | P |
| | No sharp point or edges | | P |
| *4.26 | Short-circuit protection | | N/A |
| *4.26.1 | Adequate means of uninsulated accessible SELV parts | | N/A |
| *4.26.2 | Short-circuit test with test chain according 4.26.3 | | N/A |
| | Test chain not melt through | | N/A |
| | Test sample not exceed values of Table 12.1 and 12.2 | | N/A |
| 4.27 | Terminal blocks with integrated screwless earthing contacts | | N/A |

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| IEC 60598-1 | | | |
|---------------|---|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | Test according Annex V | | N/A |
| | Pull test of terminal fixing (20 N) | | N/A |
| | After test, resistance < 0,05 Ω | | N/A |
| | Pull test of mechanical connection (50 N) | | N/A |
| | After test, resistance < 0,05 Ω | | N/A |
| | Voltage drop test, resistance < 0,05 Ω | | N/A |
| 4.28 | Fixing of thermal sensing control | | N/A |
| | Not plug-in or easily replaceable type | | N/A |
| | Reliably kept in position | | N/A |
| | No adhesive fixing if UV radiations from a lamp can degrade the fixing | | N/A |
| | Not outside the luminaire enclosure | | N/A |
| | Test of adhesive fixing: | | N/A |
| | Max. temperature on adhesive material ($^{\circ}\text{C}$)..... : | | — |
| | 100 cycles between t min and t max | | N/A |
| | Temperature sensing control still in position | | N/A |
| 4.29 | Luminaires with non-replaceable light source | | N/A |
| | Not possible to replace light source | | N/A |
| | Live part not accessible after parts have been opened by hand or tools | | N/A |
| 4.30 | Luminaires with non-user replaceable light source | | N/A |
| | If protective cover provide protection against electric shock and marked with “caution, electric shock risk” symbol: | | N/A |
| | Minimum two fixing means | | N/A |
| 4.31 | Insulation between circuits | | P |
| | Circuits insulated from LV supply fulfil requirements according 4.31.1 – 4.31.3 | | P |
| | Controllable luminaires requiring same level of insulation for all components, the insulation between control terminals and LV supply fulfil requirements according 4.31.1 – 4.31.3 | | N/A |
| 4.31.1 | SELV circuits | | N/A |
| | Used SELV source | | N/A |
| | Voltage \leq ELV | | N/A |
| | Insulating of SELV circuits from LV supply | | N/A |

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| IEC 60598-1 | | | |
|-------------|--|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | Insulating of SELV circuits from other non SELV circuits | | N/A |
| | Insulating of SELV circuits from FELV | | N/A |
| | Insulating of SELV circuits from other SELV circuits | | N/A |
| | SELV circuits insulated from accessible parts according Table X.1 | | N/A |
| | Plugs not able to enter socket-outlets of other voltage systems | | N/A |
| | Socket outlets does not admit plugs of other voltage systems | | N/A |
| | Plugs and socket-outlets does not have protective conductor contact | | N/A |
| 4.31.2 | FELV circuits | | N/A |
| | Used FELV source | | N/A |
| | Voltage \leq ELV | | N/A |
| | Insulating of FELV circuits from LV supply | | N/A |
| | FELV circuits insulated from accessible parts according Table X.1 | | N/A |
| | Plugs not able to enter socket-outlets of other voltage systems | | N/A |
| | Socket outlets does not admit plugs of other voltage systems | | N/A |
| | Socket-outlets does not have protective conductor contact | | N/A |
| 4.31.3 | Other circuits | | P |
| | Other circuits insulated from accessible parts according Table X.1 | | P |
| | Class II construction with equipotential bonding for protection against indirect contacts with live parts: | | N/A |
| | - conductive parts are connected together | | N/A |
| | - test according 7.2.3 of above | | N/A |
| | - conductive part not cause an electric shock in case of an insulation fault | | N/A |
| | - equipotential bonding in master/slave applications | | N/A |
| | - master luminaire provided with terminal for accessible conductive parts of slave luminaires | | N/A |
| | - slave luminaire constructed as class I | | N/A |
| 4.32 | Overvoltage protective devices | | N/A |

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| IEC 60598-1 | | | |
|-------------|--|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | Comply with IEC 61643-11 | | N/A |
| | External to control gear and connected to earth: | | N/A |
| | - only in fixed luminaires | | N/A |
| | - only connected to protective earth | | N/A |

| | | | |
|------------|---|--------------|------------|
| 5 | EXTERNAL AND INTERNAL WIRING | | P |
| 5.2 | Supply connection and external wiring | | N/A |
| 5.2.1 | Means of connection.....: | E27 lamp cap | P |
| | Outdoor luminaire has not PVC insulated external wiring if not class III or SELV ≤ 25 V a.c./60 V d.c. or protected from outdoor environment | | N/A |
| 5.2.2 | Type of cable.....: | | N/A |
| | Nominal cross-sectional area (mm ²).....: | | N/A |
| | Cables equal to IEC 60227 or IEC 60245 | | N/A |
| 5.2.3 | Type of attachment, X, Y or Z | | N/A |
| 5.2.5 | Type Z not connected to screws | | N/A |
| 5.2.6 | Cable entries: | | N/A |
| | - suitable for introduction | | N/A |
| | - adequate degree of protection | | N/A |
| 5.2.7 | Cable entries through rigid material have rounded edges | | N/A |
| 5.2.8 | Insulating bushings: | | N/A |
| | - suitably fixed | | N/A |
| | - material in bushings | | N/A |
| | - material not likely to deteriorate | | N/A |
| | - tubes or guards made of insulating material | | N/A |
| 5.2.9 | Locking of screwed bushings | | N/A |
| 5.2.10 | Cord anchorage: | | N/A |
| | - covering protected from abrasion | | N/A |
| | - clear how to be effective | | N/A |
| | - no mechanical or thermal stress | | N/A |
| | - no tying of cables into knots etc. | | N/A |
| | - insulating material or lining | | N/A |
| 5.2.10.1 | Cord anchorage for type X attachment: | | N/A |

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| IEC 60598-1 | | | |
|-------------|--|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | a) at least one part fixed | | N/A |
| | b) types of cable | | N/A |
| | c) no damaging of the cable | | N/A |
| | d) whole cable can be mounted | | N/A |
| | e) no touching of clamping screws | | N/A |
| | f) metal screw not directly on cable | | N/A |
| | g) replacement without special tool | | N/A |
| | Glands not used as anchorage | | N/A |
| | Labyrinth type anchorages | | N/A |
| 5.2.10.2 | Adequate cord anchorage for type Y and type Z attachment | | N/A |
| 5.2.10.3 | Tests: | | N/A |
| | - impossible to push cable; unsafe | | N/A |
| | - pull test: 25 times; pull (N)..... : | | N/A |
| | - torque test: torque (Nm)..... : | | N/A |
| | - displacement ≤ 2 mm | | N/A |
| | - no movement of conductors | | N/A |
| | - no damage of cable or cord | | N/A |
| | - function independent of electrical connection | | N/A |
| 5.2.11 | External wiring passing into luminaire | | N/A |
| 5.2.12 | Looping-in terminals | | N/A |
| 5.2.13 | Wire ends not tinned | | N/A |
| | Wire ends tinned: no cold flow | | N/A |
| 5.2.14 | Mains plug same protection | | N/A |
| | Class III luminaire plug | | N/A |
| | No unsafe compatibility | | N/A |
| 5.2.16 | Appliance inlets (IEC 60320) | | N/A |
| | Installation couplers (IEC 61535) | | N/A |
| | Other appliance inlet or connector according relevant IEC standard | | N/A |
| 5.2.17 | No standardized interconnecting cables properly assembled | | N/A |
| 5.2.18 | Used plug in accordance with | | N/A |
| | - IEC 60083 | | N/A |

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| IEC 60598-1 | | | |
|-------------|--|-----------------|----------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | - other standard | | N/A |
| 5.3 | Internal wiring | | P |
| 5.3.1 | Internal wiring of suitable size and type | | P |
| | Through wiring | | N/A |
| | - not delivered/ mounting instruction | | N/A |
| | - factory assembled | | N/A |
| | - socket outlet loaded (A)..... : | | N/A |
| | - temperatures..... : | (see Annex 2) | N/A |
| | Green- yellow for earth only | | N/A |
| 5.3.1.1 | Internal wiring connected directly to fixed wiring | | N/A |
| | Cross-sectional area (mm ²)..... : | | N/A |
| | Insulation thickness | | N/A |
| | Extra insulation added where necessary | | N/A |
| 5.3.1.2 | Internal wiring connected to fixed wiring via internal current-limiting device | | P |
| | Adequate cross-sectional area and insulation thickness | See annex 1 | P |
| 5.3.1.3 | Double or reinforced insulation for class II | | P |
| 5.3.1.4 | Conductors without insulation | | N/A |
| 5.3.1.5 | SELV current-carrying parts | | N/A |
| 5.3.1.6 | Insulation thickness other than PVC or rubber | | N/A |
| 5.3.2 | Sharp edges etc. | | P |
| | No moving parts of switches etc. | | N/A |
| | Joints, raising/lowering devices | | N/A |
| | Telescopic tubes etc. | | N/A |
| | No twisting over 360° | | P |
| 5.3.3 | Insulating bushings: | | N/A |
| | - suitable fixed | | N/A |
| | - material in bushings | | N/A |
| | - material not likely to deteriorate | | N/A |
| | - cables with protective sheath | | N/A |
| 5.3.4 | Joints and junctions effectively insulated | | N/A |
| 5.3.5 | Strain on internal wiring | | N/A |
| 5.3.6 | Wire carriers | | N/A |

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| IEC 60598-1 | | | |
|-------------|--|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 5.3.7 | Wire ends not tinned | | N/A |
| | Wire ends tinned: no cold flow | | P |
| 5.4 | Test to determine suitability of conductors having a reduced cross-sectional area | | N/A |
| | Under test the temperature of the luminaire wiring insulation not exceed the limits stated in Table 12.2 | (see Annex 2) | N/A |
| | No damage to luminaire wiring after test | | N/A |

| | | | |
|------------------|--|--|-----|
| 7 | PROVISION FOR EARTHING | | N/A |
| 7.2.1 + 7.2.3 | Accessible metal parts | | N/A |
| | Metal parts in contact with supporting surface | | N/A |
| | Resistance < 0,5 Ω: | | N/A |
| | Self-tapping screws used | | N/A |
| | Thread-forming screws | | N/A |
| | Thread-forming screw used in a groove | | N/A |
| | Earth makes contact first | | N/A |
| | Terminal blocks with integrated screwless earthing contacts tested according Annex V | | N/A |
| | Protective earthing of the luminaire not via built-in control gear | | N/A |
| 7.2.2 + 7.2.3 | Earth continuity in joints, etc. | | N/A |
| 7.2.4 | Locking of clamping means | | N/A |
| | Compliance with 4.7.3 | | N/A |
| | Terminal blocks with integrated screwless earthing contacts tested according Annex V | | N/A |
| 7.2.5 | Earth terminal integral part of connector socket | | N/A |
| 7.2.6 | Earth terminal adjacent to mains terminals | | N/A |
| 7.2.7 | Electrolytic corrosion of the earth terminal | | N/A |
| 7.2.8 | Material of earth terminal | | N/A |
| | Contact surface bare metal | | N/A |
| 7.2.10 | Class II luminaire for looping-in | | N/A |
| | Double or reinforced insulation to functional earth | | N/A |
| 7.2.11 | Earthing core coloured green-yellow | | N/A |
| | Length of earth conductor | | N/A |

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|-------------|--|--|----------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 8 | PROTECTION AGAINST ELECTRIC SHOCK | | P |
| 8.2.1 | Live parts not accessible | | P |
| | Basic insulated parts not used on the outer surface without appropriate protection | | P |
| | Basic insulated parts not accessible with standard test finger on portable, settable and adjustable luminaires | | N/A |
| | Basic insulated parts not accessible with Ø 50 mm probe from outside, other types of luminaires | | P |
| | Lamp and starterholders in portable and adjustable luminaires comply with double or reinforced insulation requirements | | N/A |
| | Basic insulation only accessible under lamp or starter replacement | E 27 lamp cap and holder used, protection electric shock should put the lamp in position | P |
| | Protection in any position | | P |
| | Double-ended tungsten filament lamp | | N/A |
| | Insulation lacquer not reliable | | N/A |
| | Double-ended high pressure discharge lamp | | N/A |
| | Relevant warning according to 3.2.18 fitted to the luminaire | | N/A |
| 8.2.2 | Portable luminaire adjusted in most unfavourable position | | N/A |
| 8.2.3.a | Class II luminaire: | | P |
| | - basic insulated metal parts not accessible during starter or lamp replacement | | N/A |
| | - basic insulation not accessible other than during starter or lamp replacement | E 27 lamp cap and holder used, protection electric shock should put the lamp in position | P |
| | - glass protective shields not used as supplementary insulation | | N/A |
| 8.2.3.b | BC lampholder of metal in class I luminaires shall be earthed | | N/A |
| 8.2.3.c | SELV circuits with exposed current carrying parts: | | N/A |
| | Ordinary luminaire: | | N/A |
| | - touch current | | N/A |
| | - no-load voltage..... | | N/A |

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| IEC 60598-1 | | | |
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| Clause | Requirement + Test | Result - Remark | Verdict |
| | Other than ordinary luminaire: | | N/A |
| | - nominal voltage | | N/A |
| 8.2.4 | Portable luminaire have protection independent of supporting surface | | N/A |
| 8.2.5 | Compliance with the standard test finger or relevant probe | | P |
| 8.2.6 | Covers reliably secured | | P |
| 8.2.7 | Discharging of capacitors $\geq 0,5 \mu\text{F}$ | 0V | P |
| | Portable plug connected luminaire with capacitor | | N/A |
| | Other plug connected luminaire with capacitor | | N/A |
| | Discharge device on or within capacitor | | N/A |
| | Discharge device mounted separately | | N/A |

| | | | |
|----------|--|------|----------|
| 9 | RESISTANCE TO DUST, SOLID OBJECTS AND MOISTURE | | P |
| | If IP > IP 20 the order of tests as specified in clause 1.12 | | P |
| 9.2 | Tests for ingress of dust, solid objects and moisture: | | — |
| | - classification according to IP..... | IP20 | — |
| | - mounting position during test..... | | — |
| | - fixing screws tightened; torque (Nm)..... | | — |
| | - tests according to clauses..... | | — |
| | - electric strength test afterwards | | P |
| | a) no deposit in dust-proof luminaire | | N/A |
| | b) no talcum in dust-tight luminaire | | N/A |
| | c) no trace of water on current-carrying parts or on insulation where it could become a hazard | | N/A |
| | d) i) For luminaires without drain holes – no water entry | | N/A |
| | d) ii) For luminaires with drain holes – no hazardous water entry | | N/A |
| | e) no water in watertight luminaire | | N/A |
| | f) no contact with live parts (IP 2X) | | P |
| | f) no entry into enclosure (IP 3X and IP 4X) | | N/A |
| | f) no contact with live parts (IP3X and IP4X) | | N/A |
| | g) no trace of water on part of lamp requiring protection from splashing water | | N/A |

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| IEC 60598-1 | | | |
|-------------|---|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | h) no damage of protective shield or glass envelope | | N/A |
| 9.3 | Humidity test 48 h | 25°C, 93%RH | P |

| | | | |
|-----------|---|----------|----------|
| 10 | INSULATION RESISTANCE AND ELECTRIC STRENGTH | | P |
| 10.2.1 | Insulation resistance test | | P |
| | Cable or cord covered by metal foil or replaced by a metal rod of mm Ø | | — |
| | Insulation resistance (MΩ)..... | | — |
| | SELV | | N/A |
| | - between current-carrying parts of different polarity: | | N/A |
| | - between current-carrying parts and mounting surface..... | | N/A |
| | - between current-carrying parts and metal parts of the luminaire..... | | N/A |
| | - between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts..... | | N/A |
| | - Insulation bushings as described in Section 5 | | N/A |
| | Other than SELV | | P |
| | - between live parts of different polarity..... | > 100 MΩ | P |
| | - between live parts and mounting surface..... | > 100 MΩ | P |
| | - between live parts and metal parts..... | > 100 MΩ | P |
| | - between live parts of different polarity through action of a switch..... | | N/A |
| | - between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts..... | | N/A |
| | - Insulation bushings as described in Section 5 | | N/A |
| 10.2.2 | Electric strength test | | P |
| | Dummy lamp | | N/A |
| | Luminaires with ignitors after 24 h test | | N/A |
| | Luminaires with manual ignitors | | N/A |
| | Test voltage (V)..... | | P |
| | SELV | | N/A |
| | - between current-carrying parts of different polarity: | | N/A |

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|-------------|---|----------------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | - between current-carrying parts and mounting surface..... : | | N/A |
| | - between current-carrying parts and metal parts of the luminaire..... : | | N/A |
| | - between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts..... : | | N/A |
| | - Insulation bushings as described in Section 5 : | | N/A |
| | Other than SELV | | P |
| | - between live parts of different polarity..... : | 1480Vac | P |
| | - between live parts and mounting surface..... : | 2960Vac | P |
| | - between live parts and metal parts..... : | 2960Vac | P |
| | - between live parts of different polarity through action of a switch..... : | | N/A |
| | - between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts..... : | | N/A |
| | - Insulation bushings as described in Section 5 : | | N/A |
| 10.3 | Touch current or protective conductor current (mA).: | 0,15mA; limit: 0,7mA | P |

| | | | |
|-----------|--|---|---|
| 11 | CREEPAGE DISTANCES AND CLEARANCES | | P |
| 11.2 | Creepage distances and clearances..... : | See Table 1.7 (11.2) | P |
| | Working voltage (V)..... : | AC100-240V | — |
| | Rated pulse voltage (kV)..... : | | — |
| | Voltage form..... : | Sinusoidal <input checked="" type="checkbox"/> Non-sinusoidal <input type="checkbox"/> | — |
| | PTI..... : | < 600 <input checked="" type="checkbox"/> ≥ 600 <input type="checkbox"/> | — |
| | Impulse withstand category (Normal category II) (Category III Annex U) | Category II <input checked="" type="checkbox"/> Category III <input type="checkbox"/> | — |

| | | | |
|-----------|---|----------------|---|
| 12 | ENDURANCE TEST AND THERMAL TEST | | P |
| | If IP > IP 20 relevant test of (12.4), (12.5) and (12.6) after (9.2) before (9.3) specified in 4.13 | | — |
| 12.3 | Endurance test: | | P |
| | - mounting- position..... : | As normal used | — |
| | - test temperature (°C)..... : | 55°C | — |

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| IEC 60598-1 | | | |
|-------------|--|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | - total duration (h).....: | 240h | — |
| | - supply voltage: Un factor; calculated voltage (V)....: | 1,1X240V | — |
| | - lamp used.....: | | — |
| 12.3.2 | After endurance test: | | P |
| | - no part unserviceable | | P |
| | - luminaire not unsafe | | P |
| | - no damage to track system | | N/A |
| | - marking legible | | P |
| | - no cracks, deformation etc. | | P |
| 12.4 | Thermal test (normal operation) | (see Annex 2) | P |
| 12.5 | Thermal test (abnormal operation) | (see Annex 2) | N/A |
| 12.6 | Thermal test (failed lamp control gear condition): | | N/A |
| 12.6.1 | Through wiring or looping-in wiring loaded by a current of (A) | | — |
| | - case of abnormal conditions.....: | | — |
| | - electronic lamp control gear | | N/A |
| | - measured winding temperature (°C): at 1,1 Un | | — |
| | - measured mounting surface temperature (°C) at 1,1 Un.....: | | N/A |
| | - calculated mounting surface temperature (°C) | | N/A |
| | - track-mounted luminaires | | N/A |
| 12.6.2 | Temperature sensing control | | N/A |
| | - case of abnormal conditions.....: | | — |
| | - thermal link | | N/A |
| | - manual reset cut-out | | N/A |
| | - auto reset cut-out | | N/A |
| | - measured mounting surface temperature (°C).....: | | N/A |
| | - track-mounted luminaires | | N/A |
| 12.7 | Thermal test (failed lamp control gear in plastic luminaires): | | N/A |
| 12.7.1 | Luminaire without temperature sensing control | | N/A |
| 12.7.1.1 | Luminaire with fluorescent lamp ≤ 70W | | N/A |
| | Test method 12.7.1.1 or Annex W | | — |
| | Test according to 12.7.1.1: | | N/A |

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| IEC 60598-1 | | | |
|-------------|--|--|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | - case of abnormal conditions.....: | | — |
| | - Ballast failure at supply voltage (V) | | — |
| | - Components retained in place after the test | | N/A |
| | - Test with standard test finger after the test | | N/A |
| | Test according to Annex W: | | N/A |
| | - case of abnormal conditions.....: | | — |
| | - measured winding temperature (°C): at 1,1 Un.....: | | — |
| | - measured temperature of fixing point/exposed part (°C): at 1,1 Un.....: | | — |
| | - calculated temperature of fixing point/exposed part (°C).....: | | — |
| | Ball-pressure test.....: | See Table 13.2.1) | N/A |
| 12.7.1.2 | Luminaire with discharge lamp, fluorescent lamp > 70W, transformer > 10 VA | | N/A |
| | - case of abnormal conditions.....: | | — |
| | - measured winding temperature (°C): at 1,1 Un.....: | | — |
| | - measured temperature of fixing point/exposed part (°C): at 1,1 Un.....: | | — |
| | - calculated temperature of fixing point/exposed part (°C).....: | | — |
| | Ball-pressure test.....: | See Table 13.2.1) | N/A |
| 12.7.1.3 | Luminaire with short circuit proof transformers ≤ 10 VA | | N/A |
| | - case of abnormal conditions.....: | | — |
| | - Components retained in place after the test | | N/A |
| | - Test with standard test finger after the test | | N/A |
| 12.7.2 | Luminaire with temperature sensing control | | N/A |
| | - thermal link.....: | Yes <input type="checkbox"/> No <input type="checkbox"/> | — |
| | - manual reset cut-out.....: | Yes <input type="checkbox"/> No <input type="checkbox"/> | — |
| | - auto reset cut-out.....: | Yes <input type="checkbox"/> No <input type="checkbox"/> | — |
| | - case of abnormal conditions.....: | | — |
| | - highest measured temperature of fixing point/exposed part (°C):.....: | | — |
| | Ball-pressure test.....: | See Table 13.2.1) | N/A |

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| IEC 60598-1 | | | |
|-------------|---|------------------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 13 | RESISTANCE TO HEAT, FIRE AND TRACKING | | P |
| 13.2.1 | Ball-pressure test..... : | See Test Table 13.2.1) | P |
| 13.3.1 | Needle-flame test (10 s)..... : | See Test Table 13.3.1) | P |
| 13.3.2 | Glow-wire test (650°C)..... : | See Test Table 13.3.2) | P |
| *13.4 | Proof tracking test (IEC 60112)..... : | See Test Table 13.4) | N/A |
| 14 | SCREW TERMINALS | | N/A |
| | Separately approved; component list..... : | (see Annex 1) | N/A |
| | Part of the luminaire..... : | (see Annex 3) | N/A |
| 15 | SCREWLESS TERMINALS AND ELECTRICAL CONNECTIONS | | N/A |
| | Separately approved; component list..... : | (see Annex 1) | N/A |
| | Part of the luminaire..... : | (see Annex 4) | N/A |

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| IEC 60598-1 | | | | | | | |
|---|--|-----|-----|-----------------|-----|-----|---------|
| Clause | Requirement + Test | | | Result - Remark | | | Verdict |
| 11.2 | TABLES: Creepage distances and clearances | | | | | | P |
| Table 11.1 | Minimum distances (mm) for a.c. (50/60 Hz) sinusoidal voltages | | | | | | P |
| RMS working voltage (V) not exceeding | | 50 | 150 | 250 | 500 | 750 | 1000 |
| Creepage distances | | | | | | | |
| Required basic insulation, PTI ≥ 600 | | 0,6 | 0,8 | 1,5 | 3 | 4 | 5,5 |
| Measured | | | | | | | |
| Required basic insulation, PTI < 600 | | 1,2 | 1,6 | 2,5 | 5 | 8 | 10 |
| Measured | | | | | | | |
| Required supplementary insulation PTI ≥ 600 | | - | 0,8 | 1,5 | 3 | 4 | 5,5 |
| Measured | | | | | | | |
| Required supplementary insulation PTI < 600 | | - | 1,6 | 2,5 | 5 | 8 | 10 |
| Measured | | | | | | | |
| Required reinforced insulation | | - | 3,2 | 5 | 6 | 8 | 11 |
| Measured | | | | | | | |
| Clearances | | | | | | | |
| Required basic insulation | | 0,2 | 0,8 | 1,5 | 3 | 4 | 5,5 |
| Measured | | | | | | | |
| Required supplementary insulation | | - | 0,8 | 1,5 | 3 | 4 | 5,5 |
| Measured | | | | | | | |
| Required reinforced insulation | | - | 1,6 | 3 | 6 | 8 | 11 |
| Measured | | | | | | | |
| Table 11.2 | Minimum distances (mm) for non-sinusoidal pulse voltages | | | | | | N/A |
| Rated pulse voltage (peak kV) | | 2,0 | 2,5 | 3,0 | 4,0 | 5,0 | 6,0 |
| Required clearances | | 1,0 | 1,5 | 2 | 3 | 4 | 5,5 |
| Measured | | | | | | | |
| Rated pulse voltage (peak kV) | | 10 | 12 | 15 | 20 | 25 | 30 |
| Required clearances | | 11 | 14 | 18 | 25 | 33 | 40 |
| Measured | | | | | | | |
| Rated pulse voltage (peak kV) | | 50 | 60 | 80 | 100 | - | - |
| Required clearances | | 75 | 90 | 130 | 170 | - | - |
| Measured | | | | | | | |

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| IEC 60598-1 | | | |
|-------------|--------------------|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |

Measured TABLE:

| 11.2 | TABLES: Creepage distances and clearances | | | | | P |
|---|---|------------------|------------------|------------------|------------------|---------|
| Test Location | Working voltage | Measured cl (mm) | Required cl (mm) | Measured cr (mm) | Required cr (mm) | Verdict |
| L/N | 240V~ | 3,2 | 1,5 | 3,2 | 2,5 | Pass |
| Current-carrying parts and accessible parts | 240V~ | 6,8 | 3,0 | 6,8 | 5,0 | Pass |
| Current-carrying parts and mounting surface | 240V~ | 6,8 | 3,0 | 6,8 | 5,0 | Pass |

| | | | | | |
|---|---|-----------------------|-------|--------------------------|---|
| 13.2.1 | TABLE: Ball Pressure Test of Thermoplastics | | | | P |
| Allowed impression diameter (mm): | | | 2,0mm | | — |
| Object/ Part No./ Material | Manufacturer/ trademark | Test temperature (°C) | | Impression diameter (mm) | |
| Plastic enclosure | -- | 77°C | | 0,8mm | |
| Bobbin | -- | 125°C | | 0,6mm | |
| PCB | -- | 125°C | | 0,5mm | |
| Support for lampholder | -- | 125°C | | 0,5mm | |
| Supplementary information:-- | | | | | |

| 13.3.1 | TABLE: Needle-flame test (IEC 60695-11-5) | | | | P |
|------------------------------|---|---|------------------------------------|------------------------------|---------|
| Object/ Part No./ Material | Manufacturer/ trademark | Duration of application of test flame (ta); (s) | Ignition of specified layer Yes/No | Duration of burning (tb) (s) | Verdict |
| PCB | -- | 10s | No | 0s | P |
| Bobbin | -- | 10s | No | 0s | P |
| Support for lampholder | -- | 10s | No | 0s | P |
| Supplementary information:-- | | | | | |

| 13.3.2 | TABLE: Glow-wire test (IEC 60695-2-11) | | | | P |
|-----------------------------|--|---|------------------------------------|------------------------------|---------|
| Glow wire temperature | | | | 650°C | — |
| Object/ Part No./ Material | Manufacturer/ trademark | Duration of application of test flame (ta); (s) | Ignition of specified layer Yes/No | Duration of burning (tb) (s) | Verdict |
| Plastic enclosure | -- | 30s | No | 0s | P |

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| IEC 60598-1 | | | |
|-------------|--------------------|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | |
|---|--|--|-----|
| Any flame or glowing of the sample extinguished within 30 s of withdrawing the glow-wire, and any burning or molten drop did not ignite the underlying parts (Yes/No).....: | | | Yes |
| Supplementary information:-- | | | |

| | | | | | |
|------------------------------|--|--|----|----|---------|
| *13.4 | TABLE: Proof tracking test (IEC 60112) | | | | N/A |
| Test voltage PTI | | 175 V | | | — |
| Object/ Part No./ Material | Manufacturer/ trademark | Withstand 50 drops without failure on three places or on three specimens | | | Verdict |
| -- | -- | -- | -- | -- | -- |
| Supplementary information:-- | | | | | |

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| IEC 60598-1 | | | |
|-------------|--------------------|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |

| ANNEX 1 | | TABLE: Critical components information | | | | | -- |
|-------------------|------|---|-----------------|---|---|---------------------------------------|----|
| Object / part No. | Code | Manufacturer/ trademark | Type / model | Technical data | Standard | Mark(s) of conformity ¹⁾ | |
| Lamp cap | B | Interchangeable | Interchangeable | E27 | EN 60598-1 | Test with appliance | |
| Lamp holder | B | Shenzhen Sonoff Technologies Co., Ltd. | -- | E27 | EN 60598-1, EN 62368 | Test with appliance LCS190326017BS | |
| Holder shell | C | Interchangeable | Interchangeable | Copper alloy, contain copper at least 50% | EN 60598-1, EN 62368 | Test with appliance | |
| Enclosure | C | SABIC INNOVATIVE PLASTICS US LLC | 940(f1) | V-0, 120°C, Min. thickness: 1,5mm | -- | UL E121562 | |
| Internal wire | C | Interchangeable | Interchangeable | Min. 18AWG, Min.80°C | -- | UL | |
| Fuse(F1) | B | XC Electronics(Shenzhen)Corp.,Ltd. | 4T | T1A, 250V | IEC 60127-1 | VDE 40029295 | |
| VDR(RV1) | B | Hongzhi Enterprises Ltd. | HEL10D471K | Min.300V 85°C | IEC 61051-1 IEC 61051-2 IEC 61051-2-2 | VDE 40037512 Comply with Annex Q | |
| (Alt.) | B | HuiZhou Lien Shun Electronic Co., Ltd. | 10D471K | Min.300V 85°C | IEC 61051-1 IEC 61051-2 IEC 61051-2-2 | VDE 40005858 Comply with Annex Q | |
| (Alt.) | B | Thinking Electronic Industrial Co., Ltd. | TVR10471 | Min.300V 85°C | IEC 61051-1 IEC 61051-2 IEC 61051-2-2 | VDE 005944 Comply with Annex Q | |
| (Alt.) | B | Shantou High-New Technology Dev. Zone Songtian Enterprise Co., Ltd. | STE-10D471K | Min.300V 85°C | IEC 61051-1 IEC 61051-2 IEC 61051-2-2 | VDE 40023049 Comply with Annex Q | |
| X-capacitor (C25) | B | Rugao Shuangcheng Electronic Co., Ltd. | MKP | ype:X2, 275V ac 0,047µf, 100°C | DIN EN 60384-14 | VDE 40025673 | |

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| IEC 60598-1 | | | | | | |
|--|--------------------|---|----------------------|--------------------------------|--|---------------------|
| Clause | Requirement + Test | | | Result - Remark | | Verdict |
| (Alt.) | B | Shantou High-New Technology Dev. Zone Songtian Enterprise Co., Ltd. | MPX | Type:X2,275V ac 0,047µf, 110°C | DIN EN 60384-14 | VDE 40034679 |
| (Alt.) | B | SURETOP TECHNOLOGY Co., Ltd. | MPX | Type:X2,275V ac 0,047µf, 105°C | DIN EN 60384-14 | VDE 40034508 |
| Relay(K1) | B | Zhejiang Fanhar Electronics Co., Ltd. | W11-1A2STLE-H | C5V 10A 250VAC/30VDC | EC 61810-1: 2015 | TUV R 50332879 |
| (Alt.) | B | Xiamen Hongfa Electroacoustic Co., Ltd. | HF32FV | 10A, 250V | IEC 61810-1: 2015 | VDE 40012204 |
| (Alt.) | B | SHENZHEN GOLDEN ELECTRICAL APPLIANCES CO.,LTD. | GI-1A-5LH | 10A, 250V | EN 61810-1: 2015 | TUV R 50160373 |
| Y-capacitor (CY1) | B | Shantou High-New Technology Dev. Zone Songtian Enterprise Co., Ltd. | CD221K | Type: Y1, 220pf, 125°C, 250Vac | IEC 60384-14: 2013 | VDE 40025754 |
| (Alt.) | B | Shantou Xinwei Electronic Co., Ltd. | CD221K | ype: Y1, 220pf, 125°C, 250Vac | IEC 60384-14 | VDE 40047774 |
| (Alt.) | B | Hongzhi Enterprises Ltd. | CD221K | ype: Y1, 220pf, 125°C, 250Vac | IEC 60384-14 | VDE 40038760 |
| Transformer (T1) | C | Shenzhen Xinchuanglong Electronics Co., Ltd. Grid | EE10-5V0.5A CSC7102B | CLASS B | EN 60950-1: 2006+A11: 2009+A1: 2010+A12: 2011+A2: 2013 | Test with appliance |
| Components incorporated in transformer | | | | | | |
| Bobbin | C | CHANGSHU SOUTH EAST PLASTIC CO., LTD. | PF2A5-151J | V-0, 150°C | -- | UL E136137 |

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| IEC 60598-1 | | | | | | |
|--|--------------------|---|--------------------|-----------------|--|---------------------|
| Clause | Requirement + Test | | | Result - Remark | | Verdict |
| Magnet wire | C | SHANTOU SHENGANG ELECTRICAL INDUSTRIAL CO., LTD. | xUEW/155, QA x/155 | 155°C | -- | UL E239508 |
| Insulating tape | | SUZHOU MAILADUONA ELECTRIC MATERIAL CO., LTD. | JY312# | 130°C | -- | UL E188295 |
| TIW(Triple insulation wire) | CB | SHENZHEN DARUN SCIENCE AND TECHNOLOGY CO., LTD. | DRTIW-B | 130°C | IEC 60950-1 | VDE 40032470 |
| Varnish | C | ZHUHAI CHANGXIAN NEW MATERIALS TECHNOLOGY CO., LTD. | E962 | 130°C | -- | UL E335405 |
| Tubing | C | FLUO TECH INDUSTRIES CO., LTD. | TFT | 200°C, 300V | -- | UL E175982 |
| Transformer (T1) (Alt.) | C | DongGuan City Shuogoo Electronics Co.,Ltd. | EE10 | CLASS B | EN 60950-1: 2006+A11: 2009+A1: 2010+A12: 2011+A2: 2013 | Test with appliance |
| Components incorporated in transformer | | | | | | |
| Bobbin | C | CHANG CHUN PLASTICS CO., LTD. | T375J | V-0, 150°C | -- | UL E59481 |
| Magnet wire | C | HONGQI GROUP JIANGXI COPPER CO., LTD. | XPEW/155 | 155°C | -- | UL E355168 |
| Insulating tape | C | BONDTEC PACIFIC CO., LTD. | 370S | 130°C | -- | UL E175868 |
| TIW(Triple insulation wire) | B | SHENZHEN DARUN SCIENCE AND TECHNOLOGY CO., LTD. | DRTIW-F | 130°C | IEC 60950-1 | VDE 40032470 |

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| IEC 60598-1 | | | | | | |
|--|--------------------|--|------------|-----------------|--|---------------------|
| Clause | Requirement + Test | | | Result - Remark | | Verdict |
| Tubing | C | SHENZHEN WOER HEAT-SHRINKABLE MATERIAL CO., LTD. | WF | 200°C, 600V | -- | UL E203950 |
| Transformer (T1) (Alt.) | C | DONGGUAN RUNZHI ELECTRONIC TECHNOLOGY CO., LTD. | EE10-2.5mH | CLASS B | EN 60950-1: 2006+A11: 2009+A1: 2010+A12: 2011+A2: 2013 | Test with appliance |
| Components incorporated in transformer | | | | | | |
| Bobbin | C | CHANG CHUN PLASTICS CO., LTD. | T375J | V-0, 150°C | -- | UL E59481 |
| Magnet wire | C | DONG GUAN YIDA INDUSTRIAL CO., LTD. | XUEW/130 | 130°C | -- | UL E344055 |
| Insulating tape | C | JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO., LTD. | PZ | 130°C | -- | UL E165111 |
| TIW(Triple insulation wire) | B | Shanghai Hengyi Special Cable Co., Ltd. | HY-F | 130°C | IEC 60950-1 | VDE 40042631 |
| Varnish | C | QUALIPOLY CHEMICAL CORP | 1032BIH | 130°C | -- | UL E213437 |
| Tubing | C | DONGGUAN CITY CHANGJIE METALS & PLASTIC PRODUCTS CO., LTD. | CJ-TT-T | 200°C, 300V | -- | UL E338209 |
| <p>Supplementary information:</p> <p>¹⁾ Provided evidence ensures the agreed level of compliance. See OD-CB2039.</p> <p>The codes above have the following meaning:</p> <p>A - The component is replaceable with another one, also certified, with equivalent characteristics</p> <p>B - The component is replaceable if authorised by the test house</p> <p>C - Integrated component tested together with the appliance</p> <p>D - Alternative component</p> | | | | | | |

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| IEC 60598-1 | | | |
|-------------|--------------------|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |

| ANNEX 2 | TABLE: Temperature measurements, thermal tests of Section 12 | | P |
|---------|---|-------------------------------------|---|
| | Type reference.....: | SlampherR2 | — |
| | Lamp used.....: | Indicate loading incandescent lamps | — |
| | Lamp control gear used.....: | | — |
| | Mounting position of luminaire.....: | See product manual | — |
| | Supply wattage (W).....: | | — |
| | Supply current (A).....: | 2A | — |
| | Calculated power factor.....: | | — |
| | Table: measured temperatures corrected for $t_a = 45\text{ }^{\circ}\text{C}$: | | P |
| | - abnormal operating mode.....: | | — |
| | - test 1: rated voltage.....: | | — |
| | - test 2: 1,06 times rated voltage or 1,05 times rated wattage.....: | 1,06*240V | — |
| | - test 3: Load on wiring to socket-outlet, 1,06 times voltage or 1,05 times wattage.....: | | — |
| | - test 4: 1,1 times rated voltage or 1,05 times rated wattage.....: | | — |
| | Through wiring or looping-in wiring loaded by a current of A during the test | | — |

| Temperature measurements, ($^{\circ}\text{C}$) | | | | | | |
|--|----------------------|--------|--------|-------|------------------------|-------|
| Part | Clause 12.4 – normal | | | | Clause 12.5 – abnormal | |
| | test 1 | test 2 | test 3 | limit | test 4 | limit |
| E27 Lamp cap | -- | 50,7 | -- | 145 | -- | -- |
| Internal wire | -- | 58,5 | -- | 150 | -- | -- |
| Plastic enclosure | -- | 50,6 | -- | Ref. | -- | -- |
| Contact of lampholder | -- | 98,3 | -- | 165 | -- | -- |
| Wire near lampholder | -- | 87,1 | -- | 90 | -- | -- |
| Rim of lampholder | -- | 80,6 | -- | 210 | -- | -- |
| PCB | -- | 72,4 | -- | 130 | -- | -- |
| RV1 | -- | 60,3 | -- | 85 | -- | -- |
| CX1 | -- | 56,4 | -- | 110 | -- | -- |
| C4 | -- | 54,6 | -- | 105 | -- | -- |

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| IEC 60598-1 | | | | | | |
|----------------------------|--------------------|------|----|-----------------|----|---------|
| Clause | Requirement + Test | | | Result - Remark | | Verdict |
| C5 | -- | 58,8 | -- | 105 | -- | -- |
| T1 Winding | -- | 67,1 | -- | 130 | -- | -- |
| T1 Bobbin | -- | 60,4 | -- | 130 | -- | -- |
| Mounting surface | -- | 49,6 | -- | 90 | -- | -- |
| Ambient | -- | 45,0 | -- | -- | -- | -- |
| Supplementary information: | | | | | | |

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| IEC 60598-1 | | | |
|-------------|--------------------|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | |
|----------------|---|---|-----|
| ANNEX 3 | Screw terminals (part of the luminaire) | | N/A |
| (14) | SCREW TERMINALS | | N/A |
| (14.2) | Type of terminal..... : | | — |
| | Rated current (A)..... : | | — |
| (14.3.2.1) | One or more conductors | | N/A |
| (14.3.2.2) | Special preparation | | N/A |
| (14.3.2.3) | Terminal size | | N/A |
| | Cross-sectional area (mm ²)..... : | | — |
| (14.3.3) | Conductor space (mm)..... : | | N/A |
| (14.4) | Mechanical tests | | N/A |
| (14.4.1) | Minimum distance | | N/A |
| (14.4.2) | Cannot slip out | | N/A |
| (14.4.3) | Special preparation | | N/A |
| (14.4.4) | Nominal diameter of thread (metric ISO thread)..... : | M | N/A |
| | External wiring | | N/A |
| | No soft metal | | N/A |
| (14.4.5) | Corrosion | | N/A |
| (14.4.6) | Nominal diameter of thread (mm)..... : | | N/A |
| | Torque (Nm)..... : | | N/A |
| (14.4.7) | Between metal surfaces | | N/A |
| | Lug terminal | | N/A |
| | Mantle terminal | | N/A |
| | Pull test; pull (N)..... : | | N/A |
| (14.4.8) | Without undue damage | | N/A |

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| IEC 60598-1 | | | |
|-------------|--------------------|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | |
|----------------|---|--|-----|
| ANNEX 4 | Screwless terminals (part of the luminaire) | | N/A |
| (15) | SCREWLESS TERMINALS | | N/A |
| (15.2) | Type of terminal.....: | | — |
| | Rated current (A).....: | | — |
| (15.3.1) | Material | | N/A |
| (15.3.2) | Clamping | | N/A |
| (15.3.3) | Stop | | N/A |
| (15.3.4) | Unprepared conductors | | N/A |
| (15.3.5) | Pressure on insulating material | | N/A |
| (15.3.6) | Clear connection method | | N/A |
| (15.3.7) | Clamping independently | | N/A |
| (15.3.8) | Fixed in position | | N/A |
| (15.3.10) | Conductor size | | N/A |
| | Type of conductor | | N/A |
| (15.5) | Terminals and connections for internal wiring | | N/A |
| (15.5.1) | Mechanical tests | | N/A |
| (15.5.1.1.1) | Pull test spring-type terminals (4 N, 4 samples).....: | | N/A |
| (15.5.1.1.2) | Pull test pin or tab terminals (4 N, 4 samples).....: | | N/A |
| | Insertion force not exceeding 50 N | | N/A |
| (15.5.1.2) | Permanent connections: pull-off test (20 N) | | N/A |
| (15.5.2) | Electrical tests | | N/A |
| | Voltage drop (mV) after 1 h (4 samples).....: | | N/A |
| | Voltage drop of two inseparable joints | | N/A |
| | Number of cycles: | | — |
| | Voltage drop (mV) after 10th alt. 25th cycle (4 samples).....: | | N/A |
| | Voltage drop (mV) after 50th alt. 100th cycle (4 samples).....: | | N/A |
| | After ageing, voltage drop (mV) after 10th alt. 25th cycle (4 samples).....: | | N/A |
| | After ageing, voltage drop (mV) after 50th alt. 100th cycle (4 samples).....: | | N/A |
| (15.6) | Terminals and connections for external wiring | | N/A |

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| IEC 60598-1 | | | |
|-------------|---|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| (15.6.1) | Conductors | | N/A |
| | Terminal size and rating | | N/A |
| (15.6.2) | Mechanical tests | | N/A |
| (15.6.2.1) | Pull test spring-type terminals or welded connections (4 samples); pull (N) | | N/A |
| (15.6.2.2) | Pull test pin or tab terminals (4 samples); pull (N) | | N/A |
| (15.6.3) | Electrical tests | | N/A |
| | Tests according 15.6.3.1 + 15.6.3.2 in IEC 60598-1 | | N/A |

| | | | | | | | | | | | |
|------------------------------|--|---|---|---|---|---|---|---|---|----|-----|
| (15.6.3.1) (15.6.3.2) | TABLE: Contact resistance test / Heating tests | | | | | | | | | | N/A |
| | Voltage drop (mV) after 1 h | | | | | | | | | | — |
| terminal | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| voltage drop (mV) | | | | | | | | | | | |
| | Voltage drop of two inseparable joints | | | | | | | | | | |
| | Voltage drop after 10th alt. 25th cycle | | | | | | | | | | |
| | Max. allowed voltage drop (mV).....: | | | | | | | | | | — |
| terminal | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| voltage drop (mV) | | | | | | | | | | | |
| | Voltage drop after 50th alt. 100th cycle | | | | | | | | | | |
| | Max. allowed voltage drop (mV).....: | | | | | | | | | | — |
| terminal | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| voltage drop (mV) | | | | | | | | | | | |
| | Continued ageing: voltage drop after 10th alt. 25th cycle | | | | | | | | | | |
| | Max. allowed voltage drop (mV).....: | | | | | | | | | | — |
| terminal | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| voltage drop (mV) | | | | | | | | | | | |
| | Continued ageing: voltage drop after 50th alt. 100th cycle | | | | | | | | | | |
| | Max. allowed voltage drop (mV).....: | | | | | | | | | | — |
| terminal | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| voltage drop (mV) | | | | | | | | | | | |
| | | | | | | | | | | | |
| Supplementary information:-- | | | | | | | | | | | |

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| IEC 60598-1 | | | | | |
|-------------|---|-------------------------|------------|-----------------|---------|
| Clause | Requirement + Test | | | Result - Remark | Verdict |
| | ANNEX 5: EMF test result according to IEC/EN 62493 | | | | P |
| 4.2.d | MEASUREMENT RESULTS | | | | P |
| | Measuring with "Van der Hoofden" test head | | | | P |
| | EUT operation model: <input checked="" type="checkbox"/> Normal operation <input type="checkbox"/> Other operation: | | | | P |
| | Voltage: | AC100-240V | Frequency: | 50Hz | -- |
| | Temperature: | 25°C | Humidity: | 55% R.H. | -- |
| | Location of EuT | Measuring distance (cm) | Result (F) | Limit (F) | Verdict |
| | SlampherR2 | 50 | 0,06205 | 0,85 | P |

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Attachment No.1

| IEC 60598_1-ATTACHMENT | | | |
|------------------------|--------------------|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |

ATTACHMENT TO TEST REPORT IEC 60598-1
EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES
Luminaires
Part 1: General requirements and tests

Differences according to..... : EN 60598-1:2015+A1:2018

| | | |
|--|--|----------|
| | CENELEC COMMON MODIFICATIONS (EN) | P |
|--|--|----------|

| | | |
|----------|---|----------|
| 3 | MARKING | P |
| 3.3.101 | For luminaires not supplied with terminal block: Adequate warning on the package | N/A |

| | | |
|----------|------------------------------------|----------|
| 4 | CONSTRUCTION | P |
| 4.11.6 | Electro-mechanical contact systems | N/A |

| | | |
|----------|--|----------|
| 5 | EXTERNAL AND INTERNAL WIRING | P |
| 5.2.1 | Connecting leads | N/A |
| | - without a means for connection to the supply | N/A |
| | - terminal block specified | N/A |
| | - relevant information provided | N/A |
| | - compliance with 4.6, 4.7.1, 4.7.2, 4.10.1, 11.2, 12 and 13.2 of Part 1 | N/A |
| 5.2.2 | Cables equal to EN 50525 | N/A |
| | Replace table 5.1 – Supply cord | N/A |

| | | |
|-----------|--|----------|
| 12 | ENDURANCE TESTS AND THERMAL TESTS | P |
| 12.4.2c | Thermal test (normal operation) see footnote c to table 12.2 relating to unsleeved fixed wiring | P |
| ZB | ANNEX ZB, SPECIAL NATIONAL CONDITIONS (EN) | P |
| 3.3 | DK: power supply cords of class I luminaires with label | N/A |
| 4.5.1 | DK: socket-outlets | N/A |

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Attachment No.1

| IEC 60598_1-ATTACHMENT | | | |
|------------------------|---|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 5.2.1 | CY, DK, FI, GB: type of plug | | P |
| ZC | ANNEX ZC, NATIONAL DEVIATIONS (EN) | | P |
| 4 & 5 | FR: Shuttered socket-outlets 10/16A | | N/A |
| | FR: Safety requirements for high buildings (Arrêté du 30 décembre 2011 portant règlement de sécurité pour la construction des immeubles de grande hauteur et leur protection contre les risques d'incendie et de panique; Section VIII; Article GH 48, Eclairage) Glow-wire test for outer parts of luminaires: | | N/A |
| | - 850°C for luminaires in stairways and horizontal travel paths | | N/A |
| | - 650°C for indoor luminaires | | N/A |
| 13.3 | GB: Requirements according to United Kingdom Building Regulation | | N/A |

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Attachment No.2

| IEC/EN 61347-2-13 Lamp controlgear Part 2-13: Particular requirements for d.c. or a.c. supplied electronic controlgear for LED modules | | | |
|--|---|-----------------|------------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 4(4) | GENERAL REQUIREMENTS | | P |
| | Insulation materials compliance with Annex N | | N/A |
| | Independent lamp controlgear compliance with EN 60598-1 | | N/A |
| | Built-in ballasts with double or reinforced insulation compliance with Annex I | | N/A |
| | IP classification | | N/A |
| | "F" mark | | N/A |
| | Integral lamp controlgear compliance with clause 0.5 of EN 60598-1 | | N/A |
| | Built-in electronic controgear compliance with Annex O | | N/A |
| | SELV controlgear comply with Annex L | | P |
| 4(--) | SELV controlgear comply with the requirements of Annex I | | P |
| 4(--) | A separating, isolating or autotransformer is used, it comply with the relevant parts of IEC 61558. | | P |
| 5(5) | GENERAL NOTES ON TEST | | --- |
| 6 (6) | CLASSIFICATION | | --- |
| | Built-in controlgear.....: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | | --- |
| | Independent controlgear.....: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | | --- |
| | Integral controlgear: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | | --- |
| | Auto-wound controlgear.....: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | | --- |
| | Separating controlgear... : Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | | --- |
| | Isolating controlgear.....: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | | --- |
| | SELV controlgear.....: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | | --- |
| 7(7) | MARKING | | N/A |

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|--|--|-------------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 7.1(7.1) | Mandatory markings: | | N/A |
| | - mark of origin | See marking label | N/A |
| | - model number, type reference | see marking label | N/A |
| | - symbol for independent controlgear, if applicable | | N/A |
| | - correlation between interchangeable parts and controlgear marked | | N/A |
| | - rated supply voltage | | N/A |
| | - earthing symbol | | N/A |
| | - symbol of tw | | N/A |
| | - max. enclosure temperature of ta | | N/A |
| | - cross –section of conductors of terminal | | N/A |
| | - lamp type and rated wattage or wattage range | | N/A |
| | - wiring diagram | | N/A |
| | - value of tc | | N/A |
| | - symbol for temperature declared, thermally protected controlgear | | N/A |
| | - heat sink(s) required | | N/A |
| | - limiting temperature of the winding under abnormal conditions | | N/A |
| | - the rated no-load output voltage | | N/A |
| | - symbol of SELV | | N/A |
| | - maximum working voltage Uout | | N/A |
| 7.1(--) | Constant voltage types | | N/A |
| | - rated output power | | N/A |
| | - rated output voltage | | N/A |
| | Constant current types | | N/A |
| | - rated output power | | N/A |
| | - rated output current | | N/A |
| | Operation with LED modules only | | N/A |
| 7.2(--) | Information to be provided if applicable | | N/A |

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|--|--|-----------------|----------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | - mains-connected windings of transformer | | N/A |
| (7.2) | Marking durable and legible | | N/A |
| | Rubbing 15 s water, 15 s petroleum; marking legible | | N/A |
| 8(10) | PROTECTION AGAINST ACCIDENTAL CONTACT WITH LIVE PARTS | | P |
| 8.1(10.1) | Lamp controlgear which do not rely upon the luminaire enclosure for protection against electric shock compliance Annex A | | N/A |
| | Integral lamp controlgear, which relies upon the luminaire enclosure for protection | | P |
| | Lacquer or enamel is not considered | | N/A |
| | Parts providing protection against accidental contact have adequate mechanical strength | | N/A |
| | - a force of 10 N test with test finger | | N/A |
| 8.2(10.2) | Capacitors > 0,5 μ F: voltage after 1 min (V): < 50V: | 0V | P |
| 8.3(10.3) | SELV-equivalent controlgear accessible parts are insulated from live parts by double or reinforced insulation | | N/A |
| | SELV output circuits is be electrically separated from earth by at least basic insulation | | P |
| | Controlgears providing ELV conductive parts is insulation | | N/A |
| 8.4(10.4) | SELV may be have accessible | | P |
| | The rated output voltage under load does not exceed 25Vr.m.s. or 60Vd.c | | P |
| | Ripple free d.c. where the voltage exceeds 25Vr.m.s. or 60Vripple free d.c. | | P |
| | - for a.c.: 0,7 mA (peak); | | P |
| | - for d.c.: 2,0 mA; | | N/A |
| | - the no-load output does not exceed 35Vpeak or 60Vripple free d.c. | | N/A |
| | If exceeding the values given above, compliance with 500Vdc insulation test | | P |

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|--|--|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | One capacitor Y1 or two capacitors Y2 of the same values used in series between live parts and the body or primary and secondary circuits - Capacitor complying with IEC 60384-14 - Other components bridging the separating transformer complying with IEC 60065, clause 14 | | P |
| 9(8) | TERMINAL | | N/A |
| 9 (8.1) | Screw terminals shall comply with Clause 14 of IEC60598-1. | | N/A |
| | Screwless terminals shall comply with Clause 15 of IEC60598-1. | | N/A |
| 9 (8.2) | Terminals other than integral terminals | | N/A |
| | Comply with relevant IEC standard | (see Annex 1) | N/A |
| | Suit the conditions | | N/A |
| | Satisfy additional relevant requirements of this standard | | N/A |
| 10(9) | PROVISIONS FOR PROTECTIVE EARTHING (EARTHING) | | N/A |
| 10.1(9.1) | Provisions for protective earthing | | N/A |
| | Earthing terminals compliance with clause 8 of EN 61347-1 | | N/A |
| | Contact no-rusting or bare metal | | N/A |
| | Protective earth, symbol | | N/A |
| 10.2(9.2) | Provisions for functional earthing | | N/A |
| 10.3(9.3) | Lamp controlgear with conductors for protective earthing by tracks on printed circuit boards | | N/A |
| | a.c. current of 25 A for 1 min between the earthing terminal or earthing contact and each of the accessible metal parts, measured resistance (Ω): < 0,5 Ω | | N/A |
| 10.4(9.4) | Earthing of built-in lamp controlgear | | N/A |
| 10.5(9.5) | Earthing via independent controlgear | | N/A |

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|--|---|-----------------|------------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 10.5.1(9.5.1) | Earth connection to other equipment | | N/A |
| | minimum cross-section of 1,5mm ² and be of copper, or an equivalent conductive material | | N/A |
| 10.5.2(9.5.2) | Earthing of the lamp compartments powered via the independent lamp controlgear | | N/A |
| | a.c. current of 25 A for 1 min between the earthing terminal or earthing contact and each of the accessible metal parts, measured resistance (Ω): $< 0,5 \Omega$ | | N/A |
| | a.c. current of 10 A for 1 min between the earthing terminal or earthing contact and the accessible metal parts, measured resistance (Ω): $< 0,5 \Omega$ | | N/A |
| 11 (11) | MOISTURE RESISTANCE AND INSULATION | | P |
| | After storage 48 h at 91- 95% relative humidity and 20- 30°C measuring of insulation resistance with d.c. 500 V (M Ω): | | P |
| | $\geq 2 \text{ M}\Omega$ for basic insulation..... : | See Annex L | P |
| | $\geq 4 \text{ M}\Omega$ for double or reinforced insulation : | See Annex L | P |
| | For insulation between primary and secondary circuits with SELV controlgear | See Annex L | P |
| 12(12) | ELECTRIC STRENGTH | | P |
| | Immediately after clause 11 electric strength test for 1 min | | P |
| | Basic insulation for voltages of SELV | | N/A |
| | Up to and including 50 V | | N/A |
| | Above 50V up to and including 1 000 V | | N/A |
| | - basic insulation (2U+1000) | See Annex L | P |
| | - supplementary insulation (2U+1000) | | N/A |
| | - double or reinforced insulation (4U+2000) | See Annex L | P |
| | Solid or thin sheet insulation | | P |
| | No flashover or breakdown after electric strength test | | P |
| 13(13) | THERMAL ENDURANCE TEST FOR WINDINGS OF BALLAST | | --- |

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|--|---|-------------------|----------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 14(14) | FAULT CONDITIONS | | P |
| | When operated under fault conditions the controlgear: | | P |
| | - does not emit flames or molten Material | | P |
| | - does not produce flammable gases | | P |
| | - protection against accidental contact not impaired | | P |
| | lamp controlgear marked with a protective earthing symbol | | P |
| | lamp controlgear marked with a functional earthing symbol | | N/A |
| | Thermally protected controlgear does not exceed the marked temperature value | | N/A |
| | Fault conditions: capacitors, resistors or inductors without proof of compliance with relevant specifications have been short-circuited or disconnected | See below. | P |
| 14.1(14.1) | Short-circuit of creepage distances and clearances if less than specified in clause 16 in Part 1 (except between live parts and accessible metal parts) | Refer to table 14 | P |
| | Distances on printed boards provided with coating according to IEC 60664-3 | | P |
| 14.2(14.2) | Short-circuit or interruption of semiconductor devices | Refer to table 14 | P |
| 14.3(14.3) | Short-circuit across insulation consisting of lacquer, enamel or textile | Refer to table 14 | P |
| 14.4(14.4) | Short-circuit across electrolytic capacitors | Refer to table 14 | P |
| 14.5(14.5) | After the tests the insulation resistance with d.c. 500 V ($M\Omega$) are $\geq 1 M\Omega$ | | P |
| | After the tests the accessible parts has not become live | | P |
| | During the tests, a five-layer tissue paper, where the test specimen is wrapped, does not ignite | | P |
| | Accessible parts compliance with Annex A | | P |
| 14(--) | controlgear provided with the marking  , comply with the requirements specified in Annex C | | N/A |

| | | |
|---------------|----------------------------|----------|
| 15(--) | TRANSFORMER HEATING | P |
|---------------|----------------------------|----------|

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|--|--|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 15.1 | controlgear contains an SELV, isolating and separating transformer, compliance with Clauses L.6 and L.7 of EN 61347-1:2007/AMD2:2012 | | P |
| 15.2 | Normal operation | | P |
| | Test voltage at rated supply voltage | | P |
| 15.3 | Abnormal operation | | P |
| | Test voltage between 90 % and 110 % of the rated supply voltage | | P |
| | Connect double the LED modules or equivalent load | | P |
| | - in parallel to the output terminals, for constant voltage output types | | N/A |
| | - in series to the output terminals, for the constant current output types | | P |
| | No LED module inserted | | P |
| | Output terminal short-circuited | | P |

| | | | |
|---------------|---|--|----------|
| 16(15) | CONSTRUCTION | | P |
| 16.1(15.1) | Wood, cotton, silk, paper and similar fibrous Material not used as insulation | | P |
| 16.2(15.2) | Printed boards used as internal connections complies with clause 14 of EN 61347-1 | | P |
| 16.3(15.3) | Plugs and socket-outlets used in SELV or ELV circuits | | N/A |
| | Plugs and socket-outlets for SELV system comply with the requirements of IEC 60906-3 and IEC60884-2-4. | | N/A |
| | Plugs and socket-outlets for SELV systems with both a rated current ~ 3A and a maximum voltage of 25Va.c. or 60Vd.c. with a power not exceeding 72W | | N/A |
| | - plugs not be able to enter socket-outlets of other standardised systems; | | N/A |
| | - socket-outlets shall not admit plugs of other standardised voltage systems; | | N/A |
| | - socket-outlets shall not have a protective earth contact | | N/A |

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| Clause | Requirement + Test | Result - Remark | Verdict |
| 17(16) | CREEPAGE DISTANCES AND CLEARANCES | | P |
| | Creepage distances and clearances according to Table 3 and 4, as appropriate | | P |
| | Printed boards see clause 14 of EN 61347-1 | | P |
| | SELV controlgears according to Annex L | See Annex L | P |
| 18(17) | SCREWS, CURRENT-CARRYING PARTS AND CONNECTIONS | | N/A |
| | Screws, current-carrying parts and connections in compliance with EN 60598-1 | | N/A |
| 19(18) | RESISTANCE TO HEAT, FIRE AND TRACKING | | P |
| 19.1(18.1) | Parts of insulating Material retaining live parts in position, ball-pressure test: | | P |
| | - part; test temperature (°C) | See report IEC/EN 60598-2-1 | P |
| | - part; test temperature (°C) | | N/A |
| 19.2(18.2) | Printed boards in accordance with IEC 60249-1, | | P |
| 19.3(18.3) | External parts of insulating Material preventing electric shock glow-wire test 650 °C | See report IEC/EN 60598-2-1 | P |
| 19.4(18.4) | Parts of insulating Material retaining live parts in position, needle-flame test 10 s: | | P |
| | - flame extinguished within 30 s | See report IEC/EN 60598-2-1 | P |
| | - no flaming drops igniting tissue paper | | P |
| 19.5(18.5) | Tracking test | | N/A |
| 20(19) | RESISTANCE TO CORROSION | | N/A |
| | Rust protection: | | N/A |
| | - test according 4.18.1 of EN 60598-1 | | N/A |
| | - adequate varnish on the outer surface | | N/A |
| 21 (-) | MAXIMUM WORKING VOLTAGE (U_{out}) IN ANY LOAD CONDITION | | P |
| | Not exceed declared maximum working voltage U _{out} in any load condition | | P |

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| Clause | Requirement + Test | Result - Remark | Verdict |
| (20) | NO-LOAD OUTPUT VOLTAGE | | P |
| | Only applicable for magnetic lamp controlgear with integrated transformer, operating with supply frequencies | | P |
| | No load output voltage not differ more than 10 % from rated voltage | | P |
| Annex A | TEST TO ESTABLISH WHETHER A CONDUCTIVE PART IS A LIVE PART WHICH MAY CAUSE AN ELECTRIC SHOCK | | N/A |
| A.1 | According to Clause A.2 and A.3 | | N/A |
| A.2 | The voltage not exceed 35Va.c. peak or 60Vripple free d.c. | | N/A |
| A.3 | Where the voltage exceeds 35Va.c. peak or 60Vripple free d.c. or a protective impedance device is used the touch-current shall not exceed: | | N/A |
| | - for a.c.: 0,7 mA (peak); | | N/A |
| | - for d.c.: 2,0 mA | | N/A |
| Annex B | PARTICULAR REQUIREMENTS FOR THERMALLY PROTECTED LAMP CONTROLGEAR | | N/A |
| B.7 | Marking | | N/A |
| | - the symbol for "class P" thermally protected lamp controlgear |  | N/A |
| | - the symbol for temperature declared thermally protected lamp controlgear |  | N/A |
| B.8 | Thermal endurance of windings | | N/A |
| B.9 | Lamp controlgear heating | | N/A |
| B.9.1 | Preselection test | | N/A |
| B.9.2 | "Class P" thermally protected lamp controlgear | | N/A |
| B.9.3 | Temperature declared thermally protected lamp controlgear as specified in IEC61347-2-8, with a rated maximum case temperature of 130°C or lower | | N/A |

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|--|--|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| B.9.4 | Temperature declared thermally protected lamp controlgear as specified in IEC61347-2-8 with a rated maximum case temperature exceeding 130°C | | N/A |
| B.9.5 | Temperature declared thermally protected lamp controlgear as specified in IEC61347-2-9 | | N/A |
| Annex C | PARTICULAR REQUIREMENTS FOR ELECTRONIC BALLASTS WITH MEANS OF PROTECTION AGAINST OVERHEATING | | N/A |
| C3 | GENERAL REQUIREMENTS | | N/A |
| C3.1 | Thermal protection means integral with the controlgear, protected against mechanical damage | | N/A |
| | Renewable only by means of a tool | | N/A |
| | If function depending on polarity, for cord-connected equipment protection means in both leads | | N/A |
| | Thermal links comply with IEC 60691 | | N/A |
| | Electrical controls comply with IEC 60730-2-3 | | N/A |
| C3.2 | No risk of fire by breaking (clause C7) | | N/A |
| C.4 | General notes on tests | | N/A |
| C.5 | Classification | | N/A |
| | a) automatic resetting type | | N/A |
| | b) manual resetting type | | N/A |
| | c) non-renewable, non-resetting type | | N/A |
| | d) renewable, non-resetting type | | N/A |
| | e) other type of thermal protection; description | | N/A |
| C.6 | Marking | | N/A |
| C6.1 | Symbol for temperature declared thermally protected ballasts | | N/A |
| C6.2 | Declaration of the type of protection provided | | N/A |
| C7 | Limitation of heating | | N/A |
| C7.1 | Preselection test | | N/A |
| | Test sample placed for at least 12 h in an oven having temperature (tc - 5) K | | N/A |

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|---|--|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | No operation of the protection device | | N/A |
| C7.2 | Functioning of protection means | | N/A |
| | Normal operation of the sample in a test enclosure according to Annex D at an ambient temperature such that (tc +0; -5) °C is obtained | | N/A |
| | No operation of the protection device | | N/A |
| | Introducing of the most onerous test condition determined during test of clause 14 | | N/A |
| | Output of windings connected to the mains supply short-circuited, and other part of the controlgear operated under normal conditions | | N/A |
| | Increasing of the current through the windings continuously until operation of the protection means | | N/A |
| | Continuous measuring of the highest surface temperature | | N/A |
| | Controlgear according to C5 a) or C5 e) operated until stable conditions are achieved | | N/A |
| | Automatic-resetting thermal protectors working 3 times | | N/A |
| | Controlgear according to C5 b) working 6 times | | N/A |
| | Controlgear according to C5 c) and C5) d) working once | | N/A |
| | Highest temperature does not exceed the marked value | | N/A |
| | Any overshoot of 10% over the marked value within 15 min | | N/A |
| Annex D | REQUIREMENTS FOR CARRY OUT THE HEATING TESTS OF THERMALLY PROTECTED LAMP CONTROLGEAR | | N/A |
| D.1 | Test enclosure | | N/A |
| D.2 | Heating of enclosure | | N/A |
| D.3 | Lamp controlgear operating conditions | | N/A |
| D.4 | Lamp controlgear position in the enclosure | | N/A |
| D.5 | Temperature measurements | | N/A |

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

| | | | |
|----------------|--|--|-----|
| Annex E | ANNEX E – USE OF CONSTANT S OTHER THAN 4500 IN t_w TESTS | | N/A |
| E1 | Constant S claimed | | N/A |
| | Claimed test method | | N/A |
| E2 | Procedure A | | N/A |
| | Adequate data provided by the manufacturer | | N/A |
| | The inverse of the slope is greater than or equal to the claimed value of S | | N/A |
| | Compliance with the failure criteria for procedure B | | N/A |
| E3 | Procedure B | | N/A |
| | Claimed value of T1 | | N/A |
| | Claimed value of T2 | | N/A |
| | Endurance test carried out at: | | N/A |
| | T1 (7 samples) | | N/A |
| | T2 (7 samples) | | N/A |
| | Duration of test calculated from equation (2) | | N/A |
| | T1 | | N/A |
| | T2 | | N/A |
| | During the test: - No open circuit - No breakdown insulation | | N/A |
| | The claimed constant S is deemed to be verified | | N/A |

| | | | |
|----------------|--|--|-----|
| Annex F | ANNEX F - DRAUGHT-PROOF ENCLOSURE | | --- |
| | Draught-proof enclosure in accordance with the description | | N/A |
| | Dimensions of the enclosure | | N/A |
| | Other design; description | | N/A |

| | | |
|----------------|--|-----|
| Annex G | EXPLANATION OF THE DERIVATION OF THE VALUES OF PULSE VOLTAGES | --- |
|----------------|--|-----|

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|--|--------------------|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| Annex H | TEST | | --- |

| | | | |
|------------------------------|--|---|-----|
| Annex I (Annex L) | Particular additional requirements for SELV d.c. or a.c. supplied electronic controlgear for LED modules (PARTICULAR ADDITIONAL REQUIREMENTS FOR CONTROLGEARS PROVIDING SELV) | | P |
| I.3 (L.3) | Classification | | P |
| | -Class I | YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> | --- |
| | -Class II | YES <input checked="" type="checkbox"/> NO <input type="checkbox"/> | --- |
| | -Class III | YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> | -- |
| | - non-inherently short circuit proof controlgear | YES <input checked="" type="checkbox"/> NO <input type="checkbox"/> | -- |
| | - inherently short-circuit proof controlgear; | YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> | -- |
| | - fail-safe controlgear; | YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> | -- |
| | - non-short-circuit proof controlgear. | YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> | -- |
| I.4 (L.4) | Marking | | P |
| | Adequate symbols are used | | P |
| I.5 (L.5) | Protection against electric shock | | P |
| | Controlgears providing SELV shall, in addition to the requirements given in 10.3 and 10.4, comply with relevant requirements specified in 9.2 of IEC 61558-1:2005 | | P |
| I.6 (L.6) | Heating | | P |
| | Compliance is checked by the relevant tests of Clause 14 of IEC 61558-1:2005, but with the following adjustments: | | P |
| | - Subclause 14.1, 10th paragraph: Replace 10 % by 6 %; | | P |
| | - Replace Table 1 by the following Table L.2: | | P |
| I.7 (L.7) | Short-circuit and overload protection | | P |
| | Compliance is checked by the relevant tests of Clause 15 of IEC 61558-1:2005, but with the following adjustments: | | P |
| | - Subclause 15.1, second paragraph: Replace the reference to "14.1" by "L.6" of this annex | | P |

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|--|--|-----------------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | – Subclause 15.1, third paragraph after Table 3: Replace the reference to "18.3" by "L.8.3" of this annex | | P |
| | – Subclause 15.3.4: This subclause is not applicable. | | N/A |
| | – Subclause 15.5.1, third paragraph: Replace the reference to "14.2" by "L.6" of this annex. | | P |
| I.8 (L.8) | Insulation resistance and electric strength | | P |
| I.8.2 (L.8.2) | Insulation resistance is measured with a d.c. voltage of approximately 500 V applied, the measurement being made 1 min after application of the voltage | | P |
| | - Between input circuits and output circuits $\geq 5\text{M}\Omega$ | $>500\text{ M}\Omega$ | P |
| | Between metal part of class II convertors which are separated from live parts by basic insulation only and the body $\geq 5\text{M}\Omega$ | | N/A |
| | Between metal foil in contact with the inner and outer surfaces of enclosures of insulating material $\geq 2\text{M}\Omega$ | | N/A |
| I.8.3 (L.8.3) | value of the test voltage and the points of application are given in Table L.4. | | P |
| I.9 (L.9) | Construction | | P |
| I.9.1 (L.9.1) | The construction of transformers used in controlgears providing SELV shall be comply with all relevant parts specified in 19.12 of IEC 61558-1:2005 | | P |
| I.10 (L.10) | Components | | P |
| | Components used as protective devices in controlgears providing SELV shall comply with relevant requirements given in 20.6, 20.7, 20.8, 20.9, 20.10 and 20.11 of IEC 61558-1:2005. | | P |
| I.11 (L.11) | Creepage distances, clearances and distances through insulation | | P |
| | Creepage distances, clearances and distances through insulation shall be not less than the values shown in Table 3 and Table L.5. | | P |

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|--|---|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | In addition transformers which form an integral part of a controlgear providing SELV shall comply with relevant requirements and tests given in Clause 26 of IEC 61558-1:2005 | | P |

| Annex J (--) | Particular additional safety requirements for a.c., a.c./d.c. or d.c. supplied electronic controlgear for emergency lighting | | N/A |
|-----------------|---|---|-----|
| J.1 (--) | General | | N/A |
| J.2 (--) | Marking | | N/A |
| J.2.1 | Mandatory markings | | N/A |
| | a) symbol of a.c., a.c./d.c. or d.c maintained emergency electronic controlgear |  | N/A |
| | b) rated emergency power supply voltage or voltage range | | N/A |
| J.2.2 | Information to be provided if applicable | | N/A |
| | a) Limits of the ambient temperature range | | N/A |
| | b) Emergency output factor | | N/A |
| | c) Information on whether the control gear is intended for use in luminaires for high-risk task area lighting | | N/A |
| J.3 | General notes on tests | | N/A |
| J.4 | Starting conditions | | N/A |
| | Control gears shall start rated load(s) without adversely affecting the performance when operated in emergency mode | | N/A |
| J.5 | Operating condition | | N/A |
| | The provisions of 7.2 of IEC 62384:2006 apply at 90 % and 110 % of the rated emergency supply voltage | | N/A |
| J.6 | Emergency supply current | | N/A |
| | At the rated emergency supply voltage or voltage range, the emergency supply current shall not differ by more than ± 15 % from the declared value when the control gear is operated in emergency mode with maximum load power | | N/A |

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|--|---|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| J.7 | EMC immunity | | N/A |
| J.8 | Pulse voltage from central battery systems | | N/A |
| | The d.c. supplied emergency controlgear shall withstand, without failure, any pulses caused by switching other equipment in the same circuit | | N/A |
| J.9 | Tests for abnormal conditions | | N/A |
| | The provisions of Clause 12 of IEC 62384:2006 apply | | N/A |
| J.10 | Temperature cycling test and endurance test | | N/A |
| | The provisions of Clause 13 of IEC 62384:2006 apply | | N/A |
| J.11 | Functional safety | | N/A |
| | EOFx is measured 5 s and 60 s after switch on of the control gear in emergency mode at maximum emergency supply voltage and at minimum emergency supply voltage | | N/A |
| | For the calculation of EOFx the lower value of the measurements below is used: | | N/A |
| | a) electrical output parameter measured after 60 s at maximum voltage/electrical output parameter measured in reference setting | | N/A |
| | b) electrical output parameter measured in steady state conditions at minimum supply voltage/electrical output parameter measured in reference setting | | N/A |
| | After 5 s of operation with maximum emergency supply voltage at least 50 % of the declared EOFx shall be reached | | N/A |
| (Annex I) | ADDITIONAL REQUIREMENTS FOR BUILT-IN MAGNATIC BALLASTS WITH DOUBLE OR REINFORCED INSULATION | | --- |
| (Annex J) | SCHEDULE OF MORE ONEROUS REQUIREMENTS | | --- |
| (Annex K) | CONFORMITY TESTING DURING MANUFACTURE | | --- |
| (Annex M) | DIELECTRIC STRENGTH TEST VOLTAGES FOR CONTROLGEAR INTENDED FOR THE USE IN IMPULSE WITHSTAND CATEGORY III | | -- |

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|--|--|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| (Annex N) | REQUIREMENTS FOR INSULATION MATERIALS USED FOR DOUBLE OR REINFORCED INSULATION | | N/A |
| (N.4) | Material requirements | | N/A |
| (N.4.1) | The insulation material shall comply with IEC 60085 and the IEC 60216 series. | | N/A |
| (N.4.2) | The adequacy of solid insulation is verified by the electric strength test (Clause 12) of at least 5 kV or the applicable test voltage specified in Table N.1 multiplied by 1,35, whichever is the greater | | N/A |
| (N.4.3) | Thin sheet insulation | | N/A |
| (N.4.3.1) | Thickness and composition of thin sheet insulation | | N/A |
| (N.4.3.2) | Mandrel test (electric strength test during mechanical stress) | | N/A |
| (Annex O) | ADDITIONAL REQUIREMENTS FOR BUILT-IN ELECTRONIC CONTROLGEAR WITH DOUBLE OR REINFORCED INSULATION | | N/A |
| (O.6) | Marking | | N/A |
| | Built-in Electronic controlgear with double or reinforced insulation marking | | N/A |
| (O.7) | Protection against accidental contact with live parts | | N/A |
| | it shall not be possible for the test finger to make contact with metal parts protected by basic insulation only. | | N/A |
| (O.8) | Terminals | | N/A |
| | Clause 8 of this standard applies. | | N/A |
| (O.9) | Provision for earthing | | N/A |
| | For doubled or reinforced built-in electronic controlgear only functional earthing terminals are permitted. The requirements of Clause 9 of this standard apply to the functional earthing terminals. | | N/A |
| (O.10) | Moisture resistance and insulation | | N/A |
| | Clause 11 of this standard applies. | | N/A |
| (O.11) | Electric strength | | N/A |
| | Clause 12 of this standard applies. | | N/A |

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Attachment No.2

| IEC/EN 61347-2-13 Lamp controlgear Part 2-13: Particular requirements for d.c. or a.c. supplied electronic controlgear for LED modules | | | |
|--|---|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| (O.13) | Fault conditions | | N/A |
| | At the end of the tests, when the controlgear has returned to the ambient temperature, shall comply in addition to Clause O.12 between live part and accessible metal parts or external parts of insulating material in contact with the supporting surface, but with the values of the dielectric strength test reduced to 35 % of the value requested in Table 1. | | N/A |
| | Furthermore, the insulation resistance according to Clause O.10 between live part and accessible metal parts or external parts of insulating material in contact with the supporting surface shall not be less than 4 M . | | N/A |
| (O.14) | Construction | | N/A |
| | All accessible metal parts of the electronic built-in electronic controlgear shall be insulated from live parts by double or reinforced insulation. | | N/A |
| (O.15) | Creepage distances and clearances | | N/A |
| | For built-in electronic controlgear, provided with double or reinforced insulation, the corresponding values given for luminaires in EN 60598-1 apply. | | N/A |
| (O.16) | Screws, current-carrying parts and connections | | N/A |
| | Clause 17 of this standard applies. | | N/A |
| (O.17) | Resistance to heat and fire | | N/A |
| | Clause 18 of this standard applies. | | N/A |
| (O.18) | Resistance to corrosion | | N/A |
| | Clause 19 of this standard applies. | | N/A |
| (P) | Creepage distances and clearances and distance through isolation (DTI) for lamp controlgear which are protected against pollution by the use of coating or potting | | N/A |
| (P.1) | General | | N/A |
| | P.2 applies if creepage distances less than the minimum in Table 7 and 8 | | N/A |
| | P.3 applies if clearance less than the minimum in Table 9, 10 and 11 | | N/A |
| (P.2) | Creepage distances | | N/A |

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| IEC/EN 61347-2-13 | | | |
|---|--|-----------------|---------|
| Lamp controlgear | | | |
| Part 2-13: Particular requirements for d.c. or a.c. supplied electronic controlgear for LED modules | | | |
| Clause | Requirement + Test | Result - Remark | Verdict |
| (P.2.2) | Minimum creepage distances for working voltages and rated voltages with frequencies up to 30 kHz (Table P.1) | | N/A |
| | Basic or supplementary insulation: | | N/A |
| | Required creepage.....: | | — |
| | Measured.....: | | N/A |
| | Supplementary information | | — |
| | Reinforced insulation: | | N/A |
| | Required creepage.....: | | — |
| | Measured.....: | | N/A |
| | Supplementary information | | — |
| (P.2.3) | Creepage distances for working voltages with frequencies above 30 kHz (Table P.2) | | N/A |
| | Voltage \hat{U}_{out} kV | | — |
| | Frequency.....: | | — |
| | Required distance.....: | | — |
| | Measured.....: | | N/A |
| | Supplementary information | | — |
| (P.2.4) | Compliance with the required creepage distances | | N/A |
| (P.2.4.1) | Compliance in accordance with 16.3.3 and test according P.2.4.2 | | N/A |
| (P.2.4.3) | Electrical tests after conditioning | | N/A |
| (P.2.4.3.1) | Insulation resistance and electric strength according Clause 11 and 12 | | N/A |
| (P.3) | Distance through isolation | | N/A |
| (P.3.4) | Electrical tests after conditioning | | N/A |
| (P.3.4.1) | Insulation resistance and electric strength according Clause 11 and 12 | | N/A |
| (P.3.4.2) | Impulse voltage dielectrical test | | N/A |
| | Basic or supplementary insulation: | | N/A |
| | Working/rated voltage | | — |
| | Impulse voltage.....: | | N/A |
| | Supplementary information | | — |
| | Reinforced insulation: | | N/A |
| | Working/rated voltage | | — |
| | Impulse voltage.....: | | N/A |
| | Supplementary information | | — |

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| IEC/EN 61347-2-13 Lamp controlgear Part 2-13: Particular requirements for d.c. or a.c. supplied electronic controlgear for LED modules | | | |
|--|---|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| (Q) | Example for Up calculation | | N/A |
| (R) | Concept of creepage distances and clearances | | N/A |
| (S) | Examples of controlgear insulation coordination | | N/A |
| (T) | Creepage distances and clearances for controlgear with a higher degree of availability (impulse withstand category III) | | N/A |

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|---|--|--|-----|-----------------|-----|---------|------|
| Lamp controlgear | | | | | | | |
| Part 2-13: Particular requirements for d.c. or a.c. supplied electronic controlgear for LED modules | | | | | | | |
| Clause | Requirement + Test | | | Result - Remark | | Verdict | |
| 14 | TABLE: tests of fault conditions | | | | | P | |
| Part | Simulated fault | Test result | | | | Hazard | |
| DB1(2-4) | s-c | Fuse open, no flame, no flammable gas, no molten parts, no hazard. | | | | YES /NO | |
| C4 | s-c | Fuse open, no flame, no flammable gas, no molten parts, no hazard. | | | | YES /NO | |
| C6 | s-c | Fuse open, no flame, no flammable gas, no molten parts, no hazard. | | | | YES /NO | |
| T1 | s-c | Shut down, recoverable, no flame, no flammable gas, no molten parts, recoverable, no hazard. | | | | YES /NO | |
| C4 | s-c | Shut down, recoverable, no flame, no flammable gas, no molten parts, recoverable, no hazard. | | | | YES /NO | |
| Output | s-c | Shut down, recoverable, no flame, no flammable gas, no molten parts, recoverable, no hazard. | | | | YES /NO | |
| 17 (16) | TABLES: Creepage distances and clearances | | | | | | |
| Table 3 | Minimum distances (mm) for a.c. (50/60 Hz) sinusoidal voltages | | | | | | |
| RMS working voltage (V) not exceeding | | 50 | 150 | 250 | 500 | 750 | 1000 |
| Creepage distances | | | | | | | |
| Required basic insulation, PTI ≥ 600 | | 0,6 | 0,8 | 1,5 | 3 | 4 | 5,5 |
| Measured | | | | | | | |
| Required basic insulation, PTI < 600 | | 1,2 | 1,6 | 2,5 | 5 | 8 | 10 |
| Measured | | | | | | | |
| Required supplementary insulation PTI ≥ 600 | | - | 0,8 | 1,5 | 3 | 4 | 5,5 |
| Measured | | | | | | | |
| Required supplementary insulation PTI < 600 | | - | 1,6 | 2,5 | 5 | 8 | 10 |
| Measured | | | | | | | |
| Required reinforced insulation | | - | 3,2 | 5 | 6 | 8 | 11 |
| Measured | | | | | | | |
| Clearances | | | | | | | |

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|---|---|-----|-----|-----------------|-----|-----|---------|
| Lamp controlgear | | | | | | | |
| Part 2-13: Particular requirements for d.c. or a.c. supplied electronic controlgear for LED modules | | | | | | | |
| Clause | Requirement + Test | | | Result - Remark | | | Verdict |
| <i>Required basic insulation</i> | 0,2 | 0,8 | 1,5 | 3 | 4 | 5,5 | |
| <i>Measured</i> | | | | | | | |
| <i>Required supplementary insulation</i> | - | 0,8 | 1,5 | 3 | 4 | 5,5 | |
| <i>Measured</i> | | | | | | | |
| <i>Required reinforced insulation</i> | - | 1,6 | 3 | 6 | 8 | 11 | |
| <i>Measured</i> | | | | | | | |
| Table 4 | Minimum distances (mm) for non-sinusoidal pulse voltages | | | | | | |
| <i>Rated pulse voltage (peak kV)</i> | 2,0 | 2,5 | 3,0 | 4,0 | 5,0 | 6,0 | 8,0 |
| <i>Required clearances</i> | 1,0 | 1,5 | 2 | 3 | 4 | 5,5 | 8 |
| <i>Measured</i> | | | | | | | |
| <i>Rated pulse voltage (peak kV)</i> | 10 | 12 | 15 | 20 | 25 | 30 | 40 |
| <i>Required clearances</i> | 11 | 14 | 18 | 25 | 33 | 40 | 60 |
| <i>Measured</i> | | | | | | | |
| <i>Rated pulse voltage (peak kV)</i> | 50 | 60 | 80 | 100 | - | - | - |
| <i>Required clearances</i> | 75 | 90 | 130 | 170 | - | - | - |
| <i>Measured</i> | | | | | | | |

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

| | | | |
|----------------------|--|--------|---|
| 6 | STANDARD RATINGS (Sample 1, 2 and 3) | | P |
| 6.1 | Rated voltage in accordance with required values | 250V | P |
| 6.2 & 6.3 | Rated current in accordance with required values | 2A | P |
| 6.4 | Rated operating temperature for T marked lampholders not less than minimum values | 170 °C | P |

| | | |
|----------|--|---|
| 7 | CLASSIFICATION (See front page) (Sample 1, 2 and 3) | P |
|----------|--|---|

| | | | |
|------------|---|--|-----|
| 8 | MARKING (Sample 1, 2 and 3) | | P |
| 8.1 | Lampholders, other than E5 and E10, marked with: | | P |
| | - rated current | | P |
| | - rated wattage stated in the manufacturer's instructions | | P |
| | - rated voltage | | P |
| | - rated ignition voltage (kV) | | N/A |
| | - symbol for nature of current | | P |
| | - mark of origin | | P |
| | - type reference | | P |
| | - IP number | | N/A |
| | - rated max. operating temperature T(°C) | | P |
| | - alternatively, max. operating temperature stated in manufacturer's instructions | | N/A |
| | - the distances for impulse withstand category II or III stated in manufacturer's instructions or the like. | | P |
| | The information that lampholder for use in class II applications is indicated in the manufacturer's catalogue or the like. | | P |
| | Enclosed reinforced insulated lampholders offer an adequate level of protection for use in luminaires where they are accessible in normal use. This information is indicated in the manufacturer's catalogue or the like. | | N/A |

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|--------------|---|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | For partly reinforced insulated lampholders, sufficient creepage distances and clearances to outer accessible surfaces will require additional protection to some parts of the lampholder by the luminaire design or by use of additional attachment(s) or cover(s). This information is indicated in the manufacturer's catalogue or the like. | | P |
| | Lampholders E10 marked with: | | N/A |
| | - rated voltage | | N/A |
| | - mark of origin | | N/A |
| | - type reference | | N/A |
| | - IP number | | N/A |
| | Lampholders E5 marked with: | | N/A |
| | - mark of origin | | N/A |
| | - type reference | | N/A |
| 8.2 | Required symbol used: | | P |
| | - for current | | P |
| | - for voltage | | P |
| | - for direct current | | N/A |
| | - IP number | | N/A |
| | - for temperature | | P |
| 8.3 | IP number on the outside of the lampholder | | N/A |
| 8.4 | Earthing terminal (if any) indicated by the symbol | | N/A |
| | The symbol not placed on screws, removable washers or other removable parts | | N/A |
| 8.5 | The marking durable and legible after the test of Chapter 19 and: | | P |
| | - after test with water, 15 s | | P |
| | - after test with petroleum spirit, 15 s | | P |

| | | | |
|------------|---|--|---|
| 9 | DIMENSIONS (Sample 1, 2 and 3) | | P |
| 9.1 | Distance from outer end of screwed shell to central contact, measured according to Standard Sheet 7005-20 of IEC 60061-2 | | P |
| | Compliance with gauges according to IEC 60061: | | P |

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| EN IEC 60238 | | | |
|--------------|---|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | - for E10, E14, and E40 ("Go"- gauge, 7006- 25) | | N/A |
| | - for E27 ("Go"- gauge, 7006- 25A) | | P |
| | - for E10, E14, E27, and E40 ("Not go"- gauge, 7006- 26) | | P |
| | - Lampholders designed with a barrel thread for shade holder rings and shade holder rings comply with IEC 60399 | | N/A |
| 9.2 | Lampholders shall allow insertion of all corresponding lamps so as to make contact. Compliance with gauges according to IEC 60061-3: | | P |
| | - for E14, 7006- 30 and 7006- 31 | | N/A |
| | - for E14, candle, 7006- 30A and 7006- 31 | | N/A |
| | - for E27, 7006- 21 and 7006- 22A | | P |
| | - for E40, 7006- 23 and 7006- 24 | | N/A |
| | E5 and E10 lampholders checked by means of the corresponding lamp delivered by the manufacturer | | N/A |
| | For lampholders use in appliances other than luminaries only: | | N/A |
| | Check maximum lamp outlines according to IEC 60630 | | N/A |
| | Following this checking, the contact-making gauge applied | | N/A |
| 9.3 | Minimum thickness of screwed shell according to table 1: | | P |
| | - unsupported | | N/A |
| | - supported | | P |
| | Minimum thickness of resilient side or central contacts | | P |
| 9.4 | Minimum length of screw engagement of shell and dome according to table 2 (not applicable for lampholders E5 and E10): | | P |
| | - metal lampholder: rolled thread | | N/A |
| | - metal lampholder: cut thread | | N/A |
| | - lampholder of insulating material | | P |
| | - or at least two turns and complying with the test of 16.3 | | P |
| 9.5 | Threaded entry lampholder provided with the following screw threads (fig. 1a or 1b) (not applicable for lampholders E5 and E10): | | N/A |
| | - for E14: M10x1 | | N/A |

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| EN IEC 60238 | | | |
|--------------|--|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | - for E27: M10x1, M13x1 or M16x1 | | N/A |
| | - for E40: M13x1, M16x1 (or G3/8A) | | N/A |
| | Compliance with gauges according to fig. 2a or 2b. | | N/A |
| 9.6 | Dimensions of threaded entries and set screws in accordance with table 3 (not applicable for lampholders E5 and E10): | | P |
| | - length of thread, metal | | P |
| | - length of thread, insulating material | | P |
| | - diameter of set screw with head | | P |
| | - diameter of set screw without head: one screw | | P |
| | - diameter of set screw without head: two or more screws | | N/A |
| 9.7 | The lampholder does not interfere with proper engagement or disengagement of lamps, the contacts do not present a cutting edge to the lamp cap: | | P |
| | - for E27, compliance with gauge 7006-22B of IEC 60061-3 | | P |
| | - other lampholders checked by inspection | | N/A |

| | | | |
|-------------|---|--|-----|
| 10 | PROTECTION AGAINST ELECTRIC SHOCK (Sample 1, 2 and 3) | | P |
| 10.1 | Lamp caps not accessible during insertion in lampholders E5, E10, E14, and E27. Lamp cap not accessible when fully inserted in lampholder E40: | | P |
| | - for E10, compliance checked by means of corresponding lamp and standard test finger | | N/A |
| | - for E14, compliance with gauge 7006-31 of IEC 60061-3 | | N/A |
| | - for E27, compliance with gauge 7006-22A of IEC 60061-3 | | P |
| | - for E40, compliance with gauge 7006-24 of IEC 60061-3 | | N/A |
| 10.2 | External parts of enclosed and independent lampholders so designed that live parts are not accessible | | P |
| | Candle lampholder tested with/without decorative cover | | N/A |
| | Compliance checked with standard test finger | | N/A |

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

| | | | |
|-------------|---|--|-----|
| | For E5 and E10 lampholders with a separate insert part mounted in an outer sleeve, the insert part is subjected to a pull force of 60N for 1 min in the axial direction | | N/A |
| | The axial misalignment movement performed during the test is up to 10° in any direction | | N/A |
| | During this test, the insert part is not become loose to such an extent that live parts become accessible with the standard test finger | | P |
| 10.3 | Parts providing protection against accidental contact reliably secured so that they will not become detached when a tightly fitting lamp is removed or when a shade is rotated | | P |
| | Torque test with test cap according to fig. 13 (test cap B) or fig. 14 : | | P |
| | - E14 with a torque of 1 Nm | | N/A |
| | - E27 with a torque of 2 Nm | | P |
| | Not possible to dismantle lampholders E5 and E10 without the aid of a tool | | N/A |
| 10.4 | Provisions for attaching a shade to the lampholder, e.g. a shade ring | | P |
| | The shade not to be fixed between parts providing protection against electric shock | | P |
| 10.5 | External parts made of insulating material for: | | P |
| | - drip- proof lampholders | | N/A |
| | - lampholders with a rated voltage of more than 250 V | | N/A |
| | - switched lampholders | | N/A |
| | - E5 and E10 lampholders | | N/A |
| | If not of insulating material, these parts cannot become live even in the event of a fault | | N/A |
| | Lacquer or enamel not used to provide adequate protection | | P |
| | Switched-lampholders with external metal parts are permitted under the conditions of 13.3 | | N/A |

| | | |
|-------------|--|-----|
| 11 | TERMINALS (Sample 1, 2 and 3) | N/A |
| 11.1 | Terminals suitable for the connection of: | N/A |

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|--------------------------|---|--|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | - for lampholders E10: 0,5 to 0,75 mm ² | | N/A |
| | - for lampholders E14 and E27 with M10x1 threaded entry: 0,5 to 1,0 mm ² | | N/A |
| | - for other lampholders E27: 0,5 to 2,5 mm ² | | N/A |
| | - for lampholders E40 with a rated current of 16 A: 1,5 to 4 mm ² | | N/A |
| | - for lampholders E40 with a rated current of 32 A: 2,5 to 6 mm ² | | N/A |
| | Lampholders E27 with screwless terminals intended for use by luminaire or equipment manufacturers only need not fulfil the requirements for all the appropriate nominal cross-section areas | | N/A |
| 11.2.1 and 11.2.2 | The lampholder provided with at least one of the following means of connection: | | N/A |
| | - screw terminals complying with 11.3 to 11.6 and 11.8 | | N/A |
| | - screwless terminals complying with Section 15 of IEC 60598- 1, provided that heating test is carried out at the rated operating temperature of the lampholder $\pm 5^{\circ}\text{C}$ | (see Annex) | N/A |
| | - tabs or pins for push-on connections complying with Section 15 of IEC 60598- 1 | | N/A |
| | - posts for wire wrapping complying with IEC 60352- 1 | | N/A |
| | - soldering lugs complying with requirements for good solderability (e.g. IEC 60068- 2- 20) | Integral lampholder used a soldered connection method in the end product | P |
| | - connecting leads (tails) complying with the requirements prescribed in 11.10 | | N/A |
| | Terminal screws have a metric or comparable thread | | N/A |
| | For E5, E10 and similar small lampholders, connections are alternatively made by: | | N/A |
| | - soldering | | N/A |
| | - welding | | N/A |
| | - crimping | | N/A |
| | - or equally effective means | | N/A |

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| Clause | Requirement + Test | Result - Remark | Verdict |
| | The screwless terminals satisfactory with both rigid conductors and flexible cables or cords, unless untended for sale to luminaire or equipment manufacturers | | N/A |
| 11.3 | Terminals fixed in such a way that they will not work loose | | N/A |
| | Torque test with fastening and loosening ten times according to Section 14 of IEC 60598-1 | | N/A |
| 11.4 | Inspection after the tests of 11.1 and 20.3 shows: | | N/A |
| | - conductor clamped between metal surfaces | | N/A |
| | - no damage to the conductor | | N/A |
| | - conductor prevented from slipping out | | N/A |
| | - no special preparation of the conductor necessary | | N/A |
| 11.5 | Dimension of terminals of the pillar type according to table 4: | | N/A |
| | - nominal thread diameter | | N/A |
| | - diameter of the hole for conductor | | N/A |
| | - length of thread in pillar | | N/A |
| | - difference between diameter of the hole and diameter of the screw, max. 0,6 mm | | N/A |
| | - length of threaded part of the terminal screw | | N/A |
| 11.6 | Dimensions of terminals of the screw type according to table 5: | | N/A |
| | - nominal thread diameter | | N/A |
| | - length of thread under the head | | N/A |
| | - length of thread in the nut | | N/A |
| | - nominal difference between diameter of head and shank of the screw | | N/A |
| | - height of head of the screw | | N/A |
| | - length of the screw in case of a washer or pressure plate | | N/A |
| 11.7 | Terminals so located that there is no risk of accidental contact between live parts and accessible parts during test with a 4 mm long escaped wire from a stranded conductor | | N/A |
| 11.8 | The conductor in pillar terminal visible, or | | N/A |

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| | the length of the hole beyond the terminal screw is at least equal to half the value of the diameter of the screw or 2,5 mm, whichever is the higher. | | N/A |
| 11.9 | Floating terminals: | | N/A |
| | - have no appreciable lateral play | | N/A |
| | - do not move longitudinally more than 3 mm when a lamp is removed or inserted | | N/A |
| 11.10 | The requirements of 11.2 to 11.6 and 11.8 do not apply to lampholders which are intended to be factory- mounted in luminaries and which are provided with connecting leads (tails) | | N/A |
| | Lampholders intended to be factory- mounted provided with: | | N/A |
| | - connecting leads (tails) | | N/A |
| | - tab- terminals | | N/A |
| | - other equally effective means | | N/A |
| | Heat resistant leads connected by: | | N/A |
| | - soldering | | N/A |
| | - welding | | N/A |
| | - crimping | | N/A |
| | - by other at least equivalent method | | N/A |
| | Test: see 20.2 | | N/A |
| | After the test, the lampholders show no damage within the meaning of this standard. | | N/A |

| | | | |
|-------------|---|--|-----|
| 12 | PROVISION FOR EARTHING (Sample 1, 2 and 3) | | N/A |
| 12.1 | Threaded entry lampholders, cord grip lampholders and backplate lampholders with provisions for earthing provided with at least one internal earthing terminal | | N/A |
| | Other lampholders without threaded entry, provided with an external earthing terminal | | N/A |
| 12.2 | Accessible metal parts of lampholders without earthing terminal allow reliable earthing | | N/A |
| | Earth continuity between metal dome and outer shell if not separated from live parts by double or reinforced insulation | | N/A |

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| Clause | Requirement + Test | Result - Remark | Verdict |
| | Test: see 15.3 | | N/A |
| | The resistance between the means of earthing and the dome(or the outer shell as appropriate) is measured, shall not exceed 0,1Ω.. | | N/A |
| 12.3 | Earthing terminal complies with clause 11 | | N/A |
| | Clamping means adequately locked against accidental loosening | | N/A |
| | Screw terminals not possible to loosen by hand | | N/A |
| | Screwless terminals not possible to loosen unintentionally by hand | | N/A |
| 12.4 | No risk of corrosion resulting from contact with the copper conductor | | N/A |
| | The screw or the body of the earthing terminal made of brass or other metal no less resistant to corrosion | | N/A |
| | Contact surfaces are bare metal | | N/A |
| 12.5 | Metal parts of cord anchorage, including clamping screws, insulated from earthing circuit | | N/A |

| | | | |
|-------------|--|--|-----|
| 13 | CONSTRUCTION (Sample 1, 2 and 3) | | P |
| 13.1 | The lampholder provided with a screw thread of Edison form for holding the lamp | | P |
| | Screw shell made of metal | | P |
| | Metal thread is continuous over a length not less than specified in Standard Sheet 7005-20 of IEC60061-2 | | P |
| | Screw shell made of other material and so designed and with such tolerances that proper engagement with relevant gauges is ensured throughout the life of the holder | | N/A |
| | Terminal/contact assembly and the screw shell are so constructed and located as to prevent canting or rotation which may impair the use of the lampholder | | N/A |
| | Deviation from the requirement for a continuous thread is made to provide a technical advantage | | N/A |
| | The lampholder complies with the feeler gauge of 0,08 x 5,0 mm | | P |

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| Clause | Requirement + Test | Result - Remark | Verdict |
| | The lampholder does not score the neck of the bulb of a normal standard lamp | | P |
| | The male screw thread of an adapter is of the same size or larger than its female screw thread | | P |
| 13.2 | The space in the dome is ample for fitting a flexible cable or cord with specified cross-sectional area | | N/A |
| | No sharp edges or a shape likely to damage the insulation of the conductors | | N/A |
| | Test with lampholder screwed onto a conduit of 10 cm length | | N/A |
| | After dismantling, cables or cord not damaged | | N/A |
| | The threaded entry provided with means to prevent the conduit from entering too far | | N/A |
| | The dome screwed onto a steel conduit with the specified torque | | N/A |
| | The conduit does not enter the space for the supply wires in the dome | | N/A |
| | The lampholder does not show any change impairing its further use | | N/A |
| 13.3 | Accessible parts of switched lampholders made of insulating material unless a loose wire or screw cannot bridge accessible parts and live parts | | P |
| 13.4 | Contact between metal screw shell and metal outer shell is prevented by an insulating ring which cannot be separated by hand | | P |
| 13.5 | It is possible to lock the threaded entry on the conduit | | P |
| | It is possible to operate the locking device from the inside, if provided as part of the lampholder (except for E5 and E10 lampholders) | | P |
| | For lampholders having an integral locking device, by the test of 16.4 | | P |
| 13.6 | Cord anchorage relieves the conductor from strain and prevents twisting | | N/A |
| | The outer covering of the cord is gripped in the lampholder | | N/A |

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| Clause | Requirement + Test | Result - Remark | Verdict |
| | The outer covering of the cord is protected from abrasion | | N/A |
| | It is clear how relief from strain and prevention from twisting shall be effected | | N/A |
| | Not possible to push the cord into the lampholder to such an extent that the cord is subjected to undue mechanical or thermal stress | | N/A |
| | Methods such as tying the cord into a knot or tying the ends with strings are not permissible | | N/A |
| | Cord anchorage made of insulating material or provided with a fixed insulating lining if an insulation fault on the cord can make accessible metal parts live | | N/A |
| | Cord anchorage is so designed that: | | N/A |
| | - at least one part is fixed to or integral with the lampholder | | N/A |
| | - it is suitable for the different types of flexible cord which may be connected to the lampholder | | N/A |
| | - it does not exert excessive pressure on the cord | | N/A |
| | - it is unlikely to be damaged when tightened or loosened as in normal use | | N/A |
| | Cord anchorage suitable for flexible cords of the following types: | | N/A |
| | - 60245 IEC 51 | | N/A |
| | - 60245 IEC 53 or the like | | N/A |
| | - 60227 IEC 52 | | N/A |
| | Not possible to push the cord further into the lampholder after connection | | N/A |
| | Pull test 100 times and torque test according to table 6 | | N/A |
| | Test repeated with specified types of cord and cross-sectional area | | N/A |
| | Pull test 50 times, 30 N for lampholders designed for chain connection | | N/A |
| | No damage to the flexible cord during the test | | N/A |
| | After the test: | | N/A |
| | - no displacement of cord by more than 2 mm | | N/A |

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| Clause | Requirement + Test | Result - Remark | Verdict |
| | - no noticeable movement at the end of the conductors in the terminals | | N/A |
| 13.7 | Suspending devices shall have no accessible metal parts which can become alive, even in the event of a fault in the lampholder | | P |
| | Suspending devices intended to be screwed into a threaded entry lampholder comply with the requirements of 13.2 | | P |
| 13.8 | Backplate lampholder not specifically intended for building-in provided with a recess for supply wires | | N/A |
| | This recess have following minimum dimensions (not applicable for lampholders E5 and E10) | | N/A |
| | - height 7mm; | | N/A |
| | - length equal to diameter or width of the base; | | N/A |
| | - width 16mm enlarged to a circular space 23mm in diameter in the centre. | | N/A |
| 13.9 | Backplate lampholder, other than those intended for building-in provided with holes for fixing screws (not applicable for lampholders E5 and E10) | | N/A |
| | Holes for the fixing screws comply with gauge (fig. 3) | | N/A |
| | The bush enters the recess for the screw head | | N/A |
| 13.10 | Backplate lampholder provided with cable entries on accessible external surface | | N/A |
| | The cable entries allow the introduction of cable covering, conduit or trunking etc. so far as to afford complete mechanical protection for a distance of min. 1 mm | | N/A |
| 13.11 | The contacts so designed and constructed so as to ensure effective and reliable electrical contact | | N/A |
| | The function of the contacts independent of the function of an optional locking device between dome and outer shell | | N/A |
| | E40 lampholder of the contact-making shell type | | N/A |
| | A single side-contact is allowed | | N/A |
| 13.12 | The lampholder not fitted with a socket-outlet | | P |

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| | | | |
|-------|--|--|-----|
| 13.13 | Device for bridging the lamp filament not integral with the lampholder | | N/A |
| 13.14 | Lampholders with a retention device can withstand a certain unscrewing torque. | | N/A |
| | Removal torque.....: | | N/A |

| | | | |
|------|--|--|-----|
| 14 | SWITCHED-LAMPHOLDERS (Sample 10, 11 and 12) | | P |
| 14.1 | Other lampholders than ordinary lampholders E14 and E27 with a rated voltage 250 V not provided with switches | | N/A |
| 14.2 | Compliance with 13.3 and the additional requirements of 14.3 to 14.5, or the relevant requirements in IEC 61058-1 | | P |
| 14.3 | Capable of making and breaking a load comprising a filament lamp or self-ballasted lamp for general lighting service (GLS) | | P |
| | Operating temperature T: | | P |
| | 200 operations at 1,1 x Un, 1,25 x Rated current and $\cos\phi = 0,6 \pm 0.05$: | | P |
| | 20 000 operations at Un, Rated current and $\cos\phi = 1$: | | P |
| | Test for insulation resistance (15.4) | | P |
| | Test for electric strength (15.4) | | P |
| 14.4 | No accidental contact between supply wires and moving parts of the switch | | P |
| 14.5 | The switch-operating member is effectively insulated from live parts and does not expose live parts | | P |
| 14.6 | Switches in lampholders for refrigerators and food freezers tested according to lamp's rated wattage | | P |

| | | | |
|------|--|--|-----|
| 15 | MOISTURE RESISTANCE, INSULATION RESISTANCE AND ELECTRIC STRENGTH (Sample 1, 2 and 3) | | P |
| 15.1 | Drip-proof construction provides the necessary degree of protection against ingress of water | | N/A |

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| Clause | Requirement + Test | Result - Remark | Verdict |
| | Electric strength test as specified in 15.4 | | N/A |
| | Inspection shows that no water has entered to an appreciable extent | | N/A |
| 15.2 | Inlet openings of drip-proof lampholders allow connections such that they prevent drops of water from reaching the inside of the lampholder | | N/A |
| 15.3 | Humidity treatment: | | P |
| | - 48 h for ordinary lampholders | | P |
| | - 168 h for IPX1 drip-proof lampholders | | N/A |
| | No damage to the lampholder | | P |
| 15.4 | a) Minimum insulation resistance at 500 VDC: between live parts of different polarity (2 MΩ): | | P |
| | - with test cap (fig. 11) | | P |
| | - on the empty lampholder | | P |
| | b) Minimum insulation resistance at 500 VDC: between live parts connected together and the body (4 MΩ): | | P |
| | - with test cap (fig. 11) | | P |
| | - on the empty lampholder | | P |
| | c) Minimum insulation resistance at 500 VDC: between accessible metal parts and metal foil on the inside of insulating lining, if any (4 MΩ) | | N/A |
| | Electric strength test for 1 min: | | P |
| | - between live parts of different polarity (2U + 1000 V or 500 V for E5 and E10) | | P |
| | - between live parts connected together and the body (2U + 1000 V) | | P |
| | - between accessible metal parts and metal foil on the inside of insulating lining, if any (2U + 1000 V) | | N/A |
| | - between live parts and other metal parts in switched lampholders (switch closed and open) (2U + 1000 V) | | N/A |
| | For enclosed and unenclosed reinforced insulated lampholders, the test voltage is determined from Table 10.2 of IEC 60598-1 | | P |
| | - between live parts of different polarity (2U + 1000 V) | | P |

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| Clause | Requirement + Test | Result - Remark | Verdict |
| | - between live parts connected together and the body (4U + 2000 V) | | P |
| | - between accessible metal parts and metal foil on the inside of insulating lining, if any (4U + 2000 V) | | N/A |
| | - between live parts and other metal parts in switched lampholders (switch closed and open) (4U + 2000 V) | | N/A |
| | No flashover or breakdown occurs | | P |

| | | | |
|-------------|--|--|-----|
| 16 | MECHANICAL STRENGTH (Sample 1, 2 and 3) | | P |
| 16.2 | Mechanical strength of the outer shell, the screw shell and the dome checked by screwing a test cap into the sample with appropriate torque for 1 min: | | P |
| | - the sample clamped at the outer shell | | P |
| | - the sample fixed by the threaded entry, dome or backplate | | P |
| | - for other E14 lampholders | | N/A |
| | The lampholder shows no change impairing its further use | | P |
| 16.3 | The mechanical strength of the connection between shell and dome/backplate checked by the torque applied to the outer shell for 1 min (not applicable for lampholders E5 and E10) | | P |
| | No loosening of the connection or other damage | | P |
| 16.4 | The fixing of the threaded entry to a brass conduit checked after tightening the set-screw with a torque according to table 12 | | P |
| | No loosening of the connection caused by anti-clockwise application for 1 min of a torque according to 16.2 | | P |
| | Repeated test, if necessary, with the set-screw further tightened | | N/A |
| | Necessary torque (Nm): | | N/A |
| 16.5 | The strength of the connection between dome and threaded entry checked as indicated in fig. 12 (not applicable for candle lampholders) | | P |
| | A sag of max. 5 mm measured at the end of the mandrel | | P |

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| Clause | Requirement + Test | Result - Remark | Verdict |
| | Repeated test, if necessary, shows no damage impairing the normal use of the lampholder | | P |
| 16.6 | a) Impact test, 4 blows applied by pendulum apparatus according to fig. 8: | | P |
| | - ceramic parts (100±1mm) | | N/A |
| | - other material (150±1,5mm) | | P |
| | - candle lampholders without decorative cover (100±1mm) | | N/A |
| | After the test, no serious damage | | P |
| | Creepage distances and clearances not reduced below values of Cl. 18 | | P |
| | b) Tumbling barrel test (50 times, 500 mm) on lampholders E5 and E10 | | N/A |
| | Mechanical strength checked by means of spring hammer. | | N/A |
| | For lampholders with a snap-on outer shell, the outer shell remain in its intended position after push and pull test | | P |
| | Additionally, the outer shell not be removed by the standard fingertip of 30 N | | P |
| 16.7 | Pressure test on metal outer shell and metal dome, pressure according to table 11 for 1 min (not applicable for lampholders E5 and E10) | | P |
| | Maximum deformation: | | P |
| | - during the test | | P |
| | - after the test | | P |
| 16.8 | Entry spouts and glands tightened with appropriate torque for 1 min | | P |
| | Glands, spouts and enclosure show no damage | | P |
| 16.9 | Backplate lampholder fixed by means of screws to a rigid flat steel sheet (not applicable for lampholders E5) | | N/A |
| | Torque test 0,5 Nm on 3 mm screws for lampholders E10 | | N/A |
| | Torque test 1,2 Nm on 4 mm screws for other lampholders | | N/A |
| | No damage impairing further use | | N/A |

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

| | | | |
|------|--|--|---|
| 17 | SCREWS, CURRENT-CARRYING PARTS AND CONNECTIONS (Sample 1, 2 and 3) | | P |
| 17.1 | Screws and mechanical connections withstand mechanical stresses | | P |
| | No damage impairing further use of screwed connection when screws or nuts are tightened and loosened with a torque according to table 12: | | P |
| | - 5 times for screws operating in a female thread in metal | | P |
| | - 10 times for screws operating in a female thread in insulating material | | P |
| 17.2 | Min. length of engagement in thread in insulating material 3 mm + 1/3 D or 8 mm | | P |
| | Correct introduction of screw into the thread is ensured | | P |
| 17.3 | Contact pressure not transmitted through insulating material, other than ceramic, unless resiliency compensates for any possible shrinkage | | P |
| | Screws not of metal which is soft or liable to creep | | P |
| | Screws transmitting contact pressure, and screws with a nominal diameter of less than 3 mm, operated when connections are made to the lampholder, are screwed into metal (locking screws excepted) | | P |
| 17.4 | Screws and rivets for electrical as well as mechanical connections locked against loosening | | P |
| 17.5 | Current-carrying parts made of copper, an alloy containing at least 50% copper, or material having characteristics at least equivalent | | P |

| | | | |
|------|--|--|-----|
| 18 | CREEPAGE DISTANCES AND CLEARANCES (Sample 1, 2 and 3) | | P |
| 18.1 | Creepage distances and clearances not less than specified minimum values measured with inserted lamp having specified diameter of central contact and without a lamp, with and without supply wires | | P |
| | Impulse withstand category.....: | | N/A |
| | Basic insulation: | | P |

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| Clause | Requirement + Test | Result - Remark | Verdict |
| | Creepage distance: | | P |
| | 1. between live parts of different polarity, between live parts and a non-live screw shell | | P |
| | - insulation with PTI \geq 600 | | N/A |
| | - insulation with PTI $<$ 600 | | P |
| | 2. between live parts and external metal parts, mounting surfaces, loose metal cover, if any, the outer surface of parts of insulating material which are permanently fixed to the holder, including screws or devices for fixing covers or fixing the holder to its support | | P |
| | - insulation with PTI \geq 600 | | N/A |
| | - insulation with PT $<$ 600 | | P |
| | Clearances: | | P |
| | 1. between live parts of different polarity, between live parts and a non-live screw shell | | P |
| | 2. between live parts and external metal parts, mounting surfaces, loose metal cover, if any, the outer surface of parts of insulating material which are permanently fixed to the holder, including screws or devices for fixing covers or fixing the holder to its support | | P |
| | Reinforced insulation: | | P |
| | Creepage distance: | | P |
| | between live parts and external metal parts, mounting surfaces, loose metal cover, if any, the outer surface of parts of insulating material which are permanently fixed to the holder, including screws or devices for fixing covers or fixing the holder to its support | | P |
| | - insulation with PTI \geq 600 | | N/A |
| | - insulation with PT $<$ 600 | | P |
| | Clearances: | | P |
| | between live parts and external metal parts, mounting surfaces, loose metal cover, if any, the outer surface of parts of insulating material which are permanently fixed to the holder, including screws or devices for fixing covers or fixing the holder to its support | | P |
| | Clearances for the rated ignition voltage of the holder is not less than the values given in Table 14: | | P |

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Attachment No.3

| EN IEC 60238 | | | |
|--------------|--|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | Basic insulation: | | P |
| | Reinforced insulation: | | P |
| | Creepage distances and clearances between live parts of different polarity for E5 and E10 intended for series-connected lamps(Max. rated voltage 25V for E5, 60V for E10) | | N/A |
| 18.2 | Sealing compound not protruding above the edge of the cavity | | N/A |

| | | | |
|----|--|--|-----|
| 19 | NORMAL OPERATION (Sample 4, 5 and 6) | | P |
| | Normal use causes no excessive wear or other harmful effect (not applicable for lampholders E5 and E10) | | P |
| | Test cap according to fig. 5 screwed in and out 100 times, using a test apparatus according to fig. 4 at a rate of 15 times/min. with specified torque | | P |
| | Clamping of the lampholder shifted from dome/backplate to outer shell after half the number of operations | | P |
| | At the end of the test, the specimen shall show: | | P |
| | - no wear impairing its operation | | P |
| | - no damage impairing protection against electric shock | | P |
| | - no loosening of electrical contacts | | P |
| | - no loosening of the connection between shell and dome | | P |
| | - no loosening of the set screw locking the threaded entry | | P |
| | Compliance with gauges according to 9.2: | | P |
| | - for E14, 7006-30 and 7006-31 | | N/A |
| | - for E14 candle, 7006-30A and 7006-31 | | N/A |
| | - for E27, 7006-21 and 7006-22A | | P |
| | - for E40, 7006-23 and 7006-24 | | N/A |
| | Electric strength test according to 15.4 but with the test voltage reduced by 500 V | | P |

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

| | | | |
|------|---|--|-----|
| 20 | GENERAL RESISTANCE TO HEAT (Sample 4, 5 and 6) | | P |
| 20.2 | For E27 lampholders: | | P |
| | - compliance with gauges according to 7006-22C and 7006-22D of IEC 60061-3 | | P |
| | - test cap screwed into the lampholder with required torque and the lampholder is placed in a vertical holder-up position in a heating cabinet maintained at the specified temperature for 48 h and loaded with rated current | | P |
| | - after cooling down, still compliance with gauges according to 7006-22C and 7006-22D of IEC 60061-3 | | P |
| | For E14 lampholders: | | N/A |
| | - test cap B screwed into the lampholder with required torque and the lampholder is placed in a vertical holder-up position in a heating cabinet maintained at the specified temperature for 48 h and loaded with rated current | | N/A |
| | - after cooling down, test cap A is screwed into the lampholder 10 times and the contact resistance between terminals is measured (0,02 Ω) | | N/A |
| 20.3 | The lampholder connected with cables of maximum cross-sectional area according to 11.1 and terminal screws tightened with 2/3 of the torque specified in 17.1 (not applicable for lampholders E5 and E10) | | P |
| | After loading the lampholder for 1 h with 1,25 times rated current, the temperature rise of the terminals does not exceed 45 K | | P |
| | The conductors are not damaged after the test | | P |
| 20.4 | The lampholder with test cap B screwed fully home placed in a vertical holder-up position in a heating cabinet maintained for 168 h at the temperature specified in table 15 or marked temperature T plus 35 K (not applicable for integral lampholders) | | P |
| | Lampholders for refrigerators and food freezers tested for 16 h at rated minimum temperature | | P |
| | a) Impact test, 4 blows applied by pendulum apparatus according to fig. 8: | | P |

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| EN IEC 60238 | | | |
|--------------|---|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | - ceramic parts (100±1mm) | | N/A |
| | - other material (150±1,5mm) | | P |
| | - candle lampholders without decorative cover (100±1mm) | | N/A |
| | After the test, no serious damage | | P |
| | Creepage distances and clearances not reduced below values of Cl. 18 | | P |
| | b) Tumbling barrel test (50 times, 500 mm) on lampholders E5 and E10 | | N/A |
| | Mechanical strength checked by means of spring hammer. | | N/A |
| | Lampholders for refrigerators and food freezers tested for 168 h at rated operating temperature plus 35 K | | N/A |
| | During the test, the sample shows no: | | P |
| | - reduction of the protection against electric shock | | P |
| | - loosening of electrical contacts | | P |
| | - cracks, swelling or shrinking | | P |
| | - sealing compound flowing out | | N/A |
| | Edison threads checked by means of "Go"-gauge in accordance with Standard Sheet 7006-25 or 7006-25A of IEC 60061-3 | | P |
| | The lampholder withstands the mechanical strength test in accordance with 16.2 but the torque reduced to 50% | | P |
| | The lampholder withstands the mechanical strength test in accordance with 16.6 but the height of fall reduced to 5 cm | | P |

| | | | |
|-------------|--|--|----------|
| 21 | RESISTANCE TO HEAT, FIRE AND TRACKING | | P |
| 21.1 | Ball-pressure test on parts retaining contacts at temperature according to 20.4 or 125 °C for E5 and E10 (not applicable for integral lampholders) (Sample 7) | | P |
| | Diameter of impression not exceeding 2 mm (Sample 7) | | P |

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| EN IEC 60238 | | | |
|--------------|--------------------|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | |
|------|---|--|-----|
| | Ball-pressure test on external parts, including those with a conductive exterior, at temperature according to 20.4 (no test for E5 or E10) (Sample 7) | | P |
| | Diameter of impression not exceeding 2 mm (Sample 7) | | P |
| | Not applicable for integral lampholders | | N/A |
| 21.3 | Glow-wire test 650 °C on parts providing protection against electric shock, including those with a conductive exterior and parts of insulating material retaining ELV parts in position (Sample 8) | | P |
| | Any flame or glowing extinguished within 30 s, and any flaming drops do not ignite tissue paper (Sample 8) | | P |
| 21.4 | Needle-flame test 10s on parts retaining live parts in position or ELV lamp contacts in position (Sample 8) | | P |
| | Any self-sustaining flame extinguished within 30s, and any flaming drops do not ignite tissue paper (Sample 8) | | P |
| 21.5 | Tracking test on parts retaining live parts or ELV parts in position of drip-proof lampholders (Sample 9) | | N/A |
| | Lampholder withstands 50 drops without failure at PTI 175 (Sample 9) | | N/A |

| | | | |
|------|---|--|-----|
| 22 | RESISTANCE TO SEASON CRACKING AND TO RUSTING (Sample 9) | | N/A |
| 22.1 | Contacts and other parts of copper or copper alloy do not show any cracks after the test in ammonium chloride solution, inspected at 8 x optical magnification | | N/A |
| 22.2 | No signs of rust after the prescribed test | | N/A |

| | | |
|--|--|-----|
| | ANNEX: screwless terminals (test made on separate samples) | N/A |
|--|--|-----|

| | | | |
|--------|----------------------------|--|-----|
| (15) | SCREWLESS TERMINALS | | N/A |
| (15.2) | Type of terminal.....: | | — |

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| EN IEC 60238 | | | |
|--------------|--|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | Rated current (A)..... : | | — |
| (15.3.1) | Material | | N/A |
| (15.3.2) | Clamping | | N/A |
| (15.3.3) | Stop | | N/A |
| (15.3.4) | Unprepared conductors | | N/A |
| (15.3.5) | Pressure on insulating material | | N/A |
| (15.3.6) | Clear connection method | | N/A |
| (15.3.7) | Clamping independently | | N/A |
| (15.3.8) | Fixed in position | | N/A |
| (15.3.10) | Conductor size | | N/A |
| | Type of conductor | | N/A |
| (15.5) | Terminals and connections for internal wiring | | N/A |
| (15.5.1) | Mechanical tests | | N/A |
| (15.5.1.1.1) | Pull test spring-type terminals (4 N, 4 samples)..... : | | N/A |
| (15.5.1.1.2) | Pull test pin or tab terminals (4 N, 4 samples)..... : | | N/A |
| | Insertion force not exceeding 50 N | | N/A |
| (15.5.1.2) | Permanent connections: pull-off test (20 N) | | N/A |
| (15.5.2) | Electrical tests | | N/A |
| | Voltage drop (mV) after 1 h (4 samples)..... : | | N/A |
| | Voltage drop of two inseparable joints | | N/A |
| | Number of cycles: | | — |
| | Voltage drop (mV) after 10th alt. 25th cycle (4 samples)..... : | | N/A |
| | Voltage drop (mV) after 50th alt. 100th cycle (4 samples)..... : | | N/A |
| | After ageing, voltage drop (mV) after 10th alt. 25th cycle (4 samples)..... : | | N/A |
| | After ageing, voltage drop (mV) after 50th alt. 100th cycle (4 samples)..... : | | N/A |
| (15.6) | Terminals and connections for external wiring | | N/A |
| (15.6.1) | Conductors | | N/A |
| | Terminal size and rating | | N/A |

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

| | | | |
|------------|---|--|-----|
| 15.6.2 | Mechanical tests | | N/A |
| (15.6.2.1) | Pull test spring-type terminals or welded connections (4 samples); pull (N) | | N/A |
| (15.6.2.2) | Pull test pin or tab terminals (4 samples); pull (N) | | N/A |
| (15.6.3) | Electrical tests | | N/A |
| | Tests according 15.6.3.1 + 15.6.3.2 in IEC 60598-1 | | N/A |

| | | | | | | | | | | | |
|----------------------------|--|---|---|---|---|---|---|---|---|----|-----|
| (15.6.3.1) (15.6.3.2) | TABLE: Contact resistance test / Heating tests | | | | | | | | | | N/A |
| | Voltage drop (mV) after 1 h | | | | | | | | | | — |
| terminal | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| voltage drop (mV) | | | | | | | | | | | |
| | Voltage drop of two inseparable joints | | | | | | | | | | |
| | Voltage drop after 10th alt. 25th cycle | | | | | | | | | | |
| | Max. allowed voltage drop (mV).....: | | | | | | | | | | — |
| terminal | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| voltage drop (mV) | | | | | | | | | | | |
| | Voltage drop after 50th alt. 100th cycle | | | | | | | | | | |
| | Max. allowed voltage drop (mV).....: | | | | | | | | | | — |
| terminal | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| voltage drop (mV) | | | | | | | | | | | |
| | Continued ageing: voltage drop after 10th alt. 25th cycle | | | | | | | | | | |
| | Max. allowed voltage drop (mV).....: | | | | | | | | | | — |
| terminal | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| voltage drop (mV) | | | | | | | | | | | |
| | Continued ageing: voltage drop after 50th alt. 100th cycle | | | | | | | | | | |
| | Max. allowed voltage drop (mV).....: | | | | | | | | | | — |
| terminal | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| voltage drop (mV) | | | | | | | | | | | |
| | | | | | | | | | | | |
| Supplementary information: | | | | | | | | | | | |

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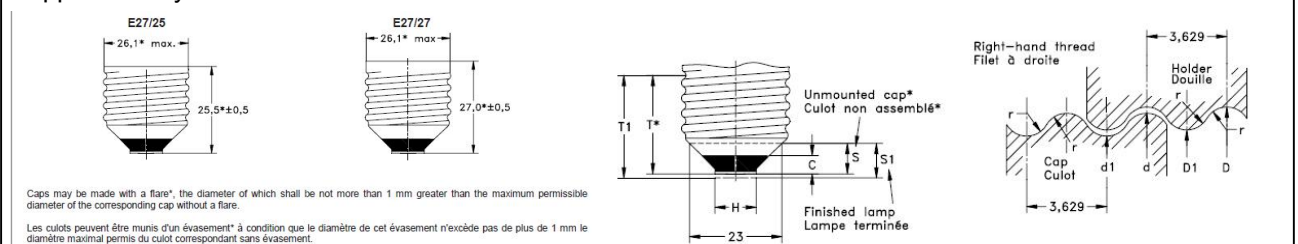


Attachment No.4

| IEC 60061-1:2018 and IEC 60061-3:2018 | | | |
|---------------------------------------|--------------------|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |

Cap Interchangeability

| | | | | | |
|----------------------------|------------------------|------------|-------|------------------|-------|
| Cap type..... | | E27 | | | |
| Used sheet of IEC 60061-1: | | 7004-21-10 | | | |
| Tested quantity..... | | 3pcs | | | |
| Dimensions | Measured values (mm) | | | Requirement (mm) | |
| | Caps on finished lamps | | | | |
| | 1# | 2# | 3# | Min. | Max. |
| C | 5.2 | 5.1 | 5.1 | (5) | -- |
| H | 9.84 | 9.86 | 9.85 | 4.8(6) | 11.5 |
| S1 | 7.83 | 7.86 | 7.84 | 7.0 | 8.5 |
| T1(3) | 22.13 | 22.14 | 22.13 | 22.0 | - |
| d | 26.07 | 26.08 | 26.07 | 26.05 | 26.45 |
| d1 | 24.19 | 24.18 | 24.20 | -- | 24.26 |

Supplementary information:

| Gauge | | |
|---|---|---------|
| Cap type..... | E27 | |
| Gauges used according to the sheets of IEC 60061-3: | 7006-28A; 7006-27B; 7006-27C 7006-50 and 7006-51A for E27 cap | |
| Tested quantity | 3pcs. | |
| Model | Gauge | Verdict |
| | 7006-27B (max. dimension of the screw thread) | P |
| | 7006-28A (min. major diameter of the screw) | P |
| | 7006-27C (dimension S1) | P |
| | 7006-50 (contact marking) | P |
| | 7006-51A (for clause 7) | P |

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Attachment No.5

Photo Documentation

View:
Model:
SlampherR2

☒General
☐Front
☐Rear
☐Internal
☐Top
☐Bottom
☐PWB



Figure 1

View:

☒General
☐Front
☐Rear
☐Internal
☐Top
☐Bottom
☐PWB



Figure 2

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Attachment No.5

Photo Documentation

View:

- ☒ General
- ☐ Front
- ☐ Rear
- ☐ Internal
- ☐ Top
- ☐ Bottom
- ☐ PWB

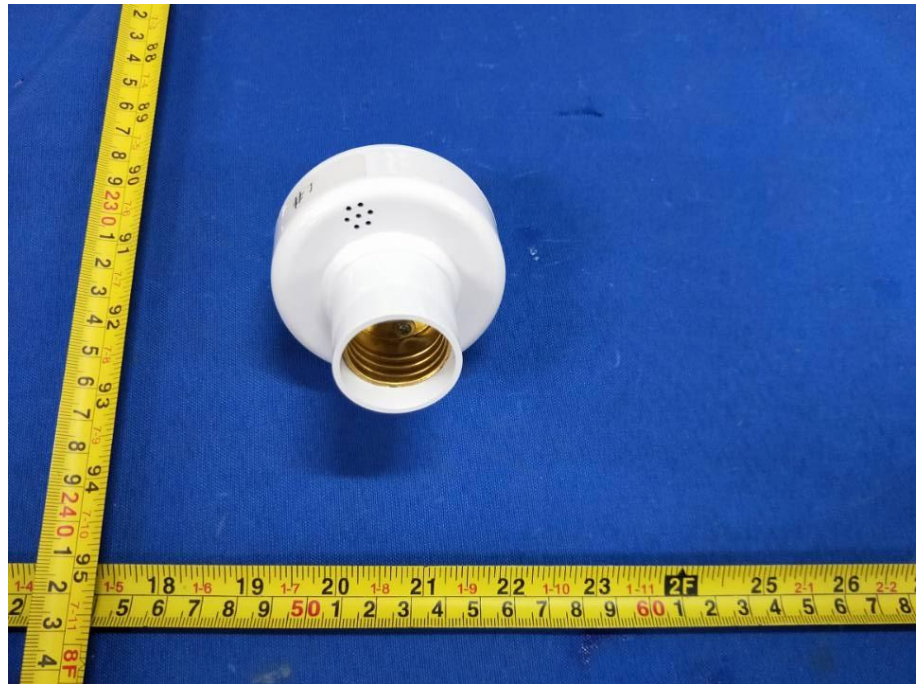


Figure 3

View:

- ☐ General
- ☐ Front
- ☐ Rear
- ☒ Internal
- ☐ Top
- ☐ Bottom
- ☐ PWB

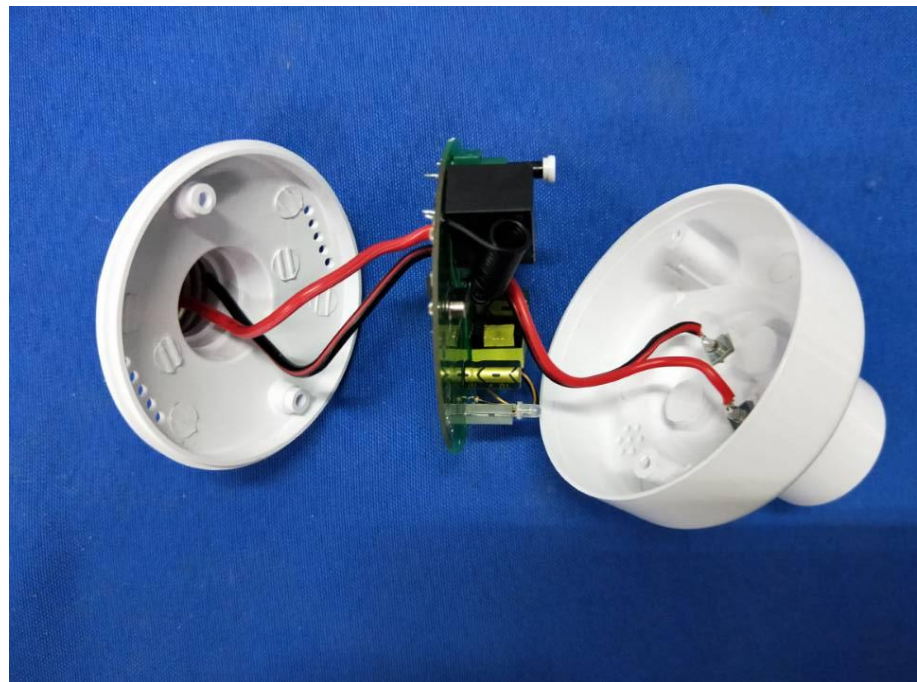


Figure 4

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Attachment No.5

Photo Documentation

View:

- ☐ General
- ☐ Front
- ☐ Rear
- ☐ Internal
- ☐ Top
- ☐ Bottom
- ☒ PWB

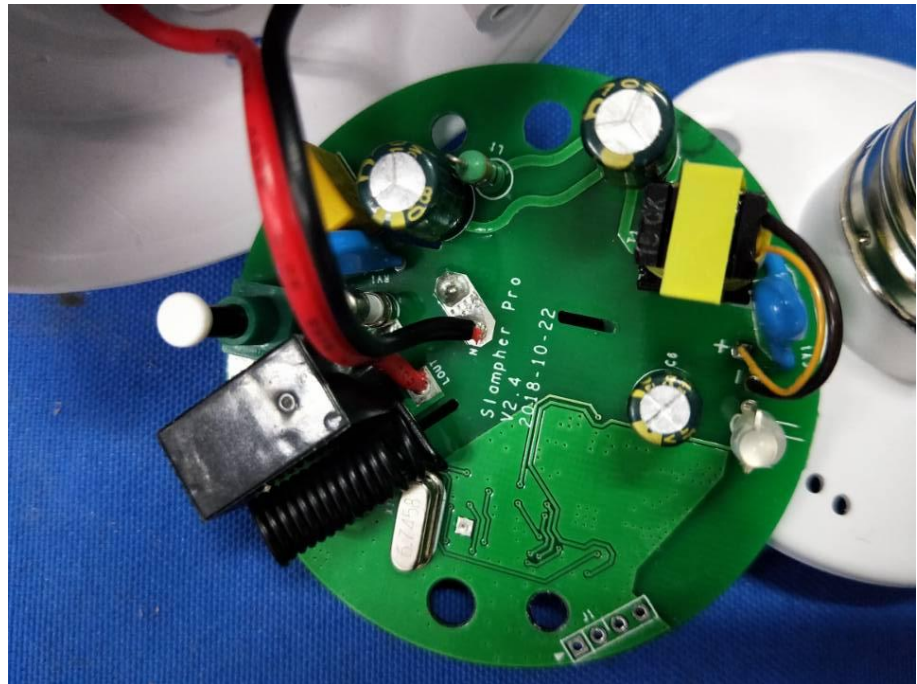


Figure 5

View:

- ☐ General
- ☐ Front
- ☐ Rear
- ☐ Internal
- ☐ Top
- ☐ Bottom
- ☒ PWB

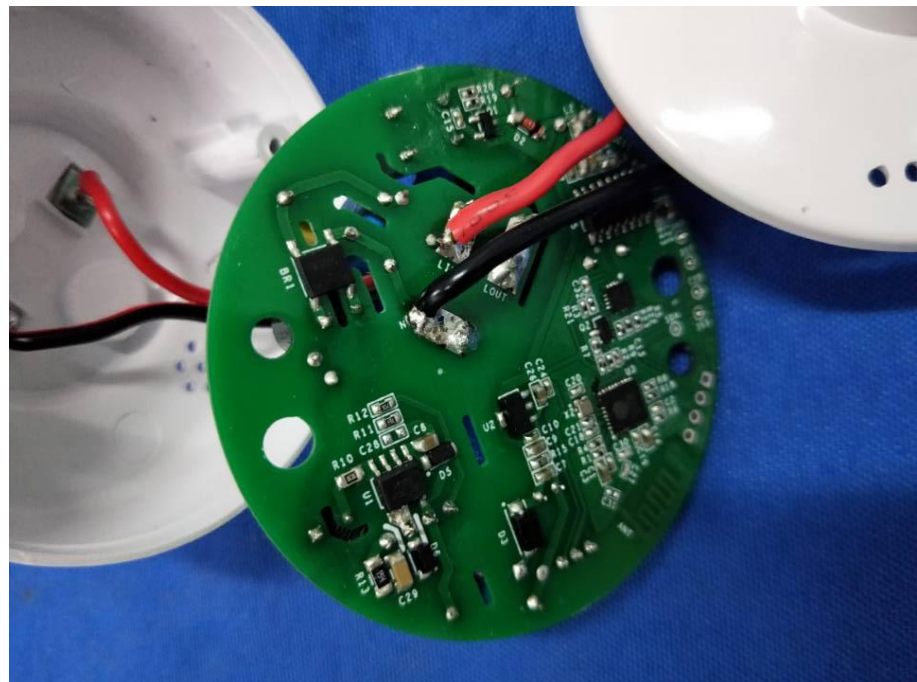


Figure 6

-----End of Test Report-----

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